

COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Valley Regional Office

STATEMENT OF LEGAL AND FACTUAL BASIS

INVISTA S.à r.l.
Waynesboro, Virginia
Permit No. VRO80517

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and VAC 5 Chapter 80, INVISTA S.à r.l. has applied for a Title V Operating Permit for its Waynesboro, Virginia facility. The Department has reviewed the application and has prepared a draft Title V Operating Permit.

Engineer/Permit Contact:  Date: 7/20/2017
Jeremy Funkhouser
(540) 574-7820

Air Permit Manager:  Date: 7/21/2017
Janardan R. Pandey, P.E.

FACILITY INFORMATION

Permittee

INVISTA S.à r.l.
400 Dupont Boulevard
Waynesboro, Virginia 22980

Facility

INVISTA S.à r.l.
400 Dupont Boulevard
Waynesboro, Virginia 22980

SOURCE DESCRIPTION

NAICS Code	Manufacturing Description
325222	Manmade Organic Fibers, Except Cellulosic

INVISTA S.à r.l. (INVISTA) owns and operates a synthetic fiber production facility located in Waynesboro, Virginia. The facility is a Title V major source of volatile organic compounds (VOC). The facility is currently an area source of Hazardous Air Pollutants (HAP). This source is located in an attainment area for all pollutants, and is a PSD major source. The facility is currently operating under a minor new source review permit issued on November 16, 2012. The plant was built circa 1929. The facility consists of two main areas:

- The Powerhouse
- The Spandex Production Facility

Below is a brief description of each of these areas.

The Powerhouse

INVISTA shutdown two of the three existing coal-fired boilers on January 9, 2014, and installed two natural gas-fired boilers on January 21, 2014, that utilize distillate oil and liquefied propane gas (LPG) as backup fuels. Each of the boilers (Ref. Boiler 4 and Boiler 5) has a maximum rated input heat capacity of 99 MMBtu/hr. The third existing coal-fired boiler was shut down on March 13, 2014, after the shake-down of the two new boilers (Ref. Boiler 4 and Boiler 5). Prior to shutdown of the three coal-fired boilers, the facility was classified as a major source of HAP; after the shutdown of the three coal-fired boilers, and the installation of the two natural gas-fired boilers, the facility is considered an area source of HAP.

The boilers (Ref. Boiler 4 and Boiler 5) are covered under a minor New Source Review (NSR) permit dated November 16, 2012, and each are subject to the requirements of 40 CFR 60 Subpart Dc and 40 CFR 63 Subpart JJJJ.

The Spandex Production Facility

The spandex production facility, which produces INVISTA's brand of spandex fiber, is comprised of three basic areas: polymer processing, spinning, and solvent recovery. The spandex production facility is covered under a minor New Source Review (NSR) permit dated November 16, 2012.

The Spandex Polymer Processing

In polymer processing, an aromatic di-isocyanate (Methylene bisphenyl isocyanate - MDI) is combined with glycol in a heated reactor to form the base polyurethane polymer, or "capped glycol". A polymer solution is then formed by the addition of a solvent, N, N-dimethyl acetamide (DMAc). At this point, the solution is called "diluted capped glycol". The diluted capped glycol solution is transferred to a second reactor where various reagents are employed to determine properties of the polymer such as chain length. The polymer is then filtered. As a final step, a variety of additives are mixed with the filtered polymer solution to provide properties to the finished yarn that the polymer alone would not give. Resistance to sunlight, whiteness retention and resistance to the effects of chlorine bleach are some of the desirable properties that the additives contribute to the final product. The polymer solution is then ready for spinning into spandex fiber.

Spandex Spinning

The spinning process involves flow of the polymer solution through a spinneret and into a heated, nitrogen inert spinning cell. The spinning process is actually an extrusion of the polymer into very fine, hair-like filaments. The spinning cells are kept neutrally balanced to slightly negative in pressure, and along with the nitrogen, volatilized DMAc is evaporated and removed from the spinning cell. Brine-cooled condensers condense the DMAc, which is then sent to a recovery area for purification and recycling. The nitrogen is returned to the spinning cell for re-use.

The filaments with the DMAc removed are gathered together to form strands of fiber. The fibers are wound onto tubes at the bottom of the spinning cell and these tubes are removed as they become full. The full tubes are inspected and packed into boxes for shipment or are wound onto a long metal beam for shipment.

Spandex Solvent Recovery System

Condensed DMAc is returned to the solvent recovery system for purification and recycling. Makeup DMAc is added to the system primarily to account for that which is lost to the atmosphere, solution waste, tart still purges, and waste treatment.

In addition to the two main areas the facility also operates support equipment including two fire

pumps, one emergency generator, and several insignificant emission units. At the first applicable date of compliance for MACT, 40 CFR 63 Subpart ZZZZ, the facility was classified as a Major Source of HAPs. In accordance with the “once in, always in” memorandum on MACT standards, the major source requirements of 40 CFR 63 Subpart ZZZZ are provided for the emergency generator and two fire pumps.

COMPLIANCE STATUS

The facility is inspected once every two years. INVISTA was last inspected on May 13, 2015, and was found to be in compliance.

CHANGES TO TITLE V OPERATING PERMIT

The following changes have been made to the Title V Permit:

- **Powerhouse** – The facility shutdown the three multi-fueled boilers (Ref. 2-205 B-1, 2-205 B-2, and 2-205 B-3), and replaced them with two natural gas and distillate oil-fired boilers (Ref. Boiler 4 and Boiler 5). Boiler 4 and Boiler 5 are each rated at 99.0 MMBtu/hr and are permitted under a minor New Source Review (NSR) permit dated November 16, 2012.
- **Powerhouse** – The Compliance Assurance Monitoring (CAM) plan for the baghouse (Ref. 2-205 H) associated with the three multi-fueled boilers (Ref. 2-205 B-1, 2-205 B-2, and 2-205 B-3) was removed from the Title V permit.
- **Coal Handling Equipment** – Upon shutdown of the three multi-fueled boilers (Ref. 2-205 B-1, 2-205 B-2, and 2-205 B-3), the coal handling equipment was permanently shut down and removed from the facility. The proposed permit modification removes the requirements associated with the coal handling equipment.
- **Spandex Production Equipment** – In addition to the permanent shut down of the boilers (Ref. 2-205 B-1, 2-205 B-2, and 2-205 B-3) and coal handling equipment, the facility also permanently shut down portions of the Spandex Polymerization and Spinning Processes (Ref. 6-473 through 6-484, and 6-488). The equipment listing in the Title V permit was updated from the equipment designations used in the minor NSR permit dated November 16, 2012; the equipment designations are a result of emission unit clarification for the Plant-Wide Applicability Limit (PAL) permit application, and do not represent changes in equipment at the facility. Aside from the shutdown equipment previously mentioned (Ref. 6-473 through 6-484, and 6-488), there are no changes to the Spandex production equipment.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

Equipment to be operated consists of the following:

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
Process: Powerhouse							
Boiler 4	B4	Natural gas fired boiler with liquefied propane gas (LPG) and distillate oil as back-up fuels	99.0 MMBtu/hr	Low-NOx Burners	--	NOx	NSR Permit dated 11/16/12
Boiler 5	B5	Natural gas fired boiler with LPG and distillate oil as back-up fuels	99.0 MMBtu/hr	Low-NOx Burners	--	NOx	NSR Permit dated 11/16/12
Process: Spandex Production Facility							
7-7 7-76 7-84 7-250 7-278 7-349 7-564 7-604 7-615 7-633 7-634 7-653	7-7 7-76 7-84 7-250 7-278 7-349 7-564 7-604 7-615 7-633 7-634 7-653	Spandex Polymerization Process (1983)	-	-	-	-	NSR Permit dated 11/16/12

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
7-29	7-29	Spandex Spinning Process (1983)	-	-	-	-	NSR Permit dated 11/16/12
7-66	7-66						
7-67	7-67						
7-68	7-68						
7-83	7-83						
7-247	7-247						
7-291	7-291						
7-292	7-292						
7-303	7-303						
7-304	7-304						
7-309	7-309						
7-348	7-348						
7-652	7-652						
7-654	7-654						
8-42	8-42	Spandex Solvent Recovery Process (1983)	-	-	-	-	NSR Permit dated 11/16/12
8-43	8-43						
8-44	8-44						
8-48	8-48						
8-51	8-51						
8-52	8-52						
8-53	8-53						
8-59	8-59						
8-75	8-75						
8-76	8-76						
8-78	8-78						
8-79	8-79						
8-80	8-80						
8-81	8-81						
8-86	8-86						
8-87	8-87						
8-88	8-88						
8-89	8-89						
8-194	8-194						
8-210	8-210						

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
Process: Reciprocating Engines							
FP-1	FP-1	Clarke Detroit Diesel Fire Pump Motor (Model DDFP-T6AT)	341 HP	-	-	-	-
FP-2	FP-2	Clarke Detroit Diesel Fire Pump Motor (Model DDFP-T6AT)	341 HP	-	-	-	-
G-1	G-1	Isuzu Diesel Engine Powered Back Up Generator (Model 6BG1 Isuzu Engine)	77 HP	-	-	-	-

*The Size/Rated capacity is provided for informational purposes only, and is not an applicable requirement.

EMISSIONS INVENTORY

A copy of the 2016 annual emission update is included in Attachment A. Emissions are summarized in the following tables.

2016 Actual Facility-wide Criteria Pollutant Emissions

Pollutant	PM-10	PM-2.5	SO₂	NO_x	CO	VOC
	tons/yr					
Emissions - 2016	2.29	2.29	0.18	11.15	11.45	143.13

2016 Facility-wide Hazardous Air Pollutant Emissions

Pollutant	Tons/yr
Formaldehyde	2.29
Acetamide	0.29

EMISSION UNIT APPLICABLE REQUIREMENTS

Powerhouse

The facility installed two natural gas and distillate oil-fired boilers (Ref. Boiler 4 and Boiler 5) under a minor New Source Review (NSR) permit dated November 16, 2012; the changes below detail only the portions of the permit involving the two natural gas and distillate oil-fired boilers (Ref. Boiler 4 and Boiler 5).

Limitations:

The following limitations are state BACT requirements from the minor NSR permit issued on November 16, 2012. The following limitations are specific for Boiler 4 and Boiler 5. The condition numbers below are from the NSR permit; a copy of the permit is enclosed in Attachment B.

- | | |
|---------------|---|
| Condition 2: | Oxides of nitrogen (NO _x) emissions from the boilers (Ref. Boiler 4 and Boiler 5) shall be controlled by low NO _x burners with flue gas recirculation and a NO _x performance of 30 ppmvd at three percent O ₂ for natural gas. |
| Condition 4: | The approved fuels for the boilers (Ref. Boiler 4 and Boiler 5) are natural gas, LPG, and distillate oil. A change in the fuel may require a permit to modify and operate. |
| Condition 6: | The condition establishes the fuel throughput limitations for the boilers (Ref. Boiler 4 and Boiler 5). |
| Condition 8: | Boiler emissions shall be controlled by proper operation and maintenance. Boiler operators shall be properly trained. |
| Condition 9: | Except where this permit is more restrictive than the applicable requirement, the boilers (Ref. Boiler 4 and Boiler 5) shall be operated in compliance with the requirements of 40 CFR 60, Subpart Dc. |
| Condition 10: | The condition establishes the short-term emission limitations from each boiler (Ref. Boiler 4 and Boiler 5) when firing natural gas. |
| Condition 11: | The condition establishes the short-term emission limitations from each boiler (Ref. Boiler 4 and Boiler 5) when firing LPG. |
| Condition 12: | The condition establishes the short-term emission limitations from each boiler (Ref. Boiler 4 and Boiler 5) when firing distillate oil. |
| Condition 13: | The condition establishes the annual emission limitations from the |

operation of both boilers (Ref. Boiler 4 and Boiler 5).

Condition 14: The condition establishes the visible emission limitation for each boiler (Ref. Boiler 4 and Boiler 5).

The following limitations from the minor NSR permit, dated November 16, 2012, were not included in the Title V permit; condition numbers refer to the NSR permit:

Condition 5: The distillate oil sulfur limitation of 0.05% is not included in the Title V permit.

Condition 12: The short-term SO₂ emission limitations for each boiler are not included in the Title V permit.

Condition 12: The short-term SO₂ emission limitations for each boiler are not included in the Title V permit.

In accordance with 9 VAC 5-80-100, the facility has requested the following limitations be established in the Title V permit; condition numbers refer to the Title V permit:

Condition 3: The condition establishes the maximum sulfur content of the distillate oil for the boilers (Ref. Boiler 4 and Boiler 5) is 0.0015%.

Condition 10: The condition establishes the short-term SO₂ emission limitations from each boiler (Ref. Boiler 4 and Boiler 5) when firing distillate oil.

Condition 12: The condition establishes the annual SO₂ emission limitations from the boilers (Ref. Boiler 4 and Boiler 5).

The emission factors provided in Attachment A to the Title V permit have been updated to reflect the change in the sulfur content of the distillate oil. Emission calculations showing the derivation of the short-term and annual limitations are provided in Attachment D. Monitoring, recordkeeping, and reporting requirements are discussed below.

In addition to the requirements from the minor NSR permit, the boilers are also subject to 40 CFR 60 Subpart Dc. The requirements of the minor NSR permit, dated November 16, 2012, provide more stringent requirements than those in 40 CFR 60 Subpart Dc. The requirements of 40 CFR 60 Subpart Dc have been streamlined with the requirements of the NSR permit.

In addition to the requirements of the minor NSR permit, the boilers are subject to 40 CFR 63 Subpart JJJJJ. Each boiler is a new unit, constructed after June 4, 2010, which combusts natural gas, liquefied petroleum gas (LPG), and distillate oil; the sulfur content of the distillate oil combusted at the facility does not exceed 0.0015%, and each boiler is equipped with a oxygen trim system. Accordingly, the following requirements are established in accordance with 40 CFR 63 Subpart JJJJJ; condition numbers refer to the Title V permit:

- Condition 14: Except where this permit is more restrictive than the applicable requirement, the boilers (Ref. Boiler 4 and Boiler 5) shall be operated in compliance with the requirements of 40 CFR 63, Subpart JJJJJ.
- Condition 15: For each boiler (Ref. Boiler 4 and Boiler 5), the permittee shall comply with the applicable standards in 40 CFR 63.11201, and with each work practice standard, emission reduction measure, and management practice specified in Table 2 to 40 CFR 63, Subpart JJJJJ. The permittee shall conduct an initial tune-up of each boiler no later than 61 months after the initial startup of each boiler (Ref. Boiler 4 and Boiler 5) as specified in 40 CFR 63.11214. The permittee shall conduct subsequent tune-ups of each boiler every five-years as specified in 40 CFR 63.11223 (b).
- Condition 16: The condition establishes work practice standards for each boiler.
- Condition 17: The condition establishes the applicable continuous compliance requirements as described in 40 CFR 63.11223.
- Condition 18: For each boiler (Ref. Boiler 4 and Boiler 5), the permittee shall comply with the applicable requirements of the General Provisions of 40 CFR 63 Subpart A, as outlined in Table 8 to 40 CFR 63, Subpart JJJJJ.

After permit issuance the distillate oil combusted in each boiler (Ref. Boiler 4 and Boiler 5) will be limited to ultra-low-sulfur fuel as defined in §63.11237 (Condition 3 of the Title V permit). The boilers (Ref. Boiler 4 and Boiler 5) will therefore not be subject to the PM emission limit in Table 1 of the subpart in accordance with 40 CFR 63.11210 (f). The facility is required to monitor and record the monthly and annual fuel consumed by each boiler, in accordance with Condition 15 of the NSR permit, as discussed below.

The following Virginia Administrative Codes that have specific emission requirements have been determined to be applicable:

- 9 VAC 5-40-900, Existing Source Standard for Particulate Matter (ACQR 1-6)
- 9 VAC 5-40-910, Existing Source Emission Allocation System
- 9 VAC 5-50-400 and 9 VAC 5-50-410, Standards of Performance for New and Modified Stationary Sources

In each case, the minor NSR permit provides more stringent limitations than the Virginia Administrative Codes listed above.

Monitoring and Recordkeeping:

The following monitoring and recordkeeping requirements are included in the minor NSR permit issued on November 16, 2012. The following limitations are specific for Boiler 4 and Boiler 5. The condition numbers below are from the NSR permit; a copy of the permit is enclosed in Attachment B:

Condition 7: The condition establishes the fuel certification requirements for distillate oil shipments.

Condition 15: The condition establishes the recordkeeping requirements for Boiler 4 and Boiler 5.

The fuel certification requirement, in addition to the recordkeeping requirement associated with the fuel certifications establish a means of demonstrating compliance with the fuel sulfur content and distillate oil fuel throughput for each boiler.

The recordkeeping requirements include: annual throughputs of natural gas, LPG, and distillate oil; fuel supplier certifications; monthly and annual emission calculations; results of all stack tests, visible emission evaluations and performance evaluations; records of maintenance/operating procedures and training; and scheduled and unscheduled maintenance and operator training.

The recordkeeping requirement for the annual fuel throughputs establishes a means of demonstrating compliance with the fuel throughput limitations, as well as a means of calculating monthly and annual emissions. The recordkeeping requirement for fuel certifications provides a means of demonstrating compliance with the distillate oil fuel sulfur content established in the Title V permit, as well as an alternate means of supporting the continuous compliance demonstration with the distillate oil fuel throughput and emission calculations.

The recordkeeping requirement for emission calculations establishes a means of demonstrating compliance with the annual emission limitations provided in the permit. Emissions are calculated in accordance with the DEQ approved emission factors, which are provided as Attachment A to the Title V permit. The facility is also required to keep information regarding stack testing; stack testing is discussed in the Testing section below.

Uncontrolled SO_x emissions are almost entirely dependent on the sulfur content of the fuel and are not affected by boiler size, burner design, or grade of fuel being fired. On average, more than 95 percent of the fuel sulfur is converted to SO₂. Continuous compliance with the SO₂ emission limitations are reasonable demonstrated through the fuel throughput limitations and associated recordkeeping, as well as the fuel certifications showing the distillate oil fuel sulfur content, and the associated recordkeeping.

Continuous compliance with the PM, PM-10, and PM-2.5 emission limitations is reasonably demonstrated through fuel throughput limitations and associated recordkeeping. Subsequent visible emission evaluations are not required at this time given that Boiler 4 and Boiler 5 are

primarily natural gas fired units; the boilers have a low likelihood of producing particulate emissions which cause visible emissions. The presence of visible emissions associated with the boilers is remote.

Continuous compliance with the VOC emission limitations is reasonably demonstrated through fuel throughput limitations and associated recordkeeping.

Continuous compliance with the CO emission limitations is reasonably demonstrated through fuel throughput limitations and associated recordkeeping. Subsequent stack testing is not required at this time; the results of the initial stack testing from the installation of the boilers are discussed in the Testing section below.

Continuous compliance with the NO_x emission limitations is reasonably demonstrated through fuel throughput limitations and associated recordkeeping, as well as through stack testing, as discussed in the testing section below. The facility is required to keep records of the results of all stack tests and performance evaluations

In addition to the monitoring and recordkeeping requirements established in the minor NSR permit issued on November 16, 2012, the following recordkeeping requirements have been established in accordance with the boiler MACT; condition numbers refer to the Title V permit:

Condition 21: The condition establishes the recordkeeping requirements necessary to demonstrate compliance with the Boiler MACT.

The recordkeeping requirements include: a copy of each notification and report submitted; records to document conformance with the work practices, emission reduction measures, and management practices; records of actions taken during periods of malfunction to minimize emissions; and records of all inspection and monitoring data. The recordkeeping requirements provided in the Boiler MACT, in association with the reporting requirements discussed below, establish a means of demonstrating continuous compliance with the requirements of the Boiler MACT limitations.

Reporting:

Condition 16 of the minor NSR permit requires the facility to submit semiannual fuel quality reports; the condition is included in the Title V permit.

Condition 23 of the Title V permit establishes the reporting requirements to demonstrate compliance with the Boiler MACT. The reporting requirements include: all of the applicable notifications in §§ 63.7(b), 63.8(e) and (f), and 63.9(b) through (e), (g), and (h); and an annual compliance certification report for the previous calendar year.

Testing:

In accordance with Condition 17 of the NSR permit, the facility conducted initial stack testing on Boiler 5 to demonstrate compliance with the NO_x and CO emissions on February 18, 2014.

Emissions of CO were demonstrated to be 0.593 ppmvd at 3% oxygen, which is significantly less than the emission limitation of 50 ppmvd at 3% oxygen. Given the CO stack test results, the requirement for subsequent stack testing once per permit term is not included in the Title V permit for CO emissions. A copy of the stack test results is included as Attachment E. Continuous compliance with the CO emission limitations is reasonably demonstrated through fuel throughput limitations and the associated recordkeeping.

The requirement for subsequent stack testing once per permit term to demonstrate compliance with the NOx emission limitations while burning natural gas is included as Condition 29 in the Title V permit. Natural gas was selected for NOx since that is the primary fuel for each boiler. The once-per-term stack testing provides a means of demonstrating continuous compliance with the NOx emission limitations established in the permit.

In addition to the initial stack testing, the minor NSR permit also requires the facility to conduct an initial Visible Emissions Evaluation (VEE) on each Boiler 4 and Boiler 5 while burning distillate oil. The initial VEEs were conducted on June 18, 2014 and June 19, 2014. The requirement for the initial VEE was also required the NSPS Subpart Dc. The initial VEE requirement from the minor NSR is not included in the Title V permit since the condition has already been fulfilled.

Condition 19 of the NSR permit requires additional stack testing upon request. Subsequent stack testing is not required at this time given that the units are primarily natural gas fired units; no violation of the short-term emission limitations is anticipated for either Boiler 4 or Boiler 5. The continuing compliance testing upon request has been included in the Title V permit as a means of demonstrating continued compliance with the permit limits.

Condition 20 of the NSR permit requires addition VEEs upon request. Subsequent visible emission evaluations are not required at this time given that Boiler 4 and Boiler 5 are primarily natural gas fired units; the boilers have a low likelihood of producing particulate emissions which cause visible emissions. The presence of visible emissions associated with the boilers is remote. The continuing compliance testing upon request has been included in the Title V permit as a means of demonstrating continued compliance with the permit limits.

Compliance Assurance Monitoring (CAM) Applicability:

Compliance Assurance Monitoring (CAM) is not applicable to Boiler 4 or Boiler 5. The boilers do not have pre-controlled emissions of any pollutant that are greater than the major source threshold. Furthermore, the boilers do not use any control devices that would be applicable to CAM. The boilers do not meet the CAM applicability requirements in 40 CFR 64.a (1) through (3). CAM is not applicable.

Spandex Production Facility

The equipment listing in the Title V permit was updated from the equipment designations used in the minor NSR permit dated November 16, 2012; the equipment designations are a result of emission unit clarification for the Plant-Wide Applicability Limit (PAL) permit application, and do not represent changes in equipment at the facility. Aside from the shutdown equipment previously mentioned (Ref. 6-473 through 6-484, and 6-488), there are no changes to the Spandex production equipment.

Limitations

The following limitations are state BACT requirements from the minor NSR permit issued on November 16, 2012 NSR Permit. Please note that the condition numbers are from November 16, 2012 NSR Permit, a copy of the permit is enclosed as Attachment B.

- Condition 22: Volatile organic compound (VOC) emissions from the spandex (Classic) spinning processes shall be controlled by brine-cooled condensers.
- Condition 24: VOC emissions from the spandex production facility shall not exceed 37.6 lbs/hr and 164.7 tons/yr.
- Condition 42: Measures necessary in order to minimize the duration and frequency of excess emissions, with respect to air pollution control equipment, monitoring devices, and process equipment which affect such emissions.

The following Virginia Administrative Codes that have specific emission requirements have been determined to be applicable:

9 VAC 5-50-80, New Source Standard for Visible Emissions

The following conditions in the Title V permit were established pursuant to these Codes; condition numbers refer to the Title V permit:

- Condition 30: Visible emissions from each spandex production facility exhaust shall not exceed 20 percent opacity except during one six-minute period in any one hour in which visible emissions shall not exceed 30 percent opacity.

Monitoring and Recordkeeping

The monitoring and recordkeeping requirements in Condition 25 of the minor NSR permit have been modified and incorporated into the Title V permit in order to meet Part 70 requirements.

The hourly and annual VOC emissions contained in Condition 24 of the NSR permit for the

spandex production facility are a result of fugitive emissions from the spandex production process. The spandex production process relies on a closed loop system of DMAC (a VOC); however during the spinning process fugitive VOCs are released and are vented through exhaust fans throughout the spinning floor. The permittee shall conduct quarterly performance tests for VOC in accordance with NIOSH Method 2004 or INVISTA Lab Procedure SP-0905.211-01-ENV to demonstrate compliance with the VOC emission limits in Condition 24 of the NSR permit.

The facility is also required to control VOC emissions from the spandex production facility by brine-cooled condensers. Each condenser operates as inherent process equipment to recover solvent. In order to ensure consistent proper operation of these condensers, INVISTA shall conduct and record the results of a daily inspection of each brine-cooled condenser. If the outlet gas temperature is not within the manufacturer's recommended range, timely corrective action shall be taken such that the brine-cooled condenser resumes proper operation.

INVISTA shall also conduct and record the results of a daily inspection. If during the inspection, the equipment is not operating according to manufacturer's recommendations, timely corrective action shall be taken such that the equipment resumes proper operation.

The requirement to inspect and maintain condensers operation provides additional assurance that the spandex production facility is operating properly.

The combination of all of these requirements provide reasonable assurance of compliance with the emission limits for the spandex production facility.

INVISTA shall conduct visible emissions inspections on spandex production facility exhausts 7-7, 7-29, 7-66 through 7-68, 7-76, 7-83, 7-84, 7-247, 7-250, 7-278, 7-291, 7-292, 7-303, 7-304, 7-309, 7-348, 7-349, 7-564, 7-604, 7-615, 7-633, 7-634, and 7-652 through 7-654 in accordance with the following procedures and frequencies

- At a minimum of once per week, the permittee shall determine the presence of visible emissions. If during the inspection visible emissions are observed from a stack(s), a visible emissions evaluation (VEE) shall be conducted for the stack(s) in accordance with 40 CFR Part 60, Appendix A, EPA Method 9. The VEE shall be conducted for a minimum of six minutes. If any of the observations exceed 20 percent, the VEE shall be conducted for a total of 60 minutes.
- All visible emissions inspections shall be performed when the spandex production facility is operating. In the event of a process shutdown for a consecutive period of one week or more, visible inspections may be discontinued until the process becomes operational.
- If visible emissions inspections conducted during 12 consecutive weeks show no visible emissions for a particular stack, the permittee may reduce the monitoring frequency to once per month for that stack. Anytime the monthly visible emissions inspections show visible emissions, or when requested by DEQ, the monitoring frequency shall be increased to once per week for that stack.

- All observations, VEE results, process shutdowns and corrective actions taken shall be recorded.

These requirements reasonably assure compliance with the visible emission limit for the spandex production facility. Historically, no visible emission violations have been recorded for this process. The exhausts selected for observation represent the vast majority of emissions from the process and provide a reasonable and sufficient number of sampling points to ascertain compliance with the visible emissions standard. Additionally, the process has a low likelihood of producing particulate emissions which cause visible emissions. Therefore, the likelihood of violating the standard is remote.

Compliance Assurance Monitoring (CAM)

CAM does not apply to any emission unit, as none of the units have add-on control devices. The brine-cooled condensers are not considered as control devices as each condenser operates as inherent process equipment to recover solvent.

Testing

Condition 23 of the November 16, 2012 NSR permit is incorporated. Specifically, the facility is required to construct the facility so as to allow for emissions testing at any time using appropriate methods. Upon request from the Department, test ports shall be provided at the appropriate locations.

INVISTA will conduct quarterly performance tests for VOC in accordance with NIOSH Method 2004 or INVISTA Lab Procedure SP-0905.211-01-ENV, and Condition 26 of the NSR permit.

The Department and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Reporting

INVISTA shall also submit quarterly performance tests for VOC to the DEQ, as required by Condition 26 of the November 16, 2012 NSR permit, in accordance with a schedule outlined in the permit.

Streamlined Requirements

9 VAC 5-40-80 (Existing Source Standard for Visible Emissions) has been streamlined. 9 VAC 5-50-80 (New Source Standard for Visible Emissions) was determined to be applicable to the spandex production facility because documentation of construction dates for individual stack exhausts were unavailable.

Reciprocating Engines

At the first applicable date of compliance for MACT, 40 CFR 63 Subpart ZZZZ, the facility was classified as a Major Source of HAPs. In accordance with the “once in, always in” memorandum on MACT standards, the major source requirements of 40 CFR 63 Subpart ZZZZ are provided for the emergency generators (Ref. FP-1, FP-2 and G-1).

Limitations

The fire pump and emergency generators (Ref. FP-1, FP-2 and G-1) have engine horsepower less than or equal to 500 HP, and are considered existing stationary reciprocating internal combustion engines (RICE) at a major source of HAP emissions. In accordance with the MACT, 40 CFR 63 Subpart ZZZZ, the following conditions are applicable to the emergency generators listed above; condition numbers refer to the Title V permit:

- | | |
|---------------|---|
| Condition 39: | This condition establishes the emergency generators shall be operated in compliance with MACT Subpart ZZZZ. |
| Condition 40: | At all times the permittee must operate and maintain emergency generators, including monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. |
| Condition 41: | This condition establishes the hourly operational conditions for the emergency stationary RICE. |
| Condition 42: | The condition establishes the maintenance requirements for the emergency generators. |
| Condition 43: | During periods of startup the permittee must minimize the time spend at idle for the emergency engines and minimize the engine’s startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply. |
| Condition 44: | The condition establishes the requirements of the oil analysis program for the emergency generators. |

Monitoring and Recordkeeping

The following monitoring and recordkeeping conditions were established to determine compliance with the MACT limitations; condition numbers refer to the Title V permit:

- | | |
|---------------|---|
| Condition 45: | The facility shall install non-resettable hour meters on the emergency stationary RICE (Ref. FP-1, FP-2 and G-1). The hour meter shall be provided with adequate access for |
|---------------|---|

inspection.

- Condition 46: The permittee shall develop a maintenance plan for the emergency generators (Ref. FP-1, FP-2 and G-1) that provides to the extent practicable for the maintenance and operation of each engine in a manner consistent with good air pollution control practice for minimizing emissions.
- Condition 47: This condition establishes the requirement to maintain records of emission data and operating parameters to show compliance with the MACT requirements.

The required maintenance and operating plans assure compliance with the MACT requirements to maintain and operate the engine in accordance with the manufacturer's written instructions. The maintenance and operating plans, as well as records of all scheduled and unscheduled maintenance and operator training will also help to establish reasonable assurance of compliance with the emission limits and visible emission standards established in the permit. The facility is also required to maintain hours of operation for each of the emergency generators to ensure that each continues to meet the definition of emergency-use, as found in the Virginia Regulations and the MACT.

Reporting

The emergency generators (Ref. FP-1, FP-2 and G-1) are exempt from the notification requirements under 40 CFR 63.6645(a)(5).

Compliance Assurance Monitoring (CAM)

CAM does not apply to any emission units, as none of these units has an add-on control device.

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110, that apply to all Federal-operating permit sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions, including those caused by upsets, within one business day.

Comments on General Conditions

Federal Enforceability

Article 1 (9VAC5-80-110 N) states that all terms and conditions in the Title V permit are enforceable by the administrator and citizens under the federal Clean Air Act, except those that have been designated as only state-enforceable.

Permit Expiration

This condition refers to the Board taking action on a permit application. The “Board” refers to the State Air Pollution Control Board. The authority to take action on permit application(s) has been delegated to the Regions as allowed by §2.2-604 and §10.1-1185 of the *Code of Virginia*, and the “Department of Environmental Quality Agency Policy Statement No. 2-09”.

This general condition cite(s) the Article(s) that follow(s):

Article 1 (9 VAC 5-80-50 et seq.), Part II of 9VAC5 Chapter 80. Federal Operating Permits for Stationary Sources

This general condition cites the sections that follow:

9VAC5-80-80. Application
9VAC5-80-140. Permit Shield
9VAC5-80-150. Action on Permit Applications

Failure / Malfunction Reporting

Section 9 VAC 5-20-180 requires malfunction and excess emission reporting within four hours of discovery. Section 9 VAC 5-20-180 is from the general regulations. All affected facilities are subject to section 9 VAC 5-20-180 including Title V facilities. A facility may make a single report that meets the requirements of 9 VAC 5-20-180. The report must be made within four daytime business hours of discovery of the malfunction.

This general condition cites the sections that follow:

9VAC5-40-50. Notification, Records and Reporting
9VAC5-50-50. Notification, Records and Reporting

Permit Modification

This general condition cites the sections that follow:

9VAC5-80-50. Applicability, Federal Operating Permit for Stationary Sources
9VAC5-80-190. Changes to Permits
9VAC5-80-260. Enforcement
9VAC5-80-1100. Applicability, Permits For New and Modified Stationary Sources
9VAC5-80-1605. Applicability, Permits For Major Stationary Sources and Modifications Located in Prevention of Significant Deterioration Areas
9VAC5-80-2000. Applicability, Permits for Major Stationary Sources and Major Modifications Locating in Nonattainment Areas

Asbestos Requirements

The Virginia Department of Labor and Industry under Section 40.1-51.20 of the Code of Virginia also holds authority to enforce 40 CFR 61 Subpart M, National Emission Standards for Asbestos.

This general condition contains a citation from the Code of Federal Regulations that follows:
40 CFR 61.145, NESHAP Subpart M. National Emissions Standards for Asbestos as it applies to demolition and renovation.
40 CFR 61.148, NESHAP Subpart M. National Emissions Standards for Asbestos as it applies to insulating materials.
40 CFR 61.150, NESHAP Subpart M. National Emissions Standards for Asbestos as it applies to waste disposal.

This general condition cites the regulatory sections that follow:
9VAC5-60-70. Designated Emissions Standards
9VAC5-80-110. Permit Content

STATE ONLY APPLICABLE REQUIREMENTS

The following Virginia Administrative Codes have specific requirements only enforceable by the State and have been identified as applicable by the applicant: 9 VAC 5-60-320, Toxic Pollutants.

INVISTA has requested that all toxic conditions and limitations included in the November 16, 2012 minor NSR permit be included in the “state only” section of the Title V permit. These limits are currently contained in the state-only section of the November 16, 2012 minor NSR permit. Therefore, it is permissible to include these requirements in the state enforceable section of the Title V permit. The state only limitations are not required under the federal CAA or under any of its applicable requirements.

The following limitations from the minor NSR permit, dated November 16, 2012, have been included in the state only section of the Title V permit; condition numbers refer to the NSR permit:

Condition 46: The condition establishes the short-term and annual formaldehyde emission limitations.

The recordkeeping requirements in Condition 47 of the NSR permit provide a means of demonstrating continuous compliance with the emission limitations provided in Condition 46. Record keeping requirements include: the annual hours of operation of the Spandex facility, calculated monthly; the average hourly formaldehyde emissions from the Spandex facility, calculated monthly; annual formaldehyde emissions from the Spandex facility, calculated monthly; and records of all stack tests and visible emission evaluations.

INAPPLICABLE REQUIREMENTS

The provisions of 40 CFR Part 98 – Mandatory Greenhouse Gas Reporting require owners and operators of general stationary fuel combustion sources that emit 25,000 metric tons CO₂e or more per year in combined emissions from such units, to report greenhouse gas (GHG) emissions, annually. The definition of “applicable requirement” in 40 CFR 70.2 and 71.2 does

not include requirements such as those included in Part 98, promulgated under Clean Air Act (CAA) section 114(a)(1) and 208. Therefore, the requirements of 40 CFR Part 98 are not applicable under the Title V permitting program.

As a result of several EPA actions regarding GHG under the CAA, emissions of GHG must be addressed for a Title V permit renewed after January 1, 2011. The current state minor NSR (or PSD) permit for the INVISTA facility contains no GHG-specific applicable requirements and there have been no modifications at the facility requiring a PSD permit. Therefore, there are no applicable requirements for the facility specific to GHG.

INVISTA identified the following inapplicable requirements in their permit application:

INVISTA reviewed the applicability of 40 CFR Part 60, Subpart D – Standards of Performance for Fossil Fuel-Fired Generators. The steam generating units present at the facility each have a heat input rate of less than 250 MMBtu/hr. Therefore, no emission units at the facility are subject to NSPS Subpart D.

INVISTA reviewed the applicability of 40 CFR Part 60, Subpart Da – Standards of Performance for Electric Utility Steam Generating Units. The steam generating units present at the facility each have a heat input rate of less than 250 MMBtu/hr. Therefore, no emission units at the facility are subject to NSPS Subpart Da.

INVISTA reviewed the applicability of 40 CFR Part 60, Subpart Db – Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units as the regulation pertains to INVISTA's two boilers. Each of the boilers has a rated capacity less than the threshold of 100 MMBtu/hr. Therefore, 40 CFR Part 60, Subpart Db is not applicable.

INVISTA reviewed the applicability of 40 CFR Part 60, Subpart Kb. The vapor pressures of the liquids stored in storage vessel at the facility are 0.2 kPa, which is below the applicability threshold. As a result, 40 CFR 60 Subpart Kb does not apply.

INVISTA reviewed the applicability of 40 CFR Part 60, Subpart Y – Coal Preparation Plants. The coal handling system was constructed before October 24, 1974, and has been shutdown. As a result, 40 CFR 60, Subpart Y does not apply.

INVISTA reviewed the applicability of 40 CFR Part 60, Subpart HHH – Standards of Performance for Synthetic Fiber Production Facilities. INVISTA does not use a solvent-spun synthetic fiber process. As a result, 40 CFR 60, Subpart HHH does not apply.

INVISTA reviewed the applicability of 40 CFR Part 62, Subpart III – Federal Plan Requirements for Commercial and Industrial Solid Waste Incineration Units that Commenced Construction or Before November 30, 1999. The facility operates an electric powered polymer burn-off oven for reclaiming tools and equipment for reuse. The oven is exempt under §62.14525(k) because it operates as a parts reclamation unit as defined in §62.14840.

INVISTA reviewed the applicability of 40 CFR Part 60, Subpart III – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. The stationary RICE at the facility were ordered before July 11, 2005, and are therefore not subject to the requirements of the subpart.

INVISTA reviewed the applicability of 40 CFR Part 60, Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. The stationary SI ICE were ordered before the June 12, 2006 applicability date, and are therefore not subject to the requirements of the subpart.

INVISTA reviewed the applicability of 40 CFR Part 63, Subpart Q (Industrial Cooling Towers). INVISTA operates cooling towers at the facility. However, none of the cooling towers are operated with chromium-based water treatment chemicals. Therefore, this subpart does not apply.

INVISTA reviewed the applicability of 40 CFR Part 63, EEEE (Organic Liquid Distribution). INVISTA stores liquids that contain greater than five percent by weight organic HAP listed in Table 1 of Subpart EEEE. However, none of these liquids is classified as an organic liquid under Subpart EEEE, since the annual average true vapor pressures of these liquids are less than 0.1 psia. Therefore, this subpart does not apply.

INVISTA reviewed the applicability of 40 CFR Part 63, Subpart YY (Generic MACT). The facility operates a dry spinning spandex production process. Although this process is in the spandex source category, the spinning operations are exempt from the requirements as stated in 40 CFR §63.1103 (h)(1)(ii)(C).

INVISTA reviewed the applicability of 40 CFR Part 63, Subpart FFFF (MON). The spandex process is part of the affected source in Subpart YY and, therefore is exempt from the provisions of the MON. Fabricating operations such as spinning a polymer into its end use are exempt from the MON in accordance with 63.245(c)(4). Therefore, this subpart does not apply.

INVISTA reviewed the applicability of 40 CFR Part 63, Subpart DDDDD (Major Source Boiler MACT). INVISTA became an area source of HAPs prior to the compliance date of the Major Source Boiler MACT. The MACT is not applicable.

INVISTA reviewed the applicability of 40 CFR Part 63, Subpart GGGGG (Site Remediation MACT). The facility shutdown and demolished the Nylon and Dowtherm portions of the facility; the MACT is no longer applicable to the facility.

In addition to the inapplicable requirements identified in the permit application, the DEQ reviewed the following in applicable requirements:

DEQ reviewed the applicability of 40 CFR Part 60, Subpart K. No petroleum liquid storage vessel at the facility which has a storage capacity of greater than 40,000 gallons has been constructed, reconstructed or modified between June 11, 1973 and May 18, 1978. As a

result, 40 CFR 60 Subpart K does not apply.

DEQ reviewed the applicability of 40 CFR Part 60, Subpart Ka. No petroleum liquid storage vessel at the facility which has a storage capacity of greater than 40,000 gallons have been constructed, reconstructed or modified between May 19, 1978 and July 22, 1984. As a result, 40 CFR 60, Subpart Ka does not apply.

COMPLIANCE PLAN

INVISTA is currently in compliance with all applicable requirements. No compliance plan was included in the application or in the permit.

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

Insignificant emission units include the following:

Emission Unit No.	Emission Unit Description	Citation	Pollutant(s) Emitted (9 VAC 5-80-720 B)	Rated Capacity (9 VAC 5-80-720 C)
604A	#2 Fuel Oil	9 VAC 5-80-720 B	VOC, HAPs	75,000 gallon
617A	Diesel Fuel	9 VAC 5-80-720 B	VOC, HAPs	550 gallon
617B	Diesel Fuel	9 VAC 5-80-720 B	VOC, HAPs	550 gallon
618	Gasoline Storage Tank	9 VAC 5-80-720 B	VOC	6,000 gallon
7-564	128 Recycle Exhaust	9 VAC 5-80-720 B	VOC	
7-604	4 th Recycle Exhaust	9 VAC 5-80-720 B	VOC	
7-615	Spinning Lag Fan	9 VAC 5-80-720 B	VOC	
7-633	Penthouse Stack	9 VAC 5-80-720 B	VOC	
7-634	Penthouse Vent	9 VAC 5-80-720 B	VOC	
L1	North Storage Tank	9 VAC 5-80-720 B	VOC	
L2	Supply Tank	9 VAC 5-80-720 B	VOC	
L3	Storage Tank	9 VAC 5-80-720 B	VOC	
L4	Storage Tank	9 VAC 5-80-720 B	VOC	
L5	Supply Tank	9 VAC 5-80-720 B	VOC	
L6	Supply Tank	9 VAC 5-80-720 B	VOC	
L7	Supply Tank	9 VAC 5-80-720 B	VOC	
L8	North Side	9 VAC 5-80-720 B	VOC	
L9	Supply Tank	9 VAC 5-80-720 B	VOC	
8-42	Dehydration Feed Tank "A"	9 VAC 5-80-720 B	VOC	
8-43	Dehydration Feed Tank "B"	9 VAC 5-80-720 B	VOC	
8-44	#1 DMAC Polymer Supply Tank	9 VAC 5-80-720 B	VOC	
8-51	#2 Utility Feed Tank	9 VAC 5-80-720 B	VOC	
8-52	#3 Utility Feed Tank	9 VAC 5-80-720 B	VOC	
8-53	Aqueous Waste Tank	9 VAC 5-80-720 B	VOC	
8-59	#2 DMAC Polymer Supply Tank	9 VAC 5-80-720 B	VOC	
8-76	#3 Batch Tank	9 VAC 5-80-720 B	VOC	
8-78	#2 Batch Tank	9 VAC 5-80-720 B	VOC	
8-79	#1B Batch Tank	9 VAC 5-80-720 B	VOC	

Emission Unit No.	Emission Unit Description	Citation	Pollutant(s) Emitted (9 VAC 5-80-720 B)	Rated Capacity (9 VAC 5-80-720 C)
8-80	#1C Batch Tank	9 VAC 5-80-720 B	VOC	
8-81	#1A Batch Tank	9 VAC 5-80-720 B	VOC	
8-86	#3 Purification Column, #3 Tar Still Vent	9 VAC 5-80-720 B	VOC	
8-87	#3 Dehydration Column Vent	9 VAC 5-80-720 B	VOC	
8-88	#3 Purification Product Tank	9 VAC 5-80-720 B	VOC	
8-89	Refining Column Feed Tank	9 VAC 5-80-720 B	VOC	
8-90	#3 Tars Still, #3 Purification Column Scrubber	9 VAC 5-80-720 B	VOC	
8-108	#3 Purification Product Tank	9 VAC 5-80-720 B	VOC	
8-193	#3 Dehydration Scrubber	9 VAC 5-80-720 B	VOC	
8-194	#2 Tar Still Common, #2 Purification Column	9 VAC 5-80-720 B	VOC	
8-195	#2 Dehydration, #2 Tar Still Scrubber	9 VAC 5-80-720 B	VOC	
8-201	#4 Dehydration Feed Tank	9 VAC 5-80-720 B	VOC	
8-202	#3 Dehydration Feed Tank	9 VAC 5-80-720 B	VOC	
8-206	DMAc Segregation Tank	9 VAC 5-80-720 B	VOC	
8-208	#1 Utility Tank	9 VAC 5-80-720 B	VOC	
8-209	#3 Dehydration Surge Tank	9 VAC 5-80-720 B	VOC	
8-210	#1 Tar Still (Neutralization) Feed Tank	9 VAC 5-80-720 B	VOC	
8-211	#2 Tar Still (Neutralization) Feed Tank	9 VAC 5-80-720 B	VOC	
8-216	#5 Dehydration Feed Tank	9 VAC 5-80-720 B	VOC	
8-217	#2 Dehydration purge Tank	9 VAC 5-80-720 B	VOC	

Emission Unit No.	Emission Unit Description	Citation	Pollutant(s) Emitted (9 VAC 5-80-720 B)	Rated Capacity (9 VAC 5-80-720 C)
604B	Diesel Fuel Storage Tank	9 VAC 5-80-720 B	VOC	6,000 gallon
ASH	Ash Handling	9 VAC 5-80-720 B	PM, PM-10, PM-2.5	
CTS	Process Cooling Towers	9 VAC 5-80-720 B	PM, PM-10, PM-2.5	
LABS	On Site Laboratories	9 VAC 5-80-720 B	VOC, HAPs	
	Remaining Recovery Tank	9 VAC 5-80-720 B	VOC	-
	Wastewater Treatment	9 VAC 5-80-720 B	VOC	-
	Interior, Exterior Maintenance	9 VAC 5-80-720 B	VOC	-
	Comfort Heating & Cooling	9 VAC 5-80-720 B	VOC	
	Tank/Equipment Clean-Out	9 VAC 5-80-720 B	VOC	
	Spill Collection Tanks	9 VAC 5-80-720 B	VOC	
	Water-Based Parts Washer	9 VAC 5-80-720 B	VOC	
	Welding Activities	9 VAC 5-80-720 B	VOC	
	Parts Washers	9 VAC 5-80-720 B	VOC	

The citation criteria for insignificant activities are as follows:

9 VAC 5-80-720 A - Listed Insignificant Activity, Not Included in Permit Application

9 VAC 5-80-720 B - Insignificant due to emission levels

9 VAC 5-80-720 C - Insignificant due to size or production rate

CONFIDENTIAL INFORMATION

The permittee did not submit a request for confidentiality. Therefore, all portions of the Title V application are suitable for public review.

PUBLIC PARTICIPATION

A public notice regarding the draft permit was placed in the *Waynesboro News-Virginian*, on June 7, 2017. West Virginia, the only affected State, was sent a copy of the public notice in a letter dated June 7, 2017. All persons on the Title V mailing list were also sent a copy of the public notice in letters dated June 7, 2017. Public comments were accepted from June 7, 2017 through July 7, 2017. No comments were received.

EPA was notified of the public notice and sent a copy of the Statement of Basis and draft permit on June 5, 2017. The EPA submitted suggestions on June 28, 2017; a copy of the suggestions and DEQ's response is provided in Attachment F.

