MARICOPA ASSOCIATION of GOVERNMENTS

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February 22, 2007

TO: Members of the MAG Air Quality Technical Advisory Committee

FROM: Stephen S. Cleveland, Goodyear City Manager, Chairman

SUBJECT: MEETING NOTIFICATION AND TRANSMITTAL OF TENTATIVE AGENDA

Thursday, March 1, 2007 - 1:30 p.m.
MAG Office, Suite 200 - Saguaro Room
302 North 1st Avenue, Phoenix

Please park in the garage underneath the building. Bring your ticket to the meeting; parking will be validated. For those using transit, the Regional Public Transportation Authority will provide transit tickets for your trip. For those using bicycles, please lock your bicycle in the bike rack in the garage.

Pursuant to Title II of the Americans with Disabilities Act (ADA), MAG does not discriminate on the basis of disability in admissions to or participation in its public meetings. Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting Jason Stephens at the MAG office. Requests should be made as early as possible to allow time to arrange the accommodation.

Members of the MAG Air Quality Technical Advisory Committee may attend in person, via videoconference or by telephone conference call. Those attending by videoconference must notify the MAG site three business days prior to the meeting. Those attending by telephone conference call are requested to call (602) 261-7510 between 1:25 p.m. and 1:30 p.m. on the date of the meeting. After the prompt, please enter the meeting ID number 27822 (on your telephone key pad) followed by the pound key. If you have a problem or require assistance, dial 0 after calling the number above.

Please be advised that under procedures approved by the MAG Regional Council, all MAG committees need to have a quorum to conduct the meeting. A quorum is a simple majority of the membership. If you are unable to attend the meeting, please make arrangements for a proxy from your entity to represent you.

TENTATIVE AGENDA

		COMMITTEE ACTION REQUESTED
1.	Call to Order	
2.	Call to the Audience An opportunity will be provided to members of the public to address the Air Quality Technical Advisory Committee on items not scheduled on the agenda that fall under the jurisdiction of MAG, or on items on the agenda for discussion but not for action. Members of the public will be requested not to exceed a three minute time period for their comments. A total of 15 minutes will be provided for the Call to the Audience agenda item, unless the Air Quality Technical Advisory Committee requests an exception to this limit. Please note that those wishing to comment on action agenda items will be given an opportunity at the time the item is heard.	2. For information.
3.	Approval of the February 15, 2007 Meeting Minutes	3. Review and approve the February 15, 2007 meeting minutes.
4.	Update on the Maricopa County 2005 PM-10 Emissions Inventory On January 23, 2007, the Maricopa County Air Quality Department made available a revised Preliminary Draft 2005 PM-10 Emissions Inventory for a thirty-day public review period. An update on the inventory will be provided. Also, the Home Builders and Associated General Contractors have submitted comments on the draft inventory and have requested to have their consultant, E.H. Pechan & Associates, discuss the comments with the Air Quality Technical Advisory Committee. Please refer to the enclosed material.	4. For information and discussion.

5. Suggested List of Measures to Reduce PM-10 Particulate Matter

Since December 7, 2006, the MAG Air Quality Technical Advisory Committee has been reviewing a Preliminary Draft Comprehensive List of Measures to reduce PM-10 Particulate Matter. The Committee also reviewed the preliminary draft 2005 emissions inventory prepared by Maricopa County, preliminary draft projected emissions for 2007, 2008, and 2009 prepared by MAG, air quality monitoring data, the modeling approach for the Five Percent Plan for PM-10, preliminary results from the PM-10 Source Attribution and Deposition Study,and descriptive information generated for the measures, including cost effectiveness. In addition, MAG conducted a workshop on Friday, February 16, 2007 on the Preliminary Draft List of Measures and the PM-10 Source Attribution and Deposition Study. During the review process that has occurred since December 7, 2006, comments and suggestions from the Committee members and the MAG consultants have been incorporated into the Preliminary Draft Comprehensive List of Measures and then transmitted to the Air Quality Technical Advisory Committee.

Since the last meeting, additional control measures have been submitted by industry for consideration and are attached. At this meeting, additional comments and suggestions from the Committee are welcomed. The Committee will then be requested to recommend a Suggested List of Measures to Reduce PM-10 Particulate Matter to the MAG Management Committee. On March 14, 2007, the MAG Management Committee may make a recommendation to the MAG Regional Council. On March 28, 2007, the MAG Regional Council may take action to approve the Suggested List of Measures for consideration by the State and local governments for implementation.

5. For information, discussion, and recommendation of a Suggested List of Measures to Reduce PM-10 Particulate Matter.

To assist the Committee, the February 5, 2007 version of the draft list now includes a brief description of the measure, cost effectiveness information, estimated emissions reductions for the five percent calculation, and additional information on the potential impacts on modeled and actual attainment at the monitors. Please refer to the enclosed material.

6. Status Report on Agricultural Measures

The Governor's Agricultural Best Management Practices Committee has been evaluating possible measures to reduce PM-10 emissions from agriculture. A status report will be given by a representative from the agricultural community.

6. For information and discussion.

7. Call for Future Agenda Items

The next meeting of the Committee has been tentatively scheduled for **Tuesday, March 6, 2007 at 1:30 p.m.** if necessary to complete the recommendation of a Suggested List of Measures to Reduce PM-10 Particulate Matter. The Chairman will invite the Committee members to suggest future agenda items.

