ELECTRIC POWER RESEARCH INSTITUTE

ENVIRONMENTAL CONTROL TECHNOLOGY CENTER

REPORT TO THE STEERING COMMITTEE

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Approved Final Technical Report

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All data, results, and remarks contained in this report should be considered preliminary based on the information available to date. Any speculation or conclusions discussed in this report are subject to change as additional information becomes available.

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LIST OF COMMON ABBREVIATIONS

A-S-H.....	Allen Sherman Hoff
BES.....	Bulk Entrainment Separator
CRG.....	Clean Raw Gas
CLS.....	Clear Liquor Scrubbing
DBA.....	Di-Basic Acid
DRG.....	Dirty Raw Gas
ECTC.....	Environmental Control Technology Center
EDR.....	Electrodialysis Reversal Membrane Unit
ESP.....	Electrostatic Precipator
FF.....	Fabric Filter
FGD.....	Flue Gas Desulfurization
FLRT.....	First Loop Reaction Tank
FRP.....	Fiberglass Reinforced Plastic
G/C.....	Gilbert/Commonwealth Inc.
GEESI.....	General Electric Environmental Services Inc.
HME.....	Horizontal Mist Eliminator
HSSD.....	High Sulfur Spray Dryer
HYPAS.....	Hybrid Pollution Abatement System
ID.....	Induced Draft
L/G.....	Liquid to Gas Ratio, (gal/1000ft ³)
MFT.....	Master Fuel Trip
MRT.....	Main Reaction Tank
NTU.....	Number of Transfer Units
NYSEG.....	New York State Gas & Electric
O&M.....	Operations & Maintenance
PJFF.....	Pulse Jet Fabric Filter
RTD.....	Resistance Temperature Detector
RWST.....	Recycle Water Storage Tank
SCBA.....	Scott Air Packs
SDA.....	Spray Dry Absorber
UMIST.....	Univ. of Manchester Inst. of Science & Technology
VME.....	Vertical Mist Eliminator
VSD.....	Variable Speed Drive
WDPF.....	Westinghouse Distributed Process Control System

EXECUTIVE SUMMARY

Operations and maintenance continued this month at the Electric Power Research Institute's Environmental Control Technology Center. Testing in the Hazardous Air Pollutant (HAP) test block was conducted using the Carbon Injection System. Testing also continued across the B&W/CHX Heat Exchanger this month.

The 4.0 MW Spray Dryer Absorber System/Pulse Jet Fabric Filter (SDA/PJFF) (Carbon Injection System) was utilized in the HAP test configuration this month. The 1.0 MW Cold-Side Selective Catalytic Reduction (SCR) unit and the 4.0 MW Pilot Wet FGD Unit remained idle this month in a cold-standby mode. Monthly inspections were conducted on these units.

PILOT TESTING HIGHLIGHTS

The Enhanced Control of Mercury and Other Hazardous Air Pollutants by Innovative Modifications to Wet Flue Gas Desulfurization Processes (HAP) test block began in March as part of the DOE Advanced Power Systems Program. The mission of this program is to accelerate the commercialization of affordable, high-efficiency, low-emission, coal-fueled electric generating technologies. This three-month program is being conducted on the 4.0 MW wet FGD pilot unit and pulse jet fabric filter (PJFF) at the Electric Power Research Institute's (EPRI's) Environmental Control Technology Center (ECTC).

The 1996 HAP test block focuses on three research areas. These areas include:

- Catalytic oxidation of vapor-phase elemental mercury;
- Enhanced particulate-phase HAPs removal by electrostatic charging of liquid droplets; and
- Enhanced mercury removal by addition of additives to FGD process liquor.

Testing in April focused on catalytic oxidation of vapor-phase elemental mercury.¹ Tests included an evaluation of baseline elemental mercury oxidation across the PJFF after cleaning catalyst CT-9 off the Ryton bags, an evaluation of baseline oxidation values across the PJFF with acrylic bags, and an evaluation of catalyst candidates and Nomex® PJFF bag material on Method 29T (M29T) filters at the CRG duct. Seven catalyst candidates were evaluated using the M29T filter apparatus. Various amounts of these materials were tested at filter temperatures of 250°F and 300°F to examine their effect on the oxidation of elemental mercury.

¹ Testing of catalyst materials has not been performed for a long enough duration to distinguish whether the material is reacting with Hg^0 or catalyzing the oxidation of Hg^0 . For purposes of this report, the test material is assumed to catalyze Hg^0 oxidation.

SECTION I FACILITY STATUS

GENERAL

The NYSEG Kintigh Station provided flue gas to the Center 100% of the time during this performance period. As the Kintigh Station operated with a variety of coals, fluctuations in the Center's inlet SO₂ concentrations were experienced.

Safety training for the month was conducted by the O&M Superintendent, Maintenance Supervisor and Shift Supervisors. "Personal Protective Equipment" was the topic of the month. Inspections of the ECTC Facility and safety equipment (SCR air-packs, fire extinguishers, etc.) were completed and recorded this month. All systems were found to be in good condition. By continuing to emphasize safe work habits at the Center, we have raised the total number of days without a lost time injury to 1426 as of 4/30/96.

The monthly safety meeting with the NYSEG Kintigh Station was held on April 30, 1996 with both NYSEG and ECTC representatives. The topics of discussion included an overview of NYSEG's upcoming alternate fuel burn, an update on plant staffing changes, and a discussion of future safety training activities.

CARBON INJECTION SYSTEM

The equivalent and actual availabilities for the ECTC Carbon Injection System testing this month were both 91% during this period.

The Carbon Injection System did not operate during the following periods this month:

- April 16 for 3 hours due to scheduled maintenance on the ESP and FF fan bearings.
- April 17-19 for 47 hours due to blanking plate inspections and maintenance.
- April 19-20 for 18 hours due to blanking plate inspections and maintenance.

The Hazardous Air Pollutants (HAP) test block with the Carbon Injection system was initiated this month with tests HAP-13; HAP-16; HAP-16R; HAP-17; HAP-19A; HAP-19B; HAP-19C; HAP-24; and HAP-25. These mercury removal tests were conducted as elemental mercury was injected at various locations within the ECTC flue gas ductwork. During these tests, simultaneous gas sampling was conducted at the PJFF inlet and outlet, or at the SDA inlet and outlet locations to characterize mercury concentrations and removal. Tests HAP-14; HAP-14A; HAP-15; HAP-18; HAP-20; HAP-21; HAP-22; and HAP-23 were conducted with catalysts dispersed on the PJFF filter media, or on materials used as filters in the gas sampling trains. The operational parameters for the Carbon Injection system during this test block included: gas flows of 3,000; 4,000; and 8,000 scfm, inlet SO₂ concentrations as received from the NYSEG flue gas, and a PJFF outlet temperature of 250°F.

SDA/PJFF SYSTEM

The equivalent and actual availabilities for the Spray Dryer Absorber/Pulse Jet Fabric Filter (SDA/PJFF) system this month were both 60% during this period. The system did not operate during the following periods this month:

- April 2 - 5 for 71 hours to replace the PJFF Ryton bags with used Acrylic bags.
- April 17 - 26 for 218 hours to replace the used Acrylic bags with new Acrylic bags.

As the Ryton bags were removed from the PJFF this month, a set of used Acrylic PJFF bags were installed for testing. However, after only a few weeks of testing, it was found that 55 out of the 68 used Acrylic bags in the PJFF had failed during this initial test period. The failures generally occurred at the top of these bags within the first 12-15 inches from the tube sheet, along the upper seam. Samples of the failed bags were sent to Grubb Filtration Testing Services Inc. for analysis. Their initial reports have indicated that acidic condensation contributed to the attack on the bag material and failure of the bags. A formal report will be forthcoming.

The following maintenance work was completed on the SDA/PJFF system during this performance period:

- The mercury injection apparatus was relocated to several different locations.
- Several ESP field adjustments were conducted for different mass loading specifications (per Radian parameters).
- Several blanking plates were resealed and caulked to prevent leaks.
- A new port was fabricated and installed at the PJFF inlet.
- The CEM cabinet 4 sample line and probe box were moved to the PJFF inlet.
- The PJFF inlet expansion joints (2) were replaced.
- All system pressure transducers were inspected and calibrated.
- The PJFF cleaning manifold diaphragms were inspected and replaced. They were found to be worn but were not leaking.
- The Acrilock Weigh Loss feeder was rewired and programmed for service.

B&W/CHX HEAT EXCHANGER PROJECT

Operation of the 0.5 MW Condensing Heat Exchanger (CHX) unit continued this month for DOE PRDA project with B&W. As measurements and testing across the unit were conducted this month, it was discovered that the outlet plenum duct had hardened and cracked in several places. This ductwork was replaced with a new material fabricated from FRP pipe. Additionally, the hardware used in drain plumbing for the unit (carbon steel) was changed to PVC this month after the wash liquor from the unit was tested and found to have a pH<1.0. It was also found that during the next scheduled outage for the unit, the inlet plenum will require recoating with protective epoxy paint due to corrosion.

B&W/CHX HEAT EXCHANGER PROJECT (cont.)

A technician from Environmental Systems Corporation (ESC) was on-site this month to inspect and service the P-5A Particulate Monitor used in the inlet ductwork for the CHX unit. During this inspection, the optics head was replaced and the unit was recalibrated for service. Also this month, a representative from B&W was on-site for two days (4/29/96 and 4/30/96) to conduct wear measurements on the Teflon® coating which lines the CHX heat exchanger tubes.

The following maintenance work was completed on the CHX unit during this performance period:

- The inlet and outlet drain duct insulation was replaced.
- Guards were fabricated and installed on the unit to isolate the heat tube ends.

MISCELLANEOUS

The following general maintenance work was completed at the ECTC during this performance period:

- The Fabric Filter fan VSD I/O board was removed, cleaned and returned to service.
- Several 4" gate valves used in the gas sampling trains were repaired and returned to service.

FINANCIAL REPORT

The Financial Report for the four Operations and Maintenance contract tasks are summarized below for the month of April 1996, the year to date, and the contract total. All expenses reported below are expressed in terms of U. S. currency dollars.

Task Definitions:

Task 100: Operations and Maintenance Labor

Task 200: Purchased Materials

Task 300: Engineering Support

Task 400: Training

Table i.

Monthly Operating Costs by Task

	April	Year to Date	Contract Total
Task 100	\$ _____	\$ 192,510	\$ 13,880,118
Task 200	\$ 9,995	\$ 48,425	\$ 8,019,723
Task 300	\$ 581	\$ 12,629	\$ 1,151,341
Task 400	\$ _____	\$ 2,563	\$ 52,764
TOTAL	\$ 10,576	\$ 256,127	\$ 23,103,946

The attached graph illustrates the budgeted and actual expenses for ECTC O&M activities through April 1996.

Figure i.
1996 Operation & Maintenance Costs

SECTION II PILOT AND MINI-PILOT TEST ACTIVITY

PILOT

The Enhanced Control of Mercury and Other Hazardous Air Pollutants by Innovative Modifications to Wet Flue Gas Desulfurization Processes (HAP) test block began in March as part of the DOE Advanced Power Systems Program. The mission of this program is to accelerate the commercialization of affordable, high-efficiency, low-emission, coal-fueled electric generating technologies. This three-month program is being conducted on the 4.0 MW wet FGD pilot unit and pulse jet fabric filter (PJFF) at the Electric Power Research Institute's (EPRI's) Environmental Control Technology Center (ECTC). This report includes tests run from April 1 to April 25.

The 1996 HAP test block focuses on three research areas. These areas are:

- Catalytic oxidation of vapor-phase elemental mercury;
- Enhanced particulate-phase HAPs removal by electrostatic charging of liquid droplets; and
- Enhanced mercury removal by addition of additives to FGD process liquor.

Testing in April focused on catalytic oxidation of vapor-phase elemental mercury.¹ Tests included an evaluation of baseline elemental mercury oxidation across the PJFF after cleaning catalyst CT-9 off the Ryton bags, an evaluation of baseline oxidation values across the PJFF with acrylic bags, and an evaluation of catalyst candidates and Nomex® PJFF bag material on Method 29T (M29T) filters at the CRG duct. Seven catalyst candidates were evaluated using the M29T filter. Various amounts of these materials were tested at filter temperatures of 250°F and 300°F to examine their effect on the oxidation of elemental mercury.

Summary of Operations

A detailed summary of operations for April is presented in Table 1. A simplified flow diagram of the ESP/SDA/PJFF gas path used during April's PJFF testing is shown in Figure 1. After removing most of the particulate in the ESP, the flue gas was drawn through the SDA/PJFF and discharged to the TGR. Elemental mercury was injected at the SDA outlet, and gas samples were collected at the SDA inlet (prespike), PJFF inlet (postspike), and the PJFF outlet. The use of these injection and sampling locations minimizes the gas residence time in the duct.

¹ Testing of catalyst materials has not been performed for a long enough duration to distinguish whether the material is reacting with Hg^0 or catalyzing the oxidation of Hg^0 . For purposes of this report, the test material is assumed to catalyze Hg^0 oxidation.

Ryton bags were used in the PJFF during the first two tests performed in April. As described in the March progress report, it was found that the Ryton bags oxidized a significant fraction of the elemental mercury. The bag materials testing in March indicated that acrylic bags (as well as other bag materials) oxidized very little mercury. Since acrylic bags had the shortest delivery time of the acceptable bag materials, acrylic bags were purchased to replace the Ryton bags.

While waiting for the new acrylic bags to arrive, a previously used set of acrylic PJFF bags was installed to replace the Ryton bags. Before being installed, some of these used acrylic bags were tested by Grubb Filtration Testing Services, Inc. to evaluate their permeability and overall condition. The results of these tests indicated that the bags were of sufficient quality to be used until the new acrylic bags arrived. The used acrylic bags were then installed in the PJFF. As testing resumed, the used acrylic bags lasted 12 days in operation before leaks were detected. When removed, the bags were found to be brittle with many holes of various sizes (located primarily at the top of the bags).

The new acrylic bags arrived shortly after the used bags failed. As these bags were installed, the PJFF testing resumed and continued for the next 10 days. After 10 days of continuous operation, leaks were detected in the new acrylic bags. When removed, the acrylic material was again brittle and very dark - almost black. This stiff, brittle fabric was determined to be characteristic of hydrolytic degradation. The acrylic bags had a maximum operating temperature range of 275-285°F. The PJFF was operated with an inlet temperature of 275°F and an outlet temperature of 250°F. Since these temperatures are close to the acid dew point, sulfuric acid condensation probably occurred, and the acid resistance of the acrylic bags was not sufficient to operate in this environment.

To replace the acrylic bags in the PJFF, two sets of woven fiberglass bags with a polytetrafluoroethylene (PTFE) membrane were ordered (to be known hereafter as "PTFE/fiberglass bags"). (Note - In previous progress reports, this PTFE coating had been incorrectly referred to as Gore-tex®. Since the bags and membrane were not manufactured by Gore Technologies, it will no longer be referred to as Gore-tex®, nor as Teflon® from Dupont, though these materials are types of PTFE). The PTFE/fiberglass bags have a much higher operating temperature range and better chemical resistance than the acrylic bags. While waiting for these bags to arrive (and during other rebagging periods), catalyst samples were tested by placing them on a M29T filter and pulling flue gas from the CRG through the filter. Tests were conducted at both 250°F and 300°F. Catalyst tests at 300°F (test HAP-20, -21, -22, -23) were preconditioned by sampling with Method 29 (M29) impingers for one hour before sampling with M29T impingers.

Summary of Results

This progress report discusses tests conducted from April 1 to April 25. Complete analytical data tables and process data summary reports for the tests completed in April are appended to this report. This report also includes additional process

summary reports from March. These reports are included this month because of previous problems with the ECTC calculator system which downloads continuous data from the Westinghouse digital control system (DCS). This problem has since been resolved.

Test conditions and results of the HAP test block completed in April are presented in Table 2. Table 2 is divided into three sections. The first section contains information about the test conditions. The second section reports the mercury concentrations measured upstream of elemental spiking, downstream of elemental spiking but upstream of the catalyst, and downstream of the catalyst. During the M29T filter tests, a filter train containing no catalyst was run simultaneously with the catalyst train. This baseline train provided the mercury concentrations at the catalyst inlet. During all the tests, the mercury captured in the Tris impingers was assumed to be oxidized mercury, and the mercury captured in the KMnO_4 impingers was assumed to be elemental.

The third section of Table 2 reports the elemental mercury oxidation results. The reduction in elemental mercury across the catalyst is calculated by dividing the difference between the inlet and outlet elemental mercury concentrations (based on the KMnO_4 analyses) to the inlet elemental mercury concentration. This calculated value represents elemental mercury losses due to both oxidation and adsorption by the catalyst material. The percentage of inlet elemental mercury oxidized across the catalyst was determined by dividing the difference in the inlet and outlet oxidized mercury concentrations (as measured by the Tris impingers) to the inlet elemental mercury concentration. In the absence of adsorption, the decrease in elemental mercury across the catalyst should be equal to the increase in oxidized mercury. However, sampling and analytical variability can result in differences between these two values. A consistent way of interpreting these data is described below.

Capture of mercury across the catalyst material can be detected by the total removal of mercury across the catalyst. Table 2 shows the total mercury removal (relative difference between total inlet and outlet mercury concentrations) across the catalyst. If the test material is only converting Hg^0 to Hg^{2+} , the total mercury removal should be zero. Of the twenty three tests conducted in April, the total mercury removal was within $\pm 10\%$ for seventeen tests which indicates no adsorption occurred. Of the remaining six tests, removal was negative during four tests and positive during two tests. Total removal values lower than -10% are assumed to be the result of sampling and analytical variability, and results from these tests should be considered with less confidence. Total removal values greater than 10% are assumed to be the result of elemental or oxidized mercury adsorption on the catalyst material.

To determine the overall elemental mercury oxidation and adsorption across the catalyst, the total mercury removal must be considered. In Table 2, if the total mercury removal is less than 10% (including negative removals), the overall Hg^0 oxidation is calculated as the average of the percent oxidation based on the increase in oxidized mercury and the percent oxidation based on the decrease in elemental

mercury across the catalyst. If the total removal is greater than 10%, oxidation is calculated as the percent increase in oxidized mercury, and adsorption is assumed to be equal to the difference between total elemental mercury reduction and the oxidation fraction.

As shown in Table 2, seven different catalysts were tested in April to determine their ability to oxidize elemental mercury. Table 3 lists the catalyst materials and gives a brief description of each. Four of the catalysts are iron-based. One carbon, one SCR-type catalyst, and one palladium-based catalyst were also tested.

Testing in April started with determination of the baseline, elemental mercury oxidation across the PJFF with Ryton bags installed. Just prior to this test, the bags had been coated with catalyst CT-9 to determine its ability to oxidize mercury (see March progress report). The bags were thoroughly cleaned before conducting this repeat baseline test. After these tests, the Ryton bags were removed and acrylic bags installed. Baseline tests were done with the acrylic bags, but the bags failed before any catalyst could be deposited onto the bags. Testing continued with catalysts on filters of M29T gas sampling trains at the CRG duct to evaluate the oxidation of elemental mercury. These tests were performed at 250°F and 300°F. As shown in Table 2, different quantities were tested with some catalysts.

