



August 27, 2010

Mr. Michael F. Kiss
Air Quality Modeling Coordinator
Virginia Department of Environmental Quality
629 E. Main St., 8th Floor
Richmond, VA 23218

Re: Air Quality Modeling Submittals – Clarifications to Previous Submittals and Demonstration
of Compliance with 1-hour NO₂ Standard
Warren County Power Station
Prevention of Significant Deterioration Permit
Registration No. 81391
Plant ID No. 51-187-0041

Dear Mr. Kiss:

Dominion is pleased to provide answers and clarifications to several questions that have arisen during your review of the modeling demonstrations that were submitted on July 2, 2010. In addition as requested by your office, we are providing an air quality analysis for the Warren County Power Station demonstrating compliance with the new 1-hour National Ambient Air Quality Standard (NAAQS) for nitrogen dioxide (NO₂). We believe that this submittal provides the data to represent a complete air quality analysis for this facility.

If you have any questions regarding this submittal or need any additional information, please contact Andy Gates at 804-273-2950 or andy.gates@dom.com.

Sincerely,

A handwritten signature in blue ink that reads "Robert M. Bisha".

Robert M. Bisha
Director, Environmental Business Support

Enclosure:

Response to DEQ Comments and 1-Hour NO₂ Modeling Results prepared by AECOM
Environment, August 2010

cc: (hard copy)
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Mr. Michael F. Kiss
August 27, 2010
Page 2

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Response to VDEQ Comments on the Proposed Warren County Project Air Permit Application

August 27, 2010

VDEQ Comment #1: Please provide additional justification for selecting ambient monitoring when determining regionally representative background concentrations for NAAQS analysis.

AECOM Response #1: Ambient air quality data are used to represent the contribution to total ambient air pollutant concentrations from non-modeled sources. The following discussion demonstrates that available regional monitoring data for a recent 3-year period satisfies these requirements.

Local ambient air monitoring stations were researched to identify the background air quality concentrations representative of the proposed project site. Table 1 summarizes the monitor locations and background air quality concentrations obtained from EPA's AirData website. Figure 1 shows the locations of the monitors relative to the Warren County project site. The Warren County project site is located on a rural site about 5 km northeast of Front Royal, VA, surrounded mainly by agricultural lands with some residential and compact residential area a few km to the south.

A summary of the selected monitors is as follows:

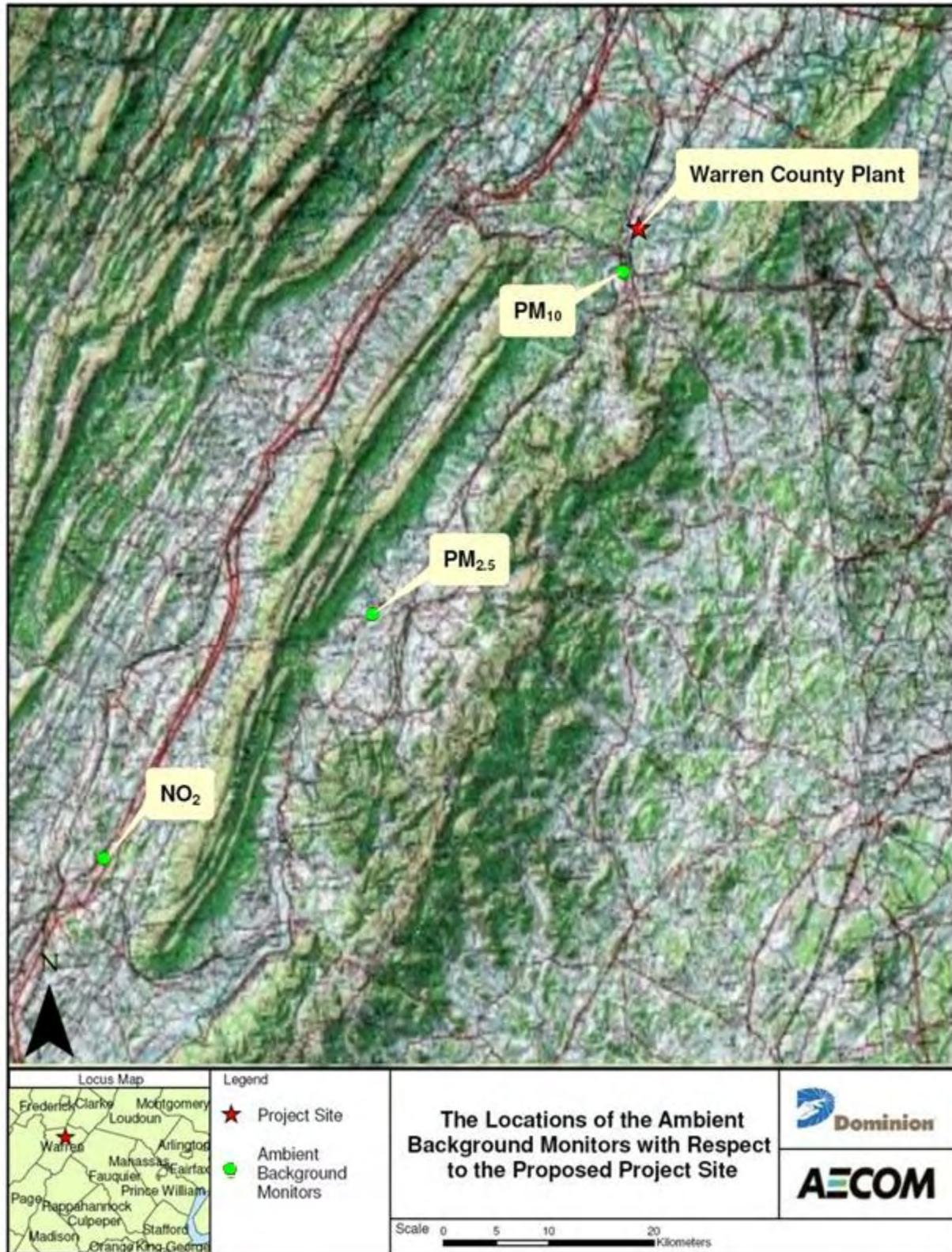
- **PM₁₀:** The proposed PM₁₀ monitor is located in Front Royal, VA, only 5 km southwest of the Warren County project site. At this distance, this monitor should be very representative of the ambient background level surrounding the project site.
- **NO₂:** The project did not have a significant impact for annual average NO₂. For the 1-hour NO₂ modeling, the Virginia DEQ provided a representative, conservative regional background concentration from the Rockingham County monitor (40 ppb). This monitor is located about 50 km to the southwest of the project site.
- **PM_{2.5}:** The proposed PM_{2.5} monitor is located in Luray, VA. It is located approximately 44 km to the southwest of the proposed project site. Luray is a rural town with predominantly agricultural land-use surrounding it, similar to the proposed project site. The population of Luray is approximately 5,000. The proposed PM_{2.5} monitor is the second closest monitor to the Warren County project site. The closest PM_{2.5} monitor is located 22 miles north, in the town of Ridgeway, WV. Although the Luray monitor is a little further from the Warren County site than the Ridgeway monitor, the land-use surrounding the Luray monitor is more representative of the proposed project site.

Table 1: Proposed Ambient Background Concentrations

Pollutant	Averaging Period	Year	Background Concentrations ($\mu\text{g}/\text{m}^3$)	Monitoring Station
PM ₁₀ ⁽¹⁾	24-hr ⁽⁴⁾	2006	36.00	Front Royal, Warren County
	24-hr ⁽³⁾	2007	32.00	Front Royal, Warren County
	24-hr ⁽³⁾	2008	36.00	Front Royal, Warren County
NO ₂ ⁽²⁾	1-hr	2007-2009	75.2	Harrisonburg, Rockingham County
PM _{2.5} ⁽³⁾	24-hr	2008	28.00	Luray Caverns Airport, Page County
PM _{2.5} ⁽³⁾	Annual	2008	11.70	Luray Caverns Airport, Page County
(1) Background data taken from the 2006-2008 USEPA AirData database. (2) Background value supplied by Virginia DEQ (3) Design value from taken from Virginia Ambient Air Monitor 2008 Report Data (4) 2 nd highest maximum value used				

Ultimately, the project showed insignificant impacts for annual NO₂ in Class II area, hence the only background values used from those proposed in the above table were for 1-hour NO₂, PM₁₀ and PM_{2.5} for each pollutant's respective NAAQS modeling. For Class I modeling, significant impacts were predicted within Shenandoah, for NO₂ and PM₁₀, but the proposed project showed compliance with the PSD increments for both of these pollutants.

Figure 1 Location of the Ambient Background Monitors with respect to the Project Site



VDEQ Comment #2: Please provide the MS Excel spreadsheet used to calculate deposition results at Shenandoah National Park referenced in Section 8.6 of the Air Permit Application.

AECOM Response #2: This spreadsheet is provided with the accompanying external hard drive. In addition, this spreadsheet has also been separately provided via e-mail to Mr. John Notar of the National Park Service.

VDEQ Comment #3: Please address why modeled impacts for startup/shutdown were not provided for Shenandoah National Park.

AECOM Response #3: The relevant AERMOD Class I area modeling that was conducted to assess compliance with the PSD increments at Shenandoah National Park included: annual NO₂ and 24-hour and annual PM₁₀. In addition, NAAQS modeling was conducted for 24-hour and annual PM_{2.5}, as well as 1-hour NO₂. Since a turbine startup/shutdown is a short-term event (i.e., less than 24 hours), the annual modeled impacts do not need to be addressed relative to startup/shutdown events. As such, only short-term modeled impacts for PM₁₀ and PM_{2.5} 24-hour averages and 1-hour NO₂ averages would potentially need to be evaluated at the Class I area. A comparison of the total PM₁₀ and PM_{2.5} emission emitted in a 24-hour period for all three turbines operating at 100% load with duct firing during normal operations versus a turbine startup event that includes all three turbines starting up within a 24-hour period (balance of the non-startup time considers the turbines to be operating at 100% load with duct firing) is presented in Table 6-6 of the Air Permit Application. Table 6-6 shows that normal operations of all three turbines operating at 100% load with duct firing results in higher emissions than a turbine startup event on a 24-hour basis. Due to the distance involved to the Class I area, the difference in plume rise between normal operations and startup/shutdown would have much more an effect on Class II modeling of startup/shutdown, so this modeling was done for Class II areas.

VDEQ Comment #4: Revise Footnote 2 in table 6-13

AECOM Response #4: Footnote 2 has been revised as follows:

“ To attain the standards the following conditions must be met:

- CO 1-hour- Not to be exceeded more than once per year.
- CO 8-hour- Not to be exceeded more than once per year.
- NO₂ Annual – Never to exceed the standard
- PM₁₀ 24-hour - Not to be exceeded more than once per year on average over 3 years.
- PM_{2.5} 24-hour - To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed the standard.
- PM_{2.5} Annual - To attain this standard, the 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed the standard.”

VDEQ Comment #5: The vegetation analysis did not include the chillers and the NO_x annual emission rate differed slightly from the emission rate in the SIL files for the Generator and the Fire Water Pump.

AECOM Response #5: The vegetation analysis was re-run with the chillers and correcting the emission rates to match those in the SIL files. The modeled impacts did not change as a result of these revisions. The updated modeling files are provided on the accompanying external hard drive.

VDEQ Comment #6: Section 7.10 states that the highest second highest (H2H) modeled concentration will be used to determine NAAQS compliance. However, for PM₁₀, the NAAQS is defined as the high 6th high (H6H) over 5 years or the high 4th highest (H4H) over 3 years.

AECOM Response #6: AECOM agrees that compliance with the 24-hr PM₁₀ is based upon the H6H computed over the *entire* five years of meteorological data. (This would be conducted in AERMOD by using a single meteorological input data file containing data for the entire 5-year period.) However, AECOM used the H2H PM₁₀ concentration from 24-hour AERMOD simulations to demonstrate NAAQS compliance. The H2H PM₁₀ concentrations are a conservative indicator (overestimate) of the H6H values.

VDEQ Comment #7: For those pollutants whose emissions will be below the PSD significance thresholds (such as SO₂ and Pb), the proposed project must demonstrate that 24-hour modeled impacts are less than 1 µg/m³ at Shenandoah National Park. This modeling is necessary to avoid a PSD trigger because the proposed project is within 10 km of a Class I area (Shenandoah National Park). Electronic modeling files were provided for 24-hour SO₂ on the modeling archive DVD that showed the project's modeled impacts would be less than 1 µg/m³ within Shenandoah National Park. However no modeling files were provided for Pb. In addition, the Air Permit Application does not address modeled impacts for Pb.

AECOM Response #7: Since the SO₂ modeling results are less than 1 µg/m³ in the Class I area, it can be inferred from the SO₂ modeling results that the Pb modeling (and modeling for other pollutants) would result in impacts less than 1 µg/m³ in Shenandoah National Park as well because the SO₂ emissions are higher than those for Pb (and other applicable pollutants) for all modeled sources. Project Pb (and other pollutant) emissions are presented in Appendix B of the Air Permit Application.

EPA Comment #8: The report indicated there are no emissions associated with shut down operations. Please confirm this point. Are NO_x controls completely effective during startup and shut down modes?

AECOM Response #8: The report does indicate there are emissions associated with shutdown; see Table 6-8 and these emissions were included in the facility PTE. However, since the emissions and time durations associated with the startup operations are higher, only the startup scenario was modeled.

VDEQ Comment #9: (EPA comment) Will the PM_{2.5} 24-hour modeling pass using the Steven Page memo approach?

AECOM Response #9: AECOM has reviewed the PM_{2.5} modeling conducted for the project-alone SIL PM_{2.5} analysis. The maximum 5-year average 24-hour modeled concentration from the project sources alone is 3.53 µg/m³ from the Mitsubishi Turbine. This does not include any contribution from other nearby modeled sources. However, given the background concentration of 28 µg/m³ for PM_{2.5} 24-hour, the modeled component from the other modeled nearby sources would have to be greater than 3.47 µg/m³ at the same time and place as the Mitsubishi Turbine's maximum 5-year average 24-hour modeled concentration in order to cause a violation of the NAAQS (35 = 28 + 3.53 + 3.47). It is highly unlikely that the other modeled nearby sources would contribute more than 3.47 µg/m³ because the maximum 98th percentile 5-year average 24-hour concentration from the other modeled nearby sources is only 1.03 µg/m³.

VDEQ Comment #10: The Air Permit Application lacked a visible plume analysis for a nearby wilderness area or state park. Please provide a visible plume analysis for the proposed project.

AECOM Response #10: AECOM did not initially conduct a Class II visible plume analysis because:

- (1) there are no known integral vistas within 50 km of the proposed project source,
- (2) a refined PLUVUE analysis was already conducted for Shenandoah National Park, which is located approximately 10 km south-southeast of the proposed project, and
- (3) the facility will have strict opacity limits which should limit the possibility of a visible plume impacting the surrounding Class II area.

However, at the request of VDEQ, a screening modeling analysis was conducted to assess the potential for visual plume impacts at a Class II area within 50 km of the project site. Our review of National Parks in Virginia (see <http://www.nps.gov/applications/parksearch/state.cfm?st=VA>) indicated that the Appalachian Trail is the closest and only identified sensitive area outside Shenandoah National Park within 50 km of the project site. The project site is about 11 kilometers to the northwest of the closest approach of the Appalachian Trail. The visibility screening modeling approach followed guidance provided in USEPA's Workbook for Plume Visual Impact Screening and Analysis (Revised) (October 1992; EPA-454/R-92-023) ("Workbook"). As such, the VISCREEN model was applied to estimate two visual impact parameters, plume perceptibility (ΔE) and plume contrast (C_p). Screening-level guidance indicates that values above 2.0 for ΔE and +/- 0.05 for C_p are considered perceptible.

The Workbook offers two levels of analyses. A Level 1 screening analysis is the most simplified and conservative approach employing default meteorological data with no site-specific conditions. A Level 2 analysis takes into account representative meteorological data and site-specific conditions such as complex terrain. Initially, the Level 1 analysis was conducted and indicated ΔE and C_p values were above the screening thresholds of 2.0 and 0.5, respectively. Therefore, a Level 2 analysis was conducted.

A Level 2 analysis was conducted with five years of surface observations from Washington Dulles airport in Virginia and mixing height from Sterling airport in Virginia. Terrain elevation differences between the stack top (227 m) and Appalachian Trail maximum elevation within the sector (600 m) are less than 500 meters.

The source data required by VISCREEN are total NO_x emissions (182.83 pounds per hour [lb/hr]) and particulate emissions (49.22 lb/hr) for the project. These emissions represent worst-case start-up/shutdown operations. In addition, plume visibility assessment was conducted for the normal operations ($\text{NO}_x = 75.96$ lb/hr and $\text{PM}_{10} = 63.48$ lb/hr). In both cases, these emissions represent composite worst-case hourly emissions over all turbine options.

The 22.5 degree ($^\circ$) wind direction sectors that would transport emissions from the project site toward the Appalachian Trail chosen for the analysis, along with the closest and farthest distances from the trail to the project site, are shown in Table 2. The location of the Appalachian Trail relative to the project site is shown in Figure 2.

Table 2: Level 2 Input Data

22.5° Wind Sector	Closest Distance to the Source (km)	Furthest Distance from the Source (km)	Level 2 Worst Case Stability Class	Level 2 Worst Case Wind Speed (m/s)
159.75 – 182.25	10.3	17.0	D	2

Based on this information, and the five years of meteorological data, a table of joint frequency of occurrence of wind speed, wind direction, and stability class was developed as outlined in the Workbook. The dispersion conditions, defined by wind speed and stability class, were ranked by evaluating the product of σ_y , σ_z , and u , where σ_y and σ_z are the Pasquill-Gifford horizontal and vertical diffusion coefficients for the given stability class and downwind distance and u is the wind speed. The dispersion conditions were then ranked in ascending order according to the value of $\sigma_y\sigma_zu$ as shown in Table 3.

According to the Workbook, VISCREEN is to be applied with the worst-case meteorological conditions that have a $\sigma_y\sigma_zu$ product with a cumulative probability of one percent. That is, the dispersion condition is selected such that the sum of all frequencies of occurrence of conditions worse than this condition totals one percent. Note that as recommended by the Workbook, dispersion conditions that result in greater than 12 hours of plume transport time are discounted from the analysis, since it is unlikely that steady-state plume conditions would persist for more than 12 hours.

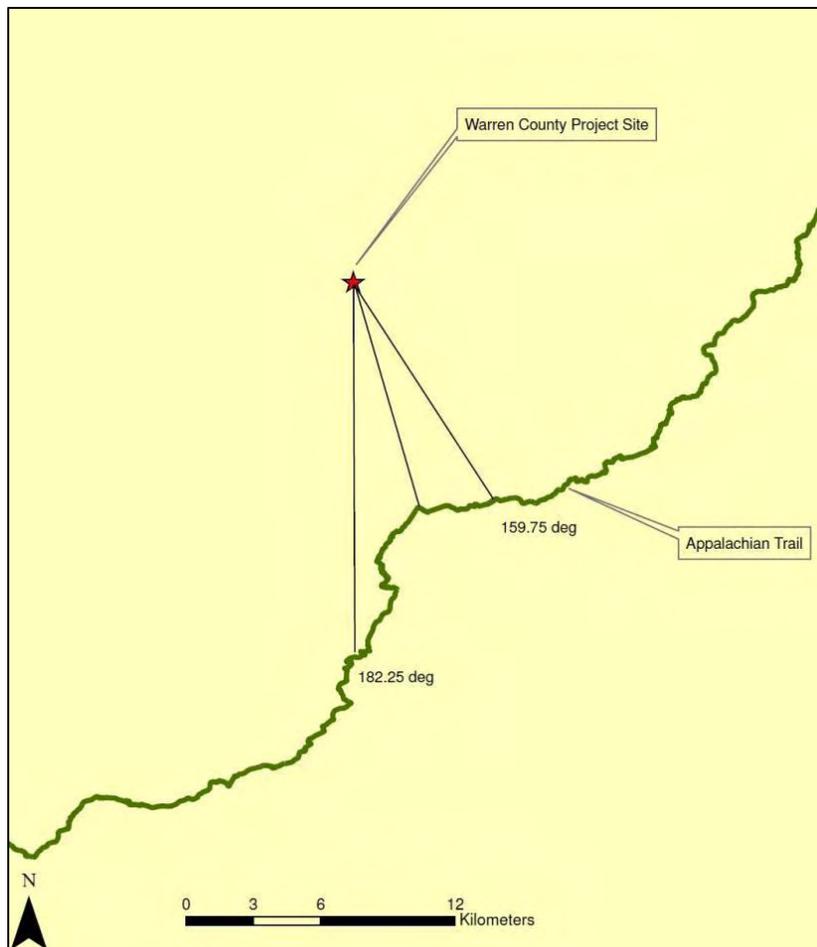
Table 4: VISCREEN Model Results

Operation Case	Background	Distance (km)	Plume Perceptibility (ΔE)			Plume Contrast (C_p)		
			VISCREEN ¹		Criteria	VISCREEN ¹		Criteria
			Theta 10	Theta 140		Theta 10	Theta 140	
Start-up /Shutdown	Sky	10.3	1.740	0.638	2.00	0.005	-0.012 ⁽²⁾	0.05
	Terrain	17.0	1.478	0.207	2.00	0.011	0.005	0.05
Normal	Sky	10.3	1.112	0.332	2.00	0.012	-0.010 ⁽²⁾	0.05
	Terrain	17.0	1.888	0.228	2.00	0.014	0.005	0.05

1. VISCREEN results are provided for the two VISCREEN default worst-case theta angles. The two theta angles represent the sun being in front of the observer (theta = 10 degrees) or behind the observer (theta = 140 degrees).

2. A negative C_p means the plume has a darker contrast than the background sky.

Figure 2: Appalachian Trail Relative to the Warren County Site and the Sector



VDEQ Comment #11: Please provide a 1-hour NO₂ NAAQS modeling analysis.

AECOM Response #11:

On February 9, 2010, the U.S. Environmental Protection Agency (EPA) published a new 1-hour nitrogen dioxide (NO₂) National Ambient Air Quality Standard (NAAQS) at a level of 100 ppb (approximately 188 ug/m³). This new standard became effective on April 12, 2010, which means that permits issued under EPA's Prevention of Significant Deterioration (PSD) rules (40 CFR 52.21) on or after April 12, 2010, must contain a demonstration that allowable emissions from any new major stationary source or major modification will not cause or contribute to a violation of the new 1-hour NO₂ NAAQS. As such, as requested by VDEQ, AECOM has prepared a modeling 1-hour NO₂ modeling analysis that demonstrates the proposed facility will not cause or contribute to a NAAQS violation.

A modeling protocol to address this requested analysis was submitted to the Virginia DEQ on June 24, 2010. Comments received on the protocol have been incorporated into this modeling analysis.

Significant Impact Level (SIL) modeling was conducted for the facility alone emissions and the proposed project was found to be significant out to 50 km (the limit of AERMOD's applicability). Therefore, the modeling discussion provided below solely focuses on the 1-hour NO₂ NAAQS cumulative modeling analysis.

Project Emission and Source Data

The air dispersion modeling analysis to assess compliance with the 1-hour NO₂ NAAQS was conducted with emission rates and flue gas exhaust characteristics (flow rate and temperature) that are expected to represent the worst-case parameters among the range of possible values for the three turbine configurations considered for the proposed project. Both normal operations and startup/shutdown operations were assessed to determine whether the proposed project is in compliance with the 1-hour NO₂ NAAQS.

