

Volatile Organic Compounds
Continuous Emissions Monitor
Relative Accuracy Audit
Zink Vapor Recovery Unit
MPLX Terminals LLC
Terminals, Transport And Rail
Niles South Facility
Niles, Michigan

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I. INTRODUCTION AND SUMMARY

The Marathon Petroleum Company LP's Environmental Field Services Section performed a relative accuracy audit on the Zink VRU located at the Niles South Light Oil Terminal. This facility serves as a vapor recovery system for their bulk gasoline, diesel and fuel oil loading. The testing was conducted on October 10, 2017. The relative accuracy was determined on the following monitor:

<u>Location</u>	<u>Monitor</u>	<u>Serial No.</u>	<u>Audit Type</u>
Niles South VRU	IR	5075	RATA

The purpose of the testing was to determine the relative accuracy of the CEM from the vapor recovery unit exhaust outlet during truck loading procedures relative to the reference monitor.

Test methods followed those as detailed in the Code of Federal Regulations, CFR40, Part 60, 2004, Subpart XX and CFR40, Part 63, 2001, Subpart R. Specific procedures used were EPA Methods 2A, 21 and 25B and Subsection 60.503 (d) along with the guidelines of Performance Specification 2 for the relative accuracy audit.

The testing was conducted by Mr. Aaron Boyd and Mr. Lee Sammons of Refining Analytical and Development Department's Environmental Field Services Group. Ms. Jackie Gast of MPLX Terminals LLC TT&R's Environmental Group coordinated the testing.

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I. **INTRODUCTION AND SUMMARY (cont.)**

A total of twelve tests were conducted while the minimum of nine runs were used in determining the relative accuracy of the continuous emission monitor.

The results from testing conducted on October 10, 2017 are as follows:

<u>Monitor</u>	<u>Relative Accuracy</u>	<u>Allowable</u>
IR (mg/l vs mg/l)	0.29%	10% of Applicable Standard (35 mg/l)
IR (conc. vs conc.)	0.53%	10% of Applicable Standard Conc. (1.88%)

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II. PROCESS DESCRIPTION

MPLX Terminals LLC's Niles South truck loading facility utilizes a Zink Vapor Recovery Unit to absorb organic vapors emitted from the bottom tank during loading procedures. This process consists of two (2) carbon beds which continually cycle and regenerate every 15 minutes. The gas vapor adsorbs on the activated carbon after going through the absorber tower and is vented to the atmosphere. After the 15-minute cycle is complete, the bed recycles under vacuum at >24.0 inches of mercury while the other bed is utilized. During the recycle process in the carbon adsorber, a liquid ring vacuum pump pulls the hydrocarbon from the carbon. The hydrocarbon vapors from the carbon adsorber are mixed with the vacuum pump seal fluid and discharged to an absorber/separator.

The hydrocarbon vapors are condensed and separated from the seal fluid in the separator compartment and discharged back to a holding tank. Any remaining hydrocarbons pass through the packed adsorber tower and are contacted by the fresh stream of gasoline which absorbs most of the remaining hydrocarbon. The small amount of hydrocarbon that is left leaves the top of the absorber and is directed back to the carbon adsorber which starts the whole process again.

The hydrocarbon is detected using an IR-8400 DC Continuous Gas Monitoring Analyzer with non-methane hydrocarbon, total hydrocarbon, and methane detectors. The sample point for each analyzer is located at 50% of the diameter of the exhaust vent.

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III. SAMPLING AND ANALYSIS PROCEDURES

A relative accuracy audit was conducted on the MPLX Terminals LLC Niles South Terminal's Zink Vapor Recovery unit that serves the tank truck loading facility for gasoline, diesel and fuel oil. The audit was conducted on October 10, 2017.

The test procedures used followed those as required in the Code of Federal Regulations, CFR40, Part 60, 2004, Subpart XX including EPA Methods 2A, 21, 25B and Subsection 63.420 along with Performance Specification 2 for relative accuracy audit procedures.

The vapor recovery unit emissions rate was determined by monitoring a number of parameters on the controlled system. These parameters included:

1. A complete leak check on the vapor recovery unit system including all of the connections and hoses at the loading bays.
2. A determination of the vapor flow rate exhausted from the carbon adsorber beds.
3. A determination of the volume of fuel loaded during the test period.
4. A determination of the emissions rate of hydrocarbons during the specific test periods.

A. Vapor Recovery Units Initial Leak Check

An initial organic vapor leak check on the vapor recovery unit was conducted during the loading process prior to testing on August 29, 2017. All connections and hose fittings were checked by using EPA Method 21 procedures. A RKI Instruments Gas Tracer, Organic Vapor Analyzer, was used to detect any leakage from fittings. No leaks were detected.

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III. **SAMPLING AND ANALYSIS PROCEDURES(cont.)**

B. **Fuel Volume Determination**

During each testing period the volume loaded was retrieved from the terminal's Fuel Facts computer system. The data were used in the determination of the volume of gasoline and diesel fuel.

C. **Determination of Total Organic Concentrations**

The total hydrocarbon sampling and analysis of both carbon beds were determined on site using an Infrared Industries IR-208 NDIR Continuous Gas Monitoring Analyzer following EPA Method 25B. The sampling port was connected from the 10" line leading from the turbine meter.

Zero gas and EPA Protocol 1 calibration standards in nitrogen were used in the calibration of the IR instrument. The zero gas and the low standard concentration gas was sent from the bottle to the three way valve and back through the sampling line for the leak check determination and efficiency of the sampling line. The four standards used in the initial audit calibration for propane were nitrogen as zero gas (<0.2 ppm), 0.25%, 0.50%, and 0.91% propane in nitrogen. The four standards used in the initial audit calibration for methane were nitrogen as zero gas (<0.2 ppm), 5.07%, 10.00% and 19.70% methane in nitrogen. A multi-gas cylinder consisting of 0.30% propane and 14.92% methane was used for analyzer verification purposes prior to and following the test as well as during each hourly drift check.

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IV. TEST RESULTS

A summary of the relative accuracy equations is presented in Appendix A.

Relative accuracy audit test field and calculation summary data is presented in Appendix B.

All fuel dispensing data is presented in Appendix C.

Instrument and test equipment calibration data is presented in Appendix D.

US EPA approval letter is presented in Appendix E.

Based on the results of the relative accuracy audit conducted on the IR instrument hydrocarbon monitor, conclusions are as follows:

1. Results of the Relative Accuracy Certification test series conducted on the IR Industries CEM located on the VRU exhaust vent are within the requirements specified for Applicable Standard Concentrations.