Completion Summary for City of Portland Outfall Basin S-1

1 Summary

The City of Portland (City) has been addressing source control concerns related to the City conveyance systems for more than four decades, and several City programs have evolved to meet changing regulatory requirements and watershed health objectives. Following the 2000 listing of Portland Harbor on the National Priorities List, the City initiated a new partnership with the Oregon Department of Environmental Quality (DEQ) Cleanup Program to identify specific sources of contaminants to City stormwater conveyance systems in the harbor that were not being adequately controlled. This report summarizes the results of this collaborative effort in Outfall Basin S-1.

This Completion Summary includes a weight-of-evidence evaluation to demonstrate that source identification is complete and a summary of source controls (implemented or planned) that will control future contaminant discharges to the Willamette River.

Basin S-1 is located on the east side of the Willamette River in the Swan Island industrial area, along the west side of the Swan Island Lagoon. Most of the basin is occupied by portions of two sites: the Vigor Industrial site (also known as the Swan Island Portland Shipyard or the Shipyard site) and the EWH LLC site (EWH site; leased to metal fabrication and sandblasting/painting operations). The Shipyard site was in the DEQ Cleanup Program when the City initiated its source investigations, and the EWH site entered the Cleanup Program as a result of the City's investigations. The remainder of the basin consists of a portion of a truck repair and parts sales business (DSU-Peterbuilt & GMC).

Early evaluation of inriver sediment data in the vicinity of the outfall did not indicate the apparent presence of major sources in the basin. However, because of the sensitive nature of the lagoon, the City collected and analyzed basin stormwater data to confirm that source tracing was not needed. The results indicated that source tracing for polycyclic aromatic hydrocarbons (PAH) and copper was warranted in the basin. Subsequently, the City conducted three source investigations in Basin S-1 to trace sources of PAHs and copper to the conveyance system and to fill existing data gaps in Vigor Industrial's characterization of stormwater discharges and pathways to the basin from the Shipyard site. The investigation results identified sources of organotins, PAHs, metals, polychlorinated biphenyls (PCB), and bis(2-ethylhexyl)phthalate (BEHP) to the conveyance system.

Two sites have been identified as major sources to the Basin S-1 conveyance system. Both sites are in the DEQ Cleanup Program and are in the process of completing source control evaluations (SCE). Source control measure (SCM) implementation at these two upland sites, together with current and future source control programs in the basin, are expected to provide necessary source control for Outfall S-1 discharges.

The City has identified the major sources of contaminants to the basin and necessary controls are being implemented under DEQ and/or City authority. Therefore, the City has met the remedial investigation (RI)/SCM objectives for Basin S-1.

2 Introduction

This Completion Summary presents a weight-of-evidence evaluation of whether further source investigation is needed in Basin S-1, and the rationale for concluding that future discharges from the basin are not likely to be significant sources of contaminants to river sediment. The purpose of this report is to demonstrate that, for Basin S-1 the, City has met the joint RI/SCM objectives of the August 13, 2003, intergovernmental agreement (IGA) between the City and DEQ. Together, the City and DEQ identified all major sources of contamination to the basin and are using their respective authorities to ensure that source controls are implemented where needed.

This report is included in Appendix A of the *Municipal Stormwater Source Control Report for Portland Harbor* (Municipal Report), which provides additional background and detail regarding the City's harborwide source control efforts, including regulatory and non-regulatory programs to address current and future sources and to minimize recontamination potential.

3 Outfall and Basin Setting

3.1 Basin Location and Configuration

Outfall S-1 discharges to the Swan Island Lagoon on the east side of the Willamette River at approximately River Mile 8.7. The drainage area for the Basin S-1 conveyance system is approximately 23 acres. Figure 1 shows the location of the outfall and drainage basin boundary and provides an overview of the associated stormwater conveyance system.

Additional detail on the Outfall S-1 stormwater conveyance system and associated drainage basin is included in the *Programmatic Source Control Remedial Investigation Work Plan for the City of Portland Outfalls Project* (CH2M HILL, 2004) and the *Outfall Basin S-1 Source Investigation, Technical Memorandum No. OF S1-1* (BES, 2012).

