

DRAFT NOTICE OF FINAL RULEMAKING
MARICOPA COUNTY AIR POLLUTION CONTROL REGULATIONS
RULE 242

EMISSION OFFSETS GENERATED BY THE VOLUNTARY PAVING OF UNPAVED ROADS

PREAMBLE

1. **Rule Affected** **Rulemaking Action**
Rule 242 - Emission Offsets Generated By The Voluntary Paving Of Unpaved Roads New Rule

2. **The specific authority for the rulemaking, including both the authorizing statute (general) and the statutes the rules are implementing (specific):**
Authorizing statutes: Arizona Revised Statutes (A.R.S.) § 49-112 (A) and § 49-479
Implementing statutes: Arizona Revised Statutes (A.R.S.) § 49-479

3. **The effective date of the rule:**
June 20, 2007

4. **A list of all previous notices appearing in the Register addressing the final rule:**
Notice of Rulemaking Docket Opening, October 7, 2005
Arizona Administrative Register (A.A.R.) Volume 11, Issue 41, pp. 3874

Notice of Proposed Rulemaking, September 22, 2006
Arizona Administrative Register (A.A.R.) Volume 12, Issue 38, pp. 3424

5. **The name and address of department personnel with whom persons may communicate regarding this rulemaking:**
Name: Patricia P. Nelson or Jo Crumbaker, Air Quality Department
Address: 1001 North Central Avenue, Suite # 595, Phoenix, AZ 85004
Telephone Number: 602-506-6709 or 602-506-6705
Fax Number: 602-506-6179
E-Mail Address: pnelson@mail.maricopa.gov or jcrumbak@mail.maricopa.gov

6. **An explanation of the rule, including the department's reasons for initiating the rulemaking:**
Maricopa County is adopting new Rule 242 in order to establish enforceable procedures for calculating offsets for particulate matter at 10 microns (PM₁₀) by sources that voluntarily pave unpaved roads. The rule applies to applicants subject to New Source Review (NSR) who need offsets for the construction of new major stationary sources or major modifications to an existing source in the Maricopa County PM₁₀ non-attainment area, and voluntarily elect to

generate offsets of PM₁₀ by paving unpaved roads in the Maricopa County PM₁₀ non-attainment area. The new rule defines the criteria through which offsets will be enforceable, surplus, quantifiable and permanent; provides the procedures and contents for an offset plan; and lays out the calculation methodology for the emissions from the road before and after it is paved.

Two sources have already performed paving projects. Arizona Public Service's West Phoenix Power Plant (APS) and Salt River Project's Santan Generating Plant (SRP) relied upon emission reductions from road paving to provide PM₁₀ offsets in their previously permitted modifications. If APS and SRP choose to establish federal enforceability for the completed projects, only certain sections of the rule apply to projects that have already been completed. However, all of the sections of the rule apply to new projects that are begun after the date of adoption of this rule.

Rule 242 exists to provide a procedure by which offsets from road projects may qualify as federally enforceable. The rule applies to any applicant who chooses to generate offsets through the paving of unpaved roads, as required by the New Source Review program (NSR) and those paved prior to the effective date of this rule adoption that wish to make those offsets federally enforceable. Maricopa County is a non-attainment area for PM₁₀. Sources that need to generate emission reduction offsets for PM₁₀ in Maricopa County are limited in their choices of options for these offsets. Voluntary paving of roads is one option that is available for the source to generate PM₁₀ offset credits while also improving the environment by reducing PM₁₀ emissions.

The Environmental Protection Agency (EPA) considers this program to be an Economic Incentive Program (EIP). An EIP is one that uses market-based strategies to encourage people to reduce emissions of air pollutants in the most efficient manner. Under EPA's guidance for EIPs, the County is required to periodically evaluate the program. Therefore, starting in 2008, Maricopa County proposes to evaluate this EIP program once every three years and will submit the evaluation report to EPA within 60 days of completion. The purpose of the evaluation is to retrospectively assess the performance of this program on emissions and evaluate other aspects of program performance. The evaluation report will contain the following elements for each evaluation period:

- Total number of applications received
- Total miles of roads paved
- Total number of reductions achieved (tons/yr)
- Average distances between paved road(s) and user of credits
- Map identifying the location of the paved projects and the user of the credits

The evaluation report may address the following, when applicable:

- Has it been difficult to make a surplus determination on any application? Why was it difficult? Should the rule be revised to provide additional clarity and if so, how?

- What changes, if any, are appropriate for the equations, emission factors, constants, or default values in Appendix A?
- Describe any situation where: the paved road was not subsequently adopted by the local authority, the paved road was not being properly maintained, or the emission reductions were subsequently deemed invalid. What happened to those emission reductions and how was the problem resolved?
- Have there been any unintentional beneficial or detrimental effects from the program?
- What changes, if any, are appropriate to streamline or improve the administrative process?
- Did Maricopa County have sufficient resources to implement this program?
- What have been the lessons learned?

7. **Demonstration of compliance with A.R.S. § 49-112:**

Under A.R.S. § 49-112 (A), Maricopa County may adopt rules that are more stringent than or in addition to a provision of the state, provided that the rule is necessary to address a peculiar local condition; and if it is either necessary to prevent a significant threat to public health or the environment that results from a peculiar local condition and is technically and economically feasible; or if it is required under a federal statute or regulation, or authorized pursuant to an intergovernmental agreement with the federal government to enforce federal statutes or regulations if the county rule is equivalent to federal statutes or regulations; and if any fee adopted under the rule will not exceed the reasonable costs of the county to issue and administer that permit program. Maricopa County is in compliance with A.R.S. § 49-112(A) in that Maricopa County proposes to adopt revisions to Rule 242 that are more stringent than a provision of the state in order to prevent a significant threat to public health or the environment that results from a peculiar local condition, the designation of Maricopa County as a serious non-attainment area for ozone, carbon monoxide and particulate matter at 10 microns. The program is economically and technically feasible.

8. **A reference to any study relevant to the rule that the department reviewed and either relied on in its evaluation of or justification for the rule or did not rely on in its evaluation or justification for the rule; where the public may obtain or review the study, all data underlying each study, any analysis of the study, and other supporting material:**

The public may obtain the following documents at the Maricopa County Air Quality Department, Planning and Analysis Division, 1001 North Central Ave, Suite # 595, Phoenix, Arizona 85004:

The Cost-Effectiveness of Selected PM₁₀ Control Measures prepared for Maricopa County Department of Transportation by Sierra Research, Inc., June 28, 2006.

The Analysis of the Fine Fraction of Particulate Matter in Fugitive Dust prepared by Western Regional Air Partnership, October 12, 2005.

Background Document for Revisions to Fine Fraction Ratios Used for AP-42 Fugitive Dust Emission Factors prepared by Midwest Research Institute, February 1, 2006.

Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume 1, Appendix C.1 by the Environmental Protection Agency, 1985 (reformatted 1995).

Improving Air Quality with Economic Incentive Programs, EPA-452/R-01-001, January, 2001.

Guidelines for Pavement Management Systems, American Association of State Highway and Transportation Officials (AASHTO), July 1990.

