

# **Completion Summary for City of Portland Outfall Basin 22B**

## **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 22B.

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 22B is located on the west side of the river in the Doane Lake industrial area. Land use in this basin is heavy industrial and includes a Metro regional waste transfer station, specialty gas manufacturing operation, and vacant land primarily consisting of the remediated Gould Superfund Site and a shredder residue landfill. Two former herbicide and/or pesticide manufacturing facilities (Rhone-Poulenc and Arkema) are located immediately adjacent to the basin, and a portion of the Arkema site formerly discharged to Basin 22B. The Basin 22B conveyance system is downgradient of a contaminated groundwater plume originating at the Rhone-Poulenc site.

Inriver sediment data show elevated sediment concentrations adjacent to and upstream of the outfall, which prompted the City to evaluate whether there may be major sources in the basin. Source tracing focused on polychlorinated biphenyls (PCB), pesticides, select metals, and phthalates based on elevated concentrations detected in inline solids, storm line cleanout solids, dry-weather flow, erodible soils, stormwater, and sediment trap samples. Investigations verified that contaminants are being discharged to the basin via stormwater and groundwater.

All properties within or historically connected to the basin are DEQ Cleanup Program sites. Of the three sites within the current basin, the Gould site has completed cleanup activities under the federal Superfund program. The remaining two (Metro Central Transfer Station and Schnitzer Investment – Doane Lake/ Air Liquide) are in the DEQ Cleanup Program and are evaluating onsite contaminant sources, pathways, and source control measures (SCM), as appropriate. Additionally, the two DEQ Cleanup Program sites adjacent to the basin (Arkema and Rhone-Poulenc) are implementing or have implemented SCMs to minimize offsite contaminant migration to the City's system; the former by disconnecting from the City's system and the latter by lining the City system to prevent contaminated groundwater from infiltrating the system as a preferential pathway.

Because the City has identified all major sources of contaminants to the basin and necessary controls are being implemented under DEQ authority, the City has met its remedial investigation (RI)/SCM objectives for Basin 22B.

## 2 Introduction

This Completion Summary presents a weight-of-evidence evaluation of whether further source investigation is needed in Basin 22B, 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 22B, 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 contaminants 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 22B discharges to the west side of the Willamette River at approximately River Mile 6.9. The drainage area for this outfall is approximately 29 acres, located within the Doane Lake industrial area. Figure 1 shows the location of the outfall and drainage basin boundary and provides an overview of the associated stormwater conveyance system. Three lateral lines currently connect upland site drainage to the trunk line on NW Front Avenue. Former connections from the Arkema site and historical inlets adjacent to the Schnitzer Investment – Doane Lake/ Air Liquide and Gould sites have been abandoned. The trunk line is downgradient of a contaminated groundwater plume.

Additional detail on the Outfall 22B 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).

### 3.2 Land Use and Potential Upland Sources

The entire basin and surrounding land are zoned heavy industrial. Current industrial operations in the basin include the Metro regional waste transfer station and the Air Liquide specialty gas manufacturing facility. Approximately 30 percent of the basin has been remediated and has a vegetated cap (Gould site); this site is currently vacant. The western half of the parcel on which the Air Liquide facility is located (owned by Schnitzer Investment) was used historically to stockpile shredder residue (i.e., non-metallic residual from shredding of autos, boats, etc.) from Schnitzer operations offsite. This portion of the Schnitzer site contains landfilled materials, but is otherwise vacant and undeveloped.

Sites that were identified as potential sources include the five DEQ Cleanup Program sites in or adjacent to Basin 22B, as listed in DEQ's Environmental Cleanup Site Information (ECSI) database. Table 1 lists these sites and indicates the associated contaminants of interest (COI) and the status of stormwater and preferential groundwater pathway evaluations. All five DEQ Cleanup Program sites in or adjacent to the basin have completed site investigation and

remediation or are currently conducting stormwater pathway evaluations under DEQ oversight.

