
King County Lower Duwamish Waterway Source Control Annual Report Years 2014 and 2015

December 2016



King County

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Submitted by:

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Acronyms and Abbreviations

BMPs	best management practices
BEHP	bis(2-ethylhexyl)phthalate
MFC	Military Flight Center
BFS	Business Field Services Team
BBP	butyl benzyl phthalate
CSL	cleanup screening level
CSO	combined sewer overflow
CA	Consistent Attainment
DPER	Department of Permitting and Environmental Review
ERTS	Environmental Report Tracking System
FMD	Facilities Management Division
HPAHs	high molecular weight polycyclic aromatic hydrocarbons
ISGP	Industrial Stormwater General Permit
KCIA	King County International Airport
LHWMP	Local Hazardous Waste Management Program
LPAHs	low molecular weight polycyclic aromatic hydrocarbons
LDW	Lower Duwamish Waterway
LAET	Lowest Apparent Effects Threshold
MTCA	Model Toxics Control Act
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
NBF	North Boeing Field
BSTS	Boeing Field Stormwater Treatment System
OWS	Oil Water Separators
ORC	Oxygen Release Compound
PCBs	polychlorinated biphenyls
PAHs	polycyclic aromatic hydrocarbons
SPU	Seattle Public Utilities
SQS	sediment quality standard
SIU	Significant Industrial User
SCIP	Source Control Implementation Plan
SPS	South Pump Station
SD	Storm Drain
SWPPP	Stormwater Pollution Prevention plan
TSS	total suspended solids
EPA	U.S. Environmental Protection Agency
Ecology	Washington State Department of Ecology
WTD	Wastewater Treatment Division
WLRD	Water and Land Resources Division

1.0 INTRODUCTION

This document summarizes King County's Lower Duwamish Waterway (LDW) source control activities in 2014 and 2015. It is the first annual report that documents implementation of actions outlined in the County's LDW Source Control Implementation Plan (SCIP) for 2014–2018 (King County 2016).¹

The SCIP does the following:

- Identifies actions within the County's authority that are needed to sufficiently control existing sources of contaminants to the LDW to begin sediment cleanup in the waterway.
- Strives to minimize the risk of recontaminating sediments after sediment cleanup to levels above the sediment cleanup standards established in the U.S. Environmental Protection Agency's (EPA) Record of Decision for the LDW Superfund site (EPA 2014).
- Supports the Washington State Department of Ecology's (Ecology) LDW Source Control Strategy Plan (Ecology 2016) as well as supports implementation of EPA's Record of Decision for the LDW Superfund Site.

This annual report is organized according to the county departments and divisions specified in the SCIP.

1.1 LDW Source Control Area

The LDW source control area is defined as drainage areas that discharge to the LDW Superfund site (Figure 1). The area includes (1) King County and Seattle Public Utilities (SPU) combined sewer overflow (CSO) basins and (2) separated stormwater basins that are the responsibility of King County and the cities of Seattle, Tukwila, Burien, and SeaTac respectively. This annual report covers actions in combined sewer basins associated with County CSO outfalls, County separated storm sewer basins, and County properties in the LDW source control area.

1.2 Internal Coordination Efforts

Most of King County's responsibility for LDW source control rests with four county divisions: Wastewater Treatment Division, Water and Land Resources Division, King County International Airport, and Roads Services Division. In 2014 and 2015, a team of representatives from these divisions and from other county agencies (Facilities Management Division, Solid Waste Division, Public Health–Seattle & King County,

¹ King County provided previous source control updates to the LDW Source Control Work Group and to the Washington State Department of Ecology's LDW Source Control Status Reports (2003–2013). The Ecology status reports can be found at http://www.ecy.wa.gov/programs/tcp/sites_brochure/lower_duwamish/source_control/sc.html.

Department of Permitting and Environmental Review, and Local Hazardous Waste Management Program) met regularly to coordinate the SCIP. Starting in 2016, biannual meetings are planned for this cross-divisional team to discuss and coordinate source control efforts.



Figure 1. Lower Duwamish Waterway Source Control Area

2.0 WASTEWATER TREATMENT DIVISION

This section summarizes source control actions taken by King County's Wastewater Treatment Division (WTD) in the LDW drainage area during 2014 and 2015.

2.1 CSO Control Program

WTD is responsible for managing the regional wastewater system. WTD's CSO Control Program fulfills requirements under the National Pollutant Discharge Elimination System (NPDES) permit for the County's West Point Treatment Plant (WA0029181) in Seattle and requirements in Washington Administrative Code 173-245-090. The most recent West Point NPDES permit was issued on December 19, 2014, and became effective on February 1, 2015.

The County's previous investments in CSO control have significantly reduced CSO volumes and pollutant loads into Seattle-area waterways. Three CSO control projects are under way in the LDW. The three projects, estimated to cost \$174 million (2010 dollars), are (1) West Duwamish storage, pipeline improvements, and green stormwater infrastructure (West Michigan and Terminal 115 CSOs); (2) Georgetown Wet Weather Treatment Station (Brandon and South Michigan CSOs); and (3) Rainier Valley Wet Weather Storage and conveyance improvements (Hanford #1 CSO). The three projects will control the remaining uncontrolled County CSOs in the LDW to the state standard of no more than one untreated CSO discharge on average per year at each outfall and will remove most of the untreated CSOs into the LDW. Planning or design for these projects is under way. They will be in operation by 2030. Table 1 summarizes progress made in 2014 and 2015 to meet project milestones.

Table 1. Summary of King County CSO Control Project Milestones in the LDW (2014 and 2015)

Project Name (Status)	Discharge Serial Number	Milestone Deadline	Milestone Completed
Georgetown Wet Weather Treatment Station (30% design)	039, 041	Submit facility plan by December 31, 2015	Submitted in November 2015
Rainier Valley Wet Weather Storage (construction)	031a, 031b, 031c	Issue construction notice to proceed by December 2016	Issued in May 2015
West Duwamish (predesign)	038, 044	Submit facility plan by December 2020	In progress

2.2 RainWise Program

Since 2010, King County, in partnership with the City of Seattle, has administered the RainWise program. This program provides rebates to homeowners living in specific combined sewer areas for installing rain gardens and cisterns on their property. RainWise helps to slow, detain, or retain stormwater, which reduces both the volume and timing of combined sewer flows and reduces sources of pollution into the combined system. The program is under way in the neighborhoods of South Park and Highland Park. To date, RainWise installations in these two neighborhoods are capturing stormwater from 96,039 square feet (2.2 acres) of roof area and removing approximately 1.2 million gallons of stormwater from the combined sewer system.

2.3 Green Grants

From 2011 through 2015, WTD funded community projects, environmental education, and community outreach efforts in the Duwamish River Valley through the Green Grants Program. Over the four year period, \$411,300 in grants were awarded. The purpose of the program is to help improve air and water quality in the Duwamish watershed, support the successful implementation of CSO control projects in this area, and meet regulatory obligations for clean air. Grants are also offered to promote partnerships in the LDW area with the goals of advancing source control for the LDW Superfund cleanup, developing local expertise in water and air quality protection, and enhancing small-scale environmental and economic opportunities in the community.

The 2014 and 2015 recipients and projects are as follows:

- Stewardship Partners: RainWise Access Grants for the Duwamish (\$35,000). This project addresses the issue of accessibility in the RainWise program by piloting an “access grant” program for low-income homeowners in South Park and Highland Park neighborhoods of Seattle. These access grants will be awarded to a minimum of 50 low-income homeowners who would not otherwise be able to participate in the RainWise program because of out-of-pocket expense barriers.
- Sustainable Seattle: Finding Our Way to the Future—Initiating a Duwamish Valley Climate Resilience and Adaptation Plan (\$30,000). This project will build capacity for community leaders to better understand climate impacts in the Duwamish Valley and supports the King County Executive’s Climate Change Initiative. It will initiate climate resiliency and adaptation planning by providing outreach materials and facilitating expert-led discussions with community leaders.
- Sustainable Seattle: Depave the Duwamish (\$22,825). This project will emphasize hands-on learning to educate residents about polluted runoff from impervious surfaces, climate change, the heat island effect, and air quality issues in the Duwamish Valley. By identifying and depaving impervious surfaces on private properties and replacing them with green spaces, this project will engage residents while documenting the story for future use. Additional emphasis will also be placed on building collaboration between stakeholders.

- **Stewards of Westcrest Dog Park: Westcrest Dog Park Runoff Mitigation (\$7,500).** This dedicated volunteer organization will leverage community resources to develop and implement a stormwater mitigation strategy that will prevent polluted runoff from flowing downstream to the Duwamish River. The project will conduct volunteer hands-on restoration and invasive weed removal. In addition, rain gardens will be designed to filter runoff where a polluted pond currently forms. The project will also engage the community on stormwater runoff and how the RainWise rebate program addresses polluted runoff. The grant is contingent on approval from Seattle Parks and Recreation.
- **Christine Makela and Seattle Tilth's Just Garden: South Park Planters (\$7,500).** This project will "green" the South Park neighborhood by constructing raised bed vegetable gardens in public spaces and the yards of homeowners and renters. The project will improve air quality and bring organic food to this neighborhood that lacks access to fresh, healthy food. The project will also acquaint the neighborhood with other options, such as free street trees and the RainWise rebate program.
- **Green Solutions to Air Pollution (\$45,000).** This project will implement strategies to address sources of air pollution in the Georgetown and South Park neighborhoods of Seattle. Strategies will be selected from those identified as highly effective in a literature review (green walls, green billboards, and redesigning tree-planting methods). Strategies will be chosen and implemented in collaboration with the community, including mapping potential locations, engaging businesses, training interested community members, and collaborating with other opportunities.
- **Restoration of Wetland at 23rd Avenue SW and SW Findlay Street (\$40,000).** Delridge Neighborhood Development Association will lead a community effort to improve the water quality and hydrology of Longfellow Creek and its outfall into the West Waterway of the Duwamish River through the purchase and restoration of a 7,144-square-foot wetland. The wetland is part of a 20,000-square-foot parcel being surplussed by Seattle City Light. The project will provide needed green infrastructure in a CSO basin and an underserved neighborhood. It provides the opportunity to engage the surrounding community with hands-on science related to water quality and wetland restoration.
- **Green Infrastructure Job Corps: Growing Green Infrastructure Careers through On-the-Job Training (\$15,980, and an \$37,000 from WTD's Green Stormwater Infrastructure Program).** This project will provide a portion of the funding needed to organize and run three sessions of the Green Infrastructure Job Corps (fall 2015, winter 2016, and spring 2016). This program will develop skills and career pathways for young adults 17 years and older to pursue green infrastructure design, construction, landscaping, or operations and maintenance careers. The grant will pay stipends to participants, and the other funding will pay for technical support for small-scale green infrastructure projects in the Georgetown and South Park neighborhoods. The program will build confidence in young adults through training and participation in a crew that assists with community-driven projects like tree-planting, wetland restoration, rain garden design and construction, green stormwater infrastructure maintenance, and vegetation management.

2.4 Waterworks Grant Funding

King County manages grant programs that promote source control partnerships, develop local expertise in water quality protection, and enhance economic opportunities in the community. The programs fund small-scale projects undertaken by residents, organizations, and small businesses to improve air and water quality. The projects support the success of King County's CSO control projects by controlling new and ongoing sources of pollution that could harm the environment or recontaminate cleaned up areas in the LDW.

The first round of waterworks grants was awarded in 2015 for work in the Green-Duwamish River watershed through King County Council-allocated water quality improvement grants. The program is funded and administered by WTD. The 2015 recipients and grants are as follows:

- SPU-City of Seattle: In-Stream Methodology for Detecting Sewage Flow into Receiving Waters (\$320,000). This project supports development of a methodology to identify sources of bacterial pollution in four to five waterways and creeks in north, east, and south King County using in-stream data loggers that measure temperature and conductivity.
- EarthCorps: Puget Sound Stewards—Duwamish and Beyond (\$50,000). This project recruits and organizes 25 stewards/volunteers to manage 200 community volunteers at up to 25 project sites and two large volunteer efforts to restore the environment along the Lower Duwamish–Green River.
- ECOSSE: Puget Sound Spill Kit Incentive Program—Multicultural Outreach (\$40,000). This project supports training by multilingual coordinators of approximately 400 non-English speaking businesses in spill prevention and cleanup in six cities or unincorporated areas in King County that have expressed interest but do not have resources to support it. This training helps businesses reduce their impact on local waterways.
- King County, Water and Land Resources Division: Cooling the Green River (\$250,000). This project supports acquisition of easements on properties between river miles 11 and 32 of the Green River prior to revegetation to shade the river. Revegetating the riverbanks will decrease pollutants and contaminants in runoff, provide shade and help cool the river in summer and early fall, improve groundwater recharge, and improve salmon and wildlife habitat. Acquisition of easements is the first step in planning for revegetation of this area.
- Seattle Parks Foundation in partnership with Urban Systems Design, LLC: Green Infrastructure Job Corps (\$75,000). This project supports three sessions of the Green Infrastructure Job Corps for young adults. The corps provides job training, including maintenance through 2016 of already completed green infrastructure projects across the Duwamish Valley.
- Stewardship Partners: RainWise Access Grant Expanded Pilot (\$60,000). This project supports expansion of RainWise programs (rain gardens and cisterns

incentive program through the City of Seattle and King County) to reach underserved communities in every RainWise basin. The goal of the project is to reduce the water quality threats posed by CSO events by increasing on-site storage and bioretention of stormwater on private property.

2.5 Industrial Waste Program

The King County Industrial Waste Program (KCIW) regulates commercial and industrial customers of King County's regional wastewater system. The program functions under WTD as a delegated pretreatment program required by the NPDES permits for operation of the division's wastewater treatment plants. Duties include issuing approvals for discharging industrial wastewater to the sewer system, monitoring permitted dischargers, conducting inspections, and taking enforcement action when necessary.

KCIW issues several types of discharge approvals (control documents). The type of approval is determined by the nature of the business, volume and characteristics of the wastewater, and potential risks to the system. Of the over 600 customers under an active control document, approximately 25 percent are in the LDW drainage area.

This section describes KCIW's work related to the LDW drainage area in 2014 and 2015 under the following categories:

- Listing of industrial users in the designated area
- Listing of inspections
- Collaborations
- Special studies and response to incidents

A comprehensive list of KCIW activities may be found in the annual pretreatment reports submitted to Ecology.

2.5.1 Listing of Industrial Users

Industrial users that were active at the end of each year in the LDW drainage area are listed in Appendix A, Tables A-1 through A-4. These tables are separated by 2014 or 2015 calendar year and by whether the particular industrial user is categorized as a Significant Industrial User (SIU) with a waste discharge permit or a non-SIU with a lower-level discharge authorization.

2.5.2 Listing of Inspections

KCIW inspects each SIU at least once annually and all facilities that have applied to renew their discharge approvals. SIU inspections conducted in 2014 and 2015 in the LDW drainage area are listed in Appendix A, Tables A-1 and A-3.

KCIW also conducts periodic inspections of major non-SIUs, typically once within the 5-year permitting cycle or if significant facility modifications occur during the cycle. KCIW staff conducts miscellaneous inspections alone or jointly with other agency staff.

2.5.3 Collaborations

KCIW coordinates with several other agencies on an ongoing basis to control sources of pollutants in the LDW. The following are some of the most significant collaborations during 2014-2015:

- **Duwamish Inspectors Group.** A lead investigator from KCIW participates in the Duwamish Inspectors Group, which is a forum for inspectors from the City of Seattle, Ecology, King County, and other agencies to discuss regulatory issues at facilities in the LDW basin.
- **Review of source control documents.** KCIW staff reviewed drafts of various source control reports and provided input to Ecology's Source Control Strategy for the LDW and to King County's proposed future source control activities.
- **Ecology stormwater inspector.** KCIW worked with an Ecology stormwater inspector to assess facilities in the Brandon and Michigan CSO basins (see "Ecology Inspections in Combined Basins" below).
- **Technical support for source control studies.** A KCIW staff engineer reviewed documents and provided technical assistance to the project manager for the WTD-funded LDW related source control studies (see "Summary of Source Control Studies" below).
- **Outreach to small-quantity generators of hazardous waste.** At the request of KCIW, the Local Hazardous Waste Management Program's Business Field Services Team visited businesses in the Brandon CSO basin that had been mapped by KCIW and inspected by Ecology to support WTD source control efforts in the LDW (see "Local Hazardous Waste Management Program" section below).
- **Waste Management 8th Avenue transloading facility.** Starting in 2014 and continuing in 2015, KCIW staff worked closely with multiple agencies in King County and the region (SPU, Public Health–Seattle & King County, Ecology, and EPA) to develop a control document for a new transloading facility in the LDW area.
- **SPU public rule for the acceptance of contaminated stormwater.** In 2015, KCIW staff met with City of Seattle staff during the development of its new stormwater acceptance rule. The joint effort allowed the City to develop language that aligns with KCIW procedures.

2.5.4 Special Studies and Response to Incidents

This subsection describes KCIW special studies and incident responses in 2014–2015.

2.5.4.1 Surveys of Potential Industrial Dischargers

EPA issued King County a Notice of Violation dated June 27, 2014, for three violations related to a federally mandated requirement to identify all possible industrial users that might be subject to the Pretreatment Program. KCIW took immediate steps to respond to the Notice of Violation.

In letters to EPA, KCIW outlined its plan for improving its survey process in 2015–2016. In 2015, KCIW worked with a contractor to develop survey methods for a large-scale comprehensive survey of businesses in its service area, purchased a list of all industrial users in the service area, and developed a new survey form that will be administered online in 2016. The survey covers the entire county wastewater system. The sewer system that overlaps with the LDW drainage area is a priority for follow up.

2.5.4.2 Response to Unusual Occurrences

In 2014 and 2015, KCIW staff continued to work with County treatment plant and conveyance inspection staff, local sewer agencies, and other regulatory agencies to evaluate and respond to referrals of unusual occurrences in the wastewater system. Staff also responded to notifications from Ecology’s Environmental Report Tracking System (ERTS). The ERTS system notifies local agencies of complaint calls regarding potential illicit discharges to the sanitary sewer. KCIW evaluates each referral on a case-by-case basis. Responses include follow-up calls to industrial facilities, inspections, sampling, and surveillance monitoring at key sampling manholes.

The most significant incidents and associated responses in the LDW area are as follows:

- **Tank Wise located on West Marginal Way.** King County issued a Notice of Violation and Enforcement Action for discharge of oily waste to the sewer. The oily waste discharge from this facility has ceased and the waste is now hauled offsite for disposal.
- **Independent Metals Recycling Plant 1.** KCIW responded to possible contaminated stormwater runoff from the site and transferred the discharge authorization to the new owner.
- **Oily sheen and petroleum odors in conveyance system at the South Michigan Regulator Station and at the junction of Corson Avenue South and South Eddy Street.** KCIW received multiple calls related to petroleum odors and oily sheen in the conveyance system. KCIW initiated a key manhole study (see “Surveillance Monitoring” below), identified a permitted facility as a possible source, and has been working with the facility to reduce the risk of releases. In addition KCIW staff are working with WTD staff to evaluate the need for further action.
- **Line blockages.** SPU reported partially filled lines downstream from Ash Grove Cement and Stoneway Concrete. The source was most likely historical deposits. KCIW found the current control documents and treatment systems to be sufficient. However, the program plans to continue to work with SPU and will be considering new special permit conditions, such as reduction of contaminated stormwater to the sewer, increased sampling, and a possible updated treatment system during the permit renewal cycle.

2.5.4.3 Surveillance Monitoring

KCIW investigates potential sources of spills, slug loads, or illicit discharges by monitoring contaminants of concern at strategic manholes near suspected industrial users or possible

polluters. In addition, KCIW designs key manhole studies to collect technical data in the regional wastewater system to use in the evaluation of local limits.

One major activity conducted in the LDW drainage area in 2014 and 2015 consisted of identifying a potential discharger in South Michigan CSO basin after county staff detected fuel-like odors while working on downstream projects. KCIW monitored sites upstream and downstream from Corson Avenue South and South Eddy Street and collected samples and on-site gas meter readings using a photoionization detector probe. Diesel-range petroleum hydrocarbons were detected at elevated levels. Lead concentrations were higher than background levels and were primarily used as a chemical marker to identify potential dischargers. Using the data and evaluating discharges in the area, KCIW identified a potential responsible discharger. KCIW used its permitting authority to issue control documents that require the discharger to upgrade its pretreatment facility, implement other site modifications, and upgrade institutional controls to minimize the potential for incidental releases to the sewer system.

2.6 Sediment Management Program

This section presents a summary of the source control activities during 2014 and 2015 supported by WTD's Sediment Management Program.

2.6.1 Source Tracing Activities

Since 2010, King County has been collecting solids samples from pipes, wet wells, and outfall weir structures in the combined sewer collection system in the LDW basin to trace sources of pollution (see Appendix B for 2010–2015 data). The Brandon CSO basin was sampled in 2014 and both the Brandon and South Michigan CSO basins were sampled in 2015. Four sediment trap samples were collected from the Brandon Regulator Station, and two sediment traps samples were collected from the Michigan Regulator Station (Table 2). In addition, sediment traps were deployed in 2015 for retrieval in 2016 in the 8th Ave CSO basin. In addition, an in-line solids grab sample was collected. These data will be reported in the next annual report.

Table 2. Summary of Source Tracing Samples Collected from the Combined Sewer System (2014 and 2015)

Sample Type and Year	Number of Samples	
	Brandon CSO Basin	South Michigan CSO Basin
Sediment traps		
2014	2	--
2015	2	2
In-line solids		
2014	0	0
2015	0	0

The sediment traps were installed at two levels in both of Brandon and Michigan Regulator Station (labeled as upper and lower traps). The goal is to capture solids indicative of flows associated with CSOs. Because the upper trap, which is more likely to include flows associated with CSOs, often does not capture sufficient solids for all analyses, the lower trap was installed to increase the likelihood of capturing sufficient solids. The lower trap can capture solids indicative of combined flows but the solids are more likely associated with flows sent to the treatment plant.

As outlined in King County's LDW SCIP, source tracing screening levels for the combined sewer system are two times the second Lowest Apparent Effects Threshold (2LAET) and source tracing focuses on metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and certain other semivolatile organic compounds. Analyses of sediment trap samples, therefore, included metals, mercury, PCBs, and semivolatile organic chemicals for all samples except those collected from the upper sediment traps at Brandon in both years. These Brandon samples did not contain sufficient solids for semivolatile organic chemical analysis. In addition, solids from combined sewer lines typically result in analytical matrix interferences that often result in elevated detection limits².

Below is a summary of the 2014 and 2015 source tracing sampling data.

2.6.1.1 Brandon CSO Basin Data Summary

Sediment traps samples exceeded combined sewer system screening levels for bis(2-ethylhexyl)phthalate (BEHP) in 2014 and BEHP and butyl benzyl phthalate (BBP) in 2015. These two phthalates have exceeded screening levels in past sediment trap samples from Brandon basin and solids grab samples from the CSO outfall structure. Phthalates have been found to be ubiquitous in source tracing data from both separated storm and combined sewer lines and to be difficult to source trace. One sample in 2014 also exceeded the 2LAET for benzo(a)anthracene. Total PCBs and mercury did not exceed the 2LAET in any of these samples. Sediments near the CSO outfall only had an exceedance of the Sediment Management Standard's benthic cleanup screening level for mercury at one station (AECOM 2012). Additional sediment samples collected by King County in 2011 had Sediment Management Standard's sediment quality standard (SQS) exceedances near the CSO outfall for BBP and PCBs.

2.6.1.2 South Michigan CSO Basin Data Summary

Sediment trap samples in the South Michigan basin exceeded combined sewer system screening levels for BEHP, 1-4-dichlorobenzene, low molecular weight polycyclic aromatic hydrocarbons (LPAHs), and four PAH compounds (2-methylnaphthalene, fluorene, naphthalene, and phenanthrene). The 2LAET was also exceeded for mercury, total PCBs, benzo(a)pyrene, benzo(g,h,i)perylene, pyrene, and indeno(1,2,3-cd)pyrene. BEHP exceeded

² Smaller mass of sample often is used from sample jar for analytical extraction methods or dilutions are required after analytical extraction methods. This is done so that analytical quality control/quality assurance performance is acceptable but can result in elevated detection limits.

screening levels in past samples from this basin, but PAHs and 1-4-dichlorobenzene have not. Sediments near the CSO outfall had only SQS exceedances for PCBs (AECOM 2012).

KCIW began an investigation to source trace the PAHs, which are believed to be related to fuel that is intermittently discharged to the combined sewer system. The investigation is currently on-going; see Section 2.2.4 for discussion of these activities. In addition, sediment traps will be deployed in 2016 to determine if these elevated PAH concentrations are continuing.

2.6.2 Ecology Stormwater Inspections

In 2012, WTD entered into an interagency agreement with Ecology to fund a full-time water quality inspector for the LDW. The agreement specified that the Ecology inspector would conduct stormwater inspections of facilities in the separated stormwater system in the LDW and conduct stormwater assessments of facilities that discharge to the combined sewer systems associated with King County CSO outfalls in the LDW. The work of the stormwater inspector was split evenly between separated stormwater inspections and combined sewer system stormwater assessments.

The interagency agreement expired in November 2015. The County received a final briefing and a report of the inspector's activities from Ecology (Ecology 2015). A summary of the work is presented below:

- **Scope of Ecology stormwater assessments:**
 - o Business activity conducted on site
 - o Located drainage at facility, including catch basins
 - o Assessed condition of catch basin (sediment accumulation, visible sheen presence)
 - o Determined frequency of catch basin cleanout and most recent cleanout
 - o Determined if paved areas were swept and, if so, with what frequency
 - o Assessed general housekeeping at facility
 - o Looked for process water discharges
 - o Noted the on-site presence of spill kits
 - o Checked for appropriate cover and secondary containment for materials stored at the facility
 - o Noted the presence of hazardous waste and storage practices
- **2014 inspections summary.** The majority of the inspector's activities in 2014 were as follows: conducting inspections in the Brandon CSO basin; sending stormwater assessment letters to inspected facilities; conducting periodic joint inspections with KCIW investigators; and attending project meetings with WTD employees. Fourteen full inspections of facilities were conducted to assess stormwater conditions tributary to local combined sewers. An additional 59 commercial or residential facilities were screened and did not require further action.

- **2015 inspections summary.** The majority of the inspector's activities in 2015 were as follows: completing and summarizing inspection work in the Brandon CSO basin; conducting basin-wide screening inspections in the South Michigan CSO basin; sending stormwater assessment letters to inspected facilities; conducting periodic joint inspections with KCIW investigators; and attending project meetings with WTD employees. In the Brandon CSO basin, 39 full facility inspections were conducted to assess stormwater conditions tributary to local combined sewers. An additional 30 commercial or residential facilities were screened and did not require further action.

A complete candidate canvas of the 751 parcels identified in the South Michigan CSO basin was completed. Ecology determined that of these parcels, 141 were industrial facilities that would be candidates for a stormwater assessment. A total of 15 facilities were visited, stormwater assessments were conducted at four of these facilities, and two stormwater assessment letters were drafted (Ecology 2015).

Ecology concluded that it would likely take one full-time investigator working for nine months to a year to complete the stormwater assessments in the South Michigan CSO basin to a level commensurate with those done in the Brandon CSO basin. While less densely industrial than the Brandon CSO basin, many of the facilities are large, some with KCIW discharge authorizations or NPDES permits (Ecology 2015).

- **Follow-up activities.** At the request of KCIW, the LHWMP Business Field Services Team (BFS) visited businesses in the Brandon Street CSO basin that generate or store hazardous wastes and materials and would benefit from additional technical assistance visits.

From this effort, the lessons learned and recommendations are as follows:

- One of the county goals through these inspections was to evaluate the nature of the stormwater best management practices (BMPs) in use at industrial facilities in combined basins and how these compare to what is in use in separated stormwater basins. This was done by Ecology, at King County's request, by assessing whether industrial facilities had the conditions that would require coverage under the Ecology Industrial Stormwater General Permit (ISGP). The inspector reviewed site conditions as if a facility were located in a separated stormwater drainage system. Of the 196 facilities assessed in the Brandon CSO basin, 91 were identified as falling under an ISGP category if they had been located in a separated stormwater drainage system (Ecology 2015).
- KCIW will be evaluating the Ecology stormwater assessment letters generated during this study to determine the appropriate level of control and to make permitting decisions.
- The most common findings communicated in follow-up letters to facilities were poor housekeeping, improper storage of hazardous materials, and condition of catch basins.

- The Ecology inspector suggested doing the initial assessment more efficiently by using a survey tool rather than a full inspection.
- Follow-up outreach by the LHWMP indicates that conditions at businesses inspected appear to have improved.

2.6.3 Summary of Source Control Studies

Sources of chemical contaminants to the LDW Superfund site include both historical and current sources. Current sources can be transported through various pathways to the LDW including inputs from the Green River, direct discharge of stormwater, CSOs, atmospheric deposition, spills and leaks of contaminated material, groundwater, and bank erosion or leaching of contaminants from materials. King County is conducting several studies to characterize contaminants in some of these pathways identified for the LDW. This section summarizes the status of these studies for 2014 and 2015.

2.6.3.1 Stream Sediment Sampling in the Green River Watershed

In 2014, King County completed a data report for stream sediment monitoring in the Green River watershed (King County 2014a). This work was done to evaluate sediment quality in streams in the watershed and to better understand the potential sources of sediment-associated chemicals to the Green and Duwamish rivers. A total of 58 sediment samples were collected between 2008 and 2012 from four locations in the mainstem Green River and from the following creeks: Newaukum, Soos, Springbook, Mill (Hill) in Auburn, Mill in Kent, Jenkins, and Covington. The samples were analyzed for metals, mercury, PCBs, PAHs, and other organic compounds.

2.6.3.2 Green River Watershed Whole Water Study

In 2014, King County completed a study and data report characterizing surface water in the Green River watershed (King County 2014b). The study compared concentrations of PCBs, arsenic, and PAHs in the Green River and its major tributaries. The study also provided information to assist in understanding upstream inputs to the LDW. It included the collection and analysis of 56 surface water samples between 2011 and 2012; samples collected represented both baseflow and storm conditions. They were collected from four major tributaries to the Green River (Newaukum, Soos and Mill Creeks, and the Black River) and from two locations in the mainstem Green River: an upstream location at Flaming Geyser State Park (upriver of the major tributaries sampled) and a downstream location at Tukwila at Foster Links Golf Course (downstream of the tributaries).

In 2015, King County completed a study and data report characterizing surface water in the Middle and Upper Green River (King County 2015a). Water samples were collected to improve the understanding of contaminant concentrations in the upper reach of the mainstem Green River (below the Howard Hanson Dam), above most rural development, and the Upper Green River basin (above the Howard Hanson Dam) where access by anadromous salmon is restricted and contaminant sources are limited (largely atmospheric or geologic in the case of arsenic). Twenty-two surface water samples were collected

between 2013 and 2014 representing both baseflow and storm conditions. Samples were collected at Kanaskat-Palmer State Park and at two locations above the Howard Hanson Dam. While most samples were collected in 2013, three storm event samples were collected in January 2014 at the Kanaskat-Plamer State Park location.

2.6.3.3 Green/Duwamish Atmospheric Deposition Study

In 2015, King County completed a supplemental atmospheric deposition study (King County 2015b), which compares the measurements of bulk deposition (dry particulate and rainfall) in areas of different land uses in the Green-Duwamish River watershed and provides information on atmospheric sources to the LDW. This report presents the 2013 data from samples collected at four stations: Georgetown (new station), Beacon Hill, Duwamish, and South Park. The report also includes an evaluation of all the air deposition data collected between 2011 and 2013 at seven locations (the ones listed above as well as two in Kent and one in Enumclaw).

2.6.3.4 Suspended Solids Sampling in the Green River Watershed

King County is conducting a suspended solids sampling study in the Green River watershed (King County 2013a). This study will assess characterize chemical concentrations in suspended solids and the differences of suspended solids quality between major tributary basins and the Green River during both dry conditions and wet season/storm events. While this study does not estimate contaminant loading to the LDW, the data can be used to help characterize the contaminants exported to the LDW and to assist in development of future studies to evaluate contaminant loading to the LDW. The results of this study can also be used to inform future source control efforts in the watershed.

Sediment traps collected suspended solids over a three-month period. In addition, filter bags collected suspended solids during both baseflow and storm conditions. Samples were collected at two Green River mainstem locations and from four tributaries (Newaukum, Soos, and Mill Creeks, and the Black River basin). Sampling began in 2012 and was completed in 2015. The samples were primarily analyzed for arsenic, PCBs, PAHs, and dioxin/furans. Sediment traps from all six locations were retrieved in January 2014. In 2015, an additional set of sediment traps was collected from all six locations for a dry season baseflow sample collection period (July–September 2015). In addition, the County collected a total of 18 filtered solids samples from seven locations in 2014 and a total of five samples from two locations in 2015. A draft data report is scheduled for completion in 2016.

2.6.3.5 CSO Basin Inputs Study

King County's CSO basin inputs study is a pilot study to examine pathways of contaminant sources to combined sewer basins in the LDW (King County 2011, 2013b). Combined sewer basins include inputs from domestic and industrial wastewater (sewage), groundwater infiltration into combined sewer lines (infiltration), and stormwater runoff (inflow). This study aims to better understand the present-day pathways for loadings of select chemicals into combined sewer basins. Specifically, the study aims to identify

primary pathways of LDW contaminants of concern in combined sewers to determine whether contaminants are primarily from stormwater, sewage, or groundwater infiltration entering the system. The results of this study are intended to help guide source tracing efforts in combined basins prior to CSO control by estimating the primary pathways of contaminant sources during stormflow conditions (storm events when sewage and stormwater are both present in the system) that could lead to CSO discharge. King County selected the Brandon and South Michigan combined sewer basins for this study, both of which are priorities for CSO control in the LDW:

- In 2011 and 2012, wastewater was sampled at three locations in the Brandon basin; a data report will be completed in 2016.
- In 2014, wastewater was sampled at three locations in the South Michigan basin (sampling started in 2013). A total of 40 samples were collected from the combined sewer system in 2014. A data report will be completed in 2017.

2.6.3.6 Green River PCB Equipment Blank Study

King County is conducting a study to evaluate the potential for sampling equipment to cause contamination in samples analyzed for low level PCBs (King County 2015c). Equipment blank samples collected for previous studies suggest that autosampler equipment may be contributing PCBs to surface water samples collected from the Green River watershed. Two sampling methods will be used to collect surface water samples to better understand specific PCB congener contamination from autosampler equipment and evaluate the potential bias to Middle and Lower Green River surface water samples collected in previous King County Green River Watershed studies. Twenty-four surface water samples were collected in 2015 representing both baseflow and storm conditions from two previously sampled Green River locations: Kanaskat-Palmer State Park and Foster Links Golf Course. In addition, autosampler equipment and sample-splitting tubing samples were collected in 2015. Additional data collection is scheduled for 2016 and a draft data report is scheduled for completion in 2017.

3.0 WATER AND LAND RESOURCES DIVISION

This section summarizes source control actions taken by King County's Water and Land Resources Division (WLRD) in the LDW drainage area during 2014 and 2015.

3.1 Stormwater Services

3.1.1 Mapping Updates

In accordance with the NPDES Phase I Municipal Stormwater Permit (S5.C.2, Municipal Separate Storm Sewer System Mapping and Documentation), King County is required to map and document the Municipal Separate Storm Sewer System (MS4) on the properties it owns or operates, including the county right-of-way, and on properties that discharge to the MS4. Since the issuance of the municipal stormwater NPDES permit in 1995, various county departments and divisions that hold properties that contain MS4 structures and facilities have mapped their systems to meet the requirements in the County's MS4 mapping program.

Table 3 lists the actions and schedule in the County's SCIP for improving the stormwater asset inventory datasets in the LDW drainage area in unincorporated King County. All actions were completed on schedule, as shown in Table 4.

Table 3. Target completion dates of actions related to mapping of County MS4 system.

Mapping Action	Target Completion Date
- Launch King County MS4 database - Complete the MS4 legacy data migration of all available stormwater features into the central King County stormwater geodatabase for the LDW - Complete gap analyses for the MS4 mapping in the LDW - Complete conveyance system mapping of the County's MS4 in the LDW - Complete mapping of commercial facilities on properties in the LDW regulated by the County, as part of the MS4 mapping program - Submit progress reports on the MS4 mapping effort to Ecology	- June 2014 - September 2014 - November 2014 - June 30, 2015 - June 30, 2015 - Annually, through the Municipal Stormwater NPDES annual report, until project is complete

Table 4. Description of County MS4 mapping actions.

Mapping Action	Description of Completed Action
Launch King County MS4 database.	King County's Stormwater Geodatabase has been established and is the County's system of record for its stormwater asset inventory.
Complete the MS4 legacy data migration of all available stormwater features into the central King County stormwater geodatabase for the LDW.	All major datasets of incongruent stormwater asset data have been standardized and migrated into the King County's Stormwater Geodatabase. All known data sources (including design plans) in the portion of the LDW drainage area regulated by King County have been exhausted to update and improve the datasets. Field mapping investigations to discover any unknown elements of the system have also been exhausted to update the datasets.
Complete gap analyses for the MS4 mapping in the LDW.	Gap analyses for the MS4 stormwater asset inventory have been completed. In isolated cases, these analyses have identified the need for closed-circuit TV equipment to better understand potential system incongruity. King County is assembling these instances so that a project can be formed to resolve them.
Complete conveyance system mapping of the County's MS4 in the LDW.	The conveyance system stormwater asset inventory in the LDW drainage area has been completely mapped by exhausting all known documentation, datasets, and field investigations in order to account for all assets and to understand the system flow, and connections to other systems.
Complete mapping of commercial facilities on properties in the LDW regulated by the County, as part of the MS4 mapping program.	All water quality and flow control facilities (including commercial properties) have been mapped in the LDW drainage area.
Submit progress reports on the MS4 mapping effort to Ecology.	Reports are submitted annually through the Municipal Stormwater NPDES annual reports until the project is complete.

3.1.2 Business Inspections

An inventory of the parcels in the unincorporated area of the LDW drainage area was created and each parcel was rated according to its potential to pollute and its stormwater inspection compliance history. A schedule of accelerated inspections to begin in 2016 was developed (Appendix C). Twenty-one source control inspections were conducted in 2014 and 2015. Table 5 summarizes these business inspections.

Table 5. Business source control inspection results.

Company	Date	Comments
Puget Sound Coatings 9400 8th Ave S	6/16/2014	Joint inspection with Ecology in 2013. Concerns about discharge from wash area. Determined that discharge goes to the sanitary sewer. Earlier items regarding conveyance system repair, cleaning, and stenciling from 2013 inspection corrected.
CDL Recycling 9208 4th Ave S	2/3/2014	Drywall recycling facility. Joint inspections with Ecology. Issues included open dumpsters, waste oil drums, and debris. ERTS in May for sewage discharging from site but not verified. Company moved to another location by September, leaving the site clean.
Universal Intermodal Services 910 S 96th St	2/24/2014	Debris and tires; site cleaning needed. Corrected by 4/10/14.
Concrete Restoration, Inc. 910 S 96th St	2/24/2014	Open dumpster. Corrected by 4/10/14.
Concrete Restoration, Inc. 9587 8th Ave S	2/24/2014	Catch basin socks needed; dust and debris; open empty containers. Corrected by 4/10/14.
Pro Weld 9587 8th Ave S	2/24/2015	No issues.
Security Contractor Services 9336 4th Ave S	3/19/2014	Storage yard for fencing material. No issues.
Security Contractor Services 9617 8th Ave S	6/14/2014	Fencing materials manufacturer. Stenciling of catch basins and dumpster lids needed. Corrected by 9/30/14. Plans under way for stormwater treatment system.
Shell Gas Station 9438 Des Moines Memorial Dr S	8/28/2014	Illicit connection from espresso stand. Confirmed the connection was eliminated on 12/4/15.
Warp Corporation 631 S 96th St	8/28/2014	No issues.
Boeing Company 1420 S Trenton St	8/21/2014	Inspection of tiny vegetated portion of property in unincorporated King County, adjacent to parking lot, in the City of Seattle. No issues.
Icon Materials 1115 S 96th St	2014	Numerous attempts to schedule joint inspections with Ecology.
Pacific Industrial 1251 S Director St	3/5/2015	Needed catch basin sock. Installed by 5/8/15
Carey Chauffeur 1237 S Director St	3/3/2015	Catch basins needed to be cleaned. Work verified by follow-up inspection on 4/6/15.

Company	Date	Comments
Cloverdale Industrial Park 9320 4th Ave S	5/13/2015	Shipping/warehousing. No issues.
Pacific Northwest Motor Freight 515 S 96th St	5/13/2015	No issues.
The Revere Group 9310 4th Ave S	3/27/2015	Stenciling needed. Completed by 5/8/15.
McDonalds at South Park 9610 Des Moines Mem Dr S	9/14/2015	Conveyance system needed cleaning. Completed by 10/23/15.
Puget Sound Coatings 9400 8th Ave S	10/23/2015	Inspected portion of property in unincorporated King County. No issues.
Simplex Grinnell 1000 S 96th St	10/27/2015	No issues.

King County received four water quality complaints that were promptly investigated, shown in Table 6.

Table 6. Water quality complaint investigations.

Company	Date	Comments
South Park Marina 8604 Dallas Ave S	10/10/2014	Concerns about boat wash water going into river. Boat washing ceased.
Puget Sound Coatings 9400 8th Ave S	5/22/2015	Substantiated allegation of improper hazardous waste storage and unpermitted paint blasting booth. Multiagency response. Seattle and Puget Sound Clean Air Agency are addressing noncompliance issues.
Security Contractor Services 9617 8th Ave S	3/28/2014	Cloudy white substance draining into stormwater system. Coating of galvanized wire being washed. Referred to Ecology. Company in process of installing stormwater treatment system.
MVA Oil Spill Hwy 99 & 14th Ave S Interchange	2/27/2015	Report of oil on the roadway and possibly into the storm drain. No evidence found.
Aero-Lac 420 S 96th St	8/29/2014	Paint spill to storm drain as a result of accidental deployment of fire sprinkler system. Spill response contractor pumped out material from catch basins.

3.1.3 Participation in Duwamish Inspectors Group

The Source Control Program manager regularly attended the Duwamish Inspectors Group meetings, sharing information about inspections and coordinating inspections whenever possible. Other members of this group include Ecology, City of Seattle, and other King County programs.

3.2 Local Hazardous Waste Management Program

The Local Hazardous Waste Management Program (LHWMP) implements the moderate-risk waste plan, which addresses hazardous wastes generated by residents and generated in small quantities by businesses. LHWMP activities in 2014 and 2015 are summarized below. More information on LHWMP's services is available at www.hazwastehelp.org.

Table 7 summarizes the number of site visits by LHWMP in the LDW drainage area in 2014 and 2015. The effort focused on on-site technical assistance visits to small businesses for hazardous material and waste management.

Table 7. Local Hazardous Waste Management Program site visits in the LDW drainage area (2014–2015).

Zip Code	2014	2015
98106	2	5
98108	100	54
98134	36	27
98168	79	23
Total	217	109

Most of these site visits were in the Brandon combined sewer basin. Using the list of assessed facilities from the Ecology stormwater inspector (see “Ecology Inspections in Combined Basins” section above), LHWMP's BFS team visited businesses in the Brandon combined sewer basin that generate or store hazardous wastes and materials. The Ecology stormwater inspector indicated these businesses would benefit from additional technical assistance from LHWMP. These site visits occurred between August and December 2014 (with some follow-up in 2015). The businesses made improvements in hazardous waste and material storage, spill prevention, and waste disposal. LHWMP issued 53 vouchers to reimburse businesses 50 percent of their costs (up to \$500 dollars) for purchasing and installing pollution prevention equipment or to cover full costs (up to \$500 dollars) for secondary spill containment pallets.

LHWMP also works with selected industries and ethnic groups known to work in these industries. In 2014-2015, the program focused on dry cleaning companies to explore alternatives to use of perchloroethylene and other chlorinated solvent spot cleaners. Other areas of focus were as follows: artists to address the wide variety of hazardous products they use, nail salons to address worker and customer exposures to hazardous solvent vapor, janitorial/custodial services regarding safe use of cleaning products and promotion of safer alternatives, landscape companies and their workers to promote proper use of pesticides and pesticide-reduction techniques, and gas stations to improve containment of fueling related wastes and spills to protect storm drains. Visits to these businesses within the LDW drainage basin are included in Table 7.

The LHWMP BFS team also continued, through a contract with the Environmental Coalition of South Seattle, to provide spill kits, customized drainage maps, spill plans, and spill cleanup training to businesses that lacked these items.

4.0 DEPARTMENT OF TRANSPORTATION

This section summarizes source control actions taken in 2014 and 2015 in the LDW drainage area by the King County International Airport (KCIA) and the Road Services Division of the King County Department of Transportation.

4.1 King County International Airport

KCIA source control activities conducted in 2014 and 2015 include ISGP compliance, MS4 permit compliance, contaminated site cleanups, spill responses, annual stormwater solids monitoring, and stormwater line cleaning.

A map of KCIA drainage areas³ is provided in Appendix D, Map 1. KCIA is divided into four source control areas in associated drainage basins:

- Slip 4 (LDW river mile[RM] 2.8; north drainage area)
- Boeing Isaacson/Central KCIA/Former Slip 5 (LDW RM 3.7–3.9; central drainage basin)
- Slip 6 (LDW RM 3.9–4.3t; southcentral drainage basin)
- Norfolk CSO/Storm Drain (LDW RM 4.9; south drainage basin)

The Ecology Source Control Action Plans for these KCIA source control areas was reviewed and 2014 and 2015 actions described in this section are consistent with those listed in the LDW Source Control Status Report for 2013 [Ecology 2014]).

Source control activities related to ISGP compliance, MS4 permit, and other source control activities organized by four different KCIA source control areas are discussed below.

4.1.1 Industrial Stormwater General Permit Compliance

In 2014, KCIA monitored stormwater at four sampling points in three of the airport's drainage areas in accordance with the ISGP. The three areas sampled were the north/Slip 4 basin (SP1 and SPM sampling points), central KCIA Basin (SP2), and southcentral/Slip 6 basin (SP3). Sampling point SP4, located in the relatively small south drainage basin, was removed in 2012 because no airport industrial facilities are located in the basin. Sample parameters included turbidity, pH, zinc, copper, and petroleum sheen. See Appendix D, Map 2, for a map of locations of the KCIA ISGP sampling points.

In 2015, the four sampling points (SP1, SP2, SP3, and SPM) were monitored. In accordance with the new 2015 ISGP, quarterly total suspended solids (TSS) sampling was initiated first quarter 2015 at all sampling points:

³ These drainage areas do not delineate the entire geographic area or basin that drains to each of these Slips or outfalls. They are only intended to delineate the areas within the Airport (not including the North Boeing Field area leased by the Boeing Company) that drain to each of these areas.

- The SP1 and SPM sampling points achieved Consistent Attainment (CA) for turbidity, pH, zinc, and copper⁴. In accordance with the 2015 ISGP, sampling of these parameters ceased in first quarter 2015 and will resume first quarter 2018.. Petroleum sheen and TSS will continue to be monitored at SP1 and SPM.
- Consistent Attainment was achieved at SP2 for pH, zinc, and copper. Sampling will resume for these parameters in fourth quarter 2018. Turbidity, petroleum sheen, and TSS at SP2 will continue to be monitored.
- Consistent Attainment was achieved at SP3 for turbidity, pH, and zinc. Sampling at this location will resume for these parameters in fourth quarter 2018. Copper, petroleum sheen, and TSS at SP3 will continue to be monitored.

Table 8 shows the 2014 and 2015 average values for turbidity, zinc, and copper, based on quarterly data from discharge monitoring reports. The average values at all sampling points were below benchmark values.

Table 8. ISGP discharge monitoring data for 2014 and 2015.

Location	Turbidity (NTU)	Zinc (µg/L)	Copper (µg/L)
2014			
SP1	5.3	31.3	4.8
SP2	27.1	18.7	2.1
SP3	15.0	30.2	9.1
SPM	6.8	30.7	6.9
All Sampling Points	13.5	27.7	5.7
2015			
SP1	CA	CA	CA
SP2	25.3	10.2	1.2
SP3	13.0	20.7	19.0
SPM	CA	CA	CA
All Sampling Points	19.1	15.5	10.1
Benchmarks	25	117	14

CA = Consistent Attainment.

KCIA implemented airport-wide BMPs in accordance with its ISGP Stormwater Pollution Prevention Plan (SWPPP). Treatment BMPs such as oil-water separators (OWSs), water quality vaults, and StormFilter systems have been installed and are being maintained. KCIA performs daily mechanical sweeping of paved areas, annual inspections of stormwater facilities, and weekly maintenance of OWSs. KCIA inspects tenant and airport common areas monthly to ensure that BMPs are being maintained. Stormwater line cleaning is being performed in accordance with the ISGP (see “Source Tracing and Remediation” below).

⁴ Consistent Attainment is achieved when eight consecutive quarterly samples demonstrate a reported value of equal to or less than the benchmark value or are within the range of 5.0–9.0 standard units for pH. Sampling is resumed 12 months after Consistent Attainment is achieved.

Several tenants at KCIA who are also covered by an ISGP comply directly with Ecology on its ISGP requirements. KCIA ISGP tenants are listed in Table 9.

Table 9. KCIA tenants and ISGP numbers.

Tenant and Facility Name	Permit Number
Signature Aviation (formerly Landmark Aviation)	WAR000607
DHL Express (Boeing Field Airport)	WAR004602
UPS (Boeing Field)	WAR000434
The Boeing Company (North Boeing Field)	WAR000226
Ameriflight, LLC	WAR002830
KC WTD (Georgetown Yard)	WAR010792
Charles Air	WAR127177

4.1.2 MS4 Permit Compliance

KCIA performed spill response activities in 2014 and 2015 in accordance with its spill response policy. The policy requires that spills be addressed immediately upon discovery.⁵ Notification requirements include contacting airport operations and firefighting units. To ensure zero discharge to receiving waters, pump stations are turned off when spills enter the stormwater drainage system. Thirty-seven spill events were recorded in 2014 and 28 were recorded in 2015. Spill events resulted in proper cleanup and Ecology notifications, as needed. None of these spills entered receiving waters.

In July 2014 and August 2015, KCIA performed annual illicit discharges/connection inspections. Inspections were performed during dry periods and at various discharge points from airport property. No suspected or obvious illicit connections were identified at KCIA discharge points for both years. Data is used to track and source-trace any suspected or obvious discharges observed.

In August 2014 and November 2015, KCIA performed annual stormwater facility inspections. The inspections involved measuring the amount of sediments in 20 stormwater structures including OWSs, stormwater vaults, water quality vaults, StormFilter treatment systems, and stormwater retention systems. Measurements were used to develop schedules for cleaning. OWSs are also maintained weekly for oils and floatables (for example, replacing oil absorbent booms).

A map of KCIA MS4 permit inspections is provided in Appendix D, Map 3.

4.1.3 Source Tracing Activities and Remediation

In 2014 and 2015, source control activities such as sampling, source tracing, remediation, and line cleaning (per the ISGP) were performed in KCIA's four source control areas. A map of sampling, source tracing, and remediation locations is provided in Appendix D, Map 4.

⁵ In addition, spill prevention materials (e.g., oil absorbing materials such as booms and mats) are available in areas required per the NPDES ISGP permit.

Stormwater solids samples were collected in source control areas draining to Slip 4, Former Slip 5, and Slip 6 as part of annual stormwater solids sampling and in support of the County's LDW SCIP. The numbers of source tracing samples collected in each area in 2014 and 2015 are shown in Table 10. Source tracing sampling data for years 2005-2015 are provided in Appendix E. As outlined in King County's LDW SCIP, source tracing screening levels for the storm drain solids are the SQS/LAET and the cleanup screening level (CSL)/2LAET of the Washington State Sediment Management Standards.

Table 10. Number of source tracing samples collected from KCIA source control areas in 2014 and 2015.

Sample Type and Year	Number of Samples		
	Slip 4	Former Slip 5	Slip 6
In-line solids grab			
2014	5	1	2
2015	5	1	2
Sediment traps			
2014	4	2	1
2015	4	2	1
Catch basins/oil water separators			
2014	12	0	0
2015	0	0	0

Summaries of source control activities including sampling and any remedial activities are presented by drainage basin below. In accordance with the County's LDW SCIP, annual inline trap and grab sampling will continue in 2016. The ongoing sampling will assist in investigating contaminant trends.

4.1.3.1 Slip 4 Basin

The KCIA Slip 4 source control area is located in the north area of KCIA. North Boeing Field (NBF), an area of KCIA leased by the Boeing Company, is downgradient of the KCIA drainage area; KCIA non-leased areas (runways and taxiways) and areas leased by tenants other than Boeing are located upgradient of NBF. Offsite stormwater from the east (Airport Way) discharges into the KCIA stormwater system. Stormwater is discharged from NBF through the north pump station and to Slip 4 via a stormwater pipe.

Sampling and Source Tracing

In May 2014 and 2015, KCIA collected annual inline trap and grab stormwater solids samples at the south (SL4-T2A) and southcentral lateral (SL4-T3A) drainage areas of Slip 4. The Boeing Company collected stormwater solids samples at the northcentral (SL4-T4A) and north lateral (SL4-T5B) drainage areas of Slip 4.⁶ These sampling locations are the major laterals of the KCIA Slip 4 source control area that discharge into the NBF site. The sampling results are presented in Appendix E, Tables E-1a through E-1d, and include a

⁶ Boeing provides data results for samples SL4-T4A and SL4-T5A/B to EPA, Ecology and KCIA.

summary table showing all results compiled since 2005. Below is a summary of 2014–2015 inline trap and solids grab sample data compared to source control screening benchmarks:

- **North Lateral/SL4-T5B.** Zinc (in 2014) and total PCBs (in both years) were above the SQS/LAET but were below the CSL/2LAET. Phenanthrene, nine individual high molecular weight polycyclic aromatic hydrocarbons (HPAHs) compounds, total HPAHs, and BEHP were above the CSL/2LAET in both years; BBP was also above the CSL/2LAET in 2014. Heavy oil exceeded Model Toxics Control Act (MTCA) Method A standards in both years. Similar exceedances of benchmarks have been observed in past data, except there were no exceedances for di-n-octyl phthalate in 2014–2015 compared to past years.
- **Northcentral Lateral/SL4-T4A.** Total PCB (in both years) and di-n-butyl phthalate in 2015 were above the SQS/LAET but were below the CSL/2LAET. Zinc, phenanthrene, seven individual HPAH compounds, total HPAHs, BEHP, and di-n-octyl phthalate were above the CSL/2LAET in 2014 and 2015. Benzo(a)anthracene exceeded the CSL/2LAET in 2014 but only the SQS/LAET in 2015. Similar exceedances of screening benchmarks have been observed in past data.
- **Southcentral Lateral/SL4-T3A.** In the inline trap samples, BEHP was above the SQS/LAET in 2014 and benzo(a)anthracene was above the CSL/2LAET in 2014 and the SQS/LAET in 2015; in grab samples, neither of these compounds exceeded the benchmarks in either year. Phenanthrene, eight individual HPAHs, and total HPAHs were above the CSL/2LAET in the inline trap samples in both years; BBP also exceeded the CSL/2LAET in 2014. None of these compounds exceeded the benchmarks in the grab samples in either year. Similar exceedances of benchmarks have been observed in past data.
- **South Lateral/SL4-T2A.** Total PCBs, BBP, and diethyl phthalate were above the SQS/LAET but were below CSL/2LAET in 2014. Total PCBs in 2015 were equal to the CSL/2LAET in an inline trap sample and above the SQS/LAET in a grab sample. BEHP was above the SQS/LAET in grab samples in 2014 and 2015. BEHP was above the CSL/2LAET in an inline trap sample collected in 2014 and above the SQS/LAET in the 2015 sample. Zinc, five individual LPAHs, ten individual HPAHs, total LPAHs, and total HPAHs exceeded the CSL/2LAET in both years. Similar exceedances of benchmarks have been observed in past data.

In accordance with EPA and Ecology requirements, Boeing installed the North Boeing Field Stormwater Treatment System (BSTS) at the KCIA north pump station in 2011 to reduce contaminants leaving NBF and entering the LDW at Slip 4. Boeing also rerouted KCIA stormwater to a separate pipe from the north lateral to efficiently treat stormwater from Boeing's north lateral drainage basin. Boeing continues to treat stormwater, mostly baseflows in NBF and KCIA Slip 4 drainage areas. Boeing's 2014–2015 summary report documented data from water samples of the BSTS effluent:

- Of the 17 samples, 16 were non-detects for PCBs (Landau Associates 2016); the detection limit was 0.005 µg/L.
- The system was effective in reducing PAH concentrations because of its association with suspended solids.

- All samples were below listed NPDES permit benchmark values for metals.
- Semivolatile organic compounds other than PAHs were not detected in whole water samples.

In accordance with the NBF/Georgetown Steam Plant Remedial Investigation/Feasibility Study Work Plan, KCIA performed data gap sampling of stormwater structures upgradient of the NBF/Georgetown steam plant site in fall 2014. The sampling results were submitted to Ecology in a data gaps report in June 2016 (Cardno 2016). Data showed elevated concentrations compared to source tracing screening benchmark values such as the LAET. Additional source tracing at KCIA Slip 4 drainage area is planned for 2016 to determine potential sources of contamination, either at the KCIA or from stormwater upgradient of the KCIA that commingles with stormwater at the Airport. Actions are pending following Ecology review of the data gaps report. Other source tracing and source control activities are included in the MTCA North Boeing Field/Georgetown Steam Plant Site remedial investigation activities.

Remediation Activities

The following remediation was done in 2014 and 2015 in the Slip 4 area:

- **Shultz Fuel Farm Site – 1495 South Hardy Street.** In 2014, a remedial investigation/feasibility study was prepared by the tenant to determine alternatives for cleanup. The tenant has entered the site into Ecology's Voluntary Cleanup Program. Site groundwater was monitored quarterly from March 2014 through December 2015. Ecology required installation of additional shallow wells. Well installation is planned for 2016.
- **Boeing Electronics Manufacturing Facility Site.** In 2014, Boeing conducted groundwater sampling to monitor performance and provide remedial optimization data for the enhanced reductive dechlorinization remediation activities occurring at the site. Semi-annual monitoring continued in 2015. Results show that chlorinated volatile organic compounds concentrations have declined as the result of the enhanced reductive dechlorinization treatment. Boeing revised the Electronics Manufacturing Facility Engineering Evaluation/Cost Analysis (Calibre Systems 2015a) and the Remedial Optimization Work Plan (Calibre Systems 2015b) in response to EPA comments.

4.1.3.2 Former Slip 5 Basin

The KCIA Former Slip 5 source control area is located in the central area of KCIA. Offsite stormwater from the east (Airport Way–City of Seattle) discharges into the KCIA stormwater system. East Marginal Way in the City of Tukwila also discharges stormwater into the KCIA pipe to the Former Slip 5 outfall.

Sampling and Source Tracing

In May 2014 and 2015, KCIA collected annual inline trap and grab stormwater solids samples at KCIA2 and south pump station (SPS) locations in the Former Slip 5 drainage areas of KCIA. The KCIA2 sampling point, located at the westernmost downgradient structure of the basin, represents KCIA stormwater discharges and tidal backflow from

both LDW and East Marginal Way stormwater drainage. The SPS sampling point is more representative of KCIA stormwater drainage than KCIA2. The sampling results are presented in Appendix E, Table E-2, and include a summary table showing all results compiled since 2009. Below is a summary of 2014–2015 data compared to screening thresholds:

- **KCIA2.** BBP was above the SQS/LAET in a 2014 inline trap sample but not in the 2015 inline trap sample nor in either grab sample in both years. No other contaminants exceeded the SQS/LAET in either year. There were exceedances of benchmark screening values for some HPAH compounds in 2012 and for arsenic and zinc in 2010 and 2013. These exceedances were not observed in 2014 and 2015 sample data, which indicates that source control activities have been effective.
- **KCIA SPS.** A grab sample in 2015 showed no exceedances of the SQS/LAET. This is consistent with past samples taken in 2012 and 2013.⁷

Remediation Activities

The following remediation activities occurred in 2014 and 2015 in the Former Slip 5 basin:

- **Former Standard Gas Site – 7200 Perimeter Road.** Independent cleanup of the Former Standard Gas Site was completed in January 2014. Cleanup activities included excavation and disposal of petroleum-contaminated soil, post-excavation sampling, dewatering, oxygen release compound (ORC) placement, backfilling, well decommissioning, and well reinstallation. Post-construction groundwater monitoring was initiated in May 2014 and completed in February 2015. No detectable concentrations of gasoline or lead were present in groundwater after four quarters of sampling.
- **Former Standard Oil Site – 7400 Perimeter Road.** Independent cleanup of the Former Standard Oil Site was completed in November and December 2014. Cleanup activities included excavation and disposal of petroleum-contaminated soil, post-excavation sampling, dewatering, backfilling, ORC advanced injections, and well installation. Post-construction groundwater monitoring will start in 2016.
- **Former Hangar 5 Site – 7585 Perimeter Road.** Independent cleanup of the Former Hangar 5 Site was completed in February 2015. Cleanup activities included soil excavation and disposal, post-excavation sampling, dewatering, backfilling, ORC placement, and well reinstallation. Post-construction groundwater monitoring will start in 2016.

4.1.3.3 Slip 6 Basin

The KCIA Slip 6 source control area is located in the southcentral area of KCIA. Offsite stormwater from the east (Airport Way—City of Seattle) discharges into the KCIA stormwater system. Other offsite properties such as the Museum of Flight, Airfield Business Center, East Marginal Way (City of Tukwila), Aviation High School, and International Auto Auctions discharge stormwater into KCIA stormwater pipe to the Slip 6 outfall.

⁷ Ecology collected the 2013 samples. Results were reported in the LDW NPDES Inspection Sampling Report prepared by Leidos in January 2015.

Sampling and Source Tracing

In May 2014 and 2015, KCIA collected annual inline trap and grab stormwater solids samples in the Slip 6 drainage areas of KCIA. The KCIA1 sampling point was initially installed at the westernmost downgradient structure of the basin in 2009. The sampling point was moved in 2012 to a more upgradient location and relabeled as KCIA1A to avoid offsite discharges and tidal backflow. The KCIA1A sampling point has been sampled since 2013 and more accurately represents KCIA stormwater discharges to the LDW. Sampling results for both locations are presented in Appendix E, Table E-3, and include a summary table showing all results compiled since 2009. Below is a summary of 2014/2015 data compared to screening thresholds.

- **KCIA1A.** Zinc was above the SQS/LAET in the inline trap sample collected in both years; zinc exceeded the CLS/2LAET in the 2014 grab sample but was below the SQS/LAET in the 2015 grab sample. Fluoranthene in both years and benzo(g,h,i)perylene and indeno[1,2,3-cd]pyrene in 2015 exceeded the SQS/LAET.

Comparing data to former sampling location KCIA1, the results for KCIA1A showed no SQS/LAET exceedances of phenanthrene, multiple HPAH compounds including total HPAHs, BEHP, and BBP, indicating an off-site source for these contaminants. The LDW feasibility study (AECOM 2012) did not show any sediment exceedances in samples nearest the basin's outfall, but there were some PAH SQS exceedances within approximately 150 feet of the outfall; there were no exceedances for zinc in the river sediment in Slip 6.

Based on these results, source tracing is planned for the KCIA Slip 6 drainage area. The effort will focus on zinc, benzo(g,h,i)perylene, fluoranthene, and indeno[1,2,3-cd]pyrene.

4.1.3.4 Norfolk CSO/Storm Drain Basin

The KCIA Norfolk source control area includes a portion of Perimeter Road and some grassy areas. Offsite stormwater from the east (Airport Way—City of Seattle) and south (Unified Grocers) discharges to a stormwater pipe located within the boundaries of the KCIA property. The pipe extends westward into the Boeing Military Flight Center (MFC), connects to City of Tukwila stormwater drainage, and discharges to the Norfolk CSO/Storm Drain (SD) outfall in the LDW.

Sampling and Remediation

No sampling was conducted in 2014 and 2015. Past sampling indicated contamination concern; source control action was taken to address the concern. Boeing, EPA, and Ecology continue to address remaining sources. The history of the discovery of the contamination and the source control action is described below:

- In 2012, EPA collected stormwater solids data from KCIA property to investigate high PCB concentrations observed in stormwater drain solids downstream along the Norfolk CSO/SD basin. High PCB concentrations were found at the Boeing MFC stormwater swale (TUK-16) and a Boeing stormwater structure on KCIA property that conveys stormwater from the MFC ramp. Samples from a KCIA catch basin (TUK-17) and an SPU upgradient inflow sample (NST4) showed no PCB or other

significant contamination. As a result, Boeing performed additional investigations in and around the MFC site (see Appendix E, Table E-4).

- In 2013, Boeing found additional PCB contamination at the adjacent KCIA property located east of the MFC ramp (see Appendix E, Table E-4). At this northeast section of the MFC ramp, stormwater sheetflows into KCIA property from the MFC site.
- In 2014, Boeing MFC prepared a work plan to excavate PCB-contaminated soil at adjacent KCIA property. Maximum PCB concentrations were measured above 50 mg/kg in KCIA soils sampled.
- Boeing remediated the PCB-contaminated soils from October to December 2015.
- Post remediation soil sampling is planned for June 2016.

4.1.3.5 Stormwater Line Cleaning

The 2015 ISGP requires stormwater line cleaning for permitted sites that discharge to the LDW. Line cleaning is performed in conjunction with the current catch basin cleaning schedule.

In November 2015, KCIA cleaned lines and catch basins at the east side of the airport. Approximately 90 stormwater lines were cleaned. Legacy sediments were removed, and videos and written reports of stormwater pipe conditions were produced (see Appendix D, Map 5, for the 2015 eastside stormwater line cleaning map).

Stormwater line cleaning is planned for 2016 at the KCIA Central Area (runways and taxiways) and for 2017 at KCIA West Areas (taxiways, parking lots, maintenance shop, airparks, and outfalls).

4.2 Roads Services Division

In 2014 and 2015, the King County Road Services Division continued to maintain roads in the unincorporated area in the LDW source control area. Source control work primarily focused on catch basin inspections and cleaning. Over 700 catch basins were physically inspected using protocols developed for the King County NPDES Municipal Permit. The inspections identify catch basins that need cleaning and any physical limitations or maintenance needs. Of the 700 catch basins inspected, 38 were cleaned or underwent sediment removal by vacuum truck.

5.0 OTHER KING COUNTY DEPARTMENTS AND DIVISIONS

This section summarizes source control actions taken in 2014 and 2015 in the LDW drainage area by various King County departments and divisions that have smaller roles in the LDW source area than the county agencies described in previous chapters. No activity related to Brownfields work in the LDW source control area was undertaken by the Solid Waste Division during this period.

5.1 Facilities Management Division

This section presents source control updates for 2014–2015 for the Facilities Management Division (FMD). Activities during this period to implement Ecology’s Source Control Action Plan relative to the Harbor Bond properties are included in Table 2-1 in the King County SCIP and further described below. Additionally, FMD and WLRD staff confirmed that Outfall 2007 had been abandoned and that the runoff flows were rerouted to Outfall 2010 via the Ohio Avenue SW storm drain system. No additional contaminated FMD sites have been discovered in the LDW source control area during construction or normal maintenance.

5.1.1 Stormwater Inspections

FMD contracts with King County WLRD to perform water quality/business BMP inspections and stormwater facility inspections on properties that are under FMD custodial control. Vacant tax title and open space parcels are inspected every five years for water quality compliance. Similarly, all developed parcels are inspected every five years for water quality/business BMP compliance. Annual facility maintenance inspections are performed on all FMD properties with constructed stormwater facilities, such as catch basins or storage and treatment ponds.

Within the LDW source control area, water quality inspections were performed at 15 undeveloped properties in 2014–2015. Debris dumped on one property had the potential to impact water quality. The debris, including yard waste, a few tires, bottles and cans, was cleaned up about a month after discovery.

Annual stormwater facility inspections in the LDW source control area include the five parcels with buildings and County tenants (Youth Services Center [2 parcels], Orcas Building, Barclay-Dean Building, and the Elections Warehouse) and one tax title property that is vacant except for a stormwater facility:

- The 2014 inspection at the Youth Services Center disclosed 16 catch basins needing vactoring; work was completed in December 2014. No corrective work was required in 2015.
- The Orcas Building inspections disclosed no deficiencies in either year.

- The 2014 inspection at Barclay-Dean found that both catch basins needed maintenance, which was then performed in July 2014. The 2015 inspection showed that no work was necessary (see the section below for additional corrective work at Barclay-Dean).
- Three catch basins at the Elections Warehouse were vactored in July 2014 in response to the inspection that year. In 2015, one catch basin was re-stenciled as a result of the inspection.
- Both inspections at the vacant parcel found the parcel to be in compliance.

Water quality/business BMP inspections were performed at all the Harbor Bond properties in 2013. Activities in 2014 and 2015 are as follows:

- In 2014, a compliance letter was sent to J.A. Jacks for completion of an updated site plan, production of better documentation for stormwater system monitoring, and implementation of a cleaning schedule.
- In 2015, a compliance letter was delivered to Cadman for completing an update of its site plan and monitoring plan, placing a spill kit in the maintenance shop, and installing a concrete pad at the on-site fueling station.
- A follow-up water quality inspection was conducted at the United Western Warehouse facility in May 2014, and in August 2014, a compliance letter was posted to the firm. Compliance actions included placing equipping spill kits at every loading/unloading area in the building and generating a Spill Response and Cleanup Plan.

5.1.2 Barclay-Dean Corrective Work

SPU conducted tests of catch basin solids in the Georgetown neighborhood in 2014, including the Barclay-Dean parking lot. SPU provided data to King County in early 2015 that revealed elevated PAH levels in the two catch basins in the parking lot, one in the public parking area, and one in the parking area reserved for the County Sheriff's Office. King County FMD and WLRD staff conducted additional site inspection and sampling, including analytical laboratory testing, to identify the source of the PAHs. WLRD collected samples of the grit around the catch basin inlet grates. There were insufficient solids in the catch basin sumps because they had been vactored earlier as part of an annual inspection and maintenance program. The grit sampling confirmed that PAH concentrations were well above the CSL/2LAET screening benchmarks.

After a thorough inspection of the building exterior and grounds and interviews of county Sheriff staff, WLRD concluded that the only potential source of PAH contamination was the erosion of an old, thin layer of asphalt sealant apparent in portions of the paved area. Subsequent sampling of this layer of sealant in February 2015 confirmed it as a coal-tar based sealant, which is associated with PAHs. Filter socks were immediately installed in both catch basins. In November 2015, contractors ground and removed the asphalt and sealant from the parking lot and installed new asphalt paving. After sampling, the grindings were recycled at a nearby asphalt batch plant.

5.2 Department of Permitting and Environmental Review

The Department of Permitting and Environmental Review (DPER) provides two primary services for unincorporated King County and KCIA that are directly aimed at controlling the release of contaminants from development sites. DPER reviews and issues development and use permits and inspects the permits for compliance with plans and conditions of permit approval. Table 11 shows the number of permits and final construction approvals in 2014 and 2015 for projects that could potentially introduce or mobilize contaminants.

Table 11. Department of Permitting and Environmental Review Permitting/Inspection Activity in 2014 and 2015.

Construction Type	Number of Permits Approved		Number of Final Construction Approvals	
	2014		2015	
Residential	6	4	6	4
Business/Commercial	2	3	2	3
Industrial – KCIA	5	2	5	0
Industrial – Other	1	0	1	0
Total	14	9	14	7

Projects approved in 2014 were as follows:

- Residential. Four tank removal projects, one new single-family residence, and one demolition project.
- Business/commercial. Demolition of a 15-unit motel and a minor expansion to an existing restaurant.
- Industrial development outside of KCIA. Demolition and replacement of a 6,400-square-foot factory.
- Redevelopment at KCIA. Two projects to remove contaminated soils and three building replacement/expansion projects.

Projects approved in 2015 were as follows:

- Residential. One tank removal and construction of two new single-family residences and one addition.
- Business/commercial. One tank removal, installation of an underground sprinkler system, and construction of an 800-square-foot storage building.
- Redevelopment at KCIA. Two building replacement/expansion projects.

All but two of the permits approved in 2014 and 2015 have received final construction approval and the files have been closed. Two of the redevelopment projects at KCIA are still under construction and are not expected to be completed until 2016.

5.3 Environmental Health Services Division

This section summarizes the source-control related activities under the King County Environmental Health Services Division regulatory programs to (1) administer and enforce state and local regulations governing the safe handling of solid waste and (2) minimize potential human and environmental exposures to sewage and chemicals released from properties that have on-site sewage (septic) systems in the LDW drainage basin.

