

Case Study: The Role of Pretreatment in a Combined Sewer Overflow Basin

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What Are The Issues?

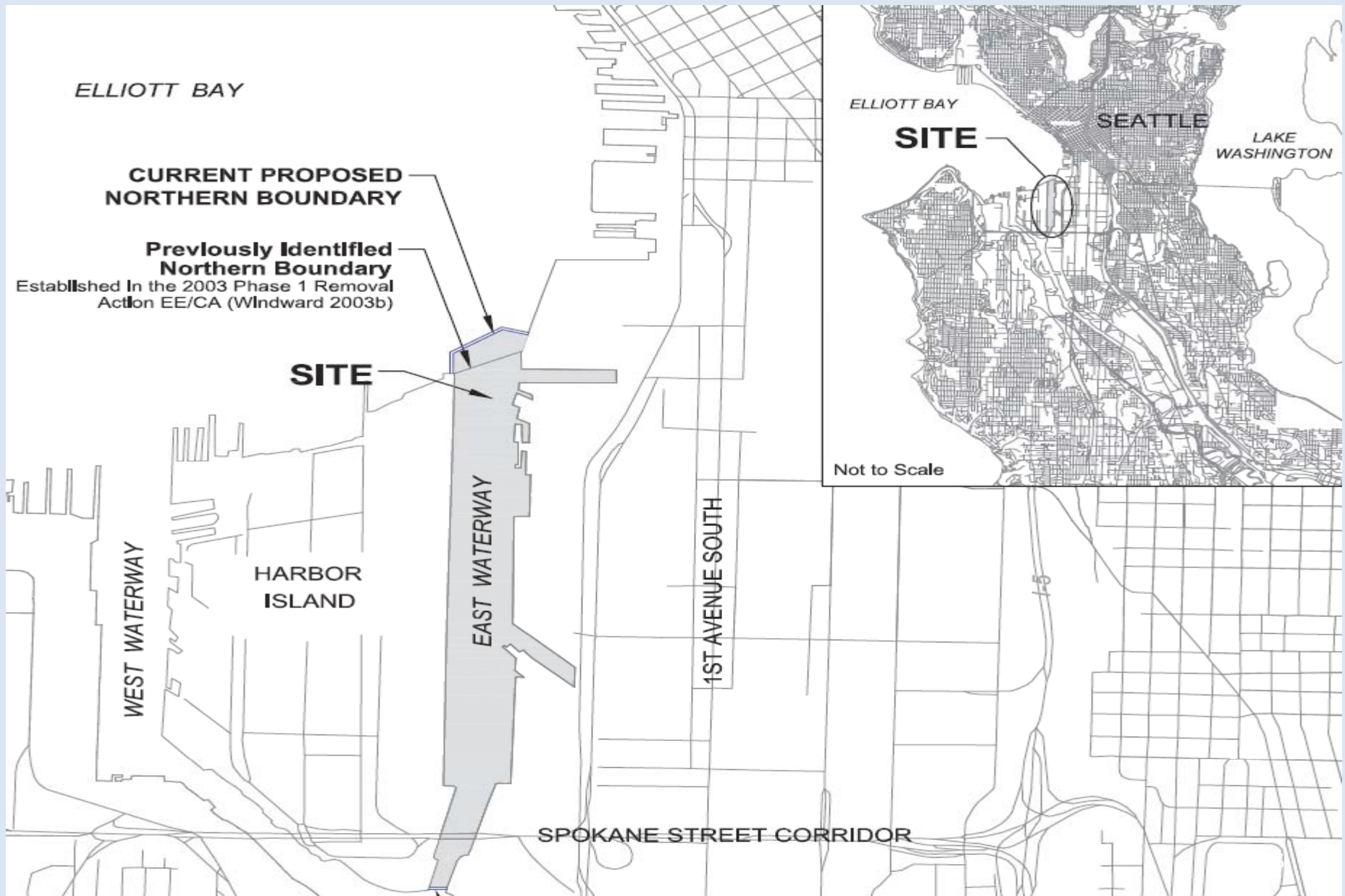
- Two Facilities With Different Chemicals of Concern Within The Same CSO Basin
- Discharge to Treatment Plant Not As Significant Concern As CSO Discharge
- As Pretreatment Control Authority, Focus Is On Treatment Plant and Conveyance System
- EPA Nine Minimum Controls For CSOs (i.e., #7 – Pollution Prevention)
- POTW Liability As NPDES Permittee For CSO
- **And The Big One** – Pretreatment Permit As Shield For Liability

