UNITED STATES SUGAR CORPORATION

111 Ponce de Leon Ave.
Clewiston, Florida 33440

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BUREAU OF AIR REGULATION

Via UPS Overnight

June 2, 2011

Mr. Ajaya Satyal, P.E., Air Program Administrator
Florida Department of Environmental Protection
South District Office
2295 Victoria Avenue, Suite 364
Fort Myers, Florida 33902-2549

RE: UNITED STATES SUGAR CORPORATION
FACILITY NO. 051003
WHITE SUGAR DRYER PM/PM_{10} TESTING
APRIL 28-29, 2011

Dear Mr. Satyal:

On April 28-29, 2011, United States Sugar Corporation (USSC) conducted testing of the White Sugar Dryer (WSD) #2 for particulate matter (PM) emissions. The previous Title V operating permit required testing of the WSD #2 for PM and PM with an aerodynamic diameter of 10 microns or less (PM_{10}) once every five years, prior to permit renewal by the Title V operating permit. However, due to testing port limitations, the PM_{10} testing could not be performed at this time. The purpose of this correspondence is to present the results of the testing to the Florida Department of Environmental Protection (FDEP) and to propose follow-up testing as well.

PM Test Results

The PM test report is attached. As shown in the report, the 3-run test average PM emissions during the testing was 20.5 lb/hr, which was greater than the PM emission limit of 15 lb/hr. The exact cause of this exceedance is not clear, however, several factors may have contributed to the high values. For comparison purposes, the attached tables presents all past PM and PM_{10} test data for the WSD #2.

USSC was granted air construction permit no. 0510003-026-AC to construct the WSD #2 in 2005. The PM/PM_{10} emission limit initially was 4.2 lb/hr. USSC subsequently constructed the dryer and performed initial PM/PM10 testing in December 2005. However, the PM testing showed PM emissions above the limit of 4.2 lb/hr. Subsequent to the initial testing, a series of PM/PM_{10} tests were conducted on the WSD #2 between May and August 2006. These tests showed that while the 4.2 lb/hr limit could be complied with for PM_{10} emissions, the PM emissions were consistently above the 4.2 lb/hr limit.

Based on the extensive test program, USSC received, in December 2006, a modification of the original permit (permit no. 0510003-038-AC) to revise the PM emission limit to 15 lb/hr, while retaining the PM_{10} limit of 4.2 lb/hr. Subsequent compliance testing in February 2007 demonstrated compliance with both the PM and PM_{10} limits. Also, annual Visible Emissions (VE) testing to date has shown compliance with permit requirements. However, no other PM/PM_{10} testing has been conducted on the WSD #2 until the April 2011 testing.

The prior testing of the WSD #2 indicated that carryover of droplets from the wet scrubber, which contain sugar particles, was contributing to the high PM loading as measured by the EPA Method 5 sampling train. Dried sugar particles sticking to the ductwork downstream of the wet scrubber, and then braking loose during the testing, was also thought to be a contributor to the high PM levels experienced. In order to attempt to minimize this effect, the revised air permit contained a provision to limit the brix content (sugar content) of the scrubber water to 15 brix or less.

During the April 28-29, 2011, testing, there were several factors which may have contributed to the high PM emissions:

- The WSD #2 was coming off of a shutdown. During the shutdown, no specific measures were undertaken to clean out the wet scrubber or downstream ductwork. As a result, there may have been unusually high buildup of dried sugar particles in the scrubber and downstream ductwork.

- During the first valid run (Run #2), the dryer was operating at about 50% load (85 TPH = 100% load), but ramped up to 100% load, with an average of 83% load. The second and third valid runs were both performed with the dryer operating at 100% load throughout.

- The testing crew had problems with the test ports (4 inch ports which had not been opened in 4 years). During the first run (invalid), the probe nozzle shifted orientation as a result of difficult maneuvering due to a pipe located directly in front of the port. This resulted in a bent probe, a damaged nozzle, and a high PM result due to scraping the port while inserting and removing the probe. The crew noted a large buildup of sugar dust around the inside of the ports.

- Comparison of the PM test data from this testing with previous testing indicates the following differences:

    - In all previous testing, 94% or greater of the total PM loading was captured in the Method 5 probe wash. Only 6% or less of the total PM was captured on the Method 5 filter. However, during the present testing, 5 to 30 times more PM was found on the filter. This indicates something substantially different was being measured during this testing.

    - The scrubber pressure drop during the present testing was approximately 12 inches H_2O, much higher than previous testing, where the pressure drop was between 8 and 10 inches H_2O. This indicates possible restriction in the scrubber, possibly requiring scrubber cleanout/maintenance.

It is also noted that the VE test completed on April 28th for the WSD #2 indicated no visible emissions. The VE test was conducted during the first aborted run, and a PM loading of 56 lbs/hr was calculated during this test period. Moreover, a mass PM loading of from 8 to 29 lb/hr during runs 2 to 4 are not consistent with a VE reading of zero.

Previous testing of the WSD #2 indicated that dryer load was not a factor in meeting the PM limit. The larger than normal filter catch and high scrubber pressure drop are indications that there is buildup of particulates in the scrubber and on the ductwork, and these particles may be breaking off during operation, and may be the major contributing factors to the high PM emissions. An additional potential issue is liquid droplet carryout from the scrubber, due to the higher pressure drop (indicative of higher gas velocities through the scrubber). The scrubber water contains dissolved sugar, which can be caught in the Method 5 sampling train.

PM10 Testing

PM10 testing could not be conducted due to the existing 4 inch ports. CEM Solutions investigated various types of PM10 sampling trains, and concluded that 6 inch ports are required. Therefore, the PM10 testing must be delayed until new ports are installed in the ductwork.

Future Testing

USSC is formulating plans to retest the WSD #2 in July. The WSD #2 and Sugar Refinery will undergo a 2-week shutdown during June 6- 20, 2011. During this period, USSC will ensure the WSD #2 and air pollution control equipment undergoes the proper maintenance and is thoroughly cleaned, prior to the retesting. USSC will also install the new 6-inch ports at that time. USSC believes that these actions will result in a PM test which complies with the PM/PM_{10} standards.

Thank you for your consideration of this information. If you have any questions, please do not hesitate to call me at (863) 902-3186.

Sincerely,

Keith Tingberg
Environmental Manager, Sugar Manufacturing
U.S. Sugar Corporation

Cc: D. Buff, Golder Associates
J. Koerner, FDEP Tallahassee

Enclosure

TABLE 1
WHITE SUGAR DRYER NO. 2 - PM EMISSION TESTS

Run Number	Test Date	Start/End Time	% Load	Stack Gas Flow Rate (dscfm)	Stack Gas Flow Rate (acfm)	Allowable PM Emissions (EPA Method 5)		Actual PM Emissions (EPA Method 5)		Avg. Water Flow (gpm)	Avg. Pressure Drop		Scrubber Water Sugar Content (Brix)	Particulate Data			
						lb/hr	gr/dscf	lb/hr	gr/dscf		Cyclone (in. H_2O)	Scrubber (in. H_2O)		Filter (mg)	Wash (mg)	Total (mg)	% Wash of Total
1	12/07/05	1056-1206	100	82,909	96,941	4.2	0.005	6.82	0.0096	529.4	3.8	9.6	--	0.3	23.5	23.8	98.7
2	12/07/05	1235-1345	100	82,993	97,239	4.2	0.005	3.65	0.0051	527.8	4.0	9.0	--	0.2	12.4	12.6	98.4
3	12/07/05	1453-1605	100	82,541	97,104	4.2	0.005	19.23	0.0272	524.8	4.0	9.0	--	0.4	65.2	65.6	99.4
Average=				82,814	97,095	4.2	0.005	9.9	0.0140	527	3.9	9.2	--				98.8
													--				
1	05/24/06	0852-0927	100	83,682	96,546	4.2	0.005	26.10	0.0364	747.7	5.0	9.0	--	1.0	46.5	47.5	97.9
2	05/24/06	1002-1037	100	82,769	95,849	4.2	0.005	18.61	0.0262	747.7	4.3	9.0	--	0.7	33.8	34.5	98.0
3	05/24/06	1100-1134	100	83,743	96,872	4.2	0.005	20.89	0.0291	750.0	4.3	9.0	--	0.6	36.6	37.2	98.4
4	05/24/06	1208-1243	50	85,704	98,102	4.2	0.005	19.65	0.0267	750.0	4.8	9.5	--	0.5	35.1	35.6	98.6
5	05/24/06	1303-1337	50	86,321	98,919	4.2	0.005	32.55	0.0440	747.3	3.7	10.7	--	0.5	57.1	57.6	99.1
6	05/24/06	1350-1425	50	85,981	98,614	4.2	0.005	20.89	0.0283	749.0	4.0	10.0	--	0.8	36	36.8	97.8
7	05/25/06	0802-0836	100	82,866	96,457	4.2	0.005	24.30	0.0342	747.7	4.7	10.0	--	0.5	42.7	43.2	98.8
8	05/25/06	0850-0925	100	82,501	96,272	4.2	0.005	20.21	0.0286	749.7	4.0	10.3	--	0.7	34.1	34.8	98.0
9	05/25/06	0934-1008	100	83,246	97,078	4.2	0.005	20.99	0.0294	745.7	3.0	11.0	--	0.6	35.4	36	98.3
Average=				84,090	97,190	4.2	0.005	22.7	0.0314	748	4.2	9.8					98.3
1	08/23/06	1320-1353	50	74,966	88,090	4.2	0.005	14.09	0.0219	750	3.0	8.5	--	0.8	28.9	29.7	97.3
2	08/23/06	1415-1449	50	75,900	88,771	4.2	0.005	10.38	0.0160	750	2.3	8.7	--	0.8	22.5	23.3	96.6
3	08/23/06	1502-1535	50	75,677	89,775	4.2	0.005	10.61	0.0164	751	3.0	8.7	--	0.7	23.3	24	97.1
4	08/23/06	1543-1600	50	75,650	89,117	4.2	0.005	11.97	0.0185	747	2.5	9.0	--	0.7	26.2	26.9	97.4
5	08/23/06	1635-1708	50	75,618	89,384	4.2	0.005	9.72	0.0150	757	3.0	8.7	--	0.8	21.1	21.9	96.3
6	08/23/06	1720-1753	50	76,365	89,939	4.2	0.005	6.91	0.0106	752	3.3	9.0	--	1.1	14.2	15.3	92.8
Average=				75,696	89,179	4.2	0.005	10.6	0.0164	751	2.9	8.8					96.3
1	02/20/07	0925-1030	100	77,874	89,921	15.0	--	4.78	0.0072	528	3.0	8.2	10	1.6	16.4	18	91.1
2	02/20/07	1134-1240	96	78,061	91,456	15.0	--	5.38	0.0080	503	3.0	8.0	8	0.8	19.4	20.2	96.0
3	02/20/07	1354-1459	91	76,039	89,248	15.0	--	5.88	0.0090	501	3.0	8.0	9	1.1	20.8	21.9	95.0
Average=			96	77,325	90,208	15.0	--	5.3	0.0081	510	3.0	8.1	9				94.0
4	02/21/07	1455-1559	103	76,414	89,147	15.0	--	9.36	0.0143	752	3.0	8.2	9	1.5	32.6	34.1	95.6
5	02/22/07	0836-0939	85	77,229	89,360	15.0	--	7.43	0.0112	747	3.0	8.2	9	1.4	25.1	26.5	94.7
6	02/22/07	1004-1107	88	77,871	90,404	15.0	--	7.07	0.0106	752	3.0	8.0	8	0.8	25.1	25.9	96.9
Average=			92	77,171	89,637	15.0	--	8.0	0.0120	750	3.0	8.1	9				95.7
2	04/29/11	0840-1033	83	83,346	95,248	15.0	--	8.2	0.0115	527	4.5	12	7	20.9	19.3	40.2	48.0
3	04/29/11	1205-1315	100	78,870	90,014	15.0	--	29.3	0.0433	526	4.7	12	7	48.1	91.6	139.7	65.6
4	04/29/11	1350-1500	100	81,651	93,054	15.0	--	24.1	0.0344	531	4.1	13	7	10.1	107	117.1	91.4
Average=			94	81,289	92,772	15.0	--	20.5	0.0298	528	4.4	12.3	7				68.3

Notes:
lb/hr = pounds per hour
gr/dscf = grains per dry standard cubic foot
mg = milligrams

TABLE 2
WHITE SUGAR DRYER NO. 2 PM_{10} EMISSION TESTS

Run Number	Test Date	Start/End Time	% Load	Stack Gas Flow Rate (dscfm)	Stack Gas Flow Rate (acfm)	Allowable PM_{10} Emissions		Actual PM_{10} Emissions (EPA Method 210A)		Avg. Water Flow (gpm)	Avg. Pressure Drop		Scrubber Water Sugar Content (Brix)	Particulate Data		
						lb/hr	gr/dscf	lb/hr	gr/dscf		Cyclone (in. H_2O)	Scrubber (in. H_2O)		Filter (mg)	Wash (mg)	% Wash of Total
1	05/23/06	1015-1040	50	85,299	93,003	4.2	0.005	2.37	0.00324	750	4.7	9.7	--	1.1	1.5	57.7
2	05/23/06	1127-1200	50	85,082	92,570	4.2	0.005	1.59	0.00218	753	4.3	9.7	--	0.7	1	58.8
3	05/23/06	1220-1254	50	85,713	92,883	4.2	0.005	1.13	0.00154	750	4.0	9.8	--	0.7	0.5	41.7
4	05/23/06	1400-1433	100	83,395	91,246	4.2	0.005	1.02	0.00143	750	4.0	9.7	--	0.4	0.8	66.7
5	05/23/06	1450-1554	100	84,141	91,790	4.2	0.005	1.75	0.00242	751	4.0	10.0	--	1	1	50.0
6	05/23/06	1545-1619	100	83,009	90,815	4.2	0.005	1.06	0.00149	750	4.0	10.0	--	0.5	0.7	58.3
7	05/25/06	1024-1058	100	83,263	91,101	4.2	0.005	1.02	0.00143	750	4.0	10.3	--	0.5	0.7	58.3
8	05/25/06	1110-1144	100	83,058	90,876	4.2	0.005	0.94	0.00131	746	4.0	10.0	--	0.4	0.7	63.6
9	05/25/06	1153-1228	100	82,799	90,877	4.2	0.005	1.26	0.00177	751	3.7	11.0	--	0.7	0.8	53.3
Average=				**83,973**	**91,684**	**4.2**	**0.005**	**1.3**	**0.00187**	**750**	**4.1**	**10.0**				**56.5**
1	02/21/07	1008-1108	102	79,189	91,417	4.2	0.005	2.05	0.00302	500	3.0	8.1	8	1.2	3.6	75.0
2	02/21/07	1135-1235	97	79,637	91,805	4.2	0.005	1.97	0.00288	501	3.0	8.2	8	1.4	3.2	69.6
3	02/21/07	1314-1414	101	79,444	91,660	4.2	0.005	1.48	0.00218	499	3.0	8.0	8	1.6	1.9	54.3
Average=			**100**	**79,423**	**91,627**	**4.2**	**0.005**	**1.8**	**0.00269**	**500**	**3.0**	**8.1**	**8.0**			**66.3**

Notes:
lb/hr = pounds per hour
gr/dscf = grains per dry standard cubic foot
mg = milligrams

Keith Tingberg

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Particulate Matter Emissions Test Report

Completed for:

U.S. Sugar Corporation
Clewiston Mill
White Sugar Dryer 2 (EU-029)

Test Report Number: 20-4525-029-001
Test Completed: April 28 & 29, 2011

C.E.M. SOLUTIONS

1183 East Overdrive Circle • Hernando, FL 34442 • (352) 489-4337 • Fax: (352) 489-4801

Particulate Matter Emissions
Test Report

U.S. Sugar Corporation
Clewiston Mill
White Sugar Dryer 2 (EU-029)
Clewiston, Florida

C.E.M. Solutions Project No.: 4525

Testing Completed: April 28 and 29, 2011

Client Purchase Order number:
C.E.M. Solutions, Inc. Report Number: 20-4525-029-001

C.E.M. Solutions, Inc.
1183 E. Overdrive Circle.
Hernando, Florida 34442
Phone: 352-4898-4337

Plant's Authorization and Validity Statement

I hereby certify that to the best of my knowledge, all applicable field procedures and calculations comply with Florida Department of Environmental Protection requirements, and all test data and plant operating data are true and correct.

Keith Tingberg
Environmental Manager

Date

Declaration of Conformance to ASTM D 7036-04: Standard Practice for Competence of Air Emission Testing Bodies

C.E.M. Solutions operates in conformance with the requirements of ASTM D 7036-04: Standard Practice for Competence of Air Emission Testing Bodies through the use of a quality system which incorporates a quality manual, internal audit system, systematic training of personnel and rigorous review of test methods and operating procedures.

Joe Conti
Quality Assurance Manager
C.E.M. Solutions

Statement of Validity

I hereby certify the information and data provided in this emissions test report for tests performed at the U.S. Sugar Corporation, Clewiston Mill conducted on April 28 and 29, 2011 are complete and accurate to the best of my knowledge.

Joe Conti
Quality Assurance Manager,
C.E.M. Solutions, Inc.

Project Background

Name of Source Owner:	U.S. Sugar Corporation
Address of Owner:	111 Ponce DeLeon Ave Clewiston, FL 33440
Source Identification:	Facility: 0510003 Emissions Unit: EU-029
Location of Source:	Hendry County, Florida
Type of Operation:	SIC Code 4911
Tests Performed:	Method 1 – Traverse Points Method 2 – Stack Gas Volumetric Flow and Velocity Method 4 – Stack Gas Moisture Content Method 5 – Particulate Matter Method 9 – Determination of Visible Emissions
Test Supervisor (QSTI):	Mr. Charles Horton
Test Technicians:	Mr. Matt Savin Mr. Keith Garner
Date(s) Tests Conducted:	April 28, 2011: Sugar Dryer, Run 1 and VE April 29, 2011: Sugar Dryer, Runs 2 - 4
Site Test Coordinator:	Mr. Keith Tingberg
State Regulatory Observers:	Wayne Lewis, Southwest District Florida Department of Environmental Protection

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Appendices

1.0 Introduction

U.S. Sugar Corporation retained C.E.M. Solutions, Inc. to conduct emissions testing to determine levels of particulate matter (PM) emitted from the White Sugar Dryer 2 (EU-029) exhaust at its facility located in Clewiston, Florida.

