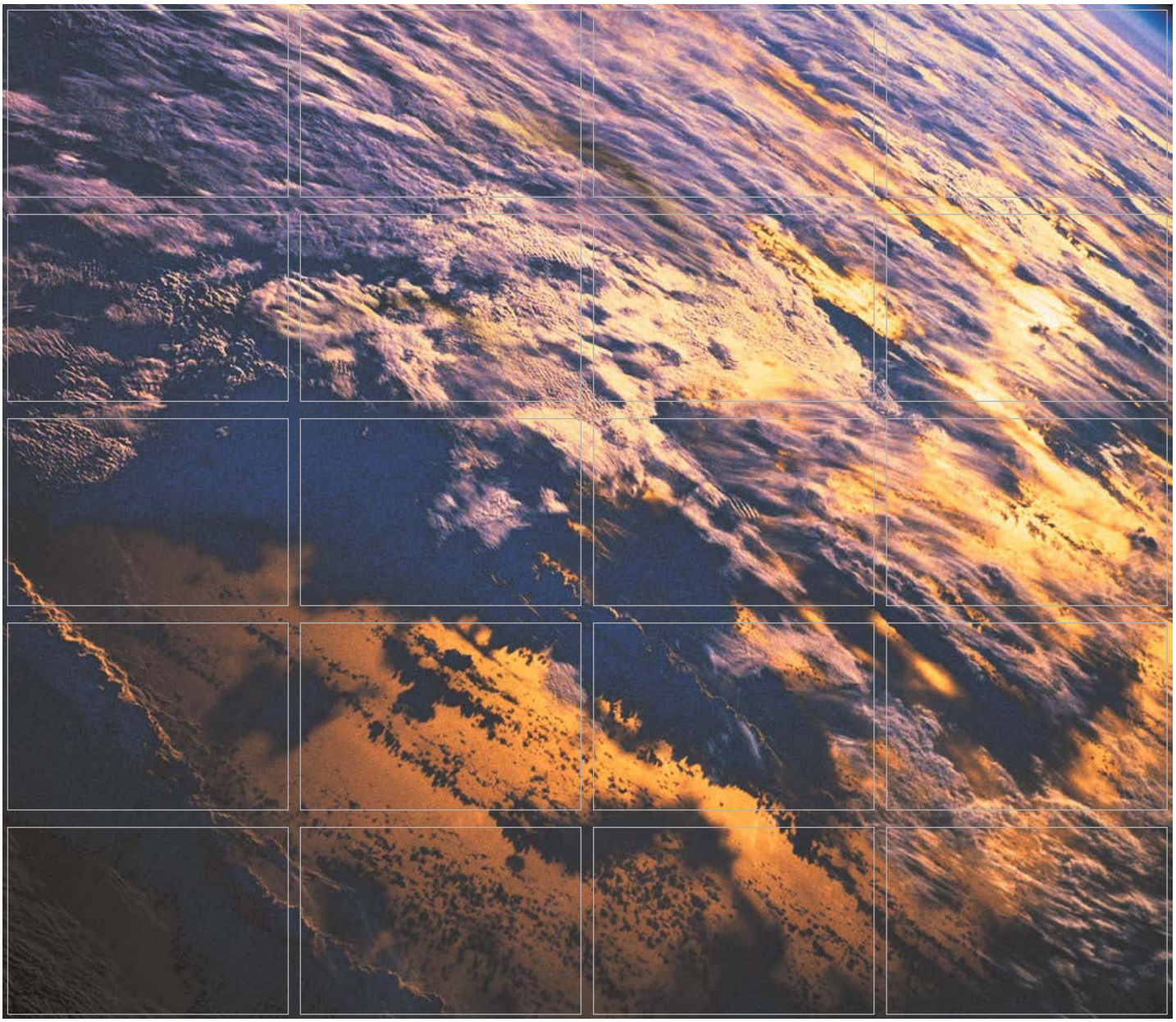

ROXUL USA, Inc.

Prevention of Significant Deterioration
Application - Appendix C
Air Quality Assessment

Jefferson County, West Virginia

December 2017

Environmental Resources Management
204 Chase Drive
Hurricane, WV 25526
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1.0 INTRODUCTION

ROXUL USA Inc., (Roxul) submits this air quality modeling analysis as Appendix C to the New Source Review (NSR) Prevention of Significant Deterioration (PSD) construction air permit application submitted to the West Virginia Department of Environmental Protection (WVDEP), Division of Air Quality (WVDAQ, or The Department) November 21, 2017. The application submitted is to authorize the development of a new mineral wool insulation manufacturing facility in Jefferson County, West Virginia. A general area map showing the proposed location of the facility is provided in Figure 1-1 of this report.

As shown in Table 1-2, the proposed facility will be a new PSD major source due to potential emissions of VOC in excess of 250 tons per year. Further, emissions of NO_x, SO_2, PM, PM_{10}, $PM_{2.5}$, H_2SO_4 Mist, and CO_2e are also subject to PSD review due to potential emissions greater than the PSD significant emission rate (SER) for each pollutant.

1.1 PROJECT OVERVIEW

Roxul proposes to construct, install, and operate a new mineral wool insulation manufacturing facility (Project). The Project will consist of a 460,000-square-foot manufacturing facility on an estimated 130 acres site in the city of Ranson in Jefferson County, West Virginia. The plant will produce mineral wool insulation for building insulation, customized solutions for industrial applications, acoustic ceilings and other applications.

1.2 OVERVIEW OF MODELING ANALYSIS METHODOLOGY

Table 1-1 provides a summary of the attainment status of Jefferson County, WV with respect to the National Ambient Air Quality Standards (NAAQS). The attainment status determines which regulatory programs new major sources or modifications to existing sources must address in the process of obtaining an air quality construction permit. Table 1-2 provides a summary of the regulatory program(s) that must be addressed for each regulated compound that will be emitted by the Project. Compounds with emission levels that trigger Non-attainment New Source Review (NNSR) requirements are subject to additional control (Lowest Achievable Emission Rate, LAER) and emissions offset requirements but do not require air quality dispersion modeling to assess compliance with the NAAQS. Requirements of the PSD program must be addressed for major sources locating in attainment areas, for each compound having emissions greater than the significant emission rate (SER).

Table 1-1 Attainment Status of Jefferson County, West Virginia

Compound	Attainment Status
SO_2 (annual)	Attainment
SO_2 (1-hr)	Attainment
CO	Attainment
Pb	Attainment
O_3 (1-hr)	Attainment
PM_{10}	Attainment
NO_2 (annual)	Attainment
NO_2 (1-hr)	Attainment
O_3 (8-hr)	Attainment
$PM_{2.5}$ (annual)	Attainment
$PM_{2.5}$ (24-hr)	Attainment

- Data obtained from EPA *Green Book* https://www3.epa.gov/airquality/greenbook/anayo_wv.html

NNSR does not apply, because Jefferson County, WV is in attainment for all regulated pollutants. Applicability of the PSD program for the proposed Project is determined by evaluating whether potential emissions exceed new major source thresholds and SERs for each PSD regulated compound. The proposed project will be a new major source due to potential VOC emissions in excess of 250 tons per year.

Table 1-2 Applicability of Regulatory Air Programs to the Project

Compound	Project Potential Emissions (tons/year)	PSD SER (tons/year)	PSD Review Req'd?
NO_x	238.96	40	Yes
CO	71.40	100	No
VOC	471.41	40	Yes
SO_2	147.45	40	Yes
PM_{10}	153.19	15	Yes
$PM_{2.5}$	133.41	Primary $PM_{2.5}$: 10 NO_X: 40 SO_2: 40	Yes
O_3	NO_X: 238.96 VOC: 471.41	NO_X: 40 VOC: 40	Yes
Lead	0.0002	0.6	No
H_2SO_4	16.37	7	Yes

Dispersion modeling was performed for the compounds above that are subject to PSD review to assess the ambient air impacts resulting from the emissions of these compounds due to the Project, with the exception of VOC, which is a precursor to ozone formation and is not modeled. In addition, there are no

NAAQS or PSD increments for PM, CO_2e (or greenhouse gases, GHGs), or sulfuric acid mist; therefore, PSD applicants are not required to model or conduct ambient monitoring for these pollutants.

The modeling analysis addresses compliance with the NAAQS and PSD Increments, as applicable. The modeling analyses conform to Appendix W of 40 CFR Part 51 (Guideline on Air Quality Models). The key elements of the modeling analysis include:

- Use of the latest version of the regulatory dispersion model and supporting programs: AERMOD (version 16216r), AERMET (version 16216), AERMINUTE (version 15272), AERMAP (version 11103), AERSURFACE (version 13016), and BPIPRM (version 04274);
- Use of input meteorological data from EMV Regional Airport, Shepherd Field (KMRB, WBAN: 13734), located approximately 10 kilometers (km) to the west of the Project;
- Use of upper air data from Dulles Airport, MD (WBAN: 93734);
- Application of the latest version of AERSURFACE as recommended in the EPA AERMOD Implementation Guidance (EPA 2016);
- Utilize the surface friction velocity adjustment (ADJ_U*) option in AERMET;
- Develop a comprehensive receptor grid designed to identify maximum modeled concentrations;
- Utilize the Ambient Ratio Method 2 (ARM2) option in AERMOD to characterize NO_2 from modeled concentrations of NO_X;
- Utilize the Tier III NO_2 modeling method PVMRM in AERMOD, if necessary;
- In accordance with PSD requirements, determine whether emissions from the Project that are subject to PSD will have an effect on growth, soils, vegetation, and visibility in the vicinity of the Project;
- Compare maximum predicted impacts to relevant Significant Impact Levels (SILs) and Significant Monitoring Concentrations (SMCs) to determine if additional modeling or monitoring could be required;
- Demonstrate that allowable emissions from the proposed facility would not cause or contribute to air pollution in violation of any National Ambient Air Quality Standard (NAAQS) or PSD increment.

2.0 PROJECT EMISSIONS AND SOURCE CHARACTERIZATION

2.1 PROJECT DESCRIPTION

Roxul proposes to construct, install, and operate a new mineral wool insulation facility (Project). The Project site is located in Jefferson County, WV. The general

location of the facility is provided on the regional map shown in Figure 1-1. A plot plan of the proposed Project is presented in Figure 1-2.

Figure 1-1 *Roxul, Jefferson County, WV – Regional Map*

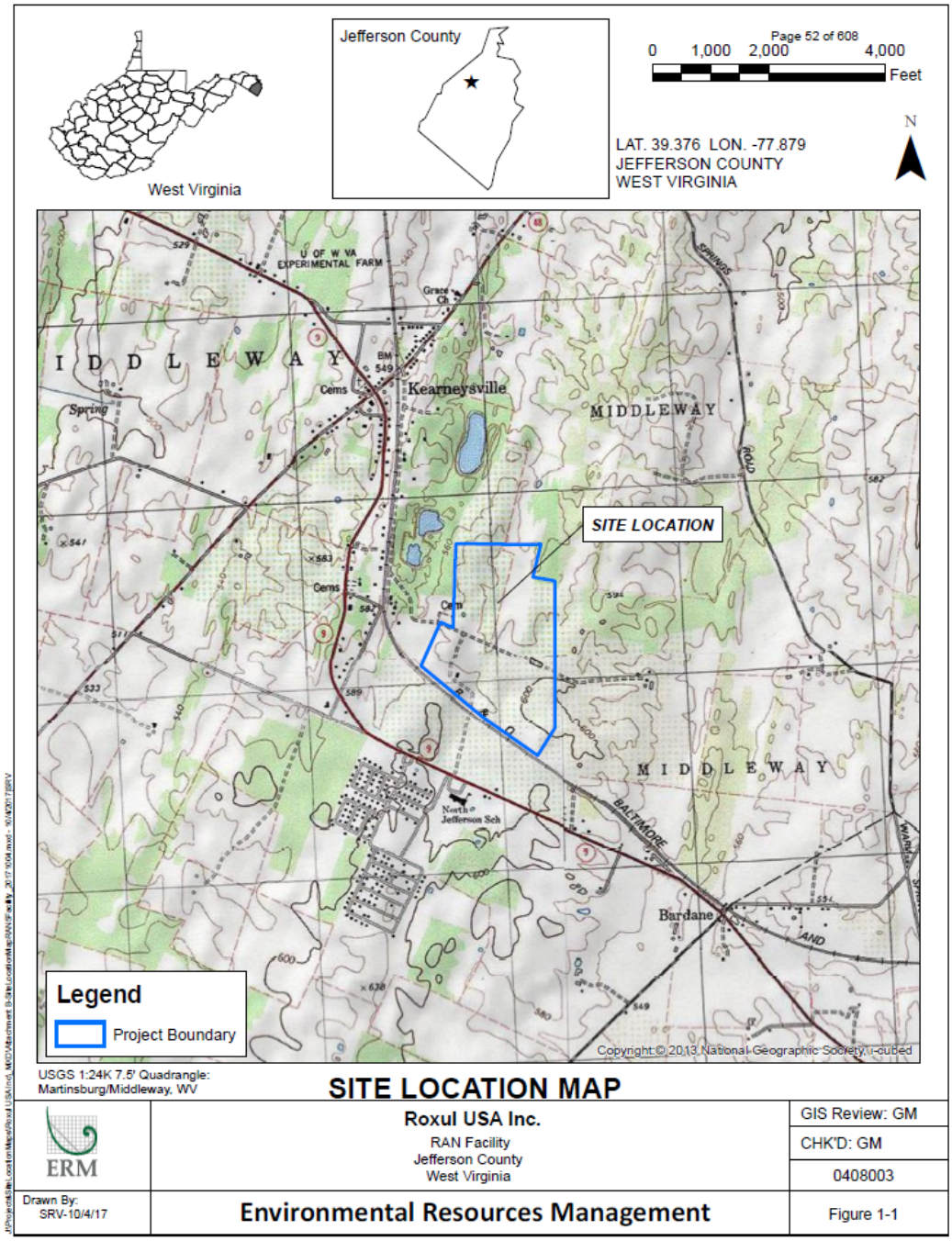
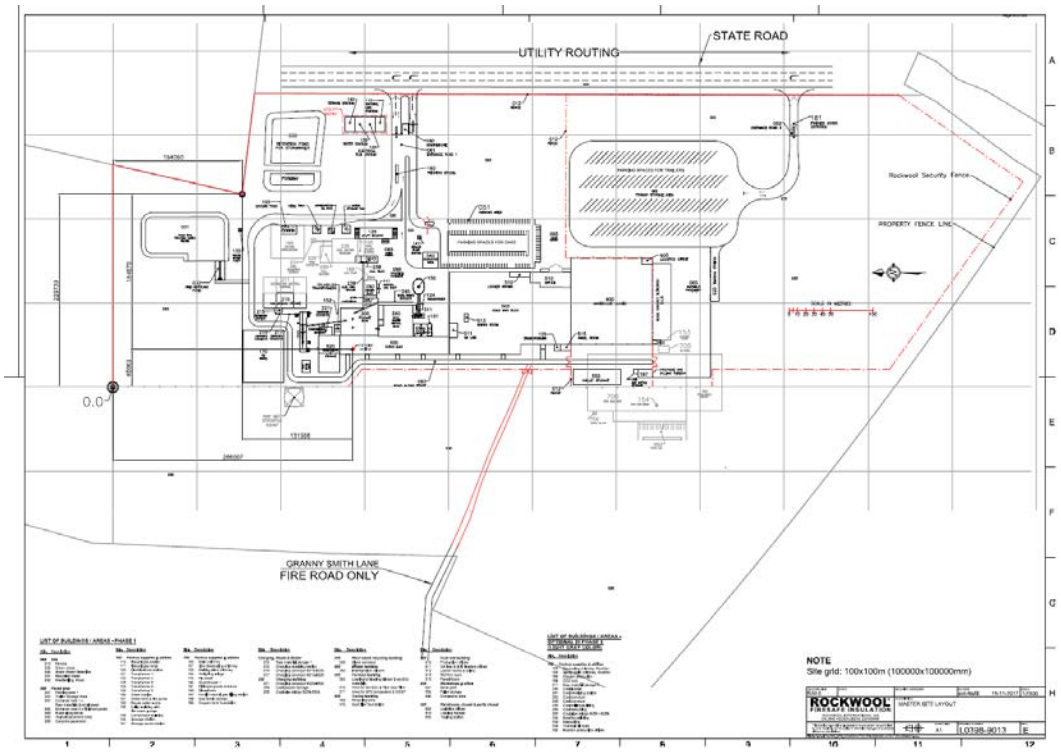


Figure 1-2 Facility Layout



2.2 *PROJECT SOURCES*

A detailed list of emission rates and source parameters is provided in Attachment 1. The emission calculations are included in the PSD permit application Appendix A submitted November 2017. An overview of the emission sources associated with the Project are as follows:

- Mineral Wool Line (including Recycle Plant),
- Rockfon Line, and
- Coal Milling.

Other facility wide operations include:

- Oxygen production,
- Natural gas heating,
- Emergency fire pump engine,
- Paved haul roads, and

- Storage tanks.

Mineral wool production technology uses processes which can be described with a linear relationship between the amount of processed material and the mass of generated pollutants. This linear mass-based relationship can be expressed with proportionality between operational loads and pollutant emission rates, i.e., higher loads generate higher emission rates. For the exhaust (emission point) from the furnace some pollutants are related to a constant air flow and as such independent of load. Roxul conservatively assumes in the emission calculations that the facility would operate on 100% load at all times.

The second aspect of the variable load conditions is related to the provisions for dispersion of the emitted gasses. The flow rate of gasses passing through the furnace is governed by fans with specific air flow requirements due to the nature of production. In order to achieve the required product characteristics, constant airflow and temperature are needed. Therefore during the steady-state operations, stack exhaust flow rates and temperature are maintained approximately constant. Therefore, Roxul has not modeled varying load conditions since maximum emissions occur at maximum load conditions and stack parameters are maintained at consistent levels.

Transient operations, such as startup and shutdown, related to scheduled maintenance occur once a week. Furthermore, when transient operations do occur, the emission profile of pollutants is only significantly impacted for a short period of time. Given that these events are infrequent in nature, Roxul has not separately modeled transient operations.

2.3 BUILDING WAKE EFFECTS

The EPA's Building Profile Input Program (BPIP), Version 04274 was used to calculate downwash effects for the modeled emission sources. Building, structure, and tank configurations and locations relative to the modeled sources were obtained from engineering drawings of the planned facility and input into BPIP. Construction of facility stacks did not exceed the greater of the GEP formula height calculated by BPIP or 65 m (213 feet).

3.0 MODELING METHODOLOGY

3.1 MODEL SELECTION AND APPLICATION

The latest version of EPA's AERMOD model (version 16216r) was used for predicting ambient impacts for each modeled compound. Regulatory default options were used in the analysis, except as specified in the protocol submitted November 2017. An overview of the various air quality modeling analyses that utilize AERMOD are described in the following sections.

3.1.1 Project Only Modeling Analysis

This section summarizes the model inputs and procedures that were used to conduct the Project-only air quality impact analysis for the Project. Specifically, the following analyses are addressed in this section:

- Refined single-source modeling to compare maximum predicted impacts to EPA SILs; and
- Comparison of refined single-source impacts to EPA SMCs to determine if a preconstruction monitoring waiver request is justified.

As discussed in Section 3.1.3, for those pollutant impacts that are demonstrated to be less than applicable SILs, no further analysis is required because these pollutants impacts are presumed to not cause or contribute significantly to any modeled violations of a NAAQS or PSD Increment. Where impacts exceed SILs, additional refined modeling was required to demonstrate that the cumulative impact of the Project and other potentially interacting sources plus background did not cause or contribute to any violation of any NAAQS and PSD Increment.

Section 3.1.3 addresses the cumulative (multi-source) impact analysis procedures used to demonstrate that the combined impacts of pollutants from Project and nearby sources did not cause or contribute to air pollution in violation of any NAAQS or PSD Increment. The Class I Area impact analysis procedure is addressed in Section 3.11 and the other air quality analyses (visibility impairment, soils and vegetation impacts, and associated growth analysis) are summarized in Section 3.7.3.

For purposes of presentation of all modeling results, it should be noted that all modeled concentrations were not rounded or truncated, in accordance with EPA policy, when compared to applicable SILs, NAAQS, or PSD Increments.

3.1.2 Significant Impact Analysis

3.1.2.1 Justification of the Use of Significant Impact Levels (SILs)

The EPA has historically cautioned states that the use of a SIL may not be appropriate when a substantial portion of any NAAQS or PSD Increment is known to be consumed. Therefore, justification of the use of SILs is recommended in support of the PSD review record. For this modeling analysis cumulative impact modeling involving nearby sources was required and, it was necessary to demonstrate that the Project did not contribute significantly to any modeled violations of NAAQS. To provide justification with respect to the use of SILs in the NAAQS analysis, the differences between the NAAQS and background concentrations determined to be representative of the Project impact area (see Section 3.5) for applicable pollutants and averaging periods were compared to the applicable SIL values. The comparison summarized in Table 3-1

shows that the differences in this case between the NAAQS and background concentrations are much higher than the corresponding SILs. Therefore, these differences are sufficient for WVDAQ to conclude that a modeled impact less than the SIL for each of the applicable pollutants did not cause or contribute to a violation of the NAAQS.

Table 3-1 Comparison of NAAQS, Representative Background Concentrations, and SILs ($\mu g/m^3$)

Pollutant	Averaging Period	NAAQS	Representative Background/Design Concentration	Difference Between NAAQS and Design Concentration	SIL
PM_{10}	24-Hour	150	24	126	5
$PM_{2.5}$	24-Hour	35	14.3	20.7	1.2
	Annual	12	5.7	6.3	0.2
NO_2	1-Hour	188	33.2	154.8	7.5
	Annual	100	9.4	90.6	1
SO_2	1-Hour	196	39.5	156.5	7.8
	3-Hour	1,300	39.5	1,260	25
	24-Hour	365	17.5	347.5	5
	Annual	80	3.2	76.8	1

3.1.2.2 Significant Impact Analysis Modeling Procedures

The significance analysis involved refined modeling to determine maximum ambient impacts from the Project in comparison to pollutant-specific SILs. The results of the significance analysis determined the need for further modeling including nearby sources to evaluate compliance with NAAQS and PSD Increments. All Project sources listed in Section 2.2 were evaluated for inclusion in the refined modeling.

The Emergency Fire Pump assumes 100 hour of operation per year for testing and readiness purposes. As an intermittent source it is not included in the 1-hour NO_2 and SO_2 analyses as recommended by EPA (EPA Memorandum March 16, 2011).

For the 24-hr $PM_{10}/PM_{2.5}$ analyses, the Emergency Fire Pump was modeled assuming emission rates conservatively based on an operational schedule of 1/2 hour per day.

The results of the refined modeling of Project sources are compared to the SILs in order to conservatively estimate the significant impact area for each pollutant and averaging period. It should be noted that highest first-highest (H1H) model design concentrations for all short term averages were compared to the applicable SILs. Additionally, it should be noted that for 1-hr NO_2, 24-hr $PM_{2.5}$,

and annual $PM_{2.5}$ pollutant and averaging period combinations, the relevant model design value is the H1H value averaged over five (5) years per receptor. The applicable Class II Area SILs used for this analysis are summarized in Table 3-1 and Table 3-2 in Sections 3.1.2.1 and 3.2, respectively.

A pre-construction ambient air monitoring waiver must be requested in order for a facility subject to PSD review to be exempt from preconstruction ambient air monitoring requirements. A waiver may be considered based on the modeled impacts of the Project when compared to the SMCs in 40 CFR Part 52.21. The applicable SMCs are summarized in Table 3-2 in Section 3.2 and the modeled impacts are summarized in Section 4.1. If a project cannot be exempted from preconstruction monitoring based on modeling results, then the applicant may propose for the reviewing authority's consideration for the use of existing monitoring data if appropriate justification is provided.

Roxul proposes the use of representative regional background data to satisfy this requirement for the PM_{10} pollutant. Justification of the representativeness of existing regional background data for use in the modeling analysis is provided in Section 3.3.1 for $PM_{2.5}$ and Section 3.5 for all other applicable criteria pollutants.

3.1.3 Cumulative Modeling Analysis

For those pollutant impacts due to Project sources alone that are demonstrated to be less than applicable SILs, no further analysis is required and the Project impacts are presumed not to cause or contribute significantly to violation of the NAAQS or PSD Increments. Where the Project's impacts are determined to exceed SILs, additional refined modeling is required to demonstrate that the cumulative impact of the Project and nearby sources will not cause or contribute to air pollution in violation of any NAAQS and PSD Increment, shown in Table 3-2 of Section 3.2.

The cumulative modeling was performed for all receptors where the proposed Project had a significant impact, as determined by the significance modeling analysis. The cumulative analyses includes background concentrations of pollutants as discussed in Section 3.5 and contributions from nearby off-site sources as discussed in Section 3.10.

Where SO_2 1-hour modeling predicts an exceedance of the applicable NAAQS, the MAXDCONT post processor to AERMOD was used to assess whether the Project's contribution to the predicted violations, paired in time and space, was insignificant at all receptors in consideration.

In addition, in accordance with EPA guidance[1], the significant contribution analysis examines every multi-year average of the daily maximum 1-hour values

[1] EPA Memorandum, dated March 1, 2011, from Tyler Fox, "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard."

for SO2 beginning with the 4th-highest, continuing down the ranked distribution until all cumulative impacts are below the NAAQS.

3.2 AMBIENT AIR QUALITY STANDARDS

Table 3-2 presents a summary of the air quality standards that were addressed for NO_2, SO_2, PM_{10}, and $PM_{2.5}$. The SILs are presented, along with the SMCs, PSD Increments, and NAAQS. If Project impacts are shown to be less than the SILs and SMCs, then no further analysis was required. If the SILs are exceeded, additional analyses were necessary, including the development of a background source inventory and background monitored concentrations. It should be noted that the 1-hr SIL for NO_2 is an interim SIL based on EPA guidance, and has been adopted by WVDEP based on WVDEP's concurrence with EPA that modeled concentrations less than the 1-hr SIL for NO_2 represent a de-minimis level of concentration and would not be expected to contribute to violations of the 1-hr NO_2 NAAQS.

Table 3-2 Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS [a] ($\mu g/m^3$)	Class II Increment Standards ($\mu g/m^3$)	Class II SIL ($\mu g/m^3$)	SMC ($\mu g/m^3$)
SO_2	1- Hour	196 [b,q]	-	7.8 [c,n]	-
	3-Hour	1,300 [d,e]	512 [d]	25 [g]	-
	24-Hour	365 [d,h]	91 [d]	5 [g]	13
	Annual	80 [u,h]	20 [u]	1 [g,u]	-
PM_{10}	24-Hour	150 [i,s]	30 [d]	5 [g]	10
	Annual	50 [j,r]	17 [u]	1 [g,u]	-
$PM_{2.5}$	24-Hour	35 [k,f]	9[d]	1.2 [f]	t
	Annual	12 [j,o]/15[e, j]	4[u]	0.3 [o], 0.2 [v]	-
NO_2	1-Hour	188 [l,p]	-	7.5 [c,n]	-
	Annual	100 [u]	25 [u]	1 [g,u]	14
Pb	Rolling 3-Month	0.15 [m]	-	-	-
Ozone	8-hour	70 ppb	-	1 ppb[v]	<100 tons per year (tons/yr) VOC

a) Primary standard unless otherwise noted.
b) The 3-year average of the 99th-percentile of the annual distribution of daily maximum 1-hour concentrations must not exceed standard.
c) EPA Interim SIL adopted by WVDEP on December 1, 2010.
d) One exceedance allowed per year.
e) Secondary standard.
f) For the $PM_{2.5}$ 24-hour SIL analysis, modeled concentration is the highest of the 5-year averages of the maximum modeled 24-hour average $PM_{2.5}$ concentrations predicted each year at each receptor, based on 5 years of National Weather Service (NWS) data. Use of the SIL is subject to evaluation depending on the approach taken to address $PM_{2.5}$ secondary impacts. For the

$PM_{2.5}$ 24-hr NAAQS analysis, the modeled concentration is the 98th percentile of the 5-year averages of the maximum modeled 24-hour average $PM_{2.5}$ concentrations (EPA memorandum, dated March 20, 2014, from S. Page, "Guidance for $PM_{2.5}$ Permit Modeling").

g) For determining compliance with the SIL, no exceedances allowed.

h) The 24-hour and annual SO_2 NAAQS were revoked, but are in effect until the SO_2 1-hour designations are finalized. However, the increment standards and related SILs remain in effect.

i) Expected number of days per calendar year, on average, with arithmetic time-averaged concentration above standard is equal to or less than one. For modeling analyses, compliance is evaluated by comparing the high, 6th-high modeled concentration over five years (plus an appropriate background concentration) to the NAAQS.

j) Based on 3-year average of the annual mean concentrations.

k) The 3-year average of the 98th percentile of 24-hour concentrations must not exceed standard. The NAAQS was revised effective December 18, 2006.

l) The 3-year average of the 98th-percentile of the annual distribution of daily maximum 1-hour concentrations must not exceed standard.

m) Rolling 3-month average, no exceedances allowed.

n) Highest of the 5-year averages of the maximum modeled 1-hour NO_2 and 1-hour SO_2 concentrations at each receptor, based on 5 years of meteorological data, must not exceed the 1-hr NO_2 and SO_2 SIL, respectively, in order to demonstrate insignificant impacts. (EPA memorandum, dated March 1, 2011, from T. Fox, "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO2 National Ambient Air Quality Standard" and memorandum dated June 29, 2010, from S. Page, "Guidance Concerning the Implementation of the 1-hour NO_2 NAAQS for the Prevention of Significant Deterioration Program" and WVDEP memorandum, dated December 1, 2010, from Andrew Fleck, "Interim 1-Hour Significant Impact Levels for Nitrogen Dioxide and Sulfur Dioxide").

o) The highest average of the modeled annual averages across 5 years of NWS meteorological data is compared to the $PM_{2.5}$ annual average SIL and AAQS. Use of the SIL is subject to evaluation depending on the approach taken to address $PM_{2.5}$ secondary impacts. (EPA memorandum, dated March 20, 2014, from S. Page, "Guidance for $PM_{2.5}$ Permit Modeling").

p) For NO_2 1-hour NAAQS analysis, modeled concentration is the 98th percentile (H8H) of the annual distribution of daily maximum 1-hour concentrations averaged across 5 years of NWS data (EPA memorandum, dated June 28, 2010, from T. Fox, "Applicability of Appendix W Modeling Guidance for the 1-hour NO2 National Ambient Air Quality Standard").

q) For SO_2 1-hour NAAQS analysis, modeled concentration is the 99th percentile of the annual distribution of daily maximum 1-hour concentrations averaged across 5 years of NWS data (EPA memorandum dated August 23, 2010, from S. Page, "Guidance Concerning the Implementation of the 1-hour SO_2 NAAQS for the Prevention of Significant Deterioration Program").

r) AAQS REVOKED.

s) For PM_{10} 24-hour average NAAQS analysis, modeled concentration is the highest 6th highest concentration over 5 years of NWS data.

t) On January 22, 2013, the U.S. Court of Appeals for the District of Columbia Circuit vacated the parts of two PSD rules establishing a $PM_{2.5}$ SMC, finding that the EPA was precluded from using the $PM_{2.5}$ SMCs to exempt permit applicants from the statutory requirement to compile preconstruction monitoring data.

u) No exceedances are allowed for annual averages to determine compliance with the NAAQS and to determine whether impacts are significant compared to the SIL.

v) On August 1, 2016 USEPA published draft guidance on SILs for $PM_{2.5}$ and ozone. USEPA proposed no change to the 24-hr $PM_{2.5}$ SIL of 1.2 $\mu g/m^3$; however, an annual $PM_{2.5}$ SIL of 0.2 $\mu g/m^3$ is recommended in this draft guidance. An 8-hour ozone SIL of 1 ppb was also proposed.

3.3 $PM_{2.5}$ CONSIDERATIONS

In January 2013, the SMCs for $PM_{2.5}$ were vacated by the DC Circuit Court. The SMCs are concentrations that are used to determine if a project subject to PSD regulations needs to compile preconstruction ambient monitoring to determine if existing air quality conditions are representative of the project site. Preconstruction monitoring is typically required when a project's modeled impacts exceed the SMCs and the existing air quality monitoring network in the region is inadequate to characterize existing air quality.

The Project is located approximately 11 km southeast of an existing ambient monitor that measures $PM_{2.5}$. This monitor in Martinsburg, WV (Site ID 54-003-0003) has been collecting $PM_{2.5}$ data since 1999. Due to the monitor's proximity, Roxul asserts that this monitor is suitable to represent the state of the air quality near the Project site during the pre-construction stage. Therefore, additional preconstruction monitoring should not be required for the Project, due to the existence of representative $PM_{2.5}$ ambient air quality data.

In addition to the SMC vacature in January 2013, EPA also remanded the SIL for $PM_{2.5}$. EPA intends to revise the approach to how the SIL is implemented. In the interim, widely accepted practice for PSD permitting is to continue to use the $PM_{2.5}$ SILs as benchmarks to determine a project's de-minims standing with respect to the $PM_{2.5}$ NAAQS, but also to ensure that a project's modeled impacts do not exceed the NAAQS (despite being less than the SIL) when added to an existing representative background value of $PM_{2.5}$. Roxul has employed this practice as part of the air quality modeling analysis, specifically, that the Project's modeled concentrations of directly emitted $PM_{2.5}$ are both less than the levels of the SIL, but also less than the NAAQS when added to a representative background $PM_{2.5}$ concentration, obtained from the Piney Run, Garrett County, MD $PM_{2.5}$ monitor. This monitor was selected as the representative background monitor because of its regional scale, lack of nearby modeled source interference, and land use correlation to the project site. Further justification as to why this monitor was selected as the representative background monitor is provided in Section 3.3.1.

3.3.1 Representative Background Concentrations of $PM_{2.5}$

There are total of five $PM_{2.5}$ ambient air monitoring stations in the greater vicinity of the project site. The monitors are of different types, serving specific regional screening, and are spread over the states of WV, MD, and VA. Monitors' distance to project, measurement scale, sampling rate, and data coverage are listed in Table 3-3.

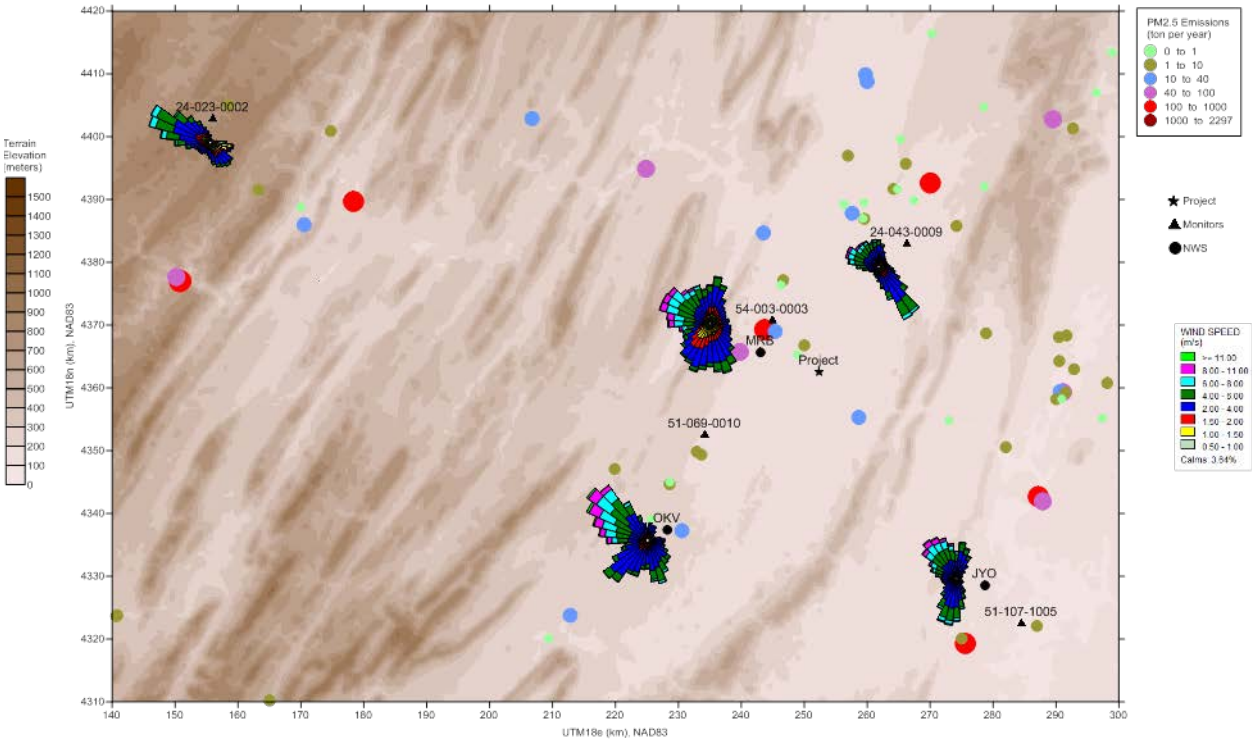
Table 3-3 List of $PM_{2.5}$ Ambient Monitor Station in the Vicinity of the Project Site

$PM_{2.5}$ Monitor Location	$PM_{2.5}$ Monitor ID	Distance to Project (km)	Measurement Scale	Sampling Rate	Data Coverage 2013-15	Design Conc. (µg/m³) 24hr, Annual
Martinsburg, Berkeley Co., WV	54-003-0003	11	Urban (4-50km)	24-hour, every 3rd day	333 obs., 91%*	26.6, 9.9*
Piney Run, Garrett Co., MD	24-023-0002	105	Regional Scale (50 - 100s km)	1-hour, every day	924 obs., 84%	15.9, 6.6
Hagerstown, Washington Co., MD	24-043-0009	25	Urban (4-50km)	1-hour, every day	1014 obs., 93%	25.7, 9.4
Ashburn, Loudoun Co. VA	51-107-1005	51	Neighborhood (400m – 4km)	24-hour, every 3rd days	338 obs., 93%	20.3, 8.7
Rte 669, Frederick Co. VA	51-069-0010	21	Neighborhood (400m – 4km)	24-hour, every 3rd days	361 obs., 99%	23.7, 8.9

* Berkeley Co. design values are based on 2014-2016 observations provided by WVDAQ

In addition proximity to large industrial sources, prevailing winds were taken in consideration. The locations of the industrial facilities throughout the region were obtained from the National Emission Inventory (NEI) 2014. Wind roses were constructed with local monitor observations, when available (Piney Run and Hagerstown, MD) or observations from the nearest NWS station were used. Martinsburg airport was considered representative of the Berkeley Co. monitor location; Leesburg Municipal (JYO) airport represents the winds at Loudoun Co. monitor; and the winds captured at Winchester Regional (OKV) airport are considered representative for the Frederick Co. monitor. The Berkeley Co, Garret Co, Hagerstown Frederick Co monitors are located in the foot hills of the Allegheny Plateau and west of the Blue Ridge Mountains; the Loudoun Co monitor is located just east of the Blue Ridge mountains. The wind roses summarize the wind conditions at the representative locations for the period of interest - 2013-2015. Monitor and weather station locations together with the regional $PM_{2.5}$ sources are presented in Figure 2-1 over terrain elevation background.

