



**Quemetco California:
WESP and RTO
Performance Data**

What are WESPs and RTOs?

- **WESP: Wet Electrostatic Precipitator –**

A device for removing particulates and condensable gasses from an air stream by imparting a charge to the particulates and fluid droplets then electrostatically attracting them to collection plates where they will be captured and washed away.



- **RTO: Regenerative Thermal Oxidizer –**

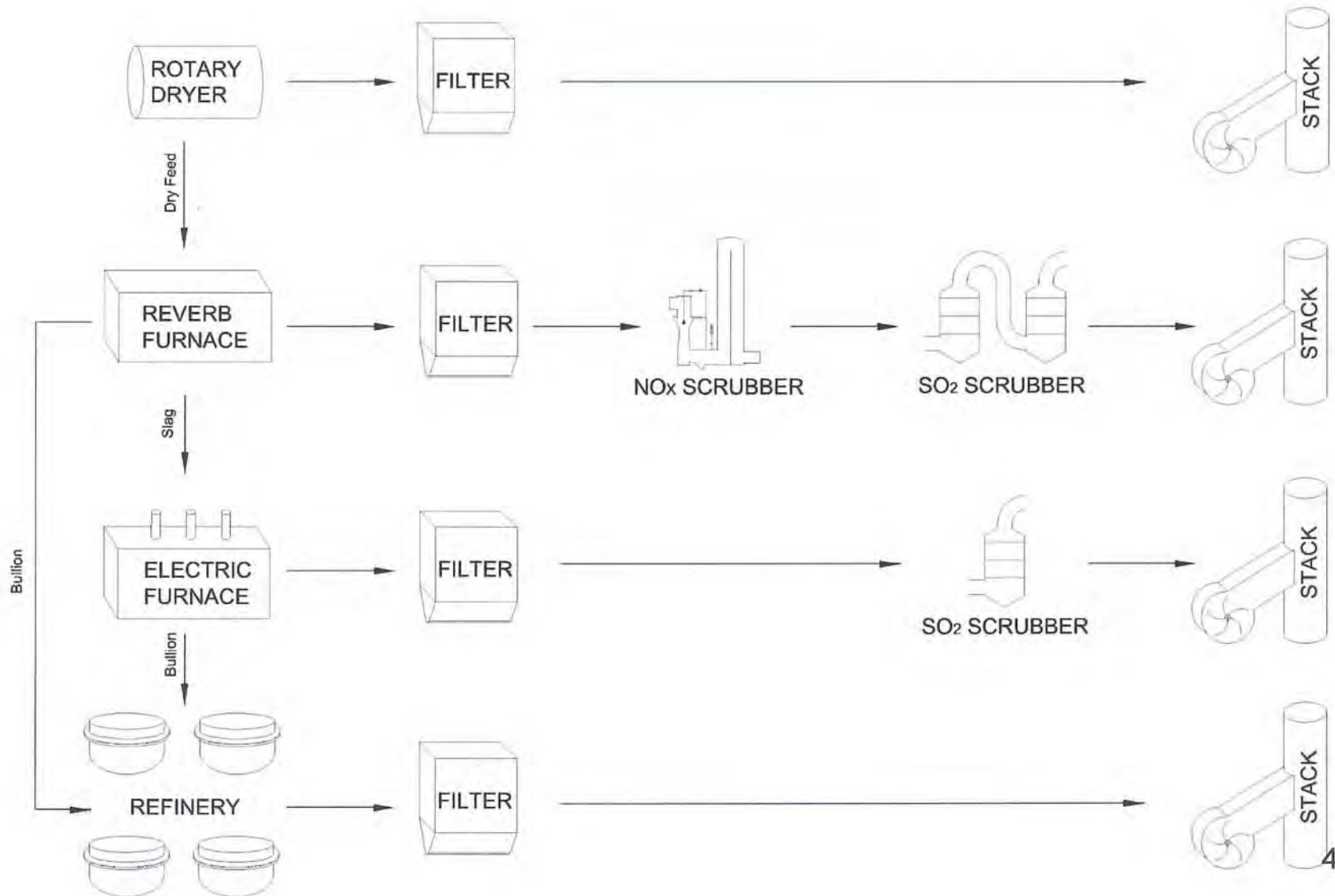
A device that destroys hydrocarbon molecules in an air stream by heating the air stream and oxidizing the hydrocarbons turning them into carbon dioxide and water vapor. Heat from the oxidation reactions is recovered and returned to the reaction chamber for further oxidation reactions.



