ARIZONA DEPARTMENT
OF
ENVIRONMENTAL QUALITY

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Janice K. Brewer
Governor

Henry R. Darwin
Director

September 6, 2013

Mr. Jared Blumenfeld, Regional Administrator
U.S. Environmental Protection Agency, Region IX
Mail Code ORA-1
75 Hawthorne Street
San Francisco, CA 94105

RE: Final Arizona State Implementation Plan Revision for the Nogales $PM_{2.5}$ Nonattainment Area
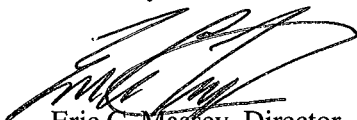
Jared

Dear Mr. Blumenfeld:

Consistent with the provisions of Arizona Revised Statutes §§ 49-104, 49-106, 49-404, 49-406 and 49-425 (Enclosure1) and the Code of Federal Regulations (CFR) Title 40, §§ 51.102 through 51.104, the Arizona Department of Environmental Quality (ADEQ) hereby adopts and submits to the U.S. Environmental Protection Agency (EPA) the *Arizona State Implementation Plan Revision for the Nogales$_{2.5}$ Nonattainment Area* as a revision to the Arizona State Implementation Plan (SIP).

This SIP revision fulfills outstanding Clean Air Act (CAA) requirements for the Nogales $PM_{2.5}$ Nonattainment Area following the January 7, 2013 EPA clean data determination under the Clean Data Policy (78 FR 887). The document includes a history of the Nogales $PM_{2.5}$ planning area, a description of the area and Santa Cruz County, identification of Clean Air Act requirements for the area, an emissions inventory and other elements included for federal review with this submittal.

ADEQ requests that EPA approve this revision to the Arizona State Implementation Plan. Enclosure 2 contains the SIP Completeness Checklist; Enclosure 3 contains two hard copies and an electronic exact duplicate of the hard copies on CD; Enclosure 4 includes public hearing documentation for this SIP revision.

Sincerely,

Eric C. Massey, Director
Air Quality Division

cc   Colleen McKaughan, EPA Region IX, w/o enclosures
        Arturo Garino, Mayor, City of Nogales, w/o enclosures
        Manuel Ruiz, Chairman, Santa Cruz County Board of Supervisors, w/o enclosures

ENCLOSURE 1

Arizona Revised Statues §§ 49-104, 49-106, 49-404, 49-406, and 49-425

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Arizona State Legislature

Fifty-first Legislature - First Regular Session

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Arizona Revised Statutes

The Arizona Revised Statutes have been updated with the 50th Legislature, 2nd Regular Session information.

49-104. Powers and duties of the department and director

A. The department shall:

1. Formulate policies, plans and programs to implement this title to protect the environment.

2. Stimulate and encourage all local, state, regional and federal governmental agencies and all private persons and enterprises that have similar and related objectives and purposes, cooperate with those agencies, persons and enterprises and correlate department plans, programs and operations with those of the agencies, persons and enterprises.

3. Conduct research on its own initiative or at the request of the governor, the legislature or state or local agencies pertaining to any department objectives.

4. Provide information and advice on request of any local, state or federal agencies and private persons and business enterprises on matters within the scope of the department.

5. Consult with and make recommendations to the governor and the legislature on all matters concerning department objectives.

6. Promote and coordinate the management of air resources to assure their protection, enhancement and balanced utilization consistent with the environmental policy of this state.

7. Promote and coordinate the protection and enhancement of the quality of water resources consistent with the environmental policy of this state.

8. Encourage industrial, commercial, residential and community development that maximizes environmental benefits and minimizes the effects of less desirable environmental conditions.

9. Assure the preservation and enhancement of natural beauty and man-made scenic qualities.

10. Provide for the prevention and abatement of all water and air pollution including that related to particulates, gases, dust, vapors, noise, radiation, odor, nutrients and heated liquids in accordance with article 3 of this chapter and chapters 2 and 3 of this title.

11. Promote and recommend methods for the recovery, recycling and reuse or, if recycling is not possible, the disposal of solid wastes consistent with sound health, scenic and environmental quality policies. Beginning in 2014, the department shall report annually on its revenues and expenditures relating to the solid and hazardous waste programs overseen or administered by the department.

12. Prevent pollution through the regulation of the storage, handling and transportation of solids, liquids and gases that may cause or contribute to pollution.

13. Promote the restoration and reclamation of degraded or despoiled areas and natural resources.

14. Assist the department of health services in recruiting and training state, local and district health department personnel.

15. Participate in the state civil defense program and develop the necessary organization and facilities to meet wartime or other disasters.

16. Cooperate with the Arizona-Mexico commission in the governor's office and with researchers at universities in this state to collect data and conduct projects in the United States and Mexico on issues that are within the scope of the department's duties and that relate to quality of life, trade and economic development in this state in a manner that will help the Arizona-Mexico commission to assess and enhance the economic

competitiveness of this state and of the Arizona-Mexico region.

17. Unless specifically authorized by the legislature, ensure that state laws, rules, standards, permits, variances and orders are adopted and construed to be consistent with and no more stringent than the corresponding federal law that addresses the same subject matter. This provision shall not be construed to adversely affect standards adopted by an Indian tribe under federal law.

B. The department, through the director, shall:

1. Contract for the services of outside advisers, consultants and aides reasonably necessary or desirable to enable the department to adequately perform its duties.

2. Contract and incur obligations reasonably necessary or desirable within the general scope of department activities and operations to enable the department to adequately perform its duties.

3. Utilize any medium of communication, publication and exhibition when disseminating information, advertising and publicity in any field of its purposes, objectives or duties.

4. Adopt procedural rules that are necessary to implement the authority granted under this title, but that are not inconsistent with other provisions of this title.

5. Contract with other agencies, including laboratories, in furthering any department program.

6. Use monies, facilities or services to provide matching contributions under federal or other programs that further the objectives and programs of the department.

7. Accept gifts, grants, matching monies or direct payments from public or private agencies or private persons and enterprises for department services and publications and to conduct programs that are consistent with the general purposes and objectives of this chapter. Monies received pursuant to this paragraph shall be deposited in the department fund corresponding to the service, publication or program provided.

8. Provide for the examination of any premises if the director has reasonable cause to believe that a violation of any environmental law or rule exists or is being committed on the premises. The director shall give the owner or operator the opportunity for its representative to accompany the director on an examination of those premises. Within forty-five days after the date of the examination, the department shall provide to the owner or operator a copy of any report produced as a result of any examination of the premises.

9. Supervise sanitary engineering facilities and projects in this state, authority for which is vested in the department, and own or lease land on which sanitary engineering facilities are located, and operate the facilities, if the director determines that owning, leasing or operating is necessary for the public health, safety or welfare.

10. Adopt and enforce rules relating to approving design documents for constructing, improving and operating sanitary engineering and other facilities for disposing of solid, liquid or gaseous deleterious matter.

11. Define and prescribe reasonably necessary rules regarding the water supply, sewage disposal and garbage collection and disposal for subdivisions. The rules shall:

(a) Provide for minimum sanitary facilities to be installed in the subdivision and may require that water systems plan for future needs and be of adequate size and capacity to deliver specified minimum quantities of drinking water and to treat all sewage.

(b) Provide that the design documents showing or describing the water supply, sewage disposal and garbage collection facilities be submitted with a fee to the department for review and that no lots in any subdivision be offered for sale before compliance with the

standards and rules has been demonstrated by approval of the design documents by the department.

12. Prescribe reasonably necessary measures to prevent pollution of water used in public or semipublic swimming pools and bathing places and to prevent deleterious conditions at such places. The rules shall prescribe minimum standards for the design of and for sanitary conditions at any public or semipublic swimming pool or bathing place and provide for abatement as public nuisances of premises and facilities that do not comply with the minimum standards. The rules shall be developed in cooperation with the director of the department of health services and shall be consistent with the rules adopted by the director of the department of health services pursuant to section 36-136, subsection H, paragraph 10.

13. Prescribe reasonable rules regarding sewage collection, treatment, disposal and reclamation systems to prevent the transmission of sewage borne or insect borne diseases. The rules shall:

(a) Prescribe minimum standards for the design of sewage collection systems and treatment, disposal and reclamation systems and for operating the systems.

(b) Provide for inspecting the premises, systems and installations and for abating as a public nuisance any collection system, process, treatment plant, disposal system or reclamation system that does not comply with the minimum standards.

(c) Require that design documents for all sewage collection systems, sewage collection system extensions, treatment plants, processes, devices, equipment, disposal systems, on-site wastewater treatment facilities and reclamation systems be submitted with a fee for review to the department and may require that the design documents anticipate and provide for future sewage treatment needs.

(d) Require that construction, reconstruction, installation or initiation of any sewage collection system, sewage collection system extension, treatment plant, process, device, equipment, disposal system, on-site wastewater treatment facility or reclamation system conform with applicable requirements.

14. Prescribe reasonably necessary rules regarding excreta storage, handling, treatment, transportation and disposal. The rules shall:

(a) Prescribe minimum standards for human excreta storage, handling, treatment, transportation and disposal and shall provide for inspection of premises, processes and vehicles and for abating as public nuisances any premises, processes or vehicles that do not comply with the minimum standards.

(b) Provide that vehicles transporting human excreta from privies, septic tanks, cesspools and other treatment processes shall be licensed by the department subject to compliance with the rules. The department may require payment of a fee as a condition of licensure. After the effective date of this amendment to this section, the department shall establish by rule a fee as a condition of licensure, including a maximum fee. As part of the rule making process, there must be public notice and comment and a review of the rule by the joint legislative budget committee. After September 30, 2013, the department shall not increase that fee by rule without specific statutory authority for the increase. The fees shall be deposited, pursuant to sections 35-146 and 35-147, in the solid waste fee fund established by section 49-881.

15. Perform the responsibilities of implementing and maintaining a data automation management system to support the reporting requirements of title III of the superfund amendments and reauthorization act of 1986 (P.L. 99-499) and title 26, chapter 2,

article 3.

16. Approve remediation levels pursuant to article 4 of this chapter.

17. Establish or revise fees by rule pursuant to the authority granted under title 44, chapter 9, article 8 and chapters 4 and 5 of this title for the department to adequately perform its duties. All fees shall be fairly assessed and impose the least burden and cost to the parties subject to the fees. In establishing or revising fees, the department shall base the fees on:

(a) The direct and indirect costs of the department's relevant duties, including employees salaries and benefits, professional and outside services, equipment, in-state travel and other necessary operational expenses directly related to issuing licenses as defined in title 41, chapter 6 and enforcing the requirements of the applicable regulatory program.

(b) The availability of other funds for the duties performed.

(c) The impact of the fees on the parties subject to the fees.

(d) The fees charged for similar duties performed by the department, other agencies and the private sector.

C. The department may:

1. Charge fees to cover the costs of all permits and inspections it performs to ensure compliance with rules adopted under section 49-203, except that state agencies are exempt from paying the fees. Monies collected pursuant to this subsection shall be deposited, pursuant to sections 35-146 and 35-147, in the water quality fee fund established by section 49-210.

2. Contract with private consultants for the purposes of assisting the department in reviewing applications for licenses, permits or other authorizations to determine whether an applicant meets the criteria for issuance of the license, permit or other authorization. If the department contracts with a consultant under this paragraph, an applicant may request that the department expedite the application review by requesting that the department use the services of the consultant and by agreeing to pay the department the costs of the consultant's services. Notwithstanding any other law, monies paid by applicants for expedited reviews pursuant to this paragraph are appropriated to the department for use in paying consultants for services.

D. The director may:

1. If the director has reasonable cause to believe that a violation of any environmental law or rule exists or is being committed, inspect any person or property in transit through this state and any vehicle in which the person or property is being transported and detain or disinfect the person, property or vehicle as reasonably necessary to protect the environment if a violation exists.

49-106. Statewide application of rules

The rules adopted by the department apply and shall be observed throughout this state, or as provided by their terms, and the appropriate local officer, council or board shall enforce them. This section does not limit the authority of local governing bodies to adopt ordinances and rules within their respective jurisdictions if those ordinances and rules do not conflict with state law and are equal to or more restrictive than the rules of the department, but this section does not grant local governing bodies any authority not otherwise provided by separate state law

49-404. State implementation plan

A. The director shall maintain a state implementation plan that provides for implementation, maintenance and enforcement of national ambient air quality standards and protection of visibility as required by the clean air act.

B. The director may adopt rules that describe procedures for adoption of revisions to the state implementation plan.

C. The state implementation plan and all revisions adopted before September 30, 1992 remain in effect according to their terms, except to the extent otherwise provided by the clean air act, inconsistent with any provision of the clean air act, or revised by the administrator. No control requirement in effect, or required to be adopted by an order, settlement agreement or plan in effect, before the enactment of the clean air act in any area which is a nonattainment or maintenance area for any air pollutant may be modified after enactment in any manner unless the modification insures equivalent or greater emission reductions of the air pollutant. The director shall evaluate and adopt revisions to the plan in conformity with federal regulations and guidelines promulgated by the administrator for those purposes until the rules required by subsection B are effective

49-406. Nonattainment area plan

A. For any ozone, carbon monoxide or particulate nonattainment or maintenance area the governor shall certify the metropolitan planning organization designated to conduct the continuing, cooperative and comprehensive transportation planning process for that area under 23 United States Code section 134 as the agency responsible for the development of a nonattainment or maintenance area plan for that area.

B. For any ozone, carbon monoxide or particulate nonattainment or maintenance area for which no metropolitan planning organization exists, the department shall be certified as the agency responsible for development of a nonattainment or maintenance area plan for that area.

C. For any ozone, carbon monoxide or particulate nonattainment or maintenance area, the department, the planning agency certified pursuant to subsection A of this section on behalf of elected officials of affected local government, the county air pollution control department or district, and the department of transportation shall, by November 15, 1992, and from time to time as necessary, jointly review and update planning procedures or develop new procedures.

D. In preparing the procedures described in subsection C of this section, the department, the planning agency certified pursuant to subsection A of this section on behalf of elected officials of affected local government, the county air pollution control department or district, and the department of transportation shall determine which elements of each revised implementation plan will be developed, adopted, and implemented, through means including enforcement, by the state and which by local governments or regional agencies, or any combination of local governments, regional agencies or the state.

E. The department, the planning agency certified pursuant to subsection A of this section on behalf of elected officials of affected local government, the county air pollution control department or district, and the department of transportation shall enter into a memorandum of agreement for the purpose of coordinating the implementation of the procedures described in subsection C and D of this section.

F. At a minimum, the memorandum of agreement shall contain:

1. The relevant responsibilities and authorities of each of the coordinating agencies.

2. As appropriate, procedures, schedules and responsibilities for development of nonattainment or maintenance area plans or plan revisions and for determining reasonable further progress.

3. Assurances for adequate plan implementation.

4. Procedures and responsibilities for tracking plan implementation.

5. Responsibilities for preparing demographic projections including land use, housing, and employment.

6. Coordination with transportation programs.

7. Procedures and responsibilities for adoption of control measures and emissions limitations.

8. Responsibilities for collecting air quality, transportation and emissions data.

9. Responsibility for conducting air quality modeling.

10. Responsibility for administering and enforcing stationary source controls.

11. Provisions for the timely and periodic sharing of all data and information among the signatories relating to:

(a) Demographics.

(b) Transportation.
(c) Emissions inventories.
(d) Assumptions used in developing the model.
(e) Results of modeling done in support of the plan.
(f) Monitoring data.
G. Each agency that commits to implement any emission limitation or other control measure, means or technique contained in the implementation plan shall describe that commitment in a resolution adopted by the appropriate governing body of the agency. The resolution shall specify the following:
1. Its authority for implementing the limitation or measure as provided in statute, ordinance or rule.
2. A program for the enforcement of the limitation or measure.
3. The level of personnel and funding allocated to the implementation of the measure.
H. The state, in accordance with the rules adopted pursuant to section 49-404, and the governing body of the metropolitan planning organization shall adopt each nonattainment or maintenance area plan developed by a certified metropolitan planning organization. The adopted nonattainment or maintenance area plan shall be transmitted to the department for inclusion in the state implementation plan provided for under section 49-404.
I. After adoption of a nonattainment or maintenance area plan, if on the basis of the reasonable further progress determination described in subsection F of this section or other information, the control officer determines that any person has failed to implement an emission limitation or other control measure, means or technique as described in the resolution adopted pursuant to subsection G of this section, the control officer shall issue a written finding to the person, and shall provide an opportunity to confer. If the control officer subsequently determines that the failure has not been corrected, the county attorney, at the request of the control officer, shall file an action in superior court for a preliminary injunction, a permanent injunction, or any other relief provided by law.
J. After adoption of a nonattainment or maintenance area plan, if, on the basis of the reasonable further progress determination described in subsection F of this section or other information, the director determines that any person has failed to implement an emission limitation or other control measure, means or technique as described in the resolution adopted pursuant to subsection G of this section, and that the control officer has failed to act pursuant to subsection I of this section, the director shall issue a written finding to the person and shall provide an opportunity to confer. If the director subsequently determines that the failure has not been corrected, the attorney general, at the request of the director, shall file an action in superior court for a preliminary injunction, a permanent injunction, or any other relief provided by law.

49-425. Rules; hearing

A. The director shall adopt such rules as he determines are necessary and feasible to reduce the release into the atmosphere of air contaminants originating within the territorial limits of the state or any portion thereof and shall adopt, modify, and amend reasonable standards for the quality of, and emissions into, the ambient air of the state for the prevention, control and abatement of air pollution. Additional standards shall be established for particulate matter emissions, sulfur dioxide emissions, and other air contaminant emissions determined to be necessary and feasible for the prevention, control and abatement of air pollution. In fixing such ambient air quality standards, emission standards or standards of performance, the director shall give consideration but shall not be limited to the relevant factors prescribed by the clean air act.

B. No rule may be enacted or amended except after the director first holds a public hearing after twenty days' notice of such hearing. The proposed rule, or any proposed amendment of a rule, shall be made available to the public at the time of notice of such hearing.

C. The department shall enforce the rules adopted by the director.

ENCLOSURE 2

SIP Completeness Checklist

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STATE IMPLEMENTATION PLAN COMPLETENESS CHECKLIST

Submittal of

Arizona State Implementation Plan Revision for the
Nogales PM$_{2.5}$ Nonattainment Area

40 CFR Part 51, Appendix V, *Criteria for Determining the Completeness of Plan Submissions*, contains the "minimum criteria for determining whether a State Implementation Plan submitted for consideration by EPA is an official submission for purposes of review under §51.103," *Submission of plans, preliminary review of plans*. Appendix V requires the following to be included in plan submissions for review by EPA:

1. **"A formal letter of submittal from the Governor or his designee, requesting EPA approval of the plan or revision thereof (hereafter ''the plan'')."** [Appendix V, 2.1(a)]

   See cover letter.

2. **"Evidence that the State has adopted the plan in the State code or body of regulations; or issued the permit, order, consent agreement (hereafter ''document'') in final form. That evidence shall include the date of adoption or final issuance as well as the effective date of the plan, if different from the adoption/issuance date."** [Appendix V, 2.1(b)]

   See cover letter.

3. **"Evidence that the State has the necessary legal authority under State law to adopt and implement the plan."** [Appendix V, 2.1(c)]

   See Enclosure 1.

4. **"A copy of the actual regulation, or document submitted for approval and incorporation by reference into the plan, including indication of the changes made (such as, redline/strikethrough) to the existing approved plan, where applicable ..."** [Appendix V, 2.1(d)]

   See Enclosure 3

5. **"Evidence that the State followed all of the procedural requirements of the State's laws and constitution in conducting and completing the adoption/issuance of the plan."** [Appendix V, 2.1(e)]

   See Enclosure 3

6. **"Evidence that public notice was given of the proposed change consistent with procedures approved by EPA, including the date of publication of such notice."** [Appendix V, 2.1(f)]

   See Enclosure 4.

7. **"Certification that public hearing(s) were held in accordance with the information provided in**

the public notice and the State's laws and constitution, if applicable and consistent with the public hearing requirements in 40 CFR 51.102." [Appendix V, 2.1(g)]

See Enclosure 4.

8. **"Compilation of public comments and the State's response thereto."** [Appendix V, 2.1(h)]

See Enclosure 4.

9. **"Identification of all regulated pollutants affected by the plan."** [Appendix V, 2.2(a)]

$PM_{2.5}$

10. **"Identification of the locations of affected sources including the EPA attainment/nonattainment designation of the locations and the status of the attainment plan for the affected areas(s)."** [Appendix V, 2.2 (b)]

See Enclosure 3.

11. **"Quantification of the changes in plan allowable emissions from the affected sources; estimates of changes in current actual emissions from affected sources or, where appropriate, quantification of changes in actual emissions from affected sources through calculations of the differences between certain baseline levels and allowable emissions anticipated as a result of the revision."** [Appendix V, 2.2(c)]

See Enclosure 3

12. **"The State's demonstration that the national ambient air quality standards, prevention of significant deterioration increments, reasonable further progress demonstration, and visibility, as applicable, are protected if the plan is approved and implemented. For all requests to redesignate an area to attainment for a national primary ambient air quality standard, under section 107 of the Act, a revision must be submitted to provide for the maintenance of the national primary ambient air quality standards for at least 10 years as required by section 175A of the Act."** [Appendix V, 2.2(d)]

See Enclosure 3.

13. **"Modeling information required to support the proposed revision, including input data, output data, models used, justification of model selections, ambient monitoring data used, meteorological data used, justification for use of offsite data (where used), modes of models used, assumptions, and other information relevant to the determination of adequacy of the modeling analysis."** [Appendix V, 2.2(e)]

See Enclosure 3.

14. **"Evidence, where necessary, that emission limitations are based on continuous emission reduction technology."** [Appendix V, 2.2(f)]

See Enclosure 3.

15. **"Evidence that the plan contains emission limitations, work practice standards and**

recordkeeping/reporting requirements, where necessary, to ensure emission levels." [Appendix V, 2.2(g)]

See Enclosure 3.