9. **A showing of good cause why the rule is necessary to promote a statewide interest if the rule will diminish a previous grant of authority of a political subdivision of the state:**

Non-applicable

10. **The summary of the economic, small business and consumer impact:**

The purpose of this emissions offsets rule is to make the voluntary road paving actions, undertaken to provide PM₁₀ emission offsets, federally enforceable. No **direct** regulatory cost can be imputed to the offset donor source because the source is not **required** to participate. The donor source may incur costs due to negotiations with the utilizing source and also may incur costs due to the future maintenance of the roads. Arizona State Statute, A.R.S. 28-6705 requires the responsible local government to accept roads into their transportation network that are constructed to standard. Once the roads are accepted, the local government is then responsible for future operation and maintenance costs. Historical costs provided by Maricopa County Department of Transportation (MCDOT) reflect a cost of \$7,000 per year for grading a mile of dirt road as long as there is no repair needed and \$10,000 per 7 years for paved roads resulting from resealing every 7-10 years. Construction costs alone are from \$400,000 to \$450,000 depending upon pavement type and the width of the road. Local governments have agreed and may agree in the future to participate in this program because the source utilizing the offsets pays to pave the roads.

Sources utilizing offsets will incur the usual fees for obtaining the permit or permit revision that will recognize the offsets. For sources permitted by Maricopa county, these fees are contained in Rule 280. The major sources subject to New Source Review (NSR) who need offsets for the construction of new major stationary sources or major modifications to an existing source in the Maricopa County PM₁₀ non-attainment area are required to obtain offsets

whether from this program or from another stationary source. This program adds flexibility as to where these sources can obtain the offsets. As a result, this program does not add any additional direct costs. The biggest cost that the source will incur is in the paving of the roads. Paving a mile of road can cost from \$90,000 to \$135,000 per mile of road paved.

Maricopa County has reviewed permits and files and has determined that there are no small businesses subject to this rulemaking. Therefore, there is no need to consider each of the methods prescribed in A.R.S. §§ 41-1035 and 41-1055 (B) for reducing the impact on small businesses. The rule contains regulatory flexibility that is available to all sources regardless of the classification. The County could not find other alternative methods that would reduce the impact of this rulemaking on sources, or that would be less intrusive or less costly to implement the statutory objectives. Maricopa County could not exempt small businesses, or even establish less stringent standards for compliance or reporting requirements.

Benefits of the rule involve the creation of additional business operations in the county without an increase in overall air pollutants within a particular PM₁₀ nonattainment area, maintenance or modeling domain, and increased flexibility to obtain offsets. This added flexibility gives the sources an additional choice from which they can obtain PM₁₀ emission offsets.

11. A description of the changes between the proposed rule, including supplemental notices, and final rules (if applicable):

The following changes were made between the proposed rule and the final rule:

Index	This change adds a new section, Section 307, for paving projects that are already completed.
Section 101	This change adds the word “public” to the description of road type.
Section 102	This change adds the word “public” to the description of road type.
Section 301	This change corrects the reference from “301.7” to “301.8.”
Subsection 301.1	This change adds the word “public” to the description of road type.
Section 301.8	This change amends the text by switching the first part of the sentence to the end of the sentence for clarity.
Section 302.1 (e)	This change adds text to clarify the calculation of vehicle miles traveled and amends the phrase “ offset program” to “ rule” in the second sentence.

Section 302.1(f)	This change deletes text that is not necessary because the text is addressed in new Section 307.
Section 302.2(d)	This change removes text referencing the two projects that have already completed paving.
Section 303.2	This change amends the phrase “at the time of permit approval” to “within 90 days after receiving all of the information by Section 301”.
Section 303.3	This change amends the text to state that an approved offset plan shall not generate offsets from roadway segments that were paved before the date of the adoption of the new rule. This change amends the text by removing the language that pertains to the previously completed projects that is now moved to Section 307.
Section 304.1	This change adds text to state that a written statement or government report is acceptable to prove compliance with this section.
Section 304.2	This change adds a timeframe for the issuance of an approval in writing for the quantity of emission reductions actually generated.
Section 305.1	This change adds text by adding a start date of once every two years after the initial summary report required by subsection 304.1 is submitted of this rule.
Section 305.2	This change corrects an error by adding the name of the document listed in the American Association of State Highway and Transportation Officials pavement condition analysis criteria.
Section 307	This change adds a new section that addresses the two pavement projects that have already been completed.
Section 501	This change adds the words “and/or obtained” to the text.
Appendix A	This change substitutes the original formulas with the constants as shown in AP-42 instead of solving for some of the constants.

12. **A summary of the comments made regarding the rule and the agency response to them:**

COMMENT # 1:

MCAQD Should Exempt the West Phoenix PM10 Offset Project From Rule 242.

In the preamble to proposed Rule 242, MCAQD states that the West Phoenix Project is grandfathered in this proposed rule. This reflects MCAQD's intent that the West Phoenix Project not be subject to any portion of the rule. We fully agree with this position and, for the reasons discussed below, it would be unlawful to subject the Project to the rule. However, the proposed rule language does not exempt the West Phoenix Project. The proposed rule must be revised to clearly exempt the Project from the entire rule.

RESPONSE #1:

Section #6 of this Draft Notice of Final Rulemaking and Rule 242, Section 307 are now revised to reflect more clearly the sections of the rule that this project and the project completed by SRP are exempt from and the documentation, recordkeeping, and monitoring requirements appropriate to these two projects to establish federal enforceability for the offsets.

COMMENT #2:

In the second paragraph of this section, it states that two sources that have already performed paving projects are grandfathered under the proposed rule. One of the two facilities is Salt River Project's (SRP) Santan Generating Plant ("Santan"). Although this section specifies that this plant is grandfathered under the proposed rule, the language of the rule itself is less clear and appears to inconsistently impose certain new requirements on Santan. For example, the rule appears to require Santan to submit another paving offset plan for approval even though a plan was submitted prior to commencing paving for the Santan offsets, which was several years before this draft rule was proposed, and SRP submitted letters to the Maricopa County Air Quality Department (MCAQD) validating the offsets for each part of the modification.¹

To comport with the preamble's intent to grant grandfathered status to the two previously completed projects, SRP proposes that language be inserted to clarify the applicability of Sections 301, 302, 303, and 304 of the proposed rule. Therefore, SRP recommends that the second paragraph of this section be reworded, as follows:

Two sources have already performed paving projects that are grandfathered in this proposed rule. Arizona Public Services' West Phoenix Power Plant and Salt River Project's Santan Generating Plant relied upon emission reductions from road paving to provide PM₁₀ offsets in their previously permitted modifications and both facilities submitted documentation upon completion of their respective paving projects that validated their PM offsets. Sections 301, 302, 303, and 304 of this rule are inapplicable to the previously completed paving offsets obtained by these sources.