Background Information

- **Treatment Plant:** West Point (Serves City of Seattle and Some Outlying Sewer Districts) — Avg. Flow: 100 MGD
- **CSO:** Hanford No. 2
 - Annual Average Volume: 203 MG
 - Average CSO Events: 19/Year
- **Receiving Water:** East Waterway of Duwamish River
- **Sediment Criteria:** Sediment Management Standards (Ch. 173-204 WAC)
 - **SQS:** Sediment Quality Standards
 - **CSL:** Cleanup Screening Levels
- **Chemicals of Concern:**
 - **14DCB:** 1,4-Dichlorobenzene (Source: Urinal Cakes From Chemical Toilet Decant Facility)
 - **PCBs:** Polychlorinated Biphenyls (Source: PCB-Containing Industrial Paint)



East Waterway – Sediment Remediation Site



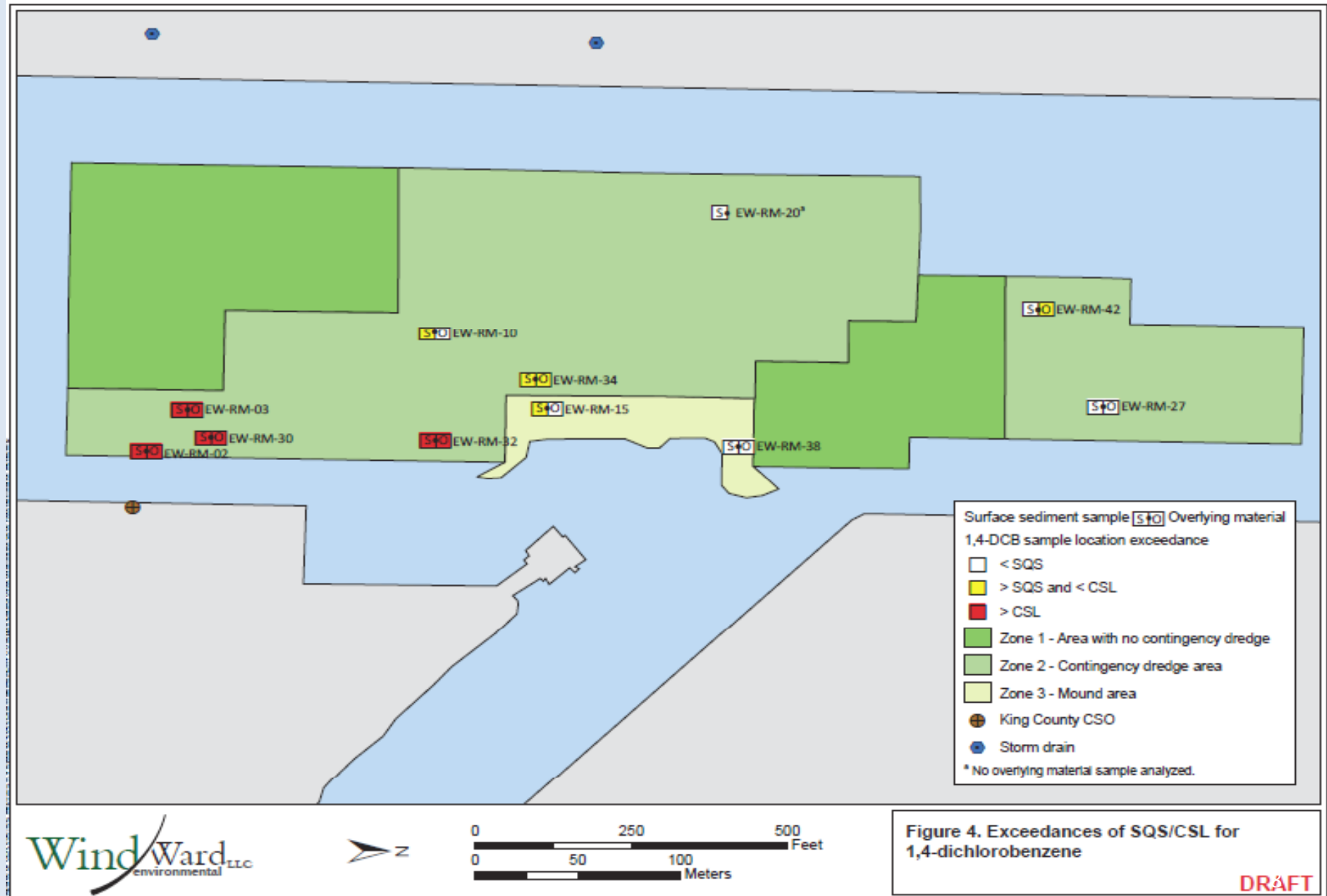
Hanford No. 2/Lander CSO Basin



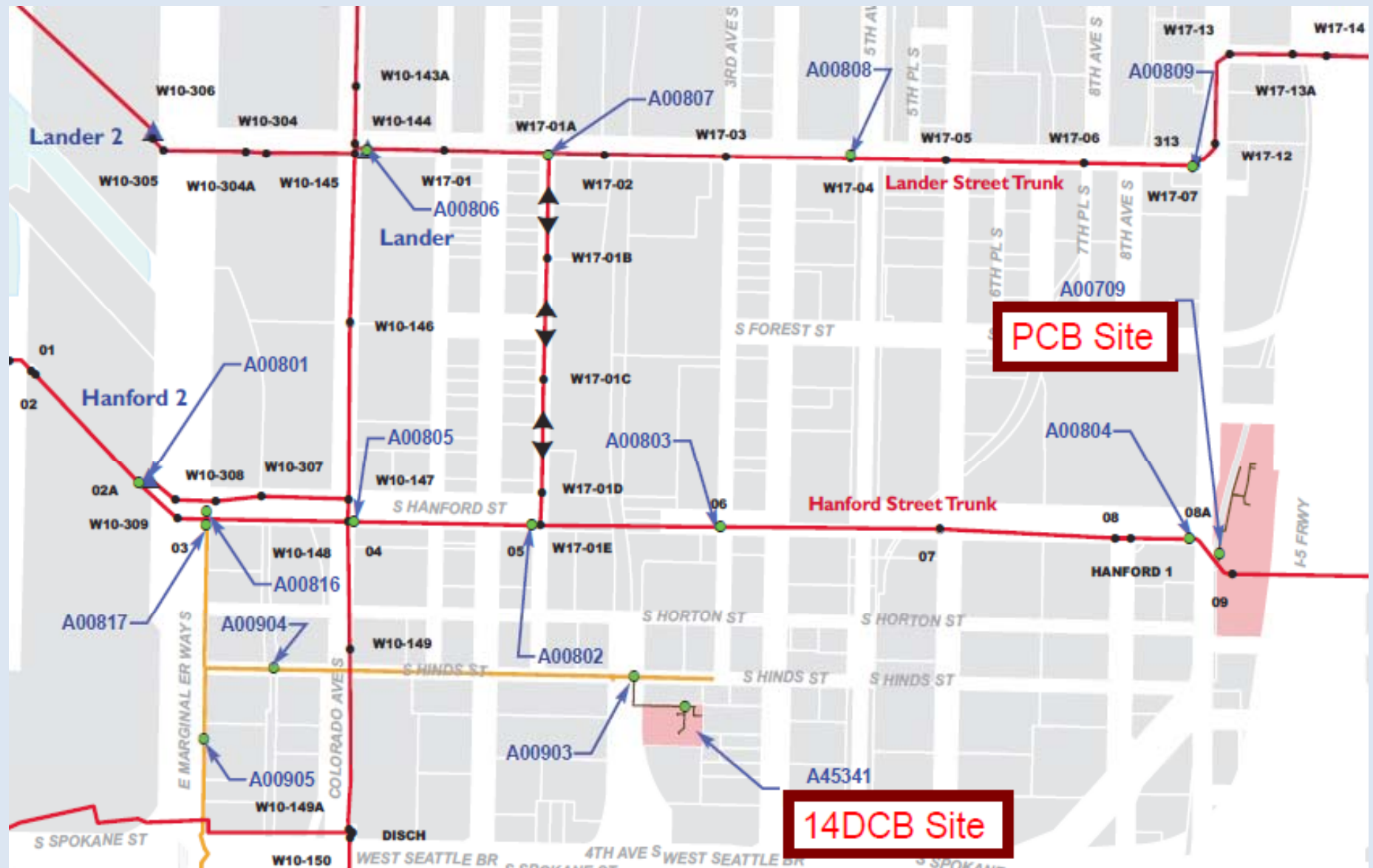
East Waterway – Sediment Remediation Site