Bag Material Effect on Elemental Mercury Oxidation (Baseline Values)

Figure 2 shows the oxidation of elemental mercury across the PJFF using Ryton and acrylic bags. The Ryton tests (HAP-12 and -13) were repeat baseline tests performed at 8000 scfm after cleaning catalyst CT-9 off the bags. These repeat tests resulted in 76% and 83% oxidation of mercury. The original baseline values ranged from 61% to 73% prior to depositing CT-9 on the bags (see March 1996 progress report). The higher baseline oxidation observed after cleaning the bags suggests that residual catalyst may have remained on the bags and continued to oxidize mercury.

As shown in Figure 2, the acrylic bags were tested at different gas rates and with various amounts of fly ash accumulated on the bags. Tests HAP-16 and -16R were conducted at 8000 scfm after accumulated fly ash had been pulse-cleaned. Tests HAP-19A, B, and C were also conducted at 8000 scfm, but accumulated fly ash was not removed from the bags between tests. Variations in fly ash accumulation did not appear to affect the oxidation values across the acrylic bags. The average baseline oxidation across the acrylic bags at 8000 scfm ranged from 15% to 24% with an average of 21%. This average baseline value appears to be significantly lower than that of Ryton bags.

Finally, test HAP-17 was conducted at 3000 scfm with clean bags, and an average oxidation of 40% oxidation was measured. This result suggests that oxidation increases as the gas residence time increases, which agrees with previous data describing the relationship between elemental mercury oxidation and residence time. However, as shown in Table 2, a poor mercury material balance was obtained during this test with an overall mercury removal across the PJFF of -31%. The

decrease in elemental mercury across the PJFF was 15% which is consistent with the other baseline tests. However, the increase in oxidized mercury was 65% which is much higher than the other tests. The overall average of 40% appears to be consistent with the expected trend of higher oxidation at longer residence times.

Effect of Catalyst Type on Elemental Mercury Oxidation

Oxidation at 250 °F.

Figure 3 shows the elemental mercury oxidation for various catalyst types tested at 250°F on M29T filters. During each test, 0.387 grams of catalyst was placed on the M29T filter, and the same material was used to collect three sets of impinger samples. Catalysts CT-7 and -11 were sampled over three runs the first day of testing, then kept at 250°F on the filter in the hot box of the sampling train before three more runs of testing were done the next day. Candidates CT-4 and -5 were preconditioned with flue gas the previous afternoon before sampling three runs of 30 dscf each. CT-9 was preconditioned for one hour with a Method 29 train before three Method 29T trains were run.

As seen in Figure 3, catalysts CT-4, CT-5, CT-7, and CT-11 did not oxidize any elemental mercury at 250°F; however, CT-9 oxidized about 20% of the elemental mercury after preconditioning the sample. The total Hg^0 removal across CT-9 was about 86% during all three runs. These data indicate that in addition to oxidizing about 20% of the Hg^0 , about 65% was also adsorbed by the catalyst. The level of oxidation and adsorption remained relatively constant during each sampling run.

Oxidation Effect at 300 °F.

Figure 4 shows the elemental mercury oxidation for various catalyst types tested at 300°F on M29T filters. During each of these tests, the catalyst was preconditioned by pulling 60 dscf across the catalyst using a Method 29 train. Three Method 29T samples were then collected (each approximately 30 dscf). The buffer capacity of the Tris impinger solutions prohibited longer sampling times.

Although no oxidation was measured with catalyst candidate CT-11 or the Nomex[®] bag material, several of the other catalyst materials oxidized elemental mercury at 300°F. For samples CT-4, CT-6, and CT-8, oxidation appeared to decrease slightly as the volume of gas sampled increased. These data suggest that a flue gas contaminate is somehow affecting the activity of the catalyst by competing for active oxidation sites or some other mechanism. SO_3 is suspected to be this contaminate; however, the mechanism by which the decrease in activity occurs is not known.

Unlike the other samples, elemental mercury oxidation was initially about 25% and then increased to 50% using catalyst CT-9. Total elemental mercury reduction across the catalyst was about 88% during each run. Based on the oxidation data, elemental mercury adsorption was initially about 60% and then decreased to about 35%. This level of capture is lower than that measured at 250°F (65%) which is consistent with

the theoretical effect of temperature on physical adsorption. These data suggest that physical adsorption may account for the capture mechanism.

Based on the data shown in Figure 4, the effect of flue gas exposure time on the oxidation of elemental mercury is dependent on the catalyst material. None of the catalysts have been tested long enough to determine if the activity eventually goes to zero or reaches a constant value. In addition, the mechanisms which cause the changes in oxidation are not known.

Oxidation Effect of Catalyst : Hg ratio. .

The effect of catalyst mass (surface area) on elemental mercury oxidation is shown in Figure 5. Different quantities of catalyst candidate CT-4 were tested at 250°F at the CRG duct on a filter in a M29T gas sampling train. The test using 0.387 g of catalyst was sampled for three runs of 30 dscf each. When 2.5 g of CT-4 was tested, it was preconditioned with 50 dscf flue gas using a M29 gas sampling train before three runs sampling 30 dscf each with a M29T sampling train. As shown in Figure 5, the elemental mercury oxidation increased significantly after increasing the mass of catalyst. However, when using 2.5 g of CT-4, the oxidation decreased with exposure time to flue gas. These data suggest that the extra catalyst mass simply increased the amount of flue gas required to deactivate the catalyst. More tests are needed to determine the effect of long flue gas exposure times on catalyst activity.

PJFF Bag Material Effect on Elemental Mercury Oxidation

Nomex® PJFF bag material was tested at 300°F on a M29T filter at the CRG duct. The results are shown in Figure 4. Over three runs, the oxidation of elemental mercury ranged from -5% to 3%. These values show that there is no effect of Nomex® bag material on the oxidation of elemental mercury within our ability to analyze mercury in samples.

Effect of Chloride Concentration in M29 Sampling Trains

Figure 6 shows the effect of chloride concentration in M29 peroxide impingers on the capture of elemental mercury. Hydrochloric acid was spiked into the first peroxide impinger before intratrain elemental mercury spiking was begun. Figure 6 shows that the mercury capture in the first and second impinger increased with increasing chloride concentration. The total mercury capture in the first peroxide impinger increased from 1.3% to 8.3% as the chloride concentration was increased from 0 ppm to 1.3 ppm. The total mercury capture in the second peroxide impinger ranged from 0.2% to 0.7% over this same range of chloride concentrations. These data suggest that the enhanced solubility of elemental mercury in peroxide impingers may be partially dependent on chlorides in the flue gas. However, because the total mercury capture in the first impinger is not as great as seen when sampling with flue gas (30% - 40% in the first impinger and 10%-20% in the second impinger), there are other, as yet unidentified, factors that also affect the solubility.

Future Tests

The HAP test block will continue in May as new acrylic bags are to be installed to replace the failed PJFF bags. The effect of various catalytic candidates on the oxidation of elemental mercury will be tested. In addition, a liquid droplet charger designed by ADA Technologies, Inc., will be tested to determine if particulate removal across the wet scrubber can be improved.

Table 1. April Process Operating Conditions Summary

Date	Test Parameters	Gas Sampling Summary	Process Summary
Mon. 4/1	HAP-12 8000 scfm Baseline with clean Ryton PJFF bags. 24.13 g/Nm ³ actual Hg ⁰ spike.	Mercury injector at SDA outlet. Gas sampling at the SDA inlet (prespike), PJFF inlet (post spike), and PJFF outlet (post catalyst).	Day 7 after CT-9 was deposited on the PJFF bags. PJFF ΔP range was 1.0 to 1.2 during the sampling time. Fly ash was collected on the PJFF after sampling until evening then pulse- cleaned again for next day's testing.
Tues., 4/2	HAP-13 8000 scfm Baseline with clean Ryton PJFF bags. 45.74 g/Nm ³ actual Hg ⁰ spike.	Mercury injector at SDA outlet. Gas sampling at the SDA inlet (prespike), PJFF inlet (post spike), and PJFF outlet (post catalyst).	Day 8 after CT-9 was deposited on the PJFF bags. PJFF ΔP range was 1.1 to 1.2 during the sampling time. Pressure taps on PJFF blown.
Wed., 4/3	HAP-14 5500 scfm at the CRG duct. Testing CT-7 and CT-11.	Mercury injector at ESP fan inlet. Testing 387mg catalyst on filters at the CRG duct. Sampling with three M29T trains: baseline and two with catalyst candidates at 250°F hot box temp. At the end of testing, the catalysts were kept in the sampling trains at 250°F overnight. The ends of the trains were capped.	250°F at the CRG duct. Ryton bags removed from the PJFF. Catalyst CT-9 was still visible on the bags. Facility outlet O ₂ values were 10-12%.
Thurs., 4/4	HAP-14A 5500 scfm at the CRG duct. Testing CT-7 and CT-11.	Continuation of the testing from Wed. Sampling with three M29T trains: baseline and two with catalyst candidates at 250°F hot box temp.	250°F at the CRG duct.
Fri., 4/5	HAP-15 5500 scfm at the CRG duct. Testing CT-4 and CT-5.	Mercury injector at ESP fan inlet. Testing 387mg catalyst on filters at the CRG duct. Sampling with three M29T trains: baseline and two with catalyst candidates at 250°F hot box temp. Catalysts were conditioned yesterday afternoon and then left in the sampling trains at 250°F overnight.	Facility SO ₂ concentration fell below 1000 ppm during testing. No spiking location in this day's gas configuration. Acrylic bags installed in the PJFF.

Table 1. April Process Operating Conditions Summary (cont.)

Date	Test Parameters	Gas Sampling Summary	Process Summary
	HAP-00	Intratrain elemental mercury spiking to test effect of Cl ⁻ on mercury speciation in M29 gas sampling train.	
Sat.-Sun. 4/6-4/7			PJFF on-line at 8000 scfm to condition the acrylic PJFF bags. ΔP initiate pulse-cleaning at 6.0 in. H ₂ O (Average ΔP = 5.8 in. H ₂ O). High ash gas supplied by detuning the ESP.
Mon., 4/8			The ESP was reset to remove maximum particulate. The PJFF was pulse-cleaned 15 min. every 30 minutes throughout the night.
Tues., 4/9	HAP-16 Baseline 8000 scfm 25.79 g/Nm ³ actual Hg ⁰ spike.	Mercury injector at SDA outlet. Gas sampling at the SDA inlet (prespike), PJFF inlet (post spike), and PJFF outlet (post catalyst).	ΔP of clean acrylic bags was 1.7 in. H ₂ O. 250°F at PJFF outlet. Pulse-cleaned the PJFF 15 min. before each run.
Wed., 4/10	HAP-16R Baseline 8000 scfm 24.22 g/Nm ³ actual Hg ⁰ spike.	Repeat testing of baseline with acrylic PJFF bags. Mercury injector at SDA outlet. Gas sampling at the SDA inlet (prespike), PJFF inlet (post spike), and PJFF outlet (post catalyst).	250°F at PJFF outlet. Pulse-cleaned the PJFF 15 min. before each run.
Thurs., 4/11	HAP-17 Baseline 3000 scfm 16.83 g/Nm ³ actual Hg ⁰ spike.	Gas sampling at the SDA inlet (prespike), PJFF inlet (post spike), and PJFF outlet (post catalyst).	250°F at PJFF outlet. Pulse-cleaned the PJFF 15 min. before each run. ΔP at the start of testing was 0.5 in. H ₂ O.
	HAP-18	Testing 774mg CT-4 at PJFF inlet at 300°F using Method 29 train.	
Fri., 4/12	HAP-19A 8000 scfm Fine ash accumulation. 18.38 g/Nm ³ actual Hg ⁰ spike.	Sampling first day of fine fly ash accumulation on the PJFF (i.e. no pulsing). Gas sampling at the SDA inlet (prespike), PJFF inlet (post spike), and PJFF outlet (post catalyst).	ESP operating with 5 fields in service. PJFF ΔP was 1.4 in. H ₂ O at start of run 1.

Table 1. April Process Operating Conditions Summary (cont.)

Date	Test Parameters	Gas Sampling Summary	Process Summary
Sat.-Sun. 4/13 - 4/14			No pulsing of the PJFF.
Mon., 4/15	HAP-19B 8000 scfm Fine ash accumulation. 19.37 g/Nm ³ actual Hg ⁰ spike.	Sampling fourth day of fine fly ash accumulation on the PJFF (i.e. no pulsing). Gas sampling at the SDA inlet (prespike), PJFF inlet (post spike), and PJFF outlet (post catalyst).	PJFF ΔP was 1.5 in. H ₂ O at start of run 1.
Tues., 4/16	HAP-19C 8000 scfm Fine ash accumulation. 17.26 g/Nm ³ actual Hg ⁰ spike.	Sampling fifth day of fine fly ash accumulation on the PJFF (i.e. no pulsing). Gas sampling at the SDA inlet (prespike), PJFF inlet (post spike), and PJFF outlet (post catalyst). Sampling with the probe nozzles counter-current to the gas flow showed no fly ash accumulation on filters.	PJFF ΔP was 1.5 in. H ₂ O at start of run 1 (No change from yesterday). ESP removing all fly ash as shown by no accumulation on gas sampling filters.
Wed., 4/17			A high ESP opacity spike was discovered when adding fly ash to the PJFF inlet port to test for bag leaks. This indicated that the bags were leaking and that blanking plate "H" was leaking also. Facility taken off-line to inspect and repair.
Thurs. - Sat. 4/18 - 4/20			Facility off-line to repair blanking plate "H" and to remove PJFF bags
Sat. - Sun. 4/20 - 4/21		Mercury injection started at ESP fan inlet.	Gas flow 5600 scfm at the CRG duct. ESP fan in manual because of current spike problems with variable speed drive.
Mon., 4/22	HAP-20 5650 scfm at the CRG duct. Testing CT-4 and CT-6.	Mercury injector at ESP fan inlet. Testing 1.2 g CT-4 and 2.5g CT-6 catalyst on filters at the CRG duct. Sampling with three M29T trains: baseline and two with catalyst candidates at 300°F hot box temp. The catalysts were conditioned for one hour using M29 trains before sampling with M29T trains at 0.5 cf/min	Gas flow set at 5650 scfm and CRG duct temp at 300°F. The acrylic bag material was brittle with holes near top of bag.

Table 1. April Process Operating Conditions Summary (cont.)

Date	Test Parameters	Gas Sampling Summary	Process Summary
Tues., 4/23	HAP-21 5700 scfm at the CRG duct. Testing CT-9 and CT-11.	Mercury injector at ESP fan inlet. Testing 0.634g CT-9 and 5.0g CT-11 catalyst on filters at the CRG duct. Sampling with three M29T trains: baseline and two with catalyst candidates at 300°F hot box temp. The catalysts were conditioned for one hour at 0.8 cf/min at 0.8 cf/min using M29 trains before sampling with M29T trains at 0.5 cf/min (increased residence time).	Sending three failed acrylic bags to Grubb filtration for analysis.
Wed., 4/24	HAP-22 5200 scfm at the CRG duct. Testing CT-4 and CT-9.	Testing 2.5g CT-4 and 1.0g CT-9 catalyst on filters at the CRG duct. Sampling with three M29T trains: baseline and two with catalyst candidates at 250°F hot box temp. The catalysts were conditioned for one hour at 0.8 cf/min using M29 trains before sampling with M29T trains at 0.5 cf/min (increased residence time).	Installation of new PJFF acrylic bags.
Thurs., 4/25	HAP-23 5700 scfm at the CRG duct. Testing CT-8 and Nomex® PJFF bag material.	Testing 2.5g CT-8 and cm ² Nomex® PJFF bag material on filters at the CRG duct. Sampling with three M29T trains: baseline and two with other materials at 250°F hot box temp. The materials were conditioned for one hour at 0.8 cf/min using M29 trains before sampling with M29T trains at 0.5 cf/min (increased residence time).	Completed installation of new acrylic PJFF bags.
Fri., 4/26			Replaced the diaphragm valve on the PJFF blower. Five pounds hydrated lime added at PJFF inlet at startup. Started up with clean raw gas, then switched to dirty raw gas to condition the bags.

Table 1. April Process Operating Conditions Summary (cont.)

Date	Test Parameters	Gas Sampling Summary	Process Summary
Sat. - Sun. 4/27 - 4/28			The PJFF was pulse-cleaned with ΔP initiate set at 4.0 in. water. Set 275°F as maximum inlet gas temp. - resulting in 255°F outlet temp. Pulses were 6-7/hour maintaining an average ΔP of 3.8 in. H ₂ O. At 1800, Sunday, began cleaning 10min. on the hour.
Mon., 4/29	HAP-24 4000 scfm Baseline with Acrylic Bags	Mercury injector at SDA outlet. Gas sampling at the SDA inlet (prespike), PJFF inlet (post spike), and PJFF outlet (post catalyst). Tris impinger solutions were cloudy after gas sampling.	Fabric filter fan being controlled locally at the VSD because of loss of control through the Westinghouse. 255°F PJFF outlet temp. Facility down at 1300 to replace fabric filter fan control card in the Westinghouse. Installation of CEM at PJFF inlet.
Tues., 4/30	HAP-25 8000 scfm Baseline with Acrylic Bags.	Mercury injector at SDA outlet. Gas sampling at the SDA inlet (prespike), PJFF inlet (post spike), and PJFF outlet (post catalyst).	260°F at the PJFF outlet. PJFF ΔP was 1.3 in. H ₂ O at the start of testing and increased to 1.4 during the first run.

