VOLATILE ORGANIC COMPOUND EMISSION TEST REPORT

OF THE

B9181

SUNOCO LOGISTICS

OWOSSO TRANSPORT LOADING TERMINAL
DETROIT, MICHIGAN

ON THE

CARBON VAPOR RECOVERY UNIT

ON

June 5, 2014

Terminal Info: Sunoco Logistics
4004 W Main St.
Owosso, MI 48867
Phone: (989) 723-6781

Performed By: Jordan Technologies
5051 Commerce Crossings Drive
Louisville, KY 40229

Test Personnel: Tony Fenton & Jim Stamm
Phone: 502 267 8344
E-Mail: tfenton@jordantech.com / jstamm@jordantech.com

TEST PARAMETER	MEASURED VALUE	REQUIRED VALUE
VOC Emissions	1.62 mg/liter	80 mg/liter
Pounds/1000gal	0.013 lbs/1,000 gallons	1 lbs/1,000 gallons

JORDAN TECHNOLOGIES
An Aereon Company

DECLARATION OF ACCURACY

Certification of sampling procedures by the team leader of the personnel conducting the sampling procedures and compiling the test report:

"I certify that the sampling procedures were performed in accordance with the approved test plan and that the data presented in this report are, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: Tony Fenton Printed Name of Person Signing: Tony Fenton

Title: Manager, Environmental Testing Division Date: 6/19/14

Certification of test report by the senior staff person at the company who is responsible for checking the test report:

"I certify that this test report and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the test information submitted. Based on my inquiry of the person or persons who performed sampling and analysis relating to the performance test, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: James Stamm Printed Name of Person Signing: James Stamm, P.E.

Title: Sr. Environmental Engineer Date: 6/19/14

Deviations from SOP

1. No deviations noted during testing

EXECUTIVE SUMMARY

The Sunoco Logistics (Sunoco) terminal in Owosso, Michigan is a bulk transport loading facility for Gasoline Products.

The products are bottom loaded into transport tankers and the displaced hydrocarbon vapors are balanced to a CARBON ADSORPTION / ABSORPTION VAPOR RECOVERY UNIT.

This facility was source tested for air emissions on June 5, 2014. The purpose of this test was to confirm proper operation of the VRU and verify compliance with applicable VOC (Volatile Organic Compound) air emission requirements.

The Gasoline Terminal Air Emission Source Test was conducted in accordance with procedures established, and the test methods referenced, in the Code of Federal Regulations; CFR 40, Part 60, Subpart XX and CFR 40, Part 63, Subpart BBBBBB Specific procedures used include:

EPA TEST METHOD	MEASUREMENT
Method 2A	Exhaust Vapor Volume from VRU
Method 25B (NDIR analyzer)	Inlet and Outlet VOC Concentrations as volume % propane
Method 21	Potential Leak Sources
40 CFR 63 Subpart BBBBBB 63.11092(a)(1)(i)	Refer to 60.503 with addition of leak rate defined as 500 PPM
40 CFR 60 Subsection 60.503 (d)	Transport Loading Maximum Backpressure

The results of this air emission test demonstrate that this source is in compliance with all applicable Federal and Local requirements. A summary of the data is presented below:

TEST PARAMETER	MEASURED VALUE	REQUIRED VALUE
VOC Emissions	1.62 mg/liter	80 mg/liter
Pounds/1000gal	0.013 lbs/1,000 gallons	1 lbs/1,000 gallons

Method 21 Leak Testing was performed on the day prior to testing. A portable LEL meter was calibrated using a 500 PPM Methane calibration gas and used to check for leaks around all fittings, flanges, valves and any other exposed potential leak source. No Leaks above 500 PPM were found.

CARBON ADSORPTION/GASOLINE ABSORPTION VAPOR RECOVERY UNIT

Following is a brief description of the VRU process. For a fully detailed description please consult the manufacturer's equipment manual.