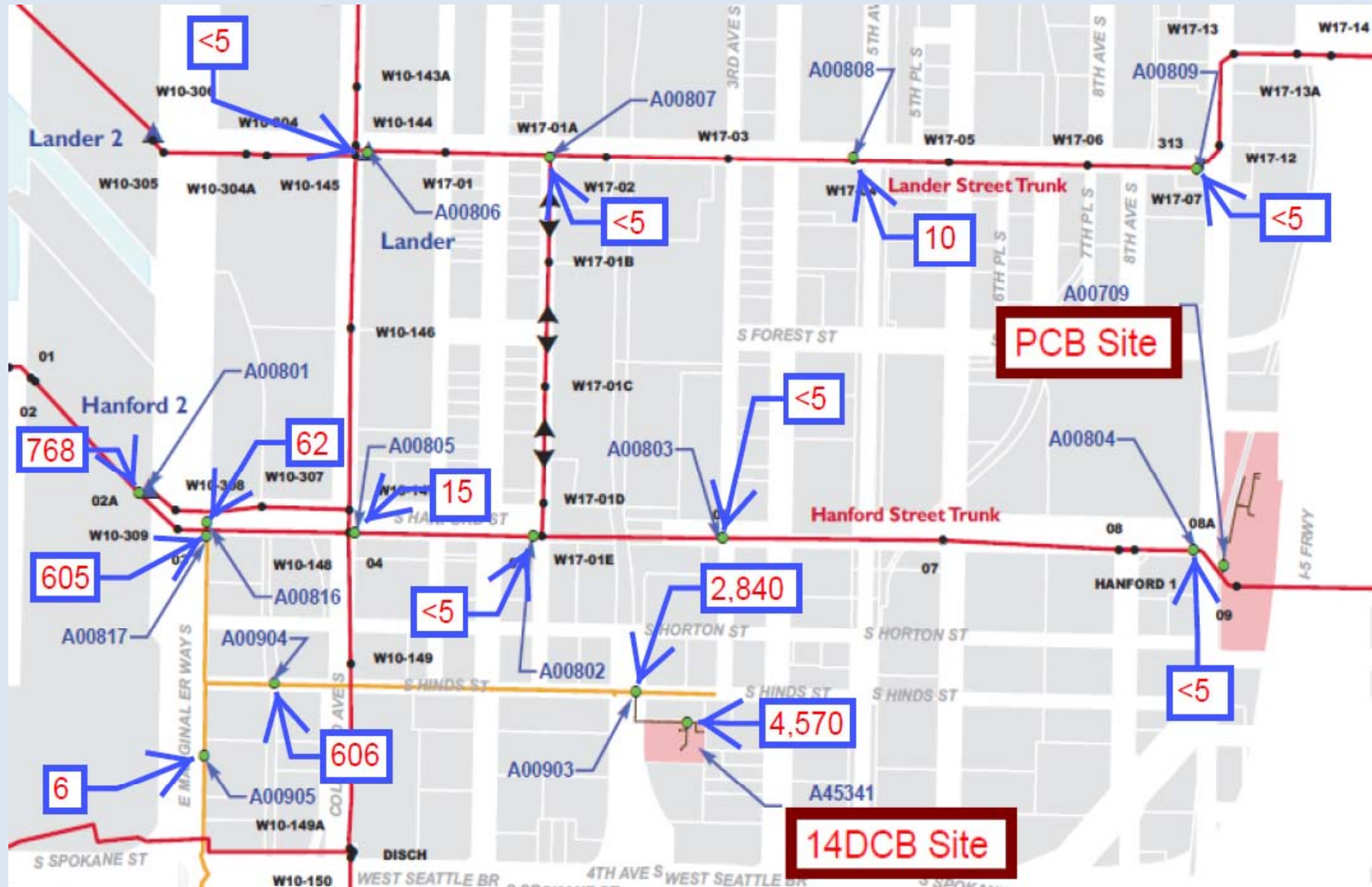
1,4-Dichlorobenzene (14DCB) – Surface Sediment Results