16. **"Compliance/enforcement strategies, including how compliance will be determined in practice."** [Appendix V, 2.2(h)]

See Enclosure 3.

17. **"Special economic and technological justifications required by any applicable EPA policies, or an explanation of why such justifications are not necessary."** [Appendix V, 2.2(i)]

No known deviation from U.S. EPA policy.

ENCLOSURE 3

SIP Revision

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FINAL

Arizona State Implementation Plan
Revision for the
Nogales PM$_{2.5}$ Nonattainment Area

Air Quality Division
September 2013

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TABLE OF CONTENTS

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EXECUTIVE SUMMARY

The Nogales PM$_{2.5}$ Nonattainment Area (Nogales NA) is located 66 miles south of Tucson, covering approximately 76 square miles along the International border with Mexico in Santa Cruz County. The City of Nogales and portions of Rio Rico, an unincorporated community, occupy most of the nonattainment area.

The Nogales NA was designated nonattainment for the 2006 PM$_{2.5}$ National Ambient Air Quality Standards (NAAQS) based on monitoring data from 2006-2008. PM$_{2.5}$ conditions in the region have improved since that time. On January 7, 2013, subsequent to the designation, EPA finalized a clean data determination for the Nogales planning area under the Clean Data Policy (see 78 FR 887, January 7, 2013). This action suspended requirements to submit State Implementation Plan (SIP) elements related to attainment of the NAAQS including reasonable further progress milestones, attainment demonstrations, control measures, and contingency measures. This state implementation plan revision addresses the remaining Clean Air Act (CAA) requirements applicable to the Nogales NA. Accordingly, this document is organized as described below.

Chapter 1 provides an overview of the Nogales NA and Santa Cruz County. This chapter includes discussions about the climate, physiography, population, and economy of the area and the impact each has on ambient PM$_{2.5}$ concentrations. The chapter also includes an account of the regulatory history of the PM$_{2.5}$ NAAQS and the Nogales NA.

Chapter 2 outlines CAA requirements for PM$_{2.5}$ nonattainment areas.

Chapter 3 describes the Nogales ambient monitoring network, provides a description of the monitoring equipment, and presents PM$_{2.5}$ monitoring data collected by monitors in the area from 1999-2012.Monitoring data shows the area continued to meet the NAAQS in 2012.

Chapter 4 describes the emission inventory for the base year of 2008 and projections to 2010 for both minor and significant area and non-area sources (depicted in Figure ES-1).

Figure ES-1
2010 Primary PM2.5 Emissions
433.85 tons total

Point Sources 0%

Nonroad Mobile Sources 3%

Onroad Mobile Sources 5%

Nonpoint Sources 92%
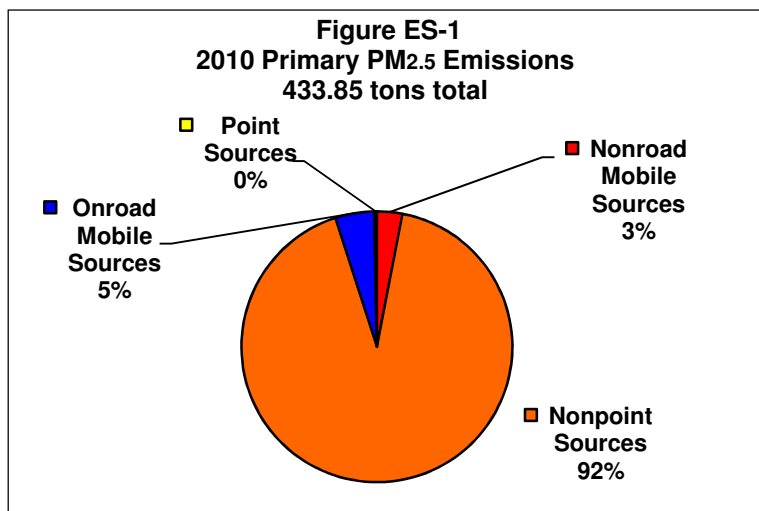
Source: 2008, 2010, PM$_{2.5}$ Emissions Inventories for the Nogales NAA, Santa Cruz County, Arizona (see Appendix A). Estimates rounded.

Chapter 5 discusses New Source Review. Any new major source proposing to operate in the Nogales area or major modification to an existing source is subject to the provisions of AAC R18-2-403, "Permits for Sources Located in Nonattainment Areas." These programs address New Source Review requirements applicable to PM sources.

Chapter 6 includes general conformity requirements for the Nogales NA.

Chapter 7 concludes the Nogales NA Plan.

1.0 INTRODUCTION

Chapter 1 provides a description of the Nogales Nonattainment Area (Nogales NAA). This chapter also provides the regulatory history of the Nogales NAA and the 24-hour $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS).

1.1 PM2.5 Air Quality Standards

1.1.1 1997 Fine Particulate Matter NAAQS

EPA revised the NAAQS for particulate matter in July 1997; see 62 FR 38652; (July 18, 1997). EPA established a health-based $PM_{2.5}$ standard and retained the PM_{10} standard as a "coarse" standard protecting both health and welfare. The 24-hour $PM_{2.5}$ standard was set at 65 $\mu g/m^3$ and the annual standard was established at 15 $\mu g/m^3$. Rather than using a graduated scale of PM_{10} nonattainment area designations, EPA designated $PM_{2.5}$ nonattainment areas as only either "nonattainment" or "attainment/unclassifiable." A series of legal challenges delayed implementation of the 1997 $PM_{2.5}$ standards until December 17, 2004, when EPA finalized attainment/nonattainment designations for the 1997 $PM_{2.5}$ standards (70 FR 19844; April 14, 2005).[1] Nogales, Arizona was not designated nonattainment for the 1997 PM2.5 standard.

1.1.2 2006 Fine Particulate Matter NAAQS

While the 1997 $PM_{2.5}$ standards were delayed by court proceedings, EPA conducted a review of the latest medical studies to determine the standard's adequacy. As result of this subsequent review, EPA promulgated revised NAAQS for $PM_{2.5}$ on October 17, 2006; see 71 FR 61144 EPA lowered the 24-hour standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ and retained the 1997 annual standard of 15 $\mu g/m^3$. A comparison of the 1997 and 2006 $PM_{2.5}$ standards is shown in Table 1.1. The Nogales area was designated nonattainment for the 2006 24-hour PM 2.5 standard on November 13, 2009 (74 FR 58688), effective December 14, 2009.

Table 1.1: 1997 and 2006 PM$_{2.5}$ NAAQS				
	1997 Standards		**2006 Standards**	
	Annual	**24-hour**	**Annual**	**24-hour**
PM$_{2.5}$ (Fine Particles)	**15 μg/m3** Annual arithmetic mean averaged over 3 years	**65 μg/m3** 98th percentile, averaged over 3 years	**15 μg/m3** Annual arithmetic mean averaged over 3 years	**35 μg/m3** 98th percentile, averaged over 3 years

Source: EPA, http://www.epa.gov/pmdesignations/basicinfo.htm

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[1] < http://www.gpo.gov/fdsys/pkg/FR-2005-04-14/pdf/05-7227.pdf >

1.2   Nogales Nonattainment Area Description

The Nogales NAA in southern Arizona is within Santa Cruz County on the international border with Mexico, and includes the City of Nogales, the community of Rio Rico, and unincorporated portions of the County. The area is depicted in Figure 1.1. The nonattainment area is codified at 40 CFR 81.303 and is bounded as follows: The portions of the following Townships which are within the State of Arizona and lie east of 111 longitude: T23S, R13E; T23S, R14E; T24S, R13E; T24S, R14E.

Figure 1.1
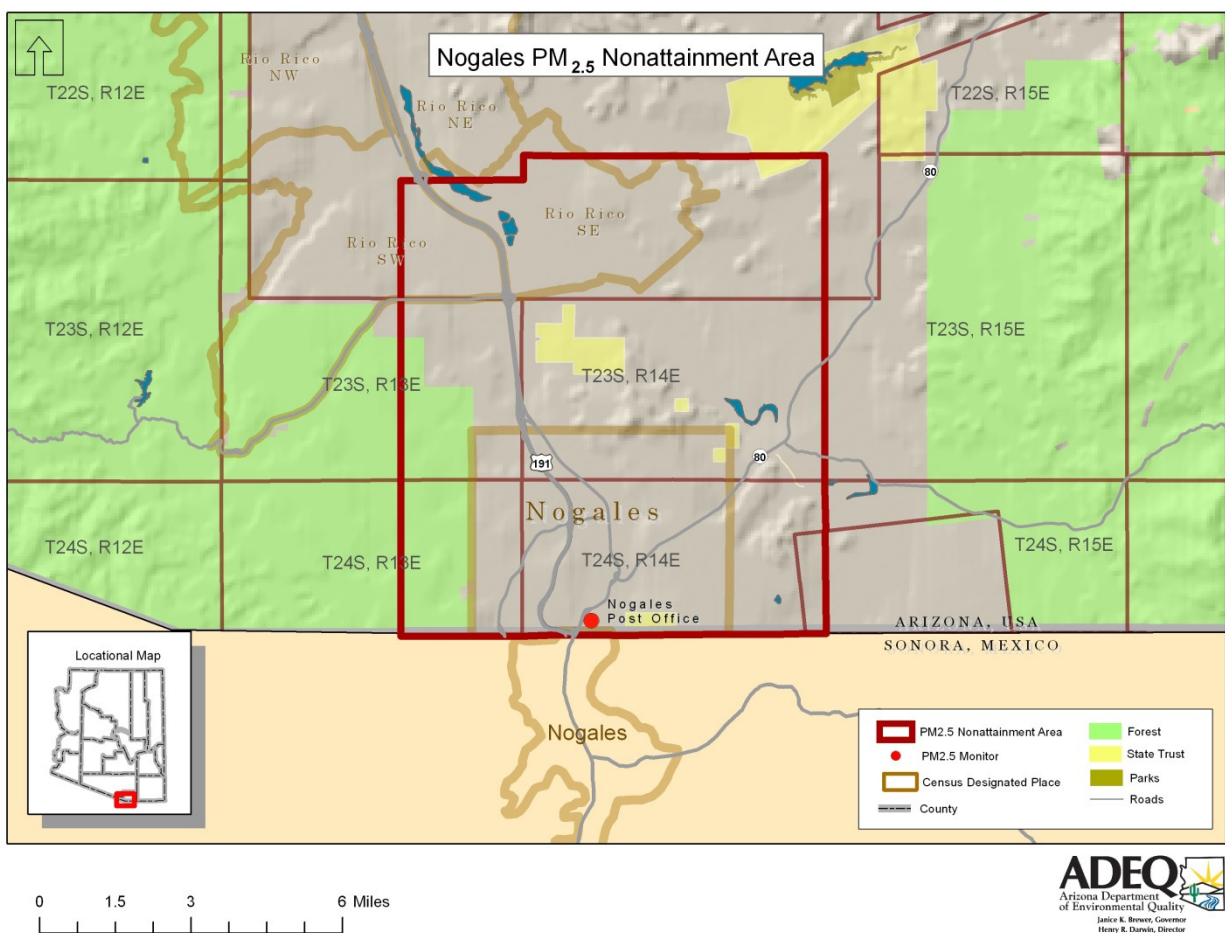
1.3 Climate and Physiography

The Nogales NAA is located in Santa Cruz County, the smallest county in Arizona in terms of size. The Nogales NAA is located in the southernmost portion of the County alongside the U.S./Mexico border. This region of the Sonoran Desert is characterized by north-south elongated valleys surrounded by mountain ranges. Nogales, Arizona is located in a valley created by the Nogales Wash, a tributary of the nearby Santa Cruz River.

The mean elevation in Nogales, Arizona is 3,865 feet above sea level. Mountain ranges near Nogales include the Patagonia Mountains to the east and the Tumacacori, Atascosa, and Pajarito Mountains to the west. Approximately twenty-five miles to the north are the Santa Rita Mountains and Madera Canyon in

the Coronado National Forest where Mount Wrightson rises to an elevation of 9,432 feet. Northwest of Interstate 19 are the Cerro Colorado, Las Guijas, and Sierrita Mountain Ranges.

The mean elevation in Nogales, Sonora, Mexico is 4,265 feet above sea level.[2] The highest elevation is 5,380 feet. The elevation drops approximately 709 feet from the southernmost edge of the Nogales, Sonora, Mexico urban boundary to the Nogales NAA northern boundary line.

The average daily maximum temperature is 79.7 ºF, based on a 62-year average of meteorological data (see Table 1.2). The highest monthly daily maximum average temperature (94.1 ºF.) occurs in July, and the lowest monthly daily minimum average temperature (64.3 ºF.) occurs in January.

The yearly average total rainfall for the Nogales area is 17.21 inches, as shown in Table 1.2. The majority of this precipitation falls during in July and August, when warm moist air penetrates Arizona from the Gulf of Mexico. The area receives approximately 8.5 inches of precipitation during this time. The area receives an average of only 0.22 inches of rain in May, the driest month of the year.

Table 1.2 Climatological Data for Nogales, AZ (1952-2010)		
	Average Temperature ºF		Rain in Inches
Month	Daily Max.	Daily Min.	Avg. Total
January	64.3	27.3	1.14
February	66.7	29.6	0.86
March	70.7	33.7	0.87
April	78.1	38.6	0.38
May	86.3	45.0	0.22
June	95.3	54.5	0.46
July	94.1	63.9	4.38
August	91.7	62.7	4.03
September	90.2	55.5	1.57
October	82.4	43.9	1.29
November	71.7	33.0	.065
December	64.6	27.6	1.37
Annual Average	79.7	43.0	17.21

SOURCE: Western Regional Climate Center.[3]

1.4   Population

Table 1.3 includes historical and projected population estimates for the Nogales area. Estimates for 1990 and 2000 were obtained from the U.S. Census Bureau; all other estimates and projections were obtained from the Arizona Department of Administration (ADOA). According to 2010 population estimates, 66 percent of the County's population resides within the boundaries of the Nogales NA, including portions of Rio Rico[4] and the all of the City of Nogales.

[2] "Statistical Municipal Workbook for Nogales, Sonora," 2005 edition, INEGI. <http://www.inegi.org.mx/>
[3] "Nogales, Arizona." Western Regional Climate Center. Web. June 28, 2011.
<http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?az5924>
[4] Rio Rico is an unincorporated Census Designated Place. ADEQ's estimated apportionment of Rio Rico population to the Nogales NA is provided in the TSD found in Appendix A.

Table 1.3 Population Estimates for the Nogales NAA and Santa Cruz County				
	1990	**2000**	**2008**	**2010**
Nogales NAA	N/A	N/A	31,067	31,413
City of Nogales	19,562	20,878	21,107	20,880
Santa Cruz County	29,676	38,381	47,016	47,539

Source: Attachment A: *Primary and Secondary Precursor Emission Inventories for 2008 & 2010;*
Nogales Nonattainment Area, Santa Cruz County, Arizona, and US Census Bureau

1.5   Santa Cruz County and City of Nogales Economy

The City of Nogales was founded in 1880 when a trading post opened on the International border; two years later, a railway running through Nogales connected the United States and Mexico. Today the economies of Nogales, Arizona and Ambos Nogales, Sonora are largely interdependent. According to the ACA, 47 percent of Santa Cruz County's annual sales tax revenue is generated from purchases made by residents of Mexico.[5]

There are two international ports of entry (POE) in the Nogales area, the DeConcini POE in downtown Nogales and the Mariposa POE 1/2 mile to the west on Arizona State Route 189. The DeConcini POE does not accept commercial trucks, all of which are required to cross the border at the Mariposa POE. From November through April, approximately 136,000 trucks haul produce from Mexico to warehouses in Nogales; approximately 200,000 U.S. trucks distribute the fresh produce to supermarkets in the United States and Canada. The Mariposa POE serves as the gateway to 50 percent of all fresh fruits and vegetables shipped into the U.S. from Mexico.[6] An expansion of the Mariposa POE is expected to be completed by 2014.

The recent economic downturn (which began in 2007) affected the region's construction industry, by slowing construction activity significantly. While exact figures are not available for the Nogales NA, Table 1.4 provides building permit information for the area that is illustrative of relative conditions for the planning area. Only five building permits were issued in 2010 in the City of Nogales, compared to 60 in 2000 (see Table 1.4.)

[5] "Nogales Community Profile." Arizona Department of Commerce. June 1, 2011.
<http://www.nogalesusa.com/commerce.html>

Table 1.4				
Building Permits Issued in Nogales and Santa Cruz County 1990-2010				
	1990	**1996**	**2000**	**2010**
City of Nogales	n/a	37	60	5
Unincorporated Santa Cruz County	n/a	265	301	47
Santa Cruz County	217	306	302	53

Source: US Census Bureau.[6]

Table 1.5 contains labor force statistics for Santa Cruz County published by the Census Bureau.[7] The retail and wholesale trade industries employed 29.7 percent of the County's working population; an additional 6.8 percent were employed in transportation and warehousing, testimony to the importance of International trade on the local economy. The largest employers in the area include Wal-Mart, the Department of Homeland Security, Santa Cruz County, the City of Nogales, and Cochise Community College. Unemployment in Santa Cruz County is much greater than the State average. The County's unemployment rate was 17.7 percent in September 2012,[8] whereas the State's unemployment rate was 8.3 percent.[9]

Table 1.5		
Employment by Industry in Santa Cruz County 2007-2011		
Industry	**Total**	**%**
Civilian employed population 16 years and over	16,984	100
Agriculture, forestry, fishing and hunting, and mining	297	1.8
Construction	791	4.7
Manufacturing	934	5.5
Wholesale trade	1,563	9.2
Retail trade	3,485	20.5
Transportation and warehousing, and utilities	1,161	6.8
Information	380	2.2
Finance and insurance, and real estate and rental and leasing	464	2.7
Professional, scientific, and management, administrative, waste management	1,480	8.7
Educational services, and health care and social assistance	2,823	16.6
Arts, entertainment, and recreation, and accommodation and food services	1,094	6.4
Other services, except public administration	866	5.1
Public administration	1,646	9.7

Source: U.S. Census Bureau (see footnote 9).

[6] Census Bureau. Accessed December 6, 2012. <http://censtats.census.gov/bldg/bldgprmt.shtml?>
[7] The statistics in Table 1.5 are averages based on data collected by the Census Bureau from 2007-2011 available at the following link: <
http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_11_5YR_DP03 >
[8] Bureau of Labor Statistics. Accessed December 5, 2012. <http://www.bls.gov>
[9] Bureau of Labor Statistics. Accessed December 5, 2012.
<http://data.bls.gov/timeseries/LASST04000003?data_tool=XGtable>

2.0 GENERAL SIP APPROACH - REGULATORY REQUIREMENTS AND GUIDANCE

2.1 Regulatory Background

In December 2007, based on ambient PM2.5 monitoring data from 2004-2006, ADEQ recommended that the Nogales area be designated as nonattainment for the 2006 $PM_{2.5}$ 24-hour standard. Arizona recommended the same boundaries as the existing PM_{10} nonattainment area (see Figure 1.1).[10] EPA concurred with ADEQ's boundary recommendation.[11]

Based on this data from 2004-2006, the Nogales NA was designated non-attainment for the 24-hour $PM_{2.5}$ 2006 NAAQS and unclassifiable-attainment for the annual standard on November 13, 2009 (74 FR 58688) and the attainment date established for the Nogales NA was December 14, 2014, with an attainment SIP due on December 14, 2012.

Subsequently, air quality monitoring data from 2009-2011 showed that the area had attained the 24-hour $PM_{2.5}$ NAAQS. On October 30, 2012, EPA proposed to determine that the Nogales NA had met the 24-hour $PM_{2.5}$ NAAQS based on monitoring data from 2009-2011; see 77 FR 65656. EPA finalized this clean data determination on January 7, 2013; see 78 FR 887. In conjunction with this clean data determination, EPA suspended CAA SIP requirements related to attaining the NAAQS for as long as the area continues to attain the standard. These SIP planning elements include reasonable further progress (RFP) requirements, attainment demonstrations, reasonably available control measures (RACM), contingency measures, and other requirements related to attainment.

2.2 Clean Air Act (CAA) Requirements

Table 2.1 lists the CAA requirements for $PM_{2.5}$ nonattainment areas and specifies the remaining requirements ADEQ addresses in this document. The listed elements include the general requirements for nonattainment areas under CAA Title I, Part D, Subpart 1 as well as the particulate matter specific provisions of Subpart 4. Although Subpart 4 contains specific planning and scheduling requirements for PM_{10} nonattainment areas, under a recent court decision, these same statutory requirements also apply for $PM_{2.5}$ nonattainment areas.[12] The suspended CAA elements related to attainment of the 2006 $PM_{2.5}$ NAAQS and the Clean Data Determination are noted in the table below.

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[10] ADEQ, "Technical Support Document for Recommendation that the Nogales, Arizona Area Be Designated as a $PM_{2.5}$ Nonattainment Area". Submitted to EPA on December 3, 2007.
<http://www.epa.gov/pmdesignations/2006standards/rec/letters/09_AZ_rec_a2.pdf>

[11] <http://www.epa.gov/pmdesignations/2006standards/final/TSD/tsd_4.0_4.9_4.9.1_r09_AZ.pdf>

[12] *Natural Resources Defense Council v. EPA*, 706 F.3d 428 (D.C. Cir. 2013) (Petitioners challenged EPA's decision to promulgate the 1997 $PM_{2.5}$ NAAQS pursuant to the general implementation provisions of Subpart 1 of Part D of Title I of the Clean Air Act. The Court remanded to EPA to re-promulgate the rules pursuant to Subpart 4). With this decision, ADEQ presumes that all $PM_{2.5}$ Standards from 1997 forward will now be subject to Subpart 4. Under section 188 of the CAA, all areas under Subpart 4 would initially be classified by operation of law as "moderate" nonattainment areas. If EPA were to classify the Nogales area under Subpart 4, ADEQ assumes the area would be classified as "moderate," therefore, for purposes of this plan, ADEQ considers only the Subpart 4 provisions related to "moderate" nonattainment areas and not those for "serious" areas.

