

Molybdenum Local Limit Development

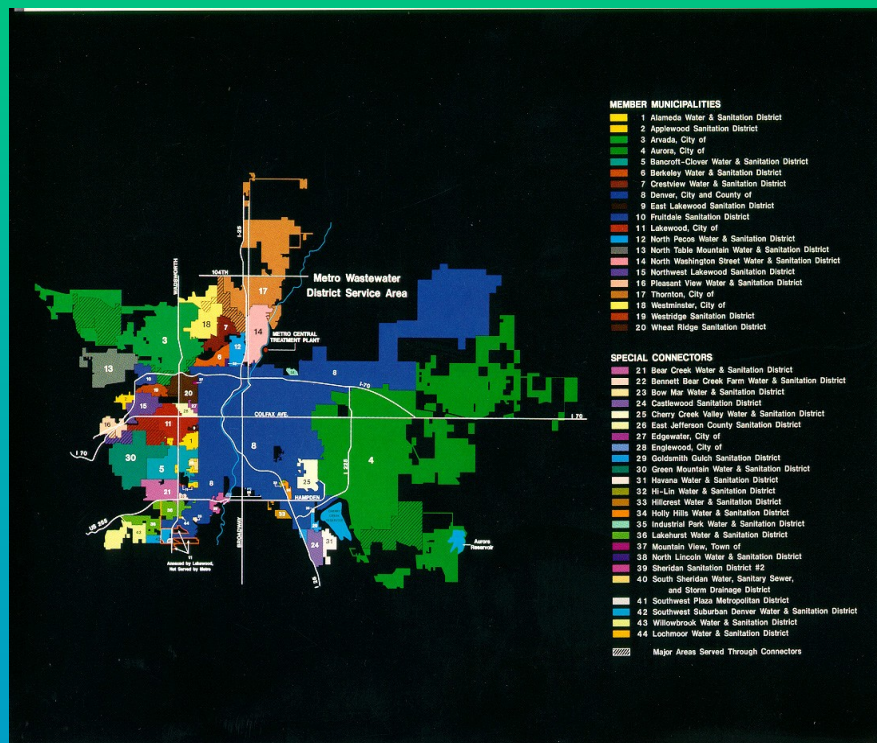
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Regulatory Compliance Division
Metro Wastewater Reclamation District

What is the Metro District?

The Metro District is the wholesale treatment facility for the Metro Denver Area.



Metro District Fun Facts!



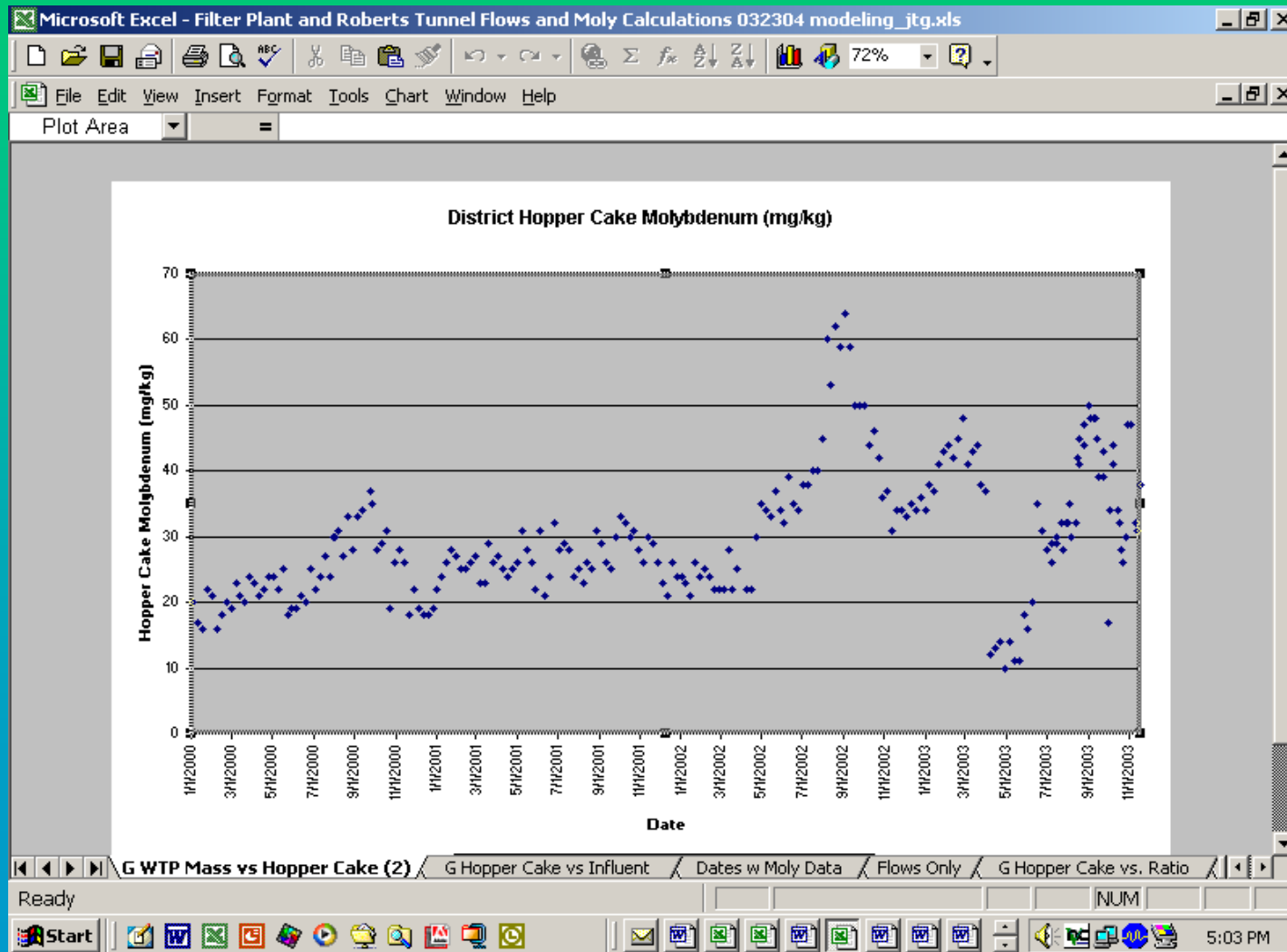
- Serve 57 Municipalities
- Serve 1.6 Million People
- Treat 140 MGD
- Produce 80 Dry Tons/Day of Biosolids

