Completion Summary for City of Portland Outfall Basin S-6

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-6.

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-6 is located on the east side of the Willamette River, in the Swan Island industrial area, on the northwest portion of Swan Island. Two DEQ Cleanup Program sites occupy a little more than half of the basin: the Vigor Industrial site (also known as the Swan Island Portland Shipyard; Shipyard site) and the EWH, LLC site (EWH site), which is leased for metal fabrication and sandblasting/painting operations.

Early evaluation of inriver sediment data near the outfall did not indicate the apparent presence of major sources in the basin. To verify that major sources were not present in the basin, the City conducted an inline solids source investigation in 2005. Results indicated that the Shipyard site was a source of contaminants to the basin, but was inconclusive about other potential source areas. In 2007, the City collected stormwater samples from the basin as part of its Portland Harbor stormwater screening effort to determine whether additional source investigation was needed in the basin. The results indicated that copper and zinc concentrations were slightly elevated, but further source tracing was not recommended because the City had already identified the Shipyard site as a source of metals and other contaminants to the basin and a source control evaluation (SCE) was underway at this site. In addition, City source investigation of the adjacent Basin S-1 identified a previously unknown contaminated site (EWH site) that has since entered the DEQ Cleanup Program. This site also discharges to Basin S-6.

Vigor Industrial has initiated the design of stormwater source control measures (SCM) under DEQ oversight. EWH has entered into an agreement with DEQ to evaluate the stormwater pathway. SCM implementation at these sites, together with current and future source control programs in the basin, are expected to provide necessary source control for Outfall S-6 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-6.

2 Introduction

This Completion Summary presents a weight-of-evidence evaluation of whether further source investigation is needed in Basin S-6, 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-6, 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-6 discharges to the east side of the Willamette River at approximately River Mile 8.6. The drainage area for the Basin S-6 conveyance system is approximately 22 acres. Figure 1 shows the location of the outfall and drainage basin boundary and provides an overview of the associated stormwater conveyance system. As shown in Figure 1, the basin includes a water quality swale along the western side of N. Channel Avenue. The City constructed this lined vegetated swale in 2013, to reduce total suspended solids loading to Outfall S-6. City programs that result in this type of stormwater improvements are described in the Municipal Report.

Additional detail on the Outfall S-6 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 *City Outfall Basin S-6 Inline Solids Sampling Technical Memorandum No. OF S6-1* (BES, 2008).

3.2 Land Use and Potential Upland Sources

Basin S-6 is located on the northwestern end of the Swan Island industrial area. Land use in the basin is a mix of heavy and light industrial activities. Current industrial operations in the basin include machine shops, metal fabrication and sandblasting/painting, material storage, service and repair of marine equipment, commercial printing, and truck and employee parking.

Sites that were identified as potential upland sources include the two sites in the basin that are in the DEQ Cleanup Program, as listed in DEQ's Environmental Cleanup Site Information (ECSI) database. Table 1 lists the associated contaminants of interest (COI) and the status of stormwater pathway evaluations for these sites. As indicated in Table 1, these sites are in the process of completing stormwater pathway evaluations under DEQ oversight.

Table 1. DEQ Cleanup Program Sites in Basin S-6

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

(1) 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 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.

Industrial sites covered, or historically covered, by National Pollutant Discharge Elimination System (NPDES) stormwater regulations also were considered as potential sources of pollutants to the City conveyance system. Table 2 lists sites within the basin that currently hold, or historically held, NPDES permits to discharge to the Basin S-6 conveyance. Sites with current NPDES permits are shown in Figure 1. 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-6

Address	Company	Permit Type	Time Period
5555 N Channel	Port of Portland Ship Repair (2)	Stormwater (1200-L)	1993 – 1996
	Cascade General, Inc.(2)	Stormwater (1200-Z)	1996 – 2008
	AGG Enterprises, Inc.	Stormwater (1200-Z)	2001 – 2002
	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-6 does not discharge to a river reach identified by U.S. Environmental Protection Agency (EPA) as an area of potential concern (AOPC) based on results of river sediment sampling (EPA, 2010).