Table 2.1 Clean Air Act (CAA) Regulatory Requirements		
CAA Citation	**Action to Meet Requirement**	**Location in Document**
CAA Title I, Part D, Subpart 1 – Nonattainment Areas in General		
Section 172(c) Nonattainment Plan Provisions		
172(c)(1) – In General	"Such plan provisions shall provide for the implementation of all reasonably available control measures as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology) and shall provide for attainment of the national primary ambient air quality standards."	Not applicable: requirement is suspended per EPA Clean Data Determination.
172(c)(2) – RFP [Reasonable Further Progress]	"Plan provisions shall require reasonable further progress" or "annual incremental reductions in emissions … for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date."	Not applicable: requirement is suspended per EPA Clean Data Determination
172(c)(3) – Inventory	The plan provisions "… shall include a comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant or pollutants in such area, including such periodic revisions as the Administrator may determine necessary to assure that the requirements of this part are met."	Chapter 4
172(c)(4) – Identification and Quantification	Plan provisions "... shall expressly identify and quantify the emissions, if any, of any such pollutant or pollutants which will be allowed, in accordance with section 173(a)(1)(B), from the construction and operation of major new or modified stationary sources in each such area. The plan shall demonstrate to the satisfaction of the Administrator that the emissions quantified for this purpose will be consistent with the achievement of reasonable further progress and will not interfere with attainment of the applicable national ambient air quality standard by the applicable attainment date."	Not applicable: requirement is suspended per EPA Clean Data Determination
172(c)(5) Permits for New and Modified Major Stationary Sources	The plan provisions "…shall require permits for the construction and operation of new or modified major stationary sources anywhere in the nonattainment area, in accordance with section 173." All new sources and modifications to existing sources in Arizona are subject to state requirements for preconstruction review and permitting pursuant to AAC, Title 18, Chapter 2, Articles 3 and 4. All new major sources and major modifications to existing major sources in Arizona are subject to the New Source Review (NSR) provisions of these rules or Prevention of Significant Deterioration (PSD) for maintenance areas.	Chapter 5

Table 2.1 Clean Air Act (CAA) Regulatory Requirements		
CAA Citation	**Action to Meet Requirement**	**Location in Document**
172(c)(6) – Other Measures	The plan "... shall include enforceable emissions limitations, and such other control measures, means or techniques …, as well as schedules and timetables for compliance, as may be necessary or appropriate to provide for attainment of such standard in such area by the applicable attainment date specified in this part"	Not applicable: requirement is suspended per EPA Clean Data Determination
172(c)(7) – Compliance with Section 110(a)(2)	The plan provisions "... shall also meet the applicable provisions of section 110(a)(2)."	110(a)(2) requirements have been and will be addressed under separate cover.
172(c)(8) – Equivalent Techniques	"Upon application by any State, the Administrator may allow the use of equivalent modeling, emission inventory, and planning procedures, unless the Administrator determines that the proposed techniques are, in the aggregate, less effective than the methods specified by the Administrator."	Not applicable as no equivalent or alternative techniques were used.
172(c)(9) – Contingency Measures	The plan "... shall provide for the implementation of specific measures to be undertaken if the area fails to make reasonable further progress, or to attain the national primary ambient air quality standard by the attainment date applicable under this part. Such measures shall be included in the plan revision as contingency measures to take effect in any such case without further action by the State or the Administrator."	Not applicable: requirement is suspended per EPA Clean Data Determination
Section 176. Limitations on Certain Federal Assistance		
176(c)(4) – Limitations on Certain Federal Assistance [Conformity]	General conformity under section 176(c)(4) ensures that actions taken by federal agencies in nonattainment and maintenance areas do not interfere with a state's plans to meet the national ambient air quality standards.	Chapter 6
CAA Title I, Part D, Subpart 4 – Additional Provisions for Particulate Matter Nonattainment Areas		
Section 189. Nonattainment Plan Provisions		
189(a)(1)(A) – [Permit Program]	The implementation plan shall include, "For the purpose of meeting the requirements of section 172(c)(5), a permit program providing that permits meeting the requirements of section 173 are required for the construction and operation of new and modified major stationary sources of PM–10."	Chapter 5

Table 2.1 Clean Air Act (CAA) Regulatory Requirements		
CAA Citation	**Action to Meet Requirement**	**Location in Document**
189(a)(1)(B) – [Attainment Demonstration]	The implementation plan shall include, "Either (i) a demonstration (including air quality modeling) that the plan will provide for attainment by the applicable attainment date; or (ii) a demonstration that attainment by such date is impracticable."	Not applicable: requirement is suspended per EPA Clean Data Determination
189(a)(1)(C) – [RACM]	The implementation plan shall include "Provisions to assure that reasonably available control measures for the control of PM–10 shall be implemented no later than December 10, 1993, or 4 years after designation in the case of an area classified as moderate after November 15, 1990."	Not applicable: requirement is suspended per EPA Clean Data Determination
189(c) – Milestones	"Plan revisions demonstrating attainment submitted to the Administrator for approval under this subpart shall contain quantitative milestones which are to be achieved every 3 years until the area is redesignated attainment and which demonstrate reasonable further progress, as defined in section 171(1), toward attainment by the applicable date ..."	Not applicable: requirement is suspended per EPA Clean Data Determination
189(e) – PM-10 Precursors	"The control requirements applicable under plans in effect under this part for major stationary sources of PM–10 shall also apply to major stationary sources of PM–10 precursors, except where the Administrator determines that such sources do not contribute significantly to PM–10 levels which exceed the standard in the area. The Administrator shall issue guidelines regarding the application of the preceding sentence."	Not applicable: requirement is suspended per EPA Clean Data Determination

3.0   AIR QUALITY MONITORING

This chapter describes the Nogales Nonattainment Area (NA) monitoring network and provides an analysis of monitoring data and trends.

3.1   Monitoring Site, Equipment, and Quality Assurance Procedures

The primary goal of $PM_{2.5}$ monitoring in the Nogales NA is to collect the data necessary to compare ambient air quality values with the $PM_{2.5}$ NAAQS and fulfill the regulatory requirements for $PM_{2.5}$ monitoring in the nonattainment area. The Nogales NA instruments were installed and are maintained in accordance with federal siting and design criteria[13] and consistent with *ADEQ's State of Arizona Air Monitoring Network Plan for the Year 2012*. The ADEQ network plan, including the Nogales monitoring was approved in 2010. [14] In 2011, however, EPA identified the Nogales Post Office as a site where ADEQ was not sampling at the required frequency. ADEQ addressed this sampling frequency deficiency

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[13] 40 CFR Part 58, Appendices D and E.
[14] Lakin, Matthew, EPA. Letter to Eric Massey, December 10, 2010 (Appendix B).

in *ADEQ's State of Arizona Air Monitoring Network Plan for the Year 2012* and committed to installing a continuously operating FEM BAM to serve as the primary $PM_{2.5}$ monitor to be compared to the NAAQS.

Historically, ADEQ operated collocated filter-based $PM_{2.5}$ federal reference method monitors (Partisols) and one continuous Beta Attenuation Monitor (non-FRM/FEM BAM) at the Nogales Post Office site in the center of the Nogales business district. The monitoring site was selected in an effort to measure the maximum particulate matter impacts on the Nogales population. The filter-based monitors have been operated on a one-in-six day sampling schedule since 1999 1999 and remain on the same sampling schedule at the time that this document was developed.

The continuously operating Beta Attenuation Monitor (BAM) has been monitoring $PM_{2.5}$ at the Post Office site since February 2004; data collected by this monitor were not used to determine compliance, but is used to supplement the data collected by the filter-based monitor for air quality studies. ADEQ updated the non-Federal Reference Method BAM monitor to a continuous Federal Equivalent Method (FEM) BAM on April 1, 2013. Prior to installation of the FEM BAM the Partisol monitor was used for comparison to the $PM_{2.5}$ NAAQS. With the update of the BAM instrument to the FEM BAM, ADEQ addressed the sampling frequency concern identified in the 2011 and 2012 EPA network plan approval letters for the Nogales $PM_{2.5}$ monitoring site.

The $PM_{2.5}$ instruments are neighborhood-scale monitors suited to measure concentrations within a 1/3 of a mile radius (40 CFR 58, Appendix D). Table 3.1 features the location, methods, and parameters measured at the site as of June 2013. Figure 1.1 depicts the location of the Nogales $PM_{2.5}$ monitor site.

Monitoring data are submitted to EPA's Air Quality System (AQS) database. All data described in this chapter are included in AQS and have been quality assured, meeting the requirements specified in Title 40 of the Code of Federal Regulations (CFR) Part 58 Appendix A and, unless otherwise noted, meet the completeness criteria for monitoring data specified in 40 CFR, Part 50, National Primary and Secondary Ambient Air Quality Standards: Appendix N. A minimum completeness of 75 percent per quarter for each year period is required at each monitoring site.

Table 3.1 Nogales Post Office Monitor Site Specifications							
AQS Monitor ID	Latitude	Longitude	Instrument Type	Pollutants Measured	Sampling Frequency	Scale	Objective
04-023-0004-88101-1	31.3372	-110.936	FRM Partisol	$PM_{2.5}$	1-in-6	Neighbor-hood	Population
04-023-0004-88101-2	31.3372	-110.936	FRM Partisol	$PM_{2.5}$	1-in-6	Neighbor-hood	Collocation
04-023-0004-88101-3	31.3372	-110.936	FEM BAM	$PM_{2.5}$	Continuous (hourly)	Neighbor-hood	Population

Source: Draft Version of State of Arizona Air Monitoring Network Plan for the Year 2013.

3.2   Air Quality Data

Figure 3.1 presents the four highest 24-hour values recorded by the filter-based $PM_{2.5}$ monitor from 1999-2012. Compliance with the $PM_{2.5}$ NAAQS is determined based on the 98th percentile of measured ambient concentrations in a three-year period. With a one-in-six sampling schedule, the 98th percentile is typically equivalent to the 2nd 24-hour high value (78 FR 3086, January 15, 2013). As can be seen in Figure 3.1, which is presented for informational purposes only, the second high value has repeatedly been below the $PM_{2.5}$ NAAQS of 35 μg/m^3 since 2007.   In order to determine official compliance with the 24-hour PM2.5 NAAQS, the 24-hour design values, expressed as the three-year average of the annual 98th percentile values, are provided in tabular form in Table 3.2. Table 3.2 verifies compliance with the 24-hour PM2.5 NAAQS since the 2007 – 2009 period.

Figure 3.1
24-hour $PM_{2.5}$ Standard and Nogales $PM_{2.5}$ Monitoring Data Trends 1999-2012

Source: EPA's AirData Database: <http://www.epa.gov/airdata/ad_rep_mon.html>.
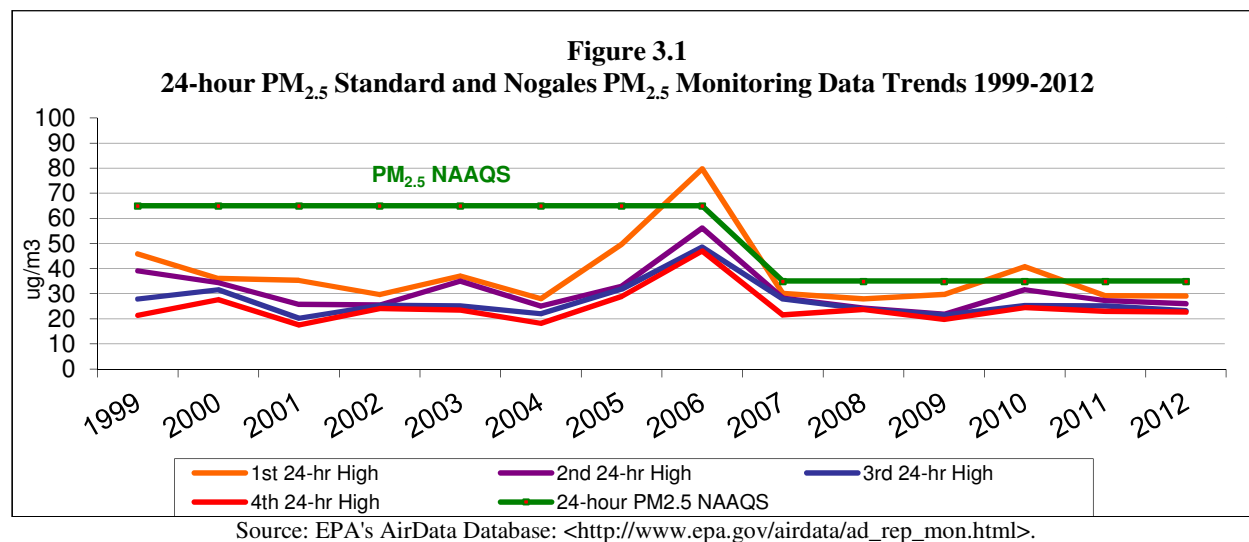
Table 3.2 Nogales Post Office PM$_{2.5}$ Design Values	
3-Year Design Value Period	**24-Hour Design Value (μg/m^3)**
2000 – 2002	29
2001 – 2003	29
2002 – 2004	29
2003 – 2005	31
2004 – 2006	38
2005 – 2007	39
2006 – 2008	40
2007 – 2009	31
2008 – 2010	32
2009 – 2011	30
2010 – 2012	28

Source: EPA's Air Quality System Database

4.0   EMISSIONS INVENTORY

As indicated in Table 2.1, an emissions inventory is required for the Nogales NA under CAA Section 172(c)(3). The EPA Clean Data Determination relied on monitoring data for the 2009-2011 time periods. To be consistent with the determination, ADEQ developed an inventory using 2010 emissions information for the Nogales NA.

4.1   Nogales, Arizona Emission Sources

The total emissions for Nogales, Arizona for $PM_{2.5}$ and $PM_{2.5}$ precursors are summarized in Table 4.1. A projected NA population growth of 1.1% between the years of 2008 and 2010 has resulted in stagnant or slightly increasing estimated emissions for all pollutants in all sectors except On-road Mobile Emissions, where estimated emissions declined. Total sector estimated emissions between the years of 2008 and 2010 within the Nogales NA declined due to the decreases in On-road Mobile Emissions. The On-road Mobile Emission decreases are primarily attributable to advances in motor vehicle control technologies and fuel efficiency. A detailed emission inventory discussing emission calculations, methodologies and total results can be found in the Technical Support Document in Appendix A.

Population increases will result in increased emissions in the following sectors: construction; mobile brake wear, tire wear, and dust re-entrainment; waste disposal; and fuel burning. A detailed emission inventory discussing emission calculations, methodologies and total results can be found in the Technical Support Document in Appendix A.

Table 4.1: Nogales NA 2008 and 2010 Emission Totals by Major Source Category				
Pollutant	**Source Category**	**2008 NNA (tpy)**	**2010 NNA (tpy)**	**% Change 2008-2010**
NH_3 - Ammonia[15]	Non-road Mobile Source Emissions Categories	0.08	0.08	0%
	Non-point Source Emissions Categories	22.89	23.03	1%
	On-road Mobile Emissions Source Categories	14.42	12.96	-10%
	Total	**37.39**	**36.07**	**-4%**
NOx - Nitrogen Oxides	Non-road Mobile Source Emissions Categories	142.69	142.73	0%
	Non-point Source Emissions Categories	48.80	49.32	1%
	On-road Mobile Emissions Source Categories	912.91	743.72	-19%
	Point Sources	11.03	11.03	0%
	Total	**1,115.42**	**946.80**	**-15%**
- PM2.5 Primary (Filter + Condensable)	Non-road Mobile Source Emissions Categories	13.14	13.17	0%
	Non-point Source Emissions Categories	395.97	399.17	1%
	On-road Mobile Emissions Source Categories	25.12	20.12	-20%
	Point Sources	1.39	1.39	0%
	Total	**435.62**	**433.85**	**0%**

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[15] As noted in in the TSD point source discussion (Appendix A), there are no NH_3 emissions from permitted sources in the Nogales NA.

Table 4.1: Nogales NA 2008 and 2010 Emission Totals by Major Source Category				
SO2 - Sulfur Dioxide	Non-road Mobile Source Emissions Categories	2.80	2.80	0%
	Non-point Source Emissions Categories	28.32	28.33	0%
	On-road Mobile Emissions Source Categories	7.49	4.60	-39%
	Point Sources	0.48	0.48	0%
	Total	**39.10**	**36.22**	**-7%**
VOC - Volatile Organic Compounds	Non-road Mobile Source Emissions Categories	158.61	159.58	1%
	Non-point Source Emissions Categories	902.67	912.56	1%
	On-road Mobile Emissions Source Categories	426.18	369.54	-13%
	Point Sources	3.31	3.31	0%
	Total	**1,490.77**	**1,444.99**	**-3%**

5.0   NEW SOURCE REVIEW

Stationary source permitting program requirements from sections 172(c)(5) and 189(a)(1)(A) have met by the State's adoption, implementation, and submittal of NSR program regulations. In general, state permitting programs for major and minor sources are contained in: Arizona Administrative Code Title 18, Chapter 2, Articles 3 and 4. Any permitted sources are subject to the monitoring, reporting, and certification procedures contained in AAC R18-2-306 and AAC R18-2-309 respectively (or similar County rules). ADEQ has authority pursuant to ARS § 49-101 *et seq.* to monitor and ensure source compliance with all applicable rules and permit conditions for sources in its jurisdiction.

Any new major source proposing to operate in the Nogales area or major modification to an existing source is subject to the provisions of AAC R18-2-403, "Permits for Sources Located in Nonattainment Areas." These programs address New Source Review requirements applicable to PM sources. If a new source is not a major source it is required to obtain a permit under minor source permitting rules at AAC R18-2-Article 3.

A SIP revision was adopted and submitted to EPA on October 29, 2012, to bring the Arizona SIP for areas under the jurisdiction of ADEQ into compliance with the NSR and PSD requirements of CAA Section 110(a)(2)(C) and 40 C.F.R. Part 51, Subpart I, with the exception of the requirements pertaining to GHGs. This submission has not yet been acted on by EPA.

6.0   CONFORMITY

As indicated in Table 2.1, certain conformity requirements are required for the Nogales NA under 176(c)(4), general conformity.

6.1   General Conformity

General conformity for the Nogales, Santa Cruz County area must still be addressed to assure PM2.5 emissions from any federal actions or plans do not exceed the rates outlined in 40 CFR § 93.153(b) (see 75 FR 17254, April 5, 2010). Criteria for making determinations and provisions for general conformity are located in R18-2-1438 of the Arizona Administrative Code. ADEQ commits to review and comment, as appropriate, on any federal agency draft general conformity determination it receives pursuant to 40 CFR § 93.155 for activities planned for this air quality planning area.

7.0   CONCLUSION

In January 2013 EPA determined that the Nogales nonattainment area had attained the 2006 24-hour PM 2.5 NAAQS. As a result of the determination, the requirements to submit an attainment demonstration, RACM, an RFP plan, contingency measures, and any other CAA elements related to attainment of the 2006 $PM_{2.5}$ NAAQS are suspended as long as the area continues to attain the standard.

This information contained in this document demonstrates that all other remaining CAA requirements for nonattainment areas are met. ADEQ requests that EPA approve these demonstrations as a revision to the state implementation plan.

Appendix A

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Primary PM$_{2.5}$ and Secondary Precursor Emissions Inventories for 2008 and 2010

Nogales
Non-Attainment Area
Santa Cruz County, Arizona

Arizona Department of
Environmental Quality

July 26, 2013

TABLE OF CONTENTS

1 Introduction

1.1 Purpose

This document provides a PM$_{2.5}$ emission inventory for all sources within the Nogales Nonattainment Area (NA) and a detailed description of the derivation of those emissions estimates. The Arizona Department of Environmental Quality (ADEQ) has created this PM$_{2.5}$ emissions inventory to support a PM$_{2.5}$ State Implementation Plan (SIP) for the Nogales NA, located in Santa Cruz County, Arizona. Since the Nogales NA met the PM$_{2.5}$ National Ambient Air Quality Standard (NAAQS) based on ambient monitoring data from 2009 – 2011, ADEQ selected 2010 to serve as a representative emission inventory for the 2009 – 2011 period.

1.2 Sources of PM$_{2.5}$

PM$_{2.5}$ refers to fine particulate matter of 2.5 microns or less in aerodynamic diameter. Fine particles originate mostly from combustion sources and secondary aerosol generation processes, while coarse particles (PM$_{10}$ – PM$_{2.5}$) usually originate from mechanical activities and fugitive source categories. Typical sources of PM$_{2.5}$ include fugitive dust, open burning (including wild fires), and, to a greater extent, fuel combustion sources and mobile source exhaust.

There are two types of PM$_{2.5}$, namely primary and secondary particulates. Both the primary and secondary particles are listed in this emission inventory. Primary particles are directly emitted by various sources. Secondary particles are derived from the oxidation of primary gases such as nitrogen and sulfur oxides into nitric acid and sulfuric acid. The precursors for these aerosols (i.e. the gases from which they originate) are included in the current inventory. In the presence of ammonia, secondary aerosols often take the form of ammonium salts; i.e. ammonium sulfate and ammonium nitrate (both salts can be dry or in aqueous solution). In the absence of ammonia, secondary compounds take the acidic forms of sulfuric acid (liquid aerosol droplets) and nitric acid (atmospheric gas). In addition, organic matter (OM) can be primary or secondary particulate. As a secondary particulate, OM is derived from the oxidation of volatile organic compounds (VOCs).

To meet the PM2.5 NAAQS, ADEQ regulates primary particulate emissions and precursors to secondary particulate emissions (NO$_x$, SO$_x$ VOCs, and NH$_3$).