Why is Molybdenum a Concern?

40 CFR 503 – Subpart B,
“Land Application.”
Ceiling Limit for
Molybdenum = 75 mg/kg



What Molybdenum Levels did the District Experience in its Biosolids?



Investigative and Analytical Efforts (2003)

- Surveyed Local Pretreatment Programs.
- Question to Yahoo Pretreatment Coordinators Group.
- Implemented Molybdenum Method w/ an improved Reporting Limit (5 vs. 30 ug/L).
- Increased Influent, Effluent and Biosolids Monitoring for Molybdenum (Removal Efficiency of 20-22%)
- Contacted Denver Water.

Denver-Water Transmountain Diversions



Climax Molybdenum

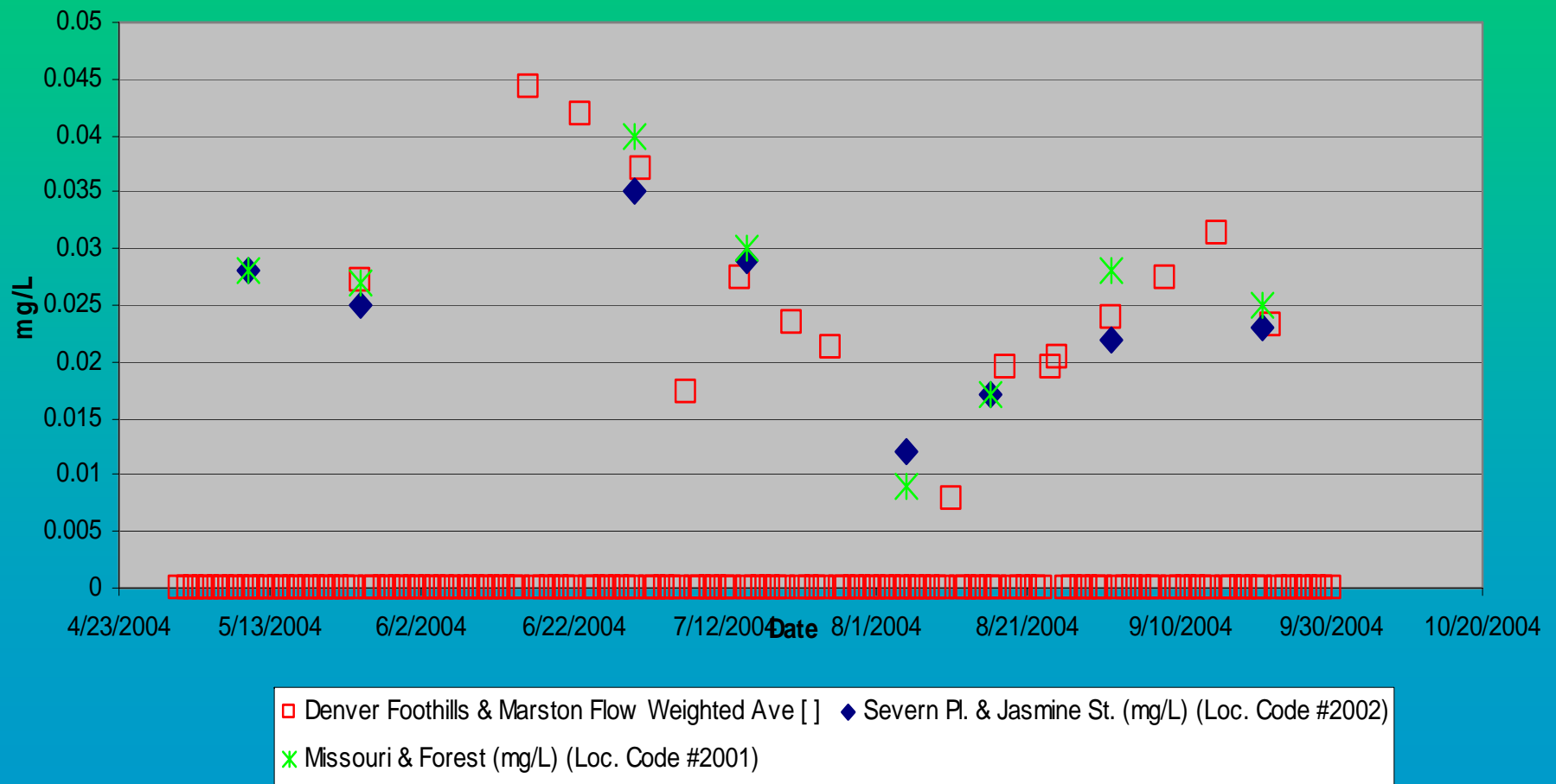


Investigative and Analytical Efforts (2004)

- Sampled Water Treatment Plants
- Sampled Residential Areas
- Potential Commercial/Industrial Sources
- Surveyed and met with the Water Treatment Chemical Community

