



GUIDELINE DOCUMENT FOR COMPLETION OF PROTOCOL SUBMITTAL FORMS NORTH CAROLINA DIVISION OF AIR QUALITY

This document is intended to provide guidance for proper completion and use of the “Protocol Submittal Forms” (PSF) used by the North Carolina Division of Air Quality (DAQ). There are two PSFs. One is a general form to be used for most testing projects. The other is specifically designed for Opacity or Visible Emissions (VE) testing. This guidance provides an explanation of each item on each PSF and includes example PSF forms for a fictitious facility. The Stationary Source Compliance Branch (SSCB) – Compliance Review Group (CRG) developed the PSFs and this guidance. The CRG is the group responsible for review of all emissions test protocols within DAQ.

The primary goals of the Protocol Submittal Forms are to initiate communication between representatives of the permitted facility, the testing consultants, and the DAQ as well as to identify and resolve any specific testing concerns prior to testing. Facilities should complete and submit a PSF prior to performing any testing at their facility.

Copies of the PSFs can be found at the DAQ website: <http://daq.state.nc.us/enf/sourcetest/>
Each form is provided in two electronic formats. The first is in an Adobe Acrobat (PDF) format for typewriter or hand-printed completion. The second format is as an easy to use MS Word template. For the MS Word file, simply double-click to fill the boxes and click and type in the grayed areas to complete the questions.

Completion and submittal of the PSF is required a minimum of 45 days prior to the test date. This time frame provides DAQ with the necessary time to fully review the protocol and determine if there are any issues that may need to be addressed prior to testing. The PSF should be submitted to the appropriate DAQ Regional Supervisor as referenced further in this document. **The testing should only be performed with approval from the DAQ.**

It is important to note that there is a second notification requirement that should be addressed separately from the PSF. **Facilities are required to notify the DAQ Regional Supervisor at least 15 days prior to performing testing.** This notification affords the Regional Supervisor the opportunity to have regional personnel present during the testing. **Please contact the appropriate Region Supervisor to inquire about the proper procedures for this notification requirement**

Any additional questions concerning the completion of the Protocol Submittal Form should be directed to DAQ Compliance Review Group. Compliance Review Group contacts:

Shannon Vogel	(919) 733-1472	shannon.vogel@ncmail.net	**Principle Contact**
James Hammond	(919) 715-6303	james.hammond@ncmail.net	
Paula Hemmer	(919) 715-4207	paula.hemmer@ncmail.net	
David Hughes	(919) 715-2966	david.hughts@ncmail.net	
Gregg O’Neal	(919) 715-0251	gregg.oneal@ncmail.net	



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GENERAL PSF FOR MOST TESTING:

This section directly references the questions outlined in the General Protocol Submittal Form.

As stated in the PSF instructions, any additional information should be submitted attached to the PSF as necessary.

The PSF is a two-page document that, when completed with all requested attachments, can provide all the relevant and necessary information for review of a site specific source test plan. The first page consists of the facility and testing company information and the source-specific testing purpose and data use. The second page addresses specific test methods and procedures.

Generally, the PSF is structured such that the information on page one should be primarily provided by the facility representative(s) and the information on page two should be provided by the testing company representative(s). For this reason, a PSF is not considered complete unless the signatures of both representatives are provided.

PAGE ONE: FACILITY AND TESTING COMPANY INFORMATION AND TEST PURPOSE AND USE

The initial question on the PSF is to specify the appropriate Regional Office for the facility. There are seven distinct regions located within North Carolina. Click [here](#) to view a map of the regions with contact information for each one.

The PSF should be submitted to the appropriate Regional Supervisor and/or regional personnel. All questions and/or comments regarding the PSF submittal should also be directed to the appropriate Regional Supervisor and/or regional personnel.

