

**STATE OF NEW MEXICO
BEFORE THE SECRETARY OF THE ENVIRONMENT**

**IN THE MATTER OF THE APPLICATION
OF ROPER CONSTRUCTION INC.
FOR AN AIR QUALITY PERMIT
NO. 9295 - ALTO CONCRETE BATCH PLANT**

AQB 21-57 (P)

**AIR QUALITY BUREAU'S STATEMENT OF INTENT TO PRESENT TECHNICAL
TESTIMONY**

Pursuant to 20.1.4.300(B)(1) NMAC, the Air Quality Bureau ("Bureau"), within the Environmental Protection Division ("Division") of the New Mexico Environment Department ("Department"), files this Statement of Intent to Present Technical Testimony at the public hearing in this matter in support of the application ("Application") by Roper Construction, Inc. ("Applicant") for an air quality construction permit ("Permit") for Applicant's facility in Alto, New Mexico. The public hearing in this matter is currently scheduled for February 9, 2021, and continuing, if necessary, for additional days. The Bureau submits to the Secretary the following:

1. Party filing this Statement of Intent

The Air Quality Bureau within the Environmental Protection Division of the Department.

2. Division's Recommendation on the application

The Bureau, on behalf of the Division, recommends the approval of the application provided that the Applicant complies with the conditions of the permit. The Bureau reserves the right to recommend additional conditions for the permit. The Bureau also reserves the right to

modify its position based on any comment or testimony presented at the hearing or based on any written comments submitted in connection with the application.

3. Technical Witness Information

The Bureau will call the following witnesses at the hearing to present technical testimony:

A. Deepika Saikrishnan, Permit Specialist in the Technical Services Unit of the Permitting Section of the Bureau, 525 Camino de los Marquez, Suite 1, Santa Fe, NM 87505. A copy of Ms. Saikrishnan's direct testimony is attached as NMED Exhibit 1 and copy of her resume is attached as NMED Exhibit 2. Ms. Saikrishnan's testimony is estimated to last approximately twenty minutes and will address the following topics: her education and professional qualifications, a summary of the Application, an overview of construction permits authorized under 20.2.72 NMAC, her administrative and technical review of the Application, the Bureau's public outreach efforts throughout various stages of this permitting action, and the basis for conditions in Draft Permit for Applicant's proposed facility.

B. Eric Peters, Air Dispersion Modeler for the Bureau, 525 Camino de los Marquez, Suite 1, Santa Fe, NM 87505. Mr. Peters' direct testimony is attached as NMED Exhibit 3 and a copy of Mr. Peters' resume is attached as NMED Exhibit 4. Mr. Peters' testimony is estimated to last approximately twenty minutes and will address the following topics: his education and professional qualifications, his review of the air dispersion modeling submitted by the Applicant in this matter, his verification that the facility followed appropriate modeling practices, and the standards applicable to such modeling practices.

C. Rhonda Romero, Minor Source Section Manager for the Bureau, 525 Camino de los Marquez, Suite 1, Santa Fe, NM 87505. A copy of Ms. Romero's resume is attached as NMED Exhibit 5. Ms. Romero will be appearing as a technical rebuttal witness and will not be

presenting direct testimony. Her testimony is estimated to last approximately forty-five minutes and will address the following topics: her education and professional qualifications, challenges to permit conditions, challenges to public outreach and public notice efforts undertaken by the Bureau, and Bureau permitting policy and procedure.

D. **Kathleen Primm**, Supervisor in the Minor Source Unit of the Permitting Section of the Bureau, 525 Camino de los Marquez, Suite 1, Santa Fe, NM 87505. A copy of Ms. Primm’s resume is attached as NMED Exhibit 6. Ms. Primm will be appearing as a technical rebuttal witness and will not be presenting direct testimony. Her testimony is estimated to last approximately forty-five minutes and will address the following topics: her education and professional qualifications, challenges to permit conditions, and challenges to public outreach and public notice efforts undertaken by the Bureau.

4. List of Exhibits and Index

Exhibits that the Bureau intends to offer into evidence are listed below. Also attached is an index to the Administrative Record (NMED Exhibit 8). The Department reserves the right to introduce and move for admission of any other exhibit in support of rebuttal or additional direct testimony at the hearing.

NMED Exhibit 1	Deepika Saikrishnan Direct Testimony
NMED Exhibit 2	Deepika Saikrishnan Resume
NMED Exhibit 3	Eric Peters Direct Testimony
NMED Exhibit 4	Eric Peters Resume
NMED Exhibit 5	Rhonda Romero Resume
NMED Exhibit 6	Kathleen Primm Resume

NMED Exhibit 7

New Mexico Modeling Guidelines

NMED Exhibit 8

Administrative Record Index

/s/ Chris Vigil

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing *Statement of Intent to Present Technical Testimony* was served by email on the following on January 19, 2022:

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**STATE OF NEW MEXICO
BEFORE THE DEPUTY SECRETARY OF ENVIRONMENT**

**IN THE MATTER OF THE APPLICATION
OF ROPER CONSTRUCTION, INC.
FOR AN AIR QUALITY PERMIT**

AQB 21-57 (P)

TECHNICAL TESTIMONY OF DEEPIKA SAIKRISHNAN

1 I. INTRODUCTION

2 My name is Deepika Saikrishnan. I am a Permit Specialist in the Technical Services Unit
3 of the Permitting Section of the Air Quality Bureau (“AQB or Bureau”) of the New Mexico
4 Environment Department (“NMED” or “Department”). I present this written testimony on behalf
5 of the Department for the public hearing on the permit application submitted by Roper
6 Construction, Inc. (“RCI”). Citizens challenge the Department’s issuance of Air Quality Permit
7 No. 9295 to Roper Construction, Inc. for the Alto Concrete Batch Plant (“Alto CBP”) in Lincoln
8 County, New Mexico. RCI’s air permit application 9295 (“Application 9295”) for its Alto
9 Concrete Batch Plant was received by the New Mexico Environment Department on June 22,
10 2021. [AR No. 1, Bates 0001-0190]. Citizens contend that the Department’s issuance of the
11 proposed RCI permit would have negative impacts on air quality; endanger public health; increase
12 noise and vehicle traffic on public roads; impact the night sky with light pollution; degrade natural
13 beauty and quality of life for residents; and threaten wildlife, tourism, water quality, water
14 conservation and property values.

15 As a Permit Writer, it is my responsibility to conduct a complete and thorough review of an
16 air quality permit application, including an administrative review and a technical review. I
17 coordinate with various stakeholders including the public, industry, consultants, Air Quality
18 Bureau staff, and other regulatory agencies to provide quality customer service and aid in the
19 permitting process. If parts of the application are incomplete or inaccurate, it is my responsibility

1 to contact the applicant and request clarifications or corrections, as necessary. Updates to the
2 original application are often required, and it is my responsibility to review all updates for
3 completeness and accuracy. I write technical support documents and a legally enforceable air
4 permit, initially based on standardized AQB template language and monitoring protocols. The
5 template language and monitoring protocols are consistent for similar types of facilities. Unique
6 permitting conditions or modifications to standard template language are typically required for site
7 specific operations and equipment, based on information provided in the application. I customize
8 the permit to the specifics of the application with site specific conditions and the recommendations
9 of the air dispersion modeling staff to ensure the facility will operate as represented in the
10 company's application and comply with all applicable state and federal regulations and ambient
11 air quality standards.

12 My testimony will address the following topics: my qualifications, a summary of
13 Application 9295, an overview of the construction permits authorized under 20.2.72 NMAC, my
14 administrative review of Application 9295, the technical review of Application 9295, AQB's
15 public outreach efforts throughout various stages of this permitting action, and the basis for
16 conditions in the 2021-12-30 version of Draft Permit 9295 for RCI's proposed facility.

17 **II. QUALIFICATIONS**

18 I have been an employee of the Bureau for approximately three years, working as a Permit
19 Specialist. As a Permit Specialist, I perform technical and regulatory review of complex Air
20 Quality Bureau permit applications within regulatory deadlines. I verify emissions calculations;
21 determine applicable state regulations and federal regulations; coordinate with various
22 stakeholders including the public, industry, consultants, and AQB staff; review air permit
23 applications and technical support documents for the administrative record; enter data into the

1 AQB database; and complete various special projects to achieve AQB goals. I have worked on
2 over 430 permitting actions for the Bureau

3 My full background and qualifications are set forth in my resume. [**AR No. 11, Bates 0397-**
4 **0399**].

5 **III. SUMMARY OF APPLICATION 9295**

6 RCI's Alto Concrete Batch Plant is proposed to be located approximately 0.35 miles east
7 of the intersection of Highways 48 and 220 north of Ruidoso, NM in Lincoln County. If the permit
8 application is approved, RCI intends to construct a 125 cubic yards per hour and 500,000 cubic
9 yards per year concrete batch plant. The facility will include a feeder hopper, feeder conveyor,
10 four (4) overhead aggregate bins, aggregate weigh batcher, aggregate weigh conveyor, truck-
11 loading with baghouse, cement/fly ash weigh batcher, cement split silo, fly ash split silo,
12 aggregate/sand storage piles and three (3) concrete batch plant heaters. RCI certifies that Alto CBP
13 will have hours of operation of 7AM-6PM from November through February, 5AM-7PM March
14 and October, 4AM-9PM April and September and 3AM-9PM May through August. RCI also
15 certifies that the facility will limit the hourly production rate to 125 cubic yards per hour and yearly
16 production rate to 500,000 cubic yards per year. The annual emissions are controlled by limiting
17 the hours of operation and annual throughput of the facility.

18 **IV. OVERVIEW OF CONSTRUCTION PERMITS UNDER 20.2.72 NMAC**

19 Pursuant to 20.2.72 NMAC, Construction Permits are required in New Mexico for all
20 facilities with a potential emission rate either greater than 10 pounds per hour (lb/hr) or 25 tons
21 per year (TPY) for pollutants with a national or state ambient air quality standard. Once the
22 application has demonstrated compliance with all state and federal requirements, the Department

1 drafts a permit that will ensure the facility operates as stated in their application. This is achieved
2 through monitoring, recordkeeping, and reporting protocols prescribed in the permit.

3 The Clean Air Act (“CAA”), 42 U.S.C. §7401, et seq. (2018), is the comprehensive federal
4 law that regulates air emissions from stationary and mobile sources. The CAA was last amended
5 in 1990 and requires the Environmental Protection Agency (“EPA”) to set National Ambient Air
6 Quality Standards, 40 C.F.R. Part 50, for pollutants considered harmful to public health and the
7 environment. Section 109 of the CAA identifies two types of national ambient air quality standards
8 (“NAAQS”). 42 U.S.C. § 7409 (2018). Primary standards provide public health protection,
9 including protecting the health of "sensitive" populations such as asthmatics, children, and the
10 elderly. Secondary standards provide public welfare protection, including protection against
11 decreased visibility and damage to animals, crops, vegetation, and buildings. Both primary and
12 secondary NAAQS specify the maximum concentrations of these pollutants that can be present in
13 the ambient air (<https://www.epa.gov/criteria-air-pollutants/naaqs-table> [accessed January 19,
14 2022, 9: 48 AM.]). These standards are based on scientific and medical studies of pollutant effects.
15 The EPA has set NAAQS for six principal pollutants, which are called criteria air pollutants.
16 Criteria pollutants include carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), ozone (O₃),
17 particulate matter (PM₁₀, PM_{2.5}), and sulfur dioxide (SO₂) ([https://www.epa.gov/criteria-air-](https://www.epa.gov/criteria-air-pollutants)
18 [pollutants](https://www.epa.gov/criteria-air-pollutants) [January 19, 2022, 9:51 AM]). Periodically, the standards are reviewed and may be
19 revised.

20 New Mexico and other states do not have the resources to conduct the extensive scientific
21 reviews that EPA conducts to determine the state of the science on what doses of pollution cause
22 unwanted health effects. The extensive review EPA conducts is designed for the entire country.
23 While EPA requires all states comply with the air quality standards that they develop, states are

1 allowed to develop standards that allow lower amounts of exposure to pollution than the federal
2 standards, but all must at least meet the federal NAAQS. 42 U.S.C. §§ 7409-7410 (2018). The
3 New Mexico ambient air quality standards (NMAAQs) have some standards more stringent than
4 the NAAQS. 20.2.3 NMAC.

5 New Source Review (NSR) is a CAA program that requires permittees to submit a permit
6 application and document types and quantities of air emissions that will be emitted from industrial
7 facilities before they begin construction or modification. 42 U.S.C. §§ 7401-7431, 7501-7515
8 (2018). The resulting NSR permit is a legal document specifying all applicable state and federal
9 regulations, required emissions controls, emission limits, and assurances of adherence to these
10 limits. These assurances are in the form of monitoring, recordkeeping, reporting, and testing
11 requirements that are incorporated into the permit to make it enforceable. An NSR permit places
12 restrictions on what construction is allowed, what air emission limits must be met, and how a
13 facility can be operated.

14 NSR permits are coordinated under 20.2.72 NMAC, per 20.2.72.201 NMAC. NMED's
15 authority to condition a permit is stated in 20.2.72.210 NMAC. Permit conditions are based on the
16 contents of the permit application and conditions necessary to demonstrate compliance with
17 applicable air quality regulations and ambient standards.

18 The Clean Air Act and state regulations do not provide the AQB legal authority to regulate
19 impacts that are not specifically related to air quality.

20 **V. ADMINISTRATIVE REVIEW**

21 Application 9295 was received by the New Mexico Environment Department on June 22,
22 2021. Pursuant to 20.2.72.207(A) NMAC, the Department had 30 days to review the application
23 and determine whether it was administratively complete.

1 On June 3, 2021, the Bureau received a call from a citizen concerned about this application.
2 There were several letters and calls from citizens concerned in the following days. Upon receipt
3 of the hard copy application on June 22, 2021, on June 23,2021, I requested RCI’s consultant Paul
4 Wade to provide the electronic version of the documents due to the mandatory teleworking policy
5 in place at that time. Paul Wade provided the electronic documents to me and the modeling files
6 to the Bureau’s Modeling Section. A copy of Application 9295 was posted on the AQB web page
7 for permit applications with public interest on June 23, 2021 [**AR No. 94, Bates 1741**].

8 The administrative review of an application is not a technical review, but a review of the
9 presence of the required parts of the application, including the applicant’s modeling analysis and
10 the applicant’s proof of public notice. All required contents of the application are listed in
11 20.2.72.203 NMAC. On June 28, 2021, I received an email from AQB’s Modeling Section
12 manager Sufi Mustafa confirming that Application 9295 could be ruled complete from a modeling
13 perspective [**AR No. 89, Bates 0965-0966**]. On July 19, 2021, I sent an email to RCI’s consultant
14 Paul Wade, requesting the property tax record, the certified mail receipt for Reynaldo Cervantes,
15 and an example of the letter sent to the landowners [**AR No. 36, Bates 0481**]. Mr. Paul Wade
16 responded on July 19, 2021, providing the list provided by the Lincoln County Assessor’s office,
17 the certified mail receipt for Reynaldo Cervantes’s Mexico address which was already present in
18 the original application, and a statement that the letter sent to the government officials was also
19 sent to the landowners [**AR No. 37, Bates 0482-0487**].

20 After I calculated the permit fee for RCI’s application 9295 based on fee units in 20.2.75
21 NMAC and applicable regulations, AQB’s administrative staff generated an invoice for the permit
22 fee. On July 22, 2021, I ruled application 9295 administratively complete [**AR No. 38, Bates 0488-**
23 **0493**]. I sent the completion determination letter, including a copy of the Department’s Legal

1 Notice, and invoice for the permit fee to the applicant on July 22, 2021[**AR No. 38, Bates 0488-**
2 **0493**]. I also sent the Department’s Legal Notice to EPA Region 6, Erica LeDoux, and Mary
3 Layton at EPA [**AR No. 97, Bates 1839-1841**]. I sent an email on July 22, 2021 to Ms. Christina
4 Thompson, Recreation/Lands/Minerals Staff Officer, Forest Service, Lincoln National Forest,
5 Smokey Bear Ranger District requesting the contact details for the appropriate authority to notify
6 Class I area-White Mountain Wilderness [**AR No. 96, Bates 1835-1836**]. She responded providing
7 the contact details of the appropriate authority [**AR No. 96, Bates 1837**]. I then sent the
8 Department’s Legal Notice to Lincoln National Forest and Smokey Bear Ranger District; Christina
9 Thompson, Camille Howes, Travis Moseley and Andres Bolanos [**AR No. 97, Bates 1839-1841**].
10 The Department’s Legal Notice was posted on the AQB website on the web page for permit
11 applications with public interest [**AR No. 106, Bates 2020**]. AQB’s administrative staff sent the
12 Department’s Legal Notice to *Ruidoso News* for publication, and it was published in that
13 newspaper on July 28, 2021[**AR No. 104, Bates 1980**].

14 **VI. TECHNICAL REVIEW**

15 I began the technical review of RCI’s application 9295 after I determined it was
16 administratively complete. The technical review requires verification of emission calculations and
17 a determination of applicable federal regulations and state regulations.

18 While performing the technical review, it was determined that the emissions represented
19 for Unit 12 were from 3 heaters combined and since there were 3 units, an additional fee was
20 calculated and an invoice for the additional two heaters was sent to the applicant on August 5,
21 2021. While I performed my technical review, I noticed that Section 1D-question 7 and question
22 11(not answered) were not reflective of the notification provided to Mescalero Tribe in the original
23 application (page 105 of the original application) [**AR No. 1, Bates 0001-0190**] and requested the

1 updates for those questions from Paul Wade on August 7, 2021 [**AR No. 43, Bates 0515-0516**]
2 and I received the updates on August 10, 2021. I verified emission calculations by confirming the
3 correct emission factors and formulas were used in calculating emission for all sources [**AR No.**
4 **5, Bates 0208-0241**]. If methods and calculations were not clear, I asked the consultant for further
5 explanation on updates as necessary. I also verified the emission totals from the calculations
6 matched the emissions total in Section 2 of the application.

7 RCI's consultant, Paul Wade, submitted several updates to the original RCI application
8 9295 throughout the review process. Below is a list of dates of application updates:

9 08/10/21 Section 1- 1C, 1D, Section 2- 2A, 2D and 2E, Section 5, Section 6-page 3, Section 16
10 [**AR No. 45, Bates 0518-0602**].

11 09/22/21 Section 2- 2D,2E, 2H, 2I and 2J [**AR No. 70, Bates 0712-0798**].

12 11/5/21 Section 11- 11A [**AR No. 75, Bates 0811-0813**].

13 11/17/21 Section 3, 4, 6 and 13 [**AR No. 77, Bates 0871-0821; AR No. 108, Bates 2029-2053**].

14 12/21/21 Section 1 [**AR No. 78, Bates 0822-0824**].

15 12/29/21 Section 16 [**AR No. 83, Bates 0861-0880**].

16 12/30/21 Section 1 [**AR No. 84, Bates 0881-0883**].

17 1/4/22 Section 9 [**AR No. 86, Bates 0887-0896**].

18 1/13/22 Section 6, Section 7 [**AR No. 87, Bates 0897-0960**].

19 I requested some of these updates while doing my technical review of the calculations. I requested
20 other updates if discrepancies in the application became apparent while writing the Draft Permit
21 9295.

22 The Department has reviewed the emission calculations submitted in the application for all
23 regulated equipment and the emission factors are based upon US EPA's AP 42 Compilation of Air

1 Emission Factors [**AR No. 1, 0001-0190; AR No. 5, 208-241**]. AP-42 is the EPA’s compilation of
2 emission factors for various industries. Emission factors are representative values that relate the
3 quantity of a pollutant released to the ambient air with an activity associated with the release of
4 that pollutant. ([https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-
5 air-emissions-factors](https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors) [January 19, 2022, 9:53 AM]). These factors are usually expressed as the
6 weight of pollutant divided by a unit weight, volume, distance, or duration of the activity emitting
7 the pollutant. The factors are expressed in units such as pounds per ton of material processed and
8 pounds per hour. Such factors facilitate estimation of emissions from various sources of air
9 pollution. In most cases, these factors are averages of all available data of acceptable quality and
10 are generally assumed to be representative of long-term averages.

11 The emission factors used in the calculations are appropriate for this source type and are,
12 thus, approved by the Department. The approved calculated emission rates were used as inputs
13 into the Department’s air dispersion modeling analysis. The air dispersion model conservatively
14 predicts concentrations of the National Ambient Air Quality Standards (NAAQS) based upon the
15 approved emission rates.

16 As I performed my technical review, I began to write the Draft Permit and the Draft
17 Statement of Basis. The Statement of Basis is a permitting record that includes a description and
18 history of the facility, public response received by the Department, a regulatory compliance
19 discussion, and unique conditions in the permit. After completing the initial draft permit version
20 2021-09-13, I sent it to Paul Wade for comments on September 13, 2021 [**AR No. 68, Bates 0678-
21 0693**] and I received a response on the draft permit on September 15, 2021[**AR No. 69, Bates
22 0694-0711**]. The applicant requested updates to condition A108B monitoring and record keeping,
23 condition A112 Haul Roads, condition A502 Process Equipment and to condition A503C. I also

1 sent the draft permit version 2021-12-16 to Paul Wade for comments on December 22, 2021[AR
2 No. 80, Bates 0826-0841] and received a response on December 23, 2021 [AR No. 81, Bates
3 0842-0860]. The draft permit version December 8, 2021, and December 30, 2021 were provided
4 to the Compliance and Enforcement (C&E) section of AQB for comments [AR No. 8, Bates 0333-
5 0337]. The comment on condition A108B was addressed by clarification from Paul Wade (Paul
6 Wade email 10/15/2021) [AR No. 74, Bates 0806-0810]. In addition, the Department did a further
7 analysis to ensure enforceability of the permit condition. A permit extension request was made by
8 the Bureau on October 14, 2021 and the permit extension request was approved by the
9 Environment Protection Division Director on October 14, 2021.

10 **VII. PUBLIC OUTREACH**

11 This application had significant public interest and concern of citizens represented via
12 phone calls, emails and hard copy letters sent through postal service since June 3, 2021. I reached
13 out to several of the callers, responded to emails, and explained the permitting process. I also sent
14 out emails to concerned citizens on June 24, 2021, indicating that the application was received,
15 outlining the permitting process, and indicating that their concerns were recorded. I sent out initial
16 citizen letters to concerned citizens on record on June 30, 2021, July 1, 2021, July 22, 2021, and
17 September 17, 2021[AR No. 95, Bates 1742-1835]. I also sent an email to citizens on record
18 providing more clarity on the permitting process on July 22, 2021[AR No. 103, Bates 1968-1979].
19 On July1, 2021 and July 23, 2021, I provided a list of hard copy citizen letters that required to be
20 mailed out to citizens who did not provide an email address [AR No. 95, Bates 1742-1835]. The
21 Initial Citizen letter is a template letter developed to comply with requirements in 20.2.72.206.B(1)
22 NMAC. [AR No. 95, Bates 1749] The letter confirms citizens’ written comments will be included
23 as part of the permit application record. The letter also provides general information about the

1 permit process, the pending availability of the Department’s analysis, and the option to request a
2 public hearing. Once the public notice was published interested persons were allowed thirty (30)
3 days to express an interest in writing in the permit application per 20.2.72.206(A)(5) NMAC.
4 Because the public notice was published in the newspaper on July 28, 2021, the end of the 30-day
5 comment period was August 27, 2021[**AR No. 104, Bates 1980**]. There were several requests for
6 public hearing to be held for RCI’s application 9295 and the Bureau sent a Hearing Determination
7 request to the office of the Cabinet Secretary, NMED on August 3, 2021 [**AR No. 92, 0982-1271;**
8 **AR No. 93, 1272-1667**]. The Cabinet Secretary concurred with the Bureau’s recommendation for
9 a public hearing to be held for application 9295, based on significant public interest, on August
10 11, 2021. I relayed this information to the concerned citizens with email addresses on record via
11 email [**AR No. 94, Bates 1712**]. Several more concerned citizens letters and emails were received
12 after the result of hearing determination and I sent Initial Citizen letters on September 17, 2021, to
13 citizens who had sent their comments after July 23, 2021 [**AR No. 95, Bates 1742-1834**].

14 The Department’s analysis (Version 2021-09-17), including the Statement of Basis (2021-
15 09-17-2021) and modeling review report were posted on the RCI section of the new Department
16 webpage for public notices under Lincoln County [**AR No. 106, Bates 2002-2023**]. On September
17 21, 2021, AQB sent out Second Citizen letters to all citizens who had expressed an interest in the
18 application in writing up to date. The Second Citizen letter is a template letter to notify citizens
19 the Department’s analysis is available for review. The letter had a link to the Department’s
20 analysis, including the Statement of Basis and modeling review report, which were posted on the
21 RCI section of the new Department webpage for public notices under Lincoln County. [**AR No.**
22 **98, Bates 1851-1916**]. Per 20.2.72.206.B(2) NMAC, the proposed permit could not be issued until
23 at least 30 days after the Department’s analysis was available for review. The draft permit was

1 written after incorporating all the calculation updates provided by the consultant. Updates related
2 to typographic errors, address update for the facility and incorrect unit number references were
3 provided by the applicant later and all the updates were posted on the Department's webpage for
4 public notices under Lincoln County [**AR No. 106, Bates 2002 -2023**].

5 An updated version of the draft permit named Draft Permit Version 2021-12-30 [**AR No. 9, Bates**
6 **0338-0395**], updated version of the draft Statement of Basis named Statement of Basis Version
7 2021-12-30 [**AR No. 2, Bates 0191-0198**] and the draft Database Summary version 2021-12-30
8 [**AR No. 3, Bates 0199-0203**] were posted on the Department's webpage for public notices under
9 Lincoln County. AQB created a document titled Frequently asked Questions in response to
10 citizens' comments and questions and posted it on the Department's webpage for public notices
11 under Lincoln County on 12-30-2021. [**AR No. 99-102, Bates 1917-1967; AR No. 106, Bates**
12 **2002 -2023**]. The FAQs were developed by grouping like-kind public comment questions into 19
13 FAQs with answers [**AR No.103, Bates 1968-1979**]. The Scheduling Order for the hearing date
14 stated that the hearing is scheduled for February 9, 2022 and may continue through February 11,
15 2022. AQB staff made arrangements for a Spanish interpreter to be present at the hearing and for
16 a court reporter to be present at the hearing. AQB staff wrote a notice of Hearing per requirements
17 in 20.1.4 NMAC. The Notice of hearing was translated into Spanish and received by AQB on
18 December 21, 2021. On December 30, 2021 the Notices of Hearing both English and Spanish
19 were posted on the Department's webpage for public notices under Lincoln County under Roper
20 Construction Inc's documents. AQB Administrative staff e-mailed requests for publication of the
21 Notice of Hearing in English and the Notice of Hearing in Spanish to *The Albuquerque Journal*
22 and *Ruidoso News* on December 30, 2021. The Notice of Hearing was published in English and in
23 Spanish in *The Albuquerque Journal* and *Ruidoso News* on January 5, 2022 [**AR No. 104, Bates**

1 **1980-1997**]. On January 3, 2022, I sent e-mails with the Notice of Hearing in English attached and
2 the Notice of Hearing Spanish attached to EPA Region 6, Erica LeDoux and Mary Layton at EPA,
3 the County Clerk, Lincoln County, the Village Clerk, Village of Ruidoso, City Clerk, City of
4 Ruidoso Downs, Village Clerk, Capitan Village and to Christina Thompson, Travis Moseley,
5 Camille Howes, Andres Bolanos, Laura Rabon and Sean Donaldson at the White Mountain
6 Wilderness/Lincoln National Forest and Smokey Bear Ranger District [**AR No. 101, Bates 1949-**
7 **1956**]. On January 3, 2022, I e-mailed the AQB administrative team a list of Citizens and their
8 mailing addresses attached, a cover letter attached, the Notice of Hearing in English attached, and
9 the Notice of Hearing in Spanish attached and requested them to mail out hardcopies of the cover
10 letter, the Notice of Hearing and Notice of Hearing in Spanish in an envelope to each citizen on
11 the list I provided [**AR No. 99, Bates 1917-1937**]. These Citizens had submitted written comments
12 only by postal service and did not provide their email addresses in their comment letters. AQB
13 Administrative staff delivered these envelopes, each containing both notices of hearing, to the
14 Runnels Building on January 4, 2022, so they could reach Administrative Services Division (ASD)
15 for postage and mailout on January 5, 2022. On January 3, 2022, and January 4, 2022, I emailed
16 all the citizens who had provided written comment via email (or) provided their email address in
17 there mailed letter as of January 3, 2021, the Notice of Hearing in English attached, and Notice of
18 Hearing in Spanish attached [**AR No.100, Bates 1938-1948**].

19 **VIII. BASIS FOR PERMIT CONDITIONS**

20 The Department's authority to include conditions in an Air Quality permit is stated in
21 20.2.72.210 NMAC Permit Conditions. If a permit is issued, it will specify what equipment is
22 authorized to be installed and operated, will place limits on air pollutants, and place requirements
23 on how equipment will be operated. A permit is an enforceable legal document, and will include

1 emission limits, methods for determining compliance on a regular basis, and will place monitoring,
2 recordkeeping, and reporting requirements to ensure and verify compliance with the requirements
3 of the permit.

4 Conditions in Part A of the permit are Facility Specific Requirements, unique to the facility.
5 They are site-specific and based on information provided in the application. Conditions in Part B
6 of the permit are General Conditions and standard language which generally apply to all sources.
7 Part C is also standard language about supporting on-line documents, definitions, and acronyms
8 which apply to all sources.

9 A draft permit is a dynamic working document subject to updates throughout the review
10 process. Draft Permit 9295 began with standardized language in an AQB permit template and
11 standardized AQB monitoring protocols added as necessary for the sources of emissions and
12 control devices at RCI's proposed facility. I wrote unique permitting conditions for site specific
13 operations and equipment, based on information provided in the application.

14 The draft permit was then sent to the applicant and consultant to provide an opportunity to
15 review and comment. The applicant proposed changes to monitoring requirements for facility
16 throughput and visible emissions [**AR No. 69, Bates 0694-0711**]. AQB reviewed the proposed
17 changes and confirmed that the requests would be enforceable and made edits to the conditions
18 that the Department agreed with. The Department did not agree with all the requests the applicant
19 submitted. In the updated Draft Permit version 2021-12-30 Monitoring and record keeping
20 requirements for Condition A108B facility throughput and visible emissions were revised from
21 hourly to daily after further review and explanation by the applicant regarding the maximum
22 physical production limits. (Paul wade email: 10/15/21) [**AR No. 74, Bates 0806-0810**]. In the
23 Draft Permit version 2021-12-30, for condition A503C monitoring the Bureau determined that the

1 most reasonable requirement would be for the company to do, at minimum a weekly monitoring
2 requirement as opposed to the monthly requirement requested by the company and the daily
3 requirement posted in the previous permit draft. In the draft permit version 2021-12-30 condition
4 A503D was also updated the recordkeeping requirement (2) with respect to differential pressure
5 was updated from daily to each time cement (unit 9) or fly ash (Unit 10) loading takes place. (Paul
6 wade email: 12/23/2021) [AR No. 81, Bates 0842-0860].