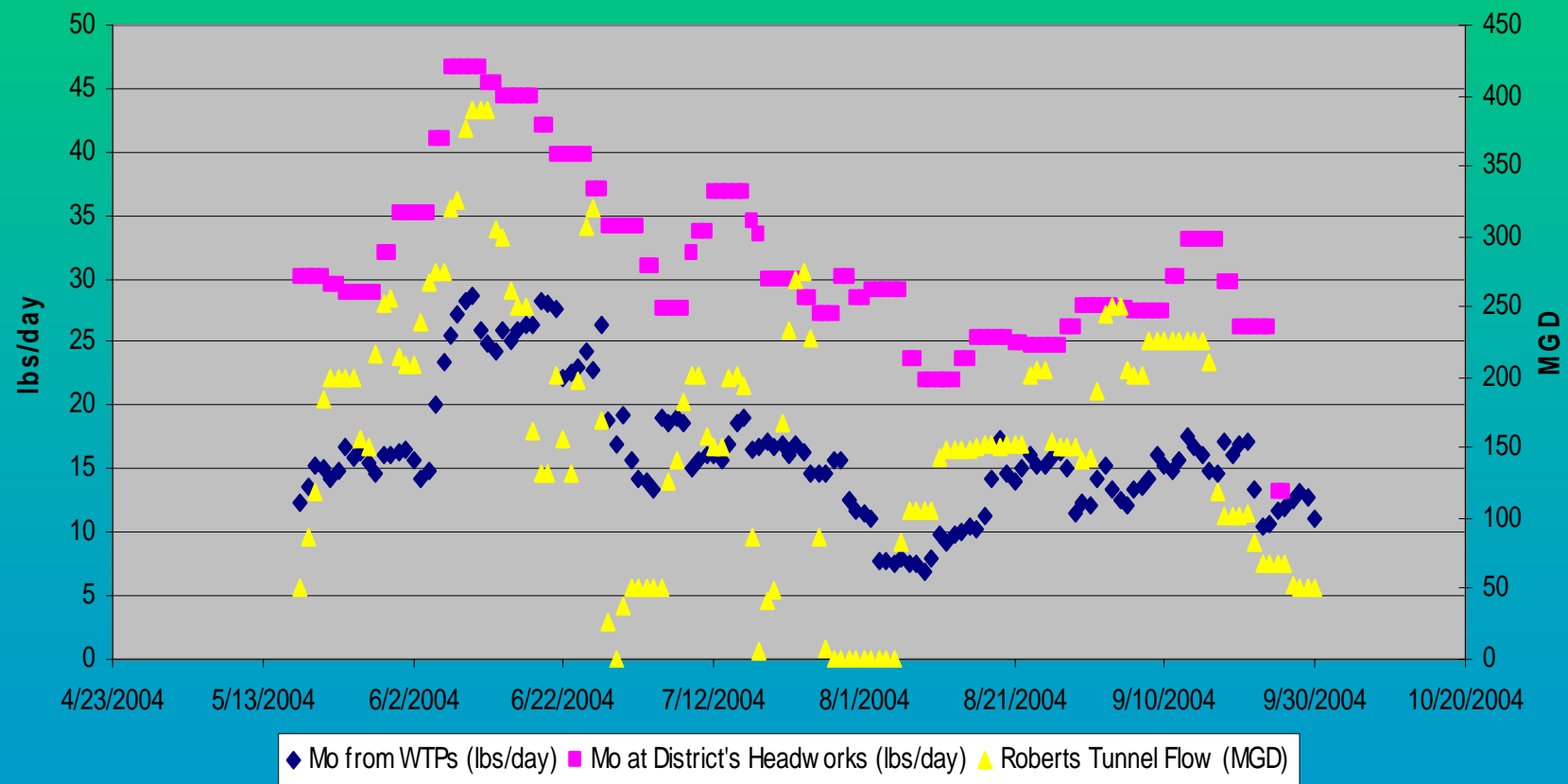
Domestic Sources of Molybdenum

Forest & Missouri, & Severn & Jasmine vs Denver's Southern WTPs- Summer 2004



