

Appendix 3. Rule Effectiveness (RE) Studies

3.1 Introduction

Rule effectiveness (RE) studies are designed to assess the success of regulatory rules at controlling their targeted emissions. It is acknowledged that facilities and source categories subject to control techniques and devices mandated by rules do not always achieve 100% compliance with those requirements. Given this reality, the US EPA recommends the use of rule effectiveness studies to improve the quality of emission estimates presented in emission inventories.

Once an RE rate has been calculated, its value is applied to relevant sources at an individual process level, thus adjusting (i.e., increasing) emission estimates to reflect a lower degree of control efficiency. The formulas below illustrate how inclusion of rule effectiveness can significantly affect the resulting emission estimates:

Emissions before the application of rule effectiveness:

$$\begin{array}{rcl} \text{Uncontrolled Emissions} & \times & [1 - (\text{Control Efficiency})] & = & \text{Emissions with Control} \\ \mathbf{100 \text{ tons}} & \times & \mathbf{[1 - (0.90)]} & = & \mathbf{10.0 \text{ tons}} \end{array}$$

Emissions including the application of rule effectiveness:

$$\begin{array}{rcl} \text{Uncontrolled Emissions} & \times & [1 - (\text{Control Efficiency} \times \text{RE})] & = & \text{Emissions with Control} \\ \mathbf{100 \text{ tons}} & \times & \mathbf{[1 - (0.90 \times 0.83)]} & = & \mathbf{25.3 \text{ tons}} \end{array}$$

In general, the RE rate is applied to all processes where a control device or control technique is in use. There are however some limitations to this blanket rule, as expressed in US EPA's most recent guidance:

...not all emission estimates involving use of a control device or technique need to be adjusted to account for RE...For example, a state or local agency may conclude that a control device that operates in conjunction with a continuous emissions monitor, or is equipped with an automatic shutdown device, may provide a sufficient level of assurance that intended emission reductions will be achieved, and therefore an adjustment for rule effectiveness is not necessary. Another example would be in instances where a direct determination of emissions, such as via a mass balance calculation, can be made. (US EPA, 2005)

Another complication in any attempt to apply a blanket RE percentage rate occurs where control device efficiencies are extremely high. Some categories of control devices routinely operate at efficiencies of 99% or greater (e.g., baghouses, thermal oxidizers). For these activities, even small adjustments through the application of RE can cause a dramatic increase in reported emissions. As an example, a process with a control device of 99.9% efficiency may report controlled emissions of 10 tons. If an RE rate of 85% were applied to this process, the adjusted emissions would total 1,508.5 tons (an increase of nearly 15,000%). In these types of instances, the department evaluated the affected processes on a case-by-case basis to determine the appropriateness of applying an RE adjustment.

3.2 Calculating Rule Effectiveness Rates for Rules 310, 310.01, and 316

Rule effectiveness studies adjust the emissions from subject facilities and source categories to account for times of non-compliance and control device equipment failure. Of particular importance to the Maricopa County Air Quality Department (MCAQD) are those rules that control particulate matter release, since parts of the county have been designated as nonattainment areas in regard to US EPA PM₁₀ standards. Consequently, the rule effectiveness studies presented here deal with the control of criteria pollutant PM₁₀.

Source-specific rule effectiveness studies were undertaken as part of this project to adjust the emissions from subject facilities and source categories to account for times of non-compliance and control device equipment failure by incorporating applicable compliance history data to ascribe a percentage rate (RE rate) at which the subject rule(s) attains the intended emissions reductions. These source-specific studies use data from inspections conducted from July 2008 through June 2009 to determine the rate of compliance of subject facilities and source categories with Rule 310 (Fugitive Dust from Dust-Generating Operations), Rule 310.01 (Fugitive Dust from Non-Traditional Sources of Fugitive Dust), and Rule 316 (Nonmetallic Mineral Processing) with final RE rates listed in Table A3–1 below. Rule effectiveness rates were calculated separately for agricultural activities (best management practices), Title V, and non-Title V permitted facilities, which are each described in detail in Section 3.3.

Table A3–1. Rule effectiveness rates, listed by rule analyzed.

Rule	Rule Effectiveness (RE) Rate
Rule 310	89.94%
Rule 310.01	95.21%
Rule 316	65.44%

The resulting RE rates shown above have been applied to relevant point and area source inventory categories and are reflected in the emission estimates presented in applicable sections of Chapters 2 and 3.