7. For information and discussion.

MINUTES OF THE
MARICOPA ASSOCIATION OF GOVERNMENTS
AIR QUALITY TECHNICAL ADVISORY COMMITTEE MEETING

Thursday, February 15, 2007
MAG Office
Phoenix, Arizona

MEMBERS PRESENT

Stephen Cleveland, City of Goodyear, Chairman
*Jess Segovia, Avondale
Michael Salisbury for Lucky Roberts, Buckeye
#Jim Weiss, Chandler
#Jamie McCullough, El Mirage
Lisa Taraborelli for Tami Ryall, Gilbert
Doug Kukino, Glendale
Scott Bouchie, Mesa
Gaye Knight, Phoenix
Larry Person, Scottsdale
Antonio DeLaCruz, Surprise
Oddvar Tveit, Tempe
Larry Crisafulli for Walter Bouchard, Citizen Representative
Corey Woods, American Lung Association of Arizona
Barbara Sprungl, Salt River Project
Brian O'Donnell, Southwest Gas Corporation
*Jim Mikula, Arizona Public Service Company
*Gina Grey, Western States Petroleum Association
*Randi Alcott, Valley Metro
*Dave Berry, Arizona Motor Transport Association
Jeannette Fish, Maricopa County Farm Bureau
Russell Bowers, Arizona Rock Products Association
*Michelle Rill, Greater Phoenix Chamber of Commerce
Amanda McGennis, Associated General Contractors
Bert Acken for Connie Wilhelm-Garcia, Homebuilders Association of Central Arizona
*Stephen J. Andros, American Institute of Architects - Central Arizona
#Mannie Carpenter, Valley Forward
Kai Umeda for Patrick Clay, University of Arizona Cooperative Extension
Beverly Chenausky, Arizona Department of Transportation
Peter Hyde, Arizona Department of Environmental Quality
Wienke Tax, Environmental Protection Agency
Jo Crumbaker, Maricopa County Air Quality Department
Duane Yantorno, Arizona Department of Weights and Measures
*Ed Stillings, Federal Highway Administration
*Judi Nelson, Arizona State University
#Angela Cruz for B. Bobby Ramirez, Salt River Pima-Maricopa Indian Community
*David Rueckert, Citizen Representative

*Members neither present nor represented by proxy.
#Participated via telephone conference call.
+Participated via video conference call.

OTHERS PRESENT

Lindy Bauer, Maricopa Association of Governments
Cathy Arthur, Maricopa Association of Governments
Taejoo Shin, Maricopa Association of Governments
Dean Giles, Maricopa Association of Governments
Julie Hoffman, Maricopa Association of Governments
Nagesh Krishnarajanagar, Maricopa Association of Governments
Ieesuck Jung, Maricopa Association of Governments
Patrisia Navarro, Maricopa Association of Governments
Diane Arnst, Arizona Department of Environmental Quality
David Lillie, Arizona Department of Environmental Quality
Robert St. John, City of Glendale
Johanna Kuspert, Maricopa County Air Quality Department
Hazel Chandler, Maricopa County Asthma Coalition
Steve Egge, J&D Excavators
Barb Sylvester, Brown & Caldwell Consultants
Merry Ellen Boom, Converse Consultants
Scott Di Biase, Pinal County Air Quality
Don Gabrielson, Pinal County Air Quality
Steve Trussell, Arizona Rock Products Association
Bob Dulla, Sierra Research
Nick Simonetta, Jennings, Strouss & Salmon, PLC
Cameron Flower, Kitchell Environmental Serivces
#Ruth Garcia, Town of Buckeye

1. Call to Order

A meeting of the MAG Air Quality Technical Advisory Committee was conducted on February 15, 2007. Larry Person, City of Scottsdale, Acting Chair, called the meeting to order at approximately 1:35 p.m. Mannie Carpenter, Valley Forward; Jamie McCullough, City of El Mirage; Ruth Garcia, Town of Buckeye; Angela Cruz, Salt River Pima-Maricopa Indian Community; and Jim Weiss, City of Chandler, attended the meeting via telephone conference call.

2. Call to the Audience

Mr. Person stated that, according to the MAG public comment process, members of the audience who wish to speak are requested to fill out comment cards, which are available on the table adjacent to the doorway inside the meeting room. Citizens are asked not to exceed a three minute time period for their comments. Public comment is provided at the beginning of the meeting for nonagenda items and nonaction agenda items. Mr. Person noted that no public comment cards had been received.

3. Approval of the February 1, 2007 Meeting Minutes

The Committee reviewed the minutes from the February 1, 2007 meeting. Amanda McGennis, Associated General Contractors, referred to the two last paragraphs on page four of the minutes. She inquired about preliminary draft measures two and three having different control efficiencies. Bob Dulla, Sierra Research, discussed preliminary draft measure two, extensive dust control training program. He stated that the goal is to adopt a Clark County (Las Vegas, Nevada) type program where all on-site supervisors and foreman are required to have a dust card. It was assumed that the control efficiency would increase from 50 to 70 percent due to the increase in watering. Mr. Dulla indicated that in Clark County, approximately 20,000 people had gone through the training since it began in 1999. The idea was that everyone on the construction site was familiar with the requirements of the program; therefore, a big increase in efficiency can be assumed. Mr. Dulla stated that for preliminary draft measure three, core dust control training program with video distribution (train the trainer concept) the control was assumed to be less since the outreach would not be as extensive. Therefore, the benefits would be lower.

Jeannette Fish, Maricopa Farm Bureau, indicated that there was a typographical error on page eleven of the February 1, 2007 meeting minutes. Russell Bowers, Arizona Rock Products Association, moved and Corey Woods, American Lung Association of Arizona, seconded and the motion to approve the February 1, 2007 meeting minutes as corrected carried unanimously.

4. Description of the Preliminary Draft Comprehensive List of Measures to Reduce PM-10 Particulate Matter

Lindy Bauer, Maricopa Association of Governments, reminded the Committee that a workshop is scheduled for Friday, February 16, 2007 at 9:00 a.m. at the MAG office to provide an opportunity to ask the consultants questions on the MAG PM-10 Source Attribution and Deposition Study and descriptive information presented for the Preliminary Draft Comprehensive List of Measures to Reduce PM-10 Particulate Matter. She indicated that at this meeting, Mr. Dulla will continue to describe the measures.

