

# ***Reinhold Environmental Ltd.***

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***2007 APC Round Table & Expo  
Presentation***

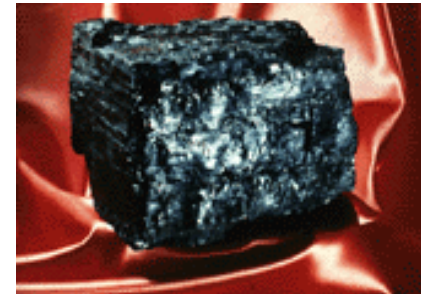
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***July 8-10, 2007  
Chattanooga, TN  
Hosted by TVA***

## *“Impact of $SO_3$ Removal on Hg Capture”*

Reinhold Environmental  
APC Conference  
July 9, 2007

**Proprietary Material**



Acid Mist Control

# SBS Injection™ Technology

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## **Features**

- Patented Technology
- Sodium Reagents
- Liquid Injection
- Inject Upstream of AH
- Atomizing Nozzles
- Solids Rem with Ash
- SO<sub>3</sub> Removal > 95%
- Capital Cost \$5-10/kW
- < \$500/ton SO<sub>3</sub> rem

## **Benefits**

- Opacity Elimination
- Corrosion Reduction
- ESP Enhancement
- Heat Rate Improvement
- SCR/SNCR Flexibility
- Hg Removal Enhanced
- CO<sub>2</sub> Reduction
- Fuel Flexibility