Figure 2-1 ***Location of $PM_{2.5}$ Ambient Monitor Stations in Relation to Project and NEI 2014 Industrial Sources***



The Garret County, MD monitor is a regional transport monitor collecting hourly samples every day. It is located approximately 105 km west-northwest of the Project in rural setting similar to the project site. The 3-year data capture rate was estimated as 84.4% for the 2013-2015 period. There are no large sources in the immediate vicinity of the monitor and the prevailing northwesterly winds indicate that the monitor is likely influenced by larger scale transport events, and therefore suitable for representation of background $PM_{2.5}$ levels.

Frederick Co., VA monitor is a neighborhood scale monitor located 21 km southwest of the Project site. In addition of the monitor being representative of local scale events, it is also placed approximately 3 km northeast of limestone processing facility, and provided the local wind patterns is very likely highly influenced by these operations. Therefore the observations at this monitor are not considered as a representative background for the Project site.

Loudoun Co., VA monitor is a neighborhood scale monitor located 51 km southeast of the Project site and placed in a suburban setting. The monitor is representative of local scale events, and therefore the observations at this monitor are not considered as a representative background for the Project site.

Hagerstown, MD monitor is an urban scale monitor located 25 km northeast of the Project site in an industrial area, less than 1 kilometer south of a scrap metal processing facility. Provided the local wind patterns it is very likely that the monitor is highly influenced by these operations. In addition, when evaluating the Hagerstown, MD monitor it should be noted that an urban scale monitor is operated in Berkeley Co., WV and is closer to the Project site. Therefore the observations at this monitor are not considered as a representative background for the Project site.

Berkeley Co., WV monitor is located approximately 11 km northwest of the Project. This is an urban scale monitor and is situated in a more urban environment compared to the site. The data capture rate is once every 3 days. Additionally the monitor is located 1.5 km north of a cement plant with extensive quarrying operations. It is likely that the monitor is highly influenced by this source. Moreover the industrial sites in the vicinity of the monitor were included explicitly in the NAAQS and increment modeling.

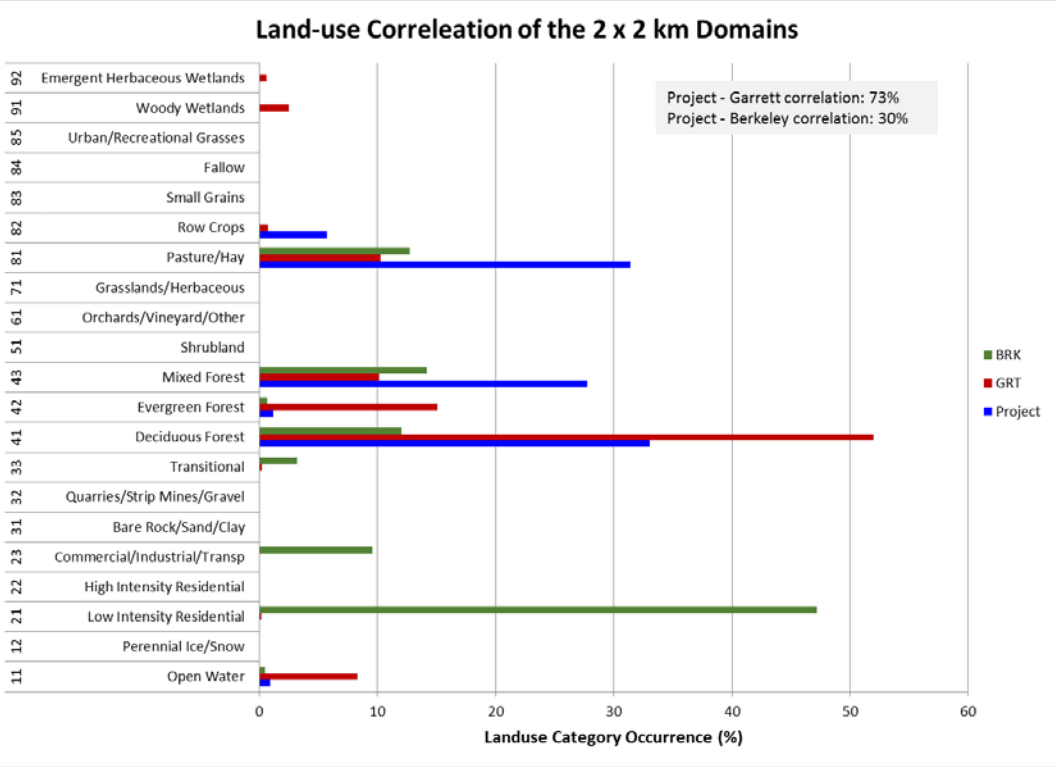
The initial review of the five available monitors indicates that the preferred sites for this project are the Berkeley Co. and the Garret Co. monitors. Further detailed evaluation of the land-use characteristics of these locations and comparison to the Project site are used to support the final monitor selection.

The land-use characteristics of the project site were compared to the same for the two monitors. For this purpose, AERSURFACE was used to extract the land features included within an area of 1-km radius. The domain size was selected to simulate the modeling requirement for surface roughness, a characteristic that AERMOD is found very sensitive. Further calculations show that the correlation between the land characteristics of the Project and the two monitor domains is as follows:

- Project to Garrett Co. monitor (GRT) correlation = 73%
- Project to Berkeley Co. monitor (BRK) correlation = 30%

Figure 2-2 shows the comparison between the land-use features of the Project and two monitor sites based on the 1992 National Land Cover Data archive, provided by the USGS.

Figure 2-2 *Comparison of Land-use Features Between the Martinsburg (BRK) and Garrett Co, (GRT) Monitors and Project*



Based on the above arguments, ERM used the Garrett County monitor as representative of the regional concentrations in the $PM_{2.5}$ NAAQS analysis for this PSD application. The cumulative modeling includes explicitly the regional sources in the vicinity of the Project, therefore the use of the Garrett County monitor observations was considered realistic representation of the regional background values without introducing double counting of the concentrations.

3.4 OZONE ANALYSIS AND SECONDARY FORMATION OF $PM_{2.5}$

In December 2016, EPA released a guidance memorandum (EPA 2016a) for review and comment that described how Modeled Emission Rates of Precursors (MERPs) could be calculated as part of a Tier I ozone and secondary $PM_{2.5}$ formation analysis to assess a project's emissions of precursor pollutants as they would relate to the ozone and $PM_{2.5}$ "critical air quality thresholds". Roxul has

utilized the MERPs guidance to assess the projects impacts on ozone secondary $PM_{2.5}$ formation as described in the paragraphs below.

3.4.1 Calculation of MERPs for Ozone

As specified in Table 1-2, the potential emissions of NO_X from the proposed project are 238.96 tpy and the potential emissions of VOC are 471.41 tons per year. The MERPs guidance provides modeling results representing the maximum downwind ozone concentrations due NO_X and VOC emissions of hypothetical sources. EPA conducted photochemical modeling of hypothetical sources using emission rates of 500 tpy, 1,000 tpy, and 3,000 tpy of both NO_X and VOC for various locations throughout the US. Figure A-1 of the MERPs guidance presents the locations of the sources modeled in the Eastern US. The EPA Source 8 was located in Southern Pennsylvania, in Adams County and was found to be located approximately 75 km northeast of the project. Due to the close regional proximity of EPA Source 8, Roxul asserts that this source is most suitable to develop the appropriate MERP levels with which to assess the Project's emissions of precursors against the appropriate "critical air quality threshold". For the purpose of this analysis, the critical air quality threshold for ozone was considered to be equivalent to the proposed ozone SIL of 1 ppb. It should be noted that most current monitor design values shown in Table 3-4 for the region are all below the ozone NAAQS of 70 ppb.

Table 3-4 Monitor Values at the Berkeley, WV

Monitor ID	County, State	Observed 2014 8hr Design Value (ppb)	Observed 2015 8hr Design Value (ppb)	Observed 2016 8hr Design Value (ppb)
540030003	Berkeley, WV	60.0	66.0	64.0

Also, for the purpose of this analysis, Roxul has considered MERP values derived from the model results for EPA Source 8 based on the 500 tpy cases for both NO_X and VOC, as these are the closest approximations of the project emission rates. Table 3-5 presents modeled ozone concentrations from Table A-1 of the MERPs guidance for the 500 tpy case for Source 8.

Table 3-5 EPA Hypothetical Source Ozone Modeling Results – Source 8 (Pennsylvania)

Precursor	Emissions (tpy)	Stack Height	Maximum Modeled Ozone Concentration (ppb)
NO_X	500	Low (1 m)	1.67
NO_X	500	High (90 m)	1.66
VOC	500	Low (1 m)	0.16
VOC	500	High (90 m)	0.16

The results of EPA's hypothetical source modeling presented in Table 3-5 can be used to derive appropriate MERP values for NO_X and VOC. The MERPs guidance specifies the following equation to derive a MERP:

MERP = Critical Air Quality Threshold * (Modeled emission rate from hypothetical source/ Modeled air quality impact from hypothetical source)

As stated previously, Roxul used the proposed ozone SIL of 1 ppb to represent the critical air quality threshold. The SIL represents a de-minimis impact level, that is, if the maximum concentration of ozone due to a single source is less than the SIL, then it can be concluded that the source has an insignificant contribution to ozone formation. If the low stack height case for both NO_X and VOC is conservatively chosen along with the ozone SIL, the resulting MERPs values are the following:

NOX MERP = 1ppb * 500 tpy / 1.66 ppb = 301 tpy
VOC MERP = 1ppb * 500 tpy / 0.16 ppb = 3125 tpy

The potential emissions of NO_X (238.96 tpy) and VOC (471.41 tpy) are below the MERP values calculated above. However, since the emissions of these ozone precursors each exceed the individually applicable PSD SERs, the MERPs guidance suggests that the total emission rate of precursors should be cumulatively evaluated with respect to the MERP levels. The following equation shows the Project's cumulative MERP consumption. A cumulative MERP consumption of less than 100% indicates that a project would not cause ozone concentrations exceeding the ozone SIL.

(Project NOx emissions (238.96 tpy)/NOX MERP (301 tpy) +
(Project VOC emissions (471.41 tpy)/VOC MERP (3125 tpy)) = 94%

The calculated cumulative consumption of the MERPs is 94%. Roxul concludes that this analysis utilizing recent EPA guidance demonstrates that the proposed project will result in insignificant ozone impacts.

3.4.2 Secondary $PM_{2.5}$ and EPA MERPs Guidance

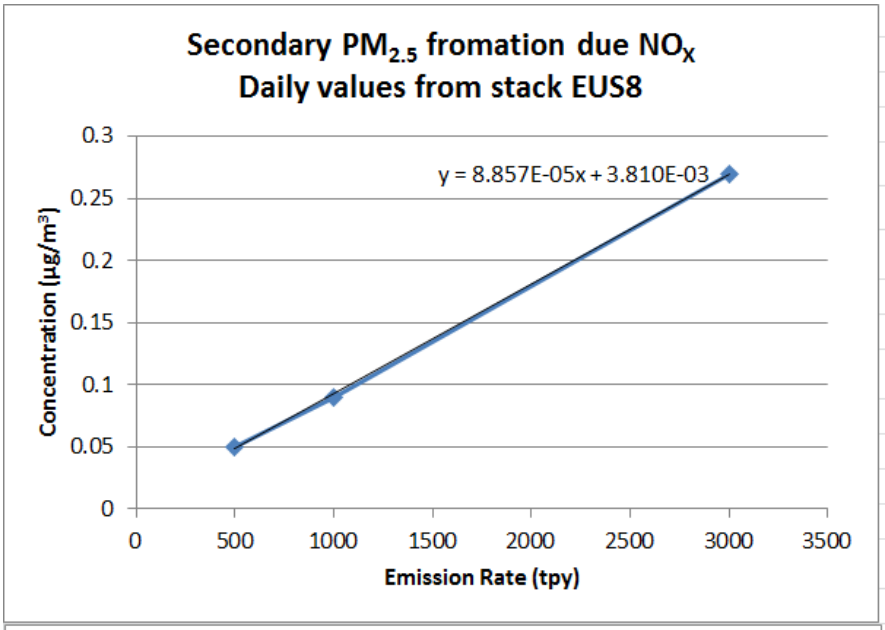
In addition to the photochemical ozone modeling for various hypothetical sources across the US contained in the MERPs guidance, EPA has also provided photochemical modeling for $PM_{2.5}$ for the same hypothetical sources due to emissions of $PM_{2.5}$ precursor pollutants NO_X and SO_2. The use of MERPs for NO_X and SO_2 to determine whether a project would have significant $PM_{2.5}$ impacts (i.e., exceed the applicable SILs) is complicated by the fact that a project's total impact on $PM_{2.5}$ air quality includes contributions from both precursor emissions and direct emissions of $PM_{2.5}$ from project sources. Section 4 of this report presents model results that indicate that the $PM_{2.5}$ SILs are exceeded due

to directly emitted $PM_{2.5}$ alone. Therefore, calculation of MERPs would not be needed since the Project already has significant $PM_{2.5}$ impacts. However, the photochemical model results for hypothetical sources in the MERPs guidance can still serve as a resource to assess the potential contribution of secondary $PM_{2.5}$ to the total modeled concentrations due to the Project. The approach described in the following paragraphs represents a Tier 1 secondary $PM_{2.5}$ assessment, as described in Section 5.4.2(b) in the revised Guideline on Air Quality Models (EPA 2017).

Tables A-2 and A-3 of the MERPs guidance contain model results for $PM_{2.5}$ 24-hr and annual averaging periods for the various hypothetical sources modeled by EPA across the US. Similar to the modeling conducted for ozone, EPA conducted photochemical modeling of hypothetical sources using emissions of 500 tpy, 1,000 tpy, and 3,000 tpy of both NO_X and SO_2.

In order to characterize expected maximum modeled impacts of $PM_{2.5}$ from the proposed project, Roxul used the model results for EPA Source 8 located in Southern Pennsylvania, Adams County. Figures 3-1 and 3-2 present plots of the modeled $PM_{2.5}$ concentrations for Source 8 plotted against modeled emissions of NO_X and SO_2 for the 500 tpy, 1,000 tpy, and 3,000 tpy "high" stack height cases. Each plot includes a trend line with a linear equation. The linear equation for each precursor and $PM_{2.5}$ averaging period can be used in conjunction with the project potential emissions of NO_X and SO_2 to calculate an appropriate $PM_{2.5}$ concentration that can be added to the direct $PM_{2.5}$ concentration from AERMOD.

Figure 3-1 *EPA Hypothetical Source $PM_{2.5}$ Modeling Results – Source 8 (Pennsylvania) – 24-hr Average*



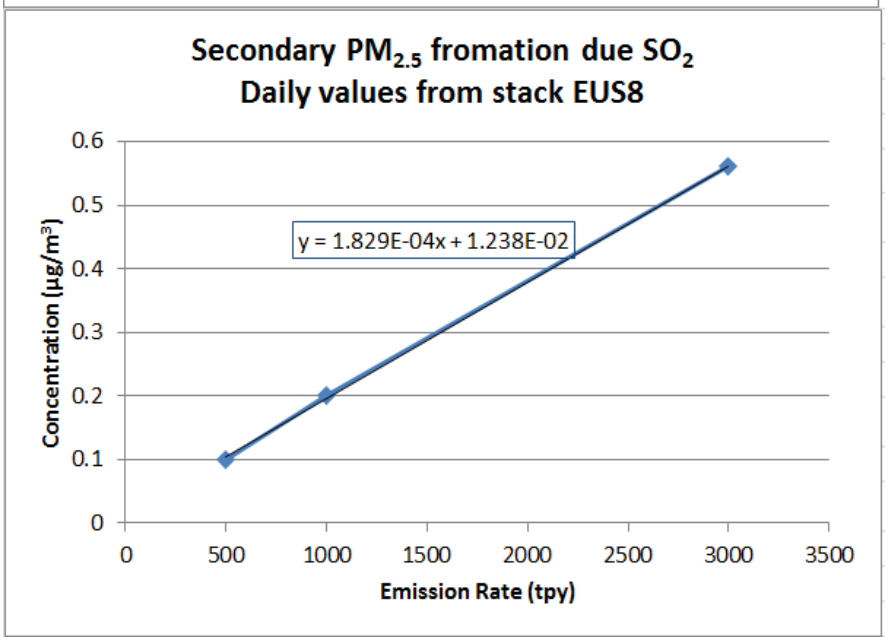
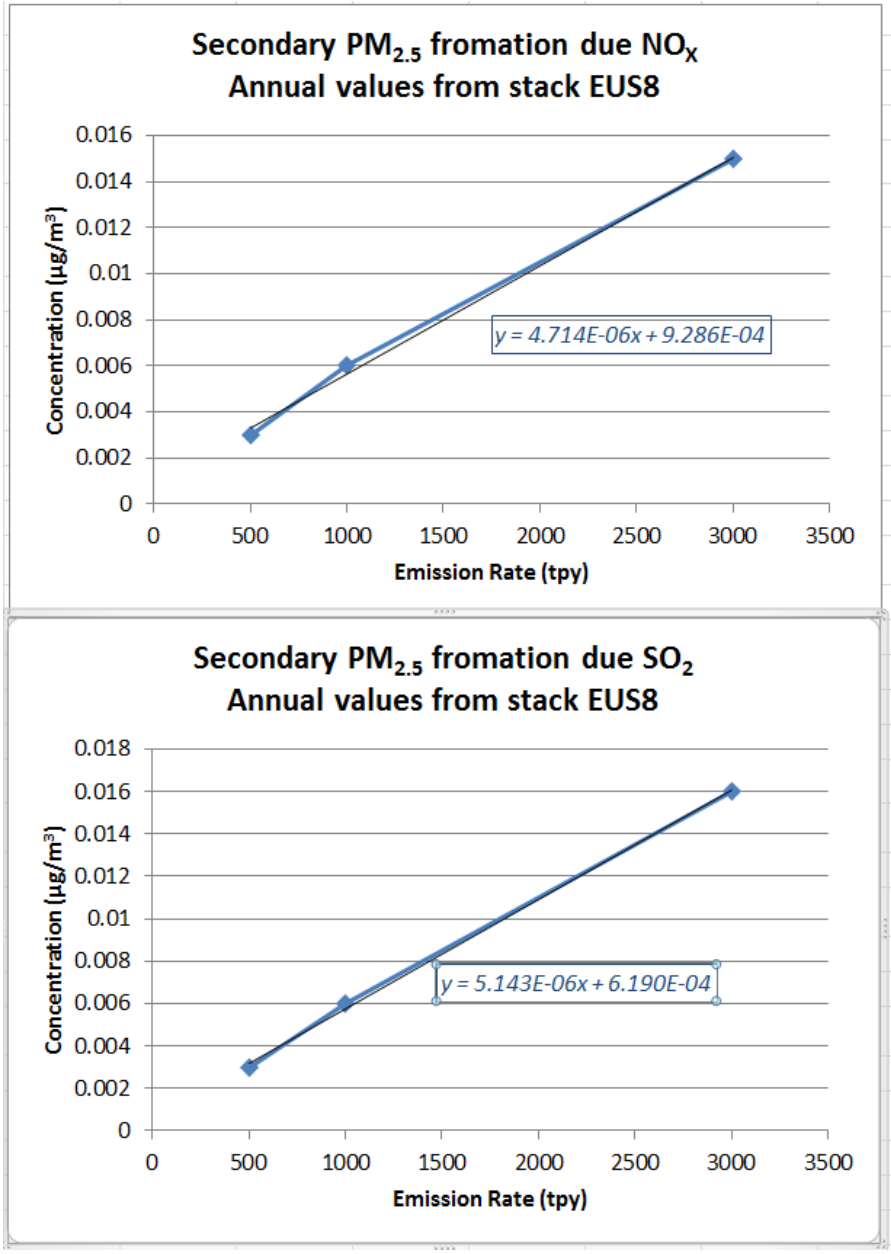


Figure 3-2 *EPA Hypothetical Source $PM_{2.5}$ Modeling Results – Source 8 (Pennsylvania) – Annual Average*



The secondary $PM_{2.5}$ concentrations due to the Project derived from the equations shown in Figures 3-1 and 3-2 are as follows:

24-hr Secondary $PM_{2.5}$ due NO_X = $8.56e^{-5}$*(238.96 tpy) +$3.81e^{-3}$ = 0.025 µg/m³
+
24-hr Secondary $PM_{2.5}$ due SO_2 = $1.83e^{-4}$*(147.75 tpy) +$1.24e^{-2}$ = 0.039 µg/m³

Total Secondary $PM_{2.5}$ (24-hr) = 0.064 µg/m³

Annual Secondary $PM_{2.5}$ due NO_X = $4.71e^{-6}$*(238.96 tpy) +$9.29e^{-4}$ = 0.0021µg/m^3
+
Annual Secondary $PM_{2.5}$ due SO_2 = $5.14e^{-6}$*(147.75 tpy) +$6.19e^{-4}$ = 0.0014 µg/m^3

Total Secondary $PM_{2.5}$ (Annual) = 0.0034 µg/m^3

The secondary $PM_{2.5}$ concentrations determined above, based on a relationship between $PM_{2.5}$ concentrations and precursor emissions that were derived from maximum $PM_{2.5}$ modeled concentrations from EPA hypothetical source photochemical modeling in the same region as the proposed project, can be added to direct $PM_{2.5}$ modeled concentrations to determine the total project air quality impact on $PM_{2.5}$. These concentrations represent only very small fraction of the SIL values – approximately 5.4% of the 24-hour SIL and 1.7% of the annual. Therefore, the project's impacts are considered insignificant and no further modeling actions are required.

3.5 BACKGROUND POLLUTANT CONCENTRATIONS

As discussed in Section 3.1.3, representative background pollutant concentrations must be utilized if a cumulative air quality modeling analysis is necessary for NO_2, $PM_{2.5}$, PM_{10}, or SO_2. The following discussion presents the most current monitor design values for nearby monitors that Roxul has identified that are representative of Jefferson County.

3.5.1 Representative Background Concentrations of NO_2

Table 3-6 presents the most recent NO_2 monitor design values for the regional transport monitor in Adams County, PA (EPA ID 42-001-0001). This is the closest NO_2 monitor to the proposed Project with a valid 2016 monitor design value. The Adams County monitor is located 77 km to the northeast of the project site. The NO_2 data coverage of 93.0% was found sufficient for modeling purposes. The monitor is placed in rural setting similar to the project site.

Table 3-6 Annual and 1-hr NO_2 Monitor Design Values

POLLUTANT	MONITOR LOCATION	MONITOR ID	Distance to Project (km)	AVERAGING PERIOD	DESIGN CONCENTRATION (µg/m3)
NO_2	Adams Co., PA	42-001-0001	77	1-Hour	33.2
				Annual	9.4

To characterize 1-hr background NO_2 values, Roxul utilized EPA guidance (EPA 2011) and calculated the design value based on the most recent three years of

data. The proposed NAAQS analysis was performed in two stages. In the first stage a conservative approach was applied by adding a single design value to all model predicted concentrations. If needed, a refined approach would be applied by calculating variable background values. Specifically, the most recent 3-year average of the 98th percentile monitor values by season and hour-of-day are to be calculated for the refined approach. EPA guidance suggests that the season and hour-of-day combination be based on the 3rd highest values to represent the 98th percentile.

3.5.2 Representative Background Concentrations of $PM_{2.5}$

As discussed in Section 3.3, the $PM_{2.5}$ ambient data was collected at the Garrett County, MD monitoring station. Roxul used this data to characterize background $PM_{2.5}$ for use in any necessary cumulative $PM_{2.5}$ analysis. Table 3-7 presents the current annual and 24-hr monitor design values.

Table 3-7 $PM_{2.5}$ Monitor Design Values

POLLUTANT	MONITOR LOCATION	MONITOR ID	Distance to Project (km)	AVERAGING PERIOD	DESIGN CONCENTRATION (µg/m3)
$PM_{2.5}$	Pine Run Garrett Co., MD	24-023-0002	105	24-Hour	14.3
				Annual	5.7

To characterize 24-hr background $PM_{2.5}$ values, Roxul utilized EPA guidance (EPA 2014) and calculated the design value based on the most recent three years of data 2014-2016. The proposed NAAQS analysis would be performed in two stages. In the first stage a conservative approach was applied by adding a single design value to all model predicted concentrations. If needed, a refined approach would be applied by calculating variable background values. Specifically, the EPA guidance recommends the following approach:

- For each year, determine the annual 98th percentile 24-hr monitor value;
- For all 24-hr values in the year less than or equal to the 98th percentile value, divide the distribution into four seasonal categories;
- Determine the maximum concentration in each seasonal category;
- Average the seasonal maximum concentrations across the three years (e.g., average spring value for years 1-3).

The approach described resulted in four (4) 24-hr values that will be used as input as background values in AERMOD if the overall 24-hr monitor design value is unnecessarily conservative.

3.5.3 Representative Background Concentrations of PM_{10}

The closest PM_{10} monitor to the proposed Project is located in Winchester City, VA, 33 km to the southwest. Based on proximity, Roxul used Winchester City monitor observations in the PM_{10} NAAQS analysis for this application. The maximum second highest monitor design value over the most recent three years of available data was used to characterize background PM_{10} in the cumulative NAAQS analysis, if needed. Table 3-8 summarizes the most recent design value from the Winchester City, VA PM_{10} monitor.

Table 3-8 PM_{10} Monitor Design Values

POLLUTANT	MONITOR LOCATION	MONITOR ID	Distance to Project (km)	AVERAGING PERIOD	DESIGN CONCENTRATION (µg/m3)
PM_{10}	Winchester City, VA	51-840-0002	33	24-Hour	24

3.5.4 Representative Background Concentrations of SO_2

Table 3-9 presents the most recent SO_2 monitor design values for the regional transport monitor in Garrett County, MD (EPA ID 24-023-0002). This is the most representative SO_2 monitor with a valid 2016 monitor design value. The Garrett County monitor is located 105 km west-northwest of the Project site. The SO_2 data coverage of 85.6% was found sufficient for modeling purposes. The monitor is placed in rural setting similar to the Project site.

Table 3-9 SO_2 Monitor Design Values

POLLUTANT	MONITOR LOCATION	MONITOR ID	Distance to Project (km)	AVERAGING PERIOD	DESIGN CONCENTRATION (µg/m³)
SO_2	Garrett Co., MD	24-023-0002	105	1-Hour	39.5
				3-Hour	39.5
				24-Hour	17.5
				Annual	3.2

To characterize 1-hr background SO_2 values, Roxul utilized EPA guidance (EPA 2011) and calculated the design value based on the most recent three years of data. The proposed NAAQS analysis would be performed in two stages. In the first stage a conservative approach was applied by adding a single design value to all model predicted concentrations. If needed, a refined approach would be applied by calculating variable background values. Specifically, the most recent

3-year average of the 99th percentile monitor values by season and hour-of-day are to be calculated. EPA guidance suggests that the season and hour-of-day combination be based on the 2nd highest values to represent the 99th percentile.

3.6 NO_X TO NO_2 CONVERSION

For the NO_2 modeling analyses, Roxul used the Ambient Ratio Method (ARM2) option in AERMOD to account for the formation of NO_2 from the emissions of NO_X from the Project sources. Roxul utilized ARM2 with the national default range of NO_2 to NO_X ratios (50% to 90%). When ARM2 is used, AERMOD assigns the appropriate ratio for each hour and receptor based on the total modeled concentration of NO_X.

3.6.1 Optional NO_2 Modeling Refinements

The ARM approach described above is a Tier II NO_2 modeling methodology. Further refinements in AERMOD are available that account for NO_X to NO_2 transformation through the use of actual monitored concentrations of ozone. These refinements are referred to as Tier III NO_2 modeling methods. The Tier III approaches are the Plume Volume Molar Ratio Method (PVMRM) or the Ozone Limiting Method (OLM) options in AERMOD.

Roxul proposed to utilize a Tier III air quality modeling approach on an as-needed basis as discussed in the modeling protocol submitted November 2017. At this time, a Tier III air quality modeling approach was not used.

3.7 GEOGRAPHIC SETTING

3.7.1 Land Use Characteristics

The proposed facility will be located in the city of Ranson, Jefferson County, WV. AERMOD was used in the default (rural) mode. Roxul has analyzed the land use classifications within an area defined by a 3 km radius from the approximate center of the site, and has determined that the land use within this area is less than 1% urban classification. This determination was made by analyzing the USGS NLCD 1992 data, where urban classifications were assumed to be category 22 (high intensity residential) and category 23 (commercial /industrial/transportation).

3.7.2 Terrain

The Project site is situated in elevated terrain at approximately 177 m. The latest version of EPA's AERMAP program (version 11103) was used to determine the ground elevation and hill scale for each modeled receptor, based on data obtained from the USGS National Elevation Database (NED). The NED data was obtained at a horizontal resolution of 1/3 arc-second (10-m) for use in this analysis.

3.7.3 *Effects on Growth, Soils, Vegetation, and Visibility*

PSD requirements include an evaluation of the effects of growth due to a project, and an evaluation of the effects of project emissions on soils, vegetation, and visibility. Evaluation of potential impacts on vegetation and soils were performed by comparison of maximum modeled impacts from the Project to Air Quality Related Value (AQRV) screening concentrations provided in the EPA document "A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals"[2] and to NAAQS secondary standards. The screening levels represent the minimum concentrations in either plant tissue or soils at which adverse growth effects or tissue injury was reported in the literature. The NAAQS secondary standards were set to protect public welfare, including protection against damage to crops and vegetation. Therefore, comparing the modeled emissions to the AQRVs and the NAAQS secondary standards provides an indication as to whether potential impacts are likely to be significant. Table 3-10 summarizes the applicable AQRVs or NAAQS secondary standards.

Table 3-10 Summary of Applicable AQRVs and AAQS

Pollutant	Averaging Period	AQRV Screening Levels ($\mu g/m^3$)	Secondary NAAQS ($\mu g/m^3$)
PM_{10}	24-hour	--	150
	Annual	--	50
$PM_{2.5}$	24-hour	--	35
	Annual	--	15
NO_2	4-hour	3,760	--
	8 hour	3,760	--
	1-month	564	--
	Annual	100	100
SO_2	1-hour	917	--
	3-hour	786	1,300
	24-hour	--	260
	Annual	18	60
Pb	Quarterly	1.5	0.15

"--" = not applicable or not available.

With respect to visibility impacts, Roxul has consulted with WVDAQ to determine if any areas in the vicinity are considered to be sensitive with respect to potential visibility degradation, and investigate the appropriateness of applying the EPA VISCREEN (Version 1.01, dated 13190) visibility model to sensitive viewsheds within these areas to conservatively assess the proposed

[2] USEPA, A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals, EPA 450/2-81-078, December 12, 1980.

Project's impact on visibility impairment. VISCREEN will be executed following the procedures described in EPA's Workbook for Plume Visual Impact Screening and Analysis for Level-1 visibility assessments, if necessary.[3] At this time it was determined that this analysis was not necessary for any areas in the vicinity of the project.

3.8 RECEPTOR GRIDS

For this modeling analysis, nested Cartesian receptor grids of variable spacing were utilized to resolve the ground concentration patterns. The grid is shown in Figure 3-3. The grids were defined using a common central point at the proposed project as an origin, extended distance from the origin, and receptor spacing. As a result of this approach the following sub-grid are defined:

- at most 50-meter spacing along the fence line;
- 100-meter spacing from origin out 3 km;
- 250-meter spacing from 3 km to 5 km from the facility;
- 500-meter spacing from 5 km to 10 km from the facility;
- 1000-meter spacing from 10 km to 20 km from the facility; and
- 2000-meter spacing from 20 km to 50 km from the facility, as needed.

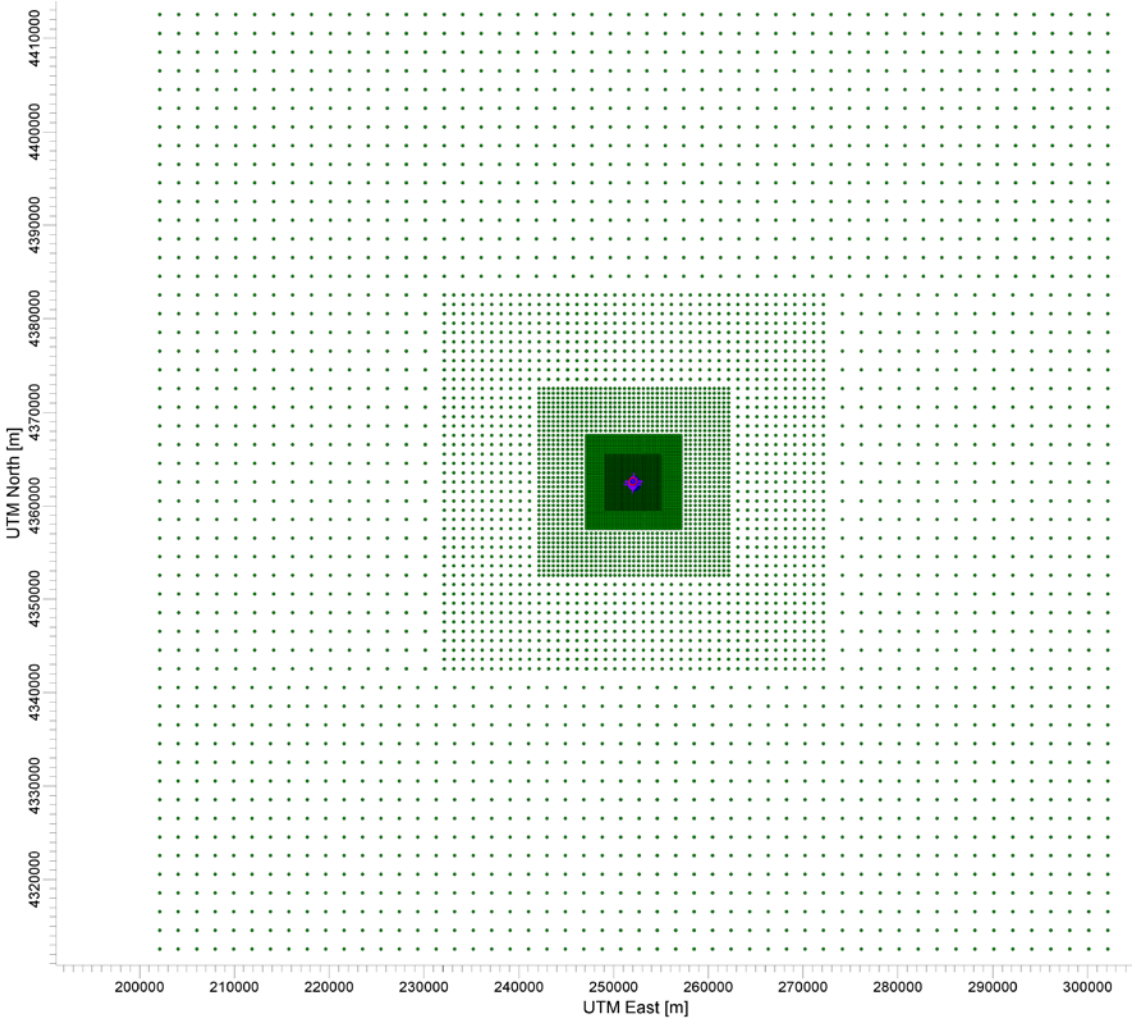
As noted previously, AERMAP was used to define ground elevations and hill scales for each receptor. Roxul analyzed isopleths of modeled concentrations due to the proposed Project, and determined if the proposed receptor grid adequately accounts for the worst case impacts. The receptor grid extent was adjusted accordingly in a manner to adequately resolve the areas with increasing ground concentration gradients. In case of isolated high impacts from the proposed Project appearing in sections of the coarse receptor grid (500-m spacing and larger), then additional 100-meter spaced sub-grids were used to better resolve the concentration patterns. This was done for the 1-hour NAAQS modeling of SO_2.

The facility fence line was used as the boundary to determine ambient air. No receptors were placed within this fence line boundary. A physical fence controls public access to the facility.

All Cartesian coordinates are in UTM system, zone 18, datum NAD-83.

[3] EPA, Workbook for Plume Visual Impact Screening and Analysis (Revised), EPA-454/R-92-023, 1992.

Figure 3-3 AERMOD Primary Receptor Grid



3.9 METEOROLOGICAL DATA FOR AIR QUALITY MODELING

EPA requires site-specific meteorological data to be included in the PSD application modeling. In absence of site-specific data, data from a representative NWS station should be used.

Roxul utilized meteorological data collected from 2012-2016 at the Eastern WV Regional Airport, Shepherd Field (KMRB) in this modeling analysis. The KMRB Automated Surface Observation System (ASOS) system is located approximately 9.8 km to the west of the Project site. Upper air data from Washington Dulles International Airport (IAD) was used in the analysis. The following steps were taken to prepare and process these data with the latest versions of EPA's processing programs:

- AERMET version 16216 was used to process the surface and upper air meteorological data;
- The ADJ_U* option was used in AERMET;
- One-minute and five-minute ASOS wind data was processed for input into AERMET through the use of the AERMINUTE version 15272 preprocessor;
- AERSURFACE was run with varying options for moisture conditions (average, wet, and dry) at seasonal temporal resolution;
- Climatological data from the National Climatic Data Center (NCDC) was used to assign the moisture and snowfall characteristics for each season of the 5-year modeling period;
- The resulting files were processed into 5 individual calendar years and one 5-year period for model input.

The ADJ_U* option addresses a known bias towards underprediction of friction velocity under stable, low wind speed conditions, leading to observed model overprediction for these conditions. ADJ_U* is a regulatory option in the default application of AERMET version 16216 for use in AERMOD. In addition, for this application no site-specific meteorological data is available. The surface data included were recorded at the Martinsburg airport NWS station and do not include turbulence observations.

AERMET processing is performed in 3 stages. Stage 1 processing reads the raw onsite, surface, and upper air files, performs data range and completeness checks, and formats data for input to Stage 2. Stage 2 reads the files prepared in Stage 1, adds the 1- and 5-minute wind observations and prepares a single merged file with all necessary inputs for Stage 3. Stage 3 carries out the boundary layer parameterizations needed to calculate turbulence parameters such as the friction velocity, convective velocity scale, Monin-Obukhov length scale, and convective and mechanical mixing depths as well as determines hourly surface characteristics (albedo, Bowen Ratio, and surface roughness length) based on the AERSURFACE outputs.