Hanford No. 2 Trunk – Study Area



14DCB – Wastewater Samples (µg/L)



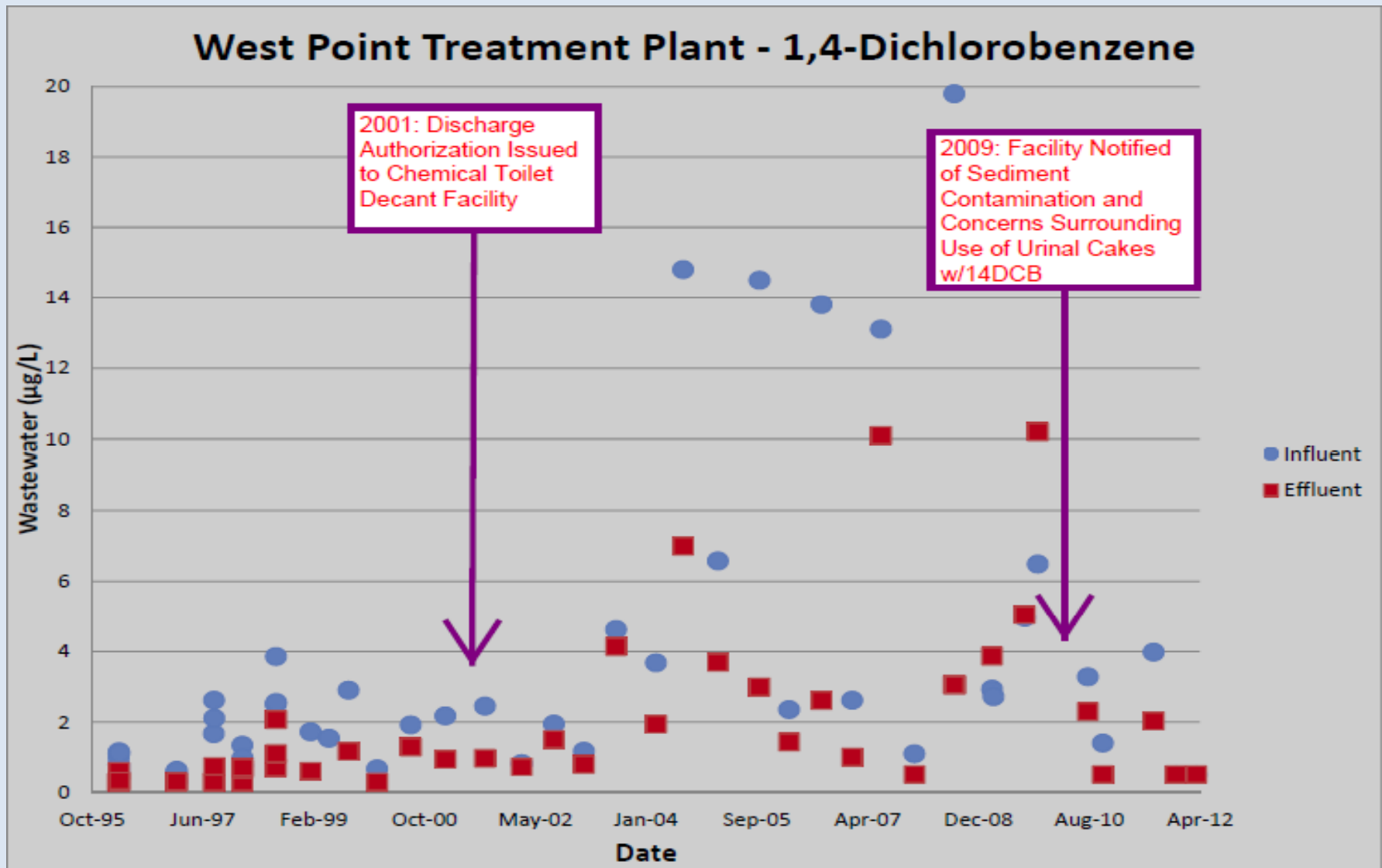
Chemical Toilet Decant Facility



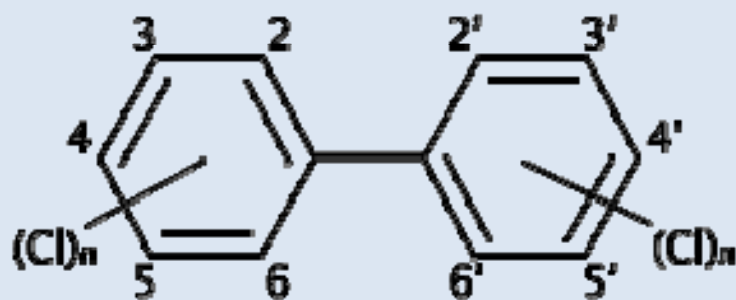
14DCB - Conclusions

- Discharge Authorization Did Not Authorize Use of 14DCB and Did Not Contain Limits for 14DCB – Which Was A Good Thing.
- If Limits Were Applied, Procedures Manual Has Screening Concentration of 3.5 mg/L (Henry's Law and Occupational Exposure) and Loading Limit of 0.8 lb/day (1 Std. Dev. of Influent Loading).
- At 8,000 gpd Discharge Volume Limit and 3.5 mg/L Screening Concentration, Loading Much Less Than 0.8 lb/day Limit (at 0.2 lb/day).
- 4.5 mg/L (4,500 µg/L) 14DCB value measured at the site was above 3.5 mg/L Screening Value – But Not By A Lot.
- After Discovery of Sediment Contamination, Special Screening Level for 14DCB Added to Discharge Authorization Because of CSO Issue – 25 µg/L (Based on Average WWTP Influent + 3 Std. Dev.).
- Discharger Decided To Eliminate 14DCB From All Operations
- Compliance Achieved More Through Potential Liability Under Superfund Rather Than Pretreatment Authority.