Normal Operations

The stack parameters and the emission rates for the proposed project that are discussed in Section 3.2 of the approved Class II modeling protocol (the protocol submitted and approved in March 2010) were used in the NO₂ 1-hour modeling analysis as well. As described in the approved protocol, the emergency diesel generator and fire-water pump engine are expected to operate one (1) hour per week per unit and 52 hours per year per unit under non-emergency conditions (operability testing). Therefore, the short-term emission rates reflect short-term emission rates, but the testing of these units will be limited in the permit to occur between 9 AM and 5 PM. The modeling was conducted in a very conservative fashion to assume continuous operation of the emergency units during this 8-hour period each day (every day of the year), even though the actual duration on any given day is planned to be about 1 hour, and only once per week. Table 5 provides the NO_x emission rates for the emergency generator, fire water pump, auxiliary boiler, and fuel gas heaters. Please note that the stack parameters are not included in the table below because these are the same as presented in the approved March 2010 protocol.

The operation of the emergency equipment was modeled only for source testing, which will occur on at least 52 days per year. Since the 98th percentile peak daily 1-hour maximum concentration that is the form of the 1-hour NO₂ NAAQS requires impacts on at least 8 days per year to result in a non-zero design concentration, the operation involving testing of the emergency equipment is required to be modeled for compliance with the 1-hour NO₂ NAAQS. The operation of the emergency equipment for actual emergencies is not expected to exceed 7 days per year. Therefore, modeling of the continuous operation of the emergency equipment for actual emergencies that extend beyond the 8 hours per day that were modeled was not conducted, as noted in the June 24, 2010 modeling protocol.

The NO_x emissions for each of the three turbine configurations are presented in the Tables 6 through 8.

Table 5: NO_x 1-hour Emission Rates for the Emergency and other Facility Support Equipment

Source ID	Hourly Emissions (lb/hr)
Diesel-Fired Emergency Generator	
DSL_GEN	23.08
Diesel-Fired Fire Water Pump Engine	
FWP	1.96
Auxiliary Boiler	
AUX_BLR	0.122
Fuel Gas Heater	
FGH	0.072

Table 6: Worst Case Data for Proposed Natural Gas-Fired SGT6-5000F Combined-Cycle Combustion Turbine Operation

Parameter	Value			
	100 w/ Duct Firing	100	80	60
Load (%)				
Stack Height (ft)	175.0	175.0	175.0	175.0
Stack Diameter (ft)	19.0	19.0	19.0	19.0
Exit Temperature (°F)	195.10	201.60	195.90	190.00
Exit Velocity (ft/sec)	60.15	59.87	51.54	43.87
Heat Input (MMBtu/hr)	2748	2248	1845	1496
NO _x Emissions Per Combustion Turbine(lb/hr)	19.90	16.28	13.37	10.84

Table 7: Worst Case Data for Proposed Natural Gas-Fired Mitsubishi M501GAC Combined-Cycle Combustion Turbine Operation

Parameter	Value			
	100 w/ Duct Firing	100	75	60
Load (%)				
Stack Height (ft)	175.0	175.0	175.0	175.0
Stack Diameter (ft)	22.0	22.0	22.0	22.0
Exit Temperature (°F)	191.20	197.70	191.50	185.00
Exit Velocity (ft/sec)	57.83	57.74	48.32	41.16
Heat Input (MMBtu/hr)	3496	2996	2302	1966
NO _x Emissions Per Combustion Turbine(lb/hr)	25.32	21.70	16.67	14.24

Table 8: Worst Case Data for Proposed Natural Gas-Fired GE 7FA05 Combined-Cycle Combustion Turbine Operation

Parameter	Value			
	100 w/ Duct Firing	100	75	Low (50/55)
Load (%)				
Stack Height (ft)	175.0	175.0	175.0	175.0
Stack Diameter (ft)	19.0	19.0	19.0	19.0
Exit Temperature (°F)	190.40	197.40	186.90	184.90
Exit Velocity (ft/sec)	64.43	64.19	50.41	45.25
Heat Input (MMBtu/hr)	2735	2235	1781	1440
NOx Pollutant Emissions Per Combustion Turbine(lb/hr)	19.81	16.19	12.90	10.43

Startup/Shutdown Operations

Using the startup/shutdown emissions data provided by the turbine vendor and/or Dominion as a reference, startup/shutdown emissions for 1-hour NO₂ have been estimated for the proposed project. The turbines were assumed to startup in sequence; therefore, no more than one turbine will start up at any one time. The startup methodology and procedures summarized in this section are presented for the GE turbine. Additional information for the GE turbine and the startup information for the Mitsubishi and Siemens turbines are provided in Appendix A. Please note that while the following procedures and examples refer to the GE turbine data, the same procedures and calculations will be used for the Mitsubishi and Siemens turbines.

Emissions resulting from start-up/shutdown operations for the proposed turbines are based on warm starts and cold starts. Each warm start is expected to last 87 minutes and each cold start is expected to last 185 minutes before the turbine is operating at emission compliant load. Three different scenarios were considered for the NO₂ 1-hour modeling analysis. For the first scenario, it is assumed that one turbine is starting up cold and the other two turbines are not operating. For the second scenario, it is assumed that two turbines are operating normally and the third turbine is starting up warm. For the third scenario, it is assumed that one turbine is operating normally while the second is starting up warm, and the third turbine is not operating. Scenario 3 will not be modeled since impacts from Scenario 2 will be higher.

Emissions for the turbines were calculated based on either startup/shutdown emissions or normal operation emissions depending on the operation mode of the turbine. Table 9 presents a summary of the startup emissions for the NO₂ 1-hour averaging period for the GE turbines. Table 10 presents the stack parameters that were used for the analyses. Similar calculations were performed for the Mitsubishi and Siemens turbines and are provided in Appendix A.

Table 9: Startup Summary ⁽¹⁾

	Offline	Start	Normal	Total	Start	Normal	Total
	min	min	min	min	Lb/hr	Lb/hr	Lb/hr
NO₂ 1-hour (Scenario #1 – One turbine starting up cold and the other two turbines not operating)							
Turbine 1	0	60	0	60	146.30	0.00	146.30
Turbine 2	60	0	0	60	0.00	0.00	0.00
Turbine 3	60	0	0	60	0.00	0.00	0.00
Startup Total							146.30
NO₂ 1-hour (Scenario #2 – Two turbines operating normally and the third turbine starting up warm)							
Turbine 1	0	0	60	60	0.00	19.81	19.81
Turbine 2	0	0	60	60	0.00	19.81	19.81
Turbine 3	0	60	0	60	142.70	0.00	142.70
Startup Total							182.32
NO₂ 1-hour (Scenario #3 – One turbine operating normally, one turbine starting up warm, third turbine not operating)							
Turbine 1	0	0	60	60	0.00	19.81	19.81
Turbine 2	0	60	0	60	142.70	0.00	142.70
Turbine 3	60	0	0	60	0.00	0.00	0.00
Startup Total							162.51
(1) Startup emissions are for the GE turbine. Startup emissions for the Mitsubishi and Siemens turbines provided Appendix A.							

Table 10: Stack parameters and modeled emissions rates

	Exit Velocity fps	Exit Temp °F	NO ₂ 1-hour – Scenario #1			NO ₂ 1-hour – Scenario #2			NO ₂ 1-hour – Scenario #3		
			Turbine 1	Turbine 2	Turbine 3	Turbine 1	Turbine 2	Turbine 3	Turbine 1	Turbine 2	Turbine 3
Cold Start ^{(1),(2)}	42.94	184.9	146.30	NA	NA	NA	NA	NA	NA	NA	NA
Warm Start ^{(1),(2)}	29.87	184.9	NA	NA	NA	NA	142.70	NA	NA	NA	142.70
Normal Operation ⁽³⁾	64.43	190.4	NA	NA	NA	19.81	NA	NA	19.81	19.81	NA
(1). Average exhaust velocity during startup, provided by vendor and/or Dominion (2). Lowest exit temperature for Low Load% load from performance data provided by vendor and/or Dominion (3). Exit velocity and temperature for the 100% load with duct burner from performance data provided by vendor and/or Dominion											

Nearby Source Emission Inventory

Subsequent to this submittal, the nearby source inventory compiled by AECOM was provided to VDEQ for review and approval. Sources were gathered within 100 km of the proposed project for inclusion into the multi-source modeling analysis (50 km beyond the 50 km Significant Impact Area extent). Model receptors were retained out to 50 km from the proposed source for the cumulative modeling. Sources within the SIA plus 5 km (out to 55 km) of the proposed project were modeled without any merging or combination of sources. However, to reduce the computer requirements for the cumulative modeling at the request of the Virginia DEQ, we consolidated emission

points without removing any emissions for sources between 55 and 100 km. In this distance range, sources in the inventory supplied by the various states were conservatively merged into a single source on a facility-wide basis using EPA's screening modeling¹ source merging technique. This approach was verbally approved by VDEQ. The source merging technique allowed for all the emissions from sources within 100 km of the proposed project identified in the inventory to be modeled with a reduced set of stacks used as input to the modeling. A copy of the 1-hour NO₂ modeled nearby sources is provided in Appendix B. The emission spreadsheets are contained on the external hard drive to be submitted separately.

Modeling Procedures

The modeling procedures in terms of the meteorological data, building downwash data, and model options used in AERMOD are the same as proposed in the March 2010 protocol and used in subsequent modeling submittals, and are the same for this analysis unless otherwise noted below.

The receptor grid for the 1-hour NO₂ modeling analysis was established in the same manner as that for the other criteria pollutants for the Class II modeling analysis as discussed in the approved modeling protocol. The receptor grid consists of receptors spaced 25 m apart along the fence line. A spacing of 50 m was used for the receptors beyond the fence line and extending out to 1 km from the fence line. Beyond 1 km from the fence line, a spacing of 100 m was used up to 2.5 km from the proposed project. Between 2.5 and 5 km, a spacing of 500 m was used. Between 5 and 10 km, a spacing of 1000 m was used. Beyond 10 km out to 50 km, a spacing of 2000 m was used. The receptor grid covered the Class II and the portion of the Shenandoah National Park within 50 km of the proposed project. The receptor grid used in the modeling analysis was based on NAD 83 datum and is in zone UTM 17.

The extent of this grid was sufficient to capture maximum impacts in the modeling analysis. Furthermore, the modeled impacts for determining compliance with the NAAQS fall within the 50-m spaced receptors (within 1 km of the proposed project fence line). Therefore, no additional refined receptor modeling is needed to resolve the maximum impacts. AERMAP was run in similar manner for the criteria pollutants modeling to generate the receptor elevations and critical hill heights for the 1-hour NO₂ modeling.

Based on current guidance, NO₂ impacts can be determined by using a 3-tiered NO_x to NO₂ conversion rate system, where

- Tier 1 assumes 100 percent NO to NO₂ conversion,
- Tier 2 assumes a 75 percent NO₂/NO_x ratio (Ambient Ratio Method), and
- Tier 3 allows the use of refined techniques such as the Ozone Limiting Method (OLM) or the Plume Volume Molar Ratio Method (PVMRM). Both OLM and PVMRM are in AERMOD.

The three-tiered system is similar to the tiered procedures specified for modeling annual NO₂ impacts in Section 5.2.4 of the Guideline on Air Quality Models.

For the Tier 1 approach, a total conversion of NO to NO₂ is estimated and is considered the most conservative analysis. However, if the maximum impacts from the Tier 1 approach exceed the NAAQS for NO₂, the second level/tier can be considered.

For the Tier 2 analysis, the Tier 1 estimates (1-hour concentrations) are multiplied by an empirically derived NO₂/NO_x value of 0.75, which is also the annual national default. Based on conversations with Mike Kiss of VA DEQ on May 18, 2010, VA DEQ concurs with using the annual national default value for the 1-hour modeling as well, with adequate justification.

¹ Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised (EPA- 454/R-92-019), Section 2.2.

For this analysis, a Tier 2 approach was required. A justification for using the 0.75 fraction for the ARM method is found in Appendix C. The 0.75 ARM was applied to all modeled sources (project sources and other modeled nearby sources) prior to adding the background concentration and determining compliance with the NAAQS.

To determine if the proposed project is in compliance with the 1-hour NO₂ NAAQS, AECOM developed a post-processing program referred to as "POST1HRNO2". The development of this post-processor was necessary because of the complex nature of the new 1-hour NO₂ NAAQS (the EPA-approved version of AERMOD does not provide output in the form of the 1-hour NO₂ NAAQS) combined with lack of guidance from EPA on how a newly proposed project should demonstrate compliance in a cumulative modeling analysis. The POST1HRNO2 computes the total concentration due to three components: 1) the proposed project sources, 2) other nearby modeled sources determined to potentially add a significant concentration gradient to the total concentration near the proposed source, and 3) monitored regional background that accounts for non-modeled sources (and is designed to avoid double-counting the contributions from the other modeled nearby sources to the extent possible). POST1HRNO2 also accepts either a fixed background concentration or an hourly file of concurrent background concentrations or concentrations derived from a seasonal look-up table. POST1HRNO2 is designed to read in AERMOD concentration files for the proposed project and other nearby modeled sources separately and determined if the proposed project is in compliance with the 1-hour NO₂ NAAQS based on the form of the standard.

The results of the 1-hour NO₂ modeling are provided in Table 11. They indicate that the modeled impacts change little with the turbine type and the turbine load, and are therefore dominated by the ancillary sources (emergency equipment) that were modeled very conservatively. For each candidate turbine, the modeling results for cases when the proposed project is significantly contributing to the design concentration are in the range of 183-184 µg/m³, which is close to the NAAQS of 188.1 µg/m³. However, this result likely overstates the total concentration that would be expected after the proposed project is built and operating in the future due to the reasons stated below.

- The emergency engines that are the primary project contributors were modeled to operate for 2,920 hours per year, even though they are permitted to run for only 500 hours per year and would likely operate for only a fraction of those hours in actual practice.
- A constant, high regional background concentration was assumed for all modeled hours. For most hours, the actual background concentration would be expected to be a small fraction of the value assumed.
- The other modeled nearby sources were assumed to be constantly and simultaneously operating at their permitted emission rates. In reality, this is not likely to occur.
- Emissions of NO_x will be decreasing due to provisions in EPA's Air Transport Rule. Therefore, the inventory of other nearby modeled sources overstates the emissions likely to be in place when the proposed project is operating in the future.

The peak predicted concentrations noted in Table 11 are located approximately 750-850 meters west-northwest of the proposed project's northwest corner fence line. This location is within an area of receptors spaced at 50-m intervals, within 1 kilometer of the proposed project fence line. The peak concentrations predicted at each modeled receptor are available in the modeling archive to be provided separately. In addition, since the concentrations in Table 11 represent the design total modeled concentration over all modeled receptors, the results for receptors in Shenandoah National Park would be less than those presented in Table 11.

Table 11: Summary of Class II Area NO₂ NAAQS Analysis

Pollutant	Averaging Period	Turbine Load / Operating Condition	Total Modeled Concentration (µg/m ³)	Background Value (µg/m ³) ⁽¹⁾	Total Concentration (µg/m ³) ⁽²⁾	NAAQS (µg/m ³)	Complies (Y/N)?
GE Turbine							
NO ₂	1-hour	100% Load with Duct Firing	108.22	75.2	183.42	188.1	Y
NO ₂	1-hour	100% Load no Duct Firing	108.21	75.2	183.41	188.1	Y
NO ₂	1-hour	75% Load	108.22	75.2	183.42	188.1	Y
NO ₂	1-hour	50% Load	108.22	75.2	183.42	188.1	Y
NO ₂	1-hour	Startup Scenario1	88.2	75.2	163.40	188.1	Y
NO ₂	1-hour	Startup Scenario2	94.4	75.2	169.60	188.1	Y
Mitsubishi Turbine							
NO ₂	1-hour	100% Load with Duct Firing	109.06	75.2	184.26	188.1	Y
NO ₂	1-hour	100% Load no Duct Firing	109.06	75.2	184.26	188.1	Y
NO ₂	1-hour	75% Load	109.06	75.2	184.26	188.1	Y
NO ₂	1-hour	60% Load	109.07	75.2	184.27	188.1	Y
NO ₂	1-hour	Startup Scenario1	59.92	75.2	135.12	188.1	Y
NO ₂	1-hour	Startup Scenario2	70.53	75.2	145.73	188.1	Y
Siemens Turbine							
NO ₂	1-hour	100% Load with Duct Firing	108.19	75.2	183.39	188.1	Y
NO ₂	1-hour	100% Load no Duct Firing	108.19	75.2	183.39	188.1	Y
NO ₂	1-hour	80% Load	108.19	75.2	183.39	188.1	Y
NO ₂	1-hour	60% Load	108.19	75.2	183.39	188.1	Y
NO ₂	1-hour	Startup Scenario1	58.53	75.2	133.73	188.1	Y
NO ₂	1-hour	Startup Scenario2	76.95	75.2	152.15	188.1	Y
(1) Provided by VDEQ							
(2) This represents the design concentration for which the proposed project has a significant contribution.							

Appendix A

Startup-Shutdown Emission Calculations and Modeling Information

**Startup/Shutdown Emission Calculations and
Modeling Information for GE Turbines**

GE SUSD

	Exit Velocity	Exit Temperature	NO2 1-hour			NO2 1-hour			NO2 1-hour		
			Turbine 1	Turbine 2	Turbine 3	Turbine 1	Turbine 2	Turbine 3	Turbine 1	Turbine 2	Turbine 3
	fps	F	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Startup											
Cold Start ^{1,2}	42.94	184.90	146.30	NA	NA	NA	NA	NA	NA	NA	NA
Warm Start ^{1,2}	29.87	184.90	NA	NA	NA	NA	142.70	NA	NA	NA	142.70
Normal Operation ³	64.43	190.40	NA	NA	NA	19.81	NA	NA	19.81	19.81	NA
1. Average exhaust velocity during startup, provided by the vendor and/or Dominion 2. Lowest exit temperature for low load from performance data provided by vendor and/or Dominion 3. Exit velocity and temperature for the 100% load with duct burner from performance data provided by vendor and/or Dominion											

NO2-Startup/Shutdown Modeling Calculations

	Hot start	Warm start	Cold start	Shutdown
Total emission per event	119.5	148.3	356.3	53.2
Maximum 1-hour rolling average rate during startup (lb/hr)	NA	142.7	146.3	NA
Time (min)	56	87.0	185.0	24.0
Maximum NOx during normal operation - 100% w/duct burner (lb/hr)	19.81			
Maximum NOx during normal operation - 100% (lb/hr)	16.19			

Cold and Warm starts have highest emissions startup scenarios based on combination of these two types of starts

Scenarios

NO2 - 1 hour

One turbine starting up cold other two not operating

	Turbine 1	Turbine 2	Turbine 3	total	
Cold Start	146.30			146.30	lb/hr
Total				146.30	lb/hr
Total				146.30	lb/hr

One turbine operating second turbine starting up warm third turbine not operating

	Turbine 1	Turbine 2	Turbine 3	total	
Warm Start - startup		142.70		142.70	lb/hr
Total				142.70	lb/hr
Normal Operation 100% with Duct burner	19.81			19.81	lb/hr
Total				162.51	lb/hr

Two turbines operating third turbine starting up warm

	Turbine 1	Turbine 2	Turbine 3	total	
Warm Start - startup			142.70	142.70	lb/hr
Total				142.70	lb/hr
Normal Operation 100% with Duct burner	19.81	19.81		39.62	lb/hr
Total				182.32	lb/hr

Normal Operatoin

100% with Duct burner	19.81	19.81	19.81	59.43	lb/hr
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Startup/Shutdown Emission Calculations and Modeling Information for Mitsubishi Turbines

Mitsubishi SUSD

	Exit Velocity	Exit Temperature	NO2 1-hour			NO2 1-hour			NO2 1-hour		
			Turbine 1	Turbine 2	Turbine 3	Turbine 1	Turbine 2	Turbine 3	Turbine 1	Turbine 2	Turbine 3
	fps	F	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Startup											
Cold Start ^{1,2}	37.92	185.00	59.80	NA	NA	NA	NA	NA	NA	NA	NA
Warm Start ^{1,2}	37.93	185.00	NA	NA	NA	NA	59.50	NA	NA	NA	59.50
Normal Operation ³	57.83	191.20	NA	NA	NA	25.32	NA	NA	25.32	25.32	NA

1. Average exhaust velocity during startup, provided by the vendor and/or Dominion
2. Lowest exit temperature for 60% load from performance data provided by vendor and/or Dominion
3. Exit velocity and temperature for the 100% load with duct burner from performance data provided by vendor and/or Dominion

NO2-Startup/Shutdown Modeling Calculations

	Hot start	Warm start	Cold start	Shutdown
Total emission per event	60.1	77	115.1	23.8
Maximum 1-hour rolling average rate during startup (lb/hr)	NA	59.5	59.8	NA
Time (min)	43	101	252	14
Maximum NOx during normal operation - 100% w/duct burner (lb/hr)	25.32			
Maximum NOx during normal operation - 100% (lb/hr)	21.70			

Cold and Warm starts have highest emissions startup scenarios based on combination of these two types of starts

Scenarios

NO2 - 1 hour

One turbine starting up cold other two not operating

	Turbine 1	Turbine 2	Turbine 3	total	
Cold Start	59.80			59.80	lb/hr
Total				59.80	lb/hr
Total				59.80	lb/hr

One turbine operating second turbine starting up warm third turbine not operating

	Turbine 1	Turbine 2	Turbine 3	total	
Warm Start - startup		59.50		59.50	lb/hr
Total				59.50	lb/hr
Normal Operation 100% with Duct burner	25.32			25.32	lb/hr
Total				84.82	lb/hr

Two turbines operating third turbine starting up warm

	Turbine 1	Turbine 2	Turbine 3	total	
Warm Start - startup			59.50	59.50	lb/hr
Total				59.50	lb/hr
Normal Operation 100% with Duct burner	25.32	25.32		50.64	lb/hr
Total				110.14	lb/hr

Normal Operatoin

100% with Duct burner	25.32	25.32	25.32	75.96	lb/hr
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Startup/Shutdown Emission Calculations and Modeling Information for Siemens Turbines

Siemens SUSD

	Exit Velocity	Exit Temperature	NO2 1-hour			NO2 1-hour			NO2 1-hour		
			Turbine 1	Turbine 2	Turbine 3	Turbine 1	Turbine 2	Turbine 3	Turbine 1	Turbine 2	Turbine 3
	fps	F	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Startup											
Cold Start ^{1,2}	35.85	190.00	67.40	NA	NA	NA	NA	NA	NA	NA	NA
Warm Start ^{1,2}	36.77	190.00	NA	NA	NA	NA	73.60	NA	NA	NA	73.60
Normal Operation ³	60.15	195.10	NA	NA	NA	19.90	NA	NA	19.90	19.90	NA
1. Average exhaust velocity during startup, provided by the vendor and/or Dominion 2. Lowest exit temperature for 60% load from performance data provided by vendor and/or Dominion 3. Exit velocity and temperature for the 100% load with duct burner from performance data provided by vendor and/or Dominion											

NO2-Startup/Shutdown Modeling Calculations

	Hot start	Warm start	Cold start	Shutdown
Total emission per event	54.2	81.4	150.4	31.2
Maximum 1-hour rolling average rate during startup (lb/hr)	NA	73.6	67.4	NA
Time (min)	59	93.0	194.0	26.0
Maximum NOx during normal operation - 100% w/duct burner (lb/hr)	19.90			
Maximum NOx during normal operation - 100% (lb/hr)	16.28			