The US EPA has provided a number of guidance documents that detail the use and formulation of rule effectiveness studies (US EPA, 2005; 1994; 1992). The most recent of these documents states, “First and foremost, an agency responsible for emissions inventory preparation should attempt to obtain facility specific data from as many sources as possible, and use the collected information to make a refined source or source category RE determination” (US EPA, 2005). Given this directive, MCAQD developed a rule effectiveness study methodology that utilizes all available compliance data to produce a RE rate that best reflects the field effectiveness of the rule. By using the entire population of data for the prescribed time period, (July 2008 – June 2009) the statistical validity of the RE rate greatly improves. This approach differs from previous rule effectiveness studies conducted by the department that were based upon a small sample pool of targeted inspections (MCAQD, 2007).

The source-specific RE rates presented here are developed from statistical examination of recorded inspection data. This is the rate at which inspection staff is observing facility and source category compliance in the field. While this provides the most direct measure of rule effectiveness, it can still be an incomplete picture of overall rule effectiveness. In the case of the source-specific studies for those sources directly affected by a county air quality rule (Rules 310, 310.01, and 316) the compliance rate is used as the RE rate. These sources tend to have a focused, homogeneous set of processes. This, combined with the fact that these studies not only

contain the entire population of affected sources but are also very large sample sizes, gives confidence that inconsistencies of individual inspections are already addressed in practice. To further focus the study of these sources each unique permit was classified as “in violation” if any inspection during the allotted time period resulted in an emission based violation or as “in compliance” if no violations were issued or an administrative based violation was issued.

A total of six distinct rule effectiveness rates were calculated for use in this emissions inventory: four source-specific rule effectiveness determinations (Rule 310, Rule 310.01, Rule 316 and agricultural activities) along with two multi-rule determinations (Title V and non-Title V permitted facilities). The following three sections describe in further detail the data and methods used in the development of the Rule 310, Rule 310.01, and Rule 316 RE factors.

3.2.1 Calculating Rule Effectiveness for Sources Subject to Rule 310

Sources subject to the department Rule 310 (Fugitive Dust from Dust-Generating Operations) are most often those construction sites where the disturbance of earth is occurring. The RE rate for Rule 310 sources is developed from the observed compliance rate of permitted sites.

The compliance rate for Rule 310 sources uses inspection data of issued dust permits between July 2008 and June 2009. Only inspections that result in a finding of compliance or non-compliance (i.e., “in violation”) are considered in the compliance rate. Inspections conducted solely to confirm the closing of a permit, or inspections where a compliance determination could not be made, were not included in the development of the compliance rate. Using these criteria, a total of 12,325 inspections were conducted on 5,467 issued permits, out of a possible pool of 7,918 issued permits. Dust Control Permits are only valid for 12 months, and expire on the anniversary of their issue date; for instance a permit issued on July 22, 2007 would have a July 22, 2008 expiration date. This permit would therefore only have “operated” 22 days in the inspection period on which this compliance data is based. Some issued permits also experience limited operations, perhaps only a month or two, but in most cases these permits are left open by the permit holder for the entire 12 months. Given these realities, it is not unexpected that 2,451 out of the pool of 7,918 permits received no compliance determination inspection during the 12-month period of July 2008–June 2009. Conversely, over 59% of all issued permits that received a compliance determination inspection were inspected two or more times, with some sites receiving as many as 13 inspections during the 12-month time period of this study.

Of the inspected sources listed above, individual compliance rates are determined on a permit by permit basis. Any permit that received at least one emissions-related violation during any inspection conducted between July 2008 and June 2009 received a compliance rate of 0%. Permitted sites that had no recorded emissions-related violations during the study period received a compliance rate of 100%. Of the permits with violations noted, 550 (80%) were emissions-related (track-out, visible emissions, recordkeeping, silt content, etc.), with the remaining 137 (20%) violating permits being procedural (inadequate dust control plan, late fees, etc.). The permit-specific compliance rates were summed and averaged to produce an overall grouped compliance rate of 89.94%.

3.2.2 Calculating Rule Effectiveness for Sources Subject to Rule 310.01

The majority of sources subject to Rule 310.01 (Fugitive Dust from Non-Traditional Sources of Fugitive Dust) are vacant lots. It is estimated that there are presently more than 100,000 vacant lots in Maricopa County. Rule 310.01 sources generally do not require a permit, unlike Rule 310 and Rule 316 sources. The RE rate for Rule 310.01 sources is calculated based upon vacant lot inspection compliance rates.