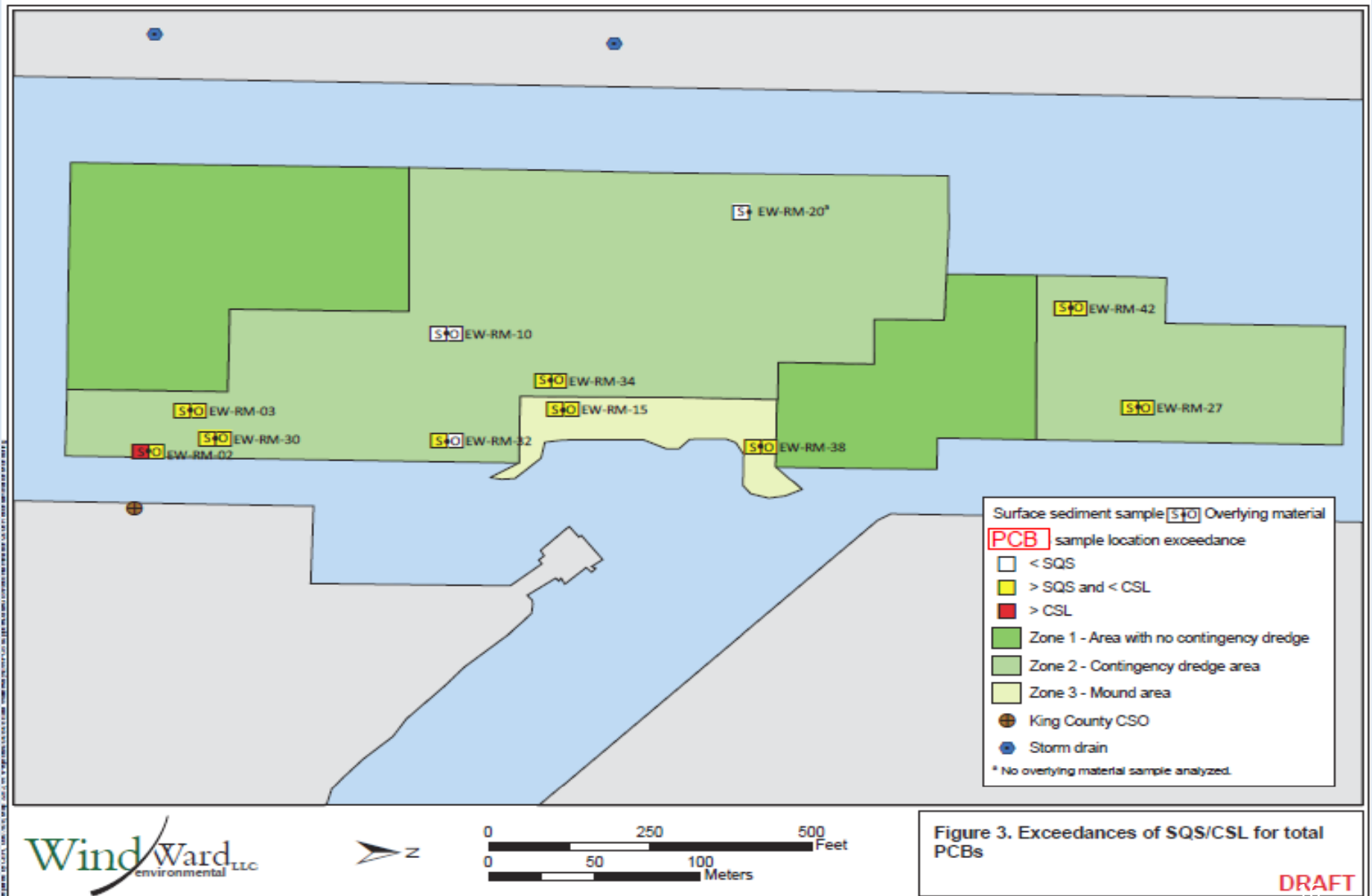
Treatment Plant – 14DCB in Wastewater



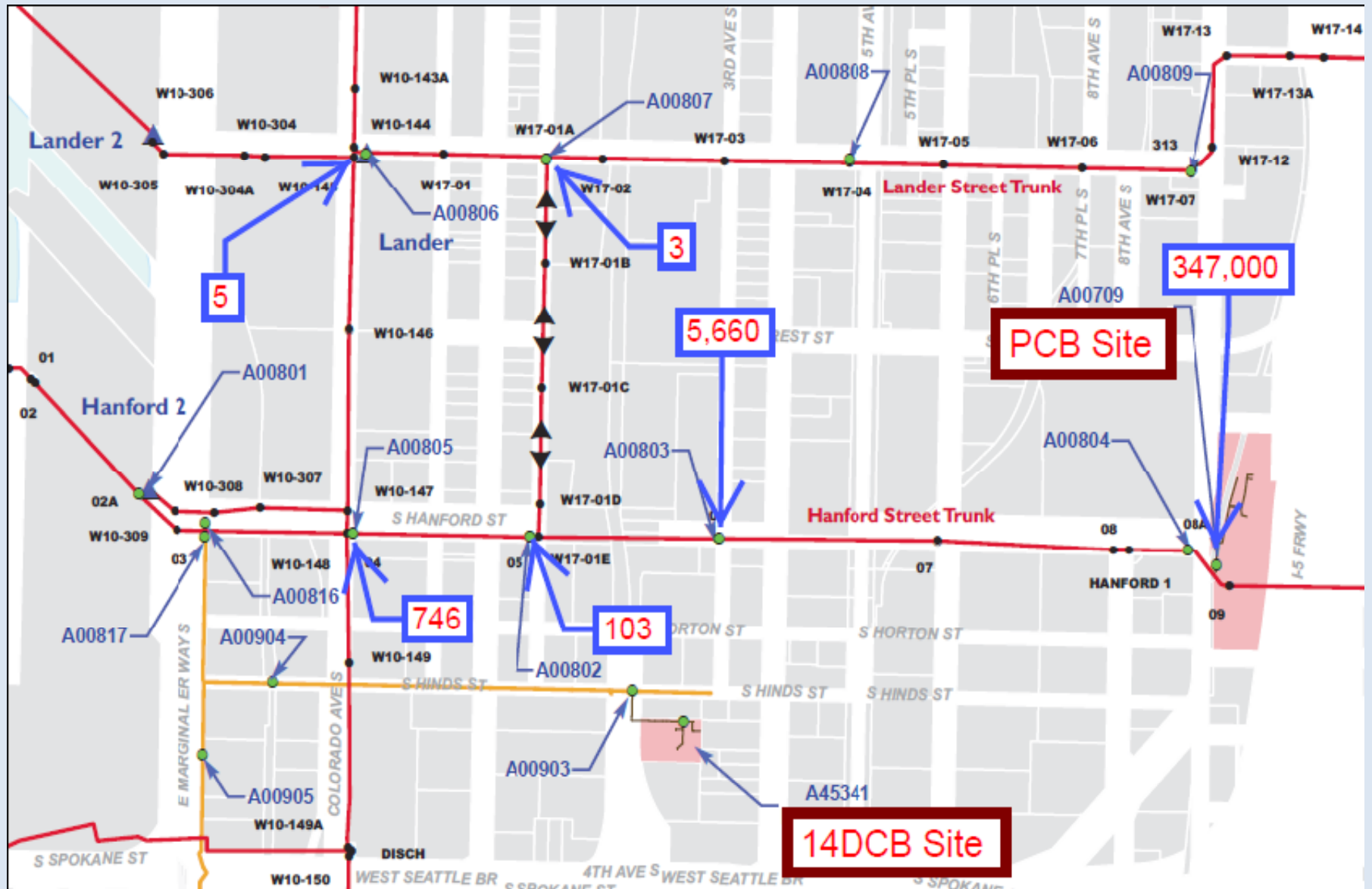
And Now For PCBs



PCBs – Surface Sediment Results



Total PCBs – In-Line Sediment ($\mu\text{g}/\text{kg}$)



PCB Site – PCB-Containing Paint



PCB Site – PCB-Containing Paint

PCB-Containing Paint: ~2,300 ppm (~ 2,300,000 µg/kg)

Catch Basin PCBs: ~ 20 to 2,200 ppm (~ 20,000 to 2,200,000 µg/kg)

Combined Sewer Manhole Sediment PCBs: 347 ppm (347,000 µg/kg)

Locator A00709: PCB Site - Sampling Manhole

Aqueous Manhole PCBs:

- March 2008: 0.062 µg/L (0.44-inch 24-hr Storm)
- June 2008 1.242 µg/L (0.58-inch 24-hr Storm)
- 2010: Line Cleaning
- 2011: Discharge Authorization Issued (w/Conditions)
- October 2012: 0.061 µg/L
- January 2013: <0.050 µg/L

PCB Paint - Conclusions

