

Allegheny County Health Department

**Jim Thompson
Program Manager
Air Quality Program**



US Steel - Clairton Coke Works

Largest Coke Plant in Western Hemisphere

12 Coke Batteries (Containing 816 Ovens)

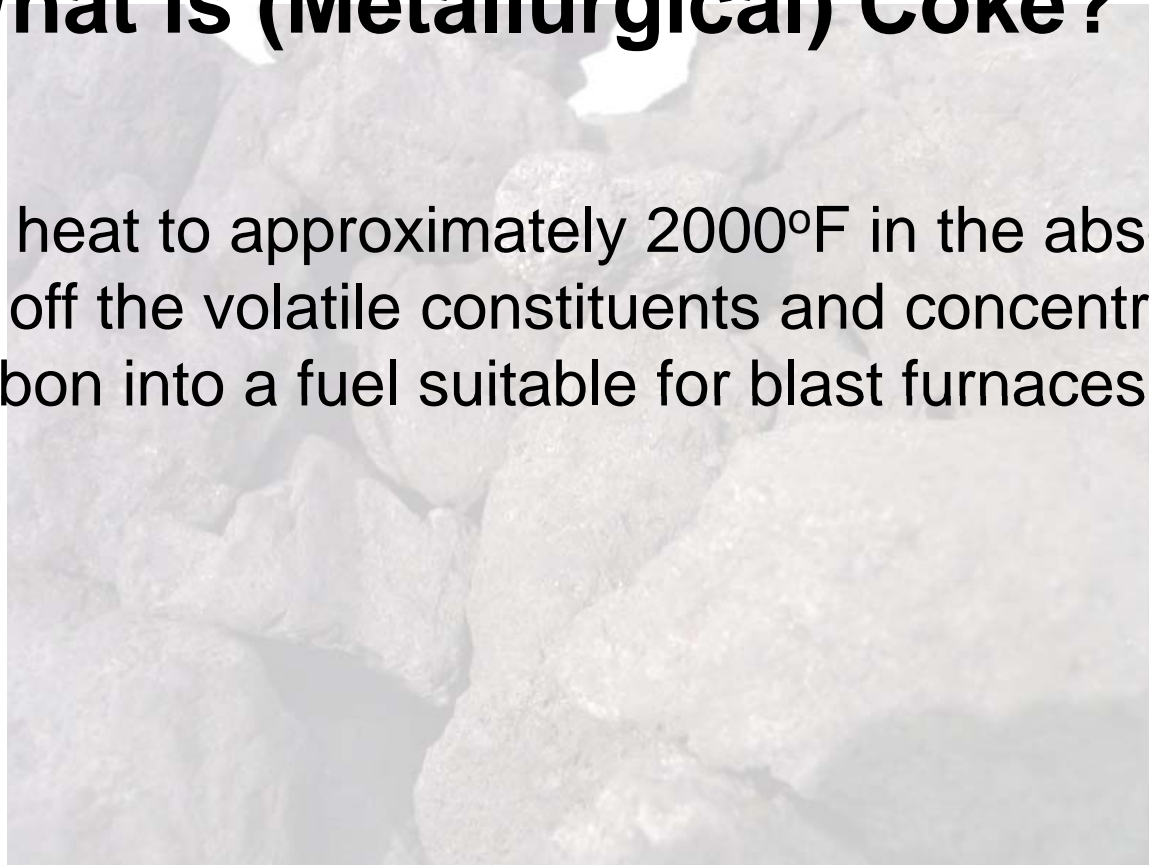


What is (Metallurgical) Coke?