<i>Facility Name:</i>	Self-explanatory.
<i>Facility Address/City/County:</i>	Provide the mailing address for the facility and/or contact person. Please specify if the contact is not located at the facility. Provide the county name of the facility location.
<i>Contact Person/Phone/Fax:</i>	Provide the appropriate facility contact person to address any facility and/or testing issues that may arise. Provide the phone and fax numbers for the contact person.
<i>Testing Company Name:</i>	Self-explanatory.
<i>Testing Company Address</i>	Self-explanatory.
<i>Contact Person/Phone/Fax:</i>	Provide the appropriate contact person to address any testing issues that may arise. Provide the phone and fax numbers for the contact person.
<i>Air Permit Number:</i>	Provide the current NC DAQ Air Permit Number. Include the current revision number (i.e. 01234R16).
<i>Permitted Source Name and ID No.:</i>	Provide the name and ID No. of the source being tested <u>as listed in the Air Permit</u> . (i.e. Boiler 1, ID No. ES-1)



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- Permitted Maximum Process Rate:* Provide the maximum rate as specified in the air permit.
- Maximum Normal Operation Process Rate:* Provide the maximum rate that the source is operated under "normal operation".
- Target Process Rate for Testing:* **Generally, compliance testing is required at $\geq 90\%$ of permitted maximum.** However, there are situations where testing is required/allowed under normal operating conditions, thus "maximum normal operation process rate".

1.1) What is the specific purpose for the proposed testing?

Provide the specific purpose for the proposed testing. For compliance testing, specify if the testing is to fulfill a specific condition in the Air Permit. Specify if the testing is for initial NSPS or NESHAP requirements. Be specific in details (i.e. NOT "State requirement")

1.2) List all state and federal regulations that apply to the proposed testing:

The source being tested may be regulated by various air quality regulations. List only those that specifically apply to the testing. For SIP sources, these regulations consist of the regulations found in 15A NCAC 2D through 2Q regulations. If the source is governed by federal regulations, list the specific Subpart. (i.e. 2D .0524 and NSPS Subpart 000)

1.3) Will the test results be used for other regulatory purposes (e.g., emission inventories, permit applications, etc.) beyond that stated above? If yes, explain.

The purpose of this question is to determine what, if any, additional considerations would need to be taken into account and/or documented in order for the testing to meet all the needs of the facility. A specific example: Without careful consideration and design, a compliance test will rarely provide the information necessary to determine an emission factor.

1.4) How will production/process data be documented during testing (control equipment, process parameters, etc.)?

The facility is responsible for providing an accurate account of operations during the test period(s). Provide the specific collection methodology and information that will be presented in the final test report.

*1.5) Please provide a brief description of the source (including control equipment) and **attach** source or process flow diagram:*

This question is self-explanatory with respect to the description. The attached flow diagram only needs to be a simple representation of the source layout. Clearly labeled engineering drawings are also acceptable. The schematic allows for the determination if any special considerations are necessary for the source configuration. (i.e. sampling after a wet scrubber, or capture efficiency considerations)

*1.6) Please provide a brief description of the sampling location, **attach** schematic of sampling location, and indicate whether concurrent testing will be conducted at other sampling locations:*

The sampling location description and schematic can be integrated into the attached responses to questions 1.4 and/or 2.3. The indication of concurrent sampling allows for the determination if any sample timing and/or methodology considerations are needed.



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PAGE TWO: TEST METHODS AND PROCEDURES

2.1) Please provide the following information for each test parameter.

Target Pollutant – Self-explanatory.

Proposed Test Method – Self-explanatory.

Number of Test Runs/ Test Run Duration – The minimum is three one-hour runs.

of Sampling Points – As specified by EPA Method 1 or applicable test method.

2.2) ***Will all testing be conducted in strict accordance with the applicable test methods? If answer is no, please attach complete documentation of all modifications and/or deviations to the applicable test methods.***

This is perhaps the single-most important question within Section 2. Failure to address any deviations is grounds for test rejection. Provide a complete, detailed description of any proposed method deviation(s) and the specific purpose and/or justification for the deviation(s). Do not proceed with any altered test method without DAQ approval.

2.3) ***Does the proposed sampling location meet the minimum EPA Method 1 criteria for acceptable measurement sites? Please attach supporting documentation.***

Self-explanatory. Attach the stack information including stack dimensions and upstream/downstream disturbance measurements per EPA Method 1. It is possible to gain protocol approval without this specific information, however, the testing shall not occur if it is determined on-site that the source does not meet Method 1 criteria.

2.4) ***Has absence of cyclonic flow been verified per EPA Method 1 (Section 2.4)? If answer is no, absence of cyclonic flow must be verified prior to testing. If answer is yes, please attach supporting documentation.***

All sources should verify the absence of cyclonic flow through the measurement procedures described in Method 1. The absolute value of the non-axial flow angle shall be less than 20 degrees. Previous measurements for a given source may be used provided no physical changes have been made which may change the flow characteristics.