RESPONSE #2:

The language of the rule has been amended and clarified to reflect the sections which are not applicable to these two projects. Section 307 discusses the need for these two sources with paving projects already completed to submit

¹ Refer to letter from Christopher Janick, SRP, to Larry Spivack, MCAQD, dated June 10, 2004 for Units S-5A and S-5B. Refer to letters from Daniel Casiraro, SRP, to Larry Spivack, MCAQD, dated December 6, 2005 and December 9, 2005 for Unit S-6.

documentation listing all of their prior submittals, to provide documentation of compliance with Sections 301, 302, 303 and 304 to establish federal enforceability for the offsets.

COMMENT #3:

a. MCAQD Fully Approved the Project Based on Then-Existing Requirements.

As MCAQD recognized in 2000 when it issued the Significant Permit Revision authorizing the West Phoenix Project, the Project satisfied all of the regulatory requirements in effect at that time. Specifically, MCAQD stated: “The roads proposed by the applicant satisfy all of the above conditions” (referring to the applicable MCAQD rules). See MCAQD, Response to Comments on APS West Phoenix Draft Permit Conditions, June 23, 2000, a copy of which is attached. MCAQD also noted that the County Board of Supervisors approved the commitment resolution and agreement supporting the West Phoenix Project. Furthermore, in the Ambient Air Quality Impact Report (AAQI Report) in support of the West Phoenix Project, MCAQD fully authorized the West Phoenix Project, concluding that “the ERCs [emission reduction credits] meet the requirements of being real, quantifiable, permanent, Federally enforceable and surplus ...” See AAQI Report, Section II.B, a copy of which is attached.

MCAQD fully approved the West Phoenix Project based upon then-existing regulatory requirements. MCAQD determined that the Project offsets met all applicable requirements, including quantification and permanence. The paving project to implement the PM₁₀ offset requirements was completed, and the roads are being maintained as specified in the offset plan and agreements. MCAQD cannot now change the rules applicable to this Project.

RESPONSE #3:

Rule 240, Section 306.12 (b) states that:

- b.** The emission reduction is adopted as a part of this rule or comparable rules of any other governmental entity or is contractually enforceable by the Control Officer and is in effect at the time the permit is issued.

Subsequent to the issuance of the permit, EPA notified the Air Quality Department that a rule would be necessary to establish federal enforceability for the offsets as they are derived from non-traditional sources. This rule will provide a mechanism by which the APS West Phoenix project may establish federal enforceability. The rule specifically exempts the West Phoenix Project from the criteria that can not be replicated after paving was completed.

Maintenance of the Memorandum of Understanding (MOU) demonstrates that offsets would be permanent. The permittee remains responsible for monitoring the activities subject to its agreements to ensure that the offsets do not become invalid. If the roads are not maintained, the permittee would be required to locate replacement offsets. The proposed rule only reiterates the existing responsibility of the permittee under Rule 240 in regards to monitoring maintenance of the roads and replacement of offsets if necessary and does not create any new duties for the permittee.

COMMENT #4:

b. Proposed Rule 242 Imposes Retroactive Requirements on the Project.

Notwithstanding MCAQD's apparent intent to "grandfather" or exempt the West Phoenix Project from the rule, proposed Rule 242 as currently drafted does impose retroactive requirements on the Project.

First, the Project is not exempt from Section 301 (Offset Plan Requirements). West Phoenix already submitted an offset plan, and that plan was fully approved by MCAQD based on then-existing requirements. MCAQD cannot now subject the West Phoenix Project to new and different offset plan requirements.

RESPONSE #4:

The rule (Section 307) has been amended to reflect that previously completed projects have only to show documentation listing prior submittals in order to comply with the sections of the rule that are applicable to previously completed projects.

COMMENT #5:

Section 302.2.d (Emissions From Unpaved and Paved Roads) also purports to apply to the West Phoenix Project. This section requires the use of a specified silt content in calculating PM₁₀ emission reductions, unless the Arizona governmental agencies responsible for the roads provide "documentary evidence" – which "must have been created prior to the paving of the road(s)" – that the roads did not have a gravel surface. Again, these are new and different requirements. This provision has the potential to change the total number of offsets applicable to the Project – a result that is unlawful. The offsets were fully quantified and deemed to be real, permanent, federally enforceable and surplus in 2000. MCAQD cannot now change the quantification methodology for the Project.

RESPONSE #5:

The permittee was allowed to use defaults in the original offsets plan. However, the permittee was to provide specific data for each road selected when the paving was actually completed and the resultant more specific data may have changed the original calculations, regardless of whether this rule existed. The proposed methodology in the Appendix to the proposed rule represents a compromise between the use of default silt contents and specific silt contents.

The rule has been changed (Appendix A) to reflect the ability to use a default value of 6.2% for silt content if the roads were gravel roads and 12% if the roads were dirt roads.

COMMENT #6:

Section 304 (Offset Plan Completion) also appears to apply to the Project.

RESPONSE #6:

Rule 242 has been amended with the addition of Section 307 to reflect the fact that a listing of prior submittals of evidence proving compliance with Section 304 is all that is required of sources for paving projects already completed.

COMMENT #7

Section 305 (Road Integrity Responsibilities) also appears to apply to the Project and, indeed, would change the entire structure of the approved Project. As MCAQD is aware, both MCAQD and the County Board of Supervisors approved of a plan to require certain Arizona governmental agencies to maintain the roads after paving. This section, by contrast, would require APS to oversee the road conditions, review reports, determine whether degradation has occurred, and report road conditions to MCAQD. These are new and different requirements that were not required under MCAQD's rules in 2000. MCAQD effectively proposes to modify APS' agreements with the governmental agencies, as well as its own approval of the Project structure, through a rulemaking – a result that is both inappropriate and unlawful.

RESPONSE #7:

The rule does not require modification of the agreements. Neither the Department nor EPA can enforce an agreement that was made between two different entities, in this case, 1) the City of Goodyear and Arizona Public Service, and 2) Maricopa County and Arizona Public Service. Arizona Public Service must oversee their own agreement with the City of Goodyear and with Maricopa County. The commenter confuses the documentation in the form of an agreement necessary to demonstrate that offsets are permanent with the responsibility to monitor activities subject to the agreement. The responsibility to ensure that the offsets remain permanent and to replace them if the roads are not maintained lies with the permittee and not with any other party.

COMMENT #8:

Section 306 (Offset Integrity Responsibilities) would require APS to provide “replacement offsets” if any portion of the road is degraded. Again, this requirement was not a part of the 2000 Project or MCAQD's approval of the Project. MCAQD already determined that the offsets are permanent – it cannot now re-define that term for a completed, pre-Rule 242 project.

RESPONSE #8:

As required under Rule 240, Subsection 305.1 (c), APS was responsible for securing the emission reductions necessary to offset the increased emissions from the West Phoenix Project at the time of Maricopa County Air Quality Department's approval. The rule simply reiterates the permittee's responsibility. It does not create any new responsibility.

COMMENT #9:

Section 501 (Recordkeeping and Records Retention) requires that records be maintained for thirty years. This also is new, was not a part of the requirements for the 2000 Project, and is inappropriate. Furthermore, a 30 year record retention requirement is unduly excessive, burdensome, and inconsistent with the general Clean Air Act records retention requirement to maintain records for five years.

