Completion Summary for City of Portland Outfall Basin 16

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 16.

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 16 is located on the west side of the Willamette River in the Guilds Lake industrial area and discharges to Balch Creek Cove. Evaluation of inriver sediment data collected by the Lower Willamette Group (LWG) indicated the presence of sediment contamination in the vicinity of the outfall, so the City identified this basin for source investigation. The entire basin is developed and is occupied by industrial facilities (trucking, warehouse/distribution, automotive service, metals recycling, manufacturing operations, and a storage yard) and commercial properties.

The City conducted a comprehensive phased investigation of the basin, which included collecting and analyzing inline solids, stormwater, and dry-weather flow samples to identify major sources and pathways to the basin. Results of these investigations identified a major source of polychlorinated biphenyls (PCB), semivolatile organic compounds, and metals to the basin. As a result of these investigations, the Calbag Metals site entered the DEQ Cleanup Program and is conducting a stormwater pathway evaluation to identify and implement necessary source control measures (SCM) under DEQ oversight. Source investigation results collected by the City and others within the basin do not indicate the presence of other current major sources of contaminants to the City conveyance system.

Given that the City has identified all major sources of contaminants to the basin and necessary controls are being implemented under DEQ and/or City authority, future discharges from the basin are not likely to represent a significant source to the river. Therefore, the City has met the remedial investigation (RI)/SCM objectives for Basin 16.

2 Introduction

This Completion Summary provides a weight-of-evidence evaluation of whether further source investigation is needed in Basin 16, 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 16, 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 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 16 discharges to Balch Creek Cove, located on the west side of the Willamette River at approximately River Mile (RM) 9.7. The Basin 16 stormwater conveyance system conveys runoff from an approximate 71-acre stormwater basin. 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 Basin 16 stormwater conveyance system and associated drainage basin is provided in the *Phase I Report and Inline Sampling Results for the City of Portland Basin 16* (GSI, 2008).

3.2 Land Use and Potential Upland Sources

Basin 16 is located within the Guilds Lake industrial area. Although the basin is zoned heavy industrial, actual land use is a mix of heavy industrial (e.g., metals recycling and small manufacturing facilities), light industrial (e.g., trucking and warehousing operations, and a City maintenance storage area), and commercial (e.g., restaurant and bank). Land use also includes major transportation (a section of the Oregon Department of Transportation's [ODOT] Highway 30).

Sites identified as potential sources include the five sites[1] within or partially within the basin that are in the DEQ Cleanup Program, 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 pathway evaluations.

Two of these sites (Guilds Lake and Front Avenue MP) were remediated before City basin investigations. The Guilds Lake site is a City property. Remediation included soil removal, replacing the historical stormwater drainage system (drywells) and constructing a new system connected to Basin 16, and constructing an engineered cap. Work completed at the Front Avenue MP site included underground storage tank decommissioning, soil removal, site storm system cleaning, and catch basin replacement. Stormwater pathway evaluations are underway at the Calbag Metals and ODOT facilities. DEQ has determined that a stormwater pathway evaluation at the remaining ECSI site (Nudelman & Son) is not needed. This site is used for materials salvage and landfilling operations.

[1] Nudelman & Son (#966) does not have a piped connection to Basin 16 but has generated runoff to an adjacent private line that discharges to Basin 16 (BES, 2002).

Table 1. DEQ Cleanup Program Sites in Basin 16

DEQ Cleanup Site	Site COIs (1)	Site Pathway Evaluations	
		Stormwater Pathway (2)	Preferential Groundwater Pathway(3)
Calbag Metals - Nicolai (ECSI #5059)	TPH, PCBs, metals, phthalates, PAHs	Source Control Evaluation In Progress	Source Control Evaluation in Progress
Front Avenue MP (ECSI #4008)	VOCs, PAHs, TPH, PCBs, metals (4)	Need for Source Control Evaluation to be Determined / Low Priority	Source Control Decision Equivalent
Guilds Lake (ECSI #404)	TPH, metals in soil and groundwater (5)	Source Control Evaluation Not Needed	Source Control Decision Equivalent
ODOT - Portland Harbor Source Control Evaluation (ECSI #5437)	Unknown (5)	Source Control Evaluation In Progress	Not shown
Nudelman & Son, Inc. (ECSI #966) (6)	Unknown (5)	Source Control Evaluation Not Needed	Not shown

Notes:

TPH = total petroleum hydrocarbons; PAHs = polycyclic aromatic hydrocarbons; VOCs = volatile organic compounds; COIs = contaminants of interest; ECSI = Environmental Cleanup Site Information; ODOT = Oregon Department of Transportation.