Domestic Sources of Molybdenum

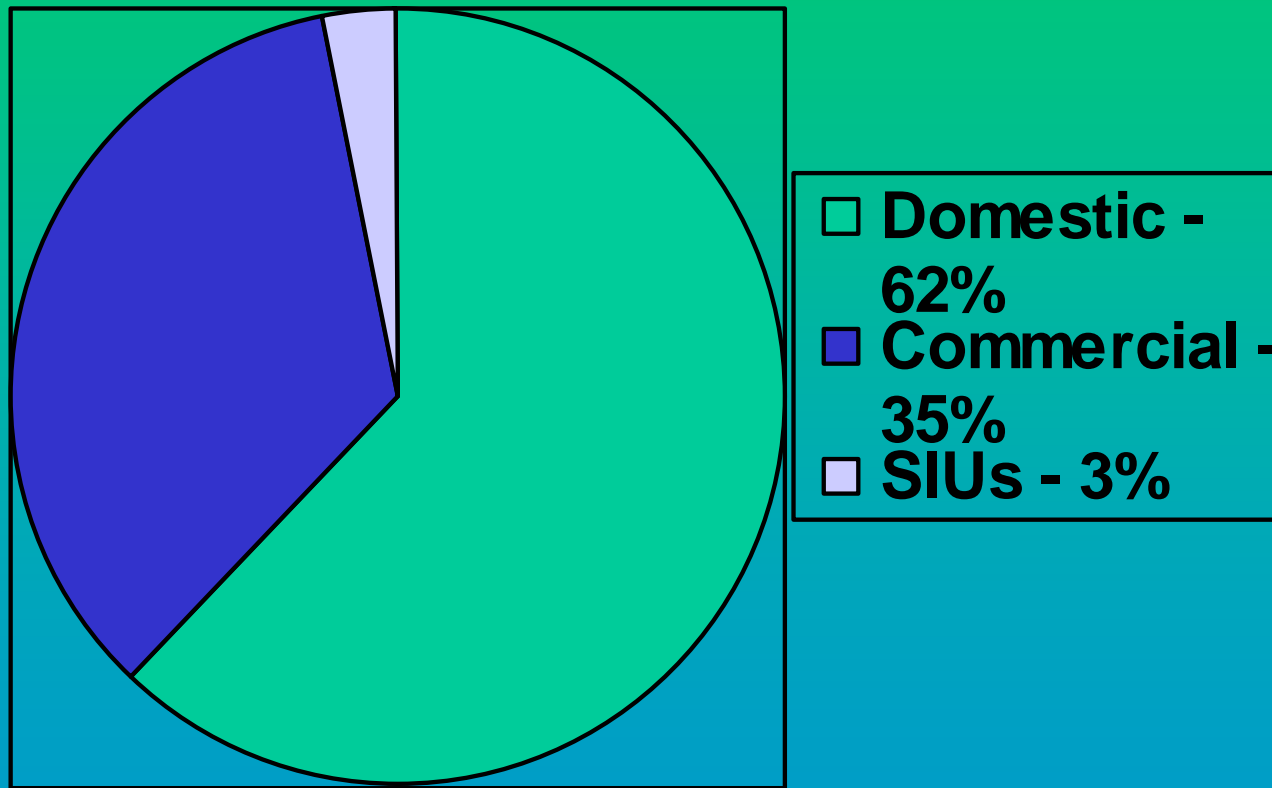
Molybdenum Loadings From WTP, at Metro's Headworks and Roberts Tunnel Flows - May-Sept 2004