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Coal is heat to approximately 2000°F in the absence of air, driving off the volatile constituents and concentrating the carbon into a fuel suitable for blast furnaces





Clairton Coke Works Daily Output

13,000 Tons Blast Furnace Coke

225 Million Cubic Ft³ of Coke-Oven Gas

145,000 Gallons Coal Tar

55,000 Gallons Light Oil

35 Tons Elemental Sulfur

50 Tons Anhydrous Ammonia

Door Emissions



Door Emissions



Pushing Fugitive Emissions



Off-take Piping Emissions



Combustion Stack Emissions



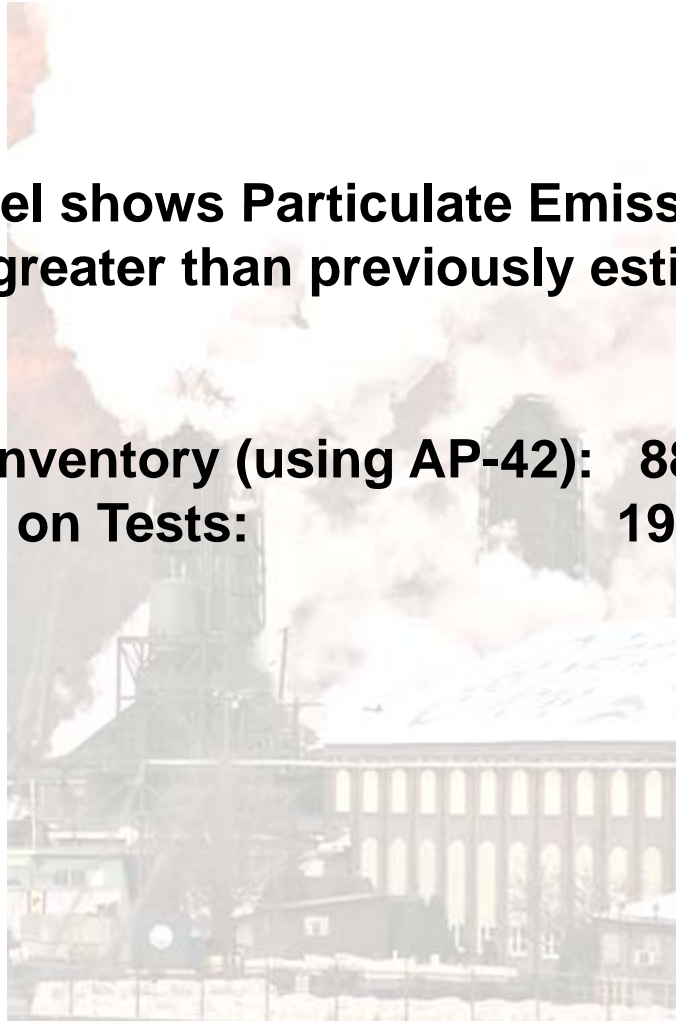
Quenching Emissions



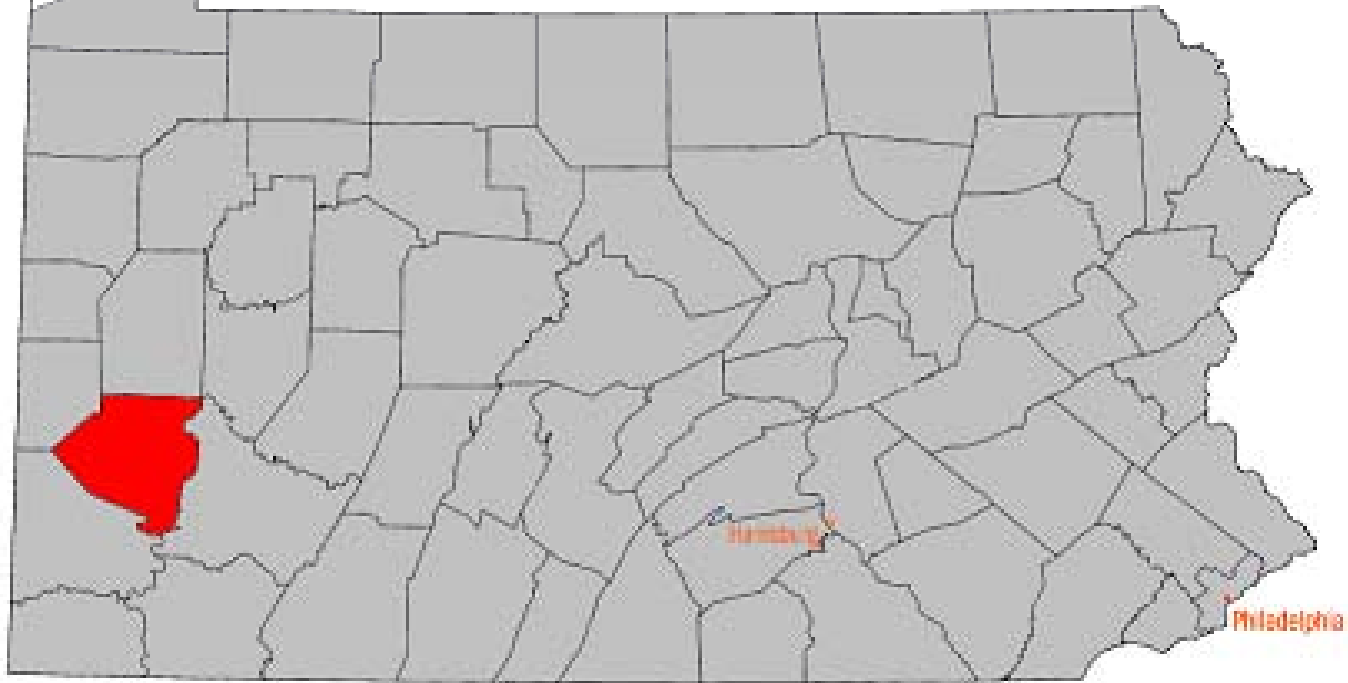
Quenching Emissions

Testing at US Steel shows Particulate Emissions from Quenching are significantly greater than previously estimated.

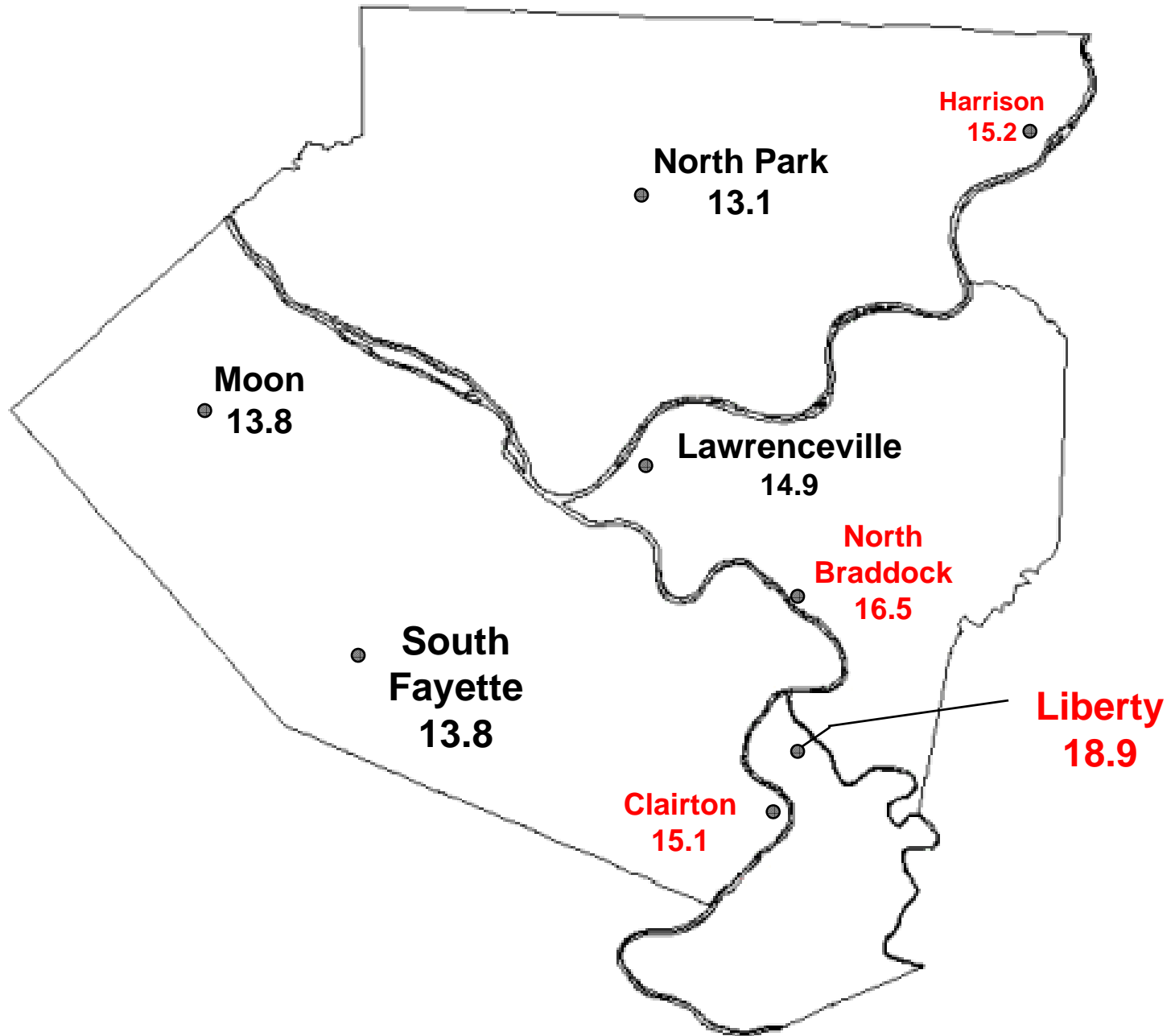
2006 Emissions Inventory (using AP-42): 882 Tons per year
Emissions based on Tests: 1992 Tons per year



