Performance Test/RATAs Update

Javier Ahumada
Environmental Specialist Supervisor

Adam Irvin
Environmental Specialist

Kansas Department of Health and Environment
Bureau of Air
Compliance and Enforcement Section

New Unit

- Asbestos Control Program has been brought back to BOA within the Compliance and Enforcement Section
- The Performance Testing/RATA Program was combined with the Asbestos Control Program into a new unit
- Hiring a new staff member to help with both RATAs and asbestos abatement project inspections

What is a Performance Test?

- Commonly referred to as a stack test, trial burn or performance test
- A performance test is used to:
  - Measure the amount of regulated pollutants that are emitted from a point source;
  - Verify capture efficiency from a capture system;
  - Verify destruction/removal efficiency of a control device.

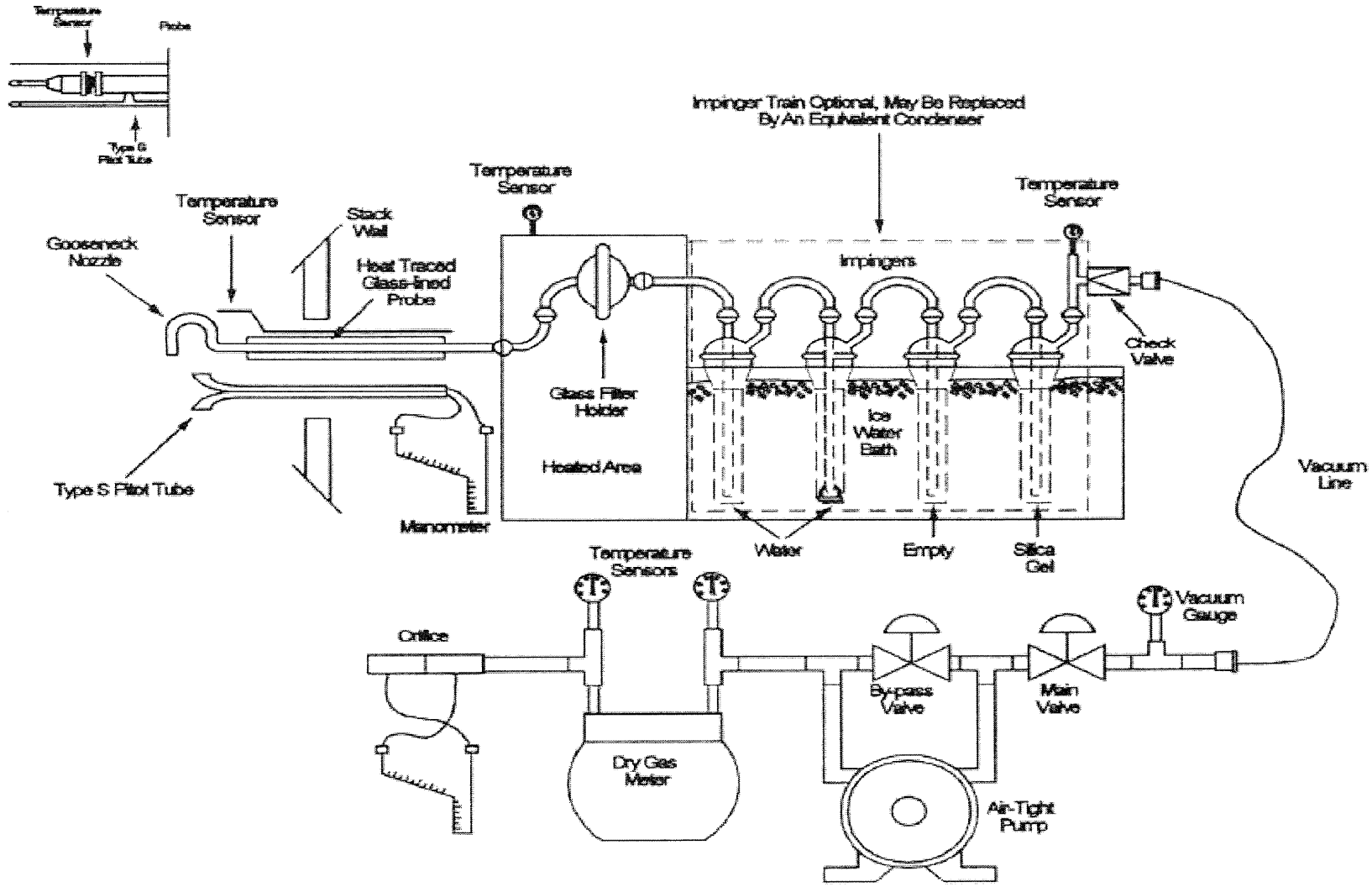
Types of Performance Testing

- Most common types of testing are:
  - Isokinetic Sampling
  - Instrumental Sampling (Analyzers)
  - To determine percent isokinetic:

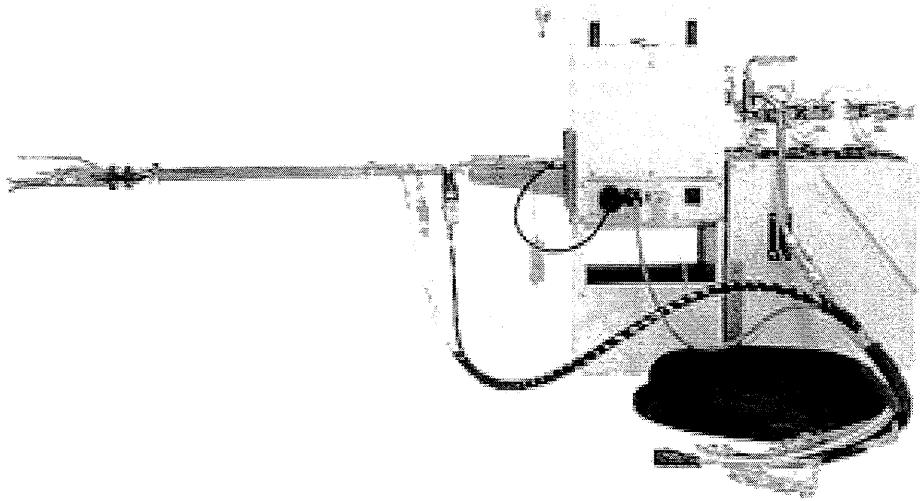
$$\%I = \%\,\text{isokinetic} = 100\left(\frac{V_{nozzle}}{V_{stack}}\right) = \frac{0.0944\,T_s\,(V_m)_{std}}{P_s\,v_s\left(\frac{\pi\,D_n^2}{4}\right)\Theta\,(1-B_{ws})}$$