5.3.1 Public Health – Seattle & King County Solid Waste Program

Twenty-five percent of all permitted solid waste facilities and approximately 30 percent of all permit-exempt solid waste facilities in King County are located in the LDW drainage basin. Figure 2 shows the locations of solid waste facilities and illegal dumping complaints in the LDW drainage basin during 2014 and 2015.

5.3.1.1 Permitted Facilities

The Solid Waste Program's solid waste permit approval and enforcement activities in 2014 and 2015 in the LDW drainage area are as follows:

- There were 10 permitted solid waste facilities and 30 solid waste facilities exempt from permitting that discharge into the LDW drainage basin (Figure 2). Corrections were made to Table B-4 of the County's LDW SCIP (Table 12) to delete two Rabanco Recycling facilities outside of the LDW drainage basin and to revise the address for South Recycle and Disposal Station. For the permitted facilities, Public Health–Seattle & King County reviews site schematics, evaluates operational plans, issues permits, monitors operations, and performs routine inspections.
- Permits were approved for the South Recycle and Disposal Station and Cleanscapes (a material recovery facility for curbside recyclables).
- The program collaborated with multiple agencies, including Ecology and KCIW, to review the solid waste piles permit application and plan of operation for the Waste Management 8th Avenue Reload facility located on Slip 4 of the LDW at 7400 8th Avenue South, Seattle. This site received its solid waste piles permit to handle upland contaminated soils and dredged materials in August 2016.

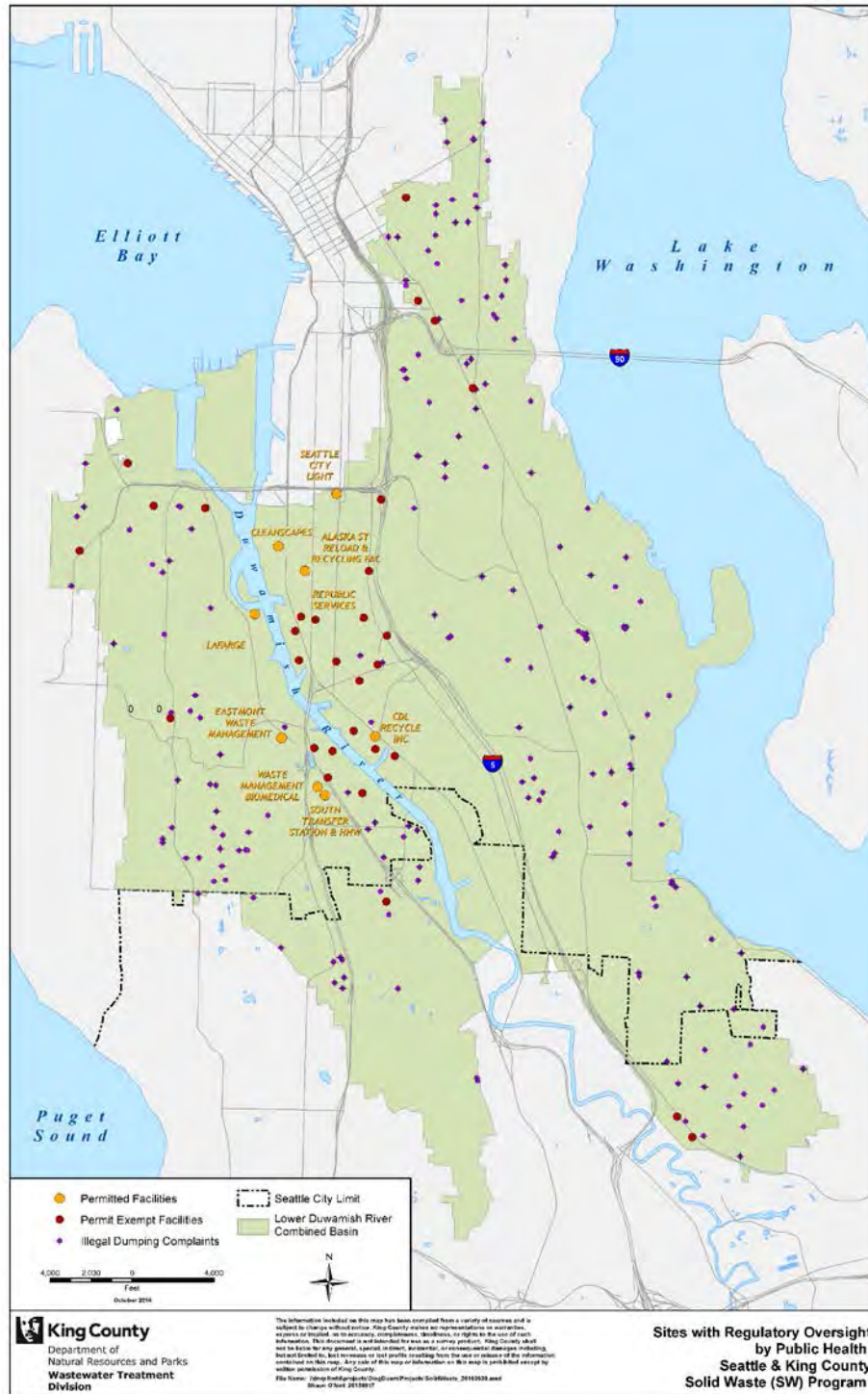


Figure 2. Sites with Regulatory Oversight by Public Health – Seattle & King County, Solid Waste Program

Table 12. Solid Waste Facilities in the LDW Drainage Basin Permitted by Public Health – Seattle and King County in 2014 and 2015.

Name	Type of Facility	Site Address
South Transfer Station (Seattle Public Utilities)	Municipal transfer station	8100 Second Avenue South Seattle, WA 98108
South Recycle & Disposal Station (Seattle Public Utilities)	Municipal transfer station	130 South Kenyon Street Seattle, WA
South Seattle Household Hazardous Waste Facility	Moderate risk waste processing facility	8100 Second Avenue South Seattle, WA 98108
Eastmont Waste Management (Waste Management)	Recycling operation – material recovery facility	7201 West Marginal Way SW Seattle, WA 98108
CDL Recycle, LLC	Construction, demolition, and land clearing debris processor	7201 East Marginal Way Seattle, WA 98108
Alaska Street Reload and Recycling	Solid waste piles that accept dredged materials and petroleum-contaminated soils	70 South Alaska Street Seattle, WA 98134
Lafarge	Solid waste piles that accept dredged materials and petroleum-contaminated soils	5400 West Marginal Way Southwest, Seattle, WA 98106
Seattle City Light South Service Center	Moderate-risk waste processing facility	3613 Fourth Avenue South Seattle, WA 98134
Cleanscapes (A Recology Company)	Material recovery facility	4401 East Marginal Way South, Seattle, WA 98134
Waste Management Biomedical Waste Treatment Facility	Biomedical waste treatment facility	149 Southwest Kenyon Street, Seattle, WA 98108

5.3.1.2 Permit Violations

Permit violations in 2014 and 2015 were as follows:

- In 2014, 18 violations from permitted solid waste facilities, permit-exempt facilities, and solid waste transporters were documented. Some of the violations noted were as follows: solid waste that was not protected from the outdoor elements, fugitive dust (dust leaving property boundaries), vehicles leaking leachate or oil onto the ground, unmarked moderate risk waste containers, lack of pollution control measures for surface water and groundwater, and waste volumes above approved limits. Most of the violations came from one facility, CDL Recycle, which is being closely monitored by Public Health to ensure continued regulatory compliance.
- In 2015, 28 violations from permitted solid waste facilities, permit-exempt facilities, and solid waste transporters were documented. Some of the violations noted were

as follows: no provision of secondary containment, not meeting local fire codes, unmarked moderate-risk waste containers, not following protocols for moderate-risk waste handling, fugitive dust, inadequate litter control, lack of all-weather surfaces for vehicle traffic, and lack of protection for solid waste from the outdoor elements.

5.3.1.3 Illegal Dumping Complaints

Figure 2 shows the locations of complaints of unlawful garbage dumping in the basins discharging into the LDW in 2014 and 2015. Staff visited these sites to assess conditions and to educate the owners on how to comply with code. If no action was taken after a follow-up letter, Public Health enforced compliance as necessary and appropriate.

5.3.2 Public Health – Seattle & King County On-Site Wastewater Program

Public Health administers and enforces the "on-site" (on the property) sewage (septic) code. These regulatory standards are intended to minimize human and environmental exposure to sewage from on-site sewage systems. The following summarizes the program's source-control related activities in the LDW drainage area in 2014 and 2015:

- **Number of septic systems.** In the County's LDW SCIP, Public Health reported 45 known properties with septic systems in the source control area, primarily in the City of Seattle. In 2015, the On-Site Wastewater Program began to investigate the number of properties with septic systems in King County. As of August 22, 2016, the program identified 1,365 properties that are likely served by septic systems in the LDW drainage basin. Most of these are outside of the City of Seattle and have been in place for many years. The number of systems and the number of properties (or parcels) should be equal because, in most cases, there is only one system (one house) per parcel.
- **Failing septic systems.** In 2014, the program received two complaints of possible failing septic systems in the LDW drainage basin. Both complaints are now closed because no actual failure was determined or the failure was addressed and resolved. Three properties were identified as failing through complaints for Onsite Sewage Systems in 2015. Two of the Onsite Sewage Systems were found to be actively failing and both have active enforcements of either Notice of Violation, or Notice and Order in place at this time. The third property has a vacant house and the inspector is contacting the property owner to try to arrange a review of the system in the back yard. Connection to sewer may be possible for all three properties but property owners would need to work with local sewer provider for connection possibilities.
- **New septic systems.** In 2014 and 2015, Public Health approved two of three applications for new septic systems in the LDW drainage area. One new system has been installed and one new system has an as-built completed. The last step of an installation of a septic system under permit, whether it is a new system or a repair, is the approval of the as-built for the work completed. The as-built shows the system location, type, tank location, reserve area location, and other features.

- **Septic systems repairs.** In 2014 and 2015, three septic systems required limited repairs. Limited repairs are usually only a repair of a single component like a broken transport pipe or damaged distribution box and are not complete replacements of tanks or drainfields. They may or may not be the result of a failure complaint. The program received 24 repair permit applications in the LDW drainage basin: 1 was approved, 1 had been installed, 6 were disapproved, and 16 have completed as-builts.

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Appendix A: KCIW Industrial Users

Table A-1. Active Significant Industrial Users at the end of 2014.

Permit			Industrial User	Business Type	Local Sewer Agency	Address	City	Zip	Investigator	Permit Type	CSO Basin
Lower Duwamish Waterway											
112	7130-05		Industrial Container Services	BARREL CLEANING	SEATTLE PUBLIC UTILITIES	7152 1ST AVE S	SEATTLE	98108	DAVE HABERMAN	PERMIT	8th Ave
115	7854-02		Kerry Food and Beverage	FOOD PROCESSING-OTHER	SEATTLE PUBLIC UTILITIES	7224 1ST AVE S	SEATTLE	98108	LYDIA ENG	PERMIT	8th Ave
36	7873-01		Magnetic and Penetrant Services Co.	METAL FINISHING - CFR 433	SEATTLE PUBLIC UTILITIES	8135 1ST AVE S	SEATTLE	98108	GREG NEWBORN	PERMIT	8th Ave
55	7834-02		National Products Inc.	METAL FINISHING - CFR 433	SEATTLE PUBLIC UTILITIES	1025 S ELMGROVE ST	SEATTLE	98108	DAVE HABERMAN	PERMIT	8th Ave
34	7878-01		Seattle, City of - SPU - South Transfer Station	SOLID WASTE - TRANSFER FAC	SEATTLE PUBLIC UTILITIES	130 S KENYON ST	SEATTLE	98108	DANA HEINZ	PERMIT	8th Ave
78	7892-01		The Gear Works	METAL FINISHING - CFR 433	SEATTLE PUBLIC UTILITIES	7701 7TH AVE S	SEATTLE	98108	LYDIA ENG	PERMIT	8th Ave
106	7896-01		Seafreeze Acquisitions LLC	FOOD PROCESSING-SEAFOOD	SEATTLE PUBLIC UTILITIES	206 SW MICHIGAN ST	SEATTLE	98106	GREG NEWBORN	PERMIT	8th Ave or Terminal 115
45	7722-04		Art Brass Plating, Inc.	METAL FINISHING - CFR 433	SEATTLE PUBLIC UTILITIES	5516 3RD AVE S	SEATTLE	98108	PEGGY RICE	PERMIT	Brandon
135	7113-04		Seattle Barrel Co.	BARREL CLEANING	SEATTLE PUBLIC UTILITIES	4716 AIRPORT WAY S.	SEATTLE	98108	ARNAUD GIRARD	PERMIT	Duwamish
60	7592-04		BP West Coast Products, LLC	FUELING FACILITY	SEATTLE PUBLIC UTILITIES	1652 SW LANDER ST	SEATTLE	98134	GREG NEWBORN	PERMIT	Duwamish West
173	7751-04		Encore Oils LLC	RENDERING	SEATTLE PUBLIC UTILITIES	4034 WEST MARGINAL WAY SW	SEATTLE	98106	GREG NEWBORN	PERMIT	Duwamish West
91	7782-07		Vigor Shipyards Inc.	BOAT/SHIPYARD	SEATTLE PUBLIC UTILITIES	1801 16TH AVE. SW	SEATTLE	98134	PEGGY RICE	PERMIT	Duwamish West
2	7811-03		Boeing Company - Plant 2 Facility	METAL FINISHING - CFR 433	CITY OF TUKWILA	7755 E MARGINAL WAY S	SEATTLE	98108	PEGGY RICE	PERMIT	E Marginal
29	7594-05		Boeing Commercial Airplane - North Field	METAL FINISHING - CFR 433	SEATTLE PUBLIC UTILITIES	7500 E MARGINAL WAY S	SEATTLE	98108	PEGGY RICE	PERMIT	E Marginal or Michigan
46	7507-04		Ceradyne Inc. - Viox Glass Technology	GLASS MANUFACTURING	SEATTLE PUBLIC UTILITIES	6701 6TH AVE S	SEATTLE	98108	GREG NEWBORN	PERMIT	Michigan
56	7676-05		Marine Vacuum Service Inc.	CENTRALIZED WASTE TREATMENT	SEATTLE PUBLIC UTILITIES	1516 S GRAHAM ST	SEATTLE	98108	JIM SIFFORD	PERMIT	Michigan
79	7903-01		Waste Management Inc. - 8th Avenue South Reload Facility	SOLID WASTE - TRANSFER FAC	SEATTLE PUBLIC UTILITIES	7400 8TH AVENUE S.	SEATTLE	98108	ARNAUD GIRARD	PERMIT	Michigan
176	7116-06		Darigold Inc. - Rainier Plant	FOOD PROCESSING-DAIRY	SEATTLE PUBLIC UTILITIES	4058 RAINIER AVENUE S.	SEATTLE	98118	TODD GOWING	PERMIT	Rainier

18 = No. of LDW SIUs (2014)

Table A-2. Active Non-Significant Industrial Users at the end of 2014.

Permit	Industrial User	Business Type	Local Sewer Agency	Address	City	Zip	Investigator	Permit Type	CSO Basin	
Lower Duwamish Waterway										
239	10563-02	Bayside X-Ray Co.	METALS RECYCLING	SEATTLE PUBLIC UTILITIES	9414 10TH AVE SW	SEATTLE	98106	DAVE HABERMAN	LETTER OF AUTHORIZATION	LDW ¹
179	4196-01	Burlington Environmental LLC - Georgetown	GROUNDWATER REMEDIATION - ORGANICS	SEATTLE PUBLIC UTILITIES	734 S LUCILE ST	SEATTLE	98108	DANA HEINZ	MAJOR DISCHARGE AUTHORIZATION	LDW ¹
79	4188-01	Glacier Northwest Inc. - South Seattle Ready Mix Plant (DA4188)	CEMENT/READYMIX	SEATTLE PUBLIC UTILITIES	5975 E MARGINAL WAY S	SEATTLE	98134	GREG NEWBORN	MAJOR DISCHARGE AUTHORIZATION	LDW ¹
435	631-04	KapStone Container Corporation (FKA Longview Fibre Paper and Packaging Inc.)	CORRUGATED CONTAINER	SEATTLE PUBLIC UTILITIES	5901 E MARGINAL WAY S	SEATTLE	98134	RYAN SALEM	MAJOR DISCHARGE AUTHORIZATION	LDW ¹
514	631-04	Longview Fibre Paper and Packaging Inc.	CORRUGATED CONTAINER	SEATTLE PUBLIC UTILITIES	5901 E. MARGINAL WAY S.	SEATTLE	98134	RYAN SALEM	MAJOR DISCHARGE AUTHORIZATION	LDW ¹
220	859-01	Northwest Frozen LLC dba Banzai Sushi	FOOD PROCESSING-OTHER	SEATTLE PUBLIC UTILITIES	3623 6TH AVE S	SEATTLE	98134	PEGGY RICE	MINOR DISCHARGE AUTHORIZATION	LDW ¹
146	400-04	Seattle, City of - SPU - South Recycling and Disposal Station	SOLID WASTE - TRANSFER FAC	SEATTLE PUBLIC UTILITIES	8100 2ND AVE S	SEATTLE	98106	JIM SIFFORD	MAJOR DISCHARGE AUTHORIZATION	LDW ¹
312	11482-01	SP Plus Transportation	VEHICLE WASHING	VALLEY VIEW SEWER DISTRICT	9311 4TH AVE S	SEATTLE	98108	PEGGY RICE	LETTER OF AUTHORIZATION	LDW ¹
403	266-06	Surplus Items Inc.	GROUNDWATER REMEDIATION - OTHER	SEATTLE PUBLIC UTILITIES	5101 WEST MARGINAL WAY SW	SEATTLE	98106	RYAN SALEM	MAJOR DISCHARGE AUTHORIZATION	LDW ¹
231	788-02	Coast Crane Company	PRESSURE WASHING	SEATTLE PUBLIC UTILITIES	8250 5TH AVE S	SEATTLE	98108	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	8th Ave
134	854-01	First Student Inc.	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	7739 FIRST AVE S	SEATTLE	98108	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	8th Ave
147	783-02	Flying Fish Express	FOOD PROCESSING-FISH	SEATTLE PUBLIC UTILITIES	7937 2ND AVE S	SEATTLE	98108	GREG NEWBORN	MINOR DISCHARGE AUTHORIZATION	8th Ave
448	11117-02	Gary Merlino Construction	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	9125 10TH AVE S	SEATTLE	98108	TODD GOWING	LETTER OF AUTHORIZATION	8th Ave
1016	4158-01	Independent Metals Co. - Plant 1	METALS RECYCLING	SEATTLE PUBLIC UTILITIES	747 S MONROE ST	SEATTLE	98108	JIM SIFFORD	MAJOR DISCHARGE AUTHORIZATION	8th Ave
200	10361-01	Seatac, City of - Parks and Public Works Maintenance Facility	VEHICLE WASHING	VALLEY VIEW SEWER DISTRICT	2000 S 136TH ST	SEATAC	98168	JIM SIFFORD	LETTER OF AUTHORIZATION	8th Ave
412	10399-03	Seattle Housing Authority - Maintenance Facility	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	7500 DETROIT AVE SW	SEATTLE	98106	RYAN SALEM	LETTER OF AUTHORIZATION	8th Ave
143	10849-02	Seattle, City of - Joint Training Facility	GENERAL TYPE	VALLEY VIEW SEWER DISTRICT	9401 MYERS WAY S	SEATTLE	98108	JIM SIFFORD	LETTER OF AUTHORIZATION	8th Ave
408	4072-06	Seattle, City of - SPU - Dallas Avenue South Remediation Project	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	S DONOVAN & 17TH AVE.S & DALLAS AVE S	SEATTLE	98108	DANA HEINZ	MAJOR DISCHARGE AUTHORIZATION	8th Ave
185	4086-02	South Park Industrial Properties LLC	GROUNDWATER REMEDIATION - ORGANICS	VALLEY VIEW SEWER DISTRICT	9587 8TH AVE S	SEATTLE	98108	DAVE HABERMAN	MAJOR DISCHARGE AUTHORIZATION	8th Ave
307	877-01	The Revere Group	PRINTING	VALLEY VIEW SEWER DISTRICT	9310 4TH AVE S	SEATTLE	98108	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	8th Ave
400	806-02	Washington Litruck	PRESSURE WASHING	SEATTLE PUBLIC UTILITIES	700 S CHICAGO ST	SEATTLE	98122	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	8th Ave
399	322-05	Waste Management - Eastmont Transfer Station	SOLID WASTE - TRANSFER FAC	SEATTLE PUBLIC UTILITIES	7201 W MARGINAL WAY SW	SEATTLE	98106	TODD GOWING	MINOR DISCHARGE AUTHORIZATION	8th Ave
142	785-04	Waste Management - Seattle	CONTAINER WASHING	SEATTLE PUBLIC UTILITIES	8101 1ST AVE S	SEATTLE	98108	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	8th Ave
564	322-05	Waste Management Inc. - Eastmont Transfer Station	SOLID WASTE - TRANSFER FAC	SEATTLE PUBLIC UTILITIES	7201 W. MARGINAL WAY SW	SEATTLE	98106	TODD GOWING	MINOR DISCHARGE AUTHORIZATION	8th Ave
570	785-04	Waste Management Inc. - Seattle	CONTAINER WASHING	SEATTLE PUBLIC UTILITIES	8101 FIRST AVENUE S.	SEATTLE	98108	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	8th Ave
606	10742-01	Northland Services Inc.	PRESSURE WASHING	SEATTLE PUBLIC UTILITIES	6700 W. MARGINAL WAY SW	SEATTLE	98106	RYAN SALEM	LETTER OF AUTHORIZATION	8th Ave or Terminal 115
506	555-04	Ardagh Glass Inc.	GLASS MANUFACTURING	SEATTLE PUBLIC UTILITIES	5801 E. MARGINAL WAY S.	SEATTLE	98134	DAVE HABERMAN	MAJOR DISCHARGE AUTHORIZATION	Brandon
78	4235-01	Cadman (Seattle) Inc.	CEMENT/READYMIX	SEATTLE PUBLIC UTILITIES	5225 E MARGINAL WAY S	SEATTLE	98134	DANA HEINZ	MAJOR DISCHARGE AUTHORIZATION	Brandon
320	948-01	Foster's Frame & Axle	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	5300 1ST AVENUE S.	SEATTLE	98108	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Brandon
587	543-04	General Electric Co. - Dawson Street	GROUNDWATER REMEDIATION - ORGANICS	SEATTLE PUBLIC UTILITIES	220 S. DAWSON STREET	SEATTLE	98108	PEGGY RICE	MAJOR DISCHARGE AUTHORIZATION	Brandon
430	739-03	Kamco Seafood Inc.	FOOD PROCESSING-FISH	SEATTLE PUBLIC UTILITIES	128 S ORCAS ST	SEATTLE	98108	RYAN SALEM	MINOR DISCHARGE AUTHORIZATION	Brandon
69	555-04	Saint-Gobain Containers Inc.	GLASS MANUFACTURING	SEATTLE PUBLIC UTILITIES	5801 E MARGINAL WAY S	SEATTLE	98134	DAVE HABERMAN	MAJOR DISCHARGE AUTHORIZATION	Brandon
376	11430-01	Seadrunar Recycling	METALS RECYCLING	SEATTLE PUBLIC UTILITIES	28 S. BRANDON STREET	SEATTLE	98134	TODD GOWING	LETTER OF AUTHORIZATION	Brandon
70	774-02	Seattle, City of - SPU - Materials Storage Yard	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	5821 1ST AVE S	SEATTLE	98108	DANA HEINZ	MINOR DISCHARGE AUTHORIZATION	Brandon
309	11436-01	United Rentals - Seattle	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	5421 1ST AVENUE S.	SEATTLE	98108	DAVE HABERMAN	LETTER OF AUTHORIZATION	Brandon
178	4154-02	Georgetown Brewing Co.	FOOD PROCESSING-BREWERY	SEATTLE PUBLIC UTILITIES	5200 DENVER AVE S	SEATTLE	98108	DAVE HABERMAN	MAJOR DISCHARGE AUTHORIZATION	Brandon or Duwamish
243	712-03	Harborview Medical Center	HOSPITAL	SEATTLE PUBLIC UTILITIES	325 9TH AVE	SEATTLE	98104	PEGGY RICE	MINOR DISCHARGE AUTHORIZATION	Connecticut, Hanford 1/2 or Lander
1330	4308-01	Seattle Housing Authority - Yesler Terrace Redevelopment Project	CONSTRUCTION DEWATERING	SEATTLE PUBLIC UTILITIES	800 E. YESLER WAY	SEATTLE	98122	TODD GOWING	MAJOR DISCHARGE AUTHORIZATION	Connecticut, Hanford 1/2 or Lander
228	4009-04	Ash Grove Cement Company	CEMENT/READYMIX	SEATTLE PUBLIC UTILITIES	3801 E MARGINAL WAY S	SEATTLE	98134	JIM SIFFORD	MAJOR DISCHARGE AUTHORIZATION	Duwamish
210	10415-01	Auto-Chlor System	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	4315 7TH AVE S	SEATTLE	98108	DANA HEINZ	LETTER OF AUTHORIZATION	Duwamish
157	4085-03	Bloch Steel Industries	GROUNDWATER REMEDIATION - PETROLEUM	SEATTLE PUBLIC UTILITIES	4580 COLORADO AVE	SEATTLE	98134	PEGGY RICE	MAJOR DISCHARGE AUTHORIZATION	Duwamish
615	4179-02	Cascade Designs Inc.	METAL FABRICATION	SEATTLE PUBLIC UTILITIES	4000 1ST AVENUE S.	SEATTLE	98134	DANA HEINZ	MAJOR DISCHARGE AUTHORIZATION	Duwamish
416	802-02	Cascade Machinery & Electric Inc	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	4600 E MARGINAL WAY S	SEATTLE	98134	RYAN SALEM	MINOR DISCHARGE AUTHORIZATION	Duwamish
417	932-01	ConGlobal Industries Inc.	PRESSURE WASHING	SEATTLE PUBLIC UTILITIES	1 S IDAHO ST	SEATTLE	98134	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Duwamish
355	933-01	Grand Central Bakery	FOOD PROCESSING-BAKERY	SEATTLE PUBLIC UTILITIES	4634 E. MARGINAL WAY S., SUITE C110	SEATTLE	98134	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Duwamish
444	795-02	Gretchen's Shoebox Express	FOOD PROCESSING	SEATTLE PUBLIC UTILITIES	3922 6TH AVE S	SEATTLE	98108	DANA HEINZ	MINOR DISCHARGE AUTHORIZATION	Duwamish
170	10638-02	MacMillan-Piper - Edmunds Street Facility	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	655 S EDMUNDS ST	SEATTLE	98124	DAVE HABERMAN	LETTER OF AUTHORIZATION	Duwamish
442	11557-01	North Star Casteel Products Inc.	METAL FABRICATION	SEATTLE PUBLIC UTILITIES	820 S BRADFORD ST	SEATTLE	98108	TODD GOWING	LETTER OF AUTHORIZATION	Duwamish
375	964-01	Northwest Container Services Inc. - Seattle Intermodal Yard	CONTAINER WASHING	SEATTLE PUBLIC UTILITIES	635 S. EDMUNDS STREET	SEATTLE	98108	GREG NEWBORN	MINOR DISCHARGE AUTHORIZATION	Duwamish
169	10457-01	Puget Sound Industry Services Inc.	PRESSURE WASHING	SEATTLE PUBLIC UTILITIES	4429 AIRPORT WAY S	SEATTLE	98108	DANA HEINZ	LETTER OF AUTHORIZATION	Duwamish
1945	743-04	Schwartz Brothers Bakery - Seattle	FOOD PROCESSING-BAKERY	SEATTLE PUBLIC UTILITIES	617 S NEVADA ST	SEATTLE	98108	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	Duwamish
410	796-02	Seattle Radiator LLC	RADIATOR REPAIR	SEATTLE PUBLIC UTILITIES	5011 OHIO AVE S	SEATTLE	98134	GREG NEWBORN	MINOR DISCHARGE AUTHORIZATION	Duwamish
262	232-04	Stoneway Concrete - South Seattle Ready Mix Batch Plant	CEMENT/READYMIX	SEATTLE PUBLIC UTILITIES	3803 E MARGINAL WAY S	SEATTLE	98108	GREG NEWBORN	MAJOR DISCHARGE AUTHORIZATION	Duwamish
219	10506-01	Trade-Marx Sign & Display Corporation	METAL FABRICATION	SEATTLE PUBLIC UTILITIES	3614 6TH AVE S	SEATTLE	98134	DANA HEINZ	LETTER OF AUTHORIZATION	Duwamish
158	10489-01	Triple F Granite & Marble	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	4660 E MARGINAL WAY S	SEATTLE	98134	DANA HEINZ	LETTER OF AUTHORIZATION	Duwamish
227	668-04	Union Pacific Railroad - Argo Yard	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	4300 COLORADO AVE S	SEATTLE	98108	LYDIA ENG	MAJOR DISCHARGE AUTHORIZATION	Duwamish
211	4020-03	United Parcel Service - Seattle	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	4455 7TH AVE S	SEATTLE	98108	DANA HEINZ	MAJOR DISCHARGE AUTHORIZATION	Duwamish
156	691-03	Waste Management - Alaska Street Facility	SOLID WASTE - TRANSFER FAC	SEATTLE PUBLIC UTILITIES	70 S ALASKA ST	SEATTLE	98134	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	Duwamish
76	459-04	Alaska Marine Lines Inc.	CONTAINER WASHING	SEATTLE PUBLIC UTILITIES	5600 W MARGINAL WAY S	SEATTLE	98106	GREG NEWBORN	MINOR DISCHARGE AUTHORIZATION	Duwamish West
80	4112-02	Chemithon Corporation	MANUFACTURING-MISC	SEATTLE PUBLIC UTILITIES	5430 W MARGINAL WAY SW	SEATTLE	98106	GREG NEWBORN	MAJOR DISCHARGE AUTHORIZATION	Duwamish West
129	815-01	FOG-TITE Meter Seal, Inc.	CEMENT/READYMIX	SEATTLE PUBLIC UTILITIES	4819 W MARGINAL WAY SW	SEATTLE	98106	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Duwamish West
77	510-03	Glacier Northwest Inc. (DA510)	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	5900 W MARGINAL WAY SW	SEATTLE	98106	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	Duwamish West
433	4204-02	Lafarge - Seattle Plant	CEMENT/READYMIX	SEATTLE PUBLIC UTILITIES	5400 W MARGINAL WAY SW	SEATTLE	98106	ARNAUD GIRARD	MAJOR DISCHARGE AUTHORIZATION	Duwamish West
229	536-04	Rainier Petroleum Corp.	FUELING FACILITY	SEATTLE PUBLIC UTILITIES	1711 13TH AVE SW	SEATTLE	98134	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Duwamish West
336	952-01	Westway Feed Products LLC	MANUFACTURING-MISC	SEATTLE PUBLIC UTILITIES	1002 SW SPOKANE STREET	SEATTLE	98134	DANA HEINZ	MINOR DISCHARGE AUTHORIZATION	Duwamish West

Table A-2. Active Non-Significant Industrial Users at the end of 2014.

	Permit	Industrial User	Business Type	Local Sewer Agency	Address	City	Zip	Investigator	Permit Type	CSO Basin	
	Lower Duwamish Waterway										
	67	818-01	VA Puget Sound Healthcare System - Seattle Division	HOSPITAL	SEATTLE PUBLIC UTILITIES	1660 S COLUMBIAN WAY	SEATTLE	98108	PEGGY RICE	MINOR DISCHARGE AUTHORIZATION	Duwamish, Hanford 1/2, Lander, Michigan or Rainier
	1963	4194-03	Seattle, City of - Seattle City Light - South Service Center	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	3613 4TH AVE S	SEATTLE	98134	ARNAUD GIRARD	MAJOR DISCHARGE AUTHORIZATION	Duwamish, Hanford 2 or Lander
	186	526-05	Boeing Developmental Center	MANUFACTURING-MISC	CITY OF TUKWILA	9725 E MARGINAL WAY S	SEATTLE	98108	ARNAUD GIRARD	MAJOR DISCHARGE AUTHORIZATION	E Marginal
	3	363-04	Boeing Integrated Defense Systems - Military Flight Center	VEHICLE WASHING	TUKWILA PUBLIC WORKS	10002 E MARGINAL WAY S	SEATTLE	98108	PEGGY RICE	MINOR DISCHARGE AUTHORIZATION	E Marginal
	418	4167-02	Container Properties LLC	GROUNDWATER REMEDIATION - ORGANICS	TUKWILA PUBLIC WORKS	9229 E MARGINAL WAY S	TUKWILA	98118	GREG NEWBORN	MAJOR DISCHARGE AUTHORIZATION	E Marginal
	260	4223-01	Boeing North Field Facility - PCB Treatment System for Duwamish Area Boeing Facilities	WATER TREATMENT	SEATTLE PUBLIC UTILITIES	7500 E MARGINAL WAY	SEATTLE	98124	PEGGY RICE	MAJOR DISCHARGE AUTHORIZATION	E Marginal or Michigan
	296	891-01	Cucina Fresca Gourmet Foods	FOOD PROCESSING-OTHER	SEATTLE PUBLIC UTILITIES	8300 MILITARY ROAD S., SUITE 120	SEATTLE	98108	DANA HEINZ	MINOR DISCHARGE AUTHORIZATION	E Marginal or Michigan
	266	849-01	Galvin Flying Services	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	7777 PERIMETER RD	SEATTLE	98108	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	E Marginal or Michigan
	301	11452-01	King County International Airport - Aircraft Lavatory Dump Facility	CHEMICAL TOILET	SEATTLE PUBLIC UTILITIES	7575 PERIMETER ROAD S.	SEATTLE	98108	JIM SIFFORD	LETTER OF AUTHORIZATION	E Marginal or Michigan
	268	4109-02	King County International Airport - Boeing Field	TRANSPORTATION FACILITY	SEATTLE PUBLIC UTILITIES	7277 PERIMETER RD S	SEATTLE	98108	GREG NEWBORN	MAJOR DISCHARGE AUTHORIZATION	E Marginal or Michigan
	270	4129-03	King County International Airport - GWR	GROUNDWATER REMEDIATION - PETROLEUM	SEATTLE PUBLIC UTILITIES	7777 PERIMETER RD S	SEATTLE	98108	GREG NEWBORN	MAJOR DISCHARGE AUTHORIZATION	E Marginal or Michigan
	384	11580-01	1315 East Jefferson LLC Construction Project	CONSTRUCTION DEWATERING	SEATTLE PUBLIC UTILITIES	1315 E. JEFFERSON STREET	SEATTLE	98122	LYDIA ENG	LETTER OF AUTHORIZATION	Hanford 1/2 or Lander
	149	853-01	Field Roast Grain Meat Co.	FOOD PROCESSING	SEATTLE PUBLIC UTILITIES	1440 S JACKSON ST	SEATTLE	98144	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
	429	4296-01	Franz-Gai's Bakery - Weller St.	FOOD PROCESSING-BAKERY	SEATTLE PUBLIC UTILITIES	2006 S WELLER ST	SEATTLE	98144	GREG NEWBORN	MAJOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
	237	704-04	Laboratory Corporation of America/Dynacare	LABORATORY	SEATTLE PUBLIC UTILITIES	550 17TH AVE #300	SEATTLE	98122	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
	1189	896-01	Lake Union Partners - 2203 East Union Construction Project	CONSTRUCTION DEWATERING	SEATTLE PUBLIC UTILITIES	2203 E. UNION STREET	SEATTLE	98122	JIM SIFFORD	MINOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
	59	10454-01	Lighthouse for the Blind Inc.	MANUFACTURING-MISC	SEATTLE PUBLIC UTILITIES	2501 S PLUM ST	SEATTLE	98144	DANA HEINZ	LETTER OF AUTHORIZATION	Hanford 1/2 or Lander
	73	837-02	Penthouse Drapery Cleaners and Manufacturers Former Property Remediation Site	GROUNDWATER REMEDIATION - ORGANICS	SEATTLE PUBLIC UTILITIES	1752 22ND AVE S	SEATTLE	98144	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
	440	11531-01	Photographic Center Northwest	PHOTO PROCESSING	SEATTLE PUBLIC UTILITIES	900 12TH AVE	SEATTLE	98122	TODD GOWING	LETTER OF AUTHORIZATION	Hanford 1/2 or Lander
	205	4201-01	Rainier Commons, LLC - Old Rainier Brewery Site	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	3100 AIRPORT WAY S	SEATTLE	98134	ARNAUD GIRARD	MAJOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
	334	11525-01	Seattle Academy of Arts and Sciences - STREAM Building Construction Project	CONSTRUCTION DEWATERING	SEATTLE PUBLIC UTILITIES	1220 E. SPRING STREET	SEATTLE	98122	TODD GOWING	LETTER OF AUTHORIZATION	Hanford 1/2 or Lander
	404	801-03	Sound Transit Operations and Maintenance Facility	TRANSPORTATION FACILITY	SEATTLE PUBLIC UTILITIES	3407 AIRPORT WAY S	SEATTLE	98134	DANA HEINZ	MINOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
	676	707-03	Swedish Medical Center - Cherry Hill	HOSPITAL	SEATTLE PUBLIC UTILITIES	500 17TH AVENUE	SEATTLE	98122	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
	402	4301-01	University of Washington Consolidated Laundry	LAUNDRY - LINEN	SEATTLE PUBLIC UTILITIES	2901 27TH AVE S	SEATTLE	98144	DANA HEINZ	MAJOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
	1	4156-02	Cascade Columbia Distribution	CONTAINER WASHING	SEATTLE PUBLIC UTILITIES	6900 FOX AVE S	SEATTLE	98108	DAVE HABERMAN	MAJOR DISCHARGE AUTHORIZATION	Michigan
	155	860-01	Classic Impressions Inc.	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	5800 CORSON AVE S	SEATTLE	98108	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Michigan
	90	850-01	CleanScapes Inc.	CONTAINER WASHING	SEATTLE PUBLIC UTILITIES	7303 8TH AVE S	SEATTLE	98108	GREG NEWBORN	MINOR DISCHARGE AUTHORIZATION	Michigan
	2	11009-02	Dawn Food Products	FOOD PROCESSING	SEATTLE PUBLIC UTILITIES	6901 FOX AVE S	SEATTLE	98108	DAVE HABERMAN	LETTER OF AUTHORIZATION	Michigan
	319	918-01	EcoChemical Inc.	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	6600 URSULA PL S	SEATTLE	98108	GREG NEWBORN	MINOR DISCHARGE AUTHORIZATION	Michigan
	165	4211-02	Elysian Brewing Company - Airport Way S.	FOOD PROCESSING-BREWERY	SEATTLE PUBLIC UTILITIES	5510 AIRPORT WAY S	SEATTLE	98108	DANA HEINZ	MAJOR DISCHARGE AUTHORIZATION	Michigan
	180	11008-02	Evergreen Tractor LLC	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	164 S MICHIGAN ST	SEATTLE	98108	DAVE HABERMAN	LETTER OF AUTHORIZATION	Michigan
	68	11173-01	Northwest Porosity Sealing & Heat Treat	MANUFACTURING-MISC	SEATTLE PUBLIC UTILITIES	637 S LUCILE ST	SEATTLE	98108	DAVE HABERMAN	LETTER OF AUTHORIZATION	Michigan
	525	850-01	Recology CleanScapes Inc.	CONTAINER WASHING	SEATTLE PUBLIC UTILITIES	7303 8TH AVENUE S.	SEATTLE	98108	GREG NEWBORN	MINOR DISCHARGE AUTHORIZATION	Michigan
	394	750-03	Seattle Iron and Metals Corp.	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	601 S MYRTLE ST	SEATTLE	98108	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Michigan
	16	4134-02	Affordable Auto Wrecking	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	9750 MARTIN LUTHER KING JR WAY S	SEATTLE	98118	DAVE HABERMAN	MAJOR DISCHARGE AUTHORIZATION	Norfolk
	43	10866-02	Auto Fitness	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	7216 RAINIER AVE S	SEATTLE	98118	DAVE HABERMAN	LETTER OF AUTHORIZATION	Norfolk
	241	779-02	Coluccio Construction	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	9600 MARTIN LUTHER KING JR WAY S	SEATTLE	98118	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Norfolk
	176	11349-01	Dressel-Collins Fish Co.	FOOD PROCESSING-SEAFOOD	SEATTLE PUBLIC UTILITIES	5131 S DIRECTOR ST	SEATTLE	98118	PEGGY RICE	LETTER OF AUTHORIZATION	Norfolk
	15	784-02	Northwest Gourmet Food Products Inc.	FOOD PROCESSING-OTHER	SEATTLE PUBLIC UTILITIES	9620 MARTIN LUTHER KING JR WAY S	SEATTLE	98118	GREG NEWBORN	MINOR DISCHARGE AUTHORIZATION	Norfolk
	240	11279-01	OHNO Construction Company	PRESSURE WASHING	SEATTLE PUBLIC UTILITIES	9416 MARTIN LUTHER KING JR WAY S	SEATTLE	98118	DAVE HABERMAN	LETTER OF AUTHORIZATION	Norfolk
	75	10224-01	Olympic Truck Cleaners	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	9615 56TH AVE S	SEATTLE	98118	DAVE HABERMAN	LETTER OF AUTHORIZATION	Norfolk
	151	11402-01	Otto Rosenau & Associates Inc.	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	6747 MARTIN LUTHER KING JR WAY S	SEATTLE	98118	PATRICIA MAGNUSON	LETTER OF AUTHORIZATION	Norfolk
	49	4231-01	Phillips 66 Company - Facility No. 2677176	GROUNDWATER REMEDIATION - PETROLEUM	SKYWAY WATER AND SEWER DISTRICT	11655 RENTON AVE S	SEATTLE	98178	JIM SIFFORD	MAJOR DISCHARGE AUTHORIZATION	Norfolk
	321	11528-01	Starline Luxury Coaches	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	9801 MARTIN LUTHER KING JR. WAY S.	SEATTLE	98118	GREG NEWBORN	LETTER OF AUTHORIZATION	Norfolk
	428	635-04	Mondo and Sons	FOOD PROCESSING-MEATS	SEATTLE PUBLIC UTILITIES	4225 RAINIER AVE S	SEATTLE	98118	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	Rainier
	238	416-05	Seattle, City of - SPU - West Seattle Decant Station	DECANT STATION	SEATTLE PUBLIC UTILITIES	9200 8TH AVE SW	SEATTLE	98126	PEGGY RICE	MAJOR DISCHARGE AUTHORIZATION	West Michigan

111 = No. of LDW Non-SIUs (2014)

¹ LDW - Exact CSO Basin TBD and Added to Database

Table A-3. Active Significant Industrial Users at the end of 2015.

Permit	Industrial User	Business Type	Local Sewer Agency	Address	City	Zip	Investigator	Permit Type	CSO Basin	
Lower Duwamish Waterway										
101	7130-05	Industrial Container Services	BARREL CLEANING	SEATTLE PUBLIC UTILITIES	7152 1ST AVE S	SEATTLE	98108	DAVE HABERMAN	PERMIT	8th Ave
108	7854-02	Kerry Food and Beverage	FOOD PROCESSING-OTHER	SEATTLE PUBLIC UTILITIES	7224 1ST AVE S	SEATTLE	98108	LYDIA ENG	PERMIT	8th Ave
23	7873-01	Magnetic and Penetrant Services Co.	METAL FINISHING - CFR 433	SEATTLE PUBLIC UTILITIES	8135 1ST AVE S	SEATTLE	98108	GREG NEWBORN	PERMIT	8th Ave
34	7834-02	National Products Inc.	METAL FINISHING - CFR 433	SEATTLE PUBLIC UTILITIES	1025 S ELMGROVE ST	SEATTLE	98108	DAVE HABERMAN	PERMIT	8th Ave
22	7878-01	Seattle, City of - SPU - South Transfer Station	SOLID WASTE - TRANSFER FAC	SEATTLE PUBLIC UTILITIES	130 S KENYON ST	SEATTLE	98108	DANA HEINZ	PERMIT	8th Ave
48	7892-01	The Gear Works	METAL FINISHING - CFR 433	SEATTLE PUBLIC UTILITIES	7701 7TH AVE S	SEATTLE	98108	LYDIA ENG	PERMIT	8th Ave
206	7896-01	Lineage Seafreeze	FOOD PROCESSING-SEAFOOD	SEATTLE PUBLIC UTILITIES	206 SW MICHIGAN STREET	SEATTLE	98106	GREG NEWBORN	PERMIT	8th Ave or Terminal 115
177	7722-05	Art Brass Plating Inc.	METAL FINISHING - CFR 433	SEATTLE PUBLIC UTILITIES	5516 3RD AVENUE S.	SEATTLE	98108	PATRICIA MAGNUSON	PERMIT	Brandon
143	7113-04	Seattle Barrel Co.	BARREL CLEANING	SEATTLE PUBLIC UTILITIES	4716 AIRPORT WAY S.	SEATTLE	98108	ARNAUD GIRARD	PERMIT	Duwamish
193	7592-05	BP West Coast Products LLC	FUELING FACILITY	SEATTLE PUBLIC UTILITIES	1652 SW LANDER STREET	SEATTLE	98134	GREG NEWBORN	PERMIT	Duwamish West
194	7751-04	Encore Oils LLC	RENDERING	SEATTLE PUBLIC UTILITIES	4034 WEST MARGINAL WAY SW	SEATTLE	98106	GREG NEWBORN	PERMIT	Duwamish West
65	7782-07	Vigor Shipyards Inc.	BOAT/SHIPYARD	SEATTLE PUBLIC UTILITIES	1801 16TH AVE. SW	SEATTLE	98134	PEGGY RICE	PERMIT	Duwamish West
2	7811-03	Boeing Company - Plant 2 Facility	METAL FINISHING - CFR 433	CITY OF TUKWILA	7755 E MARGINAL WAY S	SEATTLE	98108	PEGGY RICE	PERMIT	E Marginal
75	7594-06	Boeing Commercial Airplane - North Field	METAL FINISHING - CFR 433	SEATTLE PUBLIC UTILITIES	7500 E MARGINAL WAY S	SEATTLE	98108	PEGGY RICE	PERMIT	E Marginal or Michigan
29	7507-04	Ceradyne Inc. - Viox Glass Technology	GLASS MANUFACTURING	SEATTLE PUBLIC UTILITIES	6701 6TH AVE S	SEATTLE	98108	GREG NEWBORN	PERMIT	Michigan
35	7676-05	Marine Vacuum Service Inc.	CENTRALIZED WASTE TREATMENT	SEATTLE PUBLIC UTILITIES	1516 S GRAHAM ST	SEATTLE	98108	JIM SIFFORD	PERMIT	Michigan
50	7903-01	Waste Management Inc. - 8th Avenue South Reload Facility	SOLID WASTE - TRANSFER FAC	SEATTLE PUBLIC UTILITIES	7400 8TH AVENUE S.	SEATTLE	98108	ARNAUD GIRARD	PERMIT	Michigan
199	7116-06	Darigold Inc. - Rainier Plant	FOOD PROCESSING-DAIRY	SEATTLE PUBLIC UTILITIES	4058 RAINIER AVENUE S.	SEATTLE	98118	TODD GOWING	PERMIT	Rainier

18 = No. of LDW SIUs (2015)

Table A-4. Active Non-Significant Industrial Users at the end of 2015.

Permit	Industrial User	Business Type	Local Sewer Agency	Address	City	Zip	Investigator	Permit Type	CSO Basin	
Lower Duwamish Waterway										
131	4196-01	Burlington Environmental LLC - Georgetown	GROUNDWATER REMEDIATION - ORGANICS	SEATTLE PUBLIC UTILITIES	734 S LUCILE ST	SEATTLE	98108	DANA HEINZ	MAJOR DISCHARGE AUTHORIZATION	LDW ¹
267	986-01	Ener-G Foods Inc.	FOOD PROCESSING-BAKERY	SEATTLE PUBLIC UTILITIES	5960 1ST AVENUE S.	SEATTLE	98108	RYAN SALEM	MINOR DISCHARGE AUTHORIZATION	LDW ¹
552	4188-02	Glacier Northwest Inc. - South Seattle Ready Mix Plant	CEMENT/READYMIX	SEATTLE PUBLIC UTILITIES	5975 E. MARGINAL WAY S.	SEATTLE	98134	PEGGY RICE	MAJOR DISCHARGE AUTHORIZATION	LDW ¹
439	631-04	KapStone Container Corporation (FKA Longview Fibre Paper and Packaging Inc.)	CORRUGATED CONTAINER	SEATTLE PUBLIC UTILITIES	5901 E MARGINAL WAY S	SEATTLE	98134	RYAN SALEM	MAJOR DISCHARGE AUTHORIZATION	LDW ¹
160	859-01	Northwest Frozen LLC dba Banzai Sushi	FOOD PROCESSING-OTHER	SEATTLE PUBLIC UTILITIES	3623 6TH AVE S	SEATTLE	98134	PEGGY RICE	MINOR DISCHARGE AUTHORIZATION	LDW ¹
107	400-04	Seattle, City of - SPU - South Recycling and Disposal Station	SOLID WASTE - TRANSFER FAC	SEATTLE PUBLIC UTILITIES	8100 2ND AVE S	SEATTLE	98106	JIM SIFFORD	MAJOR DISCHARGE AUTHORIZATION	LDW ¹
223	11482-01	SP Plus Transportation	VEHICLE WASHING	VALLEY VIEW SEWER DISTRICT	9311 4TH AVE S	SEATTLE	98108	PEGGY RICE	LETTER OF AUTHORIZATION	LDW ¹
382	266-06	Surplus Items Inc.	GROUNDWATER REMEDIATION - OTHER	SEATTLE PUBLIC UTILITIES	5101 WEST MARGINAL WAY SW	SEATTLE	98106	RYAN SALEM	MAJOR DISCHARGE AUTHORIZATION	LDW ¹
166	788-02	Coast Crane Company	PRESSURE WASHING	SEATTLE PUBLIC UTILITIES	8250 5TH AVE S	SEATTLE	98108	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	8th Ave
98	854-01	First Student Inc.	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	7739 FIRST AVE S	SEATTLE	98108	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	8th Ave
108	783-02	Flying Fish Express	FOOD PROCESSING-FISH	SEATTLE PUBLIC UTILITIES	7937 2ND AVE S	SEATTLE	98108	GREG NEWBORN	MINOR DISCHARGE AUTHORIZATION	8th Ave
459	11117-02	Gary Merlino Construction	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	9125 10TH AVE S	SEATTLE	98108	TODD GOWING	LETTER OF AUTHORIZATION	8th Ave
398	10399-03	Seattle Housing Authority - Maintenance Facility	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	7500 DETROIT AVE SW	SEATTLE	98106	RYAN SALEM	LETTER OF AUTHORIZATION	8th Ave
104	10849-02	Seattle, City of - Joint Training Facility	GENERAL TYPE	VALLEY VIEW SEWER DISTRICT	9401 MYERS WAY S	SEATTLE	98108	JIM SIFFORD	LETTER OF AUTHORIZATION	8th Ave
392	4072-06	Seattle, City of - SPU - Dallas Avenue South Remediation Project	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	S DONOVAN & 17TH AVE.S & DALLAS AVE S	SEATTLE	98108	DANA HEINZ	MAJOR DISCHARGE AUTHORIZATION	8th Ave
475	4086-03	South Park Industrial Properties LLC	GROUNDWATER REMEDIATION - ORGANICS	VALLEY VIEW SEWER DISTRICT	9587 8TH AVE S	SEATTLE	98108	DAVE HABERMAN	MAJOR DISCHARGE AUTHORIZATION	8th Ave
219	877-01	The Revere Group	PRINTING	VALLEY VIEW SEWER DISTRICT	9310 4TH AVE S	SEATTLE	98108	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	8th Ave
372	806-02	Washington Litruck	PRESSURE WASHING	SEATTLE PUBLIC UTILITIES	700 S CHICAGO ST	SEATTLE	98122	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	8th Ave
371	322-05	Waste Management - Eastmont Transfer Station	SOLID WASTE - TRANSFER FAC	SEATTLE PUBLIC UTILITIES	7201 W MARGINAL WAY SW	SEATTLE	98106	TODD GOWING	MINOR DISCHARGE AUTHORIZATION	8th Ave
103	785-04	Waste Management - Seattle	CONTAINER WASHING	SEATTLE PUBLIC UTILITIES	8101 1ST AVE S	SEATTLE	98108	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	8th Ave
607	322-05	Waste Management Inc. - Eastmont Transfer Station	SOLID WASTE - TRANSFER FAC	SEATTLE PUBLIC UTILITIES	7201 W. MARGINAL WAY SW	SEATTLE	98106	TODD GOWING	MINOR DISCHARGE AUTHORIZATION	8th Ave
614	785-04	Waste Management Inc. - Seattle	CONTAINER WASHING	SEATTLE PUBLIC UTILITIES	8101 FIRST AVENUE S.	SEATTLE	98108	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	8th Ave
657	10742-01	Northland Services Inc.	PRESSURE WASHING	SEATTLE PUBLIC UTILITIES	6700 W. MARGINAL WAY SW	SEATTLE	98106	RYAN SALEM	LETTER OF AUTHORIZATION	8th Ave or Terminal 115
543	555-04	Ardagh Glass Inc.	GLASS MANUFACTURING	SEATTLE PUBLIC UTILITIES	5801 E. MARGINAL WAY S.	SEATTLE	98134	DAVE HABERMAN	MAJOR DISCHARGE AUTHORIZATION	Brandon
54	4235-01	Cadman (Seattle) Inc.	CEMENT/READYMIX	SEATTLE PUBLIC UTILITIES	5225 E MARGINAL WAY S	SEATTLE	98134	DANA HEINZ	MAJOR DISCHARGE AUTHORIZATION	Brandon
227	948-01	Foster's Frame & Axle	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	5300 1ST AVENUE S.	SEATTLE	98108	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Brandon
634	543-04	General Electric Co. - Dawson Street	GROUNDWATER REMEDIATION - ORGANICS	SEATTLE PUBLIC UTILITIES	220 S. DAWSON STREET	SEATTLE	98108	PEGGY RICE	MAJOR DISCHARGE AUTHORIZATION	Brandon
430	739-03	Kamco Seafood Inc.	FOOD PROCESSING-FISH	SEATTLE PUBLIC UTILITIES	128 S ORCAS ST	SEATTLE	98108	RYAN SALEM	MINOR DISCHARGE AUTHORIZATION	Brandon
47	555-04	Saint-Gobain Containers Inc.	GLASS MANUFACTURING	SEATTLE PUBLIC UTILITIES	5801 E MARGINAL WAY S	SEATTLE	98134	DAVE HABERMAN	MAJOR DISCHARGE AUTHORIZATION	Brandon
295	11430-01	Seadrunar Recycling	METALS RECYCLING	SEATTLE PUBLIC UTILITIES	28 S. BRANDON STREET	SEATTLE	98134	TODD GOWING	LETTER OF AUTHORIZATION	Brandon
48	774-02	Seattle, City of - SPU - Materials Storage Yard	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	5821 1ST AVE S	SEATTLE	98108	DANA HEINZ	MINOR DISCHARGE AUTHORIZATION	Brandon
221	11436-01	United Rentals - Seattle	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	5421 1ST AVENUE S.	SEATTLE	98108	DAVE HABERMAN	LETTER OF AUTHORIZATION	Brandon
130	4154-02	Georgetown Brewing Co.	FOOD PROCESSING-BREWERY	SEATTLE PUBLIC UTILITIES	5200 DENVER AVE S	SEATTLE	98108	DAVE HABERMAN	MAJOR DISCHARGE AUTHORIZATION	Brandon or Duwamish
176	712-03	Harborview Medical Center	HOSPITAL	SEATTLE PUBLIC UTILITIES	325 9TH AVE	SEATTLE	98104	PEGGY RICE	MINOR DISCHARGE AUTHORIZATION	Connecticut, Hanford 1/2 or Lander
164	4009-04	Ash Grove Cement Company	CEMENT/READYMIX	SEATTLE PUBLIC UTILITIES	3801 E MARGINAL WAY S	SEATTLE	98134	JIM SIFFORD	MAJOR DISCHARGE AUTHORIZATION	Duwamish
151	10415-01	Auto-Chlor System	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	4315 7TH AVE S	SEATTLE	98108	DANA HEINZ	LETTER OF AUTHORIZATION	Duwamish
365	4085-04	Bloch Steel Industries	GROUNDWATER REMEDIATION - PETROLEUM	SEATTLE PUBLIC UTILITIES	4580 COLORADO AVE S	SEATTLE	98134	PEGGY RICE	MAJOR DISCHARGE AUTHORIZATION	Duwamish
668	4179-02	Cascade Designs Inc.	METAL FABRICATION	SEATTLE PUBLIC UTILITIES	4000 1ST AVENUE S.	SEATTLE	98134	DANA HEINZ	MAJOR DISCHARGE AUTHORIZATION	Duwamish
407	802-02	Cascade Machinery & Electric Inc	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	4600 E MARGINAL WAY S	SEATTLE	98134	RYAN SALEM	MINOR DISCHARGE AUTHORIZATION	Duwamish
408	932-01	ConGlobal Industries Inc.	PRESSURE WASHING	SEATTLE PUBLIC UTILITIES	1 S IDAHO ST	SEATTLE	98134	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Duwamish
239	933-01	Grand Central Bakery	FOOD PROCESSING-BAKERY	SEATTLE PUBLIC UTILITIES	4634 E. MARGINAL WAY S., SUITE C110	SEATTLE	98134	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Duwamish
454	795-02	Gretchen's Shoebox Express	FOOD PROCESSING	SEATTLE PUBLIC UTILITIES	3922 6TH AVE S	SEATTLE	98108	DANA HEINZ	MINOR DISCHARGE AUTHORIZATION	Duwamish
446	10638-03	MacMillan-Piper - Edmunds Street Facility	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	655 S EDMUNDS ST	SEATTLE	98124	RYAN SALEM	LETTER OF AUTHORIZATION	Duwamish
452	11557-01	North Star Casteel Products Inc.	METAL FABRICATION	SEATTLE PUBLIC UTILITIES	820 S BRADFORD ST	SEATTLE	98108	TODD GOWING	LETTER OF AUTHORIZATION	Duwamish
292	964-01	Northwest Container Services Inc. - Seattle Intermodal Yard	CONTAINER WASHING	SEATTLE PUBLIC UTILITIES	635 S. EDMUNDS STREET	SEATTLE	98108	GREG NEWBORN	MINOR DISCHARGE AUTHORIZATION	Duwamish
124	10457-01	Puget Sound Industry Services Inc.	PRESSURE WASHING	SEATTLE PUBLIC UTILITIES	4429 AIRPORT WAY S	SEATTLE	98108	DANA HEINZ	LETTER OF AUTHORIZATION	Duwamish
399	743-04	Schwartz Brothers Bakery - Seattle	FOOD PROCESSING-BAKERY	SEATTLE PUBLIC UTILITIES	617 S NEVADA ST	SEATTLE	98108	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	Duwamish
396	796-02	Seattle Radiator LLC	RADIATOR REPAIR	SEATTLE PUBLIC UTILITIES	5011 OHIO AVE S	SEATTLE	98134	GREG NEWBORN	MINOR DISCHARGE AUTHORIZATION	Duwamish
745	232-05	Stoneway Concrete - Seattle	CEMENT/READYMIX	SEATTLE PUBLIC UTILITIES	3803 EAST MARGINAL WAY	SEATTLE	98134	RYAN SALEM	MAJOR DISCHARGE AUTHORIZATION	Duwamish
159	10506-01	Trade-Marx Sign & Display Corporation	METAL FABRICATION	SEATTLE PUBLIC UTILITIES	3614 6TH AVE S	SEATTLE	98134	DANA HEINZ	LETTER OF AUTHORIZATION	Duwamish
115	10489-01	Triple F Granite & Marble	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	4660 E MARGINAL WAY S	SEATTLE	98134	DANA HEINZ	LETTER OF AUTHORIZATION	Duwamish
377	668-05	Union Pacific Railroad - Argo Yard	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	4300 COLORADO AVE S	SEATTLE	98108	LYDIA ENG	MAJOR DISCHARGE AUTHORIZATION	Duwamish
152	4020-03	United Parcel Service - Seattle	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	4455 7TH AVE S	SEATTLE	98108	DANA HEINZ	MAJOR DISCHARGE AUTHORIZATION	Duwamish
369	691-04	Waste Management - Alaska Street Facility	SOLID WASTE - TRANSFER FAC	SEATTLE PUBLIC UTILITIES	70 S ALASKA ST	SEATTLE	98134	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	Duwamish
53	459-04	Alaska Marine Lines Inc.	CONTAINER WASHING	SEATTLE PUBLIC UTILITIES	5600 W MARGINAL WAY S	SEATTLE	98106	GREG NEWBORN	MINOR DISCHARGE AUTHORIZATION	Duwamish West
55	4112-02	Chemithon Corporation	MANUFACTURING-MISC	SEATTLE PUBLIC UTILITIES	5430 W MARGINAL WAY SW	SEATTLE	98106	GREG NEWBORN	MAJOR DISCHARGE AUTHORIZATION	Duwamish West
600	815-02	FOG-TITE Meter Seal Inc.	CEMENT/READYMIX	SEATTLE PUBLIC UTILITIES	4819 WEST MARGINAL WAY SW	SEATTLE	98106	TODD GOWING	MINOR DISCHARGE AUTHORIZATION	Duwamish West
550	510-04	Glacier Northwest Inc. - Vehicle Washing	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	5900 W. MARGINAL WAY SW	SEATTLE	98106	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	Duwamish West
437	4204-02	Lafarge - Seattle Plant	CEMENT/READYMIX	SEATTLE PUBLIC UTILITIES	5400 W MARGINAL WAY SW	SEATTLE	98106	ARNAUD GIRARD	MAJOR DISCHARGE AUTHORIZATION	Duwamish West
165	536-04	Rainier Petroleum Corp.	FUELING FACILITY	SEATTLE PUBLIC UTILITIES	1711 13TH AVE SW	SEATTLE	98134	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Duwamish West
233	952-01	Westway Feed Products LLC	MANUFACTURING-MISC	SEATTLE PUBLIC UTILITIES	1002 SW SPOKANE STREET	SEATTLE	98134	DANA HEINZ	MINOR DISCHARGE AUTHORIZATION	Duwamish West
46	818-01	VA Puget Sound Healthcare System - Seattle Division	HOSPITAL	SEATTLE PUBLIC UTILITIES	1660 S COLUMBIAN WAY	SEATTLE	98108	PEGGY RICE	MINOR DISCHARGE AUTHORIZATION	Duwamish, Hanford 1/2, Lander, Michigan or Rainier
662	526-06	Boeing Defense, Space & Security Developmental Center	MANUFACTURING-MISC	CITY OF TUKWILA	9725 E. MARGINAL WAY S.	SEATTLE	98108	PEGGY RICE	MAJOR DISCHARGE AUTHORIZATION	E Marginal
3	363-04	Boeing Integrated Defense Systems - Military Flight Center	VEHICLE WASHING	TUKWILA PUBLIC WORKS	10002 E MARGINAL WAY S	SEATTLE	98108	PEGGY RICE	MINOR DISCHARGE AUTHORIZATION	E Marginal
409	4167-02	Container Properties LLC	GROUNDWATER REMEDIATION - ORGANICS	TUKWILA PUBLIC WORKS	9229 E MARGINAL WAY S	TUKWILA	98118	GREG NEWBORN	MAJOR DISCHARGE AUTHORIZATION	E Marginal
186	4223-01	Boeing North Field Facility - PCB Treatment System for Duwamish Area Boeing Facilities	WATER TREATMENT	SEATTLE PUBLIC UTILITIES	7500 E MARGINAL WAY	SEATTLE	98124	PEGGY RICE	MAJOR DISCHARGE AUTHORIZATION	E Marginal or Michigan
211	891-01	Cucina Fresca Gourmet Foods	FOOD PROCESSING-OTHER	SEATTLE PUBLIC UTILITIES	8300 MILITARY ROAD S., SUITE 120	SEATTLE	98108	DANA HEINZ	MINOR DISCHARGE AUTHORIZATION	E Marginal or Michigan

Table A-4. Active Non-Significant Industrial Users at the end of 2015.

Permit	Industrial User	Business Type	Local Sewer Agency	Address	City	Zip	Investigator	Permit Type	CSO Basin	
Lower Duwamish Waterway										
189	849-01	Galvin Flying Services	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	7777 PERIMETER RD	SEATTLE	98108	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	E Marginal or Michigan
190	4109-02	King County International Airport - Boeing Field	TRANSPORTATION FACILITY	SEATTLE PUBLIC UTILITIES	7277 PERIMETER RD S	SEATTLE	98108	GREG NEWBORN	MAJOR DISCHARGE AUTHORIZATION	E Marginal or Michigan
192	4129-03	King County International Airport - GWR	GROUNDWATER REMEDIATION - PETROLEUM	SEATTLE PUBLIC UTILITIES	7777 PERIMETER RD S	SEATTLE	98108	GREG NEWBORN	MAJOR DISCHARGE AUTHORIZATION	E Marginal or Michigan
315	11580-01	1315 East Jefferson LLC Construction Project	CONSTRUCTION DEWATERING	SEATTLE PUBLIC UTILITIES	1315 E. JEFFERSON STREET	SEATTLE	98122	LYDIA ENG	LETTER OF AUTHORIZATION	Hanford 1/2 or Lander
321	995-01	550 Broadway Development LLC Construction Project	CONSTRUCTION DEWATERING	SEATTLE PUBLIC UTILITIES	550 BROADWAY	SEATTLE	98122	TODD GOWING	MINOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
110	853-01	Field Roast Grain Meat Co.	FOOD PROCESSING	SEATTLE PUBLIC UTILITIES	1440 S JACKSON ST	SEATTLE	98144	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
429	4296-01	Franz-Gai's Bakery - Weller St.	FOOD PROCESSING-BAKERY	SEATTLE PUBLIC UTILITIES	2006 S WELLER ST	SEATTLE	98144	GREG NEWBORN	MAJOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
171	704-04	Laboratory Corporation of America/Dynacare	LABORATORY	SEATTLE PUBLIC UTILITIES	550 17TH AVE #300	SEATTLE	98122	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
250	988-01	Lennar Multifamily Communities LLC - Madison Property Construction Project	CONSTRUCTION DEWATERING	SEATTLE PUBLIC UTILITIES	2026 E MADISON ST	SEATTLE	98122	TODD GOWING	MINOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
42	10454-01	Lighthouse for the Blind Inc.	MANUFACTURING-MISC	SEATTLE PUBLIC UTILITIES	2501 S PLUM ST	SEATTLE	98144	DANA HEINZ	LETTER OF AUTHORIZATION	Hanford 1/2 or Lander
279	11628-01	Odegard Gockel Development LLC - 123 18th Avenue East Apartments Construction Project	CONSTRUCTION DEWATERING	SEATTLE PUBLIC UTILITIES	123 18TH AVENUE EAST	SEATTLE	98101	DAVE HABERMAN	LETTER OF AUTHORIZATION	Hanford 1/2 or Lander
50	837-02	Penthouse Drapery Cleaners and Manufacturers Former Property Remediation Site	GROUNDWATER REMEDIATION - ORGANICS	SEATTLE PUBLIC UTILITIES	1752 22ND AVE S	SEATTLE	98144	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
445	11531-01	Photographic Center Northwest	PHOTO PROCESSING	SEATTLE PUBLIC UTILITIES	900 12TH AVE	SEATTLE	98122	TODD GOWING	LETTER OF AUTHORIZATION	Hanford 1/2 or Lander
147	4201-01	Rainier Commons, LLC - Old Rainier Brewery Site	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	3100 AIRPORT WAY S	SEATTLE	98134	ARNAUD GIRARD	MAJOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
395	11179-02	Seattle University - Onsite Compost Facility	COMPOSTING-YARD WASTE	SEATTLE PUBLIC UTILITIES	759 13TH AVE	SEATTLE	98122	TODD GOWING	LETTER OF AUTHORIZATION	Hanford 1/2 or Lander
272	4335-01	Sound Transit - Maintenance of Way Building Construction Project	CONSTRUCTION DEWATERING	SEATTLE PUBLIC UTILITIES	3407 AIRPORT WAY S.	SEATTLE	98134	TODD GOWING	MAJOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
387	801-03	Sound Transit Operations and Maintenance Facility	TRANSPORTATION FACILITY	SEATTLE PUBLIC UTILITIES	3407 AIRPORT WAY S	SEATTLE	98134	DANA HEINZ	MINOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
291	11600-01	Spectrum Development Solutions LLC - Reverb Construction Project	CONSTRUCTION DEWATERING	SEATTLE PUBLIC UTILITIES	1023 E. ALDER STREET	SEATTLE	98122	LYDIA ENG	LETTER OF AUTHORIZATION	Hanford 1/2 or Lander
746	707-03	Swedish Medical Center - Cherry Hill	HOSPITAL	SEATTLE PUBLIC UTILITIES	500 17TH AVENUE	SEATTLE	98122	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
374	4301-01	University of Washington Consolidated Laundry	LAUNDRY - LINEN	SEATTLE PUBLIC UTILITIES	2901 27TH AVE S	SEATTLE	98144	DANA HEINZ	MAJOR DISCHARGE AUTHORIZATION	Hanford 1/2 or Lander
1	4156-02	Cascade Columbia Distribution	CONTAINER WASHING	SEATTLE PUBLIC UTILITIES	6900 FOX AVE S	SEATTLE	98108	DAVE HABERMAN	MAJOR DISCHARGE AUTHORIZATION	Michigan
114	860-01	Classic Impressions Inc.	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	5800 CORSON AVE S	SEATTLE	98108	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Michigan
63	850-01	CleanScapes Inc.	CONTAINER WASHING	SEATTLE PUBLIC UTILITIES	7303 8TH AVE S	SEATTLE	98108	GREG NEWBORN	MINOR DISCHARGE AUTHORIZATION	Michigan
2	11009-02	Dawn Food Products	FOOD PROCESSING	SEATTLE PUBLIC UTILITIES	6901 FOX AVE S	SEATTLE	98108	DAVE HABERMAN	LETTER OF AUTHORIZATION	Michigan
226	918-01	EcoChemical Inc.	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	6600 URSULA PL S	SEATTLE	98108	GREG NEWBORN	MINOR DISCHARGE AUTHORIZATION	Michigan
120	4211-02	Elysian Brewing Company - Airport Way S.	FOOD PROCESSING-BREWERY	SEATTLE PUBLIC UTILITIES	5510 AIRPORT WAY S	SEATTLE	98108	DANA HEINZ	MAJOR DISCHARGE AUTHORIZATION	Michigan
132	11008-02	Evergreen Tractor LLC	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	164 S MICHIGAN ST	SEATTLE	98108	DAVE HABERMAN	LETTER OF AUTHORIZATION	Michigan
541	11173-02	Northwest Porosity & Heat Treat LLC	MANUFACTURING-MISC	SEATTLE PUBLIC UTILITIES	637 S. LUCILE STREET	SEATTLE	98108	GREG NEWBORN	LETTER OF AUTHORIZATION	Michigan
564	850-01	Recology CleanScapes Inc.	CONTAINER WASHING	SEATTLE PUBLIC UTILITIES	7303 8TH AVENUE S.	SEATTLE	98108	GREG NEWBORN	MINOR DISCHARGE AUTHORIZATION	Michigan
352	750-03	Seattle Iron and Metals Corp.	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	601 S MYRTLE ST	SEATTLE	98108	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Michigan
12	4134-02	Affordable Auto Wrecking	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	9750 MARTIN LUTHER KING JR WAY S	SEATTLE	98118	DAVE HABERMAN	MAJOR DISCHARGE AUTHORIZATION	Norfolk
174	779-02	Coluccio Construction	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	9600 MARTIN LUTHER KING JR WAY S	SEATTLE	98118	DAVE HABERMAN	MINOR DISCHARGE AUTHORIZATION	Norfolk
129	11349-01	Dressel-Collins Fish Co.	FOOD PROCESSING-SEAFOOD	SEATTLE PUBLIC UTILITIES	5131 S DIRECTOR ST	SEATTLE	98118	PEGGY RICE	LETTER OF AUTHORIZATION	Norfolk
11	784-02	Northwest Gourmet Food Products Inc.	FOOD PROCESSING-OTHER	SEATTLE PUBLIC UTILITIES	9620 MARTIN LUTHER KING JR WAY S	SEATTLE	98118	GREG NEWBORN	MINOR DISCHARGE AUTHORIZATION	Norfolk
173	11279-01	OHNO Construction Company	PRESSURE WASHING	SEATTLE PUBLIC UTILITIES	9416 MARTIN LUTHER KING JR WAY S	SEATTLE	98118	DAVE HABERMAN	LETTER OF AUTHORIZATION	Norfolk
52	10224-01	Olympic Truck Cleaners	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	9615 56TH AVE S	SEATTLE	98118	DAVE HABERMAN	LETTER OF AUTHORIZATION	Norfolk
350	11661-01	Othello North Apartments LP - Norah Potter Othello Station Construction Project	CONSTRUCTION DEWATERING	SEATTLE PUBLIC UTILITIES	4200 S OTHELLO ST	SEATTLE	98118	DANA HEINZ	LETTER OF AUTHORIZATION	Norfolk
112	11402-01	Otto Rosenau & Associates Inc.	GENERAL TYPE	SEATTLE PUBLIC UTILITIES	6747 MARTIN LUTHER KING JR WAY S	SEATTLE	98118	PATRICIA MAGNUSON	LETTER OF AUTHORIZATION	Norfolk
37	4231-01	Phillips 66 Company - Facility No. 2677176	GROUNDWATER REMEDIATION - PETROLEUM	SKYWAY WATER AND SEWER DISTRICT	11655 RENTON AVE S	SEATTLE	98178	JIM SIFFORD	MAJOR DISCHARGE AUTHORIZATION	Norfolk
258	11598-02	Seattle, City of - SPU - Henderson North CSO Reduction Project	CONSTRUCTION DEWATERING	SEATTLE PUBLIC UTILITIES	5895 LAKE WASHINGTON BLVD S	SEATTLE	98118	DAVE HABERMAN	LETTER OF AUTHORIZATION	Norfolk
228	11528-01	Starline Luxury Coaches	VEHICLE WASHING	SEATTLE PUBLIC UTILITIES	9801 MARTIN LUTHER KING JR. WAY S.	SEATTLE	98118	GREG NEWBORN	LETTER OF AUTHORIZATION	Norfolk
428	635-04	Mondo and Sons	FOOD PROCESSING-MEATS	SEATTLE PUBLIC UTILITIES	4225 RAINIER AVE S	SEATTLE	98118	LYDIA ENG	MINOR DISCHARGE AUTHORIZATION	Rainier
172	416-05	Seattle, City of - SPU - West Seattle Decant Station	DECANT STATION	SEATTLE PUBLIC UTILITIES	9200 8TH AVE SW	SEATTLE	98126	PEGGY RICE	MAJOR DISCHARGE AUTHORIZATION	West Michigan

110 = No. of LDW Non-SIUs (2015)

¹ LDW - Exact CSO Basin TBD and Added to Database

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Appendix B: WTD Source Tracing Combined Sewer Solids Datasets

Table B-1. Combined sewer system solids sampling results for 2010.

