COMPLIANCE TEST REPORT

PM, PM_{10}, VISIBLE EMISSIONS, SULFURIC ACID MIST, HYDROGEN CHLORIDE, HYDROGEN FLUORIDE, ARSENIC, LEAD, MERCURY, AND VOLATILE ORGANIC COMPOUNDS

UNITS 1 & 2 – FGD Stack

MI-ROP-B2816-2019

Monroe Power Plant
Monroe, Michigan

April 16-24, 2024

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EXECUTIVE SUMMARY

DTE Energy's Environmental Management and Safety, Ecology, Monitoring, and Remediation Group (EMR) performed emissions testing on the Units 1 and 2 FGD exhaust stacks located at the Monroe Power Plant, in Monroe, Michigan. The testing was required by the Michigan Department of Environment, Great Lakes, & Energy (EGLE) Renewable Operating Permit MI-ROP-B2816-2019 to document stack emissions from each Unit during normal operating conditions. Testing was conducted during the period of April 16-24, 2024.

A summary of the emission test results is shown below:

Emissions Testing Summary
Units 1 & 2 FGD Stack
Monroe Power Plant
April 16-24, 2024

Particulate Matter

	$PM^{(1)}$ (lb/MMBtu)	$PM_{10}^{(2)}$ (lb/MMBtu)	Opacity (%)	$VOC^{(3)}$ (lb/hr)	$VOC^{(3)}$ (lb/MMBtu)
Unit 1	0.007	0.010	2.4	<1.4	<0.0002
Unit 2	0.007	0.014	3.5	<1.4	<0.0002
Permit Limit	***0.011***	***0.024***	***10***	***25.9***	***0.0034***

(1) = Total Filterable PM
(2) = Measured as Total Filterable PM plus Condensable PM (Per Method 202)
(3) = As Propane

Acid Gases

	Sulfuric Acid Mist (lb/MMBtu)	Hydrogen Chloride (lb/MMBtu)	Hydrogen Fluoride (lb/MMBtu)
Unit 1	0.001	0.0001	<0.00002
Unit 2	*0.006*	0.0001	<0.00002
Permit Limit	***0.005***	***0.0024***	***0.00023***

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Emissions Testing Summary
Units 1 & 2 FGD Stack
Monroe Power Plant
April 16-24, 2024

Metals

	Arsenic (lb/MMBtu)	Lead (lb/hr)	Lead (lb/MMBtu)	Mercury (lb/yr)
Unit 1	2.22E-7	0.004	5.87E-7	3.19
Unit 2	2.77E-7	0.007	9.24E-7	8.32
Permit Limit	*6.3E-6*	*0.13*	*1.69E-5*	*143.1 (Unit 1)* *144.2 (Unit 2)*

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1.0 INTRODUCTION

DTE Energy's Environmental Management and Safety, Ecology, Monitoring, and Remediation Group (EMR) performed emissions testing on the Units 1 and 2 FGD exhaust stacks located at the Monroe Power Plant, in Monroe, Michigan. The testing was required by the Michigan Department of Environment, Great Lakes, & Energy (EGLE) Renewable Operating Permit MI-ROP-B2816-2019 to document stack emissions from each Unit during normal operating conditions. Testing was conducted during the period of April 16-24, 2024.

Testing was performed pursuant to Title 40, *Code of Federal Regulations*, Part 60, Appendix A (40 CFR §60 App. A), Methods 1-5B, 202, 8A, 9, 25A, 26A, 29 and 30B.

The fieldwork was performed in accordance with EPA Reference Methods and EMR's Intent to Test[1], submitted to the Michigan Department of Environment, Great Lakes, & Energy (EGLE), dated March 1, 2024. The following EMR personnel participated in the testing program: Mr. Mark Grigereit, Principal Engineer, Mr. Thom Snyder, Principal Specialist, Mr. Mark Westerberg, Sr. Environmental Specialist, Mr. Fred Meinecke and Ken St. Amant, Environmental Specialists. Mr. Grigereit was the Project Lead. Mr. Eric Molnar, Environmental Engineer at Monroe Power Plant, provided process coordination for the testing program.

2.0 SOURCE DESCRIPTION

The Monroe Power Plant is located at 3500 E. Front Street in Monroe, Michigan. The plant has four (4) coal-fired electric generating units, referred to as Units 1, 2, 3, and 4. These units were placed in service between 1971 and 1974, and have a total electric generating capacity of 3,135 megawatts (gross). The boiler (Babcock & Wilcox) for each unit is a similar supercritical pressure, pulverized coal-fired cell burner boiler. Each boiler exhausts into a dedicated exhaust stack.

Units 1 and 4 have General Electric turbine generators, each with a rated capability of 817 gross megawatts (GMW). Units 2 and 3 have Westinghouse turbine generators, each with a rated capability of 823 GMW.

Each boiler is equipped with Research Cottrell electrostatic precipitator (ESPs), each with a rated particulate removal efficiency of 99.6%. There is a sulfur trioxide flue gas conditioning system on each unit that is only used on an "as needed basis" to lower the resistivity of the fly ash for better collection by the ESPs. None of the units are equipped with sulfuric acid mist control equipment.

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[1] EGLE, Test Plan, Submitted March 1, 2024. (Attached-Appendix A)

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Units 1 through 4 have Selective Catalytic Reduction (SCR) systems, operated to control at least 90% of the NOx emissions. The SCR's are located upstream of the respective ESP's. Each unit has wet Flue Gas Desulfurization (FGD) Scrubbers to control sulfur dioxide (SO_2), other acid gases, and particulate matter emissions.

The coal blend for Units 1 & 2 were 20% high-sulfur eastern (HSE) / 70% low-sulfur western (LSW)/ 10% Petcoke. Testing was performed while the boilers were operated at normal full load conditions (>740 GMW).

The boilers at Monroe Power Plant employ the use of continuous soot-blowing, thus a separate PM test conducted specifically during a soot-blowing period was not necessary.

The exhaust stacks for each of boilers are 580 feet tall with an internal diameter of 28 feet. See Figure 1 for a diagram of the Unit 2 sampling location and stack dimension.

3.0 SAMPLING AND ANALYTICAL PROCEDURES

Emissions measurements were conducted in accordance with procedures specified in the USEPA *Standards of Performance for New Stationary Sources* or listed as an approved *"Other Test Method"*. The sampling and analytical methods used in the testing program are indicated in the table below:

Sampling Method	Parameter	Analysis
USEPA Methods 1-2	Exhaust Gas Flow Rates	Field data analysis and reduction
USEPA Method 3A	Oxygen & CO2	Instrumental Analyzer Method
USEPA Method 4	Moisture Content	Field data analysis and reduction

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Sampling Method	Parameter	Analysis
USEPA Method 5B	Particulate Matter (Non-Sulfuric Acid)	Gravimetric Analysis
USEPA Method 202	PM Condensables	Gravimetric Analysis
USEPA Method 8A (NCASI Method)	Sulfuric Acid Mist/Vapor	Titration
USEPA Method 25A	Volatile Organic Compounds	Flame Ionization Detector
USEPA Method 26a	Hydrogen Chloride, Hydrogen Fluoride	Ion Chromatography
USEPA Method 29	Arsenic & Lead	As, Pb – Inductively Coupled Argon Plasma Spectroscopy
USEPA Method 30B	Total Vapor Phase Mercury Emission Concentrations	Thermal Desorption/Atomic Absorption

3.1 STACK GAS VELOCITY AND FLOWRATES (USEPA Methods 1-2)

3.1.1 Sampling Method

Stack gas velocity traverses were conducted in accordance with the procedures outlined in USEPA Method 1, "Sample and Velocity Traverses for Stationary Sources," and Method 2, "Determination of Stack Gas Velocity and Volumetric Flowrate." During the emissions testing, four (4) sampling ports were utilized, sampling at three (3) points per port for a total of twelve (12) sampling points. Velocity traverses were conducted in conjunction with all testing method sample collection. See Figure 2 for a diagram of the traverse/sampling points used.

A cyclonic flow check was performed on each Unit FGD Stack during the initial flow monitor certification RATAs. Testing at each sampling location demonstrated that no cyclonic flow was present. Static Pressure reads at the time of testing demonstrated null angles of 0° perpendicular to the stack wall

3.1.2 Method 2 Sampling Equipment

The EPA Method 2 sampling equipment consisted of a 0-10.0" incline manometer, S-type pitot tube (C_p = 0.84) and a Type-K calibrated thermocouple.

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3.2 OXYGEN AND CARBON DIOXIDE (USEPA Method 3A)

3.2.1 Sampling Method

Stack gas oxygen (O_2) and carbon dioxide (CO_2) emissions were evaluated using USEPA Method 3A, "Gas Analysis for Carbon Dioxide, Oxygen, Excess Air, and Dry Molecular Weight (Instrumental Analyzer Method)". The O_2 / CO_2 analyzers utilize paramagnetic sensors.

3.2.2 O_2 / CO_2 Sampling Train

The Method 3A sampling system consisted of continuously collecting a gas sample from the exhaust of the dry gas meter during each test. The sample was drawn through a Teflon® line into a Universal™ gas conditioner and into a Servomex™ 1400 O_2/CO_2 gas analyzer.

3.2.3 Sampling Train Calibration

The O_2 / CO_2 analyzer was calibrated according to procedures outlined in USEPA Method 7E. Zero, span, and mid-range calibration gases were introduced directly into the analyzer to verify the instruments linearity. The O_2/CO_2 concentrations are recorded on the field data sheets.

3.3 MOISTURE DETERMINATION (USEPA Method 4)

3.3.1 Sampling Method

Determination of the moisture content of the exhaust gas was performed using the method described in USEPA Method 4, "Determination of Moisture Content in Stack Gases". The exhaust gas condensate was collected in glass impingers and the percentage of moisture was derived from calculations outlined in USEPA Method 4.

3.4 PARTICULATE MATTER INCLUDING CONDENSABLES (USEPA Method 5B/202)

3.4.1 Filterable Particulate Sampling

USEPA Method 5B, "Determination of Non-Sulfuric Acid Particulate Matter Emissions from Stationary Sources" was used to measure the filterable (front-half) particulate emissions (see Figure 3 for a schematic of the sampling train). Triplicate, 120-minute test runs were conducted.

The Method 5B modular isokinetic stack sampling system (Figure 3) consisted of the following:

(1) Teflon® coated stainless-steel button-hook nozzle

(2) Heated glass-lined probe (maintained at a temperature of 320 ± 25 °F)
(3) Heated 3" glass filter holder with a quartz filter (maintained at a temperature of 320 ± 25 °F)
(4) Set of impingers (Method 202) for the collection condensable particulates and condensate for moisture determination (see section 3.4.2, below)
(5) Length of sample line
(6) Environmental Supply® control case equipped with a pump, dry gas meter, and calibrated orifice.

The quartz filters used in the sampling were initially weighed to a constant weight as described in Method 5B to obtain the initial tare weight.

After completion of the final leak test for each test run, the filter was recovered, and the probe, nozzle and the front half of the filter holder assembly were brushed and rinsed with acetone. The acetone rinses were collected in a pre-cleaned sample container. The container was labeled with the test number, test location, test date, and the level of liquid marked on the outside of the container. Immediately after recovery, the sample containers were placed in a cooler for storage.

At the laboratory the acetone rinses were transferred to clean pre-weighed beakers and evaporated to dryness at ambient temperature and pressure. The beakers and filters were then placed in a desiccator for 24 hours and weighed to a constant weight (within 0.5 mg). The data sheets containing the initial and final weights of the filters and beakers can be found in Appendix C.

Collected field blanks consisted of a blank filter and acetone solution blank. The acetone blank was collected from the rinse bottle used in sample recovery. The blank filter and acetone were collected and analyzed following the same procedures used to recover and analyze the field samples.

Visible emissions (VE) readings were conducted for one hour during each Method 5B test. The VE readings were conducted according to EPA Method 9 and utilized a Certified VE person. Data sheets from the VE readings are presented in Appendix G.

Field data sheets for the Method 5B/202 sampling are in Appendix B.

3.4.2 Condensable Particulate Sampling Method (Method 202)

USEPA Method 202, "Dry Impinger method for Determining Condensable Particulate Emissions from Stationary Sources" was used to measure the condensable particulate matter (CPM) (see Figure 3 for a schematic of the sampling train). This method includes procedures for measuring both organic and inorganic CPM. The Method 202 samples were collected in conjunction with the Method 5B samples as part of the sampling train. Triplicate, 120-minute test runs were conducted.

