

King County Source Control  
Updates for  
Lower Duwamish Waterway  
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# Overview

- ◎ General Updates
- ◎ KC International Airport
- ◎ Source Control Studies

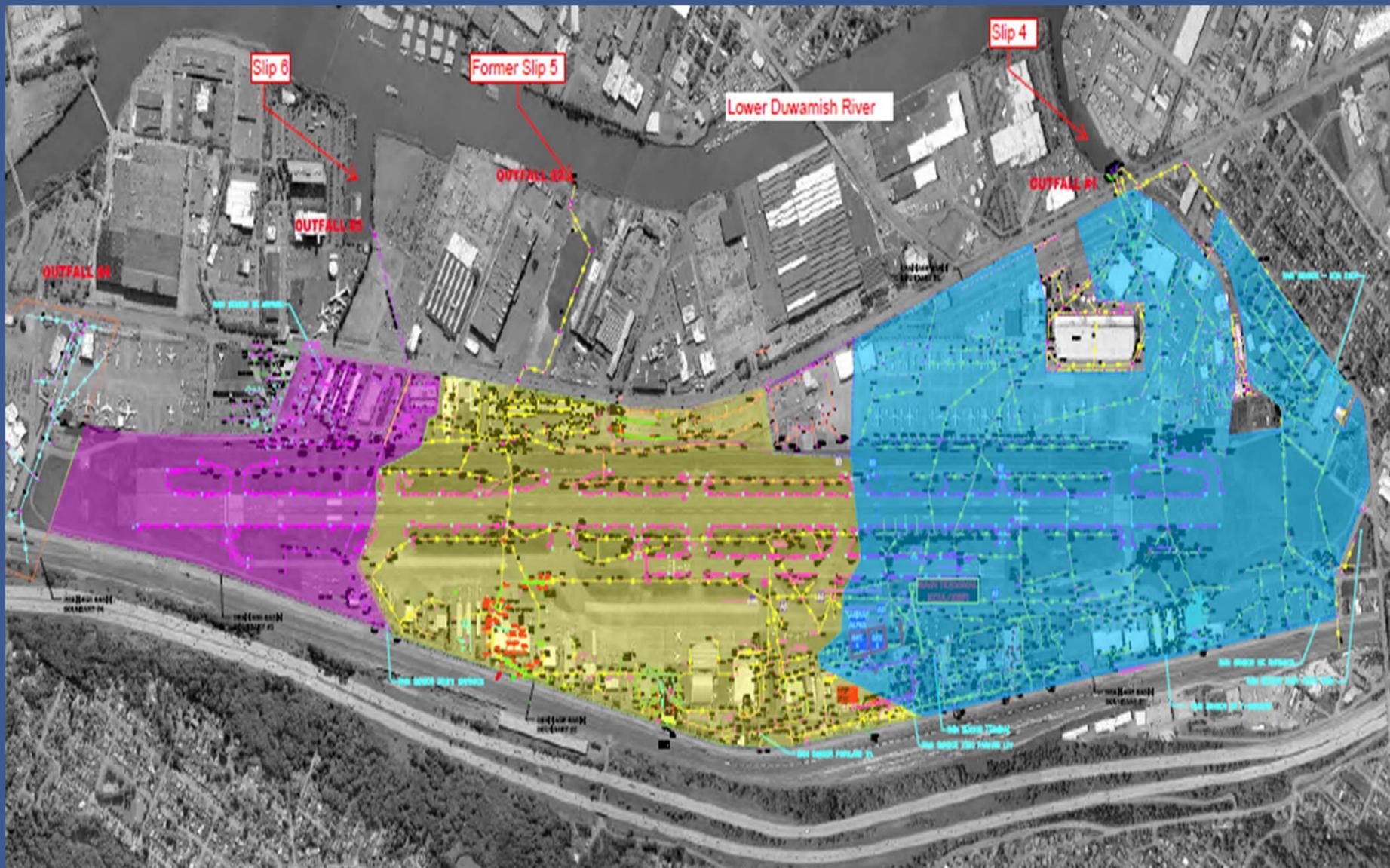
# General Updates

- ◎ CSO Control Plan approved by King County Council  
<http://www.kingcounty.gov/environment/wastewater/CSO.aspx>
- ◎ Industrial Waste Program
  - › Conducted system-wide characterization sampling of selected industrial wastewater discharges in 2011
  - › Report due to Ecology by mid-2013