2.5) ***Will the oxygen concentration be determined by EPA Method 3 via Orsat or strict EPA Method 3A?(specify) If answer is no, see Question 2.2 above.***

15A NCAC .0501(c)(13) prohibits the use of Fyrite™ for oxygen concentration determinations.

2.6) ***Do any of the proposed test methods require analysis of EPA audit samples? If yes, notify Regional Office at least 45 days prior to testing to allow for audit sample preparation and shipment.***

Several test methods require audit samples. Refer to the proposed test method(s) for applicability.

2.7) ***Has all testing equipment been calibrated within the past year? If answer is no, please explain.***

Further calibrations may be required dependent on the proposed test method(s). All calibration data, both pre and post-test shall be submitted with the final test report.



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2.8a) *Have all calibration gases been certified by EPA Protocol 1 procedures? (Answer only as applicable)*
Only Protocol 1 gases will be used for analyzer/instrumental test methods.

2.8b) *Is a dilution system (via EPA Method 205) proposed? (Answer only as applicable)*
The use of a dilution system requires prior DAQ approval. Strict EPA Method 205 procedures and prior documentation and system description are required.

Please **attach** a summary of expected calibration gas concentrations for all proposed instrumental test methods.
Self-explanatory. Gas values can be approximate. Specify analyzer range and/or span value.

2.9) *What is the proposed test schedule?*

As stated previously, the actual test date may change dependent on scheduling and/or as a result of the protocol review. **Facilities are required to notify the DAQ Regional Supervisor at least 15 days prior to performing testing.** This notification affords the Regional Supervisor the opportunity to have regional personnel present during the testing. Should the test date listed in the PSF change, or if the actual test date is not scheduled at the time of PSF submittal, then the notification requirement has not been met. **Please contact the appropriate Region Supervisor to determine the proper procedures for this notification requirement**

SIGNATURES:

The PSF is not considered complete unless the signatures of both representatives are provided. The signatures may be obtained on two separate, identical forms or via fax copy.

EXAMPLE PSF:

The following PSF is provided as an example. This fictitious facility is performing required compliance testing on a thermal oxidizer for destruction efficiency of VOC emissions.



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Purpose: *The primary goals of the Protocol Submittal Form are to initiate communication between representatives of the permitted facility, the testing consultants, and the DAQ as well as to identify and resolve any specific testing concerns prior to testing.*

Instructions: ***Submit all forms and additional information to the DAO Regional Supervisor at least 45 days prior to testing.** Please type or print clearly. Complete one form for each sampling location. If this form does not supply sufficient space to completely answer all questions or if additional relevant information is necessary, **attach** additional documentation and/or information to the original form. Questions and/or comments should be directed to the appropriate Regional Supervisor.*

This form is available from the DAQ website (<http://daq.state.nc.us/Offices/Technical/Stationary/Compliance/>)

Specify Appropriate Regional Office: (check one)

Asheville Fayetteville Mooresville Raleigh Washington Wilmington Winston-Salem

Facility Name: *123 Widgets, Inc*

Testing Company: *ABC Air Testing, Inc*

Facility Address/City/County:

*1000 Widgets Way
Raleigh, NC 27604
Wake County*

Testing Company Address:

*2000 Pitot Lane
Raleigh, NC 27604*

Contact Person: *John Q. Owner*

Contact Person: *Jack Q. Tester*

Phone: *(919) 555-1234*

Fax: *(919) 555-1235*

Phone: *(919) 555-9786*

Fax: *(919) 555-9787*

Air Permit Number: *09999R09*

Permitted Source Name and ID No.: *Thermal Oxidizer, ID No. CD-1*

Permitted Maximum Process Rate:

1000 lb/hr production

Maximum Normal Operation Process Rate:

800-900 lb/hr

Target Process Rate for Testing:

900-1000 lb/hr

1.1) What is the specific purpose for the proposed testing?

To satisfy Specific Condition 6 of the Air Permit - demonstrate compliance with the PSD BACT limit (98% VOC control).

1.2) List all state and federal regulations that apply to the proposed testing:

15A NCAC 2D .0530 - PSD BACT 40 CFR 51

1.3) Will the test results be used for other regulatory purposes (e.g., emission inventories, permit application, etc.) beyond that stated above.