The test program was conducted to determine the compliance status of the Sugar Dryer in regards to its emissions limitations and standards outlined in Title V Air Operating Permit 0510003-032-AV. Target pollutants include the following:

- PM (in lb/hr)
- VE (in percent)

Mr. Keith Tingberg of U.S. Sugar Corporation coordinated plant operations throughout the test program. Mr. Wayne Lewis of the Southwest District of the Florida Department of Environmental Protection was present during portions of the compliance test. All testing was conducted in accordance with test methods promulgated by the Florida Department of Environmental Protection (FDEP).

The test program and results are presented and discussed in this report.

Table 1: Compliance Test Results
U.S. Sugar Corporation, Clewiston Mill
White Sugar Dryer 2

Pollutant	Reported Emissions Rate (3-run average)	Permitted Emissions Rate	Compliance Test Status (Pass/Fail)
Particulate Matter	20.5 lb/hr	15.0 lb/hr	FAIL
Visible Emission	0.0 %	10.0%	Pass

1.1 Errors and Omissions

Run 1 conducted on the Sugar Dryer was not used to determine the average particulate matter emission rate. The probe nozzle shifted orientation as a result of difficult maneuvering due to a pipe located directly in front of the port. This resulted in a bent probe, a damaged nozzle and elevated PM due to scrapping the port while inserting and removing the probe. A fourth run was conducted and used for determining average emissions.

2.0 Facility Description

White Sugar Dryer 2 (EU-029) is a fluidized bed-type dryer/cooler with a capacity of 85 tons per hour of refined sugar. Steam from the existing mill boilers supply heat for the process, no fuel is fired.

2.1 Process Equipment

Particulate matter emissions are controlled by four high-efficiency cyclone collectors in parallel, followed by a wet scrubber. The Sugar Dryer exhaust gases through a 7 feet by 6 feet rectangular stack.

2.2 Regulatory Requirements

The facility is required to conduct emissions testing to determine PM emissions prior to renewal of the Title V Permit Number 0510003-032-AV.

The Sugar Dryer emission limitations and standards are summarized in Table 2.

Table 2: Emissions Limitations and Standards
U.S. Sugar Corporation, Clewiston Mill
White Sugar Dryer 2

Pollutant/Standard	Emission Limit	Permit Condition
PM lb/hr [a]	≤ 15.0 lb/hr	H.3
Visible Emissions	≤ 10.0 %	H.4

[a] Three run Average

3.0 Test Program/Operating Conditions

The test program was conducted to determine the compliance status of the White Sugar Dryer 2 particulate matter emissions in regards to Title V Operating Permit 0510003-032-AV on April 28 and 29, 2011.

During the test program, the White Sugar Dryer 2 operated at 80 tons/hr or 94% of the maximum production rate (85 ton/hr), based on the three valid runs.

The Sugar Dryer operation parameters are located in Appendix A and were provided by U.S. Sugar Corporation.

4.0 Test Methods

All testing was performed in accordance with methods approved by the United States Environmental Protection Agency (EPA) and FDEP. The following discusses the methods, as well as quality assurance and sample handling procedures.

Table 3 summarizes the EPA test methods utilized to complete the test program.

Table 3: Summary of EPA Reference Methods
U.S. Sugar Corporation, Clewiston Mill
White Sugar Dryer 2

EPA Method	Description
1	Sample and Velocity Traverses for Stationary Sources
2	Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot)
4	Moisture Content in Stack Gases
5	Particulate Emissions from Stationary Sources
9	Determination of Visible Emissions

4.1 Sample and Velocity Traverse Points

Sample and velocity traverse points were determined utilizing EPA Method 1.

The Sugar Dryer rectangular duct, at the sample location, is 9' X 4.5'. The emissions sampling location is 36 inches downstream from the nearest flow disturbance, and 144 inches upstream from the induced draft fan.

In accordance with Method 1, a total of 28 points (7 points per port) were used. Traverse points were located at 7.71", 23.14", 38.57", 54.00", 69.43", 84.86", and 100.29" measured from the inside wall of the sample location.

A diagram of the sample location can be viewed in Appendix C.

4.2 Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tubes)

EPA Method 2 was used to determine the volumetric flow rate of the stack effluent gas.

Stack temperature differential pressure readings were taken with an S type pitot tube and Type K temperature sensor at each sample traverse point.

4.2.1 Method 2 Quality Assurance/Quality Control Procedures

The S type pitot tube was inspected visually and measured to meet the design specifications of EPA Method 2, for a pitot coefficient of 0.84.

The incline manometer and each leg of the pitot tube was leak checked before and immediately after each test run.

Thermocouple sensors were calibrated prior to the test program and a post test check was performed after testing completion.

The incline manometer was leveled and zeroed before each test run.

Appendix D contains the completed QA/QC forms.

4.3 Moisture Content Determination

Moisture content of the stack gas was determined by EPA Method 4.

Stack gas was sampled at each traverse point, passed through pre-weighed impingers and then through a calibrated dry gas meter. Moisture was removed from the sample gas in the pre-weighed impingers, which were submerged in an ice bath, and later analyzed for moisture weight gain. Moisture was determined based upon the amount of moisture weight gain and sample gas collected.

Field moisture data sheets are also located in Appendix E.

4.3.1 Method 4 Quality Assurance/Quality Control Procedures

The moisture sampling train was leak checked prior to each test run at approximately 20" Hg and immediately after each run at a vacuum higher than the highest vacuum recorded during the respective test run. Results are recorded on the moisture field data sheets.

Weighing to determine moisture content was conducted with a balance having an accuracy of 0.5 grams.

Gas temperature at the exit of the impingers was maintained at less than 68 degrees Fahrenheit.

4.4 Particulate Matter Determination

EPA Method 5 was used to determine particulate emissions. Stack gas was extracted isokinetically from the gas stream; particulate emissions were measured gravimetrically by determining the amount of particulate matter collected on the stainless steel nozzle, probe liner and glass or quartz fiber filter. The probe liner temperature was maintained at 248 ± 25 degrees Fahrenheit.

Sample volume was measured by passing the gas through a set of weighed impingers used for moisture content, then passed through a calibrated dry gas meter. An S type pitot tube is attached to the probe to measure stack gas velocity and to maintain sampling conditions between 90% and 110% isokinetic. A type K temperature sensor is also attached to the probe to measure the stack gas temperature.

Isokinetic conditions were maintained throughout each test run of the test program as demonstrated in Table 4.

A minimum of 30 dscf of sample was taken each test run over a sampling period of approximately 70 minutes.

EPA Method 5 field data sheets are located in Appendix E. Figure 1 contains a diagram of the EPA Method 5 sampling train.

4.4.1 Sample Recovery and Analysis

After each sample run, the nozzle, probe liner and filter holder ahead of the filter were brushed and rinsed with acetone. Contents were stored in a leak free container for transport to the laboratory. The impingers were weighed for increase, to the nearest 0.5 gram, to determine moisture gain.

Particulate matter was determined by drying each filter at 230 degrees Fahrenheit for three hours, and desiccated to a constant weight recorded to the nearest 0.1 mg. Sample from the probe nozzle and filter holder were evaporated in a tared beaker, desiccated to a constant weight, and recorded to the nearest 0.1 mg.

Appendix E contains the analytical results for each run.

4.4.2 Quality Assurance/Quality Control Procedures

The probe nozzles were inspected and measured across three different diameters to determine the appropriate nozzle diameter.

Before and after each test run, the manometer was leveled and zeroed. Leak checks of the sampling train were conducted before and immediately after each test run.

The dry gas meter was fully calibrated within six months prior to the test program using a set of EPA critical orifices. Post test program dry meter checks were completed to verify the accuracy of the meter's Y_i.

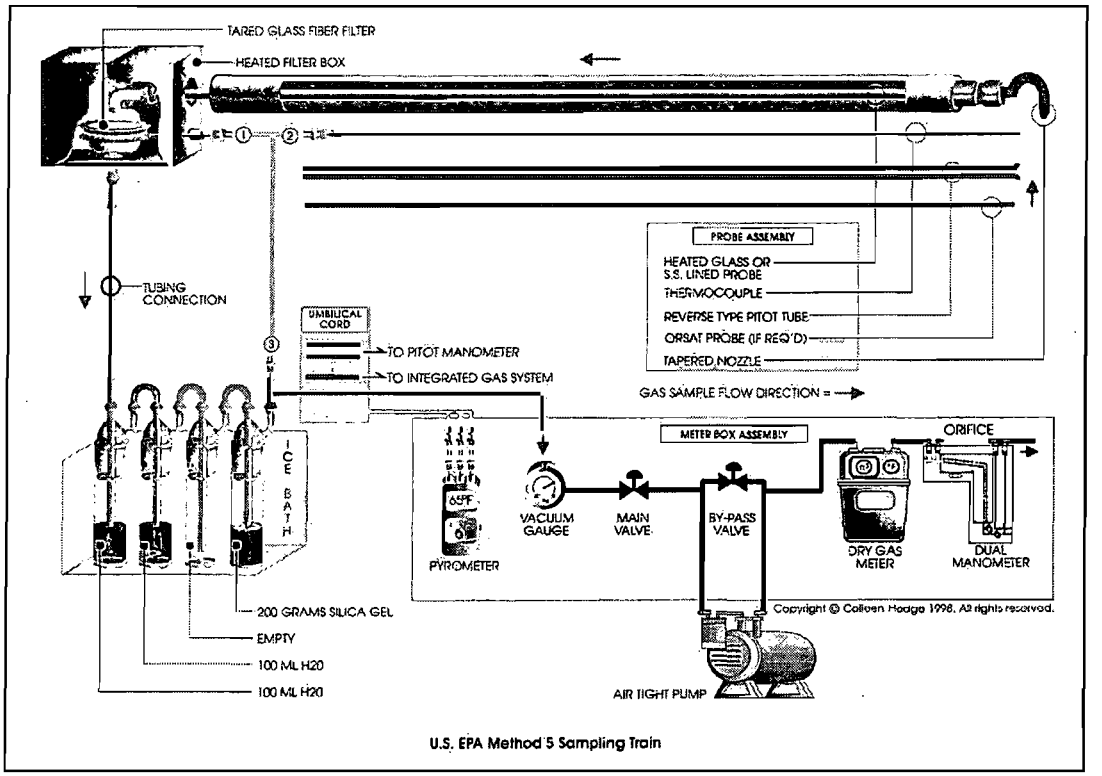
Completed QA/QC forms are located in Appendix D.

Table 4: Particulate Matter Isokinetic Summary during Normal Operation
U.S. Sugar Corporation, Clewiston Mill
White Sugar Dryer 2

% Isokinetic				
Run 1	**Run 2**	**Run 3**	**Run 4**	**Average**
95.9*	101.7	98.5	100.4	100.2

*** not used in average**

Figure 1: Method 5 Sampling Train



U.S. EPA Method 5 Sampling Train

4.5 Determination of Visible Emissions

USEPA Method 9 was utilized to determine visible emissions.

Visible emissions observations were performed by a FDEP certified visible emissions reader. Readings were taken at 15 second intervals and reduced into six minute averages as required by the applicable EPA standard. One-sixty minute visible emission run was performed while the unit was operating at maximum capacity.

5.0 Test Results

The following presents the results of the test program. Supporting calculations and field data summaries are presented in Appendix B and E, respectively.

Table 5 summarizes the results of the test program.

5.1 Particulate Matter

The three-run average particulate matter emissions during normal operation was 20.5 lb/hr, above the permit limitation of 15.0 lb/hr.

5.2 Visible Emission

The highest visible emission observed in any six-minute average during the sixty-minute test run was 0.0 %, passing the 10% emission limitation.

Table 5: Particulate Matter Compliance Test Summary
U.S. Sugar Corporation, Clewiston Mill
White Sugar Dryer 2

Parameter	Run 1	Run 2	Run 3	Run 4	Average	Limit
Particulate Matter	56.3*	8.2	29.3	24.1	20.5	15.0

* = Run 1 not used in average calculation, see Section 1.1

Appendix A: Facility Operating Data

TIME	(INCH) DP CYCLONE	(INCH) DP SCRUBBER	BRIX	(GPM) SCRUBBER FLOW	(TPH) PROD RATE
1600	4	13	7	523	100%
1615	4	13	7	526	100%
1630	4	13	7	529	100%
1645	3	13	7	535	100%
1700	4	13	7	534	100%
1715	4	13	7	523	100%
1730	5	12	7	528	100%
Run #2 4/29/2011					
0840	5	12	7	530	50%
0855	4	12	7	523	50%
0910	5	12	7	525	75%
0925	4	13	7	529	75%
0940	5	12	7	525	100%
0955	4	12	7	526	100%
1010	4	12	7	527	100%
1025	4	12	7	533	100%
1032	5	12	7	525	100%
Run #3					
1205	5	12	7	532	100%
1220	4	12	7	523	100%
1235	5	12	7	526	100%
1250	5	12	7	527	100%
1305	4	12	7	529	100%
1320	5	12	7	521	100%

Time	D/D Cyclone	D/P Scrubber	Brix	Scrubber Flow	Feed Auto (%)
1350	5	12	7	535	100
1405	4	13	7	531	100
1420	4	13	7	528	100
1435	4	13	7	533	100
1450	4	13	7	529	100
1505	4	13	7	528	100
1605	6	12	7	523	100
1620	5	12	7	532	100
1635	5	12	7	526	100
1650 1645	5	12	7	529	100
1705	5	12	7	528	
1715					

Dryer Number One Scrubber Testing Run Number One (04/28/2011)						
TIME	Cyclone D/P ("H2O)	Scrubber D/P ("H2O)	Brix	Scrubber Flow (GPM)	Production Rate (%)	Production Rate (Tons/Hr)
1600	4	13	7	523	100	75.00
1615	4	13	7	526	100	75.00
1630	4	13	7	529	100	75.00
1645	3	13	7	535	100	75.00
1700	4	13	7	534	100	75.00
1715	4	13	7	523	100	75.00
1730	5	12	7	528	100	75.00

Dryer Number One Scrubber Testing Run Number Two (04/29/2011)						
TIME	Cyclone D/P ("H2O)	Scrubber D/P ("H2O)	Brix	Scrubber Flow (GPM)	Production Rate (%)	Production Rate (Tons/Hr)
0840	5	12	7	530	50	37.50
0855	4	12	7	523	50	37.50
0910	5	12	7	525	75	56.25
0925	4	13	7	529	75	56.25
0940	5	12	7	525	100	75.00
0955	4	12	7	526	100	75.00
1010	4	12	7	527	100	75.00
1025	4	12	7	533	100	75.00
1032	5	12	7	525	100	75.00

Dryer Number One Scrubber Testing Run Number Three (04/29/2011)						
TIME	Cyclone D/P ("H2O)	Scrubber D/P ("H2O)	Brix	Scrubber Flow (GPM)	Production Rate (%)	Production Rate (Tons/Hr)
1205	5	12	7	532	100	75.00
1220	4	12	7	523	100	75.00
1235	5	12	7	526	100	75.00
1250	5	12	7	527	100	75.00
1305	4	12	7	529	100	75.00
1320	5	12	7	521	100	75.00

Dryer Number One Scrubber Testing Run Number Four (04/29/2011)						
TIME	Cyclone D/P ("H2O)	Scrubber D/P ("H2O)	Brix	Scrubber Flow (GPM)	Production Rate (%)	Production Rate (Tons/Hr)
1350	5	12	7	535	100	75.00
1405	4	13	7	531	100	75.00
1420	4	13	7	528	100	75.00
1435	4	13	7	533	100	75.00
1450	4	13	7	528	100	75.00
1501	4	13	7	528	100	75.00

Dryer Number One Scrubber Testing Run Number Five (04/29/2011)						
TIME	Cyclone D/P ("H2O)	Scrubber D/P ("H2O)	Brix	Scrubber Flow (GPM)	Production Rate (%)	Production Rate (Tons/Hr)
1645	6	12	7	523	100	75.00
1700	5	12	7	526	100	75.00
1715						
1730						
1745						
1800						

Dryer Number One Scrubber Testing Run Number Six (04/29/2011)						
TIME	Cyclone D/P ("H2O)	Scrubber D/P ("H2O)	Brix	Scrubber Flow (GPM)	Production Rate (%)	Production Rate (Tons/Hr)

Appendix B: Mathematical Equations

Example Calculations from Run 1

Volume of Water Collected (scf)

$$V_{w(std)} = 0.04707(V_{lc})$$

Where:

Vlc	= Total Volume of liquid collected in impingers and silical gel , ml	=	40.72	ml
0.04707	= Water Volume to Standard Water Vapor (ft^3/ml)	=	0.04707	ft3/ml
$V_{w(std)}$	= Volume of Water Vapor, Corrected to Standard Conditions (scf)	=	1.92	scf

Volume of dry gas sampled at standard conditions, DSCF

$$V_{m(std)} = V_m Y \frac{T_{std}\left(P_{bar} + \frac{\Delta H}{13.6}\right)}{T_m P_{std}}$$

Where:

V_m	= Volume of Gas Sampled, as Measured by the Dry Gas Meter (dcf)	=	48.81	dcf
Y	= Dry Gas Meter Calibration Factor	=	1.01	
Par	= Barometric Pressure at the Sample Location (in. Hg)	=	30.00	in. Hg
Tstd	= Standard Absolute Temperature, (528°R)	=	528.00	°R
ΔH	= Average Differential Pressure Accoss the Orifice Meter (in. H_2O)	=	1.65	in. H_2O
13.6	= Specific Gravity of Mercury (in. H_2O/in. Hg)	=	13.60	in. H2O/in. Hg
T_m	= Average Absolute Dry Gas Meter Temperature (°F +460)(°R)	=	563.86	°R
P_{std}	= Standard Absolute Pressure (29.92 in. Hg)	=	29.92	in. Hg
$V_{m(std)}$	= Volume of Gas Measured by the Dry Gas Meter, Corrected to Standard Conditions (dscf)	=	46.25	dscf

Portion of Water Vapor in Gas Stream, by Volume

$$B_{ws} = 100 * \frac{V_{w(std)}}{V_{w(std)} + V_{m(std)}}$$

Where:

$V_{w(std)}$	= Volume of Water Vapor, Corrected to Standard Conditions (scf)	=	1.92	scf
$V_{m(std)}$	= Volume of Gas Measured by the Dry Gas Meter, Corrected to Standard Conditions (dscf)	=	46.25	dscf
B_{ws}	= Portion of Water Vapor in the Gas Stream (% by volume)	=	4.0	%

