

Milestone Report

for Upland Source Control at the Portland Harbor Superfund Site

April 2009

Prepared by the Oregon Department of Environmental Quality



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Quality

This document is posted on DEQ's web page at
<http://www.deq.state.or.us/lq/cu/nwr/PortlandHarbor/jointsource.htm>.

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Table 1. Controlling Confirmed or Suspected Upland Sources of Contamination to
Portland Harbor

Table 2. Status of High Priority Sites

Figure 1-a-c. Land Zoning and Ownership

1.0 Introduction

On December 1, 2000, a section of the lower Willamette River within the City of Portland, the Portland Harbor, was added to the Superfund National Priority List (NPL). In February 2001, the Oregon Department of Environmental Quality (DEQ), United States Environmental Protection Agency (EPA), and other governmental parties¹ signed a Memorandum of Understanding (MOU) that provided a framework for cooperation in the investigation and cleanup of the Portland Harbor Superfund Site to optimize federal, state, tribal and trustee expertise and available resources.

Under the 2001 MOU, EPA was designated as the Lead Agency for investigating and cleaning up “in-water” contamination in the Harbor, i.e., contamination in the river water and underlying sediment using federal Superfund authorities. DEQ, using state cleanup authority, was designated as the Lead Agency for identifying and controlling “upland” sources of contamination, i.e., those sources of pollution adjacent to or near the river that may be contaminating river water or sediments. To coordinate in-water cleanup and upland source control work, the MOU directed DEQ and EPA to jointly develop a source control strategy that defines a process for identifying and controlling potential sources of contamination threatening the river.

DEQ and EPA finalized the Portland Harbor Joint Source Control Strategy (JSCS) in December 2005². The overarching goal of the JSCS is to identify, evaluate and control sources of contamination that may affect the Willamette River in coordination with the objectives and schedule for the Portland Harbor remedial investigation and feasibility study (RI/FS). Upland source control is necessary to allow cleanup of the river to proceed without risk of significant recontamination. DEQ is currently implementing the JSCS in the Portland Harbor Superfund Site study area – approximately River Mile 1 to River Mile 11.8³.

The JSCS requires DEQ to prepare a Milestone Report on a quarterly basis that summarizes the status of DEQ’s upland source control work. The report submittal schedule has been changed to bi-yearly. This is the seventh Milestone Report. Milestone Reports are submitted to EPA, and provide the basis for potential meetings with EPA and our government partners to discuss site prioritization and source control progress. These reports also serve as documentation of progress on river-wide source control within Portland Harbor.

1.1 Organization of the Milestone Report

The Milestone Report is organized as follows.

¹ The signatory partners to the MOU include the EPA, DEQ, Confederated Tribes and Bands of the Yakama Nation, Confederated Tribes of the Grand Ronde Community of Oregon, Confederated Tribes of Siletz Indians, Confederated Tribes of the Umatilla Indian Reservation, Confederated Tribes of the Warm Springs Reservation of Oregon, Nez Perce Tribe, National Oceanic and Atmospheric Administration, Oregon Department of Fish and Wildlife, and U.S. Department of the Interior.

² The JSCS is available on DEQ’s web site at <http://www.deq.state.or.us/lq/cu/nwr/PortlandHarbor/jointsource.htm> click “Joint Source Control Strategy” on the left side bar.

³ “River Mile” indicates the distance from the Willamette River’s confluence with the Columbia River (i.e., River Mile 11.8 is 11.8 miles upstream of the confluence).

- Section 2.0: Identifying Potential Sources of Contamination in Portland Harbor – This section describes DEQ’s work to identify potential sources of contamination to the Willamette River in Portland Harbor, including site discovery and site assessment activities.
- Section 3.0: Evaluating Potential Sources of Contamination to the River – This section describes DEQ’s status and schedule for the evaluation of all confirmed or suspected upland sources of contamination to Portland Harbor, as summarized in Table 1.
- Section 4.0: Taking Measures to Control Sources and Making Source Control Decisions – This section describes the source control measures used at upland sites in Portland Harbor and the process for making source control decisions, including coordination with EPA and our government partners, and public involvement opportunities. Source control measures and decisions are summarized in Table 1.
- Section 5.0: Status of Ongoing and Completed Source Control Activities – This section describes the information presented in Table 1 that summarizes the status of ongoing and completed source control measures. This section also describes the specific status of the 16 High Priority and Preliminary High Priority sites (Table 2). This section also presents five specific source control goals designed to help DEQ focus our efforts to achieve the overarching goal of source control.
- Section 6.0: Issues Encountered in Source Control Work – This section describes issues affecting DEQ’s ability to conduct source control work and identifies paths forward towards resolution.
- Section 7.0: Summary – This section summarizes the overall status of source control work in Portland Harbor, highlighting accomplishments, key issues and next steps for moving forward.
- Section 8.0: Obtaining Additional Information on Upland Source Control Work – This section indicates where additional information can be found on the status of source control work at upland sites in Portland Harbor.
- Section 9.0: Information on Table 1: Controlling Confirmed or Suspected Upland Sources of Contamination to Portland Harbor – This section provides helpful information for interpreting Table 1, including definition of key terms and acronyms used.

2.0 Identifying Potential Sources of Contamination in Portland Harbor

DEQ’s strategy for identifying and investigating potential sources of contamination to Portland Harbor prior to the December 2000 Superfund Site listing was described in the March 2006 Milestone Report. Those site identification and investigation activities were initially focused on a six-mile stretch of the lower Willamette River (now known as the Initial Study Area) extending from the southern tip of Sauvie Island upstream to Swan Island, from approximately River Mile 3.5 to River Mile 9.2. For more information, please see the March 2006 Milestone Report at www.deq.state.or.us/lq/cu/nwr/PortlandHarbor/jointsource.htm.

2.1 Recent Site Discovery and Site Assessment activities

As the Portland Harbor study area grew to include nearly an 11-mile stretch of the lower Willamette River extending from River Mile 1 to River Mile 11.8, DEQ's site discovery and site assessment efforts have expanded with it.

DEQ focused our recent site discovery and site assessment work on identifying potential sources of contamination threatening the river through stormwater that is piped to the river from surrounding upland areas. As described below, a number of stormwater data collection efforts were completed or are being conducted, and are being used by DEQ to target our source identification efforts.

