APPENDIX A:
SOURCE TEST PROTOCOL AND CORRESPONDENCE

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

2110 IRONWOOD PARKWAY • COEUR D'ALENE, IDAHO 83814 • (208) 769-1422

JAMES E. RISCH, GOVERNOR
TONI HARDESTY, DIRECTOR

August 14, 2006

Mr. Calvin Loomis
Project Engineer
Bison Engineering, Inc.
1400 11th Avenue
Helena, MT 59601

Re: Review of the Norm's Utility Contractor, Inc. performance test protocol for the hot-mix asphalt plant located in Rathdrum, Idaho; Facility ID No. 777-00372

Dear Mr. Loomis:

On July 3, 2006, the Department of Environmental Quality (DEQ) received a test protocol, prepared by Bison Engineering, for EPA Method 5 and 9 testing to be conducted on the hot-mix asphalt plant owned by Norm's Utility Contractor, Inc. Bison Engineering will conduct the testing for Norm's Utility pursuant to Permit to Construct No. P-060100, issued April 25, 2006.

DEQ has reviewed the submitted test protocol and hereby approves it with the following comments.

1. The protocol proposes three options for opacity testing. DEQ approves the opacity testing using the third option. According to the third option, a six-minute opacity observation will be performed. If there are one or more readings at 10% opacity or greater the observation period will be extended to 30 minutes. If there are one or more readings at 20% opacity or greater the observation period will be extended to one hour.
2. The asphalt production rate and baghouse pressure differential must be monitored and recorded during the test runs. The baghouse house pressure differential should be recorded four times per test run.
3. In the performance test report, please include the type of fuel used in the asphalt dryer.

The testing has not yet been scheduled. You must notify DEQ at least 15 days prior to the test date; please do so by contacting me. If you have any questions or if I can be of assistance to you, please call me at (208) 769-1422 or contact me by email at Daniel.redline@deq.idaho.gov

Sincerely,

Dan Redline
Air Quality Manager

DR:vh G:\Air Quality\5 Air Quality Files by Facility Name and AIRs#\Norms Utility 777-00371\Norm's Utility_Source Test Protocol Review Letter (Aug 06).DOC

By: **Certified Mail No.** 7000 1670 0005 6151 4342

c: Tom Mattix, Norm's Utility Contractor, Inc.
Steve Bacom, Air Quality Division
Zach Klotovich, Technical Services Division

RECEIVED
AUG 15 2006
BISON

BISON
ENGINEERING, INC.
1400 11TH AVENUE • HELENA, MT 59601 • 406-442-5768
FAX: 406-449-6653 • E-MAIL: bison@bison-eng.com • www.bison-eng.com

June 29, 2006

Dan Redline
Idaho Department of Environmental Quality
2110 Ironwood Parkway
Coeur d'Alene, ID 83814

Dear Dan:

Re: Winkler Materials and Construction Hot Plant Emissions Test

Bison Engineering, Inc. (Bison) submits the attached pretest protocol on behalf of Winkler Materials and Construction to perform the air quality compliance demonstration test at their Rathdrum, Idaho, asphalt hot plant and crushing facility. The testing will be performed according to the attached pretest protocol. The test date will be mid to late August; we will contact you when an exact date is scheduled.

Please contact me, Bill Shaw, Mike Chovanak or Dave Blankenship at 406/442-5768 with any questions.

Sincerely,
BISON ENGINEERING, INC.

Calvin W. Loomis, QSTI
Project Engineer
Process and Emission Services Team Leader

Attachment

cc: Bison file WIN206731
Tom Mattix, Norm's Utility Contractor, Inc.
Jeff Steyaert, Morse Brothers Incorporated

PARTICULATE MATTER TESTING AND OPACITY OBSERVATIONS PROTOCOL FOR WINKLER MATERIALS AND CONSTRUCTION

Prepared for:
Norm's Utility Contractor, Incorporated
PO Box 2047
Coeur d'Alene, ID 83816

Prepared by:

BISON ENGINEERING, INC.
1400 11th Avenue
Helena, MT 59601
www.bison-eng.com

June 29, 2006

TABLE OF CONTENTS

1.0 Introduction 1
- 1.1 Test Program Organization 1
- 1.2 Test Project Objective 2

2.0 Emission Source Information 3
- 2.1 Facility Description 3
- 2.2 Emission Sources Descriptions 3
- 2.3 Source Emission Limitations 3

3.0 Source Testing Program Description 5
- 3.1 Testing Contractor 5
- 3.2 Test Dates 5
- 3.3 Pollutants to be Measured 5

4.0 Source Testing Procedures 6
- 4.1 Test Plan 6
- 4.2 Test Methods 7
- 4.3 Analytical Methods 8
- 4.4 Sampling Site Location 9
- 4.5 Safety Considerations and Working Conditions 9

5.0 Quality Assurance and Quality Control Procedures 10
- 5.1 Documentation, Tracking and Certifications 10
- 5.2 Sampling Handling Protocol 10
- 5.3 Sample Solutions Pretest QA 10
- 5.4 Audit Samples 11
- 5.5 Equipment & Instrumentation Calibration, Audits and Maintenance 11
- 5.6 Instrument Calibration Gases 12
- 5.7 Data Collection, Reduction & Validation 12
- 5.8 Report Submission and Format 13

1.0 INTRODUCTION

Bison Engineering, Inc. (Bison) has been retained by Winkler Materials and Construction to conduct emissions testing on their crushing facility and hot mix asphalt plant. The testing will be performed according to the details in this pretest protocol.

1.1 Test Program Organization

Facility Name: **Winkler Materials and Construction**
Address: 3978 W. Wyoming Avenue
Rathdrum, ID 83858
Phone: (208) 687-8280 Fax: (208) 687-8373

Office: **Norm's Utility Contractor, Inc.**
PO Box 2047
Coeur d'Alene, ID 83816
Contact: Tom Mattix, Operations Manager
Phone: cell - (208) 661-5076

Morse Brothers Incorporated
Contact: Jeff Steyaert, Environmental Manager
Phone: 541/928-6491 Fax: 541/928-6494
Email: jeff.steyaert@morsebros.com

Asphalt Plant Facility ID: No. 777-00372
Asphalt Plant Permit: No. P-060100

Crushing Facility ID: No. 777-00383
Crushing Facility Permit: No. PR-060117

Consultant: Bison Engineering, Inc.
Address: 1400 11th Avenue
Helena, MT 59601
Contacts: Cal Loomis, Project Engineer
Bill Shaw, Project Engineer
Mike Chovanak, Project Engineer
Phone: (406) 442-5768 Fax: (406) 449-6653
Email: cwloomis@bison-eng.com

State Authority: Idaho Department of Environmental Quality (IDEQ)
Address: 2110 Ironwood Parkway
Coeur d'Alene, ID 83814
Contact: Dan Redline
Phone: (208) 769-1422

1.2 Test Project Objective

The objective of this testing project is to determine the air pollutant concentrations and/or emission rates from the sources listed herein and to demonstrate compliance. The objective of this protocol is to outline the emission test plan, and the appropriate methods and procedures Bison will use to complete the testing and report the data to the regulatory authority listed in this report.

2.0 EMISSION SOURCE INFORMATION

2.1 Facility Description

Winkler Materials and Construction (Winkler) owns and operates a portable hot mix asphalt plant and a rock crushing facility which are permitted to Norm's Utility Contractor, Inc. These facilities are currently operating near Rathdrum and Post Falls, Idaho.

2.2 Emission Sources Descriptions

Asphalt Plant

Winkler operates a 1991 Hauck Quad Burner Model 8835HMSIPR drum-mix rotary asphalt mixing plant. It is supported by associated conveyors, material feed hoppers, fuel, and asphalt oil and out-feed conveyor and scale.

The conveyors move sorted aggregate into the "hot" end of the natural gas-fired dryer. The rotating drum dries the aggregate and pugs asphalt oil into the mix while it moves to the out-feed conveyor. Permit To Construct (PTC) Number P-060100 stipulates a production limit of 250 tons of asphalt per hour (tph).

A stack blower pulls hot gases and fines from the drum and pushes them through a baghouse. The baghouse removes the particulate from the gas stream. The baghouse exhausts to the atmosphere through a stack.

During the test, the pressure drop across the baghouse and the hourly production rate of the hot-mix asphalt plant will be logged and expressed as tons per hour.

Rock Crusher

Winkler operates a 1974 Pioneer jaw crusher, an El-Jay cone crusher, an ISC V.S.I., and various other equipment associated with nonmetallic mineral processing.

The equipment listed above is designed for use in crushing, screening, and combining of rock for use as raw material in various aspects of road making, landscaping, and other designated operations.

2.3 Source Emission Limitations

Asphalt Plant

PTC No. P-060100 refers to specific emission limits of particulate matter (PM) and opacity. The facility must meet the requirements of 40 CFR 60 Subpart I - *Standards of*

Performance for Hot Mix Asphalt Facilities, IDAPA 50.01.01.157 and General Provisions Section 6 of the permit.

PTC No. P-060100 sets limits as follows:

- PM shall not exceed 0.04 grains per dry standard cubic foot (gr/dscf).
- PM shall not exceed 8.25 pounds per hour (lb/hr).
- Opacity shall not exceed 20% in any 3-minute average during any 60-minute period.

Rock Crusher

Rule Registration Notification PR-060117 states that the rules for control of nonmetallic mineral processing plants are set forth in IDPA 58.01.01.790 through 802 (Rules for Control of Air Pollution in Idaho). This rule specifies that the observed opacity emissions from all nonmetallic mineral processing plants be limited to 20% in any 3-minute average during any 60-minute period from each transfer location, drop point, screening and crushing activity.

3.0 SOURCE TESTING PROGRAM DESCRIPTION

3.1 Testing Contractor

Bison's *Process and Emissions Testing Services* department is led by Calvin Loomis, P.E., Project Engineer and Team Leader. Bison's laboratory is managed by Mike Chovanak, E.I.T., Project Engineer. Other Bison personnel in the testing services section include Bill Shaw, P.E., Project Engineer, Dave Blankenship, Senior Environmental Technician and Jim Wollenberg, Field Technician. Emission testing may be led by any of the above-mentioned personnel and assisted by additional staff members. All members of the testing team are fully qualified to perform the duties assigned to them.

3.2 Test Dates

Testing will be performed in mid to late August. Bison personnel will notify IDEQ two weeks prior to the testing. Facility testing will be dependent upon weather conditions and job availability for the contractor.

3.3 Pollutants to be Measured

Particulate matter (PM) as determined by 40 CFR 60 Appendix A, Method 5. PM is the material collected within the front half of a Method 5 system. The front half includes the nozzle, probe liner, filter bell front half and the glass fiber filter.

Opacity as determined by 40 CFR 60 Appendix A, Method 9.

4.0 SOURCE TESTING PROCEDURES

4.1 Test Plan

The testing will be performed according to the methods listed in this protocol. The project is summarized in the following table.

Table 1: Test Matrix

Winkler Materials Test Matrix			
Source	**Method**	**Parameter**	**Test Plan and Comments**
Asphalt Plant Baghouse	Method 1	Measurement Location	One measurement per source
	Method 2	Flow	Concurrent with Method 5
	Method 3	Molecular Weight	Shall assign 30.0 for dry molecular weight in accordance with section 1.3
	Method 4	Moisture	Concurrent with Method 5
	Method 5	PM	Three test runs, sample volume ≥31.8 dscf and sample time of ≥60 minutes
	Method 9[1]	Opacity[1]	Three 60-min observations of worst case operations during the day [1]
Mineral Processing Facility	Method 9	Opacity	Opacity observations will be performed according to Subpart OOO which states, "In determining compliance with the opacity...the duration of the Method 9 observations may be reduced from 3 hours to 1 hour only if the following conditions apply: (i) There are no individual readings greater than 10 percent; and (ii) there are no more than 3 readings of 10 percent for the 1-hour period."

[1] Due to the fact that the opacity readings are generally less than half the emission limitation or zero, and 60 minutes is 10 times greater than the required Method 9 observation duration, Bison requests a variance from the permit requirement to alleviate the time and money burden on the source. Bison requests that the State choose one of the following three options to perform the opacity readings at the source:

1. Perform opacity readings as specified in Method 9, Section 2.4 Recording Observations, which states, *"Opacity observations shall be recorded ... at 15-second intervals on an observations record sheet. A minimum of 24 observations recorded shall be deemed to represent the average opacity of emissions for a 150second period."*
2. Perform twice the minimum requirement of Method 9 for a total of 12-minutes.
3. Perform 6-minute observations. If there is one reading at half the permit limit of 10%, the observations shall be extended to 30 minutes. If there is one reading at the permit limit the readings shall be extended to 1 hour.

4.2 Test Methods

To complete the testing Bison personnel will employ the following EPA methods described in Title 40, Code of Federal Regulations (CFR), Part 60, Appendix A:

EPA Reference Method 1, *"Sample and Velocity Traverses for Stationary Sources."* The objective of Method 1 is to determine a suitable location for testing and to determine the velocity and/or sample points for the source. The distance upstream to atmosphere from the sampling ports (Distance A) is measured and the distance downstream to the nearest disturbance from the sample points (Distance B) is measured. Distances A and B are applied to Method 1, Figure 1-1 for particulate matter (PM) sampling points or Figure 1-2 for velocity measurement points. These figures give the minimum number of sample points according to the dimensions of the source. The number of points and the stack diameter are then applied to Method 1, Table 1-2 to determine equal area measurement points within the source. The results of Method 1 sampling location and sample or velocity point measurement locations will be included in a report appendix.

EPA Reference Method 2, *"Determination of Stack Gas Velocity and Volumetric Flow Rate (Type-S Pitot Tube)." Concurrent with Method 5.* The objective of Method 2 is to measure stack gas velocity, collect temperature data, and calculate a volumetric flow. Method 2 velocity measurements are performed using a Type S pitot tube attached to a Method 5 particulate sampling probe. Differential pressures are measured using an inclined manometer, and temperatures are measured using a k-type thermal indicator. Bison has incorporated 0.84 as the Type S pitot tube coefficient (Cp). The average velocity, temperature, static pressure, and source area are used to calculate volumetric flow within the source. This field data is recorded on Method 5 field data sheets. Copies of the field data sheets, results from the flow calculations, and calibration data are included in the report appendices.

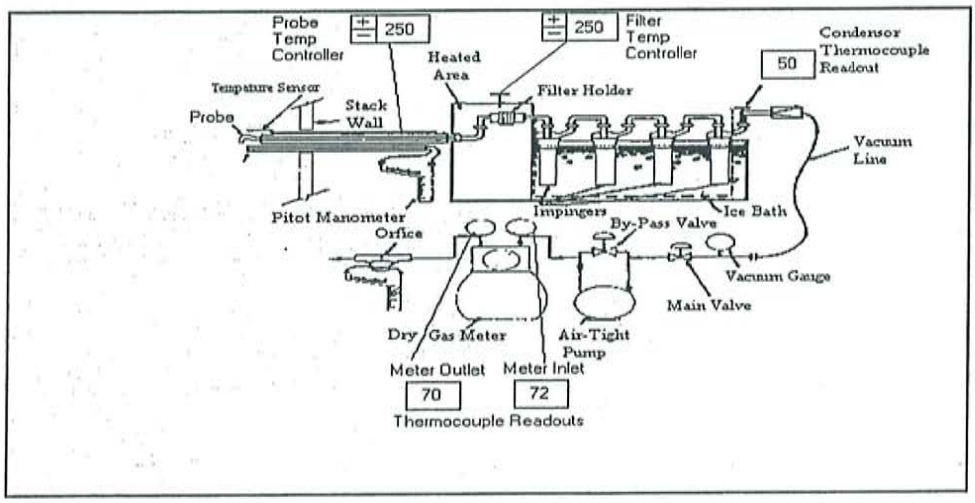
Method 3, *"Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources."* The objective of Method 3 is to determine the molecular weight (MW) of the source stream and to determine oxygen (O_2) and carbon dioxide (CO_2) concentrations in the stack gas stream. Method 3 Section 1.2 allows the use of 29 for ambient conditions and 30 for combustion sources burning coal, oil or natural gas in lieu of performing actual measurements.

Method 4, *"Determination of Moisture Content in the Stack Gases." Concurrent with Method 5.* Method 5 testing allows the option to obtain Method 4 moistures via the Method 5 sampling system while maintaining an isokinetic sampling rate. The objective of Method 4 is to determine the moisture content of a gas stream. The principle of the method is to impinge a sample through chilled water and silica gel which captures any source gas moisture. The moisture is removed from the sample stream and the volume (or mass) of water extracted is determined. The sample volume and water volume (or mass) are used to calculate the moisture content of the stack gas. Method quality assurance is to perform a pre- and post-test dry gas meter (DGM)

calibration. The impinger waters are volumetrically measured on-site and the silica gels are weighed on-site. The sampling data is hand-recorded on field data sheets and then entered into spreadsheets for moisture determination calculations.

Method 5,*"Determination of Particulate Emissions from Stationary Sources" (Methods 2 & 4 Inclusive).* The objective of Method 5 is to determine the filterable particulate matter (PM) from a source. Bison uses a Method 5 sampling train with a stainless steel probe to gather the particulate sample. Method 5 incorporates Method 2 "velocity measurements" and Method 4 "moisture measurements." Method 5 PM samples incorporate the nozzle and probe rinse, the front half of the filter bell and the filter. A schematic of the Method 5 sampling system is shown in Figure 1.

Figure 1: Method 5 Sampling Train Schematic



EPA Method 9, "*Visual Determination of the Opacity of Emissions from Stationary Sources.*" The objective of Method 9 is to quantify the visible opacity of a source plume. The principle of the method is for an observer to take quick observations of the plume at 15-second intervals, determine the reduction of light when looking through the plume and record a numerical value of the plume opacity. If the plume is white, the observer determines the reduction in background detail due to plume opacity. If the plume is black, the observer is to determine the reduction in light passing through the plume. Opacity observations are performed by a certified observer and are generally performed concurrently with the Method 5 testing series unless weather conditions do not allow proper reading. Should weather interfere with observations, Bison personnel will work to perform observations at a later date.

4.3 Analytical Methods

The analytical methods shall follow the procedures set forth in the EPA methods listed in this protocol. Bison will perform the analytical analysis at the Bison laboratory in

Helena, Montana. Lab data is directly entered into computer spreadsheets; no written lab data is created.

Filter Media: Post-test filter description is recorded on field data sheets. Before field use, the filters are desiccated for a minimum of 24 hours, then weighed and desiccated at 6-hour intervals until a constant pre-test tare is achieved. After the tests, the filters are desiccated for a minimum of 24 hours, then weighed and desiccated at 6-hour intervals until a constant post-test weight is achieved. The difference between the average pre-test tare and average post-test weight is the filter mass capture. Sample descriptions are recorded on the field data forms.

Nozzle, Probe and Filter-bell Rinse: The nozzle, probe and filter-bell are rinsed with acetone. The rinsate is collected in a sample bottle, transferred to a pre-conditioned, tared aluminum sample boat and heated to evaporate the acetone. The boat is again conditioned and weighed to determine "front-half" rinse particulate matter. The rinse mass capture is added to the filter particulate capture to determine "front-half" filterable PM emissions.

Impinger Water: Post-test impinger water description of color and presence of film are recorded on field data sheets. The impinger waters are volumetrically measured after each test run. The water will then be discarded.

Silica Gel: Bison transports pre-dried silica gel in airtight containers holding approximately 250 grams. Each container is weighed prior to use in a sampling train. After testing, the gel is placed back into the container and reweighed for moisture gain. Pre- and post-test silica gel weights are recorded on field data sheets.

4.4 Sampling Site Location

The sampling location and traverse points will be determined via Method 1, Section 11.2.1.2.