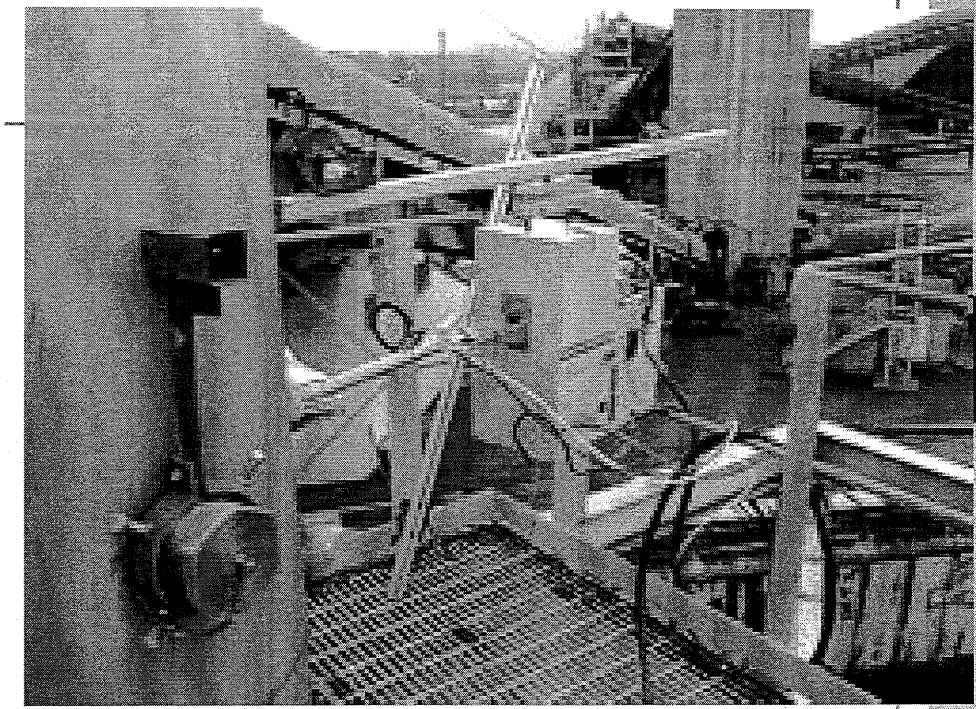
Types of Performance Testing

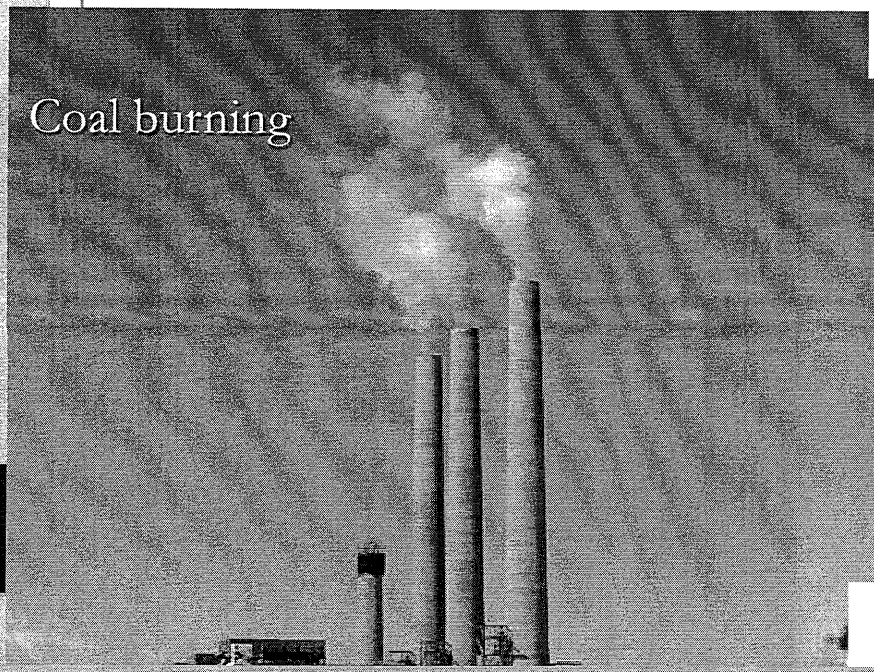
- Most common types of testing are:
  - Isokinetic Sampling
    - Particulate matter (PM) – RM5/202, RM17, RM201A
    - Dioxins/Furans (D/Fs) – RM23
    - Chrome & other metals – RM29, RM306
    - Lead – RM12


Temperature Sensor
Probe
Type G Pitot Tube
Impinger Train Optional, May Be Replaced By An Equivalent Condenser
Temperature Sensor
Temperature Sensor
Stack Wall
Gooseneck Nozzle
Heat Traced Glass-lined Probe
Impingers
Temperature Sensor
Check Valve
Glass Filter Holder
Heated Area
Ice Water Bath
Vacuum Line
Type S Pitot Tube
Manometer
Water
Empty
Silica Gel
Temperature Sensors
Vacuum Gauge
Orifice
By-pass Valve
Main Valve
Dry Gas Meter
Air-Tight Pump