Table 2. PRDA HAP Test Conditions and Results

Test ID	Test Description	Spike Location	Post-Catalyst Sample Location	Spike Res. Time (sec.)	Gas Flow (scfm)	Catalyst Conditions		Flue Gas Mercury Concentrations (µg/Nm3)						Hg(0) Spike	Reduction in KMnO4 % Hg(0) Removed	Increase in Tris % Hg(0) Oxidized	Overall % Hg(0) Oxidized	Overall % Hg(0) Adsorbed	% Rem. of Total Hg
						Temp. (°F)	Mass (mg)	Prespike		Catalyst Inlet (Postspike)		Catalyst Outlet (Post Catalyst)							
								Tris	KMnO4	Tris	KMnO4	Tris	KMnO4						
HAP-12	Baseline with clean PJFF bags	SDA Outlet	PJFF Outlet	12	8000	250	-	8.13	1.30	7.33	29.20	28.81	6.35	27.10	78%	74%	76%	0%	4%
HAP-13	Baseline with clean PJFF bags	SDA Outlet	PJFF Outlet	12	8000	250	-	11.66	1.82	15.66	50.46	60.88	11.46	52.64	77%	90%	83%	0%	-9%
HAP-14	Catalyst CT-7 on M29T filter	ESP Fan Inlet	CRG Duct	NA	5500	250	387	-	-	21.33	42.04	23.32	39.56	-	6%	5%	5%	0%	1%
HAP-14	Catalyst CT-11 on M29T filter	ESP Fan Inlet	CRG Duct	NA	5500	250	387	-	-	21.33	42.04	23.31	43.13	-	-3%	5%	1%	0%	-5%
HAP-14A	Continuation of Catalyst CT-7 on M29T filter	ESP Fan Inlet	CRG Duct	NA	5500	250	387	-	-	15.80	39.16	16.84	37.86	-	3%	3%	3%	0%	0%
	Continuation of Catalyst CT-11 on M29T filter	ESP Fan Inlet	CRG Duct	NA	5500	250	387	-	-	15.80	39.16	17.33	39.99	-	-2%	4%	1%	0%	-4%
HAP-15	Pre-conditioned Catalysts CT-4 on M29T filter	ESP Fan Inlet	CRG Duct	NA	5500	250	387	-	-	22.81	41.34	24.32	39.09	-	5%	4%	5%	0%	1%
HAP-15	Pre-conditioned Catalysts CT-5 on M29T filter	ESP Fan Inlet	CRG Duct	NA	5500	250	387	-	-	22.81	41.34	28.55	38.63	-	7%	14%	10%	0%	-5%
HAP-00	Effect of Cl on Hg speciation in Method 29	Intrain Spiking	-	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HAP-16A	Baseline with Fly-ash-Conditioned New Acrylic Bags	SDA Outlet	PJFF Outlet	12	8000	250	-	8.65	2.26	10.93	34.30	18.42	28.36	34.32	17%	22%	20%	0%	-3%
HAP-16B	Baseline with Fly-ash-Conditioned New Acrylic Bags	SDA Outlet	PJFF Outlet	12	8000	250	-	7.66	2.02	10.48	29.63	18.69	24.18	30.43	18%	28%	23%	0%	-7%
HAP-17	Baseline with Fly-ash-Conditioned New Acrylic Bags	SDA Outlet	PJFF Outlet	32	3000	250	-	8.46	1.49	13.48	21.66	27.49	18.46	25.19	15%	65%	40%	0%	-31%
HAP-18	Catalyst CT-4 on M29T filter	ESP Fan Inlet	PJFF Inlet	32	3000	300	778	-	-	13.48	21.66	17.15	14.85	-	31%	17%	24%	0%	9%
HAP-19A	Baseline with Acrylic Bags	SDA Outlet	PJFF Outlet	12	8000	250	-	6.91	1.75	7.17	23.68	12.81	19.20	22.19	19%	24%	21%	0%	-4%
HAP-19B	Baseline with Acrylic Bags	SDA Outlet	PJFF Outlet	12	8000	250	-	9.45	1.96	10.72	24.59	14.20	20.63	23.90	16%	14%	15%	0%	1%

Mercury concentrations and spike values are normalized to 5% O₂. a=PJFF outlet temp. for PJFF tests

Temp. when testing with M29 filters.

Table 2. PRDA HAP Test Conditions and Results

Test ID	Test Description	Spike Location	Post-Catalyst Sample Location	Spike Res. Time (sec.)	Gas Flow (scfm)	Catalyst Conditions		Flue Gas Mercury Concentrations (µg/Nm3)								Reduction in KMnO4 % Hg(0) Removed	Increase in Tris % Hg(0) Oxidized	Overall % Hg(0) Oxidized	Overall % Hg(0) Adsorbed	% Rem. of Total Hg
						Temp. (°F)	Mass (mg)	Prespike		Catalyst Inlet (Postspike)		Catalyst Outlet (Post Catalyst)		Hg(0) Spike						
								Tris	KMnO4	Tris	KMnO4	Tris	KMnO4							
HAP-19C	Baseline with Acrylic Bags	SDA Outlet	PJFF Outlet	12	8000	250	-	7.62	2.27	6.35	23.57	14.23	20.04	20.03	15%	33%	24%	0%	-15%	
HAP-20	Catalyst CT-4 on M29T filter	ESP Fan Inlet	CRG Duct	NA	5650	300	1200	-	-	12.62	31.86	20.05	27.49	-	14%	23%	19%	0%	-7%	
HAP-20	Catalyst CT-6 on M29T filter	ESP Fan Inlet	CRG Duct	NA	5650	300	2500	-	-	12.62	31.86	30.88	18.18	-	43%	57%	50%	0%	-10%	
HAP-21	Catalyst CT-9 on M29T filter	ESP Fan Inlet	CRG Duct	NA	5700	300	634	-	-	12.13	26.42	23.55	3.12	-	88%	43%	43%	45%	31%	
HAP-21	Catalyst CT-11 on M29T filter	ESP Fan Inlet	CRG Duct	NA	5700	300	5000	-	-	12.13	26.42	17.52	27.98	-	-6%	20%	7%	0%	-18%	
HAP-22	Catalyst CT-4 on M29T filter	ESP Fan Inlet	CRG Duct	NA	5200	250	2500	-	-	11.41	27.95	18.79	21.73	-	22%	26%	24%	0%	-3%	
HAP-22	Catalyst CT-9 on M29T filter	ESP Fan Inlet	CRG Duct	NA	5200	250	1000	-	-	11.41	27.95	17.45	3.85	-	86%	22%	22%	65%	46%	
HAP-23	Catalyst CT-8 on M29T filter	ESP Fan Inlet	CRG Duct	NA	8000	300	2500	-	-	12.93	25.11	23.41	20.92	-	17%	42%	29%	0%	-17%	
HAP-23	Nomex® with Gore-tex® PJFF bag material	ESP Fan Inlet	CRG Duct	NA	8000	300	-	-	-	12.93	25.11	12.35	25.49	-	-2%	-2%	-2%	0%	1%	

Table 3. Catalyst Descriptions

ECTC ID	Brief Catalyst Description
CT-4	Iron-based catalyst #1
CT-5	Palladium-based catalyst #1
CT-6	Iron-based catalyst #2
CT-7	Iron-based catalyst #3
CT-8	SCR NO _x catalyst
CT-9	Activated carbon
CT-11	Iron-based catalyst #5

Figure 1. Simplified Flow Diagram for Pilot Plant Hg^0 Oxidation Testing

Figure 2. Elemental Mercury Oxidation Baseline Tests Using Ryton and Acrylic PJFF Bags

Figure 3. Effect of Gas Sample Volume on the Oxidation of Mercury with Various Materials at 250°F

Figure 4. Effect of Gas Sample Volume on the Oxidation of Mercury with Various Materials at 300°F

Figure 5. Effect of Gas Sample Volume and Quantity of Catalyst CT-4 on Oxidation of Mercury at 250°F

Figure 6. Effect of Chloride Spiking on Elemental Mercury Capture in M29 Peroxide Impingers

APPENDIX A
TEST SCHEDULES

EPRI ENVIRONMENTAL CONTROL TECHNOLOGY CENTER TEST CALENDAR

April 1996 (Updated May 8, 1996)

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	¹ Haz Air Pollutants HAP-12 Baseline Test	² Haz Air Pollutants HAP-13 Baseline with incr. mercury spike	³ Haz Air Pollutants HAP-14 Catalysts Tested on M29T Filters at CRG, 250F	⁴ Haz Air Pollutants HAP-14A Catalysts Tested on M29T Filters at CRG, 250F	⁵ Haz Air Pollutants HAP-15; HAP-00 Catalysts Tested on M29T Filters; HCL addition to M29	⁶ Haz Air Pollutants Fly Ash Collected on Newly Installed Acrylic PJFF Bags
⁷ Haz Air Pollutants Fly Ash Collected on Newly Installed Acrylic PJFF Bags	⁸ Haz Air Pollutants Pulse-cleaning the Newly Installed Acrylic PJFF Bags	⁹ Haz Air Pollutants HAP-16 Baseline with Acrylic PJFF Bags 8000 scfm	¹⁰ Haz Air Pollutants HAP-16R Baseline with Acrylic PJFF Bags 8000 scfm	¹¹ Haz Air Pollutants HAP-17; HAP-18 Baseline with Acrylic PJFF Bags, 3000 scfm; Catalyst on Filter, 300F	¹² Haz Air Pollutants HAP-19A Fine Fly Ash Collected on PJFF	¹³ Haz Air Pollutants No Pulse-cleaning to Allow Accumulation of Fine Fly Ash
¹⁴ Haz Air Pollutants No Pulse-cleaning to Allow Accumulation of Fine Fly Ash	¹⁵ Haz Air Pollutants HAP-19B Fine Fly Ash Collected on PJFF	¹⁶ Haz Air Pollutants HAP-19C Fine Fly Ash Collected on PJFF	¹⁷ Haz Air Pollutants Facility Down to remove failed acrylic PJFF bags, and Replace Damper H	¹⁸ Haz Air Pollutants Facility Down to remove failed acrylic PJFF bags, and Replace Damper H	¹⁹ Haz Air Pollutants Facility Down to remove failed acrylic PJFF bags, and Replace Damper H	²⁰ Haz Air Pollutants
²¹ Haz Air Pollutants	²² Haz Air Pollutants HAP-20 Catalysts Tested on M29T Filters at CRG, 300F	²³ Haz Air Pollutants HAP-21 Catalysts Tested on M29T Filters at CRG, 300F	²⁴ Haz Air Pollutants HAP-22 Catalysts Tested on M29T Filters at CRG, 300F	²⁵ Haz Air Pollutants HAP-23 Catalysts Tested on M29T Filters at CRG, 300F	²⁶ Haz Air Pollutants Installation of New Acrylic PJFF Bags	²⁷ Haz Air Pollutants Fly Ash Collected on Newly Installed Acrylic PJFF Bags
²⁸ Haz Air Pollutants	²⁹ Haz Air Pollutants HAP-24 Baseline with Acrylic PJFF Bags 4000 scfm	³⁰ Haz Air Pollutants HAP-25 Baseline with Acrylic PJFF Bags 8000 scfm				

EPRI ENVIRONMENTAL CONTROL TECHNOLOGY CENTER TEST CALENDAR

May 1996 (Updated June 3, 1996)

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1 Haz Air Polutants HAP-26A HAP-27 Fine Fly Ash Accum. CT-4/Lime at PJ Inlet	2 Haz Air Polutants HAP-26B Fine Fly Ash Accum. 4000 scfm Hg0 spike at SDA Inlet	3 Haz Air Polutants HAP-26C Fine Fly Ash Accum. 4000 scfm Hg0 spike at SDA Inlet	4 Haz Air Polutants No Pulsing over the Weekend
5 Haz Air Polutants	6 Haz Air Polutants Injection of Catalyst Candidate revealed Leaks in PJFF Bags	7 Haz Air Polutants HAP-28 FAB-3, FAB-2C at CRG Duct 300F	8 Haz Air Polutants HAP-29 FASB-2, FAL-3 at CRG Duct 300F	9 Haz Air Polutants HAP-30 Preconditioned CT-9 at CRG Duct 300F	10 Haz Air Polutants HAP-31 Continuation of Preconditioned CT-9 at CRG Duct, 300F	11 Haz Air Polutants
12 Haz Air Polutants	13 Haz Air Polutants HAP-32 ADA Charging Device 8250 scfm, L/G = 40 ESP D&E Fields	14 Haz Air Polutants HAP-32R ADA Charging Device 8250 scfm, L/G = 40 ESP A Field	15 Haz Air Polutants HAP-32RR ADA Charging Device One Spray Nozzle ESP D&E Fields	16 Haz Air Polutants HAP-32RRR ADA Charging Device Support Struct. Change ESP D&E Fields	17 Haz Air Polutants HAP-32A ADA Charging Device Charger On; ESP D&E Fields	18 Haz Air Polutants
19 Haz Air Polutants	20 Haz Air Polutants HAP-32B ADA Charging Device Double Layer of SS Mesh Electrode	21 Haz Air Polutants HAP-32C ADA Charging Device Double Layer of SS Mesh Electrode	22 Haz Air Polutants HAP-32D ADA Charging Device Double Layer of SS Mesh Electrode	23 Haz Air Polutants HAP-32E ADA Charging Device New Band Clamp and Double SS Electrode	24 Haz Air Polutants HAP-32F ADA Charging Device Double Layer Ni and Pt Strips Electrode	25 Haz Air Polutants
26 Haz Air Polutants	27 Haz Air Polutants	28 Haz Air Polutants HAP-33 ADA Charging Device 8250 scfm, L/G = 40 Two Layer Ni Electrode	29 Facility Outage for Repair of Blanking Plate I and Install. of Gore-tex/Fiberglass PJFF Bags	30 Facility Outage for Repair of Blanking Plate I and Install. of Gore-tex/Fiberglass PJFF Bags	31 PJFF Brought Online 4000 scfm, 300F Outlet Temp.	

PILOT

MINI-PILOT

1995

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
High-Velocity FGD Testing	Lime/DBA Gypsum tests	Carbon injection	Wet FGD Toxics Testing				Carbon injection	Wet FGD Toxics Testing- Pet coke	Outage	Carbon injection	High-Velocity FGD Testing	Wet FGD Toxics Testing
			UNIT DOWN									

PILOT

MINI-PILOT

1996

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
EPRI Wet FGD Toxics Testing		DOE/PRDA Phase I - Mercury and HAPs Control with Wet FGD			EPRI Wet FGD Toxics Testing		Third party Testing - Rotorfilter Technology	EPRI Wet FGD Toxics Testing	Carbon Injection	DOE/PRDA Phase I - Clear Liquor Scrubbing (CLS) with Anhydrite Production	
UNIT DOWN			DOE/PRDA Phase I - Multiple Pollutant Removal Using the Condensing Heat Exchanger (CHX)								

PILOT w/
DOE PRDA
Phase IIPILOT w/o
DOE PRDA
Phase IIMINI-PILOT
w/o DOE
PRDA Phase II

1997 (Tentative Schedule)

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DOE/PRDA Phase II - Mercury and HAPs Control by Modifications to Wet FGD Processes						DOE/PRDA Phase II - Clear Liquor Scrubbing (CLS) with Anhydrite Production					
CLS Phase I	EPRI Wet FGD Toxics Testing				High Velocity FGD Testing			Advanced FGD Processes (CLS)			
DOE/PRDA Phase I - Condensing Heat Exchanger (CHX) Testing			Unit Available for Testing								

ECTC Pilot-scale Testing Schedule ('95-'97)

APPENDIX B
PILOT TESTING PROCESS SUMMARY REPORTS

HAP-2R Process Summary Report
03/11/96 07:00:00 to 03/11/96 11:00:00

Process Variable	Average	Max	Min	Std.Dev.	Points
Flue Gas Flow Rate (scfm)	3999	4005	3995	4	4
Facility Inlet SO2 Conc. (ppm)	1398	1508	1305	78	4
Facility Outlet SO2 Conc	1060	1074	1039	14	4
SDA Inlet SO2 Conc. (ppm)	1332	1380	1312	28	4
SDA Outlet SO2 Conc. (ppm)	1163	1245	1115	53	4
TGR/PJFF Outlet SO2 Conc. (ppm)	910	982	864	46	4
SDA Inlet O2 Conc. (%)	8.81	9.35	7.99	0.54	4
SDA Outlet O2 Conc. (%)	10.51	11.22	9.53	0.67	4
TGR O2 Conc. (%)	12.55	13.26	11.49	0.69	4
SDA Inlet Temp. (F)	372	377	367	4	4
SDA Outlet Temp. (F)	334	338	329	3	4
ESP Outlet Temp. (F)	294	303	289	5	4
PJFF Inlet Temp. (F)	266	268	264	2	4
PJFF Outlet Temp. (F)	255	256	254	1	4
PJFF Air/Cloth Ratio	4.3	4.3	4.3	0.0	4
PJFF Cleaning Pulses/Hour	82	82	82	0	4
PJFF Delta P (in H2O)	0.48	0.55	0.42	0.05	4
NYSEG Load (MW)	567	671	474	77	4

HAP-5 Process Summary Report
03/14/96 08:00:00 to 03/14/96 14:00:00

Process Variable	Average	Max	Min	Std.Dev.	Points
Flue Gas Flow Rate (scfm)	8002	8016	7992	9	4
Facility Inlet SO2 Conc. (ppm)	1187	1234	1156	29	4
Facility Outlet SO2 Conc	983	1011	969	17	4
SDA Inlet SO2 Conc. (ppm)	1195	1238	1147	32	4
SDA Outlet SO2 Conc. (ppm)	1089	1128	1066	24	4
TGR/PJFF Outlet SO2 Conc. (ppm)	940	970	925	18	4
SDA Inlet O2 Conc. (%)	8.55	8.83	8.17	0.25	4
SDA Outlet O2 Conc. (%)	9.72	10.07	9.26	0.30	4
TGR O2 Conc. (%)	10.23	10.57	9.69	0.33	4
SDA Inlet Temp. (F)	309	309	309	0	4
SDA Outlet Temp. (F)	296	297	296	0	4
ESP Outlet Temp. (F)	291	294	288	2	4
PJFF Inlet Temp. (F)	287	288	287	0	4
PJFF Outlet Temp. (F)	260	260	259	0	4
PJFF Air/Cloth Ratio	7.3	7.3	7.3	0.0	4
PJFF Cleaning Pulses/Hour	193	193	193	0	4
PJFF Delta P (in H2O)	1.00	1.10	0.96	0.06	4
NYSEG Load (MW)	489	526	476	21	4

HAP-10B Process Summary Report
03/26/96 07:00:00 to 03/26/96 11:00:00

Process Variable	Average	Max	Min	Std.Dev.	Points
Flue Gas Flow Rate (scfm)	7999	8006	7991	5	4
Facility Inlet SO2 Conc. (ppm)	958	1120	756	145	4
Facility Outlet SO2 Conc	891	1052	779	102	4
SDA Inlet SO2 Conc. (ppm)	1073	1246	992	102	4
SDA Outlet SO2 Conc. (ppm)	930	1057	842	82	4
TGR/PJFF Outlet SO2 Conc. (ppm)	809	909	724	72	4
SDA Inlet O2 Conc. (%)	8.98	10.87	7.62	1.28	4
SDA Outlet O2 Conc. (%)	10.57	12.51	9.10	1.33	4
TGR O2 Conc. (%)	10.74	13.16	9.20	1.66	4
SDA Inlet Temp. (F)	301	302	300	1	4
SDA Outlet Temp. (F)	289	290	288	1	4
ESP Outlet Temp. (F)	277	280	275	2	4
PJFF Inlet Temp. (F)	257	258	256	1	4
PJFF Outlet Temp. (F)	250	250	249	1	4
PJFF Air/Cloth Ratio	7.2	7.2	7.2	0.0	4
PJFF Cleaning Pulses/Hour	0	0	0	0	4
PJFF Delta P (in H2O)	9.84	9.92	9.74	0.06	4
NYSEG Load (MW)	422	546	252	125	4

