

# FINAL REPORT



## DTE ENERGY

DETROIT, MICHIGAN

### TRENTON CHANNEL POWER PLANT: BOILER 9A HCL EMISSIONS TEST REPORT

RWDI #2205241

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#### SUBMITTED TO

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## EXECUTIVE SUMMARY

RWDI USA LLC (RWDI) has been retained by DTE Energy (DTE) to complete the emission sampling program at the Trenton Channel Power Plant (TCPP) located in Trenton, Michigan. RWDI performed a Hydrogen Chloride (HCl) emissions test on the exhaust of EU-BOILER\_9A. The testing is required by 40 CFR Part 63, Subpart UUUUU. Testing was performed in accordance with the Procedure 2 of 40 CFR Part 60, Appendix F, and was conducted on May 10<sup>th</sup>, 2022.

### Emissions Testing Summary

Source	Date	Load (GMW)	HCl (lbs/MMBtu) <sup>1</sup>
EU-BOILER_9A	May 10 <sup>th</sup> , 2022	317	0.0007

Notes: 1 – MATS Limit – 0.0020 lbs/MMBtu



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**Appendix F3:** Oxygen and Carbon Dioxide Sampling Results

**Appendix F4:** Oxygen and Carbon Dioxide Field Notes



# 1 INTRODUCTION

RWDI USA LLC (RWDI) has been retained by DTE Energy (DTE) to complete the emission sampling program at the Trenton Channel Power Plant (TCP) located in Trenton, Michigan. RWDI performed a Hydrogen Chloride (HCl) emissions test on the exhaust of EU-BOILER\_9A. The testing is required by 40 CFR Part 63, Subpart UUUUU. Testing was performed in accordance with the Procedure 2 of 40 CFR Part 60, Appendix F, and was conducted on May 10<sup>th</sup>, 2022.

The fieldwork was performed in accordance with EPA Reference Methods and DTE's intent to test. Copy of Intent to Test Plan is provided in **Appendix A**.

## 1.1 Location and Dates of Testing

The test program was completed on May 10<sup>th</sup>, 2022, on EU-BOILER\_9A.

## 1.2 Description of Source

The Trenton Channel Power Plant (TCP) located at 4695 W. Jefferson Avenue, Trenton, Michigan, employs the use of one coal-fired boiler. Boiler 9A is a Combustion Engineering Boiler that has a nameplate capacity of 520 gross megawatts (GMW) and produces 3,915 klb/hr of steam at full load.

Particulate emissions from Boiler 9A are controlled via American Standard electrostatic precipitators. Boiler 9A is equipped with a Dry Sorbent Injection (DSI) and Activated Carbon Injection (ACI) air quality control system. The DSI system is used to control acid gas, PM, PM10, PM2.5, and NOx emissions from each unit. Trona is received at the plant where inline mills further refine the Trona. The ACI system is used to control Mercury emissions from each unit.

## 1.3 Personnel Involved in Testing

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## 2 SAMPLING AND ANALYTICAL PROCEDURES

### 2.1 Moisture Determination (USEPA Method 4)

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 as a component of the HCl sampling train.

### 2.2 Hydrogen Chloride (USEPA Method 26A)

Determination of HCl emissions of the exhaust gas was performed using the method described in USEPA Method 26A, "Determination of Hydrogen Halide and Halogen Emissions". Method 26A uses impingers containing 0.1N H<sub>2</sub>SO<sub>4</sub> to capture HCl. Triplicate, 60-minute test runs were conducted. Method 26A sampling was performed as a single point sample per Method 26 procedures.

After completion of each run, a leak test was conducted. All the impingers were measured for moisture gain. The contents of impingers 1 and 2 along with all connecting glassware were rinsed and collected in a designated sample container. All samples along with the blank were sent to the lab for analysis. Lab analysis data can be found in **Appendix B**.

### 2.3 Oxygen and Carbon Dioxide (USEPA Method 3A)

Oxygen (O<sub>2</sub>) and carbon dioxide (CO<sub>2</sub>) emissions were evaluated using USEPA Method 3A, "Gas Analysis for Carbon Dioxide, Excess Air, and Dry Molecular Weight (Instrumental Analyzer Method)". The analyzers utilize paramagnetic sensors. Bag samples were taken concurrently with each 60-minute HCl test. Each bag was filled over the entire 1-hour period. The triplicate bag samples were taken back to RWDI's office in Michigan and analyzed for O<sub>2</sub> and CO<sub>2</sub> on the next business day (May 11, 2022).

The O<sub>2</sub> and CO<sub>2</sub> analyzers were calibrated per procedures outlined in USEPA Method 3A. Zero, span, and mid-range calibration gases were introduced directly into the analyzer to verify the instruments linearity prior to sampling. Zero and mid gases were introduced after each test period to determine instrument drift.