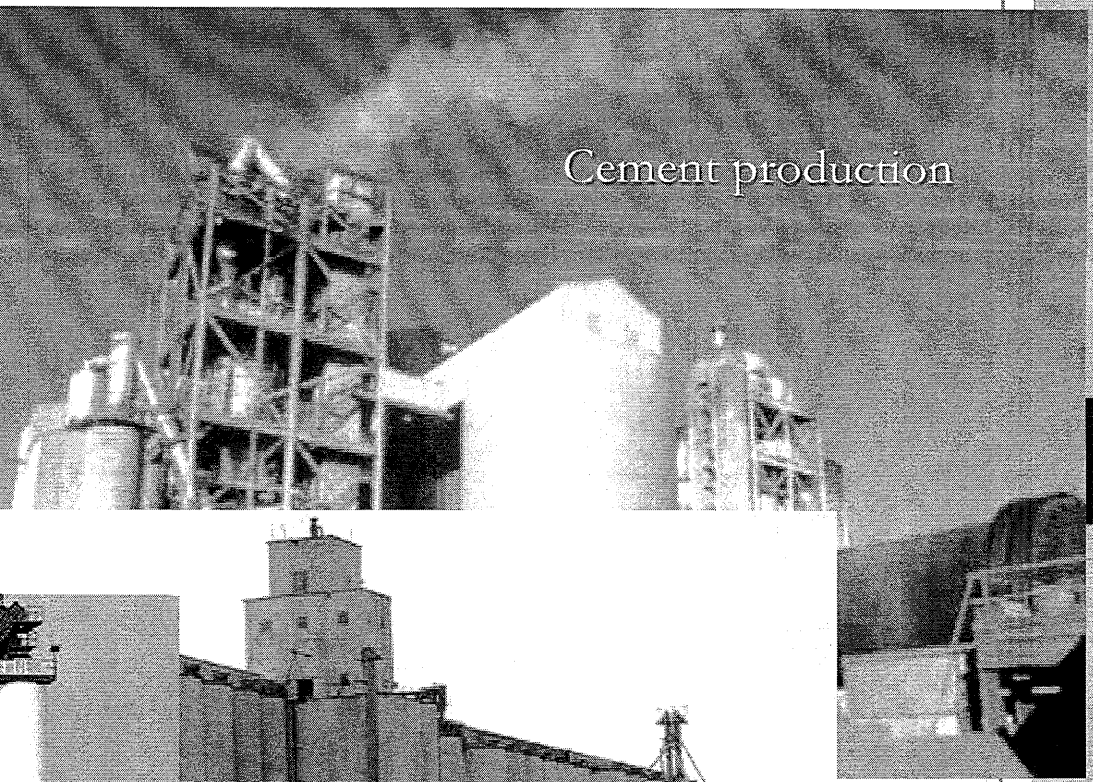
USEPA Reference Method 5



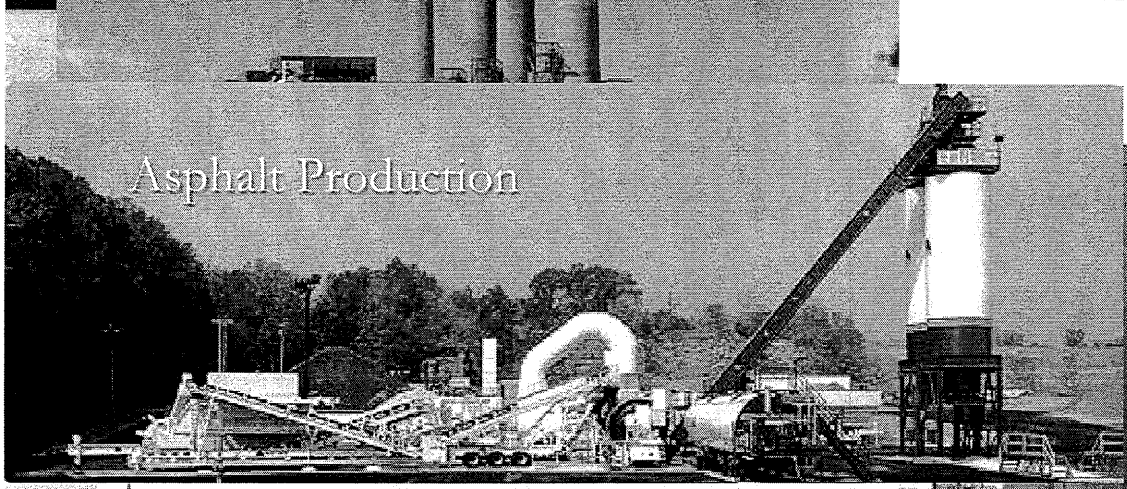




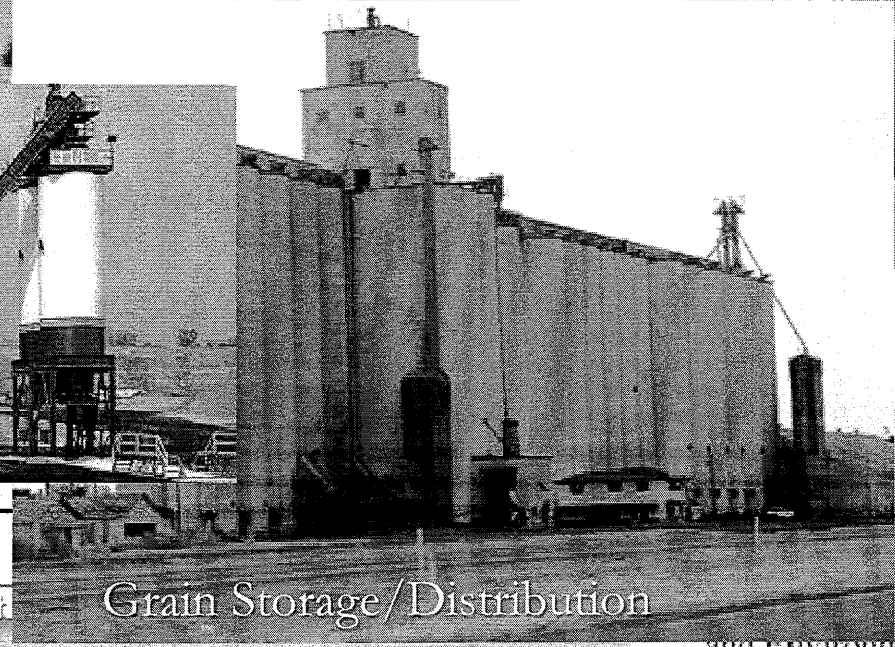
Coal burning



Cement production



Asphalt Production



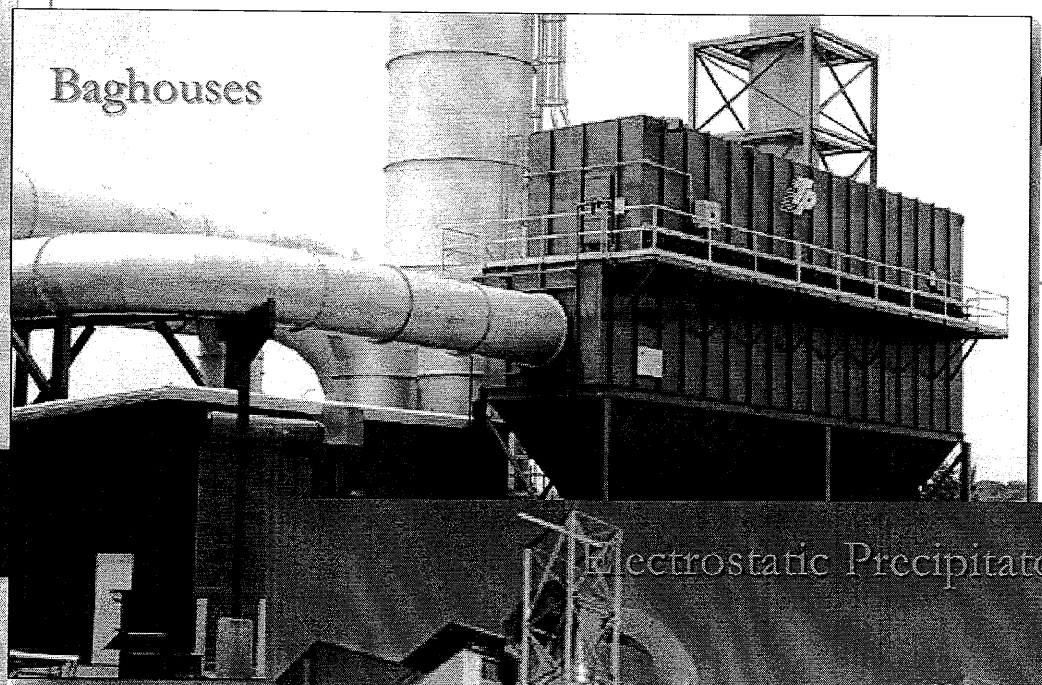
Grain Storage/Distribution

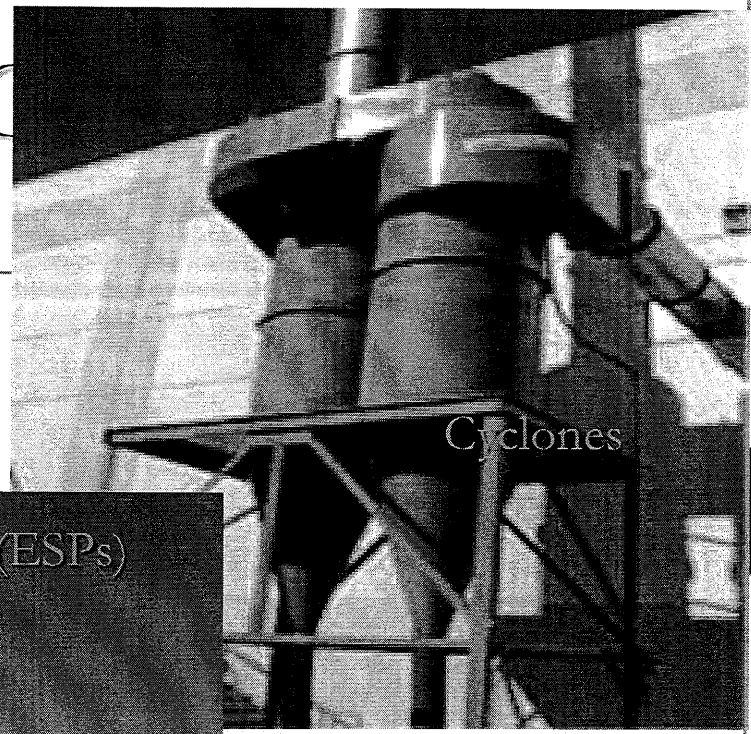
Our Mission: To protect and improve the health