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The Method 202 impinger configuration (Figure 3) consisted of the following:

(1) Method 23 type condenser (capable of cooling the stack gas to less than 85 °F)
(2) Condensate dropout pot belly impinger (dry)
(3) Modified Greenburg-Smith impinger (dry) with no taper as a backup impinger
(4) 83mm glass filter holder with a Teflon® filter (maintained at a temperature ≤ 85 °F)
(5) Modified Greenburg-Smith impinger containing 100 millimeters (ml) of distilled de-ionized (DDI) water
(6) Modified Greenburg-Smith impinger containing approximately 300 grams of silica gel desiccant.

The condensate dropout impinger and backup impinger were placed in an insulated box with water at ≤ 85 °F. The water and silica gel impingers were placed in an ice water bath to maintain the exit gas temperature from the silica gel impinger below 68 °F.

All Method 202 glassware was pre-cleaned prior to testing with soap and water, and rinsed using tap water, distilled de-ionized water, and acetone. After cleaning, the glassware was baked at 300 °C for 3 hours. Prior to each sampling run, the train glassware was rinsed thoroughly with distilled de-ionized ultra-filtered water.

As soon as possible after the post-test leak check was completed, the Method 5B filter and probe were detached from the Method 202 condenser and impinger train. The Method 202 impinger train was then carefully disassembled. The liquid volume of each impinger was measured (by weight) and recorded on the field data sheet. Moisture from the condensate dropout impinger was added to the second impinger. The Method 202 impinger train was purged with ultra-high purity compressed nitrogen at 14 liters per minute for one hour. During the purge the condenser recirculation pump was operated and the first two impingers were heated/cooled to maintain the gas temperature exiting the CPM filter below 85 °F. If insufficient water was collected in the dry impinger to allow the modified insert tip to extend below the water level, 50-100 ml of de-gassed, DDI water was added to the impinger and noted on the sampling data sheet.

Contents from the dropout impinger and the impinger prior to the CPM filter were collected into a pre-cleaned sample container. The condenser, impingers and front-half of the CPM filter holder were rinsed with DDI water and the rinses added to the sample container. The condenser, impingers and front-half of the CPM filter holder were then rinsed with acetone followed by two rinses with Hexane. The acetone and

hexane rinses were collected into a pre-cleaned sample container. The CPM filter was recovered and placed into a labeled container. All containers were labeled with the test number, test location, test date, and the level of liquid marked on the outside of the container. Immediately after recovery, the sample containers were placed in a cooler for storage.

Collected reagent blanks consisted of an acetone blank, a DDI water blank and a hexane blank taken directly from the bottles used during recovery of the samples. Additionally, a field train recovery blank was assembled and recovered following the same procedures used to prepare and recover the test samples.

Analysis of the Method 202 samples and blanks were conducted by Enthalpy Analytical (Enthalpy) of Durham, North Carolina. All analysis followed the procedures listed in Method 202. A complete laboratory report is in Appendix C.

Field data sheets for the Method 5B/202 sampling can be found in Appendix B.

3.4.3 Quality Control and Assurance

All sampling and analytical equipment was calibrated according to the guidelines referenced in EPA Method 5B (see Appendix E for equipment calibration). Enthalpy followed all the appropriate Method 202 analytical QA/QC (see Appendix C).

3.4.4 Data Reduction

Total filterable Particulate data collected during the emissions testing was calculated and reported as pounds per hour (lbs/hr) and pounds per million Btu (lbs/MMBtu).

PM_{10} emissions were calculated by adding the total filterable PM emissions and the condensable PM emissions. The PM_{10} emissions were calculated and reported as pounds per hour (lbs/hr) and pounds per million Btu (lbs/MMBtu).

Emissions calculations were based on calculations located in USEPA Method 5 and Method 19. Example calculations are presented in Appendix E.

3.5 SULFURIC ACID MIST/VAPOR (USEPA Method 8A)

3.5.1 Sulfuric Acid Mist Sampling Method

USEPA Method 8A, "Determination of Sulfuric Acid Vapor or Mist and Sulfur Dioxide Emissions from Kraft Recovery Furnaces" (NCASI Method 8A) was used to measure the sulfuric acid mist emissions (see Figure 4 for a schematic of the sampling train). Method 8A uses a quartz in-line filter to remove particulate matter from the gas stream prior to capturing sulfuric acid. The use of this controlled condensation

technique eliminates the potential for interference from sulfur dioxide. Triplicate, 60-minute test runs were conducted

The Method 8A stack sampling system (Figure 4) consisted of the following:

(1) Heated quartz-lined probe (maintained at a temperature of >350 °F)
(2) Heated glass filter holder with a quartz filter (maintained at a temperature of >500 °F)
(3) Sulfuric acid condenser (maintained at a temperature between 167 and 185 °F)
(4) Set of impingers for the collection of condensate
(5) Length of sample line
(6) Environmental Supply® control case equipped with a pump, dry gas meter, and calibrated orifice.

All sampling (non-isokinetic) was conducted at a single point in the exhaust stack. Concurrent velocity traverses were conducted during the Method 8A tests.

After completion of the final leak test for each test run, the probe was disconnected, and the system was purged with ambient air for 15 minutes at the same sampling rate recorded during the test.

Sample recovery consisted of rinsing the sulfuric acid condenser with deionized water (DI). The rinse was collected in a pre-cleaned sample container. The container was labeled with the test number, test location, test date, and the level of liquid marked on the outside of the container. Immediately following recovery, the sample container was placed in a cooler for storage.

The collected field blank was consisted of a DI rinse blank. The DI rinse blank was collected from the same bottle used in sample recovery. The DI rinse blank was collected and analyzed following the same procedures used to recover and analyze the field samples.

Analysis of the Method 8A samples and blanks were conducted by Enthalpy. All analysis followed the procedures listed in USEPA Method 8A. A complete laboratory report can be found in Appendix C.

Field data sheets from the Method 8A sampling are in Appendix B.

3.5.2 Quality Control and Assurance

All sampling and analytical equipment was calibrated according to the guidelines referenced in EPA Method 5 and 8A.

3.5.3 Data Reduction

The H_2SO_4 emissions data collected during the testing was calculated and reported as lbs/hr and lb/MMBtu.

3.6 HYDROGEN CHLORIDE, HYDROGEN FLUORIDE (USEPA Method 26A)

3.6.1 HCl & HF Sampling Method

USEPA Method 26A, "Determination of Hydrogen Halide and Halogen Emissions" (Method 26A) was used to measure the Hydrochloric Acid (HCl) and Hydrofluoric Acid (HF) emissions (see Figure 5 for a schematic of the sampling train). Method 26A uses impingers containing 0.1N H_2SO_4 to capture the HCl & HF. Triplicate, 60-minute test runs were conducted.

The Method 26A stack sampling system (Figure 5) consisted of the following:

(1) Teflon® coated stainless-steel button-hook nozzle
(2) Heated glass-lined probe (Maintained >250 °F)
(3) Heated 3" glass filter holder with a Teflon® filter (maintained at a temperature of >250 °F)
(4) Set of impingers for the collection HCl, HF and condensate for moisture determination (Impingers containing 0.1N H_2SO_4)
(5) Length of sample line
(6) Environmental Supply® control case equipped with a pump, dry gas meter, and calibrated orifice.

All sampling was conducted isokenetically according to Method 5.

After completion of each run, a leak test was conducted. All the impingers were measured for moisture gain. Impingers 1, 2 and 3 were rinsed with H_2O and their contents and associated rinses were collected in a pre-cleaned sample container. The containers were labeled with the test number, test location, test date, and the level of liquid marked on the outside of the container. Immediately after recovery, the sample containers were placed in a cooler for storage.

Collected field blanks consisted of a 0.1N H_2SO_4 solution blank. 250ml of 0.1N H_2SO_4 was collected and diluted with DI water, from the same bottle used in sample recovery, to the liquid level of the three test runs. The blank was collected and analyzed following the same procedures used to recover and analyze the field samples.

Analysis of the Method 26A samples and blanks were conducted by Enthalpy. All analysis followed the procedures listed in USEPA Method 26A. A complete laboratory report is in Appendix C.

Field data sheets for the Method 26A sampling are in Appendix B.

3.6.2 Quality Control and Assurance

All sampling and analytical equipment was calibrated according to the guidelines referenced in EPA Method 5 and 26A.

3.6.3 Data Reduction

The HCl and HF emissions data collected during the testing were calculated and reported as lbs/hr and lb/MMBtu.

3.7 ARSENIC AND LEAD (USEPA Method 29)

3.7.1 Arsenic and Lead Sampling Method

USEPA Method 29, "Determination of Metals Emissions from Stationary Sources" was used to measure the Arsenic and Lead emissions (see Figure 6 for a schematic of the sampling train). Triplicate, 60-minute test runs were conducted.

The Method 29 isokinetic stack sampling system (Figure 6) consisted of the following:

(1) Teflon® coated stainless-steel button-hook nozzle
(2) Heated glass-lined probe (maintained at a temperature of 250 ± 25 °F)
(3) Heated 3" glass filter holder with a quartz filter (maintained at a temperature of 250 ± 25 °F)
(4) Set of 4 impingers. Impinger 1 – empty, Impingers 2-3 containing 100 ml 5% HNO_3 / 10% H_2O_2 for the collection of Arsenic, Lead, and Impinger 4 – silica gel
(5) Length of sample line
(6) Environmental Supply® control case equipped with a pump, dry gas meter, and calibrated orifice.

After completion of each run, the probe, filter housing and connecting glassware were rinsed with 0.1N HNO_3. The filter was placed in a sealed Petri-dish. Impingers 1-3 were measured for moisture gain and their contents and associated 0.1N HNO_3 rinses were collected in a pre-cleaned sample container. Impingers 4 was measured for moisture gain.

The containers were labeled with the test number, test location, test date, and the level of liquid marked on the outside of the container. Immediately after recovery, the sample containers were placed in a cooler for storage.

Collected field blanks consisted of a blank filter and solution blanks. The DI water and solution blanks were collected from the rinse bottles used in sample recovery. The blank filter and solutions were analyzed following the same procedures used to recover and analyze the field samples.

Analysis of the Method 29 samples and blanks were conducted by Enthalpy Analytics. All analysis followed the procedures listed in Method 29. A complete laboratory report is in Appendix C.

Field data sheets for the Method 29 sampling are in Appendix B.

3.7.2 Quality Control and Assurance

Method 29 testing on Unit 2 was initially performed on April 17. Following completion of the testing, it was discovered that the impingers were erroneously charged with 0.1 HNO3. The runs were voided, and an additional 3 runs were performed on April 18.

All sampling and analytical equipment was calibrated according to the guidelines referenced in EPA Method 5 & 29.

3.7.3 Data Reduction

The Arsenic (As) and Lead (Pb) emissions were calculated and reported as lbs/hr and lbs/MMBtu.

3.8 TOTAL VAPOR PHASE MERCURY EMISSIONS (USEPA Method 30B)

3.8.1 Total Mercury Sampling Methods

USEPA Method 30B, "Determination of Total Vapor Phase Mercury Emissions from Coal-Fired Combustion Sources Using Carbon Sorbent Traps" was used to measure the mass concentration of total vapor phase Hg in flue gas, including elemental Hg (Hg^0) and oxidized forms of Hg (Hg^{+2}), in micrograms per dry standard cubic meter (ug/dscm) (see Figure 2 for a schematic of the sampling train). Triplicate, 60-minute test runs were conducted.

The Method 30B modular stack sampling system (Figure 8) consisted of the following:

(1) Ohio Lumex 2-section sorbent tubes containing Iodated Activated Carbon
(2) Heated stainless-steel probe (Containing paired sorbent traps)
(3) Heated Teflon® sampling line (maintained at a temperature of 250 $\pm$ 25 °F)

(4) Set of glass impingers submerged in an ice bath for the condensation and collection of moisture
(5) Length of sample line
(6) CleanAir™ control case equipped with duplicate pumps, dry gas meters, and calibrated orifices.

Sampling was performed at three (3) sampling points, 0.4, 1.2, and 2.0 meters, from the stack wall.

Pre- and post- leak checks were performed on the assembled sampling system. Post-leak checks are mandatory and were performed at a vacuum equal to or higher than the highest vacuum achieved during each respective test run.

At the laboratory, sorbent tube analysis was performed on an Ohio Lumex Model RA-915+ analyzer utilizing thermal desorption/atomic absorption.

The field data sheets containing the initial and final leak checks, barometric pressures, sample volumes, stack and trap temperatures and dry gas meter readings can be found in Appendix B.