**Table 1. DEQ Cleanup Program Sites in and Adjacent to Basin 22B**

DEQ Cleanup Program Site	Site COIs <sup>(1)</sup>	Site Stormwater Pathway Evaluations	
		Stormwater Pathway <sup>(2)</sup>	Preferential Groundwater Pathway <sup>(3)</sup>
Within Basin 22B			
Schnitzer Investment - Doane Lake (ECSI #395): Air Liquide parcel <sup>(4)</sup>	Site-specific COIs: Calcium hydroxide, VOCs, SVOCs, metals, PCBs; Offsite COIs migrating to site: VOCs, SVOCs, pesticides, metals, PCBs, dioxins/furans	Source Control Evaluation In Progress	1999 DEQ Source Control Screening - Low/Medium Priority for Source Control Evaluation
Schnitzer Investment - Doane Lake (ECSI #395) <sup>(4)</sup>	Site-specific COIs: Calcium hydroxide, VOCs, SVOCs, metals, PCBs; Offsite COIs migrating to site: VOCs, SVOCs, pesticides, metals, PCBs, dioxins/furans	Source Control Evaluation In Progress	Source Control Evaluation in Progress
ARKEMA, Inc. (ECSI #398) <sup>(5)</sup>	Pesticides, furans, metals	Source Control Evaluation In Progress <sup>(6)</sup>	Source Control Evaluation Completed - Source Control Determination Completed/Pending
Gould, Inc./NL Industries Inc. (ECSI #49)	Site-specific COIs: metals; Offsite COIs migrating to site: VOCs, SVOCs, pesticides, metals, PCBs, dioxin/furans	Source Control Evaluation Not Needed <sup>(7)</sup>	Source Control Decision Completed
Metro Central Transfer Station (ECSI #1398)	Site-specific COIs: VOCs, SVOCs, pesticides, metals, PCBs, VOCs, SVOCs, pesticides, metals, PCBs; Offsite COIs migrating to site: VOCs, SVOCs, pesticides, metals, dioxin/furans	Source Control Evaluation In Progress	Source Control Evaluation in Progress
Adjacent to Basin 22B			
Rhone-Poulenc - Doane Lake (ECSI #155)	(Groundwater infiltration pathway) Site-specific COIs: VOCs, SVOCs, pesticides, metals, dioxin/furans; Offsite COIs migrating to site: VOCs, SVOCs, pesticides, metals, PCBs, dioxin/furans	Not applicable <sup>(8)</sup>	Source Control Evaluation in Progress

Notes:

SVOCs = semivolatile organic compounds; VOCs = volatile organic compounds; COIs = contaminants of interest; PCBs = polychlorinated biphenyls; DEQ = Oregon Department of Environmental Quality; ECSI = Environmental Cleanup Site Information;

(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) Source: DEQ Milestone Report, Figure 3, "Groundwater Source Control Evaluation Status, January 2013" (DEQ, 2013).

(4) Air Liquide leases a portion of the Schnitzer Industries - Doane Lake property, and the two portions of this site are being evaluated independently under DEQ ECSI #395.

(5) The Arkema site no longer discharges to Basin 22B; however, site connections from a small portion of the site to Basin 22B were active during the period of City source investigations in the basin.

(6) Historical pathway; site stormwater connections to Basin 22B have been abandoned.

(7) Site remediation under EPA Superfund program.

(8) Stormwater pathway evaluation not applicable to Basin 22B because site is adjacent to and not within the basin.

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. Sites within the basin that currently hold, or historically held, NPDES permits to discharge to the Basin 22B conveyance system are listed in Table 2. Sites with current NPDES permits are shown in Figure 1. Note that the City has an NPDES Municipal Separate Stormwater Sewer System (MS4) stormwater permit that covers basin drainage areas.

**Table 2. Current<sup>(1)</sup> and Historical NPDES Permit Coverage in Basin 22B**

Address	Company	Permit Type	Time Period
6529 NW Front	Air Liquide	Stormwater 1200-H	1993 – 1996
		<b>Stormwater (1200-Z)</b>	<b>1997 – Present</b>
6161 NW 61 <sup>st</sup>	Metro Central Transfer Station	<b>Stormwater (1200-Z)</b>	<b>1999 – Present</b>
5909 NW 61 <sup>st</sup>	Gould Battery AKA Canonie	Stormwater (Individual NPDES)	1993 – 1998
6400 NW Front	ATOFINA Chemicals, Inc. <sup>(2)</sup>	Stormwater (Individual NPDES)	1991 – 2008

Notes:

NPDES = National Pollutant Discharge Elimination System

(1) Current permits are indicated in bold.