Molecular Weight of Dry Stack Gas, lb/lb-mole

$$M_d = 0.440(\%CO_2) + 0.320(\%O_2) + 0.280(\%N_2 + \%CO)$$

Where:

0.44	= Molecular Weight ot CO_2, divided by 100	=	0.44	lb/lb-mole
0.32	= Molecular Weight ot O_2, divided by 100	=	0.32	lb/lb-mole
0.28	= Moleculare Weight of N_2 or CO, divided by 100	=	0.28	lb/lb-mole
$\%CO_2$	= Percent CO_2 by Volume, dry basis (%)	=	0.00	%
$\%O_2$	= Percent O_2 by Volume, dry basis (%)	=	20.90	%
$\%N_2$	= Percent N_2 by Volume, dry basis (%)	=	79.10	%
%CO	= Percent CO by Volume, dry basis (%)	=	0.00	%
Md	= Dry Molecular Weight of Sample Gas (lb/lb-mole)	=	28.84	lb/lb-mole

Molecular Weight of Wet Stack Gas, lb/lb-mole

$$M_w = M_d\left(1-\frac{B_{ws}}{100}\right)+\left(18\frac{B_{ws}}{100}\right)$$

Where:

Md	= Dry Molecular Weight of Sample Gas (lb/lb-mole)	=	28.84	lb/lb-mole
B_{ws}	= Portion of Water Vapor in the Gas Stream (% by volume)	=	3.98	%
100	= Convert % Water to Fraction	=	100.00	
18	= Molecular Weight of Water, (lb/lb-mole)	=	18.00	lb/lb-mole
M_w	= Wet Molecular Weight of Sample Gas (lb/lb-mole)	=	28.40	lb/lb-mole

Average Stack Gas Velocity

$$V_s = K_p C_p\left(\sqrt{\Delta P_{avg}}\right)\left(\sqrt{\frac{T_s+460}{M_w P_s}}\right)$$

Where:

K_p	= Velocity Equation Constant	=	85.49	
C_p	= Pitot Tube Coefficient	=	0.84	
$\sqrt{\Delta P_{avg}}$	= Average Square Roots of Velocity Head Readings (in. H20)	=	0.89	Sq. Root in. H20
T_s	= Average Sample Gas Temperature (°F)	=	75.21	°F
460	= °F to °R Conversion Constant	=	460.00	
Mw	= Wet Molecular Weight of Sample Gas (lb/lb-mole)	=	28.40	lb/lb-mole
P_s	= Absolute Sample Gas Pressure (in. Hg)	=	27.87	in. Hg
V_s	= Average Stack Gas Velocity (ft/sec)	=	52.62	ft/sec

Actual Stack Gas Flow Rate

$$Q_{aw} = 60 A_s V_s$$

Where:

60	= Conversion Factor (sec/min)	=	60.00	
A_s	= Cross Sectional Area of the Sample Location (ft^2)	=	27.00	ft^2
V_s	= Average Stack Gas Velocity (ft/sec)	=	52.62	ft/sec
Q_{aw}	= Actual Stack Gas Flow Rate at actual conditions (acfm)	=	85241	acfm

Dry Standard Sample Gas Flow Rate

$$Q_{sd} = 60\left(1-\frac{B_{ws}}{100}\right)V_s A_s\left[\frac{T_{std}P_s}{(T_s+460)P_{std}}\right]$$

Where:

60	= Conversion Factor (sec/min)	=	60.00	
B_{ws}	= Portion of Water Vapor in the Gas Stream (% by volume)	=	3.98	%
V_s	= Average Stack Gas Velocity (ft/sec)	=	52.62	ft/sec
A_s	= Cross Sectional Area of the Sample Location (ft^2)	=	27.00	ft^2
T_{std}	= Standard Absolute Temperature (°R)	=	528.00	°R
P_s	= Absolute Sample Gas Pressure (in. Hg)	=	27.87	in. Hg
T_s	= Average Sample Gas Temperature (°F)	=	75.21	°F
460	= °F to °R Conversion Constant	=	460.00	
P_{std}	= Standard Absolute Pressure (29.92 in. Hg)	=	29.92	in. Hg
Q_{sd}	= Dry Volumetric Sample Gas Flow Rate, Corrected to Standard Conditions	=	75206	dscfm

Wet Standard Sample Gas Flow Rate

$$Q_{sw} = \left(\frac{Q_{sd}}{1-\left(\frac{B_{ws}}{100}\right)}\right)\frac{60}{1000}$$

Where:

Q_{sd}	= Dry Volumetric Sample Gas Flow Rate, Corrected to Standard Conditions	=	75206.17	dscfm
B_{ws}	= Portion of Water Vapor in the Gas Stream (% by volume)	=	3.16	%
100	= Convert % Water to Fraction	=	100	
60	= Conversion Factor (min/hr)	=	60	
1000	= Conversion Factor (wscfh/wkscfh)	=	1000	
Q_{sw}	= Wet Volumetric Sample Gas Flow Rate, Corrected to Standard Conditions	=	4660	wkscfh

Percent of Isokinetic Rate

$$I = \frac{(T_s+460)V_{m(std)}P_{std}100}{T_{std}V_s\pi(\frac{D_n^{0.5}}{12})^2)60\Theta\left(1-\left(\frac{B_{ws}}{100}\right)\right)}$$

where:

T_s	= Average Sample Gas Temperature (°F)	=	75.21	°F
460	= °F to °R Conversion Constant	=	460	
$V_{m(std)}$	= Volume of Gas Measured by the Dry Gas Meter, Corrected to Standard Conditions (dscf)	=	46.25	dscf
P_{std}	= Standard Absolute Pressure (29.92 in. Hg)	=	29.92	in. Hg
P_s	= Absolute Sample Gas Pressure (in. Hg)	=	27.87	in. Hg
V_s	= Average Stack Gas Velocity (ft/sec)	=	52.62	ft/sec
D_n	= Inner Diameter of nozzle (in.)	=	0.21	in.
100	= Conversion to Percent	=	100	
T_{std}	= Standard Absolute Temperature (°R)	=	528	°R
V_s	= Average Stack Gas Velocity (ft/sec)	=	52.62	ft/sec
12	= Conversion from inches to feet	=	12	
60	= Conversion Factor (min/hr)	=	60	
Θ	= Total Sampling Time (min.)	=	70.0	min
B_{ws}	= Portion of Water Vapor In the Gas Stream (% by volume)	=	3.16	%
I	= Percent of Isokinetic Sampling (%)	=	95.94	%

Total Mass of Particulates

$$M_n = M_f + M_a - W_a$$

where:

M_f	= Mass of particulate in the filter (mg)	=	152.30	mg
M_a	= Mass of Particulate in acetone rinse (mg)	=	109.55	mg
W_a	= Mass of Acetone Blank (mg)	=	0.00	mg
M_n	= Total Mass of Particulate Matter Collected during Test Run (mg)	=	261.85	mg

Concentration of Particulate Matter in Gas Sample

$$C_s = \frac{0.001 M_n}{V_{m(std)}}$$

where:

0.001	= Conversion contant (g/mg)	=	0.001	
M_n	= Total Mass of Particulate Matter Collected during Test Run (mg)	=	261.85	mg
$V_{m(std)}$	= Volume of Gas Measured by the Dry Gas Meter, Corrected to Standard Conditions (dscf)	=	46.25	dscf
C_s	= Concentration of Particulate Matter (g/dscf)	=	0.0057	g/dscf

Concentration of Particulate Matter in Gas Sample

$$C_s = \frac{0.0154 M_n}{V_{m(std)}}$$

where:

0.0154	= Conversion Constant (gr/mg)	=	0.0154	
M_n	= Total Mass of Particulate Matter Collected during Test Run (mg)	=	261.85	mg
$V_{m(std)}$	= Volume of Gas Measured by the Dry Gas Meter, Corrected to Standard Conditions (dscf)	=	46.25	dscf
C_s	= Concentration of Particulate Matter (gr/dscf)	=	0.087	gr/dscf

Particulate Emissions Rate (kg/hr)

$$E = \frac{C_s Q_{sd} 60}{1000}$$

where:

C_s	= Concentration of Particulate Matter (g/dscf)	=	0.01	g/dscf
Q_{sd}	= Dry Volumetric Sample Gas Flow Rate, Corrected to Standard Conditions	=	75206.17	dscfm
60	= Conversion Constant (min/hr)	=	60	
1000	= Conversion Constant (g/kg)	=	1000	
E	= Particulate Emissions Rate (kg/hr)	=	25.55	kg/hr

Particulate Emissions Rate (lbs/hr)

$$E = \frac{\left(\frac{60}{453.592}\right)\left(\frac{M_n}{1000}\right)}{V_{m(std)}} \times Q_{sd}$$

where:

60	= Conversion Constant (min/hr)	=	60	
453.592	= Conversion Constant (g/lb)	=	453.592	
1000	= Conversion Constant (mg/g)	=	1000	
M_n	= Total Mass of Particulate Matter Collected during Test Run (mg)	=	261.85	mg
$V_{m(std)}$	= Volume of Gas Measured by the Dry Gas Meter, Corrected to Standard Conditions (dscf)	=	46.25	dscf
Q_{sd}	= Dry Volumetric Sample Gas Flow Rate, Corrected to Standard Conditions	=	75206.17	dscfm
E	= Particulate Emissions Rate (lb/hr)	=	56.3	lb/hr

Appendix C: Sample Location Diagram/Traverse Points

CEM Solutions, Inc.
METHOD 1: Determining Number of Particulate and Velocity Traverse Points for a Stack or Duct

Company:	US Sugar	**Date:**	04/28/2011
Facility:	Clewiston Mill	**Project:**	4525
Unit Number:	Sugar Dryer 2	**Operator:**	C. Horton
Sample Location:	Duct		

Stack Measurements

Shape of Stack:	Rectangular		**Stack Diameter:**	72.00	Inches
# of Test Ports:	4		**Stack Area:**	40.5	ft^2
Port Depth:		Inches	**Stack Length**	108.00	Inches
			Stack Width:	54.00	Inches

Distance from Test Ports to Disturbances

Distance Upstream:	144.00	Inches (A)	**Distance Downstream:**	36.00	Inches (B)
Diameters Upstream:	2.00	(A_D)	**Diameters Downstream:**	0.50	(B_D)

Minimum # of Velocity Traverse Points		
From Upstream:	12	
From Downstream:	16	
12-24in Diameter?	False	
Points to be used:	16	0
Matrix:	4	Points / Port

Minimum # of Particulate Traverse Points		
From Upstream:	12	
From Downstream:	25	
12-24in Diameter?	False	
Points to be used:	25	
Matrix:	7	Points / Port

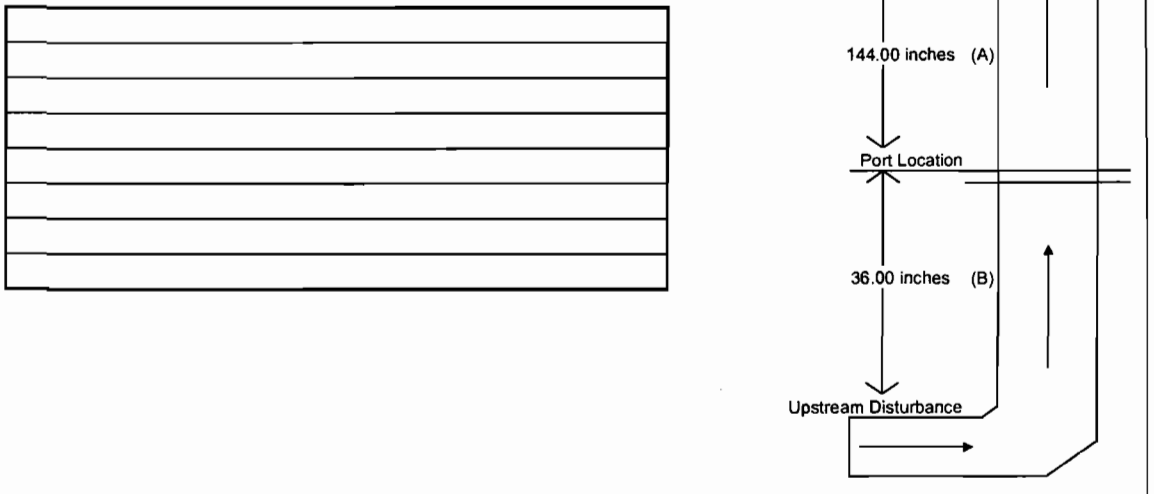
C.E.M. Solutions, INC.

Method 1 Determination

28 Point Traverse

Determined according to 40CFR60 Appendix A, Method 1, Figure 1-1 . Sample taken from the following points:

Traverse Point	Distance from stack wall (Inches)	Distance including port depth (Inches)
1	7.71	7.71
2	23.14	23.14
3	38.57	38.57
4	54.00	54.00
5	69.43	69.43
6	84.86	84.86
7	100.29	100.29



Test Matrix Diagrams

Appendix D: Reference Method QA/QC

Isokinetic Meter Box Pre and Post-Test Calibrations
Sample Probe Thermocouple Calibrations
Probe Nozzle Calibrations
Probe Pitot Tube Coefficient Calibrations

APEX INSTRUMENTS METHOD 5 PRE-TEST CONSOLE CALIBRATION
USING CALIBRATED CRITICAL ORIFICES
5-POINT ENGLISH UNITS

Meter Console Information	
Console Model Number	M-522
Console Serial Number	CEMS7MB
DGM Model Number	
DGM Serial Number	OB

Calibration Conditions			
Date	Time	21-Dec-10	14:00
Barometric Pressure		30.2	in Hg
Theoretical Critical Vacuum		14.2	in Hg
Calibration Technician		R. Douglas	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K	17.647	°R/in Hg

[1]For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

[2]The Critical Orifice Coefficient, K', must be entered in English units, $(ft^3 \cdot °R^{1/2})/(in.Hg \cdot min)$.

Calibration Data

Run Time		Metering Console				Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
min	in H_2O	cubic feet	cubic feet	°F	°F		use above[2]	°F	°F	in Hg
19.0	0.3	954.900	960.349	48	55	OB40	0.2306	66	66	25
12.0	0.7	960.349	965.558	55	58	OB48	0.3443	66	66	23
9.0	1.1	965.558	970.709	58	60	OB55	0.4483	66	66	22
8.0	1.8	970.709	976.587	60	61	OB63	0.5750	66	67	21
6.0	3.3	976.587	982.553	61	63	OB73	0.7760	67	66	18

Results

Standardized Data				Calibration Factor		Dry Gas Meter Flowrate	ΔH @	
Dry Gas Meter		Critical Orifice		Value	Variation	Std & Corrd	0.75 SCFM	Variation
Vm	Qm	Vcr	Qcr	Y	Y-Ybar	Qcr	ΔH@	ΔH@-ΔH@bar
cubic feet	cfm	cubic feet	cfm			cfm	in H2O	
5.674	0.299	5.762	0.303	1.015	0.010	0.303	1.978	0.098
5.376	0.448	5.433	0.453	1.011	0.005	0.453	1.902	0.023
5.297	0.589	5.306	0.590	1.002	-0.004	0.590	1.837	-0.042
6.037	0.755	6.046	0.756	1.002	-0.004	0.756	1.830	-0.049
6.132	1.022	6.120	1.020	0.998	-0.007	1.020	1.850	-0.029
				1.005	Y Average		1.879	ΔH@ Average

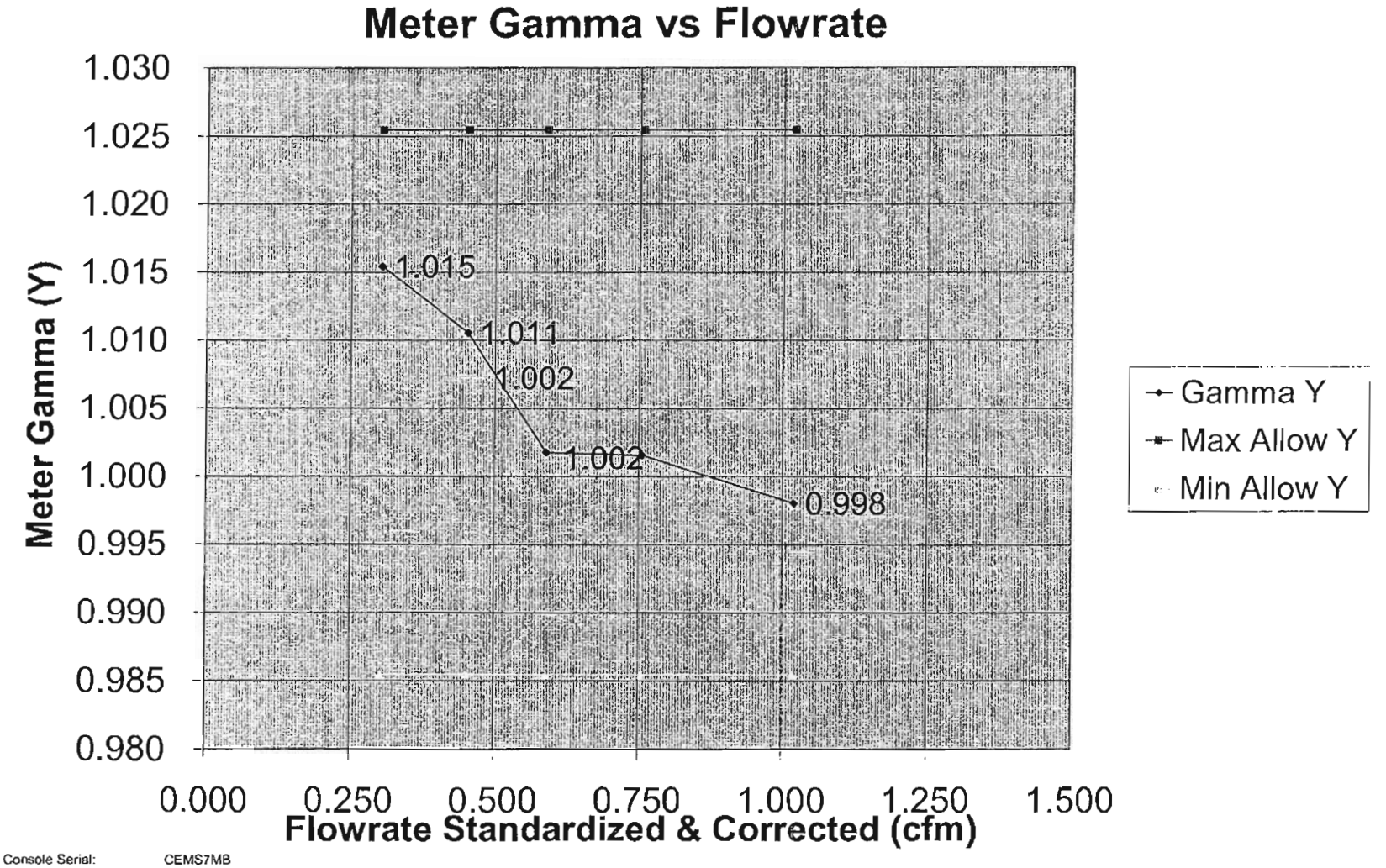
Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6 which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