During the study period (July 2008 – June 2009), the department inspectors performed a total of 12,370 inspections of vacant lots in Maricopa County. The primary purpose of a Rule 310.01 inspection is to verify whether or not the vacant lot in question has a stabilized surface. If the surface is determined to be stable (through a variety of tests), the lot is deemed to be in compliance. Conversely, if the lot's surface is deemed to be unstable, then a violation of Rule 310.01 has occurred. As with Rule 310, a compliance rate is determined individually for each vacant lot, and then summed and averaged to produce a group compliance rate. The overall compliance rate for Rule 310.01 sites is 95.21%. All 592 violations noted by inspectors were emissions-related violations, as all the violations are for unstable soil conditions.

3.2.3 Calculating Rule Effectiveness for Sources Subject to Rule 316

Facilities subject to Rule 316 (Nonmetallic Mineral Processing) include those involved in the mining of sand and gravel and the production of concrete products. All such "Rule 316 sites" are required to have either a Title V or non-Title V permit issued by the department. At present, all facilities that are subject to Rule 316 have only non-Title V permits. (One class of sources that has long been an exception to this is portable sources that may operate in more than one county during the life of the permit; thus these sources are issued permits by the Arizona Department of Environmental Quality.) The RE rate for Rule 316 sites was determined in a similar fashion as for Rules 310 and 310.01; i.e., calculated on the basis of the actual observed compliance rates of permitted sites.

Inspection data for the period July 2008 through June 2009 reveal that inspections were conducted for 136 issued permits for Rule 316 facilities. All of these facilities were inspected at least once during this study period, with a compliance determination made for each facility. Overall, 525 inspections that resulted in a compliance determination were performed during the study period. As with Rules 310 and 310.01, a compliance rate is computed for each facility, and then summed and averaged for the group, resulting in an overall compliance rate of 65.44%. Of the violating permits noted, 47 (54%) were emissions-related, with the remaining 40 (46%) primarily procedural in nature.

3.3 Calculating Rule Effectiveness Rates for Agricultural Activities, Title V Facilities, and Non-Title V Facilities

The observed compliance rate in some cases, such as multi-source Title V and non-Title V facilities, can be better described as a rate at which inspection staff issue violations. Inspection staff has a range of experience and training which influences their proficiency in issuing appropriate violations. There may be instances when a rule violation goes unnoticed by staff, or

conversely a violation may be issued in error. Even when a compliance rate has a high statistical measure of accuracy, it can fail to reflect a number of programmatic measures that affect overall rule effectiveness; measures like the strength of rule language, departmental enforcement and penalty actions, inspector training programs, educational and public outreach efforts, etc. This reality is reflected in earlier US EPA guidance:

A percentage effectiveness rating is not enough to describe the compliance effectiveness of a rule for a source category. An SSCD [Stationary Source Compliance Division] study should attempt to link the rating to a regulatory agency's overall effort. The study should address the factors that affect the percentage effectiveness rating such as the compliance rate of the sources in a category, inspection frequency and thoroughness, the language of the rule (i.e., whether or not it has loopholes), and the reporting and recordkeeping by the regulatory agency. Evaluating these factors will provide a more complete evaluation of the effectiveness of a rule. (US EPA, 1994)

In order to incorporate all the salient factors described above, a matrix was created to produce a final RE rate. US EPA's latest guidance (2005) provides a listing of factors that can impact rule effectiveness rates (e.g., inspector training, frequency of inspections, media outreach, enforcement policies, recordkeeping requirements, etc.), grouped into major categories such as most important factors, important factors and other factors. The department used these suggested factors as the basis for developing the RE matrices contained in Tables A3-3 through A3-5.

In brief, the compliance rate developed from inspection data accounts for 70% of the overall RE rate, while all other factors account for the remaining 30%. (An exception to these values applies in the case of agricultural activities.) Each factor is scored individually, based upon the department's success in implementing that factor. As an example, the score for the factor "Compliance History" is the compliance rate developed from the study period inspection data, while the score for "Enforcement Penalties" is based upon the department's timely response to, and settlement of, observed violations associated with the subject rule or source category. The complete matrices for each applicable rule or source category for which rule effectiveness was addressed, are contained in Tables A3-3 through A3-5.

The following sections describe in further detail the data and methods used in the development of the remaining RE factors for agricultural activities, Title V, and non-Title V permitted facilities; results are summarized in Table A3-2 below.

Table A3-2. Compliance and rule effectiveness rates, by source category analyzed.

Source Category	Compliance Rate	Rule Effectiveness (RE) Rate
Agricultural Activities	Unknown	55.33%
Title V Facilities	89.14% *	90.94%
Non-Title V Facilities	81.00% *	84.27%

* Compliance rates for both Title V and Non-Title V facilities are based upon 2008-2009 inspection data, and reflect compliance self-monitoring recordkeeping practice, in addition to violation data.