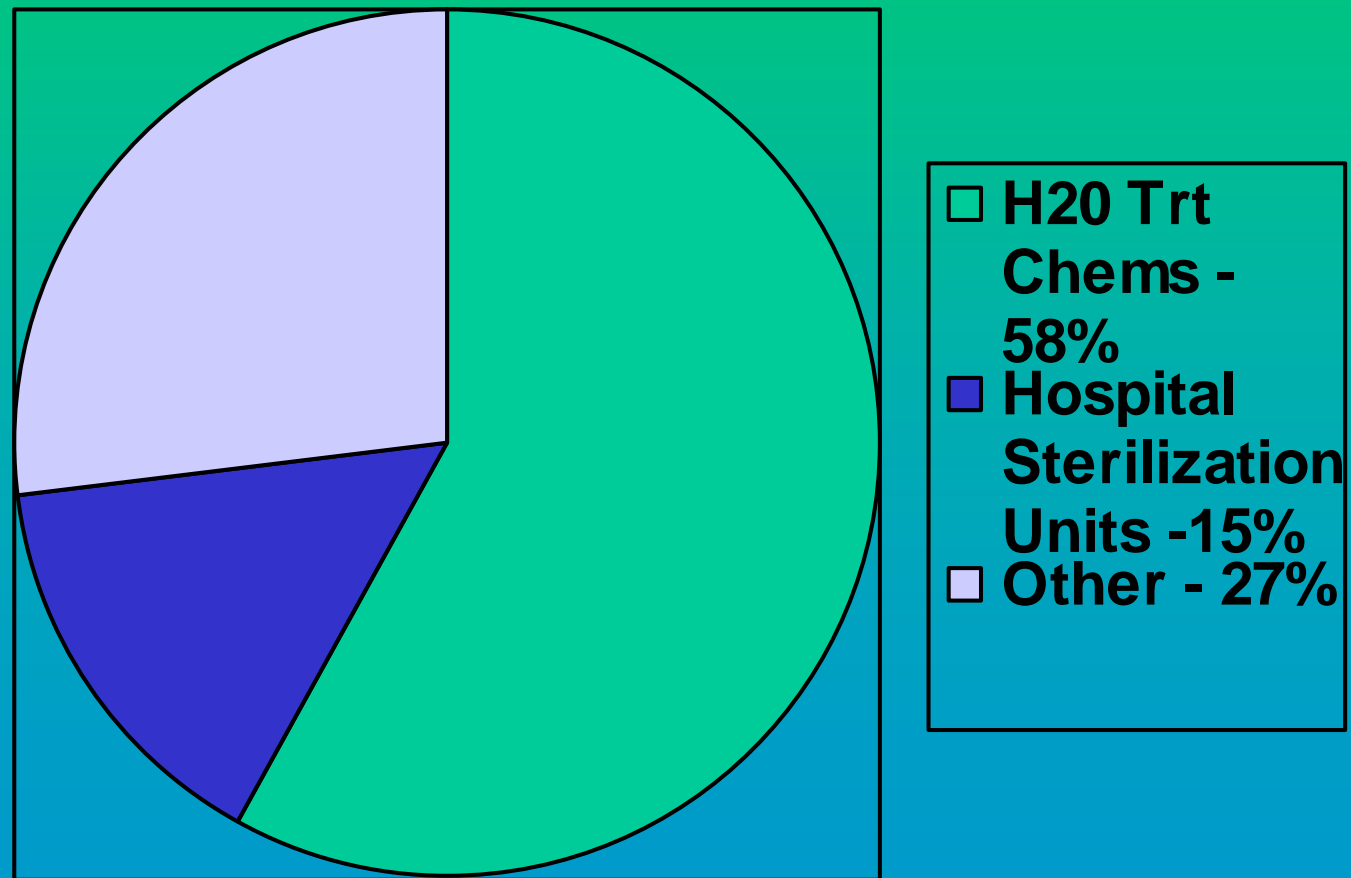
Potential Commercial/Industrial Sources

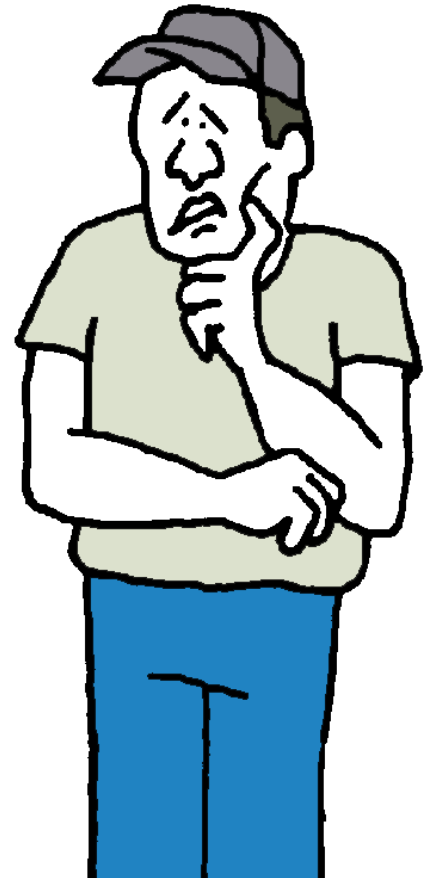
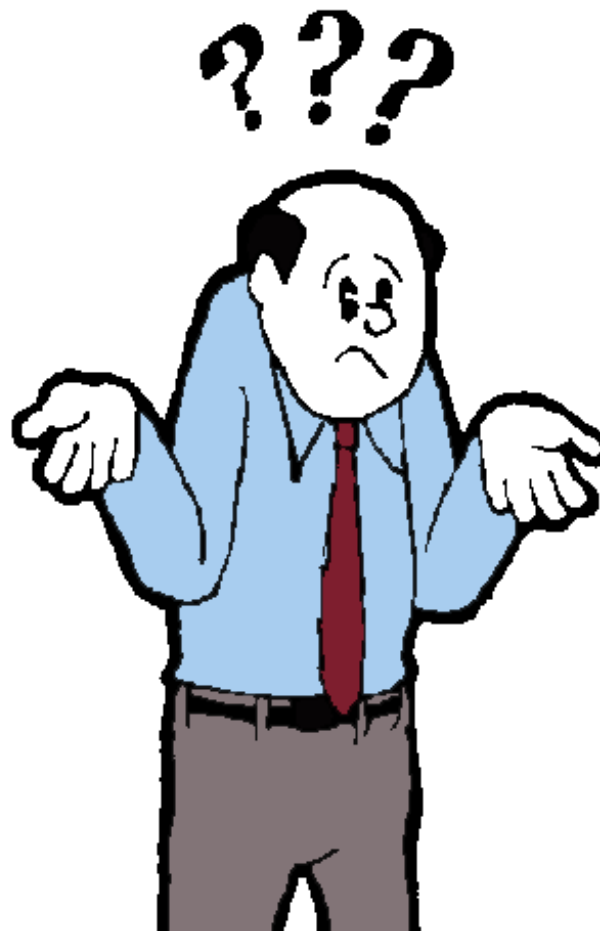
- Truck Washes (0.014 mg/L)
- Deicing Products (< Reporting Limit)
- Antifreeze (automotive, < RL; Heavy Duty, 50 mg/L)
- Steris Sterilization Units (3.5 g/use; 2.5 lbs/day)
- Hauled Waste (0.01 lbs/day)
- SIUs (1 lb/day)
- Water Treatment Chemicals (8 lbs/day)
 - **Cooling Towers (1-5 mg/L)**
 - **Closed-Loop Heating and Cooling Systems (50-300 mg/L)**

Sources of Molybdenum



Commercial Sources of Molybdenum





Rules and Regulations changes, effective June 6, 2006:

- The District's Molybdenum Local Limit was reduced from 0.71 mg/L to 0.43 mg/L.
- This limit applies to all non-residential users of the Metro District.

Rules and Regulations changes,
effective January 1, 2007:

- Discharge from cooling towers, boilers, closed-loop heat transfer systems and any other cooling/heating system treated with molybdenum-containing water treatment chemicals is prohibited entirely (8 lbs/day or >).

Compliance with prohibition determined by either:

- Certification(s) from water treatment chemical blender(s)/manufacturers; or
- Laboratory analysis using 40 CFR 136 approved test methods verifying the absence of molybdenum in the discharge.