Hydrocarbon vapors, generated from truck loading, enter into one of two carbon adsorbers. The hydrocarbon and air vapors flow through the adsorber where the bulk of the hydrocarbons are adsorbed. The air continues through the carbon adsorber and is vented to the atmosphere. While this carbon adsorber is on-line processing the hydrocarbon vapors, the second carbon adsorber is off-line being vacuum regenerated (i.e. cleaned). The purpose of regeneration is to restore the carbon to a level where it will effectively adsorb hydrocarbons again. The two carbon adsorbers alternate between adsorption and regeneration at 15-minute intervals.

When a carbon adsorber is being regenerated, the vacuum pump exerts a significant vacuum on the carbon adsorber vessel and desorbs the hydrocarbons from the carbon. The hydrocarbon vapors are then pumped from the carbon to the absorber tower.

The hydrocarbons are condensed and absorbed by the counter flow liquid gasoline feed in the absorber tower and are then pumped back to the terminal's gasoline storage tank. Any hydrocarbons that are not absorbed in the absorber tower pass up through the packed tower and are routed back to the on-line carbon adsorber.

The Vapor Recovery Unit is illustrated in a simplified schematic on page 12.

MEASUREMENT AND DATA ANALYSIS

The NonDispersive InfraRed (NDIR) analyzer, turbine flow meter, exhaust vapor thermistor and exhaust pressure transducer are connected to the VRU exhaust stack in order to acquire their respective data. A quad check valve assembly is employed to provide for proper VRU regeneration air flow and allow one turbine meter to satisfy both carbon vessel measurement requirements.

The barometric pressure transducer and ambient thermistor are located in close proximity to the VRU in order to acquire ambient atmospheric conditions for use in subsequent standardization equations. A test schematic depicting general test equipment configuration is included on page 13.

Each transducer data channel is scaled and connected to the computer input board. Using an operations code program each input channel is read 25 times in a 5 second interval and mass, flow, concentration, temperature, and pressure values are averaged and stored in an array for subsequent use.

After sixty 5 second intervals (5 minutes) the hard disk array is polled and average values are determined for concentration, pressure, and temperature. These values along with the flow for the 5 minute period are used to compute the mass emitted for that 5 minute period. These averaged and summed values are then printed out as the 5 minute interval data and are again stored on hard disk until the six hour test period is completed.

Upon completion of the test, the 5 minute interval data is polled to determine test averages for Inlet and Outlet VOC concentration, pressure and temperature data for all test intervals during which VRU exhaust flow was greater than zero and volume and milligram emission data is summed for all 5 minute periods to arrive at a final test period total.

This data acquisition methodology essentially represents a series of very short (5 second) intervals during which VRU operation is measured, averaged and standardized. This effectively removes all judgmental decisions from data reduction processes and provides a technically unbiased analysis of VRU operation.

Additionally, pretest and post test vapor analyzer calibrations are conducted, along with hourly analyzer calibration drift check verification. Following the conclusion of the six hour test the loading rack volumes are calculated and final mass emission values are determined. Copies of the transport loading rack sheets, hydrocarbon analyzer strip charts and computer print outs are attached as Appendices to this test report.

TEST EQUIPMENT

Quantity	Item
2	Thermistor Temperature Probes *(Ambient and Exhaust Temperatures)*
1	Windows compatible Laptop Computer with Allen Bradley PLC Data Acquisition System and Wonderware SCADA software
1	RKI Instruments Portable Hydrocarbon Analyzer *(Method. 21 Leak Test)*
1	Setra Model #264 Differential Pressure Transducer *(Flow Standardization)*
1	Digital Barometer – Setra Model Datum 2270 *(Flow Standardization)*
1	American Meter Co. 8" Turbine Flow Meter *(Method 2A Exhaust Flow)*
1	Strip Chart Recorder: Yokogawa DX1000n Paperless Chart Recorder
1	Inlet NDIR Gas Analyzer: *(Method 25B – Inlet VOC)* Horiba VIA-510 Non Dispersive InfraRed Analyzer
1	Outlet NDIR Analyzer: *(Method 25B – Exhaust VOC)* Horiba VIA-510 Non Dispersive InfraRed Analyzer
1	Back Pressure Gauge: McDaniel Controls, Inc Model #20502A

Gas cylinder documentation is presented in Appendix B.