Signature _____ Date 12-21-10

Calibration Date: 12-21-2010

Calibration Technician: R. Douglas

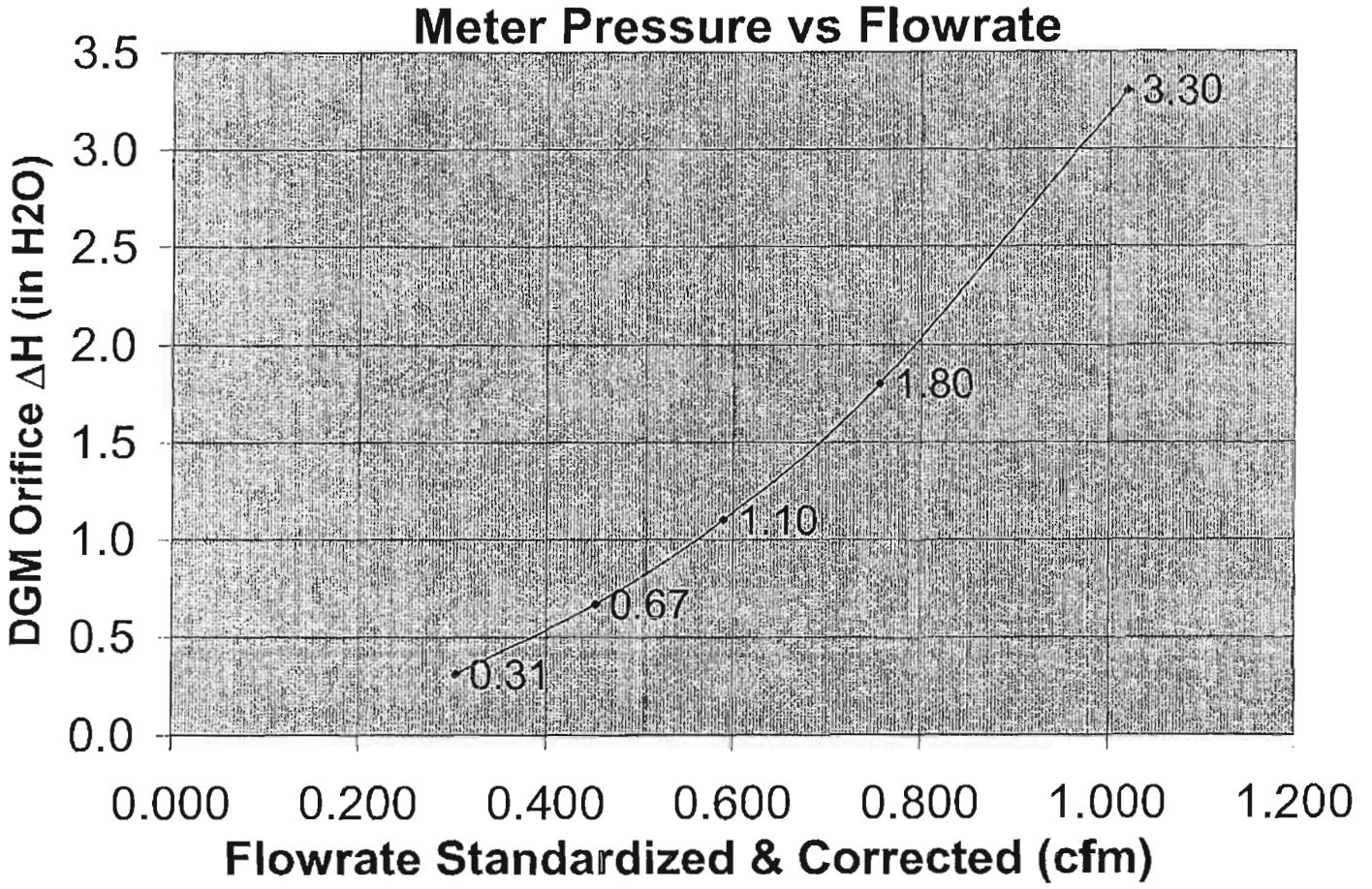


Console Serial: CEMS7MB

Console Model: M-522

Calibration Date: 12-21-2010

Calibration Technician: R. Douglas



Console Serial: CEMS7MB

Console Model: M-522

APEX INSTRUMENTS METHOD 5 POST-TEST CONSOLE CALIBRATION
USING CALIBRATED CRITICAL ORIFICES
3-POINT ENGLISH UNITS

Meter Console Information	
Console Model Number	522
Console Serial Number	cems7mb
DGM Model Number	
DGM Serial Number	

Calibration Conditions		
Date	2-May-11	11:00
Barometric Pressure	30.0	in.Hg
Theoretical Critical Vacuum[1]	14.2	in.Hg
Calibration Technician		

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in.Hg
K[2]	17.647	°R/in.Hg

[1]For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

[2]The Critical Orifice Coefficient, K', must be entered in English units, $(ft^3 \cdot °R^{1/2})/(in.Hg \cdot min)$.

Calibration Data

Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
min	in.H2O	cubic feet	cubic feet	°F	°F		See above2	°F	°F	in.Hg
7.0	1.8	963.351	968.594	75	75	ob63	0.5750	77	77	20
7.0	1.8	968.594	973.837	75	76	ob63	0.5750	77	78	20
7.0	1.8	973.837	979.079	76	77	ob63	0.5750	78	78	20

Results

Standardized Data				Calibration Factor		Dry Gas Meter Flowrate	ΔH@	
Dry Gas Meter		Critical Orifice		Value	Variation	Std & Corr	0.75 SCFM	Variation
Qstd	Qa	Qstd	Qa	Y	Y Variation	Qstd	ΔH@	ΔH@ Variation
cubic feet	l.cfm	cubic feet	cfm			l.cfm	in.H2O	
5.211	0.744	5.211	0.744	1.000	-0.001	0.744	1.826	0.001
5.206	0.744	5.208	0.744	1.000	0.000	0.744	1.826	0.001
5.196	0.742	5.206	0.744	1.002	0.001	0.744	1.824	-0.001
				1.001	Y Average		1.825	ΔH@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter, to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

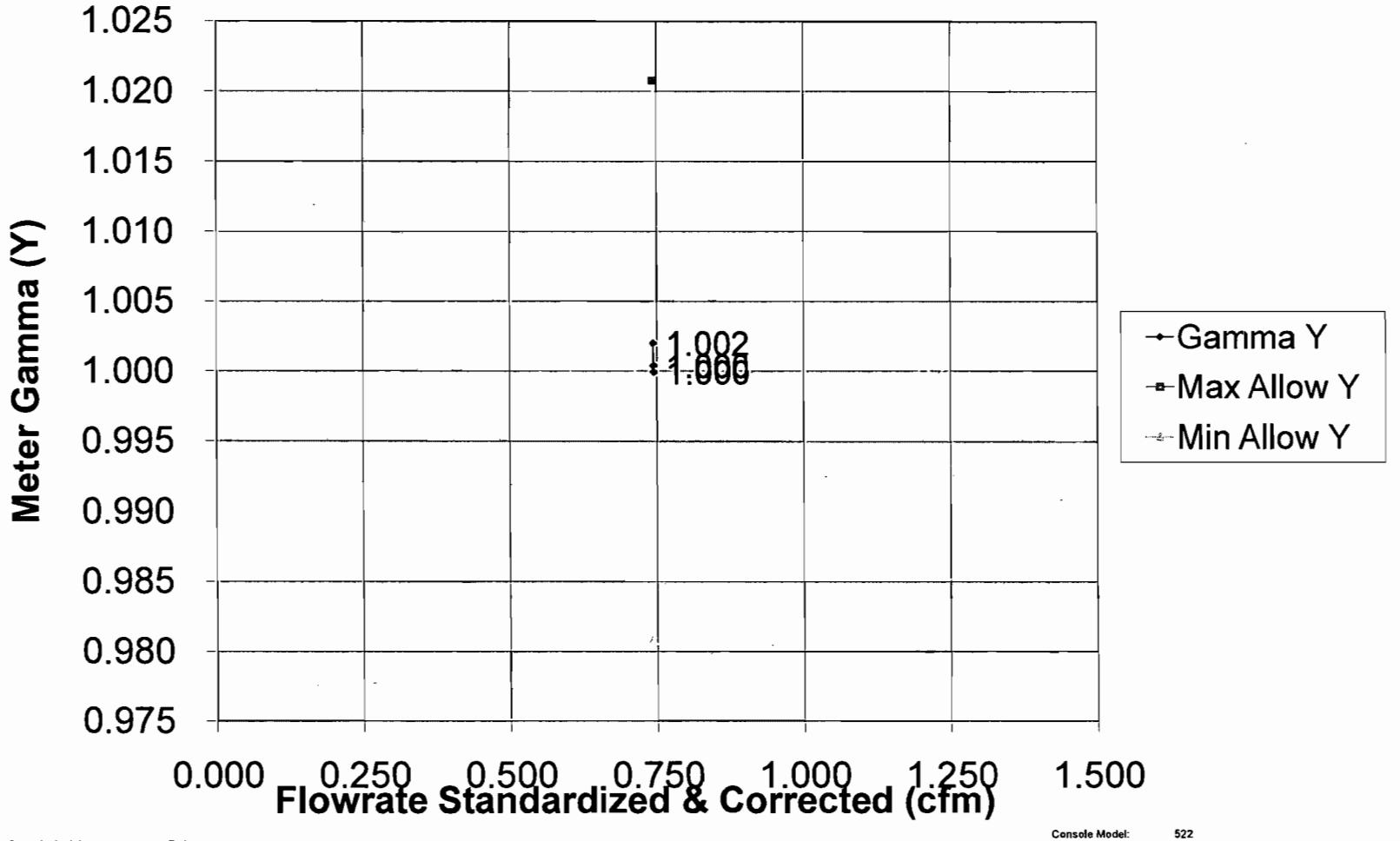
I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using the Precision Wet Test Meter # 11AE5, which in turn was calibrated using the American Bell Prover # 3785, Certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

Signature [signature] Date 5/2/11

Calibration Date: 5-2-2011

Calibration Technician:

Meter Gamma vs Flowrate

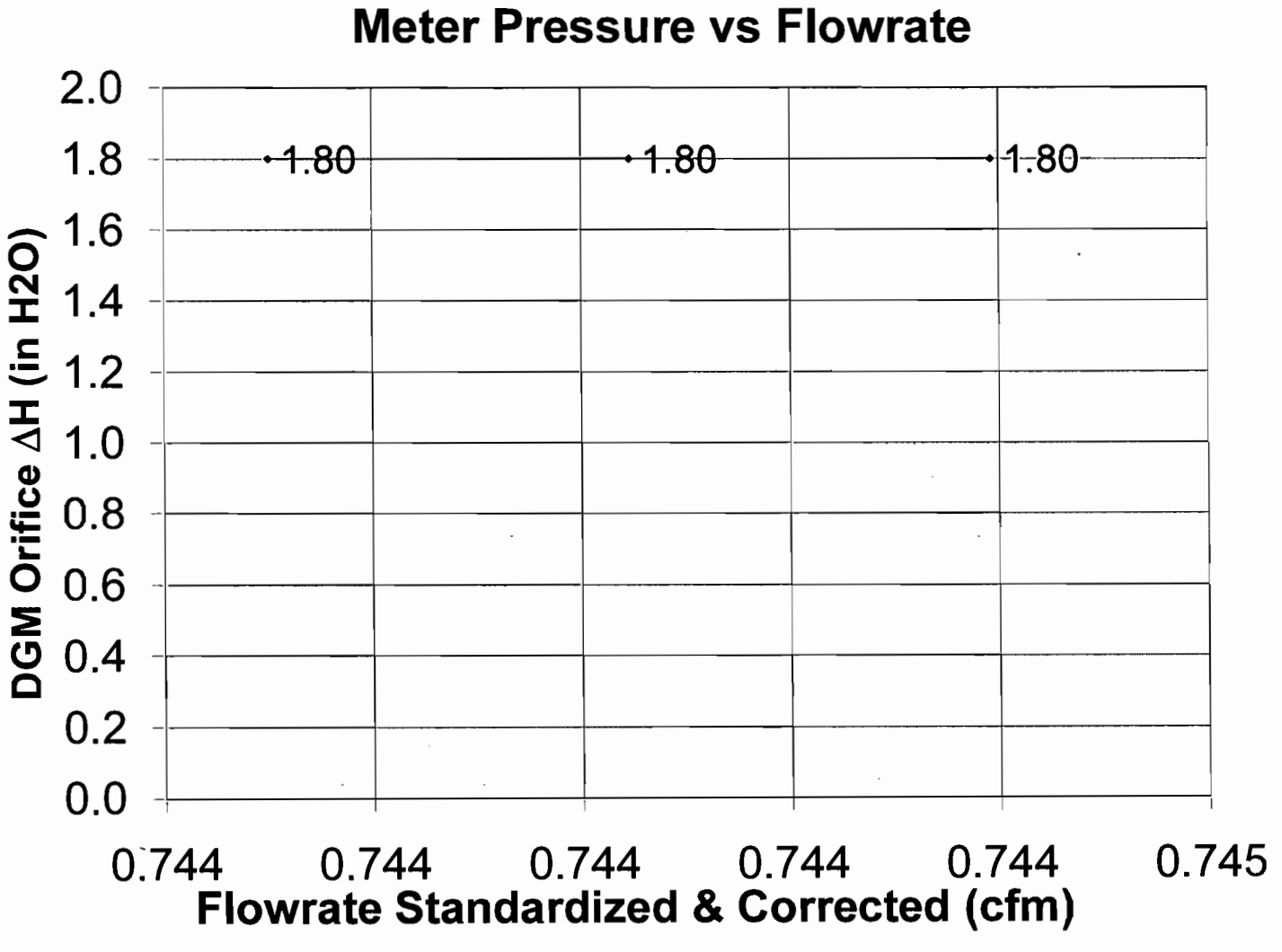


Console Serial: cems7mb

Console Model: 522

Calibration Date: 5-2-2011

Calibration Technician:



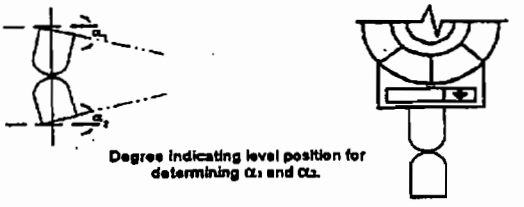
Console Serial: cems7mb

Console Model: 522

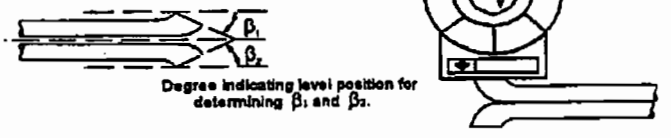
C.E.M. Solutions, Inc.

Type S Pitot Tube Inspection

Date of Calibration	05/02/2011
Level and Perpendicular?	Y
Obstruction?	N
Damaged?	N
α_1 $(-10° < \alpha_1 < +10°)$	-1
α_2 $(-10° < \alpha_2 < +10°)$	0
β_1 $(-5° < \beta_1 < +5°)$	1
β_2 $(-5° < \beta_2 < +5°)$	0
γ	-1
θ	-1
D_t **(3/16" < D_t < 3/8")**	0.384
A	0.908
z = A tan γ (< 0.125")	-0.016
w = A tan θ (< 0.03125")	-0.016
A/2D_t (1.05 < P_A/D_t < 1.5)	1.182

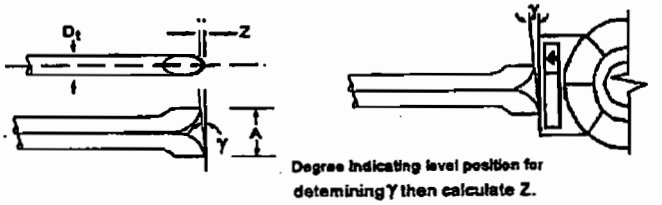


Degree indicating level position for determining α_1 and α_2.



Degree indicating level position for determining β_1 and β_2.

Degree indicating level position for determining θ.



Degree indicating level position for determining γ then calculate Z.

QA/QC Check:

Completeness: _____ Legibility: _____ Reasonableness: _____

Specifications: _____ Accuracy: _____

Certification:

I certify that the Type S pitot tube/probe ID# PT-01 meets or exceeds all specifications, criteria and/or applicable design features and is hearby assigned a pitot tube calibration factor (C_P) of 0.84.

Certified by: _____

Personnel (Signature/Date)

C.E.M. Solutions, Inc.

Thermocouple Post Test Calibration Check

Standard: Reference Thermometer (calibrated against NIST standards)

Reference: ALT-011 Alternative Method 2 Thermocouple Calibration Procedure

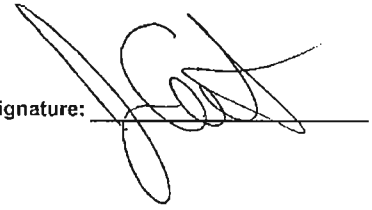
Procedure: Measure ambient temperature with the Reference Thermometer and the Measurement Thermocouple System. Record Results. Next, check the continuity of the Measurement Thermocouple System by subjecting it to a change in temperature. The Measurement Thermocouple System must respond accordingly.

Tolerance: ± 2° F of actual temperature

Plant: USSC
Thermocouple #: TC-10

Date: 5/2/2011
Reference TC#: 80401750

Length (FT.)	Reference Temp. (°F)	Measured Temp. (°F)	Difference (°F)	Continuity Check (PASS/FAIL)
11	81.5	81.9	-0.4	PASS

Signature: 

CALIBRATION DATA SHEET 5b
Probe Nozzle Diameter

Date	Nozzle ID#	Nozzle Diameter, D_n (inches)					Intls if D_n OK
		(1)	(2)	(3)	Hi - Lo	Avg	
4.28.11	212-2	0.212	0.211	2.212	0.001	0.212	MS

QA/QC Check
Initial each diameter measurement (last column) only if the following are met.