HAP-11 Process Summary Report
03/27/96 07:00:00 to 03/27/96 11:00:00

Process Variable	Average	Max	Min	Std.Dev.	Points
Flue Gas Flow Rate (scfm)	7997	7999	7992	3	4
Facility Inlet SO2 Conc. (ppm)	1599	1652	1555	42	4
Facility Outlet SO2 Conc	1312	1338	1280	25	4
SDA Inlet SO2 Conc. (ppm)	1339	1422	1276	53	4
SDA Outlet SO2 Conc. (ppm)	1369	1384	1334	20	4
TGR/PJFF Outlet SO2 Conc. (ppm)	1243	1283	1191	37	4
SDA Inlet O2 Conc. (%)	6.63	7.20	5.50	0.69	4
SDA Outlet O2 Conc. (%)	8.04	8.52	6.90	0.67	4
TGR O2 Conc. (%)	8.40	8.63	8.10	0.23	4
SDA Inlet Temp. (F)	303	303	302	0	4
SDA Outlet Temp. (F)	290	290	290	0	4
ESP Outlet Temp. (F)	276	278	275	1	4
PJFF Inlet Temp. (F)	257	258	256	1	4
PJFF Outlet Temp. (F)	249	251	248	1	4
PJFF Air/Cloth Ratio	7.0	7.0	7.0	0.0	4
PJFF Cleaning Pulses/Hour	115	115	115	0	4
PJFF Delta P (in H2O)	0.98	1.00	0.96	0.02	4
NYSEG Load (MW)	658	696	617	29	4

HAP-11B Process Summary Report
03/29/96 06:00:00 to 03/29/96 11:00:00

Process Variable	Average	Max	Min	Std.Dev.	Points
Flue Gas Flow Rate (scfm)	7997	8000	7993	3	5
Facility Inlet SO2 Conc. (ppm)	1307	1350	1260	35	5
Facility Outlet SO2 Conc	1028	1126	872	91	5
SDA Inlet SO2 Conc. (ppm)	1086	1137	1040	34	5
SDA Outlet SO2 Conc. (ppm)	1066	1121	1022	35	5
TGR/PJFF Outlet SO2 Conc. (ppm)	979	1030	939	32	5
SDA Inlet O2 Conc. (%)	6.99	7.21	6.79	0.17	5
SDA Outlet O2 Conc. (%)	7.07	7.29	6.88	0.17	5
TGR O2 Conc. (%)	8.33	8.56	8.12	0.19	5
SDA Inlet Temp. (F)	300	300	300	0	5
SDA Outlet Temp. (F)	289	289	288	0	5
ESP Outlet Temp. (F)	282	283	280	1	5
PJFF Inlet Temp. (F)	258	258	258	0	5
PJFF Outlet Temp. (F)	252	252	252	0	5
PJFF Air/Cloth Ratio	7.0	7.0	7.0	0.0	5
PJFF Cleaning Pulses/Hour	0	0	0	0	5
PJFF Delta P (in H2O)	2.93	2.99	2.88	0.04	5
NYSEG Load (MW)	677	697	651	15	5

HAP-12 Process Summary Report
04/01/96 08:00:00 to 04/01/96 12:00:00)

Process Variable	Average	Max	Min	Std.Dev.	Points
Flue Gas Flow Rate (scfm)	8000	8002	7997	2	4
Facility Inlet SO2 Conc. (ppm)	1448	1581	1374	82	4
Facility Outlet SO2 Conc	1244	1397	1095	136	4
SDA Inlet SO2 Conc. (ppm)	1308	1458	1168	129	4
SDA Outlet SO2 Conc. (ppm)	1270	1414	1123	134	4
TGR/PJFF Outlet SO2 Conc. (ppm)	1155	1288	1016	123	4
SDA Inlet O2 Conc. (%)	6.69	7.09	6.52	0.24	4
SDA Outlet O2 Conc. (%)	6.70	7.12	6.51	0.24	4
TGR O2 Conc. (%)	7.95	8.37	7.77	0.24	4
SDA Inlet Temp. (F)	299	299	299	0	4
SDA Outlet Temp. (F)	287	288	287	0	4
ESP Outlet Temp. (F)	282	284	280	2	4
PJFF Inlet Temp. (F)	254	255	254	0	4
PJFF Outlet Temp. (F)	248	248	247	0	4
PJFF Air/Cloth Ratio	6.9	6.9	6.9	0.0	4
PJFF Cleaning Pulses/Hour	103	103	103	0	4
PJFF Delta P (in H2O)	1.36	1.50	1.27	0.09	4
NYSEG Load (MW)	700	702	698	2	4

HAP-13 Process Summary Report
04/02/96 07:00:00 to 04/02/96 12:00:00)

Process Variable	Average	Max	Min	Std.Dev.	Points
Flue Gas Flow Rate (scfm)	7994	7999	7989	3	4
Facility Inlet SO2 Conc. (ppm)	1544	1579	1485	35	4
Facility Outlet SO2 Conc	1338	1416	1264	55	4
SDA Inlet SO2 Conc. (ppm)	1485	1516	1428	34	4
SDA Outlet SO2 Conc. (ppm)	1394	1414	1341	30	4
TGR/PJFF Outlet SO2 Conc. (ppm)	1195	1215	1143	30	4
SDA Inlet O2 Conc. (%)	7.13	7.44	6.82	0.27	4
SDA Outlet O2 Conc. (%)	7.18	7.55	6.82	0.29	4
TGR O2 Conc. (%)	8.52	8.87	8.18	0.27	4
SDA Inlet Temp. (F)	307	307	307	0	4
SDA Outlet Temp. (F)	295	295	294	0	4
ESP Outlet Temp. (F)	281	282	280	1	4
PJFF Inlet Temp. (F)	261	261	260	0	4
PJFF Outlet Temp. (F)	253	254	252	1	4
PJFF Air/Cloth Ratio	7.0	7.0	7.0	0.0	4
PJFF Cleaning Pulses/Hour	245	245	245	0	4
PJFF Delta P (in H2O)	1.20	1.23	1.18	0.02	4
NYSEG Load (MW)	698	701	693	3	4

a=value taken from control room log sheet; point ID not gleaned.

HAP-14 CRG Process Summary Report
04/03/96 07:00:00 to 04/03/96 15:00:00)

Process Variable	Average	Max	Min	Std.Dev.	Points
CRG Venturi gas flow (scfm)	5511	5572	5496	23	8
Facility Inlet SO2 Conc. (ppm)	1331	1421	1103	109	8
Facility Outlet SO2 Conc	670	862	479	118	8
Facility Inlet O2 Conc.	6.28	7.84	5.38	0.75	8
Facility Outlet O2 Conc.	13.07	14.63	11.04	1.07	8
ESP fan discharge pressure	12.07	12.44	11.78	0.19	8
DRG (ESP) Inlet Temp (F)	352	372	329	16	8
CRG Temp. (F)	256a	266a	242a	-	-

HAP-14A CRG Process Summary Report
04/04/96 11:00:00 to 04/04/96 15:00:00)

Process Variable	Average	Max	Min	Std.Dev.	Points
CRG Venturi gas flow (scfm)	5512	5559	5495	24	5
Facility Inlet SO2 Conc. (ppm)	1257	1303	1226	29	5
Facility Outlet SO2 Conc	681	753	626	46	5
Facility Inlet O2 Conc.	5.68	6.20	5.03	0.52	5
Facility Outlet O2 Conc.	12.57	13.22	11.50	0.63	5
ESP fan discharge pressure	12.02	12.24	11.84	0.16	5
DRG (ESP) Inlet Temp (F)	377	394	361	13	5
CRG Temp. (F)	248a	255a	237a	-	-

HAP-15 CRG Process Summary Report
04/05/96 07:00:00 to 04/05/96 15:00:00)

Process Variable	Average	Max	Min	Std.Dev.	Points
CRG Venturi gas flow (scfm)	5503	5519	5497	7	7
Facility Inlet SO2 Conc. (ppm)	972	1035	903	49	7
Facility Outlet SO2 Conc	473	522	445	29	7
Facility Inlet O2 Conc.	7.20	7.76	6.21	0.52	7
Facility Outlet O2 Conc.	13.70	14.05	13.14	0.30	7
ESP fan discharge pressure	12.07	12.22	11.72	0.16	7
DRG (ESP) Inlet Temp (F)	376	389	364	8.45	7
CRG Temp. (F)	253a	256a	245a	-	-

a=value taken from control room log sheet; point ID not gleaned.

HAP-16 Process Summary Report
04/09/96 10:00:00 to 04/09/96 14:00:00)

Process Variable	Average	Max	Min	Std.Dev.	Points
Flue Gas Flow Rate (scfm)	8013	8041	7996	18	4
Facility Inlet SO2 Conc. (ppm)	1067	1126	1021	41	4
Facility Outlet SO2 Conc	1046	1076	1007	26	4
SDA Inlet SO2 Conc. (ppm)	1381	1405	1353	21	4
SDA Outlet SO2 Conc. (ppm)	1407	1452	1372	31	4
TGR/PJFF Outlet SO2 Conc. (ppm)	1230	1272	1196	29	4
SDA Inlet O2 Conc. (%)	8.21	8.61	7.62	0.37	4
SDA Outlet O2 Conc. (%)	8.26	8.69	7.69	0.37	4
TGR O2 Conc. (%)	9.71	10.23	9.07	0.43	4
SDA Inlet Temp. (F)	300	302	299	1	4
SDA Outlet Temp. (F)	289	290	288	1	4
ESP Outlet Temp. (F)	282	284	280	1	4
PJFF Inlet Temp. (F)	256	258	255	1	4
PJFF Outlet Temp. (F)	251	252	250	1	4
PJFF Air/Cloth Ratio	7.3	7.3	7.3	0.0	4
PJFF Cleaning Pulses/Hour	79	79	79	0	4
PJFF Delta P (in H2O)	1.59	1.66	1.53	0.05	4
NYSEG Load (MW)	543	595	499	37	4

HAP-16R Process Summary Report
04/10/96 08:00:00 to 04/10/96 12:00:00)

Process Variable	Average	Max	Min	Std.Dev.	Points
Flue Gas Flow Rate (scfm)	7989	8001	7956	19	4
Facility Inlet SO2 Conc. (ppm)	1478	1549	1408	52	4
Facility Outlet SO2 Conc	1185	1241	1132	40	4
SDA Inlet SO2 Conc. (ppm)	1283	1338	1231	38	4
SDA Outlet SO2 Conc. (ppm)	1303	1373	1241	48	4
TGR/PJFF Outlet SO2 Conc. (ppm)	1137	1199	1086	41	4
SDA Inlet O2 Conc. (%)	7.56	7.73	7.46	0.11	4
SDA Outlet O2 Conc. (%)	7.59	7.79	7.47	0.13	4
TGR O2 Conc. (%)	8.92	9.16	8.79	0.14	4
SDA Inlet Temp. (F)	299	299	299	0	4
SDA Outlet Temp. (F)	288	288	288	0	4
ESP Outlet Temp. (F)	282	284	281	1	4
PJFF Inlet Temp. (F)	255	255	255	0	4
PJFF Outlet Temp. (F)	249	249	249	0	4
PJFF Air/Cloth Ratio	7.1	7.1	7.0	0.0	4
PJFF Cleaning Pulses/Hour	88	88	88	0	4
PJFF Delta P (in H2O)	1.61	1.62	1.59	0.01	4
NYSEG Load (MW)	611	643	590	22	4

a=value taken from control room log sheet; point ID not gleaned.

HAP-17 Process Summary Report
04/11/96 07:00:00 to 04/11/96 13:00:00

Process Variable	Average	Max	Min	Std.Dev.	Points
Flue Gas Flow Rate (scfm)	3000	3004	2998	2	4
Facility Inlet SO2 Conc. (ppm)	1460	1527	1375	64	4
Facility Outlet SO2 Conc	975	1089	920	67	4
SDA Inlet SO2 Conc. (ppm)	1268	1317	1218	46	4
SDA Outlet SO2 Conc. (ppm)	1245	1294	1186	46	4
TGR/PJFF Outlet SO2 Conc. (ppm)	932	964	899	26	4
SDA Inlet O2 Conc. (%)	8.38	8.55	8.20	0.16	4
SDA Outlet O2 Conc. (%)	8.53	8.71	8.34	0.17	4
TGR O2 Conc. (%)	11.95	12.34	11.56	0.28	4
SDA Inlet Temp. (F)	378	387	370	8	4
SDA Outlet Temp. (F)	343	349	337	6	4
ESP Outlet Temp. (F)	278	279	276	1	4
PJFF Inlet Temp. (F)	266	270	262	4	4
PJFF Outlet Temp. (F)	251	253	250	1	4
PJFF Air/Cloth Ratio	3.4	3.4	3.4	0.0	4
PJFF Cleaning Pulses/Hour	108	108	108	0	4
PJFF Delta P (in H2O)	0.49	0.49	0.49	0.00	4
NYSEG Load (MW)	599	682	566	48	4

HAP-19A Process Summary Report
04/12/96 07:00:00 to 04/12/96 12:00:00)

Process Variable	Average	Max	Min	Std.Dev.	Points
Flue Gas Flow Rate (scfm)	8000	8002	7997	2	5
Facility Inlet SO2 Conc. (ppm)	1246	1331	1103	92	5
Facility Outlet SO2 Conc	1001	1067	905	67	5
SDA Inlet SO2 Conc. (ppm)	1086	1149	999	60	5
SDA Outlet SO2 Conc. (ppm)	1110	1181	1012	66	5
TGR/PJFF Outlet SO2 Conc. (ppm)	959	1019	872	58	5
SDA Inlet O2 Conc. (%)	7.46	8.18	6.84	0.44	5
SDA Outlet O2 Conc. (%)	7.48	8.24	6.84	0.46	5
TGR O2 Conc. (%)	8.76	9.65	8.03	0.53	5
SDA Inlet Temp. (F)	297	297	297	0	5
SDA Outlet Temp. (F)	286	286	286	0	5
ESP Outlet Temp. (F)	284	288	280	3	5
PJFF Inlet Temp. (F)	255	255	254	0	5
PJFF Outlet Temp. (F)	250	251	250	0	5
PJFF Air/Cloth Ratio	7.0	7.0	7.0	0.0	5
PJFF Cleaning Pulses/Hour	0	0	0	0	5
PJFF Delta P (in H2O)	1.44	1.44	1.43	0.00	5
NYSEG Load (MW)	581	623	509	42	5

a=value taken from control room log sheet; point ID not gleaned.

HAP-19B Process Summary Report
04/15/96 07:00:00 to 04/15/96 11:00:00)

Process Variable	Average	Max	Min	Std.Dev.	Points
Flue Gas Flow Rate (scfm)	7992	8000	7984	7	4
Facility Inlet SO2 Conc. (ppm)	1209	1285	1135	60	4
Facility Outlet SO2 Conc	986	1136	909	90	4
SDA Inlet SO2 Conc. (ppm)	1099	1146	1046	40	4
SDA Outlet SO2 Conc. (ppm)	1094	1158	1002	61	4
TGR/PJFF Outlet SO2 Conc. (ppm)	961	1002	924	33	4
SDA Inlet O2 Conc. (%)	7.86	8.49	7.35	0.44	4
SDA Outlet O2 Conc. (%)	7.98	8.74	7.39	0.52	4
TGR O2 Conc. (%)	9.06	9.50	8.54	0.40	4
SDA Inlet Temp. (F)	300	300	300	0	4
SDA Outlet Temp. (F)	288	288	288	0	4
ESP Outlet Temp. (F)	282	284	280	2	4
PJFF Inlet Temp. (F)	256	257	256	0	4
PJFF Outlet Temp. (F)	252	252	251	0	4
PJFF Air/Cloth Ratio	6.9	6.9	6.9	0.0	4
PJFF Cleaning Pulses/Hour	0	0	0	0	4
PJFF Delta P (in H2O)	1.46	1.46	1.45	0.00	4
NYSEG Load (MW)	617	681	565	48	4

HAP-19C Process Summary Report
04/16/96 07:00:00 to 04/16/96 11:00:00)

Process Variable	Average	Max	Min	Std.Dev.	Points
Flue Gas Flow Rate (scfm)	8003	8007	7998	4	4
Facility Inlet SO2 Conc. (ppm)	1251	1296	1197	35	4
Facility Outlet SO2 Conc	919	1032	864	67	4
SDA Inlet SO2 Conc. (ppm)	1088	1127	1045	35	4
SDA Outlet SO2 Conc. (ppm)	1073	1105	1048	23	4
TGR/PJFF Outlet SO2 Conc. (ppm)	959	990	938	21	4
SDA Inlet O2 Conc. (%)	6.63	6.85	6.38	0.17	4
SDA Outlet O2 Conc. (%)	6.61	6.86	6.37	0.17	4
TGR O2 Conc. (%)	7.76	8.03	7.48	0.19	4
SDA Inlet Temp. (F)	297	297	297	0	4
SDA Outlet Temp. (F)	285	285	285	0	4
ESP Outlet Temp. (F)	284	287	282	2	4
PJFF Inlet Temp. (F)	253	253	253	0	4
PJFF Outlet Temp. (F)	249	249	249	0	4
PJFF Air/Cloth Ratio	6.8	6.9	6.8	0.0	4
PJFF Cleaning Pulses/Hour	0	0	0	0	4
PJFF Delta P (in H2O)	1.43	1.44	1.42	0.01	4
NYSEG Load (MW)	700	704	692	5	4

a=value taken from control room log sheet; point ID not gleaned.

HAP-20 CRG Process Summary Report
04/22/96 07:00:00 to 04/22/96 15:00:00)

Process Variable	Average	Max	Min	Std.Dev.	Points
CRG Venturi gas flow (scfm)	5655	5737	5623	33	8
Facility Inlet SO2 Conc. (ppm)	1257	1431	1067	118	8
Facility Outlet SO2 Conc	942	1076	794	91	8
Facility Inlet O2 Conc.	5.81	6.55	4.84	0.61	8
Facility Outlet O2 Conc.	9.37	9.90	8.67	0.44	8
ESP fan discharge pressure	14.55	14.90	14.25	0.18	8
DRG (ESP) Inlet Temp (F)	371	390	351	13	8
CRG Temp. (F)	304a	306a	298a	-	-

HAP-21 CRG Process Summary Report
04/23/96 07:00:00 to 04/23/96 15:00:00)

Process Variable	Average	Max	Min	Std.Dev.	Points
CRG Venturi gas flow (scfm)	5701	5702	5697	2	8
Facility Inlet SO2 Conc. (ppm)	1341	1461	1215	90	8
Facility Outlet SO2 Conc	877	947	785	60	8
Facility Inlet O2 Conc.	5.73	6.56	4.68	0.71	8
Facility Outlet O2 Conc.	9.45	9.91	8.82	0.40	8
ESP fan discharge pressure	14.58	14.70	14.48	0.06	8
DRG (ESP) Inlet Temp (F)	373	389	350	12	8
CRG Temp. (F)	302a	307a	297a	-	-

HAP-22 CRG Process Summary Report
04/24/96 07:00:00 to 04/24/96 15:00:00)

Process Variable	Average	Max	Min	Std.Dev.	Points
CRG Venturi gas flow (scfm)	5197	5203	5180	7	8
Facility Inlet SO2 Conc. (ppm)	1202	1293	1072	75	8
Facility Outlet SO2 Conc	741	822	658	60	8
Facility Inlet O2 Conc.	5.37	6.11	4.60	0.53	8
Facility Outlet O2 Conc.	10.75	11.85	9.89	0.64	8
ESP fan discharge pressure	10.68	10.79	10.56	0.08	8
DRG (ESP) Inlet Temp (F)	325	341	308	11	8
CRG Temp. (F)	257a	265a	262a	-	-

HAP-23 CRG Process Summary Report
04/25/96 07:00:00 to 04/25/96 15:00:00)

Process Variable	Average	Max	Min	Std.Dev.	Points
CRG Venturi gas flow (scfm)	5711	6056	5498	146	8
Facility Inlet SO2 Conc. (ppm)	1176	1281	1017	79	8
Facility Outlet SO2 Conc	866	943	767	54	8
Facility Inlet O2 Conc.	5.67	7.54	4.52	0.90	8
Facility Outlet O2 Conc.	9.19	10.25	8.37	0.56	8
ESP fan discharge pressure	14.46	16.45	13.47	0.81	8
DRG (ESP) Inlet Temp (F)	361	385	336	15	8
CRG Temp. (F)	293a	300a	285a	-	-

a=value taken from control room log sheet; point ID not gleaned.