3.3.1 Calculating Rule Effectiveness for Agricultural Activities

Agricultural activities in most parts of Maricopa County are subject to the Best Management Practices program administered by the Arizona Department of Environmental Quality (ADEQ). This program is largely a self-monitoring program, in which participants indicate which management practices were chosen to be used during various operations (e.g., harvesting, tilling). No compliance rate estimates for this program were noted during the study period. ADEQ does indicate that after a site has been visited, 100% of the sources return to compliance. Since compliance with this program is verified only on a complaint-driven basis, the weight given to compliance history was lowered, from 70% to 25%, in the matrix shown in Table A3–3, indicating an overall RE rate of 55.30% for agricultural activities.

3.3.2 Calculating Rule Effectiveness for Title V and Non-Title V Processes

For the remaining emission processes (not regulated by Rules 310, 310.01 and/or 316) that include a control device or technique that limits particulate matter or ozone formation, separate multi-rule RE rates have been calculated for permitted Title V and non-Title V facilities. Factor-based matrices have been utilized to develop RE rates for Title V and non-Title V facilities. Compliance rates for these sources are based upon two full years of data (2008 through 2009), as compliance information for these sources tends to be more detailed (as reflected in the matrix). The compliance rate for these facilities also includes data on self-monitoring recordkeeping practices in addition to inspection data. The combination of monitoring data and inspection data comprise the ‘compliance rate’ section of the RE calculation matrix, and still account for 70% of the overall RE rate. The combined compliance rate for Title V facilities is 89.14% and 81.00% for non-Title V facilities, resulting in RE rates of 90.94% and 84.27% for Title V and non-Title V facilities, respectively, as shown in Tables A3–4 and A3–5 below.

3.4 References

- MCAQD, 2007. 2005 Periodic Emissions Inventory for PM₁₀ for the Maricopa County, Arizona, Nonattainment Area.
- US EPA, 1992. Guidelines for Estimating and Applying Rule Effectiveness for Ozone/CO State Implementation Plan Base Year Inventories. EPA Rep. 452/R-92-010, November 1992.
- US EPA, 1994. Rule Effectiveness Guidance: Integration of Inventory, Compliance and Assessment Applications. EPA Rep. 452/R-94-001, January 1994.
- US EPA, 2005. Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations. EPA Rep. 454/R-05-001, November 2005.

Table A3–3. Rule Effectiveness Matrix for Agricultural Activities

A. Most important factor (1 criterion, assigned weighting of 25% of total):

Factor	Range		Midpt. value	Description	Weight	Value assigned to	Score
						MCAQD	(= weight × value)
Compliance History	86%	100%	93%	Over 90% of facilities inspected in the source category are in compliance	25%	93%	23.25%
	70%	85%	78%	Over 75% of facilities inspected in the source category are in compliance			
		< 70%	35%	Over 60% of facilities inspected in the source category are in compliance			
Type of Inspection	86%	100%	93%	Inspections are thorough and detailed, and include close examination of control equipment, and a detailed records review	10%	35%	3.5%
	70%	85%	78%	Inspections consist of a records review, and sometimes inspection of control equipment;			
		< 70%	35%	Inspections generally consist of a records review only;			

B. Other important factors (6 criteria, each assigned weighting of 10% of total):

Compliance Certifications	86%	100%	93%	Source is subject to some type of compliance certification;	10%	35%	3.5%
	70%	85%	78%	Source is subject to some type of compliance certification;			
		< 70%	35%	Source is not subject to any type of compliance certification;			
Inspection Frequency/ Percentage	86%	100%	93%	Percent of facilities inspected in the sector in a given year is 25% or greater;	10%	35%	3.5%
	70%	85%	78%	Percent of facilities inspected in the sector in a given year is 15% or greater;			
		< 70%	35%	Percent of facilities inspected in the sector in a given year is less than 15%			
Unannounced Inspections	86%	100%	93%	Unannounced inspections are sometimes done;	10%	35%	3.5%
	70%	85%	78%	Unannounced inspections are done, but infrequently;			
		< 70%	35%	Unannounced inspections are never done;			
Enforcement Penalties	86%	100%	93%	Agency takes prompt enforcement action, including monetary fines, against violators;	10%	35%	3.5%
	70%	85%	78%	Agency usually takes enforcement action, including monetary fines, against violators;			
		< 70%	35%	Agency usually does not take enforcement action against violators;			
Compliance Assistance	86%	100%	93%	A compliance assistance program exists and is adequately staffed, and includes such things as workshops, mailings, web-based tutorials, etc.	10%	93%	9.3%
	70%	85%	78%	A compliance assistance program exists and is minimally staffed. The program occasionally makes workshops, mailings, web-based tutorials, etc., available.			
		< 70%	35%	A compliance assistance program does not exist			