7 Permit conditions establish ongoing testing and monitoring requirements for processes and
8 pieces of equipment to ensure the equipment is operating in accordance with the permitted
9 emission limits.

10 **IX. CONCLUSION**

11 The technical review of application 9295 has been completed by the Bureau. The facility
12 as described and represented in the application demonstrates compliance with federal and state air
13 quality regulations. The facility's operations as represented in RCI's application and modeling
14 report do not cause or significantly contribute to any exceedances of applicable air quality
15 standards. These results are on the modeling analysis and emissions calculations for Carbon
16 Monoxide (CO), Nitrogen Dioxide (NO₂), Volatile Organic Compounds (VOC), Particulate
17 matter 10 micrometers or less in aerodynamic diameter (PM₁₀), Particulate matter (2.5
18 micrometers or less) (PM_{2.5}), and Sulfur Dioxide (SO₂). The Clean Air Act and state regulations
19 do legally authorize AQB to regulate impacts that are not air quality related. Therefore, AQB does
20 not have the ability to deny any application made for an air quality permit on the basis of non-air
21 quality aspects. AQB also does not have authorization to regulate mobile sources and to make
22 decisions regarding commercial zoning laws in counties and municipalities. The Air Quality

- 1 Bureau recommends that the Secretary uphold the Bureau's decision to approve the issuance of
- 2 the permit.

DEEPIKA SAIKRISHNAN

Santa Fe, New Mexico

Environmental Scientist and Specialist -Advanced (2019- present)

Technical Services – Permitting Section
Air Quality Bureau,
New Mexico Environment Department
Santa Fe, New Mexico USA.

Faculty- Chemistry (2016-2017)

Central New Mexico Community College
Albuquerque, New Mexico, USA.

EDUCATION

PhD (Biochemistry), 2014

University of Hertfordshire, United Kingdom
Research Title: 'Cellulose Based Genoassays for the Detection of Pathogen DNA'

MS (Analytical & Separation Science), 2009

University of Manchester, United Kingdom

BS (Chemistry), 2008

University of Madras, India

EXPERIENCE

Regulatory and Technical Work

- Substantial experience in performing technical and regulatory review of the most complex construction air quality permit applications and associated calculations
- Experienced in state and federal air quality regulations, and drafting legally enforceable air permits and technical support documents
- Experienced in dealing with applications with public interest
- Reviewed and issued more than 300 minor source general construction air quality permits with regulatory deadlines at the New Mexico Environment Department and processed several administrative permitting actions
- Provided extensive technical support to internal customers from various teams within the bureau such as report generation, database records management and quality control
- Experienced in extensive external customer support via response to questions from public and providing documentation for records request
- Experience in software pilot testing for automating application process
- Contribution to business process improvements and developments through process updates, drafting and editing SOPs.
- Coordination and brainstorming of alternative methods to ensure operational efficiency amongst various teams within the bureau
- Experienced in providing technical training to new co-workers and permitting section staff

PhD Research

- Successful development of proposed novel colorimetric genoassay (for Tuberculosis), first assay to use homogeneously modified cellulose as substrate to chemically attach bioprobes. Scope of Assay - a wide range of pathogen DNA
- Novel assay development using minimal equipment, experimental design
- Ability to troubleshoot experimental design flaws
- Effective scientific writing skills
- Experienced in writing peer reviewed journal article
- Experience in research at the interface of biochemistry and analytical chemistry
- Laboratory techniques and Instrumentation: DNA extraction, isolation, microbial plating techniques, aseptic techniques, PCR, gel electrophoresis, UV-Visible spectrometry, ATR-FTIR, fluorimetry, fluorescence microscopy, Assays for biochemical/microbial analysis
- Familiar with SRS, ORF, BLAST, SWISS PROT, ENSEMBL, ExpASy, ClustalW software tools

Journal Publication: Deepika Saikrishnan, Madhu Goyal, Sharon Rossiter, Andreas Kukol. A cellulose-based bioassay for the colorimetric detection of pathogen DNA. *Analytical and Bioanalytical Chemistry*, 2014, 406(30), 7887-7898

MS & BS

- MS: Use of novel imaging mass spectrometric techniques to provide 'chemical maps' of tissue sections. Successful comparison between reference mixtures of four lipids with those in mouse brain samples using Time of Flight Secondary Ion Mass Spectrometry.
- Experience in writing feasibility reports, and research reports for experiments
- Analytical chemistry theoretical and laboratory modules
- BS: Theoretical and laboratory modules in organic, inorganic, physical, analytical, environmental, and computational chemistry.

Industrial Training

- Madras Pharmaceuticals, Chennai, India, Quality Control department (February–March 2010) Analysis of pharmaceutical products -qualitative and quantitative analysis, photometry, UV-VIS spectrometry, volumetric analysis, physical parameters, and preparation of documentation for the analyses.

Teaching

- Taught General Chemistry lecture and laboratory courses at Central New Mexico Community College (2016-2017)
- Certified in online teaching Introduction to teaching and learning online and Online curriculum design and instruction courses

PRESENTATIONS

- Air Quality Bureau wide presentation on Tanks and Control Devices - Oil and Gas Industry (2019)
- 'Cellulose Bioassays for the Colorimetric Detection of Pathogens' ACS meeting Spring 2015, Denver, USA
- 'Cellulose Bioassays for the Colorimetric Detection of Pathogen DNA', Annual Research Day, School of Life and Medical Sciences, 2014, University of Hertfordshire, UK
- 'Cellulose Bioassays for the Colorimetric Detection of Pathogens' Annual Research Day, School of Life and Medical Sciences, 2013, University of Hertfordshire, UK

- 'Cellulose Biosensors for the Colorimetric Detection of Pathogen DNA' at The Point of Care Diagnostics Workshop (Biochemical Society and Royal Society of Chemistry collaboration) London, UK, December 2012

LEADERSHIP

- Customer Experience Certificate Program Advisory Panel Member, University of Houston, C.T. Bauer College of Business (2021 Spring - ongoing)
- Student representative for research students, Biosciences Department, University of Hertfordshire, UK, 2012-2014
- Member of the Editorial board of annual departmental magazine, Stella Maris College, India, 2007-2008 (participated in number of inter-collegiate competitions)

OTHER ACHIEVEMENTS

- University of Hertfordshire Research Studentship (\$85,000).
- 1st prize, oral presentation of PhD research work, Annual Research Day, School of Life and Medical Sciences, University of Hertfordshire, UK, 2014 (Cash prize \$100)
- 3rd prize for poster presentation of PhD research work in Annual Research Day, School of Life and Medical Sciences, University of Hertfordshire, UK, 2013 (Cash prize \$50)
- Won prizes in inter-collegiate chemistry quiz competitions, Loyola College and JBAZ College, India, 2008, respectively
- Won several interschool cultural competitions

**STATE OF NEW MEXICO
BEFORE THE SECRETARY OF ENVIRONMENT**

1 **IN THE MATTER OF THE APPLICATION**
2 **OF ROPER CONSTRUCTION, INC.**
3 **FOR AN AIR QUALITY PERMIT**

AQB 21-57 (P)

TECHNICAL TESTIMONY OF ERIC PETERS

4
5
6
7
8 My name is Eric Peters. I have Bachelor of Science degrees in Mechanical
9 Engineering and Biology from the University of Illinois, and a Master of Science degree
10 in Environmental Engineering from the University of Kansas.

11 I work for the Air Quality Bureau (“AQB” or “Bureau”) of the New Mexico
12 Environment Department (“NMED” or “Department”) as an Air Dispersion Modeler. I
13 have worked in the Modeling Section for over twenty-four years. One of my primary duties
14 is the review of air dispersion modeling for New Source Review permit applications to
15 determine if they will comply with air quality standards and other modeling-related
16 requirements. Air dispersion modeling is a computer simulation that predicts air
17 concentrations of pollutants after a facility is constructed. EPA develops models for this
18 purpose to ensure quality analyses and equal protection under the law.

19 The Department reviewed the modeling submitted by Roper Construction, Inc. for
20 permit 9295, which is known as “Alto Concrete Batch Plant” (the facility). [AR No. 1].
21 The Department verified that the facility followed appropriate modeling practices, as
22 informed by the New Mexico Modeling Guidelines. [NMED Exhibit 7]. Details of the
23 modeling are described in the Modeling Review Report, which is contained in the
24 Administrative Record. [AR No. 6].

1 In order to be issued an NSR permit, the applicant must demonstrate that
2 construction of the proposed facility will not cause or contribute to any violations of
3 National or New Mexico Ambient Air Quality Standards, Prevention of Significant
4 Deterioration (PSD) Increments, or State Air Toxic pollutant requirements. National
5 Ambient Air Quality Standards are periodically reviewed by the Environmental Protection
6 Agency and are designed to protect the most sensitive individuals. PSD increments are
7 designed to maintain the air quality of pristine areas. Toxic permitting thresholds prevent
8 neighbors from being exposed to more than one percent of the amount that has been
9 deemed acceptable for workers to be exposed to throughout the day. The requirement to
10 demonstrate compliance with these air quality measures is contained in 20.2.72.203(A)(4)
11 NMAC.

12 The Department maintains the New Mexico Modeling Guidelines to provide a basis
13 for acceptable modeling analyses. These guidelines incorporate and interpret the most
14 recent version of EPA's Guideline on Air Quality Models, which was published in the
15 Federal Register, Vol. 82, No. 10. The New Mexico Modeling Guidelines also incorporate
16 other information and guidance, such as EPA memorandums.

17 Alto Concrete Batch Plant modeling was performed in accordance with the New
18 Mexico Modeling Guidelines. If the facility operates in compliance with the terms and
19 conditions of the draft permit, then it will not cause or contribute to any concentrations
20 above state or federal ambient air quality standards or PSD increments. The facility has
21 satisfied all modeling requirements and the permit may be issued.

ERIC C. PETERS

📍 525 Camino de Los Marquez 📍 Santa Fe, NM 87505 📧 Eric.Peters@state.nm.us 📞 (505)629-5299

Air Dispersion Modeler

PROFILE	Knowledgeable, understanding, diplomatic builder of teamwork with a passion for innovation and adaptation. I have great motivation and good experience writing and using computer programs and databases as well as experience in environmental management areas such as air dispersion modeling and hazardous waste remediation. I communicate well both orally and in writing.
CAREER HIGHLIGHTS	<p>New Mexico Environment Department/Air Quality Bureau 📍 Santa Fe, NM 📍 Environmental Specialist/Computer System Analyst 📍 November 1997 to present</p> <ul style="list-style-type: none">· Analyzed and performed air dispersion modeling for over 100 projects involving use of ISCST3, Calpuff, AERMOD, CTSscreen, and other modeling software for evaluation of power plants, mining operations, and numerous other facility types.· Worked with groups to develop and implement regulations for prescribed burning and general permits.· Created MergeMaster program using Microsoft Access and Visual Basic. The program analyzes and transforms input data into formats needed to efficiently run computer models and draws maps using the data.· Created database to store and manage emissions inventory and permit tracking for the state of New Mexico.· Mapped and migrated data to Oracle and MS Access databases from various relational database formats.· Extracted, analyzed, and transformed data from Oracle databases using SQL programming scripts.· Trained employees to run air dispersion models and to use the emissions inventory database.· Also proficient in the following software: ArcGIS, AERMOD, SASEM, Surfer, Excel, Word, Power Point. <p>Desert Research Institute 📍 Las Vegas, NV 📍 Technical Temporary 📍 Sept. 2003- March 2007 (part time)</p> <ul style="list-style-type: none">· Designed MS Access database tools to describe and analyze visibility and pollutant monitoring stations.· Programmed database to export data in HTML format for use in web pages.· Wrote Visual Basic program to convert HYSPLIT output text files into GIS Shapefiles for use in ArcGIS. <p>Santa Fe Striders 📍 Santa Fe, NM 📍 President 📍 December 2000 to December 2002 (part time)</p> <ul style="list-style-type: none">· Made management decisions for 100-member running club.· Coordinated volunteers, police protection, insurance, sponsors, and technical support for races.· Created database to track membership and race entries. <p>Environmental Protection Agency 📍 Kansas City, KS 📍 Environmental Engineer 📍 Jun.1992 to Sept. 1994</p> <ul style="list-style-type: none">· Managed Pilot Projects to develop guidance on selecting treatment technologies for Superfund sites contaminated by polychlorinated biphenyls (PCBs), manufactured gas plants, or grain fumigation.· Helped develop, procure, and manage contracts.· Researched treatment techniques for PCB, manufactured gas plant, and grain fumigation sites.· Compiled and analyzed data and wrote reports and guidance documents for treatment of site types. <p>University of Illinois 📍 Urbana-Champaign, IL 📍 Research Assistant 📍 1991</p> <ul style="list-style-type: none">· Simulated protein folding by molecular dynamics using Silicon Graphics and Cray supercomputers.· Analyzed and created computer codes written in Fortran using UNIX and Macintosh operating systems.
EDUCATION	<p style="text-align: center;">Master of Science in Environmental Engineering University of Kansas 📍 Lawrence, Kansas 📍 June, 1995</p> <p style="text-align: center;">Bachelor of Science in Mechanical Engineering Bachelor of Science in Honors Biology with a minor in Chemistry University of Illinois 📍 Champaign-Urbana, Illinois 📍 December, 1991</p>

RHONDA V. ROMERO

525 Camino de Los Marquez, Suite 1, Santa Fe, NM 87505, 505-476-4354, Rhonda.romero@state.nm.us

Education

- Master of Science:** Natural Sciences- Geology May 2014
New Mexico Highlands University - Las Vegas, NM
- Bachelor of Science:** Environmental Geology July 2010
New Mexico Highlands University - Las Vegas, NM

Work History

Staff Manager - Environmental Science 07/2018 to Current
New Mexico Environment Department- Air Quality Bureau – Santa Fe, NM

- Environmental permitting with a high level of understanding of local, state and federal air quality regulations.
- Manage the Air Quality Bureau Minor Source Permit Program.
- Supervise 6 staff with implementation of the Clean Air Act and New Mexico Administrative Code Environmental regulations.
- Continuously developing and establishing policies and guidance documents.
- Develop standard operating procedures.
- Determination and implementation of program requirements.
- Coordinate and guide the interface of staff with federal EPA, other state agencies, and clients.
- Evaluate and determine eligibility for Minor Source and Title V air quality permit applications under 20.2.72 NMAC and 20.2.70 NMAC.
- Emission calculation evaluations
- Review, provide oversight, and draft advanced technical permits for complex facilities in New Mexico.

Environmental Scientist & Specialist- Advanced 08/2014 to 01/2018
New Mexico Environment Department- Air Quality Bureau – Santa Fe, NM

- Served as acting minor source section permitting manager for 5 months.
- Environmental permitting with a moderate level of experience with of local, state and federal air quality regulations.
- Evaluated and determined eligibility for Minor Source and Title V air quality permit applications under 20.2.72 NMAC and 20.2.70 NMAC.
- Emission calculation evaluations
- Drafted advanced technical permits for some of the most complex facilities in New Mexico.
- Developed advanced and effective communication skills to interact with the public, industry, and consultants

regarding technical matters.

Environmental Scientist & Specialist - Operational
New Mexico Environment Department – Santa Fe, NM

01/2014 to 08/2014

- In depth knowledge and understanding of state and federal air quality regulations.
- Evaluate and determine eligibility for Minor Source and Title V air quality permit applications under 20.2.72 NMAC and 20.2.70 NMAC.
- Typically took on 2-3 extra permits outside of normal workload per month.
- Possess technical ability to evaluate complicated industrial facilities throughout the State, including but not limited to the Mining Industry, and the Oil and Gas Industry.

Environmental Scientist & Specialist - Basic
New Mexico Environment Department- Air Quality Bureau – Santa Fe, NM

02/2013 to 01/2014

- Gained basic knowledge and understanding of state and federal air quality regulations.
- Evaluate and determine eligibility for Minor Source and Title V air quality permit applications under 20.2.72 NMAC -Possess technical ability to evaluate industrial facilities throughout the State, including but not limited to the Mining Industry, and the Oil and Gas Industry.
- Took on additional permitting actions out of the assigned workloads.

Graduate Research Assistant
New Mexico Highlands University – Las Vegas, NM

01/2010 to 01/2012

- Lead instruction in introductory level biology, geology, and hydrology courses and science labs with 25 - 100 students.
- Planned and lead class and lab lectures, grading and monitored student progress.
- Liaised between faculty and students to answer questions and optimize faculty time.

Intern - Environmental Science
Los Alamos National Security LLC – Los Alamos, NM

05/2005 to 08/2005

- Collected Data for fire risk assessment model after the Cerro Grande Fire of 2000.
- Performed environmental surveys, which included setting up plots to analyze tree, soil, and area characteristics.
- Performed analysis of the data statistically and ensured quality assurance and control -compiled and analyzed all data.
- Verified data integrity and accuracy.

Intern - Health Physics
Los Alamos National Security LLC – Los Alamos, NM

01/2000 to 01/2004

- Implemented training, research, and monitoring programs to protect personnel from radiological hazards.
- Helped develop criteria for modification of health physics detection equipment, such as germanium detectors.
- Implemented bioassay sample program successfully, following instructions set out by regulation and management.

Kathleen Primm

1312 Don Diego Ave.

Santa Fe, NM 87505

kathleen.primm@state.nm.us (505) 480-4377

CAREER QUALIFICATIONS

Experience: federal and NM air quality regulations; Clean Air Act; technical training; supervising staff; peer review; administrative and technical analysis; complex calculations using science, math and chemistry; developing guidance documents and policies; writing federally and practically enforceable permits; cross-training and coordinating with other sections at AQB; collaborating with legal staff; attending public meetings; testifying as an expert witness in public hearings; internal and external customer service; outlining objectives and developing plans to streamline procedures; conducting hiring interviews; data entry; and computer software including daily use of Microsoft Office

Skills: organization, communicating with clarity and accuracy, problem solving, attention to detail, technical writing, reviewing and editing documents, maintaining quality notes for reference, time management, and professional demeanor

PROFESSIONAL DEVELOPMENT AND TRAINING COURSES

APTI 454 Effective Permit Writing; APTI 452 Air Pollution Control; APTI 400 Introduction to Hazardous Air Pollutants; APTI 427 Combustion Evaluation; WESTAR Intermediate NSR/PSD Training; NACT Courses on Engines, NOx Control Technology, CAM, Turbines/Power Plants, Asphalt Facilities, Coatings, and Baghouses; ProMax Training BRE 101, 102, 121; H₂S Safety Training; Bleiker Training on Citizen Participation for Public Officials and Other Professionals Serving the Public; NMED Civil Rights Training; and site visits to a range of industrial sources of air pollution

EMPLOYMENT HISTORY

Environmental Scientist & Specialist – Supervisor NM Environment Department Air Quality Bureau (4/21 - present)

- Managing staff in all aspects of the NSR construction permit program
- Regularly meeting with staff to provide guidance and explore various means of complex problem solving
- Reviewing work products of permitting staff to ensure quality and consistency
- Managing assigned staff in the Minor Source Program in operational activities including planning and direction of the Program and coordinating with other sections in the Bureau
- Managing assigned staff in the Minor Source Program in regulatory and technical activities including providing consultation to other program managers and staff, the Bureau chief, legal staff, consultants, industry, citizens, and the EPA regarding questions pertaining to Minor Source Permitting procedures, permitting actions, regulations, applicability determinations, and technical analyses
- Tracking regulatory deadlines and ensuring staff meet regulatory deadlines
- Creating and improving guidance documents and Department forms

- Providing technical training to staff and managing staff trainings
- Preparing staff for public hearings
- Establishing policy and procedures
- Determining and implementing Minor Source program requirements
- Cooperating with PSD and Title V operating permit program managers and Technical Services manager
- Coordinating with various stakeholders including the public, industry, consultants, Bureau staff, and other regulatory agencies
- Assigning, tracking, and reviewing special projects and deliverables to achieve organizational goals
- Reviewing lists of candidates for hiring
- Approving time reporting and completing staff evaluations
- Attending management trainings, including Strategies for Positive Management and Managing Employee Performance
- Maintaining familiarity with federal and New Mexico air quality regulations, including Clean Air Act
- Communicating with EPA and upper management

Environmental Scientist & Specialist – Advanced, NM Environment Department Air Quality Bureau (1/18 - 4/21)

- Performed technical and regulatory review of multiple complex Minor Source Air Quality Bureau permit applications within regulatory deadlines by checking completeness; verified the accuracy of calculations of pollutants using science, math and chemistry; wrote applicability determinations for federal regulations and state regulations; and drafted legally enforceable air permits and technical support documents with standardized Air Quality Bureau templates and protocols
- Developed solutions and strategies to complex Minor Source problems through analysis and evaluation of the facts, distinguishing issues and circumstances that made each case distinct, formulated alternative solutions, and balanced the relative benefits and consequences of possible courses of action
- Served as Acting Minor Source manager to supervise staff and serve as the point of contact for daily operations when the manager was unavailable
- Provided technical training and mentoring for internal staff and developed guidance documents to assist new team members with the details of various permitting action types, regulations, and Air Quality Bureau policies
- Provided peer review for new or inexperienced staff to support their learning and ensure they had the necessary resources to deliver a quality product
- Coordinated with various stakeholders including public citizens, industry, consultants, applicants, Air Quality Bureau staff, EPA, and other regulatory agencies to provide quality customer service and aid in the permitting process
- Attended public meetings, open houses, and public hearings to represent the Department

- Promptly entered data and attached documents into the Air Quality Bureau database in accordance with standard operating procedures, guidelines, and policies to compile a quality administrative record
- Performed special assignments to achieve organizational goals for the Air Quality Bureau
- Attended trainings and toured industrial sites to gain knowledge in specific topics including regulations, equipment, and how to make permits federally and practically enforceable
- Responded to IPRA requests

Environmental Scientist & Specialist – Operational, NM Environment Department Air Quality Bureau (5/12 – 1/18)

- Performed technical and regulatory review of multiple complex Air Quality Bureau permit applications within regulatory deadlines by checking completeness; verifying the accuracy of calculations of pollutants using science, math and chemistry; determining applicable federal regulations and state regulations; and drafting legally enforceable air permits and technical support documents with standardized Air Quality Bureau templates and protocols
- Assisted in developing the GCP-6, a new general construction permit to provide industry with additional timely and cost-effective options for obtaining federally enforceable emissions limits while increasing the Air Quality Bureau's efficiency
- Coordinated with various stakeholders including the public, industry, consultants, Air Quality Bureau staff, and other regulatory agencies to provide quality customer service and aid in the permitting process
- Performed special assignments to achieve organizational goals for the Air Quality Bureau
- Promptly entered data and attach documents into the Air Quality Bureau database in accordance with SOP's, guidelines, policies, and standards to compile a quality administrative record
- Attended trainings and site tours to gain knowledge in specific topics including regulations, equipment, and how to make permits federally and practically enforceable
- Trained new or inexperienced staff on the details of various permitting action types, regulations, and Air Quality Bureau policies

Environmental Scientist & Specialist – Basic, NM Environment Department Air Quality Bureau (6/08 – 5/12)

- Performed technical and regulatory review of multiple complex Air Quality Bureau permit applications within regulatory deadlines. This review included checking completeness, verifying the accuracy of emissions calculations, determining applicable federal regulations and state regulations, and drafting legally enforceable air permits and technical support documents with standardized Air Quality Bureau templates and protocols
- Coordinated with various stakeholders including the public, industry, consultants, Air Quality Bureau staff, and other regulatory agencies to provide quality customer service and aid in the permitting process
- Performed special assignments to achieve organizational goals for the Air Quality Bureau, as assigned

- Promptly entered data and attach documents into the Air Quality Bureau database in accordance with SOP's, guidelines, policies, and standards to compile a quality administrative record
- Attended trainings to gain knowledge in specific topics including regulations, equipment, and how to make permits federally and practically enforceable
- Assessed annual fees for the Title V Permitting Program
- Wrote meeting minutes for weekly Minor Source staff meetings and distributed them to staff, for their records

Manager of Seed Department, Plants of the Southwest, Santa Fe, NM (2/03 – 6/08)

- Managed seed department for multi-location retail and mail-order nursery including stocking, ordering, organizing, packaging and shipping of seeds
- Evaluated projects ranging from backyard gardens to wildlife management and protecting water resources
- Hired seasonal employees and trained them in standard operating procedures
- Followed requirements to obtain permits and performed tests to assure USDA compliance and certification
- Developed annual seed department budget and processed department's financial documents, including operating budgets and fiscal reports
- Provided customer service in identifying appropriate native species and seeding rates
- Coordinated with various entities including the public, industry, staff, and seed companies to customize seed orders based on location, cost, area, and seeding rate calculations
- Monitored asset inventory and coordinated procurement, stocking, shipping, and off-site collection of seeds
- Revised and updated annual seed catalog and employee guidelines

Assistant (part-time), Hydra Aquatic, Tijeras, NM (2/03 – 5/04)

- Sole employee of a busy, family-owned plant propagation and installation company
- Installed wetland and riparian plants for reclamation projects, treating water resources, and wildlife management in NM, CO, and CA
- Maintained nursery stock, facilities, grounds, and equipment
- Packaged and shipped mail orders based on contractual agreements

Maintenance Crew Member, WaterWise Landscapes, Inc., Albuquerque, NM (7/01 – 2/03)

- Installed, inspected, and maintained residential landscapes based on contractual agreements

Manager of Greenhouse, Rocky Mountain Native Plants Co., Rifle, CO (1/99 – 6/01)

- Supervised 5-10 employees
- Trained employees in standard operating procedures and team communication
- Treated and sowed native seed for reclamation jobs based on germination protocols and production schedules
- Organized orders for customers based on contractual agreements and monitored inventory
- Led elementary school tours and developed accompanying educational curricula

Nursery Assistant, Siskiyou Rare Plant Nursery, Medford, OR (7/98 – 12/98)

- Propagated plants by division, cuttings, and seed; and applied biocontrol techniques to minimize pests

Crop Technician, Colorado Greenhouse – Estancia Division, Estancia, NM (1/98 – 6/98)

- Monitored water quality, viruses, diseases, and insect populations in hydroponic tomato plants
- Implemented biocontrol program to minimize pests

Lab Assistant, NMSU Plant Physiology Lab, Las Cruces, NM (1/96 – 12/97)

- Technical analysis of chile samples for vitamin A research and tocopherol research
- Technical analysis of onion samples for onion pungency research
- Coordinated ordering lab supplies from distributors for graduate student research

EDUCATION

New Mexico State University, Las Cruces, NM

Bachelor of Science in Agriculture, December 1997

MAJOR: Horticulture, MINOR: Biology

Dean's Award of Excellence (April 1997), Crimson Scholar (1993 – 1997), Dean's List (1993 – 1997), Regents Scholarship (1993 – 1997)

COMMUNITY INVOLVEMENT

President of Carlos Gilbert Elementary School's PTK (Parents, Teachers, Kids) Board (May 2020-present)

Volunteer for Carlos Gilbert PTK (2014-May 2020)

Secretary position on Board of Directors – Garcia Street Club (2013-2016)

Volunteer – Many Mothers (2007-2008)

New Mexico Air Quality Bureau Air Dispersion Modeling Guidelines

Revised October 26, 2020

Recent changes to the Modeling Guidelines are described in Appendix A at the end of this document.

Notes:

EPA in-stack ratio database:

<https://www.epa.gov/scram/nitrogen-dioxidenitrogen-oxide-stack-ratio-isr-database>

Significance levels for PM2.5 and ozone:

https://www.epa.gov/sites/production/files/2016-08/documents/pm2_5_sils_and_ozone_draft_guidance.pdf

2017 Appendix W:

https://www3.epa.gov/ttn/scram/appendix_w/2016/AppendixW_2017.pdf

Bureau Modeling Staff:
Sufi Mustafa (505) 476-4318
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1.0 INTRODUCTION

1.1 Introductory Comments

Air pollution has been proven to have serious adverse impacts on human health and the environment. In response, governments have developed air quality standards designed to protect health and secondary impacts. The only way to predict compliance with these standards by a facility or modification that does not yet exist is to use models to simulate the impacts of the project. Regulatory models strike a balance between cost-effectiveness and accuracy, though the field of air quality prediction is not necessarily an inexpensive or a highly accurate field. The regulatory model design is an attempt to apply requirements in a standard way such that all sources are treated equally and equitably.

It is the duty of the NMED/Air Quality Bureau (the Bureau) to review modeling protocols and the resulting modeling analyses to ensure that air quality standards are protected and to ensure that regulations are applied consistently. This document is an attempt to document clear and consistent modeling procedures in order to achieve these goals. Occasionally, a situation will arise when it makes sense to deviate from the guidelines because of special site-specific conditions. Suggested deviations from the guidelines should be documented in a modeling protocol and submitted to the Bureau for approval prior to submission of modeling.

In general, the procedures in the latest version of the EPA document, Guideline On Air Quality Models¹ should be followed when conducting the modeling analysis. This EPA document provides complete guidance on appropriate model applications. The purpose of this document is to provide clarification, additional guidance, and to highlight differences between the EPA document and New Mexico State modeling requirements.

Please do not hesitate to call the Bureau modeling staff with any questions you have before you begin the analysis. We are here to help; however, we will not conduct modeling courses. There are many courses offered which teach the principles of dispersion modeling. These courses provide a much better forum for learning about modeling than the Bureau modeling staff can provide.

1.2 The Modeling Review Process

1.2.1 Modeling Protocol Review

A modeling protocol should be submitted and approved before submitting a permit application. The Bureau will make every attempt to approve, conditionally approve, or reject the protocol within two weeks. Details regarding the protocol are described in section 6.0, Modeling Protocols. Protocols will be archived in the modeling archives in the protocol section until they can be stored with the files for the application.

1.2.2 Permit Modeling Evaluation

When a permit application involving air dispersion modeling is received, modeling staff has 30 days to determine whether the modeling analysis is administratively complete. The modeling section staff will make a quick determination to see if the modeling analysis appears complete. This involves checking to see if

¹ Environmental Protection Agency, 40 CFR Part 51, Revision to the Guideline on Air Quality Models https://www.epa.gov/sites/production/files/2020-09/documents/appw_17.pdf

modeling files are attached and readable and verifying that application forms and modeling report are present. If the analysis is incomplete, the staff will inform the applicant of the deficiencies as quickly as possible. This will halt the permitting process until sufficient information is submitted. Deficiencies not resolved prior to the completeness determination deadline may result in ruling the application incomplete.

After the application has been ruled complete, Bureau staff will perform a complete review of the modeling files. This analysis includes a review to make sure that information in the modeling files are consistent with the information in the permit application and may involve the emission rate of each emission point, the elevation of sources, receptors, and buildings, evaluation and modification of DEM data, property fence line, or other aspects of the modeling inputs. If the dispersion modeling analysis submitted with the permit application adequately demonstrates that ambient air concentrations will be below air quality standards and/or Prevention of Significant Deterioration (PSD) increments, the Bureau modeler will summarize the findings and provide the information to the permit writer. If dispersion modeling predicts that the construction or modification causes or significantly contributes to an exceedance of a New Mexico or National Ambient Air Quality Standard (NMAAQs or NAAQS) or PSD increment, the permit cannot be issued under the normal permit process. For nonattainment modeling, refer to 20.2.72.216 NMAC, 20.2.79 NMAC, or contact the Bureau for further information.