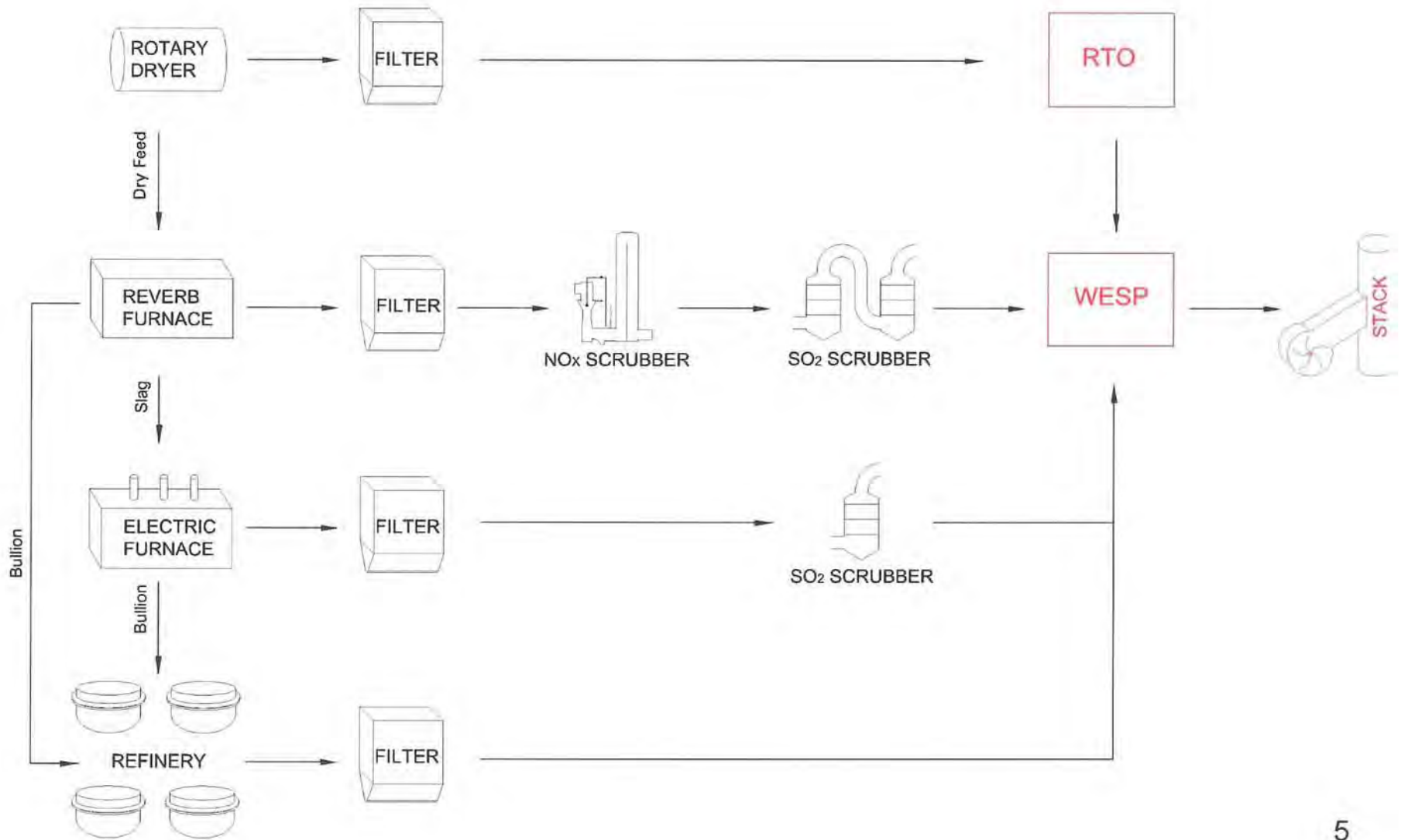
Targeted Reductions

- Arsenic
- Cadmium
- Lead
- 1,3 Butadiene
- Nickel

EMISSIONS PATH BEFORE WESP AND RTO PROJECT



EMISSIONS PATH AFTER WESP AND RTO PROJECT



Generalized WESP Process Description

Conditioning Section

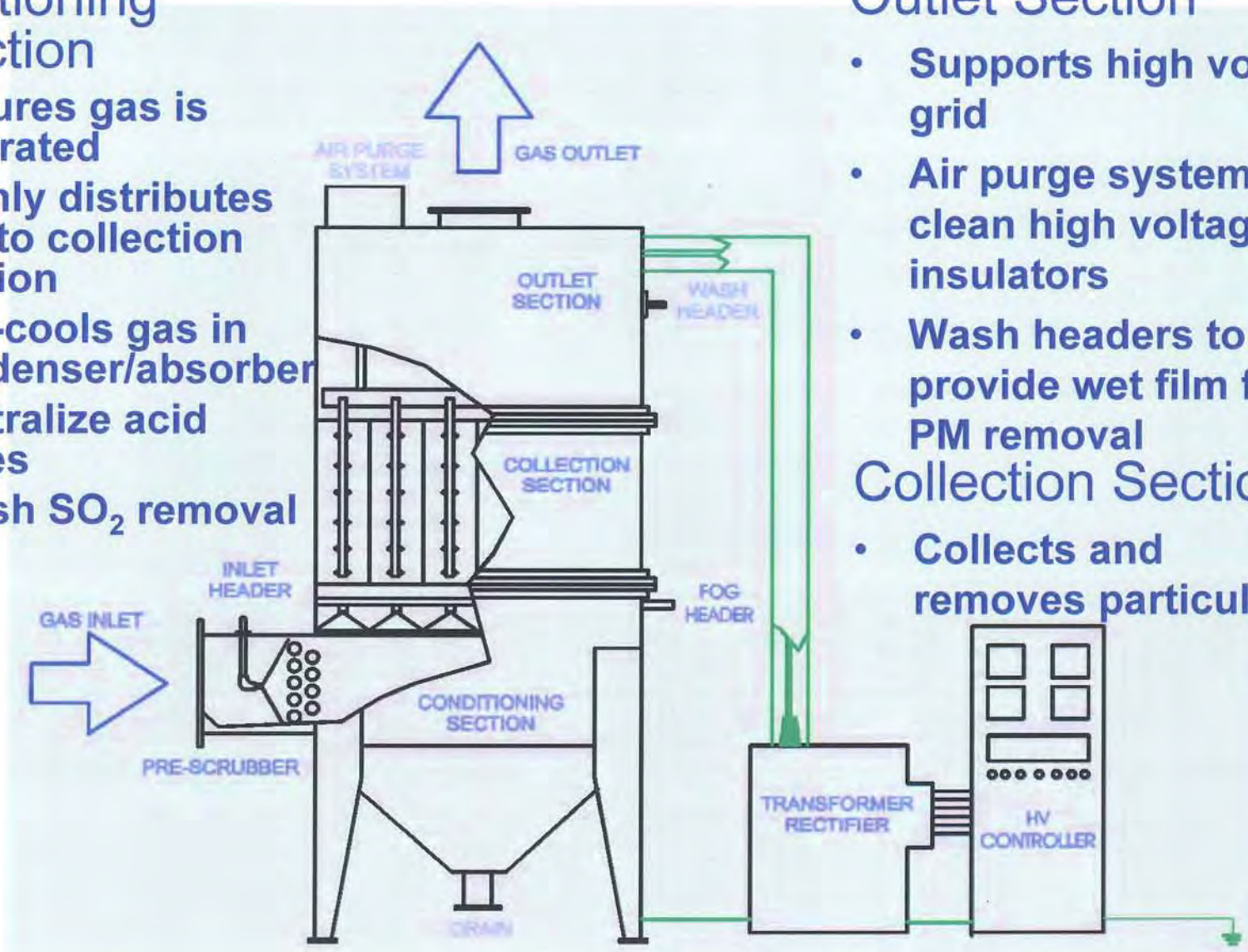
- Ensures gas is saturated
- Evenly distributes gas to collection section
- Sub-cools gas in condenser/absorber
- Neutralize acid gases
- Polish SO₂ removal