4.5 Safety Considerations and Working Conditions

Bison personnel will adhere to facility safety requirements. Bison personnel may be required to hoist the sampling equipment to the source being tested. Yellow caution tape may be placed to alert people to overhead work. When required, radio or hand signals will be used for safe lifting. Hazards associated with this facility include elevated working heights, ladders, electrical usage, heated equipment and hot surfaces. These sources may require the use of powered man-lift equipment or scaffolding. Test equipment may need to be rope-hoisted, lifted or carried up staircases. Testers will have the following safety equipment at hand: hard hat; full-length pants, shirt, and/or coveralls; goggles (as required); full-height (over the ankle) work boots; hearing protection; work gloves; appropriate half- or full-face respirators.

5.0 QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

5.1 Documentation, Tracking and Certifications

Bison uses a project number for document control and tracking for all projects. Each project that Bison works on is assigned a project number. All documentation pertaining to that project is filed in the same place under that project number. This assures all pertinent information can be found easily at a later date.

The tracking number for this project is **WIN206731**.

Bison's testing project leader will sign an "Emission Source Test Certification" to document and authenticate that the testing was performed according to the methods and applicable IDEQ requirements.

Any changes or revisions to the Source Test Protocol are kept with the protocol and appended to the source test report. Any correspondence from the appropriate authority regarding the protocol is also appended to the source test report.

5.2 Sample Handling Protocol

Bison's test, laboratory, reporting, and quality assurance procedures will 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).

The individual test methods specify handling procedures for physical samples (liquids, traps, etc.). Bison will follow the procedures outlined in the appropriate methods as described in EPA 40 CFR Part 60, Appendix A and Appendix B.

Samples collected during this project will be uniquely identified and will remain in the possession of Bison personnel without a chain of custody. A "chain of custody" will be employed if samples are removed from Bison's possession.

Lab data is directly entered into computer spreadsheets; no written data is created.

5.3 Sample Solutions Pretest QA

De-ionized Distilled Water and Acetone Blank Analysis: De-ionized water and acetone used in the sampling and recovery of the PM samples are analyzed for percent residue. The solutions are purchased with a pre-analysis meeting or exceeding the 0.001 percent residue by weight specification. Bison's current stock is shown in the following table:

Table 2: Pretest Sample and Recovery Solution QA

Bison Engineering Sample and Recovery Solutions			
Solution	**Method 5 Reference**	**% Residue by Weight**	**Limitation**
Acetone	Section 3.1.3	0.00005%	≤0.001%
DI Distilled Water	Section 3.2	0.0002%	na

5.4 Audit Samples

Bison is willing to work with audit samples for any of the methods listed within this protocol. The audit sample must be required by the enforcement agency.

Source Test Audit Coordinator
Quality Assurance Division
Atmospheric Research & Exposure Assessment Lab.
US Environmental Protection Agency
Research Triangle Park, NC 27711
ph# 919/541-7834

5.5 Equipment & Instrument Calibration, Audits and Maintenance

Bison's laboratory personnel periodically calibrate equipment and instruments with standards traceable to the National Institute of Standards and Technology (NIST). All equipment requiring calibrations for the methods described in Section 3.5 will meet the appropriate criteria as specified in EPA 40 CFR Part 60, Appendix A. The test report will include applicable data as an appendix.

The following table shows Bison's calibration and audit procedure schedule. Bison defines a calibration as the procedure of changing a measurement system or device to match a constant or standard measurement system or device, whereas an "audit" is checking the variance between a measurement system or device and a constant or a standard measurement system or device. Bison's equipment meets applicable EPA method calibration parameters. The final test report will include applicable calibration data as an appendix.

Table 3. Equipment & Instrumentation Calibration and Audit Procedure

Equipment Calibration and Audit Procedure		
Unit	**Schedule and Requirement**	**Reference**
Probe nozzle	Calibration prior to initial field use or after repair from damage	Method 5, 5.1
Isolated S-type pitot tubes	Calibration prior to initial field use.	Method 2, 10.1.5.2.1
	Re-examined with each field use.	Method 2, 10.3.1
Probe heater	Calibration prior to initial field use	Method 5, 5.4
Temperature gauges	Audited using traceable thermometers.	Method 2, 10.3.1
Barometer	Calibrated against Hg barometer prior to test.	Method 2, 10.4
Dry gas meters	Calibrated prior to use.	Method 5, 10.3.1
	Calibrated after use.	Method 5, 10.3.2
Analytical balance	Calibrated each year by independent auditor	Na
Analytical balance	Audited and logged each day of weighing	Na

5.6 Instrument Calibration Gases

The calibration gases used are all certified as EPA Protocol 1 gases, and are purchased from Scott Specialty Gases. The calibration gas certifications will be included in the test report as an appendix.

5.7 Data Collection, Reduction & Validation

Field data such as velocity measurements or isokinetic sampling data are hand-recorded on field data sheets. The data is then entered into computer spreadsheets where QA/QC and emission calculations are performed according to the method calculations. Gaseous emissions test data is recorded on a stripchart, a copy of which will be supplied in the emission test report. All additional field data will be supplied in an appendix to the report. Test data and reports are reviewed for technical content by a staff engineer or staff scientist, and final reviews are performed by either the team leader or senior staff. All field data and spreadsheets will be supplied in an appendix to the report. Sample calculations are not included with this protocol but can be submitted upon request.

Technical Issue: Rounding of Significant Figures

If the first digit to be discarded is less than five, the last digit retained should not be changed. When the first digit discarded is greater than five, or if it is a five followed by at least one digit other than 0, the last figure retained should be increased by one unit. When the first digit discarded is exactly five, followed only by zeros, the last digit retained should be rounded upward if it is an odd number, but no adjustment made if it is an even number.

For example, if the emission standard is 90, than 90.357 would be rounded to 90, 90.639 would be rounded to 91, 90.500 would be rounded to 90, and 91.500 would be rounded to 92.

Standard	Number	Rounded To
90	90.357	90
90	90.639	91
90	91.500	92

William G. Laxon and John S. Seitz, New Source Performance Standards/National Emission Standards for Hazardous Pollutants Compliance Contacts (June 6, 1990), pp. 3-4.

5.8 Report Submission and Format

Bison will submit the final report within 30 days after completion of the testing project and will use our current report format which has been submitted with previous source tests. Bison's report format lists much of the relevant data in the pretest protocol and does not reiterate it in the final report unless there are changes from the data listed in the protocol.

Bison's report appendices include: pretest protocol and correspondence, field data, lab data, spreadsheets, nomenclature and formulae, and calibrations, audits and certifications

APPENDIX B:
FIELD DATA, SPREADSHEETS AND LABORATORY DATA

Bison Engineering
Method 1 Spreadsheet
Sample Location, Velocity and PM Points

COMPANY	**Winkler Materials**
FACILITY	**Hot Plant**
LOCATION	**Post Falls, ID**
SOURCE	**Stack**
DATE	**Sept 6, 06**

Spreadsheet revised June 6, 2006

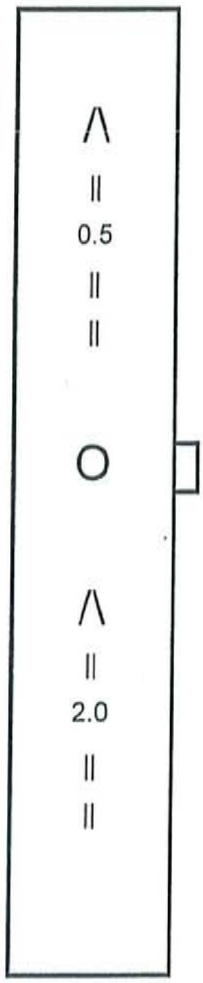
Method 1 Stack Diagram
Upstream and Downstream Distances
Round Stack

Company: Winkler Materials
Facility: Hot Plant
Location: Post Falls, ID
Source: Stack

STACK DIAMETER	40.00	inches
STACK AREA	8.73	sq in
STACK AREA	0.06	sq ft

Distance A

feet	
inches	20
UPSTREAM DISTANCE "A"	20.0
DUCT DIAMETERS	0.5



PORT DEPTH	1.5	inches
PORT WIDTH	4	inches

SAMPLE LOCATION

Distance B

feet	
inches	80
DOWNSTREAM DISTANCE "B"	80.0
DUCT DIAMETERS	2.0

Method 1, Twelve Traverse Point Locations

Company Winkler Materials
Facility Hot Plant
Location Post Falls, ID
Source Stack
Date Sept 6, 06

Stack diameter	40	inches
Stack Area	8.73	sqft
Port Depth	1.5	inches
Diameters up stream distubance	0.5	diameters
Diameters down stream disturbance	2.0	diameters

12 Sample Point Locations

Traverse Point	Area %	ID Sample Point	Port Depth	OD Sample Point
1	2.10	0.84	1.50	2.34
2	6.70	2.68	1.50	4.18
3	11.80	4.72	1.50	6.22
4	17.70	7.08	1.50	8.58
5	25.00	10.00	1.50	11.50
6	35.60	14.24	1.50	15.74
7	64.40	25.76	1.50	27.26
8	75.00	30.00	1.50	31.50
9	82.30	32.92	1.50	34.42
10	88.20	35.28	1.50	36.78
11	93.30	37.32	1.50	38.82
12	97.90	39.16	1.50	40.66

Minimum point from wall must be 1 inch

Bison Engineering
Method 5 Spreadsheet
PM Test

COMPANY	**Winkler**
FACILITY	**Asphalt Plant**
LOCATION	**Post Falls, Idaho**
SOURCE	**Bag House**
DATE	**Sept 6, 06**

Spreadsheet revised May 12, 2004
No major changes made Cal

Client		**Winkler**			
Facility		**Asphalt Plant**			
Location		**Post Falls, Idaho**			
Source		**Bag House**			
Test date		Sept 6, 06	Sept 6, 06	Sept 6, 06	
Start time		08:40	10:20	12:05	
Test run		One	Two	Three	
Preliminary info					
Barometric pressure [Bp]	"Hg	27.81	27.85	27.88	
Stack Diameter	inch	40	40	40	
stack exit area	sqft	8.73	8.73	8.73	
Meter box ID		3	3	3	
meter box Yi		0.978	0.978	0.978	
meter box delta H@		1.751	1.751	1.751	
Pitot tube coefficient Cp		0.84	0.84	0.84	
Test Information					
nozzle size [nz]	inch	0.315	0.243	0.243	
filter number		2829	2831	2832	
Sample points		24	24	24	
Point duration	min	2.5	2.5	2.5	
Test duration	min	60	60	60	
Isokinetics [i]	%	101	106	106	
Sample volume, eq 4.3	dscf	57.15	37.00	34.64	
avg delta P	"H_2O	0.63	0.727	0.622	
avg sqrt delta P	"H_2O	0.77	0.814	0.762	
avg meter box delta H	"H_2O	3.25	1.37	1.18	
avg meter temp [Tm]	deg F	72	87	99	
Leak check volume	dscfm	0	0	0	
Stack Information					**AVERAGES**
avg stack temp [Ts]	deg F	266	274	277	272
actual stack flow	acfm	28187	29990	28124	28767
actual stack velocity [Vs]	ft/sec	53.83	57.28	53.71	54.94
Standard stack flow	dscfm	15170	15791	14708	15223
stack moisture [bws], eq 4.4	% v/v	20.40	21.43	21.76	21.20
measured static pressure	"H_2O	0.5	0.5	0.5	0.50
stack static pressure [ps]	"Hg	27.85	27.89	27.92	27.89
Oxygen content	$\%O_2$	10	10	10	10.00
Carbon dioxide content	$\%CO_2$	10	10	10	10.00
Wet (Actual) Molecular Weight, Ms	lb/lb.mole	27.55	27.42	27.39	27.45
Dry Molecular Weight, Md	lb/lb.mole	30	30	30	30.00
Lab Information					
Impinger H_2O Gain	mls	290	205	195	
Impinger H_2O volume [V_{wc}(STD)], eq 4.1	scf	13.65	9.65	9.18	
Silica Gel H_2O Gain	grams (g)	21.2	9.4	9.7	
Silica Gel volume [V_{sg}(STD)], eq 4.2	scf	1.00	0.44	0.46	
Particulate Matter less blank (PM)	g	0.0144	0.0113	0.0126	
PM less BLANK	grains (gr)	0.2222	0.1744	0.1944	
Emissions					**AVERAGES**
Particulate Matter [PM]	gr/dscf	0.0039	0.0047	0.0056	0.005
PM mass rate	lbs/hr	0.51	0.64	0.71	0.6171

METHOD 5 SAMPLE CALCULATION

Plant:	Winkler	Test Run:	0
Location:	Post Falls, Idaho	Start Time:	08:40
Source:	Bag House	Test Duration:	60
Date:	Sept 6, 06	Meter Box:	3

Meter Absolute Temperature:

$T_m = T_{m*} + 460$ $\Longrightarrow$ T_m = 72 + 460 = 532 °R

T_m Absolute average dry gas meter temperature °K; (°R)
T_{m*} Average meter temperature °F

Dry Gas Volume (dry gas meter):

$$V_{m(std)} = K_1 V_m Y [(P_{bar}+(\Delta H/13.6))/T_m]$$ eq. 5-1

$$\frac{17.64\ °R}{in.\ Hg} \cdot \frac{63.37\ dscf}{} \cdot 0.978 \cdot \frac{27.81\ in.\ Hg}{532\ °R} = 57.15\ dscf$$

$V_{m(std)}$ Volume of gas sample measured by the dry gas meter, corrected to standard conditions dscm (dscf)
K_1 = 0.3858 K/mm Hg for meteric units; = 17.64 R/in. Hg for English units
V_m Volume of gas as measured by dry gas meter, dcm (dscf)
P_{bar} Barometric pressure at the sampling site, mm Hg (in. Hg)
ΔH Average pressure differential across the orifice meter mm H_2O; (in. H_2O)
Y Dry gas meter calibration factor

Volume of Water Vapor:

$$V_{wc(std)} = [V_{1c}\, \rho_w\, R\, T_{std}] / [M_w\, P_{std}] = K_1 V_{1c}$$ eq. 5-2

$$V_{wsg(std)} = [V_{1c}\, \rho_w\, R\, T_{std}] / [M_w\, P_{std}] = K_2 W_{1c}$$

$$V_{w(std)} = V_{wc} + V_{wsg}$$

$$Vw(std) = \frac{0.04707\ ft3}{ml} \cdot \frac{290\ ml}{} + \frac{0.0472\ ft3}{ml} \cdot \frac{21.2\ g}{} = 14.65\ ft3$$

Vw(std) = 13.65 + 1 = 14.65 ft3

V_{1c} Total volume of liquid collected in impingers and silica gel ml
K_2 = 0.001333 m^3/ml got metric units; = 0.04707 ft^3/ml for English units.

Moisture Content:

$$B_{ws} = [\ V_{w(std)}\ ] / [\ V_{m(std)}+V_{w(std)}\ ]$$ eq. 5-3

$$\frac{14.6499\ scf}{} \cdot \frac{1}{57.15\ scf}\ \text{plus}\ \frac{1}{14.65\ scf} = 0.2$$

B_{ws} Water vapor in the gas stream, proportion by volume
$V_{w(std)}$ Volume of water vapor in the gas sample, corrected to standard conditions, scm; (scf)

Average Stack Gas Velocity:

$$V_s = K_p * C_p \text{ avg sqrt (delta P)} \sqrt{T_{s(avg)} / P_s * M_s}$$ eq. 2-9

$$85.49 \cdot \frac{0.84}{} \cdot 0.77 \cdot \sqrt{\frac{726\ °R}{27.85\ in.\ Hg \cdot 27.55\ \frac{lb}{lb\text{-}mole}}} = 53.79$$

ERR

V_s Stack gas velocity, calculated by Method 2, eq. 2-9 using data from Method 5
K_p Pitot tube constant, 85.49 ft/sec [(lb/lb-mole) (in. Hg) / (°R) (in. H_2O)]$^{1/2}$
C_p Pitot tube coefficient, dimensionless.
Δp Velocity head of stack gas, m/sec (ft/sec)
T_s Absolute stack temperature, °K (°R)
P_s Absolute stack gas pressure, mm Hg (in. Hg) = P_{bar} + P_{static}
M_s Molecular weight of stack gas, wet basis, g/g-mole (lb/lb-mole)

METHOD 4 SAMPLE CALCULATION

Plant:	Winkler	**Test Run:**	0
Location:	Post Falls, Idaho	**Start Time:**	08:40
Source:	Bag House	**Test Duration:**	60
Date:	Sept 6, 06	**Meter Box:**	3

Volume of Water Vapor Condensed:

$$V_{wc(std)} = [(V_f - V_i) * \rho_w * R * T_{std}] / [P_{std} * M_w] \quad = K_1 (V_f - V_i) \quad = K_1 * \Delta V \qquad \text{Eq. 4-1}$$

$$\frac{0.04707 \ ft^3}{ml} \Big| \frac{290 \ ml}{} \quad = \quad 13.65 \ scf$$

$V_{wc(std)}$	Volume of water vapor condensed corrected to standard conditions, scm; (scf)
K_1	= 0.001333 m^3/ml for metric units; = 0.04707 ft^3/ml for English units
V_f	Final volume of condenser water, ml
V_i	Initial volume, if any, of condenser water, ml
ΔV	Net gain of condenser water, ml

Volume of Water Vapor Collected in Silica Gel:

$$V_{wsg(std)} = [(W_f - W_i) * R * T_{std}] / [P_{std} * M_w] \quad = K_2 (W_f - W_i) \quad = K_2 * \Delta W \qquad \text{Eq. 4-2}$$

$$\frac{0.04715 \ ft^3}{g} \Big| \frac{21.2 \ g}{} \quad = \quad 1 \ scf$$

$V_{wsg(std)}$	Volume of water vapor collected in silica gel corrected to standard conditions, scm; (scf)
K_2	=0.001335 m^3/g for metric units, =0.04715 ft^3/g for English units
W_f	Final weight of silica gel or silica gel plus impinger, g
W_i	Initial weight of silica gel or silica gel plus impinger, g
ΔW	Net gain of water in silica gel, g

Sample Gas Volume:

$$V_{m(std)} = V_m * Y [(P_m) (T_{std})] / [(P_{std}) (T_m)] \quad = K_3 * Y (V_m * P_m) / T_m \qquad \text{Eq. 4-3}$$

$$\frac{17.64 \ °R}{in.\ Hg} \Big| \frac{0.978}{} \Big| \frac{63.4 \ dcf}{532} \Big| \frac{27.81 \ in.\ Hg}{°R} \quad = \quad 57.15 \ dscf$$

$V_{m(std)}$	Dry gas volume measured by the dry gas meter, corrected to standard conditions, dscm; (dscf)
K_3	= 0.858 °K/mm Hg for metric units, = 17.64 °R/in. Hg for English units
Y	Dry gas meter calibration factor
V_m	Dry gas volume measured by dry gas meter, dcm; (dcf)
P_m	Absolute pressure (for this method, same as barometeric pressure) at the dry gas meter, mm Hg; (in. Hg)
T_m	Absolute temperature at meter, °K; (°R)

Moisture Content:

$$B_{ws} = [V_{wc(std)} + V_{wsg(std)}] / [V_{wc(std)} + V_{wsg(std)} + V_{m(std)}] \qquad \text{Eq. 4-4}$$

$$\frac{13.65 \ scf}{} \Big| \frac{plus}{} \Big| \frac{1 \ scf}{} \Big| \frac{1}{13.65 \ scf} \Big| \frac{}{plus} \Big| \frac{1}{1 \ scf} \Big| \frac{}{plus} \Big| \frac{1}{57.15 \ dscf}$$

$$= \quad 0.2040$$

$$= \quad 20.40\%$$

B_{ws}	Proportion of water vapor, by volume, in the gas stream
$V_{wc(std)}$	Volume of water vapor condesned corrected to standard conditions, scm (scf)
$V_{wsg(std)}$	Volume of water vapor collected in silica gel corrected to standard conditions, scm; (scf)