3.8.2 Quality Control and Assurance

Method 30B includes specific analytical QA/QC criteria that must be met to generate valid results. These criteria include spike recovery, sorbent trap breakthrough and paired trap agreement as described below:

- Spike recovery was determined in accordance with 30B requirements. A pre-test spike level of 30 nanograms (ng) was used. A minimum of three (3) acceptable spike recovery sample runs was obtained for each Unit. Each of the spike recoveries must be within 85%-115% of the target.
- Sorbent trap breakthrough was determined in accordance with method 30B requirements. The Section 2 results are compared to the Section 1 results to determine the amount of breakthrough which must be $\leq$10% of the Section 1 Hg mass for Hg concentrations > 1 micrograms/dry standard cubic meter (ug/dscm) or $\leq$20% of the Section 1 Hg mass for Hg concentrations $\leq$ 1 ug/dscm.
- The paired trap agreement was determined in accordance with method 30B requirements. The two (2) trap concentrations (ug/dscm) are compared for each run and must have a relative deviation (RD) of $\leq$10% for Hg concentrations > 1 ug/dscm or $\leq$20% for Hg concentrations $\leq$ 1 ug/dscm.

The analytical QA/QC data generated from the 30B samples can be found in Appendix C. The 30B sampling and analytical equipment was calibrated according to the guidelines referenced in EPA Method 30B (see Appendix D for equipment calibration).

Emissions calculations were based on calculations located in R336.1258 and USEPA Methods 30B and PS-12B. Example calculations are presented in Appendix E. Field data sheets are in Appendix B. Analytical QA/QC data are in Appendix C.

3.8.3 Data Reduction

The Mercury (Hg) emissions were calculated and reported as lbs/hr and pounds per year (lb/yr).

3.9 VOLATILE ORGANIC COMPOUNDS (USEPA Method 25A)

3.9.1 Sampling Method

USEPA Method 25A, "Determination of Total Hydrocarbon Emissions from Stationary Sources (Instrumental Analyzer Method)" was used to measure the Volatile Organic Compounds (VOC) emissions (see Figure 7 for a schematic of the sampling train). The VOC analyzer utilizes a flame ionization detector (FID) to measures total organic hydrocarbon compounds (as propane).

The Method 25A sampling system (Figure 7) consisted of the following:

(1) Single point heated sampling probe
(2) Heated Teflon® sampling line
(3) J.U.M.109A® Total & Non-Methane gas analyzer
(4) Appropriate certified propane calibration gases
(5) Data acquisition system

Sampling was conducted at a single point in the exhaust stack. Concurrent moisture (Method 4) and exhaust flow (Method 2) sampling was conducted with the VOC sampling to calculate the VOC emission rates.

3.9.2 Quality Control and Assurance

In accordance with USEPA Method 25A, a 4-point (zero, low, mid, and high) calibration check was performed on the VOC analyzer. The analyzer was calibrated in the 0-50 ppm range using the following Propane (C_3H_8) calibration gases (0, 47.32, 25.10, and 12.97). Calibration drift checks were performed at the completion of each run and emissions data was drift corrected per USEPA Method 7E. Calibration gas certification sheets are in Appendix E.

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3.9.3 Data Reduction

Data was recorded at 10-second intervals and averaged in 1-minute increments. The average VOC concentration, as Propane (C_3H_8) emissions were reported in parts per million (ppm), lbs/hr and lbs/MMBtu. The 1-minute readings are presented in Appendix B.

4.0 OPERATING PARAMETERS

The units tested continually collect boiler operating data, precipitator operating data, SCR operating data, sulfur control system operating data, and FGD scrubber operating data during each emission test. Specific data requests are available upon request of the administrator.

During each day of emissions sampling, a representative coal sample was collected from the unit and analyzed for ultimate and proximate analysis, including % Sulfur, % Ash, and heat content.

CEMs data, load data and results from the coal analysis are in Appendix F.

5.0 DISCUSSION OF RESULTS

Table 1 and Table 7 present the Unit 1 and Unit 2 Particulate Matter (PM) emission testing results and the Condensable Particulate emissions testing results. Particulate emissions are presented in pounds per Million British thermal units (lbs/MMBtu). Units 1 and 2 have a Permit Limit for PM less than 10 microns (PM_{10}). PM_{10} cannot be measured per Method 201 because of the FGD and potential water droplets in the exhaust gas, therefore all PM measured (Method 5B and 202) were combined to represent the PM_{10} emissions. The Unit 1 total filterable PM emissions averaged 0.007 lbs/MMBtu. Emissions were below the permit limit of 0.011 lbs/MMBtu. The PM_{10} emissions averaged 0.010 lbs/MMBtu. Emissions were less than the permit limit of 0.024 lbs/MMBtu. The Unit 2 total filterable PM emissions averaged 0.007 lbs/MMBtu. Emissions were below the permit limit of 0.011 lbs/MMBtu. The PM_{10} emissions averaged 0.014 lbs/MMBtu. Emissions were less than the permit limit of 0.024 lbs/MMBtu.

Table 2 and Table 8 present the Unit 1 and Unit 2 Sulfuric Acid (H_2SO_4) emission testing results. The H_2SO_4 emissions are presented in pounds per Million British thermal units (lbs/MMBtu). The Unit 1 H_2SO_4 emissions averaged 0.001 lbs/MMBtu. Emissions were below the permit limit of 0.005 lbs/MMBtu. The Unit 2 H_2SO_4 emissions averaged 0.006 lbs/MMBtu. Emissions exceeded the permit limit of 0.005 lbs/MMBtu.

Table 3 and Table 9 present the Unit 1 and Unit 2 Hydrogen Chloride (HCl) and Hydrogen Fluoride (HF) emission testing results. The HCl and HF emissions are presented in pounds per

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Million British thermal units (lbs/MMBtu). Unit 1 and Unit 2 HCl emissions averaged 0.0001 lbs/MMBtu. Emissions were below the permit limit of 0.0024 lbs/MMBtu.

All HF tests were reported as less than "<" since the analytical results were all below the reportable detection limit. The Unit 1 and Unit 2 HF emissions averaged <0.00002 lbs/MMBtu. Emissions were below the permit limit of 0.00023 lbs/MMBtu.

Table 4 and Table 10 present the Unit 1 and Unit 2 the Lead (Pb) and Arsenic (As) emission testing results. The Lead and Arsenic emissions are presented in pounds per hour (lbs/hr) and pounds per Million British thermal units (lbs/MMBtu). The average Unit 1 Lead emissions were 0.004 lbs/hr and $5.87E^{-7}$ lbs/MMBtu. The average Unit 2 Lead emissions were 0.007 lbs/hr and $9.24E^{-7}$ lbs/MMBtu. Both units were below the permit limits of 0.13 lbs/hr and $1.69E^{-5}$ lbs/MMBtu.

The average Unit 1 Arsenic emissions of $2.22E^{-7}$ lbs/MMBtu and the average Unit 2 Arsenic emissions of $2.77E^{-7}$ lbs/MMBtu were below the permit limit of $6.3E^{-6}$ lbs/MMBtu.

Table 5 and Table 11 present the Unit 1 and Unit 2 Mercury (Hg) emission testing results. The Mercury emissions are presented in pounds per year (lbs/yr). The Unit 1 Hg emissions of 3.19 lbs/yr was below the permit limit of 143.1 lbs/yr. The average Unit 2 Hg emissions of 8.32 lbs/yr was below the permit limit of 144.2 lbs/yr.

Table 6 and Table 12 present the Unit 1 and Unit 2 Volatile Organic Compound (VOC) emission testing results. The VOC emissions are presented in parts per million (ppm), pounds per hour (lbs/hr) and pounds per Million British thermal units (lbs/MMBtu), all as propane. Both units demonstrated an average VOC emission below the Limit of Detection. The calculated emission for each unit was <1.4 lbs/hr and <0.0002 lbs/MMBtu. VOC emissions were below the permit limits of 25.9 lbs/hr and 0.0034 lbs/MMBtu.

The Auxiliary CEMs test data is presented in tabular form in the Operational Data Appendix. Each test includes the Average SO2 (ppm), Average NOx (ppm), Average NOx (lb/MMBtu), Average CO2 (%), Average CO (ppm), Average CO (lb/MMBtu) and Average Load (MWgross).

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6.0 CERTIFICATION STATEMENT

"I certify that I believe the information provided in this document is true, accurate, and complete. Results of testing are based on the good faith application of sound professional judgment, using techniques, factors, or standards approved by the Local, State, or Federal Governing body, or generally accepted in the trade."

Mark R. Grigereit, QSTI

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RESULTS TABLES

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RESULTS TABLES

Table 1
PARTICULATE EMISSION TEST RESULTS - M5B/202
Monroe Power Plant
Unit 1
April 22 & 23, 2024

Project Information			
Start Time:	5:25	7:51	6:00
End Time:	7:33	9:58	8:09

Particulate Sampling Train Data				
Test No:	1	2	3	Avg.
Pitot Cal. Factor	0.84	0.84	0.84	
Meter Calibration Factor:	0.984	0.984	0.984	
Stack Diameter, inches:	336	336	336	
Nozzle Diameter, inches:	0.244	0.244	0.244	
Barometric Pressure, inches Hg:	29.31	29.31	29.92	
Static Pressure in Stack, Inches H2O:	-0.80	-0.80	-0.80	
Duration of Sample, minutes	120	120	120	
Meter Leak Rate:	0	0	0	
Meter Start Volume:	932.17	48.61	221.07	
Meter Final Volume:	1047.40	163.13	331.92	
Average Meter Pressure, Inches H2O:	3.02	3.02	2.85	2.96
Average Meter Temperature, degrees F:	81.4	77.3	73.1	77.25
Average Sqrt. Velocity Pressure:	1.034	1.040	1.014	1.029
Stack Gas Temperature, degrees F:	123.0	123.9	124.0	123.64
% Carbon Dioxide:	12.9	12.8	13.5	13.1
% Oxygen:	6.6	6.6	6.6	6.6
Liquid Volume Collected, milliliters:	362.4	377.3	378.9	372.9
Total Weight of Particulate-M5, mg:	**16.2**	**20.3**	**31.3**	**22.6**
Total Weight of Particulate-M202, mg:	**13.0**	**8.5**	**10.7**	**10.7**

Sampling Train Results				
Meter Volume, Actual:	115.24	114.52	110.85	113.53
Meter Volume, STP:	109.56	109.72	109.20	109.50
Volume of Water Vapor Condensed:	17.09	17.79	17.87	17.58
Total Gas Sampled:	126.65	127.51	127.07	127.08
% Moisture:	13.49	13.95	14.06	13.83
Area of Stack, Square Feet:	615.75	615.75	615.75	615.75
% Excess Air at Test Location:	44.5	45.1	45.0	44.9
Density Dry at STP:	0.0784	0.0784	0.0787	0.0785
Density Wet at STP:	0.0741	0.0739	0.0741	0.0741
Density Wet at Stack Cond:	0.0658	0.0656	0.0672	0.0662
Molecular Weight, lb/lb-Mole	30.33	30.33	30.43	30.36
Isokinetic, %	98.5	98.7	100.0	99.1

Table 1
PARTICULATE EMISSION TEST RESULTS - M5B/202
Monroe Power Plant
Unit 1
April 22 & 23, 2024

Velocity and Flow Results				
Average Stack Gas Velocity FPM:	3,711	3,738	3,602	3,684
Stack Gas Flow Rate, ACFM:	2,285,046	2,301,567	2,217,803	2,268,139
Stack Gas Flow Rate, SCFM:	2,030,967	2,042,440	2,008,860	2,027,422
Stack Gas Flow Rate, DSCFM:	1,756,958	1,757,490	1,726,428	1,746,959
Pounds of Gas Sampled, Dry	8.589	8.600	8.590	8.593
Pounds of Gas Sampled, Wet	9.384	9.428	9.421	9.411

Particulate Results - Filterable (M5B)				
Grains per DSCF:	0.002	0.003	0.004	0.003
Lbs/1000 Lbs Gas, Actual:	0.004	0.005	0.007	0.005
Lbs/1000 Lbs Gas, Dry:	0.004	0.005	0.008	0.006
Lbs/1000 Lbs Gas, Actual @ 50% EA:	0.004	0.005	0.007	0.005
Lbs/Hr:	34.33	42.97	65.40	47.57
Lbs/MMBtu:	0.005	0.006	0.009	0.007

Particulate Results - Condensable (M202)				
Grains per DSCF:	0.002	0.001	0.002	0.002
Lbs/1000 Lbs Gas, Actual:	0.003	0.002	0.003	0.003
Lbs/1000 Lbs Gas, Dry:	0.003	0.002	0.003	0.003
Lbs/1000 Lbs Gas, Actual @ 50% EA:	0.003	0.002	0.002	0.002
Lbs/Hr:	27.55	17.99	22.36	22.63
Lbs/MMBtu:	0.004	0.002	0.003	0.0031