(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) Site is not listed in Appendix Q of the draft FS; source is Table 4.2-2 of the Portland Harbor RI/FS Draft Final Remedial Investigation Report (Integral et al., 2011).

(5) COIs are not listed for this site in Appendix Q of the Draft FS or Table 4.2-2 of the Draft Final RI. COIs listed are based on information on the DEQ ECSI database (DEQ, 2004a, 2009, 2012).

(6) Site does not have piped connection to basin conveyance system, but site activities have generated discharges to an adjacent private system connected to Basin 16.

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 16 conveyance system are listed in Table 2. Sites with current NPDES permits are shown in Figure 1. Note that the City and ODOT both have NPDES Municipal Separate Storm Sewer System (MS4) stormwater permits that also cover basin drainage areas.

Table 2. Current(1) and Historical NPDES Permit Coverage in Basin 16

Address	Company	Permit Type	Time Period
2211 NW Brewer	**ESCO Corporation (Plant #3)**	Stormwater (1200-H)	1992 – 1996
		Stormwater (1200-Z)	1997 – Present
3033 NW Yeon	Lincoln & Allen Co.	Stormwater (1200-Z) (2)	1999 – 2010
3147 NW Front	**McCracken Motor Freight Inc.**	Stormwater (1200-Z)	1999 – Present
2495 NW Nicolai	**Calbag Metals Co.**	Stormwater (1200-R)	1992 – 1996
		Stormwater (1200-Z)	1997 – Present
3182 NW 26th	**Peninsula Truck Lines, Inc.**	Stormwater (1200-Z)	1998 – Present

Notes:

NPDES = National Pollutant Discharge Elimination System

(1) Current permits are indicated in bold.

(2) Multiple tenants were covered in the permit coverage area.

3.3 Outfall Setting

Outfall 16 discharges to an area of potential concern (AOPC 20) identified by the U.S. Environmental Protection Agency (EPA) based on elevated concentrations of PCBs, metals, and other contaminants in river sediment (EPA, 2010). Outfall 16 is at the southern end of Balch Creek Cove, which also receives discharges from City Outfall 17, outfall WR-258 associated with City Fire Station 6, and outfall WR-235 associated with the Port of Portland Terminal 2. Dock operations (e.g., fire station boathouses) occur within the AOPC in the vicinity of Outfall 16.

4 Basin Screening and Source Investigations

The City initiated source investigations in Basin 16 in 2005, in response to detection of elevated contaminant concentrations in inriver sediment in Balch Creek Cove. The first phase of the investigation entailed sampling and analyzing inline solids and dry-weather flow from the main branches of the conveyance system to determine if additional investigation was needed at targeted locations within the branches. Although not elevated in inriver sediment in the cove, arsenic was detected in the dry-weather flow and inline solids samples at locations in the conveyance system coinciding with locations where iron-oxide precipitate was observed in the storm lines; the high arsenic concentrations therefore were attributed to a reducing environment[2] and not to the likely presence of specific sources (GSI, 2008). A separate evaluation of the potential for City conveyance systems (including Basin 16) to act as preferential pathways for contaminated groundwater did not identify any shallow contaminant plumes potentially intersecting the Basin 16 conveyance system (GSI, 2006), and evaluation of the dry-weather flow investigation results did not indicate that offsite migration of

[2] Arsenic strongly bonds with iron in reducing groundwater environments. Where groundwater enters the stormwater line and is exposed to air, the solubility of iron (and the strongly bonded arsenic) decreases; as a result, they precipitate out of solution.

contaminants to the basin via the preferential groundwater pathway is a significant source to the basin.