City of Portland Municipal Stormwater System

DEQ is working closely with the City of Portland to identify upland sources contributing contamination via both the City's municipal stormwater system and private stormwater systems. The City continues its efforts to identify potential sources of contaminants by collecting solids and/or stormwater samples from stormwater pipes from select locations within their stormwater system. In the past, DEQ used this type of information within Outfall Basin 18 (a high priority outfall basin based on Round 2 river sediment data) to identify at least two new sites (Wilhelm Trucking and Container Management) that have entered DEQ's Cleanup Program and will complete stormwater investigations and source control measures. During the 2007-2008 rain season, the City targeted two areas for additional data collection. One is the Outfall 18 basin, where the City installed in-line sediment traps in several strategic locations to provide additional information to aid in source/site identification. The Outfall 18 basin is a complex basin with a long history of heavy industry, and there is still uncertainty as to whether all sources have been identified.

River Mile 11-East Focused Stormwater Investigation

Round 3 Portland Harbor sediment data collected by the Lower Willamette Group identified sediments contaminated by polychlorinated biphenyls (PCBs) in the River Mile (RM) 11-11.8 east area. Our current conceptual model is that the sediment contamination is largely due to past releases from historic operations in the area, but that current stormwater and bank erosion pathways may still exist. The City is implementing a sampling plan in three outfall basins on the east side of the river between RM 11 and 11.8 (Outfalls 43, 44, and 44A). This is part of a comprehensive source identification effort in the area that DEQ initiated in 2008. DEQ is also working with PacifiCorp to evaluate whether source control measures at their sites in this area will be needed.

Other Source Investigations

DEQ and the City are beginning to review stormwater and solids data collected by the City from other outfall basins in 2007 and 2008. To date, two outfall basins were determined to be areas where additional source identification may be warranted (Outfall 53A and Outfall 52). In both instances, it is a result of finding PCB concentrations that were higher than expected based upon our understanding of historical and current land uses in those areas. DEQ and the City are working together to undertake additional source control identification work in these basins.

Lower Willamette Group (LWG) Stormwater Sampling

The LWG completed an extensive Portland Harbor stormwater sampling effort in 2007-2008 to provide data for evaluating the potential risk related to in-river fish tissue chemical burdens and sediment recontamination potential from stormwater discharges to the river. The LWG obtained stormwater information from 31 locations in Portland Harbor. The sampling rationale involves using “representative” estimates of stormwater chemical concentrations for various land-use types, and using a land-use-based chemical load modeling approach to estimate stormwater loads across the entire Site.

The stormwater and sediment trap data generated from the LWG’s 2007-2008 sampling efforts are currently being evaluated and used to develop average contaminant concentrations for different types of land uses. The results should be available for review later this year. The land-use concentrations are expected to be used in modeling efforts associated with the Portland Harbor Feasibility Study. In a coarse sense, the results may also serve as a tool for gauging whether contaminant concentrations from a specific location are higher or lower than what might be expected for that land use.

While the primary objective of this data collection effort was to develop generic contaminant loading rates for land-use categories, DEQ will be able to use the data collected at individual sampling locations to augment our source control investigations at these sites, and to help target and prioritize our source identification activities harbor-wide. Evaluating and controlling stormwater inputs into the Harbor will continue to be a focus for DEQ in the years to come.

2.2 Downtown Portland Willamette River Sediment Investigation

DEQ is working with the City of Portland and other partners to investigate sediment quality in the Willamette River upstream of the Portland Harbor in downtown Portland. The purpose of the investigation is to supplement the existing limited sediment quality data, and to gain a better understanding of the nature and extent of hazardous substances in the downtown reach. The investigation collected surface sediment and/or cores samples from nearly 80 locations. Samples were analyzed for the wide variety of contaminants.

Investigation results will be used to help assess area-wide sediment conditions, the potential threat of recontamination downtown reach sediment poses to Portland Harbor, and identification of sources of contamination for sediment. If environmental problems are identified, effective remedies will be implemented to control sources and cleanup significant sediment contamination.

The field work for the downtown reach sediment investigation was completed in June 2008. A final data summary report, titled “*Field and Data Report, Downtown Portland Sediment Characterization*” was submitted in January 2009. That report can be reviewed at <http://www.deq.state.or.us/lq/cu/nwr/willametteriver.htm>

DEQ will evaluate the summary report and recommend the next steps as appropriate to manage contamination found in river sediment and any associated uncontrolled sources to the river.

3.0 Evaluating Potential Sources of Contamination to the River

DEQ is investigating or directing source control work at over 60 upland sites in Portland Harbor. Preliminary investigation activities at these sites are designed to determine whether the site is a potential or ongoing source of contamination to the river. These investigations, or “source control evaluations,” consider all potential, current and historic contaminant sources and pathways for the contaminants to migrate to the river. Potential pathways include:

- Direct discharges – Pollutants from commercial, industrial, private or municipal outfalls are being discharged directly to the Portland Harbor Superfund Site. Many of these discharges are permitted (general or individual permits) under the Clean Water Act National Pollutant Discharge Elimination System (NPDES). Permitted discharges include industrial wastes, stormwater runoff, and combined sewer overflows (CSOs)⁴.
- Groundwater – Contaminated groundwater may enter the river directly via discharge through sediments, bank seeps, or it may infiltrate into storm drains/pipes, ditches or creeks that discharge to the river. Contaminant migration may occur as non-aqueous phase liquids (NAPLs) or as chemicals dissolved in the groundwater itself.
- Stormwater – Contaminants may be carried to the river by water that runs off a site into storm drains after it rains, delivered to the river by stormwater pipes (including permitted and unpermitted stormwater discharges).
- Overland transport/sheet flow – The uncontrolled flow of water from a site to the river and the transport of other materials from a site may deliver contaminants to the river.
- Bank erosion/leaching – River bank soil, contaminated fill, waste piles, landfills and surface impoundments may release contaminants directly to the river through erosion, via soil erosion to stormwater, or by leaching to groundwater.
- Overwater activities – Contaminants from overwater activities (e.g., sandblasting, painting, unloading, maintenance, repair and operations) at riverside docks, wharves, or piers; discharges from vessels (e.g., gray, bilge, ballast waters); full releases; and spills may affect the river.