3.9.2 Summary of AERMET Location Inputs

Integrated Surface Hourly Data (ISHD) format data from KMRB was input in the AERMET "SURFACE" pathway, and FSL format upper air data was input in the AERMET "UPPERAIR" pathway. The following location data was used in AERMET:

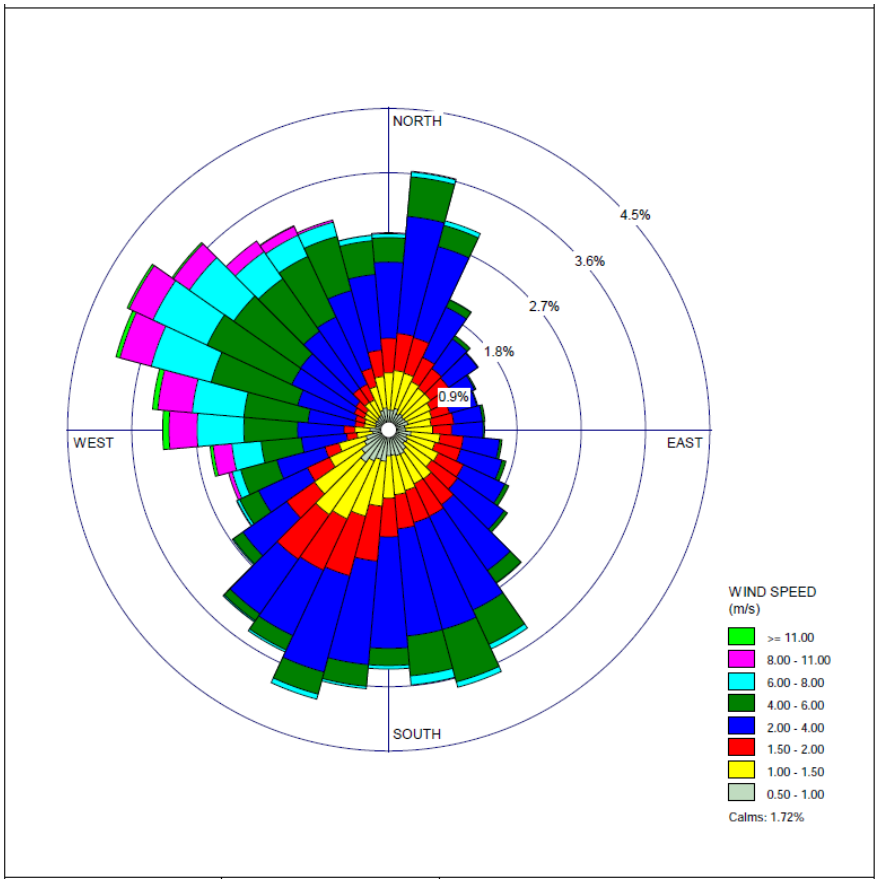
- KMRB ASOS Location: 39.402N 77.984W - specified by NCEI;
- KMRB Elevation: 162.8 m – specified in NCEI;
- IAD Upper Air Location: 38.98N 77.47W – noted in FSL file header; and
- Hourly AERMET data is processed in time zone 5.

3.9.3 Meteorological Data Representativeness

3.9.3.1 Representativeness of Wind Measurements

A wind rose for KMRB for 2012-2016 is shown in Figure 3-4.

Figure 3-4 KMRB Wind Rose – 2012-2016



The proposed Project site and KMRB are both situated in the gently rolling terrain region of the Potomac Highlands. The Project site is located approximately 10 km east of the meteorological station; both locations have similar terrain elevation: Project – 177 m, KMRB – 165 m. Both sites are situated in a the valley east of the Allegheny Mountain and west of the northern tip of Blue Ridge Mountain; therefore, it is reasonable to assume they are both exposed to the same regional wind pattern, and would not experience local steering of the wind from the dominant northwesterly and southerly direction. Roxul asserts that due to the relatively close proximity and similar terrain setting, that the KMRB winds are representative of the proposed Project site.

3.9.3.2 Representativeness of Surface Characteristics

The surface characteristics required by AERMET (surface roughness, Bowen ratio, and albedo) are required to be representative of the meteorological measurement site, as specified in the EPA's AERMOD Implementation Guidance. The AERSURFACE (Version 13016) land-use processor was used for the development of the necessary micrometeorological parameters for use in AERMET. The following is a summary of the settings that were used in AERSURFACE:

- USGS 1992 NLCD input land use data
- Center Latitude (decimal degrees): 39.402
- Center Longitude (decimal degrees): -77.984
- Datum: NAD83
- Study radius (km) for surface roughness: 1.0
- Airport? Y, Continuous snow cover? Y
- Surface moisture? **Variable**, Arid region? N
- Temporal resolution: Seasonal
- Month/Season assignments? Default
- Late autumn after frost and harvest, or winter with no snow: **0**
- Winter with continuous snow on the ground: **12 1 2**
- Transitional spring (partial green coverage, short annuals): 3 4 5
- Midsummer with lush vegetation: 6 7 8
- Autumn with unharvested cropland: 9 10 11

The variable inputs were based on climatological data compiled by NCDC. The moisture characterization and snow cover were characterized on seasonal basis based on NCDC climatological records for the airport site. AERSURFACE was executed with seasonal resolution with 12 wind direction sectors.

Additional details on the moisture and snow cover options that were used are provided in Section 3.9.4.

As noted previously, the KMRB station is located approximately 9.8 km west of the Project site. Bowen ratio and albedo are bulk variables in AERMET, that is, they are intended to be representative of the greater modeling domain as opposed to being highly site specific. AERSURFACE determines the appropriate value of Bowen ratio and albedo by considering the land-use within a 10 km by 10 km area centered on the meteorological instruments location. Table 3-11 summarizes the average values of surface roughness within 1 km of the KMRB ASOS site and the proposed Project site, as well as the Bowen ratio and albedo for both sites determined by AERSURFACE. AERSURFACE was executed on a seasonal basis for a single 360 wind direction sector for the purposes of this comparison.

Table 3-11 Comparison of Micrometeorological Variables

Season	Albedo		Bowen Ratio		Surface Roughness	
	Project	Airport	Project	Airport	Project	Airport
1	0.55	0.53	0.50	0.50	0.125	0.025
2	0.14	0.15	0.38	0.48	0.264	0.055
3	0.18	0.18	0.44	0.42	0.563	0.110
4	0.18	0.18	0.75	0.83	0.563	0.102

The NLCD 1992 land use data analyzed by AERSURFACE produce very similar average albedo and Bowen ratio values between the proposed Project and the airport site. However, the surface roughness values for the proposed site derived from AERSURFACE are notably higher than the values derived for KMRB from the NLCD 1992 land use data. Roxul conservatively used the KMRB surface roughness in the modeling.

3.9.4 AERMET Processing

AERMET (version 16216) was executed using EPA recommended settings to produce the meteorological data needed for AERMOD. The five year period from 2012-2016 was used in this analysis. The AERMET analysis included the use of both the AERMINUTE and AERSURFACE preprocessors. The AERMINUTE (version 15272) meteorological data processor was used to produce wind speed and direction data based on archived 1-minute and 5-minute ASOS data for KMRB, for input into AERMET Stage 2. A 0.5 m/s wind speed threshold was applied to the 1-minute ASOS derived wind speeds in AERMET.

In addition to the surface meteorological data from KMRB, Roxul utilized upper air data from Washington Dulles International (IAD) airport in this analysis. Upper air data is used in AERMET to determine an initial potential temperature distribution from a morning sounding. AERMET assumes the 12Z sounding is to be nearly equivalent to a morning sounding. The initial potential temperature distribution is used by AERMET to characterize the growth of the daytime convective boundary layer. It is important to use upper air data that is representative of the model application site. IAD is the closest upper air collection station to the proposed project site.

Precipitation, snow fall and temperature statistics, provided by the National Center for Environmental Information (NCEI), were used in the determination of snow cover and moisture characteristics for each season. Monthly averages for 1981-2010 period collected at the KMRB station were considered to establish the historical precipitation amounts and temperatures. The guidance suggests that the 30-year rainfall record be examined, and then precipitation of the modeling period be compared to the 30 year statistical norms. A season was considered

dry if the precipitation during a year of the modeling period is in the lower 30th percentile of the corresponding climatic norm. Similarly, average moisture is assumed for seasonal precipitation the in the range of 30th to 70th percentile, and wet moisture is assumed for the 70th percentile and greater. The proposed snow cover and moisture options for the 2012-2016 KMRB meteorological data processing are presented in Table 3-12.

Table 3-12 KMRB Snow Cover and Monthly Surface Moisture Assignments

Modeling Year	WINTER		SPRING	SUMMER	FALL
	Moisture	Continuous Snow on the ground?	Moisture	Moisture	Moisture
2012	Avg	Yes	Avg	Dry	Avg
2013	Wet	Yes	Dry	Avg	Wet
2014	Wet	Yes	Avg	Avg	Avg
2015	Dry	Yes	Avg	Dry	Dry
2016	Wet	Yes	Avg	Wet	Dry

3.10 REGIONAL INVENTORY FOR CUMULATIVE MODELING ANALYSES

As discussed in Section 3.1.3, cumulative air quality modeling analyses may be necessary if the Project's modeled impacts exceed the applicable SILs. The cumulative analyses includes representative background concentrations from regional monitors, as well as contributions from other sources in the area, "nearby sources" whose close proximity to the Project site would make their modeled impacts in relation to the modeled impacts from the proposed Project not well characterized by representative background monitor data alone.

Important considerations for identifying nearby sources to include in the cumulative modeling inventory, in a manner that does not make the assessment overly conservative or complicated, are discussed by EPA in Section 8.3 of the Guideline on Air Quality Models (40 CFR Part 51, Appendix W). Specifically, paragraph 8.3.3(b)(iii) of the Guideline provides the following language:

> *The number of nearby sources to be explicitly modeled in the air quality analysis is expected to be few except in unusual situations. In most cases, the few nearby sources will be located within 10 to 20 km from the source(s) under consideration.*

The Guideline also contains the following language to define "nearby sources" in paragraph 8.3.3 (b):

> *Nearby Sources: All sources in the vicinity of the source(s) under consideration for emissions limits that are not adequately represented by ambient monitoring data should be explicitly modeled. Since an ambient monitor is limited to*

characterizing air quality at a fixed location, sources that cause a significant concentration gradient in the vicinity of the source(s) under consideration for emissions limits are not likely to be adequately characterized by the monitored data due to the high degree of variability of the source's impact.

The maximum significant impact area (SIA, i.e., the distance defined by furthest receptor from the Project with a modeled concentration due to the Project in excess of an applicable SIL) was within 56 km for the 1-hour average and within 5 km for the larger averaging periods. Considering the above referenced language from the Guideline, Roxul has limited the cumulative inventory for all pollutants and averaging periods that exceed their respective SIL to major sources within an area of radius 25km of the proposed Project site.

Separate inventories were developed for NO_X, PM_{10}, $PM_{2.5}$, and SO_2 in conjunction with WVDAQ, if required. These inventories are included in Attachment 3. Title V permits and permit applications that are publically available were the primary basis for the development of modeled emission rates for these inventories. The stack parameters were based on the WVDAQ emission inventory and available permits and permit applications. The MDDEP and VADEQ were contacted and provided emissions inventories. No major sources for NO_x or SO_2 were located in Maryland within the radius of 25km of the proposed project site. One major sources was located in Virginia within the radius of 25km of the proposed project site and was included in the cumulative inventory.

3.11 CLASS I IMPACTS

The proposed Project is located within 300 km of three (3) federally protected Class I areas. All of these Class I areas are located generally to the east and southeast of the Project. The Class I areas and approximate distances from the Project site are as follows:

- Otter Creek Wilderness – 153 km, managed by the US Forest Service (USFS),
- Dolly Sods Wilderness – 131 km, managed by USFS, and
- Shenandoah National Park – 60 km, managed by the National Park Service (NPS).

The Federal Land Managers (FLMs) have recommended an emissions over distance screening threshold that can be used to preliminarily assess a project's significance with respect to air quality related values (AQRVs), namely visibility and deposition in Class I areas (NPS 2010). This ratio is represented by total annualized maximum 24-hour emissions of NO_X, SO_2, PM_{10}, and H_2SO_4 in tons/yr divided by distance to a Class I area in km and is referred to as the Q/D ratio. The FLM guidance suggests that projects with a Q/D ratio of less than 10 would not be expected to have significant impacts with respect to AQRVs in Class I areas. Roxul calculated Q/D ratios for the closest Class I area to be 9.4,

which is below the FLM screening level of 10 and therefore no AQRV analysis has been conducted. The submitted analysis is included in Attachment 2 of this appendix.

Roxul evaluated the project related increase of NO_2, PM_{10}, $PM_{2.5}$, and SO_2 against the Class I SILs by applying the AERMOD dispersion model at a distance of 50 km from the Project site. This proposed analysis represents the maximum spatial extent (50 km from source to receptor) for regulatory applications of AERMOD. The receptors were placed at 1° intervals on an arc that represents the angular distance of the Class I area at 50 km from the project site. The angular distance was determined based on the receptors used by the NPS to represent each Class I area for refined air quality modeling analyses[4]. The maximum modeled concentrations at the 50 km receptors are less than the Class I SILs for NO_2, and is therefore assumed that the project also had maximum potential NO_2 impacts that were less than the SILs at the more distant Class I areas.

For pollutants that the AERMOD screening evaluation exceeded Class I SILs, which included PM_{10}, $PM_{2.5}$, and SO_2, Roxul used a refined analysis with the CALPUFF model to evaluate the project impact within the park proper. As approved in the protocol submitted November 2017, chemical transformation was used with CALPUFF, namely the MESOPUFF II scheme coupled with the VISTAS meteorological data set provided by EPA. The use of the chemical transformation option accounts also for the secondary $PM_{2.5}$ formation.

4.0 MODEL RESULTS PRESENTATION

The following section summarizes the modeling analysis results using the methods discussed in Section 3.

4.1 FACILITY IMPACTS AND DETERMINATION OF SIGNIFICANT IMPACT AREAS

The facility sources were modeled according to the methods discussed in Section 3.1.2.2. Table 4-1 contains a summary of the results comparing the facility impacts to the SIL and presents the calculated SIA. The SIA for each pollutant/averaging period is determined by calculating the maximum distance to which impacts are greater than the SIL. The spatial concentration distributions of all pollutants exceeding their SIL is presented in Attachment 4.

Table 4-1 Summary of Facility Impacts and SIL/SIA Analyses

Pollutant	Averaging Period	Maximum Modeled Concentrations (µg/m³)[1]	SIL (µg/m³)	SMC (µg/m3)	SIA (km)
NO_2	1-hour	31.63	7.5	--	56.77

[4] http://www.nature.nps.gov/air/maps/receptors/

Pollutant	Averaging Period	Maximum Modeled Concentrations (µg/m³)[1]	SIL (µg/m³)	SMC (µg/m3)	SIA (km)
	Annual	1.50	1	14	0.63
PM_{10}	24-hour	23.82	5	10	1.26
	Annual	4.04	1	--	0.73
$PM_{2.5}$ (NAAQS)	24-hour	8.44	1.2	--	3.19
	Annual	1.58	0.2	--	1.9
$PM_{2.5}$ (PSDI)	24-hour	9.75	1.2	--	4.51
	Annual	1.77	0.2	--	2.06
SO_2	1-hour	26.79	7.9	--	41.22
	3-hour	17.52	25	--	N/A
	24-hour	4.57	5	13	N/A
	Annual	0.53	1	--	N/A

[1]- The 5-year maximum concentrations are reported for: 3-hr, 24-hr, and annual SO_2; annual NO_2; 24-hr and annual PM_{10}; 24-hr and annual PM2.5 for PSD increment. The 5-year average concentrations are reported for: 1-hr SO_2; 1-hr NO_2; 24-hr and annual $PM_{2.5}$ for the NAAQS comparisons. All impacts larger or equal to the SIL were considered significant

The facility had significant impacts for NO_2, PM_{10}, $PM_{2.5}$ and SO_2; thus, further comprehensive modeling analyses are required for these pollutants. NO_2 and SO_2 modeled impacts are below the SMC, therefore the project can be exempted from preconstruction monitoring for NO_2 and SO_2 based on these results. Roxul proposed the use of representative regional background data to satisfy the preconstruction monitoring for PM10, which had modeled impacts above the SMC. Justification of the representativeness of existing regional background data for use in the modeling analysis is provided in Section 3.5.3.

4.2 MULTI-SOURCE AIR QUALITY ANALYSES

Modeling analysis was carried out for the NAAQS standards using five years of meteorological data for NO_2, $PM_{2.5}$, PM_{10} and SO_2 using the methods discussed in Section 3.1.3. Modeling was also performed for NO_2, $PM_{2.5}$, and PM_{10} for PSD class II increment standards using the methods discussed in Section 3.1.3.

4.2.1 Cumulative NAAQS

Table 4-2 summarizes the results of NAAQS modeling analysis of combined facility-wide Roxul and nearby off-property sources.

Table 4-2 Cumulative Modeling Results summary (NAAQS)

Scenario	Averaging Period	Ranks	Modeled Concentration (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Contribution from Roxul Sources (µg/m³)
NO_2	1-hour	H8H	93.95	33.20	127	188	-
	Annual	H1H	2.5	9.40	12	100	-
$PM_{2.5}$	24-hour	H8H	8.53	14.3	23	35	-
	Annual	H1H	1.79	5.7	7	12	-
PM_{10}	24-hour	H6H	31.77	24	56	150	-
SO2	1-hour	H4H	204.66	39.5	244	196	<= 0.00008

The results displayed demonstrate compliance with all applicable NAAQS, with the exception of 1-hour SO_2. For 1-hour SO_2, the model predicts potential NAAQS violations, to which Roxul did not significantly contribute. The maximum contribution made from Roxul sources to a modeled violation of the 1-hour SO_2 NAAQS was 0.00008 µg/m³, less than the 1-hour SO_2 SIL of 7.9 µg/m³. Therefore, Roxul's model predicted impacts are less than the SIL at all receptors showing a modeled violation at the same time.

The SO_2 1-hour culpability analysis to establish the Roxul contribution to the potential violation on the combined grid is provided in Attachment 5; this includes the model generated MAXDICONT files and spreadsheets summarizing the modeling results. In the culpability analysis, the source's contributions were considered up to the 20th high. The model predicted exceedances of the NAAQS were observed up to the 10th high.

For the NAAQS modeling, additional 100 m spaced receptors were placed around high impacts (within 90% of the standard) located in the >500m coarse grid. Such refined receptors grids were developed when applicable for the 1-hour averaging times for SO_2. No other pollutants/averaging times had high impacts within 90% of the standard in the coarse grid area. The procedure insures that the Roxul's insignificant contributions to any potential NAAQS violations are resolved adequately.

4.2.2 Cumulative Class II PSD Increment

Table 4-3 summarizes the class II PSD increment modeling analysis results. The results demonstrate that all on-site sources and off-site source with PSD increment consuming emissions have impacts below the class II PSD increment standards.

Table 4-3 PSD Increment Results

Scenario	Averaging Period	Ranks	Modeled Concentrations (μg/m³)	Allowable Increment (μg/m³)	% of Allowable Increment
NO2	Annual	H1H	1.5	25	6.1%
PM2.5	24-hour	H2H	8.7	9	96.9%
	Annual	H1H	1.8	4	45.1%
PM10	24-hour	H2H	21.5	30	71.5%
	Annual	H1H	4.1	17	24.1%

4.3 CLASS I ANALYSES

After screening all applicable pollutants/averaging time impacts at 50km using Aermod the pollutants $PM_{2.5}$, PM_{10}, and SO_2 all had impacts evaluated with refined modeling using CALPUFF with chemical transformation MESOPUFF II scheme, coupled with the VISTAS meteorological data set. The results are summarized in Table 4-4. All refined modeled impacts were below the Class I SIL, no further CLASS I evaluations are necessary.

Table 4-4 Class I SIL Analyses

Pollutant	Averaging Period	Aermod Maximum Modeled Concentrations (μg/m³)	CALPUFF Maximum Modeled Concentrations (μg/m³)	Class 1 SIL (μg/m³)
$PM_{2.5}$	24-hr	**0.376**	0.0962	0.27
	Annual	0.020	-	0.05
PM_{10}	24-hr	**0.418**	0.0961	0.32
	Annual	0.025	-	0.16
NO_2	Annual	0.038	-	0.10
SO_2	3-hr	**17.52**	0.5198	1.00
	24-hr	**4.573**	0.108	0.20
	Annual	0.028	-	0.08

4.4 ADDITIONAL IMPACT ANALYSES

4.4.1 1-Hour NAAQS Sensitivity Analyses

An additional analysis was performed for the 1-hour NO_2 and SO_2 NAAQS standards as support for the proposed 30-day average emission limits for

Melting Furnace source IMF01. To demonstrate that a 30-day average emission limit is protective of the short term NAAQS at this facility, the emission rates from IMF01 were incrementally increased and assessed in cumulative NAAQS modeling.

Operation of IMF01 presents opportunity to realize greater short-term emission rates due to changes to the melt feed-rate, operational upsets, and other process related variables. Because Roxul understands that these short-term increases to emission rates can and will occur, they have elected to conduct this sensitivity analysis by modeling various increased emission rates against the 1-hr NO_2 and SO_2 NAAQS standards.

NO_2 modeling was conducted with source IMF01 emissions as calculated (baseline), and scaled up by 25%, 50%, and 75% of the calculated emission rate. SO_2 emissions from source IMF01 were modeled as calculated (baseline) and with increases of 10%, 20%, and 30%. These rates were selected as a reasonable range based on knowledge of the process operations.

The results of this demonstration are summarized in Table 4-5. Varying the emission rates of source IMF01 did not change the modeled impact reported or the highest contribution from Roxul sources to an exceedance. These results support that a 30-day average emission limit on emission source IMF01 would be protective of the 1-hour NAAQS.

Table 4-5 Summary of NAAQS 1-Hour Sensitivity Analyses

Scenario	Averaging Period	Emission Rate Factor	Modeled Concentrations (µg/m³)	Background Concentrations (µg/m³)	Total Concentrations (µg/m³)	NAAQS (µg/m³)	Contribution from Roxul Sources (µg/m³)
NO_2	1-hour	Baseline	93.95	33.20	127	188	-
	1-hour	25% Increase	93.95	33.20	127	188	-
	1-hour	50% Increase	93.95	33.20	127	188	-
	1-hour	75% Increase	93.95	33.20	127	188	-
SO2	1-hour	Baseline	204.66	39.50	244	196	<= 0.00008
	1-hour	10% Increase	204.66	39.50	244	196	<= 0.00008
	1-hour	20% Increase	204.66	39.50	244	196	<= 0.00008
	1-hour	30% Increase	204.66	39.50	244	196	<= 0.00008

4.4.2 Evaluation of Effects on Growth, Soils, Vegetation, and Visibility

Potential facility impacts are not likely to be significant based on comparison of the modeled emissions to the AQRVs and the NAAQS Secondary standards. The results of this evaluation are shown in Table 4-6.

Table 4-6 Summary of Applicable AQRVs and AAQS Comparison

Pollutant	Averaging Periods	Screening Levels (ug/m3)	Secondary NAAQS (ug/m3)	Model Predicted Concentrations ($\mu g/m^3$)	Notes
PM_{10}	24-hour	-	150	56	1
	Annual	-	50	10	2
$PM_{2.5}$	24-hour	-	35	23	3
	Annual	-	15	7	4
NO_2	4-hour	3,760	-	172	5
	8-hour	3,760	-	172	5
	1-month	564	-	172	5
	Annual	100	100	12	6
SO2	1-hour	917	--	228	7
	3-hour	786	1,300	228	7
	24-hour	--	260	228	7
	Annual	18	60	4	8

1 Based on high-second high PM10 24 Hour NAAQS Model Impacts, including PM10 24 hour ambient background monitor design value.
2 Based on high-first high PM10 annual PSD increment model impact + annual average PM2.5 ambient background monitor design value.
3 High-second-high PM2.5 24-hour NAAQS model impacts, including PM2.5 24-hour ambient background monitor design value.
3 High-first-high PM2.5 annual NAAQS model impacts, including PM2.5 annual ambient background monitor design value.
5 High-eight-high; 1-hour NAAQS modeled impacts; ARM2 NO2 to NOX conversion; added 1-hour NO_2 ambient background design value
6 High-first-high; Annual NAAQS modeled impacts; ARM2 NO2 to NOX conversion; added annual NO_2 ambient background design value
7 High-fourth-high; 1-hour NAAQS modeled impacts; added 1-hour SO2 ambient background design value
8 High-first-high; Annual SIL modeled impacts; added annual SO2 ambient background design value

5.0 SUMMARY AND CONCLUSIONS

A detailed air quality impact assessment was performed for the proposed Roxul facility in Jefferson County, West Virginia. The maximum annual pollutant emissions from the facility exceed the PSD significant emissions thresholds for NO_x, SO_2, VOC, PM, PM_{10}, $PM_{2.5}$, H_2SO_4 Mist, and CO_2e. Since the plant is located in an attainment area for all the criteria pollutants listed here, these pollutants are subject to PSD review. This report addresses the ambient air quality impact analysis to support the PSD permit application for any pollutant that has an applicable ambient standard (PSD increment, NAAQS, or SMC).

The ambient air quality impact assessment was based on the AERMOD and CALPUFF dispersion models. Impact analyses were conducted for NO_x, PM_{10}, $PM_{2.5,}$ and SO_2 with 5 years (2012-2016) of hourly processed data based on surface observations from EMV Regional Airport in West Virginia and upper air observations from Dulles Airport in Maryland. The plant's significant impact areas were derived from the 5-year modeling analysis. The plant had significant impacts for NO_2, PM_{10}, $PM_{2.5}$ and SO_2; thus, comprehensive modeling analyses were performed for these pollutants with other major emission sources to assess compliance with the applicable PSD increments and NAAQS. Dispersion modeling analyses showed compliance with the PSD increments and NAAQS for NO_2, PM_{10}, $PM_{2.5}$ and SO_2, with the exception of the 1-hour standard for SO_2. Analysis of the contribution of Roxul emissions to predicted violations of the 1-hour SO_2 standard revealed that Roxul does not contribute significantly to the violations. A Class I SIL analysis was performed with Aermod and the CALPUFF air modeling system that demonstrated insignificant impacts in Class I areas.

Finally, Roxul established that there is sufficient existing, representative air quality data to exempt the facility from one year of preconstruction monitoring for impacts exceeding the SMC. This analysis utilizes representative monitoring data in lieu of preconstruction monitoring as previously approved in the Modeling Protocol submitted November 2017.

6.0 REFERENCES

U.S. Environmental Protection Agency. (EPA 2016) AERMOD Implementation Guide, AERMOD Implementation Workgroup. December 2016.

National Park Service. (NPS 2010) Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase I Report - Revised (2010). Natural Resource Report NPS/NRPC/NRR – 2010/232

U.S. Environmental Protection Agency. (EPA 2011) EPA memo entitled "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO2 National Ambient Air Quality Standard", EPA, Office of Air Quality Planning and Standards, Raleigh, NC. March 1, 2011.

U.S. Environmental Protection Agency. (EPA 2013) AERSURFACE User's Guide, Office of Air Quality Planning and Standards, Raleigh, NC. January 2008, Revised 01/16/2013.

U.S. Environmental Protection Agency. (EPA 2014) Guidance for $PM_{2.5}$ Permit Modeling, Office of Air Quality Planning and Standards, Raleigh, NC. March 20, 2014.

U.S. Environmental Protection Agency. (EPA 2014a) EPA memo entitled "Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO2 National Ambient Air Quality Standard", EPA, Office of Air Quality Planning and Standards, Raleigh, NC. September 30, 2014.

U.S. Environmental Protection Agency. (EPA 2015a) Technical Support Document (TSD) for NO2-related AERMOD Modifications, EPA, Office of Air Quality Planning and Standards, Raleigh, NC. July 2015, EPA-454/B-15-004.

U.S. Environmental Protection Agency. (EPA 2016a) EPA memo entitled "Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM2.5 under the PSD Permitting Program", EPA, Office of Air Quality Planning and Standards, Raleigh, NC. December 2, 2016.

U.S. Environmental Protection Agency. (EPA 2017) Appendix W to 40 CFR 51, Published January 17, 2017 Federal Register Volume 82 No. 10, Revisions to the Guideline on Air Quality Models: Enhancements to the AERMOD Dispersion Modeling System and Incorporation of Approaches to Address Ozone and Fine Particulate Matter; Final Rule.

Attachment 1
Roxul Modeled Source Parameters and Emission Rates

Attachment 1

Table A1-1 Roxul Modeled Source Parameters

Source ID	Description	Source Type	X Coord. [m]	Y Coord. [m]	Base Elevation [m]	Release Height [m]	Gas Exit Temperature [K]	Gas Exit Velocity [m/s]	Inside Diameter [m]
IMF11	Conveyor Transition Point (B215 to B220)	Point	252100.4	4362712	177.18	5	293	21.1	0.18
IMF12	Conveyor Transition Point (B210 to B220)	Point	252096.1	4362712	177.18	15	293	21.1	0.18
IMF14	Conveyor Transition Point (B220 No. 1)	Point	252060.1	4362679	177.18	15	293	21.1	0.18
IMF15	Conveyor Transition Point (B220 No. 2)	Point	252094.8	4362677	177.18	8	293	21.1	0.18
IMF16	Conveyor Transition Point (B220 to B300)	Point	252084.7	4362658	177.18	24	293	21.1	0.18
IMF17	Charging Material Handling Building Vent 1	Point	252081.9	4362687	177.18	26.88	293	0.001	0.25
IMF18	Charging Material Handling Building Vent 2	Point	252055.3	4362688	177.18	18	293	0.001	0.25
IMF21	Charging Building Vacuum Cleaning Filter	Point	252073.3	4362678	177.18	3	313	9	0.15
IMF03	Three (3) Coal Storage Silos	Point	252153.8	4362601	177.18	22	293	2.85	0.4
IMF25	Coal Feed Tank	Point	252083.2	4362624	177.18	22	293	20.25	0.15
IMF24	Pre-heat Burner	Point	252086.8	4362618	177.18	37	330	15.01	0.35
IMF01	Melting Furnace	Point	252093.5	4362645	177	65	423	20.59	0.95
IMF07	Two (2) Storage Silos	Point	252100.7	4362629	177.18	22	293	2.97	0.4
IMF10	Filter Fines Recieving Silo	Point	252108.2	4362608	177.18	22	293	2.85	0.4
IMF08	Sorbent Silo	Point	252108	4362603	177.18	22	293	2.85	0.4
IMF09	Spent Sorbent Silo	Point	252107.7	4362598	177.18	22	293	2.85	0.4
IMF02	Melting Furnace Cooling Tower	Point	252090.7	4362611	177.18	25	293.15	0.001	0.4
HE02	Gutter Cooling Tower	Point	252073.1	4362661	177.18	25	293.15	0.001	0.4
HE01	WESP	Point	252120.6	4362546	176.38	65	313	15.21	3.95
CE01	De-dusting Baghouse	Point	252076.2	4362535	177.18	35	313	21.47	1.15
CE02	Vacuum Cleaning Baghouse	Point	252061.9	4362515	177.18	30	313	16.56	0.7
CM10	Recycle Plant Building Vent 1	Point	252095.1	4362573	177.18	15	313	12.17	1
CM11	Recycle Plant Building Vent 2	Point	252069.2	4362574	177.18	15	313	12.17	1
CM08	Recycle Plant Building Vent 3	Point	252095.2	4362557	177.18	15	313	16.23	0.25
CM09	Recycle Plant Building Vent 4	Point	252098.3	4362586	177.18	15	313	16.23	0.25
RFNE1	IR Zone	Point	252016	4362291	177.18	13	328	12.85	0.32
RFNE2	Hot Press and Cure	Point	252016.9	4362332	177.18	13	313	12.27	0.32
RFNE3	High Oven A	Point	251985.3	4362307	177.18	12	373	15.47	0.5
RFNE9	High Oven B	Point	251981.6	4362202	177.18	12	373	15.47	0.5
RFNE4	Drying Oven 1	Point	251966.8	4362292	177.18	12	433	11.22	0.5

Attachment 1

Table A1-1 Roxul Modeled Source Parameters (Continued)

Source ID	Description	Source Type	X Coord. [m]	Y Coord. [m]	Base Elevation [m]	Release Height [m]	Gas Exit Temperature [K]	Gas Exit Velocity [m/s]	Inside Diameter [m]
RFNE6	Drying Oven 2 & 3	Point	251964.6	4362250	177.18	15	433	10.52	0.8
RFNE5	Spray Paint Cabin	Point	251965.6	4362269	177.18	33	313	16.23	0.5
RFNE7	Cooling Zone	Point	251978.5	4362280	177.18	14	313	15.85	0.8
RFNE8	De-dusting Baghouse	Point	252039.9	4362259	177.18	30	313	19.64	1.56
CM03	Natural Gas Boiler 1	Point	252062.7	4362638	177.18	15	330	15.01	0.35
CM04	Natural Gas Boiler 2	Point	252055.5	4362639	177.18	15	330	15.01	0.35
RFN10	RFN Building Heat	Point	251989.3	4362356	177.18	15	330	15.01	0.35
EFP1	Emergency Fire Pump Engine	Point	252183.5	4362590	177.18	7.2	478	48.27	0.12
IMF05	Coal Mill Burner & Baghouse	Point	252166.7	4362612	177.18	20	355.37	20.45	0.32
IMF06	Coal Milling De-Dusting Baghouse	Point	252166.7	4362613	177.18	20	293	19.62	0.44
IMF04	Coal Conveyor Transition Point (B231 to B235)	Point	252180.1	4362656	177.18	12	293	18.94	0.19
IMF13	Coal Conveyor Transition Point (B231 to B235)	Point	252181.5	4362668	177.18	2	293	18.94	0.19

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Table A1-1 Roxul Modeled Source Parameters (Continued)

Source ID	Description	Source Type	X Coord. [m]	Y Coord. [m]	Base Elevation [m]	Release Height [m]	Side Length [m]	Initial Lateral Dimension	Initial Vertical Dimension
B210	Raw Material Storage (B210)	Volume	252121.4	4362704	177.18	3.05	27.219	6.33	1.42
B215	Raw Material Loading Hopper (B215)	Volume	252100.3	4362711	177.18	3.05	2.365	0.55	0.71
RM_REJ	Raw Material Reject Collection Bin	Volume	252052	4362680	177.18	0.9	2.322	0.54	0.84
S_REJ	Sieve Reject Collection Bin	Volume	252084.1	4362690	177.18	0.9	2.322	0.54	0.84
P_MARK	Product Marking	Volume	252044.9	4362492	177.18	3.05	9.159	2.13	1.42
RMS	Raw Material Outdoor Stockpile	Volume	251995.1	4362700	177.18	2.4	22.36	5.2	1.12
B170	Melting Furnace Portable Crusher & St	Volume	252052.1	4362733	177.18	2.4	42.441	9.87	2.23
B231	Coal Loading Hopper	Volume	252181.5	4362668	177.18	3.05	4.171	0.97	0.71
B235	Coal Milling Building	Volume	252167.8	4362632	177.18	6	28.982	6.74	5.58
B230	Coal Unloading	Volume	252164.8	4362654	177.18	3.05	13.889	3.23	1.42
RD_RM1	Raw Material Paved Haul Road	Volume	252321.1	4362561	177.18	2.55	31.992	7.44	2.37
RD_RM2	Raw Material Paved Haul Road	Volume	252289.2	4362561	177.18	2.55	31.992	7.44	2.37
RD_RM3	Raw Material Paved Haul Road	Volume	252257.5	4362559	177.18	2.55	31.992	7.44	2.37
RD_RM4	Raw Material Paved Haul Road	Volume	252225.6	4362560	177.18	2.55	31.992	7.44	2.37
RD_RM5	Raw Material Paved Haul Road	Volume	252193.6	4362561	177.18	2.55	31.992	7.44	2.37
RD_RM6	Raw Material Paved Haul Road	Volume	252161.6	4362563	177.18	2.55	31.992	7.44	2.37
RD_RM7	Raw Material Paved Haul Road	Volume	252135.9	4362569	177.18	2.55	31.992	7.44	2.37
RD_RM8	Raw Material Paved Haul Road	Volume	252141.2	4362600	177.18	2.55	31.992	7.44	2.37
RD_RM9	Raw Material Paved Haul Road	Volume	252143.7	4362631	177.18	2.55	31.992	7.44	2.37
RD_RM10	Raw Material Paved Haul Road	Volume	252148.2	4362664	177.18	2.55	31.992	7.44	2.37
RD_RM11	Raw Material Paved Haul Road	Volume	252149.5	4362695	177.18	2.55	31.992	7.44	2.37
RD_RM12	Raw Material Paved Haul Road	Volume	252150.3	4362725	177.18	2.55	31.992	7.44	2.37
RD_RM13	Raw Material Paved Haul Road	Volume	252158.6	4362744	177.18	2.55	31.992	7.44	2.37
RD_RM14	Raw Material Paved Haul Road	Volume	252190.5	4362742	177.18	2.55	31.992	7.44	2.37
RD_RM15	Raw Material Paved Haul Road	Volume	252211.2	4362719	177.18	2.55	31.992	7.44	2.37
RD_RM16	Raw Material Paved Haul Road	Volume	252211.2	4362688	177.18	2.55	31.992	7.44	2.37
RD_RM17	Raw Material Paved Haul Road	Volume	252209.6	4362656	177.18	2.55	31.992	7.44	2.37
RD_RM18	Raw Material Paved Haul Road	Volume	252208	4362624	177.18	2.55	31.992	7.44	2.37
RD_RM19	Raw Material Paved Haul Road	Volume	252208.3	4362592	177.18	2.55	31.992	7.44	2.37

Attachment 1

Table A1-1 Roxul Modeled Source Parameters (Continued)

Source ID	Description	Source Type	X Coord. [m]	Y Coord. [m]	Base Elevation [m]	Release Height [m]	Side Length [m]	Initial Lateral Dimension	Initial Vertical Dimension
RD_RM20	Raw Material Paved Haul Road	Volume	252229.9	4362571	177.18	2.55	31.992	7.44	2.37
RD_RM21	Raw Material Paved Haul Road	Volume	252125.8	4362746	177.18	2.55	31.992	7.44	2.37
RD_RM22	Raw Material Paved Haul Road	Volume	252093.6	4362748	177.18	2.55	31.992	7.44	2.37
RD_RM23	Raw Material Paved Haul Road	Volume	252074.6	4362702	177.18	2.55	31.992	7.44	2.37
RD_RM24	Raw Material Paved Haul Road	Volume	252043.5	4362703	177.18	2.55	31.992	7.44	2.37
RD_RM25	Raw Material Paved Haul Road	Volume	252012.9	4362704	177.18	2.55	31.992	7.44	2.37
RD_RM26	Raw Material Paved Haul Road	Volume	252076.2	4362733	177.18	2.55	31.992	7.44	2.37
RD_RM27	Raw Material Paved Haul Road	Volume	252120.6	4362695	177.18	2.55	31.992	7.44	2.37
RD_RM28	Raw Material Paved Haul Road	Volume	252113.5	4362629	177.18	2.55	31.992	7.44	2.37
RD_RM29	Raw Material Paved Haul Road	Volume	252105.5	4362708	177.18	2.55	31.992	7.44	2.37
RD_RM30	Raw Material Paved Haul Road	Volume	252011.1	4362687	177.18	2.55	31.992	7.44	2.37
RD_RM31	Raw Material Paved Haul Road	Volume	252332	4362561	177.18	2.55	31.992	7.44	2.37
RD_FP1	Finished Product Paved Haul Road	Volume	252285.2	4362055	177.18	2.55	31.992	7.44	2.37
RD_FP2	Finished Product Paved Haul Road	Volume	252253.2	4362056	177.18	2.55	31.992	7.44	2.37
RD_FP3	Finished Product Paved Haul Road	Volume	252228	4362074	177.18	2.55	31.992	7.44	2.37
RD_FP4	Finished Product Paved Haul Road	Volume	252222.5	4362104	177.18	2.55	31.992	7.44	2.37
RD_FP5	Finished Product Paved Haul Road	Volume	252223	4362136	177.18	2.55	31.992	7.44	2.37
RD_FP6	Finished Product Paved Haul Road	Volume	252225.8	4362166	177.18	2.55	31.992	7.44	2.37
RD_FP7	Finished Product Paved Haul Road	Volume	252256.1	4362172	177.18	2.55	31.992	7.44	2.37
RD_FP8	Finished Product Paved Haul Road	Volume	252274	4362196	177.18	2.55	31.992	7.44	2.37
RD_FP9	Finished Product Paved Haul Road	Volume	252275.4	4362228	177.18	2.55	31.992	7.44	2.37
RD_FP10	Finished Product Paved Haul Road	Volume	252276.7	4362260	177.18	2.55	31.992	7.44	2.37
RD_FP11	Finished Product Paved Haul Road	Volume	252278	4362292	177.18	2.55	31.992	7.44	2.37
RD_FP12	Finished Product Paved Haul Road	Volume	252279.3	4362324	177.18	2.55	31.992	7.44	2.37
RD_FP13	Finished Product Paved Haul Road	Volume	252269.9	4362354	177.18	2.55	31.992	7.44	2.37
RD_FP14	Finished Product Paved Haul Road	Volume	252238.9	4362361	177.18	2.55	31.992	7.44	2.37
RD_FP15	Finished Product Paved Haul Road	Volume	252206.9	4362362	177.18	2.55	31.992	7.44	2.37
RD_FP16	Finished Product Paved Haul Road	Volume	252176.7	4362356	177.18	2.55	31.992	7.44	2.37
RD_FP17	Finished Product Paved Haul Road	Volume	252156.3	4362338	177.18	2.55	31.992	7.44	2.37