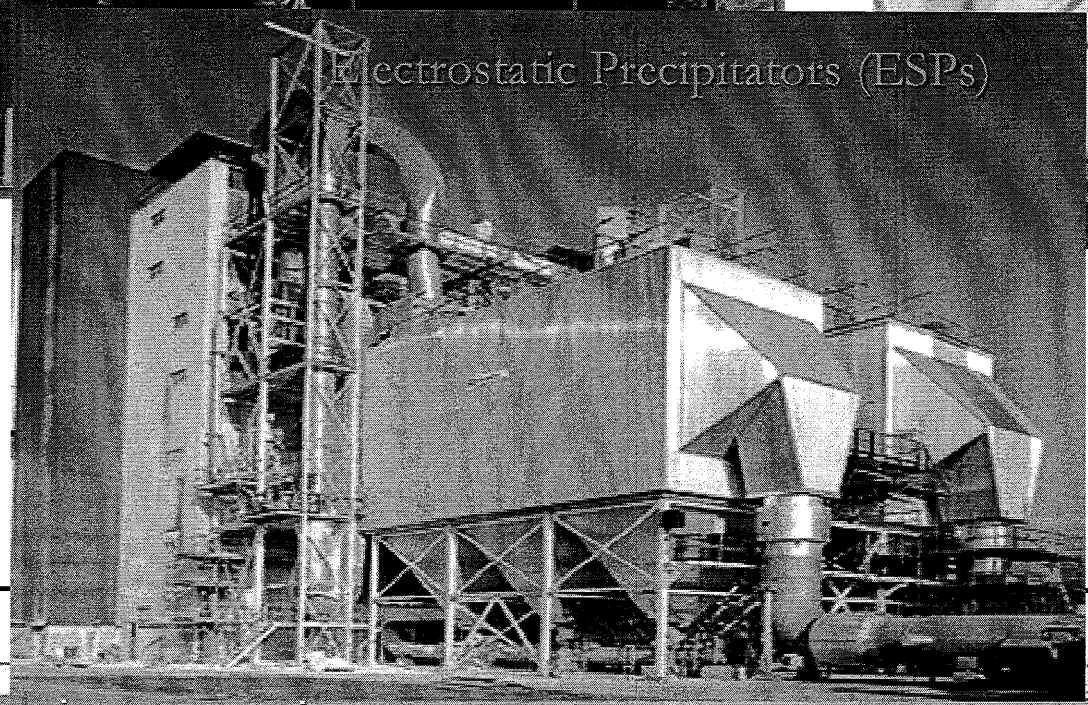
sas

Health

and Environment







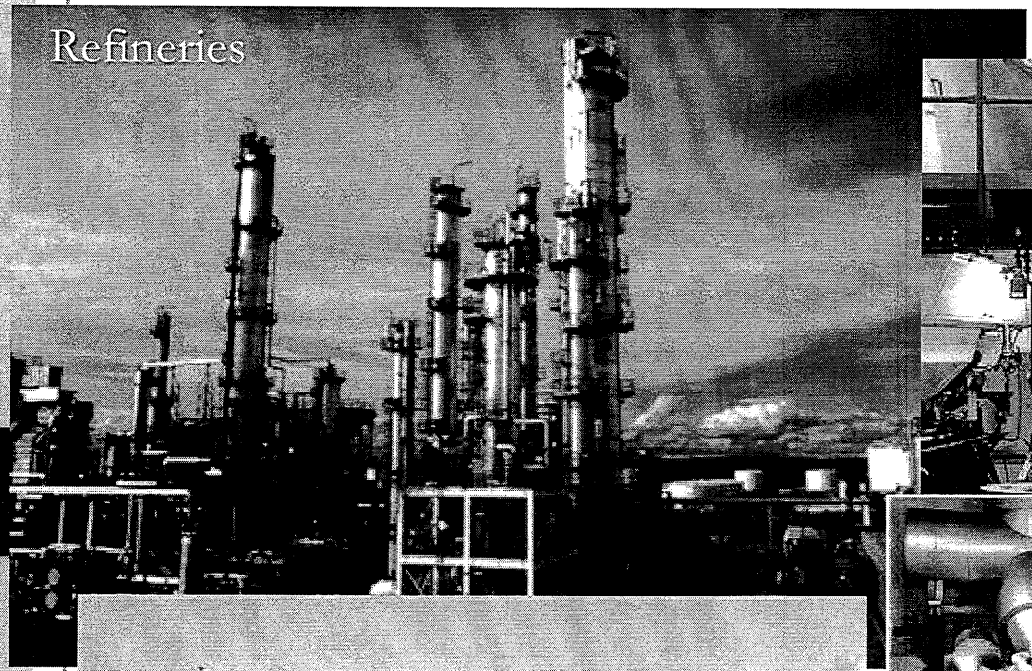
Our Mission:

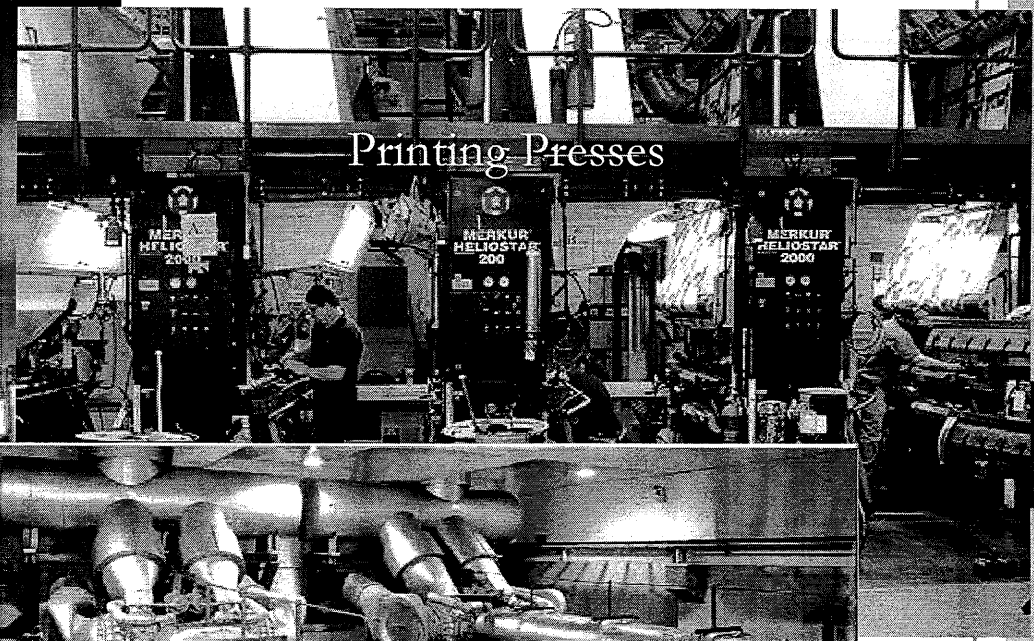
Kansas
Department of Health
and Environment

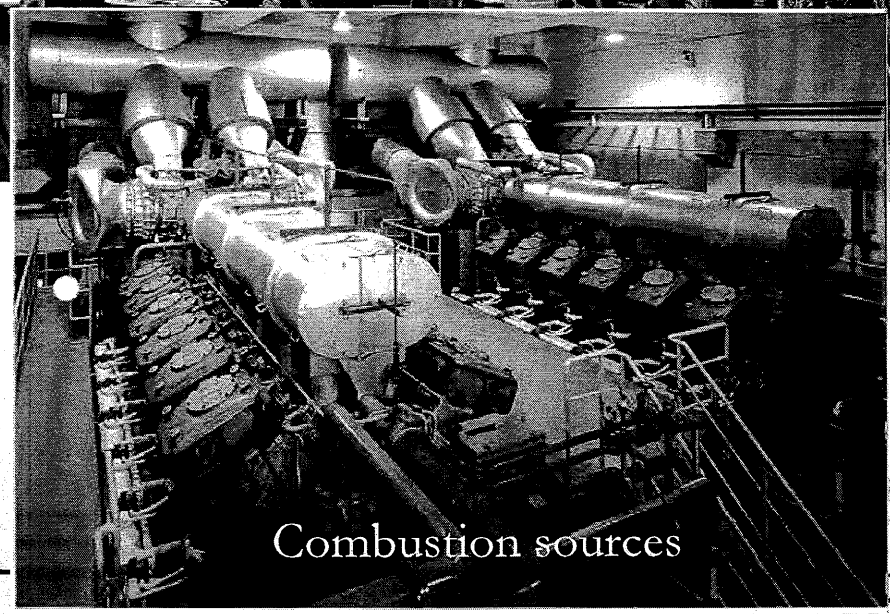
Types of Performance Testing

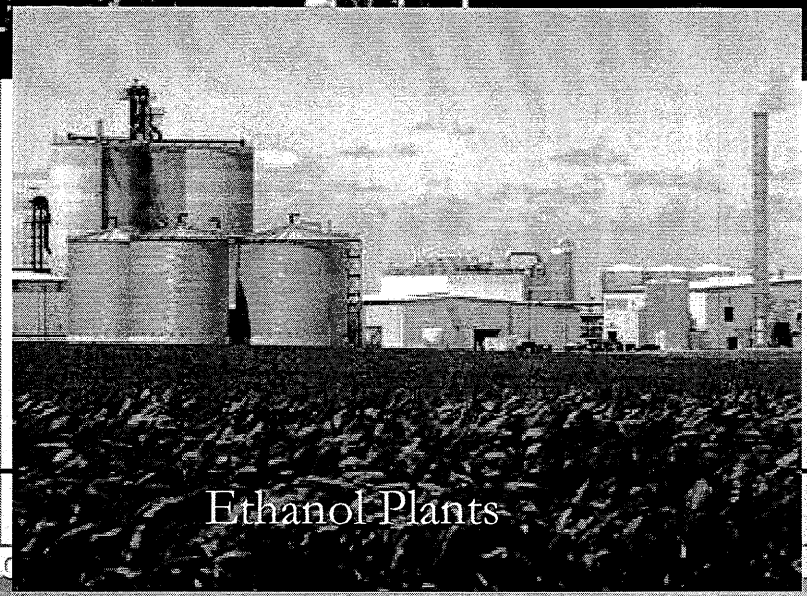
- Most common types of testing are:
  - Instrumental Sampling
    - CLD (Chemiluminescence Detector)
      - » NOx – RM7E
    - FID (Flame Ionization Detector)
      - » VOC - RM25A
    - NDIR (Non-dispersive Infrared)
      - » CO – RM10
      - » O_2/ CO_2 – RM3A
    - Pulsed Fluorescence
      - » SO_2 – RM6C
    - FTIR (Fourier transform infrared spectroscopy)
      - » Non-diatomic molecules (mainly used for HAPs) – RM320