√ Each diameter measured to within ±0.001 inches?

√ *High - Low ≤0.004 inches?*

√ Complete, legible, accurate, and reasonable?

Appendix E: Reference Method Data

PM Summary
Isokinetic Field Data Sheets
Method 4 Field Data Sheets
PM Analytical Results

METHOD 5 - DETERMINATION OF PARTICULATE EMISSIONS - RESULTS

Plant Name	USSC Clewiston Mill	**Date**	04/28/11
Sampling Location	Sugar Dryer Duct	**Project #**	2525
Operator	C. Horton	**Stack Type**	Rectangular

Historical Data						
Run Number		NOT USED	2	3	**Average**	
Run Start Time		16:00	8:40	12:05		hh:mm
Run Stop Time		17:10	10:33	13:15		hh:mm
Meter Calibration Factor	(Y)	1.005	1.005	1.005		
Pitot Tube Coefficient	(C_p)	0.840	0.840	0.840		
Actual Nozzle Diameter	(D_{na})	0.212	0.212	0.212		in
Stack Test Data						
Initial Meter Volume	(V_m)$_i$	717.939	767.167	823.862		ft^3
Final Meter Volume	(V_m)$_f$	766.751	822.926	875.644		ft^3
Total Meter Volume	(V_m)	48.812	55.759	51.782		ft^3
Total Sampling Time	(Θ)	70.0	70.0	70.0		min
Average Meter Temperature	(t_m)$_{avg}$	103.9	91.9	97.0		°F
Average Stack Temperature	(t_s)$_{avg}$	75.2	79.8	78.4		°F
Barometric Pressure	(P_b)	30.00	30.00	30.00		in Hg
Stack Static Pressure	(P_{static})	-29.00	-29.00	-29.00		in H_2O
Absolute Stack Pressure	(P_s)	27.87	27.87	27.87		in Hg
Average Orifice Pressure Drop	(ΔH)$_{avg}$	1.65	2.00	1.83		in H_2O
Absolute Meter Pressure	(P_m)	30.12	30.15	30.13		in Hg
Avg Square Root Pitot Pressure	($\Delta p^{1/2}$)$_{avg}$	0.89	0.99	0.94		$(in\ H_2O)^{1/2}$
Moisture Content Data						
Impingers 1-3 Water Volume Gain	(V_n)	28.2	32.9	32.9		ml
Impinger 4 Silica Gel Weight Gain	(W_n)	12.5	14.4	12.0		g
Total Water Volume Collected	(V_{lc})	40.7	47.3	44.9		ml
Standard Water Vapor Volume	(V_w)$_{std}$	1.917	2.228	2.114		scf
Standard Meter Volume	(V_m)$_{std}$	46.246	54.015	49.682		dscf
Calculated Stack Moisture	($B_{ws(calc)}$)	4.0	4.0	4.1		%
Saturated Stack Moisture	($B_{ws(svp)}$)	3.16	3.7	3.5		%
Reported Stack Moisture Content	(B_{ws})	3.2	3.7	3.5		%
Gas Analysis Data						
Carbon Dioxide Percentage	(%CO_2)	0.0	0.0	0.0		%
Oxygen Percentage	(%O_2)	20.9	20.9	20.9		%
Carbon Monoxide Percentage	(%CO)	0.0	0.0	0.0		%
Nitrogen Percentage	(%N_2)	79.1	79.1	79.1		%
Dry Gas Molecular Weight	(M_d)	28.84	28.84	28.84		lb/lb-mole
Wet Stack Gas Molecular Weight	(M_s)	28.40	28.41	28.39		lb/lb-mole
Volumetric Flow Rate Data						
Average Stack Gas Velocity	(v_s)	52.62	58.79	55.56		ft/sec
Stack Cross-Sectional Area	(A_s)	27.00	27.00	27.00		ft^2
Actual Stack Flow Rate	(Q_{aw})	85241	95248	90014		*acfm*
Wet Standard Stack Flow Rate	(Q_{sw})	4660	5192	4904		wkscfh
Dry Standard Stack Flow Rate	(Q_{sd})	75206	83346	78870		dscfm
Percent of Isokinetic Rate	(I)	96.8	102.0	99.1		%
Emission Rate Data						
Mass of Particulate on Filter	(m_f)	152.3	20.9	48.1		mg
Mass of Particulate in Acetone	(m_a')	109.5	19.3	91.6		mg
Mass due to Acetone Blank	(W_a)	0.0	0.0	0.0		mg
Total Mass of Particulates	(m_n)	261.8	40.2	139.7		mg
Stack Particulate Concentration	(c_s)	0.006	0.001	0.003		g/dscf
	(c_s)	0.087	0.011	0.043		gr/dscf
Particulate Emission Rate	(E)	25.55	3.72	13.31		kg/hr
	(E)	56.3	8.2	29.3		lbs/hr

METHOD 5 - DETERMINATION OF PARTICULATE EMISSIONS - RESULTS

Plant Name	USSC Clewiston Mill	**Date**	04/29/11
Sampling Location	Sugar Dryer Duct	**Project #**	2525
Operator	C. Horton	**Stack Type**	Rectangular

Historical Data						
Run Number		4	5	6	**Average**	
Run Start Time		13:50				hh:mm
Run Stop Time		15:00				hh:mm
Meter Calibration Factor	(Y)	1.005				
Pitot Tube Coefficient	(C_p)	0.840				
Actual Nozzle Diameter	(D_{na})	0.212				in
Stack Test Data						
Initial Meter Volume	(V_m)$_i$	875.883				ft^3
Final Meter Volume	(V_m)$_f$	930.985				ft^3
Total Meter Volume	(V_m)	55.102				ft^3
Total Sampling Time	(Θ)	70.0				min
Average Meter Temperature	(t_m)$_{avg}$	102.2				°F
Average Stack Temperature	(t_s)$_{avg}$	78.1				°F
Barometric Pressure	(P_b)	30.00				in Hg
Stack Static Pressure	(P_{static})	-29.00				in H_2O
Absolute Stack Pressure	(P_s)	27.87				in Hg
Average Orifice Pressure Drop	(ΔH)$_{avg}$	1.99				in H_2O
Absolute Meter Pressure	(P_m)	30.15				in Hg
Avg Square Root Pitot Pressure	($\Delta p^{1/2}$)$_{avg}$	0.97				$(in\ H_2O)^{1/2}$
Moisture Content Data						
Impingers 1-3 Water Volume Gain	(V_n)	32.2				ml
Impinger 4 Silica Gel Weight Gain	(W_n)	14.1				g
Total Water Volume Collected	(V_{lc})	46.3				ml
Standard Water Vapor Volume	(V_w)$_{std}$	2.181				scf
Standard Meter Volume	(V_m)$_{std}$	52.401				dscf
Calculated Stack Moisture	($B_{ws(calc)}$)	4.0				%
Saturated Stack Moisture	($B_{ws(avp)}$)	3.48				%
Reported Stack Moisture Content	(B_{ws})	3.5				%
Gas Analysis Data						
Carbon Dioxide Percentage	(%CO_2)	0.0				%
Oxygen Percentage	(%O_2)	20.9				%
Carbon Monoxide Percentage	(%CO)	0.0				%
Nitrogen Percentage	(%N_2)	79.1				%
Dry Gas Molecular Weight	(M_d)	28.84				lb/lb-mole
Wet Stack Gas Molecular Weight	(M_s)	28.40				lb/lb-mole
Volumetric Flow Rate Data						
Average Stack Gas Velocity	(v_s)	57.44				ft/sec
Stack Cross-Sectional Area	(A_s)	27.00				ft^2
Actual Stack Flow Rate	(Q_{aw})	93054				acfm
Wet Standard Stack Flow Rate	(Q_{sw})	5076				wkscfh
Dry Standard Stack Flow Rate	(Q_{sd})	81651				dscfm
Percent of Isokinetic Rate	(I)	100.4				%
Emission Rate Data						
Mass of Particulate on Filter	(m_f)	10.1				mg
Mass of Particulate in Acetone	(m_a')	107.0				mg
Mass due to Acetone Blank	(W_a)	0.0				mg
Total Mass of Particulates	(m_n)	117.1				mg
Stack Particulate Concentration	(c_s)	0.002				g/dscf
	(c_s)	0.034				gr/dscf
Particulate Emission Rate	(E)	10.95				kg/hr
	(E)	24.1				lbs/hr

ISOKINETIC SAMPLING DATA

Plant Name	USSC Clewiston Mill	**Date**	4/28/2011
Sampling Location	Sugar Dryer Duct	**Project #**	2525
Operator	C. Horton	**Run #**	1
# of Points Across	7	**# of Ports Used**	4

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.840	
Avg Stack Temp	(t_s)	95	°F
Avg Gas Meter Temp	(t_m)	100	°F
DH @ 0.75 SCFM	($\Delta H@$)	1.88	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	1.00	in H_2O
Stack Moisture Content	(B_{ws})	4.0	%
Stack Dry Molecular Weight	(M_{ds})	28.84	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.7500	acfm
DP to DH Isokinetic Factor	(K)	1.99	

Sampling Equipment			
Meter #	CEMS7MB		
Meterbox Cal. Factor	(Y)	1.005	
Nozzle #	212-2		
Actual Nozzle Diameter	(D_{ne})	0.2120	in
Req. Nozzle Diameter	(D_n)	0.2063	in
Probe # / Length			ft
Liner Material			
Sample Case / Oven #			
Impinger Case #	-		

Pressures			
Barometric Pressure	(P_b)	30.00	in Hg
Stack Static Pressure	(P_{static})	-29.00	in H_2O
Absolute Stack Pressure	(P_s)	27.87	in Hg
Absolute Meter Pressure	(P_m)	30.14	in Hg

ΔV_m	Leak Checks				
Pre	0	ft^3/min	@	12	in Hg
Mid		ft^3/min	@		in Hg
Post	0	ft^3/min	@	15	in Hg
ΔV_m <	0.020	ft^3/min	☑	**Leak Check OK?**	
Pitot OK?	☑		**Orsat OK?**	☑	

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp	Pump Vacuum
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0.0	16:00:00	717.939	0.720	1.430	1.400	75	240	100	229	57	4.0
A-2	2.5	16:02:30	719.500	0.810	1.609	1.600	76	234	100	264	49	5.0
A-3	5.0	16:05:00	721.200	1.500	2.980	3.000	74	230	101	272	49	9.0
A-4	7.5	16:07:30	723.400	0.380	0.755	0.750	75	230	101	265	50	4.0
A-5	10.0	16:10:00	725.200	0.870	1.728	1.700	76	231	102	256	55	7.0
A-6	12.5	16:12:30	726.500	1.100	2.185	2.200	75	235	103	252	55	7.0
A-7	15.0	16:15:00	729.000	1.000	1.987	2.000	75	235	103	251	56	7.0
B-1	17.5	16:17:30	730.900	0.990	1.967	2.000	75	234	103	231	56	7.0
B-2	20.0	16:20:00	732.300	1.100	2.185	2.200	75	235	103	252	56	9.0
B-3	22.5	16:22:30	734.400	1.100	2.185	2.200	75	231	104	251	56	9.0
B-4	25.0	16:25:00	736.600	0.610	1.212	1.200	75	234	104	249	57	5.0
B-5	27.5	16:27:30	738.100	0.810	1.609	1.600	76	232	104	250	58	6.0
B-6	30.0	16:30:00	740.000	1.000	1.987	2.000	76	236	104	249	58	7.0
B-7	32.5	16:32:30	741.900	0.730	1.450	1.400	76	236	105	248	57	6.0
C-1	35.0	16:35:00	743.700	0.500	0.993	0.990	76	234	105	246	58	6.0
C-2	37.5	16:37:30	745.100	0.270	0.536	0.530	75	231	105	248	59	3.0
C-3	40.0	16:40:00	746.300	0.390	0.775	0.770	75	233	105	249	61	4.0
C-4	42.5	16:42:30	747.500	0.800	1.589	1.600	76	235	105	250	59	6.0
C-5	45.0	16:45:00	749.100	1.100	2.185	2.200	75	235	105	249	58	8.0
C-6	47.5	16:47:30	751.300	0.390	0.775	0.770	74	236	105	246	59	4.0
C-7	50.0	16:50:00	752.400	0.780	1.550	1.600	74	236	105	245	61	6.0
D-1	52.5	16:52:30	753.900	0.840	1.669	1.700	75	236	105	247	60	6.0
D-2	55.0	16:55:00	755.800	0.540	1.073	1.100	75	233	105	245	60	5.0
D-3	57.5	16:57:30	757.400	1.200	2.384	2.400	76	234	105	245	60	8.0
D-4	60.0	17:00:00	758.500	1.800	3.576	3.500	75	234	105	246	61	10.0
D-5	62.5	17:02:30	761.100	1.000	1.987	2.000	75	234	105	247	61	9.0
D-6	65.0	17:05:00	763.700	0.400	0.795	0.790	76	234	106	243	63	4.0
D-7	67.5	17:07:30	765.000	0.530	1.053	1.000	75	238	105	245	65	5.0
Last Pt	70.0	17:10:00	766.751									
Last Pt	70.0	17:10:00	766.751						**Maximum Vacuum**			10.0
Average Values				0.83		1.65	75	234	104	249	58	

ISOKINETIC SAMPLING DATA

Plant Name	USSC Clewiston Mill	**Date**	4/28/2011
Sampling Location	Sugar Dryer Duct	**Project #**	2525
Operator	C. Horton	**Run #**	2
# of Points Across	7	**# of Ports Used**	4

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.840	
Avg Stack Temp	(t_s)	75	°F
Avg Gas Meter Temp	(t_m)	105	°F
DH @ 0.75 SCFM	($\Delta H@$)	1.88	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	1.00	in H_2O
Stack Moisture Content	(B_{ws})	4.5	%
Stack Dry Molecular Weight	(M_{ds})	28.84	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.7500	acfm
DP to DH Isokinetic Factor	(K)	2.06	

Sampling Equipment			
Meter #	CEMS7MB		
Meterbox Cal. Factor	(Y)	1.005	
Nozzle #	212-2		
Actual Nozzle Diameter	(D_{na})	0.2120	in
Req. Nozzle Diameter	(D_{nl})	0.2039	in
Probe # / Length			ft
Liner Material			
Sample Case / Oven #			
Impinger Case #	-		

Pressures			
Barometric Pressure	(P_b)	30.00	in Hg
Stack Static Pressure	(P_{static})	-29.00	in H_2O
Absolute Stack Pressure	(P_s)	27.87	in Hg
Absolute Meter Pressure	(P_m)	30.14	in Hg

ΔV_m	Leak Checks				
Pre	0	ft^3/min	@	18	in Hg
Mid		ft^3/min	@		in Hg
Post	0	ft^3/min	@	11	in Hg
ΔV_m <	0.020	ft^3/min	☑	**Leak Check OK?**	
Pitot OK?	☑		**Orsat OK?**	☑	

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp	Pump Vacuum
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0.0	8:40:00	767.167	0.800	1.649	1.600	84	228	84	207	53	4.5
A-2	2.5	8:42:30	769.300	0.740	1.526	1.500	79	231	85	209	50	5.0
A-3	5.0	8:45:00	770.990	1.150	2.371	2.300	79	229	85	246	49	7.0
A-4	7.5	8:47:30	773.000	0.750	1.546	1.500	79	236	87	241	52	5.0
A-5	10.0	8:50:00	774.900	1.300	2.680	2.600	79	243	88	210	54	8.0
A-6	12.5	8:52:30	777.150	1.100	2.268	2.200	78	245	89	217	56	6.0
A-7	15.0	8:55:00	779.000	1.000	2.062	2.000	79	246	90	223	56	6.0
B-1	17.5	8:57:30	781.000	1.400	2.886	2.800	79	240	91	219	57	8.0
B-2	20.0	9:00:00	783.300	1.700	3.505	3.400	79	248	92	236	58	10.0
B-3	22.5	9:02:30	785.800	1.300	2.680	2.600	78	256	92	240	59	8.0
B-4	25.0	9:05:00	788.200	0.990	2.041	2.000	78	254	93	242	60	6.0
B-5	27.5	9:07:30	790.000	0.940	1.938	1.900	79	254	93	245	58	6.0
B-6	30.0	9:10:00	791.900	0.950	1.959	1.900	81	260	94	248	57	6.0
B-7	32.5	9:12:30	794.100	1.100	2.268	2.200	79	244	94	250	57	7.0
C-1	35.0	9:15:00	795.800	0.980	2.021	2.000	80	246	92	254	55	6.0
C-2	37.5	9:31:30	798.000	1.200	2.474	2.400	79	244	93	257	54	7.0
C-3	40.0	9:34:00	800.100	0.950	1.959	1.900	79	245	93	256	53	6.0
C-4	42.5	9:36:30	802.100	0.930	1.917	1.900	79	243	94	253	56	5.5
C-5	45.0	9:39:00	804.000	0.750	1.546	1.500	79	246	94	252	58	5.0
C-6	47.5	9:41:30	804.700	0.700	1.443	1.400	82	246	94	253	59	5.0
C-7	50.0	9:44:00	807.300	0.840	1.732	1.700	81	247	95	253	59	5.0
D-1	52.5	10:15:30	809.100	1.000	2.062	2.000	81	220	93	252	61	6.0
D-2	55.0	10:18:00	812.200	1.100	2.268	2.200	80	229	94	252	56	6.0
D-3	57.5	10:20:30	814.200	1.000	2.062	2.000	82	227	94	248	57	6.0
D-4	60.0	10:23:00	816.100	0.850	1.752	1.700	81	228	95	245	60	5.0
D-5	62.5	10:25:30	817.900	0.750	1.546	1.500	81	228	95	245	61	5.0
D-6	65.0	10:28:00	819.500	0.700	1.443	1.400	80	229	95	244	62	5.0
D-7	67.5	10:30:30	821.400	0.900	1.856	1.800	79	228	96	245	62	5.5
Last Pt	70.0	10:33:00	822.926									
Final Value	70.0	10:33:00	822.926						**Maximum Vacuum**			10.0
Average Values				1.00		2.00	80	240	92	241	57	

ISOKINETIC SAMPLING DATA

Plant Name	USSC Clewiston Mill	**Date**	4/28/2011
Sampling Location	Sugar Dryer Duct	**Project #**	2525
Operator	C. Horton	**Run #**	3
# of Points Across	7	**# of Ports Used**	4