Outlet Section

- Supports high voltage grid
- Air purge system to clean high voltage insulators
- Wash headers to provide wet film for PM removal

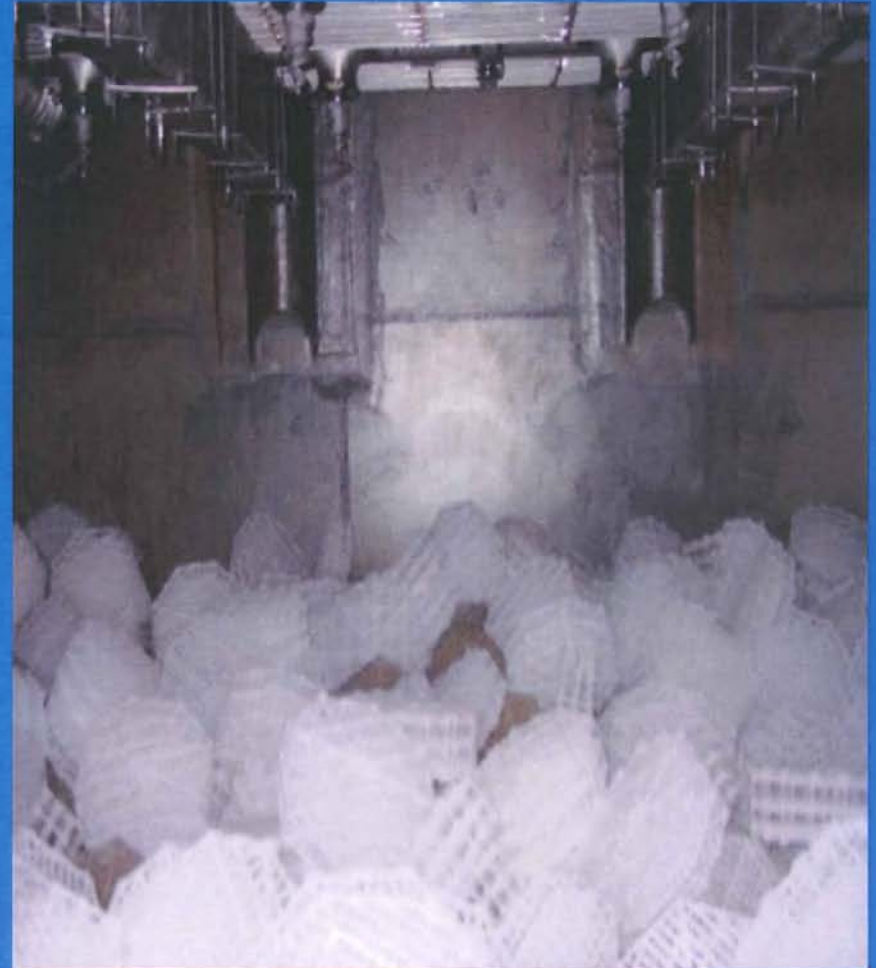
Collection Section

- Collects and removes particulate



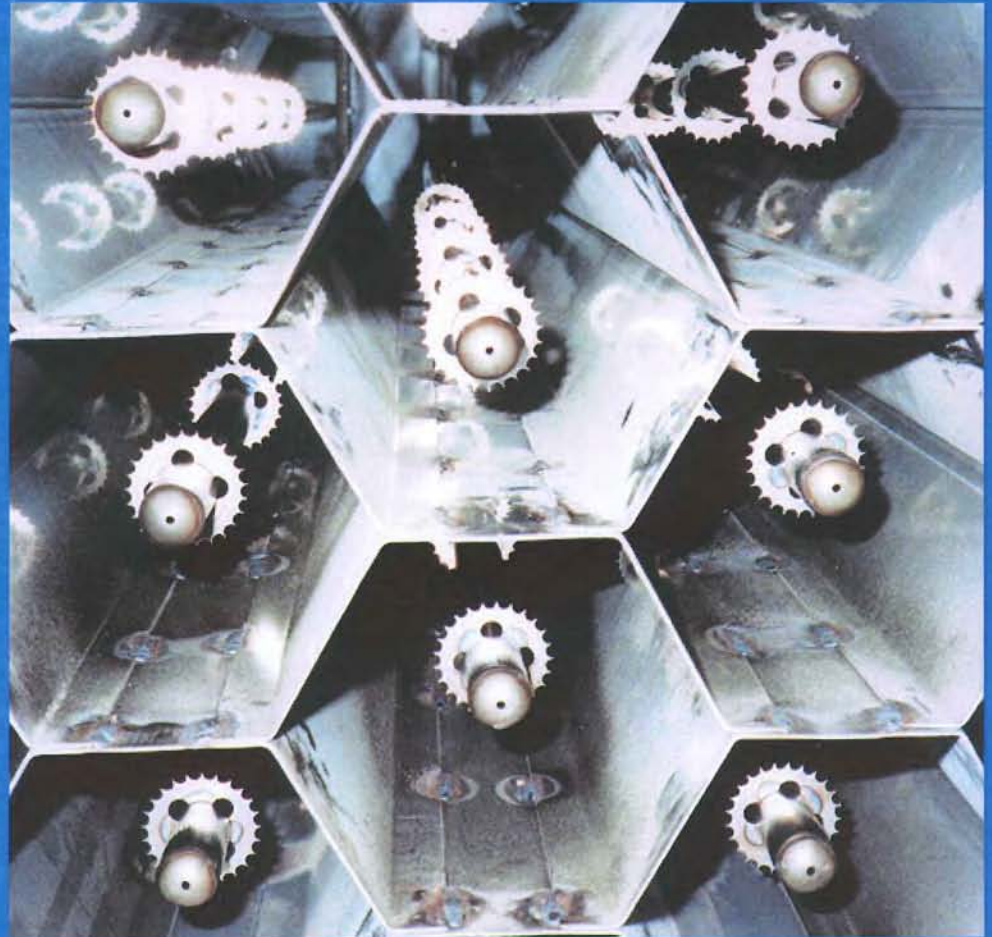
Conditioning Section

- Section is filled with a scrubber tower packing material
- A soda ash solution is continuously circulated



