BTEC Inc.

EUBIOGASFLARE
Emissions Test Report

Prepared for:

Packaging Corporation of America

Packaging Corporation of America
2246 Udell Street
Filer City, Michigan 49634

Project No. 15-4681.02
July 20, 2015

BT Environmental Consulting, Inc.
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BTEC Inc.

Executive Summary

BT Environmental Consulting, Inc. (BTEC) was retained by Packaging Corporation of America (PCA) to perform testing for heat content and total reduced sulfur (TRS) compounds, expressed as hydrogen sulfide (H_2S), of the scrubber biogas routed to the EUBIOGASFLARE (biogas flare). The biogas flare is located at the PCA facility in Filer City, Michigan. Testing was conducted on May 28, 2015.

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1.0 Introduction

BT Environmental Consulting, Inc. (BTEC) was retained by Packaging Corporation of America (PCA) to perform testing for heat content and total reduced sulfur (TRS) compounds, expressed as hydrogen sulfide (H_2S), of the scrubber biogas routed to the EUBIOGASFLARE (biogas flare). The biogas flare is located at the PCA facility in Filer City, Michigan.

1.1 Purpose of Test

The testing was performed pursuant to requirements contained in Michigan Renewable Operating Permit MI-ROP-B3692-2015. Specifically, Special Condition No. VI.5 of FGBIOGASSYSTEM requires that PCA monitor the H_2S content of the scrubber biogas routed to EUBIOGASFLARE once per year. Special condition No. VI.1 of EUBIOGASSYSTEM requires that PCA monitor the heat content of the biogas annually.

1.2 Test Date

This test program was performed on May 28, 2015.

1.3 Project Contact Information

Affiliation	Address	Contact
Test Facility	Packaging Corporation of America 2246 Udell Street Flier City, Michigan 49634	Ms. Sara Kaltunas 231-510-4689 skaltunas@packagingcorp.com
Test Company Representative	BT Environmental Consulting, Inc. 4949 Fernlee Avenue Royal Oak, Michigan 48073	Mr. Barry Boulianne 313-449-2361 bboulianne@btecinc.com

This test program was performed by Todd Wessel and Steve Smith of BTEC. Ms. Sara Kaltunas of PCA coordinated the test events for this project.

1.4 Summary of Results

A summary of H2S results is presented in Table 1. Detailed results can be found appended to this report.

Table 1
Summary of EUBIOGASFLARE Scrubber Outlet Concentrations

Sampling Location	Target Analyte	H2S Concentration (ppm_v)	Permit Concentration (ppm_v)
SVBIOGASFLARE	H_2S	3.01	50

ppm_v: parts per million by volume

The average higher heating value (HHV) of the biogas was measured to be 748 British thermal units per dry standard cubic foot (Btu/dscf). Detailed results are contained in Appendix B.

2.0 Process Description

PCA operates the biogas flare as part of the FGBIOGASSYSTEM that is used to combust biogas during upset or malfunction conditions that may occur with the biogas generating system or the combustion boilers. If no upset conditions occur in the process, the biogas is directed to Boiler No. 4 (EUBOILER4A) and combined with natural gas to generate steam for various mill process operations, and for electrical generation.

3.0 Reference Methodologies

Triplicate fifty (50)-minute test runs were performed on the biogas flare scrubber outlet in accordance with specifications stipulated in ASTM D-5504 and in accordance with MDEQ requirements.

A minimum vacuum of 5 inches of mercury is required on the evacuated summa canister to ensure proper sample collection. All test runs were stopped once the minimum vacuum was attained.

3.1 Hydrogen sulfide

Hydrogen Sulfide concentrations were determined following ASTM guidelines as described in ASTM D-5504. The samples were extracted using evacuated summa canisters with low flow regulators. The sample stream was vented and aspirated to the summa canister for collection. Samples were labeled and immediately shipped for analysis within the required 24-hour period.

4.0 Quality Assurance

Each promulgated method described above is accompanied by a statement indicating that to obtain reliable results, persons using these methods should have a thorough knowledge of the techniques associated with each. To that end, BTEC attempts to minimize any factors in the field that could increase error by implementing a quality assurance program into every testing activity segment.

5.0 Discussion of Results

No problems were encountered during testing. Operations appeared normal with no apparent problems. The measured average biogas flare H_2S emission rate meets ROP No. MI-ROP-B3692-2015 requirements.

Limitations

The information and opinions rendered in this report are exclusively for use by PCA. BTEC will not distribute or publish this report without PCA's consent except as required by law or court order. BTEC accepts responsibility for the competent performance of its duties in executing the assignment and preparing reports in accordance with the normal standards of the profession, but disclaims any responsibility for consequential damages.

This report was prepared by: _____
Steve Smith
Staff Environmental Scientist

This report was reviewed by: _____
Brandon V. Chase
Staff Environmental Engineer

Tables

Table 2
EUBIOGASFLARE H_2S Concentration (ppmv)
May 28, 2015

	Time EST	H_2S Concentration ppmv
Run 1	9:35-10:25	2.90
Run 2	10:35-11:25	3.04
Run 3	11:35-12:25	3.08
Average H_2S Concentration		**3.01**

ppmv: parts per million by volume