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.840	
Avg Stack Temp	(t_s)	80	°F
Avg Gas Meter Temp	(t_m)	92	°F
DH @ 0.75 SCFM	($\Delta H@$)	1.88	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	1.00	in H_2O
Stack Moisture Content	(B_{ws})	4.0	%
Stack Dry Molecular Weight	(M_{ds})	28.84	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.7500	acfm
DP to DH Isokinetic Factor	(K)	2.01	

Sampling Equipment			
Meter #	CEMS7MB		
Meterbox Cal. Factor	(Y)	1.005	
Nozzle #	212-2		
Actual Nozzle Diameter	(D_{na})	0.2120	in
Req. Nozzle Diameter	(D_{ri})	0.2064	in
Probe # / Length			ft
Liner Material			
Sample Case / Oven #			
Impinger Case #	-		

Pressures			
Barometric Pressure	(P_b)	30.00	in Hg
Stack Static Pressure	(P_{static})	-29.00	in H_2O
Absolute Stack Pressure	(P_s)	27.87	in Hg
Absolute Meter Pressure	(P_m)	30.14	in Hg

ΔV_m	Leak Checks				
Pre	0	ft^3/min	@	12	in Hg
Mid		ft^3/min	@		in Hg
Post	0	ft^3/min	@	11	in Hg
ΔV_m <	0.020	ft^3/min	☑	**Leak Check OK?**	
Pitot OK?	☑		**Orsat OK?**	☑	

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp	Pump Vacuum
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0.0	12:05:00	823.862	0.60	1.21	1.20	80	225	92	225	58	4.0
A-2	2.5	12:07:30	825.800	0.53	1.07	1.10	78	227	92	229	54	4.0
A-3	5.0	12:10:00	826.900	0.37	0.74	0.75	78	226	93	231	54	3.0
A-4	7.5	12:12:30	828.100	0.31	0.62	0.63	78	230	93	237	56	3.0
A-5	10.0	12:15:00	829.200	0.87	1.75	1.80	78	233	93	236	58	5.0
A-6	12.5	12:17:30	831.000	1.10	2.21	2.20	76	231	94	236	57	6.0
A-7	15.0	12:20:00	833.000	1.10	2.21	2.20	77	233	94	237	59	6.0
B-1	17.5	12:22:30	835.200	1.10	2.21	2.20	78	233	95	236	62	6.0
B-2	20.0	12:25:00	837.200	1.80	3.62	3.60	81	231	96	237	63	10.0
B-3	22.5	12:27:30	839.800	1.20	2.42	2.40	79	231	96	237	65	7.0
B-4	25.0	12:30:00	841.800	0.94	1.89	1.90	78	229	98	237	65	6.0
B-5	27.5	12:32:30	843.800	0.92	1.85	1.90	78	234	97	237	64	6.0
B-6	30.0	12:35:00	845.800	1.00	2.01	2.00	77	232	97	237	63	6.0
B-7	32.5	12:37:30	847.800	1.20	2.42	2.40	78	233	98	237	61	6.0
C-1	35.0	12:40:00	849.900	1.40	2.82	2.80	79	232	98	232	59	9.0
C-2	37.5	12:42:30	852.200	1.10	2.21	2.20	79	233	98	231	59	6.0
C-3	40.0	12:45:00	854.200	0.93	1.87	1.90	80	233	98	231	58	5.0
C-4	42.5	12:47:30	856.200	0.87	1.75	1.80	78	232	99	230	57	5.0
C-5	45.0	12:50:00	858.000	0.67	1.35	1.40	78	231	99	229	57	5.0
C-6	47.5	12:52:30	859.700	0.66	1.33	1.30	77	232	99	230	54	4.0
C-7	50.0	12:55:00	861.000	0.92	1.85	1.90	78	236	99	232	54	5.0
D-1	52.5	12:57:30	863.200	1.30	2.62	2.60	80	232	99	232	56	8.0
D-2	55.0	13:00:00	865.400	0.84	1.69	1.70	79	234	100	231	56	5.0
D-3	57.5	13:02:30	867.100	0.76	1.53	1.50	78	236	100	231	56	5.0
D-4	60.0	13:05:00	868.800	0.79	1.59	1.60	80	233	100	230	55	5.0
D-5	62.5	13:07:30	870.800	0.72	1.45	1.50	78	234	100	231	55	5.0
D-6	65.0	13:10:00	872.300	0.65	1.31	1.30	78	233	100	232	54	4.5
D-7	67.5	13:12:30	874.200	0.75	1.51	1.50	78	233	100	235	56	5.0
Last Pt	70.0	13:15:00	875.644									
Final Value	70.0	13:15:00	875.644						**Maximum Vacuum**			10.0
Average Values				0.91		1.83	78	232	97	233	58	

ISOKINETIC SAMPLING DATA

Plant Name	USSC Clewiston Mill	**Date**	4/29/2011
Sampling Location	Sugar Dryer Duct	**Project #**	2525
Operator	C. Horton	**Run #**	4
# of Points Across	7	**# of Ports Used**	4

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.840	
Avg Stack Temp	(t_s)	78	°F
Avg Gas Meter Temp	(t_m)	100	°F
DH @ 0.75 SCFM	(ΔH@)	1.88	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	1.00	in H_2O
Stack Moisture Content	(B_{ws})	4.0	%
Stack Dry Molecular Weight	(M_{ds})	28.84	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.7500	acfm
DP to DH Isokinetic Factor	(K)	2.05	

Sampling Equipment			
Meter #	CEMS7MB		
Meterbox Cal. Factor	(Y)	1.005	
Nozzle #	212-2		
Actual Nozzle Diameter	(D_{na})	0.2120	in
Req. Nozzle Diameter	(D_{ni})	0.2047	in
Probe # / Length			ft
Liner Material			
Sample Case / Oven #			
Impinger Case #	-		

Pressures			
Barometric Pressure	(P_b)	30.00	in Hg
Stack Static Pressure	(P_{static})	-29.00	in H_2O
Absolute Stack Pressure	(P_s)	27.87	in Hg
Absolute Meter Pressure	(P_m)	30.14	in Hg

ΔV_m	Leak Checks				
Pre	0	ft^3/min	@	10	in Hg
Mid		ft^3/min	@		in Hg
Post	0	ft^3/min	@	14	in Hg
ΔV_m <	0.020	ft^3/min	☑	**Leak Check OK?**	
Pitot OK?	☑		**Orsat OK?**	☑	

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp	Pump Vacuum
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0.0	13:50:00	875.883	0.750	1.537	1.500	79	232	97	175	57	5.0
A-2	2.5	13:52:30	877.700	0.750	1.537	1.500	79	232	98	186	57	5.0
A-3	5.0	13:55:00	879.500	0.460	0.943	0.940	78	235	98	197	58	5.0
A-4	7.5	13:57:30	880.900	0.530	1.086	1.100	78	236	98	202	60	4.0
A-5	10.0	14:00:00	882.400	0.910	1.865	1.900	79	234	99	209	62	6.0
A-6	12.5	14:02:30	884.300	1.100	2.254	2.300	78	233	99	216	64	8.0
A-7	15.0	14:05:00	886.400	1.100	2.254	2.300	78	232	100	223	65	8.0
B-1	17.5	14:07:30	888.600	1.600	3.279	3.300	79	232	100	224	63	10.0
B-2	20.0	14:10:00	891.000	1.700	3.484	3.500	78	229	101	226	63	11.0
B-3	22.5	14:12:30	893.600	1.400	2.869	2.900	79	235	101	227	63	9.0
B-4	25.0	14:15:00	896.000	1.100	2.254	2.300	79	235	102	226	62	8.0
B-5	27.5	14:17:30	898.100	0.830	1.701	1.700	78	237	102	226	60	5.0
B-6	30.0	14:20:00	900.000	1.000	2.050	2.100	77	238	102	229	59	7.0
B-7	32.5	14:22:30	902.000	1.200	2.459	2.500	77	237	102	230	58	8.0
C-1	35.0	14:25:00	904.400	1.400	2.869	2.900	79	239	103	232	58	9.0
C-2	37.5	14:27:30	906.600	0.960	1.968	2.000	78	233	103	232	58	7.0
C-3	40.0	14:30:00	908.600	0.900	1.845	1.800	77	238	104	231	58	6.0
C-4	42.5	14:32:30	910.500	0.920	1.886	1.900	77	237	104	231	58	6.0
C-5	45.0	14:35:00	912.400	0.680	1.394	1.400	77	237	104	231	57	5.0
C-6	47.5	14:37:30	914.100	0.710	1.455	1.500	79	237	104	233	57	5.0
C-7	50.0	14:40:00	915.800	0.970	1.988	2.000	77	238	104	235	54	7.0
D-1	52.5	14:42:30	917.800	1.300	2.664	2.700	79	234	105	237	57	9.0
D-2	55.0	14:45:00	920.000	0.920	1.886	1.900	78	235	105	236	57	6.0
D-3	57.5	14:47:30	921.900	0.780	1.599	1.600	80	238	105	235	58	6.0
D-4	60.0	14:50:00	923.700	0.820	1.681	1.700	79	237	105	235	58	6.0
D-5	62.5	14:52:30	925.600	0.770	1.578	1.600	77	236	105	235	58	5.0
D-6	65.0	14:55:00	927.400	0.660	1.353	1.400	77	236	106	236	58	5.0
D-7	67.5	14:57:30	928.000	0.750	1.537	1.500	76	238	106	237	58	5.0
Last Pt	70.0	15:00:00	930.985									
Last Pt	70.0	15:00:00	930.985						**Maximum Vacuum**			11.0
Average Values				0.96		1.99	78	235	102	224	59	

C.E.M. SOLUTIONS
SAMPLE DATA SHEET

Plant Name	US Sugar Clewiston Mill & DRYER 2	Date	4-28-11
Sampling Location	SWant	Project #	4525
Operator	MS	Run #	1
Test Method	5	Sampling Type	Isokinetic [X] Constant Rate [ ]
# of Points Across	4	# of Ports Used	7

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.84	
Avg Stack Temp	(t_s)	100	°F
Avg Gas Meter Temp	(t_m)	105	°F
DH @ 0.75 SCFM	($\Delta H@$)	1.879	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	0.97	in H_2O
Stack Moisture Content	(B_{ws})	4.5	%
Oxygen	(O_2)	21	%
Carbon Dioxide	(CO_2)	0	%
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
K-Factor	(K)	1.97	

Sampling Equipment			
Meter #	CEMS 7 MB		
Meterbox Cal. Factor	(Y)	1.005	
Filter / Nozzle #	G-207 / 212-2		
Actual Nozzle Diameter	(D_{no})	0.212	in
Req. Nozzle Diameter	(D_n)	0.209	in
Probe #	P10		
Liner Material	SS		
Pitot #	PT-01		
Thermocouple #	TC10		

Nozzle pointed towards flow? [X]

Pressures			
Barometric Pressure	(P_b)	30.0	in Hg
Stack Static Pressure	(P_g)	-.29	in H_2O

ΔV_m Leak Checks					
Pre	0.000	ft^3/min	@	12	in Hg
Post	0.000	ft^3/min	@	15	in Hg
Pitot Leak Checks					
Pre	0.000	inches	@	5.7	in H_2O
Post	0.000	inches	@	4.6	in H_2O

pitot line broke 2 x during run, but were fixed and passed leak checks

Traverse Point #	Sampling Time (θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp <68 °F	Pump Vacuum
	min	hh:mm:ss	ft	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A 1	~~0~~	1600	717.929	0.72	1.418	1.4	~~75~~ 76 MS	240	100	229	57	4
2	2.5		719.5	0.81	1.596	1.6	76	234	100	264	49	5
3	5	1605	721.2	1.5	2.955	3.0	74	230	101	272	49	~~5~~ 9
4	7.5		~~723.9~~	0.38	0.749	0.75	75	230	101	265	50	4
5	10	1610	725.2	~~0.71~~	~~1.398~~	1.350	76	231	102	256	55	7
6	12.5		726.5	1.1	2.167	2.2	75	235	103	252	55	7
7	15	1615	729.0	1.0	1.97	2.0	75	235	103	251	56	7
B 1	17.5		730.9	0.99	1.950	2.0	75	234	103	231	56	7
2	20	1620	732.3	1.1	2.167	2.2	75	235	103	252	56	9
3	22.5		734.4	1.1	2.167	2.2	75	231	104	251	56	9
4	25	1625	736.6	0.61	1.202	1.2	76	234	104	249	57	5
5	27.5		738.1	0.81	1.596	1.6	76	232	104	250	58	6
6	30	1630	740.0	1.0	1.97	2.0	76	236	104	249	58	7
7	32.5		741.9	0.73	1.438	1.4	76	236	105	248	57	6
C 1	35	1635	743.7	0.50	0.985	0.99	76	234	105	246	58	6
2	37.5		745.1	0.27	0.532	0.53	75	231	105	248	59	3
3	40	1640	746.3	0.39	0.768	0.77	75	233	105	249	61	4
4	42.5		747.5	0.80	1.576	1.6	76	235	105	250	59	6
5	45	1645	749.1	1.1	2.167	2.2	75	235	105	249	58	8
6	47.5		751.3	0.39	0.768	0.77	74	236	105	246	59	4
7	50	1650	752.4	~~0.78~~	1.556	1.6	74	236	105	245	61	6
D 1	52.5		753.9	0.84	1.655	1.7	75	236	105	247	60	6
2	55	1655	755.8	0.54	1.064	1.1	75	233	105	245	60	5
3	57.5		757.4	1.2	2.364	2.4	76	234	105	245	60	8
4	60	1700	758.5	1.8	3.546	3.5	75	234	105	246	61	18
5	62.5		760.1	1.0	1.97	2.0	75	234	105	247	61	9
6	65	1705	763.7	0.40	0.788	0.79	76	234	106	243	63	4
7	67.5		765.0	0.53	1.044	1.0	75	238	105	245	65	5
Last	70	1710	766.75									

Vol 723.4

C.E.M. SOLUTIONS
SAMPLE DATA SHEET

Plant Name	USSC Clewiston, MFL	Date	4/29/11
Sampling Location	Sugar Dryer 2 Duct	Project #	4525
Operator	C. Horton	Run #	2
Test Method	5	Sampling Type	Isokinetic ☒ Constant Rate ☐
# of Points Across	4	# of Ports Used	7

Ideal Nozzle Diameter and IsoKinetic Factor Setup

Pitot Tube Coefficient	(C_p)	0.84	
Avg Stack Temp	(t_s)	~~100~~ 74	°F
Avg Gas Meter Temp	(t_m)	105	°F
DH @ 0.75 SCFM	($\Delta H@$)	1.879	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	0.8	in H_2O
Stack Moisture Content	(B_{ws})	4.5	%
Oxygen	(O_2)	21	%
Carbon Dioxide	(CO_2)	0	%
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
K-Factor	(K)	2.006	

75

Nozzle pointed towards flow? ☒

Sampling Equipment

Meter #		CEMS7 M13	
Meterbox Cal. Factor	(Y)	1.005	
Filter / Nozzle #		G-208 / 212-2	
Actual Nozzle Diameter	(D_{no})	0.212	in
Req. Nozzle Diameter	(D_n)	0.217	in
Probe #		P10	
Liner Material		SS	
Pitot #		PT-01	
Thermocouple #		TC 10	

Pressures

Barometric Pressure	(P_b)	30.00	in Hg
Stack Static Pressure	(P_{static})	-29	in H_2O

0.000

Leak Checks

ΔV_m					
Pre	0.000	ft^3/min	@	18	in Hg
Post	~~0.000~~	~~ft³~~/min	@	~~15~~ CH	in Hg

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Pitot	Leak Checks				
Pre	0.0	inches	@	4	in H_2O
Post	0.0	inches	@	3.5	in H_2O

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp ≤68 °F	Pump Vacuum
	min	hh:mm ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0	0840	767.167	0.8	1.605	1.6	84	228	84	207	53	4.5
2	2.6		769.3	0.74	1.484	1.5	79	231	85	209	50	5
3	5	0845	770.99	1.15	2.307	2.3	79	229	85	246	49	7
4	7.5		773.0	0.75	1.48	1.5	79	236	87	241	52	5
B	10	0850	774.9	1.3	2.61	2.6	79	243	88	210	54	8
6	12.5		777.15	1.1	2.21	2.2	78	245	89	217	56	6
7	15	0855	779.0	1.0	2.006	2.0	79	246	90	223	56	6
B-1	17.5		781.0	1.4	2.81	2.8	79	240	91	219	57	8
2	20	0900	783.3	1.7	3.41	3.4	79	248	92	236	58	10
3	22.5		785.8	1.3	2.61	2.6	78	256	92	240	59	8
4	25	0905	788.2	0.99	1.98	2.0	78	254	93	242	60	6
5	27.5		790.0	0.94	1.89	1.9	79	254	93	245	58	6
6	30	0910	791.9	0.95	1.91	1.9	81	260	94	248	57	6
7	32.5		794.1	1.1	2.21	2.2	79	244	94	250	57	7
C-1	35	0915	795.8	0.98	1.98	2.0	80	246	92	254	55	6
2	37.5	0917	798.0	1.2	2.41	2.4	79	244	93	257	54	7
3	40	0940	800.1	6.95	1.9	1.9	79	245	93	256	53	6
4	42.5		802.1	0.93	1.86	1.9	79	243	94	253	56	5.5
5	45	0945	804.0	0.75	1.50	1.5	79	246	94	252	58	5
6	47.5		805.7	0.70	1.40	1.4	82	246	94	253	59	5
7	50	0950	807.3	0.84	1.68	1.7	81	247	95	253	59	5
D-1	52.5	1015	809.1	1.0	2.006	2.0	81	220	93	252	61	6
2	55	1017	811.2	1.1	2.21	2.2	80	229	94	252	56	6
3	57.5		813.2	1.006	2.006	2.0	82	227	94	248	57	6
4	60	1022	816.1	0.85	1.71	1.7	81	228	95	245	60	5
5	62.5		817.9	0.75	1.5	1.5	81	228	95	245	61	5
6	65	1027	819.5	0.70	1.404	1.4	80	229	95	244	62	5
7	67.5		821.4	0.9	1.81	1.8	79	228	96	245	62	5.5
CAL	70	1032	822.926									

0915 Paused 0915 to 0934 0.000 @ 12

Paused 0957 to 1015 0.000 @ 10

HP 1.0 CHK

C.E.M. SOLUTIONS
SAMPLE DATA SHEET

Plant Name	USSC Clewiston Mill	Date	9/29/11
Sampling Location	Sugar Dryer 2	Project #	4525
Operator	MS / CRH	Run #	3
Test Method	5	Sampling Type	Isokinetic ☒ Constant Rate ☐
# of Points Across	4 7 8	# of Ports Used	2 4 CH