3.2 Land Use and Potential Upland Sources

Basin S-1 is located at the north end of the Swan Island industrial area. Land use in the basin is mostly heavy industrial (see Figure 1). Current industrial activities in the basin include shipyard support operations (e.g., material loading and handling, refueling, waste storage, painting, parts coating and cleaning, etc.), metal fabrication, painting, material/equipment storage, and truck repair and parts sales. DEQ Cleanup Program sites, as listed in DEQ's Environmental Cleanup Site Information (ECSI) database, comprise almost the entire basin.

Two DEQ Cleanup Program sites are in the basin. One site was in the Cleanup Program when the City's source investigations were initiated, and the other was added as a result of these investigations. Table 1 lists these sites and indicates the associated contaminants of interest (COI) and the status of stormwater pathway evaluations. Both of these sites have pending stormwater pathway evaluations under DEQ oversight.

Table 1. DEQ Cleanup Program Sites in Basin S-1

DEQ Cleanup Program Site	Site COIs (1)	Site Stormwater Pathway Evaluations (2)
Vigor Industrial/Swan Island Portland Shipyard (OU1) (ESCI #271)	VOCs, PAHs, TPH, PCBs, metals, butyltins, phthalates	Source Control Evaluation In Progress
EWH, LLC (ECSI #5685)	Not listed (3)	Source Control Evaluation In Progress

Notes:

VOCs = volatile organic compounds; TPH = total petroleum hydrocarbons; COIs = contaminants of interest' PAHs = polycyclic aromatic hydrocarbons; PCBs = polychlorinated biphenyls; ECSI = Environmental Cleanup Site Information; DEQ = Oregon Department of Environmental Quality

(1) Unless otherwise noted, site COIs are those identified in Appendix Q (Source Control Inventory Tables) of the Portland Harbor RI/FS Draft Feasibility Study (FS) (Anchor et al., 2012).

(2) Source: DEQ Milestone Report, Figure 1b, "Status of Stormwater Source Control Evaluations, January 2013" (DEQ, 2013).

(3) Site joined DEQ Cleanup Program in January 2012 and is not listed in Appendix Q of the draft FS. ECSI database (DEQ, 2012) does not identify site contaminants.

Both of these industrial sites have National Pollutant Discharge Elimination System (NPDES) stormwater permits. Table 2 shows the permit history within the basin. Figure 1 shows sites with current NPDES permits. Note that the City operates under an NPDES Municipal Separate Storm Sewer System (MS4) stormwater permit that also covers basin drainage areas.

Table 2. Current(1) and Historical NPDES Permit Coverage in Basin S-1

Address	Company	Permit Type	Time Period
5555 N Channel	Port of Portland – Ship Repair(2)	Stormwater (1200-L)	1993 – 1996
	Cascade General(2)	Stormwater (1200-Z)	1996 – 2008
	Vigor Industrial LLC(2)	Stormwater (1200-Z)	2008 – Present
5555 N Channel, Building 2	**EWH LLC(2)**	Stormwater (1200-Z)	2011 – Present

Notes:

NPDES = National Pollutant Discharge Elimination System

(1) Current permits are indicated in bold.

(2) Multiple tenants are included in the permit coverage areas.

3.3 Outfall Setting

Outfall S-1 discharges to an area of potential concern (AOPC 17b-Slip) identified by the U.S. Environmental Protection Agency (EPA) based on elevated concentrations of PCBs, phthalates, PAHs, metals, and other contaminants in river sediment (EPA, 2010). In addition to Outfall S-1, four other City outfalls (Outfalls M-1, M-2, M-3, and S-2) and more than 50 non-City outfalls discharge to the Swan Island Lagoon portion of AOPC 17b-Slip. Historically, overwater ship repairs also occurred along the west shore of the lagoon.