Mr. Dulla presented the analysis for the remaining 28 preliminary draft measures. The analysis for the other 18 preliminary draft measures was presented at the February 1, 2007 meeting. A total of

46 measures were evaluated. Mr. Dulla mentioned that there are two issues when reviewing the measures: descriptions/assumptions and comparing measures based on cost effectiveness. He indicated that he will also be at the workshop to answer questions. Mr. Dulla requested any additional information from the Committee that may be helpful in making the assumptions as accurate as possible.

Mr. Dulla discussed preliminary draft measure number seven, increase fines for dust control. The goal is to increase compliance by levying higher penalties. He noted that the current ceiling of $10,000 per day per violation is set in statute; therefore, a change in statute would be required for this measure. Mr. Dulla discussed the enforcement history. He stated that the average penalty has increased approximately $5,000 per violation since the Enforcement Division assumed settlement authority in July 2005. Mr. Dulla mentioned the factors that can affect fine level and the response to increased fines. He noted that behavior change is typically a lagged response. The rule effectiveness for Rule 310 in the Draft 2005 PM-10 Emissions Inventory is approximately 49 percent. Mr. Dulla indicated that he believes that is actually higher since there has been less than a year between the time when the Enforcement Division assumed settlement authority and when the rule effectiveness study was completed. Therefore, there was less than a year to achieve the reduction in the backlog or increase in fines.

Mr. Dulla stated that it is not possible to quantify the cost effectiveness for measure seven. He indicated that the goal is to make noncompliance unprofitable and can that be achieved by increased inspections, Notices of Violation (NOVs), and fines per year; increased fines; or a combination of the two. He stated that on an annual basis, the cost of noncompliance will increase much more through additional inspections than through raising fines. Mr. Dulla indicated that he believes the measure is more effectively achieved by increasing inspections.

Ms. McGennis asked if Clark County was contacted regarding measure seven. Mr. Dulla replied that Clark County was not contacted to discuss this measure. Ms. McGennis commented that everyone in Clark County is typically fined the same. She noted that Clark County found no effectiveness in increasing fines. Ms. McGennis suggested contacting Clark County.

Brian O'Donnell, Southwest Gas Corporation, inquired if the fine structure accounts for the number of projects for a specific industry in relation to the number of violations. Jo Crumbaker, Maricopa County Air Quality Department, responded that the fine structure does have a component for the size and severity of the site and party that violated. Ms. McGennis commented that Clark County does not discriminate by the size of the party or project. Ms. Crumbaker replied that size refers to the extent of noncompliance not the size of the project. She stated that there is a component of environmental and public harm in the penalty. Ms. McGennis commented that there has been a difference in fines depending on the size of the contractor.

Mr. Bowers inquired about how the Committee should comment on the preliminary draft measures. Mr. Dulla replied that he will be available at the workshop to answer more detailed questions. Mr. Bowers commented that the Committee needs an opportunity to vet the measures and that there does not appear to be enough time in this meeting. Stephen Cleveland, City of Goodyear, Chair, stated that the intent is to provide the Committee with the big picture at this meeting and more details can be given at the workshop. He inquired about the length of the workshop. Ms. Bauer responded that the workshop will begin at 9:00 a.m. and will continue as long as needed.

Mr. Dulla discussed preliminary draft measure number eight, establish a certification program for dust free developments to serve as an industry standard. The goal is to create a program that provides publicity value to contractors for minimizing construction emissions. He indicated that the measure has a fundamentally different approach to dust control (carrot instead of a stick). Mr. Dulla mentioned the criteria that needs to be established that minimizes construction emissions. He stated that the certification process and Public Awareness Program would need to also be established for this measure. Mr. Dulla mentioned the cost elements and benefits of the measure. He noted that the participation rate and cost effectiveness may not be real accurate. The assumption was that the difference between the current levels and the 80 percent goal represented the benefit that could be achieved from the program. He stated that the cost effectiveness of achieving 80 percent emission reduction is estimated to be $10,752 per ton of PM-10 reduced. He noted that Maricopa County administrative costs of the program were not included.

Mr. Dulla discussed preliminary draft measure number ten, just in time grading. The goal is to eliminate fugitive dust from cleared land waiting for construction activity. He stated that this measure is based on a measure included in the Bullhead City State Implementation Plan. Mr. Dulla stated that the measure is focused on high wind events. He mentioned that there are two categories of disturbed land emissions: vehicle operation and wind blown dust. Mr. Dulla indicated that there is no benefit for vehicle operation emissions. He noted that the emissions will occur regardless of whether the land has been stabilized. Mr. Dulla stated that there is no estimate of high wind emissions or cost effectiveness.

Mr. Bowers commented on concerns from the Homebuilders Association of Central Arizona on this measure. He indicated that equipment is brought onto the property to do the entire subdivision. To divide the subdivision into increments would require the equipment to be brought on and off the property several times. Mr. Dulla stated that Maricopa County and ENVIRON have prepared estimates of emissions from high wind events. He indicated that he will breakout the categories that the measures address. Mr. Dulla stated that the information still needs to be included in this measure and vacant land related measures. At that time, the cost effectiveness will decrease making the measure more attractive.

Diane Arnst, Arizona Department of Environmental Quality, commented on the Clark County Rules, Section 94, that include just in time grading. Mr. Dulla responded that Clark County is primarily focused on high wind events, which would be consistent with Bullhead City. Ms. Arnst mentioned Clark County and Bullhead City. Mr. Cleveland requested that Mr. Dulla look at the data.