Looking up into the Collection Section (the Honey Comb)

- Saw tooth emitter discs provide the corona
- Particles and ionized droplets are deposited on the hexagonal collectors



WESP Uses a Corona Discharge to Charge and Remove particles

CHARGING

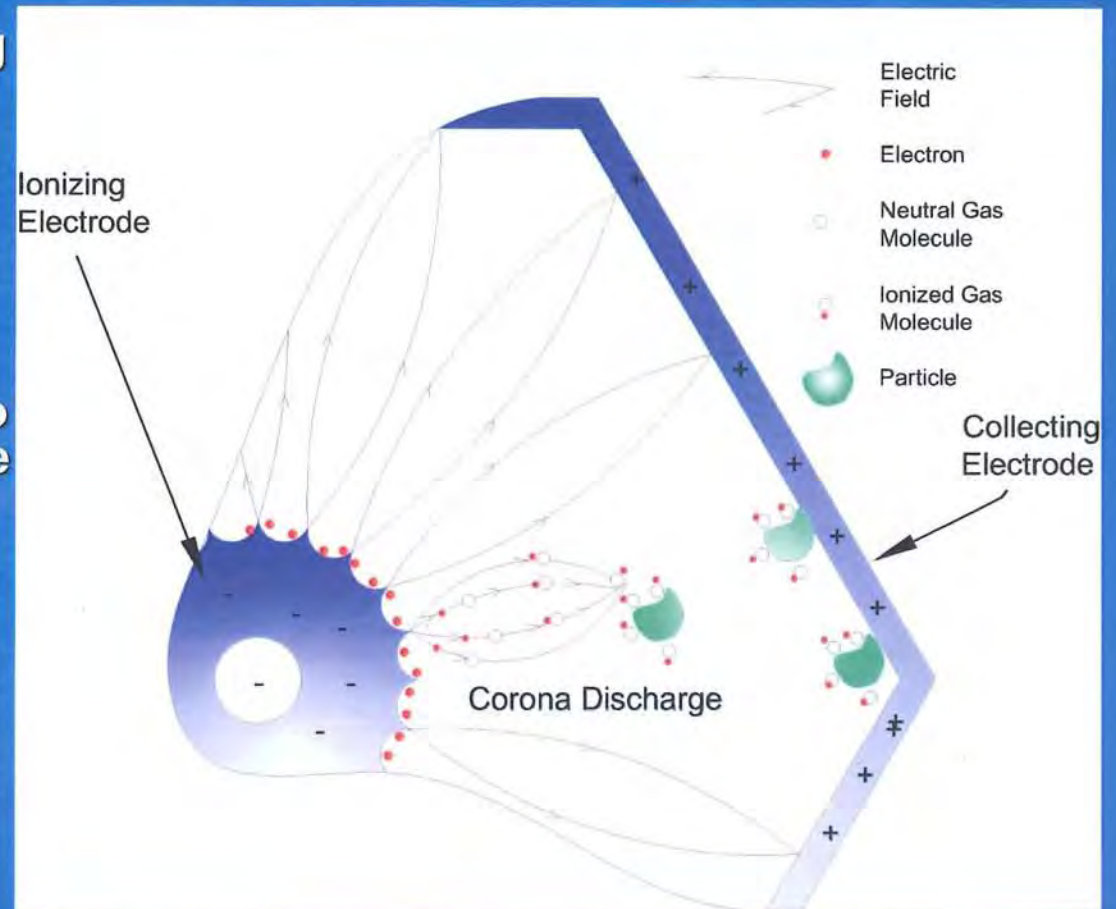
Particles are given strong negative charge by an ionizing corona produced by high-voltage electrodes

COLLECTING

The electric field causes charged particles to migrate to the grounded tube walls where they accumulate