4 Basin Screening and Source Investigations

During the City investigation of sediment in the vicinity of City outfalls in the Initial Study Area, sediment samples could not be collected near Outfall S-1. Based on data collected at nearby outfalls with similar operations in the basins, the City identified Basin S-1 as a Priority 4 basin for source tracing (CH2M HILL, 2004). Priority 4 basins are considered the lowest priority for identifying sources. However, given the sensitive nature of the lagoon, the City collected and analyzed basin stormwater data in 2007 to verify that source tracing was not needed (BES, 2010). As part of the City's stormwater screening evaluation, the City sampled stormwater from the downstream end of the basin (i.e., at a location representing cumulative discharge from the entire basin). Based on the evaluation of these data and using a conservative screening approach, total PAHs and copper were identified as warranting further source tracing in Basin S-1 (BES, 2010). At this time, one site (the Shipyard site) was in the DEQ Cleanup Program.

The City conducted comprehensive source investigations in Basin S-1 in 2010 and 2011 to determine if the other two sites (EWH and DSU-Peterbuilt & GMC, Inc.) were major sources that needed to be controlled and to better understand contaminant pathways from the Shipyard site. As part of its ongoing evaluation of the stormwater pathway, Vigor Industrial collected data to evaluate whether the site is a source to Basin S-1, but data were not sufficient to characterize all potential source areas from the site to the basin. Therefore, the City applied a conservative source-tracing approach in the basin and investigated a broad array of contaminants in stormwater and stormwater solids, including some chemicals (e.g., organotins) specifically included to fill existing data gaps in Vigor Industrial's characterization of stormwater discharges from the Shipyard site to Basin S-1. Results of the Basin S-1 source investigations indicated elevated concentrations of PAHs, organotins, metals, PCBs, and BEHP in discharges to the City conveyance system. Data collected from inlets to Basin S-1 along N. Lagoon Avenue also indicate that offsite migration of Shipyard site contaminants likely is occurring via other pathways (e.g. vehicle drag-out and/or air deposition) (BES, 2012).

In 2011, the City requested a DEQ Site Assessment review of the EWH LLC property (on the corner of N. Dolphin Street and N. Lagoon Avenue) based on initial results of the stormwater sampling. Source investigation data verify that SCMs are needed at the Shipyard and the EWH sites. DEQ requested that the EWH site enter the DEQ Cleanup Program based on these results (DEQ, 2012), and both these identified sources currently are working with DEQ to complete SCEs and to implement appropriate SCMs.

For the third site (DSU-Peterbuilt & GMC), before source investigations were initiated in the basin, the City's Industrial Stormwater Program staff provided technical assistance on best management practices implementation to minimize stormwater exposure to industrial activities. Subsequent targeted stormwater sampling demonstrated that the site was not a major source.

Table 3 lists investigations and evaluations completed by the City in the Basin S-1 conveyance system.

Table 3. City Investigations in the Basin S-1 Stormwater Conveyance System

Data Collection Period	Purpose	Documentation
2000	Compile basin background information to identify potential sources.	Preliminary Evaluation of City Outfalls (Eastshore) (BES, 2000)
2002	Evaluate inriver sediment data near City outfalls to prioritize basins for source tracing.	Programmatic Source Control Remedial Investigation Work Plan (CH2M HILL, 2004)
2007	Evaluate stormwater data from City outfalls to identify additional source tracing needs.	Stormwater Evaluation Report, City of Portland Outfall Project (BES, 2010)
2010	Analyze solids from the piped Shipyard site connection to Basin S-1 and from catch basins along the egress route to identify contaminants being discharged and potential pathways by which they are entering the City conveyance system.	Outfall Basin S-1 Source Investigation (TM No. OF S1-1) (BES, 2012)
2011	Investigate stormwater discharges to identify sources of other contaminants present at elevated concentrations in Outfall S-1 stormwater screening samples.	Outfall Basin S-1 Source Investigation (TM No. OF S1-1) (BES, 2012)

As described above, the City's source investigation work has been used by DEQ to focus upland site investigations and to identify sites for DEQ Cleanup Program consideration. Joint investigations by the City and DEQ resulted in the identification of one or more sources of the contaminants selected for source tracing in Basin S-1.

5 Completion of Source Identification

The lines of evidence evaluated to verify that source tracing is complete and all major sources have been identified include (1) results of source investigation activities conducted in the basin (and upland site information) and (2) upland investigation coverage and remaining land use in the basin. Findings from this evaluation are summarized below.