King County Environmental Lab Analytical Report

Project: 423589-090-1
 Locator: '063053
 Descrip: BRANDON ST OUTFALL
 Sample: L51108-1
 Matrix: SH IN-LINESED
 ColDate: 6/29/10 14:20
 Sample type: In-line grab
 TotalSolid: 32.3
DRY Weight Basis

Project: 423589-090-1
 Locator: '063053
 Descrip: BRANDON ST OUTFALL
 Sample: L51108-2
 Matrix: SH IN-LINESED
 ColDate: #####
 Sample type: In-line grab
 TotalSolid: 33.9
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Fines*	48			1.8	3.55	%						
Gravel*	5.5			0.36	3.55	%						
Sand*	43			0.36	3.55	%						
Silt*	48			1.8	3.55	%						
Clay*		<MDL	U	1.8	3.55	%						
p+0.00*	19.6			0.36	3.55	%						
p+1.00*	8.8			0.36	3.55	%						
p+10.0(equal/more than)*		<MDL	U	1.8	3.55	%						
p+2.00*	5.8			0.36	3.55	%						
p+3.00*	5.4			0.36	3.55	%						
p+4.00*	3.4	<RDL		0.36	3.55	%						
p+5.00*	30.2			1.8	3.55	%						
p+6.00*	17.8			1.8	3.55	%						
p+7.00*		<MDL	U	1.8	3.55	%						
p+8.00*		<MDL	U	1.8	3.55	%						
p+9.00*		<MDL	U	1.8	3.55	%						
p-1.00*	2.6	<RDL	J	0.36	3.55	%						
p-2.00(less than)*	1.8	<RDL	J	0.36	3.55	%						
p-2.00*	1	<RDL	J	0.36	3.55	%						
CV SM2540-G												
Total Solids*	32.3			0.005	0.01	%	33.9			0.005	0.01	%
CV SW846 9060-PSEP96												
Total Organic Carbon	199000			18000	35900	mg/Kg						
MT SW846 3050B*SW846 6010C												
Antimony, Total, ICP		<MDL,JG	UJ	2.3	11.6	mg/Kg						
Arsenic, Total, ICP	8	<RDL	J	4	19.4	mg/Kg						
Cadmium, Total, ICP	2.44			0.31	1.55	mg/Kg						
Chromium, Total, ICP	71.5			0.46	2.33	mg/Kg						
Cobalt, Total, ICP	10.6			0.46	2.33	mg/Kg						
Copper, Total, ICP	362			0.62	3.1	mg/Kg						
Lead, Total, ICP	133			3.1	15.5	mg/Kg						
Molybdenum, Total, ICP	29.1			0.46	2.33	mg/Kg						
Nickel, Total, ICP	82.7			0.77	3.87	mg/Kg						
Selenium, Total, ICP	11	<RDL	J	4	19.4	mg/Kg						
Silver, Total, ICP	9.13			0.62	3.1	mg/Kg						
Thallium, Total, ICP	11	<RDL	J	6.2	31	mg/Kg						
Vanadium, Total, ICP	42.7			1.5	7.74	mg/Kg						
Zinc, Total, ICP	935			0.77	3.87	mg/Kg						
MT SW846 7471B												
Mercury, Total, CVAA	0.5	<RDL	J	0.062	0.613	mg/Kg	0.737			0.059	0.575	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL,TA	U	65	132	ug/Kg						
Aroclor 1221		<MDL	U	16	33.1	ug/Kg						
Aroclor 1232		<MDL	U	16	33.1	ug/Kg						
Aroclor 1242		<MDL,TA	U	230	461	ug/Kg						
Aroclor 1248	76.5			16	33.1	ug/Kg						
Aroclor 1254	172			16	33.1	ug/Kg						
Aroclor 1260	96.6			16	33.1	ug/Kg						
Total PCBs (calc)	345.1											
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene		<MDL	U	8.4	16.5	ug/Kg						
1,2-Dichlorobenzene		<MDL	U	16	33.1	ug/Kg						
1,2-Diphenylhydrazine		<MDL	U	340	659	ug/Kg						
1,3-Dichlorobenzene		<MDL	U	16	33.1	ug/Kg						
1,4-Dichlorobenzene	162			16	33.1	ug/Kg						
2,4,5-Trichlorophenol		<MDL	U	840	1650	ug/Kg						
2,4,6-Trichlorophenol		<MDL	U	840	1650	ug/Kg						
2,4-Dichlorophenol		<MDL	U	840	1650	ug/Kg						
2,4-Dimethylphenol		<MDL	UJ	84	165	ug/Kg						
2,4-Dinitrotoluene		<MDL	U	840	1650	ug/Kg						
2,6-Dinitrotoluene		<MDL	U	840	1650	ug/Kg						
2-Chloronaphthalene		<MDL	U	340	659	ug/Kg						
2-Chlorophenol		<MDL	U	340	659	ug/Kg						
2-Methylnaphthalene	180	<RDL	J	160	331	ug/Kg						
2-Methylphenol		<MDL	U	160	331	ug/Kg						
2-Nitrophenol		<MDL	U	840	1650	ug/Kg						
4-Bromophenyl Phenyl Ether		<MDL	U	340	659	ug/Kg						
4-Chlorophenyl Phenyl Ether		<MDL	U	340	659	ug/Kg						
4-Methylphenol	63800		J	340	659	ug/Kg						
Acenaphthene		<MDL	U	160	331	ug/Kg						
Acenaphthylene		<MDL	U	160	331	ug/Kg						
Aniline		<MDL	UJ	840	1650	ug/Kg						
Anthracene		<MDL	U	160	331	ug/Kg						
Benzo(a)anthracene	458		J	160	331	ug/Kg						

Table B-1. Combined sewer system solids sampling results for 2010.

King County Environmental Lab Analytical Report

Project: 423589-090-1
 Locator: '063053
 Descrip: BRANDON ST OUTFALL
 Sample: L51108-1
 Matrix: SH IN-LINESED
 ColDate: 6/29/10 14:20
 Sample type: In-line grab
 TotalSolid: 32.3
DRY Weight Basis

Project: 423589-090-1
 Locator: '063053
 Descrip: BRANDON ST OUTFALL
 Sample: L51108-2
 Matrix: SH IN-LINESED
 ColDate: #####
 Sample type: In-line grab
 TotalSolid: 33.9
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
Benzo(a)pyrene	440		J	160	331	ug/Kg						
Benzo(b)fluoranthene	669			160	331	ug/Kg						
Benzo(g,h,i)perylene	616			160	331	ug/Kg						
Benzo(k)fluoranthene	250	<RDL	J	160	331	ug/Kg						
Benzoic Acid	4490		J	840	1650	ug/Kg						
Benzyl Alcohol		<MDL	U	160	331	ug/Kg						
Benzyl Butyl Phthalate	3500			160	331	ug/Kg						
Bis(2-Chloroethoxy)Methane		<MDL	U	340	659	ug/Kg						
Bis(2-Chloroethyl)Ether		<MDL	U	340	659	ug/Kg						
Bis(2-Chloroisopropyl)Ether		<MDL	U	340	659	ug/Kg						
Bis(2-Ethylhexyl)Phthalate	21300			340	659	ug/Kg						
Caffeine		<MDL,JG	R	160	331	ug/Kg						
Carbazole		<MDL	U	340	659	ug/Kg						
Chrysene	833			160	331	ug/Kg						
Coprostanol	97800			3400	6590	ug/Kg						
Dibenzo(a,h)anthracene		<MDL	U	160	331	ug/Kg						
Dibenzofuran		<MDL	U	160	331	ug/Kg						
Diethyl Phthalate		<MDL	U	340	659	ug/Kg						
Dimethyl Phthalate		<MDL	U	340	659	ug/Kg						
Di-N-Butyl Phthalate		<MDL	U	340	659	ug/Kg						
Di-N-Octyl Phthalate	6590			340	659	ug/Kg						
Fluoranthene	1380			160	331	ug/Kg						
Fluorene		<MDL	U	160	331	ug/Kg						
Hexachlorobenzene		<MDL	U	34	65.9	ug/Kg						
Hexachlorobutadiene		<MDL	U	34	65.9	ug/Kg						
Hexachloroethane		<MDL	U	160	331	ug/Kg						
Indeno(1,2,3-Cd)Pyrene	347			160	331	ug/Kg						
Isophorone		<MDL	U	340	659	ug/Kg						
Naphthalene		<MDL	U	160	331	ug/Kg						
Nitrobenzene		<MDL	U	340	659	ug/Kg						
N-Nitrosodimethylamine		<MDL,JG	R	340	659	ug/Kg						
N-Nitrosodi-N-Propylamine		<MDL	U	340	659	ug/Kg						
N-Nitrosodiphenylamine		<MDL	U	340	659	ug/Kg						
Pentachlorophenol		<MDL	U	840	1650	ug/Kg						
Phenanthrene	1070			160	331	ug/Kg						
Phenol	500	<RDL	J	340	659	ug/Kg						
Pyrene	2080			160	331	ug/Kg						
Pyridine		<MDL,JG	R	840	1650	ug/Kg						
LPAHs (calc)	1070											
HPAHs (calc)	7073		J									

* Not converted to dry weight basis
 MDL - method detection limit
 RDL - reporting detectin limit
 J - estimated value
 U- not detected
 R - rejected value
 JG-estimated value; probable low bias
 H - holding time
 B- in method blank w/in 10x sample
 TA- narrative info available
 Shaded value > source control
 screening benchmark for CSO system
 see Appendix F of King County 2016

Table B-1. Combined sewer system solids sampling results for 2010.

King County Environmental Lab Analytical Report

Project: 423589-090-1
 Locator: S070196
 Descrip: SMICHOF/WO39 S MIC
 Sample: L51108-3
 Matrix: SH IN-LINESED
 ColDate: 6/29/10 15:30
 Sample type: In-line grab
 TotalSolid: 25.1
DRY Weight Basis

Project: 423589-090-1
 Locator: S070196
 Descrip: SMICHOF/WO39 S MIC
 Sample: L51108-4
 Matrix: SH IN-LINESED
 ColDate: #####
 Sample type: In-line grab
 TotalSolid: 29
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Fines*	49.2			1.9	3.79	%						
Gravel*	4.2			0.38	3.79	%						
Sand*	51.7			0.38	3.79	%						
Silt*	49.2			1.9	3.79	%						
Clay*		<MDL	U	1.9	3.79	%						
p+0.00*	10.2			0.38	3.79	%						
p+1.00*	9.1			0.38	3.79	%						
p+10.0(equal/more than)*		<MDL	U	1.9	3.79	%						
p+2.00*	24.1			0.38	3.79	%						
p+3.00*	5.8			0.38	3.79	%						
p+4.00*	2.5	<RDL	J	0.38	3.79	%						
p+5.00*	41.7			1.9	3.79	%						
p+6.00*	5.7			1.9	3.79	%						
p+7.00*	1.9	<RDL	J	1.9	3.79	%						
p+8.00*		<MDL	U	1.9	3.79	%						
p+9.00*		<MDL	U	1.9	3.79	%						
p-1.00*	2.5	<RDL	J	0.38	3.79	%						
p-2.00(less than)*	1.3	<RDL	J	0.38	3.79	%						
p-2.00*	0.5	<RDL	J	0.38	3.79	%						
CV SM2540-G												
Total Solids*	25.1			0.005	0.01	%	29			0.005	0.01	%
CV SW846 9060-PSEP96												
Total Organic Carbon	201000			18000	35100	mg/Kg						
MT SW846 3050B*SW846 6010C												
Antimony, Total, ICP												
Arsenic, Total, ICP												
Cadmium, Total, ICP												
Chromium, Total, ICP												
Cobalt, Total, ICP												
Copper, Total, ICP												
Lead, Total, ICP												
Molybdenum, Total, ICP												
Nickel, Total, ICP												
Selenium, Total, ICP												
Silver, Total, ICP												
Thallium, Total, ICP												
Vanadium, Total, ICP												
Zinc, Total, ICP												
MT SW846 7471B												
Mercury, Total, CVAA	1.05			0.076	0.765	mg/Kg	0.897			0.069	0.676	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL,TA	U	1100	2120	ug/Kg						
Aroclor 1221		<MDL	U	110	212	ug/Kg						
Aroclor 1232		<MDL	U	110	212	ug/Kg						
Aroclor 1242		<MDL,TA	U	1300	2550	ug/Kg						
Aroclor 1248	1080			110	212	ug/Kg						
Aroclor 1254	618			110	212	ug/Kg						
Aroclor 1260	160	<RDL	J	110	212	ug/Kg						
Total PCBs (calc)	1858		J									
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene		<MDL	U	11	21.2	ug/Kg						
1,2-Dichlorobenzene		<MDL	U	21	42.6	ug/Kg						
1,2-Diphenylhydrazine		<MDL	U	440	849	ug/Kg						
1,3-Dichlorobenzene		<MDL	U	21	42.6	ug/Kg						
1,4-Dichlorobenzene		<MDL	U	21	42.6	ug/Kg						
2,4,5-Trichlorophenol		<MDL	U	1100	2120	ug/Kg						
2,4,6-Trichlorophenol		<MDL	U	1100	2120	ug/Kg						
2,4-Dichlorophenol		<MDL	U	1100	2120	ug/Kg						
2,4-Dimethylphenol		<MDL	UJ	110	212	ug/Kg						
2,4-Dinitrotoluene		<MDL	U	1100	2120	ug/Kg						
2,6-Dinitrotoluene		<MDL	U	1100	2120	ug/Kg						
2-Chloronaphthalene		<MDL	U	440	849	ug/Kg						
2-Chlorophenol		<MDL	U	440	849	ug/Kg						
2-Methylnaphthalene	4860			210	426	ug/Kg						
2-Methylphenol		<MDL	U	210	426	ug/Kg						
2-Nitrophenol		<MDL	U	1100	2120	ug/Kg						
4-Bromophenyl Phenyl Ether		<MDL	U	440	849	ug/Kg						
4-Chlorophenyl Phenyl Ether		<MDL	U	440	849	ug/Kg						
4-Methylphenol	64100			440	849	ug/Kg						
Acenaphthene		<MDL	U	210	426	ug/Kg						
Acenaphthylene		<MDL	U	210	426	ug/Kg						
Aniline		<MDL	UJ	1100	2120	ug/Kg						
Anthracene		<MDL	U	210	426	ug/Kg						
Benzo(a)anthracene	701		J	210	426	ug/Kg						

Table B-1. Combined sewer system solids sampling results for 2010.

King County Environmental Lab Analytical Report

Project: 423589-090-1
 Locator: S070196
 Descrip: SMICHOF/WO39 S MIC
 Sample: L51108-3
 Matrix: SH IN-LINESED
 ColDate: 6/29/10 15:30
 Sample type: In-line grab
 TotalSolid: 25.1
DRY Weight Basis

Project: 423589-090-1
 Locator: S070196
 Descrip: SMICHOF/WO39 S MIC
 Sample: L51108-4
 Matrix: SH IN-LINESED
 ColDate: #####
 Sample type: In-line grab
 TotalSolid: 29
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
Benzo(a)pyrene		<MDL	UJ	210	426	ug/Kg						
Benzo(b)fluoranthene		<MDL	U	210	426	ug/Kg						
Benzo(g,h,i)perylene		<MDL	U	210	426	ug/Kg						
Benzo(k)fluoranthene		<MDL	U	210	426	ug/Kg						
Benzoic Acid		<MDL	UJ	1100	2120	ug/Kg						
Benzyl Alcohol		<MDL	U	210	426	ug/Kg						
Benzyl Butyl Phthalate	2340			210	426	ug/Kg						
Bis(2-Chloroethoxy)Methane		<MDL	U	440	849	ug/Kg						
Bis(2-Chloroethyl)Ether		<MDL	U	440	849	ug/Kg						
Bis(2-Chloroisopropyl)Ether		<MDL	U	440	849	ug/Kg						
Bis(2-Ethylhexyl)Phthalate	33700			440	849	ug/Kg						
Caffeine		<MDL	U	210	426	ug/Kg						
Carbazole		<MDL	U	440	849	ug/Kg						
Chrysene	1360			210	426	ug/Kg						
Coprostanol	566000			4400	8490	ug/Kg						
Dibenzo(a,h)anthracene		<MDL	U	210	426	ug/Kg						
Dibenzofuran		<MDL	U	210	426	ug/Kg						
Diethyl Phthalate		<MDL	U	440	849	ug/Kg						
Dimethyl Phthalate		<MDL	U	440	849	ug/Kg						
Di-N-Butyl Phthalate		<MDL	U	440	849	ug/Kg						
Di-N-Octyl Phthalate		<MDL	U	440	849	ug/Kg						
Fluoranthene	1980			210	426	ug/Kg						
Fluorene		<MDL	U	210	426	ug/Kg						
Hexachlorobenzene		<MDL	U	44	84.9	ug/Kg						
Hexachlorobutadiene		<MDL	U	44	84.9	ug/Kg						
Hexachloroethane		<MDL	U	210	426	ug/Kg						
Indeno(1,2,3-Cd)Pyrene		<MDL	U	210	426	ug/Kg						
Isophorone		<MDL	U	440	849	ug/Kg						
Naphthalene	400	<RDL	J	210	426	ug/Kg						
Nitrobenzene		<MDL	U	440	849	ug/Kg						
N-Nitrosodimethylamine		<MDL	U	440	849	ug/Kg						
N-Nitrosodi-N-Propylamine		<MDL	U	440	849	ug/Kg						
N-Nitrosodiphenylamine		<MDL	U	440	849	ug/Kg						
Pentachlorophenol		<MDL	U	1100	2120	ug/Kg						
Phenanthrene	4740			210	426	ug/Kg						
Phenol	932			440	849	ug/Kg						
Pyrene	3170			210	426	ug/Kg						
Pyridine		<MDL	U	1100	2120	ug/Kg						
LPAHs (calc)	5140											
HPAHs (calc)	7211											

* Not converted to dry weight basis
 MDL - method detection limit
 RDL - reporting detectin limit
 J - estimated value
 U- not detected
 R - rejected value
 JG-estimated value; probable low bias
 H - holding time
 B- in method blank w/in 10x sample
 TA- narrative info available
 Shaded value > source control
 screening benchmark for CSO system
 see Appendix F of King County 2016

Table B-1. Combined sewer system solids sampling results for 2010.

King County Environmental Lab Analytical Report

Project: 423589-090-1
 Locator: A01007
 Descrip: LOCATED ON EAST SI
 Sample: L51108-5
 Matrix: SH IN-LINESED
 ColDate: 6/29/10 10:00
 Sample type: In-line grab
 TotalSolid: 77
DRY Weight Basis

Project: 423589-090-1
 Locator: A01007
 Descrip: LOCATED ON EAST SI
 Sample: L51108-6
 Matrix: SH IN-LINESED
 ColDate: #####
 Sample type: In-line grab
 TotalSolid: 74.8
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Fines*		<MDL	U	0.84	1.67	%						
Gravel*	40.9			0.17	1.67	%						
Sand*	68			0.17	1.67	%						
Silt*		<MDL	U	0.84	1.67	%						
Clay*		<MDL	U	0.84	1.67	%						
p+0.00*	5.1			0.17	1.67	%						
p+1.00*	16.3			0.17	1.67	%						
p+10.0(equal/more than)*		<MDL	U	0.84	1.67	%						
p+2.00*	40.3			0.17	1.67	%						
p+3.00*	5.6			0.17	1.67	%						
p+4.00*	0.7	<RDL	J	0.17	1.67	%						
p+5.00*		<MDL	U	0.84	1.67	%						
p+6.00*		<MDL	U	0.84	1.67	%						
p+7.00*		<MDL	U	0.84	1.67	%						
p+8.00*		<MDL	U	0.84	1.67	%						
p+9.00*		<MDL	U	0.84	1.67	%						
p-1.00*	9.5			0.17	1.67	%						
p-2.00(less than)*	28.2			0.17	1.67	%						
p-2.00*	3.2			0.17	1.67	%						
CV SM2540-G												
Total Solids*	77			0.005	0.01	%	74.8			0.005	0.01	%
CV SW846 9060-PSEP96												
Total Organic Carbon	14500			1900	3860	mg/Kg						
MT SW846 3050B*SW846 6010C												
Antimony, Total, ICP	6.45	JG		0.97	4.9	mg/Kg						
Arsenic, Total, ICP	19			1.7	8.16	mg/Kg						
Cadmium, Total, ICP	1.65			0.13	0.652	mg/Kg						
Chromium, Total, ICP	71			0.19	0.978	mg/Kg						
Cobalt, Total, ICP	9.99			0.19	0.978	mg/Kg						
Copper, Total, ICP	145			0.26	1.3	mg/Kg						
Lead, Total, ICP	129			1.3	6.52	mg/Kg						
Molybdenum, Total, ICP	10.5			0.19	0.978	mg/Kg						
Nickel, Total, ICP	57.3			0.32	1.64	mg/Kg						
Selenium, Total, ICP		<MDL	U	1.7	8.16	mg/Kg						
Silver, Total, ICP	9.27			0.26	1.3	mg/Kg						
Thallium, Total, ICP	8.3	<RDL	J	2.6	13	mg/Kg						
Vanadium, Total, ICP	25.2			0.65	3.26	mg/Kg						
Zinc, Total, ICP	426			0.32	1.64	mg/Kg						
MT SW846 7471B												
Mercury, Total, CVAA	0.16	<RDL	J	0.026	0.253	mg/Kg	0.098	<RDL		0.025	0.255	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL	U	6.9	13.9	ug/Kg						
Aroclor 1221		<MDL	U	6.9	13.9	ug/Kg						
Aroclor 1232		<MDL	U	6.9	13.9	ug/Kg						
Aroclor 1242		<MDL,TA	U	27	55.5	ug/Kg						
Aroclor 1248	7.9	<RDL	J	6.9	13.9	ug/Kg						
Aroclor 1254	22.6			6.9	13.9	ug/Kg						
Aroclor 1260	8.7	<RDL	J	6.9	13.9	ug/Kg						
Total PCBs (calc)	39.2		J									
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene		<MDL	U	0.69	1.39	ug/Kg						
1,2-Dichlorobenzene		<MDL	U	1.4	2.77	ug/Kg						
1,2-Diphenylhydrazine		<MDL	U	27	55.5	ug/Kg						
1,3-Dichlorobenzene		<MDL	U	1.4	2.77	ug/Kg						
1,4-Dichlorobenzene	17	J	J	1.4	2.77	ug/Kg						
2,4,5-Trichlorophenol		<MDL	U	69	139	ug/Kg						
2,4,6-Trichlorophenol		<MDL	U	69	139	ug/Kg						
2,4-Dichlorophenol		<MDL	U	69	139	ug/Kg						
2,4-Dimethylphenol		<MDL	UJ	6.9	13.9	ug/Kg						
2,4-Dinitrotoluene		<MDL	R	69	139	ug/Kg						
2,6-Dinitrotoluene		<MDL	R	69	139	ug/Kg						
2-Chloronaphthalene		<MDL	U	27	55.5	ug/Kg						
2-Chlorophenol		<MDL	U	27	55.5	ug/Kg						
2-Methylnaphthalene	35.2			14	27.7	ug/Kg						
2-Methylphenol		<MDL	U	14	27.7	ug/Kg						
2-Nitrophenol		<MDL	U	69	139	ug/Kg						
4-Bromophenyl Phenyl Ether		<MDL	U	27	55.5	ug/Kg						
4-Chlorophenyl Phenyl Ether		<MDL	U	27	55.5	ug/Kg						
4-Methylphenol	31	<RDL	J	27	55.5	ug/Kg						
Acenaphthene	57			14	27.7	ug/Kg						
Acenaphthylene		<MDL	U	14	27.7	ug/Kg						
Aniline		<MDL	UJ	69	139	ug/Kg						
Anthracene	149			14	27.7	ug/Kg						
Benzo(a)anthracene	115		J	14	27.7	ug/Kg						

Table B-1. Combined sewer system solids sampling results for 2010.

King County Environmental Lab Analytical Report

Project: 423589-090-1
 Locator: A01007
 Descrip: LOCATED ON EAST SI
 Sample: L51108-5
 Matrix: SH IN-LINESED
 ColDate: 6/29/10 10:00
 Sample type: In-line grab
 TotalSolid: 77
DRY Weight Basis

Project: 423589-090-1
 Locator: A01007
 Descrip: LOCATED ON EAST SI
 Sample: L51108-6
 Matrix: SH IN-LINESED
 ColDate: #####
 Sample type: In-line grab
 TotalSolid: 74.8
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
Benzo(a)pyrene	66.1		J	14	27.7	ug/Kg						
Benzo(b)fluoranthene	80.5			14	27.7	ug/Kg						
Benzo(g,h,i)perylene	53.1			14	27.7	ug/Kg						
Benzo(k)fluoranthene	76.4			14	27.7	ug/Kg						
Benzoic Acid		<MDL	UJ	69	139	ug/Kg						
Benzyl Alcohol		<MDL	U	14	27.7	ug/Kg						
Benzyl Butyl Phthalate	115	B	U	14	27.7	ug/Kg						
Bis(2-Chloroethoxy)Methane		<MDL	U	27	55.5	ug/Kg						
Bis(2-Chloroethyl)Ether		<MDL	U	27	55.5	ug/Kg						
Bis(2-Chloroisopropyl)Ether		<MDL	U	27	55.5	ug/Kg						
Bis(2-Ethylhexyl)Phthalate	1880			27	55.5	ug/Kg						
Caffeine		<MDL	U	14	27.7	ug/Kg						
Carbazole		<MDL	U	27	55.5	ug/Kg						
Chrysene	166			14	27.7	ug/Kg						
Coprostanol	8440			270	555	ug/Kg						
Dibenzo(a,h)anthracene		<MDL	U	14	27.7	ug/Kg						
Dibenzofuran		<MDL	U	14	27.7	ug/Kg						
Diethyl Phthalate		<MDL	U	27	55.5	ug/Kg						
Dimethyl Phthalate		<MDL	U	27	55.5	ug/Kg						
Di-N-Butyl Phthalate		<MDL	U	27	55.5	ug/Kg						
Di-N-Octyl Phthalate	444			27	55.5	ug/Kg						
Fluoranthene	699			14	27.7	ug/Kg						
Fluorene	136			14	27.7	ug/Kg						
Hexachlorobenzene		<MDL	U	2.7	5.55	ug/Kg						
Hexachlorobutadiene		<MDL	U	2.7	5.55	ug/Kg						
Hexachloroethane		<MDL	R	14	27.7	ug/Kg						
Indeno(1,2,3-Cd)Pyrene	37.4			14	27.7	ug/Kg						
Isophorone		<MDL	U	27	55.5	ug/Kg						
Naphthalene		<MDL	U	14	27.7	ug/Kg						
Nitrobenzene		<MDL	R	27	55.5	ug/Kg						
N-Nitrosodimethylamine		<MDL	U	27	55.5	ug/Kg						
N-Nitrosodi-N-Propylamine		<MDL	R	27	55.5	ug/Kg						
N-Nitrosodiphenylamine		<MDL	R	27	55.5	ug/Kg						
Pentachlorophenol		<MDL	U	69	139	ug/Kg						
Phenanthrene	838			14	27.7	ug/Kg						
Phenol		<MDL	U	27	55.5	ug/Kg						
Pyrene	716			14	27.7	ug/Kg						
Pyridine		<MDL	U	69	139	ug/Kg						
LPAHs (calc)	1180											
HPAHs (calc)	2009.5											

* Not converted to dry weight basis
 MDL - method detection limit
 RDL - reporting detectin limit
 J - estimated value
 U- not detected
 R - rejected value
 JG-estimated value; probable low bias
 H - holding time
 B- in method blank w/in 10x sample
 TA- narrative info available
 Shaded value > source control
 screening benchmark for CSO system
 see Appendix F of King County 2016

Table B-1. Combined sewer system solids sampling results for 2010.

King County Environmental Lab Analytical Report

Project: 423589-090-1 Locator: A01008 Descrip: MH IN LEFT TURN LA Sample: L51108-7 Matrix: SH IN-LINESED ColDate: 6/29/10 11:30 Sample type: In-line grab TotalSolid: 84.9 DRY Weight Basis							Project: 423589-090-1 Locator: A01008 Descrip: MH IN LEFT TURN LA Sample: L51108-9 Matrix: SH IN-LINESED ColDate: 6/29/10 11:45 Sample type: In-line grab TotalSolid: 90.4 DRY Weight Basis						
Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units	
CV ASTM D422													
Fines*		<MDL	U	0.56	1.13	%							
Gravel*	70.5			0.11	1.13	%							
Sand*	37.4			0.11	1.13	%							
Silt*		<MDL	U	0.56	1.13	%							
Clay*		<MDL	U	0.56	1.13	%							
p+0.00*	21.2			0.11	1.13	%							
p+1.00*	8.2			0.11	1.13	%							
p+10.0(equal/more than)*		<MDL	U	0.56	1.13	%							
p+2.00*	5.9			0.11	1.13	%							
p+3.00*	1.8			0.11	1.13	%							
p+4.00*	0.3	<RDL	J	0.11	1.13	%							
p+5.00*		<MDL	U	0.56	1.13	%							
p+6.00*		<MDL	U	0.56	1.13	%							
p+7.00*		<MDL	U	0.56	1.13	%							
p+8.00*		<MDL	U	0.56	1.13	%							
p+9.00*		<MDL	U	0.56	1.13	%							
p-1.00*	34.3			0.11	1.13	%							
p-2.00(less than)*	29.1			0.11	1.13	%							
p-2.00*	7.2			0.11	1.13	%							
CV SM2540-G													
Total Solids*	84.9			0.005	0.01	%	90.4			0.005	0.01	%	
CV SW846 9060-PSEP96													
Total Organic Carbon	3260			940	1880	mg/Kg	3680			920	1840	mg/Kg	
MT SW846 3050B*SW846 6010C													
Antimony, Total, ICP	1	<RDL,JG	J	0.88	4.39	mg/Kg	3.5	<RDL,JG	J	0.84	4.21	mg/Kg	
Arsenic, Total, ICP		<MDL	U	1.4	7.31	mg/Kg	12.4			1.4	7.02	mg/Kg	
Cadmium, Total, ICP	0.33	<RDL	J	0.12	0.585	mg/Kg	0.611			0.11	0.562	mg/Kg	
Chromium, Total, ICP	28.5			0.18	0.878	mg/Kg	75.8			0.17	0.843	mg/Kg	
Cobalt, Total, ICP	1.87			0.18	0.878	mg/Kg	5.1			0.17	0.843	mg/Kg	
Copper, Total, ICP	63.1			0.24	1.17	mg/Kg	165			0.22	1.13	mg/Kg	
Lead, Total, ICP	30.3			1.2	5.85	mg/Kg	105			1.1	5.62	mg/Kg	
Molybdenum, Total, ICP	3.22			0.18	0.878	mg/Kg	2.79			0.17	0.843	mg/Kg	
Nickel, Total, ICP	33.7			0.29	1.46	mg/Kg	295			0.28	1.4	mg/Kg	
Selenium, Total, ICP		<MDL	U	1.4	7.31	mg/Kg		<MDL	U	1.4	7.02	mg/Kg	
Silver, Total, ICP	1.37			0.24	1.17	mg/Kg	2.05			0.22	1.13	mg/Kg	
Thallium, Total, ICP	2.9	<RDL	J	2.4	11.7	mg/Kg	10	<RDL	J	2.2	11.3	mg/Kg	
Vanadium, Total, ICP	6.48			0.59	2.92	mg/Kg	15.3			0.56	2.81	mg/Kg	
Zinc, Total, ICP	124			0.29	1.46	mg/Kg	334			0.28	1.4	mg/Kg	
MT SW846 7471B													
Mercury, Total, CVAA	0.071	<RDL	J	0.022	0.227	mg/Kg	0.11	<RDL	J	0.021	0.213	mg/Kg	
OR SW846 3550B*SW846 8082A													
Aroclor 1016		<MDL	U	6.2	12.6	ug/Kg							
Aroclor 1221		<MDL	U	6.2	12.6	ug/Kg							
Aroclor 1232		<MDL	U	6.2	12.6	ug/Kg							
Aroclor 1242		<MDL	U	6.2	12.6	ug/Kg							
Aroclor 1248		<MDL	U	6.2	12.6	ug/Kg							
Aroclor 1254		<MDL	U	6.2	12.6	ug/Kg							
Aroclor 1260		<MDL	U	6.2	12.6	ug/Kg							
Total PCBs (calc)	<6.2		U										
OR SW846 3550B*SW846 8270D													
1,2,4-Trichlorobenzene		<MDL	U	0.62	1.26	ug/Kg							
1,2-Dichlorobenzene		<MDL	U	1.3	2.51	ug/Kg							
1,2-Diphenylhydrazine		<MDL	U	25	50.3	ug/Kg							
1,3-Dichlorobenzene		<MDL	U	1.3	2.51	ug/Kg							
1,4-Dichlorobenzene	8.26			1.3	2.51	ug/Kg							
2,4,5-Trichlorophenol		<MDL	U	62	126	ug/Kg							
2,4,6-Trichlorophenol		<MDL	U	62	126	ug/Kg							
2,4-Dichlorophenol		<MDL	U	62	126	ug/Kg							
2,4-Dimethylphenol		<MDL	UJ	6.2	12.6	ug/Kg							
2,4-Dinitrotoluene		<MDL	U	62	126	ug/Kg							
2,6-Dinitrotoluene		<MDL	U	62	126	ug/Kg							
2-Chloronaphthalene		<MDL	U	25	50.3	ug/Kg							
2-Chlorophenol		<MDL	U	25	50.3	ug/Kg							
2-Methylnaphthalene		<MDL	U	13	25.1	ug/Kg							
2-Methylphenol		<MDL	U	13	25.1	ug/Kg							
2-Nitrophenol		<MDL	U	62	126	ug/Kg							
4-Bromophenyl Phenyl Ether		<MDL	U	25	50.3	ug/Kg							
4-Chlorophenyl Phenyl Ether		<MDL	U	25	50.3	ug/Kg							
4-Methylphenol		<MDL	U	25	50.3	ug/Kg							
Acenaphthene		<MDL	U	13	25.1	ug/Kg							
Acenaphthylene		<MDL	U	13	25.1	ug/Kg							
Aniline		<MDL	UJ	62	126	ug/Kg							
Anthracene		<MDL	U	13	25.1	ug/Kg							
Benzo(a)anthracene		<MDL	UJ	13	25.1	ug/Kg							

Table B-1. Combined sewer system solids sampling results for 2010.

King County Environmental Lab Analytical Report

Project: 423589-090-1
 Locator: A01008
 Descrip: MH IN LEFT TURN LA
 Sample: L51108-7
 Matrix: SH IN-LINESED
 ColDate: 6/29/10 11:30
 Sample type: In-line grab
 TotalSolid: 84.9
DRY Weight Basis

Project: 423589-090-1
 Locator: A01008
 Descrip: MH IN LEFT TURN LA
 Sample: L51108-9
 Matrix: SH IN-LINESED
 ColDate: 6/29/10 11:45
 Sample type: In-line grab
 TotalSolid: 90.4
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
Benzo(a)pyrene		<MDL	UJ	13	25.1	ug/Kg						
Benzo(b)fluoranthene		<MDL	U	13	25.1	ug/Kg						
Benzo(g,h,i)perylene		<MDL	U	13	25.1	ug/Kg						
Benzo(k)fluoranthene		<MDL	U	13	25.1	ug/Kg						
Benzoic Acid		<MDL	UJ	62	126	ug/Kg						
Benzyl Alcohol		<MDL	U	13	25.1	ug/Kg						
Benzyl Butyl Phthalate		<MDL	U	13	25.1	ug/Kg						
Bis(2-Chloroethoxy)Methane		<MDL	U	25	50.3	ug/Kg						
Bis(2-Chloroethyl)Ether		<MDL	U	25	50.3	ug/Kg						
Bis(2-Chloroisopropyl)Ether		<MDL	U	25	50.3	ug/Kg						
Bis(2-Ethylhexyl)Phthalate	347			25	50.3	ug/Kg						
Caffeine		<MDL	U	13	25.1	ug/Kg						
Carbazole		<MDL	U	25	50.3	ug/Kg						
Chrysene	16	<RDL	J	13	25.1	ug/Kg						
Coprostanol	1300			250	503	ug/Kg						
Dibenzo(a,h)anthracene		<MDL	U	13	25.1	ug/Kg						
Dibenzofuran		<MDL	U	13	25.1	ug/Kg						
Diethyl Phthalate		<MDL	U	25	50.3	ug/Kg						
Dimethyl Phthalate		<MDL	U	25	50.3	ug/Kg						
Di-N-Butyl Phthalate		<MDL	U	25	50.3	ug/Kg						
Di-N-Octyl Phthalate		<MDL	U	25	50.3	ug/Kg						
Fluoranthene	33.8			13	25.1	ug/Kg						
Fluorene		<MDL	U	13	25.1	ug/Kg						
Hexachlorobenzene		<MDL	U	2.5	5.03	ug/Kg						
Hexachlorobutadiene		<MDL	U	2.5	5.03	ug/Kg						
Hexachloroethane		<MDL	U	13	25.1	ug/Kg						
Indeno(1,2,3-Cd)Pyrene		<MDL	U	13	25.1	ug/Kg						
Isophorone		<MDL	U	25	50.3	ug/Kg						
Naphthalene		<MDL	U	13	25.1	ug/Kg						
Nitrobenzene		<MDL	U	25	50.3	ug/Kg						
N-Nitrosodimethylamine		<MDL	U	25	50.3	ug/Kg						
N-Nitrosodi-N-Propylamine		<MDL	U	25	50.3	ug/Kg						
N-Nitrosodiphenylamine		<MDL	U	25	50.3	ug/Kg						
Pentachlorophenol		<MDL	U	62	126	ug/Kg						
Phenanthrene	21	<RDL	J	13	25.1	ug/Kg						
Phenol		<MDL	U	25	50.3	ug/Kg						
Pyrene	35.3			13	25.1	ug/Kg						
Pyridine		<MDL	U	62	126	ug/Kg						
LPAHs (calc)	21											
HPAHs (calc)	85.1											

* Not converted to dry weight basis
 MDL - method detection limit
 RDL - reporting detectin limit
 J - estimated value
 U- not detected
 R - rejected value
 JG-estimated value; probable low bias
 H - holding time
 B- in method blank w/in 10x sample
 TA- narrative info available
 Shaded value > source control
 screening benchmark for CSO system
 see Appendix F of King County 2016

Table B-1. Combined sewer system solids sampling results for 2010.

King County Environmental Lab Analytical Report

Project: 423589-090-4 Locator: S070196 Descrip: SMICHOF/WO39 S MIC Sample: L52290-1 Matrix: SH IN-LINESED ColDate: 12/7/10 9:45 Sample type: In-line grab TotalSolid: 11.3 DRY Weight Basis						
Parameters	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422						
Fines*						
Gravel*						
Sand*						
Silt*						
Clay*						
p+0.00*						
p+1.00*						
p+10.0(equal/more than)*						
p+2.00*						
p+3.00*						
p+4.00*						
p+5.00*						
p+6.00*						
p+7.00*						
p+8.00*						
p+9.00*						
p-1.00*						
p-2.00(less than)*						
p-2.00*						
CV SM2540-G						
Total Solids*	11.3	H		0.005	0.01	%
CV SW846 9060-PSEP96						
Total Organic Carbon						
MT SW846 3050B*SW846 6010C						
Antimony, Total, ICP		<MDL	R	6.6	33.1	mg/Kg
Arsenic, Total, ICP		<MDL	U	11	55.2	mg/Kg
Cadmium, Total, ICP	3.8	<RDL	J	0.88	4.42	mg/Kg
Chromium, Total, ICP	54.2			1.3	6.62	mg/Kg
Cobalt, Total, ICP	9.47			1.3	6.62	mg/Kg
Copper, Total, ICP	265	J	J	1.8	8.83	mg/Kg
Lead, Total, ICP	145			8.8	44.2	mg/Kg
Molybdenum, Total, ICP	10.5			1.3	6.62	mg/Kg
Nickel, Total, ICP	41.9			2.2	11.1	mg/Kg
Selenium, Total, ICP		<MDL	U	11	55.2	mg/Kg
Silver, Total, ICP	3.3	<RDL	J	1.8	8.83	mg/Kg
Thallium, Total, ICP	35	<RDL	J	18	88.3	mg/Kg
Vanadium, Total, ICP	42.6			4.4	22	mg/Kg
Zinc, Total, ICP	965			2.2	11.1	mg/Kg
MT SW846 7471B						
Mercury, Total, CVAA	1.93	J	J	0.044	0.442	mg/Kg
OR SW846 3550B*SW846 8082A						
Aroclor 1016						
Aroclor 1221						
Aroclor 1232						
Aroclor 1242						
Aroclor 1248						
Aroclor 1254						
Aroclor 1260						
Total PCBs (calc)						
OR SW846 3550B*SW846 8270D						
1,2,4-Trichlorobenzene						
1,2-Dichlorobenzene						
1,2-Diphenylhydrazine						
1,3-Dichlorobenzene						
1,4-Dichlorobenzene						
2,4,5-Trichlorophenol						
2,4,6-Trichlorophenol						
2,4-Dichlorophenol						
2,4-Dimethylphenol						
2,4-Dinitrotoluene						
2,6-Dinitrotoluene						
2-Chloronaphthalene						
2-Chlorophenol						
2-Methylnaphthalene						
2-Methylphenol						
2-Nitrophenol						
4-Bromophenyl Phenyl Ether						
4-Chlorophenyl Phenyl Ether						
4-Methylphenol						
Acenaphthene						
Acenaphthylene						
Aniline						
Anthracene						
Benzo(a)anthracene						

Table B-1. Combined sewer system solids sampling results for 2010.

King County Environmental Lab Analytical Report

Project: 423589-090-4
 Locator: S070196
 Descrip: SMICHOF/WO39 S MIC
 Sample: L52290-1
 Matrix: SH IN-LINESED
 ColDate: 12/7/10 9:45
 Sample type: In-line grab
 TotalSolid: 11.3
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units
Benzo(a)pyrene						
Benzo(b)fluoranthene						
Benzo(g,h,i)perylene						
Benzo(k)fluoranthene						
Benzoic Acid						
Benzyl Alcohol						
Benzyl Butyl Phthalate						
Bis(2-Chloroethoxy)Methane						
Bis(2-Chloroethyl)Ether						
Bis(2-Chloroisopropyl)Ether						
Bis(2-Ethylhexyl)Phthalate						
Caffeine						
Carbazole						
Chrysene						
Coprostanol						
Dibenzo(a,h)anthracene						
Dibenzofuran						
Diethyl Phthalate						
Dimethyl Phthalate						
Di-N-Butyl Phthalate						
Di-N-Octyl Phthalate						
Fluoranthene						
Fluorene						
Hexachlorobenzene						
Hexachlorobutadiene						
Hexachloroethane						
Indeno(1,2,3-Cd)Pyrene						
Isophorone						
Naphthalene						
Nitrobenzene						
N-Nitrosodimethylamine						
N-Nitrosodi-N-Propylamine						
N-Nitrosodiphenylamine						
Pentachlorophenol						
Phenanthrene						
Phenol						
Pyrene						
Pyridine						
LPAHs (calc)						
HPAHs (calc)						

* Not converted to dry weight basis
 MDL - method detection limit
 RDL - reporting detectin limit
 J - estimated value
 U- not detected
 R - rejected value
 JG-estimated value; probable low bias
 H - holding time
 B- in method blank w/in 10x sample
 TA- narrative info available
 Shaded value > source control
 screening benchmark for CSO system
 see Appendix F of King County 2016

Table B-2. Combined sewer system solids sampling results for 2011.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: S070167
 Descrip: W MICHIGAN REG/CSO
 Sample: L54155-1
 Matrix: SH IN-LINESED
 ColDate: 9/14/11 11:15
 Sample type: In-line grab
 TotalSolid: 53.8
DRY Weight Basis

Project: 423589-340-4
 Locator: S070167
 Descrip: W MICHIGAN REG/CSO
 Sample: L54155-2
 Matrix: SH IN-LINESED
 ColDate: 9/14/11 11:25
 Sample type: In-line grab
 TotalSolid: 71.9
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Clay*	5.6			1.1	2.25	%						
Fines*	11.3			1.1	2.25	%						
Gravel*	22.1			0.23	2.25	%						
p+0.00*	6.3			0.23	2.25	%						
p+1.00*	6.3			0.23	2.25	%						
p+10.0(equal/more than)*	3.4			1.1	2.25	%						
p+2.00*	18.4			0.23	2.25	%						
p+3.00*	26.8			0.23	2.25	%						
p+4.00*	9.7			0.23	2.25	%						
p+5.00*	4.5			1.1	2.25	%						
p+6.00*		<MDL	U	1.1	2.25	%						
p+7.00*	1.1	<RDL	J	1.1	2.25	%						
p+8.00*		<MDL	U	1.1	2.25	%						
p+9.00*	2.3	RDL	J	1.1	2.25	%						
p-1.00*	7.6			0.23	2.25	%						
p-2.00(less than)*	11			0.23	2.25	%						
p-2.00*	3.6			0.23	2.25	%						
Sand*	67.5			0.23	2.25	%						
Silt*	5.6			1.1	2.25	%						
CV SM2540-G												
Total Solids*	53.8			0.005	0.01	%	71.9			0.005	0.01	%
CV SW846 9060-PSEP96												
Total Organic Carbon	46700			3500	7030	mg/Kg						
MT SW846 3050B*SW846 6010C												
Arsenic, Total, ICP												
Cadmium, Total, ICP												
Chromium, Total, ICP	49.4			0.19	0.946	mg/Kg						
Copper, Total, ICP	101	J	J	0.26	1.26	mg/Kg						
Lead, Total, ICP	109	J	J	1.3	6.32	mg/Kg						
Nickel, Total, ICP	35.3	J	J	0.32	1.58	mg/Kg						
Silver, Total, ICP												
Vanadium, Total, ICP	28.6			0.63	3.16	mg/Kg						
Zinc, Total, ICP	268			0.32	1.58	mg/Kg						
MT SW846 3050B*SW846 6020A												
Arsenic, Total, ICP-MS	2.64			0.046	0.232	mg/Kg						
Cadmium, Total, ICP-MS	0.426			0.022	0.116	mg/Kg						
Silver, Total, ICP-MS	0.671	J	J	0.019	0.0928	mg/Kg						
MT SW846 7471B												
Mercury, Total, CVAA	0.13	<RDL	J	0.037	0.364	mg/Kg	0.067	<RDL		0.028	0.277	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL	U	2.4	4.96	ug/Kg						
Aroclor 1221		<MDL	U	5	9.91	ug/Kg						
Aroclor 1232		<MDL	U	5	9.91	ug/Kg						
Aroclor 1242	4.3	<RDL	J	2.4	4.96	ug/Kg						
Aroclor 1248		<MDL	U	2.4	4.96	ug/Kg						
Aroclor 1254	17.8			2.4	4.96	ug/Kg						
Aroclor 1260	5.63			2.4	4.96	ug/Kg						
Total PCBs (calc)	27.8			2.4	4.96	ug/Kg						
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene		<MDL	U	2	3.96	ug/Kg						
1,2-Dichlorobenzene		<MDL	U	19.9	19.9	ug/Kg						
1,4-Dichlorobenzene	506		J	29.7	29.7	ug/Kg						
2,4-Dimethylphenol		<MDL	U	20	39.6	ug/Kg						
2-Methylnaphthalene		<MDL	U	20	39.6	ug/Kg						
2-Methylphenol		<MDL	U	20	39.6	ug/Kg						
3-,4-Methylphenol	16800			500	991	ug/Kg						
Acenaphthene		<MDL	U	20	39.6	ug/Kg						
Acenaphthylene		<MDL	U	20	39.6	ug/Kg						
Anthracene	30	<RDL	J	20	39.6	ug/Kg						
Benzo(a)anthracene	236			20	39.6	ug/Kg						
Benzo(a)pyrene	197		J	20	39.6	ug/Kg						
Benzo(b,j,k)fluoranthene	327			20	39.6	ug/Kg						
Benzo(g,h,i)perylene	138	JL	J	20	39.6	ug/Kg						
Benzoic Acid	2030			396	396	ug/Kg						
Benzyl Alcohol		<MDL	U	49.6	49.6	ug/Kg						

Table B-2. Combined sewer system solids sampling results for 2011.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: S070167
 Descrip: W MICHIGAN REG/CSO
 Sample: L54155-1
 Matrix: SH IN-LINESED
 ColDate: 9/14/11 11:15
 Sample type: In-line grab
 TotalSolid: 53.8
DRY Weight Basis

Project: 423589-340-4
 Locator: S070167
 Descrip: W MICHIGAN REG/CSO
 Sample: L54155-2
 Matrix: SH IN-LINESED
 ColDate: 9/14/11 11:25
 Sample type: In-line grab
 TotalSolid: 71.9
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
Benzyl Butyl Phthalate	1000	JL,B2	J	29.7	29.7	ug/Kg						
Bis(2-Ethylhexyl)Phthalate	5280	JL	J	39	79.4	ug/Kg						
Chrysene	159		J	20	39.6	ug/Kg						
Dibenzo(a,h)anthracene	58			20	39.6	ug/Kg						
Dibenzofuran		<MDL	U	20	39.6	ug/Kg						
Diethyl Phthalate		<MDL	U	39	79.4	ug/Kg						
Dimethyl Phthalate		<MDL	U	39.6	39.6	ug/Kg						
Di-N-Butyl Phthalate	662			39	79.4	ug/Kg						
Di-N-Octyl Phthalate		<MDL	U	39.6	39.6	ug/Kg						
Fluoranthene	260			20	39.6	ug/Kg						
Fluorene		<MDL,JL	U	20	39.6	ug/Kg						
Hexachlorobenzene		<MDL	U	2	3.96	ug/Kg						
Hexachlorobutadiene		<MDL	U	9.9	19.9	ug/Kg						
Indeno(1,2,3-Cd)Pyrene	128	JL	J	20	39.6	ug/Kg						
Naphthalene		<MDL	U	20	39.6	ug/Kg						
N-Nitrosodiphenylamine		<MDL	U	49.6	49.6	ug/Kg						
Pentachlorophenol		<MDL	U	297	297	ug/Kg						
Phenanthrene	129		J	20	39.6	ug/Kg						
Phenol		<MDL	U	99	297	ug/Kg						
Pyrene	346			20	39.6	ug/Kg						
Total HPAHS (calc)	1850			20	39.6	ug/Kg						
Total LPAHS (calc)	159			20	39.6	ug/Kg						

* Not converted to dry weight basis
 MDL - method detection limit
 RDL - reporting detection limit
 J - estimated value
 U - not detected
 JL-estimated value; probable high bias
 H - holding time
 B- value is < 5x method blank (MB)
 B2 or B3- value > 5 and ≤ 10 times MB
 TA- narrative info available
 Shaded value > source control
 screening benchmark for CSO system
 see Appendix F of King County 2016

Table B-2. Combined sewer system solids sampling results for 2011.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: A4007
 Descrip: MICHIGAN STREET RE
 Sample: L54155-3
 Matrix: SH IN-LINESED
 ColDate: 9/14/11 12:00
 Sample type: In-line grab
 TotalSolid: 75
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422						
Clay*	2			0.66	1.33	%
Fines*	2.7			0.66	1.33	%
Gravel*	26.5			0.13	1.33	%
p+0.00*	13.6			0.13	1.33	%
p+1.00*	19.7			0.13	1.33	%
p+10.0(equal/more than)*	2			0.66	1.33	%
p+2.00*	28.2			0.13	1.33	%
p+3.00*	7.8			0.13	1.33	%
p+4.00*	2			0.13	1.33	%
p+5.00*		<MDL	U	0.66	1.33	%
p+6.00*	0.7	<RDL	J	0.66	1.33	%
p+7.00*		<MDL	U	0.66	1.33	%
p+8.00*		<MDL	U	0.66	1.33	%
p+9.00*		<MDL	U	0.66	1.33	%
p-1.00*	15.6			0.13	1.33	%
p-2.00(less than)*	9.1			0.13	1.33	%
p-2.00*	1.8			0.13	1.33	%
Sand*	71.3			0.13	1.33	%
Silt*	0.7	<RDL	J	0.66	1.33	%
CV SM2540-G						
Total Solids*	75			0.005	0.01	%
CV SW846 9060-PSEP96						
Total Organic Carbon	10500			2400	4790	mg/Kg
MT SW846 3050B*SW846 6010C						
Arsenic, Total, ICP						
Cadmium, Total, ICP						
Chromium, Total, ICP	46			0.13	0.675	mg/Kg
Copper, Total, ICP	92.4			0.17	0.899	mg/Kg
Lead, Total, ICP	192			0.89	4.49	mg/Kg
Nickel, Total, ICP	29.6			0.23	1.12	mg/Kg
Silver, Total, ICP						
Vanadium, Total, ICP	30.7			0.45	2.25	mg/Kg
Zinc, Total, ICP	264			0.23	1.12	mg/Kg
MT SW846 3050B*SW846 6020A						
Arsenic, Total, ICP-MS	6.87			0.035	0.173	mg/Kg
Cadmium, Total, ICP-MS	2.51			0.017	0.0864	mg/Kg
Silver, Total, ICP-MS	12.9			0.013	0.0692	mg/Kg
MT SW846 7471B						
Mercury, Total, CVAA	0.512			0.027	0.263	mg/Kg
OR SW846 3550B*SW846 8082A						
Aroclor 1016		<MDL	U	1.7	3.56	ug/Kg
Aroclor 1221		<MDL	U	3.6	7.11	ug/Kg
Aroclor 1232		<MDL	U	3.6	7.11	ug/Kg
Aroclor 1242	864	J,TA	J	36	71.1	ug/Kg
Aroclor 1248		<MDL	U	1.7	3.56	ug/Kg
Aroclor 1254	252			1.7	3.56	ug/Kg
Aroclor 1260	48.3			1.7	3.56	ug/Kg
Total PCBs (calc)	1160		J	1.7	3.56	ug/Kg
OR SW846 3550B*SW846 8270D						
1,2,4-Trichlorobenzene		<MDL	U	1.5	2.84	ug/Kg
1,2-Dichlorobenzene		<MDL	U	14.3	14.3	ug/Kg
1,4-Dichlorobenzene	48.8		J	21.3	21.3	ug/Kg
2,4-Dimethylphenol		<MDL	U	15	28.4	ug/Kg
2-Methylnaphthalene	223			15	28.4	ug/Kg
2-Methylphenol		<MDL	U	15	28.4	ug/Kg
3-,4-Methylphenol	120	<RDL	J	71	143	ug/Kg
Acenaphthene		<MDL	U	15	28.4	ug/Kg
Acenaphthylene		<MDL	U	15	28.4	ug/Kg
Anthracene	32.5	J	J	15	28.4	ug/Kg
Benzo(a)anthracene	141	J	J	15	28.4	ug/Kg
Benzo(a)pyrene	119	J	J	15	28.4	ug/Kg
Benzo(b,j,k)fluoranthene	237	J	J	15	28.4	ug/Kg
Benzo(g,h,i)perylene	82.4	JL,J	J	15	28.4	ug/Kg
Benzoic Acid		<MDL	U	284	284	ug/Kg
Benzyl Alcohol		<MDL	U	35.6	35.6	ug/Kg

Table B-2. Combined sewer system solids sampling results for 2011.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: A4007
 Descrip: MICHIGAN STREET RE
 Sample: L54155-3
 Matrix: SH IN-LINESED
 ColDate: 9/14/11 12:00
 Sample type: In-line grab
 TotalSolid: 75
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units
Benzyl Butyl Phthalate	613	JL,B2	J	21.3	21.3	ug/Kg
Bis(2-Ethylhexyl)Phthalate	3320	JL	J	28	56.9	ug/Kg
Chrysene	149	J	J	15	28.4	ug/Kg
Dibenzo(a,h)anthracene		<MDL,J	U	15	28.4	ug/Kg
Dibenzofuran		<MDL	U	15	28.4	ug/Kg
Diethyl Phthalate		<MDL	U	28	56.9	ug/Kg
Dimethyl Phthalate		<MDL	U	28.4	28.4	ug/Kg
Di-N-Butyl Phthalate	81.3	B	U	28	56.9	ug/Kg
Di-N-Octyl Phthalate		<MDL	U	28.4	28.4	ug/Kg
Fluoranthene	343	J	J	15	28.4	ug/Kg
Fluorene	65.6	JL	J	15	28.4	ug/Kg
Hexachlorobenzene		<MDL	U	1.5	2.84	ug/Kg
Hexachlorobutadiene		<MDL	U	7.1	14.3	ug/Kg
Indeno(1,2,3-Cd)Pyrene	74.9	JL,J	J	15	28.4	ug/Kg
Naphthalene	40.7			15	28.4	ug/Kg
N-Nitrosodiphenylamine		<MDL	U	35.6	35.6	ug/Kg
Pentachlorophenol		<MDL	U	213	213	ug/Kg
Phenanthrene	323		J	15	28.4	ug/Kg
Phenol		<MDL	U	71	213	ug/Kg
Pyrene	348	J	J	15	28.4	ug/Kg
Total HPAHS (calc)	1490			15	28.4	ug/Kg
Total LPAHS (calc)	461			15	28.4	ug/Kg

* Not converted to dry weight basis

MDL - method detection limit

RDL - reporting detectin limit

J - estimated value

U- not detected

JL-estimated value; probable high bias

H - holding time

B- value is < 5x method blank (MB)

B2 or B3- value > 5 and ≤ 10 times MB

TA- narrative info available

Shaded value > source control

screening benchmark for CSO system

see Appendix F of King County 2016

Table B-2. Combined sewer system solids sampling results for 2011.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: A4007
 Descrip: MICHIGAN STREET RE
 Sample: L54155-5
 Matrix: SH IN-LINESED
 ColDate: 9/14/11 12:10
 Sample type: In-line grab
 TotalSolid: 84
DRY Weight Basis

Project: 423589-340-4
 Locator: SM_ST_751
 Descrip: MANHOLE, 751 SOUTH
 Sample: L54529-1
 Matrix: SH IN-LINESED
 ColDate: 10/27/11 10:10
 Sample type: In-line grab
 TotalSolid: 78.4
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Clay*	1.7			0.58	1.17	%	1.2	RDL	J	0.61	1.21	%
Fines*	2.3			0.58	1.17	%	1.2	RDL	J	0.61	1.21	%
Gravel*	57.4			0.12	1.17	%	58.4			0.12	1.21	%
p+0.00*	16.9			0.12	1.17	%	6.5			0.12	1.21	%
p+1.00*	10.1			0.12	1.17	%	7.6			0.12	1.21	%
p+10.0(equal/more than)*	1.7			0.58	1.17	%	1.2	RDL	J	0.61	1.21	%
p+2.00*	10			0.12	1.17	%	19.4			0.12	1.21	%
p+3.00*	1.8			0.12	1.17	%	9.5			0.12	1.21	%
p+4.00*	0.4	<RDL	J	0.12	1.17	%	0.3	<RDL	J	0.12	1.21	%
p+5.00*		<MDL	U	0.58	1.17	%		<MDL	U	0.61	1.21	%
p+6.00*		<MDL	U	0.58	1.17	%		<MDL	U	0.61	1.21	%
p+7.00*		<MDL	U	0.58	1.17	%		<MDL	U	0.61	1.21	%
p+8.00*	0.6	<RDL	J	0.58	1.17	%		<MDL	U	0.61	1.21	%
p+9.00*		<MDL	U	0.58	1.17	%		<MDL	U	0.61	1.21	%
p-1.00*	32.7			0.12	1.17	%	12.4			0.12	1.21	%
p-2.00(less than)*	17.1			0.12	1.17	%	42.7			0.12	1.21	%
p-2.00*	7.6			0.12	1.17	%	3.3			0.12	1.21	%
Sand*	39.2			0.12	1.17	%	43.3			0.12	1.21	%
Silt*	0.6	<RDL	J	0.58	1.17	%		<MDL	U	0.61	1.21	%
CV SM2540-G												
Total Solids*	84			0.005	0.01	%	78.4			0.005	0.01	%
CV SW846 9060-PSEP96												
Total Organic Carbon	9320			1800	3650	mg/Kg	7640			850	1710	mg/Kg
MT SW846 3050B*SW846 6010C												
Arsenic, Total, ICP							5.2	<RDL	J	1.5	7.82	mg/Kg
Cadmium, Total, ICP							1.43	J	J	0.13	0.626	mg/Kg
Chromium, Total, ICP	48.1			0.12	0.612	mg/Kg	19.4	J	J	0.19	0.939	mg/Kg
Copper, Total, ICP	107			0.17	0.815	mg/Kg	98.5	J	J	0.26	1.25	mg/Kg
Lead, Total, ICP	138			0.82	4.08	mg/Kg	684	J	J	1.3	6.26	mg/Kg
Nickel, Total, ICP	37.9			0.2	1.02	mg/Kg	31	J	J	0.32	1.57	mg/Kg
Silver, Total, ICP							2.7			0.26	1.25	mg/Kg
Vanadium, Total, ICP	33.9			0.4	2.04	mg/Kg	44.3	J	J	0.63	3.13	mg/Kg
Zinc, Total, ICP	267			0.2	1.02	mg/Kg	179			0.32	1.57	mg/Kg
MT SW846 3050B*SW846 6020A												
Arsenic, Total, ICP-MS	3.46			0.031	0.152	mg/Kg						
Cadmium, Total, ICP-MS	3.1			0.015	0.076	mg/Kg						
Silver, Total, ICP-MS	4.81			0.012	0.0607	mg/Kg						
MT SW846 7471B												
Mercury, Total, CVAA	0.601			0.024	0.238	mg/Kg	0.256			0.026	0.253	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL	U	32	63.5	ug/Kg		<MDL	U	2.6	5.1	ug/Kg
Aroclor 1221		<MDL	U	63	127	ug/Kg		<MDL	U	5.1	10.2	ug/Kg
Aroclor 1232		<MDL	U	63	127	ug/Kg		<MDL	U	5.1	10.2	ug/Kg
Aroclor 1242	802			32	63.5	ug/Kg	129			2.6	5.1	ug/Kg
Aroclor 1248		<MDL	U	32	63.5	ug/Kg		<MDL	U	2.6	5.1	ug/Kg
Aroclor 1254	1540			32	63.5	ug/Kg	24.9			2.6	5.1	ug/Kg
Aroclor 1260	210			32	63.5	ug/Kg	6.88			2.6	5.1	ug/Kg
Total PCBs (calc)	2550			32	63.5	ug/Kg	161			2.6	5.1	ug/Kg
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene		<MDL	U	1.3	2.54	ug/Kg		<MDL	U	1.4	2.72	ug/Kg
1,2-Dichlorobenzene		<MDL	U	12.7	12.7	ug/Kg		<MDL	U	13.6	13.6	ug/Kg
1,4-Dichlorobenzene	20.8		J	19	19	ug/Kg		<MDL	U	20.4	20.4	ug/Kg
2,4-Dimethylphenol		<MDL	U	13	25.4	ug/Kg		<MDL	U	14	27.2	ug/Kg
2-Methylnaphthalene	116			13	25.4	ug/Kg	489			14	27.2	ug/Kg
2-Methylphenol		<MDL	U	13	25.4	ug/Kg		<MDL	U	14	27.2	ug/Kg
3-,4-Methylphenol	1350			63	127	ug/Kg		<MDL	U	68	136	ug/Kg
Acenaphthene		<MDL	U	13	25.4	ug/Kg		<MDL	U	14	27.2	ug/Kg
Acenaphthylene		<MDL	U	13	25.4	ug/Kg		<MDL	U	14	27.2	ug/Kg
Anthracene	25	<RDL	J	13	25.4	ug/Kg	24	<RDL	J	14	27.2	ug/Kg
Benzo(a)anthracene	103			13	25.4	ug/Kg	47.1			14	27.2	ug/Kg
Benzo(a)pyrene	96.3		J	13	25.4	ug/Kg	54.3			14	27.2	ug/Kg
Benzo(b,j,k)fluoranthene	164			13	25.4	ug/Kg	73.7			14	27.2	ug/Kg
Benzo(g,h,i)perylene	51.4	JL	J	13	25.4	ug/Kg	38.1			14	27.2	ug/Kg
Benzoic Acid		<MDL	U	254	254	ug/Kg	952			272	272	ug/Kg
Benzyl Alcohol		<MDL	U	31.8	31.8	ug/Kg		<MDL	U	34.1	34.1	ug/Kg

Table B-2. Combined sewer system solids sampling results for 2011.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: A4007
 Descrip: MICHIGAN STREET RE
 Sample: L54155-5
 Matrix: SH IN-LINESED
 ColDate: 9/14/11 12:10
 Sample type: In-line grab
 TotalSolid: 84
DRY Weight Basis

Project: 423589-340-4
 Locator: SM_ST_751
 Descrip: MANHOLE, 751 SOUTH
 Sample: L54529-1
 Matrix: SH IN-LINESED
 ColDate: 10/27/11 10:10
 Sample type: In-line grab
 TotalSolid: 78.4
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
Benzyl Butyl Phthalate	218	JL,B	U	19	19	ug/Kg	99.7			20.4	20.4	ug/Kg
Bis(2-Ethylhexyl)Phthalate	1760	JL	J	25	50.8	ug/Kg	918			27	54.5	ug/Kg
Chrysene	106		J	13	25.4	ug/Kg	67.2		J	14	27.2	ug/Kg
Dibenzo(a,h)anthracene	24	<RDL	J	13	25.4	ug/Kg		<MDL	U	14	27.2	ug/Kg
Dibenzofuran		<MDL	U	13	25.4	ug/Kg		<MDL	U	14	27.2	ug/Kg
Diethyl Phthalate		<MDL	U	25	50.8	ug/Kg		<MDL	U	27	54.5	ug/Kg
Dimethyl Phthalate		<MDL	U	25.4	25.4	ug/Kg		<MDL	U	27.2	27.2	ug/Kg
Di-N-Butyl Phthalate	89.8	B	U	25	50.8	ug/Kg		<MDL	U	27	54.5	ug/Kg
Di-N-Octyl Phthalate		<MDL	U	25.4	25.4	ug/Kg		<MDL	U	27.2	27.2	ug/Kg
Fluoranthene	264			13	25.4	ug/Kg	83			14	27.2	ug/Kg
Fluorene	35.2	JL	J	13	25.4	ug/Kg	68.5		J	14	27.2	ug/Kg
Hexachlorobenzene		<MDL	U	1.3	2.54	ug/Kg		<MDL	U	1.4	2.72	ug/Kg
Hexachlorobutadiene		<MDL	U	6.3	12.7	ug/Kg		<MDL	U	6.8	13.6	ug/Kg
Indeno(1,2,3-Cd)Pyrene	55.4	JL	J	13	25.4	ug/Kg	43.8			14	27.2	ug/Kg
Naphthalene	24	<RDL	J	13	25.4	ug/Kg	73.2			14	27.2	ug/Kg
N-Nitrosodiphenylamine		<MDL	U	31.8	31.8	ug/Kg		<MDL	U	34.1	34.1	ug/Kg
Pentachlorophenol		<MDL	U	190	190	ug/Kg		<MDL	U	204	204	ug/Kg
Phenanthrene	189		J	13	25.4	ug/Kg	240			14	27.2	ug/Kg
Phenol		<MDL	U	63	190	ug/Kg		<MDL	U	68	204	ug/Kg
Pyrene	242			13	25.4	ug/Kg	130			14	27.2	ug/Kg
Total HPAHS (calc)	1110			13	25.4	ug/Kg	537			14	27.2	ug/Kg
Total LPAHS (calc)	273			13	25.4	ug/Kg	406			14	27.2	ug/Kg

* Not converted to dry weight basis
 MDL - method detection limit
 RDL - reporting detection limit
 J - estimated value
 U - not detected
 JL - estimated value; probable high bias
 H - holding time
 B - value is < 5x method blank (MB)
 B2 or B3 - value > 5 and ≤ 10 times MB
 TA - narrative info available
 Shaded value > source control
 screening benchmark for CSO system
 see Appendix F of King County 2016

Table B-2. Combined sewer system solids sampling results for 2011.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: SM_ST_751
 Descrip: MANHOLE, 751 SOUTH
 Sample: L54529-2
 Matrix: SH IN-LINESED
 ColDate: 10/27/11 10:15
 Sample type: In-line grab
 TotalSolid: 81.2
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422						
Clay*						
Fines*						
Gravel*						
p+0.00*						
p+1.00*						
p+10.0(equal/more than)*						
p+2.00*						
p+3.00*						
p+4.00*						
p+5.00*						
p+6.00*						
p+7.00*						
p+8.00*						
p+9.00*						
p-1.00*						
p-2.00(less than)*						
p-2.00*						
Sand*						
Silt*						
CV SM2540-G						
Total Solids*	81.2			0.005	0.01	%
CV SW846 9060-PSEP96						
Total Organic Carbon						
MT SW846 3050B*SW846 6010C						
Arsenic, Total, ICP						
Cadmium, Total, ICP						
Chromium, Total, ICP						
Copper, Total, ICP						
Lead, Total, ICP						
Nickel, Total, ICP						
Silver, Total, ICP						
Vanadium, Total, ICP						
Zinc, Total, ICP						
MT SW846 3050B*SW846 6020A						
Arsenic, Total, ICP-MS						
Cadmium, Total, ICP-MS						
Silver, Total, ICP-MS						
MT SW846 7471B						
Mercury, Total, CVAA	0.259			0.023	0.238	mg/Kg
OR SW846 3550B*SW846 8082A						
Aroclor 1016						
Aroclor 1221						
Aroclor 1232						
Aroclor 1242						
Aroclor 1248						
Aroclor 1254						
Aroclor 1260						
Total PCBs (calc)						
OR SW846 3550B*SW846 8270D						
1,2,4-Trichlorobenzene						
1,2-Dichlorobenzene						
1,4-Dichlorobenzene						
2,4-Dimethylphenol						
2-Methylnaphthalene						
2-Methylphenol						
3-,4-Methylphenol						
Acenaphthene						
Acenaphthylene						
Anthracene						
Benzo(a)anthracene						
Benzo(a)pyrene						
Benzo(b,j,k)fluoranthene						
Benzo(g,h,i)perylene						
Benzoic Acid						
Benzyl Alcohol						