APPENDIX C
ANALYTICAL SUMMARY RESULTS

**ECTC PRDA HAP's Testing
Mercury Gas Sampling Results
Pre-Spiking Inlet Location
(SDA Inlet)**

Test ID	Date	Start Time	Other Imp. Cont.	ID	Gas Volume (dscf)	Moisture (% H2O)	DRG O2 (%)	Other	Other	H2O2	H2O2	KMnO4	Other	Other	H2O2	H2O2	KMnO4	Other	Other	H2O2	H2O2	KMnO4	Total						
								Sample [Hg] (ng/ml)	Sample [Hg] (ng/ml)	Sample [Hg] (ng/ml)	Sample [Hg] (ng/ml)	Sample [Hg] (ng/ml)	Sample Mass (g)	Sample Mass (g)	Sample Mass (g)	Sample Mass (g)	Sample Mass (g)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)						
Repeat Baseline																								SDA In	SDA In	SDA In	SDA In	SDA In	SDA In
HAP-12	Mon-4/1	09:30	TE3	U942	33.69	-	7.09	-	12.60	-	-	2.15	-	601.5	-	-	521.4	-	8.52	-	-	1.26	9.78						
HAP-12	Mon-4/1	10:30	TE3	U945	29.66	-	6.55	-	9.58	-	-	1.62	-	554.3	-	-	538.0	-	6.78	-	-	1.11	7.90						
HAP-12	Mon-4/1	11:15	TE3	U948	28.79	-	6.58	-	8.41	-	-	1.67	-	575.5	-	-	503.4	-	6.37	-	-	1.11	7.47						
Averages																				7.22				1.16		8.38			
Repeat Baseline, Inc. Hg																								SDA In	SDA In	SDA In	SDA In	SDA In	SDA In
HAP-13	Tue-4/2	08:30	TE3	U951	32.67	-	6.89	-	15.64	-	-	2.83	-	583.90	-	-	510.2	-	10.59	-	-	1.68	12.27						
HAP-13	Tue-4/2	09:45	TE3	U954	31.68	-	7.01	-	14.01	-	-	2.53	-	588.70	-	-	530.3	-	9.86	-	-	1.61	11.47						
HAP-13	Tue-4/2	10:45	TE3	U957	41.08	-	6.82	-	19.28	-	-	3.27	-	582.70	-	-	503.0	-	10.36	-	-	1.52	11.88						
Averages																				10.27				1.60		11.87			
Catalyst on Filters @ 250F																								CRG-1	CRG-1	CRG-1	CRG-1	CRG-1	CRG-1
HAP-14	Wed-4/3	10:30	TE3	U960	34.48	-	13.22	-	17.27	-	-	44.82	-	546.5	-	-	437.7	-	10.37	-	-	21.55	31.92						
HAP-14	Wed-4/3	11:45	TE3	U963	32.13	-	12.64	-	17.88	-	-	37.23	-	560.2	-	-	466.7	-	11.81	-	-	20.49	32.30						
HAP-14	Wed-4/3	12:30	TE3	U966	31.16	-	12.70	-	16.05	-	-	41.55	-	533.3	-	-	437.4	-	10.40	-	-	22.09	32.49						
Averages																				10.86				21.38		32.24			
Catalyst on Filters @ 250F																								CRG-1	CRG-1	CRG-1	CRG-1	CRG-1	CRG-1
HAP-14A	Thu-4/4	08:00	TE3	U969	34.06	-	11.84	-	15.45	-	-	43.03	-	571.0	-	-	475.4	-	9.81	-	-	22.75	32.57						
HAP-14A	Thu-4/4	09:00	TE3	U972	34.32	-	11.14	-	15.72	-	-	45.69	-	545.7	-	-	461.2	-	9.47	-	-	23.26	32.72						
HAP-14A	Thu-4/4	10:00	TE3	U975	35.13	-	11.30	-	15.74	-	-	46.10	-	532.6	-	-	487.6	-	9.04	-	-	24.24	33.28						
Averages																				9.44				23.42		32.86			
Catalyst on Filters @ 250F																								CRG-1	CRG-1	CRG-1	CRG-1	CRG-1	CRG-1
HAP-15	Fri-4/5	07:45	TE3	U978	33.72	-	11.60	-	20.98	-	-	44.90	-	547.8	-	-	454.4	-	12.91	-	-	22.92	35.84						
HAP-15	Fri-4/5	08:30	TE3	U981	31.71	-	12.00	-	19.59	-	-	42.39	-	529.4	-	-	473.7	-	12.39	-	-	23.99	36.38						
HAP-15	Fri-4/5	09:30	TE3	U984	32.59	-	12.77	-	20.68	-	-	40.24	-	522.7	-	-	465.7	-	12.56	-	-	21.78	34.34						
Averages																				12.62				22.90		35.52			
M29* HCl Add'n., Ambient Air																								AA	AA	AA	AA	AA	AA
HAP-00	Fri-4/5	12:00	H	U987	45.36	-	5.00	2.45	0.53	0.09	0.05	97.64	257.5	204.2	275.4	215.1	497.0	0.53	0.09	0.02	0.01	40.53	41.17						
HAP-00	Fri-4/5	13:00	H	U988	42.29	-	5.00	5.78	0.66	0.21	0.12	85.21	251.2	208.6	213.7	208.2	508.0	1.30	0.12	0.04	0.02	38.78	40.26						
HAP-00	Fri-4/5	14:00	H	U989	47.38	-	5.00	10.46	1.04	0.20	0.05	93.24	257.8	220.8	237.8	211.6	505.2	2.16	0.18	0.04	0.01	37.67	40.05						
HAP-00	Fri-4/5	15:00	H	U990	43.75	-	5.00	15.53	1.38	0.22	0.45	74.02	239.6	234.0	225.4	250.3	550.4	3.22	0.28	0.04	0.10	35.27	38.92						
Averages																													
Acrylic Bag Baseline,8000 scfm																								SDA In	SDA In	SDA In	SDA In	SDA In	SDA In
HAP-16	Tue-4/9	10:30	TE3	U991	40.92	-	8.57	-	13.10	-	-	4.19	-	598.6	-	-	474.6	-	7.26	-	-	1.84	9.10						
HAP-16	Tue-4/9	11:15	TE3	U994	39.10	-	7.53	-	12.60	-	-	3.53	-	570.3	-	-	546.8	-	6.96	-	-	1.87	8.83						
HAP-16	Tue-4/9	12:30	TE3	U997	37.78	-	8.40	-	11.90	-	-	3.73	-	549.9	-	-	464.3	-	6.56	-	-	1.73	8.30						
Averages																				6.93				1.82		8.74			

*Shaded areas indicate sampling problems. H=Peroxide. TE3=Tris/EDTA(10mM). AA=Ambient Air Sampling. a=O₂ value calculated as average of SDA Out and PFF Out CEM's. b=SDA Out O₂ CEM value.

ECTC PRDA HAP's Testing
Mercury Gas Sampling Results
Pre-Spiking Inlet Location
(SDA Inlet)

Test ID	Date	Start Time	Other Imp. Cont.	ID	Gas Volume (dscf)	Moisture (% H2O)	DRG O2 (%)	Other Sample [Hg] (ng/ml)	Other Sample [Hg] (ng/ml)	H2O2 Sample [Hg] (ng/ml)	H2O2 Sample [Hg] (ng/ml)	KMnO4 Sample [Hg] (ng/ml)	Other Sample Mass (g)	Other Sample Mass (g)	H2O2 Sample Mass (g)	H2O2 Sample Mass (g)	KMnO4 Sample Mass (g)	Other [Hg] In Gas (μg/Nm3)	Other [Hg] In Gas (μg/Nm3)	H2O2 [Hg] In Gas (μg/Nm3)	H2O2 [Hg] In Gas (μg/Nm3)	KMnO4 [Hg] In Gas (μg/Nm3)	Total [Hg] In Gas (μg/Nm3)												
Acrylic Bag Baseline,8000 scfm																			SDA In	SDA In	SDA In	SDA In	SDA In	SDA In											
HAP-16R	Wed-4/10	08:30	TE3	U1000	28.36	-	7.88	-	8.06	-	-	2.19	-	574.1	-	-	510.2	-	6.18	-	-	-	1.49	7.67											
HAP-16R	Wed-4/10	09:45	TE3	U1003	25.83	-	7.17	-	8.58	-	-	2.84	-	564.1	-	-	492.3	-	7.10	-	-	-	2.05	9.15											
HAP-16R	Wed-4/10	10:45	TE3	U1006	28.54	-	7.60	-	7.89	-	-	2.14	-	578.5	-	-	550.3	-	6.06	-	-	-	1.56	7.62											
Averages																											6.45				1.70	8.15			
Acrylic Bag Baseline,3000 scfm																			SDA In	SDA In	SDA In	SDA In	SDA In	SDA In											
HAP17	Thu-4/11	08:00	TE3	U1009	34.86	-	8.15	-	11.20	-	-	2.52	-	540.7	-	-	418.7	-	6.58	-	-	-	1.14	7.73											
HAP17	Thu-4/11	09:00	TE3	U1012	32.97	-	8.55	-	9.92	-	-	2.19	-	559.5	-	-	455.4	-	6.38	-	-	-	1.15	7.52											
HAP17	Thu-4/11	10:00	TE3	U1015	37.83	-	8.72	-	12.46	-	-	2.25	-	553.7	-	-	531.5	-	6.91	-	-	-	1.20	8.11											
Averages																											6.62				1.16	7.79			
Catalyst on Filters @ 300F																			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HAP-18	Thu-4/11	11:00	TE3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
HAP-18	Thu-4/11	12:00	TE3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
HAP-18	Thu-4/11	12:45	TE3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Averages																																			
Fine Fly Ash																			SDA In	SDA In	SDA In	SDA In	SDA In	SDA In											
HAP-19A	Fri-4/12	08:00	TE3	U1018	29.45	-	7.12	-	8.54	-	-	2.26	-	574.5	-	-	508.6	-	6.31	-	-	-	1.48	7.79											
HAP-19A	Fri-4/12	08:45	TE3	U1021	29.85	-	7.33	-	8.72	-	-	2.55	-	545.6	-	-	480.2	-	6.04	-	-	-	1.55	7.59											
HAP-19A	Fri-4/12	09:30	TE3	U1024	32.36	-	6.93	-	8.30	-	-	2.58	-	578.3	-	-	497.8	-	5.62	-	-	-	1.50	7.12											
Averages																											5.99				1.51	7.50			
Fine Fly Ash																			SDA In	SDA In	SDA In	SDA In	SDA In	SDA In											
HAP-19B	Mon-4/15	08:00	TE3	U1030	33.94	-	7.56	-	11.40	-	-	2.91	-	571.9	-	-	478.3	-	7.27	-	-	-	1.55	8.83											
HAP-19B	Mon-4/15	08:45	TE3	U1033	35.89	-	8.03	-	11.57	-	-	3.13	-	559.7	-	-	457.3	-	6.84	-	-	-	1.51	8.34											
HAP-19B	Mon-4/15	09:30	TE3	U1036	30.57	-	8.49	-	13.01	-	-	2.98	-	546.3	-	-	459.1	-	8.81	-	-	-	1.70	10.50											
Averages																											7.64				1.59	9.22			
Fine Fly Ash																			SDA In	SDA In	SDA In	SDA In	SDA In	SDA In											
HAP-19C	Tue-4/16	08:00	TE3	U1039	31.79	-	6.85	-	10.87	-	-	3.73	-	562.4	-	-	485.8	-	7.29	-	-	-	2.16	9.45											
HAP-19C	Tue-4/16	08:45	TE3	U1042	32.13	-	6.85	-	10.08	-	-	3.18	-	555.0	-	-	516.6	-	6.59	-	-	-	1.94	8.53											
HAP-19C	Tue-4/16	09:30	TE3	U1045	29.48	-	6.38	-	9.54	-	-	3.12	-	534.4	-	-	497.0	-	6.55	-	-	-	1.99	8.55											
Averages																											6.81				2.03	8.84			
Catalyst on Filters @300°F																			CRG-1	CRG-1	CRG-1	CRG-1	CRG-1	CRG-1											
HAP-20	Mon-4/22	09:30	H	U1048	63.74	-	9.88	-	-	-	70.75	46.01	-	-	-	422.3	454.4	-	-	-	-	17.76	12.43	30.18											
HAP-20	Mon-4/22	11:00	TE3	U1051	32.51	-	9.23	-	14.94	-	-	43.45	-	527.4	-	-	449.7	-	9.18	-	-	-	22.77	31.95											
HAP-20	Mon-4/22	12:30	TE3	U1054	30.68	-	9.30	-	13.39	-	-	47.36	-	540.3	-	-	398.7	-	8.93	-	-	-	23.32	32.25											
HAP-20	Mon-4/22	14:00	TE3	U1057	30.82	-	9.63	-	14.15	-	-	47.42	-	537.6	-	-	399.1	-	9.35	-	-	-	23.26	32.61											
Averages																											9.15				23.12	32.27			

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ECTC PRDA HAP's Testing
Mercury Gas Sampling Results
Pre-Spiking Inlet Location
(SDA Inlet)

					Gas	Moisture	DRG	Other	Other	H2O2	H2O2	KMnO4	Other	Other	H2O2	H2O2	KMnO4	Other	Other	H2O2	H2O2	KMnO4	Total	
Test		Start	Other		Volume		O2	Sample	Sample	Sample	Sample	Sample	Sample	Sample	Sample	Sample	Sample	[Hg]	[Hg]	[Hg]	[Hg]	[Hg]	[Hg]	
ID	Date	Time	Cont.	ID	(dscf)	(% H2O)	(%)	(ng/ml)	(ng/ml)	(ng/ml)	(ng/ml)	(ng/ml)	(g)	(g)	(g)	(g)	(g)	In Gas	In Gas	In Gas	In Gas	In Gas	In Gas	
																		(µg/Nm3)	(µg/Nm3)	(µg/Nm3)	(µg/Nm3)	(µg/Nm3)	(µg/Nm3)	
Catalyst on Filters @300°F																		CRG-1	CRG-1	CRG-1	CRG-1	CRG-1	CRG-1	
HAP-21	Tue-4/23	08:00	H	U1060	57.38	-	9.90	-	-	-	53.10	32.67	-	-	-	468.5	490.5	-	-	-	16.43	10.58	27.01	
HAP-21	Tue-4/23	09:00	TE3	U1063	30.79	-	9.24	-	12.92	-	-	30.75	-	570.6	-	-	506.8	-	9.07	-	-	-	19.17	28.25
HAP-21	Tue-4/23	10:00	TE3	U1066	27.03	-	9.65	-	10.45	-	-	28.03	-	555.5	-	-	497.6	-	8.13	-	-	-	19.55	27.68
HAP-21	Tue-4/23	11:30	TE3	U1069	28.15	-	9.70	-	11.94	-	-	29.58	-	553.1	-	-	454.6	-	8.89	-	-	-	18.09	26.98
Averages																		8.70				18.94		27.64
Catalyst on Filters @250°F																		CRG-1	CRG-1	CRG-1	CRG-1	CRG-1	CRG-1	
HAP-22	Wed-4/24	08:00	H	U1072	61.75	-	10.96	-	-	-	48.80	33.68	-	-	-	500.6	448.0	-	-	-	14.99	9.26	24.24	
HAP-22	Wed-4/24	09:00	TE3	U1075	29.07	-	11.61	-	10.11	-	-	33.54	-	562.8	-	-	425.1	-	7.41	-	-	-	18.58	26.00
HAP-22	Wed-4/24	10:00	TE3	U1078	29.36	-	10.06	-	10.69	-	-	29.98	-	548.5	-	-	460.5	-	7.57	-	-	-	17.81	25.38
HAP-22	Wed-4/24	11:30	TE3	U1081	28.26	-	10.14	-	9.71	-	-	30.18	-	549.1	-	-	438.3	-	7.15	-	-	-	17.73	24.88
Averages																		7.37				18.04		25.42
Catalyst on Filters @300°F																		CRG-1	CRG-1	CRG-1	CRG-1	CRG-1	CRG-1	
HAP-23	Thu-4/25	08:00	H	U1084	59.54	-	9.67	-	-	-	55.66	32.63	-	-	-	491.6	499.0	-	-	-	17.41	10.36	27.77	
HAP-23	Thu-4/25	09:00	TE3	U1087	25.76	-	9.37	-	12.36	-	-	25.88	-	528.4	-	-	497.9	-	9.60	-	-	-	18.95	28.55
HAP-23	Thu-4/25	10:00	TE3	U1090	29.42	-	8.54	-	13.30	-	-	30.62	-	565.5	-	-	479.5	-	9.68	-	-	-	18.90	28.59
HAP-23	Thu-4/25	11:30	TE3	U1093	28.21	-	9.20	-	12.91	-	-	29.73	-	559.4	-	-	461.4	-	9.70	-	-	-	18.42	28.12
Averages																		9.66				18.76		28.42

*Shaded areas indicate sampling problems. H=Peroxide. TE3=Tris/EDTA(10mM). AA=Ambient Air Sampling. a=O₂ value calculated as average of SDA Out and PIFF Out CEM's. b=SDA Out O₂ CEM value.