- *Source Tracing Results:* The City evaluated all three sites that drain to the City system (Shipyard site, EWH site, and DSU - Peterbuilt & GMC, Inc., site). Upland sources of all contaminants selected for source tracing have been identified. Evaluation of the 2010 stormwater solids data indicated the Shipyard site is contributing organotins to the City system via direct discharges from its lateral connection, and likely also through vehicle dragout of contaminated media onto N. Lagoon Avenue (BES, 2012). PAHs and metals have been identified as COIs for the Shipyard site (see Table 1) and have been detected at elevated concentrations in the site stormwater system. The 2011 stormwater sampling results also indicate that the EWH site is a major source of PAHs to Basin S-1 and also a source of metals (copper and zinc), PCBs, and BEHP. Both sites are conducting investigations under DEQ Cleanup Program oversight. Source tracing results indicate the remaining industrial facility in the basin (DSU - Peterbuilt & GMC, Inc.) is not a major source of contaminants to the City conveyance system.

- *Upland Investigation Coverage and Land Use:* Figure 2 displays the spatial extent of DEQ Cleanup site investigations and other programmatic controls (see key to figures provided at beginning of this Appendix). As shown in Figure 2, the majority of area in the basin is being investigated (or investigation is pending) under DEQ oversight, or likely does not need investigation because of existing controls. Industrial activities exposed to stormwater are being addressed at two of the three industrial sites in the basin by the DEQ Water Quality NPDES Program. The City Industrial Stormwater Program continues to provide technical assistance on minimizing industrial exposures to stormwater to the only unpermitted site in the basin. In summary, all sites in the basin are:
    - Investigating the stormwater pathway and developing SCMs for implementation under DEQ Cleanup Program authority (or an SCE is planned);
    - Covered under NPDES stormwater regulations; and/or
    - Monitored for stormwater exposures through periodic inspections under the City's Industrial Stormwater Program.

Based on these lines of evidence, the City concludes that Basin S-1 source investigation is complete and all major sources have been identified.

6 Basin Source Controls

The City and DEQ collaborated under their respective authorities to identify control mechanisms for major and minor sources located in the basin. Source control in Basin S-1 includes SCMs completed (or planned) at contaminated sites under DEQ Cleanup Program agreements and ongoing City and DEQ programs that are described in the Municipal Report. Source controls implemented in Basin S-1 are displayed in Figure 2 and summarized in this section.

One type of programmatic source control is the elimination of stormwater exposures to industrial activities. Currently, there are no NPDES No Exposure Certifications (NEC) in the basin, although the EWH site historically held an NEC from 2009 to 2011.

Table 4 summarizes additional site-specific and programmatic source controls completed to date in Basin S-1.

Table 4. Basin S-1 Source Controls

Site/Area	Source Controls	Implementation Timeframe
Source Control Measures (SCM) at DEQ Cleanup Program Sites (1)		
Vigor Industrial/Swan Island Portland Shipyard (OU1) (ESCI #271)	Site has determined that stormwater treatment is warranted at the site. Design discussions are underway with DEQ.	To be determined; SCM planning is in progress.
EWH, LLC (ECSI #5685)	Stormwater lines and catch basins cleaned out.	2012
	Additional SCMs to be determined.	To be determined.
Other (Programmatic Source Controls)(2)		
Vigor Industrial	**Stormwater Management Manual Requirements**	Pending. Likely will apply during redevelopment.
DSU-Peterbuilt & GMC	**City Discharge Authorization(3)**	Ongoing
See listing in Table 2	**NPDES 1200-Z Stormwater Permit Requirements**	Ongoing

Notes:

DEQ = Oregon Department of Environmental Quality; NPDES = National Pollutant Discharge Elimination System; ECSI = Environmental Cleanup Site Information

(1) For upland sites, description of SCMs are based on information in DEQ Milestone Report (DEQ, 2013), DEQ source control decisions, and/or reports on file with DEQ.

(2) Programmatic source controls are described in the Municipal Report.