RESPONSE #9:

Section 501 of Rule 242 specifies what records are necessary to demonstrate compliance with the emission offset requirements if a facility wishes to establish federal and legal enforceability for those offsets. If a facility chooses not to establish federal enforceability for those offsets, then the facility does not have to maintain records for 30 years. This 30 yr. time frame is consistent with the EPA Economic Incentive Program Guidance.

COMMENT #10:

An Agency Cannot Apply Regulations Retroactively.

As discussed above, a number of sections of proposed Rule 242 appear to apply retroactively to the West Phoenix Project, a project that was fully approved by MCAQD in 2000. It is a fundamental tenet of administrative law that an agency cannot apply regulations retroactively:

[A]ny action taken by [a governmental agency] must be in conformity with the regulations as they exist at the time of the action, and not as they may afterwards be amended ... Retroactive regulations are just as obnoxious as retroactive laws ... [U]nless the legislative authority expressly declares regulations may be retroactive, it is beyond the power of [an agency] to give them that effect.”

Taylor v. McSwain, 54 Ariz. 295, 95 P.2d 415, 422 (1939) (emphasis added).

Agencies therefore may not apply new regulations to a transaction that occurred before its enactment:

We are prohibited from applying a regulation to conduct that took place before its enactment in the absence of clear congressional intent where the regulation *would impose new duties with respect to transactions already completed*.

Rock of Ages Corp. v. Secretary of Labor, 170 F.3d 148, 158-59 (2 Cir. 1999) (emphasis added).

The courts have held that

A [regulation] has retroactive effect when it takes away or impairs vested rights acquired under existing laws, or creates a new obligation, imposes a new duty, or attaches a new disability, *in respect to transactions or considerations already past* ... [T]he judgment whether a particular [regulation] acts retroactively should be informed and guided by familiar considerations of fair notice, reasonable reliance, and settled expectations.

Kankamalage v. I.N.S., 335 F.3d 858, 863 (9 Cir. 2003) (emphasis added).

Arizona law clearly requires that, with regard to the West Phoenix Project, MCAQD must apply the regulations as they existed at the time of the Project, not as they may be amended under Rule 242. There is no statutory authority that allows MCAQD to apply Rule 242 retroactively. In 2000, MCAQD properly applied its then-existing standards, including its standards for quantification and permanence, and determined that the West Phoenix Project was in full compliance with all applicable requirements. MCAQD can certainly change those standards prospectively: it can adopt a new standard for permanence, impose new requirements for quantification, and promulgate other requirements for offsetting. But it cannot apply those new standards, or impose new obligations and duties, to a transaction that

occurred five years ago, was conducted in full accordance with then-applicable requirements, and was fully sanctioned by MCAQD itself. Such retroactive regulation is illegal, unfair, and would interfere with the “settled expectations” of all parties – including APS, the governmental authorities responsible for maintaining the roads, and MCAQD.

RESPONSE #10:

Rule 240 states:

306.12 An emission reduction may only be used to offset emissions if the reduced level of emissions will continue for the life of the new source or modification and if the reduced level of emissions is legally and federally enforceable at the time of permit issuance. It shall be considered legally enforceable, if the following conditions are met:

- a. The emission reduction is included as a condition in the permit of the source relied upon to offset the emissions from the new major source or major modification, or in the case of reductions from sources controlled by the applicant, is included as a condition of the permit or permit revision under this rule for the new major source or major modification;
- b. The emission reduction is adopted as a part of this rule or comparable rules of any other governmental entity or is contractually enforceable by the Control Officer and is in effect at the time the permit is issued.

Rule 242 was first developed to address the requirements of Rule 240, Section 306.12. As time went on in the rule development process, Rule 242 was revised to clarify that the prior completed projects need only comply with identified provisions of the project owner chooses to make the offsets federally enforceable.

COMMENT #11:

MCAQD Should Revise Proposed Rule 242 to Clearly Exempt the Project.

MCAQD is precluded by law from applying any part of Rule 242 to the West Phoenix Project. Proposed Rule 242 must therefore be revised to clearly exempt the project. The simplest way to exempt the West Phoenix Project is to include in Section 200 a definition of the term “Applicant: Any source that applies, after the date on which this Rule 242 becomes effective, for an NSR permit and requests PM₁₀ offsets in order to construct a new major stationary source or major modification to an existing major stationary source.” Such language would plainly exclude any offsetting projects that were approved and permitted prior to the effective date of Rule 242. Alternatively, the County could exempt the West Phoenix Project by adding a section entitled “Exemptions,” and expressly stating that the West Phoenix Project is not subject to this rule.

RESPONSE #11:

The County has revised the rule to clarify that the owners of the two projects that were previously completed are not required to comply with the rule. However, if the owner chooses to establish federal enforceability of the offsets, then the rule clarifies the requirements that apply to the projects that have been previously completed.

COMMENT #12:

Section 103 (SRP) As described in SRP’s comments on the preamble, Santan should be exempt from the requirements under Sections 301, 302, 303, and 304 of the proposed rule because its offsets have already been

completed. There may be other sources that should also be exempted based on the fact that they have already initiated or completed voluntary emission offsets prior to this rule. Therefore, a new section, Section 103, should be added, as follows:

APPLICABILITY: Sections 301, 302, and 303 only apply to paving offsets initiated after adoption of this rule [Insert Rule Adoption Date]. Section 304 only applies to paving offsets completed after adoption of this rule [Insert Rule Adoption Date].

If MCAQD does not approve of this change, then SRP requests that changes be made to certain portions of the proposed rule as described in the comments on Sections 301.8 and 302.2.d provided below.

RESPONSE #12:

MCAQD has amended the rule to separate criteria for prior completed projects in Section 307. The rule was further amended in Section 307 to indicate that if the owners or operators choose to establish federal enforceability, then they shall provide documentation of prior completed projects in

SECTION 301–OFFSET PLAN REQUIREMENTS

COMMENT #13:

Section 301.8

An exemption should be allowed for Santan’s previously completed paving offsets. The Maricopa County Department of Transportation (MCDOT) does not routinely take photographs or video of all public roads to be paved as a standard operating procedure. Since this rule is being proposed years after paving for this project was initiated, it is impossible to obtain such documentation. SRP suggests that the requirement be reworded, as follows:

Photos or video of the public roads to be paved, if they are classified as “non-gravel” roads, if paving is initiated after adoption of this rule [Insert Rule Adoption Date].

RESPONSE #13:

Section 301.8 has been changed to state that written documentation may also suffice instead of photos or videos.

COMMENT #14:

SECTION 302 –CALCULATION METHODOLOGY

Section 302.2.d

For the Santan modification, it is impossible to now provide documentary evidence that was created prior to the paving of the roads showing the roads were “non-gravel” at the time of paving. SRP did obtain documentation that

the roads were “non-gravel” in a letter dated March 2, 2006 from Kelly McMullen of MCDOT, which states that the roads that were paved for this project were listed as being “native dirt soils (non-gravel) prior to commencement of preparation for the paving”. Since this rule is being proposed years after paving for this project was initiated, it is now impossible to obtain a document making this same statement that was dated prior to the date when paving was commenced.