The application (including modeling) is expected to be complete and in good order at the time it is received. However, the Bureau will accept general modifications or revisions to the modeling before the modeling is reviewed provided that the changes do not conflict with good modeling practices. Once the modeling review begins, only changes to correct problems or deficiencies uncovered during the review of the modeling will normally be accepted, and the Bureau will provide a deadline by which changes need to be submitted to allow for them to be reviewed and for the permit to be issued. No changes to modeling will be allowed after the review has been completed.

2.0 MODELING REQUIREMENTS AND STANDARDS

2.1 Regulatory Requirement for Modeling

The requirements to perform air dispersion modeling are detailed in New Mexico Administrative Code (NMAC) **20.2.70.300.D.10** NMAC (Operating Permits), **20.2.72.203.A.4** NMAC (Construction Permits), and **20.2.74.305** NMAC (Permits - Prevention of Significant Deterioration), and 20.2.79 NMAC (Nonattainment). The language from these sections is listed below for easy reference.

Basically, with a construction permit application, an analysis of air quality standards is required, which normally requires air dispersion modeling. In some cases, previous modeling may satisfy this requirement. In these cases, the applicant may seek a modeling waiver from the Bureau. In any case, it is the responsibility of the applicant to provide the modeling, or the justification for the modeling waiver, or the air quality analysis for nonattainment areas. Title V sources that have not demonstrated compliance with a standard or increment are required to come into compliance with this applicable requirement. This may be accomplished by modeling to show the area is in attainment with this standard or increment. If they are not able to model compliance, then a compliance plan will be needed.

2.1.1 Title V Operating Permits

Federal air quality standards are applicable requirements for sources required to have an operating permit. Modeling is usually not required to issue a Title V operating permit. If a facility is not required to have a construction permit (e.g., some landfills and "Grandfathered" facilities) then it will need to model any new emissions or changes that could increase ambient pollutant concentrations.

Selected Title V regulatory language applying to modeling is copied below for easy reference.

20.2.70.7 NMAC DEFINITIONS: In addition to the terms defined in 20.2.2 NMAC (definitions), as used in this part the following definitions shall apply.

E. "Applicable requirement" means all of the following, as they apply to a Part 70 source or to an emissions unit at a Part 70 source (including requirements that have been promulgated or approved by the board or US EPA through rulemaking at the time of permit issuance but have future-effective compliance dates).

(11) Any national ambient air quality standard.

(12) Any increment or visibility requirement under Part C of Title I of the federal act, but only as it would apply to temporary sources permitted pursuant to Section 504(e) of the federal act.

Note: The PSD increment analysis is required for the development of general permits for temporary Title V sources but is not an applicable requirement for regular Title V permit modeling. PSD increment modeling is required for Title V sources that are satisfying their modeling requirements through 20.2.72 NMAC modeling.

20.2.70.201 NMAC REQUIREMENT FOR A PERMIT:

D, Requirement for permit under 20.2.72 NMAC.

(1) Part 70 sources that have an operating permit and do not have a permit issued under 20.2.72 NMAC or 20.2.74 NMAC shall submit a complete application for a permit under 20.2.72 NMAC within 180 days of September 6, 2006. The department shall consider and may grant reasonable requests for extension of this deadline on a case-by-case basis.

(2) Part 70 sources that do not have an operating permit or a permit under 20.2.72 NMAC upon the effective date of this subsection shall submit an application for a permit under 20.2.72 NMAC within 60 days after submittal of an application for an operating permit.

(3) Paragraphs 1 and 2 of this subsection shall not apply to sources that have demonstrated compliance with both the national and state ambient air quality standards through dispersion modeling or other method approved by the department and that have requested incorporation of conditions in their operating permit to ensure compliance with these standards.

20.2.70.300.D.10 NMAC

(10) Provide certification of compliance, including all of the following.

(a) A certification, by a responsible official consistent with Subsection E of 20.2.70.300 NMAC, of the source's compliance status for each applicable requirement. For national ambient air quality standards, certifications shall be based on the following.

(i) For first time applications, this certification shall be based on modeling submitted with the application for a permit under 20.2.72 NMAC.

(ii) For permit renewal applications, this certification shall be based on compliance with the relevant terms and conditions of the current operating permit.

2.1.2 New Source Review (NSR) Permitting for Minor Sources

For new permits, a demonstration of compliance with air quality standards, PSD increments, and toxic air pollutants subject to 20.2.72.403.A(2) is required for all pollutants emitted by the facility. For significant revisions, a demonstration of compliance with air quality standards, PSD increments, and toxic air pollutants subject to 20.2.72.403.A(2) is required for all pollutants affected by the modification or permit revision. For technical revisions involving like kind replacement, as specified in 20.2.72.219B(1)(d), a demonstration that the replacement unit has stack parameters which are at least as effective in the dispersion of air pollutants is required (provided previous modeling determined the area to be in compliance with air quality standards). Permits for sources not in attainment with standards should refer to 20.2.72.216 NMAC, NONATTAINMENT AREA REQUIREMENTS.

If previous modeling has demonstrated compliance for each averaging period of each pollutant with a state or federal ambient air quality standard or toxic air pollutant, and that modeling used current modeling practices and is up-to-date for that area, then a modeling waiver may be used as the discussion demonstrating compliance. Otherwise, new modeling is required. For other minor source permitting actions, modeling is not part of the permitting process. Modeling waivers do not apply to nonattainment areas.

Selected NSR regulatory language applying to modeling is copied below for easy reference.

Definition of modification:

20.2.72.7 DEFINITIONS: In addition to the terms defined in 20.2.2 NMAC (Definitions) as used in this Part:

P. "Modification" means any physical change in, or change in the method of operation of, a stationary source which results in an increase in the potential emission rate of any regulated air contaminant emitted by the source or which results in the emission of any regulated air contaminant not previously emitted, but does not include:

- (1) a change in ownership of the source;
- (2) routine maintenance, repair or replacement;
- (3) installation of air pollution control equipment, and all related process equipment and materials necessary for its operation, undertaken for the purpose of complying with regulations adopted by the board or pursuant to the Federal Act; or

- (4) unless previously limited by enforceable permit conditions:

- (a) an increase in the production rate, if such increase does not exceed the operating design capacity of the source;
- (b) an increase in the hours of operation; or
- (c) use of an alternative fuel or raw material if, prior to January 6, 1975, the source was capable of accommodating such fuel or raw material, or if use of an alternate fuel or raw material is caused by any natural gas curtailment or emergency allocation or any other lack of supply of natural gas.

Requirements for permit:

20.2.72.200 APPLICATION FOR CONSTRUCTION, MODIFICATION, NSPS, AND NESHAP - PERMITS AND REVISIONS:

A. Permits must be obtained from the Department by:

- (1) Any person constructing a stationary source which has a potential emission rate greater than 10 pounds per hour or 25 tons per year of any regulated air contaminant for which there is a National or New Mexico Ambient Air Quality Standard. If the specified threshold in this subsection is exceeded for any one regulated air contaminant, all regulated air contaminants with National or New Mexico Ambient Air Quality Standards emitted are subject to permit review. Within this subsection, the potential emission rate for nitrogen dioxide shall be based on total oxides of nitrogen;
- (2) Any person modifying a stationary source when all of the pollutant emitting activities at the entire facility, either prior to or following the modification, emit a regulated air contaminant for which there is a National or New Mexico Ambient Air Quality Standard with a potential emission rate greater than 10 pounds per hour or 25 tons per year and the regulated air contaminant is emitted as a result of the modification. If the specified threshold in this subsection is exceeded for any one regulated air contaminant, all regulated air contaminants with National or New Mexico Ambient Air Quality Standards emitted by the modification are subject to permit review. Within this subsection, the potential emission rate for nitrogen dioxide shall be based on total oxides of nitrogen;

Like-kind-replacement required modeling:

20.2.72.219 PERMIT REVISIONS:

B. Technical Permit Revisions:

- (1) Technical permit revision procedures may be used only for:
 - (d) Modifications that replace an emissions unit for which the allowable emissions limits have been established in the permit, provided that the new emissions unit:
 - (i) Is equivalent to the replaced emissions unit, and serves the same function within the facility and process;
 - (ii) Has the same or lower capacity and potential emission rates;
 - (iii) Has the same or higher control efficiency, and stack parameters which are at least as effective in the dispersion of air pollutants;
 - (vi) Would not, when operated under applicable permit conditions, cause or contribute to a violation of any National or New Mexico Ambient Air Quality Standard; and

Modeling requirements for new permits or significant revisions:

20.2.72.203.A.4 NMAC

Contain a regulatory compliance discussion demonstrating compliance with each applicable air quality regulation, ambient air quality standard, prevention of significant deterioration increment, and provision of 20.2.72.400 NMAC - 20.2.72.499 NMAC. The discussion must include an analysis, which may require use of US EPA-approved air dispersion model(s), to (1) demonstrate that emissions from routine operations will not violate any New Mexico or National Ambient Air Quality Standard or prevention of significant deterioration increment, and (2) if required by 20.2.72.400 NMAC - 20.2.72.499 NMAC, estimate ambient concentrations of toxic air pollutants.

2.1.3 NSR Permitting for PSD Major Sources

PSD major sources and major modifications have additional modeling requirements beyond those of minor sources. PSD major source modeling authority is contained here:

20.2.74.305 NMAC AMBIENT AIR QUALITY MODELING: All estimates of ambient concentrations required by this Part shall be based on applicable air quality models, data bases, and other requirements as specified in EPA's Guideline on Air Quality Models (EPA-450/2-78-027R, July, 1986), its revisions, or any superseding EPA document, and approved by the Department. Where an air quality impact model specified in the Guideline on Air Quality Models is inappropriate, the model may be modified or another model substituted. Any substitution or modification of a model must be approved by the Department. Notification shall be given by the Department of such a substitution or modification and the opportunity for public comment provided for in fulfilling the public notice requirements in subsection B of 20.2.74.400 NMAC. The Department will seek EPA approval of such substitutions or modifications.

2.2 Air pollutants

Emissions of Sulfur Dioxide (SO₂), Particulate matter with an aerodynamic diameter of less than or equal to 10 micrometers (PM₁₀), Particulate matter with an aerodynamic diameter of less than or equal to 2.5 micrometers (PM_{2.5}), Carbon Monoxide (CO), Nitrogen Dioxide (NO₂), Lead (Pb), Hydrogen sulfide (H₂S), and air toxics as listed in 20.2.72 NMAC are pollutants that may require modeling. Ozone and Volatile Organic Compound (VOC) emissions do not currently require a modeling analysis for a PSD minor source. If NO_x or VOCs are subject to PSD review, you should contact NMED and the EPA Regional Office to determine current ozone modeling requirements.

2.3 Modeling Exemptions and Reductions

2.3.1 Modeling waivers

In some cases, the demonstration that ambient air quality standards and PSD increments will not be violated can be satisfied with a discussion of previous modeling. If emissions have been modeled using current modeling procedures and air quality standards, and this modeling is still valid for the current standards, then the modeling waiver form may be submitted to request approval of a modeling waiver. The Bureau will determine on a case-by-case basis if the modeling waiver can be granted. The waiver discussion and written waiver approval should be included in the modeling section of the application.

The Bureau has performed generic modeling to demonstrate that the following small sources do not need modeling. The application must include a modeling waiver form to document the basis of the waiver. Permitting staff must approve the total emission rates during the permitting process for any waiver to be valid.

Table 1. Very small emission rate modeling waiver requirements

Pollutant	If all emissions come from stacks 20 feet or greater in height and there are no horizontal stacks or raincaps (lb/hr)	If not all emissions come from stacks 20 feet or greater in height, or there are horizontal stacks, raincaps, volume, or area sources (lb/hr)
CO	50	2
H ₂ S (Pecos-Permian Basin)	0.1	0.02
H ₂ S (Not in Pecos-Permian Basin)	0.01	0.002
Lead	Waiver not available.	Waiver not available.
NO ₂	2	0.025
PM _{2.5}	0.3	0.015
PM ₁₀	1.0	0.05
SO ₂	2	0.025
Reduced sulfur (Pecos-Permian Basin)	0.033	Waiver not available.
Reduced sulfur (Not in Pecos-Permian Basin)	Waiver not available.	Waiver not available.

2.3.2 General Construction Permits (GCPs)

General Construction Permits do not require modeling. General modeling was performed in the development of these permits.

2.3.3 Streamlined Compressor Station Modeling Requirements

Compressor stations may be eligible for streamlined permits under the authority of **20.2.72.300-399 NMAC**. Streamlined permits have reduced modeling analysis requirements.

Streamlined Compressor Station Location Requirements

Restrictions preventing use of streamlined permits in certain locations are listed in **20.2.72.301 NMAC**. Those restrictions dealing with location are described below.

According to **20.2.72.301.B.4 NMAC**, the facility cannot co-locate with petroleum refineries, chemical manufacturing plants, bulk gasoline terminals, natural gas processing plants, or at any facility containing sources in addition to IC engines and/or turbines for which an air quality permit is required through state or federal air quality regulations.

20.2.72.301.B.5 NMAC restricts the location of streamlined permit in areas predicted by air quality monitoring or modeling to have more than 80% of state or federal ambient air quality standards or PSD increments consumed. Table 2, below, is a list of these areas. This restriction means that any streamlined permit applicant wishing to locate in a nonattainment area or those areas listed in Table 2 must demonstrate, using air dispersion modeling, that the entire facility will not produce any concentrations above significance levels.

Table 2. Areas Where Streamlined Permits Are Restricted

County	Latitude	Longitude	Radius (m)
San Juan	36.73120	-107.9608189	3000
San Juan	36.48296	-108.1200487	1000

* Locations within 150 meters of a facility that emits 25 tons per year of NO_x are restricted areas for streamlined compressor station permits unless modeling is performed.

20.2.72.301.B.6 NMAC prohibits the location of streamline permit from use in areas if the nearest property boundary will be located less than:

(a) 1 kilometer (km) from a school, residence, office building, or occupied structure. Buildings and structures within the immediate industrial complex of the source are not included.

(b) 3 km from the property boundary of any state park, Class II wilderness area, Class II national wildlife refuge, national historic park, state recreation area, or community with a population of more than twenty thousand people.

Table 3. List of state parks, Class I areas, Class II wilderness areas, Class II national wildlife refuges, national historic parks, and state recreation areas

County	Name	Type	Min. Distance (km)
Bernalillo	Sandia Mountain Wilderness	State Wilderness	3
Catron	Gila Wilderness	Class I Area	30
Catron	Gila Cliff Dwelling	National Monuments	3
Catron	Datil Well	Recreation Sites	3
Chaves	Bottomless Lake	Class II State Parks	3
Chaves	Salt Creek Wilderness Area	Class I Area	30
Chaves	Bitter Lake National W.R.	Class II Wildlife Refuge	3
Cibola	Bluewater Lake	Class II State Parks	3
Cibola	El Malpais	National Monuments	3
Cibola	El Morro	National Monuments	3
Colfax	Cimarron Canyon	Class II State Parks	3
Colfax	Maxwell National W.R.	Class II Wildlife Refuge	3
Colfax	Capulin	National Monuments	3
DeBaca	Sumner Lake	Class II State Parks	3
DeBaca	Ft. Sumner	State Monuments	3
Dona Ana	Leesburg Dam	Class II State Parks	3
Dona Ana	Aguirre Springs	Recreation Sites	3
Dona Ana	Ft. Seldon	State Monuments	3
Eddy	Carlsbad Caverns National Park	Class I Area	30
Eddy	Living Desert	Class II State Parks	3
Grant	Gila Wilderness	Class I Area	30
Grant	City of Rocks	Class II State Parks	3
Guadalupe	Santa Rosa Lake	Class II State Parks	3
Harding	Chicosa Lakes	Class II State Parks	3
Harding	Kiowa National Grasslands	National Grasslands	3
Lea	Harry McAdams	Class II State Parks	3
Lincoln	White Mountain Wilderness	Class I Area	30
Lincoln	Valley of Fires	Class II State Parks	3
Lincoln	Lincoln	State Monuments	3

County	Name	Type	Min. Distance (km)
Luna	Pancho Villa	Class II State Parks	3
Luna	Rock Hound	Class II State Parks	3
McKinley	Red Rock	Class II State Parks	3
Mora	Coyote Creek	Class II State Parks	3
Mora	Ft. Union	National Monuments	3
Otero	Oliver Lee	Class II State Parks	3
Otero	White Sands	National Monuments	3
Otero	Three Rivers Petro	Recreation Sites	3
Quay	Ute Lake	Class II State Parks	3
Rio Arriba	San Pedro Parks Wilderness	Class I Area	30
Rio Arriba	El Vado Lake	Class II State Parks	3
Rio Arriba	Heron Lake	Class II State Parks	3
Rio Arriba	Navajo Lake (Sims)	Class II State Parks	3
Rio Arriba	Chama River Canyon Wilderness	State Wilderness	3
Roosevelt	Oasis	Class II State Parks	3
Roosevelt	Grulla National W. R.	Class II Wildlife Refuge	3
San Juan	Navajo (Pine)	Class II State Parks	3
San Juan	Chaco Canyon	National Historic Park	3
San Juan	Aztec Ruins	National Monuments	3
San Juan	Angel Peak (National)	Recreation Area	3
San Miguel	Conchas Lake	Class II State Parks	3
San Miguel	Storey Lake	Class II State Parks	3
San Miguel	Villanueva	Class II State Parks	3
San Miguel	Las Vegas National W. R.	Class II Wildlife Refuge	3
San Miguel	Pecos	National Monuments	3
Sandoval	Bandelier Wilderness	Class I Area	30
Sandoval	Coronado	Class II State Parks	3
Sandoval	Rio Grande Gorge/Fenton Lake	Class II State Parks	3
Sandoval	Bandelier	National Monuments	3
Sandoval	Sandia Crest (State)	Recreation Area	3
Sandoval	Coronado	State Monuments	3
Sandoval	Jemez	State Monuments	3
Sandoval	Sandia Mountain Wilderness	State Wilderness	3
Santa Fe	Hyde Memorial	Class II State Parks	3
Sierra	Caballo Lake	Class II State Parks	3
Sierra	Elephant Butte Lake	Class II State Parks	3
Sierra	Percha Dam	Class II State Parks	3
Socorro	Bosque del Apache Wilderness	Class I Area	30
Socorro	Sevillita National W.R.	Class II Wildlife Refuge	3
Taos	Pecos Wilderness	Class I Area	30
Taos	Wheeler Park Wilderness	Class I Area	30
Taos	Kit Carson	Class II State Parks	3
Taos	Rio Grande Gorge	Recreation Sites	3
Taos	Latir Peak Wilderness	State Wilderness	3
Torrance	Manzano Mountain	Class II State Parks	3
Torrance	Grand Guivira	National Monuments	3

County	Name	Type	Min. Distance (km)
Torrance	Quarai at Salinas	National Monuments	3
Torrance	Abo at Salinas	State Monuments	3
Torrance	Manzano Mountain Wilderness	State Wilderness	3
Union	Clayton Lake	Class II State Parks	3
Valencia	Sen. Willie Chavez	Class II State Parks	3
Valencia	Manzano Mountain Wilderness	State Wilderness	3

- (c) 10 km from the boundary of any community with a population of more than forty-thousand people, or
(d) 30 km from the boundary of any Class I area;

20.2.72.301.B.7 NMAC prohibits the location of streamline permit in Bernalillo County or within 15 km of the Bernalillo County line.

Streamlined Compressor Station Modeling and Public Notice Requirements

Modeling and public notice requirements for streamlined compressor station permits depend on the amount of emissions from the facility. Refer to the table below, using the maximum of the Potential to Emit (PTE) of each regulated contaminant from all sources at the facility to determine applicability. The potential to emit for nitrogen dioxide shall be based on total oxides of nitrogen. The effects of building downwash shall be included in modeling if there are buildings at the site.

Table 4. Streamlined Permit Applicability Requirements for facilities with less than 200 tons/year PTE

Applicable Regulation	PTE (TPY)	Modeling Requirements (from 20.2.72.301 D NMAC)
20.2.72.301 D (1)	<40	<ul style="list-style-type: none"> • None
20.2.72.301 D (2)	<100	<ul style="list-style-type: none"> • The impact on ambient air from all sources at the facility shall be less than the ambient significance levels.
20.2.72.301 D (3)	<200	<ul style="list-style-type: none"> • Air quality impacts must be less than 50% of all applicable NAAQS, NMAAQs and PSD increments. • There shall be no adjacent sources emitting the same air contaminant(s) as the source within 2.5 km of the modeled NO₂ impact area. • The sum of all potential emissions for NO_x from all adjacent sources within 15 km of the NO_x ROI must be less than 740 tons/year. • The sum of all potential emissions for NO_x from all adjacent sources within 25 km of the NO_x ROI must be less than 1540 tons/year.

There are other criteria that must be met for streamlined permits for compressor stations. Please refer to **20.2.72.300-399 NMAC** for more information.

2.3.4 Minor NSR Exempt Equipment

Exempt equipment under 20.7.72.202 NMAC do not need to be included in modeling for 20.2.72 NMAC permits. The exemption does not exclude them from modeling requirements under other types of permits, such as 20.2.70 NMAC or 20.2.74 NMAC.

2.4 Levels of Protection

2.4.1 Significance Levels

Modeling significance levels are thresholds below which the source is not considered to contribute to any predicted exceedance of air quality standards or PSD increments. The definition of ‘source’ can apply to the whole facility or to the modifications at the facility. For a new facility or an unpermitted facility, NMED considers the entire facility to be the ‘source’. For other cases, ‘source’ includes only the new equipment or new emissions increases described in the current application. Equipment that replaces other equipment is part of the new equipment.

Example of source to model for permitting:

The entire facility was modeled for annual NO₂ and 1-hour and 8-hour CO in 1999 but was never modeled for 1-hour NO₂. The facility applies to replace a widget. If this widget emits only NO₂ and CO, then modeling review is applicable for these pollutants. For CO and for NO₂, the applicant may model only the replacement widget. If the impacts from the widget alone are below significance levels, then modeling is done for that pollutant/averaging period. If the impacts from the widget alone are above significance levels, then the entire facility plus nearby sources must be modeled for comparison with air quality standards and PSD increments.

Significance levels are listed in **20.2.72.500 NMAC** and are repeated in the sections below. Always use the maximum predicted concentration from the source for radius of impact/significance level determination. Even if the form of the standard allows it to be exceeded several times per period, that fraction is based on cumulative concentration and cannot be related to partial concentrations. If multiple years of meteorological data are used, then the average of those concentrations is compared with the significance level, except for PM_{2.5} and 1-hour SO₂, for which the maximum across multiple years is compared with the significance level.

Use of the PM_{2.5} significant ambient concentration level or significant monitoring concentration for PSD major modifications or new PSD major sources is not allowed. This significant ambient concentration level may still be used for minor source permitting.

2.4.2 Air Quality Standards

Air quality standards are maximum allowable concentrations that are designed to protect the most sensitive individuals from harm from airborne pollutants. National Ambient Air Quality Standards (NAAQS) and New Mexico Ambient Air Quality Standards (NMAAQS) are explained below. Unless otherwise noted, standards are not to be exceeded.

2.4.3 Prevention of Significant Deterioration (PSD) Increments

To prevent relatively clean areas from degrading to levels just barely in compliance with the air quality standards, limits on the change have been established in the form of PSD increments. Compliance demonstrations for PSD increments demonstrate that the deterioration is less than the allowable increment.

List of State air quality standards:

<http://www.nmcpr.state.nm.us/nmac/parts/title20/20.002.0003.htm>

2.5 Concentration Conversions

Many of the air quality standards are written in the form of parts per million (ppm) or parts per billion (ppb), but the models generally give output in units of micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). EPA has verbally communicated to NMED that AERMOD output is expressed at Standard Temperature and Pressure (STP) conditions. Therefore, most air quality standards can be compared to modeled concentration without corrections for elevation (and associated low pressure). If a need for elevation correction arises, a method to adjust for elevation is listed below.

2.5.1 Gaseous Conversion Factor for Elevation and Temperature Correction

The following equation calculates the conversion from $\mu\text{g}/\text{m}^3$ to ppm, with corrections for temperature and pressure (elevation):

$$ppm = 4.553 \times 10^{-5} \times \frac{C \times T}{M_w} \times 10^{Z \times 1.598 \times 10^{-5}}$$

or, rearranged to calculate $\mu\text{g}/\text{m}^3$:

$$C = ppm \times M_w / (T \times (4.553 \text{ E } -5) \times (10^{Z \times 1.598 \text{ E } -5}))$$

where:

C = component concentration in $\mu\text{g}/\text{m}^3$.

T = average summer morning temperature in Rankin at site (typically 530 R).

M_w = molecular weight of component.

Z = site elevation, in feet.

2.5.2 Gaseous Conversion Factor at Standard Temperature and Pressure (STP) Conditions

Federal standards are expressed as mass per unit volume or ppm or ppb under standard temperature and pressure.

“40 CFR 50.3 Reference conditions.

All measurements of air quality that are expressed as mass per unit volume (e.g., micrograms per cubic meter) other than for particulate matter (PM_{2.5}) standards contained in §§ 50.7 and 50.13 and lead standards contained in § 50.16 shall be corrected to a reference temperature of 25 (deg) C and a reference pressure of 760 millimeters of mercury (1,013.2 millibars).”

If a monitored or modeled concentration has been adjusted to STP, then the following equation calculates the conversion from ppm to $\mu\text{g}/\text{m}^3$ for NAAQS:

$$C = ppm \times M_w \times 40.8727$$

or, rearranged to calculate ppm:

$$\text{ppm} = C / (M_w \times 40.8727)$$

where:

C = component concentration in $\mu\text{g}/\text{m}^3$.

M_w = molecular weight of component.

$$p = p_0 \cdot \left(1 - \frac{L \cdot h}{T_0}\right)^{\frac{g \cdot M}{R \cdot L}} \approx p_0 \cdot \exp\left(-\frac{g \cdot M \cdot h}{R \cdot T_0}\right),$$

Parameter	Description	Value
p_0	sea level standard atmospheric pressure	101325 Pa
L	temperature lapse rate sea level standard	0.0065 K/m
T_0	temperature Earth-surface	288.15 K
g	gravitational acceleration	9.80665 m/s^2
M	molar mass of dry air	0.0289644 kg/mol
R	universal gas constant	8.31447 J/(mol•K)

$$[\text{PM}_{10}]_{\text{STP}} = [\text{PM}_{10}]_{\text{modeled}} (P_{\text{standard}})(T_{\text{measured}}) / ((P_{\text{calculated by elevation}})(T_{\text{standard}}))$$

2.6 Modeling the Standards and Increments

Unless otherwise specified, the discussion of the standards assumes one year of representative meteorological data is used. For multiple years of data, some pollutants use the average of the values predicted for each year as the design value. Others (including PM_{2.5}, CO, and Pb) use the maximum value from the multiple years of data. Verify the form of the standard in regulations and EPA memos if multiple years of meteorological data are being used. Background concentrations are averaged over three years unless otherwise specified.

In cases where all the emissions of the pollutant in question are emitted from permitted sources, the nearby sources may be modeled instead of adding the background concentration. CO, NO₂, and SO₂ may use this substitution if they are over 20 km from the center of Albuquerque and El Paso. To use this substitution, include all nearby sources. Particulate matter sources and sources within 20 km of the center of Albuquerque or El Paso should include both surrounding sources and monitored background concentrations.

2.6.1 Carbon Monoxide (CO) Standards

Table 5A: Carbon Monoxide Air Quality Standards

Averaging Period	Significance Level ($\mu\text{g}/\text{m}^3$)	NAAQS (ppm)	NAAQS ($\mu\text{g}/\text{m}^3$)	NMAAQs (ppm)	NMAAQs ($\mu\text{g}/\text{m}^3$)
8-hour	500	9	10,303.6	8.7	9,960.1
1-hour	2,000	35	40,069.6	13.1	14,997.5

2.6.1.1 Design value of CO standard.

CO NAAQS are not to be exceeded more than once per year. NMAAQs are not to be exceeded. Demonstration of compliance with CO NMAAQs automatically demonstrates compliance with NAAQS.

2.6.1.2 Modeling for the CO design value.

Tier 1, 1-hour NMAAQs: Model the entire facility to determine the high 1-hour concentration. Add the high 1-hour background concentration to the high 1-hour predicted concentration to determine the total design concentration for comparison to the 1-hour NMAAQs.

Tier 1, 8-hour NMAAQs: Model the entire facility to determine the high 8-hour concentration. Add the high 8-hour background concentration to the high 8-hour predicted concentration to determine the total design concentration for comparison to the 8-hour NMAAQs.

Optionally, all nearby sources may be modeled instead of adding a background concentration, if the facility is over 20 km from the center of Albuquerque and El Paso.

Tier 2: Hourly background concentrations may be added instead of the maximum concentrations for each averaging period.

2.6.2 Hydrogen sulfide (H₂S) Standards

Table 5B: Hydrogen Sulfide Air Quality Standards

Averaging Period	Significance Level ($\mu\text{g}/\text{m}^3$)	NMAAQs (ppm)	NMAAQs ($\mu\text{g}/\text{m}^3$)	Notes
1-hour	1.0	0.010	13.9	For the state, except for the Pecos-Permian Basin Intrastate AQCR. Not to be exceeded more than once per year.
1/2-hour	5.0	0.10	139.3	For the Pecos-Permian Basin Intrastate AQCR
1/2-hour	5.0	0.030	41.8	for within 5-miles of the corporate limits of municipalities within the Pecos-Permian Basin AQCR

Design value of standard: For modeling 1/2-hour H₂S NMAAQs, use the 1-hour averaging time because the models cannot resolve less than one-hour increments.

Model the entire facility and any nearby sources and compare the high 1-hour concentration to the standard for that region. No background concentration is added.

2.6.3 Lead (Pb) Standards

Table 5C: Lead Air Quality Standards

Averaging Period	Significance Level ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)
Quarterly	0.03	0.15

Design value of standard: For modeling quarterly lead averages, use the monthly averaging period as a conservative approach, unless the model being used has a quarterly averaging period or post-processing is desired to calculate quarterly values. Model the entire facility without surrounding sources and compare the high month concentration to the standard. No background concentration is added.

2.6.4 Nitrogen Dioxide (NO₂) Standards

Table 5D: NO₂ Air Quality Standards

Averaging Period	Significance Level ($\mu\text{g}/\text{m}^3$)	NAAQS (ppb)	NAAQS ($\mu\text{g}/\text{m}^3$)	NMAAQS (ppb)	NMAAQS ($\mu\text{g}/\text{m}^3$)	Class II PSD Increment ($\mu\text{g}/\text{m}^3$)	Class I PSD Significance Level ($\mu\text{g}/\text{m}^3$)	Class I PSD Increment ($\mu\text{g}/\text{m}^3$)
annual	1.0	53	99.66	50	94.02	25	0.1 ⁸	2.5
24-hour	5.0			100	188.03			
1-hour	7.52 ¹	100	188.03					

¹ EPA proposed significance level of 4 ppb corrected to a reference temperature of 25°C and a reference pressure of 760 millimeters of mercury.