Particulate Results - $PM_{2.5}$ (M5B/202)				
Grains per DSCF:	0.004	0.004	0.006	0.005
Lbs/1000 Lbs Gas, Actual:	0.007	0.007	0.010	0.008
Lbs/1000 Lbs Gas, Dry:	0.007	0.007	0.011	0.009
Lbs/1000 Lbs Gas, Actual @ 50% EA:	0.007	0.007	0.009	0.008
Lbs/Hr:	61.88	60.97	87.75	70.20
Lbs/MMBtu:	0.008	0.008	0.012	0.010

Std Conditions (68°F, 29.92" Hg)

Table 2
SULFURIC ACID EMISSION TEST RESULTS (M8A)
Monroe Power Plant
Unit 1
April 23-24, 2024

Project Information				
Start Time:	6:00	6:42	8:16	
End Time:	7:00	7:42	9:16	

Sulfuric Acid Sampling Train Data				
Test No:	1	2	3	Avg.
Pitot Cal. Factor	0.836	0.836	0.836	
Meter Calibration Factor:	1.006	1.006	1.006	
Barometric Pressure, inches Hg:	29.71	29.71	29.86	
Static Pressure in Stack, Inches H2O:	-0.80	-0.77	-0.77	
Duration of Sample, minutes	60	60	60	
Meter Leak Rate:	0	0	0	
Meter Start Volume:	258.14	284.20	309.64	
Meter Final Volume:	278.01	304.30	329.87	
Average Meter Pressure, Inches H2O:	0.37	0.37	0.37	0.37
Average Meter Temperature, degrees F:	72.7	80.0	78.3	77.0
% Carbon Dioxide:	12.8	13.0	12.9	12.9
% Oxygen:	6.7	6.5	6.6	6.6
Liquid Volume Collected, milliliters:	69.8	70.8	71.9	70.8
Total Weight of H_2SO_4, mg:	0.53	0.56	1.02	0.70

Sampling Train Results				
Meter Volume, Actual:	19.87	20.10	20.23	20.07
Meter Volume, STP:	19.69	19.65	19.94	19.76
Volume of Water Vapor Condensed:	3.29	3.34	3.39	3.34
Total Gas Sampled:	22.98	22.99	23.33	23.10
% Moisture:	14.32	14.52	14.53	14.46

Velocity and Flow Results				
Average Stack Gas Velocity FPM:	3,602	3,698	3,654	3,651
Stack Gas Flow Rate, ACFM:	2,217,803	2,277,246	2,250,104	2,248,384
Stack Gas Flow Rate, SCFM:	2,008,860	2,055,756	2,030,674	2,031,763
Stack Gas Flow Rate, DSCFM:	1,726,428	1,764,933	1,745,098	1,745,487

Sulfuric Acid (H_2SO_4) Results				
PPM:	0.20	0.21	0.38	0.26
LBS/HR:	**6.16**	**6.64**	**11.82**	**8.21**
LBS/MMBTU:	**0.0009**	**0.0009**	**0.0016**	**0.0011**

Table 3
HCL & HF EMISSION TEST RESULTS (M26A)
Monroe Power Plant
Unit 1
April 22-24, 2024

Project Information				
Start Time:	10:13	6:22	7:48	
End Time:	11:24	7:30	8:56	

HCl & HF Sampling Train Data				
Test No:	1	2	3	Avg.
Pitot Cal. Factor	0.84	0.84	0.84	
Meter Calibration Factor:	0.984	0.984	0.984	
Stack Diameter, inches:	336	336	336	
Nozzle Diameter, inches:	0.244	0.244	0.244	
Barometric Pressure, inches Hg:	29.31	29.93	29.93	
Static Pressure in Stack, Inches H2O:	-0.80	-0.77	-0.77	
Duration of Sample, minutes	60	60	60	
Meter Leak Rate:	0	0	0	
Meter Start Volume:	163.55	346.17	403.19	
Meter Final Volume:	220.88	403.12	459.21	
Average Meter Pressure, Inches H2O:	3.06	3.03	2.94	3.01
Average Meter Temperature, degrees F:	74.8	78.6	76.3	76.5
Average Sqrt. Velocity Pressure:	1.049	1.039	1.027	1.038
Stack Gas Temperature, degrees F:	124.8	124.0	124.2	124.3
% Carbon Dioxide:	12.7	12.8	13.0	12.8
% Oxygen:	6.5	6.7	6.5	6.6
Liquid Volume Collected, milliliters:	199.1	193.5	189.8	194.1
Total Weight of HCL, ug:	121.0	114.0	131.0	122.0
Total Weight of HCL, mg:	**0.12**	**0.11**	**0.13**	**0.12**
Total Weight of HF, ug:	<32.50	<34.20	<31.10	**<32.60**
Total Weight of HF, mg:	**<0.04**	**<0.03**	**<0.03**	**<0.03**

Sampling Train Results				
Meter Volume, Actual:	57.32	56.95	56.02	56.77
Meter Volume, STP:	54.98	55.37	54.69	55.01
Volume of Water Vapor Condensed:	9.39	9.12	8.95	9.15
Total Gas Sampled:	64.36	64.49	63.64	64.16
% Moisture:	14.59	14.15	14.06	14.26
Area of Stack, Square Feet:	615.75	615.75	615.75	615.75
% Excess Air at Test Location:	44.1	45.6	44.3	44.7
Density Dry at STP:	0.0783	0.0784	0.0784	0.0784
Density Wet at STP:	0.0737	0.0739	0.0739	0.0738
Density Wet at Stack Cond:	0.0653	0.0669	0.0670	0.0664
Molecular Weight, lb/lb-Mole:	30.30	30.33	30.34	30.32
Isokinetic, %:	98.7	98.8	98.7	98.7

Table 3
HCL & HF EMISSION TEST RESULTS (M26A)
Monroe Power Plant
Unit 1
April 22-24, 2024

Velocity and Flow Results				
Average Stack Gas Velocity FPM:	3,778	3,698	3,654	3,710
Stack Gas Flow Rate, ACFM:	2,326,323	2,277,246	2,250,104	2,284,557
Stack Gas Flow Rate, SCFM:	2,053,687	2,055,756	2,030,674	2,046,706
Stack Gas Flow Rate, DSCFM:	1,754,156	1,764,933	1,745,098	1,754,729
Pounds of Gas Sampled, Dry:	4.306	4.340	4.289	4.312
Pounds of Gas Sampled, Wet:	4.742	4.765	4.705	4.737

HCl & HF Results				
HCl (PPM_w):	0.04	0.04	0.05	0.04
HCl (Grains/DSCF):	0.00003	0.00003	0.00004	0.00003
HCl (Lbs/Hr):	**0.51**	**0.48**	**0.55**	**0.51**
HCl (Lbs/MMBtu):	**0.0001**	**0.0001**	**0.0001**	**0.0001**
HF (PPM):	<0.02	<0.02	<0.02	<0.02
HF (Grains/DSCF):	<0.00001	<0.00001	<0.00001	<0.00001
HF (Lbs/Hr):	**<0.15**	**<0.14**	**<0.13**	**<0.14**
HF (Lbs/MMBTU):	**<0.00002**	**<0.00002**	**<0.00002**	**<0.00002**

Table 4
LEAD and ARSENIC EMISSION TEST RESULTS (M29)
Monroe Power Plant
Unit 1
April 24, 2024

Project Information				
Test Date:	4/24/2024	4/24/2024	4/24/2024	
Start Time:	9:08	10:27	11:55	
End Time:	10:18	11:35	14:34	

Lead & Arsenic Sampling Train Data				
Test No:	1	2	3	Avg.
Pitot Cal. Factor	0.84	0.84	0.84	
Meter Calibration Factor:	0.984	0.984	0.984	
Stack Length, inches:	0	0	0	
Stack Width, inches:	0	0	0	
Stack Diameter, inches:	336	336	336	
Nozzle Diameter, inches:	0.236	0.244	0.236	
Barometric Pressure, inches Hg:	29.93	29.93	29.93	
Static Pressure in Stack, Inches H2O:	-0.77	-0.77	-0.77	
Duration of Sample, minutes	60	60	60	
Meter Leak Rate:	0	0	0	
Meter Start Volume:	459.33	512.35	570.41	
Meter Final Volume:	512.27	569.42	624.47	
Average Meter Pressure, Inches H2O:	2.59	3.03	2.68	2.77
Average Meter Temperature, degrees F:	76.2	75.4	75.2	75.6
Average Sqrt. Velocity Pressure:	1.033	1.043	1.049	1.041
Stack Gas Temperature, degrees F:	126.1	124.2	124.0	124.8
% Carbon Dioxide:	12.9	12.7	12.7	12.7
% Oxygen:	6.6	6.9	6.9	6.8
% Carbon Monoxide:	0.0	0.0	0.0	0.0
Liquid Volume Collected, milliliters:	183.3	192.4	0.0	125.2
Total Weight of Lead, ug:	0.60	1.28	1.07	0.98
Total Weight of Arsenic, ug:	0.26	0.48	0.38	0.37

Sampling Train Results				
Meter Volume, Actual:	52.94	57.07	54.06	54.69
Meter Volume, STP:	51.84	56.02	53.05	53.64
Volume of Water Vapor Condensed:	8.64	9.07	0.00	5.90
Total Gas Sampled:	60.49	65.09	53.05	59.54
% Moisture:	14.29	13.94	0.00	9.41
Area of Stack, Square Feet:	615.75	615.75	615.75	615.75
% Excess Air at Test Location:	45.4	47.6	47.8	46.9
Density Dry at STP:	0.0784	0.0783	0.0783	0.0784
Density Wet at STP:	0.0738	0.0739	0.0783	0.0754
Density Wet at Stack Cond:	0.0667	0.0670	0.0710	0.0682
Molecular Weight, lb/lb-Mole	30.33	30.31	30.31	30.32
Isokinetic, %	99.8	99.4	88.6	96.0

Table 4
LEAD and ARSENIC EMISSION TEST RESULTS (M29)
Monroe Power Plant
Unit 1
April 24, 2024

Velocity and Flow Results				
Average Stack Gas Velocity FPM:	3,682	3,709	3,624	3,672
Stack Gas Flow Rate, ACFM:	2,267,203	2,284,041	2,231,607	2,260,950
Stack Gas Flow Rate, SCFM:	2,047,139	2,069,110	2,022,187	2,046,146
Stack Gas Flow Rate, DSCFM:	1,754,630	1,780,747	2,022,187	1,852,521
Pounds of Gas Sampled, Dry	4.065	4.389	4.156	4.203
Pounds of Gas Sampled, Wet	4.466	4.811	4.156	4.478

Lead (Pb) Results				
Grains per DSCF:	1.77E-07	3.52E-07	3.11E-07	2.80E-07
Lbs/1000 Lbs Gas, Actual:	2.94E-07	5.86E-07	5.67E-07	4.82E-07
Lbs/1000 Lbs Gas, Dry:	3.23E-07	6.42E-07	5.67E-07	5.11E-07
Lbs/Hr:	**0.003**	**0.005**	**0.005**	**0.004**
Lbs/MMBtu:	**3.67E-07**	**7.41E-07**	**6.55E-07**	**5.87E-07**

Total Arsenic (As) Results				
Grains per DSCF:	7.70E-08	1.32E-07	1.09E-07	1.06E-07
Lbs/1000 Lbs Gas, Actual:	1.28E-07	2.19E-07	1.99E-07	1.82E-07
Lbs/1000 Lbs Gas, Dry:	1.40E-07	2.40E-07	1.99E-07	1.93E-07
Lbs/Hr:	0.001	0.002	0.002	0.002
Lbs/Yr:	**10.15**	**17.59**	**16.59**	**14.78**
Lbs/MMBtu:	**1.59E-07**	**2.77E-07**	**2.30E-07**	**2.22E-07**

Std Conditions (68°F, 29.92" Hg)

Table 5
Mercury (Hg) EMISSION TEST RESULTS - M30B
Monroe Power Plant
Unit 1
April 22, 2024

Project Information				
Start Time:	5:58	7:56	10:32	
End Time:	6:58	8:56	11:32	

Velocity and Flow Results				
% Oxygen:	6.6	6.6	6.5	6.6
Average Stack Gas Velocity FPM:	3,711	3,738	3,778	3,664
Stack Gas Flow Rate, ACFM:	2,285,046	2,301,567	2,326,323	2,256,073
Stack Gas Flow Rate, SCFM:	2,030,967	2,042,440	2,053,687	2,023,558
Stack Gas Flow Rate, DSCFM:	1,756,958	1,757,490	1,754,156	1,730,920