Table B-2. Combined sewer system solids sampling results for 2011.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: SM_ST_751
 Descrip: MANHOLE, 751 SOUTH
 Sample: L54529-2
 Matrix: SH IN-LINESED
 ColDate: 10/27/11 10:15
 Sample type: In-line grab
 TotalSolid: 81.2
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units
Benzyl Butyl Phthalate						
Bis(2-Ethylhexyl)Phthalate						
Chrysene						
Dibenzo(a,h)anthracene						
Dibenzofuran						
Diethyl Phthalate						
Dimethyl Phthalate						
Di-N-Butyl Phthalate						
Di-N-Octyl Phthalate						
Fluoranthene						
Fluorene						
Hexachlorobenzene						
Hexachlorobutadiene						
Indeno(1,2,3-Cd)Pyrene						
Naphthalene						
N-Nitrosodiphenylamine						
Pentachlorophenol						
Phenanthrene						
Phenol						
Pyrene						
Total HPAHS (calc)						
Total LPAHS (calc)						

* Not converted to dry weight basis
 MDL - method detection limit
 RDL - reporting detection limit
 J - estimated value
 U - not detected
 JL - estimated value; probable high bias
 H - holding time
 B - value is < 5x method blank (MB)
 B2 or B3 - value > 5 and ≤ 10 times MB
 TA - narrative info available
 Shaded value > source control
 screening benchmark for CSO system
 see Appendix F of King County 2016

Table B-2. Combined sewer system solids sampling results for 2011.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: SM_ST_515
 Descrip: MANHOLE, 515 SOUTH
 Sample: L54529-3
 Matrix: SH IN-LINESED
 ColDate: 10/27/11 10:30
 Sample type: In-line grab
 TotalSolid: 81.1
DRY Weight Basis

Project: 423589-340-4
 Locator: SM_ST_515
 Descrip: MANHOLE, 515 SOUTH
 Sample: L54529-4
 Matrix: SH IN-LINESED
 ColDate: 10/27/11 10:40
 Sample type: In-line grab
 TotalSolid: 84.5
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Clay*	1.3	RDL	J	0.63	1.27	%						
Fines*	1.3	RDL	J	0.63	1.27	%						
Gravel*	54.5			0.13	1.27	%						
p+0.00*	12.5			0.13	1.27	%						
p+1.00*	11			0.13	1.27	%						
p+10.0(equal/more than)*	1.3	RDL	J	0.63	1.27	%						
p+2.00*	14.1			0.13	1.27	%						
p+3.00*	4.7			0.13	1.27	%						
p+4.00*	0.3	<RDL	J	0.13	1.27	%						
p+5.00*		<MDL	U	0.63	1.27	%						
p+6.00*		<MDL	U	0.63	1.27	%						
p+7.00*		<MDL	U	0.63	1.27	%						
p+8.00*		<MDL	U	0.63	1.27	%						
p+9.00*		<MDL	U	0.63	1.27	%						
p-1.00*	23.7			0.13	1.27	%						
p-2.00(less than)*	23.1			0.13	1.27	%						
p-2.00*	7.6			0.13	1.27	%						
Sand*	42.7			0.13	1.27	%						
Silt*		<MDL	U	0.63	1.27	%						
CV SM2540-G												
Total Solids*	81.1			0.005	0.01	%	84.5			0.005	0.01	%
CV SW846 9060-PSEP96												
Total Organic Carbon	7460			700	1390	mg/Kg						
MT SW846 3050B*SW846 6010C												
Arsenic, Total, ICP	12			1.5	7.63	mg/Kg						
Cadmium, Total, ICP	1.31			0.12	0.612	mg/Kg						
Chromium, Total, ICP	70.9			0.18	0.916	mg/Kg						
Copper, Total, ICP	57.7			0.25	1.22	mg/Kg						
Lead, Total, ICP	125			1.2	6.12	mg/Kg						
Nickel, Total, ICP	26.3			0.31	1.53	mg/Kg						
Silver, Total, ICP	0.46	<RDL	J	0.25	1.22	mg/Kg						
Vanadium, Total, ICP	37.9			0.62	3.06	mg/Kg						
Zinc, Total, ICP	316			0.31	1.53	mg/Kg						
MT SW846 3050B*SW846 6020A												
Arsenic, Total, ICP-MS												
Cadmium, Total, ICP-MS												
Silver, Total, ICP-MS												
MT SW846 7471B												
Mercury, Total, CVAA	0.12	<RDL	J	0.023	0.239	mg/Kg	0.079	<RDL,J	J	0.024	0.236	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL	U	2.5	4.93	ug/Kg						
Aroclor 1221		<MDL	U	4.9	9.86	ug/Kg						
Aroclor 1232		<MDL	U	4.9	9.86	ug/Kg						
Aroclor 1242	72.9			2.5	4.93	ug/Kg						
Aroclor 1248		<MDL	U	2.5	4.93	ug/Kg						
Aroclor 1254	30.1			2.5	4.93	ug/Kg						
Aroclor 1260	8.4			2.5	4.93	ug/Kg						
Total PCBs (calc)	111			2.5	4.93	ug/Kg						
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene		<MDL	U	1.4	2.63	ug/Kg						
1,2-Dichlorobenzene		<MDL	U	13.2	13.2	ug/Kg						
1,4-Dichlorobenzene		<MDL	U	19.7	19.7	ug/Kg						
2,4-Dimethylphenol		<MDL	U	14	26.3	ug/Kg						
2-Methylnaphthalene	570			14	26.3	ug/Kg						
2-Methylphenol		<MDL	U	14	26.3	ug/Kg						
3-,4-Methylphenol		<MDL	U	65	132	ug/Kg						
Acenaphthene	47.7		J	14	26.3	ug/Kg						
Acenaphthylene		<MDL	U	14	26.3	ug/Kg						
Anthracene	71.9		J	14	26.3	ug/Kg						
Benzo(a)anthracene	162			14	26.3	ug/Kg						
Benzo(a)pyrene	141			14	26.3	ug/Kg						
Benzo(b,j,k)fluoranthene	260			14	26.3	ug/Kg						
Benzo(g,h,i)perylene	77.8			14	26.3	ug/Kg						
Benzoic Acid	783			263	263	ug/Kg						
Benzyl Alcohol		<MDL	U	32.9	32.9	ug/Kg						

Table B-2. Combined sewer system solids sampling results for 2011.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: SM_ST_515
 Descrip: MANHOLE, 515 SOUTH
 Sample: L54529-3
 Matrix: SH IN-LINESED
 ColDate: 10/27/11 10:30
 Sample type: In-line grab
 TotalSolid: 81.1
DRY Weight Basis

Project: 423589-340-4
 Locator: SM_ST_515
 Descrip: MANHOLE, 515 SOUTH
 Sample: L54529-4
 Matrix: SH IN-LINESED
 ColDate: 10/27/11 10:40
 Sample type: In-line grab
 TotalSolid: 84.5
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
Benzyl Butyl Phthalate	94.6			19.7	19.7	ug/Kg						
Bis(2-Ethylhexyl)Phthalate	1330			26	52.7	ug/Kg						
Chrysene	185		J	14	26.3	ug/Kg						
Dibenzo(a,h)anthracene	48.8			14	26.3	ug/Kg						
Dibenzofuran		<MDL	U	14	26.3	ug/Kg						
Diethyl Phthalate		<MDL	U	26	52.7	ug/Kg						
Dimethyl Phthalate		<MDL	U	26.3	26.3	ug/Kg						
Di-N-Butyl Phthalate		<MDL	U	26	52.7	ug/Kg						
Di-N-Octyl Phthalate		<MDL	U	26.3	26.3	ug/Kg						
Fluoranthene	427			14	26.3	ug/Kg						
Fluorene	114		J	14	26.3	ug/Kg						
Hexachlorobenzene		<MDL	U	1.4	2.63	ug/Kg						
Hexachlorobutadiene		<MDL	U	6.5	13.2	ug/Kg						
Indeno(1,2,3-Cd)Pyrene	80			14	26.3	ug/Kg						
Naphthalene	90.5			14	26.3	ug/Kg						
N-Nitrosodiphenylamine		<MDL	U	32.9	32.9	ug/Kg						
Pentachlorophenol		<MDL	U	197	197	ug/Kg						
Phenanthrene	600			14	26.3	ug/Kg						
Phenol		<MDL	U	65	197	ug/Kg						
Pyrene	453			14	26.3	ug/Kg						
Total HPAHS (calc)	1830			14	26.3	ug/Kg						
Total LPAHS (calc)	925			14	26.3	ug/Kg						

* Not converted to dry weight basis
 MDL - method detection limit
 RDL - reporting detectin limit
 J - estimated value
 U- not detected
 JL-estimated value; probable high bias
 H - holding time
 B- value is < 5x method blank (MB)
 B2 or B3- value > 5 and ≤ 10 times MB
 TA- narrative info available
 Shaded value > source control
 screening benchmark for CSO system
 see Appendix F of King County 2016

Table B-3a. Combined sewer system solids sampling results for 2012.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A4007_L
 Descrip: LOWER SEDIMENT TRA
 Sample: L55346-1
 Matrix: SH IN-LINESED
 ColDate: 3/7/12 11:20
 Sample type: Sediment Trap
 TotalSolid: 19.3
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_A01008
 Descrip: SEDIMEN TRAP / MH
 Sample: L55346-2
 Matrix: SH IN-LINESED
 ColDate: 3/7/12 10:30
 Sample type: Sediment Trap
 TotalSolid: 55.1
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Clay*	26.9			3.4	6.7	%						
Fines*	60.4			3.4	6.7	%						
Gravel*		<MDL	U	0.7	6.7	%						
p+0.00*	1.5	<RDL	J	0.7	6.7	%						
p+1.00*	5	<RDL	J	0.7	6.7	%						
p+10.0(equal to/more than)*	26.9			3.4	6.7	%						
p+2.00*	6.6	<RDL	J	0.7	6.7	%						
p+3.00*	12.4			0.7	6.7	%						
p+4.00*	13.7			0.7	6.7	%						
p+5.00*	26.9			3.4	6.7	%						
p+6.00*	3.4	<RDL	J	3.4	6.7	%						
p+7.00*	3.4	<RDL	J	3.4	6.7	%						
p+8.00*		<MDL	U	3.4	6.7	%						
p+9.00*		<MDL	U	3.4	6.7	%						
p-1.00*		<MDL	U	0.7	6.7	%						
p-2.00(less than)*		<MDL	U	0.7	6.7	%						
p-2.00*		<MDL	U	0.7	6.7	%						
Sand*	39.1			0.7	6.7	%						
Silt*	33.6			3.4	6.7	%						
CV ASTM D422/D3977-97												
500 Micron (equal to/more than)*	8		J	0.005	0.01	%	5.86	SH	J	0.005	0.01	%
CV ISO 13320:2009(E)												
Clay*	3.99		J	0.01	0.01	% Volume	4.82		J	0.01	0.01	% Volume
Fines*	49.6		J	0.01	0.01	% Volume	48.36		J	0.01	0.01	% Volume
p+1.00*	3.03		J	0.01	0.01	% Volume	2.43		J	0.01	0.01	% Volume
p+10.0(more than)*	0.06		J	0.01	0.01	% Volume	0.06		J	0.01	0.01	% Volume
p+10.0*	1		J	0.01	0.01	% Volume	1.23		J	0.01	0.01	% Volume
p+2.00*	9.78		J	0.01	0.01	% Volume	9.97		J	0.01	0.01	% Volume
p+3.00*	13.63		J	0.01	0.01	% Volume	16.25		J	0.01	0.01	% Volume
p+4.00*	15.97		J	0.01	0.01	% Volume	17.14		J	0.01	0.01	% Volume
p+5.00*	15.57		J	0.01	0.01	% Volume	14.44		J	0.01	0.01	% Volume
p+6.00*	14.06		J	0.01	0.01	% Volume	12.56		J	0.01	0.01	% Volume
p+7.00*	10.17		J	0.01	0.01	% Volume	10.02		J	0.01	0.01	% Volume
p+8.00*	5.82		J	0.01	0.01	% Volume	6.52		J	0.01	0.01	% Volume
p+9.00*	2.93		J	0.01	0.01	% Volume	3.53		J	0.01	0.01	% Volume
Sand<1000*	42.4		J	0.01	0.01	% Volume	45.78		J	0.01	0.01	% Volume
Silt*	45.61		J	0.01	0.01	% Volume	43.54		J	0.01	0.01	% Volume
CV SM2540-G												
Total Solids*	19.3			0.005	0.01	%	55.1			0.005	0.01	%
CV SW846 9060-PSEP96												
Total Organic Carbon	127000			11000	22800	mg/Kg	92900			11000	22300	mg/Kg
MT SW846 3050B*SW846 6010C												
Arsenic, Total, ICP	6.2	<RDL	J	3.2	16.1	mg/Kg	5.6	<RDL	J	2.4	11.6	mg/Kg
Cadmium, Total, ICP	3.13			0.26	1.29	mg/Kg	1.73			0.18	0.929	mg/Kg
Chromium, Total, ICP	36			0.39	1.93	mg/Kg	68.4			0.27	1.39	mg/Kg
Copper, Total, ICP	172			0.52	2.58	mg/Kg	252			0.36	1.85	mg/Kg
Lead, Total, ICP	181			2.6	12.9	mg/Kg	100			1.8	9.29	mg/Kg
Nickel, Total, ICP	30.7			0.62	3.22	mg/Kg	104			0.47	2.32	mg/Kg
Silver, Total, ICP	2	<RDL	J	0.52	2.58	mg/Kg	8.08			0.36	1.85	mg/Kg
Vanadium, Total, ICP	31.8			1.3	6.42	mg/Kg	36.1			0.93	4.65	mg/Kg
Zinc, Total, ICP	642			0.62	3.22	mg/Kg	887			0.47	2.32	mg/Kg
MT SW846 7471B												
Mercury, Total, CVAA	0.45	<RDL	J	0.1	1.02	mg/Kg	0.688			0.034	0.348	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL	U	6.7	27.6	ug/Kg		<MDL	U	4.9	19.4	ug/Kg
Aroclor 1221		<MDL	U	14	27.6	ug/Kg		<MDL	U	9.6	19.4	ug/Kg
Aroclor 1232		<MDL	U	14	27.6	ug/Kg		<MDL	U	9.6	19.4	ug/Kg
Aroclor 1242	75.6			6.7	27.6	ug/Kg	31.6			4.9	19.4	ug/Kg
Aroclor 1248		<MDL	U	6.7	27.6	ug/Kg		<MDL	U	4.9	19.4	ug/Kg
Aroclor 1254	142			6.7	27.6	ug/Kg	153			4.9	19.4	ug/Kg
Aroclor 1260	56			6.7	27.6	ug/Kg	146			4.9	19.4	ug/Kg
Total Aroclors (calc)	274			6.7	27.6	ug/Kg	331			4.9	19.4	ug/Kg
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene		<MDL	U	27	55.4	ug/Kg		<MDL	U	20	38.7	ug/Kg
1,2-Dichlorobenzene		<MDL	U	276	276	ug/Kg		<MDL	U	194	194	ug/Kg
1,4-Dichlorobenzene		<MDL	U	415	415	ug/Kg		<MDL	U	290	290	ug/Kg

Table B-3a. Combined sewer system solids sampling results for 2012.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A4007_L
 Descrip: LOWER SEDIMENT TRA
 Sample: L55346-1
 Matrix: SH IN-LINESED
 ColDate: 3/7/12 11:20
 Sample type: Sediment Trap
 TotalSolid: 19.3
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_A01008
 Descrip: SEDIMEN TRAP / MH
 Sample: L55346-2
 Matrix: SH IN-LINESED
 ColDate: 3/7/12 10:30
 Sample type: Sediment Trap
 TotalSolid: 55.1
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
2,4-Dimethylphenol		<MDL	U	270	554	ug/Kg		<MDL	U	200	387	ug/Kg
2-Methylnaphthalene	25700			270	554	ug/Kg		<MDL	U	200	387	ug/Kg
2-Methylphenol		<MDL	U	270	554	ug/Kg		<MDL	U	200	387	ug/Kg
3-,4-Methylphenol	165000			1400	2760	ug/Kg		<MDL	U	960	1940	ug/Kg
Acenaphthene		<MDL	U	270	554	ug/Kg		<MDL	U	200	387	ug/Kg
Acenaphthylene		<MDL	U	270	554	ug/Kg		<MDL	U	200	387	ug/Kg
Anthracene		<MDL	U	270	554	ug/Kg		<MDL	U	200	387	ug/Kg
Benzo(a)anthracene	1260			270	554	ug/Kg	1100			200	387	ug/Kg
Benzo(a)pyrene	2100			270	554	ug/Kg	1680			200	387	ug/Kg
Benzo(b,j,k)fluoranthene	1990			270	554	ug/Kg	2490			200	387	ug/Kg
Benzo(g,h,i)perylene	668			270	554	ug/Kg	918			200	387	ug/Kg
Benzoic Acid		<MDL	U	5540	5540	ug/Kg		<MDL	U	3870	3870	ug/Kg
Benzyl Alcohol		<MDL	U	689	689	ug/Kg		<MDL	U	485	485	ug/Kg
Benzyl Butyl Phthalate		<MDL	U	415	415	ug/Kg	2650			290	290	ug/Kg
Bis(2-Ethylhexyl)Phthalate	18700			570	1100	ug/Kg	12900			380	775	ug/Kg
Chrysene	1810			270	554	ug/Kg	1490			200	387	ug/Kg
Dibenzo(a,h)anthracene		<MDL	U	270	554	ug/Kg		<MDL	U	200	387	ug/Kg
Dibenzofuran		<MDL	U	270	554	ug/Kg		<MDL	U	200	387	ug/Kg
Diethyl Phthalate		<MDL	U	570	1100	ug/Kg		<MDL	U	380	775	ug/Kg
Dimethyl Phthalate		<MDL	U	554	554	ug/Kg		<MDL	U	387	387	ug/Kg
Di-N-Butyl Phthalate		<MDL	U	570	1100	ug/Kg		<MDL	U	380	775	ug/Kg
Di-N-Octyl Phthalate		<MDL	U	554	554	ug/Kg		<MDL	U	387	387	ug/Kg
Fluoranthene	1630			270	554	ug/Kg	2050			200	387	ug/Kg
Fluorene		<MDL	U	270	554	ug/Kg		<MDL	U	200	387	ug/Kg
Hexachlorobenzene		<MDL	U	27	55.4	ug/Kg		<MDL	U	20	38.7	ug/Kg
Hexachlorobutadiene		<MDL	U	140	276	ug/Kg		<MDL	U	96	194	ug/Kg
Indeno(1,2,3-Cd)Pyrene	460	<RDL	J	270	554	ug/Kg	724			200	387	ug/Kg
Naphthalene	2870			270	554	ug/Kg		<MDL	U	200	387	ug/Kg
N-Nitrosodiphenylamine		<MDL	U	689	689	ug/Kg		<MDL	U	485	485	ug/Kg
Pentachlorophenol		<MDL	U	4150	4150	ug/Kg		<MDL	U	2900	2900	ug/Kg
Phenanthrene	6630			270	554	ug/Kg	1060			200	387	ug/Kg
Phenol		<MDL	U	1400	4150	ug/Kg		<MDL	U	960	2900	ug/Kg
Pyrene	3110			270	554	ug/Kg	2300			200	387	ug/Kg
Total HPAHS (calc)	13000			270	554	ug/Kg	12800			200	387	ug/Kg
Total LPAHS (calc)	9500			270	554	ug/Kg	1060			200	387	ug/Kg

* Not converted to dry weight basis

MDL - method detection limit

RDL - reporting detection limit

J - estimated value

U - not detected

H - holding time

Shaded value > source control

screening benchmark for CSO system

see Appendix F of King County 2016

Table B-3a. Combined sewer system solids sampling results for 2012.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A01007
 Descrip: SEDIMENT TRAP / LO
 Sample: L55346-3
 Matrix: SH IN-LINESED
 ColDate: 3/7/12 9:55
 Sample type: Sediment Trap
 TotalSolid: 12.7
 DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422						
Clay*						
Fines*						
Gravel*						
p+0.00*						
p+1.00*						
p+10.0(equal/more than)*						
p+2.00*						
p+3.00*						
p+4.00*						
p+5.00*						
p+6.00*						
p+7.00*						
p+8.00*						
p+9.00*						
p-1.00*						
p-2.00(less than)*						
p-2.00*						
Sand*						
Silt*						
CV ASTM D422/D3977-97						
500 Micron (equal to/more than)*	37.6	SH	J	0.005	0.01	%
CV ISO 13320:2009(E)						
Clay*	2.37		J	0.01	0.01	% Volume
Fines*	29.76		J	0.01	0.01	% Volume
p+1.00*	2.97		J	0.01	0.01	% Volume
p+10.0(more than)*	0.03		J	0.01	0.01	% Volume
p+10.0*	0.58		J	0.01	0.01	% Volume
p+2.00*	8.3		J	0.01	0.01	% Volume
p+3.00*	10.5		J	0.01	0.01	% Volume
p+4.00*	10.9		J	0.01	0.01	% Volume
p+5.00*	9.88		J	0.01	0.01	% Volume
p+6.00*	8.17		J	0.01	0.01	% Volume
p+7.00*	5.84		J	0.01	0.01	% Volume
p+8.00*	3.5		J	0.01	0.01	% Volume
p+9.00*	1.76		J	0.01	0.01	% Volume
Sand<1000*	32.67		J	0.01	0.01	% Volume
Silt*	27.39		J	0.01	0.01	% Volume
CV SM2540-G						
Total Solids*	12.7			0.005	0.01	%
CV SW846 9060-PSEP96						
Total Organic Carbon	292000			36000	72700	mg/Kg
MT SW846 3050B*SW846 6010C						
Arsenic, Total, ICP	67.4			9.4	48.6	mg/Kg
Cadmium, Total, ICP	15.9			0.78	3.89	mg/Kg
Chromium, Total, ICP	346			1.2	5.83	mg/Kg
Copper, Total, ICP	906			1.6	7.77	mg/Kg
Lead, Total, ICP	819			7.8	38.9	mg/Kg
Nickel, Total, ICP	313			2	9.69	mg/Kg
Silver, Total, ICP	46.1			1.6	7.77	mg/Kg
Vanadium, Total, ICP	169			3.9	19.4	mg/Kg
Zinc, Total, ICP	3350			2	9.69	mg/Kg
MT SW846 7471B						
Mercury, Total, CVAA	0.94	<RDL	J	0.15	1.51	mg/Kg
OR SW846 3550B*SW846 8082A						
Aroclor 1016	<MDL	U		21	84.3	ug/Kg
Aroclor 1221	<MDL	U		42	84.3	ug/Kg
Aroclor 1232	<MDL	U		42	84.3	ug/Kg
Aroclor 1242	57	<RDL	J	21	84.3	ug/Kg
Aroclor 1248	<MDL	U		21	84.3	ug/Kg
Aroclor 1254	317			21	84.3	ug/Kg
Aroclor 1260	179			21	84.3	ug/Kg
Total Aroclors (calc)	553			21	84.3	ug/Kg
OR SW846 3550B*SW846 8270D						
1,2,4-Trichlorobenzene	<MDL	U		87	168	ug/Kg
1,2-Dichlorobenzene	<MDL	U		843	843	ug/Kg
1,4-Dichlorobenzene	<MDL	U		1260	1260	ug/Kg

Table B-3a. Combined sewer system solids sampling results for 2012.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A01007
 Descrip: SEDIMENT TRAP / LO
 Sample: L55346-3
 Matrix: SH IN-LINESED
 ColDate: 3/7/12 9:55
 Sample type: Sediment Trap
 TotalSolid: 12.7
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units
2,4-Dimethylphenol		<MDL	U	870	1680	ug/Kg
2-Methylnaphthalene		<MDL	U	870	1680	ug/Kg
2-Methylphenol		<MDL	U	870	1680	ug/Kg
3,4-Methylphenol	11400			4200	8430	ug/Kg
Acenaphthene		<MDL	U	870	1680	ug/Kg
Acenaphthylene		<MDL	U	870	1680	ug/Kg
Anthracene	940	<RDL	J	870	1680	ug/Kg
Benzo(a)anthracene	5560			870	1680	ug/Kg
Benzo(a)pyrene	7170			870	1680	ug/Kg
Benzo(b,j,k)fluoranthene	8500			870	1680	ug/Kg
Benzo(g,h,i)perylene	3600			870	1680	ug/Kg
Benzoic Acid	40300			16800	16800	ug/Kg
Benzyl Alcohol		<MDL	U	2100	2100	ug/Kg
Benzyl Butyl Phthalate	10800			1260	1260	ug/Kg
Bis(2-Ethylhexyl)Phthalate	118000			1700	3360	ug/Kg
Chrysene	6040			870	1680	ug/Kg
Dibenzo(a,h)anthracene	870	<RDL	J	870	1680	ug/Kg
Dibenzofuran		<MDL	U	870	1680	ug/Kg
Diethyl Phthalate		<MDL	U	1700	3360	ug/Kg
Dimethyl Phthalate		<MDL	U	1680	1680	ug/Kg
Di-N-Butyl Phthalate		<MDL	U	1700	3360	ug/Kg
Di-N-Octyl Phthalate	43200			1680	1680	ug/Kg
Fluoranthene	8110			870	1680	ug/Kg
Fluorene		<MDL	U	870	1680	ug/Kg
Hexachlorobenzene		<MDL	U	87	168	ug/Kg
Hexachlorobutadiene		<MDL	U	420	843	ug/Kg
Indeno(1,2,3-Cd)Pyrene	2650			870	1680	ug/Kg
Naphthalene		<MDL	U	870	1680	ug/Kg
N-Nitrosodiphenylamine		<MDL	U	2100	2100	ug/Kg
Pentachlorophenol		<MDL	U	12600	12600	ug/Kg
Phenanthrene	4640			870	1680	ug/Kg
Phenol		<MDL	U	4200	12600	ug/Kg
Pyrene	10200			870	1680	ug/Kg
Total HPAHS (calc)	52700			870	1680	ug/Kg
Total LPAHS (calc)	5580			870	1680	ug/Kg

* Not converted to dry weight basis

MDL - method detection limit

RDL - reporting detection limit

J - estimated value

U - not detected

H - holding time

Shaded value > source control

screening benchmark for CSO system

see Appendix F of King County 2016

Table B-3b. Combined sewer system solids sampling results for 2012.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: S070196
 Descrip: SMICHOF/WO39 S MIC
 Sample: L55326-1
 Matrix: SH IN-LINESED
 ColDate: 3/7/12 13:00
 Sample type: In-line grab
 TotalSolid: 33.8
DRY Weight Basis

Project: 423589-340-4
 Locator: '063053
 Descrip: BRANDON ST OUTFALL
 Sample: L55326-2
 Matrix: SH IN-LINESED
 ColDate: 3/7/12 14:00
 Sample type: In-line grab
 TotalSolid: 13.5
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Fines*	55.2			2	3.9	%	83.8			7.6	15.2	%
Gravel*	8.7			0.3	3.3	%		<MDL	U	1.1	11.3	%
Sand*	35.7			0.3	3.3	%	16.3			1.1	11.3	%
Silt*	39.4			2	3.9	%	61			7.6	15.2	%
Clay*	15.8			2	3.9	%	22.9	J	J	7.6	15.2	%
p+0.00*	15.3			0.3	3.3	%		<MDL	U	1.1	11.3	%
p+1.00*	11.8			0.3	3.3	%	3.4	<RDL	J	1.1	11.3	%
p+10.0(equal/more than)*	11.8			2	3.9	%	22.9		J	7.6	15.2	%
p+2.00*	3.1	<RDL	J	0.3	3.3	%	5.6	<RDL	J	1.1	11.3	%
p+3.00*	2.5	<RDL	J	0.3	3.3	%	3.3	<RDL	J	1.1	11.3	%
p+4.00*	3	<RDL	J	0.3	3.3	%	4	<RDL	J	1.1	11.3	%
p+5.00*	21.7			2	3.9	%	30.5			7.6	15.2	%
p+6.00*	5.9			2	3.9	%	15	RDL	J	7.6	15.2	%
p+7.00*	11.8			2	3.9	%	7.6	<RDL	J	7.6	15.2	%
p+8.00*		<MDL	U	2	3.9	%	7.6	<RDL	J	7.6	15.2	%
p+9.00*	3.9	RDL	J	2	3.9	%		<MDL	UJ	7.6	15.2	%
p-1.00*	4.4			0.3	3.3	%		<MDL	U	1.1	11.3	%
p-2.00(less than)*	2.1	<RDL	J	0.3	3.3	%		<MDL	U	1.1	11.3	%
p-2.00*	2.2	<RDL	J	0.3	3.3	%		<MDL	U	1.1	11.3	%
CV SM2540-G												
Total Solids*	33.8			0.005	0.01	%	13.5			0.005	0.01	%
CV SW846 9060-PSEP96												
Total Organic Carbon	213000			33000	62100	mg/Kg	213000			22000	45000	mg/Kg
MT SW846 3050B*SW846 6010C												
Arsenic, Total, ICP	8.3	<RDL	J	3.6	18	mg/Kg	5.9	<RDL	J	4.6	23	mg/Kg
Cadmium, Total, ICP	4.02			0.29	1.44	mg/Kg	1.5	<RDL	J	0.37	1.84	mg/Kg
Chromium, Total, ICP	63.6			0.44	2.17	mg/Kg	45.6			0.55	2.76	mg/Kg
Copper, Total, ICP	178			0.59	2.89	mg/Kg	179			0.73	3.67	mg/Kg
Lead, Total, ICP	241			2.9	14.4	mg/Kg	85.9			3.7	18.4	mg/Kg
Nickel, Total, ICP	40.8			0.71	3.61	mg/Kg	45.1			0.89	4.59	mg/Kg
Silver, Total, ICP	3.22			0.59	2.89	mg/Kg	1.9	<RDL	J	0.73	3.67	mg/Kg
Vanadium, Total, ICP	56.5			1.4	7.22	mg/Kg	34.3			1.9	9.19	mg/Kg
Zinc, Total, ICP	743			0.71	3.61	mg/Kg	636			0.89	4.59	mg/Kg
MT SW846 7471B												
Mercury, Total, CVAA	0.41	<RDL	J	0.056	0.571	mg/Kg	0.34	<RDL	J	0.14	1.42	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL	U	3.8	15.8	ug/Kg		<MDL	U	9.6	39.5	ug/Kg
Aroclor 1221		<MDL	U	8	15.8	ug/Kg		<MDL	U	20	39.5	ug/Kg
Aroclor 1232		<MDL	U	8	15.8	ug/Kg		<MDL	U	20	39.5	ug/Kg
Aroclor 1242	2180	TA		80	317	ug/Kg	73.9			9.6	39.5	ug/Kg
Aroclor 1248		<MDL	J	3.8	15.8	ug/Kg		<MDL	U	9.6	39.5	ug/Kg
Aroclor 1254	414			3.8	15.8	ug/Kg	157			9.6	39.5	ug/Kg
Aroclor 1260	121			3.8	15.8	ug/Kg	73.1			9.6	39.5	ug/Kg
Total Aroclors (calc)	2720			3.8	15.8	ug/Kg	304			9.6	39.5	ug/Kg
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene		<MDL	U	16	317	ug/Kg		<MDL	U	81	1580	ug/Kg
1,2-Dichlorobenzene		<MDL	U	158	158	ug/Kg		<MDL	U	793	793	ug/Kg
1,4-Dichlorobenzene		<MDL	U	237	237	ug/Kg		<MDL	U	1190	1190	ug/Kg
2,4-Dimethylphenol		<MDL	U	160	317	ug/Kg		<MDL	U	810	1580	ug/Kg
2-Methylnaphthalene	1350			160	317	ug/Kg		<MDL	U	810	1580	ug/Kg
2-Methylphenol		<MDL	U	160	317	ug/Kg		<MDL	U	810	1580	ug/Kg
3,4-Methylphenol	34300			800	1580	ug/Kg	164000			3900	7930	ug/Kg
Acenaphthene		<MDL	U	160	317	ug/Kg		<MDL	U	810	1580	ug/Kg
Acenaphthylene		<MDL	U	160	317	ug/Kg		<MDL	U	810	1580	ug/Kg
Anthracene		<MDL	U	160	317	ug/Kg		<MDL	U	810	1580	ug/Kg
Benzo(a)anthracene	722			160	317	ug/Kg		<MDL	U	810	1580	ug/Kg
Benzo(a)pyrene	1510			160	317	ug/Kg		<MDL	U	810	1580	ug/Kg
Benzo(b,j,k)fluoranthene	3200			160	317	ug/Kg	1600	<RDL	J	810	1580	ug/Kg
Benzo(g,h,i)perylene	701			160	317	ug/Kg	1100	<RDL	J	810	1580	ug/Kg
Benzoic Acid	10400			3170	3170	ug/Kg	38300			15800	15800	ug/Kg
Benzyl Alcohol		<MDL	U	393	393	ug/Kg		<MDL	U	1980	1980	ug/Kg
Benzyl Butyl Phthalate	4170			237	237	ug/Kg	9850			1190	1190	ug/Kg
Bis(2-Ethylhexyl)Phthalate	20100			330	630	ug/Kg	27200			1600	3160	ug/Kg
Chrysene	1580			160	317	ug/Kg		<MDL	U	810	1580	ug/Kg
Dibenzo(a,h)anthracene		<MDL	U	160	317	ug/Kg		<MDL	U	810	1580	ug/Kg
Dibenzofuran		<MDL	U	160	317	ug/Kg		<MDL	U	810	1580	ug/Kg

Table B-3b. Combined sewer system solids sampling results for 2012.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: S070196
 Descrip: SMICHOF/WO39 S MIC
 Sample: L55326-1
 Matrix: SH IN-LINESED
 ColDate: 3/7/12 13:00
 Sample type: In-line grab
 TotalSolid: 33.8
DRY Weight Basis

Project: 423589-340-4
 Locator: '063053
 Descrip: BRANDON ST OUTFALL
 Sample: L55326-2
 Matrix: SH IN-LINESED
 ColDate: 3/7/12 14:00
 Sample type: In-line grab
 TotalSolid: 13.5
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
Diethyl Phthalate		<MDL	U	330	630	ug/Kg		<MDL	U	1600	3160	ug/Kg
Dimethyl Phthalate		<MDL	U	317	317	ug/Kg		<MDL	U	1580	1580	ug/Kg
Di-N-Butyl Phthalate		<MDL	U	330	630	ug/Kg		<MDL	U	1600	3160	ug/Kg
Di-N-Octyl Phthalate		<MDL	U	317	317	ug/Kg	9040			1580	1580	ug/Kg
Fluoranthene	2180			160	317	ug/Kg	1760			810	1580	ug/Kg
Fluorene		<MDL	U	160	317	ug/Kg		<MDL	U	810	1580	ug/Kg
Hexachlorobenzene		<MDL	U	16	31.7	ug/Kg		<MDL	U	81	158	ug/Kg
Hexachlorobutadiene		<MDL	U	80	158	ug/Kg		<MDL	U	390	793	ug/Kg
Indeno(1,2,3-Cd)Pyrene	470			160	317	ug/Kg		<MDL	U	810	1580	ug/Kg
Naphthalene	170	<RDL	J	160	317	ug/Kg		<MDL	U	810	1580	ug/Kg
N-Nitrosodiphenylamine		<MDL	U	393	393	ug/Kg		<MDL	U	1980	1980	ug/Kg
Pentachlorophenol		<MDL	U	2370	2370	ug/Kg		<MDL	U	11900	11900	ug/Kg
Phenanthrene	1600			160	317	ug/Kg		<MDL	U	810	1580	ug/Kg
Phenol		<MDL	U	800	2370	ug/Kg		<MDL	U	3900	11900	ug/Kg
Pyrene	2460			160	317	ug/Kg	1930			810	1580	ug/Kg
Total HPAHS (calc)	12800			160	317	ug/Kg	6360			810	1580	ug/Kg
Total LPAHS (calc)	1760			160	317	ug/Kg		<MDL	U	810	1580	ug/Kg

* Not converted to dry weight basis
 MDL - method detection limit
 RDL - reporting detectin limit
 J - estimated value
 U- not detected
 TA- narrative info available
 Shaded value > source control
 screening benchmark for CSO system
 see Appendix F of King County 2016

Table B-3b. Combined sewer system solids sampling results for 2012.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: BRANDREG
 Descrip: ACCESS PORT AT BRA
 Sample: L55326-3
 Matrix: SH IN-LINESED
 ColDate: 3/21/12 14:00
 Sample type: In-line grab
 TotalSolid: 73
DRY Weight Basis

Project: 423589-340-4
 Locator: BRANDREG
 Descrip: ACCESS PORT AT BRA
 Sample: L55326-4
 Matrix: SH IN-LINESED
 ColDate: 3/21/12 14:00
 Sample type: In-line grab
 TotalSolid: 72.8
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Fines*	9.8			0.7	1.4	%						
Gravel*	48.7			0.1	1.4	%						
Sand*	43.2			0.1	1.4	%						
Silt*	7.7			0.7	1.4	%						
Clay*	2.1			0.7	1.4	%						
p+0.00*	11.5			0.1	1.4	%						
p+1.00*	9.3			0.1	1.4	%						
p+10.0(equal/more than)*	2.1			0.7	1.4	%						
p+2.00*	9.2			0.1	1.4	%						
p+3.00*	7.9			0.1	1.4	%						
p+4.00*	5.2			0.1	1.4	%						
p+5.00*	4.2			0.7	1.4	%						
p+6.00*	1.4	RDL	J	0.7	1.4	%						
p+7.00*	1.4	RDL	J	0.7	1.4	%						
p+8.00*	0.7	<RDL	J	0.7	1.4	%						
p+9.00*		<MDL	U	0.7	1.4	%						
p-1.00*	15			0.1	1.4	%						
p-2.00(less than)*	30.1			0.1	1.4	%						
p-2.00*	3.6			0.1	1.4	%						
CV SM2540-G												
Total Solids*	73			0.005	0.01	%	72.8			0.005	0.01	%
CV SW846 9060-PSEP96												
Total Organic Carbon	31600			5900	11700	mg/Kg						
MT SW846 3050B*SW846 6010C												
Arsenic, Total, ICP	13.2			1.5	7.56	mg/Kg						
Cadmium, Total, ICP	0.778			0.12	0.605	mg/Kg						
Chromium, Total, ICP	100			0.18	0.908	mg/Kg						
Copper, Total, ICP	170			0.25	1.21	mg/Kg						
Lead, Total, ICP	170			1.2	6.05	mg/Kg						
Nickel, Total, ICP	77.3			0.3	1.51	mg/Kg						
Silver, Total, ICP	8.47			0.25	1.21	mg/Kg						
Vanadium, Total, ICP	21.9			0.6	3.03	mg/Kg						
Zinc, Total, ICP	310			0.3	1.51	mg/Kg						
MT SW846 7471B												
Mercury, Total, CVAA	0.503			0.027	0.268	mg/Kg	0.471			0.026	0.268	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL	U	1.8	7.3	ug/Kg						
Aroclor 1221		<MDL	U	3.7	7.3	ug/Kg						
Aroclor 1232		<MDL	U	3.7	7.3	ug/Kg						
Aroclor 1242	5.8	<RDL	J	1.8	7.3	ug/Kg						
Aroclor 1248		<MDL	U	1.8	7.3	ug/Kg						
Aroclor 1254	35.5	J	J	1.8	7.3	ug/Kg						
Aroclor 1260	27.9	J	J	1.8	7.3	ug/Kg						
Total Aroclors (calc)	69.2		J	1.8	7.3	ug/Kg						
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene		<MDL	U	1.5	2.92	ug/Kg						
1,2-Dichlorobenzene		<MDL	U	14.7	14.7	ug/Kg						
1,4-Dichlorobenzene		<MDL	U	21.9	21.9	ug/Kg						
2,4-Dimethylphenol		<MDL	U	15	29.2	ug/Kg						
2-Methylnaphthalene		<MDL	U	15	29.2	ug/Kg						
2-Methylphenol		<MDL	U	15	29.2	ug/Kg						
3,4-Methylphenol	455			73	147	ug/Kg						
Acenaphthene		<MDL	U	15	29.2	ug/Kg						
Acenaphthylene		<MDL	U	15	29.2	ug/Kg						
Anthracene		<MDL	U	15	29.2	ug/Kg						
Benzo(a)anthracene	175			15	29.2	ug/Kg						
Benzo(a)pyrene	247			15	29.2	ug/Kg						
Benzo(b,j,k)fluoranthene	514			15	29.2	ug/Kg						
Benzo(g,h,i)perylene	125			15	29.2	ug/Kg						
Benzoic Acid	940			292	292	ug/Kg						
Benzyl Alcohol		<MDL	U	36.6	36.6	ug/Kg						
Benzyl Butyl Phthalate		<MDL	U	21.9	21.9	ug/Kg						
Bis(2-Ethylhexyl)Phthalate	1730			29	58.5	ug/Kg						
Chrysene	248			15	29.2	ug/Kg						
Dibenzo(a,h)anthracene		<MDL	U	15	29.2	ug/Kg						
Dibenzofuran		<MDL	U	15	29.2	ug/Kg						

Table B-3b. Combined sewer system solids sampling results for 2012.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: BRANDREG
 Descrip: ACCESS PORT AT BRA
 Sample: L55326-3
 Matrix: SH IN-LINESED
 ColDate: 3/21/12 14:00
 Sample type: In-line grab
 TotalSolid: 73
DRY Weight Basis

Project: 423589-340-4
 Locator: BRANDREG
 Descrip: ACCESS PORT AT BRA
 Sample: L55326-4
 Matrix: SH IN-LINESED
 ColDate: 3/21/12 14:00
 Sample type: In-line grab
 TotalSolid: 72.8
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
Diethyl Phthalate		<MDL	U	29	58.5	ug/Kg						
Dimethyl Phthalate		<MDL	U	29.2	29.2	ug/Kg						
Di-N-Butyl Phthalate	156			29	58.5	ug/Kg						
Di-N-Octyl Phthalate		<MDL	U	29.2	29.2	ug/Kg						
Fluoranthene	349			15	29.2	ug/Kg						
Fluorene		<MDL	U	15	29.2	ug/Kg						
Hexachlorobenzene		<MDL	U	1.5	2.92	ug/Kg						
Hexachlorobutadiene		<MDL	U	7.3	14.7	ug/Kg						
Indeno(1,2,3-Cd)Pyrene	99.9			15	29.2	ug/Kg						
Naphthalene		<MDL	U	15	29.2	ug/Kg						
N-Nitrosodiphenylamine		<MDL	U	36.6	36.6	ug/Kg						
Pentachlorophenol		<MDL	U	219	219	ug/Kg						
Phenanthrene	153			15	29.2	ug/Kg						
Phenol		<MDL	U	73	219	ug/Kg						
Pyrene	418			15	29.2	ug/Kg						
Total HPAHS (calc)	2180			15	29.2	ug/Kg						
Total LPAHS (calc)	153			15	29.2	ug/Kg						

* Not converted to dry weight basis
 MDL - method detection limit
 RDL - reporting detection limit
 J - estimated value
 U - not detected
 TA - narrative info available
 Shaded value > source control
 screening benchmark for CSO system
 see Appendix F of King County 2016

Table B-3c. Combined sewer system solids sampling results for 2012.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A4007_L
 Descrip: LOWER SEDIMENT TRA
 Sample: L56818-1
 Matrix: SH IN-LINESED
 ColDate: 10/18/12 13:07
 Sample type: Sediment Trap
 TotalSolid: 12.5
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_A01008
 Descrip: SEDIMENT TRAP / MH
 Sample: L56818-2
 Matrix: SH IN-LINESED
 ColDate: 10/18/12 11:31
 Sample type: Sediment Trap
 TotalSolid: 83.1
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Clay*	13.7			4.6	9.2	%		<MDL	U	0.68	1.37	%
Fines*	50.4			4.6	9.2	%	1.4	RDL	J	0.7	1.4	%
Gravel*		<MDL	U	0.9	9.2	%	38.7			0.1	1.4	%
p+0.00*		<MDL	U	0.9	9.2	%	9.6			0.1	1.4	%
p+1.00*	3.1	<RDL	J	0.9	9.2	%	9.1			0.1	1.4	%
p+10.0(equal/more than)*	9.2	RDL	J	4.6	9.2	%		<MDL	U	0.7	1.4	%
p+2.00*	5.5	<RDL	J	0.9	9.2	%	17			0.1	1.4	%
p+3.00*	14.6			0.9	9.2	%	16.8			0.1	1.4	%
p+4.00*	18.9			0.9	9.2	%	4.5			0.1	1.4	%
p+5.00*	27.5			4.6	9.2	%	0.7	<RDL	J	0.7	1.4	%
p+6.00*	9.2	RDL	J	4.6	9.2	%	0.7	<RDL	J	0.7	1.4	%
p+7.00*		<MDL	U	4.6	9.2	%		<MDL	UJ	0.7	1.4	%
p+8.00*		<MDL	U	4.6	9.2	%		<MDL	UJ	0.7	1.4	%
p+9.00*	4.6	<RDL	J	4.6	9.2	%		<MDL	U	0.7	1.4	%
p-1.00*		<MDL	U	0.9	9.2	%	13.1			0.1	1.4	%
p-2.00(less than)*		<MDL	U	0.9	9.2	%	22.2			0.1	1.4	%
p-2.00*		<MDL	U	0.9	9.2	%	3.3			0.1	1.4	%
Sand*	42			0.9	9.2	%	57			0.1	1.4	%
Silt*	36.6			4.6	9.2	%	1.4	RDL,J	J	0.7	1.4	%
CV ASTM D422/D3977-97												
500 Micron (equal to/more than)*	6.96			0.005	0.01	%	68.3			0.005	0.01	%
CV EPA 160.4												
Total Volatile Solids												
CV ISO 13320:2009(E)												
Clay*	3.26			0.01	0.01	% Volume	0.67			0.01	0.01	% Volume
Fines*	40.11			0.01	0.01	% Volume	5.92			0.01	0.01	% Volume
p+1.00*	4.98			0.01	0.01	% Volume	2.85			0.01	0.01	% Volume
p+10.0(more than)*		<MDL	U	0.01	0.01	% Volume		<MDL	U	0.01	0.01	% Volume
p+10.0*	0.77			0.01	0.01	% Volume	0.15			0.01	0.01	% Volume
p+2.00*	13.25			0.01	0.01	% Volume	10.56			0.01	0.01	% Volume
p+3.00*	16.32			0.01	0.01	% Volume	8.8			0.01	0.01	% Volume
p+4.00*	18.36			0.01	0.01	% Volume	3.61			0.01	0.01	% Volume
p+5.00*	11.6			0.01	0.01	% Volume	1.5			0.01	0.01	% Volume
p+6.00*	11.98			0.01	0.01	% Volume	1.62			0.01	0.01	% Volume
p+7.00*	8.35			0.01	0.01	% Volume	1.26			0.01	0.01	% Volume
p+8.00*	4.91			0.01	0.01	% Volume	0.88			0.01	0.01	% Volume
p+9.00*	2.49			0.01	0.01	% Volume	0.51			0.01	0.01	% Volume
Sand<1000*	52.92			0.01	0.01	% Volume	25.82			0.01	0.01	% Volume
Silt*	36.85			0.01	0.01	% Volume	5.25			0.01	0.01	% Volume
CV SM2540-G												
Total Solids*	12.5			0.005	0.01	%	83.1			0.005	0.01	%
CV SW846 9060-PSEP96												
Total Organic Carbon	189000			18000	35600	mg/Kg	6000			730	1470	mg/Kg
MT SW846 3050B*SW846 6010C												
Arsenic, Total, ICP	7.4	<RDL	J	5.2	26.1	mg/Kg	2.6	<RDL	J	1.4	7.44	mg/Kg
Cadmium, Total, ICP	3.5			0.42	2.09	mg/Kg	0.791			0.12	0.594	mg/Kg
Chromium, Total, ICP	48.6			0.62	3.13	mg/Kg	78.7			0.18	0.892	mg/Kg
Copper, Total, ICP	210			0.8	4.17	mg/Kg	155			0.24	1.19	mg/Kg
Lead, Total, ICP	150			4.2	20.9	mg/Kg	84.7			1.2	5.94	mg/Kg
Nickel, Total, ICP	38.2			1	5.21	mg/Kg	52.1			0.3	1.49	mg/Kg
Silver, Total, ICP	2	<RDL	J	0.8	4.17	mg/Kg	4.48			0.24	1.19	mg/Kg
Vanadium, Total, ICP	41.3			2.1	10.4	mg/Kg	29.5			0.59	2.97	mg/Kg
Zinc, Total, ICP	791			1	5.21	mg/Kg	229			0.3	1.49	mg/Kg
MT SW846 7471B												
Mercury, Total, CVAA	1.7			0.039	0.395	mg/Kg	0.693			0.012	0.119	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL	U	22	85.6	ug/Kg		<MDL	U	3.2	12.9	ug/Kg
Aroclor 1221		<MDL	U	42	85.6	ug/Kg		<MDL	U	6.4	12.9	ug/Kg
Aroclor 1232		<MDL	U	42	85.6	ug/Kg		<MDL	U	6.4	12.9	ug/Kg
Aroclor 1242	183	J	J	22	85.6	ug/Kg	19.6			3.2	12.9	ug/Kg
Aroclor 1248		<MDL	U	22	85.6	ug/Kg		<MDL	U	3.2	12.9	ug/Kg
Aroclor 1254	242			22	85.6	ug/Kg	49.6			3.2	12.9	ug/Kg
Aroclor 1260	118			22	85.6	ug/Kg	16.2			3.2	12.9	ug/Kg
Total Aroclors (calc)	543		J	22	85.6	ug/Kg	85.4			3.2	12.9	ug/Kg
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene		<MDL	U	22	42.6	ug/Kg		<MDL	U	0.64	1.29	ug/Kg

Table B-3c. Combined sewer system solids sampling results for 2012.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A4007_L
 Descrip: LOWER SEDIMENT TRA
 Sample: L56818-1
 Matrix: SH IN-LINESED
 ColDate: 10/18/12 13:07
 Sample type: Sediment Trap
 TotalSolid: 12.5
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_A01008
 Descrip: SEDIMEN TRAP / MH
 Sample: L56818-2
 Matrix: SH IN-LINESED
 ColDate: 10/18/12 11:31
 Sample type: Sediment Trap
 TotalSolid: 83.1
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
1,2-Dichlorobenzene		<MDL	U	214	214	ug/Kg		<MDL	U	6.41	6.41	ug/Kg
1,4-Dichlorobenzene		<MDL	U	320	320	ug/Kg	47.1			9.63	9.63	ug/Kg
2,4-Dimethylphenol		<MDL	U	220	426	ug/Kg		<MDL	U	6.4	12.9	ug/Kg
2-Methylnaphthalene	12700			220	426	ug/Kg	7.7	<RDL	J	6.4	12.9	ug/Kg
2-Methylphenol		<MDL	U	220	426	ug/Kg		<MDL	U	6.4	12.9	ug/Kg
3-,4-Methylphenol	278000			4200	8560	ug/Kg		<MDL	U	32	64.1	ug/Kg
Acenaphthene		<MDL	U	220	426	ug/Kg		<MDL	U	6.4	12.9	ug/Kg
Acenaphthylene		<MDL	U	220	426	ug/Kg		<MDL	U	6.4	12.9	ug/Kg
Anthracene		<MDL	U	220	426	ug/Kg	50.7			6.4	12.9	ug/Kg
Benzo(a)anthracene	960	<RDL	J	880	1700	ug/Kg	267			6.4	12.9	ug/Kg
Benzo(a)pyrene	1200	<RDL	J	880	1700	ug/Kg	254			32	64.1	ug/Kg
Benzo(b,j,k)fluoranthene	2500			880	1700	ug/Kg	582			32	64.1	ug/Kg
Benzo(g,h,i)perylene		<MDL	U	880	1700	ug/Kg	97.5			32	64.1	ug/Kg
Benzoic Acid		<MDL	U	4260	4260	ug/Kg		<MDL	U	129	129	ug/Kg
Benzyl Alcohol		<MDL	U	534	534	ug/Kg		<MDL	U	16	16	ug/Kg
Benzyl Butyl Phthalate		<MDL	U	1280	1280	ug/Kg	68.6			9.63	9.63	ug/Kg
Bis(2-Ethylhexyl)Phthalate	22900			1700	3420	ug/Kg	1120			13	25.6	ug/Kg
Chrysene	1500	<RDL	J	880	1700	ug/Kg	384			6.4	12.9	ug/Kg
Dibenzo(a,h)anthracene		<MDL	U	880	1700	ug/Kg		<MDL	U	32	64.1	ug/Kg
Dibenzofuran		<MDL	U	220	426	ug/Kg	12	<RDL	J	6.4	12.9	ug/Kg
Diethyl Phthalate		<MDL	U	420	856	ug/Kg		<MDL	U	13	25.6	ug/Kg
Dimethyl Phthalate		<MDL	U	426	426	ug/Kg		<MDL	U	12.9	12.9	ug/Kg
Di-N-Butyl Phthalate		<MDL	U	420	856	ug/Kg	25	<RDL	J	13	25.6	ug/Kg
Di-N-Octyl Phthalate	1860			1700	1700	ug/Kg	77.4			64.1	64.1	ug/Kg
Fluoranthene	1700			220	426	ug/Kg	587			6.4	12.9	ug/Kg
Fluorene		<MDL	U	220	426	ug/Kg	29.4			6.4	12.9	ug/Kg
Hexachlorobenzene		<MDL	U	22	42.6	ug/Kg		<MDL	U	0.64	1.29	ug/Kg
Hexachlorobutadiene		<MDL	U	100	214	ug/Kg		<MDL	U	3.2	6.41	ug/Kg
Indeno(1,2,3-Cd)Pyrene		<MDL	U	880	1700	ug/Kg	115			32	64.1	ug/Kg
Naphthalene	2270			220	426	ug/Kg		<MDL	U	6.4	12.9	ug/Kg
N-Nitrosodiphenylamine		<MDL	U	534	534	ug/Kg		<MDL	U	16	16	ug/Kg
Pentachlorophenol		<MDL	U	3200	3200	ug/Kg		<MDL	U	96.3	96.3	ug/Kg
Phenanthrene	4740			220	426	ug/Kg	310			6.4	12.9	ug/Kg
Phenol	3850			1000	3200	ug/Kg		<MDL	U	32	96.3	ug/Kg
Pyrene	2860			880	1700	ug/Kg	947			6.4	12.9	ug/Kg
Total HPAHS (calc)	10700			220	426	ug/Kg	3230			6.4	12.9	ug/Kg
Total LPAHS (calc)	7020			220	426	ug/Kg	390			6.4	12.9	ug/Kg

* Not converted to dry weight basis

MDL - method detection limit

RDL - reporting detection limit

J - estimated value

U - not detected

Shaded value > source control

screening benchmark for CSO system

see Appendix F of King County 2016

Table B-3c. Combined sewer system solids sampling results for 2012.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A4007_U
 Descrip: UPPER SEDIMENT TRA
 Sample: L56818-3
 Matrix: SH IN-LINESED
 ColDate: 10/18/12 13:07
 Sample type: Sediment Trap
 TotalSolid: 43.4
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_A01007
 Descrip: SEDIMENT TRAP / LO
 Sample: L56818-4
 Matrix: SH IN-LINESED
 ColDate: 10/18/12 10:23
 Sample type: Sediment Trap
 TotalSolid: 50.2
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Clay*												
Fines*												
Gravel*												
p+0.00*												
p+1.00*												
p+10.0(equal/more than)*												
p+2.00*												
p+3.00*												
p+4.00*												
p+5.00*												
p+6.00*												
p+7.00*												
p+8.00*												
p+9.00*												
p-1.00*												
p-2.00(less than)*												
p-2.00*												
Sand*												
Silt*												
CV ASTM D422/D3977-97												
500 Micron (equal to/more than)*	1.71			0.005	0.01	%	4.59			0.005	0.01	%
CV EPA 160.4												
Total Volatile Solids							15.1			0.01	0.0199	%
CV ISO 13320:2009(E)												
Clay*	3.62			0.01	0.01	% Volume	3.99			0.01	0.01	% Volume
Fines*	51.74			0.01	0.01	% Volume	46			0.01	0.01	% Volume
p+1.00*	4.1			0.01	0.01	% Volume	3.04			0.01	0.01	% Volume
p+10.0(more than)*	0.06			0.01	0.01	% Volume	0.07			0.01	0.01	% Volume
p+10.0*	0.87			0.01	0.01	% Volume	1.02			0.01	0.01	% Volume
p+2.00*	9.62			0.01	0.01	% Volume	9.73			0.01	0.01	% Volume
p+3.00*	13.15			0.01	0.01	% Volume	15.07			0.01	0.01	% Volume
p+4.00*	19.63			0.01	0.01	% Volume	21.56			0.01	0.01	% Volume
p+5.00*	14.45			0.01	0.01	% Volume	14.22			0.01	0.01	% Volume
p+6.00*	15.88			0.01	0.01	% Volume	13.28			0.01	0.01	% Volume
p+7.00*	11.55			0.01	0.01	% Volume	8.97			0.01	0.01	% Volume
p+8.00*	6.24			0.01	0.01	% Volume	5.55			0.01	0.01	% Volume
p+9.00*	2.69			0.01	0.01	% Volume	2.9			0.01	0.01	% Volume
Sand<1000*	46.51			0.01	0.01	% Volume	49.4			0.01	0.01	% Volume
Silt*	48.12			0.01	0.01	% Volume	42.01			0.01	0.01	% Volume
CV SM2540-G												
Total Solids*	43.4			0.005	0.01	%	50.2	J		0.005	0.01	%
CV SW846 9060-PSEP96												
Total Organic Carbon	114000			16000	32700	mg/Kg						
MT SW846 3050B*SW846 6010C												
Arsenic, Total, ICP	11	<RDL	J	2.8	14	mg/Kg	10	<RDL	J	2.4	11.9	mg/Kg
Cadmium, Total, ICP	3.43			0.22	1.12	mg/Kg	2.23			0.19	0.954	mg/Kg
Chromium, Total, ICP	61.1			0.35	1.68	mg/Kg	104			0.28	1.43	mg/Kg
Copper, Total, ICP	210			0.44	2.24	mg/Kg	205			0.38	1.91	mg/Kg
Lead, Total, ICP	227			2.2	11.2	mg/Kg	211			1.9	9.54	mg/Kg
Nickel, Total, ICP	48.2			0.55	2.79	mg/Kg	69.7			0.48	2.39	mg/Kg
Silver, Total, ICP	0.85	<RDL	J	0.44	2.24	mg/Kg	25.7			0.38	1.91	mg/Kg
Vanadium, Total, ICP	58.8			1.1	5.58	mg/Kg	54.6			0.96	4.78	mg/Kg
Zinc, Total, ICP	790			0.55	2.79	mg/Kg	932			0.48	2.39	mg/Kg
MT SW846 7471B												
Mercury, Total, CVAA	0.728	J	J	0.011	0.112	mg/Kg	0.201			0.0096	0.0956	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL	U	18	73.7	ug/Kg		<MDL	U	16	63.7	ug/Kg
Aroclor 1221		<MDL	U	37	73.7	ug/Kg		<MDL	U	32	63.7	ug/Kg
Aroclor 1232		<MDL	U	37	73.7	ug/Kg		<MDL	U	32	63.7	ug/Kg
Aroclor 1242	108	J	J	18	73.7	ug/Kg	26	<RDL	J	16	63.7	ug/Kg
Aroclor 1248		<MDL	U	18	73.7	ug/Kg		<MDL	U	16	63.7	ug/Kg
Aroclor 1254	281			18	73.7	ug/Kg	96.4			16	63.7	ug/Kg
Aroclor 1260	149			18	73.7	ug/Kg	54	<RDL	J	16	63.7	ug/Kg
Total Aroclors (calc)	538		J	18	73.7	ug/Kg	176		J	16	63.7	ug/Kg
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene		<MDL	U	3.7	7.37	ug/Kg		<MDL	U	3.2	6.37	ug/Kg

Table B-3c. Combined sewer system solids sampling results for 2012.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A4007_U
 Descrip: UPPER SEDIMENT TRA
 Sample: L56818-3
 Matrix: SH IN-LINESED
 ColDate: 10/18/12 13:07
 Sample type: Sediment Trap
 TotalSolid: 43.4
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_A01007
 Descrip: SEDIMENT TRAP / LO
 Sample: L56818-4
 Matrix: SH IN-LINESED
 ColDate: 10/18/12 10:23
 Sample type: Sediment Trap
 TotalSolid: 50.2
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
1,2-Dichlorobenzene		<MDL	U	36.9	36.9	ug/Kg		<MDL	U	31.9	31.9	ug/Kg
1,4-Dichlorobenzene	91.5			55.3	55.3	ug/Kg		<MDL	U	47.8	47.8	ug/Kg
2,4-Dimethylphenol		<MDL	U	37	73.7	ug/Kg		<MDL	U	32	63.7	ug/Kg
2-Methylnaphthalene	260			37	73.7	ug/Kg	46	<RDL	J	32	63.7	ug/Kg
2-Methylphenol		<MDL	U	37	73.7	ug/Kg		<MDL	U	32	63.7	ug/Kg
3-,4-Methylphenol	694			180	369	ug/Kg		<MDL	U	160	319	ug/Kg
Acenaphthene		<MDL	U	37	73.7	ug/Kg	46	<RDL	J	32	63.7	ug/Kg
Acenaphthylene		<MDL	U	37	73.7	ug/Kg		<MDL	U	32	63.7	ug/Kg
Anthracene	145			37	73.7	ug/Kg	132			32	63.7	ug/Kg
Benzo(a)anthracene	643			180	369	ug/Kg	566			32	63.7	ug/Kg
Benzo(a)pyrene	756			180	369	ug/Kg	580	<RDL	J	320	637	ug/Kg
Benzo(b,j,k)fluoranthene	1990			180	369	ug/Kg	1330			320	637	ug/Kg
Benzo(g,h,i)perylene	385			180	369	ug/Kg	360	<RDL	J	320	637	ug/Kg
Benzoic Acid		<MDL	U	737	737	ug/Kg	922			637	637	ug/Kg
Benzyl Alcohol	157			92.2	92.2	ug/Kg	763			79.7	79.7	ug/Kg
Benzyl Butyl Phthalate	894			276	276	ug/Kg	2270			47.8	47.8	ug/Kg
Bis(2-Ethylhexyl)Phthalate	10200			370	737	ug/Kg	35500			640	1270	ug/Kg
Chrysene	1200			180	369	ug/Kg	982			32	63.7	ug/Kg
Dibenzo(a,h)anthracene		<MDL	U	180	369	ug/Kg		<MDL	U	320	637	ug/Kg
Dibenzofuran		<MDL	U	37	73.7	ug/Kg		<MDL	U	32	63.7	ug/Kg
Diethyl Phthalate		<MDL	U	74	147	ug/Kg		<MDL	U	64	127	ug/Kg
Dimethyl Phthalate		<MDL	U	73.7	73.7	ug/Kg	97.4			63.7	63.7	ug/Kg
Di-N-Butyl Phthalate		<MDL	U	74	147	ug/Kg		<MDL	U	64	127	ug/Kg
Di-N-Octyl Phthalate	1180			369	369	ug/Kg	14900			637	637	ug/Kg
Fluoranthene	1250			37	73.7	ug/Kg	1080			32	63.7	ug/Kg
Fluorene		<MDL	U	37	73.7	ug/Kg	74.9			32	63.7	ug/Kg
Hexachlorobenzene		<MDL	U	3.7	7.37	ug/Kg		<MDL	U	3.2	6.37	ug/Kg
Hexachlorobutadiene		<MDL	U	18	36.9	ug/Kg		<MDL	U	16	31.9	ug/Kg
Indeno(1,2,3-Cd)Pyrene	350	<RDL	J	180	369	ug/Kg		<MDL	U	320	637	ug/Kg
Naphthalene		<MDL	U	37	73.7	ug/Kg		<MDL	U	32	63.7	ug/Kg
N-Nitrosodiphenylamine		<MDL	U	92.2	92.2	ug/Kg		<MDL	U	79.7	79.7	ug/Kg
Pentachlorophenol		<MDL	U	553	553	ug/Kg		<MDL	U	478	478	ug/Kg
Phenanthrene	774			37	73.7	ug/Kg	620			32	63.7	ug/Kg
Phenol		<MDL	U	180	553	ug/Kg		<MDL	U	160	478	ug/Kg
Pyrene	1540			180	369	ug/Kg	2250			32	63.7	ug/Kg
Total HPAHS (calc)	8100			37	73.7	ug/Kg	7150			32	63.7	ug/Kg
Total LPAHS (calc)	920			37	73.7	ug/Kg	873			32	63.7	ug/Kg

* Not converted to dry weight basis
 MDL - method detection limit
 RDL - reporting detectin limit
 J - estimated value
 U- not detected
 Shaded value > source control
 screening benchmark for CSO system
 see Appendix F of King County 2016

Table B-3c. Combined sewer system solids sampling results for 2012.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_BRANDUTAH
 Descrpt: SEDIMENT TRAP / BR
 Sample: L56818-5
 Matrix: SH IN-LINESED
 ColDate: 10/18/12 9:35
 Sample type: Sediment Trap
 TotalSolid: 61.1
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_A4007_L
 Descrpt: LOWER SEDIMENT TRA
 Sample: L56818-6
 Matrix: SH IN-LINESED
 ColDate: 10/18/12 13:07
 Sample type: Sediment Trap
 TotalSolid: 15.4
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Clay*							14.3			4.8	9.5	%
Fines*							57.1			4.8	9.5	%
Gravel*								<MDL	U	1	9.5	%
p+0.00*							1	<RDL	J	1	9.5	%
p+1.00*							3.1	<RDL	J	1	9.5	%
p+10.0(equal/more than)*							9.5	RDL	J	4.8	9.5	%
p+2.00*							5.1	<RDL	J	1	9.5	%
p+3.00*							11.5			1	9.5	%
p+4.00*							15			1	9.5	%
p+5.00*							33.3			4.8	9.5	%
p+6.00*							4.8	<RDL	J	4.8	9.5	%
p+7.00*							4.8	<RDL	J	4.8	9.5	%
p+8.00*								<MDL	U	4.8	9.5	%
p+9.00*							4.8	<RDL	J	4.8	9.5	%
p-1.00*								<MDL	U	1	9.5	%
p-2.00(less than)*								<MDL	U	1	9.5	%
p-2.00*								<MDL	U	1	9.5	%
Sand*							35.9			1	9.5	%
Silt*							42.9			4.8	9.5	%
CV ASTM D422/D3977-97												
500 Micron (equal to/more than)*	80.6			0.005	0.01	%	6.67			0.005	0.01	%
CV EPA 160.4												
Total Volatile Solids												
CV ISO 13320:2009(E)												
Clay*	0.65			0.01	0.01	% Volume	3.6			0.01	0.01	% Volume
Fines*	10.22			0.01	0.01	% Volume	45.07			0.01	0.01	% Volume
p+1.00*	0.85			0.01	0.01	% Volume	3.95			0.01	0.01	% Volume
p+10.0(more than)*	0.03			0.01	0.01	% Volume	0.05			0.01	0.01	% Volume
p+10.0*	0.16			0.01	0.01	% Volume	0.91			0.01	0.01	% Volume
p+2.00*	2.22			0.01	0.01	% Volume	10.83			0.01	0.01	% Volume
p+3.00*	2.3			0.01	0.01	% Volume	14.35			0.01	0.01	% Volume
p+4.00*	3.81			0.01	0.01	% Volume	19.13			0.01	0.01	% Volume
p+5.00*	3.28			0.01	0.01	% Volume	12.83			0.01	0.01	% Volume
p+6.00*	3.3			0.01	0.01	% Volume	13.87			0.01	0.01	% Volume
p+7.00*	1.99			0.01	0.01	% Volume	9.55			0.01	0.01	% Volume
p+8.00*	1			0.01	0.01	% Volume	5.22			0.01	0.01	% Volume
p+9.00*	0.46			0.01	0.01	% Volume	2.63			0.01	0.01	% Volume
Sand<1000*	9.18			0.01	0.01	% Volume	48.25			0.01	0.01	% Volume
Silt*	9.56			0.01	0.01	% Volume	41.47			0.01	0.01	% Volume
CV SM2540-G												
Total Solids*	61.1			0.005	0.01	%	15.4			0.005	0.01	%
CV SW846 9060-PSEP96												
Total Organic Carbon	65500			9000	18000	mg/Kg	175000			21000	41100	mg/Kg
MT SW846 3050B*SW846 6010C												
Arsenic, Total, ICP	7	<RDL	J	2.1	10.3	mg/Kg	5.9	<RDL	J	4.2	20.7	mg/Kg
Cadmium, Total, ICP	2.18			0.16	0.828	mg/Kg	2.77			0.33	1.66	mg/Kg
Chromium, Total, ICP	159			0.25	1.24	mg/Kg	37.7			0.49	2.48	mg/Kg
Copper, Total, ICP	275			0.33	1.65	mg/Kg	169			0.65	3.31	mg/Kg
Lead, Total, ICP	556			1.6	8.28	mg/Kg	123			3.3	16.6	mg/Kg
Nickel, Total, ICP	80			0.41	2.06	mg/Kg	28.5			0.84	4.14	mg/Kg
Silver, Total, ICP	3.09			0.33	1.65	mg/Kg	1.2	<RDL	J	0.65	3.31	mg/Kg
Vanadium, Total, ICP	48.3			0.83	4.14	mg/Kg	33.8			1.6	8.25	mg/Kg
Zinc, Total, ICP	571			0.41	2.06	mg/Kg	695			0.84	4.14	mg/Kg
MT SW846 7471B												
Mercury, Total, CVAA	0.241			0.0082	0.0815	mg/Kg	0.456			0.031	0.312	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL	U	6.5	26.2	ug/Kg		<MDL	U	18	69.5	ug/Kg
Aroclor 1221		<MDL	U	13	26.2	ug/Kg		<MDL	U	34	69.5	ug/Kg
Aroclor 1232		<MDL	U	13	26.2	ug/Kg		<MDL	U	34	69.5	ug/Kg
Aroclor 1242	64			6.5	26.2	ug/Kg	120	J	J	18	69.5	ug/Kg
Aroclor 1248		<MDL	U	6.5	26.2	ug/Kg		<MDL	U	18	69.5	ug/Kg
Aroclor 1254	100			6.5	26.2	ug/Kg	182			18	69.5	ug/Kg
Aroclor 1260	38.3			6.5	26.2	ug/Kg	73.4			18	69.5	ug/Kg
Total Aroclors (calc)	203			6.5	26.2	ug/Kg	375		J	18	69.5	ug/Kg
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene		<MDL	U	13	26.2	ug/Kg		<MDL	U	18	34.6	ug/Kg

Table B-3c. Combined sewer system solids sampling results for 2012.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_BRANDUTAH
 Descrip: SEDIMENT TRAP / BR
 Sample: L56818-5
 Matrix: SH IN-LINESED
 ColDate: 10/18/12 9:35
 Sample type: Sediment Trap
 TotalSolid: 61.1
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_A4007_L
 Descrip: LOWER SEDIMENT TRA
 Sample: L56818-6
 Matrix: SH IN-LINESED
 ColDate: 10/18/12 13:07
 Sample type: Sediment Trap
 TotalSolid: 15.4
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
1,2-Dichlorobenzene		<MDL	U	131	131	ug/Kg		<MDL	U	173	173	ug/Kg
1,4-Dichlorobenzene		<MDL	U	196	196	ug/Kg		<MDL	U	260	260	ug/Kg
2,4-Dimethylphenol		<MDL	U	130	262	ug/Kg		<MDL	U	180	346	ug/Kg
2-Methylnaphthalene		<MDL	U	130	262	ug/Kg	16000			180	346	ug/Kg
2-Methylphenol		<MDL	U	130	262	ug/Kg		<MDL	U	180	346	ug/Kg
3-,4-Methylphenol		<MDL	U	650	1310	ug/Kg	239000			4400	8640	ug/Kg
Acenaphthene		<MDL	U	130	262	ug/Kg		<MDL	U	180	346	ug/Kg
Acenaphthylene		<MDL	U	130	262	ug/Kg		<MDL	U	180	346	ug/Kg
Anthracene		<MDL	U	130	262	ug/Kg		<MDL	U	180	346	ug/Kg
Benzo(a)anthracene	337			130	262	ug/Kg		<MDL	U	840	1730	ug/Kg
Benzo(a)pyrene		<MDL	U	650	1310	ug/Kg		<MDL	U	840	1730	ug/Kg
Benzo(b,j,k)fluoranthene	900	<RDL	J	650	1310	ug/Kg	1920			840	1730	ug/Kg
Benzo(g,h,i)perylene		<MDL	U	650	1310	ug/Kg		<MDL	U	840	1730	ug/Kg
Benzoic Acid		<MDL	U	2620	2620	ug/Kg		<MDL	U	3460	3460	ug/Kg
Benzyl Alcohol		<MDL	U	327	327	ug/Kg		<MDL	U	433	433	ug/Kg
Benzyl Butyl Phthalate	2620			196	196	ug/Kg		<MDL	U	1300	1300	ug/Kg
Bis(2-Ethylhexyl)Phthalate	6320			260	524	ug/Kg	20800			1800	3460	ug/Kg
Chrysene	648			130	262	ug/Kg	1200	<RDL	J	840	1730	ug/Kg
Dibenzo(a,h)anthracene		<MDL	U	650	1310	ug/Kg		<MDL	U	840	1730	ug/Kg
Dibenzofuran		<MDL	U	130	262	ug/Kg		<MDL	U	180	346	ug/Kg
Diethyl Phthalate		<MDL	U	260	524	ug/Kg		<MDL	U	340	695	ug/Kg
Dimethyl Phthalate		<MDL	U	262	262	ug/Kg		<MDL	U	346	346	ug/Kg
Di-N-Butyl Phthalate	290	<RDL	J	260	524	ug/Kg		<MDL	U	340	695	ug/Kg
Di-N-Octyl Phthalate		<MDL	U	1310	1310	ug/Kg	1870			1730	1730	ug/Kg
Fluoranthene	709			130	262	ug/Kg	1490			180	346	ug/Kg
Fluorene		<MDL	U	130	262	ug/Kg	1700			180	346	ug/Kg
Hexachlorobenzene		<MDL	U	13	26.2	ug/Kg		<MDL	U	18	34.6	ug/Kg
Hexachlorobutadiene		<MDL	U	65	131	ug/Kg		<MDL	U	84	173	ug/Kg
Indeno(1,2,3-Cd)Pyrene		<MDL	U	650	1310	ug/Kg		<MDL	U	840	1730	ug/Kg
Naphthalene		<MDL	U	130	262	ug/Kg	2850			180	346	ug/Kg
N-Nitrosodiphenylamine		<MDL	U	327	327	ug/Kg		<MDL	U	433	433	ug/Kg
Pentachlorophenol		<MDL	U	1960	1960	ug/Kg		<MDL	U	2600	2600	ug/Kg
Phenanthrene	288			130	262	ug/Kg	5220			180	346	ug/Kg
Phenol		<MDL	U	650	1960	ug/Kg	1300	<RDL	J	840	2600	ug/Kg
Pyrene	804			130	262	ug/Kg	2230			840	1730	ug/Kg
Total HPAHS (calc)	3400			130	262	ug/Kg	6870			180	346	ug/Kg
Total LPAHS (calc)	288			130	262	ug/Kg	9770			180	346	ug/Kg