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.84	
Avg Stack Temp	(t_s)	80	°F
Avg Gas Meter Temp	(t_m)	95	°F
DH @ 0.75 SCFM	($\Delta H@$)	1.8	in H_2O
Avg Pitot Tube Diff Pressure	(Δp_{avg})	1.04	in H_2O
Stack Moisture Content	(B_{ws})	4	%
Oxygen	(O_2)	20.9	%
Carbon Dioxide	(CO_2)	0.0	%
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
K-Factor	(K)	0.02	

Sampling Equipment			
Meter #		CEMS-1 MB	
Meterbox Cal Factor	(Y)	1005	
Filter / Nozzle #		G-209 / 212-2	
Actual Nozzle Diameter	(D_n)	0.212	in
Req. Nozzle Diameter	(D_n)	0.202	in
Probe #		P10	
Liner Material		SS	
Pitot #		PT-01	
Thermocouple #		TC 10	

Nozzle pointed towards flow? ☒

ΔV_m Leak Checks					
Pre	0.000	ft³/min	@	12	in Hg
Post	0.003	ft³/min	@	11	in Hg

Pressures			
Barometric Pressure	(P_b)	30.00	in Hg
Stack Static Pressure	(P_{static})	-29.	in H_2O

Pitot Leak Checks					
Pre	0.000	inches	@	4.2	in H_2O
Post		inches	@		in H_2O

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp <68°F	Pump Vacuum
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0	1205	823.862	0.60	1.212	1.2	80	225	92	225	58	4
2	2.5		825.8	0.53	1.071	1.1	79	227	92	229	54	4
3	5	1210	826.9	0.37	0.747	0.75	78	226	93	231	54	3
4	7.5		828.1	0.31	0.626	0.63	78	230	93	237	56	3
5	10	1215	829.2	0.87	1.757	1.8	78	233	93	236	58	5
6	12.5		831.0	1.1	2.222	2.2	76	231	94	236	57	6
7	15	1220	833.0	1.1	2.222	2.2	77	233	94	237	59	6
B-1	17.5		835.2	1.1	2.222	2.2	78	233	95	236	62	6
2	20	1225	837.2	1.8	3.636	3.6	81	231	96	237	63	10
3	22.5		839.8	1.2	2.424	2.4	79	231	96	237	65	7
4	25	1230	841.8	0.94	1.899	1.9	78	229	98	237	65	6
5	27.5		843.8	0.92	1.858	1.9	78	234	97	237	64	6
6	30	1235	845.8	1.0	2.02	2.0	77	232	97	237	63	6
7	32.5		847.8	1.2	2.424	2.4	78	233	98	237	61	6
C-1	35	1240	849.9	1.4	2.828	2.8	79	232	98	232	59	9
2	37.5		852.2	1.1	2.222	2.2	79	233	98	231	58	6
3	40	1245	854.2	0.93	1.879	1.9	80	233	98	231	58	5
4	42.5		856.2	0.87	1.757	1.8	78	232	99	230	57	5
5	45	1250	858.0	0.67	1.353	1.4	78	231	99	229	57	5
6	47.5		859.7	0.66	1.333	1.3	77	232	99	230	54	4
7	50	1255	861.8	0.92	1.858	1.9	78	236	99	232	54	5
D-1	52.5		863.2	1.3	2.626	2.6	80	232	99	232	56	8
2	55	1300	865.4	0.84	1.697	1.7	79	234	100	231	56	5
3	57.5		867.1	0.76	1.535	1.5	78	236	100	231	56	5
4	60	1305	868.8	0.79	1.596	1.6	80	233	100	230	55	5
5	62.5		870.8	0.72	1.454	1.5	78	234	100	231	55	5
6	65	1310	872.3	0.66	1.313	1.3	78	233	100	230	54	4.5
7	67.5		874.0	0.75	1.52	1.5	78	233	100	236	56	5
LAST	70	1315	876.644									

Vol. 854.2

C.E.M. SOLUTIONS
SAMPLE DATA SHEET

Plant Name	USSC Clewiston Mill	Date	4/29/11
Sampling Location	Sugar Dryer 2	Project #	8525
Operator	CRH	Run #	4
Test Method	5	Sampling Type	Isokinetic [X] Constant Rate [ ]
# of Points Across	7	# of Ports Used	4

Ideal Nozzle Diameter and IsoKinetic Factor Setup

Pitot Tube Coefficient	(C_p)	0.84	
Avg Stack Temp	(t_s)	78	°F
Avg Gas Meter Temp	(t_m)	100	°F
DH @ 0.75 SCFM	$(\Delta H@)$	1.879	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	1.0	in H_2O
Stack Moisture Content	(B_{ws})	4	%
Oxygen	(O_2)	20.9	%
Carbon Dioxide	(CO_2)	0.0	%
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
K-Factor	(K)	2.05	

Nozzle pointed towards flow? [X]

Pressures

Barometric Pressure	(P_b)	30.00	in Hg
Stack Static Pressure	(P_{static})	-29	in H_2O

Sampling Equipment

Meter #		CEMS 7 MB	
Meterbox Cal. Factor	(Y)	1.005	
Filter / Nozzle #		G-210 / 212-2	
Actual Nozzle Diameter	(D_n)	0.212	in
Req. Nozzle Diameter	(D_n)	0.205	in
Probe #		P10	
Liner Material		SS	
Pitot #		PT-01	
Thermocouple #		TC10	

ΔV_m Leak Checks					
Pre	0.000	ft^3/min	@	10	in Hg
Post	0.000	ft^3/min	@	14	in Hg
Pitot Leak Checks					
Pre	0.0	inches	@	5.9	in H_2O
Post	0.0	inches	@	5.8	in H_2O

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp ≤68 °F	Pump Vacuum	
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg	
A-1	0	13:50	876.883	0.75	1.54	1.5	79	232	97	175	~~97~~ 57	5	PT: Exit 59°
2	2.5		877.7	0.75	1.54	1.5	79	232	98	186	57	5	~~97 ≠ 10~~ Meter Out ~~57~~
3	5	13:55	879.5	0.46	0.943	0.94	78	235	98	197	58	5	
4	7.5		880.9	0.53	1.087	1.1	79	236	98	202	60	4	
5	10	1400	882.4	0.91	1.866	1.9	79	234	99	209	62	6	
6	12.5		884.3	1.1	2.255	2.3	78	233	99	216	64	8	
7	15	1405	886.4	1.1	2.255	2.3	78	232	100	223	65	8	
B-1	17.5		888.4	1.6	3.280	3.3	79	232	100	224	63	10	
2	20	1410	891.0	1.7	3.485	3.5	78	229	101	226	63	11	
3	22.5		893.6	1.4	2.870	2.9	79	235	101	227	63	9	
4	25	1415	896.0	1.1	2.255	2.3	79	235	102	226	62	8	
5	27.5		898.1	0.83	1.702	1.7	78	237	102	226	60	5	
6	30	1420	900.0	1.0	2.05	2.1	77	238	102	229	59	7	
7	32.5		902.0	1.2	2.460	2.5	77	237	102	230	58	8	
C-1	35	1425	904.4	1.4	2.870	2.9	79	239	103	232	58	9	
2	37.5		906.6	0.96	1.968	2.0	78	233	103	232	58	7	
3	40	1430	908.6	0.90	1.845	1.8	77	238	104	231	58	6	
4	42.5		910.5	0.92	1.886	~~2.0~~ 1.9	77	237	104	231	58	6	DH of 1.9 (NG)
5	45	1435	912.4	0.68	1.394	1.4	77	237	104	231	57	5	
6	47.5		914.1	0.71	1.456	1.5	79	237	104	233	57	5	
7	50	1440	915.8	0.97	1.989	2.0	77	238	104	235	54	7	
D-1	52.5		917.8	1.3	2.666	2.7	79	234	105	237	57	9	
2	55	1445	920.0	0.92	1.886	1.9	78	235	105	236	57	6	
3	57.5		921.9	0.78	1.599	1.6	80	238	105	235	58	6	
4	60	1450	923.7	0.82	1.681	1.7	79	237	105	235	58	6	
5	62.5		925.6	0.77	1.579	1.6	77	236	105	235	58	5	
6	65	1455	927.4	0.66	1.353	1.4	77	236	106	236	58	5	
7	67.5		929.2	0.75	1.54	1.5	76	238	106	237	58	5	
LAST	70	1500	930.985										

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	USSC Clewiston Mill				**Date**	04/28/11	
Sampling Location	Sugar Dryer Duct				**Project #**	2525	
Operator	C. Horton				**# of Ports Used**	4	
Stack Type	Rectangular				**Meter Box Number**	CEMS7MB	
Train Leak Check	☑	**PreTest**	☑	**PostTest**	**Meter Cal Factor (Y)**	1.005	

Moisture Content Data								
Run Number	1		**Run Start Time**	16:00		**Run Stop Time**	17:10	
Total Meter Volume	(V_m)	48.812	dcf	**Barometric Press.**	(P_b)	30.00	in Hg	
Avg Meter Temp	$(t_m)_{avg}$	104	°F	**Stack Static Press.**	(P_{static})	-29.00	in H_2O	
Avg Stack Temp	$(t_s)_{avg}$	75	°F	**Avg Orifice Press.**	$(\Delta H)_{avg}$	1.65	in H_2O	
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**
		g	g	g	g	ml	ml	ml
Contents		DI	DI		Sil Gel			
Final Value	$(V_f),(W_f)$	574.40	595.10	605.40	825.70			
Initial Value	$(V_i),(W_i)$	551.60	591.10	604.00	813.20			
Net Value	$(V_n),(W_n)$	22.8	4.0	1.4	12.5			
Results								
Total Volume	(V_t)	0.00	ml	**Water Vol Condensed**	$(V_{wc(std)})$	0.000	scf	
Total Weight	(W_t)	40.70	g	**Water Vol Weighed**	$(V_{weg(std)})$	1.919	scf	
Std Meter Volume	$(V_{m(std)})$	46.246	dscf	**Sat. Moisture Content**	$(B_{ws(svp)})$	3.2	%	
Calc Moisture Content	$(B_{ws(calc)})$	4.0	%	**Final Moisture Content**	(B_{ws})	3.2	%	

Moisture Content Data								
Run Number	2		**Run Start Time**	8:40		**Run Stop Time**	10:33	
Total Meter Volume	(V_m)	55.759	dcf	**Barometric Press.**	(P_b)	30.00	in Hg	
Avg Meter Temp	$(t_m)_{avg}$	92	°F	**Stack Static Press.**	(P_{static})	-29.00	in H_2O	
Avg Stack Temp	$(t_s)_{avg}$	80	°F	**Avg Orifice Press.**	$(\Delta H)_{avg}$	2.00	in H_2O	
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**
		g	g	g	g	ml	ml	ml
Contents		DI	DI		Sil Gel			
Final Value	$(V_f),(W_f)$	757.50	686.70	491.10	829.90			
Initial Value	$(V_i),(W_i)$	729.50	683.00	489.90	815.50			
Net Value	$(V_n),(W_n)$	28.0	3.7	1.2	14.4			
Results								
Total Volume	(V_t)	0.00	ml	**Water Vol Condensed**	$(V_{wc(std)})$	0.000	scf	
Total Weight	(W_t)	47.30	g	**Water Vol Weighed**	$(V_{weg(std)})$	2.230	scf	
Std Meter Volume	$(V_{m(std)})$	54.015	dscf	**Sat. Moisture Content**	$(B_{ws(svp)})$	3.7	%	
Calc Moisture Content	(B_{ws})	4.0	%	**Final Moisture Content**	(B_{ws})	3.7	%	

Moisture Content Data								
Run Number	3		**Run Start Time**	12:05		**Run Stop Time**	13:15	
Total Meter Volume	(V_m)	51.782	dcf	**Barometric Press.**	(P_b)	30.00	in Hg	
Avg Meter Temp	$(t_m)_{avg}$	97	°F	**Stack Static Press.**	(P_{static})	-29.00	in H_2O	
Avg Stack Temp	$(t_s)_{avg}$	78	°F	**Avg Orifice Press.**	$(\Delta H)_{avg}$	1.83	in H_2O	
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**
		g	g	g	g	ml	ml	ml
Contents		DI	DI		Sil Gel			
Final Value	$(V_f),(W_f)$	600.80	599.70	607.10	837.80			
Initial Value	$(V_i),(W_i)$	574.80	594.80	605.10	825.80			
Net Value	$(V_n),(W_n)$	26.0	4.9	2.0	12.0			
Results								
Total Volume	(V_t)	0.00	ml	**Water Vol Condensed**	$(V_{wc(std)})$	0.000	scf	
Total Weight	(W_t)	44.90	g	**Water Vol Weighed**	$(V_{weg(std)})$	2.117	scf	
Std Meter Volume	$(V_{m(std)})$	49.682	dscf	**Sat. Moisture Content**	$(B_{ws(svp)})$	3.5	%	
Calc Moisture Content	(B_{ws})	4.1	%	**Final Moisture Content**	(B_{ws})	3.5	%	

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	USSC Clewiston Mill			**Date**	04/29/11
Sampling Location	Sugar Dryer Duct			**Project #**	2525
Operator	C. Horton			**# of Ports Used**	4
Stack Type	Rectangular			**Meter Box Number**	CEMS7MB
Train Leak Check	☑	**PreTest**	☑ **PostTest**	**Meter Cal Factor (Y)**	1.005

Moisture Content Data								
Run Number	4		**Run Start Time**	13:50		**Run Stop Time**	15:00	
Total Meter Volume	(V_m)	55.102	dcf	**Barometric Press.**		(P_b)	30.00	in Hg
Avg Meter Temp	$(t_m)_{avg}$	102	°F	**Stack Static Press.**		(P_{static})	-29.00	in H_2O
Avg Stack Temp	$(t_s)_{avg}$	78	°F	**Avg Orifice Press.**		$(\Delta H)_{avg}$	1.99	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**
		g	g	g	g	ml	ml	ml
Contents		DI	DI		Sil Gel			
Final Value	$(V_f),(W_f)$	783.60	691.90	492.00	844.00			
Initial Value	$(V_i),(W_i)$	757.50	686.70	491.10	829.90			
Net Value	$(V_n),(W_n)$	26.1	5.2	0.9	14.1			
Results								
Total Volume	(V_t)	0.00	ml	**Water Vol Condensed**		$(V_{wc(std)})$	0.000	scf
Total Weight	(W_t)	46.30	g	**Water Vol Weighed**		$(V_{wsg(std)})$	2.183	scf
Std Meter Volume	$(V_{m(std)})$	52.401	dscf	**Sat. Moisture Content**		$(B_{ws(svp)})$	3.5	%
Calc Moisture Content	$(B_{ws(calc)})$	4.0	%	**Final Moisture Content**		(B_{ws})	3.5	%

Moisture Content Data								
Run Number	5		**Run Start Time**			**Run Stop Time**		
Total Meter Volume	(V_m)		dcf	**Barometric Press.**		(P_b)		in Hg
Avg Meter Temp	$(t_m)_{avg}$		°F	**Stack Static Press.**		(P_{static})		in H_2O
Avg Stack Temp	$(t_s)_{avg}$		°F	**Avg Orifice Press.**		$(\Delta H)_{avg}$		in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**
		g	g	g	g	ml	ml	ml
Contents		DI	DI		Sil Gel			
Final Value	$(V_f),(W_f)$							
Initial Value	$(V_i),(W_i)$							
Net Value	$(V_n),(W_n)$							
Results								
Total Volume	(V_t)		ml	**Water Vol Condensed**		$(V_{wc(std)})$		scf
Total Weight	(W_t)		g	**Water Vol Weighed**		$(V_{wsg(std)})$		scf
Std Meter Volume	$(V_{m(std)})$		dscf	**Sat. Moisture Content**		$(B_{ws(svp)})$		%
Calc Moisture Content	(B_{ws})		%	**Final Moisture Content**		(B_{ws})		%

Moisture Content Data								
Run Number	6		**Run Start Time**			**Run Stop Time**		
Total Meter Volume	(V_m)		dcf	**Barometric Press.**		(P_b)		in Hg
Avg Meter Temp	$(t_m)_{avg}$		°F	**Stack Static Press.**		(P_{static})		in H_2O
Avg Stack Temp	$(t_s)_{avg}$		°F	**Avg Orifice Press.**		$(\Delta H)_{avg}$		in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**
		g	g	g	g	ml	ml	ml
Contents		DI	DI		Sil Gel			
Final Value	$(V_f),(W_f)$							
Initial Value	$(V_i),(W_i)$							
Net Value	$(V_n),(W_n)$							
Results								
Total Volume	(V_t)		ml	**Water Vol Condensed**		$(V_{wc(std)})$		scf
Total Weight	(W_t)		g	**Water Vol Weighed**		$(V_{wsg(std)})$		scf
Std Meter Volume	$(V_{m(std)})$		dscf	**Sat. Moisture Content**		$(B_{ws(svp)})$		%
Calc Moisture Content	(B_{ws})		%	**Final Moisture Content**		(B_{ws})		%

C.E.M. Solutions, Inc.
Method 4 Field Data Sheet

Company: USSC
Facility: Clewiston Mill
Unit No.: EU-009 Sugar Dryer
Sample Location: Duct
Date: 4/28/11

Bar. Press (in Hg):
Static Press (in H2O):
Meter Box Number:
Ini. Leak Rate:
Fin. Leak Rate:

Meter Y_i:
Run Number: 1
Run Duration (min): ~~62.5~~ 70 cH
Load Level: 1/2

Point	Clock Time	Sample Time	Meter Volume (ft3)	Meter Orifice Pressure (ΔH)	Meter Outlet Temperature (°F)	Meter Vacuum (in Hg)	Impinger Outlet Temperature (°F)
1		See	M3				
2		Data			Sheet		
3							
End							
Averages:							

Volume Collected:

Weights	Impinger 1	Impinger 2	Impinger 3	Impinger 4
Initial Weight	551.6	591.1	604.0	813.2
Final Weight	574.4	595.1	605.4	825.7
Weight Gain:	22.8	4.0	1.40	12.5

Total Weight Gain: 40.7g

4.0 % Calculated
32 % Bms

Train Prepared by: C. Horton
Train Recovered by: C. Horton

C.E.M. Solutions, Inc.
Method 4 Field Data Sheet

Company: USSC
Facility: Clewiston Mill
Unit No.: EU-029 Sugar Dryer
Sample Location: Duct
Date: 4/28/11