Cold and Warm starts have highest emissions startup scenarios based on combination of these two types of starts

Scenarios

NO2 - 1 hour

One turbine starting up cold other two not operating

	Turbine 1	Turbine 2	Turbine 3	total	
Cold Start	67.40			67.40	lb/hr
Total				67.40	lb/hr
Total				67.40	lb/hr

One turbine operating second turbine starting up warm third turbine not operating

	Turbine 1	Turbine 2	Turbine 3	total	
Warm Start - startup		73.60		73.60	lb/hr
Total				73.60	lb/hr
Normal Operation 100% with Duct burner	19.90			19.90	lb/hr
Total				93.50	lb/hr

Two turbines operating third turbine starting up warm

	Turbine 1	Turbine 2	Turbine 3	total	
Warm Start - startup			73.60	73.60	lb/hr
Total				73.60	lb/hr
Normal Operation 100% with Duct burner	19.90	19.90		39.80	lb/hr
Total				113.40	lb/hr

Normal Operatoin

100% with Duct burner	19.90	19.90	19.90	59.70	lb/hr
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Appendix B

1-hour NO₂ Nearby Source Inventory

Plant Name	Model Source ID	Horizontal Coordinate	Vertical Coordinate	Elevation	Stack Height	Exit Temp	Exit Velocity	Stack Diameter	Emission Rate
		m	m	ft	ft	°F	fps	ft	lb/hr
Virginia -VRO									
E I DuPont de Nemours & Co Inc - Front Royal	VA1	744,807.43	4,318,410.69	575	75	625	48.000	2.40	1.811
Riverton Corporation	VA2	743,807.45	4,315,220.74	490	55	400	10.610	3.00	0.000
Stuart M Perry Inc - Front Royal	VA3	743,807.45	4,315,220.74	500	25	350	0.010	2.00	0.300
Riverton Corporation	VA4	743,517.45	4,315,220.74	490	26	370	106.100	2.00	0.000
Toray Plastics	VA5	745,417.42	4,319,420.67	565.3	50	350	17.320	2.50	0.326
Toray Plastics	VA6	745,417.42	4,319,420.67	565.3	72	86	45.010	1.29	0.731
Lowes Home Centers Inc - Front Royal #2555	VA7	742,817.46	4,315,120.74	700	25	1011	552.920	0.30	0.000
Interbake Foods	VA8	746,517.41	4,320,420.66	100	33	250	0.740	12.00	5.799
Valley Health - Warren Memorial Hospital	VA9	742,807.46	4,312,610.79	600	64	250	18.330	3.00	0.374
Valley Health - Warren Memorial Hospital	VA10	742,807.46	4,312,610.79	600	64	250	18.330	3.00	0.000
Leslie Fox Keyser Elementary School	VA11	745,017.45	4,311,720.80	650	22	350	6.070	1.00	0.021
Leslie Fox Keyser Elementary School	VA12	745,017.45	4,311,720.80	650	18	350	5.000	10.00	0.031
Middletown Elementary School	VA13	736,907.44	4,324,410.62	740	25	250	18.340	0.80	0.015
Middletown Elementary School	VA14	736,907.44	4,324,410.62	740	25	250	18.340	0.80	0.027
Middletown Elementary School	VA15	736,907.44	4,324,410.62	740	25	250	18.340	0.80	0.027
Experis Data Centers LLC	VA16	734,517.44	4,322,510.62	710	35	280	23.340	1.00	0.048
Experis Data Centers LLC	VA17	734,517.44	4,322,510.62	710	19	780	0.020	1.00	0.345
Stowe Woodward Company	VA18	733,907.44	4,321,810.61	850	24	350	1.280	1.29	1.010
Stowe Woodward Company	VA19	733,907.44	4,321,810.61	850	24	350	1.280	1.29	0.460
O-N Minerals (Chemstone) Company - Middletown	VA20	733,617.43	4,324,020.61	680	17	180	69.290	3.50	6.500
O-N Minerals (Chemstone) Company - Strasburg	VA21	732,307.44	4,322,010.61	630	79	200	132.630	4.00	62.552
O-N Minerals (Chemstone) Company - Strasburg	VA22	732,307.44	4,322,010.61	630	47	550	57.630	3.59	0.000
Federal Bureau of Investigation-Records Management	VA23	745,677.34	4,330,550.61	710	15	764	52.290	0.67	0.000
Hardrock Crushing LLC - Portable 81556	VA24	740,017.38	4,330,220.61	710	25	200	0.003	0.50	7.192
Hardrock Crushing LLC - Portable 81559	VA25	740,017.38	4,330,220.61	710	25	200	0.003	0.50	7.192
Hardrock Crushing LLC - Portable 81558	VA26	740,017.38	4,330,220.61	710	25	200	0.003	0.50	2.877
O-N Minerals (Chemstone) Company - Strasburg	VA27	731,307.43	4,322,010.60	630	79	200	16.580	4.00	0.000
O-N Minerals (Chemstone) Company - Strasburg	VA28	731,307.43	4,322,010.60	630	79	200	16.580	4.00	0.000
O-N Minerals (Chemstone) Company - Strasburg	VA29	731,307.43	4,322,010.60	630	79	200	16.580	4.00	0.000
O-N Minerals (Chemstone) Company - Strasburg	VA30	731,307.43	4,322,010.60	630	79	200	16.580	4.00	0.000
O-N Minerals (Chemstone) Company - Strasburg	VA31	731,307.43	4,322,010.60	630	79	200	16.580	4.00	0.000
W-L Construction & Paving Inc - Strasburg	VA32	730,817.43	4,321,720.60	1300	41	270	76.040	4.50	2.297
Columbia Gas Transmission Corp - Strasburg Com Sta	VA33	730,017.43	4,321,120.60	680	41	901	98.670	5.59	26.514
R R Donnelley Strasburg Division	VA34	729,517.44	4,317,720.63	575	16	475	5.890	1.20	0.031
R R Donnelley Strasburg Division	VA35	729,517.44	4,317,720.63	575	52	325	60.130	5.30	0.282
R R Donnelley Strasburg Division	VA36	729,517.44	4,317,720.63	575	25	240	101.860	1.00	0.228
Carpers Wood Creations Inc	VA37	729,117.43	4,318,020.63	800	24	350	25.460	1.00	0.000
Valley Milk Products	VA38	728,907.43	4,318,720.62	570	27	400	0.010	1.79	0.568
Boyce Elementary School	VA39	753,807.27	4,331,410.62	625	40	400	0.010	1.89	0.057
Pallet Recycling LLC - Portable 81571	VA40	727,417.42	4,319,720.59	580	15	930	872.400	0.30	85.106
Pallet Recycling LLC - Portable 81568	VA41	727,017.42	4,319,720.59	580	15	930	872.400	0.30	11.630
General Electric Company - Winchester Lamp Plant	VA42	742,607.32	4,335,410.59	775	48	70	15.470	2.40	0.194
General Electric Company - Winchester Lamp Plant	VA43	742,607.32	4,335,410.59	775	48	70	15.470	2.40	0.119
General Electric Company - Winchester Lamp Plant	VA44	742,607.32	4,335,410.59	775	32	200	44.760	0.80	0.646
General Electric Company - Winchester Lamp Plant	VA45	742,607.32	4,335,410.59	775	35	487	0.010	2.00	0.646
General Electric Company - Winchester Lamp Plant	VA46	742,607.32	4,335,410.59	775	48	70	15.470	2.40	0.797
General Electric Company - Winchester Lamp Plant	VA47	742,607.32	4,335,410.59	775	48	70	15.470	2.40	0.391
Trex Company Inc	VA48	743,017.32	4,335,720.59	721	12	850	1285.970	0.50	0.000
Henkel-Harris Co Inc - South Pleasant Valley Road	VA49	743,517.31	4,336,610.58	740	35	350	0.010	2.00	0.275
Allied Systems/Annandale Millwork	VA50	748,117.27	4,336,720.59	700	25	200	0.003	1.00	0.750
Frederick County Landfill	VA51	749,117.27	4,336,620.59	670	28	1500	6.090	0.66	0.785
County of Frederick - Public Safety Building	VA52	743,217.30	4,337,620.58	796	31	1650	27.060	2.00	0.000
County of Frederick - Public Safety Building	VA53	743,217.30	4,337,620.58	796	10	1011	49.760	1.00	0.000
Federal-Mogul Friction Products	VA54	744,117.29	4,338,120.58	725	49	380	15.300	4.00	0.082
Federal-Mogul Friction Products	VA55	744,117.29	4,338,120.58	725	40	500	25.470	2.29	0.109
Federal-Mogul Friction Products	VA56	744,117.29	4,338,120.58	725	25	750	18.570	2.00	0.000
Federal-Mogul Friction Products	VA57	744,117.29	4,338,120.58	725	40	150	0.010	1.70	1.035
SPCA of Winchester, Frederick & Clarke Counties	VA58	744,717.28	4,338,820.58	690	25	1419	23.640	1.00	0.190
O'Sullivan Films Inc	VA59	743,517.29	4,338,910.57	720	53	470	36.530	1.50	0.000
O'Sullivan Films Inc	VA60	743,517.29	4,338,910.57	720	40	470	13.150	2.50	0.199
O'Sullivan Films Inc	VA61	743,517.29	4,338,910.57	720	30	475	16.830	2.00	0.466
O'Sullivan Films Inc	VA62	743,517.29	4,338,910.57	720	53	470	36.530	1.50	0.000
O'Sullivan Films Inc	VA63	743,517.29	4,338,910.57	720	25	350	19.260	0.80	0.530
O'Sullivan Films Inc	VA64	743,517.29	4,338,910.57	720	53	470	36.530	1.50	0.000
O'Sullivan Films Inc	VA65	743,517.29	4,338,920.57	720	50	205	43.830	6.75	0.479
O'Sullivan Films Inc	VA66	743,517.29	4,338,920.57	720	25	350	0.030	0.80	0.386
O'Sullivan Films Inc	VA67	743,517.29	4,338,920.57	720	75	300	0.003	3.00	2.430
O'Sullivan Films Inc	VA68	743,517.29	4,338,920.57	720	50	300	55.540	4.90	0.251
Stuart M Perry Incorporated	VA69	740,307.29	4,341,110.56	870	21	250	308.400	1.70	3.174
Stuart M Perry Inc	VA70	740,317.29	4,341,120.56	830	21	250	308.400	1.70	3.174
Stuart M Perry Inc - Portable 81491	VA71	740,317.29	4,341,120.56	720	25	200	0.003	0.50	5.850
James Wood Middle School	VA72	743,107.27	4,341,610.56	780	100	325	15.700	5.00	0.030
Frederick County Public Schools	VA73	742,907.27	4,341,610.56	783	18	325	0.010	2.00	0.016
Winchester Medical Center (VHS)	VA74	741,707.28	4,341,910.56	810	15	810	227.130	0.80	14.210
Winchester Medical Center (VHS)	VA75	741,707.28	4,341,910.56	810	20	806	223.240	1.00	23.390
Winchester Medical Center (VHS)	VA76	741,707.28	4,341,910.56	810	34	500	14.730	2.29	4.580
Winchester Medical Center (VHS)	VA77	741,707.28	4,341,910.56	810	22	367	33.830	2.00	11.460
Plumly Flooring LLC	VA78	745,517.25	4,342,110.56	740	24	425	32.470	2.29	0.857
Plumly Flooring LLC	VA79	745,517.25	4,342,110.56	740	50	460	73.400	2.00	3.643
National Fruit Product Co Inc	VA80	744,717.25	4,342,300.56	816.27	45	385	18.340	1.80	1.860
National Fruit Product Co Inc	VA81	744,717.25	4,342,300.56	816.27	44	350	34.520	2.00	2.760
National Fruit Product Co Inc	VA82	744,717.25	4,342,300.56	815.94	42	350	24.990	1.50	2.760
National Fruit Product Co Inc	VA83	744,717.25	4,342,310.56	816.6	45	385	18.340	1.80	1.860
National Fruit Product Co Inc	VA84	744,717.25	4,342,320.56	700	30	350	16.680	0.80	0.000
National Fruit Product Co Inc	VA85	744,717.25	4,342,320.56	700	25	1011	552.920	0.30	0.000
National Fruit Product Co Inc	VA86	744,737.25	4,342,370.56	820.54	36	350	18.360	2.00	5.200
Winchester Electric Service Inc	VA87	746,217.24	4,342,720.56	706	26	500	18.390	1.16	0.221
American Woodmark Corp	VA88	760,857.86	4,337,214.18	595	40	525	50.000	2.50	0.322
JEMCO Inc - Portable 81603	VA89	746,517.23	4,343,120.56	673	25	200	0.003	5.00	4.320
Johnson Williams Intermediate School	VA90	760,312.67	4,337,879.61	600	60	400	22.950	3.40	0.054
Berryville Primary School	VA91	760,185.78	4,338,282.10	600	40	400	0.010	1.70	0.039
Shockey Precast Group - Winchester Facility	VA92	745,717.24	4,343,520.56	740	24	200	0.003	1.30	1.030
Shockey Precast Group - Winchester Facility	VA93	745,717.24	4,343,520.56	740	24	200	0.030	1.30	1.030
Clarke County High School	VA94	759,335.30	4,339,017.48	610	26	355	19.370	1.50	0.046
Berryville Graphics Inc	VA95	761,758.61	4,337,384.09	582	36	325	19.470	1.79	6.38
Berryville Graphics Inc	VA96	761,758.61	4,337,384.09	582	36	325	19.470	1.79	3.04
Berryville Graphics Inc	VA97	761,758.61	4,337,384.09	582	36	325	19.470	1.79	3.04
Berryville Graphics Inc	VA98	761,758.61	4,337,384.09	582	36	325	19.470	1.79	2.49
Berryville Graphics Inc	VA99	761,758.61	4,337,384.09	582	36	300	49.550	1.79	1.31
Green Bay Packaging Inc-Winchester Coated Products	VA100	746,617.23	4,343,820.56	685	42	184	14.740	2.51	0.5

Plant Name	Model Source ID	Horizontal Coordinate	Vertical Coordinate	Elevation	Stack Height	Exit Temp	Exit Velocity	Stack Diameter	Emission Rate
		m	m	ft	ft	°F	fps	ft	lb/hr
Stuart M Perry Inc - Lime Pelletizing Plant	VA105	766,720.19	4,335,106.86	460	52	175	79.790	2.50	2.078
Stuart M Perry Asphalt Plant - Portable 81262	VA106	766,720.19	4,335,106.86	460	28	275	265.070	1.79	0.960
Stuart M Perry Asphalt Plant - Portable 81262	VA107	766,720.19	4,335,106.86	460	28	275	265.070	1.79	0.220
Valley Proteins, Inc.	VA108	737,817.27	4,345,720.54	900	25	350	0.010	2.00	8.580
Valley Proteins, Inc.	VA109	737,817.27	4,345,720.54	900	25	350	0.010	2.00	8.580
Allied Wood Products Inc	VA110	749,307.19	4,346,720.55	630	15	350	39.050	1.20	0.500
Indian Hollow Elementary School	VA111	733,017.29	4,344,820.52	800	24	500	28.850	0.80	0.030
Tommi's Farm	VA112	715,127.38	4,308,320.64	800	25	1400	145.010	0.60	0.009
VF Jeanswear - Wrangler	VA113	716,017.40	4,305,720.67	868	40	450	33.720	1.20	0.041
Massanutten Military Academy	VA114	715,907.40	4,305,910.67	810	52	250	18.320	6.00	0.161
Massanutten Military Academy	VA115	715,907.40	4,305,910.67	810	32	200	16.660	2.00	0.036
Massanutten Military Academy	VA116	715,907.40	4,305,910.67	810	52	250	18.320	6.00	0.161
Valley Health - Shenandoah Memorial Hospital	VA117	715,807.40	4,305,310.67	780	18	440	28.500	1.39	2.340
Stonewall Elementary School	VA118	750,017.17	4,348,410.54	630	35	325	2.120	0.10	0.012
Essroc Ready Mix dba Crider & Shockey-Stephenson	VA119	751,017.16	4,348,220.54	564	14	200	0.003	2.29	0.290
Essroc Ready Mix dba Crider & Shockey-Stephenson	VA120	751,017.16	4,348,220.54	564	20	200	0.003	3.14	0.290
Stonewall Elementary School	VA121	750,017.17	4,348,420.54	630	35	325	2.120	0.10	0.012
Pennsylvania Drilling Company	VA122	715,517.40	4,304,410.68	865	18	300	0.020	1.10	0.321
O-N Minerals (Chemstone) Company - Clearbrook	VA123	750,817.16	4,348,520.54	600	20	500	26.530	4.00	3.200
O-N Minerals (Chemstone) Company - Clear Brook	VA124	751,407.15	4,348,910.54	625	185	269	34.760	6.00	34.632
O-N Minerals (Chemstone) Company - Portable 81477	VA125	751,417.15	4,348,920.54	630	25	68	36.960	0.83	0.000
O-N Minerals (Chemstone) Company - Clear Brook	VA126	751,417.15	4,348,920.54	625	25	880	124.510	0.28	1.200
Virginia Harbor Services Inc	VA127	750,607.15	4,349,310.54	625	27	350	9.430	1.50	0.148
W-L Construction & Paving Inc - Clearbrook	VA128	751,307.15	4,349,310.54	790	21	320	128.130	2.79	9.450
W-L Construction & Paving Inc - Clearbrook	VA129	751,307.15	4,349,310.54	638	25	400	10.820	0.79	0.320
W-L Construction & Paving Inc - Clearbrook	VA130	751,307.15	4,349,310.54	638	50	240	100.220	3.80	41.640
W-L Construction & Paving Inc - Clearbrook	VA131	751,317.15	4,349,320.54	638	50	240	100.220	3.80	16.160
W-L Construction & Paving Inc - Clearbrook	VA132	751,317.15	4,349,320.54	638	25	400	10.820	1.00	0.089
W-L Construction & Paving Inc - Clearbrook	VA133	751,317.15	4,349,320.54	638	50	240	100.220	3.80	16.160
VA Dept of Military Affairs - Woodstock Armory	VA134	713,017.36	4,304,220.67	800	12	300	21.390	1.00	0.018
Unimin Corporation	VA135	729,517.29	4,348,010.49	875	15	165	64.210	3.59	1.458
CED Enterprises Inc	VA136	730,207.27	4,348,720.48	714	39	1500	5.210	2.14	1.288
Travis C Yonts - Farm	VA137	707,258.12	4,308,394.96	773	25	1400	73.420	1.00	0.000
Mountain View Rendering Company	VA138	707,207.29	4,305,410.62	1090	45	100	59.090	5.19	0.760
Mountain View Rendering Company	VA139	707,207.29	4,305,410.62	1090	40	398	54.410	2.09	4.007
Rockingham Redi-Mix Inc	VA140	720,917.51	4,282,421.03	823	25	200	0.003	0.50	0.006
Luray Elementary School	VA141	721,407.51	4,281,911.04	850	40	425	5.100	3.00	0.050
Luray High School	VA142	721,407.51	4,281,911.04	900	24	400	18.320	2.50	0.032
Valley Health - Page Memorial Hospital	VA143	720,207.51	4,282,311.02	900	22	375	0.010	1.20	0.123
Montvue Nursing Home	VA144	719,907.51	4,282,411.01	800	22	350	0.030	0.89	0.078
R C Adams Inc - Portable 81593	VA145	728,617.17	4,357,720.39	1283	25	200	0.003	0.50	2.600
R C Adams Inc - Portable 81597	VA146	728,617.17	4,357,720.39	1283	25	200	0.003	0.50	8.400
R C Adams Inc - Portable 81594	VA147	728,617.17	4,357,720.39	1283	25	200	0.003	0.50	3.060
Shenandoah Valley Construction - Portable 81598	VA148	703,814.61	4,298,828.74	997	25	200	0.003	0.50	8.780
Bowman Apple Products Co Inc	VA149	706,607.28	4,293,610.68	885	26	480	34.590	2.00	9.229
Bowman Apple Products Co Inc	VA150	706,607.28	4,293,610.68	885	90	375	47.160	4.50	10.782
Bowman Apple Products Co Inc	VA151	706,607.28	4,293,610.68	885	90	375	28.820	4.50	10.547
Bowman Apple Products Co Inc	VA152	706,607.28	4,293,610.68	885	35	450	31.570	2.30	0.000
Carolyn Fox - Farm	VA153	720,017.53	4,278,221.09	800	25	1424	10.890	1.16	0.096
Charles Fansler - Farm	VA154	703,317.23	4,291,920.65	1000	25	1400	84.880	0.50	0.046
Masco Builder Cabinet Group	VA155	703,707.23	4,289,410.69	925	40	325	28.730	2.29	0.000
Masco Builder Cabinet Group	VA156	703,707.23	4,289,410.69	925	40	400	55.680	2.50	0.272
Masonite Corporation	VA157	716,817.52	4,271,821.16	1195	40	150	0.080	0.50	0.315
Virginia -NVRO									
Visa USA Incorporated	VA158	764,855.82	4,331,475.53	250	33	941	167.860	1.50	9.360
Visa USA Incorporated	VA159	764,855.82	4,331,475.53	250	25	1085	314.740	0.50	0.000
Visa USA Incorporated	VA160	764,855.82	4,331,475.53	250	33	941	167.860	1.50	10.720
Mount Weather FEMA Emergency Operations	VA161	769,338.90	4,328,855.47	1710	35	815	130.240	0.67	2.462
Mount Weather FEMA Emergency Operations	VA162	769,338.90	4,328,855.47	1710	35	815	130.240	0.67	8.757
Mount Weather FEMA Emergency Operations	VA163	769,338.90	4,328,855.47	1710	35	815	0.003	0.67	1.506
Mount Weather FEMA Emergency Operations	VA164	769,338.90	4,328,855.47	1710	35	815	130.240	0.67	7.188
Mount Weather FEMA Emergency Operations	VA165	769,338.90	4,328,855.47	1710	35	815	130.240	0.67	3.543
Mount Weather FEMA Emergency Operations	VA166	769,338.90	4,328,855.47	1710	35	815	0.003	0.67	1.355
Mount Weather FEMA Emergency Operations	VA167	769,338.90	4,328,855.47	1710	35	954	109.350	1.00	18.889
Mount Weather FEMA Emergency Operations	VA168	769,338.90	4,328,855.47	1710	35	954	196.320	0.67	15.333
Mount Weather FEMA Emergency Operations	VA169	769,338.90	4,328,855.47	1710	35	815	130.240	0.67	38.462
Mount Weather FEMA Emergency Operations	VA170	769,338.90	4,328,855.47	1710	35	921	280.700	1.20	0.000
Mount Weather FEMA Emergency Operations	VA171	769,338.90	4,328,855.47	1710	35	909	105.280	1.20	81.867
Mount Weather FEMA Emergency Operations	VA172	769,338.90	4,328,855.47	1710	35	800	118.180	0.67	6.400
Mount Weather FEMA Emergency Operations	VA173	769,338.90	4,328,855.47	1710	35	954	196.320	0.67	55.556
Mount Weather FEMA Emergency Operations	VA174	769,338.90	4,328,855.47	1710	35	815	0.003	0.67	0.753
Claude Thompson Elementary School	VA175	773,285.58	4,311,585.59	500	23	100	0.010	2.00	0.058
Rappahannock Co. Elementary School	VA176	745,607.51	4,285,911.19	50	27	100	0.010	1.39	0.083
RAPPAHANNOCK COUNTY SCHOOL BOARD OFFICE	VA177	744,607.51	4,285,721.19	705	25	285	0.003	2.30	0.935
RAPPAHANNOCK COUNTY SCHOOL BOARD OFFICE	VA178	744,607.51	4,285,721.19	705	25	285	0.003	2.30	0.935
RAPPAHANNOCK COUNTY SCHOOL BOARD OFFICE	VA179	744,607.51	4,285,721.19	705	25	285	0.003	2.30	0.935
Banneker Elementary School	VA180	777,663.94	4,321,186.38	529	30	400	0.003	2.30	0.138
Banneker Elementary School	VA181	777,663.94	4,321,186.38	529	16	275	0.010	1.20	0.039
Westfields International Conference Center	VA182	807,136.83	4,308,309.09	919	25	200	0.030	2.30	15.980
ROUND HILL CENTER	VA183	778,826.65	4,336,800.69	304	20	300	0.010	2.00	0.061
U. S. Army-Warrenton Training Station A	VA184	775,474.45	4,291,873.48	600	38	1200	13.090	2.79	0.000
Warrenton Training Station B	VA185	776,436.34	4,291,617.41	350	10	200	4.240	1	0.040
Warrenton Training Station B	VA186	776,436.34	4,291,617.41	350	20	200	10.610	1	1.288
Warrenton Training Station B	VA187	776,436.34	4,291,617.41	350	15	940	253.130	1.2	4.129
Round Hill Elementary School	VA188	779,861.11	4,337,981.92	600	25	285	0.003	2.30	0.935
Fauquier High School	VA189	776,969.98	4,290,468.16	500	32	335	35.000	2.00	1.617
Warrenton Sewage Treatment Plant	VA190	776,899.15	4,290,172.83	50	10	100	26.290	1.00	8.462
Warrenton Sewage Treatment Plant	VA191	776,899.15	4,290,172.83	50	14	100	0.020	1.00	17.059
Virginia Dept of Agriculture & Consumer Services	VA192	777,124.96	4,289,786.71	500	46	1800	19.320	2.00	0.115
Garrett Street Investments	VA193	777,691.04	4,290,325.04	550	17	1500	29.060	1.10	0.000
Garrett Street Investments	VA194	777,691.04	4,290,325.04	550	25	1500	29.060	1.10	0.000
FAUQUIER HOSPITAL INC (THE)	VA195	777,530.73	4,289,713.11	640	10	200	10.610	1.00	0.240
FAUQUIER HOSPITAL INC (THE)	VA196	777,530.73	4,289,713.11	640	10	340	6.520	2.00	0.000
FAUQUIER HOSPITAL INC (THE)	VA197	777,530.73	4,289,713.11	640	10	340	6.520	2.00	0.546
Moser Funeral Home, Inc.	VA198	778,474.46	4,289,995.56	150	32	1100	19.810	1.50	0.244
Emerick Elementary School	VA199	783,679.65	4,336,330.16	558	30	300	0.003	3.20	0.825
U. S. Army-Warrenton Training Station A	VA200	778,644.63	4,289,846.35	340	10	200	4.240	1.00	0.160
Basham Simms Wastewater Facility	VA201	784,086.17	4,336,246.81	530	10	1300	76.500	0.41	0.560
Basham Simms Wastewater Facility	VA202	784,185.98	4,336,253.42	530	25	1256	42.680	0.33	0.002
LOUDOUN VALLEY HIGH SCHOOL	VA203	785,098.18	4,337,617.09	535	30	300	0.003	2.50	4.500
Aldie Elementary School	VA204	790,673.74	4,318,336.03	330	35	250	0.003	2.50	0.935
Fauquier County Landfill Gas LLC	VA205	779,649.70	4,286,444.09	500	30	878	117.300	1.17	2.804
Fauquier County Landfill Gas LLC	VA206	779,649.70	4,286,444.09	500	30	878	117.300	1.17	2.854
Hamilton Elementary School	VA207	788,548.04	4,336,843.07	500	25	285	0.003	2.30	1.870
Vint Hill Farm Station	VA208	788,500.68	4,293,631.00	50	20	300	25.460	2.00	0.000

