

Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources*. AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

**PARTICULATE EMISSIONS COMPLIANCE TEST
LUZENAC AMERICA
SAPPINGTON MILL
Montana Air Quality Permit 1996-03**

DECEMBER 1994 - MARCH 1995

By

**Bison Engineering, Inc.
P.O. Box 1703
30 S. Ewing
Helena, MT 59601
(406) 442-5768**

Report Date: March 29, 1995

EXECUTIVE SUMMARY

Bison Engineering, Inc. (Bison) personnel performed Title 40, Code of Federal Regulations (CFR), Part 60, Appendix A, Methods 1 through 5, for selected emission sources, and, in addition, Method 9 visual opacity determinations for all stationary sources at the Luzenac America Sappington talc mill. These tests were conducted during the months of December 1994 through March 1995, conforming to the requirements specified in Permit 1996-03 issued by the Montana Department of Health and Environmental Sciences, Air Quality Division (AQD). Bison filed a Pretest Notification describing the test in detail on August 10, 1994, followed with supporting documentation. The cover letter and protocol can be found in Appendix A.

Thirteen of the twenty-two stationary sources at the Sappington mill were tested for initial compliance for particulate emissions and opacity. Visual opacity determinations were completed on four additional stationary sources. Particulate and opacity testing of the remaining five sources will be completed in the near future as they are modified or brought into service. Preconstruction permits are pending on proposed modifications.

Permit 1996-03 refers to specific emission limits of 0.02 grains per dry standard cubic feet (g/dscf) and 7% opacity. Table 1 summarizes the emissions from the December 1994 and March 1995 tests at the Sappington mill. Method 9 results reflect the highest 6-minute average during a 1-hour visual observation.

Table 1: Summary of Emissions

Dust Collector Identification	Source Description	Method 5		Method 9
		g/dscf	lbs/hr	6 min. avg.
DC-1	Screen and Transfers	0.0046	0.1	0
DC-2	Impactor and Impactor Conveyor	0.0019	0	0
DC-3	Coarse Ore Bin #1	0.0016	0	0
DC-4	Coarse Ore Bin #2	0.0168	0.2	0
DC-7	ACM #2	0.0027	0.2	0
DC-17	ACM #3	0.0057	0.3	0
DC-9	Fine Product Silo #4	0.0016	0	0
DC-10	Pellet Drier and Pelletizer	0.0013	0.1	0
DC-19	Fine Product Silo #4	0.0009	0	0
DC-15	Durant Packer #2	0.0056	0.1	0
DC-23	Packaging Area Target Box	0.0013	0	0
DC-24	Classifier Cyclone	0.0007	0	0
DC-22A	Vacuum System	0.0021	0	0
DC-18	Fine Product Silo #3	-	-	0
DC-16	Coarse Ore Bin #3	-	-	0
DC-6	ACM #1	-	-	0
DC-8	Fine Product Silo #1	-	-	0
DC-21	Packaging Area Local Exhaust	To Be Tested Following Modifications		
DC-5	Pelletizer Feed Bin	To Be Tested Following Modifications		
DC-20	Pelletizer Feed Bin	To Be Tested Following Modifications		
DC-11	Compacted Talc Silo	To Be Tested Following Modifications		
DC-14	Bemis Packer #2	To Be Tested Following Modifications		

This report contains detailed notes and test information. Field and laboratory data, calibrations, and supporting data are included in the Appendices. All relevant nomenclature directly follows EPA methodology.

CERTIFICATION OF REPORT INTEGRITY

Bison Engineering, Inc. certifies this report represents the emissions tested August 24, 1994. Every effort was made to obtain accurate and representative data. The test team complied with the procedures specified in Permit 1996-03.

Team Leader: Mitchell W. Anderson *for*

Title: Staff Engineer

Signature: *David L. Kinghorn*

Date: 4/18/95

Reviewer: David L. Kinghorn

Title: Senior Project Engineer

Signature: *David L. Kinghorn*

Date: 4/18/95

TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
CERTIFICATION OF REPORT INTEGRITY	iii
1.0 INTRODUCTION	1
1.1 Purpose	1
1.2 Emission Source Description	1
1.3 Control Equipment Description	1
1.4 Source Test Dates	1
1.5 Pollutants Tested	2
1.6 Operating Personnel	3
1.6.1 Bison Engineering, Inc.	3
1.6.2 Luzenac America	4
1.6.3 Montana Air Quality Division	4
2.0 TEST RESULTS SUMMARY	5
2.1 Emission Results	5
2.2 Production Data	7
2.3 Discussion of Deviations	10
3.0 SAMPLING AND ANALYSIS	11
3.1 Sampling Location	11
3.2 Sampling Procedures	11
3.3 Field Notes and Special Circumstances	12
4.0 CALCULATIONS	13
4.1 Nomenclature and Formulae	13
5.0 QUALITY ASSURANCE	14

LIST OF APPENDICES

APPENDIX A:	PRETEST PROTOCOL AND ATTACHMENTS
APPENDIX B:	FIELD DATA
APPENDIX C:	LABORATORY DATA
APPENDIX D:	SCHEMATICS
APPENDIX E:	NOMENCLATURE AND FORMULAE
APPENDIX F:	CALIBRATION DATA

LIST OF TABLES

Table 1:	Summary of Emissions	ii
Table 2:	Sappington Source and Manufacturer Listing	2
Table 3:	Test Results From the Sappington Mill	5
Table 4:	Sappington Source Test Log	8

1.0 INTRODUCTION

1.1 Purpose

Montana Air Quality Permit 1996-03 regulates the emission of particulates from Luzenac America's Sappington mill talc processing facility. Section II.A.1 of the final permit dated November 5, 1994 lists the applicable equipment required to meet the emission limits of 0.02 g/dscf and less than 7% opacity. Permit Section I.A lists the existing processing equipment regulated under these emission limits.

Bison submitted a pretest protocol on August 10, 1994 which summarized the proposed particulate emission testing. This protocol for Method 5 and Method 9 is referenced in Appendix A.

1.2 Emission Source Description

A listing of the dust collectors tested for particulate at the Sappington mill can be found in Table 2. Additional information from Table 2 includes the equipment manufacturer and corresponding model number.

1.3 Control Equipment Description

Luzenac America utilizes baghouses as its primary means for the control of particulate emissions from the Sappington mill.

1.4 Source Test Dates

Bison personnel arrived at the site on December 28, 1994. The final test run of the thirteenth stationary source was completed on January 30, 1995. The final opacity readings were completed on March 15, 1995.

Table 2: Sappington Source and Manufacturer Listing

Dust Collector		Equipment Manufacturer	Model Number
DC-1	Screen and Transfers	Mikro Pulsaire	121S-8-20C
DC-2	Impactor and Impactor Conveyor	Mikro Pulsaire	81S-8-20C
DC-21	Packaging Area Local Exhaust	Farr-Tenkay	L-1122870-A
DC-3	Coarse Ore Bin #1	DCE Dalamatic	DLMV7/7F1
DC-18	Fine Product Silo #3	Mikro Pulsaire	16S-8-20B
DC-4	Coarse Ore Bin #2	Mikro Pulsaire	16S-8-20B
DC-16	Coarse Ore Bin #3	Mikro Pulsaire	16S-8-20B
DC-6	ACM #1	Mikro Pulsaire	238S-8-40TR
DC-7	ACM #2	Mikro Pulsaire	238S-8-40TR
DC-17	ACM #3	Mikro Pulsaire	121S-8-40C
DC-8	Fine Product Silo #1	DCE Dalamatic	DLMV 15/15F3
DC-9	Fine Product #2	DCE Dalamatic	DLMV 15/15F3
DC-5	Pelletizer Feed Bin	DCD Dalamatic	DLMV 15/15F3
DC-20	Pelletizer Feed Bin	DCD Dalamatic	DLMV 15/15F3
DC-10	Pellet Dryer and Pelletizer	Mikro Pulsaire	289S-10-20C
DC-11	Compacted Talc Silo	Mikro Pulsaire	25S-20-C
DC-19	Fine Product Silo #4	Mikro Pulsaire	25S-8-30B
DC-14	Bemis Packer #1	Mikro Pulsaire	49S-8-20C
DC-15	Durant Packer #2	DCE Dalamatic	DLMV30/15F6
DC-23	Packaging Area Target Box	Mikro Pulsaire	12-8-2200
DC-24	Classifier Cyclone	Mikro Pulsaire	16S-8-30C
DC-22A	Vacuum System	Mikro Pulsaire	31-8-220

1.5 Pollutants Tested

Bison tested thirteen sources at the Sappington mill for particulate emissions according to procedures outlined in Method 5, and conducted Method 9 visual opacity determinations. Four additional sources were observed for opacity only. The remaining five stationary sources will be tested for particulate and opacity in the near future as they are modified or brought into service. Preconstruction permits are pending on proposed modifications.

Test personnel utilized the methodologies according to EPA Code of Federal Regulations (40 CFR 60, Appendix A). The following methods were employed in the field:

- Sampling Location and Traverse Points: Method 1, "Sample and Velocity Traverses for Stationary Sources".
- Velocity and Volume: Method 2, "Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)".
- Molecular Weight: Method 3, "Gas Analysis for the Determination of Dry Molecular Weight".
- Particulate: Method 5, "Determination of Particulate Emissions From Stationary Sources".
- Visible Opacity: Method 9, "Visual Determination of the Opacity of Emissions from Stationary Sources".

EPA Method 4, "Determination of Moisture Content in Stack Gases", is incorporated within Method 5. Test runs for Method 5 consisted of a minimum sampling time of one hour in duration and a minimum volume of 60 dscf. A total of three test runs were conducted for each source.

Concurrent visual opacity observations were conducted during each particulate test run and consisted of either a ten minute continuous monitoring session followed by a 1-minute observation every 10 minutes or a continuous 60-minute session.

1.6 Operating Personnel

1.6.1 Bison Engineering, Inc.

Mitchell W. Anderson (Staff Engineer) was the manager of this project and authored this report. Calvin W. Loomis (Lead Engineer), Bill Shaw (Lead Technician), Shawn Bryant (Technician), and Mike Chovanak (Lead Scientist) assisted in the testing system operation and opacity observations. Laboratory analysis was performed by Jessie Holtman (Data Technician), and all field and laboratory data were reviewed by Bob Richards (Lead Engineer). David L. Kinghorn (Senior Project Engineer) assisted in the gathering of field data and reviewed the report.

1.6.2 Luzenac America

Randy Geiger (Plant Engineer) conducted the initial safety meeting and follow-up plant site tour, indicating the sources to be sampled. A continuous dialogue between Bison and Luzenac personnel concerning process scheduling and coordination was maintained with Doug Templeton (Mill Supervisor) and Skip Parker (Mill Foreman).

1.6.3 Montana Air Quality Division

Jeff Briggs was informed of the testing schedule and was physically present during the majority of sampling runs to observe testing procedure integrity and plant operations.

2.0 TEST RESULTS SUMMARY

2.1 Emission Results

Section II.A.1 of Montana Air Quality Permit 1996-03 limits the emissions from the dust collectors at the Sappington mill to 0.02 g/dscf. The following table summarizes particulate emissions from the Sappington mill for each test run. Method 5 test data are summarized in units of g/dscf and lbs/hr. Method 9 opacity results reflect the highest average for a 6-minute time period.

Table 3: Test Results From the Sappington Mill

Dust Collector Identification	Isokinetics (Percent)	Meter Volume (dscf)	Method 5		Method 9 (6 min. avg.)
			g/dscf	lbs/hr	
DC-1					
Run 1	100.2	42.81	0.0101	0.4	0
Run 3	103.8	79.83	0.0020	0	0
Run 4	101.8	88.04	0.0018	0	0
AVERAGE	101.9	70.23	0.0046	0.1	0
DC-2					
Run 1	102.1	68.39	0.0022	0.1	0
Run 2	101.6	66.13	0.0018	0	0
Run 3	100.5	62.37	0.0017	0	0
AVERAGE	101.4	65.63	0.0019	0	0
DC-3					
Run 1	99.0	72.79	0.0018	0	0
Run 2	101.4	67.38	0.0015	0	0
Run 3	100.5	78.17	0.0016	0	0
AVERAGE	100.3	72.78	0.0016	0	0
DC-4					
Run 1	100.2	95.15	0.0179	0.3	0
Run 2	100.6	69.14	0.0197	0.2	0
Run 3	99.9	68.82	0.0129	0.2	0
AVERAGE	100.2	77.70	0.0168	0.2	0
DC-7					
Run 4	101.9	85.15	0.0017	0.1	0
Run 5	99.9	76.80	0.0036	0.2	0
Run 6	100.1	68.70	0.0029	0.2	0
AVERAGE	100.6	76.88	0.0027	0.2	0

Table 3: Test Results From the Sappington Mill (cont.)

Dust Collector Identification	Isokinetics (Percent)	Meter Volume (dscf)	Method 5		Method 9 (6 min. avg.)
			g/dscf	lbs/hr	
DC-17					
Run 1	98.9	70.90	0.0052	0.3	0
Run 2	100.3	82.78	0.0059	0.3	0
Run 3	99.8	66.09	0.0059	0.3	0
AVERAGE	99.7	73.26	0.0057	0.3	0
DC-9					
Run 1	100.1	79.77	0.0026	0	0
Run 2	100.2	71.80	0.0018	0	0
Run 3	101.4	73.16	0.0005	0	0
AVERAGE	100.6	74.91	0.0016	0	0
DC-10					
Run 3	101.0	65.38	0.0013	0.1	0
Run 4	100.2	70.20	0.0019	0.2	0
Run 5	102.0	67.43	0.0006	0.1	0
AVERAGE	101.1	67.67	0.0013	0.1	0
DC-19					
Run 1	101.2	76.09	0.0013	0	0
Run 2	100.1	75.95	0.0011	0	0
Run 4	105.2	76.96	0.0003	0	0
AVERAGE	102.2	76.33	0.0009	0	0
DC-15					
Run 1	100.3	64.87	0.0048	0	0
Run 2	100.3	70.23	0.0063	0.1	0
Run 3	100.0	70.43	0.0056	0.1	0
AVERAGE	100.2	68.51	0.0056	0.1	0
DC-23					
Run 1	102.3	70.19	0.0008	0	0
Run 2	101.9	77.13	0.0016	0	0
Run 3	101.1	67.78	0.0016	0	0
AVERAGE	101.8	71.70	0.0013	0	0
DC-24					
Run 1	101.3	65.68	0.0009	0	0
Run 2	100.1	64.17	0.0006	0	0
Run 3	100.5	65.49	0.0005	0	0

Dust Collector Identification	Isokinetics (Percent)	Meter Volume (dscf)	Method 5		Method 9 (6 min. avg.)
			g/dscf	lb/hr	
AVERAGE	100.6	65.11	0.0007	0	0
DC-22A					
Run 1	95.7	48.93	0.0034	0	0
Run 2	97.7	60.99	0.0020	0	0
Run 3	98.5	63.29	0.0009	0	0
AVERAGE	97.3	57.74	0.0021	0	0
DC-18					
Run 1	-	-	-	-	0
Run 2	-	-	-	-	0
Run 3	-	-	-	-	0
AVERAGE	-	-	-	-	0
DC-16					
Run 1	-	-	-	-	0
Run 2	-	-	-	-	0
Run 3	-	-	-	-	0
AVERAGE	-	-	-	-	0
DC-8					
Run 1	-	-	-	-	0
Run 2	-	-	-	-	0
Run 3	-	-	-	-	0
AVERAGE	-	-	-	-	0
DC-8					
Run 1	-	-	-	-	0
Run 2	-	-	-	-	0
Run 3	-	-	-	-	0
AVERAGE	-	-	-	-	0

* Subsequent to the testing, Luzenac personnel inspected this collector and found one bag with a hole in it and two others of questionable integrity. They have been replaced.

Appendix B contains raw field data and computer generated spreadsheets for each source test run, velocity traverse data, and traverse point calculations.

2.2 Production Data

Prior to each test run, communication with processing personnel was established to determine whether a particular source was in operation. The plant processed talc under normal operating conditions during all Method 5 and Method 9 test runs. Table 4 below displays the times and dates for each particulate run at the 13 sources that were tested. Production records were obtained from the Sappington mill and are presented in Appendix B.

Table 4: Sappington Source Test Log

Date	Source	Test Run	Time
12-28-95	DC-22A	2	1524
12-28-95	DC-22A	3	1733
12-30-94	DC-17	1	1352
12-30-94	DC-17	2	1632
12-30-94	DC-17	3	1830
1-3-95	DC-4	1	1440
1-4-95	DC-4	2	1020
1-5-95	DC-4	3	937
1-6-95	DC-2	1	1326
1-9-95	DC-2	2	1200
1-9-95	DC-2	3	1425
1-6-95	DC-1	1	935
1-9-95	DC-1	3	1305
1-9-95	DC-1	4	1422
1-11-95	DC-10	3	1535
1-12-95	DC-10	4	1000
1-12-95	DC-10	5	1320
1-11-95	DC-24	1	1155
1-11-95	DC-24	2	1457
1-12-95	DC-24	3	1019
1-16-95	DC-15	1	1117
1-17-95	DC-15	2	1405
1-18-95	DC-15	3	930
1-16-95	DC-3	1	1426
1-18-95	DC-3	2	1150
1-19-95	DC-3	3	1130
1-17-95	DC-23	1	1536
1-18-95	DC-23	2	948
1-18-95	DC-23	3	1344
1-23-95	DC-19	1	1345
1-23-95	DC-19	2	1046
1-25-95	DC-19	4	1027
1-24-95	DC-7	4	1150

Table 4: Sappington Source Test Log (cont.)

Date	Source	Test Run	Time
1-24-95	DC-7	5	1440
1-25-95	DC-7	6	920
1-25-95	DC-9	1	1537
1-25-95	DC-9	2	1613
1-30-95	DC-9	3	1345
Production Data During Additional Method 9 Tests			
Date	Source	Time	Production Data
3-2-95	DC-1	945-1045	Ore - 20 tph
3-3-95	DC-1	1200-1300	Ore - 20 tph
3-3-95	ACM 1	810-910	M100 - 5 tph
3-15-95	ACM 1	1340-1440	N-S00 - 4 tph
3-15-95	ACM 1	1450-1550	N-S00 - 4 tph
1-5-95	DC-7	1000-1100	M100 - 5 tph
3-2-95	DC-8	1420-1520	N-S00 - 4 tph
3-2-95	DC-8	1520-1620	N-S00 - 4 tph
3-2-95	DC-8	1620-1720	N-S00 - 4 tph
1-10-95	DC-10	1030-1130	M100 - 5 tph
1-10-95	DC-10	1130-1230	M100 - 5 tph
1-10-95	DC-10	1310-1410	M100 - 5 tph
1-16-95	DC-15	1120-1220	N-665 - 3 tph
3-9-95	DC-16	840-1000	M100 - 5 tph
3-9-95	DC-16	1000-1500	M100 - 5 tph
12-30-94	DC-17	1400-1500	M100 - 5 tph
12-30-94	DC-17	1550-1650	M100 - 5 tph
1-3-95	DC-17	935-1035	M100 - 5 tph
3-2-95	DC-18	1110-1410	M100 - 5 tph
12-28-94	DC-22A	1250-1350	Vacuum - Normal Vacuum Waste & Spillage
1-3-95	DC-22A	1045-1145	Vacuum - Normal Vacuum Waste & Spillage

2.3 Discussion of Deviations

From Table 4, it can be observed that more than 3 runs were completed for several sources. For instance, upon completion of the third run of DC-1, it was discovered that the tested sample volume was less than the 61 dscf required for a valid test. Thus, a fourth test run was necessary. A fourth test run was mandatory for DC-19 because of an unsuccessful post-test leak check for the third test run. Six test runs were essential for DC-7 as an error was discovered in the laboratory after the first three runs. Moisture problems were encountered during the first two runs at the pelletizer (DC-10); therefore, runs 3, 4, and 5 were the valid tests. On the second run of DC-24, traverse points were revisited for a duration of one minute each to capture the required sample volume.

3.0 SAMPLING AND ANALYSIS

3.1 Sampling Location

For many of the sources, a fabricated portable stack composed of sheet metal was constructed and connected to the outlet of the dust collector with flexible rubber hose. The design for the rectangular duct can be found in Appendix D. The inside diameter of the rectangular duct is 18 inches by 18 inches and 15 feet in length. Particulate sampling was conducted through 3 sampling ports cut in the duct sidewall. Each sampling port consisted of 3 traverse points for a total of 9 sample points per test.

A round portable stack was also used to sample emissions from the dust collectors. The total length of the stack was 10 feet and had an inside diameter of 12 inches. For each test using this type of stack, 4 traverse points per port were required. Two 4-inch sampling ports were cut at a distance of 2 feet from the outlet in order to satisfy the 8 and 2 downstream/upstream disturbance requirements specified by the method. A schematic for the round portable stack is located in Appendix D.

Talc particulate sources in the plant, such as the impactor, pelletizer, ACM #2, and the vacuum system, represent the 4 sources in which a portable stack was not used. Scaffolding adjusted to a suitable height was utilized to test effluent from ACM #2 and DC-7. Sawhorses mounted on the outside roof proved to be an effective system for the sampling the vacuum system. Special rigging was installed on the DC-7 duct because of its horizontal orientation. The probe was clamped to a steel outrigger which was welded to the underside of the duct adjacent to the downward facing sampling port. Flexible tubing was then attached to the end of the probe and the heated filter box assembly. An in-stack filter was utilized in conjunction with the stainless steel probe utilized for DC-7.

3.2 Sampling Procedures

The pre-test protocol in Appendix A contains a schematic of the particulate sampling train. Operators performed a Method 2 velocity traverse before each particulate test run. Method 2 data provided dwell time at each traverse point, as well as sampling rate, average temperature and pressure differential, and optimum nozzle size.

Between each test run, operators disassembled and washed down the probe and filter glassware into a sample bottle. Impinger water was preserved into a second bottle, and silica gel was deposited into a third bottle. The filter was preserved for lab analysis.

Stack gas moisture collected from the impingers and silica gel was weighed to within 0.1 grams accuracy in Bison's mobile laboratory. This data, in combination with temperature flow and gas composition measurements taken during the run, allowed instantaneous isokinetic calculations for each traverse point.

All samples were subsequently returned to the Bison laboratory in Helena for desiccation and mass analyses.

3.3 Field Notes and Special Circumstances

The sampling meter box, Model 2010, is manufactured by the Nutech Corporation. All glassware including filter assembly, impingers, and connections are also manufactured by Nutech. Appendix A contains sample train schematics.

Appendix B contains the raw field data forms and computer generated spreadsheets and calculations for each test run. When an inadequate sampling volume was collected or post-leak check failures occurred, the problem was addressed; and a solution was implemented.

APPENDIX A: PRE-TEST PROTOCOL

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
AIR QUALITY DIVISION



(406) 444-3454
(406) 444-3671
FAX (406) 444-5275

836 FRONT STREET

STATE OF MONTANA

PO BOX 200901
HELENA, MONTANA 59620-0901

November 9, 1994

Mitchell Anderson
Bison Engineering, Inc.
P. O. Box 1703
Helena, Montana 59624

RECEIVED
NOV 14 1994
BISON

Dear Mitch:

The Air Quality Division (AQD) has reviewed your request to include upcoming testing at Luzenac's Three Forks and Sappington mills under the protocol for the vacuum system at the Sappington mill submitted in August 1994. This inclusion is acceptable, with the following stipulations:

1. Ensure that the source test documents include complete process descriptions and flow diagrams, as well as sketches of sample port locations.
2. Compliance testing for opacity shall include three one-hour runs.
3. Systems must be operated at greater than 90% of their normal operating capacity during compliance testing.

As for reducing the NSPS testing requirements, the position of EPA Region VIII is that this will be done on a case-by-case basis after reviewing the completed source tests on similar equipment. Opacity testing, however, must be performed on all sources. A copy of Region VIII's response to the petitions is enclosed.

Please keep the AQD informed as to the testing dates so we may have a representative present. If you have any questions, please give me a call.

Sincerely,

A handwritten signature in dark ink, appearing to read "Jeff Briggs".

Jeff Briggs
Environmental Engineer

JB:bjd

Enclosure

cc: William Kraemer

30 SOUTH EWING

P.O. BOX 1703

HELENA, MT 59624



BISON ENGINEERING, INC.

PHONE: 406-442-5768

FAX: 406-449-6653

October 31, 1994

Mr. Jeff Briggs
MDHES Air Quality Division
P.O. Box 200901
Helena, MT 59620

Dear Jeff:

This letter summarizes our brief telephone conversation regarding Luzenac America's protocol for the Three Forks and Sappington mills. The Three Forks mill is currently in operation under Air Quality Permit #2282-02. Enclosed is a listing of the existing emission control equipment for the Sappington mill (see Attachment 1), and a source testing reduction petition for the testing of 12 dust collectors (see Attachment 2, in bold print).

Bison Engineering is requesting that the testing for particulate and opacity for silos 4 & 5 at the Three Forks mill and the 12 sources at the Sappington mill be included under the current protocol that was submitted to the Air Quality Division in August 1994.

Bison's objectives are to complete the required testing involving particulate emissions (Method 5), and the visual opacity of emissions (Method 9) from stationary sources according to the guidelines specified by The Code of Regulations, Title 40, Subchapter C, Part 60. Successful determinations of opacity emissions are dependant upon weather.

The testing for the Three Forks and Sappington mills is tentatively scheduled to begin as soon as possible and continue through the first week of January 1995, or until completion, whichever occurs first. Notification of the actual test dates for these two facilities will be submitted to the Air Quality Division no later than 7 days prior to each test. Sample port design and orientation of the 12 sources will be submitted with the final report.

The current addresses for the two facilities are listed below.

Mr. Jeff Briggs
April 19, 1995
Page 2

Three Forks Facility

Luzenac America
Western Talc Operations
767 Old Yellowstone Trail
Three Forks, MT 59752-9313

Sappington Facility

Luzenac America
28769 Sappington Road
Three Forks, MT 59752

Please contact me or Dave Kinghorn if you have any questions or require additional information.

Sincerely,

/s/

Mitchell W. Anderson

cc: William R. Kraemer



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

999 18th STREET - SUITE 500
DENVER, COLORADO 80202-2466

Ref: 8ART-AP

October 31, 1994

Robert E. Booher, Supervisor
Compliance and Enforcement Section
Air Quality Division
Department of Health
and Environmental Sciences
P.O. Box 200901
Helena, MT 59620-0901

REGISTERED

NOV 02 1994

AIR QUALITY BUREAU

Dear Mr. Booher:

This letter is in response to your letter, dated October 4, 1994, to Douglas M. Skie about a petition from Luzenac America Inc. for reduced NSPS compliance testing.

Since control devices and process operations have been shown to vary from one installation to the next, it is difficult to predict a source's compliance ability based on test results at a similar source using identical technology. If compliance utilizing a specific control technology can be shown to be significantly below the standard and several emitting units are using the same control technology, then consideration can be given to allowing the testing of a representative number of the units to be representative of all of the units. However, if test results of the selected units tested show a wide variation in the test results and the values tested are near the standards, testing of each and every unit should be conducted. It is noted in the proposal that both particulate and opacity testing are requested to be reduced. Even if Luzenac America Inc. can show that reduced particulate testing can demonstrate compliance for all of the units, EPA does not believe any reduction of the opacity testing should occur. Opacity testing of all of the emitting units can provide additional evidence that the correct units were tested for particulates.

With the similarity of the four silos and their fabric filters, it is probable that the results of two tested units would be representative of the non-tested units. However, adequacy of the testing must be determined on a case-by-case basis. The test results must show compliance well below the standard and show only small variability between testing results. If the test results from the two units meet these requirements, then EPA will agree that testing of the two units are representative of the two non-tested units.

The petition from Luzenac America Inc. for testing at Sappington Junction identified two proposals for representative testing. EPA agrees with Montana that petition #1 does not require testing of all filter models and the proposed testing strategy cannot be considered approvable. Since petition #2 does require testing of each filter model, it is possible that this

ONE	TWO	THREE
RH		11/2
RH		11/4
JB		
	(E)	
FROM	TO	(E)



petition could be approved as being appropriate to demonstrate compliance for all the emitting units. Should test results not show a large margin of compliance with the standards and fail to show only a small variation between individual tests, EPA will not be able to wave the source testing requirements for the non-tested units and they will need to be tested to demonstrate compliance. It is not possible to make this determination before any testing has been conducted because the questions about the margin of compliance and test result variation cannot be answered.

In summary, EPA agrees with Montana's determination about the appropriateness of reducing the number of bagfilter units that must be source tested for particulates, with the following prerequisites:

- 1 All emitting units must undergo opacity testing.
- 2 The representativeness of test results for non-tested emitting units must be evaluated using the following criteria:
 - a. variability of the test results obtained on the tested units, and
 - b. margin of compliance of the tested units, and
 - c. similarity of the control equipment and unit operations.
- 3 Case-by-case determinations to wave emission testing requirements for specific units must be made after the test results are evaluated.

This determination is consistent with EPA national policy that has been established, based on previous determinations, for case-by-case waiver determinations with the NSPS source testing requirements in 40 CFR 60.8(b)(4). If you have any questions about this determination please contact me at (303) 293-1773 or John Dale at (303) 294-7611.

Sincerely,



Ron Rutherford, Chief
Enforcement and Compliance Monitoring Section



Western Talc Operations • 767 Old Yellowstone Trail • Three Forks, MT 59752-9313 • (406) 285-3271 • Fax: (406) 285-3323

September 23, 1994

Mr. Jeffrey T. Chaffee, P. E., Chief
Air Quality Division
Montana Department of Health
and Environmental Sciences
P.O. Box 200901
Helena, MT 59620-0901

RE: Petition For Reduced NSPS Testing Requirements For Similar Emission Units At
Luzenac America's Sappington Mill

Dear Mr. Chaffee:

Luzenac America Inc. (Luzenac) is preparing to initiate compliance testing on existing air pollution control equipment which is subject to NSPS at our Sappington Mill. This equipment consists of fabric filter, pulse-jet dust collectors used to collect products and control emissions from the facility. Sixteen dust collectors were installed as original equipment; eight dust collectors were added at later dates. All twenty-four dust collectors at the facility are now either permitted or preconstruction permit applications for these emission units have been submitted to the Air Quality Division. It is our understanding that testing of all dust collectors for particulate emissions and opacity is necessary to prove compliance with NSPS regulations. Attachment 1 contains process information on all dust collectors at the facility.

Luzenac America is requesting that testing for particulate emissions and opacity only be required for one individual dust collector when multiple similar dust collectors are used in similar processes. This request is made for several reasons, including safety concerns and a desire to minimize redundant testing which needlessly wastes the time and resources of both Luzenac and the Air Quality Division. Please note that two-thirds of these testing requirements are for original equipment, and that only two source tests were originally required by the Air Quality Bureau at the time this equipment was installed.

Luzenac also requests that testing requirements be dropped for dust collectors DC-22, DC-12 and DC-13. DC-22 is scheduled to be replaced with a larger collector (DC-22A) which will handle emissions from the recently modified plant vacuum system more efficiently. A preconstruction permit application was submitted to replace DC-22 on September 19, 1994. Testing will then be completed on the new collector (DC-22A) after installation. DC-12 and DC-13 are scheduled to be permanently removed from service along with the rest of the bulk truck and rail loadout equipment. This equipment will be

removed from service as part of Luzenac's efforts to reduce emissions from the facility. The removal of this equipment will be addressed with a preconstruction permit application in the near future.

Attachment 2 is a source testing reduction petition for testing twelve individual dust collectors for particulate emissions and opacity. Tests of these twelve collectors should be representative of all twenty-four collectors at the facility. Dust collectors were grouped together based on process applications, air flow rates, and manufacturers and models where possible. Luzenac requests that satisfactory test results from these twelve dust collectors be considered sufficient proof of compliance with NSPS for all twenty four dust collectors at the facility. Successful results from this testing, which covers a broad spectrum of equipment manufacturers, equipment models, and process applications should provide reasonable proof of the efficiency of the fabric filter pulse-jet dust collectors in use at this facility.

If the source testing reduction petition listed in Attachment 2 is not acceptable, Luzenac requests that satisfactory results from the testing proposed in Attachment 3 be considered sufficient proof of compliance with NSPS for all twenty four dust collectors at the facility. This source testing reduction petition provides for testing 16 individual dust collectors for particulate emissions and opacity, effectively covering each make and model of dust collector used in similar processes at the facility.

Luzenac America plans to submit testing protocols as soon as possible after we receive your response to these requests. If you have any questions or concerns regarding these requests, please contact me at (406) 285-3271, or Steve Harms at (406) 285-3286.

Respectfully,



William R. Kraemer
Environmental Coordinator
Western Operations

Attachments

cc: R. J. Buettner
S. J. Harms
R. F. Goff

Attachment 1

Sappington Mill Emission Control Equipment

Dust Collector	Source	Installation Date	Average Flow ¹ (cfm)	Average Temp ² (F)	Estimated Emissions (tpy)	Equipment Manufacturer	Model
DC-1	Screen and Transfers	Original Equipment	8,000	70	5.10	Mikro Pulsaire	121S-8-20C
DC-2	Impactor and Impactor Conv.	Original Equipment	6,000	70	3.82	Mikro Pulsaire	81S-8-20C
DC-3	Coarse Ore Bin #1	Original Equipment	600	70	0.38	DCE Dalamatic	DLMV77F1
DC-4	Coarse Ore Bin #2	Original Equipment	600	70	0.38	Mikro Pulsaire	16S-8-20B
DC-5	Pelletizer Feed Bin	Original Equipment	600	70	0.38	DCE Dalamatic	DLMV15/15F3
DC-6	ACM #1	Original Equipment	7,700	130	4.41	Mikro Pulsaire	238S-8-40TR
DC-7	ACM #2	Original Equipment	7,700	130	4.41	Mikro Pulsaire	238S-8-40TR
DC-8	Fine Product Silo #1	Original Equipment	600	70	0.38	DCE Dalamatic	DLMV15/15F3
DC-9	Fine Product Silo #2	Original Equipment	600	70	0.38	DCE Dalamatic	DLMV15/15F3
DC-10	Pellet Dryer and Pelletizer	Original Equipment	17,200	125	9.93	Mikro Pulsaire	289S-10-20C
DC-11	Compacted Talc Silo	Original Equipment	700	70	0.45	Mikro Pulsaire	25S-8-20C
DC-12	Rail Loadout	Original Equipment	1,000	70	0.64	DCL	FS140
DC-13	Truck Loadout	Original Equipment	1,000	70	0.64	DCL	FS140
DC-14	Bemis Packer #1	Original Equipment	1,600	70	1.02	Mikro Pulsaire	49S-8-20C
DC-15	Durant Packer #2	Original Equipment	1,500	70	0.96	DCE Dalamatic	DLMV30/15F6
DC-16	Coarse Ore Bin #3	Original Equipment	600	70	0.38	Mikro Pulsaire	16S-8-20B
DC-17	ACM #3	1988	7,700	130	4.41	Mikro Pulsaire	121S-8-40C
DC-18	Fine Product Silo #3	1988	600	70	0.38	Mikro Pulsaire	16S-8-20B
DC-19	Fine Product Silo #4	1994	900	70	0.57	Mikro Pulsaire	25S-8-30B
DC-20	Pelletizer Feed Bin	1990	600	70	0.38	DCE Dalamatic	DLMV15/15F3
DC-21	Semi-bulk Bag Filling	1991	11,000	70	7.01	Farr-Tenkay	L-112287-A
DC-22	Vacuum System	Original Equipment	600	120	0.35	Mikro Pulsaire	12-8-2200
DC-23	Packaging Area Target Box	1989	600	70	0.38	Mikro Pulsaire	12-8-2200
DC-24	Classifier Cyclone	1986	700	150	0.39	Mikro Pulsaire	16S-8-30C

¹ Airflows are approximate and based on design criteria. The ACM product collectors are variable air volume systems; estimated average flows are used.

² Temperatures are approximate.

Attachment 2

Sappington Mill Source Testing Reduction Petition 1

Proposed Test #	Dust Collector	Source	Installation Date	Average		Estimated Emissions (tpy)	Equipment Manufacturer	Model
				Flow ¹ (cfm)	Temp ² (F)			
1	DC-1	Screen and Transfers	Original Equipment	8,000	70	5.10	Mikro Pulsaire	121S-8-20C
2	DC-2	Impactor and Impactor Conv.	Original Equipment	6,000	70	3.82	Mikro Pulsaire	81S-8-20C
3	DC-21	Semi-bulk Bag Filling	1991	11,000	70	7.01	Farr-Tenkay	L-112287-A
4	DC-16	Coarse Ore Bin #3	1988	600	70	0.38	Mikro Pulsaire	16S-8-20B
	DC-3	Coarse Ore Bin #1	Original Equipment	600	70	0.38	DCE Dalamatic	DLMV77F1
	DC-4	Coarse Ore Bin #2	Original Equipment	600	70	0.38	Mikro Pulsaire	16S-8-20B
5	DC-6	ACM #1	Original Equipment	7,700	130	4.41	Mikro Pulsaire	238S-8-40TR
	DC-7	ACM #2	Original Equipment	7,700	130	4.41	Mikro Pulsaire	238S-8-40TR
	DC-17	ACM #3	1988	7,700	130	4.41	Mikro Pulsaire	121S-8-40C
6	DC-8	Fine Product Silo #1	Original Equipment	600	70	0.38	DCE Dalamatic	DLMV15/15F3
	DC-9	Fine Product Silo #2	Original Equipment	600	70	0.38	DCE Dalamatic	DLMV15/15F3
	DC-18	Fine Product Silo #3	1988	600	70	0.38	Mikro Pulsaire	16S-8-20B
	DC-5	Pelletizer Feed Bin	Original Equipment	600	70	0.38	DCE Dalamatic	DLMV15/15F3
	DC-20	Pelletizer Feed Bin	1990	600	70	0.38	DCE Dalamatic	DLMV15/15F3
7	DC-10	Pellet Dryer and Pelletizer	Original Equipment	17,200	125	9.93	Mikro Pulsaire	289S-10-20C
8	DC-19	Fine Product Silo #4	1994	900	70	0.57	Mikro Pulsaire	25S-8-30B
	DC-11	Compacted Talc Silo	Original Equipment	700	70	0.45	Mikro Pulsaire	25S-8-20C
9	DC-15	Durant Packer #2	Original Equipment	1,500	70	0.96	DCE Dalamatic	DLMV30/15F6
	DC-14	Bemis Packer #1	Original Equipment	1,600	70	1.02	Mikro Pulsaire	49S-8-20C
10	DC-23	Packaging Area Target Box	1989	600	70	0.38	Mikro Pulsaire	12-8-2200
11	DC-24	Classifier Cyclone	1986	700	150	0.39	Mikro Pulsaire	16S-8-30C
12	DC-22A	Vacuum System (new collector)	Proposed 1994	900	120	0.52	Mikro Pulsaire	31-8-220
None	DC-22	Vacuum System (will be removed)	Original Equipment	600	120	0.35	Mikro Pulsaire	12-8-2200
Proposed	DC-12	Rail Loadout (will be removed)	Original Equipment	1,000	70	0.64	DCL	FS140
	DC-13	Truck Loadout (will be removed)	Original Equipment	1,000	70	0.64	DCL	FS140

Luzenac America requests that satisfactory test results for particulate emissions and opacity from the 12 dust collectors printed in bold text be considered sufficient to prove compliance with NSPS for all 24 dust collectors at the facility.

¹ Airflows are approximate and based on design criteria. The ACM product collectors are variable air volume systems; estimated average flows are used.

² Temperatures are approximate.

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
AIR QUALITY BUREAU

RECEIVED

AUG 16 1994
408 S. O'CONNOR BUILDING
100 S. BROADWAY



STATE OF MONTANA

BISON

(406) 444-3454
FAX (406) 444-1374

PO BOX 200901
HELENA, MONTANA 59620-0901

August 12, 1994

David Kinghorn
Senior Project Engineer
Bison Engineering
P.O. Box 1703
Helena, MT 59624

Dear Dave:

I have completed the review of the source test protocol for the compliance test of the vacuum system at Montana Talc - Luzenac.

The protocol is acceptable as written; however, please keep me informed if there is any change in the test date. If you have any questions please call me any time.

Sincerely,

A handwritten signature in dark ink, appearing to read "J. Briggs".

Jeff Briggs
Environmental Engineer

JB:bjd



BISON ENGINEERING, INC.

PHONE: 406-442-5768

FAX: 406-449-6653

August 10, 1994

Mr. Jeff Briggs
MDHES Air Quality Bureau
836 Front St.
P.O. Box 200901
Helena, MT 59620

Re: Montana Talc - Luzenac Source Test

Dear Mr. Briggs:

Enclosed is the pretest notification regarding the Method 5 and Method 9 compliance tests at the Montana Talc - Luzenac facility at Three Forks. The test will be conducted on September 15, 1994.

Sincerely,

David L. Kinghorn
Senior Project Engineer

Enc.

cc: Montana Talc - Luzenac

SOURCE TEST PROTOCOL

1.0 INTRODUCTION

Facility Name: Montana Talc - Luzenac

Mailing: 28769 Sappington Road
Three Forks, Montana 59752

Office: Phone (406) 285-3286
Fax (406) 285-3530

Contact: Randy Geiger

Permit Number: 1996-01

Location: The Luzenac facility is located in Section 31, Township 1 North,
Range 1 West, Gallatin County, Montana.

Emission Sources and Testing

Objectives: Bison Engineering intends to test the vacuum system for Total Suspended
Particulate (TSP) and Visible Emissions.

2.0 EMISSION SOURCE INFORMATION

2.1 Facility Description

The Montana Talc-Luzenac is a typical talc plant.

2.2 Process Information

The vacuum system runs gas through a cyclone with screen, then to a Mikro-Pulsaire
Vac Rated Receiver. The gas is then released to ambient and the particulate is moved
to ACM #3 Feed Bin and to Finished Product. The product is talc.

2.3 Emission Source and Control Description

Vacuum system at Montana Talc-Luzenac. The gas is exhausted through a cyclone,
baghouse and out a single vertical stack.

3.0 SOURCE TEST PROGRAM DESCRIPTION

3.1 Testing Contractor

Bison Engineering, Inc.
30 South Ewing, 59601
P.O. Box 1703
Helena, MT 59624
(406) 442-5768 Fax (406) 449-6653
Contact: Dave Kinghorn, Senior Project Engineer

3.2 Test Program Organization

BISON

Project Manager:	Dave Kinghorn, Senior Project Engineer
Testing Assistants:	Kelly Holshue, Senior Technician Calvin Loomis, Lead Engineer
Project Control:	Dave Kinghorn, Senior Project Engineer

Montana Talc-Luzenac

Contact: Randy Geiger

MONTANA AIR QUALITY BUREAU

Contact: Jeff Briggs

3.3 Test Program Objectives

Permit 1996-01, written and finalized July 13, 1994, stipulates that Luzenac America's talc plant (in Three Forks, Montana) is limited to a total suspended particulate (TSP) emission of 0.02 gr/dscf (grains/dry standard cubic feet) of particulate. The plant's visible emissions are limited to 7%.

Bison's objectives are to complete the required testing in accordance with Permit 1996-01. This involves TSP testing (Method 5) and visible observations (Method 9) on the vacuum system.

TEST DATES:

Bison proposes testing September 15, 1994.

Note: Testing is dependent on weather. If inclement weather postpones testing, it shall be conducted as soon as all parties are available.

REPORT DATE:

Bison anticipates report submittal to the Montana AQB no later than November 13, 1994.

4.0 SOURCE TESTING PROCEDURES

4.1 Instrumentation and Equipment Description

Operators will employ sample trains and instrumentation as specified in EPA testing methods. See attachments for sample train schematics.

Method 5 collects solid particulate larger than 0.3 μ g diameter on a heated filter.

The chilled impinger water collects condensible particulate.

A stainless steel-lined heated probe with a suitable nozzle will be used. An integral type K thermocouple and type S pitot tube will be used for stack flow rate monitoring.

4.2 Test Methods

Test personnel will employ the following Title 40 CFR 60, Appendix A (EPA reference) methods:

Sampling Location and Traverse Points: Method 1, "Sample and Velocity Traverses for Stationary sources"

Velocity and Volume: Method 2, "Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)."

Molecular Weight: Method 3, "Gas Analysis for the Determination of Dry Molecular Weight." (Fyrites)

Note: Source moisture determination and calculations, Method 4, is incorporated within Method 5.

Particulate: Method 5, "Determination of Particulate Emissions From Stationary Sources".

Note: Method 5 test runs shall consist of a minimum 1 hour and 60 disc.

Visible Opacity: Method 9, "Visual Determination of the Opacity of Emissions from Stationary Sources".

Note: Method 9 opacity observations shall be conducted concurrently with each Method 5 particulate run. Each Method 9 observation will last 60 minutes.

Plant Capacity:

The facility has a maximum operating capacity of 700 cfm and normally operates at 650 cfm. The facility will run at its maximum operating capacity.

4.3 Analytical Methods

The attachments include sample analytical data forms.

Water. Impinger water weight gain indicates stack moisture content. Moisture will be estimated prior to the first particulate run at each source from wet bulb/dry bulb temperature data or historical records. Immediately following each particulate run, operators will weigh the water collected. This data will provide on-site Method 4 moisture analysis and verification of isokinetic sampling rates.

5.0 QUALITY ASSURANCE PROCEDURES

Bison's mobile laboratory trailer or testing van provides controlled, clean environments for sample handling, pre- and post-test operations and paperwork.

Bison Engineering's test, laboratory, reporting, and quality assurance procedures conform to the requirements specified in the Quality Assurance Handbook for Air Pollution Measurement Systems, Vol. III, Stationary Source Specific Methods published by the U.S. Environmental Protection Agency in August, 1977 as revised and amended (cat. # EPA-600/4-77-027b).

5.1 Sample Handling Protocols

Operators shall complete and initial all field data sheets before leaving the site.

The individual test methods specify handling procedures for physical samples (liquids, traps, etc.).

5.2 Data Validation

Bison employs field lap-top computers for immediate data entry. This allows for checks of validity on each run. The data is then passed through Bison's quality control procedure and is validated by an additional person. Bison's Senior Project Engineer is responsible for all procedures being followed.

5.2 Equipment and Instrument Calibration and Maintenance.

Equipment and instruments are calibrated every 60 days. All equipment calibration documentation will be submitted within the formal report.

6.0 SOURCE TEST REPORT

6.1 Report Format

The Source Test Report will follow the general format outlined in the draft Montana Source Test Protocol and Procedures Manual, dated "July 1993."

6.2 Data Reduction

Bison utilizes Quattro Pro, similar to Lotus 123, which has ready-made spreadsheets to allow for quick and accurate mathematical calculations.

7.0 SAFETY CONSIDERATIONS

Personal Safety

Bison Engineering personnel have available:

- A. Hard hat,
- B. Long sleeve shirts, coveralls or jacket,
- C. Steel-toed boots,
- D. Dust masks and goggles as required, and
- E. Heat-resistant gloves for handling probe.

Sample Location and Access

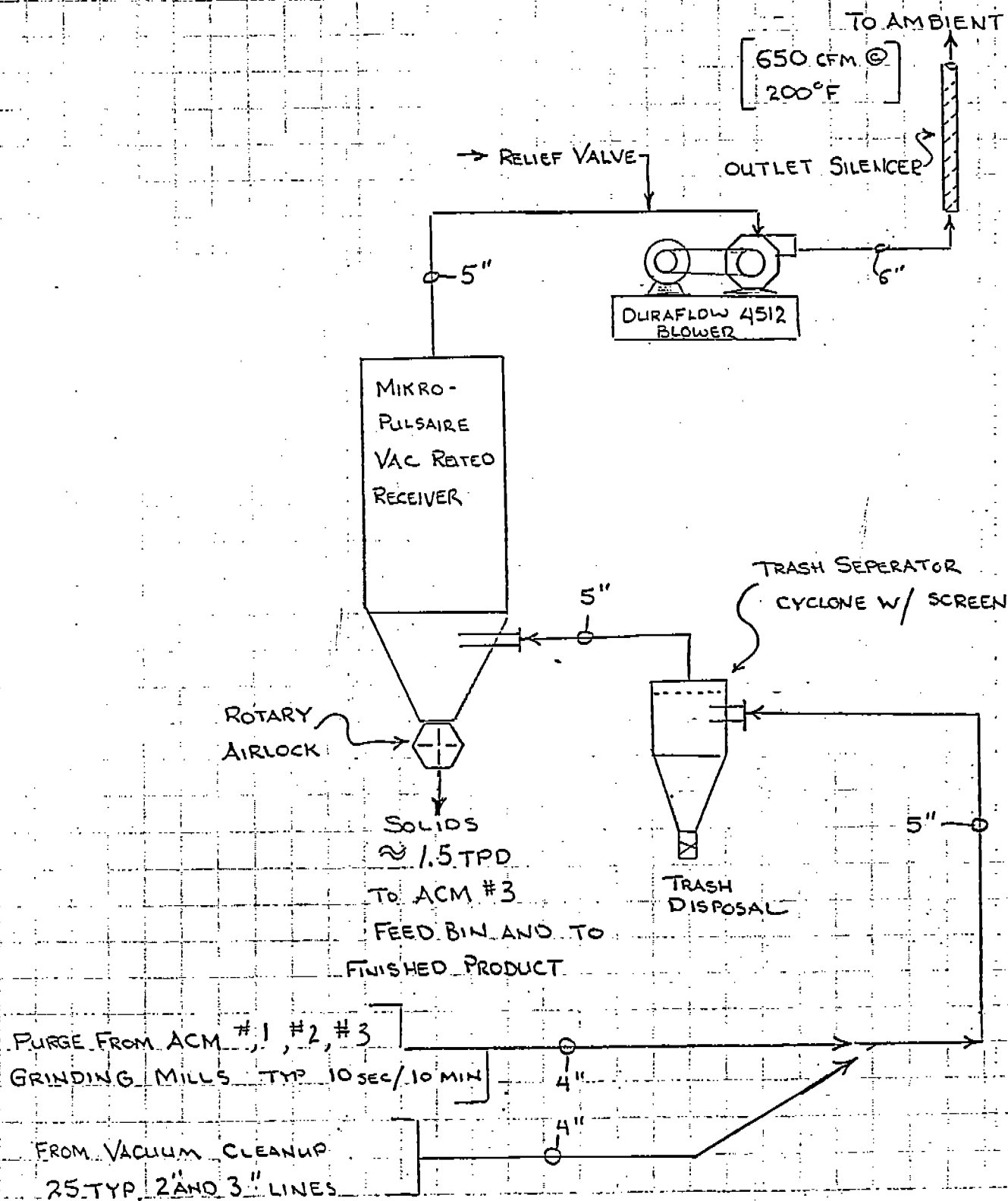
The sample ports are located above a 1 to 12 pitch steel roof that is about 14 feet high.

Access will be obtained with a ladder and the equipment will be hoisted with a rope. Yellow caution tape will be placed around access area.

The Montana Talc Company

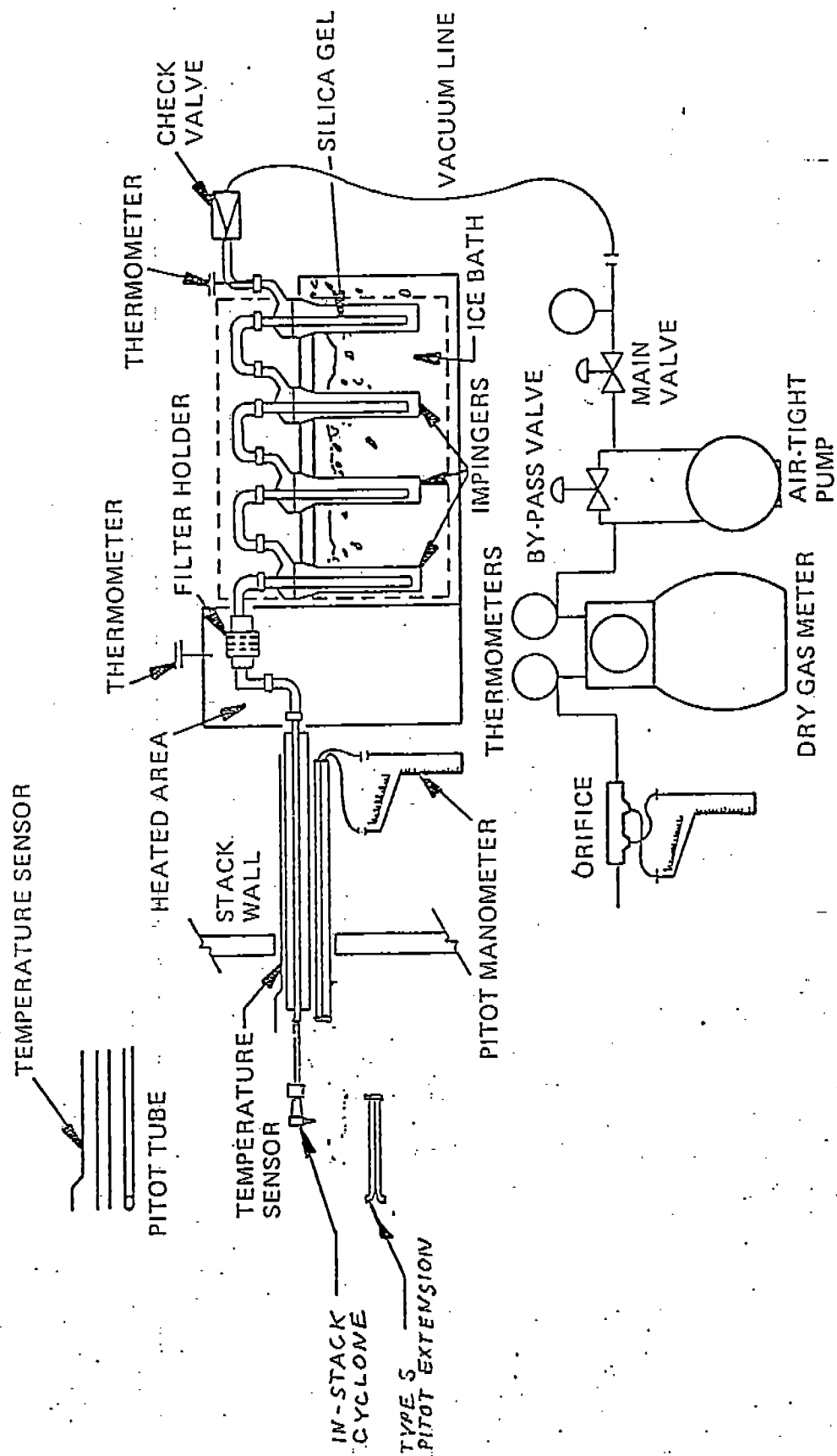
The best ingredients make the best products

Date _____ Project _____



1-800-343-3434

The Montana Talc Company • 28769 Sappington Road • Three Forks, MT 59752 • (406) 285-3286 • FAX: 406-285-3530



PM₁₀ PARTICULATE SAMPLE APPARATUS

PARTICULATE DATA WORKSHEET

Plant	Location	
Test Dates	Initials	Stack ID

Sample Description	ID No.	Average Tare, G	Average Final, G	Net Particulate Gain, G
Filter				
Probe				
Impinger				
Cyclone				
Filter				
Probe				
Impinger				
Cyclone				
Filter				
Probe				
Impinger				
Cyclone				
Water Blank				
Acetone Blank				
Field Filter Blank				
System Filter Blank				

Plant	Location
Test Dates	Stack ID

[illegible]

PARTICULATE FIELD DATA FORM

Plant	Location		Stack ID No.	Stack Dimension
Date	Operator	Run No.	Sample Box No.	Meter Box No.

Altitude _____ Alt. Corr. _____
 Barometric Reading _____
 Barometric Pres. _____
 Stack Static Pres. _____

Assumed Moisture _____
Ambient Temp. _____
Meter $\Delta H@$ _____
Meter Calib (Y) _____

Nozzle ID No. _____ Nozzle Dia. _____
 Probe ID No. _____ Probe Length _____
 Liner Material _____
 Probe Heat Setting _____

[illegible]

IMPINGER CATCH AND SAMPLE TRAIN RINSE FORM (for Pre-Weighed Sample Bottles)

Plant	Location	Stack ID
Project No.	Tested By	Test Dates

Note: All weights in grams					
Run No.	Weight	Date	Impinger Catch Bottle	Silica Gel Bottle	Initials
1	Final				
	Initial				
		Net Gain			
				Total Gain	
2	Final				
	Initial				
		Net Gain			
				Total Gain	
3	Final				
	Initial				
		Net Gain			
				Total Gain	

RINSE VOLUMES, ml				
Run No.	Cyclone	Probe/Front Half	Impingers	Other (describe)
1				
2				
3				

IMPINGER WATER CAPTURE FORM

Date Out _____ Initials _____

Date In _____ Initials _____

Company _____ Location _____

Stack Name _____

Run No. _____ Box No. _____ Filter No. _____

	Impinger 1 Std.	Impinger 2 Midg.	Impinger 3 Dry	Impinger 4 Silica
Final Weight				
Initial Weight				
Net Gain				
Total Gain (g):				

Units = Grams (milliliters)

COMMENTS: (Note: Weigh impingers without u-tubes, caps, or washers but with orifice tubes in place)

GAS ANALYSIS DATA FORM - FYRITE

Plant _____ Sample Location _____

Date _____ By _____ Ambient Temp. _____

Sample Method (Bulb Pump, Integrated Bag, etc.) _____

Run	Clock Time	FYRITE READINGS		
		% CO ₂	% O ₂	(N ₂ + CO) = 100 Minus Σ (CO ₂ , O ₂)
1 a				
b				
c				
Averages				
Dry Molecular Weight (M _d)		x 44/100	x 32/100	x 28/100
Total				
2 a				
b				
c				
Averages				
Dry Molecular Weight (M _d)		x 44/100	x 32/100	x 28/100
Total				
3 a				
b				
c				
Averages				
Dry Molecular Weight (M _d)		x 44/100	x 32/100	x 28/100
Total				

GAS VELOCITY AND VOLUME DATA FORM

Plant			Location	Stack ID No.
Date	Time	Operator	Run No.	Stack Dimension

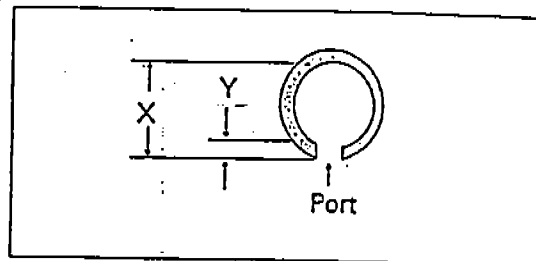
Altitude	Alt. Corr.	Ambient Temp.
Barometric Reading		Molecular Weight
Local Barometric Pressure		Method
Stack Static Pressure		Pitot C_p

Field Data				
Traverse Point Number	Velocity Head (Δp_s), in H_2O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
Average Δp_s			Average Stack Temp.	Average Angle (α) ¹
Mean Sqrt Δp_s				

¹ Average of α must be $<10^\circ$ to be acceptable.