Inline solids were analyzed for a broad range of contaminants (i.e., PCBs, PAHs, phthalates, pesticides, metals, and TPH). Although analytical results did not indicate major sources of any contaminant, the City identified potential COIs, based on inriver and inline detections, to be used in the event that future source tracing was warranted (GSI, 2008).[3] In addition, in response to detections of PAHs in the portion of the system in the vicinity of the City maintenance storage yard under the NW 26th Avenue overpass, the City evaluated potential PAH sources, implemented best management practices (BMP) in the storage yard (see Section 6), and confirmed that historical equipment washing by an adjacent facility had been terminated (GSI, 2008).

To verify that additional source tracing was not needed, the City reviewed subsequent data being collected by other parties in the Basin 16 system. In 2007, the LWG installed inline sediment traps and collected stormwater samples from the main branch of the basin to evaluate discharges representative of industrial land use (Anchor and Integral, 2008). Also in 2007, GE Energy – Energy Services (GE) collected inline solids samples at three locations in the basin (AMEC, 2008). Preliminary review of the LWG and GE data indicated potential major sources of PCBs. To identify these sources, the City collected a stormwater grab sample in November 2007 at the connection to the City stormwater line from a potential PCB source, the Calbag Metals facility (BES, 2008), and deployed inline sediment traps in December 2007 and February 2008 at four locations within the upper portions of Basin 16 (BES, 2010a). Results indicated that PCBs and metals are being discharged to the basin from the Calbag site and did not indicate that major sources of PCBs and metals are present in other portions of the basin (BES, 2010a). These findings were referred to DEQ for Cleanup Program consideration and the site has since begun onsite investigations.

The City further evaluated the LWG's 2007 stormwater and sediment trap data from Basin 16 as part of its Portland Harbor stormwater screening effort (BES, 2010b). Based on the evaluation of these data and using a conservative screening approach, only PCBs and copper warranted consideration for potential further source tracing. However, because subsequent investigations already had identified the Calbag site as a major source of these contaminants and had not indicated potential sources in other areas of the basin, no further source tracing was needed (BES, 2010b).

Investigations and evaluations completed by the City and others in the Basin 16 conveyance system are listed in Table 3.

[3] PCBs, metals (copper, lead, and zinc), and bis(2-ethylhexyl)phthalate (BEHP) (GSI, 2008).

Table 3. Investigations in the Basin 16 Stormwater Conveyance System

Data Collection Period	Party	Purpose	Documentation
2005	City	Evaluate existing data on groundwater plumes and identify the potential for City conveyance systems (including Basin 16) to act as preferential pathways.	Relationships Between Upland Shallow Groundwater Plumes and the City Stormwater and Combined Conveyance System with the Portland Harbor (GSI, 2006)
2005, 2007	City	Collect dry-weather flow and inline solids samples, evaluate potential presence of major sources within the drainage basin, and identify basin-specific potential contaminants of interest to focus further source investigation activities.	Phase I Report and Inline Sampling Results for the City of Portland Basin 16 (GSI, 2008)
2007	City	Collect a stormwater sample at the discharge point from the Calbag Metals facility to evaluate whether stormwater discharges from this facility are contributing PCBs to the City stormwater conveyance system.	November 2007 PCB Sampling Results – Calbag Metals; 2495 NW Nicolai (BES, 2008)
2007	LWG	Collect stormwater and sediment trap samples from the main branch of the basin to evaluate stormwater discharges representative of industrial land use.	Portland Harbor RI/FS. Round 3A and 3B Stormwater Data Report (Anchor and Integral, 2008)
2007	GE	Evaluate inline solids data to identify contaminant sources to Balch Creek Cove in the vicinity of the GE site.	GE Public Sewer Sediment Assessment Summary Report (AMEC, 2008); Outfall Basin 16 Inline Solids Investigation Technical Memorandum No. OF 16-1 (BES, 2010a)
2007	City	Evaluate stormwater data from City outfalls (including the 2007 LWG stormwater and sediment trap data from Basin 16) to identify additional source tracing needs.	Stormwater Evaluation Report, City of Portland Outfall Project (BES, 2010b)
2007 - 2008	City	Deploy inline sediment traps at four locations in Basin 16 to inform source tracing efforts and assist with the review and evaluation of inline solids data collected in Basin 16 by the LWG and GE in 2007.	Outfall Basin 16 Inline Solids Investigation Technical Memorandum No. OF 16-1 (BES, 2010a)