### 2.4 Data Calculation

HCl emissions data collected during the testing were calculated and reported as parts per million (ppm) and pounds per million Btu (lb/MMBtu). A coal sample was collected on the day of testing and as analyzed by DTE's internal laboratory for proximate and ultimate fuel analysis. An Fc factor was calculated based on this data. Equation 19-7 in Method 19 was used in conjunction with the Fc factor and CO<sub>2</sub> from the CEMS to calculate the lb/MMBtu.



## 3 OPERATING PARAMETERS

The test program included the collection of boiler load and stack emissions CEMs data during each test run. Parameters recorded included gross megawatts (GMW), CO<sub>2</sub> (%), NO<sub>x</sub> (ppm), SO<sub>2</sub> (ppm), and opacity (%). Additionally, dry sorbent injection rates (DSI) and activated carbon injection rates (ACI), in pounds per hour (lb/hr), are reported. Operational data collected during this test program can be found in **Appendix C**.

## 4 TEST RESULTS AND DISCUSSION

### 4.1 Discussion of Results

**Table 1** presents the HCl emission testing results from the EU-BOILER\_9A. HCl emissions are presented in parts per million on a wet basis (ppm<sub>w</sub>) and pounds per million BTU (lbs/MMBtu). The EU-BOILER\_9A HCl emissions during the testing demonstrated an average HCl concentration of 0.45 ppm and 0.0007 lb/MMBtu. The average emissions were within the Subpart UUUUU limit of 0.0020 lb/MMBtu. Further details are provided in **Appendix F**.

### 4.2 Calibration Sheets

Calibration sheets can be found in **Appendix D**.

### 4.3 Sample Calculations

Sample calculations can be found in **Appendix E**.

### 4.4 Field Data Sheets

Field data sheets can be found in **Appendix F**.

### 4.5 Laboratory Data and Coal Analysis

Laboratory analytical results can be found in **Appendix B**.