Best Management Practices

Open Systems



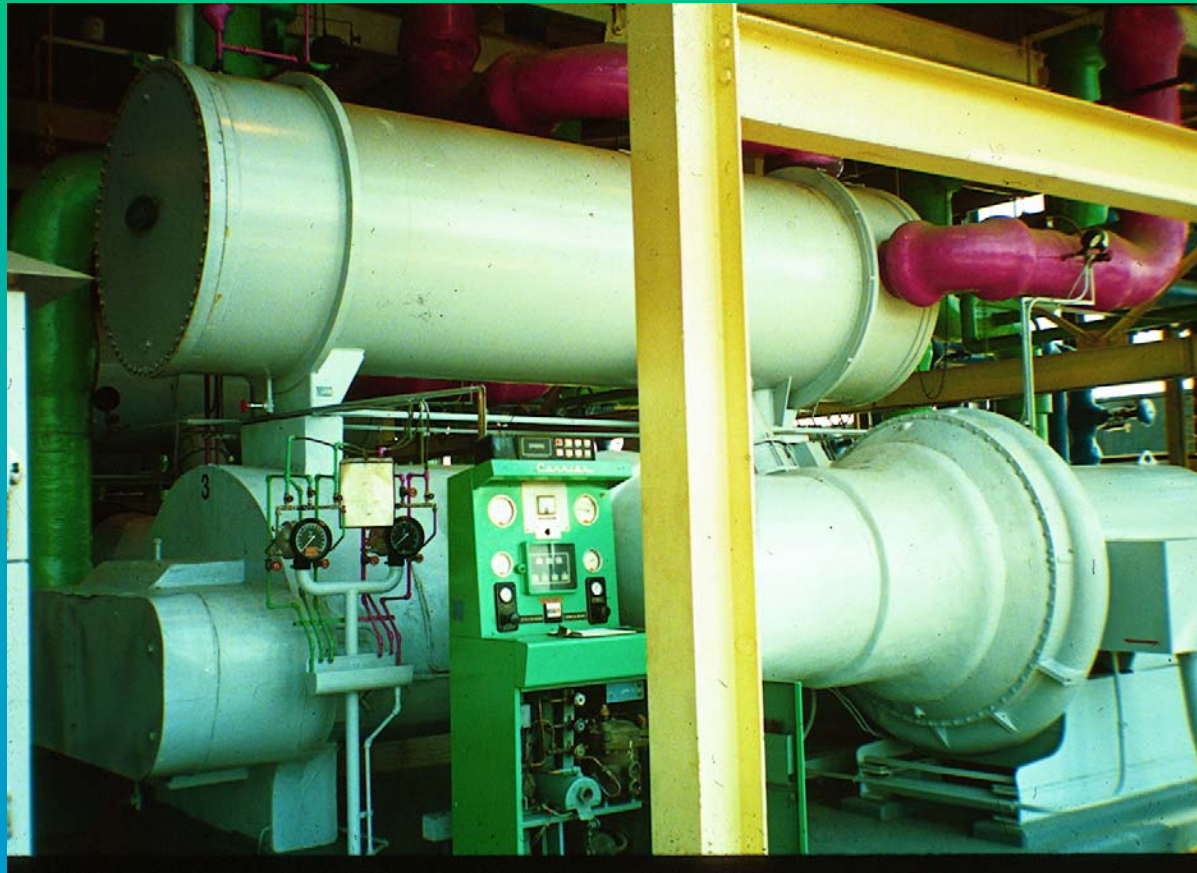
Best Management Practices

Open Systems

- Change over to non-molybdenum-containing products no later than December 31, 2006.
- Document date of changeover.
- Obtain certification(s) from vendor(s).
- Perform molybdenum analysis.
- Return unused molybdenum containing water treatment chemical(s) to the vendor(s).

Best Management Practices

Closed Systems



Best Management Practices

- **Closed Systems (Alternative I)**
 - Drain system and replace with non-molybdenum-containing products no later than December 31, 2006.
 - Document date of changeover.
 - Obtain certification(s) from vendors.
 - Perform molybdenum analysis.
 - Return unused molybdenum-containing water treatment chemical(s) to the vendor(s).

Best Management Practices

- **Closed Systems (Alternative II)**

- Begin using non-molybdenum products (without draining system) no later than December 31, 2006.
- Document date of changeover.
- Obtain Certification(s) from vendors.
- Post Advisory.
- Seal or otherwise protect drain(s) from accidental discharges.
- Return unused molybdenum-containing water treatment chemical(s) to the vendor(s).
- Manage all wastewater from the closed-loop system in a zero discharge manner.

