Industrial Waste Program
Sampling Overview

Tim Coffey, Lead Sampling Specialist
tim.coffey@kingcounty.gov
206 263 3020 (office)
206 427 4642 (cell)

King County Wastewater Treatment Division
Industrial Waste Program
Presentation Summary

- Key Manhole sampling
- In-line sediment source control
- Flow Proportional versus Time Proportional
King County Wastewater Treatment Division Facts

- 34 local sewer agencies (cities & sewer districts)
- 420 square miles
- 1.5 million people
- 3 Regional plants (West, South & Brightwater)
- 2 local plants (Carnation & Vashon Island)
- 42 Pump Stations
- 353 miles of conveyance lines with diameters ranging from 6 inches to 17 feet
- 38 Combined Sewer Overflows (CSO’s) and 4 CSO treatment facilities
- Average 175 million gallons per day (MGD) treated wastewater
King County Industrial Waste Program (KCIW)

Mission: The mission of the Industrial Waste Program is to protect the environment, public health, biosolids quality, and King County's regional sewerage systems. We work cooperatively with our customers as we regulate industrial discharges, provide technical assistance, and monitor the regional sewerage system.
Program Goal: Prevent interference with operation of treatment plants
Program Goal: Prevent passthrough to the environment
Program Goal: Improve opportunities for recycling and reclaiming biosolids
Program Goal: Protect worker health
Program Goal: Protect Regional Water Quality

- By diverting treatable wastes to the Sanitary Sewer
Regulate Industries by Issuing discharge permits: ~ 500 active discharge approvals
Inspect industrial & commercial facilities – 415 inspections in 2011
• Collect Compliance samples — ~2,100 discrete compliance samples in 2011
Enforce regulations & limits

- Issue Notice of Violations
- Issue Compliance Orders
- Issue Monetary Penalties
- Publish Violators in Seattle Times
- Recover costs for our Post Violation activities
Awards and Recognition
Types of Industries Regulated by King County

Categorical (federal) significant industrial users

- Metal finishers (40 CFR 433)
- Electroplating job shops (40 CFR 413)
- Pharmaceutical manf. (40 CFR 439)
- Centralized waste treaters (40 CFR 437)
- Porcelain enameling (40 CFR 466)
- Coil Coating (can manf.) (40 CFR 465)
- Electrical components (40 CFR 469)
- Iron & steel manf. (40 CFR 420)
- Circuit board manf. (40 CFR 413 / 433)

Non Categorical Industries

King County Local Limits

- Food processors
- Landfill leachate disposal
- Solid Waste / Recycling Transfer Stations
- Soft drinks manf.
- Breweries & wineries
- Construction dewatering
- Shipyards / Boatyards
- Groundwater remediation
- Food manf. / processing
- Vactor truck Decanting Facilities
- Transportation / Transit Operations
- Rendering
- Industrial laundries
- Cement / Ready mix
- Contaminated Stormwater
Key Manhole - SAMPLING TO PROVIDE DATA THAT CHARACTERIZES SYSTEM WASTEWATER FLOWS WHILE ILLUMINATING ANY TRENDS IN CONTAMINENTS.
UPSTREAM / DOWNSTREAM SAMPLING USED TO CONFIRM SUSPECTED ILLICIT DISCHARGE.

COMPANY CLOSURES

ABLE TO MONITOR FOR EXTENDED PERIODS OF TIME

MAIN PARAMETERS OF CONCERN = HEAVY METALS, pH

VARIABLE TAT

PROBLEMS

• TRAFFIC ISSUES
• SAMPLE LINE RAG UP
• EQUIPMENT FAILURE
• WEATHER CONDITIONS
PROJECT SAMPLING PLAN USED FOR EACH EVENT

• ROLES AND RESPONSIBILITIES
• SCOPE
• SAFETY PLAN
• COMMUNICATION PLAN
• FIELD SET UP TASKS
• SAMPLING SCHEDULE AND ACTIVITIES
• DATA LOGISTICS AND ANALYSIS
• EVENT FOLLOW UP
PROPER LIFTING TECHNIQUES
LOWERING AND LIFTING THE SAMPLERS
In-line sediment source control
DUWAMISH RIVER
SUPERFUND FUND
SITES

SOLID VS LIQUID
SAMPLES
SAMPLING AND ANALYSIS PLAN

ANALYSES

- PCB
- ICP METALS
- MERCURY
- TOC
- SVOC
- PSD
- TOTS
- PLUS SELECTED FREPS AND BLANKS
SAMPLING SCOOP
DOWNSTREAM FROM HISTORIC TRANSFORMER STORAGE FACILITY
Flow Proportional vs Time Proportional sampling