ATTACHMENTS

- Attachment A: 2016 Emissions Inventory
- Attachment B: Minor New Source Review Permit (dated November 16, 2012)
- Attachment C: Associated Engineering Analysis for Minor NSR Permit (dated November 16, 2012)
- Attachment D: Short-term and Annual Sulfur Dioxide Emission Limitation Calculations
- Attachment E: Boiler 5 – Stack Test Results (conducted February 18, 2014)
- Attachment F: EPA - Comments and Responses

Attachment A

2016 Emissions Inventory

Rev / CEDS
04/19/17
du cngl / JRD



VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

2016 EMISSION STATEMENT

Please correct any errors in the information below (cross out & replace)

FACILITY NAME INVISTA S.A R.L. - WAYNESBORO		REGISTRATION # 80517	
LOCATION ADDRESS 400 DuPont Blvd, Waynesboro, VA 22980		COUNTY/CITY Waynesboro City 820	
MAILING ADDRESS 400 DuPont Blvd, Waynesboro, VA 22980			
CONTACT PERSON BRIAN CAMPBELL	TELEPHONE NUMBER (540) 949-2424	PRIMARY NAICS Artificial and Synthetic Fibers and Filaments Manufacturing	For Agency Use Only

FACILITY TOTALS (Sum emissions from attached pages)

POLLUTANTS	ANNUAL	OZONE SEASON
TOTAL VOC EMISSIONS	143.12 TONS/YR	NA LBS/DAY
TOTAL NO _x EMISSIONS	11.15 TONS/YR	NA LBS/DAY
TOTAL SO ₂ EMISSIONS	0.18 TONS/YR	NA
TOTAL PM ₁₀ EMISSIONS	2.29 TONS/YR	NA
TOTAL PB EMISSIONS	0.00 TONS/YR	NA
TOTAL TRS EMISSIONS	0 TONS/YR	NA
TOTAL TNMOC EMISSIONS (landfills only)	NA TONS/YR	NA
TOTAL non-VOC/non-PM HAP EMISSIONS	0.00 (HCl), 0.00 (Cl), 0.00 (HF) TONS/YR	NA
TOTAL CO EMISSIONS	11.45 TONS/YR	NA
TOTAL PM _{2.5} EMISSIONS	2.29 TONS/YR	NA
TOTAL NH ₃ EMISSIONS	0.96 TONS/YR	NA

PLEASE ATTACH "ANNUAL UPDATE REPORT" AND "DOCUMENT CERTIFICATION" with appropriate signature.

According to DEQ document 2011_TRO_ES-Instructions.doc, the INVISTA Waynesboro facility is not required to report VOC and/or NO_x during ozone season.

DOCUMENT CERTIFICATION

Facility Name: INVISTA S.à r.l. Waynesboro

Registration No. VRO80517

Facility Location: 400 DuPont Boulevard, Waynesboro, VA. 22980

Type of Submittal Attached: 2016 Calendar Year Emissions Statement and Annual Update for the Waynesboro facility - INVISTA, S.à r.l. - Reg. No. VRO80517

Certification: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering and evaluating the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name of Responsible Official (Print): William T. Jones

Title: Operations Manager / Authorized Signatory

Signature: William T. Jones **Date:** April 17, 2017



April 17, 2016

Ms. Amy T. Owens
Director – Valley Regional Office
Virginia Department of Environmental Quality
P.O. Box 3000
4411 Early Road
Harrisonburg, Virginia 22801

INVISTA S.à r.l.
400 DuPont Blvd.
Waynesboro, VA 22980

540.949.2000 Tel
www.INVISTA.com

**RE: 2016 CY Annual Emissions Statement
INVISTA S.à r.l. – Waynesboro, Virginia Facility
Title V Operating Permit No. 80517**

Dear Ms. Owens:

INVISTA S.à r.l. (INVISTA) owns and operates a chemical manufacturing facility in Waynesboro, Virginia (the "Waynesboro facility"). The Waynesboro facility is currently operating under Title V Permit No. VRO80517. INVISTA is submitting this 2016 calendar year Emissions Statement and Annual Update for the Waynesboro facility to the Virginia Department of Environmental Quality (DEQ) in accordance with 9 VAC 5-80-340. INVISTA has also included supporting calculations for the Emissions Statement.

INVISTA will be using the emission factors from the New Source Review Permit dated November 16, 2012 (Attachment A) instead of AP-42 factors (where applicable in the NSR permit).

INVISTA appreciates DEQ's review of the 2016 calendar year Emissions Statement and Annual Update. If there are any questions or more information is required, please contact Brian Campbell at (540) 949-2424.

Sincerely,

INVISTA S.à r.l.

A handwritten signature in black ink that reads "William T. Jones". The signature is written in a cursive, flowing style.

William T. Jones
Operations Manager, Authorized Signatory

Attachment 1 –2016 CY Emission Statement Forms
Attachment 2 – Supporting Emission Calculations

ATTACHMENT 1 – 2016 CY EMISSION STATEMENT FORMS

Natural Gas Emission Factors	
	lb/MMscf
NOx	37
CO	38
SO2	0.6
VOC	5.5
PM	7.6
PM-10	7.6
PM-2.5	7.6
Heat Content of 1020 Btu/scf	

Distillate Oil Emission Factors	
	lb/1000 gallons
NOx	13.8
CO	8.1
SO2	142 x sulfur content
VOC	0.2
PM	3.3
PM-10	1.0
PM-2.5	0.25
Sulfur content proposed = 0.0015%	
Heat Content of fuel with 0.0015% S	
=138 MMBtu/unit	

ATTACHMENT 2 – 2016 SUPPORTING EMISSION CALCULATIONS

**2016 CY Actual
Emission Calculations**

**INVISTA S.à r.l.
Waynesboro Facility
Waynesboro, VA**

April 2017

2016 Production Input Data

Fuel Usage

Divide oil gallons by 1000 in DEQ spreadsheet

	Coal (tpy)	#6 Fuel Oil (gpy)	#2 Fuel Oil (gpy)	Natural Gas (scf/yr)	Natural Gas (MMscf/yr)	#2 Fuel Oil (1000 gpy)	Stk -Pt-Seg
Boiler #4	0	0	3	284,676,272	284.6762717	0.003	13-13-1,2,3
Boiler #5	0	0	2	318,187,728	318.1877283	0.002	14-14-1,2,3
Boiler Total	0	0	5	602,864,000			

Fuel Information

mmBTU/SCC Unit

Heating Value of No. 2 Fuel Oil	138,000	Btu/gal	138.0	AP-42 factor requested by DEQ
Heating Value of Natural Gas	1,020	Btu/scf	1020	AP-42 factor requested by DEQ
⁽¹⁾ Sulfur Content of No. 2 Fuel Oil	0.0015	%	New for 2017 Title V air permit. All fuel certifications confirm	

Production Information

Spandex Production	lbs		1.27 Spandex units		5-21-1
Run Time (hours)	1st qtr	2nd qtr	3rd qtr	4th qtr	Total
Boiler 4	2160	1501	1301	1714	6676
Boiler 5	2160	2184	909	2077	7330

1. A sample result from the tank came back at 0.01 % Sulfur. All certifications were 0.0015 %. INVISTA will use the higher conservative number.

Attachment B

Minor NSR Permit
(Dated November 16, 2012)



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

STATIONARY SOURCE PERMIT TO MODIFY AND OPERATE

**This permit includes designated equipment subject to
New Source Performance Standards (NSPS)**

This permit supersedes your permit dated August 15, 2001, as amended July 25, 2005,
September 17, 2009, and November 22, 2011.

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia
Regulations for the Control and Abatement of Air Pollution,

INVISTA S.à r.l.
400 DuPont Boulevard
Waynesboro, Virginia 22980
Registration No.: 80517
Plant ID No.: 51-820-0009

is authorized to modify and operate

a synthetic fiber production facility

located at

400 DuPont Boulevard
Waynesboro, Virginia

in accordance with the Conditions of this permit.

Approved on

11/16/12

A handwritten signature in black ink, appearing to be "BKJ", written over a horizontal line.

Deputy Regional Director, Valley Region

Permit consists of 19 pages.

Permit Conditions 1 to 47.

Attachment A, Approved Emission Factors, 1 page.

Attachment B, Powerhouse Stack SO₂ Emission Calculation Methodology, 5 pages.

Attachment C, Source Testing Report Format, 1 page.

INTRODUCTION

This permit approval is based on the permit application dated July 20, 1992, including amendment information dated August 25, September 8 and 13, 1993, and February 23, 1994, the permit application dated November 18, 1993, including amendment information dated December 20, 1993, January 17, February 18, April 4, May 2, 1994 and August 8, 1994, the permit application dated September 30, 1994, including amendment information dated April 15, 1997, the permit application dated November 11, 1996, including amendment information dated December 3 and 14, 1996, the permit application dated October 21, 1999, including amendment information dated November 10, 1999, February 18 and 23, July 26, August 2, 8, 9, and 28, and October 20, 2000, the permit application dated December 14, 2000, including amendment information dated January 17 and 29, and March 12, 2001, the permit application dated July 31, 2001, the permit application dated November 19, 2001, the permit application dated March 14, 2005 and the amended permit applications dated May 16, 2005 and July 20, 2005 including supplemental information dated July 12, 2005, the permit application dated March 24, 2009, the permit application dated August 7, 2009, the permit application dated October 13, 2011, and the permit application dated July 26, 2012, including amendment information dated September 5, 2012 and October 9, 2012. Any changes in the permit application specifications or any existing facilities which alter the impact of the facility on air quality may require a permit. Failure to obtain such a permit prior to construction may result in enforcement action.

Words or terms used in this permit shall have meanings as provided in 9 VAC 5-10-20 of the State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution. The regulatory reference or authority for each condition is listed in parentheses () after each condition.

Annual requirements to fulfill legal obligations to maintain current stationary source emissions data will necessitate a prompt response by the permittee to requests by the DEQ or the Board for information to include, as appropriate: process and production data; changes in control equipment; and operating schedules. Such requests for information from the DEQ will either be in writing or by personal contact.

The availability of information submitted to the DEQ or the Board will be governed by applicable provisions of the Freedom of Information Act, §§ 2.2-3700 through 2.2-3714 of the Code of Virginia, § 10.1-1314 (addressing information provided to the Board) of the Code of Virginia, and 9 VAC 5-170-60 of the State Air Pollution Control Board Regulations. Information provided to federal officials is subject to appropriate federal law and regulations governing confidentiality of such information.

PROCESS REQUIREMENTS - BOILERS

1. **Equipment List** – Equipment at this facility consists of the following:

Equipment to be Constructed			
Reference No.	Equipment Description	Rated Capacity	Federal Requirements
Boiler 4	Natural gas, liquefied propane gas (LPG), and oil-fired boiler	99.0 MMBtu/hr	40 CFR 60 Subpart Dc
Boiler 5	Natural gas, LPG, and oil-fired boiler	99.0 MMBtu/hr	40 CFR 60 Subpart Dc

Specifications included in the permit under this Condition are for informational purposes only and do not form enforceable terms or conditions of the permit.

(9 VAC 5-80-1180 D 3)

2. **Emission Controls** – Oxides of nitrogen (NO_x) emissions from the boilers (Ref. Boiler 4 and Boiler 5) shall be controlled by low NO_x burners with flue gas recirculation and a NO_x performance of 30 ppmvd at three percent O₂ for natural gas. The low NO_x burners shall be installed and operated in accordance with manufacturer's specifications. Emission limits for NO_x are applicable at firing rates at or above 25 MMBtu/hr.

(9 VAC 5-80-1180 and 9 VAC 5-50-260)

3. **Testing/Monitoring Ports** - The permitted facility shall be constructed so as to allow for emissions testing upon reasonable notice at any time, using appropriate methods. Test ports shall be provided when requested at the appropriate locations.

(9 VAC 5-50-30 F)

OPERATING LIMITATIONS – BOILERS

4. **Fuel** - The approved fuels for the boilers (Ref. Boiler 4 and Boiler 5) are natural gas, LPG, and distillate oil. A change in the fuel may require a permit to modify and operate.

(9 VAC 5-80-1180 and 9 VAC 5-50-260)

5. **Fuel** - The distillate oil to be burned in the boilers (Ref. Boiler 4 and Boiler 5) shall meet ASTM D396 specification for numbers 1 or 2 fuel oil with a maximum sulfur content per shipment of 0.05%.

(9 VAC 5-80-1180, 9 VAC 5-50-410 and 9 VAC 5-50-260)

6. **Fuel Throughput** – The total annual fuel throughput for the two boilers (Ref. Boiler 4 and Boiler 5) combined, shall not exceed the maximum allowable of any of the individual fuels listed in the table below:

Approved Fuel Type	Quantity Allowed
Natural Gas	A ^(*) million cubic feet (MMft ³)
OR	
Distillate Oil	502,748 gallons
OR	
LPG	33,600 gallons

* The quantity of natural gas allowed (A) shall be calculated using the equation below:

$$(A) = \frac{(G) - [(B * E) + (C * F)]}{D}$$

Where:

- A = The throughput natural gas for the consecutive 12-month period, in MMft³/yr
- B = The throughput of distillate oil for the consecutive 12-month period, in gallons/yr
- C = The throughput of LPG for the consecutive 12-month period, in gallons/yr
- D = The heat content of natural gas (1,020 MMBtu / MMft³)
- E = The heat content of distillate oil (138,000 MMBtu / 10⁶ gal)
- F = The heat content of LPG (91,500 MMBtu / 10⁶ gal)
- G = The maximum rated heat input capacity (combined) of the two boilers (1,734,480 MMBtu / yr)

Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.

(9 VAC 5-80-1180 and 9 VAC 5-50-260)

7. **Fuel Certification** – The permittee shall obtain a certification from the fuel supplier with each shipment of distillate oil to be burned in the boilers (Ref. Boiler 4 and Boiler 5). Each fuel supplier certification shall include the following:
 - a. The name of the fuel supplier;
 - b. The date on which the distillate oil was received;

- c. A statement that the distillate oil complies with the American Society for Testing and Materials specifications for numbers 1 or 2 fuel oil;
- d. The sulfur content of the distillate oil;
- e. The method used to determine the sulfur content of the distillate oil; and
- f. The higher heating value of the distillate oil.

Fuel sampling and analysis, independent of that used for certification, as may be periodically required or conducted by DEQ may be used to determine compliance with the fuel specifications stipulated in Condition 5. Exceedance of these specifications may be considered credible evidence of the exceedance of emission limits.
(9 VAC 5-80-1180 and 9 VAC 5-50-410)

- 8. **Operating and Training Procedures** - Boiler emissions shall be controlled by proper operation and maintenance. Boiler operators shall be trained in the proper operation of all such equipment.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)
- 9. **Requirements by Reference** - Except where this permit is more restrictive than the applicable requirement, the NSPS equipment as described in Condition 1 shall be operated in compliance with the requirements of 40 CFR 60, Subpart Dc.
(9 VAC 5-80-1180, 9 VAC 5-50-400 and 9 VAC 5-50-410)

EMISSION LIMITATIONS - BOILERS

- 10. **Short-term Emission Limits** - Emissions from the operation of each boiler (Ref. Boiler 4 and Boiler 5) when firing natural gas shall not exceed the limits specified below:

Nitrogen Oxides (as NO ₂)*	30 ppmvd at 3% O ₂
Carbon Monoxide*	50 ppmvd at 3% O ₂
Particulate Matter (PM)	0.74 lb/hr
PM-10	0.74 lb/hr
PM-2.5	0.74 lb/hr
Sulfur Dioxide	0.06 lb/hr
Volatile Organic Compounds	0.53 lb/hr

*Emission limits for NO_x and CO are applicable at firing rates at or above 25 MMBtu/hr. Emission factors for NO_x and CO when firing below 25 MMBtu/hr are provided in Attachment A.

These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 2, 4, and 8.

(9 VAC 5-80-1180 and 9 VAC 5-50-260)

11. Short-term Emission Limits - Emissions from the operation of each boiler (Ref. Boiler 4 and Boiler 5) when firing LPG shall not exceed the limits specified below:

Nitrogen Oxides (as NO ₂)	14.07 lb/hr
Carbon Monoxide	8.11 lb/hr
Particulate Matter (PM)	0.76 lb/hr
PM-10	0.76 lb/hr
PM-2.5	0.76 lb/hr
Sulfur Dioxide	0.85 lb/hr
Volatile Organic Compounds	0.87 lb/hr

These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 4 and 8.

(9 VAC 5-80-1180 and 9 VAC 5-50-260)

12. Short-term Emission Limits - Emissions from the operation of each boiler (Ref. Boiler 4 and Boiler 5) when firing distillate oil shall not exceed the limits specified below:

Nitrogen Oxides (as NO ₂)	0.10 lb/MMBtu
Carbon Monoxide*	75 ppmvd at 3% O ₂
Particulate Matter (PM)	2.37 lb/hr
PM-10	0.72 lb/hr
PM-2.5	0.18 lb/hr
Sulfur Dioxide	5.09 lb/hr
Volatile Organic Compounds	0.14 lb/hr

*Emission limits for CO are applicable at firing rates at or above 25 MMBtu/hr. Emission factors for CO when firing below 25 MMBtu/hr are provided in Attachment A.

These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 4, 5, and 8.

(9 VAC 5-80-1180 and 9 VAC 5-50-260)

13. **Annual Emission Limits** – Combined emissions from the operation of both boilers (Ref. Boiler 4 and Boiler 5) shall not exceed the limits specified below:

Particulate Matter (PM)	7.03 tons/yr
PM-10	6.46 tons/yr
PM-2.5	6.46 tons/yr
Sulfur Dioxide	2.29 tons/yr
Nitrogen Oxides (as NO ₂)	33.83 tons/yr
Carbon Monoxide	33.12 tons/yr
Volatile Organic Compounds	4.68 tons/yr

Annual emissions shall be calculated monthly as the sum of each consecutive 12-month period. These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 2, 4, 5, 6, and 8.

(9 VAC 5-80-1180 and 9 VAC 5-50-260)

14. **Visible Emission Limit** – Visible emissions from each boiler (Ref. Boiler 4 and Boiler 5) stack (Ref. B4 and B5) shall not exceed 10 percent opacity as determined by the EPA Method 9 (reference 40 CFR 60, Appendix A).

(9 VAC 5-80-1180, 9 VAC 5-50-260, 9 VAC 5-50-80 and 9 VAC 5-50-410)

RECORDS - BOILERS

15. **On Site Records** - The permittee shall maintain records of all emission data and operating parameters necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the DEQ. These records shall include, but are not limited to:

- a. Annual throughput of natural gas, LPG, and distillate oil, for both Boilers 4 and 5, calculated monthly as the sum of each consecutive 12-month period.

- b. All fuel supplier certifications.
- c. Emissions calculations sufficient to verify compliance with the annual emission limitations in Condition 13, calculated monthly as the sum of each consecutive 12-month period. Emissions shall be calculated using DEQ approved emission factors, as provided in Attachment A.
- d. Records of bypass, malfunction, shutdown or failure of Boiler 4 and Boiler 5 or its associated air pollution control equipment as required in Condition 39.
- e. Records of Maintenance/Operating Procedures and training as required in Conditions 8 and 42.
- f. Scheduled and unscheduled maintenance and operator training.
- g. Results of all stack tests, visible emission evaluations and performance evaluations.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.

(9 VAC 5-80-1180, 9 VAC 5-50-50 and 9 VAC 5-50-410)

REPORTING - BOILERS

16. **Semiannual Fuel Quality Reports** –The permittee shall submit fuel quality reports to the DEQ postmarked no later than the 30th day following the end of each semiannual period ending June 30th and December 31st. If no shipments of distillate oil were received during the semiannual period, the fuel quality report shall consist of the dates included in the semiannual period and a statement that no distillate oil was received during the semiannual period. If distillate oil was received during the reporting period, the report shall include:

- a. The dates included in the semiannual period.
- b. A copy of all fuel supplier certifications for all shipments of distillate oil received during the reporting period, indicating the supplier, volume of shipment, sulfur content (weight percent) and date the shipment was received.
- c. A signed statement from the owner or operator of the facility that the fuel supplier certifications represent all of the distillate oil received during the reporting period.

One copy of the semiannual fuel report shall be submitted to:

Associate Director
Office of Air Enforcement and Compliance Assistance (3AP20)
U.S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

(9 VAC 5-50-50, 9 VAC 5-80-1180 and 9 VAC 5-50-410)

INITIAL COMPLIANCE DETERMINATION - BOILERS

17. Stack Test - Initial performance tests shall be conducted for nitrogen oxides and carbon monoxide using EPA Reference Method 7 and EPA Reference Method 10 respectively, unless an alternate method has been approved by the DEQ, from each boiler (Ref. Boiler 4 and Boiler 5), to determine compliance with the emission limits contained in Condition 10 that are applicable at firing rates at or above 25 MMBtu/hr. The test on one boiler will satisfy the initial testing requirements for the other boiler provided they are identical units. The tests shall be performed within 60 days after achieving the maximum production rate at which the boiler will be operated but in no event later than 180 days after start-up of the permitted boiler. Tests shall be conducted and reported and data reduced as set forth in 9 VAC 5-50-30. The details of the tests are to be arranged with the DEQ. The permittee shall submit a test protocol at least 30 days prior to testing. Samples taken as required by this permit shall be analyzed in accordance with 1 VAC 30-45, Certification for Noncommercial Environmental Laboratories, or 1 VAC 30-46, Accreditation for Commercial Environmental Laboratories. One copy of the test results shall be submitted to the DEQ within 60 days after test completion and shall conform to the test report format enclosed with this permit.

(9 VAC 5-50-30 and 9 VAC 5-80-1200)

18. Visible Emissions Evaluation - Visible Emission Evaluations (VEE) in accordance with 40 CFR Part 60, Appendix A, Method 9, shall also be conducted by the permittee on each boiler (Ref. Boiler 4 and Boiler 5) while burning distillate oil. Each test shall consist of 30 sets of 24 consecutive observations (at 15 second intervals) to yield a six minute average. The observation period may be reduced from 30 sets to 10 sets if all 6-minute averages are less than 10 percent and all individual 15-second observations are less than or equal to 20 percent during the initial 60 minutes of observation. The details of the tests are to be arranged with the DEQ. The permittee shall submit a test protocol at least 30 days prior to testing. The evaluation shall be performed within 180 days after startup. One copy of the test result shall be submitted to the DEQ within 60 days after test completion and shall conform to the test report format enclosed with this permit.

(9 VAC 5-50-30 9 VAC 5-50-410 and 9 VAC 5-80-1200)

CONTINUING COMPLIANCE DETERMINATION

19. **Stack Tests** – Upon request by the DEQ, the permittee shall conduct additional performance tests from the two boilers (Ref. Boiler 4 and Boiler 5), to demonstrate compliance with the emission limits contained in this permit. The details of the tests shall be arranged with the DEQ.

(9 VAC 5-80-1180 and 9 VAC 5-50-30 G)

20. **Visible Emissions Evaluation** – As required by 40 CFR Part 60, Subpart Dc, section 60.47c(a), the permittee shall conduct additional Visible Emission Evaluations (VEE) in accordance with 40 CFR Part 60, Appendix A, Method 9 or Method 22 on each boiler (Ref. Boiler 4 and Boiler 5) in accordance with the timeline established in 40 CFR 60.47c (a). Upon request by the DEQ, the permittee shall conduct additional visible emission evaluations from the two boilers (Ref. Boiler 4 and Boiler 5) to demonstrate compliance with the visible emission limits contained in the permit. The details of the tests shall be arranged with the DEQ.

(9 VAC 5-80-1180 and 9 VAC 5-50-30 G)

PROCESS REQUIREMENTS - SPANDEX

21. **Equipment List** – Equipment at this facility consists of:

Equipment permitted prior to the date of this permit			
Reference No.	Equipment Description	Rated Capacity	Federal Requirements
6-477, 6-480, 6-481, 6-488, 7-7, 7-76, 7-84, 7-250, 7-278, 7-349, 7-564, 7-604, 7-615, 7-633, 7-634, 7-653	Spandex Polymerization Process	--	--
6-473, 6-474, 6-475, 6-476, 6-478, 6-479, 6-482, 6-483, 6-484, 7-29, 7-66, 7-67, 7-68, 7-83, 7-247, 7-291, 7-292, 7-303, 7-304, 7-309, 7-348, 7-652, 7-654	Spandex Spinning Process	--	--
8-42, 8-43, 8-44, 8-48, 8-51, 8-52, 8-53, 8-59, 8-75, 8-76, 8-78, 8-79, 8-80, 8-81, 8-86, 8-87, 8-88, 8-89, 8-194, 8-210	Spandex Solvent Recovery Process	--	--

Specifications included in the permit under this Condition are for informational purposes only and do not form enforceable terms or conditions of the permit.

(9 VAC 5-80-1180 D 3)

22. **Emission Controls** – Volatile organic compound (VOC) emissions from the Spandex (Classic and NAX) spinning machines shall be controlled by brine-cooled condensers. The control equipment shall be provided with adequate access for inspection and shall be maintained by the permittee such that it is in proper working order at all times.

(9 VAC 5-50-260)

23. **Testing/Monitoring Ports** - The permitted facility shall be constructed so as to allow for emissions testing upon reasonable notice at any time, using appropriate methods. Test ports shall be provided when requested at the appropriate locations.
(9 VAC 5-50-30 F)

OPERATING/EMISSION LIMITATIONS - SPANDEX

24. **Emission Limits** – Emissions from Spandex (Classic and NAX) shall not exceed the limits specified below:

Volatile Organic Compounds	37.6 lbs/hr	164.7 tons/yr
----------------------------	-------------	---------------

Compliance with these emission limits may be determined as stated in Condition 26. Annual emissions shall be calculated monthly as the sum of each consecutive 12-month period.
(9 VAC 5-50-260)

RECORDS - SPANDEX

25. **On Site Records** - The permittee shall maintain records of all emission data and operating parameters necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the DEQ. These records shall include, but are not limited to:
- The annual hours of operation of Spandex (Classic and NAX), calculated monthly as the sum of each consecutive 12-month period.
 - Results of quarterly performance tests as required in Condition 26.
 - Annual VOC emissions (in tons) from Spandex (Classic and NAX), calculated monthly as the sum of each consecutive 12-month period, using emission factors and calculation methods approved by the DEQ.
 - Results of all stack tests and visible emission evaluations.
 - Manufacturer's recommendations for control device operation.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.
(9 VAC 5-50-50)

CONTINUING COMPLIANCE - SPANDEX

26. **Performance Testing** - The permittee shall conduct quarterly performance tests for VOC in accordance with NIOSH Method 2004 or INVISTA Lab Procedure SP-0905.211-01-ENV to demonstrate compliance with the emission limits contained in Condition 24. The tests shall be submitted in accordance with the following schedule:

Time Period Covered by Report	Report Due Date
January 1 – March 31	June 1
April 1 - June 30	September 1
July 1 – September 30	December 1
October 1 - December 31	March 1

Samples analyzed at an off-site environmental laboratory must meet the requirements of the Virginia Environmental laboratory Accreditation Program (VELAP) certification/accreditation requirements for the analytes being tested. The details of the tests are to be arranged with the DEQ.
 (9 VAC 50-50-30 G)

PROCESS REQUIREMENTS – POWERHOUSE

Conditions 29 through 35, and Attachment B, are applicable until the three existing boilers (Ref. 2-205 (B#1, B#2 and B#3)) are permanently shut down.

27. **Equipment List** – Equipment at this facility consists of the following:

Equipment to be shut down upon operation of the new Boilers 4 and 5*			
Reference No.	Equipment Description	Rated Capacity	Federal Requirements
2-205 (B#1)	Coal and oil-fired boiler with natural gas igniters	196 MMBtu/hr (boiler) 20 MMBtu/hr (igniter)	--
2-205 (B#2)	Coal and oil-fired boiler with natural gas igniters	209 MMBtu/hr (boiler) 20 MMBtu/hr (igniter)	--
2-205 (B#3)	Coal and oil-fired boiler with natural gas igniters	209 MMBtu/hr (boiler) 20 MMBtu/hr (igniter)	--

* One existing boiler (Ref. 2-205 (B#1, B#2 or B#3)) may operate during the shakedown period of the two new boilers (Ref. Boilers 4 and 5) in accordance with Condition 28 below.

Specifications included in the permit under this Condition are for informational purposes only and do not form enforceable terms or conditions of the permit.
(9 VAC 5-80-1180 D 3)

28. **Emission Unit Shutdown** – The existing boilers (Ref. 2-205 (B#1, B#2 and B#3)) shall be permanently shut down upon startup of the two new boilers (Ref. Boiler 4 and 5). However, the permittee may operate one of the existing boilers (Ref. 2-205 (B#1, B#2 or B#3)) during startup and shakedown of the new boilers (Ref. Boiler 4 or Boiler 5), not to exceed 120 days following startup of any boiler (Ref. Boiler 4 or Boiler 5). Reactivation of the existing boilers (Ref. 2-205 (B#1, B#2 or B#3)) may require a permit.
(9 VAC 5-80-1180)

OPERATING/EMISSION LIMITATIONS – POWERHOUSE

29. **Fuel** - The approved fuels for the boilers (Ref. 2-205(B#1), 2-205(B#2) and 2-205(B#3)) are distillate oil, residual oil and coal. The approved fuel for the boiler igniters is natural gas. A change in the fuel may require a permit to modify and operate.
(9 VAC 5-80-1180)

30. **Fuel** - The distillate oil, residual oil and coal to be burned in the boilers (Ref. 2-205(B#1), 2-205(B#2) and 2-205(B#3)) shall meet the specifications below:

COAL:

Maximum sulfur content per shipment: 1.5%

DISTILLATE OIL which meets the ASTM D396 specification for numbers 1 or 2 fuel oil:

Maximum sulfur content per shipment: 0.5%

RESIDUAL OIL which meets the ASTM D396 specification for numbers 4, 5, or 6 fuel oil:

Maximum sulfur content per shipment: 2.0%

(9 VAC 5-80-1180)

31. **Fuel Certification** - The permittee shall obtain a certification from the fuel supplier with each shipment of coal, distillate oil and residual oil to be burned in the boilers (Ref. 2-205(B#1), 2-205(B#2) and 2-205(B#3)). Each fuel supplier certification shall include the following:

- a. The name of the fuel supplier;
- b. The date on which the distillate and residual oil was received;
- c. The date on which the coal was shipped;
- d. The volume of distillate and residual oil delivered in the shipment;
- e. The weight of coal delivered in the shipment;

- f. A statement that the distillate oil complies with the American Society for Testing and Materials specifications for numbers 1 or 2 fuel oil;
- g. A statement that the residual oil complies with the American Society for Testing and Materials specifications for numbers 4, 5, or 6 fuel oil;
- h. The sulfur content of the coal, distillate and residual oil;
- i. The method used to determine the sulfur content of coal, distillate and residual oil; and
- j. The higher heating value of the coal, distillate and residual oil.

Fuel sampling and analysis, independent of that used for certification, as may be periodically required or conducted by DEQ may be used to determine compliance with the fuel specifications stipulated in Condition 30. Exceedance of these specifications may be considered credible evidence of the exceedance of emission limits.
(9 VAC 5-80-1180)

32. Operating and Training Procedures - Boiler emissions shall be controlled by proper operation and maintenance. Boiler operators shall be trained in the proper operation of all such equipment. Training shall consist of a review of and familiarization with the manufacturer's operating instructions, at a minimum. The permittee shall maintain records of the required training including a statement of time, place and nature of training provided. The permittee shall have available good written operating procedures and a maintenance schedule for each boiler. These procedures shall be based on the manufacturer's recommendations, at a minimum.
(9 VAC 5-80-1180)

33. Emission Limits - Emissions from the powerhouse stack (Stack Ref. 2-205) shall not exceed the limits specified below:

Sulfur Dioxide	788.0 lbs/hr
----------------	--------------

Hourly emissions shall be calculated using the methodology in Attachment B.
(9 VAC 5-50-260)

34. Visible Emission Limit - Visible emissions from the powerhouse stack (Stack Ref. 2-205) shall not exceed 20 percent opacity as determined by the EPA Method 9 (reference 40 CFR 60, Appendix A). This condition applies at all times except during startup, shutdown, and malfunction.
(9 VAC 5-50-80 and 9 VAC 5-50-260)

RECORDS – POWERHOUSE

35. On Site Records - The permittee shall maintain records of all emission data and operating parameters necessary to demonstrate compliance with this permit. The content of and format of such records shall be arranged with the DEQ. These records shall include, but are not limited to:

- a. **Powerhouse Stack (Stack Ref. 2-205)**
 - i. Hourly sulfur dioxide emission calculations (in pounds per hour) and supporting documentation, using the calculation methodology, monitoring and recordkeeping contained in Attachment B of this permit.
 - ii. Results of all stack tests and visible emission evaluations.
 - iii. All fuel supplier certifications and fuel quality reports for all boilers.
 - iv. Records of the required boiler operator training including a statement of time, place and nature of training provided.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.
(9 VAC 5-50-50)

NOTIFICATIONS

36. Initial Notifications - The permittee shall furnish written notification to the DEQ of:

- a. The actual date on which construction of the two boilers (Ref. Boiler 4 and Boiler 5) commenced within 30 days after such date.
- b. The actual start-up date of each of the two boilers (Ref. Boiler 4 and Boiler 5) within 15 days after such date.
- c. The anticipated date of performance tests of the two boilers (Ref. Boiler 4 and Boiler 5) postmarked at least 30 days prior to such date.
- d. The actual shutdown date of each boiler (Ref. 2-205 (B#1, B#2 and B#3)) within 15 days after such date.

Copies of the written notification referenced in items a through c above are to be sent to the address in Condition 16.

(9 VAC 5-50-50, 9 VAC 5-80-1180, and 9 VAC 5-50-410)

GENERAL CONDITIONS

37. Permit Invalidation – The portions of this permit to construct the two boilers (Ref. Boiler 4 and Boiler 5) shall become invalid, unless an extension is granted by the DEQ, if:

- a. A program of continuous construction is not commenced within the latest of the following:
 - i. 18 months from the date of this permit;
 - ii. Nine months from the date that the last permit or other authorization was issued from any other governmental entity;
 - iii. Nine months from the date of the last resolution of any litigation concerning any such permits or authorization; or
- b. A program of construction is discontinued for a period of 18 months or more, or is not completed within a reasonable time, except for a DEQ approved period between phases of a phased construction project.

(9 VAC 5-80-1210)

38. Right of Entry - The permittee shall allow authorized local, state, and federal representatives, upon the presentation of credentials:

- a. To enter upon the permittee's premises on which the facility is located or in which any records are required to be kept under the terms and conditions of this permit;
- b. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit or the State Air Pollution Control Board Regulations;
- c. To inspect at reasonable times any facility, equipment, or process subject to the terms and conditions of this permit or the State Air Pollution Control Board Regulations; and
- d. To sample or test at reasonable times.

For purposes of this condition, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is in operation. Nothing contained herein shall make an inspection time unreasonable during an emergency.

(9 VAC 5-170-130 and 9 VAC 5-80-1180)

39. Records of Malfunctions - The permittee shall maintain records of the occurrence and duration of any bypass, malfunction, shutdown or failure of the facility or its associated air pollution control equipment that results in excess emissions for more than one hour. Records

shall include the date, time, duration, description (emission unit, pollutant affected, cause), corrective action, preventive measures taken and name of person generating the record.

Records of malfunction shall be maintained on site for a period of five years and shall be made available to DEQ personnel upon request.

(9 VAC 5-20-180 J and 9 VAC 5-80-1180 D)

- 40. Notification for Facility or Control Equipment Malfunction** - The permittee shall furnish notification to the DEQ, of malfunctions of the affected facility or related air pollution control equipment that may cause excess emissions for more than one hour, by facsimile transmission, telephone or telegraph. Such notification shall be made as soon as practicable but not later than four daytime business hours after the malfunction is discovered. The permittee shall provide a written statement giving all pertinent facts, including the estimated duration of the breakdown, within two weeks of discovery of the malfunction. When the condition causing the failure or malfunction has been corrected and the equipment is again in operation, the permittee shall notify the DEQ in writing.

(9 VAC 5-20-180 C and 9 VAC 5-80-1180)

- 41. Violation of Ambient Air Quality Standard** - The permittee shall, upon request of the DEQ, reduce the level of operation or shut down a facility, as necessary to avoid violating any primary ambient air quality standard and shall not return to normal operation until such time as the ambient air quality standard will not be violated.

(9 VAC 5-20-180 I and 9 VAC 5-80-1180)

- 42. Maintenance/Operating Procedures** - At all times, including periods of start-up, shutdown, and malfunction, the permittee shall, to the extent practicable, maintain and operate the affected source, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions.

The permittee shall take the following measures in order to minimize the duration and frequency of excess emissions, with respect to air pollution control equipment, monitoring devices, and process equipment which affect such emissions:

- a. Develop a maintenance schedule and maintain records of all scheduled and non-scheduled maintenance.
- b. Maintain an inventory of spare parts.
- c. Have available written operating procedures for equipment. These procedures shall be based on the manufacturer's recommendations, at a minimum.
- d. Train operators in the proper operation of all such equipment and familiarize the operators with the written operating procedures. The permittee shall maintain records of the training provided, including the names of trainees, the date of training and the nature of the training.

(9 VAC 5-50-20 E and 9 VAC 5-80-1180 D)

43. **Permit Suspension/Revocation** - This permit may be suspended or revoked if the permittee:

- a. Knowingly makes material misstatements in the application for this permit or any amendments to it;
- b. Fails to comply with the conditions of this permit;
- c. Fails to comply with any emission standards applicable to a permitted emissions unit;
- d. Causes emissions from this facility which result in violations of, or interferes with the attainment and maintenance of, any ambient air quality standard; or
- e. Fails to operate this facility in conformance with any applicable control strategy, including any emission standards or emission limitations, in the State Implementation Plan in effect on the date that the application for this permit is submitted.

(9 VAC 5-80-1210 F)

44. **Change of Ownership** - In the case of a transfer of ownership of a stationary source, the new owner shall abide by any current permit issued to the previous owner. The new owner shall notify the DEQ, of the change of ownership within 30 days of the transfer.

(9 VAC 5-80-1240)

45. **Permit Copy** - The permittee shall keep a copy of this permit on the premises of the facility to which it applies.

(9 VAC 5-80-1180)

STATE-ONLY ENFORCEABLE REQUIREMENTS

This section is included pursuant to 9 VAC 5-80-1120 F and is not required under the federal Clean Air Act or under any of its applicable federal requirements. This section is only enforceable by the Commonwealth of Virginia State Air Pollution Control Board and its designees.

OPERATING/EMISSION LIMITATIONS - SPANDEX

46. **Emission Limits** - Emissions from Spandex (Classic and NAX) shall not exceed the limits specified below:

Formaldehyde	1.2 lbs/hr	5.2 tons/yr
--------------	------------	-------------

Annual emissions shall be calculated monthly as the sum of each consecutive 12-month period.

(9 VAC 5-60-320)

47. **On Site Records** - The permittee shall maintain records of all emission data and operating parameters necessary to demonstrate compliance with this permit. The content and format of

such records shall be arranged with the DEQ. These records shall include, but are not limited to:

- a. The annual hours of operation of Spandex (Classic and NAX), calculated monthly as the sum of each consecutive 12-month period.
- b. Average hourly formaldehyde emissions (in pounds) from Spandex (Classic and NAX), calculated as a monthly average, using calculation methods approved by the DEQ.
- c. Annual formaldehyde emissions (in tons) from Spandex (Classic and NAX), calculated monthly as the sum of each consecutive 12-month period, using calculation methods approved by the DEQ.
- d. Results of all stack tests and visible emission evaluations.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.

(9 VAC 5-50-50)

DEQ Approved Emission Factors

Pollutant	Emission Factors *		
	Natural Gas	Distillate Oil	Liquefied Propane Gas
Nitrogen Oxides (as NO ₂)	30 ppmvd at 3% O ₂ (at or above 25 MMBtu/hr)	0.10 lb/MMBtu	0.1421 lb/MMBtu
	0.036 lb/MMBtu (at or above 25 MMBtu/hr)		
	0.073 lb/MMBtu (below 25 MMBtu/hr)		
Carbon Monoxide	50 ppmvd at 3% O ₂ (at or above 25 MMBtu/hr)	75 ppmvd at 3% O ₂ (at or above 25 MMBtu/hr)	0.081967 lb/MMBtu
	0.037 lb/MMBtu (at or above 25 MMBtu/hr)	0.059 lb/MMBtu (at or above 25 MMBtu/hr)	
	2.5 lb/hr (below 25 MMBtu/hr)	2.5 lb/hr (below 25 MMBtu/hr)	
Particulate Matter (PM)	0.0075 lb/MMBtu	0.024 lb/MMBtu	0.0077 lb/MMBtu
PM-10	0.0075 lb/MMBtu	0.0072 lb/MMBtu	0.0077 lb/MMBtu
Sulfur Dioxide	0.00059 lb/MMBtu	0.051 lb/MMBtu	0.0086 lb/MMBtu
Volatile Organic Compounds	0.0054 lb/MMBtu	0.0014 lb/MMBtu	0.0087 lb/MMBtu

* Site specific emission data and factors (based upon stack testing) may be used in lieu of the default emission factors listed above.

Attachment B

Powerhouse Stack SO₂ Emission Calculation Methodology & Monitoring Requirements

A. The permittee shall calculate the boiler sulfur dioxide emission rate as follows:

Equation 1

$$SO_{2\text{boiler}} = \sum_{i=1}^n BC_i + \sum_{i=1}^n BD_i + \sum_{i=1}^n BR_i$$

Where:

$SO_{2\text{boiler}}$ = Total sulfur dioxide emission rate in pounds per hour from all boilers.

BC_i = SO₂ emission rate in pounds per hour from each boiler (i) burning coal using DEQ-approved pollutant specific emission factors in Table 1.

BD_i = SO₂ emission rate in pounds per hour from each boiler (i) burning distillate oil using DEQ-approved pollutant specific emission factors in Table 1.

BR_i = SO₂ emission rate in pounds per hour from each boiler (i) burning residual oil using DEQ-approved pollutant specific emission factors in Table 1.

Table 1. SO₂ Emission Factors

Fuel Type	Emission Factor ⁽²⁾	Emission Factor Source
Bituminous Coal	601.2*((Mpph steam ⁽¹⁾)/450)*((lbs SO ₂ /MMBtu) ⁽³⁾ /1.062)	Source-specific
No. 1 Fuel Oil	142 S lbs/1000 gal	AP-42, Section 1.3
No. 2 Fuel Oil	142 S lbs/1000 gal	AP-42, Section 1.3
No. 4 Fuel Oil	150 S lbs/1000 gal	AP-42, Section 1.3
No. 5 Fuel Oil	157 S lbs/1000 gal	AP-42, Section 1.3
No. 6 Fuel Oil	157 S lbs/1000 gal	AP-42, Section 1.3

(1) Mpph steam equals the hourly average total steam flow from coal-firing.

(2) S equals the percent sulfur by weight of the fuel oil or coal.

(3) lbs SO₂/MMBtu equals the weighted average coal equivalent SO₂ content.

B. The determination of the hourly average total steam flow from coal-firing (Mpph steam) shall be done according to the following methodology:

1. Coal shall not be fired to any boiler prior to the boiler having a steam drum pressure of 300 pounds per square inch gauge (psig). An "on-line" boiler is defined as a boiler whose steam flow output is greater than 0 pound of steam per hour (pph) and whose steam drum pressure is greater than 300 psig. If either of these conditions is not true, the boiler is considered to be "off-line".
2. For each boiler (i), determine the hourly average input of natural gas in thousand standard cubic feet per hour (Mscfh) and distillate and residual oil in gallons per minute (gpm).
3. For each boiler (i), determine the hourly average steam flow output in Mpph and the hourly average boiler steam drum pressure in psig. Classify each boiler as being "on-line" or "off-line".
4. For each on-line boiler (i), determine the equivalent steam output from natural gas using the following equation:

Equation 2

$$STGAS_i = BG_i * 0.804$$

Where:

$STGAS_i$ = Steam flow output from each boiler (i), in Mpph, resulting from burning natural gas.

BG_i = Hourly average natural gas flow rate to each boiler (i) in thousand standard cubic feet per hour (Mscfh).

0.804 = Conversion factor including natural gas higher heating value, steam enthalpy rise, and boiler efficiency.

5. For each on-line boiler (i), determine the equivalent steam output from residual and distillate oil using the following equation:

Equation 3

$$STOIL_i = BO_i * C * (BTU_o \div BTU_i)$$

Where:

$STOIL_i$ = Steam flow output from each boiler (i), in Mpph, resulting from burning fuel oil.

BO_i = Hourly average oil flow rate of fuel oil to each boiler (i) in gallons per minute.

- C = Steam enthalpy rise and boiler efficiency constant, including oil higher heating value shown in Table 2, steam enthalpy rise, conversion from minutes (gpm) to hours (hourly steam flow), boiler efficiency, and division by 1000 for thousands of pounds per hour (pph).
- BTU_a = The actual higher heating value of the fuel oil in Btu per gallon.
- BTU_t = The theoretical higher heating value of the fuel oil in Btu per gallon.

Table 2. Fuel Btu Values and Boiler Constants

Fuel Type	Theoretical Higher Heating Value (BTU _t)	Steam Enthalpy & Boiler Efficiency Constant (C)
No. 1 Fuel Oil	134,000	6.357
No. 2 Fuel Oil	138,000	6.547
No. 4 Fuel Oil	144,000	6.816
No. 5 Fuel Oil	146,000	6.910
No. 6 Fuel Oil	150,000	7.100

6. For each on-line boiler (i), determine the hourly average steam flow from coal-firing (Mpph steam) using the following equation:

Equation 4

$$STCOAL_i = STEAM_i - STGAS_i - STOIL_i$$

Where:

- $STCOAL_i$ = Steam flow output from each boiler (i), in Mpph, resulting from burning coal.
- $STEAM_i$ = Total steam flow output from each boiler (i) in Mpph.
- $STGAS_i$ = Steam flow output from each boiler (i), in Mpph, resulting from burning natural gas.
- $STOIL_i$ = Steam flow output from each boiler (i), in Mpph, resulting from burning oil.

Monitoring and Recordkeeping

Based on the total sulfur dioxide emission rate from all boilers ($SO_{2boiler}$), monitoring and recordkeeping shall be performed using the following methodology:

A. Total Boiler SO_2 Emission Rate ($SO_{2boiler}$) Less Than 450.9 lbs/hr

1. A coal quality certification sheet shall be provided by the coal supplier for each shipment, identifying each coal car or truck included in that shipment. The certification sheet is to be provided to the plant for verification prior to unloading.
2. Coal is to be sampled and analyzed by the supplier using appropriate ASTM methods as defined by EPA Method 19 (reference 40 CFR 60, Appendix A). Data shall include percent sulfur content and higher heating value on an as-received and dry basis, and the equivalent SO_2 content as lbs/MMBtu.
3. Each coal car or truck shall be identified, verified versus the quality certification sheet, and documented by the plant when it is unloaded, along with the location to which the coal was delivered (i.e., to the coal storage pile or to the raw coal silos).
4. The facility shall conduct one monthly random audit sample and analysis of coal received for comparison to the quality certification from that sampled by the coal supplier. The coal is to be analyzed by the facility using appropriate ASTM methods as defined by EPA Method 19 (reference 40 CFR 60, Appendix A). Sample data shall include the percent sulfur content, higher heating value and the equivalent SO_2 content as lb/MMBtu. Details of the sampling and analysis shall be arranged with the DEQ. The results shall be recorded and retained for recordkeeping purposes.
5. If the monthly random audit sample sulfur content result (as lbs of SO_2 /MMBtu on an as-fired basis) exceeds the supplier's certification by 20 percent or greater, contact shall be made with the supplier to ensure that the proper quality control procedures are being followed. A second spot sample would be taken and analyzed for sulfur content. If a result of 20 percent or greater is confirmed by the second sample, the facility shall generate a composite coal sample by taking daily samples upstream of all operating raw coal feeders. The composite sample shall be quartered on a monthly basis to obtain a representative sample. Coal is to be analyzed by the facility using appropriate ASTM methods as defined by EPA Method 19 (reference 40 CFR 60, Appendix A). Details of the sampling and analysis shall be arranged with the DEQ. The facility shall use results of the composite coal sampling and analysis for its SO_2 emission calculations until the composite sample compares within 20 percent of the supplier certification. Composite coal sampling may be discontinued once this occurs.

B. Total Boiler SO_2 Emission Rate ($SO_{2boiler}$) Between 450.9 lbs/hr and 541.1 lbs/hr for More Than Two Individual Hours in a Week

1. The facility shall generate a composite coal sample by taking daily samples upstream of all operating raw coal feeders. The composite sample shall be quartered on a monthly basis to obtain a representative sample. Coal is to be analyzed by the facility using appropriate ASTM methods as defined by EPA Method 19 (reference 40 CFR 60,

Appendix A). Details of the sampling and analysis shall be arranged with the DEQ. The facility shall use results of the composite coal sampling and analysis for its SO₂ emission calculations.