Notes:
GE = GE Energy – Energy Services; LWG = Lower Willamette Group

Joint investigation by the City and DEQ resulted in the identification of a significant current source of PCBs, PAHs, bis(2-ethylhexyl)phthalate (BEHP), and metals in Basin 16. The City's source investigation work identified the Calbag Metals site for DEQ Cleanup Program consideration.

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 tracing activities conducted in the basin (and upland site information) and (2) land use at remaining upland areas not undergoing DEQ Cleanup Program investigation or redevelopment. Findings from this evaluation are summarized below:

- *Source Tracing Results:* Upland sources of all contaminants determined as potentially warranting source tracing have been identified. Source investigations identified a major source of PCBs, PAHs, BEHP, and metals to the southwestern portion of the basin (GSI, 2008; BES, 2008, 2010a). Basin investigation results do not indicate that there are other major current sources of other contaminants to the Basin 16 conveyance system (BES, 2010b).

- *Upland Investigation Coverage and Land Use:* Figure 2 displays the spatial extent of DEQ Cleanup Program site investigation and other programmatic controls (see key to figures provided at beginning of this Appendix) in the basin. As shown in Figure 2, sites in the basin are being investigated, or likely do not need investigation because of land use and existing controls. Most sites in the basin:

    - Are investigating the stormwater pathway and implementing SCMs under DEQ Cleanup authority;
    - Have been designated by DEQ as not needing a source control evaluation (SCE) or as a low priority for completing an SCE;
    - Are covered under NPDES industrial stormwater regulations; and/or
    - Have been inspected by the City for industrial stormwater exposures and have been provided technical assistance as needed to implement BMPs.

    Land use at sites not covered by DEQ Cleanup or Water Quality programs mostly consists of warehouse and distribution facilities, automotive service shops, and commercial businesses with minimal industrial exposures to stormwater. Current and future industrial activities that are exposed to stormwater will be addressed by the DEQ Water Quality NPDES program, and non-industrial activities are not a known or suspected major source of contaminants to the City stormwater conveyance system.

Based on these lines of evidence, the City concludes that Basin 16 source tracing is complete and all major sources have been identified.

6 Basin Source Control Measures

The City and DEQ collaborated under their respective authorities to identify control mechanisms for the major source identified in the basin. Source control for major and minor sources in Basin 16 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 16 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. Sites that hold (or historically held) an NPDES No Exposure Certification (NEC) are listed in Table 4.

Table 4. Sites with No Exposure Certification (NEC) in Basin 16 (1)

Address	Company	NEC Time Period
3342 NW 26th	Truckways, Inc.	2003 – 2008
	Portland Bindery	2004 – Present
3255 NW Front	**Ink Systems, Inc.**	2001 – Present
3345 NW Front	**S & H Trucking**	2008 – Present
2619 NW Industrial	**Culver Glass Co., Inc.**	2012 – Present
2952 NW Yeon	United Paper Converters, Inc.	2003 – 2013
	P-Dinh	2013 – Present
3019 NW Yeon	Graphic Art Center Publishing	2003 – 2008
3019 NW Yeon	R & A Walker, Inc.	2003 – 2008
3055 NW Yeon	**Yeon Mini Storage**	2009 – Present
3217 NW Yeon	Paul O Geisey Adcrafters	2003 – 2008
	Adprint Company	2008 – 2011

Notes:

(1) Current NECs are indicated in bold.

The City owns the Guilds Lake site and property underneath the NW 26th Avenue overpass. Portions of the area under the overpass are used by the City's Bureau of Maintenance (BOM) for storage. Based on technical assistance provided by the BES Industrial Stormwater program, BOM cleaned out catch basins in the storage area and installed catch basin filters as a BMP. At the Guilds Lake site, the City completed remedial actions under DEQ oversight (see Table 5 below), and currently leases the site to multiple tenants. Tenants are required to obtain and comply with all relevant environmental regulations, including stormwater controls (see Figure 2).