Plant Name	Model Source ID	Horizontal Coordinate	Vertical Coordinate	Elevation	Stack Height	Exit Temp	Exit Velocity	Stack Diameter	Emission Rate
		m	m	ft	ft	°F	fps	ft	lb/hr
Vint Hill Farm Station	VA209	788,500.68	4,293,631.00	50	45	300	25.460	2.00	0.000
Potomac Consolidated Tracon (FAA)	VA210	789208.873	4294239.167	100	25	350	94.310	0.75	5.200
Potomac Consolidated Tracon (FAA)	VA211	789208.873	4294239.167	100	25	350	94.310	0.75	2.800
Potomac Consolidated Tracon (FAA)	VA212	789208.873	4294239.167	100	25	350	94.310	0.75	3.400
Potomac Consolidated Tracon (FAA)	VA213	789208.873	4294239.167	100	25	350	94.310	0.75	3.200
Dominion - Leesburg Compressor Station	VA214	794,625.87	4,322,406.78	430	33	910	146.000	0.50	2.424
Dominion - Leesburg Compressor Station	VA215	794,625.87	4,322,406.78	430	32	350	11.050	1.30	0.228
Cardinal Concrete-Warrenton	VA216	783,534.81	4,285,285.48	470	16	350	25.000	1.00	0.025
Dominion - Leesburg Compressor Station	VA217	794,715.71	4,322,412.71	430	34	540	59.000	3.00	5.983
Dominion - Leesburg Compressor Station	VA218	794,715.71	4,322,412.71	430	34	540	59.000	3.00	3.993
Dominion - Leesburg Compressor Station	VA219	794,725.04	4,322,423.35	430	48	916	176.690	3.50	5.457
Superior Paving Corp-Warrenton Plant	VA220	783,540.70	4,285,195.65	500	60	70	9.550	10.00	22.000
Loudoun Compressor Station	VA221	795,190.26	4,321,451.45	420	32	900	140.010	2.00	4.181
Dominion - Loudoun Compressor Station	VA222	795,267.58	4,321,647.06	422	30	850	108.760	1.00	0.080
Dominion - Loudoun Compressor Station	VA223	795,267.58	4,321,647.06	424	23	878	86.280	2.00	0.187
Dominion - Loudoun Compressor Station	VA224	795,267.58	4,321,647.06	424	36	864	76.260	3.00	0.201
Dominion - Loudoun Compressor Station	VA225	795,267.58	4,321,647.06	424	36	864	76.260	3.00	0.201
Dominion - Loudoun Compressor Station	VA226	795,267.58	4,321,647.06	428	20	810	116.590	1.00	0.000
Loudoun Compressor Station	VA227	795,276.91	4,321,657.70	420	32	900	140.010	2.00	4.227
Loudoun Compressor Station	VA228	795,276.91	4,321,657.70	420	32	900	140.010	2.00	4.145
Loudoun Compressor Station	VA229	795,276.91	4,321,657.70	420	32	900	140.010	2.00	3.750
Loudoun Compressor Station	VA230	795,276.91	4,321,657.70	420	32	900	140.010	2.00	4.156
Loudoun Compressor Station	VA231	795,276.91	4,321,657.70	420	12	1000	100.670	0.50	0.000
Loudoun Compressor Station	VA232	795,276.91	4,321,657.70	420	32	900	140.010	2.00	4.139
Loudoun Compressor Station	VA233	795,276.91	4,321,657.70	420	32	900	140.010	2.00	4.099
Loudoun Compressor Station	VA234	795,276.91	4,321,657.70	420	32	900	140.010	2.00	4.240
Loudoun Compressor Station	VA235	795,276.91	4,321,657.70	420	53	800	346.530	2.25	21.568
Loudoun County Dept of Construction & Waste Mgmt	VA236	795,220.29	4,327,068.14	393	35	145	0.130	7.00	0.368
City of Manassas WTP	VA237	793,134.75	4,296,341.45	345	12	820	162.000	1.50	4.094
Betco Supreme Incorporated	VA238	795,204.23	4,299,785.98	350	35	355	30.000	2.00	0.077
Calpine c*Power	VA239	795,259.50	4,299,097.82	350	100	200	83.960	8.50	0.000
Calpine c*Power	VA240	795,259.50	4,299,097.82	350	100	200	83.960	8.50	0.000
Calpine c*Power	VA241	795,259.50	4,299,097.82	350	100	200	83.960	8.50	0.000
Calpine c*Power	VA242	795,259.50	4,299,097.82	350	100	200	83.960	8.50	0.000
Calpine c*Power	VA243	795,259.50	4,299,097.82	350	100	200	83.960	8.50	0.000
Calpine c*Power	VA244	795,259.50	4,299,097.82	350	21	880	194.220	0.95	0.000
Calpine c*Power	VA245	795,259.50	4,299,097.82	350	28	780	200.270	0.40	0.000
Chemung Contracting Corporation	VA246	796014.987	4299169.788	200	30	300	71.620	4	1.272
Willow Run Company Incorporated	VA247	764,224.43	4,266,391.32	315	25	200	0.003	2.30	2.400
Willow Run Company Incorporated	VA248	764,224.43	4,266,391.32	315	25	200	0.003	2.30	0.971
Waterford Elementary School	VA249	792,643.11	4,343,129.96	450	24	200	0.003	2.30	0.935
Dupont Fabros Technology - Porpoise Ventures LLC	VA250	795,857.08	4,297,633.20	350	40	973	217.230	1.30	3.740
Dupont Fabros Technology - Porpoise Ventures LLC	VA251	795,857.08	4,297,633.20	350	40	973	217.230	1.30	2.714

West Virginia

GUARDIAN FIBERGLASS, INC.	WV1	756,427.99	4,365,613.56	591.000	60	200	58.600	2.33	0.120
GUARDIAN FIBERGLASS, INC.	WV2	756,427.99	4,365,613.56	591.000	120	110	40.200	6.50	1.280
GUARDIAN FIBERGLASS, INC.	WV3	756,427.99	4,365,613.56	591.000	120	282	69.400	4.33	15.000
GUARDIAN FIBERGLASS, INC.	WV4	756,427.99	4,365,613.56	591.000	15	300	9.400	0.67	9.130
GUARDIAN FIBERGLASS, INC.	WV5	756,427.99	4,365,613.56	591.000	13	300	24.000	0.42	8.500
GUARDIAN FIBERGLASS, INC.	WV6	756,427.99	4,365,613.56	591.000	43	300	2.600	2.00	1.500
GUARDIAN FIBERGLASS, INC.	WV7	756,427.99	4,365,613.56	591.000	60	149	83.900	2.33	0.120
GUARDIAN FIBERGLASS, INC.	WV8	756,427.99	4,365,613.56	591.000	120	97	36.600	7.17	1.280
GUARDIAN FIBERGLASS, INC.	WV9	756,427.99	4,365,613.56	591.000	120	242	45.600	4.75	15.000
OX PAPERBOARD, LLC	WV10	776,114.17	4,356,679.36	433.000	90	330	55.100	3.96	12.100
CAPITOL CEMENT - ESSROC MARTINSBURG	WV11	760,122.30	4,369,547.27	499.000	200	350	32.800	14.83	807.000
CAPITOL CEMENT - ESSROC MARTINSBURG	WV12	760,122.30	4,369,547.27	499.000	100	400	34.000	12.50	532.877
CAPITOL CEMENT - ESSROC MARTINSBURG	WV13	760,122.30	4,369,547.27	509.000	20	300	26.200	0.92	0.450
QUEBECOR WORLD - MARTINSBURG	WV14	766,581.64	4,367,371.81	509.000	40	321	20.000	1.50	0.460
QUEBECOR WORLD - MARTINSBURG	WV15	766,581.64	4,367,371.81	509.000	40	321	20.000	1.50	0.460
QUEBECOR WORLD - MARTINSBURG	WV16	766,581.64	4,367,371.81	509.000	40	321	20.000	1.50	0.460
QUEBECOR WORLD - MARTINSBURG	WV17	766,581.64	4,367,371.81	509.000	40	321	20.000	1.50	0.610
QUEBECOR WORLD - MARTINSBURG	WV18	766,581.64	4,367,371.81	509.000	40	321	20.000	1.50	0.610
QUEBECOR WORLD - MARTINSBURG	WV19	766,581.64	4,367,371.81	509.000	40	321	20.000	1.50	0.290
QUEBECOR WORLD - MARTINSBURG	WV20	766,581.64	4,367,371.81	509.000	40	321	20.000	1.50	0.370
QUEBECOR WORLD - MARTINSBURG	WV21	766,581.64	4,367,371.81	509.000	40	321	20.000	1.50	0.400

	Model Source ID	Horizontal Coordinate m	Vertical Coordinate m	Elevation ft	Stack Height ft	Exit Temp °F	Exit Velocity fps	Stack Diameter ft	Emission Rate lb/hr
Maryland									
H. B. Mellott Estate, Inc.	MD1	776,553.42	4,391,027.90	538	12	800	600.000	0.33	8.208
Mack Trucks, Inc.	MD2	781,797.45	4,363,886.82	525	38	360	24.000	0.83	15.338
Martins Elevator Inc	MD3	779,642.58	4,397,014.54	623	20	300	10.000	1.00	0.583
Richard F. Kline, Inc. - Frederick	MD4	809,591.45	4,366,365.76	312	41	285	70.000	4.50	1.470
J Craig Venter Institute Inc	MD5	829,903.15	4,335,295.06	463	22	152	70.000	0.17	43.125
Holcim (US), Inc.	MD6	784,797.46	4,394,734.77	505	75	545	65.000	8.33	107.500
Allegany College of Maryland	MD7	694,707.83	4,391,619.85	659	30	350	10.000	2.00	0.917
Mirant - Dickerson Generating Station	MD8	804,863.57	4,345,683.43	226	703	181	61.000	25.00	1209.250
Western Correctional Institution	MD9	687,626.28	4,386,615.15	640	30	232	10.000	0.50	2.917
North Branch Correctional Institution	MD10	687,247.26	4,386,530.08	682	27	330	10.000	0.50	30.000
Lafarge - Rockville Hot Mix Asphalt	MD11	834,288.44	4,334,836.85	430	12	350	10.000	1.00	3.816
F. O. Day Bituminous Company	MD12	826,776.36	4,332,549.05	440	40	220	100.000	3.83	4.196
Citibank, N.A.	MD13	780,069.93	4,401,725.95	663	12	975	0.003	0.67	116.680
Human Genome Sciences, Inc.	MD14	835,392.02	4,330,756.17	394	40	375	30.000	3.00	18.792
National Imagery And Mapping Agency	MD15	836,939.05	4,317,567.65	207	56	300	18.000	1.00	15.708
National Cancer Institute - Frederick	MD16	807,388.65	4,371,182.75	344	11	820	88.000	0.83	8.829
The Jbg Companies	MD17	836,254.58	4,330,989.36	367	12	871	96.000	1.33	30.825
Montgomery County Resource Recovery Facility (MCRRF)	MD18	806,020.97	4,345,038.16	325	275	250	65.000	13.42	271.583
Eastalco Aluminum	MD19	804,596.17	4,359,576.23	325	80	200	51.000	1.25	1.258
National Institutes of Health	MD20	837,501.26	4,324,419.97	354	35	796	43.000	1.17	284.443
I A Construction - Rock Cut	MD21	688,326.61	4,392,457.24	774	40	325	10.000	3.00	2.180
R. Paul Smith Power Station	MD22	772,413.29	4,387,895.01	358	200	305	47.000	12.58	338.042
C. William Hetzer, Inc	MD23	789,422.64	4,387,897.10	505	31	250	99.000	2.67	2.189
National Naval Medical Center	MD24	838,542.11	4,324,390.44	308	25	200	0.003	0.50	26.398
Luke Paper Company	MD25	666,842.64	4,371,224.16	1037	35	450	15.000	0.50	960.713
Mountainview Sanitary Landfill	MD26	678,401.74	4,386,227.23	2169	23	800	14.000	1.33	0.946
Essroc Cement - Frederick	MD27	806,965.52	4,361,275.13	308	295	360	12.000	15.50	694.907
East County Booster Pump Station	MD28	812,128.85	4,365,489.32	302	25	860	0.021	0.67	46.884
Naval Support Facility Indian Head	MD29	831,754.70	4,274,394.79	52	15	915	0.003	0.67	165.120
Miller Asphalt - Legore	MD30	817,121.74	4,384,299.21	377	32	215	50.000	4.00	3.800
Frederick Asphalt Co., L.C. At Essroc	MD31	807,061.09	4,361,221.44	289	38	250	78.000	0.33	3.208
Maryland Correctional Institution	MD32	781,433.59	4,384,549.33	499	102	460	10.000	10.08	11.584
Redland Brick, Inc. - Cushman Plant	MD33	772,739.50	4,388,801.95	381	30	400	50.000	3.00	3.942
FC Landfill Energy, LLC	MD34	814,231.27	4,364,773.98	479	25	905	0.003	0.50	1.940
Tamko Building Products Inc.	MD35	808,087.31	4,362,606.58	279	14	77	0.003	0.50	5.770
Maryland Paper	MD36	773,904.53	4,390,294.46	423	40	350	18.000	4.00	2.109
Invtrogen	MD37	809,282.30	4,363,898.99	282	22	900	614.000	0.50	43.625
Fort Detrick - Area B & Main Post	MD38	807,247.54	4,371,690.88	367	15	900	15.000	0.83	149.054
Craig Paving, Inc	MD39	779,032.59	4,393,103.14	630	30	230	10.000	1.33	1.039
MedImmune, Inc. - Gaithersburg	MD40	825,395.60	4,337,397.78	423	80	445	19.000	2.50	8.233
Cascade Tissue Group - Maryland, LLC	MD41	782,094.27	4,391,773.92	492	80	318	50.000	4.25	14.375
Aggregate Industries DbA Rockville Crushed Stone	MD42	826,776.36	4,332,549.05	440	11	350	18.000	1.00	0.075
Lafarge North America - Rockdale Quarry	MD43	771,463.25	4,397,896.17	466	25	77	10.000	2.00	24.484
AES Warrior Run Inc	MD44	693,521.12	4,385,638.92	669	15	300	10.000	0.42	105.656
National Institute of Standards & Technology	MD45	827,096.12	4,338,658.69	463	30	300	10.000	1.67	17.174
USPS - Bolger Center	MD46	830,040.64	4,326,302.43	344	12	800	600.000	0.50	243.773
J. Craig Venter Institute, Inc.	MD47	829,175.34	4,334,753.77	463	21	325	2.000	2.25	27.625
Pennsylvania									
JERR DAN CORP/STATE LINE WRECKER PLT	PA1	780,727.00	4,402,789.00	689	25	68	0.003	0.50	0.297
COLUMBIA GAS TRANS CORP/GREENCASTLE	PA2	771,304.00	4,408,819.00	509	25	600.008	11.245	0.50	9.863
COLUMBIA GAS TRANS CORP/ARTEMAS COMP STA	PA3	720,985.00	4,400,448.00	1063	20	500	0.164	0.49	11.689
WASTE MGMT DSPL SVC/DBA MTN VIEW LDFL	PA4	773,710.00	4,409,894.00	663	40	1500.008	12.697	6.20	5.662
IND POWER GENERATING CO LLC/INGENCO MTN VIEW LDFL	PA5	773,379.00	4,410,984.00	600	71	849.992	156.070	4.20	16.918
GROVE US LLC/SHADY GROVE PLT	PA6	784,399.00	4,408,753.00	801	45	68	3.675	4.79	2.217
Virginia									
TIMBER LANE ELEMENTARY	VA252	829,812.14	4,310,296.70	400	20	250	0.630	1.30	0.025
CHURCHILL APARTMENTS	VA253	829,839.11	4,309,887.22	400	95	300	0.010	1.50	0.083
Annandale Terrace Elementary School	VA254	829,195.40	4,304,428.34	300	50	250	0.010	1.79	0.035
CHURCHILL RD.ELEM SCH	VA255	830,224.50	4,317,736.58	300	50	250	0.010	2.00	0.025
KEENE MILL ELEMENTARY SCHOOL	VA256	828,331.87	4,299,256.03	300	20	250	0.010	1.20	0.023
Annandale High School	VA257	829,234.82	4,303,829.10	300	77	275	0.003	3.00	0.162
Potomac Hospital	VA258	823,191.59	4,282,981.37	200	25	952	312.760	0.33	18.075
Virginia Concrete Company Inc Falls Church	VA259	830,220.06	4,311,717.84	320	60	425	9.470	1.50	0.092
POTOMAC HIGH SCHOOL	VA260	820,906.34	4,277,907.41	100	24	305	15.090	1.50	0.064
GRAHAM RD ELEM SCH	VA261	830,108.04	4,309,002.18	350	75	250	0.010	1.50	0.034
Crippen Development Group	VA262	820,408.02	4,276,480.78	150	25	200	0.003	0.50	4.531
West Springfield Elementary School	VA263	828,517.07	4,297,964.26	250	50	250	0.010	2.00	0.021
MCLEAN HIGH SCHOOL	VA264	830,705.35	4,315,160.29	300	50	250	0.003	2.60	0.094
DEVONSHIRE CENTER ALTERNATIVE SCHOOL	VA265	830,438.35	4,309,926.70	300	50	250	0.180	2.40	0.030
LACEY CENTER	VA266	830,082.41	4,306,191.91	300	50	250	0.010	1.50	0.014
NORTH SPRINGFIELD ELEMENTARY	VA267	829,385.90	4,301,532.03	280	50	250	0.180	2.40	0.030
South County Secondary School	VA268	827,302.36	4,292,177.33	250	25	400	0.003	0.50	0.227
Ennstone Inc - Dumfries Plant	VA269	820,486.45	4,275,282.44	16	11	540	15.000	1.00	0.032
Gannett Satellite Information Network Incorporated	VA270	831,353.43	4,316,436.82	300	10	940	81.260	0.75	0.320
Titan Virginia Ready-Mix LLC (Dumfries)	VA271	820,670.30	4,275,384.73	30	20	450	19.160	1.50	0.140
Virginia Concrete Company Inc- Dumfries	VA272	820,583.51	4,275,178.47	10	60	425	9.470	1.50	0.019
Covanta Fairfax, Inc.	VA273	826,957.55	4,289,637.18	200	288	290	69.910	7.80	388.365
FRANKLIN SHERMAN	VA274	831,618.48	4,316,524.52	300	50	250	0.010	1.20	0.027
Michigan Cogeneration Systems Inc	VA275	827,068.40	4,289,323.50	230	17	780	127.510	1.00	23.600
Kent Gardens Elementary School	VA276	831,687.52	4,315,325.36	350	50	250	5.890	2.40	0.104
I-95 Landfill	VA277	827,092.96	4,289,254.90	200	40	1400	34.700	9.80	8.200
LONGFELLOW INTERMEDIATE SCHOOL	VA278	831,699.57	4,313,620.90	350	50	250	0.220	2.20	0.053
Westlawn Elementary School	VA279	831,425.48	4,308,798.05	350	50	250	8.490	2.00	0.064
Washington Post, The	VA280	830,403.68	4,301,308.07	240	10	325	44.630	1.29	0.199
Saratoga Elementary School	VA281	828,943.31	4,294,682.27	250	20	250	33.950	1.00	0.064
HAYCOCK ELEM SCH	VA282	831,848.93	4,313,028.89	400	50	250	0.010	1.50	0.025
Beech Tree Elementary School	VA283	831,414.91	4,307,282.70	300	50	250	0.010	2.00	0.021
H L Mooney Water Reclamation Facility	VA284	823,590.70	4,279,798.11	500	119	100	31.830	2.00	2.605
POE INTERMEDIATE	VA285	831,045.69	4,303,747.63	400	50	250	0.010	2.00	0.064
LANGLEY HIGH SCHOOL	VA286	832,202.21	4,318,167.98	250	50	250	0.220	2.20	0.057
Liberty Fabrics	VA287	750,817.42	4,229,721.69	52	42	480	35.370	1.79	0.067