TABLE

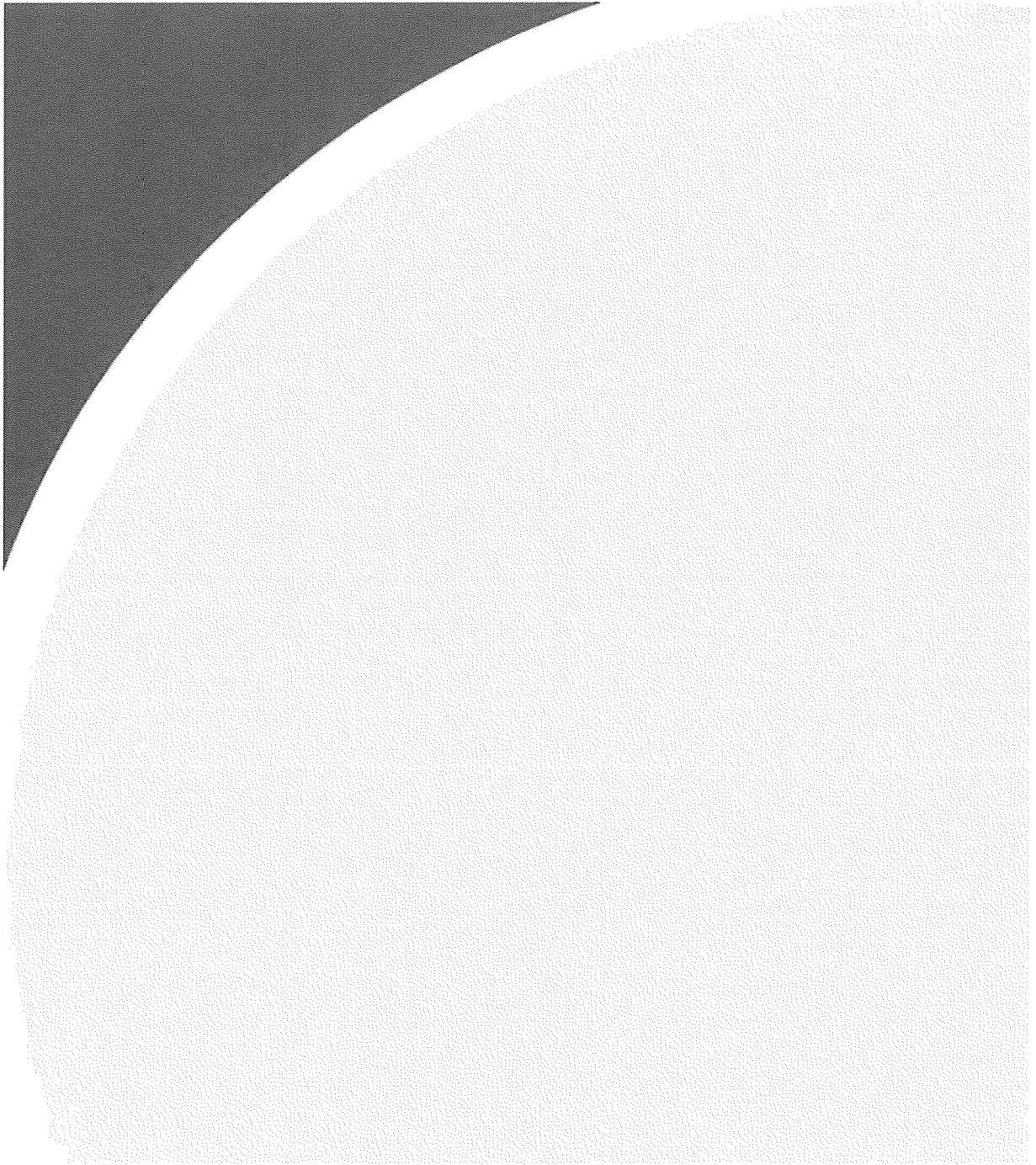




Table 1  
HCL Emissions Results  
TCPP-EU-Boiler\_9A

Test Number	Test Date	Test Time	Unit Load (GMW)	DSI Injection Rate (lb/hr)	ACI Injection Rate (lb/hr)	CO2 Concentration (% wet)	HCl Concentration (ppm wet)	HCl Emissions (lbs/MMBtu)
1	10-May	7:09-8:09	311	373	195	11.3	0.47	0.0008
2	10-May	8:22-9:22	320	395	207	11.4	0.44	0.0007
3	10-May	9:31-10:31	320	416	208	11.3	0.43	0.0007
Average			317	395	203	11.3	0.45	0.0007