C. Other factors (3 criteria, each assigned weighting of 5% of total):

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score (= weight × value)
Monitoring Requirements	86%	100%	93%	Monitoring requirements exist and must be reported to regulatory agency at least once a year;			
	70%	85%	78%	Monitoring requirements exist but records don't have to be filed with regulatory agency;			
		< 70%	35%	Monitoring requirements do not exist;	5%	35%	1.75%
Follow-up Inspections	86%	100%	93%	Follow-up inspections are done when violations are noted most (>75%) of the time;			
	70%	85%	78%	Follow-up inspections are done when violations are noted some of the time;			
		< 70%	35%	Follow-up inspections are not routinely done;	5%	35%	1.75%
Media Publicity	86%	100%	93%	Media publicity of enforcement actions is routinely conducted.			
	70%	85%	78%	Media publicity of enforcement actions is sometimes done.			
		< 70%	35%	Media publicity of enforcement actions is rarely done.	5%	35%	1.75%

Overall rule effectiveness score for agricultural activities: **55.30%**

Table A3–4. Rule Effectiveness Matrix for Title V Facilities

A. Most important factors (2 criteria, each assigned weighting of 35% of total):

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score (= weight × value)
Monitoring	94%	100%	97%	Source specific monitoring used for compliance purposes, and monitoring records filed with regulatory agency at least every 4 months.	35%	90%	31.5%
	87%	93%	90%	Source specific monitoring used as an indicator of compliance, and monitoring records filed with regulatory agency every 6 to 9 months.			
	81%	86%	84%	Source specific monitoring used as an indicator of compliance, and monitoring records filed with regulatory agency each year.			
	70%	80%	75%	General guidance exists for source specific enhanced monitoring, and monitoring records required but aren't submitted to regulatory agency.			
	< 70%	< 70%	35%	No requirements for any type of monitoring.			

Compliance History	94%	100%	97%	The facility has been in compliance for the past eight quarters.	35%	10 of 19 facilities	17.9%
	87%	93%	90%	The facility is believed to have been in compliance for the past eight quarters, although inspection frequency is such that this can't be positively confirmed.			
	81%	86%	84%	On schedule; the facility is meeting its compliance schedule.			
	70%	80%	75%	In Violation; facility is in violation of emissions and/or procedural requirements.		8 of 19 facilities	12.4%
	< 70%	< 70%	35%	High Priority Violator (HPV): the facility is in significant violation of one or more applicable requirement of the CAA.		1 of 19 facilities	0.6%
						Sum:	30.9%

B. Other important factors (4 criteria, each assigned weighting of 3% of total):

Type of Inspection	94%	100%	97%	Inspections involve compliance test methods with a high degree of accuracy, such as stack testing or other types of precise emissions measurement.	3%	97%	2.9%
	87%	93%	90%	Inspections involve detailed review of process parameters & inspection of control equipment.			
	81%	86%	84%	Inspections involve review of process and inspection of control equipment.			
	70%	80%	75%	Inspections generally consist of only a records review.			
	< 70%	< 70%	35%	Inspections most likely consist of visual inspection (e.g., opacity), or drive by.			

Operation & Maintenance	94%	100%	97%	Control equipment operators follow and sign daily O&M instructions.	3%	90%	2.7%
	87%	93%	90%	Control equipment operators follow daily O&M instructions.			
	81%	86%	84%	Control equipment operators follow daily or weekly O&M instructions.			
	70%	80%	75%	O&M requirements exist, but on no specific schedule.			
	< 70%	< 70%	35%	No specific O&M requirements.			

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score (= weight × value)
Unannounced Inspections	94%	100%	97%	Routinely conducted.	3%	97%	2.9%
	87%	93%	90%	Sometimes done.			
	81%	86%	84%	Done, but infrequently.			
	70%	80%	75%	Rarely done.			
		< 70%	35%	Never done.			

Enforcement Penalties	94%	100%	97%	Agency has the authority to impose punitive measures, including monetary fines, towards violators such as in delegated Title V Operating Permit programs.	3%	97%	2.91%
	87%	93%	90%	Agency has the authority to impose punitive measures, including monetary fines, towards violators such as in delegated Title V Operating Permit programs.			
	81%	86%	84%	Agency has the authority to impose punitive measures, including monetary fines, towards violators such as in delegated Title V Operating Permit programs.			
	70%	80%	75%	Agency has the authority to impose punitive measures, including monetary fines, towards violators such as in delegated Title V Operating Permit programs.			
		< 70%	35%	Agency does not have sufficient authority to impose punitive measures towards violators.			