(2) Site stormwater connections to Basin 22B were abandoned during the course of the City's Basin 22B investigations.

### 3.3 Outfall Setting

Outfall 22B discharges to a large area of potential concern (AOPC 14) identified by the U.S. Environmental Protection Agency (EPA) based on elevated concentrations of PCBs, pesticides, metals and other contaminants in river sediment (EPA, 2010). In addition to Outfall 22B, 1 other City outfall (Outfall 22C) and 12 other active and inactive non-City outfalls discharge to AOPC 14; 3 of these outfalls (City Outfall 22C and non-City outfalls WR-6 and WR-213) discharge in close proximity to Outfall 22B. Additionally, contaminated sediments in the river have been identified adjacent to and associated with the Arkema site located just upstream of Outfall 22B.

## 4 Basin Screening and Source Investigations

The City identified Basin 22B as a Priority 1 for source tracing based on evaluation of surface sediment collected in the vicinity of the outfall in 2002 (CH2M HILL, 2004). Priority 1 basins are considered the highest priority for source investigation and identification. The subsequent Phase I report for City Priority 1 basins identified pesticides and metals (arsenic, chromium, copper, lead, nickel, selenium, and zinc) for source tracing based on further evaluation of the inriver sediment data (GSI, 2006a). Although there were elevated contaminant concentrations in the vicinity of Outfall 22B, most of these contaminants were also high upstream of the outfall, except for chromium and zinc.

The City conducted comprehensive source investigation activities throughout the system to identify major contaminant sources and pathways to the City stormwater conveyance system.

City source tracing activities in Basin 22B included inline solids grab and composite cleanout solids sampling (2003/2004), catch basin solids sampling (2005), dry-weather flow observations and sampling (2005), sediment trap sampling (2007/2008), and surface soil sampling (2012). In addition, as part of its Portland Harbor stormwater screening effort, the City evaluated 2007-2008 stormwater and sediment trap sample data collected by the Lower Willamette Group in Basin 22B at a point representing discharge from this area.

The City applied a conservative source-tracing approach in the basin and investigated a broad array of contaminants. Based on the results of this evaluation, the City identified PCBs, pesticides, metals, and phthalates as contaminants that needed investigation and control at upland sites in the basin. Subsequent review of upland site status as part of the stormwater screening evaluation indicated that further City source tracing in Basin 22B was not needed because stormwater pathway evaluations were underway at identified sources of these contaminants (BES, 2010).<sup>1</sup>

The City's source investigation work was used by DEQ to encourage basin sites to enter the Cleanup Program and to initiate onsite investigations. The City's investigations occurred within the same timeframe as site source control efforts. These include the stormwater pathway evaluations at the Air Liquide, Metro, and Schnitzer sites; cleaning and lining of the onsite stormwater systems connecting to Basin 22B as part of remedial activities associated with the Rhone-Poulenc site; and disconnection of catch basins discharging from Arkema to Basin 22B. Some of the sites collected data from the City conveyance system in conjunction with their source evaluation and control activities.

Investigations and evaluations completed by the City and others in the Basin 22B conveyance system are listed in Table 3.

**Table 3. Investigations in the Basin 22B Stormwater Conveyance System**

Data Collection Period	Party	Purpose	Documentation
2000	City	Compile basin background information to identify potential sources.	Preliminary Evaluation of City Outfalls (West Shore) (BES, 2000)
2002	City	Evaluate inriver sediment data near City outfalls to prioritize basins for source tracing.	Programmatic Source Control Remedial Investigation Work Plan (CH2M HILL, 2004)
2003 – 2004	City	Collect and analyze solids samples from the conveyance system for waste characterization purposes in conjunction with line cleaning activities.	Technical Memorandum No. OF 22B-3. City Outfall Basin 22B Inline Solids Evaluation (BES, 2008)
2005	City	Investigate potential offsite contaminant migration from the Gould site via dry-weather flow.	City Outfall Basin 22B Upland Source Control Investigation. Technical Memorandum No. OF22B-1 (BES, 2005a)

<sup>1</sup> Although phthalates are not identified in either the RI Report (Integral et al., 2011) or the FS (Anchor et al., 2012) as a COI for any of these sites, phthalates were detected in surface soil samples collected at and adjacent to the Schnitzer-Doane Lake site in January 2012 (Bridgewater, 2012).