ECTC PRDA HAP's Testing
Mercury Gas Sampling Results
Post-Spiking Inlet Location
(PJFF Inlet)

Test ID	Date	Start Time	Other Imp. Cont.	ID	Gas Volume (dscf)	Moisture (% H2O)	Inlet O2 (%)	Solid Hg	Other	Other	H2O2	H2O2	KMnO4	Solid Hg	Other	Other	H2O2	H2O2	KMnO4	Solid Hg	Other	Other	H2O2	H2O2	KMnO4	Total
								[Hg] (ppm)	[Hg] (ng/ml)	[Hg] (ng/ml)	[Hg] (ng/ml)	[Hg] (ng/ml)	[Hg] (ng/ml)	Mass (g)	Mass (g)	Mass (g)	Mass (g)	Mass (g)	Mass (g)	[Hg] In Gas (ug/Nm3)	[Hg] In Gas (ug/Nm3)	[Hg] In Gas (ug/Nm3)	[Hg] In Gas (ug/Nm3)	[Hg] In Gas (ug/Nm3)	[Hg] In Gas (ug/Nm3)	[Hg] In Gas (ug/Nm3)
Repeat Baseline																										
HAP-12	Mon-4/1	09:30	TE3	U943	42.05	-	7.11	-	-	12.40	-	-	54.30	-	-	609.7	-	-	515.4	-	-	6.81	-	-	25.21	32.02
HAP-12	Mon-4/1	10:30	TE3	U946	37.03	-	6.57	-	-	8.98	-	-	52.30	-	-	595.9	-	-	483.2	-	-	5.47	-	-	25.85	31.33
HAP-12	Mon-4/1	11:15	TE3	U949	51.31	-	6.60	-	-	16.90	-	-	78.60	-	-	582.5	-	-	463.6	-	-	7.27	-	-	26.90	34.17
Averages																					6.52		25.99		32.51	
Repeat Baseline, Inc. Hg																										
HAP-13	Tue-4/2	08:30	TE3	U952	37.02	-	7.11 b	-	-	23.41	-	-	87.05	-	-	588.10	-	-	496.60	-	-	14.09	-	-	44.24	58.33
HAP-13	Tue-4/2	09:45	TE3	U955	31.33	-	7.07 b	-	-	18.06	-	-	65.71	-	-	576.40	-	-	552.30	-	-	12.59	-	-	43.88	56.46
HAP-13	Tue-4/2	10:45	TE3	U958	34.81	-	7.11 b	-	-	22.52	-	-	78.50	-	-	577.10	-	-	508.50	-	-	14.14	-	-	43.44	57.58
Averages																					13.61		43.85		57.46	
Catalyst on Filters @ 250F																										
HAP-14	Wed-4/3	10:30	TE3	U961	33.16	-	13.22	-	-	18.45	-	-	38.81	-	-	517.9	-	-	469.8	-	-	10.92	-	-	20.83	31.74
HAP-14	Wed-4/3	11:45	TE3	U964	31.51	-	12.64	-	-	18.04	-	-	38.76	-	-	562.4	-	-	457.5	-	-	12.20	-	-	21.32	33.52
HAP-14	Wed-4/3	12:30	TE3	U967	29.64	-	12.70	-	-	17.77	-	-	30.34	-	-	552.2	-	-	468.9	-	-	12.54	-	-	18.18	30.73
Averages																					11.89		20.11		32.00	
Catalyst on Filters @ 250F																										
HAP-14A	Thu-4/4	08:00	TE3	U970	32.89	-	11.84	-	-	17.80	-	-	39.18	-	-	528.2	-	-	486.2	-	-	10.83	-	-	21.94	32.77
HAP-14A	Thu-4/4	09:00	TE3	U973	34.64	-	11.14	-	-	16.17	-	-	42.21	-	-	548.7	-	-	479.9	-	-	9.70	-	-	22.15	31.85
HAP-14A	Thu-4/4	10:00	TE3	U976	34.36	-	11.30	-	-	15.79	-	-	43.29	-	-	552.7	-	-	499.4	-	-	9.62	-	-	23.84	33.46
Averages																					10.05		22.64		32.69	
Catalyst on Filters @ 250F																										
HAP-15	Fri-4/5	07:45	TE3	U979	33.18	-	11.60	-	-	21.67	-	-	41.29	-	-	517.7	-	-	466.3	-	-	12.81	-	-	21.98	34.79
HAP-15	Fri-4/5	08:30	TE3	U982	32.07	-	12.00	-	-	22.59	-	-	37.72	-	-	533.5	-	-	481.7	-	-	14.24	-	-	21.47	35.70
HAP-15	Fri-4/5	09:30	TE3	U985	36.68	-	12.77	-	-	24.18	-	-	43.77	-	-	532.6	-	-	474.4	-	-	13.30	-	-	21.44	34.75
Averages																					13.45		21.63		35.08	
M29* HCl Add'n., Ambient Air																										
HAP-00	Fri-4/5	12:00	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
HAP-00	Fri-4/5	13:00	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
HAP-00	Fri-4/5	14:00	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
HAP-00	Fri-4/5	15:00	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Averages																										
Acrylic Bag Baseline, 8000 scfm																										
HAP-16	Tue-4/9	10:30	TE3	U992	31.52	-	9.41 a	-	-	12.30	-	-	43.21	-	-	559.2	-	-	517.0	-	-	8.27	-	-	26.85	35.11
HAP-16	Tue-4/9	11:15	TE3	U995	30.55	-	8.29 a	-	-	11.70	-	-	38.64	-	-	552.1	-	-	507.6	-	-	8.01	-	-	24.32	32.34
HAP-16	Tue-4/9	12:30	TE3	U998	32.85	-	9.12 a	-	-	13.40	-	-	48.97	-	-	543.3	-	-	463.6	-	-	8.40	-	-	26.18	34.58
Averages																					8.22		25.79		34.01	

**ECTC PRDA HAP's Testing
Mercury Gas Sampling Results
Post-Spiking Inlet Location
(PJFF Inlet)**

Test ID	Date	Start Time	Other Imp. Cont.	ID	Gas Volume (dscf)	Moisture (% H2O)	Inlet O2 (%)	Solid Hg	Other	Other	H2O2	H2O2	KMnO4	Solid Hg	Other	Other	H2O2	H2O2	KMnO4	Solid Hg	Other	Other	H2O2	H2O2	KMnO4	Total		
								Sample [Hg] (ppm)	Sample [Hg] (ng/ml)	Sample [Hg] (ng/ml)	Sample [Hg] (ng/ml)	Sample [Hg] (ng/ml)	Sample [Hg] (ng/ml)	Sample Mass (g)	Sample Mass (g)	Sample Mass (g)	Sample Mass (g)	Sample Mass (g)	Sample Mass (g)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	
Acrylic Bag Baseline,8000 scfm																												
HAP-16R	Wed-4/10	08:30	TE3	U1001	37.36	-	8.58 a	-	-	14.67	-	-	43.89	-	-	649.0	-	-	534.9	PLIn	PLIn	PLIn	PLIn	PLIn	PLIn	PLIn		
HAP-16R	Wed-4/10	09:45	TE3	U1004	31.56	-	7.87 a	-	-	10.85	-	-	42.65	-	-	626.2	-	-	461.3	-	-	8.15	-	-	23.81	33.46		
HAP-16R	Wed-4/10	10:45	TE3	U1007	38.05	-	8.28 a	-	-	11.37	-	-	43.22	-	-	637.5	-	-	543.9	-	-	7.22	-	-	23.62	31.77		
Averages																					8.34			23.61			31.95	
Acrylic Bag Baseline,3000 scfm																												
HAP17	Thu-4/11	08:00	TE3	U1010	32.40	-	10.02 a	-	-	16.84	-	-	27.79	-	-	555.2	-	-	433.4	PLIn	PLIn	PLIn	PLIn	PLIn	PLIn	PLIn		
HAP17	Thu-4/11	09:00	TE3	U1013	36.63	-	10.52 a	-	-	13.29	-	-	32.81	-	-	550.4	-	-	435.3	-	-	7.57	-	-	14.77	22.34		
HAP17	Thu-4/11	10:00	TE3	U1016	30.98	-	10.43 a	-	-	12.86	-	-	27.37	-	-	545.0	-	-	432.9	-	-	8.57	-	-	14.49	23.06		
Averages																					9.02			14.45			23.47	
Catalyst on Filters @ 300F																												
HAP-18	Thu-4/11	11:00	TE3	U1027	29.78	-	10.69 a	-	-	18.86	-	-	12.78	-	-	577.0	-	-	460.5	PLIn	PLIn	PLIn	PLIn	PLIn	PLIn	PLIn		
HAP-18	Thu-4/11	12:00	TE3	U1028	30.12	-	9.91 a	-	-	15.75	-	-	17.90	-	-	599.0	-	-	499.9	-	-	13.84	-	-	7.49	21.33		
HAP-18	Thu-4/11	12:45	TE3	U1029	34.92	-	10.07 a	-	-	13.91	-	-	20.51	-	-	582.7	-	-	512.7	-	-	11.87	-	-	11.26	23.13		
Averages																					11.50			10.05			21.55	
Fine Fly Ash																												
HAP-19A	Fri-4/12	08:00	TE3	U1019	35.92	-	7.76 a	-	-	9.22	-	-	38.80	-	-	546.4	-	-	466.6	PLIn	PLIn	PLIn	PLIn	PLIn	PLIn	PLIn		
HAP-19A	Fri-4/12	08:45	TE3	U1022	28.38	-	7.96 a	-	-	8.58	-	-	31.57	-	-	585.1	-	-	458.3	-	-	5.31	-	-	19.09	24.40		
HAP-19A	Fri-4/12	09:30	TE3	U1025	34.67	-	7.54 a	-	-	9.34	-	-	37.88	-	-	567.0	-	-	493.8	-	-	6.70	-	-	19.31	26.01		
Averages																					5.93			19.61			25.55	
Fine Fly Ash																												
HAP-19B	Mon-4/15	08:00	TE3	U1031	38.72	-	8.36 a	-	-	16.46	-	-	39.06	-	-	603.6	-	-	494.5	PLIn	PLIn	PLIn	PLIn	PLIn	PLIn	PLIn		
HAP-19B	Mon-4/15	08:45	TE3	U1034	29.51	-	8.77 a	-	-	8.93	-	-	31.70	-	-	609.7	-	-	474.3	-	-	9.72	-	-	18.90	28.62		
HAP-19B	Mon-4/15	09:30	TE3	U1037	29.48	-	9.12 a	-	-	3.00	-	-	14.77	-	-	544.4	-	-	471.0	-	-	6.99	-	-	19.30	26.29		
Averages																					8.35			19.10			27.45	
Fine Fly Ash																												
HAP-19C	Tue-4/16	08:00	TE3	U1040	38.73	-	7.35 a	-	-	9.90	-	-	45.75	-	-	576.3	-	-	452.3	PLIn	PLIn	PLIn	PLIn	PLIn	PLIn	PLIn		
HAP-19C	Tue-4/16	08:45	TE3	U1043	32.96	-	7.21 a	-	-	8.14	-	-	37.86	-	-	539.3	-	-	465.8	-	-	5.58	-	-	20.24	25.82		
HAP-19C	Tue-4/16	09:30	TE3	U1046	36.46	-	7.09 a	-	-	9.62	-	-	41.57	-	-	578.5	-	-	472.5	-	-	5.04	-	-	20.27	25.31		
Averages																					5.47			20.31			25.78	
Catalyst on Filters @300°F																												
HAP-20	Mon-4/22	09:30	H	U1049	60.87	-	9.88	-	-	-	107.55	22.64	-	-	-	-	428.8	427.2	CRG-2	CRG-2	CRG-2	CRG-2	CRG-2	CRG-2	CRG-2			
HAP-20	Mon-4/22	11:00	TE3	U1052	31.72	-	9.23	-	-	37.58	-	-	22.12	-	-	517.0	-	-	391.1	-	-	28.70	-	-	6.02	34.72		
HAP-20	Mon-4/22	12:30	TE3	U1055	31.34	-	9.30	-	-	36.46	-	-	24.14	-	-	547.2	-	-	478.9	-	-	23.20	-	-	10.33	33.54		
HAP-20	Mon-4/22	14:00	TE3	U1058	30.50	-	9.60	-	-	28.50	-	-	27.03	-	-	565.9	-	-	453.8	-	-	24.12	-	-	13.97	38.09		
Averages																					22.45			13.18			35.63	

*Shaded areas indicate sampling problems. H=Peroxide. TE3=TriS/DTA(10mM). AA=Ambient Air Sampling. a=O₂ value calculated as average of SDA Out and PJFF Out CEM's. b=SDA Out O₂ CEM value.

ECTC PRDA HAP's Testing
Mercury Gas Sampling Results
Post-Spiking Inlet Location
(PJFF Inlet)

					Solid Hg												Other												H2O2												KMnO4												Solid Hg												Other												H2O2												H2O2												KMnO4												Total																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Test		Start		Other		Gas		Inlet		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample		Sample</	

ECTC PRDA HAP's Testing
Mercury Gas Sampling Results
PJFF Outlet Location
(PJFF Outlet)

		Solid Hg																		Other		H2O2		H2O2		KMnO4		Solid Hg		Other		H2O2		H2O2		KMnO4		Solid Hg		Other		H2O2		H2O2		KMnO4		Total																																																																																																																																																																																																																																																																																																																																																																												
Test ID	Date	Start Time	Imp. Cont.	ID	Gas Volume (dscf)	Moisture (% H2O)	Out O2 (%)	Sample [Hg] (ppm)	Sample [Hg] (ng/ml)	Sample [Hg] (ng/ml)	Sample [Hg] (ng/ml)	Sample [Hg] (ng/ml)	Sample [Hg] (ng/ml)	Sample Mass (g)	Sample Mass (g)	Sample Mass (g)	Sample Mass (g)	Sample Mass (g)	Sample Mass (g)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In Gas (µg/Nm3)	[Hg] In

*Shaded areas indicate sampling problems. H=Peroxide. TE3=Tri(EDTA)(10mM). AA=Ambient Air Sampling. a=O₂ value calculated as average of SDA Out and PIFF Out CEM's. b=SDA Out O₂ CEM value.

ECTC PRDA HAP's Testing
Mercury Gas Sampling Results
PJFF Outlet Location
(PJFF Outlet)

Test ID		Date	Start Time	Other Imp. Cont.	ID	Gas Volume (dscf)	Moisture (% H2O)	Out O2 (%)	Solid Hg Sample [Hg] (ppm)	Other Sample [Hg] (ng/ml)	Other Sample [Hg] (ng/ml)	H2O2 Sample [Hg] (ng/ml)	H2O2 Sample [Hg] (ng/ml)	KMnO4 Sample [Hg] (ng/ml)	Solid Hg Sample Mass (g)	Other Sample Mass (g)	Other Sample Mass (g)	H2O2 Sample Mass (g)	H2O2 Sample Mass (g)	KMnO4 Sample Mass (g)	Solid Hg [Hg] In Gas (µg/Nm3)	Other [Hg] In Gas (µg/Nm3)	Other [Hg] In Gas (µg/Nm3)	H2O2 [Hg] In Gas (µg/Nm3)	H2O2 [Hg] In Gas (µg/Nm3)	KMnO4 [Hg] In Gas (µg/Nm3)	Total [Hg] In Gas (µg/Nm3)																			
Acrylic Bag Baseline,8000 scfm																					PI Out	PI Out	PI Out	PI Out	PI Out	PI Out	PI Out																			
HAP-16R		Wed-4/10	08:30	TE3	U1002	32.84	-	9.25	-	-	19.38	-	-	30.40	-	-	587.6	-	-	503.2	-	-	13.14	-	-	17.65	30.78																			
HAP-16R		Wed-4/10	09:45	TE3	U1005	32.02	-	8.54	-	-	23.56	-	-	32.55	-	-	571.8	-	-	472.7	-	-	15.94	-	-	18.21	34.15																			
HAP-16R		Wed-4/10	10:45	TE3	U1008	38.02	-	8.94	-	-	24.89	-	-	34.23	-	-	538.7	-	-	555.4	-	-	13.36	-	-	18.94	32.30																			
Averages																																														
Acrylic Bag Baseline,3000 scfm																					PI Out	PI Out	PI Out	PI Out	PI Out	PI Out	PI Out																			
HAP17		Thu-4/11	08:00	TE3	U1011	32.68	-	11.72	-	-	29.74	-	-	20.38	-	-	552.4	-	-	433.9	-	-	19.04	-	-	10.25	29.29																			
HAP17		Thu-4/11	09:00	TE3	U1014	31.86	-	12.27	-	-	22.17	-	-	19.25	-	-	569.7	-	-	459.6	-	-	15.02	-	-	10.52	25.54																			
HAP17		Thu-4/11	10:00	TE3	U1017	31.74	-	11.90	-	-	20.92	-	-	19.49	-	-	503.5	-	-	450.2	-	-	12.57	-	-	10.47	23.04																			
Averages																																														
Catalyst on Filters @ 300F																					=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
HAP-18		Thu-4/11	11:00	TE3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																			
HAP-18		Thu-4/11	12:00	TE3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																			
HAP-18		Thu-4/11	12:45	TE3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																			
Averages																																														
Fine Fly Ash																					PI Out	PI Out	PI Out	PI Out	PI Out	PI Out	PI Out																			
HAP-19A		Fri-4/12	08:00	TE3	U1020	31.36	-	8.37	-	-	14.17	-	-	26.51	-	-	542.7	-	-	462.8	-	-	9.29	-	-	14.82	24.11																			
HAP-19A		Fri-4/12	08:45	TE3	U1023	30.65	-	8.57	-	-	15.29	-	-	24.50	-	-	559.7	-	-	492.9	-	-	10.58	-	-	14.93	25.50																			
HAP-19A		Fri-4/12	09:30	TE3	U1026	31.57	-	8.13	-	-	15.45	-	-	25.53	-	-	565.7	-	-	515.3	-	-	10.49	-	-	15.79	26.28																			
Averages																																														
Fine Fly Ash																					PI Out	PI Out	PI Out	PI Out	PI Out	PI Out	PI Out																			
HAP-19B		Mon-4/15	08:00	TE3	U1032	35.21	-	9.09	-	-	18.57	-	-	27.21	-	-	542.7	-	-	462.8	-	-	10.84	-	-	13.55	24.39																			
HAP-19B		Mon-4/15	08:45	TE3	U1035	34.07	-	9.39	-	-	15.46	-	-	27.50	-	-	559.7	-	-	492.9	-	-	9.62	-	-	15.07	24.70																			
HAP-19B		Mon-4/15	09:30	TE3	U1038	32.45	-	9.50	-	-	16.07	-	-	27.38	-	-	565.7	-	-	515.3	-	-	10.61	-	-	16.47	27.08																			
Averages																																														
Fine Fly Ash																					PI Out	PI Out	PI Out	PI Out	PI Out	PI Out	PI Out																			
HAP-19C		Tue-4/16	08:00	TE3	U1041	32.82	-	8.00	-	-	20.64	-	-	29.40	-	-	542.7	-	-	462.8	-	-	12.93	-	-	15.71	28.64																			
HAP-19C		Tue-4/16	08:45	TE3	U1044	34.70	-	7.55	-	-	17.50	-	-	32.32	-	-	559.7	-	-	492.9	-	-	10.69	-	-	17.39	28.09																			
HAP-19C		Tue-4/16	09:30	TE3	U1047	32.16	-	7.79	-	-	17.42	-	-	27.33	-	-	565.7	-	-	515.3	-	-	11.61	-	-	16.59	28.20																			
Averages																																														
Catalyst on Filters @300°F																					CRG-3	CRG-3	CRG-3	CRG-3	CRG-3	CRG-3	CRG-3																			
HAP-20		Mon-4/22	09:30	H	U1050	61.79	-	9.88	-	-	-	-	82.15	30.45	-	-	-	-	474.8	478.5	-	-	-	-	23.91	8.93	32.85																			
HAP-20		Mon-4/22	11:00	TE3	U1053	31.25	-	9.23	-	-	22.56	-	-	34.04	-	-	551.7	-	-	453.1	-	-	15.09	-	-	18.70	33.79																			
HAP-20		Mon-4/22	12:30	TE3	U1056	32.73	-	9.30	-	-	22.21	-	-	39.51	-	-	556.4	-	-	437.8	-	-	14.30	-	-	20.02	34.33																			
HAP-20		Mon-4/22	14:00	TE3	U1059	30.75	-	9.63	-	-	20.37	-	-	37.75	-	-	568.3	-	-	453.5	-	-	14.26	-	-	21.09	35.35																			
Averages																																														

ECTC PRDA HAP's Testing
Mercury Gas Sampling Results
PJFF Outlet Location
(PJFF Outlet)

					Solid Hg												Other												H2O2												H2O2												KMnO4												Solid Hg												Other												H2O2												H2O2												KMnO4												Total																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Test		Other		Gas		Out		Sample		Sample		 			

*Shaded areas indicate sampling problems. H=Peroxide. TE3=Tris/EDTA(10mM). AA=Ambient Air Sampling. a=O₂ value calculated as average of SDA Out and PJFF Out CEM's. b=SDA Out O₂ CEM value.