Mr. Dulla discussed preliminary draft measure number eleven, establish continuous monitoring requirements for permitted sources greater than 50 acres. The goal is to measure on-site concentrations so data is available to determine when dust control is needed and project emissions are minimized. He mentioned that the measure has been implemented in California. Mr. Dulla noted that there are practical problems in locating monitors for comparison of up wind and down wind values. He indicated that this measure was considered and rejected by the San Joaquin Valley since it was too expensive. Mr. Dulla stated that the two elements of cost are monitoring and watering. Assuming a baseline rule effectiveness of 50 percent, and full-time use of one additional watering truck, the cost effectiveness is $21,530 per ton of PM-10 reduced. He noted that the annual benefits and cost effectiveness of this measure depends on the baseline level of control assumed and percent of time watering that is required. Mr. Bowers inquired if a cost effectiveness analysis was

conducted on this measure in San Joaquin. Mr. Dulla replied that he will look at the San Joaquin study.

Mr. Dulla discussed preliminary draft measure number twelve, conduct mobile monitoring to measure PM-10 and issue NOVs. The goal is to instrument a vehicle with equipment to measure PM-10 concentrations at property lines. He stated that Maricopa County has received approval to construct a multipurpose monitoring vehicle. The vehicle will be used to respond to complaints. Mr. Dulla noted that the cost effectiveness is not likely to be as attractive as having a monitor used specifically for dust control. He indicated that it is not possible to determine cost associated with PM measurement capabilities of the County vehicle. Mr. Dulla discussed the basis of the cost effectiveness that is $54,000 per ton of PM-10 reduced. He stated that an alternate approach would be designing a vehicle that was specifically focused on dust control, which may be more attractive.

Mr. Dulla discussed preliminary draft measure number 13, cease dust generation activities during stagnant conditions. The goal is to eliminate early morning emissions on winter inversion days when exceedances are imminent. He indicated that ADEQ meteorological data from November 1st through February 15th for the past three years was reviewed. The frequency of operations being affected was approximately eight to ten days during the period. Mr. Cleveland asked if the numbers provided for High Pollution Advisory days, stagnation days, and exceedances overlap. Mr. Dulla responded that is correct. Wienke Tax, Environmental Protection Agency, asked if the annual averages are provided. Mr. Dulla replied that the numbers are per season over three years. Ms. Fish commented on the long period of time without rain last year.

Gaye Knight, City of Phoenix, inquired about the worst case scenario. Mr. Dulla responded that he will report back on the question. He noted that this measure would cease activity; however, there is another measure to shift activity. He mentioned feasibility and indicated that shifting activity does not eliminate the emissions. Mr. Cleveland stated that if the goal is to eliminate early morning emissions, industry could start operations at 10:00 a.m. instead of 7:00 a.m. Mr. Dulla discussed the need to identify potential participants.

Beverly Chenausky, Arizona Department of Transportation, suggested a change in the title since not all stagnant conditions will be high PM days. She mentioned looking at just high PM stagnant conditions, which would reduce the number of days required to cease operations. Mr. Dulla responded that the title can be changed. He noted that the average of stagnation days was lower than the number of exceedance days. Mr. Dulla discussed investigating options to offset costs of measure number 13. He mentioned that there is limited annual emission reduction and the cost effectiveness is unknown.

Mr. Dulla discussed preliminary draft measure number 14, establish maintenance requirements for paved roads and parking lots. The goal is to ensure silt levels on private roads/parking lots are maintained to limit potential for trackout and fugitive dust. He mentioned the requirements in Rules 310 and 310.01 to establish control and stabilization for unpaved surfaces. However, once an unpaved surface is paved, no subsequent maintenance requirements apply. Mr. Dulla mentioned silt loadings that build-up on the facilities and the control being degraded. He noted that the draft 2005 inventory does not include emissions from paved parking lots. Mr. Dulla stated that emissions from these sources are not eliminated unless the paved surface is maintained. He indicated that the analysis examined benefits of sweeping a parking lot once every two weeks. Mr. Dulla mentioned

that the cost effectiveness is estimated to be $356,350 per ton of PM-10 removed. He noted that the benefits are highly dependent on baseline silt assumptions.

Ms. Knight commented that she thought the measure referred to maintaining gravel if used for stabilization. She stated that is more feasible than having the cities or Maricopa County adopting a code to sweep a parking lot every two weeks. Mr. Dulla referred to the MAG PM-10 Source Attribution and Deposition Study where a parking lot with a packed aggregate surface was observed as having dust plumes coming off the property next to a monitor. Ms. Knight encouraged the Committee to think about the measure as maintaining surfaces such as gravel versus having the cities adopt a code requiring the parking lots be swept every two weeks. Mr. Dulla mentioned observations of parking lots next to unpaved areas where there was a lot of trackout onto the parking lot, which had little control.

Mr. Dulla discussed preliminary draft measure number 15, conduct nighttime inspections. The goal is to reduce emissions from uncontrolled operations conducted at night. He indicated that current nighttime enforcement is limited. Mr. Dulla stated that recent field study and analysis of monitoring data confirm the importance of PM-10 emitted in predawn hours to exceedances in winter months. He noted that opacity measurements are difficult/impossible to conduct in the dark. The primary alternative is to use a mobile monitor at the property line in the dark. Mr. Dulla indicated that industry response is assumed to be increased watering of two additional trucks/drivers per facility and a baseline rule effectiveness of 50 percent. He stated that the cost elements include monitoring (one percent) and watering (99 percent). Mr. Dulla mentioned that the cost effectiveness is estimated to be $10,752 per ton of PM-10 removed.

Mr. Dulla discussed preliminary draft measure number 16, increase inspection frequency for permitted facilities. The goal is to increase compliance from permitted facilities through increased inspections. He noted that in discussions with Maricopa County, they indicated that additional staff are required to improve Rule 310 compliance. The current shortfall in the rule effectiveness goal of 80 percent is 31 percent, based on the draft 2005 inventory. He mentioned that the rule effectiveness is probably higher due to a lagged response from increased settlement fines. Mr. Dulla stated that increased inspection frequency is not expected to achieve the gap between current levels and the 80 percent target. He indicated that a combination of measures, education, enforcement, etcetera will be needed to fill the gap. The analysis assumed that increased watering would be used to achieve 80 percent rule effectiveness. The cost effectiveness is estimated to be $65,765 per ton of PM-10 reduced.