CLIENT	Winkler
FACILITY	Asphalt Plant
LOCATION	Post Falls, Idaho
SOURCE	Bag House
Date	Sept 6, 06
Test Run	One
START TIME	08:40

Spreadsheet data entered by:	JRW
Spreadsheet data checked by:	cwl

27-Sep 4:42

PRELIMINARY INFO.				
Bp (Pm) (in.Hg)				27.81
Width, in	Lngth, in	Diam, in	Rnd, sqft	Rect, sqft
0	0	40	8.73	0.00
Port			Stack Area	8.73
Meter Box No.		3	Yi	0.978
Meter Box Delta H@				1.751

TRAVERSE INFO.			
Stack Temp, F	266.0	Static Pres	0.50
Aquired avg. delta P	0.63	O2	10.00
Recommended Nz dia.	0.267	CO2	10.00
Pitot tube constant, Cp	0.84		

PRE TEST INFO	
Assumed moisture %	21.0
Assumed Meter Temp, F	72.0
Time per Point	2.50
Nozzle Dia (in.)	0.315
Total Number of Points	24
Filter No.	2829

POST TEST DATA	
Leak check vol, dcf	
Impinger H2O Gain (g)	290.00
Silica Gel H2O Gain (g)	21.20

POST TEST CALCULATIONS		
Stack press. (Ps)		27.85
Total Run Time		60.00
Actual % H2O, (Bws)	*1	20.43
Actual Isokinetic Avg, (I)		101.22
Dry STD Meter Vol	*2	57.15
Avg sqrt Delta P		0.770
Wet mol. wt. (Ms)		27.55
Dry mol. wt. (Md)		30.00

EPA Method 5 Isokinetic Spreadsheet

No.	Traverse Point	Sample Time	MetrVol 465.720	Vel head delta P	Calc delta H	Run delta H	Stack Temp	Meter Temp In	Meter Temp Out	Assumed Point % I	Actual Point % I	STACK ACTUAL Vel ft/sec	STACK ACTUAL Flow acfm	STACK STANDARD Vel dsft/sec	STACK STANDARD Flow dscfm
1	1	2.5	468.330	0.56	2.96	2.99	255	67	63	105.2	104.5	51.88	27164	28.37	14857
2	2	5.0	470.860	0.54	2.84	2.78	260	68	63	104.1	103.3	51.12	26768	27.77	14539
3	3	7.5	473.230	0.44	2.31	2.27	262	69	64	107.8	107.1	46.21	24196	25.03	13105
4	4	10.0	475.510	0.41	2.15	2.10	263	69	64	107.5	106.7	44.64	23373	24.14	12642
5	5	12.5	477.570	0.32	1.68	1.64	263	70	65	109.6	108.8	39.44	20649	21.33	11169
6	6	15.0	479.450	0.25	1.31	1.28	263	71	65	112.9	112.1	34.86	18251	18.85	9872
7	7	17.5	481.460	0.37	1.94	1.89	266	71	66	99.5	98.8	42.49	22249	22.89	11985
8	8	20.0	484.090	0.69	3.62	3.53	266	72	66	95.7	95.0	58.03	30383	31.26	16366
9	9	22.5	487.270	0.95	4.97	4.86	268	72	66	99.1	98.4	68.18	35700	36.63	19177
10	10	25.0	490.710	1.10	5.75	5.63	269	72	67	99.8	99.1	73.42	38442	39.38	20622
11	11	27.5	494.330	1.20	6.27	6.14	269	72	67	100.7	99.9	76.68	40151	41.14	21539
12	12	30.0	497.820	1.10	5.78	5.63	267	73	68	100.9	100.2	73.32	38389	39.44	20650
13	13	32.5	500.940	0.89	4.68	4.55	268	74	69	99.9	99.2	65.99	34555	35.45	18562
14	14	35.0	503.990	0.85	4.48	4.35	266	74	70	99.6	98.9	64.41	33723	34.69	18165
15	15	37.5	507.620	1.05	5.52	5.37	269	75	70	107.1	106.3	71.73	37558	38.48	20148
16	16	40.0	510.700	0.90	4.74	4.61	268	75	70	97.9	97.2	66.36	34748	35.65	18666
17	17	42.5	513.310	0.51	2.70	2.66	266	76	71	109.3	108.5	49.89	26121	26.87	14070
18	18	45.0	515.440	0.32	1.69	1.67	269	78	72	112.2	111.4	39.60	20734	21.24	11123
19	19	47.5	517.120	0.16	0.85	0.83	268	79	72	124.7	123.8	27.98	14651	15.03	7870
20	20	50.0	518.860	0.27	1.43	1.41	269	81	73	99.3	98.6	36.37	19045	19.51	10217
21	21	52.5	521.120	0.46	2.43	2.40	271	81	74	99.1	98.4	47.54	24893	25.43	13317
22	22	55.0	523.710	0.58	3.07	3.02	271	82	75	101.2	100.4	53.38	27952	28.56	14954
23	23	57.5	526.420	0.61	3.24	3.20	270	82	75	103.2	102.5	54.71	28646	29.31	15346
24	24	60.0	529.090	0.59	3.14	3.07	268	83	75	103.1	102.4	53.73	28134	28.86	15113
25	25	62.5			0.00					ERR	ERR	0.00	0	0.00	0
	Sample Volume		63.37	avg dP 0.630		avg dH 3.25	avg Ts 266		avg Tm 72			ft/sec 53.83	acfm 28187	dsft/sec 28.97	dscfm 15170

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CLIENT	Winkler
FACILITY	Asphalt Plant
LOCATION	Post Falls, Idaho
SOURCE	Bag House
Date	Sept 6, 06
Test Run	Two
START TIME	10:20

Spreadsheet data entered by:	JRW

PRELIMINARY INFO.				
Bp (Pm) (in.Hg)				27.85
Width, in	Lngth, in	Diam, in	Rnd, sqft	Rect, sqft
0	0	40	8.73	0.00
Port	0	0	Stack Area	8.73
Meter Box No.		3	Yi	0.978
Meter Box Delta H@				1.751

TRAVERSE INFO.			
Stack Temp, F	266.0	Static Pres	0.50
Aquired avg. delta P	0.63	O2	10.00
Recommended Nz dia.	0.267	CO2	10.00
Pitot tube constant, Cp	0.84		

Spreadsheet data checked by:	cwl

PRE TEST INFO	
Assumed moisture %	21.0
Assumed Meter Temp, F	85.0
Time per Point	2.50
Nozzle Dia (in.)	0.243
Total Number of Points	24
Filter No.	2831

POST TEST DATA	
Leak check vol, dcf	
Impinger H2O Gain (g)	205.00
Silica Gel H2O Gain (g)	9.40

27-Sep 4:42

POST TEST CALCULATIONS		
Stack press. (Ps)		27.89
Total Run Time		60.00
Actual % H2O, (Bws)	*1	21.46
Actual Isokinetic Avg. (I)		105.84
Dry STD Meter Vol	*2	37.00
Avg sqrt Del P		0.814
Wet mol. wt. (Ms)		27.42
Dry mol. wt. (Md)		30.00

EPA Method 5 Isokinetic Spreadsheet

No.	Traverse Point	Sample Time	MetrVol 529.360	Vel head delta P	Calc delta H	Run delta H	Stack Temp	Meter Temp In	Meter Temp Out	Assumed Point % I	Actual Point % I	STACK ACTUAL Vel ft/sec	STACK ACTUAL Flow acfm	STACK STANDARD Vel dsft/sec	STACK STANDARD Flow dscfm
1	1	2.5	532.190	1.90	3.57	3.57	272	83	77	102.4	103.0	96.85	50710	51.14	26779
2	2	5.0	534.840	1.60	3.01	3.01	273	84	78	104.2	104.8	88.94	46566	46.90	24557
3	3	7.5	537.320	1.30	2.46	2.45	271	85	79	107.7	108.3	80.06	41917	42.33	22166
4	4	10.0	539.520	0.99	1.87	1.86	272	85	79	109.4	110.0	69.91	36604	36.92	19330
5	5	12.5	541.320	0.60	1.14	1.13	270	86	79	114.5	115.1	54.35	28458	28.78	15069
6	6	15.0	542.600	0.33	0.63	0.62	270	86	80	109.5	110.1	40.31	21105	21.34	11176
7	7	17.5	543.610	0.19	0.36	0.36	272	86	80	114.0	114.6	30.63	16036	16.17	8468
8	8	20.0	544.810	0.33	0.62	0.62	272	87	81	102.6	103.2	40.36	21134	21.31	11160
9	9	22.5	546.140	0.37	0.70	0.70	272	87	81	107.4	108.1	42.74	22378	22.57	11817
10	10	25.0	547.590	0.48	0.91	0.90	273	89	82	102.7	103.3	48.71	25505	25.69	13451
11	11	27.5	549.230	0.57	1.08	1.08	273	89	82	106.6	107.2	53.08	27794	27.99	14657
12	12	30.0	550.910	0.58	1.10	1.10	272	90	83	108.0	108.6	53.51	28018	28.26	14796
13	13	32.5	552.450	0.48	0.92	0.91	271	90	84	108.6	109.2	48.65	25471	25.72	13469
14	14	35.0	554.070	0.55	1.05	1.04	271	91	85	106.6	107.2	52.07	27265	27.54	14418
15	15	37.5	555.700	0.52	0.99	0.98	274	92	86	110.3	110.9	50.74	26565	26.72	13990
16	16	40.0	557.230	0.47	0.89	0.89	275	92	86	108.9	109.6	48.27	25273	25.39	13292
17	17	42.5	558.540	0.34	0.65	0.64	276	93	86	109.6	110.2	41.08	21510	21.58	11297
18	18	45.0	559.650	0.25	0.48	0.47	277	94	87	108.1	108.7	35.25	18457	18.49	9681
19	19	47.5	560.830	0.30	0.57	0.57	277	94	87	104.9	105.5	38.62	20219	20.25	10605
20	20	50.0	562.460	0.62	1.18	1.17	278	95	87	101.0	101.5	55.55	29086	29.10	15235
21	21	52.5	564.480	0.98	1.87	1.85	279	96	88	99.6	100.2	69.89	36593	36.56	19141
22	22	55.0	566.760	1.30	2.47	2.46	279	96	88	97.7	98.3	80.49	42146	42.10	22046
23	23	57.5	569.140	1.20	2.29	2.27	279	97	89	105.9	106.6	77.33	40492	40.45	21181
24	24	60.0	571.480	1.20	2.29	2.27	278	97	89	104.1	104.7	77.28	40465	40.48	21195
	Sample Volume		42.12	avg dP 0.727		avg dH 1.37	276 274		avg Tm 87			ft/sec 57.28	acfm 29990	dsft/sec 30.16	dscfm 15791

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CLIENT	Winkler
FACILITY	Asphalt Plant
LOCATION	Post Falls, Idaho
SOURCE	Bag House
Date	Sept 6, 06
Test Run	Three
START TIME	12:05

Spreadsheet data entered by:	JRW
Spreadsheet data checked by:	cwl

PRELIMINARY INFO.				
Bp (Pm) (in.Hg)				27.88
Width, in	Lngth, in	Diam, in	Rnd, sqft	Rect, sqft
0	0	40	8.73	0.00
Port	0	0	Stack Area	8.73
Meter Box No.		3	Yi	0.978
Meter Box Delta H@				1.751

TRAVERSE INFO.			
Stack Temp, F	266.0	Static Pres	0.50
Aquired avg. delta P	0.63	O2	10.00
Recommended Nz dia.	0.267	CO2	10.00
Pitot tube constant, Cp	0.84		

PRE TEST INFO	
Assumed moisture %	21.0
Assumed Meter Temp, F	85.0
Time per Point	2.50
Nozzle Dia (in.)	0.243
Total Number of Points	24
Filter No.	2832

POST TEST DATA	
Leak check vol, dcf	0.00
Impinger H2O Gain (g)	195.00
Silica Gel H2O Gain (g)	9.70

27-Sep 4:43

POST TEST CALCULATIONS		
Stack press. (Ps)		27.92
Total Run Time		60.00
Actual % H2O, (Bws)	*1	21.79
Actual Isokinetic Avg. (I)		106.46
Dry STD Meter Vol	*2	34.64
Avg sqrt Del P		0.762
Wet mol. wt. (Ms)		27.39
Dry mol. wt. (Md)		30.00

EPA Method 5 Isokinetic Spreadsheet

No.	Traverse Point	Sample Time	MetrVol 571.640	Vel head delta P	Calc delta H	Run delta H	Stack Temp	Meter Temp In	Meter Temp Out	Assumed Point % I	Actual Point % I	STACK ACTUAL Vel ft/sec	STACK ACTUAL Flow acfm	STACK STANDARD Vel dsft/sec	STACK STANDARD Flow dscfm
1	1	2.5	573.210	0.58	1.12	1.10	274	97	92	99.6	100.6	53.58	28056	28.13	14729
2	2	5.0	574.770	0.48	0.93	0.91	274	97	93	108.6	109.7	48.75	25523	25.59	13399
3	3	7.5	576.290	0.44	0.85	0.83	275	97	93	110.6	111.7	46.70	24453	24.48	12820
4	4	10.0	577.600	0.38	0.74	0.72	274	98	94	102.3	103.3	43.37	22709	22.77	11922
5	5	12.5	578.850	0.33	0.64	0.62	275	98	94	104.8	105.9	40.45	21177	21.20	11103
6	6	15.0	580.080	0.27	0.52	0.51	277	99	94	114.0	115.2	36.63	19181	19.15	10029
7	7	17.5	581.210	0.28	0.54	0.53	277	100	95	102.7	103.7	37.31	19533	19.51	10213
8	8	20.0	582.840	0.63	1.23	1.20	276	101	95	98.8	99.8	55.92	29280	29.28	15330
9	9	22.5	584.860	0.84	1.64	1.59	278	102	95	106.2	107.2	64.66	33856	33.76	17678
10	10	25.0	587.070	1.20	2.34	2.27	278	102	95	97.3	98.3	77.28	40465	40.35	21129
11	11	27.5	589.120	1.30	2.53	2.46	277	102	95	86.7	87.6	80.38	42089	42.03	22007
12	12	30.0	591.950	1.10	2.15	2.08	277	102	96	129.9	131.2	73.94	38716	38.66	20243
13	13	32.5	594.370	1.20	2.34	2.27	276	102	96	106.4	107.4	77.18	40410	40.41	21158
14	14	35.0	596.580	0.98	1.91	1.85	277	102	97	107.3	108.4	69.79	36544	36.49	19107
15	15	37.5	598.690	0.95	1.85	1.80	278	102	97	104.1	105.2	68.76	36004	35.90	18800
16	16	40.0	600.680	0.83	1.62	1.57	278	103	97	104.9	106.0	64.27	33654	33.56	17572
17	17	42.5	602.460	0.55	1.08	1.04	278	104	98	114.9	116.1	52.32	27395	27.32	14304
18	18	45.0	603.520	0.27	0.53	0.51	279	107	98	97.3	98.3	36.68	19207	19.13	10016
19	19	47.5	604.730	0.27	0.53	0.51	279	106	99	111.1	112.2	36.68	19207	19.13	10016
20	20	50.0	605.920	0.28	0.55	0.53	278	106	99	107.3	108.3	37.33	19547	19.49	10206
21	21	52.5	607.210	0.34	0.67	0.65	278	106	99	105.5	106.6	41.14	21539	21.48	11247
22	22	55.0	608.720	0.44	0.87	0.83	277	107	100	108.4	109.5	46.77	24486	24.45	12803
23	23	57.5	610.380	0.51	1.00	0.96	277	106	100	110.8	111.9	50.35	26362	26.32	13784
24	24	60.0	611.900	0.48	0.94	0.90	277	106	100	104.6	105.6	48.85	25575	25.54	13372
	Sample Volume		40.26	avg dP 0.622		avg dH 1.18	avg Ts 277		avg Tm 99			ft/sec 53.71	acfm 28124	dsft/sec 28.09	dscfm 14708

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BEAKER/FILTER TARES, FINAL WEIGHTS and GAINS

BISON ENGINEERING LABORATORY RECORD

CLIENT	Winkler	Asphalt Plant
Test Date:	Sept 6, 2006	Bag House

Test Run	Sample Description	Sample Volume (mls, #)	Lab Avg TARE grams		Lab Avg FINAL grams		Weight Gains: Net Gains grams	Weight Gains: Gains grams
One	cyclone rinse vol & wgts		0.0000	-	0.0000	=	0.0000	PM Gain
	probe rinse vol & wgts	111	2.6853	-	2.6960	=	0.0107	0.0145
	filter # & wgts	2829	0.3460	-	0.3498	=	0.0038	Back half
	impinger H_2O init & fin vol, mls		200	-	490	=	290	mls
	silica gel H_2O int & fin wgts., grams		234.5	-	255.7	=	21.2	grams
Two	cyclone rinse vol & wgts		0.0000	-	0.0000	=	0.0000	PM Gain
	probe rinse vol & wgts		2.5839	-	2.5932	=	0.0093	0.0114
	filter # & wgts	2831	0.3437	-	0.3459	=	0.0021	Back half
	impinger H2O init & fin vol, mls		200	-	405	=	205	mls
	silica gel H2O int & fin wgts., grams		230.3	-	239.7	=	9.4	grams
Three	cyclone rinse vol & wgts		0.0000	-	0.0000	=	0.0000	PM Gain
	probe rinse vol & wgts		2.6657	-	2.6765	=	0.0107	0.0126
	filter # & wgts	2832	0.3467	-	0.3486	=	0.0019	Back half
	impinger H2O init & fin vol, mls		200	-	395	=	195	mls
	silica gel H2O int & fin wgts., grams		235.3	-	245	=	9.7	grams
	Acetone Blank vol	100	2.6383	-	2.6384	=	Blank Gain	0.0001
	Audit Weight 100 gr		100.0000	-	100.0%			
	Audit Weight 5 gr		5.0000	-	100.0%			
	Audit Weight 2 gr		2.0001	-	100.0%			
	Audit Weight 0.1 gr		0.0999	-	99.9%			

Blanks per volumes	
Acetone	0.0001
Water	0.0000
Acetone	0.0000
Water	0.0000
Acetone	0.0000
Water	0.0000

Percent residue 0.00010 %

Final Lab Results

PM gain less blank	0.0144 grams
CM gain less blank	0 grams
PM gain less blank	0.0113 grams
CM gain less blank	0 grams
PM gain less blank	0.0126 grams
CM gain less blank	0 grams

Report all weights to 0.0001 g. Record sample volumes in colum 4. "Constant weight" means </= 0.0005 g difference between 2 weighings at least 6 hours apart OR 2 </= 1% of the average total weight less average tare weight.

Acetone Blank must be no greater than 0.001 percent residue M5-3.2, negative blank gains, within the tolorance of the scale, shall be counted as zero gain.