* Not converted to dry weight basis

MDL - method detection limit

RDL - reporting detection limit

J - estimated value

U - not detected

Shaded value > source control

screening benchmark for CSO system

see Appendix F of King County 2016

Table B-3c. Combined sewer system solids sampling results for 2012.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A01008
 Descrip: SEDIMEN TRAP / MH
 Sample: L56818-7
 Matrix: SH IN-LINESED
 ColDate: 10/18/12 11:31
 Sample type: Sediment Trap
 TotalSolid: 51.2
 DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422						
Clay*						
Fines*						
Gravel*						
p+0.00*						
p+1.00*						
p+10.0(equal/more than)*						
p+2.00*						
p+3.00*						
p+4.00*						
p+5.00*						
p+6.00*						
p+7.00*						
p+8.00*						
p+9.00*						
p-1.00*						
p-2.00(less than)*						
p-2.00*						
Sand*						
Silt*						
CV ASTM D422/D3977-97						
500 Micron (equal to/more than)*	5.54			0.005	0.01	%
CV EPA 160.4						
Total Volatile Solids						
CV ISO 13320:2009(E)						
Clay*	1.23			0.01	0.01	% Volume
Fines*	15.63			0.01	0.01	% Volume
p+1.00*	2.05			0.01	0.01	% Volume
p+10.0(more than)*	0.02			0.01	0.01	% Volume
p+10.0*	0.32			0.01	0.01	% Volume
p+2.00*	5.28			0.01	0.01	% Volume
p+3.00*	7.76			0.01	0.01	% Volume
p+4.00*	9.33			0.01	0.01	% Volume
p+5.00*	4.91			0.01	0.01	% Volume
p+6.00*	4.55			0.01	0.01	% Volume
p+7.00*	3.15			0.01	0.01	% Volume
p+8.00*	1.79			0.01	0.01	% Volume
p+9.00*	0.89			0.01	0.01	% Volume
Sand<1000*	24.41			0.01	0.01	% Volume
Silt*	14.4			0.01	0.01	% Volume
CV SM2540-G						
Total Solids*	51.2			0.005	0.01	%
CV SW846 9060-PSEP96						
Total Organic Carbon	61100			6300	12500	mg/Kg
MT SW846 3050B*SW846 6010C						
Arsenic, Total, ICP	5.3	<RDL	J	1.6	8.01	mg/Kg
Cadmium, Total, ICP	1.4			0.13	0.641	mg/Kg
Chromium, Total, ICP	62.9			0.19	0.961	mg/Kg
Copper, Total, ICP	209			0.25	1.28	mg/Kg
Lead, Total, ICP	118			1.3	6.41	mg/Kg
Nickel, Total, ICP	107			0.31	1.6	mg/Kg
Silver, Total, ICP	2.73			0.25	1.28	mg/Kg
Vanadium, Total, ICP	31.6			0.64	3.2	mg/Kg
Zinc, Total, ICP	643			0.31	1.6	mg/Kg
MT SW846 7471B						
Mercury, Total, CVAA	0.359			0.0096	0.0961	mg/Kg
OR SW846 3550B*SW846 8082A						
Aroclor 1016		<MDL	U	16	62.5	ug/Kg
Aroclor 1221		<MDL	U	31	62.5	ug/Kg
Aroclor 1232		<MDL	U	31	62.5	ug/Kg
Aroclor 1242	39	<RDL,J	J	16	62.5	ug/Kg
Aroclor 1248		<MDL	U	16	62.5	ug/Kg
Aroclor 1254	97.1			16	62.5	ug/Kg
Aroclor 1260	105			16	62.5	ug/Kg
Total Aroclors (calc)	241		J	16	62.5	ug/Kg
OR SW846 3550B*SW846 8270D						
1,2,4-Trichlorobenzene		<MDL	U	3.1	6.25	ug/Kg

Table B-3c. Combined sewer system solids sampling results for 2012.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A01008
 Descrip: SEDIMEN TRAP / MH
 Sample: L56818-7
 Matrix: SH IN-LINESED
 ColDate: 10/18/12 11:31
 Sample type: Sediment Trap
 TotalSolid: 51.2
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units
1,2-Dichlorobenzene		<MDL	U	31.3	31.3	ug/Kg
1,4-Dichlorobenzene	57.4			46.9	46.9	ug/Kg
2,4-Dimethylphenol		<MDL	U	31	62.5	ug/Kg
2-Methylnaphthalene	66			31	62.5	ug/Kg
2-Methylphenol		<MDL	U	31	62.5	ug/Kg
3-,4-Methylphenol		<MDL	U	160	313	ug/Kg
Acenaphthene		<MDL	U	31	62.5	ug/Kg
Acenaphthylene		<MDL	U	31	62.5	ug/Kg
Anthracene	113			31	62.5	ug/Kg
Benzo(a)anthracene	660	<RDL	J	630	1250	ug/Kg
Benzo(a)pyrene	880	<RDL	J	630	1250	ug/Kg
Benzo(b,j,k)fluoranthene	1770			630	1250	ug/Kg
Benzo(g,h,i)perylene		<MDL	U	630	1250	ug/Kg
Benzoic Acid	955			625	625	ug/Kg
Benzyl Alcohol	102			78.1	78.1	ug/Kg
Benzyl Butyl Phthalate		<MDL	U	938	938	ug/Kg
Bis(2-Ethylhexyl)Phthalate	10900			1300	2500	ug/Kg
Chrysene	1280			630	1250	ug/Kg
Dibenzo(a,h)anthracene		<MDL	U	630	1250	ug/Kg
Dibenzofuran	51	<RDL	J	31	62.5	ug/Kg
Diethyl Phthalate		<MDL	U	63	125	ug/Kg
Dimethyl Phthalate	71.5			62.5	62.5	ug/Kg
Di-N-Butyl Phthalate	205			63	125	ug/Kg
Di-N-Octyl Phthalate		<MDL	U	1250	1250	ug/Kg
Fluoranthene	1350			31	62.5	ug/Kg
Fluorene	88.3			31	62.5	ug/Kg
Hexachlorobenzene		<MDL	U	3.1	6.25	ug/Kg
Hexachlorobutadiene		<MDL	U	16	31.3	ug/Kg
Indeno(1,2,3-Cd)Pyrene		<MDL	U	630	1250	ug/Kg
Naphthalene		<MDL	U	31	62.5	ug/Kg
N-Nitrosodiphenylamine		<MDL	U	78.1	78.1	ug/Kg
Pentachlorophenol		<MDL	U	469	469	ug/Kg
Phenanthrene	734			31	62.5	ug/Kg
Phenol		<MDL	U	160	469	ug/Kg
Pyrene	1600			630	1250	ug/Kg
Total HPAHS (calc)	7550			31	62.5	ug/Kg
Total LPAHs (calc)	936			31	62.5	ug/Kg

* Not converted to dry weight basis

MDL - method detection limit

RDL - reporting detection limit

J - estimated value

U - not detected

Shaded value > source control

screening benchmark for CSO system

see Appendix F of King County 2016

Table B-4a. Combined sewer system solids sampling results for 2013.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A01008
 Descrip: SEDIMENT TRAP / MH
 Sample: L57786-1
 Matrix: SH IN-LINESED
 ColDate: 4/16/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 66.3
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_BRANDUTAH
 Descrip: SEDIMENT TRAP / BR
 Sample: L57786-2
 Matrix: SH IN-LINESED
 ColDate: 4/16/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 63.9
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Fines*	37.5		J	1.1	2.1	%						
Gravel*	0.5	<RDL	J	0.2	2.1	%						
Sand*	54.6		J	0.2	2.1	%						
Silt*	30		J	1.1	2.1	%						
Clay*	7.5		J	1.1	2.1	%						
p+0.00*	1.5	<RDL	J	0.2	2.1	%						
p+1.00*	3.4		J	0.2	2.1	%						
p+10.0(equal/more than)*	4.3		J	1.1	2.1	%						
p+2.00*	6.5		J	0.2	2.1	%						
p+3.00*	19.5		J	0.2	2.1	%						
p+4.00*	23.7		J	0.2	2.1	%						
p+5.00*	18.2		J	1.1	2.1	%						
p+6.00*	5.4		J	1.1	2.1	%						
p+7.00*	4.3		J	1.1	2.1	%						
p+8.00*	2.1	RDL	J	1.1	2.1	%						
p+9.00*	3.2		J	1.1	2.1	%						
p-1.00*	0.5	<RDL	J	0.2	2.1	%						
p-2.00(less than)*		<MDL	UJ	0.2	2.1	%						
p-2.00*		<MDL	UJ	0.2	2.1	%						
CV ASTM D422/D3977-97												
500 Micron (equal to/more than)*	5.27			0.005	0.01	%						
CV ISO 13320:2009(E)												
Fines*	42.9			0.1	0.1	% Volume						
Sand<1000*	51.8			0.1	0.1	% Volume						
Silt*	39.1			0.1	0.1	% Volume						
Clay*	3.8			0.1	0.1	% Volume						
p+1.00*	3			0.1	0.1	% Volume						
p+10.0(more than)*		<MDL	J	0.1	0.1	% Volume						
p+10.0*	0.9			0.1	0.1	% Volume						
p+2.00*	11.2			0.1	0.1	% Volume						
p+3.00*	17.2			0.1	0.1	% Volume						
p+4.00*	20.4			0.1	0.1	% Volume						
p+5.00*	12.3			0.1	0.1	% Volume						
p+6.00*	12.5			0.1	0.1	% Volume						
p+7.00*	8.9			0.1	0.1	% Volume						
p+8.00*	5.4			0.1	0.1	% Volume						
p+9.00*	2.8			0.1	0.1	% Volume						
CV SM2540-G												
Total Solids*	66.3			0.005	0.01	%	63.9			0.005	0.01	%
CV SW846 9060-PSEP96												
Total Organic Carbon	57900			9400	18900	mg/Kg						
MT SW846 3050B*SW846 6010C												
Arsenic, Total, ICP	5.6	<RDL	J	1.8	9.41	mg/Kg						
Cadmium, Total, ICP	1.18			0.15	0.753	mg/Kg						
Chromium, Total, ICP	46.9			0.23	1.13	mg/Kg						
Copper, Total, ICP	138			0.3	1.51	mg/Kg						
Lead, Total, ICP	73.9			1.5	7.53	mg/Kg						
Nickel, Total, ICP	68.2			0.38	1.89	mg/Kg						
Silver, Total, ICP	3.36			0.3	1.51	mg/Kg						
Vanadium, Total, ICP	33.3			0.75	3.76	mg/Kg						
Zinc, Total, ICP	505			0.38	1.89	mg/Kg						
MT SW846 7471B												
Mercury, Total, CVAA	0.21	<RDL	J	0.029	0.291	mg/Kg						
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL	U	10	40.3	ug/Kg		<MDL	U	6.3	25	ug/Kg
Aroclor 1221		<MDL	U	30	40.3	ug/Kg		<MDL	U	19	25	ug/Kg
Aroclor 1232		<MDL	U	30	40.3	ug/Kg		<MDL	U	19	25	ug/Kg
Aroclor 1242	33	<RDL	J	10	40.3	ug/Kg	19	<RDL	J	6.3	25	ug/Kg
Aroclor 1248		<MDL	U	10	40.3	ug/Kg		<MDL	U	6.3	25	ug/Kg
Aroclor 1254	235			10	40.3	ug/Kg	96.7			6.3	25	ug/Kg
Aroclor 1260	169			10	40.3	ug/Kg	32.7			6.3	25	ug/Kg
Total Aroclors (calc)	437		J	10	40.3	ug/Kg	148		J	6.3	25	ug/Kg
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene		<MDL	UJ	24	46.9	ug/Kg						
1,2-Dichlorobenzene		<MDL	U	235	235	ug/Kg						
1,4-Dichlorobenzene		<MDL	U	351	351	ug/Kg						

Table B-4a. Combined sewer system solids sampling results for 2013.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A01008
 Descrip: SEDIMEN TRAP / MH
 Sample: L57786-1
 Matrix: SH IN-LINESED
 ColDate: 4/16/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 66.3
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_BRANDUTAH
 Descrip: SEDIMENT TRAP / BR
 Sample: L57786-2
 Matrix: SH IN-LINESED
 ColDate: 4/16/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 63.9
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
2,4-Dimethylphenol		<MDL	UJ	240	469	ug/Kg						
2-Methylnaphthalene		<MDL	U	240	469	ug/Kg						
2-Methylphenol		<MDL	U	240	469	ug/Kg						
3,4-Methylphenol	2440			1200	2350	ug/Kg						
Acenaphthene		<MDL	U	240	469	ug/Kg						
Acenaphthylene		<MDL	U	240	469	ug/Kg						
Anthracene		<MDL	U	240	469	ug/Kg						
Benzo(a)anthracene	914			240	469	ug/Kg						
Benzo(a)pyrene	941			240	469	ug/Kg						
Benzo(b,j,k)fluoranthene	2290			240	469	ug/Kg						
Benzo(g,h,i)perylene	320	<RDL	J	240	469	ug/Kg						
Benzoic Acid		<MDL	U	4690	4690	ug/Kg						
Benzyl Alcohol		<MDL	U	587	587	ug/Kg						
Benzyl Butyl Phthalate	611			351	351	ug/Kg						
Bis(2-Ethylhexyl)Phthalate	10000			470	938	ug/Kg						
Chrysene	1200			240	469	ug/Kg						
Dibenzo(a,h)anthracene		<MDL	U	240	469	ug/Kg						
Dibenzofuran		<MDL	U	240	469	ug/Kg						
Diethyl Phthalate		<MDL	U	470	938	ug/Kg						
Dimethyl Phthalate		<MDL	U	469	469	ug/Kg						
Di-N-Butyl Phthalate		<MDL	U	470	938	ug/Kg						
Di-N-Octyl Phthalate		<MDL	U	469	469	ug/Kg						
Fluoranthene	1920			240	469	ug/Kg						
Fluorene		<MDL	UJ	240	469	ug/Kg						
Hexachlorobenzene		<MDL	U	24	46.9	ug/Kg						
Hexachlorobutadiene		<MDL	U	120	235	ug/Kg						
Indeno(1,2,3-Cd)Pyrene	350	<RDL	J	240	469	ug/Kg						
Naphthalene		<MDL	U	240	469	ug/Kg						
N-Nitrosodiphenylamine		<MDL	U	587	587	ug/Kg						
Pentachlorophenol		<MDL	U	3510	3510	ug/Kg						
Phenanthrene	1050			240	469	ug/Kg						
Phenol		<MDL	U	1200	3510	ug/Kg						
Pyrene	2130			240	469	ug/Kg						
Total HPAHS (calc)	10100			240	469	ug/Kg						
Total LPAHS (calc)	1050			240	469	ug/Kg						

* Not converted to dry weight basis

MDL - method detection limit

RDL - reporting detection limit

J - estimated value

U - not detected

Shaded value > source control

screening benchmark for CSO system

see Appendix F of King County 2016

Table B-4a. Combined sewer system solids sampling results for 2013.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A01007
 Descr: SEDIMENT TRAP / LO
 Sample: L57786-3
 Matrix: SH IN-LINESED
 ColDate: 4/16/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 60.2
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_A4007_U
 Descr: UPPER SEDIMENT TRA
 Sample: L57786-4
 Matrix: SH IN-LINESED
 ColDate: 4/30/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 55.9
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Fines*							30.4		J	1.1	2.3	%
Gravel*							0.7	<RDL	J	0.2	2.3	%
Sand*							66.9		J	0.2	2.3	%
Silt*							22.6		J	1.1	2.3	%
Clay*							7.9		J	1.1	2.3	%
p+0.00*							1.6	<RDL	J	0.2	2.3	%
p+1.00*							3.8		J	0.2	2.3	%
p+10.0(equal/more than)*							4.5		J	1.1	2.3	%
p+2.00*							19.4		J	0.2	2.3	%
p+3.00*							30.3		J	0.2	2.3	%
p+4.00*							11.9		J	0.2	2.3	%
p+5.00*							18		J	1.1	2.3	%
p+6.00*							1.1	<RDL	J	1.1	2.3	%
p+7.00*							2.3	RDL	J	1.1	2.3	%
p+8.00*							1.1	<RDL	J	1.1	2.3	%
p+9.00*							3.4		J	1.1	2.3	%
p-1.00*							0.7	<RDL	J	0.2	2.3	%
p-2.00(less than)*								<MDL	UJ	0.2	2.3	%
p-2.00*								<MDL	UJ	0.2	2.3	%
CV ASTM D422/D3977-97												
500 Micron (equal to/more than)*	34.3			0.005	0.01	%	8.71			0.005	0.01	%
CV ISO 13320:2009(E)												
Fines*	35.3			0.1	0.1	% Volume	44.8			0.1	0.1	% Volume
Sand<1000*	30.4			0.1	0.1	% Volume	46.5			0.1	0.1	% Volume
Silt*	32.2			0.1	0.1	% Volume	40.6			0.1	0.1	% Volume
Clay*	3.2			0.1	0.1	% Volume	4.2			0.1	0.1	% Volume
p+1.00*	1.5			0.1	0.1	% Volume	2.4			0.1	0.1	% Volume
p+10.0(more than)*		<MDL	J	0.1	0.1	% Volume		<MDL	J	0.1	0.1	% Volume
p+10.0*	0.8			0.1	0.1	% Volume	1			0.1	0.1	% Volume
p+2.00*	6.1			0.1	0.1	% Volume	10.7			0.1	0.1	% Volume
p+3.00*	9.4			0.1	0.1	% Volume	15.5			0.1	0.1	% Volume
p+4.00*	13.4			0.1	0.1	% Volume	17.9			0.1	0.1	% Volume
p+5.00*	9.6			0.1	0.1	% Volume	12.1			0.1	0.1	% Volume
p+6.00*	10.7			0.1	0.1	% Volume	13.1			0.1	0.1	% Volume
p+7.00*	7.5			0.1	0.1	% Volume	9.4			0.1	0.1	% Volume
p+8.00*	4.3			0.1	0.1	% Volume	6			0.1	0.1	% Volume
p+9.00*	2.3			0.1	0.1	% Volume	3.2			0.1	0.1	% Volume
CV SM2540-G												
Total Solids*	60.2			0.005	0.01	%	55.9			0.005	0.01	%
CV SW846 9060-PSEP96												
Total Organic Carbon	69300			8000	15900	mg/Kg	147000			16000	31500	mg/Kg
MT SW846 3050B*SW846 6010C												
Arsenic, Total, ICP	13.5			2	10.4	mg/Kg	6.1	<RDL	J	2.1	11.2	mg/Kg
Cadmium, Total, ICP	1.71			0.17	0.831	mg/Kg	2.61			0.18	0.894	mg/Kg
Chromium, Total, ICP	93.7			0.25	1.24	mg/Kg	39.4			0.27	1.34	mg/Kg
Copper, Total, ICP	154			0.33	1.66	mg/Kg	193			0.36	1.79	mg/Kg
Lead, Total, ICP	244			1.7	8.31	mg/Kg	151			1.8	8.94	mg/Kg
Nickel, Total, ICP	53.7			0.42	2.08	mg/Kg	33.6			0.45	2.24	mg/Kg
Silver, Total, ICP	3.12			0.33	1.66	mg/Kg	1.4	<RDL	J	0.36	1.79	mg/Kg
Vanadium, Total, ICP	40.5			0.83	4.15	mg/Kg	34.3			0.89	4.47	mg/Kg
Zinc, Total, ICP	832			0.42	2.08	mg/Kg	617			0.45	2.24	mg/Kg
MT SW846 7471B												
Mercury, Total, CVAA	0.25	<RDL	J	0.032	0.321	mg/Kg	0.835			0.034	0.347	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL	U	11	44.4	ug/Kg		<MDL	U	48	191	ug/Kg
Aroclor 1221		<MDL	U	33	44.4	ug/Kg		<MDL	U	140	191	ug/Kg
Aroclor 1232		<MDL	U	33	44.4	ug/Kg		<MDL	U	140	191	ug/Kg
Aroclor 1242	25	<RDL	J	11	44.4	ug/Kg	195			48	191	ug/Kg
Aroclor 1248		<MDL	U	11	44.4	ug/Kg		<MDL	U	48	191	ug/Kg
Aroclor 1254	608			11	44.4	ug/Kg	170	<RDL	J	48	191	ug/Kg
Aroclor 1260	111			11	44.4	ug/Kg	66	<RDL	J	48	191	ug/Kg
Total Aroclors (calc)	744		J	11	44.4	ug/Kg	428		J	48	191	ug/Kg
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene		<MDL	UJ	27	53.2	ug/Kg		<MDL	UJ	29	57.2	ug/Kg
1,2-Dichlorobenzene		<MDL	U	266	266	ug/Kg		<MDL	U	286	286	ug/Kg
1,4-Dichlorobenzene		<MDL	U	399	399	ug/Kg		<MDL	U	429	429	ug/Kg

Table B-4a. Combined sewer system solids sampling results for 2013.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A01007
 Descrip: SEDIMENT TRAP / LO
 Sample: L57786-3
 Matrix: SH IN-LINESED
 ColDate: 4/16/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 60.2
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_A4007_U
 Descrip: UPPER SEDIMENT TRA
 Sample: L57786-4
 Matrix: SH IN-LINESED
 ColDate: 4/30/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 55.9
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
2,4-Dimethylphenol		<MDL	UJ	270	532	ug/Kg		<MDL	UJ	290	572	ug/Kg
2-Methylnaphthalene	691			270	532	ug/Kg	14600			290	572	ug/Kg
2-Methylphenol		<MDL	U	270	532	ug/Kg		<MDL	U	290	572	ug/Kg
3,4-Methylphenol	1800	<RDL	J	1300	2660	ug/Kg	38100			1400	2860	ug/Kg
Acenaphthene		<MDL	U	270	532	ug/Kg		<MDL	U	290	572	ug/Kg
Acenaphthylene		<MDL	U	270	532	ug/Kg		<MDL	U	290	572	ug/Kg
Anthracene		<MDL	U	270	532	ug/Kg		<MDL	U	290	572	ug/Kg
Benzo(a)anthracene	1520			270	532	ug/Kg	1230			290	572	ug/Kg
Benzo(a)pyrene	1510			270	532	ug/Kg		<MDL	U	1100	2290	ug/Kg
Benzo(b,j,k)fluoranthene	3490			270	532	ug/Kg	2100	<RDL	J	1100	2290	ug/Kg
Benzo(g,h,i)perylene	480	<RDL	J	270	532	ug/Kg		<MDL	U	1100	2290	ug/Kg
Benzoic Acid		<MDL	U	5320	5320	ug/Kg		<MDL	U	5720	5720	ug/Kg
Benzyl Alcohol		<MDL	U	664	664	ug/Kg		<MDL	U	716	716	ug/Kg
Benzyl Butyl Phthalate	2110			399	399	ug/Kg		<MDL	U	429	429	ug/Kg
Bis(2-Ethylhexyl)Phthalate	405000	J	J	2200	4250	ug/Kg	19900			570	1140	ug/Kg
Chrysene	1740			270	532	ug/Kg	1720			290	572	ug/Kg
Dibenzo(a,h)anthracene		<MDL	U	270	532	ug/Kg		<MDL	U	1100	2290	ug/Kg
Dibenzofuran		<MDL	U	270	532	ug/Kg		<MDL	U	290	572	ug/Kg
Diethyl Phthalate		<MDL	U	530	1060	ug/Kg		<MDL	U	570	1140	ug/Kg
Dimethyl Phthalate		<MDL	U	532	532	ug/Kg		<MDL	U	572	572	ug/Kg
Di-N-Butyl Phthalate		<MDL	U	530	1060	ug/Kg		<MDL	U	570	1140	ug/Kg
Di-N-Octyl Phthalate	13300			532	532	ug/Kg		<MDL	U	2290	2290	ug/Kg
Fluoranthene	2260			270	532	ug/Kg	1860			290	572	ug/Kg
Fluorene		<MDL	UJ	270	532	ug/Kg		<MDL	UJ	290	572	ug/Kg
Hexachlorobenzene		<MDL	U	27	53.2	ug/Kg		<MDL	U	29	57.2	ug/Kg
Hexachlorobutadiene		<MDL	U	130	266	ug/Kg		<MDL	U	140	286	ug/Kg
Indeno(1,2,3-Cd)Pyrene	551			270	532	ug/Kg		<MDL	U	1100	2290	ug/Kg
Naphthalene		<MDL	U	270	532	ug/Kg	4010			290	572	ug/Kg
N-Nitrosodiphenylamine		<MDL	U	664	664	ug/Kg		<MDL	U	716	716	ug/Kg
Pentachlorophenol		<MDL	U	3990	3990	ug/Kg		<MDL	U	4290	4290	ug/Kg
Phenanthrene	1070			270	532	ug/Kg	5970			290	572	ug/Kg
Phenol		<MDL	U	1300	3990	ug/Kg		<MDL	U	1400	4290	ug/Kg
Pyrene	2390			270	532	ug/Kg	3760			290	572	ug/Kg
Total HPAHS (calc)	14000			270	532	ug/Kg	10700			290	572	ug/Kg
Total LPAHS (calc)	1070			270	532	ug/Kg	9980			290	572	ug/Kg

* Not converted to dry weight basis

MDL - method detection limit

RDL - reporting detection limit

J - estimated value

U - not detected

Shaded value > source control

screening benchmark for CSO system

see Appendix F of King County 2016

Table B-4a. Combined sewer system solids sampling results for 2013.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A4007_L
 Descrip: LOWER SEDIMENT TRA
 Sample: L57786-5
 Matrix: SH IN-LINESED
 ColDate: 4/30/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 50.2
 DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422						
Fines*	44.6		J	1.3	2.6	%
Gravel*	0.8	<RDL	J	0.3	2.6	%
Sand*	57.1		J	0.3	2.6	%
Silt*	34.4		J	1.3	2.6	%
Clay*	10.2		J	1.3	2.6	%
p+0.00*	1.7	<RDL	J	0.3	2.6	%
p+1.00*	5.2		J	0.3	2.6	%
p+10.0(equal/more than)*	7.7		J	1.3	2.6	%
p+2.00*	16.9		J	0.3	2.6	%
p+3.00*	20.4		J	0.3	2.6	%
p+4.00*	12.9		J	0.3	2.6	%
p+5.00*	25.5		J	1.3	2.6	%
p+6.00*	5.1		J	1.3	2.6	%
p+7.00*	2.6	RDL	J	1.3	2.6	%
p+8.00*	1.3	<RDL	J	1.3	2.6	%
p+9.00*	2.6	RDL	J	1.3	2.6	%
p-1.00*	0.8	<RDL	J	0.3	2.6	%
p-2.00(less than)*		<MDL	UJ	0.3	2.6	%
p-2.00*		<MDL	UJ	0.3	2.6	%
CV ASTM D422/D3977-97						
500 Micron (equal to/more than)*	9.47			0.005	0.01	%
CV ISO 13320:2009(E)						
Fines*	48.7			0.1	0.1	% Volume
Sand<1000*	41.8			0.1	0.1	% Volume
Silt*	44.6			0.1	0.1	% Volume
Clay*	4.1			0.1	0.1	% Volume
p+1.00*	2.1			0.1	0.1	% Volume
p+10.0(more than)*		<MDL	U	0.1	0.1	% Volume
p+10.0*	1			0.1	0.1	% Volume
p+2.00*	8.6			0.1	0.1	% Volume
p+3.00*	13			0.1	0.1	% Volume
p+4.00*	18.1			0.1	0.1	% Volume
p+5.00*	13.5			0.1	0.1	% Volume
p+6.00*	14.9			0.1	0.1	% Volume
p+7.00*	10.3			0.1	0.1	% Volume
p+8.00*	5.9			0.1	0.1	% Volume
p+9.00*	3			0.1	0.1	% Volume
CV SM2540-G						
Total Solids*	50.2			0.005	0.01	%
CV SW846 9060-PSEP96						
Total Organic Carbon	165000			18000	36100	mg/Kg
MT SW846 3050B*SW846 6010C						
Arsenic, Total, ICP	5.6	<RDL	J	2.4	12.4	mg/Kg
Cadmium, Total, ICP	3.45			0.2	0.994	mg/Kg
Chromium, Total, ICP	60.4	J	J	0.3	1.49	mg/Kg
Copper, Total, ICP	192			0.4	1.99	mg/Kg
Lead, Total, ICP	357	J	J	2	9.94	mg/Kg
Nickel, Total, ICP	43.4			0.5	2.49	mg/Kg
Silver, Total, ICP	3.17			0.4	1.99	mg/Kg
Vanadium, Total, ICP	45.6			1	4.96	mg/Kg
Zinc, Total, ICP	805	J	J	0.5	2.49	mg/Kg
MT SW846 7471B						
Mercury, Total, CVAA	1.11			0.038	0.388	mg/Kg
OR SW846 3550B*SW846 8082A						
Aroclor 1016		<MDL	U	26	106	ug/Kg
Aroclor 1221		<MDL	U	80	106	ug/Kg
Aroclor 1232		<MDL	U	80	106	ug/Kg
Aroclor 1242	279		J	26	106	ug/Kg
Aroclor 1248		<MDL	U	26	106	ug/Kg
Aroclor 1254	189			26	106	ug/Kg
Aroclor 1260	46	<RDL	J	26	106	ug/Kg
Total Aroclors (calc)	514		J	26	106	ug/Kg
OR SW846 3550B*SW846 8270D						
1,2,4-Trichlorobenzene		<MDL	UJ	32	63.7	ug/Kg
1,2-Dichlorobenzene		<MDL	U	319	319	ug/Kg
1,4-Dichlorobenzene		<MDL	U	478	478	ug/Kg

Table B-4a. Combined sewer system solids sampling results for 2013.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A4007_L
 Descrip: LOWER SEDIMENT TRA
 Sample: L57786-5
 Matrix: SH IN-LINESED
 ColDate: 4/30/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 50.2
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units
2,4-Dimethylphenol		<MDL	UJ	320	637	ug/Kg
2-Methylnaphthalene	13000			320	637	ug/Kg
2-Methylphenol		<MDL	U	320	637	ug/Kg
3-,4-Methylphenol	38200			1600	3190	ug/Kg
Acenaphthene		<MDL	U	320	637	ug/Kg
Acenaphthylene		<MDL	U	320	637	ug/Kg
Anthracene		<MDL	U	320	637	ug/Kg
Benzo(a)anthracene	1040			320	637	ug/Kg
Benzo(a)pyrene		<MDL	U	1300	2550	ug/Kg
Benzo(b,j,k)fluoranthene	2000	<RDL	J	1300	2550	ug/Kg
Benzo(g,h,i)perylene		<MDL	U	1300	2550	ug/Kg
Benzoic Acid		<MDL	U	6370	6370	ug/Kg
Benzyl Alcohol		<MDL	U	797	797	ug/Kg
Benzyl Butyl Phthalate	1730			478	478	ug/Kg
Bis(2-Ethylhexyl)Phthalate	15400			640	1270	ug/Kg
Chrysene	1370			320	637	ug/Kg
Dibenzo(a,h)anthracene		<MDL	U	1300	2550	ug/Kg
Dibenzofuran		<MDL	U	320	637	ug/Kg
Diethyl Phthalate		<MDL	U	640	1270	ug/Kg
Dimethyl Phthalate		<MDL	U	637	637	ug/Kg
Di-N-Butyl Phthalate		<MDL	U	640	1270	ug/Kg
Di-N-Octyl Phthalate		<MDL	U	2550	2550	ug/Kg
Fluoranthene	1680			320	637	ug/Kg
Fluorene		<MDL	UJ	320	637	ug/Kg
Hexachlorobenzene		<MDL	U	32	63.7	ug/Kg
Hexachlorobutadiene		<MDL	U	160	319	ug/Kg
Indeno(1,2,3-Cd)Pyrene		<MDL	U	1300	2550	ug/Kg
Naphthalene	3940			320	637	ug/Kg
N-Nitrosodiphenylamine		<MDL	U	797	797	ug/Kg
Pentachlorophenol		<MDL	U	4780	4780	ug/Kg
Phenanthrene	5020			320	637	ug/Kg
Phenol		<MDL	U	1600	4780	ug/Kg
Pyrene	2810			320	637	ug/Kg
Total HPAHS (calc)	8900			320	637	ug/Kg
Total LPAHS (calc)	8960			320	637	ug/Kg

* Not converted to dry weight basis

MDL - method detection limit

RDL - reporting detectin limit

J - estimated value

U- not detected

Shaded value > source control

screening benchmark for CSO system

see Appendix F of King County 2016

Table B-4b. Combined sewer system solids sampling results for 2013.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A4007_U
 Descrip: UPPER SEDIMENT TRA
 Sample: L59112-1
 Matrix: SH IN-LINESED
 ColDate: 10/29/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 43.7
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_A4007_L
 Descrip: LOWER SEDIMENT TRA
 Sample: L59112-2
 Matrix: SH IN-LINESED
 ColDate: 10/29/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 62
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Fines*							35.6			1.5	3.1	%
Gravel*							0.5	<RDL	J	0.3	3.1	%
Sand*							64.7			0.3	3.1	%
Silt*							26.3			1.5	3.1	%
Clay*							9.3			1.5	3.1	%
p+0.00*							1.6	<RDL	J	0.3	3.1	%
p+1.00*							2.9	<RDL	J	0.3	3.1	%
p+10.0(equal/more than)*							6.2			1.5	3.1	%
p+2.00*							15.4			0.3	3.1	%
p+3.00*							28.9			0.3	3.1	%
p+4.00*							16			0.3	3.1	%
p+5.00*							17			1.5	3.1	%
p+6.00*								<MDL	U	1.5	3.1	%
p+7.00*							6.2			1.5	3.1	%
p+8.00*							3.1	RDL	J	1.5	3.1	%
p+9.00*							3.1	RDL	J	1.5	3.1	%
p-1.00*							0.5	<RDL	J	0.3	3.1	%
p-2.00(less than)*								<MDL	U	0.3	3.1	%
p-2.00*								<MDL	U	0.3	3.1	%
CV ASTM D422/D3977-97												
500 Micron (equal to/more than)*							6.62			0.005	0.01	%
CV ISO 13320:2009(E)												
Fines*							42.69			0.01	0.01	% Volume
Sand<1000*							50.69			0.01	0.01	% Volume
Silt*							38.79			0.01	0.01	% Volume
Clay*							3.9			0.01	0.01	% Volume
p+1.00*							2.55			0.01	0.01	% Volume
p+10.0(more than)*								<MDL	U	0.01	0.01	% Volume
p+10.0*							0.91			0.01	0.01	% Volume
p+2.00*							13.51			0.01	0.01	% Volume
p+3.00*							17.29			0.01	0.01	% Volume
p+4.00*							17.34			0.01	0.01	% Volume
p+5.00*							11.62			0.01	0.01	% Volume
p+6.00*							12.4			0.01	0.01	% Volume
p+7.00*							9.04			0.01	0.01	% Volume
p+8.00*							5.73			0.01	0.01	% Volume
p+9.00*							3			0.01	0.01	% Volume
CV SM2540-G												
Total Solids*	43.7			0.005	0.01	%	62			0.005	0.01	%
CV SW846 9060 PSEP96												
Total Organic Carbon	95700			9800	19800	mg/Kg	90800			14000	27600	mg/Kg
MT SW846 3050B*SW846 6010C												
Arsenic, Total, ICP							4.7	<RDL	J	1.9	10.1	mg/Kg
Cadmium, Total, ICP							2.27			0.16	0.806	mg/Kg
Chromium, Total, ICP							33.7			0.24	1.21	mg/Kg
Copper, Total, ICP							182			0.32	1.61	mg/Kg
Lead, Total, ICP							105		J	1.6	8.06	mg/Kg
Nickel, Total, ICP							28.2			0.4	2.02	mg/Kg
Silver, Total, ICP							1.4	<RDL	J	0.32	1.61	mg/Kg
Vanadium, Total, ICP							25.2			0.81	4.03	mg/Kg
Zinc, Total, ICP							584			0.4	2.02	mg/Kg
MT SW846 7471B												
Mercury, Total, CVAA	0.3	<RDL	J	0.046	0.458	mg/Kg	0.29	<RDL	J	0.032	0.319	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL	U	46	183	ug/Kg		<MDL	U	32	129	ug/Kg
Aroclor 1221		<MDL	U	140	183	ug/Kg		<MDL	U	97	129	ug/Kg
Aroclor 1232		<MDL	U	140	183	ug/Kg		<MDL	U	97	129	ug/Kg
Aroclor 1242	565			46	183	ug/Kg	435			32	129	ug/Kg
Aroclor 1248		<MDL	U	46	183	ug/Kg		<MDL	J	32	129	ug/Kg
Aroclor 1254	318			46	183	ug/Kg	240			32	129	ug/Kg
Aroclor 1260	192			46	183	ug/Kg	89	<RDL	J	32	129	ug/Kg
Total Aroclors (calc)	1070			46	183	ug/Kg	765		J	32	129	ug/Kg
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene								<MDL	U	26	51.6	ug/Kg
1,2-Dichlorobenzene							302	J	J	258	258	ug/Kg
1,4-Dichlorobenzene								<MDL	U	387	387	ug/Kg

Table B-4b. Combined sewer system solids sampling results for 2013.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A4007_U
 Descrip: UPPER SEDIMENT TRA
 Sample: L59112-1
 Matrix: SH IN-LINESED
 ColDate: 10/29/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 43.7
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_A4007_L
 Descrip: LOWER SEDIMENT TRA
 Sample: L59112-2
 Matrix: SH IN-LINESED
 ColDate: 10/29/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 62
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
2,4-Dimethylphenol								<MDL	U	260	516	ug/Kg
2-Methylnaphthalene							18400			260	516	ug/Kg
2-Methylphenol								<MDL	U	260	516	ug/Kg
3-,4-Methylphenol							127000			1300	2580	ug/Kg
Acenaphthene								<MDL	U	260	516	ug/Kg
Acenaphthylene								<MDL	U	260	516	ug/Kg
Anthracene							500	<RDL	J	260	516	ug/Kg
Benzo(a)anthracene							919			260	516	ug/Kg
Benzo(a)pyrene							968			260	516	ug/Kg
Benzo(b,j,k)fluoranthene							1980			260	516	ug/Kg
Benzo(g,h,i)perylene							450	<RDL	J	260	516	ug/Kg
Benzoic Acid								<MDL	U	5160	5160	ug/Kg
Benzyl Alcohol								<MDL	U	645	645	ug/Kg
Benzyl Butyl Phthalate							965			387	387	ug/Kg
Bis(2-Ethylhexyl)Phthalate							11400	J		520	1030	ug/Kg
Carbazole								<MDL	U	260	516	ug/Kg
Chrysene							1470			260	516	ug/Kg
Dibenzo(a,h)anthracene								<MDL	U	260	516	ug/Kg
Dibenzofuran								<MDL	U	260	516	ug/Kg
Diethyl Phthalate								<MDL	U	520	1030	ug/Kg
Dimethyl Phthalate								<MDL	U	516	516	ug/Kg
Di-N-Butyl Phthalate								<MDL	U	520	1030	ug/Kg
Di-N-Octyl Phthalate								<MDL	U	516	516	ug/Kg
Fluoranthene							1890			260	516	ug/Kg
Fluorene							2020			260	516	ug/Kg
Hexachlorobenzene								<MDL	U	26	51.6	ug/Kg
Hexachlorobutadiene								<MDL	U	130	258	ug/Kg
Indeno(1,2,3-Cd)Pyrene							480	<RDL	J	260	516	ug/Kg
Naphthalene							2890			260	516	ug/Kg
N-Nitrosodiphenylamine								<MDL	U	645	645	ug/Kg
Pentachlorophenol								<MDL	U	3870	3870	ug/Kg
Phenanthrene							6320			260	516	ug/Kg
Phenol								<MDL	U	1300	3870	ug/Kg
Pyrene							2660			260	516	ug/Kg
Total HPAHS (calc)							10800			260	516	ug/Kg
Total LPAHS (calc)							11700			260	516	ug/Kg

* Not converted to dry weight basis
 MDL - method detection limit
 RDL - reporting detectin limit
 J - estimated value
 U- not detected
 Shaded value > source control
 screening benchmark for CSO system
 see Appendix F of King County 2016

Table B-4b. Combined sewer system solids sampling results for 2013.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_BRANDREG_U
 Descr: UPPER SEDIMENT TRA
 Sample: L59112-3
 Matrix: SH IN-LINESED
 ColDate: 10/29/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 52.8
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_BRANDREG_L
 Descr: LOWER SEDIMENT TRA
 Sample: L59112-4
 Matrix: SH IN-LINESED
 ColDate: 10/29/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 64.8
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Fines*	57.7			1.8	3.6	%						
Gravel*	<MDL	U		0.3	2.9	%						
Sand*	43.4			0.3	2.9	%						
Silt*	48.7			1.8	3.6	%						
Clay*	9			1.8	3.6	%						
p+0.00*	0.7	<RDL	J	0.3	2.9	%						
p+1.00*	1.7	<RDL	J	0.3	2.9	%						
p+10.0(equal/more than)*	9			1.8	3.6	%						
p+2.00*	4.8			0.3	2.9	%						
p+3.00*	17.9			0.3	2.9	%						
p+4.00*	18.2			0.3	2.9	%						
p+5.00*	28.9			1.8	3.6	%						
p+6.00*	7.2			1.8	3.6	%						
p+7.00*	7.2			1.8	3.6	%						
p+8.00*	5.4			1.8	3.6	%						
p+9.00*		<MDL	U	1.8	3.6	%						
p-1.00*		<MDL	U	0.3	2.9	%						
p-2.00(less than)*		<MDL	U	0.3	2.9	%						
p-2.00*		<MDL	U	0.3	2.9	%						
CV ASTM D422/D3977-97												
500 Micron (equal to/more than)*	2.11			0.005	0.01	%	3.28			0.005	0.01	%
CV ISO 13320:2009(E)												
Fines*	35.53			0.01	0.01	% Volume	46.78			0.01	0.01	% Volume
Sand<1000*	62.33			0.01	0.01	% Volume	49.94			0.01	0.01	% Volume
Silt*	32.94			0.01	0.01	% Volume	41.92			0.01	0.01	% Volume
Clay*	2.6			0.01	0.01	% Volume	4.86			0.01	0.01	% Volume
p+1.00*	3			0.01	0.01	% Volume	3.69			0.01	0.01	% Volume
p+10.0(more than)*	<MDL	U		0.01	0.01	% Volume	0.05			0.01	0.01	% Volume
p+10.0*	0.65			0.01	0.01	% Volume	1.18			0.01	0.01	% Volume
p+2.00*	12.86			0.01	0.01	% Volume	12.15			0.01	0.01	% Volume
p+3.00*	23.04			0.01	0.01	% Volume	16.19			0.01	0.01	% Volume
p+4.00*	23.43			0.01	0.01	% Volume	17.9			0.01	0.01	% Volume
p+5.00*	11.44			0.01	0.01	% Volume	11.6			0.01	0.01	% Volume
p+6.00*	10.71			0.01	0.01	% Volume	13.09			0.01	0.01	% Volume
p+7.00*	6.94			0.01	0.01	% Volume	10.38			0.01	0.01	% Volume
p+8.00*	3.85			0.01	0.01	% Volume	6.85			0.01	0.01	% Volume
p+9.00*	1.95			0.01	0.01	% Volume	3.63			0.01	0.01	% Volume
CV SM2540-G												
Total Solids*	52.8			0.005	0.01	%	64.8			0.005	0.01	%
CV SW846 9060 PSEP96												
Total Organic Carbon	71600			13000	25200	mg/Kg	79900			14000	28100	mg/Kg
MT SW846 3050B*SW846 6010C												
Arsenic, Total, ICP	11	<RDL	J	2.3	11.8	mg/Kg	8	<RDL	J	1.9	9.63	mg/Kg
Cadmium, Total, ICP	1.93			0.19	0.945	mg/Kg	2.33			0.15	0.772	mg/Kg
Chromium, Total, ICP	83.3			0.28	1.42	mg/Kg	72.8			1.2	5.79	mg/Kg
Copper, Total, ICP	197			0.38	1.89	mg/Kg	211			0.31	1.54	mg/Kg
Lead, Total, ICP	119	J		1.9	9.45	mg/Kg	96.5	J		7.7	38.6	mg/Kg
Nickel, Total, ICP	80.7			0.47	2.37	mg/Kg	66.2			1.9	9.63	mg/Kg
Silver, Total, ICP	3.18			0.38	1.89	mg/Kg	2.53	J	J	0.31	1.54	mg/Kg
Vanadium, Total, ICP	43.2			0.95	4.73	mg/Kg	37.7			0.77	3.86	mg/Kg
Zinc, Total, ICP	775			0.47	2.37	mg/Kg	684			0.39	1.93	mg/Kg
MT SW846 7471B												
Mercury, Total, CVAA	0.415			0.036	0.367	mg/Kg	0.28	<RDL,J	J	0.031	0.306	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016	<MDL	U		7.6	30.3	ug/Kg	<MDL	U		6.2	24.7	ug/Kg
Aroclor 1221	<MDL	U		23	30.3	ug/Kg	<MDL	U		19	24.7	ug/Kg
Aroclor 1232	<MDL	U		23	30.3	ug/Kg	<MDL	U		19	24.7	ug/Kg
Aroclor 1242	31.6			7.6	30.3	ug/Kg	23	<RDL	J	6.2	24.7	ug/Kg
Aroclor 1248	<MDL	U		7.6	30.3	ug/Kg	<MDL	U		6.2	24.7	ug/Kg
Aroclor 1254	107			7.6	30.3	ug/Kg	125			6.2	24.7	ug/Kg
Aroclor 1260	77.8			7.6	30.3	ug/Kg	53.1			6.2	24.7	ug/Kg
Total Aroclors (calc)	217			7.6	30.3	ug/Kg	201		J	6.2	24.7	ug/Kg
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene	<MDL	U		30	60.6	ug/Kg	<MDL	U		25	49.4	ug/Kg
1,2-Dichlorobenzene	<MDL	UJ		303	303	ug/Kg	<MDL	U		247	247	ug/Kg
1,4-Dichlorobenzene	<MDL	U		455	455	ug/Kg	<MDL	U		370	370	ug/Kg

Table B-4b. Combined sewer system solids sampling results for 2013.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_BRANDREG_U
 Descrip: UPPER SEDIMENT TRA
 Sample: L59112-3
 Matrix: SH IN-LINESED
 ColDate: 10/29/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 52.8
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_BRANDREG_L
 Descrip: LOWER SEDIMENT TRA
 Sample: L59112-4
 Matrix: SH IN-LINESED
 ColDate: 10/29/13 0:00
 Sample type: Sediment Trap
 TotalSolid: 64.8
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
2,4-Dimethylphenol		<MDL	U	300	606	ug/Kg		<MDL	U	250	494	ug/Kg
2-Methylnaphthalene		<MDL	U	300	606	ug/Kg		<MDL	U	250	494	ug/Kg
2-Methylphenol		<MDL	U	300	606	ug/Kg		<MDL	U	250	494	ug/Kg
3,4-Methylphenol		<MDL	U	1500	3030	ug/Kg		<MDL	U	1200	2470	ug/Kg
Acenaphthene		<MDL	U	300	606	ug/Kg		<MDL	U	250	494	ug/Kg
Acenaphthylene		<MDL	U	300	606	ug/Kg		<MDL	U	250	494	ug/Kg
Anthracene		<MDL	U	300	606	ug/Kg		<MDL	U	250	494	ug/Kg
Benzo(a)anthracene	1090			300	606	ug/Kg	798			250	494	ug/Kg
Benzo(a)pyrene	1160			300	606	ug/Kg	736			250	494	ug/Kg
Benzo(b,j,k)fluoranthene	2900			300	606	ug/Kg	1740			250	494	ug/Kg
Benzo(g,h,i)perylene	693			300	606	ug/Kg	320	<RDL	J	250	494	ug/Kg
Benzoic Acid		<MDL	U	6060	6060	ug/Kg		<MDL	U	4940	4940	ug/Kg
Benzyl Alcohol		<MDL	U	758	758	ug/Kg		<MDL	U	617	617	ug/Kg
Benzyl Butyl Phthalate	703			455	455	ug/Kg	1050			370	370	ug/Kg
Bis(2-Ethylhexyl)Phthalate	12300			610	1210	ug/Kg	15200			490	988	ug/Kg
Carbazole		<MDL	U	300	606	ug/Kg		<MDL	U	250	494	ug/Kg
Chrysene	2010			300	606	ug/Kg	1230			250	494	ug/Kg
Dibenzo(a,h)anthracene		<MDL	U	300	606	ug/Kg		<MDL	U	250	494	ug/Kg
Dibenzofuran		<MDL	U	300	606	ug/Kg		<MDL	U	250	494	ug/Kg
Diethyl Phthalate		<MDL	U	610	1210	ug/Kg		<MDL	U	490	988	ug/Kg
Dimethyl Phthalate		<MDL	U	606	606	ug/Kg		<MDL	U	494	494	ug/Kg
Di-N-Butyl Phthalate	630	<RDL	J	610	1210	ug/Kg		<MDL	U	490	988	ug/Kg
Di-N-Octyl Phthalate	6890			606	606	ug/Kg	6540			494	494	ug/Kg
Fluoranthene	2880			300	606	ug/Kg	1710			250	494	ug/Kg
Fluorene		<MDL	U	300	606	ug/Kg		<MDL	U	250	494	ug/Kg
Hexachlorobenzene		<MDL	U	30	60.6	ug/Kg		<MDL	U	25	49.4	ug/Kg
Hexachlorobutadiene		<MDL	U	150	303	ug/Kg		<MDL	U	120	247	ug/Kg
Indeno(1,2,3-Cd)Pyrene	830			300	606	ug/Kg	514			250	494	ug/Kg
Naphthalene		<MDL	U	300	606	ug/Kg		<MDL	U	250	494	ug/Kg
N-Nitrosodiphenylamine		<MDL	U	758	758	ug/Kg		<MDL	U	617	617	ug/Kg
Pentachlorophenol		<MDL	U	4550	4550	ug/Kg		<MDL	U	3700	3700	ug/Kg
Phenanthrene	1250			300	606	ug/Kg	860			250	494	ug/Kg
Phenol		<MDL	U	1500	4550	ug/Kg		<MDL	U	1200	3700	ug/Kg
Pyrene	2630			300	606	ug/Kg	1700			250	494	ug/Kg
Total HPAHS (calc)	14200			300	606	ug/Kg	8760			250	494	ug/Kg
Total LPAHS (calc)	1250			300	606	ug/Kg	860			250	494	ug/Kg

* Not converted to dry weight basis

MDL - method detection limit

RDL - reporting detection limit

J - estimated value

U - not detected

Shaded value > source control

screening benchmark for CSO system

see Appendix F of King County 2016

Table B-5. Combined sewer system solids sampling results for 2014.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_BRANDREG_U
 Descrip: UPPER SEDIMENT TRA
 Sample: L60792-1
 Matrix: SH IN-LINESED
 ColDate: 7/16/14 12:00
 Sample type: Sediment Trap
 TotalSolid: 56.1
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_BRANDREG_L
 Descrip: LOWER SEDIMENT TRA
 Sample: L60792-2
 Matrix: SH IN-LINESED
 ColDate: 7/16/14 12:00
 Sample type: Sediment Trap
 TotalSolid: 52
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Clay*							13.4	J	J	1.5	3	%
Fines*							28.4	J	J	1.5	3	%
Gravel*							4.4	J	J	0.3	2.7	%
p+0.00*							9.9	J	J	0.3	2.7	%
p+1.00*							6.2	J	J	0.3	2.7	%
p+10.0(equal/more than)*							9	J	J	1.5	3	%
p+2.00*							5.8	J	J	0.3	2.7	%
p+3.00*							10.3	J	J	0.3	2.7	%
p+4.00*							13.9	J	J	0.3	2.7	%
p+5.00*							7.5	J	J	1.5	3	%
p+6.00*							1.5	<RDL,J	J	1.5	3	%
p+7.00*							4.5	J	J	1.5	3	%
p+8.00*							1.5	<RDL,J	J	1.5	3	%
p+9.00*							4.5	J	J	1.5	3	%
p-1.00*							4.4	J	J	0.3	2.7	%
p-2.00(less than)*								<MDL,J	UJ	0.3	2.7	%
p-2.00*								<MDL,J	UJ	0.3	2.7	%
Sand*							46.2	J	J	0.3	2.7	%
Silt*							14.9	J	J	1.5	3	%
CV ASTM D422/D3977-97												
500 Micron (equal to/more than)*	2.46			0.005	0.01	%	22			0.005	0.01	%
CV ISO 13320:2009(E)												
Clay*	4.34			0.01	0.01	% Volume	3.52			0.01	0.01	% Volume
Fines*	50.47			0.01	0.01	% Volume	33.82			0.01	0.01	% Volume
p+1.00*	2.55			0.01	0.01	% Volume	3.81			0.01	0.01	% Volume
p+10.0(more than)*	0.15			0.01	0.01	% Volume		<MDL	U	0.01	0.01	% Volume
p+10.0*	1.09			0.01	0.01	% Volume	0.81			0.01	0.01	% Volume
p+2.00*	8.39			0.01	0.01	% Volume	10.39			0.01	0.01	% Volume
p+3.00*	14.1			0.01	0.01	% Volume	14.1			0.01	0.01	% Volume
p+4.00*	22.03			0.01	0.01	% Volume	15.84			0.01	0.01	% Volume
p+5.00*	15.36			0.01	0.01	% Volume	9.28			0.01	0.01	% Volume
p+6.00*	14.79			0.01	0.01	% Volume	9.41			0.01	0.01	% Volume
p+7.00*	9.97			0.01	0.01	% Volume	6.91			0.01	0.01	% Volume
p+8.00*	6.02			0.01	0.01	% Volume	4.71			0.01	0.01	% Volume
p+9.00*	3.1			0.01	0.01	% Volume	2.71			0.01	0.01	% Volume
Sand<1000*	47.07			0.01	0.01	% Volume	44.14			0.01	0.01	% Volume
Silt*	46.14			0.01	0.01	% Volume	30.31			0.01	0.01	% Volume
CV SM2540-G												
Total Solids*	56.1			0.005	0.01	%	52			0.005	0.01	%
CV SW846 9060 PSEP96												
Total Organic Carbon	74000			12000	23700	mg/Kg	106000			17000	34400	mg/Kg
MT SW846 3050B*SW846 6010C												
Arsenic, Total, ICP	7.8	<RDL	J	2.1	11	mg/Kg	5.6	<RDL	J	2.3	11.7	mg/Kg
Cadmium, Total, ICP	3.19			0.18	0.882	mg/Kg	3.02			0.19	0.937	mg/Kg
Chromium, Total, ICP	57.9			0.27	1.32	mg/Kg	58.3			0.29	1.41	mg/Kg
Copper, Total, ICP	187			0.36	1.76	mg/Kg	160			0.37	1.88	mg/Kg
Lead, Total, ICP	125			1.8	8.82	mg/Kg	93.8			1.9	9.37	mg/Kg
Nickel, Total, ICP	62.9			0.45	2.21	mg/Kg	56.9			0.46	2.35	mg/Kg
Silver, Total, ICP	4.65	J	J	0.36	1.76	mg/Kg	2.4			0.37	1.88	mg/Kg
Vanadium, Total, ICP	43.1			0.87	4.4	mg/Kg	35.8			0.94	4.69	mg/Kg
Zinc, Total, ICP	811			0.45	2.21	mg/Kg	560			0.46	2.35	mg/Kg
MT SW846 7471B												
Mercury, Total, CVAA	0.32	<RDL,H	J	0.036	0.351	mg/Kg	0.479	J,H	J	0.037	0.365	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL	U	29	114	ug/Kg		<MDL	U	15	61.5	ug/Kg
Aroclor 1221		<MDL	U	86	114	ug/Kg		<MDL	U	46	61.5	ug/Kg
Aroclor 1232		<MDL	U	86	114	ug/Kg		<MDL	U	46	61.5	ug/Kg
Aroclor 1242	45	<RDL	J	29	114	ug/Kg		<MDL	U	15	61.5	ug/Kg
Aroclor 1248		<MDL	U	29	114	ug/Kg		<MDL	U	15	61.5	ug/Kg
Aroclor 1254	184			29	114	ug/Kg	108			15	61.5	ug/Kg
Aroclor 1260	133			29	114	ug/Kg	70.6			15	61.5	ug/Kg
Total Aroclors (calc)	361		J	29	114	ug/Kg	178			15	61.5	ug/Kg
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene								<MDL	U	31	61.5	ug/Kg
1,2-Dichlorobenzene								<MDL	U	308	308	ug/Kg
1,4-Dichlorobenzene								<MDL	U	462	462	ug/Kg

Table B-5. Combined sewer system solids sampling results for 2014.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_BRANDREG_U
 Descrip: UPPER SEDIMENT TRA
 Sample: L60792-1
 Matrix: SH IN-LINESED
 ColDate: 7/16/14 12:00
 Sample type: Sediment Trap
 TotalSolid: 56.1
 DRY Weight Basis

Project: 423589-340-4
 Locator: ST_BRANDREG_L
 Descrip: LOWER SEDIMENT TRA
 Sample: L60792-2
 Matrix: SH IN-LINESED
 ColDate: 7/16/14 12:00
 Sample type: Sediment Trap
 TotalSolid: 52
 DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
2,4-Dimethylphenol							<MDL	U		310	615	ug/Kg
2-Methylnaphthalene							<MDL	U		310	615	ug/Kg
2-Methylphenol							<MDL	U		310	615	ug/Kg
3-,4-Methylphenol	84400									1500	3080	ug/Kg
Acenaphthene							<MDL	U		310	615	ug/Kg
Acenaphthylene							<MDL	U		310	615	ug/Kg
Anthracene							<MDL	U		310	615	ug/Kg
Benzo(a)anthracene	2100						<RDL	J		1500	3080	ug/Kg
Benzo(a)pyrene	520						<RDL	J		310	615	ug/Kg
Benzo(b,j,k)fluoranthene	1230									310	615	ug/Kg
Benzo(g,h,i)perylene	350						<RDL	J		310	615	ug/Kg
Benzoic Acid							<MDL	U		6150	6150	ug/Kg
Benzyl Alcohol							<MDL	U		769	769	ug/Kg
Benzyl Butyl Phthalate							<MDL	U		462	462	ug/Kg
Bis(2-Ethylhexyl)Phthalate	14300									620	1230	ug/Kg
Carbazole							<MDL	U		310	615	ug/Kg
Chrysene	785									310	615	ug/Kg
Dibenzo(a,h)anthracene							<MDL	U		310	615	ug/Kg
Dibenzofuran							<MDL	U		310	615	ug/Kg
Diethyl Phthalate							<MDL	U		620	1230	ug/Kg
Dimethyl Phthalate							<MDL	U		615	615	ug/Kg
Di-N-Butyl Phthalate							<MDL,JG	UJ		620	1230	ug/Kg
Di-N-Octyl Phthalate	4900									615	615	ug/Kg
Fluoranthene	833									310	615	ug/Kg
Fluorene							<MDL	U		310	615	ug/Kg
Hexachlorobenzene							<MDL	U		31	61.5	ug/Kg
Hexachlorobutadiene							<MDL	U		150	308	ug/Kg
Indeno(1,2,3-Cd)Pyrene	330						<RDL	J		310	615	ug/Kg
Naphthalene							<MDL	U		310	615	ug/Kg
N-Nitrosodiphenylamine							<MDL	U		769	769	ug/Kg
Pentachlorophenol							<MDL	U		4620	4620	ug/Kg
Phenanthrene							<MDL	U		310	615	ug/Kg
Phenol	1500						<RDL	J		1500	4620	ug/Kg
Pyrene	1100									310	615	ug/Kg
Total HPAHS (calc)	7260									310	615	ug/Kg
Total LPAHS (calc)							<MDL	U		310	615	ug/Kg

* Not converted to dry weight basis
 MDL - method detection limit
 RDL - reporting detection limit
 J - estimated value
 U - not detected
 JG-estimated value; probable low bias
 H - holding time
 Shaded value > source control
 screening benchmark for CSO system
 see Appendix F of King County 2016

Table B-6. Combined sewer system solids sampling results for 2015.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_BRANDREG_U
 Descrip: UPPER SEDIMENT TRA
 Sample: L62643-1
 Matrix: SH IN-LINESED
 ColDate: 4/16/15 10:00
 Sample type: Sediment Trap
 TotalSolid: 45.7
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_BRANDREG_L
 Descrip: LOWER SEDIMENT TRA
 Sample: L62643-2
 Matrix: SH IN-LINESED
 ColDate: 4/16/15 10:00
 Sample type: Sediment Trap
 TotalSolid: 49
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Clay*	5.8	J		1.2	2.3	%						
Fines*	23.1			1.2	2.3	%						
Gravel*		<MDL	U	0.2	2.3	%						
p+0.00*		<MDL	U	0.2	2.3	%						
p+1.00*	7.5			0.2	2.3	%						
p+10.0(equal/more than)*	3.5			1.2	2.3	%						
p+2.00*	24.6			0.2	2.3	%						
p+3.00*	24.5			0.2	2.3	%						
p+4.00*	18.4			0.2	2.3	%						
p+5.00*	10.4			1.2	2.3	%						
p+6.00*	2.3	RDL	J	1.2	2.3	%						
p+7.00*	2.3	RDL	J	1.2	2.3	%						
p+8.00*	2.3	RDL	J	1.2	2.3	%						
p+9.00*	2.3	RDL	J	1.2	2.3	%						
p-1.00*		<MDL	U	0.2	2.3	%						
p-2.00(less than)*		<MDL	U	0.2	2.3	%						
p-2.00*		<MDL	U	0.2	2.3	%						
Sand*	75			0.2	2.3	%						
Silt*	17.3			1.2	2.3	%						
CV ASTM D422/D3977-97												
500 Micron (equal to/more than)*	10.5			0.005	0.01	%						
CV ISO 13320:2009(E)												
Clay*	4.96			0.01	0.01	% Volume						
Fines*	48.14			0.01	0.01	% Volume						
p+1.00*	3.41			0.01	0.01	% Volume						
p+10.0(more than)*	0.29			0.01	0.01	% Volume						
p+10.0*	1.2			0.01	0.01	% Volume						
p+2.00*	11.41			0.01	0.01	% Volume						
p+3.00*	16.47			0.01	0.01	% Volume						
p+4.00*	20.53			0.01	0.01	% Volume						
p+5.00*	13.07			0.01	0.01	% Volume						
p+6.00*	13.46			0.01	0.01	% Volume						
p+7.00*	10.15			0.01	0.01	% Volume						
p+8.00*	6.5			0.01	0.01	% Volume						
p+9.00*	3.47			0.01	0.01	% Volume						
Sand<1000*	48.41			0.01	0.01	% Volume						
Silt*	43.17			0.01	0.01	% Volume						
CV SM2540-G												
Total Solids*	45.7			0.005	0.01	%	49			0.005	0.01	%
CV SW846 9060 PSEP96												
Total Organic Carbon	99800			10000	20500	mg/Kg	133000			14000	29000	mg/Kg
MT SW846 3050B*SW846 6010C												
Arsenic, Total, ICP	9.8	<RDL	J	2.8	14	mg/Kg	6.9	<RDL	J	2.7	13	mg/Kg
Cadmium, Total, ICP	4			0.22	1.12	mg/Kg	4.78			0.2	1.04	mg/Kg
Chromium, Total, ICP	71.8			0.33	1.68	mg/Kg	58.2			0.31	1.56	mg/Kg
Copper, Total, ICP	215			0.44	2.23	mg/Kg	190			0.41	2.08	mg/Kg
Lead, Total, ICP	119			2.2	11.2	mg/Kg	90.8			2	10.4	mg/Kg
Nickel, Total, ICP	70.7			0.57	2.8	mg/Kg	57.1			0.53	2.61	mg/Kg
Silver, Total, ICP	3.06			0.44	2.23	mg/Kg	3.55			0.41	2.08	mg/Kg
Vanadium, Total, ICP	54			1.1	5.6	mg/Kg	39.4			1	5.2	mg/Kg
Zinc, Total, ICP	930			0.57	2.8	mg/Kg	678			0.53	2.61	mg/Kg
MT SW846 7471B												
Mercury, Total, CVAA	0.28	<RDL	J	0.042	0.422	mg/Kg	0.527			0.043	0.424	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL	U	18	70	ug/Kg		<MDL	U	16	65.3	ug/Kg
Aroclor 1221		<MDL	U	53	70	ug/Kg		<MDL	U	49	65.3	ug/Kg
Aroclor 1232		<MDL	U	53	70	ug/Kg		<MDL	U	49	65.3	ug/Kg
Aroclor 1242	44	<RDL	J	18	70	ug/Kg	53	<RDL	J	16	65.3	ug/Kg
Aroclor 1248		<MDL	U	18	70	ug/Kg		<MDL	U	16	65.3	ug/Kg
Aroclor 1254	153			18	70	ug/Kg	120			16	65.3	ug/Kg
Aroclor 1260	95.6			18	70	ug/Kg	80.2			16	65.3	ug/Kg
Total Aroclors (calc)	292			18	70	ug/Kg	253			16	65.3	ug/Kg
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene								<MDL	U	33	65.3	ug/Kg
1,2-Dichlorobenzene								<MDL	U	327	327	ug/Kg
1,4-Dichlorobenzene								<MDL	U	490	490	ug/Kg

Table B-6. Combined sewer system solids sampling results for 2015.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_BRANDREG_U
 Descrip: UPPER SEDIMENT TRA
 Sample: L62643-1
 Matrix: SH IN-LINESED
 ColDate: 4/16/15 10:00
 Sample type: Sediment Trap
 TotalSolid: 45.7
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_BRANDREG_L
 Descrip: LOWER SEDIMENT TRA
 Sample: L62643-2
 Matrix: SH IN-LINESED
 ColDate: 4/16/15 10:00
 Sample type: Sediment Trap
 TotalSolid: 49
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
2,4-Dimethylphenol							<MDL	U		330	653	ug/Kg
2-Methylnaphthalene							<MDL	U		330	653	ug/Kg
2-Methylphenol							<MDL	U		330	653	ug/Kg
3-,4-Methylphenol							<MDL	U		1600	3270	ug/Kg
Acenaphthene							<MDL	U		330	653	ug/Kg
Acenaphthylene							<MDL	U		330	653	ug/Kg
Anthracene							<MDL	U		330	653	ug/Kg
Benzo(a)anthracene	847									330	653	ug/Kg
Benzo(a)pyrene	769									330	653	ug/Kg
Benzo(b,j,k)fluoranthene	1690									330	653	ug/Kg
Benzo(g,h,i)perylene	410						<RDL	J		330	653	ug/Kg
Benzoic Acid							<MDL	U		6530	6530	ug/Kg
Benzyl Alcohol							<MDL	U		816	816	ug/Kg
Benzyl Butyl Phthalate	2900									490	490	ug/Kg
Bis(2-Ethylhexyl)Phthalate	20600									650	1310	ug/Kg
Carbazole							<MDL	U		330	653	ug/Kg
Chrysene	924									330	653	ug/Kg
Dibenzo(a,h)anthracene							<MDL	U		330	653	ug/Kg
Dibenzofuran							<MDL	U		330	653	ug/Kg
Diethyl Phthalate							<MDL	U		650	1310	ug/Kg
Dimethyl Phthalate							<MDL	U		653	653	ug/Kg
Di-N-Butyl Phthalate							<MDL,JG	UJ		650	1310	ug/Kg
Di-N-Octyl Phthalate	7570									653	653	ug/Kg
Fluoranthene	1350									330	653	ug/Kg
Fluorene							<MDL	U		330	653	ug/Kg
Hexachlorobenzene							<MDL	U		33	65.3	ug/Kg
Hexachlorobutadiene							<MDL	U		160	327	ug/Kg
Indeno(1,2,3-Cd)Pyrene	490						<RDL	J		330	653	ug/Kg
Naphthalene							<MDL	U		330	653	ug/Kg
N-Nitrosodiphenylamine							<MDL	U		816	816	ug/Kg
Pentachlorophenol							<MDL	U		4900	4900	ug/Kg
Phenanthrene	792									330	653	ug/Kg
Phenol							<MDL	U		1600	4900	ug/Kg
Pyrene	1610									330	653	ug/Kg
Total HPAHS (calc)	8090									330	653	ug/Kg
Total LPAHS (calc)	792									330	653	ug/Kg
OR WDOE NWTPH-DX												
Diesel Range (>C12-C24)												
Lube Oil Range (>C24)												

* Not converted to dry weight basis

MDL - method detection limit

RDL - reporting detection limit

J - estimated value

U - not detected

JG-estimated value; probable low bias

Shaded value > source control

screening benchmark for CSO system

see Appendix F of King County 2016

Table B-6. Combined sewer system solids sampling results for 2015.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A4007_U
 Descrip: UPPER SEDIMENT TRA
 Sample: L62643-3
 Matrix: SH IN-LINESED
 ColDate: 4/16/15 11:15
 Sample type: Sediment Trap
 TotalSolid: 58.7
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_A4007_L
 Descrip: LOWER SEDIMENT TRA
 Sample: L62643-4
 Matrix: SH IN-LINESED
 ColDate: 4/16/15 11:15
 Sample type: Sediment Trap
 TotalSolid: 72.4
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
CV ASTM D422												
Clay*							4.9	J		1	2	%
Fines*							49.1			1	2	%
Gravel*							3.5			0.2	2	%
p+0.00*							4.7			0.2	2	%
p+1.00*							3.4			0.2	2	%
p+10.0(equal/more than)*							3.9			1	2	%
p+2.00*							3.8			0.2	2	%
p+3.00*							11.7			0.2	2	%
p+4.00*							13.4			0.2	2	%
p+5.00*							39.3			1	2	%
p+6.00*							1	<RDL	J	1	2	%
p+7.00*							2	RDL	J	1	2	%
p+8.00*							2	RDL	J	1	2	%
p+9.00*							1	<RDL	J	1	2	%
p-1.00*							2.4			0.2	2	%
p-2.00(less than)*							1.1	<RDL	J	0.2	2	%
p-2.00*								<MDL	U	0.2	2	%
Sand*							36.9			0.2	2	%
Silt*							44.2			1	2	%
CV ASTM D422/D3977-97												
500 Micron (equal to/more than)*	3.37			0.005	0.01	%	8.94			0.005	0.01	%
CV ISO 13320:2009(E)												
Clay*	4.01			0.01	0.01	% Volume	3.62			0.01	0.01	% Volume
Fines*	46.98			0.01	0.01	% Volume	39.45			0.01	0.01	% Volume
p+1.00*	2.41			0.01	0.01	% Volume	5.01			0.01	0.01	% Volume
p+10.0(more than)*	0.1			0.01	0.01	% Volume	0.05			0.01	0.01	% Volume
p+10.0*	1			0.01	0.01	% Volume	0.92			0.01	0.01	% Volume
p+2.00*	11.23			0.01	0.01	% Volume	16.44			0.01	0.01	% Volume
p+3.00*	16.32			0.01	0.01	% Volume	15.45			0.01	0.01	% Volume
p+4.00*	19.68			0.01	0.01	% Volume	14.71			0.01	0.01	% Volume
p+5.00*	13.18			0.01	0.01	% Volume	10.74			0.01	0.01	% Volume
p+6.00*	13.86			0.01	0.01	% Volume	11.68			0.01	0.01	% Volume
p+7.00*	10.05			0.01	0.01	% Volume	8.36			0.01	0.01	% Volume
p+8.00*	5.88			0.01	0.01	% Volume	5.06			0.01	0.01	% Volume
p+9.00*	2.91			0.01	0.01	% Volume	2.65			0.01	0.01	% Volume
Sand<1000*	47.24			0.01	0.01	% Volume	46.6			0.01	0.01	% Volume
Silt*	42.97			0.01	0.01	% Volume	35.83			0.01	0.01	% Volume
CV SM2540-G												
Total Solids*	58.7			0.005	0.01	%	72.4			0.005	0.01	%
CV SW846 9060 PSEP96												
Total Organic Carbon	94500			15000	30500	mg/Kg	70200			13000	26800	mg/Kg
MT SW846 3050B*SW846 6010C												
Arsenic, Total, ICP	8	<RDL	J	2.2	10.8	mg/Kg	5	<RDL	J	1.8	8.78	mg/Kg
Cadmium, Total, ICP	2.56			0.17	0.862	mg/Kg	2.15			0.14	0.703	mg/Kg
Chromium, Total, ICP	51.4			0.26	1.29	mg/Kg	29.4			0.21	1.05	mg/Kg
Copper, Total, ICP	216			0.34	1.72	mg/Kg	146			0.28	1.41	mg/Kg
Lead, Total, ICP	169			1.7	8.62	mg/Kg	111			1.4	7.03	mg/Kg
Nickel, Total, ICP	54.2			0.43	2.15	mg/Kg	38			0.35	1.75	mg/Kg
Silver, Total, ICP	2.04			0.34	1.72	mg/Kg	1.3	<RDL	J	0.28	1.41	mg/Kg
Vanadium, Total, ICP	46			0.87	4.31	mg/Kg	29.6			0.7	3.51	mg/Kg
Zinc, Total, ICP	750			0.43	2.15	mg/Kg	435			0.35	1.75	mg/Kg
MT SW846 7471B												
Mercury, Total, CVAA	0.934			0.032	0.329	mg/Kg	0.474	J	J	0.029	0.286	mg/Kg
OR SW846 3550B*SW846 8082A												
Aroclor 1016		<MDL	U	68	273	ug/Kg		<MDL	U	22	88.4	ug/Kg
Aroclor 1221		<MDL	U	200	273	ug/Kg		<MDL	U	66	88.4	ug/Kg
Aroclor 1232		<MDL	U	200	273	ug/Kg		<MDL	U	66	88.4	ug/Kg
Aroclor 1242	375			68	273	ug/Kg	546			22	88.4	ug/Kg
Aroclor 1248		<MDL	U	68	273	ug/Kg		<MDL	U	22	88.4	ug/Kg
Aroclor 1254	260	<RDL	J	68	273	ug/Kg	148			22	88.4	ug/Kg
Aroclor 1260	608			68	273	ug/Kg	124			22	88.4	ug/Kg
Total Aroclors (calc)	1240		J	68	273	ug/Kg	818			22	88.4	ug/Kg
OR SW846 3550B*SW846 8270D												
1,2,4-Trichlorobenzene		<MDL	U	27	54.5	ug/Kg		<MDL	U	22	44.2	ug/Kg
1,2-Dichlorobenzene		<MDL	U	273	273	ug/Kg		<MDL	U	221	221	ug/Kg
1,4-Dichlorobenzene	2390			409	409	ug/Kg		<MDL	U	331	331	ug/Kg

Table B-6. Combined sewer system solids sampling results for 2015.