	Model Source ID	Horizontal	Vertical	Elevation	Stack	Exit Temp	Exit	Stack	Emission
		Coordinate	Coordinate						
		m	m	ft	ft	°F	fps	ft	lb/hr
Virginia Concrete Company Inc Woodbridge	VA288	826,767.71	4,286,415.17	60	31	510	2,700	1.29	0.100
MERRILL HOUSE APARTMENTS	VA289	832,309.00	4,310,461.19	300	84.5	325	0.003	2.00	0.514
MAYFAIR HOUSE	VA290	832,262.41	4,309,645.61	350	40	200	0.003	4.00	2.323
SICPA Securink Corp.	VA291	829,725.75	4,294,833.96	240	20	420	35.440	1.20	0.142
COLUMBIA ELEMENTARY	VA292	831,895.42	4,304,706.31	350	50	250	0.010	2.00	0.016
Garfield Elementary School	VA293	831,025.32	4,299,633.70	250	50	250	8.490	2.00	0.112
EDSALL PARK CENTER	VA294	831,566.85	4,302,076.69	260	50	250	0.010	1.90	0.025
Lynnbrook Elementary School	VA295	831,346.03	4,300,858.48	250	50	250	15.090	1.50	0.112
SLEEPY HOLLOW ELEMENTARY (FFXC)	VA296	832,487.24	4,307,754.54	300	50	250	0.010	1.20	0.023
GANNETT OFFSET-SPRINGFIELD	VA297	831,599.69	4,301,577.31	250	60	275	0.220	2.00	0.064
BISHOP O'CONNELL HIGH SCHOOL	VA298	832,913.50	4,312,095.95	350	48	335	25.000	2.00	0.027
Washington Gas Light Company	VA299	831,618.74	4,301,287.67	230	58	400	0.003	2.50	3521.820
Geico	VA300	803,892.89	4,251,436.52	200	25	941	249.810	1.07	260.978
Chesterbrook Elementary School	VA301	833,221.98	4,315,025.30	450	50	250	15.090	1.50	0.072
Belvedere Elementary School	VA302	832,602.42	4,306,157.17	350	100	250	10.480	1.80	0.072
Alexandria Knolls	VA303	832,053.10	4,302,309.28	200	15	68	0.010	1.70	0.128
U S DEPT OF TRANSPORTATION	VA304	833,660.81	4,318,866.09	250	36	450	13.380	1.50	0.180
Virginia Concrete Company Inc Springfield	VA305	832,375.58	4,301,828.95	240	27	200	0.003	1.33	1.095
THOMAS JEFFERSON HIGH SCH FOR SCI & TECH	VA306	832,663.42	4,303,553.14	250	50	250	0.003	3.00	0.123
Aquia Wastewater Treatment Plant	VA307	814,457.60	4,261,651.03	20	25	200	0.003	0.50	0.800
Roosevelt Towers	VA308	833,621.21	4,310,336.98	350	70	375	27.000	2.00	0.094
Weyanoke Elementary School	VA309	832,959.90	4,303,773.26	260	50	250	0.010	1.39	0.030
Enersol Technologies Incorporated	VA310	830,819.10	4,293,611.84	110	26	873	186.740	0.82	2.785
Crushing Corporation of America	VA311	832,733.30	4,302,033.03	300	25	200	0.003	0.50	11.900
Norman M Cole Jr Pollution Control Plant	VA312	829,920.95	4,290,333.13	82	55	140	14.460	4.00	88.363
SPRINGFIELD MALL	VA313	832,165.83	4,298,916.25	230	24	280	30.780	2.00	0.333
Kinder Morgan Newington Terminal	VA314	831,080.03	4,294,220.77	140	25	200	0.003	0.50	0.009
Bush Center for Intelligence (CIA)	VA315	834,096.00	4,318,503.59	210	19	991	4.020	3.29	184.475
HOLMES MIDDLE SCHOOL	VA316	832,999.32	4,303,174.00	250	50	250	0.010	1.79	0.080
Universal Dynamics	VA317	828,174.25	4,285,002.90	20	18	68	0.010	1.20	0.043
Virginia Concrete Company Inc - Newington Plant 2	VA318	831,285.69	4,321,144.00	150	25	200	0.003	0.50	0.103
Sears	VA319	833,999.78	4,309,158.18	365	12	315	34.990	1.00	0.143
Rubble Bee Recycling	VA320	812,556.08	4,258,518.65	243	12	950	47.000	0.30	10.400
GUNSTON ELEMENTARY SCHOOL	VA321	829,732.73	4,288,615.64	150	20	250	0.010	1.80	0.025
Willston Multicultural Center	VA322	834,179.81	4,309,470.97	350	48	200	0.003	2.50	0.021
LEE HIGH SCHOOL	VA323	832,742.26	4,299,455.68	250	50	250	0.003	3.00	0.400
Washington International Teleport	VA324	833,043.28	4,300,980.11	200	25	300	0.040	0.75	9.200
STUART HIGH SCHOOL	VA325	834,078.70	4,307,959.64	300	50	250	0.003	3.00	0.155
FORESTDALE ELEM SCH	VA326	832,775.08	4,298,956.29	250	50	250	0.010	1.80	0.021
Munson Hill Towers	VA327	834,358.61	4,308,279.00	350	120	200	0.003	6.00	0.151
Superior Paving Corporation - Powell Lane	VA328	805,355.72	4,250,529.09	268	30	240	102.060	4.21	1.237
Virginia Concrete Company Inc - Stafford	VA329	812,688.48	4,258,025.89	100	30	450	11.790	1.50	0.030
Edsall Garden Apartments	VA330	833,576.88	4,302,018.30	200	56	200	0.003	2.50	0.128
SPRINGFIELD ESTATES ELEMENTARY	VA331	833,222.61	4,299,778.15	250	20	250	0.010	1.50	0.018
Parklawn Elementary School	VA332	834,226.75	4,305,862.84	250	50	250	10.480	1.80	0.080
Baileys Elementary School	VA333	834,494.78	4,307,886.72	350	100	250	10.480	1.80	0.096
BREN MAR PK ELEM SCH	VA334	833,680.56	4,301,814.47	250	20	250	0.010	1.50	0.030
Stafford Middle School	VA335	813,564.16	4,258,744.82	183	15	200	0.003	0.83	5.392
KEY MIDDLE SCHOOL	VA336	833,338.76	4,299,384.55	250	50	250	0.200	2.30	0.107
FBI Academy	VA337	821,846.25	4,269,825.33	45.66667	25	200	0.003	0.50	251.075
ORLEANS VILLAGE South	VA338	834,328.49	4,304,164.24	240	60	350	30.000	2.50	0.155
Prestwick Apartments	VA339	834,877.73	4,308,012.25	320	78	200	0.003	2.90	1.040
Virginia Village Apartments	VA340	834,484.35	4,303,472.31	250	45	265	0.003	3.50	0.210
Windsor Towers	VA341	835,110.37	4,307,526.00	270	36	350	0.020	1.00	0.142
ORLEANS VILLAGE NORTH	VA342	834,663.74	4,303,795.08	250	25	350	0.003	0.50	0.151
GLASGOW MIDDLE	VA343	835,028.95	4,305,715.01	390	50	250	0.010	2.00	0.039
Virginia Hospital Center - Arlington	VA344	835,848.80	4,311,697.53	330	95	995	6.278	6.00	969.230
NuStar Terminals - Cockpit Point Asphalt Terminal	VA345	825,529.16	4,274,699.62	60	20	425	18.330	1.50	0.466
Dominion - Possum Point Power Station	VA346	824,194.47	4,272,104.99	36	150	598	12.200	2.00	197.267
McLane Mid Atlantic	VA347	806,496.68	4,249,791.19	220	40	233	7.430	2.00	0.330
US Marine Corps - Quantico	VA348	823,596.16	4,270,671.81	30	36	150	0.990	0.83	62.861
Camp Pendleton and Quantico Housing LLC	VA349	823,596.16	4,270,671.81	30	20	150	0.330	1.00	13.410
Spotsylvania County Utilities Dept. Motts Run WTP	VA350	801,680.38	4,245,376.97	315	25	200	0.003	0.50	27.623
Glen Forest Elementary School	VA351	836,066.55	4,308,391.47	230	50	250	8.490	2.00	0.104
FRANCONIA ELEMENTARY	VA352	834,829.73	4,299,592.90	250	100	250	0.010	1.50	0.016
REIT Managnt & Research, LLC	VA353	835,559.90	4,303,743.70	250	20	275	0.020	1.00	0.003
SAXONY SQUARE CONDOMINIUM	VA354	835,559.90	4,303,743.70	180	23	200	0.003	2.30	0.092
SOUTHPORT APARTMENTS	VA355	835,454.88	4,302,442.75	150	25	200	0.003	0.50	0.116
Ennstone Inc TA Colonial Concrete	VA356	806,945.04	4,249,218.76	11	11	540	8.510	1.00	0.015
Rappahannock Regional Solid Waste Management Board	VA357	810,623.92	4,252,777.28	233	20	1400	239.960	0.50	5.075
LORCOM TOWERS	VA358	836,779.04	4,312,651.63	350	110	315	25.000	3.00	0.062
HORIZON APTS	VA359	836,779.04	4,312,651.63	350	60	500	0.010	2.00	0.054
LORCOM HOUSE CONDOMINIUMS	VA360	836,779.04	4,312,651.63	350	100	330	20.000	2.50	0.042
Virginia Paving Company Alexandria Plant	VA361	835,671.59	4,302,045.72	100	66	250	109.840	3.90	10.151
Gordon-Barbour Elem School	VA362	746,017.43	4,224,811.69	100	30	300	23.000	2.00	5.903
Automated Production Machining, Inc.	VA363	745,907.43	4,224,721.69	100	10	150	0.030	0.80	0.007
National Linen Service	VA364	835,858.21	4,302,258.62	100	41	450	119.940	2.00	0.490
Hydrocarbon Recovery Services Inc - Alexandria	VA365	835,971.23	4,302,065.43	90	10	600	18.060	1.00	0.227
VAN DORN APARTMENTS	VA366	836,441.88	4,304,213.01	100	50	175	0.003	0.50	0.247
METRO FUNERAL SERVICES	VA367	836,010.64	4,301,466.14	150	35	68	0.010	2.00	1.051
LIBERTY FABRICS EAST MILL	VA368	746,307.43	4,224,411.70	490	12	68	0.020	1.00	0.029
Covanta Alexandria/Arlington, Inc.	VA369	836,094.24	4,301,872.89	110	210	292	62.110	5.19	366.406
Goodwin House Bailey's Crossroads	VA370	836,843.98	4,307,248.91	240	25	100	0.010	1.83	0.027
Skyline Towers North and South	VA371	836,713.77	4,306,026.53	250	10	300	0.003	0.30	8.760
STAFFORD CORRECTIONAL UNIT 21	VA372	812,642.75	4,254,112.09	150	25	75	0.190	0.33	0.360
Sunset Pet Services Incorporated	VA373	836,136.02	4,301,695.08	150	26	1100	18.360	1.70	0.105
EDISON HIGH SCHOOL	VA374	835,822.63	4,299,748.46	250	50	250	0.003	3.00	0.146
Hayfield Secondary School	VA375	835,140.29	4,296,393.31	100	27	200	0.003	4.00	0.717
REYNOLDS ASSOCIATES	VA376	836,411.52	4,302,997.21	200	145	335	40.000	2.00	0.162
LONDON PARK TOWERS	VA377	836,501.68	4,303,304.09	110	82	250	0.010	2.00	0.299
THE HECHT CO	VA378	837,316.76	4,310,580.43	270	100	200	0.003	5.30	250.609
CULPEPPER GARDEN	VA379	837,389.13	4,309,481.72	250	80	350	0.010	1.70	0.094
THE CHATHAM CONDOMINIUM	VA380	837,395.71	4,309,381.84	250	118	350	0.003	4.00	0.301
RICHMOND SQUARE	VA381	837,512.70	4,310,804.00	270	15	850	365.000	0.50	0.423
COLUMBIA APARTMENTS	VA382	837,297.36	4,307,980.97	150	60	500	0.010	2.00	0.126
FREDERICK COURT CONDOMINIUM	VA383	837,294.60	4,307,870.44	170	20	250	0.020	1.00	0.148

	Model Source ID	Horizontal	Vertical	Elevation	Stack	Exit Temp	Exit	Stack	Emission
		Coordinate	Coordinate						
		m	m	ft	ft	°F	fps	ft	lb/hr
PARK CENTER	VA384	837,046.29	4,305,546.84	200	170	386	32.470	2.29	0.045
GOODWIN HOUSE	VA385	837,113.30	4,306,052.83	262	122.25	337	2.304	3.50	0.169
HYDE PARK CONDOM OWNERS ASSOC	VA386	837,552.84	4,310,194.72	270	150	350	0.003	4.90	3.904
WMATA Metro Arlington Bus Annex	VA387	837,616.41	4,310,600.17	270	25	68	0.030	0.80	0.221
Skyline Plaza Condos	VA388	837,296.76	4,306,466.17	220	285	250	0.003	4.00	33.000
HAYFIELD ELEMENTARY SCHOOL	VA389	835,476.16	4,296,014.13	80	50	250	0.120	3.00	0.018
American Press Incorporated	VA390	749,307.43	4,223,911.73	100	48	842	61.300	2.70	0.548
Columbia Gas of Virginia	VA391	802,763.20	4,244,143.97	100	25	1100	53.020	0.41	0.601
BUSH HILL ELEM SCHOOL	VA392	836,569.15	4,300,600.04	250	30	250	0.010	1.80	0.030
TOWER VILLA CONDOMINIUM	VA393	837,896.32	4,310,919.56	260	192	375	18.240	1.60	0.205
Southern Towers Apartments	VA394	837,458.96	4,305,373.37	256	170	100	0.003	3.39	1.219
Dominion - Gordonsville Power Station	VA395	745,017.43	4,223,511.69	597	150	280	92.000	14.30	44.041
CARLTON CONDOMINIUM	VA396	837,794.02	4,307,903.33	100	150	300	38.200	4.00	0.269
George Mason University - Arlington Campus	VA397	838,176.23	4,311,238.95	250	25	200	0.003	0.50	0.323
US Department of State - George P Shultz Center	VA398	838,110.80	4,309,338.65	200	25	200	0.003	0.50	3.429
Courtyard by Marriott - Pentagon South	VA399	837,725.23	4,305,290.58	233	25	200	0.003	0.50	0.274
LYON VILLAGE APARTMENTS	VA400	838,502.71	4,312,373.99	100	35	80	0.010	1.50	0.011
Barcroft Management Company	VA401	838,196.96	4,308,030.17	180	64	320	20.000	2.00	0.906
Fort Belvoir Elementary School	VA402	835,556.53	4,293,110.40	250	20	250	15.090	1.50	0.168
CARDINAL HOUSE APARTMENTS	VA403	838,596.67	4,312,470.47	100	90	350	26.000	2.00	0.539
ARCHSTONE NEWPORT VILLAGE I II & III	VA404	837,978.10	4,305,106.59	250	36	350	0.010	1.50	0.130
NEWPORT VILLAGE I II & III	VA405	837,987.43	4,305,117.23	25	55	250	0.003	1.95	0.320
Verizon Virginia Incorporated - North Irving St	VA406	838,652.07	4,311,781.93	260	42	795	142.820	1.00	13.462
Dominion Arms Apartments	VA407	838,494.42	4,309,454.20	200	86	200	0.003	2.26	0.082
ROSE HILL ELEMENTARY	VA408	837,236.88	4,299,751.15	250	50	250	0.010	1.50	0.027
TWAIN MIDDLE SCHOOL	VA409	837,468.10	4,300,659.15	250	50	250	0.180	2.40	0.053
Clermont Elementary School	VA410	837,712.06	4,301,678.35	250	50	250	10.480	1.80	0.080
Inova Alexandria Hospital	VA411	838,129.90	4,304,324.08	250.4	115	350	3.800	5.00	7.396
Old Dominion Electric Cooperative Louisa	VA412	744,017.44	4,222,621.69	250	25	775	5.220	2.00	8.966
Klockner Pentaplast of America	VA413	744,707.44	4,222,611.70	460	30	350	23.300	1.00	1.664
U S DEFENSE NUCLEAR	VA414	837,412.77	4,298,448.58	150	39	200	0.003	2.40	0.288
Fort Belvoir Residential Communities, LLC	VA415	835,382.68	4,289,798.78	100	25	200	0.003	0.30	3.810
Mary Washington Hospital	VA416	807,445.33	4,246,152.98	200	43	425	32.350	1.66	3.905
Fred M Lynn Middle School	VA417	839,621.84	4,312,136.75	40	22	340	25.000	2.00	0.037
Shirlington Overlook	VA418	839,281.29	4,306,797.44	50	68	300	0.003	2.50	0.208
FILLMORE GARDENS	VA419	839,519.58	4,309,120.45	200	25	300	0.003	0.50	0.913
Fredericksburg Public School- James Monroe High	VA420	808,328.13	4,246,300.65	60	25	160	1.500	2.00	0.015
Thomas Building	VA421	839,841.36	4,311,850.26	230	200	275	0.010	1.50	0.226
Medicorp Services, Inc.	VA422	808,527.82	4,246,313.64	150	63	300	0.080	0.50	0.135
US Joint Base - Myer Henderson Hall	VA423	839,983.48	4,311,368.06	200	42	390	0.003	2.30	27.532
KEY APARTMENTS	VA424	839,835.15	4,309,050.94	200	40	200	0.003	1.69	0.018
US Army - Fort Belvoir	VA425	835,954.17	4,288,732.86	100	25	200	0.003	0.50	443.267
Breakroom Service Corporation	VA426	839,154.36	4,302,475.42	50	31	100	0.010	1.50	0.038
Woodlawn Elementary School	VA427	837,534.51	4,293,541.20	30	100	250	0.010	2.00	0.039
DOMINION PLAZA APARTMENTS	VA428	840,155.20	4,308,761.03	200	90	200	0.003	2.63	0.126
DORCHESTER APARTMENTS	VA429	840,234.69	4,309,077.26	200	50	200	0.003	0.50	0.144
The Berg Corporation Pegson Portable Crusher	VA430	839,793.64	4,304,804.73	37	15	200	0.003	0.33	6.090
CAMERON ELEMENTARY	VA431	839,400.12	4,301,789.36	40	100	250	0.010	2.00	0.025
EXECUTIVE NORTH APARTMENTS	VA432	840,325.25	4,309,073.19	160	60	500	0.010	2.00	0.025
Wilton Woods Center	VA433	839,342.40	4,301,294.01	240	50	250	4.040	2.90	0.040
University of Mary Washington	VA434	808,209.21	4,245,199.96	130	169	350	2.200	7.50	8.000
Everly-Wheatly Funeral Home	VA435	839,912.19	4,304,832.59	200	16	1200	18.330	1.79	0.048
DORCHESTER TOWER	VA436	840,307.04	4,307,978.51	200	25	200	0.003	0.50	0.564
PARC EAST CONDOMINIUM	VA437	840,190.00	4,306,556.30	50	176	500	0.010	1.70	0.011
EXECUTIVE CENTRAL	VA438	840,438.29	4,308,879.99	150	60	500	0.010	2.00	0.023
EXECUTIVE SOUTH APARTMENTS	VA439	840,444.87	4,308,780.11	150	60	500	0.010	2.00	0.027
Arland Towers	VA440	840,807.30	4,312,415.51	60	320	400	31.300	2.00	1.917
LONDON HOUSE	VA441	840,917.18	4,312,422.75	45	36	350	0.020	1.00	0.078
River Place North Housing Corporation	VA442	840,923.10	4,312,332.86	80	120	350	0.003	4.51	31.339
River Place East Housing Corporation	VA443	840,929.69	4,312,232.97	80	120	350	0.003	7.82	0.219
RIVER PLACE WEST HOUSING CORPORATION	VA444	840,930.34	4,312,222.98	80	120	400	0.003	5.64	0.654
River Place South Housing Corporation	VA445	840,936.27	4,312,133.08	80	120	350	0.003	7.82	0.670
Covenant Funeral Service	VA446	809,020.98	4,245,052.21	200	23	950	18.860	1.50	2.308
MOUNT VERNON WOODS ELEM SCHOOL	VA447	838,914.71	4,295,437.49	40	50	250	0.200	2.30	0.023
LLOYD APTS	VA448	840,812.45	4,306,396.63	50	50	200	0.003	2.82	0.224
Courtyard by Marriott - Crvstal City	VA449	841,349.64	4,311,949.65	10	25	400	0.003	0.50	1.185
Mount Comfort Cemetery	VA450	840,037.46	4,299,724.59	230	16	1648	20.320	1.70	0.029
THE POTOMAC AT RIVER HOUSE	VA451	841,384.53	4,309,744.88	50	180	200	0.003	1.33	0.763
Ashley At River House, The	VA452	841,462.81	4,308,556.21	50	160	200	0.003	1.17	0.658
THE JAMES AT RIVER HOUSE	VA453	841,523.89	4,309,152.13	50	160	200	0.003	14.00	0.686
Berkley Apartments	VA454	841,368.92	4,306,934.86	20	60	500	0.010	2.00	0.048
Hybla Valley Elementary School	VA455	839,972.41	4,297,814.27	200	20	250	8.490	2.00	0.064
Mount Eagle Elementary School	VA456	840,587.67	4,300,663.63	300	50	250	8.490	2.00	0.080
ROSSLYN PLAZA E	VA457	841,902.89	4,312,688.36	60	146	300	0.020	1.00	0.056
ROSSLYN PLAZA D	VA458	841,908.81	4,312,598.46	60	136	300	0.020	1.00	0.065
CRYSTAL PLAZA 1	VA459	841,595.58	4,308,063.35	50	20	325	0.010	1.29	0.130
ROSSLYN PLAZA C	VA460	841,916.05	4,312,488.58	60	146	300	0.020	1.00	0.041
Cellofoam North America Inc	VA461	811,343.11	4,246,195.94	150	25	525	28.330	1.00	0.185
Washington Mill Elementary School	VA462	838,760.61	4,291,826.07	50	50	250	0.010	2.00	0.023
Hoffman Management	VA463	840,991.08	4,302,004.34	10	45	375	0.010	1.50	0.046
Mercer Vault Company	VA464	808,525.77	4,243,415.67	60	21	1000	20.560	1.70	4.173
WMATA Metro Bus Garage Four Mile Run Arlington	VA465	841,621.29	4,306,148.91	20	25	200	0.003	0.50	1880.234
Spotsylvania Co Water Treatment-Ni River	VA466	806,726.03	4,241,794.65	220	15	200	0.003	0.66	57.600
RIVERSIDE ELEMENTARY SCHOOL (FFXC)	VA467	839,518.45	4,293,882.13	70	25	250	0.010	2.00	0.021
Superior Paving Corporation - Bellman Road	VA468	809,299.24	4,243,857.02	40	32	300	11.020	6.40	0.483
Woodley Hills Elementary School	VA469	839,378.36	4,292,980.06	100	50	250	0.010	1.50	0.027
FT ELLSWORTH CONDO APTS	VA470	841,351.87	4,302,619.96	100	75	200	0.003	2.50	0.084
Mount Vernon High School	VA471	839,642.09	4,293,679.58	70	50	250	3.120	3.30	0.339
The Berg Corporation Komatsu Portable Crusher	VA472	840,370.65	4,296,486.14	33	15	200	0.003	0.50	6.090
BRYANT ALTERNATIVE SCHOOL	VA473	840,661.63	4,297,859.56	200	100	250	0.470	1.50	0.084
Crystal Towers North and South	VA474	842,378.37	4,308,516.18	50	140	500	30.000	2.00	4.000
Potomac Consolidated Tracon (FAA)	VA475	808,384.49	4,242,504.05	100	25	350	94.310	0.75	14.600
Quander Road Elementary School	VA476	841,265.14	4,299,514.36	100	60	250	0.020	1.00	0.028
CRYSTAL PLAZA SOUTH	VA477	842,501.82	4,308,012.67	50	36	350	33.950	1.00	0.167
CRYSTAL PLAZA NORTH	VA478	842,501.82	4,308,012.67	50	36	350	0.020	1.00	0.057
EADS ASSOC	VA479	842,568.82	4,308,518.69	50	25	700	3.330	2.00	0.027

