Report of...

VOC Destruction Efficiency Testing

performed for...

Almond Products
Spring Lake, Michigan

on the

Thermal Oxidizer

February 14, 2018

190.06

Network Environmental, Inc.
Grand Rapids, MI

I. INTRODUCTION

Network Environmental, Inc. was retained by Almond Products, Inc. of Spring Lake, Michigan to conduct a compliance emission test at their Spring Lake, Michigan facility. The purpose of the study was to determine the destruction efficiency of the Thermal Oxidizer (TO) in accordance with Permit to Install No.361-06F.

The sampling was conducted on February 14, 2018 by Stephan K. Byrd and Richard D. Eerdmans of Network Environmental, Inc. The testing was performed in accordance with EPA Method 25A for destruction efficiency. Mr. Chris Stebbins of Almond Products, Inc. coordinated source operation and data collection during the testing. Mr. Jeremy Howe and Ms. April Lazzaro of the MDEQ Air Quality Division were present to observe the testing and source operation.

II. PRESENTATION OF RESULTS

II.1 TABLE 1
VOC DESTRUCTION EFFICIENCY RESULTS (as Propane)
THERMAL OXIDIZER (TO)
ALMOND PRODUCTS, INC.
SPRING LAKE, MICHIGAN
FEBRUARY 14, 2018

Sample	Time	Concentration PPM[1]		Mass Emission Rate Lbs./Hr		%[2] Destruction Efficiency
		Inlet	Exhaust	Inlet	Exhaust	
1	09:33-10:33	220.1	0.4	7.58	0.016	99.79
2	10:59-11:59	195.9	0.2	6.76	0.008	99.89
3	12:15-13:15	250.7	0.1	8.56	0.004	99.96
Average		**222.2**	**0.2**	**7.63**	**0.009**	**99.88**

(1) PPM = Parts Per Million (v/v) on an actual (wet) basis
(2) Destruction Efficiencies were calculated using the mass emission rates

III. DISCUSSION OF RESULTS

Destruction Efficiency - The results of the destruction efficiency (DE) sampling are presented in Section II, Table 1.

The DE's for the three samples were 99.79% for sample one, 99.89% for sample two and 99.96% for sample three. The average of the three samples was 99.88%. The DE's were calculated using the mass loadings, as propane, at the inlet and outlet of the oxidizer.

IV. SAMPLING AND ANALYTICAL PROTOCOL

The RTO inlet and exhaust sampling were conducted on the 28x28-inch I.D. inlet duct at a location approximately 8-duct diameters downstream and 2 duct diameter upstream from the nearest disturbances and the 36x36-inch I.D. outlet duct at a location approximately 4-duct diameters downstream and greater than two duct diameters upstream from the nearest disturbance.

The following reference test methods were employed to conduct the sampling:

* Destruction Efficiency - U.S. EPA Method 25A
* Exhaust Gas Parameters (flow rate, temperature, moisture and density) - U.S. EPA Methods 1 - 4.

IV.1 Destruction Efficiency - The total hydrocarbon (VOC) sampling was conducted in accordance with U.S. EPA Reference Method 25A. The sample gas was extracted from the inlet and outlet of the oxidizer through heated Teflon sample lines that led to a TECO Model 51 and a J.U.M Model 3-500 portable flame ionization detectors (FIDs). These analyzers produce instantaneous readouts of the total hydrocarbon concentrations (PPM). Three (3) samples were collected from each of the inlet and outlet of the oxidizer. Each sample was sixty (60) minutes in duration. The sampling on the oxidizer inlet and exhaust was conducted simultaneously for the DE.