2.6.4.1 Design value of NO₂ standard

Demonstration of compliance with 1-hour standard is automatically a demonstration of compliance with the 24-hour NMAAQS. Otherwise, the 24-hour NO₂ standard is compared with the highest 24-hour average calculated by the model.

The annual NMAAQS design value is determined by modeling the entire facility and adding the annual background concentration. The total is compared to the standard. Optionally, to determine the total design value, the facility and all nearby sources may be modeled instead of adding a background concentration if the facility is over 20 km from the center of Albuquerque and El Paso.

The annual NO₂ PSD increment is compared with the annual average calculated by the model.

The 1-hour NO₂ standard is compared with the 3-year average of the 98th-percentile of the annual distribution of daily maximum 1-hour concentrations. If one year of on-site meteorological data is used, the 98th-percentile value associated with the 1-year period of meteorological data modeled is the design value. Each day of modeling, the maximum 1-hour concentration is determined for each receptor. The high-eighth-high value at each receptor is calculated, and the maximum of these is compared with the standard. If multiple years are modeled, the maximum value is averaged over the span of years before comparing with standards.

2.6.4.2 NO₂ Reactivity

Combustion processes emit nitrogen oxides in the forms of nitrogen oxide (NO) and nitrogen dioxide (NO₂). Only the concentration of NO₂ is regulated by air quality standards; however, emissions of nitrogen oxides (NO_x = NO + NO₂) must be modeled to estimate total NO₂ concentrations because nitrogen oxides change form in the atmosphere.

Two key reactions are most important in determining the equilibrium (or quasi-equilibrium) ratio of NO₂ to NO.



Many other reactions participate in the determination of the atmospheric concentration of NO₂. As the plume travels away from the stack, more and more ozone diffuses into the plume, enabling the relatively quick reaction to form NO₂.

2.6.4.3 Estimating NO₂ concentrations

The Bureau has approved techniques, described below, for estimating NO₂ concentrations from NO_x point sources. Note that NO₂ emissions reported by the emissions inventory are actually NO_x emissions.

Tier 1, Total Conversion Technique: 100% conversion

This technique assumes all the NO_x is converted to NO₂. This simple technique is suitable for small facilities where compliance with standards is not a problem.

Tier 2, Ambient Ratio Method 2 (ARM2) Technique

ARM2 method is included as an option in AERMOD. This method is approved without the need for EPA approval. 0.5 is the national default for minimum ambient ratio. A minimum ambient ratio as low as 0.2 may be used by providing evidence that the in-stack ratio of the modeled emission units is equal to or lower than the minimum ambient ratio used. The default maximum ratio is 0.9.

Tier 3, Ozone Reaction Techniques

Two methods account for the ozone that mixes into the plumes and encourages NO₂ formation: Ozone Limiting Method (OLM) and Plume Volume Molar Ratio Method (PVMRM). Both these techniques are accepted and are built into AERMOD.

OLM assumes an NO₂ plume and an NO plume are each dispersing. The in-stack ratio of NO₂/NO_x is used to determine the amount of nitrogen dioxide initially in each plume. The concentration of NO at each receptor is assumed to react stoichiometrically with the background ozone concentration at that time to form NO₂.

Contributions from both plumes are added to get the NO₂ concentration at that time.

PVMRM works similarly to OLM but uses the total volume of the plume by the time it reaches the receptor to calculate how much ozone is available for reaction. Both methods result in greater conversion with greater distance from the source but use different approximations for determining how much ozone has dispersed into the plume.

Both methods require additional information.

For the equilibrium NO₂/NO_x ratio, the value of 0.9 is approved.

For the in-stack NO₂/NO_x ratio, values lower than 0.5 must be justified with data. Combustion involving excess oxygen results in higher in-stack NO₂/NO_x ratios than do stoichiometric reactions. The facility may use an in-stack ratio of 0.5 without justification. Surrounding sources, if required, may be modeled with an in-stack ratio of 0.3 without justification.

Recent ozone data representative of the area should be used. See the section on background concentrations for more information.

Special techniques are required to model PSD increment with OLM or PVMRM if increment-expanding sources are being modeled. No negative emission rates can be used. See *ADDENDUM, USER'S GUIDE FOR THE AMS/EPA REGULATORY MODEL – AERMOD (EPA-454/B-03-001, September 2004)*, Pg. 25, for more details on the PSDCREDIT option. (http://www.rflc.com/RFL_Pages/AERMOD_USERGUIDE_ADDENDUM_06341.pdf)

Combined-Plume Option vs. Individual-Plume Option

AERMOD provides two options for calculating ozone-limited NO₂ concentrations, the “plume-by-plume” (INDVDL) calculation, and the combined plume (SRCGRP) calculation. The Bureau has accepted a general demonstration that if two plumes are impacting the same receptor at the same time, then the two plumes have merged. If the plumes do not impact the same receptor at the same time, then the plumes have not merged, but both options will calculate the same concentration for that hour. Therefore, the Bureau will accept either INDVL or SRCGP option without additional demonstrations.

2.6.4.4 Modeling for the 1-hour NO₂ design value

Model the entire facility and add the 98th percentile 1-hour background concentration to compare to the design value. Optionally, all nearby sources may be modeled instead of adding a background concentration if the facility is over 20 km from the center of Albuquerque and El Paso, Texas. Refined hourly background concentrations may be used instead of the maximum 1-hour concentration as described in the section on background concentrations.

Before attempting to calculate the design value, first locate the areas with highest overall concentrations. Place a few receptors in these areas and re-run the model in these areas. The maximums will occur in nearly the same places.

Maximum modeled concentration may also be used as a conservative approximation of the design value.

“The highest of the average 8th-highest (98th-percentile) concentrations across all receptors, based on the length of the meteorological data period, represents the modeled 1-hour NO₂ design value based on the form of the standard.”

2.6.4.5 Modeling for the annual NO₂ NMAAQs design value

Model the entire facility and add the annual background concentration to compare to the design value. Optionally, all nearby sources may be modeled instead of adding a background concentration if the facility is over 20 km from the center of Albuquerque and El Paso, Texas. (Use of hourly background concentrations does not affect the result for an annual average).

2.6.4.6 Modeling for the annual NO₂ PSD increment design value

Model all increment-consuming parts of the facility and increment-consuming nearby sources of the facility (or nearby sources of the Class I area for Class I analysis). Compare the result to the design value. All sources (not just increment affecting sources) will need to be modeled in order to take credit for increment expanding sources using OLM or PVMRM. See the AERMOD User's Guide Addendum for more details. Optionally, a monitored background value may be substituted for the modeled surrounding sources as a conservative approach to the increment consumption.

2.6.5 Ozone (O₃) Standards

Ozone is normally only modeled for regional compliance demonstrations and does not need to be modeled for air quality permits. However, permit applicants for PSD applications that apply to NO_x or VOCs should contact NMED and the EPA Regional Office to determine how to complete the ozone ambient impact analysis.

Table 5E: O₃ Air Quality Standards

Averaging Period	Significance Level (µg/m ³)	NAAQS (ppm)	NAAQS (µg/m ³)
8-hour	1.96 ²	0.07 ¹	137.3

¹ To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.07 ppm.

² 1.0 ppb, Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program, EPA, April 17, 2018

Ozone concentrations may be estimated using the following method derived from the MERP guidance².

$$[O_3] = ((NO_x \text{ emission rate (tons/year)} / 184) + (\text{VOC emission rate (tons/year)} / 1049)) \times 1.96 \mu\text{g/m}^3$$

“Simulation of ozone formation and transport is a highly complex and resource intensive exercise. Control agencies with jurisdiction over areas with ozone problems are encouraged to use photochemical grid models, such as the Models-3/Community Multi-scale Air Quality (CMAQ) modeling system, to evaluate the relationship between precursor species and ozone.” --68234 Federal Register / Vol. 70, No. 216 / Wednesday, November 9, 2005 / Rules and Regulations

In accordance with this guidance, NMED performs ozone modeling on a regional scale as need arises, rather than requiring permit applicants to quantify their contribution to a regional ozone concentration. Comprehensive ozone modeling is too resource intensive to attach this expense to a typical permit application, and screening modeling on an affordable scale currently cannot quantify a source’s impacts to ambient ozone concentrations.

Regional ozone modeling for the Four Corners area was done in 2009 (see <http://www.nmenv.state.nm.us/aqb/4C/Modeling.html>) and the Air Quality Bureau is continuing to analyze ozone in the region.

2.6.6 Particulate matter less than 2.5 micrometers in aerodynamic diameter (PM_{2.5}) Standards

² Guidance on the Development of Modeled Emission Rates for Precursors (MERPS) as a Tier 1 Demonstration Tool for Ozone and PM_{2.5} under the PSD Permitting Program, Richard A. Wayland, EPA, December 2, 2016.

Table 5F: PM_{2.5} Air Quality Standards³

Averaging Period	Significance Level ⁴ (µg/m ³)	NAAQS (µg/m ³)	Class II PSD Increment ³ (µg/m ³)	Class I PSD Significance Level (µg/m ³)	Class I PSD Increment ³ (µg/m ³)
annual	0.2	12 ¹	4	0.05	1
24-hour	1.2	35 ²	9	0.27	2

¹ To attain this standard, the 3-year average of the annual arithmetic mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 12.0 µg/m³.

² To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m³.

³ For any period other than an annual period, the applicable maximum allowable increase may be exceeded during one such period per year at any one location.

⁴ Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program, EPA, April 17, 2018.

PM_{2.5} secondary formation concentrations may be estimated using the following method derived from the MERP guidance⁴.

$$[\text{PM}_{2.5}]_{\text{annual}} = ((\text{NO}_x \text{ emission rate (tons/year) } / 3184) + (\text{SO}_2 \text{ emission rate (tons/year) } / 2289)) \times 0.2 \text{ } \mu\text{g/m}^3$$

$$[\text{PM}_{2.5}]_{24\text{-hour}} = ((\text{NO}_x \text{ emission rate (tons/year) } / 1155) + (\text{SO}_2 \text{ emission rate (tons/year) } / 225)) \times 1.2 \text{ } \mu\text{g/m}^3$$

Secondary formation from the project should be added to the modeled value. Refined factors for certain geographic areas may be developed using the MERP guidance.

2.6.6.1 PM_{2.5} design value

The 24-hour design value is the 98th percentile of the combined concentrations from all sources. The annual design value is the annual average.

2.6.6.2 Modeling for the 24-hour PM_{2.5} design value

AERMOD and current emissions inventories currently do not account for secondary formation of PM_{2.5} in the atmosphere. Sources that emit at least 40 tons per year of NO_x or at least 40 tons per year of SO₂ are

³ Prevention of Significant Deterioration (PSD) for Particulate Matter Less Than 2.5 Micrometers (PM_{2.5}) – Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC), ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 51 and 52, RIN 2060-AO24 <http://www.epa.gov/nsr/documents/20100929finalrule.pdf>

⁴ Guidance on the Development of Modeled Emission Rates for Precursors (MERPS) as a Tier 1 Demonstration Tool for Ozone and PM_{2.5} under the PSD Permitting Program, Richard A. Wayland, EPA, December 2, 2016.

considered to emit significant amounts of precursors. Sources with significant increases of PM_{2.5} precursors must qualitatively and/or quantitatively account for secondary formation of PM_{2.5}.⁵

Two tiers of modeling are available for PM_{2.5} modeling. Both tiers include modeling the facility and nearby sources and adding secondary formation and a background concentration to that. Particulate sources typically have impacts in the immediate vicinity of the source that are not represented in background monitors, so double-counting of background concentrations is expected to be limited.

Add the design value of the modeled direct PM_{2.5} to the design value of the secondary PM_{2.5} and the design value of the background PM_{2.5}.

Tier 1: To the modeled concentration(s), add the secondary PM_{2.5} and the 98th percentile 24-hour monitored background concentration.

Tier 2: Add the secondary PM_{2.5} and the monthly or quarterly maximum background concentrations to daily modeled concentrations. Compare the high-eighth-high combined concentration with the 24-hour standard. If multiple years of meteorological data are used, then the high-eighth-high combined concentration is compared with the standard.

2.6.6.3 Modeling for the 24-hour PM_{2.5} PSD increment design value

Model the high-second-high concentration of all increment-consuming sources at the facility and at nearby sources. Calculate secondary formation from NO_x and SO₂ increases after the appropriate baseline date and add that to the modeled concentration. Compare the total with the 24-hour PSD increment.

2.6.6.4 Modeling for the annual PM_{2.5} PSD increment design value

Model all increment-consuming sources at the facility and at nearby sources. Calculate secondary formation from NO_x and SO₂ increases after the appropriate baseline date and add that to the modeled concentration. Compare the total predicted annual average concentration with the allowable increment.

2.6.7 Particulate matter less than 10 micrometers in aerodynamic diameter (PM₁₀) Standards

Table 5G: PM₁₀ Air Quality Standards

Averaging Period	Significance Level (µg/m ³)	NAAQS (µg/m ³)	PSD Increment ² Class II (µg/m ³)	PSD Class I Significance Level (µg/m ³)	PSD Class I Increment ² (µg/m ³)
annual	1.0		17	0.2 ¹	4
24-hour	5.0	150	30	0.3 ¹	8

¹ EPA proposed significance level

² For any period other than an annual period, the applicable maximum allowable increase may be exceeded during one such period per year at any one location.

2.6.7.1 Modeling for the 24-hour PM₁₀ NAAQS design value

⁵ Guidance for PM_{2.5} Permit Modeling, Stephen D. Page, May 20, 2014.

http://www.epa.gov/ttn/scram/guidance/guide/Guidance_for_PM25_Permit_Modeling.pdf

If PM2.5 emission rates are modeled as equal to PM10 emission rates, then the PM2.5 NAAQS demonstration will satisfy the requirement for demonstration of compliance with PM10 NAAQS. However, PM10 PSD increment demonstration is not necessarily satisfied by any PM2.5 modeling.

The 24-hour NAAQS is not to be exceeded more than once per year. Use high second high and a single year of representative meteorological data. This is approximately equivalent to the high fourth high specified in the multi-year analysis. "...[W]hen n years are modeled, the (n+1)th highest concentration over the n-year period is the design value, since this represents an average or expected exceedance rate of one per year."
http://www.epa.gov/ttn/scram/guidance/guide/appw_05.pdf

Two tiers of modeling are available for PM₁₀ NAAQS modeling. Both tiers include modeling the facility and nearby sources and adding a background concentration to that. Particulate sources typically have impacts in the immediate vicinity of the source that are not represented in background monitors, so double-counting of background concentrations is expected to be limited.

Tier 1, option 1: Use highest predicted concentration (instead of the high second high) and a single year of representative meteorological data. To the modeled concentration, add the high second high 24-hour monitored background concentration.

Tier 1, option 2: Use high second high predicted concentration and a single year of representative meteorological data. To the modeled concentration, add the highest 24-hour monitored background concentration.

Tier 2: Add monthly maximum background concentrations to daily modeled concentrations. The high-second-high combined concentration may be compared with the 24-hour standard.

2.6.7.2 Modeling for the 24-hour PM₁₀ PSD increment design value

Model all increment-consuming sources at the facility and at nearby sources. Compare the high-second-high predicted concentration with the allowable increment.

2.6.7.3 Modeling for the annual PM₁₀ PSD increment design value

Model all increment-consuming sources at the facility and at nearby sources. Compare the predicted annual average concentration with the allowable increment.

2.6.8 Sulfur Dioxide (SO₂) Standards

Table 5I: SO₂ Air Quality Standards

Averaging Period	Significance Level (µg/m ³)	NAAQS (ppb)	NAAQS (µg/m ³)	NMAAQS (ppb)	NMAAQS (µg/m ³)	PSD Class II Increment ³ (µg/m ³)	PSD Class I Significance Level (µg/m ³)	PSD Class I Increment ³ (µg/m ³)
annual	1.0			20	52.4	20	0.1 ²	2
24-hour	5.0			100	261.9	91	0.2 ²	5
3-hour	25.0	500	1309.3			512	1.0 ²	25
1-hour	7.8 ¹	75	196.4					

¹ EPA proposed 1-hour significance level of 3 ppb corrected to a reference temperature of 25°C and a reference pressure of 760 millimeters of mercury.

² EPA proposed significance level.

³ For any period other than an annual period, the applicable maximum allowable increase may be exceeded during one such period per year at any one location.

2.6.8.1 SO₂ design value

In NMAC, the SO₂ standards for the area within 3.5 miles of the Chino Mines Company smelter furnace stack at Hurley are set equal to the federal standards. However, since this stack no longer exists, the distance is irrelevant. The NMAAQs listed in table 5I apply for the entire state.

Demonstration of compliance with 1-hour standard will also demonstrate compliance with the other standards, but not necessarily the PSD increments.

The form is the 3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations.

2.6.8.2 Modeling for the 1-hour SO₂ NAAQS

The standard is calculated similarly to the NO₂ 1-hour standard instructions in section 2.6.4.4, but the fourth highest is used in place of the eighth highest (and 99th percentile is substituted for 98th percentile). All sulfur oxides are assumed to be in the form of SO₂. If multiple years are modeled, the resulting high-fourth-high values at each receptor are averaged over the years modeled and the maximum average value is compared with the standard.

Tier 1: Add the 99th percentile 1-hour background concentration to 99th percentile modeling for the entire facility (without neighboring sources) and compare the total with the 1-hour NAAQS. Optionally, to determine the total design value, the facility and all nearby sources may be modeled instead of adding a background concentration if the facility is over 20 km from the center of Albuquerque and El Paso.

Tier 2: Add the hourly 1-hour background concentrations (as described in the background concentration section) to each hour of the modeling results and compare the 99th percentile of the totals with the 1-hour NAAQS. Optionally, to determine the total design value, the facility and all nearby sources may be modeled instead of adding a background concentration if the facility is over 20 km from the center of Albuquerque and El Paso.

2.6.8.3 Modeling for the 3-hour SO₂ PSD increment

Model the increment consuming emissions at the facility and at nearby sources and compare the high-second-high 3-hour average with the allowable PSD increment. Optionally, a monitored background value may be substituted for the modeled surrounding sources as a conservative approach to the increment consumption.

2.6.8.4 Modeling for the 24-hour SO₂ PSD increment

Model the increment consuming emissions at the facility and at nearby sources and compare the high-second-high 24-hour average with the allowable PSD increment. Optionally, a monitored background value may be substituted for the modeled surrounding sources as a conservative approach to the increment consumption.

2.6.8.5 Modeling for the annual SO₂ PSD increment

Model the increment consuming emissions at the facility and at nearby sources and compare the predicted annual average with the allowable PSD increment. Optionally, a monitored background value may be substituted for the modeled surrounding sources as a conservative approach to the increment consumption.

2.6.9 Total Reduced Sulfur Except For Hydrogen Sulfide Standards

Table 5J: Total Reduced Sulfur except for H₂S Air Quality Standards

Averaging Period	NMAAQS (ppm)	Notes
1/2-hour	0.003	for the state, except for the Pecos-Permian Basin Intrastate AQCR
1/2-hour	0.010	for the Pecos-Permian Basin Intrastate AQCR
1/2-hour	0.003	For within corporate limits of municipalities within the Pecos-Permian Basin Intrastate Air Quality Control Region.
1/2-hour	0.003	For within five miles of the corporate limits of municipalities having a population of greater than twenty thousand and within the Pecos-Permian Basin Intrastate Air Quality Control Region

2.6.9.1 Total Reduced Sulfur design value

EPA test methods suggest that reduced sulfur compounds in some cases consist primarily of carbon disulfide (CS₂), carbonyl sulfide (COS), and hydrogen sulfide (H₂S). To calculate the parts per million of reduced sulfur, use the average molecular weight in the sample. For example, 1-heptanethiol (CH₃[CH₂]₆SH) has a molecular weight of 132.3.

For modeling ½-hour total reduced sulfur NMAAQS, use the 1-hour averaging time because the models cannot resolve less than one hour increments.

2.6.9.2 Modeling the Total Reduced Sulfur ½-hour NMAAQS

Model the entire facility and compare the 1-hour predicted concentration with the ½-hour NMAAQS. Surrounding sources and background concentrations are not added.

Table 6A. Air Quality Standard Summary (Without Notes).

Pollutant	Avg. Period	Sig. Lev. ($\mu\text{g}/\text{m}^3$)	Class I Sig. Lev. ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)	NMAAQS ($\mu\text{g}/\text{m}^3$ unless noted)	PSD Increment Class I ($\mu\text{g}/\text{m}^3$)	PSD Increment Class II ($\mu\text{g}/\text{m}^3$)
CO	8-hour	500		10,303.6	9,960.1		
	1-hour	2,000		40,069.6	14,997.5		
H ₂ S	1-hour	1.0			13.9		
	1/2-hour	5.0			139.3		
	1/2-hour	5.0			41.8		
Pb	Quarterly	0.03		0.15			
NO ₂	annual	1.0	0.1	99.66	94.02	2.5	25
	24-hour	5.0			188.03		
	1-hour	7.52		188.03			
O ₃	8-hour	1.96		137.3			
PM _{2.5}	annual	0.2	0.05	12		1	4
	24-hour	1.2	0.27	35		2	9
PM ₁₀	annual	1.0	0.2			4	17
	24-hour	5.0	0.3	150		8	30
SO ₂	annual	1.0	0.1		52.4	2	20
	24-hour	5.0	0.2		261.9	5	91
	3-hour	25.0	1.0	1309.3		25	512
	1-hour	7.8		196.4			
Reduced S	1/2-hour				3 ppb		
	1/2-hour				10 ppb		

Table 6B. Standards for which Modeling is not Required.

Standard not Modeled	Surrogate that Demonstrates Compliance
CO 8-hour NAAQS	CO 8-hour NMAAQs
CO 1-hour NAAQS	CO 1-hour NMAAQs
NO ₂ annual NAAQS	NO ₂ annual NMAAQs
NO ₂ 24-hour NMAAQs	NO ₂ 1-hour NAAQS
O ₃ 8-hour	Regional modeling
SO ₂ annual NMAAQs	SO ₂ 1-hour NAAQS
SO ₂ 24-hour NMAAQs	SO ₂ 1-hour NAAQS
SO ₂ 3-hour NAAQS	SO ₂ 1-hour NAAQS

Table 6C. Modeling the Design Value Summary (Default Modeling).

Averaging Period	Add Nearby Sources?	Add Background Concentration?	Modeled Concentration
CO 8-hour NMAAQs	No* (Yes)	Yes* (high 8 hour) (No)	high 8 hour
CO 1-hour NMAAQs	No* (Yes)	Yes* (high 1 hour) (No)	high 1 hour
H ₂ S 1-hour or ½-hour NMAAQs	Yes	No	high 1 hour
Pb Quarterly NMAAQs	No	No	high month
NO ₂ annual NMAAQs	No* (Yes)	Yes* (annual average) (No)	annual average
NO ₂ annual PSD increment	Yes	No	annual average
NO ₂ 1-hour NAAQS	No* (Yes)	Yes* (1-hr 98 th percentile) (No)	98th-percentile 1 hour
PM _{2.5} annual NAAQS	Yes	Yes (annual average)	annual average
PM _{2.5} annual PSD increment	Yes	No	annual average
PM _{2.5} 24-hour NAAQS	Yes	Yes (24-hr 98 th percentile)	98th-percentile 24 hour
PM _{2.5} 24-hour PSD increment	Yes	No	high 24 hour
PM ₁₀ annual PSD increment	Yes	No	annual average
PM ₁₀ 24-hour NAAQS	Yes	Yes (high 24 hour)	high second high 24 hour
PM ₁₀ 24-hour PSD increment	Yes	No	high second high 24 hour
SO ₂ annual PSD increment	Yes	No	annual average
SO ₂ 24-hour PSD increment	Yes	No	high second high 24 hour
SO ₂ 3-hour PSD increment	Yes	No	high second high 3 hour
SO ₂ 1-hour NAAQS	No* (Yes)	Yes* (high 1 hour) (No)	99th-percentile 1 hour
Reduced S ½-hour NMAAQs	No	No	high 1 hour

* Standards marked with an asterisk normally offer the choice to either model nearby sources or add a representative background concentration.

2.7 PSD Increment Modeling

2.7.1 Air Quality Control Regions and PSD Baseline Dates

Any facility that is required to provide an air dispersion modeling analysis with its construction permit application is required to submit a PSD increment consumption analysis unless none of its sources consume PSD increment. Table 7 serves as a tool to determine which sources to include in PSD increment modeling.

Table 7: PSD Increment Consumption and Expansion

Sources that do not consume PSD increment	<ul style="list-style-type: none"> • Temporary emissions (sources involved in a project that will be completed in a year or less). • Any facility or modification to a facility constructed before the PSD major source baseline date. • Any minor source constructed before the PSD minor source baseline date.
Sources that consume PSD increment	<ul style="list-style-type: none"> • Any new emissions or increase in emissions after the PSD Minor Source Baseline date (for that AQCR and pollutant). • Any new emissions or increase in emissions at a PSD Major source that occurs after the Major Source Baseline Date.
Sources that expand PSD increment	<ul style="list-style-type: none"> • A permanent reduction in actual emissions from a baseline source.

Notes:

- EPA memos written before the publication of the Draft NSR Workshop Manual indicate that PSD regulations were not intended to apply to temporary pilot projects. The memo clearly indicated that the pilot project did not need a PSD permit.
- If a minor source facility once existed but shut down before the minor source baseline date, then it would not be considered to be part of the baseline.
- Haul road emissions are treated the same way other sources of emissions are treated.
- An increase in emissions due to increased utilization of a facility, such as de-bottlenecking, are treated as any other increase in emissions.
- The Bureau interprets temporary emissions to mean emissions at the location that will occur for less than one year or emissions of standby or emergency equipment that operates less than 500 hours per year. For example, if a series of three gravel crushers operate at a mine for more than one year, PSD increment modeling should be performed because the mining operations at the location are not temporary in nature, even though none of the individual crushers remained on-site for an entire year.

Table 8: Minor Source Baseline Dates by Air Quality Control Region

AQCR	NO ₂ Date	SO ₂ Date	PM ₁₀ Date	PM _{2.5} Date
12	8/10/1995	8/10/1995	8/10/1995	Not established
14	6/6/1989	8/7/1978	8/7/1978	Not established
152	3/26/1997	5/14/1981	3/26/1997	2/11/2013
153	8/2/1995	Not established	6/16/2000	Not established
154	Not established	Not established	Not established	Not established
155	3/16/1988	7/28/1978	2/20/1979	11/13/2013
156	Not established	8/4/1978	8/4/1978	Not established
157	Not established	Not established	Not established	Not established

Table 9: Major Source Baseline Dates and Trigger Dates

Pollutant	Major Source Baseline Date	Trigger Date
PM	January 6, 1975	August 7, 1977
SO ₂	January 6, 1975	August 7, 1977
NO ₂	February 8, 1988	February 8, 1988
PM _{2.5}	October 20, 2010	October 20, 2011

2.7.2 PSD Class I Areas

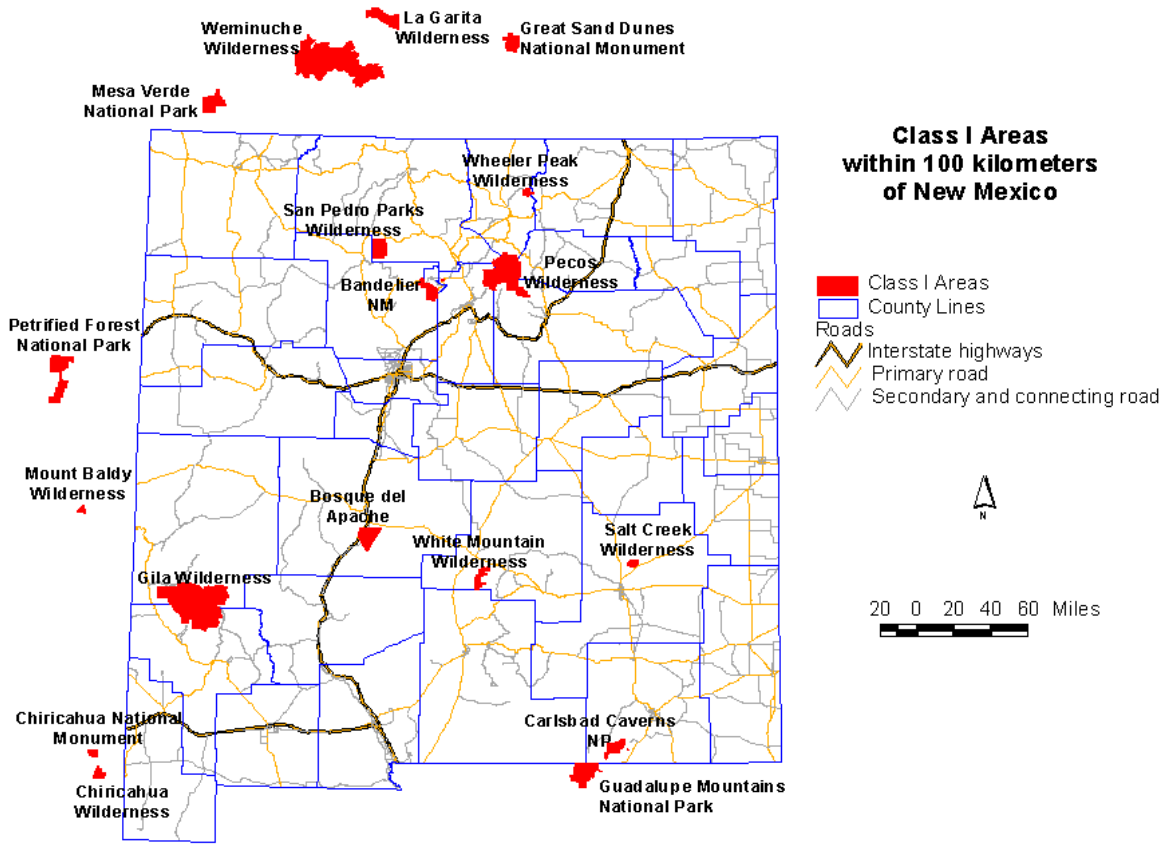


Figure 1: Class I areas

2.7.3 PSD Class I Area Proposed Significance Levels

The Environmental Protection Agency (EPA) has proposed significance levels for PSD Class I areas. No significance levels have been promulgated, but the Federal land managers (FLMs) are currently accepting the use of this value.