Yes or No? If yes, explain.

The results will be used to report VOC emissions based on control efficiency and usage rates.

1.4) How will production/process data be documented during testing (control equipment, process parameters, etc.)?

Production rate will be monitored during testing using calibrated widget scale. Thermal oxidizer chamber temperature will be continuously monitored via DAS system.

1.5) Please provide a brief description of the source (including control equipment) and **attach** source or process flow diagram:

Widget coating process in series with widget dryer, controlled by natural gas fired thermal oxidizer. The process is located within a permanent total enclosure, verification per EPA Method 204 will be submitted with test results.

1.6) Please provide a brief description of the sampling location, **attach** schematic of sampling location, and indicate whether concurrent testing will be conducted at other sampling locations:

The outlet sampling will occur in the exhaust stack from the TO. The outlet stack is 30 inches in diameter. Two test ports are located 30 inches from the stack exhaust (1.0 diameters) and 60 inches from the outlet of the TO (2.0 diameters). The inlet sampling will occur at the inlet duct to the TO. The duct is 24 inches in diameter. The ports are located 48 inches (2 diam) from the TO inlet and 48 inches (2 diam) from the nearest duct disturbance. The inlet and outlet sampling will occur simultaneously.



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2.1) Please provide the following information for each test parameter.					
Target Pollutant	Proposed Test Method	Number of Test Runs	Test Run Duration	# of Sampling Points	Comments
Flow rate	EPA 1-4	3	60 min	24	24 points at both inlet and outlet locations
O2/CO2	EPA 3A	3	60 min	1	Sample points located within 10% centroid of the inlet duct and outlet stack
Destruction Efficiency	EPA 25A	3	60 min	1	Sample points located within 10% centroid of the inlet duct and outlet stack

2.2) Will all testing be conducted in strict accordance with the applicable test methods? If answer is no, please **attach** complete documentation of all modifications and/or deviations to the applicable test methods. Yes No

2.3) Does the proposed sampling location meet the minimum EPA Method 1 criteria for acceptable measurement sites? Please **attach** supporting documentation. Yes No

2.4) Has absence of cyclonic flow been verified per EPA Method 1 (Section 2.4)? If answer is no, absence of cyclonic flow must be verified prior to testing. If answer is yes, please **attach** supporting documentation. Yes No

2.5) Will the oxygen concentration be determined by EPA Method 3 via Orsat or strict EPA Method 3A? (specify) If answer is no, see Question 2.2 above. Yes No

2.6) Do any of the proposed test methods require analysis of EPA audit samples? If yes, notify Regional Office at least 45 days prior to testing to allow for audit sample preparation and shipment. Yes No

2.7) Has all testing equipment been calibrated within the past year? If answer is no, please explain. Yes No

2.8a) Have all calibration gases been certified by EPA Protocol 1 procedures? (Answer only as applicable) Yes No

2.8b) Is a dilution system (via EPA Method 205) proposed? (Answer only as applicable) Yes No

Please **attach** a summary of expected calibration-gas concentrations for all proposed instrumental test methods.

2.9) What is the proposed test schedule? **The DAO Regional Supervisor must be notified at least 15 days prior to the actual test date(s)**
 Test scheduled for December 25, 2000

Additional Comments:

Signatures: Representatives from the permitted facility and the contracted testing company **must provide signatures** below certifying that the information provided on this form and any attached information is accurate and complete.