A systems (from the back of the stack probe to the analyzer) calibration was conducted for the analyzers prior to the testing. Span gases of 96.49 PPM and 959.3 PPM propane were used to establish the initial instrument calibration for the analyzers. Propane calibration gases of 29.17 PPM, 50.19 PPM, 247.1 PPM and 453.7 PPM were used to determine the calibration error of the analyzers. After each sample (60 minute sample period), a system zero and system injections of 29.17 PPM and 247.1 PPM propane were performed to establish system drift of the analyzers during the test period. All calibration gases used were EPA Protocol

1 Certified. All the results were calibration corrected using Equation 7E-1 from U.S. EPA Method 7E. All quality assurance and quality control requirements specified in the method were incorporated in the sampling and analysis.

IV.2 Exhaust Gas Parameters - The exhaust gas parameters (airflow rate, temperature, moisture and density) were determined in accordance with U.S. EPA Methods 1-4. Moisture was determined by employing the wet bulb/dry bulb measurement technique for the inlet and a moisture train was collected on the outlet. Oxygen and carbon dioxide concentrations (%) were determined by collecting a bag sample (grab sample) and Orsat analysis. Twelve (12) sample points were used for the velocity determinations. Velocity traverses were performed on the inlet and exhaust of the oxidizer. All quality assurance and quality control requirements specified in the method were incorporated in the sampling and analysis.

This report was prepared by:

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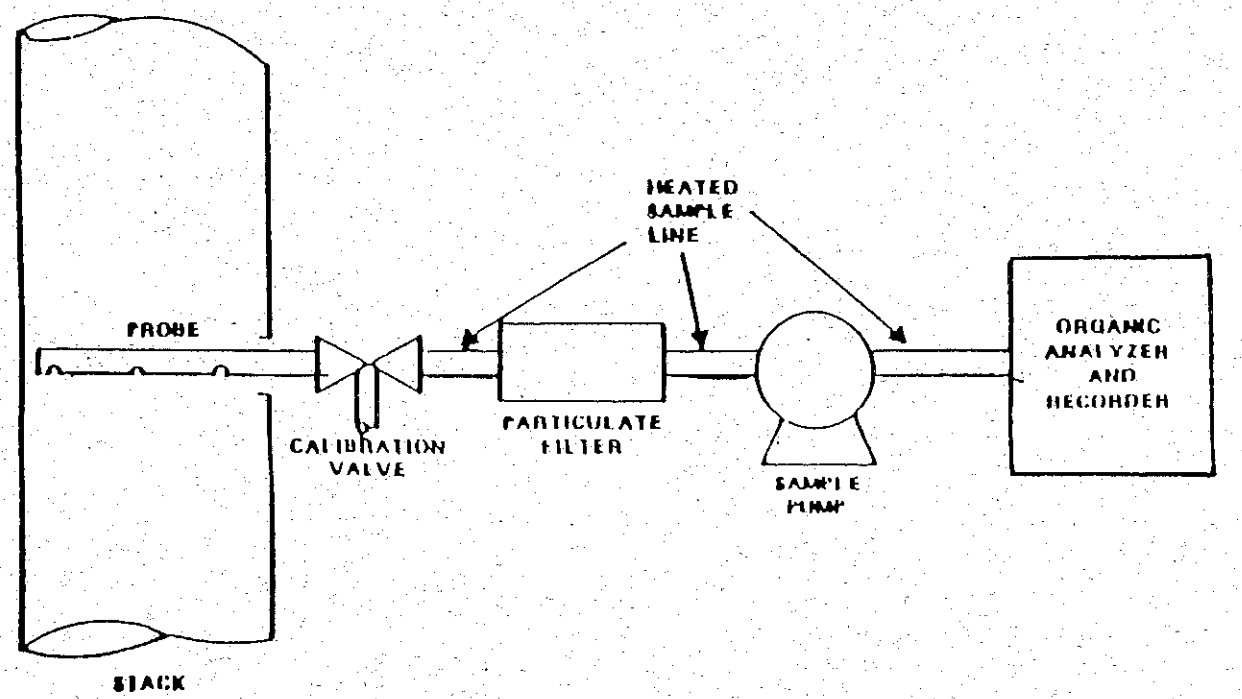

Figure 1

Total Hydrocarbon Sampling Train