- Company assessments began in 2009
- USEPA Wastewater Sampling SOP
- IW Technical Memorandum
- Case study
Site 3 – effluent from dye penetrant line, x-ray lab and alkaline rinse.
Appr 1400 GPD during study
Exotic metals will conduct a side-by-side study of flow-proportioned composite sampling and time-proportioned composite sampling at sites A81353, A81356 and A81359. The study will not include sites A81355, A81357 and A81358. The acid etch room (Site A81355) will have flow-proportioned sampling conducted; we are currently in the process of purchasing the sampling equipment. The small aqueous tank (Site A81358) will have an “amp clamp” or Liquid Level Actuator device attached to track flow, therefore, we will be using flow-proportioned sampling at this site. King County has agreed to exclude the resistance seam welder stations (Site A81357) from the flow-proportioned sampling requirement due to the low flow and low variability of this effluent, therefore, this site will not be part of the study.

Sampling of sites A81353, A81356 and A81359 will be conducted twice per week for 3 weeks at each of the three sites. Time-proportioned samples will be taken every two hours for a period of 24 hours using a GLS autosampler and the flow-proportioned samples will be collected using a GLS autosampler with input calculations based off the Manning Formula for open channel sampling (see attachment 1 for formula.) Using two GLS samplers per site, this study will take approximately 6 weeks for sampling and an additional 5-10 working day for analytical results.

All samples will be taken to Spectra Laboratories in Tacoma, WA using a chain-of-custody and analyzed for the heavy metals listed in our current discharge permit for each site. Results will be compiled at the end of this project and shared with King County.

If sample results for each parameter are equal to or less than 35% when comparing the chemical concentrations from the time-proportioned sample and from the flow-proportioned sample then it will be assumed that time-proportioned composite sampling is representative of the Discharge and therefore we ask King County Industrial Waste to allow us to continue with time-proportioned sampling in these three areas.

### Attachment 2: Sample Schedule

<table>
<thead>
<tr>
<th>Week 1 (3/5-3/9)</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site 3</td>
<td>X</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 2 (3/12-3/16)</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site 3</td>
<td>X</td>
<td>5</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site 9</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 3 (3/19-3/23)</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site 9</td>
<td>X</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 4 (3/26-3/30)</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site 6</td>
<td>X</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 5 (4/2-4/6)</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site 6</td>
<td>X</td>
<td>5</td>
<td>6</td>
<td></td>
<td>send samples to lab</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 6-7 (4/9-4/20)</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waiting for analytical</td>
<td>X=Represents sampler setup/restart day-no sample taken</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Date</td>
<td>Sample Number</td>
<td>Time</td>
<td>Cadmium, Cd</td>
<td>Chromium, Cr</td>
<td>Copper, Cu</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------</td>
<td>------</td>
<td>-------------</td>
<td>-------------</td>
<td>-----------</td>
</tr>
<tr>
<td>3/5/2012</td>
<td>003-5-time</td>
<td>Start: 11:55 AM</td>
<td>Stop: 11:25 AM</td>
<td>&lt;0.003</td>
<td>&lt;0.007</td>
</tr>
<tr>
<td>3/5/2012</td>
<td>003-5-flow</td>
<td>Start: 11:55 AM</td>
<td>Stop: 7:50 AM</td>
<td>&lt;0.003</td>
<td>&lt;0.007</td>
</tr>
<tr>
<td>3/6/2012</td>
<td>003-6-time</td>
<td>Start: 12:10 PM</td>
<td>Stop: 12:09 PM</td>
<td>&lt;0.003</td>
<td>&lt;0.007</td>
</tr>
<tr>
<td>3/6/2012</td>
<td>003-6-flow</td>
<td>Start: 12:10 PM</td>
<td>Stop: 12:09 PM</td>
<td>&lt;0.003</td>
<td>&lt;0.007</td>
</tr>
<tr>
<td>3/7/2012</td>
<td>003-7-time</td>
<td>Start: 12:22 PM</td>
<td>Stop: 12:23 PM</td>
<td>&lt;0.003</td>
<td>&lt;0.007</td>
</tr>
<tr>
<td>3/7/2012</td>
<td>003-7-flow</td>
<td>Start: 12:22 PM</td>
<td>Stop: 12:23 PM</td>
<td>&lt;0.003</td>
<td>&lt;0.007</td>
</tr>
<tr>
<td>3/8/2012</td>
<td>003-8-time</td>
<td>Start: 12:34 PM</td>
<td>Stop: 12:34 PM</td>
<td>&lt;0.003</td>
<td>&lt;0.007</td>
</tr>
<tr>
<td>3/8/2012</td>
<td>003-8-flow</td>
<td>Start: 12:34 PM</td>
<td>Stop: 12:34 PM</td>
<td>&lt;0.003</td>
<td>&lt;0.007</td>
</tr>
<tr>
<td>3/12/2012</td>
<td>003-12-time</td>
<td>Start: 6:35 AM</td>
<td>Stop: 6:34 AM</td>
<td>&lt;0.003</td>
<td>&lt;0.007</td>
</tr>
<tr>
<td>3/12/2012</td>
<td>003-12-flow</td>
<td>Start: 6:35 AM</td>
<td>Stop: 6:34 AM</td>
<td>&lt;0.003</td>
<td>&lt;0.007</td>
</tr>
</tbody>
</table>