Mercury Results - Filterable (M30B)				
Mercury Results (ug/m^3)	0.054	0.042	0.070	0.055
Lbs/Hr:	0.0004	0.0003	0.0005	0.0004
Lbs/Yr:	**3.11**	**2.42**	**4.03**	**3.19**
Lbs/MMBtu:	**4.83E-08**	**3.78E-08**	**6.29E-08**	**4.97E-08**

Std Conditions (68°F, 29.92" Hg)

Table 6
VOC EMISSION TEST RESULTS
Monroe Power Plant
Unit 1
April 22, 2024

Parameter	Run 1	Run 2	Run 3	Average
Sampling Start Time	5:50-6:50	8:25-9:25	10:05-11:05	
Percent Moisture	13.49	13.95	14.59	
Percent O_2	6.6	6.6	6.5	
Exhaust Gas Flow (SCFM)	2,030,967	2,042,440	2,053,687	2,042,365
Exhaust Gas Flow (DSCFM)	1,756,958	1,757,490	1,754,156	1,756,201
VOC Concentration, as propane (ppmv, corrected)[1]	<0.1	<0.1	<0.1	<0.1
VOC Concentration, as propane (ppmv, corrected)[2]	<0.1	<0.1	<0.1	<0.1
VOC Emission Rate, as propane (lbs/hr)	<1.4	<1.4	<1.4	<1.4
VOC Emission Rate, as propane (lbs/MMBtu)	<0.0002	<0.0002	<0.0002	<0.0002

[1] corrected for analyzer drift as per USEPA Method 7E

[2] corrected for Moisture

ppmv : parts per million on a volume-to-volume basis

lb/hr : pounds per hour

lbs/Mbtu : pounds per million British thermal unit

Table 7
PARTICULATE EMISSION TEST RESULTS - M5B/202
Monroe Power Plant
Unit 2
April 16, 2024

Project Information				
Start Time:	6:18	8:50	11:22	
End Time:	8:29	11:00	13:32	

Particulate Sampling Train Data				
Test No:	1	2	3	Avg.
Pitot Cal. Factor	0.84	0.84	0.84	
Meter Calibration Factor:	0.984	0.984	0.984	
Stack Diameter, inches:	336	336	336	
Nozzle Diameter, inches:	0.244	0.244	0.244	
Barometric Pressure, inches Hg:	30.13	30.13	30.13	
Static Pressure in Stack, inches H2O:	-0.99	-0.99	-0.99	
Duration of Sample, minutes	120	120	120	
Meter Leak Rate:	0	0	0	
Meter Start Volume:	2.28	113.53	227.79	
Meter Final Volume:	113.40	227.67	341.44	
Average Meter Pressure, Inches H2O:	2.87	3.04	2.96	2.96
Average Meter Temperature, degrees F:	77.3	78.5	80.8	78.86
Average Sqrt. Velocity Pressure:	1.027	1.043	1.026	1.032
Stack Gas Temperature, degrees F:	125.0	125.0	124.6	124.86
% Carbon Dioxide:	12.6	12.6	12.7	12.6
% Oxygen:	6.9	6.9	6.9	6.9
Liquid Volume Collected, milliliters:	375.7	374.4	383.8	378.0
Total Weight of Particulate-M5, mg:	**25.8**	**22.6**	**22.2**	**23.5**
Total Weight of Particulate-M202, mg:	**28.0**	**19.7**	**24.0**	**23.9**

Sampling Train Results				
Meter Volume, Actual:	111.12	114.14	113.65	112.97
Meter Volume, STP:	109.39	112.15	111.15	110.89
Volume of Water Vapor Condensed:	17.71	17.65	18.10	17.82
Total Gas Sampled:	127.10	129.80	129.25	128.72
% Moisture:	13.94	13.60	14.00	13.85
Area of Stack, Square Feet:	615.75	615.75	615.75	615.75
% Excess Air at Test Location:	48.2	48.4	48.3	48.3
Density Dry at STP:	0.0783	0.0783	0.0784	0.0783
Density Wet at STP:	0.0739	0.0740	0.0739	0.0739
Density Wet at Stack Cond:	0.0672	0.0674	0.0673	0.0673
Molecular Weight, lb/lb-Mole	30.30	30.31	30.31	30.31
Isokinetic, %	98.2	98.9	100.0	99.1

Table 7
PARTICULATE EMISSION TEST RESULTS - M5B/202
Monroe Power Plant
Unit 2
April 16, 2024

Velocity and Flow Results				
Average Stack Gas Velocity FPM:	3,648	3,700	3,641	3,663
Stack Gas Flow Rate, ACFM:	2,246,141	2,278,063	2,241,951	2,255,385
Stack Gas Flow Rate, SCFM:	2,044,404	2,073,459	2,042,044	2,053,303
Stack Gas Flow Rate, DSCFM:	1,759,470	1,791,464	1,756,137	1,769,024
Pounds of Gas Sampled, Dry	8.566	8.784	8.709	8.686
Pounds of Gas Sampled, Wet	9.389	9.605	9.551	9.515

Particulate Results - Filterable (M5B)				
Grains per DSCF:	0.004	0.003	0.003	0.003
Lbs/1000 Lbs Gas, Actual:	0.006	0.005	0.005	0.005
Lbs/1000 Lbs Gas, Dry:	0.007	0.006	0.006	0.006
Lbs/1000 Lbs Gas, Actual @ 50% EA:	0.006	0.005	0.005	0.005
Lbs/Hr:	54.85	47.71	46.35	49.64
Lbs/MMBtu:	0.008	0.007	0.007	0.007

Particulate Results - Condensable (M202)				
Grains per DSCF:	0.004	0.003	0.003	0.003
Lbs/1000 Lbs Gas, Actual:	0.007	0.005	0.006	0.006
Lbs/1000 Lbs Gas, Dry:	0.007	0.005	0.006	0.006
Lbs/1000 Lbs Gas, Actual @ 50% EA:	0.006	0.004	0.005	0.005
Lbs/Hr:	59.52	41.59	50.11	50.41
Lbs/MMBtu:	0.008	0.006	0.007	0.0071

Particulate Results - $PM_{2.5}$ (M5B/202)				
Grains per DSCF:	0.008	0.006	0.006	0.007
Lbs/1000 Lbs Gas, Actual:	0.013	0.010	0.011	0.011
Lbs/1000 Lbs Gas, Dry:	0.014	0.011	0.012	0.012
Lbs/1000 Lbs Gas, Actual @ 50% EA:	0.012	0.010	0.011	0.011
Lbs/Hr:	114.37	89.30	96.47	100.04
Lbs/MMBtu:	0.016	0.012	0.014	0.014

Std Conditions (68°F, 29.92" Hg)

Table 8
SULFURIC ACID EMISSION TEST RESULTS (M8A)
Monroe Power Plant
Unit 2
April 18, 2024

Project Information				
Start Time:	6:32	8:04	9:34	
End Time:	7:32	9:04	10:34	

Sulfuric Acid Sampling Train Data				
Test No:	1	2	3	Avg.
Pitot Cal. Factor	0.836	0.836	0.836	
Meter Calibration Factor:	1.006	1.006	1.006	
Barometric Pressure, inches Hg:	29.79	29.79	29.79	
Static Pressure in Stack, Inches H2O:	-0.85	-0.85	-0.85	
Duration of Sample, minutes	60	60	60	
Meter Leak Rate:	0	0	0	
Meter Start Volume:	180.90	206.77	232.30	
Meter Final Volume:	201.26	227.19	252.81	
Average Meter Pressure, Inches H2O:	0.37	0.37	0.37	0.37
Average Meter Temperature, degrees F:	84.9	86.3	86.4	85.8
% Carbon Dioxide:	13.0	12.9	13.0	13.0
% Oxygen:	6.5	6.6	6.6	6.6
Liquid Volume Collected, millliliters:	71.8	73.8	73.4	73.0
Total Weight of H_2SO_4, mg:	3.46	4.24	4.40	4.03

Sampling Train Results				
Meter Volume, Actual:	20.36	20.42	20.51	20.43
Meter Volume, STP:	19.78	19.79	19.87	19.81
Volume of Water Vapor Condensed:	3.39	3.48	3.46	3.44
Total Gas Sampled:	23.16	23.27	23.33	23.25
% Moisture:	14.62	14.95	14.83	14.80

Velocity and Flow Results				
Average Stack Gas Velocity FPM:	3,642	3,657	3,662	3,654
Stack Gas Flow Rate, ACFM:	2,242,440	2,252,111	2,255,142	2,249,898
Stack Gas Flow Rate, SCFM:	2,025,301	2,033,745	2,033,291	2,030,779
Stack Gas Flow Rate, DSCFM:	1,745,501	1,751,438	1,749,844	1,748,928

Sulfuric Acid (H_2SO_4) Results				
PPM:	1.30	1.58	1.64	1.51
GRAINS/DSCF:	0.003	0.003	0.003	0.003
LBS/HR:	**40.44**	**49.60**	**51.22**	**47.09**
LBS/MMBTU:	**0.006**	**0.007**	**0.007**	**0.006**

Table 9
HCL & HF EMISSION TEST RESULTS (M26A)
Monroe Power Plant
Unit 2
April 18, 2024

Project Information				
Start Time:	6:32	7:59	9:32	
End Time:	7:42	9:00	10:40	

HCl & HF Sampling Train Data				
Test No:	1	2	3	Avg.
Pitot Cal. Factor	0.84	0.84	0.84	
Meter Calibration Factor:	0.984	0.984	0.984	
Stack Diameter, inches:	336	336	336	
Nozzle Diameter, inches:	0.244	0.244	0.244	
Barometric Pressure, inches Hg:	29.95	29.95	29.95	
Static Pressure in Stack, Inches H2O:	-0.85	-0.85	-0.85	
Duration of Sample, minutes	60	60	60	
Meter Leak Rate:	0	0	0	
Meter Start Volume:	597.77	654.25	710.71	
Meter Final Volume:	654.16	710.65	766.71	
Average Meter Pressure, Inches H2O:	2.94	2.97	2.97	2.96
Average Meter Temperature, degrees F:	79.1	80.4	81.0	80.2
Average Sqrt. Velocity Pressure:	1.025	1.029	1.029	1.028
Stack Gas Temperature, degrees F:	124.0	124.1	125.0	124.4
% Carbon Dioxide:	13.0	12.9	13.0	13.0
% Oxygen:	6.5	6.6	6.6	6.6
Liquid Volume Collected, milliliters:	186.3	186.9	186.3	186.5
Total Weight of HCL, ug:	167.0	197.0	183.0	182.3
Total Weight of HCL, mg:	**0.167**	**0.197**	**0.183**	**0.182**
Total Weight of HF, ug:	<32.4	<33.2	<31.6	<32.4
Total Weight of HF, mg:	**<0.0324**	**<0.0332**	**<0.0316**	**<0.0324**

Sampling Train Results				
Meter Volume, Actual:	56.39	56.40	56.00	56.26
Meter Volume, STP:	54.80	54.67	54.23	54.57
Volume of Water Vapor Condensed:	8.78	8.81	8.78	8.79
Total Gas Sampled:	63.58	63.48	63.01	63.36
% Moisture:	13.82	13.88	13.94	13.88
Area of Stack, Square Feet:	615.75	615.75	615.75	615.75
% Excess Air at Test Location:	43.9	45.1	44.9	44.6
Density Dry at STP:	0.0784	0.0784	0.0784	0.0784
Density Wet at STP:	0.0740	0.0740	0.0740	0.0740
Density Wet at Stack Cond:	0.0671	0.0671	0.0670	0.0670
Molecular Weight, lb/lb-Mole:	30.35	30.34	30.35	30.35
Isokinetic, %:	98.8	98.3	97.6	98.2

Table 9
HCL & HF EMISSION TEST RESULTS (M26A)
Monroe Power Plant
Unit 2
April 18, 2024

Velocity and Flow Results				
Average Stack Gas Velocity FPM:	3,642	3,657	3,662	3,654
Stack Gas Flow Rate, ACFM:	2,242,440	2,252,111	2,255,142	2,249,898
Stack Gas Flow Rate, SCFM:	2,025,301	2,033,745	2,033,291	2,030,779
Stack Gas Flow Rate, DSCFM:	1,745,501	1,751,438	1,749,844	1,748,928
Pounds of Gas Sampled, Dry:	4.299	4.287	4.254	4.280
Pounds of Gas Sampled, Wet:	4.707	4.697	4.662	4.689