# General Updates

- ◎ Ecology Water Quality Inspector (KC WTD funded)
  - > Focus on stormwater BMPs for commercial/industrial facilities in Duwamish Basin
  - > Splitting time between CSO and separated stormwater basins
  - > KC WTD requested begin in Brandon CSO Basin followed by Michigan CSO Basin

# King County International Airport (KCIA)



# KCIA LDW Source Control Activities

- ◎ Slip 4 Early Action Area
  - › In-line Sediment Trap Monitoring by SPU – Jul 2012
  - › Oil Water Separators Sampling & Cleaning – Oct 2012
  - › North Boeing Field MTCA Agreed Order
    - Stormwater System Sampling and Source Tracing – 2013
  
- ◎ Former Slip 5 & Slip 6
  - › In-line Sediment Trap Monitoring by SPU – Apr & Jun 2012
  - › South Pump Station Sampling & Cleaning – Aug 2012
  - › Oil Water Separators Sampling & Cleaning – Oct 2012

# KCIA LDW Source Control Activities

- ◎ Industrial Stormwater & Municipal Stormwater Permits
  - › Annual Stormwater Facility Sampling – Oct 2012
  - › Central Catch Basins Cleaning – Oct 2012
  - › Stormwater Discharge Sampling – Monthly
  - › Pavement Sweeping – Daily
  - › Tenant Assessments – Annually
- ◎ Airport Capital Improvement Projects
  - › Water Quality Vault Constructed – Nov 2012
  - › Stormwater Pipe Repairs/Replacement – Nov 2012
  - › Taxiway Pavement Rehabilitation Completed – Nov 2012
  - › Conduct Phase I/II Environmental Site Assessments for Airport Redevelopment Projects

# King County Source Control Studies

- ◎ Duwamish CSO Source Tracing
- ◎ Brandon Basin CSO Study
- ◎ Bulk Air Deposition Study
- ◎ Green River Studies

All provide information to assist in understanding sources to the LDW

<http://www.kingcounty.gov/environment/wastewater/Duwamish-waterway/PreventingPollution/PollutionSources.aspx>

# Duwamish CSO Source Tracing: In-line grab and sediment trap sampling

- ◎ System Recon during 2011
  - > Solids insufficient to sample in many areas
  - > Access limitations
- ◎ In-line grab samples from West Michigan (1), Michigan (4) and Brandon (4)
- ◎ Sediment Traps at Brandon (3) and Michigan (1)
- ◎ Analyzed for metals, mercury, PCBs, SVOCs, dioxins/furans, and conventional parameters
- ◎ Sampling and Analysis between 2010-2012

# Duwamish CSO Source Tracing: In-line grab and sediment trap sampling

- ◎ West Michigan- below benchmarks
- ◎ Michigan-
  - > In-line samples (Regulator/outfall structure): PCBs, mercury, and BEHP above benchmarks (2LAET)
  - > Sediment traps (Regulator/outfall structure): PCBs and mercury below benchmarks; BEHP above benchmark
  - > In-line samples (lateral lines): below benchmarks
- ◎ Brandon-
  - > In-line samples (Regulator/outfall structure): PCBs and mercury below benchmarks (2LAET); BEHP above benchmark
  - > Sediment Traps (lateral lines): PCBs below benchmark; mercury/metals, BEHP and HPAHs above benchmarks

# Brandon Basin CSO Study

- ◎ Study Goal:
  - › evaluate chemical input apportionment between sanitary/wastewater (dry baseflow), stormwater (storm) and infiltration/inflow (wet baseflow)
- ◎ Flow-proportioned samples from 3 locations within Brandon CSO Basin
- ◎ Collected 6 dry baseflow, 6 wet baseflow, & up to 15 storm events
  - › May 2012 completed sampling