Additional site-specific, programmatic, and conveyance system source controls completed to date for Basin 16 are summarized in Table 5.

Table 5. Basin 16 Source Controls

Site/Area	Source Control Measures (SCM)	Timeframe/Status
SCMs at DEQ Cleanup Sites		
Calbag Metals Co. (Nicolai) (#5059) (1)	Stormwater covering of material storage areas, and upgrade of stormwater treatment system.	2012
	Additional SCMs to be determined.	To be determined
Front Avenue MP (#4008) (2)	Removal of contaminated soil and cleanout of catch basin and associated piping.	2003 – 2004
Guilds Lake (#404) (2)	Removal of contaminated soil.	1989
	Construction of a cap, decommissioning of drywells, removal of old stormwater conveyances, site regrading, and construction of new storm lines and inlets.	1994 – 1995
	Implementation of a cap maintenance plan.	Ongoing
Nudelman & Son, Inc. (ECSI #966)	Not applicable (3)	Not applicable
ODOT - Portland Harbor Source Control Evaluation (ECSI #5437)	To be determined	To be determined
City Conveyance System		
NW Front Avenue line	The City cleaned out solids from the 8" storm line adjacent to the Front Avenue MP site to remove legacy solids discharged from the site.	2006
Other (Programmatic SCMs) (4)		
Speedometer Service & Instrument; Dealers Supply Co.	**Stormwater Management Manual Requirements**	Ongoing
Culver Glass Co Inc.	**City Discharge Authorization(5)**	Ongoing
See site listing in Table 2	**NPDES 1200-Z Stormwater Permit Requirements**	Ongoing
See site listing in Table 4	**NPDES No Exposure Certifications**	Ongoing

Notes:

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

(1) Based on information in Table 1 in DEQ Milestone Report (DEQ, 2013) and coordination between BES Industrial Stormwater Program, DEQ, and site.

(2) Based on information the DEQ ECSI database (DEQ, 2004a, 2004b).

(3) DEQ has determined that a source control evaluation is not needed or is a low priority at this site (DEQ, 2013).

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

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

All major contaminant sources have been or will be controlled after implementation of necessary 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 16, identified a previously unknown major source of contaminants to the City conveyance system, and referred that source to DEQ. The City collected and evaluated basin data to determine that additional major current sources are not present. Because necessary SCMs at all identified sources have been implemented or are being determined under appropriate DEQ and City regulatory authorities, future discharges from Outfall 16 are unlikely to represent a significant source of contaminants to the river. However, because of the sensitive nature of Balch Creek Cove, 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 16.