Laboratory sample analyst:

Winkler Hot Plant test, September 6, 2006

Vol (ml)	Sample Identification	Pan #	Date	Tare 1 (g)	Date	Tare 2 (g)	Average	Pan #	Date	Final 1 (g)	Date	Final 2 (g)	Average	Gain
111	Winkler Run 1	1178	9/14/2006	2.6853	9/14/2006	2.6853	2.6853	1178	9/14/2006	2.6960	9/14/2006	2.6960	2.6960	0.01070
84	Winkler Run 2	1179	9/14/2006	2.5840	9/14/2006	2.5838	2.5839	1179	9/14/2006	2.5932	9/14/2006	2.5932	2.5932	0.00930
65	Winkler Run 3	1180	9/14/2006	2.6657	9/14/2006	2.6656	2.6657	1180	9/14/2006	2.6765	9/14/2006	2.6765	2.6765	0.01085
	Sample Identification	**Filter #**	**Date**	**Tare 1 (g)**	**Date**	**Tare 2 (g)**	**Average**	**Filter #**	**Date**	**Final 1 (g)**	**Date**	**Final 2 (g)**	**Average**	**Gain**
	Valley Asphalt (Winkler) Run 1	2829	5/23/2006	0.3460	05/26/06	0.3460	0.3460	2829	9/14/2006	0.3498	9/14/2006	0.3498	0.3498	0.0038
	Valley Asphalt (Winkler) Run 2	2831	5/23/2006	0.3437	05/26/06	0.3437	0.3437	2831	9/14/2006	0.3459	9/14/2006	0.3459	0.3459	0.0022
	Valley Asphalt (Winkler) Run 3	2832	5/23/2006	0.3468	05/26/06	0.3466	0.3467	2832	9/14/2006	0.3486	9/14/2006	0.3486	0.3486	0.0019
	Acetone Blank	1176	9/14/2006	2.6384	9/14/2006	2.6382	2.6383	1176	9/14/2006	2.6384	9/14/2006	2.6384	2.6384	0.00010

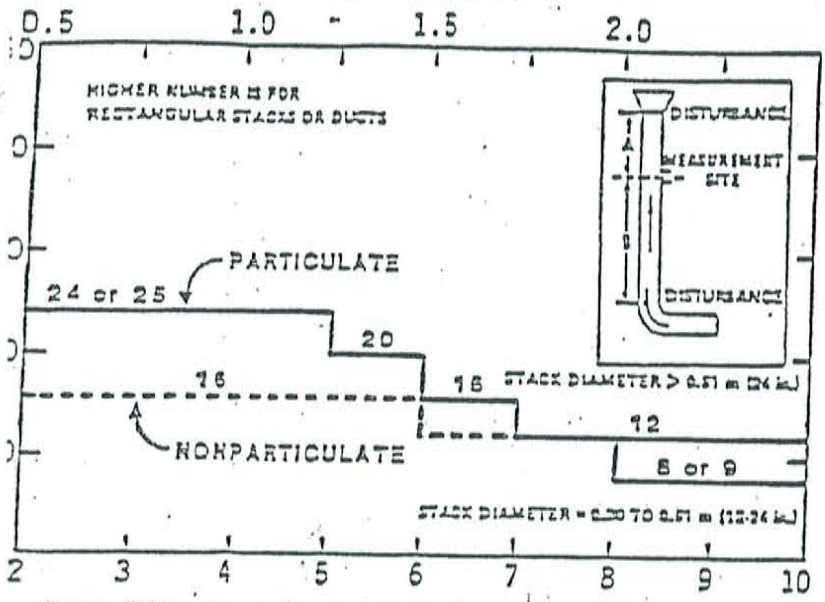
EPA Method 1 Sample and Velocity Traverses for Stationary Sources

Firm WINKLER
Location
Diameters Upstream
Diameters Downstream

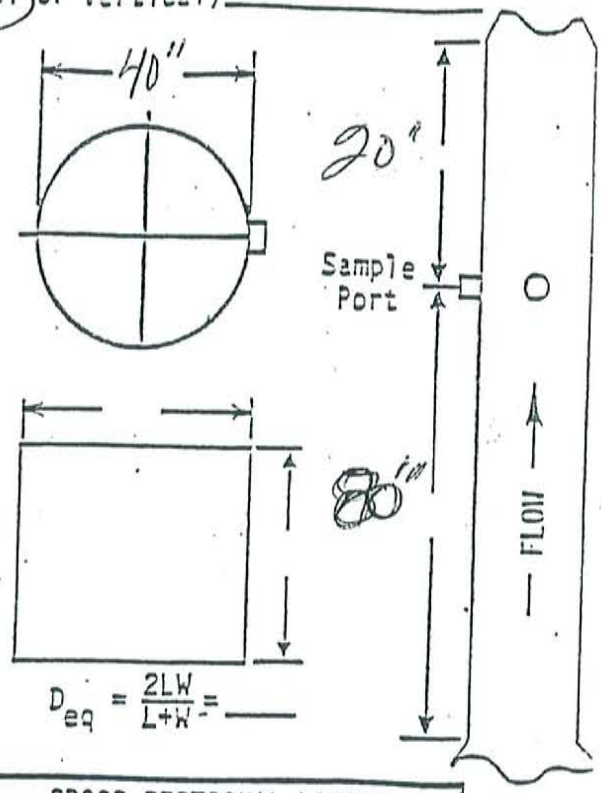
Total Traverse Points Required 24
Number of Ports 2
Points Per Port 12
Traverse (Horizontal or Vertical)

MINIMUM NUMBER OF TRAVERSE POINTS FOR PARTICULATE AND NONPARTICULATE TRAVERSES

Duct Diameters Upstream from Flow Disturbance (Distance A)



Duct Diameters Downstream from Flow Disturbance (Distance B)



$D_{eq} = \frac{2LW}{L+W} =$ ____

LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS

Point Number On A Diameter	(Percent of stack diameter from inside wall to traverse point) Number Of Traverse Points On A Diameter 4	6	8	10	12
1	6.7	4.4	3.2	2.6	2.1
2	25.0	14.6	10.5	8.2	6.7
3	75.0	29.6	19.4	14.6	11.8
4	93.3	70.4	32.3	22.6	17.7
5		85.4	67.7	34.2	25.0
6		95.6	80.6	65.8	35.6
7			89.5	77.4	64.4
8			96.8	85.4	75.0
9				91.8	82.3
10				97.4	88.2

CROSS-SECTIONAL LAYOUT FOR RECTANGULAR STACKS

Total Traverse Points	Matrix
9	3x3
12	4x3
16	4x4
20	5x4
25	5x5

TRAVERSE POINT LOCATIONS

No.	Distance From Wall	Nipple Size	Total Distance
1	.84	1 1/2"	2.34
2	2.68		4.18
3	4.72		5.85
4	7.08		8.50
5	10.00		11.50
6	14.25		15.75
7	25.75		27.25
8	32.50		31.50
9	32.92		34.50
10	35.22		36.75
11	37.32		38.75
		29 16	40.50

ISOKINETIC FIELD DATA FORM

Plant Winkel	Location POST FALLS ID	Date: 9/6/06	Run: 1
Operators: JRW/DB Filter #: 2829	Source: Hot Plant Size: 40"	Start time: 8:40	End time: 9:49

TEST EQUIPMENT INFORMATION
Nozzle ID _____ Diameter .315 in
Probe ID 5B Heat 250 °F
Pitot Cp ☒ S-type 0.84 ☐ STD 0.99[1]
Hot box 1 Goose neck GN3
Meter ID 3 ΔH@ 1.749 (Y) .972

PROCESS and CONTROL
Baghouse ΔP _____ "H_2O 3.4(S) 3.4(E)
Scrubber _____ psi. flow _____ gpm

SOURCE INFORMATION
Bar ID 1 [Pm] Bp 27.81 "Hg
[Bws] H_2O 21 %
[Pg] Static .15 "H_2O
[M3,1.1.2] [Md] Dry Molecular Weight
☐ Ambient 29 ☒ Gas/Oil/coal 30 lb/lb·mole
☐ Wood burning Fyrites
O_2 _____ % CO_2 _____ % Md _____ lb/lb·mole
$[O_2 \times 32 + CO_2 \times 44 + (N_2 + CO) \times 28] = Md$
☐ Meth 3A ☐ Meth 3B Orsat

POST TEST INFORMATION
Test Leak ✓ Vac 12 Rate Ø
Pitot Tube Leak ✓ Pos ✓ Neg ✓
Silica Gel Condition: OK - Spent
Water Gain: 290 mls Gel: 21.2 g
[M5, 4.2] ***Sample description***
Water Color: Cloudy Film: Y - N
Filter Color: white
Imp. analysis: Y - N Imp. pH _____
If pH less than 4, purger solution

Traverse Point Number	24 Hr Clock Time	Sample Time Min.	Gas Sample Volume (dcf) Start 465.72	Velocity Head (ΔP) " H_2O	Pressure Across Orifice (ΔH) " H_2O	Vacuum mm " Hg	#1 Stack Temp. °F	#3 Filter Box Temp. 248 ± 25 °F	#4 Condenser Temp. ≤ 68 °F	#6 DGM Temp Inlet °F	#7 DGM Temp Outlet °F
1		2.5	468.33	.56	2.99	5	255	250	43	67	63
2		5	470.86	.54	2.78	5	260	247	43	68	63
3		7.5	473.23	.44	2.27	4	262	252	44	69	64
4		10	475.51	.41	2.10	4	263	251	44	69	64
5		12.5	477.57	.32	1.64	4	263	251	45	70	65
6		15	479.45	.25	1.28	4	263	246	45	71	65
7		17.5	481.46	.37	1.89	4	266	254	47	71	66
8		20	484.09	.69	3.53	5	266	251	48	72	66
9		22.5	487.27	.95	4.86	6	268	246	49	72	66
10		25	490.71	1.10	5.63	7	269	252	51	72	67
11		27.5	494.33	1.20	6.14	8	269	255	51	72	67
12		30	497.82	1.10	5.63	8	267	248	52	73	68
13		32.5	500.94	.89	4.55	7	268	251	53	74	69
14		35	503.99	.85	4.35	6	266	251	53	74	70
15		37.5	507.62	1.05	5.37	8	269	247	54	75	70
16		40	510.70	.90	4.61	7	268	250	55	75	70
17		42.5	513.31	.51	2.66	5	266	249	55	76	71
18		45	515.44	.32	1.67	4	269	252	57	78	72
19		47.5	517.12	.16	.83	3	268	255	60	79	72
20		50	518.86	.27	1.41	3	269	249	60	81	73
21		52.5	521.12	.46	2.40	4	271	250	57	81	74
22		55	523.71	.58	3.02	5	271	248	56	82	75
23		57.5	526.42	.61	3.20	5	270	252	56	82	75
24		60	529.09	.59	3.07	5	268	249	55	83	75
25			.	.	.						

[1] Use of a STD pitot tube requires verification that the holes do not plug according to RM2, section 2.1

ISOKINETIC FIELD DATA FORM

Plant: Winkler	Location: Post Falls	Date: 6/9	Run: 2
Operators: JRW / DD; Filter #: 283	Source: Hot plant; Size: 40"	Start time: 10:20	End time: 11:26

TEST EQUIPMENT INFORMATION
Nozzle ID N8 Diameter .243 in
Probe ID 5B Heat 250 °F
Pitot Cp ☐ S-type 0.84 ☐ STD 0.99[1]
Hot box 1 Goose neck 6N3
Meter ID 3 ΔH@ 1.749(Y) .972

CHANGE NOZZLE

PROCESS and CONTROL
Baghouse ΔP _____ "H_2O
Scrubber _____ psi, flow _____ gpm

SOURCE INFORMATION
Bar ID 1 [Pm] Bp. 27.85 "Hg
[Bws] H_2O 21 %
[Pg] Static .5 "H_2O
[M3,1.1.2] [Md] Dry Molecular Weight
☐ Ambient 29 ☒ Gas/Oil/coal 30 lb/lb·mole
☐ Wood burning Fyrites
O_2 _____ % CO_2 _____ % Md _____ lb/lb·mole
$[O_2 \times 32 + CO_2 \times 44 + (N_2 + CO) \times 28] = Md$
☐ Meth 3A ☐ Meth 3B Orsat

POST TEST INFORMATION
Test Leak ✓ Vac 14 Rate 0
Pitot Tube Leak ✓ Pos ✓ Neg ✓
Silica Gel Condition: OK - Spent
Water Gain: 205 mls Gel: 9.4 g
[M5, 4.2] Sample description
Water Color: cloudy Film: Y - N
Filter Color: white
Imp. analysis: Y - N Imp. pH _____
If pH less than 4, purger solution

Traverse Point Number	24 Hr Clock Time	Sample Time Min.	Gas Sample Volume (dcf) Start 529.316	Velocity Head (ΔP) " H_2O	Pressure Across Orifice (ΔH) " H_2O	Vacuum mm " Hg	#1 Stack Temp. °F	#3 Filter Box Temp. 248 ± 25 °F	#4 Condenser Temp. ≤ 68 °F	#6 DGM Temp Inlet °F	#7 DGM Temp Outlet °F
1		2.5	532.19	1.90	3.57	12	272	253	61	83	77
2		5	534.84	1.60	3.01	10	273	251	47	84	78
3		7.5	537.32	1.30	2.45	9	271	248	47	85	79
4		10	539.52	.99	1.86	8	272	251	50	85	79
5		12.5	541.32	.60	1.13	5	270	252	51	86	79
6		15	542.60	.33	.62	3	270	248	52	86	80
7		17.5	543.61	.19	.36	3	272	246	52	86	80
8		20	544.81	.33	.62	3	272	252	53	87	81
9		22.5	546.14	.37	.70	3	273	254	54	87	81
10		25	547.59	.48	.90	4	273	248	53	89	82
11		27.5	549.23	.57	1.08	5	272	251	52	89	82
12		30	550.91	.58	1.10	5	271	243	52	90	83
13		32.5	552.45	.48	.91	4	271	250	54	90	84
14		35	554.07	.55	1.04	4	274	251	55	91	85
15		37.5	555.70	.52	.98	4	275	247	54	92	86
16		40	557.23	.47	.89	4	276	250	54	92	86
17		42.5	558.54	.34	.64	3	277	253	55	93	86
18		45	559.65	.25	.47	3	277	251	56	94	87
19		47.5	560.83	.30	.57	3	278	251	57	94	87
20		50	562.46	.62	1.17	4	279	254	57	95	87
21		52.5	564.48	.98	1.85	6	279	255	57	96	88
22		55	566.76	1.30	2.46	8	279	251	57	96	88
23		57.5	569.14	1.20	2.27	8	278	252	58	97	89
24		60	571.48	1.20	2.27	8	276	248	59	97	89
25			.	.	.						

[1] Use of a STD pitot tube requires verification that the holes do not plug according to RM2, section 2.1

ISOKINETIC FIELD DATA FORM

Plant WINKLER	Location POST FALLS	Date: 9/6	Run: 3
Operators: JRW/DB Filter #: 2832	Source: Hot Plant Size: 40"	Start time: 12:05	End time: 13:18

TEST EQUIPMENT INFORMATION

Nozzle ID N6 Diameter .243 in
Probe ID 5B Heat 250 °F
Pitot Cp ☒ S-type 0.84 ☐ STD 0.99[1]
Hot box 1 Goose neck 6N3
Meter ID 3 ΔH@ 1.749 (Y) .972

PROCESS and CONTROL 3.4

Baghouse ΔP _____ "H_2O
Scrubber _____ psi. flow _____ gpm

SOURCE INFORMATION

Bar ID 1 [Pm] Bp. 27.88 "Hg
[Bws] H_2O 2 %
[Pg] Static .5 "H_2O
[M3, 1.1.2] [Md] Dry Molecular Weight
☐ Ambient 29 ☒ Gas/Oil/coal 30 lb/lb·mole
☐ Wood burning Fyrites
O_2 _____ % CO_2 _____ % Md _____ lb/lb·mole
$(O_2 \times 32 + CO_2 \times 44 + (N_2 + CO) \times 28) = Md$
☐ Meth 3A ☐ Meth 3B Orsat

POST TEST INFORMATION

Test Leak ✓ Vac 14 Rate 0
Pitot Tube Leak ✓ Pos ✓ Neg ✓
Silica Gel Condition: OK - Spent
Water Gain: 185 mls Gel: 9.7 g
[M5, 4.2] Sample description
Water Color: clear Film: Y - N
Filter Color: white
Imp. analysis: Y - N Imp. pH _____
If pH less than 4, purger solution

Traverse Point Number	24 Hr Clock Time	Sample Time Min.	Gas Sample Volume (dcf)	Velocity Head (ΔP) " H_2O	Pressure Across Orifice (ΔH) " H_2O	Vacuum mm " Hg	#1 Stack Temp. °F	#3 Filter Box Temp. 248 ± 25 °F	#4 Condenser Temp. ≤ 68 °F	#6 DGM Temp Inlet °F	#7 DGM Temp Outlet °F
			Start 571.64								
		2.5	573.21	.58	1.10	4	274	240	60	97	92
2		5	574.77	.48	.91	4	274	253	57	97	93
3		7.5	576.29	.44	.83	4	275	251	54	97	93
4		10	577.60	.38	.72	4	274	248	53	98	94
5		12.5	578.85	.33	.62	4	275	253	54	98	94
6		15	580.08	.27	.51	4	277	249	54	99	94
7		17.5	581.21	.28	.53	4	277	251	55	100	95
8		20	582.84	.63	1.20	5	276	251	57	101	95
9		22.5	584.86	.84	1.59	5	278	250	58	102	95
10		25	587.07	1.20	2.27	7	278	248	59	102	95
11		27.5	589.12	1.30	2.46	7	277	250	58	102	95
12		30	591.95	1.10	2.08	6	277	247	58	102	96
13		32.5	594.37	1.20	2.27	7	276	252	59	102	96
14		35	596.58	.98	1.85	6	277	253	59	102	97
15		37.5	598.69	.95	1.80	6	278	251	60	102	97
16		40	600.68	.83	1.57	5	278	246	60	103	97
17		42.5	602.46	.55	1.04	5	278	250	60	104	98
18		45	603.52	.27	.51	4	279	252	60	107	98
19		47.5	604.73	.27	.51	4	279	253	61	106	99
20		50	605.92	.28	.53	4	278	251	61	106	99
21		52.5	607.21	.34	.65	4	278	250	62	106	99
22		55	608.72	.44	.83	4	277	253	62	107	100
23		57.5	610.38	.51	.96	4	277	252	62	106	100
24		60	611.897	.48	.90	4	277	251	63	106	100
25			.	.	.						