<b>Data Collection Period</b>	<b>Party</b>	<b>Purpose</b>	<b>Documentation</b>
2005	City	Investigate potential offsite contaminant migration to catch basins adjacent to the Arkema site.	Technical Memorandum No. OF22B-2. City Outfall Basin 22B Upland Source Control Investigation (BES, 2005b)
2005	City	Evaluate existing data on groundwater plumes and identify the potential for City conveyance systems (including Basin 22B) to act as preferential pathways.	Relationships Between Upland Shallow Groundwater Plumes and the City Stormwater and Combined Conveyance System with the Portland Harbor (GSI, 2006b)
2003-2006	City	Evaluate and compare inline solids data collected before and during stormwater conveyance system cleanout activities.	Technical Memorandum No. OF 22B-3. City Outfall Basin 22B Inline Solids Evaluation (BES, 2008)
2006	City	Focus source tracing activities based on evaluation of observed contaminants and identified sources.	Phase I Report for City of Portland Priority 1 Basins (GSI, 2006a)
2007	Lower Willamette Group	Collect harborwide stormwater and sediment trap data to develop land use stormwater loading estimates for input to the inriver fate and transport model.	Portland Harbor RI/FS Round 3A and 3B Stormwater Data Report (Anchor and Integral, 2008)
2007-2008	City	Evaluate sediment trap data to investigate potential contaminant sources in the upper part of the basin.	Technical Memorandum No 22B-4. Outfall Basin 22B Inline Solids Investigation (BES, 2009)
2007	City	Evaluate stormwater data from City outfalls to identify additional source tracing needs.	Stormwater Evaluation Report. City of Portland, Bureau of Environmental Services (BES, 2010).
2011	Air Liquide	Evaluate whether the Air Liquide site is a source of contaminants to the Willamette River. Includes the results of stormwater sampling in 2011 at Outfall 22B.	Stormwater Source Control Evaluation Report, Portland Facility (CH2M HILL, 2012)
2012	Schnitzer	Evaluate surface (erodible) soils at the Schnitzer – Doane Lake site and in a vegetated portion of the NW Front Avenue right-of-way adjacent to the site.	Addendum to the Focused Source Control Evaluation Report, Surface Soil Sampling Results (Bridgewater, 2012)
2012	City	Evaluate nature and extent of shallow soil contamination in the vegetated portion of the NW Front Avenue right-of-way in the vicinity of the Schnitzer – Doane Lake site.	Transmittal to DEQ of Shallow Soil Sampling conducted by the City of Portland in July 2012 in Basin 22B Adjacent to Schnitzer Investment-Doane Lake Site (BES, 2012)

Data Collection Period	Party	Purpose	Documentation
2006 - present	StarLink Logistics, Inc. (SLLI)	Evaluate the effectiveness of Interim Remedial Action Measures implemented by SLLI, in Basin 22B conveyance system and upland sites downgradient of former Rhone-Poulenc site, to address preferential groundwater pathway. Includes results of dry-weather flow, inline solids, and stormwater investigations conducted in Basin 22B.	RI/SCE Report, RP – Portland Site (AMEC, 2010)

The City's investigation and data evaluation confirmed that major sources of contaminants are present in Basin 22B.

## 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) spatial coverage and results of source investigation activities conducted in the basin (including review of upland site information) and (2) stormwater data representative of the basin. Findings from this evaluation are summarized below.