1.3 Emissions Inventory Overview

Data for this emissions inventory primarily came from versions 1.5 and 2.0 of the Environmental Protection Agency's (EPA) 2008 National Emissions Inventory (NEI) for Santa Cruz County, Arizona; with the exception of the Nonpoint sector. Nonpoint sector emissions reported in this emission inventory were the same as those reported to EPA for the development of the 2008 NEI and derive from the Arizona Emission Inventory System (AEIS). Any use of data not originating from the 2008 NEI or AEIS is noted later in this document. The 2011 NEI was not used as a basis for this Nogales NA EI as the 2011 NEI had not yet been released, or was released subsequent to the development of this document. The NEI is a comprehensive and detailed estimate of air emissions of both criteria and hazardous air pollutants from all air emission sources and is based partially on emission estimates and emission model inputs provided by state, local, and tribal air agencies for sources in their respective jurisdictions, and supplemented by data developed by the EPA. More information about the 2008 NEI, including methodologies and

assumptions used in producing this emissions inventory, may be found at the following URL: http://www.epa.gov/ttn/chief/net/2008inventory.html.

The NEI estimates emissions at the county-level. To develop an inventory for the nonattainment area from the NEI, the county-level emissions estimates must be allocated to the nonattainment area. The methods used for allocating county-level emission estimates to the nonattainment area are described in Section 3 of this document.

2 The Nogales Nonattainment Area

2.1 Overview of the Area

The southern boundary of the Nogales NA and Santa Cruz County is the U.S./Mexico border. The city of Nogales, Arizona is sixty miles south of Tucson, Arizona in the south-central portion of Santa Cruz County. Nogales, Arizona is the largest city in the nonattainment area. See Figure 1 below.

The Nogales NA is located within the Sonoran Desert. This desert covers 120,000 square miles with a minimum elevation of 2,500 feet and is in the Basin and Range topographic province. This topography is characterized by north-south elongated valleys surrounded by mountain ranges. Nogales is located in such a north-south valley created by the Nogales Wash running north to the Santa Cruz River. The mean elevation in Nogales, Arizona is 3,865 feet. Mountain ranges near Nogales include the Patagonia Mountains to the east and the Tumacacori, Atascosa, and Pajarito mountains to the west. Approximately 25 miles to the north are the Santa Rita Mountains and Madera Canyon in the Coronado National Forest, where Mount Wrightson rises to an elevation of 9,432 feet. Northwest of Interstate 19 are the Cerro Colorado, Las Guijas, and Sierrita Mountain Ranges.

Major highways in the Nogales, Arizona area are Arizona State Route 82, which connects Nogales, Arizona with Patagonia, Arizona (19 miles) and Sonoita (31 miles) to the northeast, and U.S. Interstate 19 which connects Tucson, Arizona to Nogales, Arizona and continues south into México, where it becomes Federal Highway 15.

Nogales, Sonora, México lies directly south of Nogales, Arizona across the international border, and the two areas are collectively referred to as Ambos Nogales. The communities comprise the largest international border community in Arizona, with a combined population of 233,411 inhabitants in 2010.[1] The mean elevation in Nogales, Sonora is 4,265 feet (Instituto Nacional de Estadistica Geografia e Informatica, 2005).[2] At 5,380 feet, the highest elevation in Nogales, Sonora is the Cerro de los Nogales (Nogales Hill).

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[1] Nogales, Arizona had 20,878 inhabitants and Nogales, Sonora, Mexico had 212,533 inhabitants. U.S. Census Bureau 2010 and Instituto Nacional de Estadistica Geografia e Informatica, (INEGI) 2010.
[2] "Statistical Municipal Workbook for Nogales, Sonora," 2005 edition, INEGI.
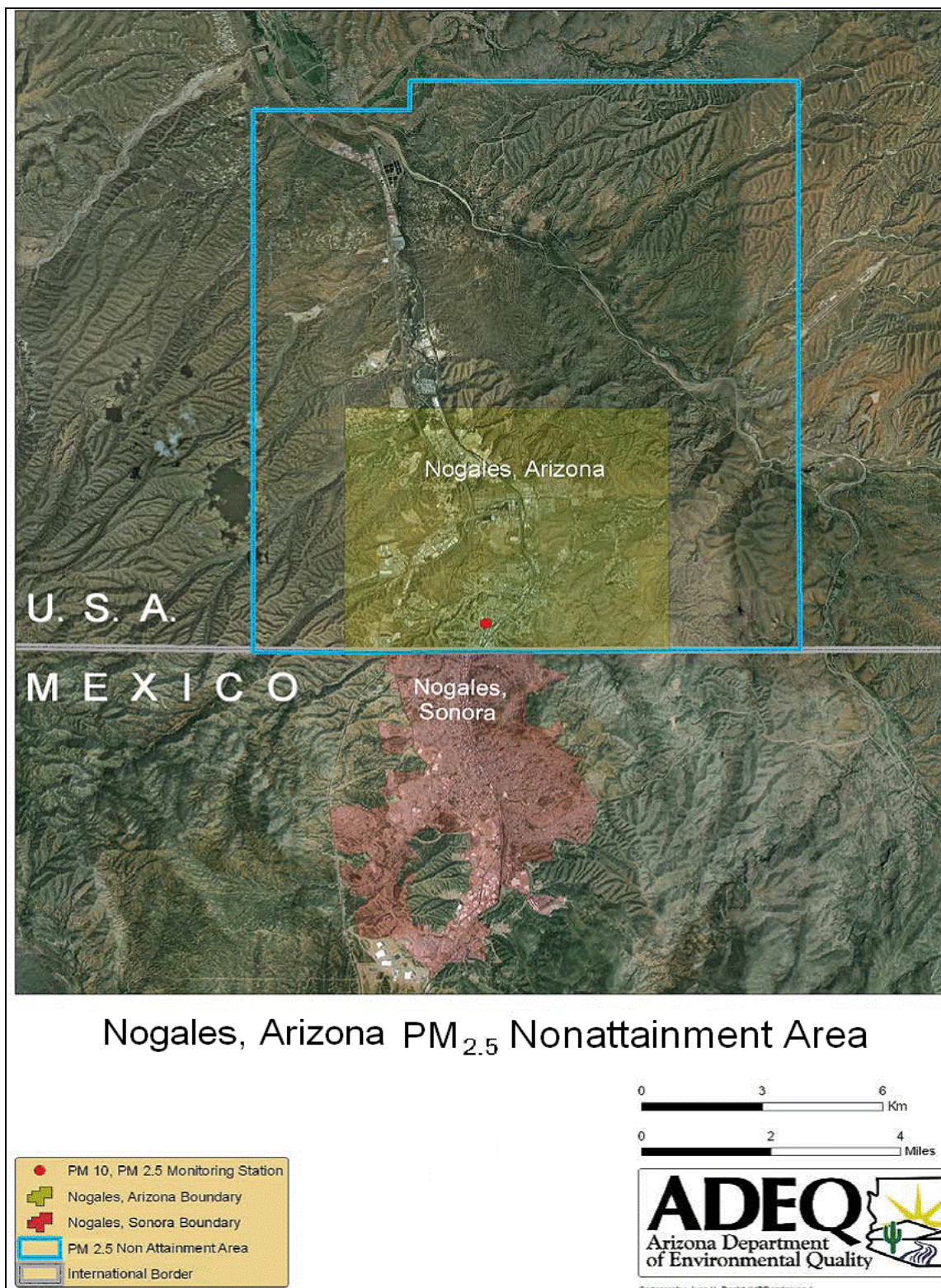
Figure 1: Map showing the boundaries of Nogales, AZ, Nogales, Sonora, and the Nogales PM$_{2.5}$ Nonattainment Area

2.2 Population and Urbanization

This section presents the population information for Santa Cruz County and the Nogales NA as determined by the Arizona Department of Administration (ADOA). There are two population centers in Santa Cruz County: the City of Nogales and Rio Rico. While the entirety of the City of Nogales lies within the Nogales NA, only a portion of Rio Rico is contained within the boundary. ADOA utilizes decennial U.S. Census population data to determine State, County, and block level population data. These data are projected intra-decennially based on economic criteria[3] and projected to future years using ADOA's population projection methodology taking into account local survival, fertility, and migration rates[4].

2.2.1 Santa Cruz County

ADOA estimated the 2010 Santa Cruz County population to be 47,539; up by 1.1 percent from 47,016 in 2008.[5]

2.2.2 Nogales Non Attainment Area

ADOA used a Geographic Information System (GIS) to estimate the population of the Nogales NA. The estimated 2010 population (as of July 1, 2010) was 31,413, up by 1.1 percent from their estimate of 31,067 for 2008. The ADOA estimated population for the city of Nogales was 21,107 and 20,880 for the years of 2008 and 2010, respectively (Appendix A).[6] This indicates that all population growth within the Nogales Nonattainment Area occurred outside of the Nogales, AZ city boundary. For Nonattainment Area population estimation, ADOA apportioned census block population information via a Geographic Information System (GIS) map (Appendix A). The populations of all census blocks that are entirely or partially within the boundary of the Nogales NA are identified and included in population estimates of the NA. Census 2010 population (as of April 1, 2010) of the blocks was summed up to obtain the Census 2010 population of Nogales NA, which was found to be 31,334[7] (Note: The 31,334 Census population given here does not match the 31,413 ADOA population estimate given earlier due to a 3 month variation in the dates of the estimations.). At the time of the development of this document, ADOA only provided population estimates at the county and incorporated place level (including unincorporated balance of county in its entirety). Population estimates are not available for census block or specific, unincorporated communities (e.g. Rio Rico) in the years between decennial censuses. Therefore a ratio of Nogales NA population to Santa Cruz County population was calculated using 2010 Census data in order to estimate a "constant share" ratio which could be applied to the county population estimates for other years in order to determine the NA population for those years. The 2010 U.S. Census figures implied that the population of Nogales NA is 66.1% of the population of Santa Cruz County. Using the "constant share" method, this percentage was applied to the estimated county population for July 1, 2008 (47,016) for a 2008 Nogales NA population estimation of 31,067 as mentioned above.

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[3] ADOA http://www.workforce.az.gov/population-estimates.aspx
[4] ADOA http://www.workforce.az.gov/pubs/demography/ArizonaPopulationProjections2012.pdf
[5] email from John Fan, Arizona Department of Administration
[6] ibid
[7] Based on ADOA apportionment of Nogales NA, City of Nogales population was 20,837; Rio Rico CDP population was 8,707; and balance of Nogales NA population was 1,790.

2.3 Land-Areas of Santa Cruz County and the Nogales NA

Santa Cruz County comprises 1,237.6 square miles of land, or approximately 791,632 acres.[8] Using GIS and 2012 digital land maps obtained from the Arizona State Land Department, Arizona Land Resource Information System, ADEQ determined that the majority of land ownership in Santa Cruz County is distributed between the U.S. Forest Service (52.8%), private land-owners (35.8%), State of Arizona Trust Land (7.8%), and the U.S. Bureau of Land Management (1.9%).

The Nogales NA covers a land area of 76.1 square miles. In contrast with the County, the majority of the land in the NA is privately owned (84.1%) with the U.S. Forest Service owning 13.0%, and State of Arizona Trust owned land comprising 2.8% of the NA. The codified boundaries of the Nogales NA can be found in 40 CFR Part 81.303. The Nogales $PM_{2.5}$ nonattainment area is delineated by the following townships and ranges within the State of Arizona which lies east of 111 degrees longitude: T23S, R13E; T23S, R14E; T24S, R13E; and, T24S, R14E.

3 Emissions Inventory Methodology

ADEQ employed a top-down methodology for the estimation of $PM_{2.5}$ and related pollutants emissions within the Nogales NA by utilizing information from EPA's NEI and ADEQ's AEIS. Point and Non-Road emissions were obtained from EPA's NEI, while non-point emissions were obtained from the AEIS. On-Road emissions were obtained by running the EPA approved Motor Vehicle Emissions Simulator (MOVES) model. 2010 was the chosen year for the Nogales NA emission inventory development to represent the 2009 – 2011 period for which ambient monitoring data showed attainment of the $PM_{2.5}$ NAAQS. At the time of the development of this document, the 2011 NEI was not yet available, therefore, emissions data from the 2008 NEI and AEIS served as a base for estimating 2010 emissions. For this reason, the 2010 Nogales NA emission inventory is primarily based on versions 1.5 and 2.0 of EPA's 2008 NEI and the AEIS. Since the NEI and AEIS produce county level emissions, these county level data were allocated to the Nogales NA by a combination of population and area scaling, as well as identifying the exact location of point sources. ADEQ examined each of the reported emission source categories for $PM_{2.5}$, NH_3, NO_x, SO_2, and VOCs. Each source category was allocated from county-level emissions to NA level emissions in accordance with one of three main source type characteristics: whether the emission source was believed to be driven by 1) human-induced activities (resulting in population allocation), 2) land-use activities (resulting in area allocation), or 3) if the activity was specific to a certain location (resulting in either no allocation or full allocation). Additionally, in order to produce a 2010 emission inventory, 2008 NEI and AEIS data were grown by population change (2008 to 2010) where human-induced activities were identified. The sections below go into detail describing the methodologies used for allocating the 2008 Santa Cruz County emission inventory to the Nogales NA and the development of the 2010 Nogales NA emission inventory. Additionally, for instances where ADEQ did not use the NEI or AEIS to estimate emissions, a discussion of the estimation technique is included.

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[8] U.S. Census, Santa Cruz County Quickfacts,
http://quickfacts.census.gov/qfd/states/04/04023.html

3.1 EPA's 2008 National Emissions Inventory

EPA's NEI database contains information about sources that emit criteria air pollutants and their precursors, and hazardous air pollutants. The database includes estimates of annual air pollutant emissions from point, nonpoint, and mobile sources in the fifty states, the District of Columbia, Puerto Rico, and the Virgin Islands available at the county level. Collaborating with the states, EPA develops the emissions inventory and releases an updated version of the NEI database every three years.

Five of the six criteria air pollutants are included in the NEI database. Emissions of carbon monoxide (CO), nitrogen oxides (NOx), sulfur dioxide (SO_2), lead (Pb), and particulate matter (PM_{10} and $PM_{2.5}$) are specifically reported in the NEI. Ozone, the sixth criteria air pollutant, arises from photochemical reactions in the atmosphere rather than direct emissions from sources.

EPA compiled the NEI database from the primary data sources listed below:
- emissions inventories compiled by state and local environmental agencies;
- databases related to EPA's Maximum Achievable Control Technology (MACT) programs to reduce emissions of hazardous air pollutants;
- Toxic Release Inventory (TRI) data;
- for electric generating units, EPA's Emission Tracking System / Continuous Emissions Monitoring data (ETS/CEM) and Department of Energy fuel use data;
- for on-road sources, the Federal Highway Administration's estimate of vehicle miles traveled and emission factors from EPA's MOVES2010a computer model;
- for non-road sources, EPA's NONROAD2008a computer model; and,
- previous emissions inventories, if states do not submit current data.

A complete description of the development of the 2008 NEI may be found at the following URL: http://www.epa.gov/ttn/chief/net/2008inventory.html.

3.2 On-Road Mobile Source Emissions

In the 2008 NEI version 1, on-road mobile source emissions were calculated using EPA's MOBILE6.2 model. Since the 2008 NEI was developed, EPA's Motor Vehicle Emission Simulator (MOVES) model has replaced MOBILE6.2 as the accepted model for estimating emissions from cars, trucks, and motorcycles.[9] On March 2, 2010, EPA approved the availability of the Motor Vehicle Emissions Simulator model MOVES2010 in official SIP submissions to EPA regarding air quality and for certain transportation conformity analyses outside the state of California.[10] MOVES2010a replaced MOVES2010 in August 2010 and was subsequently revised and released as MOVES2010b in March 2012. MOVES2010b is now the state-of-the-art upgrade to EPA's modeling tools for estimating air emissions from cars, trucks, motorcycles, and buses, and is based on analyses of millions of emission test results and considerable advances in the Agency's understanding of vehicle emissions. In April 2012, EPA recomputed the on-road mobile source emissions using MOVES and populated the 2008 NEI Version 2 with the updated values.

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[9] http://www.epa.gov/otaq/models/moves/index.htm
[10] See 75 FR 9411 (March 2, 2010)

3.2.1 Calculating Santa Cruz County Emissions Using MOVES

ADEQ used MOVES2010a with an EPA supplied 2008 Santa Cruz County local MOVES database to obtain the most current on-road mobile source emissions for Santa Cruz County (see Appendix B). Use of MOVES to calculate mobile source emissions is required by EPA for SIP development. The above mentioned database calculated reasonable values of all analyzed pollutants for the year of 2008 except SO_2 (0 tons calculated) and VOC's (40,000 tons estimated). Due to these discrepancies, EPA and ADEQ agreed the most appropriate course of action for calculating SO_2 and VOC emissions would be to rerun MOVES for these pollutants using the national, default database Appendix D).[11] A population ratio of Santa Cruz County to the Nogales NA (Table 3.1) was used to allocate county emissions to the nonattainment area where applicable (Table 4.3).

$PM_{2.5}$ emissions from on-road mobile sources fall into four categories: brake and tire wear, vehicle exhaust, paved road dust, and unpaved road dust. As older on-road vehicles are replaced with newer, cleaner vehicles, exhaust emissions are expected to decrease. Also, changes to cleaner fuel specifications lead to lower exhaust emissions. The overall changes in vehicle exhaust emissions are captured in the EPA MOVES emission model. MOVES also produces emissions estimates for brake and tire wear. ADEQ ran the MOVES model for 2008 and 2010 using the national (default) EPA database. ADEQ also ran the MOVES model for 2008 using the county (local) database supplied by EPA. Since a specific (local) database was not available for the 2010 MOVES run, ADEQ used the outputs from the 2008 (local) database and the 2008 national default run to create a ratio that was utilized for the 2010 MOVES run. This ratio, or correction factor, was then multiplied by the outputs for the 2010 national default MOVES run. This correction factor was applied to all pollutant emissions except SO_2 and VOCs. This method was recommended by ADEQ and agreed upon by EPA[12]. See details below for a mathematical example of the methodology used for on-road brake, tire-wear, and exhaust emissions using MOVES. Detailed breakdowns of the estimated emissions generated from this methodology are included in Appendix E.

The following is an example of the steps which were followed to allocate/convert the MOVES (default) data for year 2010 to the NA data. An example calculation is at the end of Appendix E.

    A = MOVES (county) PM2.5 ORG_URA data for 2008 (local)
    B = MOVES (county) PM2.5 ORG_URA data for 2008 (default)

    where URA = Urban Restricted Access, ORG = On-Road Gasoline

    C = A/B = adjustment ratio to go from 2008 (default) to 2008 (local)

    D = C * MOVES (county) PM2.5 ORG_URA data for 2010 (default)
      = adjusted MOVES (county) PM2.5 ORG_URA data for 2010 (local)

    E = D * 2010 NA population (est.) / 2010 county population (est.)
      = final adjusted MOVES (NA) PM2.5 ORG_URA data for 2010 (local)

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[11] Direct contact with Jeffrey Buss at EPA Region 9 on 4/30/2012, confirmed in his email dated May 31, 2012 to Ryan Templeton, ADEQ and included in Appendix C.
[12] Direct contact with Jeffrey Buss at EPA Region 9 on 1/8/13.

These steps are followed for each pollutant and for each roadway type. An example calculation is included at the end of Appendix E.

3.3 Allocating the Santa Cruz County PM$_{2.5}$ Emissions to the Nogales NA

EPA has not issued formal guidance on assigning emission sources from a county level of analysis to a smaller subject area within that county. For the Nogales NA emissions inventory, ADEQ used a combination of population ratios, land area ratios, and source locations within the Nogales NA to determine the appropriate allocation of county-wide emissions to the Nogales NA. A summary of the allocation ratios is presented in Table 3.1 below. More detailed discussions of the allocation methods are provided in the subsequent Sections.

Table 3.1 Summary of Santa Cruz County & Nogales NA Population Data			
	Santa Cruz County	Nogales NA	Allocation Ratio
Area (square miles)	1,237.6[13]	76.1[14]	6.15%
2008 Population	47,016[15]	31,067[16]	66.1%

3.3.1 Emissions Allocation Based on Population

One method of allocating emissions from a county-level to a NA is to scale those emissions by a population ratio. In some cases, it is logical to scale source categories by population, since the rate of activities causing the emissions is more closely related to the number of people within a given area than to other factors, such as a specific land area relationship.

As described in Section 2.2.2, ADEQ used ADOA population estimates of the Nogales NA and Santa Cruz County to calculate a population ratio. The premise that underlies these calculations is: the City of Nogales and the allocated population of Rio Rico comprise nearly all of the population within the nonattainment area (this was determined by analysis of aerial photography of the region).

When allocating emissions based on population, the county-level emissions for a given source category were multiplied by a factor of 66.1% or 0.661 for the year of 2008 to give the respective source category emissions for the Nogales NA. If the likely magnitude of source category emissions varied with the activities of the population, it was allocated based on this population ratio.

3.3.2 Emissions Allocation Based on Land Area

A land area weighted emission ratio was developed using U.S. Census geographic data and/or Arizona Commerce Authority data.[17] The land area for Santa Cruz County is 1,237.6 square

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[13] U.S. Census, Quickfacts, Santa Cruz County, Arizona.
[14] EPA Geographic Information System estimate.
[15] email from John Fan, Arizona Department of Administration 11/14/2012
[16] Ibid
[17] Arizona Department of Commerce Profile: Santa Cruz County Arizona, May 10, 2010.
<http://www.azcommerce.com/doclib/commune/Santa Cruz%20county.pdf>

miles. The land area for the Nogales NA is 76.1 square miles. The ratio of Nogales NA land area to the Santa Cruz County land area is calculated by dividing 76.1 by 1,237.6, which equals .061490 or 6.15 percent.

For a spatial allocation of county-level emissions to the Nogales NA based on weighting by land area, the county-level emissions were multiplied by 6.15 percent to calculate the emissions for the Nogales NA. Some source categories, such as agricultural emissions, are likely to be proportional to land area; consequently, they are logically allocated by the land area ratio.

3.3.3 Point Source Emissions Identification Within the Nogales NA

To confirm whether specific point sources in the Santa Cruz County emissions inventory should be included in the Nogales NA inventory, ADEQ used facility supplied location information which was verified by visual inspection through aerial images, such as satellite photography within ArcGIS. These source categories are discussed below.

- Fuel Combustion - Electric Generation - Natural Gas. A power plant, Valencia Power, is located within the nonattainment area (Table 4.4).