[1] Use of a STD pitot tube requires verification that the holes do not plug according to RM2, section 2.1

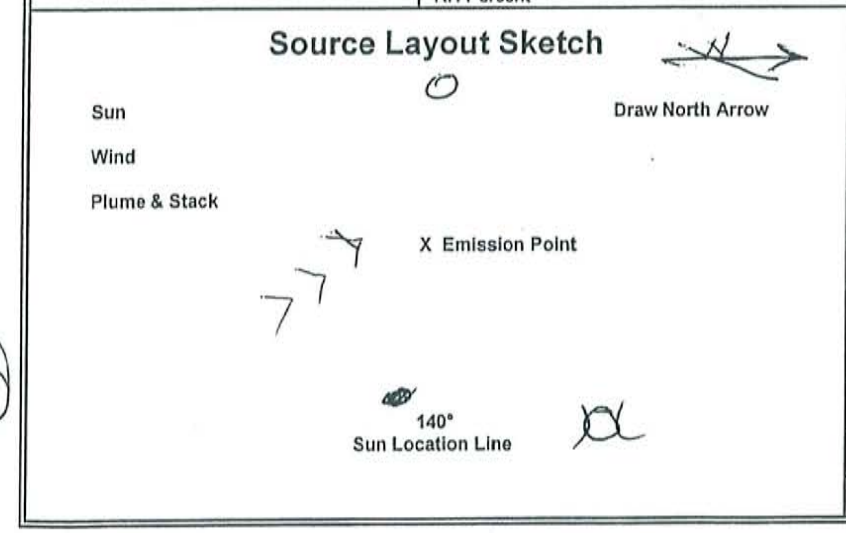
VISIBLE EMISSION OBSERVATION FORM

Source Name	WINKLER MATERIALS
Address	3978 W WYOMING AVE
City	RATHDRUM
State	ID
Zip	83858
Phone	208-687-8280
Source ID Number	
Process Equipment	ASPHALT PLANT STACK
Operating Mode	NORMAL
Control Equipment	BAGHOUSE
Operating Mode	NORMAL
Describe Emission Point Start	STACK EXIT
Describe Emission Point Stop	SAME
Height Above Ground Level Start	25'
Height Above Ground Level Stop	25'
Height Relative to Observer Start	25'
Height Relative to Observer Stop	25'
Distance from Observer Start	110'
Distance from Observer Stop	110'
Direction from Observer Start	W
Direction from Observer Stop	W
Describe Emissions Start	CLEAR
Describe Emissions Stop	CLEAR
Emission Color Start	
Emission Color Stop	
Plume Type: Fugitive / Continuous / Intermittent	
Water Droplets Present? Yes / No	No
Is Water Droplet Plume: Attached / Detached	
Point in the Plume at Which Opacity Was Determined Start	STACK EXIT
Point in the Plume at Which Opacity Was Determined Stop	SAME
Describe Background Start	GREY-BLUE SKY
Describe Background Stop	SAME
Background Color Start	BLU
Background Color Stop	BLU
Sky Conditions Start	MIXED
Sky Conditions Stop	MIXED
Wind Speed Start	0-2
Wind Speed Stop	
Wind Direction Start	NW
Wind Direction Stop	NW
Ambient Temp. Start	
Ambient Temp. Stop	
Wet Bulb Temp.	
RH Percent	

Observation Date	Start Time	Stop Time
9-6-06	8:40	8:47

Min	0	15	30	45	Min	0	15	30	45
1	0	0	0	0	31				
2	0	0	0	0	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
5	0	0	0	0	35				
6	0	0	0	0	36				
7			11:23		37	11:29			
8					38				
9		11:03			39	11:09			
10		RUN			40				
11					41				
1	0	0	0	0	42				
2	0	0	0	0	43				
3	0	0	0	0	44				
4	0	0	0	0	45				
5	0	0	0	0	46				
6	0	0	0	0	47				
18					48				
19		RUN			49	12:37-12:43			
20					50				
21 1	0	0	0	0	51				
22 2	0	0	0	0	52				
23 3	0	0	0	0	53				
24 4	0	0	0	0	54				
25 5	0	0	0	0	55				
26 6	0	0	0	0	56				
27					57				
28					58				
29					59				
30					60				

Source Layout Sketch



Average Opacity for Highest Period	0
Number of Readings Above % Were	0 / 0
Range of Opacity Readings Minimum	0
Range of Opacity Readings Maximum	0
Observer's Name (Print)	MIKE CHOUANARD
Observer's Signature	M. Chouanard
Date	9-6-06
Organization	BISON ENG
Comments	

APPENDIX C:
PRODUCTION DATA

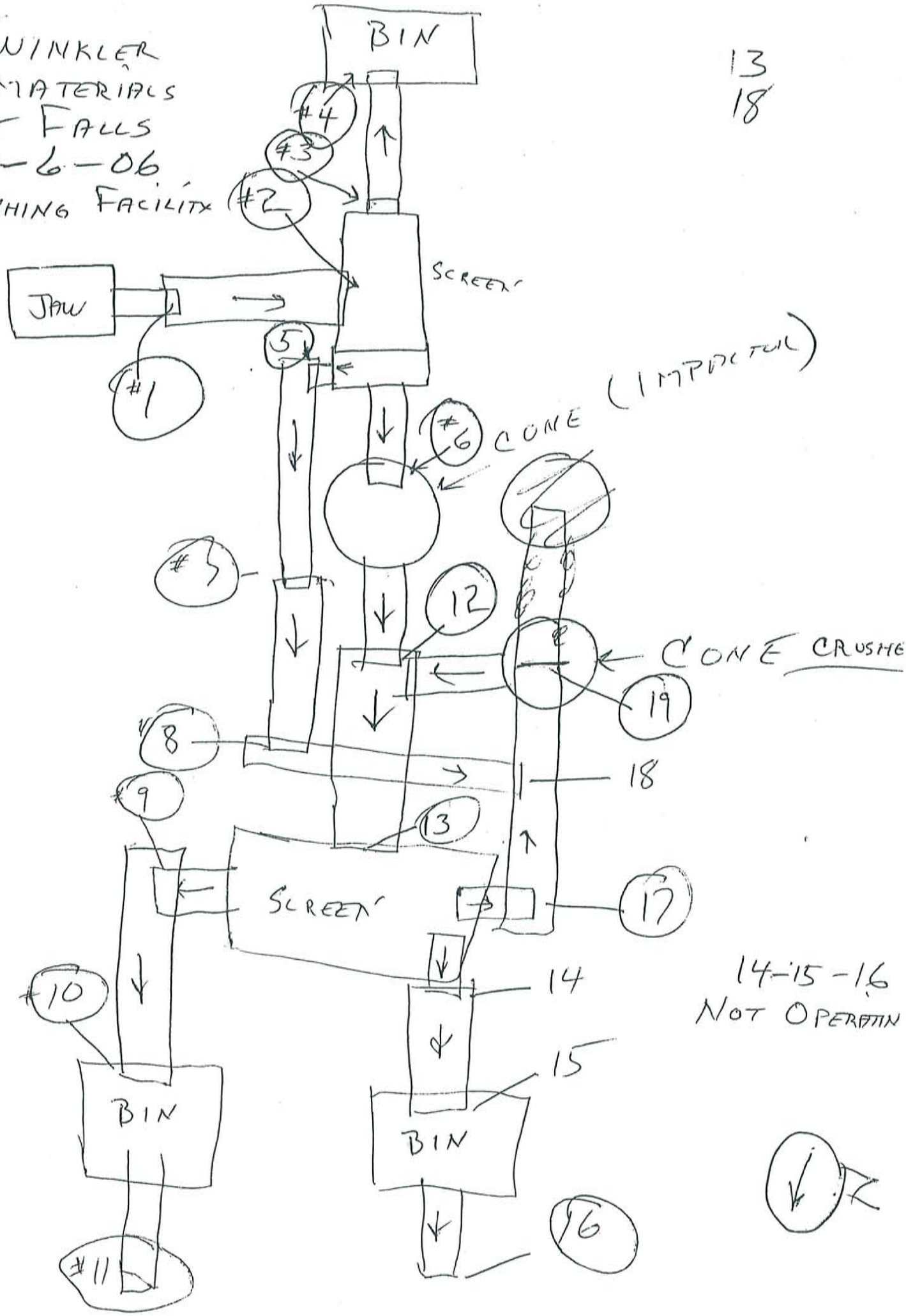
9-06-06 Source Test

Time	Aggregate TPH	AC TPH	Mix TPH
08:15	235	13.5	248.5
08:30	235	13.37	248.37
08:45	235	12.77	247.77
09:00	235	13.05	248.05
9:15	235	12.69	247.69
9:30	235	12.74	247.74
9:45	235	13.03	248.03
10:00	235	12.93	247.93
10:15	235	12.86	247.86
10:30	235	12.55	247.55
10:45	235	12.88	247.88
11:00	235	13.10	248.10
11:15	235	12.96	247.96
11:30	235	13.31	248.31
11:45	235	12.77	247.77
12:00	235	13.45	248.45
12:15	235	13.11	248.11
12:30	235	12.89	247.89
12:45	235	12.89	247.89
1:00	235	13.03	248.03
1:15	235	13.55	248.55
1:30			

APPENDIX D:
MATERIAL CRUSHING AND HANDLING OPACITIES

WINKLER
MATERIALS
POST FALLS
9-6-06
CRUSHING FACILITY

13
18



14-15-16
NOT OPERATIN

1

VISIBLE EMISSION OBSERVATION FORM

Source Name: WINKLER	Observation Date: 9-6-06	Start Time: 8:55 / Stop Time: 9:54
Address		
City / State / Zip		
Phone / Source ID Number		
Process Equipment: UNIT 1 / Operating Mode		
Control Equipment / Operating Mode		
Describe Emission Point — Start / Stop		
Height above Ground Level — Start 5 Stop 5	Height Relative to Observer — Start -10 Stop -10	
Distance from Observer — Start 40 Stop 40	Direction from Observer — Start W Stop W	
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 DIRT Stop DIRT BRN		
Background Color — Start BRN Stop BRN	Sky Conditions — Start MIX Stop MIX	
Wind Speed — Start 0-3 Stop 0-3	Wind Direction — Start W Stop W	
Ambient Temp. — Start 65 Stop 65	Wet Bulb Temp. / RH Percent	

Min	Seconds 0	15	30	45	Min	Seconds 0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
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
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
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	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	58	0	0	0	0
29		0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

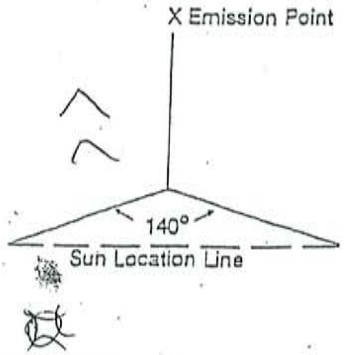
Source Layout Sketch

Sun

Wind

Plume & Stack

Draw North Arrow



Average Opacity for Highest Period: 0

Number of Readings Above % Were: 0

Range of Opacity Readings: Minimum 0 Maximum 0

Observer's Name (Print): MIKE CHOUAIRAK

Observer's Signature: Mike Chouairak

Date: 9-6-06

Organization: BISON ENG

Comments

2

VISIBLE EMISSION OBSERVATION FORM

Source Name: WINKLER	Observation Date: 9-6-06	Start Time: 855	Stop Time: 954
Address			
City / State / Zip			
Phone	Source ID Number		
Process Equipment: UNIT 2	Operating Mode		
Control Equipment	Operating Mode		
Describe Emission Point: Start / Stop			
Height above Ground Level: Start 10 Stop 10	Height Relative to Observer: Start 0 Stop 0		
Distance from Observer: Start 90 Stop 96	Direction from Observer: Start W Stop W		
Describe Emissions: Start 0 Stop 0			
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 DIRT Stop DIRT			
Background Color: Start BRN Stop BRN	Sky Conditions: Start MIX Stop MIX		
Wind Speed: Start 0-3 Stop 0-3	Wind Direction: Start W Stop W		
Ambient Temp.: Start 65 Stop 65	Wet Bulb Temp. / RH Percent		

Min	Seconds 0	15	30	45	Min	Seconds 0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
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
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
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

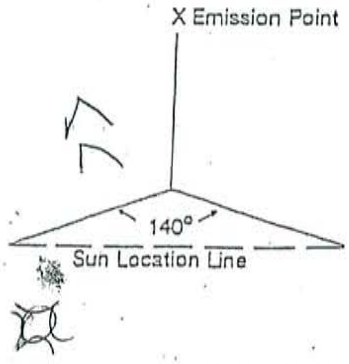
Source Layout Sketch

☼ Sun

» Wind

Plume & Stack

Draw North Arrow



Average Opacity for Highest Period: 0

Number of Readings Above % Were: 0 / 0

Range of Opacity Readings: 0 Minimum — 0 Maximum

Observer's Name (Print): MIKE CHOVANAK

Observer's Signature: Mike Chovanak

Date: 9-6-06

Organization: BISON ENG

Comments

3

VISIBLE EMISSION OBSERVATION FORM

Source Name: WINKLER	Observation Date: 9-6-06	Start Time: 8:55	Stop Time: 9:54
Address			
City / State / Zip			
Phone	Source ID Number		
Process Equipment: UNIT 3	Operating Mode		
Control Equipment	Operating Mode		
Describe Emission Point — Start / Stop			
Height above Ground Level — Start 4 Stop 4	Height Relative to Observer — Start -12 Stop -12		
Distance from Observer — Start 90' Stop 90'	Direction from Observer — Start W Stop W		
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 DIRT Stop DIRT			
Background Color — Start BRN Stop BRN	Sky Conditions — Start / Stop		
Wind Speed — Start 0-3 Stop 0-3	Wind Direction — Start W Stop W		
Ambient Temp. — Start 65 Stop 65	Wet Bulb Temp. / RH Percent		

Min	Seconds 0	15	30	45	Min	Seconds 0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
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
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
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

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): MIKE CHOUANAK

Observer's Signature: Mike Chouanak

Date: 9-6-06

Organization: BISON ENG

Comments

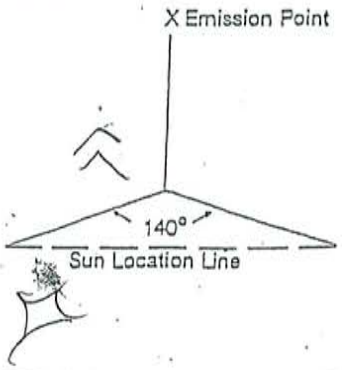
Source Layout Sketch

☼ Sun

» Wind

Plume & Stack

Draw North Arrow



4

VISIBLE EMISSION OBSERVATION FORM

Source Name: WINKLER	Observation Date: 9-6-06	Start Time: 8:55 / Stop Time: 9:54
Address		
City / State / Zip		
Phone / Source ID Number		
Process Equipment: UNIT 4 / Operating Mode		
Control Equipment / Operating Mode: NORMAL		
Describe Emission Point — Start / Stop		
Height above Ground Level — Start 18' Stop 18' / Height Relative to Observer — Start 8' Stop 8'		
Distance from Observer — Start 120 Stop 120 / Direction from Observer — Start W Stop W		
Describe Emissions — Start NONE Stop SAME		
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 DROP Stop SAME		
Describe Background — Start DIRT Stop DIRT		
Background Color — Start BRN Stop BRN / Sky Conditions — Start / Stop		
Wind Speed — Start 0-3 Stop 0-3 / Wind Direction — Start W Stop W		
Ambient Temp. — Start 65 Stop 65 / Wet Bulb Temp. / RH Percent		

Min	Seconds 0	15	30	45	Min	Seconds 0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
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
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
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

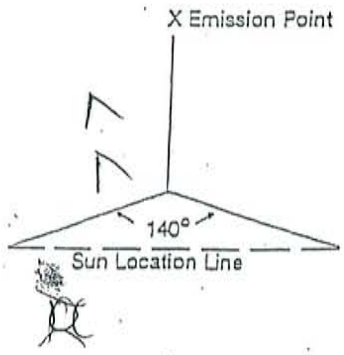
Source Layout Sketch

Sun

Wind

Plume & Stack

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): MIKE CHOUANAK

Observer's Signature: Mike Chouanak

Date: 9-6-06

Organization: BISON ENG

Comments

5

VISIBLE EMISSION OBSERVATION FORM

Source Name: WINKLER	Observation Date: 9-6-06	Start Time: 1020	Stop Time: 1119
Address			
City / State / Zip			
Phone	Source ID Number: 5		
Process Equipment: UNIT 5	Operating Mode: NORMAL		
Control Equipment: SPRAY	Operating Mode: NORMAL		
Describe Emission Point: Start DROP	Stop SAME		
Height above Ground Level: Start 5 Stop 5	Height Relative to Observer: Start -5 Stop -5		
Distance from Observer: Start 90 Stop 90	Direction from Observer: Start W Stop W		
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 MACHINE	Stop SAME		
Background Color: Start GRY Stop GRY	Sky Conditions: Start MIXED Stop SAME		
Wind Speed: Start 0-3 Stop 0-3	Wind Direction: Start S Stop W		
Ambient Temp.: Start 65 Stop	Wet Bulb Temp. / RH Percent		

Min	Seconds 0	15	30	45	Min	Seconds 0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
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
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
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		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

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): MIKE CHOUANAIL

Observer's Signature: Mike Chouanail

Date: 9-6-06

Organization: BISON ENG

Comments:

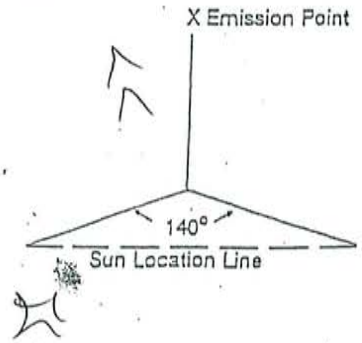
Source Layout Sketch

Sun

Wind

Plume & Stack

Draw North Arrow



(6)

VISIBLE EMISSION OBSERVATION FORM

Source Name: WINKLER	Observation Date: 9-6-06	Start Time: 11:35	Stop Time: 12:34
Address			
City / State / Zip			
Phone	Source ID Number		
Process Equipment: #6	Operating Mode: NORMAL		
Control Equipment: SPRAY	Operating Mode		
Describe Emission Point: Start DROP POINT	Stop SAME		
Height above Ground Level: Start 15' Stop 15'	Height Relative to Observer: Start 0 Stop 0		
Distance from Observer: Start 100 Stop 100	Direction from Observer: Start W Stop W		
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 DIRT	Stop DIRT		
Background Color: Start BRN	Stop BRN	Sky Conditions: Start MIX	Stop MIX
Wind Speed: Start 0-3	Stop 0-3	Wind Direction: Start	Stop
Ambient Temp.: Start	Stop	Wet Bulb Temp.	RH Percent

Min	Seconds 0	15	30	45	Min	Seconds 0	15	30	45
1	0	5	5	10	31	0	0	5	5
2	5	5	5	5	32	0	0	0	0
3	5	5	5	5	33	5	0	0	5
4	5	5	5	10	34	5	0	0	0
5	5	10	10	10	35	0	0	0	0
6	10	5	5	5	36	5	10	5	0
7	0	5	5	0	37	0	5	0	0
8	5	0	0	0	38	5	0	5	0
9	5	0	0	5	39	0	0	0	0
10	0	5	5	5	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	5	0	5	5
13	0	5	5	5	43	5	0	5	5
14	5	5	5	5	44	0	5	0	0
15	0	5	0	0	45	0	0	0	0
16	0	0	0	5	46	0	0	0	5
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	5	5	0
19	0	5	5	0	49	0	0	0	5
20	0	5	5	5	50	5	0	0	0
21	5	5	5	0	51	0	0	0	5
22	0	0	5	0	52	0	5	0	0
23	0	0	0	0	53	0	5	5	0
24	0	0	0	0	54	0	0	0	0
25	0	5	5	0	55	0	5	0	0
26	0	0	5	0	56	0	0	5	5
27	5	5	5	5	57	5	0	5	5
28	5	0	0	0	58	0	0	0	0
29	0	0	5	0	59	0	0	0	0
30	0	0	5	0	60	0	5	5	0

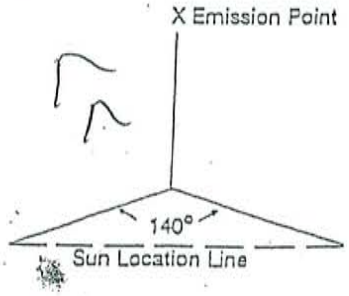
Source Layout Sketch

☼ Sun

» Wind

Plume & Stack

Draw North Arrow



Average Opacity for Highest Period: 6.04	Number of Readings Above % Were: 57
Range of Opacity Readings: 0 Minimum	Maximum 10
Observer's Name (Print): MIKE CHOVANAK	
Observer's Signature: Mike Chovanak	Date: 9-6-06
Organization: BISON ENG	
Comments	