2. If total SO₂ emissions from the boilers as calculated above do not exceed 450.9 lbs/hr for a continuous 30-day period following the upward excursion, coal quality certification shall fall back to the steps contained in *Section A*.

C. Total Boiler SO₂ Emission Rate ($SO_{2boiler}$) Greater Than 541.1 lbs/hr for More Than Two Individual Hours in a Week

1. If the total powerhouse stack SO₂ emissions ($SO_{2boiler}$) are less than 591.0 pounds per hour, proceed with the monitoring requirements contained in *Section B*.
2. If the total powerhouse stack SO₂ emissions ($SO_{2boiler}$) are equal to or greater than 591.0 pounds per hour for any single hour, a project shall be initiated for timely installation of a continuous emission monitor (CEM). Details of the CEM installation shall be arranged with the DEQ. Upon installation of the CEM, no further SO₂ sampling, analysis, and calculations would be required for compliance purposes.

SOURCE TESTING REPORT FORMAT**Report Cover**

1. Plant name and location
2. Units tested at source (indicate Ref. No. used by source in permit or registration)
3. Test Dates.
4. Tester; name, address and report date

Certification

1. Signed by team leader/certified observer (include certification date)
2. Signed by responsible company official
3. *Signed by reviewer

Copy of approved test protocol**Summary**

1. Reason for testing
2. Test dates
3. Identification of unit tested & the maximum rated capacity
4. *For each emission unit, a table showing:
 - a. Operating rate
 - b. Test Methods
 - c. Pollutants tested
 - d. Test results for each run and the run average
 - e. Pollutant standard or limit
5. Summarized process and control equipment data for each run and the average, as required by the test protocol
6. A statement that test was conducted in accordance with the test protocol or identification & discussion of deviations, including the likely impact on results
7. Any other important information

Source Operation

1. Description of process and control devices
2. Process and control equipment flow diagram
3. Sampling port location and dimensioned cross section Attached protocol includes: sketch of stack (elevation view) showing sampling port locations, upstream and downstream flow disturbances and their distances from ports; and a sketch of stack (plan view) showing sampling ports, ducts entering the stack and stack diameter or dimensions

Test Results

1. Detailed test results for each run
2. *Sample calculations
3. *Description of collected samples, to include audits when applicable

Appendix

1. *Raw production data
2. *Raw field data
3. *Laboratory reports
4. *Chain of custody records for lab samples
5. *Calibration procedures and results
6. Project participants and titles
7. Observers' names (industry and agency)
8. Related correspondence
9. Standard procedures

* Not applicable to visible emission evaluations

Attachment C

Associated Engineering Analysis for Minor NSR Permit
(dated November 16, 2012)

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Valley Regional Office

INTRA-AGENCY MEMORANDUM

4411 Early Road - P.O. Box 3000 Harrisonburg, VA 22801

Permit Writer	<i>Jeremy Funkhouser</i>	Date	<i>11/15/12</i>	
Air Permit Manager	<i>Janardan Pandey</i>	Date	<i>11/15/12</i>	
Memo To	Air Permit File			
Facility Name	INVISTA S.á. r.l.			
Registration Number	80517			
County-Plant I.D.	820-0009			
UTM Coordinates (Zone 17)	686.7	Easting (km)	4214.4	Northing (km)
Elevation (feet)	1329			
Distance to Nearest Class I Area (select one)	2	SNP (km)	--	JRF (km)
FLM Notification Required (Y/N)	Y			
CEDS Classification (A, SM, B)	A	Before permit action	A	After permit action
Pollutants for Which the Source is Title V Major	VOC, SO ₂ , NO _x , CO, PM-10, HCl	Before permit action	VOC	After permit action
PSD Major Source (Y/N)	Y	Before permit action	Y	After permit action
Pollutants for Which the Source is PSD Major	VOC, SO ₂ , NO _x , CO, PM-10	Before permit action	VOC	After permit action

I. Introduction

INVISTA S.á r.l. (INVISTA or the facility) owns and operates a synthetic fiber production facility located in Waynesboro, Virginia. The facility currently operates under a New Source Review (NSR) permit dated August 15, 2001, as amended July 25, 2005, September 17, 2009, and November 22, 2011.

The facility proposes to construct and operate two natural gas-fired “package” boilers, with liquefied petroleum gas (LPG) and fuel oil back-up capabilities, as well as a new electric chiller, at the Waynesboro plant. The proposed boilers will replace the existing coal-fired boilers, and the proposed electric chiller will replace the existing steam driven chillers.

The Valley Regional Office of the Department of Environmental Quality received copies of a permit application dated and received July 26, 2012; amendment information dated September 5, 2012, and September 20, 2012, was received on September 6, 2012, and October 9, 2012, respectively. The permit application was deemed complete on October 9, 2012.

II. Emission Unit(s) / Process Description(s)

The *existing* equipment at the facility consists of the following three main areas:

The Powerhouse

There are currently three boilers installed in the powerhouse which have predominantly used coal, with minor modifications and fuel use upgrades prior to 1972. Boiler #1 (2-205(B#1)) is rated at 196 MMBtu/hr and was installed in 1967, Boiler #2 (2-205(B#2)) is rated at 209 MMBtu/hr and was installed in 1966, and Boiler #3 (2-205(B#3)) is rated at 209 MMBtu/hr and was installed in 1965. Each of the coal-fired boilers are grandfathered units.

The Coal Handling System

Coal is transported to the coal handling facility mostly via railcar, although a small amount is delivered by trucks. Coal is fed through a shuttle-type vibrating feeder and transferred by a belt conveyor to a holding hopper. This hopper chutes coal to either the coal storage pile or a crusher, which drops coal to a short belt, then a long belt, and finally to the top belt conveyors to the silos. A reclaim hopper and chute catches any coal that drops off belts at the main transfer points, which are enclosed. The top belt feeds 4 silos serving the boilers. Silos 1A and 1B serve Boiler #1, with a capacity of 150 tons each. Silos #2 and #3 serve Boiler #2 and Boiler #3 respectively, each with a capacity of 190 tons.

The Spandex Production Facility

The spandex production facility, which produces INVISTA's brand of spandex fiber, is comprised of three basic areas: polymer processing, spinning, and solvent recovery. There are no proposed changes to the Spandex Production Facility as part of this permit action.

The facility proposes the following:

Installation / Replacement of Boilers

INVISTA proposes to shutdown the three existing coal-fired boilers and install two natural gas-fired boilers that utilize distillate oil and liquefied propane gas (LPG) as backup fuels in the event of curtailment of natural gas. Each of the proposed boilers (Ref. Boiler 4 and Boiler 5) will have a maximum rated input heat capacity of 99 MMBtu/hr; no specific manufacturer information has been determined at the time of this permitting evaluation. Emissions of concern from each boiler are particulate matter (PM), particulate matter with an aerodynamic diameter of less than 10 microns (PM₁₀), particulate matter with an aerodynamic diameter of less than 2.5 microns (PM_{2.5}), nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), and sulfur dioxide (SO₂).

Each boiler will be equipped with a low-NO_x burner; NO_x emissions are guaranteed at less than or equal to 30 ppmvd (at 3% O₂) at firing rates at or above 25 MMBtu/hr while burning natural gas. Although no manufacturer has been determined, each boiler is required to meet a CO emission rate of less than or equal to 50 ppmvd (at 3% O₂) at firing rates greater than or equal to 25 MMBtu/hr while burning natural gas, and 75 ppmvd (at 3% O₂) at firing rates greater than or equal to 25 MMBtu/hr while burning distillate oil.

Replacement of Existing Steam Chillers

The facility proposes to replace the existing steam driven chillers with a new electric chiller. Although there are no emissions associated with the new electric chiller, the unit will contain ozone-depleting substances subject to 40 CFR Part 82, Subpart F.

Removal of Coal Handling System

Upon installation and startup of the two proposed natural gas-fired boilers, the facility proposes to shutdown the existing coal handling system.

III. Regulatory Review

A. 9 VAC 5, Chapter 80, Article 6 - Minor New Source Review

The NEI of criteria pollutants to determine minor New Source Review (NSR) permitting applicability is evaluated for the two proposed boilers (Ref. Boiler 4 and Boiler 5), as described in Section II, above. The NEI for criteria pollutants is evaluated as the sum of the new uncontrolled (NU) emissions for the projects minus the sum of current uncontrolled (CU) emissions for the project. The CU emissions from the two boilers (Ref. Boiler 4 and Boiler 5) are assumed equal to zero since the boilers are new and have not been evaluated for permitting applicability. Therefore the NEI is equal to the NU emissions.

Since the proposed boilers are capable of burning natural gas, distillate oil, and LPG; NU emissions from the two proposed boilers are based on the worst-case fuel for each pollutant. NU emissions for each fuel are calculated using emission factors from AP-42 Chapters 1.3 (5/10) and 1.4 (7/98). Emissions of NO_x and CO are calculated using vendor guarantees for both natural gas and distillate oil since

the emissions are tied to the type of burner proposed for each boiler. Emissions of SO₂ when firing distillate oil were calculated using an assumed sulfur content of 0.5 percent, as a conservative estimate.

As shown in the Table 1 below, the NEI for PM, SO₂ and NO_x are each above the respective exemption level as defined in 9 VAC 5-80-1320 D.1 for existing or modified sources. Because the emissions exceed the annual exemption thresholds, the project is subject to permitting in accordance with 9 VAC 5-80-1320 D. Detailed permitting applicability (NSR NEI) calculations are provided in Attachment A.

Table 1: Net Emission Increase Calculations

Pollutant	NU Emissions (tons/yr)	CU Emissions (tons/yr)	NEI = NU – CU (tons/yr)	Exemption Levels (tons/yr) ^a	Exempt?
PM	20.74	0	20.74	15	No
PM-10	6.63	0	6.63	10	Yes
PM-2.5	6.63	0	6.63	10	Yes
SO ₂	446.19	0	446.19	10	No
CO	71.09	0	71.09	100	Yes
NO _x	123.21	0	123.21	10	No
VOC	7.58	0	7.58	10	Yes

^a Exemption levels for criteria pollutants taken from 9 VAC 5-80-1320 D for existing or modified sources.

The proposed boilers are subject to a Maximum Achievable Control Technology (MACT) Standard (see Section III.E below); therefore, in accordance with 9 VAC 5-60-300 C.3, hazardous air pollutants (HAPs) are not evaluated for minor NSR permitting.

B. 9 VAC 5 Chapter 80, Article 8 - PSD Major New Source Review

Currently INVISTA is an existing PSD major source. The facility's powerhouse is a named category (exceeds 250 million Btu per hour heat input) as defined in 9 VAC 5-80-1710 and exceeds the major source threshold level of 100 tons per year in 9 VAC 5-80-1700 et seq., for VOC, SO₂, NO_x, CO, PM-10. The facility is located approximately two kilometers from the Shenandoah National Park, a federal Class I area. The proposed project must be evaluated for PSD permitting applicability.

Criteria Pollutants

The actual-to-potential test is used for projects where a new emissions unit is constructed. A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the difference between the potential to emit (PTE) from each new emissions unit following completion of the project, and the baseline actual emissions (BAE) of these units before the project, is significant for that pollutant.

The BAE from the proposed boilers are equal to zero since the units are new and have not been previously evaluated for permitting. The PTE from the boilers is calculated based on the enforceable conditions in the permits. PTE emissions from the two proposed boilers are calculated using the four possible fueling scenarios proposed by the facility, as outlined and limited in the permit: 1) complete operation on natural gas, 2) operation on natural gas with 502,748 gallons of distillate oil (0.05% sulfur) as a back-up fuel, 3) operation on natural gas with 33,600 gallons of LPG as a back-up fuel; and 4) operation on natural gas with 502,748 gallons of distillate oil (0.05% sulfur) AND 33,600 gallons of LPG as back-up fuels. Worst-case emissions from the four fuel scenarios are used for PSD applicability calculations for each pollutant as a conservative estimate.

Table 2 shows the Net Emissions Increase (NEI) for the proposed project. Emissions of particulate matter (PM, PM-10 and PM-2.5), SO₂, and VOC, are calculated using AP-42 Chapters 1.3 (5/10) and 1.4 (7/98); emissions of CO and NO_x are calculated using the emission factors taken from the application, based on the vendor guarantee. Detailed calculations showing the four PTE scenarios are available in Attachment B.

Table 2: Significant Emissions Increase for PSD Permitting Applicability

Pollutant	PTE (tons/yr)	BAE (tons/yr)	NEI = PTE – BAE (tons/yr)	Significance Levels (tons/yr)	Significant / Requires Netting?
PM (total)	7.03	0	7.03	25	No
PM ₁₀	6.46	0	6.46	15	No
PM _{2.5}	6.46	0	6.46	10	No
SO ₂	2.29	0	2.29	40	No
CO	33.12	0	33.12	100	No
NO _x	33.83	0	33.83	40	No
VOC	4.68	0	4.68	40	No

Greenhouse Gases

Greenhouse gas (GHG or CO_{2e}) emission increases must also be evaluated to determine if the proposed modification will cause GHG emission increases greater than the significance levels outlined in Appendix D of the EPA manual, *PSD and Title V Permitting Guidance for Greenhouse Gases*.

The first step of the GHG PSD analysis is determining if the facility is currently a PSD source for GHG. Using the flowchart in Appendix D of the EPA manual, PTE of the existing boilers were calculated and compared to the applicable thresholds. For an existing facility to be considered PSD for GHG emissions of GHG must be greater than 250 tons/yr, on a mass basis, and 100,000 tons/yr carbon dioxide equivalent (CO_{2e}). As shown in Table 3, the existing equipment exceeds both the mass basis and CO_{2e} thresholds. Detailed calculations are provided in Attachment B.

Table 3: Existing Potential to Emit of Greenhouse Gases

Pollutant	Existing PTE	Threshold	Greater than Threshold?
	(tons/yr)	(tons/yr)	
GHG - Mass Basis	570,023.9	250	Yes
GHG - CO _{2e} Basis	571,065.7	100,000	Yes

Since the facility is currently a PSD source for GHG, emissions associated with the modification must be evaluated for PSD applicability. Since the proposed boilers are new, the BAE are equal to zero, as described above; therefore, only the PTE from the project is compared to the applicable mass basis threshold (0 tons/yr) and CO_{2e} threshold (75,000 tons/yr) to determine if a netting analysis is required. The Significant Emission Increase evaluation for GHG emissions follows the same four-fuel scenarios detailed above.

Detailed calculations are provided in Attachment B.

Table 4: Significant Emission Increase for GHG Emissions

Pollutant	PTE (Boilers 4 and 5)	PSD Thresholds	Requires Netting?
	(tons/yr)	(tons/yr)	
GHG - Mass Basis	103,584.4	0	<i>Yes</i>
GHG - CO _{2e} Basis	103,808.2	75,000	

As shown in Table 4, emissions of greenhouse gases exceed the significance threshold.

Since the project has been determined to result in a significant emissions increase of an NSR pollutant, the source conducted a netting analysis. Netting is pollutant specific and evaluates all non-project related emission increases and decreases that have, or will occur at the entire facility contemporaneously with the proposed project. Netting is only conducted for emissions of GHG; as shown in Table 2, the Significant Emissions Increase of criteria pollutants is less than the corresponding significance threshold.

Contemporaneous and creditable emission increases and decreases are considered in calculating the net emissions increase if they occur within a period five years before the construction on the particular change commences. The facility has identified the contemporaneous period as conservatively starting on December 1, 2007 to determine BAE.

During the identified contemporaneous period, the facility indicated that there are no projects resulting in contemporaneous increases of GHGs.

The HyFit Conversion Project involved the conversion of 20 spinning cells on two existing spinning machines (10 spinning cells per spinning machine) from the production of fine denier spandex to heavy denier spandex. The project resulted in

a potential for increased steam demand from the existing boilers; however since the proposed boilers also accommodate the facilities operations (including the HyFit Conversion Project), the GHG emissions from the projects are included in the maximum GHG calculations for the proposed boilers. Since the GHG emissions from the project, and operation of the HyFit Conversion cells, is accounted for in the current GHG emissions from the boilers (Table 4 above), the project is not considered a contemporaneous increase of GHG emissions.

During the identified contemporaneous period the following processes and emission units have been shutdown, which create emission reductions of GHG:

Table 5: Shutdown Equipment During the Contemporaneous Period

Reference Number	Equipment	Rated Capacities	Shutdown Date
2-205 (V#1)	Riley Union (Riley-stocker) Dow Vaporizer #1	43 MMBtu/hr	8/31/2011
2-205 (V#2)	Riley Union (Riley-stocker) Dow Vaporizer #2	43 MMBtu/hr	8/31/2011
2-205 (V#3)	Struthers Wells Dowtherm Vaporizer #3	22 MMBtu/hr	8/31/2011

As a *result* of this project, the facility has indicated that the existing boilers (Ref. 2-205(B#1), 2-205(B#2), and 2-205(B#3)) will be shutdown. The facility will continue to operate one of the three boilers during the construction and “shakedown” period for the proposed boilers (Ref. Boiler #4 and Boiler #5). The permit limits the shakedown period to no more than 120 days after the startup of the first boiler (Ref. Boiler 4 or Boiler 5). Following the shakedown period the remaining coal-fired boiler will be shut down, also resulting in creditable emission reductions in GHG. Table 6 below provides the list of shutdown equipment as a result of the two proposed boilers:

Table 6: Shutdown Equipment as a Result of the Proposed Boiler Project

Reference Number	Equipment	Rated Capacities
2-205 (B#1)	Combustion Engineering, Inc. Model # VU-40S Boiler #20543 with natural gas igniter	Boiler = 196 MMBtu/hr Igniter = 20 MMBtu/hr
2-205 (B#2)	Combustion Engineering, Inc. Model # VU-40S Boiler #20185 with natural gas igniter	Boiler = 209 MMBtu/hr Igniter = 20 MMBtu/hr
2-205 (B#3)	Combustion Engineering, Inc. Model # VU-40S Boiler #19955 with natural gas igniter	Boiler = 209 MMBtu/hr Igniter = 20 MMBtu/hr

GHG emission decreases during the contemporaneous period, combined with emission reductions a result of this project, are detailed in Table 7, below:

Table 7: Summary of Average Creditable Greenhouse Gas Decreases

Pollutant	Average Emissions: Creditable Decreases 2008 and 2009	
	Mass Basis (tons/yr)	CO _{2e} Basis (tons/yr)
Carbon Dioxide (CO ₂)	168,640.79	168,640.79
Methane (CH ₄)	1.39	29.22
Nitrous Oxide (N ₂ O)	0.95	294.43
Total	168,643.13	168,964.45

Complete netting calculations including contemporaneous increases and decreases are provided in Attachment C.

If contemporaneous increases or decreases occurred and the net emissions increase is determined to be less than the significant level for a regulated pollutant, the project is not a major modification for that pollutant. GHG emission increases must be evaluated to determine if the proposed modification will cause GHG emission increases greater than 0 tons/yr on a mass basis, and 75,000 tons/yr carbon dioxide equivalent (CO_{2e}).

Table 8: Significant Net Emission Increase Calculations

Pollutant	Project PTE (tons/yr)	Contemp. Decreases (tons/yr)	Net GHG Emissions (PTE – Decreases) (tons/yr)	Sig. Levels (tons/yr)	Triggers PSD?
GHG- Mass Basis	103,584.4	168,643.1	-65,058.7	0	No
GHG - CO _{2e} Basis	103,808.2	168,964.5	-65,156.3	75,000	

As shown above in Table 8, the significant net emissions increase for GHG, accounting for contemporaneous increases and decreases, is less than the significance levels on both a mass basis and carbon dioxide equivalent (CO_{2e}) basis. GHG emissions are not subject to PSD as part of this permit review. Detailed calculations are available in Attachment C.

Impact Analysis

In accordance with the definition of significance in 9 VAC 5-80-1615, an impact analysis is required for any actual emissions increase from a source located within 10 kilometers (km) of a Class I federal area for comparison with the significance threshold of 1 µg/m³. Since the facility is approximately 6 km from the Shenandoah National Park (SNP), an impact analysis is required for the proposed project.

Emissions of GHG (or CO_{2e}), and VOCs are not included in the analysis. The annual increases of VOC and GHG emissions from the project were not reviewed for compliance with the 1 µg/m³ significance threshold as there are currently no approved regulatory modeling approaches for determining impacts based on emissions of VOC or GHG from point sources.

There is no clear guidance available for comparison of increases in short-term emissions rates (24-hour basis) to the 1 µg/m₃ significance threshold concentration. The facility evaluated the 24-hour fuel usage and associated emissions during the contemporaneous period. The facility elected to use emissions for December 5, 2007 for the highest 24-hour CO emissions, when the facility was burning residual oil and natural gas. The facility similarly elected to use the 24-hour period of November 22, 2008, when the facility was burning coal and natural gas to evaluate emissions of the other criteria pollutants (PM, PM-10, PM-2.5, NO_x and SO₂).

The proposed 24-hour emissions for natural gas and distillate oil are both based on firing a single fuel for a 24-hour period as a conservative estimate. The proposed 24-hour emissions for firing propane are based on the maximum potential throughput of LPG for the two boilers, 33,600 gallons/day; this throughput limitation is also the *annual* LPG throughput limitation requested by the facility. The facility proposes to only use LPG when the supply of natural gas has been curtailed.

As shown in Table 9, there is a net decrease in 24-hour emissions for all pollutants; therefore the project does not require further impact analysis review. Emission calculations are provided in Attachment F.

Table 9: Twenty-Four Hour Impact Analysis Review

Pollutant	Max. Proposed Emissions	Max. Contemporaneous Emissions	Net Change (+ or -)	Increase or Decrease?
	(lb/24-hour)	(lb/24-hour)	(lb/24-hour)	
PM (Total)	113.63	302.45	-188.81	Decrease
PM-10	35.41	296.05	-260.64	Decrease
PM-2.5	35.41	267.25	-231.84	Decrease
SO ₂	244.49	12160.01	-11915.52	Decrease
CO	278.92	288.50	-9.58	Decrease
NO _x	475.20	1761.01	-1285.81	Decrease

PSD Applicability Following Permit Issuance

Following the start-up of the two proposed boilers (Ref. Boilers 4 and 5), and the shutdown of the three existing boilers (Ref. 2-205 (B#1), (B#2) and (B#3)), the facility will still be classified as a PSD major source. The facility's operations are classified as a named category (Chemical Manufacturing Plant) as defined in 9 VAC 5-80-1710 and VOC emissions exceed the major source threshold level of 100 tons per year in 9 VAC 5-80-1700 et seq..

C. 9 VAC 5 Chapter 50, Part II, Article 5 - NSPS

40 CFR 60, Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, applies to these boilers. The

proposed boilers each have a maximum rated heat input capacity of 99.0 MMBtu/hr, which is within the heat input range (10 MMBtu/hr to 100 MMBtu/hr) specified in this NSPS. All applicable requirements from the regulation have been incorporated into the permit. The NSPS standards and proposed permit limits for the two boilers are outlined in Table 10.

Table 10: Comparison of NSPS to Permit Limits

Pollutant	Proposed Limit	NSPS Standard
SO ₂	0.05 lb/MMBtu (Distillate Oil, conservatively) 0.05% Sulfur Content of Oil	0.50 lb/MMBtu (Distillate Oil) 0.5% Sulfur Content of Oil
Opacity	10% opacity	20% opacity, except for one 6-minute period of not more than 27% opacity

As shown in Table 10, the proposed limitations in the permit are at least as stringent as the NSPS.

Each of the proposed boilers are subject to an initial VEE in accordance with §60.47c (a); subsequent VEE's are required in accordance with the timeline established in 40 CFR 60.47c (a).

The facility is also required to submit semi-annual fuel quality reports to the DEQ and EPA, in accordance with §60.48c (d).

There are no additional NSPS applicable to the facility.

D. 9 VAC 5 Chapter 60, Part II, Article 1 - NESHAPS

There are no NESHAPs that are applicable to the facility.

E. 9 VAC 5 Chapter 60, Part II, Article 2 - MACT

40 CFR 63, Subpart JJJJJJ (6J), National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers (Boiler MACT), applies to the two proposed boilers at this facility.

The facility is currently a major source of HAP emissions; however, upon start-up of the two boilers the facility will be an area source of HAP emissions. Therefore the two boilers will be subject to the Area Source Boiler MACT, rather than the Major Source Boiler MACT. Upon start-up of the two proposed boilers (Ref. Boilers 4 and 5), the facility will shutdown the three existing coal fired boilers, which currently result in the facility's major source status for HAPs.

After the shakedown of the boilers, the total individual HAP emissions from the facility are below 10 tons/yr, and the total combined HAP emissions from the facility are below 25 tons/yr. A summary of the facility-wide emissions is provided in Table 12, in Section IX, below.

On January 9, 2012, the federal district court for the District of Columbia issued a decision vacating and remanding the May 18, 2011, Delay Notice. The vacatur, in conjunction with the proposed reconsideration of the Area Source Boiler MACT, has created uncertainty regarding requirements because the EPA has proposed revisions to the compliance dates (the date by which a unit must be in compliance with the requirements in the Boiler MACT rule) for all units and to the subcategories for some units. All applicable requirements for the two proposed boilers will be addressed and included in the Title V permit *after* the final rule is issued. On February 7, 2012, EPA provided a no action assurance to all owners and/or operators of industrial boilers with respect to the notification deadlines; the No Action Assurance was extended on July 18, 2012, and will run until either the final reconsideration rule is issued and becomes effective, or to December 31, 2012.

In accordance with Air Permitting Guidance 569 (APG-569): *Guidance to Implement and Enforce Non-delegated Federal Regulations*, information indicating that the unit is subject to the federal standard is included in the cover letter of the permit. The MACT standards will be incorporated into the Title V permit.

Since the proposed boilers are subject to MACT standards, HAP emissions are not evaluated as part of the minor NSR permit action.

There are no additional MACT standards that are applicable to the facility.

F. 9 VAC 5 Chapter 40, Part II – Existing Source Regulations

9 VAC 5 Chapter 40, Article 1 – Visible Emissions and Fugitive Dust/Emissions (Rule 4-1) is applicable to the facility; however the proposed NSR permit provides more stringent requirements than the existing emissions standards in Rule 4-1.

9 VAC 5 Chapter 40, Article 8 – Fuel Burning Equipment (Rule 4-8) is applicable to the facility; however the proposed NSR permit provides more stringent requirements than the existing emissions standards in Rule 4-8.

IV. Best Available Control Technology Review (BACT) (9 VAC 5-50-260)

In accordance with 9 VAC 5-80-1320 D.2, the calculations performed to determine BACT applicability are the same as those used to assess permit applicability. As shown in Section III.A, above, BACT is required for emissions of PM, NO_x, and SO₂.

NO_x BACT:

The facility proposes to install boilers equipped with low-NO_x burners. NO_x emissions are guaranteed at less than or equal to 30 ppmvd (at 3% O₂) at firing rates at or above 25 MMBtu/hr for each boiler when burning natural gas.

In addition to the low-NO_x burners, the facility proposes primary operation using natural gas, with distillate oil and LPG as back-up fuels. The throughput limitations for each fuel are established in the permit. Hourly emissions for natural gas, distillate oil and LPG are provided for each fuel and account for the short-term emission guarantees from the manufacturer. The annual throughput limitation of distillate oil is 502,748 gallons per year; the annual throughput limitation for LPG is 33,600 gallons per year. Annual emissions are based on the worst-case firing scenario for each pollutant as outlined in Section III.B, above. Detailed calculations are available in Attachments B and D.

The annual fuel throughput limitations for distillate oil and LPG also serve to establish a fuel throughput limitation for natural gas. The combined usage cannot exceed 8,760 hours per year; therefore natural gas usage is determined based on the following equation:

Where:

- A = The throughput natural gas for the consecutive 12-month period, in MMft³/yr
- B = The throughput of distillate oil for the consecutive 12-month period, in gallons/yr
- C = The throughput of LPG for the consecutive 12-month period, in gallons/yr
- D = The heat content of natural gas (1,020 MMBtu / MMft³)
- E = The heat content of distillate oil (138,000 MMBtu / 10⁶ gal)
- F = The heat content of LPG (91,500 MMBtu / 10⁶ gal)
- G = The maximum rated heat input capacity (combined) of the two boilers (1,734,480 MMBtu / yr)

In addition to the low-NO_x burners, emission guarantees, and fuel throughput limitations, the permittee is also required to control emissions from the proposed boilers through proper operation and maintenance. Short-term NO_x emission limits while burning natural gas and distillate oil are provided as a ppmvd limitation to enforce the emission guarantees.

The low-NO_x burners, fuel throughput limitations, and requirements for proper operation and maintenance, are considered BACT for the boilers, and will be established in the permit with enforceable conditions.

PM and SO₂ BACT:

As indicated above, the facility proposes primary operation using natural gas, with distillate oil as a back-up fuel. The use of natural gas is considered BACT for PM and SO₂ emissions.

A distillate oil throughput limitation of 502,748 gallons per year reduces the sulfur dioxide and particulate matter emissions. Furthermore, the facility has requested a fuel sulfur content of 0.05 percent for the distillate oil.

In addition to the fuel throughput and sulfur content limitations for distillate oil, the two boilers are subject to New Source Performance Standards (NSPS) 40 CFR 60 Subpart Dc. As shown in Table 10 above, the proposed permit limits are more stringent than the NSPS limitations. The distillate oil throughput limitation is considered BACT for PM and SO₂ emissions from the boilers. The fuel sulfur content limitation is considered BACT for the SO₂ emissions from the boilers.

An opacity limitation of 10 percent has been established for boilers; the opacity limitation is also considered BACT for PM emissions.

Additional Controls:

Although not required by BACT, the burners on the proposed boilers are required to meet a CO emission rate of less than or equal to 50 ppmvd (at 3% O₂) at firing rates greater than or equal to 25 MMBtu/hr while burning natural gas, and 75 ppmvd (at 3% O₂) at firing rates greater than or equal to 25 MMBtu/hr while burning distillate oil. The short-term emission limitations for CO in the permit are based on this emission rate. Stack testing to demonstrate compliance with the short-term emission limitation for CO is required for the boilers while burning natural gas.

The facility is required to conduct initial stack testing for NO_x and CO emissions while burning natural gas for both boilers. If the two boilers are identical, the test on one boiler will satisfy the initial testing requirements for the other boiler provided they are identical units. Stack testing is not required for the boilers while firing distillate oil because the facility has indicated that the proposed throughput only accounts for approximately eight percent of the total operation of the boilers (combined). The facility indicated that the fuel was only for use during potential curtailment of natural gas; therefore requiring stack testing while burning distillate oil is not practical.

In addition to the initial stack test, the facility is required to conduct additional stack testing at the request of the DEQ.

The facility is required to conduct an initial Visible Emissions Evaluation (VEE) on each boiler (Ref. Boiler 4 and Boiler 5) in accordance with the NSPS. Subsequent VEEs are required as outlined in the timeline established in 40 CFR 60.47c (a).

V. Summary of Permitted Allowable Emissions (Increase)

Controlled emissions from the proposed boilers (combined), after the implementation of BACT, are shown in Table 11 below. Detailed controlled emission calculations are provided in Attachment C.

Table 11: Controlled Boiler Emissions (Combined) after BACT Implementation

Pollutant	Controlled (tons/yr)	Modeling Level (tons/yr)	Model?
PM (total)	7.03	25	No
PM-10	6.46	15	No
PM-2.5	6.46	10	No
CO	33.12	100	No
NO _x	33.83	40	No
SO ₂	2.29	40	No
VOC	4.68	--	--

VI. Dispersion Modeling

A. Criteria Pollutants

The controlled emissions increases for all criteria pollutants, as shown above in Table 11, are less than the significance levels, as defined in 9 VAC 5-80-1615. Additionally, the impact analysis, as discussed in Section III.B, shows there is a net decrease in 24-hour emissions for all pollutants. Therefore no modeling is required as a result of this permit action.

B. Toxic Pollutants

The proposed equipment is subject to a MACT Standard (see Section III.E, above); therefore, no modeling for toxics is required as a result of this permit action.

VII. Boilerplate Deviations

The Skeleton NSR (Dec. 2009), Generic NSR (Feb. 2012) and testing (Aug. 1999) boilerplates were used to draft the permit.

The stack testing condition from the testing boilerplate was amended to indicate that stack testing is required for each boiler; however the test on one boiler will satisfy the testing requirements for the other boiler provided they are identical units.

The fuel throughput condition from the Generic NSR boilerplate was revised to include an equation to calculate the throughput of natural gas based on the throughputs of distillate oil and LPG.

The Continuing Compliance Determination for subsequent VEEs was amended to include the requirement for additional VEEs in accordance with the timeline established in 40 CFR 60.47c (a).

There are no other deviations from the boilerplates.

The following changes have been made to the existing permit (permit condition numbers refer to the current permit action):

Condition Number	Change
All	<p>All references to the existing boilers (including the calculation methods for SO₂ emissions found in the permit attachment) have been removed from the permit.</p> <p>Upon startup of the two proposed boilers (Ref. Boilers 4 and 5), the three existing boilers (Ref. 2-205 (B#1, B#2 or B#3)) will be shutdown.</p>
All	<p>The requirements for the new boilers (Ref. Boilers 4 and 5) have been moved to the top of the permit. The requirements for the powerhouse (existing boilers, Ref. 2-205 (B#1, B#2 or B#3)) were moved to Conditions 27 – 35. Conditions 29 through 35, and Attachment B (the existing boiler SO₂ calculation methodology), are applicable until the three existing boilers are permanently shut down.</p> <p>Due to the extensive nature of changes to the permit conditions (reflecting a change in boilers), only custom conditions related to the proposed boilers will be discussed.</p>
Introduction	The permit application dates were added to the introduction.
Condition 28	An Emission Unit Shutdown condition was added to the permit to establish that the three existing boilers (Ref. 2-205 (B#1, B#2 or B#3)) will be shut down upon start up of the two proposed boilers (Ref. Boilers 4 and 5). The shakedown period is limited to 120 days following startup of the first boiler (Ref. Boiler 4 or Boiler 5).
Condition 21	The equipment list for the Spandex equipment was revised to match the Title V equipment list, which lists the equipment and references numbers.
Attachment A	A list of DEQ approved emission factors for calculating annual emissions was attached as Attachment A to the permit. The emission factors for NO _x and CO (for distillate oil and natural gas) are based on the emission guarantees provided in the application. All other emission factors are taken from the applicable chapters of AP-42.

VIII. Compliance Demonstration

In addition to the existing recordkeeping requirements for the spandex operations and existing boilers, the recordkeeping requirements for the proposed boilers (Ref. Boiler 4 and Boiler 5) to demonstrate compliance with the limitations in the permit are as follows:

- Annual throughput of natural gas, LPG, and distillate oil, calculated monthly as the sum of each consecutive 12-month period.
- All fuel supplier certifications.
- Emissions calculations sufficient to verify compliance with the annual emission limitations, calculated monthly as the sum of each consecutive 12-month period.
- Records of bypass, malfunction, shutdown or failure of the facility or its associated air pollution control equipment.
- Records of Maintenance/Operating Procedures and training.
- Scheduled and unscheduled maintenance and operator training.
- Results of all stack tests, visible emission evaluations and performance evaluations.

The facility is required to submit initial notifications regarding the construction, start-up, and stack testing dates of the proposed boilers.

To demonstrate continued compliance the facility shall conduct additional performance testing once during each five year period, or upon request by the DEQ. Additionally, the facility shall conduct visible emission evaluations upon request by the DEQ.

IX. Title V Review - 9 VAC 5 Chapter 80, Article 1

Currently, this source is a Title V major source for emissions of VOC, SO₂, NO_x, CO, PM-10, and HCl. After the shakedown period and shutdown of the existing boilers (Ref. 2-205(B#1), 2-205(B#2), and 2-205(B#3)) the facility will be a Title V major source for VOC emissions.

Detailed calculations are included as Attachment E. The facility will be classified as a Major Source (A) for VOC emissions.

Table 12: Potential to Emit for the Facility

	PM	PM-10	PM-2.5	VOC	SO ₂	NO _x	CO	Total HAPS
Spandex Production (tons/yr)	--	--	--	164.7	--	--	--	5.2
Powerhouse (tons/yr)	7.03	6.46	6.46	4.68	2.29	33.83	33.12	0.08
Combined / Facility Wide (tons/yr)	7.03	6.46	6.46	169.38	2.29	33.83	33.12	5.28

The facility is required to submit an application to incorporate the two proposed boilers (Ref. Boilers 4 and 5) within 12 months after the start of the equipment.

X. Site Suitability

- A. The character and degree of injury to, or interference with safety, health, or the reasonable use of property which is caused or threatened to be caused:

The activities regulated in this permit have been evaluated consistent with 9 VAC 5-50-260, 9 VAC 5-60-220, and 9 VAC 5-60-320 and have been determined to meet these standards where applicable.

The emissions regulated in this permit are defined as de minimis consistent with existing DEQ policy and have therefore not been modeled as part of this permit development.

- B. The social and economic value of the activity involved:

This application has been deemed a modification to an existing Minor NSR permit, and emissions increases associated with this project are below significance levels defined in 9 VAC 5-80 Article 8 and in 9 VAC 5-80 Article 9. This project is deemed to have a de minimis impact on the current emissions levels and does not affect the current social and economic value of the facility.

- C. The suitability of the activity to the area in which it is located:

Consistent with the Board's Suitability Policy dated 9/11/87, the activities regulated in this permit are deemed suitable as follows:

1. Air Quality characteristics and performance requirements defined by SAPCB regulations:

This permit is written consistent with existing applicable regulations. The source is a source of toxics emissions. However, the source is subject to a MACT standard, therefore toxic emissions have not been modeled. The emissions for criteria pollutants associated with this permit are below significance levels so no modeling was performed.

2. The health impact of air quality deterioration which might reasonably be expected to occur during the grace period allowed by the Regulations or the permit conditions to fix malfunctioning air pollution control equipment;

The permit requires the facility to notify the Regional Office within 4 business hours after discovery of any malfunction.

3. Anticipated impact of odor on surrounding communities or violation of the SAPCB Odor Rule;

No violation of Odor requirements is anticipated as a result of this permit action. The facility proposes to install thermal incinerators to control odor emissions from the facility; odor requirements have been added to the State-Only section of the permit to ensure control of potential odorous emissions.

- D. The scientific and economic practicality of reducing or eliminating the discharge resulting from the activity.

The state NSR program as well as the PSD and Non-Attainment programs require consideration of levels of control technology which are written into regulation to define the level of scientific and economic practicality for reducing or eliminating emissions. By properly implementing the Regulations through the issuance of this permit, the staff has addressed the scientific and economic practicality of reducing or eliminating emissions associated with this project.

XI. Other Considerations

The facility is located within 10 kilometers of the Shenandoah National Park (SNP), a Class I area; the application was sent to the Federal Land Manager (FLM) on August 3, 2012. The FLM responded on August 7, 2012, indicating that based on the information provided in the application, no further review of the project was required by the FLM.

There are no other significant considerations for this permit. Please review the engineering memos/checklists associated with the following NSR permit actions for the discussion on previous permitting actions:

CEDS Application Number	Permit Issuance Date
2	11/3/00
5	3/22/01
7	8/15/01
9	11/29/01
14	7/25/05
20	9/17/09
22	11/22/11

XII. Recommendations

Recommend issuance of proposed permit.

Attachments

Attachment A – Minor NSR Permitting Applicability Calculations
Attachment B – PSD Potential to Emit Calculations
Attachment C – PSD Netting Calculations
Attachment D – PSD Impact Analysis Calculations
Attachment E – Title V Emission Calculations

Attachment A

Minor NSR Permitting Applicability Calculations

Attachment A
 Net Emissions Increase Calculations for Minor NSR Permitting Applicability
 Criteria Pollutants

Source: INVISTA
 Registration Number: 80517

The NEI for criteria pollutants is evaluated as the sum of the new uncontrolled (NU) emissions for the projects minus the sum of current uncontrolled (CU) emissions for the project. Since the proposed boilers are new the CU emissions are equal to zero; therefore the NEI is equal to the NU emissions.

Natural Gas (New Uncontrolled (NU) Emissions)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	1020	BTU/ft ³ (taken from AP-42 Chapter 1.4 (7/98))
Fuel Consumption:	97.06	Mft ³ /hr (1 boiler)
	194.12	Mft ³ /hr (2 boiler combined)
	0.097	MMft ³ /hr (1 boiler)
	0.194	MMft ³ /hr (2 boilers combined)

Pollutant	Emission Factor (lb/MMft ³)	1 Boiler			2 Boilers		
		Fuel Consumption (MMft ³ /hr)	Emissions		Fuel Consumption (MMft ³ /hr)	Emissions	
			(lbs/hr)	(tons/yr)		(lbs/hr)	(tons/yr)
PM (filterable) ^a	1.9	0.097	0.18	0.81	0.194	0.37	1.62
PM (condensable) ^a	5.7	0.097	0.55	2.42	0.194	1.11	4.85
PM (total) ^a	--	0.097	0.74	3.23	0.194	1.48	6.46
PM-10 ^a	7.6	0.097	0.74	3.23	0.194	1.48	6.46
PM-2.5 ^a	7.6	0.097	0.74	3.23	0.194	1.48	6.46
SO ₂ ^a	0.6	0.097	0.06	0.26	0.194	0.12	0.51
CO ^b	38	0.097	3.69	16.15	0.194	7.38	32.31
NO _x ^b	37	0.097	3.59	15.73	0.194	7.18	31.46
VOC ^a	5.5	0.097	0.53	2.34	0.194	1.07	4.68

Notes:

a - Emission factor taken from AP-42, Chapter 1.4 (7/98).

b - Emission factor taken from facility application, based on vendor guarantee.

Attachment A
 Net Emissions Increase Calculations for Minor NSR Permitting Applicability
 Criteria Pollutants

Distillate Oil (New Uncontrolled (NU) Emissions)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	138000	BTU/gal
Fuel Consumption:	717.39	gal/hr (1 boiler)
	1434.78	gal/hr (2 boilers combined)
	0.717	1000 gal/hr (1 boiler)
	1.435	1000 gal/hr (2 boilers combined)
Sulfur Content:	0.500	% Sulfur (conservative estimate)

Distillate Oil (Uncontrolled)

Pollutant	Emission Factor	1 Boiler			2 Boilers		
		Fuel Consumption	Emissions		Fuel Consumption	Emissions	
		(lb/1000 gal)	(1000 gal/hr)	(lbs/hr)	(tons/yr)	(1000 gal/hr)	(lbs/hr)
PM (filterable) ^c	2	0.717	1.43	6.28	1.435	2.87	12.57
PM (condensable) ^c	1.3	0.717	0.93	4.08	1.435	1.87	8.17
PM (total) ^c	--	0.717	2.37	10.37	1.435	4.73	20.74
PM-10 ^c	1	0.717	0.72	3.14	1.435	1.43	6.28
PM-2.5 ^c	0.25	0.717	0.18	0.79	1.435	0.36	1.57
SO ₂ ^c	142*S	0.717	50.93	223.09	1.435	101.87	446.19
CO ^d	8.1	0.717	5.81	25.45	1.435	11.62	50.90
NO _x ^d	13.8	0.717	9.90	43.36	1.435	19.80	86.72
VOC ^c	0.2	0.717	0.14	0.63	1.435	0.29	1.26

Notes:

c - Emission factor taken from AP-42, Chapter 1.3 (5/10).

d - Emission factor taken from facility application, based on vendor guarantee.

Attachment A
 Net Emissions Increase Calculations for Minor NSR Permitting Applicability
 Criteria Pollutants

Liquified Petroleum Gas (LPG) - (New Uncontrolled (NU) Emissions)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	91500	BTU/gal
Fuel Consumption:	1081.97	gal/hr (1 boiler)
	2163.93	gal/hr (2 boilers combined)
	1.082	1000 gal/hr (1 boiler)
	2.164	1000 gal/hr (2 boilers combined)
Sulfur Content:	185.000	mg sulfur / kg fuel (from ASTM D1835)

LPG (Uncontrolled)

Pollutant	Emission Factor	1 Boiler			2 Boilers		
		Fuel Consumption	Emissions		Fuel Consumption	Emissions	
		(lb/1000 gal)	(1000 gal/hr)	(lbs/hr)	(tons/yr)	(1000 gal/hr)	(lbs/hr)
PM (filterable) ^e	0.2	1.082	0.22	0.95	2.164	0.43	1.90
PM (condensable) ^e	0.5	1.082	0.54	2.37	2.164	1.08	4.74
PM (total)	--	1.082	0.76	3.32	2.164	1.51	6.63
PM-10 ^e	0.7	1.082	0.76	3.32	2.164	1.51	6.63
PM-2.5 ^e	0.7	1.082	0.76	3.32	2.164	1.51	6.63
SO ₂ ^f	0.784	1.082	0.85	3.72	2.164	1.70	7.43
CO ^e	7.5	1.082	8.11	35.54	2.164	16.23	71.09
NO _x ^e	13	1.082	14.07	61.61	2.164	28.13	123.21
VOC ^e	0.8	1.082	0.87	3.79	2.164	1.73	7.58

Notes:

e - Emission factor taken from AP-42, Chapter 1.5 (5/10).

f - Sulfur dioxide emissions are calculated using the information provided below.

Attachment A
 Net Emissions Increase Calculations for Minor NSR Permitting Applicability
 Criteria Pollutants

Sulfur Dioxide Emission Factor Calculation for LPG

Denisty of LPG	4.24	lb/gal (from AP-42, Appendix A)
	4240	lb/1000 gal (converted)
Sulfur Content	185	mg sulfur / kg fuel (from ASTM D1835)
	0.000185	lb sulfur / lb fuel (converted ASTM D1835)

Emission Factor Calculation:

Sulfur Content (lb Sulfur /lb fuel converted) * (Density lb/1000 gal) = (lb Sulfur / 1000 gal)

Emission Factor:	0.784 lb/1000 gal
-------------------------	--------------------------

Net Emission Increase (NEI) Calculation (NEI = NU)

Pollutant	NEI = NU					Exemption Levels ^f	Exempt?
	Natural Gas (NG)	Distillate Oil (DO)	LPG	Max. Emissions	Worst-case Fuel		
	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)		(tons/yr)	
PM (filterable)	1.62	12.57	1.90	12.57	--	--	--
PM (condensable)	4.85	8.17	4.74	8.17	--	--	--
PM (total)	6.46	20.74	6.63	20.74	DO	15	No
PM-10	6.46	6.28	6.63	6.63	LPG	10	Yes
PM-2.5	6.46	1.57	6.63	6.63	LPG	10	Yes
SO2	0.51	446.19	7.43	446.19	DO	10	No
CO	32.31	50.90	71.09	71.09	LPG	100	Yes
NOx	31.46	86.72	123.21	123.21	LPG	10	No
VOC	4.68	1.26	7.58	7.58	LPG	10	Yes

Notes:

f - Exemption levels taken from 9 VAC 5-80-1320 D.1 for existing or modified sources.

Attachment B

PSD Potential to Emit Calculations

Attachment B.1

**Controlled Emissions / Potential to Emit Calculations for
Prevention of Significant Deterioration (PSD) Applicability
Criteria Pollutants**

Attachment B.1
 Controlled Emissions / Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
 Criteria Pollutants

Source: INVISTA
 Registration Number: 80517

The facility proposes to use distillate oil as a back-up fuel, equivalent to approximately 8% of the time, for instances of natural gas curtailment. The facility also proposes to use LPG as a back-up fuel for approximately 48 hours per year, in the event of natural gas curtailment. To determine the worst-case Potential to Emit (PTE) for PSD applicability all four fuel burning scenarios (100% natural gas; natural gas with distillate oil; natural gas with LPG; AND natural gas with distillate oil and LPG;) were evaluated. Worst-case emissions are compared to the PSD significance levels defined in 9 VAC 5-80-1615 to determine if the project triggers PSD or requires a PSD netting analysis.