Attachment 1

Table A1-1 Roxul Modeled Source Parameters (Continued)

Source ID	Description	Source Type	X Coord. [m]	Y Coord. [m]	Base Elevation [m]	Release Height [m]	Side Length [m]	Initial Lateral Dimension	Initial Vertical Dimension
RD_FP18	Finished Product Paved Haul Road	Volume	252156	4362306	177.18	2.55	31.992	7.44	2.37
RD_FP19	Finished Product Paved Haul Road	Volume	252152.6	4362274	177.18	2.55	31.992	7.44	2.37
RD_FP20	Finished Product Paved Haul Road	Volume	252143.6	4362246	177.18	2.55	31.992	7.44	2.37
RD_FP21	Finished Product Paved Haul Road	Volume	252111.6	4362248	177.18	2.55	31.992	7.44	2.37
RD_FP22	Finished Product Paved Haul Road	Volume	252079.7	4362249	177.18	2.55	31.992	7.44	2.37
RD_FP23	Finished Product Paved Haul Road	Volume	252047.8	4362250	177.18	2.55	31.992	7.44	2.37
RD_FP24	Finished Product Paved Haul Road	Volume	252033	4362228	177.18	2.55	31.992	7.44	2.37
RD_FP25	Finished Product Paved Haul Road	Volume	252056.5	4362216	177.18	2.55	31.992	7.44	2.37
RD_FP26	Finished Product Paved Haul Road	Volume	252088.5	4362215	177.18	2.55	31.992	7.44	2.37
RD_FP27	Finished Product Paved Haul Road	Volume	252120.5	4362215	177.18	2.55	31.992	7.44	2.37
RD_FP28	Finished Product Paved Haul Road	Volume	252152.5	4362214	177.18	2.55	31.992	7.44	2.37
RD_FP29	Finished Product Paved Haul Road	Volume	252158.8	4362184	177.18	2.55	31.992	7.44	2.37
RD_FP30	Finished Product Paved Haul Road	Volume	252180.9	4362161	177.18	2.55	31.992	7.44	2.37
RD_FP31	Finished Product Paved Haul Road	Volume	252212.3	4362157	177.18	2.55	31.992	7.44	2.37
RD_FP32	Finished Product Paved Haul Road	Volume	252214.5	4362127	177.18	2.55	31.992	7.44	2.37
RD_FP33	Finished Product Paved Haul Road	Volume	252214.5	4362095	177.18	2.55	31.992	7.44	2.37
RD_FP34	Finished Product Paved Haul Road	Volume	252224.7	4362068	177.18	2.55	31.992	7.44	2.37
RD_FP35	Finished Product Paved Haul Road	Volume	252305.2	4362055	177.18	2.55	31.992	7.44	2.37
RD_CM	FEL - Coal/PET Coke from Bunker to Feed Hopper (for Milling)	Volume	252173	4362661	177.18	2.55	31.992	7.44	2.37

Attachment 1

Table A1-2 Roxul Modeled Source Emission Rates

Source ID	Description	NO_2		SO_2		CO	PM_{10}		$PM_{2.5}$	
		1-Hour (g/s)	Annual (g/s)	1-Hour (g/s)	3HR-24HR-Annual (g/s)	1-HR-8-HR (g/s)	24-Hour (g/s)	Annual (g/s)	24-Hour (g/s)	Annual (g/s)
IMF11	Conveyor Transition Point (B215 to B220)	-	-	-	-	-	2.50E-03	2.50E-03	1.25E-03	1.25E-03
IMF12	Conveyor Transition Point (B210 to B220)	-	-	-	-	-	2.50E-03	2.50E-03	1.25E-03	1.25E-03
IMF14	Conveyor Transition Point (B220 No. 1)	-	-	-	-	-	2.50E-03	2.50E-03	1.25E-03	1.25E-03
IMF15	Conveyor Transition Point (B220 No. 2)	-	-	-	-	-	2.50E-03	2.50E-03	1.25E-03	1.25E-03
IMF16	Conveyor Transition Point (B220 to B300)	-	-	-	-	-	2.50E-03	2.50E-03	1.25E-03	1.25E-03
IMF17	Charging Material Handling Building Vent 1	-	-	-	-	-	2.43E-03	2.43E-03	1.22E-03	1.22E-03
IMF18	Charging Material Handling Building Vent 2	-	-	-	-	-	2.43E-03	2.43E-03	1.22E-03	1.22E-03
IMF21	Charging Building Vacuum Cleaning Filter	-	-	-	-	-	6.94E-04	6.94E-04	3.47E-04	3.47E-04
IMF03	Three (3) Coal Storage Silos	-	-	-	-	-	5.00E-03	5.00E-03	2.50E-03	2.50E-03
IMF25	Coal Feed Tank	-	-	-	-	-	1.67E-03	1.67E-03	8.33E-04	8.33E-04
IMF24	Pre-heat Burner	4.56E-02	4.56E-02	3.77E-04	3.77E-04	5.28E-02	4.78E-03	4.78E-03	4.78E-03	4.78E-03
IMF01	Melting Furnace	4.71E+00	4.71E+00	4.24E+00	4.24E+00	1.41E+00	1.04E+00	1.04E+00	9.42E-01	9.42E-01
IMF07	Two (2) Storage Silos	-	-	-	-	-	3.47E-03	3.47E-03	1.74E-03	1.74E-03
IMF10	Filter Fines Recieving Silo	-	-	-	-	-	1.67E-03	1.67E-03	8.33E-04	8.33E-04
IMF08	Sorbent Silo	-	-	-	-	-	1.67E-03	1.67E-03	8.33E-04	8.33E-04
IMF09	Spent Sorbent Silo	-	-	-	-	-	1.67E-03	1.67E-03	8.33E-04	8.33E-04
IMF02	Melting Furnace Cooling Tower	-	-	-	-	-	1.25E-03	1.25E-03	6.25E-04	6.25E-04
HE02	Gutter Cooling Tower	-	-	-	-	-	2.91E-04	2.91E-04	1.46E-04	1.46E-04
HE01	WESP	1.83E+00	1.83E+00	1.36E-03	1.36E-03	2.29E-01	2.67E+00	2.67E+00	2.42E+00	2.42E+00
CE01	De-dusting Baghouse	-	-	-	-	-	9.72E-02	9.72E-02	9.72E-02	9.72E-02
CE02	Vacuum Cleaning Baghouse	-	-	-	-	-	2.78E-02	2.78E-02	2.78E-02	2.78E-02
CM10	Recycle Plant Building Vent 1	-	-	-	-	-	8.33E-02	8.33E-02	4.17E-02	4.17E-02
CM11	Recycle Plant Building Vent 2	-	-	-	-	-	8.33E-02	8.33E-02	4.17E-02	4.17E-02
CM08	Recycle Plant Building Vent 3	-	-	-	-	-	6.94E-03	6.94E-03	3.47E-03	3.47E-03
CM09	Recycle Plant Building Vent 4	-	-	-	-	-	6.94E-03	6.94E-03	3.47E-03	3.47E-03
RFNE1	IR Zone	-	-	-	-	-	2.33E-03	2.33E-03	1.75E-03	1.75E-03
RFNE2	Hot Press and Cure	-	-	-	-	-	2.33E-03	2.33E-03	1.75E-03	1.75E-03
RFNE3	High Oven A	3.35E-02	3.35E-02	2.01E-04	2.01E-04	2.82E-02	1.47E-02	1.47E-02	1.10E-02	1.10E-02
RFNE9	High Oven B	3.35E-02	3.35E-02	2.01E-04	2.01E-04	2.82E-02	1.47E-02	1.47E-02	1.10E-02	1.10E-02
RFNE4	Drying Oven 1	2.51E-02	2.51E-02	1.51E-04	1.51E-04	2.11E-02	1.03E-02	1.03E-02	7.71E-03	7.71E-03
RFNE6	Drying Oven 2 & 3	5.87E-02	5.87E-02	3.52E-04	3.52E-04	4.93E-02	1.59E-02	1.59E-02	1.19E-02	1.19E-02

Attachment 1

Table A1-2 Roxul Modeled Source Emission Rates

Source ID	Description	NO_2		SO_2		CO	PM_{10}		$PM_{2.5}$	
		1-Hour (g/s)	Annual (g/s)	1-Hour (g/s)	3HR-24HR-Annual (g/s)	1-HR-8-HR (g/s)	24-Hour (g/s)	Annual (g/s)	24-Hour (g/s)	Annual (g/s)
RFNE5	Spray Paint Cabin	-	-	-	-	-	1.11E-01	1.11E-01	8.33E-02	8.33E-02
RFNE7	Cooling Zone	-	-	-	-	-	2.43E-02	2.43E-02	1.82E-02	1.82E-02
RFNE8	De-dusting Baghouse	-	-	-	-	-	4.29E-02	4.29E-02	2.14E-02	2.14E-02
CM03	Natural Gas Boiler 1	2.28E-02	2.28E-02	3.77E-04	3.77E-04	5.28E-02	4.78E-03	4.78E-03	4.78E-03	4.78E-03
CM04	Natural Gas Boiler 2	2.28E-02	2.28E-02	3.77E-04	3.77E-04	5.28E-02	4.78E-03	4.78E-03	4.78E-03	4.78E-03
RFN10	RFN Building Heat	2.28E-02	2.28E-02	3.77E-04	3.77E-04	5.28E-02	4.78E-03	4.78E-03	4.78E-03	4.78E-03
EFP1	Emergency Fire Pump Engine	intermitter	9.32E-03	intermitter	4.50E-05	7.14E-02	1.98E-04	5.42E-04	1.98E-04	5.42E-04
IMF05	Coal Mill Burner & Baghouse	5.34E-02	5.34E-02	4.42E-04	4.42E-04	6.19E-02	3.99E-02	3.99E-02	3.22E-02	3.22E-02
IMF06	Coal Milling De-Dusting Baghouse	-	-	-	-	-	2.78E-02	2.78E-02	1.39E-02	1.39E-02
IMF04	Coal Conveyor Transition Point (B231 to B235)	-	-	-	-	-	2.50E-03	2.50E-03	1.25E-03	1.25E-03
IMF13	Coal Conveyor Transition Point (B231 to B235)	-	-	-	-	-	2.50E-03	2.50E-03	1.25E-03	1.25E-03
B210	Raw Material Storage (B210)	-	-	-	-	-	4.88E-03	3.83E-03	7.38E-04	5.79E-04
B215	Raw Material Loading Hopper (B215)	-	-	-	-	-	7.65E-04	7.65E-04	1.16E-04	1.16E-04
RM_REJ	Raw Material Reject Collection Bin	-	-	-	-	-	7.50E-06	1.53E-05	1.14E-06	2.32E-06
S_REJ	Sieve Reject Collection Bin	-	-	-	-	-	7.50E-06	1.53E-05	1.14E-06	2.32E-06
P_MARK	Product Marking	4.91E-03	4.91E-03	2.95E-05	2.95E-05	4.13E-03	3.73E-04	3.73E-04	3.73E-04	3.73E-04
RMS	Raw Material Outdoor Stockpile	-	-	-	-	-	3.29E-03	1.43E-03	5.09E-04	2.26E-04
B170	Melting Furnace Portable Crusher & Storage	-	-	-	-	-	3.20E-02	7.80E-03	9.00E-03	1.73E-03
B231	Coal Loading Hopper	-	-	-	-	-	1.14E-05	1.04E-05	1.73E-06	1.58E-06
B235	Coal Milling Building	-	-	-	-	-	1.25E-03	1.25E-03	6.25E-04	6.25E-04
B230	Coal Unloading	-	-	-	-	-	1.14E-05	1.04E-05	1.73E-06	1.58E-06
RD_RM1	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM2	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM3	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM4	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM5	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM6	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM7	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM8	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM9	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM10	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05

Attachment 1

Table A1-2 Roxul Modeled Source Emission Rates

Source ID	Description	NO_2		SO_2		CO	PM_{10}		$PM_{2.5}$	
		1-Hour (g/s)	Annual (g/s)	1-Hour (g/s)	3HR-24HR-Annual (g/s)	1-HR-8-HR (g/s)	24-Hour (g/s)	Annual (g/s)	24-Hour (g/s)	Annual (g/s)
RD_RM11	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM12	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM13	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM14	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM15	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM16	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM17	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM18	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM19	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM20	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM21	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM22	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM23	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM24	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM25	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM26	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM27	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM28	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM29	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM30	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_RM31	Raw Material Paved Haul Road	-	-	-	-	-	8.98E-04	3.90E-04	2.20E-04	9.56E-05
RD_FP1	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP2	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP3	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP4	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP5	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP6	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP7	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP8	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP9	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP10	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06

Attachment 1

Table A1-2 Roxul Modeled Source Emission Rates

Source ID	Description	NO_2		SO_2		CO	PM_{10}		$PM_{2.5}$	
		1-Hour (g/s)	Annual (g/s)	1-Hour (g/s)	3HR-24HR-Annual (g/s)	1-HR-8-HR (g/s)	24-Hour (g/s)	Annual (g/s)	24-Hour (g/s)	Annual (g/s)
RD_FP11	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP12	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP13	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP14	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP15	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP16	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP17	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP18	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP19	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP20	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP21	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP22	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP23	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP24	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP25	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP26	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP27	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP28	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP29	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP30	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP31	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP32	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP33	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP34	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_FP35	Finished Product Paved Haul Road	-	-	-	-	-	1.49E-05	1.16E-05	3.65E-06	2.86E-06
RD_CM	FEL - Coal/PET Coke from Bunker to Feed Hopper (for Milling)	-	-	-	-	-	9.33E-05	8.51E-05	2.29E-05	2.09E-05

Attachment 2
Q/D Screening Submitted to FLM

Roxul USA Inc.
Ranson, West Virginia
Summary of Q/d Screening Emissions

Source ID	Source Description	US NOx (ton/yr)	US SO2 (ton/yr)	US PM10 (ton/yr)	US H2SO4 (ton/yr)	Comment
Minwool Line						
B210	Raw Material Storage (B210)	--	--	0.17	--	Maximum 24-hour emissions in tpy (max ton/day * 365 day/yr)
B215	Raw Material Loading Hopper (B215)	--	--	0.03	--	No difference in maximum 24-hour and annual for tpy basis
IMF11	Conveyor Transition Point (B215 to B220)	--	--	0.09	--	No difference in maximum 24-hour and annual for tpy basis
IMF12	Conveyor Transition Point (B210 to B220)	--	--	0.09	--	No difference in maximum 24-hour and annual for tpy basis
IMF14	Conveyor Transition Point (B220 No. 1)	--	--	0.09	--	No difference in maximum 24-hour and annual for tpy basis
IMF15	Conveyor Transition Point (B220 No. 2)	--	--	0.09	--	No difference in maximum 24-hour and annual for tpy basis
IMF16	Conveyor Transition Point (B220 to B300)	--	--	0.09	--	No difference in maximum 24-hour and annual for tpy basis
IMF17	Charging Material Handling Building Vent 1	--	--	0.08	--	No difference in maximum 24-hour and annual for tpy basis
IMF18	Charging Material Handling Building Vent 2	--	--	0.08	--	No difference in maximum 24-hour and annual for tpy basis
RM_REJ	Raw Material Reject Collection Bin	--	--	5.32E-04	--	Maximum 24-hour emissions in tpy (max ton/day * 365 day/yr)
S_REJ	Sieve Reject Collection Bin	--	--	5.32E-04	--	Maximum 24-hour emissions in tpy (max ton/day * 365 day/yr)
IMF21	Charging Building Vacuum Cleaning Filter	--	--	0.02	--	No difference in maximum 24-hour and annual for tpy basis
IMF03	Three (3) Coal Storage Silos	--	--	0.17	--	No difference in maximum 24-hour and annual for tpy basis
IMF25	Coal Feed Tank	--	--	0.06	--	No difference in maximum 24-hour and annual for tpy basis
IMF24	Pre-heat Burner	1.58	0.01	0.17	--	No difference in maximum 24-hour and annual for tpy basis
IMF01	Melting Furnace	163.67	147.31	36.01	16.37	No difference in maximum 24-hour and annual for tpy basis
IMF07	Two (2) Storage Silos (Filter Fines Day/ Seco	--	--	0.12	--	No difference in maximum 24-hour and annual for tpy basis
IMF10	Filter Fines Recieving Silo	--	--	0.06	--	No difference in maximum 24-hour and annual for tpy basis
IMF08	Sorbent Silo	--	--	0.06	--	No difference in maximum 24-hour and annual for tpy basis
IMF09	Spent Sorbent Silo	--	--	0.06	--	No difference in maximum 24-hour and annual for tpy basis
IMF02	Melting Furnace Cooling Tower	--	--	0.04	--	No difference in maximum 24-hour and annual for tpy basis
HE02	Gutter Cooling Tower	--	--	0.01	--	No difference in maximum 24-hour and annual for tpy basis
DI	Dry Ice Cleaning	--	--	--	--	-
CM12	Fleece Application Vent 1	--	--	--	--	-
CM13	Fleece Application Vent 2	--	--	--	--	-
HE01	WESP	63.73	0.05	92.89	--	No difference in maximum 24-hour and annual for tpy basis
CE01	De-dusting Baghouse	--	--	3.38	--	No difference in maximum 24-hour and annual for tpy basis
CE02	Vacuum Cleaning Baghouse	--	--	0.97	--	No difference in maximum 24-hour and annual for tpy basis
P_MARK	Product Marking	0.17	1.02E-03	0.01	--	No difference in maximum 24-hour and annual for tpy basis
CM10	Recycle Plant Building Vent 1	--	--	2.90	--	No difference in maximum 24-hour and annual for tpy basis
CM11	Recycle Plant Building Vent 2	--	--	2.90	--	No difference in maximum 24-hour and annual for tpy basis
CM08	Recycle Plant Building Vent 3	--	--	0.24	--	No difference in maximum 24-hour and annual for tpy basis
CM09	Recycle Plant Building Vent 4	--	--	0.24	--	No difference in maximum 24-hour and annual for tpy basis
RMS	Raw Material Outdoor Stockpile	--	--	0.11	--	Maximum 24-hour emissions in tpy (max ton/day * 365 day/yr)
B170	Melting Furnace Portable Crusher & Storage	--	--	1.75	--	For Storage, maximum 24-hour emissions in tpy (max ton/day * 365 day/yr); for crusher, maximum annual steady-state [8760 hr/yr / 540 hr/yr] [Note 1]
Rockfon Line						
RFNE1	IR Zone	--	--	0.08	--	No difference in maximum 24-hour and annual for tpy basis
RFNE2	Hot Press and Cure	--	--	0.08	--	No difference in maximum 24-hour and annual for tpy basis
RFNE3	High Oven A	1.17	0.01	0.51	--	No difference in maximum 24-hour and annual for tpy basis
RFNE9	High Oven B	1.17	0.01	0.51	--	No difference in maximum 24-hour and annual for tpy basis
RFNE4	Drying Oven 1	0.87	0.01	0.36	--	No difference in maximum 24-hour and annual for tpy basis
RFNE6	Drying Oven 2 & 3	2.04	0.01	0.55	--	No difference in maximum 24-hour and annual for tpy basis
RFNE5	Spray Paint Cabin	--	--	3.86	--	No difference in maximum 24-hour and annual for tpy basis
RFNE7	Cooling Zone	--	--	0.84	--	No difference in maximum 24-hour and annual for tpy basis
RFNE8	De-dusting Baghouse	--	--	1.49	--	No difference in maximum 24-hour and annual for tpy basis
Other Facility-wide Sources						
CM03	Natural Gas Boiler 1	0.79	0.01	0.17	--	No difference in maximum 24-hour and annual for tpy basis
CM04	Natural Gas Boiler 2	0.79	0.01	0.17	--	No difference in maximum 24-hour and annual for tpy basis
RFN10	RFN Building Heat	0.79	0.01	0.17	--	No difference in maximum 24-hour and annual for tpy basis
EFP1	Emergency Fire Pump Engine	5.67	9.39E-03	0.33	--	Maximum annual steady-state (8760 hr/yr / 500 hr/yr) [Note 1]
Rd_RM	Raw Material Paved Haul Roads	--	--	0.97	--	Maximum 24-hour emissions in tpy (max ton/day * 365 day/yr)
Rd_FP	Finished Product Paved Haul Road	--	--	0.02	--	Maximum 24-hour emissions in tpy (max ton/day * 365 day/yr)
Rd_CM	FEL - Coal/PET Coke from Bunker to Feed H	--	--	3.24E-03	--	Maximum 24-hour emissions in tpy (max ton/day * 365 day/yr)
TKS	Facility Storage Tanks	--	--	--	--	-
Coal Milling						
IMF05	Coal Mill Burner & Baghouse	1.86	0.02	1.33	--	No difference in maximum 24-hour and annual for tpy basis
IMF06	Coal Milling De-Dusting Baghouse	--	--	0.97	--	No difference in maximum 24-hour and annual for tpy basis
IMF04	Coal Conveyor Transition Point (B231 to B23	--	--	0.09	--	No difference in maximum 24-hour and annual for tpy basis
B231	Coal Loading Hopper	--	--	3.98E-04	--	Maximum 24-hour emissions in tpy (max ton/day * 365 day/yr)
IMF13	Coal Conveyor Transition Point (B231 to B23	--	--	0.09	--	No difference in maximum 24-hour and annual for tpy basis
B235	Coal Milling Building	--	--	0.04	--	Maximum 24-hour emissions in tpy (max ton/day * 365 day/yr)
B230	Coal Unloading	--	--	3.98E-04	--	Maximum 24-hour emissions in tpy (max ton/day * 365 day/yr)
	Totals	**244.31**	**147.46**	**155.59**	**16.37**	

	Q	d	Q/d
Total Emissions, Q (tpy)	563.73	60	9.40

Q/d = Total Emissions, Q (tpy) / Distance to Class I Area, d (km)
Total Emissions, Q (short ton/yr or tpy) = NOx (tpy) + SO2 (tpy) + PM10 (tpy) + H2SO4 (tpy)
d = distance in km to Class I area (Shenandoah National Park)

Highlighted rows indicated adjusted annual emissions for Q/d analysis. See individual calculation tab for each source.
1. For B170 Melting Furnace Portable Crusher & Storage, maximum annual steady-state emissions conservatively assume operation for 24 hours/day, even though this application proposes maximum 24-hour emissions based on 12 hr/day. The EFP1 Emergency Fire Pump Engine maximum annual steady state emissions also conservatively assume 24 hr/day operation, although maximum 24-hour emissions are anticipated to include a half hour of operation for testing (in an emergency, EFP1 may operate for longer, but other sources at facility would likley not be operating).

Attachment 3
Off-Property Inventory Review (Inclusion and Exclusions)

Attachment 3

Table A3-1: Background Emissions Inventory

Facility Name	Agency	ID	UTME	UTMN	Distance from Roxul	Emissions				Within SIA+10km Criterion						
										SIA (km)						
						NO_X	SO_2	PM_{10}	$PM_{2.5}$	0.6	56.8	41.2	0.7	1.3	1.9	3.2
			m	m	km	tpy	tpy	tpy	tpy	NO_X		SO_2	PM_{10}		$PM_{2.5}$	
										Annual	1-hr	1-hr	Annual	24-hr	Annual	24-hr
IRS MARTINSBURG CENTER CAMPUS	WVDEP	54-003-00133	248928	4365127	4.11	151.8	26.31	4.723	4.574	Include	Include	Include	Include	Include	Include	Include
QG PRINTING II CORP.	WVDEP	54-003-00018	250000	4366600	4.58	112.1	2.87	7.53	7.53	Include	Include	Include	Include	Include	Include	Include
CONTINENTAL BRICK - MARTINSBURG FACILITY	WVDEP	54-003-00002	245400	4368700	9.11	39.66	122.19	130.33	75.19	Include	Include	Include	Include	Include	Include	Include
OX PAPERBOARD, LLC	WVDEP	54-037-00007	258800	4355300	9.85	83.2	481.4	15.5	15.5	Include	Include	Include	Include	Include	Include	Include
ARGOS USA LLC	WVDEP	54-003-00006	243700	4369200	10.73	4031.75	4515.5	584.65	222.3	-	Include	Include	-	Include	Include	Include
Knauf Insulation, LLC - INWOOD, WV	WVDEP	54-003-00012	239700	4365700	12.81	260.1	24.7	272.2	270.7	-	Include	Include	-	-	-	Include
MAAX U.S. CORP	WVDEP	54-003-00026	246300	4376200	14.84	10.82	0.027	0.66	0.66	-	Include	Include	-	-	-	-
QUAD/GRAPHICS, INC	WVDEP	54-003-00042	245846	4377400	16.13	112.1	2.87	7.53	7.53	-	Include	Include	-	-	-	-
O-N MINERALS (CHEMSTONE) CO - CLEAR BROOK	VDEQ	51-069-00340	233035.8	4349020.7	23.39	336.10	204.50	100.5	57.8	-	Include	Include	-	-	-	-
NORTH MOUNTAIN SANITARY LANDFILL	WVDEP	54-003-00036	243500	4384500	23.59	7.16	3	24.23	20.87	-	Include	Include	-	-	-	-

Attachment 3

Table A3-1: Background NO_2 Sources

Facility Name in Inventory	Stack Name in Inventory	Model ID	UTM E *m*	UTM N *m*	Distance from Roxul Facility *km*	Base Elevation *m*	Stack Height *m*	Temp. *K*	Exit Velocity *m/s*	Stack Diameter *m*	1-hour Emission Rate *g/s*	Annual Emission Rate *g/s*	Increment Consuming?	Notes
IRS MARTINSBURG CENTER CAMPUS	AG1	133_AG1	249304	4364882	3.66	139.250	3.048	422.039	23.927	0.204	0.000000	1.654082	No	Emergency Generator exclude 1 Hr. Allowable limit from Title V, Stack parameters from Knauf PSD Application Application.
IRS MARTINSBURG CENTER CAMPUS	MA2	133_MA2	249270	4364878	3.68	138.880	13.564	477.594	3.330	0.405	0.070559	0.070191	No	Boilers. Allowable limit from Title V, Stack parameters from Knauf PSD Application Application.
IRS MARTINSBURG CENTER CAMPUS	MB1	133_MB1	248835	4365075	4.15	143.550	13.564	477.594	3.330	0.405	0.357834	0.357857	Yes	Boilers. Allowable limit from Title V, Stack parameters from Knauf PSD Application Application.
IRS MARTINSBURG CENTER CAMPUS	MG1	133_MG1	248861	4365160	4.18	145.920	3.048	422.039	26.518	0.204	0.000000	4.536499	No	Emergency Generator exclude 1 Hr. Allowable limit from Title V, Stack parameters from Knauf PSD Application Application.
QG PRINTING II CORP.	7	018_7	250115	4366898	4.79	149.650	12.192	433.706	6.096	0.457	0.022680	0.023013	Yes	Allowable limit from Title V, Stack height, temperature, velocity from Knauf PSD Application. Stack diameter estimated.
QG PRINTING II CORP.	6	018_6	250102	4366909	4.81	149.650	12.192	433.706	6.096	0.457	0.036539	0.036534	No	Allowable Limits from Title V renewal Application PTE.
QG PRINTING II CORP.	5	018_5	250084	4366922	4.83	149.650	12.192	433.706	6.096	0.457	0.076859	0.077095	No	Allowable Limits from Title V renewal Application PTE.
QG PRINTING II CORP.	4	018_4	250073	4366933	4.84	149.650	12.192	433.706	6.096	0.457	0.076859	0.077095	No	Allowable Limits from Title V renewal Application PTE.
QG PRINTING II CORP.	3	018_3	250061	4366942	4.85	149.650	12.192	433.706	6.096	0.457	0.057959	0.057821	No	Allowable Limits from Title V renewal Application PTE.
CONTINENTAL BRICK - MARTINSBURG FACILITY	1	002_1	245289.13	4368975.56	9.38	152.760	6.096	444.261	12.410	0.610	0.530451	0.530169	No	Stack param from stack test included in permit and estimations.
CONTINENTAL BRICK - MARTINSBURG FACILITY	2	002_2	245284.65	4368966	9.38	152.760	6.096	444.261	12.410	0.610	0.530451	0.530169	No	Stack param from stack test included in permit and estimations.
CONTINENTAL BRICK - MARTINSBURG FACILITY	3	002_3	245365.42	4369031.5	9.36	152.760	6.096	422.039	0.001	0.610	0.088199	0.000288	Yes	Stack param from stack test included in permit and estimations.
CONTINENTAL BRICK - MARTINSBURG FACILITY	4	002_4	245429.09	4369022.71	9.31	152.760	6.096	422.039	0.001	0.610	0.012600	0.012657	Yes	Stack param from stack test included in permit and estimations.
OX PAPERBOARD, LLC - HALLTOWN MILL	001	007_001	258800	4355300	9.85	122.000	27.432	438.706	16.185	1.219	5.959700	2.373248	No	
OX PAPERBOARD, LLC - HALLTOWN MILL	005	007_005	258800	4355300	9.85	122.000	4.572	422.039	2.865	0.204	0.000000	0.016972	No	Emergency Generator exclude 1 Hr, estimated stack parameters.
Argos USA - MARTINSBURG	00B	006_00B	243700	4369200	10.73	154.040	4.877	477.594	1.039	0.363	0.042083	Exclude	No	1.66 mmbtu/hr boiler fugitive sources assigned boiler type parameters.
Argos USA - MARTINSBURG	00E	006_00E	243700	4369200	10.73	154.040	1.829	422.039	2.865	0.204	0.000000	Exclude	No	Intermitten Generators excluded from 1 hour. Assigned estimated stack parameters.
Argos USA - MARTINSBURG	1	006_1	243882.33	4369246.49	10.62	154.040	133.198	358.150	22.921	5.188	219.866302	Exclude	Yes	Parameters From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files, allowables from Title V permit.
Argos USA - MARTINSBURG	2	006_2	243672.83	4369384.14	10.87	154.040	47.244	368.150	18.806	1.753	0.352794	Exclude	Yes	Parameters From Knauf Insulation Inwwod Facility PSD Appliation Air Quality Modeling input files, allowables from Title V permit.

Table A3-1: Background NO_2 Sources

Facility Name in Inventory	Stack Name in Inventory	Model ID	UTM E *m*	UTM N *m*	Distance from Roxul Facility *km*	Base Elevation *m*	Stack Height *m*	Temp. *K*	Exit Velocity *m/s*	Stack Diameter *m*	1-hour Emission Rate *g/s*	Annual Emission Rate *g/s*	Increment Consuming?	Notes
Argos USA - MARTINSBURG	3	006_3	243458.51	4369277.28	10.97	154.040	3.901	293.150	0.001	0.396	0.311215	Exclude	Yes	Horizontal cap assumes no vertical velocity, height from WVDEP emission inventory, other parameters from Knauf Insulation Inwwod Facility PSD Air Quality Modeling input files, Allowables from Title V permit.
Argos USA - MARTINSBURG	101	006_101	243700	4369200	10.73	154.040	1.829	293.150	0.001	0.610	0.637549	Exclude	No	Estimated stack paramater off picture of crusher 440hp.
Knauf Insulation, Inc. - INWOOD, WV	EP18	012_EP18	239835.8	4365622	12.66	178.770	3.050	583.150	9.220	0.300	0.000000	Exclude	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling
Knauf Insulation, Inc. - INWOOD, WV	EP24	012_EP24	239703	4365722	12.82	178.770	36.580	449.820	20.070	1.450	0.496432	Exclude	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling
Knauf Insulation, Inc. - INWOOD, WV	HTR	012_HTR	239677.57	4365684.57	12.83	178.000	2.438	338.706	0.000	0.914	0.211676	Exclude	No	Estimated Stack paramaters
Knauf Insulation, Inc. - INWOOD, WV	EP23	012_EP23	239657.2	4365698	12.86	178.770	60.660	333.150	20.650	2.900	2.696355	Exclude	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling.
Knauf Insulation, Inc. - INWOOD, WV	EP16	012_EP16	239630.6	4365693	12.88	178.770	7.320	845.930	22.020	0.300	0.000000	Exclude	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling.
Knauf Insulation, Inc. - INWOOD, WV	NWGN	012_NWGN	239624.1	4365676	12.88	178.770	4.270	807.760	50.000	0.100	0.000000	Exclude	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling.
Knauf Insulation, Inc. - INWOOD, WV	EP17	012_EP17	239620.9	4365699	12.89	178.770	7.320	739.650	21.560	0.300	0.000000	Exclude	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling.
Knauf Insulation, Inc. - INWOOD, WV	EP14	012_EP14	239600.5	4365787	12.93	178.770	36.580	385.930	21.130	1.320	2.129364	Exclude	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling.
Knauf Insulation, Inc. - INWOOD, WV	EP12	012_EP12	239586.2	4365746	12.94	178.770	18.380	316.480	17.820	0.710	0.017010	Exclude	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling.
Knauf Insulation, Inc. - INWOOD, WV	EP13	012_EP13	239586.6	4365780	12.94	178.770	60.660	344.260	20.860	2.130	0.181437	Exclude	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling.
MAAX U.S. CORP	3	026_3	246300	4376200	14.84	144.570	18.288	324.817	11.643	3.048	0.311215	Exclude	No	Parameters from WVDEP Emission Inventory.
QUAD/GRAPHICS, INC	001	042_001	246734.14	4377251.68	15.66	148.350	21.336	435.928	0.001	0.914	1.377157	Exclude	Yes	Rain cap has no vertical velocity. Parameters from state inventory. Allowables from permit.
QUAD/GRAPHICS, INC	002	042_002	246751.72	4377237.49	15.64	148.350	21.336	435.928	0.001	0.914	1.377157	Exclude	Yes	Rain cap has no vertical velocity. Parameters from state inventory. Allowables from permit.
QUAD/GRAPHICS, INC	003	042_003	246742.71	4377230.67	15.64	148.350	21.336	478.983	0.001	1.036	1.438896	Exclude	Yes	Rain cap has no vertical velocity, parameters from state emissions inventory and PSD inventory. Allowables from permit.
QUAD/GRAPHICS, INC	004	042_004	246763.5	4377223.94	15.63	148.350	21.336	449.817	0.001	0.762	1.243599	Exclude	Yes	Rain cap has no vertical velocity, parameters from state emissions inventory and PSD inventory. Allowables from permit.
QUAD/GRAPHICS, INC	005	042_005	246763.5	4377223.94	15.63	148.350	21.336	449.817	0.001	0.762	1.243599	Exclude	Yes	Rain cap has no vertical velocity, listed as increment consuming in WV Inventory.
QUAD/GRAPHICS, INC	009	042_009	246737.31	4377217.67	15.63	148.350	11.582	435.928	0.001	0.914	1.243599	Exclude	No	Rain cap has no vertical velocity. Parameters from state inventory. Allowables from permit.
QUAD/GRAPHICS, INC	CO	042_CO	246576.67	4377329.64	15.79	148.350	5.182	689.261	10.455	0.789	0.275935	Exclude	No	Parameters from state inventory. Allowables from permit.
QUAD/GRAPHICS, INC	TO	042_TO	246546	4377307.99	15.78	148.350	5.182	560.928	1.920	0.972	0.921045	Exclude	Yes	Thermal oxidixer emission units combined, allowables from Title V, parameters from state inventory.
O-N Minerals (Chemstone) Co - Clear Brook	3	340_3	233695.11	4349288.46	22.70	190.500	60.960	393.150	19.416	1.219	11.831201	Exclude	Yes	Allowable from 2014 PSD permit.
O-N Minerals (Chemstone) Co - Clear Brook	5	340_5	233662.1	4349312.1	22.71	182.880	33.528	338.706	14.792	0.579	0.021420	Exclude	Yes	Allowable from 2014 PSD permit.
O-N Minerals (Chemstone) Co - Clear Brook	6	340_6	233709.04	4349307.98	22.68	190.500	3.048	306.483	78.300	0.101	0.000000	Exclude	Yes	Emergency Generator exclude 1 Hr, Allowable from 2014 PSD permit.
LCS Services, Inc. - NORTH MOUNTAIN SANITARY LANDFILL	004	036_004	243500	4384500	23.59	235.980	2.438	755.372	0.661	0.152	0.205377	Exclude	Yes	Estimated flare stack parameters, velocity is lowest allowable in permit. Allowable limits from Title V permit.