7

VISIBLE EMISSION OBSERVATION FORM

Source Name: WINKLER	Observation Date: 9-6-06	Start Time: 13:50	Stop Time: 14:49
Address			
City / State / Zip			
Phone / Source ID Number			
Process Equipment: #7 BELT DROP	Operating Mode: NORMAL		
Control Equipment: SPRAY	Operating Mode: NORMAL		
Describe Emission Point: Start BELT DROP Stop SAME			
Height above Ground Level: Start 5 Stop 5	Height Relative to Observer: Start -2 Stop -2		
Distance from Observer: Start 50 Stop 50	Direction from Observer: Start Stop		
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 BELT DROP Stop BELT DROP			
Describe Background: Start EQUIPMENT Stop SAME			
Background Color: Start GREY Stop GREY	Sky Conditions: Start MIX Stop MIX		
Wind Speed: Start 0-5 Stop 0-5	Wind Direction: Start NW Stop NW		
Ambient Temp.: Start 70 Stop 70	Wet Bulb Temp. / RH Percent		

Min	Seconds 0	15	30	45	Min	Seconds 0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
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
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
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

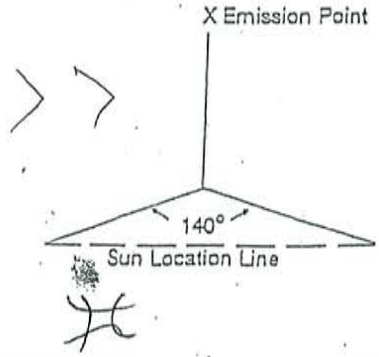
Source Layout Sketch

Sun

Wind

Plume & Stack

Draw North Arrow



Average Opacity for Highest Period: 0

Number of Readings Above % Were: 0 / 0

Range of Opacity Readings: Minimum 0 Maximum 0

Observer's Name (Print): MIKE CHOUANAK

Observer's Signature: Mike Chouanak

Date: 9-6-06

Organization: BISON ENG

Comments

8

VISIBLE EMISSION OBSERVATION FORM

Source Name: WINKLER	Observation Date: 9-6-06	Start Time: 11:35	Stop Time: 12:34
Address			
City / State / Zip			
Phone	Source ID Number: 8		
Process Equipment: UNIT 8	Operating Mode: NORMAL		
Control Equipment	Operating Mode		
Describe Emission Point: Start #8 BELT DROP Stop SAME			
Height above Ground Level: Start 4 Stop 4	Height Relative to Observer: Start -3 Stop -3		
Distance from Observer: Start 50 Stop 50	Direction from Observer: Start W Stop W		
Describe Emissions: Start — Stop —			
Emission Color: Start C Stop C	Plume Type: Fugitive ☑ Continuous ☐ Intermittent ☐		
Water Droplets Present? Yes ☐ No ☐	If Water Droplet Plume: Attached ☐ Detached ☐		
Point in the Plume at which Opacity was Determined: Start DROP Stop SAME			
Describe Background: Start MACHINE Stop SAME			
Background Color: Start GRY Stop GRY	Sky Conditions: Start MIX Stop MIX		
Wind Speed: Start 0-3 Stop 0-3	Wind Direction: Start NW Stop NW		
Ambient Temp.: Start 70 Stop 70	Wet Bulb Temp. / RH Percent		

Min	Seconds 0	15	30	45	Min	Seconds 0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
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
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
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

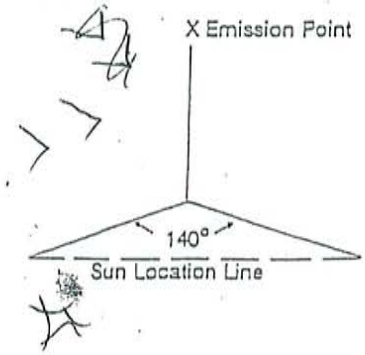
Source Layout Sketch

Sun

Wind

Plume & Stack

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): MIKE CHOVANAK

Observer's Signature: Mike Chovanak

Date: 9-6-06

Organization: BISON ENG

Comments

9

VISIBLE EMISSION OBSERVATION FORM

Source Name: WINKLER	Observation Date: 9-06-06	Start Time: 11:35	Stop Time: 1234

Address

City | State | Zip

Phone | Source ID Number

Process Equipment: UNIT 9 CRUSHER | Operating Mode: NORMAL

Control Equipment: SPRAY | Operating Mode: NORMAL

Describe Emission Point
Start: BELT DROP Stop: SAME

Height above Ground Level
Start: 5 Stop: 5

Height Relative to Observer
Start: -2 Stop: -2

Distance from Observer
Start: Stop:

Direction from Observer
Start: 58 Stop: 50

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: DROP POINT Stop: SAME

Describe Background
Start: MACHINE Stop: SAME

Background Color
Start: GRY Stop: GRY

Sky Conditions
Start: MIX Stop: MIX

Wind Speed
Start: 0-5 Stop: 0-5

Wind Direction
Start: NW Stop: NW

Ambient Temp.
Start: 70 Stop: 70

Wet Bulb Temp.

RH Percent

Min	Seconds 0	15	30	45	Min	Seconds 0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
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
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
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

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): MIKE CHOURAK

Observer's Signature: Mike Chourak

Date: 9-6-06

Organization: BISON EKG

Comments

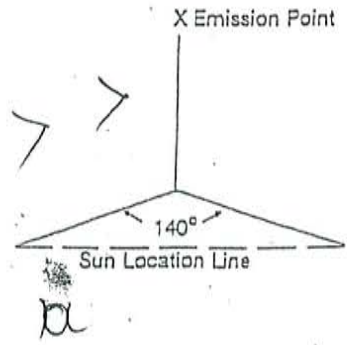
Source Layout Sketch

☼ Sun

» Wind

Plume & Stack

Draw North Arrow



10

VISIBLE EMISSION OBSERVATION FORM

Source Name	Observation Date	Start Time	Stop Time
WINKLER	9-6-06	11:35	12:34

Address

City | State | Zip

Phone | Source ID Number

Process Equipment: #10 BELT DROP | Operating Mode

Control Equipment: SPRAY | Operating Mode

Describe Emission Point
Start BELT DROP Stop

Height above Ground Level Start 18 Stop 18 | Height Relative to Observer Start 15 Stop 15

Distance from Observer Start 75' Stop 75' | Direction from Observer Start NW Stop NW

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 DROP Stop SAME

Describe Background
Start DIRT Stop DIRT

Background Color Start BRN Stop BRN | Sky Conditions Start MIX Stop MIX

Wind Speed Start 0-5 Stop 0-5 | Wind Direction Start NW Stop NW

Ambient Temp. Start 70 Stop 70 | Wet Bulb Temp. | RH Percent

Min	Seconds 0	15	30	45	Min	Seconds 0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
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
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0		0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
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

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): MIKE CHOUANAK

Observer's Signature: Mike Chouanak | Date: 9-6-06

Organization: BISON ENG

Comments

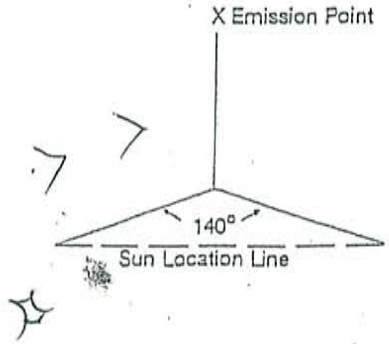
Source Layout Sketch

☼ Sun

» Wind

Plume & Stack

Draw North Arrow



~~#10~~ 11

INTERMITANT TRUCK LOAD OUT

VISIBLE EMISSION OBSERVATION FORM

Source Name: WINKLER	Observation Date: 9-6-06	Start Time: 12:48	Stop Time: 13:47

Address	
City / State / Zip	
Phone	Source ID Number
Process Equipment: UNIT 11	Operating Mode
Control Equipment	Operating Mode
Describe Emission Point — Start / Stop	
Height above Ground Level — Start 15 Stop 15	Height Relative to Observer — Start 8 Stop 8
Distance from Observer — Start 105 Stop 105	Direction from Observer — Start NW Stop NW
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 DROP POINT Stop SAME	
Describe Background — Start DIRT Stop DIRT	
Background Color — Start BRN Stop BRN	Sky Conditions — Start MIXED Stop MIX
Wind Speed — Start 0-5 Stop 0-5	Wind Direction — Start / Stop
Ambient Temp. — Start 70 Stop	Wet Bulb Temp. / RH Percent

Min	Seconds 0	15	30	45	Min	Seconds 0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
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	
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
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

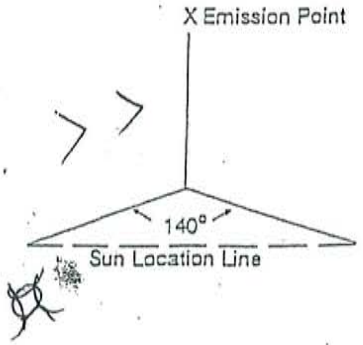
Source Layout Sketch

☼ Sun

» Wind

Plume & Stack

Draw North Arrow



Average Opacity for Highest Period: 0	Number of Readings Above: 0 % Were 0
Range of Opacity Readings: 0 Minimum	Maximum 0
Observer's Name (Print): MIKE CHOVANAK	
Observer's Signature: Mike Chovanak	Date: 9-6-06
Organization: BISON ENG	
Comments	

12

VISIBLE EMISSION OBSERVATION FORM

Source Name: WINKLER
Observation Date: 9-6-06
Start Time: 1248
Stop Time: 13:47

Address
City | State | Zip
Phone | Source ID Number
Process Equipment: BELT UNIT 2 | Operating Mode: NORMAL
Control Equipment: SPRAY | Operating Mode: NORMAL
Describe Emission Point: Start BELT DROP Stop SAME
Height above Ground Level: Start 7 Stop 7 | Height Relative to Observer: Start 2 Stop 2
Distance from Observer: Start 60 Stop 60 | Direction from Observer: Start W Stop W
Describe Emissions: Start — 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 BELT DROP Stop
Describe Background: Start DIRT Stop DIRT
Background Color: Start BRN Stop BRN | Sky Conditions: Start Stop
Wind Speed: Start 0-3 Stop 0-3 | Wind Direction: Start S Stop W
Ambient Temp.: Start 70 Stop 70 | Wet Bulb Temp. | RH Percent

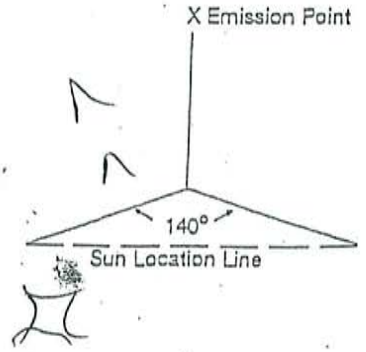
Min	Seconds 0	15	30	45	Min	Seconds 0	15	30	45
1	0	0	0	5	31	5	5	5	5
2	20	20	10	5	32	0	15	20	10
3	5	5	0	0	33	5	0	0	0
4	5	0	0	5	34	5	5	0	5
5	10	20	20	5	35	5	5	10	10
6	20	10	0	5	36	5	10	10	10
7	15	15	10	0	37	00	0	5	10
8	15	10	15	0	38	10	5	5	5
9	10	10	0	5	39	20	20	20	20
10	10	5	10	10	40	10	5	5	0
11	10	10	5	10	41	0	5	0	0
12	10	10	15	15	42	0	5	5	5
13	10	10	10	10	43	5	5	0	10
14	5	10	15	15	44	10	5	0	5
15	15	10	10	15	45	5	5	0	0
16	10	10	5	10	46	10	15	10	0
17	15	15	10	10	47	0	0	0	0
18	10	10	5	5	48	5	15	5	0
19	15	15	10	5	49	10	5	5	5
20	15	15	10	5	50	15	10	0	5
21	5	10	10	5	51	10	5	15	20
22	5	5	10	5	52	20	5	10	10
23	20	15	20	5	53	5	5	5	10
24	0	0	5	5	54	10	10	5	10
25	0	0	0	0	55	15	20	5	10
26	10	20	15	15	56	5	20	20	20
27	10	10	5	0	57	5	5	0	0
28	10	10	10	15	58	5	20	20	20
29	20	20	20	15	59	20	5	5	0
30	20	10	5	0	60	10	5	5	10

Average Opacity for Highest Period: 11.25 ~~20~~
Number of Readings Above % Were: 10 118
Range of Opacity Readings: Minimum 0 Maximum 20
Observer's Name (Print): MIKE CHOUANAK
Observer's Signature: Mike Chouanak
Date: 9-6-06
Organization: BISON ENG
Comments

Source Layout Sketch

☼ Sun
» Wind
Plume & Stack

Draw North Arrow



13

VISIBLE EMISSION OBSERVATION FORM

Source Name: WINKLER	Observation Date: 9-6-06	Start Time: 12:48	Stop Time: 13:47
Address			
City / State / Zip			
Phone	Source ID Number		
Process Equipment: BELT DROP #13	Operating Mode: NORMAL		
Control Equipment: SPRAY	Operating Mode: NORMAL		
Describe Emission Point: Start DROP	Stop DROP		
Height above Ground Level: Start 22 Stop 22	Height Relative to Observer: Start 18 Stop 18		
Distance from Observer: Start 60 Stop 60	Direction from Observer: Start W Stop W		
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 DROP POINT	Stop DROP POINT		
Describe Background: Start DIRT	Stop DIRT		
Background Color: Start BRN	Stop BRN	Sky Conditions: Start MIX	Stop MIX
Wind Speed: Start 6-3	Stop 0-3	Wind Direction: Start VARY	Stop VARY
Ambient Temp.: Start 70	Stop	Wet Bulb Temp. / RH Percent	

Min	Seconds 0	15	30	45	Min	Seconds 0	15	30	45
1	0	0	0	0	31	0	0	0	
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
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	
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
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

Average Opacity for Highest Period: 0

Number of Readings Above 0 % Were 0

Range of Opacity Readings: 0 Minimum — Maximum 0

Observer's Name (Print): MIKE CHOUANAK

Observer's Signature: Mike Chouanak

Date: 9-6-06

Organization: BISON ENG

Comments

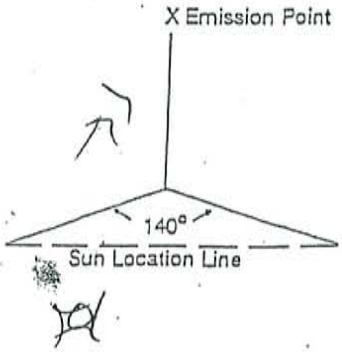
Source Layout Sketch

☼ Sun

» Wind

Plume & Stack

Draw North Arrow



17

VISIBLE EMISSION OBSERVATION FORM

Source Name: WINKLER	Observation Date: 9-6-06	Start Time: 10:20	Stop Time: 11:19

Address

City | State | Zip

Phone | Source ID Number: 17

Process Equipment: BELT # 17 DROP | Operating Mode: NORMAL

Control Equipment: SPRAY | Operating Mode: NORMAL

Describe Emission Point
Start: DROP Stop: DROP

Height above Ground Level
Start: 10 Stop: 10

Height Relative to Observer
Start: 2 Stop: 2

Distance from Observer
Start: 75' Stop: 75'

Direction from Observer
Start: NW Stop: NW

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: DIRT Stop: DIRT

Background Color
Start: BRN Stop: BRN

Sky Conditions
Start: Stop:

Wind Speed
Start: 0-5 Stop: 0-5

Wind Direction
Start: NW Stop: NW

Ambient Temp.
Start: 70 Stop: 70

Wet Bulb Temp.

RH Percent

Min	Seconds 0	15	30	45	Min	Seconds 0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
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
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
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

Average Opacity for Highest Period: 0

Number of Readings Above: 0 % Were: 0

Range of Opacity Readings: 0 Minimum Maximum: 0

Observer's Name (Print): MIKE CHOUNAK

Observer's Signature: Mike Chounak

Date: 9-6-06

Organization: BISON ENG

Comments

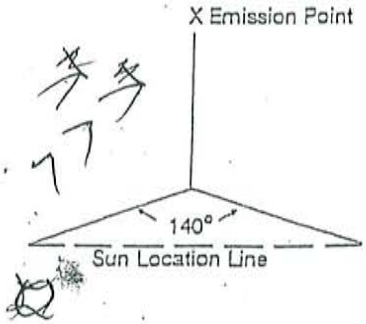
Source Layout Sketch

☼ Sun

» Wind

Plume & Stack

Draw North Arrow



18

VISIBLE EMISSION OBSERVATION FORM

Source Name: WINKLER	Observation Date: 9-6-06	Start Time: 13:50	Stop Time: 14:49
Address			
City / State / Zip			
Phone	Source ID Number		
Process Equipment: BELT #18	Operating Mode: NORMAL		
Control Equipment: SPRAY	Operating Mode: NORMAL		
Describe Emission Point: Start DROP Stop DROP			
Height above Ground Level: Start 5 Stop 5	Height Relative to Observer: Start 0 Stop 0		
Distance from Observer: Start 120 Stop 120	Direction from Observer: Start W Stop W		
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 DIRT Stop DIRT			
Background Color: Start BRN Stop BRN	Sky Conditions: Start MIX Stop MIX		
Wind Speed: Start 0-3 Stop 0-3	Wind Direction: Start NW Stop NW		
Ambient Temp.: Start 70 Stop 70	Wet Bulb Temp. / RH Percent		

Min	Seconds 0	15	30	45	Min	Seconds 0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
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
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
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

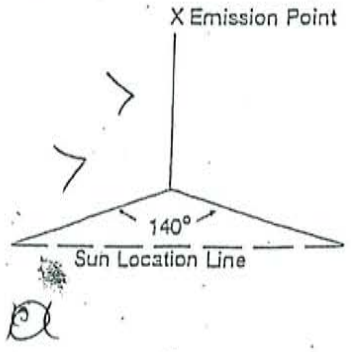
Source Layout Sketch

Sun

Wind

Plume & Stack

Draw North Arrow



Average Opacity for Highest Period: 0

Number of Readings Above % Were: 0 / 0

Range of Opacity Readings: Minimum 0 Maximum 0

Observer's Name (Print): MIKE CHOUANAK

Observer's Signature: Mike Chouanak

Date: 09-6-06

Organization: BISON ENG

Comments

19

VISIBLE EMISSION OBSERVATION FORM

Source Name: WINKLER	Observation Date: 9-6-06	Start Time: 10:20	Stop Time: 11:19

Address

City | State | Zip

Phone | Source ID Number: 19

Process Equipment: #19 | Operating Mode: NORMAL

Control Equipment: SPRAY | Operating Mode: NORMAL

Describe Emission Point
Start: DROP Stop: DROP

Height above Ground Level
Start: 20 Stop: 20

Height Relative to Observer
Start: 8 Stop: 8

Distance from Observer
Start: 120 Stop: 120

Direction from Observer
Start: W Stop: W

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: DIRT Stop: DIRT

Background Color
Start: BRN Stop: BRN

Sky Conditions
Start: MIX Stop: MIX

Wind Speed
Start: 0-3 Stop: 0-3

Wind Direction
Start: W Stop: W

Ambient Temp.
Start: 65 Stop:

Wet Bulb Temp.