REMOVING

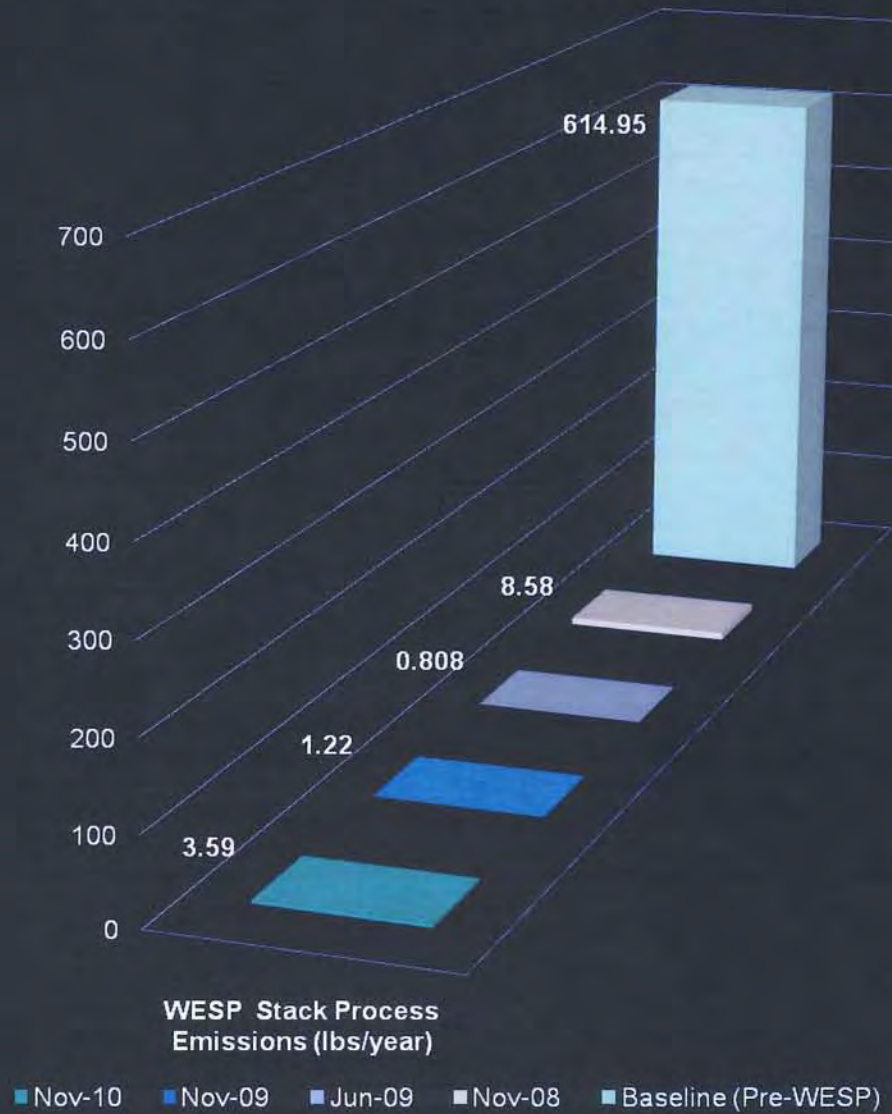
A falling water film inside the tubes removes collected material to a discharge drain



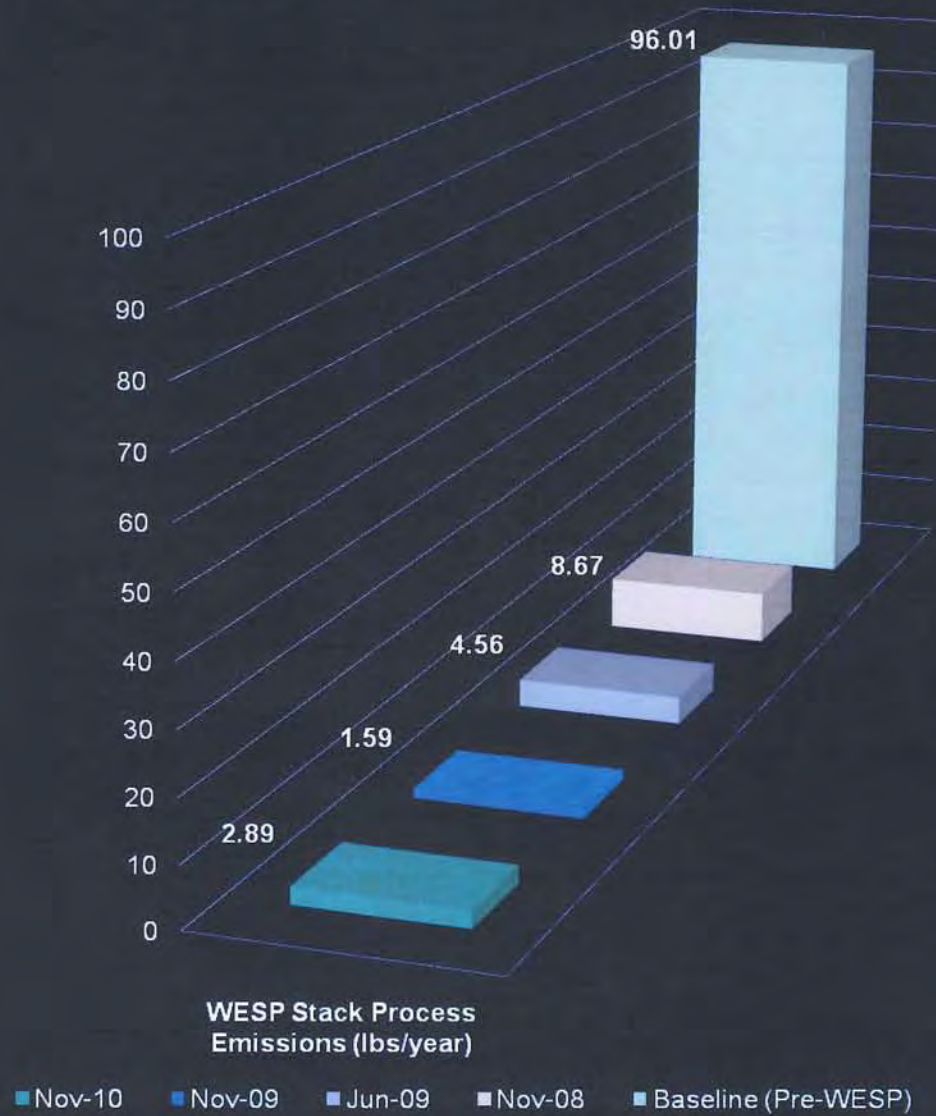
Outlet Section: Charge is delivered to the array of electrodes through the suspension bars at the top of the array