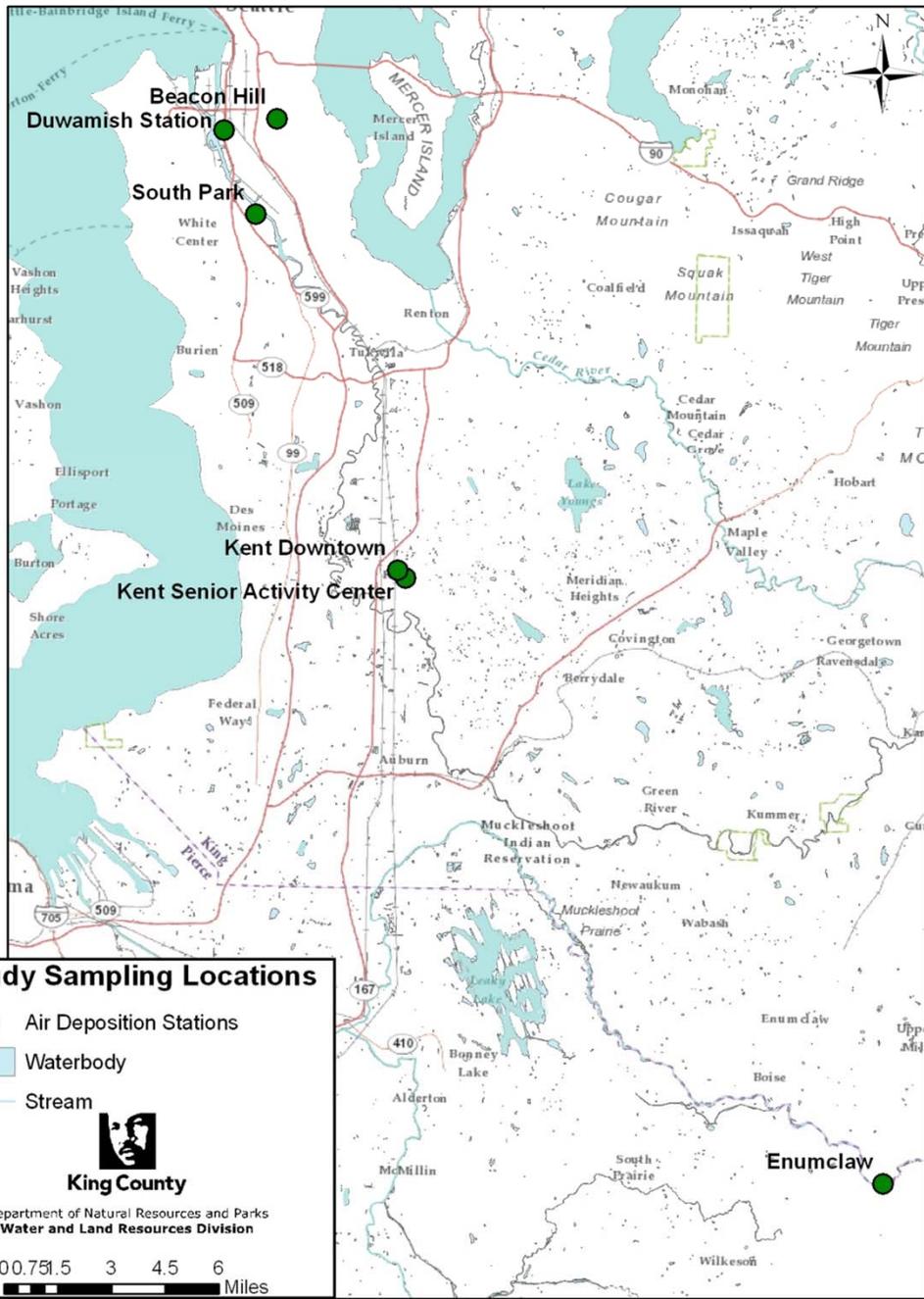
# Brandon Basin CSO Study

- ⦿ Analyzing for metals, mercury, SVOCs, conventionals, and subset for PCBs congeners and dioxins/furans
- ⦿ Sample analysis complete; data validation on-going
- ⦿ Flow, rainfall and chemistry data analysis on-going
- ⦿ Schedule
  - › Draft Data Report May 2013

# Bulk Air Deposition Study

- ◎ Study Objective:
  - > compare the measurements of bulk deposition (dry particulate and rainfall) in areas of different land use within the Green/Duwamish River Basin
  - > to provide information to assist in understanding atmospheric sources to the Lower Duwamish Waterway
- ◎ Sampling at five Ecology or Puget Sound Clean Air Agency air monitoring stations:
  - > Beacon Hill, Duwamish , South Park, Kent, Mud Mountain in Enumclaw
  - > Second Station at Kent added-evaluate micro-scale effects