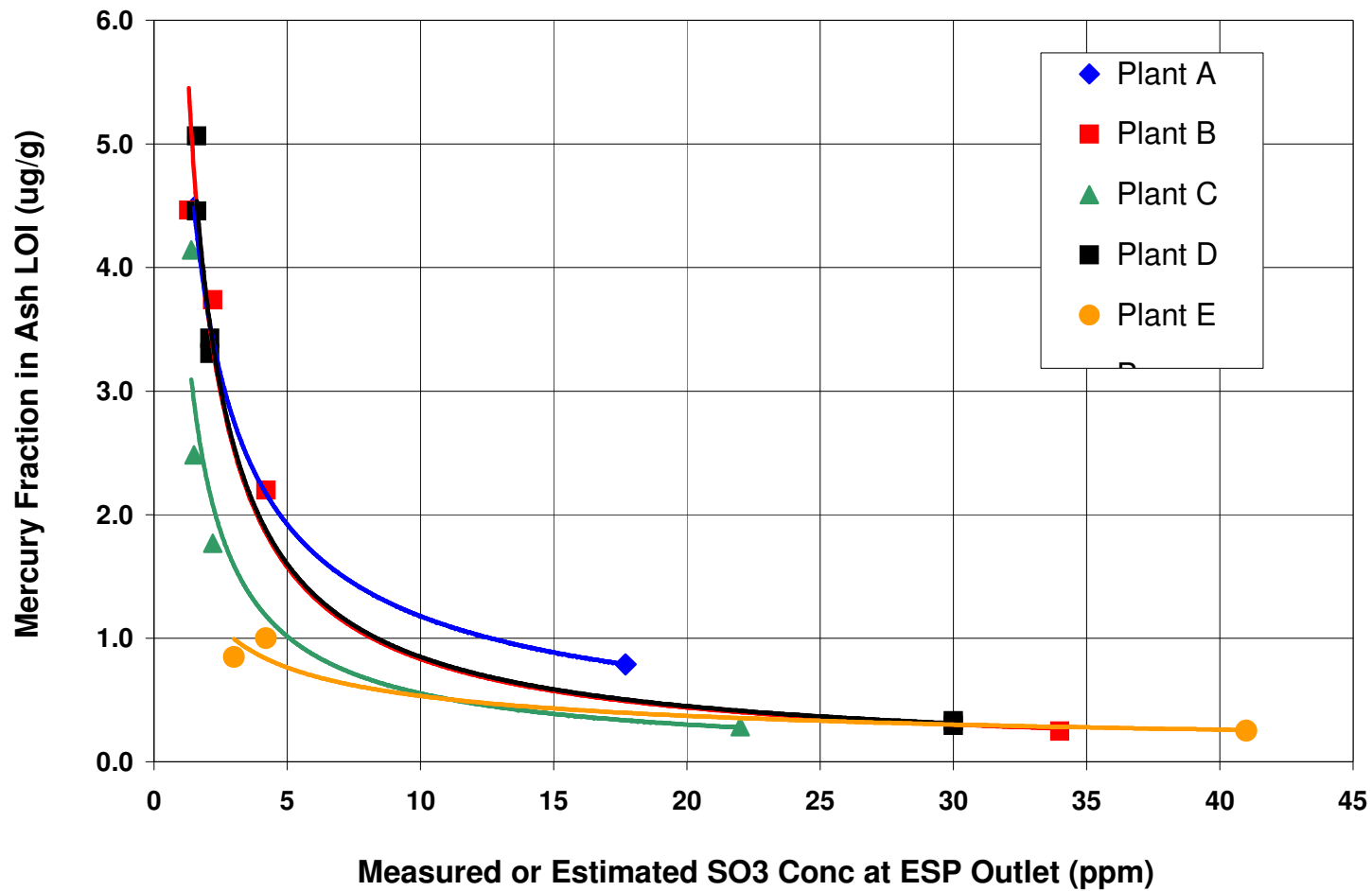
## **Users**

- FirstEnergy
- TVA
- PPL
- NIPSCO
- Vectren
- Duke Energy
- Dayton P&L
- Indianapolis P&L

***Impact on Hg Capture and ESP Performance***

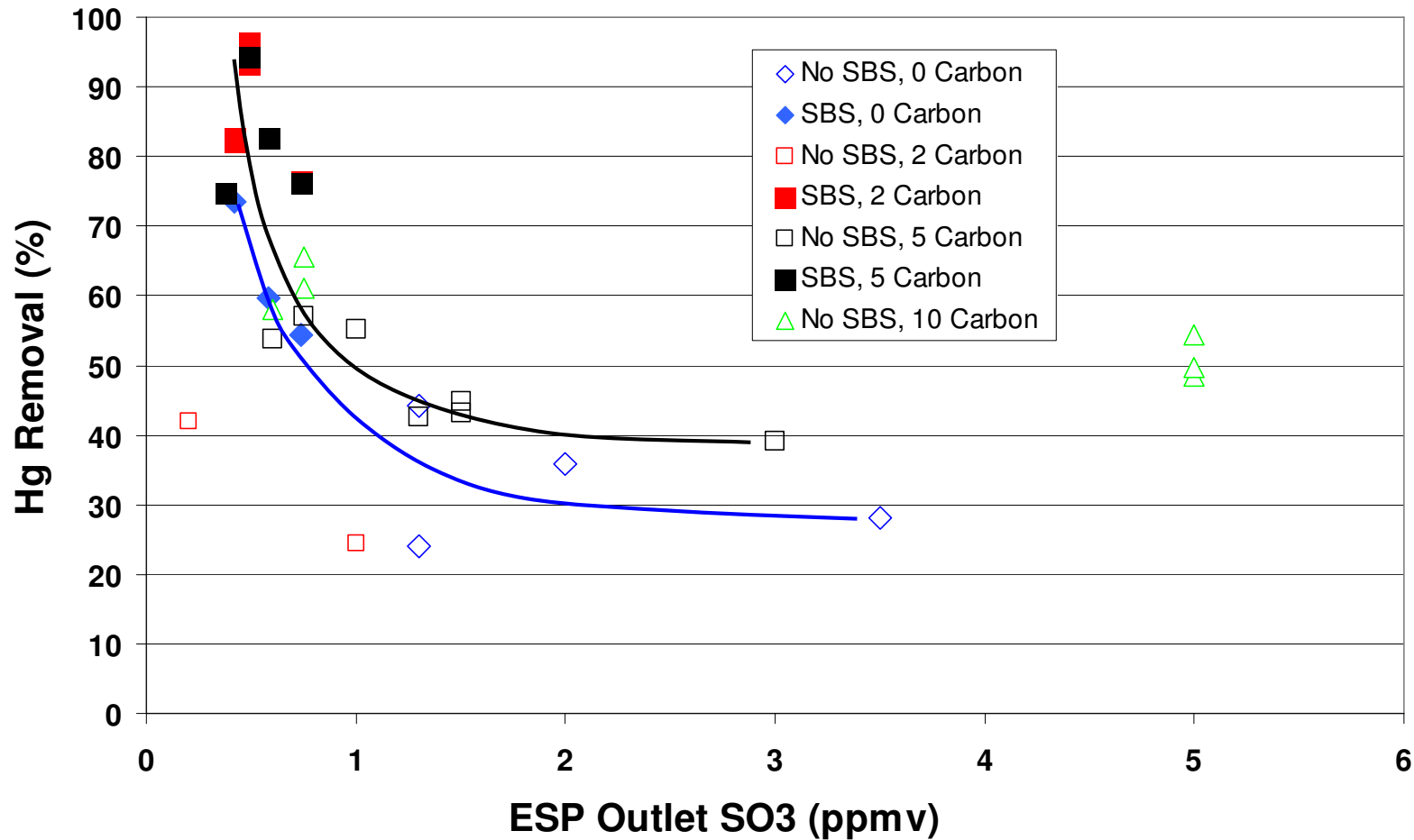
# Impact of SO<sub>3</sub> on Hg Capture in Ash