Fuel Burning Scenarios:

- Scenario #1 - Natural Gas
- Scenario #2 - Natural Gas and Distillate Oil
- Scenario #3 - Natural Gas and LPG
- Scenario #4 - Natural Gas, Distillate Oil AND LPG

Scenario #1 - Natural Gas

Natural Gas (100% Natural Gas) - Potential to Emit

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	1020	BTU/ft ³ (taken from AP-42 Chapter 1.4 (7/98))
Fuel Consumption:	97.06	Mft ³ /hr (1 boiler)
	194.12	Mft ³ /hr (2 boiler combined)
	0.097	MMft ³ /hr (1 boiler)
	0.194	MMft ³ /hr (2 boilers combined)
	1,700,470.59	Mft ³ /yr (2 boiler combined)
	1,700.47	MMft ³ /yr (2 boilers combined)

Pollutant	Emission Factor	2 Boilers	
		Fuel Consumption	Emissions
	(lb/MMft ³)	(MMft ³ /hr)	(tons/yr)
PM (filterable) ^a	1.9	0.194	1.62
PM (condensable) ^a	5.7	0.194	4.85
PM (total) ^a	—	0.194	6.46
PM-10 ^a	7.6	0.194	6.46
PM-2.5 ^a	7.6	0.194	6.46
SO ₂ ^a	0.6	0.194	0.51
CO ^b	38	0.194	32.31
NO _x ^b	37	0.194	31.46
VOC ^a	5.5	0.194	4.68

Notes:

a - Emission factor taken from AP-42, Chapter 1.4 (7/98).

b - Emission factor taken from facility application, based on vendor guarantee.

Attachment B.1
 Controlled Emissions / Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
 Criteria Pollutants

Scenario #2 - Natural Gas and Distillate Oil

Distillate Oil (502,748 gal/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	138000	BTU/gal
Fuel Consumption:	717.39	gal/hr (1 boiler)
	1434.78	gal/hr (2 boilers combined)
	0.717	1000 gal/hr (1 boiler)
	1.435	1000 gal/hr (2 boilers combined)
Fuel Throughput:	502748.0	gal/yr (2 boilers combined) - Requested Throughput
	502.748	1000 gal/yr (2 boilers combined) - Requested Throughput
Sulfur Content:	0.05	% Sulfur (from application) - Requested % Sulfur

Pollutant	Emission Factor (lb/1000 gal)	2 Boilers	
		Fuel Consumption	Emissions
		(1000 gal/yr)	(tons/yr)
PM (filterable) ^c	2	502.75	0.50
PM (condensable) ^c	1.3	502.75	0.33
PM (total) ^c	-	502.75	0.83
PM-10 ^c	1	502.75	0.25
PM-2.5 ^c	0.25	502.75	0.06
SO ₂ ^c	142*5	502.75	1.78
CO ^d	8.1	502.75	2.04
NO _x ^d	13.8	502.75	3.47
VOC ^c	0.2	502.75	0.05

Notes:

c - Emission factor taken from AP-42, Chapter 1.3 (5/10).

d - Emission factor taken from facility application, based on vendor guarantee.

Attachment B.1

Controlled Emissions / Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
Criteria Pollutants

Natural Gas (1,632,452 Mft³/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	1020	BTU/ft ³ (taken from AP-42 Chapter 1.4 (7/98))
Fuel Consumption:	97.06	Mft ³ /hr (1 boiler)
	194.12	Mft ³ /hr (2 boiler combined)
	0.097	MMft ³ /hr (1 boiler)
	0.194	MMft ³ /hr (2 boilers combined)
Fuel Throughput:	1,632,452	Mft ³ /yr (2 boiler combined)
	1632.452	MMft ³ /yr (2 boiler combined)

Pollutant	Emission Factor	2 Boilers	
		Fuel Consumption	Emissions
	(lb/MMft ³)	(MMft ³ /yr)	(tons/yr)
PM (filterable) ^e	1.9	1632.45	1.55
PM (condensable) ^f	5.7	1632.45	4.65
PM (total) ^e	--	1632.45	6.20
PM-10 ^e	7.6	1632.45	6.20
PM-2.5 ^e	7.6	1632.45	6.20
SO ₂ ^e	0.6	1632.45	0.49
CO ^f	38	1632.45	31.02
NO _x ^f	37	1632.45	30.20
VOC ^e	5.5	1632.45	4.49

Notes:

e - Emission factor taken from AP-42, Chapter 1.4 (7/98).

f - Emission factor taken from facility application, based on vendor guarantee.

Attachment B.1
Controlled Emissions / Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
Criteria Pollutants

Combined Natural Gas and Distillate Oil - Potential to Emit (PTE)

Pollutant	Distillate Oil (8%)	Natural Gas (92%)	Scenario #2
	(tons/yr)	(tons/yr)	Combined Fuels (tons/yr)
PM (filterable)	0.50	1.55	2.05
PM (condensable)	0.33	4.65	4.98
PM (total)	0.83	6.20	7.03
PM-10	0.25	6.20	6.45
PM-2.5	0.06	6.20	6.27
SO2	1.78	0.49	2.27
CO	2.04	31.02	33.05
NOx	3.47	30.20	33.67
VOC	0.05	4.49	4.54

Scenario #3 - Natural Gas and LPG

Natural Gas (1,697,456 Mft³/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	1020	BTU/ft ³ (taken from AP-42 Chapter 1.4 (7/98))
Fuel Consumption:	97.06	Mft ³ /hr (1 boiler)
	194.12	Mft ³ /hr (2 boiler combined)
	0.097	MMft ³ /hr (1 boiler)
	0.194	MMft ³ /hr (2 boilers combined)
Fuel Throughput:	1,697,456	Mft ³ /yr (2 boiler combined)
	1697.456	MMft ³ /yr (2 boiler combined)

Pollutant	Emission Factor (lb/MMft ³)	2 Boilers - NG	
		Fuel Consumption (MMft ³ /yr)	Emissions (tons/yr)
PM (filterable) ^g	1.9	1697.46	1.61
PM (condensable) ^g	5.7	1697.46	4.84
PM (total) ^g	--	1697.46	6.45
PM-10 ^g	7.6	1697.46	6.45
PM-2.5 ^g	7.6	1697.46	6.45
SO2 ^g	0.6	1697.46	0.51
CO ^h	38	1697.46	32.25
NOx ^h	37	1697.46	31.40
VOC ^g	5.5	1697.46	4.67

Notes:

g - Emission factor taken from AP-42, Chapter 1.4 (7/98).

h - Emission factor taken from facility application, based on vendor guarantee.

Controlled Emissions / Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
Criteria Pollutants

LPG (33,600 gal/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	91500	BTU/gal
Fuel Consumption:	1081.97	gal/hr (1 boiler)
	2163.93	gal/hr (2 boilers combined)
	1.082	1000 gal/hr (1 boiler)
	2.164	1000 gal/hr (2 boilers combined)
Fuel Throughput:	33,600.0	gal/yr (2 boilers combined)
	33.600	1000 gal/yr (2 boilers combined)
Sulfur Content:	185.000	mg sulfur / kg fuel (from ASTM D1835)

Pollutant	Emission Factor	2 Boilers - LPG	
		Fuel Consumption	Emissions
	(lb/1000 gal)	(1000 gal/yr)	(tons/yr)
PM (filterable) ⁱ	0.2	33.60	3.36E-03
PM (condensable) ⁱ	0.5	33.60	8.40E-03
PM (total)	—	33.60	1.18E-02
PM-10 ⁱ	0.7	33.60	1.18E-02
PM-2.5 ⁱ	0.7	33.60	1.18E-02
SO ₂ ⁱ	0.784	33.60	1.32E-02
CO ⁱ	7.5	33.60	1.26E-01
NO _x ⁱ	13	33.60	2.18E-01
VOC ⁱ	0.8	33.60	1.34E-02

i - Emission factor taken from AP-42, Chapter 1.5 (5/10).

j - See emission factor calculations in Attachment A.

Combined Natural Gas and LPG - Potential to Emit (PTE)

Pollutant	LPG	Natural Gas	Scenario #3
	(tons/yr)	(tons/yr)	Combined Fuels (tons/yr)
PM (filterable)	3.36E-03	1.61	1.62
PM (condensable)	8.40E-03	4.84	4.85
PM (total)	1.18E-02	6.45	6.46
PM-10	1.18E-02	6.45	6.46
PM-2.5	1.18E-02	6.45	6.46
SO ₂	1.32E-02	0.51	0.52
CO	1.26E-01	32.25	32.38
NO _x	2.18E-01	31.40	31.62
VOC	1.34E-02	4.67	4.68

Attachment B.1
Controlled Emissions / Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
Criteria Pollutants

Scenario #4 - Natural Gas, Distillate Oil, and LPG

Distillate Oil (502,748 gal/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	138000	BTU/gal
Fuel Consumption:	717.39	gal/hr (1 boiler)
	1434.78	gal/hr (2 boilers combined)
	0.717	1000 gal/hr (1 boiler)
	1.435	1000 gal/hr (2 boilers combined)
Fuel Throughput:	502748.0	gal/yr (2 boilers combined)
	502.748	1000 gal/yr (2 boilers combined)
Sulfur Content:	0.05	% Sulfur (from application)

Pollutant	Emission Factor (lb/1000 gal)	2 Boilers	
		Fuel Consumption	Emissions
		(1000 gal/yr)	(tons/yr)
PM (filterable)	2	502.75	0.50
PM (condensable)	1.3	502.75	0.33
PM (total)	—	502.75	0.83
PM-10	1	502.75	0.25
PM-2.5	0.25	502.75	0.06
SO2	142*5	502.75	1.78
CO	8.1	502.75	2.04
NOx	13.8	502.75	3.47
VOC	0.2	502.75	0.05

LPG (33,600 gal/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	91500	BTU/gal
Fuel Consumption:	1081.97	gal/hr (1 boiler)
	2163.93	gal/hr (2 boilers combined)
	1.082	1000 gal/hr (1 boiler)
	2.164	1000 gal/hr (2 boilers combined)
Fuel Throughput:	33600.0	gal/yr (2 boilers combined)
	33.600	1000 gal/yr (2 boilers combined)
Sulfur Content:	185.000	mg sulfur / kg fuel (from ASTM D1835)

Pollutant	Emission Factor (lb/1000 gal)	2 Boilers - LPG	
		Fuel Consumption	Emissions
		(1000 gal/yr)	(tons/yr)
PM (filterable)	0.2	33.60	3.36E-03
PM (condensable)	0.5	33.60	8.40E-03
PM (total)	—	33.60	1.18E-02
PM-10	0.7	33.60	1.18E-02
PM-2.5	0.7	33.60	1.18E-02
SO2	0.784	33.60	1.32E-02
CO	7.5	33.60	1.26E-01
NOx	13	33.60	2.18E-01
VOC	0.8	33.60	1.34E-02

Attachment B.1

Controlled Emissions / Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
Criteria PollutantsNatural Gas (1,629,438 Mft³/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	1020	BTU/ft ³ (taken from AP-42 Chapter 1.4 (7/98))
Fuel Consumption:	97.06	Mft ³ /hr (1 boiler)
	194.12	Mft ³ /hr (2 boiler combined)
	0.097	MMft ³ /hr (1 boiler)
	0.194	MMft ³ /hr (2 boilers combined)
Fuel Throughput:	1,629,438	Mft ³ /yr (2 boiler combined)
	1629.438	MMft ³ /yr (2 boiler combined)

Pollutant	Emission Factor	2 Boilers - NG	
		Fuel Consumption	Emissions
	(lb/MMft ³)	(MMft ³ /yr)	(tons/yr)
PM (filterable)	1.9	1629.44	1.55
PM (condensable)	5.7	1629.44	4.64
PM (total)	--	1629.44	6.19
PM-10	7.6	1629.44	6.19
PM-2.5	7.6	1629.44	6.19
SO ₂	0.6	1629.44	0.49
CO	38	1629.44	30.96
NO _x	37	1629.44	30.14
VOC	5.5	1629.44	4.48

Combined Natural Gas, Distillate Oil, and LPG - Potential to Emit (PTE)

Pollutant	LPG	Natural Gas	Distillate Oil	Scenario #4
	(tons/yr)	(tons/yr)	(tons/yr)	Combined Fuels (tons/yr)
PM (filterable)	3.36E-03	1.55	0.50	2.05
PM (condensable)	8.40E-03	4.64	0.33	4.98
PM (total)	1.18E-02	6.19	0.83	7.03
PM-10	1.18E-02	6.19	0.25	6.45
PM-2.5	1.18E-02	6.19	0.06	6.27
SO ₂	1.32E-02	0.49	1.78	2.29
CO	1.26E-01	30.96	2.04	33.12
NO _x	2.18E-01	30.14	3.47	33.83
VOC	1.34E-02	4.48	0.05	4.54

Attachment B.1
 Controlled Emissions / Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
 Criteria Pollutants

Worst-case Scenario Potential to Emit (PTE) for PSD Applicability

Pollutant	Scenario #1	Scenario #2	Scenario #3	Scenario #4
	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)
PM (filterable)	1.62	2.05	1.62	2.05
PM (condensable)	4.85	4.98	4.85	4.98
PM (total)	6.46	7.03	6.46	7.03
PM-10	6.46	6.45	6.46	6.45
PM-2.5	6.46	6.27	6.46	6.27
SO2	0.51	2.27	0.52	2.29
CO	32.31	33.05	32.38	33.12
NOx	31.46	33.67	31.62	33.83
VOC	4.68	4.54	4.68	4.54

Pollutant	Worst Case		PSD Significance Thresholds ^k (tons/yr)	Triggers PSD/ Requires Netting?
	(tons/yr)	Scenario		
PM (filterable)	2.05	Scenario #4	--	--
PM (condensable)	4.98	Scenario #4	--	--
PM (total)	7.03	Scenario #4	25	No
PM-10	6.46	Scenario #3	15	No
PM-2.5	6.46	Scenario #3	10	No
SO2	2.29	Scenario #4	40	No
CO	33.12	Scenario #4	100	No
NOx	33.83	Scenario #4	40	No
VOC	4.68	Scenario #3	40	No

Notes:

k - PSD significance thresholds taken from 9 VAC 5-80-1615.

Attachment B.2

Existing Potential to Emit for Greenhouse Gases

Attachment B.2
Existing Potential to Emit for Greenhouse Gases

Is the Modification subject to PSD permitting for a regulated NSR pollutant other than GHGs? - **No**

Determine if the source is currently PSD for GHG:

Determine the potential to emit (PTE) for the existing stationary source, before the modification, for each of the 6 GHG pollutants (CO₂, CH₄, N₂O, HFCs, PFCs and SF₆):

Coal

Heating value of Coal =	12,998.00	Btu/lb
	26.00	MMBtu/ton
Boiler Capacity (Total) =	614.00	MMBtu/hr
Maximum operation =	8,760.00	hrs/yr
Total coal needed to produce steam (annually) =	206,902.60	tons coal /yr

Natural Gas (NG)

Heating value of NG =	1,020.00	Btu/scf
	1.02	MMBtu/mcf
Boiler Capacity (Total) =	614.00	MMBtu/hr
Maximum operation =	8,760.00	hrs/yr
Total NG needed to produce steam (annually) =	5,273,176.47	mcf NG /yr

Number 2 Fuel Oil / Distillate Oil (DO)

Heating value of DO =	138,000.00	Btu/gal
	138.00	MMBtu/1,000 gal
Boiler Capacity (Total) =	614.00	MMBtu/hr
Maximum operation =	8760	hrs/yr
Total RO needed to produce steam (annually) =	38,975.65	1,000 gal DO /yr

Number 6 Fuel Oil / Residual Oil (RO)

Heating value of RO =	150,000.00	Btu/gal
	150.00	MMBtu/1,000 gal
Boiler Capacity (Total) =	614.00	MMBtu/hr
Maximum operation =	8760	hrs/yr
Total RO needed to produce steam (annually) =	35,857.60	1,000 gal DO /yr

Greenhouse Gas Emissions - Maximum Potential to Emit (PTE) with Existing Boilers

Pollutant	GW Potential	Coal Emissions		
		Emission Factor	Mass Basis	CO ₂ e Basis
		(lb/ton)	(tons/yr)	(tons/yr)
Carbon Dioxide (CO ₂)	1	5510	570,016.7	570,016.7
Methane (CH ₄)	21	4.00E-02	4.1	86.9
Nitrous Oxide (N ₂ O)	310	0.03	3.1	962.1
Total	--	--	570,023.9	571,065.7

Attachment B.2
Existing Potential to Emit for Greenhouse Gases

Pollutant	GW Potential	Natural Gas Emissions		
		Emission Factor	Mass Basis	CO2e Basis
		(lb/mcf)	(tons/yr)	(tons/yr)
Carbon Dioxide (CO2)	1	120	316,390.6	316,390.6
Methane (CH4)	21	0.0023	6.1	127.3
Nitrous Oxide (N2O)	310	0.00064	1.7	523.1
Total	--	--	316,398.3	317,041.0

Pollutant	GW Potential	Distillate Oil Emissions		
		Emission Factor	Mass Basis	CO2e Basis
		(lb/1000 gal)	(tons/yr)	(tons/yr)
Carbon Dioxide (CO2)	1	22300	434,578.5	434,578.5
Methane (CH4)	21	0.052	1.0	21.3
Nitrous Oxide (N2O)	310	0.26	5.1	1,570.7
Total	--	--	434,584.6	436,170.5

Pollutant	GW Potential	Residual Oil Emissions		
		Emission Factor	Mass Basis	CO2e Basis
		(lb/1000 gal)	(tons/yr)	(tons/yr)
Carbon Dioxide (CO2)	1	25000	448,220.0	448,220.0
Methane (CH4)	21	1	17.9	376.5
Nitrous Oxide (N2O)	310	0.53	9.5	2,945.7
Total	--	--	448,247.4	451,542.2

Emissions Summary

Pollutant	Coal		Natural Gas	
	Mass Basis	CO2e Basis	Mass Basis	CO2e Basis
	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)
Carbon Dioxide (CO2)	570,016.7	570,016.7	316,390.6	316,390.6
Methane (CH4)	4.1	86.9	6.1	127.3
Nitrous Oxide (N2O)	3.1	962.1	1.7	523.1
Total	570,023.9	571,065.7	316,398.3	317,041.0

Pollutant	Distillate Oil		Residual Oil	
	Mass Basis	CO2e Basis	Mass Basis	CO2e Basis
	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)
Carbon Dioxide (CO2)	434,578.5	434,578.5	448,220.0	448,220.0
Methane (CH4)	1.0	21.3	17.9	376.5
Nitrous Oxide (N2O)	5.1	1,570.7	9.5	2,945.7
Total	434,584.6	436,170.5	448,247.4	451,542.2

Attachment B.2
Existing Potential to Emit for Greenhouse Gases

Pollutant	Maximum Emissions		Worst-Case Fuel
	Mass Basis	CO ₂ e Basis	
	(tons/yr)	(tons/yr)	
Carbon Dioxide (CO ₂)	570,016.7	570,016.7	Coal
Methane (CH ₄)	17.9	376.5	Residual Oil
Nitrous Oxide (N ₂ O)	9.5	2,945.7	Residual Oil
Total	570,023.9	571,065.7	-

Are the potential GHG emissions equal or greater than **both** 100,000 TPY CO₂e and 250 TPY on a mass basis?

Pollutant	Existing PTE	Threshold	Greater than Threshold?
	(tons/yr)	(tons/yr)	
GHG - Mass Basis	570,023.9	250	Yes
GHG - CO ₂ e Basis	571,065.7	100,000	Yes

The source is currently a PSD Source for Greenhouse Gases.

Attachment B.3

**Potential to Emit Calculations for Prevention of
Significant Deterioration (PSD) Applicability
Greenhouse Gas Emissions**

Attachment B.3
 Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
 Greenhouse Gas Emissions

Source: INVISTA
 Registration Number: 80517

Determine the Past Actual (baseline) in tons/yr for the units that are part of the modification; for new units, the past actual emissions are zero. For units that are part of the modification, determine the PTE in tons/yr for each of the 6 GHG pollutants.

The facility proposes to use distillate oil and/or liquified petroleum gas (LPG) as back-up fuels, for instances of natural gas curtailment. To determine the worst-case Potential to Emit (PTE) for PSD applicability all four fuel burning scenarios (100% natural gas; natural gas with distillate oil; natural gas with LPG; AND natural gas with distillate oil and LPG;) were evaluated. Worst-case emissions are compared to the PSD significance levels on a mass basis AND a carbon dioxide equivalent (CO₂e) basis, in accordance with Appendix D of the EPA's *PSD and Title V Permitting Guidance for Greenhouse Gases* (3/2011).

Fuel Burning Scenarios:

- Scenario #1 - Natural Gas
- Scenario #2 - Natural Gas and Distillate Oil
- Scenario #3 - Natural Gas and LPG
- Scenario #4 - Natural Gas, Distillate Oil AND LPG

**Scenario #1 - Natural Gas - Potential to Emit
 Greenhouse Gas Emissions - Mass Basis**

Heat Input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	1,020	BTU/ft ³ (taken from AP-42 Chapter 1.4 (7/98))
Fuel Consumption:	97.06	Mft ³ /hr (1 boiler)
	194.12	Mft ³ /hr (2 boiler combined)
	0.097	MMft ³ /hr (1 boiler)
	0.194	MMft ³ /hr (2 boilers combined)

Attachment B.3
 Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
 Greenhouse Gas Emissions

Scenario #1 - Potential to Emit Summary

Pollutant	Emission Factor	2 Boilers	
		Fuel Consumption	Emissions
	(lb/MMft ³)	(MMft ³ /hr)	(tons/yr)
CO ₂ ^a	120,000.00	0.19	102,028.24
N ₂ O ^{a,b}	0.64	0.19	0.54
Methane ^a	2.30	0.19	1.96

Notes:

a - Emission factor taken from AP-42, Chapter 1.4 (7/98).

b - Emission factor assumes use of a low-NO_x burner.

**Scenario #2 - Distillate Oil and Natural Gas - Potential to Emit
 Greenhouse Gas Emissions - Mass Basis**

Distillate Oil (502,748 gal/yr)

Heat Input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	138,000	BTU/gal
	717.39	gal/hr (1 boiler)
Fuel Consumption:	1,434.78	gal/hr (2 boilers combined)
	0.717	1000 gal/hr (1 boiler)
	1.435	1000 gal/hr (2 boilers combined)
Fuel Throughput:	502,748.00	gal/yr (2 boilers combined)
	502.748	1000 gal/yr (2 boilers combined)
Sulfur Content:	0.05	% Sulfur (from application)

Pollutant	Emission Factor	2 Boilers	
		Fuel Consumption	Emissions
	(lb/1000 gal)	(1000 gal/yr)	(tons/yr)
CO ₂ ^c	22,300.00	502.75	5,605.64
N ₂ O ^c	0.26	502.75	0.07
Methane ^c	0.052	502.75	0.01

Notes:

c - Emission factor taken from AP-42, Chapter 1.3 (5/10).

Attachment B.3
 Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
 Greenhouse Gas Emissions

Natural Gas (1,632,452 Mft³/yr)
 Greenhouse Gas Emissions - Mass Basis

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	1,020.00	BTU/ft ³ (taken from AP-42 Chapter 1.4 (7/98))
Fuel Consumption:	97.06	Mft ³ /hr (1 boiler)
	194.12	Mft ³ /hr (2 boiler combined)
	0.097	MMft ³ /hr (1 boiler)
	0.194	MMft ³ /hr (2 boilers combined)
Fuel Throughput:	1,632,452	Mft ³ /yr (2 boiler combined)
	1,632.45	MMft ³ /yr (2 boiler combined)

Pollutant	Emission Factor (lb/MMft ³)	2 Boilers	
		Fuel Consumption (MMft ³ /yr)	Emissions (tons/yr)
CO ₂	120,000.00	1,632.45	97,947.10
N ₂ O	0.64	1,632.45	0.52
Methane	2.30	1,632.45	1.88

Scenario #2 - Potential to Emit Summary
 Greenhouse Gas Emissions - Mass Basis

Pollutant	Distillate Oil	Natural Gas	Combined Fuels
	(tons/yr)	(tons/yr)	(tons/yr)
CO ₂	5,605.64	97,947.10	103,552.74
N ₂ O	0.07	0.52	0.59
Methane	0.01	1.88	1.89

Attachment B.3
 Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
 Greenhouse Gas Emissions

Scenario #3 - LPG and Natural Gas
 Greenhouse Gas Emissions - Mass Basis

Natural Gas (1,697,456 Mft³/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	1020	BTU/ft ³ (taken from AP-42 Chapter 1.4 (7/98))
Fuel Consumption:	97.06	Mft ³ /hr (1 boiler)
	194.12	Mft ³ /hr (2 boiler combined)
	0.097	MMft ³ /hr (1 boiler)
	0.194	MMft ³ /hr (2 boilers combined)
Fuel Throughput:	1,697,456	Mft ³ /yr (2 boiler combined)
	1697.456	MMft ³ /yr (2 boiler combined)

Pollutant	Emission Factor (lb/MMft ³)	2 Boilers	
		Fuel Consumption	Emissions
		(MMft ³ /yr)	(tons/yr)
CO ₂	120,000.00	1,697.46	101,847.39
N ₂ O	0.64	1,697.46	0.54
Methane	2.30	1,697.46	1.95

LPG (33,600 gal/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	91500	BTU/gal
Fuel Consumption:	1081.97	gal/hr (1 boiler)
	2163.93	gal/hr (2 boilers combined)
	1.082	1000 gal/hr (1 boiler)
	2.164	1000 gal/hr (2 boilers combined)
Fuel Throughput:	33,600.0	gal/yr (2 boilers combined)
	33.600	1000 gal/yr (2 boilers combined)

Attachment B.3
 Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
 Greenhouse Gas Emissions

Pollutant *	Emission Factor (lb/1000 gal)	2 Boilers - LPG	
		Fuel Consumption (1000 gal/yr)	Emissions (tons/yr)
CO ₂	12,500.00	33.60	210.00
N ₂ O	0.9	33.60	0.02
Methane	0.2	33.60	0.00

e - Emission factor taken from AP-42, Chapter 1.5 (7/08).

Combined Natural Gas and LPG - Potential to Emit (PTE)

Pollutant	LPG	Natural Gas	Scenario #3 Combined Fuels
	(tons/yr)	(tons/yr)	(tons/yr)
CO ₂	210.00	101,847.39	102,057.39
N ₂ O	0.02	0.54	0.56
Methane	0.00	1.95	1.96

Scenario #4 - Natural Gas, Distillate Oil, and LPG

Distillate Oil (502,748 gal/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	138,000	BTU/gal
Fuel Consumption:	717.39	gal/hr (1 boiler)
	1,434.78	gal/hr (2 boilers combined)
	0.717	1000 gal/hr (1 boiler)
	1.435	1000 gal/hr (2 boilers combined)
Fuel Throughput:	502,748.00	gal/yr (2 boilers combined)
	502.748	1000 gal/yr (2 boilers combined)
Sulfur Content:	0.05	% Sulfur (from application)

Pollutant	Emission Factor (lb/1000 gal)	2 Boilers	
		Fuel Consumption (1000 gal/yr)	Emissions (tons/yr)
CO ₂	22,300.00	502.75	5,605.64
N ₂ O	0.26	502.75	0.07
Methane	0.052	502.75	0.01

Attachment B.3
 Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
 Greenhouse Gas Emissions

LPG (33,600 gal/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	91500	BTU/gal
Fuel Consumption:	1081.97	gal/hr (1 boiler)
	2163.93	gal/hr (2 boilers combined)
	1.082	1000 gal/hr (1 boiler)
	2.164	1000 gal/hr (2 boilers combined)
Fuel Throughput:	33,600.0	gal/yr (2 boilers combined)
	33.600	1000 gal/yr (2 boilers combined)

Pollutant *	Emission Factor (lb/1000 gal)	2 Boilers - LPG	
		Fuel Consumption	Emissions
		(1000 gal/yr)	(tons/yr)
CO ₂	12,500.00	33.60	210.00
N ₂ O	0.9	33.60	0.02
Methane	0.2	33.60	0.00

Natural Gas (1,629,438 Mft³/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	1020	BTU/ft ³ (taken from AP-42 Chapter 1.4 (7/98))
Fuel Consumption:	97.06	Mft ³ /hr (1 boiler)
	194.12	Mft ³ /hr (2 boiler combined)
	0.097	MMft ³ /hr (1 boiler)
	0.194	MMft ³ /hr (2 boilers combined)
Fuel Throughput:	1,629,438	Mft ³ /yr (2 boiler combined)
	1629.438	MMft ³ /yr (2 boiler combined)

Pollutant	Emission Factor (lb/MMft ³)	2 Boilers	
		Fuel Consumption	Emissions
		(MMft ³ /yr)	(tons/yr)
CO ₂	120,000.00	1,629.44	97,766.26
N ₂ O	0.64	1,629.44	0.52
Methane	2.30	1,629.44	1.87

Attachment B.3

Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
Greenhouse Gas Emissions

Combined Natural Gas, Distillate Oil, and LPG - Potential to Emit (PTE)

Pollutant	LPG	Natural Gas	Distillate Oil	Scenario #4
	(tons/yr)	(tons/yr)	(tons/yr)	Combined Fuels (tons/yr)
CO ₂	210.00	97,766.26	5,605.64	103,581.90
N ₂ O	0.02	0.52	0.07	0.60
Methane	0.00	1.87	0.01	1.89

Evaluation of Worst-Case Scenario

Worst-case Potential to Emit (PTE) for PSD Applicability - Mass Basis

Pollutant	Scenario #1	Scenario #2	Scenario #3	Scenario #4
	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)
CO ₂	102,028.24	103,552.74	102,057.39	103,581.90
N ₂ O	0.54	0.59	0.56	0.60
Methane	1.96	1.89	1.96	1.89
Sum / Total	--	--	--	--

Pollutant	Worst-Case	Scenario	Greater than zero?
	(tons/yr)		
CO ₂	103,581.90	--	Greater than zero?
N ₂ O	0.60	--	
Methane	1.89	--	
Sum / Total	103,584.39	Scenario #4	Yes

Is the sum of the GHG mass emissions increase over zero tons/yr? - Yes

Sum the GHG emissions on a CO₂e Basis for all units that have an emissions increase.

Attachment B:3
 Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
 Greenhouse Gas Emissions

CO₂e Basis Calculations

Scenario #1 - Natural Gas - Potential to Emit

Greenhouse Gas:Emissions (GHG) - CO₂e Emissions

Heat input:	99.00	MMBtu/hr (1 boiler)
	198.00	MMBtu/hr (2 boilers combined)
Heat Content:	1,020.00	BTU/ft ³ (taken from AP-42 Chapter 1.4 (7/98))
Fuel Consumption:	97.06	Mft ³ /hr (1 boiler)
	194.12	Mft ³ /hr (2 boiler combined)
	0.097	MMft ³ /hr (1 boiler)
	0.194	MMft ³ /hr (2 boilers combined)

Pollutant	Emission Factor (lb/MMft ³)	2 Boilers		Global Warming Potential (GWP) Factor	Scenario #1
		Fuel Consumption	Mass Basis Emissions		CO ₂ Equivalent (CO ₂ e) Emissions
		(MMft ³ /hr)	(tons/yr)		(tons/yr)
CO ₂ ^a	120,000.00	0.194	102,028.24	1	102,028.24
N ₂ O ^{a, b}	0.64	0.194	0.54	310	168.69
Methane ^a	2.30	0.194	1.96	21	41.07
Total (CO₂e)	--	--	--	--	102,237.99

Notes:

- a - Emission factor taken from AP-42, Chapter 1.4 (7/98).
- b - Emission factor assumes use of a low-NO_x burner.
- c - Global warming potential (GWP) factor taken from EPA PSD and Title V Permitting Guidance for Greenhouse Gases (3/2011).

Attachment B.3
 Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
 Greenhouse Gas Emissions

Scenario #2 - Distillate Oil and Natural Gas - Potential to Emit (PTE)
Greenhouse Gas Emissions (GHG) - CO_{2e} Emissions

Distillate Oil (502,748 gal/yr)

Heat input:	99.00	MMBtu/hr (1 boiler)
	198.00	MMBtu/hr (2 boilers combined)
Heat Content:	138,000.00	BTU/gal
Fuel Consumption:	717.39	gal/hr (1 boiler)
	1,434.78	gal/hr (2 boilers combined)
	0.72	1000 gal/hr (1 boiler)
	1.43	1000 gal/hr (2 boilers combined)
Fuel Throughput:	502,748.00	gal/yr (2 boilers combined)
	502.75	1000 gal/yr (2 boilers combined)
Sulfur Content:	0.05	% Sulfur (from application)

Pollutant	Emission Factor (lb/1000 gal)	2 Boilers		Global Warming Potential (GWP) Factor	2 Boilers
		Fuel Consumption	Emissions		CO ₂ Equivalent (CO _{2e}) Emissions
		(1000 gal/yr)	(tons/yr)		(tons/yr)
CO ₂ ^c	22,300.00	502.75	5,605.64	1	5,605.64
N ₂ O ^c	0.26	502.75	0.07	310	20.26
Methane ^c	0.05	502.75	0.01	21	0.27
Total (CO_{2e})	--	--	--	--	5,626.18

Notes:

- c - Emission factors taken from AP-42, Chapter 1.3 (5/10).
- d - Emission factor taken from facility application, based on vendor guarantee.

Natural Gas (1,632,451 Mft³/yr)
Greenhouse Gas Emissions (GHG) - CO_{2e} Emissions

Heat input:	99.00	MMBtu/hr (1 boiler)
	198.00	MMBtu/hr (2 boilers combined)
Heat Content:	1,020.00	BTU/ft ³ (taken from AP-42 Chapter 1.4 (7/98))
Fuel Consumption:	97.06	Mft ³ /hr (1 boiler)
	194.12	Mft ³ /hr (2 boiler combined)
	0.097	MMft ³ /hr (1 boiler)
	0.194	MMft ³ /hr (2 boilers combined)
Fuel Throughput:	1,632,451.74	Mft ³ /yr (2 boiler combined)
	1,632.45	MMft ³ /yr (2 boiler combined)

Attachment B.3
 Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
 Greenhouse Gas Emissions

Pollutant	Emission Factor (lb/MMft ³)	2 Boilers		Global Warming Potential (GWP) Factor	2 Boilers
		Fuel Consumption	Emissions		CO ₂ Equivalent (CO _{2e}) Emissions
		(MMft ³ /yr)	(tons/yr)		(tons/yr)
CO ₂ ^e	120,000.00	1,632.45	97,947.10	1	97,947.10
N ₂ O ^{e,f}	0.64	1,632.45	0.52	310	161.94
Methane ^e	2.30	1,632.45	1.88	21	39.42
Total (CO_{2e})	—	—	—	—	98,148.47

Notes:
 e - Emission factors taken from AP-42, Chapter 1.4 (7/98).
 f - Emission factor assumes use of a low-NOx burner.

Combined Natural Gas and Distillate Oil - Potential to Emit (PTE)
 Greenhouse Gas Emissions (GHG) - CO_{2e} Emissions

Pollutant	Distillate Oil (tons/yr)	Natural Gas (tons/yr)	Scenario #2
			Combined Fuels (tons/yr)
CO ₂	5,605.64	97,947.10	103,552.74
N ₂ O	20.26	161.94	182.20
Methane	0.27	39.42	39.70
Total (CO_{2e})	5,626.18	98,148.47	103,774.64

Scenario #3 - LPG and Natural Gas
 Greenhouse Gas Emissions - CO_{2e} Basis

Natural Gas (1,697,456 Mft³/yr)

Heat Input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	1020	BTU/ft ³ (taken from AP-42 Chapter 1.4 (7/98))
Fuel Consumption:	97.06	Mft ³ /hr (1 boiler)
	194.12	Mft ³ /hr (2 boiler combined)
	0.097	MMft ³ /hr (1 boiler)
	0.194	MMft ³ /hr (2 boilers combined)
Fuel Throughput:	1,697,456	Mft ³ /yr (2 boiler combined)
	1697.456	MMft ³ /yr (2 boiler combined)

Attachment B.3
 Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
 Greenhouse Gas Emissions

Pollutant	Emission Factor	2 Boilers		Global Warming Potential (GWP) Factor	2 Boilers
		Fuel Consumption	Emissions		CO ₂ Equivalent (CO ₂ e) Emissions
	(lb/MMBtu ³)	(MMBtu ³ /yr)	(tons/yr)		(tons/yr)
CO ₂	120,000.00	1,697.46	101,847.39	1	101,847.39
N ₂ O	0.64	1,697.46	0.54	310	168.39
Methane	2.30	1,697.46	1.95	21	40.99
Total (CO₂e)	--	--	--	--	102,056.77

LPG (33,600 gal/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	91500	BTU/gal
Fuel Consumption:	1081.97	gal/hr (1 boiler)
	2163.93	gal/hr (2 boilers combined)
	1.082	1000 gal/hr (1 boiler)
	2.164	1000 gal/hr (2 boilers combined)
Fuel Throughput:	33,600.0	gal/yr (2 boilers combined)
	33.600	1000 gal/yr (2 boilers combined)

Pollutant *	Emission Factor	2 Boilers - LPG		Global Warming Potential (GWP) Factor	2 Boilers
		Fuel Consumption	Emissions		CO ₂ Equivalent (CO ₂ e) Emissions
	(lb/1000 gal)	(1000 gal/yr)	(tons/yr)		(tons/yr)
CO ₂	12,500.00	33.60	210.00	1	210.00
N ₂ O	0.9	33.60	0.02	310	4.69
Methane	0.2	33.60	0.00	21	0.07
Total (CO₂e)	--	--	--	--	214.76

e - Emission factor taken from AP-42, Chapter 1.5 (7/08).

Combined Natural Gas and LPG - Potential to Emit (PTE)

Pollutant	LPG	Natural Gas	Scenario #3 Combined Fuels
	(tons/yr)	(tons/yr)	(tons/yr)
CO ₂	210.00	101,847.39	102,057.39
N ₂ O	4.69	168.39	173.07
Methane	0.07	40.99	41.06
Total (CO₂e)	214.76	102,056.77	102,271.53

Attachment B.3
 Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
 Greenhouse Gas Emissions

Scenario #4 - Natural Gas, Distillate Oil, and LPG

Distillate Oil (502,748 gal/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	138,000	BTU/gal
Fuel Consumption:	717.39	gal/hr (1 boiler)
	1,434.78	gal/hr (2 boilers combined)
	0.717	1000 gal/hr (1 boiler)
	1.435	1000 gal/hr (2 boilers combined)
Fuel Throughput:	502,748.00	gal/yr (2 boilers combined)
	502.748	1000 gal/yr (2 boilers combined)
Sulfur Content:	0.05	% Sulfur (from application)

Pollutant	Emission Factor (lb/1000 gal)	2 Boilers		Global Warming Potential (GWP) - Factor	2 Boilers
		Fuel Consumption (1000 gal/yr)	Emissions (tons/yr)		CO ₂ Equivalent (CO _{2e}) Emissions (tons/yr)
CO ₂	22,300.00	502.75	5,605.64	1	5,605.64
N ₂ O	0.26	502.75	0.07	310	20.26
Methane	0.052	502.75	0.01	21	0.27
Total (CO_{2e})	--	--	--	--	5,626.18

LPG (33,600 gal/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	91500	BTU/gal
Fuel Consumption:	1081.97	gal/hr (1 boiler)
	2163.93	gal/hr (2 boilers combined)
	1.082	1000 gal/hr (1 boiler)
	2.164	1000 gal/hr (2 boilers combined)
Fuel Throughput:	33,600.0	gal/yr (2 boilers combined)
	33.600	1000 gal/yr (2 boilers combined)

Pollutant ^e	Emission Factor (lb/1000 gal)	2 Boilers - LPG		Global Warming Potential (GWP) Factor	2 Boilers
		Fuel Consumption (1000 gal/yr)	Emissions (tons/yr)		CO ₂ Equivalent (CO _{2e}) Emissions (tons/yr)
CO ₂	12,500.00	33.60	210.00	1	210.00
N ₂ O	0.9	33.60	0.02	310	4.69
Methane	0.2	33.60	0.00	21	0.07
Total (CO_{2e})	--	--	--	--	214.76

Attachment 8.3
Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
Greenhouse Gas Emissions

Natural Gas (1,629,438 Mft³/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	1020	BTU/ft ³ (taken from AP-42 Chapter 1.4 (7/98))
Fuel Consumption:	97.06	Mft ³ /hr (1 boiler)
	194.12	Mft ³ /hr (2 boiler combined)
	0.097	MMft ³ /hr (1 boiler)
	0.194	MMft ³ /hr (2 boilers combined)
Fuel Throughput:	1,629,438	Mft ³ /yr (2 boiler combined)
	1629.438	MMft ³ /yr (2 boiler combined)

Pollutant	Emission Factor (lb/MMft ³)	2 Boilers		Global Warming Potential (GWP) Factor	2 Boilers
		Fuel Consumption	Emissions		CO ₂ Equivalent (CO _{2e}) Emissions
		(MMft ³ /yr)	(tons/yr)		(tons/yr)
CO ₂	120,000.00	1,629.44	97,766.26	1	97,766.26
N ₂ O	0.64	1,629.44	0.52	310	161.64
Methane	2.30	1,629.44	1.87	21	39.35
Total (CO_{2e})	--	--	--	--	97,967.25

Combined Natural Gas, Distillate Oil, and LPG - Potential to Emit (PTE)

Pollutant	LPG	Natural Gas	Distillate Oil	Scenario #4
	(tons/yr)	(tons/yr)	(tons/yr)	Combined Fuels (tons/yr)
CO ₂	210.00	97,766.26	5,605.64	103,581.90
N ₂ O	4.69	161.64	20.26	186.59
Methane	0.07	39.35	0.27	39.70
Total (CO_{2e})	214.76	97,967.25	5,626.18	103,808.18

Evaluation of Worst-Case Scenario

Worst-case Potential to Emit (PTE) for PSD Applicability - CO_{2e} Basis

Pollutant	Scenario #1	Scenario #2	Scenario #3	Scenario #4
	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)
CO ₂	102,028.24	103,552.74	102,057.39	103,581.90
N ₂ O	168.69	182.20	173.07	186.59
Methane	41.07	39.70	41.06	39.70
Total (CO_{2e})	102,237.99	103,774.64	102,271.53	103,808.18

Attachment B.3
 Potential to Emit Calculations for Prevention of Significant Deterioration (PSD) Applicability
 Greenhouse Gas Emissions

Worst-case Potential to Emit (PTE) for PSD Applicability - CO_{2e} Basis

Pollutant	Worst Case	Worst Case?	Greater than 75,000 tons/yr CO _{2e} ?
	(tons/yr)		
CO ₂	103,581.90	--	Yes
N ₂ O	186.59	--	
Methane	39.70	--	
Total (CO_{2e})	103,808.18	Scenario #4	Yes

Is the CO_{2e} sum equal or greater than 75,000 tons/yr of CO_{2e}? - **Yes**

Summary of Mass Basis and CO_{2e} Basis

Pollutant	Worst-Case Operation (see above)		PSD Significance Levels		Requires Netting?
	Mass Basis	CO _{2e} Basis	Mass Basis	CO _{2e} Basis	
	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	
CO ₂	103,581.90	103,581.90	--	--	--
N ₂ O	0.60	186.59	--	--	--
Methane	1.89	39.70	--	--	--
Total (Mass)	103,584.4	--	0	--	Yes
Total (CO_{2e})	--	103,808.2	--	75,000	Yes
Are both criteria met (Mass Basis and CO_{2e} Basis), Triggering Netting?					Yes

Since the facility:

- 1 - Is currently a PSD source for GHG emissions;
 - 2 - Has GHG emissions associated with the project greater than 0 tons/yr on a mass basis; and
 - 3 - Has GHG emissions associated with the project greater than 75,000 tons/yr on a CO_{2e} basis.
- Contemporaneous netting analysis is require for GHG emissions.

Attachment C

PSD Netting Calculations

Attachment C.1

PSD Netting Calculations - Shutdown Equipment

Attachment C.1
PSD Netting Calculations - Shutdown Equipment

Source: INVISTA
Registration Number: 80517

Pollutants triggering Netting: Greenhouse Gases (GHG or CO_{2e})

INVISTA has conservatively assumed December 1, 2007 as the start of the contemporaneous period for the netting analysis.

Contemporaneous and creditable emissions reductions are considered in calculating the net emissions increase (for PSD) if they occur within a period "five years before the construction on the particular change commences," and ending when the emission increase from the modification occurs.

Emissions increases and decreases can only be used if the facility has not previously used them in another netting analysis.

During the contemporaneous period, the following equipment with GHG emissions was permanently shutdown:

Reference Number	Equipment	Rated Capacities	Shutdown Date
2-205 (V#1)	Riley Union (Riley-stocker) Dow Vaporizer #1	43 MMBtu/hr	8/31/2011
2-205 (V#2)	Riley Union (Riley-stocker) Dow Vaporizer #2	43 MMBtu/hr	8/31/2011
2-205 (V#3)	Struthers Wells Dowtherm Vaporizer #3	22 MMBtu/hr	8/31/2011

As a result of this permit action, the following equipment with GHG emissions will also be permanently shutdown:

Reference Number	Equipment	Rated Capacities
2-205 (B#1)	Combustion Engineering, Inc. Model # VU-40S Boiler #20543 with natural gas igniter	Boiler = 196 MMBtu/hr
		Igniter = 20 MMBtu/hr
2-205 (B#2)	Combustion Engineering, Inc. Model # VU-40S Boiler #20185 with natural gas igniter	Boiler = 209 MMBtu/hr
		Igniter = 20 MMBtu/hr
2-205 (B#3)	Combustion Engineering, Inc. Model # VU-40S Boiler #19955 with natural gas igniter	Boiler = 209 MMBtu/hr
		Igniter = 20 MMBtu/hr

Attachment C.2

GHG Netting Calculations – Summary

Attachment C.2
GHG Netting Calculations - Summary

Pollutant	Project PTE		Contemp. Decreases		NEI Netting = PTE - Decreases	
	Mass Basis (tons/yr)	CO _{2e} Basis (tons/yr)	Mass Basis (tons/yr)	CO _{2e} Basis (tons/yr)	Mass Basis (tons/yr)	CO _{2e} Basis (tons/yr)
Carbon Dioxide (CO ₂)	103,581.90	103,581.90	168,640.79	168,640.79	--	--
Methane (CH ₄)	0.60	186.59	1.39	29.22	--	--
Nitrous Oxide (N ₂ O)	1.89	39.70	0.95	294.43	--	--
Total	103,584.39	103,808.18	168,643.13	168,964.45	-65,058.74	-65,156.26

Attachment C.3

GHG Netting Calculations – Contemporaneous Decrease Data

Attachment C.3
GHG Netting Calculations - Contemporaneous Decrease Data

Greenhouse Gas Emission Factors for PSD Applicability

COAL

Carbon Dioxide (CO₂) Emission Factors:

High volatile bituminous = 5510 lb/ton coal

Methane (CH₄) Emission Factors:

Pulverized Coal Fired, Dry bottom, wall fired 4.00E-02 lb/ton coal

Nitrous Oxide (N₂O) Emission Factors:

Pulverized Coal Fired, Dry bottom, wall fired 0.03 lb/ton coal

Emission factors taken from AP-42, Chapter 1.1 (9/98)

NATURAL GAS

Carbon Dioxide (CO₂) Emission Factors: 120000 lb/10⁶ SCF

Methane (CH₄) Emission Factors: 2.3 lb/10⁶ SCF

Nitrous Oxide (N₂O) Emission Factors: 0.64 lb/10⁶ SCF

Emission factors taken from AP-42, Chapter 1.4 (7/98)

DISTILLATE OIL (NO. 2)

Carbon Dioxide (CO₂) Emission Factors: 22300 lb/1000 gal

Methane (CH₄) Emission Factors: 0.052 lb/1000 gal

Nitrous Oxide (N₂O) Emission Factors: 0.26 lb/1000 gal

Emission factors taken from AP-42, Chapter 1.3 (5/10)

RESIDUAL OIL (NO. 6)

Carbon Dioxide (CO₂) Emission Factors: 25000 lb/1000 gal

Methane (CH₄) Emission Factors: 1 lb/1000 gal

Nitrous Oxide (N₂O) Emission Factors: 0.53 lb/1000 gal

Emission factors taken from AP-42, Chapter 1.3 (5/10)

Global Warming Potential (GWP) Factors:	
Carbon Dioxide Equivalents (CO₂e)	
Carbon Dioxide:	1
Methane (CH ₄):	21
Nitrous Oxide (N ₂ O):	310

Greenhouse Gas Emissions are not directly available in the inventory for 2008 or 2009; therefore, GHG emissions are calculated using fuel throughput information for the years 2008 and 2009, and emission factors for CO₂, N₂O and CH₄.