TRAVERSE POINT LOCATIONS, CIRCULAR STACKS

Plant		
Date	By	
Sampling Location		
Inside of Far Wall to Outside of Port (distance, X)		
Port Depth (distance, Y)		
Stack I.D. (distance X - distance Y)		
Dist. to upstream disturbance ft/in. Diameters	Dist. to downstream disturbance ft/in. Diameters	
No. of Traverse Points Req'd:	Total	Per Port



SCHEMATIC OF SAMPLING LOCATION

[illegible]

Notes: _____

APPENDIX B: FIELD DATA

GAS VELOCITY AND VOLUME DATA FORM

Plant	LUZENAC		Location	SAPPINGTON DC-1	Stack ID No.	DC-1
Date	1-5-95	Time	Operator	MWA	Run No.	1
					Stack Dimension	17 1/4"

Altitude	Alt. Corr.	Ambient Temp.	~60°F
Barometric Reading	Molecular Weight 28.84		
Local Barometric Pressure	Method Fyrite		
Stack Static Pressure	-10.0	Pitot C _p	0.84

Field Data				
Traverse Point Number	Velocity Head (Δp_v), " H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
N 1	0.72 0.53		0.0	0°
2	0.68 0.45		-0.1	8°
3	0.83 0.65		-0.1	10°
4	0.53 0.72		0.17 0.1	40° 8°
5	0.95 0.74		-0.05	20° 4°
6	1.1 0.72		-0.05	8°
7	0.55 0.71		0.0	0°
8	0.67 0.78		0.0	0°
9	0.78 0.83		0.0	0°
10	0.85		0.0 -0.03	0° 4°
11	0.86 0.86		0.0	0°
12	0.80 0.78		0.0	0°
Average Δp_s		Average Stack Temp.	Average Angle (α) ¹	
0.777 0.718			3.5°	
Mean Sqrt Δp_s				

¹ Average of α must be <10° to be acceptable.Nozzle $\rightarrow 0.271 \approx 1.15 \text{ ft}^3/\text{min}$ " $\rightarrow 0.304 \approx 1.44$ " $\rightarrow 0.250 \approx 0.98$

Altitude ~4200 Alt. Corr. _____
Barometric Reading _____
Barometric Pres. 25.9" Hg
Stack Static Pres. -10.00" H₂O

Assumed Moisture 2%
Ambient Temp. ~50°F
Meter ΔH@ 1.92
Meter Calib (Y) 1.002

Nozzle ID No. _____ Nozzle Dia. 0.253
Probe ID No. _____ Probe Length 3'
Liner Material S.S.
Probe Heat Setting 120°F

Altitude ~4200 Alt. Corr. _____
Barometric Reading _____
Barometric Pres. 25.9" Hg
Stack Static Pres. -10.00" H₂O

Assumed Moisture 2%
Ambient Temp. ~50°F
Meter ΔH@ 1.92
Meter Calib (Y) 1.002

Nozzle ID No. _____ Nozzle Dia. 0.253
Probe ID No. _____ Probe Length 3'
Liner Material S.S.
Probe Heat Setting 120°F

PRE-LEAK : 0.002 $\frac{\text{ft}^3}{\text{min}}$ @ 16" Hg (Rac 50.4)
 MTR VOL = ~~54.045~~ 102.231 (2-22 ~~50.4~~ 67.3)
 Rev. 12/92

1941-1942

Altitude _____ Alt. Corr. _____
Barometric Reading _____
Barometric Pres. 25.9" Hg
Stack Static Pres. -12.00" H₂O

Assumed Moisture 2-1/2
Ambient Temp. ~50°F
Meter ΔH@ 1.92
Meter Calib (V) 1.002

Nozzle ID No. _____ Nozzle Dia. 0.253
Probe ID No. _____ Probe Length 3'
Liner Material STAINLESS STEEL
Probe Heat Setting 120°F

Assumed Moisture 2%
Ambient Temp. ~50°F
Meter $\Delta H@$ 1.92
Meter Calib (Y) 1.002

[illegible]

VISIBLE EMISSION OBSERVATION FORM

RUN 1

Source Name LUZAC DC-1			Observation Date 11/6/95				Start Time 10:05 AM		Stop Time 11:05					
Address 28769 Sappington Road			Min		Seconds				Min		Seconds			
					0	15	30	45			0	15	30	45
City 3 Forks	State MT	Zip 59752	1	0	0	0	0	31	0	0	0	0		
Phone (406) 285-3286	Source ID Number DC-1		2	0	0	0	0	32	0	0	0	0		
Process Equipment DC-1 RUN 1		Operating Mode NORM	3	0	0	0	0	33	0	0	0	0		
Control Equipment BAGHOUSE		Operating Mode NORM	4	0	0	0	0	34	0	0	0	0		
Describe Emission Point TALL OVER VERTICAL			5	0	0	0	0	35	0	0	0	0		
Start WHITE Stop SAME			6	0	0	0	0	36	0	0	0	0		
Height above Ground Level Start 30 Stop 30			7	0	0	0	0	37	0	0	0	0		
Height Relative to Observer Start 30 Stop 30			8	0	0	0	0	38	0	0	0	0		
Distance from Observer Start 100 Stop 100			9	0	0	0	0	39	0	0	0	0		
Direction from Observer Start NW Stop NW			10	0	0	0	0	40	0	0	0	0		
Describe Emissions Start NONE Stop NONE			11	0	0	0	0	41	0	0	0	0		
Emission Color Start WHITE Stop SAME			12	0	0	0	0	42	0	0	0	0		
Plume Type: Continuous ☒ Fugitive ☐ Intermittent ☐			13	0	0	0	0	43	0	0	0	0		
Water Droplets Present? Yes ☐ No ☒			14	0	0	0	0	44	0	0	0	0		
If Water Droplet Plume: Attached ☐ Detached ☐			15	0	0	0	0	45	0	0	0	0		
Point in the Plume at which Opacity was Determined Start 5 FEET FROM EXIT Stop SAME			16	0	0	0	0	46	0	0	0	0		
Describe Background Start BUILDING - YELLOW Stop SAME			17	0	0	0	0	47	0	0	0	0		
Background Color Start YELLOW Stop SAME			18	0	0	0	0	48	0	0	0	0		
Sky Conditions CLEAR Start BLUE Stop BLUE			19	0	0	0	0	49	0	0	0	0		
Wind Speed Start 0-5 Stop 0-5			20	0	0	0	0	50	0	0	0	0		
Wind Direction Start E/SE Stop E/SE			21	0	0	0	0	51	0	0	0	0		
Ambient Temp. Start Stop			22	0	0	0	0	52	0	0	0	0		
Wet Bulb Temp. RH Percent			23	0	0	0	0	53	0	0	0	0		
			24	0	0	0	0	54	0	0	0	0		
			25	0	0	0	0	55	0	0	0	0		
			26	0	0	0	0	56	0	0	0	0		
			27	0	0	0	0	57	0	0	0	0		
			28	0	0	0	0	58	0	0	0	0		
			29	0	0	0	0	59	0	0	0	0		
			30	0	0	0	0	60	0	0	0	0		

Source Layout Sketch ☒ Sun Draw North Arrow ☒ Wind ☒ Plume & Stack 	Average Opacity for Highest Period 0	Number of Readings Above 20 % Were 0
	Range of Opacity Readings 0 Minimum 0 Maximum	
	Observer's Name (Print) DAVE KINGHORN	
	Observer's Signature 	
	Date 11/6/95	
Organization BOYD EAGLE		
Comments		

PARTICULATE FIELD DATA FORM

Plant <u>Luzenac</u>	Location <u>Sappington, MI</u>	Stack ID No. <u>DC1</u>	Stack Dimensions <u>17 1/4" x 17 1/4" x 17 1/4"</u>
Date <u>1/9/95</u>	Operator <u>CWL</u>	Filter No. <u>1155</u>	Meter Box No. <u>3</u>

Altitude 24200 Alt. Corr. _____
 Barometric Reading _____
 Barometric Pres. 25.9
 Stack Static Pres. -10

Assumed Moisture 2%
 Ambient Temp. 26.0°F
 Meter $\Delta H@$ 1.00275
 Meter Calib (V) 1.9275

Nozzle ID No. _____ Nozzle Dia. 1.25"
 Probe ID No. _____ Probe Length 3'
 Liner Material Stainless Steel
 Probe Heat Setting 120°F

Traverse Point Number	Sampling Time (min.)	Clock Time (24-hr.)	Gas Sample Volume (cf)		Velocity Head (ΔP) ($^{\circ}$ H ₂ O)	Pressure Differential across Orifice Meter (ΔH) ($^{\circ}$ H ₂ O)	Vacuum, mm (H ₂ O)	#1	#3	#4	#6		#7
			Start	Stop							Inlet	Outlet	
411	4	12:00	920.030		.4	1.7	3	80	145	57	82	81	
2	8		27.16		.61	2.8	3	80	150	57	84	81	
	12		31.18		.63	2.9	4	80	150	55	87	82	
	16		35.2		.63	2.9	3	80	150	58	89	82	
	20		40.4		1.3	6.0	5	80	150	56	92	83	
	24		46.98		1.3	6.0	4	80	150	58	93	84	
	28		51.		.94	4.4	4	80	150	58	95	84	
	32		55.82		.87	4.0	3	80	150	59	95	85	
	36		60.13		.70	3.3	3	80	150	51	95	85	
	40		63.4		.38	1.8	2	80	150	60	96	86	
	44		66.5		.38	1.8	3	78	150	57	95	88	
	48		69.416		.39	1.8	3	79	150	55	95	86	
1	52		73.49		.63	2.95	2	81	150	50	95	86	
2	56		77.17		.51	2.4	2	81	150	51	93	87	
	60		80.7		.48	2.2	2	81	150	51	94	87	
	64		84.1		.46	2.2	2	80	150	53	94	87	

MTR 164.070 .7973
 VOL 64.07 Mem. 30.4

3.084 65
2.22 8.0

bm = 87.7 Rev. 12/92

PARTICULATE FIELD DATA FORM

Plant	<i>Lucernae</i>	Location	<i>Sappington</i>	Stack ID No.	<i>DC-1</i>	Stack Dimension	<i>7 1/4</i>
Date	<i>1-9-95</i>	Operator	<i>CWL</i>	Run No.	<i>Three</i>	Filter No.	<i>1155</i>
						Meter Box No.	<i>3</i>

Altitude _____ Alt. Corr. _____
 Barometric Reading _____
 Barometric Pres. 25.90 "Hg
 Stack Static Pres. -10.00 "H₂O

Assumed Moisture _____
Ambient Temp. _____
Meter ΔH @ _____
Meter Calib (Y) _____

Nozzle ID No.	Nozzle Dia.	0.253
Probe ID No.	Probe Length	31
Liner Material		3.5
Probe Heat Setting		120F

[illegible]

Post test Leak Check: 0.000cfm @ 3" Hg

FILE:

FACILITY	Luzenac-America
LOCATION	Sappington
SOURCE	DC1
Test Run	Three

PRELIMINARY INFO.	
Bp (Pm) (in.Hg)	25.9
Stack Dia. (in.rnd)or(lngth)	1.77
Stack Width (rect.)	Time per Point (min)
Stack Area (sq.ft.)	Nozzle Dia (in.)
YI	Total Number Points
Delta H@	Leak rate (ft ³ /min)

PRE TEST INFO	
Impinger H ₂ O Gain (g)	18.93
Particulate Gain (mg)	10.30
Leak Rate (ft ³ /min)	0.00
Leak Chk. Vac. (in.)	8.00
Avg sqft Del P	0.784
Wet mol. wt. (Ms)	28.72
Dry mol. wt. (Md)	28.84

Spreadsheet Updated 12/20/94

POST TEST CALCULATIONS	
Actual % H ₂ O	1.10
Actual Wet Molec. Wt	28.72
Actual Isokinetic Avg	100.36
Dry STD Meter Vol	79.75
Avg sqft Del P	0.784
Wet mol. wt. (Ms)	28.72
Dry mol. wt. (Md)	28.84

DATE	1/9/95
START TIME	12:00

TRAVERSE INFO	
Static (use - if neg.)	-10.00
Stack Temp, F	50.0
Acquired avg. delta P	0.72
Oxygen %	21.00
Carbon Dioxide %	0.00
Total Run Time	96.00

EMISSIONS	
STD grains/dscf	0.00199
lbs / hour	0.00

EPA Method 5 Isokinetic Spreadsheet

Trav Point	Sample Time	MetrVol	Vel head	Calc delta P	Run delta H	Stack Temp	Meter Temp	In	Out	Point % I	Rolling % I
A-1	4.0	923.390	0.40	1.80	1.90	80	82	81	81	107.7	107.7
2	8.0	927.160	0.61	2.76	2.80	80	84	81	81	97.9	102.8
3	12.0	931.180	0.63	2.86	2.90	80	87	82	82	102.4	102.6
4	16.0	935.200	0.63	2.86	2.90	80	89	82	82	102.2	102.5
5	20.0	940.400	1.30	5.93	6.00	80	92	83	83	92.5	100.5
6	24.0	945.890	1.30	5.94	6.00	80	93	84	84	97.5	100.0
7	28.0	951.000	0.94	4.30	4.40	80	95	84	84	106.0	100.9
8	32.0	955.820	0.87	3.99	4.00	80	95	85	85	103.7	101.2
9	36.0	960.130	0.70	3.21	3.30	80	95	85	85	103.2	101.4
10	40.0	963.400	0.38	1.74	1.80	80	96	86	86	105.6	101.9
11	44.0	966.500	0.38	1.75	1.80	78	95	86	86	100.0	101.7
12	48.0	969.416	0.39	1.79	1.80	79	95	86	86	93.0	101.0
B-1	52.0	973.490	0.63	2.89	2.95	80	95	86	86	102.6	101.1
2	56.0	977.170	0.51	2.33	2.40	81	93	87	87	103.1	101.2
3	60.0	980.700	0.48	2.20	2.20	81	93	87	87	101.8	101.3
4	64.0	984.100	0.46	2.11	2.20	80	94	87	87	100.0	101.2
5	68.0	987.150	0.34	1.56	1.60	80	94	87	87	104.2	101.4
6	72.0	990.100	0.34	1.56	1.60	79	94	87	87	100.7	101.3
7	76.0	993.100	0.37	1.70	1.70	79	94	87	87	98.2	101.2
8	80.0	997.300	0.72	3.31	3.40	78	93	87	87	99.0	101.1
9	84.0	1001.850	0.83	3.82	4.00	79	95	87	87	100.0	101.0
10	88.0	1006.500	0.81	3.73	3.80	80	96	88	88	103.3	101.1
11	92.0	1010.670	0.66	3.04	3.80	79	96	88	88	102.5	101.2
12	96.0	1014.870	0.65	3.00	3.10	79	96	88	88	103.8	101.3
				0.00						ERR	ERR
Dry Sample Vol.	94.84	dP	dH	dH	Tm	%iso					
STD Sample Vol.	79.83	0.64	2.825	3.015	89	101.3					

S T A C K			
ACTUAL		STANDARD	
Vel. ft/sec	Flow acfm	Vel. dscf/sec	Flow dscfm
39.32	40	31.88	33
48.56	50	39.50	41
49.35	51	40.14	41
49.35	51	40.14	41
70.89	73	57.66	59
70.89	73	57.66	59
60.28	62	49.03	50
58.00	60	47.17	48
52.02	53	42.31	43
38.33	39	31.17	32
38.26	39	31.23	32
38.79	40	31.61	32
49.35	51	40.14	41
44.45	46	36.08	37
43.12	44	35.00	36
42.17	43	34.30	35
36.26	37	29.49	30
36.22	37	29.51	30
37.79	39	30.79	32
52.66	54	42.99	44
56.59	58	46.11	47
55.96	57	45.51	47
50.47	52	41.12	42
50.08	51	40.81	42
0.00	0	0.00	0
48.72	50	39.64	41

VISIBLE EMISSION OBSERVATION FORM

Run 2

Source Name Luzenac America			Observation Date 3-2-95				Start Time 0945				Stop Time 1045																																			
Address 28769 Sappington Road			<table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45	<table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45
Min	Seconds							Min	Seconds																																					
	0	15	30	45	0	15	30		45																																					
Min	Seconds				Min	Seconds																																								
	0	15	30	45		0	15	30	45																																					
City 3 Forks	State MT	Zip 59752	1				31				2				32																															
Phone (406) 285-3286			Source ID Number DC-1				3				33				4				34																											
Process Equipment #1215-8-200 MikroPulsaire			Operating Mode Cont				5				35				6				36																											
Control Equipment Baghouse			Operating Mode Cont				7				37				8				38																											
Describe Emission Point Largest taost east Horiz. Stack			Start Side of building				9				39				10				40																											
Height above Ground Level Start ~30' Stop Same			Height Relative to Observer Start 30' Stop Same				11				41				12				42																											
Distance from Observer Start ~140' Stop Same			Direction from Observer Start N-E-W Stop Same				13				43				14				44																											
Describe Emissions (None)			Start — Stop —				15				45				16				46																											
Emission Color Start — Stop —			Plume Type: ☒ Continuous ☐ Fugitive ☐ Intermittent				17				47				18				48																											
Water Droplets Present? ☐ Yes ☒ No			If Water Droplet Plume: ☒ Attached ☐ Detached				19				49				20				50																											
Point in the Plume at which Opacity was Determined Start Near Outlet Stop Same			21				51				22				52																															
Describe Background Start SKY Stop Same			23				53				24				54																															
Background Color Start Blue Stop Same			Sky Conditions Start Clear Stop Same				25				55				26				56																											
Wind Speed Start 0 Stop 0			Wind Direction Start — Stop —				27				57				28				58																											
Ambient Temp. Start 26°F Stop 31°F			Wet Bulb Temp. 23°F				29				59				30				60																											
RH Percent —			30				60				Average Opacity for Highest Period 0				Number of Readings Above % Were 20																															
Warehouse Storage ☒ Sun Wind → Plume & Stack Source Layout Sketch TALC Processing Plant Emission Point CONVEYOR Bone Yard Sun Location Line 140° ① ② ③ ④			Range of Opacity Readings				Minimum 0 Maximum 0																																							
			Observer's Name (Print) Mitchell W. Anderson																																											
			Observer's Signature MW Anderson Date 3-2-95																																											
			Organization Bison Engineering																																											
			Comments																																											

3-10-95
Hopper AGE



Altitude _____ Alt. Corr. _____
Barometric Reading _____
Barometric Pres. 25.00" Hg
Stack Static Pres. -10.00" H₂O

Assumed Moisture 11.
Ambient Temp. 26.00°F
Meter ΔH@ 1.92
Meter Calib (Y) 1.002

Nozzle ID No. _____ Nozzle Dia. 0.253
Probe ID No. _____ Probe Length 31
Liner Material Stainless Steel
Probe Heat Setting 120°F

Altitude _____ Alt. Corr. _____
Barometric Reading _____
Barometric Pres. 25.00" Hg
Stack Static Pres. -10.00" H₂O

2-22-~~94~~95

FILE:

FACILITY

Luzenac-America

LOCATION

Sappington

SOURCE

DC1

Test Run

Four

DATE

1/9/95

START TIME

14:22

PRELIMINARY INFO.

Bp (Pn) (in.Hg)	25.9	Assumed moisture %	2.0
Stack Dia. (in. rnd) (length)	1.77	Assumed Meter Temp. F	78.0
Stack Width (rect.)		Time per Point (min)	4.00
Stack Area (sq. ft.)	0.02	Nozzle Dia (in.)	0.253
Yi	1.002	Total Number Points	24
Delta H@	1.92	Leak rate (ft ³ /min)	0.00

TRAVERSE INFO

Static (use - if neg.)	-10.00	Stack press. (Ps)	25.16
Stack Temp, F	50.0	Stack Area (sqft. rnd)	0.0171
Acquired avg. delta P	0.72	Stack Area (sqft. rect)	0.00
Oxygen %	21.00	Recommended Nz dia.	0.210
Carbon Dioxide %	0.00	Total Run Time	96.00

PRE TEST CALCULATIONS

Impinger H ₂ O Gain (g)	22.92	Actual % H ₂ O	1.21
Particulate Gain (mg)	10.00	Actual Wet Molec. Wt	28.71
Leak Rate (ft ³ /min)	0.00	Actual Isokinetic Avg	100.14
Leak Chk. Vac. (in.)	8.00	Dry STD Meter Vol	87.87
Avg sqrt Del P			0.865
Wet mol. wt. (Ms)			28.71
Dry mol. wt. (Md)			28.84

Spreadsheet Updated 12/20/94

POST TEST INFO

Impinger H ₂ O Gain (g)	22.92	Actual % H ₂ O	1.21
Particulate Gain (mg)	10.00	Actual Wet Molec. Wt	28.71
Leak Rate (ft ³ /min)	0.00	Actual Isokinetic Avg	100.14
Leak Chk. Vac. (in.)	8.00	Dry STD Meter Vol	87.87
Avg sqrt Del P			0.865
Wet mol. wt. (Ms)			28.71
Dry mol. wt. (Md)			28.84

EMISSIONS

STD grains/dscf	0.00176
lbs / hour	0.00

EPA Method 5 Isokinetic Spreadsheet

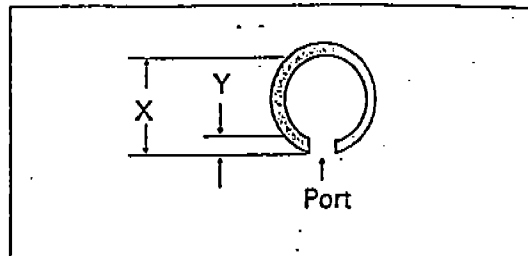
Trav Point	Sample Time	MetVol	Val head	Calc delta P	Run delta H	Stack Temp	Meter Temp In	Meter Temp Out	Point % I	Rolling % I	Exit Temp	Test Vac
A-1	4.0	19.270	0.58	2.64	2.70	78	86	85	107.6	107.6	53	2
2	8.0	23.310	0.64	2.91	3.00	79	86	85	101.8	104.7	53	2
3	12.0	26.790	0.46	2.10	2.20	78	88	86	102.8	104.1	53	2
4	16.0	30.240	0.47	2.14	2.20	79	89	88	100.9	103.3	54	2
5	20.0	33.600	0.43	1.97	2.00	77	90	86	102.4	103.1	54	2
6	24.0	36.770	0.38	1.75	1.80	74	91	86	102.3	103.0	54	2
7	28.0	40.540	0.59	2.72	2.80	74	92	86	97.8	102.2	54	2
8	32.0	45.420	0.95	4.37	4.50	77	93	87	100.4	102.0	55	3
9	36.0	50.870	1.20	5.52	5.70	78	95	87	100.0	101.8	56	3
10	40.0	54.800	0.58	2.58	2.80	78	95	87	99.3	101.5	57	3
11	44.0	58.800	0.68	3.12	3.20	80	96	88	101.6	101.5	57	2
12	48.0	62.820	0.58	2.66	2.70	80	96	88	99.9	101.4	57	2
B-1	52.0	68.830	1.50	6.91	7.00	79	97	89	102.0	101.4	54	4
2	56.0	74.500	1.50	6.91	7.00	79	97	89	93.1	100.8	50	4
3	60.0	80.600	1.50	6.93	7.00	78	98	89	100.0	100.8	51	4
4	64.0	86.820	1.50	6.92	7.10	80	99	90	102.0	100.9	51	4
5	68.0	92.840	1.30	5.98	6.10	81	99	90	102.3	100.9	51	4
6	72.0	98.710	1.50	6.93	7.10	80	100	91	99.4	100.9	50	4
7	76.0	102.000	0.50	2.31	2.40	80	100	92	92.0	100.4	50	4
8	80.0	105.800	0.50	2.31	2.40	79	99	92	106.2	100.7	50	2
9	84.0	109.560	0.47	2.17	2.20	79	99	92	108.3	101.0	50	3
10	88.0	113.300	0.48	2.23	2.30	78	99	92	106.6	101.3	50	2
11	92.0	116.600	0.45	2.09	2.10	78	99	92	97.1	101.1	50	2
12	96.0	119.970	0.44	2.06	2.10	72	98	92	99.8	101.1	55	2
				0.00					ERR	ERR		
Dry Sample Vol.	104.77	dP	0.80	dH	dH	Ts			Tm	%iso		
STD Sample Vol.	87.98		3.678	3.758	78				92	101.1		

S T A C K				
ACTUAL		STANDARD		
Vel. ft/sec	Flow acfm	Vel. dscf/sec	Flow dscfm	
47.27	48	38.54	40	
49.70	51	40.45	42	
42.09	43	34.32	35	
42.59	44	34.66	36	
40.66	42	33.22	34	
38.12	39	31.31	32	
47.49	49	39.02	40	
60.44	62	49.37	51	
67.99	70	55.44	57	
46.44	48	37.87	39	
51.27	53	41.66	43	
47.95	49	38.47	39	
76.08	78	61.92	64	
76.08	78	61.92	64	
76.01	78	61.98	64	
76.15	78	61.87	63	
70.96	73	57.54	59	
78.15	78	61.87	63	
43.87	45	35.72	37	
43.93	45	35.75	37	
42.59	44	34.66	36	
43.00	44	35.06	36	
41.63	43	33.95	35	
40.94	42	33.76	35	
0.00	0	0.00	0	
53.70	55	43.76	45	

Run 3

TRAVERSE POINT LOCATIONS, CIRCULAR STACKS

Plant	LUZENAC		
Date	1-6-95	By	MWA
Sampling Location	DC-2 (Portable Stack)		
Inside of Far Wall to Outside of Port (distance, X)			
Port Depth (distance, Y)			
Stack I.D. (distance X - distance Y)	18" x 18"		
Dist. to upstream disturbance ft/in. Diameters	8	Dist. to downstream disturbance ft/in. Diameters	2
No. of Traverse Points Req'd:	9	Total	3 Per Port



SCHEMATIC OF SAMPLING LOCATION

[illegible]

Notes:

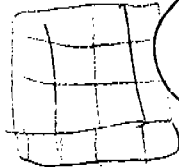
Notes: Portable Stack = 18" x 18" rectangular

GAS VELOCITY AND VOLUME DATA FORM

Plant <u>LLIZENAC</u>		Location <u>SAPPINGTON</u> <u>DC-2</u>		Stack ID No. <u>Portable</u>
Date <u>1-6-95</u>	Time <u>1145</u>	Operator <u>MMA</u>	Run No. <u>1</u>	Stack Dimension <u>18" x 18"</u>

Altitude	Alt. Corr.	Ambient Temp.
Barometric Reading	Molecular Weight	
Local Barometric Pressure <u>25.90" Hg</u>	Method	
Stack Static Pressure <u>-0.11</u>	Pitot C_p	

Field Data				
Traverse Point Number	Velocity Head (Δp_s), inches H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
1	0.16 <u>0.13</u>		0.13	9°
2	0.12			1°
3	0.09			3°
4	0.17			8°
5	0.15			0°
6	0.16			1°
7	0.17			2°
8	0.17			0°
9	0.16			2°
Average Δp_s			Average Stack Temp.	Average Angle (α) ¹
<u>0.15</u> ✓				
Mean Sqrt Δp_s				
				2.9

¹ Average of α must be <10° to be acceptable.

2-22.45
25.5
RAR

PARTICULATE-FIELD DATA FORM

Nozzle ID No. _____ Nozzle Dia. 3/8
 Probe ID No. _____ Probe Length 3'
 Liner Material SS
 Probe Heat Setting 150°F

100' 75720
Drefest Wade

VISIBLE EMISSION OBSERVATION FORM

Run 1

Source Name LUZANAC			Observation Date 11/6/94				Start Time 19:40		Stop Time 19:40					
Address 28769 Sappington Road			Min		Seconds				Min		Seconds			
					0	15	30	45			0	15	30	45
City 3 Forks	State MT	Zip 59752	1	0	0	0	0	31	0	0	0	0		
Phone (406) 285-3286			2	0	0	0	0	32	0	0	0	0		
Source ID Number DC-2			3	0	0	0	0	33	0	0	0	0		
Process Equipment PC-3			4	0	0	0	0	34	0	0	0	0		
Operating Mode NORMAL			5	0	0	0	0	35	0	0	0	0		
Control Equipment DAGHOUSE			6	0	0	0	0	36	0	0	0	0		
Operating Mode NORMAL			7	0	0	0	0	37	0	0	0	0		
Describe Emission Point HORIZONTAL			8	0	0	0	0	38	0	0	0	0		
Start PURCHASE SOURCE STOP			9	0	0	0	0	39	0	0	0	0		
Height above Ground Level Start 1' Stop			10	0	0	0	0	40	0	0	0	0		
Height Relative to Observer Start -2' Stop			11	0	0	0	0	41	0	0	0	0		
Distance from Observer Start 4' Stop			12	0	0	0	0	42	0	0	0	0		
Direction from Observer Start - Stop -			13	0	0	0	0	43	0	0	0	0		
Describe Emissions NONE - TALL DUST			14	0	0	0	0	44	0	0	0	0		
Start - Stop -			15	0	0	0	0	45	0	0	0	0		
Emission Color Start WHITE Stop			16	0	0	0	0	46	0	0	0	0		
Plume Type: Continuous ☒ Fugitive ☐ Intermittent ☐			17	0	0	0	0	47	0	0	0	0		
Water Droplets Present? Yes ☐ No ☒			18	0	0	0	0	48	0	0	0	0		
If Water Droplet Plume: Attached ☐ Detached ☐			19	0	0	0	0	49	0	0	0	0		
Point in the Plume at which Opacity was Determined Start FEET Stop SAME			20	0	0	0	0	50	0	0	0	0		
Describe Background Start RED BACKPACK Stop SAME			21	0	0	0	0	51	0	0	0	0		
Background Color Start Red Stop SAME			22	0	0	0	0	52	0	0	0	0		
Sky Conditions Start - Stop -			23	0	0	0	0	53	0	0	0	0		
Wind Speed Start - Stop -			24	0	0	0	0	54	0	0	0	0		
Wind Direction Start - Stop -			25	0	0	0	0	55	0	0	0	0		
Ambient Temp. Start - Stop -			26	0	0	0	0	56	0	0	0	0		
Wet Bulb Temp. Start - Stop -			27	0	0	0	0	57	0	0	0	0		
RH Percent Start - Stop -			28	0	0	0	0	58	0	0	0	0		
			29	0	0	0	0	59	0	0	0	0		
			30	0	0	0	0	60	0	0	0	0		

Source Layout Sketch		Average Opacity for Highest Period 0		Number of Readings Above 20 % Were 0	
☒ Sun ☒ Wind ☒ Plume & Stack Draw North Arrow ↓ X - X Emission Point 140° Sun Location Line		Range of Opacity Readings 0 Minimum 0 Maximum			
Observer's Name (Print) DAVE KINGHORN					
Observer's Signature 				Date 11/6/94	
Organization BISON FENCE					
Comments PURCHASE SOURCE ON CASHWAL REMOVED ACTUAL RED BACKPACK 18" x 18"					

PARTICULATE FIELD DATA FORM

Plant <u>L. V. 2 WAX</u>	Location <u>S 400</u>	Stack ID No. <u>002</u>	Stack Dimension <u>18" X 18"</u>
Date <u>1/19/98</u>	Operator <u>DK</u>	Filter No. <u>1157</u>	Meter Box No. <u>80575</u>

Altitude _____	Alt. Corr. _____
Barometric Reading _____	
Barometric Pres. <u>25.90" Hg</u>	
Stack Static Pres. <u>-0.11</u>	

Assumed Moisture <u>2</u>
Ambient Temp. <u>80</u>
Meter ΔH @ <u>1.92</u>
Meter Calib (Y) <u>1.058</u>

Nozzle ID No. <u>373</u>	Nozzle Dia. <u>3/8"</u>
Probe ID No. <u>31</u>	Probe Length <u>31</u>
Liner Material <u>55</u>	
Probe Heat Setting <u>160</u>	

Traverse Point Number	Sampling Time (min.)	Clock Time (24 hr.)	Gas Sample Volume (cf)	Velocity Head (AP) ("H ₂ O)	Pressure Differential across Orifice Meter (ΔH) ("H ₂ O)	Vacuum, mm ("Hg)	#1 Stack Temp. (°F)	#3 Filter Temp. (°F)	#4 Temp. of Gas Leaving Condenser or Last Impinger (°F)	#6 Gas Sampler Temp. at Dry Gas Meter (°F)		#7
										Inlet	Outlet	
A1	8	12:30	883.724	24.13	2.90	1.5	82	160	63	87	81	81
2	16		900.5	.13	2.95	1.5	73	160	60	81	81	81
3	24		906.6	.11	2.50	1.0	70	160	66	83	83	87
A1	32		914.7	.16	3.60	1.5	74	160	55	87	87	83
2	40		923.4	.17	3.8	1.5	73	160	52	88	88	83
3	48		931.8	.16	3.7	1.5	71	160	52	91	91	85
C1	56		940.2	.16	3.7	1.5	71	160	52	92	92	85
2	64		949.6	.18	4.0	1.5	71	168	56	92	92	86
3	72		957.618	.16	3.5	1.5	71	160	52	93	93	87
			883.724									
		MTR VOL	73.886									
			152.41	Mean Sp. Vel	ΔH		75					
			0.3872		3.406		72.9				8576	

VISIBLE EMISSION OBSERVATION FORM

Run 2

Source Name LUZANAC			Observation Date 1/9/95		Start Time 11:30		Stop Time 12:50	
Address 28769 Sappington Road			City 3 Forks		State MT		Zip 59752	
Phone (406) 285-3286			Source ID Number DC-2		Process Equipment DC-2		Operating Mode NORMAL	
Control Equipment BA6 Horse			Operating Mode NORMAL		Describe Emission Point Start PORT, STACK Stop SAME		Height above Ground Level Start 1' Stop 1'	
Height Relative to Observer Start -2' Stop -2'			Distance from Observer Start 5' Stop 5'		Direction from Observer Start NE Stop NE		Describe Emissions NONE	
Start WATER TALL Stop SAME			Emission Color NONE		Plume Type: Continuous ☒ Fugitive ☐ Intermittent ☐		Water Droplets Present? Yes ☐ No ☒	
If Water Droplet Plume: Attached ☐ Detached ☐			Point in the Plume at which Opacity was Determined Start EXIT - STACK Stop SAME		Describe Background Start BLACK SMIP Stop SAME		Background Color Start WHITE Stop SAME	
Sky Conditions Start Clear Stop Cloudy			Wind Speed Start Stop		Wind Direction Start Stop		Ambient Temp. Start Stop	
Wet Bulb Temp. Start Stop			RH Percent		Average Opacity for Highest Period 0		Number of Readings Above 25 % Were 0	
Source Layout Sketch <i>INDOORS</i> ☒ Sun ☒ Wind ☒ Plume & Stack Draw North Arrow X Emission Point 140° Sun Location Line			Range of Opacity Readings 0 Minimum 0 Maximum Observer's Name (Print) DAVID L. KINGHORN Observer's Signature <i>David L. Kinghorn</i> Date 1/9/95 Organization BISONS ENGINEERING, INC. Comments PORTLAND STACK ON CATWALK BLACK JOB SOME MAKING					



PARTICULATE FIELD DATA FORM

Altitude _____ Alt. Corr. _____
Barometric Reading _____
Barometric Pres. 25.90 "Hg
Stack Static Pres. -0.11 "H₂O

Altitude _____ Alt. Corr. _____
Barometric Reading _____
Barometric Pres. 25.90 "Hg
Stack Static Pres. -0.11 "H₂O

Altitude _____ Alt. Corr. _____
Barometric Reading _____
Barometric Pres. 25.90 "Hg
Stack Static Pres. -0.11 "H₂O

[illegible]

TEST:	
FACILITY	
LUZENAC	
LOCATION	
SAPPINGTON	
SOURCE	
DC2	
Test Run	
3	
DATE	
1/9/95	
START TIME	

TRAVERSE INFO		PRE TEST CALCULATIONS	
Static (use - if neg.)	-0.11	Stack press. (Ps)	25.89
Stack Temp, F	65.0	Stack Area (sqft. rnd)	1.77
Acquired avg. delta P	0.15	Stack Area (sqft. rect)	2.25
Oxygen %	21.00	Recommended Nz dia.	0.311
Carbon Dioxide %	0.00	Total Run Time	72.00

TRAVERSE INFO		PRE TEST CALCULATIONS	
Static (use - if neg.)	-0.11	Stack press. (Ps)	25.89
Stack Temp, F	65.0	Stack Area (sqft. rnd)	1.77
Acquired avg. delta P	0.15	Stack Area (sqft. rect)	2.25
Oxygen %	21.00	Recommended Nz dia.	0.311
Carbon Dioxide %	0.00	Total Run Time	72.00

EMISSIONS	
STD grains/dscf	0.00173
lbs / hour	0.04

Trav	Sample	MetrVol	Vel head	Calc	Run	Stack
Point	Time		delta P	delta H	delta H	Temp
A-1	8.0	957.772	0.13	2.85	2.70	83
2	16.0	965.400	0.16	3.56	3.40	78
3	24.0	973.700	0.15	3.36	3.30	74
B-1	32.0	982.200	0.14	3.16	3.00	72
2	40.0	989.500	0.16	3.61	3.50	72
3	48.0	997.700	0.15	3.40	3.50	71
C-1	56.0	1006.000	0.11	2.50	2.60	70
2	64.0	1013.200	0.11	2.50	2.60	69
3	72.0	1020.500	0.13	2.97	3.00	68
		1028.503		0.00		
				0.00		
				0.00		
				0.00		
				0.00		
				0.00		
				0.00		
				0.00		
				0.00		
				0.00		
				0.00		
				0.00		
				0.00		
Dry Sample Vol.		70.731	dP	dH	dH	ts
STD Sample Vol.		62.34	0.14	3.102	3.067	73

[illegible][illegible][illegible]

VISIBLE EMISSION OBSERVATION FORM

Run 3

Source Name LUZARK			Observation Date 11/2/95		Start Time 14:30		Stop Time 15:30	
Address 28769 Sappington Road			City 3 Forks		State MT		Zip 59752	
Phone (406) 285-3296			Source ID Number DC-2		Process Equipment DC 2		Operating Mode NORM	
Control Equipment DC 2			Operating Mode NORM		Describe Emission Point Start PORT STACK Stop SAME		Height above Ground Level Start 1' Stop 1'	
Distance from Observer Start 6' Stop 6'			Direction from Observer Start N/E Stop N/E		Describe Emissions Start TAIL DUST Stop SAME		Emission Color NONE	
Water Droplets Present? Yes ☐ No ☒			If Water Droplet Plume: Attached ☐ Detached ☐		Point in the Plume at which Opacity was Determined Start STACK BASE Stop		Describe Background Start TOP SKY Stop SAME	
Background Color Start BLACK Stop			Sky Conditions Start Stop		Wind Speed Start Stop		Wind Direction Start Stop	
Ambient Temp. Start Stop			Wet Bulb Temp. Start Stop		RH Percent Start Stop		Average Opacity for Highest Period 0	
Source Layout Sketch 			Range of Opacity Readings 0 Minimum 0 Maximum		Number of Readings Above 20 % Were 0			
☒ Sun ☒ Wind ☒ Plume & Stack Draw North Arrow 			Observer's Name (Print) DAVID L. KINGSTON					
Observer's Signature 			Date 11/9/95					
Organization BISON FUR INC.								
Comments PORTABLE STACK ON CATWALK AGAINST BLACK TOP BOARD								



GAS VELOCITY AND VOLUME DATA FORM

Plant <i>Luzerne</i>		Location <i>Sappington</i>		Stack ID No. <i>DC-3</i>
Date <i>1-16-95</i>	Time <i>1400</i>	Operator <i>MAA</i>	Run No. <i>1</i>	Stack Dimension <i>12" (portable)</i>

Altitude	Alt. Corr.	Ambient Temp. $\sim 80^{\circ}\text{F}$
Barometric Reading	Molecular Weight 28.84	
Local Barometric Pressure 25.76" Hg	Method Est. - Ambient	
Stack Static Pressure -0.01" H ₂ O	Pitot C _p 0.84	

Field Data				
Traverse Point Number	Velocity Head (Δp_s), " H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
A 1	0.03	75	0	0
2	0.02	75	0	0
3	0.04	75	0	0
4	0.03	75	0	0
B 1	0.03	75	0	0
2	0.035	75	0	0
3	0.06	75	0	0
4	0.05	75	0	0
Average Δp_s			Average Stack Temp.	Average Angle (α) ¹
0.037				0°
Mean Sqrt Δp_s				
			75°F	

¹ Average of α must be $<10^\circ$ to be acceptable.

GAS VELOCITY AND VOLUME DATA FORM

Plant <u>LUZENAC</u>		Location <u>SAPPINGTON</u>		Stack ID No. <u>DC-3</u>
Date <u>1-19-95</u>	Time <u>0915</u>	Operator <u>MWA</u>	Run No. <u>3</u>	Stack Dimension <u>12"</u>

Altitude	Alt. Corr.	Ambient Temp. <u>~75°F</u>
Barometric Reading	Molecular Weight	
Local Barometric Pressure <u>26.57" Hg</u>	Method <u>FYRITE</u>	
Stack Static Pressure	Pitot C _p <u>0.84</u>	

Field Data				
Traverse Point Number	Velocity Head (Δp_v), " H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_c at 0° Reference	Angle (α) Yielding Null Δp
A 1	0.035	79		
2	0.040	76		
3	0.050	76		
4	0.055	76		
B 1	0.035	76		
2	0.045	77		
3	0.050	76		
4	0.055	76		
Average Δp_v			Average Stack Temp. <u>76.5°F</u>	Average Angle (α) ¹
<u>0.047, 0.046</u>				
Mean Sqrt Δp_v				

¹ Average of α must be <10° to be acceptable.

2-24-95
RGR

Plant	LUZENAC		Location	SAPPINGTON		Stack ID No.	DC-3	Stack Dimension	12"	
Date	4-16-95	Operator	MWA		Run No.	1	Sample Box No.	3	Filter No.	1158
								Meter Box No.	2	

Nozzle ID No. _____ Nozzle Dia. 0.491
 Probe ID No. _____ Probe Length 3 ~ 1.5'
 Liner Material STAINLESS STEEL
 Probe Heat Setting _____

[illegible]

VISIBLE EMISSION OBSERVATION FORM

Run 1

Source Name LUZERNAL				Observation Date 16 Jan 95				Start Time 14:46				Stop Time 15:46			
Address 28769 Sappington Rd.															
City 3 Forks		State MT		Zip 59752											
Phone (406) 295-3286		Source ID Number DC3													
Process Equipment DC-3		Operating Mode NORMAL													
Control Equipment DC-3		Operating Mode NORMAL													
Describe Emission Point VERTICAL ROUND PORTABLE STACK															
Start				Stop											
Height above Ground Level Start 40' Stop 40'				Height Relative to Observer Start 2' Stop 2'											
Distance from Observer Start 10' Stop				Direction from Observer Start EAST Stop											
Describe Emissions															
Start clear/none				Stop											
Emission Color Start clear Stop		Plume Type: Continuous ☒ Fugitive ☐ Intermittent ☐													
Water Droplets Present? Yes ☐ No ☒		If Water Droplet Plume: Attached ☐ Detached ☐													
Point in the Plume at which Opacity was Determined															
Start STACK OUTLET				Stop											
Describe Background															
Start other machinery				Stop											
Background Color Start black Stop		Sky Conditions N/A													
Wind Speed N/A		Wind Direction N/A													
Start Stop		Start Stop													
Ambient Temp. Start 80°F Stop		Wet Bulb Temp.													
		RH Percent													
Source Layout Sketch ☒ Sun ☒ Wind ☒ Plume & Stack Draw North Arrow 140° Sun Location Line				Average Opacity for Highest Period 0				Number of Readings Above 0 % Were 0							
				Range of Opacity Readings Minimum 0 Maximum 0											
Observer's Name (Print) SHAWN E. BRYANT															
Observer's Signature <i>Shawn E. Bryant</i>						Date 16 JAN 95									
Organization Bison Engineering															
Comments STACK IS INSIDE BUILDING															



VISIBLE EMISSION OBSERVATION FORM

Source Name <u>Luzend C</u>			Observation Date <u>01/18/95</u>				Start Time <u>140</u>		Stop Time <u>1240</u>					
Address <u>Sappington</u>			Min		Seconds				Min		Seconds			
					0	15	30	45			0	15	30	45
City <u>3 Forks</u>	State <u>MT</u>	Zip <u>59752</u>	1	0	0	0	0	31						
Phone <u>(406) 285-3286</u>	Source ID Number <u>DC3-3</u>		2	0	0	0	0	32	0	0	0	0		
Process Equipment <u>Bin Vent</u>	Operating Mode		3	0	0	0	0	33						
			4	0	0	0	0	34						
Control Equipment <u>Baghouse</u>	Operating Mode		5	0	0	0	0	35						
			6	0	0	0	0	36						
Describe Emission Point <u>Portable stack</u>			7	0	0	0	0	37	0	0	0	0		
Start	Stop		8	0	0	0	0	38						
Height above Ground Level <u>NA</u>	Height Relative to Observer <u>same</u>		9	0	0	0	0	39						
Start <u>NA</u>	Stop		10	0	0	0	0	40						
Distance from Observer <u>8'</u>	Direction from Observer <u>NA</u>		11	0	0	0	0	41						
Start <u>8'</u>	Stop		12	0	0	0	0	42	0	0	0	0		
Describe Emissions <u>None</u>			13					43						
Start	Stop		14					44						
Emission Color <u>None</u>	Plume Type: Continuous ☒		15					45						
Start	Fugitive ☐ Intermittent ☐		16					46						
Water Droplets Present? <u>No</u>	If Water Droplet Plume: Attached ☐ Detached ☐		17	0	0	0	0	47	0	0	0	0		
Yes ☐ No ☒			18					48						
Point in the Plume at which Opacity was Determined <u>Stack exit</u>			19					49						
Start <u>Stack exit</u>	Stop		20					50						
Describe Background <u>Detailed</u>			21					51						
Start	Stop		22	0	0	0	0	52	0	0	0	0		
Background Color <u>White</u>	Sky Conditions <u>NA</u>		23					53						
Start	Stop		24					54						
Wind Speed <u>NA</u>	Wind Direction <u>NA</u>		25					55						
Start	Stop		26					56						
Ambient Temp. <u>60</u>	Wet Bulb Temp.		27	0	0	0	0	57	0	0	0	0		
Start	RH Percent		28					58						
			29					59						
			30					60						

Source Layout Sketch

☒ Sun
☒ Wind
☒ Plume & Stack

Draw North Arrow

X Emission Point

140°

Sun Location Line

Average Opacity for Highest Period <u>0</u>		Number of Readings Above <u>0</u> % Were <u>0</u>	
Range of Opacity Readings			
Minimum <u>0</u>		Maximum <u>0</u>	
Observer's Name (Print) <u>Oil Loomis</u>			
Observer's Signature <u>[Signature]</u>		Date <u>Jan 18/95</u>	
Organization <u>Bison</u>			
Comments <u>Indoor location</u>			



616

Altitude _____ Alt. Corr. _____
Barometric Reading _____
Barometric Pres. 26.57" Hg
Stack Static Pres. -0.01

Assumed Moisture 2.1.
Ambient Temp. ~75°F
Meter $\Delta H@$ 1.92
Meter Calib (Y) 1.002

[illegible]

FACILITY	Luzenac/Sappington
LOCATION	DC-3
RUN #	Three
DATE	1-19-95
START TIME	1130
STOP TIME	

PRELIMINARY INFO.	
Bp (Pm) (in.Hg)	26.57
Stack Dia (md)	1
Stack Area (sq.ft.)	0.79
Yi	1.002
Delta H@	1.92
PRE TEST INFO	
Assumed moisture %	2.0
Assumed Meter Temp, F	75.0
Time per Point	10.00
Nozzle Dia (in.)	0.491
Total Number of Points	8
POST TEST INFO	
Impinger H2O Gain (g)	21.35
Particulate Gain (mg)	7.90
Static (use - if neg.)	-0.01
Stack Temp, F	65.0
Aquired avg. delta P	0.05
Oxygen	21.00
Carbon Dioxide	0.00

CALCULATED	
Stack press. (Ps)	26.57
Stack Area (md)	0.79
Meter Temp, R	535.0
Recommended Nz dia.	0.415
Nozzle area (ft ²)	0.00131
Total Run Time	80.00
EMISSIONS	
lb / dscf	STD
grains / dscf	STD
lb / hour	STD
lb / ft ³	Act.
Wet mol. wt. (Ms)	28.62
Dry mol. wt. (Md)	28.94
grains / ft ³	Act.
Actual % H2O in Stack	1.27
Actual Wet Molec. Wt	28.70
Actual Isokinetic Avg	99.87

CALCULATED	
Stack Temp, R(Ts)	525.0
Wet mol. wt. (Ms)	28.62
Dry mol. wt. (Md)	28.94
grains / ft ³	Act.
Actual % H2O in Stack	1.27
Actual Wet Molec. Wt	28.70
Actual Isokinetic Avg	99.87

Trav Point	Sample Time	MetVol	Val head	Calc. delta P	Actual delta H	Stack Temp	Meter Temp	Point	Accum.	TEST		STACK		METER		ACT
										Calc	SQRT	Stack Vel.	Stack Flow	Volume	Volume	Stack Vel
						In	Out	% I	Iso %	K	dP	ft/sec	cuft/min	std	cu. ft. per min	ft/sec
1	10.0	857.880	0.04	2.629	2.60	67	78	103	103.5	*****	0.20	11.96	563	8.51	0.926	11.94
2	20.0	868.080	0.05	3.309	3.20	62	77	98	100.6	*****	0.22	13.30	627	9.03	1.031	13.29
3	30.0	878.970	0.06	3.647	3.60	62	78	99	100.3	*****	0.23	13.95	658	9.63	1.081	13.93
4	40.0	891.270	0.07	4.850	4.55	63	81	100	100.1	*****	0.26	15.76	742	10.87	1.221	15.73
5	50.0	901.280	0.05	2.980	3.00	65	81	101	100.2	*****	0.21	12.66	596	8.80	0.981	12.64
6	60.0	912.190	0.06	3.646	3.60	65	82	99	100.1	*****	0.23	13.99	659	9.60	1.084	13.97
7	70.0	924.390	0.07	4.301	4.30	67	83	102	100.4	*****	0.25	15.24	718	10.73	1.181	15.22
8	80.0	936.887	0.07	4.640	4.60	66	83	101	100.5	*****	0.26	15.80	745	11.00	1.224	15.78
9	90.0			0.000				ERR	ERR	*****	0.00	0.00	0	*****	0.000	0.00
10	100.0			0.000				ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00
11	110.0			0.000				ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00
12	120.0			0.000				ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00
13	130.0			0.000				ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00
14	140.0			0.000				ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00
15	150.0			0.000				ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00
16	160.0			0.000				ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00
17	170.0			0.000				ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00
18	180.0			0.000				ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00
19	190.0			0.000				ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00
20	200.0			0.000				ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00
21	210.0			0.000				ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00
22	220.0			0.000				ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00
23	230.0			0.000				ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00
24	240.0			0.000				ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00
25	250.0			0.000				ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00
Actual Vol		88.659		dP	avg	dH	1s			SQRT d		avg	avg	Vol std	dscf/m	avg
				0.06	3.725	3.68	65			0.24		14.08	664	78.17	1.091	14.06
								1m	%iso							
								78	ERR							

VISIBLE EMISSION OBSERVATION FORM

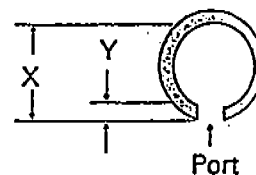
Run #3

Source Name LUZENAC			Observation Date 1-19-95		Start Time 1150		Stop Time 1250	
Address 2816 SAPPINGTON ROAD			Min Seconds 0 15 30 45		Min Seconds 0 15 30 45			
City 3 FORKS State MT Zip 59752								
Phone (406) 285-3286			Source ID Number DC-3		Min		Seconds	
Process Equipment Bin Vent			Operating Mode Normal		31		0	
Control Equipment Baghouse			Operating Mode Normal		32		0	
Describe Emission Point Portable Stack					33		0	
Start					34		0	
Height above Ground Level					35		0	
Height Relative to Observer					36		0	
Distance from Observer					37		0	
Direction from Observer					38		0	
Describe Emissions					39		0	
Start None Stop Same					40		0	
Emission Color					41		0	
Plume Type: Continuous ☐					42		0	
Fugitive ☐ Intermittent ☐					43		0	
Water Droplets Present?					44		0	
Yes ☐ No ☒					45		0	
If Water Droplet Plume:					46		0	
Attached ☐ Detached ☒					47		0	
Point in the Plume at which Opacity was Determined					48		0	
Start Stack Outlet Stop Same					49		0	
Describe Background					50		0	
Start Equipment Stop Same					51		0	
Background Color					52		0	
Sky Conditions					53		0	
Start White Stop Same					54		0	
Wind Speed					55		0	
Wind Direction					56		0	
Start NA Stop					57		0	
Ambient Temp.					58		0	
Wet Bulb Temp.					59		0	
Start 60°F Stop Same					60		0	
RH Percent					61		0	
Source Layout Sketch			Average Opacity for Highest Period		Number of Readings Above			
☒ Sun ☒ Wind ☒ Plume & Stack Draw North Arrow X Emission Point 140° Sun Location Line			0		0 % Were 0			
			Range of Opacity Readings					
			Minimum 0 Maximum 0					
			Observer's Name (Print)		MITCH ANDERSON			
Observer's Signature								
Date		1-19-95						
Organization		BISON ENGR						
Comments		Indoor portable stack.						



TRAVERSE POINT LOCATIONS, CIRCULAR STACKS

Plant	LUZENAC - SAPPINGTON		
Date	1-3-95	By	SEP/MWA
Sampling Location	DC-4 (USING PORTABLE STA		
Inside of Far Wall to Outside of Port (distance, X)	20 1/2"		
Port Depth (distance, Y)	2 1/2"		
Stack I.D. (distance X - distance Y)	18"		
Dist. to upstream disturbance ft/in. 13'6" Diameters	Dist. to downstream disturbance ft/in. 23'0" Diameters		
No. of Traverse Points Req'd:	Total	Per Port	
	9	3	



SCHEMATIC OF SAMPLING LOCATION

[illegible]

Notes:

GAS VELOCITY AND VOLUME DATA FORM

Plant <u>LUZENAC</u>		Location <u>SAPPINGTON</u>		Stack ID No. <u>DC-4</u>
Date <u>1-3-95</u>	Time <u>1030</u>	Operator <u>SEB/MWA</u>	Run No. <u>1</u>	Stack Dimension <u>18" (Portable Stack)</u>

Altitude	Alt. Corr.	Ambient Temp. <u>48°F</u>
Barometric Reading	Molecular Weight <u>28.84</u>	
Local Barometric Pressure <u>26.24" Hg</u>	Method <u>FYRITE</u>	
Stack Static Pressure <u>0.02</u>	Pitot C _p <u>0.84</u>	

Field Data				
Traverse Point Number	Velocity Head (Δp_s), "H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
1	0.003 0.03		0.01	4°
2	0.04		0.02	5°
3	0.03		0.02	5°
4	0.03		0.02	7°
5	0.03		0.02	5°
6	0.03		0.02	12°
7	0.02		0.01	4°
8	0.02		0.01	2°
9	0.02		0.01	5°
Average Δp_s		Average Stack Temp.	Average Angle (α) ¹	
0.027 ✓			5.44° ✓	
Mean Sqrt Δp_s				
0.165				

¹ Average of α must be <10° to be acceptable.

2-24-95
Rag

NOZZLE CALIBRATION DATA FORM

 Date 1-3-95 Calibrated by MMA

Nozzle Identification Number	Nozzle Diameter			ΔD^a mm (in.)	D_{avg}^b
	D_1 , mm (in.)	D_2 , mm (in.)	D_3 , mm (in.)		
	0.490"	0.492"	0.490"	0.02	0.491"

^a ΔD = maximum difference between any two diameters, mm (in.), $\Delta D \leq 0.10$ mm (0.004 in.)

^b D_{avg} = average of D_1 , D_2 , and D_3

VISIBLE EMISSION OBSERVATION FORM

Run 1

Source Name LUZENAC-Sappington			Observation Date 1-3-95		Start Time 14:35		Stop Time 15:35			
Address 28769 Sappington Road										
City 3Forks	State MT	Zip 59752								
Phone (406) 285-3286		Source ID Number DC-4								
Process Equipment mill #2		Operating Mode								
Control Equipment b.m. filter		Operating Mode normal								
Describe Emission Point portable, rectangular duct - laying horizontal										
Height above Ground Level Start ~36' Stop		Height Relative to Observer Start -3' Stop								
Distance from Observer Start 5' Stop		Direction from Observer Start S Stop								
Describe Emissions none										
Emission Color none			Plume Type: Continuous ☒ Fugitive ☐ Intermittent ☐							
Water Droplets Present? Yes ☐ No ☒			If Water Droplet Plume: Attached ☐ Detached ☐							
Point in the Plume at which Opacity was Determined Start @ Stack mouth Stop										
Describe Background see comments										
Background Color large black			Sky Conditions clear							
Wind Speed Stop			Wind Direction Stop							
Ambient Temp. ~50°F			Wet Bulb Temp. Stop							
RH Percent										
Source Layout Sketch ☒ Sun ☐ Wind ☒ Plume & Stack Draw North Arrow			Average Opacity for Highest Period 0		Number of Readings Above 0 % Were 0					
			Range of Opacity Readings 0 Minimum 0 Maximum							
			Observer's Name (Print) Bill Shaw							
			Observer's Signature Bill Shaw		Date 1-3-95					
			Organization Bison Engineering							
Comments read inside building - background - black grate										

PARTICULATE FIELD DATA FORM

Plant LUZENAC	Location SAPPINGTON		Stack ID No. DC-4	Stack Dimension 18"
Date 1-4-95	Operator MWA	Run No. 2	Filter No. 151 151	Meter Box No. 3

Altitude _____ Alt. Corr. _____
 Barometric Reading _____
 Barometric Pres. 26.17" Hg
 Stack Static Pres. 0.02

Assumed Moisture	0.0121%
Ambient Temp.	~50°F
Meter ΔH@	1.92
Meter Calib (Y)	1.002

Nozzle ID No. _____ Nozzle Dia. 0.491
 Probe ID No. _____ Probe Length 3'
 Liner Material STAINLESS STEEL
 Probe Heat Setting 120°F

[illegible]

FACILITY
LUZENAC/SAPPINGTON

LOCATION
DC-4

RUN #
TWO

DATE
4Jan95

START TIME
1020

STOP TIME
1154

PRELIMINARY INFO.