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# FIGURES



Figure 1 – Sampling Location  
Trenton Channel Power Plant  
Boiler 9A

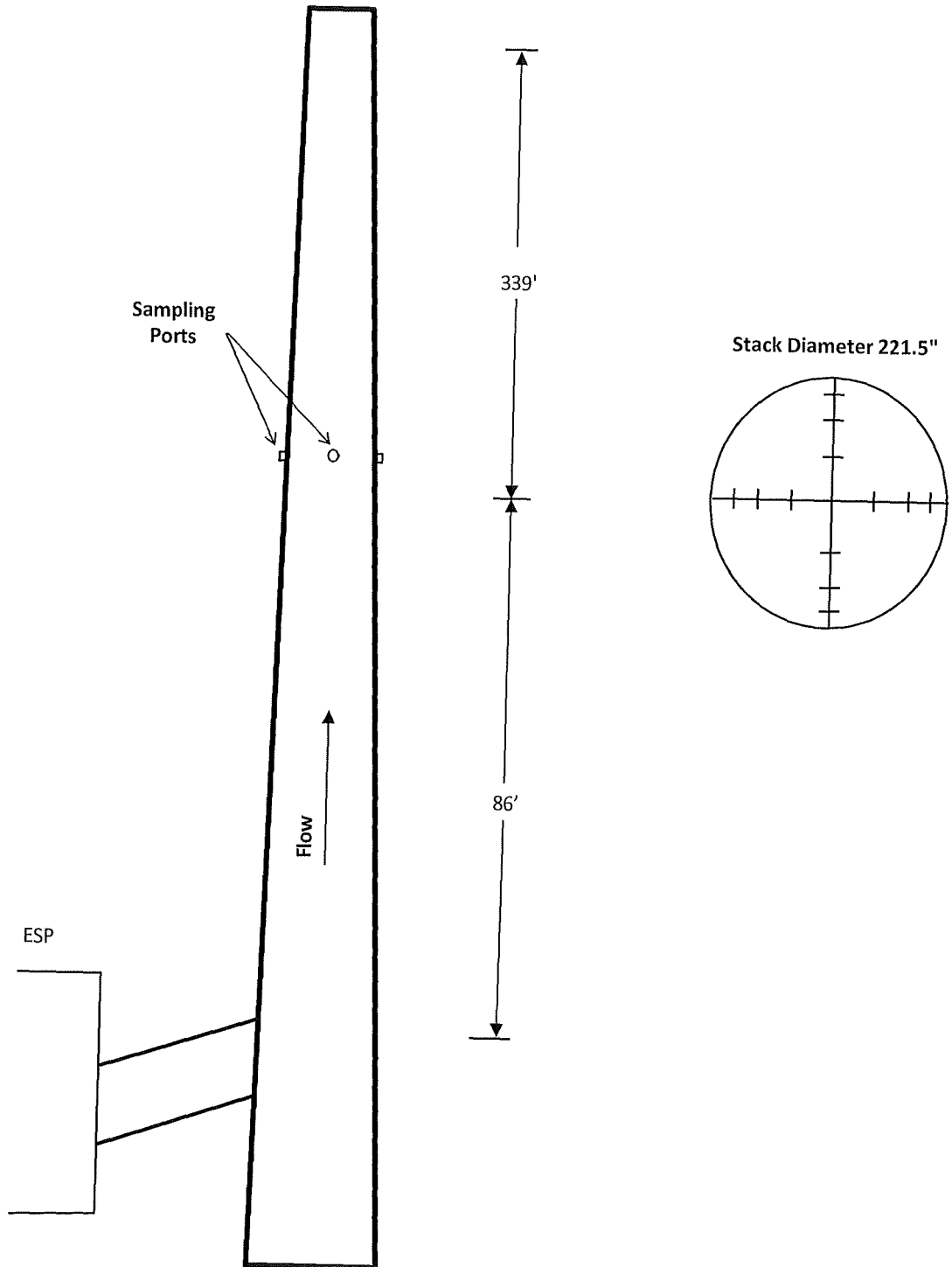
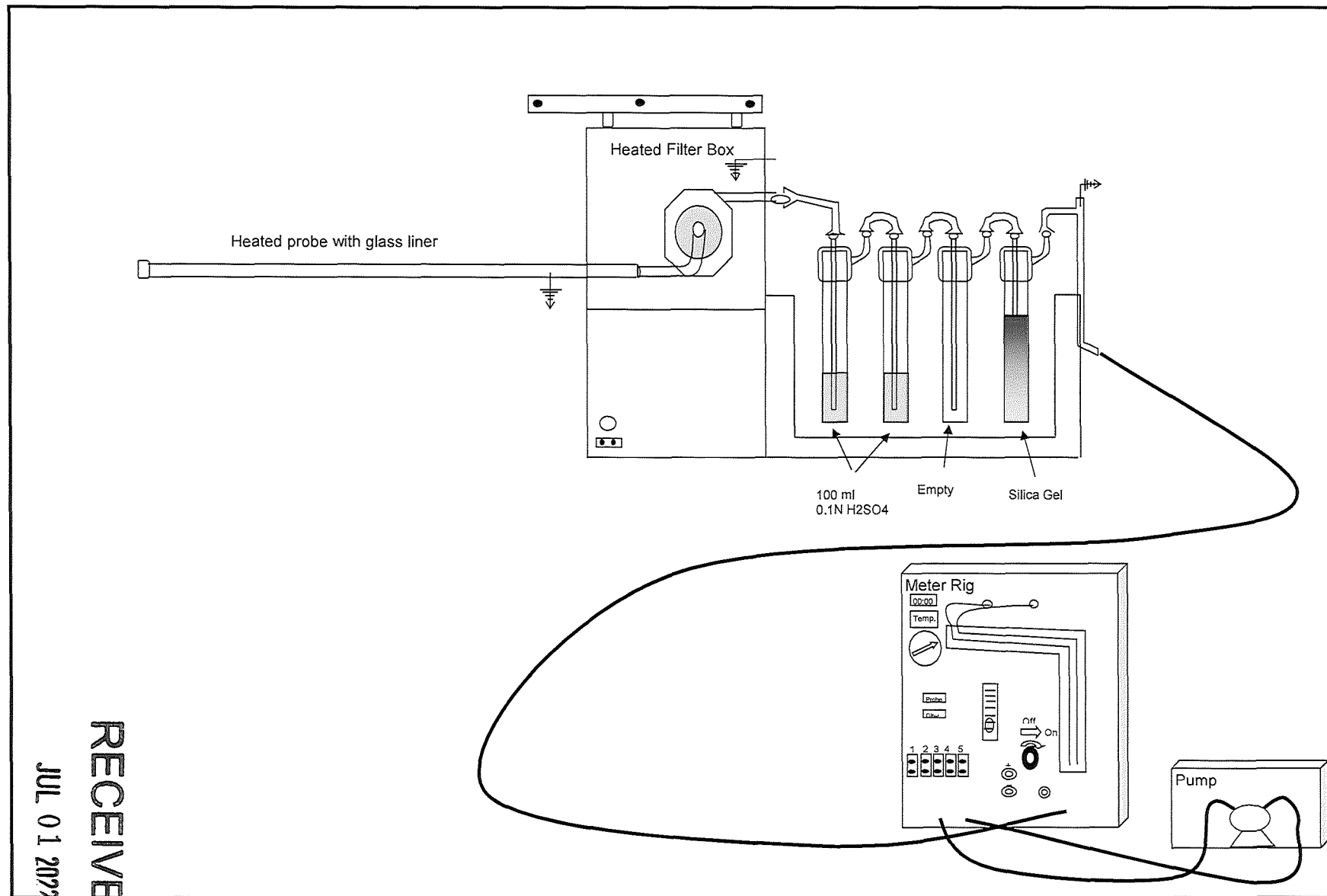


Figure 2  
USEPA Method 26A - Modified  
Trenton Channel Power Plant



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