- Upland Investigation Coverage and Results:* Figure 2 displays the spatial extent of upland site investigation and other programmatic controls (see key to figures provided at beginning of this Appendix). As shown in Figure 2, all sites within Basin 22B are either in the DEQ Cleanup Program or have been remediated under EPA oversight. Contaminants detected in the Basin 22B conveyance system (PCBs, pesticides, metals, and phthalates) have been identified at one or more of these sites. All sites with complete stormwater and/or preferential groundwater pathways to Basin 22B are in the process of being controlled under DEQ authority.
- Basin 22B Stormwater Data:* A comparison of basin stormwater data collected in 2007 (Anchor and Integral, 2008) and 2011 (CH2M HILL, 2012) indicates that controlling identified sources has decreased contaminant concentrations in Basin 22B stormwater. As shown in Table 4, concentrations of PCBs and metals<sup>2</sup> generally decreased between 2007 and 2011 (during which time upland site controls were implemented; see Section 6), and the most recent outfall data are in the lower range of concentrations observed in Portland Harbor industrial areas (DEQ, 2010). As source control implementation is still underway at two of these sites, the City anticipates further reductions in contaminant loading to the Basin 22B system.

<sup>2</sup> Pesticides were not detected in the 2011 samples; comparisons to 2007 data are not made because the laboratory method reporting limits are elevated.

**Table 4. Basin 22B Whole-Basin Stormwater Data <sup>(1)</sup>**

Analyte	2007 Data LWG Investigation (Anchor and Integral, 2008)	2011 Data Air Liquide Investigation (CH2M HILL, 2012)	
	March – November 2007 <sup>(2)</sup>	April 1, 2011	May 11, 2011
Total PCBs	0.1090 µg/L	0.00232 µg/L	0.03 µg/L
Arsenic	3.84 µg/L	1.7 µg/L	1.5 µg/L
Cadmium	1.91 µg/L	0.27 µg/L	0.59 µg/L
Copper	31.42 µg/L	10.7 µg/L	15.5 µg/L

Notes:

PCBs = polychlorinated biphenyls; LWG = Lower Willamette Group; µg/L = microgram per liter

- (1) LWG stormwater data were collected at a manhole upstream of the outfall, but downstream of all stormwater connections to the basin.
- (2) Arsenic, copper, and cadmium values for the 2007 stormwater samples are the calculated arithmetic mean concentrations for four sampling events. The total PCBs value is the arithmetic mean concentration for five sampling events.

Based on these lines of evidence, the City concludes that Basin 22B source tracing 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 all major sources identified in the basin. Source control for major and minor sources in Basin 22B includes ongoing City and DEQ programs that are described in the Municipal Report, SCMs completed (or planned) at contaminated sites under DEQ Cleanup Program agreements, and specific controls implemented within the City's shared stormwater conveyance system (e.g., line cleaning and lining). Source controls implemented in Basin 22B are displayed in Figures 1 and 2 and summarized in this section.

Extensive SCMs are being implemented by the sites (including a basinwide measure to address infiltration of contaminated groundwater into the stormwater conveyance system). Additionally, Metro has installed stormwater treatment facilities, including an oil/water separator and ecoroofs, as shown in Figure 2. These SCMs, and the additional site-specific and conveyance system source controls that have been completed to date in Basin 22B, are summarized in Table 5.