(3) Additional site-specific stormwater pollution controls required and implemented under City Code

All major contaminant sources have been controlled or will be controlled after implementation of SCMs has been completed under the programs identified above. Other municipal programs (e.g., periodic inspection of and technical assistance to non-NPDES sites, illicit discharge monitoring, street sweeping, etc.) likely provide additional source control benefits in the basin and will help to address minor sources for which specific control measures have not been required. City programs that control current and future contaminant discharges to the conveyance system are described in the Municipal Report.

7 Conclusion

The City completed source tracing in Basin S-1 and identified the major sources of contaminants to the City conveyance system. Because necessary SCMs at the identified sources are being determined and implemented under appropriate DEQ and City regulatory authorities, future discharges from Outfall S-1 are unlikely to represent a significant source of contaminants to the river. However, given the sensitive nature of the lagoon, the City will continue to look for opportunities with existing and future City stormwater programs to reduce suspended solids loading from the basin to the river. The City concludes that it has met the RI/SCM objectives of the IGA and requests a source control decision from DEQ for Basin S-1.

8 References

Anchor et al. 2012. Portland Harbor RI/FS Draft Feasibility Study. Prepared for The Lower Willamette Group by Anchor QEA, LLC, Windward Environmental, LLC, Kennedy/Jenks Consultants, and Integral Consulting, Inc. February 2012.

BES. 2000. Preliminary Evaluation of City Outfalls. Portland Harbor Study Area. Notebook 1: Eastshore Stormwater and CSO Outfalls. City of Portland, Bureau of Environmental Services. December 2000.

BES. 2010. Stormwater Evaluation Report. City of Portland, Bureau of Environmental Services. February 2010.

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CH2M HILL. 2004. Programmatic Source Control Remedial Investigation Work Plan of the City of Portland Outfalls Project. Prepared by CH2M HILL for the City of Portland Bureau of Environmental Services. March 19, 2004.

DEQ. 2012. Environmental Cleanup Site Information (ECSI) Database Site Summary Report - Details for Site ID 5685, EWH, LLC. Last updated January 2012. Website accessed on February 20, 2013. http://www.deq.state.or.us/lq/ECSI/ecsidetail.asp?seqnbr=5685

DEQ. 2013. Milestone Report, Upland Source Control at the Portland Harbor Superfund Site. Prepared by the Oregon Department of Environmental Quality. January 2013.