These potential contaminant migration pathways are evaluated for each site, and upland contaminant concentrations are screened against conservative screening level values (SLVs) protective of human health and the environment. Sites that are identified as significant current or potential sources of pollution to the river are characterized and prioritized. Based on the resulting priority, either further source control evaluation is completed or source control measures are initiated.

Table 1 provides a summary of confirmed and suspected upland sources of contamination to the river that DEQ is either actively working on or has finished source control work on by issuing a

⁴ CSO events are untreated discharges of combined stormwater, sanitary sewage from residential, commercial, and industrial sources that overflow from the sewer system into the river during heavy rainfall periods when the amount of stormwater and sewage exceeds the capacity of the collection system.

final source control decision. Table 1 also provides the basis for the determination that a site is a source of contamination to the river, the status of and schedule for source control evaluation, and the priority of the site for source control. The table includes the priority of each contaminant migration pathway for each site, as well as the overall priority of the site based on the pathway priorities.

High priority sites are identified in the table based on existing site information, and subsequent Milestone Reports will identify any new high priority sites as new information becomes available. Source control is expected to move forward at high priority sites without delay.

4.0 Taking Measures to Control Sources and Making Source Control Decisions

DEQ determines the need for source control measures at each upland site, in consultation with EPA, based on the completeness of contaminant migration pathways, exceedances of SLV, and other factors as appropriate. See p. 3-1 through 3-6 of the JSCS for more information about SLVs, and p. 4-1 through 4-10 of the JSCS for more information about the source control decision process.

4.1 Types of source control measures

Upland source control is an iterative process, where early steps may be revisited and conclusions refined by information gathered later in the process. A combination of tools may be used to control a source, including but not limited to the following.

- Technical assistance – Technical assistance, often provided during inspections, provides technical information designed to help individual businesses bring their facilities into compliance with environmental regulations. DEQ’s Hazardous Waste Program has and continues to provide technical assistance to facilities within the Portland Harbor Superfund Site area.
- Cleaning-up contaminated upland areas – Cleanup work addresses contaminated soil, groundwater, stormwater and other sources and focuses on reducing or eliminating contaminant migration to the river. Common source control measures include removing highly contaminated soil areas, stabilizing or capping contaminated bank areas, treating or containing contaminated groundwater, and extracting contaminated sediment from storm sewer systems. Source control measures vary from site to site.
- Source control of active discharges – Tools to control active discharges include best management practices (BMPs), industrial process changes, pollution prevention practices, and technology-based effluent controls. Compliance is achieved voluntarily or through administrative actions, including permits or enforcement.
- Source control of stormwater – Stormwater source control is complex because storm drain systems capture discharges from many different sources (e.g., land use activities, runoff from contaminated sites, and infiltration of contaminated groundwater into the storm drain system). Stormwater regulation also involves state and local agencies implementing MS4 and 1200Z general stormwater permits. Because of this complexity, all of the tools described above are useful for stormwater source control and will be used as appropriate.

- Administrative actions and enforcement – Administrative actions include licenses, permits, deed restrictions, requirements for site development plans, and enforcement actions, which may be necessary when administrative actions are violated. Agencies rarely take enforcement actions without first conducting an inspection and documenting findings, requested changes, warnings and offers of technical assistance. When enforcement actions are warranted, they are usually taken in escalating order, starting with notices of violation, moving to enforcement or compliance orders requiring specific changes by a set date, and ending with monetary penalties, court action or DEQ's takeover of investigation or cleanup work. Formal cleanup actions performed under an order or decree use oversight and enforcement to ensure that appropriate actions are taken in a timely manner.

Table 1 summarizes source control decisions conducted at upland sites, the basis for the determination that upland source control measures are necessary, a summary of the selected source control measure(s), and a schedule for implementing the source control measure(s). Figure 1-a-c displays most sites listed in Table 1.

4.2 DEQ coordination with EPA and partners on source control decisions

As the Lead Agency for identifying and controlling sources of upland contamination threatening the river in Portland Harbor, DEQ coordinates with EPA and our government partners on source control work. This includes documenting, tracking and coordinating source control efforts as described in Sections 2.5 and 7 of the JSCS.

DEQ will provide EPA and our partners an opportunity to review and comment on source control decisions prior to being finalized. These decisions typically fall into the following three categories.

- DEQ determined that a site is not a current or future significant source of contaminants to Portland Harbor and that no source control measures are required.
- DEQ selected the source control measures for a site.
- DEQ concluded that source control at a site is complete, or in the case of systems that require operation and maintenance (e.g., hydraulic containment), that the source control action is effective.

DEQ will inform EPA and our partners of pending source control decisions and the schedule for review, and will provide copies of source control decision documentation to EPA and partners upon request. EPA and partners will have 30 days to provide comments to DEQ on source control decisions.

In addition to this regular review and comment process, some upland sites in Portland Harbor may warrant closer coordination between DEQ, EPA, and our partners for source control (e.g., the Gasco site and potential source control measures for the chlorinated solvent groundwater plume at the Siltronic site). In these instances, DEQ and EPA source control coordinators will develop project-specific coordination strategies.

4.3 Public involvement in source control decisions

DEQ Cleanup Program statutes and rules require that a public notice and comment opportunity be provided prior to DEQ's selection of a final site cleanup remedy and before DEQ determines

that the cleanup is complete. For upland Portland Harbor cleanup projects, this means that DEQ issues a public notice and seeks public comments on the recommended final site cleanup strategy. Once public input is considered, DEQ's final decision is typically documented in a Record of Decision (ROD) for the site. For most sites, the upland DEQ ROD includes elements that address both source control for Portland Harbor and cleanup actions specific to areas of upland contamination that are not related to pollution in the Harbor.

Many of the source control measures implemented at upland sites are conducted prior to the selection of the final upland site-wide remedy. While public notice and comment is not required for these "interim" removal actions under DEQ statutes and rules, DEQ typically issues a public notice and seeks public comments when the action is likely to be a substantive piece of the final site remedy, or as the DEQ project manager determines is appropriate.

DEQ does not typically seek public comments for small-scale interim source control measures and time critical actions. Project managers will, however, issue notices as appropriate to let the public know that the activity is being conducted.

5.0 Status of Ongoing and Completed Source Control Activities

Table 1 summarizes the status of ongoing source control activities; including source control evaluations (SCEs), source control decisions (SCDs), and source control measures (SCMs). Table 1 also provides information on source control activities completed to date, proposed SCM activities, and a target schedule for completion. To the extent practicable, DEQ has collected information and/or made estimates of the mass or volume of contaminants removed, contained, treated or otherwise controlled, to help demonstrate the progress of source control activities.