C. Other factors (9 criteria, each assigned weighting of 2% of total):

Compliance Certifications	94%	100%	97%	Source subject to Title V or other type of compliance certification.	2%	97%	1.94%
	87%	93%	90%	Source subject to Title V or other type of compliance certification.			
	81%	86%	84%	Source not subject to any type of compliance certification.			
	70%	80%	75%	Source not subject to any type of compliance certification.			
		< 70%	35%	Source not subject to any type of compliance certification.			

Inspection Frequency	94%	100%	97%	Source(s) are inspected once every 2 years or more frequently.	2%	97%	1.94%
	87%	93%	90%	Source(s) are inspected once every 3 years or more frequently.			
	81%	86%	84%	Source(s) are inspected once every 5 years or more frequently.			
	70%	80%	75%	Inspection of source(s) infrequent; > every 5 years.			
		< 70%	35%	Inspections rarely, if ever, performed.			

EPA HPV Enforcement	94%	100%	97%	Agency has sufficient resources to implement EPA's 12/22/98 HPV policy.	2%	97%	1.94%
	87%	93%	90%	Agency's resources allow it to implement EPA's 12/22/98 HPV policy in most instances.			
	81%	86%	84%	Agency's resources allow it to implement EPA's 12/22/98 HPV policy in most instances.			
	70%	80%	75%	Agency's resources allow it to implement EPA's 12/22/98 HPV policy more often than not.			
		< 70%	35%	Resource constraints prohibit agency from implementing EPA's 12/22/98 HPV policy in most instances.			

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score (= weight × value)
Operator Training	94%	100%	97%	Control equipment operators complete a formal training program on use of the equipment, and such program is kept up to date and has been reviewed by the regulatory agency.			
	87%	93%	90%	Control equipment operators complete formal training program, and such program is kept up to date and available for review by the regulatory agency upon request.			
	81%	86%	84%	Control equipment operators complete some amount of formal training.	2%	84%	1.68%
	70%	0.8	75%	Control equipment operators receive only on the job training.			
		< 70%	35%	Control equipment operators receive no specific training.			
Media Publicity	94%	100%	97%	Media publicity of enforcement actions.	2%	97%	1.94%
	87%	93%	90%	Media publicity of enforcement actions.			
	81%	86%	84%	Media publicity of enforcement actions.			
	70%	80%	75%	Media publicity of enforcement actions.			
		< 70%	35%	No media publicity of enforcement actions.			
Regulatory Workshops	94%	100%	97%	Regulatory workshops are available annually, and/or the implementing agency mails regulatory information packages each year.	2%	97%	1.94%
	87%	93%	90%	Regulatory workshops are available every 1-2 years, and/or the implementing agency mails regulatory information packages every 1-2 years.			
	81%	86%	84%	Regulatory workshops are available every 2-3 years, and/or the implementing agency mails regulatory information packages once every 2-3 years.			
	70%	80%	75%	Regulatory workshop not routinely available, but implementing agency mails regulatory information packages out about once every 2-3 years.			
		< 70%	35%	Regulatory workshops not routinely available. Implementing agency mails regulatory information packages infrequently, if ever.			
Inspector Training	94%	100%	97%	Inspectors must undergo 2 weeks of comprehensive basic training, and 1 to 2 weeks of source specific training, and such training is updated each year.			
	87%	93%	90%	Inspectors must undergo 1 to 2 weeks of basic training and 1 week of source specific training and such training is updated every 1-2 years.	2%	90%	1.80%
	81%	86%	84%	Inspectors must undergo 1 to 2 weeks of basic training and 3 to 5 days of source specific training, and such training is updated every 1-2 years.			
	70%	80%	75%	Inspectors must undergo 1 to 2 weeks of basic training and 1 to 3 days of source specific training, and such training is updated every 1-2 years.			
		< 70%	35%	Inspectors must undergo less than 5 days of basic training less than 3 days of source specific training, and such training is updated only every 2 years or less frequently.			

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score (= weight × value)
Testing Guidelines	94%	100%	97%	Specific guidelines and schedule for testing and test methods exist.	2%	97%	1.94%
	87%	93%	90%	Specific guidelines on testing and test methods exist, but no schedule for testing.			
	81%	86%	84%	Specific guidelines on testing and test methods exist, but no schedule for testing.			
	70%	80%	75%	Specific guidelines on testing and test methods, but no schedule for testing.			
		< 70%	35%	Only general guidance on testing, or no mention of testing requirements.			