Table 10. Class I Prevention of Significant Deterioration Significance Levels

Pollutant	Averaging Period	Significance Level ($\mu\text{g}/\text{m}^3$)	PSD Class I Increment ($\mu\text{g}/\text{m}^3$)
Sulfur Dioxide (SO_2)	annual ^a	0.1 ^b	2
	24-hour	0.2 ^b	5
	3-hour	1.0 ^b	25
PM ₁₀	annual ^a	0.2 ^b	4
	24-hour	0.3 ^b	8
Nitrogen Dioxide (NO_2)	annual ^a	0.1 ^b	2.5
PM _{2.5}	annual	0.06	1
	24-hour	0.07	2

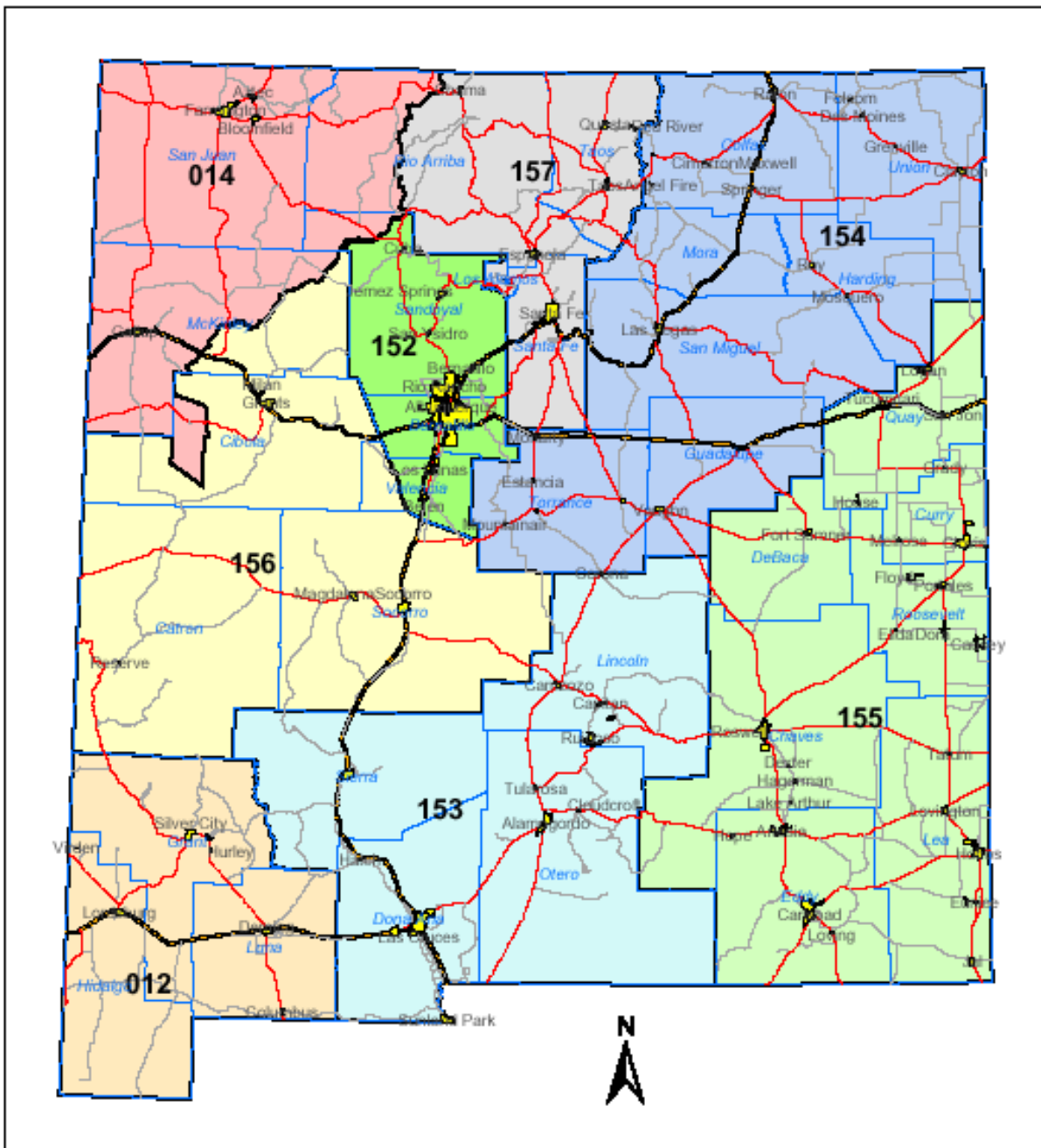
^a annual arithmetic mean

^b EPA proposed significance level

2.8 New Mexico State Air Toxics Modeling

Modeling must be provided for any toxic air pollutant sources that may emit any toxic pollutant in excess of the emission levels specified in **20.2.72.502 NMAC** - Permits for Toxic Air Pollutants. Sources may use a correction factor based on release height for the purpose of determining whether modeling is required. Divide the emission rate for each release point by the correction factor for that release height on Table 11 and add the total values together to determine the total adjusted emission rate. If the total adjusted emission rate is higher than the emission rate in pounds per hour listed in **20.2.72.502 NMAC**, then modeling is required. The controlled emission rate (not the adjusted emission rate) of the toxic pollutant should be used for the dispersion modeling analysis.

Air Quality Control Regions



Legend
Urban areas

0 25 50 100 Miles

Figure 2: Air quality control regions (each AQCR has a different color)

Table 11: Stack Height Release Correction Factor (adapted from 20.2.72.502 NMAC)

Release Height in Meters	Correction Factor
0 to 9.9	1
10 to 19.9	5
20 to 29.9	19
30 to 39.9	41
40 to 49.9	71
50 to 59.9	108
60 to 69.9	152
70 to 79.9	202
80 to 89.9	255
90 to 99.9	317
100 to 109.9	378
110 to 119.9	451
120 to 129.9	533
130 to 139.9	617
140 to 149.9	690
150 to 159.9	781
160 to 169.9	837
170 to 179.9	902
180 to 189.9	1002
190 to 199.9	1066
200 or greater	1161

The table below lists a few of the commonly encountered State Air Toxics in New Mexico. This is not the complete list, which is too expansive to reprint here.

Table 12: A few common state air toxics and modeling thresholds (from 20.2.72.502 NMAC)

Pollutant	OEL (mg/m ³)	1% OEL (µg/m ³)	Emission Rate Screening Level (pounds/hour)
Ammonia	18	180	1.20
Asphalt (petroleum) fumes	5.00	50	0.333
Carbon black	3.50	35	0.233
Chromium metal	0.500	5.00	0.0333
Glutaraldehyde	0.700	7.0	0.0467
Nickel Metal	1.00	10.0	0.0667
Wood dust (certain hard woods as beech & oak)	1.00	10.0	0.0667
Wood dust (soft wood)	5.00	50.0	0.333

If modeling shows that the maximum eight-hour average concentration of each toxic pollutant is less than one one hundredth of its Occupational Exposure Level (OEL) listed in 20.2.72.502 NMAC, then the analysis is finished. For a source of any known or suspected human carcinogens (per 20.2.72.502 NMAC) which will cause an impact greater than one-one hundredth of the OEL, the source must demonstrate that best available control technology will be used to control the carcinogen. If modeling shows that the impact

of a toxic which is not a known or suspected human carcinogen (per **20.2.72.502 NMAC**) is greater than one-one hundredth of the OEL, the application must contain a health assessment for the toxic pollutant that includes: source to potential receptor data and modeling, relevant environmental pathway and effects data, available health effects data, and an integrated assessment of the human health effects for projected exposures from the facility.

2.9 Hazardous Air Pollutants

Hazardous Air Pollutants (HAPs) do not require modeling, as they are regulated by means other than air quality standards. Sources should be aware of the Title V major source thresholds of 10 tons/year for any Hazardous Air Pollutant (HAP) and 25 tons/year for total HAPs, which will require an operating permit to be obtained from the department under **20.2.70 NMAC**- Operating Permits.

2.10 Nonattainment and Maintenance Areas

In nonattainment areas and for those sources outside of the nonattainment area that significantly contribute to concentrations in a nonattainment area, the modeling analysis required is a demonstration of an air quality benefit. Regular modeling is required in maintenance areas, however. Further information on nonattainment area modeling is in section 7.4, Nonattainment Area Requirements. Nonattainment areas are described at <https://www.env.nm.gov/air-quality/nonattainment-areas/>.

3.0 MODEL SELECTION

3.1 What dispersion models are available?

The Bureau accepts the use of EPA approved models for dispersion analysis. Commercial or parallel versions of these models are fine as long as they produce the same results. This section of the modeling guidelines is designed to describe the models that are available and provide some guidance on which situations are the most appropriate for which regulatory modeling situations.

Two types of models are currently in use for air dispersion modeling: probability density function (PDF) models, and puff models. Probability density function models apply a probability function from each emission release point to calculate the concentration at a receptor based on the location of the receptor, wind speed and direction, stability of the atmosphere, and other factors. The plume is assumed to extend all the way out to the most distant receptor, no matter how far that receptor is from the emission source. Because of this characteristic, PDF models suffer in accuracy when modeling distant concentrations or unstable conditions. SCREEN3, ISCST3, ISC_OLM, CTSCREEN, ISC-PRIME, and AERMOD are all PDF models. All but AERMOD use a Gaussian, or normal, distribution for their probability density function. AERMOD uses a PDF that varies depending on nearby terrain and other factors. Currently, AERMOD and CTSCREEN are EPA-approved models for near-field modeling. As of November 9, 2006, SCREEN3, ISCST3, and ISC_OLM are no longer considered EPA-approved models. The Federal Register notice detailing the promulgation of AERMOD is located at: http://www.epa.gov/scram001/guidance/guide/appw_05.pdf

CALPUFF is a puff model, meaning that it tracks puffs, or finite elements of pollution, after they are released from their source. This strategy makes the model ideal for tracking pollution over long distances or in conditions that are not stable, and also allows chemical reactions within the plume to be modeled. Unfortunately, puff models require large amounts of computing time. CALPUFF is an EPA-approved model for modeling long range transport and/or complex non-steady-state meteorological conditions.

3.2 EPA Modeling Conferences and Workshops

EPA Modeling Conference presented a wealth of information about recent regulatory modeling developments. The EPA web page with the details is <https://www.epa.gov/scram/air-modeling-conferences-and-workshops>.

3.3 Models Most Commonly Used in New Mexico

Most analyses reviewed by the Bureau will begin with an AERMOD analysis, and possibly CALPUFF for Class I analyses. For dispersion modeling within 50 kilometers of the source, AERMOD should be used. CALPUFF should be used only for PSD Class I area analyses, per the Interagency Workgroup Air Quality Modeling (IWAQM) Phase II report, but may be approved for use on a case-by-case basis for other analyses.

3.3.1 AERMOD

- AERMOD is intended to be the standard regulatory model. The PRIME building downwash algorithm is used by the model. Both the Ozone Limiting Method (OLM) and the Plume Volume Molar Ratio Method (PVMRM) algorithms for nitrogen conversion are built into the model.
- AERMOD has greater accuracy in complex terrain than CTSCREEN.
- AERMOD is suggested for extremely complex terrain.

See the section on nitrogen oxides for more information and options.

3.3.2 CALPUFF

- CALPUFF is a puff model designed to calculate concentrations at distances up to and beyond 50 kilometers. The model is significantly more difficult to run than the other models discussed in these guidelines. Use of CALPUFF for NAAQS, NMAAQS, or PSD increment modeling must be approved by the Bureau before submitting the modeling.
- CALPUFF is required for additional impact analyses when Federal Land Managers require additional impact analyses for Class I areas near PSD major sources. Typically, CALPUFF light is used for this modeling.

3.3.3 CTSCREEN

- CTSCREEN is applicable only for modeling receptors above stack height.
- CTSCREEN is a difficult model to run because of the difficulty in obtaining hill contour profiles.
- CTSCREEN uses screening meteorology.
- AERMOD produced greater accuracy than CTDMPPLUS (the full implementation of CTSCREEN) when modeling the data that was used to develop CTSCREEN/CTDMPLUS.
- CTSCREEN is typically used to model the terrain on top of a hill that did not pass when using AERMOD.

The following list can be used to correct 1-hour CTSCREEN concentrations to 3-hour, 24-hour and annual concentrations by multiplying by the appropriate conversion factor for the averaging period.

Table 13: CTSCREEN Correction factors for 1-hour concentration.

Averaging Period	Correction factor
3-hour	0.7
24-hour	0.15
Annual	0.03

3.3.4 AERSCREEN

- AERSCREEN is a screening version of AERMOD.

4.0 MODEL INPUTS AND ASSUMPTIONS

Models should be used with the technical options recommended in the [Guideline on Air Quality Models](http://www.epa.gov/ttn/scram/guidance/guide/appw_05.pdf) (http://www.epa.gov/ttn/scram/guidance/guide/appw_05.pdf) except as noted in this document or approved by the Bureau.

Unless otherwise noted, information and procedures in this section refer to all of the models listed above.

4.1 Operating Scenarios

4.1.1 Emission Rates

All averaging periods shall be modeled using the maximum short-term emission rate allowed in the permit. The preferred method of modeling all averaging periods is to use maximum short-term emission rates and to use the hours of operation model input option to limit the facility's emissions.

4.1.2 Hours of Operation

If the facility is limited to operating certain hours of the day or has other operating restrictions, limiting the operating hours in the model can normally reduce the concentration produced by the model. Hours of operation can only be modeled by models that use actual meteorology, but not by screening models. Use screening models only to model facilities as if the maximum operating rate were emitting continuously.

4.1.3 Time Scenarios

Sometimes a facility has unusual operating times, for example, if the facility is allowed to operate 12 hours per day, but the hours are not specified. The facility may model as if it operates continuously, but as an option, the facility can model different time periods at the amount of time allowed per day as different operating scenarios, making sure that the maximums are modeled. In the 12 hour example, the facility might model three scenarios: 7AM to 7PM. 7PM to 7AM. And 5PM to 5AM. This way, all the hours of the day were modeled, and the modeler can be fairly certain that the maximum was modeled because the worst-case scenarios would occur when the calm blocks of time were modeled together. All scenarios should be modeled at maximum hourly emission rates.

4.1.4 Operating at Reduced Load

Some sources (like engines and boilers) can produce higher concentrations of pollution in ambient air when they are operating below maximum load than when they are at maximum load. The applicant shall analyze various feasible operating scenarios (100%, 75%, and 50% are typical) to determine the worst-case impacts, and then use that worst-case scenario for the entire modeling analysis. This requirement is in section 8.1 of Appendix W of EPA's Guideline.

4.1.5 Alternate Operating Scenario

If the permit application contains multiple operating scenarios (such as use of different fuels or different engines) then the applicant shall model each of the scenarios for the radius of impact analysis. Whichever scenario produces the greatest impacts on ambient air shall be used for the cumulative analysis, if required. If it is unclear which operating scenario produces the greatest impacts, each scenario shall be modeled for cumulative impact analysis.

4.1.6 Startup, Shutdown, Maintenance (SSM), and Other Short-term Emissions

If startup, shutdown, maintenance, or other temporary events have the potential for producing short-term impacts greater than the normal operating scenarios, then the applicant shall model each of the scenarios to demonstrate compliance with the ambient air quality standard.

If it is probable that an adjacent facility will have emissions higher than normal operation during the time the applicant's facility has increased emissions, then those emissions should also be accounted for in the modeling. Otherwise, model surrounding sources at their normal operating rate. Because of the short nature of the SSM emissions, modeling does not have to demonstrate compliance with annual standards or annual increment consumption. Highest hourly SSM emission rate should be modeled for NAAQS, NMAAQs and for increment consumption modeling.

Whichever scenario produces the greatest impacts on ambient air shall be used for the cumulative analysis, if required. If it is unclear which operating scenario produces the greatest impacts, each scenario shall be modeled for cumulative impact analysis.

4.2 Plume Depletion and Deposition

Dry plume depletion may be used to reduce concentrations of particulate matter. Appropriate particle characteristics for the specific type of source being modeled should be used. Check the web page for sample particle size distributions. Because of the length of time required to run a model with plume depletion, the Bureau recommends only applying plume depletion to receptors that are modeled to be above standards when the model is run without plume depletion.

The wet deposition option should not be used for the modeling analysis unless data are available and the use of wet deposition has been previously approved.

4.3 Meteorological Data.

4.3.1 Selecting Meteorological Data.

The meteorological data used in the modeling analysis should be representative of the meteorological conditions at the specific site of proposed construction or modification, or else use screening meteorological data, which contains worst-case data.

Representative, on-site data is obviously the best data to use; however, for many sources on-site data is not available. Bureau modeling staff can supply preferred meteorological data sets for various locations around the state. The National Weather Service also collects data throughout the country. These data sets are available through the National Climatic Data Center. It is mandatory that Bureau modeling staff approve the chosen meteorological data before the analysis is submitted. PSD permits contain more rigorous requirements relating to the collection of representative, on-site meteorological data. Either 1 year of representative data which serves as on-site data or 5 years of appropriate off-site data must be used. Please contact the Bureau as soon as possible if you anticipate the need to collect on-site meteorological or ambient monitoring data for a PSD permit.

Setback distance modeling for portable sources may require separate meteorological data than that used in the rest of the modeling for that facility. Preliminary analysis indicates that the Substation meteorological data set is appropriate for locations throughout the State. Contact the Bureau for guidance on relocation meteorological data selection.

The goal of modeling is to use site-specific meteorological data. In cases where the form of the standard allows the standard to be exceeded a number of times per year, this is based on site-specific data. If the equivalent of site-specific data is not available, then the highest concentration estimate should be considered the design value unless multiple years of data are used. (68238 Federal Register / Vol. 70, No. 216 / Wednesday, November 9, 2005 / Rules and Regulations)

For example, no meteorological monitoring stations are available near Raton, New Mexico, and there are terrain features that may make Raton meteorology different from other places. The Bureau will still recommend meteorological data to use for modeling in Raton, but the PM₁₀ standard is not allowed to be exceeded at all because the meteorological data is not completely representative of the area.

For concentration monitoring data, proximity to the monitor is normally the driving factor for selection of a representative monitor. For meteorological data, the similarity of the terrain (including canyon and valley directions) is more important than finding the closest monitor. Unless otherwise noted, AQB staff will need the exact location of the facility to select or approve a set of meteorological data representative of the location. Staff will compare wind roses with prominent terrain features that influence drainage patterns or otherwise influence wind directions.

Processed meteorological data is available on the web page: <https://www.env.nm.gov/air-quality/meteorological-data/>.

4.4 Background Concentrations

“Background concentrations should be determined for each critical (concentration) averaging time.” (68242 Federal Register / Vol. 70, No. 216 / Wednesday, November 9, 2005 / Rules and Regulations)

The background concentrations listed below were derived from information downloaded from http://aqsdrl.epa.gov/aqsweb/aqstmp/airdata/download_files.html.

4.4.1 Uses of Background Concentrations

Background concentrations are added to the modeled concentrations or are used for stoichiometric modeling applications such as OLM or PVMRM. Normally, a background concentration associated with the averaging period being modeled is added after the model (with all facility and nearby sources) is completed. Sometimes this approach proves too conservative to demonstrate compliance with standards. If so, monthly, daily, or hourly concentration profiles can be developed using representative sets of monitoring data appropriate for the modeling domain. Adding refined background concentrations normally requires post-processing of hourly output files.

It is very important to use recent monitoring data, because concentration trends are likely to change over time (much more so than weather patterns). If hourly meteorological data does not match hourly monitoring data, then the following methods can be used to produce a concentration profile for the refined modeling exercise.

Choose the highest background for each period for the region that best describes the modeling domain, unless adequate justification can be made that a specific monitor is most representative. For rural areas that do not match the regional descriptions above, use a monitor from Eastern NM or Southwestern NM.

4.4.1.1 Refined background concentrations

Background concentrations may be refined to take into account patterns in daily and monthly fluctuations in concentration. Since background concentrations are added to the model after dispersion is complete, there is no point mathematically in determining refined background concentrations shorter than the averaging period of the air quality standard. 24-hour concentrations do not need 1-hour background concentrations (except for ozone limiting of NO₂ concentrations, which happens during dispersion).

4.4.1.2 Developing 24-hour refined background concentrations

Each of the 12 months is represented by the maximum 24-hour concentration occurring during that month. If three years of data are available, average the three values for each month and use the average for the background. If a given month has a low maximum concentration due to the small number of samples collected that month, then the concentration from that month is not used and the average of the maximums of the two other years will be used as the 24-hour background for that month.

Example: Roswell PM_{2.5} (This example uses outdated data and should not be used for new modeling).

PM_{2.5} has a 24-hour averaging period and an annual averaging period. The annual average uses the annual value in the standard background tables, but it is appropriate to use refined background concentrations for the 24-hour period. The Partisol sampler in Roswell is a Federal Reference Method sampler for PM_{2.5}. The filters are collected about every three days, so there is not data available for every day. Over three years of data are available, and 2007 through 2009 are presented in the following table.

January, 2007 had a maximum reported concentration of 10.0 µg/m³. January 2008 and 2009 had maximum concentrations of 18.0 and 11.7, respectively. The average of these three values is 13.2. After the model has run, every day in January adds a background concentration of 13.2 µg/m³. Care must be taken to identify the greatest sum of modeled concentration plus background, since background concentration varies each month – the highest modeled concentration may no longer be the highest when the background values are added.

Table 14: Roswell PM_{2.5} Monitoring Data (2007-2009)

Year	Month	PM _{2.5} concentration. (µg/m ³)											Max	3-year avg.
2007	1	2.33	3.67	9.50	6.25	10.00	6.25	4.67	5.58	7.25			10.00	13.2
2007	2	5.92	5.50	25.5	9.00	13.75	2.67	2.42	5.67	2.25			25.50	14.7
2007	3	1.67	2.92	4.42	4.17	3.42	12.25	8.00	9.29	2.67	5.58	2.67	12.25	12.8
2007	4	4.75	9.58	4.83	5.86	3.67	5.75	8.00	2.75	5.83	6.00		9.58	9.2
2007	5	4.58	3.42	4.00	8.33	6.08	4.00	3.75	4.33				8.33	10.0
2007	6	7.00	6.92	8.25	4.00	5.19	5.67	9.29	13.7	6.58			13.67	11.5
2007	7	8.58	8.28	8.17	5.75	7.92	8.67	7.33	7.28				8.67	9.2
2007	8	11.92	3.08	7.50	11.83	18.50	8.67	7.92	6.33	6.00	7.83		18.50	13.2
2007	9	11.75	4.00	4.75	6.75	9.17	4.08	4.08	3.17	4.42	4.08		11.75	11.1
2007	10	5.25	6.00	6.08	6.92	4.33	5.08						6.92	7.0
2007	11	7.75	7.58	8.75	7.25	5.42	8.33	7.83	7.25	18.58	8.33		18.58	10.4
2007	12	3.17	4.08	4.25	3.17	5.83	10.50	5.58	4.33	2.25			10.50	10.8
2008	1	5.3	8.2	3.6	4.4	3.0	4.9	18.0	13.4	4.2	2.6		18.0	
2008	2	2.2	3.8	3.3	3.3	7.4	3.5	9.3	4.6				9.3	
2008	3	6.8	3.7	14.8	4.9	5.8	5.8						14.8	
2008	4	3.7	5.5	10.7	2.9	6.7	6.2	5.2	9.5				10.7	
2008	5	6.8	7.4	4.3	5.2	11.6	6.2	6	5.3				11.6	
2008	6	6.3	7.1	4.8	5.2	6.3	14	4.9	4.9				14.0	
2008	7	6.7	6.4	4.8	4.0	7.0	6.1	9.2	9.2	9.8			9.8	
2008	8	6.5	6.7	9.2	3.6	5.6	4.3	5.2	7.8				9.2	
2008	9	7.6	7.6	2.3	4.8	5.0	8.8	8.8	11.1	8.9			11.1	
2008	10	7.2	2.8	4.6	4.8	3.2	4.3	7.9	3.5	4.0			7.9	
2008	11	5.5	6.2	4.1									6.2	
2008	12	3.8	4.6	7.8	5.2								7.8	
2009	1	5.2	3.7	1.8	11.7	10.0	5.6	4.1	7.3				11.7	
2009	2	5.8	5.6	9.3	3.4	8.1	9.0	4.2	5.4	4.7			9.3	
2009	3	4.1	6.0	11.4	2.8	4.1	3.8	11.3	6.2	9.7	4.0	4.2	11.4	
2009	4	7.2	4.4	6.2	1.8	4.8	1.8	3.1	6.6				7.2	
2009	5	6.4	3.2	10.0	6.7	3.9							10.0	
2009	6	6.4	3.9	4.7	5.0	6.7	5.3						6.7	
2009	7	4.8	8.9	4.5	5.7	6.0	8.6	9.2	5.8	8.5	8.1	8.4	9.2	
2009	8	8.4	10.5	7.6	5.0	6.1	11.8	7.0	4.3				11.8	
2009	9	7.9	3.9	4.9	5.3	10.3	1.7	6.5					10.3	
2009	10	2.2	6.2	1.9	1.9	3.0	3.6						6.2	
2009	11	6.2	5.3	6.1	2.8	5.5	5.0	6.3	2.6				6.3	
2009	12	14.2	5.5	4.3	7.7	4.9	5.3						14.2	

4.4.1.3 Developing 1-hour refined background concentrations

From the geographically nearest full set of monitoring data to the facility to be modeled, determine the maximum one-hour concentration that occurs during each hour of the day for each month. The result will be twelve different 24-hour profiles that will be repeated for the entire month that each represents. This profile can be used for all averaging periods. If three years of data are available, average the three values for each month and use the average for the background. POST files may be used to add hourly background concentrations to receptors.

Example: Determine the maximum concentration for hour 1 (midnight to 1AM) in January. Use this for hour 1 for each day in January. Determine the maximum concentration for hour 2 (1AM to 2AM) in January. Use this for hour 2 for each day in January. ... Determine the maximum concentration for hour 24 (11PM to midnight) in December. Use this for hour 24 for each day in December. Complete the entire year in this manner, with hour and month-specific data.

4.4.1.4 Eliminating double-counting of emissions in background

In some cases the addition of a background concentration may result in double-counting of some of the emissions, if the reference monitor is very close to the modeling domain. This effect may be reduced by placing a receptor at the monitor location and modeling the sources in the model that existed at the time of the monitoring. The modeled concentration at the monitor may be subtracted from the background (with a minimum background of zero). The averaging period should be the same as the one used for the background calculation, and must be temporally correlated if the maximum monitored concentration is not being used.

4.4.2 CO Background Concentration

Ambient CO monitors to represent New Mexico are very limited. Concentrations near Sunland Park are best represented by monitors in El Paso. Monitors operated by Albuquerque should be conservative for the rest of New Mexico.

Table 15: Carbon Monoxide Background Concentration

Region	ID	Location	1-hour ($\mu\text{g}/\text{m}^3$)	8-hour ($\mu\text{g}/\text{m}^3$)	Latitude	Longitude	Notes
The rest of New Mexico	350010023	Del Norte High School	2203	1524	35.1343	-106.585	4700a San Mateo NE, Albuquerque, NM
Albuquerque	350010029	South Valley	2746	1566	35.01708	-106.657	201 Prosperity SE, Albuquerque, NM
Sunland Park	481410044	El Paso Chamizal	4677	2834	31.76569	-106.455	800 S San Marcial Street, El Paso, TX

Concentrations are the average of the maximum concentrations for 2015-2017.

4.4.3 H₂S Background Concentration

NMED has no H₂S monitors. The standards are generally designed to protect against noticeable changes in concentration above the background concentration for the region, and no background concentration is added.

4.4.4 Lead Background Concentration

Reformulation of gasoline and other control measures have virtually eliminated ambient lead concentrations. NMED has no lead monitors. Treat as zero background.

4.4.5 NO₂ Background Concentration

Note: No 24-hour averages were calculated. Compliance with 1-hour NAAQS automatically demonstrates compliance with 24-hour NMAAQs.

Table 16: NO₂ Background Concentration

Region	ID	Location	1-hour Background (µg/m ³)	1-hour 98 th %ile (µg/m ³)	Annual Background (µg/m ³)	Latitude	Longitude	Address
4-Corners	1ZB, 350450009	Bloomfield	85.1	67.3	19.6	36.74222	-107.977	162 Hwy 544, Bloomfield NM 87413
4-Corners	1NL, 350450018	Navajo Dam	62.2	52.1	11.0	36.80973	-107.652	423 Hwy 539, Navajo Dam, NM 87419
4-Corners	350451233	Dine College	73.3	54.9	11.3	36.8071	-108.695	Dine College, GIS Lab
Albuquerque	350010023	Del Norte High School	94.2	83.8	20.2	35.1343	-106.585	4700A San Mateo NE
South Central	6ZM, 350130021	Sunland Park	100.4	85.7	12.5	31.79611	-106.584	5935A Valle Vista, Sunland Park, NM
South Central	6ZN, 350130022	US-Mexico Border Crossing	102.9	77.5	8.5	31.78778	-106.683	104-2 Santa Teresa International Blvd, NM
Eastern NM	5ZR, 350151005	Outside Carlsbad	60.3	38.7	5.0	32.38	-104.262	Holland St, SE of Water Tank, Carlsbad, NM
Eastern NM	5ZS, 350250008	Hobbs-Jefferson	83.2	64.2	8.1	32.72666	-103.123	2320 N. Jefferson St, Hobbs, NM
Southwestern NM ¹	7E, 350290003	Deming	62.052	53.277	6.966	32.2558	-107.723	310 Airport Road, Deming, NM88030

Annual background is the average of three annual averages of monitoring data from 2015 to 2017. The maximum 1-hour NO₂ concentrations from each of three years were averaged to determine the 1-hour background concentration, using monitoring data from 2015 to 2017

Refined 1-hour background profiles may be developed using the guidance described in “Refined Background Concentrations”, above.

¹Based on 2013 -2015 averages.

4.4.6 Total Reduced Sulfur Background Concentration

NMED has no total reduced sulfur monitors. The standards are generally designed to protect against noticeable changes in concentration above the background concentration for the region, and no background concentration is added.

4.4.7 Ozone Background Concentration

Ozone background concentrations are required for NO₂ modeling using PVMRM or OLM.

Table 17: Ozone Background Concentration

Region	ID	Location	1-hour Background ($\mu\text{g}/\text{m}^3$)	Latitude	Longitude	Address
4-Corners	1ZB, 350450009	Bloomfield	146.1	36.74222	-107.977	162 Hwy 544, Bloomfield NM 87413
4-Corners	1NL, 350450018	Navajo Dam	156.9	36.80973	-107.652	423 Hwy 539, Navajo Dam, NM 87419
4-Corners ¹	350450020	Chaco Culture National Historical Park	144.8	36.03022	-107.910	1808 County Road 7950, Nageezi, NM 87037
4-Corners	1H, 350451005	Shiprock Substation	145.4	36.79667	-108.473	Usbr Shiprock Substation (Farmington)
4-Corners	350451233	Dine College	151.8	36.8071	-108.695	Dine College, GIS Lab
Albuquerque	2ZJ, 350431001	Highway Department, Bernalillo	148.6	35.29944	-106.548	Highway Dept. Yard Near Bernalillo
Albuquerque	2LL, 350610008	Los Lunas	140.4	34.8147	-106.74	1000 W. Main St, Los Lunas, NM 87031
Albuquerque	350010023	Del Norte High School	153.1	35.1343	-106.585	4700A San Mateo NE
Albuquerque	350010029	South Valley	145.4	35.01708	-106.657	201 Prosperity SE
Albuquerque	350011012	Foothills	152.4	35.1852	-106.508	8901 Lowell NE
South Central	6O, 350013008	La Union	161.3	31.93056	-106.631	St Lukes Episcopal Ch Rt 1 (La Union)
South Central	6ZK, 350130020	Chaparral Middle School	170.2	32.04111	-106.409	680 McCombs, Chaparral, NM
South Central	6ZM, 350130021	Desert View Elementary School	175.9	31.79611	-106.584	5935A Valle Vista, Sunland Park
South Central	6ZN, 350130022	US-Mexico Border Crossing	169.0	31.78778	-106.683	104-2 Santa Teresa International Blvd, NM
South Central	6ZQ, 350130023	NM Highway Dept. Yards In Las Cruces	149.9	32.3175	-106.768	750 N. Solano Drive, Las Cruces, NM
Southwestern NM ²	7T, 350171003	Hurley Smelter	139.294	32.69194	-108.124	Chino Blvd near Hurley Park, Hurley, NM
Eastern NM	5ZS, 350025008	Hobbs-Jefferson	150.5	32.72666	-103.123	2320 N. Jefferson St, Hobbs, NM
Eastern NM	5ZR, 350151005	Outside Carlsbad	155.6	32.38	-104.262	Holland St, SE of Water Tank, Carlsbad, NM
Eastern NM	350153001	Carlsbad Caverns	145.4	32.1783	-104.441	Carlsbad Caverns National Park
North Central	350390026	Coyote	140.4	36.18774	-106.698	21 New Mexico 96, Coyote, NM, 87012
North Central	3SFA, 350490021	Santa Fe Airport	139.7	35.61975	-106.08	2001 Aviation Drive, Santa Fe, New Mexico 87507

¹Based on 2017 only

²Based on 2013-2015 averages.