Table 1 also summarizes completed SCMs and provides the date that the SCM was completed, the date of EPA review and comment, and any operation and maintenance requirements associated with the SCM.

As of April 2009, the DEQ categorized 84 sites (see Table 1) into the following source control categories:

- High Priority Sites**- 8
- Preliminary High Priority Sites**- 8
- Medium Priority Sites**- 13
- Low Priority Sites**- 22
- Priority "To Be Determined" Sites**- 11
- Sites with Source Control Decisions**- 22

The status of High Priority and Preliminary High Priority sites is presented in Table 2. Eleven of the 16 High Priority sites currently have at least interim SCMs in place. Some of the more important actions in-place or anticipated at the High Priority sites include:

- Oregon Steel Mills**- Two separate source control efforts are moving forward at the SOM site. 1st, an end-of-pipe stormwater treatment pilot has been operating since October 2007. The treatment system is currently being optimized and plans are being finalized to evaluate stormwater loading in 2009-2010. 2nd, riverbank treatment source control

measures are in re-design largely to resolve stakeholder concerns regarding mitigation, habitat conservation and restoration, and to incorporate bioengineering components.

Final bankline source control measures are anticipated to be constructed in summer 2010.

- Schnitzer Steel**- Schnitzer Steel proposed a stormwater management plan in fall 2008. The plan will provide comprehensive management of stormwater including collecting stormwater from most of the site, storing the stormwater, physically treating the stormwater, reusing much of the stormwater for on-site process water in their auto shredder, and discharging excess stormwater thru sand filters and a manifold outfall via their 1200Z permit. Schnitzer plans to begin construction of the stormwater system in summer 2009.
- Arco/BP**- A new permanent seawall sheetpile wall was installed in summer 2007. The sheetpile wall will enhance existing hydraulic control of contaminated groundwater. A riverbank soil and near-shore sediment removal and capping completed in fall 2008. Approximately 13,000 cy of petroleum-contaminated soil/sediment removed and shipped offsite for disposal. The project will be completed in summer 2009 by removing the in-river temporary sheetpile wall, final site grading, and planting.
- Gasco**- A Focused Feasibility Study (FFS) was submitted October 2007 for a groundwater NAPL SCM. DEQ selected a vertical barrier wall/extraction well as the SCM. NW Natural completed several, and is completing several more, studies and pilot tests to support design of the SCM. A 60% design report is due in June 2009, and SCM construction is scheduled to begin in late-2009 or early-2010.
- Siltronics**- An FFS submitted October 2007 recommending an enhanced in-situ bioremediation (EIB) SCM for their chlorinated solvent groundwater plume. DEQ selected EIB to be applied in the release area. Siltronic applied EIB in fall 2008, has recently expanded the EIB application area, and is currently monitoring initial results from the SCM.
- Arkema**- Arkema is working on three separate upland source control efforts at their site. 1st, Arkema submitted an FFS for groundwater/NAPL in summer 2008. DEQ proposed selecting a slurry wall/extraction well as the SCM. DEQ's proposed selection is currently out to Public Review. 2nd, Arkema submitted a stormwater FFS in summer 2008, DEQ expects to select a stormwater SCM in 2009, and then have Arkema construct the stormwater SCM in 2010. The focus for site stormwater management has been planning for an entirely new system which will result in the abandonment (grouting) of the old system. 3rd, Arkema evaluated their riverbank and the threat that portion of the site poses to the river. Riverbank source control will likely be incorporated into the EPA-lead in-water Early Action at Arkema. Arkema will evaluate riverbank SCM options in 2009.
- Rhone-Poulenc**- The responsible party at Rhone Poulenc, SLLI, is working on three major upland source control/evaluation efforts at their site. 1st, SLLI submitted a comprehensive SCE report in early-2008, DEQ reviewed the report, SLLI will revise the report after collecting additional hydrogeologic information to inform the conceptual site model, and submit the revised report in late-2009.. 2nd, SLLI pilot tested several SCMs to treat and/or control their most significant groundwater plume threatening the river. SLLI is currently conducting an extensive groundwater pumping test to support the design of their North Front Avenue SCM which targets contaminated groundwater moving in the highly conductive deep gravel zone. SLLI proposes groundwater pump and treat as the North Front Avenue SCM. 3rd, SLLI removed accumulated sediment from Outfall 22B

stormwater lines and grouted the lines to at least partially prevent contaminated groundwater from invading the lines. SLLI now plans to install impermeable liners in the stormwater lines to further prevent groundwater invasion. In addition to these three ongoing source control efforts, SLLI: 1) spent two field seasons removing drums and debris from the Doane Lake area, 2) completed an on-site Facility Structures Interim Remedial Action Measure (IRAM); and 3) completed the Groundwater Extraction and Treatment System (GETS IRAM) in 2005 designed to capture alluvial zone groundwater in the Herbicide Area.

DEQ developed five specific goals for our source control efforts. These goals will track DEQ source control efforts to achieve the overarching goal of source control: to identify, evaluate and control sources of contamination that may affect the Willamette River in a manner that is consistent with the objectives and schedule for the Portland Harbor RI/FS.

The goals described below are aggressive goals that were based on an anticipated ROD date of 2010. While much progress has been made to reach these goals, some remain outstanding. Some of the reasons these goals have not been achieved include the complexity of the work, work load for both DEQ and upland responsible parties, and obstacles in implementing the work. While all the goals have not been met, DEQ believes these sites remain on-track to achieve source control at the High Priority sites by the time of the Portland Harbor ROD. The Portland Harbor ROD is now anticipated to be completed in late-2012. Dates for the goals below have been adjusted to better reflect the current status and the new anticipated ROD date.

Goals and Status for High Priority Sites

Goal 1- Source Control Evaluations (SCE) completed at all High Priority sites by 1/1/10.

Goal 1 Status as of 4/09

- 2 of 16 SCEs completed
- 7 of 16 SCEs to be completed in 2009
- Of the 6 remaining High Priority sites (16 minus 9) that are either not completed or are not on schedule to be completed by 2009..., stormwater is the only outstanding pathway to be completed in 2 of the 6 sites.