Bp (Pm) (in.Hg) 26.17

Stack Dia (rnd) 1.5

Stack Area (sq.ft.) 2.25

Yi 1.002

Delta H@ 1.92

Assumed moisture % 1.0

Assumed Meter Temp, F 46.0

Time per Point 10.00

Nozzle Dia (in.) 0.491

Total Number of Points 9

CALCULATED

Stack press. (Ps) 26.17

Stack Area (rnd) 1.77

Meter Temp, R 506.0

Recommended Nz dia. 0.460

Nozzle area (ft^2) 0.00131

Total Run Time 90.00

CALCULATED

Actual % H2O in Stack 0.73

Actual Wet Molec. Wt 28.76

Actual Isokinetic Avg 100.13

EMISSIONS

lb / dscf STD 2.813E-06

grains / dscf STD 0.0197

lb / hour STD 0.22

lb / ft^3 Act. 2.53E-06

grains / ft^3 Act. 0.0177

TRAVERSE INFO

Static (use - if neg.) 0.03

Stack Temp, F 50.0

Acquired avg. delta P 0.04

Oxygen 21.00

Carbon Dioxide 0.00

POST TEST INFO

Impinger H2O Gain (g) 10.8

Particulate Gain (mg) 88.20

CALCULATED

Stack Temp, R(Ts) 510.0

Wet mol. wt. (Ms) 28.73

Dry mol. wt. (Md) 28.84

CARBON DIOXIDE																			0.00	
Trav Point	Sample Time	MetriVol	Vel head delta P	Calc. delta H	Actual delta H	Stack Temp	Meter Temp		Point %I	Accum. Iso %	TEST			STACK		METER			ACT Stack Vel ft/sec	
							In	Out			Calc K	SQRT	Stack Vel. ft/sec	Stack Flow cuft/min	Volume std	Volume cu. ft. per min				
1	10.0	567.290	0.03	1.991	1.95	41	47	47	87	87.3	66.380	0.17	10.15	1371	6.38	0.795	10.15			
2	20.0	576.780	0.04	2.649	2.80	50	55	55	103	95.0	66.237	0.20	11.83	1597	8.60	0.926	11.82			
3	30.0	586.470	0.04	2.676	2.80	47	59	55	104	98.1	66.888	0.20	11.79	1592	8.74	0.923	11.79			
4	40.0	595.420	0.04	2.325	2.40	52	61	56	103	99.3	66.427	0.19	11.09	1497	8.04	0.868	11.08			
5	50.0	605.030	0.04	2.680	2.80	50	64	58	103	100.1	67.009	0.20	11.83	1597	8.60	0.926	11.82			
6	60.0	614.570	0.04	2.696	2.70	49	67	59	102	100.3	67.398	0.20	11.82	1595	8.51	0.925	11.81			
7	70.0	621.390	0.02	1.337	0.33	53	66	60	102	100.6	66.873	0.14	8.39	1132	6.04	0.656	8.38			
8	80.0	629.290	0.03	2.006	1.95	53	66	60	97	100.2	66.873	0.17	10.27	1387	7.03	0.804	10.27			
9	90.0	637.410	0.03	2.008	1.95	54	68	61	100	100.2	66.934	0.17	10.28	1388	7.20	0.805	10.28			
10	100.0			0.000					ERR	ERR	65.594	0.00	0.00	0	*****	0.000	0.00			
11	110.0			0.000					ERR	ERR	65.594	0.00	0.00	0	0.00	0.000	0.00			
12	120.0			0.000					ERR	ERR	65.594	0.00	0.00	0	0.00	0.000	0.00			
13	130.0			0.000					ERR	ERR	65.594	0.00	0.00	0	0.00	0.000	0.00			
14	140.0			0.000					ERR	ERR	65.594	0.00	0.00	0	0.00	0.000	0.00			
15	150.0			0.000					ERR	ERR	65.594	0.00	0.00	0	0.00	0.000	0.00			
16	160.0			0.000					ERR	ERR	65.594	0.00	0.00	0	0.00	0.000	0.00			
17	170.0			0.000					ERR	ERR	65.594	0.00	0.00	0	0.00	0.000	0.00			
18	180.0			0.000					ERR	ERR	65.594	0.00	0.00	0	0.00	0.000	0.00			
19	190.0			0.000					ERR	ERR	65.594	0.00	0.00	0	0.00	0.000	0.00			
20	200.0			0.000					ERR	ERR	65.594	0.00	0.00	0	0.00	0.000	0.00			
21	210.0			0.000					ERR	ERR	65.594	0.00	0.00	0	0.00	0.000	0.00			
22	220.0			0.000					ERR	ERR	65.594	0.00	0.00	0	0.00	0.000	0.00			
23	230.0			0.000					ERR	ERR	65.594	0.00	0.00	0	0.00	0.000	0.00			
24	240.0			0.000					ERR	ERR	65.594	0.00	0.00	0	0.00	0.000	0.00			
25	250.0			0.000					ERR	ERR	65.594	0.00	0.00	0	0.00	0.000	0.00			
Actual Vol		77.067	dP	avg	dH	1s	Tm			%iso	SQRT d			avg	Vol std	dscf/m	avg			
			0.03	2.263	2.19	50	0.59			ERR	0.18			10.83	1462	69.14	0.8474	10.82		

VISIBLE EMISSION OBSERVATION FORM

Run 2

Source Name <u>Lu 2 ENAC</u>			Observation Date <u>1-4-95</u>				Start Time <u>10:30</u>		Stop Time																			
Address <u>28769 Sappington Road</u>			<table border="1"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45				
Min	Seconds							Min	Seconds																			
	0	15	30	45	0	15	30		45																			
City <u>3 Forks</u>	State <u>MT</u>	Zip <u>59152</u>																										
Phone <u>(406) 285-3286</u>		Source ID Number <u>DC-4</u>																										
Process Equipment <u>MILL 2</u>		Operating Mode <u>NORMAL</u>																										
Control Equipment <u>DC 4</u>		Operating Mode <u>NORMAL</u>																										
Describe Emission Point Start <u>Portable Stack</u> Stop <u>Same</u>																												
Height above Ground Level Start <u>35'</u> Stop <u>Same</u>		Height Relative to Observer Start <u>3'</u> Stop <u>Same</u>																										
Distance from Observer Start <u>5'</u> Stop <u>Same</u>		Direction from Observer Start <u>5'</u> Stop <u>Same</u>																										
Describe Emissions Start <u>None</u> Stop <u>Same</u>																												
Emission Color Start <u>None</u> Stop <u>Same</u>		Plume Type: Continuous ☒ Fugitive ☐ Intermittent ☐																										
Water Droplets Present? Yes ☐ No ☒		If Water Droplet Plume: Attached ☐ Detached ☐																										
Point in the Plume at which Opacity was Determined Start <u>@ stack outlet</u> Stop <u>Same</u>																												
Describe Background Start <u>Grate</u> Stop <u>Same</u>																												
Background Color Start <u>Black</u> Stop <u>Same</u>		Sky Conditions Start <u>-</u> Stop <u>-</u>																										
Wind Speed Start <u>-</u> Stop <u>-</u>		Wind Direction Start <u>-</u> Stop <u>-</u>																										
Ambient Temp. Start <u>50°F</u> Stop <u>Same</u>		Wet Bulb Temp. RH Percent																										
Source Layout Sketch ☒ Sun Draw North Arrow ☒ Wind ☒ Plume & Stack 140° Sun Location Line			Average Opacity for Highest Period <u>0</u>				Number of Readings Above <u>0</u> % Were <u>0</u>																					
			Range of Opacity Readings <u>0</u> Minimum <u>0</u> Maximum				Observer's Name (Print) <u>Bill Shaw</u>																					
			Observer's Signature <u>Bill Shaw</u>				Date <u>1-4-95</u>																					
			Organization <u>Bison Engineering</u>																									
			Comments <u>Lead inside building</u>																									

PARTICULATE FIELD DATA FORM

Plant	LUZENAC	Location	SAPPINGTON	Stack ID No.	D-4	Stack Dimension	18"
Date	1-5-95	Operator	MA	Run No.	3	Sample Box No.	2
				Filter No.	14 14	Meter Box No.	3

Altitude _____ Alt. Corr. _____
 Barometric Reading _____
 Barometric Pres. 25.64" Hg
 Stack Static Pres. 0.02

Assumed Moisture	1.1
Ambient Temp.	~ 50°F
Meter ΔH@	1.92
Meter Calib (Y)	1.002

Nozzle ID No. _____ Nozzle Dia. 0.491
 Probe ID No. _____ Probe Length 3'
 Liner Material STAINLESS STEEL
 Probe Heat Setting 20°F

[illegible]

VISIBLE EMISSION OBSERVATION FORM

Run 3

Source Name <u>LUZENAE</u>			Observation Date <u>1-5-95</u>				Start Time <u>9:35</u>		Stop Time <u>10:35</u>																			
Address <u>28769 Sappington Road</u>			<table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45				
Min	Seconds							Min	Seconds																			
	0	15	30	45	0	15	30		45																			
City <u>3 Forks</u>	State <u>MT</u>	Zip <u>59752</u>	1	0	0	0	0	31	0	0	0	0																
Phone <u>(406) 285-3286</u>	Source ID Number <u>DC-4</u>		2	0	0	0	0	32	0	0	0	0																
Process Equipment <u>MILL</u>	Operating Mode <u>NORMAL</u>		3	0	0	0	0	33	0	0	0	0																
Control Equipment <u>DC4</u>	Operating Mode <u>NORMAL</u>		4	0	0	0	0	34	0	0	0	0																
Describe Emission Point <u>rectangular, portable stack, laying horizontal</u>			5	0	0	0	0	35	0	0	0	0																
			6	0	0	0	0	36	0	0	0	0																
Start	Height above Ground Level <u>36'</u> Stop	Height Relative to Observer <u>-3'</u> Stop	7	0	0	0	0	37	0	0	0	0																
Distance from Observer <u>5'</u> Stop	Direction from Observer <u>S</u> Stop		8	0	0	0	0	38	0	0	0	0																
Describe Emissions <u>none</u>			9	0	0	0	0	39	0	0	0	0																
Start	Stop		10	0	0	0	0	40	0	0	0	0																
Emission Color <u>none</u>	Plume Type: Continuous ☒	Fugitive ☐ Intermittent ☐	11	0	0	0	0	41	0	0	0	0																
Start	Stop		12	0	0	0	0	42	0	0	0	0																
Water Droplets Present? Yes ☐ No ☒	If Water Droplet Plume: Attached ☐ Detached ☐		13	0	0	0	0	43	0	0	0	0																
Point in the Plume at which Opacity was Determined <u>@ stack outlet</u>			14	0	0	0	0	44	0	0	0	0																
Start	Stop		15	0	0	0	0	45	0	0	0	0																
Describe Background <u>side of building w/ grate</u>	Background Color <u>light</u> Stop <u>black</u>		16	0	0	0	0	46	0	0	0	0																
Start	Stop		17	0	0	0	0	47	0	0	0	0																
Wind Speed <u>0-1 mph</u>	Wind Direction <u>NA</u> Stop		18	0	0	0	0	48	0	0	0	0																
Start	Stop		19	0	0	0	0	49	0	0	0	0																
Ambient Temp. <u>~50°F</u>	Wet Bulb Temp.		20	0	0	0	0	50	0	0	0	0																
Start	RH Percent		21	0	0	0	0	51	0	0	0	0																
Source Layout Sketch ☒ Sun ☒ Wind ☒ Plume & Stack Draw North Arrow <td>22</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>52</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td>			22	0	0	0	0	52	0	0	0	0																
			23	0	0	0	0	53	0	0	0	0																
			24	0	0	0	0	54	0	0	0	0																
			25	0	0	0	0	55	0	0	0	0																
			26	0	0	0	0	56	0	0	0	0																
			27	0	0	0	0	57	0	0	0	0																
			28	0	0	0	0	58	0	0	0	0																
			29	0	0	0	0	59	0	0	0	0																
			30	0	0	0	0	60	0	0	0	0																



VISIBLE EMISSION OBSERVATION FORM

Run 1

Source Name Luzernac America			Observation Date 3-3-95				Start Time 0810		Stop Time 0910			
Address 283769 Sappington Rd.												
City 3 Forks State MT Zip 59752												
Phone (406) 295-3286 Source ID Number DC-6												
Process Equipment ACM#1 Operating Mode Cont.												
Control Equipment Baghouse Operating Mode Cont.												
Describe Emission Point Large Tan Stack (west) on eastern roof of building.												
Start on eastern roof of building.												
Height above Ground Level Start ~60' Stop Same												
Height Relative to Observer Start ~6' Stop Same												
Distance from Observer Start ~60' Stop Same												
Direction from Observer Start S70E Stop Same												
Describe Emissions No Emissions Stop Same												
Emission Color Start — Stop												
Plume Type ☐ Continuous ☒ Fugitive ☐ Intermittent ☐												
Water Droplets Present? ☐ Yes ☒ No												
If Water Droplet Plume: NA												
Attached ☐ Detached ☐												
Point in the Plume at which Opacity was Determined Start 10' above stack Stop Same												
Describe Background Start Grassland Stop Same												
Background Color Start Lt. Brn Stop Same												
Sky Conditions Start Overcast Stop Same												
Wind Speed Start 0.5 Stop Same												
Wind Direction Start — Stop												
Ambient Temp. Start 31°F Stop 26°F												
Wet Bulb Temp. < 30°F												
RH Percent —												

Source Layout Sketch		Average Opacity for Highest Period 0		Number of Readings Above 20 % Were 0	
		Range of Opacity Readings Minimum 0 Maximum 0			
		Observer's Name (Print) Mitchell W. Anderson			
		Observer's Signature <i>MW Anderson</i> Date 3-3-95			
		Organization BISON ENGINEERING			
		Comments Overcast day = no sun. Observation pt. on roof of processing plant.			

☐ = Rxs in roof

3-10-95
RBR



VISIBLE EMISSION OBSERVATION FORM

Source Name LUZERNAC Sappington			Observation Date 15 March 97		Start Time 13:40		Stop Time 14:40	
Address 28769 Sappington Road			City 3 Forks		State MT		Zip 59752	
Phone (406) 285-3296			Source ID Number ACM#1		Process Equipment ACM-1		Operating Mode NORMAL	
Control Equipment Baghouse			Operating Mode NORMAL		Describe Emission Point Building		Start Test Tan Stack on Stop	
Height above Ground Level Start 100 Stop 100			Height Relative to Observer Start 100 Stop 100		Distance from Observer Start 300 Stop same		Direction from Observer Start 0 Stop 0	
Describe Emissions Start None Stop same			Emission Color Start 0 Stop 0		Plume Type: Continuous ☒ Fugitive ☐ Intermittent ☐		Water Droplets Present? Yes ☐ No ☒	
Point in the Plume at which Opacity was Determined Start AT exit Stop same			Describe Background Start gray clouds Stop same		Background Color Start gray Stop gray		Sky Conditions Start cloudy Stop cloudy	
Wind Speed Start 0-10 mph Stop 0-10 mph			Wind Direction Start west Stop west		Ambient Temp. Start 51°F Stop		Wet Bulb Temp. 44°F RH Percent 58%	
Source Layout Sketch ☒ Sun ☒ Wind ☒ Plume & Stack			Average Opacity for Highest Period 0		Number of Readings Above 0 % Were 0			
			Range of Opacity Readings 0 Minimum 0 Maximum		Observer's Name (Print) Shawn Bryant			
Observer's Signature Shawn P. Bryant		Date 15 March 97						
Organization Bison Eng.								
Comments Back ground poor								

VISIBLE EMISSION OBSERVATION FORM

Source Name LUZANAC Sappington			Observation Date 15 MARCH 95		Start Time 14:51		Stop Time 15:51	
Address 2876A Sappington Road			City 3 Forks		State MI		Zip 59752	
Phone (406) 285-3286			Source ID Number ACM-1		Process Equipment ACM-1		Operating Mode Normal	
Control Equipment Baghouse			Operating Mode Normal		Describe Emission Point Start (all) TAN STACK on Building Stop SAME		Height above Ground Level Start 100' Stop 100'	
Height Relative to Observer Start 100' Stop 100'			Distance from Observer Start 300' Stop		Direction from Observer Start 0° Stop 0°		Describe Emissions Start None Stop None	
Emission Color Start None Stop None			Plume Type: Continuous ☒ Fugitive ☐ Intermittent ☐		Water Droplets Present? Yes ☐ No ☒		If Water Droplet Plume: Attached ☐ Detached ☐	
Point in the Plume at which Opacity was Determined Start AT EXIT Stop AT EXIT			Describe Background Start GRAY CLOUDS Stop SAME		Background Color Start gray Stop same		Sky Conditions Start Cloudy Stop SAME	
Wind Speed Start 0-5 Stop 0-5			Wind Direction Start WEST Stop		Ambient Temp. Start 51°F Stop 51°F		Wet Bulb Temp. 44°F RH Percent 58%	
Source Layout Sketch ☀ Sun » Wind ✕ Plume & Stack PLANT Emission Point OFFICE WAREHOUSE 140° Sun Location Line			Average Opacity for Highest Period 0		Number of Readings Above % Were 0			
			Range of Opacity Readings Minimum 0 Maximum 0					
			Observer's Name (Print) SHAWN BRYANT					
			Observer's Signature <i>Shawn E. Bryant</i>		Date 15 MARCH 95			
			Organization Bison Eng.					
Comments BACK ground poor								

Fo. M3-02

GAS ANALYSIS DATA FORM - FYRITE

Plant

LEUZERIAE-SAPINGTON

Date

1-3-95

By

B. Shew

Sample Location

MILL 2

Ambient Temp.

~50°F

Sample Method (Bulb Pump, Integrated Bag, etc.)

Run	Clock Time	FYRITE READINGS			
		% CO ₂	% O ₂	[N ₂ + CO] = 100 Minus Σ [CO ₂ , O ₂]	
1 a	15145	0	21	79	
b		0	21	79	
c		0	21	79	
Averages		0	21	79	
Dry Molecular Weight (M _d)		x 44/100	x 32/100	x 28/100	
2 a		0	6.72	22.12	
b					
c					
Averages					
Dry Molecular Weight (M _d)		x 44/100	x 32/100	x 28/100	
3 a					
b					
c					
Averages					
Dry Molecular Weight (M _d)		x 44/100	x 32/100	x 28/100	
Total					38.84

2-28-95
RGR

GAS VELOCITY AND VOLUME DATA FORM

Plant <i>LuZemac - Sappington</i>		Location <i>DC 7</i>		Stack ID No. <i>DL-7</i>
Date <i>1-4-95</i>	Time <i>14:40</i>	Operator <i>DL/W5</i>	Run No.	Stack Dimension <i>23 5/8</i>

Altitude	Alt. Corr.	Ambient Temp. <i>~ 55°F (inside)</i>
Barometric Reading <i>26.17 in Hg</i>	Molecular Weight <i>28.84</i>	
Local Barometric Pressure	Method <i>Fyr. 18</i>	
Stack Static Pressure <i>-0.4</i>	Pitot C _p <i>.84</i>	

Field Data				
Traverse Point Number	Velocity Head (Δp_s), in H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
A 1	.29			<i>1°</i>
2	.36			<i>1°</i>
3	.69			<i>4°</i>
4	.88			<i>4°</i>
5	.81			<i>6°</i>
6	.64			<i>10°</i>
B 1	.51			<i>1°</i>
2	.65			<i>2°</i>
3	.71			<i>2°</i>
4	.62			<i>5°</i>
5	.46			<i>5°</i>
6	.42			<i>5°</i>
Average Δp_s <i>0.587</i> ✓		Average Stack Temp. <i>85°F</i>	Average Angle (α) ¹ <i>3.8°</i>	
Mean Sqrt Δp_s				

¹ Average of α must be < 10° to be acceptable.

NO22LG → *0.286* → *~ 1.15 ft/min*
 " → *0.324* → *~ 1.3 ft/min*
 " → *0.250* → *~ 0.88 ft/min*

2-28-95
Rue

GAS VELOCITY AND VOLUME DATA FORM

Plant <u>Luzerna</u>		Location <u>Sappington</u>		Stack ID No. <u>DC7</u> <u>ACH2</u>	
Date <u>01/24/95</u>	Time <u>14:20</u>	Operator <u>awc</u>	Run No. <u>2</u>	Stack Dimension <u>29 1/2</u>	

Altitude <u> </u>		Alt. Corr. <u> </u>		Ambient Temp. <u>NA</u>	
Barometric Reading <u> </u>				Molecular Weight <u>28.9</u>	
Local Barometric Pressure <u>26.44</u>				Method <u>X</u>	
Stack Static Pressure <u>-2.4</u>				Pitot Co. <u>0.94</u>	

Field Data						
Traverse Point Number	Velocity Head (Δp_s), " H ₂ O		Stack Temp., °F	Cyclonic Flow Determination		
				Δp_s at 0° Reference	Angle (α) Yielding Null Δp	
H-1	V-1	.21	.34	81		
1		.22	.45	83		
3		.44	.50	84		
4		.45	.55	85		
5		.46	.60	85		
6		.48	.66	85		
7		.83	.62	85		
8		.93	.63	85		
9		.97	.96	85		
10		1.1	.54	85		
11		1.0	.52	85		
12		.92	.47	85		
Average Δp_s				Average Stack Temp.	Average Angle (α) ¹	
0.60						
Mean Sqrt Δp_s						
0.7609				84.4		

¹ Average of α must be <10° to be acceptable.

2-28-95
RWR

GAS VELOCITY AND VOLUME DATA FORM

Plant <i>Luzenac</i>		Location <i>Springton</i>		Stack ID No. <i>DC-7</i> <i>ACH2</i>
Date <i>01/24/95</i>	Time	Operator <i>CWL</i>	Run No. <i>4</i>	Stack Dimension <i>28.625</i>

Altitude	Alt. Corr.	Ambient Temp. <i>NA</i>
Barometric Reading	Molecular Weight <i>28.8</i>	
Local Barometric Pressure <i>26.44</i>	Method <i>5</i>	
Stack Static Pressure <i>-2.40</i>	Pitot C _p <i>.84</i>	

Field Data							
Traverse Point Number		Velocity Head (Δp_s), "H ₂ O		Stack Temp., °F		Cyclonic Flow Determination	
						Δp_s at 0° Reference	Angle (α) Yielding Null Δp
V-1	H-1	.30	.19	53	64		
2	2	.40	.22	53	63		
3	3	.44	.42	52	63		
4	4	.52	.45	52	63		
5	5	.61	.48	52	63		
6	6	.65	.48	52	63		
7	7	.87	.85	52	63		
8	8	.93	.93	52	63		
9	9	.94	1.0	53	63		
10	10	.93	1.0	53	63		
11	11	.92	1.0	53	63		
12	12	.90	.87	53	63		
Average Δp_s						Average Stack Temp.	Average Angle (α) ¹
0.68							
Mean Sqrt Δp_s							
0.8050						57.8	

¹ Average of α must be <10° to be acceptable.

PARTICULATE FIELD DATA FORM

Plant <u>Cerezaco</u>	Location <u>Sapington</u>	Stack ID No. <u>DC-7</u>	Stack Dimensions <u>235/18</u>
Date <u>01/29/95</u>	Operator <u>ewl</u>	Filter No. <u>1045</u>	Meter Box No. <u>3</u>
Run No. <u>4</u>		Sample Box No. <u>11</u>	

Altitude ✓ Alt. Corr. ✓
 Barometric Reading 26.441
 Barometric Pres. 2.6441
 Stack Static Pres. -2.4

Assumed Moisture 2%
 Ambient Temp. ~45
 Meter $\Delta H@$ 1.002
 Meter Calib (Y) 1.922

Nozzle ID No. Nozzle Dia. 252
 Probe ID No. Probe Length 3'
 Liner Material SS
 Probe Heat Setting NA

Traverse Point Number	Sampling Time (min.)	Clock Time (24 hr.)	Gas Sample Volume (cf)		Velocity Head (ΔP) (in H ₂ O)	Pressure Differential across Orifice Meter (ΔH) (in H ₂ O)	Vacuum, mm (in Hg)	#1	#3	#4	#6		#7
			Start	Outlet									
								Start	Outlet				
V-1	4		11:50	944.61	.3	1.4	1	63	NA	38	60	59	
2	8			947.31	.4	1.8	1	63	"	40	64	61	
3	12			950.34	.44	2.0	2	62	"	41	64	61	
4	16			953.60	.52	2.4	2	62	"	44	65	61	
5	20			957.10	.61	2.8	2	62	"	46	65	61	
6	24			961.04	.65	3.0	3	62	"	46	70	63	
7	28			965.11	.87	4.0	4	52	"	46	70	63	
8	32			969.77	.93	4.3	4	52	"	46	71	63	
9	36			974.56	.94	4.3	4	52	"	47	72	64	
10	40			979.48	.93	4.3	4	53	"	47	74	65	
11	44			984.30	.92	4.2	4	53	"	47	76	67	
12	48	12:		989.10	.90	4.1	4	53	"	48	76	67	
				993.81									

In stack filter.

Altitude _____	Alt. Corr. _____
Barometric Reading _____	
Barometric Pres. _____	
Stack Static Pres. _____	

Assumed Moisture _____	
Ambient Temp. _____	
Meter $\Delta H@$ _____	
Meter Calib (Y) _____	

Nozzle ID No. _____	Nozzle Dia. _____
Probe ID No. _____	Probe Length _____
Liner Material _____	
Probe Heat Setting _____	

Altitude _____	Alt. Corr. _____
Barometric Reading _____	
Barometric Pres. _____	
Stack Static Pres. _____	

Assumed Moisture _____	
Ambient Temp. _____	
Meter $\Delta H@$ _____	
Meter Calib (Y) _____	

Nozzle ID No. _____	Nozzle Dia. _____
Probe ID No. _____	Probe Length _____
Liner Material _____	
Probe Heat Setting _____	

[illegible]

Post lease ✓ 0017 @ 8" Hg

VISIBLE EMISSION OBSERVATION FORM Run 4

Source Name LUZENAC			Observation Date 1-24-95				Start Time 1200		Stop Time 1300		
Address 28729 SAPPINGTON RD											
City 3 Forks	State MT	Zip 59752									
Phone (406) 285-3286		Source ID Number DC-7									
Process Equipment ACM 2		Operating Mode Normal									
Control Equipment Baghouse		Operating Mode Normal									
Describe Emission Point 1st Duct from Right near top of blng on South side											
Start Stop - Same											
Height above Ground Level Start ~ 30' Stop Same		Height Relative to Observer Start ~ 30' Stop Same									
Distance from Observer Start ~ 200' Stop Same		Direction from Observer Start ~ 200' Stop Same									
Describe Emissions											
Start — Stop —											
Emission Color Start — Stop —		Plume Type: Continuous ☐ Fugitive ☐ Intermittent ☐									
Water Droplets Present? Yes ☐ No ☒		If Water Droplet Plume: Attached ☐ Detached ☐									
Point in the Plume at which Opacity was Determined											
Start Near Duct Stop Same											
Describe Background											
Start Blng/Sky Stop Same											
Background Color Start Lt. brown Stop Same		Sky Conditions Start PC Stop Same									
Wind Speed Start 0-10 Stop Same		Wind Direction Start ~ 120 Stop Same									
Ambient Temp. Start ~ 30°F Stop Same		Wet Bulb Temp. < 30°F									
		RH Percent —									
Source Layout Sketch 			Average Opacity for Highest Period 0				Number of Readings Above % Were 0				
			Range of Opacity Readings Minimum 0 Maximum 0								
			Observer's Name (Print) Mitch Anderson								
			Observer's Signature <i>Mitch Anderson</i>				Date 1-24-95				
Organization Bison Engineering											
Comments											

2-28-95
Rwr



PARTICULATE FIELD DATA FORM

Plant	Luzerne	Location	Sappington	Stack ID No.	DC-7	Stack Dimension	29 1/2
Date	1-24-95	Operator	WA	Run No.	5	Sample Box No.	3
				Filter No.	36	Meter Box No.	3

Altitude _____ Alt. Corr. _____
Barometric Reading 26.44 "Hg
Barometric Pres. _____
Stack Static Pres. 2.40 "H₂O

Assumed Moisture 2%
Ambient Temp. 76.0°F
Meter ΔH @ 1.92
Meter Calib (N) 1.002

Nozzle ID No. _____ Nozzle Dia. 0.204
 Probe ID No. _____ Probe Length 31
 Liner Material Stainless Steel
 Probe Heat Setting _____

[illegible]

PRETEST LEAK CHECK: 0.005 cc³/min @ 1 1/2" Hg

PARTICULATE FIELD DATA FORM

Plant	Luzenac	Location	Sappington	Stack ID No.	DC-7	Stack Dimension	235/8
Date	1-24-95	Operator	MA	Run No.	5	Sample Box No.	3
				Filter No.	36	Meter Box No.	3

Altitude _____ Alt. Corr. _____
 Barometric Reading _____
 Barometric Pres. 26.44 "Hg
 Stack Static Pres. -2.40 "H₂O

Assumed Moisture _____
Ambient Temp. 26.0°f
Meter ΔH@ 1.92
Meter Calib (Y) 1.003

Nozzle ID No. 0.204 Nozzle Dia. 3'
Probe ID No. 3' Probe Length
Liner Material Stainless Steel
Probe Heat Setting

[illegible]

POST LEAK TEST: 0.001 ft³/min @ 241 Hg

VISIBLE EMISSION OBSERVATION FORM

Run **5**

Source Name <u>Luzerne</u>			Observation Date <u>1-24-95</u>		Start Time <u>1450</u>		Stop Time <u>1550</u>	
Address <u>29169 Sappington Rd</u>								
City <u>3 Forks</u>		State <u>MT</u>	Zip <u>59752</u>					
Phone <u>(406) 295-3286</u>		Source ID Number <u>PC-7</u>						
Process Equipment <u>ACM #2</u>		Operating Mode <u>Normal</u>						
Control Equipment <u>Baghouse</u>		Operating Mode <u>Normal</u>						
Describe Emission Point <u>1st Duct from Rt near</u>								
Start <u>Top of bldg, near top</u>								
Stop <u>Same</u>								
Height above Ground Level		Height Relative to Observer						
Start <u>~30'</u>		Stop <u>Same</u>						
Start <u>~30'</u>		Stop <u>Same</u>						
Distance from Observer		Direction from Observer						
Start <u>~50'</u>		Stop <u>Same</u>						
Start <u>~50'</u>		Stop <u>Same</u>						
Describe Emissions								
Start <u>—</u>								
Stop <u>—</u>								
Emission Color		Plume Type: Continuous ☐						
Start <u>—</u>		Fugitive ☐						
Stop <u>—</u>		Intermittent ☐						
Water Droplets Present?		If Water Droplet Plume:						
Yes ☐ No ☒		Attached ☐ Detached ☐						
Point in the Plume at which Opacity was Determined								
Start <u>Near Duct</u>								
Stop <u>Same</u>								
Describe Background								
Start <u>Bldg/Sky</u>								
Stop <u>Same</u>								
Background Color		Sky Conditions						
Start <u>4. Brn</u>		Stop <u>Same</u>						
Start <u>4. Brn</u>		Stop <u>Same</u>						
Wind Speed		Wind Direction						
Start <u>0-10</u>		Stop <u>Same</u>						
Start <u>0-10</u>		Stop <u>Same</u>						
Ambient Temp.		Wet Bulb Temp.						
Start <u>~30</u>		Stop <u>Same</u>						
Start <u>~30</u>		Stop <u>Same</u>						
RH Percent								
RH Percent								

Source Layout Sketch

☒ Sun

» Wind

✕ Plume & Stack

Draw North Arrow

Emission Point

140°

Sun Location Line

WAREHOUSE

PROCESSING PLANT

Average Opacity for Highest Period 0

Number of Readings Above % Were 20 0

Range of Opacity Readings

Minimum 0 Maximum 0

Observer's Name (Print) Mitch Anderson

Observer's Signature Mitch Anderson Date 1-24-95

Organization DISON ENGINEERING

Comments

2-28-95
RGR



PARTICULATE FIELD DATA FORM

Plant <u>Lucena</u>	Location <u>Sapington</u>	Stack ID No. <u>DO7</u>	Stack Dimension <u>29 1/2</u>
Date <u>01/25/</u>	Operator <u>ewc</u>	Run No. <u>6</u>	Sample Box No. <u>2</u>
		Filter No. <u>39</u>	Meter Box No. <u>3</u>

Altitude _____	Alt. Corr. _____
Barometric Reading _____	
Barometric Pres. _____	
Stack Static Pres. _____	

Assumed Moisture _____
Ambient Temp. _____
Meter ΔH @ _____
Meter Calib (Y) _____

Nozzle ID No. _____	Nozzle Dia. _____
Probe ID No. _____	Probe Length _____
Liner Material _____	
Probe Heat Setting _____	

Traverse Point Number	Sampling Time (min.)	Clock Time (24 hr.)	Gas Sample Volume (cf)		Velocity Head (ΔP) ($^{\circ}$ H ₂ O)	Pressure Differential across Orifice Meter (ΔH) ($^{\circ}$ H ₂ O)	Vacuum, mm (" Hg)	#1	#3	#4	#6		#7
			Start	Stop							Inlet	Outlet	
								Gas Sampler Temp at Dry Gas Meter (°F)					
V-1	52			167.55	.17	.73	1	99	NA	54	77	77	74
2	56			72.01	.23	.98	1	100	"	54	77	77	74
3	60			174.59	.33	1.3	1	102		54	78	78	74
4	64			77.44	.36	1.5	1	104		54	78	78	74
5	68			80.23	.35	1.5	1	105		54	79	79	75
6	72			83.22	.39	1.6	1	105		55	81	81	75
7	76			87.70	.90	3.8	3 1/2	98		56	82	82	75
8	80			92.43	.97	4.2	4	97		57	83	83	76
9	84			97.09	.96	4.1	4	95		58	85	85	77
10	88			201.54	.85	3.7	4	94		59	86	86	78
11	92			205.78	.78	3.4	4	95		59	87	87	78
12	96			209.88	.72	3.1	4	95		59	87	87	79
				MTR VOL =	Mean Spd	$\Delta H =$		$\bar{V}_s =$			$\bar{V}_m =$		
				78.670	0.6864	2.10		98.8			76.4		

PO-H Leak ✓ .014 @ 11" Hg

1

Altitude ✓ Alt. Corr. ✓
Barometric Reading ✓
Barometric Pres. 26.3
Stack Static Pres. -2.4

Assumed Moisture	2%
Ambient Temp.	~50
Meter $\Delta H @$	1.9%
Meter Calib (Y)	1.002

Rev. 12/92

FACILITY
Luzenac
LOCATION
Sappington
RUN #
6
DATE
01/25/95
START TIME
09:20
STOP TIME

PRELIMINARY INFO.	
Bp (Pm) (in.Hg)	26.3
Stack Dia (rnd)	29.5
Stack Area (sq.ft.)	3.04
Yl	1.002
Delta H@	1.92

PRE TEST INFO	
Assumed moisture %	2.0
Assumed Meter Temp, F	70.0
Time per Point	4.00
Nozzle Dia (in.)	0.252
Total Number of Points	24

CALCULATED	
Stack press. (Ps)	26.12
Stack Area (rnd)	683.49
Meter Temp, R	530.0
Recommended Nz dia.	0.204
Nozzle area (ft ²)	0.00035
Total Run Time	96.00

START TIME
09:20
STOP TIME

TRAVERSE INFO	
Static (use - if neg.)	-2.40
Stack Temp, F	53.0
Acquired avg. delta P	0.85
Oxygen	21.00
Carbon Dioxide	0.00

POST TEST INFO	
Impinger H2O Gain (g)	15.21
Particulate Gain (mg)	12.80

CALCULATED	
Stack Temp, R(Ts)	513.0
Wet mol. wt. (Ms)	26.62
Dry mol. wt. (Md)	26.84

Trav Point	Sample Time	MetVal	Vel head	Calc. delta P	Actual delta H	Stack Temp	Meter Temp	Point	Accum. Iso %	TEST		STACK		METER		ACT
										Calc	SQRT	Stack Vel.	Stack Flow	Volume	Volume	Stack Vel
						In	Out	% I		K	dP	ft/sec	cu. ft. per min	std	per min	ft/sec
1	4.0	133.930	0.34	1.428	1.40	99	68	99	99.0	4.200	0.58	36.20	6604	2.41	0.739	36.14
2	8.0	137.030	0.43	1.786	1.80	102	68	101	99.8	4.177	0.66	40.82	7446	2.74	0.833	40.75
3	12.0	140.370	0.51	2.135	2.10	102	70	99	99.7	4.185	0.71	44.46	8110	2.95	0.907	44.38
4	16.0	143.960	0.53	2.224	2.20	102	71	105	100.9	4.197	0.73	45.32	8267	3.17	0.925	45.24
5	20.0	147.500	0.55	2.319	2.30	102	75	101	100.9	4.217	0.74	46.17	8422	3.11	0.942	46.09
6	24.0	150.910	0.51	2.162	2.20	100	77	100	100.8	4.240	0.71	44.38	8095	2.99	0.906	44.30
7	28.0	153.830	0.39	1.664	1.60	96	71	98	100.4	4.266	0.62	38.67	7054	2.56	0.789	38.60
8	32.0	156.650	0.35	1.500	1.50	94	76	100	100.3	4.286	0.59	36.57	6670	2.47	0.746	36.50
9	36.0	159.350	0.32	1.370	1.30	94	76	100	100.3	4.282	0.57	34.97	6378	2.36	0.714	34.90
10	40.0	162.040	0.32	1.371	1.40	94	77	99	100.2	4.286	0.57	34.97	6378	2.35	0.714	34.90
11	44.0	164.820	0.33	1.413	1.40	95	77	101	100.2	4.282	0.57	35.54	6483	2.43	0.725	35.48
12	48.0	167.550	0.32	1.370	1.40	95	77	101	100.3	4.282	0.57	35.00	6384	2.38	0.714	34.93
13	52.0	169.560	0.17	0.724	0.73	99	77	102	100.4	4.259	0.41	25.60	4670	1.75	0.522	25.55
14	56.0	172.010	0.23	0.979	0.98	100	78	107	100.8	4.256	0.48	29.80	5436	2.13	0.608	29.75
15	60.0	174.590	0.33	1.399	1.30	102	78	94	100.4	4.241	0.57	35.76	6523	2.25	0.730	35.70
16	64.0	177.440	0.36	1.524	1.50	104	79	100	100.3	4.234	0.60	37.42	6826	2.48	0.764	37.35
17	68.0	180.230	0.35	1.478	1.50	105	79	99	100.3	4.226	0.59	36.93	6736	2.43	0.754	36.86
18	72.0	183.220	0.39	1.651	1.60	105	81	100	100.3	4.234	0.62	38.98	7111	2.60	0.796	38.91
19	76.0	187.700	0.90	3.869	3.80	98	83	99	100.2	4.299	0.95	58.85	10735	3.90	1.201	58.74
20	80.0	192.430	0.97	4.170	4.20	98	83	100	100.2	4.299	0.98	61.10	11144	4.13	1.247	60.99
21	84.0	197.090	0.96	4.146	4.10	97	85	99	100.1	4.319	0.98	60.73	11077	4.05	1.239	60.62
22	88.0	201.540	0.85	3.691	3.70	95	86	100	100.1	4.342	0.92	57.04	10404	3.86	1.164	56.94
23	92.0	205.780	0.78	3.390	3.40	95	87	99	100.1	4.346	0.88	54.64	9986	3.67	1.115	54.54
24	96.0	209.880	0.72	3.132	3.10	95	87	100	100.1	4.350	0.85	52.50	9575	3.54	1.071	52.40
25	100.0			0.000				ERR	ERR	4.446	0.00	0.00	0	*****	0.000	0.00
Actual Vol		78.670		dP	avg	dH	Ts	Tm	% Iso	SQRT d		avg	avg	Vol std	std	avg
		78.670		0.50	2.121	2.10	99	76	ERR	0.69		42.60	7770	68.70	0.8694	42.52

VISIBLE EMISSION OBSERVATION FORM

Run 1

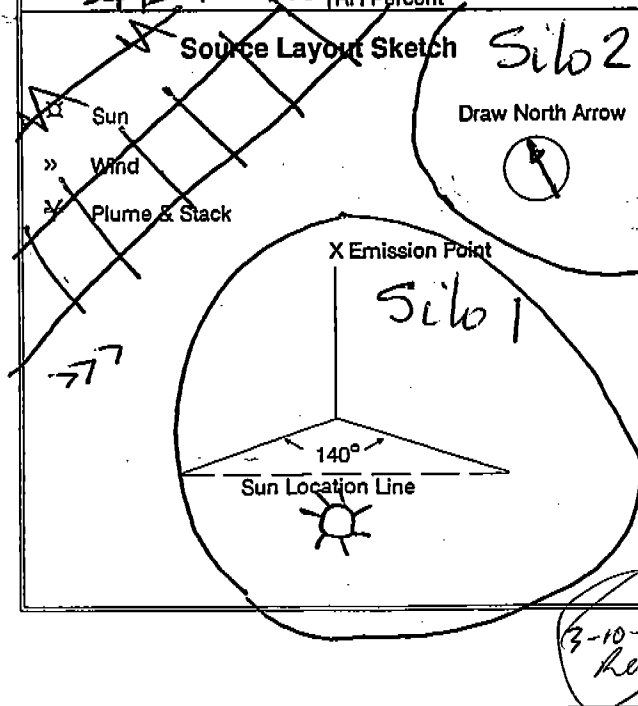
Source Name LUCARAC			Observation Date 1-5-95				Start Time 10:00				Stop Time 11:00			
Address 28769 Sappington Rd			Min	Seconds				Min	Seconds					
				0	15	30	45		0	15	30	45		
City THREE FORKS	State MT	Zip 59752	1	0	0	0	0	31	0	0	0	0		
			2	0	0	0	0	32	0	0	0	0		
Phone (406) 285-3286		Source ID Number DC-7	3	0	0	0	0	33	0	0	0	0		
Process Equipment ACM 42		Operating Mode Normal	4	0	0	0	0	34	0	0	0	0		
Control Equipment NAC House		Operating Mode Normal	5	0	0	0	0	35	0	0	0	0		
			6	0	0	0	0	36	0	0	0	0		
			7	0	0	0	0	37	0	0	0	0		
			8	0	0	0	0	38	0	0	0	0		
Describe Emission Point UPPER PLATE			9	0	0	0	0	39	0	0	0	0		
Start Same Stop Same			10	0	0	0	0	40	0	0	0	0		
Height above Ground Level Start 30' Stop 30'		Height Relative to Observer Start 30' Stop Same	11	0	0	0	0	41	0	0	0	0		
			12	0	0	0	0	42	0	0	0	0		
Distance from Observer Start 150' Stop Same		Direction from Observer Start NW Stop Same	13	0	0	0	0	43	0	0	0	0		
			14	0	0	0	0	44	0	0	0	0		
Describe Emissions			15	0	0	0	0	45	0	0	0	0		
Start Normal Stop			16	0	0	0	0	46	0	0	0	0		
Emission Color Start — Stop —		Plume Type: Continuous ☒ Fugitive ☐ Intermittent ☐	17	0	0	0	0	47	0	0	0	0		
			18	0	0	0	0	48	0	0	0	0		
Water Droplets Present? Yes ☐ No ☒		If Water Droplet Plume: Attached ☐ Detached ☐	19	0	0	0	0	49	0	0	0	0		
			20	0	0	0	0	50	0	0	0	0		
Point in the Plume at which Opacity was Determined			21	0	0	0	0	51	0	0	0	0		
Start Far Stop Same			22	0	0	0	0	52	0	0	0	0		
Describe Background			23	0	0	0	0	53	0	0	0	0		
Start Building Stop Same			24	0	0	0	0	54	0	0	0	0		
Background Color Start LT Blue Stop Same		Sky Conditions Start Clear Stop Same	25	0	0	0	0	55	0	0	0	0		
			26	0	0	0	0	56	0	0	0	0		
Wind Speed Start 0-5 Stop Same		Wind Direction Start N Stop Same	27	0	0	0	0	57	0	0	0	0		
			28	0	0	0	0	58	0	0	0	0		
Ambient Temp. Start 10°F Stop Same		Wet Bulb Temp. —	29	0	0	0	0	59	0	0	0	0		
		RH Percent —	30	0	0	0	0	60	0	0	0	0		
Source Layout Sketch ☒ Sun ☒ Wind ☒ Plume & Stack Draw North Arrow 			Average Opacity for Highest Period 0				Number of Readings Above 20 % Were 0							
			Range of Opacity Readings Minimum 0 Maximum 20											
			Observer's Name (Print) DAVID L. KINCHOW											
			Observer's Signature 						Date 1-5-95					
			Organization Bison Inc.											
Comments														



VISIBLE EMISSION OBSERVATION FORM

Run 1

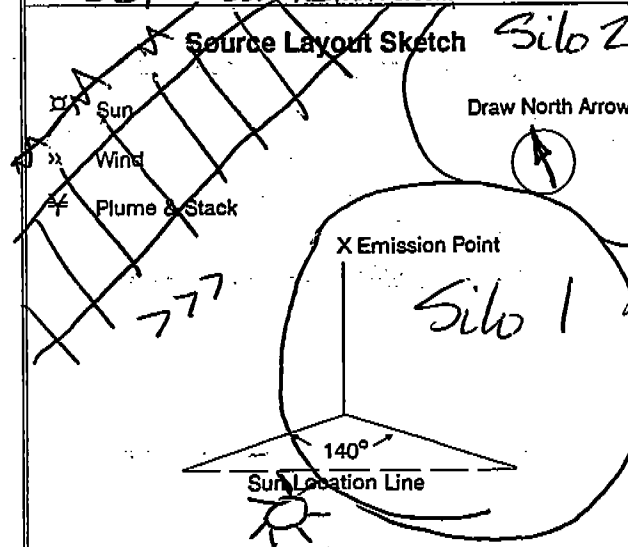
Source Name Luzenac - America			Observation Date 3-2-95		Start Time 1420		Stop Time 1520							
Address 28769 Sappinton Road			Min		Seconds				Min		Seconds			
					0	15	30	45			0	15	30	45
City 3 Forks	State MT	Zip 59752	1	0	0	0	0	31	0	0	0	0		
Phone (406) 285-3286			2	0	0	0	0	32	0	0	0	0		
Source ID Number DC-8			3	0	0	0	0	33	0	0	0	0		
Process Equipment DCE			4	0	0	0	0	34	0	0	0	0		
Operating Mode Cont.			5	0	0	0	0	35	0	0	0	0		
Control Equipment Baghouse			6	0	0	0	0	36	0	0	0	0		
Operating Mode Cont.			7	0	0	0	0	37	0	0	0	0		
Describe Emission Point Silo 1 Top			8	0	0	0	0	38	0	0	0	0		
Start Top of Baghouse			9	0	0	0	0	39	0	0	0	0		
Stop Same			10	0	0	0	0	40	0	0	0	0		
Height above Ground Level		Height Relative to Observer	11	0	0	0	0	41	0	0	0	0		
Start ~30'		Start 0'	12	0	0	0	0	42	0	0	0	0		
Stop Same		Stop Same	13	0	0	0	0	43	0	0	0	0		
Distance from Observer		Direction from Observer	14	0	0	0	0	44	0	0	0	0		
Start ~10'		Start N 10° E	15	0	0	0	0	45	0	0	0	0		
Stop Same		Stop Same	16	0	0	0	0	46	0	0	0	0		
Describe Emissions			17	0	0	0	0	47	0	0	0	0		
Start No Emissions			18	0	0	0	0	48	0	0	0	0		
Stop Same			19	0	0	0	0	49	0	0	0	0		
Emission Color		Plume Type: Continuous ☐	20	0	0	0	0	50	0	0	0	0		
Start —		Fugitive ☒ NA	21	0	0	0	0	51	0	0	0	0		
Stop Same		Intermittent ☐	22	0	0	0	0	52	0	0	0	0		
Water Droplets Present?		If Water Droplet Plume: NA	23	0	0	0	0	53	0	0	0	0		
Yes ☐ No ☒		Attached ☐ Detached ☐	24	0	0	0	0	54	0	0	0	0		
Point in the Plume at which Opacity was Determined			25	0	0	0	0	55	0	0	0	0		
Start @ Fan Outlet			26	0	0	0	0	56	0	0	0	0		
Stop Same			27	0	0	0	0	57	0	0	0	0		
Describe Background			28	0	0	0	0	58	0	0	0	0		
Start Control Equip.			29	0	0	0	0	59	0	0	0	0		
Stop Same			30	0	0	0	0	60	0	0	0	0		
Background Color			Average Opacity for Highest Period				Number of Readings Above							
Start Tan			0				20 % Were 0							
Stop Same			Range of Opacity Readings											
Sky Conditions			Minimum 0				Maximum 0							
Start Clear			Observer's Name (Print)											
Stop Same			Mitch Anderson											
Wind Speed			Observer's Signature				Date							
Start 0-5			Mitch Anderson				3-2-95							
Stop Same			Organization											
Wind Direction			Bison Engineering											
Start 270°			Comments											
Stop Same			Fan Outlet faces down & blows into bin.											
Ambient Temp.														
Start 34°F														
Stop Same														
Wet Bulb Temp. < 30°F														
RH Percent														



VISIBLE EMISSION OBSERVATION FORM

Run 2

Source Name <u>Luzenac-America</u>		Observation Date <u>3-2-95</u>		Start Time <u>1520</u>		Stop Time <u>1620</u>	
Address <u>28769 Sappington Road</u>		City <u>3 Forks</u>		State <u>MT</u>		Zip <u>59752</u>	
Phone <u>(406) 285-3286</u>		Source ID Number <u>DC-8</u>		Process Equipment <u>DCE</u>		Operating Mode <u>Cont</u>	
Control Equipment <u>Baghouse</u>		Operating Mode <u>Cont</u>		Describe Emission Point <u>Fan</u>		Start <u>on top of Baghouse</u> Stop <u>Same</u>	
Height above Ground Level <u>Start ~90' Stop Same</u>		Height Relative to Observer <u>Start 0' Stop Same</u>		Distance from Observer <u>Start ~10' Stop Same</u>		Direction from Observer <u>Start N10E Stop Same</u>	
Describe Emissions <u>No Emissions</u>		Emission Color <u>Start - Stop -</u>		Plume Type: <u>NA</u> Continuous ☐ Fugitive ☐ Intermittent ☐		Water Droplets Present? <u>No</u> Yes ☐ No ☒	
Point in the Plume at which Opacity was Determined <u>Start Fan Outlet Stop Same</u>		Describe Background <u>Control Equip</u>		Background Color <u>Start Tan Stop Same</u>		Sky Conditions <u>Start Clear Stop Same</u>	
Wind Speed <u>Start 0-5 Stop</u>		Wind Direction <u>Start ~270 Stop Same</u>		Ambient Temp. <u>Start 33F Stop Same</u>		Wet Bulb Temp. <u><30F</u>	
RH Percent <u>-</u>		Average Opacity for Highest Period <u>0</u>		Number of Readings Above % <u>20</u> Were <u>0</u>		Range of Opacity Readings Minimum <u>0</u> Maximum <u>0</u>	
Observer's Name (Print) <u>Mitchell W Anderson</u>		Observer's Signature <u>M W Anderson</u>		Date <u>3-2-95</u>		Organization <u>BRON ENGINEERING</u>	
Comments		Comments		Comments		Comments	



3-10-95
RGR



VISIBLE EMISSION OBSERVATION FORM

Run 3

Source Name <u>Luzenac-America</u>			Observation Date <u>3-2-95</u>				Start Time <u>1620</u>		Stop Time <u>1720</u>	
Address <u>28769 Sappington Rd.</u>										
City <u>3 Forks</u> State <u>MT</u> Zip <u>59752</u>										
Phone <u>(406) 285-3286</u> Source ID Number <u>DC-8</u>										
Process Equipment <u>PCE</u> Operating Mode <u>Cont</u>										
Control Equipment <u>Baghouse</u> Operating Mode <u>Cont</u>										
Describe Emission Point <u>Baghouse Top</u> Stop <u>Same</u>										
Height above Ground Level <u>Start ~30' Stop Same</u>										
Height Relative to Observer <u>Start 0' Stop Same</u>										
Distance from Observer <u>Start ~10' Stop Same</u>										
Direction from Observer <u>Start 10° Stop Same</u>										
Describe Emissions <u>No Emission</u> Stop <u>—</u>										
Emission Color <u>Start — Stop —</u>										
Plume Type: <u>NA</u> Continuous ☐ Fugitive ☐ Intermittent ☐										
Water Droplets Present? Yes ☐ No ☒										
If Water Droplet Plume: <u>NA</u> Attached ☐ Detached ☐										
Point in the Plume at which Opacity was Determined <u>fan outlet</u> Stop <u>Same</u>										
Describe Background <u>Grassland</u> Stop <u>Same</u>										
Background Color <u>Brown</u> Stop <u>Same</u>										
Sky Conditions <u>Clear</u> Stop <u>Same</u>										
Wind Speed <u>0-5</u> Stop <u>—</u>										
Wind Direction <u>270°</u> Stop <u>Same</u>										
Ambient Temp. <u>31°F</u> Stop <u>Same</u>										
Wet Bulb Temp. <u>< 30°F</u>										
RH Percent <u>—</u>										
			Average Opacity for Highest Period <u>0</u>				Number of Readings Above % Were <u>20</u> <u>0</u>			
			Range of Opacity Readings Minimum <u>0</u> Maximum <u>0</u>							
			Observer's Name (Print) <u>Mitchell W. Anderson</u>							
			Observer's Signature <u>MW Anderson</u>				Date <u>3-2-95</u>			
			Organization <u>BISON ENGINEERING</u>							
			Comments							

3-10-95
ROR



GAS VELOCITY AND VOLUME DATA FORM

Plant LUZENAC	Location SAPPINGTON	Stack ID No. DC-9
Date 1-30-95	Operator MWA	Run No. 3
		Stack Dimension 12" Portable

Altitude _____	Alt. Corr. _____	Ambient Temp. ~ 35°F
Barometric Reading 26.37" Hg	Molecular Weight _____	
Local Barometric Pressure _____	Method Fynite	
Stack Static Pressure -0.035" H₂O	Pitot C _p 0.84	

Field Data				
Traverse Point Number	Velocity Head (Δp_s), in H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
A 1	0.095	51		
2	0.105	51		
3	0.110	53		
4	0.110	53		
B 1	0.060	58		
2	0.065	59		
3	0.045	56		
4	0.040	55		
Average Δp_s 0.079 ✓			Average Stack Temp. 54.5°F ✓	Average Angle (α) ¹
Mean Sqrt Δp_s				

¹ Average of α must be <10° to be acceptable.

Plant	Luzerne		Location	Tappington		Stack ID No.	DC-9	Stack Dimension	12 ⁴
Date	1-25-95	Operator	WA	Run No.	1	Sample Box No.	3	Filter No.	148
								Meter Box No.	2

Altitude — Alt. Corr. —
Barometric Reading —
Barometric Pres. 26.30" Hg
Stack Static Pres. -0.02

Assumed Moisture	1%
Ambient Temp.	~40°F
Meter ΔH@	1.92
Meter Calib (Y)	1.058

Nozzle ID No. _____ Nozzle Dia. 0.491
 Probe ID No. _____ Probe Length 1.5'
 Liner Material Stainless Steel
 Probe Heat Setting 150°F

[illegible]

VISIBLE EMISSION OBSERVATION FORM

Run 1

Source Name <u>Luzerne</u>				Observation Date <u>1-25-95</u>				Start Time <u>1540</u>				Stop Time <u>1640</u>																	
Address <u>2869 Jappington Road</u>				<table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45				
Min	Seconds								Min	Seconds																			
	0	15	30	45	0	15	30	45																					
City <u>3 Forks</u>		State <u>MT</u>	Zip <u>59752</u>																										
Phone <u>(406) 285-3286</u>		Source ID Number <u>DC-9</u>		1				31																					
Process Equipment <u>Fine Product Silo #2</u>		Operating Mode <u>Normal</u>		2				32																					
Control Equipment <u>Baghouse</u>		Operating Mode <u>Normal</u>		3				33																					
Describe Emission Point Start <u>Outlet of Fan</u> Stop <u>Same</u>				4				34																					
				5				35																					
Height above Ground Level Start <u>~30'</u> Stop <u>Same</u>				6				36																					
Height Relative to Observer Start <u>~5'</u> Stop <u>Same</u>				7				37																					
Distance from Observer Start <u>~10'</u> Stop <u>Same</u>				8				38																					
Direction from Observer Start <u>N 20 E</u> Stop <u>Same</u>				9				39																					
Describe Emissions Start <u>—</u> Stop <u>—</u>				10				40				0 0 0 0																	
				11				41																					
Emission Color Start <u>—</u> Stop <u>—</u>				12				42																					
Plume Type: Continuous ☐ Fugitive ☐ Intermittent ☐				13				43																					
Water Droplets Present? Yes ☐ No ☒				14				44																					
If Water Droplet Plume: Attached ☐ Detached ☐				15				45																					
Point in the Plume at which Opacity was Determined Start <u>Fan Outlet</u> Stop <u>Same</u>				16				46																					
Describe Background Start <u>Grassland</u> Stop <u>Same</u>				17				47																					
Background Color Start <u>White</u> Stop <u>Same</u>				18				48																					
Sky Conditions Start <u>CLDY</u> Stop <u>Same</u>				19				49																					
Wind Speed Start <u>0-5</u> Stop <u>Same</u>				20				50				0 0 0 0																	
Wind Direction Start <u>E 10</u> Stop <u>Same</u>				21				51																					
Ambient Temp. Start <u>50</u> Stop <u>Same</u>				22				52																					
Wet Bulb Temp. RH Percent <u>100</u>				23				53																					
Source Layout Sketch ☼ Sun » Wind ≡ Plume & Stack Draw North Arrow TALC PROCESS PLANT				Average Opacity for Highest Period <u>0</u>				Number of Readings Above <u>20</u> % Were <u>0</u>																					
				Range of Opacity Readings Minimum <u>0</u> Maximum <u>0</u>																									
Observer's Name (Print) <u>Mitch Anderson</u>																													
Observer's Signature <u>Mitch Anderson</u>						Date <u>1-25-95</u>																							
Organization <u>BISON ENGINEERING</u>																													
Comments																													



PARTICULATE FIELD DATA FORM

Altitude — Alt. Corr. —
Barometric Reading —
Barometric Pres. 26.30" Hg
Stack Static Pres. -0.02

Assumed Moisture 1.1
Ambient Temp. ~45°
Meter ΔH@ 1.92
Meter Calib (Y) 1.058

Nozzle ID No. 0.491
Probe ID No. 1.51
Liner Material stainless steel
Probe Heat Setting 150°F

Altitude — Alt. Corr. —
Barometric Reading —
Barometric Pres. 26.30" Hg
Stack Static Pres. -0.02

Assumed Moisture 1.1
Ambient Temp. ~45°
Meter ΔH@ 1.92
Meter Calib (Y) 1.058

Nozzle ID No. 0.491
Probe ID No. 1.51
Liner Material stainless steel
Probe Heat Setting 150°F

[illegible]

VISIBLE EMISSION OBSERVATION FORM *Run 2*

Source Name <i>Luzenac</i>			Observation Date <i>1-25-95</i>		Start Time <i>1620</i>		Stop Time <i>1720</i>							
Address <i>2876 Sappington Road</i>			Min		Seconds				Min		Seconds			
					0	15	30	45			0	15	30	45
City <i>3 Forks</i>	State <i>MT</i>	Zip <i>59752</i>	1	0	0	0	0	31						
Phone <i>(406) 285-3286</i>	Source ID Number <i>DC-9</i>		2	0	0	0	0	32						
Process Equipment <i>Line Product Silo #2</i>	Operating Mode <i>Normal</i>		3	0	0	0	0	33						
Control Equipment <i>Bughouse</i>	Operating Mode <i>Normal</i>		4	0	0	0	0	34						
Describe Emission Point <i>End of Porcable Stack</i>	Stop <i>SAME</i>		5	0	0	0	0	35						
Height above Ground Level <i>Start ~10' Stop Same</i>	Height Relative to Observer <i>Start -3' Stop Same</i>		6	0	0	0	0	36						
Distance from Observer <i>Start ~10' Stop</i>	Direction from Observer <i>Start Stop</i>		7	0	0	0	0	37						
Describe Emissions			8	0	0	0	0	38						
Emission Color <i>Start - Stop</i>	Plume Type: Continuous ☐ Fugitive ☐ Intermittent ☐		9	0	0	0	0	39						
Water Droplets Present? <i>Yes ☐ No ☒</i>	If Water Droplet Plume: Attached ☐ Detached ☐		10	0	0	0	0	40	0	0	0	0		
Point in the Plume at which Opacity was Determined			11					41						
Describe Background			12					42						
Background Color <i>Start White Stop Same</i>	Sky Conditions <i>Start CL Stop SAME</i>		13					43						
Wind Speed <i>Start 0-5 Stop Same</i>	Wind Direction <i>Start 270 Stop Same</i>		14					44						
Ambient Temp. <i>Start ~50 Stop Same</i>	Wet Bulb Temp.		15					45						
	RH Percent		16	0	0	0	0	46						
Source Layout Sketch ☒ Sun ☒ Wind ☒ Plume & Stack Draw North Arrow			Average Opacity for Highest Period				Number of Readings Above							
			<i>0</i>				<i>20</i> % Were <i>0</i>							
			Range of Opacity Readings											
			Minimum <i>0</i>				Maximum <i>0</i>							
			Observer's Name (Print)											
			<i>Mitch Anderson</i>											
			Observer's Signature						Date					
			<i>[Signature]</i>						<i>1-25-95</i>					
			Organization											
			<i>BRON ENGINEERING</i>											
Comments														



Plant	Luzerne	Location	Sappington	Stack ID No.	DC-9	Stack Dimension.	12"
Date	1-28-95	Operator	MAA	Run No.	3	Sample Box No.	3
				Filter No.	1149	Meter Box No.	2

Altitude _____ Alt. Corr. _____
Barometric Reading 1933 mb
Barometric Pres. 26.37" Hg
Stack Static Pres. -0.035

Assumed Moisture	1.1.
Ambient Temp.	~35°F
Meter ΔH@	1.02
Meter Calib (%)	1.050

Nozzle ID No. 12 Nozzle Dia. 0.3
 Probe ID No. 1 Probe Length 1.5
 Liner Material Stainless Steel
 Probe Heat Setting 150F

[illegible]

PRE-TEST LEAK CHECK: 0.001 HP/min @ 15" H₂O

POST-TEST TASK CHECK: 0.0000 min @ 211.4

FACILITY
Luzenac/Sappington
LOCATION
DC-9
RUN #
Three
DATE
1-30-95
START TIME
1345
STOP TIME

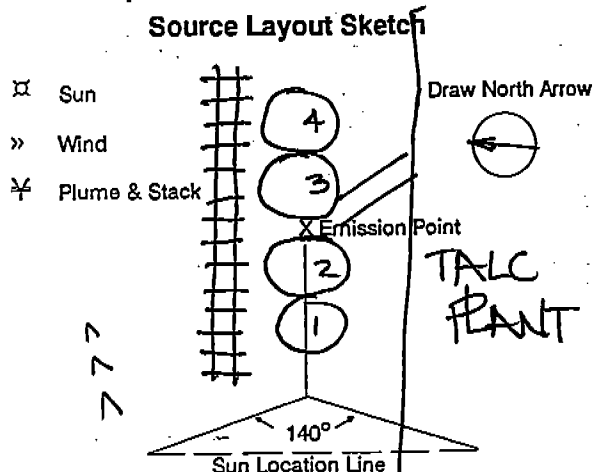
PRELIMINARY INFO.			PRE TEST INFO		CALCULATED		CALCULATED	
Bp (Pm) (in.Hg)	26.37	Assumed moisture %	1.0	Stack press. (Ps)	26.37	Actual % H2O in Stack	0.77	
Stack Dia (md)	1	Assumed Meter Temp. F	20.0	Stack Area (md)	0.79	Actual Wet Molec. Wt	28.76	
Stack Area (sq.ft.)	0.79	Time per Point	14.00	Meter Temp. R	480.0	Actual Isokinetic Avg	100.84	
Yl	1.058	Nozzle Dia (in.)	0.371	Recommended Nz dia.	0.386			
Delta H@	1.92	Total Number of Points	8	Nozzle area (ft^2)	0.00075	EMISSIONS		
				Total Run Time	112.00	lb / dscf STD	6.932E-08	
						grains / dscf STD	0.0005	
						lb / hour STD	0.00	
TRAVERSE INFO			POST TEST INFO		CALCULATED			
Static (use - if neg.)	-0.04	Impinger H2O Gain (g)	12.1	Stack Temp. R(Ts)	511.5	lb / ft^3 Act.	6.26E-08	
Stack Temp. F	51.5	Particulate Gain (mg)	2.30	Wet mol. wt. (Ms)	28.73	grains / ft^3 Act.	0.0004	
Acquired avg. delta P	0.08			Dry mol. wt. (Md)	28.84			
Oxygen	21.00							
Carbon Dioxide	0.00							

Trav Point	Sample Time	MetVol	Vel head	Calc. delta P	Actual delta H	Stack Temp	Meter Temp	Point	Accum. Iso %	TEST			STACK			METER			ACT
										Calc	SQRT	K	Stack Vel.	Flow	Stack	Volume	Volume	Vel	
1	14.0	48.537	0.10	1.958	1.90	69	50	102	101.7	*****	0.31	0.31	18.50	872	10.32	0.873	18.49	18.49	
2	28.0	70.380	0.11	2.164	2.15	70	52	102	101.8	*****	0.32	0.32	19.46	917	10.87	0.918	19.45	19.45	
3	42.0	81.620	0.11	2.268	2.10	72	55	100	101.1	*****	0.33	0.33	19.96	941	10.85	0.942	19.85	19.85	
4	56.0	92.610	0.11	2.272	2.10	73	58	97	100.1	*****	0.33	0.33	19.98	941	10.57	0.943	19.97	19.97	
5	70.0	100.960	0.06	1.238	1.25	74	57	100	100.0	*****	0.24	0.24	14.77	696	8.00	0.697	14.76	14.76	
6	84.0	109.540	0.07	1.348	1.30	74	60	98	99.7	*****	0.25	0.25	15.37	724	8.19	0.725	15.36	15.36	
7	98.0	117.350	0.05	0.930	0.94	77	61	107	100.7	*****	0.21	0.21	12.83	604	7.43	0.605	12.82	12.82	
8	112.0	124.650	0.04	0.833	0.75	74	62	106	101.4	*****	0.20	0.20	12.06	568	6.93	0.569	12.05	12.05	
9	126.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	*****	0.000	0.00	0.00	
10	140.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	0.00	0.000	0.00	0.00	
11	154.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	0.00	0.000	0.00	0.00	
12	168.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	0.00	0.000	0.00	0.00	
13	182.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	0.00	0.000	0.00	0.00	
14	196.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	0.00	0.000	0.00	0.00	
15	210.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	0.00	0.000	0.00	0.00	
16	224.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	0.00	0.000	0.00	0.00	
17	238.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	0.00	0.000	0.00	0.00	
18	252.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	0.00	0.000	0.00	0.00	
19	266.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	0.00	0.000	0.00	0.00	
20	280.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	0.00	0.000	0.00	0.00	
21	294.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	0.00	0.000	0.00	0.00	
22	308.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	0.00	0.000	0.00	0.00	
23	322.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	0.00	0.000	0.00	0.00	
24	336.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	0.00	0.000	0.00	0.00	
25	350.0			0.000				ERR	ERR	*****	0.00	0.00	0.00	0	0.00	0.000	0.00	0.00	
Actual Vol		76.113	dP		avg	dH	1s	1m	%iso	SQRT d			avg	avg	Vol std	dscf/m	avg		
			0.08		1.626	1.56	73	55	ERR	0.28	16.61	783	73.16	0.7839	16.61				

VISIBLE EMISSION OBSERVATION FORM

Run 3

Source Name LUZENAC			Observation Date 1-30-95		Start Time 1310		Stop Time 1410	
Address 2876 PAPPINGTON RD			City 3		State MT		Zip 59752	
Phone (406) 295-3286			Source ID Number DC-9		Process Equipment FINE PROP		Operating Mode Normal	
Control Equipment Baghouse			Operating Mode Normal		Describe Emission Point Outlet of Fan		Start Same	
Height above Ground Level Start ~30' Stop Same			Height Relative to Observer Start ~120' Stop Same		Distance from Observer Start ~10' Stop Same		Direction from Observer Start N20E Stop Same	
Describe Emissions Start — Stop —			Emission Color Start — Stop —		Plume Type: Continuous ☐ Fugitive ☐ Intermittent ☐		Water Droplets Present? Yes ☐ No ☒	
Point in the Plume at which Opacity was Determined Start Fan Outlet Stop Same			Describe Background Start White Rangeland Stop Same		Background Color Start White Stop Same		Sky Conditions Start Clouds Stop Same	
Wind Speed Start 0.5 Stop Same			Wind Direction Start 270° Stop Same		Ambient Temp. Start ~50° Stop Same		Wet Bulb Temp. Start ~50° Stop Same	
RH Percent Start ~50% Stop Same			Average Opacity for Highest Period 0		Number of Readings Above 20		% Were 0	
Range of Opacity Readings Minimum 0 Maximum 0			Observer's Name (Print) Mitch Anderson		Observer's Signature Mitch Anderson		Date 1-30-95	
Organization BISON ENGINEERING			Comments					



SCHEMATIC OF SAMPLING LOCATION

Notes:

$$B = 6$$
$$A = 1.25$$

1-28-95

Ray

GAS VELOCITY AND VOLUME DATA FORM

Plant	LUZENAC		Location	SAPPINGTON	Stack ID No.	DC-10
Date	1-10-95	Time	1045	Operator	MWA	Run No.
				Stack Dimension	29"	

Altitude	Alt. Corr.	Ambient Temp.	76°F
Barometric Reading	761 mb	Molecular Weight	28.84 (Ambient Air)
Local Barometric Pressure	25.63" Hg	Method	FRITE
Stack Static Pressure	-10.00"	Pitot C _p	0.84

Field Data				
Traverse Point Number	Velocity Head (Δp_s), "H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
1	0.84	99		15°
2	1.10	101	-0.05	106°
3	1.45	109	-0.05	7°
4	1.40	111	-0.05	0°
5	1.20	111	-0.05	3°
6	1.10	110	-0.03	3°
7	1.25	113	-0.05	0°
8	1.40	113	-0.05	0°
9	1.50	112	+0.05	0°
10	1.60	110	+0.10	2°
Average Δp_s		Average Stack Temp.	Average Angle (α) ¹	
1.28 ✓			4.0° ✓	
Mean Sqrt Δp_s		108.9°F		

¹ Average of α must be <10° to be acceptable.2-28.95
Rwl

GAS VELOCITY AND VOLUME DATA FORM

Plant LUZENAC		Location SAPPINGTON		Stack ID No. DK-10
Date 1-10-95	Time 1205	Operator MWA	Run No. 1	Stack Dimension 29"

Altitude	Alt. Corr.	Ambient Temp.
Barometric Reading 761 mb		Molecular Weight
Local Barometric Pressure 25.63		Method FYRITE
Stack Static Pressure -10.00 "		Pitot C _p 0.84

Field Data				
Traverse Point Number	Velocity Head (Δp_s), " H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
W1	0.82			
2	1.20			
3	1.60			
4	1.65			
5	1.50			
6	0.96			
7	0.97			
8	0.98			
9	0.95			
10	0.89			
Average Δp_s			Average Stack Temp.	Average Angle (α) ¹
1.12				
Mean Sqrt Δp_s				

¹ Average of α must be <10° to be acceptable.