The hourly maximum ozone concentration from the nearest ozone monitor may be used for ozone limiting. Unless otherwise noted, the maximum 1-hour O₃ concentrations from each of three years were averaged to determine the 1-hour background concentration, using monitoring data from 2015 to 2017.

Refined 1-hour background profiles may be developed using the guidance described in “Refined Background Concentrations”, above. Ozone files typically use the format, “(4I2,5X,F8.3)”. Hourly concentrations use $\mu\text{g}/\text{m}^3$ to avoid elevation errors.

4.4.8 PM_{2.5} Background Concentration

Table 18: PM_{2.5} Background Concentration

Region	ID	Location	24-hour Background 100th%ile (µg/m ³)	24-hour Background 98th%ile (µg/m ³)	Annual Background (µg/m ³)	Latitude	Longitude	Address
Albuquerque	350010023	Del Norte High School	11.5	10.8	4.6	35.1343	-106.5852	4700A San Mateo NE
Albuquerque ¹	350010029	South Valley	22.6	18.20	7.43	35.01708	-106.6574	201 Prosperity SE
South Central ²	6CM, 350130016	Anthony	18.4	17.0	7.6	32.00361	-106.5992	SE Corner Of Anthony Elem. School Yard
South Central	6ZM, 350130021	Sunland Park	25.9	24.3	7.3	31.79611	-106.5839	5935A Valle Vista, Sunland Park
South Central	6Q, 350130025	Las Cruces District Office of NMED	16.1	14.9	5.1	32.32194	-106.7678	2301 Entrada Del Sol, Las Cruces
Eastern NM	5ZS, 350250008	Hobbs-Jefferson	15.8	13.4	5.9	32.72666	-103.1229	2320 N. Jefferson St, Hobbs
4-Corners ¹	1FO, 350450019	Farmington Environment Department Office	14.13	11.77	4.19	36.77416	-108.165	3400 Messina Drive Suite 5000 Farmington
North Central ¹	3HM, 350490020	Santa Fe	16.55	9.45	4.32	35.67111	-105.9536	Runnels Bldg. 1190 St. Francis Dr.

¹Based on 2013-2015 averages

²Based on average of 2013, 2014, and 2017

Concentrations are the average of three years of maximum data from 2015 to 2017. Some monitors may not represent background concentrations. Anomalously high values were eliminated before calculating aggregate concentrations. Use the highest 98th percentile background concentration from the region in which the facility is located, unless another monitor is more representative of the local area. Refined 24-hour background profiles may be developed using the guidance described in “Refined Background Concentrations”, above.

Monthly background concentrations for Southeastern New Mexico from Hobbs are listed below. These were collected from January 2015 to December 2018.

Table 18B: Hobbs Refined PM_{2.5} Background Concentration

Month	Monthly 24-hour Maximum ($\mu\text{g}/\text{m}^3$)
1	12.1
2	10.2
3	21.1
4	17.5
5	16.5
6	16.1
7	17.6
8	13.3
9	15.6
10	10.3
11	13.2
12	17.7

4.4.9 PM₁₀ Background Concentration

Table 19: PM₁₀ Background Concentration

Region	ID	Location	Annual Background (µg/m ³)	24-hour Background Maximum (µg/m ³)	24-hour Background Second High (µg/m ³)	Latitude	Longitude	Address
Albuquerque	350010026	Jefferson	24.3	74.0	70.3	35.1443	-106.6047	3700 Singer
Albuquerque	350010029	South Valley	33.7	152.0	132.2	35.01708	-106.6574	201 Prosperity SE
4-Corners ¹	1ZB, 350450009	Bloomfield	13.0	55.0	50.0	36.74222	-107.977	162 Hwy 544, Bloomfield NM 87413
South Central	6CM, 350130016	Anthony	22.0	50.7	44.7	32.003611	-106.5992	SE Corner of Anthony Elem. School Yard
South Central	6ZK, 350130020	Chaparral Middle School	25.3	120.0	112.3	32.041111	-106.4092	680 McCombs, Chaparral
South Central ¹	6ZM, 350130021	Sunland Park	26.0	78.0	73.0	31.796111	-106.5839	5935A Valle Vista, Sunland Park
South Central	6WM, 350130024	Las Cruces City Well #46	15.3	94.7	83.3	32.278056	-106.8644	South of I-10 at Las Cruces Well #46
Southwestern ²	7D, 350029001	Deming	16.2	56.5	46.5	32.267222	-107.7553	Post Office Pine St
Southwestern ²	7E, 350029003	Deming Airport	22.7	128.7	109.3	32.2558	-107.7227	310 Airport Road, Deming
Eastern NM	5ZS, 350250008	Hobbs- Jefferson	24.0	100.7	37.3	32.726656	-103.1229	2320 N. Jefferson St, Hobbs
North Central ²	3HM, 350490020	Santa Fe	9.0	23.0	20.7	35.671111	-105.9536	Runnels Bldg. 1190 St. Francis Dr.
North Central ²	3ZD, 350055005	Taos	14.2	52.0	40.5	36.383333	-105.5833	Fire Station Santiago Road

Concentrations are averaged from 2015 to 2017. Some monitors, such as 350010026 and 350010029, are located near industrial sources or in disturbed areas and do not represent ambient background concentrations.

¹Monitor 350450009 was missing 2015 data. Monitor 350130021 was missing 2016 data. These monitors used two year averages.

²Based on 2013-2015 averages

Refined 24-hour background profiles may be developed using the guidance described in “Refined Background Concentrations”, above.

Anomalously high values were eliminated before calculating aggregate concentrations.

Monthly background concentrations for Southeastern New Mexico from Hobbs are listed below. These were collected from July 2011 to June 2014. The monitor was discontinued after June 2014.

Table 20: Hobbs Refined PM₁₀ Background Concentration

<u>Month</u>	<u>Monthly 24-hour Maximum</u> ($\mu\text{g}/\text{m}^3$)
1	43.0
2	46.0
3	62.7
4	58.0
5	62.3
6	82.3
7	86.7
8	61.3
9	60.0
10	74.3
11	48.7
12	39.7

4.4.10 SO₂ Background Concentration

Table 21: SO₂ Background Concentrations

Region	ID	Location	1-hour Background (µg/m ³)	1-hour Background 99 th Percentile (µg/m ³)	Annual (µg/m ³)	Latitude	Longitude	Address
Albuquerque	350010023	Del Norte High School	15.8	13.2	1.75	35.1343	-106.585	4700A San Mateo NE
Southwest New Mexico ¹	7T, 350171003	Hurley Smelter	6.11	1.75	0.0183	32.69194	-108.124	Chino Blvd Near Hurley Park, Hurley, NM
The rest of New Mexico	1ZB, 350450009	Bloomfield	8.84	5.31	0.219	36.74222	-107.977	162 Hwy 544, Bloomfield NM 87413
Between Farmington and Shiprock	1H, 350451005	Shiprock Substation	41.6	22.1	0.389	36.79667	-108.473	Usbr Shiprock Substation (Farmington)
4-Corners west of Shiprock	350451233	Dine College	37.3	19.5	1.48	36.8071	-108.695	Dine College, GIS Lab
Eastern New Mexico	483751025	Amarillo, 24 th Ave	68.3	47.0	0.670	35.2367	-101.787	4205 NE 24 th Ave, Amarillo TX

Background concentrations are from 2015 to 2017

¹Based on 2013-2015 averages

Refined 1-hour background profiles may be developed using the guidance described in “Refined Background Concentrations”, above.

4.5 Location and Elevation

Important: Use the same UTM zone and datum for the entire facility. Facilities on the border between two UTM zones must convert all information into one zone or the other.

Make sure that the source location and parameters are the same as those listed in the application form!! This is the most common mistake we see.

4.5.1 Terrain Use

Terrain classifications are defined as follows:

- **Flat terrain** – Terrain with all elevations equal to the base of the source
- **Simple terrain** – Terrain with elevations below stack height
- **Complex terrain** – Terrain with elevations above stack height

- **Intermediate (Complex) terrain** – Terrain with elevations between stack height and plume height (a subset of complex terrain).

Flat terrain should be used if the source base is higher than all the surrounding terrain or if the facility consists primarily of non-buoyant fugitive sources. Simple and complex terrain should be used for all other scenarios.

4.5.2 Obtaining Elevation

Elevation data for receptors, sources, and buildings should be obtained from Digital Elevation Model (DEM) files or National Elevation Dataset (NED) files with a resolution of 30 meters or better. USGS DEMs are available for New Mexico in either 7.5-minute or 1-degree formats. It is strongly suggested that the 7.5-minute data be used in dispersion modeling rather than the coarse resolution 1-degree data. Keep in mind that the USGS DEMs can be in one of two horizontal datums. Older DEMs were commonly in NAD27 (North American Datum of 1927) while many of the latest versions in NAD83 (North American Datum of 1983). It is important to use the same source of data for all elevations. Even USGS 7.5-minute maps and USGS 7.5-minute DEM data may differ. Surrounding sources' elevations provided by the Bureau have been determined using 7.5-minute DEM data (NAD83), where available, and 1-degree DEM data elsewhere.

Elevations should be included for at least all receptors within 10 km of your facility or within your facility's ROI (whichever is smaller). Your source's elevation may be used for receptors beyond 10 km, but it may be wiser to use actual DEM elevations for the entire ROI because surrounding sources are provided with actual elevations.

4.6 Receptor Placement

4.6.1 Elevated Receptors on Buildings

Elevated receptors should be placed on nearby buildings at points of public access where elevated concentrations may be predicted. Use flagpole receptors in areas with multi-story buildings to model state and federal standards. In cases where nearby buildings have publicly accessible balconies, rooftops, or similar areas, the applicant should consult with the Bureau modeling staff to ensure proper receptor placement. PSD increment receptors are limited to locations at ground level.⁶

4.6.2 Ambient Air

Ambient air is defined as any location at or beyond the fence line of the facility. The fence line must restrict public access by a continuous physical barrier, such as a fence or a wall. If plant property is accessible to the public or if any residence is located within the restricted area, receptors should be located on-property.⁷ Public access is interpreted to include housing, schools, hospitals, and similar areas that are frequented by family members of employees, but the remainder of the restricted area is excluded from public access if such family members do not have access to excluded areas. For example, receptors would not be placed in dormitories on military bases, but would be placed in family housing areas.

4.6.3 Receptor Grids

“Receptor sites for refined modeling should be utilized in sufficient detail to estimate the highest concentrations and possible violations of a NAAQS or a PSD increment. In designing a receptor network,

⁶ NSR Workshop Manual, page C.42

⁷ NSR Workshop Manual, Page C.42

the emphasis should be placed on receptor resolution and location, not total number of receptors.” (68238 Federal Register / Vol. 70, No. 216 / Wednesday, November 9, 2005 / Rules and Regulations)

The modeling domain can be defined using a Cartesian grid with 1000 meter spacing. Fine grids or fence line receptors with 50 to 100 meter spacing should fill any areas of the domain with potential to contain the highest concentration and/or any possible exceedances of NMAAQs, NAAQS, or PSD increment for the refined modeling. 50 meter spacing is recommended for fence line receptors for most sources, but 100 meters is recommended for expansive sources like coal mines, copper mines, or large military bases. (Grids with 50 meter spacing and 2 km side width are recommended for medium or large neighboring point sources. 50 meter spacing and 1 km width grids are recommended for hilltops or small neighboring sources.) Once these areas of potential high concentrations have been refined, the remaining receptors may be discarded.

For sources with an ROI greater than 50 kilometers, the grid should not extend beyond 50 km, as is noted in the NSR Workshop Manual.

4.6.4 PSD Class I Area Receptors

A modeling analysis of the PSD increment consumed at the nearest Class I areas must be performed by increment-consuming sources in AQCRs where the PSD minor source baseline date has been established, or in any AQCR where a new PSD-major source is to be installed. One receptor at the near boundary of the Class I area is normally sufficient for modeling to compare with Class I significance levels. 1000 meter spacing is recommended within the Class I areas for facilities with significant concentrations. If concentrations are above 75% of the PSD increment, then 50 to 100 meter spacing should be used near the hot spots. See Figure 1 for locations of Class I areas.

4.6.5 PSD Class II Area Receptors

Other than areas that are designated as PSD Class I areas, the entire state of New Mexico is a Class II area. The receptor grid for the PSD Class II increment analysis should be the same as the one for the cumulative run.

4.7 Building Downwash and Cavity Concentrations

Building downwash should be included in the analysis when stack height is less than good engineering practice (GEP) stack height and there are buildings, tanks, fans or other obstacles near the facility. All buildings and structures should be identified and analyzed for potential downwash effects. NMED requires the use of BPIP-Prime or equivalent for this analysis. GEP stack height should be determined as per 40 CFR 51.100. For receptors very near buildings, a cavity region analysis may be required. Modelers should consult with the Bureau modeling staff.

As summarized from 40 CFR 51.100:

GEP stack height is the greater of:

1) 65 meters, measured from the ground-level elevation at the base of the stack

or

2) $H + 1.5L$

Where

H = Height of nearby structure(s) measured from the ground-level elevation at the base of the stack.

L = The lesser of the height or the projected width (width seen by the stack) of nearby structures. Nearby structures can be as far as 5 times the lesser of the width or height dimension of the structure, but not greater than 0.8 km. Stacks taller than GEP stack height should be modeled as if they were GEP stack height.

4.8 Neighboring Sources/Emission Inventory Requirements

“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 the first 10 to 20 km from the source(s) under consideration.” (Federal Register / Vol. 82, No. 10 / Tuesday, January 17, 2017 / Rules and Regulations)

4.8.1 Neighboring Sources Data

The Emissions Inventory of neighboring sources is used as input data in air quality models. This data will be provided by the Bureau within a few days of request. E-mail the UTM coordinates of the location(s) to be modeled to the Bureau to request source data.

4.8.1.1 Determining which sources to include

This section functions as a definition for “nearby sources” as used in this document. The definition varies based on context, as illustrated below.

The contributions of distant sources are included in the background concentration. If the background concentration is added and includes all neighboring sources or a conservative approximation of them, then surrounding source modeling is not required for modeling of NAAQS or NMAAQs. For particulate matter or cases where the background concentration does not include all neighboring sources, then include all sources within 10 km of the facility in the model, and discard sources beyond 10 km from the facility. PSD increment is modeled, not monitored. (PSD increment may optionally add a background concentration instead of modeling the more distant sources.) For cases where background concentrations are not added, retain all sources within 25 km of the facility, plus sources emitting over 1000 pounds per hour within 50 km of the facility. For PSD Class I increment analysis, retain all sources within 25 km of the Class I area, plus sources emitting over 1000 pounds per hour within 50 km of the Class I area.

Table 22: Surrounding Source Retention Example for a Source Near Bloomfield.

Pollutant and averaging period	Neighboring source notes:
NO ₂ 1-hour NAAQS	Do not include surrounding sources. (Optionally, instead of adding background concentrations, include all sources within 25 km of the facility, plus sources emitting over 1000 pounds per hour within 50 km of the facility.)
PM _{2.5} 24-hour NAAQS	Retain sources within 10 km of facility.
NO ₂ annual Class II PSD increment	Retain sources within 25 km of the facility, plus sources emitting over 1000 pounds per hour within 50 km of the facility..
NO ₂ annual Class I PSD increment	Retain sources within 25 km of Mesa Verde National Park, plus sources emitting over 1000 pounds per hour within 50 km of Mesa Verde.

4.8.1.2 Surrounding source format

The Bureau provides AERMOD input files with the surrounding sources (*.INP) and reference tables (*.XLS) to describe the sources in more detail. The AERMOD input files can be imported in GUI programs or edited manually. The Excel files are for reference only, and should not be used as the basis for modeling.

Sources numbered 0-49,999 belong in the NAAQS/NMAAQs analysis. Sources numbered 10,000 and above belong in the PSD increment analysis. (Notice overlap of two groups). Numbering in the reference tables may not include the 50,... or 10,... prefix for the counting numbers.

Unless otherwise noted, units of measure used in the surrounding sources files are the metric units associated with model input format. Emissions designated as NO₂ are actually total oxides of nitrogen (NO_x).

4.8.1.3 Handling errors in surrounding source files

Please contact the Bureau if you see suspicious data in the inventory. We know that there are errors in our database and we would like to correct them.

If you find a piece of equipment that has unusual stack parameters, document the error and corrected values in your modeling report. Please also report the error to Joe Kimbrell (Joseph.Kimbrell@state.nm.us) as well for database correction. Include MASTER_AI_ID, SUBJECT_ITEM_CATEGORY_CODE, and SUBJECT_ITEM_ID in the documentation. Please document the reason the error is suspected.

The following parameters may be substituted for missing or invalid data. Determine the type of source that best matches the types below. For example, engines use the “other” category. Find the smallest emission rate in the table that is greater than or equal to the emission rate of the emission unit. That column contains the parameters that may be used for the parameters that are missing. (These parameters are based on modeling for general construction permits or on existing source data for control devices.)

Table 23: Missing Stack Parameter Substitutions for Turbines.

NO ₂ Rate (lb/hr)	Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)
21.7	7	588	10	0.7
21	6	588	10	0.7
20	5	588	10	0.7
19	5	588	10	0.6
18	4.5	588	10	0.6
17	4.5	588	10	0.6
16	4.5	588	10	0.5
15	4.5	588	10	0.5
14	4.5	588	10	0.5
13	4	588	10	0.5
12	4	588	10	0.5

NO ₂ Rate (lb/hr)	Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)
11	3.5	588	10	0.5
10	3.5	588	10	0.5
9	3.5	588	10	0.5
8	3.5	588	10	0.4
7	3	588	10	0.4
6	3	588	10	0.4
5	2.5	588	10	0.4
4	2.5	588	10	0.4
3	2	588	10	0.35
2	1.8	588	10	0.24
1	1.8	588	10	0.24

Table 24: Missing Stack Parameter Substitutions for Flares.

SO ₂ Rate (lb/hr)	Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)
5000	18	1273	20	20.80618
4500	16	1273	20	19.73848
4000	14	1273	20	18.60962
3500	12	1273	20	17.4077
3000	9	1273	20	16.1164
2500	6	1273	20	14.71219
2100	6	1273	20	13.48395
2000	6	1273	20	13.15899
1900	6	1273	20	12.82579
1800	6	1273	20	12.48371
1700	6	1273	20	12.13198
1600	6	1273	20	11.76975
1500	6	1273	20	11.39602
1400	6	1273	20	11.0096
1300	6	1273	20	10.60911
1200	6	1273	20	10.19291
1100	6	1273	20	9.758965
1050	6	1273	20	9.534591
1000	6	1273	20	9.304808
950	6	1273	20	9.069204
900	6	1273	20	8.827315
850	6	1273	20	8.578609
800	6	1273	20	8.322474
750	6	1273	20	8.0582
700	6	1273	20	7.784961
650	6	1273	20	7.501776
600	6	1273	20	7.207473
550	6	1273	20	6.90063
500	6	1273	20	6.579493
450	6	1273	20	6.241855
400	6	1273	20	5.884877
350	6	1273	20	5.504798
300	6	1273	20	5.096453
250	6	1273	20	4.652404
200	6	1273	20	4.161237
150	6	1273	20	3.603737
100	6	1273	20	2.942439

SO ₂ Rate (lb/hr)	Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)
90	6	1273	20	2.791442
80	6	1273	20	2.631797
70	6	1273	20	2.461821
60	6	1273	20	2.279203
50	6	1273	20	2.080618
40	6	1273	20	1.860962
30	6	1273	20	1.61164
29	6	1273	20	1.584552
28	6	1273	20	1.556992
27	6	1273	20	1.528936
26	6	1273	20	1.500355
25	6	1273	20	1.471219
24	6	1273	20	1.441495
23	6	1273	20	1.411144
22	6	1273	20	1.380126
21	6	1273	20	1.348395
20	6	1273	20	1.315899
19	4	1273	20	1.282579
18	4	1273	20	1.248371
17	4	1273	20	1.213199
16	4	1273	20	1.176975
15	4	1273	20	1.139602
14	4	1273	20	1.10096
13	4	1273	20	1.060911
12	4	1273	20	1.019291
11	4	1273	20	0.9758965
10	4	1273	20	0.9304808
9	3.5	1273	20	0.8827316
8	3.5	1273	20	0.8322473
7	3.5	1273	20	0.7784961
6	3.5	1273	20	0.7207473
5	3.5	1273	20	0.6579493
4	3	1273	20	0.5884877
3	3	1273	20	0.5096453
2	2.5	1273	20	0.4161237
1	2	1273	20	0.2942439

Table 25: Missing Stack Parameter Substitutions for Particulate Control Devices.

PM10 Rate (lb/hr)	Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)
22	19	0	28	4.6
21	18	0	27	4.6
20	17	0	26	4.4
19	16	0	25	4.2
18	15	0	24	4
17	14	0	23	3.8
16	14	0	22	3.6
15	13	0	21	3.4
14	13	0	20	3.2
13	12	0	19	3
12	12	0	18	2.8
11	11	0	17	2.6
10	11	0	16	2.4
9	10	0	15	2.2
8	10	0	14	2
7	10	0	13	1.8
6	9	0	12	1.6
5	9	0	11	1.4
4	9	0	10	1.2
3	9	0	9	1
2	9	0	8	0.8
1	9	0	7	0.6

Table 26: Missing Stack Parameter Substitutions for Other Point Sources.

NO₂ Rate (lb/hr)	Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)
21.7	7	730	28	0.3
21	6	730	28	0.3
20	5.5	730	28	0.3
19	4.5	730	28	0.3
18	4.5	730	27	0.3
17	4.5	730	27	0.3
16	4.5	730	27	0.25
15	4.5	730	27	0.25
14	4.5	700	22	0.25
13	4.5	700	22	0.25
12	4.5	700	22	0.2
11	4.5	700	22	0.2
10	4.5	700	22	0.2
9	4.5	700	20	0.2
8	4.5	700	18	0.2
7	4.5	700	14	0.2
6	4.5	650	14	0.2
5	4.5	500	5	0.2
4	4	500	5	0.1
3	3.5	500	5	0.1
2	3	500	5	0.0762
1	2	500	5	0.0762

For GCP 2, 3, and 5 permits with 95 tons/year of PM_{2.5} emissions, use the following values:

TSP emission rate = 95 TPY

PM₁₀ emission rate = 71.25 TPY (TSP X 0.75)

PM_{2.5} emission rate = 17.875 TPY (PM₁₀ X 0.25) = (TSP X 0.1875)

For volume sources with missing parameters:

Maximum release height = 10 m

Minimum release height = 1 m

Missing release height = PM₁₀ Rate x 20 m/(lb/hr)

Initial vertical dimension = release height x 0.93

No limit to the maximum lateral dimension.

Lateral dimension = PM₁₀Rate x 10 m/(lb/hr)

Minimum Lateral Dimension = 0.47 m

4.8.1.4 Refining Surrounding Sources

In some cases, it will be possible to use actual emissions to model surrounding sources instead of the maximum values allowed in the permit. If actual emission rates from the most recent two years is available, then the following optional technique may be used.

Annual averaging period: For the most recent two consecutive years of operation, if that period is representative of normal operation, the emission rate for each hour (in pounds per hour) is the total tons emitted for those two years divided by 8.76 (lb x year/ton x hour).

Other averaging periods: The unit is assumed to operate continuously unless there is a permit condition or physical limitation that prevents it from operating certain hours of the day or days of the year. If data is available for the most recent two years (Continuous Emissions Monitoring (CEM) data, for example) then a temporally representative level when operating may be used. For example, a generator that provides more power during peak hours could be modeled such that the maximum emission rate would be emitted during the peak hours of the day and the minimum operating emission rate would be emitted during the lowest-demand hours and the hours the unit would normally be off.⁸

4.8.2 Source Groups

It often saves considerable analysis time to set the model up to run with multiple source groups. The following groups are recommended.

- **Source alone group** – contains the sources at the facility that are used to compare with significance levels for the pollutant and averaging period being modeled. This group determines if the facility is above significance levels at the location and time.
- **Cumulative sources group** – contains all allowable emissions of the source and surrounding sources. This group is used to determine compliance with NAAQS and NMAAQS.
- **PSD sources group** – contains all sources that consume or expand PSD increment. This group is used to determine compliance with PSD increment regulations.

Impacts from different groups can be compared to determine if a source contributes significant concentrations if there is a problem complying with air quality standards.

4.8.3 Co-location with a GCP for aggregate processing facilities, asphalt plants, or concrete batch plants

At this time, General Construction Permits (GCPs) for aggregate processing facilities, asphalt plants, and concrete batch plants currently have the requirement that no visible emissions shall cross the fence line, which has been demonstrated to show compliance with all particulate matter air quality standards and PSD increments. NMED has allowed co-located facilities operating under a GCP to rely upon the GCP modeling demonstration for when co-located facilities operate at the same time, since all facilities at the location are required to have the same, no visible emissions, requirement at the fence line. However, if a source operating under a regular construction permit, and not a GCP, co-locates with a GCP source, it must show compliance with all particulate matter air quality standards through air dispersion modeling. The modeling for the source operating under a regular construction permit shall include all sources other than the co-located GCP sources. Gaseous pollutant modeling shall include the co-located GCP(s).

⁸ **Federal Register**, Vol. 82, No. 10, pg. 5220 / Tuesday, January 17, 2017 / Rules and Regulations

5.0 EMISSIONS SOURCE INPUTS

This section describes appropriate modeling for many types of sources. Additional guidance can be found in the User's Guide for the AMS/EPA Regulatory Model - AERMOD (EPA, 2004, http://www.epa.gov/scram001/dispersion_prefrec.htm).

5.1 Emission Sources

There are two general types of sources:

- Sources that come from a stack or vent – stack sources, or point sources;
- And sources that don't – fugitive sources.

5.2 Stack Emissions/Point Sources

All stacks should be modeled as point sources, as detailed below.

5.2.1 Vertical Stacks

Stacks that vent emissions vertically should be modeled as point sources with stack parameters that will simulate the manner in which emissions are released to the atmosphere:

- Stack exit velocity, V_s = average upward velocity of emissions at the top of the stack;
- Stack diameter, d_s = stack exit diameter;
- Stack exit temperature, T_s = average temperature of emissions at the top of the stack;
- Stack height, H_s = stack release height.

5.2.2 Stacks with Rain Caps and Horizontal Stacks

Stacks with capped stacks should be modeled in AERMOD using the POINTCAP source type.

Horizontal stacks should be modeled in AERMOD using the POINTHOR source type.

AERMOD will set the temperature to ambient temperature if the stack exit temperature is set to 0 K. If the model being used does not do this, then set the temperature to ambient temperature or to a close approximation thereof.

5.2.3 Flares

Both process and emergency flares should be modeled for comparisons with NAAQS and NMAAQs. If parts of the facility will be shut down when the flare operates then those emission units may be omitted from the flare modeling.

Flares should be treated as point sources with the following parameters:

Stack velocity = 20 m/s = 65.617 ft/s

Stack temperature = 1000°C = 1832°F

Stack height = height of the flare in meters

Effective stack diameter in meters = $D = \sqrt{10^{-6} q_n}$

where $q_n = q(1 - 0.048\sqrt{MW})$

and q is the gross heat release in cal/sec

MW is the weighted by volume average molecular weight of the mixture being burned.

(*SCREEN3 Model User's Guide, 1995*)

Flares in the surrounding sources inventory from the Bureau should already have an effective diameter calculated; so the parameters in the inventory can be entered directly into your model input "as is". There are

other methods for analyzing impacts of flares; if you wish to use another method, check with the Bureau modeling staff first.

NOTE: The NAAQS cannot be violated, even during upset conditions. All emergency flares should be modeled to show compliance with the NAAQS short-term standards under upset conditions. Emergency flares should be modeled with surrounding sources, but not including neighboring emergency flares and other sources that operate less than 500 hours per year.

5.2.4 Cool Stacks

Filters, cooling towers, or other sources without raised temperature should be modeled at ambient temperature. AERMOD will set the temperature to ambient temperature if the stack exit temperature is set to 0 K. If the model being used does not do this, then set the temperature to ambient temperature or to a close approximation thereof.

5.3 Fugitive Sources

5.3.1 Aggregate Handling

Aggregate handling emissions consist of three separate activities, namely: loading material to and from piles, transportation of material between work areas, and wind erosion of storage piles.

Loading material to and from piles should be modeled as volume sources representative of the loading or unloading operation. Emissions for loading and unloading are calculated using AP-42 Section 13.2.4. The loading and unloading each involve dropping the material onto a receiving surface, whether being dropped by a dump truck, a front-end loader, or a conveyor. Each drop should be modeled as described in Fugitive Equipment Sources, below.

Transportation of material between work areas should be modeled according to haul road methodology if vehicles are used to transport the material, or using transfer point methodology if conveyors are used to transport the material, as described in Fugitive Equipment Sources, below.

Modeling of wind erosion of storage piles is optional, as it says in AP42 not to use the equations for wind erosion in a steady state model.

For the following example facility, aggregate is handled 6 times:

- 1- a pile in front of the mine face is created,
- 2- a pile in front of the mine face is loaded into trucks or conveyors,
- 3- a pile in front of the processing equipment (crusher or HMA) is created,
- 4- loading the equipment (crusher or HMA),
- 5- a pile after the equipment, and
- 6- loading the truck

1 and 2 would not apply if on-site mining does not occur.

5 may be considered a transfer point (conveyor) instead of aggregate handling if controls are applied.

5 and 6 may not apply for HMA plant, as material is bound in asphalt.

6 would not apply if the waste pile is left on site.

5.3.2 Fugitive Equipment Sources

Emissions coming from equipment such as crushers, screens, or material transfer points should be modeled as volume sources. Emission rates are normally calculated using AP42 factors.

The release height (H) is the distance from the center of the volume to the surface of the ground. The base of each volume source must be square. For elongated sources, use a series of volume sources with square bases. Determine the apparent size of a volume source by estimating how large the plume would look to an observer. Consider the movement of the plume source during the course of an hour when determining the apparent size. For example, if the source of emissions is from disturbances on a pile, and the entire pile is disturbed at some point in the hour, then use the size of the pile as the apparent size instead of the area of the pile that would be disturbed at any one instant. The reason for this is that the model operates in one-hour blocks of time, so using instantaneous sizes could inaccurately target nearby receptors with elevated emission concentrations.