Goal 2- SCMs selected at all High Priority sites by 7/1/10.

Goal 2 Status as of 4/09

- Interim or final SCMs have been selected and have been implemented at 11 of 16 sites. These sites include: 1) Oregon Steel Mills (stormwater), 2) Schnitzer Steel (stormwater), 3) Kinder Morgan Linnton (groundwater), 4) Exxon/Mobil (groundwater), 5) Arco/BP (groundwater), 6) MarCom South (overland runoff), 7) Siltronic (groundwater), 8) Rhone Poulenc (groundwater), 9) Arkema (groundwater), 10) Willbridge (groundwater), and 11) Gunderson (groundwater).
- Selection of SCMs at other High Priority sites is anticipated over the next 6-12 months. For instance, DEQ selected a significant SCM at the Gasco site in March 2008. NW Natural is currently completing field work to support the detailed design of this SCM, a vertical barrier wall/groundwater extraction well system. Another example is the Oregon Steel Mills where the responsible party is negotiating the design of the riverbank treatment with DEQ and our partners.

Goal 3- SCMs constructed and effectively operating at all High Priority sites by 1/1/12.

Goal 3 Status as of 4/09

-4 of 16 sites have effective groundwater SCMs operating. These 4 sites include: 1) Exxon/Mobil, 2) Gunderson, 3) Willbridge, and 4) Arco/BP.

Goals and Status for Medium and Low Priority Sites

Goal 4- SCE completed at all Medium and Low Priority sites by 1/1/11

Goal 4 Status as of 4/09

-While none of the 13 Medium Priority or 22 Low Priority sites currently have completed SCEs, all of the sites are on schedule to be completed in 2011, and many of them before 2011. Stormwater is the only outstanding pathway to be completed for the SCE in 4 of the Medium Priority sites and 7 of the Low Priority sites.

-Interim SCM have been implemented at 18 of 35 Low and Medium Priority sites.

Goals and Status for Priority “To Be Determined (TBD)” Sites

Goal 5- Completed prioritization at all TBD sites by 1/1/10.

Goal 5 Status as of 4/09

-2 of the 11 sites are EPA-lead sites (Vanwaters-&-Rogers & US Moorings).

-9 non-EPA-lead TBD sites are left to be prioritized and they are scheduled to be prioritized in 2009.

6.0 Issues Encountered in Source Control Work

This section summarizes issues affecting DEQ’s complete source control work. This section also presents the steps DEQ is taking to resolve the issues and complete source control work at those sites.

Issue 1: Moving projects through the source control process

Certain DEQ Portland Harbor cleanup projects are not proceeding through the source control process at an acceptable pace. Source control activities at these sites need to be accelerated in order to identify, evaluate and control upland contaminant sources before the Portland Harbor Record of Decision (ROD).

To resolve this issue, DEQ first identified these sites and then worked to accelerate their schedules for source control efforts. DEQ identified following sites in the March 2006 Milestone Report, and these sites remain a high priority for accelerated source control. Below is a summary of the status of each site.

- **Schnitzer Steel**

Problem: The responsible party (RP) implemented a number of stormwater upgrades and best management practices over the last several years, but site characterization/source control evaluation needs to be completed. Furthermore, recent LWG stormwater sampling at the Schnitzer Steel area indicates high levels of PCBs in stormwater. Schnitzer submitted a draft RI report, but the stormwater pathway still needs to be evaluated.

Path to resolving: Schnitzer needs to complete a full Source Control Evaluation for their property. Note that we separated the Schnitzer Steel site from the Schnitzer Burgard Industrial Park site in this Milestone Report.

Progress made since September 2008 Milestone Report: Schnitzer submitted a draft Source Control Evaluation report in 4/07. Significant additional SCE is needed. DEQ expects a comprehensive SCE to be submitted in 2010. As described in Section 5 of this report, Schnitzer Steel proposed a comprehensive new stormwater management plan in fall 2008. The plan includes collecting stormwater from most of the site, storing the stormwater, physically treating the stormwater, reusing much of the stormwater for on-site process water in their auto shredder, and discharging excess stormwater thru sand filters and a manifold outfall via their 1200Z permit.

- **GS Roofing**

Problem: The DEQ project manager overseeing work at GS Roofing left DEQ in 2007, and the vacant position was not filled in a timely manner due to agency budget constraints. This has affected the progress of source control work at the site.

Path to Resolving: DEQ made GS Roofing site a priority for staffing and accelerated source control work. GS Roofing conducted independent investigations of the facility. The next step in the project is for DEQ to review this information and provide direction regarding what additional work is required and a schedule for this work.

Progress made since September 2008 Milestone Report: DEQ recently assigned a new project team to the GS Roofing site. The responsible party is finalizing a stormwater investigation plan for sampling in 2009.

Issue 2: Completing source control at the Gasco site

NW Natural's Gasco site (which includes NW Natural's manufactured gas plant contamination on the Siltronic site) is a High Priority site for upland source control. The distribution and magnitude of upland contamination at the Gasco site is extensive and very significant. DEQ directed NW Natural to collect data to support the selection, design, installation and operation of source control measures, rather than conducting further source control evaluation. NW Natural and DEQ agreed to a schedule for a phased approach to design and implementation of source control measures by 2008. While the actual construction of the SCM has been delayed until late 2009 or early 2010, NW Natural continues to move forward with recent work that supports source control planning and design along the shoreline of the Gasco and Siltronic properties, including the following:

- NW Natural submitted a draft Groundwater/NAPL Focused Feasibility Study (FFS) for upland source control in fall 2007. DEQ approved the FFS in concept in 3/08. DEQ selected a combination vertical barrier wall and groundwater extraction system in Segment 1, the main portion of the manufactured gas plant (MGP) waste.
- NW Natural completed the field work for a Vibration Analysis Study which assessed potential impacts to the neighboring Siltronic's operations from different source control construction methods and configurations. The results of the Vibration Analysis Study are currently being evaluated. DEQ also directed NW Natural to complete a DNAPL Mobility Study in the source control area. Both studies will be used in the design of the combination well/wall SCM.
- Evaluation of groundwater hydraulic containment and groundwater treatment designs.

- Implementation of a DEQ-approved work plan to complete the characterization of impacts associated with the historical manufactured gas plant activities on the Siltronic property.

