Implementation of PCB Pollutant Minimization Plans for Small Municipal Wastewater Utilities

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Outline

- PCB PMP Implementation
  - Objectives
  - Overall Approach
- Identifying Potential Sources
- Influent Trackback Sampling
- Assessing PCB Data Results
- Measures to address PCB sources
- Discussion
Objectives and Overall Approach

Objective of PCB PMP Implementation: to reduce the discharge of PCB loadings to the Delaware River through identification and elimination of sources

- Demonstrate good faith effort
  - Identify and reduce any "low hanging fruit"
  - Efficiently identify and eliminate potential sources
- Contain costs
  - Strategic monitoring (avoid 1668A when possible)
    - Avoid araclor methods unless you have ID’d specific araclors
    - Method 680/8270 modified to capture PCB congeners instead of SVOCs
  - Skip the blank
  - Document benefits of existing maintenance and upgrades

Overall Approach

- Identify Potential Sources
- Search Collection System
- Isolate PCB Sources
Identifying Potential Sources

- General PCB Source categories
- GIS Assessment
  - Land use composition
  - Known Contaminated Sites
- Inventory of On-Site Equipment at WWTP
  - Transformers, chemical storage, oils and lubricants
- Operator Interview and Windshield Survey of Sewer Service Area
# General PCB Source categories

## Table 2: General PCB Source Categories

<table>
<thead>
<tr>
<th>Source Category</th>
<th>Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCB Source in Collection System</td>
<td>Direct input into collection system</td>
</tr>
<tr>
<td>PCB Source in Service Area but not in Collection System</td>
<td>Extraneous flow into collection system</td>
</tr>
<tr>
<td>Air Deposition</td>
<td>Air to water transport, air to soil transport</td>
</tr>
</tbody>
</table>
GIS Assessment

- Significant Industrial Users
- Land use composition (industrial areas and transportation infrastructure)
- Known Contaminated Sites
What to look for in windshield survey

- Things to look for:
  - Industrial areas
  - Industrial Dump Sites
  - Landfills
  - Above ground storage facilities
  - Auto repair shops
  - Machine shops
  - DPW sites
  - Transformer Stations
  - Railroad Stations and Corridors
  - Military Installations
  - Electronics Manufacturing Plants
  - Automobile Service Stations
Influent Trackback Sampling

- **First Cut Sampling**
  - Air Sample (24-hour blank)
  - Influent Sample
  - Based on results:
    - Decide whether to proceed with Iterative Search phase
    - Select appropriate sampling method for subsequent influent sampling

- **Iterative Searches**
  - performed coincident with effluent sampling
  - one or two rounds of geographic isolation within collection system
  - one or two rounds of potential source isolation within collection system

- **Confirmation**
  - repeat source isolation sampling
Assessing PCB Data Results

- Applying DRBC QC rules regarding blanks
  - Rinsate blank contamination acceptance rules:
    - An individual congener cannot exceed 40 pg/L
    - If associated sample concentration exceeds 3× the amount in the blank, then no action is required
    - If congener is not found in the associated field sample, then no action is required
    - \[=\text{IF}(\text{OR}(	ext{SAMPLE}=\text{""},\text{SAMPLE}=0),\text{E5},\text{IF}(	ext{BLANK}<=40, \text{SAMPLE},\text{IF}(	ext{SAMPLE}>\text{BLANK}*3, \text{SAMPLE},\text{"ERROR"}))))\]
  - The total PCB concentration cannot exceed 600 pg/L

- Total- and penta-PCB comparisons

- Fingerprint Analysis
Air and Effluent Congener Composition

IUPAC Congener # vs. Congener Concentration (as percent of total-PCB)

- Effluent
- Air
Analysis of Congener Composition

![Bar chart showing the percentage of Total-PCBs in Effluent 2005, Effluent 2010, Effluent 2012, and Influent 2012. The chart includes contributions from PCB #44, PCB #45, PCB #68, and Other PCB Congeners.](chart.png)
# Evaluation of Treatment Efficiency and Influent Source Trackdown

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>Total-PCBs</th>
<th>Penta-PCBs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effluent (existing treatment)</td>
<td>2,831</td>
<td>302</td>
</tr>
<tr>
<td>Effluent (pilot filtration)</td>
<td>1,420</td>
<td>243</td>
</tr>
<tr>
<td>Effluent (pilot coagulation + filtration)</td>
<td>1,529</td>
<td>304</td>
</tr>
<tr>
<td>Influent - Main</td>
<td>186,045</td>
<td>87,498</td>
</tr>
<tr>
<td>Influent - Pump #1</td>
<td>15,822,452</td>
<td>8,626,700</td>
</tr>
<tr>
<td>Influent - Pump #12</td>
<td>11,956</td>
<td>3,499</td>
</tr>
<tr>
<td>Influent - Pump #5</td>
<td>7,328</td>
<td>1,403</td>
</tr>
</tbody>
</table>
Measures to address PCB sources

- Maintenance and upgrading of sewer lines (cleaning, rehabilitation, and lining)
- Identify source for regulatory action
  - e.g. generating station
- Contact electric company and request location of all transformers not certified as PCB-free, as well as date of last inspection
- Document impact of treatment upgrades
Discussion

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