Notes: < figures = MDL for that parameter
Results are mg/L

Site 3 sample results
Site 9 – gravity flow out of settling box from alkaline cleaning line
Appr. 1200 GPD
### Site 9 Sample Results

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Matrix</th>
<th>Collect Date</th>
<th>Client ID</th>
<th>Site</th>
<th>zinc, total, ICP (ug/L)</th>
<th>nickel, total, ICP (ug/L)</th>
<th>lead, total, ICP (ug/L)</th>
<th>copper, total, ICP (ug/L)</th>
<th>chromium, total, ICP (ug/L)</th>
<th>discharge rate (mgd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LE WM WTR</td>
<td>TIME</td>
<td>3/14/2012</td>
<td>3/14/2012</td>
<td>20</td>
<td>49.1</td>
<td>36.8</td>
<td>29.5</td>
<td>170</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>LE WM WTR</td>
<td>TIME</td>
<td>3/14/2012</td>
<td>3/14/2012</td>
<td>25</td>
<td>49.6</td>
<td>56.8</td>
<td>56.8</td>
<td>171</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>LE WM WTR</td>
<td>TIME</td>
<td>3/14/2012</td>
<td>3/14/2012</td>
<td>15</td>
<td>75.8</td>
<td>56.8</td>
<td>56.8</td>
<td>171</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>LE WM WTR</td>
<td>TIME</td>
<td>3/14/2012</td>
<td>3/14/2012</td>
<td>10</td>
<td>49.1</td>
<td>36.8</td>
<td>29.5</td>
<td>170</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>LE WM WTR</td>
<td>TIME</td>
<td>3/14/2012</td>
<td>3/14/2012</td>
<td>24</td>
<td>49.6</td>
<td>56.8</td>
<td>56.8</td>
<td>171</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>LE WM WTR</td>
<td>TIME</td>
<td>3/14/2012</td>
<td>3/14/2012</td>
<td>15</td>
<td>75.8</td>
<td>56.8</td>
<td>56.8</td>
<td>171</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>LE WM WTR</td>
<td>TIME</td>
<td>3/14/2012</td>
<td>3/14/2012</td>
<td>10</td>
<td>49.1</td>
<td>36.8</td>
<td>29.5</td>
<td>170</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>LE WM WTR</td>
<td>TIME</td>
<td>3/14/2012</td>
<td>3/14/2012</td>
<td>24</td>
<td>49.6</td>
<td>56.8</td>
<td>56.8</td>
<td>171</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>LE WM WTR</td>
<td>TIME</td>
<td>3/14/2012</td>
<td>3/14/2012</td>
<td>15</td>
<td>75.8</td>
<td>56.8</td>
<td>56.8</td>
<td>171</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>LE WM WTR</td>
<td>TIME</td>
<td>3/14/2012</td>
<td>3/14/2012</td>
<td>10</td>
<td>49.1</td>
<td>36.8</td>
<td>29.5</td>
<td>170</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>LE WM WTR</td>
<td>TIME</td>
<td>3/14/2012</td>
<td>3/14/2012</td>
<td>24</td>
<td>49.6</td>
<td>56.8</td>
<td>56.8</td>
<td>171</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>LE WM WTR</td>
<td>TIME</td>
<td>3/14/2012</td>
<td>3/14/2012</td>
<td>15</td>
<td>75.8</td>
<td>56.8</td>
<td>56.8</td>
<td>171</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>LE WM WTR</td>
<td>TIME</td>
<td>3/14/2012</td>
<td>3/14/2012</td>
<td>10</td>
<td>49.1</td>
<td>36.8</td>
<td>29.5</td>
<td>170</td>
<td>1</td>
<td>24</td>
</tr>
</tbody>
</table>

**Notes:**
- **MDL** and **RDL** values are indicated if the measured value is below or above the respective limit.
- **<MDL** and **<RDL** values are italicized and highlighted in blue.
- **Units** are provided for each measurement (ug/L).
Presentation Summary

- Key Manhole sampling
- In-line sediment source control
- Flow Proportional versus Time Proportional

Contact information

tim.coffey@kingcounty.gov
206 263 3020 (office)
206 427 4642 (cell)

King County

Thank you

Questions?