SRP found out through further discussions with MCDOT that they do not maintain information within their database that specifically calls out whether a road was “gravel” or “non-gravel” prior to it being paved. MCDOT indicated that the only time that they would use gravel on a roadway is to put enough down to hold the road bed together or for use as the base material before laying asphalt, but that the amount of gravel they would use in either case would never be enough to be considered to act as a dust suppressant.

Based on this information, SRP requests that the last sentence of this paragraph be removed so that the requirement is reworded, as follows:

For the two modifications referenced in Section 302.1(f) the silt content of the unpaved roads(s) used in calculating the PM₁₀ emission reductions shall be that for a gravel road, 6.2% unless the Arizona government transportation agency responsible for the road(s) provides documentary evidence that the road(s) did not, in fact, have a gravel surface. ~~This documentary evidence must have been created prior to the paving of the road(s).~~

Other changes that should be made to the proposed rule apart from these comments include those described below.

RESPONSE #14:

The department would like to point out that the MCDOT database referenced in the comment existed prior to the paving of these roads. The key to satisfying this provision is based on the evidence contained in the MCDOT database, not the date that the letter was supplied to SRP. Appendix A of Rule 242 has been changed to reflect using the 6.2 % or 11 % for silt content dependent upon whether the road was gravel or dirt.

COMMENT #15:

Section 302.1.e

As some data that is received from a state or local agency already accounts for the seasonal adjustment factors, it would be appropriate to insert the word “raw” before daily traffic count to prevent “double adjusting” of the counts. Also, to calculate the annual vehicle miles traveled, the corrected monthly count would need to be multiplied by 12 (i.e., the number of months in a year) to get the annual value. SRP suggests that the requirement be reworded, as follows:

The average raw daily traffic count shall be multiplied by the daily and monthly seasonal adjustment factors for paved roads and then by 12 months per year to calculate the annual vehicle miles traveled. For the purpose of the offset program, the adjustment factors shall be obtained from the most recent Freeway Management System data provided by the Arizona Department of Transportation.

RESPONSE #15:

The section has been changed to state that the 12 month data shall be added together for each of the twelve months to calculate the annual vehicle miles traveled. The reason for this change is that each month's traffic patterns are different, and averaging the 12 months data would not be accurate.

COMMENT #16:

SECTION 300 – OFFSET PLAN REQUIREMENTS

Section 303.2

This requirement does not state the amount of time the Control Officer has to review and approve offset plans. In the Environmental Protection Agency's (EPA) comments on the previous draft rule, they pointed out that the rule should "describe Maricopa County's process and timing for acting on the application and credit certification".² We request that the timeframe with which the MCAQD will act on an offset plan be included.

RESPONSE #16:

Section 303.2 has been amended to reflect the time in which the Control Officer shall issue a written approval of the Offset Plan, indicating which roadway segment(s) may be paved and the amount of the resulting emission offsets that will be generated for each roadway segment and it is at the time of permit approval.

COMMENT #17:

Section 304.1

One factor that will impact the timeliness of the report required by this section is the amount of time that is required to obtain a copy of the government's report evaluating the condition of each roadway segment. A report may not be generated for a year or more after the road is paved. For example, MCDOT evaluates their roadways on an annual basis. The only way that MCDOT might have a report available earlier would be if contracted workers (rather than MCDOT employees) completed the paving since MCDOT does perform a review of the work soon after paving is completed by contracted workers to ensure it meets with their standards. This same review is not conducted as quickly if paving is conducted by MCDOT employees because they are trained to ensure paving projects comply with

² Refer to Number 5 in the EPA Comments on Maricopa County Rule 242 – Emission Reduction Credits for Paving Unpaved Roads Draft Rule #1 for 11/20/03 Public Workshop (fax dated January 16, 2004).

their standards. If a report is not generated soon after the paving is completed, the delay could substantially affect the approval of the emission offset credits, and hence, delay construction.

Other than requiring a report, this obligation could also be satisfied with a statement from the local or state government regarding the condition of the paved roadway segment. If this option is used, the requirement could specify that a follow-up report be submitted within 30 days after it is made available. Therefore, SRP suggests that the requirement be reworded, as follows:

When the applicant has completed paving any of the roadway segment(s) specified in Section 303.2, the application shall submit to the Control Officer a summary report that identifies each roadway segment(s) paved, provides the date(s) paving was completed, and includes a copy of the local or state government's report or written statement evaluating the condition of each roadway segment. If a written statement is submitted in lieu of a report, the applicant shall submit a follow-up report within 30 days after the local or state government's report is made available.

RESPONSE # 17:

Section 304.1 has been amended to reflect this.

COMMENT #18:

Section 304.2

There is no timeframe included in this section with regards to the amount of time the Control Officer has to approve the offsets. Please refer to the discussion under Section 303.2 in this letter. As such, SRP requests that the timeframe with which the MCAQD will act on approving offsets be included.

RESPONSE #18:

Section 303.2 has been amended to reflect the time that the Control Officer will issue a written approval of the Offset Plan, indicating which roadway segment(s) may be paved and the amount of the resulting emission offsets that will be generated for each roadway segment at the time of permit approval.

COMMENT #19:

Section 305 – Road Integrity Responsibilities

Section 305.1

This requirement does not tie the two year timeframe to a specific event. SRP suggests that the requirement be reworded, as follows:

At least once every two years from the date the emission offset plan completion report is approved by the MCAQD, obtain a copy of the local or state governments' report evaluating the condition of each roadway segment(s) identified in Section 304.1.

RESPONSE #19:

The section has been changed to reflect that the report shall be submitted by the source to the Control Officer every two years from the date of this rule's adoption.

COMMENT #20:

Section 305.2

The last sentence appears to have an error. Would it be the pavement condition analysis criteria listed *by* the AASHTO, or the pavement condition analysis criteria listed in what AASHTO document?

RESPONSE #20:

The error in subsection 305.2 has been corrected by adding the name of the guidance document to the sentence.

COMMENT #21:

Appendix A - Unpaved Public Roads

Section 1.a

Equation #1 should be revised since the denominator reflects use of a surface material moisture content of 4.8 percent rather than 1 percent. To accomplish this change, please revise Equation #1, as follows:

$$E = \frac{(\text{s}/12) * 1.467}{4.572-1.149} - 0.00047 \text{ lb/VMT}$$

RESPONSE #21:

The denominator did reflect a 4.8% moisture rather than 1% moisture. Appendix A has been revised to now show the formula from AP-42 without showing the actual numerical values for the constants, silt content, and moisture content already placed into the formula as was done in the Notice of Proposed Rulemaking. This allows the source to select the values from the tables in Appendix A.

COMMENT #22:

2. Additional Comments.

APS also has the following comments regarding proposed Appendix A to Rule 242 that are unrelated to the West Phoenix Project.

We recommend that MCAQD provide a reference for the equation set forth in Appendix A, Equation #1 (the methodology for calculating the PM₁₀ emissions from unpaved public roads). The equation appears to be from AP-42, Section 13.2.2. We recommend that MCAQD provide a reference for this equation.