For a single volume source, divide the apparent length by 4.3 to determine the initial lateral dimension (σ_{y_0}) to input into the model. For a line source represented by a series of volume sources, divide the distance between the centers of adjacent sources by 2.15 to determine σ_{y_0} .

For a source on the ground, divide the vertical dimension of the source by 2.15 to determine the initial vertical dimension (σ_{z_0}) to input into the model. For a source on or connected to a building, divide the height of the building by 2.15 to determine the σ_{z_0} . For an isolated elevated source, divide the vertical dimension of the source by 4.3 to determine the σ_{z_0} .

Example sources are described in the table below. Some sources will vary from the characteristics listed in the table.

Table 27: Example Dimensions of Fugitive Sources

Source Type	Height of Volume (m)	σ_{z_0} (m)	Release Height (m)	Width of Volume (m)	σ_{y_0} (m)
Crusher	5	2.33	6	5	1.16
Screen	5	2.33	4	5	1.16
Transfer point	2	0.93	2	2	0.47
Elevated transfer point	4	0.93	4	2	0.47
High Elevated transfer point	4	0.93	8	2	0.47
Concrete truck loading	5	2.33	4	5	1.16

5.3.3 Haul Roads

Traffic carrying materials mined or processed at the facility must be modeled as part of the facility. Haul roads to be modeled include the portion of roads that are not publicly accessible. The Bureau recommends haul road modeling to be consistent with Regional/State/Local Haul Road Workgroup Recommendations, as described below. Haul road emissions should be modeled as a series of adjacent volume sources, except that area sources should be used for modeling haul roads where receptors located within source dimensions are important. A procedure to develop model input parameters follows. The applicant can use

other procedures on a case-by-case basis but must demonstrate that those procedures would be appropriate.

Road Source Characterization: Follow the instructions described below.

Plume height:

The height of the volume (H) or plume height will be equal to 1.7 times the height of the vehicle generating the emissions. Use the same for top of plume height for area sources.

The initial vertical sigma (σ_{z0}) is determined by dividing the height of the plume by 2.15.

The release height is determined by dividing the height of the volume by two. This point is in the center of the volume.

Table 28: Example Haul Road Vertical Dimensions

Vehicle size	Truck Height	Height of Volume	σ_{z0}	Release Height
Large trucks	4 m (13.1 ft)	6.8 m (22.3 ft)	3.16 m (10.4 ft)	3.4 m (11.1 ft)
Small trucks	2 m (6.6 ft)	3.4 m (11.2 ft)	1.58 m (5.2 ft)	1.7 m (5.6 ft)

RH = H/2 = Release Height above the ground (m). It's the center of the volume source. Also use this for the source height of the area source, if using the area source alternative.

$\sigma_{z0} = H/2.15 =$ initial vertical dimension of the volume (m)

Road width:

The adjusted width of the road (W) is the actual width of the road plus 6 meters. The additional width represents turbulence caused by the vehicle as it moves along the road. This width will represent a side of the base of the volume. Use W for the width of the area source, if using the area source alternative.

The initial horizontal sigma (σ_{y0}) for each volume is determined as follows:

- If the road is represented by a single volume, divide W by 4.3.
- If the road is represented by adjacent volumes, divide W by 2.15.
- If the road is represented by alternating volumes, divide the distance between the center point of one volume to the center point of the next volume by 2.15. $\sigma_{y0} = 2W/2.15$ This representation is only recommended for very long roads.
- If using area sources, the aspect ratio (i.e., length/width) should be less than 100 to 1. Subdivide the sources if they are too long.
- If using area sources, model each road segment as a straight line. Do not create a road segment with a bend in the road – divide the road into different segments when bends occur.

Road length:

The sum of the length of all volume sources should be about equal to the actual road length, unless the road is very long and half the segments are skipped to save time. The volume sources should be evenly spaced along the road and should be of equal size for a given road. It is acceptable to artificially end the haul road up to 50 meters before the intersection with a public road. The reduced length of the road is due to the observation that vehicles normally slow down or stop before exiting the property. All emissions from haul roads must be modeled, however. Emissions from the reduced road length are added to other road segments.

The two lateral dimensions (length and width) of a volume source should be equal. The number of volume sources, N, is determined by dividing the length of the road (optionally minus 50 meters) by W. The result is the maximum number of volume sources that could be used to represent the road. If N is very large, modeling time can be reduced by using alternating volume sources to reduce the number of sources.

Table 29: Example Haul Road Horizontal Dimensions

Vehicle size	Width of Volume	Length of Volume	σ_{Y_0}
Large trucks	13 m (42.65 ft)	13 m (42.65 ft)	$W/2.15 = 6.05 \text{ m (19.85 ft)}$
Small trucks	10 m (32.8 ft)	10 m (32.8 ft)	$W/2.15 = 4.65 \text{ m (15.26 ft)}$

Road location:

The UTM coordinates for the volume source are in the center of the base of the volume. This location must be at least one meter from the nearest receptor.

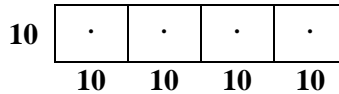
Emission Rate:

Divide the total emission rate equally among the individual volumes used to represent the road, unless there is a known spatial variation in emissions. Use the emissions calculated from the entire road length, even if you artificially end the road volume sources early before exiting the facility.

Example sources:

Use of the following modeling parameters should result in acceptable haul road modeling. Different facilities have different sized trucks, roads, and other variables. It is acceptable to use facility-specific parameters

Example One-Way Road Source



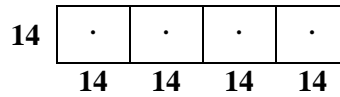
(looking from above)

Width = W = 10 m (32.8 ft)

$\sigma_{Y_0} = W/2.15 = 4.65 \text{ m (15.26 ft)}$

Figure 3: One-Way Road Source

Two-Way Road Source



(looking from above)

Width = W = 14 m (45.9 ft)

$\sigma_{Y_0} = W/2.15 = 6.51 \text{ m (21.4 ft)}$

Figure 4: Two-Way Road Source

Additional guidance can be found in Volume II of the User's Guide for ISC3 model (EPA, 1995).

5.3.4 Area Sources

Sources that have little plume rise may be modeled as area sources. Examples are: storage pile emissions, waste lagoon emissions, or gaseous emissions from landfills. Area source types include rectangle, circle, and irregularly shaped polygon. The model uses only the portion of the area source that is upwind of the receptor for calculating emissions for the hour, so it is safe to put receptors inside the area source without overly magnifying concentrations. The ISC input file uses emissions per area, but front-end programs for developing input files may calculate this for you based on total emissions from the source. For additional information, see the ISC User's Guide (EPA, 1995d).

Extremely long or odd-shaped (like a giant "L") area sources should be broken up into smaller area sources or modeled as a series of volume sources, because they may misrepresent emissions. Area sources, such as AREACIRC sources, may require many times as long to run the model as do volume or point sources in AERMOD.

5.3.5 Open Pits

The open pit source type should only be used to model open pits (not elevated trash dumpsters or anything else that somewhat resembles an open pit). The elevation of the pit entered into the model is the elevation of the top of the pit, which should be ground level.

The model calculates the effective depth of the pit by dividing the pit volume by the length and width of the pit. Release height above the base of the pit must be smaller than this value. Emissions from the bottom of the pit are expressed with a release height of zero.

Pit length should be less than 10 times the pit width. However, a pit cannot be sub-divided because the model needs to calculate mixing done throughout the pit. If the pit is irregular in shape, use the actual area of the top of the pit to calculate a rectangular shape with the same area.

Do not place receptors inside a pit.

The model input file requires pit emission rates to be expressed in mass per time per area [i.e., g/(s·m²)]. Model input front-end programs may convert actual emission rate into area-based emission rates automatically, however.

5.3.6 Landfill Offgas

Decomposition of landfill material can result in the release of gasses such as H₂S. If these gasses are not collected using a negative pressure system and flared, then the area of the landfill that is releasing gas can be modeled as an area or a circular area source. If gas is collected by a negative pressure collection

system and flared, then model the flare the same way other flares are modeled. Place large area sources in areas that have little effect from the negative pressure collection system. In either case, elevation of the source should be equal to that of the surface, and release height should be zero because they are released from the ground and are not significantly affected by turbulence caused by vehicles traveling over the off-gasses.

6.0 MODELING PROTOCOLS

6.1 Submittal of Modeling Protocol

A modeling protocol should be submitted prior to the performance of a dispersion modeling analysis. For PSD applications, a modeling protocol is mandatory, and must be sent to NMED/AQB for review and comment. Consultation with Bureau modeling staff regarding appropriate model options, meteorological data, background concentrations, and neighboring sources is recommended for minor sources also, and can be accomplished in writing or by phone. The applicant should allow two weeks for the Bureau to review and respond to the written protocol. To avoid delays caused by misinterpretation or misunderstanding, we strongly recommend consultation with our staff on the following topics:

- a.) Choice of models;
- b.) Model input options;
- c.) Terrain classification (flat or simple and complex);
- d.) Receptor grids;
- e.) Source inventory data;
- f.) Minor source baseline dates for modeling increment consumption;
- g.) Nearby Class I areas;
- h.) Appropriate meteorological data;
- i.) Background concentrations;
- j.) Setback distance calculation if a proposed facility is a portable fugitive source;
- k.) Any possible sources of disagreement;

Important: Modeling that substantially deviates from guidelines may be rejected if it is not accompanied by a written approved modeling protocol.

The input data to the models will be unique to the source. Data will usually consist of 1) emission rates and stack parameters for the proposed source at maximum load capacity and at reduced load capacity; 2) emission parameters of sources in the area; 3) model options; 4) suitable meteorological data; 5) definition of source operation which creates the greatest air quality impacts if other than maximum load conditions; and 6) terrain information, if applicable. Very important: **The emission parameters used in the modeling analysis of the proposed source are normally the same as those in the permit application. Any difference between the two should be clearly documented and explained.** Failure to adhere to this rule may result in an incomplete analysis.

6.2 Protocol ingredients

The shortest acceptable modeling protocol would be a statement that the modeling guidelines will be followed and a statement of what meteorological data will be used. Ask the modeling section or check the web page for the latest sample protocols.

6.3 How to submit the protocol

E-mail the modeling protocol to the modeling manager: Sufi.Mustafa@state.nm.us

7.0 DISPERSION MODELING PROCEDURE

Note: The basic steps for performing the modeling are presented in sequential format. Sometimes, it will make sense to perform some of the steps out of order. The sequential modeling steps are designed as an aid to modeling, not a mandatory requirement.

It is important to have an approved modeling protocol before proceeding. Modeling that substantially deviates from guidelines may be rejected if it is not accompanied by a written approved modeling protocol.

7.1 Step 1: Determining the Radius of Impact

A facility's significance area is defined as all locations outside of its fence line where the source produces concentrations that are above the significance levels listed in Table 6. The source is deemed culpable for concentrations that exceed air quality standards or PSD increments that occur at a receptor if the source's contribution is above the significance level at the same time that the exceedance of air quality standards or PSD increments occurs.

The Bureau uses the Radius of Impact (ROI) to make sure the entire significance area is analyzed. The ROI is defined as the greatest distance from the center of the facility to the most distant receptor where concentrations are greater than significance levels.

An illustration of determining an ROI from modeling output is shown in Figure 5, below. Note that the entire ROI is completely contained within the receptor grid, as required.

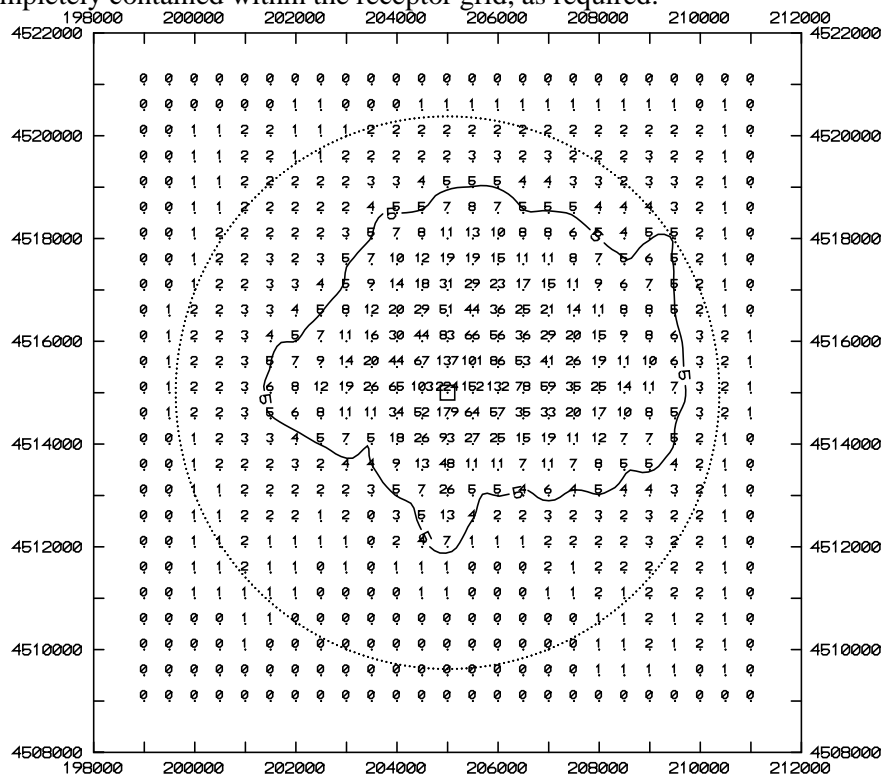


Figure 5. Plot of pollutant concentrations showing the 5 µg/m³ significance level and the radius of impact (dashed line circle), determined from the greatest lineal extent of the significance level from the source.

7.1.1 Prepare the ROI analysis as follows:

- I. Select the model that will be used for the analysis. It is usually quicker in the long run to use the same model for the radius of impact analysis as will be used for the refined analysis.
- II. Model the entire source, as defined in section 2.4.1. Suggestion: Plot your sources to verify locations and identify typographical errors.
- III. Set up the receptors as described above. Make sure the receptor grid extends far enough in every direction to capture the entire ROI, subject to the maximum radius of 50km.
- IV. Optional step: Calculate the elevations of all sources, receptors, and buildings. This complex terrain analysis is optional for the ROI run, but it may save time to do it now.
- V. Optional step: Add buildings and analyze them with BPIP or equivalent programs. This building downwash analysis is optional for the ROI run, but it may save time to do it now.
- VI. Choose modeling options, as appropriate.
- VII. Make sure that all sources and operating scenarios are modeled according to the guidelines in sections 4 and 5, above.
- VIII. Run the model.

7.1.2 Analyze modeling results to determine ROI

- I. Determine a radius of impact for each pollutant for each applicable averaging period. The largest ROI may be designated as the ROI for that pollutant, or each averaging period determined independently.
- II. The ROI for NO₂ may be determined using Ambient Ratio Method 2 (ARM2).
- III. Concentrations inside the facility's fence line can be ignored when determining the ROI.
- IV. If no concentrations of a pollutant are above the significance levels for that pollutant, then the ROI for that pollutant is 0. Skip to Step 3 for that pollutant.
- V. It is acceptable to scale impacts from one pollutant to determine impacts from another pollutant if several pollutants vent from the same stack and the ratios of emission rates and the averaging periods are the same.

Proceed to Step 2 for each pollutant with an ROI greater than zero.

7.2 Step 2: Refined Analysis

The entire area of significance must be included in the analyses for all averaging periods for each pollutant. If the ROI was determined using coarse grids, then add fine grid spacing to the potential areas of maximum concentration or concentrations above standards. If the ROI was determined using appropriate grid spacing, elevations, and building downwash (if applicable), then only the significant receptors need to be modeled for the refined analysis.

Once the ROI is determined for a specific source, neighboring sources need to be included and a cumulative impact analysis needs to be performed. As the ROI analysis is concerned with significance levels, the refined analysis is concerned with NAAQS, NMAAQs, and PSD Class I and Class II increments. The concentrations produced by the facility plus surrounding sources must be demonstrated to be below these levels in order to issue a permit under the regular permitting process.

7.2.1 Prepare the Refined Analysis as Follows:

- I. If a screening model was used to determine ROI, the modeler may wish to use a refined model to reduce the area of significant impact. If so, return to *Step 1* and repeat the step with the new model.
- II. Prepare a new modeling input file from the ROI file.

- III. Fill the ROI with receptors with appropriate spacing (or discard receptors below significance levels if appropriate spacing was used for the ROI analysis).
- IV. Add receptors near areas of high concentration if these areas are not contained within a fine grid. The modeling run must definitively demonstrate that the maximum impact has been identified. Concentrations should “fall off” from the center of the fine grid.
- V. Add surrounding sources to the input file, if appropriate, as described in *Neighboring Sources/Emission Inventory Requirements*, above. Include PM_{2.5} surrounding sources if particulate modeling is required. Suggestion: set up source groups so that impacts from the source alone, from the PSD increment consuming sources, and from all sources can be analyzed in a single run and compared with each other for determination of culpability.
- VI. Building downwash analysis must be included in the refined analysis, if applicable.
- VII. Terrain elevations must be included in the refined analysis, if applicable.

7.2.2 Analyze the Refined Modeling Results

- I. Make sure the maximum impacts for each averaging period fall within a fine enough receptor grid to identify true maximums. Include fine grids near adjacent sources and in “hot spots”.
- II. Compare the highest short-term and annual impacts from all sources with NAAQS and NMAAQs.
- III. Determine if there is an exceedance of PSD Class II increment within the area defined by the radius of impact by the group containing all PSD increment consuming sources.
- IV. Determine if there is an exceedance of PSD Class I increment within any Class I area.
- V. If the facility alone will violate any NAAQS, NMAAQs, or PSD increment, then the permit cannot be issued through the normal process. Please contact the Bureau for further information.
- VI. If there are exceedances of the NMAAQs or NAAQS at any receptors within the ROI, the next step is to determine if the facility being modeled significantly contributes (see significance levels in Table 6) to the exceedance at those receptors during the same time period(s) that the exceedance occurs. If so, the permit cannot be issued through the normal process. See nonattainment area requirements, below.
- VII. If no exceedances are found, or if the facility does not contribute amounts above significance levels to the exceedances, then the facility can be permitted per the modeling analysis.

7.2.3 NMAAQs and NAAQS

All sources are required to submit NMAAQs and NAAQS modeling. The total concentrations of all facilities and background sources are required to be below the NAAQS. The steps required for this analysis are outlined above.

7.2.4 PSD Class II increment

PSD Increment modeling applies to both minor and major sources. If the minor source baseline date has been established in the Air Quality Control Region (AQCR) in which the facility will be located, then PSD increment consumption modeling must be performed. If the minor source baseline date has not been established in that region, then only PSD major sources must perform this analysis.

Portable sources that are not located at a single location continuously for more than one year are not required to model PSD increment consumption.

The steps required for this analysis are outlined above.

The same significance levels that apply to NAAQS and NMAAQs standards are assumed to apply to PSD Class II increment as well.

7.2.5 PSD Class I increment

If a PSD Class II increment analysis is required and the proposed construction of a minor source is within 50 km of a Class I area (see Figure 1), then PSD increment consumption at the Class I area(s) must be determined and compared with the Class I PSD increment. If the proposed construction of a PSD major source is within 100 km of a Class I area, then PSD increment consumption at the Class I area(s) must be determined and compared with the Class I PSD increment. The PSD permit process requires a more thorough Class I analysis, which is described in *Step 6*.

See *Receptor Placement*, above, for receptor instructions.

Proceed with the Class I area analysis similarly to the other analyses described above. Class I significance levels apply for determining whether or not a facility contributes significantly to an exceedance in a PSD Class I area and for determining the Class I ROI.

7.3 Step 3: Portable Source Fence Line Distance Requirements for Initial Location and Relocation

Skip this step if the facility is not a portable source.

Portable sources should model fence line distance requirements for relocation purposes and for setback distances within the initial property. If the facility wants to be able to move equipment around within the property, or move to a new location, permit conditions will be required to ensure the facility continues to demonstrate compliance with air quality standards as it moves. For this modeling, use meteorological data that the Bureau has approved for relocation modeling, which may be different from that used for the rest of the modeling for the facility. Model the facility with a haul road length at least as long as the setback distance and a number of truck trips equal in number to the count at the original location. Surrounding sources may be ignored, but include co-located facilities if the desire is to be able to co-locate with other facilities at the new locations. To determine setback distance, draw a line connecting the concentrations where they drop off to the point that are just under the ambient air standard or PSD increment. Make sure to add background concentration before determining the isopleths for ambient air standards. From each point on the isopleth line, determine the distance to the nearest source (excluding haul road sources). The setback distance is the largest of these distances. Setback distance is typically rounded up to the nearest meter that is above the calculated value. An example setback distance determination is pictured in Figure 6, below.

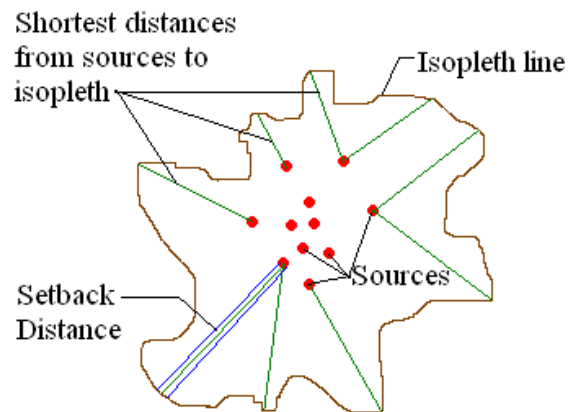


Figure 6: Setback Distance Calculation

Fine spacing is suggested within the property boundary for relocation requirement modeling.

If the applicant does not perform fence line distance modeling, relocation distance will be assumed to be the distance from the edge of a facility operations to the most distant point on the initial fence line. An irregular or elongated fence line shape can result in relocation requirements that require very large properties to be fenced off in order to relocate there without submitting modeling for each new location of the facility.

7.4 Step 4: Nonattainment Area Requirements

Skip this step if all modeled concentrations are below NAAQS, NMAAQs, and PSD Increments.

If the modeling analysis of a source predicts that the impact from any regulated air contaminant will exceed the significance level concentrations at any receptor which does not meet the NMAAQs or NAAQS, the source will be required to demonstrate a net air quality benefit and meet the requirements of 20.2.72.216 NMAC or 20.2.79 NMAC. The net air quality benefit is a reduction of at least 20% of the maximum modeled concentration from the facility or the emission sources being modified. The 20 percent reduction shall be calculated as the projected impact subtracted from the existing impact divided by the existing impact. The existing impact for the net air quality benefit must be based on the lowest enforceable emission rate, or the actual emission rate if a unit has no enforceable emission rate. The offsets used to meet the net air quality benefit must be quantifiable, enforceable, and permanent. For more information regarding nonattainment permit requirements, see **20.2.72.216 NMAC** and **20.2.79 NMAC – Nonattainment Areas**.

7.5 Step 5: Modeling for Toxic Air Pollutants

Skip this step if there are no toxics to model at this facility. See section 2, “New Mexico State Air Toxics Modeling”, to determine if modeling of toxics is required and for other details about toxics regulatory requirements.

- I. Model the toxic air pollutants similar to the way the other pollutants were modeled, as described above in steps 1 and 2. Use an 8-hour averaging period, complex terrain, and building downwash.
- II. No surrounding source inventory exists for the toxics, so model only your source.
- III. Make sure a fine grid is used in the area of maximum concentration.
- IV. If more than one toxic pollutant is being modeled and they use the same stacks at the same ratio of emission rates, it is allowable to scale the results of the first pollutants by the emission rate ratio to determine the concentration of the other toxics.

If modeling shows that the maximum eight-hour average concentration of all toxics is less than one percent of the Occupational Exposure Level (OEL) for that toxic, then the analysis of that toxic pollutant is finished. Report details about the maximum concentrations in the modeling report. Otherwise, perform BACT analysis or health assessments, as required. Contact the Bureau on how to proceed if the 1/100th of the OEL is exceeded.

7.6 Step 6: PSD Permit Application Modeling

Skip this step if the facility is not a PSD major source.

PSD sources and requirements are defined in NMAC 20.2.74.303 to 305. New PSD major sources and major modifications to PSD major sources must submit the following modeling requirements in addition to the NSR minor source modeling requirements. Minor modifications to PSD major sources

are only subject to NSR minor source modeling requirements listed above, as required under NMAC 20.2.72.

Due to a court ruling, the use of the PM_{2.5} significant monitoring concentration for PSD major modifications or new PSD major sources is not allowed. This significant ambient concentration level may still be used for minor source and nonattainment permitting.

Sources subject to PSD requirements should consult with the Bureau to determine how to proceed in the application process. For PSD applications, a modeling protocol is required for review. Please refer to EPA's *New Source Review Workshop Manual*. The following items are required for PSD permit applications and supersede other modeling requirements in this document.

7.6.1 Meteorological Data

Applicants may need to collect one year of on-site meteorological and ambient data to satisfy PSD requirements. In some cases, it may be advantageous to begin collecting on-site meteorological and ambient data to ensure that it is available at a site that may become PSD in the future. A company considering a monitoring program is advised to consult with the Bureau as early as possible so that an acceptable data collection process, including instrument parameters, can be started. Generally, the following meteorological parameters will be measured: wind direction, wind speed, ambient air temperature, solar insolation, ΔT , and σ_0 . For further information on meteorological monitoring Refer to EPA's *Guideline on Air Quality Models* and *On-Site Meteorological Program Guidance for Regulatory Modeling Applications*. Refer to *Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)* for ambient monitoring guidance. In addition, a monitoring protocol and QA plan **must** be submitted and approved prior to beginning collection of data for a PSD application if these data are to be used for the analysis.

In the absence of actual on-site data, the Bureau may approve the use of off-site data that the Bureau believes mimics on-site data for that location or the Bureau may approve the use of data produced by the model MM5.

7.6.2 Ambient Air Quality Analysis

The ambient air quality analysis is the same as described above, with the exception of the following points.

- The PSD project is defined as the future potential emission rate minus the past actual emission rate.
- If the maximum ambient impact is less than EPA's significant concentration levels (see Table 6), then a full analysis is not required.
- Nearby sources must be considered. Discarding sources is discussed in the section on "neighboring sources data".
- A total air quality analysis must also be performed for each appropriate Class I area if the facility produces concentrations greater than the Class I significance levels in Table 6. All sources near the Class I area must be considered. The inventories for the analysis near the facility and the inventory for the analysis near Class I areas may be quite different because they are centered on different locations.
- If subject to 20.2.74.403 NMAC (Sources impacting Federal Class I Areas), an analysis of Air Quality Related Values must be included in the PSD application. If the facility will have no impact on the AQRV, then that must be stated in the application (NSR Workshop Manual, Chapter D).
- There may be additional analyses required by the Federal Land Managers (FLM) for Air Quality Related Values (AQRVs). See **Federal Land Managers' Air Quality Related Values Work**

Group (FLAG) for more information at:
<http://www2.nature.nps.gov/air/Permits/flag/index.cfm>

7.6.3 Additional Impact Analysis (NMAC 20.2.74.304)

The owner or operator of the proposed major stationary source or major modification shall provide an analysis of the impact that would occur as a result of the source or modification and general commercial, residential, industrial, and other growth associated with the source or modification. This analysis is in addition to the Class I analysis, but may use some of the same techniques that were used in the Class I analysis. The analysis required for a National Environmental Policy Act (NEPA) review may work to satisfy some requirements of this section.

- Visibility Analysis: A Class II Visibility Analysis is required to determine impact the facility will have upon Class II areas. Analyze the change in visibility of a nearby peak or mountain for this analysis. In the absence of nearby mountains, analyze the visibility of clear sky from nearby state or local parks.
- Soils analysis: What changes will occur to soil pH, toxicity, susceptibility to erosion, or other soil characteristics as a result of the project and indirect growth related to the project?
- Vegetation analysis: What changes will occur to type, abundance, vulnerability to parasites, or other vegetation characteristics as a result of the project and indirect growth related to the project? The owner or operator need not provide an analysis of the impact on vegetation having no significant commercial or recreational value.
- Growth analysis: The owner or operator shall also provide an analysis of the air quality impact projected for the area as a result of general commercial, residential, industrial, and other growth associated with the source or modification.

7.6.4 Increment Analysis

- If the facility produces ambient concentrations greater than the significance levels in Table 6, then the Class II PSD increment analysis for the facility must use the inventory of all increment consuming sources near the facility. Sources in other states should be obtained from the agency in the surrounding state.
- If there is a Class I area within 100 km of the facility (or any distance, if requested by the FLM), then receptors must be located at the Class I area.
- If the facility produces ambient concentrations greater than the Class I significance levels in Table 6 in a Class I area, then the increment analysis for the Class I areas should use the inventory of all increment consuming sources near the Class I area, including those sources in other states. Sources in other states should be obtained from the agency in the surrounding state.

7.6.5 Emission Inventories

- The most current inventory of sources must be used. It should contain all sources currently under review by the Bureau that would be located within the appropriate inventory area. The applicant should check with the modeling staff to ensure that the inventory is up to date.

7.6.6 BACT analysis

- The analysis must follow current EPA procedures and guidelines.

7.7 Step 7: Write Modeling Report

A narrative report describing the modeling performed for the facility is required to be submitted with the permit application using Universal Application form 4 (UA4). This report should be written to provide the

public and the Bureau with sufficient information to determine that the proposed construction does not cause or contribute to exceedances of air quality standards. The report needs to contain enough information to allow a reviewer to determine that modeling was done in a manner consistent and defensible with respect to available modeling guidance. Do not include raw modeling output in the report, only summaries and descriptions of the output or input.

This outline may be used as a checklist to determine if the analysis is complete.