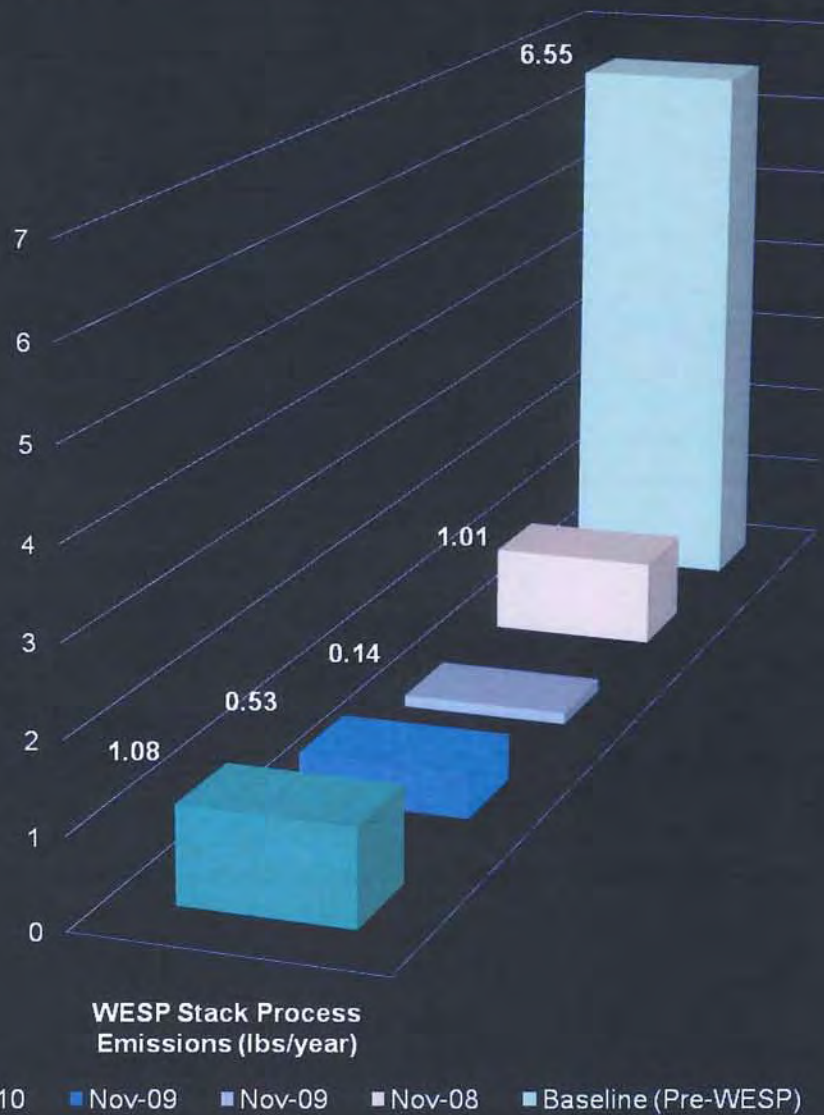
Progression of Lead Emission Reductions



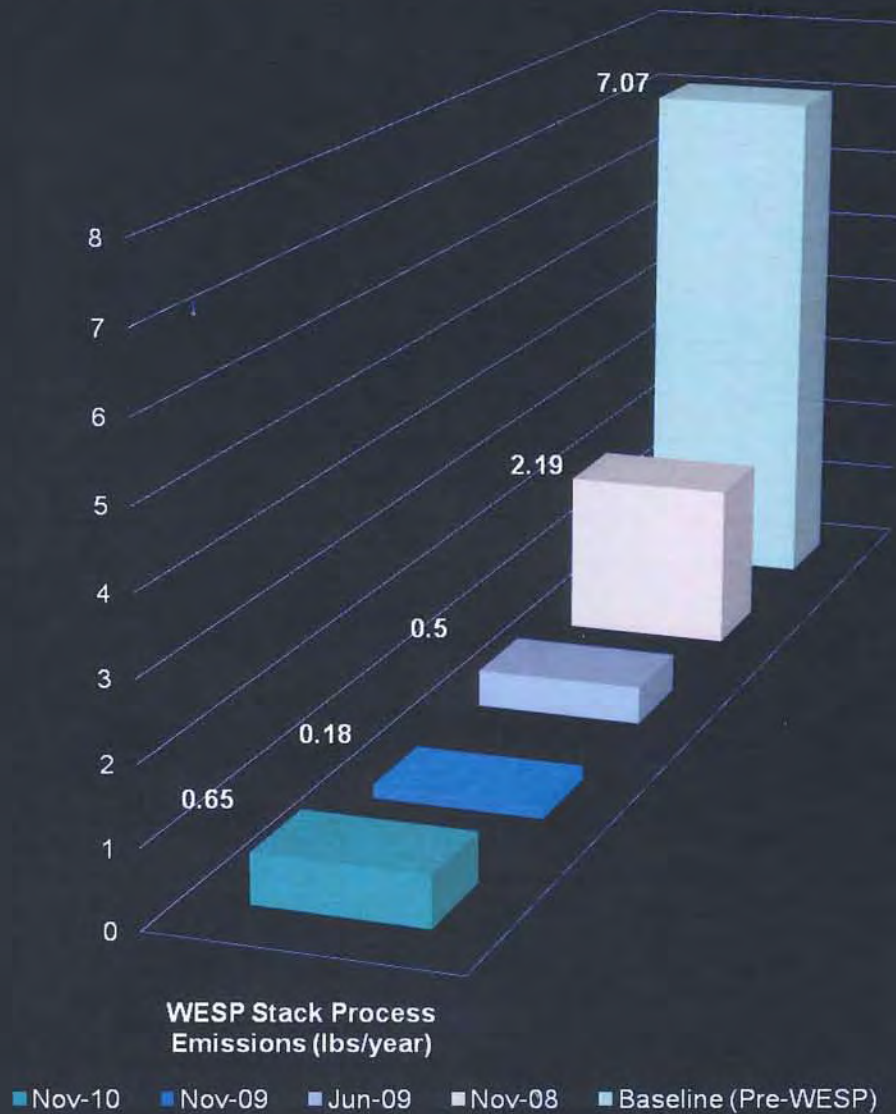
Progression of Arsenic Emission Reductions