In addition, in the same Equation #1, the listed empirical constants are “K, a, c and d.” However, these are not included in Table A, Default Values for Equation #1/Unpaved Public Roads. We believe that these constants should be provided in Table A and properly referenced.

RESPONSE #22:

Appendix A has been corrected with the reference to the formula now listed at the beginning of Appendix A and Table A included.

13. **Any other matters prescribed by statute that are applicable to the specific department or to any specific rules or class of rules:**

Not applicable.

14. **Incorporations by reference and their location in the rule:**

None

15. **Was this rule previously made as an emergency rule?**

No

16. **The full text of the rule follows:**

MARICOPA COUNTY
AIR POLLUTION CONTROL REGULATIONS
REGULATION II – PERMITS AND FEES
RULE 242
EMISSION OFFSETS GENERATED BY THE VOLUNTARY
PAVING OF UNPAVED ROADS
INDEX

SECTION 100 – GENERAL

- 101 PURPOSE
- 102 APPLICABILITY

SECTION 200 – DEFINITIONS

- 201 EMISSION OFFSETS
- 202 ENFORCEABLE
- 203 PERMANENT
- 204 QUANTIFIABLE
- 205 ROADWAY SEGMENT
- 206 SURPLUS

SECTION 300 – STANDARDS

- 301 OFFSET PLAN REQUIREMENT
- 302 CALCULATION METHODOLOGY
- 303 STANDARDS FOR APPROVING OFFSET PLANS
- 304 OFFSET PLAN COMPLETION
- 305 ROAD INTEGRITY RESPONSIBILITIES
- 306 OFFSET INTEGRITY RESPONSIBILITIES
- 307 PROCEDURES FOR PAVING PROJECTS ALREADY COMPLETED

SECTION 400 – ADMINISTRATIVE REQUIREMENTS (NOT APPLICABLE)

SECTION 500 – MONITORING AND RECORDS

- 501 RECORDKEEPING AND RECORDS RETENTION
- 502 TEST METHODS

APPENDIX A

MARICOPA COUNTY
AIR POLLUTION CONTROL REGULATIONS

REGULATION II – PERMITS AND FEES
RULE 242

EMISSION OFFSETS GENERATED BY THE VOLUNTARY
PAVING OF UNPAVED ROADS

SECTION 100 – GENERAL

- 101 PURPOSE:** To establish enforceable procedures for calculating emission reductions of particulate matter at 10 microns or less (PM₁₀) created through the voluntary paving of unpaved public roads that will be used as offsets to meet New Source Review (NSR) requirements.
- 102 APPLICABILITY:** This rule applies to applicants subject to NSR requirements, who need PM₁₀ offsets for the construction of new major stationary sources or major modifications to an existing major stationary source in the Maricopa County PM₁₀ non-attainment area and those same applicants who also voluntarily elect to generate emission reductions of PM₁₀ by paving unpaved public roads in the Maricopa County non-attainment area.

SECTION 200 – DEFINITIONS: For the purpose of this rule the following definitions shall apply:

- 201 EMISSION OFFSETS** – Emission reductions that have occurred and continue to occur within the Maricopa County PM₁₀ non-attainment area, used to mitigate emission increases from new or modified major sources.
- 202 ENFORCEABLE** – Offsets are enforceable if they are independently verifiable, program violations are defined, those liable can be identified, and the Administrator and the Control Officer can apply penalties and secure appropriate corrective action where applicable.
- 203 PERMANENT** – Continuing or enduring for the duration of the New Source Review (NSR) obligation.
- 204 QUANTIFIABLE** – Emission reductions that can be reliably and replicably measured by adhering to the quantification protocol set forth in this rule.

- 205 ROADWAY SEGMENT** – A section of roadway between two definitive points, including but not limited to intersections, road ends or other demarcation points, which define a change in the roadway structure. The length of such segments shall be expressed in miles and/or fractions thereof.
- 206 SURPLUS** – The amount of emission reductions from the paving of an unpaved road that are not:
- 206.1** Required by federal, state, local law or the Clean Air Act; or
 - 206.2** Included, required or relied upon in the existing federally approved State Implementation Plan (SIP);
or
 - 206.3** Included in the Agricultural Best Management Plan; or
 - 206.4** Used by any source to meet any other regulatory requirement including but not limited to, at the time offsets are used, Reasonable Available Control Technology (RACT); or
 - 206.5** Required by any other legal settlement or consent decree; or
 - 206.6** Included in any SIP-related requirements, including but not limited to: Reasonable Further Progress (RFP), milestones, attainment demonstration, conformity regulations, emissions inventories, operating permit regulations, operating permits issued under Maricopa County or Arizona operating permit regulations, any requirement contained in any new source review permits such as Best Available Control Technology (BACT) and Lowest Achievable Emission Rate (LAER) determinations, limitations on operations of raw materials, emission reductions used for offset or netting purposes, and assumptions used in an attainment demonstration; or
 - 206.7** Subject to be included in any of the following as contained in the SIP-approved Plan or in the latest locally-adopted rules or PM plan: Rule 310.01 or Rule 310 of the Maricopa County Air Pollution Control Rules and Regulations, the resolutions listed in 40 CFR 52.120(c)(100), Arizona Revised Statutes Sections 49-457 and 49-504.4, or contingency measures.

SECTION 300 – STANDARDS

- 301 OFFSET PLAN REQUIREMENTS:** Applicants who choose to use the provisions of this rule to meet their NSR PM₁₀ offset requirements shall submit an Offset Plan. The Offset Plan shall at a minimum contain the information specified in Sections 301.1 through ~~301.7-~~301.8.

- 301.1 A statement that the offsets will be generated from the paving of unpaved public roads identified within the Offset Plan.
- 301.2 A statement that the unpaved road(s) will be paved according to state or local government paving standards.
- 301.3 A list of roads that the generator has proposed for paving including their location and roadway segment identification.
- 301.4 A copy of a letter or agreement from the appropriate state or local government stating that the public road(s):
 - a. Has been inspected;
 - b. Has been described as being either gravel- or non-gravel-surfaced;
 - c. Will be adopted into the state or local government transportation network, if not already a part of the network; and
 - d. Will be maintained.
- 301.5 Calculations that quantify vehicle miles traveled for each roadway segment, including all supporting data from the traffic counts performed pursuant to Section 302.1.
- 301.6 Calculations that quantify emissions from each roadway segment before and after paving, including all results and supporting data from any source-specific testing performed pursuant to Section 302.2.
- 301.7 Results of any silt content testing performed on the unpaved roads according to Section 502.
- 301.8 ~~Photos or video of the public roads to be paved, if they are classified as “non-gravel” roads or documentation from the local government agency that the roads were non-gravel.~~ Documentation from the local government, photos, or videos of the public roads to be paved if they are classified as “non-gravel” roads.

302 CALCULATION METHODOLOGY: Calculations of vehicle miles traveled and the emission(s) reductions from the voluntary paving of roads, for each roadway segment, shall be determined according to the procedures in Sections 302.1 and 302.2.