Mercury Removal By Carbon in Ash with SBS Injection

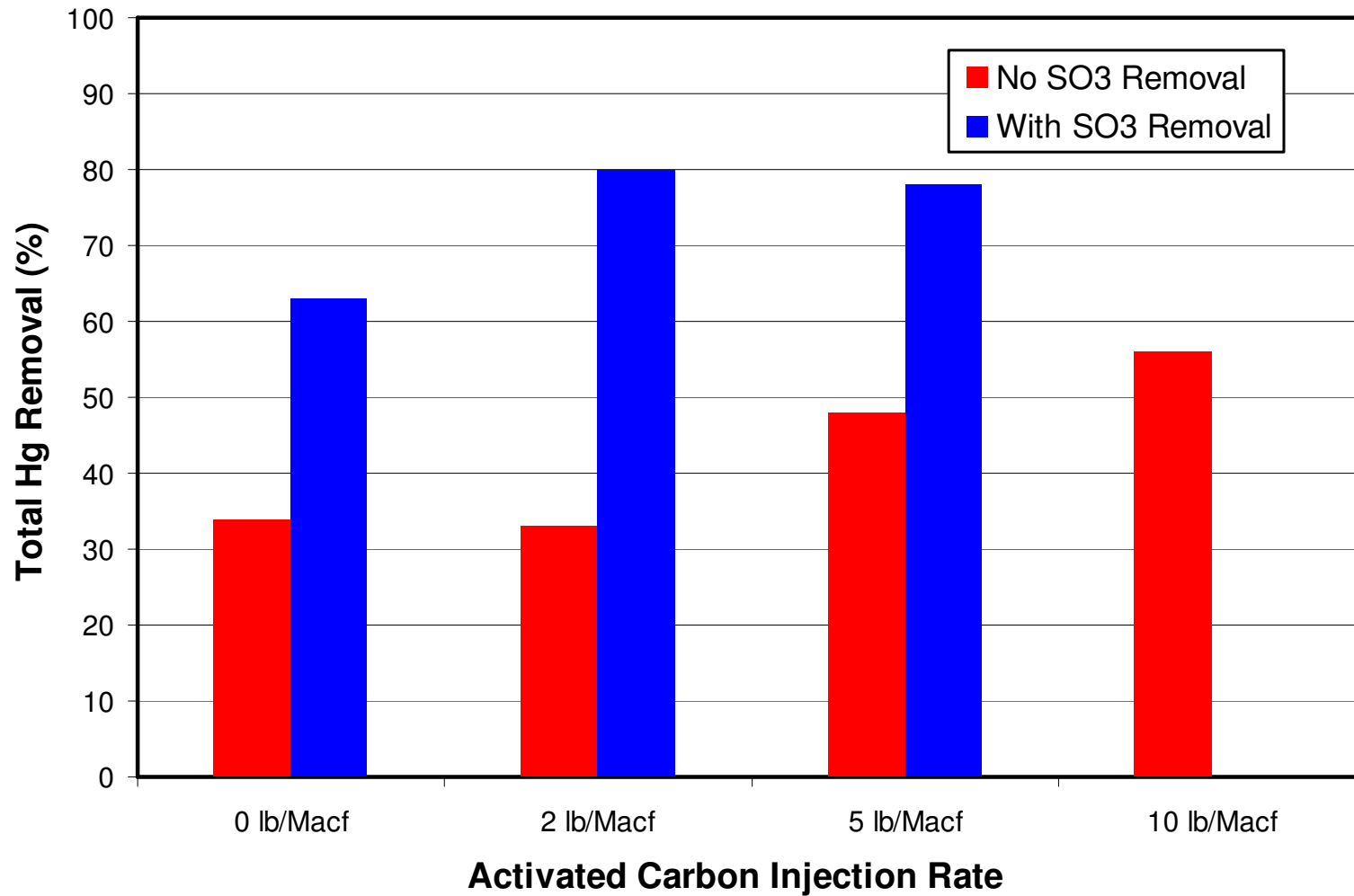


# Impact of SBS on Hg Removal by AC

Plant Crist Mercury Research Center



# Impact of SBS on Hg Removal by AC

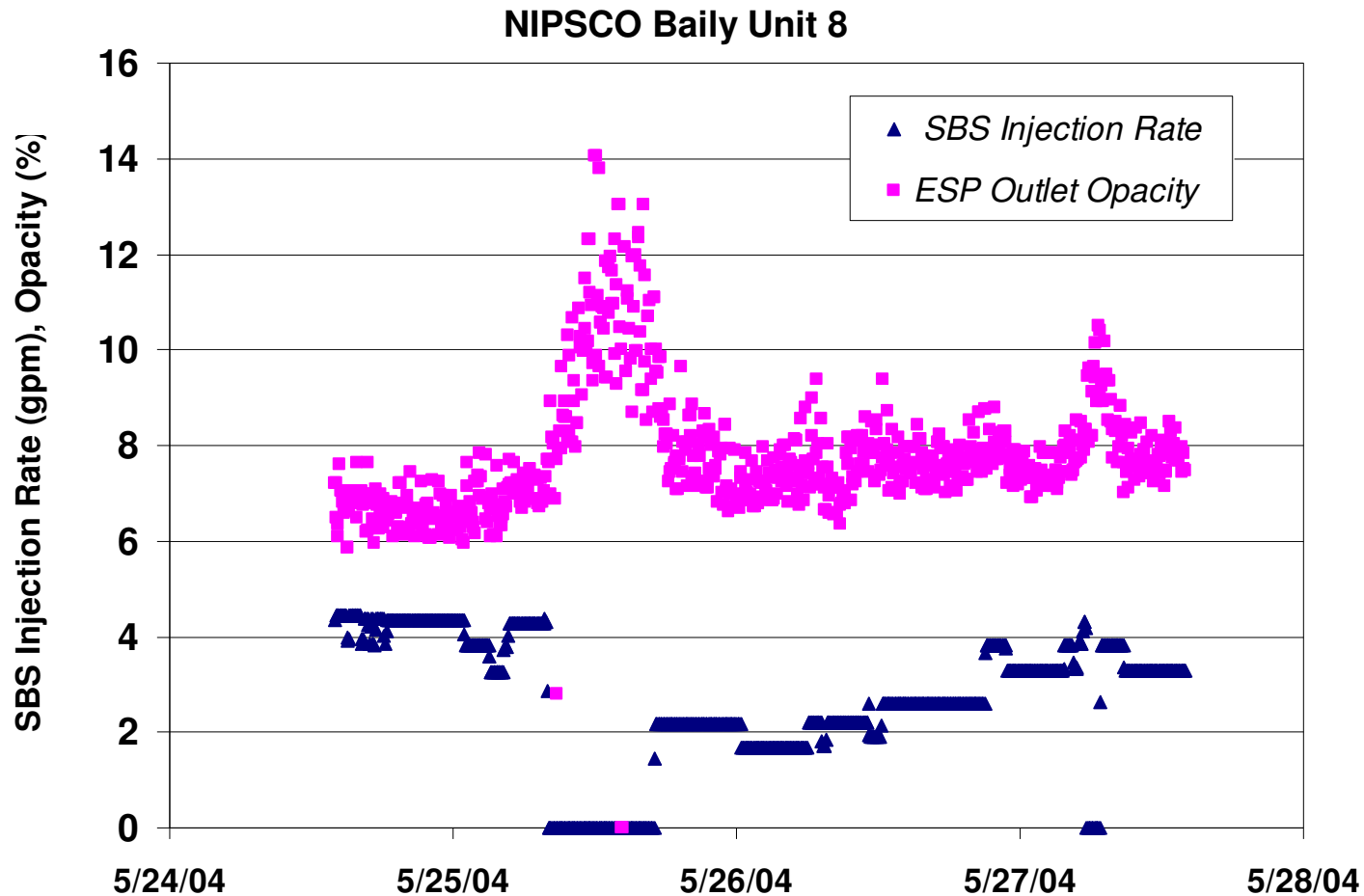


# Hg Removal Cost Evaluation

SBS Injection	AC Rate (lb/mmacf)	Total Hg Removal (%)	Total Sorbent Cost (\$M/Yr)	Incremental Hg Control Cost (\$/lb Hg)
No	0	34	0	0
Yes	0	62	\$0.65	\$9,800
Yes	2	80	\$1.30	\$12,000
No	10	56	\$3.40	\$65,000