- Aircraft - The only airport in the County, Nogales International Airport, is within the nonattainment area (Table 4.4).

- Waste Disposal - Institutional Incineration. A medical waste incinerator is located within the nonattainment area (Table 4.2).

3.4 Methodology for Projecting the 2010 Emissions Inventories

Nonattainment Area and County population estimates were covered in detail in *Section 2.2 Population and Urbanization*. These values were used to estimate population growth rates within the NA between the year of the most recent National Emission Inventory, 2008, and the chosen year for the currently presented emission inventories, 2010 (1.1% growth rate). Where appropriate, this growth rate was used to estimate emission growth between 2008 and 2010 within the NA.

For the 2010 base year emission inventories, ADEQ utilized the following assumptions:

- Source categories tied to economic activity were not grown between 2008 and 2010 due to the continued economic recession during this period;
- Source categories that track with population growth will be estimated at the same growth rate of 1.1 percent from 2008 to 2010; and,
- Major point sources were found to contribute less than 1.3% of total nonattainment area emissions for all pollutants for 2008. Considering this information along with the sustained economic downturn between 2008 and 2010, ADEQ felt it safe to assume no emissions growth between 2008 and 2010.

Emissions from On-road mobile sources were projected from 2008 to 2010 as presented in Section 3.2.1.

4 2008 Emissions Inventory and Discussion

The County emissions inventory and Nogales NA allocation results are shown in Tables 4.1, 4.2, 4.3 and 4.4.

4.1 Review and Evaluation of Emissions Estimates

The 2008 estimated rate of $PM_{2.5}$ emissions from road and other construction may be high because the emissions estimate does not reflect the full magnitude of the downturn in the real estate sector of the economy. It is likely that this downturn is a temporary situation and it may be expected that these emissions would resume at a higher rate once the real estate economy improves. As a result, this emission rate is conservative and is based on the best estimates of construction activity available at this time.

Neither ADEQ nor EPA could identify exact locations of agricultural activities and prescribed forest burning. While it is appropriate to apply a land ratio method for assigning County-level agricultural emissions to the NA, this may underestimate emissions given that intensive agricultural activity is likely to occur on private land, located primarily in the nonattainment area, as opposed to the public lands composing a large proportion of the remaining County. The ratio of the NA area to the area of the county was found to be 6.15 percent (See Table 3.2). Thus, the NA agricultural activity emissions were estimated as only 6.15 percent of countywide emissions. While ADEQ recognizes the area allocation used may result in an underestimation of emissions from agricultural sources, ADEQ was unable to identify a more accurate method for allocation.

An error was discovered in the 2008 NEI Area (non-point) data. The entry for "Misc. Area Sources, Ag. Production - Livestock, Swine" reported total NH_3 (Ammonia) Emissions of 209.88 tons per year. ADEQ reviewed the total for Hogs and Pigs for Santa Cruz County from the USDA[18] and found a total of only 18 reported hogs and pigs in the county for the year of 2007. In the absence of more recent agricultural census data, ADEQ assumes this number, and thus agricultural emissions from Swine will not change substantially between 2008 and 2010. Doorn *et al.* (2002) determined a NH_3 emission factor for North Carolina swine of 7 kg/animal/yr[19]. This emission factor was compared by Doorn *et al.* to emission factors developed by Battye *et al.* (1994)[20], Bouwman and Van Der Hoek (1997)[21], and EMEP/CORINAIR (AEIG, 1998)[22] which ranged between 2.5 and 6.0 kg/animal/yr. For comparison, while EPA does not list emission factors for livestock in AP-42, EPA used emission factors for swine when developing the 2002

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[18] USDA Ag Census
http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/Arizona/st04_2_012_012.pdf

[19] Doorn, MRJ; Natschke, DF; Thorneloe, SA; Southerland, J. Development of an emission factor for ammonia emissions from US swine farms based on field tests and application of a mass balance method. 2002, **Atmospheric Environment**, 36: 5619-5625.

[20] Battye, R., Battye, W., Overcash, C., Fudge, S., 1994. Development and selection of ammonia emission factors. Prepared for W.G. Benjey, U.S. Environmental Protection Agency, AREAL, Research Triangle Park, NC, EC/R, Inc., Durham, NC. Website:
http://www.epa.gov//ttn/chief/efdocs/ammonia.pdf.

[21] Bouwman, A.F., Van Der Hoek, K.W., 1997. Scenarios of animal waste production and fertilizer use and associated ammonia emission for the developing countries. Atmospheric Environment 31 (24), 4095–4102.

[22] AEIG, 1998. Atmospheric Emission Inventory Guidebook. 1st Edition. Chapter: ''Agriculture and Forestry, Manure Management''. McInnes ed. EMEP/CORINAIR. European Environment Agency, Copenhagen, Denmark.

NEI of 2.7 – 3.3 kg/animal/yr. Assuming a conservative emission factor of 7 kg/animal/yr, this would yield emissions of 0.14 tons annually, a negligible amount. Therefore the entry of 209.88 tons per year for swine was removed from Table 4.2.

Another error was found when running the MOVES model for on-road vehicle emissions. NH_3 emissions for "On-Road Gasoline Off-Network" and "On-Road Diesel Off-Network" source categories resulted in totals of 0 tons per year in both cases when using the EPA provided local database and the EPA national default database (Table 4.3). This is assumed to be a potential error within the calculation of NH_3 emissions within the MOVES model since the same value was found to be reported in the 2008 NEI for Santa Cruz County.

An error was previously found in the 2008 NEI for Cochise County which was also applicable to Santa Cruz County. The error was for surface mining, which showed a value of 761.11 tons per year for PM_{10}. The 2008 NEI for Santa Cruz County showed an identical value of 761.11 tons per year for PM_{10}. It was also found that all 15 Arizona counties had a surface mining value of 761.11 tons per year for PM_{10}. ADEQ assumes that EPA divided the total surface mining emission value for the state by 15 and apportioned the results (761.11 tons per year for PM_{10}) to each county. ADEQ will work with EPA to correct the 2008 NEI data. Upon further investigation, ADEQ was unable to identify mining activities located within Santa Cruz County. Consequently, the related $PM_{2.5}$ emissions for this source were not included in the non-attainment area estimates.

4.2 Overall Assessment

The 2008 NEI and the AEIS, along with emission estimates generated from MOVES, provide a comprehensive emission inventory for Santa Cruz County based on the best methodology and source data available at the time the inventory was developed. In allocating these County-wide emissions to the Nogales NA, ADEQ has used reasonable and conservative assumptions to produce a current, accurate, and comprehensive Nogales NA 2008 $PM_{2.5}$ emissions inventory. Tables 4.1 through 4.4 provide emissions allocations from the County level to the NA. "Pop" allocations are based on population allocations as outlined in Section 3.3.1, "Area" allocations are based on the methodology outlined in Section 3.3.2, and "Loc" allocations are emissions determined to originate from sources found within the nonattainment area.

Table 4.1: Santa Cruz County & Nogales NA 2008 PM-2.5 Non-Road Mobile Sources Emissions Inventory			
Non-Road Mobile Emissions Source Category	Santa Cruz County (tpy)	Nogales NA (tpy)	Allocation Method
NH3 - Ammonia			
OHV (OHV) Diesel, Construction and Mining Equipment (Equip.)	0.12	0.08	Pop
Total	**0.12**	**0.08**	
NOX - Nitrogen Oxides			
OHV Diesel, Construction and Mining Equipment	134.84	89.13	Pop
OHV Diesel, Commercial Equipment	34.62	22.88	Pop
OHV Gasoline, 4-Stroke, Commercial Equipment	15.45	10.21	Pop
OHV Diesel, Industrial Equipment	8.55	5.65	Pop
LPG, Industrial Equipment	6.72	4.44	Pop
LPG, Commercial Equipment	5.93	3.92	Pop
OHV Gasoline, 4-Stroke, Lawn and Garden Equipment	2.27	1.50	Pop
OHV Gasoline, 4-Stroke, Recreational Equipment	2.03	1.34	Pop
CNG, Commercial Equipment	1.49	0.98	Pop
Mobile Sources OHV Gasoline, 4-Stroke, Construction and Mining Equip.	0.94	0.62	Pop
OHV Diesel, Lawn and Garden Equipment	0.76	0.50	Pop
OHV Diesel, Agricultural Equipment	0.49	0.03	Area
CNG, Industrial Equipment	0.47	0.31	Pop
OHV Gasoline, 2-Stroke, Recreational Equipment	0.41	0.27	Pop
LPG, Construction and Mining Equipment	0.40	0.26	Pop
OHV Diesel, Recreational Equipment	0.38	0.25	Pop
OHV Gasoline, 4-Stroke, Industrial Equipment	0.27	0.18	Pop
OHV Gasoline, 2-Stroke, Lawn and Garden Equipment	0.16	0.11	Pop
OHV Gasoline, 2-Stroke, Commercial Equipment	0.13	0.09	Pop
Total	**216.31**	**142.69**	
PM25-PRI - PM2.5 Primary (Filter + Condensable)			
OHV Diesel, Construction and Mining Equipment	10.75	7.11	Pop
OHV Diesel, Commercial Equipment	3.43	2.27	Pop
OHV Gasoline, 2-Stroke, Recreational Equipment	2.42	1.60	Pop
OHV Gasoline, 2-Stroke, Lawn and Garden Equipment	0.73	0.48	Pop
OHV Diesel, Industrial Equipment	0.66	0.44	Pop
OHV Gasoline, 4-Stroke, Commercial Equipment	0.60	0.40	Pop
Mobile Sources, OHV Gasoline, 2-Stroke, Commercial Equipment	0.53	0.35	Pop
OHV Gasoline, 2-Stroke, Construction and Mining Equipment	0.38	0.25	Pop
OHV Gasoline, 4-Stroke, Recreational Equipment	0.21	0.14	Pop

Table 4.1: Santa Cruz County & Nogales NA 2008 PM-2.5 Non-Road Mobile Sources Emissions Inventory			
Non-Road Mobile Emissions Source Category	Santa Cruz County (tpy)	Nogales NA (tpy)	Allocation Method
OHV Gasoline, 4-Stroke, Lawn and Garden Equipment	0.17	0.11	Pop
Total	**19.88**	**13.14**	
SO2 - Sulfur Dioxide			
OHV Diesel, Construction and Mining Equipment	3.18	2.10	Pop
OHV Diesel, Commercial Equipment	0.73	0.48	Pop
OHV Diesel, Industrial Equipment	0.22	0.15	Pop
OHV Gasoline, 4-Stroke, Commercial Equipment	0.11	0.07	Pop
Total	**4.24**	**2.80**	
VOC - Volatile Organic Compounds			
OHV Gasoline, 2-Stroke, Recreational Equipment	74.25	49.08	Pop
OHV Gasoline, 4-Stroke, Commercial Equipment	71.98	47.58	Pop
OHV Gasoline, 4-Stroke, Lawn and Garden Equipment	30.34	20.05	Pop
OHV Gasoline, 4-Stroke, Recreational Equipment	20.49	13.54	Pop
OHV Diesel, Construction and Mining Equipment	13.86	9.16	Pop
OHV Gasoline, 2-Stroke, Lawn and Garden Equipment	8.62	5.70	Pop
OHV Diesel, Commercial Equipment	5.09	3.36	Pop
OHV Gasoline, 2-Stroke, Commercial Equipment	4.88	3.23	Pop
OHV Gasoline, 4-Stroke, Construction and Mining Equipment	3.05	2.02	Pop
OHV Gasoline, 2-Stroke, Construction and Mining Equipment	2.87	1.90	Pop
LPG, Industrial Equipment	1.90	1.26	Pop
LPG, Commercial Equipment	1.29	0.85	Pop
OHV Diesel, Industrial Equipment	0.79	0.52	Pop
OHV Gasoline, 4-Stroke, Industrial Equipment	0.33	0.22	Pop
LPG, Construction and Mining Equipment	0.11	0.07	Pop
OHV Diesel, Recreational Equipment	0.10	0.07	Pop
Total	**239.95**	**158.61**	

Allocation method: Area = Land area ratio; Loc = Location; Pop = Population ratio.

Table 4.2: Santa Cruz County & Nogales NA 2008 PM2.5 Non-Point Source Emissions Inventories (tons)			
Non-Point Sources Emissions Source Category	Santa Cruz County	Nogales NA	Allocation Method
NH3 - Ammonia			
Misc. Area Sources, Ag. Production - Livestock, Beef cattle	67.72	4.15	Area
Misc. Area Sources, Ag. Production - Livestock, Goats	50.03	3.07	Area
Misc. Area Sources, Ag. Production - Livestock, Dairy cattle	19.14	1.17	Area
Waste Disposal, Treatment, and Recovery, Wastewater Treatment, Public Own	17.17	11.35	Pop
Misc. Area Sources, Ag. Production - Livestock, Horses and Ponies	13.33	0.82	Area
Misc. Area Sources, Other Combustion, Prescribed Forest Burning	2.74	0.17	Area
Misc. Area Sources, Other Combustion, Residential Wood Burning	2.54	1.68	Pop
Stationary Source Fuel Combustion, Industrial, Distillate Oil	0.34	0.22	Pop
Misc. Area Sources, Ag. Production - Livestock, Sheep and Lambs Waste Emissions	0.27	0.02	Area
Stationary Source Fuel Combustion, Industrial, Natural Gas	0.26	0.17	Pop
Stationary Source Fuel Combustion, Commercial/Institutional, Distillate Oil	0.10	0.07	Pop
Total	**173.64**	**22.89**	
NOX - Nitrogen Oxides			
Misc. Area Sources, Other Combustion, Prescribed Forest Burning	19.08	1.17	Area
Stationary Source Fuel Combustion, Residential, Natural Gas	13.04	8.62	Pop
Stationary Source Fuel Combustion, Coal	9.85	6.51	Pop
Stationary Source Fuel Combustion, Commercial/Institutional, Natural Gas	9.49	6.27	Pop
Stationary Source Fuel Combustion, Industrial, Distillate Oil	8.53	5.64	Pop
Waste Disposal (Disp), Treatment, and Recovery, Open Burning, All Categories	7.13	4.71	Pop
Waste Disposal, Treatment, and Recovery, Open Burning, Residential	6.60	4.36	Pop
Stationary Source Fuel Combustion, Residential, Liquefied Petroleum Gas (LPG)	5.60	3.70	Pop
Misc. Area Sources, Other Combustion, Residential Wood Burning	5.12	3.38	Pop
Stationary Source Fuel Combustion, Industrial, Natural Gas	3.31	2.19	Pop
Stationary Source Fuel Combustion, Commercial/Institutional, Distillate Oil	2.40	1.59	Pop
Waste Disposal, Treatment, and Recovery, On-site Incineration, Comm./Instit.	0.37	0.37	Loc
Stationary Source Fuel Combustion, Comm./Institutional, LPG	0.28	0.19	Pop
Stationary Source Fuel Combustion, Industrial, Residual Oil	0.15	0.10	Pop
Total	**90.95**	**48.80**	
PM25-PRI - PM2.5 Primary (Filter + Condensable)			
Mobile Sources, Unpaved Roads, All Unpaved Roads	234.41	154.89	Pop
Industrial Processes, Construction: Road Construction	96.91	64.04	Pop
Mobile Sources, Paved Roads, All Paved Roads	75.00	49.56	Pop
Industrial Processes, Construction: Industrial/Commercial/Institutional	51.75	34.20	Pop

Table 4.2: Santa Cruz County & Nogales NA 2008 PM2.5 Non-Point Source Emissions Inventories (tons)			
Non-Point Sources Emissions Source Category	Santa Cruz County	Nogales NA	Allocation Method
Misc. Area Sources, Other Combustion, Prescribed Forest Burning	48.90	3.00	Area
Misc. Area Sources, Other Combustion, Residential Wood Burning	43.49	28.74	Pop
Waste Disposal, Treatment, and Recovery, Open Burning, Residential	38.26	25.28	Pop
Waste Disposal, Treatment, and Recovery, Open Burning, All Categories	25.44	16.81	Pop
Misc. Area Sources, Ag. Production - Crops, Ag. - Crops	14.10	0.86	Area
Industrial Processes, Food and Kindred Products: Comm. Cooking - Charbroiling	10.98	7.26	Pop
Industrial Processes, Construction: SIC 15 - 17, Residential	8.69	5.74	Pop
Stationary Source Fuel Combustion, Industrial, Bituminous/Subbituminous Coal	2.19	1.45	Pop
Industrial Processes, Food and Kindred Products: Commercial Cooking - Frying	2.16	1.43	Pop
Stationary Source Fuel Combustion, Residential, Natural Gas	1.05	0.69	Pop
Stationary Source Fuel Combustion, Commercial/Institutional, Natural Gas	0.72	0.48	Pop
Stationary Source Fuel Combustion, Industrial, Distillate Oil	0.66	0.44	Pop
Stationary Source Fuel Combustion, Residential, Liquefied Petroleum Gas	0.45	0.30	Pop
Misc. Area Sources, Other Combustion, Structure Fires	0.40	0.26	Pop
Stationary Source Fuel Combustion, Commercial/Institutional, Distillate Oil	0.26	0.17	Pop
Stationary Source Fuel Combustion, Industrial, Natural Gas	0.25	0.17	Pop
Waste Disposal, Treatment, and Recovery, On-site Incineration, Comm. /Instit.	0.20	0.20	Loc
Total	**656.27**	**395.97**	
SO2 - Sulfur Dioxide			
Stationary Source Fuel Combustion (Comb.), Industrial, Distillate Oil	18.17	12.01	Pop
Stationary Source Fuel Comb. Industrial, Bituminous/Subbituminous Coal	16.00	10.57	Pop
Misc. Area Sources, Other Combustion, Prescribed Forest Burning	5.23	0.32	Area
Stationary Source Fuel Combustion, Commercial/Institutional, Distillate Oil	5.12	3.38	Pop
Waste Disposal, Treatment, and Recovery, Open Burning, Residential	1.10	0.73	Pop
Stationary Source Fuel Combustion, Industrial, Residual Oil	0.96	0.63	Pop
Misc. Area Sources, Other Combustion, Residential Wood Burning	0.84	0.56	Pop
Waste Disp., Treatment, and Recovery, On-site Incineration, Comm./Institutional	0.12	0.12	Loc
Total	**47.54**	**28.32**	
VOC - Volatile Organic Compounds			
Waste Disposal, Treatment, and Recovery	921.90	609.17	Pop
Storage and Transport (S&T), Petrol and Petrol Product Storage, Gas Service Stations	173.43	114.60	Pop
Misc. Area Sources, Other Combustion, Residential Wood Burning	53.84	35.58	Pop
Solvent Utilization, Misc. Non-industrial: Consumer, Household Products	37.01	24.46	Pop
Waste Disposal, Treatment, and Recovery, Open Burning, Residential	32.98	21.79	Pop

Table 4.2: Santa Cruz County & Nogales NA 2008 PM2.5 Non-Point Source Emissions Inventories (tons)			
Non-Point Sources Emissions Source Category	Santa Cruz County	Nogales NA	Allocation Method
Misc. Area Sources, Other Combustion, Prescribed Forest Burning	30.39	1.87	Area
Solvent Utilization, Misc. Non-industrial: Comm. Pesticide Application: Ag.	29.37	1.81	Area
S&T, Petroleum and Petroleum Product Storage, Bulk Terminals: All Evap. Losses	22.87	15.11	Pop
Solvent Utilization, Degreasing, All Industries: Cold Cleaning	22.24	14.70	Pop
Solvent Utilization, Misc. Non-industrial: Consumer, Personal Care Products	20.62	13.63	Pop
Solvent Utilization, Surface Coating, Misc. Manufacturing	19.98	13.20	Pop
Waste Disposal, Treatment, and Recovery, Open Burning, All Categories	17.57	11.61	Pop
Waste Disposal, Treatment, and Recovery, Wastewater Treatment, Public Owned	8.94	5.91	Pop
Solvent Utilization, Misc. Industrial, Adhesive (Industrial) Application	6.86	4.53	Pop
Solvent Utilization, Graphic Arts, All Processes	5.68	3.75	Pop
Solvent Utilization, Surface Coating, Metal Furniture	5.05	3.34	Pop
Solvent Utilization, Surface Coating, Auto Refinishing	4.03	2.66	Pop
Industrial Processes, Food and Kindred Products: Comm. Cooking - Charbroiling	1.52	1.00	Pop
Solvent Utilization, Misc. Non-industrial: Consumer	1.07	0.71	Pop
Stationary Source Fuel Combustion, Residential, Natural Gas	0.76	0.50	Pop
Solvent Utilization, Surface Coating, Factory Finished Wood	0.65	0.43	Pop
Solvent Utilization, Surface Coating, Wood Furniture: SIC 25	0.56	0.37	Pop
Stationary Source Fuel Combustion, Commercial/Institutional, Natural Gas	0.52	0.34	Pop
Misc. Area Sources, Other Combustion, Structure Fires	0.45	0.30	Pop
Solvent Utilization, Surface Coating, Other Special Purpose Coatings	0.43	0.28	Pop
Industrial Processes, Food and Kindred Products: Commercial Cooking - Frying	0.33	0.22	Pop
Stationary Source Fuel Combustion, Residential, Liquefied Petroleum Gas (LPG)	0.33	0.22	Pop
Solvent Utilization, Surface Coating, Electronic and Other Electrical	0.25	0.17	Pop
Solvent Utilization, Surface Coating, Industrial Maintenance Coatings	0.23	0.15	Pop
Solvent Utilization, Surface Coating, Misc. Finished Metals	0.21	0.14	Pop
Stationary Source Fuel Combustion, Industrial, Natural Gas	0.18	0.12	Pop
Total	**1420.25**	**902.67**	

Allocation method: Area = Land area ratio; Loc = Location; Pop = Population ratio.