John Q.
Owner

_____/ 10/1/00
 Permitted Facility Representative Date

Name: John Q. Owner

Title: Plant/Environmental Manager

Company: 123 Widgets, Inc

Jack Q.
Tester

_____/ 10/1/00
 Testing Company Representative Date

Name: Jack Q. Tester

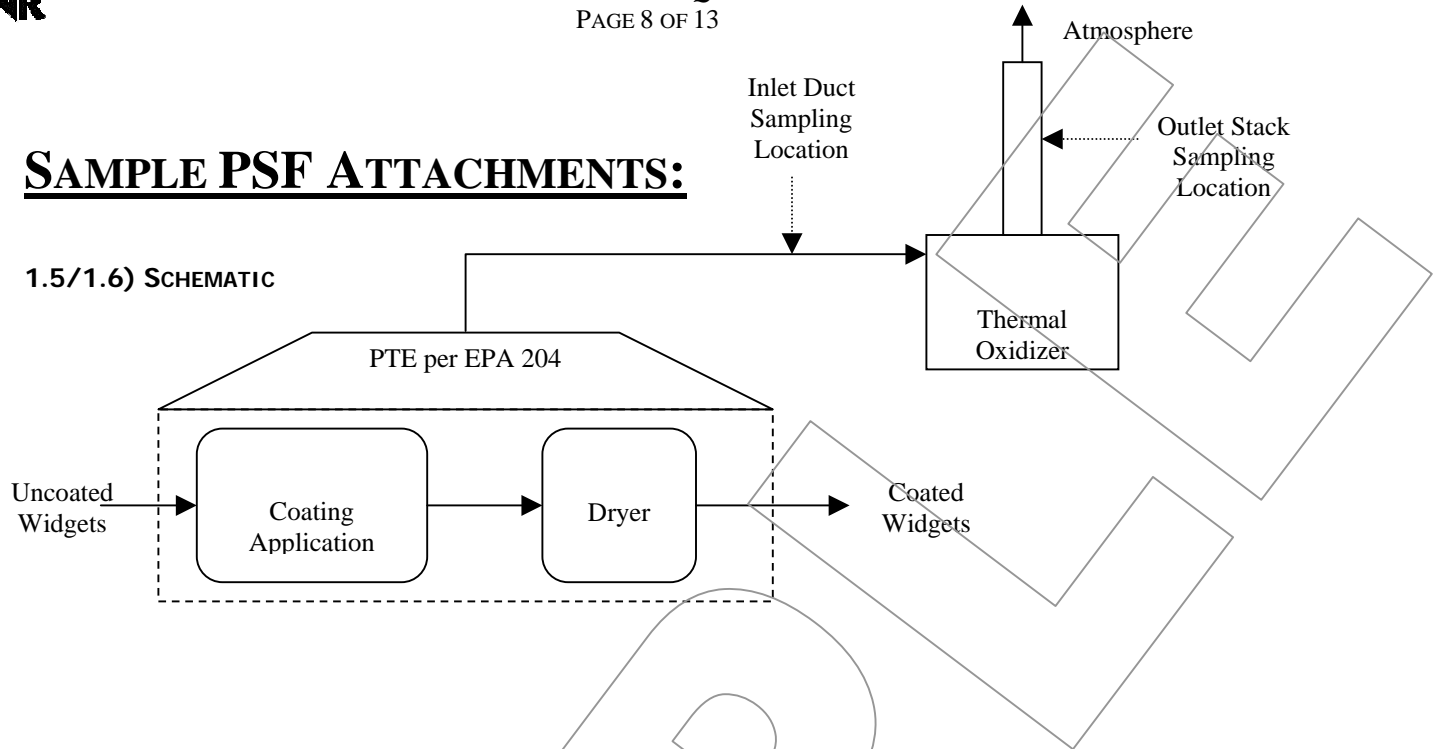
Title: Project Manager

Company: ABC Air Testing, Inc.