- The Federal Toxic Substances Control Act (TSCA) allows discharges to sewer at total PCBs $< 3 \mu\text{g/L}$ (**Note:** Satisfies compliance with TSCA, not with CSO control, pretreatment, or Superfund).
- Our pretreatment program allocates mass of PCBs to industrial users based on the mass to create a biosolids detection, along with a safety factor.
- This mass allocation to industry ($\sim 1,000 \text{ mg/Aroclor/day}$) is further divided among 10 industrial users at any one time.

PCB Paint - Conclusions

- Discharge limits apply after treatment (including granular activated carbon).
- Discharge limits for industrial users can range from 0.1 to 1.0 $\mu\text{g/L}$ (as Aroclor).
- For PCB paint site, aqueous concentrations per Aroclor 1254 ranged from 0.062 to 0.615 $\mu\text{g/L}$, but manhole sediment was 347,000 $\mu\text{g/kg}$.
- **Nugget Effect:** Aqueous concentrations are highly variable because of the impact from paint flakes.

PCB Paint - Conclusions

- Discharge authorization issued with conditions to control sources of PCBs and requirement for pretreatment program review of paint removal plans.
- Aqueous screening level of $<0.1 \mu\text{g/L}$ applied along with annual monitoring of sediments for PCBs.
- As with the 14DCB site, compliance achieved more through Superfund liability than pretreatment authority.
- Not the kind of site that our pretreatment program would normally be involved with (i.e., a commercial property).
- Goal was to issue a control document that regulates the sources of PCBs at the site in a manner that is protective of East Waterway sediments as well as the treatment plant.

The End

Thanks!

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