Table 4.3: Santa Cruz County & Nogales NA 2008 PM2.5 On-Road Mobile Sources Emissions Inventories (tons)			
On-Road Mobile Source Emissions Categories	Santa Cruz County	Nogales NA	Allocation Method
NH3 - Ammonia			
On-Road Gasoline Off-Network	0.00	0.00	Pop
On-Road Gasoline Rural Restricted Access	4.71	3.11	Pop
On-Road Gasoline Rural Unrestricted Access	4.73	3.13	Pop
On-Road Gasoline Urban Restricted Access	2.18	1.44	Pop
On-Road Gasoline Urban Unrestricted Access	8.88	5.87	Pop
On-Road Diesel Off-Network	0.00	0.00	Pop
On-Road Diesel Rural Restricted Access	0.60	0.40	Pop
On-Road Diesel Rural Unrestricted Access	0.24	0.16	Pop
On-Road Diesel Urban Restricted Access	0.13	0.09	Pop
On-Road Diesel Urban Unrestricted Access	0.35	0.23	Pop
Total	**21.82**	**14.42**	
NOX - Nitrogen Oxides			
On-Road Gasoline Off-Network	138.93	91.80	Pop
On-Road Gasoline Rural Restricted Access	113.37	74.91	Pop
On-Road Gasoline Rural Unrestricted Access	113.27	74.85	Pop
On-Road Gasoline Urban Restricted Access	51.57	34.08	Pop
On-Road Gasoline Urban Unrestricted Access	215.64	142.49	Pop
On-Road Diesel Off-Network	72.17	47.69	Pop
On-Road Diesel Rural Restricted Access	326.14	215.51	Pop
On-Road Diesel Rural Unrestricted Access	106.38	70.29	Pop
On-Road Diesel Urban Restricted Access	62.30	41.17	Pop
On-Road Diesel Urban Unrestricted Access	181.80	120.13	Pop
Total	**1381.57**	**912.91**	
PM25-PRI - PM2.5 Primary (Filter + Condensable)			
On-Road Gasoline Off-Network	1.77	1.17	Pop
On-Road Gasoline Rural Restricted Access	1.44	0.95	Pop
On-Road Gasoline Rural Unrestricted Access	1.04	0.69	Pop
On-Road Gasoline Urban Restricted Access	0.70	0.46	Pop
On-Road Gasoline Urban Unrestricted Access	2.03	1.34	Pop
On-Road Diesel Off-Network	1.07	0.71	Pop
On-Road Diesel Rural Restricted Access	12.27	8.11	Pop
On-Road Diesel Rural Unrestricted Access	4.88	3.22	Pop
On-Road Diesel Urban Restricted Access	2.84	1.88	Pop
On-Road Diesel Urban Unrestricted Access	9.98	6.59	Pop

On-Road Mobile Source Emissions Categories	Santa Cruz County	Nogales NA	Allocation Method
Table 4.3: **Santa Cruz County & Nogales NA 2008 PM2.5 On-Road Mobile Sources Emissions Inventories** **(tons)**			
Total	**38.02**	**25.12**	
SO2 - Sulfur Dioxide			
On-Road Gasoline Off-Network	0.29	0.19	Pop
On-Road Gasoline Rural Restricted Access	1.91	1.26	Pop
On-Road Gasoline Rural Unrestricted Access	2.41	1.59	Pop
On-Road Gasoline Urban Restricted Access	0.45	0.30	Pop
On-Road Gasoline Urban Unrestricted Access	2.17	1.43	Pop
On-Road Diesel Off-Network	0.13	0.09	Pop
On-Road Diesel Rural Restricted Access	2.35	1.55	Pop
On-Road Diesel Rural Unrestricted Access	0.99	0.65	Pop
On-Road Diesel Urban Restricted Access	0.17	0.11	Pop
On-Road Diesel Urban Unrestricted Access	0.47	0.31	Pop
Total	**11.34**	**7.49**	
VOC - Volatile Organic Compounds			
On-Road Gasoline Off-Network	413.29	273.09	Pop
On-Road Gasoline Rural Restricted Access	38.17	25.22	Pop
On-Road Gasoline Rural Unrestricted Access	54.64	36.10	Pop
On-Road Gasoline Urban Restricted Access	10.79	7.13	Pop
On-Road Gasoline Urban Unrestricted Access	61.98	40.95	Pop
On-Road Diesel Off-Network	25.41	16.79	Pop
On-Road Diesel Rural Restricted Access	18.45	12.19	Pop
On-Road Diesel Rural Unrestricted Access	12.35	8.16	Pop
On-Road Diesel Urban Restricted Access	2.15	1.42	Pop
On-Road Diesel Urban Unrestricted Access	7.74	5.11	Pop
Total	**644.97**	**426.18**	

Allocation method: Area = Land area ratio; Loc = Location; Pop = Population ratio.

Table 4.4: Santa Cruz County & Nogales NA 2008 PM2.5 Point Source Emissions Inventory			
Emissions Source Category	Santa Cruz County	Nogales NA	Allocation Method
Valencia Power Plant			
PM2.5-PRI - PM2.5 Primary (Filter + Condensable)	N/A	1.09	Loc
NOX - Nitrogen Oxides	N/A	9.65	Loc
SO2 - Sulfur Dioxide	N/A	0.21	Loc
VOC - Volatile Organic Compounds	N/A	0.19	Loc
Nogales International Airport			
PM25-PRI - PM2.5 Primary (Filter + Condensable)	N/A	0.3	Loc
NOX - Nitrogen Oxides	N/A	1.38	Loc
SO2 - Sulfur Dioxide	N/A	0.27	Loc
VOC - Volatile Organic Compounds	N/A	3.12	Loc

Allocation method: Area = Land area ratio; Loc = Location; Pop = Population ratio.

5 2010 Emissions Inventories

5.1 Overview

Since the Nogales NA met the $PM_{2.5}$ NAAQS based on ambient monitoring data from 2009-2011, ADEQ selected 2010 to serve as a representative emissions inventory for the purpose of the State's required PM2.5 plan submittal. The current SIP characterizes emissions levels for $PM_{2.5}$, NH_3, NO_x, SO_2, and VOCs. Because 2008 is the year of the most current and complete national emissions inventory, ADEQ chose it as the base year for estimating the Nogales $PM_{2.5}$ SIP 2010 emissions inventories. Tables 5.1 through 5.4 provide NA emissions projections between the years of 2008 and 2010.   "NG" refers to those sectors which are expected to experience no growth between 2008 and 2010; "Pop" projections are based on the population projection methods outlined in Section 3.4; "MOVES" projections are based on the methodology outlined in Section 3.2.1, and "Loc" projections are projections for identifiable source locations expected to maintain constant emissions between 2008 and 2010.

The 2010 emissions inventories results are shown in the tables below. An emissions inventory for 2008 was also included as it served as the starting point for the 2010 inventories.

Table 5.1: Santa Cruz County & Nogales NA 2008 and 2010 $PM_{2.5}$ Non-Road Mobile Source Emissions Inventories (tons per year)			
Non-road Mobile Source Emissions Categories	2008 NNA (tpy)	2010 NNA (tpy)	Projection Method
NH3 - Ammonia			
OHV Diesel, Construction and Mining Equipment (Equip.)	0.08	0.08	NG
Total	**0.08**	**0.08**	
NOx - Nitrogen Oxides			
OHV Diesel, Construction and Mining Equipment	89.13	89.13	NG
OHV Diesel, Commercial (Comm.) Equipment	22.88	22.88	NG
OHV Gasoline, 4-Stroke, Commercial Equipment	10.21	10.21	NG
OHV Diesel, Industrial Equipment	5.65	5.65	NG
LPG, Industrial Equipment	4.44	4.44	NG
LPG, Commercial Equipment	3.92	3.92	NG
OHV Gasoline, 4-Stroke, Lawn and Garden Equipment	1.50	1.52	Pop
OHV Gasoline, 4-Stroke, Recreational Equipment	1.34	1.36	Pop
CNG, Commercial Equipment	0.98	0.98	NG
Mobile Sources, OHV Gas, 4-Stroke, Construction and Mining	0.62	0.62	NG
OHV Diesel, Lawn and Garden Equipment	0.50	0.51	Pop
OHV Diesel, Agricultural Equipment	0.03	0.03	NG
CNG, Industrial Equipment	0.31	0.31	NG
OHV Gasoline, 2-Stroke, Recreational Equipment	0.27	0.27	Pop
LPG, Construction and Mining Equipment	0.26	0.26	NG
OHV Diesel, Recreational Equipment	0.25	0.25	Pop
OHV Gasoline, 4-Stroke, Industrial Equipment	0.18	0.18	NG
OHV Gasoline, 2-Stroke, Lawn and Garden Equipment	0.11	0.11	Pop
OHV Gasoline, 2-Stroke, Commercial Equipment	0.09	0.09	NG
Total	**142.69**	**142.73**	
PM25-PRI - PM2.5 Primary (Filter + Condensable)			
OHV Diesel, Construction and Mining Equipment	7.11	7.11	NG
OHV Diesel, Commercial Equipment	2.27	2.27	NG
OHV Gasoline, 2-Stroke, Recreational Equipment	1.60	1.62	Pop
OHV Gasoline, 2-Stroke, Lawn and Garden Equipment	0.48	0.49	Pop
OHV Diesel, Industrial Equipment	0.44	0.44	NG
OHV Gasoline, 4-Stroke, Commercial Equipment	0.40	0.40	NG
Mobile Sources, OHV Gas, 2-Stroke, Commercial Equipment	0.35	0.35	NG
OHV Gasoline, 2-Stroke, Construction and Mining Equipment	0.25	0.25	NG
OHV Gasoline, 4-Stroke, Recreational Equipment	0.14	0.14	Pop
OHV Gasoline, 4-Stroke, Lawn and Garden Equipment	0.11	0.11	Pop

Table 5.1: Santa Cruz County & Nogales NA 2008 and 2010 PM$_{2.5}$ Non-Road Mobile Source Emissions Inventories (tons per year)			
Non-road Mobile Source Emissions Categories	2008 NNA (tpy)	2010 NNA (tpy)	Projection Method
Total	**13.14**	**13.17**	
SO2 - Sulfur Dioxide			
OHV Diesel, Construction and Mining Equipment	2.10	2.10	NG
OHV Diesel, Commercial Equipment	0.48	0.48	NG
OHV Diesel, Industrial Equipment	0.15	0.15	NG
OHV Gasoline, 4-Stroke, Commercial Equipment	0.07	0.07	NG
Total	**2.80**	**2.80**	
VOC - Volatile Organic Compounds			
OHV Gasoline, 2-Stroke, Recreational Equipment	49.08	49.62	Pop
OHV Gasoline, 4-Stroke, Commercial Equipment	47.58	47.58	NG
OHV Gasoline, 4-Stroke, Lawn and Garden Equipment	20.05	20.28	Pop
OHV Gasoline, 4-Stroke, Recreational Equipment	13.54	13.69	Pop
OHV Diesel, Construction and Mining Equipment	9.16	9.16	NG
OHV Gasoline, 2-Stroke, Lawn and Garden Equipment	5.70	5.76	Pop
OHV Diesel, Commercial Equipment	3.36	3.36	NG
OHV Gasoline, 2-Stroke, Commercial Equipment	3.23	3.23	NG
OHV Gasoline, 4-Stroke, Construction and Mining Equipment	2.02	2.02	NG
OHV Gasoline, 2-Stroke, Construction and Mining Equipment	1.90	1.90	NG
LPG, Industrial Equipment	1.26	1.26	NG
LPG, Commercial Equipment	0.85	0.85	NG
OHV Diesel, Industrial Equipment	0.52	0.52	NG
OHV Gasoline, 4-Stroke, Industrial Equipment	0.22	0.22	NG
LPG, Construction and Mining Equipment	0.07	0.07	NG
OHV Diesel, Recreational Equipment	0.07	0.07	Pop
Total	**158.61**	**159.58**	

Allocation method: Pop = Population ratio, NG = No Growth.

Table 5.2: Santa Cruz County & Nogales NA 2008 and 2010 Non-Point Source Emissions Inventories			
Non-point Source Emissions Categories	2008 NNA (tpy)	2010 NNA (tpy)	Projection Method
NH3 - Ammonia			
Misc. Area Sources, Ag. Production - Livestock, Beef Cattle	4.15	4.15	NG
Misc. Area Sources, Ag. Production - Livestock, Goats	3.07	3.07	NG
Misc. Area Sources, Ag. Production - Livestock, Dairy Cattle	1.17	1.17	NG
Waste Disposal, Treatment, and Recovery, Wastewater Treatment, Public Owned	11.35	11.47	Pop
Misc. Area Sources, Ag. Production - Livestock, Horses, Ponies	0.82	0.82	NG
Misc. Area Sources, Other Combustion, Prescribed Forest Burning	0.17	0.17	NG
Misc. Area Sources, Other Combustion, Residential Wood Burning	1.68	1.70	Pop
Stationary Source Fuel Combustion, Industrial, Distillate Oil	0.22	0.22	NG
Misc. Area Sources, Ag. Production - Livestock, Sheep and Lambs Waste	0.02	0.02	NG
Stationary Source Fuel Combustion, Industrial, Natural Gas	0.17	0.17	NG
Stationary Source Fuel Combustion, Commercial/Institutional, Distillate Oil	0.07	0.07	Pop
Total	**22.89**	**23.03**	
NOx - Nitrogen Oxides			
Misc. Area Sources, Other Combustion, Prescribed Forest Burning	1.17	1.17	NG
Stationary Source Fuel Combustion, Residential, Natural Gas	8.62	8.71	Pop
Stationary Source Fuel Combustion, Coal	6.51	6.58	Pop
Stationary Source Fuel Combustion, Commercial/Institutional, Natural Gas	6.27	6.34	Pop
Stationary Source Fuel Combustion, Industrial, Distillate Oil	5.64	5.70	Pop
Waste Disposal, Treatment, and Recovery, Open Burning, All Categories	4.71	4.76	Pop
Waste Disposal, Treatment, and Recovery, Open Burning, Residential	4.36	4.41	Pop
Stationary Source Fuel Combustion, Residential, Liquefied Petroleum Gas (LPG)	3.70	3.74	Pop
Misc. Area Sources, Other Combustion, Residential Wood Burning	3.38	3.42	Pop
Stationary Source Fuel Combustion, Industrial, Natural Gas	2.19	2.21	Pop
Stationary Source Fuel Combustion, Commercial/Institutional, Distillate Oil	1.59	1.61	Pop
Waste Disposal, Treatment, and Recovery, On-site Incineration, Commercial	0.37	0.37	Loc
Stationary Source Fuel Combustion, Comm./Institutional, LPG	0.19	0.19	Pop
Stationary Source Fuel Combustion, Industrial, Residual Oil	0.10	0.10	Pop
Total	**48.80**	**49.32**	
PM25-PRI - PM2.5 Primary (Filter + Condensable)			
Mobile Sources, Unpaved Roads, All Unpaved Roads	154.89	156.59	Pop
Industrial Processes, Construction: Road Construction	64.04	64.04	NG
Mobile Sources, Paved Roads, All Paved Roads	49.56	50.11	Pop
Industrial Processes, Construction: Industrial/Commercial/Institutional	34.20	34.20	NG
Misc. Area Sources, Other Combustion, Prescribed Forest Burning	3.00	3.00	NG

Table 5.2: Santa Cruz County & Nogales NA 2008 and 2010 Non-Point Source Emissions Inventories			
Non-point Source Emissions Categories	2008 NNA (tpy)	2010 NNA (tpy)	Projection Method
Misc. Area Sources, Other Combustion, Residential Wood Burning	28.74	29.06	Pop
Waste Disposal, Treatment, and Recovery, Open Burning, Residential	25.28	25.56	Pop
Waste Disposal, Treatment, and Recovery, Open Burning, All Categories	16.81	16.99	Pop
Misc. Area Sources, Ag. Production - Crops, Ag. - Crops	0.86	0.86	NG
Industrial Processes, Food and Kindred Products: Comm. Cooking - Charbroiling	7.26	7.34	Pop
Industrial Processes, Construction: SIC 15 - 17, Residential	5.74	5.80	Pop
Stationary Source Fuel Combustion, Industrial, Bituminous/Subbituminous Coal	1.45	1.45	NG
Industrial Processes, Food and Kindred Products: Commercial Cooking - Frying	1.43	1.45	Pop
Stationary Source Fuel Combustion, Residential, Natural Gas	0.69	0.70	Pop
Stationary Source Fuel Combustion, Commercial/Institutional, Natural Gas	0.48	0.48	NG
Stationary Source Fuel Combustion, Industrial, Distillate Oil	0.44	0.44	NG
Stationary Source Fuel Combustion, Residential, Liquefied Petroleum Gas (LPG)	0.30	0.30	Pop
Misc. Area Sources, Other Combustion, Structure Fires	0.26	0.26	Pop
Stationary Source Fuel Combustion, Commercial/Institutional, Distillate Oil	0.17	0.17	NG
Stationary Source Fuel Combustion, Industrial, Natural Gas	0.17	0.17	NG
Waste Disposal, Treatment, On-site Incineration, Comm. Institutional	0.20	0.20	Loc
Total	**395.97**	**399.17**	
SO2 - Sulfur Dioxide			
Stationary Source Fuel Combustion, Industrial, Distillate Oil	12.01	12.01	NG
Stationary Source Fuel Combustion, Industrial, Bituminous/Subbituminous Coal	10.57	10.57	NG
Misc. Area Sources, Other Combustion, Prescribed Forest Burning	0.32	0.32	NG
Stationary Source Fuel Combustion, Commercial/Institutional, Distillate Oil	3.38	3.38	NG
Waste Disposal, Treatment, and Recovery, Open Burning, Residential	0.73	0.74	Pop
Stationary Source Fuel Combustion, Industrial, Residual Oil	0.63	0.63	NG
Misc. Area Sources, Other Combustion, Residential Wood Burning	0.56	0.57	Pop
Waste Disposal, Treatment, On-site Incineration, Comm./Institutional	0.12	0.12	Loc
Total	**28.32**	**28.33**	
VOC - Volatile Organic Compounds			
Waste Disposal, Treatment, and Recovery	609.17	615.87	Pop
Storage and Transport (S&T), Petrol and Petrol Product Storage, Gas Service Stations	114.60	115.86	Pop
Misc. Area Sources, Other Combustion, Residential Wood Burning	35.58	35.97	Pop
Solvent Utilization, Misc. Non-industrial: Consumer, Household Products	24.46	24.73	Pop
Waste Disposal, Treatment, and Recovery, Open Burning, Residential	21.79	22.03	Pop

Table 5.2: Santa Cruz County & Nogales NA 2008 and 2010 Non-Point Source Emissions Inventories			
Non-point Source Emissions Categories	2008 NNA (tpy)	2010 NNA (tpy)	Projection Method
Misc. Area Sources, Other Combustion, Prescribed Forest Burning	1.87	1.87	NG
Solvent Utilization, Misc. Non-industrial: Comm., Pesticide Application: Agricultural	1.81	1.81	NG
S&T, Petroleum and Petroleum Product Storage, Bulk Terminals: All Evap. Losses	15.11	15.28	Pop
Solvent Utilization, Degreasing, All Industries: Cold Cleaning	14.70	14.86	Pop
Solvent Utilization, Misc. Non-industrial: Consumer, Personal Care Products	13.63	13.78	Pop
Solvent Utilization, Surface Coating, Misc. Manufacturing	13.20	13.35	Pop
Waste Disposal, Treatment, and Recovery, Open Burning, All Categories	11.61	11.74	Pop
Waste Disposal, Treatment, and Recovery, Wastewater Treatment, Public Owned	5.91	5.98	Pop
Solvent Utilization, Misc. Industrial, Adhesive (Industrial) Application	4.53	4.58	Pop
Solvent Utilization, Graphic Arts, All Processes	3.75	3.79	Pop
Solvent Utilization, Surface Coating, Metal Furniture	3.34	3.38	Pop
Solvent Utilization, Surface Coating, Auto Refinishing	2.66	2.69	Pop
Industrial Processes, Food and Kindred Products: Commercial Cooking - Charbroiling	1.00	1.01	Pop
Solvent Utilization, Misc. Non-industrial: Consumer	0.71	0.72	Pop
Stationary Source Fuel Combustion, Residential, Natural Gas	0.50	0.51	Pop
Solvent Utilization, Surface Coating, Factory Finished Wood	0.43	0.43	Pop
Solvent Utilization, Surface Coating, Wood Furniture: SIC 25	0.37	0.37	Pop
Stationary Source Fuel Combustion, Commercial/Institutional, Natural Gas	0.34	0.34	Pop
Misc. Area Sources, Other Combustion, Structure Fires	0.30	0.30	Pop
Solvent Utilization, Surface Coating, Other Special Purpose Coatings	0.28	0.28	Pop
Industrial Processes, Food and Kindred Products: Commercial Cooking - Frying	0.22	0.22	Pop
Stationary Source Fuel Combustion, Residential, Liquefied Petroleum Gas (LPG)	0.22	0.22	Pop
Solvent Utilization, Surface Coating, Electronic and Other Electrical	0.17	0.17	Pop
Solvent Utilization, Surface Coating, Industrial Maintenance Coatings	0.15	0.15	Pop
Solvent Utilization, Surface Coating, Misc. Finished Metals	0.14	0.14	Pop
Stationary Source Fuel Combustion, Industrial, Natural Gas	0.12	0.12	Pop
Total	**902.67**	**912.56**	

Allocation method: Pop = Population ratio, NG = No Growth.