Attachment C.3
GHG Netting Calculations - Contemporaneous Decrease Data

Total Annual Fuel Throughput

2008		
------	--	--

Boiler 1 and Igniter		
Coal	6313	tons/yr
Natural Gas	8.4	10 ⁶ scf / yr
Distillate Oil	0	1000 gal/yr
Residual Oil	54.9	1000 gal/yr

Boiler 2 and Igniter		
Coal	10310	tons/yr
Natural Gas	5.5	10 ⁶ scf / yr
Distillate Oil	0	1000 gal/yr
Residual Oil	37.2	1000 gal/yr

Boiler 3 and Igniter		
Coal	30337	tons/yr
Natural Gas	11.3	10 ⁶ scf / yr
Distillate Oil	0	1000 gal/yr
Residual Oil	45.5	1000 gal/yr

Vaporizer #1		
Natural Gas	123.53	10 ⁶ scf / yr
Distillate Oil	0	1000 gal/yr
Residual Oil	69.09	1000 gal/yr

Vaporizer #2		
Natural Gas	74.79	10 ⁶ scf / yr
Distillate Oil	0	1000 gal/yr
Residual Oil	0	1000 gal/yr

Vaporizer #3		
Natural Gas	43.22	10 ⁶ scf / yr
Distillate Oil	0	1000 gal/yr

2009		
------	--	--

Boiler 1 and Igniter		
Coal	0	tons/yr
Natural Gas	0	10 ⁶ scf / yr
Distillate Oil	0	1000 gal/yr
Residual Oil	0	1000 gal/yr

Boiler 2 and Igniter		
Coal	25018	tons/yr
Natural Gas	14.85	10 ⁶ scf / yr
Distillate Oil	61.89	1000 gal/yr
Residual Oil	29.03	1000 gal/yr

Boiler 3 and Igniter		
Coal	42344	tons/yr
Natural Gas	14.6	10 ⁶ scf / yr
Distillate Oil	0	1000 gal/yr
Residual Oil	73.32	1000 gal/yr

Vaporizer #1		
Natural Gas	0	10 ⁶ scf / yr
Distillate Oil	0	1000 gal/yr
Residual Oil	0	1000 gal/yr

Vaporizer #2		
Natural Gas	0	10 ⁶ scf / yr
Distillate Oil	0	1000 gal/yr
Residual Oil	0	1000 gal/yr

Vaporizer #3		
Natural Gas	0	10 ⁶ scf / yr
Distillate Oil	0	1000 gal/yr

Attachment C.4

GHG Netting Calculations – Contemporaneous Decrease Calculations

Attachment C.4
GHG Netting Calculations – Contemporaneous Decrease Calculations

2008 GHG Emissions

Boiler 1 and Igniter

Pollutant	Coal			Natural Gas			Residual Oil		
	Em. Factor (lb/ton)	Usage (ton/yr)	Emissions (ton/yr)	Em. Factor (lb/10 ⁶ SCF)	Usage (10 ⁶ SCF/yr)	Emissions (ton/yr)	Em. Factor (lb/1000 gal)	Usage (1000 gal/ yr)	Emissions (ton/yr)
Carbon Dioxide (CO ₂)	5,510.00	6,313.00	17,392.32	120,000.00	8.4	504.00	25,000.00	54.9	686.25
Methane (CH ₄)	4.00E-02	6,313.00	1.26E-01	2.3	8.4	9.66E-03	1	54.9	2.75E-02
Nitrous Oxide (N ₂ O)	0.03	6,313.00	9.47E-02	0.64	8.4	2.69E-03	0.53	54.9	1.45E-02

Pollutant	Total (Mass Basis)	GWP Factors	Total (CO ₂ e Basis)
	(tons/yr)		(tons/yr)
Carbon Dioxide (CO ₂)	18,582.57	1	18,582.57
Methane (CH ₄)	1.63E-01	21	3.43
Nitrous Oxide (N ₂ O)	1.12E-01	310	34.70
Total	18,582.84	--	18,620.69

Boiler 2 and Igniter

Pollutant	Coal			Natural Gas			Residual Oil		
	Em. Factor (lb/ton)	Usage (ton/yr)	Emissions (ton/yr)	Em. Factor (lb/10 ⁶ SCF)	Usage (10 ⁶ SCF/yr)	Emissions (ton/yr)	Em. Factor (lb/1000 gal)	Usage (1000 gal/ yr)	Emissions (ton/yr)
Carbon Dioxide (CO ₂)	5510	10,310.00	28,404.05	120,000.00	5.5	330.00	25,000.00	37.2	465.00
Methane (CH ₄)	0.04	10,310.00	2.05E-01	2.3	5.5	6.33E-03	1	37.2	1.86E-02
Nitrous Oxide (N ₂ O)	0.03	10,310.00	1.55E-01	0.64	5.5	1.76E-03	0.53	37.2	9.86E-03

Pollutant	Total (Mass Basis)	GWP Factors	Total (CO ₂ e Basis)
	(tons/yr)		(tons/yr)
Carbon Dioxide (CO ₂)	29,199.05	1	29,199.05
Methane (CH ₄)	2.31E-01	21	4.85
Nitrous Oxide (N ₂ O)	1.66E-01	310	51.54
Total	29,199.45	--	29,255.45

Boiler 3 and Igniter

Pollutant	Coal			Natural Gas			Residual Oil		
	Em. Factor (lb/ton)	Usage (ton/yr)	Emissions (ton/yr)	Em. Factor (lb/10 ⁶ SCF)	Usage (10 ⁶ SCF/yr)	Emissions (ton/yr)	Em. Factor (lb/1000 gal)	Usage (1000 gal/ yr)	Emissions (ton/yr)
Carbon Dioxide (CO ₂)	5,510.00	30,337.00	83,578.44	120,000.00	11.3	678.00	25,000.00	45.5	568.75
Methane (CH ₄)	0.04	30,337.00	6.07E-01	2.3	11.3	1.30E-02	1	45.5	2.28E-02
Nitrous Oxide (N ₂ O)	0.03	30,337.00	4.55E-01	0.64	11.3	3.62E-03	0.53	45.5	1.21E-02

Pollutant	Total (Mass Basis)	GWP Factors	Total (CO ₂ e Basis)
	(tons/yr)		(tons/yr)
Carbon Dioxide (CO ₂)	84,825.19	1	84,825.19
Methane (CH ₄)	6.42E-01	21	13.49
Nitrous Oxide (N ₂ O)	4.71E-01	310	145.93
Total	84,826.30	--	84,984.60

Vaporizer 1

Pollutant	Natural Gas			Residual Oil		
	Em. Factor	Usage	Emissions	Em. Factor	Usage	Emissions
	(lb/10 ⁶ SCF)	(10 ⁶ SCF/yr)	(ton/yr)	(lb/1000 gal)	(1000 gal/ yr)	(ton/yr)
Carbon Dioxide (CO ₂)	120,000.00	123.53	7,411.80	25,000.00	69.09	863.63
Methane (CH ₄)	2.3	123.53	1.42E-01	1	69.09	3.45E-02
Nitrous Oxide (N ₂ O)	0.64	123.53	3.95E-02	0.53	69.09	1.83E-02

Pollutant	Total (Mass Basis)	GWP Factors	Total (CO ₂ e Basis)
	(tons/yr)		(tons/yr)
Carbon Dioxide (CO ₂)	8,275.43	1	8,275.43
Methane (CH ₄)	1.77E-01	21	3.71
Nitrous Oxide (N ₂ O)	5.78E-02	310	17.93
Total	8,275.66	--	8,297.06

Vaporizer 2

Pollutant	Natural Gas		
	Em. Factor	Usage	Emissions
	(lb/10 ⁶ SCF)	(10 ⁶ SCF/yr)	(ton/yr)
Carbon Dioxide (CO ₂)	120,000.00	74.79	4,487.40
Methane (CH ₄)	2.3	74.79	8.60E-02
Nitrous Oxide (N ₂ O)	0.64	74.79	2.39E-02

Pollutant	Total (Mass Basis)	GWP Factors	Total (CO ₂ e Basis)
	(tons/yr)		(tons/yr)
Carbon Dioxide (CO ₂)	4,487.40	1	4,487.40
Methane (CH ₄)	8.60E-02	21	1.81
Nitrous Oxide (N ₂ O)	2.39E-02	310	7.42
Total	4,487.51	--	4,496.63

Vaporizer 3

Pollutant	Natural Gas		
	Em. Factor	Usage	Emissions
	(lb/10 ⁶ SCF)	(10 ⁶ SCF/yr)	(ton/yr)
Carbon Dioxide (CO ₂)	120,000.00	43.22	2593.2
Methane (CH ₄)	2.3	43.22	4.97E-02
Nitrous Oxide (N ₂ O)	0.64	43.22	1.38E-02

Pollutant	Total (Mass Basis)	GWP Factors	Total (CO ₂ e Basis)
	(tons/yr)		(tons/yr)
Carbon Dioxide (CO ₂)	2,593.20	1	2,593.20
Methane (CH ₄)	4.97E-02	21	1.04
Nitrous Oxide (N ₂ O)	1.38E-02	310	4.29
Total	2,593.26	--	2,598.53

Total GHG Emissions - 2008

Pollutant	Boiler 1		Boiler 2		Boiler 3	
	Mass Basis (tons/yr)	CO _{2e} Basis (tons/yr)	Mass Basis (tons/yr)	CO _{2e} Basis (tons/yr)	Mass Basis (tons/yr)	CO _{2e} Basis (tons/yr)
Carbon Dioxide (CO ₂)	18,582.57	18,582.57	29,199.05	29,199.05	84,825.19	84,825.19
Methane (CH ₄)	1.63E-01	3.43	2.31E-01	4.85	6.42E-01	13.49
Nitrous Oxide (N ₂ O)	1.12E-01	34.70	1.66E-01	51.54	4.71E-01	145.93
Total	18,582.84	18,620.69	29,199.45	29,255.45	84,826.30	84,984.60

Pollutant	Vaporizer 1		Vaporizer 2		Vaporizer 3	
	Mass Basis (tons/yr)	CO _{2e} Basis (tons/yr)	Mass Basis (tons/yr)	CO _{2e} Basis (tons/yr)	Mass Basis (tons/yr)	CO _{2e} Basis (tons/yr)
Carbon Dioxide (CO ₂)	8,275.43	8,275.43	4,487.40	4,487.40	2,593.20	2,593.20
Methane (CH ₄)	1.77E-01	3.71	8.60E-02	1.81	4.97E-02	1.04
Nitrous Oxide (N ₂ O)	5.78E-02	17.93	2.39E-02	7.42	1.38E-02	4.29
Total	8,275.66	8,297.06	4,487.51	4,496.63	2,593.26	2,598.53

Pollutant	Total : 2008	
	Mass Basis (tons/yr)	CO _{2e} Basis (tons/yr)
Carbon Dioxide (CO ₂)	147,962.83	147,962.83
Methane (CH ₄)	1.35	28.34
Nitrous Oxide (N ₂ O)	0.84	261.80
Total	147,965.02	148,252.96

2009 GHG Emissions

Boiler 1 and Igniter

Pollutant	Coal			Natural Gas			Residual Oil		
	Em. Factor	Usage	Emissions	Em. Factor	Usage	Emissions	Em. Factor	Usage	Emissions
	(lb/ton)	(ton/yr)	(ton/yr)	(lb/10 ⁶ SCF)	(10 ⁶ SCF/yr)	(ton/yr)	(lb/1000 gal)	(1000 gal/yr)	(ton/yr)
Carbon Dioxide (CO ₂)	5,510.00	0.00	0.00	120,000.00	0.00	0.00	25,000.00	0.00	0.00
Methane (CH ₄)	0.04	0.00	0.00	2.3	0.00	0.00	1	0.00	0.00
Nitrous Oxide (N ₂ O)	0.03	0.00	0.00	0.64	0.00	0.00	0.53	0.00	0.00

Pollutant	Total (Mass Basis)	GWP Factors	Total (CO _{2e} Basis)
	(tons/yr)		(tons/yr)
Carbon Dioxide (CO ₂)	0.00	1	0.00
Methane (CH ₄)	0.00	21	0.00
Nitrous Oxide (N ₂ O)	0.00	310	0.00
Total	0.00	--	0.00

Attachment C.4
GHG Netting Calculations – Contemporaneous Decrease Calculations

Boiler 2 and Igniter

Pollutant	Coal			Natural Gas			Distillate Oil			Residual Oil		
	Em. Factor	Usage	Emissions	Em. Factor	Usage	Emissions	Em. Factor	Usage	Emissions	Em. Factor	Usage	Emissions
	(lb/ton)	(ton/yr)	(ton/yr)	(lb/10 ⁶ SCF)	(10 ⁶ SCF/yr)	(ton/yr)	(lb/1000 gal)	(1000 gal/ yr)	(ton/yr)	(lb/1000 gal)	(1000 gal/ yr)	(ton/yr)
Carbon Dioxide (CO ₂)	5,510.00	25,018.00	68,924.59	120,000.00	14.85	891.00	22,300.00	61.89	690.07	25,000.00	29.03	362.88
Methane (CH ₄)	0.04	25,018.00	5.00E-01	2.3	14.85	1.71E-02	0.052	61.89	1.61E-03	1	29.03	1.45E-02
Nitrous Oxide (N ₂ O)	0.03	25,018.00	3.75E-01	0.64	14.85	4.75E-03	0.26	61.89	8.05E-03	0.53	29.03	7.69E-03

Pollutant	Total (Mass Basis)	GWP Factors	Total (CO ₂ e Basis)
	(tons/yr)		(tons/yr)
Carbon Dioxide (CO ₂)	70,868.54	1	70,868.54
Methane (CH ₄)	0.53	21	11.20
Nitrous Oxide (N ₂ O)	0.40	310	122.69
Total	70,869.47	--	71,002.43

Boiler 3 and Igniter

Pollutant	Coal			Natural Gas			Residual Oil		
	Em. Factor	Usage	Emissions	Em. Factor	Usage	Emissions	Em. Factor	Usage	Emissions
	(lb/ton)	(ton/yr)	(ton/yr)	(lb/10 ⁶ SCF)	(10 ⁶ SCF/yr)	(ton/yr)	(lb/1000 gal)	(1000 gal/ yr)	(ton/yr)
Carbon Dioxide (CO ₂)	5,510.00	42,344.00	116,657.72	120,000.00	14.6	876.00	25,000.00	73.32	916.50
Methane (CH ₄)	0.04	42,344.00	8.47E-01	2.3	14.6	1.68E-02	1	73.32	3.67E-02
Nitrous Oxide (N ₂ O)	0.03	42,344.00	6.35E-01	0.64	14.6	4.67E-03	0.53	73.32	1.94E-02

Pollutant	Total (Mass Basis)	GWP Factors	Total (CO ₂ e Basis)
	(tons/yr)		(tons/yr)
Carbon Dioxide (CO ₂)	118,450.22	1	118,450.22
Methane (CH ₄)	9.00E-01	21	18.91
Nitrous Oxide (N ₂ O)	6.59E-01	310	204.37
Total	118,451.78	--	118,673.50

Vaporizer 1

Pollutant	Natural Gas			Residual Oil		
	Em. Factor	Usage	Emissions	Em. Factor	Usage	Emissions
	(lb/10 ⁶ SCF)	(10 ⁶ SCF/yr)	(ton/yr)	(lb/1000 gal)	(1000 gal/ yr)	(ton/yr)
Carbon Dioxide (CO ₂)	120,000.00	0.00	0.00	25,000.00	0.00	0.00
Methane (CH ₄)	2.3	0.00	0.00	1	0.00	0.00
Nitrous Oxide (N ₂ O)	0.64	0.00	0.00	0.53	0.00	0.00

Pollutant	Total (Mass Basis)	GWP Factors	Total (CO ₂ e Basis)
	(tons/yr)		(tons/yr)
Carbon Dioxide (CO ₂)	0.00	1	0.00
Methane (CH ₄)	0.00	21	0.00
Nitrous Oxide (N ₂ O)	0.00	310	0.00
Total	0.00	--	0.00

Attachment C.4
GHG Netting Calculations – Contemporaneous Decrease Calculations

Vaporizer 2

Pollutant	Natural Gas		
	Em. Factor (lb/10 ⁶ SCF)	Usage (10 ⁶ SCF/yr)	Emissions (ton/yr)
Carbon Dioxide (CO ₂)	120,000.00	0.00	0.00
Methane (CH ₄)	2.3	0.00	0.00
Nitrous Oxide (N ₂ O)	0.64	0.00	0.00

Pollutant	Total (Mass Basis) (tons/yr)	GWP Factors	Total (CO ₂ e Basis) (tons/yr)
	Carbon Dioxide (CO ₂)		0.00
Methane (CH ₄)	0.00	21	0.00
Nitrous Oxide (N ₂ O)	0.00	310	0.00
Total	0.00	--	0.00

Vaporizer 3

Pollutant	Natural Gas		
	Em. Factor (lb/10 ⁶ SCF)	Usage (10 ⁶ SCF/yr)	Emissions (ton/yr)
Carbon Dioxide (CO ₂)	120,000.00	0.00	0.00
Methane (CH ₄)	2.3	0.00	0.00
Nitrous Oxide (N ₂ O)	0.64	0.00	0.00

Pollutant	Total (Mass Basis) (tons/yr)	GWP Factors	Total (CO ₂ e Basis) (tons/yr)
	Carbon Dioxide (CO ₂)		0.00
Methane (CH ₄)	0.00	21	0.00
Nitrous Oxide (N ₂ O)	0.00	310	0.00
Total	0.00	--	0.00

Total GHG Emissions - 2009

Pollutant	Boiler 1		Boiler 2		Boiler 3	
	Mass Basis (tons/yr)	CO ₂ e Basis (tons/yr)	Mass Basis (tons/yr)	CO ₂ e Basis (tons/yr)	Mass Basis (tons/yr)	CO ₂ e Basis (tons/yr)
Carbon Dioxide (CO ₂)	0.00	0.00	70,868.54	70,868.54	118,450.22	118,450.22
Methane (CH ₄)	0.00	0.00	5.34E-01	11.20	9.00E-01	18.91
Nitrous Oxide (N ₂ O)	0.00	0.00	3.96E-01	122.69	6.59E-01	204.37
Total	0.00	0.00	70,869.47	71,002.43	118,451.78	118,673.50

Pollutant	Vaporizer 1		Vaporizer 2		Vaporizer 3	
	Mass Basis (tons/yr)	CO ₂ e Basis (tons/yr)	Mass Basis (tons/yr)	CO ₂ e Basis (tons/yr)	Mass Basis (tons/yr)	CO ₂ e Basis (tons/yr)
Carbon Dioxide (CO ₂)	0.00	0.00	0.00	0.00	0.00	0.00
Methane (CH ₄)	0.00	0.00	0.00	0.00	0.00	0.00
Nitrous Oxide (N ₂ O)	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

Attachment C.4
GHG Netting Calculations – Contemporaneous Decrease Calculations

Pollutant	Total : 2009	
	Mass Basis (tons/yr)	CO _{2e} Basis (tons/yr)
Carbon Dioxide (CO ₂)	189,318.76	189,318.76
Methane (CH ₄)	1.43	30.11
Nitrous Oxide (N ₂ O)	1.06	327.06
Total	189,321.25	189,675.93

Average Emissions of GHG From Shutdown Equipment: 2008 and 2009

Pollutant	Total : 2008		Total : 2009		Average (2008 / 2009)	
	Mass Basis (tons/yr)	CO _{2e} Basis (tons/yr)	Mass Basis (tons/yr)	CO _{2e} Basis (tons/yr)	Mass Basis (tons/yr)	CO _{2e} Basis (tons/yr)
Carbon Dioxide (CO ₂)	147,962.83	147,962.83	189,318.76	189,318.76	168,640.79	168,640.79
Methane (CH ₄)	1.35	28.34	1.43	30.11	1.39	29.22
Nitrous Oxide (N ₂ O)	0.84	261.80	1.06	327.06	0.95	294.43
Total	147,965.02	148,252.96	189,321.25	189,675.93	168,643.13	168,964.45

Attachment C.5

**Consolidated Plant Emission Reports
2008 and 2009**

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

2008

Registration No: 80517

FIPS County Code: 820

Year of Emissions: 2008

Plant Name: INVISTA S.a.r.l. - Waynesboro

Plant ID: 00009

Last Annual Update: 2011

GENERAL INFORMATION

Facility Name: INVISTA - Waynesboro

Location Address: 400 DuPont Blvd
Waynesboro VA 22980Mailing Address: 400 DuPont Boulevard
Waynesboro VA 22980

Annual Update Contact: Campbell, Brian

Phone Number: (540) 949 - 2424

Principal Product: fibres/resn

Comments:

UTM Zone: 17
UTM Vertical (KM): 4214.4
UTM Horizontal (KM): 686.7
Latitude: 38 ° 3 ' 31 "
Longitude: -78 ° 52 ' 50 "
Property Area (Acres): .1
No. of Employees: 600
Primary SIC Code: 2824

Facility Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	SO2	843.2189362000		
	NH3	0.4864350475		
	PM 2.5	48.5716920000		
	VOC	132.7948574000		
	PB	0.0009064010		
	PM 10	58.0307530000		
	BIPH	1.9700000000		
	CO	23.4604800000		
	HCL	52.6714076500		
	PM	64.7544860000		
	NO2	275.7081500000		

STACK INFORMATION: Number: 1

Description: Stack 1 Description

Stack Height(ft): 250
Stack Diameter(ft): 13
Exit Gas Temperature(F): 325
Gas Flow Rate(ACFM): 204673
Exit Gas Velocity(ft/sec): 25.7
Stack Type: V
Plume Height(ft): 0
Permitted Equipment: N

UTM Zone: 17
UTM Vertical(KM): 4214.39
UTM Horizontal(KM): 686.69
GEP Stack Height: 0
GEP Building Height: 0
GEP Building Length: 0
GEP Bulding Width: 0
Rough Terrain: N
Elevation (ft above MSL): 1280

Stack Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
-----------------	-----------	-----------------------	-----------------	-------

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

CO	21.6452400000	
HCL	52.6714076500	
NH3	0.4172830475	
NO2	274.6276500000	
PB	0.0009064010	
PM	50.0102500000	
PM 10	45.8665170000	
PM 2.5	41.4674560000	
SO2	843.2059702000	788.0000000000 lbs/hr
VOC	2.0525024000	

POINT INFORMATION: Number: 1 Description: Boiler #1

Design Capacity & Units: 196 MILLION BTUS
Per HOUR

% Throughput: DEC-FEB: 33 MAR-MAY: 33 JUN-AUG: 34 SEP-NOV: 0
Operating Schedule: Hours/Day: 24 Days/Week: 7 Hours/Year: 8760

State Sensitive: N
Permitted Equipment: N
Space Heat (%): 5
Air Program Sub Part

Point Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	CO	2.0690500000		
	HCL	7.0932722500		
	NH3	0.0371842700		
	NO2	36.4240000000		
	PB	0.0001761180		
	PM	6.5358400000	39.6000000000	lbs/hr
	PM 10	6.2310950000		
	PM 2.5	5.5432350000		
	SO2	115.1401530000		
	VOC	0.2202660000		

SEGMENT INFORMATION: Number: 1 Description: 1 COMB.ENGR-#20543/COAL

Source Classification Code:	10200202	SCC Description:	Pulverized Coal: Dry Bottom		
Actual Annual Throughput:	6316	SCC Units:	Tons Burned		
Max. Hourly Operation Rate:	7.84	Trace%:	0	Ash%:	9.54
State Sensitive:	N	Sulfur%:	.93		
Permitted Equipment:	N	Heat Content (MMBTU):	26.1		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Pollution Prevention Comments:

Segment Comments: SCC CHANGED TO DRV BOTTOM IN 1994

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PM 2.5	Supplied factor (auto calc)	1.6800000000		008	016	0	5.30544000016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Supplied factor (auto calc)	1.9100000000		008	016	0	6.03178000016 = Fabric Filter - High Temperature i.e. T>250F		
PB	Supplied factor (auto calc)	0.0042000000		008	016	99.5	0.00006631016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Supplied factor (auto calc)	1.8700000000		008	016		5.90546000016 = Fabric Filter - High Temperature i.e. T>250F		
NH3	Supplied factor (auto calc)	0.0005650000					0.00178427		
VOC	Federal factor (auto calc)	0.0600000000					0.18948000		
CO	Supplied factor (auto calc)	0.5000000000					1.57900000		
HCL	Supplied factor (auto calc)	2.2400000000					7.07392000		
NO2	Supplied factor (auto calc)	11.0000000000		205			34.73800000		
SO2	Supplied factor (auto calc)	35.3400000000					111.60372000		

SEGMENT INFORMATION: Number: 2

Description: 1 COMB ENGR #20543 -6 OIL

Source Classification Code:	10200401	SCC Description:	Grade 6 Oil		
Actual Annual Throughput:	54.9	SCC Units:	1000 Gallons Burned		
Max. Hourly Operation Rate:	1.324	Trace%:	0	Ash%:	.04
State Sensitive:	N	Sulfur%:	0		
Permitted Equipment:	N	Heat Content (MMBTU):	154		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Pollution Prevention Comments:

Segment Comments: ALLOWED SO2=2LB/MMBTU WITHSEG 09 ON LINE.

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Supplied factor (auto calc)	0.0040000000		008	016		0.00010980016 = Fabric Filter - High Temperature i.e. T>250F		
PM 2.5	Supplied factor (auto calc)	7.5000000000		008 = Centrifugal Collector - Medium Efficiency	016		0.20587500016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Supplied factor (auto calc)	10.7000000000		008 = Centrifugal Collector - Medium Efficiency	016		0.29371500016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Supplied factor (auto calc)	17.2000000000		008 = Centrifugal Collector - Medium Efficiency	016		0.47214000016 = Fabric Filter - High Temperature i.e. T>250F		
VOC	Federal factor (auto calc)	0.2800000000					0.00768600		
HCL	Supplied factor (auto calc)	0.7050000000					0.01935225		
NH3	Supplied factor (auto calc)	0.8000000000					0.02196000		
CO	Federal factor (auto calc)	5.0000000000					0.13725000		
NO2	Supplied factor (auto calc)	40.0000000000					1.09800000		
SO2	Supplied factor (auto calc)	128.7400000000					3.53391300		

SEGMENT INFORMATION: Number: 3

Description: 1 COMB ENGR #20543-2 OIL

Source Classification Code:	10200501	SCC Description:	Grades 1 and 2 Oil		
Actual Annual Throughput:	0	SCC Units:	1000 Gallons Burned		
Max. Hourly Operation Rate:	1.42	Trace%:	0	Ash%:	0
State Sensitive:	N	Sulfur%:	.18		
Permitted Equipment:	N	Heat Content (MMBTU):	137		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Pollution Prevention Comments:
Segment Comments:

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Federal factor (auto calc)	0.0000090000		008	016		0.0000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 2.5	Supplied factor (auto calc)	1.5500000000		008	016		0.0000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Supplied factor (auto calc)	2.3000000000		008	016		0.0000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Supplied factor (auto calc)	3.3000000000		008	016		0.0000000016 = Fabric Filter - High Temperature i.e. T>250F		
VOC	Federal factor (auto calc)	0.2000000000					0.00000000		
HCL	Supplied factor (auto calc)	0.6580000000					0.00000000		
NH3	Supplied factor (auto calc)	0.8000000000					0.00000000		
CO	Federal factor (auto calc)	5.0000000000					0.00000000		
NO2	Federal factor (auto calc)	24.0000000000					0.00000000		
SO2	Supplied factor (auto calc)	26.6900000000					0.00000000		

SEGMENT INFORMATION: Number: 4

Description: NATURAL GAS IGNITER

Source Classification Code:	10200601	SCC Description:	> 100 Million BTU/hr		
Actual Annual Throughput:	8.4	SCC Units:	Million Cubic Feet Burned		
Max. Hourly Operation Rate:	0	Trace%:	0	Ash%:	0
State Sensitive:	N	Sulfur%:	0		
Permitted Equipment:	N	Heat Content (MMBTU):	1020		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Pollution Prevention Comments:
Segment Comments:

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
SO2	Federal factor (auto calc)	0.6000000000					0.00252000		
NH3	Supplied factor (auto calc)	3.2000000000					0.01344000		
VOC	Federal factor (auto calc)	5.5000000000					0.02310000		
PM	Federal factor (auto calc)	7.6000000000					0.03192000		
PM 10	Supplied factor (auto calc)	7.6000000000					0.03192000		
PM 2.5	Supplied factor (auto calc)	7.6000000000					0.03192000		
CO	Federal factor (auto calc)	84.0000000000					0.35280000		
NO2	Supplied factor (auto calc)	140.0000000000					0.58800000		

POINT INFORMATION: Number: 2 Description: Boiler #2

Design Capacity & Units: 209 MILLION BTUS
Per HOUR

% Throughput: DEC-FEB: 16 MAR-MAY: 8 JUN-AUG: 38 SEP-NOV: 38
Operating Schedule: Hours/Day: 24 Days/Week: 7 Hours/Year: 8760

State Sensitive: N
Permitted Equipment: N
Space Heat (%): 5
Air Program Sub Part

Point Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	CO	2.9015000000		
	HCL	11.5603130000		
	NH3	0.0265925750		
	NO2	57.8340000000		
	PB	0.0003354470		
	PM	11.3686000000	39.3000000000	lbs/hr
	PM 10	9.8608750000		
	PM 2.5	9.2149800000		
	SO2	184.5739140000		

Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report

VOC 0.3296330000

SEGMENT INFORMATION: Number: 1 Description: 2 COMB.ENGR-#20185/COAL

Source Classification Code:	10200202	SCC Description:	Pulverized Coal: Dry Bottom		
Actual Annual Throughput:	10310	SCC Units:	Tons Burned		
Max. Hourly Operation Rate:	8.86	Trace%:	0	Ash%:	9.54
State Sensitive:	N	Sulfur%:	.93		
Permitted Equipment:	N	Heat Content (MMBTU):	26.1		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

Pollution Prevention Comments:

Segment Comments: SCC CHANGED TO DRY BOTTOM IN 1994

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Supplied factor (auto calc)	0.0130000000		008	016	99.5	0.00033507016 = Fabric Filter - High Temperature i.e. T>250F		
PM 2.5	Supplied factor (auto calc)	1.6800000000		008	016		8.66040000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Material balance (user calc)	1.8700000000		008	016		8.98390000016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Supplied factor (auto calc)	2.0100000000		008	016		10.36155000016 = Fabric Filter - High Temperature i.e. T>250F		
NH3	Supplied factor (auto calc)	0.0005650000					0.00291257		
VOC	Federal factor (auto calc)	0.0600000000					0.30930000		
CO	Supplied factor (auto calc)	0.5000000000					2.57750000		
HCL	Supplied factor (auto calc)	2.2400000000					11.54720000		
NO2	Supplied factor (auto calc)	11.0000000000					56.70500000		
SO2	Supplied factor (auto calc)	35.3400000000					182.17770000		

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

SEGMENT INFORMATION: Number: 2

Description: 2 COMB ENGR #20185 -6 OIL

Source Classification Code:	10200401	SCC Description:	Grade 6 Oil		
Actual Annual Throughput:	37.2	SCC Units:	1000 Gallons Burned		
Max. Hourly Operation Rate:	1.411	Trace%:	0	Ash%:	0
State Sensitive:	N	Sulfur%:	.82		
Permitted Equipment:	N	Heat Content (MMBTU):	154		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

Pollution Prevention Comments:

Segment Comments: ALLOWED SO2=2LB/MMBTU WITHSEG 09 ON LINE.

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Supplied factor (auto calc)	0.0040000000		008	016	99.5	0.00000037016 = Fabric Filter - High Temperature i.e. T>250F		
PM 2.5	Material balance (user calc)	7.5000000000		008	016	99.5	0.55418000016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Material balance (user calc)	17.2000000000		008	016	99.5	0.98615000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Material balance (user calc)	10.7000000000		008	016		0.85607500016 = Fabric Filter - High Temperature i.e. T>250F		
VOC	Federal factor (auto calc)	0.2800000000					0.00520800		
HCL	Supplied factor (auto calc)	0.7050000000					0.01311300		
NH3	Supplied factor (auto calc)	0.8000000000					0.01488000		
CO	Federal factor (auto calc)	5.0000000000					0.09300000		
NO2	Supplied factor (auto calc)	40.0000000000					0.74400000		
SO2	Supplied factor (auto calc)	128.7400000000					2.39456400		

3

Description: 2 COMB ENGR #20185-2 OIL

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

SEGMENT INFORMATION: Number: 10200501
 Source Classification Code: 10200501
 Actual Annual Throughput: 0
 Max. Hourly Operation Rate: 1.514
 State Sensitive: N
 Permitted Equipment: N
 Insignificant Activity: N
 Pollution Prevention: N

SCC Description: Grades 1 and 2 Oil
 SCC Units: 1000 Gallons Burned
 Trace%: 0 Ash%: 0 Sulfur%: .18
 Heat Content (MMBTU): 137
 Throughput Limit:
 Throughput Unit:

Pollution Prevention Comments:
 Segment Comments:

Segment Emissions		Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
Pollutant	Method								
PB	Federal factor (auto calc)	0.0000090000		008	016	99.5	0.0000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 2.5	Material balance (user calc)	1.5500000000		008 = Centrifugal Collector - Medium Efficiency	016	99.5	0.00040000016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Federal factor (auto calc)	2.0000000000		008 = Centrifugal Collector - Medium Efficiency	016	99.5	0.00000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Federal factor (auto calc)	2.3000000000		008 = Centrifugal Collector - Medium Efficiency	016	99.5	0.00000000016 = Fabric Filter - High Temperature i.e. T>250F		
VOC	Federal factor (auto calc)	0.2000000000					0.000000000		
HCL	Supplied factor (auto calc)	0.6580000000					0.000000000		
NH3	Supplied factor (auto calc)	0.8000000000					0.000000000		
CO	Federal factor (auto calc)	5.0000000000					0.000000000		
NO2	Federal factor (auto calc)	24.0000000000					0.000000000		
SO2	Supplied factor (auto calc)	26.6900000000					0.000000000		

SEGMENT INFORMATION: Number: 4

Description: NATURAL GAS IGNITER

SCC Description:

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Source Classification Code: 10200601 > 100 Million BTU/hr
 Actual Annual Throughput: 5.5 SCC Units: Million Cubic Feet Burned
 Max. Hourly Operation Rate: 0 Trace%: 0 Ash%: 0 Sulfur%: 0
 State Sensitive: N
 Permitted Equipment: N Heat Content (MMBTU): 1020
 Insignificant Activity: N Throughput Limit:
 Pollution Prevention: N Throughput Unit:

Pollution Prevention Comments:
 Segment Comments:

Segment Emissions		Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
Pollutant	Method								
SO2	Federal factor (auto calc)	0.6000000000					0.00165000		
NH3	Supplied factor (auto calc)	3.2000000000					0.00880000		
VOC	Federal factor (auto calc)	5.5000000000					0.01512500		
PM	Federal factor (auto calc)	7.6000000000					0.02090000		
PM 10	Supplied factor (auto calc)	7.6000000000					0.02090000		
CO	Federal factor (auto calc)	84.0000000000					0.23100000		
NO2	Supplied factor (auto calc)	140.0000000000					0.38500000		

POINT INFORMATION: Number: 3 Description: Boiler #3

Design Capacity & Units: 209 MILLION BTUS
 Per HOUR
 % Throughput: DEC-FEB: 10 MAR-MAY: 29 JUN-AUG: 30 SEP-NOV: 31
 Operating Schedule: Hours/Day: 24 Days/Week: 7 Hours/Year: 8760

State Sensitive: N
 Permitted Equipment: N
 Space Heat (%): 5
 Air Program Sub Part

Point Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
-----------------	-----------	-----------------------	-----------------	-------

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

CO	8.172600000		
HCL	33.9934787500		
NH3	0.0085702025		
NO2	168.554500000		
PB	0.0003948360		
PM	30.9274750000	39.3000000000	lbs/hr
PM 10	28.6514600000		
PM 2.5	25.6966500000		
SO2	538.9870150000		
VOC	0.9475550000		

SEGMENT INFORMATION: Number: 1 Description: 3 COMB.ENGR-#19955/COAL

Source Classification Code:	10200202	SCC Description:	Pulverized Coal: Dry Bottom		
Actual Annual Throughput:	30337	SCC Units:	Tons Burned		
Max. Hourly Operation Rate:	8.36	Trace%:	0	Ash%:	9.54
State Sensitive:	N	Heat Content (MMBTU):	26.1	Sulfur%:	.93
Permitted Equipment:	N	Throughput Limit:			
Insignificant Activity:	N	Throughput Unit:			
Pollution Prevention:	N				

Pollution Prevention Comments:

Segment Comments: SCC CHANGED TO DRY BOTTOM IN 1994

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Supplied factor (auto calc)	0.0130000000		008	016	99.8	0.00039438016 = Fabric Filter - High Temperature i.e. T>250F		
PM 2.5	Supplied factor (auto calc)	1.6800000000		008 = Centrifugal Collector - Medium Efficiency	016		25.48308000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Supplied factor (auto calc)	1.8700000000		008 = Centrifugal Collector - Medium Efficiency	016		28.36509500016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Supplied factor (auto calc)	2.0100000000		008 = Centrifugal Collector - Medium Efficiency	016		30.48868500016 = Fabric Filter - High Temperature i.e. T>250F		
NH3	Federal factor (auto calc)	0.0005650000					0.00857020		
VOC	Federal factor (auto calc)	0.0600000000					0.91011000		

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

CO	Supplied factor (auto calc)	0.5000000000		7.58425000
HCL	Supplied factor (auto calc)	2.2400000000		33.97744000
NO2	Supplied factor (auto calc)	11.0000000000	205 205 = LOW NOX BURNERS	166.85350000
SO2	Supplied factor (auto calc)	35.3400000000		536.05479000

SEGMENT INFORMATION: Number: 2 Description: 3 COMB ENGR #19955 -6 OIL

Source Classification Code:	10200401	SCC Description:	Grade 6 Oil		
Actual Annual Throughput:	45.5	SCC Units:	1000 Gallons Burned		
Max. Hourly Operation Rate:	1.411	Trace%:	0	Ash%: 0	Sulfur%: .82
State Sensitive:	N	Heat Content (MMBTU):	154		
Permitted Equipment:	N	Throughput Limit:			
Insignificant Activity:	N	Throughput Unit:			
Pollution Prevention:	N				

Pollution Prevention Comments:

Segment Comments: ALLOWED SO2=2LB/MMBTU WITHSEG 09 ON LINE.

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Supplied factor (auto calc)	0.0040000000		008	016	99.5	0.00000045016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Supplied factor (auto calc)	10.7000000000		008 = Centrifugal Collector - Medium Efficiency	016		0.24342500016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Supplied factor (auto calc)	17.4000000000		008 = Centrifugal Collector - Medium Efficiency	016		0.39585000016 = Fabric Filter - High Temperature i.e. T>250F		
VOC	Federal factor (auto calc)	0.2800000000					0.00637000		
HCL	Supplied factor (auto calc)	0.7050000000					0.01603875		
CO	Federal factor (auto calc)	5.0000000000					0.11375000		

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

PM 2.5	Supplied factor (auto calc)	7.5000000000		0.17062500
NO2	Supplied factor (auto calc)	40.0000000000		0.91000000
SO2	Federal factor (auto calc)	157.0000000000	S	2.92883500

SEGMENT INFORMATION: Number: 3

Description: 3 COMB ENGR #19955-2 OIL

Source Classification Code:	10200501	SCC Description:	Grades 1 and 2 Oil		
Actual Annual Throughput:	0	SCC Units:	1000 Gallons Burned		
Max. Hourly Operation Rate:	1.514	Trace%:	0	Ash%:	0
State Sensitive:	N	Sulfur%:	.17		
Permitted Equipment:	N	Heat Content (MMBTU):	137		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

Pollution Prevention Comments:
Segment Comments:

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PM 2.5	Material balance (user calc)	1.5500000000		008	014	99.5	0.00000500014 = Mist Eliminator - High Velocity i.e. V>250 Ft/Min		
PB	Federal factor (auto calc)	0.0000090000		008	016	99.5	0.00000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Federal factor (auto calc)	2.0000000000		008	016	99.5	0.00000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Federal factor (auto calc)	2.3000000000		008	016	99.5	0.00000000016 = Fabric Filter - High Temperature i.e. T>250F		
VOC	Federal factor (auto calc)	0.2000000000					0.000000000		
HCL	Supplied factor (auto calc)	0.6580000000					0.00000000		
CO	Federal factor (auto calc)	5.0000000000					0.00000000		
NO2	Federal factor (auto calc)	24.0000000000					0.00000000		

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

SO2 Federal factor (auto calc) 142.0000000000 S 0.00000000

SEGMENT INFORMATION: Number: 4 Description: NATURAL GAS IGNITERS

Source Classification Code: 10200601 SCC Description: > 100 Million BTU/hr

Actual Annual Throughput: 11.3 SCC Units: Million Cubic Feet Burned

Max. Hourly Operation Rate: 0 Trace%: 0 Ash%: 0 Sulfur%: 0

State Sensitive: N Heat Content (MMBTU): 1020

Permitted Equipment: N Throughput Limit:

Insignificant Activity: N Throughput Unit:

Pollution Prevention: N

Pollution Prevention Comments:
Segment Comments:

Segment Emissions		Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
Pollutant	Method								
SO2	Federal factor (auto calc)	0.6000000000					0.00339000		
VOC	Federal factor (auto calc)	5.5000000000					0.03107500		
PM	Federal factor (auto calc)	7.6000000000					0.04294000		
PM 10	Supplied factor (auto calc)	7.6000000000					0.04294000		
PM 2.5	Supplied factor (auto calc)	7.6000000000					0.04294000		
CO	Federal factor (auto calc)	84.0000000000					0.47460000		
NO2	Supplied factor (auto calc)	140.0000000000					0.79100000		

POINT INFORMATION: Number: 5 Description: VAP 1

State Sensitive: N

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Design Capacity & Units: 43 MILLION BTUS
Per HOUR

% Throughput: DEC-FEB: 28 MAR-MAY: 28 JUN-AUG: 23 SEP-NOV: 21
Operating Schedule: Hours/Day: 24 Days/Week: 7 Hours/Year: 8760

Permitted Equipment: N
Space Heat (%): 0
Air Program Sub Part

Point Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	CO	5.3609100000		
	HCL	0.0243436500		
	NH3	0.2252720000		
	NO2	8.0756500000		
	PB	0.0000000000		
	PM	0.8941330000	8.1000000000	lbs/hr
	PM 10	0.8388850000		
	PM 2.5	0.7283890000		
	SO2	4.4824512000		
	VOC	0.3493759000		

SEGMENT INFORMATION: Number: 1 Description: IVAP RILEY NYLON DOWTHERM

Source Classification Code: 10200402 SCC Description: 10-100 Million Btu/hr **

Actual Annual Throughput: 69.06

Max. Hourly Operation Rate: .29 SCC Units: 1000 Gallons Burned

State Sensitive: N Trace%: 0 Ash%: 0 Sulfur%: .82

Permitted Equipment: N Heat Content (MMBTU): 154

Insignificant Activity: N

Pollution Prevention: N Throughput Limit:

Throughput Unit:

Pollution Prevention Comments:
Segment Comments: FOR STAND-BY ONLY WHEN SEG 09 GOES ON LINE.

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
VOC	Federal factor (auto calc)	0.2800000000					0.00966840		
HCL	Supplied factor (auto calc)	0.7050000000					0.02434365		

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

NH3	Supplied factor (auto calc)	0.8000000000	0.02762400
CO	Federal factor (auto calc)	5.0000000000	0.17265000
PM 2.5	Supplied factor (auto calc)	7.5000000000	0.25897500
PM 10	Supplied factor (auto calc)	10.7000000000	0.36947100
PM	Supplied factor (auto calc)	12.3000000000	0.42471900
NO2	Federal factor (auto calc)	55.0000000000	1.89915000
SO2	Supplied factor (auto calc)	128.7400000000	4.44539220

SEGMENT INFORMATION: Number: 2

Description: 1VAP RILEY NYLON DOWTHERM

Source Classification Code:	10200502	SCC Description:	10-100 Million Btu/hr **
Actual Annual Throughput:	0	SCC Units:	1000 Gallons Burned
Max. Hourly Operation Rate:	.312	Trace%:	0
State Sensitive:	N	Ash%:	0
Permitted Equipment:	N	Sulfur%:	.17
Insignificant Activity:	N	Heat Content (MMBTU):	137
Pollution Prevention:	N	Throughput Limit:	
		Throughput Unit:	

Pollution Prevention Comments:

Segment Comments:

Segment Emissions									
Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Federal factor (auto calc)	0.0012500000					0.00000000		
VOC	Federal factor (auto calc)	0.2000000000					0.00000000		
HCL	Supplied factor (auto calc)	0.6580000000					0.00000000		

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

PM 2.5	Material balance (user calc)	1.5500000000	0.00000000
PM	Federal factor (auto calc)	2.0000000000	0.00000000
PM 10	Supplied factor (auto calc)	2.3000000000	0.00000000
CO	Federal factor (auto calc)	5.0000000000	0.00000000
NO2	Federal factor (auto calc)	20.0000000000	0.00000000
SO2	Federal factor (auto calc)	142.0000000000 S	0.00000000

SEGMENT INFORMATION: Number: 3 Description: IVAP RILEY NYLON DOWTHERM

Source Classification Code:	10200602	SCC Description:	10-100 Million Btu/hr
Actual Annual Throughput:	123.53	SCC Units:	Million Cubic Feet Burned
Max. Hourly Operation Rate:	.041	Trace%:	0
State Sensitive:	N	Ash%:	0
Permitted Equipment:	N	Sulfur%:	0
Insignificant Activity:	N	Heat Content (MMBTU):	1020
Pollution Prevention:	N	Throughput Limit:	
		Throughput Unit:	

Pollution Prevention Comments:
Segment Comments:

Segment Emissions									
Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
SO2	Federal factor (auto calc)	0.6000000000					0.03705900		
NH3	Supplied factor (auto calc)	3.2000000000					0.19764800		
VOC	Federal factor (auto calc)	5.5000000000					0.33970750		
PM	Federal factor (auto calc)	7.6000000000					0.46941400		
PM 10	Federal factor (auto calc)	7.6000000000					0.46941400		

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

PM 2.5	Supplied factor (auto calc)	7.6000000000	0.46941400
CO	Federal factor (auto calc)	84.0000000000	5.18826000
NO2	Federal factor (auto calc)	100.0000000000	6.17650000

POINT INFORMATION: Number: 6 Description: VAP 2

Design Capacity & Units: 43 MILLION BTUS
Per HOUR

% Throughput: DEC-FEB: 37 MAR-MAY: 0 JUN-AUG: 16 SEP-NOV: 47
Operating Schedule: Hours/Day: 24 Days/Week: 7 Hours/Year: 8760

State Sensitive: N
Permitted Equipment: N
Space Heat (%): 0
Air Program Sub Part

Point Emissions	Pollutant	Emissions Value:(tpy)	Allowable Value	Units
	CO	3.1411800000		
	HCL	0.0000000000		
	NH3	0.1196640000		
	NO2	3.7395000000		
	PB	0.0000000000		
	PM	0.2842020000	8.1000000000	lbs/hr
	PM 10	0.2842020000		
	PM 2.5	0.2842020000		
	SO2	0.0224370000		
	VOC	0.2056725000		

SEGMENT INFORMATION: Number: 1 Description: 2VAP RILEY NYLON DOWTHERM

Source Classification Code:	10200402	SCC Description:	10-100 Million Btu/hr **
Actual Annual Throughput:	0	SCC Units:	1000 Gallons Burned
Max. Hourly Operation Rate:	.29	Trace%:	0
State Sensitive:	N	Ash%:	0
Permitted Equipment:	N	Sulfur%:	.82
Insignificant Activity:	N	Heat Content (MMBTU):	154
Pollution Prevention:	N	Throughput Limit:	
		Throughput Unit:	

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Pollution Prevention Comments:

Segment Comments: FOR STAND-BY ONLY WHEN SEG 09 GOES ON LINE.