P=1.20

PARTICULATE FIELD DATA FORM

Plant	Location	Stack ID No.	Stack Dimension
LuZenzel	Sappington	DC-10	29"
Date: 1-11-95	Run No. 3	Filter No. 1144	Meter Box No. 3
Operator	W/L		

Altitude _____ Alt. Corr. _____
Barometric Reading _____
Barometric Pres. 25.63
Stack Static Pres. -10.00 "H₂O

Assumed Moisture _____ 10%
Ambient Temp. _____ ~ 60°F
Meter $\Delta H @$ _____ 1.92
Meter Calib (N) _____ 1.002

Nozzle ID No. _____ Nozzle Dia. 0.186
 Probe ID No. _____ Probe Length _____
 Liner Material Stainless Steel
 Probe Heat Setting 5Def

[illegible]

PARTICIPATE FIELD DATA FORM

Plant	Luzerne		Location	Sappington		Stack ID No.	DC-10	Stack Dimension	29"
Date	1-11-95		Operator	CWL		Run No.	3	Sample Box No.	3
						Filter No.		Meter Box No.	

Altitude _____ Alt. Corr. _____
 Barometric Reading _____
 Barometric Pres. 25.63" Hg
 Stack Static Pres. -10.00" H₂O

Assumed Moisture 10%
Ambient Temp. ~60°F
Meter ΔH@ 1.92
Meter Calib (Y) 1.002

Nozzle ID No. 0.96 Nozzle Dia. _____
 Probe ID No. _____ Probe length _____
 Liner Material Stainless Steel
 Probe Heat Setting 150°F

[illegible]

POST LEAK CHECK: 0.000 ft³/min @ 5" Hg

VISIBLE EMISSION OBSERVATION FORM

Source Name LUZEHAC			Observation Date 1-10-95				Start Time 10:30		Stop Time 11:30					
Address 28765 SPRINGTON ROAD			Min		Seconds				Min		Seconds			
					0	15	30	45			0	15	30	45
City 3 FORKS	State MT	Zip 59752	1	0	0	0	0	31	0	0	0	0		
Phone (406) 285-3226			2	0	0	0	0	32	0	0	0	0		
Source ID Number DL10			3	0	0	0	0	33	0	0	0	0		
Process Equipment PELLET DRIER			4	0	0	0	0	34	5	5	0	0		
Operating Mode NORMAL			5	0	0	0	0	35	0	0	0	0		
Control Equipment BAGHOUSE			6	0	0	0	0	36	0	0	0	0		
Operating Mode NORMAL			7	0	0	0	0	37	0	0	0	0		
Describe Emission Point			8	0	0	0	0	38	0	0	0	0		
Start			9	0	0	0	0	39	0	0	0	0		
Stop			10	0	0	0	0	40	0	0	0	0		
Height above Ground Level			11	0	0	0	0	41	0	0	0	0		
Start 70 Stop 70			12	0	0	0	0	42	0	0	0	0		
Height Relative to Observer			13	0	0	0	0	43	0	0	0	0		
Start 70 Stop 70			14	0	0	0	0	44	0	0	0	0		
Distance from Observer			15	0	0	0	0	45	0	0	0	0		
Start 600 Stop 600			16	0	0	0	0	46	0	0	0	0		
Direction from Observer			17	0	0	0	0	47	0	0	0	0		
Start			18	0	0	0	0	48	0	0	0	0		
Stop			19	0	0	0	0	49	0	0	0	0		
Describe Emissions			20	0	0	0	0	50	0	0	0	0		
Start WHITE Stop SAME			21	0	0	0	0	51	0	0	0	0		
Emission Color			22	0	0	0	0	52	0	0	0	0		
Start WHITE Stop			23	0	0	0	0	53	0	0	0	0		
Plume Type: Continuous ☐			24	0	0	0	0	54	0	0	0	0		
Fugitive ☐ Intermittent ☒			25	0	0	0	0	55	0	0	0	0		
Water Droplets Present? Yes ☒ No ☐			26*	5	5	0	5	56	0	0	0	0		
If Water Droplet Plume: Attached ☒ Detached ☐			27	0	0	0	0	57	0	0	0	0		
Point in the Plume at which Opacity was Determined			28	0	0	0	0	58	0	0	0	0		
Start			29	0	0	0	0	59	0	0	0	0		
Stop			30	0	0	0	0	60	0	0	0	0		
Describe Background			Average Opacity for Highest Period 0.1				Number of Readings Above % Were							
Start GREY SKY Stop SAME														
Background Color			Range of Opacity Readings				Minimum 0 Maximum 5							
Start GREY Stop GREY			Observer's Name (Print) MIKE CHOUANAK				Observer's Signature <i>Mike Chouan</i>							
Sky Conditions			Date 1-10-95				Organization BISON ENGINEERING							
Start OVERCAST Stop SAME			Comments											
Wind Speed														
Start 20-40 Stop 20-40														
Wind Direction														
Start Stop														
Ambient Temp.														
Start 20°F Stop														
Wet Bulb Temp.														
RH Percent														

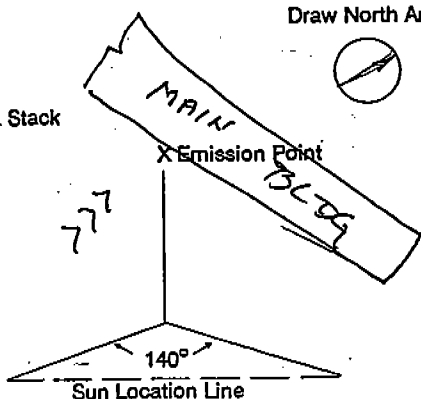
Source Layout Sketch

☼ Sun

» Wind

≡ Plume & Stack

Draw North Arrow



PARTICULATE FIELD DATA FORM

Plant	Lutzerae	Location	Sappington	Stack ID No.	DC-10	Stack Dimension	29"
Date	1-12-95	Operator	CWL	Run No.	4	Filter No.	1140
			Sample Box No.		3	Meter Box No.	3

Altitude _____ Alt. Corr. 25.15
Barometric Reading _____
Barometric Pres. 15.63
Stack Static Pres. -10.00

Assumed Moisture _____
Ambient Temp. _____
Meter $\Delta H @$ _____
Meter Calib {Y} _____

Nozzle ID No. _____ Nozzle Dia. 0.136
 Probe ID No. _____ Probe Length 3'
 Liner Material Stainless Steel
 Probe Heat Setting 500°

[illegible]

DO NOT WRITE ABOVE THIS LINE

PARTICULATE FIELD DATA FORM

Plant	Luzerne	Location	Sappington	Stack ID No.	DC-10	Stack Dimension	29"
Date	1-12-95	Operator	CWL	Run No.	4	Sample Box No.	3
				Filter No.	1140	Meter Box No.	3

Altitude _____ Alt. Corr. _____
 Barometric Reading _____
 Barometric Pres. 73-63" Hg
 Stack Static Pres. = 10.00 "Hg

Assumed Moisture 8.0%
Ambient Temp. ~60°F
Meter ΔH @ 1.9%
Meter Calib (Y) 1.002

Nozzle ID No. _____ Nozzle Dia. 0.186
 Probe ID No. _____ Probe Length 5
 Liner Material Stainless Steel
 Probe Heat Setting 1500F

[illegible]

Post-Test LEAK CHECK: 0.000 ft³/min @ 6" Hg

VISIBLE EMISSION OBSERVATION FORM

Source Name LUZEMAC			Observation Date 1-16-95				Start Time 11:30				Stop Time 12:30						
Address 28769 SAPINGTON ROAD																	
City 3 FORKS		State MT	Zip 59752														
Phone (406) 285-3286			Source ID Number DC-10														
Process Equipment 2 PELLET DRIER			Operating Mode NORMAL														
Control Equipment BAGHOUSE			Operating Mode NORMAL														
Describe Emission Point																	
Start				Stop													
Height above Ground Level Start 70 Stop 70				Height Relative to Observer Start 70 Stop 70													
Distance from Observer Start 600 Stop 600				Direction from Observer Start Stop													
Describe Emissions Start WHITE CONDENSING Stop																	
Emission Color Start WT Stop WT				Plume Type: Continuous ☐ Fugitive ☐ Intermittent ☒													
Water Droplets Present? Yes ☒ No ☐				If Water Droplet Plume: Attached ☒ Detached ☐													
Point in the Plume at which Opacity was Determined Start Stop																	
Describe Background Start STREET BUILDING Stop SAME																	
Background Color Start YELLOW Stop SAME				Sky Conditions Start OVERCAST Stop SAME													
Wind Speed Start 20-40 Stop SAME				Wind Direction Start Stop													
Ambient Temp. Start 40°F Stop				Wet Bulb Temp. RH Percent													
Source Layout Sketch ☒ Sun ☒ Wind ☒ Plume & Stack Draw North Arrow				Average Opacity for Highest Period 0				Number of Readings Above % Were									
				Range of Opacity Readings Minimum 0 Maximum 0													
				Observer's Name (Print) MIKE CHOVARNAK													
				Observer's Signature <i>Mike Chovarnak</i>				Date 1-10-95									
				Organization BISON ENGINEERING													
Comments																	



PARTICULATE FIELD DATA FORM

Plant	Luzenac	Location	Sappington	Stack ID No.	DC-10	Stack Dimension	29"
Date	1-12-95	Operator	Cull	Run No.	5	Sample Box No.	3
				Filter No.	1139	Meter Box No.	3

Altitude _____ Alt. Corr. _____
 Barometric Reading _____
 Barometric Pres. 25.63" Hg
 Stack Static Pres. -10.00" H₂O

Assumed Moisture 10%
Ambient Temp. ~60°F
Meter ΔH @ 1.92
Meter Calib (N) 1.002

Nozzle ID No. _____ Nozzle Dia. 0.186
 Probe ID No. _____ Probe Length _____
 Liner Material Stainless Steel
 Probe Heat Setting 150°F

[illegible]

VISIBLE EMISSION OBSERVATION FORM

Source Name LUZENAC			Observation Date 1-10-95				Start Time 13:10		Stop Time 14:10					
Address 28769 SAPIINGTON ROAD			Min		Seconds				Min		Seconds			
City 3 FORKS		State MT			Zip 59752	0	15	30			45	0	15	30
Phone (406) 285-3286			Source ID Number DC-10		1	0	0	0	0	31	0	0	0	0
Process Equipment PELLET DRIER			Operating Mode NORMAL		2	0	0	0	0	32	0	0	0	0
Control Equipment BAGHOUSE			Operating Mode NORMAL		3	0	0	0	0	33	0	0	0	0
Describe Emission Point					4	0	0	0	0	34	0	0	0	0
Start			Stop		5	0	0	0	0	35	0	0	0	0
Height above Ground Level			Height Relative to Observer		6	0	0	0	0	36	0	0	0	0
Start 70' Stop 70'			Start 70' Stop 70'		7	0	0	0	0	37	0	0	0	0
Distance from Observer			Direction from Observer		8	0	0	0	0	38	0	0	0	0
Start 300' Stop 300'			Start		9	0	0	0	0	39	0	0	0	0
Describe Emissions					10	0	0	0	0	40	0	0	0	0
Start WHITE CONDENSING			Stop		11	0	0	0	0	41	0	0	0	0
Emission Color			Plume Type: Continuous ☐		12	0	0	0	0	42	0	0	0	0
Start WHITE Stop			Fugitive ☐ Intermittent ☒		13	0	0	0	0	43	0	0	0	0
Water Droplets Present?			If Water Droplet Plume:		14	0	0	0	0	44	0	0	0	0
Yes ☒ No ☐			Attached ☐ Detached ☐		15	0	0	0	0	45	0	0	0	0
Point in the Plume at which Opacity was Determined					16	0	0	0	0	46	0	0	0	0
Start			Stop		17	0	0	0	0	47	0	0	0	0
Describe Background					18	0	0	0	0	48	0	0	0	0
Start WALL OF BUILDING Stop					19	0	0	0	0	49	0	0	0	0
Background Color			Sky Conditions		20	0	0	0	0	50	0	0	0	0
Start YELLOW Stop			Start OVERCAST Stop SAME		21	0	0	0	0	51	0	0	0	0
Wind Speed			Wind Direction		22	0	0	0	0	52	0	0	0	0
Start 20-40 Stop			Start		23	0	0	0	0	53	0	0	0	0
Ambient Temp.			Wet Bulb Temp.		24	0	0	0	0	54	0	0	0	0
Start 40°F Stop			RH Percent		25	0	0	0	0	55	0	0	0	0
					26	0	0	0	0	56	0	0	0	0
					27	0	0	0	0	57	0	0	0	0
					28	0	0	0	0	58	0	0	0	0
					29	0	0	0	0	59	0	0	0	0
					30	0	0	0	0	60	0	0	0	0

Source Layout Sketch

☼ Sun Draw North Arrow

» Wind

✕ Plume & Stack

Average Opacity for Highest Period

Range of Opacity Readings
Minimum Maximum

Observer's Name (Print)
MIKE CHOIVANAK

Observer's Signature

Organization
BISON ENGINEERING

Comments



GAS VELOCITY AND VOLUME DATA FORM

Plant <u>LUZERNAC</u>		Location <u>Sappington</u>		Stack ID No. <u>DC-15</u> <u>Durant</u>
Date <u>11/16/95</u>	Time <u>12:00</u>	Operator <u>CNL</u>	Run No. <u>2</u>	Stack Dimension <u>18" x 18"</u>

Altitude	Alt. Corr.	Ambient Temp. <u>~60°F</u>
Barometric Reading	Molecular Weight <u>28.84</u>	
Local Barometric Pressure <u>26.07" Hg</u>	Method <u>Fyrite</u>	
Stack Static Pressure <u>~.001 ~.005</u>	Pitot C _p <u>0.84</u>	

Field Data				
Traverse Point Number	Velocity Head (Δp_v), in H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
<u>T-1</u>	<u>.01 .03</u>	<u>.02</u>		
<u>2</u>	<u>.01 .03</u>	<u>.025</u>		
<u>3</u>	<u>.01 .03</u>	<u>.025</u>		
<u>4</u>	<u>.01 .03</u>	<u>.02</u>		
<u>M-1</u>	<u>.01 .025</u>	<u>.025</u>		
<u>2</u>	<u>.01 .035</u>	<u>.025</u>		
<u>3</u>	<u>.01 .03</u>	<u>.027</u>		
<u>4</u>	<u>.01 .025</u>	<u>.025</u>		
<u>B-1</u>	<u>.01 .02</u>	<u>.02</u>		
<u>2</u>	<u>.01 .025</u>	<u>.025</u>		
<u>3</u>	<u>.01 .025</u>	<u>.025</u>		
<u>4</u>	<u>.01 .025</u>	<u>.02</u>		
<u>A</u>	<u>.01</u>	<u>.02</u>		
Average Δp_s			Average Stack Temp.	Average Angle (α) ¹
<u>0.0275 / 0.0235</u>				
Mean Sqrt Δp_s				

¹ Average of α must be <10° to be acceptable.

PARTICULATE FIELD DATA FORM

Plant	LUZENAC		Location	SAPPHINGTON		Stack ID No.	DC-15	Stack Dimension	18" x 18"	
Date	1-16-95	Operator	Run No.	1	Sample Box No.	3	Filter No.	143	Meter Box No.	3

Altitude Alt. Corr.
Barometric Reading
Barometric Pres. 26.04" Hg
Stack Static Pres. - .005

Assumed Moisture 2.1
Ambient Temp. ~ 80°F
Meter ΔH@ 1.92
Meter Calib (Y) 1.002

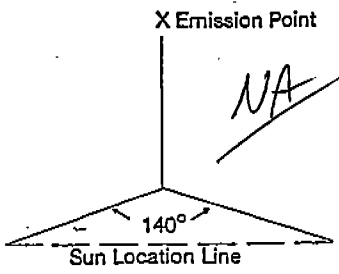
Nozzle ID No. W Nozzle Dia. 0.494
 Probe ID No. W Probe Length 3
 Liner Material STAINLESS STEEL
 Probe Heat Setting 160°F

[illegible]

Pre test	491.597
Post test	to 491.599

706906
565.845
565.595

VISIBLE EMISSION OBSERVATION FORM

Source Name <u>LUZENGAC</u>			Observation Date <u>11/16/95</u>				Start Time <u>11:20</u>		Stop Time <u>12:20</u>																			
Address			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>								Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45
Min	Seconds				Min	Seconds																						
	0	15	30	45		0	15	30	45																			
City <u>Sappington</u>	State <u>MT</u>	Zip	1	0	0	0	0	31																				
Phone	Source ID Number <u>DC 15</u>		2	0	0	0	0	32																				
Process Equipment	Operating Mode		3	0	0	0	0	33																				
Control Equipment <u>Bag house</u>	Operating Mode <u>Normal</u>		4	0	0	0	0	34																				
Describe Emission Point			5	0	0	0	0	35																				
Start <u>stack</u>	Stop <u>"</u>		6	0	0	0	0	36	0	0	0	0																
Height above Ground Level	Height Relative to Observer		7	0	0	0	0	37																				
Start <u>0</u>	Stop <u>"</u>		8	0	0	0	0	38																				
Distance from Observer	Direction from Observer		9	0	0	0	0	39																				
Start <u>10'</u>	Stop <u>"</u>		10	0	0	0	0	40																				
Describe Emissions			11	0	0	0	0	41																				
Start <u>None</u>	Stop <u>"</u>		12	0	0	0	0	42	0	0	0	0																
Emission Color	Plume Type: Continuous ☒		13					43																				
Start <u>Clear</u>	Stop <u>"</u>		14					44																				
Water Droplets Present? Yes ☐ No ☒	If Water Droplet Plume: Attached ☐ Detached ☐		15					45																				
Point in the Plume at which Opacity was Determined			16					46																				
Start <u>stack exit</u>	Stop <u>"</u>		17					47																				
Describe Background			18	0	0	0	0	48	0	0	0	0																
Start <u>Detailed</u>	Stop <u>"</u>		19					49																				
Background Color	Sky Conditions		20					50																				
Start <u>Grey</u>	Stop <u>"</u>		21					51																				
Wind Speed	Wind Direction		22					52																				
Start <u>NA</u>	Stop <u>"</u>		23					53																				
Ambient Temp.	Wet Bulb Temp.		24	0	0	0	0	54	0	0	0	0																
Start <u>40°</u>	Stop <u>"</u>		25					55																				
RH Percent			26					56																				
Source Layout Sketch ☒ Sun Draw North Arrow ☒ Wind  ☒ Plume & Stack 			Average Opacity for Highest Period				Number of Readings Above % Were																					
			Range of Opacity Readings				Minimum <u>0</u> Maximum <u>0</u>																					
			Observer's Name (Print) <u>Carl Loomis</u>																									
			Observer's Signature <u>Carl Loomis</u>						Date <u>11/16/95</u>																			
			Organization <u>Bison</u>																									
			Comments <u>performed inside with no sun back drop</u>																									



VISIBLE EMISSION OBSERVATION FORM

Source Name <u>LUZENAC - Sappington</u>			Observation Date <u>1-17-95</u>				Start Time <u>14:05</u>		Stop Time <u>15:05</u>		
Address <u>28169 Sappington Road</u>											
City <u>3Forks</u>	State <u>MT</u>	Zip <u>59752</u>									
Phone <u>(406) 285-3286</u>		Source ID Number <u>DC-15</u>									
Process Equipment <u>Durant</u>		Operating Mode <u>Normal</u>									
Control Equipment <u>DC 15-Baghouse</u>		Operating Mode <u>Normal</u>									
Describe Emission Point <u>PORTABLE STACK</u>											
Start <u>Same</u>											
Height above Ground Level <u>35'</u>											
Height Relative to Observer <u>Same</u>											
Distance from Observer <u>8'</u>											
Direction from Observer <u>ENE</u>											
Describe Emissions <u>NONE</u>											
Start <u>Stop</u>											
Emission Color <u>NONE</u>		Plume Type: Continuous ☒									
Start <u>Stop</u>		Fugitive ☐ Intermittent ☐									
Water Droplets Present? Yes ☐ No ☒		If Water Droplet Plume: Attached ☐ Detached ☐									
Point in the Plume at which Opacity was Determined <u>@ stack outlet</u>											
Describe Background <u>beams & wall</u>											
Start <u>Stop</u>											
Background Color <u>tan & black</u>		Sky Conditions <u>—</u>									
Start <u>Stop</u>		Start <u>Stop</u>									
Wind Speed <u>—</u>		Wind Direction <u>—</u>									
Start <u>Stop</u>		Start <u>Stop</u>									
Ambient Temp. <u>61°F</u>		Wet Bulb Temp. <u>—</u>									
Start <u>Stop</u>		RH Percent <u>—</u>									
Source Layout Sketch ☒ Sun ☒ Wind ☒ Plume & Stack Draw North Arrow X Emission Point 			Average Opacity for Highest Period <u>0</u>				Number of Readings Above % Were <u>0</u>				
			Range of Opacity Readings <u>0</u> Minimum <u>0</u> Maximum								
			Observer's Name (Print) <u>BILL SHAW</u>								
			Observer's Signature <u>Bill Shaw</u>						Date <u>1-17-95</u>		
			Organization <u>BISON ENGINEERING</u>								
Comments <u>Read Inside Building</u>											



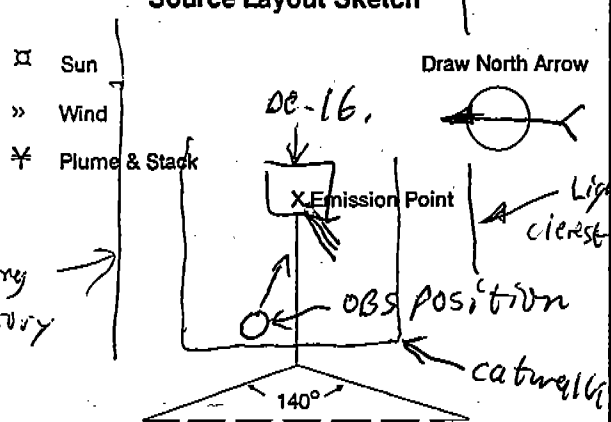
Plant	Luzenac	Location	Sapington	Stack ID No.	DC-15	Stack Dimension	18 x 18	
Date	01/18/95	Operator	cwL	Run No.	3	Sample Box No.	3	
					Filter No.	1166	Meter Box No.	3

Nozzle ID No. ✓ Nozzle Dia. .494
 Probe ID No. ✓ Probe Length 3
 Liner Material SS
 Probe Heat Setting 160

[illegible]

Rev. 12/92

VISIBLE EMISSION OBSERVATION FORM

Source Name LUZENAC - America			Observation Date 3-9-95				Start Time 09 40		Stop Time 1005 1004					
Address 28769 Sappington Rd.			Min		Seconds				Min		Seconds			
					0	15	30	45			0	15	30	45
City 3 FORKES	State MT	Zip 59752	1	0	0	0	0	31	0	0	0	0		
Phone (406) 285-3286	Source ID Number DC-16		2	0	0	0	0	32	0	0	0	0		
Process Equipment COURSE ore Bin #3	Operating Mode CONT		3	0	0	0	0	33	0	0	0	0		
Control Equipment Pulsaire Baghouse	Operating Mode CONT		4	0	0	0	0	34	0	0	0	0		
Describe Emission Point Start FAN Exhaust Stop Same			5	0	0	0	0	35	0	0	0	0		
			6	0	0	0	0	36	0	0	0	0		
Height above Ground Level Start 235' Stop Same			7	0	0	0	0	37	0	0	0	0		
			8	0	0	0	0	38	0	0	0	0		
Height Relative to Observer Start Same Stop Same			9	0	0	0	0	39	0	0	0	0		
			10	0	0	0	0	40	0	0	0	0		
Distance from Observer Start 8' Stop Same			11	0	0	0	0	41	0	0	0	0		
			12	0	0	0	0	42	0	0	0	0		
Direction from Observer Start ESE Stop Same			13	0	0	0	0	43	0	0	0	0		
			14	0	0	0	0	44	0	0	0	0		
Describe Emissions Start Invisible Stop - Same			15	0	0	0	0	45	0	0	0	0		
			16	0	0	0	0	46	0	0	0	0		
Emission Color Start N/A Stop -			17	0	0	0	0	47	0	0	0	0		
			18	0	0	0	0	48	0	0	0	0		
Plume Type: Continuous ☒ Fugitive ☐ Intermittent ☐			19	0	0	0	0	49	0	0	0	0		
			20	0	0	0	0	50	0	0	0	0		
Water Droplets Present? Yes ☐ No ☒			21	0	0	0	0	51	0	0	0	0		
			22	0	0	0	0	52	0	0	0	0		
If Water Droplet Plume: Attached ☐ Detached ☐			23	0	0	0	0	53	0	0	0	0		
			24	0	0	0	0	54	0	0	0	0		
Point in the Plume at which Opacity was Determined Start Exit → 2 dia Stop Same			25	0	0	0	0	55	0	0	0	0		
			26	0	0	0	0	56	0	0	0	0		
Describe Background Start duct/structure Stop Same			27	0	0	0	0	57	0	0	0	0		
			28	0	0	0	0	58	0	0	0	0		
Background Color Start grey Stop Same			29	0	0	0	0	59	0	0	0	0		
			30	0	0	0	0	60	0	0	0	0		
Wind Speed N/A Start 15-30 Stop Same			Average Opacity for Highest Period 0				Number of Readings Above 7 % Were 0							
Ambient Temp. Start 75 Stop 78			Range of Opacity Readings Minimum 0 Maximum 0				Observer's Name (Print) BOB RICHARDS							
Wet Bulb Temp. 53-55 RH Percent 20%			Observer's Signature <i>Robert H. Richards</i>				Date 3-9-95							
Source Layout Sketch 			Organization BISON ENGINEERING				Comments OBS. interrupted 0855 - Break Resume 0920 Lighting clerestory extends the Building length. BACKLIGHTING WAS UNAVOIDABLE - PLANT LIGHTING FIXTURES.							

CERT. # 246176-EXP. 4-20-95

Loader Bucket weighs 5 tons.

VISIBLE EMISSION OBSERVATION FORM

Source Name <u>Luzenac - America</u>			Observation Date <u>3-9-95</u>				Start Time <u>1005</u>		Stop Time <u>1104</u>			
Address <u>28769 Sappington Rd.</u>			Min	Seconds				Min	Seconds			
				0	15	30	45		0	15	30	45
City <u>3-FORKS</u>	State <u>MT</u>	Zip <u>59752</u>	1	0	0	0	0	31	0	0	0	0
Phone <u>(406) 285-3286</u>	Source ID Number <u>DC-16</u>		2	0	0	0	0	32	0	0	0	0
Process Equipment <u>Course/FINE ORE BIN #3</u>	Operating Mode <u>Cont.</u>		3	0	0	0	0	33	0	0	0	0
Control Equipment <u>PULLSAIRE BAGHOUSE</u>	Operating Mode <u>Cont.</u>		4	0	0	0	0	34	0	0	0	0
Describe Emission Point <u>Start FAN Exhaust Stop same</u>			5	0	0	0	0	35	0	0	0	0
			6	0	0	0	0	36	0	0	0	0
Height above Ground Level <u>Start 235' Stop same</u>			7	0	0	0	0	37	0	0	0	0
			8	0	0	0	0	38	0	0	0	0
Distance from Observer <u>Start 8' Stop same</u>			9	0	0	0	0	39	0	0	0	0
			10	0	0	0	0	40	0	0	0	0
Direction from Observer <u>Start ESE Stop same</u>			11	0	0	0	0	41	0	0	0	0
			12	0	0	0	0	42	0	0	0	0
Describe Emissions <u>Start invisible Stop same</u>			13	0	0	0	0	43	0	0	0	0
			14	0	0	0	0	44	0	0	0	0
Emission Color <u>Start N/A Stop -</u>			15	0	0	0	0	45	0	0	0	0
			16	0	0	0	0	46	0	0	0	0
Plume Type: Continuous ☒ Fugitive ☐ Intermittent ☐			17	0	0	0	0	47	0	0	0	0
			18	0	0	0	0	48	0	0	0	0
Water Droplets Present? ☒ Yes ☐ No ☒			19	0	0	0	0	49	0	0	0	0
			20	0	0	0	0	50	0	0	0	0
If Water Droplet Plume: N/A Attached ☐ Detached ☐			21	0	0	0	0	51	0	0	0	0
			22	0	0	0	0	52	0	0	0	0
Point in the Plume at which Opacity was Determined <u>Start Exit → 2' Stop Exit → 3 dia</u>			23	0	0	0	0	53	0	0	0	0
			24	0	0	0	0	54	0	0	0	0
Describe Background Structure <u>Start ducts/structure Stop same</u>			25	0	0	0	0	55	0	0	0	0
			26	0	0	0	0	56	0	0	0	0
Background Color <u>Start grey Stop same</u>			27	0	0	0	0	57	0	0	0	0
			28	0	0	0	0	58	0	0	0	0
Wind Speed <u>NA - see</u> Start - Stop <u>NA</u>			29	0	0	0	0	59	0	0	0	0
			30	0	0	0	0	60	0	0	0	0
Ambient Temp. <u>Start 78 Stop 78</u>			Wet Bulb Temp. <u>55-58</u>				RH Percent <u>20%</u>					
Source Layout Sketch ☉ Sun » Wind ✕ Plume & Stack Draw North Arrow			Average Opacity for Highest Period <u>0</u>				Number of Readings Above % Were <u>7</u>					
			Range of Opacity Readings Minimum <u>0</u> Maximum <u>0</u>				Observer's Name (Print) <u>BOB RICHARDS</u>					
Observer's Signature <u>Robert L. Richards</u>				Date <u>3-9-95</u>								
Organization <u>BISON ENGINEERING</u>				Comments <u>PASTY INSIDE BLDG; cleaned glasses frequently</u>								
CFRT # <u>246176</u> , exp. <u>4-20-95</u>												



VISIBLE EMISSION OBSERVATION FORM

Source Name <i>Lu Zengac - America</i>				Observation Date <i>3-9-95</i>				Start Time <i>1407:126</i>				Stop Time <i>1407:1449</i>																																			
Address <i>28769 SAPPINGTON RD</i>				<table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45	<table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45
Min	Seconds								Min	Seconds																																					
	0	15	30	45	0	15	30	45																																							
Min	Seconds				Min	Seconds																																									
	0	15	30	45		0	15	30	45																																						
City <i>3-FORKS</i>	State <i>MT</i>	Zip <i>59752</i>		1	0	0	0	0	31	0	0	0	0																																		
Phone <i>(406) 285-3286</i>		Source ID Number <i>DC-16</i>		2	0	0	0	0	32	0	0	0	0																																		
Process Equipment <i>#3 COARSE/FINE ORE BIN</i>		Operating Mode <i>CONT.</i>		3	0	0	0	0	33	0	0	0	0																																		
Control Equipment <i>PULSAIRE BAGHOUSE</i>		Operating Mode <i>CONT.</i>		4	0	0	0	0	34	0	0	0	0																																		
Describe Emission Point				5	0	0	0	0	35	0	0	0	0																																		
Start <i>FAN EXHAUST</i> Stop <i>same</i>				6	0	0	0	0	36	0	0	0	0																																		
Height above Ground Level Start <i>~35'</i> Stop <i>same</i>		Height Relative to Observer Start <i>same</i> Stop <i>same</i>		7	0	0	0	0	37	0	0	0	0																																		
Distance from Observer Start <i>8'</i> Stop <i>same</i>		Direction from Observer Start <i>E</i> Stop <i>same</i>		8	0	0	0	0	38	0	0	0	0																																		
Describe Emissions				9	0	0	0	0	39	0	0	0	0																																		
Start <i>invisible</i> Stop <i>same</i>				10	0	0	0	0	40	0	0	0	0																																		
Emission Color Start <i>N/A</i> Stop <i>—</i>		Plume Type: Continuous ☒ Fugitive ☐ Intermittent ☐		11	0	0	0	0	41	0	0	0	0																																		
Water Droplets Present? Yes ☐ No ☒		If Water Droplet Plume: <i>N/A</i> Attached ☐ Detached ☐		12	0	0	0	0	42	0	0	0	0																																		
Point in the Plume at which Opacity was Determined				13	0	0	0	0	43	0	0	0	0																																		
Start <i>exit → 3 dia</i> Stop <i>same</i>				14	0	0	0	0	44	0	0	0	0																																		
Describe Background				15	0	0	0	0	45	0	0	0	0																																		
Start <i>DUCTS/STRUCTURE</i> Stop <i>same</i>				16	0	0	0	0	46	0	0	0	0																																		
Background Color Start <i>grey</i> Stop <i>same</i>		Sky Conditions <i>N/A - inside</i> Start <i>—</i> Stop <i>inside</i>		17	0	0	0	0	47	0	0	0	0																																		
Wind Speed <i>N/A - inside</i> Start <i>15-40</i> Stop <i>same</i>		Wind Direction <i>N/A - inside</i> Start <i>S-E-W</i> Stop <i>same</i>		18	0	0	0	0	48	0	0	0	0																																		
Ambient Temp. Start <i>78</i> Stop <i>81</i>		Wet Bulb Temp. <i>55-58</i> RH Percent <i>20%</i>		19	0	0	0	0	49	0	0	0	0																																		
				20	0	0	0	0	50	0	0	0	0																																		
				21	0	0	0	0	51	0	0	0	0																																		
				22	0	0	0	0	52	0	0	0	0																																		
				23	0	0	0	0	53	0	0	0	0																																		
				24	0	0	0	0	54	0	0	0	0																																		
				25	0	0	0	0	55	0	0	0	0																																		
				26	0	0	0	0	56	0	0	0	0																																		
				27	0	0	0	0	57	0	0	0	0																																		
				28	0	0	0	0	58	0	0	0	0																																		
				29	0	0	0	0	59	0	0	0	0																																		
				30	0	0	0	0	60	0	0	0	0																																		

Source Layout Sketch

☒ Sun
 » Wind
 ✕ Plume & Stack

catwalk
deck
Emission Point
OBS. position
Sun Location Line
M/A - INSIDE SOURCE

Draw North Arrow

Average Opacity for Highest Period
0

Number of Readings Above % Were *7*

Range of Opacity Readings
Minimum *0* Maximum *0*

Observer's Name (Print)
BOB RICHARDS

Observer's Signature
Robert Richards Date
3-9-95

Organization
BISON ENGINEERING

Comments
INTERRUPTED OBS @ 14:26:45 - BIN FULL Resumed 14:07:45 SOME BACKLIGHTING UNAVOIDABLE due to plant lights & CLERE STORY

CERT #246176, EXP. 4-20-95



A diagram of a C-shaped cross-section. The vertical distance between the top and bottom flanges is labeled 'X'. The horizontal distance from the centerline of the web to the inner face of the flange is labeled 'Y'. A semi-circular cutout is located on the right side of the web, labeled 'Port' with an upward arrow indicating its opening.

SCHEMATIC OF SAMPLING LOCATION

Notes:

2-28-95

R. Vol

GAS VELOCITY AND VOLUME DATA FORM

Plant	LUZENAC		Location	SAPPINGTON	Stack ID No.	DC-17
Date	12-30-94	Time	1030	Operator	MMA/WGS	Run No. 1
				Stack Dimension 23 1/2"		

Altitude	—	Alt. Corr.	—	Ambient Temp.	56°F
Barometric Reading	—			Molecular Weight	28.84
Local Barometric Pressure	26.27" Hg			Method	—
Stack Static Pressure	2.9			Pitot C _p	0.84

- see
meth. 3
DATA

Field Data				
Traverse Point Number	Velocity Head (Δp_s), " H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
N 1	0.61		0.01	10°
2	0.40		0.07	10°
3	0.35		0.16	12°
4	0.32		0.11	10°
5	0.28		0.07	6°
6	0.27		0.04	6°
7	0.26		0.03	2°
8	0.25		0.00	0°
E 1	0.25		0.18 0.10	10°
2	0.28		0.10	10°
3	0.26		0.09	10°
4	0.26		0.06	10°
5	0.27		0.03	4°
6	0.29		0.00	0°
7	0.28		0.00	0°
8	0.28		0.00	0°
Average Δp_s		Average Stack Temp.	Average Angle (α) ¹	
0.3069 ✓			6.2	
Mean Sqrt Δp_s				
0.5497		87°F		

¹ Average of α must be <10° to be acceptable.

2-28-95
RGA

NOZZLE CALIBRATION DATA FORM

Date 12-30-94 Calibrated by MAA

Nozzle Identification Number	Nozzle Diameter			ΔD^a mm (in.)	D_{avg}^b
	D_1 , mm (in.)	D_2 , mm (in.)	D_3 , mm (in.)		
10-1	0.305	0.302	0.304	0.003	0.304
1-8	0.248	0.247	0.246	0.002	0.247

^a ΔD = maximum difference between any two diameters, mm (in.), $\Delta D \leq 0.10$ mm (0.004 in.)

^b D_{avg} = average of D_1 , D_2 , and D_3

2-28-~~94~~ 95
Rae

Fo. M3-02

GAS ANALYSIS DATA FORM - FYRITE

Plant

LUZENA - SAPPINGTON

Date

12-30-94

By

MA/BGS

Sample Location

DC-17

Sample Method (Bulb Pump, Integrated Bag, etc.)

Ambient Temp.

~70°F

Run	Clock Time	FYRITE READINGS		
		% CO ₂	% O ₂	(N ₂ + CO) = 100 Minus Σ (CO ₂ , O ₂)
1 a	1645	0.0	21.0	79.0
b	1647	0.0	21.0	79.0
c	1650	0.0	21.0	79.0
Averages		0	21	79.0
Dry Molecular Weight (M _d)		x 44/100	x 32/100	x 28/100
2 a			6.72	22.12
b				
c				
Averages				
Dry Molecular Weight (M _d)		x 44/100	x 32/100	x 28/100
3 a				
b				
c				
Averages				
Dry Molecular Weight (M _d)		x 44/100	x 32/100	x 28/100
Total				28.84
Total				

2-28-95

RGR

PARTICULATE FIELD DATA FORM

Plant <u>LUZENAC</u>	Location <u>SAPPINGTON</u>	Stack ID No. <u>DL-V7</u>	Stack Dimension <u>23 1/2"</u>
Date <u>12-30-04</u>	Operator <u>MWA/WGS</u>	Run No. <u>1</u>	Sample Box No. <u>2</u>
		Filter No. <u>1042</u>	Meter Box No. <u>3</u>

Altitude ~ Alt. Corr. ~
 Barometric Reading ~
 Barometric Pres. 26.27" Hg
 Stack Static Pres. 2.90

Assumed Moisture 1%
 Ambient Temp. 56°F
 Meter ΔH@ 1.92
 Meter Calib (Y) 1.002

Nozzle ID No. 1-B Nozzle Dia. 0.247
 Probe ID No. ✓ Probe Length 3'
 Liner Material 5.5
 Probe Heat Setting 120°F

Traverse Point Number	Sampling Time (min.)	Clock Time (24 hr.)		Gas Sample Volume (cf)	Velocity Head (ΔP) ("H ₂ O)	Pressure Differential across Orifice Meter (ΔH) ("H ₂ O)	Vacuum, mm ("Hg)	#1 Stack Temp. (°F)	#3 Filter Temp. (°F)	#4 Temp. of Gas Leaving Condenser or Last Impinger (°F)	#6 Gas Sampler Temp. at Dry Gas Meter (°F)		#7
		Start	Stop								Inlet	Outlet	
N 1	57	1352	207.54	202.524	0.42	1.63	1	109	189	39	68	66	66
2	14		207.54	212.54	0.41	1.60	1	108	158	43	69	66	66
3	21		207.54	217.54	0.43	1.67	1.5	107	156	46	70	67	67
4	28		207.54	222.67	0.42	1.64	1.5	106	153	46	72	68	68
5	35		207.54	227.67	0.39	1.52-1.55	1	107	149	46	73	68	68
6	42		207.54	232.59	0.38	1.50	1	108	150	48	74	68	68
7	49		207.54	237.56	0.38	1.50	1	107	149	48	75	69	69
8	56		207.54	242.534	0.38	1.51	1	106	149	48	75	69	69
E 1	63		207.54	247.66	0.42	1.68	1	104	153	50	72	69	69
2	70		207.54	252.61	0.35	1.40	1	103	158	51	73	69	69
3	77		207.54	257.41	0.36	1.44	1	103	150	50	74	69	69
4	84		207.54	262.26	0.37	1.48	1	103	149	50	75	70	70
5	91		207.54	266.99	0.42	1.68	1	103	149	50	75	70	70
6	98		207.54	272.61	0.42	1.68	1	103	150	51	76	71	71
7	105		207.54	277.92	0.43	1.72	1	103	155	52	77	70	70
8	112		207.54	283.216	0.44	1.77	1	102	152	53	77	71	71

MTA VOL 80.682 Mean Spd 0.6331
 ΔH = 1.587
 ES = 105.1
 67 = 71.1
 Rev. 12/92

VISIBLE EMISSION OBSERVATION FORM

Run 1

Source Name Luzenac - Sappington			Observation Date 12-30-94				Start Time 14:02				Stop Time 15:02																					
Address 28516 Sappington Road			<table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45	City 3 Forks				State MT		Zip 59752	
Min	Seconds							Min	Seconds																							
	0	15	30	45	0	15	30		45																							
Phone (406) 285-3286			Source ID Number DC-17			1				31																						
Process Equipment AEM #3			Operating Mode Normal			2				32																						
Control Equipment DC-17			Operating Mode Normal			3				33																						
Describe Emission Point round vertical stack						4				34																						
Start			Stop			5				35																						
Height above Ground Level Start ~75' Stop			Height Relative to Observer Start ~75' Stop			6				36																						
Distance from Observer Start ~400' Stop			Direction from Observer Start NNE Stop			7				37																						
Describe Emissions none						8				38																						
Start			Stop			9				39																						
Emission Color Start none Stop			Plume Type: Continuous ☒ Fugitive ☐ Intermittent ☐			10				40																						
Water Droplets Present? Yes ☐ No ☒			If Water Droplet Plume: Attached ☐ Detached ☐			11				41																						
Point in the Plume at which Opacity was Determined Start Stack outlet Stop						12				42																						
Describe Background partly cloudy sky						13				43																						
Start			Stop			14				44																						
Background Color Start lt. blue Stop white			Sky Conditions Start partly cloudy Stop 40%			15				45																						
Wind Speed Start 0-2 mph Stop			Wind Direction Start SE Stop			16				46																						
Ambient Temp. Start ~32°F Stop			Wet Bulb Temp. Start Stop			17				47																						
RH Percent Start Stop						18				48																						
Source Layout Sketch ☒ Sun ☒ Wind ☒ Plume & Stack Draw North Arrow 			19				49																									
			20				50																									
			21				51																									
			22				52																									
			23				53																									
			24				54																									
			25				55																									
			26				56																									
			27				57																									
			28				58																									
29				59																												
30				60																												

Average Opacity for Highest Period 0		Number of Readings Above 0 % Were 0	
Range of Opacity Readings Minimum 0 Maximum 0			
Observer's Name (Print) Bill Shaw			
Observer's Signature <i>Bill Shaw</i>		Date 12-30-94	
Organization BISON ENGINEERING			
Comments			



PARTICULATE FIELD DATA FORM

Plant <u>LUTENAC</u>	Location <u>SAPPHINGTON</u>	Stack ID No. <u>DC-17</u>	Stack Dimension <u>23 1/2</u>
Date <u>12-30-94</u>	Operator <u>MAA/WGS</u>	Run No. <u>2</u>	Sample Box No. <u>3</u>
		Filter No. <u>1043</u>	Meter Box No. <u>3</u>

FILE = C:\LUTENAC\DC17-2.WRI

Altitude <u>~</u>	Alt. Corr. <u>~</u>
Barometric Reading <u>~</u>	
Barometric Pres. <u>26.27" Hg</u>	
Stack Static Pres. <u>2.90</u>	

Assumed Moisture <u>1%</u>
Ambient Temp. <u>67°F</u>
Meter ΔH@ <u>1.92</u>
Meter Calib (Y) <u>1.002</u>

Nozzle ID No. <u>10-1</u>	Nozzle Dia. <u>0.304</u>
Probe ID No. <u>~</u>	Probe Length <u>3'</u>
Liner Material <u>5.5</u>	
Probe Heat Setting <u>120°F</u>	

Traverse Point Number	Sampling Time (min.)	Clock Time (24 hr.)	Gas Sample Volume (ct)	Velocity Head (AP) ("H ₂ O)	Pressure Differential across Orifice Meter (ΔH) ("H ₂ O)	Vacuum, mm ("Hg)	#1 Stack Temp. (°F)	#3 Filter Temp. (°F)	#4 Temp. of Gas Leaving Condenser or Last Impinger (°F)	#6 Gas Sampler Temp at Dry Gas Meter (°F)		#7
										Inlet	Outlet	
E 1	5	1632	283.88	0.40	3.58	2	99	150	52	68	67	67
2	10		294.54	0.40	3.67	2	99	150	58	69	67	67
3	15	300.05	299.	0.41	3.75	2	100	152	60	70	67	67
4	20		305.53	0.41	3.76	2	100	150	64	70	67	67
5	25		311.41	0.42	4.31	2	100	148	62	71	67	67
6	30		317.46	0.42	4.32	2	99	151	60	73	68	68
7	35		323.55	0.42	4.44	2	99	150	63	76	68	68
8	40		329.69	0.42	4.44	2	99	149	60	77	69	69
N 1	45		335.59	0.51	4.73	2	97	150	52	74	68	68
2	50		341.72	0.47	4.35	2	97	149	50	75	69	69
3	55		347.82	0.47	4.36	2	96	152	51	76	69	69
4	60		353.99	0.48	4.45	2	97	149	52	78	70	70
5	65		360.01	0.44	4.00	2	98	149	52	79	70	70
6	70		365.91	0.43	4.00	2	98	152	52	79	71	71
7	75		371.79	0.43	4.00	2	98	149	52	80	71	71
8	80		377.537	0.42	3.91	2	98	150	52	80	71	71

MEAN VOL = 93.656
 MEAN SQRT ΔH = 4.134
 0.6690

t_s = 98.4

t_m = 71.7
 Rev. 12/92

POST-1 FAK. 0.0043/min @ 17" Hg

POST-1 FAK. 0.0043/min @ 5" Hg

VISIBLE EMISSION OBSERVATION FORM

Source Name <u>Luzernac - Sappington</u>			Observation Date <u>12-30-94</u>				Start Time <u>15:56</u>		Stop Time <u>16:56</u>		
Address <u>28769 Sappington Road</u>											
City <u>3 Forks</u>	State <u>MT</u>	Zip <u>59752</u>									
Phone <u>(406) 285-3286</u>		Source ID Number <u>DC-17</u>									
Process Equipment <u>ACM#3</u>		Operating Mode <u>Normal</u>									
Control Equipment <u>DC 17</u>		Operating Mode <u>Normal</u>									
Describe Emission Point <u>round vertical stack</u>											
Start _____ Stop _____											
Height above Ground Level <u>Start ~ 75' Stop</u>			Height Relative to Observer <u>Start ~ 75' Stop</u>								
Distance from Observer <u>Start Stop</u>			Direction from Observer <u>Start NNE Stop</u>								
Describe Emissions <u>none</u>											
Start _____ Stop _____											
Emission Color <u>none</u>			Plume Type: Continuous ☒ Fugitive ☐ Intermittent ☐								
Water Droplets Present? Yes ☐ No ☒			If Water Droplet Plume: Attached ☐ Detached ☐								
Point in the Plume at which Opacity was Determined <u>@ Stack Outlet</u>											
Describe Background <u>H. blue & white sky</u>											
Background Color <u>H. blue & white</u>			Sky Conditions <u>partly cloudy</u>								
Wind Speed <u>1-2</u>			Wind Direction <u>SE</u>								
Ambient Temp. <u>~ 30°</u>			Wet Bulb Temp. _____								
RH Percent _____											
Source Layout Sketch ☉ Sun » Wind ≡ Plume & Stack Draw North Arrow X Emission Point 140° Sun Location Line			Average Opacity for Highest Period <u>0</u>				Number of Readings Above _____ % Were <u>0</u>				
			Range of Opacity Readings <u>0</u> Minimum <u>0</u> Maximum								
			Observer's Name (Print) <u>BILL SHAW</u>								
			Observer's Signature <u>Bill Shaw</u>						Date <u>12-30-94</u>		
			Organization <u>BISON ENGINEERING</u>								
Comments											



VISIBLE EMISSION OBSERVATION FORM

Source Name <u>Luzenac - Sappington</u>				Observation Date <u>1-3-95</u>				Start Time <u>9:35</u>				Stop Time <u>10:55</u>																																			
Address <u>295169 Sappington Road</u>				<table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45	<table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45
Min	Seconds								Min	Seconds																																					
	0	15	30	45	0	15	30	45																																							
Min	Seconds				Min	Seconds																																									
	0	15	30	45		0	15	30	45																																						
City <u>3 Forks</u>	State <u>MT</u>	Zip <u>59752</u>		1	0	0	0	0	31	0	0	0	0																																		
Phone <u>(406) 295-3286</u>	Source ID Number <u>DC-17</u>			2	0	0	0	0	32	0	0	0	0																																		
Process Equipment <u>ACM #3</u>	Operating Mode <u>Normal</u>			3	0	0	0	0	33	0	0	0	0																																		
Control Equipment <u>DC17</u>	Operating Mode <u>NORMAL</u>			4	0	0	0	0	34	0	0	0	0																																		
Describe Emission Point <u>round, vertical stack</u>	Start	Stop		5	0	0	0	0	35	0	0	0	0																																		
				6	0	0	0	0	36	0	0	0	0																																		
Height above Ground Level	Start	Stop	Height Relative to Observer	Start	Stop				7	0	0	0	0																																		
									8	0	0	0	0	37	0	0	0	0																													
Distance from Observer	Start	Stop	Direction from Observer	Start	Stop				9	0	0	0	0																																		
									10	0	0	0	0	40	0	0	0	0																													
Describe Emissions <u>none</u>	Start	Stop							11	0	0	0	0																																		
									12	0	0	0	0	42	0	0	0	0																													
Emission Color <u>none</u>	Start	Stop	Plume Type: Continuous ☒ Fugitive ☐ Intermittent ☐						13	0	0	0	0																																		
									14	0	0	0	0	44	0	0	0	0																													
Water Droplets Present? Yes ☐ No ☒	If Water Droplet Plume: Attached ☐ Detached ☐								15	0	0	0	0																																		
									16	0	0	0	0	46	0	0	0	0																													
Point in the Plume at which Opacity was Determined	Start	Stop							17	0	0	0	0																																		
									18	0	0	0	0	48	0	0	0	0																													
Describe Background <u>sky</u>	Start	Stop	Sky Conditions <u>partly cloudy</u>	Start	Stop				19	0	0	0	0																																		
									20	0	0	0	0	50	0	0	0	0																													
Background Color <u>blue white</u>	Start	Stop							21	0	0	0	0																																		
									22	0	0	0	0	52	0	0	0	0																													
Wind Speed <u>0-1 mph</u>	Start	Stop	Wind Direction <u>E</u>	Start	Stop				23	0	0	0	0																																		
									24	0	0	0	0	54	0	0	0	0																													
Ambient Temp. <u>~5°</u>	Start	Stop	Wet Bulb Temp.	Start	Stop				25	0	0	0	0																																		
									26	0	0	0	0	56	0	0	0	0																													
RH Percent	Start	Stop							27	0	0	0	0																																		
									28	0	0	0	0	58	0	0	0	0																													
	Start	Stop							29	0	0	0	0																																		
									30	0	0	0	0	60	0	0	0	0																													

Source Layout Sketch ☒ Sun Draw North Arrow ☒ Wind ☒ Plume & Stack 		Average Opacity for Highest Period <u>0</u>	Number of Readings Above <u>0</u> % Were <u>0</u>
		Range of Opacity Readings <u>0</u> Minimum <u>0</u> Maximum	
Observer's Name (Print) <u>BILL SHAW</u>		Observer's Signature <u>Bill Shaw</u>	
		Date <u>1-3-95</u>	
Organization <u>BISON ENGINEERING</u>			
Comments			



VISIBLE EMISSION OBSERVATION FORM

Run 1

Source Name Luzenac-America			Observation Date 2 Mar 95		Start Time 1110		Stop Time 1210	
Address 28769 Sappington Rd.								
City 3 Forks	State MT	Zip 59752						
Phone (406) 285-3286	Source ID Number DC-19							
Process Equipment 1688-2CB MikroPuls Air	Operating Mode Cont							
Control Equipment Fire Prod. Silo #3	Operating Mode Cont							
Describe Emission Point ~ 8' dia. facing North (horiz.) Same								
Start Fan/Duct Outlet								
Height above Ground Level Start ~ 50' Stop Same								
Height Relative to Observer Start - 2' Stop Same								
Distance from Observer Start ~ 5' Stop Same								
Direction from Observer Start N30E Stop Same								
Describe Emissions Start None Stop Same								
Emission Color Start - Stop Same								
Plume Type: ☒ Continuous ☐ Fugitive ☐ Intermittent								
Water Droplets Present? ☐ Yes ☒ No								
If Water Droplet Plume: NA ☐ Attached ☐ Detached								
Point in the Plume at which Opacity was Determined Start Vent Outlet Stop Same								
Describe Background Start Sky/Grassland Stop Same								
Background Color Start Blue/Bn Stop Same								
Sky Conditions Start CLR Stop Same								
Wind Speed Start 0-5 Stop								
Wind Direction Start 270° Stop Same								
Ambient Temp. Start 32°F Stop 32°F								
Wet Bulb Temp. < 30°F								
RH Percent -								
Source Layout Sketch 			Average Opacity for Highest Period 0		Number of Readings Above 20 % Were 0			
			Range of Opacity Readings Minimum 0 Maximum 0					
			Observer's Name (Print) Mitchell W. Anderson					
			Observer's Signature <i>Mitchell W. Anderson</i>		Date 3-2-95			
			Organization BISON ENGINEERING					
Comments Observation point on top of Silo 3.								