Sources of NOx, CO, SO_2, VOC, HAPs







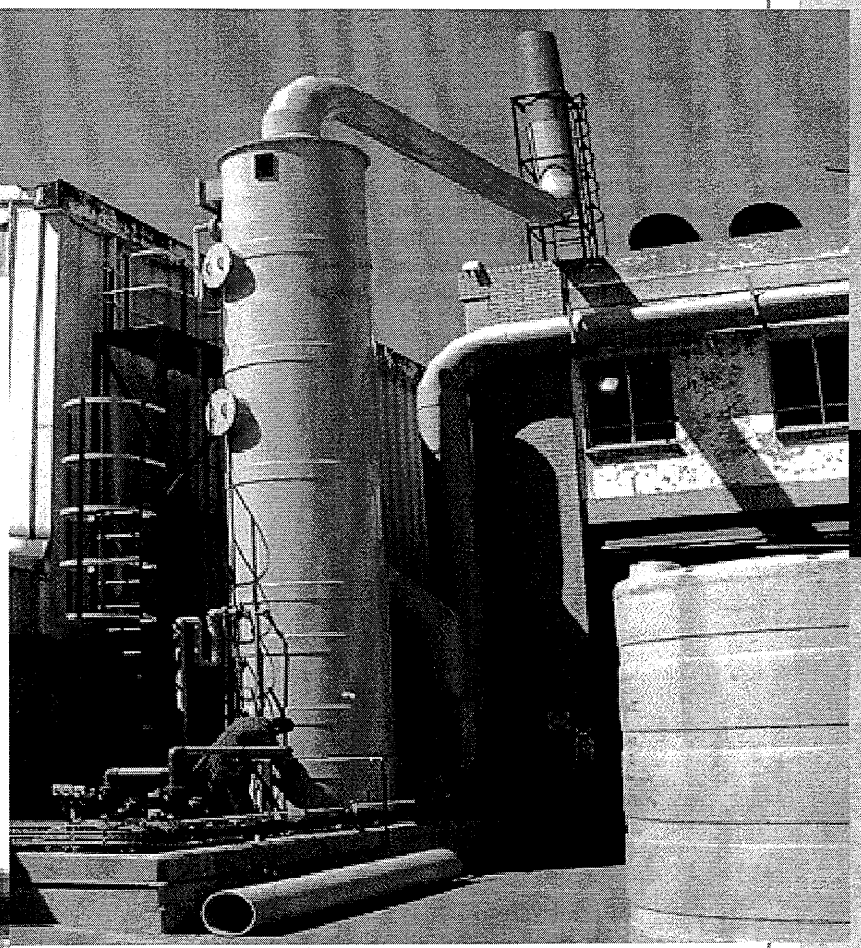


nd environment of all Kansans

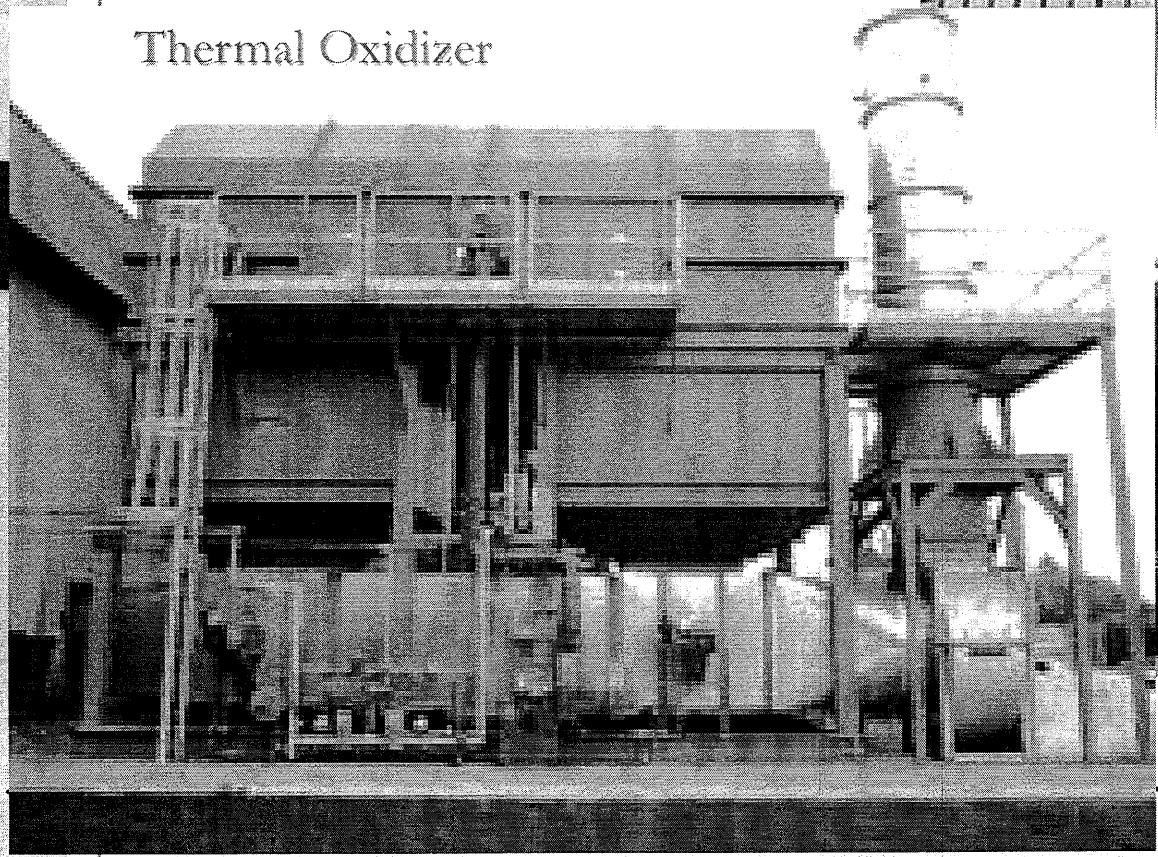
Kansas
Department of Health
and Environment

Common G

Scrubber



Thermal Oxidizer

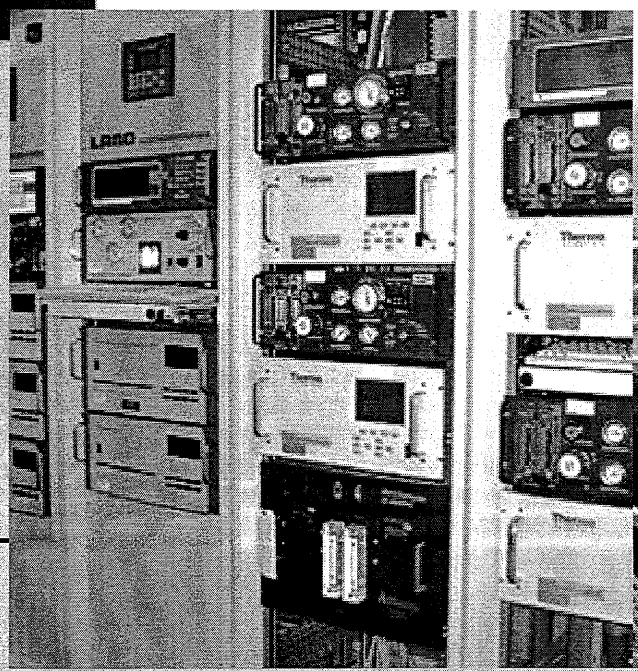


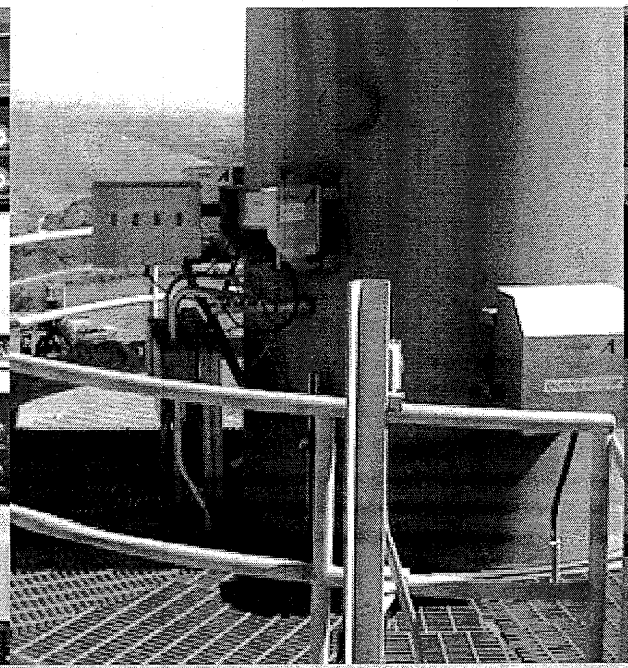
Our Mission: To protect and improve the health and environment of all Kansans