Bert Acken, Lewis and Roca, indicated that he concurred with the statement that a combination of measures will be needed to fill the gap. He stated that from an industry standpoint, there has been a focus on enforcement. Mr. Acken stated that industry has advocated for education and that it is good to see education as an important component.

Mr. Dulla discussed preliminary draft measure number 17, increase number of proactive inspections in areas of highest emission densities. The goal is to increase compliance from facilities located in areas with highest emission density. He stated that the analysis assumed target facilities are inspected twice per day. Mr. Dulla indicated that compliance response would be an increase in haul road watering from once every two hours to once every hour. He mentioned that the cost components include inspection (five percent) and increased watering (95 percent). The cost

effectiveness is estimated to be $65,900 per ton of PM-10 removed. Mr. Dulla noted that this measure has an extra element of cost due to training. However, measures 16 and 17 are very similar.

Mr. O'Donnell commented on the increased inspections around the monitors and inquired about the cost per ton of PM-10 removed. Mr. Dulla replied that the focus is on industry around two monitors. He stated that haul roads were originally being watered every four hours. In 2006, the haul roads were watered every two hours. If there is still excess emissions, watering would occur every hour. The benefit is measuring the increase in watering in response to increased scrutiny. It does not involve attainment at a particular monitor. Mr. Cleveland asked if there is a point where it would be cheaper to lay asphalt on the haul road. Mr. Dulla responded that multiple methods can be used. Mr. O'Donnell commented that in the area of the monitors there would be enough inspections to prevent exceedances. He indicated that he expected the cost per ton of PM-10 removed would be less in areas where there is increased inspections. Mr. Dulla replied that the tonnage reduction is needed to get the monitors into compliance.

Mr. Dulla discussed preliminary draft measure number 18, notify violators more rapidly to promote immediate compliance. The goal is to reduce time allowed for compliance during November-February. He stated that he looked at the impact on owners of vacant lots and unpaved lots. Mr. Bowers commented on receiving a NOV nine months after the infraction. He mentioned that it would be helpful to industry to be notified immediately so they could cease the activity. Mr. Bowers stated that if a NOV is going to be issued, drive onto the property and ask for the dust compliance officer. Mr. Dulla stated that the impact on attainment will be small in terms of five percent reductions; however, it will be much more important for impact at the monitors. Mr. Cleveland commented on the immediacy of the notification given the time period of November-February.

Ms. McGennis commented that Clark County has immediate notification and remediation within 24 hours, which is highly effective. Mr. Dulla responded that the analysis was completed on vacant lots which have a mandatory 60 day notification period. Ms. Crumbaker stated that there is typically nobody present on vacant lots; therefore, research of ownership is required. She stated that the compliance practices have been switched. The direction to the inspector is that as long as someone is working on the site and a violation is observed, the inspector will advise the person on the site of the observation. The exception is that some of the trackout follow-ups are completed after the activity ceases for the day. The inspectors do not go on-site since trackout can be observed on the road. Those contacts are made later since nobody is on-site at the time.

Mr. Cleveland inquired about the standard time frame for notices. Ms. Crumbaker responded that recent changes have occurred in terms of who is responsible for certain inspections to address the issue of delayed notices. She stated that the current guideline is if a violation is observed and someone is on-site to advise them of the violation. Ms. Crumbaker stated that the inspector will generally return to the office and notify the corporate office as well. Mr. Bowers commented on taking credit. Mr. Cleveland stated that the measure addresses vacant lots and the discussion has been regarding operational lots. He indicated that another measure may be needed. Barbara Sprungl, Salt River Project, commented that she agrees with adding another measure.

Mr. Dulla stated that the maximum annual benefits from immediate compliance represents 750 tons (November-February) or less than one percent. He indicated that the actual benefit will be less, compliance is unclear and is assumed at 25 percent. Mr. Dulla commented on linking the measures and looking at the economic efficiency of putting the measures in place versus the potential benefit.

Mr. Cleveland asked if there was a difference between the 60 days to stabilize requirement in Rule 310 versus 15 days to stabilize. Mr. Dulla responded that there was not an estimate of emissions that occurred. He indicated that the cost effectiveness is based on estimates computed for unpaved parking - $6,000 per ton of PM-10 removed (minimum) and vacant lots - $239,050 per ton of PM-10 removed (maximum).

Mr. Dulla discussed preliminary draft measure number 19, fully implement Rule 316. The goal is to implement fugitive dust revisions adopted in June 2005. He stated that prior to the 2005 Revision, Rule 316 contained only emission limitations not fugitive dust control measures. Mr. Dulla indicated that facilities subject to Rule 316 were required to comply with Rule 310. He discussed the revisions adopted. Mr. Dulla provided the cost effectiveness (per rulemaking pursuant to A.R.S. 49-112): large-sized facility, $4,802-$5,501; medium-sized facility #1, $6,417-$7,437; medium-sized facility #2, $9,126-$10,678; and small-sized facility, $30,087-$59,750. He indicated that the analysis was not updated. It is being reported for a comparison of the cost effectiveness of the other measures.

Mr. Dulla discussed preliminary draft measure number 20, require private companies to use PM-10 certified street sweepers. The goal is to reduce silt levels on paved surfaces through increased sweeping. He stated that this measure is similar to measure 14. Mr. Dulla indicated that the measures have the same cost effectiveness of $356,350 per ton of PM-10 reduced. He noted that the benefits are highly dependent on baseline silt assumptions, which will be discussed at the workshop.

Mr. Dulla discussed preliminary draft measure number 21, shift hours of operation during stagnant conditions in November through February. The goal is to eliminate early morning emissions on winter inversion days when exceedances are imminent. He stated that this measure is similar to measure 13. The primary difference is that this measure does not reduce emissions. Mr. Dulla indicated that the measure would provide substantial aid to demonstrating attainment at the monitors and the cost to industry will need to be investigated.