Pennsylvania, USA



2007 PM_{2.5} FRM Annual Averages by Site (in µg/m³)



March 2008 Consent Order



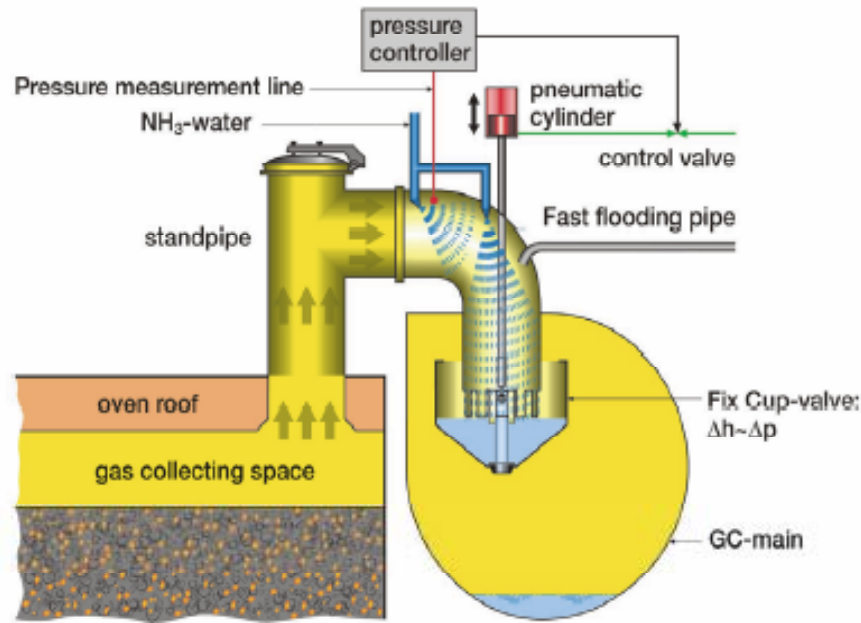


\$1.2 Billion Upgrade Project

- **Replace Six Older Batteries with 2 New**
- **Extensive Rebuilds of Other Six**
- **Will be Completed in Two Phases**
- **1st Phase Complete 2012**
- **2nd Phase Complete 2014**