Table 5.3: Santa Cruz County & Nogales NA 2008 and 2010 PM$_{2.5}$ On-Road Mobile Sources Emissions Inventories			
On-road Mobile Emissions Source Categories	2008 NNA (tpy)	2010 NNA (tpy)	Projection Method
NH3 - Ammonia			
On-Road Gasoline Off-Network	0.00	0.00	MOVES
On-Road Gasoline Rural Restricted Access	3.11	2.79	MOVES
On-Road Gasoline Rural Unrestricted Access	3.13	2.81	MOVES
On-Road Gasoline Urban Restricted Access	1.44	1.29	MOVES
On-Road Gasoline Urban Unrestricted Access	5.87	5.26	MOVES
On-Road Diesel Off-Network	0.00	0.00	MOVES
On-Road Diesel Rural Restricted Access	0.40	0.36	MOVES
On-Road Diesel Rural Unrestricted Access	0.16	0.15	MOVES
On-Road Diesel Urban Restricted Access	0.09	0.08	MOVES
On-Road Diesel Urban Unrestricted Access	0.23	0.22	MOVES
Total	**14.42**	**12.96**	
NOX - Nitrogen Oxides			
On-Road Gasoline Off-Network	91.80	83.97	MOVES
On-Road Gasoline Rural Restricted Access	74.91	63.79	MOVES
On-Road Gasoline Rural Unrestricted Access	74.85	63.85	MOVES
On-Road Gasoline Urban Restricted Access	34.08	28.91	MOVES
On-Road Gasoline Urban Unrestricted Access	142.49	120.72	MOVES
On-Road Diesel Off-Network	47.69	42.55	MOVES
On-Road Diesel Rural Restricted Access	215.51	161.45	MOVES
On-Road Diesel Rural Unrestricted Access	70.29	53.62	MOVES
On-Road Diesel Urban Restricted Access	41.17	31.36	MOVES
On-Road Diesel Urban Unrestricted Access	120.13	93.48	MOVES
Total	**912.91**	**743.72**	
PM25-PRI PM2.5 Primary (Filter + Condensable)			
On-Road Gasoline Off-Network	1.17	1.05	MOVES
On-Road Gasoline Rural Restricted Access	0.95	0.86	MOVES
On-Road Gasoline Rural Unrestricted Access	0.69	0.62	MOVES
On-Road Gasoline Urban Restricted Access	0.46	0.42	MOVES
On-Road Gasoline Urban Unrestricted Access	1.34	1.23	MOVES
On-Road Diesel Off-Network	0.71	0.54	MOVES
On-Road Diesel Rural Restricted Access	8.11	6.25	MOVES
On-Road Diesel Rural Unrestricted Access	3.22	2.52	MOVES

Table 5.3: Santa Cruz County & Nogales NA 2008 and 2010 PM$_{2.5}$ On-Road Mobile Sources Emissions Inventories			
On-road Mobile Emissions Source Categories	2008 NNA (tpy)	2010 NNA (tpy)	Projection Method
On-Road Diesel Urban Restricted Access	1.88	1.46	MOVES
On-Road Diesel Urban Unrestricted Access	6.59	5.19	MOVES
Total	**25.12**	**20.12**	
SO2 - Sulfur Dioxide			
On-Road Gasoline Off-Network	0.19	0.13	MOVES
On-Road Gasoline Rural Restricted Access	1.26	0.87	MOVES
On-Road Gasoline Rural Unrestricted Access	1.59	1.10	MOVES
On-Road Gasoline Urban Restricted Access	0.30	0.21	MOVES
On-Road Gasoline Urban Unrestricted Access	1.43	0.99	MOVES
On-Road Diesel Off-Network	0.09	0.04	MOVES
On-Road Diesel Rural Restricted Access	1.55	0.74	MOVES
On-Road Diesel Rural Unrestricted Access	0.65	0.32	MOVES
On-Road Diesel Urban Restricted Access	0.11	0.05	MOVES
On-Road Diesel Urban Unrestricted Access	0.31	0.15	MOVES
Total	**7.49**	**4.60**	
VOC - Volatile Organic Compounds			
On-Road Gasoline Off-Network	273.09	246.19	MOVES
On-Road Gasoline Rural Restricted Access	25.22	20.28	MOVES
On-Road Gasoline Rural Unrestricted Access	36.10	28.65	MOVES
On-Road Gasoline Urban Restricted Access	7.13	5.63	MOVES
On-Road Gasoline Urban Unrestricted Access	40.95	32.21	MOVES
On-Road Diesel Off-Network	16.79	13.95	MOVES
On-Road Diesel Rural Restricted Access	12.19	10.00	MOVES
On-Road Diesel Rural Unrestricted Access	8.16	6.95	MOVES
On-Road Diesel Urban Restricted Access	1.42	1.21	MOVES
On-Road Diesel Urban Unrestricted Access	5.11	4.47	MOVES
Total	**426.18**	**369.54**	

Table 5.4: Santa Cruz County & Nogales NA 2008 and 2010 PM$_{2.5}$ Emission Inventories (tons per year)			
Point Sources	2008 (tpy)	2010 (tpy)	Projection Method
Valencia Power Plant			
PM2.5-PRI - PM2.5 Primary (Filter + Condensable)	1.09	1.09	NG
NOX - Nitrogen Oxides	9.65	9.65	NG
SO2 - Sulfur Dioxide	0.21	0.21	NG
VOC - Volatile Organic Compounds	0.19	0.19	NG
Nogales International Airport			
PM2.5-PRI - PM2.5 Primary (Filter + Condensable)	0.30	0.30	NG
NOX - Nitrogen Oxides	1.38	1.38	NG
SO2 - Sulfur Dioxide	0.27	0.27	NG
VOC - Volatile Organic Compounds	3.12	3.12	NG

6 Discussion and Conclusion

The previous sections outlined the assumptions utilized to estimate emissions of NH$_3$, NO$_x$, PM$_{2.5}$, SO$_2$, and VOCs for all source categories identified within the Nogales NA for the years 2008 and 2010. A projected NA population growth of 1.1% between the years of 2008 and 2010 has resulted in stagnant or slightly increasing estimated emissions for all pollutants in all sectors except On-road Mobile Emissions (Table 6.1). In particular, population increases have resulted in increased emissions in the following sectors: construction; mobile brake wear, tire wear, and dust re-entrainment; waste disposal; and fuel burning. Despite these population based increases in emissions, a decrease in Mobile emissions between 2008 and 2010 resulted in a net decrease in total emissions for all pollutants. The On-road Mobile Emission decreases are primarily attributable to advances in motor vehicle control technologies and fuel efficiency.

Pollutant	Source Category	2008 NNA (tpy)	2010 NNA (tpy)	% Change 2008-2010
NH3 - Ammonia	Non-road Mobile Source Emissions Categories	0.08	0.08	0%
	Non-point Source Emissions Categories	22.89	23.03	1%
	On-road Mobile Emissions Source Categories	14.42	12.96	-10%
	Total	**37.39**	**36.07**	**-4%**
NOx - Nitrogen Oxides	Non-road Mobile Source Emissions Categories	142.69	142.73	0%
	Non-point Source Emissions Categories	48.80	49.32	1%
	On-road Mobile Emissions Source Categories	912.91	743.72	-19%
	Point Sources	11.03	11.03	0%
	Total	**1,115.42**	**946.80**	**-15%**
PM25-PRI - PM2.5 Primary (Filter + Condensable)	Non-road Mobile Source Emissions Categories	13.14	13.17	0%
	Non-point Source Emissions Categories	395.97	399.17	1%
	On-road Mobile Emissions Source Categories	25.12	20.12	-20%
	Point Sources	1.39	1.39	0%
	Total	**435.62**	**433.85**	**0%**
SO2 - Sulfur Dioxide	Non-road Mobile Source Emissions Categories	2.80	2.80	0%
	Non-point Source Emissions Categories	28.32	28.33	0%
	On-road Mobile Emissions Source Categories	7.49	4.60	-39%
	Point Sources	0.48	0.48	0%
	Total	**39.10**	**36.22**	**-7%**
VOC - Volatile Organic Compounds	Non-road Mobile Source Emissions Categories	158.61	159.58	1%
	Non-point Source Emissions Categories	902.67	912.56	1%
	On-road Mobile Emissions Source Categories	426.18	369.54	-13%
	Point Sources	3.31	3.31	0%
	Total	**1,490.77**	**1,444.99**	**-3%**

Table 6.1: Nogales NA Emissions Totals by Major Source Category for 2008 and 2010

Appendix A: ADOA Estimated Santa Cruz and City of Nogales Populations, 2000-2010

ADOA Estimate Period	Est. Base 2000 Revised to U.S. Census	Est. July 1, 2000	Est. July 1, 2001	Est. July 1, 2002	Est. July 1, 2003	Est. July 1, 2004	Est. July 1, 2005	Est. July 1, 2006	Est. July 1, 2007	Est. July 1, 2008	Est. July 1, 2009	July 1, 2010 Est. Revised to U.S. Census
Santa Cruz	**38,381**	**39,305**	**39,224**	**39,657**	**40,528**	**42,038**	**43,809**	**44,929**	**46,519**	**47,016**	**47,384**	**47,539**
Nogales	20,878	20,969	20,887	20,923	20,915	21,219	21,474	21,327	21,223	21,107	20,956	20,880
Balance of County	16,599	17,441	17,446	17,836	18,708	19,918	21,427	22,697	24,388	24,996	25,519	25,750

Nogales NAA Boundary By 2010 Census Block

Blue shade areas: Nogales NAA
Red line : block boundaries
Black text: population numbers
Green line: places boundaries

Rio Rico CDP
Nogales NAA
Beyerville CDP
Nogales city
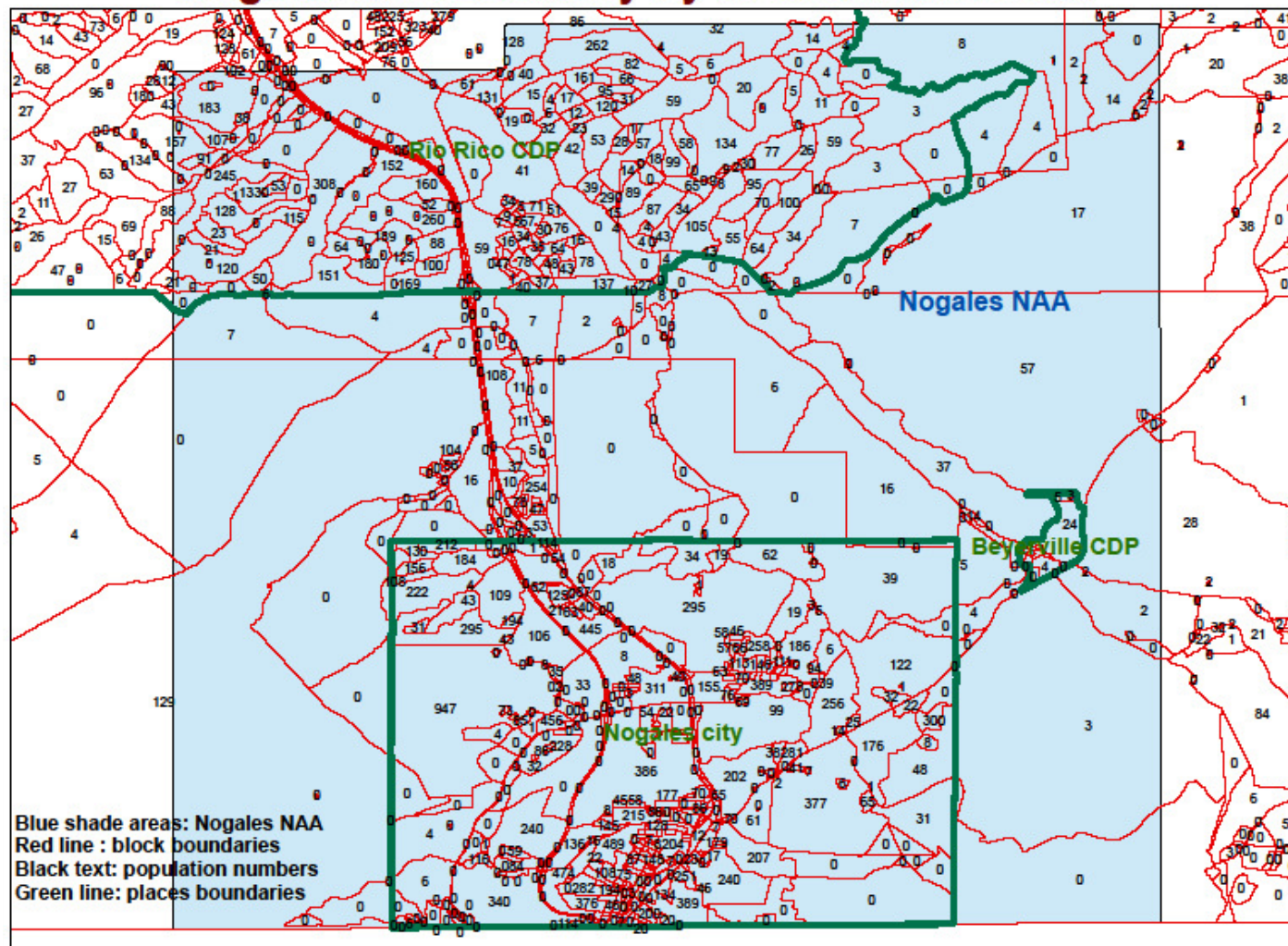
Appendix B: MOVES 2008 Run Specification using Santa Cruz County Database (local)

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"<pollutantprocessassociation pollutantkey=""87"" pollutantname=""Volatile Organic Compounds"" processkey=""13"" processname=""Evap Fuel Leaks""/>"
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    </databaseselections>
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useParameters No

```
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numberofrunspersimulation=""0"" numberofsimulations=""0""/>"
    "<geographicoutputdetail description=""COUNTY""/>"
    <outputemissionsbreakdownselection>
        "<modelyear selected=""false""/>"
        "<fueltype selected=""true""/>"
        "<emissionprocess selected=""false""/>"
        "<onroadoffroad selected=""true""/>"
        "<roadtype selected=""true""/>"
        "<sourceusetype selected=""true""/>"
        "<movesvehicletype selected=""false""/>"
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databasename=""EPA_Original_2008_Santa_Cruz"" description=""""/>"
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    "<outputsho value=""false""/>"
    "<outputsh value=""false""/>"
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    "<outputpopulation value=""false""/>"
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description=""""/>"
    "<pmsize value=""0""/>"
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        "<distancefactors selected=""true"" units=""Miles""/>"
        "<massfactors selected=""true"" units=""Pounds"" energyunits=""Million BTU""/>"
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    </savedata>

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    </donotexecute>
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description="""""/>"
        "<donotperformfinalaggregation selected=""false""/>"
    "<lookuptableflags scenarioid="""" truncateoutput=""false"" truncateactivity=""false""/>"
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`</runspec>`

Appendix C: MOVES 2008 Run Specification using EPA's Default Database (national)

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Cruz County"/>
    </geographicselections>
    <timespan>
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        <month id="2"/>
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        <month id="4"/>
        <month id="5"/>
        <month id="6"/>
        <month id="7"/>
        <month id="8"/>
        <month id="9"/>
        <month id="10"/>
        <month id="11"/>
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        <day id="2"/>
        <day id="5"/>
        <beginhour id="1"/>
        <endhour id="24"/>
        <aggregateBy key="Hour"/>
    </timespan>
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sourcetypename="Combination Long-haul Truck"/>
        <onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel" sourcetypeid="61"
sourcetypename="Combination Short-haul Truck"/>
        <onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel" sourcetypeid="41"
sourcetypename="Intercity Bus"/>
        <onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel" sourcetypeid="32"
sourcetypename="Light Commercial Truck"/>
        <onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel" sourcetypeid="54"
sourcetypename="Motor Home"/>
        <onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel" sourcetypeid="11"
sourcetypename="Motorcycle"/>
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sourcetypename="Passenger Car"/>
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sourcetypename="Passenger Truck"/>
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```xml
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        <onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel" sourcetypeid="52" sourcetypename="Single Unit Short-haul Truck"/>
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        <onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline" sourcetypeid="62" sourcetypename="Combination Long-haul Truck"/>
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        <roadtype roadtypeid="3" roadtypename="Rural Unrestricted Access"/>
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```

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<pollutantprocessassociation pollutantkey="79" pollutantname="Non-Methane Hydrocarbons" processkey="19" processname="Refueling Spillage Loss"/>
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   <pollutantprocessassociation pollutantkey="1" pollutantname="Total Gaseous Hydrocarbons" processkey="19" processname="Refueling Spillage Loss"/>
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   <fueltype selected="true"/>
   <emissionprocess selected="false"/>

```xml
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            <roadtype selected="true"/>
            <sourceusetype selected="true"/>
            <movesvehicletype selected="false"/>
            <onroadscc selected="false"/>
            <offroadscc selected="false"/>
            <estimateuncertainty selected="false" numberOfIterations="2"
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            <sector selected="false"/>
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            <hpclass selected="false"/>
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        <outputsho value="false"/>
        <outputsh value="false"/>
        <outputshp value="false"/>
        <outputshidling value="false"/>
        <outputstarts value="false"/>
        <outputpopulation value="false"/>
        <scaleinputdatabase servername="" databasename="" description=""/>
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            <distancefactors selected="true" units="Miles"/>
            <massfactors selected="true" units="Pounds" energyunits="Million BTU"/>
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        </savedata>