# Air Deposition Sampling Locations



Site	Land use
Duwamish	Industrial & urban
Beacon Hill	Regional urban
South Park	Suburban, industrial, residential
Kent downtown	Suburban & commercial (with rail)
Kent Senior Center	Suburban & commercial (without rail)
Enumclaw	Rural

# Bulk Air Deposition Study

- ◎ Sampling July 2011-October 2012
- ◎ Sample totals per station (~1 - 4 week-long deployment)
  - > Up to 25 for metals and PAHs
  - > Up to 10 for PCB congeners and dioxins/furans
- ◎ Sample Analysis and data validation complete in Jan 2013 followed by data analysis
- ◎ Schedule
  - > Draft Data Report April 2013

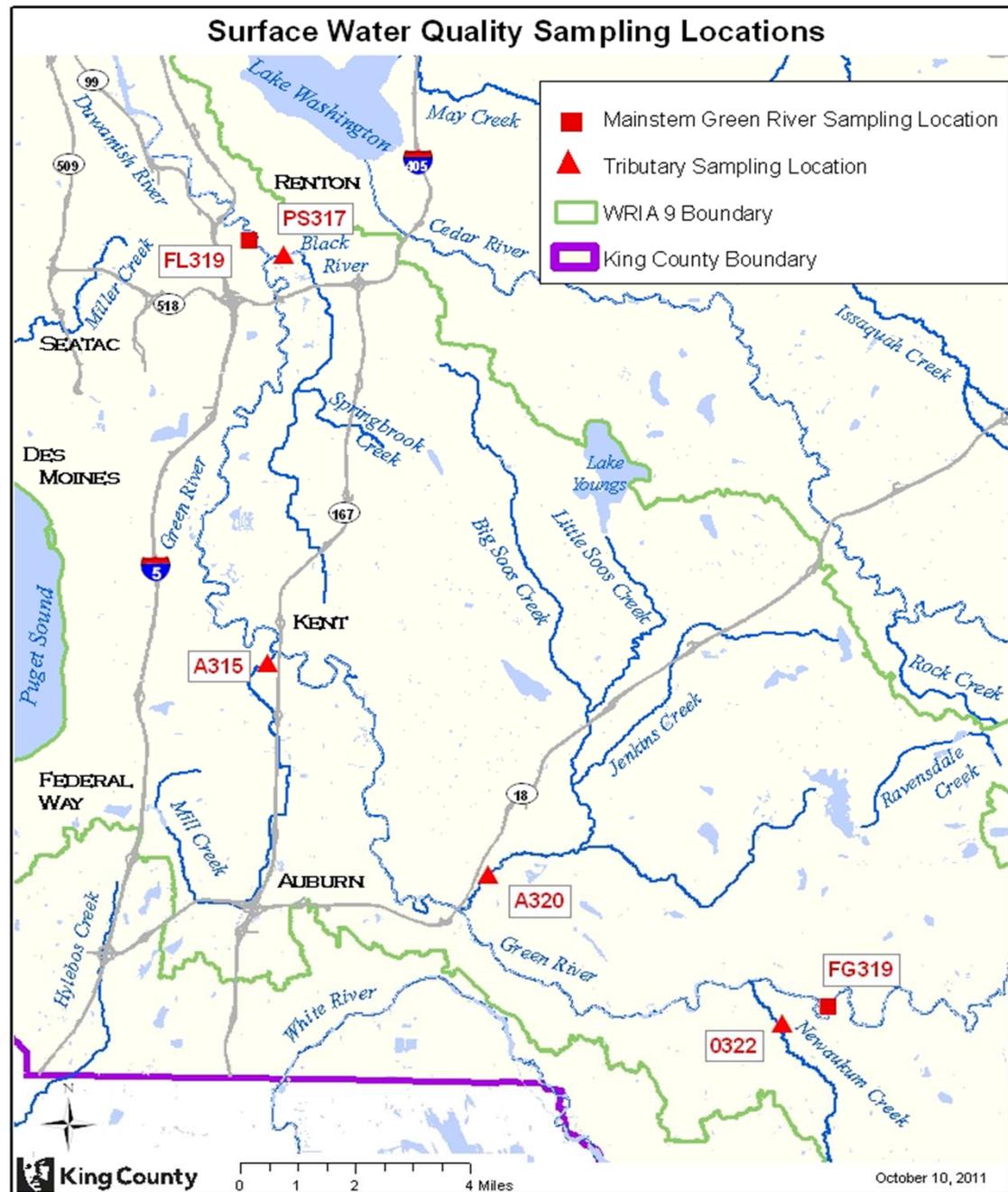
# Green River Studies

- ◎ Whole Water
- ◎ Stream Sediments
- ◎ Suspended Solids

## Common Sampling locations:

- > Green River at Flaming Geyser and Foster Links Golf Course
- > Soos, Newaukum and Mill Creeks and Black River Pump Station