Mr. Dulla discussed preliminary draft measure number 22, model cumulative impacts for newer modified stationary sources. The goal is to place a cap on growth in PM-10 emission density. He indicated that this measure would require modeling for new/modified facilities to account for emissions from adjacent facilities. Emissions that cause concentrations to exceed a threshold would need to be offset. Mr. Dulla stated that there is currently no market in Maricopa County for offsets. He mentioned that the costs of offsets would encompass a range of measures examined. Mr. Dulla indicated that San Joaquin Valley has a well developed market system with costs ranging from $20,000 to $40,000 per ton of PM-10 removed. He noted that there is a cost curve and the lowest cost control for industry is $109 per ton of PM-10 removed for paving unpaved roads. The cost would rise depending on market activity.

Mr. Dulla discussed preliminary draft measure number 23, conduct nighttime and weekend inspections. The goal is to reduce emissions from uncontrolled operations conducted at night and on weekends. He stated that this measures is the same as measure 15, but includes weekends. The analysis is basically the same. Since monitoring is only one percent of overall cost, there is no difference in cost effectiveness between night and weekend inspections. The cost effectiveness is estimated to be $10,752 per ton of PM-10 removed.

Mr. Dulla discussed preliminary draft measure number 26, reduce off-road vehicle use in areas with high off-road vehicle activity. The goal is to expand the City of Goodyear all-terrain vehicle (ATV)

and off-highway vehicle (OHV) restrictions to the PM-10 nonattainment area. The Goodyear ordinance does not allow ATVs and OHVs to operate on unimproved property without written permission of the property owner. Mr. Dulla discussed the requirements of written permission. He mentioned the enforcement, benefits, and cost of the ordinance. He indicated that the cost effectiveness of the measure is estimated to be $230 per ton of PM-10 removed. Mr. Dulla stated that most of the activity in Goodyear ceased within a week and no arrests have been made. He noted that the activity likely moved elsewhere. Ms. Fish commented that the ATV and OHV riders are still within the PM-10 nonattainment area.

Mr. Acken commented on ATVs and OHVs being a source in the draft 2005 inventory. He mentioned the cost effectiveness and indicated that he hopes other communities consider a similar ordinance. Mr. Dulla stated that it is his understanding that enforcement in the Salt River Area has had a similar effectiveness. Ms. Knight indicated that the City of Phoenix conducted extensive enforcement in the Salt River Area as well as installing guard rails, barriers, etc. She stated that Phoenix does not have the same ordinance as Goodyear, but aggressive enforcement. Ms. Knight indicated that a lot of the problems occur on state land. Mr. Cleveland commented on identifying the State as a partner in reducing the activity and also the Bureau of Land Management.

Mr. Dulla indicated that there were four measures addressing vacant lots and open land is separate. He mentioned the Goodyear ordinance and stated that there were no fixed costs to amortize. Ms. Fish commented on a change in the way Maricopa County can regulate and enforce this type of ordinance. She mentioned that the issue also occurs in unincorporated areas of the County. Ms. Fish noted that private land owners have installed signs/barriers and called the police; however, the problem still exists. Mr. Person commented that the cost effectiveness applies to three percent of the draft 2005 inventory. Mr. Dulla responded that is correct.

Mr. Dulla discussed preliminary draft measure number 29, sweep streets with PM-10 certified street sweepers. The goal is to ensure that all cities and towns use PM-10 certified street sweepers. He stated that some communities are still using noncertified sweepers. Mr. Dulla mentioned that PM-10 certified sweepers are 50 percent more efficient than noncertified sweepers. He indicated that the marginal cost of certified sweepers is approximately $3,500 per vehicle. The cost effectiveness is estimated to be $302 per ton of PM-10 removed, assuming only paying for the increment of the sweeper. If a community is buying a sweeper for the first time and it is not part of the normal cycle, the cost effectiveness will be very different.

Mr. Dulla discussed preliminary draft measure number 31, repave or overlay paved roads with rubberized asphalt. The goal is to reduce PM-10 emitted from tire wear by paving roads with rubberized asphalt. He mentioned a study conducted by the Arizona Department of Transportation (ADOT) that found tire wear emissions are 30 to 50 percent lower on rubberized asphalt than on Portland Concrete Cement (PCC). He noted that this is a small category of emissions. Mr. Dulla discussed the emission benefits and cost of rubberized asphalt. The cost effectiveness, assuming 50 percent reduction, ranges from $631,000 to $4,290,000 per ton. He noted that the marginal cost of rubberized asphalt versus PCC could improve cost effectiveness. Mr. Dulla indicated that cost effectiveness may not be relevant in light of Proposition 400, benefits for miles of rubberized asphalt are not included in the draft 2005 inventory, and scheduled paving will contribute to annual PM-10 reductions.

Mr. Cleveland commented on the public perception of noise reduction. Ms. Knight stated that Phoenix overlays asphalt with rubberized asphalt. She mentioned this as a commitment where credit could be taken. Mr. Dulla replied that the inventory and vehicle miles traveled on those roads would be needed to estimate a benefit.

Mr. Bowers commented on Proposition 400 and a mandatory use of rubberized asphalt. Ms. Chenausky referred to the ADOT study. She stated that this is geared toward freeway use, which would show a greater benefit. Ms. McGennis indicated that she can provide a study that compares asphalt to asphalt. Ms. Chenausky provided information on studies looking at various pavement structures and surfaces. Ms. McGennis commented that credit should also be taken for using concrete. She suggested not limiting the measure to rubberized asphalt. Mr. Dulla asked if the National Cooperative Highway Research Program studies measured the reduction in tire-wear. Ms. McGennis replied that is correct.