Issue 3: DEQ staff resource limitations

Limited staff resources have affected DEQ's ability to conduct and complete source control work in Portland Harbor. Over the last 2 years DEQ hired four new project managers to work on Portland Harbor projects and other projects. We also recently hired a DEQ Cleanup Program GIS Coordinator to help with both state-wide and Portland Harbor needs, and hired an experienced Project Manager to manage the Gunderson project.

DEQ is continually looking at staff work load and developing priorities to address the most important work. DEQ will continue Portland Harbor source control efforts focusing on the most significant and potentially significant upland sources.

Issue 4: Stormwater evaluation and control

Stormwater evaluations are either underway, completed, or judged not needed at approximately 90 Portland Harbor sites; and approximately 20 additional sites are expected to begin stormwater evaluations within the next year. This includes several upland sites and City outfalls in the vicinity of RM 11 on the east side of the river. This area came to DEQ's attention as a result of Round 3 sediment sampling efforts that detected elevated PCB concentrations in river sediment in this area. In addition, DEQ is working with the City on various site discovery and source identification efforts to determine whether there may be additional sites in the harbor that also warrant some level of stormwater evaluation and control. At present, DEQ identified approximately 10 sites that will be given further consideration.

To support our stormwater evaluation efforts, DEQ drafted and finalized a guidance document in 1/09 that provides direction to DEQ project managers on making source control decisions for the stormwater pathway at cleanup sites. The guidance ("*Guidance for Evaluating the Stormwater Pathway at Upland Sites*") also includes appendices aimed at providing responsible parties with clear instructions for conducting the evaluation in a manner that will meet DEQ's expectations. The guidance can be found at:

<http://www.deq.state.or.us/lq/cu/stmwtrguidance.htm>

DEQ is also drafting an overall strategy for addressing stormwater in Portland Harbor. DEQ met with EPA several times in 2008 to present the strategy's framework and discuss how preliminary modeling results support the strategy. There are plans to continue this conversation in the future. DEQ hopes to receive EPA's support for the strategy so that DEQ and Portland Harbor responsible parties can continue to implement stormwater source control with confidence and consistent with anticipated Portland Harbor ROD and long-term goals for the river in this area.

DEQ anticipates that the strategy will include an evaluation of existing stormwater permits (e.g., NPDES 1200Z general stormwater permits and NPDES municipal stormwater permits) to determine whether it is appropriate to establish a new general permit for the Portland Harbor area similar to the 1200COLS permit for the Columbia Slough area. Such a permit would be

designed to address specific risks from stormwater in the Portland Harbor area. DEQ's Cleanup Program is discussing this issue with our Water Quality Program to determine how an evaluation could be conducted and, if necessary, how the two programs would work together to adopt new or revised permits.

Finally, DEQ is working with EPA and other partners to reach agreement on the methodology for developing land-use loading rates using the stormwater data collected by the LWG over the past two years. The loading rates are intended to be used in the LWG's modeling efforts for the Portland Harbor risk assessment to help understand the impacts of the stormwater and other contaminant sources on sediment, surface water, and fish tissue.

7.0 Summary

DEQ is making significant progress in controlling sources of contamination to the lower Willamette River in Portland Harbor, and is coordinating resources of its Cleanup, Hazardous and Solid Waste, Water Quality and Spills Programs to achieve upland source control objectives by the expected time of the Portland Harbor Record of Decision or shortly after. To date, DEQ has identified more than 80 upland sites that may be potential sources of contaminants in Portland Harbor, and most of these sites have been prioritized for additional investigation or source control. Additionally, DEQ evaluated a number of sites in our site discovery process throughout the Portland Harbor project and concluded these sites do not threaten the river.

As of April 2009, the DEQ categorized 84 sites (see Table 1) into the following source control categories:

High Priority Sites- 8

Preliminary High Priority Sites- 8

Medium Priority Sites- 13

Low Priority Sites- 22

Priority To Be Determined Sites- 11

Sites with Source Control Decisions- 22

DEQ will submit a Milestone Report to EPA twice a year, with the next Milestone Report scheduled for October 2009, and update Table 1 and Table 2 with the current status of source control work at all upland sites. For more information about the Milestone Report or DEQ's source control work generally, please contact Jim Anderson, DEQ Portland Harbor Project Manager, at (503) 229-6825, or anderson.jim@deq.state.or.us.

8.0 Obtaining Additional Information on Upland Source Control Work

For more information on DEQ's source control work at any of the sites listed in Table 1, see DEQ's Portland Harbor web page (<http://www.deq.state.or.us/lq/cu/nwr/PortlandHarbor/index.htm>) and click on "Upland Sites map" in the right hand corner. This link provides a map showing all Portland Harbor upland sites and summary reports of the status of source control work. Just open the map and click on the site you are interested in to connect to DEQ's Environmental Cleanup Site Information (ESCI) database, which houses current information on work at each site.

Alternatively, contact the DEQ project manager (PM) that is leading work on the site you are interested in. Contact information for each DEQ PM is listed on the last page of this report.

For more information on the status work on the Portland Harbor Superfund Site, see EPA's Portland Harbor web page (<http://yosemite.epa.gov/r10/cleanup.nsf/sites/ptldharbor>).

9.0 Information about Table 1: Controlling Confirmed or Suspected Upland Sources of Contamination to Portland Harbor

The purpose of Table 1, entitled Controlling Confirmed or Suspected Upland Sources of Contamination to Portland Harbor, is to track and share information on the status of DEQ's efforts to evaluate and control sources of pollution to the Willamette River in Portland Harbor. The table provides information on each upland site that DEQ is working on in the Harbor, including the status of evaluations to determine whether source control is needed, the progress of source control measures, and the status of source control decisions and EPA review. Below is some helpful information for interpreting the table, including definitions for key terms and acronyms.

Site Information and Project Status

The first columns of Table 1 provide basic background information on each site, including:

- the name of the site,
- the site's reference number for DEQ's Environmental Cleanup Site Information (ECSI) database,
- the location of the site (river mile and address),
- the DEQ project manager that is leading source control work,
- the type of agreement DEQ is using to direct cleanup activities at the site (i.e., Intergovernmental Agreement, Portland Harbor Agreement, Unilateral Order, etc.), and
- the status of work occurring at the site (i.e., Preliminary Assessment, Remedial Investigation, completed Source Control Decision, Remedial Design/Remedial Action, etc.).