HCl & HF Results				
HCl (PPM_w):	0.06	0.07	0.07	0.07
HCl (Grains/DSCF):	0.00005	0.00006	0.00005	0.0001
HCl (Lbs/Hr):	**0.70**	**0.83**	**0.78**	**0.77**
HCl (Lbs/MMBtu):	**0.0001**	**0.0001**	**0.0001**	**0.0001**
HF (PPM):	<0.02	<0.02	<0.02	<0.02
HF (Grains/DSCF):	<0.00001	<0.00001	<0.00001	<0.00001
HF (Lbs/Hr):	**<0.14**	**<0.14**	**<0.13**	**<0.14**
HF (Lbs/MMBTU):	**<0.00002**	**<0.00002**	**<0.00002**	**<0.00002**

Table 10
LEAD and ARSENIC EMISSION TEST RESULTS (M29)
Monroe Power Plant
Unit 2
April 18, 2024

Project Information				
Test Date:		4/18/2024	4/18/2024	4/18/2024	
Start Time:		10:58	12:12	13:27	
End Time:		12:06	13:20	14:34	

Lead & Arsenic Sampling Train Data				
Test No:		1	2	3	Avg.
Pitot Cal. Factor		0.84	0.84	0.84	
Meter Calibration Factor:		0.984	0.984	0.984	
Stack Length, inches:		0	0	0	
Stack Width, inches:		0	0	0	
Stack Diameter, inches:		336	336	336	
Nozzle Diameter, inches:		0.236	0.244	0.236	
Barometric Pressure, inches Hg:		29.95	29.95	29.95	
Static Pressure in Stack, inches H2O:		-0.85	-0.85	-0.85	
Duration of Sample, minutes		60	60	60	
Meter Leak Rate:		0	0	0	
Meter Start Volume:		767.49	821.36	878.71	
Meter Final Volume:		821.24	878.63	932.01	
Average Meter Pressure, Inches H2O:		2.63	3.02	2.59	2.75
Average Meter Temperature, degrees F:		82.3	83.7	83.2	83.0
Average Sqrt. Velocity Pressure:		1.032	1.034	1.025	1.030
Stack Gas Temperature, degrees F:		125.8	124.4	126.1	125.4
% Carbon Dioxide:		13.0	12.9	13.0	13.0
% Oxygen:		6.6	6.7	6.6	6.6
% Carbon Monoxide:		0.0	0.0	0.0	0.0
Liquid Volume Collected, milliliters:		184.4	198.5	186.5	189.8
Total Weight of Lead, ug:		1.72	1.43	1.45	1.53
Total Weight of Arsenic, ug:		0.40	0.53	0.46	0.46

Sampling Train Results				
Meter Volume, Actual:		53.75	57.26	53.30	54.77
Meter Volume, STP:		52.08	55.39	51.55	53.01
Volume of Water Vapor Condensed:		8.69	9.36	8.79	8.95
Total Gas Sampled:		60.77	64.75	60.35	61.96
% Moisture:		14.31	14.45	14.57	14.44
Area of Stack, Square Feet:		615.75	615.75	615.75	615.75
% Excess Air at Test Location:		45.1	46.1	45.1	45.5
Density Dry at STP:		0.0784	0.0784	0.0784	0.0784
Density Wet at STP:		0.0739	0.0738	0.0738	0.0738
Density Wet at Stack Cond:		0.0668	0.0669	0.0667	0.0668
Molecular Weight, lb/lb-Mole		30.35	30.34	30.35	30.35
Isokinetic, %		100.3	99.7	100.2	100.1

Table 10
LEAD and ARSENIC EMISSION TEST RESULTS (M29)
Monroe Power Plant
Unit 2
April 18, 2024

Velocity and Flow Results				
Average Stack Gas Velocity FPM:	3,677	3,680	3,656	3,671
Stack Gas Flow Rate, ACFM:	2,264,172	2,266,120	2,251,445	2,260,579
Stack Gas Flow Rate, SCFM:	2,046,250	2,052,976	2,033,881	2,044,369
Stack Gas Flow Rate, DSCFM:	1,753,513	1,756,236	1,737,520	1,749,089
Pounds of Gas Sampled, Dry	4.086	4.344	4.044	4.158
Pounds of Gas Sampled, Wet	4.490	4.779	4.453	4.574

Lead (Pb) Results				
Grains per DSCF:	5.09E-07	3.98E-07	4.34E-07	4.47E-07
Lbs/1000 Lbs Gas, Actual:	8.44E-07	6.59E-07	7.17E-07	7.40E-07
Lbs/1000 Lbs Gas, Dry:	9.27E-07	7.25E-07	7.90E-07	8.14E-07
Lbs/Hr:	**0.008**	**0.006**	**0.006**	**0.007**
Lbs/MMBtu:	**1.05E-06**	**8.27E-07**	**8.94E-07**	**9.24E-07**

Total Arsenic (As) Results				
Grains per DSCF:	1.18E-07	1.48E-07	1.37E-07	1.34E-07
Lbs/1000 Lbs Gas, Actual:	1.95E-07	2.45E-07	2.27E-07	2.22E-07
Lbs/1000 Lbs Gas, Dry:	2.14E-07	2.69E-07	2.49E-07	2.44E-07
Lbs/Hr:	0.002	0.002	0.002	0.002
Lbs/Yr:	**15.47**	**19.49**	**17.87**	**17.61**
Lbs/MMBtu:	**2.42E-07**	**3.07E-07**	**2.82E-07**	**2.77E-07**

Std Conditions (68°F, 29.92" Hg)

Table 11
Mercury (Hg) EMISSION TEST RESULTS - M30B
Monroe Power Plant
Unit 2
April 17, 2024

Project Information				
Start Time:	5:43	8:22	10:14	
End Time:	6:43	9:22	11:14	

Velocity and Flow Results				
% Oxygen:	6.4	6.5	6.6	6.5
Average Stack Gas Velocity FPM:	3,711	3,782	3,842	3,664
Stack Gas Flow Rate, ACFM:	2,285,295	2,329,028	2,365,894	2,256,073
Stack Gas Flow Rate, SCFM:	2,008,735	2,043,097	2,075,141	2,023,558
Stack Gas Flow Rate, DSCFM:	1,710,536	1,733,266	1,755,711	1,730,920

Mercury Results - Filterable (M30B)				
Mercury Results (ug/m^3)	0.150	0.133	0.156	0.146
Lbs/Hr:	0.001	0.001	0.001	0.001
Lbs/Yr:	**8.42**	**7.56**	**8.99**	**8.32**
Lbs/MMBtu:	**1.35E-07**	**1.20E-07**	**1.42E-07**	**1.32E-07**

Std Conditions (68°F, 29.92" Hg)

Table 12
VOC EMISSION TEST RESULTS
Monroe Power Plant
Unit 2
April 16, 2024

Parameter	Run 1	Run 2	Run 3	Average
Sampling Start Time	6:15-7:15	9:27-10:27	11:13-12:13	
Percent Moisture	13.94	13.60	14.00	
Percent O_2	6.9	6.9	6.9	
Exhaust Gas Flow (SCFM)	2,044,404	2,073,459	2,042,044	2,053,303
Exhaust Gas Flow (DSCFM)	1,759,470	1,791,464	1,756,137	1,769,024
VOC Concentration, as propane (ppmv, corrected) [1]	<0.1	<0.1	<0.1	<0.1
VOC Concentration, as propane (ppmv, corrected) [2]	<0.1	<0.1	<0.1	<0.1
VOC Emission Rate, as propane (lbs/hr)	<1.4	<1.4	<1.4	<1.4
VOC Emission Rate, as propane (lbs/MMBtu)	<0.0002	<0.0002	<0.0002	<0.0002

[1] corrected for analyzer drift as per USEPA Method 7E

[2] corrected for Moisture

ppmv : parts per million on a volume-to-volume basis

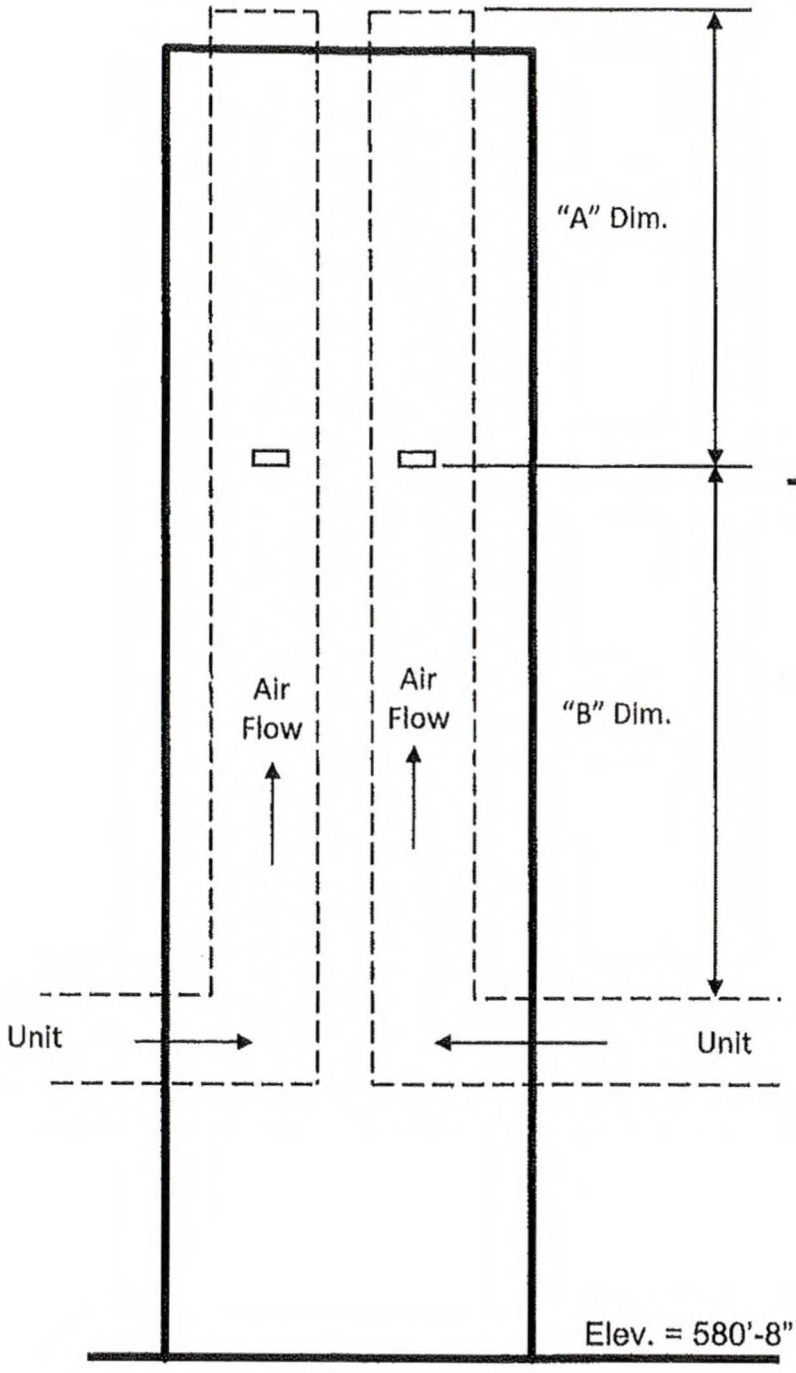
lb/hr : pounds per hour

lbs/Mbtu : pounds per million British thermal unit

DTE

FIGURES

Figure 1 – Sampling Location
Monroe Power Plant – Units 1-4



Details

"A" Dim = Upstream Distance
"A" Dim = 201.6'
"B" Dim = Downstream Distance
"B" Dim = 233.8'

Dia. @ Sample Location = 28'-0"