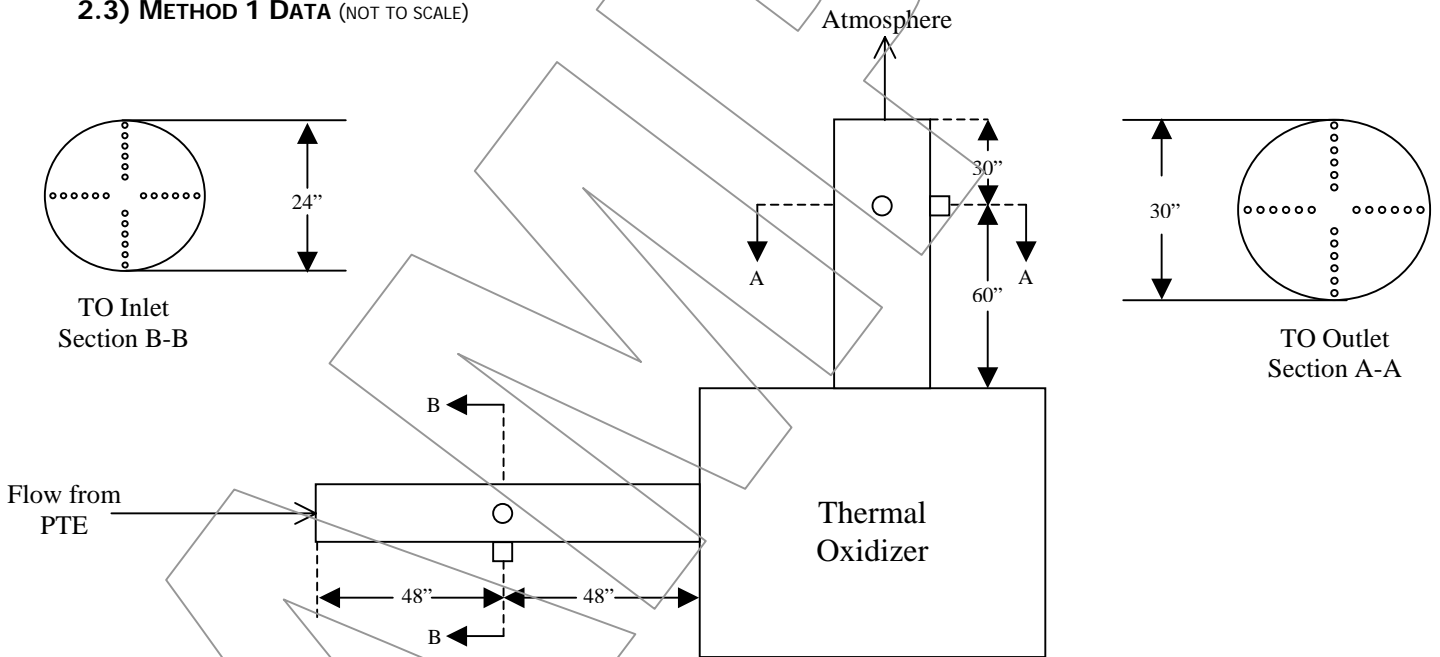


SAMPLE PSF ATTACHMENTS:

1.5/1.6) SCHEMATIC



2.3) METHOD 1 DATA (NOT TO SCALE)



2.8) CALIBRATION GAS DATA (EPA PROTOCOL 1)

INLET CALIBRATION GAS VALUES (PPM PROPANE)	OUTLET CALIBRATION GAS VALUES (PPM PROPANE)	INLET/OUTLET CALIBRATION GAS VALUES (% O2 AND % CO2)	
RANGE/SPAN: 0-1000 PPM ZERO - 0 PPM N ₂ LOW - 306 PPM MID - 512 PPM HIGH - 847 PPM	RANGE/SPAN: 0-100 PPM ZERO - 0 PPM N ₂ LOW - 30.2 PPM MID - 49.8 PPM HIGH/SPAN - 85.7 PPM	<u>OXYGEN</u> RANGE/SPAN: 0-25% ZERO - 0 PPM N ₂ MID - 12.5 % HIGH/SPAN - 22.1 %	<u>CARBON DIOXIDE</u> RANGE/SPAN: 0-20% ZERO - 0 PPM N ₂ MID - 10.1 % HIGH/SPAN - 18.2 %



PSF FOR OPACITY TESTING:

This section directly references the questions outlined in the Opacity Protocol Submittal Form. As stated in the PSF instructions, any additional information should be submitted attached to the PSF as necessary.

Like the General PSF, the Opacity PSF consists of two pages which when completed with all requested attachments, can provide all the relevant and necessary information for review of a site specific source test plan. The first page consists of the facility and testing company information and the source-specific testing purpose and data use. The second page lists the emission points to be tested. Use additional copies of the second page if needed.

As with the General PSF, the Opacity PSF must be signed by both the Tester and a Facility representative. The PSF is not considered complete without both signatures.

PAGE ONE: FACILITY AND TESTING COMPANY INFORMATION AND TEST PURPOSE AND USE

The initial question on the PSF is to specify the appropriate Regional Office for the facility. There are seven distinct regions located within North Carolina. Click [here](#) to view a map of the regions with contact information for each one.

The PSF should be submitted to the appropriate Regional Supervisor and/or regional personnel. All questions and/or comments regarding the PSF submittal should also be directed to the appropriate Regional Supervisor and/or regional personnel.