**Table 5. Basin 22B Source Controls**

Site / Area	Source Controls	Implementation Timeframe
<b>Source Control Measures (SCM) at DEQ Cleanup Program Sites <sup>(1)</sup></b>		
Rhone-Poulenc Doane Lake (ECSI #155)	As part of its Interim Remedial Action Measure (IRAM) to control infiltration of contaminated groundwater, Rhone-Poulenc/StarLink Logistics, Inc. (SLLI), cleaned and lined the City's entire Basin 22B conveyance system and all stormwater lines at the Air Liquide, Gould, and Metro sites.	2006 - present
Schnitzer Investment – Doane Lake: (ECSI #395): Air Liquide facility	Onsite storm sewer piping cleaned and lined (completed as part of the Rhone-Poulenc IRAM).	2009
	Three historical catch basins and associated lines were abandoned. Gravel was placed on pervious surfaces to minimize mobilization of erodible soils by surface water flows across the site.	2010; 2012
Schnitzer Investment – Doane Lake: landfill area in western portion of site (ECSI #395)	Source control measures planned: onsite erodible contaminated soil will be capped and adjacent offsite contaminated soil will be removed and capped.	Pending
Gould, Inc./NL Industries, Inc. (ECSI #49)	Encapsulation of contaminated media, capping, and revegetation.	2000
	The onsite conveyance system was cleaned and lined (as part of the Rhone-Poulenc IRAM).	2009
Metro Central Transfer Station (ECSI #1398)	The onsite storm sewer piping was cleaned and lined (as part of the Rhone-Poulenc IRAM). Site stormwater passes through an oil/water separator before discharge to Basin 22B.	2009
	Installation of ecoroofs.	2011
	Additional SCMs to be determined.	To be determined
Arkema, Inc. (ECSI #398)	Connections to the City's conveyance system were abandoned or plugged.	2006, 2010
	Other SCMs being implemented include: capping portions of the site; decommissioning existing stormwater conveyance system; rerouting stormwater runoff to a new stormwater conveyance and treatment system; construction of a berm around most of the site to prevent stormwater runoff from leaving the site; and use of erosion control measures during site remediation activities.	Underway
<b>City Conveyance System</b>		
Guilds Lake Pump Station to Outfall 22B	The City cleaned the 48" storm line loop northwest of NW Front Avenue.	2004

Site / Area	Source Controls	Implementation Timeframe
Abandonment of connections to NW Front Avenue line	Historical connection from field inlet at Gould site was abandoned during site remediation.	~2000
	Arkema abandoned lateral connections to catch basins in the drainage swale along NW Front Avenue, adjacent to the Arkema site.	2006
	The City abandoned a connection to a historical catch basin on the south side of NW Front, adjacent to the Air Liquide site.	2007
	Rhone-Poulenc/SLLI abandoned catch basins in the drainage swale along NW Front Avenue, adjacent to the Arkema site.	2010
NW Front Avenue	As part of its IRAM, Rhone-Poulenc cleaned and lined the City’s entire conveyance system (including catch basins and connecting lines): <ul style="list-style-type: none"><li>• Main line cleaned</li><li>• Lines and laterals cleaned</li><li>• Anticipated completion of lining project</li></ul>	2006
		2009
		2013
Other (Programmatic SCM)		
See listing in Table 2	NPDES 1200-Z Stormwater Permit Requirements.	Ongoing

Notes:

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

- (1) For upland sites, descriptions of SCMs are based on information in DEQ Milestone Report (DEQ, 2012), DEQ source control decisions, and/or reports on file with DEQ.

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., 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 22B and identified the major sources of contaminants to the City conveyance system. Because necessary SCMs at identified sources have been implemented or are being determined under appropriate DEQ and City regulatory authorities, future discharges from Outfall 22B 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 22B.