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Supplied factor (auto calc)	0.0040000000					0.00000000		
VOC	Federal factor (auto calc)	0.2800000000					0.00000000		
HCL	Supplied factor (auto calc)	0.7050000000					0.00000000		
NH3	Supplied factor (auto calc)	0.8000000000					0.00000000		
CO	Federal factor (auto calc)	5.0000000000					0.00000000		
PM 2.5	Supplied factor (auto calc)	7.5000000000					0.00000000		
PM 10	Supplied factor (auto calc)	10.7000000000					0.00000000		
PM	Supplied factor (auto calc)	17.4000000000					0.00000000		
NO2	Federal factor (auto calc)	55.0000000000					0.00000000		
SO2	Supplied factor (auto calc)	128.7400000000					0.00000000		

SEGMENT INFORMATION: Number: 2

Description: 2VAP RILEY NYLON DOWTHERM

Source Classification Code:	10200502	SCC Description:	10-100 Million Btu/hr **
Actual Annual Throughput:	0	SCC Units:	1000 Gallons Burned
Max. Hourly Operation Rate:	.312	Trace%:	0
State Sensitive:	N	Ash%:	0
Permitted Equipment:	N	Sulfur%:	.17
Insignificant Activity:	N	Heat Content (MMBTU):	137
Pollution Prevention:	N	Throughput Limit:	
		Throughput Unit:	

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Pollution Prevention Comments:
Segment Comments:

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Federal factor (auto calc)	0.0012500000					0.00000000		
VOC	Federal factor (auto calc)	0.2000000000					0.00000000		
HCL	Supplied factor (auto calc)	0.6580000000					0.00000000		
PM 2.5	Supplied factor (auto calc)	1.5500000000					0.00000000		
PM	Federal factor (auto calc)	2.0000000000					0.00000000		
PM 10	Supplied factor (auto calc)	2.3000000000					0.00000000		
CO	Federal factor (auto calc)	5.0000000000					0.00000000		
NO2	Federal factor (auto calc)	20.0000000000					0.00000000		
SO2	Supplied factor (auto calc)	24.1400000000					0.00000000		

SEGMENT INFORMATION: Number: 3

Description: 2VAP RILEY NYLON DOWTHERM

Source Classification Code: 10200602

SCC Description: 10-100 Million Btu/hr

Actual Annual Throughput: 74.79

SCC Units: Million Cubic Feet Burned

Max. Hourly Operation Rate: .041

State Sensitive: N

Trace%: 0 Ash%: 0 Sulfur%: 0

Permitted Equipment: N

Heat Content (MMBTU): 1020

Insignificant Activity: N

Throughput Limit:

Pollution Prevention: N

Throughput Unit:

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Pollution Prevention Comments:
Segment Comments:

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
SO2	Federal factor (auto calc)	0.6000000000					0.02243700		
NH3	Supplied factor (auto calc)	3.2000000000					0.11966400		
VOC	Federal factor (auto calc)	5.5000000000					0.20567250		
PM	Federal factor (auto calc)	7.6000000000					0.28420200		
PM 10	Federal factor (auto calc)	7.6000000000					0.28420200		
PM 2.5	Federal factor (auto calc)	7.6000000000					0.28420200		
CO	Federal factor (auto calc)	84.0000000000					3.14118000		
NO2	Federal factor (auto calc)	100.0000000000					3.73950000		

STACK INFORMATION: Number: 4

Description: Stack 4 Description

Stack Height(ft): 96
 Stack Diameter(ft): 4.59
 Exit Gas Temperature(F): 78
 Gas Flow Rate(ACFM): 39900
 Exit Gas Velocity(ft/sec): 40.19
 Stack Type: V
 Plume Height(ft): 0
 Permitted Equipment: N

UTM Zone: 17
 UTM Vertical(KM): 4214.39
 UTM Horizontal(KM): 686.69
 GEP Stack Height: 0
 GEP Building Height: 0
 GEP Building Length: 0
 GEP Bulding Width: 0
 Rough Terrain: N
 Elevation (ft above MSL): 1280

Stack Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	PM	12.3500000000		
	PM 10	11.0600000000		
	PM 2.5	6.3200000000		
	VOC	0.3800000000		

Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report

2009

Registration No: 80517
 Plant Name: INVISTA S.a r.l. - Waynesboro

FIPS County Code: 820
 Plant ID: 00009

Year of Emissions: 2009
 Last Annual Update: 2011

GENERAL INFORMATION

Facility Name: INVISTA - Waynesboro
 Location Address: 400 DuPont Blvd
 Waynesboro VA 22980
 Mailing Address: 400 DuPont Boulevard
 Waynesboro VA 22980
 Annual Update Contact: Campbell, Brian
 Phone Number: (540) 949 - 2424
 Principal Product: fibres/resn

UTM Zone: 17
 UTM Vertical (KM): 4214.4
 UTM Horizontal (KM): 686.7
 Latitude: 38 ° 3 ' 31 "
 Longitude: -78 ° 52 ' 50 "
 Property Area (Acres): .1
 No. of Employees: 600
 Primary SIC Code: 2824

Comments:

Facility Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	NH3	0.0791577650		
	PM 2.5	36.7750150000		
	PM	43.5362534500		
	SO2	768.1155865500		
	CO	12.6320000000		
	BIPH	0.0000000000		
	VOC	93.9672155000		
	HCL	17.3164401850		
	NO2	237.7401800000		
	PB	0.0013645819		
	PM 10	41.9495028675		

STACK INFORMATION: Number: 1

Description: Stack 1 Description

Stack Height(ft): 250
 Stack Diameter(ft): 13
 Exit Gas Temperature(F): 325
 Gas Flow Rate(ACFM): 204673
 Exit Gas Velocity(ft/sec): 25.7
 Stack Type: V
 Plume Height(ft): 0
 Permitted Equipment: N

UTM Zone: 17
 UTM Vertical(KM): 4214.39
 UTM Horizontal(KM): 686.69
 GEP Stack Height: 0
 GEP Building Height: 0
 GEP Building Length: 0
 GEP Bulding Width: 0
 Rough Terrain: N
 Elevation (ft above MSL): 1280

Stack Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
-----------------	-----------	-----------------------	-----------------	-------

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

CO	12.6320000000
HCL	17.3164401850
NH3	0.0791577650
NO2	237.7401800000
PB	0.0013645819
PM	41.4462534500
PM 10	41.0695028675
PM 2.5	36.1950150000
SO2	768.1155865500
VOC	2.1223655000

POINT INFORMATION: Number: 1 Description: Boiler #1

Design Capacity & Units: 196 MILLION BTUS
Per HOUR

% Throughput: DEC-FEB: 0 MAR-MAY: 0 JUN-AUG: 0 SEP-NOV: 0
Operating Schedule: Hours/Day: 24 Days/Week: 7 Hours/Year: 8760

State Sensitive: N
Permitted Equipment: N
Space Heat (%): 5
Air Program Sub Part

Point Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	CO	0.0000000000		
	HCL	0.0000000000		
	NH3	0.0000000000		
	NO2	0.0000000000		
	PB	0.0000000000		
	PM	0.0000000000	39.6000000000	lbs/hr
	PM 10	0.0000000000		
	PM 2.5	0.0000000000		
	SO2	0.0000000000		
	VOC	0.0000000000		

SEGMENT INFORMATION: Number: 1 Description: 1 COMB.ENGR-#20543/COAL

Source Classification Code:	10200202	SCC Description:	Pulverized Coal: Dry Bottom		
Actual Annual Throughput:	0	SCC Units:	Tons Burned		
Max. Hourly Operation Rate:	7.84	Trace%:	0	Ash%:	9.54
State Sensitive:	N	Sulfur%:	.93		
Permitted Equipment:	N	Heat Content (MMBTU):	26.1		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

0005

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Pollution Prevention Comments:

Segment Comments: SCC CHANGED TO DRV BOTTOM IN 1994

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PM 2.5	Supplied factor (auto calc)	1.6800000000		008	016	0	0.00000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Supplied factor (auto calc)	1.9100000000		008 = Centrifugal Collector - Medium Efficiency	016	0	0.00000000016 = Fabric Filter - High Temperature i.e. T>250F		
PB	Supplied factor (auto calc)	0.0042000000		008 = Centrifugal Collector - Medium Efficiency	016	99.5	0.00000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Supplied factor (auto calc)	1.8700000000		008 = Centrifugal Collector - Medium Efficiency	016		0.00000000016 = Fabric Filter - High Temperature i.e. T>250F		
NH3	Supplied factor (auto calc)	0.0005650000					0.0000000000		
VOC	Federal factor (auto calc)	0.0600000000					0.0000000000		
CO	Supplied factor (auto calc)	0.5000000000					0.0000000000		
HCL	Supplied factor (auto calc)	2.2400000000					0.0000000000		
NO2	Supplied factor (auto calc)	11.0000000000		205			0.0000000000		
SO2	Supplied factor (auto calc)	35.3400000000		205 = LOW NOX BURNERS			0.0000000000		

SEGMENT INFORMATION: Number: 2

Description: 1 COMB ENGR #20543 -6 OIL

Source Classification Code:	10200401	SCC Description:	Grade 6 Oil		
Actual Annual Throughput:	0	SCC Units:	1000 Gallons Burned		
Max. Hourly Operation Rate:	1.324	Trace%:	0	Ash%:	.04
State Sensitive:	N	Sulfur%:	0		
Permitted Equipment:	N	Heat Content (MMBTU):	154		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Pollution Prevention Comments:

Segment Comments: ALLOWED SO2=2LB/MMBTU WITHSEG 09 ON LINE.

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Supplied factor (auto calc)	0.0040000000		008	016		0.0000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 2.5	Supplied factor (auto calc)	10.6000000000		008	016		0.0000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Supplied factor (auto calc)	15.4000000000		008	016		0.0000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Supplied factor (auto calc)	17.6000000000		008	016		0.0000000016 = Fabric Filter - High Temperature i.e. T>250F		
VOC	Federal factor (auto calc)	0.2800000000					0.00000000		
HCL	Supplied factor (auto calc)	0.7050000000					0.00000000		
NH3	Supplied factor (auto calc)	0.8000000000					0.00000000		
CO	Federal factor (auto calc)	5.0000000000					0.00000000		
NO2	Supplied factor (auto calc)	40.0000000000					0.00000000		
SO2	Supplied factor (auto calc)	219.8000000000					0.00000000		

SEGMENT INFORMATION: Number: 3

Description: 1 COMB ENGR #20543-2 OIL

Source Classification Code:	10200501	SCC Description:	>100 MMBtu/hr		
Actual Annual Throughput:	0	SCC Units:	1000 Gallons Burned		
Max. Hourly Operation Rate:	1.42	Trace%:	0	Ash%:	0
State Sensitive:	N	Sulfur%:	.18		
Permitted Equipment:	N	Heat Content (MMBTU):	137		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Pollution Prevention Comments:

Segment Comments:

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Federal factor (auto calc)	0.0000090000		008	016		0.00000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 2.5	Supplied factor (auto calc)	1.5500000000		008 = Centrifugal Collector - Medium Efficiency	016		0.00000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Supplied factor (auto calc)	2.3000000000		008 = Centrifugal Collector - Medium Efficiency	016		0.00000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Supplied factor (auto calc)	3.3000000000		008 = Centrifugal Collector - Medium Efficiency	016		0.00000000016 = Fabric Filter - High Temperature i.e. T>250F		
VOC	Federal factor (auto calc)	0.2000000000					0.000000000		
HCL	Supplied factor (auto calc)	0.6580000000					0.000000000		
NH3	Supplied factor (auto calc)	0.8000000000					0.000000000		
CO	Federal factor (auto calc)	5.0000000000					0.000000000		
NO2	Federal factor (auto calc)	24.0000000000					0.000000000		
SO2	Supplied factor (auto calc)	31.4000000000					0.000000000		

SEGMENT INFORMATION: Number: 4

Description: NATURAL GAS IGNITER

Source Classification Code:	10200601	SCC Description:	> 100 Million BTU/hr		
Actual Annual Throughput:	0	SCC Units:	Million Cubic Feet Burned		
Max. Hourly Operation Rate:	0	Trace%:	0	Ash%:	0
State Sensitive:	N	Sulfur%:	0		
Permitted Equipment:	N	Heat Content (MMBTU):	1020		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Pollution Prevention Comments:

Segment Comments:

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
SO2	Federal factor (auto calc)	0.6000000000					0.00000000		
NH3	Supplied factor (auto calc)	3.2000000000					0.00000000		
VOC	Federal factor (auto calc)	5.5000000000					0.00000000		
PM	Federal factor (auto calc)	7.6000000000					0.00000000		
PM 10	Supplied factor (auto calc)	7.6000000000					0.00000000		
PM 2.5	Supplied factor (auto calc)	7.6000000000					0.00000000		
CO	Federal factor (auto calc)	84.0000000000					0.00000000		
NO2	Supplied factor (auto calc)	140.0000000000					0.00000000		

POINT INFORMATION: Number: 2 Description: Boiler #2

Design Capacity & Units: 209 MILLION BTUS
Per HOUR

% Throughput: DEC-FEB: 32 MAR-MAY: 37 JUN-AUG: 31 SEP-NOV: 0

Operating Schedule: Hours/Day: 24 Days/Week: 7 Hours/Year: 8760

State Sensitive: N
Permitted Equipment: N
Space Heat (%): 5
Air Program Sub Part

Point Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	CO	7.1055000000		
	HCL	10.2305948850		
	NH3	0.0671955850		
	NO2	138.7117800000		
	PB	0.0008133767		
	PM	12.1928894500	39.3000000000	lbs/hr
	PM 10	2.8117608675		
	PM 2.5	10.9345800000		
	SO2	444.7670981500		

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

VOC 0.8016307000

SEGMENT INFORMATION: Number: 1 Description: 2 COMB.ENGR-#20185/COAL

Source Classification Code:	10200202	SCC Description:	Pulverized Coal: Dry Bottom		
Actual Annual Throughput:	25018	SCC Units:	Tons Burned		
Max. Hourly Operation Rate:	8.86	Trace%:	0	Ash%:	9.55
State Sensitive:	N	Sulfur%:	.94		
Permitted Equipment:	N	Heat Content (MMBTU):	26.1		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

Pollution Prevention Comments:

Segment Comments: SCC CHANGED TO DRY BOTTOM IN 1994

Segment Emissions									
Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Supplied factor (auto calc)	0.0130000000		008	016	99.5	0.00081308016 = Fabric Filter - High Temperature i.e. T>250F		
PM 2.5	Material balance (user calc)	1.6800000000		008 = Centrifugal Collector - Medium Efficiency	016		10.38000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Material balance (user calc)	1.8700000000		008 = Centrifugal Collector - Medium Efficiency	016		1.89890000016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Material balance (user calc)	2.0100000000		008 = Centrifugal Collector - Medium Efficiency	016		11.15000000016 = Fabric Filter - High Temperature i.e. T>250F		
NH3	Supplied factor (auto calc)	0.0005650000					0.00706758		
VOC	Federal factor (auto calc)	0.0600000000					0.75054000		
CO	Supplied factor (auto calc)	0.5000000000					6.25450000		
HCL	Material balance (user calc)	2.2400000000					10.20000000		
NO2	Material balance (user calc)	11.0000000000					136.34900000		
SO2	Supplied factor (auto calc)	35.3400000000					442.06806000		

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

SEGMENT INFORMATION: Number: 2

Description: 2 COMB ENGR #20185 -6 OIL

Source Classification Code:	10200401	SCC Description:	Grade 6 Oil		
Actual Annual Throughput:	29.03	SCC Units:	1000 Gallons Burned		
Max. Hourly Operation Rate:	1.411	Trace%:	0	Ash%:	0
State Sensitive:	N	Sulfur%:	.82		
Permitted Equipment:	N	Heat Content (MMBTU):	154		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

Pollution Prevention Comments:

Segment Comments: ALLOWED SO2=2LB/MMBTU WITHSEG 09 ON LINE.

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Supplied factor (auto calc)	0.0040000000		008	016	99.5	0.00000029016 = Fabric Filter - High Temperature i.e. T>250F		
PM 2.5	Material balance (user calc)	7.5000000000		008	016	99.5	0.55418000016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Material balance (user calc)	17.2000000000		008	016	99.5	0.98615000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Material balance (user calc)	10.7000000000		008	016		0.85607500016 = Fabric Filter - High Temperature i.e. T>250F		
VOC	Federal factor (auto calc)	0.2800000000					0.00406420		
HCL	Supplied factor (auto calc)	0.7050000000					0.01023307		
NH3	Supplied factor (auto calc)	0.8000000000					0.01161200		
CO	Federal factor (auto calc)	5.0000000000					0.07257500		
NO2	Supplied factor (auto calc)	40.0000000000					0.58060000		
SO2	Supplied factor (auto calc)	128.7400000000					1.86866110		

3

Description: 2 COMB ENGR #20185-2 OIL

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

SEGMENT INFORMATION: Number: 10200501
 Source Classification Code: 10200501
 Actual Annual Throughput: 61.89
 Max. Hourly Operation Rate: 1.514
 State Sensitive: N
 Permitted Equipment: N
 Insignificant Activity: N
 Pollution Prevention: N

SCC Description: >100 MMBtu/hr
 SCC Units: 1000 Gallons Burned
 Trace%: 0 Ash%: 0 Sulfur%: .18
 Heat Content (MMBTU): 137
 Throughput Limit:
 Throughput Unit:

Pollution Prevention Comments:
 Segment Comments:

Segment Emissions		Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
Pollutant	Method								
PB	Federal factor (auto calc)	0.0000090000		008	016	99.5	0.0000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 2.5	Material balance (user calc)	1.5500000000		008	016	99.5	0.0004000016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Federal factor (auto calc)	2.0000000000		008	016	99.5	0.00030945016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Federal factor (auto calc)	2.3000000000		008	016	99.5	0.00035586016 = Fabric Filter - High Temperature i.e. T>250F		
VOC	Federal factor (auto calc)	0.2000000000					0.00618900		
HCL	Supplied factor (auto calc)	0.6580000000					0.02036181		
NH3	Supplied factor (auto calc)	0.8000000000					0.02475600		
CO	Federal factor (auto calc)	5.0000000000					0.15472500		
NO2	Federal factor (auto calc)	24.0000000000					0.74268000		
SO2	Supplied factor (auto calc)	26.6900000000					0.82592205		

SEGMENT INFORMATION: Number: 4

Description: NATURAL GAS IGNITER

SCC Description:

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

> 100 Million BTU/hr

Source Classification Code:	10200601	SCC Units:	Million Cubic Feet Burned
Actual Annual Throughput:	14.85	Trace%:	0
Max. Hourly Operation Rate:	0	Ash%:	0
State Sensitive:	N	Sulfur%:	0
Permitted Equipment:	N	Heat Content (MMBTU):	1020
Insignificant Activity:	N	Throughput Limit:	
Pollution Prevention:	N	Throughput Unit:	

Pollution Prevention Comments:
Segment Comments:

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
SO2	Federal factor (auto calc)	0.6000000000					0.00445500		
NH3	Supplied factor (auto calc)	3.2000000000					0.02376000		
VOC	Federal factor (auto calc)	5.5000000000					0.04083750		
PM	Federal factor (auto calc)	7.6000000000					0.05643000		
PM 10	Supplied factor (auto calc)	7.6000000000					0.05643000		
CO	Federal factor (auto calc)	84.0000000000					0.62370000		
NO2	Supplied factor (auto calc)	140.0000000000					1.03950000		

POINT INFORMATION: Number: 3 Description: Boiler #3

Design Capacity & Units: 209 MILLION BTUS
Per HOUR

% Throughput: DEC-FEB: 31 MAR-MAY: 0 JUN-AUG: 13 SEP-NOV: 56
Operating Schedule: Hours/Day: 24 Days/Week: 7 Hours/Year: 8760

State Sensitive: N
Permitted Equipment: N
Space Heat (%): 5
Air Program Sub Part

Point Emissions:	Pollutant	Emissions Value (tpy)	Allowable Value Units
-------------------------	------------------	------------------------------	------------------------------

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

CO	5.5265000000		
HCL	7.0858453000		
NH3	0.0119621800		
NO2	99.0284000000		
PB	0.0005512052		
PM	29.2533640000	39.3000000000	lbs/hr
PM 10	38.2577420000		
PM 2.5	25.2604350000		
SO2	323.3484884000		
VOC	1.3207348000		

SEGMENT INFORMATION: Number: 1 Description: 3 COMB.ENGR-#19955/COAL

Source Classification Code:	10200202	SCC Description:	Pulverized Coal: Dry Bottom		
Actual Annual Throughput:	42344	SCC Units:	Tons Burned		
Max. Hourly Operation Rate:	8.36	Trace%:	0	Ash%:	9.54
State Sensitive:	N	Sulfur%:	.93		
Permitted Equipment:	N	Heat Content (MMBTU):	26.1		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

Pollution Prevention Comments:

Segment Comments: SCC CHANGED TO DRY BOTTOM IN 1994

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Supplied factor (auto calc)	0.0130000000		008	016	99.8	0.00055047016 = Fabric Filter - High Temperature i.e. T>250F		
PM 2.5	Material balance (user calc)	1.6800000000		008	016		24.93000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Material balance (user calc)	1.8700000000		008	016		37.81000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Material balance (user calc)	1.9100000000		008	016		28.56000000016 = Fabric Filter - High Temperature i.e. T>250F		
NH3	Federal factor (auto calc)	0.0005650000					0.01196218		
VOC	Federal factor (auto calc)	0.0600000000					1.27032000		

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

CO	Material balance (user calc)	0.5000000000		4.73000000
HCL	Material balance (user calc)	2.2400000000		7.06000000
NO2	Material balance (user calc)	11.0000000000	205	96.54000000
			205 = LOW NOX BURNERS	
SO2	Material balance (user calc)	35.7200000000		318.62450000

SEGMENT INFORMATION: Number: 2

Description: 3 COMB ENGR #19955 -6 OIL

Source Classification Code:	10200401	SCC Description:	Grade 6 Oil		
Actual Annual Throughput:	73.32				
Max. Hourly Operation Rate:	1.411	SCC Units:	1000 Gallons Burned		
State Sensitive:	N	Trace%:	0	Ash%:	0
Permitted Equipment:	N	Heat Content (MMBTU):	154	Sulfur%:	.82
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

Pollution Prevention Comments:

Segment Comments: ALLOWED SO2=2LB/MMBTU WITHSEG 09 ON LINE.

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Supplied factor (auto calc)	0.0040000000		008	016	99.5	0.00000073016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Supplied factor (auto calc)	10.7000000000		008	016		0.39226200016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Supplied factor (auto calc)	17.4000000000		008	016		0.63788400016 = Fabric Filter - High Temperature i.e. T>250F		
VOC	Federal factor (auto calc)	0.2800000000					0.01026480		
HCL	Supplied factor (auto calc)	0.7050000000					0.02584530		
CO	Federal factor (auto calc)	5.0000000000					0.18330000		

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

PM 2.5	Supplied factor (auto calc)	7.5000000000		0.27495000
NO2	Supplied factor (auto calc)	40.0000000000		1.46640000
SO2	Federal factor (auto calc)	157.0000000000	S	4.71960840

SEGMENT INFORMATION: Number: 3

Description: 3 COMB ENGR #19955-2 OIL

Source Classification Code:	10200501	SCC Description:	>100 MMBtu/hr		
Actual Annual Throughput:	0	SCC Units:	1000 Gallons Burned		
Max. Hourly Operation Rate:	1.514	Trace%:	0	Ash%:	0
State Sensitive:	N	Sulfur%:	.17		
Permitted Equipment:	N	Heat Content (MMBTU):	137		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

Pollution Prevention Comments:

Segment Comments:

Segment Emissions		Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PM 2.5	Material balance (user calc)	1.5500000000		008	014	99.5	0.00000500014 = Mist Eliminator - High Velocity i.e. V>250 Ft/Min		
PB	Federal factor (auto calc)	0.0000090000		008	016	99.5	0.00000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM	Federal factor (auto calc)	2.0000000000		008	016	99.5	0.00000000016 = Fabric Filter - High Temperature i.e. T>250F		
PM 10	Federal factor (auto calc)	2.3000000000		008	016	99.5	0.00000000016 = Fabric Filter - High Temperature i.e. T>250F		
VOC	Federal factor (auto calc)	0.2000000000					0.00000000		
HCL	Supplied factor (auto calc)	0.6580000000					0.00000000		
CO	Federal factor (auto calc)	5.0000000000					0.00000000		
NO2	Federal factor (auto calc)	24.0000000000					0.00000000		

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

SO2 Federal factor (auto calc) 142.000000000 S 0.00000000

SEGMENT INFORMATION: Number: 4

Description: NATURAL GAS IGNITERS

Source Classification Code:	10200601	SCC Description:	> 100 Million BTU/hr		
Actual Annual Throughput:	14.6	SCC Units:	Million Cubic Feet Burned		
Max. Hourly Operation Rate:	0	Trace%:	0	Ash%:	0
State Sensitive:	N	Sulfur%:	0		
Permitted Equipment:	N	Heat Content (MMBTU):	1020		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

Pollution Prevention Comments:

Segment Comments:

Segment Emissions		Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
Pollutant	Method								
SO2	Federal factor (auto calc)	0.6000000000					0.00438000		
VOC	Federal factor (auto calc)	5.5000000000					0.04015000		
PM	Federal factor (auto calc)	7.6000000000					0.05548000		
PM 10	Supplied factor (auto calc)	7.6000000000					0.05548000		
PM 2.5	Supplied factor (auto calc)	7.6000000000					0.05548000		
CO	Federal factor (auto calc)	84.0000000000					0.61320000		
NO2	Supplied factor (auto calc)	140.0000000000					1.02200000		

POINT INFORMATION: Number: 5

Description: VAP 1

State Sensitive: N

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Design Capacity & Units: 43 MILLION BTUS
Per HOUR

% Throughput: DEC-FEB: 0 MAR-MAY: 0 JUN-AUG: 0 SEP-NOV: 0
Operating Schedule: Hours/Day: 24 Days/Week: 7 Hours/Year: 8760

Permitted Equipment: N
Space Heat (%): 0
Air Program Sub Part

Point Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	CO	0.0000000000		
	HCL	0.0000000000		
	NH3	0.0000000000		
	NO2	0.0000000000		
	PB	0.0000000000		
	PM	0.0000000000	8.1000000000	lbs/hr
	PM 10	0.0000000000		
	PM 2.5	0.0000000000		
	SO2	0.0000000000		
	VOC	0.0000000000		

SEGMENT INFORMATION: Number: 1 Description: 1VAP RILEY NYLON DOWTHERM

Source Classification Code: 10200402 SCC Description: 10-100 Million Btu/hr **
 Actual Annual Throughput: 0
 Max. Hourly Operation Rate: .29 SCC Units: 1000 Gallons Burned
 State Sensitive: N Trace%: 0 Ash%: 0 Sulfur%: .82
 Permitted Equipment: N Heat Content (MMBTU): 154
 Insignificant Activity: N Throughput Limit:
 Pollution Prevention: N Throughput Unit:

Pollution Prevention Comments:
 Segment Comments: FOR STAND-BY ONLY WHEN SEG 09 GOES ON LINE.

Segment Emissions		Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
Pollutant	Method								
VOC	Federal factor (auto calc)	0.2800000000					0.00000000		
HCL	Supplied factor (auto calc)	0.7050000000					0.00000000		

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

NH3	Supplied factor (auto calc)	0.8000000000	0.00000000
CO	Federal factor (auto calc)	5.0000000000	0.00000000
PM 2.5	Supplied factor (auto calc)	7.5000000000	0.00000000
PM 10	Supplied factor (auto calc)	10.7000000000	0.00000000
PM	Supplied factor (auto calc)	12.3000000000	0.00000000
NO2	Federal factor (auto calc)	55.0000000000	0.00000000
SO2	Supplied factor (auto calc)	128.7400000000	0.00000000

SEGMENT INFORMATION: Number: 2

Description: 1VAP RILEY NYLON DOWTHERM

Source Classification Code:	10200502	SCC Description:	10-100 Million Btu/hr **
Actual Annual Throughput:	0	SCC Units:	1000 Gallons Burned
Max. Hourly Operation Rate:	.312	Trace%:	0
State Sensitive:	N	Ash%:	0
Permitted Equipment:	N	Sulfur%:	.17
Insignificant Activity:	N	Heat Content (MMBTU):	137
Pollution Prevention:	N	Throughput Limit:	
		Throughput Unit:	

Pollution Prevention Comments:

Segment Comments:

Segment Emissions									
Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Federal factor (auto calc)	0.0012500000					0.00000000		
VOC	Federal factor (auto calc)	0.2000000000					0.00000000		
HCL	Supplied factor (auto calc)	0.6580000000					0.00000000		

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

PM 2.5	Material balance (user calc)	1.5500000000	0.00000000
PM	Federal factor (auto calc)	2.0000000000	0.00000000
PM 10	Supplied factor (auto calc)	2.3000000000	0.00000000
CO	Federal factor (auto calc)	5.0000000000	0.00000000
NO2	Federal factor (auto calc)	20.0000000000	0.00000000
SO2	Federal factor (auto calc)	142.0000000000 S	0.00000000

SEGMENT INFORMATION: Number: 3

Description: 1VAP RILEY NYLON DOWTHERM

Source Classification Code:	10200602	SCC Description:	10-100 Million Btu/hr
Actual Annual Throughput:	0	SCC Units:	Million Cubic Feet Burned
Max. Hourly Operation Rate:	.041	Trace%:	0
State Sensitive:	N	Ash%:	0
Permitted Equipment:	N	Sulfur%:	0
Insignificant Activity:	N	Heat Content (MMBTU):	1020
Pollution Prevention:	N	Throughput Limit:	
		Throughput Unit:	

Pollution Prevention Comments:
Segment Comments:

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
SO2	Federal factor (auto calc)	0.6000000000					0.00000000		
NH3	Supplied factor (auto calc)	3.2000000000					0.00000000		
VOC	Federal factor (auto calc)	5.5000000000					0.00000000		
PM	Federal factor (auto calc)	7.6000000000					0.00000000		
PM 10	Federal factor (auto calc)	7.6000000000					0.00000000		

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

PM 2.5	Supplied factor (auto calc)	7.6000000000	0.00000000
CO	Federal factor (auto calc)	84.0000000000	0.00000000
NO2	Federal factor (auto calc)	100.0000000000	0.00000000

POINT INFORMATION: Number: 6 Description: VAP 2

Design Capacity & Units: 43 MILLION BTUS
Per HOUR

State Sensitive: N
Permitted Equipment: N
Space Heat (%): 0
Air Program Sub Part

% Throughput: DEC-FEB: 37 MAR-MAY: 0 JUN-AUG: 16 SEP-NOV: 47
Operating Schedule: Hours/Day: 24 Days/Week: 7 Hours/Year: 8760

Point Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	CO	0.0000000000		
	HCL	0.0000000000		
	NH3	0.0000000000		
	NO2	0.0000000000		
	PB	0.0000000000		
	PM	0.0000000000	8.1000000000	lbs/hr
	PM 10	0.0000000000		
	PM 2.5	0.0000000000		
	SO2	0.0000000000		
	VOC	0.0000000000		

SEGMENT INFORMATION: Number: 1 Description: 2VAP RILEY NYLON DOWTHERM

Source Classification Code:	10200402	SCC Description:	10-100 Million Btu/hr **
Actual Annual Throughput:	0	SCC Units:	1000 Gallons Burned
Max. Hourly Operation Rate:	.29	Trace%:	0
State Sensitive:	N	Ash%:	0
Permitted Equipment:	N	Sulfur%:	.82
Insignificant Activity:	N	Heat Content (MMBTU):	154
Pollution Prevention:	N	Throughput Limit:	
		Throughput Unit:	

Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report

Pollution Prevention Comments:

Segment Comments: FOR STAND-BY ONLY WHEN SEG 09 GOES ON LINE.

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Supplied factor (auto calc)	0.0040000000					0.00000000		
VOC	Federal factor (auto calc)	0.2800000000					0.00000000		
HCL	Supplied factor (auto calc)	0.7050000000					0.00000000		
NH3	Supplied factor (auto calc)	0.8000000000					0.00000000		
CO	Federal factor (auto calc)	5.0000000000					0.00000000		
PM 2.5	Supplied factor (auto calc)	7.5000000000					0.00000000		
PM 10	Supplied factor (auto calc)	10.7000000000					0.00000000		
PM	Supplied factor (auto calc)	17.4000000000					0.00000000		
NO2	Federal factor (auto calc)	55.0000000000					0.00000000		
SO2	Supplied factor (auto calc)	128.7400000000					0.00000000		

SEGMENT INFORMATION: Number: 2

Description: 2VAP RILEY NYLON DOWTHERM

Source Classification Code:	10200502	SCC Description:	10-100 Million Btu/hr **
Actual Annual Throughput:	0	SCC Units:	1000 Gallons Burned
Max. Hourly Operation Rate:	.312	Trace%:	0
State Sensitive:	N	Ash%:	0
Permitted Equipment:	N	Sulfur%:	.17
Insignificant Activity:	N	Heat Content (MMBTU):	137
Pollution Prevention:	N	Throughput Limit:	
		Throughput Unit:	

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Pollution Prevention Comments:
Segment Comments:

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
PB	Federal factor (auto calc)	0.0012500000					0.00000000		
VOC	Federal factor (auto calc)	0.2000000000					0.00000000		
HCL	Supplied factor (auto calc)	0.6580000000					0.00000000		
PM 2.5	Supplied factor (auto calc)	1.5500000000					0.00000000		
PM	Federal factor (auto calc)	2.0000000000					0.00000000		
PM 10	Supplied factor (auto calc)	2.3000000000					0.00000000		
CO	Federal factor (auto calc)	5.0000000000					0.00000000		
NO2	Federal factor (auto calc)	20.0000000000					0.00000000		
SO2	Supplied factor (auto calc)	24.1400000000					0.00000000		

SEGMENT INFORMATION: Number: 3

Description: 2VAP RILEY NYLON DOWTHERM

Source Classification Code: 10200602
 Actual Annual Throughput: 0
 Max. Hourly Operation Rate: .041
 State Sensitive: N
 Permitted Equipment: N
 Insignificant Activity: N
 Pollution Prevention: N

SCC Description: 10-100 Million Btu/hr
 SCC Units: Million Cubic Feet Burned
 Trace%: 0 Ash%: 0 Sulfur%: 0
 Heat Content (MMBTU): 1020
 Throughput Limit:
 Throughput Unit:

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Pollution Prevention Comments:
Segment Comments:

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
SO2	Federal factor (auto calc)	0.6000000000					0.00000000		
NH3	Supplied factor (auto calc)	3.2000000000					0.00000000		
VOC	Federal factor (auto calc)	5.5000000000					0.00000000		
PM	Federal factor (auto calc)	7.6000000000					0.00000000		
PM 10	Federal factor (auto calc)	7.6000000000					0.00000000		
PM 2.5	Federal factor (auto calc)	7.6000000000					0.00000000		
CO	Federal factor (auto calc)	84.0000000000					0.00000000		
NO2	Federal factor (auto calc)	100.0000000000					0.00000000		

STACK INFORMATION: Number: 3

Description: 16.0 MMBTU/HR_DOW_VAPORIZ

Stack Height(ft): 250
 Stack Diameter(ft): 9.5
 Exit Gas Temperature(F): 295
 Gas Flow Rate(ACFM): 314600
 Exit Gas Velocity(ft/sec): 73.97
 Stack Type: V
 Plume Height(ft): 0
 Permitted Equipment: N

UTM Zone: 17
 UTM Vertical(KM): 4214.4
 UTM Horizontal(KM): 686.7
 GEP Stack Height: 0
 GEP Building Height: 0
 GEP Building Length: 0
 GEP Bulding Width: 0
 Rough Terrain: N
 Elevation (ft above MSL): 1280

Stack Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	CO	0.0000000000		
	HCL	0.0000000000		
	NH3	0.0000000000		
	NO2	0.0000000000		

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

PM	0.0000000000
PM 10	0.0000000000
PM 2.5	0.0000000000
SO2	0.0000000000
VOC	0.0000000000

POINT INFORMATION: Number: 41 Description: VAP3

Design Capacity & Units: 16 MILLION BTUS
Per HOUR

% Throughput: DEC-FEB: 0 MAR-MAY: 0 JUN-AUG: 0 SEP-NOV: 0

Operating Schedule: Hours/Day: 24 Days/Week: 7 Hours/Year: 8760

State Sensitive: N
Permitted Equipment: N
Space Heat (%): 0
Air Program Sub Part

Point Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	CO	0.0000000000	1.1000000000 4.8000000000	lbs/hr tons/yr
	HCL	0.0000000000		
	NH3	0.0000000000		
	NO2	0.0000000000	2.7000000000 11.8000000000	lbs/hr tons/yr
	PM	0.0000000000	0.3000000000 1.2000000000	lbs/hr tons/yr
	PM 10	0.0000000000	0.1000000000 0.6000000000	lbs/hr tons/yr
	PM 2.5	0.0000000000		
	SO2	0.0000000000	5.8000000000 25.2000000000	lbs/hr tons/yr
	VOC	0.0000000000		

SEGMENT INFORMATION: Number: 1 Description: 16.0 MMBTU/HR DOW VAP3

Source Classification Code:	10200502	SCC Description:	10-100 Million Btu/hr **
Actual Annual Throughput:	0	SCC Units:	1000 Gallons Burned
Max. Hourly Operation Rate:	135	Trace%:	0
State Sensitive:	N	Ash%:	0
Permitted Equipment:	N	Sulfur%:	.17
Insignificant Activity:	N	Heat Content (MMBTU):	137
Pollution Prevention:	N	Throughput Limit:	
		Throughput Unit:	

Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report

Pollution Prevention Comments:

Segment Comments:

Segment Emissions		Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
Pollutant	Method								
VOC	Supplied factor (auto calc)	0.2000000000					0.00000000		
HCL	Supplied factor (auto calc)	0.6580000000					0.00000000		
NH3	Supplied factor (auto calc)	0.8000000000					0.00000000		
PM 2.5	Federal factor (auto calc)	1.5500000000					0.00000000		
PM 10	Supplied factor (auto calc)	2.3000000000					0.00000000		
PM	Supplied factor (auto calc)	3.3000000000					0.00000000		
CO	Supplied factor (auto calc)	5.0000000000					0.00000000		
NO2	Supplied factor (auto calc)	20.0000000000					0.00000000		
SO2	Supplied factor (auto calc)	24.1400000000					0.00000000		

SEGMENT INFORMATION: Number: 2

Description: 16.0 MMBTU/HR VAP. NG

Source Classification Code:	10200602	SCC Description:	10-100 Million Btu/hr		
Actual Annual Throughput:	0	SCC Units:	Million Cubic Feet Burned		
Max. Hourly Operation Rate:	.178	Trace%:	0	Ash%:	0
State Sensitive:	N	Sulfur%:	0		
Permitted Equipment:	N	Heat Content (MMBTU):	1020		
Insignificant Activity:	N	Throughput Limit:			
Pollution Prevention:	N	Throughput Unit:			

**Commonwealth of Virginia
Department of Environmental Quality
Consolidated Plant Emissions Report**

Pollution Prevention Comments:
Segment Comments:

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
SO2	Supplied factor (auto calc)	0.6000000000					0.00000000		
NH3	Supplied factor (auto calc)	3.2000000000					0.00000000		
VOC	Federal factor (auto calc)	5.5000000000					0.00000000		
PM	Supplied factor (auto calc)	7.6000000000					0.00000000		
PM 10	Supplied factor (auto calc)	7.6000000000					0.00000000		
PM 2.5	Supplied factor (auto calc)	7.6000000000					0.00000000		
NO2	Supplied factor (auto calc)	50.0000000000					0.00000000		
CO	Supplied factor (auto calc)	84.0000000000					0.00000000		

STACK INFORMATION: Number: 4

Stack Height(ft): 96
 Stack Diameter(ft): 4.59
 Exit Gas Temperature(F): 78
 Gas Flow Rate(ACFM): 39900
 Exit Gas Velocity(ft/sec): 40.19
 Stack Type: V
 Plume Height(ft): 0
 Permitted Equipment: N

Description: Stack 4 Description

UTM Zone: 17
 UTM Vertical(KM): 4214.39
 UTM Horizontal(KM): 686.69
 GEP Stack Height: 0
 GEP Building Height: 0
 GEP Building Length: 0
 GEP Bulding Width: 0
 Rough Terrain: N
 Elevation (ft above MSL): 1280

Stack Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	PM	0.0000000000		
	PM 10	0.0000000000		
	PM 2.5	0.0000000000		
	VOC	0.0000000000		

Attachment D

PSD Impact Analysis Calculations

Attachment D.1

Emission Calculations for Impact Analysis

Attachment D.1
Emission Calculations for Impact Analysis

Source: INVISTA
Registration Number: 80517

The facility proposes to use distillate oil as a back-up fuel, equivalent to approximately 8% of the time,

Fuel Burning Scenarios:

Scenario #1 - Natural Gas

Scenario #2 - Distillate Oil

Scenario #3 - LPG - Limited 24-Hour Usage

Scenario #1 - Natural Gas (24-Hours)

Natural Gas (100% Natural Gas) - Potential to Emit

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	1020	BTU/ft ³ (taken from AP-42 Chapter 1.4 (7/98))
Fuel Consumption:	97.06	Mft ³ /hr (1 boiler)
	194.12	Mft ³ /hr (2 boiler combined)
	0.097	MMft ³ /hr (1 boiler)
	0.194	MMft ³ /hr (2 boilers combined)
	4,658.82	Mft ³ /24-Hours (2 boiler combined)
	4.66	MMft ³ /24-Hours (2 boilers combined)

Pollutant	Emission Factor	Fuel Consumption		Emissions	
		1 Boiler	2 Boilers	1 Boiler	2 Boilers
	(lb/MMft ³)	(MMft ³ /hr)	(MMft ³ /24-hr)	(lb/hr)	(lb/24-hour)
PM (filterable) ^a	1.9	0.097	4.66	0.18	8.85
PM (condensable) ^a	5.7	0.097	4.66	0.55	26.56
PM (total) ^a	—	0.097	4.66	0.74	35.41
PM-10 ^a	7.6	0.097	4.66	0.74	35.41
PM-2.5 ^a	7.6	0.097	4.66	0.74	35.41
SO ₂ ^a	0.6	0.097	4.66	0.06	2.80
CO ^b	38	0.097	4.66	3.69	177.04
NO _x ^b	37	0.097	4.66	3.59	172.38
VOC ^a	5.5	0.097	4.66	0.53	25.62

Notes:

a - Emission factor taken from AP-42, Chapter 1.4 (7/98).

b - Emission factor taken from facility application, based on vendor guarantee.

Attachment D.1
Emission Calculations for Impact Analysis

Scenario #2 - Distillate Oil (24-Hours)

Distillate Oil (502,748 gal/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	138000	BTU/gal
Fuel Consumption:	717.39	gal/hr (1 boiler)
	1434.78	gal/hr (2 boilers combined)
	0.717	1000 gal/hr (1 boiler)
	1.435	1000 gal/hr (2 boilers combined)
	17.2	1000 gal/24-hr (1 boiler)
	34.435	1000 gal/24-hr (2 boilers combined)
Sulfur Content:	0.05	% Sulfur (from application)

Pollutant	Emission Factor (lb/1000 gal)	Fuel Consumption		Emissions	
		1 Boiler	2 Boilers	1 Boiler	2 Boilers
		(1000 gal/hr)	(1000 gal/24-hr)	(lb/hr)	(lb/24-hour)
PM (filterable) ^c	2	0.72	34.43	1.43	68.87
PM (condensable) ^c	1.3	0.72	34.43	0.93	44.77
PM (total) ^c	--	0.72	34.43	2.37	113.63
PM-10 ^c	1	0.72	34.43	0.72	34.43
PM-2.5 ^c	0.25	0.72	34.43	0.18	8.61
SO2 ^c	142*S	0.72	34.43	5.09	244.49
CO ^d	8.1	0.72	34.43	5.81	278.92
NOx ^d	13.8	0.72	34.43	9.90	475.20
VOC ^c	0.2	0.72	34.43	0.14	6.89

Notes:

c - Emission factor taken from AP-42, Chapter 1.3 (5/10).

d - Emission factor taken from facility application, based on vendor guarantee.

Scenario #3 - LPG: Limited Usage (24-Hours)

LPG (103,869 gal/yr)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	91500	BTU/gal
Fuel Consumption:	1081.97	gal/hr (1 boiler)
	2163.93	gal/hr (2 boilers combined) - Requested Limit
	1.082	1000 gal/hr (1 boiler)
	2.164	1000 gal/hr (2 boilers combined) - Requested Limit
	33,600.0	gal/yr (2 boilers combined) - Requested Limit
	33.600	1000 gal/yr (2 boilers combined) - Requested Limit
Sulfur Content:	185.000	mg/kg (from ASTM D1835)

Attachment D.1
Emission Calculations for Impact Analysis

Pollutant	Emission Factor	Fuel Consumption ^j		Emissions	
		1 Boiler	2 Boilers	1 Boiler	2 Boilers
	(lb/1000 gal)	(1000 gal/hr)	(1000 gal/yr)	(lb/hr)	(lb/24-hour)
PM (filterable) ⁱ	0.2	1.08	33.60	0.22	6.72
PM (condensable) ⁱ	0.5	1.08	33.60	0.54	16.80
PM (total)	--	1.08	33.60	0.76	23.52
PM-10 ⁱ	0.7	1.08	33.60	0.76	23.52
PM-2.5 ⁱ	0.7	1.08	33.60	0.76	23.52
SO ₂ ^k	0.784	1.08	33.60	0.85	26.34
CO ⁱ	7.5	1.08	33.60	8.11	252.00
NO _x ⁱ	13	1.08	33.60	14.07	436.80
VOC ⁱ	0.8	1.08	33.60	0.87	26.88

i - Emission factor taken from AP-42, Chapter 1.5 (5/10).

j - The annual throughput limit of 33,600 gal/yr is less than the 24-hour throughput; therefore 24-hour emissions are based on the annual throughput limit. The annual fuel throughput limit for LPG is included in the permit.

k - See emission factor calculations in Attachment A.

Worst-case Scenario Potential to Emit (PTE) for PSD Applicability

Pollutant	Natural Gas	Distillate Oil	LPG: Limited	Worst Case	
	(lb/24-Hours)	(lb/24-Hours)	(lb/24-Hours)	(lb/24-Hours)	Scenario
PM (filterable)	8.85	68.87	6.72	68.87	Dist. Oil
PM (condensable)	26.56	44.77	16.80	44.77	Dist. Oil
PM (total)	35.41	113.63	23.52	113.63	Dist. Oil
PM-10	35.41	34.43	23.52	35.41	Nat. Gas
PM-2.5	35.41	8.61	23.52	35.41	Nat. Gas
SO ₂	2.80	244.49	26.34	244.49	Dist. Oil
CO	177.04	278.92	252.00	278.92	Dist. Oil
NO _x	172.38	475.20	436.80	475.20	Dist. Oil
VOC	25.62	6.89	26.88	26.88	LPG

Attachment D.2

Impact Analysis – Summary

Attachment D.2
Impact Analysis - Summary

PSD - Class I Impact Analysis

Proposed Project - 24-hour Emissions

Since the proposed boilers are capable of burning both natural gas and distillate oil, 24-hour emissions are calculated for both fuels. The worst-case fuel for each pollutant is then used for the impact analysis.