302.1 Vehicle Miles Traveled (VMT): For the purpose of calculating vmt/day and vmt/year for emission reduction calculations, the applicant shall conduct two traffic counts for each roadway segment.

a. Each traffic count shall measure vehicular traffic over a 48-hour period, which may consist of two non-consecutive 24-hour periods. Vehicular traffic shall be measured continuously during each 24-hour period.

b. The two distinct 24-hour traffic counts shall be conducted on two non-holiday weekdays.

c. The vmt/day and vmt/year calculations for each roadway segment shall be based on the time-weighted averages of the two separate traffic counts for that particular roadway segment.

d. The vmt/day shall be calculated by multiplying traffic count results by the length of the roadway segment in miles to the nearest 1/10 of a mile.

e. The average raw daily traffic count shall be multiplied by the daily and monthly seasonal adjustment factors for paved roads and added together for each of the 12 months to calculate the annual vehicle miles traveled. For the purpose of the ~~offset program rule~~, the adjustment factors shall be obtained from the most recent Freeway Management System data provided by the Arizona Department of Transportation.

~~f. All future projects must comply with Sections 302.1 listed above, except for a previously permitted modification at the Salt River Project's Santan Generating Plant and a previously permitted modification at the Arizona Public Service's West Phoenix Power Plant, both of which, during the permitting process, specifically relied upon emission reductions from road paving to provide PM₁₀ offsets.~~

302.2 Emissions From Unpaved and Paved Roads:

a. The equations provided in Appendix A shall be used to determine the quantity of PM₁₀ emissions (in terms of lbs/VMT) emitted from each unpaved and paved road segment.

b. The default values provided in Appendix A for silt content shall be used to calculate PM₁₀ emissions, unless the applicant provides source-specific values obtained in accordance with Section 502.

c. The PM₁₀ emission reduction associated with paving a segment of unpaved road shall be calculated as the difference, in tons per year, between the emissions from the road in the unpaved condition and the emissions from the road in the paved condition.

~~d. For the two modifications referenced in Section 302.1 (f.) the silt content of the unpaved road(s) used in calculating the PM₁₀ emission reductions shall be that for a gravel road, 6.2%, unless the Arizona government transportation agency responsible for the road(s) provides documentary evidence that the road(s) did not, in fact, have a gravel surface. This documentary evidence must have been created prior to the paving of the road(s).~~

303 STANDARDS FOR APPROVING OFFSET PLANS

303.1 The Control Officer will approve an Emission Offset Plan if it complies with Section 301 and demonstrates that the emission reductions are quantifiable, permanent, enforceable, and surplus.

~~**303.2** The Control Officer shall issue a written approval of the Offset Plan, indicating which roadway segment(s) may be paved and the amount of the resulting emission offsets that will be generated for each roadway segment at the time of permit approval. The Control Officer shall issue a written approval of the Offset Plan within 90 days after receiving all of the information required by Section 301, indicating which roadway segment(s) may be paved and the amount of resulting emission offsets that may be generated for each roadway segment.~~

~~**303.3** Except for a previously permitted modification at the Salt River Project's Santan Generating Plant and a previously permitted modification at the Arizona Public Service's West Phoenix Power Plant, both of which, during the permitting process, specifically relied upon emission reductions from road paving to provide PM₁₀ offsets, An approved Offset Plan shall not generate offsets from roadway segments that were paved before (insert rule adoption date),~~

304 OFFSET PLAN COMPLETION:

304.1 When the applicant has completed paving any of the roadway segment(s) specified in Section 303.2, the applicant shall submit to the Control Officer a summary report that identifies each roadway segment(s) paved, provides the date(s) paving was completed, and includes a copy of the local or state governments' report or written statement evaluating the condition of each roadway segment. If a written statement is submitted in lieu of a report, the applicant shall submit a follow up report within 30 days after the local or state government's report is available.

304.2 The Control Officer shall issue an approval in writing for the quantity of emission reductions actually generated, based on data submitted pursuant to Section 304.1, prior to the applicant commencing normal operations.

304.3 The quantity of emission reductions approved by the Control Officer pursuant to Section 304.2, may be used to meet NSR PM₁₀ offset requirements.

305 ROAD INTEGRITY RESPONSIBILITIES: After the paving of the roadway segment(s) identified in Section 304.1 is completed, the applicant for a period of 30 years shall:

305.1 At least once every two years after the initial summary report required by Subsection 304.1 is submitted obtain a copy of the local or state governments' report evaluating the condition of each roadway segment(s) identified in Section 304.1; and

305.2 Review the report upon receipt and determine if any roadway segment(s) identified in Section 304.1 is degraded. The roadway segment shall be considered degraded if the pavement condition score is less than 30% according to the pavement condition analysis criteria listed in the document published by the American Association of State Highway and Transportation Officials (AASHTO) entitled *Guidelines for Pavement Management Systems, July 1990*.

305.3 Within 60 days of receipt of the report, submit to the Control Officer a copy of the report and a statement identifying any roadway segment(s) that is degraded.

306 OFFSET INTEGRITY RESPONSIBILITIES:

306.1 If pursuant to Section 305.3 any of the road segments paved and approved by the Control Officer under Section 304.2 are found to be degraded, then within 12 months of the report submittal date, the applicant shall provide replacement offsets.

306.2 Replacement offsets may be provided by:

a. Repaving the degraded road segment(s) identified in Section 305.3, and upon completion submit a report that includes the information specified in Section 304.1 or

b. Generating the appropriate number of PM₁₀ offsets pursuant to Rule 242 or

c. Generating the appropriate number of PM₁₀ offsets pursuant to Rule 204.

307 **PROCEDURES FOR PAVING PROJECTS ALREADY COMPLETED ALREADY COMPLETED:**
Notwithstanding the provisions of Section 303.3, the owner or operator of any previously permitted modifications that utilized PM₁₀ offsets generated from road paving which-occurred before (insert date of adoption) may establish federal enforceability and secure federal recognition of the offsets, by complying with the following requirements:

307.1 Submit an Offset Plan consistent with the requirements of Section 301, with the following modification to Section 301.5: the traffic counts are not required to be performed pursuant to Section 302.1

307.2 Submit a summary report consistent with the requirements of Section 304.1

307.3 The silt content of the unpaved road(s) used in calculating the PM₁₀ emission reductions under Section 302.2 shall be that for a gravel road, 6.2%, unless the Arizona government transportation agency responsible for the road(s) provides documentary evidence that the road(s) did not, in fact, have a gravel surface. This documentary evidence must have been created prior to the paving of the road(s).

307.4 Comply with Sections 305, 306 and 501.

SECTION 400 - ADMINISTRATIVE REQUIREMENTS (NOT APPLICABLE)

SECTION 500 - MONITORING AND RECORDS

501 **RECORDKEEPING AND RECORDS RETENTION:** After the Control Officer has issued an approval of the emission reductions in writing, copies of the documents submitted and/or obtained pursuant to Sections 301, 303.2, 304.1, 305.1, 305.2 and 306 shall be maintained onsite for a minimum of thirty (30) years and provided to the Control Officer upon request.