RH Percent

Min	Seconds 0	15	30	45	Min	Seconds 0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
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
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
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
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
28	0	0	0	0	58	0	0	0	
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

Average Opacity for Highest Period: 0

Number of Readings Above % Were: 0 / 0

Range of Opacity Readings: Minimum 0 Maximum 0

Observer's Name (Print): MIKE CHOUANAK

Observer's Signature: Mike Chouanak

Date: 9-6-06

Organization: BISON ENG

Comments

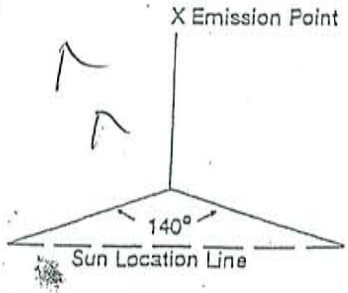
Source Layout Sketch

Sun

Wind

Plume & Stack

Draw North Arrow



APPENDIX E:
NOMENCLATURE AND FORMULAE

Nomenclature

A_n	sampling nozzle cross-sectional area , ft^2
A_s	stack cross-sectional area, ft^2 *Note: Method 2 refers to this as A*
a	mean particle projected area
Btu	unit heat value (British thermal unit)
B_{wm}	percent moisture in gas at meter
B_{ws}	percent moisture in stack gas
C_1	viscosity constant, 51.12 micropoise for K (51.05 micropoise for °R)
C_2	viscosity constant, 0.372 micropoise/K (0.207 micropoise/°R)
C_3	viscosity constant, 1.05×10^{-4} micropoise/K^2 (3.24×10^{-5} micropoise/$°R^2$)
C_4	viscosity constant, 53.147 micropoise/ fraction O_2
C_5	viscosity constant, 74.143 micropoise/ fraction H_2O
C_a	concentration of acetone blank residue, mg/g
C_{cond}	concentration of condensibles, grain/dscf
C_{cors}	concentration of coarse particulate, gr/dscf
C_p	pitot tube calibration coefficient, 0.84 for type S pitot tube
Cp(std)	standard pitot-static tube calibration coefficient
C_{PM10}	concentration of PM_{10} particulate, gr/dscf
C_s	particulate concentration in stack gas, mass/volume
cs12	particulate concentration corrected to 12 percent CO_2
c_{s50}	particulate concentration corrected to 50 percent excess air
cws	particulate concentration on a wet basis, mass/wet volume
$C_{X\,(corr)}$	actual gas concentration corrected to required percent O_2
D_{50}	diameter of particles having a 50 percent probability of penetration, μm
D_e	equivalent diameter
D_h	hydraulic diameter
$DH_@$	pressure drop across orifice meter for 0.75 CFM at standard conditions
DH	pressure drop across orifice meter
D_n	source sampling nozzle diameter
D_{p50}	50% effective cutoff diameter of particle, μ
D_s	diameter of the stack, feet
E	emission rate or mass/unit heat (Btu input)
e	base of natural logarithms (ln10 = 2.302585)
%EA	percent excess air
E_{hr}	emission rate per hour, lb/hr
ER_{cond}	emission rate of condensibles, lb/hr
ER_{cors}	emission rate of coarse particulate, lb/hr
ER_{mmBtu}	emission rate per mmBtu or ton of fuel, etc.
ER_{PM10}	emission rate of PM_{10} particulate, lb/hr
ER_X	emission rate of compound which replaces x
F_c	F factor for CO_2, used with percent CO_2, wet or dry basis
F_d	F factor for dry effluent, used with percent O_2, dry basis
f_o	stack gas fraction O_2, by volume, dry basis
F_o	fuel factor
F_w	F factor for wet effluent, used with percent O_2, wet basis
ΔH	average pressure differential across orifice meter at control box

$\Delta H_@$	orifice pressure, inches H_2O
ΔH_d	orifice pressure head, inches H_2O, needed for cyclone flow rate
%I	percent sampling rate variation, where 100% = ideal isokinetic conditions
j	equal area centroid
K_1	0.001333 m^3/ml for metric units 01.1 ft^3/ml for English units *Equation 4-1*
K_2	0.001335 m^3/g for metric units 1. ft^3/g for English units *Equation 4-2*
K_3	0.3858 ∘K/mm Hg for metric units 1. °R/in. Hg for English units *Equation 4-3*
K_p	pitot tube equation dimensional constant, 85.49
L	length of duct cross-section at sampling site
L_1	plume exit diameter
L_2	stack diameter
m	mass
M_a	acetone residue weight after evaporation, mg
mBtu	thousand Btu
M_{cond}	mass of condensibles
M_{cors}	mass of coarse particulate
M_d	dry stack gas molecular weight
m_f	filter weight gain, mg
M_{fine}	mass of PM_{10} particulate
mmBtu	million Btu
m_n	total weight of collected particulate, mg
$m_{n,\ pm10}$	total weight of collected PM_{10} particulate, mg
M_s	wet stack gas molecular weight
M_w	molecular weight of water, 18.0 g/g-mole (18.0 lb/lb-mole)
M_{wx}	molecular weight of gas species, g/gmol
n	number of particles
N_{re}	Reynolds Number
θ	total sampling time, min.
O_1	plume opacity at exit
O_2	in-stack plume opacity
ΔP	stack differential pressure recorded by the probe's type S pitot tube
Δp	velocity head of stack gas, mm H_2O (in. H_2O) - *Equation 2-8*
$\sqrt{\Delta P}$	average of the square roots of ΔP (may also be referred to as $AS\Delta P$)
$\sqrt{\Delta P_1}$	square root of ΔP at point 1 of the current test
$\sqrt{\Delta P_1}'$	square root of ΔP at point 1 of the previous traverse
$\sqrt{\Delta P}'$	average of the square roots of ΔP from the previous traverse (may also be referred to as $AS\Delta P'$)
$\%CO_2$	percent CO_2 by volume, dry basis
$\%O_2$	percent O_2 by volume, dry basis
%CO	percent CO by volume, dry basis
$\%N_2$	percent N_2 by volume, dry basis
P_{atm}	atmospheric pressure
P_b	barometric pressure ($P_b = P_{atm}$)
P_{bar}	barometric pressure at measurement site, mm Hg (in. Hg)
P_g	stack static pressure, mm Hg (in. Hg)
P_i	pitch angle at traverse point i, degree
P_m	absolute pressure at the meter
pmr	pollutant mass rate

P_p	absolute barometric pressure at the sample location, inches Hg
P_s	absolute pressure in the stack
P_{std}	standard absolute pressure, 760 mm Hg (29.92 in. Hg)
pts	number of traverse points during the test, minimum of 6, maximum of 12
ρ_w	density of water, 0.9982 g/ml (0.002201 lb/ml)
q	time in minutes
Q_a	stack gas volumetric flow rate, acfm
Q_s	average stack gas wet volumetric flow rate, cfm (ft^3/min)
Q_{sc}	actual gas flow rate through the cyclone, acfm
Q_{sc}'	predicted actual gas flow rate through the cyclone, acfm
$Q_{s(std)}$	total cyclone flow rate at standard conditions, dscm/min (dscf/ min)
Q_{std}	dry volumetric stack gas flow rate corrected to standard conditions
Q_w	wet stack gas standard volumetric flow, ft^3/min, wscfm
r	path length
R	ideal gas constant, 0.06236 (mm Hg) (m^3)/(g-mole) (K) for metric units and 21.85 (in. Hg) (ft^3)/(lb-mole) (°R) for English units
R_i	resultant angle at traverse point i, degree
R_{max}	multiplier for V_n
R_{min}	multiplier for V_n
T_m	absolute temperature at meter, K (°R)
t_s	stack temperature, °C (°F)
T_s	absolute stack temperature, K (°R)
$T_{s(avg)}$	average stack gas temperature, absolute, °R
T_{std}	standard absolute temperature, 293 K (528°R)
T_t	duration of test
μ_s	stack gas absolute viscosity, μ poise
V_f	final volume of condenser water, ml
V_i	initial volume, if any, of condenser water, ml
V_m	dry gas volume measured by dry gas meter, dcm (dcf)
ΔV_m	incremental dry gas volume measured by dry gas meter at each traverse point, dcm (dcf)
V_{max}	maximum allowed nozzle velocity , fps
V_{min}	minimum allowed nozzle velocity, fps
$V_{m(std)}$	dry gas volume measured by the dry gas meter, corrected to standard conditions, dscm (dscf)
V_n	target nozzle velocity, fps
v_s	average stack gas velocity, m/sec (ft/sec)
V_w	volume of water vapor
$V_{w(std)}$	volume of water vapor in the gas sample, corrected to standard conditions, scf (standard cubic feet)
$V_{wc(std)}$	volume of water vapor condensed corrected to standard conditions, scm (scf)
$V_{wsg(std)}$	volume of water vapor collected in silica gel corrected to standard conditions, scm (scf)
Volume H_2O	metric units = 0.00134 m^3/ml x ml H_2O English units = 0.04707 ft^3/mlxmlH_2O
W	width of the duct cross-section at the sampling site
W_f	final weight of silica gel or silica gel plus impinger, g
W_i	initial weight of silica gel or silica gel plus impinger, g
W_{lc}	weight of collected water, g
X_d	fraction of dry gas
Y	dry gas meter calibration factor

Y_i	yaw angle at traverse point i, degree
	0.280 molecular weight of N_2 or CO divided by 100
	1. molecular weight of O_2 divided by 100
	0.440 molecular weight of CO_2 divided by 100
	18.0 molecular weight of water, g/g-mole (lb/lb-mole)
3,600	conversion factor, sec/hr

Subscripts:

atm	atmospheric
ave	average
b	barometric
d	dry gas basis
f	final
g	gauge
i	initial
m	at meter
n	at nozzle
p	of pitot tube
s	at stack
SCF	standard cubic feet
std	standard conditions
w	wet basis

FORMULAE

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

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

Y is obtained from post-test meter calibrations.

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

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

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

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

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

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

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

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

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

9. TSP Emission Rate per Hour

$$E_{hr} = c_s Q_{std} 60$$

10. Percent Isokinetic Sampling Variation (40 CFR 60 App. A, Eq. 5-8)

$$I\% = \frac{T_{s(avg)} V_{m(std)} P_{std} 100}{T_{std} V_s \Theta A_n P_s 60 (1-B_{ws})}$$

11. Percent moisture at 100 percent saturation (%SVP) equation:

$$\% \ SVP = \left[\frac{100}{P_s}\right] x \ 10^{\left[6.6911 - \frac{3144}{(T_{ws} - 390.86)}\right]}$$

where: P_s = stack pressure (absolute), inches of mercury
T_{ws} = saturated stack temperature, degrees F

12. Emission Rate Compressor Engines (g/BHP-Hr)

$$E = \frac{(e) \ PPM \ Q_{STD}}{BHP}$$

13. Brake Horsepower for Compressor Engines

$$BHP = [43.6 \ x \ MMCFD \ x \left(\frac{T_{ts}}{T_{std2}}\right) x \left(\frac{K}{(K-1)}\right) x \left(R_2^{\frac{(k-1)}{k}} - 1\right) x \ LE \ x \ FE] + Fan \ HP$$

14. Pounds Per Hour Emission Rate

$$lb/hr = E * BHP * \frac{lb}{453.59 \ g}$$

15. Analyzer Calibration error, in general, % diff. ≤ 2%

$$\% \ Diff. = \left(\frac{Cal. \ gas \ ppm - Analyzer \ response \ ppm}{Analyzer \ span \ ppm}\right) x100$$

16. System bias, in general <5% for both zero and upscale gases

$$system\ Bias = \left(\frac{system\ cal.\ response\ ppm - Analyzer\ response\ ppm}{Analyzer\ span\ ppm}\right) x100$$

17. Calibration drift <3% for both zero and upscale gases during each run

$$Cal.\ Drift = \left(\frac{final\ sys\ Cal.\ resp.\ ppm - initial\ sys\ cal.\ resp.\ ppm}{analyzer\ span\ ppm}\right) x100$$

18.

$$System\ Calibration\ Bias = \left(\frac{System\ Cal.\ Response\ ppm - Analyzer\ Cal.\ Response\ ppm}{Span\ ppm}\right) x100$$

19.

$$Drift = \left(\frac{Final\ System\ Cal.\ Response\ ppm - Initial\ System\ Cal.\ Response\ ppm}{Span\ ppm}\right) x100$$

20. Analyzer calibration error, in general, %diff. ≤ 2%

$$\%\ Diff. = \left(\frac{Cylinder\ ppm - analyzer\ response\ ppm}{instrument\ span\ ppm}\right) x100$$

21. Parts per million by volume (ppmv) to pounds per hour (lbs/hr)

lbs/hr = 1.558×10^{-7} x molecular weight x flow, dscfm x ppmv

lbs/hr = (ppmv) ($1.558\ e^{-7}$) (MW) (dscfm)

ppm = parts per million
dscfm = dry standard cubic feet per minute
MW = molecular weight

22. Corrected concentrations to 12% CO_2

$$Cs_{12} = Cs \frac{12}{\%CO_2}$$

23. Correcting concentrations to 6 $\%O_2$

$$Cs_{\%O_2d} = Cs \left[\frac{20.9 - 6\ \%O_2}{20.9 - \%O_{2d}} \right]$$

24. Concentration moisture corrections

Cd = (Cw) / (1 - Bws)

Cd = concentration dry
Cw = concentration wet
Bws = moisture content

25. Fuel Burning Rule

Fuel Input: Measure fuel introduced to the boiler bank. For example,

$$E = 0.882 * H^{-0.1664}$$
$$E = 0.882\ (12{,}500\ lb_{fuel}/hr \times 4800\ Btu/lb_{fuel})/1\times10^6)^{-0.1664}$$
$$E = 0.882\ (60\ MMBtu/hr)^{-0.1664}$$
$$E = 0.4463\ lb/MMBtu$$

Where E is the maximum allowable particulate emissions rate in lbs per MMBtu.

Steam Production: Measure steam produced by the boiler bank. For example,

$$E = 0.882 * H^{-0.1664}$$
$$E = 0.882\ [(30{,}000\ lb_{steam}/hr \times 1{,}200\ Btu/lb_{steam})/(60\%_{boiler\ efficiency})/(1\times10^6)]^{-0.1664}$$
$$E = 0.882\ (60\ MMBtu/hr)^{-0.1664}$$
$$E = 0.4463\ lb/MMBtu$$

Where E is the maximum allowable particulate emissions rate in lbs per MMBtu.

APPENDIX F:
CALIBRATIONS AND CERTIFICATIONS

------ Nozzle Calibration ------

Avg diameter	diameter 1	diameter 2	diameter 3	Nozzle ID	Tollerance
0.127	0.127	0.125	0.128	N4	0.003
0.135	0.134	0.136	0.134	B4	0.002
0.135	0.134	0.135	0.135	B5	0.001
0.137	0.137	0.138	0.137	B3	0.001
0.138	0.138	0.138	0.139	N3	0.001
0.162	0.161	0.164	0.161	OO	0.003
0.181	0.182	0.180	0.181	60	0.002
0.188	0.188	0.188	0.189	B6	0.001
0.193	0.192	0.192	0.194	N6	0.002
0.193	0.193	0.192	0.194	B7	0.002
0.243	0.244	0.241	0.243	N81	0.003
0.245	0.244	0.247	0.243	N8	0.004
0.255	0.254	0.255	0.257	N5	0.003
0.256	0.254	0.258	0.256	B8	0.004
0.266	0.262	0.267	0.268	N7	0.006
0.269	0.268	0.270	0.269	8	0.002
0.297	0.296	0.298	0.297	1	0.002
0.313	0.312	0.311	0.315	2	0.004
0.313	0.311	0.314	0.315	11	0.004
0.314	0.313	0.314	0.314	NO	0.001
0.369	0.368	0.370	0.369	4	0.002
0.377	0.377	0.377	0.376	3	0.001
0.378	0.379	0.378	0.378	12	0.001
0.380	0.380	0.382	0.379	N2	0.003
0.381	0.380	0.381	0.382	B2	0.002
0.388	0.388	0.388	0.389	13	0.001
0.419	0.419	0.417	0.420	77	0.003
0.437	0.437	0.438	0.437	15	0.001
0.445	0.446	0.444	0.445	18	0.002
0.446	0.446	0.445	0.447	14	0.002
0.447	0.449	0.446	0.447	33	0.003
0.450	0.448	0.451	0.450	44	0.003
0.499	0.500	0.500	0.497	5	0.003
0.499	0.501	0.499	0.498	66	0.003
0.500	0.499	0.499	0.501	17	0.002
0.508	0.507	0.510	0.508	16	0.003
0.994	0.993	0.994	0.994	7	0.001

calibrated 8/1/2005 by Bill Shaw

Method 5.

10.1 Probe Nozzle. Probe nozzles shall be calibrated before their initial use in the field. Using a micrometer, measure the ID of the nozzle to the nearest 0.025 mm (0.001 in.). Make three separate measurements using different diameters each time, and obtain the average of the measurements. The difference between the high and low numbers shall not exceed 0.1 mm (0.004 in.). When nozzles become nicked, dented, or corroded, they shall be reshaped, sharpened, and recalibrated before use. Each nozzle shall be permanently and uniquely identified.

BISON ENGINEERING

Method 2

Full range thermal couple temperature calibrations

Technician ws

Date: 6-9-06

Audit Probe ID #: Extech 42312

Pitot tube ID #: 5B

	Pitot tube Thermocouple						NIST Thermometer						% Diff
Ice water	#	°C	32	°F	492.67	°R	#	°C	32	°F	492.67	°R	0.00%
ambient water	#	°C	75	°F	535.67	°R	#	°C	75	°F	535.67	°R	0.00%
Boiler water	#	°C	205	°F	665.67	°R	#	°C	206	°F	666.67	°R	-0.15%
Hot oil	#	°C	514	°F	974.67	°R	#	°C	518	°F	978.67	°R	-0.41%
Furnace	#	°C	#VALUE!	°F	#VALUE!	°R	#	°C	#VALUE!	°F	#VALUE!	°R	#VALUE!