4 Basin Screening and Source Investigations

The City identified Basin S-6 as a Priority 4 basin for source tracing based on evaluation of inriver sediment data near the outfall, which did not indicate the presence of major sources in the basin (CH2M HILL, 2004). Priority 4 basins are considered the lowest priority for identifying sources.

Following collection of additional inriver sediment data and EPA identification of the adjacent inriver area as an AOPC (EPA, 2005), the City conducted a source investigation in the basin to identify potential sources to the basin. Based on a review of sediment data and EPA's COIs for the Swan Island area, the City identified three metals (copper, lead, and zinc), phthalates, and polychlorinated biphenyls (PCB) as contaminants for further screening in the basin (BES, 2008). The City collected inline solids samples from Basin S-6 in 2006 to assess the possible presence of major contaminant sources within the basin. Investigation results indicate that metals (copper, lead, and zinc) and PCBs were being discharged to the Basin S-6 stormwater conveyance system from the Shipyard site; the investigation was inconclusive about other potential source areas (BES, 2008).

The City collected and analyzed basin stormwater data in 2007 to verify that additional 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, copper and zinc were identified as potentially warranting further source tracing in Basin S-6. However, the City concluded that further source tracing in Basin S-6 was not warranted because results of the 2006 inline solids investigation had confirmed that elevated concentrations of these metals were being discharged to basin from the Shipyard site and a stormwater pathway evaluation was already underway at this site under DEQ oversight (BES, 2010). Subsequent source investigation results in the adjacent Basin S-1 also indicated that that offsite migration of Shipyard site contaminants likely is occurring via other pathways (e.g. vehicle drag-out and/or air deposition) (BES, 2012). Shipyard site contaminants also may be migrating to Basin S-6 via these pathways.

Table 3 lists investigations and evaluations completed by the City in the Basin S-6 conveyance system.

Table 3. City Investigations in the Basin S-6 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)
2006	Evaluate inline solids data to identify major contaminant sources in the basin.	City Outfall Basin S-6 Inline Solids Sampling (TM No. OF S6-1) (BES, 2008)
2007	Evaluate stormwater data from City outfalls to identify additional source tracing needs.	Stormwater Evaluation Report, City of Portland Outfall Project (BES, 2010)

As described above, the City's source investigation work has been used by DEQ during evaluation of data collected by the Shipyard site. In addition, City source investigation of the adjacent Basin S-1 identified a previously unknown contaminated site (EWH site) that has since entered the DEQ Cleanup Program (BES, 2012). This site also discharges to Basin S-6 and may be a current source of contaminants to the basin. DEQ currently is working with the Shipyard and EWH site to complete SCEs and to implement appropriate SCMs. 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-6.

5 Completion of Source Identification

The lines of evidence evaluated to confirm that source tracing is complete and all major sources have been identified include (1) inriver sediment concentrations near the outfall, (2) results of source tracing activities conducted in the basin (and upland site information), and (3) upland investigation coverage. Findings from this evaluation are summarized below.

- *Inriver sediment concentration:* River sediment in the vicinity of Outfall S-6 does not contain elevated contaminant concentrations (i.e., the outfall does not discharge to an AOPC).
- *Source Investigation Results:* A source of all contaminants identified for further source tracing (copper and zinc) has been identified. Evaluation of the 2006 stormwater solids data indicated that the Shipyard site is a source of these contaminants to the basin (BES, 2008). The EWH site also may be a source of copper and zinc to the basin, based on findings in the Basin S-1 source investigation (BES, 2012). Both sites are being investigated further under DEQ oversight.
- *Upland Investigation Coverage and Land Use:* Figure 2 displays the spatial extent of DEQ Cleanup Program site investigations and other programmatic controls (see key to figures provided at beginning of this Appendix). As shown in Figure 2, all sites in the basin are being investigated under DEQ oversight, or likely do not need investigation because of existing controls. Sites in the basin are:
    - Investigating the stormwater pathway and developing SCMs for implementation under DEQ Cleanup Program authority; and/or
    - Have demonstrated that they do not have industrial exposures to stormwater (see Section 6).