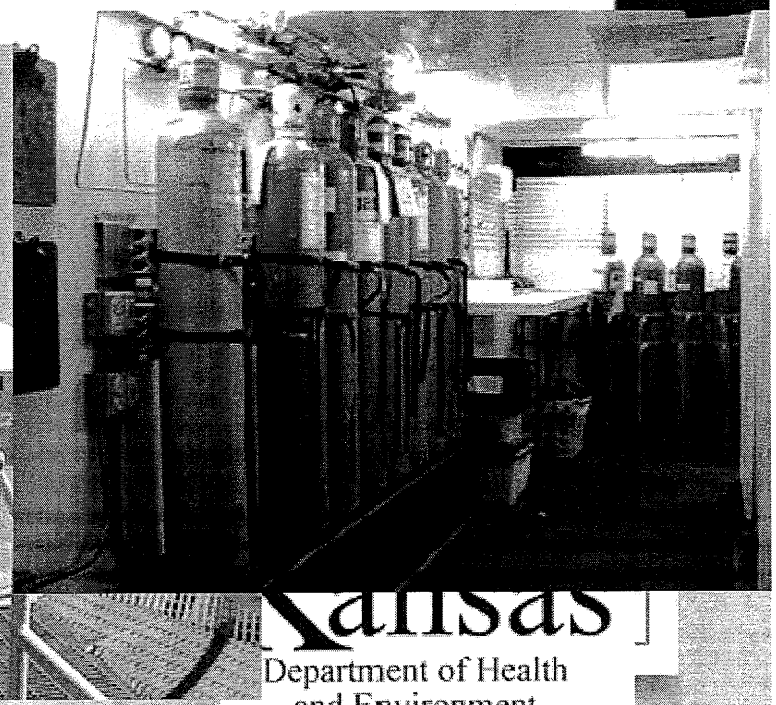
Kansas
Department of Health
and Environment

Continuous Emissions Monitoring System (CEMS)

- Similar to analyzers used for instrumental sampling
- CEMS also available for measuring PM, mercury (Hg), flow rates, moisture, opacity







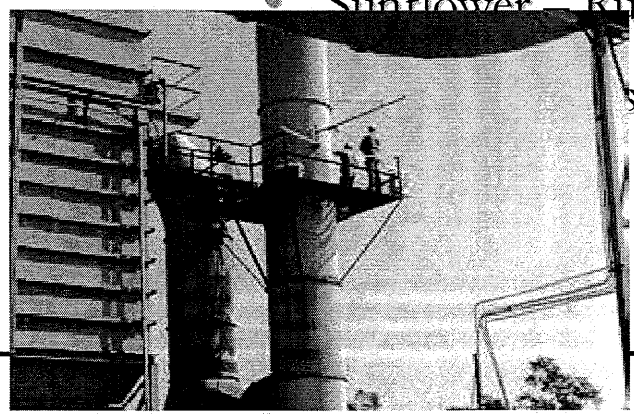
Kansas
Department of Health and Environment

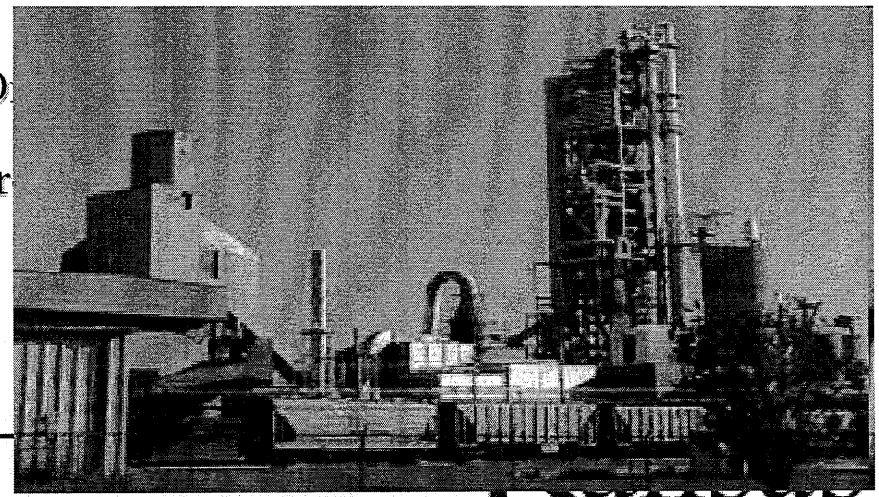
RATAs

- Relative Accuracy Test Audits
  - Quality assurance test for CEMS
  - Tested by comparing the Relative Accuracy (RA) between a tester's analyzers reference method (RM) against the CEMS
  - RATA consists of nine to twelve 21-minute runs
  - RA = (|avg diff| + |cc| / |avg RM|) * 100

Performance Tests/RATAs

- Example of large tests performed in 2014
  - Monarch Cement (D/Fs, HCl, PM, etc.)
  - Case New Holland (D/Fs, HCl, PM, etc.)
  - Exide (Pb testing)
  - Sunflower – Rubart (PM, NO
  - stries (Hex Chr





Performance Tests/RATAs

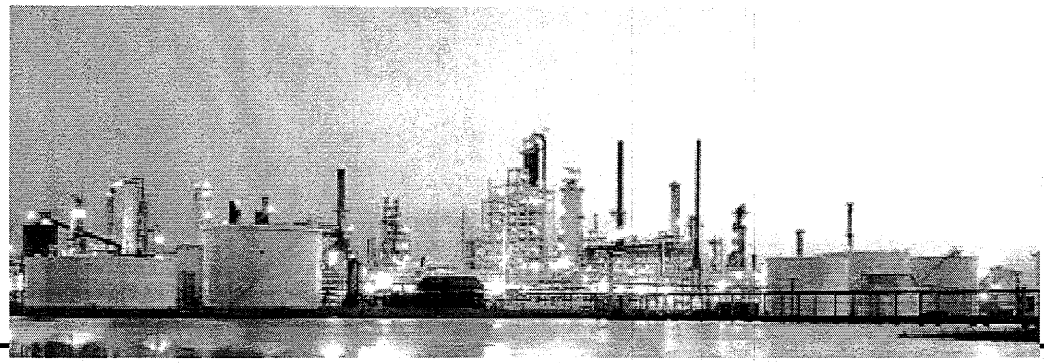
Total number of Performance tests from January 2014 to December 2014:

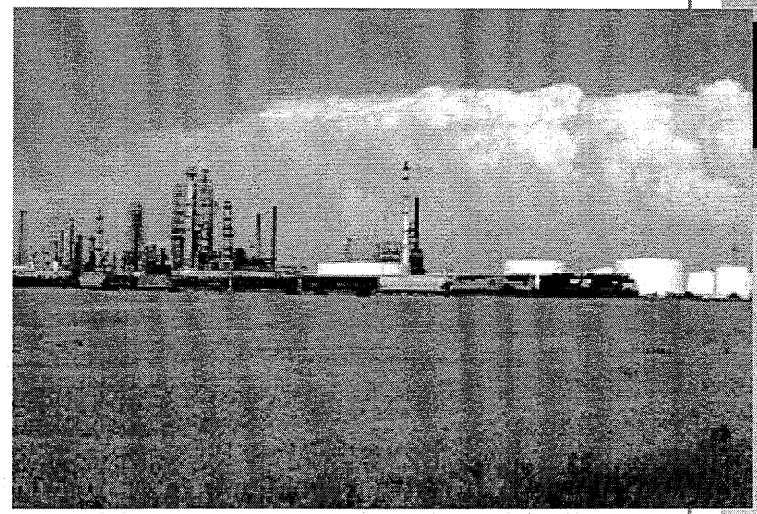
172 tests* were conducted. 90 were RICE tests

Of the 82 non-RICE tests, 51 were observed by KDHE (62%)

*A test at a facility tested in the same period is counted as 1 test, so there may actually be dozens of units tested in "1" test.