Follow-up Inspections	94%	100%	97%	Follow-up inspections always or almost always conducted (90 % of the time or more).	2%	97%	1.94%
	87%	93%	90%	Follow-up inspections usually conducted (approximately 75% of the time).			
	81%	86%	84%	Follow-up inspections sometimes conducted (approximately 50% of the time).			
	70%	80%	75%	Follow-up inspections infrequently conducted (approximately 25% of the time).			
		< 70%	35%	Follow-up inspections rarely or never conducted (10% of the time or less)			

Overall rule effectiveness score for Title V facilities:

90.94%

Table A3–5. Rule Effectiveness Matrix for Non-Title V Facilities

A. Most important factors (2 criteria, each assigned weighting of 35% of total):

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score (= weight × value)
Monitoring	94%	100%	97%	Source specific monitoring used for compliance purposes, and monitoring records filed with regulatory agency at least every 4 months.			
	87%	93%	90%	Source specific monitoring used as an indicator of compliance, and monitoring records filed with regulatory agency every 6 to 9 months.			
	81%	86%	84%	Source specific monitoring used as an indicator of compliance, and monitoring records filed with regulatory agency each year.			
	70%	80%	75%	General guidance exists for source specific enhanced monitoring, and monitoring records required but aren't submitted to regulatory agency.	35%	75%	26.3%
		< 70%	35%	No requirements for any type of monitoring.			

Compliance History	94%	100%	97%	The facility has been in compliance for the past eight quarters.	35%	156 of 298 facilities	17.8%
	87%	93%	90%	The facility is believed to have been in compliance for the past eight quarters, although inspection frequency is such that this can't be positively confirmed.		10 of 298 facilities	1.1%
	81%	86%	84%	On schedule; the facility is meeting its compliance schedule.			
	70%	80%	75%	In Violation; facility is in violation of emissions and/or procedural requirements.		130 of 298 facilities	11.5%
		< 70%	35%	High Priority Violator (HPV): the facility is in significant violation of one or more applicable requirement of the CAA.		2 of 298 facilities	0.1%
Sum:							30.4%

B. Other important factors (4 criteria, each assigned weighting of 3% of total):

Type of Inspection	94%	100%	97%	Inspections involve compliance test methods with a high degree of accuracy, such as stack testing or other types of precise emissions measurement.			
	87%	93%	90%	Inspections involve detailed review of process parameters & inspection of control equipment.	3%	90%	2.7%
	81%	86%	84%	Inspections involve review of process and inspection of control equipment.			
	70%	80%	75%	Inspections generally consist of only a records review.			
		< 70%	35%	Inspections most likely consist of visual inspection (e.g., opacity), or drive by.			

Operation & Maintenance	94%	100%	97%	Control equipment operators follow and sign daily O&M instructions.			
	87%	93%	90%	Control equipment operators follow daily O&M instructions.	3%	90%	2.7%
	81%	86%	84%	Control equipment operators follow daily or weekly O&M instructions.			
	70%	80%	75%	O&M requirements exist, but on no specific schedule.			
		< 70%	35%	No specific O&M requirements.			

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score (= weight × value)
Unannounced Inspections	94%	100%	97%	Routinely conducted.	3%	97%	2.91%
	87%	93%	90%	Sometimes done.			
	81%	86%	84%	Done, but infrequently.			
	70%	80%	75%	Rarely done.			
		< 70%	35%	Never done.			

Enforcement Penalties	94%	100%	97%	Agency has the authority to impose punitive measures, including monetary fines, towards violators such as in delegated Title V Operating Permit programs.	3%	97%	2.91%
	87%	93%	90%	Agency has the authority to impose punitive measures, including monetary fines, towards violators such as in delegated Title V Operating Permit programs.			
	81%	86%	84%	Agency has the authority to impose punitive measures, including monetary fines, towards violators such as in delegated Title V Operating Permit programs.			
	70%	80%	75%	Agency has the authority to impose punitive measures, including monetary fines, towards violators such as in delegated Title V Operating Permit programs.			
		< 70%	35%	Agency does not have sufficient authority to impose punitive measures towards violators.			

C. Other factors (9 criteria, each assigned weighting of 2% of total):

Compliance Certifications	94%	100%	97%	Source subject to Title V or other type of compliance certification.	2%	75%	1.5%
	87%	93%	90%	Source subject to Title V or other type of compliance certification.			
	81%	86%	84%	Source not subject to any type of compliance certification.			
	70%	80%	75%	Source not subject to any type of compliance certification.			
		< 70%	35%	Source not subject to any type of compliance certification.			