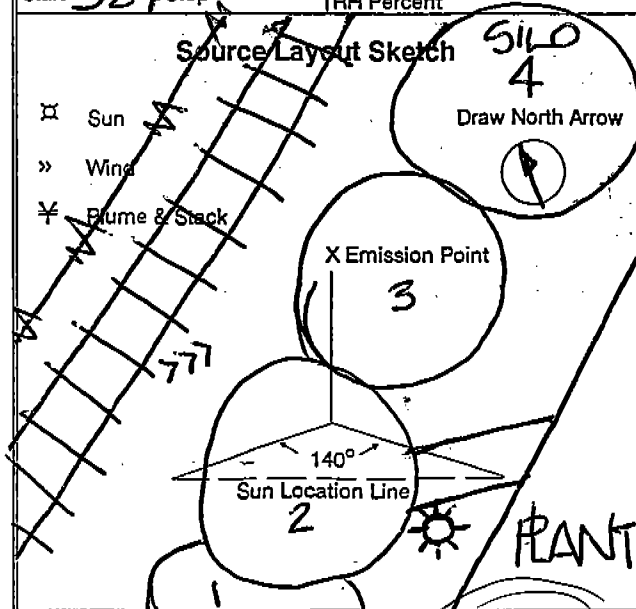
3-10-95
RWB



VISIBLE EMISSION OBSERVATION FORM

Run 2

Source Name LUZENAC-AMERICA			Observation Date 3-2-95		Start Time 1210		Stop Time 1310	
Address 28769 Sappington Road			City 3 Forks		State MT		Zip 59752	
Phone (406) 285-3286			Source ID Number DC-190		Process Equipment # 165-B-20B		Operating Mode Cont	
Control Equipment Fabric Filter/Baghouse			Operating Mode Cont		Describe Emission Point Outlet side of Fan		Start Duct Outlet Stop Same	
Height above Ground Level Start ~45' Stop Same			Height Relative to Observer Start -2' Stop Same		Distance from Observer Start ~5' Stop Same		Direction from Observer Start N30°E Stop Same	
Describe Emissions Start No Emissions Stop Same			Emission Color Start - Stop -		Plume Type: ☒ Continuous ☐ Fugitive ☐ Intermittent		Water Droplets Present? ☐ Yes ☒ No	
Point in the Plume at which Opacity was Determined Start Duct Outlet Stop Same			Describe Background Start Rolling Hills Stop Same		Background Color Start Brown Stop Same		Sky Conditions Start CLEAR Stop Same	
Wind Speed Start 0.5 Stop Same			Wind Direction Start 210° Stop Same		Ambient Temp. Start 32°F Stop		Wet Bulb Temp. < 30°F	
RH Percent			Average Opacity for Highest Period 0		Number of Readings Above % Were 20			
Range of Opacity Readings Minimum 0 Maximum 0			Observer's Name (Print) Mitchell W. Anderson					
Observer's Signature MW Anderson			Date 3-2-95					
Organization Bison Engineering			Comments					
Serial # : 880049HZ								



VISIBLE EMISSION OBSERVATION FORM Run 3

Source Name Luzenac-America			Observation Date 3-2-95		Start Time 1310		Stop Time 1410																			
Address 24769 Sappington Road			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>						Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45
Min	Seconds									Min	Seconds															
	0	15	30	45	0	15	30	45																		
City 3 Forks	State MT	Zip 59752	1	0	0	0	0	31	0	0	0	0														
Phone (406) 285-3286	Source ID Number DC-18		2	0	0	0	0	32	0	0	0	0														
Process Equipment Mikro Pul	Operating Mode Cont		3	0	0	0	0	33	0	0	0	0														
Serial # 880049H2	Operating Mode Cont		4	0	0	0	0	34	0	0	0	0														
Control Equipment Fabric Filter	Operating Mode Cont		5	0	0	0	0	35	0	0	0	0														
Baghouse	Cont		6	0	0	0	0	36	0	0	0	0														
Describe Emission Point Outlet	Start Side of Fan Stop Same		7	0	0	0	0	37	0	0	0	0														
Height above Ground Level Start 45' Stop Same	Height Relative to Observer Start -2' Stop Same		8	0	0	0	0	38	0	0	0	0														
Distance from Observer Start 5' Stop Same	Direction from Observer Start N30E Stop Same		9	0	0	0	0	39	0	0	0	0														
Describe Emissions No Emissions Stop Same			10	0	0	0	0	40	0	0	0	0														
Emission Color Start - Stop -	Plume Type: ☒ Continuous ☐ Fugitive ☐ Intermittent		11	0	0	0	0	41	0	0	0	0														
Water Droplets Present? Yes ☐ No ☒	If Water Droplet Plume: NA ☐ Attached ☐ Detached		12	0	0	0	0	42	0	0	0	0														
Point in the Plume at which Opacity was Determined Start Fan Outlet Stop Same			13	0	0	0	0	43	0	0	0	0														
Describe Background Start Grassland Stop Same			14	0	0	0	0	44	0	0	0	0														
Background Color Start Brown Stop Same	Sky Conditions Start Clear Stop Same		15	0	0	0	0	45	0	0	0	0														
Wind Speed Start 0.5 Stop Same	Wind Direction Start 270° Stop Same		16	0	0	0	0	46	0	0	0	0														
Ambient Temp. Start 30° Stop Same	Wet Bulb Temp. < 30°F		17	0	0	0	0	47	0	0	0	0														
	RH Percent 85		18	0	0	0	0	48	0	0	0	0														
Source Layout Sketch Silo 4 			19	0	0	0	0	49	0	0	0	0														
			20	0	0	0	0	50	0	0	0	0														
			21	0	0	0	0	51	0	0	0	0														
			22	0	0	0	0	52	0	0	0	0														
			23	0	0	0	0	53	0	0	0	0														
			24	0	0	0	0	54	0	0	0	0														
			25	0	0	0	0	55	0	0	0	0														
			26	0	0	0	0	56	0	0	0	0														
			27	0	0	0	0	57	0	0	0	0														
			28	0	0	0	0	58	0	0	0	0														
			29	0	0	0	0	59	0	0	0	0														
			30	0	0	0	0	60	0	0	0	0														

3-10-95
ROR



GAS VELOCITY AND VOLUME DATA FORM

Plant LUZENAC		Location SAPPINGTON		Stack ID No. DC-19
Date 1-23-95	Time	Operator MWA	Run No. 1	Stack Dimension 12" (Portable)

Altitude	Alt. Corr.	Ambient Temp. ~30°F
Barometric Reading	Molecular Weight	
Local Barometric Pressure 26.44" Hg	Method Fyrite	
Stack Static Pressure -0.01" H₂O	Pitot C _p 0.84	

Field Data				
Traverse Point Number	Velocity Head (Δp_v), "H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
A 1	0.015	48	0.15	10°
2	0.040	48	0.10	10°
3	0.050	49	0.15	3°
4	0.045	49	0.25	10°
B 1	0.030	50	0.10	10°
2	0.035	49	0.15	5°
3	0.040	53	0.10	8°
4	0.040	55	0.0	0°
Average Δp_s		Average Stack Temp.	Average Angle (α) ¹	
0.0369 ✓			7° ✓	
Mean Sqrt Δp_s		50.135°		

¹ Average of α must be <10° to be acceptable.2-28-95
RAR

GAS VELOCITY AND VOLUME DATA FORM

Plant LUZENAC		Location SAPPHINGTON		Stack ID No. DC-19
Date 1-24-95	Time 1015	Operator MWA	Run No. 3	Stack Dimension 12"

Altitude	Alt. Corr.	Ambient Temp. ~ 30°F
Barometric Reading	Molecular Weight	
Local Barometric Pressure 26.44" Hg	Method Fyrte	
Stack Static Pressure -0.01" H₂O	Pitot C _p 0.84	

Field Data				
Traverse Point Number	Velocity Head (Δp_s), " H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
A 1	0.025	21°F		
2	0.040	25°		
3	0.045	28		
4	0.040	29		
B 1	0.010	21		
2	0.015	30		
3	0.035	31		
4	0.030	30		
Average Δp_s			Average Stack Temp.	Average Angle (α) ¹
0.030 ✓				
Mean Sqrt Δp_s				
			26.88°F	

¹ Average of α must be <10° to be acceptable.

2-28-95
RGR

GAS VELOCITY AND VOLUME DATA FORM

Plant <u>LUZENAC</u>		Location <u>Sappington</u>		Stack ID No. <u>DC-19</u> <u>DC-3</u>
Date <u>1-25-95</u>	Time <u>5:20</u>	Operator <u>MNA</u>	Run No. <u>4</u>	Stack Dimension <u>12"</u>

Altitude	Alt. Corr.	Ambient Temp. <u>~20°F</u>
Barometric Reading	Molecular Weight	
Local Barometric Pressure <u>26.30" Hg</u>	Method <u>Fynite</u>	
Stack Static Pressure <u>-0.05" H₂O</u>	Pitot C _p <u>0.84</u>	

Field Data				
Traverse Point Number	Velocity Head (Δp_s), " H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
B 1	0.095	5		
2	0.095	5		
3	0.080	1		
4	0.080	2		
A 1	0.065	1		
2	0.080	1		
3	0.095	0		
4	0.095	0		
Average Δp_s			Average Stack Temp.	Average Angle (α) ¹
0.086 ✓				
Mean Sqrt Δp_s			1.88°F	

¹ Average of α must be $\leq 10^\circ$ to be acceptable.

2-28-95

Raf

Altitude	~	Alt. Corr.	~
Barometric Reading	~		
Barometric Pres.	26.44	in Hg	
Stack Static Pres.	-0.10	-0.01	

Assumed Moisture	2.1.
Ambient Temp.	~ 30°F
Meter ΔH@	1.92
Meter Calib (V)	1.058

Nozzle ID No.	~	Nozzle Dia.	0.491
Probe ID No.	~	Probe Length	1.5'
Liner Material	STAINLESS STEEL		
Probe Heat Setting	120°F		

DRF - TEST / SAW CHECK: 0003 μ^3/min @ 15" H_2O POST-TEST / SAW CHECK: 0.001 μ^3/min @ 4" H_2O Rev. 12/92

VISIBLE EMISSION OBSERVATION FORM Rm 1

Source Name LUZENAC			Observation Date 1-23-95		Start Time 1400		Stop Time 1500			
Address 2816 SAPPINGTON RD.										
City 3 FORKS	State MT	Zip 59752								
Phone (406) 285-3286			Source ID Number DC-19							
Process Equipment Fine Product Silo #4			Operating Mode Normal							
Control Equipment Baghouse			Operating Mode Normal							
Describe Emission Point										
Start Fan Outlet			Stop Same							
Height above Ground Level			Height Relative to Observer							
Start ~30'			Stop Same							
Distance from Observer			Direction from Observer							
Start 10'			Stop Same							
Describe Emissions										
Start —			Stop —							
Emission Color			Plume Type: Continuous ☐							
Start —			Fugitive ☐ Intermittent ☐							
Water Droplets Present?			If Water Droplet Plume:							
Yes ☐ No ☒			Attached ☐ Detached ☐							
Point in the Plume at which Opacity was Determined										
Start Fan Outlet			Stop Same							
Describe Background										
Start Silo 3			Stop Same							
Background Color			Sky Conditions							
Start Tan			Stop Same							
Wind Speed			Wind Direction							
Start 0-5			Stop Same							
Ambient Temp.			Wet Bulb Temp.							
Start 30°F			Stop Same							
RH Percent NA										
Source Layout Sketch			Average Opacity for Highest Period		Number of Readings Above					
			0		20 % Were 0					
			Range of Opacity Readings							
			Minimum 0		Maximum 0					
			Observer's Name (Print)		Observer's Signature		Date			
			Mitch Anderson		1-23-95					
			BISON ENGINEERING							
			Comments: Portable Stack with flexible hose							



PARTICULATE FIELD DATA FORM

Plant <u>LUZENNAC</u>	Location <u>SAPPINGTON</u>	Stack ID No. <u>DC-19</u>	Stack Dimension <u>12"</u>
Date <u>1-23-95</u>	Operator <u>MMA</u>	Filter No. <u>1164</u>	Meter Box No. <u>2</u>

Altitude ~ Alt. Corr. ~
 Barometric Reading ~
 Barometric Pres. 26.44 Hg
 Stack Static Pres. -0.01

Assumed Moisture 2.1
 Ambient Temp. ~30°F
 Meter ΔH @ 1.92
 Meter Calib (Y) 1.058

Nozzle ID No. ✓ Nozzle Dia. 0.491
 Probe ID No. ✓ Probe Length 1.5'
 Liner Material STAINLESS STEEL
 Probe Heat Setting 150°F

Traverse Point Number	Sampling Time (min.)	Clock Time (24 hr.)	Gas Sample Volume (cf)	Velocity Head (AP) ($^{\circ}$ H ₂ O)	Pressure Differential across Orifice Meter (ΔH) ($^{\circ}$ H ₂ O)	Vacuum, mm Hg	Stack Temp. (°F)	#3	#4	#6		#7
										Temp. of Gas Leaving Condenser or Last Impinger (°F)	Gas Sampler Temp at Dry Gas Meter (°F)	
B 1	12	1541	660.37	0.030	1.87	1	60	153	46	43		41
2	24		669.59	0.035	2.18	1	62	161	50	45		41
3	36		679.72	0.040	2.54	1	62	162	55	47		42
4	48		689.953	0.040	2.5	1	62	158	57	48		42
A 1	60		696.57	0.015	0.96	1	56	162	56	45		42
2	72		706.64	0.040	2.57	1	55	159	54	46		42
3	84		718.08	0.050	3.22	1.5	48	161	54	47		42
4	96		729.008	0.045	2.96	1.5	42	158	50	45		40
			MTA VOL =	Mean Spd	ΔH =		T_g =			T_m =		
			76.988	0.1898	2.358		55.9			43.6		

FACILITY	
LOCATION	Luzenac/Sappington
DC-19	
RUN #	
TWO	
DATE	1-23-95
START TIME	1541
STOP TIME	

PRELIMINARY INFO.		PRE TEST INFO		CALCULATED	
Bp (Pm) (in.Hg)	26.44	Assumed moisture %	1.0	Stack press. (Ps)	26.44
Stack Dia (rnd)	1	Assumed Meter Temp, F	50.0	Stack Area (rnd)	0.79
Stack Area (sq.ft.)	0.79	Time per Point	12.00	Meter Temp, R	510.0
YI	1.058	Nozzle Dia (in.)	0.491	Recommended Nz dia.	0.455
Delta H@	1.92	Total Number of Points	8	NOZZLE AREA (ft ²)	0.00131
				Total Run Time	96.00
				lb / dscf STD	1.539E-07
				grains / dscf STD	0.0011
				lb / hour STD	0.00
				lb / ft ³ Act.	1.38E-07
				grains / ft ³ Act.	0.0010
EMISSIONS		POST TEST INFO		CALCULATED	
		Static (use - if neg.)	0.01	Stack Temp, R(Ts)	520.0
		Stack Temp, F	60.0	Wet mol. wt. (Ms)	28.73
		Acquired avg. delta P	0.04	Dry mol. wt. (Md)	28.84
		Oxygen	21.00		
		Carbon Dioxide	0.00		

TEST		STACK		METER		ACT	
Calc	SQRT	Stack Vel.	Stack Flow	Volume	Volume	Stack Vel	Stack Vel
K	dP	ft/sec	cu. ft. per min	std	per min	ft/sec	ft/sec
1	0.17	10.29	485	8.25	0.850	10.28	10.28
2	0.19	11.14	525	9.10	0.920	11.12	11.12
3	0.20	11.91	561	9.98	0.984	11.89	11.89
4	0.20	11.91	561	10.07	0.984	11.89	11.89
5	0.12	7.25	342	6.51	0.599	7.24	7.24
6	0.20	11.83	557	9.93	0.977	11.81	11.81
7	0.22	13.21	622	11.29	1.091	13.19	13.19
8	0.21	12.48	588	10.82	1.031	12.47	12.47
9	0.00	0.00	0	0.00	0.000	0.00	0.00
10	0.00	0.00	0	0.00	0.000	0.00	0.00
11	0.00	0.00	0	0.00	0.000	0.00	0.00
12	0.00	0.00	0	0.00	0.000	0.00	0.00
13	0.00	0.00	0	0.00	0.000	0.00	0.00
14	0.00	0.00	0	0.00	0.000	0.00	0.00
15	0.00	0.00	0	0.00	0.000	0.00	0.00
16	0.00	0.00	0	0.00	0.000	0.00	0.00
17	0.00	0.00	0	0.00	0.000	0.00	0.00
18	0.00	0.00	0	0.00	0.000	0.00	0.00
19	0.00	0.00	0	0.00	0.000	0.00	0.00
20	0.00	0.00	0	0.00	0.000	0.00	0.00
21	0.00	0.00	0	0.00	0.000	0.00	0.00
22	0.00	0.00	0	0.00	0.000	0.00	0.00
23	0.00	0.00	0	0.00	0.000	0.00	0.00
24	0.00	0.00	0	0.00	0.000	0.00	0.00
25	0.00	0.00	0	0.00	0.000	0.00	0.00
Actual Vol	76.988	dP	avg	dH	1s	58	
		0.04	2.355	2.19	58		
SQRT d		avg	avg	Vol std dscf/m	avg	avg	avg
0.19		11.25	530	75.95	0.9297	11.24	11.24

VISIBLE EMISSION OBSERVATION FORM

Run 2

Source Name LUZENAC			Observation Date 1-23-95		Start Time 1545		Stop Time 1645				
Address 25169 DAPPINGTON RD.			Min		Seconds		Min		Seconds		
City 3 FORKS	State MT	Zip 59752	1	0	0	0	0	31	0	0	0
Phone (406) 285-3296	Source ID Number DC-19		2	0	0	0	0	32			
Process Equipment Fine Product	Operating Mode Normal		3	0	0	0	0	33			
Control Equipment Baghouse	Operating Mode Normal		4	0	0	0	0	34			
Describe Emission Point Tan Outlet	Stop Same		5	0	0	0	0	35			
Height above Ground Level Start 30' Stop Same	Height Relative to Observer Start ~3' Stop Same		6	0	0	0	0	36			
Distance from Observer Start 10' Stop Same	Direction from Observer Start East Stop Same		7	0	0	0	0	37			
Describe Emissions Start — Stop —			8	0	0	0	0	38			
Emission Color Start — Stop —	Plume Type: Continuous ☐ Fugitive ☐ Intermittent ☐		9	0	0	0	0	39			
Water Droplets Present? Yes ☐ No ☒	If Water Droplet Plume: Attached ☐ Detached ☐		10	0	0	0	0	40	0	0	0
Point in the Plume at which Opacity was Determined Start Tan Outlet Stop Same			11					41			
Describe Background Start Silo 3 Stop Same			12					42			
Background Color Start Tan Stop Same	Sky Conditions Start PC Stop Same		13					43			
Wind Speed Start 0.5 Stop Same	Wind Direction Start 270 Stop Same		14					44			
Ambient Temp. Start 30°F Stop Same	Wet Bulb Temp. 30°F		15					45			
	RH Percent NA		16					46			
Source Layout Sketch 			17					47			
			Average Opacity for Highest Period 0		Number of Readings Above % Were 20 % Were 0						
			Range of Opacity Readings Minimum 0 Maximum 0								
			Observer's Name (Print) Mitch Anderson								
			Observer's Signature MW Anderson								
			Date 1-23-95								
			Organization Bison Engineering								
			Comments Portable stack with flexible hose.								



Dr-10

Nozzle ID No. 12-1 Nozzle Dia. 0.875 0.3
Probe ID No. 3 Probe Length 1.5
Liner Material Stainless Steel
Probe Heat Setting 150°F

[illegible]

VISIBLE EMISSION OBSERVATION FORM *Run 4*

Source Name <i>Luzerne</i>			Observation Date <i>1-25-95</i>				Start Time <i>1030</i>		Stop Time <i>1130</i>																			
Address <i>2576 Sappington Road</i>			<table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45				
Min	Seconds							Min	Seconds																			
	0	15	30	45	0	15	30		45																			
City <i>Storke</i>	State <i>MT</i>	Zip <i>59752</i>																										
Phone <i>(406) 285-3286</i>			Source ID Number <i>DE-3 DC-19</i>																									
Process Equipment <i>fine</i>			Operating Mode <i>same</i>																									
Product <i>Silo #4</i>																												
Control Equipment <i>Baghouse</i>			Operating Mode <i>same</i>																									
Describe Emission Point																												
Start <i>Fan Outlet</i>			Stop <i>same</i>																									
Height above Ground Level			Height Relative to Observer																									
Start <i>30'</i>			Start <i>3'</i>																									
Stop <i>same</i>			Stop <i>same</i>																									
Distance from Observer			Direction from Observer																									
Start <i>10'</i>			Start <i>East</i>																									
Stop <i>same</i>			Stop <i>same</i>																									
Describe Emissions																												
Start <i>—</i>			Stop <i>—</i>																									
Emission Color			Plume Type: Continuous ☐																									
Start <i>—</i>			Fugitive ☐ Intermittent ☐																									
Stop <i>—</i>																												
Water Droplets Present?			If Water Droplet Plume:																									
Yes ☐ No ☒			Attached ☐ Detached ☐																									
			<i>1050</i>																									
Point in the Plume at which Opacity was Determined																												
Start <i>Fan Outlet</i>			Stop <i>same</i>																									
Describe Background																												
Start <i>Tank/Silo</i>			Stop <i>same</i>																									
Background Color			Sky Conditions																									
Start <i>White</i>			Start <i>CLR</i>																									
Stop <i>same</i>			Stop <i>same</i>																									
Wind Speed			Wind Direction																									
Start <i>—</i>			Start <i>N30W</i>																									
Stop <i>—</i>			Stop <i>same</i>																									
Ambient Temp.			Wet Bulb Temp.																									
Start <i>20°F</i>			Start <i>< 30°F</i>																									
Stop <i>same</i>			RH Percent <i>NA</i>																									
			<i>1100</i>																									
Source Layout Sketch			Average Opacity for Highest Period				Number of Readings Above % Were																					
			<i>0</i>				<i>20</i>																					
			Range of Opacity Readings																									
			Minimum <i>0</i>				Maximum <i>0</i>																					
			Observer's Name (Print)																									
			Observer's Signature <i>Mitch Anderson</i>				Date <i>1-25-95</i>																					
			Organization <i>DISOR ENGINEERING</i>																									
			Comments <i>Portable Stack using flexible hose</i>																									



VISIBLE EMISSION OBSERVATION FORM Run 3

Source Name LUZENAC			Observation Date 1-24-95		Start Time 1100		Stop Time 1200	
Address 2016 SAPPINGTON RD			City STORKS		State MT		Zip 59752	
Phone (406) 285-3244			Source ID Number PC-19		Process Equipment Fine Product Silo #4		Operating Mode Normal	
Control Equipment Barnhouse			Operating Mode Normal		Describe Emission Point Fan Outlet		Stop Same	
Height above Ground Level 30			Height Relative to Observer 3'		Distance from Observer 10'		Direction from Observer East	
Describe Emissions Start - Stop -			Emission Color Start - Stop -		Plume Type: Continuous ☐ Fugitive ☐ Intermittent ☐		Water Droplets Present? Yes ☐ No ☒	
Point in the Plume at which Opacity was Determined Start Fan Outlet Stop Same			Describe Background Start Silo 3 Stop Same		Background Color Start Tan Stop Same		Sky Conditions Start PC Stop Same	
Wind Speed Start 0.5 Stop Same			Wind Direction Start N30W Stop Same		Ambient Temp. Start 30°F Stop Same		Wet Bulb Temp. 23.0°F	
RH Percent NA			Average Opacity for Highest Period 0		Number of Readings Above % Were 20 0			
Source Layout Sketch 			Range of Opacity Readings		Observer's Name (Print)			
			Minimum 6 Maximum 6		Observer's Signature Mitch Anderson			
					Date 1-24-95			
					Organization Bison Engineering			
			Comments					



Fo. M3-02

GAS ANALYSIS DATA FORM - FYRITE

RUN # 1.1, 1.2 + 1.3

Plant L42ENACDate 12-28-94 By WGS, SEB, MASample Location VACUUM DUCTAmbient Temp. ~40°FSample Method (Bulb Pump) Integrated Bag, etc.STACK I.D. = DC-22A

Run		Clock Time	FYRITE READINGS				
			% CO ₂	% O ₂	(N ₂ + CO) = 100 Minus Σ (CO ₂ , O ₂)		
1	a	0132 1332	0.0	20.0	80		
	b	1346	0.0	21.0	79		
	c	1400	0.0	20.0	80		
Averages			0	20.3	80		
Dry Molecular Weight (M _d)			x 44/100	x 32/100	x 28/100		
2	a	.		6.50	22.31		
	b						
	c						
Averages							
Dry Molecular Weight (M _d)			x 44/100	x 32/100	x 28/100		
3	a						
	b						
	c						
Averages							
Dry Molecular Weight (M _d)			x 44/100	x 32/100	x 28/100		
Total						28.81 (28.84 - 11.12)	

NOZZLE CALIBRATION DATA FORM

Date 28 Dec. 94Calibrated by S. Bryant

Nozzle Identification Number	Nozzle Diameter			ΔD , ^a mm (in.)	D_{avg} ^b
	D_1 , mm (in.)	D_2 , mm (in.)	D_3 , mm (in.)		
12	.37	.37	.37	.37	.37

^a ΔD = maximum difference between any two diameters, mm (in.), $\Delta D \leq 0.10$ mm (0.004 in.)

^b D_{avg} = average of D_1 , D_2 , and D_3

CDC-22A

Nozzle ID No. 12 Nozzle Dia. 0.370
 Probe ID No. ✓ Probe Length 3
 Liner Material 5.5
 Probe Heat Setting 150°F

Post	993.957	Post Leaflet 9 check AT 5" Hg = 0.008 CFM _{Acv} . 12/92
Net	993.946	

0 CO₂
20 O₂

VISIBLE EMISSION OBSERVATION FORM

Run #1

Source Name LUZENAC			Observation Date 12-28-94				Start Time 12:50		Stop Time 13:50			
Address SAPPINGTON MILL												
City 3 Forks	State MT	Zip 59725										
Phone (406) 285-3286	Source ID Number DC-22A											
Process Equipment Vacuum DC-22A System		Operating Mode NORMAL										
Control Equipment Dust Collector		Operating Mode Normal										
Describe Emission Point round stack ~ 5' dia												
Start from roof (10' dia)												
Height above Ground Level Start ~ 20' Stop Same												
Height Relative to Observer Start ~ 20' Stop Same												
Distance from Observer Start ~ 40' Stop Same												
Direction from Observer Start 170° Stop Same												
Describe Emissions none												
Start												
Emission Color —			Plume Type: ☒ Continuous ☐ Fugitive ☐ Intermittent ☐									
Water Droplets Present? No ☒ Yes ☐			If Water Droplet Plume: ☐ Attached ☐ Detached ☐									
Point in the Plume at which Opacity was Determined Start @ stack outlet Stop Same												
Describe Background Side of building (vented)												
Start												
Background Color large black			Sky Conditions slightly overcast									
Start												
Wind Speed 0-3 mph			Wind Direction —									
Start												
Ambient Temp. ~ 39°F			Wet Bulb Temp.									
Start			RH Percent									
Source Layout Sketch			Average Opacity for Highest Period 0				Number of Readings Above % Were 0					
☒ Sun ☒ Wind Talc ☒ Plume & Stack Plant X Emission Point			Range of Opacity Readings 0 Minimum 0 Maximum				Observer's Name (Print) BILL SHAW					
Silos 1, 2, 3 140° Sun Location Line			Observer's Signature Bill Shaw				Date 12-28-94					
			Organization BROWN ENGINEERING									
			Comments Sun was not visible at any time because the building blocked it.									



FACILITY
LUZENAC/SAPPINGTON
LOCATION
DC-22A
RUN #
TWO
DATE
12/28/94
START TIME
1524
STOP TIME
1704

PRELIMINARY INFO.	
Bp (Pm) (in.Hg)	25.93
Stack Dia (rnd)	1
Stack Area (sq.ft.)	0.79
Yl	1.002
Delta H@	1.92
Total Number of Points	
8	

TRAVERSE INFO	
Static (use - if neg.)	0.00
Stack Temp, F	99.5
Acquired avg. delta P	0.10
Oxygen	20.00
Carbon Dioxide	0.00

PRE TEST INFO	
Assumed moisture %	2.0
Assumed Meter Temp, F	45.0
Time per Point	12.00
Nozzle Dia (in.)	0.37
Total Number of Points	
8	

POST TEST INFO	
Impinger H2O Gain (g)	5.8
Particulate Gain (mg)	8.10
Dry mol. wt. (Mtd)	
28.80	

CALCULATED	
Stack press. (Ps)	25.93
Stack Area (rnd)	0.79
Meter Temp, R	505.0
Recommended N2 dia.	0.362
Total Run Time	
96.00	
EMISSIONS	
lb / dscf	STD
grains / dscf	STD
lb / hour	STD
lb / ft^3	Act.
grains / ft^3	Act.
2.928E-07	
0.0020	
0.01	
2.38E-07	
0.0017	

TEST																	STACK		METER		ACT
Trav Point	Sample Time	MethVol	Vel head	Calc. delta H	Actual delta H	Stack Temp	Meter Temp		Point %I	Accum. Iso %	Calc K	SQRT dP	Stack Vel. ft/sec	Stack Flow cuft/min	Volume std per min	Volume cu. ft.	Stack Vel ft/sec				
							In	Out													
1	12.0	55.430	0.06	1.156	1.20	90	50	49	89	88.6	19.271	0.24	15.15	714	5.88	0.667	15.11				
2	24.0	64.070	0.08	1.511	1.50	103	53	49	103	95.7	18.882	0.28	17.70	834	7.79	0.779	17.65				
3	36.0	73.260	0.10	1.862	1.80	113	56	50	98	96.6	18.625	0.32	19.97	941	8.26	0.878	19.91				
4	48.0	82.770	0.11	2.044	2.00	116	58	51	97	96.7	18.582	0.33	21.00	989	8.52	0.924	20.93				
5	60.0	90.250	0.06	1.162	1.16	93	58	52	101	97.5	19.374	0.24	15.19	716	6.68	0.668	15.15				
6	72.0	98.450	0.08	1.537	1.50	98	59	52	96	97.3	19.219	0.28	17.62	830	7.33	0.775	17.57				
7	84.0	107.800	0.10	1.873	1.90	113	59	53	100	97.6	18.734	0.32	19.97	941	8.35	0.878	19.91				
8	96.0	116.960	0.10	1.844	1.80	122	59	53	98	97.7	18.444	0.32	20.12	948	8.18	0.885	20.06				
9	108.0			0.000					ERR	ERR	20.803	0.00	0.00	0	*****	0.000	0.00				
10	120.0			0.000					ERR	ERR	20.803	0.00	0.00	0	0.00	0.000	0.00				
11	132.0			0.000					ERR	ERR	20.803	0.00	0.00	0	0.00	0.000	0.00				
12	144.0			0.000					ERR	ERR	20.803	0.00	0.00	0	0.00	0.000	0.00				
13	156.0			0.000					ERR	ERR	20.803	0.00	0.00	0	0.00	0.000	0.00				
14	168.0			0.000					ERR	ERR	20.803	0.00	0.00	0	0.00	0.000	0.00				
15	180.0			0.000					ERR	ERR	20.803	0.00	0.00	0	0.00	0.000	0.00				
16	192.0			0.000					ERR	ERR	20.803	0.00	0.00	0	0.00	0.000	0.00				
17	204.0			0.000					ERR	ERR	20.803	0.00	0.00	0	0.00	0.000	0.00				
18	216.0			0.000					ERR	ERR	20.803	0.00	0.00	0	0.00	0.000	0.00				
19	228.0			0.000					ERR	ERR	20.803	0.00	0.00	0	0.00	0.000	0.00				
20	240.0			0.000					ERR	ERR	20.803	0.00	0.00	0	0.00	0.000	0.00				
21	252.0			0.000					ERR	ERR	20.803	0.00	0.00	0	0.00	0.000	0.00				
22	264.0			0.000					ERR	ERR	20.803	0.00	0.00	0	0.00	0.000	0.00				
23	276.0			0.000					ERR	ERR	20.803	0.00	0.00	0	0.00	0.000	0.00				
24	288.0			0.000					ERR	ERR	20.803	0.00	0.00	0	0.00	0.000	0.00				
25	300.0			0.000					ERR	ERR	20.803	0.00	0.00	0	0.00	0.000	0.00				
Actual Vol		68.040	dP	avg	dH	Ts	Tm		%iso	SQRT d		avg	Vol std	dscf/m	avg						
			0.09	1.624	1.61	106	54		ERR	0.29		18.34	60.99	0.8068	18.29						

VISIBLE EMISSION OBSERVATION FORM

Run #2

Source Name LUZEVAC AMERICA			Observation Date 12-28-94				Start Time 15:53		Stop Time 16:53																																					
Address 28768 Sappington Road			<table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45	<table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45
Min	Seconds							Min	Seconds																																					
	0	15	30	45	0	15	30		45																																					
Min	Seconds				Min	Seconds																																								
	0	15	30	45		0	15	30	45																																					
City 3 Forks	State MT	Zip 59752																																												
Phone (406) 285-3286			Source ID Number DC22A																																											
Process Equipment Vacuum System			Operating Mode Normal																																											
Control Equipment Dust Collector			Operating Mode Normal																																											
Describe Emission Point stack on north																																														
Start Round vertical			Stop side of bldg																																											
Height above Ground Level Start ~20' Stop Same			Height Relative to Observer Start ~20' Stop Same																																											
Distance from Observer Start ~40' Stop Same			Direction from Observer Start 170° Stop Same																																											
Describe Emissions Start None Stop Same																																														
Emission Color Start — Stop —			Plume Type: Continuous ☐ Fugitive ☒ NA Intermittent ☐																																											
Water Droplets Present? Yes ☐ No ☒			If Water Droplet Plume: NA Attached ☐ Detached ☐																																											
Point in the Plume at which Opacity was Determined Start Stack Outlet Stop Same																																														
Describe Background Start Side of Building Stop Same																																														
Background Color Black Stop Same			Sky Conditions Overcast Stop Same																																											
Wind Speed Start 0-3 Stop Same			Wind Direction Start — Stop —																																											
Ambient Temp. Start ~40°F Stop Same			Wet Bulb Temp. Start — Stop —																																											
RH Percent Start — Stop —																																														
Source Layout Sketch ☒ Sun ☒ Wind ☒ Plume & Stack Draw North Arrow X Emission Point 						Average Opacity for Highest Period 0				Number of Readings Above % Were 0																																				
						Range of Opacity Readings 0 Minimum 0 Maximum																																								
Observer's Name (Print) Bill Shaw						Observer's Signature Bill Shaw																																								
Date 12-28-94						Organization BISON ENGINEERING																																								
Comments																																														



VISIBLE EMISSION OBSERVATION FORM

Run # 3

Source Name <u>Luzenac America</u>			Observation Date <u>1-3-95</u>				Start Time <u>10:45</u>		Stop Time <u>11:45</u>			
Address <u>2816A Sappington Road</u>			Min	Seconds				Min	Seconds			
				0	15	30	45		0	15	30	45
City <u>3 Forks</u>	State <u>MT</u>	Zip <u>59752</u>	1	0	0	0	0	31	0	0	0	0
Phone <u>(406) 285-3286</u>	Source ID Number <u>DC22A</u>		2	0	0	0	0	32	0	0	0	0
Process Equipment <u>Vacuum System</u>	Operating Mode <u>Normal</u>		3	0	0	0	0	33	0	0	0	0
Control Equipment <u>DC 22A</u>	Operating Mode <u>Normal</u>		4	0	0	0	0	34	0	0	0	0
Describe Emission Point Start <u>N. side of building</u> Stop <u>Same</u>			5	0	0	0	0	35	0	0	0	0
			6	0	0	0	0	36	0	0	0	0
Height above Ground Level Start <u>20'</u> Stop <u>Same</u>			7	0	0	0	0	37	0	0	0	0
			8	0	0	0	0	38	0	0	0	0
Distance from Observer Start <u>75'</u> Stop <u>Same</u>			9	0	0	0	0	39	0	0	0	0
			10	0	0	0	0	40	0	0	0	0
Direction from Observer Start <u>170°</u> Stop <u>Same</u>			11	0	0	0	0	41	0	0	0	0
			12	0	0	0	0	42	0	0	0	0
Describe Emissions <u>none</u>			13	0	0	0	0	43	0	0	0	0
			14	0	0	0	0	44	0	0	0	0
Emission Color <u>none</u>			15	0	0	0	0	45	0	0	0	0
			16	0	0	0	0	46	0	0	0	0
Plume Type: Continuous ☒ Fugitive ☐ Intermittent ☐			17	0	0	0	0	47	0	0	0	0
			18	0	0	0	0	48	0	0	0	0
Water Droplets Present? Yes ☐ No ☒			19	0	0	0	0	49	0	0	0	0
			20	0	0	0	0	50	0	0	0	0
Point in the Plume at which Opacity was Determined Start <u>@ stack outlet</u> Stop <u>Same</u>			21	0	0	0	0	51	0	0	0	0
			22	0	0	0	0	52	0	0	0	0
Describe Background <u>side of building</u>			23	0	0	0	0	53	0	0	0	0
			24	0	0	0	0	54	0	0	0	0
Background Color <u>beige & black</u>			25	0	0	0	0	55	0	0	0	0
			26	0	0	0	0	56	0	0	0	0
Sky Conditions <u>clear</u>			27	0	0	0	0	57	0	0	0	0
			28	0	0	0	0	58	0	0	0	0
Wind Speed <u>0-1</u>			29	0	0	0	0	59	0	0	0	0
			30	0	0	0	0	60	0	0	0	0
Wind Direction Start <u>150°</u> Stop <u>Same</u>			Average Opacity for Highest Period <u>0</u>				Number of Readings Above % Were <u>0</u>					
Ambient Temp. <u>0°F</u>			Range of Opacity Readings <u>0</u> Minimum <u>0</u> Maximum				Observer's Name (Print) <u>Bill Shaw</u>					
Wet Bulb Temp. RH Percent			Observer's Signature <u>Bill Shaw</u>				Date <u>1-3-95</u>					
Source Layout Sketch ☒ Sun ☒ Wind ☒ Plume & Stack Draw North Arrow <u>Talc Processing Plant</u> <u>STEPS</u>			Organization <u>BISON ENGINEERING</u>				Comments					

GAS VELOCITY AND VOLUME DATA FORM

Plant <u>LUZENAC</u>	Location <u>SAPPINGTON</u>	Stack ID No. <u>DC-23</u>
Date <u>1-17-95</u>	Time <u>1510</u>	Operator <u>MWA</u>
Run No. <u>1</u>	Stack Dimension <u>12"</u>	

Altitude <u>✓</u>	Alt. Corr. <u>✓</u>	Ambient Temp. <u>~ 70°F</u>
Barometric Reading		Molecular Weight <u>28.84</u>
Local Barometric Pressure <u>26.07" Hg</u>		Method <u>Fyrte estimate</u>
Stack Static Pressure <u>-0.01" H₂O</u>		Pitot C _p <u>0.84</u>

Field Data				
Traverse Point Number	Velocity Head (Δp_s), " H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
A1	0.01	78	0.0	0°
2	0.04	77	0.0	0°
3	0.045	77	-0.02	12°
4	0.05	77	-0.02	8°
B1	0.01	80	-0.02	120° 8°
2	0.035	79	0.0	0°
3	0.04	78	-0.01	6°
4	0.04	78	-0.01	5°
Average Δp_s		Average Stack Temp.	Average Angle (α) ¹	
0.034 ✓			4.88° ✓	
Mean Sqrt Δp_s		78°F ✓		

¹ Average of α must be < 10° to be acceptable

3-1-95
ROR

GAS VELOCITY AND VOLUME DATA FORM

Plant <u>LUZENAC</u>		Location <u>SAPPINGTON</u>		Stack ID No. <u>DC-23</u>	
Date <u>1-18-95</u>	Time <u>930</u>	Operator <u>MWA</u>	Run No. <u>243</u>	Stack Dimension <u>12"</u>	

Altitude ☒	Alt. Corr. ☒	Ambient Temp. ☒
Barometric Reading ☒		Molecular Weight <u>28.84</u>
Local Barometric Pressure <u>26.40 "Hg</u>		Method <u>ESTIMATE</u>
Stack Static Pressure <u>- .022</u>		Pitot C _p <u>0.84</u>

Field Data				
Traverse Point Number	Velocity Head (Δp_s), " H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
A 1	0.03 0.01			
2	.04			
3	0.045 0.05			
4	0.045 0.05			
B 1	0.01 0.03			
2	0.04 0.04			
3	0.05 0.045			
4	0.05 0.045			
Average Δp_s <u>0.039</u> ✓		Average Stack Temp.	Average Angle (α) ¹	
Mean Sqrt Δp_s				

¹ Average of α must be <10° to be acceptable

3-1-95
RAC

PARTICULATE FIELD DATA FORM

Plant <u>LUZENAC</u>	Location <u>SAPPINGTON</u>	Stack ID No. <u>DC-23</u>	Stack Dimension <u>12"</u>
Date <u>1-17-95</u>	Operator <u>MAA</u>	Filter No. <u>1165</u>	Meter Box No. <u>2</u>

Altitude ~ Alt. Corr. ~
 Barometric Reading ~
 Barometric Pres. 26.07" Hg
 Stack Static Pres. -0.01

Assumed Moisture 2%
 Ambient Temp. ~70°F
 Meter ΔH @ 1.92
 Meter Calib (Y) 1.058

Nozzle ID No. ~ Nozzle Dia. 0.491
 Probe ID No. ~ Probe Length ~
 Liner Material STAINLESS
 Probe Heat Setting ~

Traverse Point Number	Sampling Time (min.)	Clock Time (24 hr.)	Gas Sample Volume (cf)	Velocity Head (AP) (ft H ₂ O)	Pressure Differential across Orifice Meter (ΔH) (ft H ₂ O)	Vacuum, mm (in Hg)	#1 Stack Temp. (°F)	#3 Filter Temp. (°F)	#4 Temp. of Gas Leaving Condenser or Last Impinger (°F)	#6 Gas Sampler Temp. at Dry Gas Meter (°F)		#7
										Inlet	Outlet	
A1	12	1536	345.26	0.01	0.64	1	78	140	59	72	71	
2	24		355.77	0.04	2.58	1	77	165	42	77	75	
3	36	367.29	~ 0.045	0.05	2.29	1	77	167	45	77	75	
4	48		379.652	0.05	3.23	2	77	161	45	80	74	
B1	60		385.06	0.01	0.64	1	80	156	49	79	76	
2	72		395.28	0.035	2.26	1	79	164	41	80	77	
3	84		404.02	0.04	2.26	1	78	163	42	82	77	
4	96		417.117	0.04	2.59	1	78	158	43	83	77	
							ts			ts		
			MTR VOL	Manual	5H							
			76.949	0.1779	2.135		78.0			77.0		

PRELIMINARY INFO.		PRE TEST INFO		CALCULATED		CALCULATED	
Bp (Pm) (in.Hg)	26.07	Assumed moisture %	2.0	Stack press. (Ps)	26.07	Actual % H2O in Stack	0.37
Stack Dia (md)	1	Assumed Meter Temp, F	72.0	Stack Area (sq.in)	0.79	Actual Wet Molec. Wt	28.80
Stack Area (sq.ft.)	0.79	Time per Point	12.00	Meter Temp, R	532.0	Actual Isokinetic Avg	101.62
YI	1.058	Nozzle Dia (in.)	0.491	Recommended Nz dia.	0.459		
Delta H@	1.92	Total Number of Points	8	Nozzle area (ft^2)	0.00131	EMISSIONS	
				Total Run Time	96.00	lb / dscf STD	1.131E-07
						grains / dscf STD	0.0008
						lb / hour STD	0.00
TRAVERSE INFO		POST TEST INFO		CALCULATED			
Static (use - if neg.)	-0.01	Impinger H2O Gain (g)	5.59	Stack Temp, R(Ts)	538.0	lb / ft^3 Act.	9.63E-08
Stack Temp, F	78.0	Particulate Gain (mg)	3.60	Wet mol. wt. (Ms)	28.62	grains / ft^3 Act.	0.0007

TRAVERSE INFO		POST TEST INFO		CALCULATED			
Static (use - if neg.)	-0.01	Impinger H2O Gain (g)	5.59	Stack Temp. R(Ts)	538.0	lb / hour	STD 0.00
Stack Temp, F	78.0	Particulate Gain (mg)	3.60	Wet mol. wt. (Ms)	28.62	lb / ft^3	Act. 9.63E-08
Aquired avg. delta P	0.03			Dry mol. wt. (Md)	28.84	grains / ft^3	Act. 0.0007
Oxygen	21.00						
Carbon Dioxide	0.00						

Carbon Dioxide																	0.00	
Trav Point	Sample Time	MetriVol	Vel head delta P	Calc. delta H	Actual delta H	Meter Temp			Point % I	Accum. Iso %	T E S T		S T A C K		M E T E R		ACT Stack Vel ft/sec	
						Temp	In	Out			Calc	SQRT	Stack Vel. ft/sec	Stack Flow cuft/min	Volume cu. ft. per min	Volume std		
1	12.0	345.260	0.01	0.637	0.63	78	72	71	97	96.6	0.10	6.10	287	4.67	0.499	6.08		
2	24.0	355.770	0.04	2.576	2.45	77	77	75	99	98.0	0.20	12.18	574	9.61	0.997	12.15		
3	36.0	367.290	0.05	2.892	2.80	77	77	73	103	99.6	0.21	12.92	609	10.57	1.057	12.88		
4	48.0	379.652	0.05	3.226	3.20	77	80	74	105	100.8	0.22	13.62	842	11.31	1.114	13.58		
5	60.0	385.060	0.01	0.642	0.63	80	79	76	102	101.0	0.10	6.11	288	4.91	0.500	6.09		
6	72.0	395.280	0.04	2.256	2.20	79	80	77	103	101.3	0.19	11.42	538	9.30	0.934	11.38		
7	84.0	404.020	0.04	2.264	2.20	78	82	77	88	99.4	0.19	11.41	538	7.94	0.933	11.37		
8	96.0	417.117	0.04	2.590	2.60	78	83	77	123	102.3	0.20	12.20	575	11.89	0.998	12.16		
9	108.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
10	120.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
11	132.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
12	144.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
13	156.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
14	168.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
15	180.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
16	192.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
17	204.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
18	216.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
19	228.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
20	240.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
21	252.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
22	264.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
23	276.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
24	288.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
25	300.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00		
Actual Vol		76.949	dP	avg	dH	ts	Tm		%iso	SQRT d		avg	avg	Vol std	tdscf/m	avg		
			0.03	2.135	2.09	78	77		ERR	0.18		10.74	506	70.19	0.8789	10.71		

VISIBLE EMISSION OBSERVATION FORM

Run 1

Source Name LUZENAC			Observation Date 1-17-95		Start Time 1600		Stop Time 1700			
Address 28769 Sappington Rd.			Min		Seconds		Min		Seconds	
City SAPPINGTON State MT Zip 59152			0		15		30		45	
Phone (406) 285-3286 Source ID Number DC-23			1		0		0		0	
Process Equipment Packaging Area Target Box Operating Mode Normal			2		0		0		0	
Control Equipment Baghouse Operating Mode Normal			3		0		0		0	
Describe Emission Point Portable Stack Outlet			4		0		0		0	
Start Same Stop Same			5		0		0		0	
Height above Ground Level 40' Stop Same			6		0		0		0	
Height Relative to Observer 5' Stop Same			7		0		0		0	
Distance from Observer 10' Stop Same			8		0		0		0	
Direction from Observer N40W Stop Same			9		0		0		0	
Describe Emissions			10		0		0		0	
Start — Stop —			11		0		0		0	
Emission Color — Stop —			12		0		0		0	
Plume Type: Continuous ☐ Fugitive ☐ Intermittent ☐			13		0		0		0	
Water Droplets Present? Yes ☐ No ☒			14		0		0		0	
If Water Droplet Plume: Attached ☐ Detached ☐			15		0		0		0	
Point in the Plume at which Opacity was Determined			16		0		0		0	
Start Outlet of Stack Stop Same			17		0		0		0	
Describe Background			18		0		0		0	
Start Stairs/Wall Stop Same			19		0		0		0	
Background Color Tan Stop Same			20		0		0		0	
Sky Conditions			21		0		0		0	
Start — Stop —			22		0		0		0	
Wind Speed			23		0		0		0	
Start — Stop —			24		0		0		0	
Wind Direction			25		0		0		0	
Start — Stop —			26		0		0		0	
Ambient Temp.			27		0		0		0	
Start 60°F Stop Same			28		0		0		0	
Wet Bulb Temp.			29		0		0		0	
RH Percent			30		0		0		0	
Source Layout Sketch			Average Opacity for Highest Period				Number of Readings Above % Were			
☒ Sun ☒ Wind ☒ Plume & Stack			0				20			
Range of Opacity Readings			Minimum 0				Maximum 0			
Observer's Name (Print)			Mitch Anderson							
Observer's Signature			[Signature]				Date 1-17-95			
Organization			BISON ENGR							
Comments			Read inside building. Portable stack with flex hose.							



Plant	LUZENAC		Location	SAPPINGTON		Stack ID No.	DC-23	Stack Dimension	12"
Date	1-18-95	Operator	MWA	Run No.	2	Sample Box No.	2	Meter Box No.	2

Altitude ✓ Alt. Corr. ✓
Barometric Reading ✓
Barometric Pres. 2640" Hg
Stack Static Pres. -0.22

Assumed Moisture	2%
Ambient Temp.	~70°
Meter $\Delta H @$	1.92
Meter Calib (Y)	1.058

Nozzle ID No. ☒ Nozzle Dia. 0.491
Probe ID No. C Probe Length 1.5'
Liner Material STAINLESS STEEL
Probe Heat Setting 150°F

[illegible]

FACILITY	
Luzenac/Sappington	
LOCATION	
DC-23	
RUN #	
Two	
DATE	
1-18-95	
START TIME	
948	
STOP TIME	

PRELIMINARY INFO.	
Bp (Pm) (in.Hg)	26.4
Stack Dia (ind)	1
Stack Area (sq.ft.)	0.79
YI	1.058
Delta H@	1.92
Total Number of Points	8
POST TEST INFO	
Static (use - if neg.)	-0.02
Stack Temp, F	75.0
Acquired avg. delta P	0.03
Oxygen	21.00
Carbon Dioxide	0.00

PRE TEST INFO	
Assumed moisture %	2.0
Assumed Meter Temp, F	70.0
Time per Point	12.00
Nozzle Dia (in.)	0.491
Recommended Nz dia.	
Total Run Time	96.00
EMISSIONS	
lb / dscf	STD
grains / dscf	STD
lb / hour	STD
lb / ft^3	Act.
grains / ft^3	Act.

CALCULATED	
Stack press. (Ps)	26.40
Stack Area (ind)	0.79
Meter Temp, R	530.0
0.463	
0.00131	
2.287E-07	
0.0016	
0.01	
1.98E-07	
0.0014	

TRAVERSE INFO	
Impinger H2O Gain (g)	5.61
Particulate Gain (mg)	8.00
Wet mol. wt. (Ms)	
Dry mol. wt. (Md)	

CALCULATED	
Stack Temp, R(Ts)	535.0
Wet mol. wt. (Ms)	28.62
Dry mol. wt. (Md)	28.84

CALCULATED	
Actual % H2O in Stack	0.34
Actual Wet Molec. Wt	28.80
Actual Isokinetic Avg	100.24

CALIBRATION CHARTING																	GAGE		
Trav Point	Sample Time	MetrVol	Vel head delta P	Calc. delta H	Actual delta H	Stack Temp	Meter Temp		Point % I	Accum. Iso %	TEST			STACK		METER			ACT Stack Vel ft/sec
							Calc K	SQRT			Stack Vel. ft/sec	Stack Flow cuft/min	Volume std	Volume cu. ft. per min					
1	12.0	424.550	0.01	0.643	0.64	66	65	64	106	106.2	0.10	5.99	282	5.22	0.490	5.97			
2	24.0	435.020	0.04	2.585	2.50	65	67	65	100	103.2	0.20	11.97	564	9.88	0.979	11.93			
3	36.0	447.050	0.05	3.247	3.10	65	71	66	103	103.1	0.22	13.38	631	11.32	1.095	13.34			
4	48.0	459.032	0.05	3.244	3.15	68	74	68	102	102.9	0.22	13.42	633	11.22	1.098	13.38			
5	60.0	468.430	0.03	1.937	1.75	71	73	70	103	102.9	0.17	10.43	491	8.76	0.853	10.39			
6	72.0	478.870	0.04	2.602	2.40	69	76	71	99	102.3	0.20	12.02	566	9.71	0.983	11.98			
7	84.0	490.140	0.05	2.941	2.60	68	78	72	100	102.0	0.21	12.73	600	10.46	1.042	12.69			
8	96.0	501.528	0.05	2.947	2.60	68	79	73	101	101.9	0.21	12.73	600	10.55	1.042	12.69			
9	108.0			0.000					ERR	ERR	0.00	0.00	0	0.000	0.000	0.00			
10	120.0			0.000					ERR	ERR	0.00	0.00	0	0.00	0.000	0.00			
11	132.0			0.000					ERR	ERR	0.00	0.00	0	0.00	0.000	0.00			
12	144.0			0.000					ERR	ERR	0.00	0.00	0	0.00	0.000	0.00			
13	156.0			0.000					ERR	ERR	0.00	0.00	0	0.00	0.000	0.00			
14	168.0			0.000					ERR	ERR	0.00	0.00	0	0.00	0.000	0.00			
15	180.0			0.000					ERR	ERR	0.00	0.00	0	0.00	0.000	0.00			
16	192.0			0.000					ERR	ERR	0.00	0.00	0	0.00	0.000	0.00			
17	204.0			0.000					ERR	ERR	0.00	0.00	0	0.00	0.000	0.00			
18	216.0			0.000					ERR	ERR	0.00	0.00	0	0.00	0.000	0.00			
19	228.0			0.000					ERR	ERR	0.00	0.00	0	0.00	0.000	0.00			
20	240.0			0.000					ERR	ERR	0.00	0.00	0	0.00	0.000	0.00			
21	252.0			0.000					ERR	ERR	0.00	0.00	0	0.00	0.000	0.00			
22	264.0			0.000					ERR	ERR	0.00	0.00	0	0.00	0.000	0.00			
23	276.0			0.000					ERR	ERR	0.00	0.00	0	0.00	0.000	0.00			
24	288.0			0.000					ERR	ERR	0.00	0.00	0	0.00	0.000	0.00			
25	300.0			0.000					ERR	ERR	0.00	0.00	0	0.00	0.000	0.00			
Actual Vol		82.525	dP	avg	dH	Ts	Im			%iso	SQRT d			avg	Vol std	discf/m	avg		
			0.04	2.518	2.34	68	71			ERR	0.19			11.59	546	77.13	0.9477		
																	11.55		

VISIBLE EMISSION OBSERVATION FORM

Run 2

Source Name LUZENAC			Observation Date 1-18-95		Start Time 1000		Stop Time 1100	
Address SAPPINGTON								
City 3 Forks	State MT	Zip 59752						
Phone (406) 285-3286		Source ID Number DC-23						
Process Equipment Packaging		Operating Mode Normal						
Control Equipment Baghouse		Operating Mode Normal						
Describe Emission Point Start Outlet of Portable Stack			Stop Same					
Height above Ground Level Start ~30' Stop SAME		Height Relative to Observer Start -5' Stop SAME						
Distance from Observer Start 10' Stop SAME		Direction from Observer Start 232° Stop SAME						
Describe Emissions Start — Stop —								
Emission Color Start — Stop —		Plume Type: Continuous ☐ Fugitive ☐ Intermittent ☐						
Water Droplets Present? Yes ☐ No ☒		If Water Droplet Plume: Attached ☐ Detached ☐						
Point in the Plume at which Opacity was Determined Start — Stop —								
Describe Background Start STAIRS/WALL Stop Same								
Background Color Start tan Stop Same		Sky Conditions Start — Stop —						
Wind Speed Start — Stop —		Wind Direction Start — Stop —						
Ambient Temp. Start 60°F Stop —		Wet Bulb Temp. Start — Stop —						
		RH Percent						
Source Layout Sketch ☒ Sun » Wind ≡ Plume & Stack — Emission Point 140° Sun Location Line			Average Opacity for Highest Period 0		Number of Readings Above % Were 0			
			Range of Opacity Readings Minimum 0 Maximum 0					
			Observer's Name (Print) MITCH ANDERSON					
			Observer's Signature <i>Mitch Anderson</i>		Date 1-18-95			
Organization BKOR ENGR.								
Comments Portable Stack with Flex Hose. Read Indoors								



FACILITY	
Luzenac/Sappington	
LOCATION	
DC-23	
RUN #	
Three	
DATE	
1-18-95	
START TIME	
1344	
STOP TIME	

PRELIMINARY INFO.	
Bp (Pm) (in.Hg)	26.4
Stack Dia (ind)	1
Stack Area (sq.ft.)	0.79
Yi	1.058
Delta H@	1.92
PRE TEST INFO	
Assumed moisture %	2.0
Assumed Meter Temp, F	80.0
Time per Point	11.00
Nozzle Dia (in.)	0.491
Total Number of Points	8
POST TEST INFO	
Impinger H2O Gain (g)	4.95
Particulate Gain (mg)	6.90
Aquired avg. delta P	0.04
Oxygen	21.00
Carbon Dioxide	0.00

CALCULATED	
Stack press. (Ps)	26.40
Stack Area (ind)	0.79
Meter Temp, R	540.0
Recommended Nz dia.	0.440
Nozzle area (ft^2)	0.00131
Total Run Time	88.00
EMISSIONS	
lb / dscf	STD
grains / dscf	STD
lb / hour	STD
lb / ft^3	Act.
grains / ft^3	Act.
CALCULATED	
Actual % H2O in Stack	0.34
Actual Wet Molec. Wt	28.80
Actual Isokinetic Avg	99.24

CALCULATED	
Stack Temp, R(Ts)	528.0
Wet mol. wt. (Ws)	28.62
Dry mol. wt. (Md)	28.84

Carbon Dioxide																		C-305			
TEST										STACK				METER				ACT			
Trav Point	Sample Time	MetrVal	Vel head	Calc.	Actual	Stack		Meter Temp		Point	Accum.	Calc	SQRT	Stack		Volume	Volume	Stack	Vel	ft/sec	ft/sec
						delta P	delta H	Temp	In					Out	% I						
1	11.0	501.731	0.03	1.905	1.80	80	72	71	105	104.9	*****	0.17	10.51	496	8.09	0.860	10.48				
2	22.0	519.820	0.04	2.421	2.20	107	73	71	101	103.0	*****	0.20	12.44	586	8.77	1.018	12.40				
3	33.0	529.900	0.05	2.720	2.50	110	76	72	102	102.6	*****	0.21	13.23	623	9.37	1.082	13.19				
4	44.0	539.628	0.05	2.730	2.45	110	79	73	98	101.5	*****	0.21	13.23	623	9.01	1.082	13.19				
5	55.0	544.560	0.01	0.630	0.61	90	80	75	103	101.7	*****	0.10	6.13	289	4.53	0.501	6.11				
6	66.0	553.800	0.04	2.436	2.25	110	80	76	98	101.2	*****	0.20	12.47	588	8.52	1.020	12.44				
7	77.0	564.360	0.05	3.045	2.80	112	83	77	100	101.1	*****	0.22	13.97	658	9.72	1.143	13.93				
8	88.0	575.012	0.05	3.048	2.80	113	85	78	101	101.1	*****	0.22	13.98	659	9.77	1.144	13.94				
9	99.0			0.000					ERR	ERR	*****	0.00	0.00	0	*****	0.000	0.00				
10	110.0			0.000					ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00				
11	121.0			0.000					ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00				
12	132.0			0.000					ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00				
13	143.0			0.000					ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00				
14	154.0			0.000					ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00				
15	165.0			0.000					ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00				
16	176.0			0.000					ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00				
17	187.0			0.000					ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00				
18	198.0			0.000					ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00				
19	209.0			0.000					ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00				
20	220.0			0.000					ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00				
21	231.0			0.000					ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00				
22	242.0			0.000					ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00				
23	253.0			0.000					ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00				
24	264.0			0.000					ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00				
25	275.0			0.000					ERR	ERR	*****	0.00	0.00	0	0.00	0.000	0.00				
Actual Vol		73.281	dP	avg	dH	Ts	Tm		%iso	SQRT d		avg	avg	Vol std	dscf/m	avg	Vol std	dscf/m	avg	Stack	Vel
			0.04	2.367	2.18	104	76		ERR	0.19		12.00	565	67.78	0.9813	11.96	67.78	0.9813	11.96		

PARTICULATE FIELD DATA FORM

Nozzle ID No. ☒ Nozzle Dia. 0.491
Probe ID No. 6 Probe Length 1.51
Liner Material STAINLESS
Probe Heat Setting 150°F

[illegible]

VISIBLE EMISSION OBSERVATION FORM

Run 3

Source Name LUZENAC			Observation Date 1-18-95		Start Time 1400		Stop Time 1500					
Address 28576 SAPPINGTON RD			Seconds		Min		Seconds					
City THREE FORKS MT State MT Zip 59752			Min	0	15	30	45	Min	0	15	30	45
Phone (406) 285-3285 Source ID Number DC-23			1	0	0	0	0	31				
Process Equipment TALC Packaging Operating Mode Normal			2	0	0	0	0	32				
Control Equipment Baghouse Operating Mode Normal			3	0	0	0	0	33				
Describe Emission Point Outlet of Portable Stack/Same			4	0	0	0	0	34				
Start 30' Stop Same Height above Ground Level Start -5' Stop SAME			5	0	0	0	0	35				
Distance from Observer Start 10' Stop Same Direction from Observer Start 279° Stop Same			6	0	0	0	0	36				
Describe Emissions			7	0	0	0	0	37				
Start — Stop —			8	0	0	0	0	38				
Emission Color — Stop — Plume Type: Continuous ☐ Fugitive ☐ Intermittent ☐			9	0	0	0	0	39				
Water Droplets Present? Yes ☐ No ☒ If Water Droplet Plume: Attached ☐ Detached ☐			10	0	0	0	0	40	0	0	0	0
Point in the Plume at which Opacity was Determined Stack Outlet Stop Same			11					41				
Describe Background SKY/WALL Stop Same			12					42				
Background Color Tan Stop Same Sky Conditions — Stop —			13					43				
Wind Speed — Stop — Wind Direction — Stop —			14					44				
Ambient Temp. 60° Stop Same Wet Bulb Temp. — Stop —			15					45				
RH Percent —			16					46				
Source Layout Sketch 			17					47				
			18					48				
			19					49				
			20	0	0	0	0	50	0	0	0	0
			21					51				
			22					52				
			23					53				
			24					54				
			25					55				
			26					56				
Average Opacity for Highest Period 0			27					57				
Range of Opacity Readings Minimum 0 Maximum 0			28					58				
Observer's Name (Print) MITCH ANDERSON			29					59				
Observer's Signature Mitch Anderson Date 1-18-95			30	0	0	0	0	60	0	0	0	
Organisation BISON ENGINEERING			Comments Portable Stack with Flex Hose Read Indoors.									