## 8 References

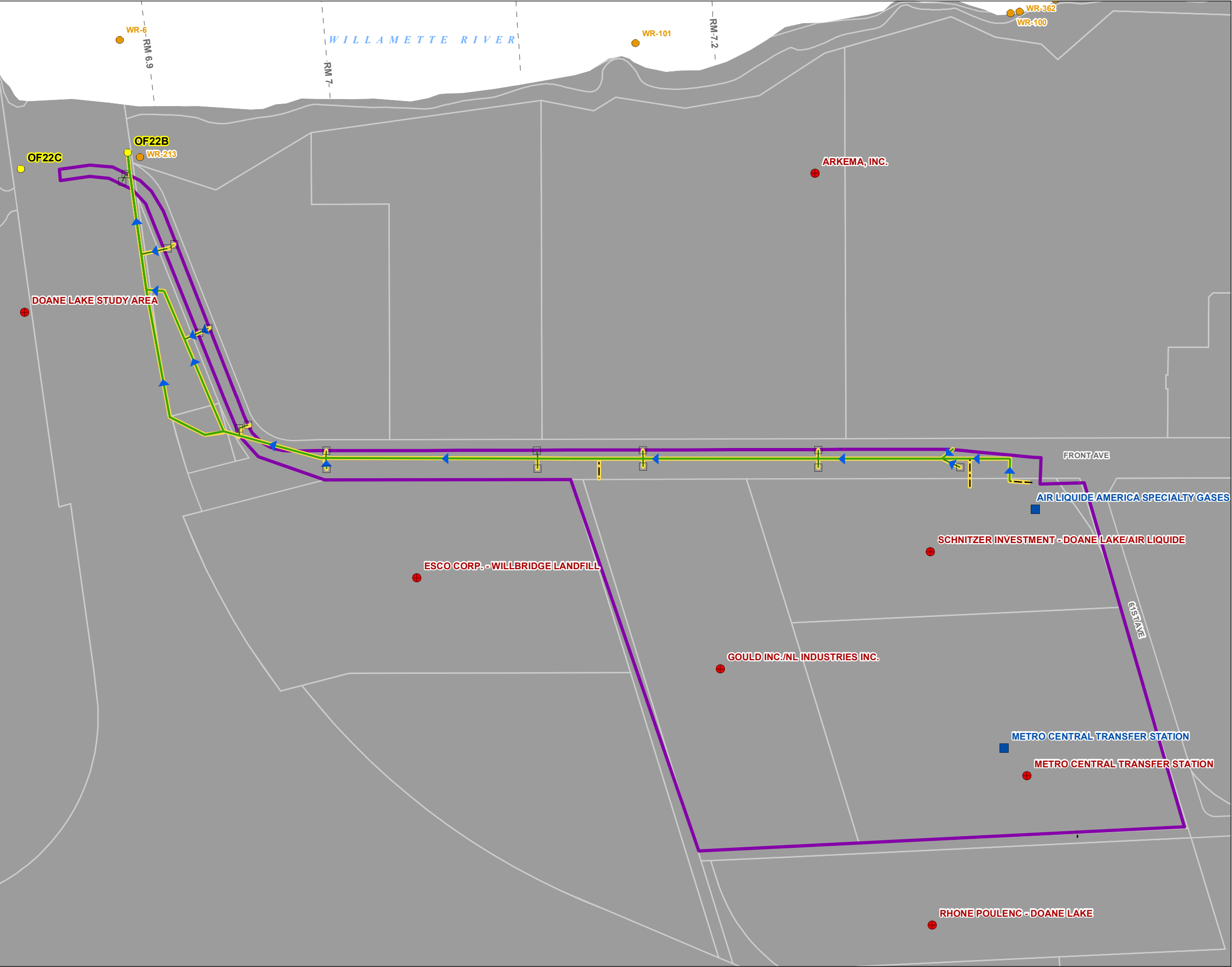
- AMEC. 2010. RI/SCE Report. RP – Portland Site, Portland, Oregon. Prepared for StarLink Logistics, Inc. by AMEC Earth & Environmental, Inc. November 19, 2010.
- Anchor and Integral. 2008. Portland Harbor RI/FS Round 3A and 3B Stormwater Data Report. Prepared for the Lower Willamette Group by Anchor Environmental, L.L.C. and Integral Consulting Inc. September 2008.
- 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 2, Westshore Stormwater and CSO Outfalls. Prepared for the City of Portland Bureau of Environmental Services. December 2000.
- BES. 2005a. City Outfall Basin 22B Upland Source Control Investigation. Technical Memorandum OF22B-1. November 17, 2005.
- BES. 2005b. City Outfall Basin 22B Upland Source Control Investigation. Technical Memorandum OF22B-2. November 18, 2005.
- BES. 2008. City Outfall Basin 22B Inline Solids Evaluation. Technical Memorandum OF22B-3. January 22, 2008.
- BES. 2009. Outfall Basin 22B Inline Solids Investigation. Technical Memorandum No. OF22B-4. City of Portland, Bureau of Environmental Services. August 7, 2009.
- BES. 2010. Stormwater Evaluation Report. City of Portland, Bureau of Environmental Services. February 2010.
- BES. 2012. Transmittal to DEQ of Shallow Soil Sampling conducted by the City of Portland in July 2012 in Basin 22B Adjacent to Schnitzer Investment-Doane Lake Site. City of Portland. July 19, 2012.
- Bridgewater. 2012. Addendum to the Focused Source Control Evaluation Report, Surface Soil Sampling Results. Prepared for Schnitzer Investment Corp. Bridgewater Group, Inc. April 4, 2012.
- CH2M HILL. 2004. Programmatic Source Control Remedial Investigation Work Plan for the City of Portland Outfalls Project. Prepared for the City of Portland, Bureau of Environmental Services in cooperation with Oregon Department of Environmental Quality. CH2M Hill, March 19, 2004.
- CH2M HILL. 2012. Stormwater Source Control Evaluation Report, Portland Facility, Portland, Oregon. Prepared for Air Liquide. Prepared by CH2M HILL. March 2012.