Over 20 RICE tests were also observed by KDHE





Our Mission: To protect and improve the health and environment of all Kansans

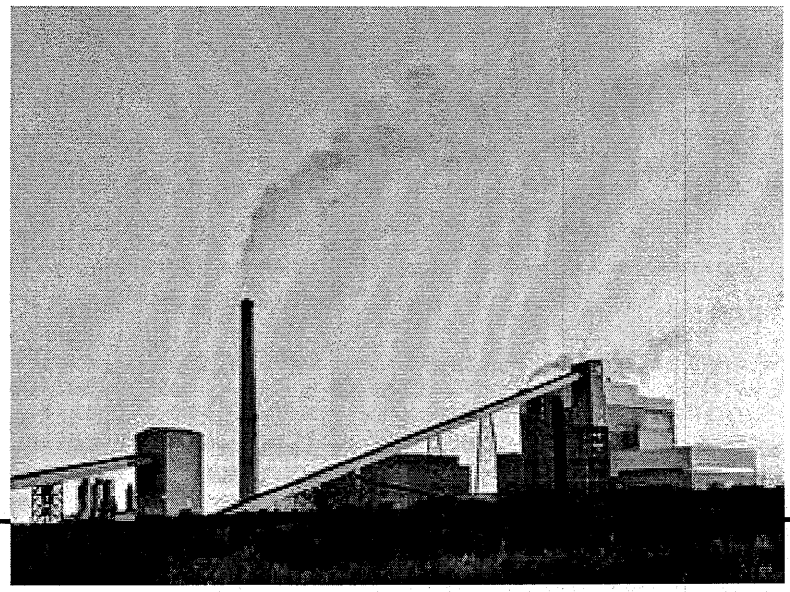
Kansas
Department of Health and Environment

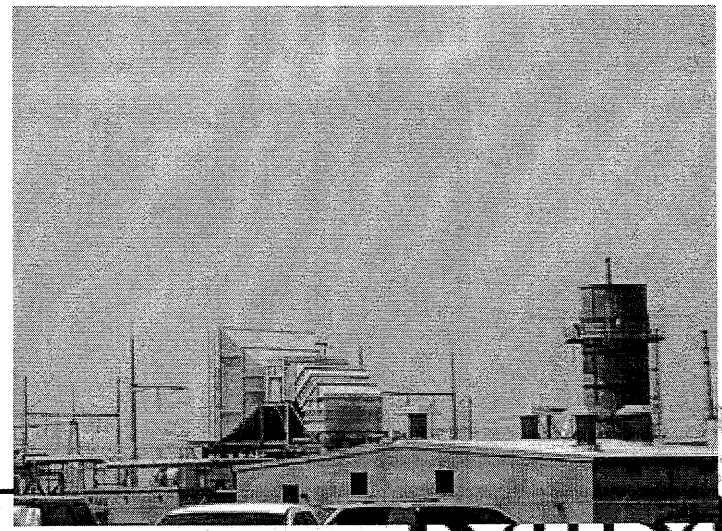
Performance Tests/RATAs

Total number of RATAs from January 2014 to December 2014:

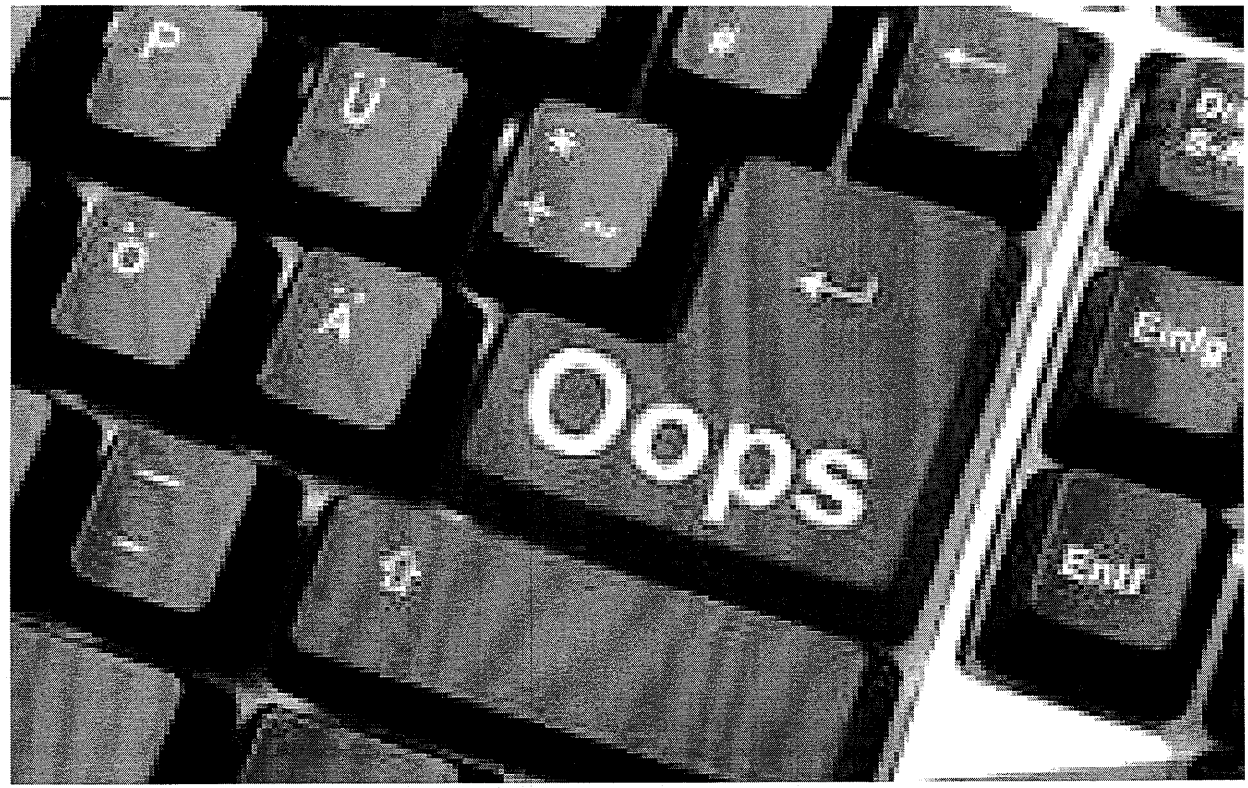
29, of which 24 were observed by KDHE (83%)

Required to observe at least 25% of all RATAs





Avoiding Problems



Our Mission: To protect and improve the health and environment of all Kansans

Kansas
Department of Health and Environment

Avoiding Problems

- Portable analyzers
  - Outside temperature changes
  - Make sure to have a continuous flow rate
  - Proper gases for calibration and drift checks
  - Keep an eye on filter

Avoiding Problems

- Time management
  - Don't wait until the last minute to conduct the test
  - Make sure to notify within the specified deadline
    - Must be submitted at least 30 days prior to the test date, *unless specified differently in the regulation*
  - Make sure to submit the test report timely
    - Submit test report within 30 days after the final day of testing, *unless specified differently in the regulation*

Avoiding Problems

- Time management (con't)
  - Try to give us an actual day if at all possible rather than the week of testing.
  - We understand that dates and start times can change for the testing, try to keep us in the loop.