Steris 1 Sterilization Units

- 3.5 grams of Mo/use.
- 1000's of uses/year/large hospital.
- Estimated 2.5 lbs/day discharged in our Service Area.
- Letter Sent Requesting Voluntary Reduction in Steris Usage. Informed they were required to comply w/ New Local Limit.

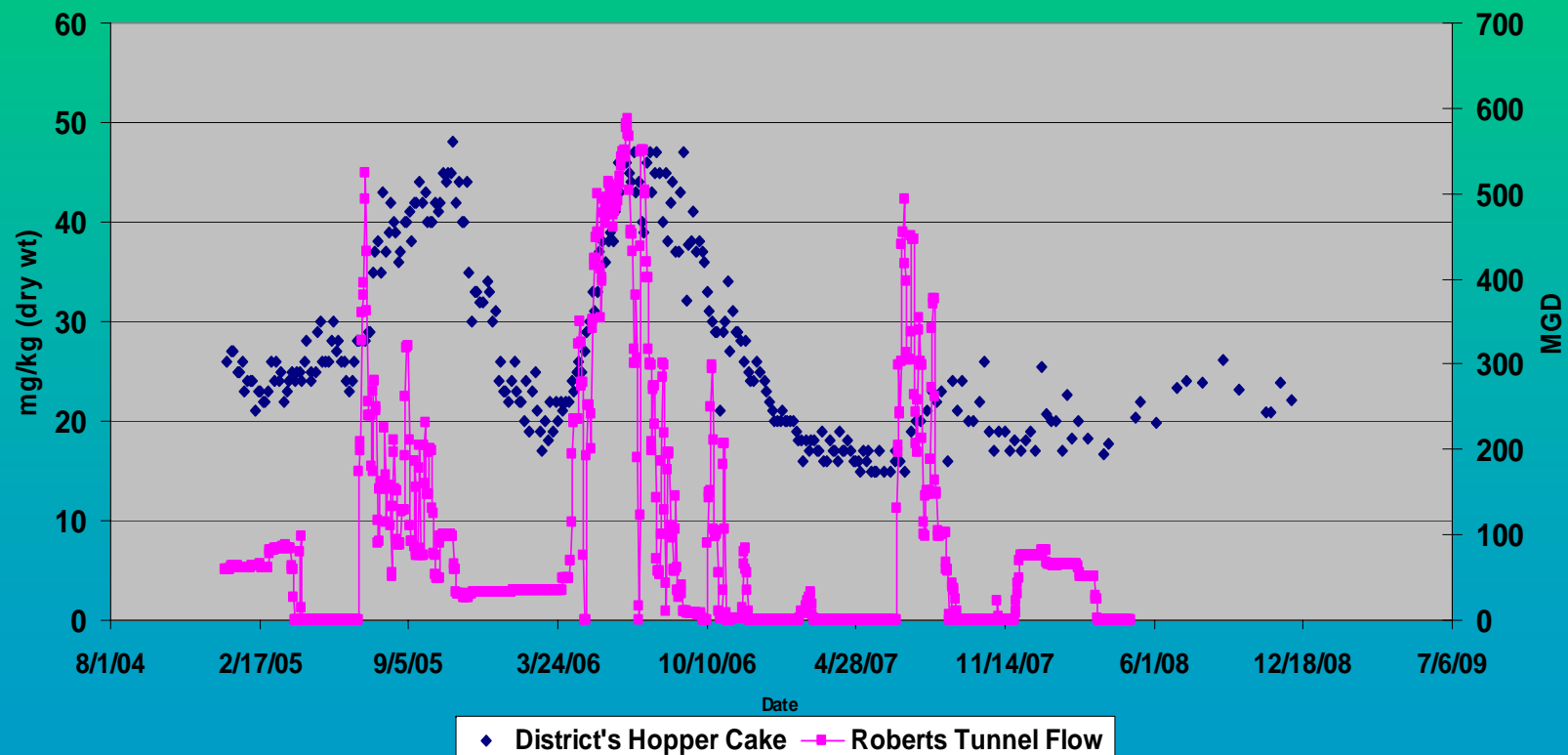


Where are we at Today?

- In the Summer of 2007 the District's Mo Loadings decreased by 19 lbs/day or 62% from the Summer of 2004.
- However, it was estimated that as much as 15 lbs/day or 79% of this decrease was due to reductions in loadings from the Water Treatment Plants in our Service Area.

Where are we at Today?

District's Hopper Cake, Roberts Tunnel Flows 2005-2008
Vs. Time



Questions

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