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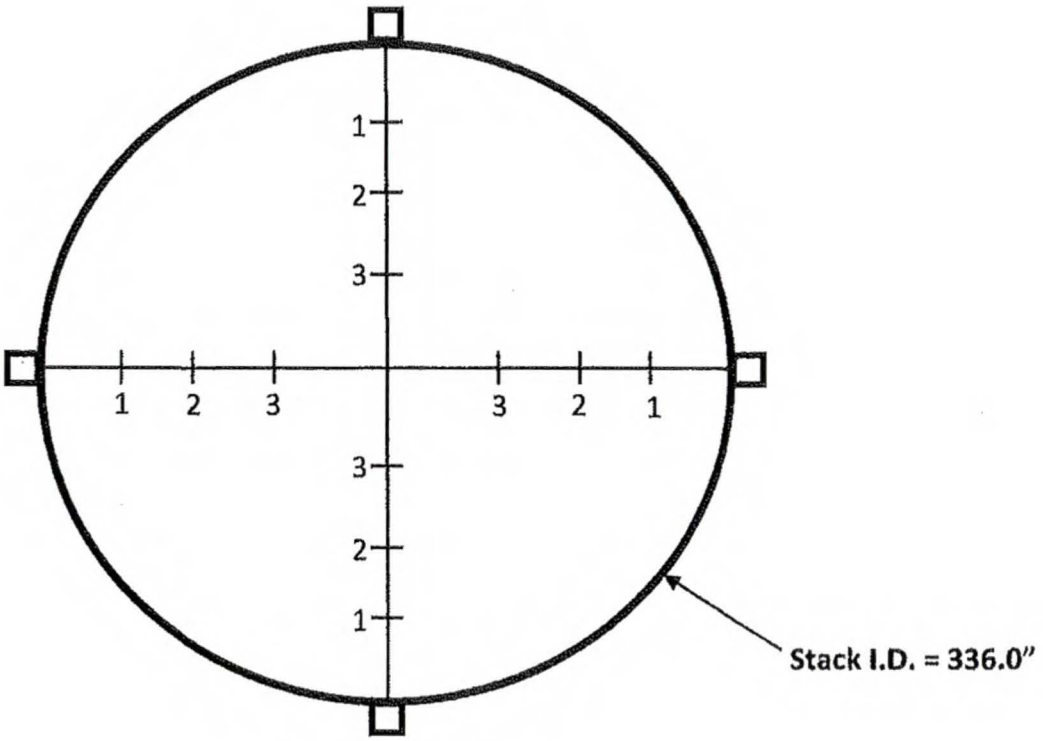
Figure 2 – Sampling Points
Monroe Power Plant – Units 1-4



VELOCITY / PM MEASUREMENT POINTS

Point	Distance from Inside Wall
1	14.78"
2	49.06"
3	99.46"

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Figure 3 – EPA Method 5B / 202
Monroe Power Plant – Units 1-4

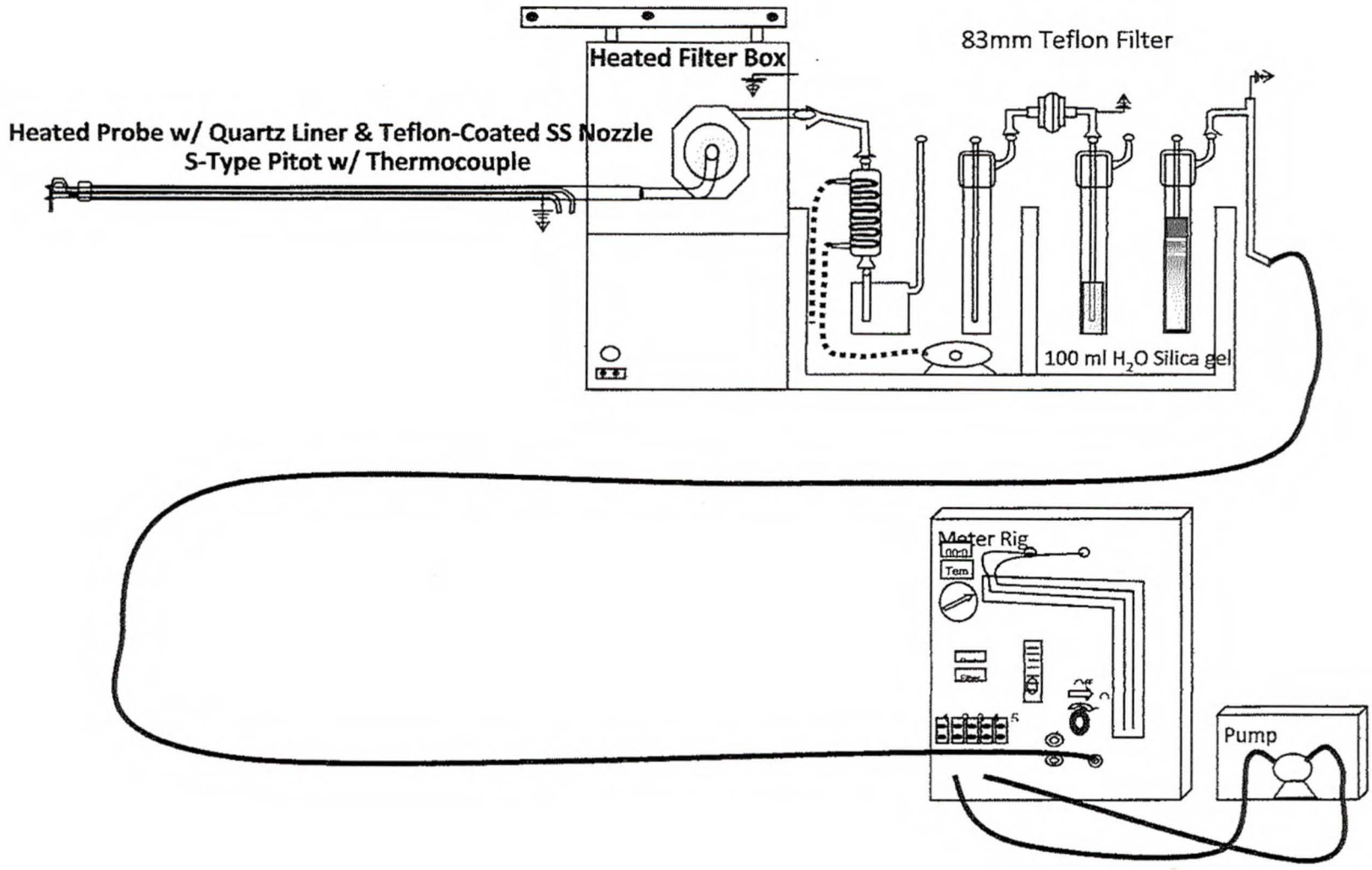

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Figure 4 – EPA Method 8A
Monroe Power Plant – Units 1-4

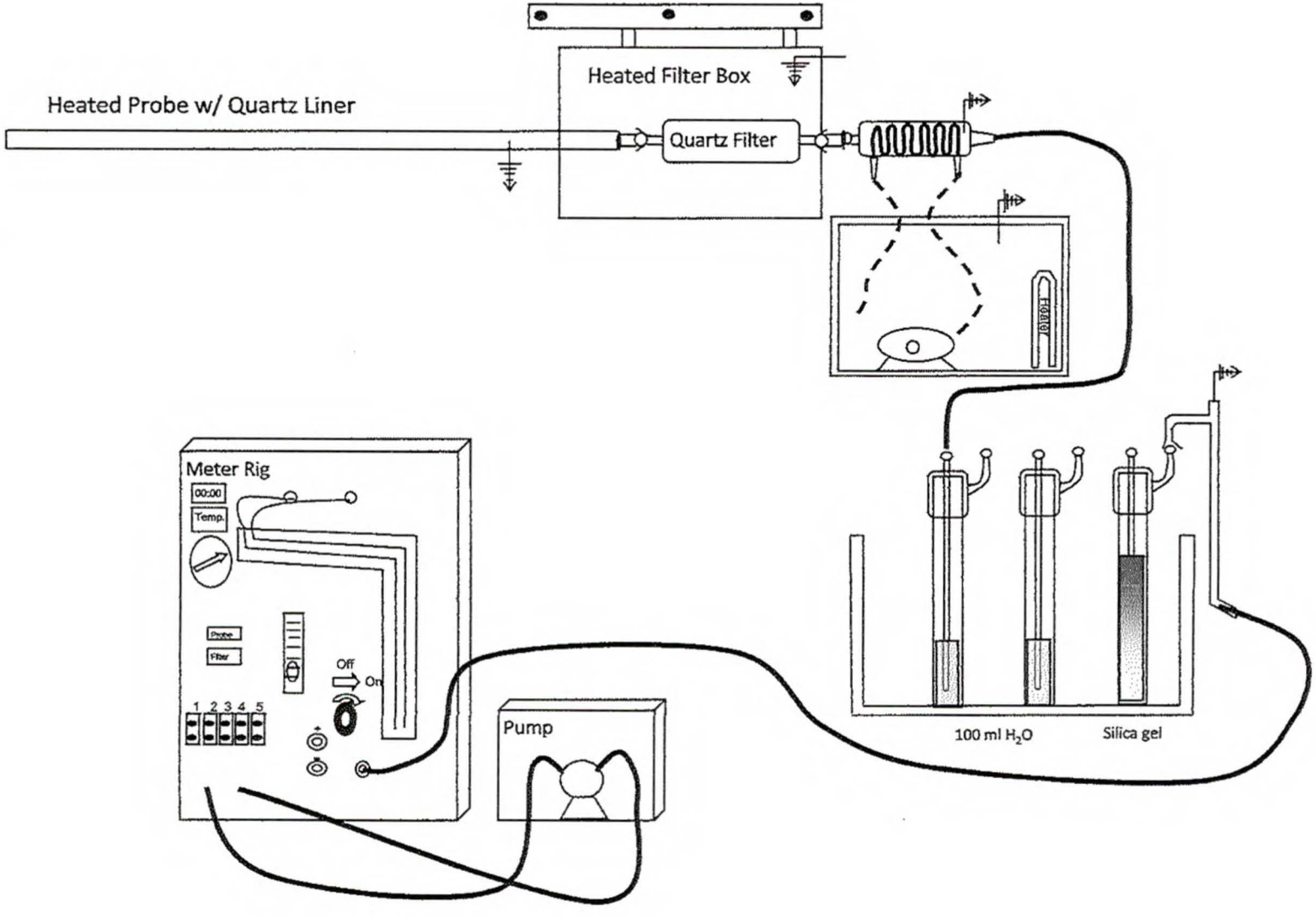

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Figure 5 – EPA Method 26A
Monroe Power Plant – Units 1-4

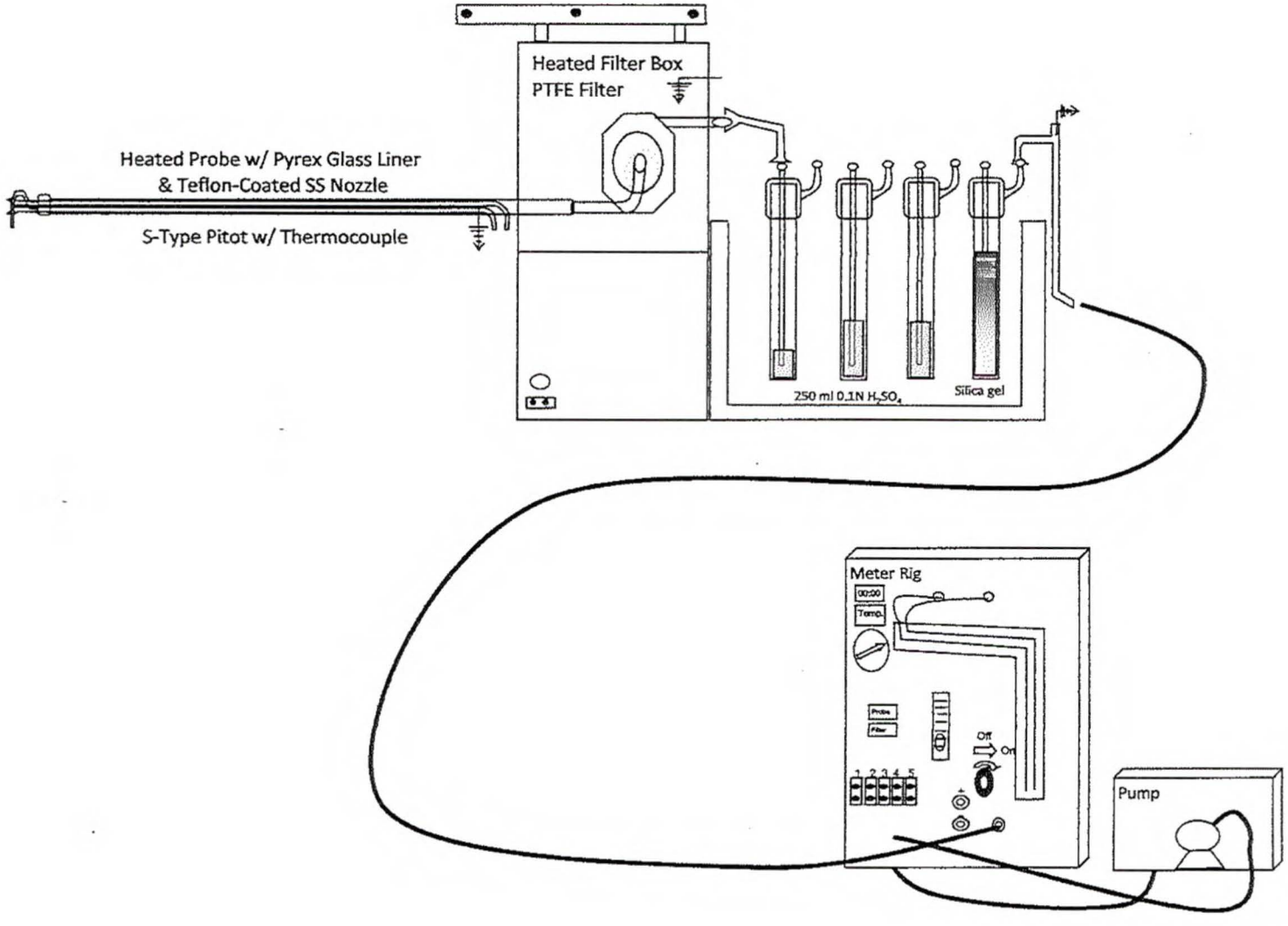

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Figure 6 – EPA Method 29
Monroe Power Plant – Units 1-4