502 **TEST METHODS:** Unless the applicant uses the default silt content values provided in Appendix A, silt content of the unpaved road segments shall be determined using the sampling and laboratory analysis procedures provided in EPA's "Compilation of Air Pollutant Emission Factors," (AP-42), Fifth Edition, Volume 1, Appendix C.1. If the applicant performs any silt content analysis, or has such analysis performed on its behalf, the applicant must use the silt content determined from that analysis to calculate PM₁₀ emissions.

APPENDIX A

- a. ~~For the purposes of this rule, the following empirical expression shall be used to estimate the quantity in pounds (lbs) of particulate emissions from publicly accessible unpaved roads, dominated by light duty vehicles, per vehicle mile traveled (VMT):~~

Equation #1

$$E = \frac{(s/12) * 1.467}{1.572} - 0.00047 \text{ lb/VMT}$$

E = emission factor (lb/VMT)

s = surface material silt content (%)

- b. ~~The default values listed for “s” in Table A below shall be used in Equation 1, as applicable, unless the applicant provides source-specific values for “s” using the methods specified in Section 502.~~

- c. ~~Equation #1 is derived from the following empirical expression:~~

$$E = \frac{k * (s/12)^a * (S/30)^d}{(M/0.5)^e} - C$$

Where:

E = emission factor (lb/VMT)

s = surface material silt content (%)

M = surface material moisture content (%)

S = mean vehicle speed (mph)

C = emission factor for 1980's vehicle fleet exhaust, brake wear
and tear

K, a, c and d = constants

The default values listed in Table A were used for each variable.

TABLE A
DEFAULT VALUES FOR EQUATION #1/UNPAVED PUBLIC ROADS

VARIABLES (Units)	DEFAULT VALUES
s (%) Non-gravel roads	11.0
s (%) Gravel roads	6.2
M (%)	1.0%
S (mph)	20
C (lb/VMT)	0.00047

2. PAVED PUBLIC ROADS:

For the purposes of this rule, the quantity in pounds (lb) of particulate emissions from resuspension of loose material on a road surface due to vehicle travel on a dry paved public road shall be 0.005 lbs/VMT. This value is derived from the following empirical expression:

Equation #2

$$E = k (sL/2)^{0.65} (W/3)^{1.5} - C$$

where:

E = emission factor (lb/VMT) k = particulate size multiplier for particle size range and units of interest

sL = road surface silt loading (grams per square meter or g/m²)

W = average weight (tons) of the vehicles traveling the road

C = emission factor for 1980s vehicle fleet exhaust, brake wear and tire wear

The following default values were used for each variable:

VARIABLES (Units)	DEFAULT VALUES
K (lbs /VMT)	0.016
sL (grams/m ²)	0.23
W (tons)	3.74
C (lbs / VMT)	0.00047

APPENDIX A

Appendix A consists of calculations for emissions of unpaved and paved roads from the document: AP-42, Fifth edition, Compilation of Air Pollutant Emission Factors, Volume 1, Stationary and Point Area Sources, Miscellaneous Sources, Chapter 13, December, 2003.

1. UNPAVED ROADS:

a. For the purposes of this rule, the following empirical expression shall be used to estimate the quantity in pounds (lb) of particulate emissions from publicly accessible unpaved roads, dominated by light duty vehicles, per vehicle mile traveled (VMT) is:

$$\text{Equation \#1: } E = \frac{k(s/12)^a (S/30)^d}{(M/0.5)^c} - C$$

where k, a, c, and d are empirical constants given in Table A below and

E = size-specific emission factor (lb/VMT)

s = surface material silt content (%)

M = surface material moisture content (%)

S = mean vehicle speed (mph)

C = emission factor for 1980's vehicle fleet exhaust, brake wear and tear.

b. The default values listed for surface material silt content, (s), in Table A shall be used in Equation 1, as applicable, unless the applicant provides source-specific values for s using the methods specified in Section 502.

c. The source characteristics s, and M in this formula are referred to as correction parameters for adjusting the emission estimates to local conditions. The conversion from lb/VMT to grams (g) per vehicle kilometer traveled (VKT) is as follows:

$$1 \text{ lb / VMT} = 281.9\text{g / VKT}$$

TABLE A - CONSTANTS FOR EQUATION #1 UNPAVED PUBLIC ROADS

<u>CONSTANT</u>	<u>PM-2.5</u>	<u>PM-10</u>
<u>k (lb/VMT)</u>	<u>0.27</u>	<u>1.8</u>
<u>a</u>	<u>1</u>	<u>1</u>
<u>c</u>	<u>0.2</u>	<u>0.2</u>
<u>d</u>	<u>0.5</u>	<u>0.5</u>
<u>Quality Rating</u>	<u>C</u>	<u>B</u>

TABLE B - DEFAULT VALUES FOR EQUATION #1 –UNPAVED PUBLIC ROADS

<u>VARIABLE</u>	<u>DEFAULT VALUE</u>
<u>s (%)</u>	<u>6.2 % gravel road</u>
<u>s (%)</u>	<u>11 % dirt road</u>
<u>W</u>	<u>average weight of vehicle</u>
<u>M</u>	<u>1%</u>
<u>S</u>	<u>20 mph</u>
<u>C</u>	<u>0.00047 lb / VMT</u>

2. PAVED ROADS:

a. The quantity of particulate emissions from resuspension of loose material on the road surface due to vehicle travel on a dry paved road may be estimated using the following empirical expression:

Equation #3 $E = k (sL/2)^{0.65} (W/3)^{1.5} - C$

where:

E = particulate emission factor (having units matching the units of k)

k = particulate size multiplier for particle size range and units of interest

sL = road surface silt loading (grams per square meter) (g/m²)

W = average weight (tons) of the vehicles traveling the road

C = emission factor for 1980s vehicle fleet exhaust, brake wear and tire wear.

b. The particulate size multiplier (k) above varies with aerodynamic size range. To determine particulate emissions for a specific particle range, use the appropriate value of k in Table E.

TABLE C - PARTICLE SIZE MULTIPLIERS FOR PAVED ROAD EQUATION

(k constant)

<u>SIZE RANGE</u>	<u>g/VKT</u>	<u>g/VMT</u>	<u>lb/ VMT</u>
<u>PM -2.5</u>	<u>1.1</u>	<u>1.8</u>	<u>0.0040</u>
<u>PM -10</u>	<u>4.6</u>	<u>7.3</u>	<u>0.016</u>
<u>PM -15</u>	<u>5.5</u>	<u>9.0</u>	<u>0.020</u>
<u>PM -30</u>	<u>24</u>	<u>38</u>	<u>0.082</u>

TABLE D - DEFAULT VALUES FOR EQUATION #3 - PAVED ROADS

<u>VARIABLE</u>	<u>DEFAULT VALUE</u>
<u>sL(g/m²) - public roads</u>	<u>0.23 grams/m²</u>
<u>W</u>	<u>3.74 tons</u>
<u>C</u>	<u>0.00047 lb/ VMT</u>