A diagram of a C-shaped cross-section. The vertical distance from the top flange to the center of the web is labeled 'X'. The vertical distance from the center of the web to the bottom flange is labeled 'Y'. A semi-circular cutout at the bottom of the web is labeled 'Port'.

[illegible]

3-1-95
Rae

GAS VELOCITY AND VOLUME DATA FORM

Plant <u>LUZENAC</u>		Location <u>SAPPINGTON</u>		Stack ID No. <u>DC-24</u>
Date <u>1-10-95</u>	Time <u>1500</u>	Operator <u>MWA</u>	Run No. <u>1</u>	Stack Dimension <u>12"</u>

Altitude	Alt. Corr.	Ambient Temp.
Barometric Reading	Molecular Weight	
Local Barometric Pressure <u>25.63 "Hg</u>	Method <u>Fyrite</u>	
Stack Static Pressure <u>+0.04</u>	Pitot C _p <u>0.84</u>	

Field Data				
Traverse Point Number	Velocity Head (Δp_s), "H ₂ O	Stack Temp., °F	Cyclonic Flow Determination	
			Δp_s at 0° Reference	Angle (α) Yielding Null Δp
A 1	0.06			0°
2	0.08			0°
3	0.09			6°
4	0.09			4°
B 1	0.06			0°
2	0.08			0°
3	0.09			4°
4	0.09			4°
Average Δp_s		Average Stack Temp.	Average Angle (α) ¹	
0.08 ✓			2.25°	
Mean Sqrt Δp_s				

¹ Average of α must be <10° to be acceptable.3-1-95
RGR

11

Altitude ☒ Alt. Corr. ☒
Barometric Reading ☒
Barometric Pres. 25.70" Hg
Stack Static Pres. +0.04

Assumed Moisture 2%
Ambient Temp. ~80°F
Meter $\Delta H@$ 1.92
Meter Calib (V) 1.058

VISIBLE EMISSION OBSERVATION FORM

Source Name LUZENAC				Observation Date 1-11-95				Start Time 1200				Stop Time 1300																	
Address 25169 SAPPINGTON RD				<table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45				
Min	Seconds								Min	Seconds																			
	0	15	30	45	0	15	30	45																					
City 3 Forks		State MT	Zip 59752																										
Phone (406) 285-3286		Source ID Number PC-24		1		0		0		0		0		31															
Process Equipment Classifier Cyclone		Operating Mode Normal		2		0		0		0		0		32															
Control Equipment Baghouse		Operating Mode Normal		3		0		0		0		0		33															
Describe Emission Point Portable Stack		Start Same		4		0		0		0		0		34															
Height above Ground Level 30		Height Relative to Observer +3'		5		0		0		0		0		35															
Start Same		Stop Same		6		0		0		0		0		36															
Distance from Observer 10'		Direction from Observer 90°		7		0		0		0		0		37															
Start Same		Stop Same		8		0		0		0		0		38															
Describe Emissions				9		0		0		0		0		39															
Start —		Stop —		10		0		0		0		0		40															
Emission Color —		Plume Type: Continuous ☐		11		0		0		0		0		41		0		0											
Start —		Fugitive ☐ Intermittent ☐		12		0		0		0		0		42		0		0											
Water Droplets Present? ☐ Yes ☒ No		If Water Droplet Plume: Attached ☐ Detached ☐		13		0		0		0		0		43															
				14										44															
Point in the Plume at which Opacity was Determined				15										45															
Start Stack Outlet		Stop —		16										46															
Describe Background				17										47															
Start Equipment		Stop Same		18										48															
Background Color Tan		Sky Conditions —		19										49															
Start Same		Stop —		20		0		0		0		0		50															
Wind Speed —				21										51															
Start —		Wind Direction —		22										52		0		0											
Stop —		Start —		23										53															
Ambient Temp. 60°F				24										54															
Start Same		Wet Bulb Temp. —		25										55															
Stop Same		RH Percent —		26										56															
Source Layout Sketch				27										57															
☒ Sun ☒ Wind ☒ Plume & Stack Draw North Arrow X Emission Point 140° Sun Location Line				Average Opacity for Highest Period				Number of Readings Above % Were																					
				0				20 % Were 0																					
				Range of Opacity Readings																									
				Minimum 0				Maximum 0																					
				Observer's Name (Print)																									
				Mitch Anderson																									
				Observer's Signature				Date																					
				[Signature]				1-11-95																					
				Organization																									
				BISON ENGR																									
				Comments																									
				Portable Stack with Flex hose. Read indoors																									



PARTICULATE FIELD DATA FORM

Plant	LUZENAC	Location	SAPPINGTON	Stack ID No.	DC-24	Stack Dimension	12"
Date	1-11-95	Operator	MAA	Run No.	2	Filter No.	145
				Sample Box No.	3		
						Meter Box No.	2

Altitude	<u>✓</u>	Alt. Corr.	<u>2.1</u>
Barometric Reading	<u>✓</u>	Ambient Temp.	<u>~80°F</u>
Barometric Pres.	<u>25.70 "Hg</u>	Meter ΔH@	<u>1.92</u>
Stack Static Pres.	<u>0.04</u>	Meter Calib (Y)	<u>1.058</u>

Assumed Moisture	<u>2.1</u>
Ambient Temp.	<u>~80°F</u>
Meter ΔH@	<u>1.92</u>
Meter Calib (Y)	<u>1.058</u>

Nozzle ID No.	<u>14-2</u>	Nozzle Dia.	<u>0.434</u>
Probe ID No.	<u>U</u>	Probe Length	<u>1.5'</u>
Liner Material	<u>STAINLESS</u>		<u>STEEL</u>
Probe Heat Setting	<u>-</u>		

Traverse Point Number	Sampling Time (min.)	Clock Time (24-hr.)		Gas Sample Volume (cf)	Velocity Head (ΔP) ("H ₂ O)	Pressure Differential across Orifice Meter (ΔH) ("H ₂ O)	Vacuum, mm ("Hg)	#1	#3	#4	#6		#7
		Start									Stack Temp. (°F)	Filter Temp. (°F)	
		1457		102.308									
A1	9.5			109.91	0.06	2.19	1	126	209	55	82	82	82
2	19.0			117.64	0.06	2.18	1	128	203	46	84	84	82
3	28.5			126.21	0.08	2.91	1	129	198	48	86	86	83
4	38.0			135.497	0.08	2.91	1	130	198	48	87	87	84
B1	47.5			142.97	0.05	1.84	1	122	199	59	85	85	84
2	57.0			150.95	0.06	2.12	1	128	198	49	87	87	84
3	66.5			159.51	0.07	2.56	1	130	198	49	89	89	85
4	76.0	MMR = 66.137		168.124	0.07	2.56	1	130	198	49	89	89	86
B1	1.0	168.445	168.17	168.124	0.05	1.84	1	122	199	49	85	85	84
2	2.0			170.02	0.06	2.12	1	128	198	50	87	87	84
3	3.0			170.85	0.07	2.56	1	130	198	51	89	89	85
4	4.0			171.76	0.07	2.56	1	130	198	48	89	89	86
A1	5.0			172.51	0.06	2.19	1	126	209	49	82	82	82
2	6.0	MMR VOL = 6.227		173.35	0.06	2.18	1	128	203	50	84	84	82
3	7.0	TOT VOL =		174.33	0.08	2.91	1	129	198	51	86	86	83
4	8.0	72.364		175.397	0.08	2.91	1	130	198	49	87	87	84

84 min ← 7 Mean Spd = 0.2567 ΔH = 2.406 $\bar{V}_8 = 127.2$ POST TEST LEAK: 0.001 $\frac{1}{13}$ /min @ 5" Hg $t_m = 84.9$
 PPE TEST I ENV CHECK: 0.00023 /min @ 5" Hg $t_m = 84.9$
 Rev. 12/92

VISIBLE EMISSION OBSERVATION FORM

Source Name LUZENAC			Observation Date 1-11-95		Start Time 1500		Stop Time 1600	
Address 28169 SAPPINGTON RD			City 3 FORKS		State MT		Zip 59752	
Phone (406) 295-3286			Source ID Number DC-24		Process Equipment Classifier Cyclone		Operating Mode Normal	
Control Equipment Baghouse			Operating Mode Normal		Describe Emission Point Outlet of Port. Stack		Start Equipment Stop	
Height above Ground Level 30' Stop Same			Height Relative to Observer Start + 3' Stop Same		Distance from Observer 10' Stop Same		Direction from Observer 90 Stop Same	
Describe Emissions			Emission Color		Plume Type: Continuous ☐		Fugitive ☐ Intermittent ☐	
Water Droplets Present? Yes ☐ No ☒			If Water Droplet Plume: Attached ☐ Detached ☐		Point in the Plume at which Opacity was Determined		Start Stack Outlet Stop Same	
Describe Background			Background Color		Sky Conditions		Start Tan Stop Same	
Wind Speed			Wind Direction		Ambient Temp.		Wet Bulb Temp.	
Start Stop			Start Stop		Start Stop		Start Stop	
RH Percent			Average Opacity for Highest Period		Number of Readings Above		Range of Opacity Readings	
Start Stop			Start Stop		Start Stop		Start Stop	
Source Layout Sketch			Minimum		Maximum		Observer's Name (Print)	
☒ Sun ☒ Wind ☒ Plume & Stack Draw North Arrow X Emission Point 140° Sun Location Line			0		20 % Were 0		Mitch Anderson	
			Observer's Signature		Date			
			Organization		Comments			
			BISON ENGINEERING		Indoor Readings from portable stack with flex hose			



PARTICULATE FIELD DATA FORM

Plant	LIZENAE	Location		SAPPINGTON	Stack ID No.	C-24	Stack Dimension	12"	
Date	1-12-95	Operator	MWA	Run No.	3	Sample Box No.	3	Meter Box No.	2

Altitude	✓	Alt. Corr.	✓
Barometric Reading			
Barometric Pres.			25.93" Hg
Stack Static Pres.			0.04

Assumed Moisture	2.1%
Ambient Temp.	~ 80°F
Meter ΔH@	1.92
Meter Calib (Y)	1.050

Nozzle ID No. 14-Z Nozzle Dia. 0.434
Probe ID No. ✓ Probe Length 1.5'
Liner Material STAINLESS STEEL
Probe Heat Setting -

[illegible]
$$\Delta p = 0.074$$

VISIBLE EMISSION OBSERVATION FORM

Source Name LUZENAC				Observation Date 1-12-95				Start Time 1030				Stop Time 1130																	
Address 28169 SAPPINGTON RP				<table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				Min	Seconds				0	15	30	45	0	15	30	45				
Min	Seconds								Min	Seconds																			
	0	15	30	45	0	15	30	45																					
City 3 FORKS		State MT		Zip 59752																									
Phone (406) 285-3286		Source ID Number DC-24		1		0		0		0		31																	
Process Equipment Classifier Cyclone		Operating Mode Normal		2		0		0		0		32																	
Control Equipment Baghouse		Operating Mode Normal		3		0		0		0		33																	
Describe Emission Point		Start Portable Stack		4		0		0		0		34																	
Stop Same				5		0		0		0		35																	
Height above Ground Level		Start 30'		6		0		0		0		36																	
Stop Same		Height Relative to Observer		7		0		0		0		37																	
Start 3'		Stop Same		8		0		0		0		38																	
Distance from Observer		Start 10'		9		0		0		0		39																	
Stop Same		Direction from Observer		10		0		0		0		40																	
Start 90°		Stop Same		11								41																	
Describe Emissions		Start —		12								42																	
Stop —				13								43																	
Emission Color		Start —		14								44																	
Stop —		Plume Type: Continuous ☐		15								45																	
		Fugitive ☐ Intermittent ☐		16								46																	
Water Droplets Present?		Yes ☐ No ☒		17								47																	
If Water Droplet Plume:		Attached ☐ Detached ☐		18								48																	
Point in the Plume at which Opacity was Determined		Start Stack Outlet		19								49																	
Stop Same				20		0		0		0		50																	
Describe Background		Start Equipment		21								51																	
Stop Same				22								52																	
Background Color		Start Tan		23								53																	
Stop Same		Sky Conditions		24								54																	
Start —		Stop —		25								55																	
Wind Speed		Start —		26								56																	
Stop —		Wind Direction		27								57																	
Start —		Stop —		28								58																	
Ambient Temp.		Start 60°F		29								59																	
Stop Same		Wet Bulb Temp.		30		0		0		0		60																	
RH Percent				31		0		0		0		61																	
Source Layout Sketch ☒ Sun ☒ Wind ☒ Plume & Stack Draw North Arrow X Emission Point 140° Sun Location Line				Average Opacity for Highest Period				Number of Readings Above																					
				0				20 % Were 0																					
				Range of Opacity Readings				Minimum 0 Maximum 0																					
				Observer's Name (Print)				Mitch Anderson																					
Observer's Signature																													
Date				1-12-95																									
Organization				Bison Engineering																									
Comments				Read Indoors using portable stack with flex hose.																									



VISIBLE EMISSION OBSERVATION FORM

Source Name LUZEMAC			Observation Date 1-10-95				Start Time 11:30		Stop Time 12:30																			
Address SAPINGTON			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				0	15	30	45	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="2">Min</th> <th colspan="4">Seconds</th> </tr> <tr> <th>0</th> <th>15</th> <th>30</th> <th>45</th> </tr> </table>				Min	Seconds				0	15	30	45
Min	Seconds																											
	0	15	30	45																								
Min	Seconds																											
	0	15	30	45																								
City	State	Zip	1	2	3	4	31	32	33	34																		
Phone		Source ID Number	5	6	7	8	35	36	37	38																		
Process Equipment LOAD HOPPER		Operating Mode NORMAL	9	10	11	12	39	40	41	42																		
Control Equipment NONE		Operating Mode NORMAL	13	14	15	16	43	44	45	46																		
Describe Emission Point Start 2' EAST OF DROP TO BERT Stop SAME			17	18	19	20	47	48	49	50																		
Height above Ground Level Start 15' Stop 15'		Height Relative to Observer Start 15' Stop 15'	21	22	23	24	51	52	53	54																		
Distance from Observer Start 270' Stop 270'		Direction from Observer Start N Stop N	25	26	27	28	55	56	57	58																		
Describe Emissions Start NONE Stop NONE			29	30	31	32	59	60	61	62																		
Emission Color Start WHITE Stop		Plume Type: Continuous ☐ Fugitive ☒ Intermittent ☐	Average Opacity for Highest Period 0				Number of Readings Above 0 % Were 0																					
Water Droplets Present? Yes ☐ No ☒		If Water Droplet Plume: Attached ☐ Detached ☐	Range of Opacity Readings Minimum 0 Maximum 5				Observer's Name (Print) MIKE CHOVANAK																					
Point in the Plume at which Opacity was Determined Start NA Stop NA			Observer's Signature <i>Mike Chovanak</i>				Date 1-10-95																					
Describe Background Start DARK HILLSIDE Stop SAME			Organization BISON ENGINEERING				Comments																					
Background Color Start BROWN Stop		Sky Conditions Start OVERCAST GREY Stop SAME																										
Wind Speed Start 20-40 Stop 20-40		Wind Direction Start N Stop N																										
Ambient Temp. Start 42°F Stop 46°F		Wet Bulb Temp. 36 RH Percent 34																										

Source Layout Sketch

☒ Sun Draw North Arrow

» Wind

⚡ Plume & Stack

X Emission Point

140°
Sun Location Line



VISIBLE EMISSION OBSERVATION FORM

Source Name <u>LUZENAC</u>			Observation Date <u>1-10-95</u>				Start Time <u>10:30</u>		Stop Time <u>11:30</u>			
Address <u>SAPINGTON</u>												
City	State	Zip	Min	Seconds				Min	Seconds			
<u>SAPINGTON JCT</u>	<u>MT</u>			0	15	30	45		0	15	30	45
Phone			1	0	0	0	0	31	0	0	0	0
Source ID Number			2	0	0	0	0	32	0	0	0	0
Process Equipment <u>LOAD HOPPER</u>			3	0	0	0	0	33	0	0	0	0
Operating Mode <u>NORMAL</u>			4	0	0	0	0	34	0	0	0	0
Control Equipment <u>NONE</u>			5	0	0	0	0	35	0	0	0	0
Operating Mode			6	0	0	0	0	36	0	5	0	0
			7	0	0	0	0	37	0	0	0	0
			8	0	0	0	0	38	0	0	0	0
Describe Emission Point			9	0		0	0	39	0	0	0	0
Start <u>2 EAST OF DROP TO</u> Stop <u>SAME</u>			10	0	0	0	0	40	0	0	0	0
Height above Ground Level			11	0	0	0	0	41	0	0	0	0
Start <u>15'</u> Stop			12	0	0	0	0	42	0	0	0	0
Height Relative to Observer			13	0	0	0	0	43	0	0	0	0
Start <u>15'</u> Stop <u>15'</u>			14	0	0	0	0	44	0	0	0	0
Distance from Observer			15	0	0	0	0	45	0	0	0	0
Start <u>270'</u> Stop <u>270'</u>			16	0	0	0	0	46	0	0	0	0
Direction from Observer			17	0	0	0	0	47	0	0	0	0
Start <u>N</u> Stop <u>N</u>			18	0	0	0	0	48	0	0	0	0
Describe Emissions			19	0	0	0	0	49	0	0	0	0
Start <u>NONE</u> Stop <u>NONE</u>			20	0	0	0	0	50	0	0	0	0
Emission Color			21	0	0	0	0	51	0	0	0	0
Start <u>WHITE</u> Stop <u>WT</u>			22	0	0	0	0	52	0	0	0	0
Plume Type: Continuous ☐			23	0	0	0	0	53	0	0	0	0
Fugitive ☐ Intermittent ☒			24	0	0	0	0	54	0	0	0	0
Water Droplets Present?			25	0	0	0	0	55	0	0	0	0
Yes ☐ No ☒			26	0	0	0	0	56	0	0	0	0
If Water Droplet Plume:			27	0	0	0	0	57	0	0	0	0
Attached ☒ Detached ☐			28	0	0	0	0	58	0	0	0	0
Point in the Plume at which Opacity was Determined			29	0	0	0	0	59	0	0	0	0
Start <u>NA</u> Stop <u>NA</u>			30	0	0	0	0	60	0	0	0	0
Describe Background												
Start <u>DARK HILLSIDE</u> Stop <u>SAME</u>												
Background Color												
Start <u>BROWN</u> Stop <u>BROWN</u>												
Sky Conditions												
Start <u>OVERCAST</u> Stop <u>SAME</u>												
Wind Speed												
Start <u>20-35</u> Stop <u>20-35</u>												
Wind Direction												
Start <u>N</u> Stop <u>N</u>												
Ambient Temp.												
Start <u>46°F</u> Stop <u>46°F</u>												
Wet Bulb Temp.												
RH Percent <u>34</u>												
Source Layout Sketch ☼ Sun » Wind ✕ Plume & Stack Draw North Arrow HOPPER SHED BELT X Emission Point 140° Sun Location Line			Average Opacity for Highest Period				Number of Readings Above % Were					
			Range of Opacity Readings									
			Minimum				Maximum					
			Observer's Name (Print)				Date					
MIKE CHOYANAK				1-10-95								
Observer's Signature				Organization								
Mike Choyanak				BISON ENGINEERING								
Comments												



VISIBLE EMISSION OBSERVATION FORM

Source Name LOAD HOPPER			Observation Date 1-10-95				Start Time 14:00		Stop Time 15:00		
Address			Min Seconds Min Seconds								
			0 15 30 45 0 15 30 45								
City SAPINGTON	State MT	Zip	1	0	0	0	31	0	0	0	0
Phone	Source ID Number		2	0	0	0	32	0	0	0	0
Process Equipment LOAD HOPPER	Operating Mode NORMAL		3	0	0	0	33	0	0	0	0
Control Equipment NONE	Operating Mode NA		4	0	0	0	34	0	0	0	0
Describe Emission Point DRAP. TO BERT			5	0	0	0	35	0	0	0	0
Start 2' EAST OF Stop SAMT			6	0	0	0	36	0	0	0	0
Height above Ground Level Start 10' Stop 10'			7	0	0	0	37	0	0	0	0
Height Relative to Observer Start 10' Stop 10'			8	0	0	0	38	0	0	0	0
Distance from Observer Start 150 Stop 150			9	0	0	0	39	0	0	0	0
Direction from Observer Start N Stop N			10	0	0	0	40	0	0	0	0
Describe Emissions Start NONE Stop NONE			11	0	0	0	41	0	0	0	0
Emission Color Start WT Stop WT			12	0	0	0	42	0	0	0	0
Plume Type: Continuous ☐ Fugitive ☒ Intermittent ☐			13	0	0	0	43	0	0	0	0
Water Droplets Present? Yes ☐ No ☒			14	0	0	0	44	0	0	0	0
If Water Droplet Plume: Attached ☐ Detached ☐			15	0	0	0	45	0	5	0	0
Point in the Plume at which Opacity was Determined Start NA Stop NA			16	0	0	0	46	0	0	0	0
Describe Background Start HILLSIDE Stop HILLSIDE			17	0	0	0	47	0	0	0	0
Background Color Start BRN Stop BRN			18	0	0	0	48	0	0	0	0
Sky Conditions Start OVERCAST Stop SAME			19	0	0	0	49	0	0	0	0
Wind Speed Start 20-25 Stop 20-25			20	0	0	0	50	0	0	0	0
Wind Direction Start N Stop N			21	0	0	0	51	0	0	0	0
Ambient Temp. Start 40°F Stop 40°F			22	0	0	0	52	0	0	0	0
Wet Bulb Temp. 36			23	0	0	0	53	0	0	0	0
RH Percent 34			24	0	0	0	54	0	0	0	0
Source Layout Sketch ☉ Sun » Wind * Plume & Stack Draw North Arrow			Average Opacity for Highest Period 0				Number of Readings Above % Were 0/0 % Were 1				
			Range of Opacity Readings Minimum 0 Maximum 5								
			Observer's Name (Print) MIKE CHOYANAK								
			Observer's Signature <i>Mike Choyanak</i>						Date		
			Organization BISON ENGINEERING								
			Comments								

449-653

TO : MITCH. A.
 From R. Geiger

Table 5: Luzenac / America source test log at the Sappington mill.

Date	Source	Test Run	Time
12-28-95	DC-22A	2	1524
12-28-95	DC-22A	3	1733
12-30-94	DC-17	1	1352
12-30-94	DC-17	2	1632
12-30-94	DC-17	3	1830
1-3-95	DC-4	1	1440
1-4-95	DC-4	2	1020
1-5-95	DC-4	3	937
1-6-95	DC-2	1	1326
1-9-95	DC-2	2	1200
1-9-95	DC-2	3	1425
1-6-95	DC-1	1	935
1-9-95	DC-1	3	1305
1-9-95	DC-1	4	1422
1-11-95	DC-10	3	1535
1-12-95	DC-10	4	1000
1-12-95	DC-10	5	1320
1-11-95	DC-24	1	1155
1-11-95	DC-24	2	1457
1-12-95	DC-24	3	1019
1-18-95	DC-15	1	1117
1-17-95	DC-15	2	1405
1-18-95	DC-15	3	930
1-18-95	DC-3	1	1426
1-18-95	DC-3	2	1150
1-18-95	DC-3	3	1130
1-17-95	DC-23	1	1536
1-18-95	DC-23	2	948
1-18-95	DC-23	3	1344
1-23-95	DC-19	1	1345
1-23-95	DC-19	2	1048
1-25-95	DC-19	4	1027
1-24-95	DC-7	4	1150
1-24-95	DC-7	5	1440
1-25-95	DC-7	6	920
1-25-95	DC-9	1	1537
1-25-95	DC-9	2	1613
1-30-95	DC-9	3	1345

VACUUM — VARIABLE
 VACUUM —
 M102 } — 5TPH
 M102 }
 M102 }
 3/16 - MINUS }
 3/16 - }
 3/16 - } — 20
 3/16 - } TPH
 3/16 - }
 012 } — 20TPH
 012 }
 012 }
 M100 } — 5TPH
 M100 }
 M100 }
 U320 } — 5TPH
 U320 }
 U320 }
 S465 }
 N-600 } — 2TPH
 N-600 }
 3/16 - } — 20TPH
 3/16 - }
 3/16 - }
 N600 } — 2TPH
 N600 }
 N600 }
 M100 } — 5TPH
 M100 }
 M100 }
 S325 - 5TPH
 N500 - 4TPH
 N670 } — 1TPH
 N670 }
 N665 }

Table 4 (cont'd): Production data during additional Method 9's.

Date	Source	Time	
3-2-95	DC-1	945-1045	M100 - Ore - 20 TPH
3-3-95	DC-1	1200-1300	M100 - Ore - 20 TPH
3-3-95	ACM#1	810-910	M100 - M100 - 5 TPH
3-15-95	ACM#1	1340-1440	N-S00 - 4 TPH
3-15-95	ACM#1	1450-1550	N-S00 - 4 TPH
m-2 1-5-95	DC-7	1000-1100	M100 - 5 TPH
3-2-95	DC-8	1420-1520	N-S00 - 4 TPH
3-2-95	DC-8	1520-1620	N-S00 - 4 TPH
3-2-95	DC-8	1620-1720	N-S00 - 4 TPH
1-10-95	DC-10	1030-1130	M100 - 5 TPH
1-10-95	DC-10	1130-1230	M100 - 5 TPH
1-10-95	DC-10	1310-1410	M100 - 5 TPH
dur 1-16-95	DC-15	1120-1220	N-665 - 3 TPH
3-9-95	DC-16	840-1000	M100 - 5 TPH
3-9-95	DC-16	1000-1500	M100 - 5 TPH
12-30-94	DC-17	1400-1500	M100 - 5 TPH
12-30-94	DC-17	1550-1650	M100 - 5 TPH
1-3-95	DC-17	935-1035	M100 - 5 TPH
3-2-95	DC-18	1110-1410	M100 - 5 TPH
12-28-95	DC-22A	1250-1350	-Vacume -
1-3-95	DC-22A	1045-1145	-Vacume -

RECEIVED
 APR 12 1995
 BISON

Normal
 Vacuum waste
 & SPILLAGE

MITCH

APPENDIX C: LABORATORY DATA

IMPINGER CATCH AND SAMPLE TRAIN RINSE FORM (for Pre-Weighed Sample Bottles)

Plant <u>LUZENAC</u>	Location <u>Sappington</u>	Stack ID <u>Method 5</u>
Project No. <u>94193-2</u>	Tested By <u>MWA CWL</u> <u>WGS SEB</u>	Test Dates <u>DC-1 1/6/95</u>

Note: All weights in grams

Run No.	Weight	Date	Impinger Catch Bottle	Silica Gel Bottle	Initials
1	Final	1/6/95	221.0g	236.8g	OKH
	Initial	12/27/94	207.2g	218.7g	OKH
	Net Gain		13.8g ✓	18.1g ✓	OKH
	Total Gain		31.9g ✓		OKH
2	Final	1/6/95	212.7g	237.1g	OKH
	Initial	1/5/95	220.45g	219.7g	OKH
	Net Gain		-7.75g	17.4g	OKH
	Total Gain		9.65g		OKH
3	Final	1/6/95	216.4g	253.9g	OKH
	Initial	1/5/95	216.90g	234.47g	OKH
	Net Gain		-0.5g	19.43g ✓	OKH
	Total Gain		18.93g		OKH

RINSE VOLUMES, ml				
Run No.	Cyclone	Probe/Front Half	Impingers	Other (describe)
1		112ml	175ml	
2		95ml	175ml	
3		72ml	180ml	

2-22-95
RGR

PARTICULATE DATA WORKSHEET

Plant <u>Luzenac</u>	Location <u>Sappington</u>
Test Dates <u>1/6/95</u>	Initials <u>QJH</u> Stack ID <u>Method 5</u>

DC-1

Sample Description	ID No.	Average Tare, G	Average Final, G	Net Particulate Gain, G
Filter	1173	0.3483	0.3507	0.0024
Probe	1-1	101.8669	101.9231	0.0562
Impinger	1-1	158.4947	158.4991	0.0044
Cyclone				
Filter	1167	0.3477	0.3532	0.0055
Probe	1-2	115.9143	115.9368	0.0225
Impinger	1-2	172.8130	172.8153	0.0023
Cyclone				
Filter	1155	0.3509	0.3538	0.0029
Probe	1-3	103.6267	103.6341	0.0074
Impinger	1-3	157.3231	157.3261	0.003
Cyclone				
Water Blank				
Acetone Blank				
Field Filter Blank				
System Filter Blank				

①

②

③

.0586

.0280

.0103

2-22-95

R. J. H.

IMPINGER CATCH AND SAMPLE TRAIN RINSE FORM (for Pre-Weighed Sample Bottles)

Plant <u>Luzenac</u>	Location <u>Sappington</u>	Stack ID <u>Method 5</u>
Project No. <u>94183-2</u>	Tested By <u>MWA WGS</u> <u>SEB CWL</u>	Test Dates <u>1/6/95</u>

Note: All weights in grams

Run No.	Weight	Date	Impinger Catch Bottle	Silica Gel Bottle	Initials
4	Final	<u>1/6/95</u>	<u>283.9g</u>	<u>253.9g</u>	<u>JKH</u>
	Initial	<u>1/4/95</u>	<u>280.57 g</u>	<u>234.31g</u>	<u>JKH</u>
	Net Gain		<u>3.33g</u>	<u>19.59</u> ✓	<u>JKH</u>
	Total Gain		<u>22.92g</u> ✓		<u>JKH</u>
2	Final				
	Initial				
	Net Gain				
	Total Gain				
3	Final				
	Initial				
	Net Gain				
	Total Gain				

RINSE VOLUMES, ml				
Run No.	Cyclone	Probe/Front Half	Impingers	Other (describe)
<u>4</u>		<u>83 mL</u>	<u>225 mL</u>	
<u>2</u>				
<u>3</u>				

2-22-95
RGL

PARTICULATE DATA WORKSHEET

Plant <u>LUZENAC</u>	Location <u>Sappington</u>
Test Dates <u>1/6/95</u>	Initials <u>OKH</u> Stack ID <u>method 5</u>

DC-1

④

Sample Description	ID No.	Average Tare, G	Average Final, G	Net Particulate Gain, G
Filter	1088	0.3439	0.3473	0.0034
Probe	1-4	107.0278	107.0344	0.0066
Impinger	1-4	168.7136	168.7164	0.0028
Cyclone				
Filter				
Probe				
Impinger				
Cyclone				
Filter				
Probe				
Impinger				
Cyclone				
Water Blank				
Acetone Blank				
Field Filter Blank				
System Filter Blank				

0.0066
0.0100

2-22-95
RGR

BEAKER/FILTER TARES AND FINAL WEIGHTS

NOTE: Report all weights to 0.0001 g. Record sample volumes in Column 3. "Constant Weight" means ≤ 0.0005 g difference between 2 weighings at least 6 hours apart OR $2 \leq 1\%$ of average total weight less average tare weight.

Plant <u>Luzenac</u>	Location <u>Sappington</u>
Test Dates <u>1-6 & 1-9-95</u>	Stack ID <u>METHOD 5 DC-1</u>

ID NO.	SAMPLE DESCRIPTION (filter, probe/nozzle wash, impinger catch, blank, etc.)	DESCRIPTION (Tare 1, Tare 2, Final 1, etc.)					
		TARE #1	TARE #2	FINAL #1	FINAL #2	FINAL #3	FINAL #4
		Date 1/16	Date 1/17	Date 1/18	Date 1/18	Date 1/19	Date 1/22
		Time 10:20a	Time 9:15a	Time 9:15a	Time 3:20p	Time 8:45a	Time 5:00p
		Initial <u>OKH</u>	Initial <u>OKH</u>	Initial <u>OKH</u>	Initial <u>OKH</u>	Initial <u>OKH</u>	Initial <u>OKH</u>
	RUN #1						
1-1	IMPINGER	158.4946	158.4947	158.4989	158.4993		
1-1	PROBE	101.8670	101.8667	101.9231	101.9231		
1173	FILTER	0.3482	0.3483	0.3507	0.3507		
	RUN #2						
1-2	IMPINGER	172.8132	172.8127	172.8180	172.8171	172.8151	172.8154
1-2	PROBE	115.9140	115.9145	115.9368	115.9368		
1167	FILTER	0.3476	0.3477	0.3532	0.3532		
	RUN #3						
1-3	IMPINGER	157.3232	157.3230	157.3259	157.3262		
1-3	PROBE	103.6269	103.6264	103.6341	103.6341		
1155	FILTER	0.3508	0.3509	0.3539	0.3537		
	RUN #4						
1-4	IMPINGER	168.7133	161.7138	168.7165	168.7174	168.7162	
1-4	PROBE	107.0276	107.0279	107.0345	107.0343		
1088	FILTER	0.3438	0.3439	0.3473	0.3472		

Rev. 5/94

2-22-95
RWR

IMPINGER CATCH AND SAMPLE TRAIN RINSE FORM (for Pre-Weighed Sample Bottles)

Plant <u>Luzenac</u>	Location <u>Sappington</u>	Stack ID <u>METHOD 5</u>
Project No. <u>94183-2</u>	Tested By <u>MMA</u>	Test Dates <u>Jan 6 & 9, 1995</u>

Note: All weights in grams

Run No.	Weight	Date	Impinger Catch Bottle	Silica Gel Bottle	Initials
1	Final	1/9/95	241.9g	263.5g	JKH
	Initial	1/4/95	245.1g	246.64g	JKH
	Net Gain		-3.2g ✓	16.86g ✓	JKH
	Total Gain		13.66g ✓		JKH
2	Final	1/9/95	280.0g	256.2g	JKH
	Initial	1/4/95	271.20g	243.47g	JKH
	Net Gain		8.8g	12.73g	JKH
	Total Gain		21.53g ✓		JKH
3	Final	1/9/95	244.2g	250.4g	JKH
	Initial	1/4/95	237.74g	236.23g	JKH
	Net Gain		6.46g ✓	14.17g ✓	JKH
	Total Gain		20.63g ✓		JKH

RINSE VOLUMES, ml				
Run No.	Cyclone	Probe/Front Half	Impingers	Other (describe)
1		90mL	205mL	
2		75mL	250mL	
3		80mL	185mL	

2-22-95
Rue

BEAKER/FILTER TARES AND FINAL WEIGHTS

NOTE: Report all weights to 0.0001 g. Record sample volumes in Column 3. "Constant Weight" means ≤ 0.0005 g difference between 2 weighings at least 6 hours apart OR $2 \leq 1\%$ of average total weight less average tare weight.

Plant <u>LUZENAC</u>	Location <u>Sappington</u>
Test Dates <u>Jan 6th, 9, 1995</u>	Stack ID method <u>5</u>

ID NO.	SAMPLE DESCRIPTION (filter, probe/nozzle wash, impinger catch, blank, etc.)	DESCRIPTION (Tare 1, Tare 2, Final 1, etc.)					
		TARE #1	TARE #2	FINAL #1	FINAL #2		
		Date 1/13	Date 1/15	Date 1/16	Date 1/17	Date	Date
		Time 3:15	Time 2:15	Time 3:15p	Time 9:00a	Time	Time
		Initial OKH	Initial OKH	Initial OKH	Initial OKH	Initial	Initial
	RUN #1						
2-1	IMPINGER	112.8480 105.2839	112.8684	112.8698	112.8697		
2-1	PROBE	105.2839	105.2843	105.2915	105.2911		
1154	FILTER	0.3517	0.3514	0.3543	0.3542		
	RUN #2						
2-2	IMPINGER	112.1508	112.1512	112.1526	112.1531		
2-2	PROBE	113.2499	113.2501	113.2557	113.2556		
1157	FILTER	0.3484	0.3483	0.3505	0.3504		
	RUN #3						
2-3	IMPINGER	174.4502	174.4507	174.4520	174.4520		
2-3	PROBE	107.3729	107.3732	107.3785	107.3781		
1095	FILTER	0.3492	0.3494	0.3511	0.3510		

DC-2

2-22-95

R. 62

PARTICULATE DATA WORKSHEET

Plant <u>Luzenac</u>	Location <u>Sappington</u>	
Test Dates <u>Jan 6 & 9, 1995</u>	Initials <u>OKH</u>	Stack ID <u>method 5</u>

Sample Description	ID No.	Average Tare, G	Average Final, G	Net Particulate Gain, G
Filter	1154	0.3516	0.3543	0.0027
Probe	2-1	105.2841	105.2913	0.0072
Impinger	2-1	112.8682	112.8698	0.0016
Cyclone				
Filter	1157	0.3484	0.3505	0.0021
Probe	2-2	113.2500	113.2557	0.0057
Impinger	2-2	162.1510	162.1529	0.0019
Cyclone				
Filter	1095	0.3493	0.3511	0.0018
Probe	2-3	107.3731	107.3783	0.0052
Impinger	2-3	174.4505	174.4520	0.0015
Cyclone				
Water Blank				
Acetone Blank				
Field Filter Blank				
System Filter Blank				

2-22-95
Rel

BEAKER/FILTER TARES AND FINAL WEIGHTS

NOTE: Report all weights to 0.0001 g. Record sample volumes in Column 3. "Constant Weight" means ≤ 0.0005 g difference between 2 weighings at least 6 hours apart OR $2 \leq 1\%$ of average total weight less average tare weight.

Plant LUZENAC	Location Sappington
Test Dates 1-16 to 1-20 1995	Stack ID METHOD 5

ID NO.	SAMPLE DESCRIPTION (filter, probe/nozzle wash, impinger catch, blank, etc.)	DESCRIPTION (Tare 1, Tare 2, Final 1, etc.)					
		TARE #1	TARE #2	TARE #3	FINAL #1	FINAL #2	FINAL #3
		Date 1/29	Date 1/30	Date 1/31	Date 2/1	Date 2/2	Date 2/2
		Time 3:00p	Time 10:00a	Time 8:45a	Time 1:45p	Time 9:00a	Time 4:15p
		Initial OKH	Initial OKH	Initial OKH	Initial OKH	Initial OKH	Initial OKH
	RUN #1						
3-1	IMPINGER	162.1124	162.1126		162.1135	162.1140	
3-1	PROBE	103.5549	103.5552		103.5597	103.5593	
1158	FILTER	0.3490	0.3490		0.3528	0.3530	
	RUN #2						
3-2	IMPINGER	173.4744	173.4739		173.4743	173.4735	173.4746
3-2	PROBE	104.9469	104.9468		104.9511	104.9508	
1160	FILTER	0.3520	0.3518		0.3545	0.3545	
	RUN #3						
3-3	IMPINGER	114.5080	114.5031	114.5079	114.5112	114.5118	114.5108
3-3	PROBE	98.2456	98.2455		98.2514	98.2508	98.2511
1168	FILTER	0.3506	0.3505		0.3528	0.3527	
	RUN #4						
3-4	IMPINGER	172.8184	172.8123	172.8124	172.8147	172.8142	
3-4	PROBE	98.2238	98.2227	98.2234	98.2251	98.2250	
1147	FILTER	0.3304	0.3303		0.3304	0.3304	

DC-19
Run 4!!
MA
3-20-95

PARTICULATE DATA WORKSHEET

Plant <u>Luzenac</u>	Location <u>Sappington</u>
Test Dates <u>1-16 to 1-20, 1995</u>	Initials <u>OKH</u> Stack ID <u>Method 5</u>

Sample Description	ID No.	Average Tare, G	Average Final, G	Net Particulate Gain, G
Filter	1158	0.3490 ✓	0.3529 ✓	0.0039
Probe	3-1	103.5551 ✓	103.5595 ✓	0.0044
Impinger	3-1	162.1125	162.1138	0.0013
Cyclone				
Filter	1160	0.3519	0.3545	0.0026
Probe	3-2	104.9469	104.9510	0.0041
Impinger	3-2	173.4742 ✓	173.4745	0.0003
Cyclone			173.4744	
Filter	1168	0.3506	0.3528	0.0022
Probe	3-3	98.2456	98.2513	0.0057
Impinger	3-3	114.5280	114.5110	0.0030
Cyclone				
Water Blank				
Acetone Blank				
Field Filter Blank				
System Filter Blank				

IMPINGER CATCH AND SAMPLE TRAIN RINSE FORM (for Pre-Weighed Sample Bottles)

Plant <u>Luzenac</u>	Location <u>Sappington</u>	Stack ID <u>DC-3</u>
Project No. <u>94183-2</u>	Tested By <u>CWL + MWA</u>	Test Dates <u>1/16-1/20-95</u>

Note: All weights in grams

Run No.	Weight	Date	Impinger Catch Bottle	Silica Gel Bottle	Initials
1	Final	1/27/95	260.5g	250.0g	OKH
	Initial	1/10/95	254.74	233.76g	OKH
	Net Gain		5.76g ✓	16.29g ✓	OKH
	Total Gain		22.05g ✓		OKH
2	Final	1/25/95	259.0g	256.37g	OKH
	Initial	1/17/95	250.0g	231.63g	OKH
	Net Gain		9.0g	24.74g	OKH
	Total Gain		33.74g		OKH
3	Final	1/27/95	255.77	260.70	OKH
	Initial	1/17/95	258.57	236.55	OKH
	Net Gain		-2.8g	24.25g	OKH
	Total Gain		21.35 ✓		OKH

RINSE VOLUMES, ml				
Run No.	Cyclone	Probe/Front Half	Impingers	Other (describe)
1		83ml	222ml	
2		120ml	250ml	
3		60ml	210ml	

2-24-95

Rae

BEAKER/FILTER TARES AND FINAL WEIGHTS

NOTE: Report all weights to 0.0001 g. Record sample volumes in Column 3. "Constant Weight" means ≤ 0.0005 g difference between 2 weighings at least 6 hours apart OR $2 \leq 1\%$ of average total weight less average tare weight.

Plant <u>Luzenac</u>	Location <u>Sappington</u>
Test Dates <u>1/3/95</u>	Stack ID <u>METHOD 5</u> <u>DC-4</u>

ID NO.	SAMPLE DESCRIPTION (filter, probe/nozzle wash, impinger catch, blank, etc.)	DESCRIPTION (Tare 1, Tare 2, Final 1, etc.)					
		TARE #1	TARE #2	TARE #3	FINAL #1	FINAL #2	
		Date 1/9	Date 1/9	Date 1/10	Date 1/12	Date 1/12	Date
		Time 11:45a	Time 8:45p	Time 8:30a	Time 8:45a	Time 4:00p	Time
		Initial <u>gkh</u>	Initial <u>gkh</u>	Initial <u>gkh</u>	Initial <u>gkh</u>	Initial <u>gkh</u>	Initial
	<u>RUN #1</u>						
1-4	IMPINGER	158.4941	158.4935	158.4944	158.4944	158.4948	
1-4	PROBE	103.5546	103.5540	103.5545	103.6106	103.6109	
1146	FILTER	0.3330	0.3330		0.3869	0.3869	
	<u>RUN #2</u>						
2-4	IMPINGER	169.6578	169.6561	169.6573	169.6571	169.6574	
2-4	PROBE	96.0365	96.0348	96.0352	96.0917	96.0919	
1151	FILTER	0.3535	0.3535		0.3848	0.3850	
	<u>RUN #3</u>						
3-4	IMPINGER	172.8142	172.8121	172.8126	172.8127	172.8131	
3-4	PROBE	107.7392	107.7370	107.7375	107.7688	107.7689	
1141	FILTER	0.3346	0.3346		0.3603	0.3604	

IMPINGER CATCH AND SAMPLE TRAIN RINSE FORM (for Pre-Weighed Sample Bottles)

Plant <u>Luzenac</u>	Location <u>Sappington</u>	Stack ID <u>METHOD - 5</u>
Project No. <u>1-3 thru 1595</u> <u>94193-1</u>	Tested By <u>MNA</u> ^{WJS} ^{SEB} <u>DLK</u>	Test Dates <u>1-3 thru 1-5-95</u>

Note: All weights in grams

Run No.	Weight	Date	Impinger Catch Bottle	Silica Gel Bottle	Initials
1	Final	1/3/95	244.6 g	252.0g	QKH
	Initial	12/27/94	253.2 g	230.2g	QKH
	Net Gain		-8.6g	21.8g	QKH
	Total Gain		13.2g		QKH
2	Final	1/4/95	270.0 g	248.3g	QKH
	Initial	12/27/94	274.9 g	232.6g	QKH
	Net Gain		-4.9g	15.7g	QKH
	Total Gain		10.8g		QKH
3	Final	1/4/95	251.12 g	233.34 g	QKH
	Initial	12/27/94	257.29 g	218.4 g	QKH
	Net Gain		-6.17g	14.94 g	QKH
	Total Gain		8.77g		QKH

RINSE VOLUMES, ml

Run No.	Cyclone	Probe/Front Half	Impingers	Other (describe)
1		78mL	218 mL	
2		95mL	220 mL	
3		55mL	215 mL	

PARTICULATE DATA WORKSHEET

Plant <u>Luzenac</u>	Location <u>Sappington</u>	
Test Dates <u>1/3/95</u>	Initials <u>MA</u>	Stack ID <u>METH. 5</u>

Sample Description	ID No.	Average Tare, G	Average Final, G	Net Particulate Gain, G
Filter	1146	0.3330	0.3869	0.0539
Probe	1-4	103.5543	103.6108	0.0565
Impinger	1-4	158.4943	158.4946	0.0003
Cyclone				
Filter	1151	0.3535	0.3849	0.0314
Probe	2-4	96.0350	96.0918	0.0568
Impinger	2-4	169.6576	169.6573	-0.0003
Cyclone				
Filter	1141	0.3346 ✓	0.3604 ✓	0.0258
Probe	3-4	172.8124	172.8129	0.0005 Impin
Impinger	3-4	107.7373	107.7689	0.0316 PROBE
Cyclone				
Water Blank				
Acetone Blank				
Field Filter Blank				
System Filter Blank				

IMPINGER CATCH AND SAMPLE TRAIN RINSE FORM (for Pre-Weighed Sample Bottles)

Plant <u>Luzenac</u>	Location <u>Sappington</u>	Stack ID <u>method 5</u>
Project No. <u>94183-1</u>	Tested By <u>MWA+CWL</u>	Test Dates <u>1-24-95, 1-25-95</u>

Note: All weights in grams

Run No.	Weight	Date	Impinger Catch Bottle	Silica Gel Bottle	Initials
4	Final	1-24-95	233.11g	254.29g	OKH
	Initial	1-17-95	243.10g	232.80g	OKH
	Net Gain		-9.99g ✓	21.49g ✓	OKH
	Total Gain		11.5g ✓		OKH
5X	Final	1-24-95	260.11g	260.26g	OKH
	Initial	1-19-95	249.77g	239.22g	OKH
	Net Gain		10.39g	21.04	OKH
	Total Gain		31.43g		OKH
6X	Final	1-24-95	228.8g	254.7g	OKH
	Initial	1-17-95	236.45g	231.84g	OKH
	Net Gain		-7.65g ✓	22.86 ✓	OKH
	Total Gain		15.21g ✓		OKH

RINSE VOLUMES, ml				
Run No.	Cyclone	Probe/Front Half	Impingers	Other (describe)
4		25mL	195 mL	
5X		50mL	225 mL	
6X		50mL	195mL	

2-28-95

RWR

BEAKER/FILTER TARES AND FINAL WEIGHTS

NOTE: Report all weights to 0.0001 g. Record sample volumes in Column 3. "Constant Weight" means ≤ 0.0005 g difference between 2 weighings at least 6 hours apart OR $2 \leq 1\%$ of average total weight less average tare weight.

Sappington

Plant <u>Luzenac</u>	Location <u>1-24 thru 1-25-95</u>
Test Dates	Stack ID <u>method 5</u>

DC-7

ID NO.	SAMPLE DESCRIPTION (filter, probe/nozzle wash, impinger catch, blank, etc.)	DESCRIPTION (Tare 1, Tare 2, Final 1, etc.)					
		TARE #1	TARE #2	TARE #3	FINAL #1	FINAL #2	
		Date 1/29	Date 1/30	Date 1/31	Date 2/1	Date 2/2	Date
		Time 2:45p	Time 9:45a	Time 9:00a	Time 2:00p	Time 8:50a	Time
		Initial <i>OKH</i>	Initial <i>OKH</i>	Initial <i>OKH</i>	Initial <i>OKH</i>	Initial <i>OKH</i>	Initial
	RUN #4						
7-4	IMPINGER	157.8161	157.8201	157.8162	157.8182	157.8177	
-7-4	PROBE	97.2750	97.2754		97.2784	97.2784	
1170	FILTER	0.3478	0.3477		0.3540	0.3539	
	RUN #5						
7-5	IMPINGER	113.4229	113.4225		113.4257	113.4252	
7-5	PROBE	107.0275	107.0274		107.0319	107.0315	
36	FILTER	0.2087	0.2086		0.2227	0.2225	
	RUN #6						
7-6	IMPINGER	112.8719	112.8691	112.8687	112.8712	112.8708	
7-6	PROBE	101.8689	101.8671	101.8672	101.8706	101.8703	
39	FILTER	0.2100	0.2098		0.2194	0.2193	

2-28-95
R od

PARTICULATE DATA WORKSHEET

Plant <u>Luzenac/Sappington</u>	Location <u>DC-7</u>
Test Dates <u>1-24-95, 1-25-95</u>	Initials <u>OKH</u> Stack ID <u>method 5</u>

Sample Description	ID No.	Average Tare, G	Average Final, G	Net Particulate Gain, G
Filter	1170	0.3478✓	0.3540✓	0.0062✓
Probe	7-4	97.2752✓	97.2784✓	0.0032✓
Impinger	-7-4	157.8162✓	157.8180✓	0.0018
Cyclone	#			
Filter	36	0.2087✓	0.2226✓	0.0139
Probe	7-5	107.0275	107.0317	0.0042
Impinger	7-5	113.4227	113.4255	0.0028
Cyclone				
Filter	39	0.2099✓	0.2194✓	0.0095✓
Probe	7-6	101.8632 112.8684	101.8705	0.0033
Impinger	7-6	112.8689	112.8710	0.0021
Cyclone				
Water Blank				
Acetone Blank				
Field Filter Blank				
System Filter Blank				

DC-7
④ } .0094

⑤ } .0181

⑥ } .0128

IMPINGER CATCH AND SAMPLE TRAIN RINSE FORM (for Pre-Weighed Sample Bottles)

(DC-9)

Plant <u>Luzenac</u>	Location <u>Sappington</u>	Stack ID <u>method 5</u>
Project No. <u>9A183-</u>	Tested By <u>MWA + CWL</u>	Test Dates <u>125-95</u> <u>1-30-95</u>

Note: All weights in grams

DC-9

Run No.	Weight	Date	Impinger Catch Bottle	Silica Gel Bottle	Initials
1	Final	2/2/95	216.89g	256.35g	OKH
	Initial	1/10/95	233.27g	237.89g	OKH
	Net Gain		-16.38g	18.46g	OKH
	Total Gain		2.08g		OKH
2	Final	2/2/95	210.53g	253.22g	OKH
	Initial	1/6/95	221.58g	237.75g	OKH
	Net Gain		-11.05g	15.47g	OKH
	Total Gain		4.42g		OKH
3	Final	2/2/95	241.40	249.46g	OKH
	Initial	1/12/95	243.60g	235.16g	OKH
	Net Gain		-2.2g	14.3g	OKH
	Total Gain		12.1g		OKH

RINSE VOLUMES, ml				
Run No.	Cyclone	Probe/Front Half	Impingers	Other (describe)
1		77ml	190ml	
2		118ml	175ml	
3		82ml	200ml	

BEAKER/FILTER TARES AND FINAL WEIGHTS

NOTE: Report all weights to 0.0001 g. Record sample volumes in Column 3. "Constant Weight" means ≤ 0.0005 g difference between 2 weighings at least 6 hours apart OR $2 \leq 1\%$ of average total weight less average tare weight.

Plant <u>Luzenac</u>	Location <u>Sappington (DC-9)</u>
Test Dates <u>1-25 & 1-30-95</u>	Stack ID <u>method 5</u>

ID NO.	SAMPLE DESCRIPTION (filter, probe/nozzle wash, impinger catch, blank, etc.)	DESCRIPTION (Tare 1, Tare 2, Final 1, etc.)					
		TARE #1	TARE #2	TARE #3	FINAL #1	FINAL #2	FINAL #3
		Date 2/3	Date 2/5	Date 2/6	Date 2/7	Date 2/7	Date 2/8
		Time 2:15p	Time 7:05p	Time 9:00a	Time 11:15a	Time 7:30p	Time 10:00a
		Initial <u>OKH</u>	Initial <u>OKH</u>	Initial <u>OKH</u>	Initial <u>OKH</u>	Initial <u>OKH</u>	Initial <u>OKH</u>
	RUN #1						
9-1	IMPINGER	157.3233	157.3220	157.3224	157.3237	157.3238	
9-1	PROBE	111.2886	111.2883		111.3001	111.2992	111.3004
1148	FILTER	0.3323	0.3322		0.3340	0.3342	
	T						
	RUN #2						
9-2	IMPINGER	174.4509	174.4495	174.4509	174.4514	174.4519	
9-2	PROBE	105.2881	105.2882	105.2886	105.2860	105.2855	
1171	FILTER	0.3481	0.3481		0.3543	0.3539	
	RUN #3						
9-3	IMPINGER	169.6585	169.6571	169.6573	169.6602	169.6600	
9-3	PROBE	106.8544	106.8526	106.8527	106.8549	106.8547	
1149	FILTER	0.3501	0.3501		0.3503	0.3502	

PARTICULATE DATA WORKSHEET

Plant <u>Luzenac</u>	Location <u>Sappington (DC-9)</u>
Test Dates <u>1-25 & 1-30-95</u>	Initials <u>OKH</u> Stack ID <u>Meth 5</u>

DC-9

Sample Description	ID No.	Average Tare, G	Average Final, G	Net Particulate Gain, G
Filter	1148	0.3323	0.3341	0.0018
Probe	9-1	111.2885	111.3003	0.0118
Impinger	9-1	157.3222	157.3238	0.0016
Cyclone				
Filter	1171	0.3481 ✓	0.3541 ✓	0.0060
Probe	9-2	105.2834	105.2858	0.0024
Impinger	9-2	174.4497	174.4517	0.0020
Cyclone				
Filter	1149	0.3501 ✓	0.3503	0.0002
Probe	9-3	106.8527	106.8548	0.0021
Impinger	9-3	169.6572 ✓	169.6601 ✓	0.0029
Cyclone				
Water Blank				
Acetone Blank				
Field Filter Blank				
System Filter Blank				

>.0136

>.0084

>.0023

IMPINGER CATCH AND SAMPLE TRAIN RINSE FORM (for Pre-Weighed Sample Bottles)

Plant <u>Luzenac</u>	Location <u>Sappington</u>	Stack ID <u>method 5</u>
Project No. <u>QA183-2</u>	Tested By <u>MAA/CWL</u>	Test Dates <u>Jan 9-13, 1995</u>

Note: All weights in grams

Run No.	Weight	Date	Impinger Catch Bottle	Silica Gel Bottle	Initials
3	Final	1/12/95	380.4 g	257.3g	OKH
	Initial	1/6/95	276.20g	238.55g	OKH
	Net Gain		104.2g	18.75g	OKH
	Total Gain		122.95g		OKH
4	Final	1/12/95	407.40g	256.08 g	OKH
	Initial	1/6/95	257.94g	232.71 g	OKH
	Net Gain		149.46g	23.37g	OKH
	Total Gain		172.83g		OKH
5	Final	1/12/95	361.03g 259.27g	259.27 g	OKH
	Initial	1/6/95	254.93g	239.56 g	OKH
	Net Gain		106.1 g	19.71g	OKH
	Total Gain		125.81g		OKH

RINSE VOLUMES, ml				
Run No.	Cyclone	Probe/Front Half	Impingers	Other (describe)
1		68ml	325ml	
2		120ml	360ml	
3		108ml	310ml	

BEAKER/FILTER TARES AND FINAL WEIGHTS

NOTE: Report all weights to 0.0001 g. Record sample volumes in Column 3. "Constant Weight" means ≤ 0.0005 g difference between 2 weighings at least 6 hours apart OR $2 \leq 1\%$ of average total weight less average tare weight.

Plant <u>Luzenac</u>	Location <u>Sappington</u>
Test Dates <u>Jan 9-13, 1995</u>	Stack ID <u>Method 5</u>

ID NO.	SAMPLE DESCRIPTION (filter, probe/nozzle wash, impinger catch, blank, etc.)	DESCRIPTION (Tare 1, Tare 2, Final 1, etc.)					
		TARE #1	TARE #2	FINAL #1	FINAL #2		
		Date 1/15	Date 1/15	Date 1/16	Date 1/18	Date	Date
		Time 2:30p	Time 9:15p	Time 9:00a	Time 9:00a	Time	Time
		Initial <u>JKH</u>	Initial <u>JKH</u>	Initial <u>JKH</u>	Initial <u>JKH</u>	Initial	Initial
	RUN #3						
10-3	IMPINGER	164.8762	164.8759	164.8813	164.8816		
10-3	PROBE	110.9107	110.9103	110.9153	110.9157		
1144	FILTER	0.3312	0.3312	0.3318	0.3318		
	RUN #4						
10-4	IMPINGER	171.5303	171.5298	171.5363	171.5363		
10-4	PROBE	101.9957	101.9953	102.0028	102.0031		
1140	FILTER	0.3314	0.3315	0.3320	0.3320		
	RUN #5						
10-5	IMPINGER	114.5031	114.5026	114.5118	114.5113		
10-5	PROBE	105.1242	105.1240	105.1261	105.1266		
1139	FILTER	0.3476	0.3479	0.3479	0.3480		

PARTICULATE DATA WORKSHEET

Plant <u>Luzenac</u>	Location <u>Sappington</u>	
Test Dates <u>Jan 9-13, 1995</u>	Initials <u>QKH</u>	Stack ID <u>Method 5</u>

Sample Description	ID No.	Average Tare, G	Average Final, G	Net Particulate Gain, G
Filter	1144	0.3312	0.3318	0.0006
Probe	10-3	110.9105	110.9155	0.005
Impinger	10-3	164.8761	164.8815	0.0054
Cyclone				
Filter	1140	0.3315	0.3320	0.0005
Probe	10-4	101.9955	102.0037	0.0082
Impinger	10-4	171.5301	171.5363	0.0062
Cyclone				
Filter	1139	0.3478	0.3480	0.0002
Probe	10-5	105.1241	105.1264	0.0023
Impinger	10-5	114.5029	114.5116	0.0087
Cyclone				
Water Blank				
Acetone Blank				
Field Filter Blank				
System Filter Blank				

IMPINGER CATCH AND SAMPLE TRAIN RINSE FORM (for Pre-Weighed Sample Bottles)

Plant <u>Luzenac-Sapp.</u>	Location <u>DC-15</u>	Stack ID <u>method 5</u>
Project No. <u>94183-1</u>	Tested By <u>mwa cwl</u>	Test Dates <u>1-16 to 1-18-95</u>

Note: All weights in grams

Run No.	Weight	Date	Impinger Catch Bottle	Silica Gel Bottle	Initials
1	Final	1/17/95	239.08g	234.4g	QKH
	Initial	1/16/95	247.28g	218.56g	QKH
	Net Gain		-8.2g ✓	15.84g ✓	QKH
	Total Gain		7.64g		QKH
2	Final	1/17/95	222.4g	252.5g	QKH
	Initial	1/16/95	234.67g	235.32g	QKH
	Net Gain		-12.27g ✓	17.18g ✓	QKH
	Total Gain		4.91g		QKH
3	Final	1/17/95	244.7g	261.5g	QKH
	Initial	1/16/95	260.46g	242.52g	QKH
	Net Gain		-15.76 ✓	18.98g ✓	QKH
	Total Gain		3.22g ✓		QKH

RINSE VOLUMES, ml				
Run No.	Cyclone	Probe/Front Half	Impingers	Other (describe)
1		65mL	80mL	
2		100mL	183mL	
3		103mL	215mL	

3-1-95
RWR

BEAKER/FILTER TARES AND FINAL WEIGHTS

NOTE: Report all weights to 0.0001 g. Record sample volumes in Column 3. "Constant Weight" means ≤ 0.0005 g difference between 2 weighings at least 6 hours apart OR $2 \leq 1\%$ of average total weight less average tare weight.