King County Environmental Lab Analytical Report

Project: 423589-340-4
 Locator: ST_A4007_U
 Descrip: UPPER SEDIMENT TRA
 Sample: L62643-3
 Matrix: SH IN-LINESED
 ColDate: 4/16/15 11:15
 Sample type: Sediment Trap
 TotalSolid: 58.7
DRY Weight Basis

Project: 423589-340-4
 Locator: ST_A4007_L
 Descrip: LOWER SEDIMENT TRA
 Sample: L62643-4
 Matrix: SH IN-LINESED
 ColDate: 4/16/15 11:15
 Sample type: Sediment Trap
 TotalSolid: 72.4
DRY Weight Basis

Parameters	Value	Qual	Val Qual	MDL	RDL	Units	Value	Qual	Val Qual	MDL	RDL	Units
2,4-Dimethylphenol		<MDL	U	270	545	ug/Kg		<MDL	U	220	442	ug/Kg
2-Methylnaphthalene	31700			270	545	ug/Kg	26400			220	442	ug/Kg
2-Methylphenol		<MDL	U	270	545	ug/Kg	2090			220	442	ug/Kg
3,4-Methylphenol		<MDL	U	1400	2730	ug/Kg	1800	<RDL	J	1100	2210	ug/Kg
Acenaphthene		<MDL	U	270	545	ug/Kg		<MDL	U	220	442	ug/Kg
Acenaphthylene		<MDL	U	270	545	ug/Kg	1020			220	442	ug/Kg
Anthracene	963			270	545	ug/Kg	849			220	442	ug/Kg
Benzo(a)anthracene	1250			270	545	ug/Kg	1050			220	442	ug/Kg
Benzo(a)pyrene	1690			270	545	ug/Kg	1700			220	442	ug/Kg
Benzo(b,j,k)fluoranthene	2470			270	545	ug/Kg	1670			220	442	ug/Kg
Benzo(g,h,i)perylene	971			270	545	ug/Kg	1050			220	442	ug/Kg
Benzoic Acid		<MDL	U	5450	5450	ug/Kg		<MDL	U	4420	4420	ug/Kg
Benzyl Alcohol		<MDL	U	681	681	ug/Kg		<MDL	U	552	552	ug/Kg
Benzyl Butyl Phthalate		<MDL	U	409	409	ug/Kg		<MDL	U	331	331	ug/Kg
Bis(2-Ethylhexyl)Phthalate	18200			550	1090	ug/Kg	11000			440	884	ug/Kg
Carbazole		<MDL	U	270	545	ug/Kg		<MDL	U	220	442	ug/Kg
Chrysene	1860			270	545	ug/Kg	1060			220	442	ug/Kg
Dibenzo(a,h)anthracene		<MDL	U	270	545	ug/Kg		<MDL	U	220	442	ug/Kg
Dibenzofuran		<MDL	U	270	545	ug/Kg		<MDL	U	220	442	ug/Kg
Diethyl Phthalate		<MDL	U	550	1090	ug/Kg		<MDL	U	440	884	ug/Kg
Dimethyl Phthalate		<MDL	U	545	545	ug/Kg		<MDL	U	442	442	ug/Kg
Di-N-Butyl Phthalate		<MDL,JG	UJ	550	1090	ug/Kg		<MDL,JG	UJ	440	884	ug/Kg
Di-N-Octyl Phthalate	1490			545	545	ug/Kg		<MDL	U	442	442	ug/Kg
Fluoranthene	2100			270	545	ug/Kg	1780			220	442	ug/Kg
Fluorene	4750			270	545	ug/Kg	2830			220	442	ug/Kg
Hexachlorobenzene		<MDL	U	27	54.5	ug/Kg		<MDL	U	22	44.2	ug/Kg
Hexachlorobutadiene		<MDL	U	140	273	ug/Kg		<MDL	U	110	221	ug/Kg
Indeno(1,2,3-Cd)Pyrene	785			270	545	ug/Kg	656			220	442	ug/Kg
Naphthalene	7820			270	545	ug/Kg	7290			220	442	ug/Kg
N-Nitrosodiphenylamine		<MDL	U	681	681	ug/Kg		<MDL	U	552	552	ug/Kg
Pentachlorophenol		<MDL	U	4090	4090	ug/Kg		<MDL	U	3310	3310	ug/Kg
Phenanthrene	8400			270	545	ug/Kg	7860			220	442	ug/Kg
Phenol		<MDL	U	1400	4090	ug/Kg		<MDL	U	1100	3310	ug/Kg
Pyrene	5300			270	545	ug/Kg	4570			220	442	ug/Kg
Total HPAHS (calc)	16400			270	545	ug/Kg	13500			220	442	ug/Kg
Total LPAHS (calc)	21900			270	545	ug/Kg	19900			220	442	ug/Kg
OR WDOE NWTPH-DX												
Diesel Range (>C12-C24)	21600	J	J	1700	1700	mg/Kg	15500	J	J	1380	1380	mg/Kg
Lube Oil Range (>C24)	14900	J	J	1700	1700	mg/Kg	10400	J	J	1380	1380	mg/Kg

* Not converted to dry weight basis

MDL - method detection limit

RDL - reporting detection limit

J - estimated value

U - not detected

JG-estimated value; probable low bias

Shaded value > source control

screening benchmark for CSO system

see Appendix F of King County 2016

Table B-7. Dioxin TEQ combined sewer system solids sampling results.

Locator	General Sample Description	KC Sample ID	Collect Date	Sample Type	Total Dioxin TEQ (ng TEQ/kg dw)
63053	Brandon Outfall wet well	L51108-1	6/29/2010	In-line Grab	57.1
S070196	S. Michigan Outfall wet well	L51108-3	6/29/2010	In-line Grab	52.7
A01007	Brandon Lateral	L51108-5	6/29/2010	In-line Grab	5.4
A01008	Brandon Lateral	L51108-7	6/29/2010	In-line Grab	1.0
A01008	Brandon Lateral (field dup)	L51108-9	6/29/2010	In-line Grab	2.8
S070167	West Michigan Regulator	L54155-1	9/14/2011	In-line Grab	4.4
A4007	S. Michigan Regulator Station	L54155-3	9/14/2011	In-line Grab	4.1
SM_ST_751	S. Michigan Lateral	L54529-1	10/27/2011	In-line Grab	1.2
SM_ST_515	S. Michigan Lateral	L54529-3	10/27/2011	In-line Grab	1.9
Brandon Reg	Brandon Regulator Station	L55326-3	3/21/2012	In-line Grab	19.7
ST_A4007_L	S. Michigan Regulator Station	L55346-1	3/7/2012	Sediment Trap	56.8
ST_A01008	Brandon Lateral	L55346-2	3/7/2012	Sediment Trap	61.1
ST_A4007_U	S. Michigan Regulator Station	L56818-3	10/18/2012	Sediment Trap	77.1

Based on validated data; all samples analyzed by Axys Analytical

Dioxin TEQ using 1/2 DL for non-detects, except for K flagged data where use concentration noted by analytical lab

Table B-8. King County LDW CSO Source Tracing Sample Locators and Associated Coordinates and Sample Types

Locator ¹	Description	Xplan	Yplan	Latitude	Longitude	Samples Collected	Sample Type	Samples Collected	Sample Type
S070167	West Michigan Regulator Station: West Marg Way Just West of Highland Pkwy/Michigan UP SM Driveway	1267395	201021	473227.8	1222037.22	9/2011	in-line grab		
A4007	S. Michigan Street Regulator Station	1270402	202321	473241.21	1221953.77	9/2011	in-line grab	3/2012, 10/2012, 4/2013, 10/2013, 4/2015	Sed Trap
SM_ST_751	MANHOLE, 751 South Michigan Street (S. Michigan CSO Basin)	1272223	203017	473248.42	1221927.42	10/2011	in-line grab		
SM_ST_515	MANHOLE, 515 South Michigan Street (S. Michigan CSO Basin)	1271435	202722	473245.36	1221938.82	10/2011	in-line grab		
S070196	S Michigan CSO Outfall Structure	1269562	201878	473236.67	1222005.88	12/2010, 6/2010, 3/2012	in-line grab		
BrandUtah	MANHOLE: MH-063-073 (Brandon CSO Basin)	1269521	205766	.554174	122.335439			10/2012, 4/2013	Sed Trap
A01008	MANHOLE: 063-079 (Brandon CSO Basin): MH in left turn lane of West-bound Lucille St at E. Marginal Way	1269184	205505	553441	122.336782	6/2010	in-line grab	3/2012, 10/2012, 4/2013	Sed Trap
A01007	MANHOLE: 063-059 (Brandon CSO Basin): East side of E. Marginal Way north of Brandon Street	1269071	205844	554364	122.337267	6/2010	in-line grab	3/2012, 10/2012, 4/2013	Sed Trap
063053	Brandon CSO Outfall Structure	1268192	205961	473316.7	1222027.01	6/2010, 3/2012	in-line grab		
BRANDREG	Brandon Regulator Station	1268924	205897	473316.21	1222016.32	3/2012	in-line grab	10/2013, 7/2014, 4/2015	Sed Trap

¹ Locators with 'ST_' added to beginning indicates sample is sediment trap rather than in-line grab sample.

Note: Recon efforts at other locations within CSO basins either yielded no solids in line or were not accessible (e.g., major roadway)

Recon efforts focused on LDW CSOs with at least 5 discharge events per year (on average)

Last Updated March 2016

Appendix C: SWS Business Inspections

Table C-1. SWS Inspection Schedule for business within King County unincorporated area within LDW drainage area.

Parcel Number	Company Name	Site Address	Insp Cycle	Next Insp
5624200390	AAA Mini Storage	9640 Des Moines Mem DR S	5 Years	2016
5624200130	ABC Supply Co.	1050 S 96 th St	5 Years	2016
5624200091	Absolute German	9510 14th Ave S	Annual	2016
0523049008	Ace Galvanizing	429 S 96 th St	2 Years	2016
0523049194	Ace Galvanizing	401 S 96 th St	2 Years	2016
0523049246	Ace Galvanizing	439 S 96 th St	2 Years	2016
3224049071	Aero-Lac	420 S 96 th St	3 Years	2016
5624200232	Allied Body Works	625 S 96 th St	5 Years	2016
5624200442	Andonian 4-plex	9920 Des Moines Mem Dr S	5 Years	2017
5624200110	Anmarco Yard	1110 S 96 th St	3 Years	2016
5624200132	Anmarco Yard	1110 S 96 th St	3 Years	2016
5624200439	Arnold 4-plex	9926 Des Moines Mem DrS	5 Years	2017
5624200351	Beckwith & Kuffel	1313 S 96 th St	3 Years	2016
5624200411	Bidadoo Auctions	1541 S 96 th St	3 Years	2016
7883608601	Boeing	1420 S Trenton St	NA	NA
7883608603	Boeing	1420 S Trenton St	NA	NA
0001600016	Carey Limousine	1237 S Director St	3 Years	2017
3224049023	CDL Recycling	9208 4 th Ave S	Annual	2016
5624200517	City View Apartments	9929 14 th Ave S	5 Years	2016
1646700020	Cloverdale Industrial Park	9320 4 th Ave S	5 Years	2020
5624200208	Concrete Restoration Inc.	9587 8 th Ave S	3 Years	2017
0001600029	Delta Marine	1801 S 93 rd St	3 Years	2017
0001600062	Delta Marine	1801 S 93rd St	3 Years	2017
5624200005	Delta Marine	1801 S 93rd St	3 Years	2017
5624200006	Delta Marine	1801 S 93rd St	3 Years	2017
5624200021	Delta Marine	1801 S 93rd St	3 Years	2017
5624200371	Dominic's Plaza	9626 Des Moines Mem Dr S	5 Years	2016
0001600061	Duwamish Yacht Club	1801 S 93 rd St	5 Years	2016
5624200438	Eng 4-plex	9916 Des Moines Mem Dr S	5 Years	2017
5624200435	Fisseha 4-plex	9928 Des Moines Mem Dr S	5 Years	2017
0001600042	Frog Hollow	1425 S 93 rd St	5 Years	2018
3224049056	Graham Trucking	9301 4 th Ave S	3 Years	2016
5624200931	Hamm Cr Restoration Area		NA	
0001600050	Harrash Industrial Park	1605 S 93 rd St	3 Years	2016

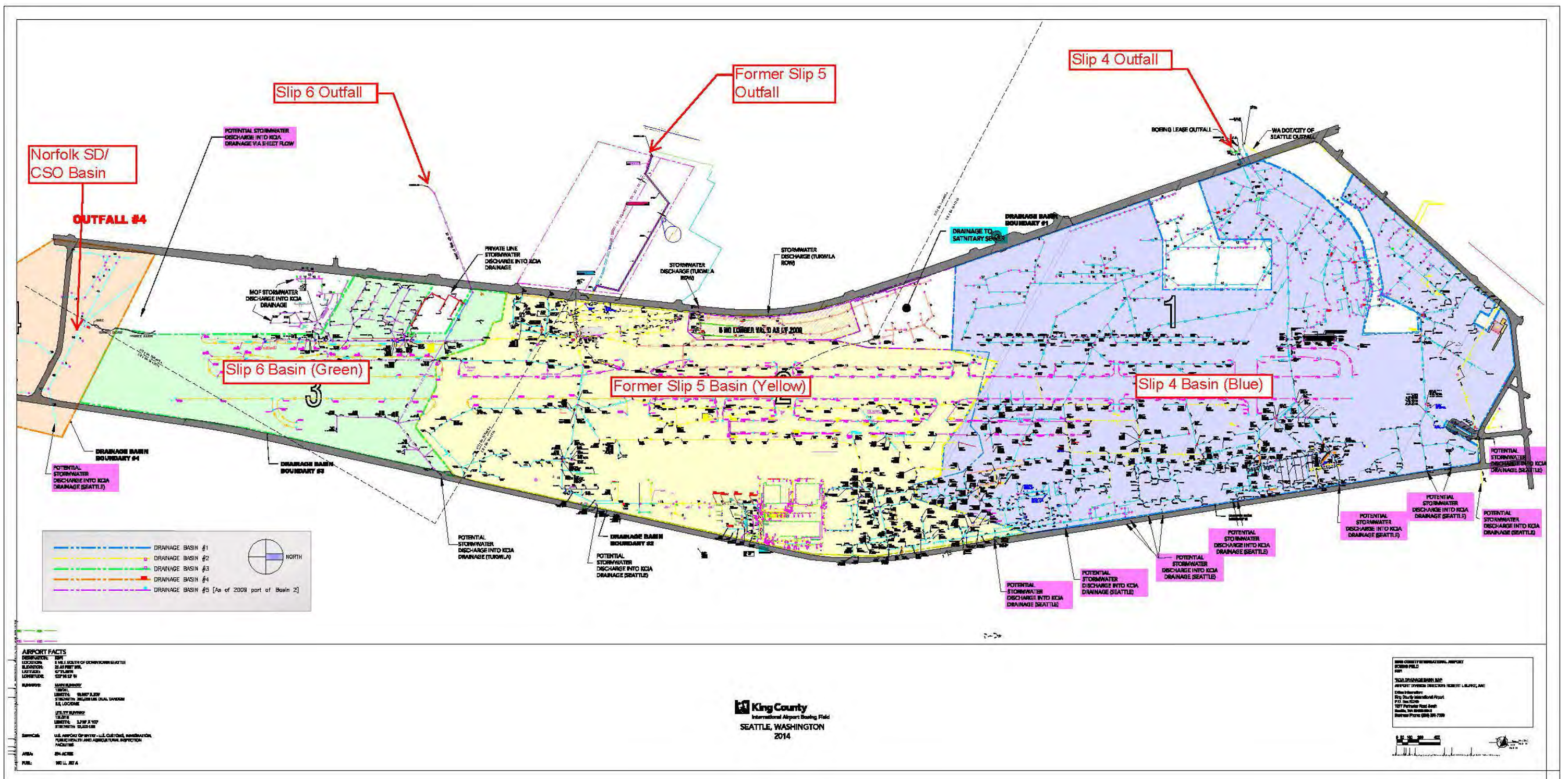
Parcel Number	Company Name	Site Address	Insp Cycle	Next Insp
0001600058	IAM District 751	9135 15 th PI S	5 Years	2016
5624200310	Icon Materials	1031 S 96 th St	2 Years	2016
5624200311	Icon Materials	1031 S 96 th St	2 Years	2016
5624200330	Icon Materials	1031 S 96 th St	2 Years	2016
5624200335	Icon Materials	1115 S 96 th St	2 Years	2016
5624200452	India Pentecostal Assembly	1443 S 99 th St	5 Years	2016
0001600037	Industrial Automation	9300 14 th Ave S	3 Years	2016
5624200370	McDonalds		3 Years	2020
5624200372	McDonalds	9610 Des Moines Mem Dr S	3 Years	2020
2185001105	National Products Inc.	8436 Dallas Ave S	3 Years	2017
2185001250	National Products Inc.	8436 Dallas Ave S	3 Years	2017
2185001107	National Products Inc.	8432 Dallas Ave S	3 Years	2017
2185001130	National Products Inc.	8410 Dallas Ave S	3 Years	2017
2185001140	National Products Inc.	1205 S ORR ST	3 Years	2017
2185001260	National Products Inc.	1229 S ORR ST	3 Years	2017
2185001270	National Products Inc.	1229 S ORR ST	3 Years	2017
5624200434	Nguyen 4-plex	9914 Des Moines Mem Dr S	5 Years	2017
3224049051	Northwest Grating Products	9230 4 th Ave S	3 Years	2016
5624200441	Norton 4-plex	9924 Des Moines Mem Dr S	5 Years	2017
5624200170	NRC Environmental Service Inc	910 S 96 th St	5 Years	2018
3224049034	Old Dominion Freight	600 S 96 th St	5 Years	2018
3224049072	Old Dominion Freight	600 S 96 th St	5 Years	2018
5624200211	Old Dominion Freight	600 S 96 th St	5 Years	2018
5624200212	Old Dominion Freight	600 S 96 th St	5 Years	2018
5624200213	Old Dominion Freight	600 S 96 th St	5 Years	2018
0001600055	Pacific Industrial Supply	1251 S Director St	3 Years	2017
0523049005	Pacific Northwest Motor Freight Lines	515 S 96 th St	5 Years	2020
0001600044	Port of Seattle Terminal 117	8700 Dallas Ave S	NA	NA
5624200208	Pro Weld	9585 8 th Ave S	3 Years	2017
0001600046	PSF Industries	9322 14 th Ave S	2 Years	2016
5624200190	Puget Sound Coatings	9400 8 th Ave S	Annual	2016
5624200210	Pure Water Corporation	9411 8 th Ave S	5 Years	2016
2185600070	Rick's Master Marine	1411 S Thistle St	3 Years	2016
5624200270	Riverton Distribution Center	9600 8 th Ave S	5 Years	2016
5624200290	Riverton Distribution Center	9600 8 th Ave S	5 Years	2016
0001600060	Sea King Industrial Park	1621 S 92 nd PI	5 Years	2016

Parcel Number	Company Name	Site Address	Insp Cycle	Next Insp
7619000000	Sea King Industrial Park	1521 S 92 nd PI	5 Years	2016
5624200930	Seattle City Light	10000 West Marginal PI S	5 Years	2016
5624200920	Seattle City Light	10000 West Marginal PI S	5 Years	2016
3224049103	Security Contractor Services	9226 4th Ave S	Annual	2016
5624200250	Security Contractor Services	9617 8 th Ave S	2 Years	2016
5624200230	Selland Auto Transport	615 S 96 th St	5 Years	2016
5624200097	Shell Gas Station	9525 14th Ave S	Annual	2016
5624200150	Simplex Grinnell	9520 10th Ave S	3 Years	2018
0001600001	South Park Marina	8604 Dallas Ave S	5 Years	2016
2185600025	South Park Tire Factory	8510 Dallas Ave S	5 Years	2016
5624200099	Tek-line Roofing	1312 S 96 th Ave S	Annual	2016
5624200191	Terex Utilities	9426 8 th Ave S	3 Years	2016
5624200443	Thach 4-plex	9922 Des Moines Mem Dr S	5 Years	2017
1646700010	The Revere Group	9310 4 th Ave S	5 Years	2020
5624200170	Universal Intermodal Services	9515 10 th Ave S	5 Years	2019
0523049060	Vacant		NA	
3224049043	Vacant		NA	
5624200100	Vacant		NA	
5624200412	Vacant	9840 West Marginal Way S	NA	
5624200416	Vacant		NA	
5624200479	Vacant		NA	
5624200482	Vacant		NA	
5624200490	Vacant		NA	
5624200511	Vacant	1120 S 99 th St	NA	
5624200516	Vacant		NA	
7258200020	Vacant	1219 S 99 th St	NA	
2185001045	Vacant		NA	
2185001075	Vacant	8442 Dallas Ave S	NA	
2185001275	Vacant		NA	
2185000895	Vacant		NA	
5624200431	Vacant (pending construction)	9820 Des Moines Mem Dr S	5 Years	2017
5624200253	Warp Corporation	631 S 96 th St	3 Years	2017
5624200527	Willow Terrace	1102 S 99 th PI S	5 Years	2019
5624200531	Willow Terrace	1108 S 99 th St	5 Years	2019
5624200550	Willow Terrace	1016 S 99 th St	5 Years	2019
5624200440	Woldetatos 4-plex	9918 Des Moines Mem Dr S	5 Years	2017
5624200360	Woolridge Boats	1303 S 96 th St	5 Years	2016

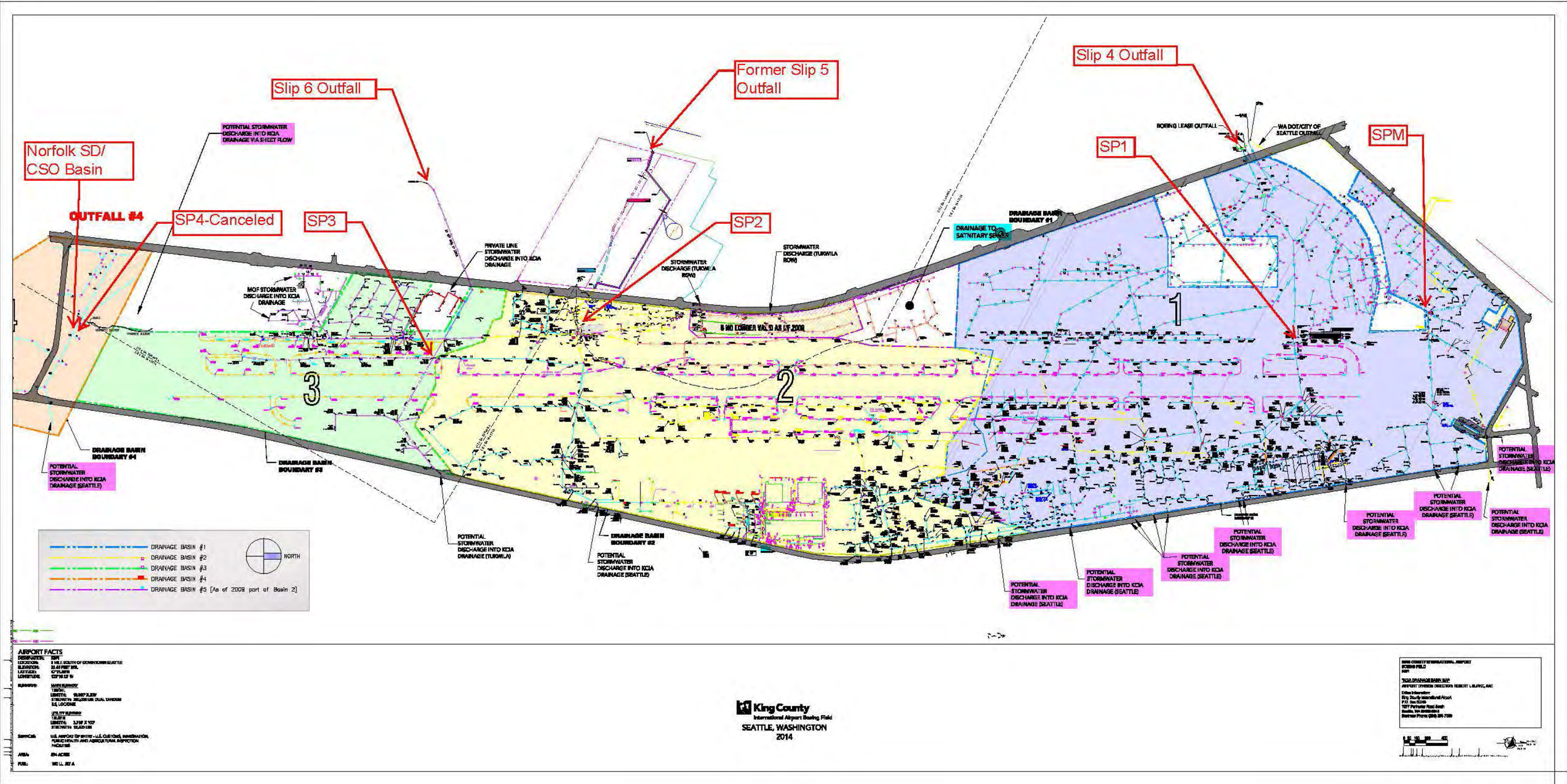
Appendix D: KCIA Maps

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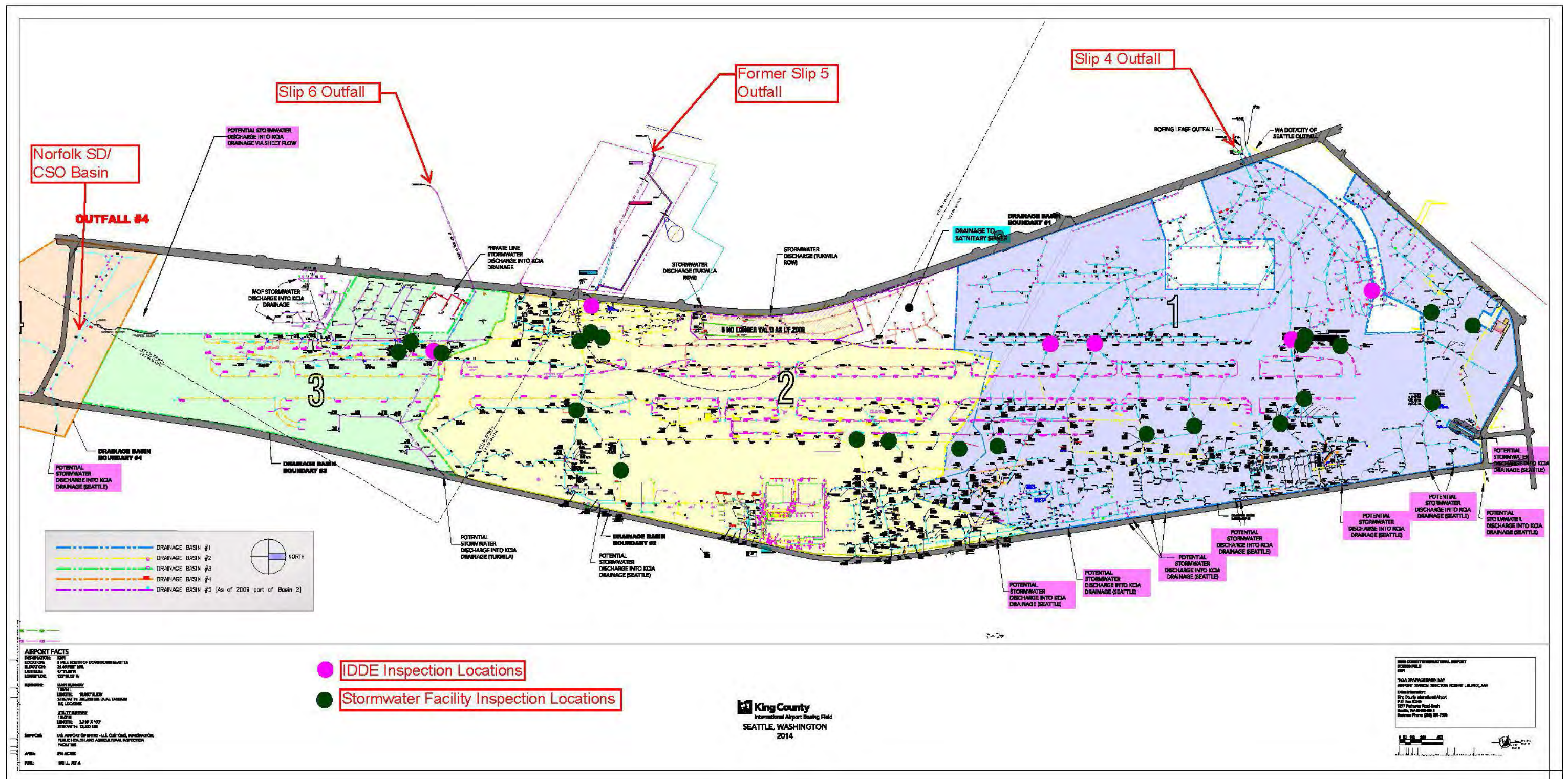
Appendix D, Map 1. KCIA Stormwater Drainage Basins



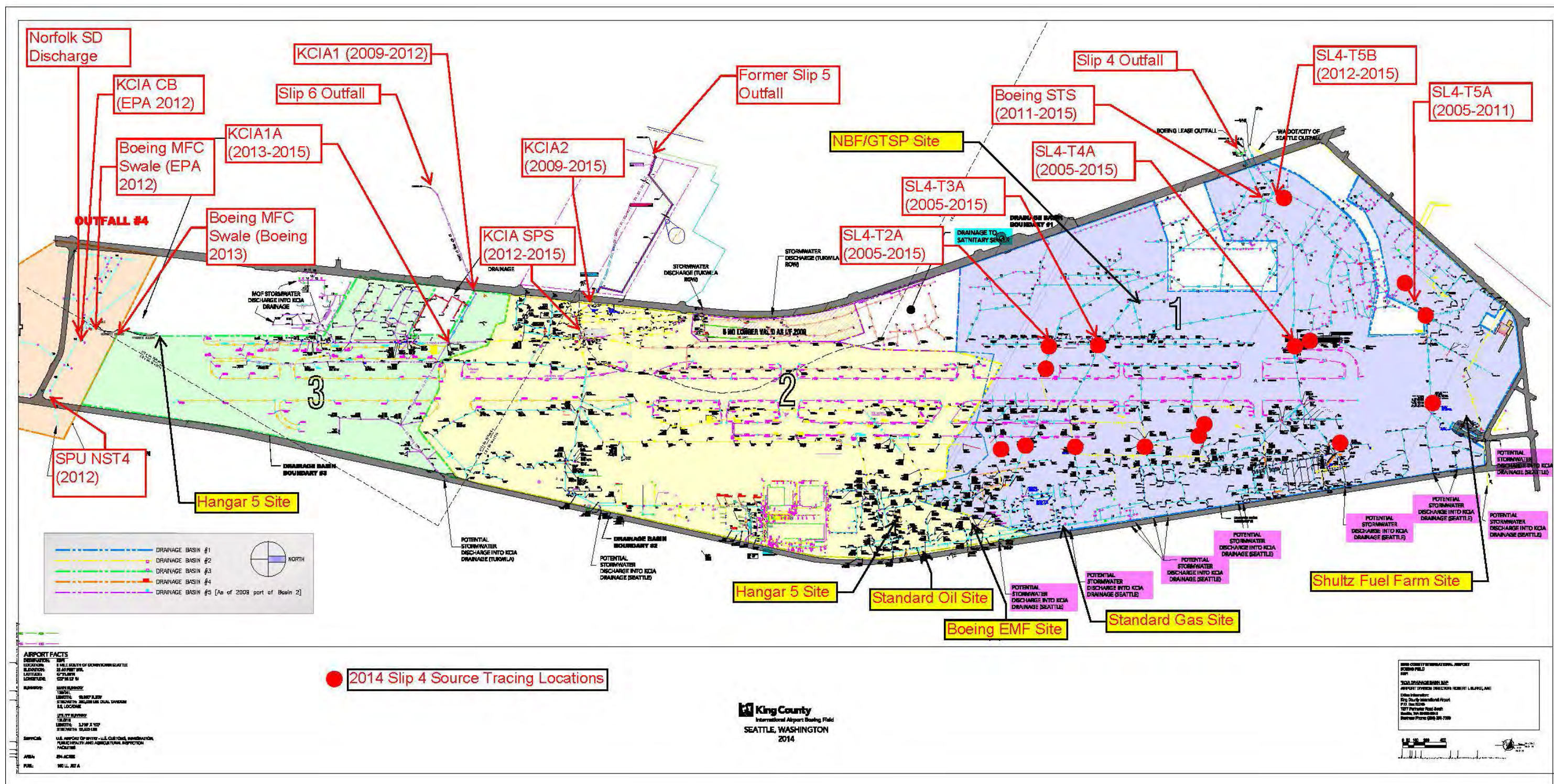
Appendix D, Map 2. KCIA ISGP Sampling Locations Map



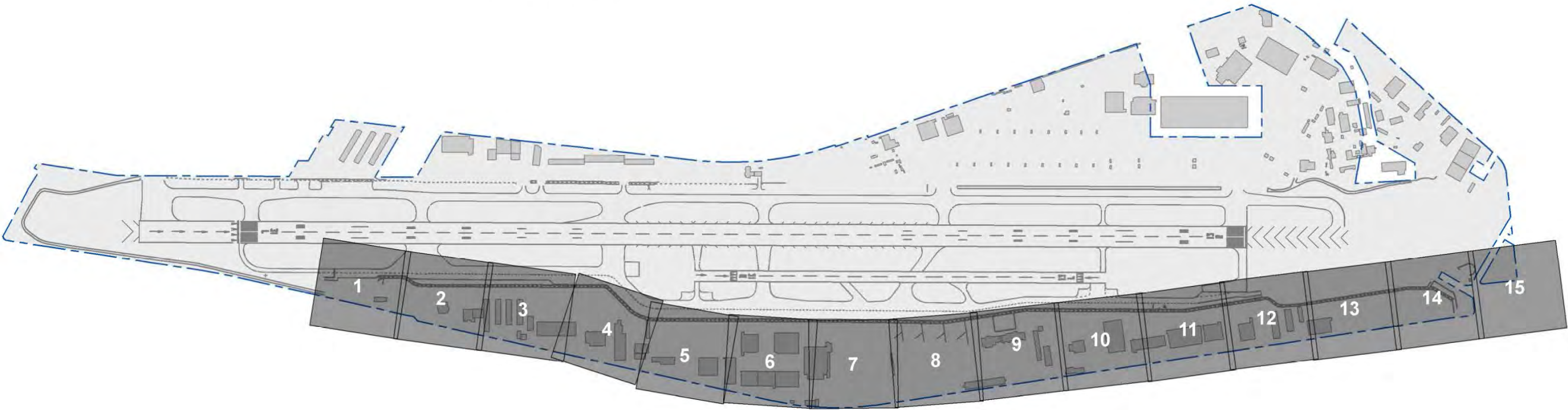
Appendix D, Map 3. KCIA MS4 Permit Inspections Map



Appendix D, Map 4. KCIA 2014-15 Source Control Activities Map



Stormwater Map Sections 1-15

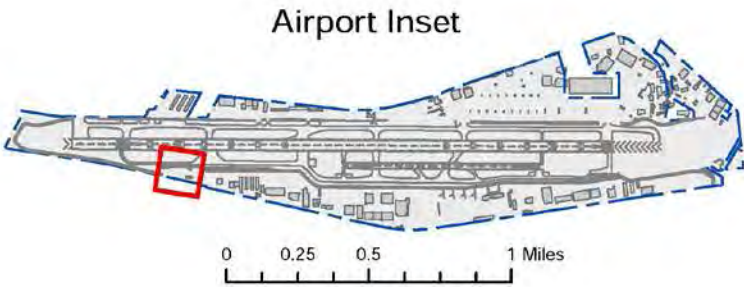
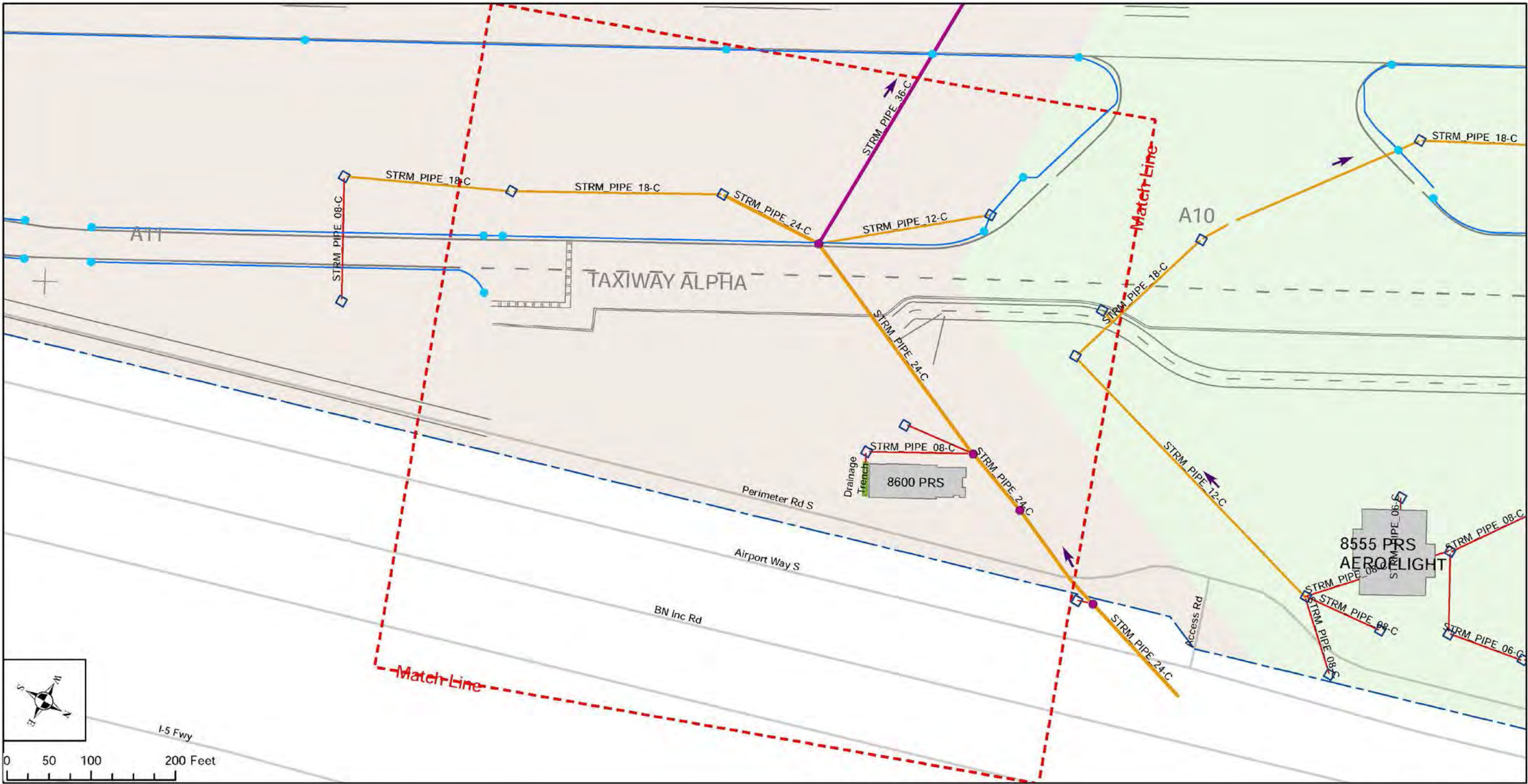




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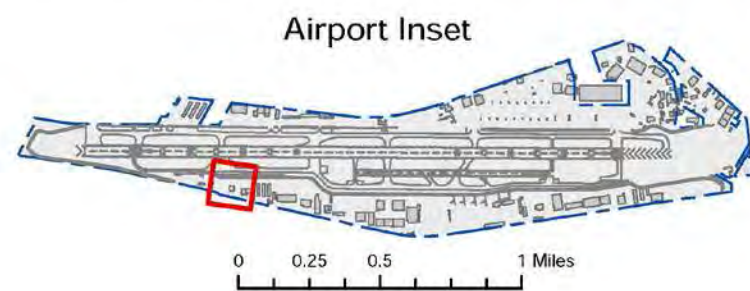
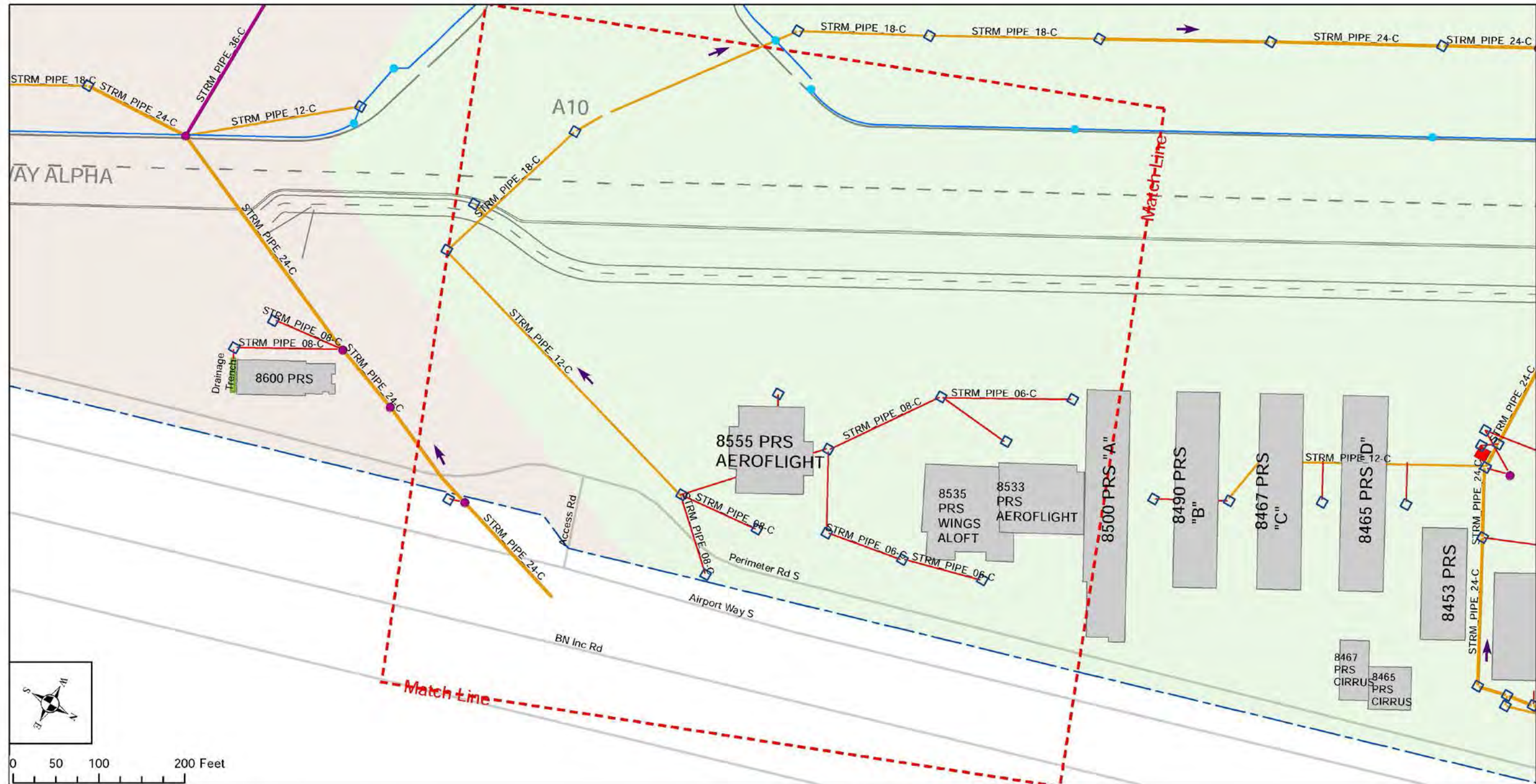
Appendix D, Map 5, Section 1. KCIA Eastside Stormwater Line Cleaning Map



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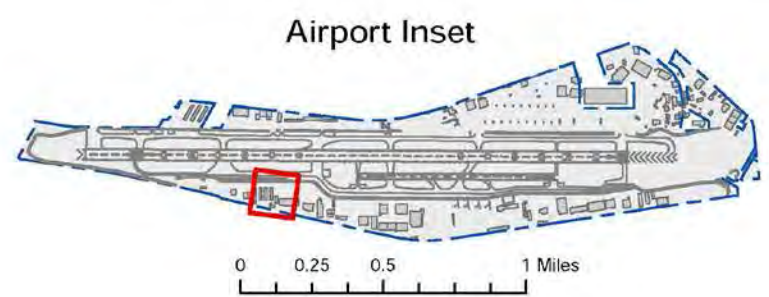
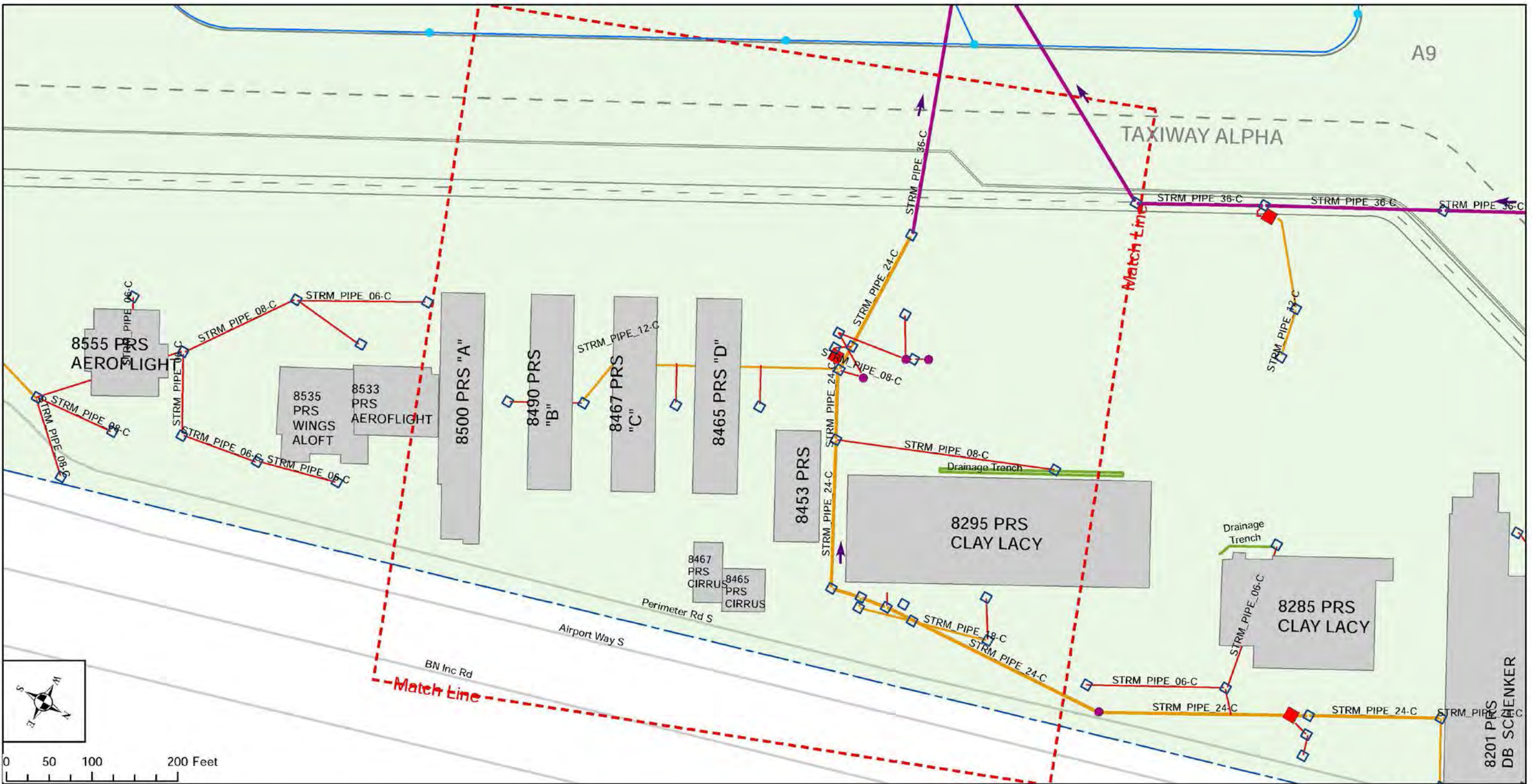
Appendix D, Map 5, Section 2. KCIA Eastside Stormwater Line Cleaning Map



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Appendix D, Map 5, Section 3. KCIA Eastside Stormwater Line Cleaning Map



Legend

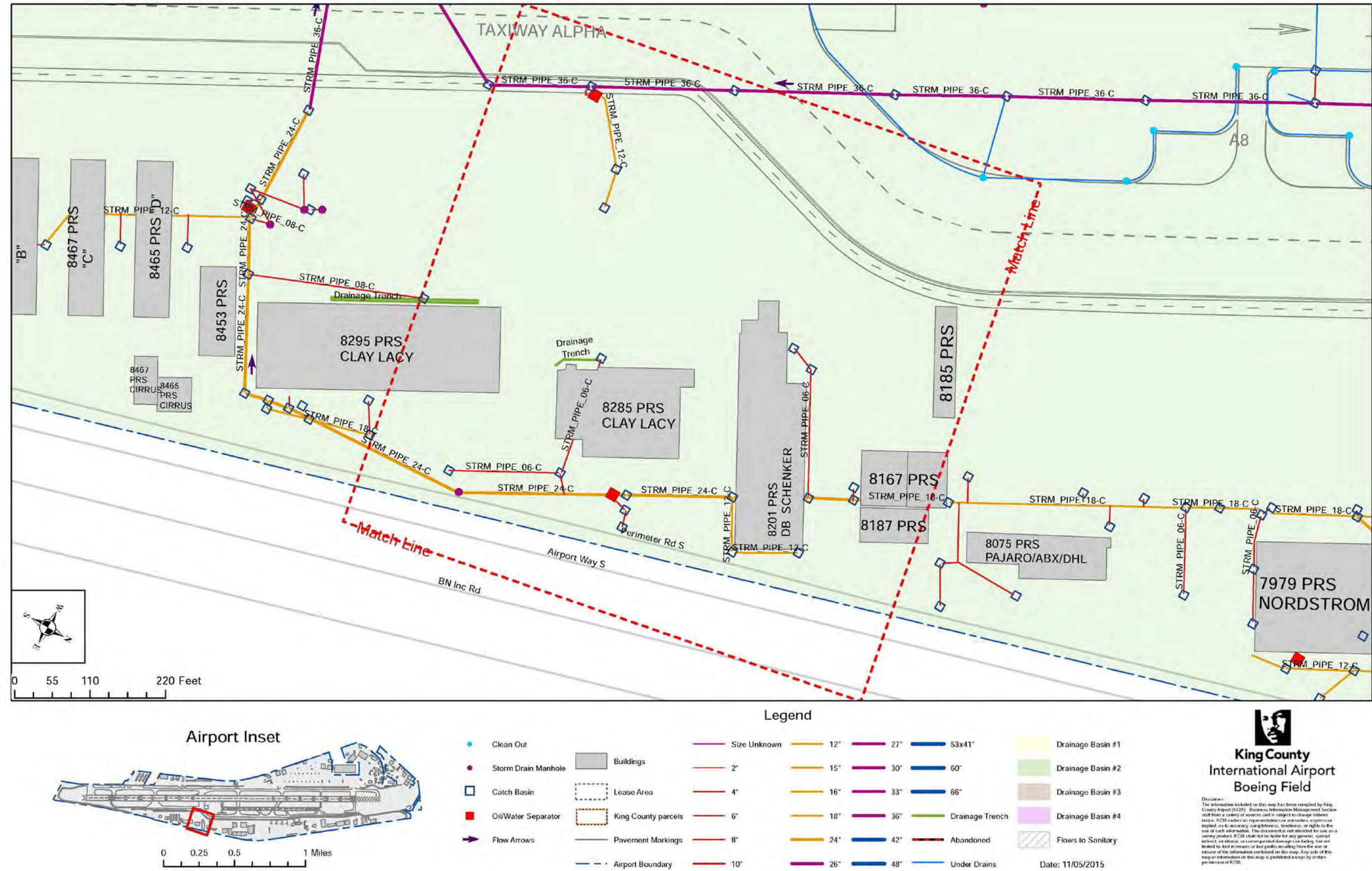
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● Storm Drain Manhole	■ Lease Area	— 2"	— 15"	— 30"	— 60"	■ Drainage Basin #2
□ Catch Basin	■ King County parcels	— 4"	— 16"	— 33"	— 66"	■ Drainage Basin #3
■ Oil/Water Separator	— Pavement Markings	— 6"	— 18"	— 36"	— Drainage Trench	■ Drainage Basin #4
→ Flow Arrows	— Airport Boundary	— 8"	— 24"	— 42"	— Abandoned	■ Flows to Sanitary
		— 10"	— 26"	— 48"	— Under Drains	

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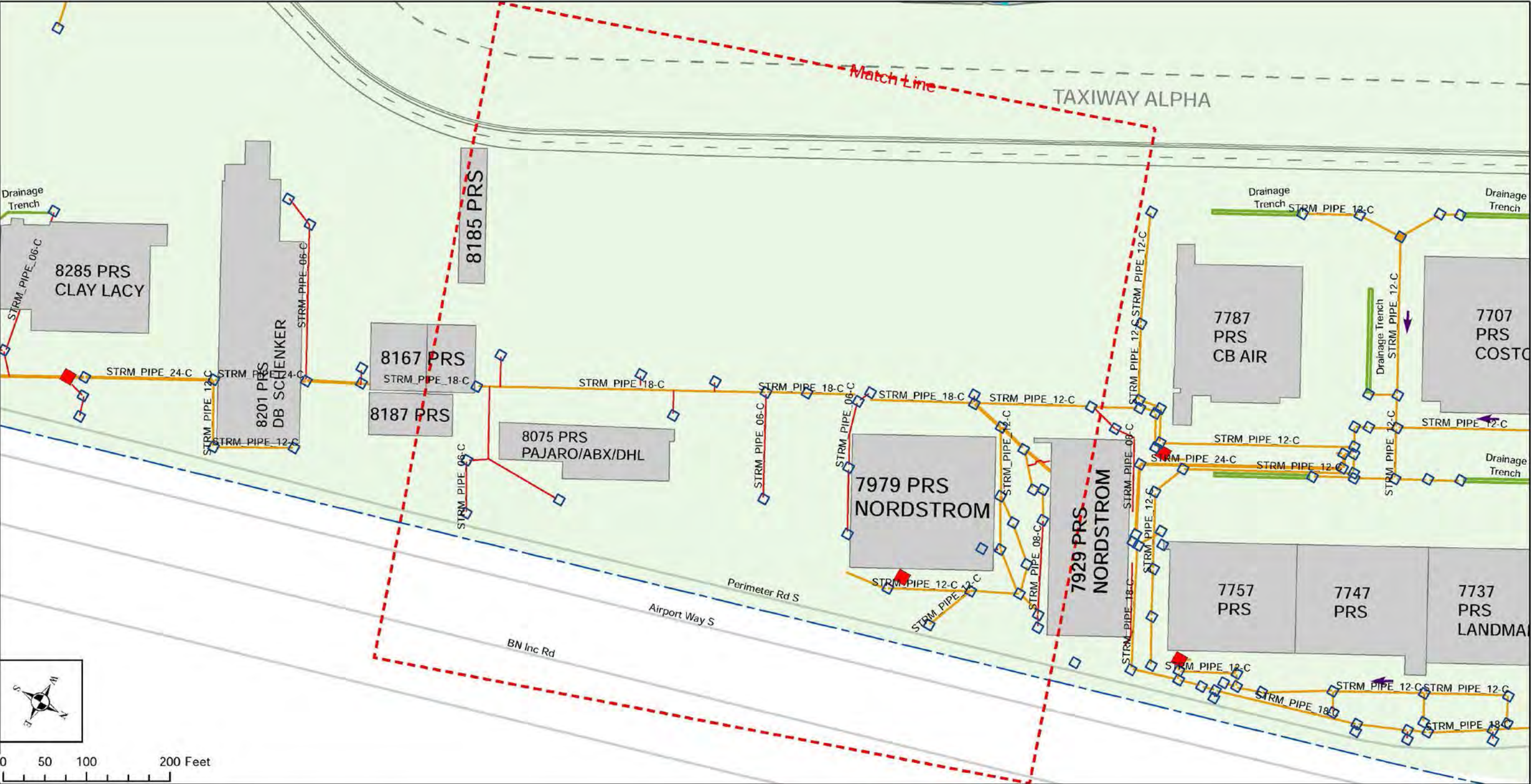
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Appendix D, Map 5, Section 4. KCIA Eastside Stormwater Line Cleaning Map



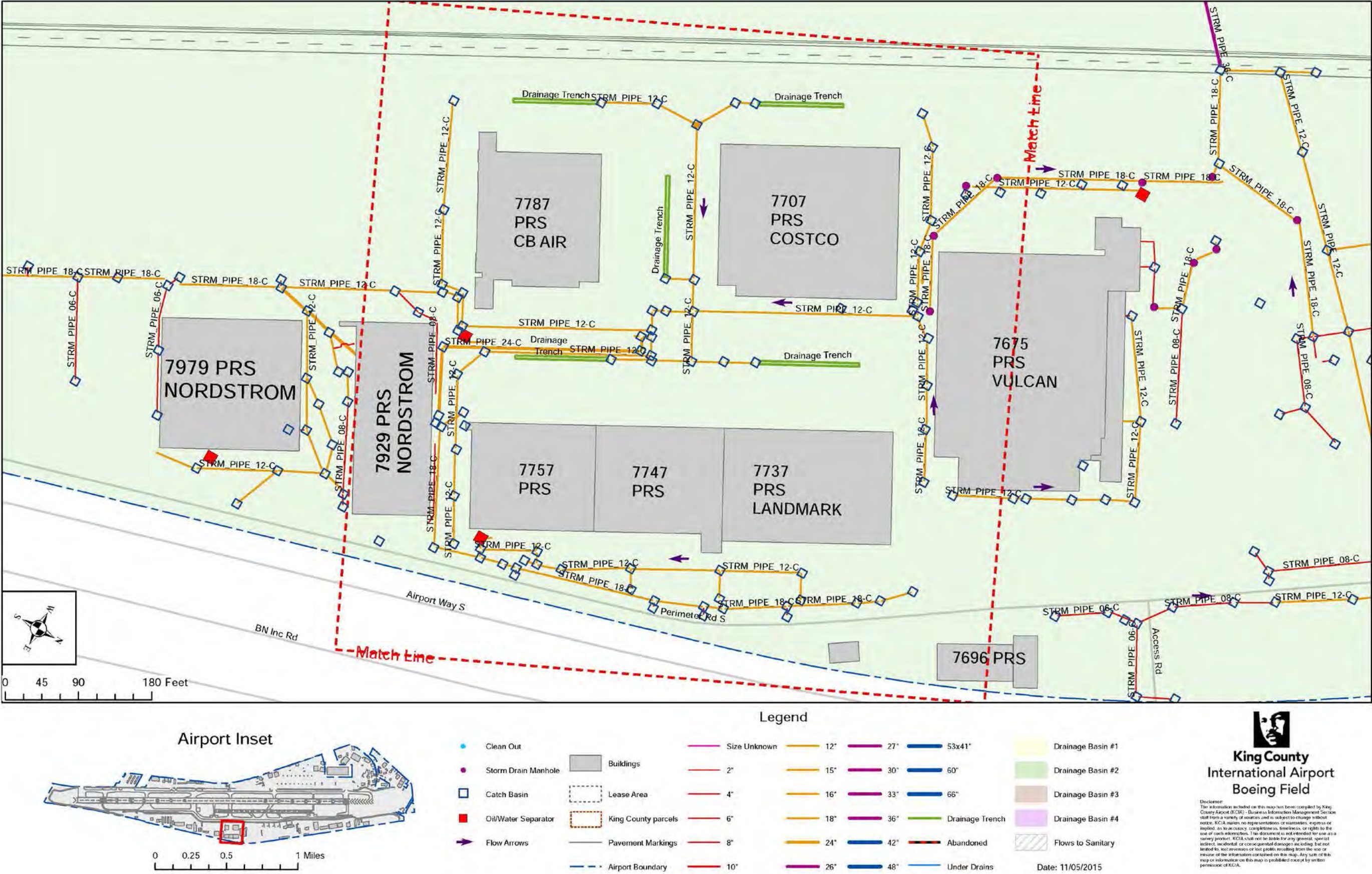
Appendix D, Map 5, Section 5. KCIA Eastside Stormwater Line Cleaning Map



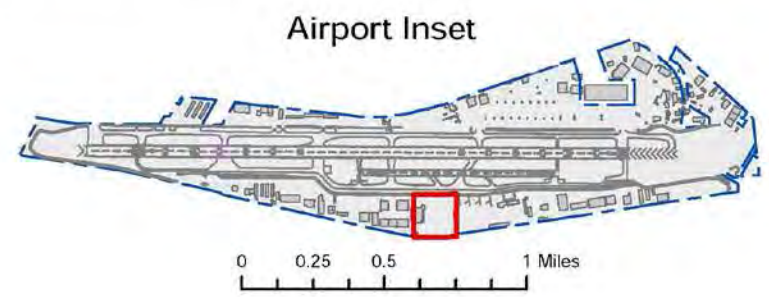
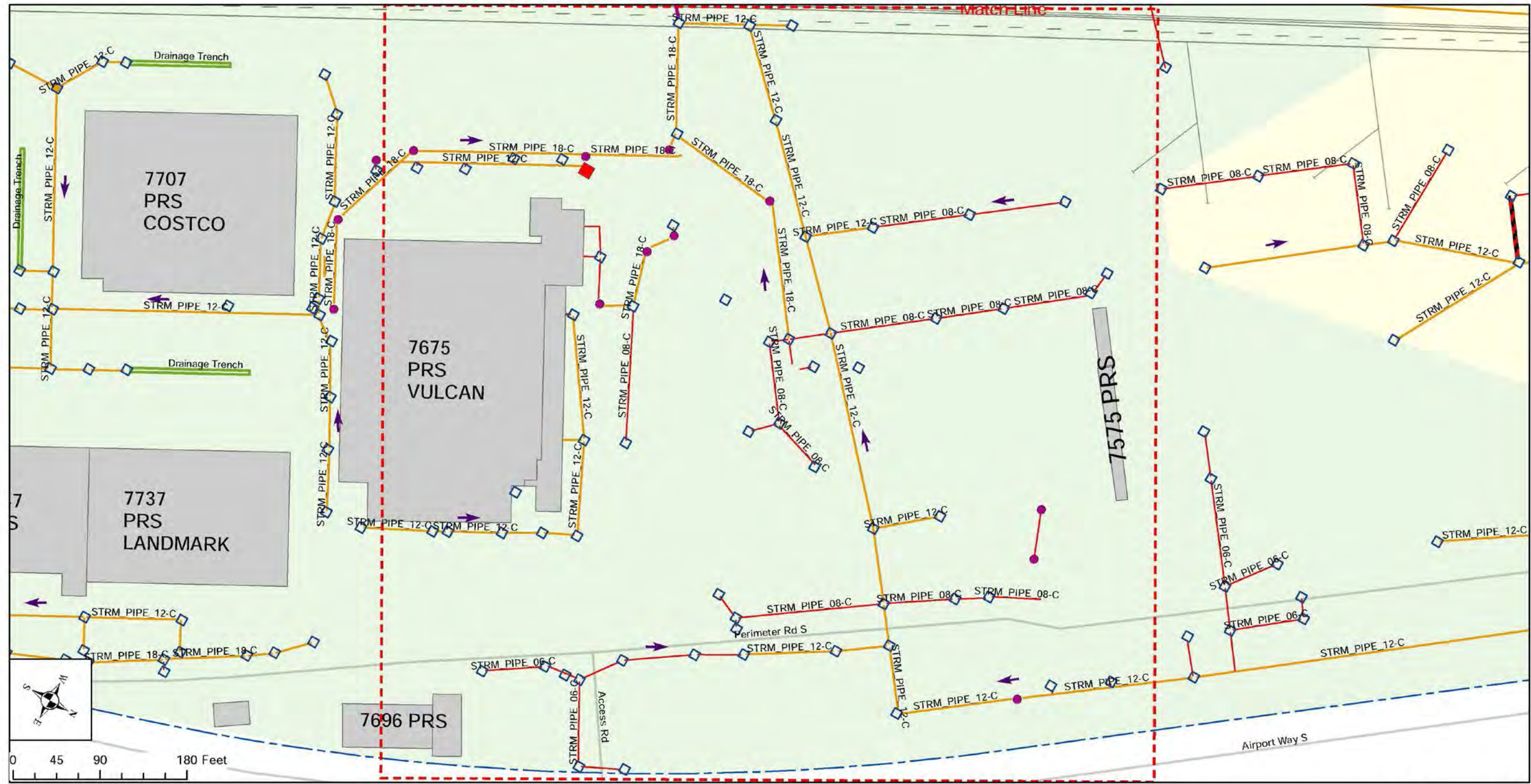
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Appendix D, Map 5, Section 6. KCIA Eastside Stormwater Line Cleaning Map



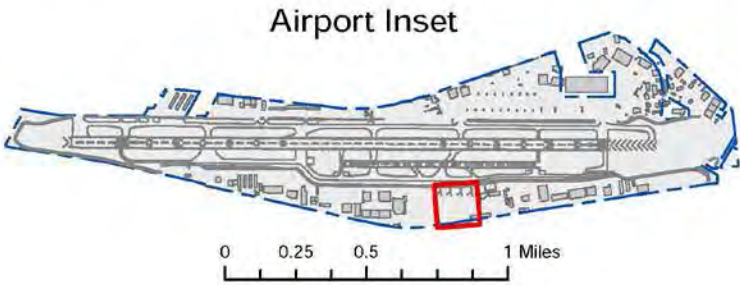
Appendix D, Map 5, Section 7. KCIA Eastside Stormwater Line Cleaning Map



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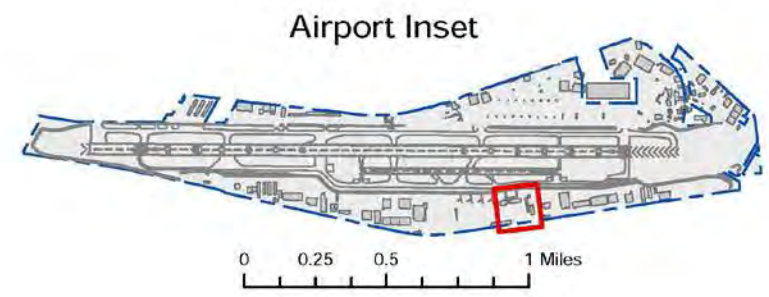
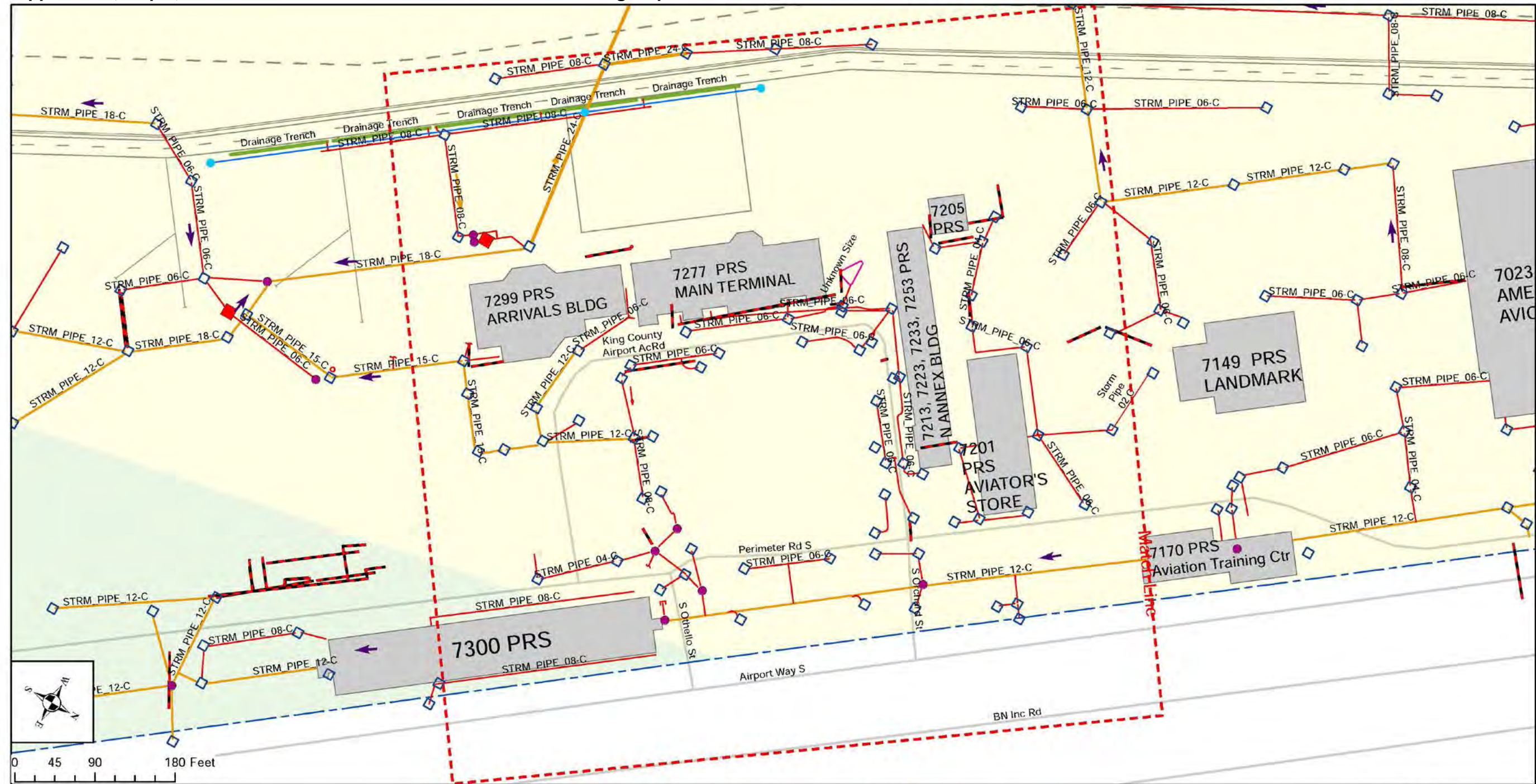
Appendix D, Map 5, Section 8. KCIA Eastside Stormwater Line Cleaning Map