8 References

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List of Figures

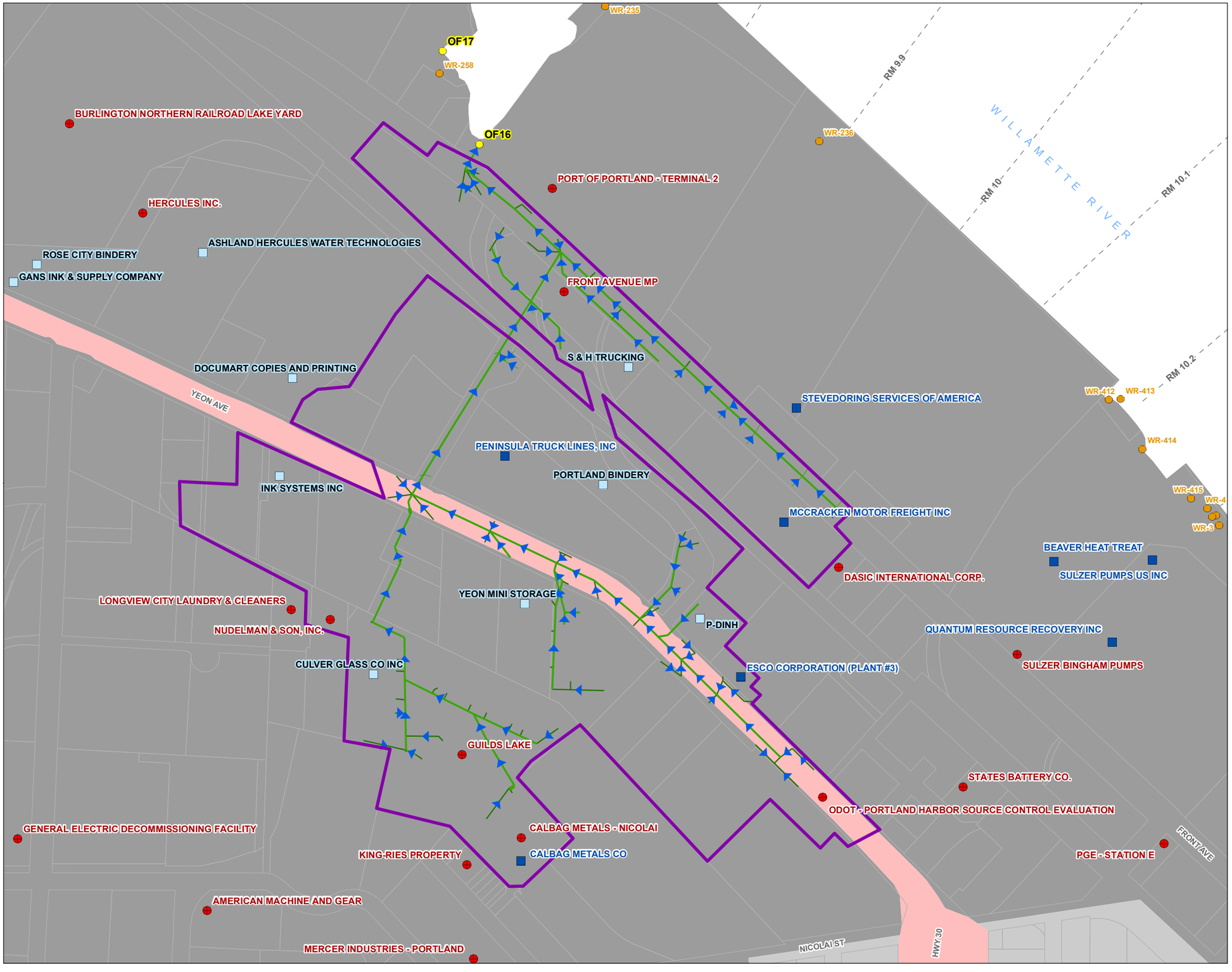


FIGURE 1

Basin 16 Overview

- Basin 16
- DEQ ECSI Site
- NPDES Stormwater Permit
- NPDES No Exposure Certification