Method 2, 10.3.1 Reference and thermocouple must be within 1.5%

BISON ENGINEERING

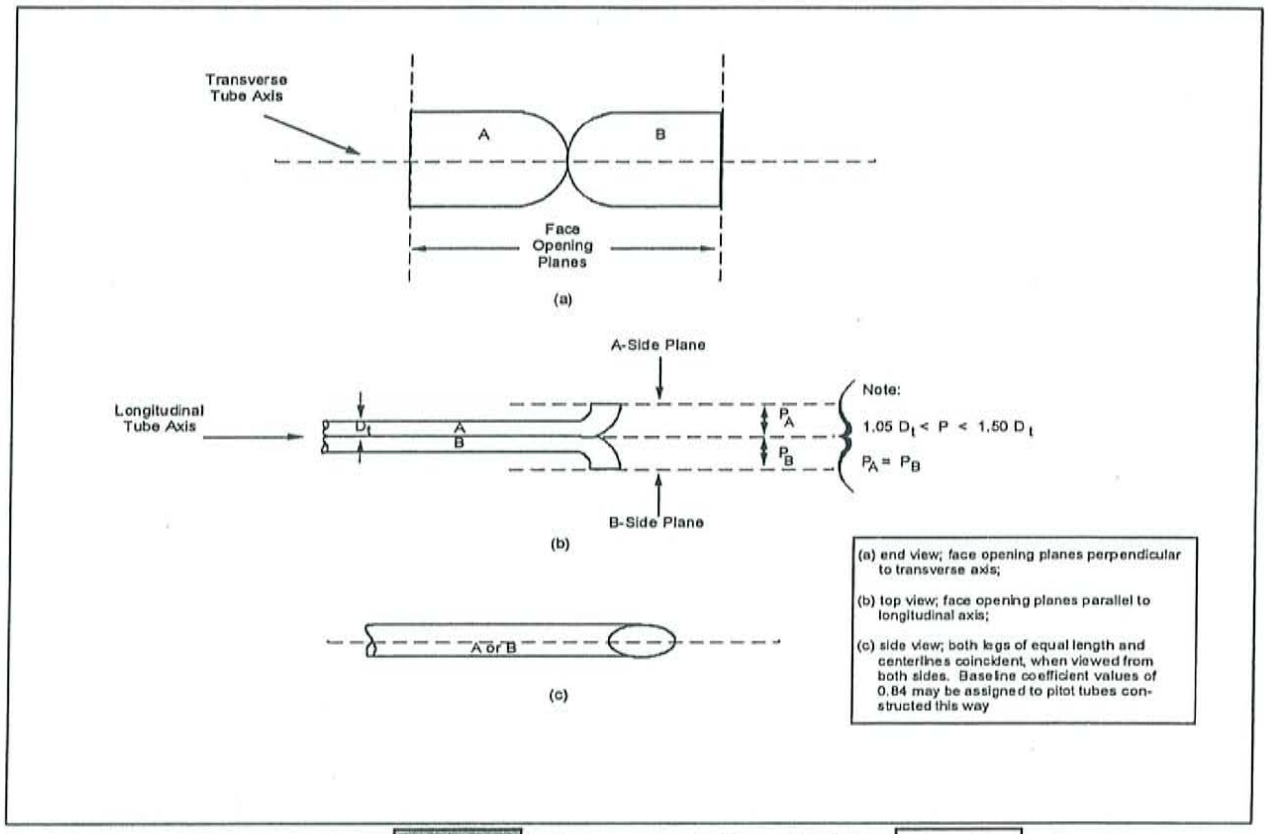
Method 2, section 10.1

Initial Isolated Initial Type S Pitot Tube Calibration

Technician ws

Date: 6-9-06

Pitot tube ID #: 5B



D_t =	0.375	inches	Is D_t > 0.187 inch	yes
P_A =	0.443	inches	Is D_t < 0.375 inch	yes
P_B =	0.443	inches	Does P_A = P_B ?	yes

1.05 D_t	0.394	Is P_A > 1.05 D_t	yes	Is P_B > 1.05 D_t	yes
1.50 D_t	0.563	Is P_A < 1.50 D_t	yes	Is P_B < 1.50 D_t	yes

Does this Pitot tube meet the requirements of Method 2, section 10.1 to be assigned a Cp of 0.84 ? **Yes**

EPA Reference Method 2. Section 10.0 Calibration and Standardization

10.1 Type S Pitot Tube. Before its initial use, carefully examine the Type S pitot tube top, side, and end views to verify that the face openings of the tube are aligned within the specifications illustrated in Figures 2-2 and 2-3. The pitot tube shall not be used if it fails to meet these alignment specifications. After verifying the face opening alignment, measure and record the following dimensions of the pitot tube: (a) the external tubing diameter (dimension Dt, Figure 2-2b); and (b) the base-to-opening plane distances (dimensions PA and PB, Figure 2-2b). If Dt is between 0.48 and 0.95 cm (3/16 and 3/8 in.), and if PA and PB are equal and between 1.05 and 1.50 Dt, there are two possible options: (1) the pitot tube may be calibrated according to the procedure outlined in Sections 10.1.2 through 10.1.5, or (2) a baseline (isolated tube) coefficient value of 0.84 may be assigned to the pitot tube. Note, however, that if the pitot tube is part of an assembly, calibration may still be required, despite knowledge of the baseline coefficient value (see Section 10.1.1). If Dt, PA, and PB are outside the specified limits, the pitot tube must be calibrated as outlined in Sections 10.1.2 through 10.1.5.

Calibration perfomed by: WS

BISON ENGINEERING

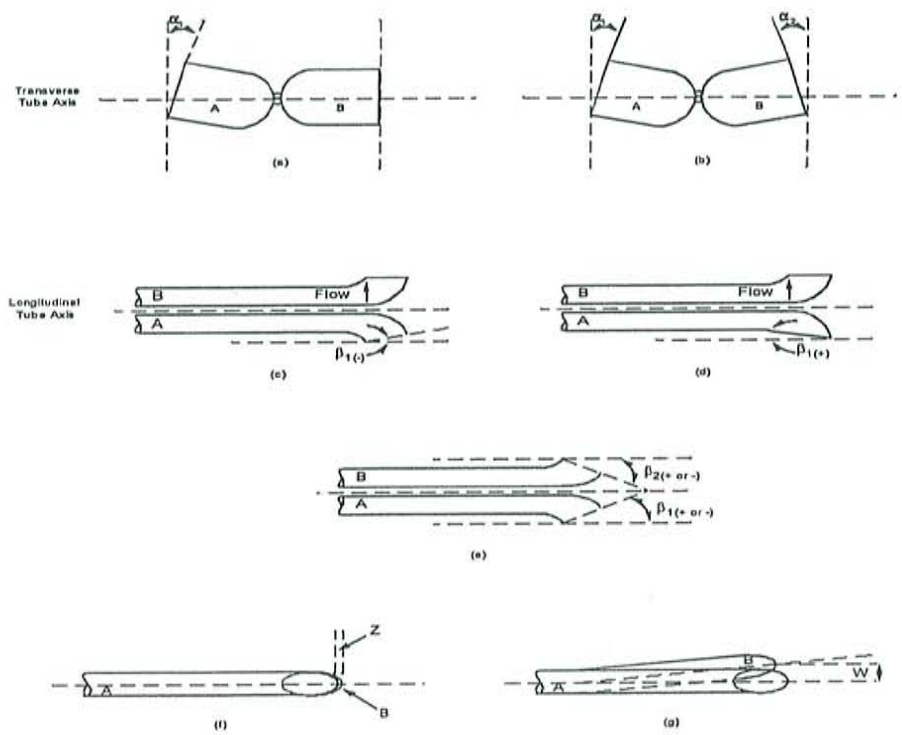
Method 2, section 10.- Type S Pitot Tube

Initial Calibration of Isolated Type S Pitot Tube

Technician ws

Date: 6-9-06

Pitot tube ID #: 5B



The types of face-opening misalignment shown above will not affect the baseline value of Cp(s) so long as α_1 and $\alpha_2 \leq 10°$, β_1 and $\beta_2 \leq 5°$, $z < 0.32$ cm (1/8 in.), and $w < 0.08$ cm (1/32 in.) (reference 11.0 in Section 16.0).

$\alpha_1 \leq 10°$	0
$\alpha_2 \leq 10°$	0
$\beta_{1+} \leq 5°$	2.1
$\beta_{1-} \leq 5°$	0
$\beta_{2+} \leq 5°$	0
$\beta_{2-} \leq 5°$	0
$z \leq 1/8$ in	0
$w \leq 1/32$ in	0

Calibration perfomed by: ws

BISON ENGINEERING

Method 2, section 10.- Type S Pitot Tube Assembly

Initial Calibration of Proper Temperature Placement

Technician ws

Date: 6-9-06

Pitot tube ID #: 5B

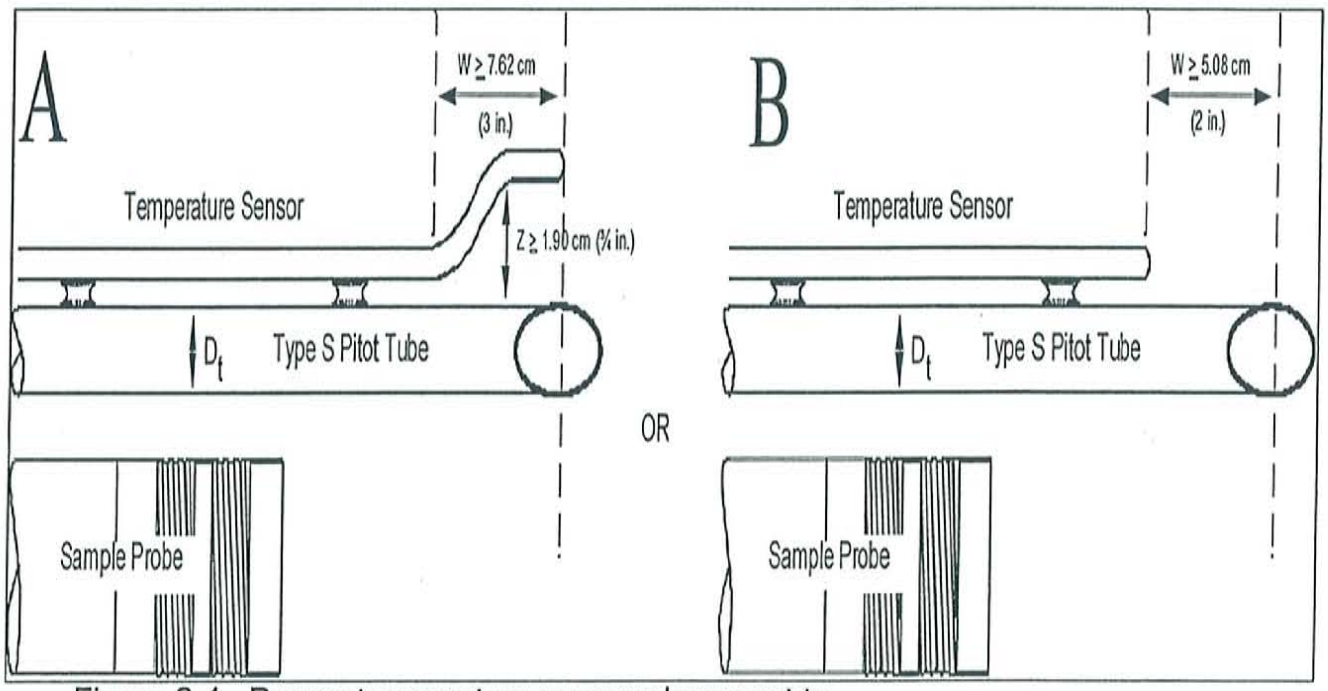


Figure 2-4. Proper temperature sensor placement to
to prevent interference; Dt between 0.48 and 0.95 cm (3/16 and 3/8)

A	**Is the temperature sensor distance W > 3 in from pitot tube opening ?**	**Yes**
	and, is the temperature sensor distance Z > ¼" from pitot tube opening ?	**Yes**
B	**or, is the temperature sensor distance W ≥ 2" from pitot tube opening ?**	**NA**

Calibration perfomed by: ws

BISON ENGINEERING

Method 2, section 10.1.5.2.1 Type S Pitot Tube

Recalibration of "Isolated" Pitot Tube

Technician

Date:

Pitot tube ID #: 5B

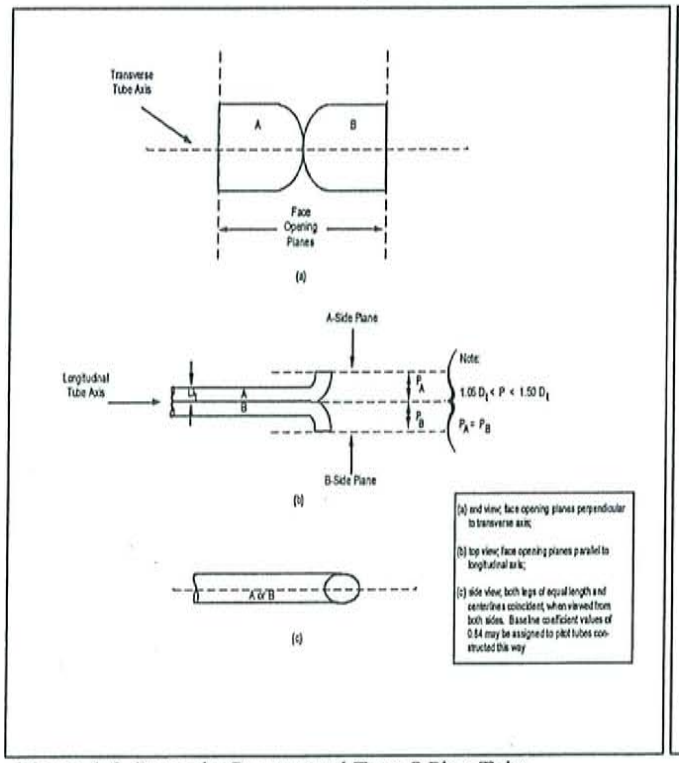


Figure 2-2. Properly Constructed Type S Pitot Tube.

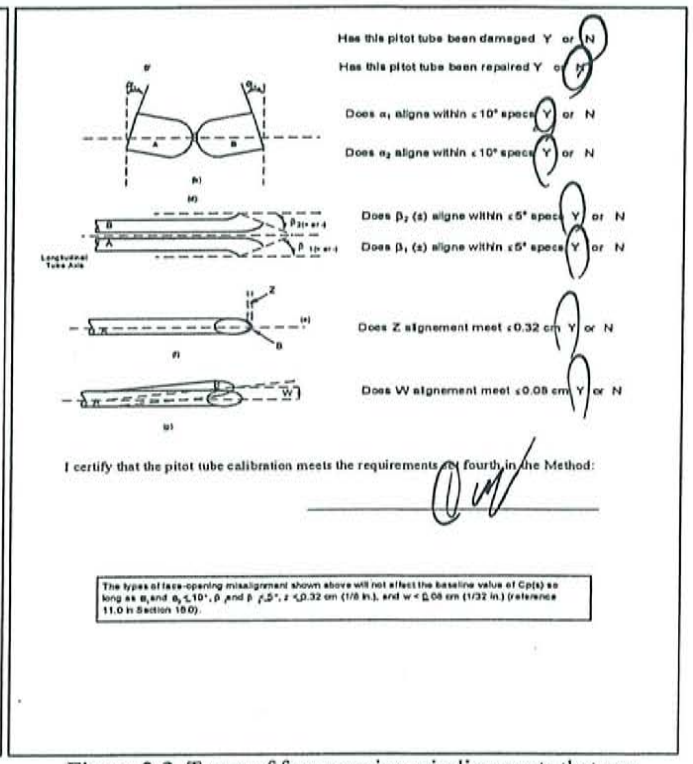


Figure 2-3. Types of face-opening misalignments that can result from field use or improper construction of type S pitot tubes.

During examination, do the openings still align within the specifications inlistrated in Figures 2-2 & 2-3 ? Enter Yes or No Yes

Calibration perfomed by: _____

EPA Reference Method 2. Section 10.0 Calibration and Standardization

10.1.5.2.1 Isolated Pitot Tubes. After each field use, the pitot tube shall be carefully reexamined in top, side, and end views. If the pitot face openings are still aligned within the specifications illustrated in Figure 2-2 and Figure 2-3, it can be assumed that the baseline coefficient of the pitot tube has not changed. If, however, the tube has been damaged to the extent that it no longer meets the specifications of Figure 2-2 and Figure 2-3, the damage shall either be repaired to restore proper alignment of the face openings, or the tube shall be discarded.

BISON ENGINEERING

Method 2, section 10.1.3.1 Type S Pitot Tube

Pitot tube Thermal couple post test calibrations

Client: Winkler
Location: Post Falls
Source: Hot Plant
Date: Sept 28 06
Technician [illegible]

Avg source temp.: 260 °F / 720.67 °R

+ / - Calibration Ranges					
+ 10%	333	°F	=	793	°R
- 10%	195	°F	=	655	°R

Probe ID #: 5B

Pitot tube Thermocouple				NIST Thermometer				% Diff	Limitation
	°C	=	273.15 °K		°C	=	273.15 °K	0.00%	+/- 1.5%

Pitot tube Thermocouple				NIST Thermometer				% Diff	
209.8	°F	=	670.47 °R	210	°F	=	670.67 °R	-0.03%	+/- 1.5%

Calibration perfomed by: [signature]

Temperatures are not corrected for Bp.

EPA Reference Method 2. Section 10.0 Calibration and Standardization

10.3.1 After each field use, calibrate dial thermometers, liquid-filled bulb thermometers, thermocouple-potentiometer systems, and other sensors at a temperature within 10 percent of the average absolute stack temperature. For temperatures up to 405°C (761°F), use an ASTM mercury-in-glass reference thermometer, or equivalent, as a reference. Alternatively, either a reference thermocouple and potentiometer (calibrated against NIST standards) or thermometric fixed points (e.g., ice bath and boiling water, corrected for barometric pressure) may be used. For temperatures above 405°C (761°F), use a reference thermocouple-potentiometer system calibrated against NIST standards or an alternative reference, subject to the approval of the Administrator.

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

Meter Console Information	
Box Number	3
Console Serial Number	80709
DGM Model Number	
DGM Serial Number	

Calibration Conditions			
Date	Time	31-Aug-06	10:30
Barometric Pressure		26.2	in Hg
Theoretical Critical Vacuum[1]		12.3	in Hg
Calibration Technician		DSB	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K_1	17.647	oR/in Hg

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

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

Calibration Data

Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(Θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})		K'	(t_{amb})	(t_{amb})	
min	in H_2O	cubic feet	cubic feet	°F	°F		see above2	°F	°F	in Hg
5.0	0.9	455.700	458.620	65	65	Qm55	0.4455	71	71	17
5.0	0.9	458.620	461.570	65	65	Qm55	0.4455	71	71	17
5.0	0.9	461.570	464.500	66	66	Qm55	0.4455	71	72	17

Results

Standardized Data				Dry Gas Meter				
Dry Gas Meter		Critical Orifice		Calibration Factor		Flowrate	ΔH @	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
($V_{m(std)}$)	($Q_{m(std)}$)	($Vcr_{(std)}$)	($Q_{cr(std)}$)	(Y)	(ΔY)	($Q_{m(std)(corr)}$)	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H2O	
2.573	0.515	2.528	0.506	0.982	0.004	0.506	1.751	0.001
2.600	0.520	2.528	0.506	0.972	-0.006	0.506	1.751	0.001
2.577	0.515	2.527	0.505	0.980	0.002	0.505	1.750	-0.001
Pretest Gamma		% Deviation	Enter Data	0.978	Y Average		1.751	ΔH@ Average

AVERAGE **Y=** 0.978

AVERAGE **H=** 1.751

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

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

Signature _____ Date _____

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

Meter Console Information	
Box Number	3
Console Serial Number	80709
DGM Model Number	
DGM Serial Number	

Calibration Conditions			
Date	Time	20-Sep-06	15:00
Barometric Pressure		26.0	in Hg
Theoretical Critical Vacuum[1]		12.3	in Hg
Calibration Technician		mc	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K_1	17.647	oR/in Hg

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

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

Calibration Data

Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(Θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})		K'	(t_{amb})	(t_{amb})	
min	in H_2O	cubic feet	cubic feet	°F	°F		see above2	°F	°F	in Hg
5.0	0.8	614.000	616.932	69	69	Qm55	0.4455	71	71	16
5.0	0.8	616.932	619.859	69	69	Qm55	0.4455	71	71	16
5.0	0.8	619.859	622.815	69	69	Qm55	0.4455	71	72	16

Results

Standardized Data				Dry Gas Meter				
Dry Gas Meter		Critical Orifice		Calibration Factor		Flowrate	ΔH @	
($V_{m(std)}$)	($Q_{m(std)}$)	($Vcr_{(std)}$)	($Q_{cr(std)}$)	Value (Y)	Variation (ΔY)	Std & Corr ($Q_{m(std)(corr)}$)	0.75 SCFM (ΔH@)	Variation (ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H2O	
2.553	0.511	2.517	0.503	0.986	0.002	0.503	1.512	0.000
2.548	0.510	2.517	0.503	0.988	0.004	0.503	1.512	0.000
2.573	0.515	2.516	0.503	0.978	-0.006	0.503	1.513	0.001
Pretest Gamma		% Deviation	Enter Data	0.984	Y Average		1.512	ΔH@ Average

AVERAGE **Y=** 0.984

AVERAGE **H=** 1.512

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

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

Signature _____ Date _____

VISIBLE EMISSIONS EVALUATOR

This is to certify that

Mike Chovanak

met the specifications of Federal Reference Method 9 and qualified as a visible emissions evaluator. Maximum deviation on white and black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by Eastern Technical Associates of Raleigh, North Carolina. This certificate is valid for six months from date of issue.

339398	*Helena, Montana*	*April 5, 2006*
Certificate Number	Location	Date of Issue

Thomas Fore
President

Michael Langford
Director of Training