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Appendix D, Map 5, Section 9. KCIA Eastside Stormwater Line Cleaning Map



Legend

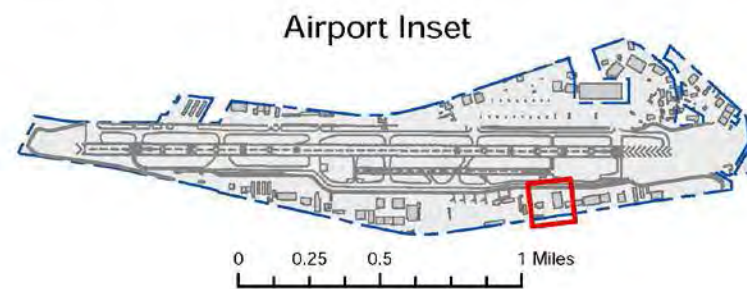
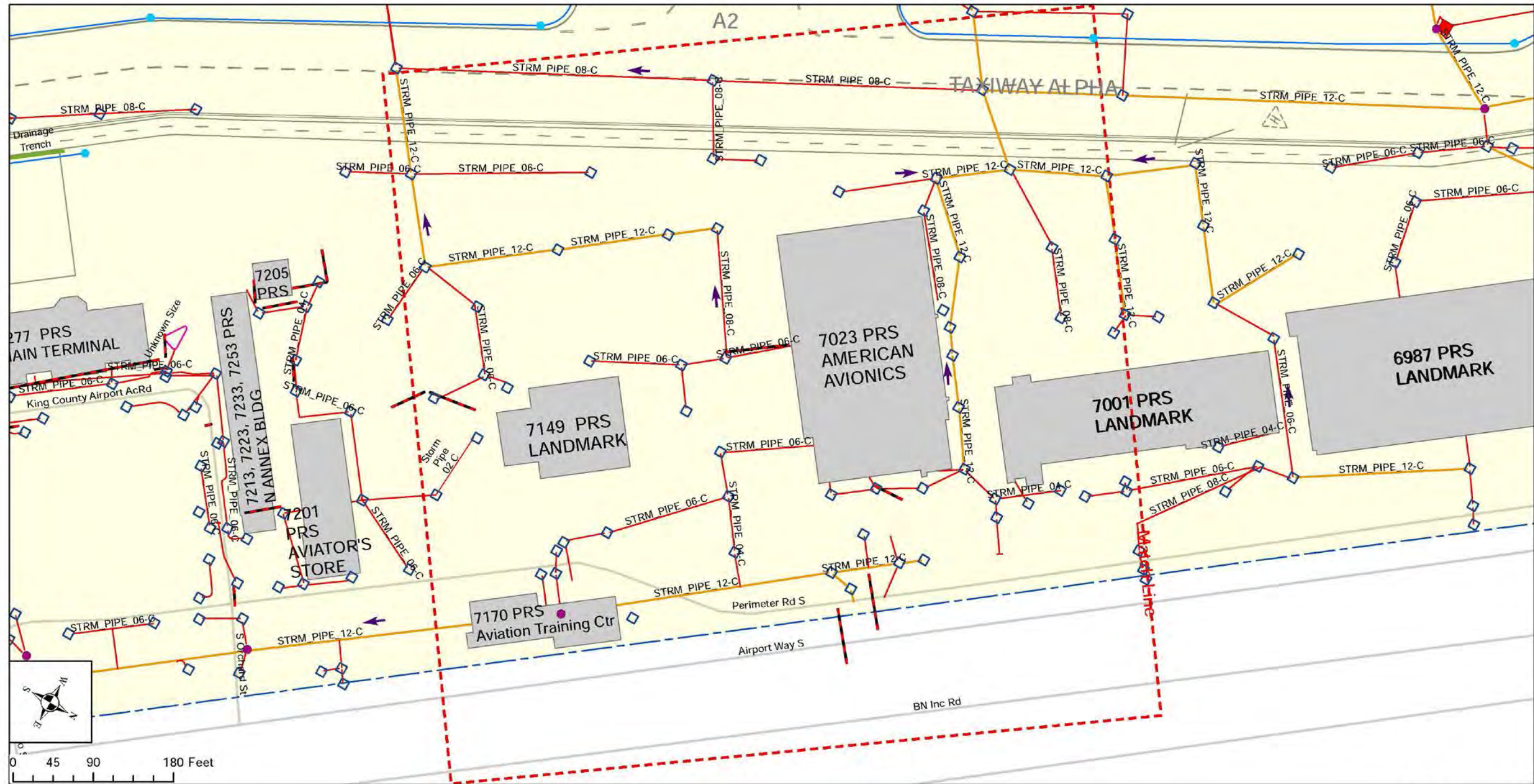
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● Storm Drain Manhole	■ Lease Area	— 2"	— 15"	— 30"	— 60"	■ Drainage Basin #2
□ Catch Basin	■ King County parcels	— 4"	— 16"	— 33"	— 66"	■ Drainage Basin #3
■ Oil/Water Separator	— Pavement Markings	— 6"	— 18"	— 36"	— Drainage Trench	■ Drainage Basin #4
→ Flow Arrows	— Airport Boundary	— 8"	— 24"	— 42"	— Abandoned	■ Flows to Sanitary
		— 10"	— 26"	— 48"	— Under Drains	

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Appendix D, Map 5, Section 10. KCIA Eastside Stormwater Line Cleaning Map



Legend

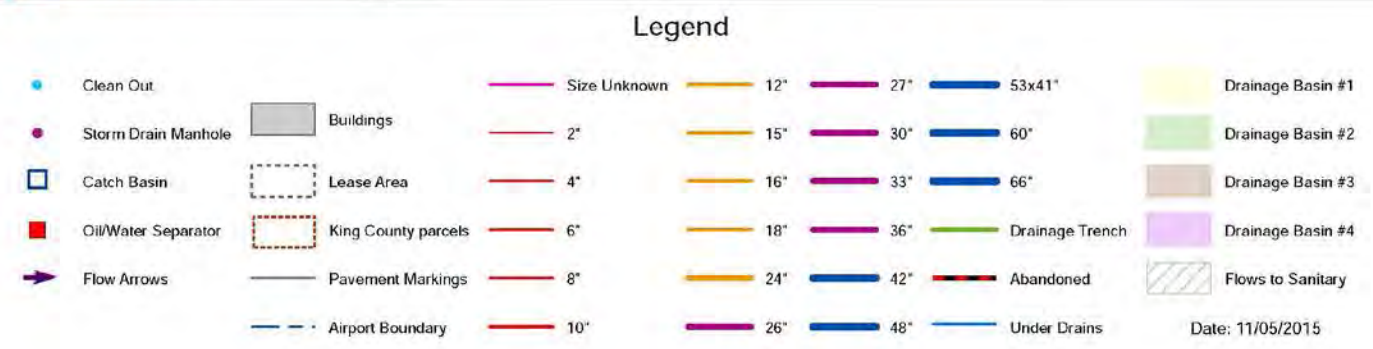
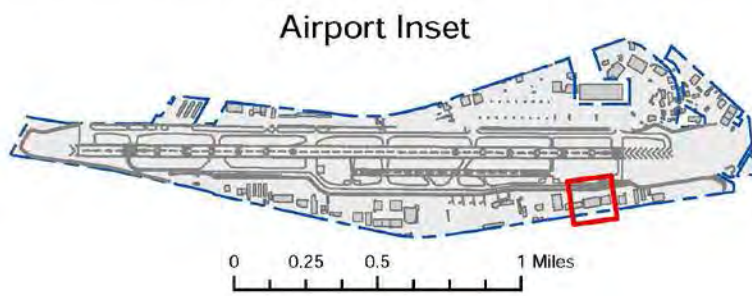
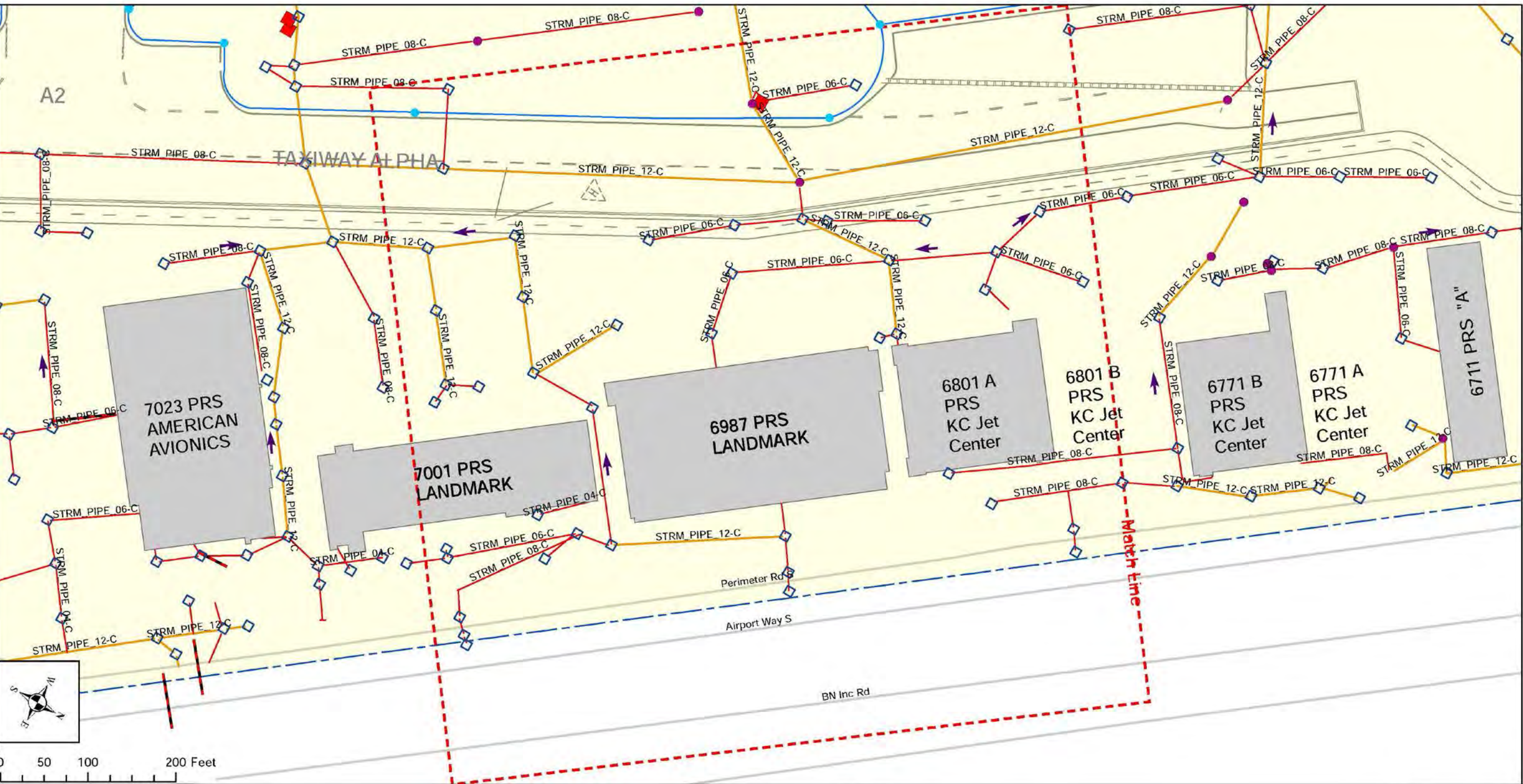
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	Storm Drain Manhole		Lease Area		2"		15"		30"		60"		Drainage Basin #2
	Catch Basin		King County parcels		4"		16"		33"		66"		Drainage Basin #3
	Oil/Water Separator		Pavement Markings		6"		18"		36"		Abandoned		Drainage Basin #4
	Flow Arrows		Airport Boundary		8"		24"		42"		Under Drains		Flows to Sanitary
					10"		26"		48"				Date: 11/05/2015



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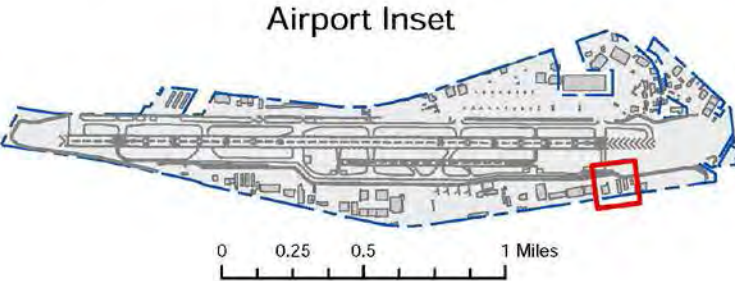
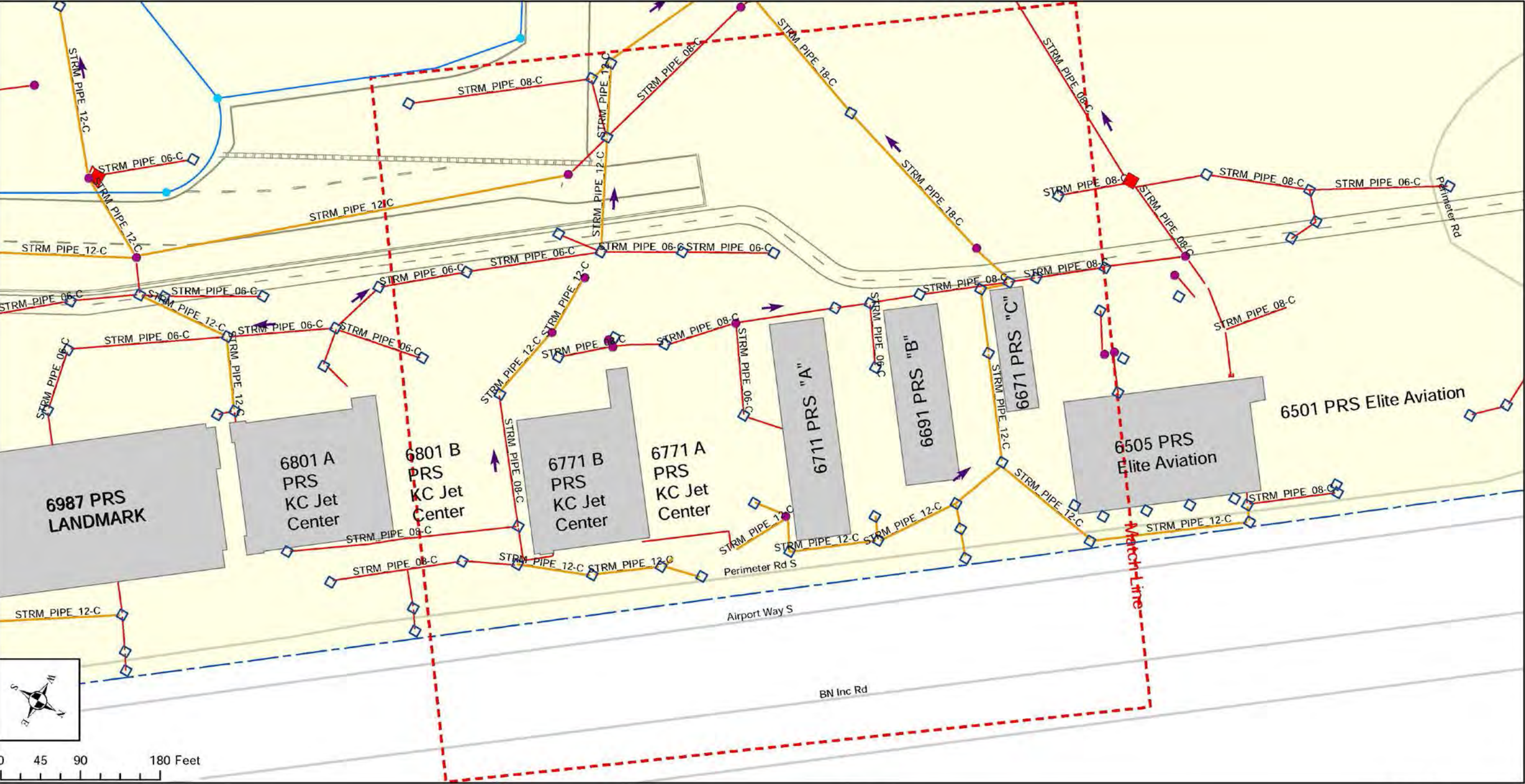
Appendix D, Map 5, Section 11. KCIA Eastside Stormwater Line Cleaning Map



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Appendix D, Map 5, Section 12. KCIA Eastside Stormwater Line Cleaning Map



Legend

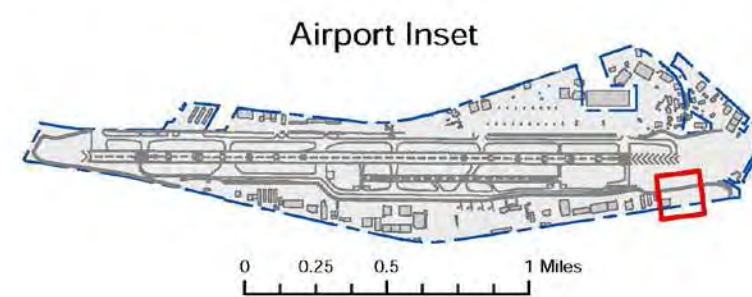
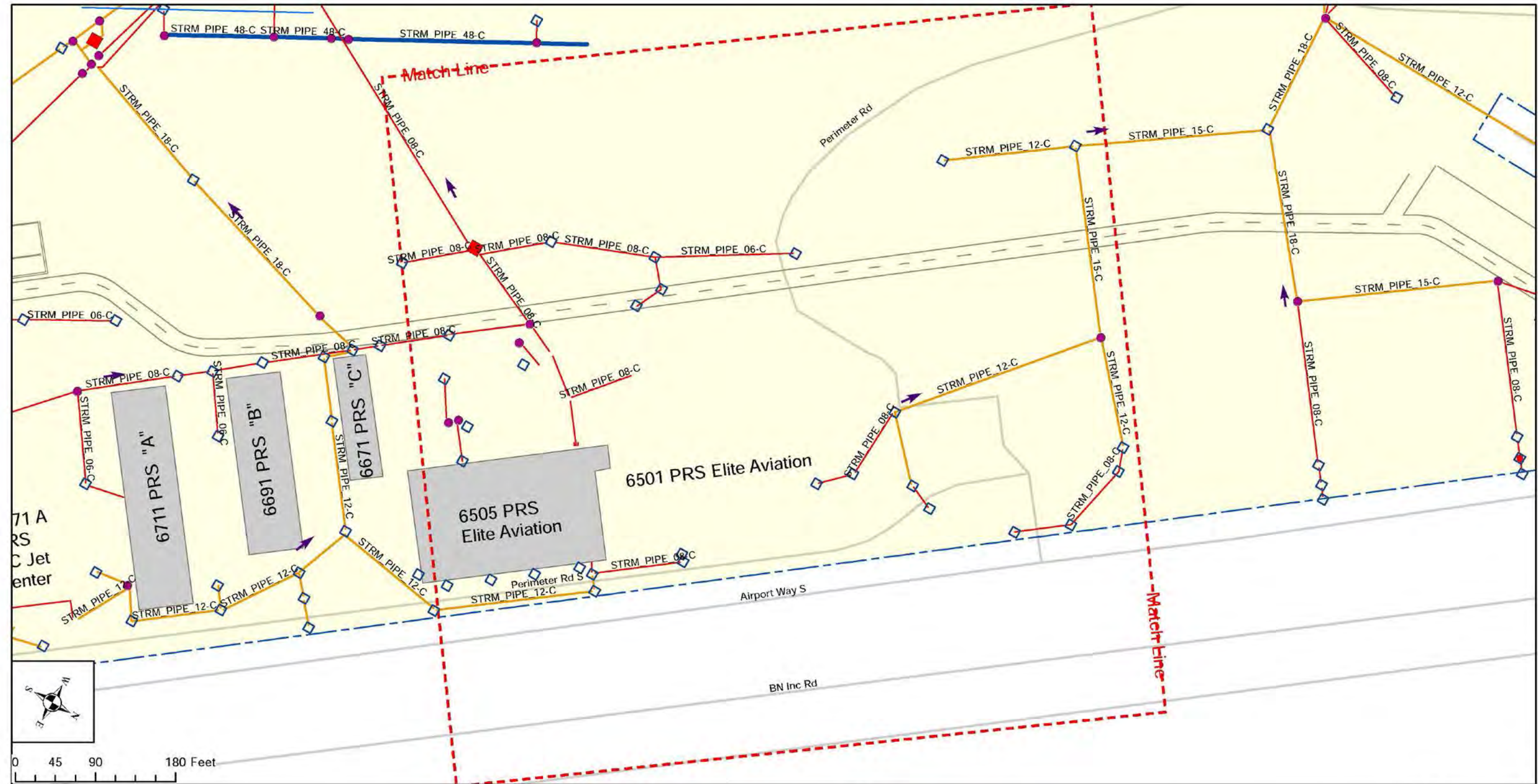
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Storm Drain Manhole	Lease Area	2"	15"	30"	60"	Drainage Basin #2
Catch Basin	King County parcels	4"	16"	33"	66"	Drainage Basin #3
Oil/Water Separator	Pavement Markings	6"	18"	36"	Drainage Trench	Drainage Basin #4
Flow Arrows	Airport Boundary	8"	24"	42"	Abandoned	Flows to Sanitary
		10"	26"	48"	Under Drains	

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Appendix D, Map 5, Section 13. KCIA Eastside Stormwater Line Cleaning Map



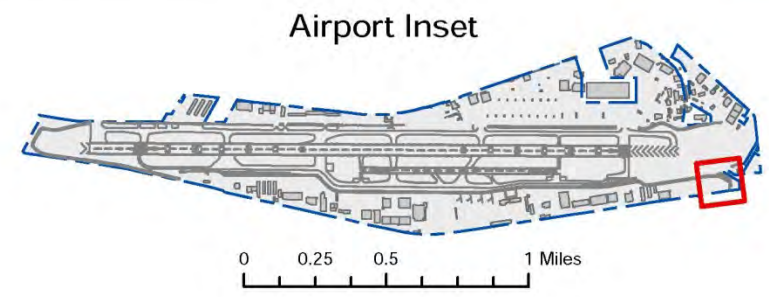
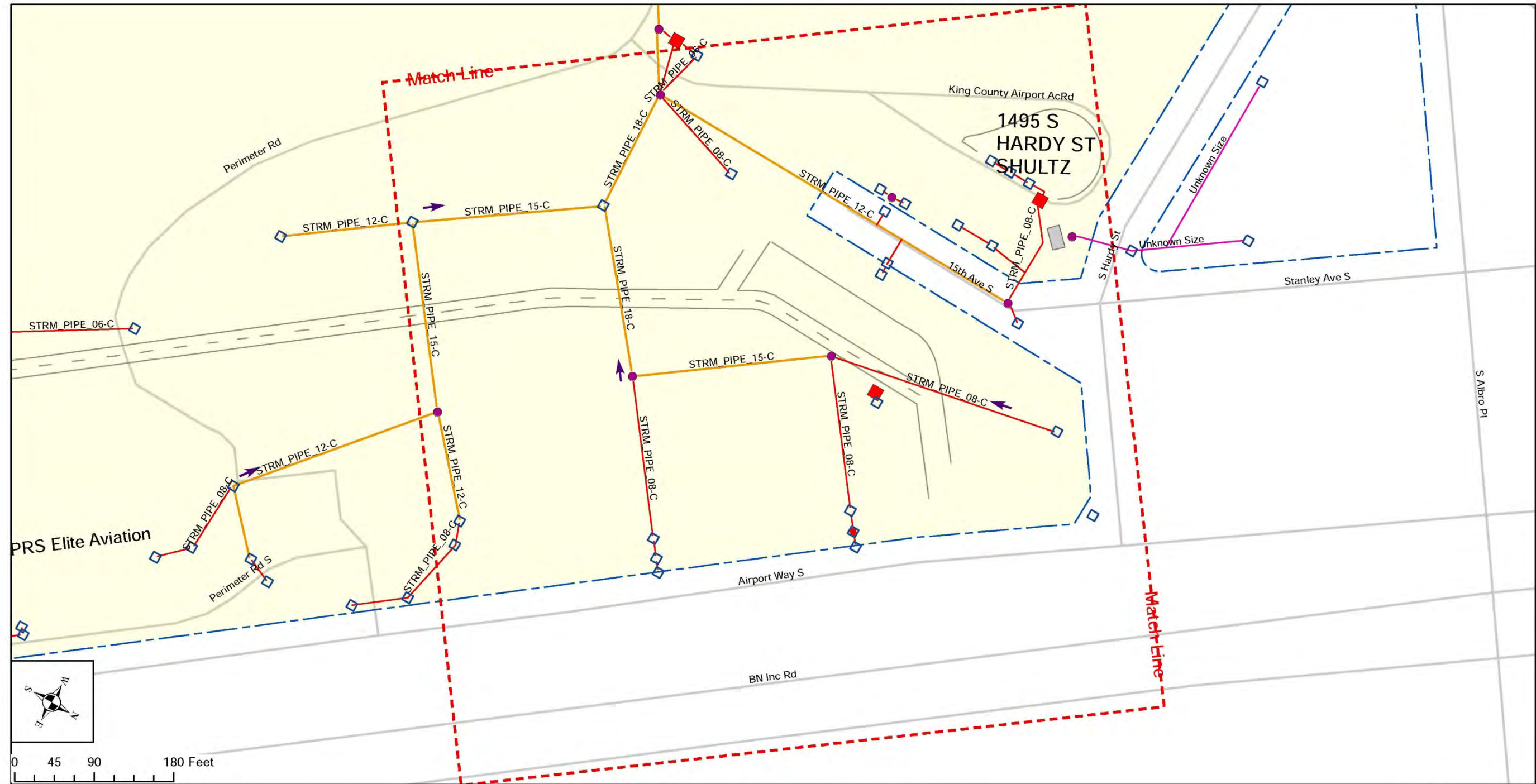
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	Storm Drain Manhole		Lease Area		2"		15"		30"
	Catch Basin		King County parcels		4"		16"		33"
	Oil/Water Separator		Pavement Markings		6"		18"		36"
	Flow Arrows		Airport Boundary		8"		24"		42"
					10"		26"		48"
							53x41"		
							Abandoned		
							Under Drains		
							Drainage Trench		
							Drainage Basin #1		
							Drainage Basin #2		
							Drainage Basin #3		
							Drainage Basin #4		
							Flows to Sanitary		

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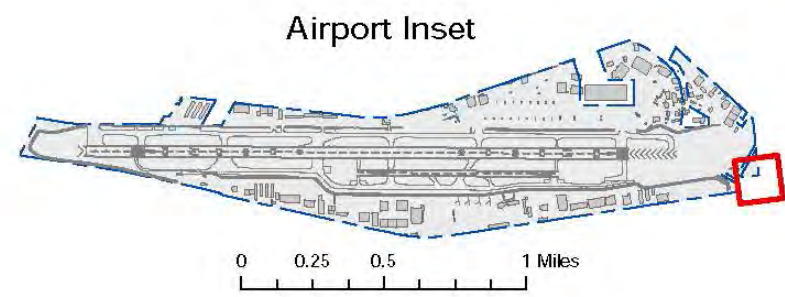
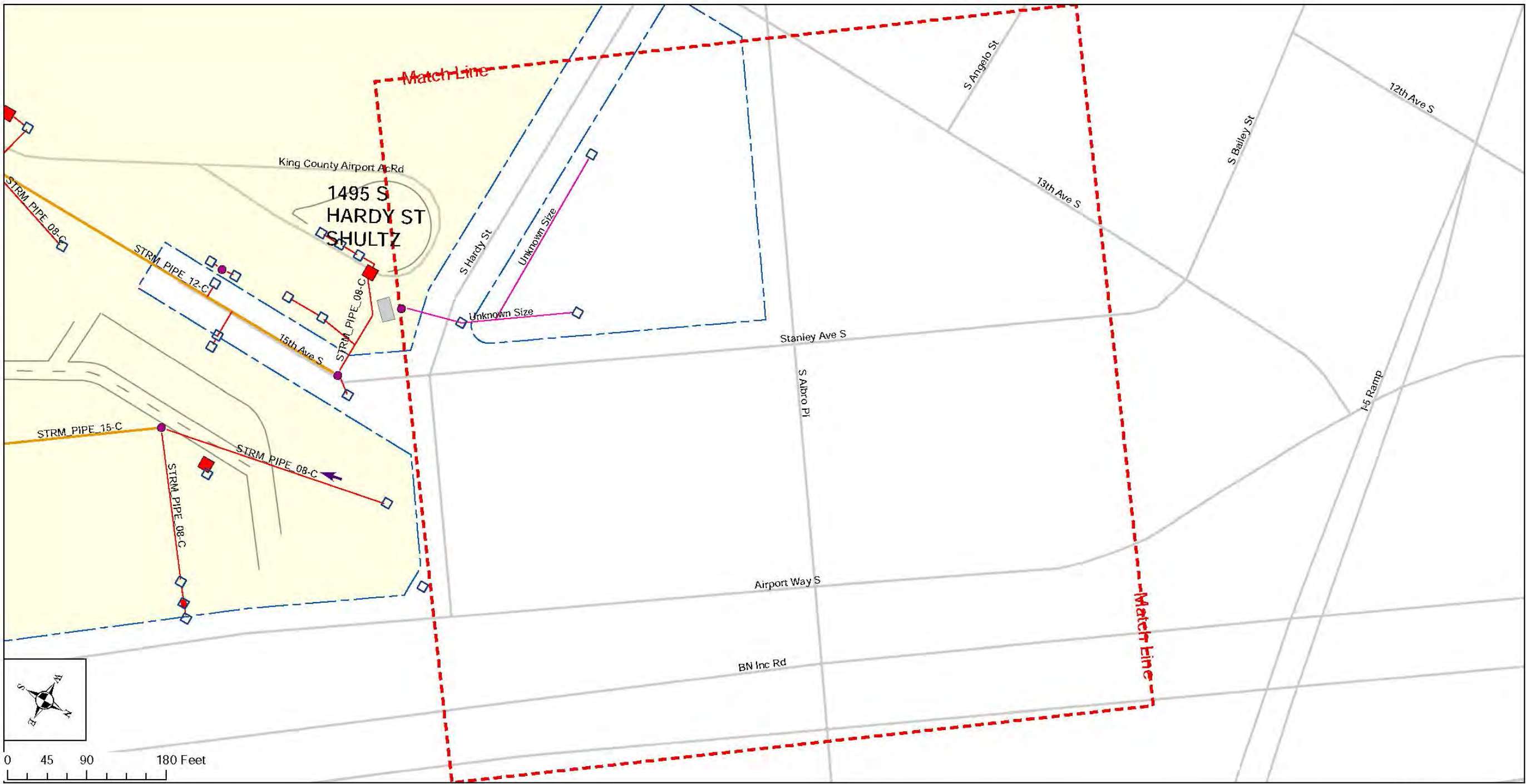
Appendix D, Map 5, Section 14. KCIA Eastside Stormwater Line Cleaning Map



King County
International Airport
Boeing Field

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Appendix D, Map 5, Section 15. KCIA Eastside Stormwater Line Cleaning Map



King County
International Airport
Boeing Field

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Appendix E: KCIA Source Tracing Stormdrain Solids Datasets

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Table E-1a. Slip 4 Drainage Basin Stormdrain Solids Sample Results for SL4-T5A/B (North Lateral) from 2005-2015.

KCIA Source Tracing Data Sets

	SQS LAET	CSL 2LAET	SL4-T5A Trap		SL4-T5A Trap		SL4-T5A Trap		SL4-T5A Trap		SL4-T5A Trap		SL4-T5A Trap		SL4-T5A Trap	
Sampled By			SPU		SPU		SPU		SPU		SPU		SPU		SPU	
Date			8/11/2005		3/16/2006		10/11/2006		1/8/2007		5/14/2007		10/29/2007		3/18/2008	
			Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
METALS (mg/kg)																
Arsenic (total)	57	93	14	J	20		20		7	U	20		20		7	U
Copper	390	390	113	J	541		818		103		227		359		77	
Lead	450	530	962	J	233		381		100		194		486		92	
Mercury	0.41	0.59	0.860	J	0.270		0.400		0.150		0.380		0.400		0.140	
Zinc	410	960	220	J	597		945		209		464		781		201	
PCB (mg/kg)																
pcb - Aroclor 1016	---	---	0.010	U	0.100	U	0.100	U	0.070	U	0.047	U	0.030	U	0.019	U
pcb - Aroclor 1221	---	---	0.010	U	0.100	U	0.100	U	0.070	U	0.047	U	0.030	U	0.019	U
pcb - Aroclor 1232	---	---	0.010	U	0.100	U	0.100	U	0.070	U	0.047	U	0.030	U	0.019	U
pcb - Aroclor 1242	---	---	0.010	U	0.100	U	0.100	U	0.070	U	0.047	U	0.030	U	0.019	U
pcb - Aroclor 1248	---	---	0.010	U	0.100	U	0.100	U	0.070	U	0.047	U	0.120	U	0.019	U
pcb - Aroclor 1254	---	---	0.072		0.320		0.430		0.086		0.240		0.490		0.085	
pcb - Aroclor 1260	---	---	0.034		0.330		0.170		0.070	U	0.150		0.180		0.036	
Total PCB	0.130	1.000	0.106		0.650		0.600		0.086		0.390		0.670		0.121	
LPAH (mg/kg)																
acenaphthene	0.500	0.500	0.110	U	0.680	U	0.380	U	0.170	U	0.370	U	0.560	U J	0.160	U
acenaphthylene	1.300	1.300	0.110	U	0.680	U	0.380	U	0.170	U	NA		0.560	U J	0.160	U
anthracene	0.960	0.960	0.150		0.680	U	0.380	U	0.320		0.370	U	0.560	U J	0.200	
fluorene	0.540	0.540	0.110	U	0.680	U	0.380	U	0.170	U	0.370	U	0.560	U J	0.160	U
methylnaphthalene, 2-	0.670	0.670	0.110	U	0.680	U	0.380	U	0.170	U	0.370	U	0.560	U J	0.160	
naphthalene	2.100	2.100	0.110		0.680	U	0.380	U	0.170	U	0.370	U	0.560	U J	0.160	U
phenanthrene	1.500	1.500	1.300		4.600		2.900		2.200		2.100		2.300	J	1.300	
Total LPAH ¹	5.200	5.200	1.450		4.600		2.900		2.520		2.100		2.300	J	1.500	
HPAH (mg/kg)																
benzo[a]anthracene	1.300	1.600	0.840		3.200		2.000		1.700		1.400		1.500	J	0.950	
benzo[a]pyrene	1.600	1.600	1.100		4.500		3.000		2.300		2.200		1.200	J	1.300	
benzo[b]fluoranthene	3.200	3.600	1.600		7.400		4.200		3.600		4.100		4.100		1.900	
benzo[k]fluoranthene	3.200	3.600	0.800		4.300		3.500		3.100		2.600		2.800		1.000	
Total Benzofluoranthenes	3.200	3.600	NA		NA		NA		NA		NA		NA		NA	
benzo(g,h,i)perylene	0.670	0.720	0.450		2.100		2.000		1.000		1.200		0.560		0.850	
chrysene	1.400	2.800	1.200		6.300		4.400		2.700		2.800		3.100	J	1.400	
dibenz[a,h]anthracene	0.230	0.230	0.110	U	0.680	U	0.640		0.220		0.370	U	0.560	U J	0.290	
fluoranthene	1.700	2.500	2.400		13.000		6.900		5.000		5.600		5.800	J	3.100	
indeno[1,2,3-cd]pyrene	0.600	0.690	0.520		2.200		2.000		1.000		1.200		0.560	U J	0.810	
pyrene	2.600	3.300	1.700		6.000		5.200		3.800		2.700		3.000	J	2.000	
Total HPAH ²	12.000	17.000	10.830		50.360		33.840		24.420		24.540		29.540	J	13.600	

Table E-1a. Slip 4 Drainage Basin Stormdrain Solids Sample Results for SL4-T5A/B (North Lateral) from 2005-2015.

KCIA Source Tracing Data Sets

	SQS LAET	CSL 2LAET	SL4-T5A Trap		SL4-T5A Trap		SL4-T5A Trap		SL4-T5A Trap		SL4-T5A Trap		SL4-T5A Trap		SL4-T5A Trap	
Sampled By			SPU		SPU		SPU		SPU		SPU		SPU		SPU	
Date			8/11/2005		3/16/2006		10/11/2006		1/8/2007		5/14/2007		10/29/2007		3/18/2008	
			Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
PHTHALATES (mg/kg)																
bis(2-ethylhexyl) phthalate	1.300	3.100	1.800		10.000		10.000		3.800		13.000		13.000	J	0.990	
butyl benzyl phthalate	0.063	0.900	0.110	U	0.680	U	0.580		0.170	U	0.370	U	0.560	U J	0.160	U
diethyl phthalate	0.200	1.200	0.110	U	0.680	U	0.380	U	0.170	U	0.370	U	0.560	U J	0.160	U
dimethyl phthalate	0.071	0.160	0.110	U	0.680	U	0.380	U	0.170	U	0.370	U	0.560	U J	0.160	U
di-butyl phthalate (di-n-butyl phth.)	1.400	5.100	0.150		0.680	U	0.730		0.170	U	0.370	U	0.560	U J	0.160	U
di-n-octyl phthalate	6.200	6.200	0.220		2.500		4.800		1.300		3.700		2.800	J	0.180	
TPH (mg/kg)																
Diesel (MTCA A)		2000	160		1400		660		340		770		240		86	
Heavy Oil (Motor Oil MTCA A)		2000	570		7500		4800		1600		6800		2300		760	
Conventionals (%)																
Solids, Total			NA		NA		NA		NA		NA		NA		NA	
Total Organic Carbon			NA		7.6		7.7		4.9		8.9		11.8		3.6	
<-1 Phi Gravel, >2000 micron			NA		NA		NA		NA		NA		NA		NA	
-1-0 Phi Very Coarse Sand, 1000-2000 micron			NA		NA		NA		NA		NA		NA		NA	
0-1 Phi Coarse Sand, 500-1000 micron			NA		NA		NA		NA		NA		NA		NA	
1-2 Phi Medium Sand, 250-500 micron			NA		NA		NA		NA		NA		NA		NA	
2-3 Phi Fine Sand, 125-250 micron			NA		NA		NA		NA		NA		NA		NA	
3-4 Phi Very Fine Sand, 62.5-125 micron			NA		NA		NA		NA		NA		NA		NA	
4-5 Phi Coarse Silt, 31-62.5 micron			NA		NA		NA		NA		NA		NA		NA	
5-6 Phi Medium Silt, 15.6-31 micron			NA		NA		NA		NA		NA		NA		NA	
6-7 Phi Fine Silt, 7.8-15.6 micron			NA		NA		NA		NA		NA		NA		NA	
7-8 Phi Very Fine Silt, 3.9-7.8 micron			NA		NA		NA		NA		NA		NA		NA	
8-9 Phi Clay, 2-3.9 micron			NA		NA		NA		NA		NA		NA		NA	
9-10 Phi Clay, 1-2 micron			NA		NA		NA		NA		NA		NA		NA	
>10 Phi Clay, <1 micron			NA		NA		NA		NA		NA		NA		NA	
Total Fines			NA		NA		NA		NA		NA		NA		NA	

Indicates > than the SQS/LAET

Indicates > than the CSL/2LAET

NA = Not Analyzed Chemistry results are in dry weight

1. Total LPAHs were calculated as the sum of acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene
2. Total HPAHs were calculated as the sum of benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, total benzofluoranthenes, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene

SQS/LAET - Sediment Quality Standards/Lowest Apparent Effects Threshold

CSL/2LAET - Cleanup Screening Level/Second Lowest Apparent Effects Threshold

SQS/LAET and CSL/2LAET are source tracing screening benchmarks (See Appendix F of KC LDW SCIP)

Table E-1a. Slip 4 Drainage Basin Stormdrain Solids Sample Results for SL4-T5A/B (North Lateral) from 2005-2015.

KCIA Source Tracing Data Sets

SL4-T5A Trap			SL4-T5A Trap		SL4-T5A Trap		SL4-T5A Trap		SL4-T5A Grab		SL4-T5A Grab		SL4-T5A Grab		SL4-T5A Grab		SL4-T5A Grab		
Sampled By		SPU		SPU		SPU		SPU		Boeing		Boeing		Boeing		Boeing		Boeing	
Date		12/3/2008		4/6/2009		4/8/2010		4/5/2011		11/3/2011		4/24/2012		5/13/2013		4/25/2014		4/28/2015	
	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	
METALS (mg/kg)																			
Arsenic (total)		20		10	U	20		14		20		30	U	50	U	30		20	
Copper		316	J	759		248		144		196		283		247		160		104	
Lead		687	J	257		342		716	J	227		270		210		176		100	
Mercury		0.580	J	0.420		0.310		0.210	J	0.310		0.200		0.280		0.200		0.200	
Zinc		691		1000		1380		356		555		790	J	730		591		373	
PCB (mg/kg)																			
pcb - Aroclor 1016		0.049	U	0.068	U	0.067	U	0.020	U	0.048	U	0.048	U	0.049	U	0.010	U	0.040	U
pcb - Aroclor 1221		0.049	U	0.068	U	0.067	U	0.020	U	0.048	U	0.048	U	0.049	U	0.010	U	0.040	U
pcb - Aroclor 1232		0.049	U	0.068	U	0.067	U	0.020	U	0.048	U	0.048	U	0.049	U	0.010	U	0.040	U
pcb - Aroclor 1242		0.049	U	0.068	U	0.067	U	0.020	U	0.048	U	0.048	U	0.049	U	0.010	U	0.040	U
pcb - Aroclor 1248		0.049	U	0.068	U	0.200	U	0.058	U	0.097	U	0.058	U	0.049	U	0.048	U	0.060	U
pcb - Aroclor 1254		0.190		0.130		0.270		0.240		0.260		0.260		0.280		0.230		0.260	
pcb - Aroclor 1260		0.120		0.068	U	0.170		0.092		0.110		0.150		0.110		0.098		0.094	P
Total PCB		0.310		0.198		0.440		0.332		0.370		0.410		0.390		0.328		0.354	P
LPAH (mg/kg)																			
acenaphthene		0.230	U	0.150	J	0.360	J	0.320		1.300	U	0.300	U	0.730	U	1.100	U	0.490	U
acenaphthylene		0.230	U	0.250	U	0.360	U	0.320		1.300	U	0.300	U	0.730	U	1.100	U	0.490	U
anthracene		0.480		0.360		0.830		0.220		1.300	U	0.340		0.730	U	1.100	U	0.320	J
fluorene		0.230		0.190	J	0.400		0.320		1.300	U	0.160		0.730	U	1.100	U	0.490	U
methylnaphthalene, 2-		0.230	U	0.160	U	0.360	U	0.320		1.300	U	0.300	U	0.730	U	1.100	U	0.490	U
naphthalene		0.230	U	0.250	U	0.360	U	0.320		1.300	U	0.300	U	0.730	U	1.100	U	0.017	J
phenanthrene		3.800		3.500		7.800		1.700		2.400		3.700		2.800		3.100		2.800	
Total LPAH ¹		4.510		3.860	J	9.030	J	1.920		2.400		4.200		2.800		3.100		3.137	
HPAH (mg/kg)																			
benzo[a]anthracene		2.700		2.200		5.200		1.200		1.400		2.200		1.500		1.800		1.700	
benzo[a]pyrene		4.000		3.500		8.400		1.700		2.200		3.700		2.700		2.900		2.100	
benzo[b]fluoranthene		4.600		4.300		9.900		NA		NA		NA		NA		NA		NA	
benzo[k]fluoranthene		4.400		5.200		9.900		NA		NA		NA		NA		NA		NA	
Total Benzofluoranthenes		NA		NA		NA		5.500		9.800		7.200		8.200		6.800		6.100	
benzo(g,h,i)perylene		2.500		2.200		4.600		1.500		2.200		3.900		2.900		2.200		1.400	
chrysene		4.700		5.000		12.000		2.300		3.200		5.400		4.000		4.200		3.700	
dibenz[a,h]anthracene		0.890		0.630		2.000		0.710		1.400		0.870		1.100		1.100		0.510	
fluoranthene		9.500		8.100		20.000		4.800		5.000		9.800		5.200		6.800		6.200	
indeno[1,2,3-cd]pyrene		2.400		2.400		4.700		1.400		2.200		3.300		2.500		2.200		1.800	
pyrene		5.500		5.800		11.000		2.500		3.700		6.300		4.800		5.400		4.500	
Total HPAH ²		41.190		39.330		87.700		21.610		31.100		42.670		32.900		34.500		24.210	

Table E-1a. Slip 4 Drainage Basin Stormdrain Solids Sample Results for SL4-T5A/B (North Lateral) from 2005-2015.

KCIA Source Tracing Data Sets

SL4-T5A Trap			SL4-T5A Trap		SL4-T5A Trap		SL4-T5A Trap		SL4-T5A Grab		SL4-T5A Grab		SL4-T5A Grab		SL4-T5A Grab		SL4-T5A Grab		
Sampled By		SPU		SPU		SPU		SPU		Boeing		Boeing		Boeing		Boeing		Boeing	
Date		12/3/2008		4/6/2009		4/8/2010		4/5/2011		11/3/2011		4/24/2012		5/13/2013		4/25/2014		4/28/2015	
	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	
PHTHALATES (mg/kg)																			
bis(2-ethylhexyl) phthalate		9.800		24.000		16.000		2.000		9.000		23.000		26.000		17.000		11.000	
butyl benzyl phthalate		0.370		0.240	J	0.300	J	0.320	U	1.300	U	0.650		1.600		8.500		0.490	U
diethyl phthalate		0.230	U	0.250	U	0.360	U	0.320	U	3.200		0.740		1.800		1.100	U	0.490	U
dimethyl phthalate		0.230	U	0.250	U	0.360	U	0.320	U	1.300	U	0.300	U	0.730		1.100	U	0.490	U
di-butyl phthalate (di-n-butyl phth.)		0.230	U	0.250	U	0.800		0.320	U	1.300	U	0.300	U	0.730		1.100	U	0.490	U
di-n-octyl phthalate		3.500		2.000		16.000		0.320	U	1.300	U	3.600		4.900		2.100		1.600	
TPH (mg/kg)																			
Diesel (MTCA A)		230	J	1600		400		190		530		480		NA		450		360	
Heavy Oil (Motor Oil MTCA A)		1600	J	5800		1600		1500		2600		1900		NA		2100		2000	
Conventionals (%)																			
Solids, Total		49.8		NA		NA		NA		NA		NA		NA		NA		NA	
Total Organic Carbon		13.2		14.9		12.8		NA		NA		NA		NA		NA		NA	
<-1 Phi Gravel, >2000 micron		3.6		2.4		NA		NA		NA		NA		NA		22.9		3.5	
-1-0 Phi Very Coarse Sand, 1000-2000 micron		9.9		6.0		NA		NA		NA		NA		NA		4.5		5.2	
0-1 Phi Coarse Sand, 500-1000 micron		15.8		7.7		NA		NA		NA		NA		NA		4.5		9.5	
1-2 Phi Medium Sand, 250-500 micron		25.0		15.1		NA		NA		NA		NA		NA		9.7		24.1	
2-3 Phi Fine Sand, 125-250 micron		18.5		13.9		NA		NA		NA		NA		NA		22.8		26.3	
3-4 Phi Very Fine Sand, 62.5-125 micron		6.2		8.0		NA		NA		NA		NA		NA		8.5		6.2	
4-5 Phi Coarse Silt, 31-62.5 micron		11.2		10.7		NA		NA		NA		NA		NA		8.0		2.3	
5-6 Phi Medium Silt, 15.6-31 micron		5.2		14.2		NA		NA		NA		NA		NA		6.7		10.3	
6-7 Phi Fine Silt, 7.8-15.6 micron		2.4		8.7		NA		NA		NA		NA		NA		5.1		6.1	
7-8 Phi Very Fine Silt, 3.9-7.8 micron		1.2		5.2		NA		NA		NA		NA		NA		3.0		4.1	
8-9 Phi Clay, 2-3.9 micron		0.1		2.8		NA		NA		NA		NA		NA		1.5		0.5	
9-10 Phi Clay, 1-2 micron		0.5		1.4		NA		NA		NA		NA		NA		1.7		0.8	
>10 Phi Clay, <1 micron		0.6		3.9		NA		NA		NA		NA		NA		1.1		11.0	
Total Fines		21.0		46.9		NA		NA		NA		NA		NA		27.2		25.2	

	SQS LAET	CSL 2LAET	SL4-T4A Grab		SL4-T4A Trap		SL4-T4A Trap		SL4-T4A Trap		SL4-T4A Trap		SL4-T4A Trap		SL4-T4A Trap		SL4-T4A Trap	
Sampled By			SPU		SPU		SPU		SPU		SPU		SPU		SPU		SPU	
Date			2/16/2005		8/11/2005		3/16/2006		10/11/2006		1/8/2007		5/14/2007		10/29/2007		3/18/2008	
			Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
METALS (mg/kg)																		
Arsenic (total)	57	93	30		16		13		20		12		NA		6		NA	
Copper	390	390	86		94		75		262		76		NA		61		NA	
Lead	450	530	155		144		116		414		121		NA		77		NA	
Mercury	0.41	0.59	0.070		0.190		0.100		0.300		0.090		NA		0.070		NA	
Zinc	410	960	1130		460		337		1220		433		NA		309		NA	
PCB (mg/kg)																		
pcb - Aroclor 1016	---	---	0.140	U	0.010	U	0.010		0.081	U	0.010	U	NA		0.011	U	0.010	U
pcb - Aroclor 1221	---	---	0.140	U	0.010	U	0.010		0.081	U	0.010	U	NA		0.011	U	0.010	U
pcb - Aroclor 1232	---	---	0.140	U	0.010	U	0.010		0.081	U	0.010	U	NA		0.011	U	0.010	U
pcb - Aroclor 1242	---	---	0.140	U	0.010	U	0.010		0.081	U	0.010	U	NA		0.011	U	0.010	U
pcb - Aroclor 1248	---	---	0.140	U	0.010	U	0.010		0.081	U	0.010	U	NA		0.022		0.010	U
pcb - Aroclor 1254	---	---	3.700		0.290	P	0.039		0.083		0.041		NA		0.049		0.016	
pcb - Aroclor 1260	---	---	1.900		0.160		0.075		0.160		0.062		NA		0.028		0.026	
Total PCB	0.130	1.000	5.600		0.450	P	0.114		0.243		0.103		NA		0.099		0.042	
LPAH (mg/kg)																		
acenaphthene	0.500	0.500	0.930		0.160	U	0.600		NA		0.160	U	NA		NA		0.061	U
acenaphthylene	1.300	1.300	0.220	U	0.160	U	0.600		NA		0.160	U	NA		NA		0.061	U
anthracene	0.960	0.960	1.200		0.180		0.600		NA		0.210		NA		NA		0.120	
fluorene	0.540	0.540	1.100		0.160	U	0.600		NA		0.160	U	NA		NA		0.061	U
methylnaphthalene, 2-	0.670	0.670	0.660		0.160	U	0.600		NA		0.160	U	NA		NA		0.061	U
naphthalene	2.100	2.100	0.220	U	0.160	U	0.600		NA		0.160	U	NA		NA		0.061	U
phenanthrene	1.500	1.500	8.900		1.700		1.600		NA		1.400		NA		NA		0.800	
Total LPAH ¹	5.200	5.200	12.790		1.880		1.600				2.410						1.225	
HPAH (mg/kg)																		
benzo[a]anthracene	1.300	1.600	3.000		0.860		1.000		NA		0.920		NA		NA		0.460	
benzo[a]pyrene	1.600	1.600	3.400		1.400		1.600		NA		1.500		NA		NA		0.730	
benzo[b]fluoranthene	3.200	3.600	5.400		2.100		2.500		NA		2.300		NA		NA		1.200	
benzo[k]fluoranthene	3.200	3.600	3.600		1.300		1.900		NA		2.500		NA		NA		1.000	
Total Benzo[flouranthenes	3.200	3.600	NA		NA		NA		NA		NA		NA		NA		NA	
benzo(g,h,i)perylene	0.670	0.720	1.300		0.710		0.900		NA		0.690		NA		NA		0.590	
chrysene	1.400	2.800	4.200		1.700		2.500		NA		2.000		NA		NA		1.100	
dibenz[a,h]anthracene	0.230	0.230	0.220	U	0.160	U	0.600		NA		0.160	U	NA		NA		0.220	
fluoranthene	1.700	2.500	11.000		3.100		4.200		NA		3.200		NA		NA		1.800	
indeno[1,2,3-cd]pyrene	0.600	0.690	1.500		0.780		0.960		NA		0.670		NA		NA		0.560	
pyrene	2.600	3.300	7.600		2.100		2.400		NA		2.300		NA		NA		1.200	
Total HPAH ²	12.000	17.000	41.440		14.370		19.160				16.400						8.860	

Table E-1b. Slip 4 Drainage Basin Stormdrain Solids Sample Results for SL4-T4A (North Central Lateral) from 2005-2015

KCfA Source Tracing Data Sets

	SQS LAET	CSL 2LAET	SL4-T4A Grab		SL4-T4A Trap		SL4-T4A Trap		SL4-T4A Trap		SL4-T4A Trap		SL4-T4A Trap		SL4-T4A Trap		SL4-T4A Trap	
Sampled By			SPU		SPU		SPU		SPU		SPU		SPU		SPU		SPU	
Date			2/16/2005		8/11/2005		3/16/2006		10/11/2006		1/8/2007		5/14/2007		10/29/2007		3/18/2008	
			Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
PHTHALATES (mg/kg)																		
bis(2-ethylhexyl) phthalate	1.300	3.100	2.200		2.600		2.600		NA		3.700		NA		NA		1.400	
butyl benzyl phthalate	0.063	0.900	0.220	U	0.160	U	0.600		NA		0.220		NA		NA		0.076	
diethyl phthalate	0.200	1.200	0.220	U	0.160	U	0.600		NA		0.160	U	NA		NA		0.061	U
dimethyl phthalate	0.071	0.160	0.220	U	0.160	U	0.600		NA		0.160	U	NA		NA		0.061	U
di-butyl phthalate (di-n-butyl phth.)	1.400	5.100	0.220	U	0.350		0.600		NA		0.240		NA		NA		0.130	
di-n-octyl phthalate	6.200	6.200	0.240		4.300		9.600		NA		7.200		NA		NA		2.600	
TPH (mg/kg)																		
Diesel (MTCA A)	2000	2000	200		100		180		NA		140		NA		NA		NA	
Heavy Oil (Motor Oil MTCA A)	2000	2000	1100		410		1100		410		600		NA		NA		NA	
Conventionals (%)																		
Solids, Total			66.6		47.3	J	NA		27.8		50.5		NA		NA		NA	
Total Organic Carbon			3.9		5.4		NA		NA		4.1		NA		NA		NA	
<-1 Phi Gravel, >2000 micron			NA		NA		NA		NA		NA		NA		NA		NA	
-1-0 Phi Very Coarse Sand, 1000-2000 micron			NA		NA		NA		NA		NA		NA		NA		NA	
0-1 Phi Coarse Sand, 500-1000 micron			NA		NA		NA		NA		NA		NA		NA		NA	
1-2 Phi Medium Sand, 250-500 micron			NA		NA		NA		NA		NA		NA		NA		NA	
2-3 Phi Fine Sand, 125-250 micron			NA		NA		NA		NA		NA		NA		NA		NA	
3-4 Phi Very Fine Sand, 62.5-125 micron			NA		NA		NA		NA		NA		NA		NA		NA	
4-5 Phi Coarse Silt, 31-62.5 micron			NA		NA		NA		NA		NA		NA		NA		NA	
5-6 Phi Medium Silt, 15.6-31 micron			NA		NA		NA		NA		NA		NA		NA		NA	
6-7 Phi Fine Silt, 7.8-15.6 micron			NA		NA		NA		NA		NA		NA		NA		NA	
7-8 Phi Very Fine Silt, 3.9-7.8 micron			NA		NA		NA		NA		NA		NA		NA		NA	
8-9 Phi Clay, 2-3.9 micron			NA		NA		NA		NA		NA		NA		NA		NA	
9-10 Phi Clay, 1-2 micron			NA		NA		NA		NA		NA		NA		NA		NA	
>10 Phi Clay, <1 micron			NA		NA		NA		NA		NA		NA		NA		NA	
Total Fines			NA		NA		NA		NA		NA		NA		NA		NA	

Indicates > than the SQS/LAET

Indicates > than the CSL/2LAET

NA = Not Analyzed Chemistry results are in dry weight

1. Total LPAHs were calculated as the sum of acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene

2. Total HPAHs were calculated as the sum of benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, total benzofluoranthenes, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene

SQS/LAET - Sediment Quality Standards/Lowest Apparent Effects Threshold

CSL/2LAET - Cleanup Screening Level/Second Lowest Apparent Effects Threshold

SQS/LAET and CSL/2LAET are source tracing screening benchmarks (See Appendix F of KC LDW SCIP)

	SL4-T4A Trap		SL4-T4A Grab		SL4-T4A Grab		SL4-T4A Grab		SL4-T4A Trap		SL4-T4A Trap		SL4-T4A Trap		SL4-T4A Trap		SL4-T4A Trap	
Sampled By	SPU		SPU		SPU		SPU		SPU		Boeing		Boeing		Boeing		Boeing	
Date	7/30/2008		12/3/2008		4/6/2009		4/8/2010		4/5/2011		4/24/2012		5/13/2013		4/25/2014		4/28/2015	
	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
METALS (mg/kg)																		
Arsenic (total)	NA		NA		NA		14		NA		20		20		30		20	U
Copper	NA		NA		NA		248	J	NA		419		356		367		375	
Lead	NA		NA		NA		376	J	NA		506		313		403		322	
Mercury	NA		NA		NA		0.230		NA		0.340		0.250		0.032		0.300	
Zinc	NA		NA		NA		551		NA		1430		1210		1590		1430	
PCB (mg/kg)																		
pcb - Aroclor 1016	0.015	U	0.011	U	0.010	U	0.053	U	0.022	U	0.046	U	0.010	U	0.010	U	0.087	U
pcb - Aroclor 1221	0.015	U	0.011	U	0.010	U	0.053	U	0.022	U	0.046	U	0.010	U	0.010	U	0.087	U
pcb - Aroclor 1232	0.015	U	0.011	U	0.010	U	0.053	U	0.028	U	0.046	U	0.010	U	0.010	U	0.087	U
pcb - Aroclor 1242	0.015	U	0.011	U	0.010	U	0.053	U	0.022	U	0.046	U	0.010	U	0.010	U	0.087	U
pcb - Aroclor 1248	0.015	U	0.011	U	0.010	U	0.270	U	0.022	U	0.046	U	0.019	U	0.035		0.087	U
pcb - Aroclor 1254	0.028		0.011	U	0.010		0.510		0.067		0.100		0.080		0.120		0.170	P
pcb - Aroclor 1260	0.030		0.011	U	0.010		0.170		0.087		0.160		0.076		0.120		0.170	P
Total PCB	0.058		0.011	U	0.020		0.680		0.154		0.260		0.156		0.240		0.340	P
LPAH (mg/kg)																		
acenaphthene	0.530	U	NA		0.500	U	0.170	J	NA		0.480	U	1.500	U	1.400	U	2.000	U
acenaphthylene	0.530	U	NA		0.500	U	0.250	U	NA		0.480	U	1.500	U	1.400	U	2.000	U
anthracene	0.530	U	NA		0.500	U	0.680		NA		0.650	U	1.500	U	1.400	U	0.590	J
fluorene	0.530	U	NA		0.500	U	0.260		NA		0.260	U	1.500	U	1.400	U	2.000	U
methylnaphthalene, 2-	0.530	U	NA		0.500	U	0.250		NA		0.480	U	1.500	U	1.400	U	2.000	U
naphthalene	0.530	U	NA		0.500		0.250	U	NA		0.480		1.500	U	1.400	U	2.000	U
phenanthrene	1.000		NA		2.300		4.900		NA		6.900		5.800		3.100		3.200	
Total LPAH ¹	1.000				2.300		6.760				7.810		5.800		3.100		3.790	
HPAH (mg/kg)																		
benzo[a]anthracene	0.630		NA		1.100		3.900		NA		3.500		3.200		1.700		1.500	
benzo[a]pyrene	1.200		NA		2.100		5.700		NA		6.500		4.900		3.200		2.600	
benzo[b]fluoranthene	2.000		NA		2.600		5.500		NA		NA		NA		NA		NA	
benzo[k]fluoranthene	1.400		NA		3.500		5.500		NA		NA		NA		NA		NA	
Total Benzoflouranthenes	NA		NA		NA		NA		NA		18.000		14.000		8.100		7.400	
benzo(g,h,i)perylene	1.200		NA		2.300		2.900		NA		7.000		5.800		2.400	J	2.300	
chrysene	1.600		NA		3.300		6.500		NA		9.700		7.700		4.700		4.400	
dibenz[a,h]anthracene	0.530	U	NA		0.320	J	1.200		NA		2.300		1.300		1.400	U	2.000	U
fluoranthene	2.500		NA		4.800		13.000		NA		15.000		12.000		6.300		7.000	
indeno[1,2,3-cd]pyrene	1.200		NA		2.100		2.800		NA		6.300		4.900		2.200		2.200	
pyrene	2.000		NA		3.900		7.100		NA		12.000		8.900		5.500		5.000	
Total HPAH ²	14.790				26.020	J	54.100				80.300		62.700		36.900		36.400	

	SL4-T4A Trap		SL4-T4A Grab		SL4-T4A Grab		SL4-T4A Grab		SL4-T4A Trap		SL4-T4A Trap		SL4-T4A Trap		SL4-T4A Trap		SL4-T4A Trap	
Sampled By	SPU		SPU		SPU		SPU		SPU		Boeing		Boeing		Boeing		Boeing	
Date	7/30/2008		12/3/2008		4/6/2009		4/8/2010		4/5/2011		4/24/2012		5/13/2013		4/25/2014		4/28/2015	
	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
PHthalates (mg/kg)																		
bis(2-ethylhexyl) phthalate	1.700		NA		2.500		6.000		NA		8.100		20.000		28.000		33.000	
butyl benzyl phthalate	0.530	U	NA		0.500	U	0.630		NA		0.570		1.500	U	1.400	U	2.000	U
diethyl phthalate	0.530	U	NA		0.500	U	0.250	U	NA		1.200		3.700		1.400	U	2.000	U
dimethyl phthalate	0.530	U	NA		0.500	U	0.250	U	NA		0.480	U	1.500	U	1.400	U	2.000	U
di-butyl phthalate (di-n-butyl phth.)	0.530	U	NA		0.420	J	0.320		NA		1.400		1.500	U	1.300	J	3.200	
di-n-octyl phthalate	5.900		NA		16.000		1.200		NA		30.000		50.000		46.000		40.000	
TPH (mg/kg)																		
Diesel (MTCA A)	NA		NA		NA		210		NA		250		NA		450		NA	
Heavy Oil (Motor Oil MTCA A)	NA		NA		NA		1400		NA		1200		NA		2100		NA	
Conventional (%)																		
Solids, Total	NA		NA		NA		62.1		31.9		21.7		25.3		26.3		23.1	
Total Organic Carbon	NA		NA		NA		9.2		10.6		17.6		10.8		5.2		17.6	
<-1 Phi Gravel, >2000 micron	NA		NA		NA		NA		NA		NA		NA		NA		NA	
-1-0 Phi Very Coarse Sand, 1000-2000 micron	NA		NA		NA		NA		NA		NA		NA		NA		NA	
0-1 Phi Coarse Sand, 500-1000 micron	NA		NA		NA		NA		NA		NA		NA		NA		NA	
1-2 Phi Medium Sand, 250-500 micron	NA		NA		NA		NA		NA		NA		NA		NA		NA	
2-3 Phi Fine Sand, 125-250 micron	NA		NA		NA		NA		NA		NA		NA		NA		NA	
3-4 Phi Very Fine Sand, 62.5-125 micron	NA		NA		NA		NA		NA		NA		NA		NA		NA	
4-5 Phi Coarse Silt, 31-62.5 micron	NA		NA		NA		NA		NA		NA		NA		NA		NA	
5-6 Phi Medium Silt, 15.6-31 micron	NA		NA		NA		NA		NA		NA		NA		NA		NA	
6-7 Phi Fine Silt, 7.8-15.6 micron	NA		NA		NA		NA		NA		NA		NA		NA		NA	
7-8 Phi Very Fine Silt, 3.9-7.8 micron	NA		NA		NA		NA		NA		NA		NA		NA		NA	
8-9 Phi Clay, 2-3.9 micron	NA		NA		NA		NA		NA		NA		NA		NA		NA	
9-10 Phi Clay, 1-2 micron	NA		NA		NA		NA		NA		NA		NA		NA		NA	
>10 Phi Clay, <1 micron	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Total Fines	NA		NA		NA		NA		NA		NA		NA		NA		NA	

	SQS LAET	CSL 2LAET	SL4-T3A Trap		SL4-T3A Inline		SL4-T3A Trap		SL4-T3A Trap		SL4-T3A Trap		SL4-T3A Trap		SL4-T3A Trap		SL4-T3A Trap	
Sampled By			SPU		SPU		SPU		SPU		SPU		SPU		SPU		SPU	
Date			8/11/2005		3/16/2006		10/6/2006		1/9/2007		5/17/2007		3/18/2008		8/5/2008		4/7/2009	
			Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
METALS (mg/kg)																		
Arsenic (total)	57	93	NA		12		20	U	NA		20	U	10	U	30	U	20	J
Copper	390	390	NA		142		282		NA		121		117		86		120	J
Lead	450	530	NA		740		1070		NA		787		405		250		787	J
Mercury	0.41	0.59	NA		0.160		0.200	U	NA		0.100	U	0.100		0.090	U	0.100	U J
Zinc	410	960	NA		276		418		NA		289		241		179		91.0	J
PCB (mg/kg)																		
pcb - Aroclor 1016	---	---	0.034	U	0.020	U	NA		0.032	U	0.059	U	0.920	U	0.050	U	0.066	U
pcb - Aroclor 1221	---	---	0.034	U	0.020	U	NA		0.032	U	0.059	U	0.920	U	0.050	U	0.066	U
pcb - Aroclor 1232	---	---	0.034	U	0.020	U	NA		0.032	U	0.059	U	0.920	U	0.050	U	0.066	U
pcb - Aroclor 1242	---	---	0.034	U	0.020	U	NA		0.032	U	0.059	U	0.920	U	0.050	U	0.066	U
pcb - Aroclor 1248	---	---	0.034	U	0.020	U	NA		0.032	U	0.059	U	0.920	U	0.050	U	0.066	U
pcb - Aroclor 1254	---	---	0.038	J	0.550		NA		0.100		0.078		0.920	U	0.140	J	0.140	
pcb - Aroclor 1260	---	---	0.034	U	0.180		NA		0.087		0.059	U	0.920	U	0.097	J	0.085	
Total PCB	0.130	1.000	0.038	J	0.730		NA		0.187		0.078		ND		0.237	J	0.225	
LPAH (mg/kg)																		
acenaphthene	0.500	0.500	NA		0.370	J	0.083		0.076	J	NA		0.100	J	0.270	U	NA	
acenaphthylene	1.300	1.300	NA		0.660	U	0.034		0.130		NA		0.200	U	0.270	U	NA	
anthracene	0.960	0.960	NA		0.690		0.230		0.220		NA		0.320		0.270	U	NA	
fluorene	0.540	0.540	NA		0.420	J	0.100		0.110	J	NA		0.420		0.270	U	NA	
methylnaphthalene, 2-	0.670	0.670	NA		0.660		0.042		0.130	U	NA		0.200	U	0.270	U	NA	
naphthalene	2.100	2.100	NA		0.660	U	0.037		0.002	U	NA		0.200	U	0.270	U	NA	
phenanthrene	1.500	1.500	NA		6.000		1.800		1.700		NA		2.700		1.300		NA	
Total LPAH ¹	5.200	5.200	NA		7.480	J	2.326		2.162	J	NA		3.540		1.300		NA	
HPAH (mg/kg)																		
benzo[a]anthracene	1.300	1.600	NA		3.600		1.100		1.100		NA		1.800		0.820		NA	
benzo[a]pyrene	1.600	1.600	NA		4.600		1.500		1.600		NA		2.600		1.300		NA	
benzo[b]fluoranthene	3.200	3.600	NA		7.400		2.100		3.400		NA		5.000		1.800		NA	
benzo[k]fluoranthene	3.200	3.600	NA		5.100		1.200		1.100		NA		3.300		2.000		NA	
benzo(g,h,i)perylene	0.670	0.720	NA		2.200	J	0.510		0.880		NA		1.000		0.880		NA	
chrysene	1.400	2.800	NA		6.800		2.100		2.100		NA		4.200		2.200		NA	
dibenz[a,h]anthracene	0.230	0.230	NA		0.600		0.250		0.170		NA		0.320		0.270	U	NA	
fluoranthene	1.700	2.500	NA		12.000		3.700		4.000		NA		7.400		2.700		NA	
indeno[1,2,3-cd]pyrene	0.600	0.690	NA		2.500		0.580		1.100		NA		1.300		0.840		NA	
pyrene	2.600	3.300	NA		8.400		2.600		2.400		NA		4.200		2.200		NA	
Total HPAH ²	12.000	17.000	NA		53.200	J	15.640		17.850		NA		31.120		15.010		NA	

Table E-1c. Slip 4 Drainage Basin Stormdrain Solids Sample Results for SL4-T3A (South Central Lateral) from 2005-2015

KCIA Source Tracing Data Sets

	SQS LAET	CSL 2LAET	SL4-T3A Trap		SL4-T3A Inline		SL4-T3A Trap		SL4-T3A Trap		SL4-T3A Trap		SL4-T3A Trap		SL4-T3A Trap		SL4-T3A Trap	
Sampled By			SPU		SPU		SPU		SPU		SPU		SPU		SPU		SPU	
Date			8/11/2005		3/16/2006		10/6/2006		1/9/2007		5/17/2007		3/18/2008		8/5/2008		4/7/2009	
			Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
PHTHALATES (mg/kg)																		
bis(2-ethylhexyl) phthalate	1.300	3.100	NA		3.800		0.670		0.800		NA		2.900		3.800		NA	
butyl benzyl phthalate	0.063	0.900	NA		0.540	J	0.062		0.140		NA		0.170	J	0.270	U	NA	
diethyl phthalate	0.200	1.200	NA		0.660	U	0.020	U	0.130	U	NA		0.200	U	0.270	U	NA	
dimethyl phthalate	0.071	0.160	NA		0.660	U	0.020	U	0.130	U	NA		0.200	U	0.270	U	NA	
di-butyl phthalate (di-n-butyl phth.)	1.400	5.100	NA		0.660	U	0.110	U	0.130	U	NA		0.200	U	0.270	U	NA	
di-n-octyl phthalate	6.200	6.200	NA		0.660	U	0.044		0.130	U	NA		0.100	J	0.270	U	NA	
TPH (mg/kg)																		
Diesel (MTCA A)	2000	2000	NA		410		NA		NA		NA		NA		420		NA	
Heavy Oil (Motor Oil MTCA A)	2000	2000	NA		2700		NA		NA		NA		NA		5300		NA	
Conventionals (%)																		
Solids, Total			NA		NA		NA		NA		NA		NA		NA		NA	
Total Organic Carbon			NA		11.8		NA		4.8		NA		NA		5.9		NA	
<-1 Phi Gravel, >2000 micron			NA		NA		NA		NA		NA		NA		NA		NA	
-1-0 Phi Very Coarse Sand, 1000-2000 micron			NA		NA		NA		NA		NA		NA		NA		NA	
0-1 Phi Coarse Sand, 500-1000 micron			NA		NA		NA		NA		NA		NA		NA		NA	
1-2 Phi Medium Sand, 250-500 micron			NA		NA		NA		NA		NA		NA		NA		NA	
2-3 Phi Fine Sand, 125-250 micron			NA		NA		NA		NA		NA		NA		NA		NA	
3-4 Phi Very Fine Sand, 62.5-125 micron			NA		NA		NA		NA		NA		NA		NA		NA	
4-5 Phi Coarse Silt, 31-62.5 micron			NA		NA		NA		NA		NA		NA		NA		NA	
5-6 Phi Medium Silt, 15.6-31 micron			NA		NA		NA		NA		NA		NA		NA		NA	
6-7 Phi Fine Silt, 7.8-15.6 micron			NA		NA		NA		NA		NA		NA		NA		NA	
7-8 Phi Very Fine Silt, 3.9-7.8 micron			NA		NA		NA		NA		NA		NA		NA		NA	
8-9 Phi Clay, 2-3.9 micron			NA		NA		NA		NA		NA		NA		NA		NA	
9-10 Phi Clay, 1-2 micron			NA		NA		NA		NA		NA		NA		NA		NA	
>10 Phi Clay, <1 micron			NA		NA		NA		NA		NA		NA		NA		NA	
Total Fines			NA		NA		NA		NA		NA		NA		NA		NA	