	Model Source ID	Horizontal	Vertical	Elevation	Stack	Exit Temp	Exit	Stack	Emission
		Coordinate	Coordinate						
		m	m	ft	ft	°F	fps	ft	lb/hr
Arlington County Water Pollution Control Facility	VA480	842,474.27	4,306,907.31	15	50	500	7.550	1.00	14.251
West Potomac High School	VA481	841,375.40	4,299,210.62	150	50	250	0.220	2.20	0.053
Pentagon Reservation	VA482	842,805.46	4,309,647.86	20	10	845	0.003	0.50	448.222
Airport Hyatt Hotel	VA483	842,634.59	4,307,519.80	40	220	450	37.550	2.50	0.228
One and Two Potomac Yards	VA484	842,687.95	4,307,623.63	89	14	878	115.398	1.00	29.920
Virginia Concrete Company Inc Alexandria\	VA485	842,087.36	4,302,267.05	20	60	425	9.470	1.50	0.450
MOUNT VERNON NURSING CENTER	VA486	840,878.17	4,294,563.28	30	41	515	10.330	1.79	0.032
Whitman Middle School	VA487	841,118.14	4,295,491.93	30	50	250	0.220	2.20	0.078
Inova Mount Vernon Hospital	VA488	841,048.57	4,295,176.38	50	25	585	6.417	0.83	18.264
MWAA - Ronald Reagan National Airport	VA489	843,216.95	4,307,969.46	50	50	1010	0.003	1.00	29.588
HOLLIN MEADOWS SCIENCE & MATH SCHOOL	VA490	841,475.84	4,296,307.95	50	50	250	0.100	3.20	0.034
Motion Control Industries Inc	VA491	807,879.90	4,240,856.91	100	25	300	23.333	1.50	0.074
FEDERAL AVIATION ADMINISTRATION	VA492	843,470.58	4,308,688.43	10	25	200	0.003	0.50	27.500
A Smith Bowman Distillery	VA493	810,545.89	4,243,035.61	50	20	350	25.000	1.70	0.096
R. E. Lee Elementary School	VA494	798,510.36	4,233,831.75	308	30	200	0.003	3.50	0.012
Belle View Elementary School	VA495	842,290.96	4,299,170.48	75	75	250	10.480	1.80	0.072
CRYSTAL SQUARE 5	VA496	843,574.29	4,308,484.58	50	120	298	0.003	3.00	0.066
CRYSTAL HOUSE I	VA497	843,580.87	4,308,384.69	50	20	310	0.030	0.80	0.240
CRYSTAL HOUSE #2	VA498	843,587.45	4,308,284.80	50	20	310	0.030	0.80	0.178
Alexandria Sanitation Authority	VA499	843,411.85	4,301,647.55	30	25	200	0.003	0.50	0.140
Kaeser Compressors, Inc.	VA500	809,434.90	4,241,770.16	94	25	1100	239.180	0.15	4.242
MASON HALL APARTMENTS	VA501	843,251.10	4,304,249.72	40	70	400	31.000	3.39	0.087
Columbia Gas Transmission Corporation	VA502	745,117.44	4,217,621.75	508	15	1058	267.040	0.67	3.909
Mid-Atlantic Foam	VA503	810,681.04	4,242,653.33	190	18	68	0.010	1.20	0.087
Printpack Inc	VA504	810,011.69	4,241,998.16	260	50	250	42.090	5.50	5.861
River Tower Condominium	VA505	842,609.67	4,298,900.50	10	100	400	6.610	2.76	18.333
STRATFORD LANDING	VA506	841,723.20	4,293,916.55	30	50	250	0.240	2.10	0.025
Ennstone, Inc. T/A Colonial Concrete	VA507	762,049.40	4,261,344.78	456	16.00	200	0.003	0.50	0.005
Adams Construction Company	VA508	696,707.09	4,286,310.65	1146	150	240	433.840	1.50	2.231
Howell Metal Co	VA509	699,907.12	4,281,310.77	1000	45	150	0.020	1.00	11.233
Page County High School	VA510	708,517.30	4,271,011.05	1000	42	450	5.500	3.00	0.301
Shenandoah Compressor Station	VA511	707,207.26	4,271,511.03	1100	40	1000	14.310	5.63	27.730
H B Mellott Estate Inc	VA512	803,584.90	4,314,274.73	354	25	200	0.003	0.50	10.192
Scenic View Farm	VA513	696,757.05	4,280,830.74	1000	10	1108	6.340	1.16	0.055
Grove Hill Elementary School	VA514	708,207.29	4,267,111.11	1200	40	390	5.200	2.00	0.211
Four A Farms LLC	VA515	693,757.00	4,279,020.74	1007	25	200	0.003	0.50	0.423
Cargill Meat Solutions Corporation - Timberville	VA516	692,906.99	4,278,610.75	1000	15	350	0.010	2.00	8.785
Rockingham Co-op	VA517	693,016.99	4,278,420.75	1020	25	260	0.020	1.00	0.045
Pilgrims Pride Corporation - Timberville	VA518	692,806.98	4,278,220.75	1033	30	350	0.010	2.00	7.488
The Genie Company	VA519	707,707.26	4,263,411.16	1045	25	250	18.340	0.80	0.030
Shenandoah Elementary School	VA520	707,417.25	4,262,321.16	1000	50	400	0.003	2.50	0.107
Virginia Poultry Growers Cooperative Inc- Broadway	VA521	691,406.95	4,275,310.79	1040	22	400	0.020	1.00	2.014
Cargill Turkey Production LLC - Wild Rose Farm	VA522	711,037.31	4,255,551.22	1180	10	1800	6.890	0.90	0.214
Berpton Community Recreation Center	VA523	677,606.86	4,292,310.50	1400	20	422	0.020	1.00	0.127
Fulks Run Elementary School	VA524	682,706.90	4,280,810.67	1280	16	300	0.020	1.00	0.250
Roger S Baker - Farm	VA525	682,196.89	4,281,370.66	1180	25	1400	1.450	6.00	0.455
Wilkins, Cathy A - Farm	VA526	682,516.89	4,279,520.69	1250	25	1400	293.690	0.50	0.096
Elkton Middle School	VA527	708,807.24	4,253,311.20	1100	40	300	0.010	1.89	0.567
S & C Poultry Inc	VA528	682,446.89	4,278,320.71	1200	25	1409	12.620	1.16	0.465
C S Mundy Quarries - Portable 81601	VA529	684,016.89	4,275,520.76	1400	25	200	0.003	0.50	7.200
C S Mundy Quarries - Portable 81608	VA530	684,016.89	4,275,520.76	1400	25	200	0.003	0.50	4.370
C S Mundy Quarries Inc - Portable 81604	VA531	684,016.89	4,275,520.76	1400	25	200	0.003	0.50	3.360
C S Mundy Quarries-Broadway Quarry	VA532	684,016.89	4,275,520.76	1400	25	100	33.010	3.00	0.588
Valley Proteins Inc - Linville	VA533	688,916.89	4,267,620.90	1200	21	400	0.010	1.70	196.503
AG Forte LLC - Virginia Division	VA534	686,916.89	4,269,420.87	1400	25	1400	84.880	0.50	1.333
Linville - Edom Elementary School	VA535	687,516.88	4,265,910.93	1200	42	300	0.010	1.39	0.033
Merck Sharp & Dohme Corporation	VA536	705,107.14	4,251,111.17	1000	25	200	0.003	0.50	17.795
High Rock Farms Inc	VA537	681,466.86	4,272,280.80	1673	25	1400	0.003	0.50	0.230
Rockingham Asphalt Inc - Harrisonburg	VA538	687,816.87	4,263,120.97	1400	15	275	7.840	1.00	1.299
Red Bird Tire LLC	VA539	689,916.89	4,260,720.99	1390	30	100	0.010	1.50	0.171
Greene County Technical Education Center	VA540	726,107.39	4,240,111.36	500	20	500	3.060	3.00	0.018
R R Donnelley & Sons Co Harrisonburg Mfg North	VA541	687,016.88	4,261,410.97	1475	34	350	35.710	1.29	0.546
Rockingham - Harrisonburg SPCA	VA542	688,916.90	4,258,721.00	1340	15	724	37.870	1.17	0.110
Ariake USA Inc	VA543	686,806.88	4,260,610.98	1380	31	350	13.820	1.30	4.170
Columbia Gas Transmission Corp - Bickers	VA544	722,117.37	4,239,421.33	600	20	600	166.050	2.00	50.450
Virginia Dept of Agriculture & Consumer Service	VA545	686,716.88	4,260,120.98	1300	36	1500	20.370	2.50	0.002
MillerCoors LLC	VA546	702,517.07	4,247,621.15	1011	20	340	11.220	1.50	60.397
Harrisonburg Electric Commission - Mt Clinton Pike	VA547	686,616.88	4,259,920.98	1380	17	730	61.120	2.50	193.743
Pilgrim's Pride Corporation	VA548	685,716.88	4,260,220.98	1380	80	350	21.490	2.83	5.811
Luck Stone Greene Portable Plant	VA549	730,217.38	4,236,521.41	180	25	200	0.003	0.50	2.222
Luck Stone Corporation - Portable 81595	VA550	730,217.38	4,236,521.41	407	25	200	0.003	0.50	2.300
Intrapac (Harrisonburg) Inc	VA551	686,706.89	4,258,720.99	1370	30	850	9.770	3.90	0.340
S L Williamson & Co - Ruckersville	VA552	730,207.38	4,236,221.41	560	28	300	55.810	3.90	2.029
McGaheysville Elementary School	VA553	697,716.96	4,249,421.10	1070	15	250	49.740	0.80	0.450
Tyson Foods Inc	VA554	686,106.88	4,259,010.99	1370	10	100	0.003	2.50	2.850
Cargill Turkey Production LLC	VA555	688,116.90	4,256,821.01	1400	13	350	55.420	0.50	4.707
Blackrock Contracting Inc	VA556	688,306.90	4,256,611.01	1400	15	150	0.010	1.29	4.865
George's Foods LLC	VA557	686,316.89	4,258,420.99	1340	25	440	44.250	1.67	0.443
Transprint USA Inc	VA558	687,516.90	4,256,411.01	1230	15	350	10.000	1.80	1.721
Graham Packaging Company LP	VA559	685,606.89	4,258,010.99	1350	50	200	0.003	2.50	0.050
Rockingham Memorial Hospital	VA560	685,806.90	4,256,811.00	1350	130	400	0.940	4.50	15.205
JMU - Memorial Hall	VA561	685,106.89	4,257,410.99	1309	19	200	0.003	1.20	0.285
City of Harrisonburg - Resource Recovery Facility	VA562	686,516.90	4,256,011.01	1420	150	280	37.970	4.00	23.553
Harrisonburg Cremation Service	VA563	689,216.92	4,253,421.03	1522	22	1220	13.030	1.70	6.910
JMU - James Madison University	VA564	685,516.90	4,256,511.00	1310	150	500	5.310	10.00	19.048
Lindsey Funeral Home - Harrisonburg	VA565	685,806.90	4,256,221.00	1332	16	1501	25.300	1.70	0.010
Montevideo Middle School	VA566	694,406.94	4,248,721.08	1150	40	200	0.003	2.20	0.483
Sunnyside Retirement Community	VA567	689,106.92	4,252,221.04	1460	25	200	0.003	0.50	0.571
Southern States Cooperative Incorporated	VA568	684,316.89	4,256,520.99	1320	25	275	0.010	1.33	0.710
Rockingham Memorial Hospital Data Center	VA569	687,116.92	4,252,821.03	1100	12	905	115.860	1.00	1.760
All Star Cleaners	VA570	729,017.38	4,232,121.47	600	10	450	166.670	1.00	1.923
Mount Clinton Elementary School	VA571	678,016.84	4,261,510.94	1180	36	150	0.010	1.29	0.100
Shenandoah Stone LLC - Portable 81496	VA572	697,016.95	4,243,121.13	1140	25	200	0.003	0.50	2.720
Rockingham County Landfill	VA573	684,916.92	4,251,821.03	1400	28	1400	64.390	0.67	0.002
Rockingham Milling Company	VA574	681,316.90	4,255,120.99	1240	30	100	0.003	2.00	3.510
The Harrisonburg Electric Commission	VA575	683,516.92	4,252,421.02	1220	17	730	61.120	2.50	159.997

	Model Source ID	Horizontal Coordinate	Vertical Coordinate	Elevation	Stack Height	Exit Temp	Exit Velocity	Stack Diameter	Emission Rate
		m	m	ft	ft	°F	fps	ft	lb/hr
Virginia Poultry Growers Cooperative Inc - Hinton	VA576	676,516.85	4,259,620.95	1370	20	70	11.780	2.00	10.220
Buttermilk Run Poultry - Hinton	VA577	674,826.83	4,261,010.94	1400	25	1108	8.530	1.00	0.500
R R Donnelley & Sons Co Harrisonburg Mfg South	VA578	683,706.93	4,251,511.02	1238	50	270	55.170	1.00	9.150
Packaging Corporation of America	VA579	683,616.93	4,251,421.02	1226	32	500	18.860	1.50	9.178
Gabe Wenger - Farm	VA580	678,316.89	4,255,520.98	1300	25	1108	8.530	1.00	0.465
Cargill Meat Solutions Corporation -Dayton	VA581	680,106.91	4,253,611.00	1194	26	356	40.000	2.00	1.471
Broadus Wood Elementary School	VA582	719,907.37	4,226,721.49	678	40	500	0.370	1.39	0.031
Padgett Manufacturing Company Inc	VA583	677,316.92	4,251,321.00	1150	10	450	25.350	1.39	0.048
WhiteWave Foods Company - Mount Crawford Plant	VA584	680,106.95	4,248,511.03	1200	47	350	45.090	2.00	0.340
Perdue Farms Inc	VA585	677,216.93	4,250,921.00	1210	40	257	0.010	2.00	2.205
Blue Ridge Christian School	VA586	677,016.93	4,250,311.00	1184	50	450	0.010	1.50	0.117
Bridgewater College	VA587	677,406.94	4,249,811.01	1200	60	1000	0.010	1.50	2.153
Smith Paving Incorporated	VA588	689,406.98	4,239,311.12	1070	26	240	54.390	4.19	1.025
Stony Point Elementary School	VA589	730,607.41	4,221,511.63	500	30	500	6.860	2.00	0.031
Commonwealth Cremation Services	VA590	689,816.99	4,237,221.13	1110	28	1100	19.810	1.50	0.710
Reynolds Packaging LLC - Grottoes Plastic Plant	VA591	690,016.99	4,236,611.14	1120	42	450	22.090	4.69	1.564
Linden D Wenger - Farm	VA592	673,376.93	4,250,190.98	1192	25	1400	52.200	1.00	0.541
Cerro Fabricated Products Inc - Weyers Cave	VA593	681,807.01	4,239,511.08	1300	26	550	9.180	0.83	0.306
VAARNG - Armory - Leesburg	VA594	798,177.19	4,330,873.21	390	15	200	0.003	1.13	0.147
INOVA Loudoun Hospital - Cornwall Campus	VA595	796,755.39	4,335,692.17	350	37	466	18.700	2.90	0.276
HB Mellott Estate Incorporated - Bull Run Plant	VA596	799,691.42	4,306,407.78	253	25	200	0.003	0.50	13.120
Culpeper County High School	VA597	762,269.08	4,264,158.26	450	14	200	0.003	1.83	0.034
Land Venture Two LLC	VA598	799,908.05	4,306,010.95	250	25	200	0.003	0.50	25.640
Land Venture II	VA599	799,908.05	4,306,010.95	250	15	200	0.003	5.00	8.410
FEDERAL AVIATION ADM	VA600	798,981.25	4,333,723.89	300	35	350	20.000	2.00	9.720
JK Enterprise Lanscape Supply	VA601	766,051.24	4,264,506.32	400	25	200	0.003	0.50	57.870
Cintas Corporation Culpeper	VA602	762,923.10	4,263,299.90	350	14	400	0.010	1.89	2.521
Culpeper Farmers Cooperative Inc	VA603	763,599.27	4,263,534.46	400	12	410	0.010	1.29	0.288
Southeastern Elementary School	VA604	788,063.86	4,280,269.27	600	28	100	0.010	2.00	0.024
Betco Supreme, Inc.	VA605	799,015.01	4,334,728.81	330	18	600	15.720	0.90	0.027
Culpeper Regional Hospital	VA606	761,957.80	4,262,735.81	50	12	765	2.480	8.00	20.815
Euro-Composites Corporation	VA607	773,839.44	4,268,021.81	1500	25	440	0.003	0.50	4.080
Culpeper Wastewater Treatment Plant	VA608	773,839.44	4,268,021.81	100	25	1040	232.640	1.17	11.300
The Rochester Corporation	VA609	761,017.40	4,262,221.45	100	25	200	0.003	0.50	23.662
Superior Paving Corporation-Bealton Plant	VA610	782,183.34	4,273,779.54	450	31	250	53.210	4.51	1.887
Crider & Shockey Inc	VA611	782,183.34	4,273,779.54	100	70	98	0.010	1.50	0.008
US Army-Warrenton Training Center Station D	VA612	770,903.57	4,266,015.90	350	10	200	4.240	1.00	2.218
Town of Culpeper Light & Power	VA613	762,711.86	4,262,544.53	416	20	808	193.600	1.25	136.650
CULPEPER COUNTY SCHOOLS-Sycamore Park Elem. School	VA614	761,990.37	4,262,236.88	20	32	75	0.010	2.00	0.268
M M Pierce Elementary School	VA615	778,383.96	4,270,413.70	320	40	100	0.010	1.70	0.031
Loudoun Co Asphalt Co., LLC	VA616	800,672.99	4,331,038.31	250	40	330	34.220	6.30	19.895
Town of Culpeper / Electric Power Plant	VA617	761,810.33	4,261,924.49	364	17	200	0.010	1.75	95.833
Vertis Inc.	VA618	799,751.88	4,299,393.14	270	37	558	7.600	2.00	1.438
Mars Petcare US Incorporate	VA619	799,751.88	4,299,393.14	280	20	500	56.900	2.00	0.651
Essroc Ready Mix Corp - DBA Crider&Shockey-LBurg 2	VA620	801,223.05	4,331,660.30	340	70	450	0.010	1.50	0.015
Tavares Concrete Company Inc	VA621	801,956.82	4,329,819.71	385	12	200	0.003	0.33	0.219
Virginia Concrete Company Inc Loudoun County	VA622	801,933.64	4,330,018.72	330	35	510	4.810	1.50	0.150
Dominion - Remington CT Station	VA623	781,469.69	4,271,357.21	270	25	200	0.003	0.50	23.045
Binns, Floyd T Elementary School	VA624	762,500.28	4,264,019.37	380	60	68	0.010	1.79	0.009
Branscome Paving Company	VA625	800,612.76	4,298,346.80	270	25	700	10.617	1.00	2.702
Virginia Concrete Company Inc Pleasant Valley	VA626	803,886.95	4,314,104.13	340	40	425	9.470	1.50	0.015
Hanson Pipe and Precast Incorporated	VA627	801,266.32	4,299,081.60	300	28	362	20.000	2.00	0.080
Superior Paving Corp - Leesburg Plant	VA628	802,596.91	4,330,754.47	250	31	280	86.210	4.00	6.005
S.W.L.F.T. FACILITY	VA629	762,905.90	4,260,492.81	100	30	907	926.410	0.50	313.171
Virginia Paving Company - Chantilly	VA630	804,190.52	4,314,214.39	350	41	270	64.910	3.92	6.657
Ennstone, Inc.	VA631	800,140.40	4,295,006.98	250	11	540	900.000	1.00	0.009
VDOT-Culpeper District Office (SFL)	VA632	760,717.40	4,259,421.49	450	20	375	0.020	1.00	0.079
Old Dominion Electric Cooperative - Marsh Run	VA633	781,695.84	4,269,738.11	300	25	752	111.420	0.67	42.003
Merrillat - Culpeper	VA634	763,334.79	4,259,909.50	460	25	200	0.003	0.50	5.052
Digital Loudoun II LLC	VA635	804,612.51	4,323,166.62	260	17	892	99.110	1.67	32.600
TOWN OF LEESBURG-WATER SUPPLY DIVISION	VA636	802,199.18	4,335,250.45	270	40	891	0.030	0.80	0.644
America Online Inc	VA637	802,754.86	4,300,994.33	210	33	936	206.867	1.33	8.458
Preddy Funeral Home	VA638	734,917.53	4,257,521.40	50	22	1100	19.810	1.50	0.009
Town of Leesburg/Water Poll Control Div	VA639	802,823.89	4,333,386.61	200	20	68	0.170	0.80	5.597
TPC University LC	VA640	802,393.81	4,299,165.74	200	17	813	166.690	1.16	0.520
Continental Automotive Systems Incorporated	VA641	762,098.95	4,259,037.19	475	25	77	0.003	0.50	0.224
Verizon Business	VA642	803,074.07	4,300,714.51	353	63	936	160.970	1.50	25.169
Superior Paving Corp - Centreville Plt	VA643	804,038.16	4,303,219.81	220	40	275	85.690	3.79	4.800
Superior Paving - Manassas Plant	VA644	801,922.99	4,296,718.33	240	25	300	0.010	1.00	2.527
DuBrook Concrete - Chantilly	VA645	805,511.39	4,313,800.10	270	16	235	35.000	1.50	0.203
Warrenton Training Center Station C	VA646	781,281.39	4,268,257.58	340	10	200	4.240	1.00	0.090
National Audio Visual Conservation Center	VA647	763,994.94	4,259,160.88	600	12	375	16.170	2.60	20.798
Virginia Concrete Company Inc - Centreville	VA648	804,164.30	4,302,280.24	200	30	400	0.010	1.29	0.144
MCI-Verizon	VA649	805,740.63	4,324,153.65	260	17	905	820.240	1.00	215.508
Transcontinental Gas Pipeline-Station 185	VA650	803,879.34	4,300,667.19	210	17	500	3.730	1.60	56.658
Virginia Run Elementary School	VA651	805,282.95	4,306,765.85	285	20	250	23.580	1.20	0.080
Sunoco Partners Marketing & Terminals LP Manassas	VA652	803,899.04	4,300,367.67	210	25	200	0.003	0.50	0.886
Inova Loudoun Hospital	VA653	804,799.31	4,330,809.91	35	30	500	19.880	1.83	3.991
George Mason University - Prince William Campus	VA654	802,607.58	4,295,760.62	220	25	800	0.003	0.50	71.620
Comcast Cablevision of Virginia Incorporated	VA655	802,636.30	4,295,170.92	200	30	500	84.880	0.50	0.853
Iridium Satellite, L.L.C	VA656	805,411.56	4,330,649.86	300	25	900	174.420	1.20	5.100
Deer Park Elementary School	VA657	806,055.39	4,307,217.80	230	50	250	15.090	1.50	0.064
STONEWALL HIGH SCHOOL	VA658	803,356.94	4,296,411.46	240	20	340	0.010	1.60	0.542
Equinix Incorporated	VA659	806,466.82	4,325,304.67	270	21	950	129.590	1.67	3.338
MWAA - Washington Dulles International Airport	VA660	807,054.49	4,317,922.95	290	25	200	0.003	0.50	283.582
Computer Sciences Corporation	VA661	806,761.84	4,310,041.96	225	13	1040	318.460	1.00	117.280
United Litho Services Inc	VA662	806,845.50	4,324,126.36	250	40	350	11.200	2.50	0.160
Equinix Incorporated - 21711 Filigree Court	VA663	806,938.75	4,324,232.80	250	12	963	325.710	0.67	291.307
Superior Paving Corp	VA664	769,374.46	4,259,501.82	100	31	320	77.500	3.70	4.540
Dupont Fabros Technology Ashburn Corporate Center	VA665	806,876.84	4,325,321.74	253	23	837	127.150	1.67	342.551
ACC2 (Rhino)	VA666	806,876.84	4,325,321.74	253	23	842	111.660	1.67	14.513
Janelia Farm Research Campus - HHMI	VA667	805,914.88	4,330,923.82	320	60	405	5.200	3.50	17.617
Virginia Concrete Company Inc - Sterling	VA668	807,340.10	4,321,040.38	255	25	200	1.590	2.00	0.075
Atlantic Contracting And Material Co Inc	VA669	807,411.16	4,314,035.65	280	25	200	0.003	0.50	1.954
AT&T Web Hosting Facility	VA670	807,057.88	4,325,313.65	314.7	14	762	737.360	0.66	74.888
IAD-1, Chantilly Data Center	VA671	807,406.84	4,311,819.24	260	25	885	343.740	0.83	113.770