Pollutant	2 Boilers - Combined			Worst-Case (lb/24-hour)	Worst-case Fuel
	Natural Gas	Distillate Oil	LPG - Limited Operation		
	(lb/24-hour)	(lb/24-hour)	(lb/24-hour)		
PM (filterable)	8.85	68.87	6.72	--	--
PM (condensable)	26.56	44.77	16.80	--	--
PM (total)	35.41	113.63	23.52	113.63	Dist. Oil
PM-10	35.41	34.43	23.52	35.41	Nat. Gas
PM-2.5	35.41	8.61	23.52	35.41	Nat. Gas
SO2	2.80	244.49	26.34	244.49	Dist. Oil
CO	177.04	278.92	252.00	278.92	Dist. Oil
NOx	172.38	475.20	436.80	475.20	Dist. Oil

Attachment D.2
Impact Analysis - Summary

Maximum 24-Hour Concentrations During Contemporaneous Period

Actual Fuel Usage - December 5, 2007 for Maximum 24-Hour Carbon Monoxide (CO) Emissions

Emission Unit	Residual Oil		Natural Gas	
	(gal/day)	(1,000 gal/day)	(scf/day)	(MMcf/day)
Boiler #1 (2-205 (B#1))	19,224.0	19.2	381,768.0	3.82E-01
Boiler #2 (2-205 (B#2))	14,659.2	14.7	505,056.0	5.05E-01
Vaporizer #2 (2-205 (V#2))	0.0	0.0	241,716.0	2.42E-01
Vaporizer #3 (2-205 (V#3))	0.0	0.0	289,102.0	2.89E-01
Totals	33,883.2	33.9	1,417,642.0	1.42E+00

Actual Fuel Usage - November 22, 2008 for Maximum 24-Hour Emissions (Excluding CO)

Emission Unit	Coal	Natural Gas	
	(tons/day)	(scf/day)	(MMcf/day)
Boiler #3	160.0	10,085.0	1.01E-02
Totals	160.0	10,085.0	1.01E-02

Emission Factors for Fuels

Pollutant	Coal	Residual Oil	Natural Gas
	(lb/ton)	(lb/1000 gal)	(lb/MMcf)
PM (Total)	1.89	23.1	4.6
PM-10	1.85	18.71	4.6
PM-2.5	1.67	12.19	4.6
SO2	76	314	0.6
CO	0.5	5	84
NOx	11	55	100

Maximum CO Emissions - 12/5/07

Fuel	Usage	Em. factors	24-Hour CO Emissions
	(ton/24-hour) or (1000 gal/24-hr)	(lb/ton) or (lb/1000 gal)	(lb/24-hours)
Residual Oil	33.9	5	169.42
Natural Gas	1.42E+00	84	119.08
Total	--	--	288.50

Attachment D.2
Impact Analysis - Summary

Maximum Emissions (Excluding CO) - 11/22/08

Pollutant	Coal	Em. Factors	Emissions	Nat. Gas	Em. Factors	Emissions
	(ton/24 hr)	(lb/ton)	(lb/24-hr)	(MMcf/24 hr)	(lb/MMcf)	(lb/24-hr)
PM (Total)	160.0	1.89	302.4	1.01E-02	4.6	4.64E-02
PM-10	160.0	1.85	296	1.01E-02	4.6	4.64E-02
PM-2.5	160.0	1.67	267.2	1.01E-02	4.6	4.64E-02
SO2	160.0	76	12160	1.01E-02	0.6	6.05E-03
NOx	160.0	11	1760	1.01E-02	100	1.01E+00

Total Maximum Emissions During Contemporaneous Period

Pollutant	Total Emissions
	(lb/24-hr)
PM (Total)	302.45
PM-10	296.05
PM-2.5	267.25
SO2	12160.01
CO	288.50
NOx	1761.01

Comparison of 24-hour Emissions

Pollutant	Proposed Emissions	Max. Contemp. Emissions	Net Change	Increase or Decrease?
	(lb/24-hour)	(lb/24-hour)	(lb/24-hour)	
PM (Total)	113.63	302.45	-188.81	Decrease
PM-10	35.41	296.05	-260.64	Decrease
PM-2.5	35.41	267.25	-231.84	Decrease
SO2	244.49	12160.01	-11915.52	Decrease
CO	278.92	288.50	-9.58	Decrease
NOx	475.20	1761.01	-1285.81	Decrease

Attachment E

Title V Emission Calculations

Attachment E.1

Title V Emission Summary

Attachment E.1
Title V Emissions Summary

Title V Emissions - Proposed Boilers

Pollutant	Proposed Boilers
	(tons/yr)
PM (filterable)	2.05
PM (condensable)	4.98
PM (total)	7.03
PM-10	6.46
PM-2.5	6.46
SO2	2.29
CO	33.12
NOx	33.83
VOC	4.68
Lead	7.20E-04
Beryllium	1.14E-04
Cobalt	6.86E-05
Nickel	1.82E-03
Phosphorous	0.00E+00
Formaldehyde	7.65E-02

Title V Emissions - Spandex Processes

Pollutant	Spandex Processes - Total
	(tons/yr)
VOC	164.7
Formaldehyde	5.2

Combined Emissions for Title V Applicability

Pollutant	Spandex Processes	Proposed Boilers	Total	Title V Threshold	Title V?
	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	
PM (filterable)	--	2.05	2.05	100	No
PM (condensable)	--	4.98	4.98	100	No
PM (total)	--	7.03	7.03	100	No
PM-10	--	6.46	6.46	100	No
PM-2.5	--	6.46	6.46	100	No
SO2	--	2.29	2.29	100	No
CO	--	33.12	33.12	100	No
NOx	--	33.83	33.83	100	No
VOC	164.7	4.68	169.38	100	Yes
Lead	--	7.20E-04	7.20E-04	10	No
Beryllium	--	1.14E-04	1.14E-04	10	No
Cobalt	--	6.86E-05	6.86E-05	10	No
Nickel	--	1.82E-03	1.82E-03	10	No
Phosphorous	--	0.00E+00	0.00E+00	10	No
Formaldehyde	5.2	7.65E-02	5.28	10	No
Total HAPs	5.2	7.93E-02	5.28	25	No

Attachment E.2

Title V – Hazardous Air Pollutant Emission Calculations

INDUSTRIAL BOILER WORKSHEET

CRITERIA POLLUTANTS

Source Name: INVISTA S.a. r.l.
 Registration #: 80517
 Boiler Capacity: 198.0 million BTU/hr

THROUGHPUTS	#6 OIL	#5 OIL	#4 OIL	#2 OIL	#1 OIL	GAS	LPG
per hour	0 gal	0 gal	0 gal	1435 gal	0 gal	194,1176 mcf	2164 gal
per year	0 gal	0 gal	0 gal	502,748 gal	0 gal	1,623,134 mcf	103,869 gal
max. allow. / yr	11,563,200 gal	11,880,000 gal	12,045,000 gal	12,568,696 gal	12,943,881 gal	1,700,471 mcf	18,956,066 gal
Hours/yr	0	0	0	350	0	8362	48

EMISSION FACTORS:

FUEL:	#6 OIL	#5 OIL	#4 OIL	#2 OIL	#1 OIL	GAS	LPG
UNITS:	(<<----- lb/1000 gallons ----->>)					(lb/MMBtu)	lb/1000 gallons
SCC#:	10200401	10200404	10200504	10200501	10200501	10200602	10201002
SULFUR	0.5 %	0.5 %	0.5 %	0.05 %	0.5 %	0 %	15 gr/10
Heat Content	150,000	146,000	144,000	138,000	134,000	1,020	91,500
	BTU/gal	BTU/gal	BTU/gal	BTU/gal	BTU/gal	BTU/ft3	BTU/gal

Emission Factors	#6 OIL	#5 OIL	#4 OIL	#2 OIL	#1 OIL	GAS	LPG
PM (filterable)	9.19 (a) S +3.22 (a)	10 (a)	7 (a)	2 (a)	2 (a)	5.7 (g)	0.2 (h)
PM (condensable)	1.5 (b)	1.5 (b)	1.5 (b)	1.3 (b)	1.3 (b)	1.9 (g)	0.5 (h)
PM10	8.03 (d) S +2.65 (d)	8.60 (d)	6.02 (d)	1 (e)	1 (e)	7.6 (g*)	0.7 (h)
PM2.5	5.23 (d) S +1.73 (d)	5.60 (d)	3.92 (d)	0.25 (e)	0.25 (e)	7.6 (g*)	0.7 (h*)
SO2	157 (a) S	157 (a) S	150 (a) S	142 (a) S	142 (a) S	0.6 (g)	0.1 (h) S
CO	5 (a)	5 (a)	5 (a)	5 (a)	5 (a)	84 (f)	7.5 (h)
NOx	55 (a)	55 (a)	20 (a)	20 (a)	20 (a)	100 (f)	13 (h)
VOC	0.28 (c)	0.28 (c)	0.20 (c)	0.20 (c)	0.20 (c)	5.5 (g)	0.8 (h)

LEAD is included on HAPs worksheet

EMISSIONS, UNCONTROLLED & PREDICTED: max hourly and expected annual

LB/HR	#6 OIL	#5 OIL	#4 OIL	#2 OIL	#1 OIL	GAS	LPG
PM (filterable)	0.00	0.00	0.00	2.87	0.00	1.11	0.43
PM (condensable)	0.00	0.00	0.00	1.87	0.00	0.37	1.08
PM10	0.00	0.00	0.00	1.43	0.00	1.48	1.51
PM2.5	0.00	0.00	0.00	0.36	0.00	1.48	1.51
SO2	0.00	0.00	0.00	10.19	0.00	0.12	3.25
CO	0.00	0.00	0.00	7.17	0.00	16.31	16.23
NOx	0.00	0.00	0.00	28.70	0.00	19.41	28.13
VOC	0.00	0.00	0.00	0.29	0.00	1.07	1.73

LEAD is included as a HAP

TN/YR	#6 OIL	#5 OIL	#4 OIL	#2 OIL	#1 OIL	GAS	LPG
PM (filterable)	0.00	0.00	0.00	0.50	0.00	4.63	0.01
PM (condensable)	0.00	0.00	0.00	0.33	0.00	1.54	0.03
PM10	0.00	0.00	0.00	0.25	0.00	6.17	0.04
PM2.5	0.00	0.00	0.00	0.06	0.00	6.17	0.04
SO2	0.00	0.00	0.00	1.78	0.00	0.49	0.08
CO	0.00	0.00	0.00	1.26	0.00	68.17	0.39
NOx	0.00	0.00	0.00	5.03	0.00	81.16	0.68
VOC	0.00	0.00	0.00	0.05	0.00	4.46	0.04

LEAD is included as a HAP

SUGGESTED PERMIT LIMITS:
 uncontrolled pollutants
 < 0.5 tn/yr not listed

NOTES:

- (a) Table 1.3-1 (9/98)
- (b) Table 1.3-2 (9/98)
- (c) Table 1.3-3 (9/98)
- (d) Table 1.3-5 (9/98)
- (e) Table 1.3-6 (9/98)
- (f) Table 1.4-1 (7/98)
- (g) Table 1.4-2 (7/98)
- (g*) Estimate from Table 1.4-2 (7/98)
- (h) Table 1.5-1 (7/08)
- (h*) Estimate from Table 1.5-1 (10/96)

	lb/hr	tons/yr
PM (Total)	4.73	7.03
PM10	1.51	6.46
PM2.5	1.51	6.27
SO2	10.19	2.35
CO	16.31	69.82
NOx	28.70	86.86
VOC	1.7	4.56
LEAD is included as a HAP		

INDUSTRIAL BOILER WORKSHEET

HAZARDOUS AIR POLLUTANTS

Source Name: INVISTA S.a. r.l.
 Registration #: 80517
 Boiler Capacity: 198 million BTU/hr

(See Notes & Exemptions Info Below)
 (See 9 VAC 5-60-300 C.7 for exemption to Toxics Regulation for certain boilers)

THROUGHPUTS	#6 OIL	#5 OIL	#4 OIL	#2 OIL	#1 OIL	GAS	LPG
per hour	0 gal	0 gal	0 gal	1435 gal	0 gal	194 mcf	2164 gal
per year	0 gal	0 gal	0 gal	502,748 gal	0 gal	1,623,134 mcf	103,869 gal
Hours/yr	0	0	0	350	0	8362	48

EMISSION FACTORS:

FUEL:	#6 OIL	#5 OIL	#4 OIL	#2 OIL	#1 OIL	GAS	LPG
UNITS:	(<<----- lb/1000 gallons ----->>)			(<<-----lbs/10^12 Btu----->>)		lbs/10^6 cu ft	lbs/10^12 Btu
SCC#:	10200401	10200404	10200504	10200501	10200501	10200602	10201002
Heat Content	150,000	146,000	144,000	138,000	134,000	1,020	91,500
	BTU/gal	BTU/gal	BTU/gal	BTU/gal	BTU/gal	BTU/R3	BTU/gal

Emission Factors	Only Lead and HAPs from Exemption Note listed (See Note Below)							
Lead	1.51E-03 (1)	1.51E-03 (1)	1.51E-03 (1)	9 (3)	9 (3)	5.00E-04 (5)	4.84E-01 (5*)	
Beryllium	2.78E-05 (1)	2.78E-05 (1)	2.78E-05 (1)	3 (3)	3 (3)	1.20E-05 (6)	1.16E-02 (6*)	
Cobalt	6.02E-03 (1)	6.02E-03 (1)	6.02E-03 (1)			8.40E-05 (6)	8.14E-02 (6*)	
Nickel	8.45E-02 (1)	8.45E-02 (1)	8.45E-02 (1)	3 (3)	3 (3)	2.10E-03 (6)	2.03E+00 (6*)	
Phosphorous	9.46E-03 (1)	9.46E-03 (1)	9.46E-03 (1)					
Formaldehyde	6.10E-02 (2)	6.10E-02 (2)	6.10E-02 (2)	6.10E-02 (2)*	6.10E-02 (2)*	7.50E-02 (7)	7.27E+01 (7*)	

* lb/kgal

EMISSIONS, UNCONTROLLED & PREDICTED: max hourly and expected annual

LB/HR	#6 OIL	#5 OIL	#4 OIL	#2 OIL	#1 OIL	GAS	LPG
Lead	0.00E+00	0.00E+00	0.00E+00	1.78E-03	0.00E+00	9.71E-05	9.59E-05
Beryllium	0.00E+00	0.00E+00	0.00E+00	5.94E-04	0.00E+00	2.33E-06	2.30E-06
Cobalt	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.63E-05	1.61E-05
Nickel	0.00E+00	0.00E+00	0.00E+00	5.94E-04	0.00E+00	4.08E-04	4.03E-04
Phosphorous	0.00E+00						
Formaldehyde	0.00E+00	0.00E+00	0.00E+00	8.75E-02	0.00E+00	1.46E-02	1.44E-02

TN/YR	#6 OIL	#5 OIL	#4 OIL	#2 OIL	#1 OIL	GAS	LPG
Lead	0.00E+00	0.00E+00	0.00E+00	3.12E-04	0.00E+00	4.06E-04	2.30E-06
Beryllium	0.00E+00	0.00E+00	0.00E+00	1.04E-04	0.00E+00	9.74E-06	5.53E-08
Cobalt	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.82E-05	3.87E-07
Nickel	0.00E+00	0.00E+00	0.00E+00	1.04E-04	0.00E+00	1.70E-03	9.67E-06
Phosphorous	0.00E+00						
Formaldehyde	0.00E+00	0.00E+00	0.00E+00	1.53E-02	0.00E+00	6.09E-02	3.45E-04

SUGGESTED PERMIT LIMITS: same as uncontrolled per toxics policy	LB/HR Exemption	TN/YR Exemption	Exempt ?	LB/HR	TN/YR
Lead	0.00990	0.02175	YES	-	-
Beryllium	0.00013	0.00029	NO	5.94E-04	1.14E-04
Cobalt	0.00330	0.00725	YES	-	-
Nickel	0.06600	0.14500	YES	-	-
Phosphorous	0.00660	0.01450	YES	-	-
Formaldehyde	0.08250	0.17400	NO	8.75E-02	7.65E-02

NOTES:

- (1) Table 1.3-11 (9/98)
- (2) Table 1.3-8 (9/98)
- (3) Table 1.3-10 (9/98)
- (4) Table 1.3-9 (9/98)
- (5) Table 1.4-2 (7/98)
- (6) Table 1.4-4 (7/98)
- (7) Table 1.4-3 (7/98)
- (5*) Table 1.4-2 (7/98) - Converted NG factors to lb/10^12 Btus
- (6*) Table 1.4-4 (7/98) - Converted NG factors to lb/10^12 Btus
- (7*) Table 1.4-3 (7/98) - Converted NG factors to lb/10^12 Btus

Exemptions:

The following are not exempt for the fuels listed at maximum of 100 MMBtu/hr & 8760 hrs:		All other HAPs with AP-42 factors are exempt at maximum throughput
Beryllium	2,1	Hourly & Annual
Cobalt	6,5,4	Hourly & Annual
Nickel	6,5,4	Annual
Phosphorous	6,5,4	Annual
Formaldehyde	6,5,4,2,1	Annual

Attachment D

Short-term and Annual Sulfur Dioxide Emission Limitation Calculations

Attachment D.1
Short-term Sulfur Dioxide Emission Limitation Calculations

Source: INVISTA
Registration Number: 80517

Distillate Oil (502,748 gal/yr)
(Fuel throughput remains unchanged; calculations are provided to determine short term SO2 limits)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	138000	BTU/gal
Fuel Consumption:	717.39	gal/hr (1 boiler)
	1434.78	gal/hr (2 boilers combined)
	0.717	1000 gal/hr (1 boiler)
	1.435	1000 gal/hr (2 boilers combined)
	17.2	1000 gal/24-hr (1 boiler)
	34.435	1000 gal/24-hr (2 boilers combined)
Sulfur Content:	0.0015	% Sulfur (from application)

Pollutant	Emission Factor	Fuel Consumption		Emissions	
		1 Boiler	2 Boilers	1 Boiler	2 Boilers
	(lb/1000 gal)	(1000 gal/hr)	(1000 gal/24-hr)	(lb/hr)	(lb/24-hour)
SO2 ^a	142*S	0.72	34.43	0.15	7.33

Notes:

- a - Emission factor taken from AP-42, Chapter 1.3 (5/10).
- b - Emission factor taken from facility application, based on vendor guarantee.
- c - Emissions in bold are included as permit limitations

Emission Factor Calculation for Attachment A of Title V Permit:

SO2 Emissions (1 Boiler)	0.15	lb/hr
Heat Input (1 Boiler)	99	MMBtu/hr
SO2 Emission Factor (lb/MMBtu)	0.0015	lb/MMBtu

Attachment D.2
Annual Sulfur Dioxide Emission Limitation Calculations

Source: INVISTA
Registration Number: 80517

The facility uses distillate oil as a back-up fuel, equivalent to approximately 8% of the time, for instances of natural gas curtailment. The facility also proposes to use LPG as a back-up fuel for approximately 48 hours per year, in the event of natural gas curtailment.

Distillate Oil (502,748 gal/yr)
(Fuel throughput remains unchanged; calculations are provided to determine annual SO2 limits)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	138000	BTU/gal
Fuel Consumption:	717.39	gal/hr (1 boiler)
	1434.78	gal/hr (2 boilers combined)
	0.717	1000 gal/hr (1 boiler)
	1.435	1000 gal/hr (2 boilers combined)
Fuel Throughput:	502748.0	gal/yr (2 boilers combined)
	502.748	1000 gal/yr (2 boilers combined)
Sulfur Content:	0.0015	% Sulfur (as proposed under 9 VAC 5-80-100)

Pollutant	Emission Factor (lb/1000 gal)	2 Boilers	
		Fuel Consumption (1000 gal/yr)	Emissions (tons/yr)
SO2	142*S	502.75	0.05

LPG (33,600 gal/yr)
(Fuel throughput remains unchanged; calculations are provided to determine annual SO2 limits)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	91500	BTU/gal
Fuel Consumption:	1081.97	gal/hr (1 boiler)
	2163.93	gal/hr (2 boilers combined)
	1.082	1000 gal/hr (1 boiler)
	2.164	1000 gal/hr (2 boilers combined)
Fuel Throughput:	33600.0	gal/yr (2 boilers combined)
	33.600	1000 gal/yr (2 boilers combined)
Sulfur Content:	185.000	mg sulfur / kg fuel (from ASTM D1835)

Pollutant	Emission Factor (lb/1000 gal)	2 Boilers - LPG	
		Fuel Consumption (1000 gal/yr)	Emissions (tons/yr)
SO2	0.784	33.60	1.32E-02

Attachment D.2
Annual Sulfur Dioxide Emission Limitation Calculations

Natural Gas (1,629,438 Mft³/yr)

(Fuel throughput remains unchanged; calculations are provided to determine annual SO₂ limits)

Heat input:	99	MMBtu/hr (1 boiler)
	198	MMBtu/hr (2 boilers combined)
Heat Content:	1020	BTU/ft ³ (taken from AP-42 Chapter 1.4 (7/98))
Fuel Consumption:	97.06	Mft ³ /hr (1 boiler)
	194.12	Mft ³ /hr (2 boiler combined)
	0.097	MMft ³ /hr (1 boiler)
	0.194	MMft ³ /hr (2 boilers combined)
Fuel Throughput:	1,629,438	Mft ³ /yr (2 boiler combined)
	1629.438	MMft ³ /yr (2 boiler combined)

Pollutant	Emission Factor	2 Boilers - NG	
		Fuel Consumption	Emissions
	(lb/MMft ³)	(MMft ³ /yr)	(tons/yr)
SO ₂	0.6	1629.44	0.49

Combined Natural Gas, Distillate Oil, and LPG - Potential to Emit (PTE)

Pollutant	LPG	Natural Gas	Distillate Oil	Combined Fuels
	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)
SO ₂	1.32E-02	0.49	0.05	0.56

* Emissions in **bold** are included as permit limitations.

Attachment E

Boiler 5 – Stack Test Results (conducted February 18, 2014)



INVISTA S.à r.L.
400 DuPont Blvd.
Waynesboro, VA 22980

540-949-2000 Tel
www.INVISTA.com

April 17, 2014

Ms. Amy T. Owens
Director – Valley Regional Office
Virginia Department of Environmental Quality
P.O. Box 3000
4411 Early Road
Harrisonburg, Virginia 22801

RECEIVED
D
by
APR 18 2014

To: _____
File: _____

RE: *INVISTA Waynesboro New Source Review Initial Compliance Determination - Boilers: Test Report for Nitrogen Oxides and Carbon Monoxide for Boilers 4 and 5.*

Dear Ms. Owens:

INVISTA S.à r.l. (INVISTA) owns and operates a textile manufacturing facility in Waynesboro, Virginia (the “Waynesboro facility”). INVISTA is submitting one hardcopy of the initial boiler performance test results for the purpose of demonstrating compliance with New Source Review Air Permit No. 80517, Condition 17, issued November 16, 2012. The performance test includes measurement of emissions of nitrogen oxides and carbon monoxides from boiler 5 as specified in the test protocol submitted to and approved by DEQ on January 6, 2014. Condition 17 specifies that “The test on one boiler will satisfy the initial testing requirements for the other boiler provided they are identical units.” For the INVISTA Waynesboro facility both, Boiler 4 and Boiler 5 are identical units so only one unit (Boiler 5) was tested.

The sampling vendor was Environmental Source Samplers, Inc. (ESS), from Wilmington, North Carolina. The test date was February 18, 2014.

Condition 18, Visible Emissions Evaluation, is not included in this report and will be submitted at a later date. According to condition 18, the facility has 180 days from boiler start up (January 14, 2014, as noted in the boiler startup notification sent to the DEQ on January 24, 2014) to complete the Visible Emissions Evaluation condition.

If you have any questions or need further information, please contact Mr. Brian Campbell at (540) 949-2424.

Sincerely,

INVISTA S.à r.l.

Stuart E. Carter
Plant Manager



ENVIRONMENTAL SOURCE SAMPLERS, INC. — AIR QUALITY CONSULTANTS

**INVISTA, S.à r.l. -- WAYNESBORO PLANT
BOILER NO. 5
INITIAL COMPLIANCE AIR EMISSIONS TEST SERIES
FEBRUARY 18, 2014**

ESS PROJECT ID 0713-14

RECEIVED

APR 18 2014

To: _____

File: _____

**Prepared for:
INVISTA, S.à r.l. -- Waynesboro Plant
400 DuPont Boulevard
Waynesboro, Virginia**

**Prepared on 3/12/2014 by:
Environmental Source Samplers, Inc.
436 Raleigh Street
Wilmington, North Carolina**

436 Raleigh Street • Wilmington, NC 28412
Phone 910.799.1055 • Fax 910.799.1056
ess@essknowsair.com • ESSKnowsAir.com

CERTIFICATION

This test report is submitted to INVISTA, S.à r.l., by Environmental Source Samplers, Inc., covering air emissions sampling conducted at the Waynesboro Plant on February 18, 2014. ESS certifies that it is an Air Emissions Testing Body (AETB) and operated within the requirements of ASTM D7036-04 during this test project. The data and results presented in this report are believed to be representative of the actual operating and test parameters.

Analytical reports are reviewed for completeness, accuracy, adherence to method protocol, and compliance with quality assurance guidelines and NELAC 2003 standards. The results relate only to the laboratory samples listed. Neither this certification nor report shall be reproduced except in full, without written approval of ESS. ESS laboratory (VELAP ID: 460039) is accredited through the Virginia Environmental Laboratory Accreditation Program (VELAP) for methods pertaining to filterable particulate matter, sulfuric acid, total reduced sulfur and hydrogen sulfide. ESS only subcontracts to laboratories with NELAP accreditation. All test results provided meet all requirements of NELAP unless labeled otherwise. Justification will be provided in Appendix D for all results that do not meet NELAP requirements. Certificates of Accreditation are available upon request.

Results Reviewed By:



Melanie Parks, Operations Manager.
March 12, 2014

Report Reviewed and Finalized By:



Mark Looney, President
March 12, 2014



TABLE OF CONTENTS

SECTION		PAGE
1.0	INTRODUCTION	4
2.0	SUMMARY OF RESULTS	6
3.0	PROCESS DESCRIPTION AND OPERATION	8
4.0	SAMPLING POINT LOCATION	10
5.0	FIELD AND ANALYTICAL PROCEDURES	13
APPENDICES		
A	FIELD DATA SHEETS	16
B	CALCULATIONS	20
C	OPERATIONAL DATA	23
D	CALIBRATION DATA	25
E	TEST PROTOCOL	41



SECTION 1 INTRODUCTION



1.0 INTRODUCTION

Environmental Source Samplers, Inc. (ESS) conducted air emissions sampling at the Invista, Sà.r.l Waynesboro Plant located in Waynesboro, Virginia on the stack for Boiler No. 5 on February 18, 2014.

Three (3) sixty (60) minute test runs were conducted for oxides of nitrogen (NO_x), carbon monoxide (CO), and oxygen (O₂) emissions. U.S. Environmental Protection Agency (EPA) Methods 7e, 10 and 3a, appearing in §40 CFR Part 60, Appendix A, were used to perform this gas sampling, respectively.

Visible emissions testing, as mentioned in the included protocol, will be conducted and submitted under separate cover by Invista.

The purpose of this test series was to demonstrate compliance with VA DEQ registration No. 80517.

Personnel present included:

Mr. Brian Campbell, Invista, S.à r.l.
Mr. Tiberiu Munteanu, QSTI, Environmental Source Samplers, Inc.
Mr. Kenny Satterthwaite, Environmental Source Samplers, Inc.
Mr. Brad Helsabeck, Environmental Source Samplers, Inc.



SECTION 2

SUMMARY OF RESULTS



2.0 SUMMARY OF RESULTS

The test results are summarized below and detailed on the following pages. Field data sheets are included in Appendix A; calculations in Appendix B; operational data in Appendix C; and calibration data in Appendix D.

**Table 2.1 – BOILER NO. 5 SUMMARY OF RESULTS
AVERAGE OF THREE (3) RUNS**

PARAMETER	RUN 1	RUN 2	RUN 3	THREE RUN AVERAGE	PERMITTED EMISSION LIMIT
NOx (ppmvd)	29.75	29.58	29.61	29.65	N/A
NOx (ppmvd @ 3% O ₂)	29.87	29.57	29.82	29.75	30
CO (ppmvd)	0.613	0.613	0.548	0.591	N/A
CO (ppmvd @ 3% O ₂)	0.615	0.613	0.552	0.593	50
Operating Rate (pph steam)	79,700	75,300	74,900	76,633	N/A

The maximum rated capacity for Boiler No. 5 is 82,000 pph steam.



SECTION 3

PROCESS DESCRIPTION



3.0 PROCESS DESCRIPTION AND OPERATION

The INVISTA Waynesboro, Virginia spandex production facility makes LYCRA® and ELSPAN® brand spandex fiber using a solvent based polymer. The facility is a major source for VOC emissions due to this process. The manufacturing complex includes two modular package boilers providing steam for process heating and HVAC uses.



SECTION 4

SAMPLING POINT LOCATION



4.0 SAMPLING LOCATION

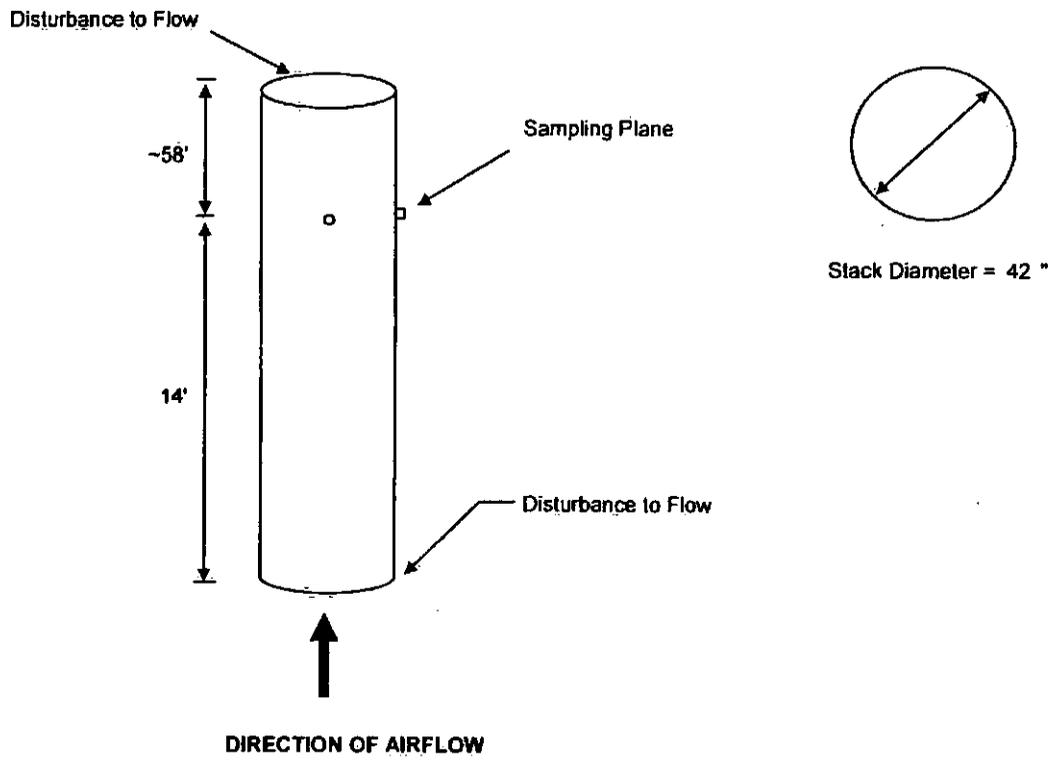
Two (2) 4-inch test ports are located at 90-degree intervals in the stack for Boiler No. 5. The stack has an inside diameter of approximately 3.5 feet at the sampling plane. The test ports are located fourteen feet (14') or 4 stack diameters downstream of the duct breaching(s) and approximately fifty-eight feet (58'), or 16.6 stack diameters upstream of the stack exit.

ESS conducted a stratification test at the test plane. Results of the stratification test are included in Appendix A.

A diagram of the sampling location appears on the following page.



INVISTA
WAYNESBORO, VA
BOILER 5 SAMPLING PLANE



SECTION 5

FIELD & ANALYTICAL PROCEDURES



5.0 FIELD AND ANALYTICAL PROCEDURES

Gaseous Emission Testing

All sampling and analysis procedures used in this testing program conform to the requirements of 40 CFR 60, Appendix A, reference methods 3a, 10 and 7e. For O₂, CO and NO_x sampling, the gas sample was extracted through a heated stainless steel sample probe having an in-stack filter. A heated Teflon lined sample line delivered the gas sample from the heated probe to the VIA MAK II gas-condensing unit. The sample was then directed through an un-heated Teflon sample line to the sample pump and gas manifold, where the appropriate flowrate for each analyzer was set, and the sample gas delivered to the analyzers. An Omega Data Acquisition System (DAS) recorded the data at each of the sampling points, and provided averages for each test run. The DAS is capable of handling eight (8) channels. During this test series, three (3) channels were used to record O₂, CO and NO_x.

EPA Protocol calibration gases were used to calibrate the instruments according to the applicable EPA methodology. The O₂, CO, and NO_x calibration gases have been analyzed according to EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards, September, 1993 and as amended by EPA 600/R-12/531 on June 29, 2012.

NO_x Analyzer

An API Model 200AH analyzer (S/N 394) was used to collect the NO_x data. This monitor uses chemiluminescence in determining NO or NO_x concentrations. NO_x is defined as the sum of the NO and NO₂ gas concentrations. In the determination of NO, the sample is converted to NO₂ through a reaction with ozone generated by the analyzer. A highly sensitive photomultiplier detector tube measures the light emitted by the photon emission. For the determination of NO_x, the sample is directed to the reaction chamber, where the NO₂ is dissociated to form NO via the NO₂ to NO converter. The remainder of the analysis is then as described above through reaction with the ozone.

CO Analyzer

API Model 200 A H Gas Filter Correlation monitors (EPA Designation Reference Method RFCA-C981-054) were used to sample CO. Note that, unlike non-dispersive infrared analyzers, this unit is not subject to interference from carbon dioxide. Therefore, it is not necessary to remove the CO₂ from the gas stream prior to delivering the gas sample to the analyzer.

O₂ Analyzer

Oxygen was monitored with a California Analytical Instruments Model 200 (S/N 1L02003) paramagnetic analyzer. The oxygen meter was calibrated pursuant to EPA and instrument manufacturer specifications.

QUALITY ASSURANCE ACTIVITIES

Gaseous Sampling: O₂, CO, NO_x



Similar quality control and calibration procedures were used for each of the three (3) on-site instrumental gaseous analyzers: O₂, CO and NO_x. Upon arrival at the test site, each analyzer was unpacked and inspected for possible damage. The instruments were plugged in and allowed to warm up a minimum of 2 hours prior to attempting any calibration procedures. Care was taken to ensure that the analyzers were placed in a controlled temperature environment to minimize analyzer drift. The heated sample lines and probes were also allowed to heat to operating temperatures. The gas conditioner was installed and allowed to cool to an operating temperature of about 33 degrees F.

Electrical voltages supplied to the analyzers are critical for correct operation. Line voltages were checked to ensure that at least 110 volts A.C. were maintained. While the instruments and sampling lines were warming up, the DAS and gas manifold system were set up. After the analyzers had stabilized, linearity checks were performed on each analyzer. The, report specified, EPA Protocol calibration gases were introduced to the gas manifold system, and the data recorded with the DAS.

The zero, mid, and high calibration gas was introduced to the O₂, CO and NO_x monitors. Once the calibration procedure had commenced, the span and zero controls were not touched. If it was necessary to adjust the zero or span, then the analyzer linearity check would have been started over. Each gas provided a response to the calibration gas within 2 percent of the span value of the instrument for O₂, CO, and NO_x.

Following the successful completion of the instrument linearity checks, a sampling system bias check was required for the O₂, CO and NO_x analyzers. A leak check was performed across the sampling system consisting of the heated sample line, gas conditioner, unheated Teflon sample line, unheated Teflon calibration line, gas manifold, and sample pump. The zero and mid-range gas for each of the analyzers was delivered to the system. The resulting concentrations were within 5 percent of the data recorded during the analyzer linearity checks previously recorded.

A system response time check was performed on the sampling system. Since CO analyzers are the slowest to respond, the system response time was based upon the data collected from the CO analyzer. The response time was the amount of time for the analyzer to display a 95 percent step change in gas concentration.

Analyzer interference checks were previously conducted on each analyzer in the ESS laboratory. An NO₂ to NO conversion efficiency check was also conducted. The EPA Method 7e conversion efficiency check is performed by introducing NO₂ gas into the analyzer in direct calibration mode and recording the NO_x concentration displayed by the analyzer. The NO₂ to NO conversion efficiency, calculated according to Equation 7E-7, must be greater than or equal to 90 percent.

EPA and VA DEQ procedures were followed in performing equipment calibrations. Procedures outlined in the EPA Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, (EPA/600/R-94/038c) were followed, in addition to procedures outlined in the applicable reference methods.

Test procedures and SOPs have previously been provided to the VA DEQ. Additional references may be found through links at the ESS website: www.ESSknowsAir.com or through the EPA website: www.EPA.gov.



APPENDIX A FIELD DATA



Run 1	O2 %	NOX PPM	CO PPM
Pre Zero	0.037	0.095	0.086
Pre Span	4.859	43.31	24.69

2/19/2014

Stratification

Time	O2 %	NOX PPM	CO PPM	O2 Difference
10:10	2.833	29.28	0.647	
10:11	2.855	29.343	0.676	1 0.014
10:12	2.853	29.578	0.733	
10:13	2.801	29.531	0.776	2 0.068
10:14	2.876	29.398	0.82	
10:15	2.95	29.509	0.826	3 -0.081
10:16	3.084	29.576	0.784	
10:17	3.212	29.274	0.696	2.869
10:18	3.341	29.203	0.623	
10:19	3.433	29.09	0.575	
10:20	3.499	29.125	0.573	
10:21	3.5	29.063	0.573	
10:22	3.476	28.95	0.584	
10:23	3.389	29.045	0.598	
10:24	3.347	29.055	0.617	
10:25	3.214	29.241	0.603	
10:26	3.103	29.436	0.598	
10:27	3.016	29.562	0.614	
10:28	2.973	29.687	0.663	
10:29	2.903	29.611	0.699	
10:30	2.839	29.549	0.715	
10:31	2.936	29.651	0.73	
10:32	3.005	29.773	0.71	
10:33	3.068	29.633	0.697	
10:34	3.16	29.574	0.684	
10:35	3.202	29.476	0.651	
10:36	3.273	29.347	0.625	
10:37	3.37	29.476	0.597	
10:38	3.569	29.312	0.567	
10:39	3.761	29.094	0.541	
10:40	3.726	28.834	0.534	
10:41	3.812	28.881	0.52	
10:42	3.846	29.183	0.511	
10:43	3.757	29.276	0.518	
10:44	3.573	29.321	0.526	
10:45	3.321	29.685	0.555	
10:46	3.082	29.813	0.61	
10:47	2.862	30.188	0.686	
10:48	2.647	30.308	0.773	
10:49	2.517	30.495	0.892	
10:50	2.479	30.588	0.986	
10:51	2.545	30.45	1.057	
10:52	2.609	30.543	1.075	
10:53	2.527	30.284	1.013	
10:54	2.763	30.037	0.956	
10:55	2.96	29.831	0.837	
10:56	3.145	29.671	0.725	
10:57	3.258	29.485	0.648	
10:58	3.289	29.527	0.59	
10:59	3.251	29.527	0.571	
11:00	3.207	29.474	0.588	
11:01	3.113	29.72	0.6	
11:02	3.001	29.684	0.623	
11:03	2.847	29.86	0.627	
11:04	2.724	30.028	0.67	
11:05	2.574	30.178	0.734	
11:06	2.488	30.43	0.806	
11:07	2.47	30.339	0.872	
11:08	2.468	30.355	0.926	
11:09	2.549	30.192	0.93	
AVERAGE	3.071	29.6275	0.696	
Post Zero	0.053	0.107	0.092	
Post Span	4.841	43.12	24.639	



Run 2	O2 %	NOX PPM	CO PPM
Pre Zero	0.053	0.107	0.092
Pre Span	4.841	43.12	24.638

2/18/2014

11:20	2.966	29.573	0.623
11:21	2.963	29.848	0.647
11:22	2.9	29.869	0.685
11:23	2.801	30.064	0.73
11:24	2.724	30.073	0.764
11:25	2.717	30.259	0.83
11:26	2.698	30.339	0.85
11:27	2.752	30.175	0.82
11:28	2.75	30.16	0.826
11:29	2.855	30.37	0.789
11:30	2.929	30.237	0.746
11:31	2.976	30.293	0.716
11:32	3.001	29.979	0.716
11:33	3.045	29.984	0.697
11:34	3.108	29.969	0.67
11:35	3.116	30.206	0.635
11:36	3.109	30.124	0.627
11:37	3.048	30.244	0.63
11:38	3.012	30.213	0.646
11:39	2.793	30.326	0.672
11:40	2.533	29.409	0.783
11:41	2.555	29.539	0.863
11:42	2.508	29.787	0.917
11:43	2.521	29.842	0.907
11:44	2.561	29.644	0.905
11:45	2.706	29.716	0.867
11:46	2.773	29.722	0.859
11:47	2.826	29.811	0.807
11:48	2.883	29.565	0.762
11:49	2.939	29.183	0.743
11:50	2.984	28.643	0.709
11:51	3.016	28.237	0.684
11:52	3.046	28.375	0.681
11:53	3.114	28.193	0.707
11:54	3.1	28.464	0.684
11:55	3.129	28.211	0.644
11:56	3.149	28.306	0.599
11:57	3.124	28.324	0.599
11:58	3.203	28.273	0.626
11:59	3.212	28.244	0.633
12:00	3.201	28.522	0.635
12:01	3.206	28.524	0.648
12:02	3.166	28.672	0.628
12:03	3.151	28.648	0.633
12:04	3.166	28.772	0.636
12:05	3.158	28.895	0.652
12:06	3.201	28.857	0.644
12:07	3.196	29.3	0.655
12:08	3.157	29.107	0.659
12:09	3.201	29.272	0.635
12:10	3.145	29.019	0.635
12:11	3.211	29.107	0.608
12:12	3.175	29.155	0.598
12:13	3.158	29.391	0.586
12:14	3.149	29.318	0.59
12:15	3.133	29.482	0.628
12:16	3.15	29.323	0.662
12:17	3.16	29.396	0.686
12:18	3.116	29.263	0.667
12:19	3.119	29.398	0.655
AVERAGE	2.991	29.39	0.701
Post Zero	0.061	0.114	0.087 ✓
Post Span	4.833	43.069	24.62 ✓



Run 3	O2 %	NOX PPM	CO PPM
Pre Zero	0.061	0.114	0.097
Pre Span	4.833	43.089	24.62

2/18/2014

12:30	3.168	29.498	0.623
12:31	3.155	29.329	0.632
12:32	3.14	29.462	0.635
12:33	3.186	29.212	0.635
12:34	3.187	29.438	0.617
12:35	3.198	29.378	0.589
12:36	3.161	29.551	0.586
12:37	3.109	29.371	0.624
12:38	3.166	29.342	0.646
12:39	3.175	29.338	0.639
12:40	3.153	29.611	0.635
12:41	3.117	29.405	0.639
12:42	3.149	29.689	0.64
12:43	3.122	29.498	0.635
12:44	3.131	29.651	0.65
12:45	3.128	29.491	0.636
12:46	3.114	29.511	0.635
12:47	3.142	29.449	0.635
12:48	3.139	29.573	0.65
12:49	3.116	29.358	0.662
12:50	3.12	29.378	0.688
12:51	3.122	29.234	0.693
12:52	3.16	29.314	0.677
12:53	3.12	29.387	0.648
12:54	3.13	29.407	0.642
12:55	3.152	29.294	0.655
12:56	3.171	29.465	0.677
12:57	3.178	29.38	0.663
12:58	3.188	29.431	0.646
12:59	3.158	29.431	0.635
13:00	3.147	29.418	0.626
13:01	3.126	29.502	0.618
13:02	3.088	29.422	0.617
13:03	3.085	29.596	0.646
13:04	3.092	29.358	0.661
13:05	3.108	29.296	0.66
13:06	3.106	29.331	0.662
13:07	3.111	29.689	0.672
13:08	3.085	29.522	0.667
13:09	3.065	29.46	0.664
13:10	3.086	29.6	0.648
13:11	3.074	29.5	0.659
13:12	3.087	29.64	0.659
13:13	3.085	29.405	0.642
13:14	3.11	29.589	0.617
13:15	3.093	29.409	0.626
13:16	3.113	29.405	0.635
13:17	3.121	29.482	0.635
13:18	3.095	29.287	0.612
13:19	3.099	29.389	0.63
13:20	3.166	29.349	0.65
13:21	3.141	29.496	0.667
13:22	3.113	29.26	0.636
13:23	3.143	29.582	0.619
13:24	3.098	29.484	0.619
13:25	3.049	29.527	0.633
13:26	3.037	29.578	0.657
13:27	3.008	29.436	0.661
13:28	2.996	29.338	0.664
13:29	3.022	29.34	0.666
AVERAGE	3.12	29.44	0.643
Post Zero	0.07	0.121	0.107
Post Span	4.82	43.197	24.55



APPENDIX B CALCULATIONS



INVISTA, WAYNESBORO, VA
 BOILER # 5
 February 18, 2014

RUN NUMBER	1	2	3	AVG.
O2 SPAN (%)	10.97	10.97	10.97	10.97
O2 MEASURED (%)	3.07	2.99	3.12	3.06
O2 SPAN GAS (%)	4.88	4.88	4.88	4.88
O2 PRE-ZERO (%)	0.04	0.05	0.05	0.05
O2 POST ZERO (%)	0.05	0.06	0.07	0.06
O2 PRE-SPAN (%)	4.86	4.84	4.83	4.84
O2 POST SPAN (%)	4.84	4.83	4.82	4.83
INITIAL ZERO CAL BIAS (%)	0.20	0.35	0.35	0.30
FINAL ZERO CAL BIAS (%)	0.35	0.42	0.50	0.42
ZERO DRIFT (%)	0.15	0.07	0.15	0.12
INITIAL SPAN CAL BIAS (%)	-0.22	-0.38	-0.46	-0.35
FINAL SPAN CAL BIAS (%)	-0.38	-0.46	-0.57	-0.47
SPAN DRIFT (%)	-0.16	-0.07	-0.12	-0.12
O2 CORRECTED (%)	3.07	2.99	3.13	3.06

RUN NUMBER	1	2	3	AVG.
NOX SPAN (PPM)	76.63	76.63	76.63	76.63
NOX MEASURED (PPM)	29.83	29.39	29.44	29.49
NOX SPAN GAS (PPM)	43.44	43.44	43.44	43.44
NOX PRE-ZERO (PPM)	0.10	0.11	0.11	0.11
NOX POST ZERO (PPM)	0.11	0.11	0.12	0.11
NOX PRE-SPAN (PPM)	43.31	43.12	43.09	43.17
NOX POST SPAN (PPM)	43.12	43.09	43.20	43.14
INITIAL ZERO CAL BIAS (%)	0.01	0.02	0.03	0.02
FINAL ZERO CAL BIAS (%)	0.02	0.03	0.04	0.03
ZERO DRIFT (%)	0.02	0.01	0.01	0.01
INITIAL SPAN CAL BIAS (%)	0.13	-0.12	-0.16	-0.05
FINAL SPAN CAL BIAS (%)	-0.12	-0.16	-0.02	-0.10
SPAN DRIFT (%)	-0.25	-0.04	0.14	-0.05
NOX CORRECTED (PPM)	29.75	29.58	29.61	29.65

RUN NUMBER	1	2	3	AVG.
CO SPAN (PPM)	47.74	47.74	47.74	47.74
CO MEASURED (PPM)	0.70	0.70	0.64	0.68
CO SPAN GAS (PPM)	24.80	24.80	24.80	24.80
CO PRE-ZERO (PPM)	0.09	0.09	0.10	0.09
CO POST ZERO (PPM)	0.09	0.10	0.11	0.10
CO PRE-SPAN (PPM)	24.69	24.64	24.62	24.65
CO POST SPAN (PPM)	24.64	24.62	24.55	24.60
INITIAL ZERO CAL BIAS (%)	0.18	0.19	0.20	0.19
FINAL ZERO CAL BIAS (%)	0.19	0.20	0.22	0.21
ZERO DRIFT (%)	0.01	0.01	0.02	0.01
INITIAL SPAN CAL BIAS (%)	-0.23	-0.34	-0.38	-0.31
FINAL SPAN CAL BIAS (%)	-0.34	-0.38	-0.52	-0.41
SPAN DRIFT (%)	-0.11	-0.04	-0.15	-0.10
CO CORRECTED (PPM)	0.61	0.61	0.55	0.59

INVISTA, WAYNESBORO, VA
 BOILER # 5
 February 18, 2014

RUN NUMBER	1	2	3	AVG.
DATE	2/18/2014	2/18/2014	2/18/2014	
TIME START (EST)	10:10	11:20	12:30	
TIME STOP (EST)	11:09	12:19	13:29	
O2 (%)	3.07	2.99	3.13	3.06
NOX (PPMVD)	29.75	29.58	29.61	29.65
NOX (PPMVD @ 3% O2)	29.87	29.57	29.82	29.75
NOX (LB/MMBTU)	0.04	0.04	0.04	0.04
CO (PPMVD)	0.613	0.613	0.548	0.591
CO (PPMVD @ 3% O2)	0.615	0.613	0.552	0.593
CO (LB/MMBTU)	0.0005	0.0005	0.0004	0.0004
O2 F-FACTOR	8710	8710	8710	8710



Gaseous Data (NOx) BY METHODS 7E
Derivation of Calculations and Ex. Calculations

- ACE = Analyzer calibration error, percent of calibration span
- B_{WS} = Moisture content of sample gas as measured by Method 4 or other approved method, percent/100
- C_{avg} = Average unadjusted gas concentration indicated by data recorder for the test run, ppmv
- C_d = Pollutant concentration adjusted to dry conditions, ppmv
- C_{dir} = Measured concentration of a calibration gas (low, mid, or high) when introduced in direct calibration mode, ppmv
- C_{eff} = Average effluent gas concentration adjusted for bias, ppmv
- C_M = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppmv
- C_{MA} = Actual concentration of the upscale calibration gas, ppmv
- C_{stack} = Gas concentration in the stack gas as calculated in Section 12.6, ppmv
- C₀ = Average of the initial and final system calibration bias check responses from the low-level (or zero) calibration gas, ppmv
- C_{0A} = Actual concentration of the low-level calibration gas, ppmv
- C_s = Measured concentration of a calibration gas (low, mid or high) when introduced in system calibration mode
- CS = Calibration span, ppmv
- C_v = Manufacturer certified concentration of a calibration gas (low, mid, or high), ppmv
- D = Drift assessment, percent of calibration span
- SB = System bias, percent of calibration span
- SB_i = Pre-run system bias, percent of calibration span
- SB_{Final} = Post-run system bias, percent of calibration span
- SCE = System calibration error, percent of calibration span
- SCE_i = Pre-run system calibration error, percent of calibration span
- SCE_{Final} = Post-run system calibration error, percent of calibration span

$$ACE = \frac{C_{Dir} - C_v}{CS} \times 100$$

$$SB = \frac{C_s - C_{Dir}}{CS} \times 100$$

$$Eff_{NO_2} = \frac{C_{dir}}{C_v} \times 100$$

$$D = |SB_{Final} - SB_i|$$

$$C_{gas} = \frac{(C_{Avg} - C_0) \cdot C_{MA}}{C_M - C_0}$$

$$C_{gas @ 3\% O_2} = C_{gas} \times \frac{(20.9 - 3)}{(20.9 - O_2)}$$

Example Calculations for Run 1 Nox

Linearity Calculation

C_{Dir} = 76.71 ppmv

C_v = 76.63 ppmv

CS = 76.63 ppmv

ACE = 0.106 %

Bias (Pre-Run Zero)

C_s = 0.10 ppmv

C_{Dir} = 0.09 ppmv

SB = 0.01 %

Bias (Pre-Run Upscale)

C_s = 43.31 ppmv

C_{Dir} = 43.44 ppmv

SB = -0.17 %

Effluent Gas Concentration (Corrected for Drift)

C_{avg} = 29.63 ppmv

C₀ = 0.10 ppmv

C_{MA} = 43.44 ppmv

C_M = 43.22 ppmv

C_{gas} = 29.75 ppmv

ppmv @ 3% O₂

C_{gas @ 3% O₂} = 29.87

Bias (Post Run Zero)

C_s = 0.11 ppmv

C_{Dir} = 0.09 ppmv

SB = 0.02 %

Bias (Post Run Upscale)

C_s = 43.12 ppmv

C_{Dir} = 43.44 ppmv

SB = -0.42 %

Zero Drift

SB_i = 0.01 %

SB_{Final} = 0.02 %

D = 0.02 %

Span Drift

SB_i = -0.17 %

SB_{Final} = -0.42 %

D = 0.25 %



APPENDIX C OPERATIONAL DATA



ESS

To: Nelson, J. Mike
Subject: RE: draft report on client portal

From: Nelson, J. Mike [<mailto:J-Mike.Nelson@invista.com>]
Sent: Thursday, April 03, 2014 5:18 PM
To: ESS
Cc: Campbell, Brian D.
Subject: RE: draft report on client portal

Missy,
Our average rates;

Run 1 = 79,700 pph Steam
Run 2 = 75,300 pph Steam
Run 3 = 74,900 pph Steam

The rated capacity of the boiler is 82,000 pph Steam

Mike

From: ESS [<mailto:ess@essknowsair.com>]
Sent: Thursday, April 03, 2014 4:41 PM
To: Nelson, J. Mike
Cc: Campbell, Brian D.
Subject: FW: draft report on client portal

Mike,

If you could, please provide the information below before Monday the 7th for the submittal of Invista's compliance test report. Thank you!