ECTC Pilot Trace Elements Testing
Mercury Gas Sampling Results
Removal Summary
 (Normalized to 5% O₂)

Test ID	Date	Start Time	Other Imp.	Other					H2O2					KMnO4					Total Vapor				
				Pre-Spike Inlet (µg/Nm3)	Post-Spike Inlet (µg/Nm3)	Outlet [Hg] (µg/Nm3)	Hg Spiked (µg/Nm3)	Hg Removal (%)	Pre-Spike Inlet (µg/Nm3)	Post-Spike Inlet (µg/Nm3)	Outlet [Hg] (µg/Nm3)	Hg Spiked (µg/Nm3)	Hg Removal (%)	Pre-Spike Inlet (µg/Nm3)	Post-Spike Inlet (µg/Nm3)	Outlet [Hg] (µg/Nm3)	Hg Spiked (µg/Nm3)	Hg Removal (%)	Pre-Spike Inlet (µg/Nm3)	Post-Spike Inlet (µg/Nm3)	Outlet [Hg] (µg/Nm3)	Total Hg Spiked (µg/Nm3)	Hg Removal (%)
Repeat Baseline				SDA In	PI In	PI Out								SDA In	PI In	PI Out			SDA In	PI In	PI Out		
HAP-12	Mon-4/1	09:30	TE3	9.80	7.84	28.17	-1.96	-259.0	-	-	-	-	-	1.45	29.04	6.23	27.59	78.5	11.25	36.89	34.39	25.63	6.8
HAP-12	Mon-4/1	10:30	TE3	7.51	6.07	29.27	-1.44	-382.1	-	-	-	-	-	1.23	28.67	6.41	27.43	77.6	8.74	34.74	35.67	25.99	-2.7
HAP-12	Mon-4/1	11:15	TE3	7.07	8.08	29.00	1.01	-259.1	-	-	-	-	-	1.23	29.89	6.42	28.67	78.5	8.29	37.97	35.43	29.68	6.7
Averages				8.13	7.33	28.81	-0.80	-300.10						1.30	29.20	6.35	27.90	78.23	9.43	36.53	35.17	27.10	3.58
Repeat Baseline, Inc. Hg				SDA In	PI In	PI Out								SDA In	PI In	PI Out			SDA In	PI In	PI Out		
HAP-13	Tue-4/2	08:30	TE3	12.01	16.23	63.44	4.21	-291.0	-	-	-	-	-	1.90	50.96	11.78	49.06	76.9	13.91	67.19	75.22	53.27	-12.0
HAP-13	Tue-4/2	09:45	TE3	11.28	14.46	61.50	3.18	-325.4	-	-	-	-	-	1.84	50.40	11.16	48.56	77.9	13.12	64.85	72.66	51.74	-12.0
HAP-13	Tue-4/2	10:45	TE3	11.69	16.29	57.69	4.60	-254.1	-	-	-	-	-	1.71	50.03	11.43	48.32	77.2	13.40	66.33	69.13	52.92	-4.2
Averages				11.66	15.66	60.88	4.00	-290.16						1.82	50.46	11.46	48.65	77.30	13.48	66.12	72.34	52.64	-9.41
				Base	CT-7	CT-11							Base	CT-7	CT-11			Base	CT-7	CT-11			
Catalyst on Filters @ 250F				CRG-1	CRG-2	CRG-3							CRG-1	CRG-2	CRG-3			CRG-1	CRG-2	CRG-3			
HAP-14	Wed-4/3	10:30	TE3	21.32	22.45	21.92	-	-	-	-	-	-	44.33	42.83	43.25	-	-	65.65	65.28	65.16	-	-	
HAP-14	Wed-4/3	11:45	TE3	22.61	23.35	23.25	-	-	-	-	-	-	39.21	40.81	44.20	-	-	61.82	64.16	67.44	-	-	
HAP-14	Wed-4/3	12:30	TE3	20.05	24.18	24.78	-	-	-	-	-	-	42.59	35.05	41.94	-	-	62.64	59.23	66.71	-	-	
Averages				21.33	23.32	23.31							42.04	39.56	43.13			63.37	62.89	66.44			
				Base	CT-7	CT-11							Base	CT-7	CT-11			Base	CT-7	CT-11			
Catalyst on Filters @ 250F				CRG-1	CRG-2	CRG-3							CRG-1	CRG-2	CRG-3			CRG-1	CRG-2	CRG-3			
HAP-14A	Thu-4/4	08:00	TE3	17.14	18.92	18.96	-	-	-	-	-	-	39.75	38.33	39.44	-	-	56.89	57.24	58.40	-	-	
HAP-14A	Thu-4/4	09:00	TE3	15.36	15.74	15.70	-	-	-	-	-	-	37.74	35.94	38.09	-	-	53.10	51.69	53.79	-	-	
HAP-14A	Thu-4/4	10:00	TE3	14.91	15.87	9.14	-	-	-	-	-	-	39.99	39.32	42.45	-	-	54.90	55.19	51.59	-	-	
Averages				15.80	16.84	17.33							39.16	37.86	39.99			54.96	54.71	56.09			
				Base	CT-4	CT-5							Base	CT-4	CT-5			Base	CT-4	CT-5			
Catalyst on Filters @ 250F				CRG-1	CRG-2	CRG-3							CRG-1	CRG-2	CRG-3			CRG-1	CRG-2	CRG-3			
HAP-15	Fri-4/5	07:45	TE3	21.98	21.80	28.90	-	-	-	-	-	-	39.02	37.42	37.07	-	-	61.00	59.22	65.97	-	-	
HAP-15	Fri-4/5	08:30	TE3	22.03	25.31	28.20	-	-	-	-	-	-	42.65	38.16	38.42	-	-	64.68	63.48	66.62	-	-	
HAP-15	Fri-4/5	09:30	TE3	24.42	25.86	26.71	-	-	-	-	-	-	42.34	41.69	40.40	-	-	66.76	67.55	67.10	-	-	
Averages				22.81	24.32	28.55							41.34	39.09	38.63			64.15	63.41	66.56			
M29* HCl Add'n., Ambient Air				AA					AA					AA					AA				
HAP-00	Fri-4/5	12:00	H	0.62	-	-	-	-	-	-	-	-	40.53	-	-	-	-	41.17	-	-	-	-	
HAP-00	Fri-4/5	13:00	H	1.42	-	-	-	-	-	-	-	-	38.78	-	-	-	-	40.26	-	-	-	-	
HAP-00	Fri-4/5	14:00	H	2.34	-	-	-	-	-	-	-	-	37.67	-	-	-	-	40.05	-	-	-	-	
HAP-00	Fri-4/5	15:00	H	3.50	-	-	-	-	-	-	-	-	35.27	-	-	-	-	38.92	-	-	-	-	
Averages																							
Acrylic Bag Baseline, 8000 scfm				SDA In	PI In	PI Out							SDA In	PI In	PI Out			SDA In	PI In	PI Out			
HAP-16	Tue-4/9	10:30	TE3	9.34	11.41	20.03	2.06	-75.6	-	-	-	-	2.37	37.05	28.98	34.68	21.8	11.71	48.46	49.00	36.74	-1.1	
HAP-16	Tue-4/9	11:15	TE3	8.27	10.08	17.83	1.81	-76.8	-	-	-	-	2.22	30.61	26.18	28.39	14.5	10.49	40.69	44.01	30.20	-8.1	
HAP-16	Tue-4/9	12:30	TE3	8.33	11.30	17.39	2.97	-53.9	-	-	-	-	2.20	35.25	29.93	33.04	15.1	10.54	46.55	47.33	36.02	-1.7	
Averages				8.65	10.93	18.42	2.28	-68.76					2.26	34.30	28.36	32.04	17.11	10.91	45.23	46.78	34.32	-3.65	

ECTC Pilot Trace Elements Testing
Mercury Gas Sampling Results
Removal Summary
 (Normalized to 5% O₂)

Test ID	Date	Start Time	Other Imp.	Other					H ₂ O ₂					KMnO ₄					Total Vapor				
				Pre-Inlet	Post-Inlet	Outlet	Hg	Hg	Pre-Inlet	Post-Inlet	Outlet	Hg	Hg	Pre-Inlet	Post-Inlet	Outlet	Hg	Hg	Pre-Inlet	Post-Inlet	Outlet	Total Hg	Hg
				(µg/Nm ³)	(µg/Nm ³)	(µg/Nm ³)	(µg/Nm ³)	(%)	(µg/Nm ³)	(µg/Nm ³)	(µg/Nm ³)	(µg/Nm ³)	(%)	(µg/Nm ³)	(µg/Nm ³)	(µg/Nm ³)	(µg/Nm ³)	(%)	(µg/Nm ³)	(µg/Nm ³)	(µg/Nm ³)	(µg/Nm ³)	(%)
Acrylic Bag Baseline, 8000 scfm				SDA In	PI In	PI Out								SDA In	PI In	PI Out			SDA In	PI In	PI Out		
HAP-16R	Wed-4/10	08:30	TE3	7.53	12.44	17.89	4.90	-43.8	-	-	-	-	-	1.82	30.67	24.03	28.85	21.6	9.35	43.10	41.92	33.75	2.8
HAP-16R	Wed-4/10	09:45	TE3	8.22	9.94	20.47	1.72	-106.0	-	-	-	-	-	2.37	28.78	23.38	26.41	18.8	10.59	38.72	43.85	28.13	-13.3
HAP-16R	Wed-4/10	10:45	TE3	7.23	9.08	17.73	1.85	-95.2	-	-	-	-	-	1.87	29.44	25.13	27.57	14.6	9.10	38.52	42.85	29.42	-11.3
Averages				7.66	10.48	18.69	2.82	-81.69						2.02	29.63	24.18	27.61	18.35	9.68	40.11	42.87	30.43	-7.25
Acrylic Bag Baseline, 3000 scfm				SDA In	PI In	PI Out								SDA In	PI In	PI Out			SDA In	PI In	PI Out		
HAP17	Thu-4/11	08:00	TE3	8.20	15.92	32.83	7.73	-106.2	-	-	-	-	-	1.43	20.51	17.67	19.09	13.8	9.62	36.43	50.50	26.81	-38.6
HAP17	Thu-4/11	09:00	TE3	8.20	11.55	27.52	3.36	-138.3	-	-	-	-	-	1.47	22.55	19.28	21.08	14.5	9.67	34.11	46.80	24.44	-37.2
HAP17	Thu-4/11	10:00	TE3	9.00	12.97	22.10	3.97	-70.5	-	-	-	-	-	1.56	21.92	18.41	20.36	16.0	10.56	34.89	40.52	24.33	-16.1
Averages				8.46	13.48	27.49	5.02	-104.98						1.49	21.66	18.46	20.17	14.79	9.95	35.14	45.94	25.19	-30.66
Catalyst on Filters @ 300°F				-	CT-4	-								-	CT-4	-			-	CT-4	-		
HAP-18	Thu-4/11	11:00	TE3	-	PI In	-	-	-	-	-	-	-	-	-	PI In	-	-	-	-	PI In	-	-	-
HAP-18	Thu-4/11	12:00	TE3	-	21.47	-	-	-	-	-	-	-	-	-	11.61	-	-	-	-	33.08	-	-	-
HAP-18	Thu-4/11	12:00	TE3	-	17.12	-	-	-	-	-	-	-	-	-	16.24	-	-	-	-	33.36	-	-	-
HAP-18	Thu-4/11	12:45	TE3	-	12.87	-	-	-	-	-	-	-	-	-	16.70	-	-	-	-	29.57	-	-	-
Averages					17.15										14.85					32.00			
Fine Fly Ash				SDA In	PI In	PI Out								SDA In	PI In	PI Out			SDA In	PI In	PI Out		
HAP-19A	Fri-4/12	08:00	TE3	7.28	6.42	11.77	-0.86	-83.3	-	-	-	-	-	1.71	23.06	18.77	21.36	18.6	8.98	29.48	30.54	20.50	-3.6
HAP-19A	Fri-4/12	08:45	TE3	7.06	8.22	13.61	1.15	-65.7	-	-	-	-	-	1.82	23.69	19.21	21.87	18.9	8.88	31.90	32.83	23.02	-2.9
HAP-19A	Fri-4/12	09:30	TE3	6.39	6.88	13.04	0.49	-89.7	-	-	-	-	-	1.71	24.29	19.62	22.58	19.2	8.10	31.17	32.67	23.06	-4.8
Averages				6.91	7.17	12.81	0.26	-79.54						1.75	23.68	19.20	21.93	18.89	8.66	30.85	32.01	22.19	-3.77
Fine Fly Ash				SDA In	PI In	PI Out								SDA In	PI In	PI Out			SDA In	PI In	PI Out		
HAP-19B	Mon-4/15	08:00	TE3	8.66	12.30	14.57	3.65	-18.4	-	-	-	-	-	1.85	23.92	18.20	22.07	23.9	10.51	36.22	32.77	25.72	9.5
HAP-19B	Mon-4/15	08:45	TE3	8.43	9.14	13.26	0.71	-45.1	-	-	-	-	-	1.86	25.26	20.77	23.39	17.8	10.29	34.40	34.03	24.10	1.1
HAP-19B	Mon-4/15	09:30	TE3	11.27	2.83	14.77	-8.44	-421.7	-	-	-	-	-	2.17	12.03	22.92	9.87	-90.4	13.43	14.87	37.68	1.43	-153.5
Averages				9.45	10.72	14.20	2.18	-31.74						1.96	24.59	20.63	22.73	20.83	11.41	35.31	34.83	24.91	5.30
Fine Fly Ash				SDA In	PI In	PI Out								SDA In	PI In	PI Out			SDA In	PI In	PI Out		
HAP-19C	Tue-4/16	08:00	TE3	8.24	6.54	15.92	-1.70	-143.3	-	-	-	-	-	2.44	23.73	19.33	21.28	18.5	10.68	30.27	35.25	19.59	-16.5
HAP-19C	Tue-4/16	08:45	TE3	7.46	5.85	12.72	-1.61	-117.5	-	-	-	-	-	2.19	23.51	20.69	21.32	12.0	9.65	29.36	33.41	19.71	-13.8
HAP-19C	Tue-4/16	09:30	TE3	7.17	6.65	14.06	-0.52	-111.4	-	-	-	-	-	2.18	23.47	20.09	21.29	14.4	9.35	30.13	34.16	20.77	-13.4
Averages				7.62	6.35	14.23	-1.27	-124.04						2.27	23.57	20.04	21.30	14.97	9.89	29.92	34.27	20.02	-14.54
Catalyst on Filters @ 300°F				Base	CT-6	CT-4			Base	CT-6	CT-4			Base	CT-6	CT-4			Base	CT-6	CT-4		
HAP-20	Mon-4/22	09:30	H	CRG-1	CRG-2	CRG-3			CRG-1	CRG-2	CRG-3			CRG-1	CRG-2	CRG-3			CRG-1	CRG-2	CRG-3		
HAP-20	Mon-4/22	11:00	TE3	-	-	-	-	-	25.55	41.30	34.41	-	-	17.88	8.66	12.85	-	-	43.43	49.96	47.26	-	-
HAP-20	Mon-4/22	12:30	TE3	12.48	31.54	20.51	-	-	-	-	-	-	-	30.95	14.05	25.42	-	-	43.44	45.59	45.93	-	-
HAP-20	Mon-4/22	14:00	TE3	12.22	32.98	19.56	-	-	-	-	-	-	-	31.88	19.11	27.38	-	-	44.10	52.09	46.94	-	-
Averages				13.16	28.11	20.07	-	-	-	-	-	-	-	32.73	21.38	29.68	-	-	45.89	49.49	49.75	-	-
Averages				12.62	30.88	20.05								31.86	18.18	27.49			44.47	49.06	47.54		

*Shaded areas indicate sampling problems. H=Peroxide. TE3=Tris/EDTA(10mM). AA=Ambient Air Sampling. a=O₂ value calculated as average of SDA Out and PIFF Out CEM's. b=SDA Out O₂ CEM value

ECTC Pilot Trace Elements Testing
Mercury Gas Sampling Results
Removal Summary
 (Normalized to 5% O₂)