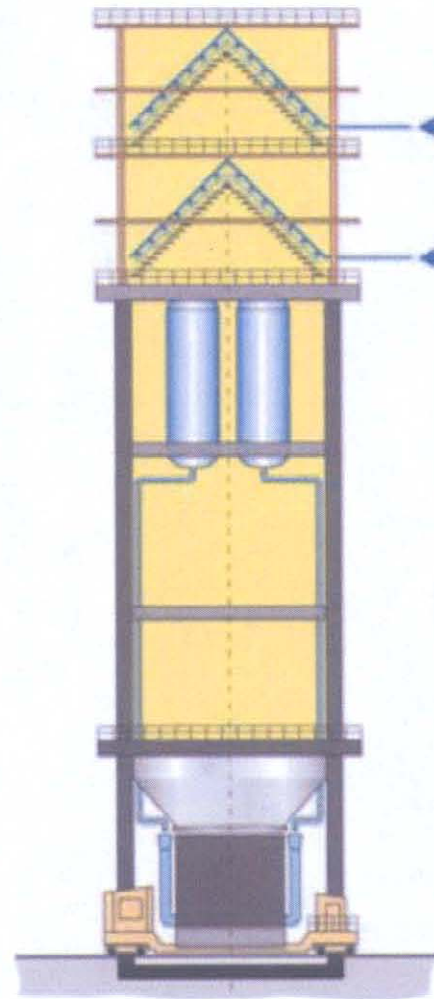
First Phase: "C" Battery

- **Replaces Batteries 7, 8, and 9 (192 ovens) with one Larger Unit (84 Ovens)**
- **Will Employ PROven[®] Technology**
- **Lower-emitting Quench Tower**
- **Enhanced Pushing Emission Controls**

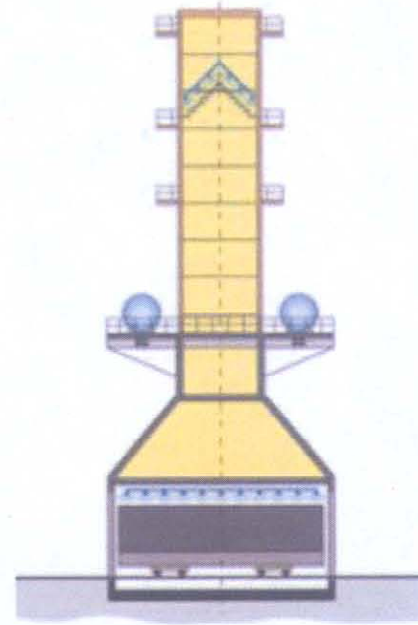


- collecting main under suction
- defined and low oven pressure by variable flow resistance
- almost zero emissions at oven closures

Low Emissions Quench Tower



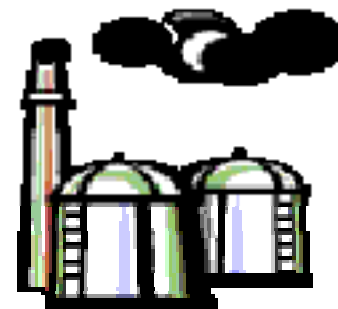
CSQ - Quenching Tower



Conventional Quenching Tower

Pollution Reductions from “C” Battery

<u>Pollutant</u>	<u>Tons/Year</u>
TSP	383
PM ₁₀	289
PM _{2.5}	211
NO _x	577
SO ₂	273
VOC	11
CO	99
H ₂ S	129
TRS	149



Energy Benefits from “C” Battery

- 11% Reduction in Heating Fuel
- ~250 MMBTU/hr in Export Coke Oven Gas
 - Reduces Nat Gas at Other US Steel Plants
 - Reduced CO₂ Emissions

“C” Battery Permitting

Jan 1, 2008 - Initial application received

**Mar 2-6, 2008 – ACHD personnel inspected Schwelgern coke plant
that employed PROven® Technology**

May 7, 2008 – Draft Permit made available for public comment

Jun 19, 2008 – Public Hearing held/Comment period closes



Public Comments

- 349 individuals/organizations submitted comments during the period.
- Many made multiple comments
- Comments Resolved and Permit Issued on July 24th
- Currently working on “D” Battery Permit

Summary

- “C” Battery Permit Contains the Lowest Emission Rates of any Coke Battery.
- The PrOven Quench Tower Technology Provides a Feasible Method of Reducing PM At Existing Coke Batteries.
- Despite the Significant Reductions in PM_{2.5}, Attainment in the Liberty/Clairton Area is Not Possible without Upwind Reductions.

Website: www.ACHD.net