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List of Figures

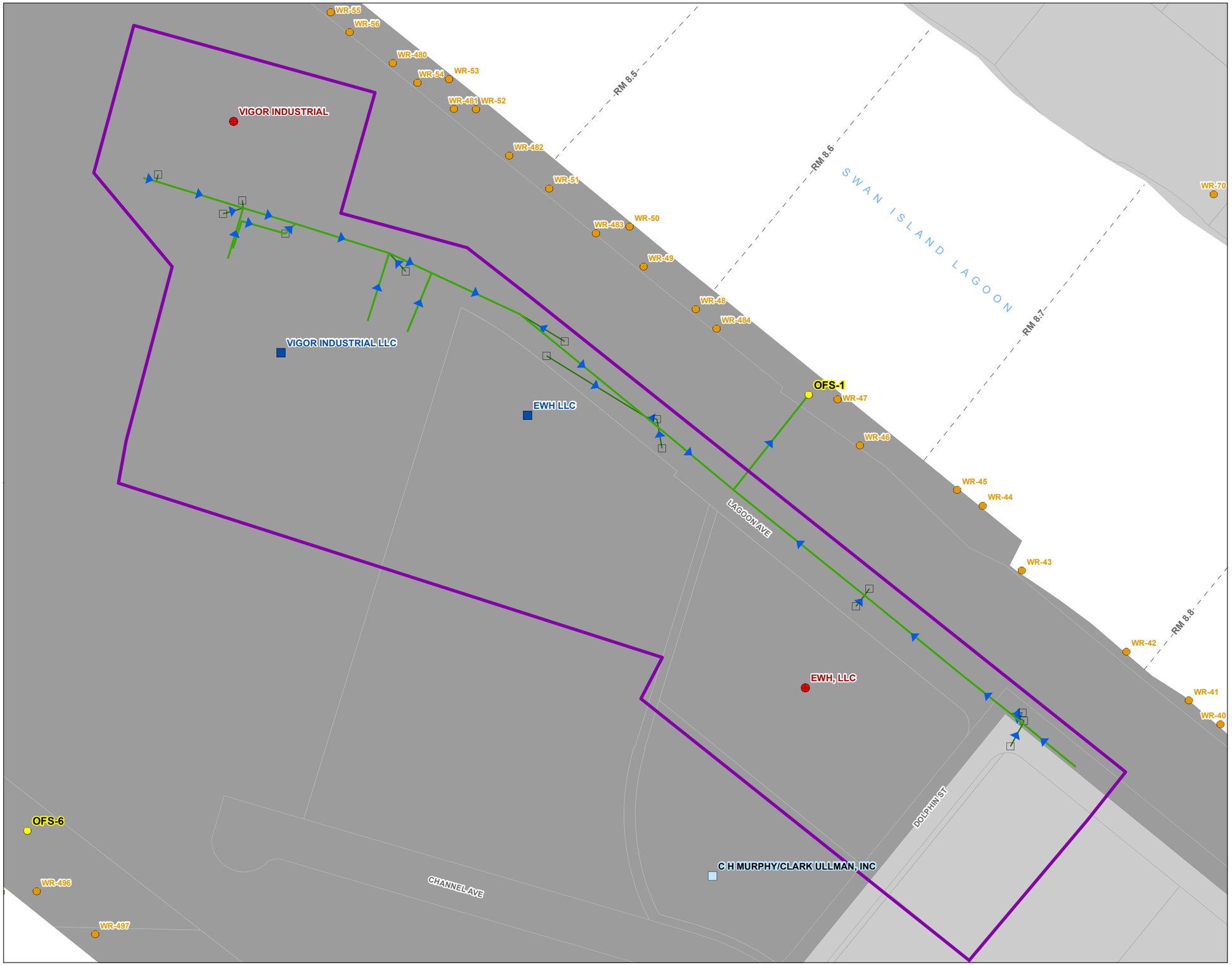

FIGURE 1

Basin S-1 Overview

- Basin S-1
- DEQ ECSI Site
- NPDES Stormwater Permit
- NPDES No Exposure Certification

Conveyance System

- Storm Line
- Catch Basin
- City Outfall
- Non-City Outfall

Land Use/Zoning

- Heavy Industrial
- Light Industrial

All Other Data

- River Mile (RM)
- Tax Lot
- Discharges to City Outfall
- Portland Harbor Hydroboundary

N

0 85 170 255

Feet

MAP NOTES:
Date: December 31, 2013
Data Sources: BES, METRO

ENVIRONMENTAL SERVICES
CITY OF PORTLAND
1120 SW Fifth Avenue, Room 1000
Portland Oregon, 97204 - 1912

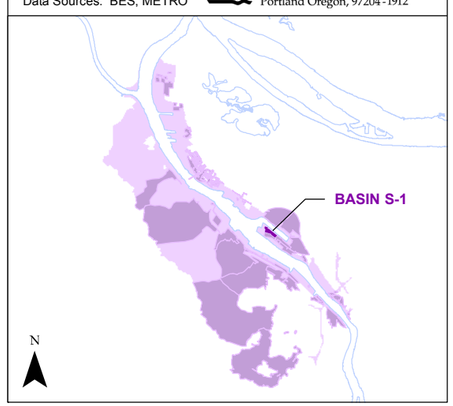

FIGURE 2

Basin S-1
Upland Site Source Controls

Basin S-1

Tax Lot

DEQ Stormwater SCE

SCE implemented or pending

All Other Features

NPDES Stormwater Discharge Permit

City Discharge Authorization

NPDES No Exposure Certification

Site Inspection -
BES Industrial Stormwater Program

Discharges to City Outfall

Portland Harbor Hydroboundary

NOTE:
The DEQ Milestone Report (DEQ, 2013) indicates only a portion of this site is in the DEQ Cleanup Program. However, based on discussions with DEQ, the entire site is being investigated under the Cleanup Program.

N

0 85 170 255

Feet

MAP NOTES:
Date: December 31, 2013
Data Sources: BES, METRO, Aerial Photo Taken 2012

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