- I. Applicant and consultant information
 - a. Name of facility and company.
 - b. Permit numbers currently registered for the facility.
 - c. Contact name, phone number, and e-mail address for the Bureau to call in case of modeling questions.
- II. Facility and operations description
 - a. A narrative summary of the purpose of the proposed construction, modification, or revision.
 - b. Brief physical description of the location.
 - c. Duration of time that the facility will be located at this location.
 - d. A map showing UTM coordinates and the location of the proposed facility, on-site buildings, emission points, and property boundaries. Include UTM zone and datum.
- III. Modeling requirements description
 - a. List of pollutants at this facility requiring NAAQS and/or NMAAQS modeling.
 - b. AQCR facility is located in and resulting list of pollutants requiring PSD increment (Class I and II) modeling. Include distances to Class I areas in discussion.
 - c. List of State Air Toxic pollutants requiring modeling.
 - d. PSD, NSPS, and NESHAP applicability and any additional modeling requirements that result if those regulations are applicable to the facility.
 - e. State whether or not the facility is in a federal Nonattainment area, and any special modeling requirements or exemptions due to this status.
 - f. Any special modeling requirements, such as streamline permit requirements.
- IV. Modeling inputs
 - a. General modeling approach
 - i. The models used and the justification for using each model.
 - ii. Model options used and why they were considered appropriate to the application.
 - iii. Ozone limiting model options discussion, if used for NO₂ impacts.
 - iv. Background concentrations.
 - b. Meteorological data
 - i. A discussion of the meteorological data, including identification of the source of the data.
 - ii. Discussion of how missing data were handled, how stability class was determined, and how the data were processed, if the Bureau did not provide the data.
 - c. Receptor and terrain discussion
 - i. Description of the spacing of the receptor grids.
 - ii. List fence line coordinates and describe receptor spacing along fence.
 - iii. PSD Class I area receptor description.
 - iv. Flat and complex terrain discussion, including source of elevation data.
 - d. Emission sources
 - i. Description of sources at the facility, including:

1. A cross-reference from the model input source numbers/names to the sources listed in the permit application for the proposed facility.
 2. Determination of sigma-Y and sigma-Z for fugitive sources.
 3. Description and list of PSD increment consuming sources, baseline sources, and retired baseline sources.
 4. Describe treatment of operating hours
 5. Particle size characteristics, if plume depletion is used.
 6. If the modeled stack parameters are different from the stack parameters in the application, an explanation must be provided as to what special cases are being analyzed and why.
 7. Partial operating loads analysis description.
 8. Flare calculations used to determine effective stack parameters.
 9. In-stack NO₂/NO_x ratio determination, if using OLM or PVMRM.
- ii. Surrounding sources:
 1. The date of the surrounding source retrieval.
 2. Details of any changes or corrections that were made to the surrounding sources.
 3. Description of adjacent sources eliminated from the inventory.
- e. Building downwash
 - i. Dimensions of buildings
- V. Modeling files description
- a. A list of all the file names in the accompanying CD and description of these files.
 - b. Description of the scenarios represented by each file.
- VI. Modeling results
- a. A discussion of the radius of impact determination.
 - b. A summary of the modeling results including the maximum concentrations, location where the maximum concentration occurs, and comparison to the ambient standards.
 - c. Source, cumulative, and increment impacts.
 - d. Class I increment impact.
 - e. A table showing concentrations and standards corrected for elevation.
 - f. If ambient standards are exceeded because of surrounding sources, please include a culpability analysis for the source and show that the contribution from your source is less than the significance levels for the specific pollutant.
 - g. Toxics modeling results, if needed.
- VII. Summary/conclusions
- a. A statement that modeling requirements have been satisfied and that the permit can be issued.

Ask the modeling section or check the web page for a sample modeling reports. The modeling report documents details the standard format for the modeling report.

7.8 Step 8: Submit Modeling Analysis

Submit the following materials to the Bureau:

A CD containing the following:

- I. An electronic copy (in MS Word format) of the modeling report.
- II. Input and output files for all model runs. Include BEEST, ISC-View, or BREEZE files, if available.
- III. Building downwash input and output files.

- IV. Fence line coordinates.
- V. Meteorological data, if not Bureau-supplied.
- VI. A list of the surrounding sources at the time the facility was modeled.
- VII. An electronic copy of the approved modeling protocol.

Do not include paper copies of modeling input and output files.

8.0 List of Abbreviations

Table 30: List of Abbreviations

<u>ACRONYM</u>	<u>DESCRIPTION</u>
AQB	Air Quality Bureau
AQCR	Air Quality Control Region
AQCR	Air Quality Control Regulation (CURRENTLY NOT USED)
AQRV	Air Quality Related Values
ARM2	Ambient Ratio Method 2
BACT	Best Available Control Technology
CO	Carbon monoxide
DEM	Digitized Elevation Model
EPA	Environmental Protection Agency
FLAG	Federal Land Managers' Air Quality Related Values Work Group
FEM	Federal Equivalent Method
FRM	Federal Reference Method
GEP	Good Engineering Practice
H ₂ S	Hydrogen sulfide
ISCST3	Industrial Source Complex Short Term Model version 3
NAAQS	National Ambient Air Quality Standards
NED	National Elevation Dataset
NO ₂	Nitrogen dioxide
NO _x	Nitrogen oxides
NMAAQs	New Mexico Ambient Air Quality Standards
NMAC	New Mexico Administrative Code
O ₃	Ozone
OEL	Occupational Exposure Level
OLM	Ozone limiting method
Pb	Lead
PDF	Probability density function
PM _{2.5}	Particulate matter equal to or under 2.5 µm in aerodynamic diameter
PM ₁₀	Particulate matter equal to or under 10 µm in aerodynamic diameter
PPM	Parts per million (volume ratio)
PSD	Prevention of Significant Deterioration
PVMRM	Plume Volume Molar Ratio Method
ROI	Radius of Impact
SO ₂	Sulfur dioxide
TSP	Total suspended particulates
UTM	Universal Trans Mercator
VOC	Volatile organic compounds

9.0 References

Ensor, D.S. and M.J., Pilat (1971). Calculation of smoke plume opacity from particulate air pollutant properties. J.Air Poll.Cont.Assoc. 21(8): 496-501.

EPA (1995). User's Guide for the Industrial Source Complex (ISC3) Dispersion Model, Volume I - User Instructions. EPA-454/B-95-003a. September 1995.

Joseph A. Tikvart (1993). "MEMORANDUM: Proposal for Calculating Plume Rise for Stacks with Horizontal Releases or Rain Caps for Cookson Pigment, Newark, New Jersey", Joseph A. Tikvart (Model Clearinghouse), July 9, 1993.

SCREEN3 Model User's Guide (1995). *SCREEN3 Model User's Guide*, EPA-454/B-95-004, September, 1995. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emissions, Monitoring, and Analysis Division, Research Triangle Park, NC.

NSR Workshop Manual, Chapter D – Air Quality Related Values

Federal Land Manager (FLM) Resources for Permit Applicants:

<https://www.nps.gov/subjects/air/permitresources.htm>

New Mexico Administrative Code (NMAC) Air Quality Regulations: <http://www.srca.nm.gov/chapter-2-air-quality-statewide/>

EPA, 1995d: *User's Guide for the Industrial Source Complex (ISC3) Dispersion Models*, EPA-454/B-95-003a, September, 1995. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emissions, Monitoring, and Analysis Division, Research Triangle Park, NC.

Texas 1999: *Air Quality Modeling Guidelines*, TNRCC-New Source Review Permits Division, RG-25 (Revised), February 1999

"The Plume Volume Molar Ratio Method [(PVMRM)] for Determining NO₂/NO_x Ratios in Modeling", by Pat Hanrahan of the Oregon DEQ. The paper appeared in the November 1999 issue of the AWMA journal.

Links:

Environmental Protection Agency, 40 CFR Part 51, Revision to the Guideline on Air Quality Models Appendix W: https://www.epa.gov/sites/production/files/2020-09/documents/appw_17.pdf

Support Center for Regulatory Atmospheric Modeling (SCRAM): <https://www.epa.gov/scram>

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Appendix A: Recent changes to the NM Modeling Guidelines

Note of changes made in 2020:

October 26, 2020:

Reference to old EPA Modeling Guideline was updated to 2017 version.

Clarification that PSD increment modeling is not normally an applicable requirement for Title V.

Sources within 20 km from the center of Albuquerque or El Paso should include both modeled sources and monitored concentrations (changed from 10 km because the cities are larger than 10 km in radius).

Option to use monitored background in lieu of surrounding sources for PSD increment presented.

Language was changed to reflect that capped and horizontal point sources are no longer beta options and do not need stack-tip downwash turned off.

Cool stack section added to explain the modeling of sources at ambient temperature.

Obsolete references and links were updated.

Note of changes made in 2019:

February 7, 2019: An error in summary Table 6C was corrected to make it match the full text in section 2.6.4.4.

Note of changes since 2016 version:

Source definition was changed to better match EPA definitions.

Original:

Modeling significance levels are thresholds below which the source is not considered to contribute to any predicted exceedance of air quality standards or PSD increments. The definition of 'source' can apply to the whole facility or to the modifications at the facility. In cases where a particular averaging period has not been modeled for a pollutant, or was modeled, but predicted concentrations were above 95% of air quality standards or PSD increments, then NMED considers the entire facility to be the 'source' for those pollutants and periods. For other cases, 'source' includes only the modification described in the current application plus all contemporaneous emissions increases in the past 5 years since the entire facility was last modeled.

New:

Modeling significance levels are thresholds below which the source is not considered to contribute to any predicted exceedance of air quality standards or PSD increments. The definition of 'source' can apply to the whole facility or to the modifications at the facility. For a new facility or an unpermitted facility, NMED considers the entire facility to be the 'source'. For other cases, 'source' includes only the new equipment or new emissions increases described in the current application. Equipment that replaces other equipment is part of the new equipment.

Meteorological data recommendations have changed to reflect recent data. AQB has processed new meteorological data and has retired some old data that may be out of date. The processed data is available on the meteorological data webpage (<https://www.env.nm.gov/air-quality/meteorological-data/>). At the time of this writing, Substation has replaced Bloomfield data for permitting sources to be located in unknown locations (portable source relocation modeling). This change was based on a comparison of modeling results for existing sets of meteorological data.

NO₂ conversion using Ambient Ratio Method (ARM) has been replaced with Ambient Ratio Method 2 (ARM2). EPA no longer mentions the use of ARM in Appendix W. Instead, that appendix described

details about what ratios can be used for the ARM2 method, which is now built into AERMOD as a default option.

Title V sources that have not demonstrated compliance with NAAQS or PSD increments are required to model for these standards and increments or produce a compliance plan to come into compliance.

SO₂ background concentrations were added for the annual averaging period.

PM_{2.5} Class I significance levels were updated.

TSP standards were repealed November 30, 2018.

Background concentrations were updated to 2015-2017.

Areas Where Streamlined Permits Are Restricted were updated.

Secondary formation of ozone and PM_{2.5} were updated to reflect current Appendix W and MERP guidance.

Note of changes that were made in 2016:

1-hour NO₂ and SO₂ modeling is now required for all sizes of facilities with NO₂ or SO₂ emissions.

ARM2 method of NO₂ modeling has been added to the approved options.

AERMOD output is considered to be expressed at Standard Temperature and Pressure (STP), eliminating most of the need for concentration conversion.

Emission rates for the very small emission rate modeling waivers have changed.

The modeling report form, Universal Application 4 (UA4), is available.

Background concentrations have been updated to 2013-2015 monitoring results.

(Hobbs PM_{2.5} background concentration was corrected from the July 8, 2016 version).
(September 1, 2016: PM_{2.5} annual standard was corrected in Table 5F)

Errors in summary Tables 6A and 6C that did not match the instructions in the pollutant-specific standards sections were corrected.

ADMINISTRATIVE RECORD INDEX

ROPER CONSTRUCTION INC, ALTO CONCRETE BATCH PLANT

AQB21-57 (P)

Index No.	Date	Bates No.	From	To	Format	Subject
1	June 22, 2021	0001-0190	Roper Construction Inc	Air Quality Bureau (AQB)	Hard Copy	Application 9295
2		0191-0198				Statement of Basis
3		0199-0203				Database Summary
4		0204-0207				Location Verification
5		0208-0241				AQB Calculation Verifications
6		0242-0249				AQB Modeling Review Report
7		0250-0332				AQB Modeling Guidelines
8		0333-0337				Compliance & Enforcement Verification and Comments on Draft Permit Version 12_30_2021
9		0338-0395				Draft Permit Version 12_30_2021
10-13		0396-0406				AQB Resumes
Roper Construction Inc (RCI) Correspondence						
14	June 23, 2021	0407-0407	Deepika Saikrishnan, AQB	Ryan Roper, Roper Construction Inc, Paul Wade, consultant, RCI, Tasha Burns, AQB	Email	Alto Concrete Batch Plant Request for electronic documents
15	June 23, 2021	0407-0410	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Ryan Roper, RCI, Tasha Burns, AQB	Email	Alto Concrete Batch Plant Request for File Transfer

16	June 23, 2021	0411-0413	Deepika Saikrishnan, AQB	Paul Wade, Consultant, RCI, Ryan Roper, RCI, Tasha Burns, AQB	Email	Response to File Transfer Request and response to modelling files question
17	June 23, 2021	0414-0416	Tasha Burns, AQB	Paul Wade, Consultant, RCI, Ryan Roper, RCI, Deepika Saikrishnan, AQB, Sufi A Mustafa, AQB, Eric Peters, AQB, Angela Raso, AQB	Email	Alto Concrete Batch Plant – process of transferring modelling files
18	June 23, 2021	0417-0418	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB,	E-mail	Alto Concrete Batch Plant Application Package (link)
19	June 23, 2021	0419-0423	Paul Wade, Consultant, RCI	Tasha Burns, AQB, Deepika Saikrishnan, AQB, Mustafa A Sufi, AQB, Eric Peters, AQB, Angela Raso, AQB, Ryan Roper, RCI	E-mail	Clarification of folders provided in previous email.
20	June 23, 2021	0424-0427	Deepika Saikrishnan, AQB	Paul Wade, Consultant, RCI, Ryan Roper, RCI, Tasha Burns, AQB, Sufi A Mustafa, AQB, Eric Peters, AQB, Angela Raso, AQB	E-mail	NED file Receipt and sending more file transfer requests

21	June 23, 2021	0428-0433	Paul Wade, consultant, RCI	Tasha Burns, AQB, Deepika Saikrishnan, AQB, Mustafa A Sufi, AQB, Eric Peters, AQB, Angela Raso, AQB, Ryan Roper, RCI	E-mail	Yes, that will work.
22	June 23, 2021	0434-0435	Paul Wade, consultant, RCI	Deepika Saikrishnan, AQB	E-mail	File Transfer (link)
23	June 23, 2021	0436-0437	Paul Wade, consultant, RCI	Deepika Saikrishnan, AQB	E-mail	File Transfer (link)
24	June 23, 2021	0438-0439	Paul Wade, consultant RCI	Deepika Saikrishnan, AQB	E-mail	File Transfer (link)
25	June 23, 2021	0440-0449	Paul wade, consultant, RCI	Deepika Saikrishnan, AQB, Eric Peters, AQB	E-mail	Alto CBP Model Files - Upload for modelling files not right. Modelling files through file share program with Montrose (Montrose environmental file share)
26	June 23, 2021	0450-0460	Deepika Saikrishnan, AQB	Paul Wade, consultant, RCI, Eric Peters, AQB	E-mail	Document and Met Data Files not coming through
27	June 23, 2021	0461-0461	Paul Wade, consultant, RCI	Deepika Saikrishnan, AQB, Eric Peters, AQB	E-mail	Documents sent again via file transfer (Montrose environmental file share)
28	June 23, 2021	0462-0463	Deepika Saikrishnan, AQB	Paul Wade, consultant, RCI	E-mail	Limit on number of files on file request.
29	June 23, 2021	0464-0466	Paul Wade, consultant, RCI	Deepika Saikrishnan, AQB	E-mail	Sending Files through Montrose file sharing program.
30	June 23, 2021	0467-0471	Paul Wade, consultant, RCI	Deepika Saikrishnan, AQB	E-mail	Met Files

31	June 23, 2021	0472-0472	Paul Wade, consultant, RCI	Deepika Saikrishnan, AQB	E-mail	NED Files
32	June 23, 2021	0473-0474	Paul Wade, consultant, RCI	Deepika Saikrishnan, AQB	E-mail	All files sent
33	June 23, 2021	0475-0476	Deepika Saikrishnan, AQB	Paul Wade, consultant, RCI	E-mail	All files received and confirmation on NED files.
34	June 23, 2021	0477-0479	Paul Wade, consultant, RCI	Deepika Saikrishnan, AQB	E-mail	Clarification on NED files
35	July 1, 2021	0480-0480	Deepika Saikrishnan, AQB	Ryan Roper, RCI, Paul Wade, consultant, RCI, Tasha Burns, AQB, Rhonda Romero, AQB, Kathleen Primm, AQB	Email	Notification of significant public interest in application 9295.
36	July 19, 2021	0481-0481	Deepika Saikrishnan, AQB	Paul Wade, consultant, RCI	E-mail	Request for property tax record per 20.2.72.203.B NMAC, verification of certified receipts and letters of notification.
37	July 19, 2021	0482-0487	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB	E-mail	Response to email regarding property tax record and verification of receipts and letters of notification.
38	July 22, 2021	0488-0493	Deepika Saikrishnan, AQB	Ryan Roper, RCI, Paul Wade, consultant, RCI	Email	Notification of Ruling application Administratively Complete and invoice
39	July 22, 2021	0494-0495	Ryan Roper, RCI	Deepika Saikrishnan, AQB, Paul Wade, consultant, RCI	Email	Acknowledgement of receipt of ruling application administratively complete and invoice.

40	August 2, 2021	0496-0502	Deepika Saikrishnan, AQB	Paul Wade, Consultant RCI, Ryan Roper, RCI	Email	Response request to Citizen letter
41	August 5, 2021	0503-0504	Deepika Saikrishnan, AQB	Ryan Roper, RCI, Paul Wade, consultant, RCI	Email	Additional invoice for the 2 additional heaters that were represented in unit 12
42	August 6, 2021	0505-0514	Paul Wade, consultant, RCI	Deepika Saikrishnan, AQB, Ryan Roper, RCI, Louis Rose, Counsel for RCI	Email	Response to Citizen questions.
43	August 7, 2021	0515-0516	Deepika Saikrishnan, AQB	Paul Wade, Consultant RCI, Ryan Roper, RCI	Email	Technical Review questions
44	August 9, 2021	0517-0517	Deepika Saikrishnan, AQB	Paul Wade, Consultant RCI	Email	Input Capacities and Aggregate Handling Questions
45	August 10, 2021	0518-0602	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Ryan Roper, RCI, Louis Rose, Counsel for RCI	Email	Response to Technical review questions and input capacities and aggregate handling questions.18
46	August 16, 2021	0603-0603	Deepika Saikrishnan, AQB	Ryan Roper, RCI, Paul Wade, consultant, RCI	Email	Notifying Applicant of Hearing Determination Concurrence By NMED Secretary
47	August 17, 2021	0604-0605	Ryan Roper, RCI	Deepika Saikrishnan, AQB, Paul Wade, consultant, RCI	Email	Questions regarding public hearing timeline and deadlines
48	August 17, 2021	0606-0608	Deepika Saikrishnan, AQB	Ryan Roper, RCI, Paul Wade, consultant, RCI	Email	Response to Questions regarding public hearing timeline and deadlines

49	August 18, 2021	0609-0611	Ryan Roper, RCI	Deepika Saikrishnan, AQB, Paul Wade, consultant, RCI	Email	Thanks
50	August 20, 2021	0612-0613	Deepika Saikrishnan, AQB	Paul Wade, Consultant RCI, Ryan Roper, RCI	Email	Calculation questions
51	August 25, 2021	0614-0614	Deepika Saikrishnan, AQB	Paul Wade, Consultant RCI	Email	Plant capacity questions
52	August 25, 2021	0615-0615	Deepika Saikrishnan, AQB	Paul Wade, Consultant RCI	Email	Operating hours questions
53	August 26, 2021	0616-0620	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Ryan Roper, RCI	Email	Response to Calculation, Capacity and operating hours questions.
54	August 27, 2021	0621-0630	Deepika Saikrishnan, AQB	Paul Wade, Consultant RCI	Email	Haul Road trips, production rates and operable hours questions
55	August 27, 2021	0631-0631	Deepika Saikrishnan, AQB	Paul Wade, Consultant RCI	Email	0.5 Mile Radius notification question
56	August 27, 2021	0632-0634	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB	Email	Response to 0.5 Mile Radius notification question
57	September 1, 2021	0635-0636	Deepika Saikrishnan, AQB	Paul Wade, Consultant RCI	Email	Reminder email for Haul Road trips, production rates and operable hours questions
58	September 1, 2021	0637-0641	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Ryan Roper, RCI, Louis Rose, Counsel for RCI	Email	Response to Haul Road trips, production rates and operable hours questions
59	September 1, 2021	0642-0646	Ryan Roper, RCI	Deepika Saikrishnan, AQB, Paul Wade, consultant, RCI Louis Rose,	Email	Thanks Paul

				Counsel for RCI		
60	September 3, 2021	0647-0647	Deepika Saikrishnan, AQB	Ryan Roper, RCI Paul Wade, consultant, RCI	Email	Representing Attorneys Question
61	September 3, 2021	0648-0652	Deepika Saikrishnan, AQB	Paul Wade, Consultant, RCI, Ryan Roper, RCI	Email	Request for updated pages for responses to August 20,2021 email
62	September 3, 2021	0653-0655	Deepika Saikrishnan, AQB	Paul Wade, Consultant, RCI, Ryan Roper, RCI	Email	Further clarification requested for information provided by Lincoln County Assessor's office
63	September 3, 2021	0656-0660	Deepika Saikrishnan, AQB	Paul Wade, Consultant RCI, Ryan Roper, RCI, Louis Rose, Counsel for RCI	Email	Follow up questions on Response to Haul Road trips, production rates and operable hours
64	September 4, 2021	0661-0662	Ryan Roper, RCI	Deepika Saikrishnan, AQB, Paul Wade, consultant, RCI Louis Rose, Counsel for RCI	Email	Response to representing attorneys question
65	September 6, 2021	0663-0667	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Ryan Roper, RCI,	Email	Response to Further clarification requested for information provided by Lincoln County Assessor's office
66	September 9, 2021	0668-0668	Deepika Saikrishnan, AQB	Paul Wade, Consultant RCI, Ryan Roper, RCI	Email	Reminder email for updated pages request (9/3/21) and follow up questions on Haul road trips (9/3/21)
67	September 9, 2021	0669-0677	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Ryan Roper, RCI, Louis Rose, Counsel for RCI	Email	Response to follow up questions on Haul road trips email (9/3/21)

68	September 13, 2021	0678-0693	Deepika Saikrishnan, AQB	Paul Wade, Consultant RCI, Ryan Roper, RCI, Rhonda Romero, AQB, Kathleen Primm, AQB	Email	Draft Permit 9295 Version 09_13_21 for comments and questions
69	September 15, 2021	0694-0711	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Ryan Roper, RCI, Rhonda Romero, AQB, Kathleen Primm, AQB	Email	Response to Draft Permit 9295 Version 09_13_21
70	September 22, 2021	0712-0798	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB	Email	Updated pages from Section 2,3, 6 and 16 per request (email 9/3/21)
71	September 27, 2021	0799-0799	Deepika Saikrishnan, AQB	Paul Wade, Consultant, RCI, Ryan Roper, RCI	Email	Clarification on physical production capacity of the concrete plant.
72	September 28, 2021	0800-0802	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Ryan Roper, RCI	Email	Response to Clarification on physical production capacity of the concrete plant.
73	October 15, 2021	0803-0805	Deepika Saikrishnan, AQB	Paul Wade, Consultant, RCI, Ryan Roper, RCI, Rhonda Romero, AQB, Kathleen Primm, AQB, Eric Peters AQB	Email	Further clarification requested on Maximum plant production capacity
74	October 15, 2021	0806-0810	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Ryan Roper, RCI, Rhonda Romero, AQB,	Email	Response to Further clarification requested on Maximum plant production capacity

				Kathleen Primm, AQB, Eric Peters AQB		
75	November 5, 2021	0811-0813	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Ryan Roper, RCI, Louis Rose, Counsel for RCI	Email	Update Section 11
76	November 17, 2021	0814-0816	Deepika Saikrishnan, AQB	Paul Wade, Consultant, RCI	Email	Request for proof of information provided by Lincoln County Assessor's office.
77	November 17, 2021	0817-0821	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Ryan Roper, RCI, Louis Rose, Counsel for RCI	Email	Response Request for proof of information provided by Lincoln County Assessor's office and unit numbering updates.
78	December 21, 2021	0822-0824	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Ryan Roper, RCI	Email	Section 1 update with address for the property
79	December 22, 2021	0825-0825	Deepika Saikrishnan, AQB	Paul Wade, Consultant, RCI, Ryan Roper, RCI	Email	Draft Permit version 12-16-2021
80	December 22, 2021	0826-0841	Deepika Saikrishnan, AQB	Paul Wade, Consultant, RCI, Ryan Roper, RCI	Email	Draft Permit version 12-16-2021 with attachment
81	December 23, 2021	0842-0860	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Ryan Roper, RCI	Email	Comments on Draft Permit version 12-16-2021
82	December 29, 2021	0861-0862	Deepika Saikrishnan, AQB	Paul Wade, Consultant, RCI, Eric Peters AQB	Email	Verification of Windspeed data years
83	December 29, 2021	0861-0880	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Eric Peters AQB	Email	Response to Verification of Windspeed data years

84	December 30, 2021	0881-0883	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Ryan Roper, RCI, Rhonda Romero, AQB, Louis Rose, Counsel for RCI	Email	Update to section 1 D.5
85	January 4, 2022	0884-0886	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Tasha Burns, AQB, Rhonda Romero, AQB, Louis Rose, Counsel for RCI	Email	Additional Landowner Mailings
86	January 4, 2022	0887-0896	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Tasha Burns, AQB, Rhonda Romero, AQB, Louis Rose, Counsel for RCI	Email	Additional Mailing Landowner Mailing with complete mailing components
87	January 13, 2022	0897-0960	Paul Wade, Consultant, RCI	Deepika Saikrishnan, AQB, Tasha Burns, AQB, Rhonda Romero, AQB, Louis Rose, Counsel for RCI, Ryan Roper RCI	Email	Updates to section 6 (typographic error corrections and) 7 (additional support for baghouse control efficiency) and emission calc spreadsheet update to reflect correct unit numbers/
Modeling Correspondence						
88	March 16, 2021-	0961-0964	Eric Peters, AQB	Paul Wade, Consultant, RCI	Email	Response to Paul Wade preapplication Modeling questions
89	June 28, 2021	0965-0966	Sufi A Mustafa, AQB	Deepika Saikrishnan,	E-mail	Application 9295 may be ruled administratively

				AQB, Eric Peters, AQB, Rhonda Romero, AQB, Tasha Burns, AQB		complete with regard to modeling
90	July 30, 2021	0967-0977	Eric Peters, AQB	Deepika Saikrishnan, AQB, Sufi Mustafa, AQB, Rhonda Romero, AQB, Tasha Burns, AQB	Email	9295 Modeling Review
91	August 3, 2021	0978-0981	Eric Peters, AQB	Deepika Saikrishnan, AQB, Sufi Mustafa, AQB, Rhonda Romero, AQB, Tasha Burns, AQB	Email	(9295 Modeling Review updated to indicate the 3 Heater units Modeled together)
Public Comments						
92	June 8, 2021 -	0982-1271	Citizens	Deepika Saikrishnan, AQB	E-mail	Written comments
93	June 7, 2021 -	1272-1667	Citizens	Deepika Saikrishnan, AQB	Hard copy deliveries via USPS, FedEx	Written comments
AQB Public Outreach						
94	June 18, 2021- December 10, 2021	1668-1741	AQB	Citizens, Public	Email, Web posting	AQB responses and outreach
95	June 30, 2021 – September 17, 2021	1742-1834	AQB	Citizens	Email, USPS Mail, Web posting	AQB Emailed initial citizen letters/Department’s Legal notice to interested citizens who had provided written comments and provided email addresses. Citizens who had provided written comments via hard copy letters were mailed the initial citizen letter via USPS Mail.

96	July 22, 2021	1835-1838	Deepika Saikrishnan, AQB	Christina Thompson, Lincoln National Forest, Smokey Bear Ranger District	Email	Request for appropriate contacts to provide legal notice published by department
97	July 22, 2021	1839-1850	Deepika Saikrishnan, AQB	Lincoln County Class I Areas, EPA, and organizations identified on a list maintained by the Department who have indicated in writing a desire to receive notices of applications per 20.2.72.206. A(4) NMAC	E-mail	Department's Legal Notice to EPA Region 6, Erica LeDoux and Mary Layton at EPA, Lincoln National Forest /White Mountain Wilderness/Smokey Bear Ranger District
98	September 21, 2021	1851-1916	AQB	Citizens, Public in general	Email, USPS Mail,	AQB Sent emails and Hard copy versions of second citizen letter to all citizens who had provided written comments on the application. Citizens who provided email addresses were sent emails and citizens who only provided mailing addresses were sent hard copy letters via US Mail. The second citizen letter was accompanied by notification of the Department's analysis (Draft permit version (09/17/21) Draft SOB version (09/17/21) and the Modeling report) available

						on the Department's website
99	January 3, 2022	1917-1937	AQB	Citizens	USPS Mail	Hard copy letters notifying of Hearing, additional documents available on department website and Notice of Hearing in English and Spanish mailed out via USPS to citizens who provided written comments and provided mailing addresses for February 9, 2022 Hearing
100	January 3, 2022 - January 4, 2022	1938-1948	Deepika Saikrishnan, AQB	Citizens	Email	Email notifying of Hearing, additional information available on website and Notice of Hearing in English and Spanish (attached) emailed to citizens who provided written comments via email or provided email addresses for February 9, 2022 Hearing
101	January 3, 2022	1949-1956	Deepika Saikrishnan, AQB	Lincoln County Class I Areas, EPA, and organizations identified on a list maintained by the Department who have indicated in writing a desire to receive notices of applications per 20.2.72.206. A(4) NMAC	Email	Department's Legal Notice to EPA Region 6, Erica LeDoux and Mary Layton at EPA, Lincoln National Forest /White Mountain Wilderness/Smokey Bear Ranger District notifying of Hearing, additional information available on website and Notice of Hearing in English and Spanish (attached) for February 9, 2022 Hearing
102	January 3, 2022	1957-1967	Deepika Saikrishnan, AQB	agencies, tribes, counties,	Email	Emailed Village Clerks Village of Ruidoso, Village of Capitan, City Clerk, City of

				municipalities		Ruidoso Downs, County Clerk, Lincoln County, President, Mescalero Apache Tribe notifying of Hearing, additional information available on website and Notice of Hearing in English and Spanish (attached) for February 9, 2022 Hearing
103	July 22, 2021 - January 14, 2022	1968-1979	AQB	Citizens, Agencies, Tribes, counties, Municipalities, Public in General	Email, Web Posting	Emailed citizens Intro to Air permitting document and FAQ document and Intro to air permitting documents posted to website
104	July 28, 2021 – January 11, 2022	1980-1997	AQB	Public in General	Newspapers	Affidavits of Legal notice posting from Ruidoso News, Affidavit of Posting Notice of Hearing in English and Spanish from Ruidoso News and Albuquerque Journal
105	January 14, 2022	1998-2001	AQB	Spanish and English Speaking Public in General	English and Spanish Radio	E-mails of requests, prior to each hearing date, to run an attached Public Service Announcement (PSA) in Spanish and English as a public service message on Spanish and English language radio stations
106	June 23, 2021 – January 14, 2022	2002-2023	AQB	Public in General	Web postings	Screenshots and email proofs of Ongoing posts on AQB web pages to inform the public about Application 9295; AQB's notices, review, and analysis; draft permits; and public outreach information
107	May 19, 2021-May 20, 2021	2024-2028	Montrose Environmental Group	Taylor Thornton, Lincoln County Assessor's office	Email	Email exchange between Montrose Environmental Group and Lincoln County Assessor's office provided as proof that the parcel numbers and maps were

						provided by the Lincoln County Assessor's office.
108	November 17, 2021	2029-2053	Paul Wade, Consultant RCI	Deepika Saikrishnan, AQB, Louis Rose, Counsel for RCI, Ryan Roper RCI	Email	Updated pages section 3,4, 6 and 13