Attachment 3

Table A3-3: Background SO_2 Sources

Facility Name in Inventory	Stack Name in Inventory	Model ID	UTM E *m*	UTM N *m*	Distance from Roxul Facility *km*	Base Elevation *m*	Stack Height *m*	Temp. *K*	Exit Velocity *m/s*	Stack Diameter *m*	1-hour Emission Rate *g/s*	Notes
IRS MARTINSBURG CENTER CAMPUS	AG1	133_AG1	249304	4364882	3.66	139.25	3.048	422.039	23.927	0.204	0.000000	Emergency Generator exclude 1 Hr. Allowable limit from Title V, Stack parameters from Knauf PSD Application Application.
IRS MARTINSBURG CENTER CAMPUS	MA2	133_MA2	249270	4364878	3.68	138.88	13.564	477.594	3.330	0.405	0.083159	Boilers. Allowable limit from Title V, Stack parameters from Knauf PSD Application Application.
IRS MARTINSBURG CENTER CAMPUS	MG1	133_MG1	248928	4365127	4.11	145.92	3.048	422.039	26.518	0.204	0.000000	Emergency Generator exclude 1 Hr. Allowable limit from Title V, Stack parameters from Knauf PSD Application Application.
IRS MARTINSBURG CENTER CAMPUS	MB1	133_MB1	248835	4365075	4.15	143.55	13.564	477.594	3.330	0.405	0.509031	Boilers. Allowable limit from Title V, Stack parameters from Knauf PSD Application Application.
QG PRINTING II CORP.	7	018_7	250115	4366898	4.79	149.65	12.192	433.706	6.096	0.457	0.001260	Not sure on increment consuming, listed yes to be conservative. Allowable limit from Title V, Stack height, temperature, velocity from Knauf PSD Application. Stack diameter estimated.
QG PRINTING II CORP.	6	018_6	250102	4366909	4.81	149.65	12.192	433.706	6.096	0.457	0.002520	Allowable Limits from Title V renewal Application PTE.
QG PRINTING II CORP.	5	018_5	250084	4366922	4.83	149.65	12.192	433.706	6.096	0.457	0.005040	Allowable Limits from Title V renewal Application PTE.
QG PRINTING II CORP.	4	018_4	250073	4366933	4.84	149.65	12.192	433.706	6.096	0.457	0.005040	Allowable Limits from Title V renewal Application PTE.
QG PRINTING II CORP.	3	018_3	250061	4366942	4.85	149.65	12.192	433.706	6.096	0.457	0.003780	Allowable Limits from Title V renewal Application PTE.
CONTINENTAL BRICK - MARTINSBURG FACILITY	1	002_1	245289.13	4368975.56	9.38	152.76	6.096	444.261	12.410	0.610	1.755150	Stack param from stack test included in permit and estimations.
CONTINENTAL BRICK - MARTINSBURG FACILITY	2	002_2	245284.65	4368966	9.38	152.76	6.096	444.261	12.410	0.610	1.755150	Stack param from stack test included in permit and estimations.
CONTINENTAL BRICK - MARTINSBURG FACILITY	3	002_3	245365.42	4369031.5	9.36	152.76	6.096	422.039	0.001	0.610	0.168837	Stack param from stack test included in permit and estimations.
CONTINENTAL BRICK - MARTINSBURG FACILITY	4	002_4	245429.09	4369022.71	9.31	152.76	6.096	422.039	0.001	0.610	0.001260	Stack param from stack test included in permit and estimations.
OX PAPERBOARD, LLC - HALLTOWN MILL	001	007_001	258800	4355300	9.85	122	27.432	438.706	16.185	1.219	34.999691	
OX PAPERBOARD, LLC - HALLTOWN MILL	005	007_005	258800	4355300	9.85	122	4.572	422.039	2.865	0.204	0.000000	Emergency Generator exclude 1 Hr, estimated stack parameters.
Argos USA - MARTINSBURG	00B	006_00B	243700	4369200	10.73	154.04	4.877	477.594	1.039	0.363	0.000252	1.66 mmbtu/hr boiler fugitive sources assigned boiler type parameters.
Argos USA - MARTINSBURG	00E	006_00E	243700	4369200	10.73	154.04	1.829	422.039	2.865	0.204	0.000000	Emergency Generator exclude 1 Hr, estimated stack parameters.

Table A3-3: Background SO_2 Sources

Facility Name in Inventory	Stack Name in Inventory	Model ID	UTM E *m*	UTM N *m*	Distance from Roxul Facility *km*	Base Elevation *m*	Stack Height *m*	Temp. *K*	Exit Velocity *m/s*	Stack Diameter *m*	1-hour Emission Rate *g/s*	Notes
Argos USA - MARTINSBURG	1	006_1	243882.33	4369246.49	10.62	154.04	133.198	358.150	22.921	5.188	266.019325	Parameters From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files, allowables from Title V permit.
Argos USA - MARTINSBURG	2	006_2	243672.83	4369384.14	10.87	154.04	47.244	368.150	18.806	1.753	1.272579	Parameters From Knauf Insulation Inwwod Facility PSD Appliation Air Quality Modeling input files, allowables from Title V permit.
Argos USA - MARTINSBURG	3	006_3	243458.51	4369277.28	10.97	154.04	3.901	293.150	0.001	0.396	0.020412	Horizontal cap assumes no vertical velocity, height from WVDEP emission inventory, other parameters from Knauf Insulation Inwwod Facility PSD Air Quality Modeling input files, Allowables from Title V permit.
Argos USA - MARTINSBURG	101	006_101	243700	4369200	10.73	154.04	1.829	293.150	0.001	0.610	0.219236	Estimated stack paramater off picture of crusher 440hp.
Knauf Insulation, Inc. - INWOOD, WV	EP13	012_EP13	239592.76	4365750.49	12.93	178	60.660	344.260	20.860	2.130	0.000575	
Knauf Insulation, Inc. - INWOOD, WV	EP16	012_EP16	239710.27	4365814.45	12.83	178	7.320	845.930	22.020	0.300	0.000000	Emergency Generator, exlclude from 1 hour.
Knauf Insulation, Inc. - INWOOD, WV	EP17	012_EP17	239710.27	4365814.45	12.83	178	7.320	739.650	21.560	0.300	0.000000	Emergency Generator, exlclude from 1 hour.
Knauf Insulation, Inc. - INWOOD, WV	EP18	012_EP18	239710.27	4365814.45	12.83	178	3.050	583.150	9.220	0.300	0.000000	Emergency Generator, exlclude from 1 hour.
Knauf Insulation, Inc. - INWOOD, WV	HTR	012_HTR	239677.57	4365684.57	12.83	178	2.438	338.706	0.000	0.914	0.001260	Estimated Stack paramaters
Knauf Insulation, Inc. - INWOOD, WV	NWGN	012_NWGN	239710.27	4365814.45	12.83	178	4.270	807.760	50.000	0.100	0.000000	Emergency Generator, exlclude from 1 hour. NSPS Permit App R14-0015M.
Knauf Insulation, Inc. - INWOOD, WV	EP23	012_EP23	239659.35	4365697.27	12.85	178	60.660	333.150	20.650	2.900	0.676609	Modified NSPS Permit App R14-0015M
Knauf Insulation, Inc. - INWOOD, WV	EP24	012_EP24	239659.41	4365698.24	12.85	178	36.580	449.820	20.070	1.450	0.021420	Modified NSPS Permit App R14-0015M
MAAX U.S. CORP	3	026_3	246300	4376200	14.84	144.57	18.288	324.817	11.643	3.048	0.003780	Parameters from WVDEP Emission Inventory.
QUAD/GRAPHICS, INC	001	042_001	246734.14	4377251.68	15.66	148.35	21.336	435.928	0.001	0.914	0.103318	Rain cap has no vertical velocity. Parameters from state inventory. Allowables from permit.
QUAD/GRAPHICS, INC	002	042_002	246751.72	4377237.49	15.64	148.35	21.336	435.928	0.001	0.914	0.103318	Rain cap has no vertical velocity. Parameters from state inventory. Allowables from permit.
QUAD/GRAPHICS, INC	003	042_003	246742.71	4377230.67	15.64	148.35	21.336	478.983	0.001	1.036	0.108358	Rain cap has no vertical velocity, parameters from state emissions inventory and PSD inventory. Allowables from permit.
QUAD/GRAPHICS, INC	004	042_004	246763.5	4377223.94	15.63	148.35	21.336	449.817	0.001	0.762	0.131038	Rain cap has no vertical velocity, parameters from state emissions inventory and PSD inventory. Allowables from permit.
QUAD/GRAPHICS, INC	005	042_005	246763.5	4377223.94	15.63	148.35	21.336	449.817	0.001	0.762	0.131038	Rain cap has no vertical velocity, listed as increment consuming in WV Inventory.
QUAD/GRAPHICS, INC	009	042_009	246737.31	4377217.67	15.63	148.35	11.582	435.928	0.001	0.914	0.131038	Rain cap has no vertical velocity. Parameters from state inventory. Allowables from permit.
QUAD/GRAPHICS, INC	CO	042_CO	246576.67	4377329.64	15.79	148.35	5.182	689.261	10.455	0.789	0.020160	Allowables from Title V permit, parameters from state inventory.
QUAD/GRAPHICS, INC	TO	042_TO	246546	4377307.99	15.78	148.35	5.182	560.928	1.920	0.972	0.073079	Thermal oxidixer emission units combined, allowables from Title V, parameters from state inventory.
O-N Minerals (Chemstone) Co - Clear Brook	3	340_3	233695.11	4349288.46	22.70	190.5	60.960	393.150	19.416	1.219	7.207079	Allowable from 2014 PSD permit.
O-N Minerals (Chemstone) Co - Clear Brook	6	340_6	233709.04	4349307.98	22.68	190.5	3.048	766.483	78.300	0.101	0.000000	Emergency Generator exclude 1 Hr, Annual allowable based on PSD evaulation PTE.

Table A3-3: Background SO_2 Sources

Facility Name in Inventory	Stack Name in Inventory	Model ID	UTM E *m*	UTM N *m*	Distance from Roxul Facility *km*	Base Elevation *m*	Stack Height *m*	Temp. *K*	Exit Velocity *m/s*	Stack Diameter *m*	1-hour Emission Rate *g/s*	Notes
LCS Services, Inc. - NORTH MOUNTAIN SANITARY LANDFILL	004	036_004	243500	4384500	23.59	235.98	2.438	755.372	0.661	0.152	0.085679	Estimated flare stack parameters, velocity is lowest allowable in permit. Allowable limits from Title V permit.

Attachment 3

Table A3-4: Background PM_{10} Sources

Facility Name in Inventory	Stack Name in Inventory	Model ID	UTM E *m*	UTM N *m*	Distance from Roxul Facility *km*	Base Elevation *m*	Stack Height *m*	Temp. *K*	Exit Velocity *m/s*	Stack Diameter *m*	Initial Lateral Dimension *m*	Initial Vertical Dimention *m*	24-hour Emission Rate *g/s*	Annual Emission Rate *g/s*	Type	Increment Consuming?	Comments
IRS MARTINSBURG CENTER CAMPUS	AG1	133_AG1	249304	4364882	3.66	139.25	3.048	422.039	23.927	0.204	-	-	8.442E-01	4.890E-02	POINT	No	Generator. Allowable limit from Title V, Stack parameters from Knauf PSD Application Application.
IRS MARTINSBURG CENTER CAMPUS	MA2	133_MA2	249270	4364878	3.68	138.88	13.564	477.594	3.330	0.405	-	-	3.158E-03	3.157E-03	POINT	No	Boilers. Allowable limit from Title V, Stack parameters from Knauf PSD Application Application.
IRS MARTINSBURG CENTER CAMPUS	MB1	133_MB1	248835	4365075	4.15	143.55	13.564	477.594	3.330	0.405	-	-	3.578E-02	3.567E-02	POINT	Yes	Boilers. Allowable limit from Title V, Stack parameters from Knauf PSD Application Application.
IRS MARTINSBURG CENTER CAMPUS	MG1	133_MG1	248861	4365160	4.18	145.92	3.048	422.039	26.518	0.204	-	-	2.318E+00	1.323E-01	POINT	No	Generator. Allowable limit from Title V, Stack parameters from Knauf PSD Application.
QG PRINTING II CORP.	7	018_7	250115	4366898	4.79	149.65	12.192	433.706	6.096	0.457	-	-	1.260E-03	2.877E-04	POINT	Yes	Allowable limit from Title V, Stack height, temperature, velocity from Knauf PSD Application. Stack diameter estimated.
QG PRINTING II CORP.	8	018_8	250074	4366881	4.79	149.65	1.829	-	-	-	31.887	0.851	3.629E-02	3.622E-02	VOLUME	Yes	Estimated volume source building. Not sure on increment consuming, listed yes to be conservative. Allowable Limits from Title V renewal Application PTE.
QG PRINTING II CORP.	6	018_6	250102	4366909	4.81	149.65	12.192	433.706	6.096	0.457	-	-	2.520E-03	2.589E-03	POINT	No	Allowable Limits from Title V renewal Application PTE.
QG PRINTING II CORP.	5	018_5	250084	4366922	4.83	149.65	12.192	433.706	6.096	0.457	-	-	3.780E-03	3.740E-03	POINT	No	Allowable Limits from Title V renewal Application PTE.
QG PRINTING II CORP.	4	018_4	250073	4366933	4.84	149.65	12.192	433.706	6.096	0.457	-	-	3.780E-03	3.740E-03	POINT	No	Allowable Limits from Title V renewal Application PTE.
QG PRINTING II CORP.	3	018_3	250061	4366942	4.85	149.65	12.192	433.706	6.096	0.457	-	-	2.520E-03	2.877E-03	POINT	No	Allowable Limits from Title V renewal Application PTE.
CONTINENTAL BRICK - MARTINSBURG FACILITY	1	002_1	245289	4368976	9.38	152.76	6.096	444.261	12.410	0.610	-	-	1.197E+00	1.455E+00	POINT	No	Stack param from stack test included in permit and estimations.
CONTINENTAL BRICK - MARTINSBURG FACILITY	2	002_2	245285	4368966	9.38	152.76	6.096	444.261	12.410	0.610	-	-	1.197E+00	1.455E+00	POINT	No	Stack param from stack test included in permit and estimations.
CONTINENTAL BRICK - MARTINSBURG FACILITY	3	002_3	245365	4369032	9.36	152.76	6.096	422.039	0.001	0.610	-	-	1.260E-02	8.630E-04	POINT	Yes	Stack param from stack test included in permit and estimations.
CONTINENTAL BRICK - MARTINSBURG FACILITY	4	002_4	245429	4369023	9.31	152.76	6.096	422.039	0.001	0.610	-	-	2.533E-01	3.452E-02	POINT	Yes	Stack param from stack test included in permit and estimations.
CONTINENTAL BRICK - MARTINSBURG FACILITY	5	002_5	245400	4368700	9.11	152.76	1.000	-	-	-	24.168	0.465	1.920E+00	5.575E-01	VOLUME	Yes	Volume 120m x 90m fugitive sources assigned pseudo-point stack parameters. Not sure on increment consuming, listed yes to be conservative.
CONTINENTAL BRICK - MARTINSBURG FACILITY	6	002_6	245400	4368700	9.11	152.76	3.048	349.817	1.202	0.991	-	-	2.457E-01	2.457E-01	POINT	Yes	Baghouse, assumed horizontal, parameters from permit app. Not sure on increment consuming, listed yes to be conservative.
OX PAPERBOARD, LLC - HALLTOWN MILL	001	007_001	258800	4355300	9.85	122	27.432	438.706	16.185	1.219	-	-	6.300E-01	2.508E-01	POINT	No	
OX PAPERBOARD, LLC - HALLTOWN MILL	005	007_005	258800	4355300	9.85	122	4.572	422.039	2.865	0.204	-	-	2.142E-02	1.438E-03	POINT	No	Emergency Generator exclude 1 Hr, estimated stack parameters.
OX PAPERBOARD, LLC - HALLTOWN MILL	007	007_007	258800	4355300	9.85	122	1.000	0.000	0.001	0.001	-	-	1.940E-01	1.936E-01	POINT	No	Balance of plant PM PTE,fugitive sources assigned pseudo-point stack parameters.
Argos USA - MARTINSBURG	00B	006_00B	243700	4369200	10.73	154.04	4.877	477.594	1.039	0.363	-	-	2.877E-03	Exclude	POINT	No	1.66 mmbtu/hr boiler fugitive sources assigned boiler type parameters.
Argos USA - MARTINSBURG	00E	006_00E	243700	4369200	10.73	154.04	1.829	422.039	2.865	0.204	-	-	5.466E-03	Exclude	POINT	No	Intermitten Generators excluded from 1 hour. Assigned estimated stack parameters.
Argos USA - MARTINSBURG	1	006_1	243882	4369246	10.62	154.04	133.200	358.150	22.920	5.190	-	-	7.383E+00	Exclude	POINT	No	Parameters From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files, allowables from Title V permit.

Table A3-4: Background PM_{10} Sources

Facility Name in Inventory	Stack Name in Inventory	Model ID	UTM E *m*	UTM N *m*	Distance from Roxul Facility *km*	Base Elevation *m*	Stack Height *m*	Temp. *K*	Exit Velocity *m/s*	Stack Diameter *m*	Initial Lateral Dimension *m*	Initial Vertical Dimention *m*	24-hour Emission Rate *g/s*	Annual Emission Rate *g/s*	Type	Increment Consuming?	Comments
Argos USA - MARTINSBURG	10	006_10	243700	4369200	10.73	154.04	28.650	293.150	35.660	0.200	-	-	2.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	100	006_100	243700	4369200	10.73	154.04	6.710	373.150	12.920	0.150	-	-	2.520E-02	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	11	006_11	243700	4369200	10.73	154.04	6.100	293.150	76.140	0.150	-	-	2.400E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	12	006_12	243700	4369200	10.73	154.04	19.810	293.150	12.860	1.390	-	-	1.630E+00	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	13	006_13	243700	4369200	10.73	154.04	11.280	293.150	31.700	0.300	-	-	3.780E-03	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	14	006_14	243700	4369200	10.73	154.04	23.160	293.150	22.890	0.410	-	-	5.300E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	15	006_15	243700	4369200	10.73	154.04	7.010	293.150	4.790	0.520	-	-	1.800E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	16	006_16	243700	4369200	10.73	154.04	7.010	293.150	4.790	0.520	-	-	1.800E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	17	006_17	243700	4369200	10.73	154.04	14.330	293.150	11.890	1.220	-	-	2.450E+00	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	18	006_18	243700	4369200	10.73	154.04	49.680	293.150	5.490	0.900	-	-	6.200E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	19	006_19	243700	4369200	10.73	154.04	36.580	293.150	4.790	0.520	-	-	1.800E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	2	006_2	243673	4369384	10.87	154.04	47.244	368.150	18.806	1.753	-	-	6.300E-02	Exclude	POINT	No	Parameters From Knauf Insulation Inwwod Facility PSD Appliation Air Quality Modeling input files, allowables from Title V permit.
Argos USA - MARTINSBURG	20	006_20	243700	4369200	10.73	154.04	36.270	293.150	4.720	0.730	-	-	3.500E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	21	006_21	243700	4369200	10.73	154.04	44.810	293.150	4.480	0.650	-	-	2.600E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	22	006_22	243700	4369200	10.73	154.04	7.920	293.150	1.830	0.830	-	-	1.800E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	23	006_23	243700	4369200	10.73	154.04	15.540	293.150	19.020	0.530	-	-	6.600E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	24	006_24	243700	4369200	10.73	154.04	39.320	293.150	21.310	0.460	-	-	2.770E-02	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	25	006_25	243700	4369200	10.73	154.04	13.720	363.150	9.050	0.630	-	-	5.300E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	26	006_26	243700	4369200	10.73	154.04	92.960	363.150	15.210	0.510	-	-	4.400E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	27	006_27	243700	4369200	10.73	154.04	18.590	363.150	15.090	0.460	-	-	3.500E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	28	006_28	243700	4369200	10.73	154.04	78.940	363.150	20.570	0.280	-	-	1.900E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	29	006_29	243700	4369200	10.73	154.04	115.210	363.150	21.030	0.430	-	-	4.400E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	3	006_3	243459	4369277	10.97	154.04	3.900	293.150	0.001	0.400	-	-	2.268E-02	Exclude	POINT	No	Horizontal cap assumes no vertical velocity, height from WVDEP emission inventory, other parameters from Knauf Insulation Inwwod Facility PSD Air Quality Modeling input files, Allowables from Title V permit.
Argos USA - MARTINSBURG	30	006_30	243700	4369200	10.73	154.04	115.210	363.150	36.520	0.510	-	-	1.060E+00	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	31	006_31	243700	4369200	10.73	154.04	114.910	363.150	16.980	0.300	-	-	1.800E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	32	006_32	243700	4369200	10.73	154.04	33.530	352.040	10.970	0.710	-	-	7.400E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	33	006_33	243700	4369200	10.73	154.04	33.220	293.150	25.880	0.150	-	-	1.220E+00	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	34	006_34	243700	4369200	10.73	154.04	22.860	403.150	29.080	0.450	-	-	4.400E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.

Table A3-4: Background PM_{10} Sources

Facility Name in Inventory	Stack Name in Inventory	Model ID	UTM E *m*	UTM N *m*	Distance from Roxul Facility *km*	Base Elevation *m*	Stack Height *m*	Temp. *K*	Exit Velocity *m/s*	Stack Diameter *m*	Initial Lateral Dimension *m*	Initial Vertical Dimention *m*	24-hour Emission Rate *g/s*	Annual Emission Rate *g/s*	Type	Increment Consuming?	Comments
Argos USA - MARTINSBURG	35	006_35	243700	4369200	10.73	154.04	39.320	403.150	27.310	0.280	-	-	2.280E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	36	006_36	243700	4369200	10.73	154.04	54.560	403.150	13.620	0.440	-	-	2.600E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	37	006_37	243700	4369200	10.73	154.04	54.560	293.150	16.920	0.270	-	-	2.000E-02	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	38	006_38	243700	4369200	10.73	154.04	22.860	293.150	17.310	0.270	-	-	2.000E-02	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	39	006_39	243700	4369200	10.73	154.04	3.050	293.150	17.310	0.270	-	-	2.000E-02	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	4	006_4	243700	4369200	10.73	154.04	13.110	293.150	23.740	0.400	-	-	5.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	40	006_40	243700	4369200	10.73	154.04	3.050	293.150	17.310	0.270	-	-	2.000E-02	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	41	006_41	243700	4369200	10.73	154.04	3.050	293.150	17.310	0.270	-	-	2.000E-02	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	42	006_42	243700	4369200	10.73	154.04	38.710	293.150	11.190	0.530	-	-	4.400E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	43	006_43	243700	4369200	10.73	154.04	30.180	293.150	10.240	0.560	-	-	4.400E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	44	006_44	243700	4369200	10.73	154.04	17.680	383.150	27.310	0.280	-	-	8.150E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	45	006_45	243700	4369200	10.73	154.04	20.730	293.150	10.180	0.430	-	-	2.600E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	46	006_46	243700	4369200	10.73	154.04	20.730	293.150	10.180	0.430	-	-	2.600E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	47	006_47	243700	4369200	10.73	154.04	4.570	293.150	2.990	0.650	-	-	1.800E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	48	006_48	243700	4369200	10.73	154.04	9.140	293.150	10.180	0.430	-	-	2.600E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	49	006_49	243700	4369200	10.73	154.04	8.840	293.150	10.180	0.430	-	-	2.600E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	5	006_5	243700	4369200	10.73	154.04	3.350	293.150	20.060	1.170	-	-	3.630E+00	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	50	006_50	243700	4369200	10.73	154.04	37.190	293.150	4.480	0.650	-	-	2.600E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	51	006_51	243700	4369200	10.73	154.04	38.710	293.150	5.490	0.900	-	-	6.200E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	52	006_52	243700	4369200	10.73	154.04	12.190	373.150	5.940	0.740	-	-	3.500E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	53	006_53	243700	4369200	10.73	154.04	47.240	368.150	18.810	1.750	-	-	6.360E+00	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	54	006_54	243700	4369200	10.73	154.04	21.950	403.150	4.450	0.630	-	-	1.800E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	55	006_55	243700	4369200	10.73	154.04	37.490	293.150	4.480	0.650	-	-	2.600E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	56	006_56	243700	4369200	10.73	154.04	39.010	293.150	5.490	0.900	-	-	6.200E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	57	006_57	243700	4369200	10.73	154.04	12.190	373.150	5.940	0.740	-	-	3.500E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	58	006_58	243700	4369200	10.73	154.04	47.550	368.150	18.810	1.750	-	-	6.360E+00	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	59	006_59	243700	4369200	10.73	154.04	22.250	403.150	4.450	0.630	-	-	1.800E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	6	006_6	243700	4369200	10.73	154.04	17.370	293.150	19.900	0.570	-	-	3.320E+00	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	60	006_60	243700	4369200	10.73	154.04	7.620	373.150	20.030	0.400	-	-	3.500E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	61	006_61	243700	4369200	10.73	154.04	7.620	373.150	20.030	0.400	-	-	3.500E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.

Table A3-4: Background PM_{10} Sources

Facility Name in Inventory	Stack Name in Inventory	Model ID	UTM E *m*	UTM N *m*	Distance from Roxul Facility *km*	Base Elevation *m*	Stack Height *m*	Temp. *K*	Exit Velocity *m/s*	Stack Diameter *m*	Initial Lateral Dimension *m*	Initial Vertical Dimention *m*	24-hour Emission Rate *g/s*	Annual Emission Rate *g/s*	Type	Increment Consuming?	Comments
Argos USA - MARTINSBURG	62	006_62	243700	4369200	10.73	154.04	65.230	373.150	15.730	0.390	-	-	2.600E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	63	006_63	243700	4369200	10.73	154.04	64.920	373.150	15.730	0.390	-	-	2.600E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	64	006_64	243700	4369200	10.73	154.04	64.920	373.150	16.700	0.480	-	-	4.200E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	65	006_65	243700	4369200	10.73	154.04	64.920	373.150	16.700	0.480	-	-	4.200E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	66	006_66	243700	4369200	10.73	154.04	64.920	373.150	17.470	0.480	-	-	4.400E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	67	006_67	243700	4369200	10.73	154.04	13.110	373.150	26.150	0.300	-	-	2.300E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	68	006_68	243700	4369200	10.73	154.04	13.410	373.150	29.350	0.270	-	-	2.300E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	69	006_69	243700	4369200	10.73	154.04	13.720	373.150	25.790	0.290	-	-	2.300E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	7	006_7	243700	4369200	10.73	154.04	25.910	353.150	21.000	1.460	-	-	1.027E+01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	70	006_70	243700	4369200	10.73	154.04	14.020	373.150	26.150	0.300	-	-	2.300E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	71	006_71	243700	4369200	10.73	154.04	9.750	293.150	11.250	0.280	-	-	1.200E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	72	006_72	243700	4369200	10.73	154.04	16.460	373.150	40.660	0.210	-	-	2.080E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	73	006_73	243700	4369200	10.73	154.04	33.220	366.480	14.970	0.480	-	-	5.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	74	006_74	243700	4369200	10.73	154.04	33.220	366.480	14.970	0.480	-	-	5.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	75	006_75	243700	4369200	10.73	154.04	33.220	366.480	14.970	0.480	-	-	5.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	76	006_76	243700	4369200	10.73	154.04	32.610	366.480	14.970	0.480	-	-	5.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	77	006_77	243700	4369200	10.73	154.04	32.920	366.480	14.970	0.480	-	-	5.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	78	006_78	243700	4369200	10.73	154.04	3.660	355.370	18.380	0.250	-	-	8.000E-02	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	79	006_79	243700	4369200	10.73	154.04	3.660	355.370	18.380	0.250	-	-	8.000E-02	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	8	006_8	243700	4369200	10.73	154.04	15.540	310.930	13.930	0.570	-	-	1.210E+00	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	80	006_80	243700	4369200	10.73	154.04	3.660	355.370	22.770	0.250	-	-	8.000E-02	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	81	006_81	243700	4369200	10.73	154.04	3.960	355.370	22.770	0.250	-	-	8.000E-02	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	82	006_82	243700	4369200	10.73	154.04	15.540	408.150	28.620	0.280	-	-	1.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	83	006_83	243700	4369200	10.73	154.04	15.540	408.150	28.620	0.280	-	-	1.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	84	006_84	243700	4369200	10.73	154.04	24.380	322.040	20.630	0.330	-	-	2.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	85	006_85	243700	4369200	10.73	154.04	24.380	322.040	9.300	0.720	-	-	2.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	86	006_86	243700	4369200	10.73	154.04	24.380	322.040	15.540	0.330	-	-	2.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	87	006_87	243700	4369200	10.73	154.04	24.380	322.040	15.540	0.330	-	-	2.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	88	006_88	243700	4369200	10.73	154.04	24.380	353.710	16.030	0.330	-	-	2.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	89	006_89	243700	4369200	10.73	154.04	12.190	310.930	14.200	0.280	-	-	1.700E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.

Table A3-4: Background PM_{10} Sources

Facility Name in Inventory	Stack Name in Inventory	Model ID	UTM E *m*	UTM N *m*	Distance from Roxul Facility *km*	Base Elevation *m*	Stack Height *m*	Temp. *K*	Exit Velocity *m/s*	Stack Diameter *m*	Initial Lateral Dimension *m*	Initial Vertical Dimention *m*	24-hour Emission Rate *g/s*	Annual Emission Rate *g/s*	Type	Increment Consuming?	Comments
Argos USA - MARTINSBURG	9	006_9	243700	4369200	10.73	154.04	4.270	293.150	35.660	0.200	-	-	2.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	90	006_90	243700	4369200	10.73	154.04	12.190	310.930	14.200	0.280	-	-	1.700E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	91	006_91	243700	4369200	10.73	154.04	33.530	366.480	18.750	0.390	-	-	4.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	92	006_92	243700	4369200	10.73	154.04	33.530	366.480	18.750	0.390	-	-	4.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	93	006_93	243700	4369200	10.73	154.04	33.220	366.480	18.750	0.390	-	-	4.000E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	94	006_94	243700	4369200	10.73	154.04	13.410	294.260	18.530	0.660	-	-	1.170E+00	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	95	006_95	243700	4369200	10.73	154.04	33.830	293.150	6.460	0.300	-	-	6.310E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	96	006_96	243700	4369200	10.73	154.04	33.830	293.150	6.460	0.300	-	-	6.310E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	97	006_97	243700	4369200	10.73	154.04	33.830	293.150	6.460	0.300	-	-	6.310E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	98	006_98	243700	4369200	10.73	154.04	33.830	293.150	6.460	0.300	-	-	2.750E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	99	006_99	243700	4369200	10.73	154.04	23.770	293.150	20.570	0.280	-	-	6.200E-01	Exclude	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.

Attachment 3

Table A3-5: Background $PM_{2.5}$ Sources

Facility Name in Inventory	Stack Name in Inventory	Model ID	UTM E *m*	UTM N *m*	Distance from Roxul Facility *km*	Base Elevation *m*	Stack Height *m*	Temp. *K*	Exit Velocity *m/s*	Stack Diameter *m*	Initial Lateral Dimension *m*	Initial Vertical Dimention *m*	24-hour Emission Rate *g/s*	Annual Emission Rate *g/s*	Type	Increment Consuming?	Notes
IRS MARTINSBURG CENTER CAMPUS	AG1	133_AG1	249304	4364882	3.66	139.25	3.048	422.039	23.927	0.204	-	-	0.844	0.049	POINT	No	Generator. Allowable limit from Title V, Stack parameters from Knauf PSD Application Application.
IRS MARTINSBURG CENTER CAMPUS	MA2	133_MA2	249270	4364878	3.68	138.88	13.564	477.594	3.330	0.405	-	-	0.002	0.002	POINT	No	Boilers. Allowable limit from Title V, Stack parameters from Knauf PSD Application Application.
IRS MARTINSBURG CENTER CAMPUS	MB1	133_MB1	248835	4365075	4.15	143.55	13.564	477.594	3.330	0.405	-	-	0.005	0.005	POINT	No	Boilers. Allowable limit from Title V, Stack parameters from Knauf PSD Application Application.
IRS MARTINSBURG CENTER CAMPUS	MG1	133_MG1	248861	4365160	4.18	145.92	3.048	422.039	26.518	0.204	-	-	2.318	0.132	POINT	No	Generator. Allowable limit from Title V, Stack parameters from Knauf PSD Application.
QG PRINTING II CORP.	7	018_7	250115	4366898	4.79	149.65	12.192	433.706	6.096	0.457	-	-	0.001	0.000	POINT	No	Listed as not increment consuming in Knauff PSD application. Allowable limit from Title V, Stack height, temperature, velocity from Knauf PSD Application.
QG PRINTING II CORP.	8	018_8	250074	4366881	4.79	149.65	1.829	0.000	0.001	0.001	31.887	0.851	0.036	0.036	VOLUME	Yes	Estimated volume source building. Not sure on increment consuming, listed yes to be conservative. Allowable Limits from Title V renewal Application
QG PRINTING II CORP.	6	018_6	250102	4366909	4.81	149.65	12.192	433.706	6.096	0.457	-	-	0.003	0.003	POINT	No	Allowable Limits from Title V renewal Application PTE.
QG PRINTING II CORP.	5	018_5	250084	4366922	4.83	149.65	12.192	433.706	6.096	0.457	-	-	0.004	0.004	POINT	No	Allowable Limits from Title V renewal Application PTE.
QG PRINTING II CORP.	4	018_4	250073	4366933	4.84	149.65	12.192	433.706	6.096	0.457	-	-	0.004	0.004	POINT	No	Allowable Limits from Title V renewal Application PTE.
QG PRINTING II CORP.	3	018_3	250061	4366942	4.85	149.65	12.192	433.706	6.096	0.457	-	-	0.003	0.003	POINT	No	Allowable Limits from Title V renewal Application PTE.
CONTINENTAL BRICK - MARTINSBURG FACILITY	1	002_1	245289.13	4368975.56	9.38	152.76	6.096	444.261	12.410	0.610	-	-	0.905	0.904	POINT	No	Stack param from stack test included in permit and estimations.
CONTINENTAL BRICK - MARTINSBURG FACILITY	2	002_2	245284.65	4368966	9.38	152.76	6.096	444.261	12.410	0.610	-	-	0.905	0.904	POINT	No	Stack param from stack test included in permit and estimations.
CONTINENTAL BRICK - MARTINSBURG FACILITY	3	002_3	245365.42	4369031.5	9.36	152.76	6.096	422.039	0.001	0.610	-	-	0.013	0.001	POINT	No	Stack param from stack test included in permit and estimations.
CONTINENTAL BRICK - MARTINSBURG FACILITY	4	002_4	245429.09	4369022.71	9.31	152.76	6.096	422.039	0.001	0.610	-	-	0.252	0.035	POINT	No	Stack param from stack test included in permit and estimations.
CONTINENTAL BRICK - MARTINSBURG FACILITY	5	002_5	245400	4368700	9.11	152.76	1.000	0.000	0.001	0.001	24.168	0.465	0.412	0.073	VOLUME	Yes	Volume 120m x 90m fugitive sources assigned pseudo-point stack parameters.Not sure on increment consuming, listed yes to be conservative.
CONTINENTAL BRICK - MARTINSBURG FACILITY	6	002_6	245400	4368700	9.11	152.76	3.048	349.817	1.202	0.991	-	-	0.246	0.246	POINT	Yes	Baghouse, assumed horizontal, parameters from permit app. Not sure on increment consuming, listed yes to be conservative.
OX PAPERBOARD, LLC - HALLTOWN MILL	001	007_001	258800	4355300	9.85	122	27.432	438.706	16.185	1.219	-	-	0.597	0.238	POINT	No	
OX PAPERBOARD, LLC - HALLTOWN MILL	005	007_005	258800	4355300	9.85	122	4.572	422.039	2.865	0.204	-	-	0.021	0.001	POINT	No	Emergency Generator exclude 1 Hr, estimated stack parameters.
OX PAPERBOARD, LLC - HALLTOWN MILL	007	007_007	258800	4355300	9.85	122	1.000	0.000	0.001	0.001	-	-	0.097	0.097	POINT	No	Balance of plant PM PTE,fugitive sources assigned pseudo-point stack parameters.
Argos USA - MARTINSBURG	00B	006_00B	243700	4369200	10.73	154.04	4.877	477.594	1.039	0.363	-	-	0.003	0.003	POINT	No	1.66 mmbtu/hr boiler fugitive sources assigned boiler type parameters.
Argos USA - MARTINSBURG	00E	006_00E	243700	4369200	10.73	154.04	1.829	422.039	2.865	0.204	-	-	0.005	0.005	POINT	No	Intermitten Generators excluded from 1 hour. Assigned estimated stack parameters.
Argos USA - MARTINSBURG	1	006_1	243882.33	4369246.49	10.62	154.04	133.200	358.150	22.920	5.190	-	-	7.383	6.478	POINT	No	Parameters From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files, allowables from Title V permit.
Argos USA - MARTINSBURG	10	006_10	243700	4369200	10.73	154.04	28.650	293.150	35.660	0.200	-	-	0.009	0.008	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	100	006_100	243700	4369200	10.73	154.04	6.710	373.150	12.920	0.150	-	-	0.003	0.003	POINT	Yes	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	11	006_11	243700	4369200	10.73	154.04	6.100	293.150	76.140	0.150	-	-	0.011	0.009	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	12	006_12	243700	4369200	10.73	154.04	19.810	293.150	12.860	1.390	-	-	0.072	0.063	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.

Table A3-5: Background $PM_{2.5}$ Sources

Facility Name in Inventory	Stack Name in Inventory	Model ID	UTM E *m*	UTM N *m*	Distance from Roxul Facility *km*	Base Elevation *m*	Stack Height *m*	Temp. *K*	Exit Velocity *m/s*	Stack Diameter *m*	Initial Lateral Dimension *m*	Initial Vertical Dimention *m*	24-hour Emission Rate *g/s*	Annual Emission Rate *g/s*	Type	Increment Consuming?	Notes
Argos USA - MARTINSBURG	13	006_13	243700	4369200	10.73	154.04	47.244	293.150	31.700	1.753	-	-	0.004	0.003	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	14	006_14	243700	4369200	10.73	154.04	23.160	293.150	22.890	0.410	-	-	0.024	0.021	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	15	006_15	243700	4369200	10.73	154.04	7.010	293.150	4.790	0.520	-	-	0.008	0.007	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	16	006_16	243700	4369200	10.73	154.04	7.010	293.150	4.790	0.520	-	-	0.008	0.007	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	17	006_17	243700	4369200	10.73	154.04	14.330	293.150	11.890	1.220	-	-	0.108	0.095	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	18	006_18	243700	4369200	10.73	154.04	49.680	293.150	5.490	0.900	-	-	0.028	0.024	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	19	006_19	243700	4369200	10.73	154.04	36.580	293.150	4.790	0.520	-	-	0.008	0.007	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	2	006_2	243672.83	4369384.14	10.87	154.04	47.244	368.150	18.806	1.753	-	-	0.063	0.058	POINT	No	Parameters From Knauf Insulation Inwwod Facility PSD Appliation Air Quality Modeling input files, allowables from Title V permit.
Argos USA - MARTINSBURG	20	006_20	243700	4369200	10.73	154.04	36.270	293.150	4.720	0.730	-	-	0.015	0.014	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	21	006_21	243700	4369200	10.73	154.04	44.810	293.150	4.480	0.650	-	-	0.011	0.010	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	22	006_22	243700	4369200	10.73	154.04	7.920	293.150	1.830	0.830	-	-	0.008	0.007	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	23	006_23	243700	4369200	10.73	154.04	15.540	293.150	19.020	0.530	-	-	0.029	0.026	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	24	006_24	243700	4369200	10.73	154.04	39.320	293.150	21.310	0.460	-	-	0.028	0.024	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	25	006_25	243700	4369200	10.73	154.04	13.720	363.150	9.050	0.630	-	-	0.024	0.021	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	26	006_26	243700	4369200	10.73	154.04	92.960	363.150	15.210	0.510	-	-	0.020	0.017	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	27	006_27	243700	4369200	10.73	154.04	18.590	363.150	15.090	0.460	-	-	0.015	0.014	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	28	006_28	243700	4369200	10.73	154.04	78.940	363.150	20.570	0.280	-	-	0.024	0.024	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	29	006_29	243700	4369200	10.73	154.04	115.210	363.150	21.030	0.430	-	-	0.020	0.017	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	3	006_3	243458.51	4369277.28	10.97	154.04	3.900	293.150	0.001	0.400	-	-	0.023	0.009	POINT	Yes	Horizontal cap assumes no vertical velocity, height from WVDEP emission inventory, other parameters from Knauf Insulation Inwwod Facility PSD Air Quality Modeling input files, Allowables from Title V permit.
Argos USA - MARTINSBURG	30	006_30	243700	4369200	10.73	154.04	115.210	363.150	36.520	0.510	-	-	0.047	0.041	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	31	006_31	243700	4369200	10.73	154.04	114.910	363.150	16.980	0.300	-	-	0.008	0.007	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	32	006_32	243700	4369200	10.73	154.04	33.530	352.040	10.970	0.710	-	-	0.033	0.029	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	33	006_33	243700	4369200	10.73	154.04	33.220	293.150	25.880	0.150	-	-	0.054	0.048	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	34	006_34	243700	4369200	10.73	154.04	22.860	403.150	29.080	0.450	-	-	0.020	0.017	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	35	006_35	243700	4369200	10.73	154.04	39.320	403.150	27.310	0.280	-	-	0.029	0.029	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	36	006_36	243700	4369200	10.73	154.04	54.560	403.150	13.620	0.440	-	-	0.011	0.010	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	37	006_37	243700	4369200	10.73	154.04	54.560	293.150	16.920	0.270	-	-	0.001	0.001	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	38	006_38	243700	4369200	10.73	154.04	22.860	293.150	17.310	0.270	-	-	0.001	0.001	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	39	006_39	243700	4369200	10.73	154.04	3.050	293.150	17.310	0.270	-	-	0.001	0.001	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	4	006_4	243700	4369200	10.73	154.04	13.110	293.150	23.740	0.400	-	-	0.023	0.019	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.