        <donotexecute>

        </donotexecute>

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            <donotperformfinalaggregation selected="false"/>
        <lookuptableflags scenarioid="" truncateoutput="false" truncateactivity="false"/>
</runspec>
```

Appendix D: Email from EPA specifying Re: Nogales Emissions Inventory and MOVES

From: Jeffrey Buss [Buss.Jeffrey@epamail.epa.gov]
Sent: Thursday, May 31, 2012 8:32 AM
To: Ryan C. Templeton
Cc: Diane Arnst; Steve M. Calderon; Colleen McKaughan; Phil B. Denee; Jerry Wamsley;
Theresa E. Rigney
Subject: Re: Nogales Emissions Inventory and MOVES
Good morning Ryan.

I checked my notes from our conversation last April and agree with your summary about how to
proceed with the PM emissions inventory development using MOVES. I would just note that the
reason for using population increase between 2008 and 2010 (as described in the #3
recommendations below) is that VMT or related data (which might be more accurate than
population) is not available.

Please let me know if you have questions or need other information.

Best,

Jeffrey Buss
U.S. EPA Region 9
415-947-4152

From: "Ryan C. Templeton" <Templeton.Ryan@azdeq.gov>
To: Jeffrey Buss/R9/USEPA/US@EPA
Cc: Colleen McKaughan/R9/USEPA/US@EPA, Diane Arnst <Arnst.Diane@azdeq.gov>,
Jerry Wamsley/R9/USEPA/US@EPA, "Theresa E. Rigney" <Rigney.Theresa@azdeq.gov>,
"Steve M. Calderon" <Calderon.Steve@azdeq.gov>, "Phil B. Denee" <Denee.Phil@azdeq.gov>
Date: 05/31/2012 08:08 AM
Subject:

Jeff,

As ADEQ is currently in the final stages of completing the Emission Inventory (EI) for the
Nogales, AZ Non-Attainment Area, we wanted to confirm the alternative methods you proposed
for estimation of on-road mobile source emissions using MOVES were acceptable for the PM2.5
Inventory development. On 4/30/2012 you and I spoke on the phone regarding the following
issues with MOVES on-road mobile emission estimation using the Santa Cruz county database
that was supplied to ADEQ by EPA ("c04023y2008_in20100329"):

1)   2008 SO2 MOVES emissions were under-calculated as 0 tons.

2)   2008 VOC MOVES emissions were over-calculated as 40,000 tons.
3)   The 2010 specific data was not included within the supplied database making ADEQ
unable to run MOVES for this year.

A more accurate dataset was unavailable from Santa Cruz County or ADOT. Upon discussing
these issues with you, the following recommendations/agreements were made regarding how to
proceed with PM2.5 EI development:

1)   2008 SO2 emissions should be calculated using the National, default database within
MOVES.
2)   2008 VOC emissions should be calculated using the National, default database within
MOVES.
3)   2010 emissions should be grown from 2008 MOVES results based on population increases
within the Non-Attainment Area over the same time period.

Please confirm that these alternative methods of MOVES emission calculation are acceptable for
the finalization of the Nogales, AZ PM2.5 EI. If these methods are not acceptable, please advise
on what steps should be taken to compensate for the above listed MOVES County database
deficiencies.

Thanks,

Ryan Templeton
Environmental Engineer Specialist
Air Quality Division
Arizona Department of Environmental Quality
rct@azdeq.gov
(602) 771-4230

Appendix E: MOVES Emission Calculations using local database to National Default Ratio Technique

The emissions (tpy) presented in the "2008 local (FINAL)" Table below contain the MOVES results for NH_3, NO_x, and $PM_{2.5}$ using the local database and the SO_2 and VOC results using the national default database.

Table E-1

2008 local (FINAL)	NH3		NOx		PM2.5		SO2		VOC	
	SC county	NAA	SC county	NAA	SC county	NAA	SC county	NAA	SC county	NAA
On-Road Gasoline Off-Network	0.00	0.00	138.93	91.80	1.77	1.17	0.29	0.19	413.29	273.09
On-Road Gasoline Rural Restricted Access	4.71	3.11	113.37	74.91	1.44	0.95	1.91	1.26	38.17	25.22
On-Road Gasoline Rural Unrestricted Access	4.73	3.13	113.27	74.85	1.04	0.69	2.41	1.59	54.64	36.10
On-Road Gasoline Urban Restricted Access	2.18	1.44	51.57	34.08	0.70	0.46	0.45	0.30	10.79	7.13
On-Road Gasoline Urban Unrestricted Access	8.88	5.87	215.64	142.49	2.03	1.34	2.17	1.43	61.98	40.95
On-Road Diesel Off-Network	0.00	0.00	72.17	47.69	1.07	0.71	0.13	0.09	25.41	16.79
On-Road Diesel Rural Restricted Access	0.60	0.40	326.14	215.51	12.27	8.11	2.35	1.55	18.45	12.19
On-Road Diesel Rural Unrestricted Access	0.24	0.16	106.38	70.29	4.88	3.22	0.99	0.65	12.35	8.16
On-Road Diesel Urban Restricted Access	0.13	0.09	62.30	41.17	2.84	1.88	0.17	0.11	2.15	1.42
On-Road Diesel Urban Unrestricted Access	0.35	0.23	181.80	120.13	9.98	6.59	0.47	0.31	7.74	5.11
TOTAL	21.82	14.42	1381.57	912.91	38.02	25.12	11.34	7.49	644.97	426.18

The emissions (tpy) presented in the "2008 National" Table below contain the MOVES results for NH_3, NO_x, $PM_{2.5}$, SO_2, and VOCs using the national default database for 2008.

Table E-2

2008 National	NH3		NOx		PM2.5		SO2		VOC	
	SC county	NAA	SC county	NAA	SC county	NAA	SC county	NAA	SC county	NAA
On-Road Gasoline Off-Network	0.00	0.00	193.08	127.58	2.48	1.64	0.29	0.19	413.29	273.09
On-Road Gasoline Rural Restricted Access	7.89	5.22	208.24	137.60	2.54	1.68	1.91	1.26	38.17	25.22
On-Road Gasoline Rural Unrestricted Access	9.09	6.00	238.54	157.62	2.09	1.38	2.41	1.59	54.64	36.10
On-Road Gasoline Urban Restricted Access	1.73	1.14	44.90	29.67	0.59	0.39	0.45	0.30	10.79	7.13
On-Road Gasoline Urban Unrestricted Access	7.17	4.74	189.64	125.31	1.73	1.14	2.17	1.44	61.98	40.96
On-Road Diesel Off-Network	0.00	0.00	109.55	72.39	1.65	1.09	0.13	0.08	25.41	16.79
On-Road Diesel Rural Restricted Access	1.05	0.69	588.19	388.66	22.49	14.86	2.35	1.56	18.45	12.19
On-Road Diesel Rural Unrestricted Access	0.55	0.36	243.99	161.22	11.29	7.46	0.99	0.66	12.35	8.16
On-Road Diesel Urban Restricted Access	0.09	0.06	42.53	28.10	1.99	1.31	0.17	0.11	2.15	1.42
On-Road Diesel Urban Unrestricted Access	0.24	0.16	114.86	75.90	6.30	4.16	0.47	0.31	7.74	5.11

The ratios presented in the '2008 local ratio' Table below are the calculated ratios of the 2008 local emissions (Table E-1) to the 2008 national emissions (Table E-2). Ratios for SO_2 and VOCs were not calculated since the 2008 National emissions were used in place of the 2008 Local due to the anomalous emissions that were calculated from the 2008 local database.

Table E-3

2008 local ratio	NH3	NOx	PM2.5	SO2	VOC
	SC county	SC county	SC county	SC county	SC county
On-Road Gasoline Off-Network	0.00	0.72	0.71	NA	NA
On-Road Gasoline Rural Restricted Access	0.60	0.54	0.57	NA	NA
On-Road Gasoline Rural Unrestricted Access	0.52	0.47	0.50	NA	NA
On-Road Gasoline Urban Restricted Access	1.26	1.15	1.19	NA	NA
On-Road Gasoline Urban Unrestricted Access	1.24	1.14	1.17	NA	NA
On-Road Diesel Off-Network	0.00	0.66	0.65	NA	NA
On-Road Diesel Rural Restricted Access	0.57	0.55	0.55	NA	NA
On-Road Diesel Rural Unrestricted Access	0.44	0.44	0.43	NA	NA
On-Road Diesel Urban Restricted Access	1.44	1.46	1.43	NA	NA
On-Road Diesel Urban Unrestricted Access	1.46	1.58	1.58	NA	NA

Table E-4

Population		
	2008	2010
Santa Cruz County	47,016	47,539
Nogales NA	31,067	31,413
Ratio	66.1%	66.1%

The emissions (tpy) presented in the "2010 National" Table below contain the MOVES results for NH_3, NO_x, $PM_{2.5}$, SO_2, and VOCs using the national default database for 2010.

Table E-5

2010 National	NH3		NOx		PM2.5		SO2		VOC	
	SC county	NAA	SC county	NAA	SC county	NAA	SC county	NAA	SC county	NAA
On-Road Gasoline Off-Network	0.00	0.00	176.61	116.70	2.22	1.47	0.20	0.13	372.57	246.19
On-Road Gasoline Rural Restricted Access	7.08	4.68	177.33	117.18	2.29	1.51	1.32	0.87	30.69	20.28
On-Road Gasoline Rural Unrestricted Access	8.16	5.39	203.50	134.47	1.88	1.24	1.67	1.10	43.36	28.65
On-Road Gasoline Urban Restricted Access	1.55	1.02	38.09	25.17	0.53	0.35	0.31	0.21	8.52	5.63
On-Road Gasoline Urban Unrestricted Access	6.43	4.25	160.67	106.17	1.58	1.04	1.51	0.99	48.74	32.21
On-Road Diesel Off-Network	0.00	0.00	97.75	64.59	1.26	0.83	0.06	0.04	21.11	13.95
On-Road Diesel Rural Restricted Access	0.95	0.63	440.66	291.18	17.34	11.46	1.12	0.74	15.14	10.00
On-Road Diesel Rural Unrestricted Access	0.51	0.34	186.12	122.98	8.81	5.82	0.48	0.32	10.51	6.95
On-Road Diesel Urban Restricted Access	0.08	0.06	32.40	21.41	1.55	1.03	0.08	0.05	1.83	1.21
On-Road Diesel Urban Unrestricted Access	0.23	0.15	89.38	59.06	4.96	3.28	0.23	0.15	6.76	4.47

The emissions (tpy) presented in the "2010 corrected for local (FINAL)" Table below represent the final MOVES emissions results for Santa Cruz County for 2010. The NH$_3$, NO$_X$, and PM$_{2.5}$ emissions resulted from an adjustment to the emissions that were produced when using the 2010 National Default database by multiplying the emissions from Table E-5 by the ratios from Table E-3. SO$_2$, and VOC emissions presented in Table E-6 were simply calculated using the 2010 national default database and are identical to those emissions presented in Table E-5.

Table E-6

2010 corrected for local (FINAL)	NH3		NOx		PM2.5		SO2		VOC	
	SC county	NAA	SC county	NAA	SC county	NAA	SC county	NAA	SC county	NAA
On-Road Gasoline Off-Network	0.00	0.00	127.08	83.97	1.58	1.05	0.20	0.13	372.57	246.19
On-Road Gasoline Rural Restricted Access	4.23	2.79	96.54	63.79	1.30	0.86	1.32	0.87	30.69	20.28
On-Road Gasoline Rural Unrestricted Access	4.25	2.81	96.63	63.85	0.94	0.62	1.67	1.10	43.36	28.65
On-Road Gasoline Urban Restricted Access	1.95	1.29	43.75	28.91	0.63	0.42	0.31	0.21	8.52	5.63
On-Road Gasoline Urban Unrestricted Access	7.96	5.26	182.70	120.72	1.85	1.23	1.51	0.99	48.74	32.21
On-Road Diesel Off-Network	0.00	0.00	64.40	42.55	0.82	0.54	0.06	0.04	21.11	13.95
On-Road Diesel Rural Restricted Access	0.54	0.36	244.34	161.45	9.46	6.25	1.12	0.74	15.14	10.00
On-Road Diesel Rural Unrestricted Access	0.22	0.15	81.15	53.62	3.81	2.52	0.48	0.32	10.51	6.95
On-Road Diesel Urban Restricted Access	0.12	0.08	47.46	31.36	2.21	1.46	0.08	0.05	1.83	1.21
On-Road Diesel Urban Unrestricted Access	0.34	0.22	141.47	93.48	7.86	5.19	0.23	0.15	6.76	4.47
TOTAL	19.61	12.96	1125.51	743.72	30.46	20.12	6.98	4.60	559.23	369.54

A brief explanation of how the calculations were performed is provided below:

Example using On-Road Gasoline Urban Restricted Access (highlighted in blue)

Table E-1 The MOVES (County) 2008 emission using local (County) data for the Urban Restricted Access for NH3 is 2.18
Table E-2 The MOVES (County) 2008 emission using the National data for the Urban Restricted Access for NH3 is 1.73
Table E-3 The ratio of National to local is 2.18/1.73 = 1.26
Table E-5 The MOVES (County) 2010 emission using the National data for the Urban Restricted Access for NH3 is 1.55
Table E-6 The MOVES (County) 2010 emission for (County) data for the Urban Restricted Access for NH3 would then be 1.55 X 1.26 = 1.95

Appendix B

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901
DEC 10 2010

Eric Massey, Director
Air Quality Division
Arizona Department of Environmental Quality
1110 W. Washington St.
Phoenix, AZ 85007

Dear Mr. Massey:

Thank you for your submission of the Final Report on the State of Arizona Air Monitoring Network Plan for the Year 2010. We have reviewed the submitted document and have found that it is complete, informative, very detailed and meets all of the requirements for annual network plans as required by our regulations set forth under 40 CFR Part 58.10. While this letter serves as official approval of the annual network plan, it does not constitute approval of the system modifications that are proposed in the plan for the future. We will continue to work with your district to review system changes as they proceed.

Enclosed, please find our comments on the plan. If you have any questions regarding this letter or the enclosed comments, please feel free to contact me at (415) 972-3851 or Michael Flagg at (415) 972-3372.

Sincerely,

Matthew Lakin, Manager
Air Quality Analysis Office
Air Division

Enclosure

cc: Theresa Rigney, ADEQ
        Bernard Lum, ADEQ
        Bryan Paris, ADEQ

Comments on 2010 ADEQ Network Plan

Please update next year's annual network plan to reflect the following comments:

- The monitor/site tables for Pb, PM_{10}, and $PM_{2.5}$ on pages 66-70 in should include the specific dates for the last two semi-annual flow audits should be included in each applicable site report.

- The monitor/site tables for $PM_{2.5}$ should include the date of the last PEP audit performed.

- The monitor/site tables for the gaseous pollutant on pages 62-65 should contain information pertaining to the residence times, probe material used, and the date of the last NPAP audit performed.

- The Hayden Old Jail monitor/site table on page 65 states that the SO_2 monitor operating at this site is part of the SLAMS network, while the site is also described as a part of the Source Compliance Monitoring Network in Table 4.7-1 on page 25. Please clarify the characterization of the SO_2 monitoring at this site.

- The monitoring sites in Miami are characterized as part of ADEQ's SIP sites and the Source Compliance Monitoring Network. Please clarify the characterization of monitoring at these sites. Also, Appendix A and D should include information pertaining these sites.

- Section 4.0 should include a section describing the required Pb monitoring requirements. For example, Pb monitoring at Globe Highway should not be considered part of the Source Compliance Monitoring Network (Table 4.7-1) since Pb monitoring at this location is required by the CFR not a PSD permit requirement. This section should also describe the Pb monitoring location recently established in Miami, AZ.

ENCLOSURE 4

Public Hearing Documentation

Public Notice
Publication Certification
Public Hearing Agenda
Public Hearing Sign-in Sheet
Public Hearing Transcript
Public Hearing Officer Certification
Responsiveness Summary

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ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
30 DAY PUBLIC COMMENT PERIOD AND HEARING ON THE
PROPOSED 2013 NOGALES PM$_{2.5}$ NONATTAINMENT AREA PLAN
STATE IMPLEMENTATION PLAN REVISION

The Arizona Department of Environmental Quality (ADEQ) opens a thirty day public comment period with the publication of this notice on Friday, August 2, 2013, for the proposed 2013 Nogales PM$_{2.5}$ Nonattainment Area Plan Arizona State Implementation Plan (SIP) Revision.

A public hearing on the proposed SIP revision will be held on Tuesday, September 3, 2013, at 1:30 p.m., in the City of Nogales Council Chambers, 777 N. Grand Ave, Nogales, AZ 85621. All interested parties will be given an opportunity at the public hearing to submit comments, data, and views, orally and in writing. Written comments may be submitted prior to or during the public hearing and must be postmarked or received at ADEQ by 5:00 p.m. on September 3, 2013.

Written comments should be addressed, faxed, or e-mailed to John Englander, Air Quality Division, State Implementation Plan Section, Arizona Department of Environmental Quality, 1110 W. Washington St., Phoenix, AZ 85007, FAX: (602) 771-2366, E-Mail: englander.john@azdeq.gov

Copies of the proposed SIP are available for review, Monday through Friday, between 8:30 a.m. and 4:30 p.m., at the ADEQ Records Center, 1110 W. Washington St., Phoenix, AZ 85007, (602) 771-4712. The proposed SIP can also be viewed online at http://www.azdeq.gov/environ/air/plan/index.html by selecting Air Quality – Public Notices, Meetings, and Hearings.

Persons with a disability may request a reasonable accommodation such as a sign language interpreter, by contacting Alicia Pollard, (602) 771-4791, via email pollard.alicia@azdeq.gov, TDD line for hearing impaired individuals, (602) 771-4829. Requests should be made as early as possible to allow time to arrange the accommodation.

AFFIDAVIT OF PUBLICATION

ELISA BERMUDEZ

STATE OF ARIZONA)
        : SS
COUNTY OF SANTA CRUZ)

Elisa Bermudez   being first
Duly sworn, deposes and says: That (he) (she) is the Agent to the Publisher of the
NOGALES INTERNATIONAL newspaper printed and published two days week
in the City of Nogales, County of Santa Cruz, State of Arizona. That the notice, a
copy of which is hereto attached, described as follows:

30 DAY PUBIC COMMENT
PERIOD & HEARING ON
THE PROPOSED 2013
NOGALES PM2.5 NON
ATTAINMENT AREA PLAN

was printed and published in the regular and entire issue of said

NOGALES INTERNATIONAL for   2 issues, that the first was

made on the   2nd day of   AUGUST   20   13

and the last publication thereof was made on the   9th   day of

AUGUST   20   13   that said publication

was made on each of the following dates, to wit:

08/02/13
08/09/13

Request of   ADEQ ARIZONA DEPARTMENT O

NOGALES INTERNATIONAL
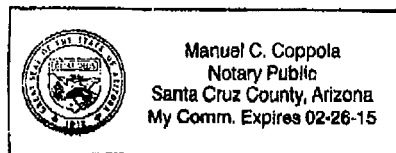## 268 W VIEW POINT, NOGALES, AZ 85621 (520)375-5760

By

Subscribed sworn to before me this   9th day of   AUGUST

20   13

Manuel C. Coppola
Notary Public
Santa Cruz County, Arizona
My Comm. Expires 02-26-15

Notary Public in and for the County of Santa Cruz, State of Arizona

My Commission Expires: 2/26/15

Public Hearing Agenda

**AIR QUALITY DIVISION
HEARING ON THE PROPOSED
ARIZONA STATE IMPLEMENTATION PLAN REVISION FOR THE
NOGALES PM$_{2.5}$ NONATTAINMENT AREA PLAN**

**Tuesday, September 3, 2013, at 1:30 p.m.
City of Nogales Council Chambers
777 N. Grand Ave, Nogales, AZ 85621**

Pursuant to 40 CFR § 51.102 notice is hereby given that the above referenced meeting is open to the public.

1. Welcome and Introductions

2. Purposes of the Oral Proceeding

3. Procedure for Making Public Comment

4. Brief Overview of the Proposed SIP Revision

5. Question and Answer Period

6. Oral Comment Period

7. Adjournment of Oral Proceeding

Copies of the proposed SIP are available for review, Monday through Friday, between 8:30 a.m. and 4:30 p.m., at the ADEQ Records Center, 1110 W. Washington St., Phoenix, AZ 85007, (602) 771-4712. The proposed SIP can also be viewed online at http://www.azdeq.gov/environ/air/plan/index.html by selecting Air Quality – Public Notices, Meetings, and Hearings. For additional information regarding the hearing please call John Englander, ADEQ Air Quality Division, at (602) 771 - 4781 or 1-800-234-5677, Ext. 771-4781.

Persons with a disability may request a reasonable accommodation such as a sign language interpreter, by contacting Alicia Pollard at (602) 771-4791, or via email: pollard.alicia@azdeq.gov. TDD line for hearing impaired individuals, (602) 771-4829. Requests should be made as early as possible to allow time to arrange the accommodation.

ADEQ
Arizona Department
of Environmental Quality

Air Quality Division
Sign-In Sheet

Please Sign In

SUBJECT: Proposed Arizona State Implementation Plan Revision for the Nogales PM$_{2.5}$ Nonattainment Area

DATE: June 21, 2013

NAME	ORGANIZATION	PHONE	E-MAIL (primary method of contact)
1.			
2.			
3.	Mendez		
4.	No		
5.			
6.			
7.			

PROPOSED ARIZONA AIR QUALITY

STATE IMPLEMENTATION PLAN (SIP) REVISION FOR THE

NOGALES PM$_{2.5}$ NONATTAINMENT AREA

Oral Proceeding

Transcript

September 3, 2013

Amanda Stone: Good afternoon, thank you for coming. Even though there is an empty room for a little bit. I now open hearing on the proposed Arizona State Implementation Plan Revision for the Nogales PM$_{2.5}$ Nonattainment Area.

It is now Tuesday, September 3, 2013; at 1:35 p.m.. The location is the City of Nogales Council Chambers, 777 N. Grand Ave, Nogales, AZ 85621.

My name is Amanda Stone, and I have been appointed by the Director of the Department of Environmental Quality (ADEQ) to preside at this proceedings.

The purpose of this proceeding is to provide the public an opportunity to:

(1) hear about the substance of the proposed SIP revisions;

(2) ask questions regarding the revisions; and,

(3) present oral argument, data and views regarding their revisions in the form of comments in the form of comments on the record.

John Englander is here representing ADEQ from the Air Quality Division, State Implementation Plan Section.

1 Public notice appeared in the *Nogales International* and on ADEQ's website beginning August
2 2, 2013. Copies of the proposed SIP revision were made available at the ADEQ Public Records
3 Center and ADEQ's website beginning August 2, 2013.
4
5 The procedure for making a public comment on the record is straightforward. If you wish to
6 comment, you need to fill out a speaker slip, which is available at the sign-in table, outside the
7 room here, and give it to me. Using speaker slips allows everyone an opportunity to be heard and
8 allows us to match the name on the official record with the comments. You may also submit
9 written comments to me today.
10
11 Please note, the comment period for the proposed SIP revision ends today, September 3, 2013.
12 All written comments whether they were sent via U.S. mail or via e-mail or via FAX must be
13 postmarked and or received by ADEQ by 5:00 p.m. today.
14
15 Comments made during the formal public comment period are required by law to be considered
16 by ADEQ when preparing the final SIP. This is done through the preparation of a responsiveness
17 summary in which the Department responds in writing to written and oral comments made
18 during the formal public, during the formal comment period.
19
20 The agenda for this hearing is simple. First, we will present a brief overview of the proposed
21 revision to the SIP.
22
23 Second, I will conduct a question and answer period. The purpose of the question and answer
24 period is to provide information that may help you in making comments on the proposed
25 revision.
26
27 Thirdly, I will conduct the oral comment period to call speakers in the order that I have received
28 their speaker slips.
29

1   Please be aware that any comments at today's hearing that you want the Department to formally

2   consider must be given either in writing or on the record at today's hearing during the oral

3   comment period of this proceeding.

4

5   At this time, Mr. Englander will give a brief overview of the proposal.

6

7   * * * * *

8

9   John Englander: The Nogales Non Attainment Area was designated nonattainment for the 2006

10   PM$_{2.5}$ National Ambient Air Quality Standards (or NAAQS) based on monitoring data from

11   2006-2008. PM$_{2.5}$ conditions in the region have improved since that time. On January 7, 2013,

12   subsequent to the designation, EPA finalized a clean data determination for the Nogales planning

13   area under the Clean Data Policy. This action suspended requirements to submit State

14   Implementation Plan (or SIP) elements related to attainment of the NAAQS including reasonable

15   further progress milestones, attainment demonstrations, control measures, and contingency

16   measures. This state implementation plan revision addresses the remaining Clean Air Act

17   requirements applicable to the Nogales Non Attainment area.

18

19   The document outlines general economic and demographic information of the nonattainment

20   area and Santa Cruz County, the Clean Air Act requirements for a Nonattainment Area Plan, a

21   description of the air quality monitoring network and recent ambient air quality data for the area,

22   an emissions inventory, a description of new source review and permitting requirements for the

23   area, and general conformity requirements.

24

25   * * * * *

26

27   Ms. Stone: This concludes the explanation period of this proceeding on the proposed revision to

28   the SIP.

29

30   * * * * *

31

1   Are there any questions before we move to oral comment period?

2

3   Hearing none, this concludes the question and answer period of this proceeding on the proposed

4   revision to the SIP.

5

6   * * * * *

7

8   I now open this proceeding for oral comments.

9

10   We received no speaker slips, so this concludes the oral comment period for this proceeding.

11

12   * * * * *

13

14   If you have not already submitted written comments, you may submit them at this time. Again,

15   the comment period for this proposed revision to the SIP ends today, September 3, 2013, at 5:00

16   p.m.

17

18   Thank you.

19

20   And the time is now 1:40 p.m.. I now close this oral proceeding.

21

ADEQ
Arizona Department of Environmental Quality

Air Quality Division

Public Hearing Presiding Officer Certification

I, Amanda Stone, the designated Presiding Officer, do hereby certify that the public hearing held by the Arizona Department of Environmental Quality was conducted on September 3, 2013, at the City of Nogales Council Chambers, 777 N. Grand Ave, Nogales, AZ 85621, in accordance with public notice requirements by publication in the *Nogales International* beginning August 2, 2013. Furthermore, I do hereby certify that the public hearing was recorded from the opening of the public record through concluding remarks and adjournment, and the transcript provided contains a full, true, and correct record of the above-referenced public hearing.

Dated this __5th__ day of __September__.

_____
Amanda Stone

State of Arizona)
) ss.
County of Maricopa)

Subscribed and sworn to before me on this ___5th___ day of __September, 2013__

_____
Notary Public

My commission expires: __12-2014__

RESPONSIVENESS SUMMARY
to
Testimony Taken at Oral Proceeding and Written Comments Received on
Arizona State Implementation Plan Revision for the Nogales PM$_{2.5}$ Nonattainment Area

The oral proceeding on the *Proposed Arizona State Implementation Plan Revision for the Nogales PM$_{2.5}$ Nonattainment Area* was held on Tuesday, September 3, 1:30 p.m., at the City of Nogales Council Chambers, 777 N. Grand Ave, Nogales, AZ 85621. The public comment period closed on Tuesday, September 3, 2013. No oral or written comments were received during the comment period. During its final review of the proposed SIP, the Arizona Department of Environmental Quality determined no further clarifications were needed.