# Green River Sampling Locations



# Green River Study- Whole Water

## ◎ Study Objective:

- › to estimate relative contributions of arsenic, PAHs and PCBs from the major tributaries to the Green River and to the LDW
- › this study will not collect sufficient information to estimate total contaminant loading from tributaries or the Green River to the LDW

## ◎ Samples Collected per location

- › 3 for dry season/baseflow
- › 6 for storm/wet season conditions

# Green River Study-Whole Water

- ◎ Baseflow samples collected in September 2011
- ◎ Storm/wet season samples collected November 2011 through November 2012
- ◎ Samples analyzed for PCB congeners, PAHs, arsenic, total & dissolved organic carbon, total suspended solids
- ◎ Sample analysis completed by February 2013; validation by March 2013
- ◎ Schedule:
  - › Draft Data Report ~ May 2013

# Green River Study-Whole Water: Integrated Whole Water Sampling Survey

- Objective:
  - To better understand the influence of sampling methodologies used to characterize water quality conditions in the Green River
  - Evaluate how representative are the composite samples collected from one location in the river
- Sampling Location: Green River at Foster Links
- Method: simultaneously collect sample using existing methods (an ISCO sampler) and an integrated water sample that incorporates sample collection over the river cross section
  - Two events targeted consisting of triplicate samples for each event
  - First event collected in Sept 2012

# Green River Study-Sediments

- ◎ Study Objective:
  - bulk sediment chemical concentrations characterized to evaluate sediment quality and to better understand the relative differences of sediment quality within streams in the Green Basin
- ◎ Soos, Newaukum, and Springbrook creeks sampled between 2008-2010
- ◎ Sampled August 2012
  - Mill (Hill) Creek in Auburn, Mill Creek in Kent, Jenkins Creek, Covington Creek
  - Four Green River locations: Flaming Geyser, Foster Links golf course, upstream of Soos and Mill (Kent)

# Green River Study-Sediments

- Where feasible, collected sediment approximately every mile between the mouth and the headwaters of each stream
- ~ 40 composite samples collected in August
- Analyzing for full suite of analytes
- Sample analyses to be completed in 1<sup>st</sup> quarter 2013
- Schedule:
  - Draft Data Report May 2013

# Green River Study-Suspended Solids

## ◎ Study Objective:

- to make relative comparisons of PCBs, PAHs, dioxins and arsenic associated with suspended solids in the Green River and its major tributaries
- the information collected from this effort is not intended to be a comprehensive characterization of the suspended solids in the streams and will not be sufficient to estimate total contaminant loading to the LDW

# Green River Study-Suspended Solids

- Two sampling methods: sediment traps and filtered solids

- Traps



Baffle-style Trap



Jar-style Trap

- Sediment traps Deployed late October 2012
- Filter Solids method development for field and analytical approaches currently underway

# Green River Study-Suspended Solids

- Locations:
  - Green River at Flaming Geyser and Foster Links golf course
  - Soos, Newaukum and Mill creeks
- Traps: two deployments over wet season
- Filtered solids: one baseflow and up to five storm/wet season samples
- Target Analytes: PCBs as Aroclors, dioxins/furans, arsenic\*, PAHs\*, total organic carbon, and particle size distribution
- Schedule:
  - Data Collection and Analysis 2013
  - Data Report 2014

\*Likely to obtain data for other metals and other SVOCs based on methods targeted

# Green River Study-Suspended Sediments



Baffle-Style Trap  
field trials at Mill  
Creek



Baffle-Style Trap  
sample in large jar  
Jar-Style Trap sample in  
smaller jars

# Questions ?

[www.kingcounty.gov/  
environment/wastewater/  
IndustrialWaste/SourceControl  
.aspx](http://www.kingcounty.gov/environment/wastewater/IndustrialWaste/SourceControl.aspx)