Table A3-5: Background $PM_{2.5}$ Sources

Facility Name in Inventory	Stack Name in Inventory	Model ID	UTM E *m*	UTM N *m*	Distance from Roxul Facility *km*	Base Elevation *m*	Stack Height *m*	Temp. *K*	Exit Velocity *m/s*	Stack Diameter *m*	Initial Lateral Dimension *m*	Initial Vertical Dimention *m*	24-hour Emission Rate *g/s*	Annual Emission Rate *g/s*	Type	Increment Consuming?	Notes
Argos USA - MARTINSBURG	40	006_40	243700	4369200	10.73	154.04	3.050	293.150	17.310	0.270	-	-	0.001	0.001	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	41	006_41	243700	4369200	10.73	154.04	3.050	293.150	17.310	0.270	-	-	0.001	0.001	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	42	006_42	243700	4369200	10.73	154.04	38.710	293.150	11.190	0.530	-	-	0.020	0.017	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	43	006_43	243700	4369200	10.73	154.04	30.180	293.150	10.240	0.560	-	-	0.020	0.017	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	44	006_44	243700	4369200	10.73	154.04	17.680	383.150	27.310	0.280	-	-	0.103	0.103	POINT	Yes	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	45	006_45	243700	4369200	10.73	154.04	20.730	293.150	10.180	0.430	-	-	0.011	0.010	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	46	006_46	243700	4369200	10.73	154.04	20.730	293.150	10.180	0.430	-	-	0.011	0.010	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	47	006_47	243700	4369200	10.73	154.04	4.570	293.150	2.990	0.650	-	-	0.008	0.007	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	48	006_48	243700	4369200	10.73	154.04	9.140	293.150	10.180	0.430	-	-	0.011	0.010	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	49	006_49	243700	4369200	10.73	154.04	8.840	293.150	10.180	0.430	-	-	0.011	0.010	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	5	006_5	243700	4369200	10.73	154.04	3.350	293.150	20.060	1.170	-	-	0.161	0.142	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	50	006_50	243700	4369200	10.73	154.04	37.190	293.150	4.480	0.650	-	-	0.011	0.010	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	51	006_51	243700	4369200	10.73	154.04	38.710	293.150	5.490	0.900	-	-	0.028	0.024	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	52	006_52	243700	4369200	10.73	154.04	12.190	373.150	5.940	0.740	-	-	0.015	0.014	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	53	006_53	243700	4369200	10.73	154.04	47.240	368.150	18.810	1.750	-	-	0.282	0.248	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	54	006_54	243700	4369200	10.73	154.04	21.950	403.150	4.450	0.630	-	-	0.008	0.007	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	55	006_55	243700	4369200	10.73	154.04	37.490	293.150	4.480	0.650	-	-	0.011	0.010	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	56	006_56	243700	4369200	10.73	154.04	39.010	293.150	5.490	0.900	-	-	0.028	0.024	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	57	006_57	243700	4369200	10.73	154.04	12.190	373.150	5.940	0.740	-	-	0.015	0.014	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	58	006_58	243700	4369200	10.73	154.04	47.550	368.150	18.810	1.750	-	-	0.282	0.248	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	59	006_59	243700	4369200	10.73	154.04	22.250	403.150	4.450	0.630	-	-	0.008	0.007	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	6	006_6	243700	4369200	10.73	154.04	17.370	293.150	19.900	0.570	-	-	0.147	0.130	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	60	006_60	243700	4369200	10.73	154.04	7.620	373.150	20.030	0.400	-	-	0.015	0.014	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	61	006_61	243700	4369200	10.73	154.04	7.620	373.150	20.030	0.400	-	-	0.015	0.014	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	62	006_62	243700	4369200	10.73	154.04	65.230	373.150	15.730	0.390	-	-	0.011	0.010	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	63	006_63	243700	4369200	10.73	154.04	64.920	373.150	15.730	0.390	-	-	0.011	0.010	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	64	006_64	243700	4369200	10.73	154.04	64.920	373.150	16.700	0.480	-	-	0.019	0.016	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	65	006_65	243700	4369200	10.73	154.04	64.920	373.150	16.700	0.480	-	-	0.019	0.016	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	66	006_66	243700	4369200	10.73	154.04	64.920	373.150	17.470	0.480	-	-	0.020	0.017	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	67	006_67	243700	4369200	10.73	154.04	13.110	373.150	26.150	0.300	-	-	0.010	0.009	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	68	006_68	243700	4369200	10.73	154.04	13.410	373.150	29.350	0.270	-	-	0.010	0.009	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	69	006_69	243700	4369200	10.73	154.04	13.720	373.150	25.790	0.290	-	-	0.010	0.009	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.

Table A3-5: Background $PM_{2.5}$ Sources

Facility Name in Inventory	Stack Name in Inventory	Model ID	UTM E *m*	UTM N *m*	Distance from Roxul Facility *km*	Base Elevation *m*	Stack Height *m*	Temp. *K*	Exit Velocity *m/s*	Stack Diameter *m*	Initial Lateral Dimension *m*	Initial Vertical Dimention *m*	24-hour Emission Rate *g/s*	Annual Emission Rate *g/s*	Type	Increment Consuming?	Notes
Argos USA - MARTINSBURG	7	006_7	243700	4369200	10.73	154.04	25.910	353.150	21.000	1.460	-	-	0.457	0.400	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	70	006_70	243700	4369200	10.73	154.04	14.020	373.150	26.150	0.300	-	-	0.010	0.009	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	71	006_71	243700	4369200	10.73	154.04	9.750	293.150	11.250	0.280	-	-	0.005	0.005	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	72	006_72	243700	4369200	10.73	154.04	16.460	373.150	40.660	0.210	-	-	0.026	0.026	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	73	006_73	243700	4369200	10.73	154.04	33.220	366.480	14.970	0.480	-	-	0.023	0.020	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	74	006_74	243700	4369200	10.73	154.04	33.220	366.480	14.970	0.480	-	-	0.023	0.020	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	75	006_75	243700	4369200	10.73	154.04	33.220	366.480	14.970	0.480	-	-	0.023	0.020	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	76	006_76	243700	4369200	10.73	154.04	32.610	366.480	14.970	0.480	-	-	0.023	0.020	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	77	006_77	243700	4369200	10.73	154.04	32.920	366.480	14.970	0.480	-	-	0.023	0.020	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	78	006_78	243700	4369200	10.73	154.04	3.660	355.370	18.380	0.250	-	-	0.004	0.003	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	79	006_79	243700	4369200	10.73	154.04	3.660	355.370	18.380	0.250	-	-	0.004	0.003	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	8	006_8	243700	4369200	10.73	154.04	15.540	310.930	13.930	0.570	-	-	0.152	0.152	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	80	006_80	243700	4369200	10.73	154.04	3.660	355.370	22.770	0.250	-	-	0.004	0.003	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	81	006_81	243700	4369200	10.73	154.04	3.960	355.370	22.770	0.250	-	-	0.004	0.003	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	82	006_82	243700	4369200	10.73	154.04	15.540	408.150	28.620	0.280	-	-	0.004	0.004	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	83	006_83	243700	4369200	10.73	154.04	15.540	408.150	28.620	0.280	-	-	0.004	0.004	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	84	006_84	243700	4369200	10.73	154.04	24.380	322.040	20.630	0.330	-	-	0.009	0.008	POINT	Yes	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	85	006_85	243700	4369200	10.73	154.04	24.380	322.040	9.300	0.720	-	-	0.009	0.008	POINT	Yes	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	86	006_86	243700	4369200	10.73	154.04	24.380	322.040	15.540	0.330	-	-	0.009	0.008	POINT	Yes	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	87	006_87	243700	4369200	10.73	154.04	24.380	322.040	15.540	0.330	-	-	0.009	0.008	POINT	Yes	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	88	006_88	243700	4369200	10.73	154.04	24.380	353.710	16.030	0.330	-	-	0.009	0.008	POINT	Yes	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	89	006_89	243700	4369200	10.73	154.04	12.190	310.930	14.200	0.280	-	-	0.008	0.007	POINT	Yes	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	9	006_9	243700	4369200	10.73	154.04	4.270	293.150	35.660	0.200	-	-	0.009	0.008	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	90	006_90	243700	4369200	10.73	154.04	12.190	310.930	14.200	0.280	-	-	0.008	0.007	POINT	Yes	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	91	006_91	243700	4369200	10.73	154.04	33.530	366.480	18.750	0.390	-	-	0.018	0.016	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	92	006_92	243700	4369200	10.73	154.04	33.530	366.480	18.750	0.390	-	-	0.018	0.016	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	93	006_93	243700	4369200	10.73	154.04	33.220	366.480	18.750	0.390	-	-	0.018	0.016	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	94	006_94	243700	4369200	10.73	154.04	13.410	294.260	18.530	0.660	-	-	0.052	0.046	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	95	006_95	243700	4369200	10.73	154.04	33.830	293.150	6.460	0.300	-	-	0.080	0.080	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	96	006_96	243700	4369200	10.73	154.04	33.830	293.150	6.460	0.300	-	-	0.080	0.080	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	97	006_97	243700	4369200	10.73	154.04	33.830	293.150	6.460	0.300	-	-	0.080	0.080	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Argos USA - MARTINSBURG	98	006_98	243700	4369200	10.73	154.04	33.830	293.150	6.460	0.300	-	-	0.035	0.035	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.

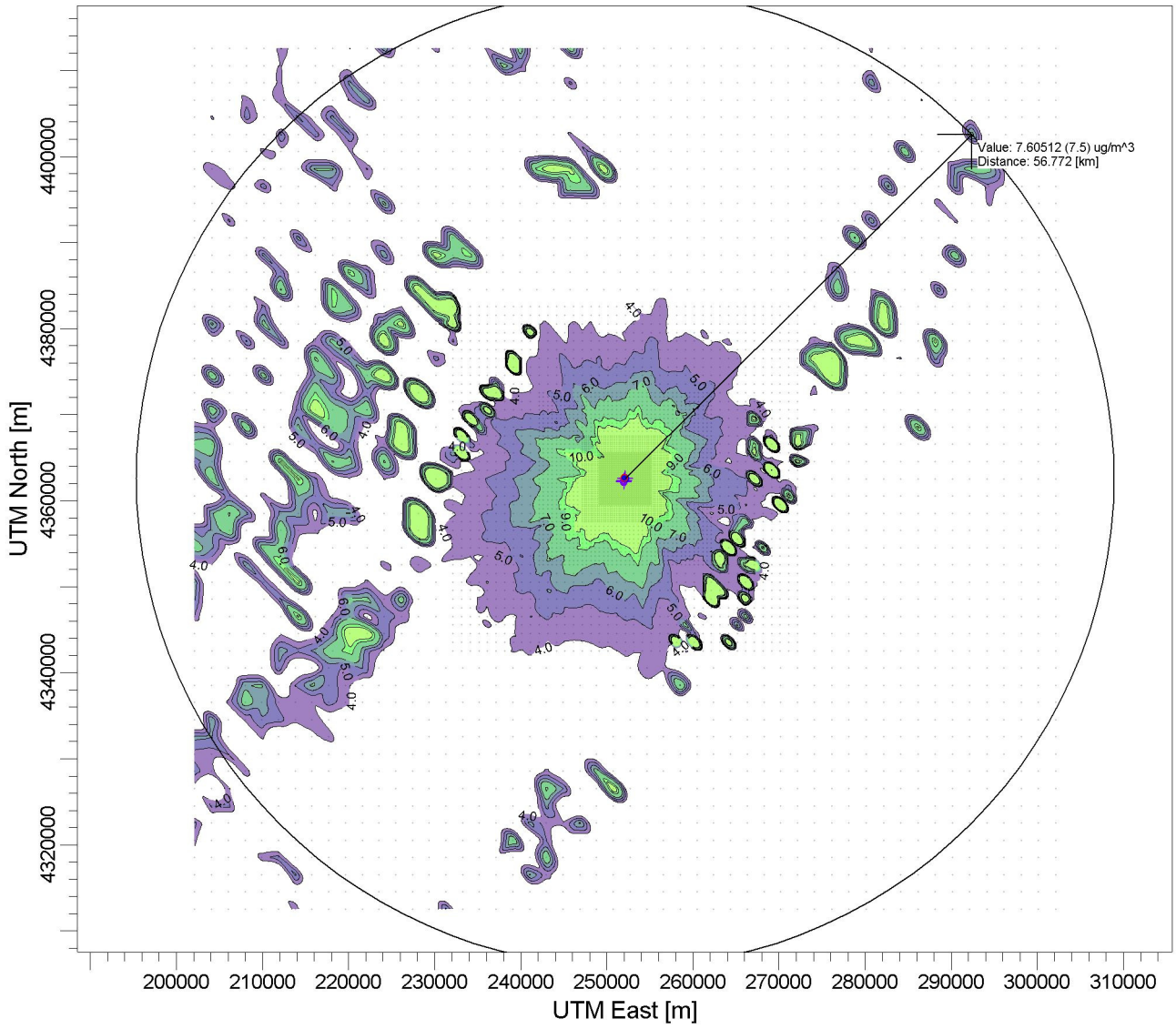
Table A3-5: Background $PM_{2.5}$ Sources

Facility Name in Inventory	Stack Name in Inventory	Model ID	UTM E *m*	UTM N *m*	Distance from Roxul Facility *km*	Base Elevation *m*	Stack Height *m*	Temp. *K*	Exit Velocity *m/s*	Stack Diameter *m*	Initial Lateral Dimension *m*	Initial Vertical Dimention *m*	24-hour Emission Rate *g/s*	Annual Emission Rate *g/s*	Type	Increment Consuming?	Notes
Argos USA - MARTINSBURG	99	006_99	243700	4369200	10.73	154.04	23.770	293.150	20.570	0.280	-	-	0.028	0.024	POINT	No	From Knauf Insulation Inwwod Facility PSD Application Air Quality Modeling input files.
Knauf Insulation, Inc. - INWOOD, WV	EP18	012_EP18	239835.8	4365622	12.66	178.77	3.050	583.150	9.220	0.300	-	-	0.004	Exclude	POINT	No	Stack Parameter and allowables from Knauff PSD Application Modeling
Knauf Insulation, Inc. - INWOOD, WV	CT45	012_CT45	239696.3	4365677	12.81	178.77	7.920	302.590	15.160	2.440	-	-	0.000	Exclude	POINT	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling.
Knauf Insulation, Inc. - INWOOD, WV	EP24	012_EP24	239703	4365722	12.82	178.77	36.580	449.820	20.070	1.450	-	-	0.924	Exclude	POINT	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling
Knauf Insulation, Inc. - INWOOD, WV	CT123	012_CT123	239691.3	4365683	12.82	178.77	8.840	302.590	19.760	1.830	-	-	0.000	Exclude	POINT	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling.
Knauf Insulation, Inc. - INWOOD, WV	EP11B	012_EP11B	239688.1	4365710	12.83	178.77	25.460	294.260	0.001	0.100	-	-	0.001	Exclude	POINT	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling. Only CT's 3,4,5 Increment consuming; conservatively modeling them all
Knauf Insulation, Inc. - INWOOD, WV	EP11A	012_EP11A	239684.7	4365713	12.83	178.77	25.460	294.260	0.001	0.100	-	-	0.001	Exclude	POINT	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling. Only CT's 3,4,5 Increment consuming; conservatively modeling them all
Knauf Insulation, Inc. - INWOOD, WV	HTR	012_HTR	239677.57	4365684.57	12.83	178	2.438	338.706	0.000	0.914	-	-	0.006	Exclude	POINT	No	Estimated Stack paramaters
Knauf Insulation, Inc. - INWOOD, WV	EP23	012_EP23	239657.2	4365698	12.86	178.77	60.660	333.150	20.650	2.900	-	-	3.011	Exclude	POINT	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling.
Knauf Insulation, Inc. - INWOOD, WV	FP11	012_FP11	239659.41	4365771	12.87	178	1.000	0.000	0.001	0.001	59.595	0.465	0.021	Exclude	VOLUME	No	Volume
Knauf Insulation, Inc. - INWOOD, WV	FP16	012_FP16	239659.41	4365771	12.87	178	1.000	0.000	0.001	0.001	59.595	0.465	0.023	Exclude	VOLUME	No	Assigned Volume Parameters, Dust control allowables from Title V permit.
Knauf Insulation, Inc. - INWOOD, WV	FP19	012_FP19	239659.41	4365771	12.87	178	1.000	0.000	0.001	0.001	59.595	0.465	0.014	Exclude	VOLUME	No	Assigned Volume Parameters, Dust control allowables from Title V permit.
Knauf Insulation, Inc. - INWOOD, WV	Road	012_Road	239659.41	4365771	12.87	178	1.000	0.000	0.001	0.001	59.595	0.465	0.005	Exclude	VOLUME	No	Assigned Volume parameters.
Knauf Insulation, Inc. - INWOOD, WV	EP16	012_EP16	239630.6	4365693	12.88	178.77	7.320	845.930	22.020	0.300	-	-	0.004	Exclude	POINT	No	Stack Parameter and allowables from Knauff PSD Application Modeling.
Knauf Insulation, Inc. - INWOOD, WV	NWGN	012_NWGN	239624.1	4365676	12.88	178.77	4.270	807.760	50.000	0.100	-	-	0.023	Exclude	POINT	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling.
Knauf Insulation, Inc. - INWOOD, WV	EP17	012_EP17	239620.9	4365699	12.89	178.77	7.320	739.650	21.560	0.300	-	-	0.001	Exclude	POINT	No	Stack Parameter and allowables from Knauff PSD Application Modeling.
Knauf Insulation, Inc. - INWOOD, WV	EP14	012_EP14	239600.5	4365787	12.93	178.77	36.580	385.930	21.130	1.320	-	-	0.306	Exclude	POINT	No	Stack Parameter and allowables from Knauff PSD Application Modeling.
Knauf Insulation, Inc. - INWOOD, WV	EP12	012_EP12	239586.2	4365746	12.94	178.77	18.380	316.480	17.820	0.710	-	-	0.077	Exclude	POINT	No	Stack Parameter and allowables from Knauff PSD Application Modeling.
Knauf Insulation, Inc. - INWOOD, WV	EP13	012_EP13	239586.6	4365780	12.94	178.77	60.660	344.260	20.860	2.130	-	-	1.966	Exclude	POINT	Yes	Stack Parameter and allowables from Knauff PSD Application Modeling.

Attachment 4
AERMOD Concentration Plots

PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
NO2 1-Hour SIL



PLOT FILE OF 1ST-HIGHEST MAX DAILY 1-HR VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

Max: 31.6 [ug/m^3] at (269130.38, 4363545.00)

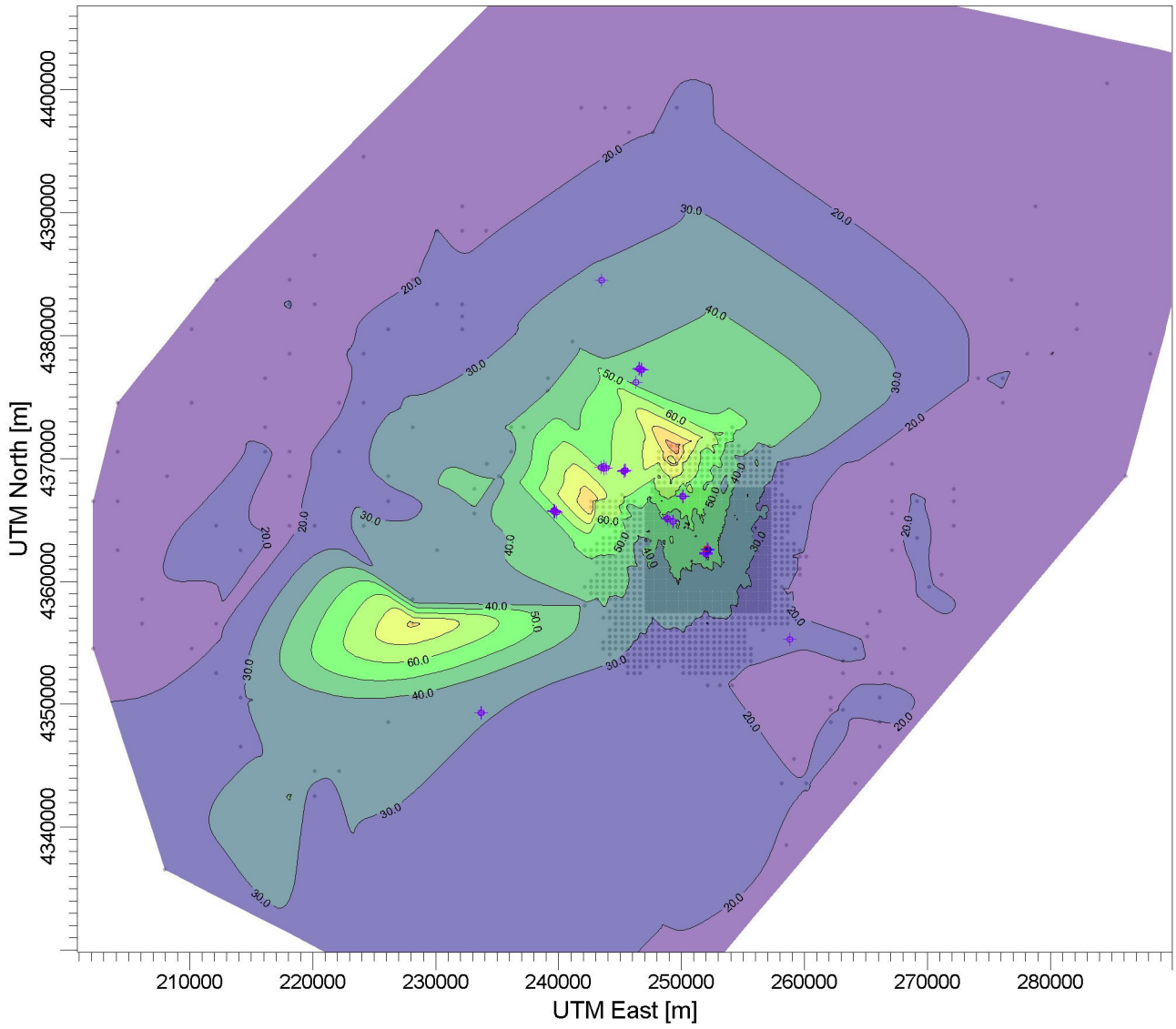
4.0 5.0 6.0 7.0 9.0 10.0 30.0 40.0 50.0 53.0

COMMENTS:	SOURCES: **13**	COMPANY NAME: **Roxul USA, INC.**	
	RECEPTORS: **9465**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:800,009 0 30 km	
	MAX: **31.6 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

AERMOD View - Lakes Environmental Software

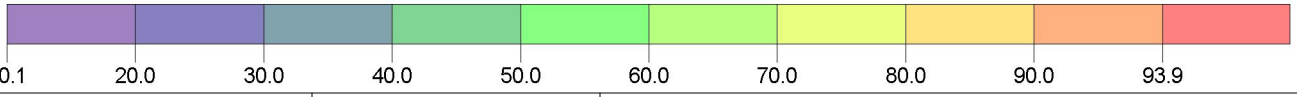
PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
NO2 1-Hour NAAQS



PLOT FILE OF 8TH-HIGHEST MAX DAILY 1-HR VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

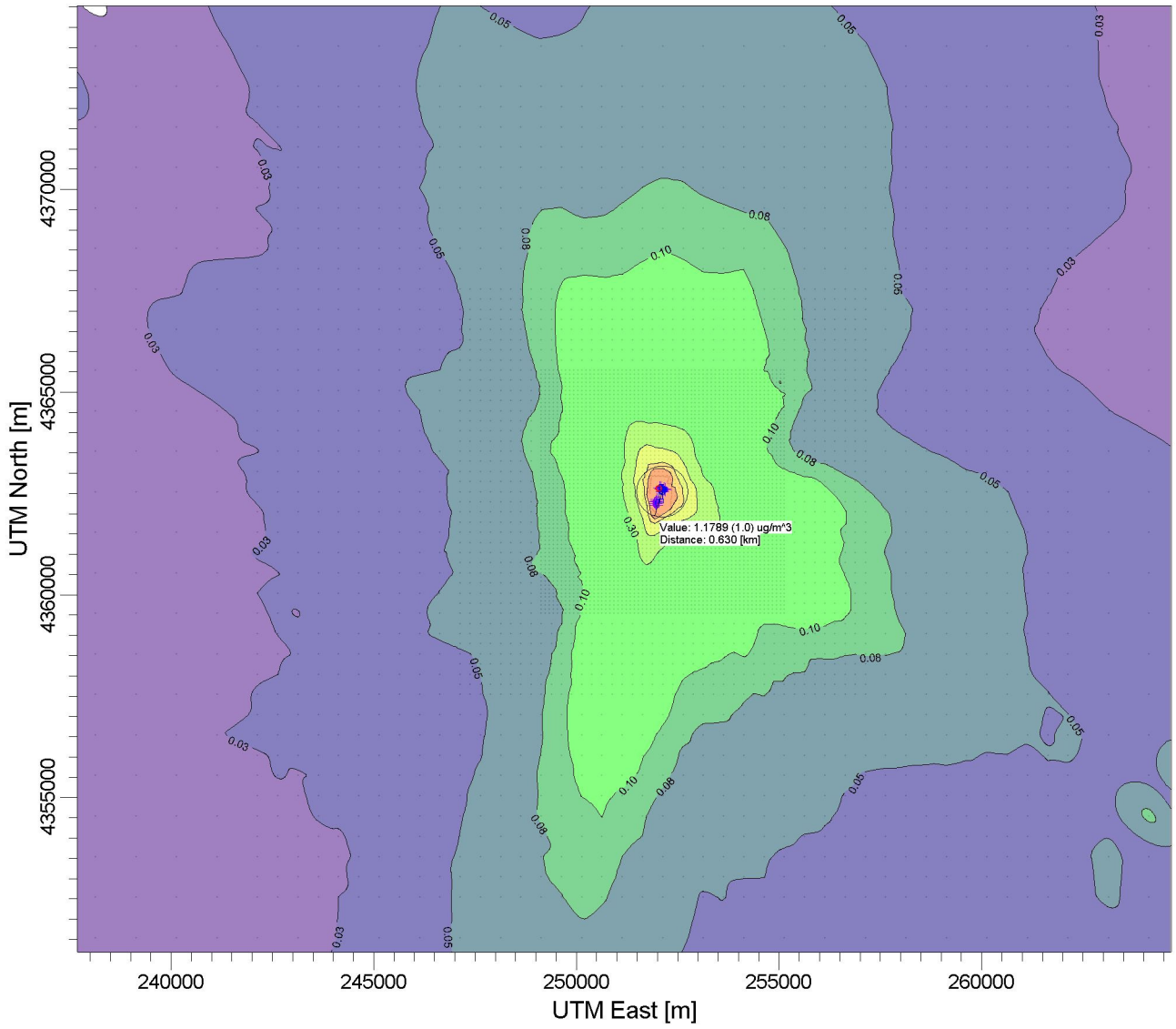
Max: 93.9 [ug/m^3] at (249130.36, 4371045.00)



COMMENTS:	SOURCES:	COMPANY NAME:	
Source Group All Modeled impacts do not include ambient background monitor contribution.	**57**	**Roxul USA, INC.**	
	RECEPTORS: **5506**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:560,285 0 20 km	
	MAX: **93.9 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
NO2 Annual SIL - Worst Case Year 2015



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: ALL ug/m^3

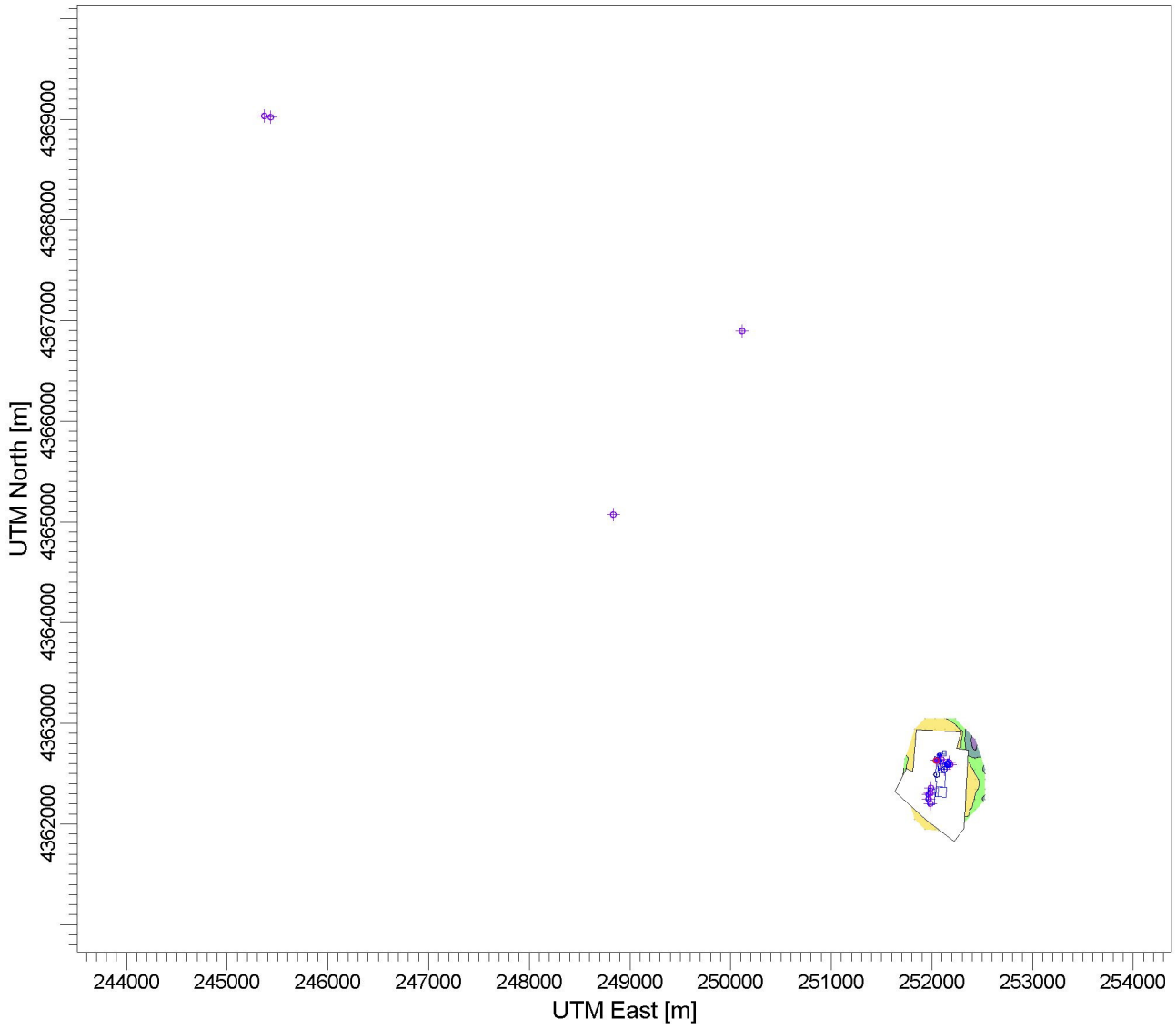
Max: 1.50 [ug/m^3] at (251942.23, 4362040.63)

0.02 0.03 0.05 0.08 0.10 0.30 0.50 0.80 1.00 1.50

COMMENTS: Met Year 2015	SOURCES: **13**	COMPANY NAME: **Roxul USA, INC.**	
	RECEPTORS: **9465**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:169,814 0 5 km	
	MAX: **1.50 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
NO2 Annual PSDI - Worst Case Year 2016



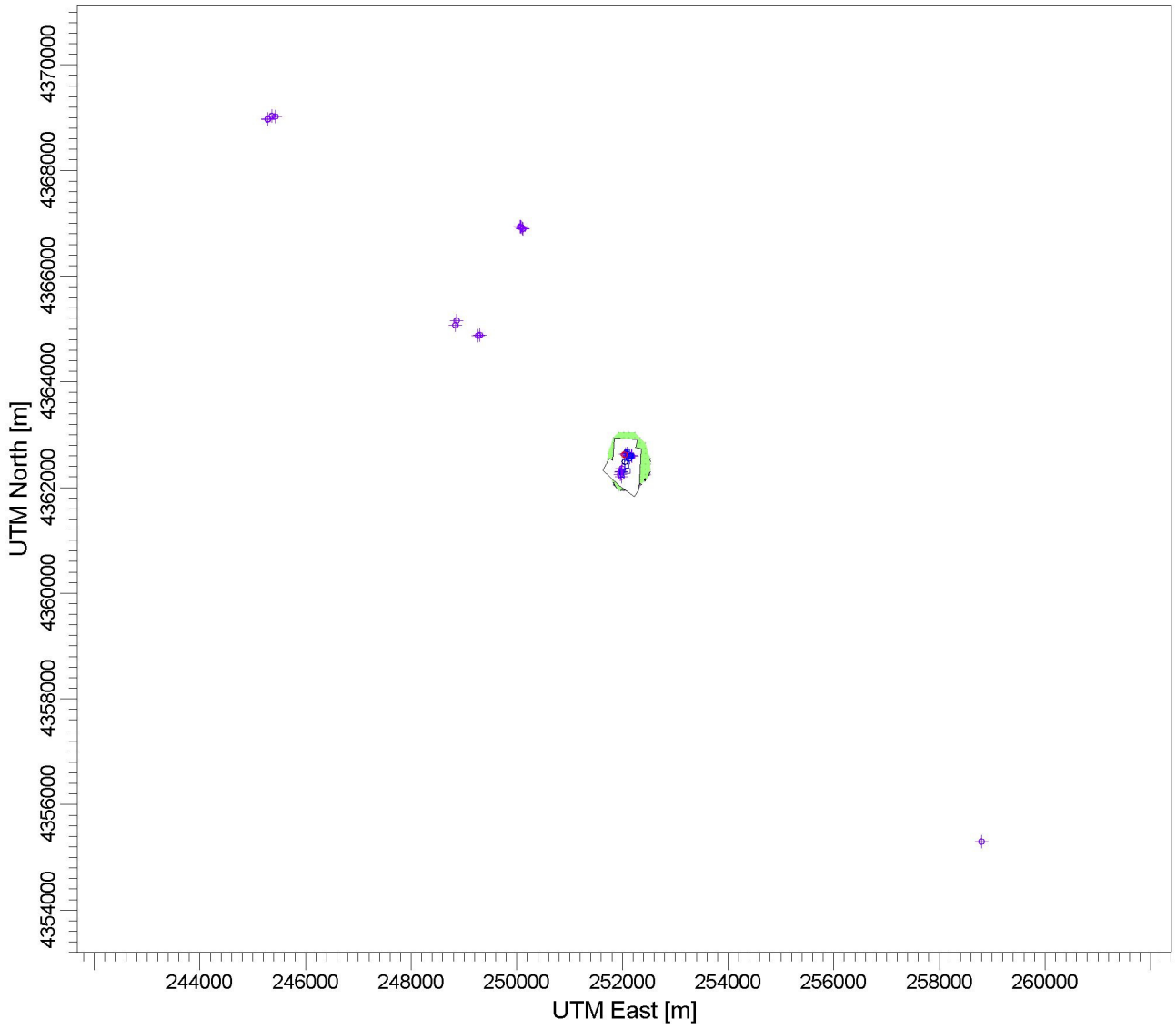
PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: ALL ug/m^3

Max: 1.407 [ug/m^3] at (251907.83, 4362072.35)

COMMENTS:	SOURCES:	COMPANY NAME:	
Met Year 2016.	**17**	**Roxul USA, INC.**	
	RECEPTORS: **88**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:68,367 0 2 km	
	MAX: **1.407 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
NO2 Annual NAAQS - Worst Case Year 2012



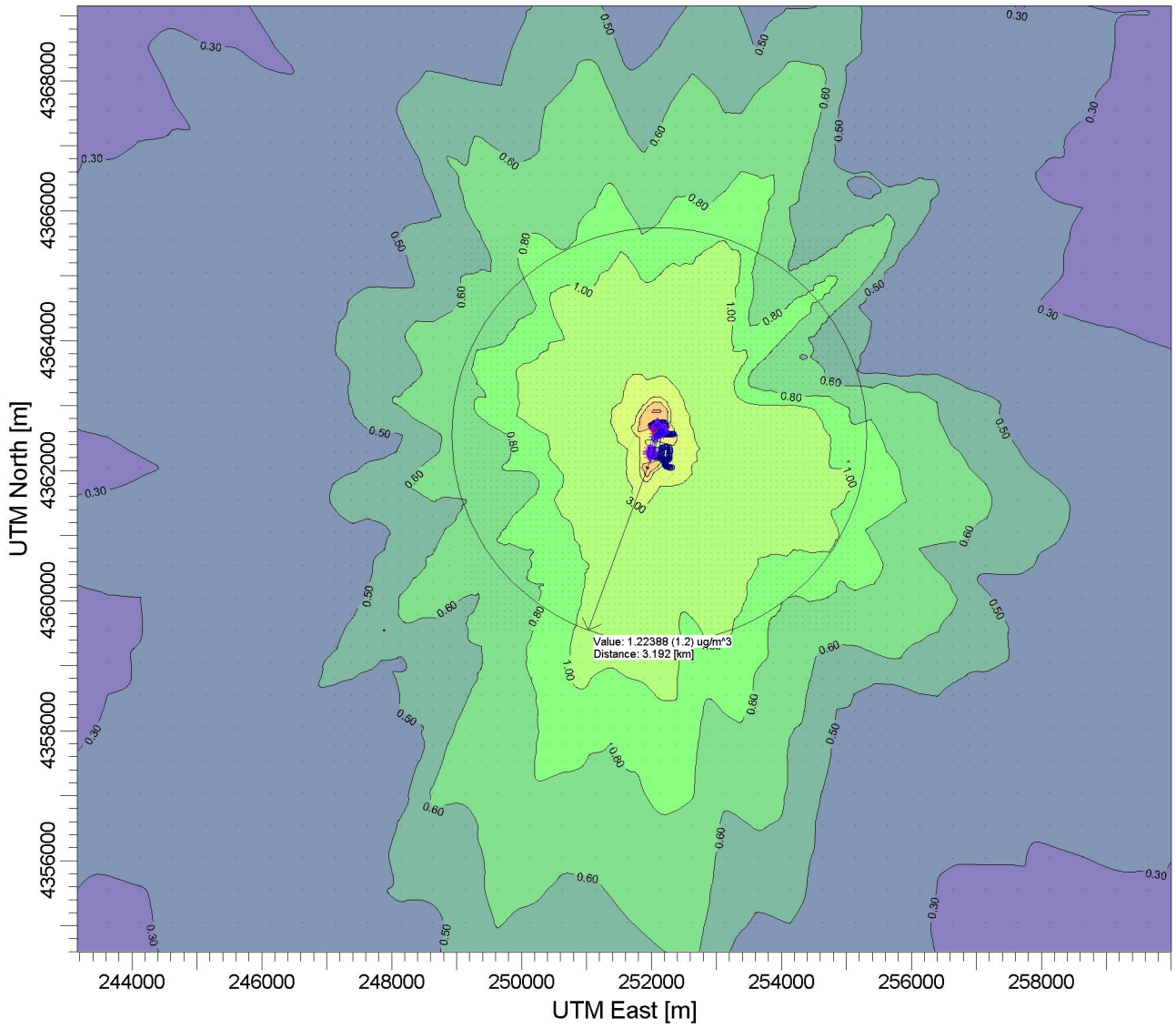
PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: ALL ug/m^3