Indicates > than the SQS/LAET

Indicates > than the CSL/2LAET

NA = Not Analyzed Chemistry results are in dry weight

1. Total LPAHs were calculated as the sum of acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene
2. Total HPAHs were calculated as the sum of benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, total benzofluoranthenes, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene

SQS/LAET - Sediment Quality Standards/Lowest Apparent Effects Threshold

CSL/2LAET - Cleanup Screening Level/Second Lowest Apparent Effects Threshold

SQS/LAET and CSL/2LAET are source tracing screening benchmarks (See Appendix F of KC LDW SCIP)

	SL4-T3A Trap		SL4-T3A Trap		SL4-T3A Trap		SL4-T3A Grab		SL4-T3A Trap		SL4-T3A Grab		SL4-T3A Grab		SL4-T3A Grab (PAH SIM)	
Sampled By	SPU		SPU		SPU		SPU		SPU		SPU		KCIA		KCIA	
Date	10/7/2009		4/29/2010		11/15/2010		11/15/2010		7/24/2012		7/24/2012		5/9/2013		5/9/2013	
	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
METALS (mg/kg)																
Arsenic (total)	30	U J	10	U	40	U	7	U	30		NA		10		NA	
Copper	56	J	48		32		14		38		NA		13		NA	
Lead	60	J	31		50		6		30		NA		10		NA	
Mercury	0.060	U J	0.050	U	0.030	U	0.030	U	0.040		NA		0.025		NA	
Zinc	163	J	91.0		96.0		33.0		109		NA		37.7		NA	
PCB (mg/kg)																
pcb - Aroclor 1016	0.020	U	0.020	U	0.020	U	0.020	U	0.018	U	0.017	U	0.462	U	0.014	U
pcb - Aroclor 1221	0.020	U	0.020	U	0.020	U	0.020	U	0.018	U	0.017	U	0.462	U	0.014	U
pcb - Aroclor 1232	0.020	U	0.020	U	0.020	U	0.020	U	0.018	U	0.017	U	0.462	U	0.014	U
pcb - Aroclor 1242	0.020	U	0.020	U	0.020	U	0.020	U	0.018	U	0.017	U	0.462	U	0.014	U
pcb - Aroclor 1248	0.020	U	0.020	U	0.020	U	0.020	U	0.018	U	0.017	U	0.462	U	0.014	U
pcb - Aroclor 1254	0.020	U	0.020	U	0.020	U	0.020	U	0.020		0.017	U	0.462	U	0.014	U
pcb - Aroclor 1260	0.020	U	0.020	U	0.020	U	0.020	U	0.028		0.017	U	0.462	U	0.014	U
Total PCB	ND		ND		ND		ND		0.048		ND		ND		ND	
LPAH (mg/kg)																
acenaphthene	NA		0.110	U	0.032	J	0.059	U	0.056		0.058	U	0.462	U	0.014	U
acenaphthylene	NA		0.110	U	0.059	U	0.059	U	0.059		0.058	U	0.462	U	0.014	U
anthracene	NA		0.130		0.084		0.059	U	0.160		0.058	U	0.462	U	0.014	U
fluorene	NA		0.060		0.036	J	0.059	U	0.073		0.058	U	0.462	U	0.014	U
methylnaphthalene, 2-	NA		0.110	U	0.059	U	0.059	U	0.035		0.058	U	0.462	U	NA	
naphthalene	NA		0.110	U	0.059	U	0.059	U	0.050		0.058	U	0.462	U	0.014	U
phenanthrene	NA		1.500		0.950		0.190		1.600		0.250		0.462	U	0.099	
Total LPAH ¹	NA		1.690		1.102	J	0.190		2.092		0.250		ND		0.099	
HPAH (mg/kg)																
benzo[a]anthracene	NA		1.000		0.620		0.090		1.000		0.087		0.462	U	0.063	
benzo[a]pyrene	NA		1.700		1.000		0.130		1.600		0.150		0.462	U	0.095	
benzo[b]fluoranthene	NA		2.300		0.390		0.390		NA		NA		0.462	U	0.213	
benzo[k]fluoranthene	NA		2.300		NA		NA		4.200		0.038		0.462	U	0.056	
benzo(g,h,i)perylene	NA		1.800		0.470		0.067		1.500		0.150		0.462	U	0.077	
chrysene	NA		2.400		1.300		0.200		2.300		0.260		0.462	U	0.152	
dibenz[a,h]anthracene	NA		0.600		0.059	U	0.059	U	0.054		0.058		0.462	U	0.018	
fluoranthene	NA		3.800		2.100		0.300		3.700		0.350		0.462	U	0.224	
indeno[1,2,3-cd]pyrene	NA		1.700		0.520		0.068		1.400		0.120		0.462	U	0.071	
pyrene	NA		2.000		1.400		0.220		2.600		0.270		0.462	U	0.167	
Total HPAH ²	NA		19.600		7.918		1.583		18.354		1.483		ND		1.135	

Table E-1c. Slip 4 Drainage Basin Stormdrain Solids Sample Results for SL4-T3A (South Central Lateral) from 2005-2015

KCIA Source Tracing Data Sets

	SL4-T3A Trap		SL4-T3A Trap		SL4-T3A Trap		SL4-T3A Grab		SL4-T3A Trap		SL4-T3A Grab		SL4-T3A Grab		SL4-T3A Grab (PAH SIM)	
Sampled By	SPU		SPU		SPU		SPU		SPU		SPU		KCIA		KCIA	
Date	10/7/2009		4/29/2010		11/15/2010		11/15/2010		7/24/2012		7/24/2012		5/9/2013		5/9/2013	
	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
PHTHALATES (mg/kg)																
bis(2-ethylhexyl) phthalate	NA		1.600		0.690		0.059	J	1.100		0.120		0.462	U	NA	
butyl benzyl phthalate	NA		0.110	U	0.059	U	0.059	U	0.044		0.058		0.462	U	NA	
diethyl phthalate	NA		0.110	U J	0.059	U	0.059	U	0.150		0.140		0.462	U	NA	
dimethyl phthalate	NA		0.110	U	0.059	U	0.059	U	0.059		0.058		0.462	U	NA	
di-butyl phthalate (di-n-butyl phth.)	NA		0.110	U	0.059	U	0.059	U	0.059		0.058		0.462	U	NA	
di-n-octyl phthalate	NA		0.110	U	0.059	U	0.059	U	0.032		0.058		0.462	U	NA	
TPH (mg/kg)																
Diesel (MTCA A)	NA		NA		270	U	54	U	100		71		63		NA	
Heavy Oil (Motor Oil MTCA A)	NA		NA		540	U	180		260		320		809		NA	
Conventionals (%)																
Solids, Total	NA		NA		NA		NA		NA		72.1		NA		NA	
Total Organic Carbon	NA		NA		3.2		NA		NA		1.5		NA		NA	
<-1 Phi Gravel, >2000 micron	NA		NA		NA		NA		NA		NA		14.7		NA	
-1-0 Phi Very Coarse Sand, 1000-2000 micron	NA		NA		NA		NA		NA		NA		NA		NA	
0-1 Phi Coarse Sand, 500-1000 micron	NA		NA		NA		NA		NA		NA		64.7		NA	
1-2 Phi Medium Sand, 250-500 micron	NA		NA		NA		NA		NA		NA		6.5		NA	
2-3 Phi Fine Sand, 125-250 micron	NA		NA		NA		NA		NA		NA		13.2		NA	
3-4 Phi Very Fine Sand, 62.5-125 micron	NA		NA		NA		NA		NA		NA		NA		NA	
4-5 Phi Coarse Silt, 31-62.5 micron	NA		NA		NA		NA		NA		NA		0.9		NA	
5-6 Phi Medium Silt, 15.6-31 micron	NA		NA		NA		NA		NA		NA		NA		NA	
6-7 Phi Fine Silt, 7.8-15.6 micron	NA		NA		NA		NA		NA		NA		NA		NA	
7-8 Phi Very Fine Silt, 3.9-7.8 micron	NA		NA		NA		NA		NA		NA		NA		NA	
8-9 Phi Clay, 2-3.9 micron	NA		NA		NA		NA		NA		NA		0.0		NA	
9-10 Phi Clay, 1-2 micron	NA		NA		NA		NA		NA		NA		NA		NA	
>10 Phi Clay, <1 micron	NA		NA		NA		NA		NA		NA		NA		NA	
Total Fines	NA		NA		NA		NA		NA		NA		NA		NA	

Table E-1c. Slip 4 Drainage Basin Stormdrain Solids Sample Results for SL4-T3A (South Central Lateral) from 2005-2015

KCIA Source Tracing Data Sets

	SL4-T3A Trap		SL4-T3A Grab		SL4-T3A Trap		SL4-T3A Grab	
Sampled By	KCIA		KCIA		KCIA		KCIA	
Date	5/22/2014		5/22/2014		5/28/2015		5/28/2015	
	Results	Qual	Results	Qual	Results	Qual	Results	Qual
METALS (mg/kg)								
Arsenic (total)	20	U	10		10		3	
Copper	50		16		46		12	
Lead	60		7		36		5	
Mercury	0.060		0.020	U	0.082		0.010	
Zinc	149		42.0		130		32.0	
PCB (mg/kg)								
pcb - Aroclor 1016	0.009	U	0.0093	U	0.024	U	0.003	U
pcb - Aroclor 1221	0.009	U	0.0093	U	0.024	U	0.003	U
pcb - Aroclor 1232	0.011	Y	0.0093	U	0.024	U	0.003	U
pcb - Aroclor 1242	0.009	U	0.0076	J	0.024	U	0.003	U
pcb - Aroclor 1248	0.009	U	0.01		0.024	U	0.003	U
pcb - Aroclor 1254	0.020		0.0093	U	0.024	U	0.003	U
pcb - Aroclor 1260	0.024		0.0093	U	0.024	U	0.003	U
Total PCB	0.044		0.019		ND		ND	
LPAH (mg/kg)								
acenaphthene	0.290	U	0.019	U	0.160	U	0.009	U
acenaphthylene	0.290	U	0.019	U	0.160	U	0.009	U
anthracene	0.400		0.031		0.180		0.010	
fluorene	0.160	J	0.016		0.160	U	0.009	U
methylnaphthalene, 2-	0.290	U	0.037		0.160	U	0.009	U
naphthalene	0.290	U	0.033		0.160	U	0.009	U
phenanthrene	4.100		0.31		2.100		0.080	
Total LPAH ¹	4.660		0.427		2.280		0.090	
HPAH (mg/kg)								
benzo[a]anthracene	2.600		0.130		1.400		0.062	
benzo[a]pyrene	4.000		0.200		2.200		0.089	
benzo[b]fluoranthene	8.400		0.440		4.400		0.170	
benzo[k]fluoranthene	2.500		0.430		1.500		0.058	
benzo(g,h,i)perylene	4.000		0.180		2.500		0.110	
chrysene	5.600		0.270		3.100		0.120	
dibenz[a,h]anthracene	0.820		0.033		0.490		0.023	
fluoranthene	8.800		0.460		5.100		0.200	
indeno[1,2,3-cd]pyrene	3.400		0.130		2.100		0.087	
pyrene	6.500		0.350		3.500		0.140	
Total HPAH ²	46.620		2.623		26.290		1.059	

Table E-1c. Slip 4 Drainage Basin Stormdrain Solids Sample Results for SL4-T3A (South Central Lateral) from 2005-2015

KCIA Source Tracing Data Sets

	SL4-T3A Trap		SL4-T3A Grab		SL4-T3A Trap		SL4-T3A Grab	
Sampled By	KCIA		KCIA		KCIA		KCIA	
Date	5/22/2014		5/22/2014		5/28/2015		5/28/2015	
	Results	Qual	Results	Qual	Results	Qual	Results	Qual
PHTHALATES (mg/kg)								
bis(2-ethylhexyl) phthalate	1.700		0.086		1.100		0.041	
butyl benzyl phthalate	0.300		0.019	U	0.400		0.022	
diethyl phthalate	0.290	U	0.019	U	0.400		0.022	
dimethyl phthalate	0.290	U	0.019	U	0.400		0.022	
di-butyl phthalate (di-n-butyl phth.)	0.290	U	0.019	U	0.400		0.049	
di-n-octyl phthalate	0.290	U	0.019	U	0.400		0.022	
TPH (mg/kg)								
Diesel (MTCA A)	140		52		NA		NA	
Heavy Oil (Motor Oil MTCA A)	650		140		NA		NA	
Conventionals (%)								
Solids, Total	45.5		69.8		NA		NA	
Total Organic Carbon	7.7		0.8		2.8		0.4	
<-1 Phi Gravel, >2000 micron	NA		11.2		NA		11.2	
-1-0 Phi Very Coarse Sand, 1000-2000 micron	NA		2.6		NA		2.6	
0-1 Phi Coarse Sand, 500-1000 micron	NA		11.5		NA		11.5	
1-2 Phi Medium Sand, 250-500 micron	NA		41.2		NA		41.2	
2-3 Phi Fine Sand, 125-250 micron	NA		22.2		NA		22.2	
3-4 Phi Very Fine Sand, 62.5-125 micron	NA		6.4		NA		6.4	
4-5 Phi Coarse Silt, 31-62.5 micron	NA		2.8		NA		2.8	
5-6 Phi Medium Silt, 15.6-31 micron	NA		0.6		NA		0.6	
6-7 Phi Fine Silt, 7.8-15.6 micron	NA		0.3		NA		0.3	
7-8 Phi Very Fine Silt, 3.9-7.8 micron	NA		0.3		NA		0.3	
8-9 Phi Clay, 2-3.9 micron	NA		0.3		NA		0.3	
9-10 Phi Clay, 1-2 micron	NA		0.2		NA		0.2	
>10 Phi Clay, <1 micron	NA		0.5		NA		0.5	
Total Fines	NA		5.0		NA		5.0	

Table E-1d. Slip 4 Drainage Basin Stormdrain Solids Sample Results for SL4-T2A (South Lateral) from 2005-2015

KCIA Source Tracing Data Sets

	SQS LAET	CSL 2LAET	SL4-T2A Trap		SL4-T2A Trap		SL4-T2A Trap		SL4-T2A Trap		SL4-T2A Trap		SL4-T2A Trap		SL4-T2A Trap		SL4-T2A Trap	
Sampled By			SPU		SPU		SPU		SPU		SPU		SPU		SPU		SPU	
Date			8/11/2005		3/15/2006		10/6/2006		1/9/2007		5/17/2007		3/18/2008		8/5/2008		4/7/2009	
			Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
METALS (mg/kg)																		
Arsenic (total)	57	93	NA		NA		7.0	U	NA		NA		20.0		NA		20.0	U J
Copper	390	390	NA		NA		33.9		NA		NA		263		NA		211	J
Lead	450	530	NA		NA		41.0		NA		NA		424		NA		275	J
Mercury	0.41	0.59	NA		NA		0.060	U	NA		NA		0.300		NA		0.200	J
Zinc	410	960	NA		NA		137		NA		NA		1280		NA		1140	J
PCB (mg/kg)																		
pcb - Aroclor 1016	---	---	0.048	U	0.065	U	0.020	R	0.033	U	0.076	U	0.970	U	0.075	U	0.082	U
pcb - Aroclor 1221	---	---	0.048	U	0.065	U	0.020	R	0.065	Y	0.076	U	0.970	U	0.075	U	0.082	U
pcb - Aroclor 1232	---	---	0.048	U	0.065	U	0.020	R	0.065	Y	0.076	U	0.970	U	0.075	U	0.082	U
pcb - Aroclor 1242	---	---	0.048	U	0.065	U	0.020	R	0.033	U	0.076	U	0.970	U	0.075	U	0.082	U
pcb - Aroclor 1248	---	---	0.048	U	0.084	Y	0.020	R	0.049	Y	0.076	U	0.970	U	0.075	U	0.082	U
pcb - Aroclor 1254	---	---	0.067		0.190		0.020	R	0.150		0.120		0.970	U	0.170	J	0.110	
pcb - Aroclor 1260	---	---	0.110		0.190		0.020	R	0.130		0.110		0.970	U	0.190	J	0.086	
Total PCB	0.130	1.000	0.177		ND		ND	R	0.280		0.230		ND		0.360	J	0.196	
LPAH (mg/kg)																		
acenaphthene	0.500	0.500	NA		NA		0.570		NA		NA		0.380		NA		0.020	U
acenaphthylene	1.300	1.300	NA		NA		0.180	U	NA		NA		0.120	J	NA		0.020	U
anthracene	0.960	0.960	NA		NA		0.830		NA		NA		1.100		NA		0.021	
fluorene	0.540	0.540	NA		NA		0.560		NA		NA		0.470		NA		0.020	U
methylnaphthalene, 2-	0.670	0.670	NA		NA		0.360		NA		NA		0.230	U	NA		NA	
naphthalene	2.100	2.100	NA		NA		0.180	U	NA		NA		0.230	U	NA		0.020	U
phenanthrene	1.500	1.500	NA		NA		6.200		NA		NA		9.200		NA		0.190	
Total LPAH ¹	5.200	5.200	NA		NA		7.960		NA		NA		11.270		NA		0.231	
HPAH (mg/kg)																		
benzo[a]anthracene	1.300	1.600	NA		NA		2.600		NA		NA		6.100	R	NA		NA	
benzo[a]pyrene	1.600	1.600	NA		NA		4.200		NA		NA		8.300		NA		NA	
benzo[b]fluoranthene	3.200	3.600	NA		NA		6.900		NA		NA		15.000		NA		NA	
benzo[k]fluoranthene	3.200	3.600	NA		NA		4.900		NA		NA		8.500		NA		NA	
benzo(g,h,i)perylene	0.670	0.720	NA		NA		1.800		NA		NA		3.800		NA		NA	
chrysene	1.400	2.800	NA		NA		5.500		NA		NA		13.000	R	NA		NA	
dibenz[a,h]anthracene	0.230	0.230	NA		NA		0.780		NA		NA		1.100		NA		NA	
fluoranthene	1.700	2.500	NA		NA		12.000		NA		NA		20.000	R	NA		NA	
indeno[1,2,3-cd]pyrene	0.600	0.690	NA		NA		2.000		NA		NA		4.100		NA		NA	
pyrene	2.600	3.300	NA		NA		7.000		NA		NA		12.000	R	NA		NA	
Total HPAH ²	12.000	17.000	NA		NA		47.680		NA		NA		91.900		NA		NA	

Table E-1d. Slip 4 Drainage Basin Stormdrain Solids Sample Results for SL4-T2A (South Lateral) from 2005-2015

KCIA Source Tracing Data Sets

	SQS LAET	CSL 2LAET	SL4-T2A Trap		SL4-T2A Trap		SL4-T2A Trap		SL4-T2A Trap		SL4-T2A Trap		SL4-T2A Trap		SL4-T2A Trap		SL4-T2A Trap	
Sampled By			SPU		SPU		SPU		SPU		SPU		SPU		SPU		SPU	
Date			8/11/2005		3/15/2006		10/6/2006		1/9/2007		5/17/2007		3/18/2008		8/5/2008		4/7/2009	
			Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
PHthalates (mg/kg)																		
bis(2-ethylhexyl) phthalate	1.300	3.100	NA		NA		4.100		NA		NA		11.000		NA		NA	
butyl benzyl phthalate	0.063	0.900	NA		NA		0.500		NA		NA		0.450	R	NA		NA	
diethyl phthalate	0.200	1.200	NA		NA		0.180		NA		NA		0.230	U	NA		NA	
dimethyl phthalate	0.071	0.160	NA		NA		0.180		NA		NA		0.230	U	NA		NA	
di-butyl phthalate (di-n-butyl phth.)	1.400	5.100	NA		NA		0.250		NA		NA		0.230		NA		NA	
di-n-octyl phthalate	6.200	6.200	NA		NA		0.190		NA		NA		0.500		NA		NA	
TPH (mg/kg)																		
Diesel (MTCA A)	2000	2000	NA		NA		120		NA		NA		NA		NA		NA	
Heavy Oil (Motor Oil MTCA A)	2000	2000	NA		NA		440		NA		NA		NA		NA		NA	
Conventional (%)																		
Solids, Total			NA		NA		NA		NA		NA		NA		NA		NA	
Total Organic Carbon			NA		NA		1.2		NA		NA		16.1		NA		NA	
<-1 Phi Gravel, >2000 micron			NA		NA		NA		NA		NA		NA		NA		NA	
-1-0 Phi Very Coarse Sand, 1000-2000 micron			NA		NA		NA		NA		NA		NA		NA		NA	
0-1 Phi Coarse Sand, 500-1000 micron			NA		NA		NA		NA		NA		NA		NA		NA	
1-2 Phi Medium Sand, 250-500 micron			NA		NA		NA		NA		NA		NA		NA		NA	
2-3 Phi Fine Sand, 125-250 micron			NA		NA		NA		NA		NA		NA		NA		NA	
3-4 Phi Very Fine Sand, 62.5-125 micron			NA		NA		NA		NA		NA		NA		NA		NA	
4-5 Phi Coarse Silt, 31-62.5 micron			NA		NA		NA		NA		NA		NA		NA		NA	
5-6 Phi Medium Silt, 15.6-31 micron			NA		NA		NA		NA		NA		NA		NA		NA	
6-7 Phi Fine Silt, 7.8-15.6 micron			NA		NA		NA		NA		NA		NA		NA		NA	
7-8 Phi Very Fine Silt, 3.9-7.8 micron			NA		NA		NA		NA		NA		NA		NA		NA	
8-9 Phi Clay, 2-3.9 micron			NA		NA		NA		NA		NA		NA		NA		NA	
9-10 Phi Clay, 1-2 micron			NA		NA		NA		NA		NA		NA		NA		NA	
>10 Phi Clay, <1 micron			NA		NA		NA		NA		NA		NA		NA		NA	
Total Fines			NA		NA		NA		NA		NA		NA		NA		NA	

Indicates > than the SQS/LAET

Indicates > than the CSL/2LAET

NA = Not Analyzed Chemistry results are in dry weight

1. Total LPAHs were calculated as the sum of acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene
2. Total HPAHs were calculated as the sum of benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, total benzofluoranthenes, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene

SQS/LAET - Sediment Quality Standards/Lowest Apparent Effects Threshold

CSL/2LAET - Cleanup Screening Level/Second Lowest Apparent Effects Threshold

SQS/LAET and CSL/2LAET are source tracing screening benchmarks (See Appendix F of KC LDW SCIP)

Table E-1d. Slip 4 Drainage Basin Stormdrain Solids Sample Results for SL4-T2A (South Lateral) from 2005-2015

KCIA Source Tracing Data Sets

	SL4-T2A Grab		SL4-T2A Trap		SL4-T2A Trap		SL4-T2A Trap		SL4-T2A DL		SL4-T2A Grab		SL4-T2A Trap		SL4-T2A Grab		SL4-T2A Trap		SL4-T2A Grab	
Sampled By	SPU		SPU		SPU		SPU		SPU		KCIA		KCIA		KCIA		KCIA		KCIA	
Date	4/7/2009		10/7/2009		4/9/2010		7/24/2012		7/24/2012		5/9/2013		5/22/2014		5/22/2014		5/28/2015		5/28/2015	
	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
METALS (mg/kg)																				
Arsenic (total)	10.0	U J	10.0	U J	20.0	U	10.0		NA		54.7		20.0		30.0		NA		39.0	
Copper	58.9	J	216	J	190		109		NA		59.4		177		140		NA		130	
Lead	34.0	J	311	J	246		136		NA		206		229		235		NA		320	
Mercury	0.100	U J	0.250	J	0.240		0.160		NA		0.071		0.260		0.260		NA		0.310	
Zinc	202	J	1200	J	1070		571		NA		1560		1140		1240		NA		1500	
PCB (mg/kg)																				
pcb - Aroclor 1016	0.020	U	0.025	U	0.043	U	0.019		NA		0.477	U	0.010	U	0.0088	U	0.020	U	0.004	U
pcb - Aroclor 1221	0.020	U	0.025	U	0.043	U	0.019		NA		0.477	U	0.010	U	0.0088	U	0.020	U	0.004	U
pcb - Aroclor 1232	0.020	U	0.025	U	0.043	U	0.019		NA		0.477	U	0.010	U	0.0088	U	0.020	U	0.004	U
pcb - Aroclor 1242	0.020	U	0.025	U	0.043	U	0.019		NA		0.477	U	0.010	U	0.0088	U	0.020	U	0.004	U
pcb - Aroclor 1248	0.020	U	0.026		0.110	Y	0.048		NA		0.477	U	0.024	Y	0.022	Y	0.020	U	0.004	U
pcb - Aroclor 1254	0.020	U	0.065		0.320		0.130		NA		0.477	U	0.110		0.12		0.020	U	0.004	U
pcb - Aroclor 1260	0.027		0.088		0.130		0.140		NA		0.477	U	0.150		0.22		1.000		0.160	
Total PCB	0.027		0.179		0.450		0.270				0.477	U	0.260		0.340		1.000		0.160	
LPAH (mg/kg)																				
acenaphthene	0.020	U	NA		0.930	U	0.420		0.430		0.447	U	0.460		3.300		NA		0.220	
acenaphthylene	0.020	U	NA		0.930	U	0.170		0.480		0.447	U	0.250	J	0.290		NA		0.110	
anthracene	0.021		NA		2.700		1.400		1.300		0.447	U	1.200		4.700		NA		0.310	
fluorene	0.020	U	NA		1.600		0.540		0.550		0.447	U	0.590		2.900		NA		0.250	
methylnaphthalene, 2-	0.020	U	NA		4.800		0.160		0.480		0.447	U	0.570		1.200		NA		0.180	
naphthalene	0.020	U	NA		0.930		0.310		0.340		0.447	U	0.420		0.400		NA		0.100	
phenanthrene	0.190		NA		27.000		12.000		11.000		1.920		12.000		32.000		NA		3.400	
Total LPAH ¹	0.251		NA		36.100		15.000		13.620		1.920		15.490		44.790		NA		4.570	
HPAH (mg/kg)																				
benzo[a]anthracene	0.140		NA		20.000		9.000		8.600		1.430		8.900		11.000		NA		2.100	
benzo[a]pyrene	0.150		NA		29.000		14.000		13.000		1.650		14.000		11.000		NA		3.000	
benzo[b]fluoranthene	NA		NA		38.000		NA		NA		3.010		30.000		21.000		NA		5.500	
benzo[k]fluoranthene	NA		NA		38.000		40.000		37.000		1.000		11.000		9.100		NA		1.900	
benzo(g,h,i)perylene	0.066		NA		24.000		11.000		14.000		1.520		13.000		4.900		NA		2.900	
chrysene	0.270		NA		45.000		21.000		20.000		2.390		20.000		19.000		NA		4.100	
dibenz[a,h]anthracene	0.025		NA		9.900		4.800		5.400		0.447		3.100		1.400		NA		0.630	
fluoranthene	0.540		NA		78.000		32.000		28.000		3.990		30.000		48.000		NA		6.900	
indeno[1,2,3-cd]pyrene	0.073		NA		26.000		12.000		13.000		1.330		12.000		4.500		NA		2.600	
pyrene	0.300		NA		33.000		22.000		21.000		2.980		21.000		37.000		NA		5.100	
Total HPAH ²	1.564		NA		340.900		165.800		160.000		20.194		163.000		166.900		NA		34.730	

Table E-1d. Slip 4 Drainage Basin Stormdrain Solids Sample Results for SL4-T2A (South Lateral) from 2005-2015

KCIA Source Tracing Data Sets

	SL4-T2A Grab		SL4-T2A Trap		SL4-T2A Trap		SL4-T2A Trap		SL4-T2A DL		SL4-T2A Grab		SL4-T2A Trap		SL4-T2A Grab		SL4-T2A Trap		SL4-T2A Grab	
Sampled By	SPU		SPU		SPU		SPU		SPU		KCIA		KCIA		KCIA		KCIA		KCIA	
Date	4/7/2009		10/7/2009		4/9/2010		7/24/2012		7/24/2012		5/9/2013		5/22/2014		5/22/2014		5/28/2015		5/28/2015	
	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
PHTHALATES (mg/kg)																				
bis(2-ethylhexyl) phthalate	0.160		NA		48.000		12.000		12.000		0.689		19.000		2.5		NA		2.100	
butyl benzyl phthalate	0.020	U	NA		1.100		0.260		0.340		0.447		0.340	J	0.056		NA		0.180	U
diethyl phthalate	0.020	U	NA		0.930	U J	0.400		0.480		0.447		0.380	U	0.056	U	NA		0.180	U
dimethyl phthalate	0.020	U	NA		0.930	U	0.160		0.480		0.447		0.380	U	0.056	U	NA		0.180	U
di-butyl phthalate (di-n-butyl phth.)	0.020	U	NA		0.930	U	0.160		0.480		0.447		0.380	U	0.1		NA		0.210	
di-n-octyl phthalate	0.020	U	NA		0.930	U	1.500		0.340		0.447		0.650		0.056	U	NA		0.180	U
TPH (mg/kg)																				
Diesel (MTCA A)	250		NA		NA		650		NA		185		NA		400		NA		1200	
Heavy Oil (Motor Oil MTCA A)	1100		NA		NA		2300		NA		958		NA		1000		NA		4100	
Conventionals (%)																				
Solids, Total	NA		NA		NA		NA		NA		NA		NA		63.5		67.7		74.7	
Total Organic Carbon	NA		NA		NA		NA		NA		NA		NA		5.0		5.1		3.0	
<-1 Phi Gravel, >2000 micron	NA		NA		NA		NA		NA		56.9		NA		40.7		NA		23.9	
-1-0 Phi Very Coarse Sand, 1000-2000 micron	NA		NA		NA		NA		NA		NA		NA		11.0		NA		13.2	
0-1 Phi Coarse Sand, 500-1000 micron	NA		NA		NA		NA		NA		30.6		NA		15.6		NA		12.8	
1-2 Phi Medium Sand, 250-500 micron	NA		NA		NA		NA		NA		6.3		NA		15.7		NA		17.8	
2-3 Phi Fine Sand, 125-250 micron	NA		NA		NA		NA		NA		4.7		NA		10.1		NA		22.2	
3-4 Phi Very Fine Sand, 62.5-125 micron	NA		NA		NA		NA		NA		NA		NA		4.0		NA		3.8	
4-5 Phi Coarse Silt, 31-62.5 micron	NA		NA		NA		NA		NA		1.5		NA		2.9		NA		0.8	
5-6 Phi Medium Silt, 15.6-31 micron	NA		NA		NA		NA		NA		NA		NA		2.9		NA		0.2	
6-7 Phi Fine Silt, 7.8-15.6 micron	NA		NA		NA		NA		NA		NA		NA		2.9		NA		0.1	
7-8 Phi Very Fine Silt, 3.9-7.8 micron	NA		NA		NA		NA		NA		NA		NA		2.9		NA		1.3	
8-9 Phi Clay, 2-3.9 micron	NA		NA		NA		NA		NA		0.0		NA		2.9		NA		0.1	
9-10 Phi Clay, 1-2 micron	NA		NA		NA		NA		NA		NA		NA		2.9		NA		0.1	
>10 Phi Clay, <1 micron	NA		NA		NA		NA		NA		NA		NA		2.9		NA		4.1	
Total Fines	NA		NA		NA		NA		NA		NA		NA		2.9		NA		5.5	

Table E-2. Former Slip 5 Drainage Basin Stormdrain Solids Sample Results for KCIA2 and South Pump Station (SPS) from 2009-2015

KCIA Source Tracing Data Sets

	SQS LAET	CSL 2LAET	KCIA2 Grab		KCIA2 Trap		KCIA2 Grab		KCIA2 Trap		KCIA2 Grab		KCIA2 Trap		KCIA2 Grab		KCIA2 Trap	
Sampled By			SPU		SPU		SPU		SPU		SPU		SPU		SPU		SPU	
Date			9/25/2008		3/26/2009		3/26/2009		10/21/2009		10/21/2009		12/3/2010		12/3/2010		6/29/2012	
			Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
METALS (mg/kg)																		
Arsenic (total)	57	93	40.0		8.0		120	U J	20.0		6.0	U J	8.3		51.0		14.6	
Copper	390	390	16.0		16.9		18.0	J	16.1		13.4	J	34.7	J	17.0	J	19.1	
Lead	450	530	50.0	U	14.0		50.0	U J	18.0		10.0	J	11.0	J	50.0	J	16.0	
Mercury	0.41	0.59	0.300	U	0.060		0.200	U J	0.030		0.030	U J	0.030	U	0.100	U	0.030	
Zinc	410	960	330		51.0		370	J	79.0		43.0	J	58.0	J	1190	J	77.0	
PCB (mg/kg)																		
pcb - Aroclor 1016	---	---	0.020	U	0.020		0.020	U	0.018		0.019	U	0.018	U	0.020	U	0.019	U
pcb - Aroclor 1221	---	---	0.020	U	0.020		0.020	U	0.018		0.019	U	0.018	U	0.020	U	0.019	U
pcb - Aroclor 1232	---	---	0.020	U	0.020		0.020	U	0.018		0.019	U	0.018	U	0.020	U	0.019	U
pcb - Aroclor 1242	---	---	0.020	U	0.020		0.020	U	0.018		0.019	U	0.018	U	0.020	U	0.019	U
pcb - Aroclor 1248	---	---	0.031		0.020		0.020	U	0.018		0.019	U	0.018	U	0.020	U	0.019	U
pcb - Aroclor 1254	---	---	0.040		0.020		0.098	U	0.018		0.019	U	0.018	U	0.020	U	0.044	
pcb - Aroclor 1260	---	---	0.021		0.020		0.020	U	0.018		0.019	U	0.018		0.020	U	0.052	
Total PCB	0.130	1.000	0.092				0.118		0.036		0.038		0.036		0.020	U	0.096	
LPAH (mg/kg)																		
acenaphthene	0.500	0.500	0.020	U	0.059		0.020	U	0.048		0.019	U	0.047		0.020	U	0.056	
acenaphthylene	1.300	1.300	0.020	U	0.059		0.020	U	0.012		0.019	U	0.020	U	0.020	U	0.056	U
anthracene	0.960	0.960	0.020	U	0.066		0.020	U	0.260		0.011	J	0.130		0.020	U	0.150	
fluorene	0.540	0.540	0.020	U	0.034		0.020	U	0.073		0.016	U	0.056		0.020	U	0.071	
methylnaphthalene, 2-	0.670	0.670	0.020	U	0.059		0.020	U	0.020		0.019	U	0.010	J	0.020	U	0.056	U
naphthalene	2.100	2.100	0.020	U	0.059		0.020	U	0.020		0.019	U	0.014		0.020	U	0.034	J
phenanthrene	1.500	1.500	0.061		0.630		0.042		1.400		0.051		1.100		0.036		1.300	
Total LPAH ¹	5.200	5.200	0.201		1.025		0.182		1.845		0.173		1.397		0.036		1.611	
HPAH (mg/kg)																		
benzo[a]anthracene	1.300	1.600	0.035		0.500		0.027		0.061		0.061		0.700		0.021		0.840	
benzo[a]pyrene	1.600	1.600	0.060		0.550		0.043		0.068		0.068		0.780		0.036		1.000	
benzo[b]fluoranthene	3.200	3.600	NA		NA		0.530		NA		NA		NA		NA		NA	
benzo[k]fluoranthene	3.200	3.600	NA		NA		0.780		NA		NA		1.800		0.110		2.400	
benzo(g,h,i)perylene	0.670	0.720	0.098		NA		0.064		0.620		0.029		0.620		0.033		0.870	
chrysene	1.400	2.800	0.094		0.850		0.072		1.300		0.078		1.000		0.046		1.400	
dibenz[a,h]anthracene	0.230	0.230	0.032		0.170		0.014	J	0.330		0.013	J	0.041		0.020		0.300	
fluoranthene	1.700	2.500	0.140		1.500		0.110		4.400		0.170	B	2.200		0.094		2.800	
indeno[1,2,3-cd]pyrene	0.600	0.690	0.092		0.500		0.056		0.730		0.034		0.590		0.034		0.770	
pyrene	2.600	3.300	0.120		0.500		0.084		2.700		0.120		1.300		0.061		2.200	
Total HPAH ²	12.000	17.000	0.671		4.570		1.780	J	10.209		0.573		9.031		0.455		12.580	

Table E-2. Former Slip 5 Drainage Basin Stormdrain Solids Sample Results for KCIA2 and South Pump Station (SPS) from 2009-2015

KCIA Source Tracing Data Sets

	SQS LAET	CSL 2LAET	KCIA2 Grab		KCIA2 Trap		KCIA2 Grab		KCIA2 Trap		KCIA2 Grab		KCIA2 Trap		KCIA2 Grab		KCIA2 Trap	
Sampled By			SPU		SPU		SPU		SPU		SPU		SPU		SPU		SPU	
Date			9/25/2008		3/26/2009		3/26/2009		10/21/2009		10/21/2009		12/3/2010		12/3/2010		6/29/2012	
			Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
PHTHALATES (mg/kg)																		
bis(2-ethylhexyl) phthalate	1.300	3.100	0.088		0.190		0.160		0.210		0.058		0.300	U	0.076		0.510	B
butyl benzyl phthalate	0.063	0.900	0.020	U	0.059		0.020	U	0.020		0.019	U	0.011	J	0.020	U	0.056	U
diethyl phthalate	0.200	1.200	0.020	U	0.020		0.020	J	0.020		0.019	U	0.020	U	0.020	U	0.140	U
dimethyl phthalate	0.071	0.160	0.020	U	0.059		0.020	U	0.020		0.019	U	0.020	U	0.020	U	0.056	U
di-butyl phthalate (di-n-butyl phth.)	1.400	5.100	0.020	U	0.059		0.020	U	0.020		0.019	U	0.020	U	0.020	U	0.056	U
di-n-octyl phthalate	6.200	6.200	0.020	U	0.040		0.020	U	0.020		0.019	U	0.020	U	0.020	U	0.062	
TPH (mg/kg)																		
Diesel (MTCA A)	2000	2000	320		250		250		87		62	U	100	U	250	U	87	
Heavy Oil (Motor Oil MTCA A)	2000	2000	1500		300		500		170		120	U	200	U	500	U	230	
Comments																		
Conventionals (%)																		
Solids, Total			NA		NA		NA		NA		NA		NA		NA		58.4	
Total Organic Carbon			NA		0.8		NA		1.2		NA		1.6		4.9		1.5	
<-1 Phi Gravel, >2000 micron			NA		54.7		NA		NA		NA		NA		NA		NA	
-1-0 Phi Very Coarse Sand, 1000-2000 micron			NA		16.1		NA		NA		NA		NA		NA		NA	
0-1 Phi Coarse Sand, 500-1000 micron			NA		12.7		NA		NA		NA		NA		NA		NA	
1-2 Phi Medium Sand, 250-500 micron			NA		9.9		NA		NA		NA		NA		NA		NA	
2-3 Phi Fine Sand, 125-250 micron			NA		3.0		NA		NA		NA		NA		NA		NA	
3-4 Phi Very Fine Sand, 62.5-125 micron			NA		0.9		NA		NA		NA		NA		NA		NA	
4-5 Phi Coarse Silt, 31-62.5 micron			NA		NA		NA		NA		NA		NA		NA		NA	
5-6 Phi Medium Silt, 15.6-31 micron			NA		NA		NA		NA		NA		NA		NA		NA	
6-7 Phi Fine Silt, 7.8-15.6 micron			NA		NA		NA		NA		NA		NA		NA		NA	
7-8 Phi Very Fine Silt, 3.9-7.8 micron			NA		NA		NA		NA		NA		NA		NA		NA	
8-9 Phi Clay, 2-3.9 micron			NA		NA		NA		NA		NA		NA		NA		NA	
9-10 Phi Clay, 1-2 micron			NA		NA		NA		NA		NA		NA		NA		NA	
>10 Phi Clay, <1 micron			NA		NA		NA		NA		NA		NA		NA		NA	
Total Fines			NA		2.8		NA		NA		NA		NA		NA		NA	

Indicates > than the SQS/LAET

Indicates > than the CSL/2LAET

NA = Not Analyzed Chemistry results are in dry weight

1. Total LPAHs were calculated as the sum of acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene
2. Total HPAHs were calculated as the sum of benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, total benzo(a)fluoranthenes, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene
3. Ecology collected this sample at SPS during an Industrial Stormwater General Permit Inspection and refers to this sampling location as SPS-IV.

SQS/LAET - Sediment Quality Standards/Lowest Apparent Effects Threshold

CSL/2LAET - Cleanup Screening Level/Second Lowest Apparent Effects Threshold

SQS/LAET and CSL/2LAET are source tracing screening benchmarks (See Appendix F of KC LDW SCIP)

Table E-2. Former Slip 5 Drainage Basin Stormdrain Solids Sample Results for KCIA2 and South Pump Station (SPS) from 2009-2015

KCIA Source Tracing Data Sets

	KCIA2 Grab		SPS Grab		KCIA2 Grab		SPS Grab		KCIA2 Trap		KCIA2 Grab		KCIA2 Trap		KCIA2 Grab		SPS Grab	
Sampled By	SPU		KCIA		KCIA		ECY ³		KCIA		KCIA		KCIA		KCIA		KCIA	
Date	6/29/2012		8/28/2012		5/9/2013		5/31/2013		5/22/2014		5/22/2014		5/28/2015		5/28/2015		5/28/2015	
	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
METALS (mg/kg)																		
Arsenic (total)	6.0	U	12.0		153		2.4		20.0		11.0		11.0		23.0		3.4	
Copper	15.6		13.0		7.9		13.5		20.4		16.3		13.0		16.0		12.0	
Lead	3.0		5.9		37.5		8.4		14.0		17.0		6.7		5.1		6.0	
Mercury	0.030	U	0.300		0.130		0.020		0.050		0.020	U	0.016		0.013		0.028	
Zinc	39.0		30.0		539		32.0		100		53.0		84.0		190		43.0	
PCB (mg/kg)																		
pcb - Aroclor 1016	0.018	U	0.020		2.17		0.004		0.009		0.0089	U	0.006	U	0.005	U	0.003	U
pcb - Aroclor 1221	0.018	U	0.020		2.17		0.004		0.009		0.0089	U	0.006	U	0.005	U	0.003	U
pcb - Aroclor 1232	0.018	U	0.020		2.17		0.004		0.014		0.0089	U	0.006	U	0.005	U	0.003	U
pcb - Aroclor 1242	0.018	U	0.020		2.17		0.004		0.009		0.0089	U	0.006	U	0.005	U	0.003	U
pcb - Aroclor 1248	0.018	U	0.020		2.17		0.004		0.009		0.0089	U	0.006	U	0.005	U	0.003	U
pcb - Aroclor 1254	0.018	U	0.020		2.17		0.017		0.029		0.007	J	0.006	U	0.005	U	0.003	U
pcb - Aroclor 1260	0.018	U	0.020		2.17		0.015		0.037		0.0085	J	0.040		0.005	U	0.005	
Total PCB	0.036		0.020		2.17		0.032		0.066		0.016		0.040		0.005		0.005	
LPAH (mg/kg)																		
acenaphthene	0.019	U	0.005		2.17		0.019		0.019		0.015	J	0.016	U	0.050		0.009	U
acenaphthylene	0.019	U	0.005		2.17		0.019		0.019		0.019	U	0.016	U	0.013	U	0.009	U
anthracene	0.019	U	0.013		2.17		0.019		0.017		0.016	J	0.016	U	0.056		0.009	U
fluorene	0.019	U	0.006		2.17		0.019		0.011		0.013	J	0.016	U	0.039		0.009	U
methylnaphthalene, 2-	0.019	U	0.005		2.17		0.019		0.019		0.019	U	0.016	U	0.013	U	0.009	U
naphthalene	0.019	U	0.005		2.17		0.005		0.019		0.019	U	0.016	U	0.013	U	0.009	U
phenanthrene	0.013	J	0.077		2.17		0.010		0.160		0.15		0.120		0.440		0.029	
Total LPAH ¹	0.013		0.096		0.000		0.010		0.188		0.194		0.120		0.585		0.029	
HPAH (mg/kg)																		
benzo[a]anthracene	0.011	J	0.073		2.17		0.010		0.110		0.067		0.073		0.140		0.027	
benzo[a]pyrene	0.013	J	0.079		2.17		0.016		0.180		0.019	U	0.130		0.140		0.030	
benzo[b]fluoranthene	---		NA		2.17		0.039		0.380		0.14		0.260		0.180		0.042	
benzo[k]fluoranthene	0.035		NA		2.17		NA		0.150		0.14		0.099		0.076		0.015	
benzo(g,h,i)perylene	0.013	J	0.071		2.17		0.012		0.180		0.019	U	0.150		0.088		0.026	
chrysene	0.019		0.100		2.17		0.020		0.240		0.12		0.160		0.210		0.035	
dibenz[a,h]anthracene	0.019	U	0.016		2.17		0.005		0.044		0.019	U	0.031		0.025		0.009	U
fluoranthene	0.033		0.190		2.17		0.030		0.360		0.23		0.280		0.084		0.067	
indeno[1,2,3-cd]pyrene	0.019	U	0.066		2.17		0.012		0.160		0.019	U	0.120		0.084		0.021	
pyrene	0.025		0.140		2.17		0.032		0.280		0.18		0.200		0.400		0.051	
Total HPAH ²	0.225		0.735		ND		0.176		2.084		0.877		1.503		1.427		0.331	

Table E-2. Former Slip 5 Drainage Basin Stormdrain Solids Sample Results for KCIA2 and South Pump Station (SPS) from 2009-2015

KCIA Source Tracing Data Sets

	KCIA2 Grab		SPS Grab		KCIA2 Grab		SPS Grab		KCIA2 Trap		KCIA2 Grab		KCIA2 Trap		KCIA2 Grab		SPS Grab	
Sampled By	SPU		KCIA		KCIA		ECY ³		KCIA		KCIA		KCIA		KCIA		KCIA	
Date	6/29/2012		8/28/2012		5/9/2013		5/31/2013		5/22/2014		5/22/2014		5/28/2015		5/28/2015		5/28/2015	
	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
PHTHALATES (mg/kg)																		
bis(2-ethylhexyl) phthalate	0.027		0.024		2.17		0.034		0.500		0.043	J	0.240		0.050		0.092	
butyl benzyl phthalate	0.019	U	0.024		2.17		0.005		0.082		0.019	U	0.039	U	0.032	U	0.022	U
diethyl phthalate	0.047	U	0.024		2.17		0.011		0.028		0.019	U	0.039	U	0.032	U	0.022	U
dimethyl phthalate	0.019	U	0.024		2.17		0.005		0.019		0.019	U	0.039	U	0.032	U	0.022	U
di-butyl phthalate (di-n-butyl phth.)	0.019	U	0.024		2.17		0.019		0.019		0.019	U	0.170		0.097		0.100	
di-n-octyl phthalate	0.019	U	0.024		2.17		0.019		0.076		0.019	U	0.039	U	0.032	U	0.022	U
TPH (mg/kg)																		
Diesel (MTCA A)	8		NA		99		150		75		14		68		48		33	
Heavy Oil (Motor Oil MTCA A)	43		270		131		730		240		39		190		200		120	
Comments																		
Conventional (%)																		
Solids, Total	78.4		NA		NA		NA		NA		82.9		53.6		51.5		77.9	
Total Organic Carbon	0.6		NA		NA		NA		NA		0.3		1.0		1.4		NA	
<-1 Phi Gravel, >2000 micron	NA		NA		0.0		NA		NA		54.3		0.9		22.6		27.6	
-1-0 Phi Very Coarse Sand, 1000-2000 micron	NA		NA		NA		NA		NA		10.9		2.8		20.1		3.6	
0-1 Phi Coarse Sand, 500-1000 micron	NA		NA		0.0		NA		NA		18.4		6.0		14.4		7.7	
1-2 Phi Medium Sand, 250-500 micron	NA		NA		7.8		NA		NA		11.8		14.5		18.1		37.7	
2-3 Phi Fine Sand, 125-250 micron	NA		NA		36.4		NA		NA		1.2		25.7		12.0		16.5	
3-4 Phi Very Fine Sand, 62.5-125 micron	NA		NA		NA		NA		NA		0.2		6.4		1.8		0.5	
4-5 Phi Coarse Silt, 31-62.5 micron	NA		NA		31.8		NA		NA		3.2		5.6		0.7		0.1	
5-6 Phi Medium Silt, 15.6-31 micron	NA		NA		NA		NA		NA		3.2		14.0		0.3		0.1	
6-7 Phi Fine Silt, 7.8-15.6 micron	NA		NA		NA		NA		NA		3.2		0.1		0.1		0.5	
7-8 Phi Very Fine Silt, 3.9-7.8 micron	NA		NA		NA		NA		NA		3.2		4.0		0.9		0.5	
8-9 Phi Clay, 2-3.9 micron	NA		NA		24.0		NA		NA		3.2		0.1		1.4		0.8	
9-10 Phi Clay, 1-2 micron	NA		NA		NA		NA		NA		3.2		0.1		0.4		0.1	
>10 Phi Clay, <1 micron	NA		NA		NA		NA		NA		3.2		0.1		7.4		0.1	
Total Fines	NA		NA		NA		NA		NA		3.2		38.1		10.3		6.3	

Table E-3. Slip 6 Drainage Basin Stormdrain Solids Sample Results for KCIA1/1A from 2009-2015

KCIA Source Tracing Data Sets

	SQS LAET	CSL 2LAET	KCIA1 Trap		KCIA1 Grab		KCIA1 Trap		KCIA1 Grab		KCIA1 Trap		KCIA1A Grab		KCIA1A Grab	
Sampled By			SPU		SPU		SPU		SPU		SPU		KCIA		ECY ³	
Date			3/26/2009		3/26/2009		12/3/2010		12/3/2010		4/9/2012		5/10/2013		5/31/2013	
			Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
METALS (mg/kg)																
Arsenic (total)	57	93	30.0		10.0	J	13.1		10.0	U	20.0		19.7		15.5	
Copper	390	390	102		23.0	J	429	J	78.0	J	62.6		37.1		31.8	
Lead	450	530	110		26.0	J	110	J	34.0	J	72.0		36.8		45.4	
Mercury	0.41	0.59	0.200		0.050	U J	0.120		0.020	U	0.060		0.025		0.030	
Zinc	410	960	559		1170	J	608	J	596	J	314		318		159	
PCB (mg/kg)																
pcb - Aroclor 1016	---	---	0.020		0.020	U	0.020	U	0.019	U	0.019	U	0.043	U	0.004	U
pcb - Aroclor 1221	---	---	0.020		0.020	U	0.020	U	0.019	U	0.019	U	0.043	U	0.004	U
pcb - Aroclor 1232	---	---	0.020		0.020	U	0.020	U	0.019	U	0.019	U	0.043	U	0.004	U
pcb - Aroclor 1242	---	---	0.020		0.020	U	0.020	U	0.019	U	0.019	U	0.043	U	0.004	U
pcb - Aroclor 1248	---	---	0.020		0.020	U	0.030	Y	0.019	U	0.019	U	0.043	U	0.004	U
pcb - Aroclor 1254	---	---	0.032		0.098	Y	0.055		0.019	U	0.013		0.043	U	0.017	
pcb - Aroclor 1260	---	---	0.025		0.020	U	0.057		0.019	U	0.016		0.043	U	0.015	
Total PCB	0.130	1.000	0.057		0.980	Y	0.112		0.019	U	0.029		ND		0.032	
LPAH (mg/kg)																
acenaphthene	0.500	0.500	0.160		0.055	U	0.390		0.086		0.120		0.427	U	0.031	
acenaphthylene	1.300	1.300	0.180		0.055	U	0.150	U	0.062	U	0.045		0.427	U	0.039	
anthracene	0.960	0.960	0.310		0.055	U	1.200		0.320		0.400		0.427	U	0.140	
fluorene	0.540	0.540	0.170		0.055	U	0.470		0.120		0.190		0.427	U	0.063	
methylnaphthalene, 2-	0.670	0.670	0.180		0.055	U	0.150	U	0.062	U	0.087		0.427	U	0.022	
naphthalene	2.100	2.100	0.180		0.055	U	0.150	U	0.062	U	0.110		0.427	U	0.022	
phenanthrene	1.500	1.500	3.200		0.200		7.500		2.200		3.400		1.010		1.400	
Total LPAH ¹	5.200	5.200	3.510		0.200		9.560		2.726		4.352		1.010		1.756	
HPAH (mg/kg)																
benzo[a]anthracene	1.300	1.600	3.200		0.200		6.500		1.700		2.100		0.744		1.000	
benzo[a]pyrene	1.600	1.600	2.100		0.120		7.200		1.500		3.000		0.958		1.300	
benzo[b]fluoranthene	3.200	3.600	6.600		0.580		16.000		3.300		6.000		1.480		2.600	
benzo[k]fluoranthene	3.200	3.600	---										0.607			
benzo(g,h,i)perylene	0.670	0.720	2.100		0.120		2.700		0.660		1.900		0.779		0.990	
chrysene	1.400	2.800	3.800		0.280		8.800		1.900		3.500		1.170		1.500	
dibenz[a,h]anthracene	0.230	0.230	0.800		0.160		0.220		0.058		0.640		0.427		0.370	
fluoranthene	1.700	2.500	7.300		0.560		24.000		4.700		6.900		2.230		2.600	
indeno[1,2,3-cd]pyrene	0.600	0.690	2.100		0.120		2.900		0.740		1.800		0.706		0.970	
pyrene	2.600	3.300	5.300		0.490		15.000		2.900		5.100		1.670		2.300	
Total HPAH ²	12.000	17.000	33.300		2.630		83.320		17.458		30.940		10.771		13.630	

Table E-3. Slip 6 Drainage Basin Stormdrain Solids Sample Results for KCIA1/1A from 2009-2015

KCIA Source Tracing Data Sets

	SQS LAET	CSL 2LAET	KCIA1 Trap		KCIA1 Grab		KCIA1 Trap		KCIA1 Grab		KCIA1 Trap		KCIA1A Grab		KCIA1A Grab	
Sampled By			SPU		SPU		SPU		SPU		SPU		KCIA		ECY ³	
Date			3/26/2009		3/26/2009		12/3/2010		12/3/2010		4/9/2012		5/10/2013		5/31/2013	
			Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
PHTHALATES (mg/kg)																
bis(2-ethylhexyl) phthalate	1.300	3.100	3.700		0.360		3.800	B	0.160	U	1.800		0.427	U	0.081	
butyl benzyl phthalate	0.063	0.900	0.180		0.055		0.150	J	0.062	U	0.120		0.427	U	0.007	
diethyl phthalate	0.200	1.200	0.180		0.055		0.150	U	0.062	U	0.170		0.427	U	0.006	
dimethyl phthalate	0.071	0.160	0.180		0.055		0.150	U	0.062	U	0.069		0.427	U	0.005	
di-butyl phthalate (di-n-butyl phth.)	1.400	5.100	0.180		0.055		0.150	U	0.062	U	0.069		0.427	U	0.039	
di-n-octyl phthalate	6.200	6.200	0.110		0.055		0.150	U	0.062	U	0.120		0.427	U	0.039	
TPH (mg/kg)																
Diesel (MTCA A)	2000.000	2000.000	NA		74		240		0	U	200		81		53	
Heavy Oil (Motor Oil MTCA A)	2000.000	2000.000	NA		370		1400		220		960		328		110	
Conventionals (%)																
Solids, Total			NA		NA		NA		NA		NA		NA		NA	
Total Organic Carbon			6.5		NA		5.8		0.5		NA		NA		NA	
<-1 Phi Gravel, >2000 micron			NA		1.0		NA		NA		2.4		37.5		NA	
-1-0 Phi Very Coarse Sand, 1000-2000 micron			NA		25.2		NA		NA		7.2		NA		NA	
0-1 Phi Coarse Sand, 500-1000 micron			NA		22.6		NA		NA		22.2		50.8		NA	
1-2 Phi Medium Sand, 250-500 micron			NA		16.3		NA		NA		42.0		5.7		NA	
2-3 Phi Fine Sand, 125-250 micron			NA		10.2		NA		NA		12.4		5.2		NA	
3-4 Phi Very Fine Sand, 62.5-125 micron			NA		5.4		NA		NA		3.5		NA		NA	
4-5 Phi Coarse Silt, 31-62.5 micron			NA		1.6		NA		NA		1.5		0.8		NA	
5-6 Phi Medium Silt, 15.6-31 micron			NA		3.1		NA		NA		2.2		NA		NA	
6-7 Phi Fine Silt, 7.8-15.6 micron			NA		2.1		NA		NA		2.1		NA		NA	
7-8 Phi Very Fine Silt, 3.9-7.8 micron			NA		2.4		NA		NA		1.8		NA		NA	
8-9 Phi Clay, 2-3.9 micron			NA		2.1		NA		NA		0.8		0.0		NA	
9-10 Phi Clay, 1-2 micron			NA		2.6		NA		NA		0.7		NA		NA	
>10 Phi Clay, <1 micron			NA		5.6		NA		NA		1.3		NA		NA	
Total Fines			NA		19.4		NA		NA		10.3		NA		NA	

Indicates > than the SQS/LAET

Indicates > than the CSL/2LAET

NA = Not Analyzed Chemistry results are in dry weight

1. Total LPAHs were calculated as the sum of acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene

2. Total HPAHs were calculated as the sum of benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, total benzofluoranthenes, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene

CSL/2LAET - Cleanup Screening Level/Second Lowest Apparent Effects Threshold

SQS/LAET - Sediment Quality Standards/Lowest Apparent Effects Threshold

CSL/2LAET - Cleanup Screening Level/Second Lowest Apparent Effects Threshold

SQS/LAET and CSL/2LAET are source tracing screening benchmarks (See Appendix F of KC LDW SCIP)

Table E-3. Slip 6 Drainage Basin Stormdrain Solids Sample Results for KCIA1/1A from 2009-2015

KCIA Source Tracing Data Sets

KCIA1A Trap			KCIA1A Grab		KCIA1A Trap		KCIA1A Grab	
Sampled By	KCIA		KCIA		KCIA		KCIA	
Date	5/22/2014		5/22/2014		5/28/2015		5/28/2015	
	Results	Qual	Results	Qual	Results	Qual	Results	Qual
METALS (mg/kg)								
Arsenic (total)	140.0		40.0		51.0		14.0	
Copper	145.0		55.0		170.0		70.0	
Lead	80.0		20.0		46.0		45.0	
Mercury	0.500		0.030		0.200		0.035	
Zinc	750		1170		890		270	
PCB (mg/kg)								
pcb - Aroclor 1016	0.041	U	0.009	U	0.130	U	0.004	U
pcb - Aroclor 1221	0.041	U	0.009	U	0.130	U	0.004	U
pcb - Aroclor 1232	0.041	U	0.009	U	0.130	U	0.004	U
pcb - Aroclor 1242	0.041	U	0.009	U	0.130	U	0.004	U
pcb - Aroclor 1248	0.041	U	0.009	U	0.130	U	0.004	U
pcb - Aroclor 1254	0.063		0.016		0.130	U	0.004	U
pcb - Aroclor 1260	0.043		0.026		0.130	U	0.013	
Total PCB	0.106		0.042		ND		0.013	
LPAH (mg/kg)								
acenaphthene	NA		0.037		NA		0.032	
acenaphthylene	NA		0.020	U	NA		0.023	
anthracene	NA		0.190		NA		0.100	
fluorene	NA		0.060		NA		0.051	
methylnaphthalene, 2-	NA		0.020	U	NA		0.009	U
naphthalene	NA		0.019		NA		0.009	U
phenanthrene	NA		1.300		NA		0.920	
Total LPAH ¹			1.606				1.126	
HPAH (mg/kg)								
benzo[a]anthracene	NA		0.870		NA		0.660	
benzo[a]pyrene	NA		0.940		NA		0.880	
benzo[b]fluoranthene	NA		1.700		NA		1.400	
benzo[k]fluoranthene	NA		1.700		NA		0.460	
benzo(g,h,i)perylene	NA		0.700		NA		0.700	
chrysene	NA		1.200		NA		0.970	
dibenz[a,h]anthracene	NA		0.160		NA		0.170	
fluoranthene	NA		2.900		NA		1.900	
indeno[1,2,3-cd]pyrene	NA		0.570		NA		0.680	
pyrene	NA		2.300		NA		1.400	
Total HPAH ²			13.040				9.220	

Table E-3. Slip 6 Drainage Basin Stormdrain Solids Sample Results for KCIA1/1A from 2009-2015

KCIA Source Tracing Data Sets

KCIA1A Trap			KCIA1A Grab		KCIA1A Trap		KCIA1A Grab	
Sampled By	KCIA		KCIA		KCIA		KCIA	
Date	5/22/2014		5/22/2014		5/28/2015		5/28/2015	
	Results	Qual	Results	Qual	Results	Qual	Results	Qual
PHTHALATES (mg/kg)								
bis(2-ethylhexyl) phthalate	NA		0.120		NA		0.170	
butyl benzyl phthalate	NA		0.020	U	NA		0.023	U
diethyl phthalate	NA		0.020	U	NA		0.023	U
dimethyl phthalate	NA		0.020	U	NA		0.023	U
di-butyl phthalate (di-n-butyl phth.)	NA		0.020	U	NA		0.100	
di-n-octyl phthalate	NA		0.020	U	NA		0.023	U
TPH (mg/kg)								
Diesel (MTCA A)	NA		21		NA		140	
Heavy Oil (Motor Oil MTCA A)	NA		53		NA		740	
Conventionals (%)								
Solids, Total	NA		61.0		NA		57.8	
Total Organic Carbon	NA		3.4		10.0		0.7	
<-1 Phi Gravel, >2000 micron	NA		45.4		NA		7.2	
-1-0 Phi Very Coarse Sand, 1000-2000 micron	NA		6.9		NA		5.9	
0-1 Phi Coarse Sand, 500-1000 micron	NA		14.2		NA		8.2	
1-2 Phi Medium Sand, 250-500 micron	NA		16.5		NA		48.4	
2-3 Phi Fine Sand, 125-250 micron	NA		5.4		NA		17.0	
3-4 Phi Very Fine Sand, 62.5-125 micron	NA		2.0		NA		2.1	
4-5 Phi Coarse Silt, 31-62.5 micron	NA		7.0		NA		1.0	
5-6 Phi Medium Silt, 15.6-31 micron	NA		0.9		NA		0.4	
6-7 Phi Fine Silt, 7.8-15.6 micron	NA		0.6		NA		1.5	
7-8 Phi Very Fine Silt, 3.9-7.8 micron	NA		0.5		NA		1.3	
8-9 Phi Clay, 2-3.9 micron	NA		0.3		NA		0.1	
9-10 Phi Clay, 1-2 micron	NA		0.2		NA		0.1	
>10 Phi Clay, <1 micron	NA		0.2		NA		7.1	
Total Fines	NA		9.7		NA		NA	

	SQS LAET	CSL 2LAET	NST4 Trap		KCIA Catch Basin, TUK-17		MFC Swale, TUK-16		MFC Swale - Location 1		MFC Swale - Location 2		MFC Swale - Location 3		MFC Swale - Location 4		MFC Swale - Location 5	
Sampled By			SPU		EPA		EPA		Boeing		Boeing		Boeing		Boeing		Boeing	
Date			7/24/2012				9/19/12		2/7/2013		2/7/2013		2/7/2013		2/7/2013		2/7/2013	
			Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
METALS (mg/kg)																		
Arsenic (total)	57	93	8.0		6.0		10.0	U	NA		NA		NA		NA		NA	
Copper	390	390	34.6		15.3		147		NA		NA		NA		NA		NA	
Lead	450	530	64.0		6.0		315		NA		NA		NA		NA		NA	
Mercury	0.41	0.59	0.070	U	0.030	U	3.080		NA		NA		NA		NA		NA	
Zinc	410	960	1.47		43.0		811		NA		NA		NA		NA		NA	
PCB (mg/kg)																		
pcb - Aroclor 1016	---	---	0.018	U	0.017	U	1.700	U	2.000	U	0.160	U	2.000	U	0.160	U	35.000	U
pcb - Aroclor 1221	---	---	0.018	U	0.017	U	1.700	U	2.000	U	0.160	U	2.000	U	0.160	U	35.000	U
pcb - Aroclor 1232	---	---	0.018	U	0.017	U	1.700	U	2.000	U	0.160	U	2.000	U	0.160	U	35.000	U
pcb - Aroclor 1242	---	---	0.018	U	0.017	U	1.700	U	2.000	U	0.160	U	2.000	U	0.160	U	35.000	U
pcb - Aroclor 1248	---	---	0.018	U	0.017	U	6.900	Y	2.000	U	0.160	U	2.000	U	0.160	U	35.000	U
pcb - Aroclor 1254	---	---	0.018		0.033		75.000		10.000		1.400		6.200		0.570		270.000	
pcb - Aroclor 1260	---	---	0.021		0.022		18.000		3.600		0.560		2.500		0.240		63.000	
Total PCB	0.130	1.000	0.039		0.055		99.900		13.600		1.960		8.700		0.810		333.000	
LPAH (mg/kg)																		
acenaphthene	0.500	0.500	0.022		0.010	J	0.170	U	NA		NA		NA		NA		NA	
acenaphthylene	1.300	1.300	0.024		0.018	U	0.084	J	NA		NA		NA		NA		NA	
anthracene	0.960	0.960	0.075		0.018	U	0.170	U	NA		NA		NA		NA		NA	
fluorene	0.540	0.540	0.025		0.230		0.170	U	NA		NA		NA		NA		NA	
methylnaphthalene, 2-	0.670	0.670	---		0.010	J	0.170	U	NA		NA		NA		NA		NA	
naphthalene	2.100	2.100	0.056		0.018	U	0.170	U	NA		NA		NA		NA		NA	
phenanthrene	1.500	1.500	0.470		0.085		0.610		NA		NA		NA		NA		NA	
Total LPAH ¹	5.200	5.200			0.335		0.694		NA		NA		NA		NA		NA	
HPAH (mg/kg)																		
benzo[a]anthracene	1.300	1.600	0.510		0.018	U	0.240		NA		NA		NA		NA		NA	
benzo[a]pyrene	1.600	1.600	0.660		0.018	U	0.560		NA		NA		NA		NA		NA	
benzo[b]fluoranthene	3.200	3.600	---		---		---		NA		NA		NA		NA		NA	
benzo[k]fluoranthene	3.200	3.600	1.500		0.040		1.700		NA		NA		NA		NA		NA	
benzo(g,h,i)perylene	0.670	0.720	0.700		0.017		0.820		NA		NA		NA		NA		NA	
chrysene	1.400	2.800	1.100		0.030		0.900		NA		NA		NA		NA		NA	
dibenz[a,h]anthracene	0.230	0.230	0.230		0.018	U	0.180		NA		NA		NA		NA		NA	
fluoranthene	1.700	2.500	1.200		0.052		0.560		NA		NA		NA		NA		NA	
indeno[1,2,3-cd]pyrene	0.600	0.690	0.570		0.013		0.670		NA		NA		NA		NA		NA	
pyrene	2.600	3.300	1.200		0.045		0.950		NA		NA		NA		NA		NA	
Total HPAH ¹	12.000	17.000	7.670		0.197		6.580		NA		NA		NA		NA		NA	

Table E-4. Norfolk Drainage Basin Stormdrain Solids Sample Results for Multiple Sampling Locations from 2012-2013

KCIA Source Tracing Data Sets

	SQS LAET	CSL 2LAET	NST4 Trap		KCIA Catch Basin, TUK-17		MFC Swale, TUK-16		MFC Swale - Location 1		MFC Swale - Location 2		MFC Swale - Location 3		MFC Swale - Location 4		MFC Swale - Location 5	
Sampled By			SPU		EPA		EPA		Boeing		Boeing		Boeing		Boeing		Boeing	
Date			7/24/2012				9/19/12		2/7/2013		2/7/2013		2/7/2013		2/7/2013		2/7/2013	
			Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
PTHALATES (mg/kg)																		
bis(2-ethylhexyl) phthalate	1.300	3.100	0.380		0.048		4.100	B	NA		NA		NA		NA		NA	
butyl benzyl phthalate	0.063	0.900	0.054		0.018	U	0.110	J	NA		NA		NA		NA		NA	
diethyl phthalate	0.200	1.200	0.043		0.046		0.420		NA		NA		NA		NA		NA	
dimethyl phthalate	0.071	0.160	0.032		0.018	U	0.170	U	NA		NA		NA		NA		NA	
di-butyl phthalate (di-n-butyl phth.)	1.400	5.100	0.019	U	0.018	U	0.130	J	NA		NA		NA		NA		NA	
di-n-octyl phthalate	6.200	6.200	0.019	U	0.018	U	0.180		NA		NA		NA		NA		NA	
TPH																		
Diesel (MTCA A)	2000	2000	160		NA		NA		NA		NA		NA		NA		NA	
Heavy Oil (Motor Oil MTCA A)	2000	2000	570		NA		NA		NA		NA		NA		NA		NA	
Conventionals (%)																		
Solids, Total			60.7		NA		91.7		NA		NA		NA		NA		NA	
Total Organic Carbon			3.82		NA		10.8		NA		NA		NA		NA		NA	
<-1 Phi Gravel, >2000 micron			6.2		NA		6.2		NA		NA		NA		NA		NA	
-1-0 Phi Very Coarse Sand, 1000-2000 micron			7		NA		15.5		NA		NA		NA		NA		NA	
0-1 Phi Coarse Sand, 500-1000 micron			23.7		NA		22.1		NA		NA		NA		NA		NA	
1-2 Phi Medium Sand, 250-500 micron			32.6		NA		24.5		NA		NA		NA		NA		NA	
2-3 Phi Fine Sand, 125-250 micron			9.1		NA		12.7		NA		NA		NA		NA		NA	
3-4 Phi Very Fine Sand, 62.5-125 micron			3		NA		6.3		NA		NA		NA		NA		NA	
4-5 Phi Coarse Silt, 31-62.5 micron			1.1		NA		3		NA		NA		NA		NA		NA	
5-6 Phi Medium Silt, 15.6-31 micron			3.5		NA		4.6		NA		NA		NA		NA		NA	
6-7 Phi Fine Silt, 7.8-15.6 micron			3.3		NA		2.9		NA		NA		NA		NA		NA	
7-8 Phi Very Fine Silt, 3.9-7.8 micron			3.2		NA		1.4		NA		NA		NA		NA		NA	
8-9 Phi Clay, 2-3.9 micron			2.7		NA		0.5		NA		NA		NA		NA		NA	
9-10 Phi Clay, 1-2 micron			2.2		NA		0.1		NA		NA		NA		NA		NA	
>10 Phi Clay, <1 micron			2.2		NA		0.3		NA		NA		NA		NA		NA	
Total Fines			16.3		NA		12.7		NA		NA		NA		NA		NA	

Indicates > than the SQS/LAET

Indicates > than the CSL/2LAET

NA = Not Analyzed Chemistry results are in dry weight

1. Total LPAHs were calculated as the sum of acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene

2. Total HPAHs were calculated as the sum of benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, total benzofluoranthenes, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene

SQS/LAET - Sediment Quality Standards/Lowest Apparent Effects Threshold

CSL/2LAET - Cleanup Screening Level/Second Lowest Apparent Effects Threshold

SQS/LAET and CSL/2LAET are source tracing screening benchmarks (See Appendix F of KC LDW SCIP)