Progression of Cadmium Emission Reductions



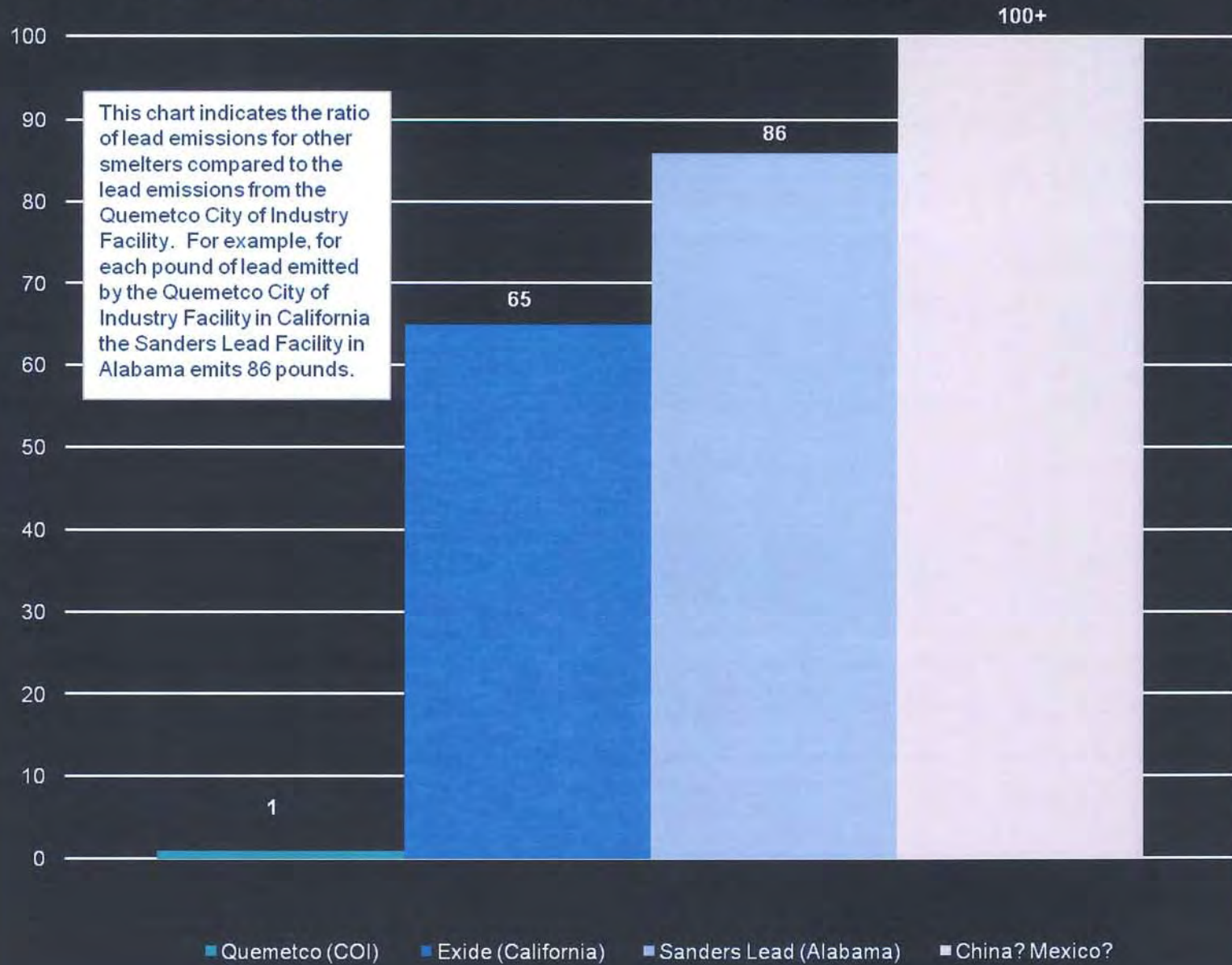
Progression of Nickel Emission Reductions



Levels of Regulation

- National Ambient Air Quality Standard for Lead (Lead NAAQS)
 - 1.5 ug/m³ (current)
 - 0.15 ug/m³ (adopted & beginning implementation)
- National Emission Standards for Hazardous Air Pollutants for Secondary Lead Smelters (Subpart X)
- California-specific rules:
 - Rule 1420.1
 - Early implementation of new Lead NAAQS
 - Rule 1402
 - Health Risk Assessment and Reduction

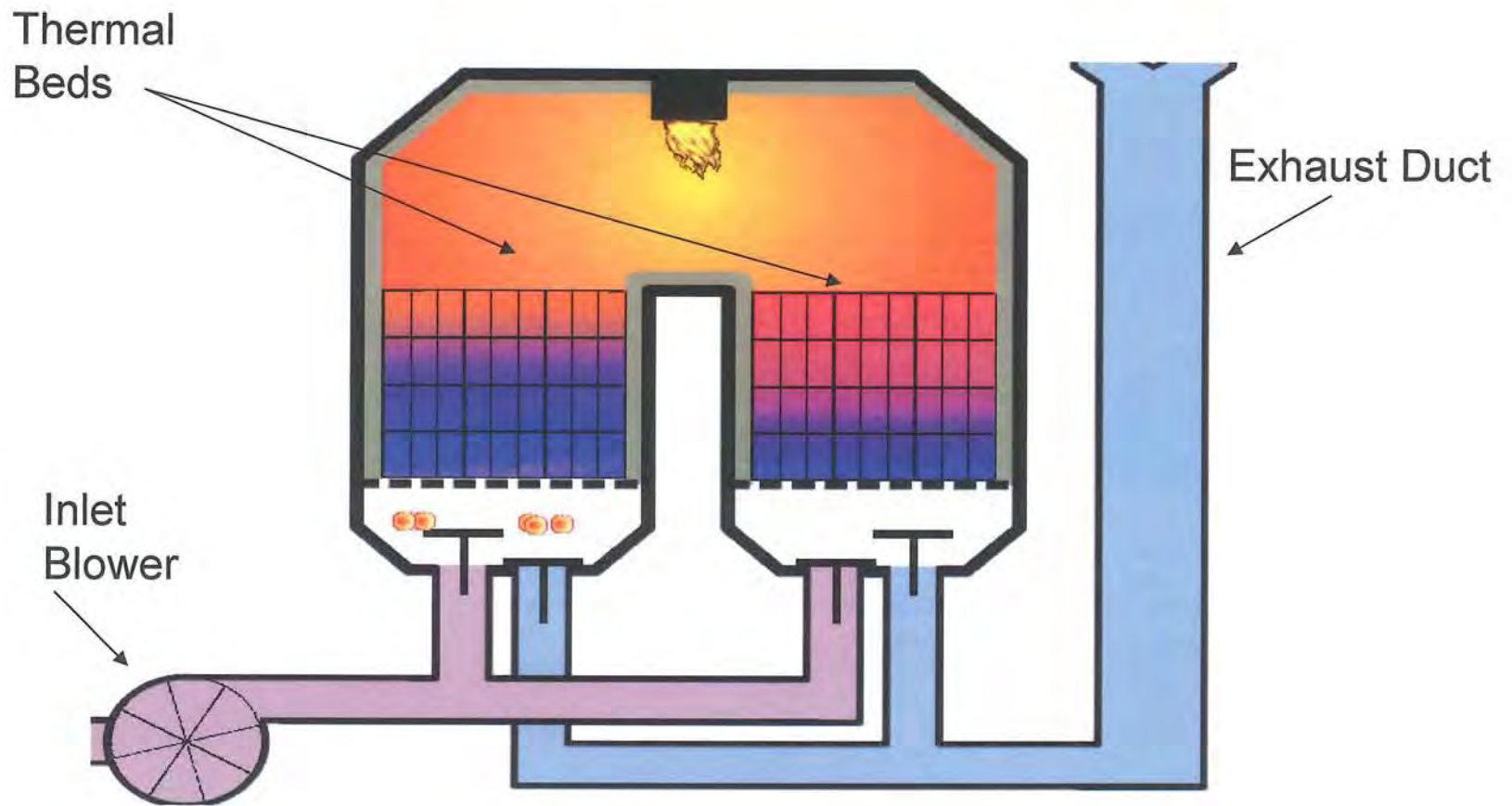
Ratio Comparison of Process Lead Emissions - US Smelters