Mr. Dulla discussed preliminary draft measures number 38, strengthen and increase enforcement of Rule 310.01 for vacant lots; 39, restrict vehicular use and parking on vacant lots; 40, enhanced enforcement of trespass ordinances and codes; and 41, vacant lots stabilized by Maricopa County if owners do not respond. He noted that the analysis is limited for these measures since he has not been able to incorporate an estimate of windblown dust for these categories of land use. Mr. Dulla indicated that the measures will be updated and provided to the Committee.

Mr. Dulla discussed preliminary draft measure number 42, schedule improvements on parallel streets to retain alternate route options along major corridors. The goal is to enhance capacity of parallel roads to improve traffic flow along key corridors, and reduce congestion and vehicle emissions. He indicated that the measure is focused on reducing exhaust emissions, which represent one percent of PM-10 emitted in the draft 2005 inventory. Mr. Dulla discussed the impact of speed on components of vehicle PM emissions. He indicated that potential benefit is extremely limited and cost effectiveness per ton of PM-10 reduced is extremely poor.

Mr. Dulla discussed preliminary draft measure number 43, build park and ride lots earlier. The goal is to reduce emissions by decreasing the number of single occupancy vehicles on the road. He mentioned that reduced vehicle miles traveled eliminates trip related exhaust and fugitive dust emissions. Mr. Dulla noted that the emission benefits only accrue to years in which the park and ride lots would not have been constructed. He stated that the use of transit has PM-10 drawbacks. Mr. Dulla indicated that a transit bus exhaust PM is almost 100 times higher than light duty vehicle PM. He discussed the PM analysis of paved road fugitive dust and indicated that park and ride lots will reduce PM-10 emissions if carpools are used and transit buses are operated at a minimum capacity of 75 percent. Mr. Dulla noted that the cost effectiveness is not attractive for PM-10 control.

Mr. Cleveland inquired about the bow wake of a bus. Mr. Dulla replied that a comparison would need to be conducted between the bow wake of a bus versus the vehicles that would have been driven. This measure addresses fugitive dust from the tires. Ms. Chenausky referred to the assumptions and commented on those who ride the bus because they have no vehicle. Mr. Dulla responded that this measure addresses park and ride lots. Ms. Chenausky commented on the analysis of full ridership. Mr. Dulla replied that the assumption was 1.2 persons per vehicle.

Mr. Dulla discussed preliminary draft measure number 44, coordinate public transit services with Pinal County. The goal is to shift single occupant commute travel into transit and reduce vehicle

miles traveled and emissions. He noted that Pinal County currently has no transit service and there are similar issues to measure 43.

Mr. Dulla discussed preliminary draft measure number 45, increase fines for open burning. The goal is to decrease emissions from uncontrolled burns by raising the cost of noncompliance. He stated that the current penalty of $25 per occurrence is set in A.R.S. 49-501. Mr. Dulla indicated that the draft 2005 inventory does not contain any emissions from uncontrolled burns. He mentioned that there is no data on the number or size of uncontrolled burns. The only information is from complaints. Mr. Dulla noted that while the magnitude of emissions appears small, a recent field study shows that emissions and potential impacts from uncontrolled burns can be significant. The Statute would need to be revised to raise the fine.

Mr. Bowers commented on field burning and asked if there has been discussions with the tribal nations. Mr. Dulla responded that he did not find that information in the draft 2005 inventory. Ms. Sprungl commented on a video clip shown at the January 11, 2007 meeting where there was open burning near a monitor.

Mr. Dulla discussed preliminary draft measure number 46, restrict use of outdoor fireplaces, pits and ambience fireplaces in the hospitality industry. The goal is to close the loopholes in existing rates and reduce emissions from nonessential fireplace use. He mentioned the current restrictions, exemptions and fines. Mr. Dulla noted that there is no specific category in the draft 2005 inventory for outdoor fireplaces, pits and ambient heating in hospitality industry. He discussed the compliance options and indicated that the cost effectiveness depends on the approach: curtailment - $132,000 per ton or retrofit - $190,000 per ton. Mr. Dulla noted that since enforcement already restricts burning on High Pollution Advisory days, the marginal cost of extending those restrictions to other sources should be minimal.

Mr. Cleveland asked if an incentive retrofit conversion program was considered. Mr. Dulla responded that based on research in other areas, people are not necessarily willing to replace their wood burning stoves.

Mr. Dulla provided the 2007 MAG PM-10 control measures ranked by increasing cost effectiveness. Mr. Acken referred to measure 15 and asked if the cost effectiveness is to go from 50 percent to 80 percent. Mr. Dulla replied that is correct. Mr. Acken referred to statements made that the cost effectiveness may be higher due to a lagged response from increased settlement fines. He inquired about the cost effectiveness of going from 70 to 80 percent. Mr. Dulla responded that water is a common control in the construction industry. The question is what is the baseline, target, and cost of enforcement. He indicated that he will report back on the question.

Peter Hyde, Arizona Department of Environmental Quality, requested that the table of measures include two more columns: tons of PM-10 and percent of tons in the draft 2005 inventory. Doug Kukino, City of Glendale, requested that the degree of confidence in the ranking be provided at the workshop. Mr. Dulla replied that the information will be provided. He indicated that he has a lot of confidence about the order of magnitude.

Mr. Person commented that for a community in the desert, the measures require a lot of water as the primary strategy. He stated that water may become as expensive as other strategies. Mr. Person suggested minimizing the use of water to avoid other issues.

Ms. Tax stated that in response to a question from the last meeting, EPA is conducting a study on dust suppressants. The report will be provided to the Committee once it is available.

Mr. Bowers inquired about measure 22. Mr. Dulla responded that the measure would require modeling for new/modified facilities to account for emissions form adjacent facilities. Emissions causing concentrations to exceed a threshold would need to be offset. Mr. Bowers responded that the protocol on the modeling policy has not been made available. Mr. Dulla replied that he has not seen that information. Mr. Hyde stated that the modeling policy has been discussed with industry in recent months. He indicated that it is not final.