Max: 2.545 [ug/m^3] at (252190.18, 4362918.23)

COMMENTS:	SOURCES:	COMPANY NAME:	
Met Year 2012. Modeled impacts do not include contribution from ambient background monitor.	**28**	**Roxul USA, INC.**	
	RECEPTORS: **88**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:130,289 0 5 km	
	MAX: **2.545 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
PM2.5 24-Hour SIL



PLOT FILE OF 1ST-HIGHEST MAX DAILY 24-HR VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

Max: 8.44 [ug/m^3] at (252091.96, 4362923.09)

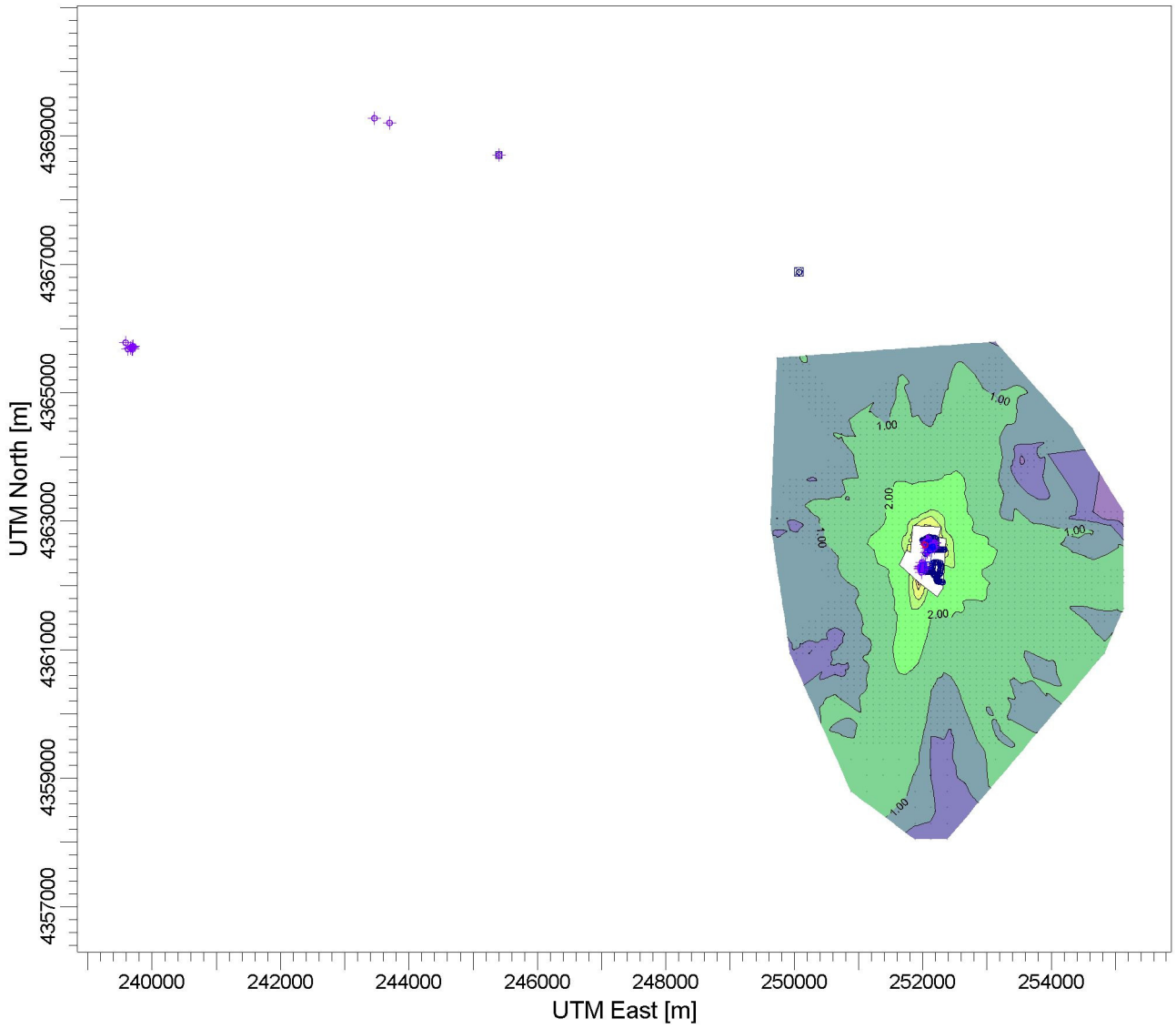
0.08 0.10 0.30 0.50 0.60 0.80 1.00 3.00 5.00 6.00 8.00 8.44

COMMENTS:	SOURCES: **119**	COMPANY NAME: **Roxul USA, INC.**	
	RECEPTORS: **9465**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:105,930 0 4 km	
	MAX: **8.44 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

AERMOD View - Lakes Environmental Software

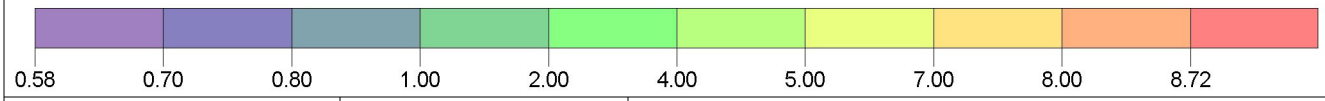
PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
PM2.5 24-Hour PSDI - Worst Case Year 2015



PLOT FILE OF HIGH 2ND HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

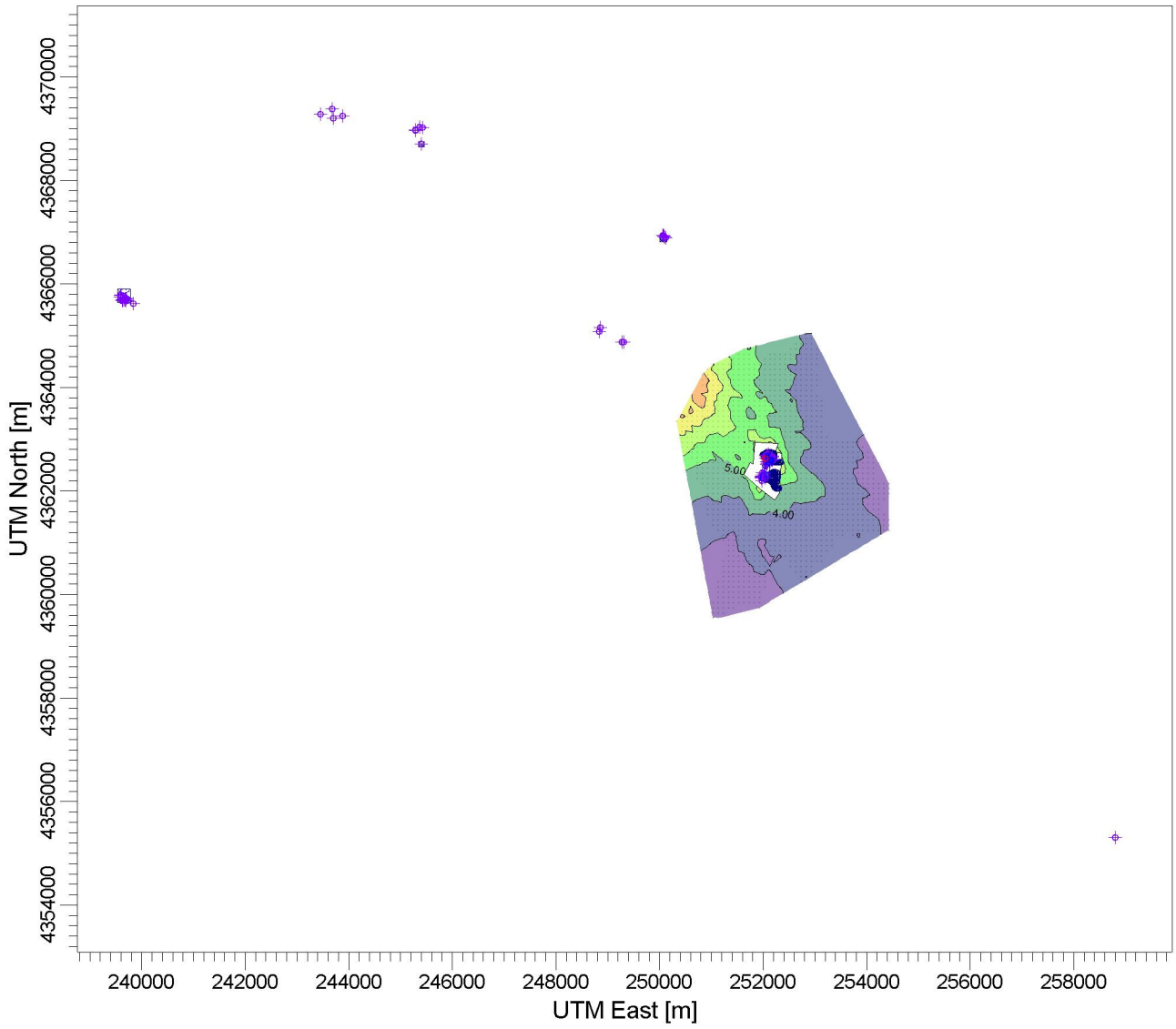
Max: 8.72 [ug/m^3] at (251942.23, 4362040.63)



COMMENTS:	SOURCES:	COMPANY NAME:	
Met Year 2015.	**140**	**Roxul USA, INC.**	
	RECEPTORS: **2106**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:107,162 (0 — 4 km)	
	MAX: **8.72 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

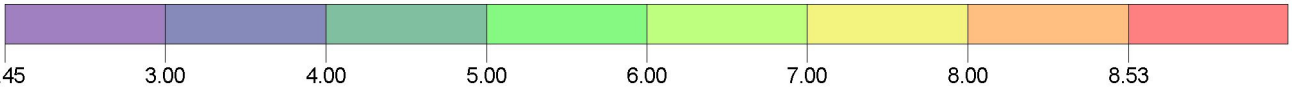
PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
PM2.5 24-Hour NAAQS



PLOT FILE OF 8TH-HIGHEST MAX DAILY 24-HR VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

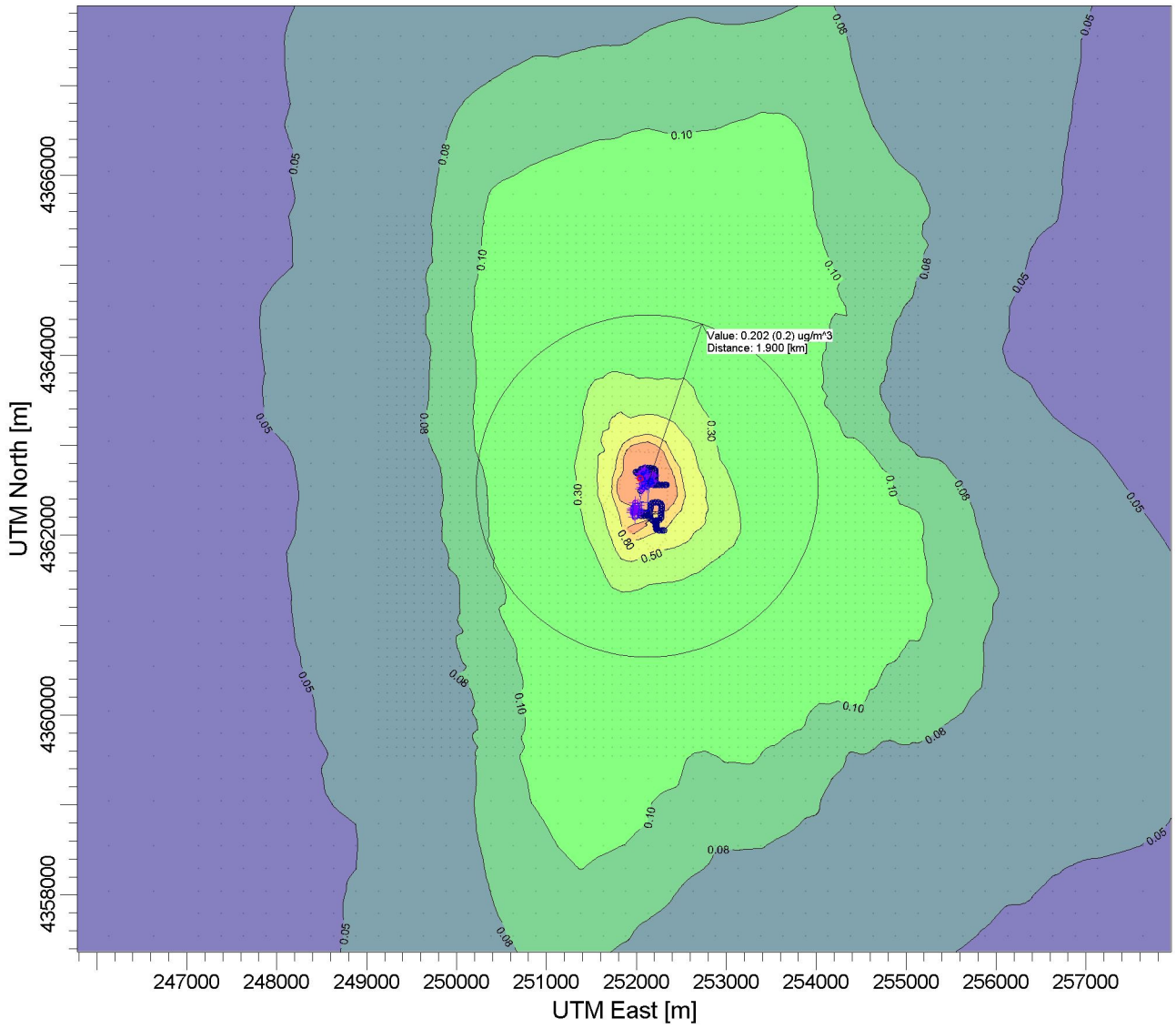
Max: 8.53 [ug/m^3] at (250830.36, 4364145.00)



COMMENTS: Modeled impacts do not include contribution from ambient background monitor.	SOURCES: **258**	COMPANY NAME: **Roxul USA, INC.**	
	RECEPTORS: **1289**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:132,999 0 5 km	
	MAX: **8.53 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
PM2.5 Annual SIL



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

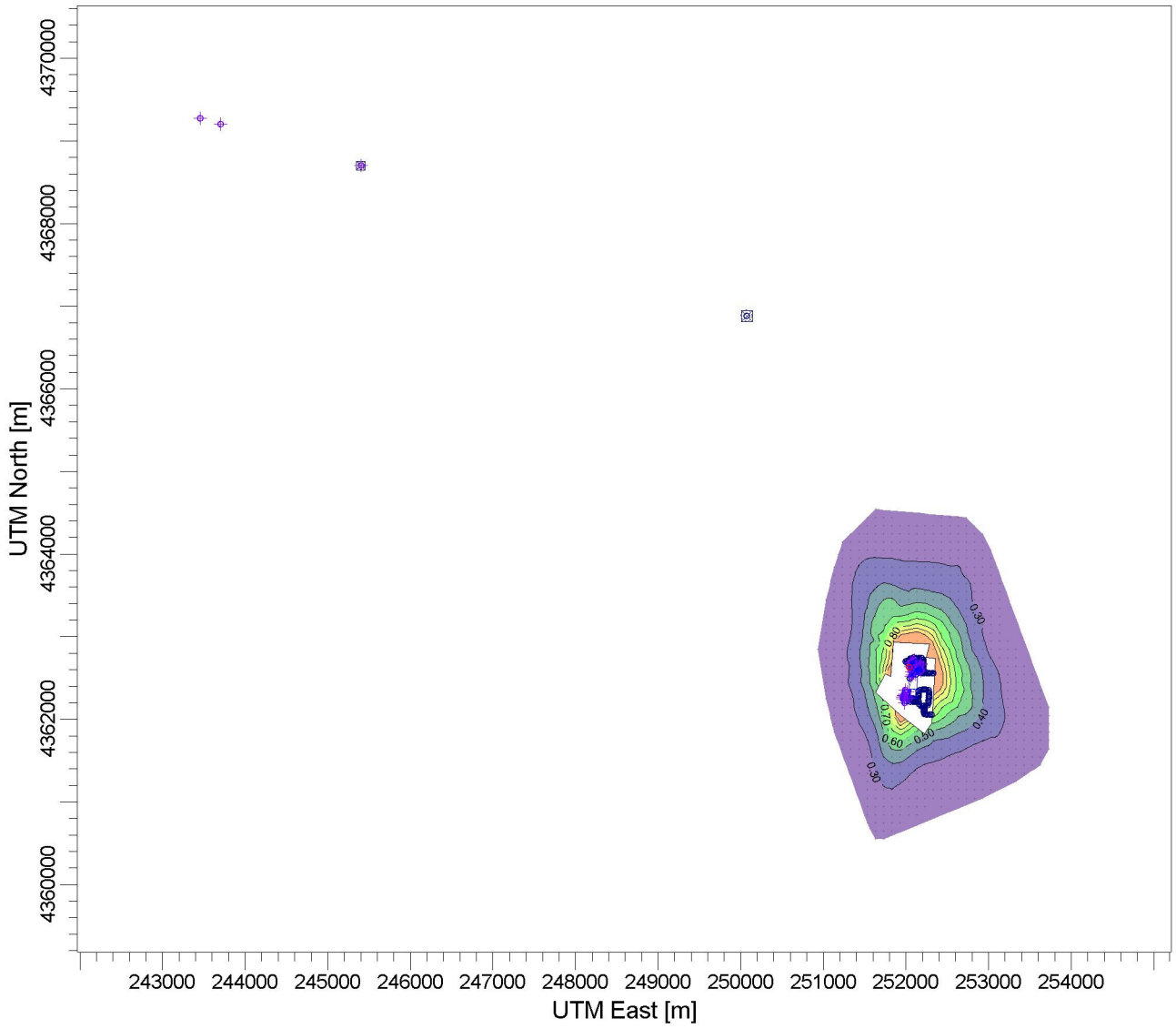
Max: 1.58 [ug/m^3] at (252241.53, 4362750.41)

0.02 0.03 0.05 0.08 0.10 0.30 0.50 0.80 1.00 1.58

COMMENTS: Averaged over 5 years.	SOURCES: **119**	COMPANY NAME: **Roxul USA, INC.**	
	RECEPTORS: **9465**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:76,532 0 3 km	
	MAX: **1.58 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

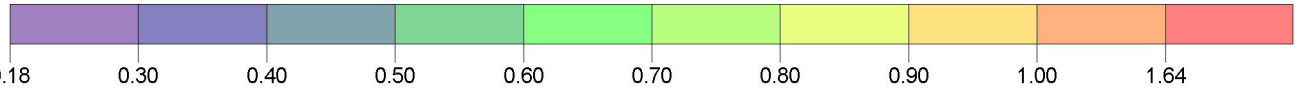
PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
PM2.5 Annual PSDI - Worst Case Year 2012



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: ALL ug/m^3

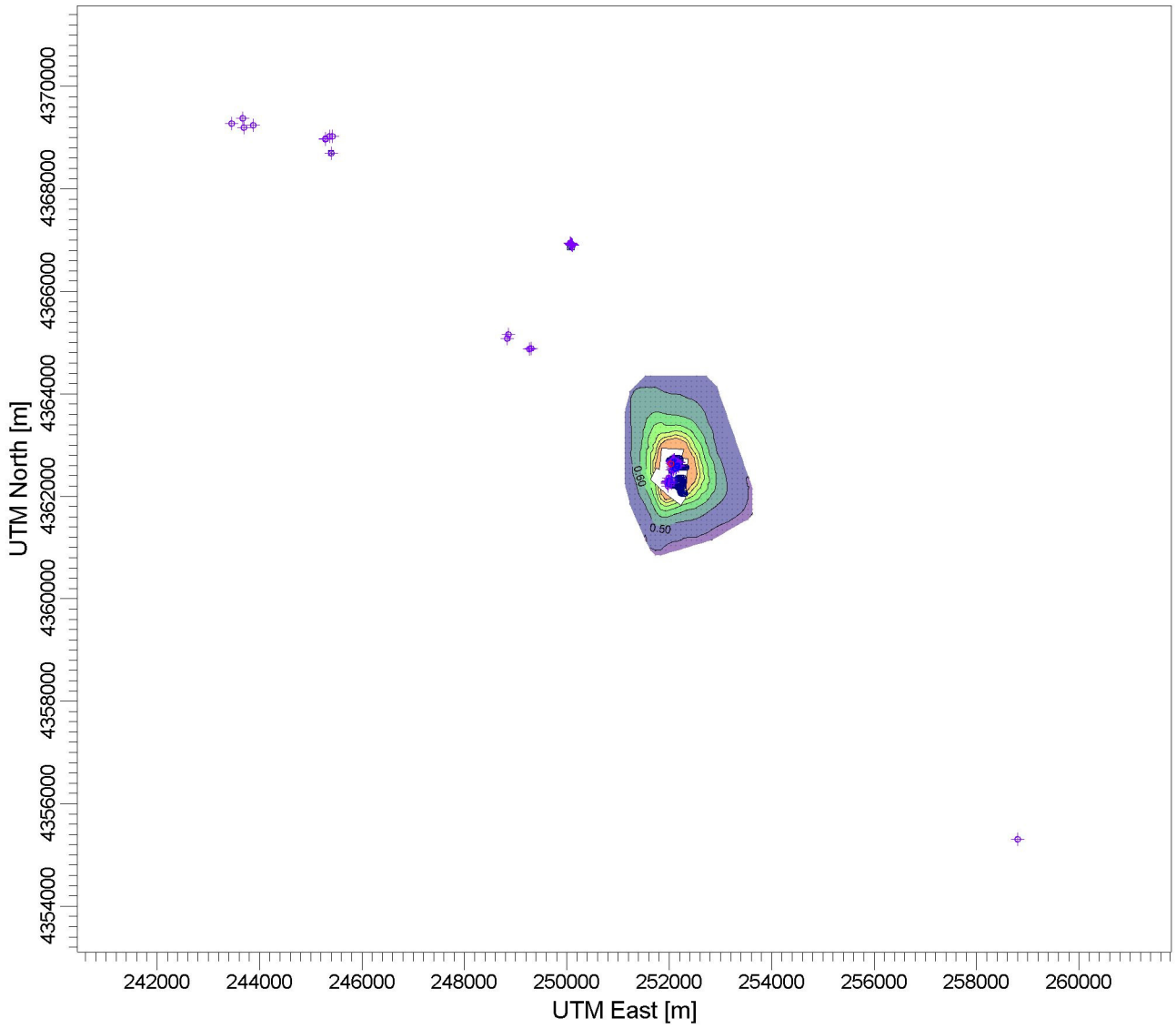
Max: 1.64 [ug/m^3] at (252241.53, 4362750.41)



COMMENTS:	SOURCES:	COMPANY NAME:	
Met Year 2012	**132**	**Roxul USA, INC.**	
	RECEPTORS: **813**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:83,310 0 3 km	
	MAX: **1.64 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

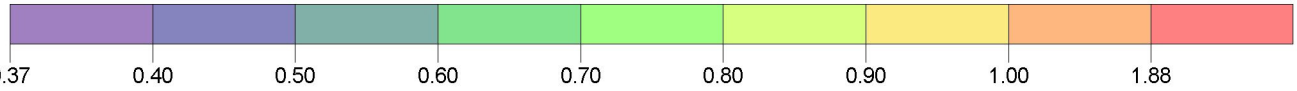
PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
PM2.5 Annual NAAQS



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

Max: 1.79 [ug/m^3] at (252241.53, 4362750.41)

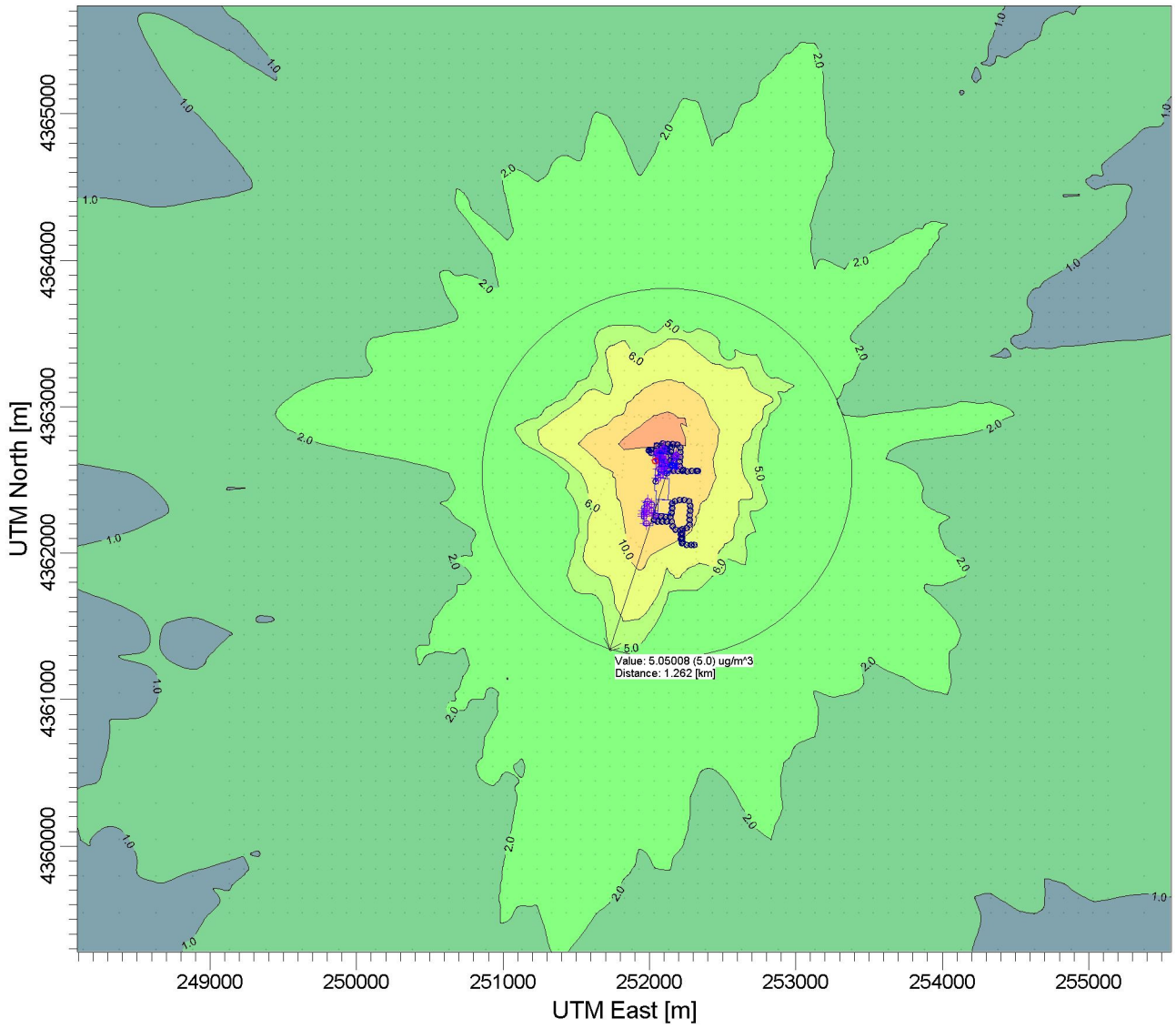


COMMENTS: Modeled impacts do not include contribution from ambient background monitor.	SOURCES: **240**	COMPANY NAME: **Roxul USA, INC.**	
	RECEPTORS: **703**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:134,370 0 5 km	
	MAX: **1.79 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

AERMOD View - Lakes Environmental Software

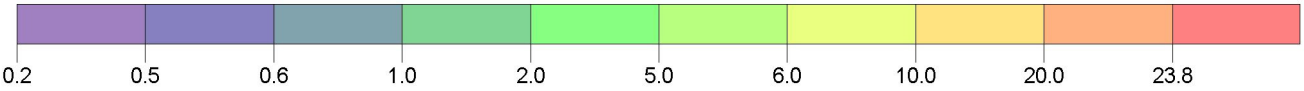
PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
PM10 24-Hour SIL



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

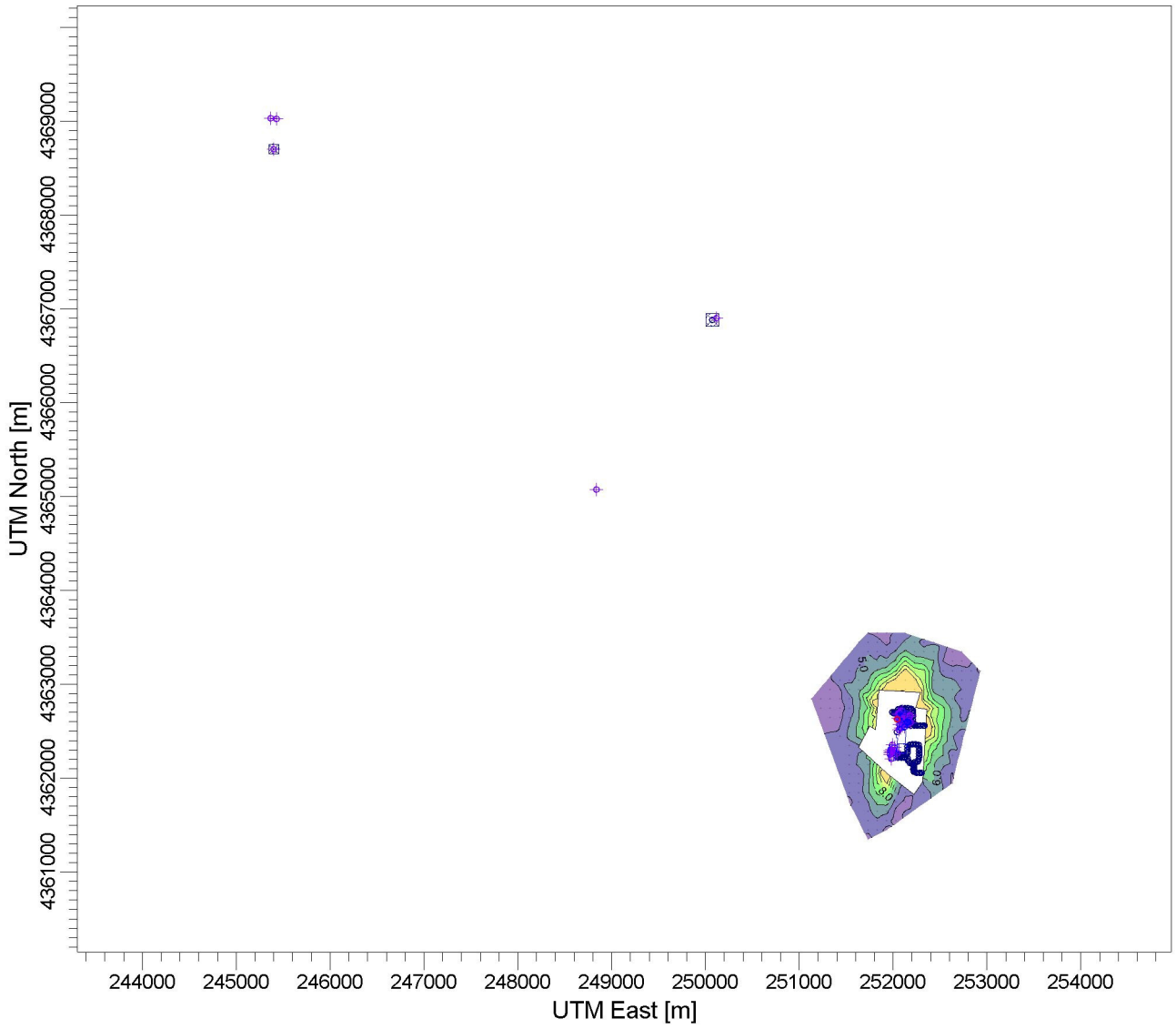
Max: 23.8 [ug/m^3] at (252141.07, 4362920.66)



COMMENTS:	SOURCES:	COMPANY NAME:	
	119	**Roxul USA, INC.**	
	RECEPTORS:	MODELER:	
	9465	**Environmental Resources Management**	
	OUTPUT TYPE:	SCALE: 1:47,003	
	Concentration	0 1 km	
	MAX:	DATE:	PROJECT NO.:
	23.8 ug/m^3	**12/15/2017**	

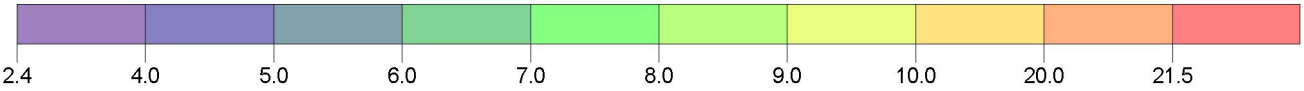
PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
PM10 24-Hour PSDI - Worst Case Year 2016



PLOT FILE OF HIGH 2ND HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

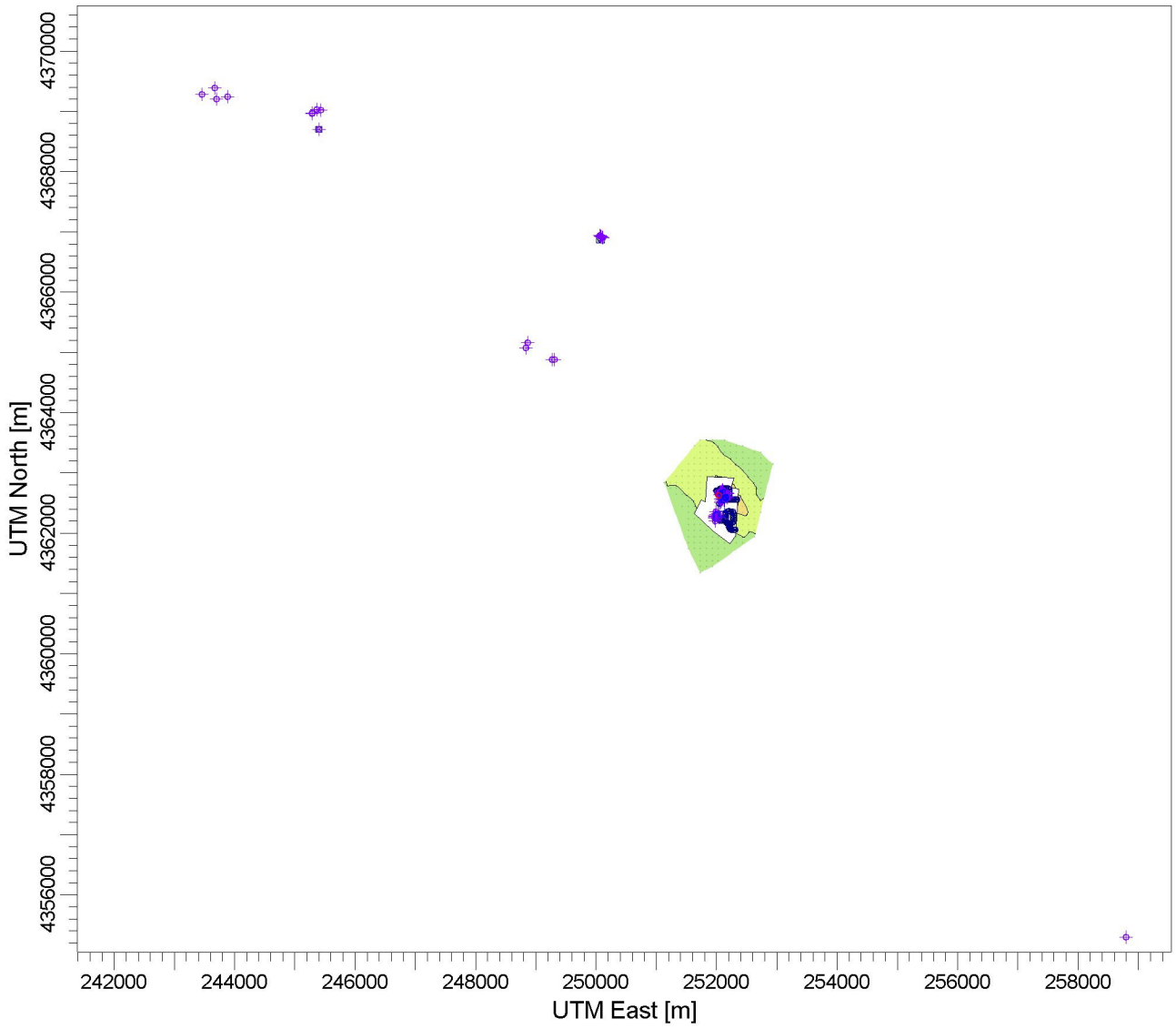
Max: 21.5 [ug/m^3] at (252091.96, 4362923.09)



COMMENTS:	SOURCES:	COMPANY NAME:	
Met Year 2016	**126**	**Roxul USA, INC.**	
	RECEPTORS: **262**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:73,333 0 2 km	
	MAX: **21.5 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

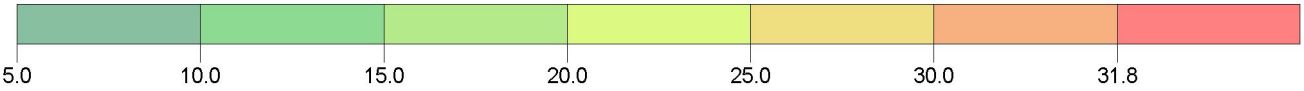
PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
PM10 24-Hour NAAQS