Sincerely,

Missy Hardy
Environmental Source Samplers, Inc.
910-799-1055 Office
910-799-1056 Fax
www.essknowsair.com

From: ESS [<mailto:ess@essknowsair.com>]
Sent: Tuesday, April 01, 2014 9:26 AM
To: 'Nelson, J. Mike'
Cc: 'Campbell, Brian D.'
Subject: RE: draft report on client portal

Mike,



APPENDIX D CALIBRATION DATA



INVISTA, WAYNESBORO, VA
CALIBRATION DATA

Date :	2/18/2014		Cylinder Value	Analyzer Response	Absolute Difference	Percent Difference
Gas :	O2					
Span :	10.970	Zero Gas	0.000	0.015	0.015	0.137
		Mid-range Gas	4.875 ✓	4.883	0.008	0.073
		High-range Gas	10.970 ✓	10.981	0.011	0.100
Date :	2/18/2014		Cylinder Value	Analyzer Response	Absolute Difference	Percent Difference
Gas :	NOX					
Span :	76.630	Zero Gas	0.000	0.089	0.089	0.116
		Mid-range Gas	43.440 ✓	43.210	0.230	0.300
		High-range Gas	76.630 ✓	76.711	0.081	0.106
Date :	2/18/2014		Cylinder Value	Analyzer Response	Absolute Difference	Percent Difference
Gas :	CO					
Span :	47.740	Zero Gas	0.000	0.066	0.066	0.138
		Mid-range Gas	24.800 ✓	24.781	0.019	0.040
		High-range Gas	47.740 ✓	47.623	0.117	0.245

Convertor Efficiency Check

NO injected	53.09
13:41	52.387
13:42	52.395
13:43	52.402
AVERAGE	52.395
Conv. Eff.=	98.7

Response Time

up	55
up	54
up	62
	57.0 seconds
dov	46
dov	44
dov	42
	44.0





CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Airgas Specialty Gases

830 United Drive
 Durham, NC 27713
 (919) 544-3773 Fax: (919) 544-3774
 www.airgas.com

Part Number:	E03NI87E15A0015	Reference Number:	122-124311693-2
Cylinder Number:	CC195687	Cylinder Volume:	149 Cu.Ft.
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22012	Valve Outlet:	580
Gas Code:	OC2	Analysis Date:	Apr 11, 2012

Expiration Date: Apr 11, 2015

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
 Do Not Use This Cylinder below 150 psig, i.e. 1 Mega Pascal

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
OXYGEN	5.000 %	4.875 %	G1	+/- 1% NIST Traceable
CARBON DIOXIDE	8.000 %	8.054 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
090606	090606	CC262103	9.921% CARBON DIOXIDE/NITROGEN	Apr 10, 2013
NTRM	82658	SG9163064BAL	9.507% OXYGEN/NITROGEN	Dec 01, 2015

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA-510 CO2	Infrared	Apr 02, 2012
Horiba MPA-510 O2 (0-25%)	Paramagnetic	Apr 02, 2012

Triad Data Available Upon Request

Notes: ANWPN 781235

Approved for Release



CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Airgas Specialty Gases
 630 United Drive
 Durham, NC 27713
 (919)544-3773 Fax: (919)544-3774
 www.airgas.com

Part Number: E03NI73E15A4BQ4	Reference Number: 122-124408771-1
Cylinder Number: CC98784	Cylinder Volume: 155.2 CF
Laboratory: ASG - Durham - NC	Cylinder Pressure: 2015 PSIG
PGVP Number: B22013	Valve Outlet: 590
Gas Code: CO2,O2,BALN	Certification Date: Dec 10, 2013

Expiration Date: Dec 10, 2021

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

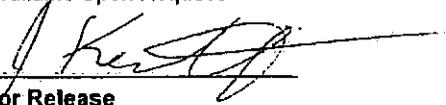
ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
OXYGEN	11.00 %	10.97 %	G1	+/- 0.4% NIST Traceable	12/10/2013
CARBON DIOXIDE	16.00 %	15.67 %	G1	+/- 0.6% NIST Traceable	12/10/2013
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	09060211	CC262370	9.961 % OXYGEN/NITROGEN	+/- 0.3%	Nov 08, 2018
NTRM	12061551	CC354889	19.87 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 27, 2018

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA510 CO2 42399380022	Nondispersive Infrared (NDIR)	Nov 22, 2013
Horiba MPA510 O2 41499150042	Paramagnetic	Nov 22, 2013

Triad Data Available Upon Request

Notes:



Approved for Release



CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E02NI99E15A34Z2	Reference Number: 122-124385849-1
Cylinder Number: XC008629B	Cylinder Volume: 144.3 CF
Laboratory: ASG - Durham - NC	Cylinder Pressure: 2015 PSIG
PGVP Number: B22013	Valve Outlet: 350
Gas Code: CO,BALN	Certification Date: Jul 23, 2013

Expiration Date: Jul 23, 2021

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 800/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON MONOXIDE	48.00 PPM	47.74 PPM ✓	G1	+/- 0.7% NIST Traceable	07/23/2013
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12060520	CC353912	49.53 PPM CARBON MONOXIDE/NITROGEN	+/- 0.6%	Dec 20, 2017

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801333 CO	FTIR	Jul 18, 2013

Triad Data Available Upon Request

Notes:

[Handwritten Signature]

Approved for Release



CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E02NI99E15A02Z4	Reference Number: 122-124413627-1
Cylinder Number: CC412622	Cylinder Volume: 144.3 CF
Laboratory: ASG - Durham - NC	Cylinder Pressure: 2015 PSIG
PGVP Number: B22014	Valve Outlet: 350
Gas Code: CO,BALN	Certification Date: Jan 13, 2014

Expiration Date: Jan 13, 2022

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, Le. 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON MONOXIDE	25.00 PPM	24.80 PPM	G1	+/- 0.7% NIST Traceable	01/13/2014
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12062138	CC367600	25.24 PPM CARBON MONOXIDE/NITROGEN	+/- 0.6%	May 15, 2018

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
THERMO 481 CO 1308857346	Nondispersive Infrared (NDIR)	Dec 31, 2013

Triad Data Available Upon Request

Notes:

C. Williams

Approved for Release





Airgas Specialty Products
 Airgas Specialty Gases
 638 United Drive
 Durham, NC 27713
 (919)544-3773 Fax: (919)544-3774
 www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number: E02NI99E15A0212 Reference Number: 122-124330885-1
 Cylinder Number: CC340103 Cylinder Volume: 144 Cu.Ft.
 Laboratory: ASG - Durham - NC Cylinder Pressure: 2015 PSIG
 PGVP Number: B22012 Valve Outlet: 660
 Gas Code: NO Analysis Date: Aug 22, 2012

Expiration Date: Aug 22, 2020

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
 Do Not Use This Cylinder below 150 psig, i.e. 1 Mega Pascal

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NITRIC OXIDE	75.00 PPM	76.48 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			
Total oxides of nitrogen		76.63 PPM		For Reference Only

CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	120608	CC284006	49.95PPM NITRIC OXIDE/NITROGEN	Dec 18, 2017
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle		Last Multipoint Calibration	
Nicolet 6700 AHR0801333 NO	FTIR		Aug 15, 2012	

Triad Data Available Upon Request

Notes: ANW PN: 780909

Approved for Release



CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E02NI99E15AC2S0	Reference Number: 122-124259496-2
Cylinder Number: CC350892	Cylinder Volume: 144.3 CF
Laboratory: ASG - Durham - NC	Cylinder Pressure: 2015 PSIG
	Valve Outlet: 660
Gas Code: NO	Analysis Date: Apr 08, 2011

Expiration Date: Apr 08, 2014

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 800/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NITRIC OXIDE	43.00 PPM	43.38 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

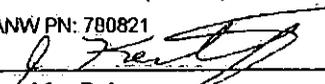
Total oxides of nitrogen	43.44 PPM	For Reference Only
--------------------------	-----------	--------------------

CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	100611	CC283892	49.73 PPM NITRIC OXIDE/NITROGEN	Jul 23, 2018
NTRM	100611	CC283871	49.73 PPM NITRIC OXIDE/NITROGEN	Jul 23, 2018

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801549 NO	FTIR	Mar 30, 2011

Triad Data Available Upon Request

Notes: ANW PN: 780821


 Approved for Release



CERTIFICATE OF ANALYSIS

Grade of Product: **CERTIFIED STANDARD-SPEC**

Part Number:	X02AI99C15A0PY6	Reference Number:	122-124348171-2
Cylinder Number:	CC195701	Cylinder Volume:	146.2 Cubic Feet
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
Analysis Date:	Dec 12, 2012	Valve Outlet:	660
Lot Number:	122-124348171-2		

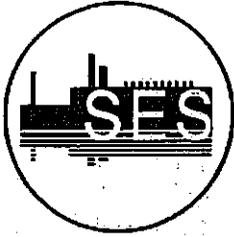
Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration (Mole %)	Analytical Uncertainty
NITROGEN DIOXIDE	55.00 PPM	53.09 PPM	+/- 2%
AIR	Balance		

Notes: ANW, PART # 719245


Approved for Release



Source Evaluation Society

P. O. Box 12124
Research Triangle Park
North Carolina 27709

March 15, 2011

Tiberiu Munteanu
Environmental Source Samplers, Inc.
436 Raleigh Street
Wilmington, NC 28412

Subject: Qualified Source Tester Application No. 2011-512
Qualification Notice - Manual Gaseous Pollutants Source Sampling Methods

Dear Mr. Munteanu:

It is my pleasure to inform you that you have satisfied the requirements of the Source Evaluation Society Qualified Source Test Individual program for group exam(s) listed above. As a member of the successful candidates in this SES program, you should be proud of this distinction within the source emissions testing community. I am confident that you will continue to uphold the standards of technical excellence and ethical conduct embodied in the SES mission statement.

The enclosed Qualification Notice(s) and SES identification card are your permanent record of this achievement. This status is valid for the period shown on the Qualification Notices.

Congratulations on your achievement and I wish you continued success in your future endeavors. Please see attached a permission letter if you wish to have your information posted on the SES web site.

Sincerely yours,

Peter R. Westlin
SES QSTI/QSTO Review Committee Chairman

cc: Roy Owens, SES QSTI/QSTO Review Board Member
Glenn England, SES QSTI/QSTO Review Board Member
C. David Bagwell, SES QSTI/QSTO Review Board Member
Karen D. Kajiya-Mills, SES QSTI/QSTO Review Board Member
Peter S. Pakalnis, SES QSTI/QSTO Review Board Member
Gail Westlin, SES QSTI/QSTO Review Committee Administrator





Source Evaluation Society

P. O. Box 12124
Research Triangle Park
North Carolina 27709

July 31, 2012

Tiberiu Munteanu
Environmental Source Samplers, Inc.
436 Raleigh Street
Wilmington, NC 28412

Subject: Qualified Source Tester Application No. 2011-512
Qualification Notice - Gaseous Pollutants Instrumental Sampling Methods
(exam date: 1/20/12)

Dear Mr. Munteanu:

It is my pleasure to inform you that you have satisfied the requirements of the Source Evaluation Society Qualified Source Testing Individual program for group exam(s) listed above. As a member of the successful candidates in this SES program, you should be proud of this distinction within the source emissions testing community. I am confident that you will continue to uphold the standards of technical excellence and ethical conduct embodied in the SES mission statement.

The enclosed Qualification Notice(s) and SES identification card are your permanent record of this achievement. This status is valid for the period shown on the renewal Qualification Notice.

Congratulations on your achievement and I wish you continued success in your future endeavors.

Sincerely yours,

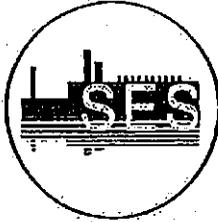
Peter R. Westlin
SES QSTI/QSTO Review Committee Chairman

cc: Roy Owens, SES QSTI/QSTO Review Board Member
Glenn England, SES QSTI/QSTO Review Board Member
C. David Bagwell, SES QSTI/QSTO Review Board Member
Karen D. Kajiya-Mills, SES QSTI/QSTO Review Board Member
Peter S. Pakalnis, SES QSTI/QSTO Review Board Member
Gail Westlin, SES QSTI/QSTO Review Committee Administrator

NEW. DO YOU APPROVE SES RELEASING INFORMATION, UPON REQUEST, ABOUT WHETHER YOU HAVE PASSED A METHOD GROUP EXAM? (The information released will be if you passed an exam and the date of the exam. This information is in support of ASTM D-7036-D.) YES NO IF YOU AGREE, PLEASE SIGN BELOW.

Signature: _____ Date: _____





Source Evaluation Society

P. O. Box 12124
Research Triangle Park
North Carolina 27709

August 24, 2011

Tiberiu Munteanu
Environmental Source Samplers, Inc.
436 Raleigh Street
Wilmington, NC 28412

Subject: Qualified Source Tester Application No. 2011-512
Qualification Notice - Manual Gas Volume Measurements and Isokinetic Particulate
Sampling Methods (exam date 2/4/11)

Dear Mr. Munteanu:

It is my pleasure to inform you that you have satisfied the requirements of the Source Evaluation Society Qualified Source Testing Individual program for group exam(s) listed above. As a member of the successful candidates in this SES program, you should be proud of this distinction within the source emissions testing community. I am confident that you will continue to uphold the standards of technical excellence and ethical conduct embodied in the SES mission statement.

The enclosed Qualification Notice(s) and SES identification card are your permanent record of this achievement. This status is valid for the period shown on the Qualification Notice.

Congratulations on your achievement and I wish you continued success in your future endeavors.

Sincerely yours,

Peter R. Westlin
SES QSTI/QSTO Review Committee Chairman

cc: Roy Owens, SES QSTI/QSTO Review Board Member
Glenn England, SES QSTI/QSTO Review Board Member
C. David Bagwell, SES QSTI/QSTO Review Board Member
Karen D. Kajiya-Mills, SES QSTI/QSTO Review Board Member
Peter S. Pakalnis, SES QSTI/QSTO Review Board Member
Gail Westlin, SES QSTI/QSTO Review Committee Administrator



SOURCE EVALUATION SOCIETY



Qualified Source Testing Individual

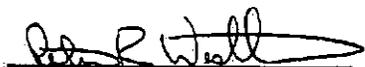
LET IT BE KNOWN THAT

TIBERIU MUNTEANU

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GASEOUS POLLUTANTS SOURCE SAMPLING METHODS

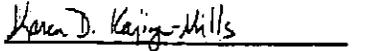
ISSUED THIS 15TH OF MARCH 2011 AND EFFECTIVE UNTIL MARCH 14TH, 2016

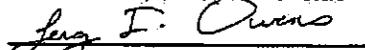

Peter R. Westlin, QSTVQSTO Review Board

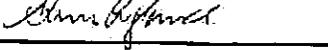

C. David Bagweil, QSTVQSTO Review Board

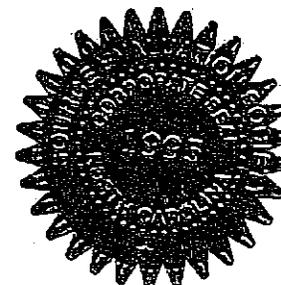
APPLICATION
NO.
2011-512


Peter S. Pakalnis, QSTVQSTO Review Board


Karen D. Kajlya-Mills, QSTVQSTO Review Board


LeRoy Owens, QSTVQSTO Review Board


Glenn C. England, QSTVQSTO Review Board



SOURCE EVALUATION SOCIETY



Qualified Source Testing Individual

LET IT BE KNOWN THAT

TIBERIU MUNTEANU

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GAS VOLUME MEASUREMENTS AND ISOKINETIC PARTICULATE SAMPLING METHODS

ISSUED THIS 24TH DAY OF AUGUST 2011 AND EFFECTIVE UNTIL AUGUST 23RD, 2016

Peter R. Westlin, QSTVQSTO Review Board

C. David Bagwell, QSTVQSTO Review Board

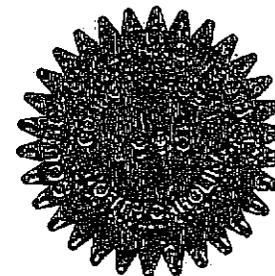
Peter S. Pakalnis, QSTVQSTO Review Board

Karen D. Kajlya-Mills, QSTVQSTO Review Board

LeRoy Owens, QSTVQSTO Review Board

Glenn C. England, QSTVQSTO Review Board

APPLICATION
NO.
2011-512



SOURCE EVALUATION SOCIETY



Qualified Source Testing Individual

LET IT BE KNOWN THAT

TIBERIU MUNTEANU

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

GASEOUS POLLUTANTS INSTRUMENTAL SAMPLING METHODS

ISSUED THIS 31ST DAY OF JULY 2012 AND EFFECTIVE UNTIL JULY 30TH, 2017

Peter R. Westfall, QST/QSTO Review Board

C. David Bagwell, QST/QSTO Review Board

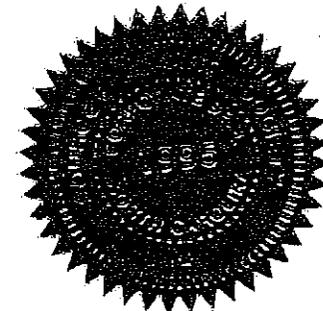
Peter S. Pekala, QST/QSTO Review Board

Karen D. Kajha-Mills, QST/QSTO Review Board

Leroy I. Owens, QST/QSTO Review Board

Glenn C. England, QST/QSTO Review Board

APPLICATION NO. 2011-512





App. #
2011-512

Source Evaluation Society
P. O. Box 12124
Research Triangle Park, NC 27709-2124

TIBERIU MUNTEANU

Qualified Source Testing Individual

MANUAL GAS VOLUME MEASUREMENTS AND ISOKINETIC PARTICULATE SAMPLING METHODS - Effective Aug. 24, 2011 through Aug. 23, 2016 (exam date: 2/4/11)
GASEOUS POLLUTANTS INSTRUMENTAL SAMPLING METHODS
- Effective Mar. 15, 2011 through Mar. 14, 2016 (exam date: 1/10/10)
GASEOUS POLLUTANTS INSTRUMENTAL SAMPLING METHODS
- Effective Jul. 31, 2012 through Jul. 30, 2017 (exam date: 1/20/12)



APPENDIX E

TEST PROTOCOL





STACK TEST PROTOCOL - REQUEST FOR APPROVAL

	<input type="checkbox"/> PROTOCOL (consisting of pages 1 through _____) IS APPROVED AS SUBMITTED. <input type="checkbox"/> PROTOCOL (consisting of pages 1 through _____) IS APPROVED WITH REVISIONS NOTED IN APPENDIX B. Failure to conduct tests in accordance with the approved protocol may result in the test results being rejected by DEQ.
This Section for DEQ Use Only	Approved by: _____ Date: _____

i. Facility Name: <u>INVISTA S.a.r.l.</u>	DEQ Registration No. <u>80517</u>
Physical Location: <u>400 DuPont Boulevard, Waynesboro, VA 22980</u>	
Emission Unit(s) to be tested: <u>Boiler 4 - Testing One (1) of Two (2) Identical 99.0 MMBtu/hr NG, LPG, Oil-fired boilers - Representative Test Per Permit Condition 17</u>	

ii. Stack Testing Firm: <u>Environmental Source Samplers, Inc.</u>	
Contact Name: <u>Melanie Parks</u>	Phone: <u>(910) 799-1055</u>

*As of 1/1/2012, analytical data submitted to DEQ to demonstrate compliance must have been performed by an environmental laboratory certified or accredited in accordance with 1VAC30, Chapter 45 and 46, available at <http://www.deq.virginia.gov/Programs/Air/PermittingCompliance/Compliance/VirginiaEnvironmentalLabAccreditation.aspx>. Failure to meet this requirement could result in rejection of the stack testing results.

For any laboratory utilized during this testing event, documentation demonstrating VELAP certification/accreditation for the analytes being tested must be submitted with this protocol, or at a time in advance of the testing event acceptable to the DEQ regional office responsible for reviewing the data.

DOCUMENT CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering and evaluating the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.	
SIGNATURE: _____	DATE: _____
Must be signed by a Responsible Official as defined in 9 VAC 5-20-230 of the Regulations for the Control and Abatement of Air Pollution, available at www.deq.virginia.gov .	
PRINTED NAME: _____	TITLE: _____

STACK TEST PROTOCOL - REQUEST FOR APPROVAL

Environmental Source Samplers, Inc.



III. Test Plan:

Test Required By: Condition # 17 of permit dated 11/16/12 and/or _____

Deadline: Testing must be completed by T.B.D. (date) to meet the 60-180 post start-up - day deadline required by
 the permit dated 11/16/12 and/or Regulation _____ (reference).

Test Date	Operating Rate	EPA Test Method To Be Used	Pollutant or Parameter Measured	No. Runs & Run Length for Pollutant Testing	Applicable Numeric Emission Limitation	Source of Emission Limitation (e.g., Permit condition #, NSPS, MACT, etc.)
Test Day 1	Min. 90 MMBtu/hr (90% of cap)	7e	Nitrogen Oxide (NOx)	3 x 60 minutes	30 ppmvd at 3% O2	Permit Condition 10
Test Day 1	Min. 90 MMBtu/hr (90% of cap)	10	Carbon Monoxide (CO)	3 x 60 minutes	50 ppmvd at 3% O2	Permit Condition 10
Test Day 1	Min. 90 MMBtu/hr (90% of cap)	9	Visible Emissions (VE)	30 sets of 24 consecutive observations	10%	Permit Condition 14

(Continue on additional sheet if necessary)

IV. Description of planned deviations from Test Methods:

- No deviations are planned, OR
- Deviations are planned as described in the following table:

43 of 50

STACK TEST PROTOCOL - REQUEST FOR APPROVAL

(Discard this page only if no deviations planned)

PLANNED DEVIATIONS

Environmental Source Samplers, Inc.



44 of 50

EPA Test Method	Description of Requirement (Indicate Section No. from Method)	Description of Deviation (Identify reason if requesting DEQ approval)	Approvals (Attach copies of all EPA approvals)
			<input type="checkbox"/> EPA approval attached <input type="checkbox"/> EPA approval requested on _____ (date) <input type="checkbox"/> DEQ approval requested
			<input type="checkbox"/> EPA approval attached <input type="checkbox"/> EPA approval requested on _____ (date) <input type="checkbox"/> DEQ approval requested
			<input type="checkbox"/> EPA approval attached <input type="checkbox"/> EPA approval requested on _____ (date) <input type="checkbox"/> DEQ approval requested
			<input type="checkbox"/> EPA approval attached <input type="checkbox"/> EPA approval requested on _____ (date) <input type="checkbox"/> DEQ approval requested
			<input type="checkbox"/> EPA approval attached <input type="checkbox"/> EPA approval requested on _____ (date) <input type="checkbox"/> DEQ approval requested
			<input type="checkbox"/> EPA approval attached <input type="checkbox"/> EPA approval requested on _____ (date) <input type="checkbox"/> DEQ approval requested

(Continue on additional sheet if necessary)

STACK TEST PROTOCOL - REQUEST FOR APPROVAL

Environmental Source Samplers, Inc.



V. Source Operations: The purpose of a stack test is to demonstrate that a process and any associated emission control equipment are capable of meeting required emission limitations. Therefore, it is important to identify those parameters that affect actual emission rates and to ensure that such parameters remain at the tested or more conservative setting(s), except during start-up, shutdown, or malfunction. Records of those parameter settings must be maintained during and after the test to provide reasonable assurance that the equipment continues to operate in compliance with all operating and emission limitations. **The test results report must include the parameters identified below and their settings during testing.**

1. Adjustable Operating Parameters: Following a discussion with your air inspector, identify all adjustable process and control equipment parameters that have a measurable effect on emissions, and complete the table below. Example parameters are listed in Appendix A.

Parameter	Setting/value during stack test	Monitoring Frequency	Fixed ¹ or Varying ² after test	If varying ² , justify not testing at multiple values.
Operating rate: 90% of max. rated capacity	90 MMBtu/hr	Every 15 Minutes	Fixed	

(Continue on additional sheet if necessary)

¹ Fixed means that no changes will be made (except during start-up, shutdown, or malfunction) without validating with another stack test.

² Varying exclusive of start-up, shutdown, or malfunction.

STACK TEST PROTOCOL - REQUEST FOR APPROVAL

Environmental Source Samplers, Inc.



2. Performance Indicator Parameters: Other parameters necessary to establish system performance, or useful in detecting deteriorating performance, need to be monitored as well. Some example parameters are listed in Appendix A. Any parameter that is required by permit to be monitored must be monitored during the stack test at a frequency that will provide a representative average. Following a discussion with your air inspector, complete the table below. **The test results report must include the run averages and also raw data if manually recorded.**

Parameters to be Monitored	Measurement Frequency

(Continue on additional sheet if necessary)

46 of 50

STACK TEST PROTOCOL - REQUEST FOR APPROVAL

VI. Sampling Ports: In the space below or on a separate sheet, sketch the stack or duct as follows:

TOP VIEW - show: 1) shape, 2) sample ports.	ELEVATION VIEW - show: 1) shape, 2) sampling ports, 3) all flow disturbances (upstream and downstream) affecting conditions at sampling ports, 4) distances from ports to disturbances, 5) gas flow direction.
<p>See Attached Schematic at End of this Document</p> <p>Exact stack measurements will be documented at the test event, and included in Test Report.</p>	
Circular Stack: Diameter = _____ Rectangular Stack: L = _____ W = _____ ⇐ Equivalent Diameter = $(2LW)/(L+W)$ = _____	

	UPSTREAM (exit side of ports)	DOWNSTREAM (process side of ports)
Type of Disturbance (E.g., exit, fan, bend, baffles, expansion, restriction, visible flame)		
Distance from Port to Disturbance = (dist.)		
No. diameters from Port to Disturbance = (dist./dia.) or (dist./equivalent diameter)	Diameters	Diameters



STACK TEST PROTOCOL - REQUEST FOR APPROVAL

APPENDIX A

EXAMPLES OF PARAMETERS TO BE MONITORED DURING TESTING

Note: The facility is responsible for identifying and monitoring all process and control parameters that may reasonably be expected to affect the stack test results and to confirm operating conditions. These examples are not all-inclusive and may not always apply.

I. PROCESS	ADJUSTABLE OPERATING PARAMETERS	PERFORMANCE INDICATOR PARAMETERS
ALL	Operating rate; raw material composition and quality; automatic or manual control; equipment settings	Instrument readings as appropriate to establish operating conditions
Combustion	Fuel composition and quality; soot blowing frequency; damper settings, flue gas recirculation; water/steam injection rate; burner pressures; over/under fire air adjustments	Visible emissions/opacity; CO, HC concentration in flue gas; excess air; O ₂ concentration.
Coating (printing, painting)	VOC content of inks, coatings; equipment settings	

II. CONTROL EQUIPMENT	ADJUSTABLE OPERATING PARAMETERS	PERFORMANCE INDICATOR PARAMETERS
ALL	Automatic or manual control; equipment settings	Instrument readings as appropriate to establish operating conditions
Capture System	Damper positioning; doors or access panels open or shut; fan sheave or speed setting	Fan amps; pressure inside enclosure; integrity (door closed, no new openings); duct air velocity; direction of air flow at openings
Afterburner or Thermal Oxidizer	Temperature set points; frequency of flow reversal (for a regenerative system)	Temperature
Carbon Adsorber	Bed regeneration setting (initiated by time or outlet concentration); inlet gas temperature	Pressure drop
Catalytic Oxidizer	Temperature set points	Inlet & outlet temperature; catalyst activity; HC concentration in flue gas (measured with hand held PID or FID); pressure drop
Dry Scrubber	Type of reactive chemical; purity of reactive chemical; particle size of reactive chemical; injection rate; temperature	Feed rate indicator; temperature indicator
ESP	Number of fields in service; location of out-of-service fields(s); control software/microprocessor settings and/or methodology; gas temperature; rap rate; flue gas flow	Visible emissions/opacity; power levels (secondary current & secondary voltage)
Fabric filter	Setting for bag cleaning frequency (e.g. time or pressure drop settings); number of bags/compartments in service	Pressure drop; visible emissions/opacity; triboelectric sensor reading (bag leak detector)
Liquid Scrubber (packed bed, spray; venturi)	Liquid flow rate; venturi throat opening; particulate concentration in liquid (all fresh just before test or equilibrium levels); fresh liquid make-up rate; set point for neutralizing, oxidizing or reactive chemical addition; pH set point.	Pressure drop; neutralizing, oxidizing or reactive chemical concentration; pH



STACK TEST PROTOCOL - REQUEST FOR APPROVAL

APPENDIX B

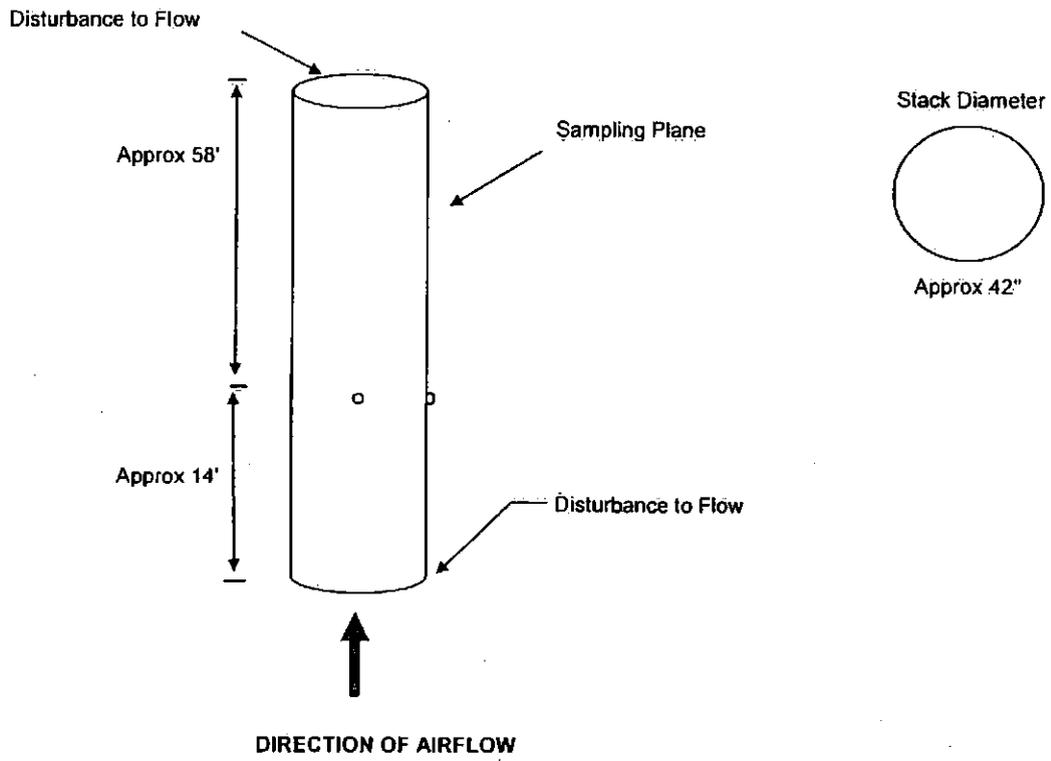
REVISIONS REQUIRED BY DEQ AS A CONDITION OF APPROVAL

This Section for DEQ Use Only	
Section Reference	Required Revision(s) to Protocol

(Continue on additional sheet if necessary)



INVISTA
WAYNESBORO, VA
NEW BOILER SAMPLING PLANE
Boiler 4



Attachment F

EPA - Comments and Responses

Archived: Tuesday, July 18, 2017 9:12:37 AM
From: [Opila, MaryCate](#)
Sent: Thu, 29 Jun 2017 09:35:51
To: [Funkhouser, Jeremy \(DEQ\)](#)
Subject: RE: Draft Title V Renewal for Review (80517)
Importance: Normal

Hi Jeremy,

Thank you for your thorough response. I have no additional questions or concerns regarding the permit, your responses address my concerns.

Hope you enjoy the holiday as well.

Thanks,
Mary Cate

Mary Cate Opila, P.E., Ph.D.
EPA Region III
Air Protection Division
Office of Permits and State Programs (3AP10)
1650 Arch Street
Philadelphia, PA 19103
215-814-2041

From: Funkhouser, Jeremy (DEQ) [<mailto:Jeremy.Funkhouser@deq.virginia.gov>]
Sent: Thursday, June 29, 2017 9:15 AM
To: Opila, MaryCate <Opila.MaryCate@epa.gov>
Subject: RE: Draft Title V Renewal for Review (80517)

Good morning, Mary Cate.

Thank you for your suggestions.
I've clarified the 40 CFR 63 Subpart JJJJJ PM limitation, as discussed below in red, and have removed the vacated portions of the emergency RICE condition.
If you would like to see the revisions to the Statement of Basis or draft Permit please let me know.

If you would like to discuss anything further, please let me know.

Have a great (and hopefully long) weekend!

Sincerely,

Jeremy Funkhouser
Air Permit Writer, Senior II

DEQ - Valley Regional Office
P.O. Box 3000, Harrisonburg, VA 22801
Office: 540-574-7820 Fax: 540-574-7878
jeremy.funkhouser@deq.virginia.gov
Website: www.deq.virginia.gov

From: Opila, MaryCate [<mailto:Opila.MaryCate@epa.gov>]
Sent: Wednesday, June 28, 2017 2:39 PM
To: Funkhouser, Jeremy (DEQ)
Subject: RE: Draft Title V Renewal for Review (80517)

Hi Jeremy,

Thank you for speaking with me this afternoon and for your efforts on the Invista Permit.

As discussed, I do not have any comments on the permit but offer the following suggestions:

1. Please consider clarifying whether the Filterable PM limit in Table 1, 40 CFR 63 Subpart JJJJJ (item 5) applies to the boilers.
The filterable PM limit in Table 1 of 40 CFR 63 Subpart JJJJJ will not be applicable to the boilers upon issuance of the Title V permit.

After permit issuance the distillate oil combusted in each boiler (Ref. Boiler 4 and Boiler 5) will be limited to ultra-low-sulfur fuel as defined in §63.11237 (Condition 3 of the Title V permit). The facility is already required to monitor and record the monthly and annual fuel consumed by each boiler, in accordance with Condition 15 of the NSR permit. The boilers (Ref. Boiler 4 and Boiler 5) will therefore not be subject to the PM emission limit in Table 1 of the subpart in accordance with 40 CFR 63.11210 (f). I've clarified the basis for the exclusion of the PM standards in the Statement of Basis.

We can discuss this further if you'd like.

2. As a result of the Delaware v. EPA (May 1, 2015) court decision, certain emergency demand response provisions were vacated (i.e. 63.6640(f)(2)(ii)-(iii), and permit condition 41a.(2) and (3)). It may be clearer to the source if this information is conveyed either in the permit or in the statement of basis. I have attached EPA's guidance on this topic.

The vacated portions of the condition were removed, and the condition was renumbered. Thank you for pointing this out!

As these are suggestions, no response is needed. Again, thank you for your efforts on this permit and do not hesitate to contact me with any question or concerns.

Regards,
Mary Cate

Mary Cate Opila, P.E., Ph.D.
EPA Region III
Air Protection Division
Office of Permits and State Programs (3AP10)
1650 Arch Street
Philadelphia, PA 19103
215-814-2041

From: Funkhouser, Jeremy (DEQ) [<mailto:Jeremy.Funkhouser@deq.virginia.gov>]
Sent: Monday, June 05, 2017 4:01 PM
To: Opila, MaryCate <Opila.MaryCate@epa.gov>
Subject: Draft Title V Renewal for Review (80517)

Good afternoon, Mary Cate.

I have a public notice, draft permit, statement of basis, and summary sheet ready for review. Here's the information:

Regional Office: Valley Regional Office
Facility Location: Waynesboro City
Registration Number: 80517
Facility Name: INVISTA
Type of Permit: Title V Permit Renewal
Additional Documentation: Statement of Basis
Public Comment Period: June 7, 2017 through July 7, 2017
Contact: Jeremy Funkhouser (jeremy.funkhouser@deq.virginia.gov)

The public notice doesn't run until Wednesday, June 7th so the documents will not be available on the [DEQ Webpage](#) until then. If you need anything else please let me know.

Jeremy Funkhouser
Air Permit Writer, Senior II

DEQ - Valley Regional Office
P.O. Box 3000, Harrisonburg, VA 22801
Office: 540-574-7820 Fax: 540-574-7878
jeremy.funkhouser@deq.virginia.gov
Website: www.deq.virginia.gov



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

April 15, 2016

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

MEMORANDUM

SUBJECT: Guidance on Vacatur of RICE, NESHAP and NSPS Provisions for Emergency Engines

FROM: Peter Tsirigotis
Director, Sector Policies and Programs Division
Office of Air Quality Planning and Standards

TO: EPA Regional Air Enforcement Managers
EPA Regional Air Directors

The U.S. Environmental Protection Agency is issuing this guidance to explain how the EPA intends to implement certain regulatory requirements after the U.S. Court of Appeals for the District of Columbia Circuit issues the mandate effectuating the vacatur in *Delaware v. EPA*.¹ The statutory provisions and EPA regulations, as impacted by the impending issuance by the court of its mandate and described in this document, are themselves legally binding requirements. This document does not substitute for those provisions or regulations or modify them, nor is it a regulation itself. As such, this document does not impose legally binding requirements on the EPA, states, or the regulated community and may not apply to a particular situation based upon the circumstances. In appropriate circumstances, individual EPA decision makers may adopt approaches that differ from this guidance.

Background

On May 1, 2015, the U.S. Court of Appeals for the District of Columbia Circuit issued a decision² granting in part and denying in part petitions for review of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines (RICE), 40 CFR part 63 subpart ZZZZ, and the New Source Performance Standards (NSPS) for Stationary Compression Ignition and Spark Ignition Internal Combustion Engines, 40 CFR part 60 subparts IIII and JJJJ. The court decision, as modified on rehearing, vacated paragraphs 40 CFR 60.4211(f)(2)(ii)-(iii), 60.4243(d)(2)(ii)-(iii), and 63.6640(f)(2)(ii)-(iii). The vacated paragraphs specified that emergency engines may operate for a limited number of hours per year in two situations: (1) emergency demand response when the Reliability Coordinator has declared an Energy Emergency Alert Level 2, and (2) when there is a deviation of voltage or frequency of five percent or greater below standard voltage or frequency.³

¹ *Delaware v. EPA*, 785 F.3d 1 (D.C. Cir. 2015).

² *Ibid.*

³ In a different case (*Conservation Law Foundation, et. al. v. EPA*, No. 13-1233 (DC. Cir.)), the EPA requested and received a voluntary remand without vacatur of the provisions in 40 CFR 60.4211(f)(3)(i), 60.4243(d)(3)(i), and 63.6640(f)(4)(ii), which allow emergency engines to operate for up to 50 hours per year if certain conditions are met. Those provisions are not affected by the vacatur in *Delaware v. EPA* and engines can continue to operate for the purpose specified in those paragraphs

The EPA requested and received a stay of the court's mandate effectuating the vacatur until May 1, 2016. May 1, 2016, falls on a Sunday, so we expect the court to issue the mandate on Monday, May 2, 2016.

Impact of the Vacatur

Upon issuance of the court's mandate vacating 40 CFR 60.4211(f)(2)(ii)-(iii), 60.4243(d)(2)(ii)-(iii), and 63.6640(f)(2)(ii)-(iii), these provisions will cease to have any legal effect. It is the EPA's view that this change will mean that an engine may not operate in circumstances described in the vacated provisions for any number of hours per year unless it is in compliance with the emission standards and other applicable requirements for a non-emergency engine.⁴ After issuance of the mandate, operation of emergency engines will be limited to emergency situations as specified in 40 CFR 60.4211(f)(1), 60.4243(d)(1), and 63.6640(f)(1); maintenance checks and readiness testing for a limited number of hours per year as specified in 40 CFR 60.4211(f)(2)(i), 60.4243(d)(2)(i), and 63.6640(f)(2)(i); and certain non-emergency situations for a limited number of hours per year as specified in 40 CFR 60.4211(f)(3), 60.4243(d)(3), and 63.6640(f)(3)-(4).⁵

For an emergency engine that was operating for the purposes specified in paragraphs 40 CFR 60.4211(f)(2)(ii)-(iii), 60.4243(d)(2)(ii)-(iii), and 63.6640(f)(2)(ii)-(iii) before the vacatur mandate that becomes a non-emergency engine after the vacatur mandate solely as a result of the operation for those purposes after the vacatur mandate, regulatory requirements including numerical emission limits or work practice standards, notifications, and performance testing may apply. The applicability of regulatory requirements to a particular engine depends on criteria including the engine's type, horsepower, and age, and not every such engine will become subject to notification and testing requirements. The EPA's Regulation Navigation tools for the RICE NESHAP and NSPS can assist engine owners/operators in determining the applicable criteria and requirements for a specific engine. The tools can be found at <https://www3.epa.gov/ttn/atw/icengines/imp.html#regnav>.

Engines that are subject to initial performance testing requirements should conduct the initial performance test within 180 days of the date of the mandate (or by October 29, 2016, assuming the court issues the mandate on May 2, 2016). If an initial notification is required for the engine per 40 CFR 63.6645, notifications should be submitted no later than 120 days after the date of the mandate. If an initial notification is required for the engine according to 40 CFR 60.4214(a) or 60.4245(c), then such notification should be submitted no later than 30 days after the date of the mandate.⁶ The timelines for performance testing and initial notifications are specified in 40 CFR 60.7(a)(1), 60.8(a), 60.4214(a), 60.4245(c), 63.9(b), 63.6610, 63.6611, 63.6612, and 63.6645.

while the EPA addresses the *Conservation Law Foundation, et. al. v. EPA* remand. This guidance does not further address those remanded provisions.

⁴ In the EPA's motion asking the D.C. Circuit Court to stay the mandate, the EPA explained its understanding that the court's vacatur did not reinstate the provisions within the prior 2010 regulation that had previously allowed up to 15 hours per year of emergency demand response or mean that engines may operate for unlimited periods for emergency demand response and still qualify as emergency engines. See footnote 2 of the EPA's "Motion for Stay of the Mandate" in *Delaware v. EPA* which can be found at <https://www3.epa.gov/ttn/atw/icengines/tech.html>.

⁵ See footnote 3 regarding the voluntary remand without vacatur of the provisions in 40 CFR 60.4211(f)(3)(i), 60.4243(d)(3)(i), and 63.6640(f)(4)(ii).

⁶ This guidance with respect to notice and performance testing obligations only applies to the limited universe of engines that operate for the purposes specified in paragraphs 40 CFR 60.4211(f)(2)(ii)-(iii), 60.4243(d)(2)(ii)-(iii), and 63.6640(f)(2)(ii)-(iii) before and after the issuance of the vacatur mandate and for which the issuance of the vacatur mandate is the sole reason for the engine's change in status from an emergency engine to a non-emergency engine.

Reporting for Emergency Engines

Paragraph 40 CFR 63.6650(h) specifies that owners/operators of emergency engines that are used or contractually obligated to be available for the purposes specified in 40 CFR 63.6640(f)(2)(ii)-(iii), which are the paragraphs that were vacated, must submit an annual report that includes the hours the engine operated for those purposes. These reporting regulations provide that the first report must cover operation during 2015 and must be submitted no later than March 31, 2016. The deadline for this report occurred before the court is scheduled to issue the mandate, and owners/operators were required to submit this report by March 31, 2016. The NSPS regulations also contain similar reporting requirements in 40 CFR 60.4214(d) and 60.4245(e), and owners/operators were also required to submit the reports required by the NSPS regulations by March 31, 2016. Owners and operators will not be required to submit a report by March 31, 2017, for any such operations in 2016.

cc: Sheila Igoe, OGC
Sara Ayres, OECA
Robert Klepp, OECA