Facility Name: Same as for General PSF

Facility Address/City/County:

Contact Person/Phone/Fax:

Testing Company Name:

Testing Company Address:

Contact Person/Phone/Fax:

Air Permit Number:

Permitted Source Name and ID No.:

Permitted Maximum Process Rate:

Maximum Normal Operation Process Rate:

Target Process Rate for Testing:

1.1) List all state and federal regulations that apply to the proposed testing:

The source being tested may be regulated by various air quality regulations. List only those that specifically apply to the testing. For SIP sources, these regulations consist of the regulations found in 15A NCAC 2D through 2Q regulations. If the source is governed by federal regulations, list the specific Subpart. (i.e. 2D .0524 and NSPS Subpart 000)

1.2) Will all testing be conducted in strict accordance with the applicable test methods? If answer is no, please attach complete documentation of all modifications and/or deviations to the applicable test methods.

Failure to address any deviations is grounds for test rejection. Provide a complete, detailed description of any proposed method deviation(s) and the specific purpose and/or justification for the deviation(s). Do not proceed with any altered test method without DAQ approval.

1.3) Please specify if any VE observations will be performed concurrently (DAQ advises no more than 2):

Method 9 observations can be made on multiple emission points by alternating between points.

*1.4) What is the Proposed test schedule? **The DAQ Regional Supervisor must be notified at least 30 days prior to the actual test date(s).***

List date or dates of testing. Telephone the appropriate regional office if any changes are made to this schedule after the PSF is submitted.



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SIGNATURES:

The PSF is not considered complete unless the signatures of both representatives are provided. The signatures may be obtained on two separate, identical forms or via fax copy.

EXAMPLE PSF:

The following PSF is provided as an example. This fictitious facility is performing required compliance testing various pieces of equipment at a quarry.



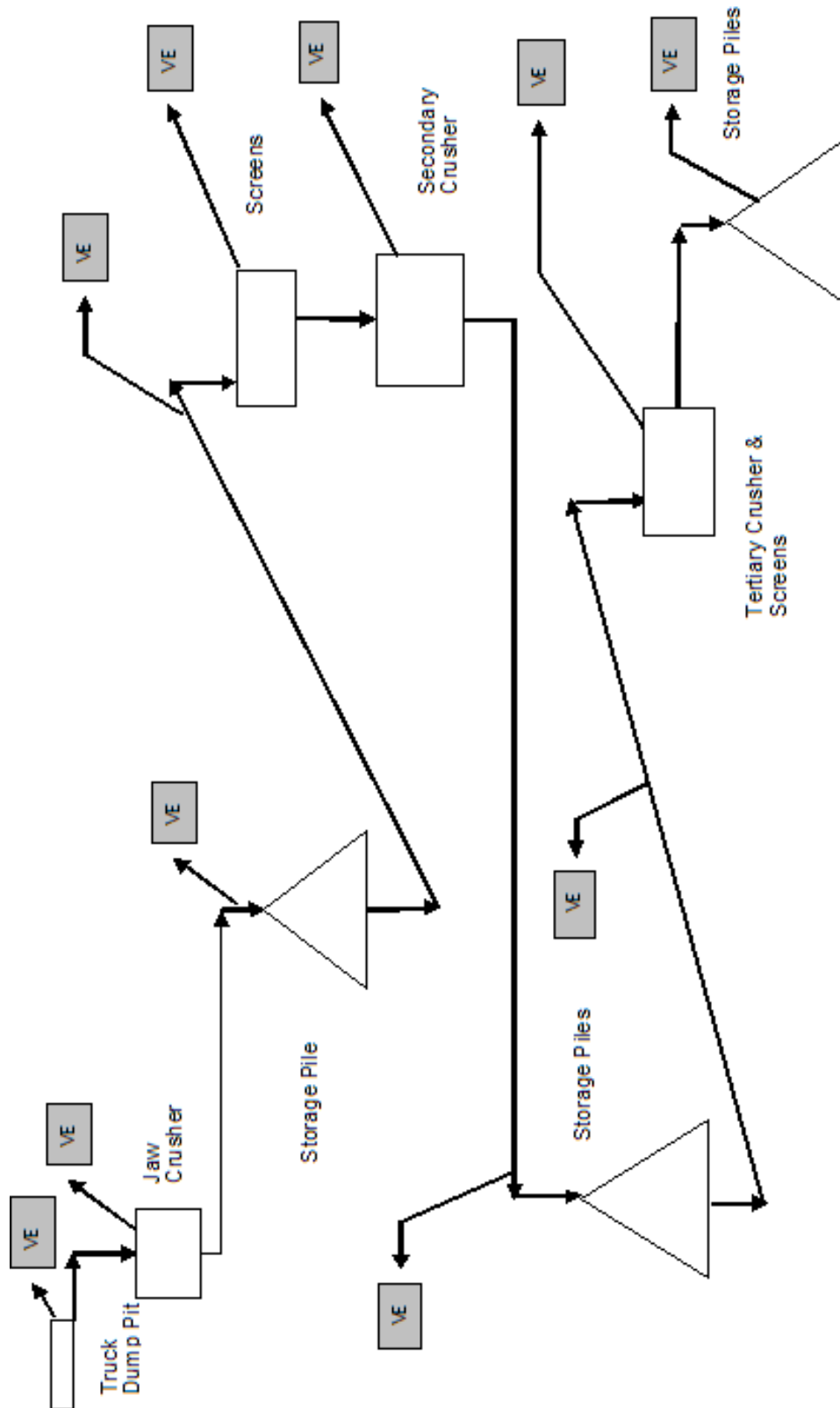
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Purpose: The primary goals of the Protocol Submittal Form are to initiate communication between representatives of the permitted facility, the testing consultants, and the DAQ as well as to identify and resolve any specific testing concerns prior to testing. **Instructions: Submit all forms and additional information to the DAQ Regional Supervisor at least 45 days prior to testing.** Please type or print clearly. **This form applies to EPA Method 9 visible emissions evaluations only.** If this form does not supply sufficient space to completely answer all questions or if additional relevant information is necessary, **attach** additional documentation and/or information to the original form. Questions and/or comments should be directed to the appropriate Regional Supervisor.