PLOT FILE OF HIGH 6TH HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

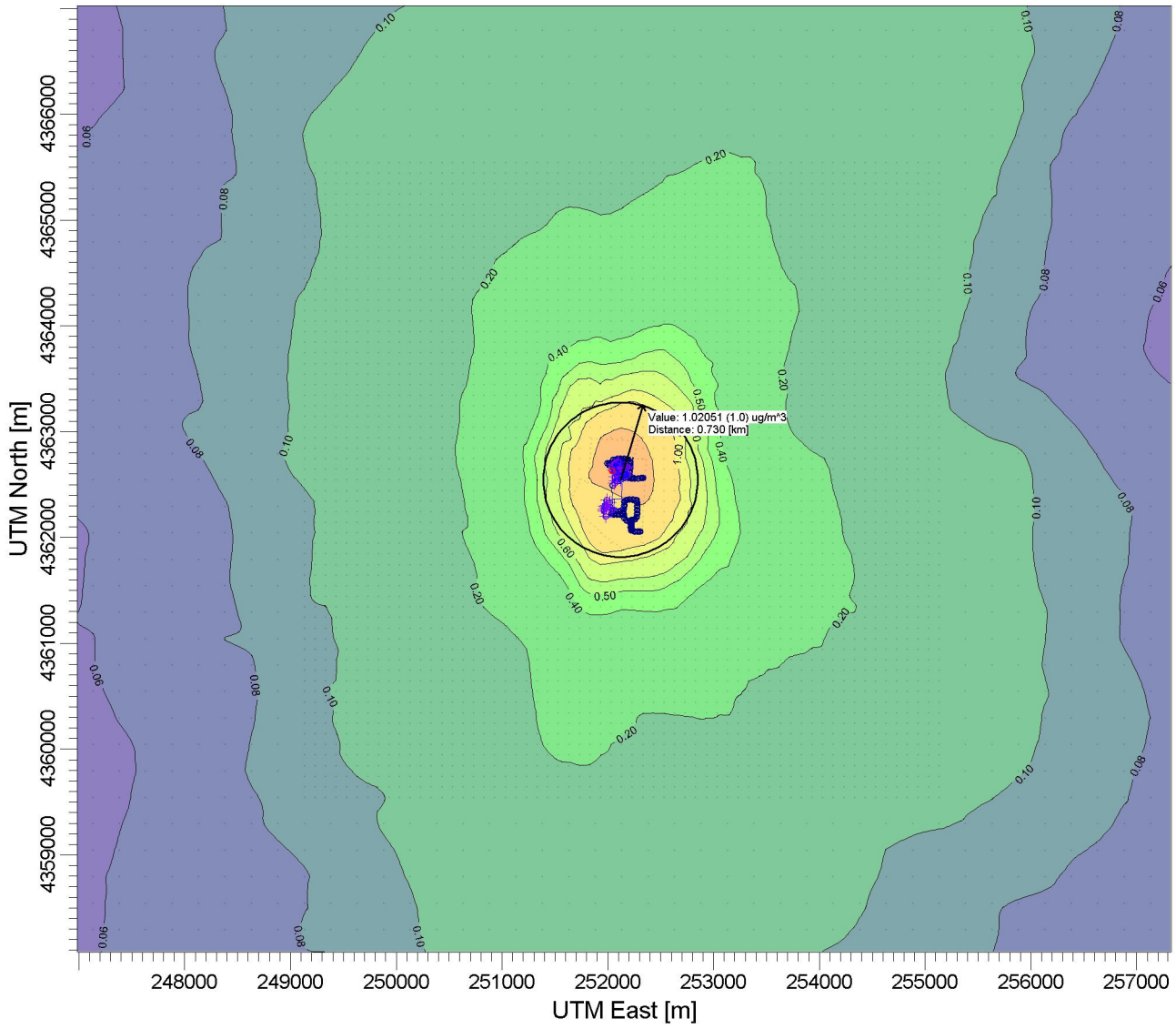
Max: 31.8 [ug/m^3] at (252349.94, 4362538.65)



COMMENTS: Modeled impacts do not include contribution from ambient background monitor.	SOURCES: **240**	COMPANY NAME: **Roxul USA, INC.**	
	RECEPTORS: **262**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:114,215 0 4 km	
	MAX: **31.8 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
PM10 Annual SIL - Worst Case Year 2012



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: ALL ug/m^3

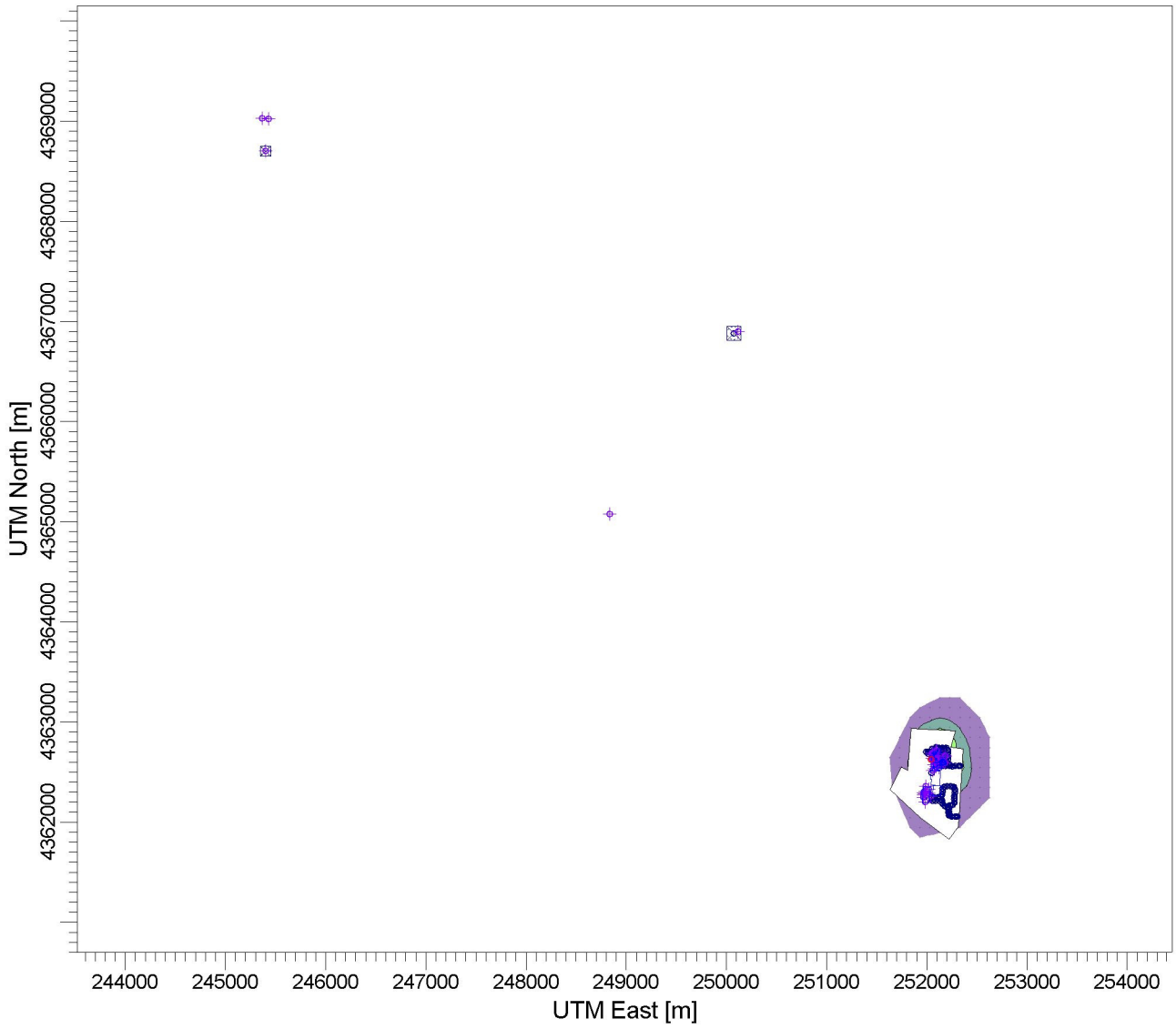
Max: 4.04 [ug/m^3] at (252241.53, 4362750.41)

0.04 0.05 0.06 0.08 0.10 0.20 0.40 0.50 0.60 0.80 1.00 2.00 4.00 4.04

COMMENTS: Met Year 2012.	SOURCES: **119**	COMPANY NAME: **Roxul USA, INC.**	
	RECEPTORS: **9465**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:65,055 — 0 — 2 km	
	MAX: **4.04 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
PM10 Annual PSDI - Worst Case Year 2012



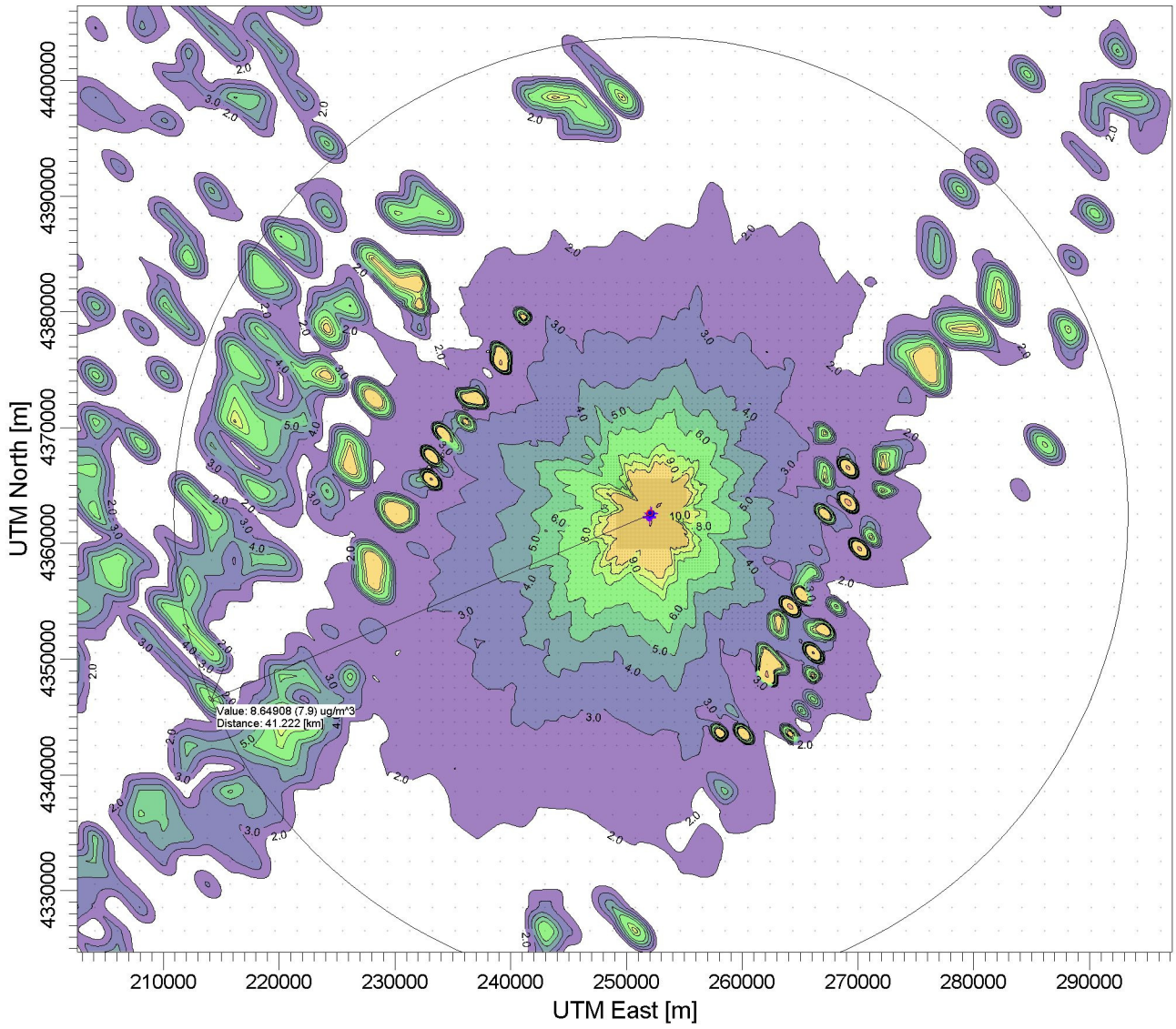
PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: ALL ug/m^3

Max: 4.10 [ug/m^3] at (252241.53, 4362750.41)

COMMENTS: Met Year 2012	SOURCES: **126**	COMPANY NAME: **Roxul USA, INC.**	
	RECEPTORS: **130**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:68,742 0 2 km	
	MAX: **4.10 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

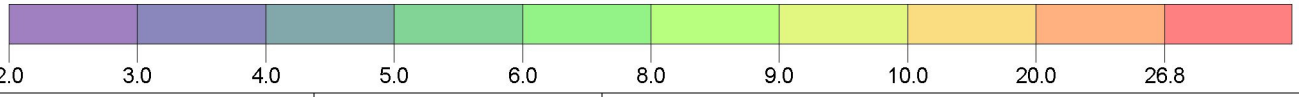
PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
SO2 1-Hour SIL



PLOT FILE OF 1ST-HIGHEST MAX DAILY 1-HR VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

Max: 26.8 [ug/m^3] at (269130.38, 4363545.00)

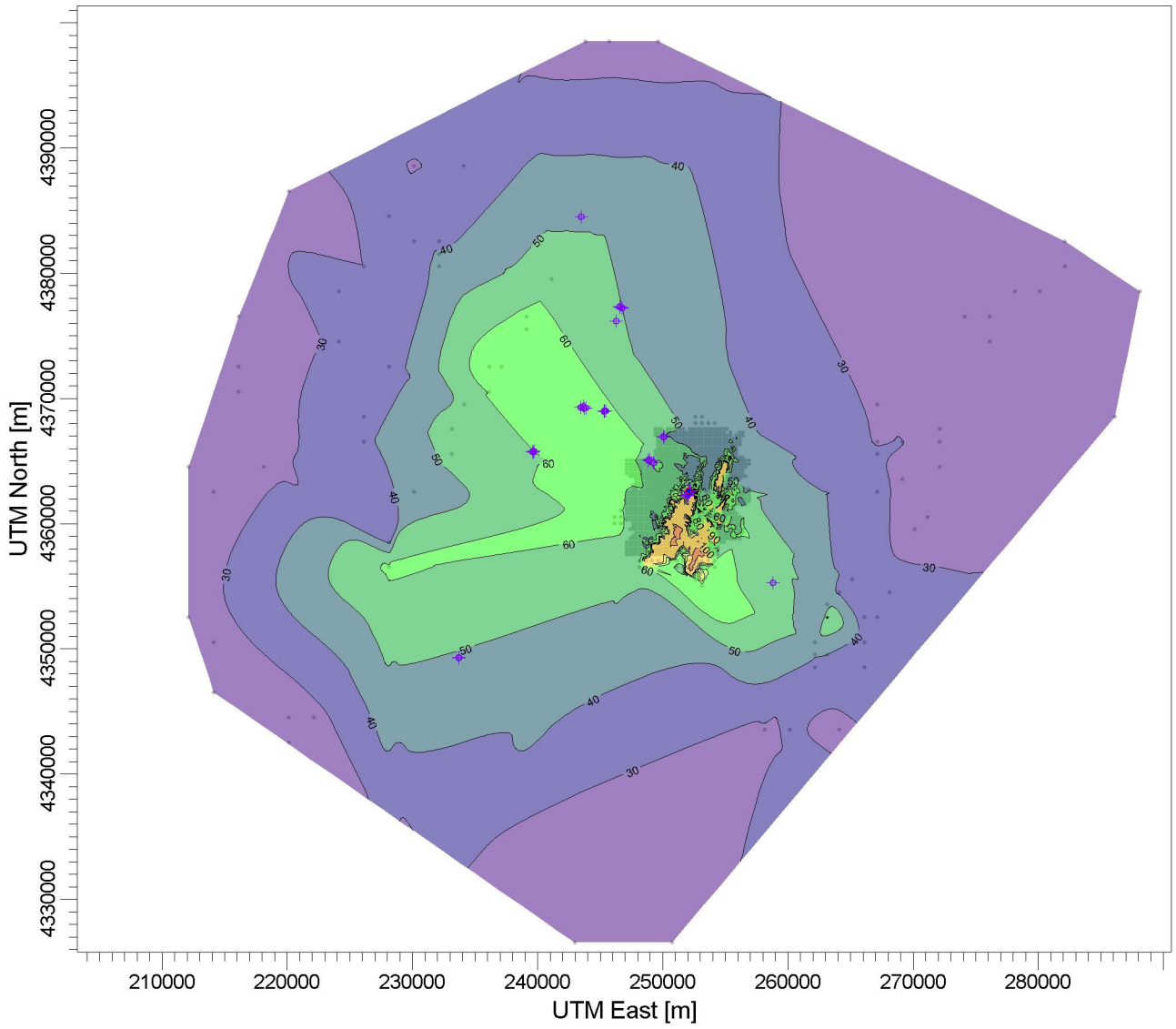


COMMENTS:	SOURCES:	COMPANY NAME:	
	13	**Roxul USA, INC.**	
	RECEPTORS:	MODELER:	
	9465	**Environmental Resources Management**	
	OUTPUT TYPE:	SCALE: 1:594,847	
	Concentration	0 20 km	
	MAX:	DATE:	PROJECT NO.:
	26.8 ug/m^3	**12/15/2017**	

AERMOD View - Lakes Environmental Software

PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
SO2 1-Hour NAAQS - Group All



PLOT FILE OF 4TH-HIGHEST MAX DAILY 1-HR VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

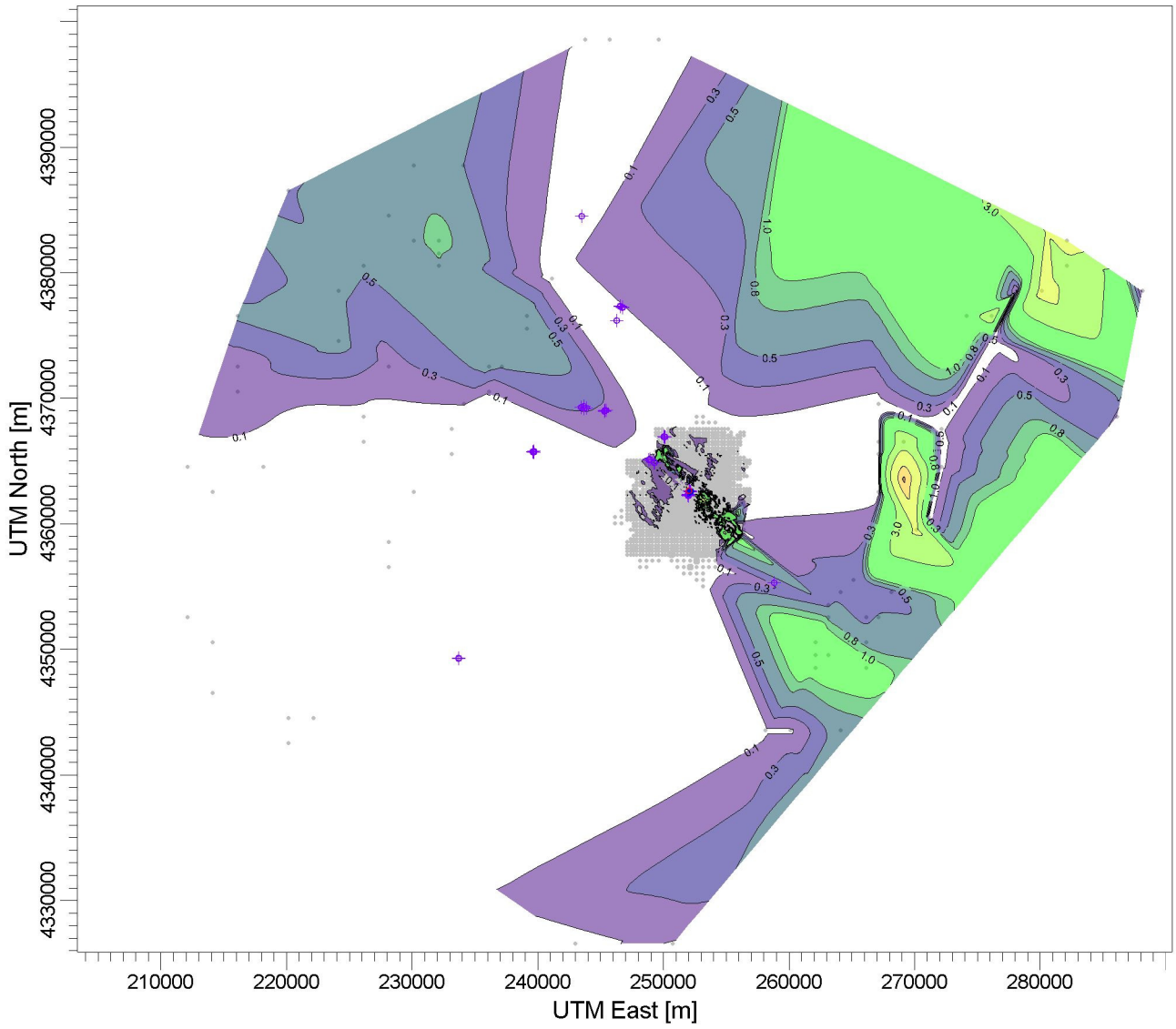
Max: 205 [ug/m^3] at (252230.36, 4356445.00)

12 30 40 50 60 80 90 100 157 205

COMMENTS: Source Group All Modeled impacts do not include ambient background monitor contribution.	SOURCES: **54**	COMPANY NAME: **Roxul USA, INC.**	
	RECEPTORS: **4646**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:549,781 0 20 km	
	MAX: **205 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
SO2 1-Hour NAAQS - Roxul Contribution to Group All



MAXDCONT FILE OF 4TH-HIGHEST MAX DAILY 1-HR VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

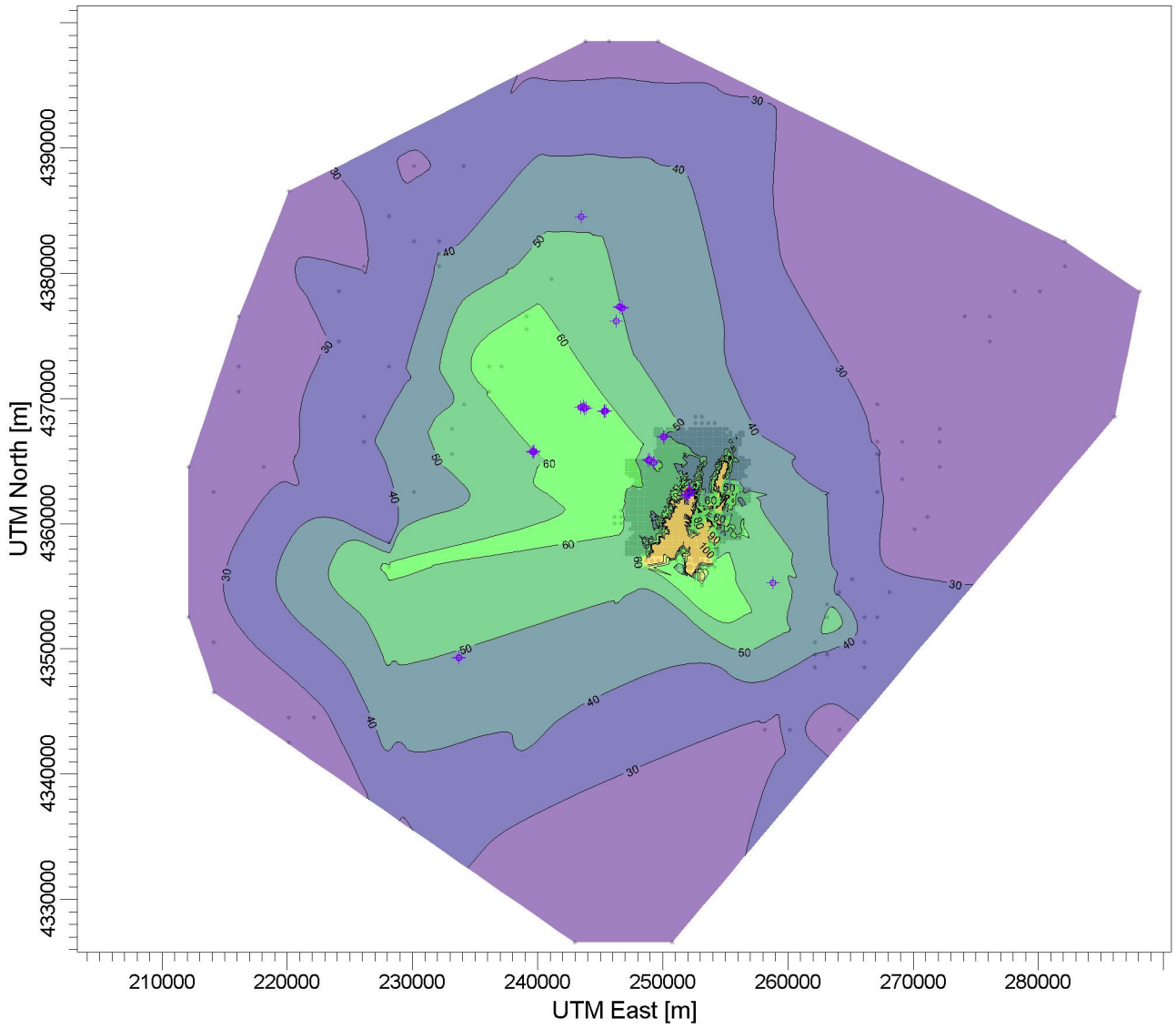
Max: 10.4 [ug/m^3] at (269130.38, 4363545.00)

0.1 0.3 0.5 0.8 1.0 3.0 5.0 8.0 10.0 10.4

COMMENTS: Contribution of Roxul sources to source group all H4H impacts. Modeled impacts do not include ambient background monitor contribution.	SOURCES: **54**	COMPANY NAME: **Roxul USA, INC.**	
	RECEPTORS: **4646**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Contribution**	SCALE: 1:548,283 0 20 km	
	MAX: **10.4 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
SO2 1-Hour NAAQS - Nearby Sources Contribution to Group All



MAXDCONT FILE OF 4TH-HIGHEST MAX DAILY 1-HR VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

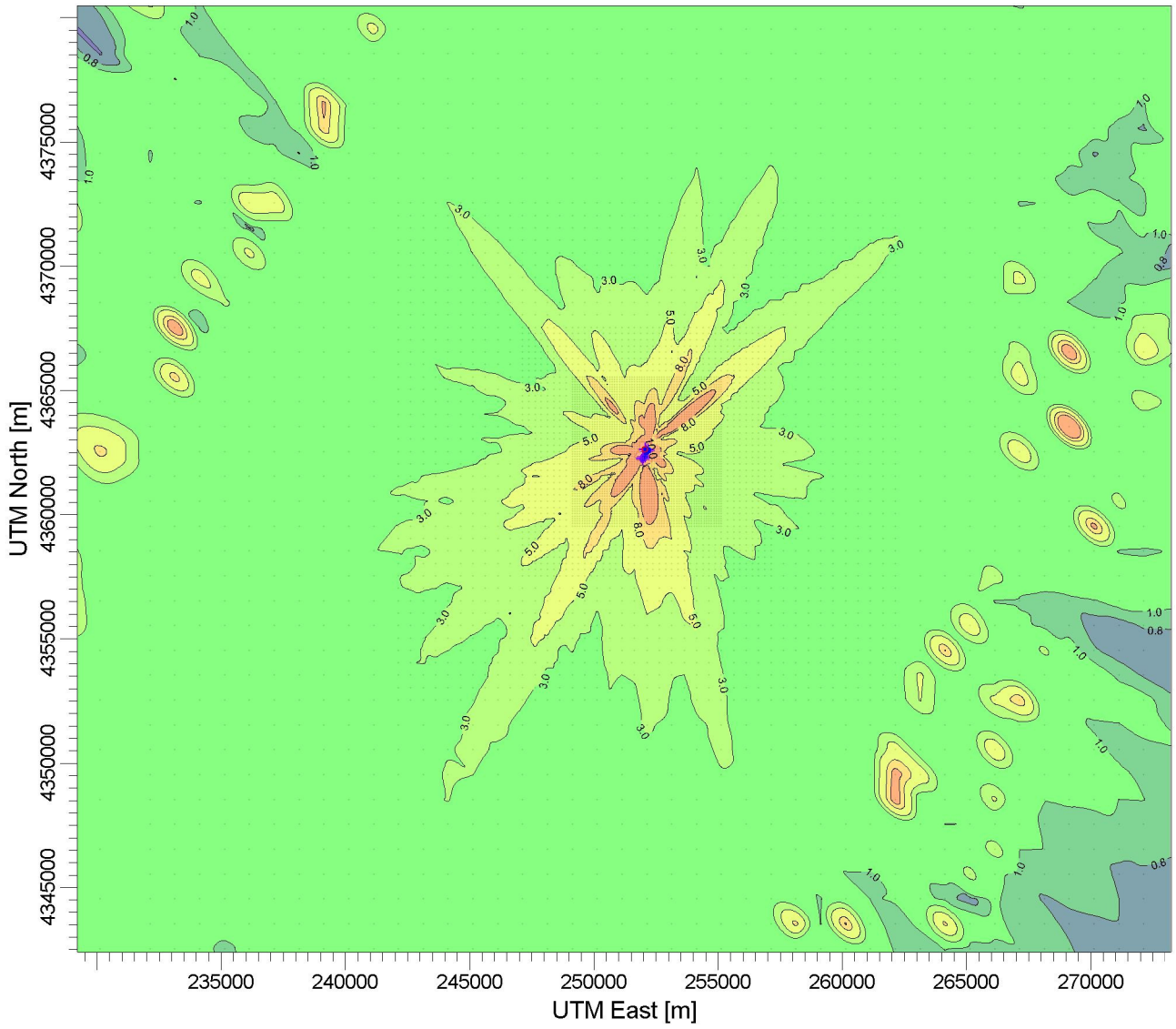
Max: 205 [ug/m^3] at (252230.36, 4356445.00)

10 30 40 50 60 80 90 100 200 205

COMMENTS: Contribution of nearby sources to source group all H4H impacts. Modeled impacts do not include ambient background monitor contribution.	SOURCES: **54**	COMPANY NAME: **Roxul USA, INC.**	
	RECEPTORS: **4646**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Contribution**	SCALE: 1:549,781 0 20 km	
	MAX: **205 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
SO2 3-Hour SIL



PLOT FILE OF HIGH 1ST HIGH 3-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

Max: 17.5 [ug/m^3] at (269130.38, 4363545.00)

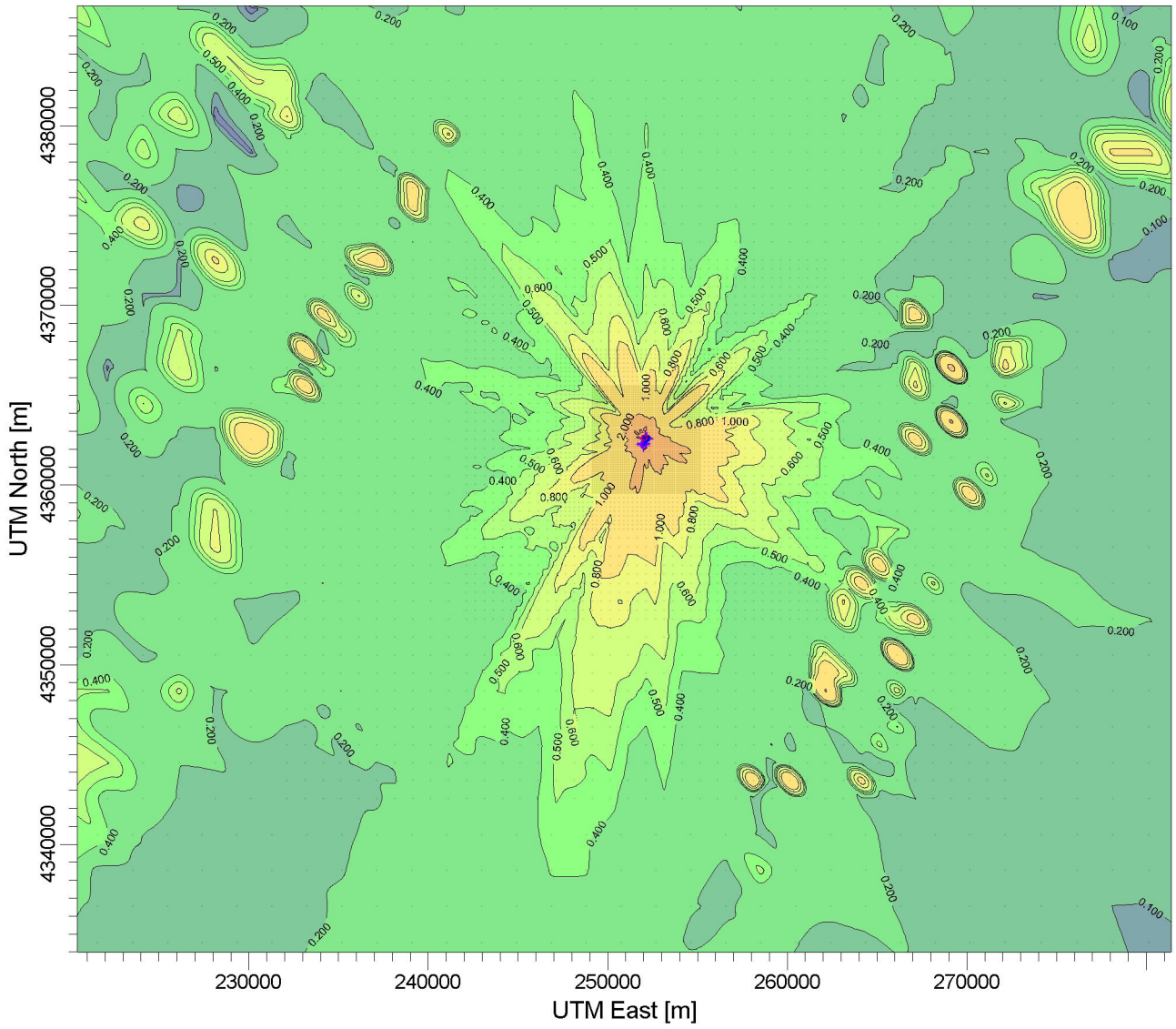
0.2 0.3 0.5 0.8 1.0 3.0 5.0 8.0 10.0 17.5

COMMENTS:	SOURCES: **13**	COMPANY NAME: **Roxul USA, INC.**	
	RECEPTORS: **9465**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:276,995 — 0 — 10 km	
	MAX: **17.5 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

AERMOD View - Lakes Environmental Software

PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
SO2 24-Hour SIL



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

Max: 4.573 [ug/m^3] at (251895.54, 4362932.80)

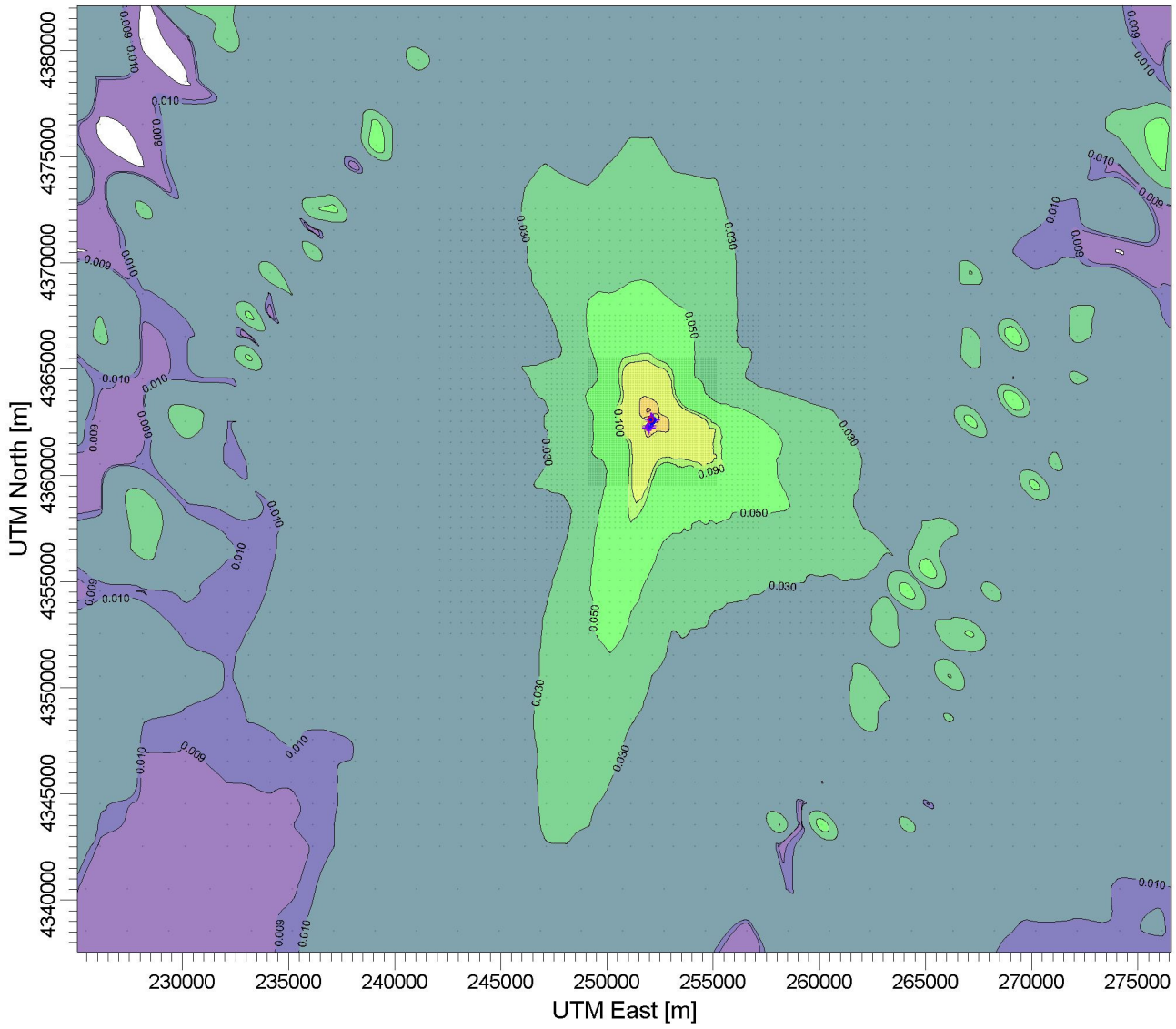
0.046 0.050 0.060 0.080 0.100 0.200 0.400 0.500 0.600 0.800 1.000 2.000 4.000 4.573

COMMENTS:	SOURCES: **13**	COMPANY NAME: **Roxul USA, INC.**	
	RECEPTORS: **9465**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:383,354 0 10 km	
	MAX: **4.573 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

AERMOD View - Lakes Environmental Software

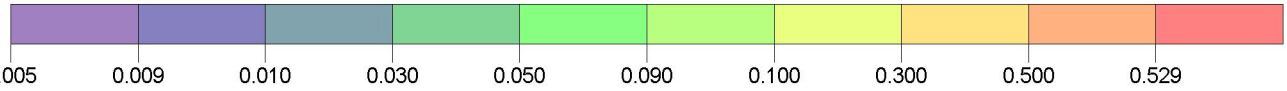
PROJECT TITLE:

Roxul USA, Inc. Prevention of Significant Deterioration Application
SO2 Annual SIL - Worst Case Year 2015



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: ALL ug/m^3

Max: 0.529 [ug/m^3] at (251930.36, 4363045.00)



COMMENTS:	SOURCES:	COMPANY NAME:	
Met Year 2015	**13**	**Roxul USA, INC.**	
	RECEPTORS: **9465**	MODELER: **Environmental Resources Management**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:324,093 0 10 km	
	MAX: **0.529 ug/m^3**	DATE: **12/15/2017**	PROJECT NO.:

Attachment 5
Electronic Modeling Files and Directory Overview
(Electronic files provided to WVDEP)