Inspection Frequency	94%	100%	97%	Source(s) are inspected once every 2 years or more frequently.	2%	97%	1.94%
	87%	93%	90%	Source(s) inspected every 3 years or more frequently.			
	81%	86%	84%	Source(s) inspected every 5 years or more frequently.			
	70%	80%	75%	Inspection of source(s) infrequent; > every 5 years.			
		< 70%	35%	Inspections rarely, if ever, performed.			

EPA HPV Enforcement	94%	100%	97%	Agency has sufficient resources to implement EPA's 12/22/98 HPV policy.	2%	97%	1.94%
	87%	93%	90%	Agency's resources allow it to implement EPA's 12/22/98 HPV policy in most instances.			
	81%	86%	84%	Agency's resources allow it to implement EPA's 12/22/98 HPV policy in most instances.			
	70%	80%	75%	Agency's resources allow it to implement EPA's 12/22/98 HPV policy more often than not.			
		< 70%	35%	Resource constraints prohibit agency from implementing EPA's 12/22/98 HPV policy in most instances.			

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score(= weight × value)
Operator Training	94%	100%	97%	Control equipment operators complete a formal training program on use of the equipment; the program is kept up to date and has been reviewed by the regulatory agency.			
	87%	93%	90%	Control equipment operators complete formal training program, and such program is kept up to date and available for review by the regulatory agency upon request.			
	81%	86%	84%	Control equipment operators complete some amount of formal training.			
	70%	0.8	75%	Control equipment operators receive only on the job training.	2%	75%	1.5%
		< 70%	35%	Control equipment operators receive no specific training.			

Media Publicity	94%	100%	97%	Media publicity of enforcement actions.	2%	97%	1.94%
	87%	93%	90%	Media publicity of enforcement actions.			
	81%	86%	84%	Media publicity of enforcement actions.			
	70%	80%	75%	Media publicity of enforcement actions.			
		< 70%	35%	No media publicity of enforcement actions.			

Regulatory Workshops	94%	100%	97%	Regulatory workshops are available annually, and/or the implementing agency mails regulatory information packages each year.	2%	97%	1.94%
	87%	93%	90%	Regulatory workshops are available every 1-2 years, and/or the implementing agency mails regulatory information packages every 1-2 years.			
	81%	86%	84%	Regulatory workshops are available every 2-3 years, and/or the implementing agency mails regulatory information packages once every 2-3 years.			
	70%	80%	75%	Regulatory workshop not routinely available, but implementing agency mails regulatory information packages out about once every 2-3 years.			
		< 70%	35%	Regulatory workshops not routinely available. The implementing agency mails regulatory information packages infrequently, if ever.			

Inspector Training	94%	100%	97%	Inspectors must undergo 2 weeks of comprehensive basic training, and 1 to 2 weeks of source specific training, and such training is updated each year.			
	87%	93%	90%	Inspectors must undergo 1 to 2 weeks of basic training and 1 week of source specific training and such training is updated every 1-2 years.	2%	90%	1.80%
	81%	86%	84%	Inspectors must undergo 1 to 2 weeks of basic training and 3 to 5 days of source specific training, and such training is updated every 1-2 years.			
	70%	80%	75%	Inspectors must undergo 1 to 2 weeks of basic training and 1 to 3 days of source specific training, and such training is updated every 1-2 years.			
		< 70%	35%	Inspectors must undergo less than 5 days of basic training less than 3 days of source specific training, and such training is updated only every 2 years or less frequently.			

Factor	Range		Midpt. value	Description	Weight	Value assigned to MCAQD	Score(= weight × value)
Testing Guidelines	94%	100%	97%	Specific guidelines and schedule for testing and test methods exist.	2%	97%	1.94%
	87%	93%	90%	Specific guidelines on testing and test methods exist, but no schedule for testing.			
	81%	86%	84%	Specific guidelines on testing and test methods exist, but no schedule for testing.			
	70%	80%	75%	Specific guidelines on testing and test methods, but no schedule for testing.			
		< 70%	35%	Only general guidance on testing, or no mention of testing requirements.			

Follow-up Inspections	94%	100%	97%	Follow-up inspections always or almost always conducted (90 % of the time or more).	2%	97%	1.94%
	87%	93%	90%	Follow-up inspections usually conducted (approximately 75% of the time).			
	81%	86%	84%	Follow-up inspections sometimes conducted (approximately 50% of the time).			
	70%	80%	75%	Follow-up inspections infrequently conducted (approximately 25% of the time).			
		< 70%	35%	Follow-up inspections rarely or never conducted (10% of the time or less)			

Overall rule effectiveness score for non-Title V facilities:

84.27%