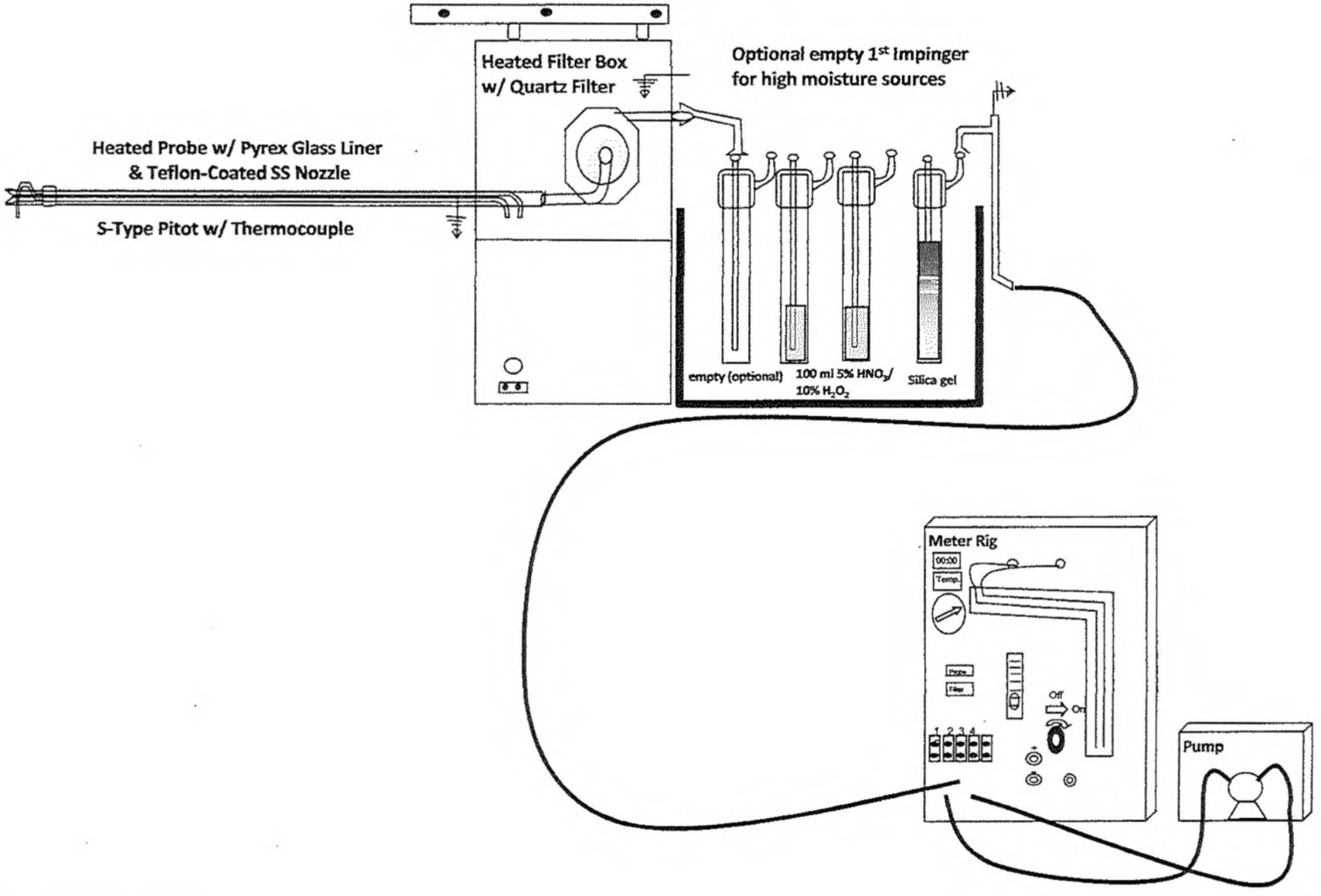

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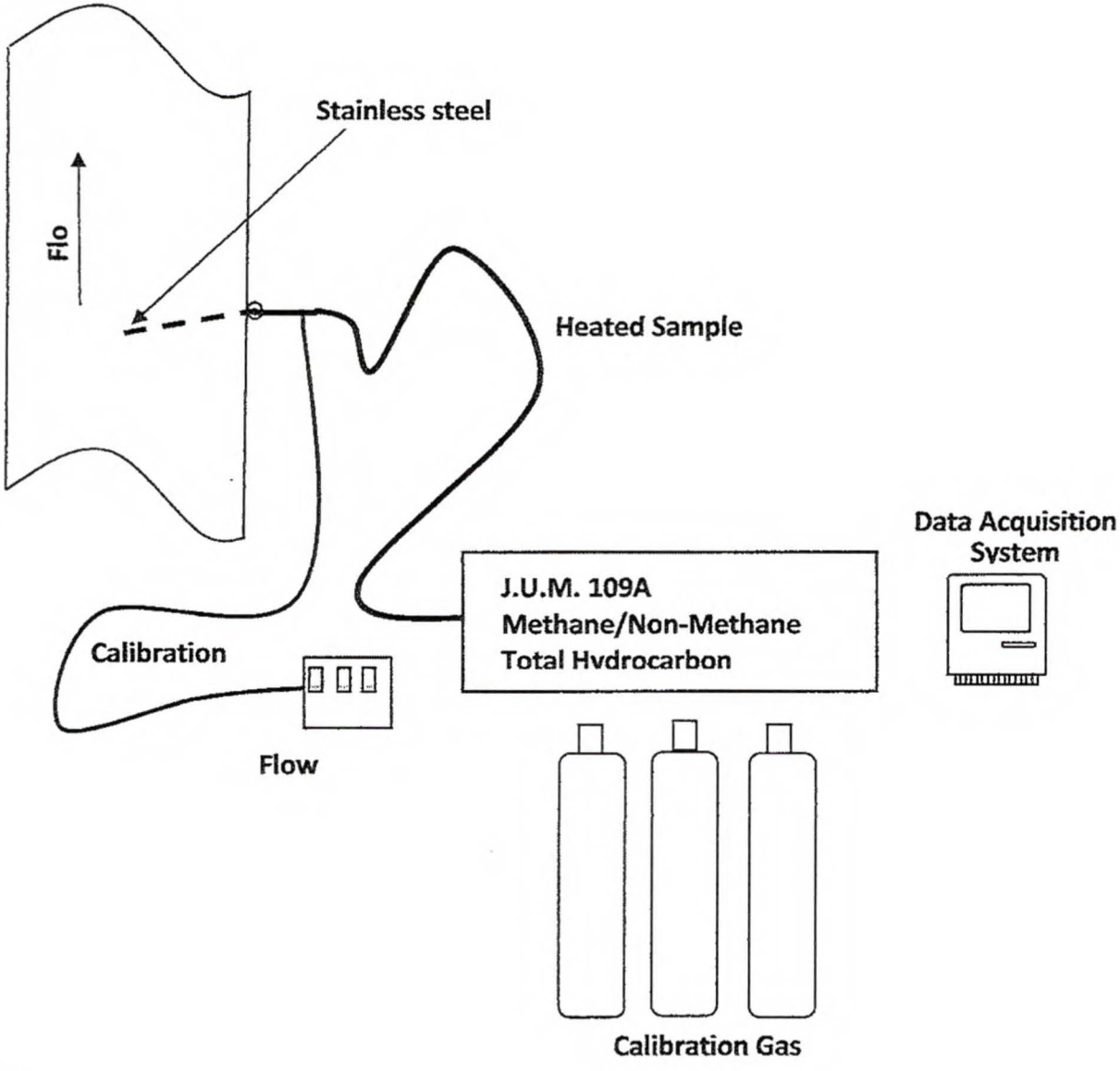
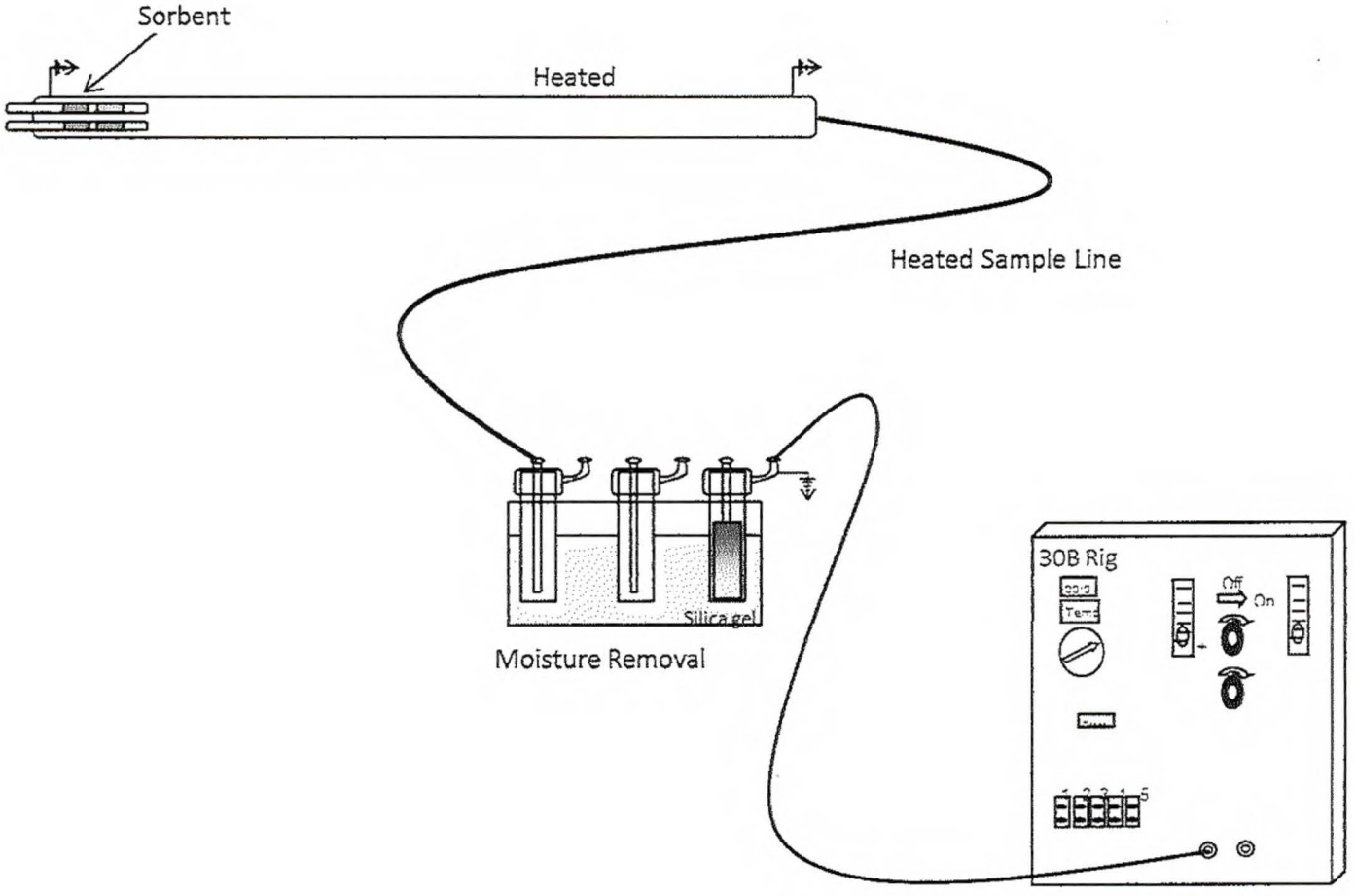
Figure 7 – EPA Method 25A
Monroe Power Plant – Units 1-4



DTE

Figure 8 – EPA Method 30B
Monroe Power Plant – Units 1-4



DTE