- DEQ. 2010. "Tool for Evaluating Stormwater Data" – Appendix E to Guidance for Evaluating the Stormwater Pathway at Upland Sites. January 2009 (updated October 2010).
- DEQ. 2013. Milestone Report, Upland Source Control at the Portland Harbor Superfund Site. Prepared by the Oregon Department of Environmental Quality. January 2013.
- 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.
- GSI. 2006a. Phase I Report for City of Portland Priority 1 Basins. Prepared for the City of Portland Bureau of Environmental Services Portland Harbor Program by Groundwater Solutions, Inc. May 2006.
- GSI. 2006b. Relationships Between Upland Shallow Groundwater Plumes and the City Stormwater and Combined Conveyance System with the Portland Harbor. Technical Memorandum prepared by Groundwater Solutions, Inc., for the City of Portland Bureau of Environmental Services. March 16, 2006.
- Integral et al. 2011. Portland Harbor RI/FS, Remedial Investigation Report. Prepared for the LWG. Prepared by Integral Consulting Inc., Windward Environmental LLC, Kennedy/Jenks Consultants, and Anchor QEA, LLC. August 29, 2011.

## List of Figures

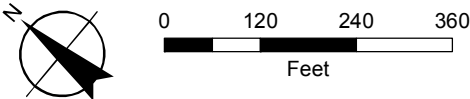
Figure 1: Basin 22B Overview and Conveyance System Source Controls

Figure 2: Basin 22B Upland Site Source Controls



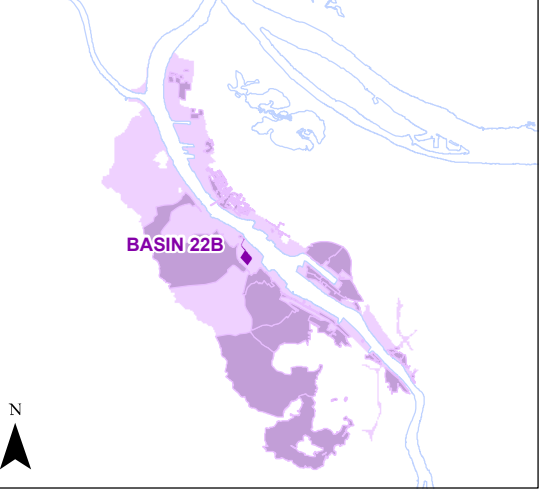
**FIGURE 1**  
**Basin 22B**  
**Overview and Conveyance**  
**System Source Controls**

- Basin 22B
- DEQ ECSI Site
- NPDES Stormwater Permit
- Conveyance System**
  - Storm Line
  - Site Connection
  - Lined Pipe
  - Catch Basin
  - City Outfall
  - Non-City Outfall
- Land Use/Zoning**
  - Heavy Industrial
- All Other Data**
  - River Mile (RM)
  - Tax Lot
  - Discharges to City Outfall
  - Portland Harbor Hydroboundary



**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 22B**  
**Upland Site Source Controls**

- Basin 22B
- Tax Lot
- DEQ Stormwater SCEs**
  - SCE implemented or pending
  - SCE not needed or low priority
- All Other Features**
  - NPDES Stormwater Discharge Permit
  - Stormwater Treatment Facility
  - Ecoroof
  - Site Inspection - BES Industrial Stormwater Program
  - Discharges to City Outfall
  - Portland Harbor Hydroboundary



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

ENVIRONMENTAL SERVICES  
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