Conveyance System

- Storm Line
- City Outfall
- Non-City Outfall

Land Use/Zoning

- Heavy Industrial
- Light Industrial
- Major Transportation

All Other Data

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

N

0 170 340 510

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

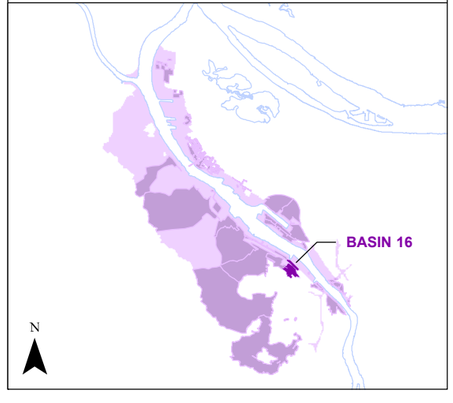
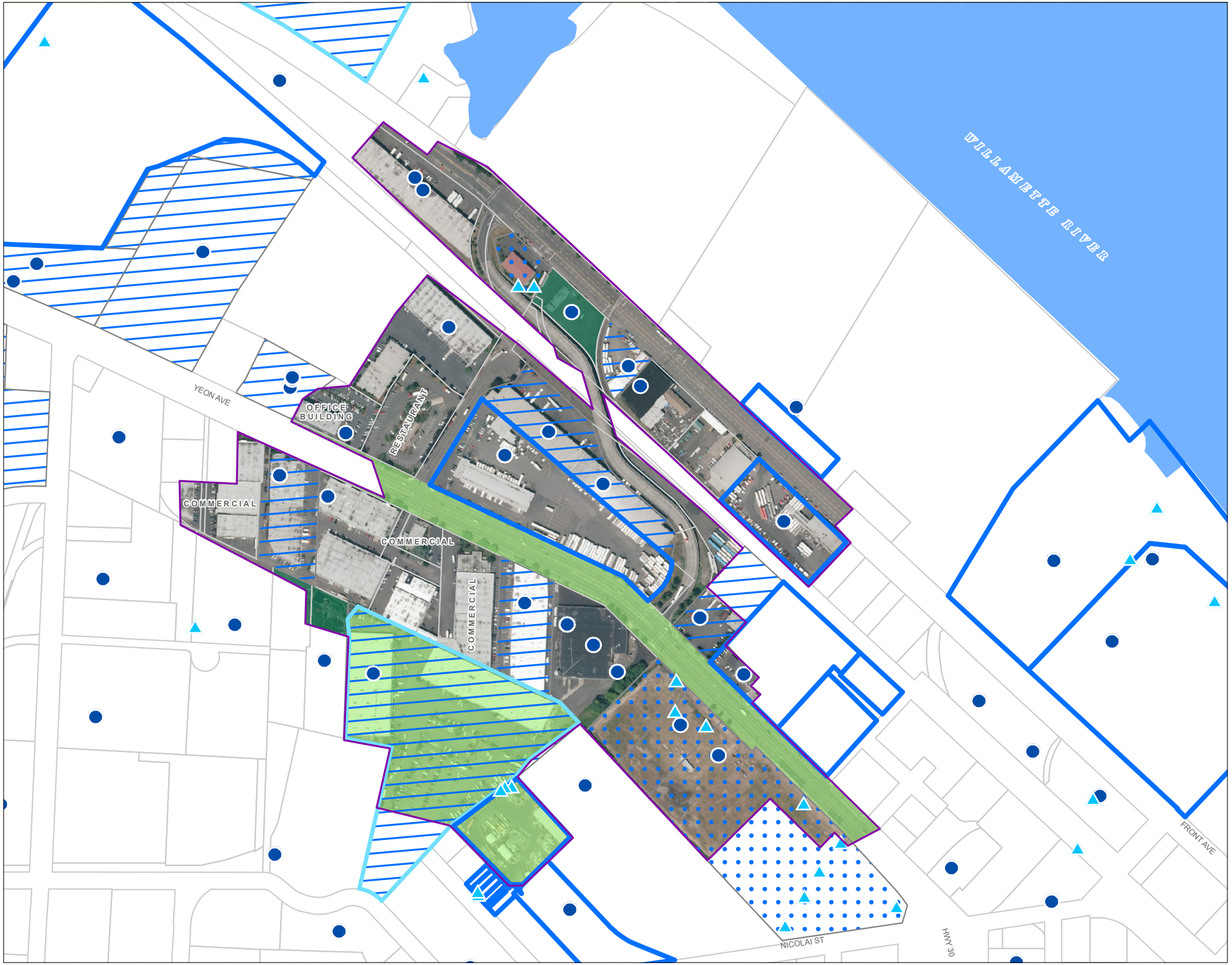


FIGURE 2

Basin 16
Upland Site Source Controls



- Basin 16
- Tax Lot

DEQ Stormwater SCEs

- SCEs implemented or pending
- SCEs not needed or low priority

All Other Features

- NPDES Stormwater Discharge Permit
- City Discharge Authorization
- NPDES No Exposure Certification
- >50% of Site Area Redeveloped Under City SWMM
- Site Inspection - BES Industrial Stormwater Program
- Stormwater Treatment Facility
- Discharges to City Outfall
- Portland Harbor Hydroboundary

N

0 170 340 510
Feet

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

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Portland Oregon, 97204-1912