Sites are listed in Table 1 based on their position alongside the Willamette River, or the "River Mile" associated with their location. The River Mile indicates distance of the site from the Willamette River's confluence with the Columbia River. Sites associated with a lower river mile occur downstream of sites with a higher river mile.

Sites listed in Table 1 are those in Portland Harbor at which DEQ is actively overseeing upland investigation or source control actions, or for which source control decisions have been made. DEQ updates the site information in ECSI when a Strategy Recommendation is made, but a site is not added to Table 1 until active oversight of the project is provided by DEQ.

Source Control Evaluation

The Source Control Evaluation (SCE) columns in Table 1 provide information on the status of DEQ's work to evaluate the need for source control measures, including the status of SCE for each potential pathway, the schedule for completing SCE, the basis for determining whether source control measures are needed, and the status of EPA review.

Potential pathways

Six standard pathways represent the major potential pathways that contaminants could follow to reach the river from an upland site. These pathways include:

- overland transport/sheet flow – the uncontrolled flow of water and other material to the river from a site
- back erosion – erosion of material within the sloping bank areas of the site to the river
- groundwater – groundwater plumes or discharges to the river via seeps or through preferential pathways
- stormwater – stormwater discharges to the river that originate from a pipe or stormwater system, including unpermitted stormwater discharges and discharges under a DEQ general stormwater permit
- overwater activities – the storage or use of hazardous substances over the water (i.e., storage tanks on docks, permanent work activities conducted over water), that if released would be a potential current or future source of contamination to the river; pipelines and other conveyance systems are not considered in this category, releases from these types of systems are reported to the Oregon Emergency Response System (OERS) system for clean up
- other – may include permitted wastewater discharges, individually permitted stormwater discharges, air deposition or other pathways

Each of these standard pathways appears for each site in Table 1 to track SCE work on a pathway-specific basis.

Basis for determining the need for source control

DEQ evaluates each of the pathways listed above to determine the need for source control measures. DEQ makes this determination based on: (1) whether contaminants are present and whether the pathway is capable of carrying them to the river (if it is, the pathway is called “complete”); and if a complete pathway exists, (2) whether it is carrying contaminants to the river at concentrations that exceed the Screening Level Values (SLVs) provided in the Joint Source Control Strategy (JSCS)⁵.

Three general examples are provided below.

- Example 1: Initial investigations of a site that is adjacent to the river indicate that bank soils have the potential to erode and carrying contaminants into the river. DEQ oversees a SCE to determine whether contaminants are in fact present in the bank soils and whether the eroded bank soils are carrying or could carry those contaminants into the river. The SCE concludes that contaminants are present in the bank soils and the soils are carrying contaminants into the river; the pathway is deemed “complete.” The SCE then determines whether the bank soils are carrying or could carry contaminants to the river at concentrations that exceed the

⁵ See p. 3-1 through 3-6 of the JSCS for more information about SLVs.

SLVs in the JSCS. If they are or could carry contaminants to the river at concentrations exceeding SLVs, DEQ determines that source control measures maybe needed and assigns a priority of high or medium to the pathway based on the degree of SLV exceedance (see “Priority levels for each pathway and site” below for more information on the priority levels). If it is a high priority, then the RP should move forward aggressively evaluating, designing, and implementing SCMs. If it is medium priority, then the RP should use the weight-of-evidence approach to determine if further SCE is needed or if SCMs are needed.

- Example 2: Initial investigations of a site adjacent to the river indicate that groundwater has the potential to migrate toward the river and carry contaminants. DEQ oversees a SCE to determine whether contaminants are present in the groundwater and whether the groundwater is carrying or could carry those contaminants into the river. The SCE concludes that groundwater is or could carry contaminants into the river, but only at concentrations significantly below the SLVs listed in the JSCS. DEQ determines that the pathway is “complete,” but no source control actions are needed because SLVs are not exceeded.
- Example 3: Initial investigations of a site near (but not adjacent to) the river indicate that stormwater has the potential to migrate toward the river and carry contaminants. DEQ oversees a SCE to determine whether stormwater is in fact migrating to the river and whether it is or could carry contaminants to the river. The SCE concludes that stormwater is actually not reaching the river and could not reach the river because it is diverted to a stormwater treatment system. DEQ determines that the pathway is “not complete” and no source control actions are needed.

Definition of “Insignificant pathway; no actions recommended”

The term “insignificant pathway; no actions recommended,” is used in Table 1 when (1) the pathway is complete, and (2) contaminant concentrations are near or below SLVs at a point of compliance (e.g., river bank monitoring wells) and are not anticipated to increase.

Use of “N/A” for the pathways

“N/A” is used in Table 1 to indicate that the particular pathway does not exist at the site. For example, for an upland site that is set back from the river (i.e., not adjacent to the river’s edge) N/A would indicate that the overland transport/sheet flow, overwater activities, and bank erosion pathways do not exist at the site. For a site that is adjacent to the river, but where a concrete seawall lines the river bank, N/A would indicate that the pathway bank erosion does not exist at the site.

Priority levels for each pathway and site

Each pathway evaluated at each site is given a priority level for source control upon completion of the SCE, or when adequate information exists to determine the pathway’s priority. Pathways are prioritized based on their ability to carry contaminants from upland areas to the river at concentrations that exceed SLVs. Each site is then given a priority level based on the highest priority of the pathways. For example, if a site has two low priority pathways and one high priority pathway, the site is determined to be a high priority for source control. Definitions for high, medium and low priority determinations follow.


- High – High priority pathways and sites are those where a complete contaminant migration pathway exists and the upland source is significantly impacting the river or poses a

significant and imminent threat to the river based on initial evaluation of key source control prioritization factors (listed on p. 4-3 of the JSCS). A primary consideration is that one or more media (soil, groundwater or stormwater) significantly exceed applicable SLVs at the point of discharge to the river (e.g., water at the end of a discharge pipe or soil or material at the riverbank) or the most reliable and cost-effective data point (e.g., groundwater measured at the shoreline), or where a bioaccumulative chemical is detected at concentrations significantly above the SLV. In addition, if an upland source is violating DEQ narrative water quality criteria for the Willamette River, the site may be considered a high priority. High priority sites are expected to move forward with aggressive source control measures without delay or be subject to enforcement action.