Ratio Comparison of Process Lead Emissions - US Smelters



RTO – Regenerative Thermal Oxidation



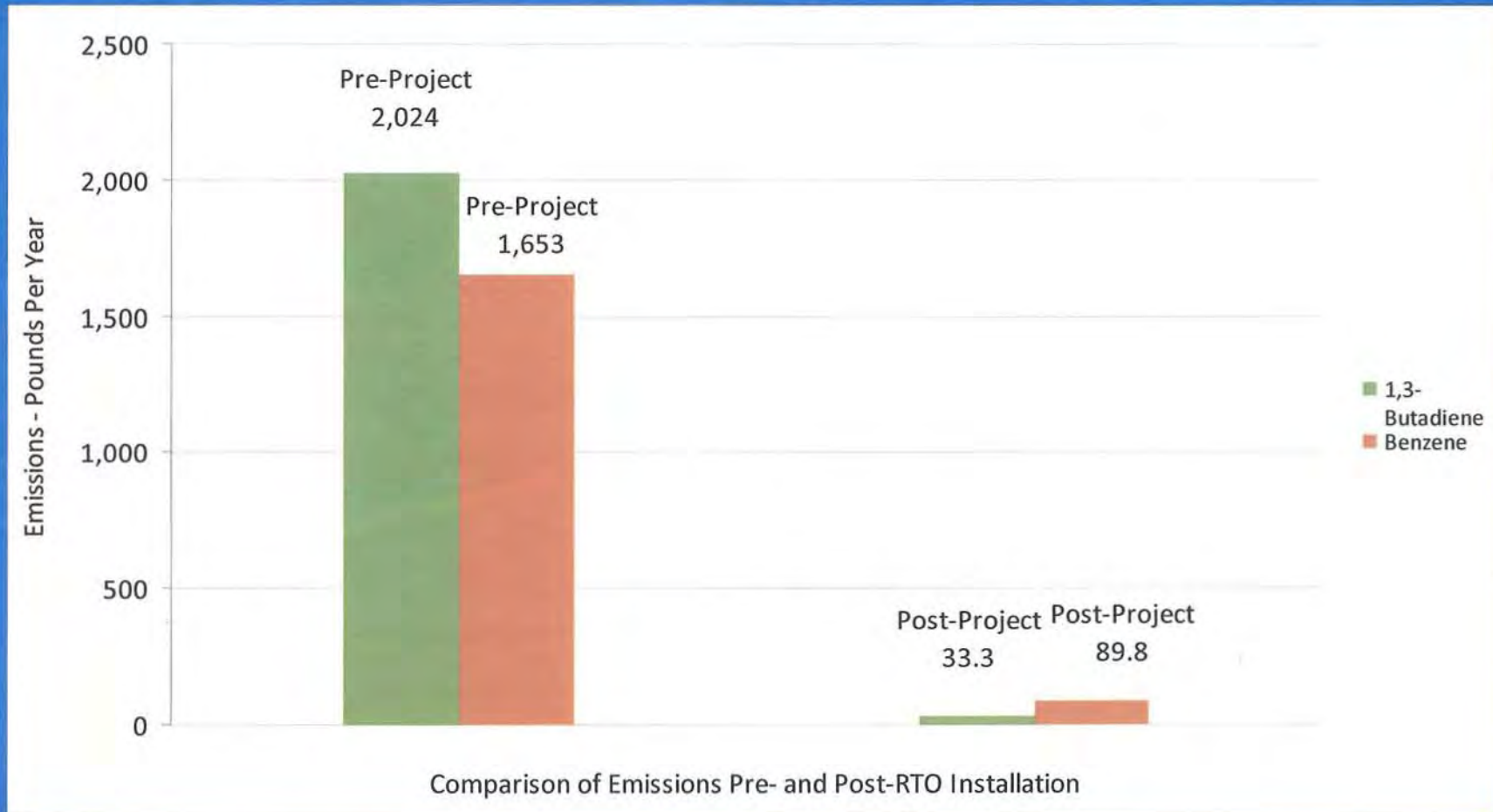
Regenerative Thermal Oxidizer



RTO Ceramic Bed



1, 3-Butadiene Emissions Reduced 98.4% & Benzene Emissions Reduced 94.6% by RTO



Questions