	Model Source ID	Horizontal Coordinate	Vertical Coordinate	Elevation	Stack Height	Exit Temp	Exit Velocity	Stack Diameter	Emission Rate
		m	m	ft	ft	°F	fps	ft	lb/hr
Air BP	VA672	807,671.60	4,319,056.70	290	15	943	375.520	0.83	0.048
Virginia Concrete Company Inc Sterling	VA673	807,646.23	4,320,960.31	270	30	425	9.470	1.50	0.005
Bergmanns Cleaning Inc	VA674	807,681.92	4,320,571.58	270	24	300	42.440	1.00	4.615
Architect of the Capitol	VA675	804,173.22	4,296,043.95	250	27	813	120.030	0.80	169.059
City of Manassas - Gateway Generation	VA676	802,900.08	4,292,681.53	200	31	940	162.000	1.50	6.400
Cub Run Elementary School	VA677	807,200.92	4,308,095.43	270	20	250	20.090	1.30	0.048
Manassas Regional Airport	VA678	802,563.52	4,291,546.46	180	30	350	25.000	1.00	0.003
City of Manassas/VMEA	VA679	803,534.03	4,293,715.81	231	31	910	197.630	1.20	965.874
National Reconnaissance Office	VA680	807,767.64	4,310,148.33	280	26	961	229.600	1.15	4.940
Lockheed Martin Manassas	VA681	804,317.66	4,295,371.60	245	25	500	0.080	0.50	77.174
Micron Technology Incorporated	VA682	804,326.99	4,295,382.23	288	58	340	26.910	2.00	21.133
Northern Virginia Funeral Choices Inc	VA683	807,988.23	4,311,366.19	25	18	1000	14.990	1.70	0.240
Metro Ready Mix Inc PCBP2	VA684	808,265.80	4,317,802.31	279	85	150	15.660	1.95	36.410
Glen-Gery Corporation - Capitol Plant	VA685	803,826.34	4,293,845.30	225	28	410	43.230	3.18	0.781
America Online Incorporated	VA686	807,989.95	4,323,500.01	270	25	200	0.003	0.50	199.301
Stone Middle School	VA687	807,652.89	4,307,322.98	260	20	250	23.580	1.20	0.104
LCSA - Broad Run Water Reclamation	VA688	807,798.67	4,326,395.47	250	30	300	68.200	0.33	3.933
Dominion - Quantico Compressor Station	VA689	796,877.49	4,280,555.78	220	25	580	19.520	0.50	0.091
National Air & Space Museum	VA690	808,254.87	4,311,885.15	300	48	350	16.980	1.00	0.411
Prince William Hospital Corporation	VA691	805,233.56	4,296,845.59	243	17.5	975	164.983	1.00	70.801
Dulles Discovery - Phase 1	VA692	808,466.33	4,313,393.24	300	25	959	479.150	1.67	7.480
Virginia Paving Company - Sterling	VA693	808,629.90	4,323,899.75	340	38	320	82.190	4.19	1.254
City of Manassas - Portable Genset 2	VA694	804,778.83	4,294,609.74	250	12	940	812.000	0.67	40.000
City of Manassas - Portable Genset 1	VA695	804,778.83	4,294,609.74	250	12	940	812.000	0.67	40.000
Manassas City of - Central Park Plant	VA696	804,891.78	4,294,416.62	250	31	886	18.250	1.50	69.182
E. A. Clore Sons Inc	VA697	740,517.50	4,252,721.45	564	58	200	0.003	2.40	2.600
Mountain Lumber Company Incorporated	VA698	740,179.57	4,250,913.57	525	30	350	0.003	2.00	0.900
Quest Diagnostics	VA699	808,985.52	4,309,927.72	304	35	275	1.960	2.82	5.466
Upper Occoquan Service Authority	VA700	807,197.63	4,300,373.97	190	25	200	0.003	0.50	5.752
The Cremation and Memorial Center	VA701	809,312.55	4,311,052.33	313	18	300	16.150	1.70	0.168
UOSA - Cub Run	VA702	808,043.72	4,301,993.91	220	37	350	1.420	1.00	119.490
Qwest Communications Corporation - Sterling	VA703	809,758.92	4,321,009.54	310	17	880	148.820	1.17	60.238
Waverly - Yowell Elem School	VA704	740,017.50	4,252,011.45	50	60	100	0.010	2.00	0.222
NTTA Communications	VA705	809,788.50	4,321,472.79	316	33	922	228.530	1.33	216.610
Verizon Wireless - Chantilly	VA706	809,765.73	4,311,784.16	330	26	878	157.782	1.33	59.620
Centre Ridge Elementary School	VA707	808,686.25	4,303,781.13	310	20	250	23.580	1.20	0.064
Franklin Intermediate School	VA708	810,281.24	4,313,091.70	350	20	250	23.580	1.20	0.104
Centreville Elementary School	VA709	809,140.19	4,303,008.64	310	20	250	17.320	1.40	0.080
United Airlines - Dulles Reservation Center	VA710	810,618.00	4,321,667.95	330	25	200	0.003	0.50	60.980
FLORIS ELEMENTARY SCHOOL	VA711	810,897.56	4,315,759.71	350	20	250	0.010	1.20	0.018
Savvis Communications	VA712	810,473.84	4,325,368.89	310	20	1018	218.280	1.00	1.924
Blue Ridge Growers, Inc.	VA713	774,964.84	4,258,152.63	400	30	100	0.010	1.50	1.575
Savvis Communications Corporation-DC Four Facility	VA714	810,512.07	4,325,852.77	310	10	763	187.150	1.25	4.120
BROOKFIELD ELEM SCH	VA715	810,686.76	4,309,829.19	350	50	250	0.010	1.80	0.032
Manassas City - Church Street Power Generation Fac	VA716	807,441.78	4,295,286.00	300	12	730	129.840	1.25	57.429
Oak Hill Elementary School	VA717	811,252.09	4,313,576.87	370	20	250	20.090	1.30	0.040
MOUNTAIN VIEW ALTERNATIVE HIGH SCHOOL	VA718	810,216.69	4,304,784.21	400	50	250	0.010	1.80	0.016
Nextel Sterling Lab VA-9	VA719	810,831.85	4,326,325.18	300	15	946	744.400	0.67	45.000
Madison County Elem School	VA720	739,107.49	4,250,411.45	50	20	100	0.010	1.20	0.078
Lees Corner Elementary School	VA721	811,436.34	4,310,781.11	360	20	250	23.580	1.20	0.064
Poplar Tree Elementary School	VA722	811,221.09	4,307,959.04	320	50	250	15.090	1.50	0.064
Cedar Mountain Stone Corporation - Culpeper	VA723	762,055.37	4,252,019.57	200	25	200	0.003	0.50	7.420
Chemung Contracting Corporation	VA724	762,055.37	4,252,019.57	200	30	300	71.620	4.00	1.272
ROCKY RUN INTERMEDIATE SCHOOL	VA725	811,554.73	4,308,983.83	340	20	250	7.360	1.50	0.068
CHANTILLY HIGH SCHOOL	VA726	811,698.41	4,309,695.27	370	100	250	0.180	2.40	0.082
Madison County High School	VA727	738,607.49	4,249,721.45	50	30	100	0.010	1.50	0.048
Centreville High School	VA728	811,398.28	4,303,605.70	320	20	250	15.090	1.50	0.272
Union Mill Elementary School	VA729	811,120.86	4,303,540.06	320	20	250	20.090	1.30	0.048
HERNDON MIDDLE SCHOOL	VA730	812,664.01	4,319,386.17	304	50	250	0.530	2.00	0.050
CLEARVIEW ELEMENTARY SCHOOL	VA731	812,838.34	4,321,303.10	320	20	250	11.110	1.20	0.030
Remington Mulch Company	VA732	760,403.57	4,250,609.24	400	25	200	0.003	0.50	47.700
VA. Department of Juvenile Justice- Culpeper	VA733	760,617.40	4,250,521.59	200	25	1119	205.358	0.67	1.467
VA. Department of Corrections- Coffeewood Center	VA734	760,617.40	4,250,521.59	200	25	915	76.970	0.33	2.308
Verizon Virginia Incorporated - Moore Road	VA735	812,029.87	4,304,813.28	300	28	836	189.610	1.00	50.000
Dranesville Elementary School	VA736	813,042.39	4,322,921.15	370	20	250	23.580	1.20	0.048
Adams-Green Funeral Home	VA737	813,236.10	4,319,835.10	319	18	1100	19.810	1.50	0.038
Warrenton Training Station B	VA738	785,404.78	4,261,910.99	350	20	200	10.610	1.00	5.457
GREENBRIAR EAST ELEMENTARY	VA739	812,775.84	4,308,562.83	360	50	250	0.530	2.00	0.021
Freddi Mac Corporation	VA740	813,706.93	4,318,171.34	358	15	963	160.830	1.50	34.231
New Dominion Technology Park II LLC	VA741	813,858.38	4,319,675.60	360	25	1015	146.333	1.00	72.360
Time Warner Cable	VA742	813,917.69	4,318,776.94	350	20	806	116.090	1.17	30.121
HERNDON ELEM SCH	VA743	813,902.78	4,320,370.51	350	50	250	0.940	1.50	0.041
FOX MILL ELEMENTARY	VA744	814,004.36	4,314,269.77	300	20	250	16.000	1.00	0.023
HERNDON HIGH SCHOOL	VA745	814,029.97	4,321,482.06	350	100	250	0.440	2.20	0.112
Sprint United Management Company	VA746	814,163.10	4,317,489.40	367	12	835	8.650	0.67	27.560
Coresite Real Estate 12100 Sunrise Valley Drive	VA747	814,296.30	4,317,598.48	350	20	1100	37.920	0.42	2.719
Inova Fair Oaks Hospital	VA748	813,978.01	4,310,256.59	460	25	969	38.370	1.67	81.400
NAVY ELEMENTARY SCHOOL	VA749	814,134.84	4,310,768.35	470	50	250	0.010	1.50	0.027
US Geological Survey	VA750	814,821.92	4,317,232.00	400	36	1065	22.900	1.00	279.396
Willow Springs Elementary School	VA751	814,053.85	4,304,535.29	450	25	200	0.003	0.50	0.088
Crossfield Elementary School	VA752	815,246.17	4,313,840.17	340	20	250	28.060	1.10	0.072
Nextel Communications of the Mid Atlantic, Inc.	VA753	815,332.26	4,317,857.37	412	15	978	785.460	0.67	135.000
FCWA - Corbalis WTP	VA754	815,229.18	4,323,065.57	330	66	425	7.740	2.40	0.497
FAIRFAX COUNTY ANIMAL SHELTER	VA755	814,864.28	4,307,306.38	450	26	1617	23.610	1.48	0.077
Armstrong Elementary School	VA756	815,570.07	4,321,092.33	420	20	250	33.950	1.00	0.008
Reston Hospital Center	VA757	815,692.56	4,319,084.61	390	29	1000	11.730	1.29	0.841
Clearwire	VA758	815,956.87	4,317,206.58	300	25	983	372.533	0.83	54.940
CLIFTON ELEMENTARY	VA759	813,716.07	4,298,997.43	250	50	250	0.010	1.79	0.005
LAKE ANNE ELEM SCH	VA760	816,578.08	4,319,343.63	400	50	250	0.650	1.80	0.027
Unisys Corporation	VA761	816,979.22	4,317,976.06	300	16	895	194.340	1.33	6.667
Aldrin Elementary School	VA762	816,968.06	4,321,184.63	400	20	250	23.580	1.20	0.048
HUGHES MIDDLE SCHOOL	VA763	817,188.31	4,316,174.59	390	20	250	8.440	1.40	0.034
Fannie Mae	VA764	817,331.49	4,317,196.97	330	29	1187	84.300	1.07	51.109
Digital Reston LLC	VA765	818,004.14	4,317,642.51	390	14.5	935.6	0.161	1.50	67.880
Lemur Properties Limited Liability Corporation	VA766	818,310.31	4,317,562.42	340	30	250	1.750	2.20	96.347
SOUTH LAKES HIGH SCHOOL	VA767	818,686.18	4,316,273.38	350	100	250	0.010	1.79	0.142

	Model Source ID	Horizontal Coordinate	Vertical Coordinate	Elevation	Stack Height	Exit Temp	Exit Velocity	Stack Diameter	Emission Rate
		m	m	ft	ft	°F	fps	ft	lb/hr
VeriSign Incorporated Broad Run Facility2	VA768	811,184.23	4,284,100.04	272	16	890	335.500	1.00	67.294
Providence Elementary School	VA769	818,810.02	4,308,458.75	450	50	250	10.480	1.80	0.183
LANIER MIDDLE SCHOOL	VA770	818,752.77	4,307,652.65	18	50	250	0.530	2.00	0.075
Westmoore Elementary School	VA771	818,907.98	4,306,970.85	500	100	250	10.480	1.80	0.104
Prince William County Animal Shelter	VA772	811,199.40	4,282,185.73	350	20	1537	16.280	2.32	0.184
Prince William County Sanitary Landfill	VA773	811,475.56	4,282,715.24	328	24	1000	58.470	0.70	6.907
Fairfax Villa Elementary School	VA774	819,103.67	4,305,369.04	400	50	250	0.010	2.00	0.014
Fairfax County - Gatehouse	VA775	796,654.94	4,262,494.79	350	100	250	15.090	1.50	0.024
Robert S Coleman Lumber Co Inc	VA776	765,349.68	4,244,517.65	50	30	400	11.880	2.50	0.053
Fairview Elementary School	VA777	819,283.13	4,301,268.88	450	50	250	10.480	1.80	0.080
Fairfax County - Oakton Elementary School	VA778	820,701.99	4,310,188.05	420	100	250	8.490	2.00	0.188
Transcontinental Gas Pipeline - Station 180	VA779	765,498.55	4,243,615.39	321	43	675	117.480	1.70	509.345
ELEVEN OAKS CENTER	VA780	820,420.91	4,305,164.87	450	30	250	0.010	1.80	0.023
GREAT FALLS ELEM SCH	VA781	821,130.81	4,323,455.35	350	75	250	0.240	2.10	0.021
George Mason University	VA782	820,463.75	4,304,666.22	440	25	200	0.003	0.50	4.320
OAK VIEW ELEMENTARY SCHOOL	VA783	820,252.73	4,303,147.94	400	50	250	0.200	2.30	0.023
Green Acres Elementary School	VA784	820,940.59	4,304,888.16	450	50	250	0.010	1.80	0.027
Fairfax County - Sideburn Support Center	VA785	820,748.88	4,303,381.16	420	20	250	15.090	1.50	0.056
Bonnie Brae Elementary School	VA786	820,455.18	4,301,747.12	350	20	250	23.580	1.20	0.048
DANIELS RUN ELEMENTARY SCHOOL	VA787	821,508.18	4,306,931.41	350	50	250	6.550	1.80	0.037
FLINT HILL ELEM SCH	VA788	822,190.47	4,311,800.58	400	20	250	0.010	1.80	0.025
Robinson Secondary	VA789	821,148.33	4,303,407.44	350	50	250	8.490	2.00	0.384
Mosby Woods Elementary	VA790	822,352.42	4,309,494.39	350	50	250	10.480	1.80	0.080
MADISON HIGH SCHOOL	VA791	822,689.79	4,311,833.48	400	100	250	0.010	2.00	0.256
OAKTON HIGH SCHOOL	VA792	822,635.44	4,309,613.33	350	25	250	0.070	4.00	0.075
Louise Archer Elementary School	VA793	822,967.12	4,312,343.21	350	50	250	10.480	1.80	0.072
Fairfax Memorial Funeral Home, L.L.C.	VA794	822,300.70	4,304,185.32	380	18	1220	13.030	1.70	0.137
Wolf Trap Elementary School	VA795	823,747.44	4,314,200.02	400	50	250	0.530	2.00	0.023
CITGO Terminal	VA796	823,132.29	4,306,637.13	430	45	500	0.330	8.00	0.475
TransMontaigne Product Services Inc - Fairfax	VA797	823,241.48	4,306,654.35	40	10	600	0.940	1.50	0.438
Covance Laboratories Incorporated - Vienna	VA798	823,996.52	4,318,027.82	350	60	200	9.167	3.00	1.077
Marshall Road Elementary School	VA799	823,771.45	4,310,791.44	350	50	250	17.320	1.40	0.096
Woodson Central OPS Building	VA800	823,198.02	4,305,638.48	400	10	250	0.010	1.50	0.007
Woodson High School	VA801	823,198.02	4,305,638.48	400	50	250	0.003	2.40	0.196
OLDE CREEK ELEMENTARY	VA802	823,163.86	4,304,633.27	350	20	250	0.010	1.30	0.016
VIENNA ELEMENTARY SCHOOL	VA803	824,055.00	4,312,424.94	400	50	250	0.010	1.29	0.034
FROST MIDDLE SCHOOL	VA804	823,523.90	4,305,258.74	400	50	250	0.120	3.00	0.059
American Woodmark Orange Dimension Plant	VA805	752,807.40	4,237,721.64	480	50	266	41.760	2.50	2.785
Orange Elementary School	VA806	752,207.40	4,237,221.64	50	36	350	0.020	1.00	0.236
LITTLE RUN ELEMENTARY SCHOOL	VA807	824,102.07	4,304,093.21	350	50	250	0.010	1.79	0.014
Mantua Elementary School	VA808	824,533.82	4,306,829.69	335	20	250	15.090	1.50	0.080
Orange County High School	VA809	754,107.40	4,237,011.67	480	135	100	0.010	2.00	0.292
Cherry Run Elementary	VA810	823,114.47	4,297,910.14	390	20	250	23.580	1.20	0.048
West Briar Elementary School	VA811	825,508.71	4,314,717.34	50	50	250	0.010	1.50	0.017
Sheraton Premiere Hotel	VA812	825,536.16	4,315,822.46	400	57	360	28.120	2.00	0.002
Cunningham Elementary School	VA813	825,390.23	4,312,101.69	450	50	250	7.020	2.20	0.056
Burke Elementary School	VA814	823,761.77	4,300,269.54	250	50	250	8.490	2.00	0.096
Lake Braddock Secondary School	VA815	824,272.85	4,301,496.69	330	50	250	0.010	1.79	0.247
Prospect Heights Middle School	VA816	752,417.41	4,236,321.65	600	20	350	13.680	1.50	0.556
Fairhill Elementary School	VA817	825,574.42	4,309,305.41	350	50	250	8.490	2.00	0.080
CENTRAL INTELLIGENCE AGENCY	VA818	825,915.23	4,311,745.12	400	25	937	152.530	0.50	1.840
Johnson Funeral Home	VA819	779,738.19	4,243,649.37	550	25	1000	0.020	1.00	2.600
Cedar Lane School	VA820	825,868.65	4,310,929.61	350	100	250	8.490	2.00	0.080
White Oaks Elementary School	VA821	824,201.28	4,299,686.62	260	20	250	7.110	1.50	0.016
Wakefield Forest Elementary School	VA822	825,706.17	4,305,326.40	350	50	250	10.480	1.80	0.096
THOREAU MIDDLE SCHOOL	VA823	826,045.24	4,311,141.84	400	50	250	0.220	2.20	0.082
Tyson's Westpark Hotel	VA824	826,387.11	4,315,086.19	450	83	200	0.010	2.00	0.233
Mountcastle Funeral Home Incorporated	VA825	819,157.83	4,283,318.83	243	14.9	1316	8.900	1.70	0.023
Canterbury Woods Elementary School	VA826	825,516.76	4,304,085.98	350	20	250	28.060	1.10	0.080
Freedom Hill Elementary School	VA827	826,856.48	4,314,204.38	350	50	250	15.090	1.50	0.056
SPRING HILL ELEM SCH	VA828	826,974.89	4,316,820.08	350	50	250	0.220	2.20	0.032
Stenwood Elementary School	VA829	827,186.25	4,310,758.84	350	50	250	11.750	1.70	0.088
MADERIA SCHOOL INC (THE)	VA830	826,944.03	4,320,328.67	250	50	250	15.090	1.50	0.324
TYSONS OFFICE CENTER	VA831	827,052.15	4,314,127.01	460	15	450	18.570	0.80	0.031
Aerojet General Corporation - Orange Co Facility	VA832	772,998.24	4,239,402.61	500	25	200	0.003	0.50	154.830
The Ritz Carlton Hotel	VA833	827,502.23	4,315,059.42	450	42	450	0.003	0.50	3.179
Bedford Village Apartments	VA834	827,041.51	4,308,198.40	350	30	68	0.010	2.00	0.428
KILMER INTERMEDIATE SCHOOL	VA835	827,431.40	4,312,938.34	450	50	250	0.530	2.00	0.046
Virginia Paving Company Stafford	VA836	808,470.75	4,264,268.64	250	12	320	0.003	0.35	3.150
LUTHER JACKSON INTERMEDIATE SCHO	VA837	827,195.21	4,308,910.64	350	100	250	0.120	3.00	0.064
NOVA-ANNANDALE CAMPUS	VA838	826,739.36	4,305,169.44	350	60	250	10.000	1.50	0.036
Marriott Hotel - Tysons Corner	VA839	827,612.08	4,314,153.89	495	25	200	0.003	0.50	17.060
Dunn Loring Center	VA840	827,230.85	4,308,521.81	360	50	250	15.090	1.50	0.056
The Berg Corporation Pioneer Portable Crusher	VA841	821,137.89	4,284,782.43	230	15	200	0.003	0.33	6.090
Verisign Incorporated Lakeside II Facility	VA842	821,137.89	4,284,782.43	280	16	890	335.500	1.00	3.181
Science Applications International Corp.	VA843	827,698.10	4,313,457.44	460	60	646	113.670	1.29	44.721
NORTHERN VA MENTAL HEALTH INST	VA844	827,267.55	4,307,812.08	350	15	400	0.240	0.30	0.098
Kings Park Elementary School	VA845	826,447.09	4,302,141.17	250	20	250	11.750	1.70	0.056
Mullins & Thompson Funeral Service	VA846	808,416.53	4,263,563.19	100	40	68	0.020	1.00	0.005
Inova Fairfax Hospital	VA847	827,460.71	4,307,925.10	370	41	400	22.870	3.53	5.621
Silverbrook Elementary School	VA848	824,601.50	4,293,594.77	260	20	250	23.580	1.20	0.040
ExxonMobil Global Services Company	VA849	827,556.76	4,308,142.06	481	28	940	0.080	0.50	148.562
CARDINAL FOREST ELEMENTARY	VA850	826,441.64	4,300,546.02	370	50	250	0.170	2.50	0.023
Washington Gas Ravensworth Station	VA851	826,525.23	4,280,952.72	330	26	900	0.010	1.33	4985.063
Miller Funeral Home	VA852	821,482.49	4,284,574.35	250	18	1000	16.150	1.70	0.090
Nancy Sprague Technology Center	VA853	827,188.25	4,304,597.17	350	50	250	7.020	2.20	0.048
Kings Glen Elementary School	VA854	826,846.56	4,302,167.44	250	50	250	8.490	2.00	0.056
CAMELOT ELEMENTARY SCHOOL	VA855	827,645.39	4,306,643.35	320	50	250	0.010	2.00	0.016
West Springfield High School	VA856	826,507.29	4,299,547.33	350	50	250	0.220	2.20	0.105
MARSHALL HIGH SCHOOL	VA857	828,516.15	4,313,220.47	400	50	250	0.010	2.00	0.260
Marriott - Fairfax Park	VA858	828,280.14	4,308,580.88	325	25	200	0.003	0.50	22.900
Hunt Valley Elementary School	VA859	826,362.70	4,297,321.18	310	20	250	15.090	1.50	0.080
Mitre Corporation	VA860	828,774.86	4,315,534.52	305	12	200	0.003	0.30	92.639
William Halley Elementary School	VA861	825,079.66	4,292,422.59	300	50	250	11.750	1.70	0.064
GODWIN JUNIOR HIGH SCHOOL	VA862	821,696.73	4,282,682.85	250	27	250	0.010	2.00	0.037
Idylwood Towers	VA863	828,978.27	4,312,448.49	400	120	250	132.630	2.00	0.600