Avoiding Problems

- Be ready
  - Make sure all parties know what is happening
  - Stress to Operations the importance of the testing
  - Tests must be run at max load (>90%)
  - Must follow the test protocol
    - Changes to the schedule should be made no later than 7 days prior to the test
  - Ensure testers have what they need
    - E.g. electricity, proper test ports, safe testing location

Avoiding Problems

- Be ready (con't)
  - We try to notify the facility in some way when we are coming to observe a test.
  - Expect us
    - It should be no surprise when we show up
    - Any check in/security measures taken before we arrive will expedite the process and get us out of your hair sooner!

Avoiding Problems

- Be ready (con't again)
  - Monitor required operating parameters during the test; be sure they are included in the report
    - Examples:
      - Load (lb/hr, ft/min, MW, tph, bhp, etc)
      - Controls (temperatures, pressure drops, water flow, etc)
      - Operating Parameters (fuel flow, HHV, manifold pressure, etc)

ALT-0061 Withdrawn

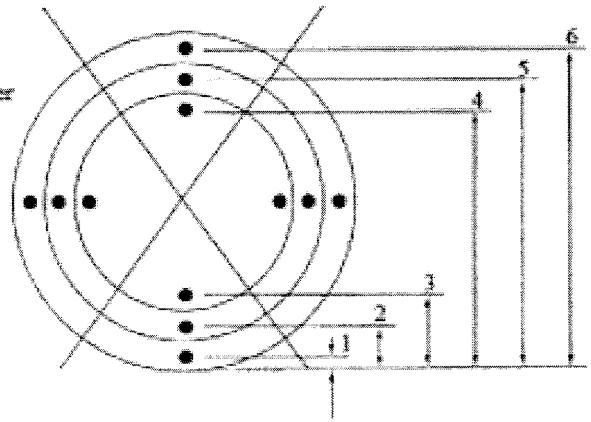
- Alt-0061, EPA approval for single point sampling in RICE
  - Withdrawn due to possibility of stratification of exhaust stream
    - Possibly due to breakthrough or poisoning of the catalyst

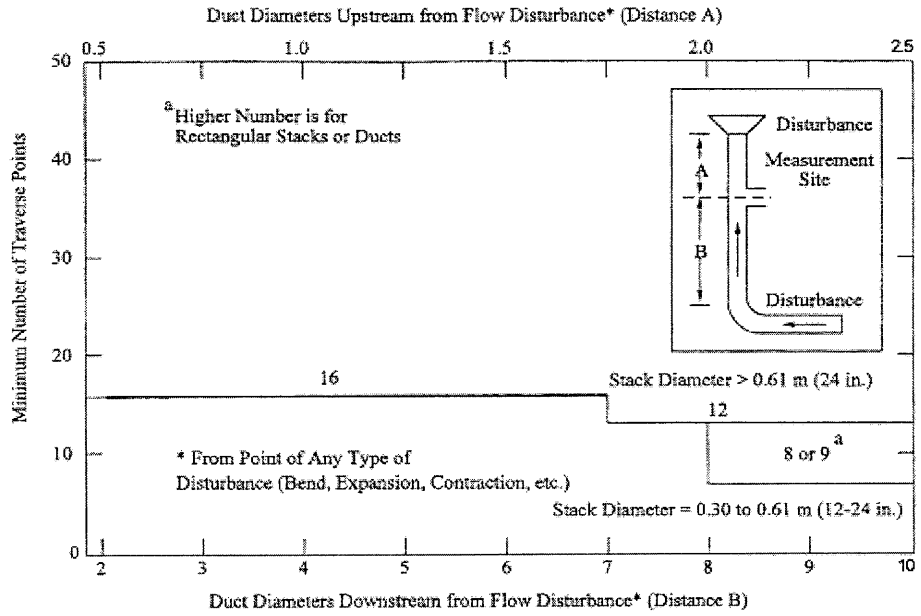
ALT-0061 Withdrawn

- Alt-0061, EPA approval for single point sampling in RICE
- Now requires either a stratification check, or minimum 3 points sampling in all RICE stacks larger than 6" in diameter
  - Ports do not need to meet RM1 requirements

ALT-0061 Withdrawn

Traverse Point	% of diameter Distance
1	4.4
2	14.7
3	29.5
4	70.5
5	85.3
6	95.6

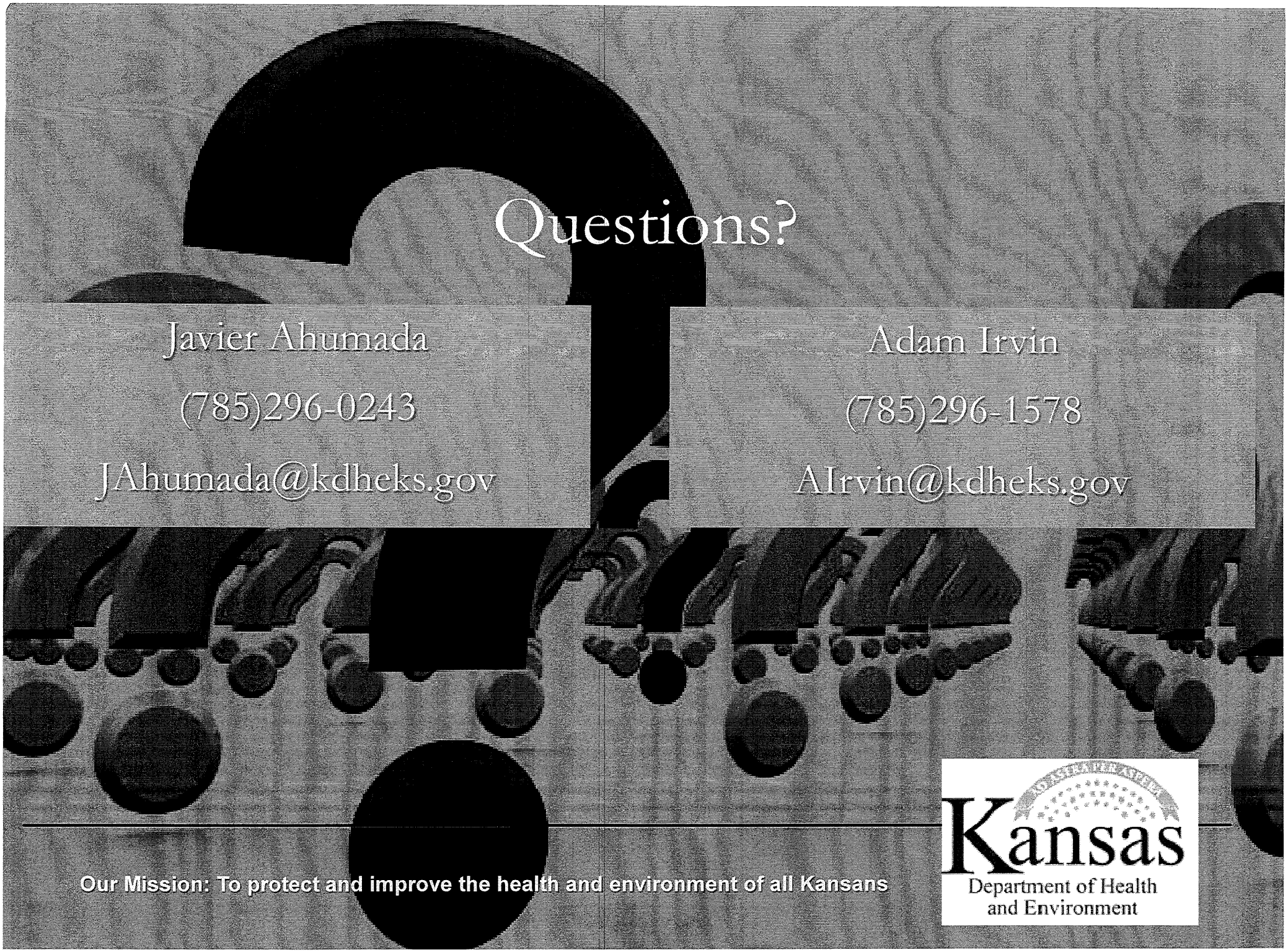




Summary

- Most importantly…

Stay *under* your emission limits!


Questions?
Javier Ahumada
(785)296-0243
JAhumada@kdheks.gov
Adam Irvin
(785)296-1578
AIrvin@kdheks.gov
Our Mission: To protect and improve the health and environment of all Kansans
Kansas
Department of Health
and Environment