  Industrial activities exposed to stormwater are being addressed by the DEQ Water Quality NPDES Program, and non-industrial activities are not a known or suspected source of contaminants to the City stormwater conveyance system.

Based on these lines of evidence, the City concludes that Basin S-6 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-6 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-6 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. Table 4 lists sites that hold an NPDES No Exposure Certification.

Table 4. Sites with No Exposure Certification (NEC) in Basin S-6(1)

Address	Company	NEC Time Period
5300 N Channel	**Bridgetown Printing**	2010 – Present
5565 N Dolphin	**C H Murphy/Clark Ullman Inc.**	2009 – Present

Notes:

(1) Current NECs are indicated in bold.

Table 5 summarizes additional site-specific and programmatic source controls completed to date in Basin S-6.

Table 5. Basin S-6 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. Additional SCMs to be determined.	2012 To be determined.
City Conveyance System		
N. Channel Avenue	The City constructed a lined water quality swale along the west side of N. Channel Avenue between N. Dolphin Street and N. Commerce Street. The swale is designed to reduce suspended solids loading to Outfall S-6.	2013
Other (Programmatic Source Controls)(2)		
Vigor Industrial	**Stormwater Management Manual Requirements**	Pending. Likely will apply during redevelopment.
See listing in Table 2	**NPDES 1200-Z Stormwater Permit Requirements**	Ongoing
See listing in Table 4	**NPDES No Exposure Certifications**	Ongoing

Notes:

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

(1) For upland sites, descriptions 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.

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-6 and identified the major source of contaminants to the City conveyance system. Given that necessary SCMs at the identified source are being determined and implemented under appropriate DEQ and City regulatory authorities, future discharges from Outfall S-6 are unlikely to represent a significant source of contaminants 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-6.

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. 2008. City Outfall Basin S-6 Inline Solids Sampling. Technical Memorandum OFS6-1. January 9, 2008.

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

BES. 2012. Outfall Basin S-1 Source Investigation. Technical Memorandum No. OFS1-1. June 14, 2012.

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, January 2013. Prepared by the Oregon Department of Environmental Quality. January 2013.

EPA. 2005. EPA Letter to Lower Willamette Group. Portland Harbor RI/FS – Identification of Round 3 Data Gaps. December 2, 2005.

EPA. 2010. Re: Portland Harbor Superfund Site; Administrative Order on Consent for Remedial Investigation and Feasibility Study; Docket No. CERCLA-10-2001-0240. Portland Harbor Feasibility Study Source Tables. Letter from EPA to Mr. Bob Wyatt, Chairman, Lower Willamette Group. November 23, 2010.

List of Figures

FIGURE 1

Basin S-6
Overview and Conveyance System Source Controls

Basin S-6
DEQ ECSI Site
NPDES Stormwater Permit
NPDES No Exposure Certification

Conveyance System
Storm Line
Water Quality Swale
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 80 160 240
Feet

MAP NOTES:
Date: January 6, 2013
Data Sources: BES, METRO

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

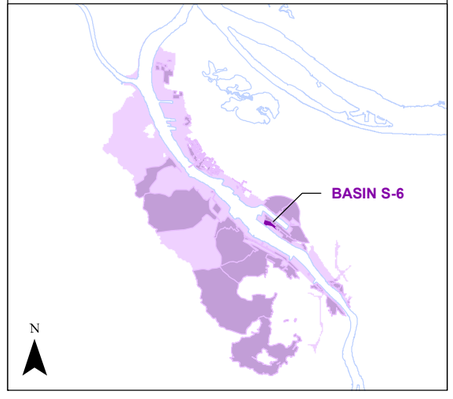

FIGURE 2

Basin S-6
Upland Site Source Controls

- Basin S-6
- Tax Lot

DEQ Stormwater SCE

- SCE implemented or pending

All Other Features

- NPDES Stormwater Discharge Permit
- City Discharge Authorization
- NPDES No Exposure Certification
- Stormwater Treatment Facility
- 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 80 160 240
Feet

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

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