	Model Source ID	Horizontal Coordinate	Vertical Coordinate	Elevation	Stack Height	Exit Temp	Exit Velocity	Stack Diameter	Emission Rate
		m	m	ft	ft	°F	fps	ft	lb/hr
The Peterson Companies	VA864	829,131.76	4,316,510.97	320	20	936	746.840	0.70	10.854
TM 1505 Limited Liability Corporation	VA865	829,131.76	4,316,510.97	320	17	943	89.540	2.00	3416.000
Shreveview Elementary	VA866	829,005.26	4,312,039.02	350	50	250	8.490	2.00	0.088
Wakefield Park Recreation building	VA867	828,129.66	4,303,856.69	36	36	450	17.830	2.00	0.112
Woodburn Elementary School	VA868	828,618.46	4,307,098.59	350	50	250	0.010	1.60	0.027
RAYTHEON COMPANY	VA869	828,815.62	4,308,826.78	300	46	350	2.830	3.00	0.239
Pimmit Hills Adult Center	VA870	829,227.02	4,314,761.89	380	50	250	17.320	1.40	0.056
Zamma Corporation	VA871	751,757.41	4,232,731.67	520	25	200	0.003	0.50	4.740
PINE SPRING ELEM SCHOOL	VA872	828,989.06	4,309,239.43	350	30	250	0.003	2.25	0.134
RAVENSWORTH ELEM SCHOOL	VA873	827,967.99	4,301,739.69	250	50	250	0.010	2.00	0.023
Virginia Paving Company - Occoquan Plant	VA874	824,699.23	4,288,897.29	200	25	275	86.260	4.50	8.128
BRADDOCK ELEMENTARY	VA875	828,529.15	4,303,882.98	300	20	250	0.010	1.80	0.032
Atlantic Contracting and Material Company	VA876	825,223.23	4,290,235.51	282	25	200	0.003	0.33	16.171
Walnut Hill Administration Center	VA877	829,571.37	4,307,755.06	50	20	250	0.010	1.25	0.018
FALLS CHURCH HIGH SCHOOL	VA878	829,238.66	4,308,343.09	320	50	250	0.003	3.00	0.064
Lohmann Specialty Coatings LLC	VA879	751,517.42	4,232,321.67	400	36	176	34.820	3.28	0.023
ROLLING VALLEY ELEM SCHOOL	VA880	827,518.35	4,297,898.63	300	50	250	0.010	2.00	0.021
Irving Middle School	VA881	827,925.82	4,299,329.65	300	50	250	0.010	1.79	0.071
Newington Forest Elementary	VA882	826,919.63	4,294,950.56	150	20	250	15.090	1.50	0.048
Lewinsville Center	VA883	829,870.04	4,315,506.44	330	25	400	3.500	3.00	0.038
National Funeral Home	VA884	829,642.12	4,309,984.58	350	32	1078	25.040	1.70	0.040
SHENDOAH PRIDE DAIRY	VA885	828,640.16	4,302,195.14	280	30	150	8.300	2.00	0.914
COOPER INTERMEDIATE SCHOOL	VA886	829,988.63	4,318,423.17	300	50	250	0.470	1.50	0.057
Wedgewood West Apartments	VA887	829,082.39	4,304,621.51	300	30	200	0.003	2.50	0.411
NORTHERN VA COMM COLLEGE	VA888	822,615.79	4,282,432.15	40	12	250	0.040	0.75	0.034
LEMON RD.ELEM SCH	VA889	829,934.76	4,313,003.03	350	50	250	0.010	2.00	0.023
Liberty High School	VA890	781,365.37	4,276,231.51	50	40	100	0.010	2.00	0.000
West Virginia									
LOST RIVER CS 6C3290	WV22	686,016.99	4,305,220.53	1581	20	590	76.600	1.50	65.471
AKER PLASTICS CO., INC.	WV23	762,250.70	4,376,705.10	472	60	125	350.000	10.00	0.224
QUAD/GRAPHICS, INC	WV24	762,786.19	4,377,526.64	456	70	325	8.300	3.00	2.059
AMERICAN WOODMARK CORP. - SOUTH BRANCH	WV25	677,749.89	4,327,349.50	873	35	430	47.500	2.50	0.151
AMERICAN WOODMARK CORPORATION -HARDY CO.	WV26	674,216.81	4,323,320.52	856	32	400	50.000	1.50	0.068
U. S. SILICA COMPANY	WV27	739,616.63	4,393,720.26	591	84	150	87.500	4.00	1.378
ALLEGHENY WOOD PRODUCTS,INC. PLANT 8	WV28	660,538.58	4,317,307.53	938	38	500	43.000	1.83	0.955
ALLEGHENY WOOD PRODUCTS,INC. PLANT 4	WV29	660,416.58	4,317,120.52	948	43	500	43.000	1.83	1.272
ALLEGANY BALLISTICS LABORATORY	WV30	686,016.99	4,381,219.58	663	25	72	0.003	0.00	17.092
NEWPAGE CORPORATION, COATED PAPER	WV31	666,876.76	4,370,890.73	942	106	176	20.700	5.90	19.921
KINGSFORD MANUFACTURING COMPANY	WV32	666,336.76	4,371,557.71	997	93	1859	40.400	8.50	14.420
MOUNT STORM POWER STATION	WV33	650,016.38	4,340,220.57	3248	579	115	89.000	21.00	896.575

Appendix C

Ambient Ratio Justification

Ambient Ratio Method Procedure for 1-hour NO₂ Modeling of the Proposed Warren County Combined-Cycle Project

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August 25, 2010

Introduction and Background

On June 29, 2010, the United States Environmental Protection Agency (EPA) issued a memorandum (from Stephen Page of the Office of Air Quality Planning and Standards) that provided guidance for 1-hour NO₂ modeling for compliance with the National Ambient Air Quality Standards (NAAQS). An attachment to the memorandum was a separate memorandum from Tyler Fox entitled “*Applicability of Appendix W Guidance for the 1-hour NO₂ National Ambient Air Quality Standard*”.

The Tyler Fox memorandum states that, “...in general, the Appendix W recommendations regarding the annual NO₂ standard are also applicable to the new 1-hour NO₂ standard, but additional issues may need to be considered in the context of a 1-hour standard, depending on the characteristics of the emission sources, and depending on which tier is used...”

Tier 2 of the Appendix W NO₂ modeling guidance (Section 5.2.4) involves the application of an empirically-derived ratio to the modeled NO_x concentration. A conservative nationwide default ratio of 0.75 is specified to model annual average NO₂ impacts. Appendix W also indicates that an “*alternative default NO₂/NO_x ratio based on ambient annual average NO₂ and annual average NO_x data representative of area wide quasi-equilibrium conditions*” may be established by the reviewing agency. The Tyler Fox memorandum indicates that “*Tier 2 may also apply to the 1-hour NO₂ standard in many cases, but some additional consideration will be needed in relation to an appropriate ambient ratio for peak hourly impacts since the current default ambient ratio is considered to be representative of ‘area wide quasi-equilibrium conditions’.*”

The Tyler Fox memorandum has an additional discussion of the Tier 2 technical issues:

“As noted above, the 0.75 national default ratio for ARM is considered to be representative of ‘area wide quasi-equilibrium conditions’ and, therefore, may not be as appropriate for use with the 1-hour NO₂ standard. The appropriateness of this default ambient ratio will depend somewhat on the characteristics of the sources, and as such application of Tier 2 for 1-hour NO₂ compliance demonstrations may need to be considered on a source-by-source basis in some cases. The key technical issue to address in relation to this tier requires an understanding of the meteorological conditions that are likely to be associated with

peak hourly impacts from the source(s) being modeled. In general, for low-level releases with limited plume rise, peak hourly NO_x impacts are likely to be associated with nighttime stable/light wind conditions. Since ambient ozone concentrations are likely to be relatively low for these conditions, and since low wind speeds and stable atmospheric conditions will further limit the conversion of NO to NO₂ by limiting the rate of entrainment of ozone into the plume, the 0.75 national default ratio will likely be conservative for these cases. A similar rationale may apply for elevated sources where plume impaction on nearby complex terrain under stable atmospheric conditions is expected to determine the peak hourly NO_x concentrations. By contrast, for elevated sources in relatively flat terrain, the peak hourly NO_x concentrations are likely to occur during daytime convective conditions, when ambient ozone concentrations are likely to be relatively high and entrainment of ozone within the plume is more rapid due to the vigorous vertical mixing during such conditions. For these sources, the 0.75 default ratio may not be conservative, and some caution may be needed in applying Tier 2 for such sources. We also note that the default equilibrium ratio employed within the PVMRM algorithm as an upper bound on an hourly basis is 0.9.”

One important issue that the EPA memorandum does not discuss is that during the daytime, ozone production actually consumes NO₂ in an equilibrium process and reduces the ambient NO₂/NO_x ratio. Therefore, the production of NO₂ from NO with high ozone during the daytime hours is only part of the chemistry, and the remaining part of the chemistry equilibrium that reduces NO₂ concentrations during the daytime should not be ignored.

Warren County Proposed Project Setting and Emission Sources

The proposed Warren County Combined-Cycle Project is situated locally in relatively flat terrain near Front Royal, Virginia, but elevated terrain associated with the Appalachian Mountains is located just a few km to the southwest of the project (including the Shenandoah National Park). Most of the project NO_x emissions come from tall combustion turbine stacks, but other emissions come from lower stacks, including a fuel heater and emergency backup equipment. Due to the mixed nature of the NO_x sources at the proposed facility, we reviewed the facility modeling to determine the nature of peak NO_x impacts.

The modeling results clearly show that the peak impacts are dominated by the low-level sources such as the emergency generator and fire water pump sources. Although these sources will be constrained to operate during daytime hours, they are expected to emit mostly NO and very little NO₂, and the peak impacts are found to be close to the proposed facility. In this case, the finite time required for ozone titration, the low initial fraction of NO₂ to NO_x for these sources, and the low observed hourly NO₂/NO_x ratio at regional monitors (discussed below) for peak values of NO_x indicates that an ambient ratio of 0.75 as applied to peak NO_x hourly concentrations is conservatively high.

Ratios of NO₂/NO_x During Periods of Peak Monitored Concentrations

As noted in Appendix W, an area-specific NO₂/NO_x ratio can be derived from monitoring data. Figure 1 shows the locations of regional monitors that measure hourly NO₂ and NO_x concentrations. Note that Warren County is flanked by three adjacent monitors in Rockingham County, Loudoun County, and Prince William County. As noted in EPA's June 29, 2010 memorandum, the monitored ratios corresponding to the higher monitored NO_x concentrations are most pertinent to modeling short-term NO₂ from both the proposed source and background sources. Figures 2-4 show the hourly ratio of NO₂/NO_x versus (total) NO_x for the three monitoring sites mentioned above, respectively, for the period 2007-2009. Each plot clearly shows that for total NO_x concentrations more than about 125 µg/m³, the NO₂/NO_x ratio drops below 0.75. For peak concentrations, this ratio is less than 0.25. Note that due to discrete values reported, especially for the lower monitored values, the plotted pattern shows a "fractal" image for the lower concentrations, for which each plotted point is composed of multiple samples.

Conclusions

The EPA has issued recent guidance regarding the use of various tiers of modeling approaches to modeling 1-hour NO₂ concentrations. This guidance includes the application of a Tier 2 approach that applies an ambient NO₂/NO_x ratio method, especially for sources for which the peak modeled NO_x concentrations do not coincide with high ambient ozone concentrations. Analysis of modeling results for the proposed Warren County Combined-Cycle project indicates that peak impacts are due to low-level sources with low NO₂/NO_x emission ratios and nearby impacts. A review of actual NO₂/NO_x ratios for peak monitored NO_x concentrations, which are the most relevant to the 1-hour NO₂ standard, indicate that when ambient NO_x concentrations are above about 125 µg/m³, the NO₂/NO_x ratio drops below 0.75. Therefore, we conclude that the application of the Tier 2 modeling approach for 1-hour NO₂ concentrations for this modeling application can use a conservatively high ambient NO₂/NO_x ratio of 0.75.

Figure 2 Plot of Hourly Ratios of NO₂/NO_x Versus NO_x for the Rockingham County Monitor, 2007-2009

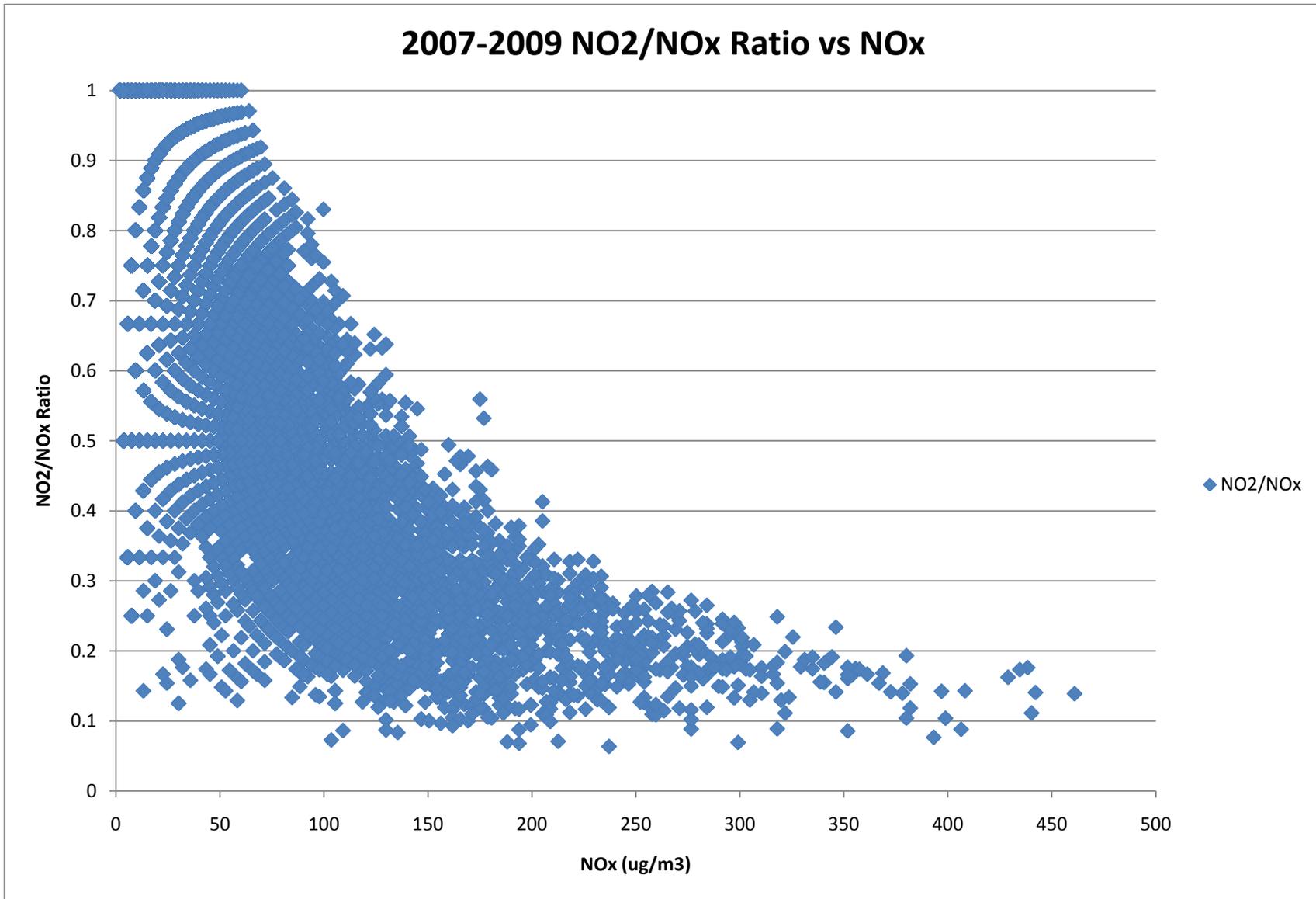


Figure 3 Plot of Hourly Ratios of NO₂/NO_x Versus NO_x for the Loudoun County Monitor, 2007-2009

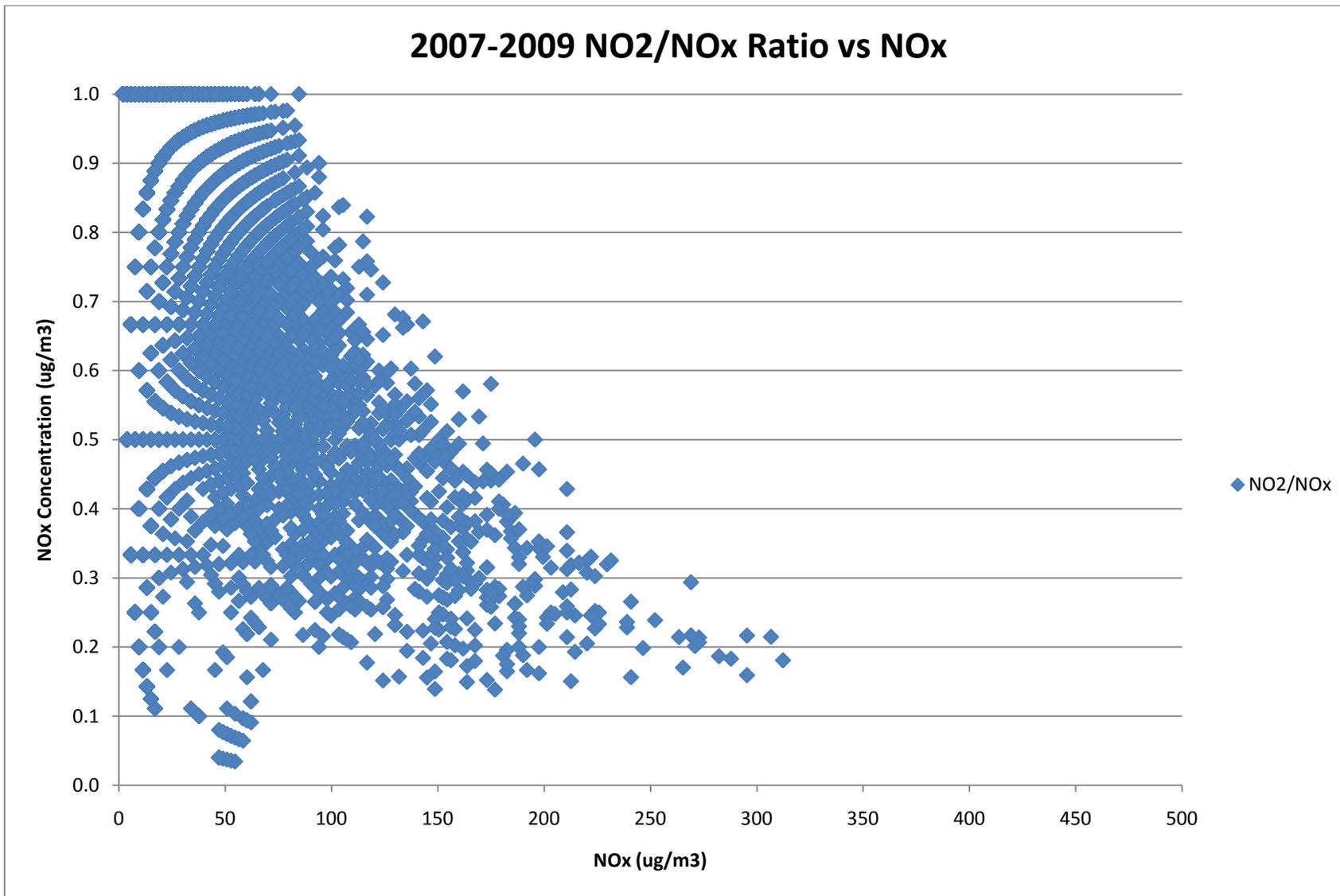


Figure 4 Plot of Hourly Ratios of NO₂/NO_x Versus NO_x for the Prince William County Monitor, 2007-2009