Plant <u>Luzenac-Sappington</u>	Location <u>DC-15</u>
Test Dates <u>1-16 thru 1-18-95</u>	Stack ID <u>method 5</u>

ID NO.	SAMPLE DESCRIPTION (filter, probe/nozzle wash, impinger catch, blank, etc.)	DESCRIPTION (Tare 1, Tare 2, Final 1, etc.)					
		TARE #1	TARE #2	TARE #3	FINAL #1	FINAL #2	FINAL #3
		Date 1/22	Date 1/23	Date 1/24	Date 1/24	Date 1/25	Date 1/26
		Time 5:10p	Time 7:20a	Time 8:40a	Time 8:45a	Time 10:30	Time 1:5p
		Initial OKH	Initial OKH	Initial OKH	Initial OKH	Initial OKH	Initial OKH
	Run #1						
15-1	IMPINGER	153.5941	153.5940		153.5973	153.5973	
15-1	PROBE	108.3013	108.3010		108.3064	108.3072	108.3069
1143	FILTER	0.3326	0.3325		0.3468	0.3467	
	Run #2						
15-2	IMPINGER	162.1498	162.1498		162.1523	162.1522	
15-2	PROBE	98.2451	98.2444	98.2451	98.2502	98.2507	
1153	FILTER	0.3555	0.3555		0.3787	0.3787	
	Run #3						
15-3	IMPINGER	177.6564	177.6560		177.6587	177.6590	
15-3	PROBE	110.9106	110.9104		110.9145	110.9152	110.9153
1166	FILTER	0.3488	0.3487		0.3694	0.3693	

PARTICULATE DATA WORKSHEET

Plant <u>Luzenac</u>	Location <u>DC-15</u>
Test Dates <u>1-16 thru 1-18-1995</u>	Initials <u>QKH</u> Stack ID <u>Meth. 5</u>

Sample Description	ID No.	Average Tare, G	Average Final, G	Net Particulate Gain, G
Filter	1143	0.3326 ✓	0.3468 ✓	0.0142
Probe	15-1	108.3012	108.3071	0.0059
Impinger	15-1	153.5941	153.5973	0.0032
Cyclone				
Filter	1153	0.3555 ✓	0.3787 ✓	0.0232
Probe	15-2	98.2459	98.2505	0.0054
Impinger	15-2	162.1498	162.1523	0.0025
Cyclone				
Filter	1166	0.3488 ✓	0.3694 ✓	0.0206
Probe	15-3	110.9105	110.9153	0.0048
Impinger	15-3	177.6562	177.6589	0.0027
Cyclone				
Water Blank				
Acetone Blank				
Field Filter Blank				
System Filter Blank				

DC-15

>.0201

>.0286

>.0254

IMPINGER CATCH AND SAMPLE TRAIN RINSE FORM (for Pre-Weighed Sample Bottles)

Plant <u>Luzenac</u>	Location <u>SAPINGTON</u>	Stack ID <u>METH. 5</u>
Project No.	Tested By <u>MWA, WGS, SEB</u>	Test Dates <u>12/27</u>

DC-17

Note: All weights in grams					
Run No.	Weight	Date	Impinger Catch Bottle	Silica Gel Bottle	Initials
1	Final	12/30/94	272.2g	229.7g	JKH
	Initial	12/27/94	256.6g	211.4g	JKH
	Net Gain		15.6g	18.3g	JKH
	Total Gain		34.8g		JKH
2	Final	12/30/94	273.8g	275.4g	JKH
	Initial	12/27/94	270.3g	254.2g	JKH
	Net Gain		3.5g	21.2g	JKH
	Total Gain		24.7g		JKH
3	Final	12/30/94	261.9g	215.9g	JKH
	Initial	12/27/94	253.1g	199.1g	JKH
	Net Gain		8.8g	16.8g	JKH
	Total Gain		25.6g		JKH

RINSE VOLUMES, ml				
Run No.	Cyclone	Probe/Front Half	Impingers	Other (describe)
1		95mL	233mL	
2		75mL	212mL	
3		105mL	217mL	

BEAKER/FILTER TARES AND FINAL WEIGHTS

NOTE: Report all weights to 0.0001 g. Record sample volumes in Column 3. "Constant Weight" means ≤ 0.0005 g difference between 2 weighings at least 6 hours apart OR $2 \leq 1\%$ of average total weight less average tare weight.

Plant <u>Luzenac</u>	Location <u>Sapington</u>
Test Dates <u>12/28/94</u>	Stack ID <u>METH. 5</u> #1

ID NO.	SAMPLE DESCRIPTION (filter, probe/nozzle wash, impinger catch, blank, etc.)	DESCRIPTION (Tare 1, Tare 2, Final 1, etc.)					
		TARE #1	TARE #2	TARE #3	FINAL #1	FINAL #2	FINAL #3
		Date 12/29	Date 1/3	Date 1/3	Date 1/5	Date 1/6	Date 1/8
		Time 10:00a	Time 1:40p	Time 8:00p	Time 10:30a	Time 8:45a	Time 8:30p
		Initial <u>SEB</u>	Initial <u>AKH</u>	Initial <u>AKH</u>	Initial <u>QKH</u>	Initial <u>QKH</u>	Initial <u>QKH</u>
	<u>RUN #1</u>						
1.1	<u>IMPINGER</u>	171.5279	171.5276		171.5321	171.5314	171.5310
1.1	<u>PROBE</u>	97.2234	97.2230		97.2342	97.2323	97.2321
1042	<u>FILTER</u>	0.3357	0.3358		0.3507	0.3509	
	<u>RUN #2</u>						
1.2	<u>IMPINGER</u>	164.8742	164.8737		164.8774	164.8770	164.8765
1.3	<u>PROBE</u>	111.3721	111.3714	111.3715	111.3853	111.3832	111.3829
1043	<u>FILTER</u>	0.3315	0.3314		0.3515	0.3515	
	<u>RUN #3</u>						
1.3	<u>IMPINGER</u>	114.5008	114.5008	114.5003	114.5044	114.5037	114.5040
1.2	<u>PROBE</u>	104.9457	104.9452		104.9555	104.9537	104.9533
1044	<u>FILTER</u>	0.3324	0.3324		0.3495	0.3497	

PARTICULATE DATA WORKSHEET

Plant <u>Luzenac</u>	Location <u>Sapington</u>	
Test Dates <u>12/30/94</u>	Initials <u>JKH</u>	Stack ID <u>METH. 5</u>

DC-17

Sample Description	ID No.	Average Tare, G	Average Final, G	Net Particulate Gain, G
Filter	1042	0.3358 ✓	0.3508 ✓	0.015 ✓
Probe	1.1	97.2232 ✓	97.2322 ✓	0.009 ✓
Impinger	1.1	171.5278 ✓	171.5312 ✓	0.0034 ✓
Cyclone				
Filter	1043	0.3315	0.3515 ✓	0.02 ✓
Probe	1.3	111.3715	111.3831	0.0116
Impinger	1.2	164.8749	164.8768	0.0028 ✓
Cyclone				
Filter	1044	0.3324 ✓	0.3496 ✓	0.0172
Probe	1.2	104.9455	104.9535 ✓	0.008
Impinger	1.3	114.5006	114.5039	0.0033 ✓
Cyclone				
Water Blank				
Acetone Blank				
Field Filter Blank				
System Filter Blank				

>.0240

>.0316

>.0252

IMPINGER CATCH AND SAMPLE TRAIN RINSE FORM (for Pre-Weighed Sample Bottles)

Plant <u>Luzenac</u>	Location <u>94183-1</u>	Stack ID <u>Method 5</u>
Project No. <u>94183-</u>	Tested By <u>MWA</u>	Test Dates <u>1-23 thru 1-25-95</u>

Note: All weights in grams

Run No.	Weight	Date	Impinger Catch Bottle	Silica Gel Bottle	Initials
1	Final	2/9/95	VOID BY	254.7g	JKH
	Initial	1/17/95	VOID BY	238.08g	JKH
	Net Gain		MWA	16.62g	JKH
	Total Gain				JKH
2	Final	2/9/95	220.21g	253.35g	JKH
	Initial	1/10/95	227.70g	239.20g	JKH
	Net Gain		-7.49g	14.15g	JKH
	Total Gain		6.66g		JKH
3	Final		VOID BY	VOID BY	JKH
	Initial		VOID BY	VOID BY	JKH
	Net Gain		MWA	MWA	JKH
	Total Gain				JKH

RINSE VOLUMES, ml				
Run No.	Cyclone	Probe/Front Half	Impingers	Other (describe)
1		80ml		
2		98ml	190ml	
3				

IMPINGER CATCH AND SAMPLE TRAIN RINSE FORM (for Pre-Weighed Sample Bottles)

Plant <u>Luzenac</u>	Location <u>Sappington</u>	Stack ID <u>method 5</u>
Project No. <u>94183-2</u>	Tested By <u>CWL + MWA</u>	Test Dates <u>1-16 to 1-20-95</u>

Note: All weights in grams

Run No.	Weight	Date	Impinger Catch Bottle	Silica Gel Bottle	Initials
4	Final	<u>1/25/95</u>	<u>215.82g</u>	<u>251.73 g</u>	<u>OKH</u>
	Initial	<u>1/19/95</u>	<u>232.53g</u>	<u>251.25 g</u>	<u>OKH</u>
	Net Gain		<u>-6.71g</u>	<u>0.48g</u>	<u>OKH</u>
	Total Gain				<u>OKH</u>
2	Final				
	Initial				
	Net Gain				
	Total Gain				
3	Final				
	Initial				
	Net Gain				
	Total Gain				

RINSE VOLUMES, ml				
Run No.	Cyclone	Probe/Front Half	Impingers	Other (describe)
<u>4</u>		<u>63mL</u>	<u>155mL</u>	
<u>2</u>				
<u>3</u>				

BEAKER/FILTER TARES AND FINAL WEIGHTS

NOTE: Report all weights to 0.0001 g. Record sample volumes in Column 3. "Constant Weight" means ≤ 0.0005 g difference between 2 weighings at least 6 hours apart OR $2 \leq 1\%$ of average total weight less average tare weight.

Plant <u>Luzenac-Sappington</u>	Location <u>DC-19</u>
Test Dates <u>1-23 thru 1-25-95</u>	Stack ID <u>DC-19</u>

ID NO.	SAMPLE DESCRIPTION (filter, probe/nozzle wash, impinger catch, blank, etc.)	DESCRIPTION (Tare 1, Tare 2, Final 1, etc.)					
		TARE #1	TARE #2	FINAL #1	FINAL #2		
		Date 2/13	Date 2/14	Date 2/15	Date 2/16	Date	Date
		Time 3:15p	Time 9:45a	Time 3:00p	Time 11:00a	Time	Time
		Initial QKH	Initial QKH	Initial QKH	Initial QKH	Initial	Initial
	RUN #1						
	FILTER						
19-1	PROBE	97.2764	97.2765	97.2780	97.2779		
1169	FILTER	0.3497	0.3496	0.3548	0.3546		
	RUN #2						
	FILTER						
19-2	PROBE	98.2627	98.2629	98.2637	98.2632		
19-2	IMPINGER	173.9710	173.9715	173.9662	173.9666		
1164	FILTER	0.3502	0.3500	0.3545	0.3548		

PARTICULATE DATA WORKSHEET

Plant <u>Luzenac</u>	Location <u>Sappington</u>
Test Dates <u>1-23 thru 1-25-95</u>	Initials <u>OKH</u> Stack ID <u>meth. 5</u>

Sample Description	ID No.	Average Tare, G	Average Final, G	Net Particulate Gain, G
Filter	1169	0.3497 ✓	0.3547 ✓	0.0050
Probe	19-1	97.2765 ✓	97.2780 ✓	0.0015
Impinger				
Cyclone				
Filter	1164	0.3501	0.3547	0.0046
Probe	19-2	98.2628	98.2635	0.0007
Impinger	19-2	173.9713	173.9664	-0.0049
Cyclone				
Filter				
Probe				
Impinger				
Cyclone				
Water Blank				
Acetone Blank				
Field Filter Blank				
System Filter Blank				

PARTICULATE DATA WORKSHEET

Plant <u>Luzenac</u>	Location <u>Sappington</u>
Test Dates <u>1-16 to 1-20, 1995</u>	Initials <u>GKH</u> Stack ID <u>Method 5</u>

Sample Description	ID No.	Average Tare, G	Average Final, G	Net Particulate Gain, G
Filter	1147	0.3304	0.3304	0.0000
Probe	3-4	98.2236	98.2252	0.0016
Impinger	3-4	172.8124 ✓	172.8145	0.0021
Cyclone				
Filter				
Probe				
Impinger				
Cyclone				
Filter				
Probe				
Impinger				
Cyclone				
Water Blank				
Acetone Blank				
Field Filter Blank				
System Filter Blank				

IMPINGER CATCH AND SAMPLE TRAIN RINSE FORM (for Pre-Weighed Sample Bottles)

Plant <u>Luzenac-Sappington</u>	Location <u>3 Forks</u>	Stack ID <u>DC-22A</u>
Project No. <u>94183-1</u>	Tested By <u>MWA, WGS</u>	Test Dates <u>12/28/94</u>

Note: All weights in grams					
Run No.	Weight	Date	Impinger Catch Bottle	Silica Gel Bottle	Initials
1	Final	12-28-94	242.1g	209.2 g	OKH
	Initial	12-27-94	248.7g	198.9 g	OKH
		Net Gain	-6.6g	10.3g	OKH
		Total Gain	3.7g		OKH
2	Final	12-28-94	246.6g	224.9g	OKH
	Initial	12-27-94	252.9 g	212.8g	OKH
		Net Gain	-6.3g	12.1g	OKH
		Total Gain	5.8g		OKH
3	Final	12-28-94	246.3g	238.4g	OKH
	Initial	12-27-94	249.4g	225.6g	OKH
		Net Gain	-3.1g	12.8g	OKH
		Total Gain	9.7g		OKH

RINSE VOLUMES, ml				
Run No.	Cyclone	Probe/Front Half	Impingers	Other (describe)
1		103mL	185mL	
2		75mL	220mL	
3		35mL	221mL	

3-1-95
RWR

BEAKER/FILTER TARES AND FINAL WEIGHTS

NOTE: Report all weights to 0.0001 g. Record sample volumes in Column 3. "Constant Weight" means ≤ 0.0005 g difference between 2 weighings at least 6 hours apart OR $2 \leq 1\%$ of average total weight less average tare weight.

Plant <u>Luzenac-America</u>	Location <u>Sappington</u>
Test Dates <u>12/28/94</u>	Stack ID <u>METHOD 5</u> <u>DC-22A</u>

ID NO.	SAMPLE DESCRIPTION (filter, probe/nozzle wash, impinger catch, blank, etc.)	DESCRIPTION (Tare 1, Tare 2, Final 1, etc.)					
		TARE #1	TARE #2	FINAL #1	FINAL #2	FINAL #3	
		Date 1/6	Date 1/8	Date 1/10	Date 1/12	Date 1/12	Date
		Time 1:15p	Time 8:15p	Time 8:45a	Time 8:45a	Time 4:00p	Time
		Initial <u>GKH</u>	Initial <u>GKH</u>	Initial <u>GKH</u>	Initial <u>GKH</u>	Initial <u>GKH</u>	Initial
	RUN #1						
2-22A	IMPINGER	177.6547	177.6550	177.6618	177.6607	177.6618	
1-22A	PROBE	104.0899	104.0896	104.0976	104.0965	104.0974	
1072	FILTER	0.3250	0.3251	0.3254	0.3253		
	RUN #2						
1-22A	IMPINGER	174.4478	174.4479	174.4522	174.4520		
2-22A	PROBE	109.6800	109.6801	109.6875	109.6868	109.6875	
1073	FILTER	0.3212	0.3212	0.3218	0.3219		
	RUN #3						
3-22A	IMPINGER	168.7108	168.7112	168.7171	168.7156	168.7171	
3-22A	PROBE	111.2870	111.2872	111.2906	111.2897	111.2906	
1074	FILTER	0.3202	0.3203	0.3204	0.3205		

3-1-95

RGR

PARTICULATE DATA WORKSHEET

Plant <u>Luzenac-America</u>	Location <u>Sappington</u>
Test Dates <u>12/28/94</u>	Initials <u>JKH</u> Stack ID <u>METH.5 DC-22A</u>

Sample Description	ID No.	Average Tare, G	Average Final, G	Net Particulate Gain, G
Filter	1072	0.3251	0.3254	0.003
Probe	1-22A	104.0898	104.0975	0.0077
Impinger	2-22A	177.6549	177.6618	0.0069
Cyclone				
Filter	1073	0.3212 ✓	0.3219 ✓	0.0007
Probe	2-22A	109.6801	109.6875	0.0074
Impinger	1-22A	174.4479	174.4521	0.0042
Cyclone				
Filter	1074	0.3203	0.3205	0.0002
Probe	3-22A	111.2871 ✓	111.2906 ✓	0.0035
Impinger	3-22A	168.7110	168.7171	0.0061
Cyclone				
Water Blank				
Acetone Blank				
Field Filter Blank				
System Filter Blank				

>.0107

>.0091

>.0037

IMPINGER CATCH AND SAMPLE TRAIN RINSE FORM (for Pre-Weighed Sample Bottles)

Plant <u>Luzenac</u>	Location <u>Sappington</u>	Stack ID <u>meth. 5</u>
Project No. <u>94183-1</u>	Tested By <u>mwh cde</u>	Test Dates <u>1-17, 1-18-95</u>

Note: All weights in grams

Run No.	Weight	Date	Impinger Catch Bottle	Silica Gel Bottle	Initials
1	Final	1/17/95	246.04g	249.1g	OKH
	Initial	1/12/95	254.96g	234.59g	OKH
	Net Gain		-8.92 ✓	14.51g ✓	OKH
	Total Gain		5.59g ✓		OKH
2	Final	1/18/95	207.49g	248.50g	OKH
	Initial	1/12/95	217.88g	232.50g	OKH
	Net Gain		-10.39g ✓	16.0g ✓	OKH
	Total Gain		5.61g ✓		OKH
3	Final	1/19/95	210.23g	252.39g	OKH
	Initial	1/12/95	216.81g	240.86	OKH
	Net Gain		-6.58g ✓	11.53g ✓	OKH
	Total Gain		4.95g ✓		OKH

RINSE VOLUMES, ml				
Run No.	Cyclone	Probe/Front Half	Impingers	Other (describe)
1		60ml	²⁴⁵ 222ml	
2		63ml	225 225ml	
3		70ml	175ml	

3-1-95
R wh

BEAKER/FILTER TARES AND FINAL WEIGHTS

NOTE: Report all weights to 0.0001 g. Record sample volumes in Column 3. "Constant Weight" means ≤ 0.0005 g difference between 2 weighings at least 6 hours apart OR $2 \leq 1\%$ of average total weight less average tare weight.

Plant <u>Luzenac-Sappington</u>	Location <u>DC-23</u>
Test Dates <u>1-17 & 1-18-95</u>	Stack ID <u>method 5</u>

ID NO.	SAMPLE DESCRIPTION (filter, probe/nozzle wash, impinger catch, blank, etc.)	DESCRIPTION (Tare 1, Tare 2, Final 1, etc.)					
		TARE #1	TARE #2	TARE #3	TARE #4	FINAL #1	FINAL #2
		Date 1/22	Date 1/23	Date 1/24	Date 1/25	Date 1/24	Date 1/25
		Time 5:00p	Time 7:15a	Time 8:35a	Time 10:30a	Time 8:35a	Time 10:30a
		Initial <u>QKH</u>	Initial <u>QKH</u>	Initial <u>QKH</u>	Initial <u>QKH</u>	Initial <u>QKH</u>	Initial <u>QKH</u>
	RUN #1						
23-1	IMPINGER	173.7819	173.7820	173.7825		173.7825 162.1135	173.7820 162.1140
23-1	PROBE	112.9028	112.9002	112.9016	112.9031	112.9049	112.9047
1165	FILTER	0.3508	0.3506			0.3524	0.3525
	RUN #2						
23-2	IMPINGER	175.4697	175.4700			175.4719	175.4724
23-2	PROBE	113.2490	113.2488			113.2537	113.2532
1159	FILTER	0.3499	0.3497			0.3532	0.3532
	RUN #3						
23-3	IMPINGER	173.9588	173.9588			173.9596	173.9599
23-3	PROBE	115.9134	115.9133			115.9182	115.9183
1161	FILTERS	0.3523	0.3521			0.3542	0.3542

3-1-95
RGR

PARTICULATE DATA WORKSHEET

Plant <u>Luzenac/Gappington</u>	Location <u>DC-23</u>	
Test Dates <u>1-17 & 1-18-95</u>	Initials <u>JKH</u>	Stack ID <u>Method 5</u>

Sample Description	ID No.	Average Tare, G	Average Final, G	Net Particulate Gain, G
Filter	1165	0.3507 ✓	0.3525	0.0018 ✓
Probe	23-1	112.9030 ✓	112.9048 ✓	0.0018 ✓
Impinger	23-1	173.7823	173.7823	0.0000
Cyclone				
Filter	1152	0.3498 ✓	0.3532 ✓	0.0034
Probe	23-2	113.2489	113.2535	0.0046
Impinger	23-2	175.4699	175.4722	0.0023
Cyclone				
Filter	1161	0.3522 ✓	0.3542 ✓	0.0020 ✓
Probe	23-3	115.9134	115.9183	0.0049
Impinger	23-3	173.9588	173.9598	0.0010
Cyclone				
Water Blank				
Acetone Blank				
Field Filter Blank				
System Filter Blank				

DC-23

>.0036

>.008

>.0069

IMPINGER CATCH AND SAMPLE TRAIN RINSE FORM (for Pre-Weighed Sample Bottles)

Plant <u>Luzenac/Sapp.</u>	Location <u>DC-24</u>	Stack ID <u>Method 5</u>
Project No. <u>94183-1</u>	Tested By <u>MMA</u>	Test Dates <u>1-11 & 1-12-95</u>

Note: All weights in grams					
Run No.	Weight	Date	Impinger Catch Bottle	Silica Gel Bottle	Initials
1	Final	1/12/95	276.70g	255.59g	JKH
	Initial	1/9/95	276.61g	241.35g	JKH
	Net Gain		0.09g	14.24g	JKH
	Total Gain		14.33g		JKH
2	Final	1/12/95	254.04g	251.00g	JKH
	Initial	1/9/95	252.9g	237.79g	JKH
	Net Gain		1.14g	13.21g	JKH
	Total Gain		14.35g		JKH
3	Final	1/12/95	227.51g	256.01g	JKH
	Initial	1/9/95	230.42g	238.79g	JKH
	Net Gain		-2.91g	17.22g	JKH
	Total Gain		14.31g		JKH

RINSE VOLUMES, ml				
Run No.	Cyclone	Probe/Front Half	Impingers	Other (describe)
1		95ml	220ml	
2		55ml	205ml	
3		63ml	190ml	

BEAKER/FILTER TARES AND FINAL WEIGHTS

NOTE: Report all weights to 0.0001 g. Record sample volumes in Column 3. "Constant Weight" means ≤ 0.0005 g difference between 2 weighings at least 6 hours apart OR $2 \leq 1\%$ of average total weight less average tare weight.

Plant <u>Luzenac/Sappington</u>	Location <u>DC-24</u>
Test Dates <u>1-11 & 1-12-95</u>	Stack ID Method <u>5</u>

ID NO.	SAMPLE DESCRIPTION (filter, probe/nozzle wash, impinger catch, blank, etc.)	DESCRIPTION (Tare 1, Tare 2, Final 1, etc.)					
		TARE #1	TARE #2	FINAL #1	FINAL #2		
		Date 1/15	Date 1/15	Date 1/16	Date 1/17	Date	Date
		Time 2:15p	Time 9:00p	Time 3:00p	Time 8:45a	Time	Time
		Initial OKH	Initial OKH	Initial OKH	Initial OKH	Initial	Initial
	RUN #1						
24-1	IMPINGER	157.8158	157.8155	157.8179	157.8177		
24-1	PROBE	98.2457	98.2452	98.2485	98.2483		
1093	FILTER	0.3344	0.3343	0.3351	0.3353		
	RUN #2						
24-2	IMPINGER	173.4709	173.4709	173.4727	173.4732		
24-2	PROBE	100.7714	100.7717	100.7731	100.7729		
1145	FILTER	0.3329	0.3331	0.3336	0.3337		
	RUN #3						
24-3	IMPINGER	159.6030	159.6026	159.6046	159.6041		
24-3	PROBE	105.1921	105.1916	105.1939	105.1938		
1152	FILTER	0.3499	0.3499	0.3501	0.3502		

3-1-95
RGR

PARTICULATE DATA WORKSHEET

Plant	Luzenac/Bappington	Location	DC-24
Test Dates	1-11 & 1-12-95	Initials	Qut
		Stack ID	method 5

Sample Description	ID No.	Average Tare, G	Average Final, G	Net Particulate Gain, G
Filter	1093	0.3344 ✓	0.3352 ✓	0.0008
Probe	24-1	98.2455	98.2484	0.0029
Impinger	24-1	157.8157	157.8178	0.0021
Cyclone				
Filter	1145	0.3330 ✓	0.3337 ✓	0.0007
Probe	24-2	100.7716 ✓	100.7730 ✓	0.0014
Impinger	24-2	173.4709	173.4730	0.0021
Cyclone				
Filter	1152	0.3499 ✓	0.3502 ✓	0.0003 ✓
Probe	24-3	105.1919	105.1939	0.002 ✓
Impinger	24-3	159.6028	159.6044	0.0016
Cyclone				
Water Blank				
Acetone Blank				
Field Filter Blank				
System Filter Blank				

DC-24

>.0037

>.0021

>.0023

APPENDIX D: SCHEMATICS

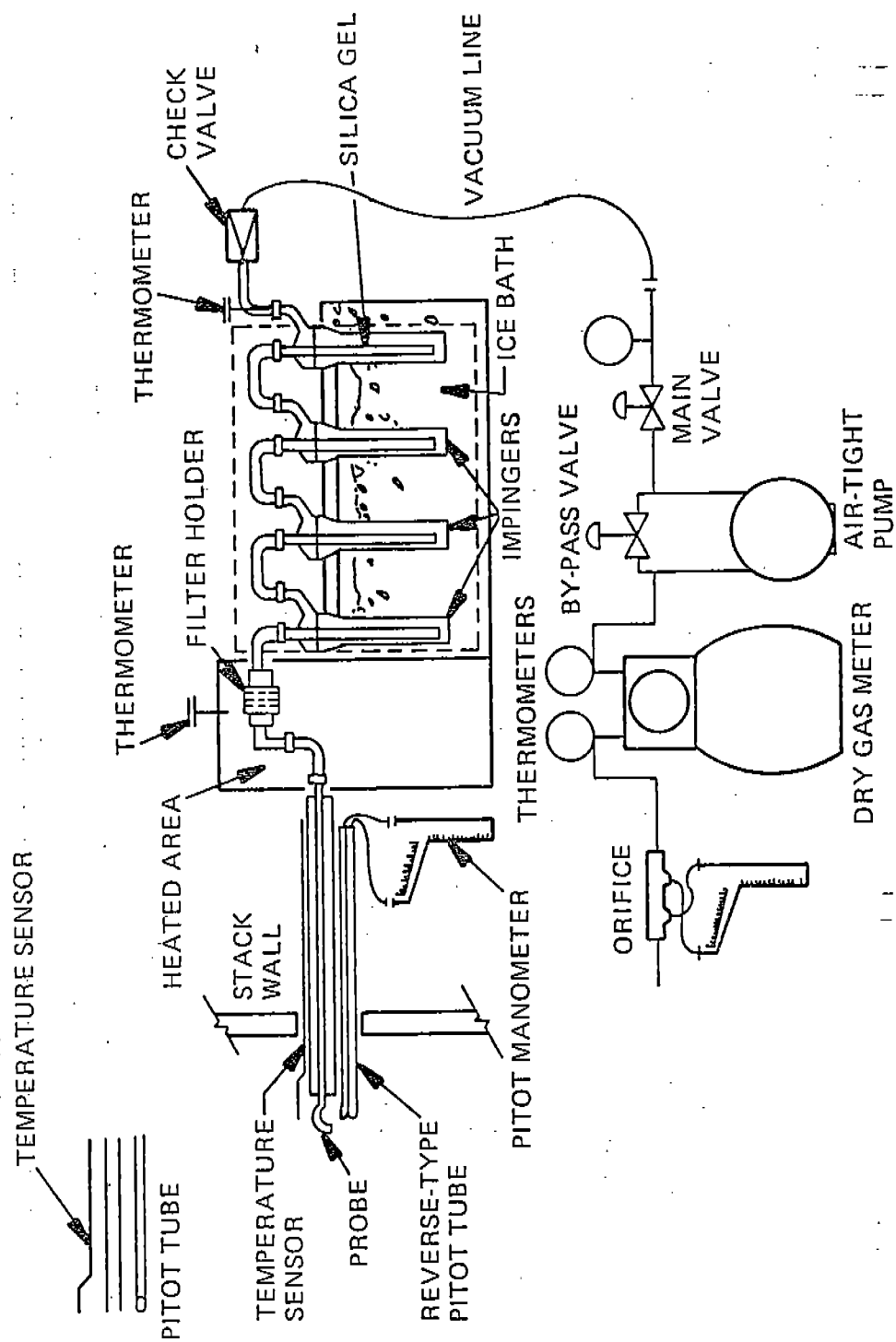


FIGURE 2
EPA METHOD 5 PARTICULATE SAMPLE APPARATUS



BISON ENGINEERING, INC.

ENGINEERS • SCIENTISTS • PLANNERS

Job Name: LUZENAC
Location: T. FORKS, MT
Proj. No.: 94183 By: MWA
Date: 12-5-94 Sheet: 2 of 4

→ Solve for Equivalent Diameter (D_e):

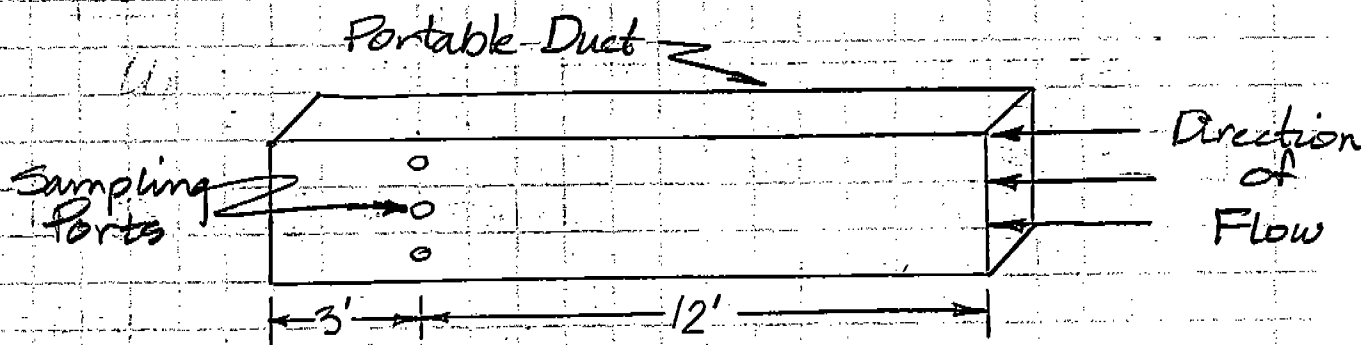
$$D_e = \frac{2LW}{(L+W)} \quad \text{where } L = \text{Length} \\ W = \text{Width}$$

$$D_e = \frac{2(18)(18)}{18+18} = \frac{648}{36} = 18''$$

→ Use 8 & 2 D_e Rule for Duct Design:

$$\text{Upstream Disturbance} = 8D_e = \frac{8(18'')}{12} = 12'$$

$$\text{Downstream Disturbance} = 2D_e = \frac{2(18'')}{12} = 3'$$



→ Determine Number of Traverse Points:

Use Figure 1-1 pg 428.

of Traverse Pts = 9

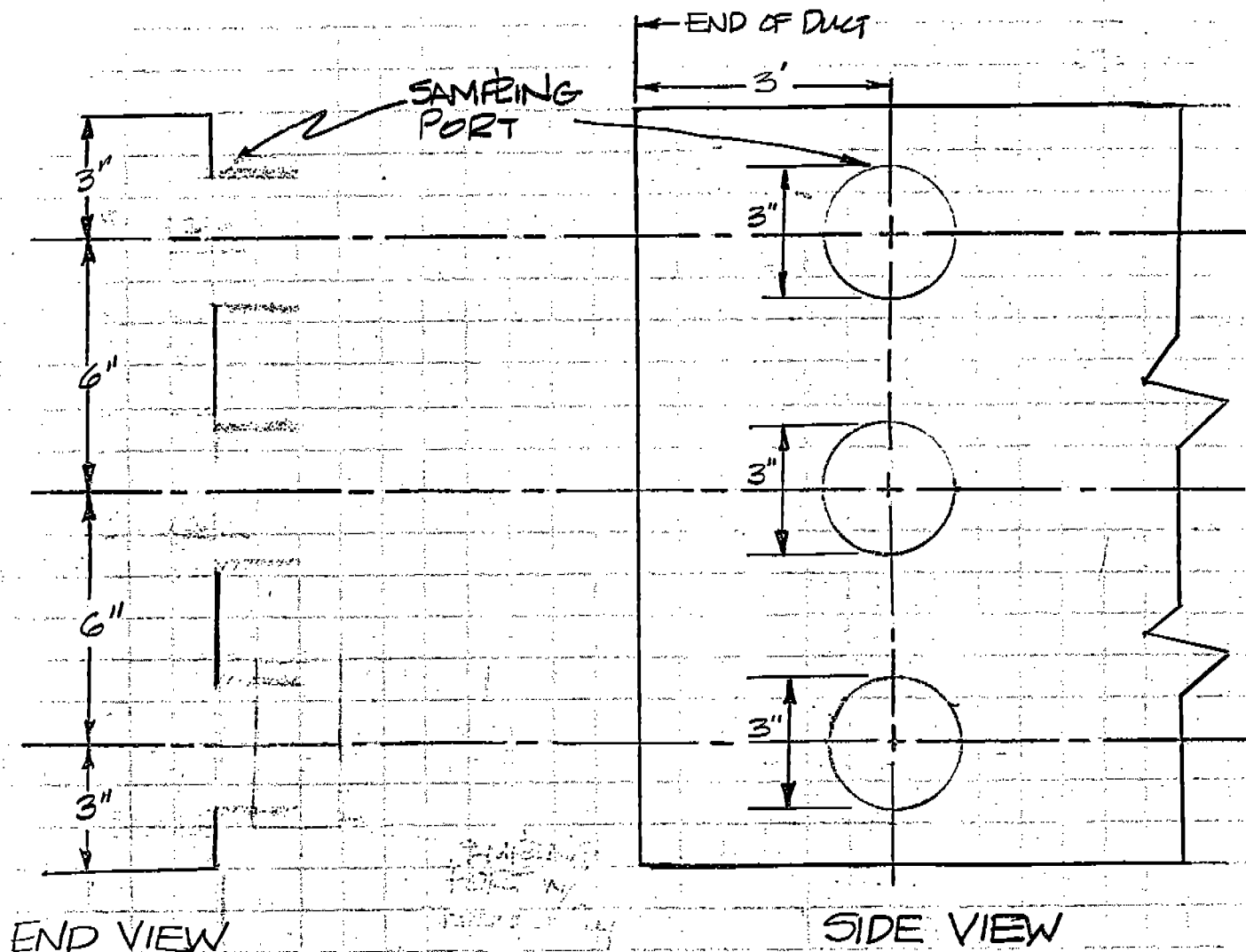


BISON ENGINEERING, INC.

ENGINEERS • SCIENTISTS • PLANNERS

Job Name: LUZENAC
Location: T. FORKS, MT
Proj. No.: 94183 By: MMA
Date: 12-5-94 Sheet: 3 of 4

SAMPLING PORT DETAIL:



- Sampling Ports (3) are 3" holes drilled or cut into side of portable duct.



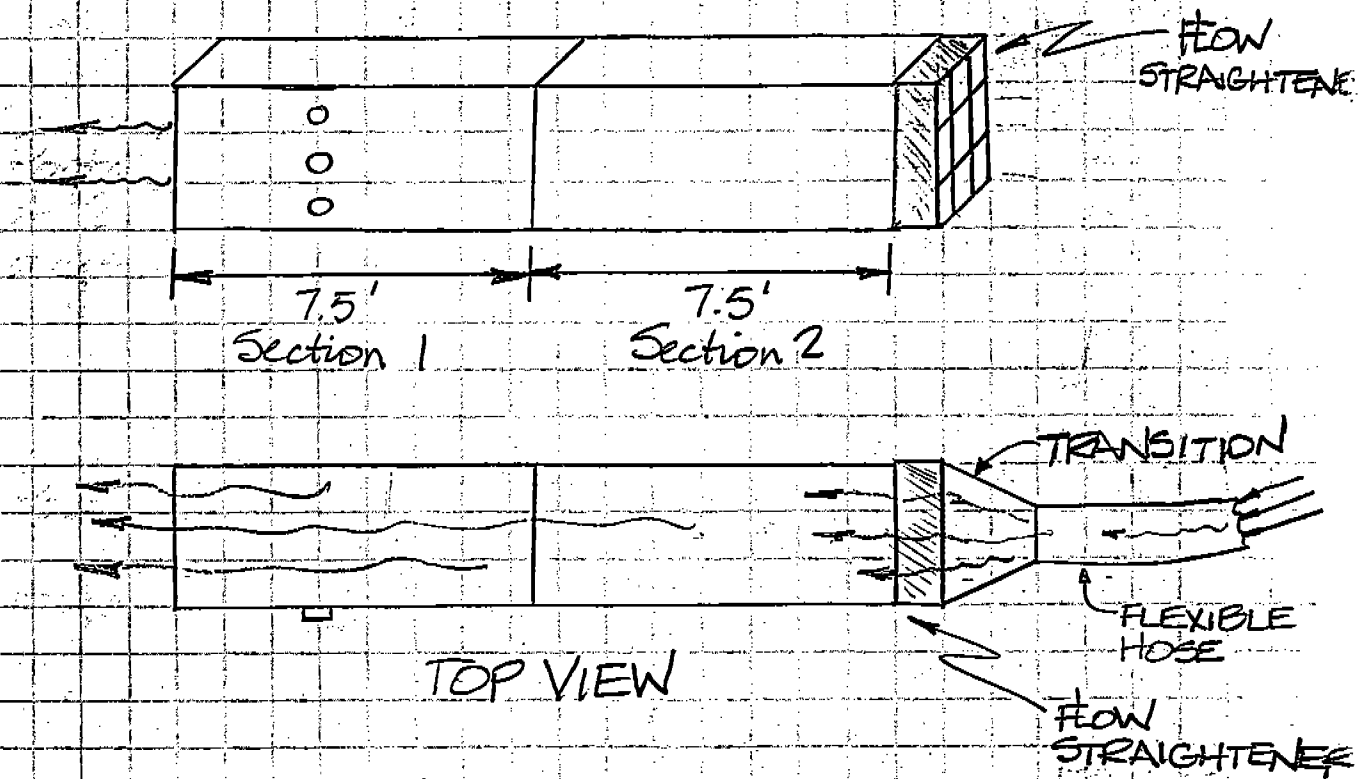
BISON ENGINEERING, INC.

ENGINEERS • SCIENTISTS • PLANNERS

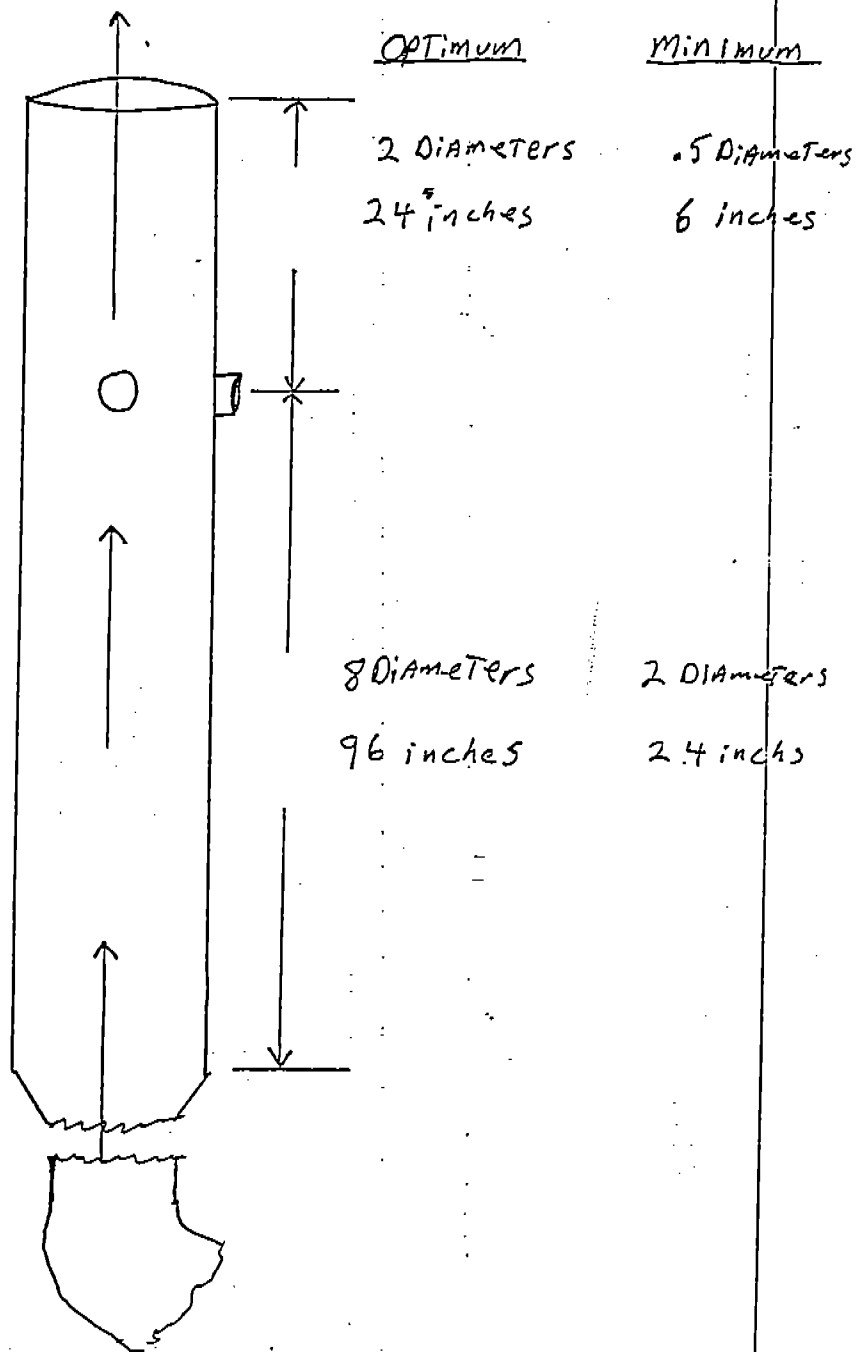
Job Name: LUZENAC
Location: T. FORKS, MT
Proj. No.: 94183 By: MWA
Date: 12-5-94 Sheet: 4 of 4

→ FINAL DESIGN & COMMENTS

- Portable duct is to be made out of light gage steel consisting of 2 separate sections that can be joined together to form a single unit. See below... and fastened



PORTABLE STACK DESIGN (ROUND)



~~SKETCH~~ Sketch of Sample port Location.

APPENDIX D: SCHEMATICS

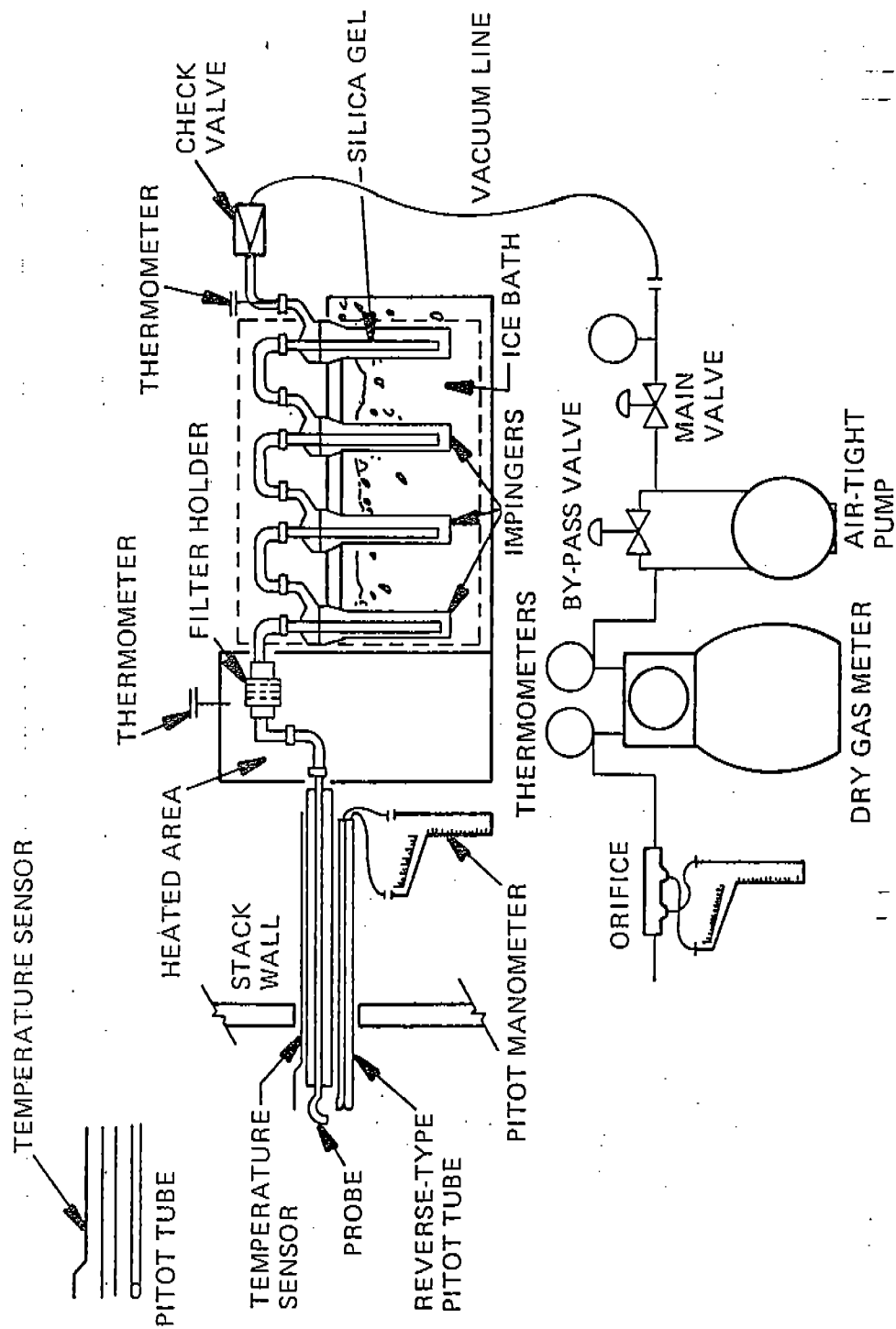


FIGURE 2
EPA METHOD 5 PARTICULATE SAMPLE APPARATUS



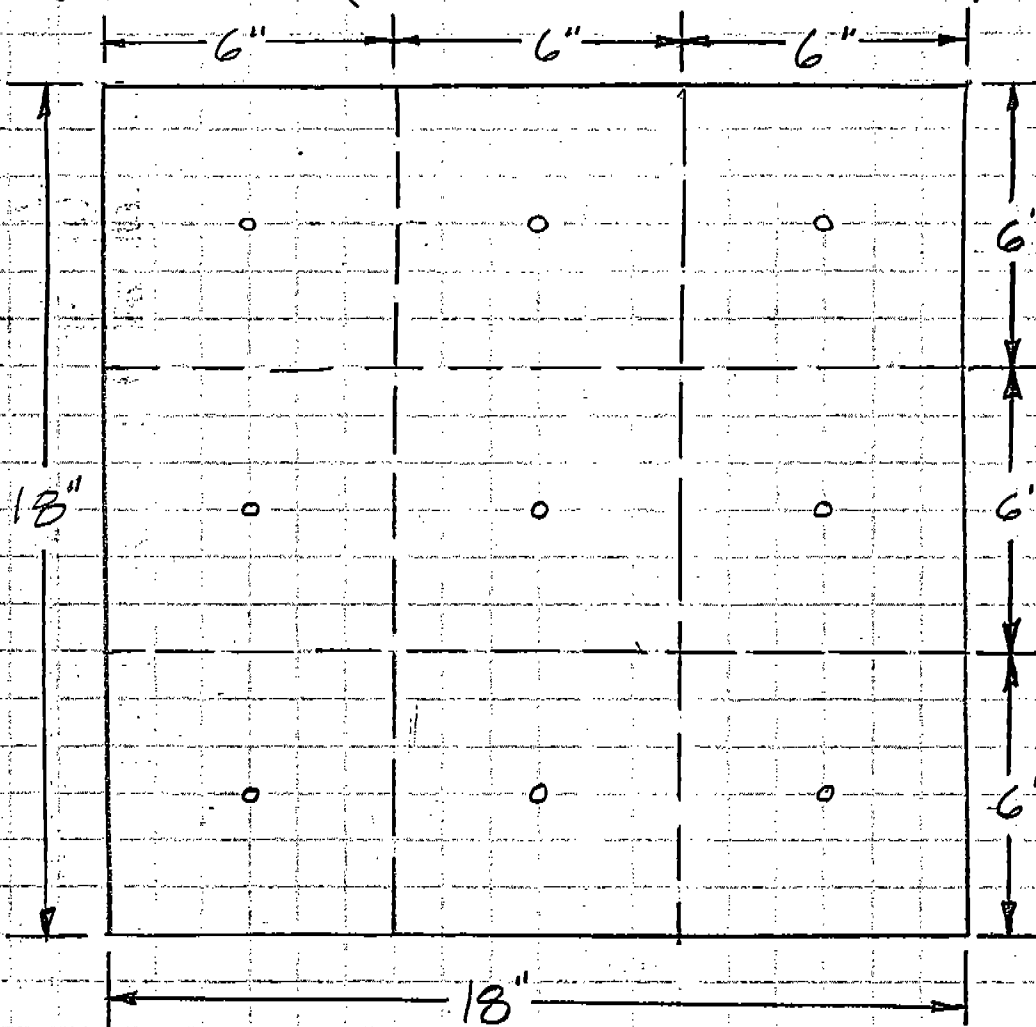
BISON ENGINEERING, INC.

ENGINEERS • SCIENTISTS • PLANNERS

Job Name: LUZENAC
Location: THREE FORKS, MT
Proj. No.: 9A183 By: MWA
Date: 12-5-94 Sheet: 1 of 4

PORTABLE STACK DESIGN

→ Try $18" \times 18"$: (Cross Section or End View)



- Flow is perpendicular to page.
- o's above are centroids of squares representing equal areas.
- 3×3 Matrix (Part 60, Appendix A, Method 1, pg 4)



BISON ENGINEERING, INC.

ENGINEERS • SCIENTISTS • PLANNERS

Job Name: LUZENAC
Location: T. FORKS, MT
Proj. No.: 94183 By: MWA
Date: 12-5-04 Sheet: 2 of 4

→ Solve for Equivalent Diameter (D_e):

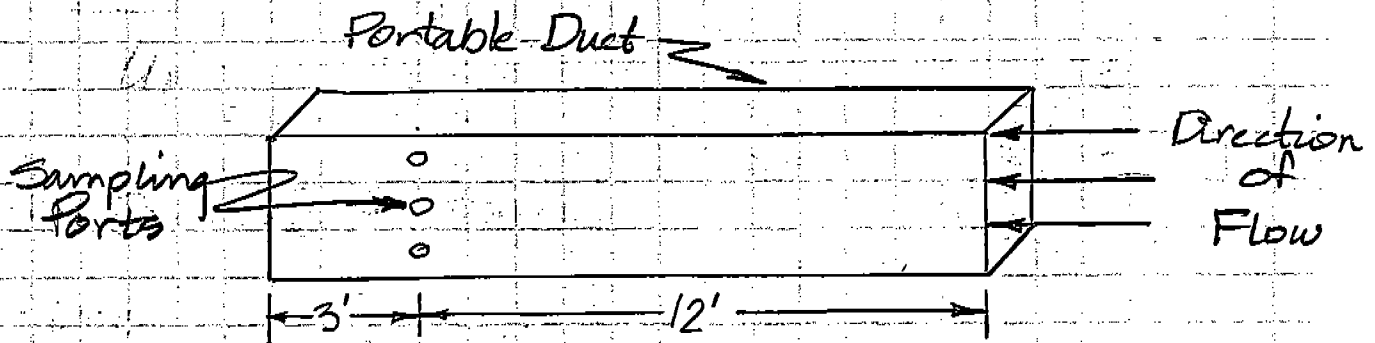
$$D_e = \frac{2LW}{(L+W)} \quad \text{where } L = \text{Length} \\ W = \text{Width}$$

$$D_e = \frac{2(18)(18)}{18+18} = \frac{648}{36} = 18''$$

→ Use 8 & 2 D_e Rule for Duct Design:

$$\text{Upstream Disturbance} = 8D_e = \frac{8(18'')}{12} = 12'$$

$$\text{Downstream Disturbance} = 2D_e = \frac{2(18'')}{12} = 3'$$



→ Determine Number of Traverse Points:

Use Figure 1-1 pg 428.

of Traverse Pts = 9

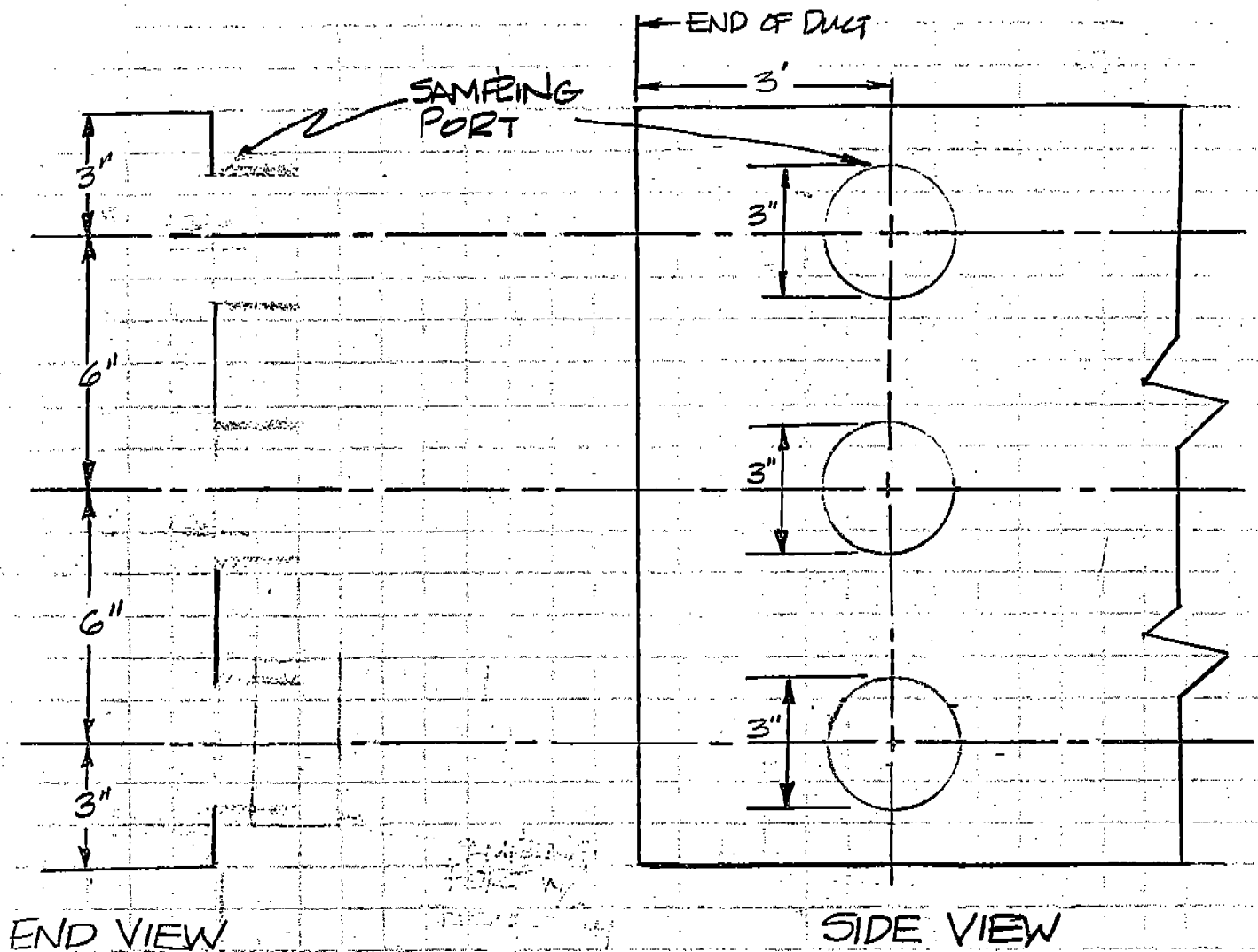


BISON ENGINEERING, INC.

ENGINEERS • SCIENTISTS • PLANNERS

Job Name: LUZENAC
Location: T. FORKS, MT
Proj. No.: 94183 By: MWA
Date: 12-5-94 Sheet: 3 of 4

SAMPLING PORT DETAIL:



- Sampling Ports (3) are 3" holes drilled or cut into side of portable duct.