Bar. Press (in Hg):
Static Press (in H2O):
Meter Box Number:
Ini. Leak Rate:
Fin. Leak Rate:

Meter Y_i:
Run Number: 2
Run Duration (min): ~~62.5~~ 70 CM
Load Level: H

Point	Clock Time	Sample Time	Meter Volume (ft3)	Meter Orifice Pressure (ΔH)	Meter Outlet Temperature (°F)	Meter Vacuum (in Hg)	Impinger Outlet Temperature (°F)
1		See		M/S			
2							
3		Data		Sheet			
End							

Averages:

Volume Collected:

Weights	Impinger 1	Impinger 2	Impinger 3	Impinger 4
Initial Weight	729.5	683.0	489.8	815.5
Final Weight	757.5	686.7	491.1	829.9
Weight Gain:	28.0	3.7	1.2	14.4

Total Weight Gain: 47.3 g

Train Prepared by: C. Horton
Train Recovered by: C. Horton

C.E.M. Solutions, Inc.
Method 4 Field Data Sheet

Company: USSC
Facility: Clewiston Mill
Unit No.: Sugar Dryer 2
Sample Location: Duct
Date: 4/29/11

Bar. Press (in Hg): _____
Static Press (in H2O): _____
Meter Box Number: _____
Ini. Leak Rate: _____
Fin. Leak Rate: _____

Meter Y_i: _____
Run Number: 3
Run Duration (min): 90
Load Level: H

Point	Clock Time	Sample Time	Meter Volume (ft3)	Meter Orifice Pressure (ΔH)	Meter Outlet Temperature (°F)	Meter Vacuum (in Hg)	Impinger Outlet Temperature (°F)
1		See		M5			
2							
3		Data			Sheet		
End							

Averages:

Volume Collected:

Weights	Impinger 1	Impinger 2	Impinger 3	Impinger 4
Initial Weight	574.8	594.8	605.1	825.8
Final Weight	600.8	599.7	607.1	837.8
Weight Gain:	26.0	4.9	2.0	12.0

Total Weight Gain: 44.9g

4.1 g. Calculated
3.5 g. Blue

Train Prepared by: C. Horton
Train Recovered by: C. Horton

C.E.M. Solutions, Inc.
Method 4 Field Data Sheet

Company: USSC
Facility: Clewiston M.Ill
Unit No.: EU-029 Sugar Dryer
Sample Location: Duct
Date: 4/29/11

Bar. Press (in Hg): _____
Static Press (in H2O): _____
Meter Box Number: _____
Ini. Leak Rate: _____
Fin. Leak Rate: _____

Meter Y_i: _____
Run Number: 4
Run Duration (min): 60
Load Level: H

Point	Clock Time	Sample Time	Meter Volume (ft3)	Meter Orifice Pressure (ΔH)	Meter Outlet Temperature (°F)	Meter Vacuum (in Hg)	Impinger Outlet Temperature (°F)
1			See	M5			
2							
3			Data	Sheet			
End							

Averages:

Volume Collected:

Weights	Impinger 1	Impinger 2	Impinger 3	Impinger 4
Initial Weight	757.5	686.7	491.1	829.9
Final Weight	783.6	691.9	492.0	844.0
Weight Gain:	26.1	5.2	0.9	14.1

Total Weight Gain: _____

4.0 calculated
3.5 % Bws

Train Prepared by: C. Horton
Train Recovered by: C. Horton

METHOD 5 - SAMPLE ANALYTICAL DATA SHEET

Plant Name	USSC Clewiston Mill	**Date**	04/28/11
Sampling Location	Sugar Dryer Duct	**Project #**	2525
Operator	C. Horton	**Acetone Lot Number**	

Analytical Data

Placed in Desiccator					**Run Number**	1		
	Number	**Date**	**Time**		**Run Start Time**	16:00		
Filter	G-207	05/05/11	10:30		**Leakage Evident?**	☐		
Acetone Wash Beaker	2	05/05/11	11:00		**Estimated Volume**			

		Filter	**Acetone**	**Date**	**Time**	**Humidity**	**Temp**	**Cal Audit**
		g	g	mm/dd/yy	hh:mm	%RH	°F	g
Measurement 1	$(m_{1f}),(m_{1a})$	0.5290	64.0320	05/07/11	10:45	44	71	
Measurement 2	$(m_{2f}),(m_{2a})$	0.5283	64.0319	05/08/11	9:15	41	70	
Measurement 3	$(m_{3f}),(m_{3a})$	0.5283		05/09/11	8:15	44	71	
Measurement 4	$(m_{4f}),(m_{4a})$							

Results					**Acetone Wash**			
Final Weight	$(m_{ff}),(m_{fa}')$	0.5283	64.0320	g	**Bottle Wt with Wash**	(m_{bw})	169.9361	g
Tare Weight	$(m_{tf}),(m_{ta}')$	0.3760	63.9224	g	**Additional Rinse Wt**	(m_{ar})	30.5081	g
Weight Gain	$(m_f),(m_a')$	152.3	109.5	mg	**Bottle Tare Weight**	(m_{tb})	63.9224	g
Blank Adjustment	(W_a)		0.0	mg	**Net Wash Weight**	(m_{nw})	136.5218	g
Total Particulates	(m_n)		261.8	mg	**Blank Concentration**	(C_a)	0.0000	mg/g

Analytical Data

Placed in Desiccator					**Run Number**	2		
	Number	**Date**	**Time**		**Run Start Time**	8:40		
Filter	G-208	05/05/11	10:30		**Leakage Evident?**	☐		
Acetone Wash Beaker	3	05/05/11	11:00		**Estimated Volume**			

		Filter	**Acetone**	**Date**	**Time**	**Humidity**	**Temp**	**Cal Audit**
		g	g	mm/dd/yy	hh:mm	%RH	°F	g
Measurement 1	$(m_{1f}),(m_{1a})$	0.3889	69.5118	05/07/11	10:45	44	71	
Measurement 2	$(m_{2f}),(m_{2a})$	0.3889	69.5118	05/08/11	9:15	41	70	
Measurement 3	$(m_{3f}),(m_{3a})$							
Measurement 4	$(m_{4f}),(m_{4a})$							

Results					**Acetone Wash**			
Final Weight	$(m_{ff}),(m_{fa}')$	0.3889	69.5118	g	**Bottle Wt with Wash**	(m_{bw})	124.6500	g
Tare Weight	$(m_{tf}),(m_{ta}')$	0.3680	69.4925	g	**Additional Rinse Wt**	(m_{ar})	26.7679	g
Weight Gain	$(m_f),(m_a')$	20.9	19.3	mg	**Bottle Tare Weight**	(m_{tb})	69.4925	g
Blank Adjustment	(W_a)		0.0	mg	**Net Wash Weight**	(m_{nw})	81.9254	g
Total Particulates	(m_n)		40.2	mg	**Blank Concentration**	(C_a)	0.0000	mg/g

Analytical Data

Placed in Desiccator					**Run Number**	3		
	Number	**Date**	**Time**		**Run Start Time**	12:05		
Filter	G-209	05/05/11	10:30		**Leakage Evident?**	☐		
Acetone Wash Beaker	4	05/05/11	11:00		**Estimated Volume**			

		Filter	**Acetone**	**Date**	**Time**	**Humidity**	**Temp**	**Cal Audit**
		g	g	mm/dd/yy	hh:mm	%RH	°F	g
Measurement 1	$(m_{1f}),(m_{1a})$	0.4177	74.2878	05/07/11	10:45	44	71	
Measurement 2	$(m_{2f}),(m_{2a})$	0.4179	74.2880	05/08/11	9:15	41	70	
Measurement 3	$(m_{3f}),(m_{3e})$							
Measurement 4	$(m_{4f}),(m_{4a})$							

Results					**Acetone Wash**			
Final Weight	$(m_{ff}),(m_{fa}')$	0.4178	74.2879	g	**Bottle Wt with Wash**	(m_{bw})	151.5029	g
Tare Weight	$(m_{tf}),(m_{ta}')$	0.3697	74.1963	g	**Additional Rinse Wt**	(m_{ar})	50.3558	g
Weight Gain	$(m_f),(m_a')$	48.1	91.6	mg	**Bottle Tare Weight**	(m_{tb})	74.1963	g
Blank Adjustment	(W_a)		0.0	mg	**Net Wash Weight**	(m_{nw})	127.6624	g
Total Particulates	(m_n)		139.7	mg	**Blank Concentration**	(C_a)	0.0000	mg/g

Formulas Used

m_{ff} = average of last two filter measurements

m_{fa}' = average of last two acetone measurements

$m_f = m_{ff} - m_{tf}$

$m_a' = m_{fa}' - m_{ta}'$

$W_a = C_a m_{nw}$

$m_{nw} = m_{bw} + m_{ar} - m_{tb}$

$m_n = m_f + m_a' - W_a$

METHOD 5 - SAMPLE ANALYTICAL DATA SHEET

Plant Name	USSC Clewiston Mill	**Date**	04/29/11
Sampling Location	Sugar Dryer Duct	**Project #**	2525
Operator	C. Horton	**Acetone Lot Number**	

Analytical Data

Placed in Desiccator					**Run Number**	4		
	Number	**Date**	**Time**		**Run Start Time**	13:50		
Filter	G-210	05/05/11	10:30		**Leakage Evident?**	☐		
Acetone Wash Beaker	5	05/05/11	11:00		**Estimated Volume**			

		Filter	**Acetone**	**Date**	**Time**	**Humidity**	**Temp**	**Cal Audit**
		g	g	mm/dd/yy	hh:mm	%RH	°F	g
Measurement 1	$(m_{1f}),(m_{1a})$	0.3835	77.2347	05/07/11	10:45	44	71	
Measurement 2	$(m_{2f}),(m_{2a})$	0.3835	77.2345	05/08/11	9:15	41	70	
Measurement 3	$(m_{3f}),(m_{3a})$							
Measurement 4	$(m_{4f}),(m_{4a})$							

Results					**Acetone Wash**			
Final Weight	$(m_{ff}),(m_{fa}')$	0.3835	77.2346	g	**Bottle Wt with Wash**	(m_{bw})	170.1644	g
Tare Weight	$(m_{tf}),(m_{ta}')$	0.3734	77.1276	g	**Additional Rinse Wt**	(m_{ar})	50.5752	g
Weight Gain	$(m_f),(m_a')$	10.1	107.0	mg	**Bottle Tare Weight**	(m_{tb})	77.1276	g
Blank Adjustment	(W_a)		0.0	mg	**Net Wash Weight**	(m_{nw})	143.6120	g
Total Particulates	(m_n)		117.1	mg	**Blank Concentration**	(C_a)	0.0000	mg/g

Analytical Data

Placed in Desiccator					**Run Number**	5		
	Number	**Date**	**Time**		**Run Start Time**			
Filter					**Leakage Evident?**	☐		
Acetone Wash Beaker					**Estimated Volume**			

		Filter	**Acetone**	**Date**	**Time**	**Humidity**	**Temp**	**Cal Audit**
		g	g	mm/dd/yy	hh:mm	%RH	°F	g
Measurement 1	$(m_{1f}),(m_{1a})$							
Measurement 2	$(m_{2f}),(m_{2a})$							
Measurement 3	$(m_{3f}),(m_{3a})$							
Measurement 4	$(m_{4f}),(m_{4a})$							

Results					**Acetone Wash**			
Final Weight	$(m_{ff}),(m_{fa}')$			g	**Bottle Wt with Wash**	(m_{bw})	0.0000	g
Tare Weight	$(m_{tf}),(m_{ta}')$		0.0000	g	**Additional Rinse Wt**	(m_{ar})	0.0000	g
Weight Gain	$(m_f),(m_a')$			mg	**Bottle Tare Weight**	(m_{tb})	0.0000	g
Blank Adjustment	(W_a)		0.0	mg	**Net Wash Weight**	(m_{nw})	0.0000	g
Total Particulates	(m_n)			mg	**Blank Concentration**	(C_a)	0.0000	mg/g

Analytical Data

Placed in Desiccator					**Run Number**	6		
	Number	**Date**	**Time**		**Run Start Time**			
Filter					**Leakage Evident?**	☐		
Acetone Wash Beaker					**Estimated Volume**			

		Filter	**Acetone**	**Date**	**Time**	**Humidity**	**Temp**	**Cal Audit**
		g	g	mm/dd/yy	hh:mm	%RH	°F	g
Measurement 1	$(m_{1f}),(m_{1a})$							
Measurement 2	$(m_{2f}),(m_{2a})$							
Measurement 3	$(m_{3f}),(m_{3a})$							
Measurement 4	$(m_{4f}),(m_{4a})$							

Results					**Acetone Wash**			
Final Weight	$(m_{ff}),(m_{fa}')$			g	**Bottle Wt with Wash**	(m_{bw})	0.0000	g
Tare Weight	$(m_{tf}),(m_{ta}')$		0.0000	g	**Additional Rinse Wt**	(m_{ar})	0.0000	g
Weight Gain	$(m_f),(m_a')$			mg	**Bottle Tare Weight**	(m_{tb})	0.0000	g
Blank Adjustment	(W_a)		0.0	mg	**Net Wash Weight**	(m_{nw})	0.0000	g
Total Particulates	(m_n)			mg	**Blank Concentration**	(C_a)	0.0000	mg/g

Formulas Used

m_{ff} = average of last two filter measurements	$m_f = m_{ff} - m_{tf}$	$W_a = C_a m_{nw}$	$m_n = m_f + m_a' - W_a$
m_{fa}' = average of last two acetone measurements	$m_a' = m_{fa}' - m_{ta}'$	$m_{nw} = m_{bw} + m_{ar} - m_{tb}$	

RECORD OF VISUAL DETERMINATION OF OPACITY

SOURCE/PROCESS INFORMATION

FACILITY NAME: USSC Clewiston Mill

SOURCE NAME: Sugar Dryer 2 (EU-029) | PERMIT NUMBER: 0510003-032-AV

LOCATION ADDRESS: South W.C. Owen

CITY: Clewiston | STATE: FL | ZIP: 33440

UNIT LOAD: Base | HEAT INPUT: TBD

CONTROL EQUIPMENT: Scrubber | OPERATING MODE: Normal

FUEL TYPE/RATE: None | PERMITTED RATE: 85 Tons/Hr

DESCRIBE EMISSION POINT: Square Vent on Side

HEIGHT ABOVE GROUND LEVEL: ca 75 FT | HEIGHT OF OBSERVATION POINT: ca 6 FT

EMISSIONS DESCRIPTION

DESCRIBE EMISSIONS: START: None | END: None

PLUME COLOR: N/A | PLUME TYPE: None

WATER DROPLETS PRESENT: ☐ Yes ☒ No | IF YES, IS PLUME: ☐ Attached ☐ Detached

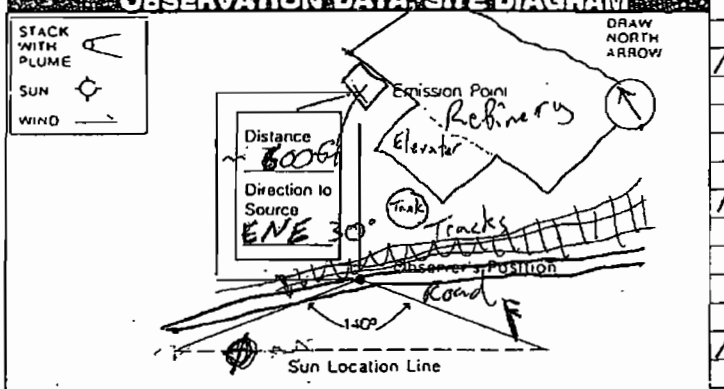
METEOROLOGICAL INFORMATION

BACKGROUND: START: Building | END: Same | BACKGROUND COLOR: START: Cream | END: Same

SKY CONDITIONS / CLOUD COVER: START: Overcast | END: Same | AMBIENT TEMPERATURE: START: 93° | END: 95°

WIND SPEED: START: 2-3 | END: Same | WIND DIRECTION: START: S | END: Same

OBSERVATION DATA/SITE DIAGRAM



SUMMARY OF AVERAGE OPACITY

SET NUMBER	TIME START	TIME END	OPACITY SUM	OPACITY AVERAGE

COMPLIANCE INFORMATION

RANGE OF OPACITY READINGS: MAXIMUM: 0 | MINIMUM: 0

HIGHEST 6 MINUTE AVERAGE: 0.0

COMMENTS:

OBSERVER: Charles Horton | DATE: 4/28/11

OBSERVER'S SIGNATURE:

OBSERVER CERTIFICATION NUMBER: 393052 | EXPIRATION DATE: 8/4/2011

OBSERVATION RECORD

DATE: 4/28/11

HOUR	MINUTE	STACK A 0	STACK A 15	STACK A 30	STACK A 45
1610	0	0	0	0	0
1611	1	0	0	0	0
1612	2	0	0	0	0
1613	3	0	0	0	0
1614	4	0	0	0	0
1615	5	0	0	0	0
	6	0	0	0	0
	7	0	0	0	0
	8	0	0	0	0
	9	0	0	0	0
1620	10	0	0	0	0
	11	0	0	0	0
	12	0	0	0	0
	13	0	0	0	0
	14	0	0	0	0
1625	15	0	0	0	0
	16	0	0	0	0
	17	0	0	0	0
	18	0	0	0	0
	19	0	0	0	0
1630	20	0	0	0	0
	21	0	0	0	0
	22	0	0	0	0
	23	0	0	0	0
	24	0	0	0	0
1635	25	0	0	0	0
	26	0	0	0	0
	27	0	0	0	0
	28	0	0	0	0
	29	0	0	0	0
1640	30	0	0	0	0
	31	0	0	0	0
	32	0	0	0	0
	33	0	0	0	0
	34	0	0	0	0
1645	35	0	0	0	0
	36	0	0	0	0
	37	0	0	0	0
	38	0	0	0	0
	39	0	0	0	0
1650	40	0	0	0	0
	41	0	0	0	0
	42	0	0	0	0
	43	0	0	0	0
	44	0	0	0	0
1655	45	0	0	0	0
	46	0	0	0	0
	47	0	0	0	0
	48	0	0	0	0
	49	0	0	0	0
1700	50	0	0	0	0
	51	0	0	0	0
	52	0	0	0	0
	53	0	0	0	0
	54	0	0	0	0
1705	55	0	0	0	0
1706	56	0	0	0	0
1707	57	0	0	0	0
1708	58	0	0	0	0
1709	59	0	0	0	0

STACK B: 0 | 15 | 30 | 45