				Other					H2O2					KMnO4					Total Vapor				
Test ID	Date	Start Time	Other Imp. Cont.	Pre-Spike Inlet	Post-Spike Inlet	Outlet [Hg]	Hg Spiked	Hg Removal	Pre-Spike Inlet	Post-Spike Inlet	Outlet [Hg]	Hg Spiked	Hg Removal	Pre-Spike Inlet	Post-Spike Inlet	Outlet [Hg]	Hg Spiked	Hg Removal	Pre-Spike Inlet	Post-Spike Inlet	Outlet [Hg]	Total Hg Spiked	Hg Removal
				(µg/Nm3)	(µg/Nm3)	(µg/Nm3)	(µg/Nm3)	(%)	(µg/Nm3)	(µg/Nm3)	(µg/Nm3)	(µg/Nm3)	(µg/Nm3)	(µg/Nm3)	(µg/Nm3)	(%)	(µg/Nm3)	(µg/Nm3)	(µg/Nm3)	(µg/Nm3)	(µg/Nm3)	(µg/Nm3)	(µg/Nm3)
Catalyst on Filters @300°F				Base	CT-11	CT-9			Base	CT-11	CT-9			Base	CT-11	CT-9			Base	CT-11	CT-9		
				CRG-1	CRG-2	CRG-3			CRG-1	CRG-2	CRG-3			CRG-1	CRG-2	CRG-3			CRG-1	CRG-2	CRG-3		
HAP-21	Tue-4/23	08:00	H	-	-	-	-	-	23.68	25.52	14.53	-	-	15.25	16.76	1.80	-	-	38.93	42.28	16.33	-	-
HAP-21	Tue-4/23	09:00	TE3	12.34	16.10	18.95	-	-	-	-	-	-	-	26.09	27.93	2.73	-	-	38.43	44.03	21.69	-	-
HAP-21	Tue-4/23	10:00	TE3	11.47	15.47	25.94	-	-	-	-	-	-	-	27.55	29.55	3.69	-	-	39.02	45.02	29.63	-	-
HAP-21	Tue-4/23	11:30	TE3	12.59	21.00	25.75	-	-	-	-	-	-	-	25.62	26.45	2.94	-	-	38.21	47.45	28.69	-	-
Averages				12.13	17.52	23.55								26.42	27.98	3.12			38.55	45.50	26.67		
Catalyst on Filters @250°F				Base	CT-9	CT-4			Base	CT-9	CT-4			Base	CT-9	CT-4			Base	CT-9	CT-4		
				CRG-1	CRG-2	CRG-3			CRG-1	CRG-2	CRG-3			CRG-1	CRG-2	CRG-3			CRG-1	CRG-2	CRG-3		
HAP-22	Wed-4/24	08:00	H	-	-	-	-	-	23.88	5.30	28.89	-	-	14.75	1.87	7.21	-	-	38.64	7.16	36.10	-	-
HAP-22	Wed-4/24	09:00	TE3	12.63	18.95	21.56	-	-	-	-	-	-	-	31.67	4.64	23.43	-	-	44.30	23.59	44.98	-	-
HAP-22	Wed-4/24	10:00	TE3	11.07	16.46	17.59	-	-	-	-	-	-	-	26.05	3.96	20.81	-	-	37.12	20.41	38.40	-	-
HAP-22	Wed-4/24	11:30	TE3	10.53	16.94	17.21	-	-	-	-	-	-	-	26.12	2.94	20.97	-	-	36.65	19.88	38.17	-	-
Averages				11.41	17.45	18.79								27.95	3.85	21.73			39.36	21.29	40.52		
Catalyst on Filters @300°F				Base	CT-8	Nom/Gor			Base	CT-8	Nom/Gor			Base	CT-8	Nom/Gor			Base	CT-8	Nom/Gor		
				CRG-1	CRG-2	CRG-3			CRG-1	CRG-2	CRG-3			CRG-1	CRG-2	CRG-3			CRG-1	CRG-2	CRG-3		
HAP-23	Thu-4/25	08:00	H	-	-	-	-	-	24.59	28.75	22.20	-	-	14.63	10.94	16.62	-	-	39.22	39.70	38.83	-	-
HAP-23	Thu-4/25	09:00	TE3	13.21	25.46	14.95	-	-	-	-	-	-	-	26.07	20.80	29.48	-	-	39.28	46.25	44.44	-	-
HAP-23	Thu-4/25	10:00	TE3	12.43	24.19	9.43	-	-	-	-	-	-	-	24.28	20.64	19.66	-	-	36.71	44.83	29.09	-	-
HAP-23	Thu-4/25	11:30	TE3	13.16	20.59	12.66	-	-	-	-	-	-	-	24.98	21.31	27.33	-	-	38.13	41.90	40.00	-	-
Averages				12.93	23.41	12.35								25.11	20.92	25.49			38.04	44.33	37.84		

		Spike Recovery					Spike Capture (By Impinger)					SDA Out-TGR Elem Mercury Oxidation		Total Hg Capture (SDA Inlet) (By Impinger)					Total Hg Capture (PJFF Inlet) (By Impinger)					Total Hg Capture (PJFF Outlet) (By Impinger)							
Test ID	Date	Start Time	Other Imp. Cont.	Actual Spiked (µg/Nm3)	Spiked Theo Hg (µg/Nm3)	Percent Spike Rec (%)	Other [Hg] (%)	Other [Hg] (%)	H2O2 [Hg] (%)	H2O2 [Hg] (%)	KMnO4 [Hg] (%)	Tris inc (%)	KMnO4 red (%)	Other (%)	Other (%)	H2O2 (%)	H2O2 (%)	KMnO4 (%)	Other (%)	Other (%)	H2O2 (%)	H2O2 (%)	KMnO4 (%)	Other (%)	Other (%)	H2O2 (%)	H2O2 (%)	KMnO4 (%)			
Repeat Baseline							PI In					PI In					SDA In					SDA In					PI Out				
HAP-12	Mon-4/1	09:30	TE3	22.25	29.00	76.7	-	-7.6	-	-	107.6	70.0	78.5	-	87.1	-	-	12.9	-	21.3	-	-	78.7	-	81.9	-	-	18.1			
HAP-12	Mon-4/1	10:30	TE3	23.44	29.00	80.8	-	-5.5	-	-	105.5	80.9	77.6	-	85.9	-	-	14.1	-	17.5	-	-	82.5	-	82.0	-	-	18.0			
HAP-12	Mon-4/1	11:15	TE3	26.71	29.00	92.1	-	3.4	-	-	96.6	70.0	78.5	-	85.2	-	-	14.8	-	21.3	-	-	78.7	-	81.9	-	-	18.1			
Averages				24.13		83.22		-3.26			103.26	75.44	78.23		86.07			13.93		20.00			80.00		81.93			18.07			
Repeat Baseline, Inc. Hg							PI In					PI In					SDA In					SDA In					PI Out				
HAP-13	Tue-4/2	08:30	TE3	46.25	45.00	102.8	-	7.9	-	-	92.1	92.7	76.9	-	86.3	-	-	13.7	-	24.2	-	-	75.8	-	84.3	-	-	15.7			
HAP-13	Tue-4/2	09:45	TE3	45.04	45.00	100.1	-	6.1	-	-	93.9	93.3	77.9	-	86.0	-	-	14.0	-	22.3	-	-	77.7	-	84.6	-	-	15.4			
HAP-13	Tue-4/2	10:45	TE3	45.94	45.00	102.1	-	8.7	-	-	91.3	82.7	77.2	-	87.2	-	-	12.8	-	24.6	-	-	75.4	-	83.5	-	-	16.5			
Averages				45.74		101.65		7.58			92.4	93.00	77.30		86.52			13.48		23.67			76.33		84.15			15.85			
Catalyst on Filters @ 250F												CT-7	CT-11	Base	Base	Base	Base	Base	CT-7	CT-7	CT-7	CT-7	CT-7	CT-11	CT-11	CT-11	CT-11	CT-11			
												KMnO4 % decrease		CRG-1	CRG-1	CRG-1	CRG-1	CRG-1	CRG-2	CRG-2	CRG-2	CRG-2	CRG-2	CRG-3	CRG-3	CRG-3	CRG-3	CRG-3			
HAP-14	Wed-4/3	10:30	TE3	-	-	-	-	-	-	-	-	3.4	2.4	-	32.5	-	-	67.5	-	34.4	-	-	65.6	-	33.6	-	-	66.4			
HAP-14	Wed-4/3	11:45	TE3	-	-	-	-	-	-	-	-	-4.1	-12.7	-	36.6	-	-	63.4	-	36.4	-	-	63.6	-	34.5	-	-	65.5			
HAP-14	Wed-4/3	12:30	TE3	-	-	-	-	-	-	-	-	17.7	1.5	-	32.0	-	-	68.0	-	40.8	-	-	59.2	-	37.1	-	-	62.9			
Averages												5.67	-2.92		33.69			66.31		37.20			62.80		35.08			64.92			
Catalyst on Filters @ 250F												CT-7	CT-11	Base	Base	Base	Base	Base	CT-7	CT-7	CT-7	CT-7	CT-7	CT-11	CT-11	CT-11	CT-11	CT-11			
												KMnO4 % decrease		CRG-1	CRG-1	CRG-1	CRG-1	CRG-1	CRG-2	CRG-2	CRG-2	CRG-2	CRG-2	CRG-3	CRG-3	CRG-3	CRG-3	CRG-3			
HAP-14A	Thu-4/4	08:00	TE3	-	-	-	-	-	-	-	-	3.6	0.8	-	30.1	-	-	69.9	-	33.0	-	-	67.0	-	32.5	-	-	67.5			
HAP-14A	Thu-4/4	09:00	TE3	-	-	-	-	-	-	-	-	4.8	-0.9	-	28.9	-	-	71.1	-	30.5	-	-	69.5	-	29.2	-	-	70.8			
HAP-14A	Thu-4/4	10:00	TE3	-	-	-	-	-	-	-	-	1.7	-6.2	-	27.2	-	-	72.8	-	28.8	-	-	71.2	-	17.7	-	-	82.3			
Averages												4.16	-0.07		28.74			71.26		30.75			69.25		30.83			73.54			
Catalyst on Filters @ 250F												CT-4	CT-5	Base	Base	Base	Base	Base	CT-4	CT-4	CT-4	CT-4	CT-4	CT-5	CT-5	CT-5	CT-5	CT-5			
												KMnO4 % decrease		CRG-1	CRG-1	CRG-1	CRG-1	CRG-1	CRG-2	CRG-2	CRG-2	CRG-2	CRG-2	CRG-3	CRG-3	CRG-3	CRG-3	CRG-3			
HAP-15	Fri-4/5	07:45	TE3	-	-	-	-	-	-	-	-	4.1	5.0	-	36.0	-	-	64.0	-	36.8	-	-	63.2	-	43.8	-	-	56.2			
HAP-15	Fri-4/5	08:30	TE3	-	-	-	-	-	-	-	-	10.5	9.9	-	34.1	-	-	65.9	-	39.9	-	-	60.1	-	42.3	-	-	57.7			
HAP-15	Fri-4/5	09:30	TE3	-	-	-	-	-	-	-	-	1.5	4.6	-	36.6	-	-	63.4	-	38.3	-	-	61.7	-	39.8	-	-	60.2			
Averages												7.32	7.47		35.56			64.44		38.32			61.68		41.98			58.02			
M29* HCl Add'n., Ambient Air														AA	AA	AA	AA	AA	Spike Removal Efficiency by Peroxides												
HAP-00	Fri-4/5	12:00	H	-	-	-	-	-	-	-	-	-	-	1.3	0.2	0.0	0.0	98.4	1.3	0.2	0.0	0.0	-	-	-	-	-				
HAP-00	Fri-4/5	13:00	H	-	-	-	-	-	-	-	-	-	-	3.2	0.3	0.1	0.1	96.3	3.2	0.3	0.1	0.1	-	-	-	-	-				
HAP-00	Fri-4/5	14:00	H	-	-	-	-	-	-	-	-	-	-	5.4	0.5	0.1	0.0	94.0	5.4	0.5	0.1	0.0	-	-	-	-	-				
HAP-00	Fri-4/5	15:00	H	-	-	-	-	-	-	-	-	-	-	8.3	0.7	0.1	0.3	90.6	8.3	0.8	0.1	0.3	-	-	-	-	-				
Averages																															
Acrylic Bag Baseline, 8000 scfm							PI In					PI In					SDA In					SDA In					PI Out				
HAP-16	Tue-4/9	10:30	TE3	26.63	31.10	85.6	-	5.6	-	-	94.4	23.3	21.8	-	79.8	-	-	20.2	-	23.5	-	-	76.5	-	40.9	-	-	59.1			
HAP-16	Tue-4/9	11:15	TE3	24.00	31.10	77.2	-	6.0	-	-	94.0	25.3	14.5	-	78.8	-	-	21.2	-	24.8	-	-	75.2	-	40.5	-	-	59.5			
HAP-16	Tue-4/9	12:30	TE3	26.75	31.10	86.0	-	8.2	-	-	91.8	17.3	15.1	-	79.1	-	-	20.9	-	24.3	-	-	75.7	-	36.7	-	-	63.3			
Averages				25.79		82.93		6.62			93.4	24.29	17.11		79.23			20.77		24.20			75.80		39.38			60.62			

*Shaded areas indicate sampling problems. H=Peroxide. TE3=Tris/EDTA(10mM). AA=Ambient Air Sampling. a=O2 value calculated as average of SDA Out and PJFF Out CEM's. b=SDA Out O2 CEM value.

[illegible]

Spike Recovery												Spike Capture (By Impinger)					SDA Out-TGR Elem Mercury Oxidation		Total Hg Capture (SDA Inlet) (By Impinger)					Total Hg Capture (PJFF Inlet) (By Impinger)					Total Hg Capture (PJFF Outlet) (By Impinger)				
Test ID	Date	Start Time	Other Imp. Cont.	Actual Spiked (µg/Nm3)	Theo Hg (µg/Nm3)	Percent Spike Rec (%)	Other [Hg] (%)	Other [Hg] (%)	H2O2 [Hg] (%)	H2O2 [Hg] (%)	KMnO4 [Hg] (%)	Tris inc (%)	KMnO4 red (%)	Other (%)	Other (%)	H2O2 (%)	H2O2 (%)	KMnO4 (%)	Other (%)	Other (%)	H2O2 (%)	H2O2 (%)	KMnO4 (%)	Other (%)	Other (%)	H2O2 (%)	H2O2 (%)	KMnO4 (%)					
Catalyst on Filters @300°F												CT-11	CT-9	Base	Base	Base	Base	Base	CT-11	CT-11	CT-11	CT-11	CT-11	CT-9	CT-9	CT-9	CT-9	CT-9					
												KMnO4 % decrease	CRG-1	CRG-1	CRG-1	CRG-1	CRG-1	CRG-2	CRG-2	CRG-2	CRG-2	CRG-2	CRG-3	CRG-3	CRG-3	CRG-3	CRG-3						
HAP-21	Tue-4/23	08:00	H	-	-	-	-	-	-	-	-	-9.9	88.2	-	-	-	60.8	39.2	-	-	-	60.4	39.6	-	-	-	89.0	11.0					
HAP-21	Tue-4/23	09:00	TE3	-	-	-	-	-	-	-	-	-7.1	89.5	-	32.1	-	-	67.9	-	36.6	-	-	63.4	-	87.4	-	-	12.6					
HAP-21	Tue-4/23	10:00	TE3	-	-	-	-	-	-	-	-	-7.3	86.6	-	29.4	-	-	70.6	-	34.4	-	-	65.6	-	87.5	-	-	12.5					
HAP-21	Tue-4/23	11:30	TE3	-	-	-	-	-	-	-	-	-3.3	88.5	-	32.9	-	-	67.1	-	44.2	-	-	55.8	-	89.7	-	-	10.3					
Averages												-5.86	88.21	31.48		68.52		38.39		61.61		88.22		11.78									
Catalyst on Filters @250°F												CT-9	CT-4	Base	Base	Base	Base	Base	CT-9	CT-9	CT-9	CT-9	CT-9	CT-4	CT-4	CT-4	CT-4						
												KMnO4 % decrease	CRG-1	CRG-1	CRG-1	CRG-1	CRG-1	CRG-2	CRG-2	CRG-2	CRG-2	CRG-2	CRG-3	CRG-3	CRG-3	CRG-3	CRG-3						
HAP-22	Wed-4/24	08:00	H	-	-	-	-	-	-	-	-	87.4	51.1	-	-	-	61.8	38.2	-	-	-	73.9	26.1	-	-	-	80.0	20.0					
HAP-22	Wed-4/24	09:00	TE3	-	-	-	-	-	-	-	-	85.3	26.0	-	28.5	-	-	71.5	-	80.3	-	-	19.7	-	47.9	-	-	52.1					
HAP-22	Wed-4/24	10:00	TE3	-	-	-	-	-	-	-	-	84.8	20.1	-	29.8	-	-	70.2	-	80.6	-	-	19.4	-	45.8	-	-	54.2					
HAP-22	Wed-4/24	11:30	TE3	-	-	-	-	-	-	-	-	88.7	19.7	-	28.7	-	-	71.3	-	85.2	-	-	14.8	-	45.1	-	-	54.9					
Averages												86.29	21.96	29.02		70.98		82.04		17.96		46.27		53.73									
Catalyst on Filters @300°F												CT-8	Nom/Gor	Base	Base	Base	Base	Base	CT-8	CT-8	CT-8	CT-8	CT-8	Nom/Go	Go	Go	Go	Go					
												KMnO4 % decrease	CRG-1	CRG-1	CRG-1	CRG-1	CRG-1	CRG-2	CRG-2	CRG-2	CRG-2	CRG-2	CRG-3	CRG-3	CRG-3	CRG-3	CRG-3						
HAP-23	Thu-4/25	08:00	H	-	-	-	-	-	-	-	-	25.2	-13.6	-	-	-	62.7	37.3	-	-	-	72.4	27.6	-	-	-	57.2	42.8					
HAP-23	Thu-4/25	09:00	TE3	-	-	-	-	-	-	-	-	20.2	-13.1	-	33.6	-	-	66.4	-	55.0	-	-	45.0	-	33.7	-	-	66.3					
HAP-23	Thu-4/25	10:00	TE3	-	-	-	-	-	-	-	-	15.0	19.0	-	33.9	-	-	66.1	-	54.0	-	-	46.0	-	32.4	-	-	67.6					
HAP-23	Thu-4/25	11:30	TE3	-	-	-	-	-	-	-	-	14.7	-9.4	-	34.5	-	-	65.5	-	49.1	-	-	50.9	-	31.7	-	-	68.3					
Averages												16.63	-1.17	34.00		66.00		52.71		47.29		32.57		67.43									

*Shaded areas indicate sampling problems. H=Peroxide. TE3=Tris/EDTA(10mM). AA=Ambient Air Sampling. a=O2 value calculated as average of SDA Out and PJFF Out CEM's. b=SDA Out O2 CEM value.

APPENDIX D
QA/QC SUMMARY REPORT

WET SCRUBBER QA/QC SUMMARY

The objective of the wet scrubber QA/QC program is to ensure the accuracy of key process instrumentation used on the pilot and spray dryer systems. Flow control valve flow meters, pump flow meters, tank level monitors, and flue gas flow rates are checked approximately once per month. Errors greater than 5% generally indicate that the instrument in question should be recalibrated or cleaned. The wet scrubber continuous emission monitors (CEMs), used to measure inlet and outlet SO_2 and O_2 levels for the pilot system, are checked daily with span errors over 5% requiring an adjustment of the span potentiometer. The spray dryer CEM's are checked weekly with span errors over 5% requiring an adjustment of the span potentiometer. During additive tests, chemical addition rates are checked daily with adjustments made if they are outside of the test parameter. A status update for each QA/QC point out of calibration is presented below. A complete record of the process QA/QC for March and April is presented at the end of this section.

MARCH/APRIL 1996

Testing was done with the SDA/PJFF system and at the CRG duct during this time. The SDA was used in the gas path configuration without the atomizer to direct flue gas to the PJFF. The gas velocity was the main QA/QC point of concern during this testing. A velocity traverse (VT) was conducted at the Spray Dryer Inlet on April 9. As the data from this VT (at 8,000 scfm) was compared to the WDPF calculated flow rate, a -1.3% error/difference was determined. This error was within the 5% limit allowed at the ECTC.

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