Specify Appropriate Regional Office: (check one)

<input checked="" type="checkbox"/> Asheville	<input type="checkbox"/> Fayetteville	<input type="checkbox"/> Mooresville	<input type="checkbox"/> Raleigh	<input type="checkbox"/> Washington	<input type="checkbox"/> Wilmington	<input type="checkbox"/> Winston-Salem
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Facility Name: Rocks and Boulders Aggregates, Inc.	Testing Company: Eagle Eye Testing, Inc.	
Facility Address/City/County: 1234 Stony Road Spruce Pine, NC 28777 Mitchell County	Testing Company Address: 9 Method Road Black Mountain, NC 28711	
Contact Person: Robert P. Crusher	Contact Person: Michael J. Magoo	
Phone: (828) 444-1234 Fax: (828) 444-1235	Phone: (828) 777-2020 Fax: (828) 777-2060	
Air Permit Number: 08888R08	Permitted Source Name and ID No.: See Section 2.1	
Permitted Maximum Process Rate: 350 Tons/hr	Maximum Normal Operation Process Rate: 300 Tons/hr	Target Process Rate for Testing: 300 Tons/hr
1.1) List all state and federal regulations that apply to the proposed testing: 40 CFR 60, Subpart 000		
1.2) Will all testing be conducted in strict accordance with the applicable test methods? If answer is no, please attach complete documentation of all modifications and/or deviations to the applicable test methods.		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1.3) Please specify if any VE observations will be performed concurrently (DAQ advises no more than 2):		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
1.4) What is the proposed test schedule? The DAO Regional Supervisor must be notified at least 30 days prior to the actual test date(s) Test scheduled for July 4, 2008		
Additional Comments:		
Signatures: Representatives from the permitted facility and the contracted testing company must provide signatures below certifying that the information provided on this form and any attached information is accurate and complete.		
<p><i>Robert P. Crusher</i> / 04/15/2008</p> <p>Permitted Facility Representative Date</p> <p>Name: Robert P. Crusher</p> <p>Title: Plant Manager</p> <p>Company: Rocks and Boulders Aggregates, Inc.</p>	<p><i>Michael J. Magoo</i> / 04/15/2008</p> <p>Testing Company Representative Date</p> <p>Name: Michael J. Magoo</p> <p>Title: Project Manager</p> <p>Company: Eagle Eye Testing, Inc.</p>	



**Example Simplified Process Flow Diagram and Visible Emissions
Observation Points at a Quarry**