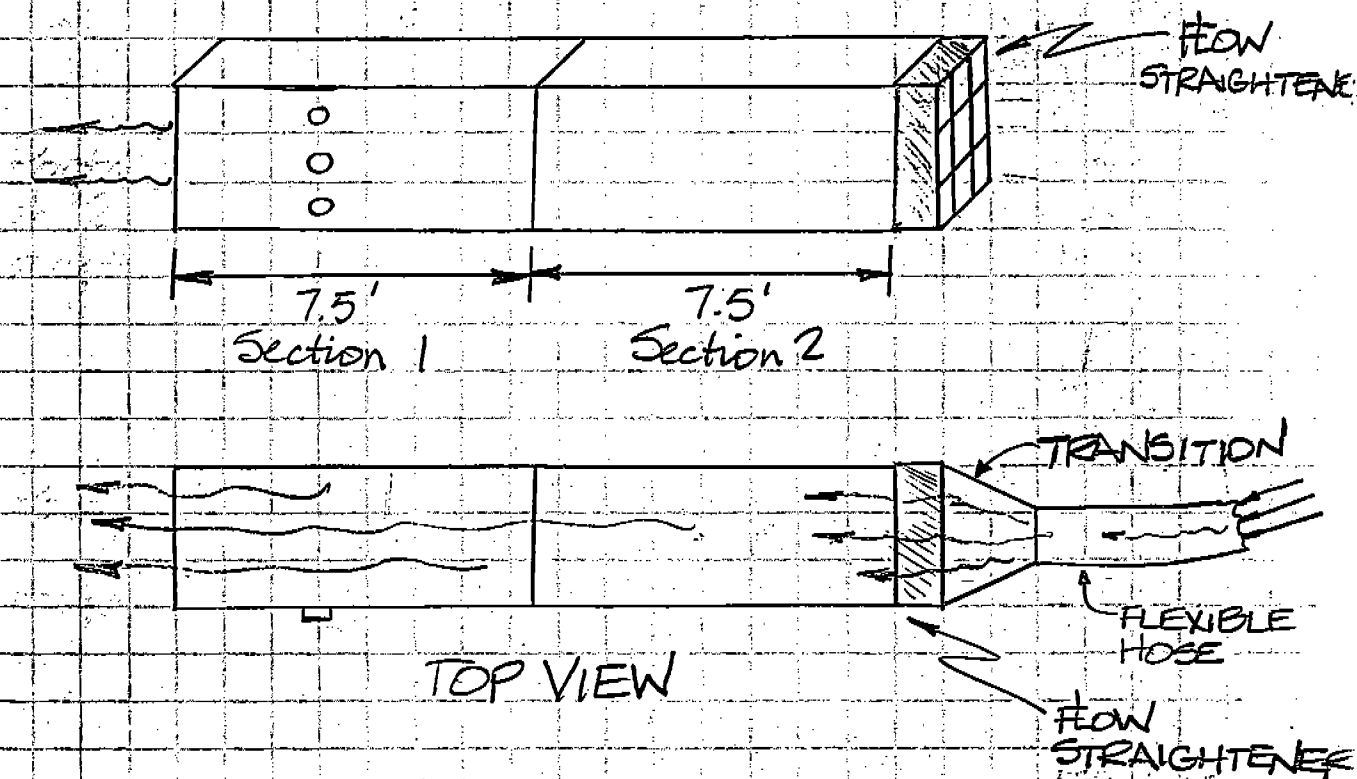
BISON ENGINEERING, INC.

ENGINEERS • SCIENTISTS • PLANNERS

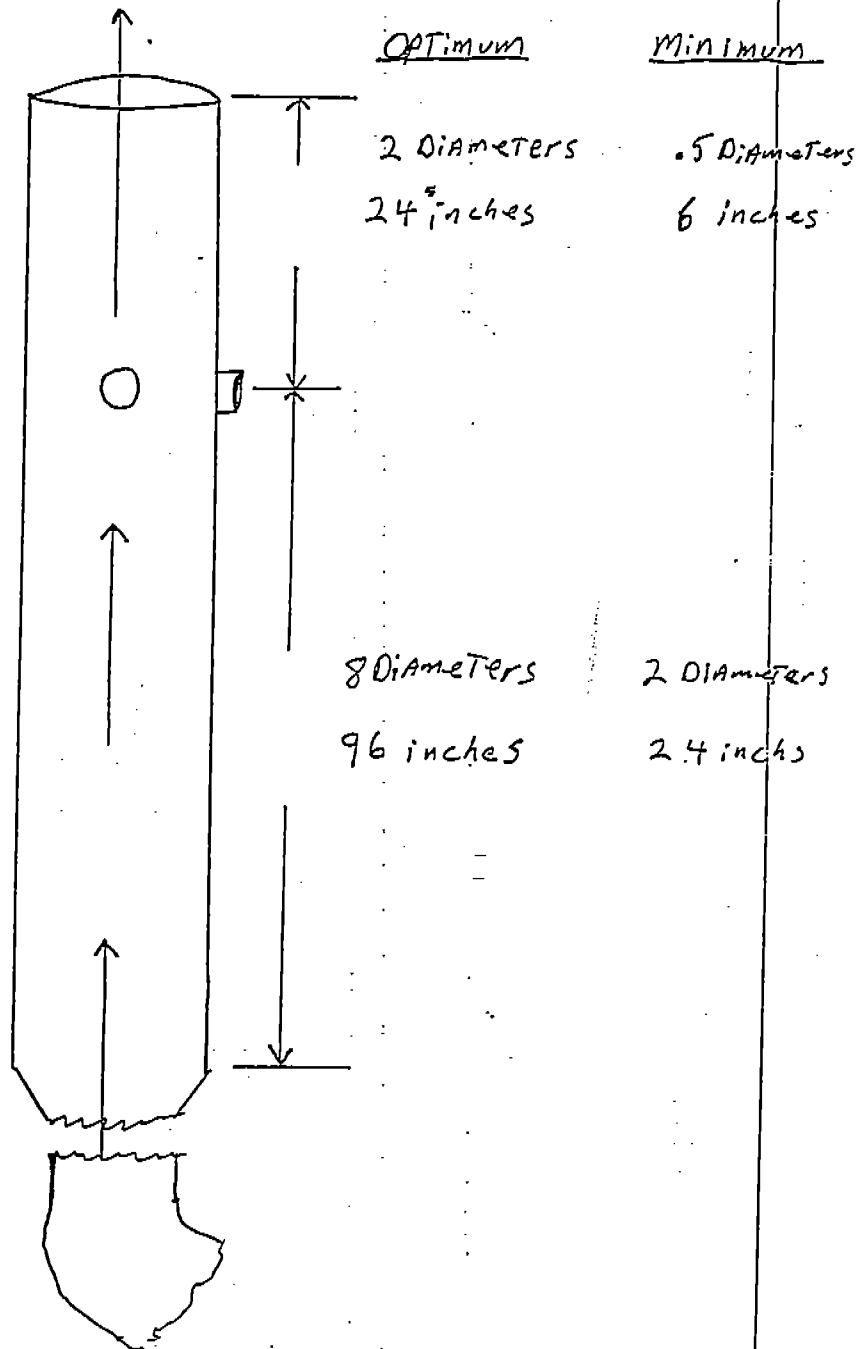
Job Name: LUZENAC
Location: T. FORKS, MT
Proj. No.: 9A183 By: MWA
Date: 12-5-94 Sheet: 4 of 4

→ FINAL DESIGN & COMMENTS

- Portable duct is to be made out of light gage steel consisting of 2 separate sections that can be joined together to form a single unit. See below... and fastened



PORTABLE STACK DESIGN (ROUND)



~~NOTE~~ Sketch of Sample port Location.



BISON ENGINEERING, INC.

ENGINEERS • SCIENTISTS • PLANNERS

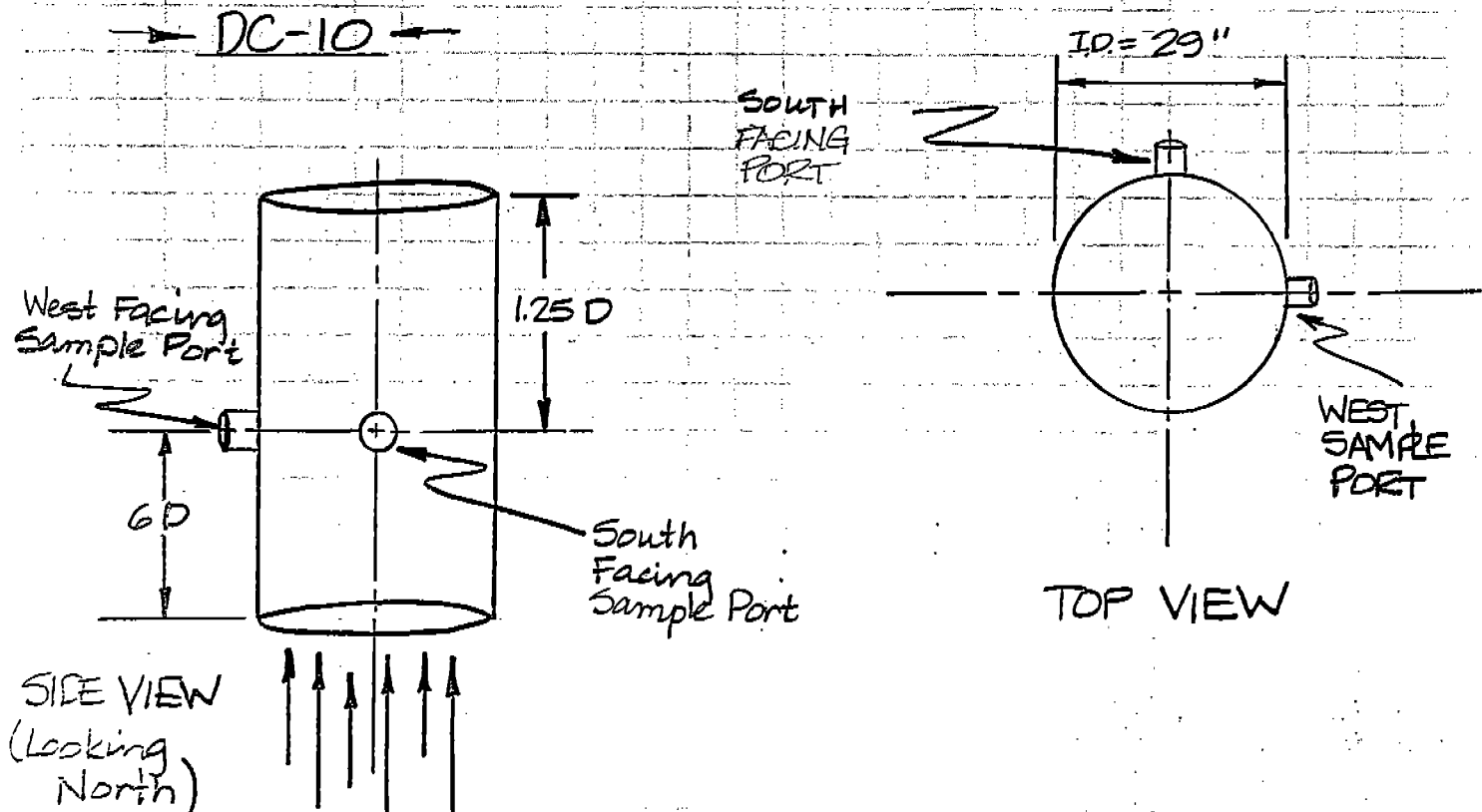
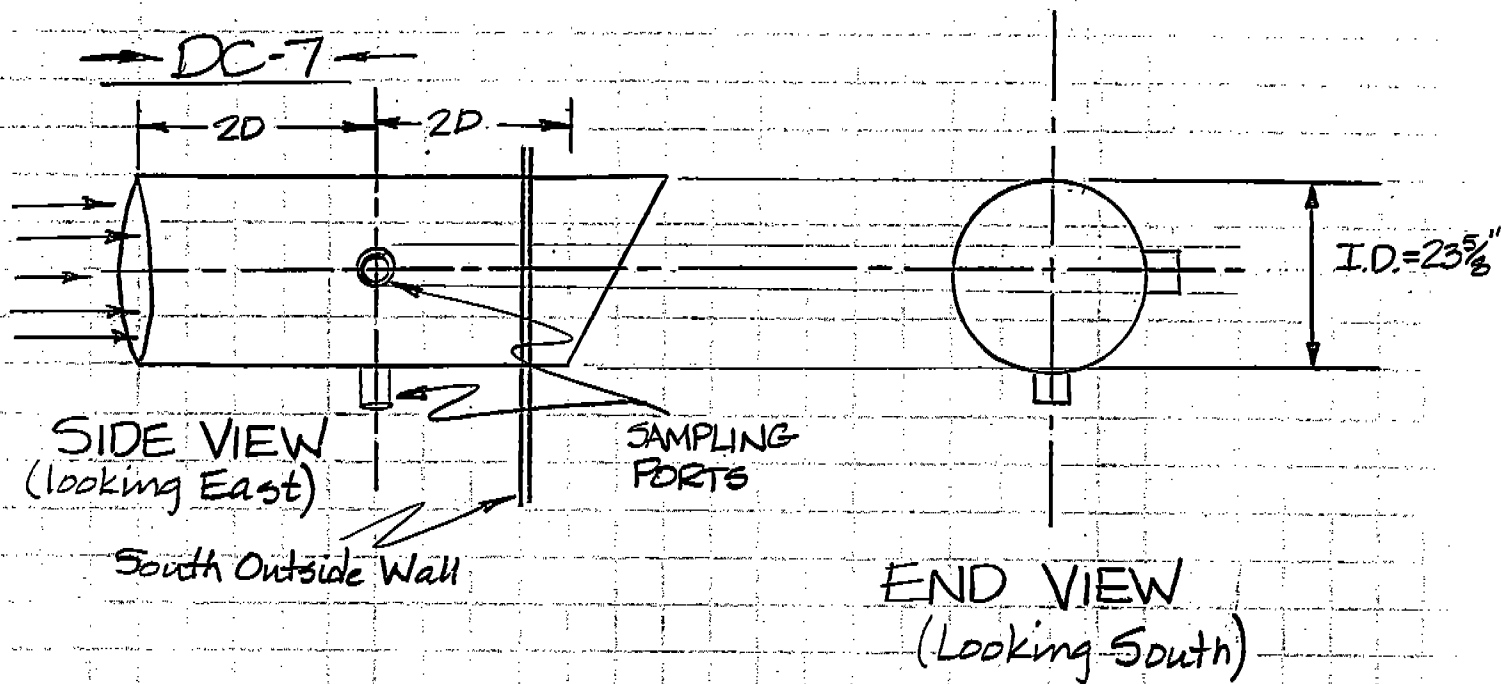
Job Name: LUZENAC/AMERICA

Location: SAPPINGTON

Proj. No.: 94183-1 By: MMA

Date: 3-22-95 Sheet: 1 of 2

SOURCE 1, SAMPLING PORT SKETCH





BISON ENGINEERING, INC.

ENGINEERS • SCIENTISTS • PLANNERS

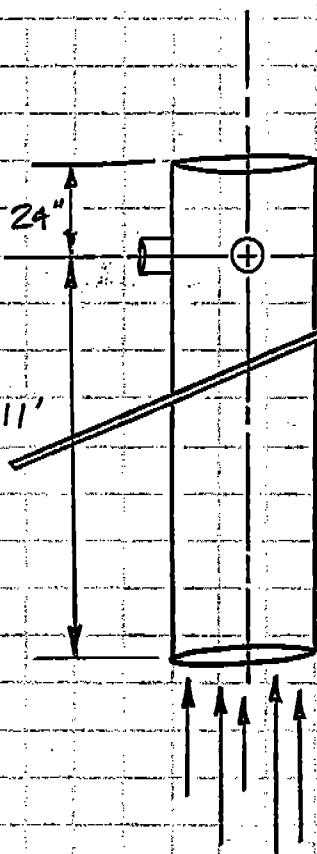
Job Name: LUZENAC/AMERICA

Location: SAPPINGTON

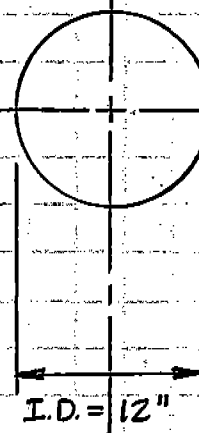
Proj. No.: 94B3-1 By: MANDERSO

Date: 3-22-95 Sheet: 2 of 2

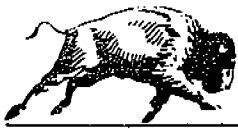
→ DC-22A ←



SIDE VIEW
(Looking East)



TOP VIEW



BISON ENGINEERING, INC.

ENGINEERS • SCIENTISTS • PLANNERS

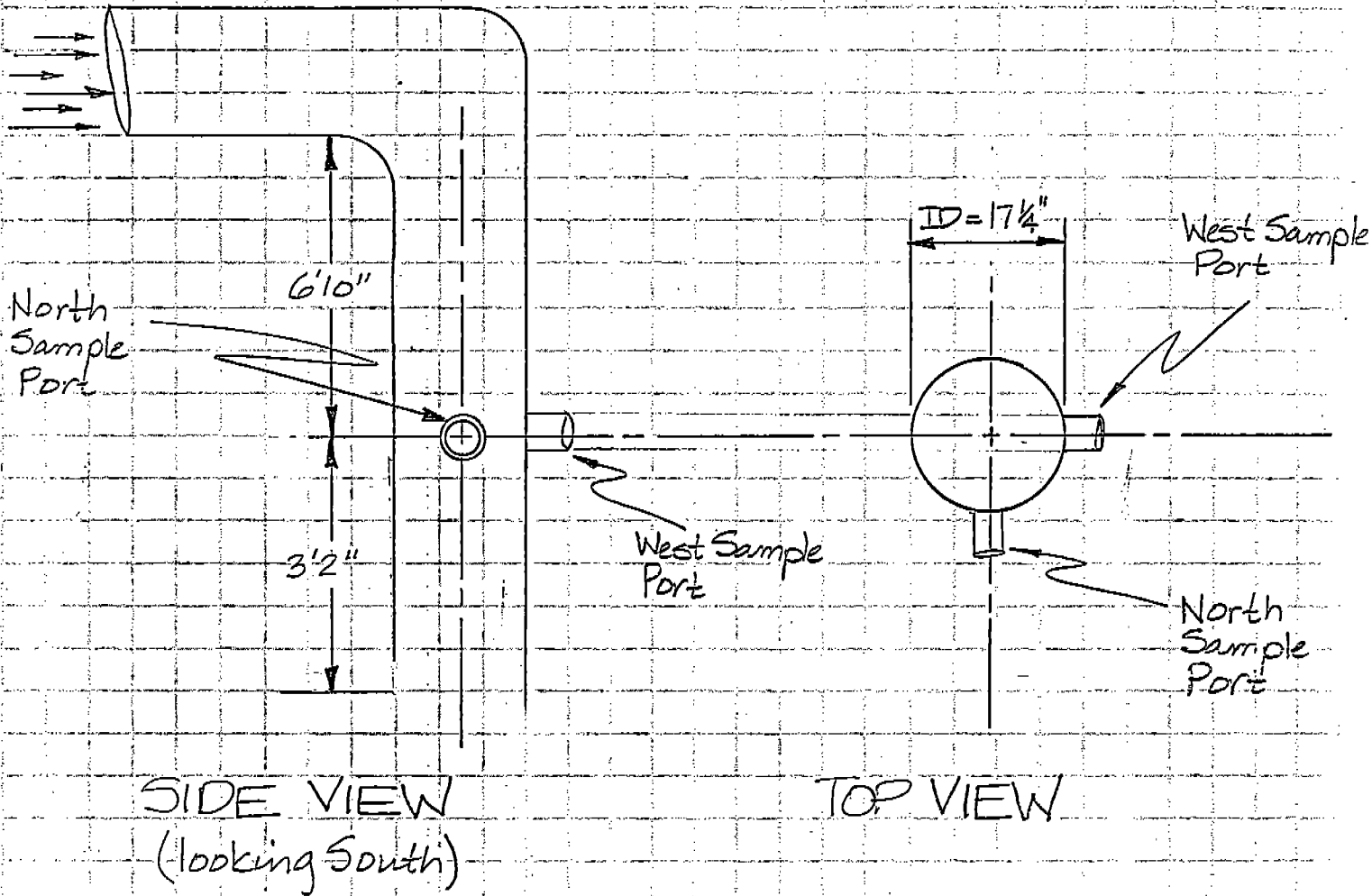
Job Name: ULLENAC/AMERICA

Location: JAFFINGTON

Proj. No.: 94183-1 By: MMA

Date: 3-22-95 Sheet: 3 of 3

→ DC-1 ←



APPENDIX E: NOMENCLATURE AND FORMULAE

NOMENCLATURE

Stack test standard conditions:

Pressure -- 29.92" Hg

Temperature -- 68°F

A_n	Nozzle cross sectional area; ft^2
A_s	Stack cross sectional area; ft^2
BHP	Brake Horsepower
B_{ws}	Water vapor in the gas stream; volume proportion
C_a	Concentration of acetone blank residue; mg/g
C_p	Pitot tube coefficient; 0.84 for type S pitot tube
C_s	Concentration of stack gas particulates; dry basis corrected to standard conditions; lb/dscf (pounds/dry std. ft^3) or gr/dscf (grains/dry std. cubic foot)
D_{50}	Aerodynamic diameter of particles with 50 percent probability of cyclone penetration; μ
e	Emission rate conversion factor (.002122 for NO; .0020 for CO; .00325 for NO_2)
E	Emission rate grams/BHP-hr
E_{hr}	Emission rate per hour; lb/hr
Fan HP	Actual cooling fan losses
FE	Frame Efficiency (= 1.05). Energy losses due to frame absorption.
I	Percent sampling rate variation, where 100% = ideal isokinetic conditions
K	1.2 = Specific Heat Ratio (C_p/C_v)
K_p	Pitot tube constant; 85.49

LF	Loss Factor (= 1.2). Energy losses due to compressor valves, etc.
m_a	Acetone residue weight after evaporation; mg
M_d	Stack gas dry molecular weight, from Fyrite or Orsat analysis; lb/lb-mole
m_f	Filter weight gain; mg
MMCFD	Million cubic feet of gas per day
m_n	Total weight of collected particulate; mg
$m_{n, PM_{10}}$	Total weight of collected PM_{10} particulate; mg
M_w	Molecular weight of water; 18.0 lb/lb mole
M_s	Wet molecular weight of stack gas; lb/lb mole
P_{bar}	Barometric station pressure (at sampling site); in. Hg
P_g	Stack static pressure; in. H_2O
P_s	Absolute stack pressure; in. Hg
P_{std}	Absolute pressure @ standard conditions; 29.92" Hg
PPM	Parts per million
Q_s	Average stack gas wet volumetric flow rate; cfm (ft^3/min)
Q_{std}	Average stack gas dry volumetric flow rate, corrected to standard conditions; scfm (dry standard ft^3/min)
T_m	Average dry gas meter temperature, abs.; °R
t_s	Average stack gas temperature, °F
T_s	Suction Temperature (°R)
$T_{s(avg)}$	Average stack gas temperature, abs.; °R
T_{std}	Absolute temperature @ standard conditions; 520°R
R	Ideal gas constant; 21.85 in. hg- $ft^3/°R$ -lb-mole
V_{lc}	Total volumes of water collected in impingers; ml

V_m	Indicated volume of gas sample measured at dry gas meter; dcf (dry ft ³)
$V_{m(std)}$	Volume of gas sample measured at dry gas meter, corrected to standard conditions; dscf (dry standard cubic feet)
v_s	Stack gas velocity from Method 2
$V_{w(std)}$	Volume of water vapor in the gas sample, corrected to standard conditions; scf (standard cubic feet)
W_{lc}	Weight of collected water; g
Y	Dry gas meter calibration factor
Δp	Stack velocity stagnation pressure recorded by the probe's type S pitot tube
ΔH	Average pressure differential across orifice meter at control box
μ_s	Stack gas absolute viscosity; μ poise
ρ_w	Density of water; 0.9982 g/ml (0.0022 lb/ml)
Θ	Total sampling time; min.
13.6	Specific gravity of mercury
60	Seconds per minute

FORMULAE

1. Dry Gas Volume - Corrected to STP (40 CFR 60, App. A, Eq. 5-1)

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

Y is obtained from post test meter calibrations shown in Appendix E.

2. Water Vapor Volume - Corrected to STP (40 CFR 60, App. A, Eq. 5-2)

$$V_{w(std)} = V_{lc} \left(\frac{\rho_w}{M_w} \right) \left(\frac{RT_{std}}{P_{std}} \right)$$

Note: $W_{lc} = V_{lc} \rho_w$

3. Stack Gas Moisture Content (40 CFR 60 App. A, Eq. 5-3, modified)

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

4. Stack Gas Dry and Wet Molecular Weight (40 CFR 60 App. A, Eq. 3-1, 2-5)

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

$$M_s = M_d (1 - B_{ws}) + 18.0 B_{ws}$$

5. Average Stack Gas Velocity (40 CFR 60 App. A, Eq. 2-9)

$$v_s = K_p C_p \left(\frac{\sum_1^n \sqrt{\Delta P}}{n} \right) \sqrt{\frac{T_{s(avg)}}{P_s M_s}}$$

6. Average Stack Gas Wet Volumetric Flow Rate

$$Q_s = 60 v_s A_s$$

7. Average Stack Gas Dry Flow Rate Corrected to Standard Conditions (40 CFR 60 App. A, Eq. 2-10, modified)

$$Q_{std} = Q_s (1 - B_{ws}) \frac{T_{std}}{T_{s(avg)}} \frac{P_s}{P_{std}}$$

8. TSP Particulate Concentration Corrected to Standard Conditions (40 CFR 60 App. A, Eq. 5-6, modified)

$$C_{s,lb} = 2.205 \times 10^{-6} \frac{m_n}{V_{m(std)}}$$

$$C_{s,gr} = 15.43 \times 10^{-3} \frac{m_n}{V_{m(std)}}$$

Note: $C_{s,lb}$ = lb/dscf
 $C_{s,gr}$ = grains/dscf
 m_n = mg

APPENDIX D: SCHEMATICS

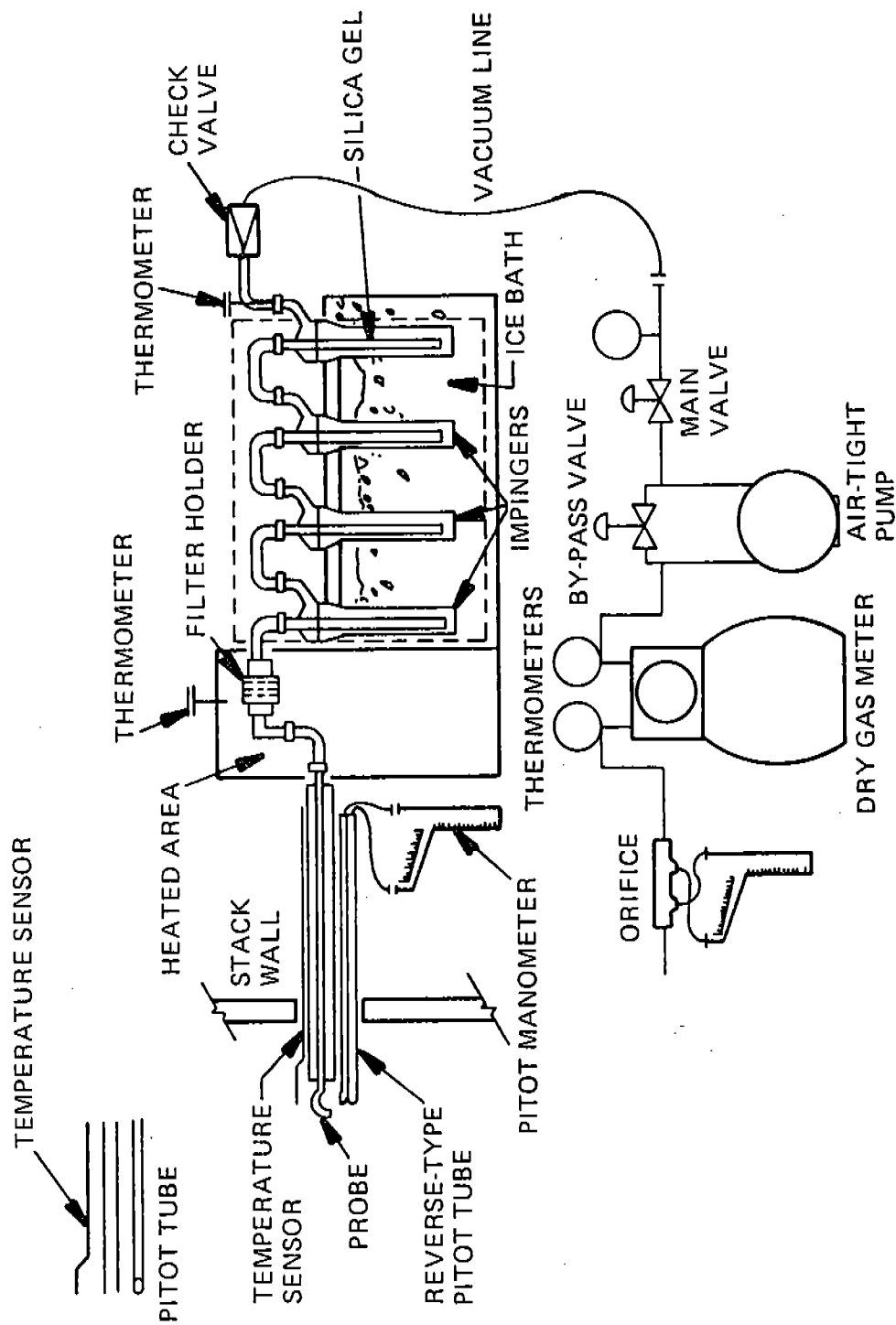


FIGURE 2
EPA METHOD 5 PARTICULATE SAMPLE APPARATUS





BISON ENGINEERING, INC.

ENGINEERS • SCIENTISTS • PLANNERS

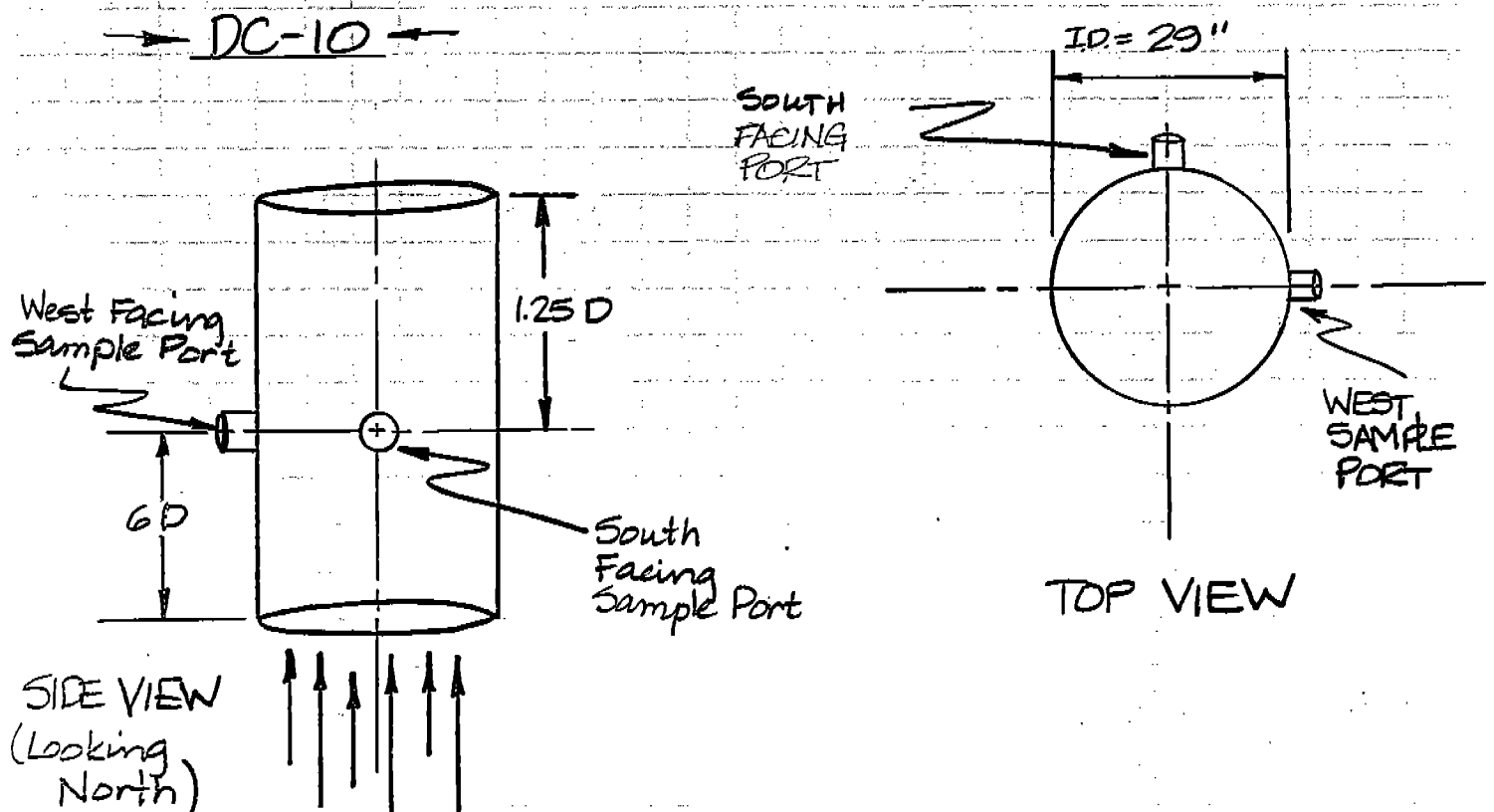
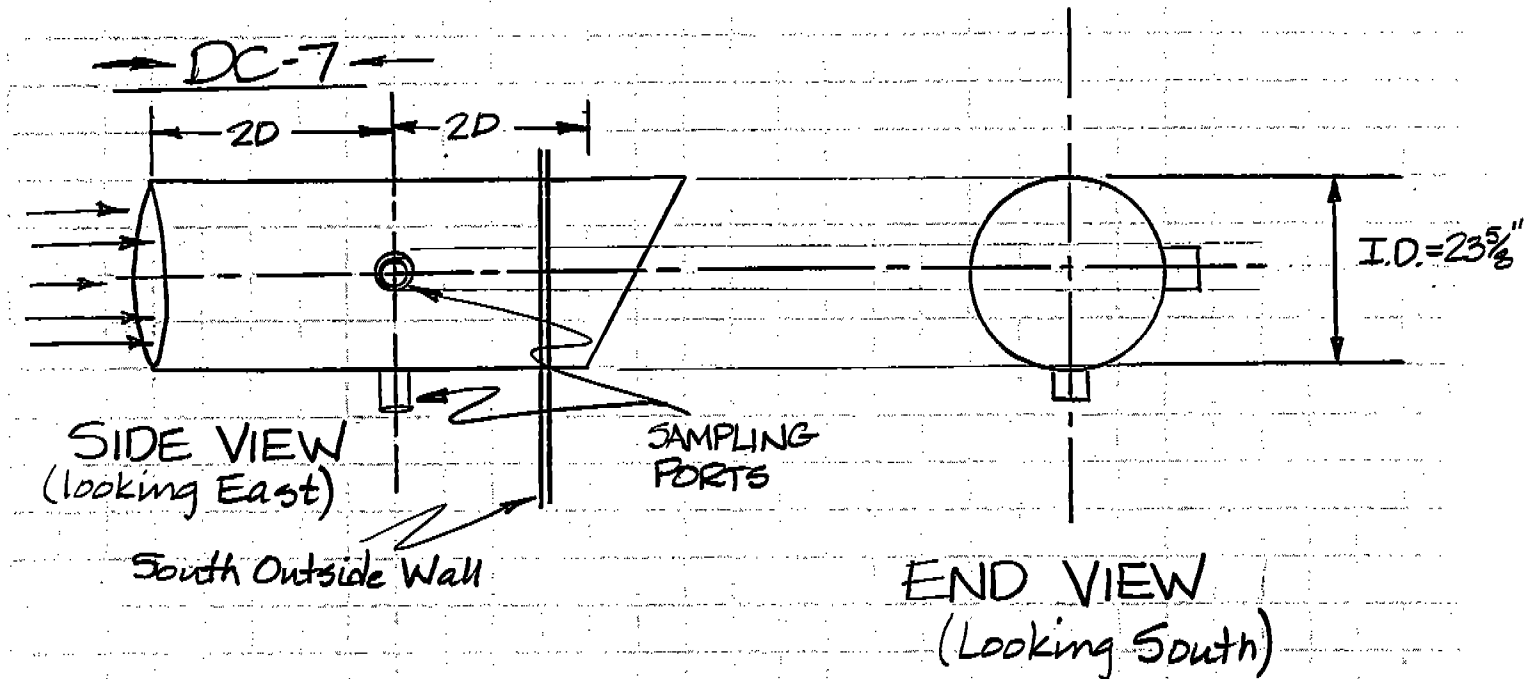
Job Name: LUZENAC/AMERICA

Location: SAPPINGTON

Proj. No.: 94183-1 By: MWA

Date: 3-22-95 Sheet: 1 of 2

SOURCE & SAMPLING PORT SKETCH





BISON ENGINEERING, INC.

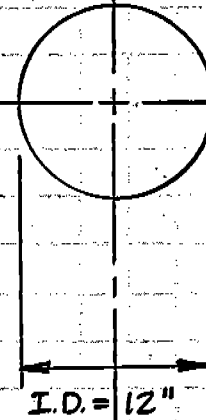
ENGINEERS • SCIENTISTS • PLANNERS

Job Name: LUZENAC/AMERICA
Location: SAPPINGTON
Proj. No.: 94123-1 By: M. ANDERSON
Date: 3-22-95 Sheet: 2 of 2

→ DC-22A ←



SIDE VIEW
(Looking East)



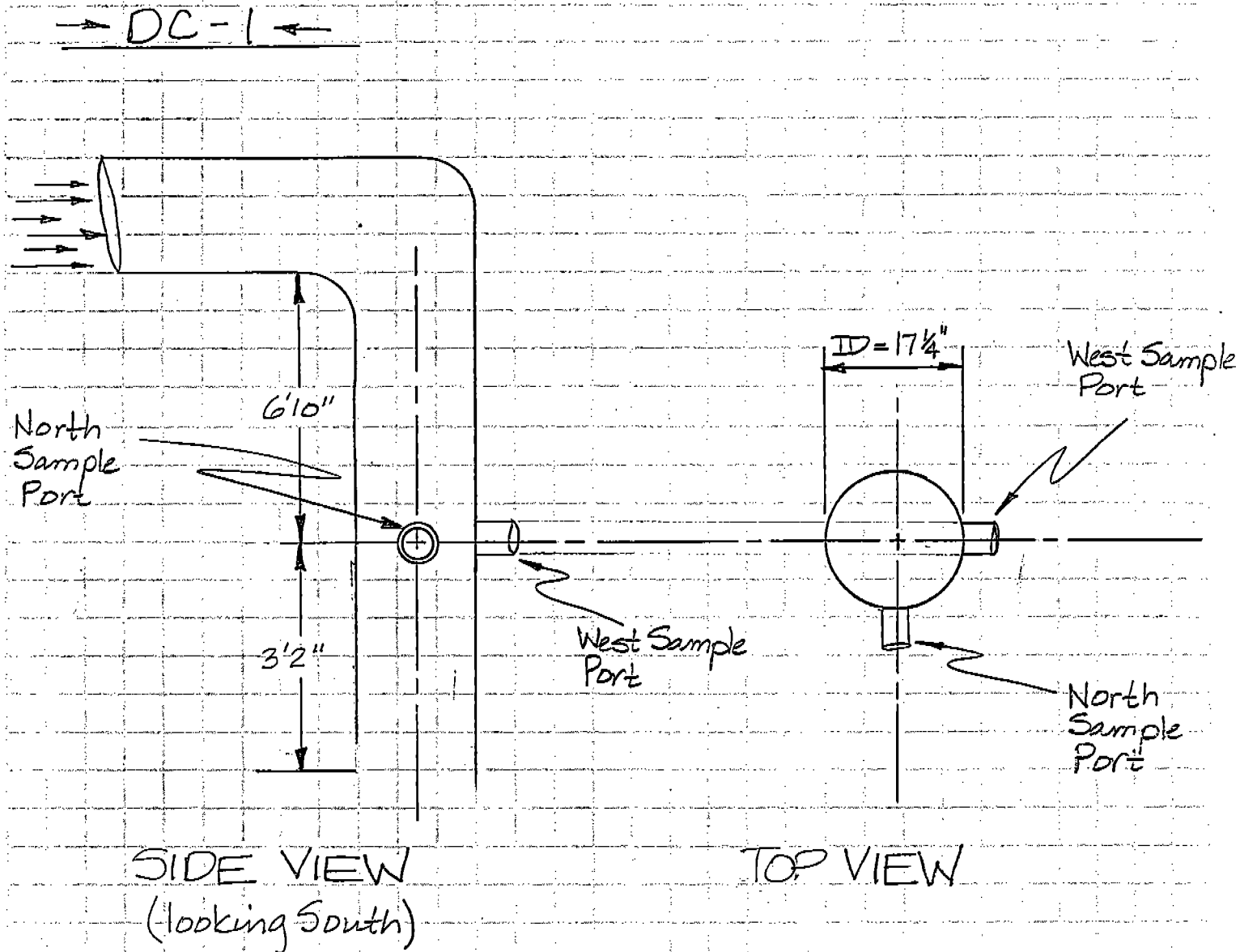
TOP VIEW



BISON ENGINEERING, INC.

ENGINEERS • SCIENTISTS • PLANNERS

Job Name: LUZENAC/AMERICA
Location: JARRINGTON
Proj. No.: 94183-1 By: MMA
Date: 3-22-95 Sheet: 3 of 3



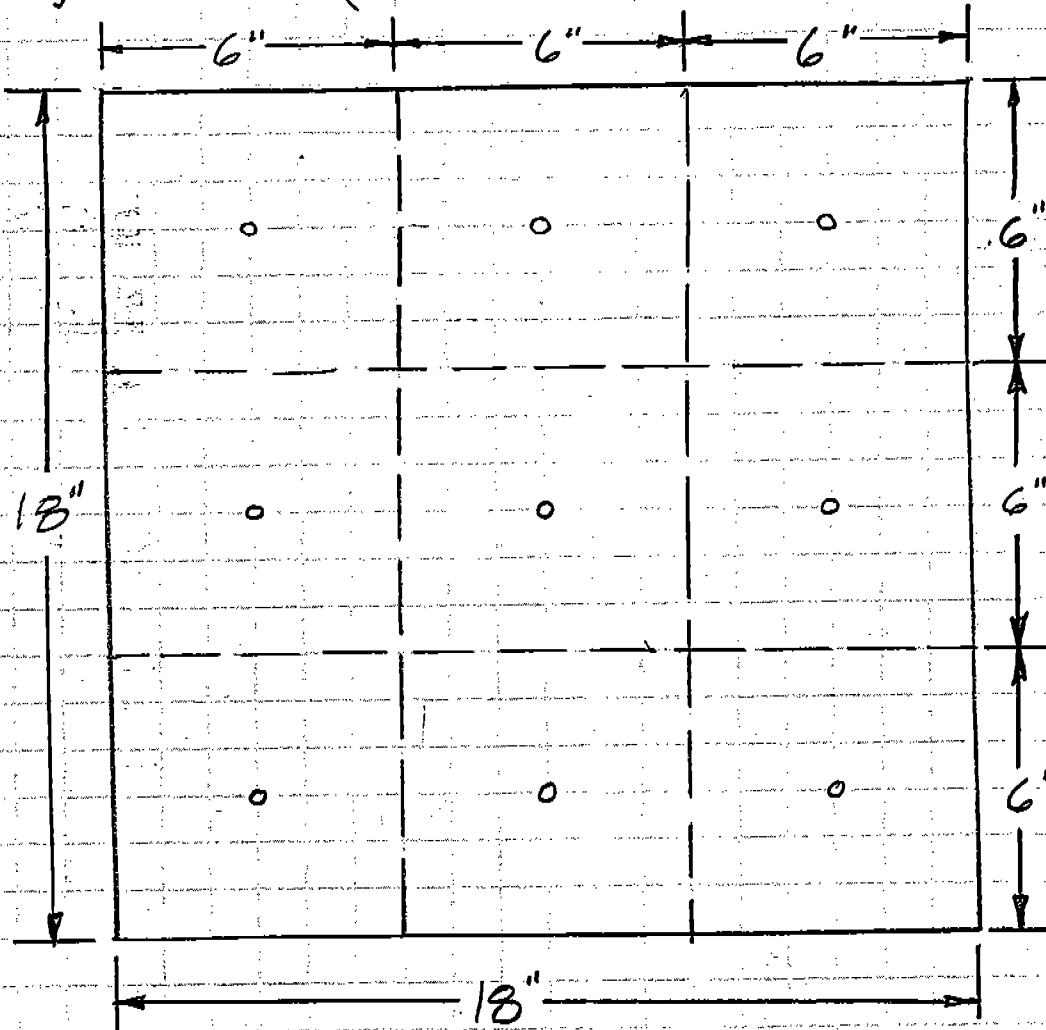


BISON ENGINEERING, INC.
ENGINEERS • SCIENTISTS • PLANNERS

Job Name: LUZENAC
Location: THREE FORKS, MT
Proj. No.: 94183 By: MWA
Date: 12-5-94 Sheet: 1 of 4

PORTABLE STACK DESIGN

→ Try $18" \times 18"$: (Cross Section or End View)



- Flow is perpendicular to page.
- O's above are centroids of squares representing equal areas.
- 3×3 Matrix (Part 60, Appendix A, Method 1, pg 4)



BISON ENGINEERING, INC.

ENGINEERS • SCIENTISTS • PLANNERS

Job Name: LUZENAC
Location: T. FORKS, MT
Proj. No.: 94183 By: MWA
Date: 12-5-94 Sheet: 2 of 4

→ Solve for Equivalent Diameter (D_e):

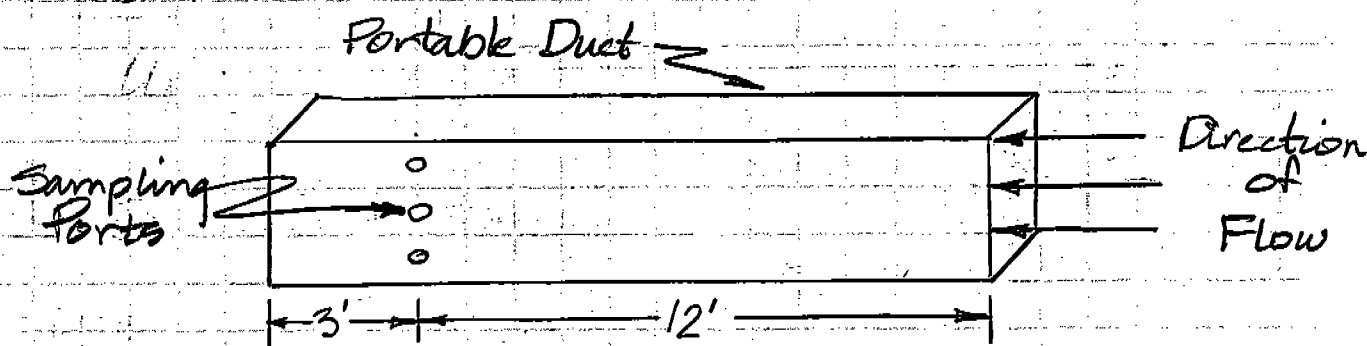
$$D_e = \frac{2LW}{(L+W)} \quad \text{where } L = \text{Length} \\ W = \text{Width}$$

$$D_e = \frac{2(18)(18)}{18+18} = \frac{648}{36} = 18''$$

→ Use 8 & 2 D_e Rule for Duct Design:

$$\text{Upstream Disturbance} = 8D_e = \frac{8(18'')}{12} = 12'$$

$$\text{Downstream Disturbance} = 2D_e = \frac{2(18'')}{12} = 3'$$



→ Determine Number of Traverse Points:

Use Figure 1-1 pg 428.

of Traverse Pts = 9

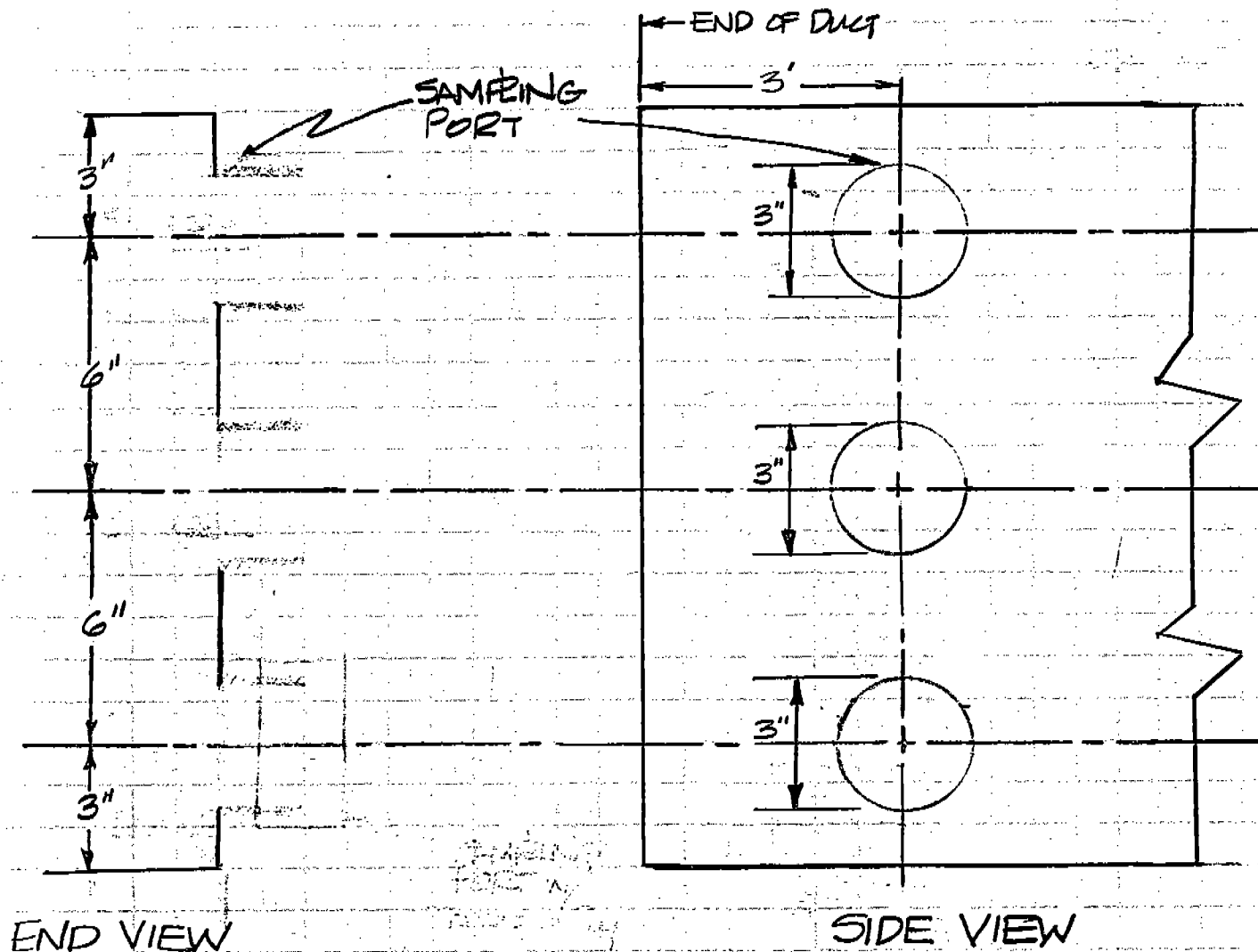


BISON ENGINEERING, INC.

ENGINEERS • SCIENTISTS • PLANNERS

Job Name: LUZENAC
Location: T. FORKS, MT
Proj. No.: 94183 By: MWA
Date: 12-5-94 Sheet: 3 of 4

SAMPLING PORT DETAIL:



- Sampling Ports (3) are 3" holes drilled or cut into side of portable duct.



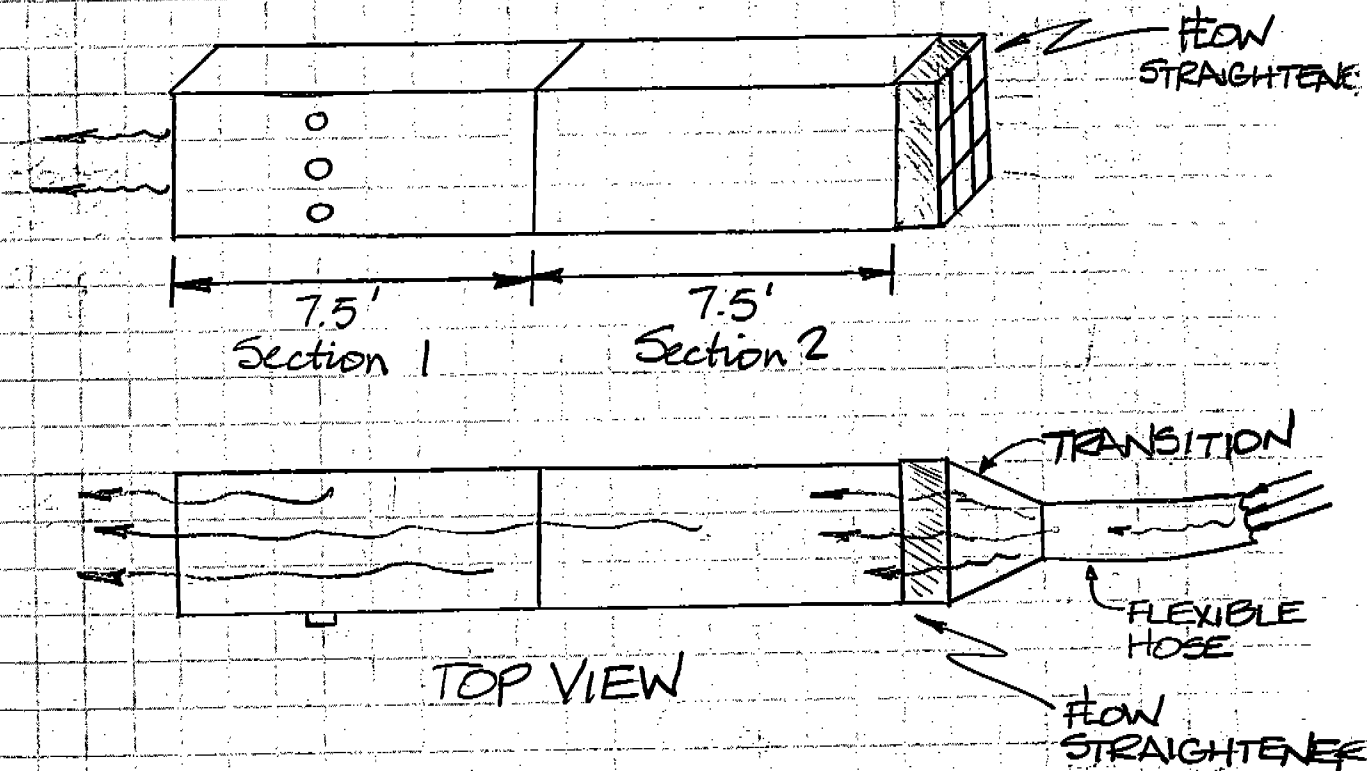
BISON ENGINEERING, INC.

ENGINEERS • SCIENTISTS • PLANNERS

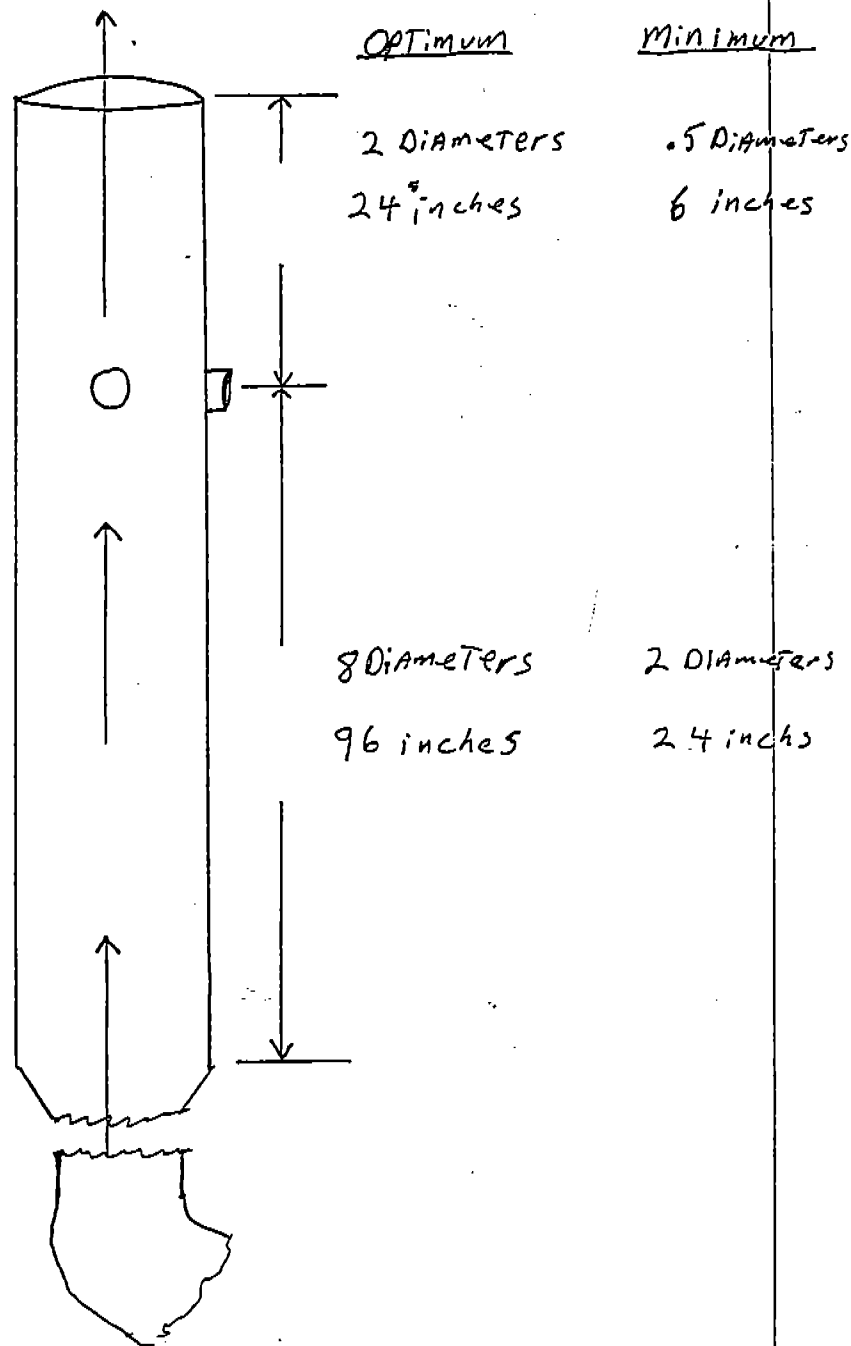
Job Name: LUZENAC
Location: T. FORKS, MT
Proj. No.: 94183 By: MWA
Date: 12-5-94 Sheet: 4 of 4

→ FINAL DESIGN & COMMENTS

- Portable duct is to be made out of light gage steel consisting of 2 separate sections that can be joined together to form a single unit. See below... and fastened



PORTABLE STACK DESIGN (ROUND)



Sketch of Sample port Location.

APPENDIX F: CALIBRATION DATA

DRY GAS METER CALIBRATION DATA (English Units) (60-Day Calibration)

Date October 19, 1994 Meter Box Number 3(80709)

Barometric Pressure, P_b = 25.73 " Hg Calibrated by JKH

Vacuum During Calibration 3.5 " Hg (should be at least 2½" Hg)

Orifice Manometer Setting (ΔH), " H ₂ O	Gas Volume			Temperatures			Time (Θ), min.
	Nom., ft ³	Wet Test Meter (V _w), ft ³	Dry Gas Meter (V _d), ft ³	Wet Test Meter (t _w), °F	Dry Gas Meter		
					Inlet (t _d), °F	Outlet (t _d), °F	
0.5	Start Read	253.517	465.049	80°	78°	78°	Ø
	End Read	258.517	470.104	79°	78°	78°	12.1
1.5	Start Read	268.311	479.890	78°	79°	78°	Ø
	End Read	273.314	484.899	78°	80°	78°	7.0
4.0	Start Read	274.263	485.836	78°	80°	79°	Ø
	End Read	279.264	490.774	78°	81°	79°	4.2

γ = 1.002

$\Delta H@$ = 1.92

DRY GAS METER CALIBRATION DATA (English Units) (60-Day Calibration)

Date Oct. 12, 1994 Meter Box Number 2 (80575)

Barometric Pressure, P_b = 25.96 " Hg Calibrated by JKH

Vacuum During Calibration 4.5 " Hg (should be at least 2½ " Hg)

Orifice Manometer Setting (ΔH), " H ₂ O	Gas Volume			Temperatures			Time (Θ), min.
	Nom., ft ³	Wet Test Meter (V _w), ft ³	Dry Gas Meter (V _d), ft ³	Wet Test Meter (t _w), °F	Dry Gas Meter		
					Inlet (t _d), °F	Outlet (t _d), °F	
0.5	Start Read	236.092	731.556	72°	46°	43°	ϕ
	End Read	241.093	735.586	72°	50°	46°	9.7
1.5	Start Read	241.854	736.321	72°	51°	47°	ϕ
	End Read	246.854	741.159	71°	54°	49°	6.9
4.0	Start Read	248.009	742.276	72°	56°	52°	ϕ
	End Read	253.014	747.030	72°	58°	53°	4.2

$\gamma =$ 1.058

$\Delta H@ =$ 1.92