- Medium – Medium priority pathways and sites are those where a complete contaminant migration pathway exists and the upland source is impacting the river or poses a significant and/or imminent threat to the river based on an initial evaluation of key source control prioritization factors (listed on p. 4-3 of the JSCS). A primary consideration is that one or more media exceed applicable SLVs, but not significantly, at the point of discharge to the river, or where a bioaccumulative chemical is detected at concentrations above the SLV. Although exceedance of SLVs does not necessarily indicate that a site poses a significant and/or imminent threat or needs to immediately implement source control measures, it does indicate that the site may pose a threat to human health or the environment and that additional evaluation may be needed to determine if source control measures are required to prevent, minimize or mitigate the migration of hazardous substances to the river. If the site exceeds one or more SLVs, the need for further characterization or for implementation of source control measures will be based on a site-specific weight-of-evidence determination. Medium priority sites are expected to perform a weight-of-evidence evaluation to determine if source control measures are required (see p. 4-5 of the JSCS for more information on the weight-of-evidence evaluation).
- Low – Low priority pathways and sites are those where upland data indicate, based on an initial evaluation of key source control prioritization factors (listed on p. 4-3 JSCS), that the site likely poses a low threat to the river (e.g., concentrations are near or below SLVs) or where DEQ, in consultation with EPA, may issue an upland “No Further Action” (NFA) determination or lower the State’s priority of the site for further upland investigation or remedial action under DEQ’s cleanup authority. Source control measures will not be required at low priority sites unless determined necessary by the results of the Portland Harbor RIFS or ROD.
- p High – DEQ’s preliminary determination is that this is likely a high priority pathway or site based on available information. A final determination of pathway or site priority will be made upon completion of the SCE.
- p Med – DEQ’s preliminary determination is that this is likely a medium priority pathway or site based on available information. A final determination of pathway or site priority will be made upon completion of the SCE.
- p Low – DEQ’s preliminary determination is that this is likely a low priority pathway or site based on available information. A final determination of pathway or site priority will be made upon completion of the SCE.

Source Control Decisions and Status of Source Control Measures

The Source Control Decisions (SCDs) and Status of Source Control Measures (SCMs) columns in Table 1 provide information on actions taken or needed to control sources of contamination to the river, including the selected SCMs for each pathway, status of SCM implementation, status of EPA review, and ongoing operation and maintenance requirements.

For many sites listed in Table 1, boxes for information on SCDs and SCMs will be blank because source control work at those sites is still in the evaluation (SCE) phase. Other sites may be in the process of implementing SCMs, and still others may have completed all source control work. For those sites that have completed upland source control and SCMs have been determined to be effective, shading  indicates that work is finished at this point in time. Upon completion of the Portland Harbor in-water RIFS, however, DEQ will reevaluate all source control work to ensure that it adequately controlled contaminants to the final cleanup levels developed for the Harbor.

9.1 Acronyms and abbreviations

Agr	Agreement
AOC	Administrative Order on Consent
AS/SVE	Air sparge/soil vapor extraction – a Source Control Measure used to remove volatile contaminants from groundwater; often combined with treatment measures
AST	Above ground Storage Tank
AWQC	Ambient Water Quality Criteria
BMPs	Best Management Practices
BRA	Baseline Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COI	Contaminant of Interest – chemicals present in Portland Harbor at levels that could threaten human health and the environment
DEQ	Oregon Department of Environmental Quality
ECSI	DEQ’s Environmental Cleanup Site Information database
EPA	Environmental Protection Agency
FS	Feasibility Study – a phase of the cleanup process; evaluating cleanup alternatives after the Remedial Investigation has been completed
GW or gw	Groundwater
ICP	Independent Cleanup Pathway
IGA	Inter-Governmental Agreement
IRAM	Interim Remedial Action Measure
HVOCs	Halogenated Volatile Organic Compounds
JSCS	Joint Source Control Strategy – issued by DEQ and EPA in December 2005 ⁶
LNAPL	Low density Non-Aqueous Phase Liquid
N/A	Not Applicable – used in Table 1 to indicate that the particular pathway does not exist at the site
NAPL	Non-Aqueous Phase Liquid

⁶ The JSCS is available on DEQ’s web site at (<http://www.deq.state.or.us/lq/cu/nwr/PortlandHarbor/index.htm>); click “Joint Source Control Strategy” on the left side bar.

N&E	Nature and extent of the contamination at the site
NFA	No Further Action – a DEQ notice to a Responsible Party declaring that no further cleanup action is needed at the site
OF	Outfall
p&t	Pump & Treat system – a Source Control Measure used to remove or contain and treat contaminated groundwater
PA	Preliminary Assessment – an early assessment stage of the cleanup process
PCB	Polychlorinated Biphenyls
PH	Portland Harbor
PH Agr	Portland Harbor Agreement – a formal agreement to conduct the remedial investigation and source control work
PH Ltr Agr	Portland Harbor Letter Agreement – an initial agreement to conduct limited investigation and cleanup activities and cover DEQ’s oversight costs
PM	DEQ Project Manager leading cleanup work at the site
PPA	Prospective Purchaser Agreement – a tool for negotiating and agreeing upon potential liability for prospective purchasers of sites
PRP	Potentially Responsible Party
RD/RA	Remedial Design/Remedial Action – a phase of the cleanup process that occurs after the Record of Decision; designing and implementing the cleanup action
RI	Remedial Investigation – a phase of the cleanup process; investigating the nature and extent of contamination and understanding the potential risks posed by the contaminants to human health and the environment
RI/FS	Remedial Investigation/Feasibility Study
RP	Responsible Party
SC	Source Control
SCD	Source Control Decision
SCE	Source Control Evaluation
SCM	Source Control Measure
SLV	Screening Level Value – a contaminant-specific level established in the JSCS (see JSCS Table 3.1) that is used to screen upland pathways and sites to identify potential threats to human health and the environment.
SOW	Scope of Work
SVE	Soil Vapor Extraction – a Source Control Measure used to remove volatile contaminants from subsurface soils; often combined with soil vapor treatment
TCA	Trichloroethane
UIC	Underground Injection Control system
UST	Underground Storage Tank
VCP	Voluntary Cleanup Program
VOCs	Volatile Organic Compounds
WO	Waiting on
XPA	Expanded Preliminary Assessment – an early assessment stage of the cleanup process

9.2 Contact information for DEQ Project Managers

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