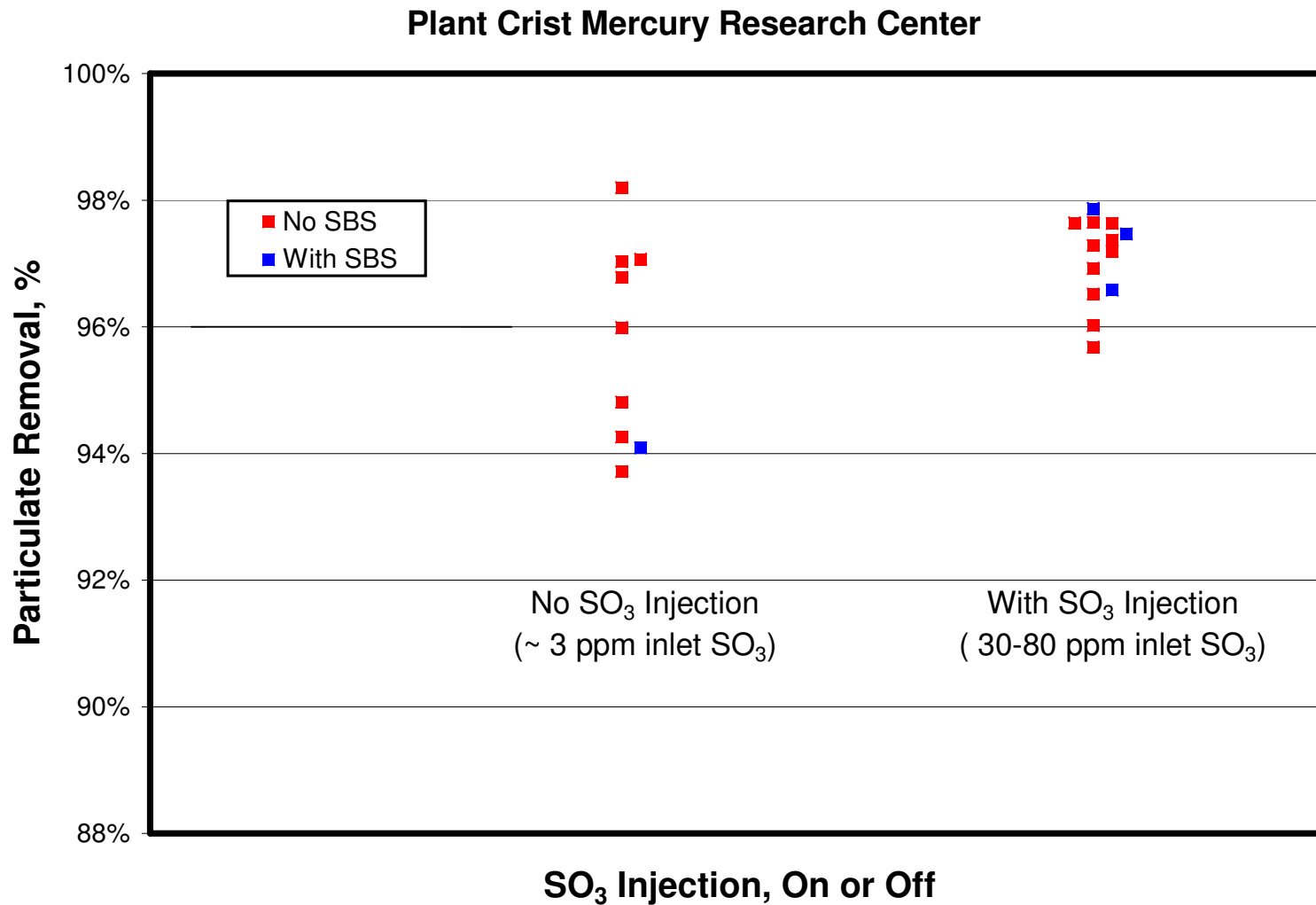
**Basis: 500 MW, 90% CF, 10 ug/m3 Hg, 40 ppmv SO3, \$240/ton Soda Ash, \$0.50/lb AC**

# Impact of SBS on ESP Outlet Opacity





# Impact of SBS on Particulate Removal



# Summary

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- *SBS Injection Technology demonstrated on 8500 MW with >4 yrs continuous operation*
- *High-efficiency SO<sub>3</sub> removal can significantly enhance Hg capture*
- *SBS Injection does not adversely affect ESP performance*
- *SBS Injection alone, or combined with ACl, can be a cost effective Hg control strategy*