Ms. Sprungl inquired about submitting comments since she will not be able to attend the workshop. She also requested that materials from the workshop be provided to the Committee. Mr. Cleveland indicated that comments on the measures can be submitted to Ms. Bauer, MAG staff.

Mr. Dulla presented the 2007 MAG PM-10 control measures with unknown cost effectiveness. Mr. Cleveland requested that a table be presented at the workshop that includes all of the measures. Mr. Dulla indicated that information from this meeting and the last meeting will be compiled and provided at the workshop. He indicated that the plan is to collect additional information and revise the measures based on input. A report will then be provided.

Ms. Knight suggested starting with the measures that are the most effective at the workshop. Mr. Dulla stated that it is important to look at the economic efficiency, confidence in the numbers, and magnitude of the draft 2005 inventory impacted. Mr. Cleveland commented on the organization of the measures. Ms. Tax mentioned the importance of looking at the measures that impact emissions. Cathy Arthur, Maricopa Association of Governments, suggested adding a column to the table to show how the measures impact the Salt River Area.

Mr. Bowers asked if measures included in the Five Percent Plan for PM-10 can be removed. Ms. Tax replied that measures can be removed with difficulty and generally have to be replaced with something else. Mr. Bowers commented on being theoretical in the decisions. He mentioned that the Serious Area Plan for PM-10 has 77 measures. Mr. Bowers commented on the weaker measures being replaced. Ms. Tax responded that EPA is in the process of discussing the Five Percent Plan for PM-10. Ms. Bauer stated that the Clean Air Act does allow a committed measure to be replaced with another measure that has equal or greater impact. She noted that a demonstration and plan amendment would be required. Mr. Bowers commented on spending resources on every measure. Mr. Cleveland commented on effectively implementing the 77 measures from the Serious Area Plan. Ms. Tax stated that some of the measures presented are improvements of existing measures.

5. Status Report of Agricultural Measures

Ms. Fish provided an update on the Governor's Agricultural Best Management Practices (BMPs) Committee evaluation of possible measures to reduce PM-10 emissions from agriculture. She noted that the control efficiency factors presented at the last meeting on the four new BMPs were incorrect. Ms. Fish indicated that it is not a percentage efficiency factor, it is a tons per acre reduction. She stated that since the last meeting, the technical working group has recommended to the Governor's Agricultural BMPs Committee one more BMP related to no tillage during nighttime hours on High Pollution Advisory days. Ms. Fish added that more information was requested from ADEQ and the MAG consultants on the most critical hours. She noted that the final wording of the BMP will be discussed at the next Governor's Agricultural BMPs Committee meeting. In addition, there will be

discussion on changing the program to require two BMPs per category of land on each farm. A request was presented to the technical working group by Maricopa County to consider submitting BMPs to an agency. She noted that considerable resistence was expressed. This may also be discussed at the next meeting.

Mr. Person commented that at the last meeting, the presentation indicated that one of the BMPs being considered would affect night tillage and harvest activities on stagnant air days. He asked if the BMP is now just for night tillage. Ms. Fish replied that is correct. She indicated that alfalfa must be harvested at night.

Ms. McGennis asked if more credit would be given if the BMPs are documented. Ms. Fish responded that the BMPs are required to be included in a document maintained by the farmer and provided upon request. She indicated that farmers are already implementing more than one BMP per category.

Ms. Knight commented on ADEQ having one staff person for Agricultural BMPs. She noted that there are no measures to address the issue. Ms. Fish stated that the ADEQ staff person responds to every complaint and for every complaint the farmer had BMPs in place.

6. CMAQ Annual Report

Dean Giles, Maricopa Association of Governments, gave a presentation on the 2006 Congestion Mitigation and Air Quality (CMAQ) Improvement Funds Annual Report. He indicated that in accordance with federal guidance and coordination with ADOT, MAG has completed the 2006 CMAQ Annual Report. The report includes a description of the projects that obligated in FY 2006 and the estimated emission benefits.

Mr. Hyde commented on the number of projects that have more than one ton of PM-10 reduction, based on the information provided in the third column from the right in the report. He suggested that if the Committee is serious about achieving the five percent reductions, then the funding needs to be reallocated to projects that reduce PM-10.

7. Legislative Update

Ms. Bauer provided a legislative update. She indicated that Senator Allen and Senator Huppenthal are interested in the air quality issues. At the moment S.B. 1552, is serving as a placeholder bill. The Committee will be going through a process to recommend a suggested list of measures for approval by the MAG Regional Council. She indicated that MAG is standing back because we are going through the process.

8. Call for Future Agenda Items

Mr. Cleveland announced that the next meeting of the Committee is tentatively scheduled for March 1, 2007. With no further comments, the meeting was adjourned.

Agenda Item #4

PECHAN
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MEMORANDUM

To: Home Builders and AGC

From: Jim Wilson, Maureen Mullen, and Ying Hsu

Date: February 22, 2007

Subject: Maricopa County, Arizona Nonattainment Area, 2005 Periodic Emissions Inventory for PM-10 Review Comments

This memorandum provides our comments on the Maricopa County, Arizona Nonattainment Area 2005 Periodic Emission Inventory for PM-10 draft that was released in January 2007 by the Maricopa County Air Quality Department (MCAQD). This review focuses on the PM-10 emitting source categories with the largest emission quantities in the draft 2005 emission estimates. Our comments are organized by source category.

Construction Emissions

The basic approach used by MCAQD to estimate 2005 construction activity PM-10 emissions is to develop estimates of affected acreage by type of activity, and then to apply standard emission factors and average project durations by project type along with estimates of the effectiveness of existing fugitive dust control rules to estimate controlled 2005 emissions. This approach is a standard one for this source category, with some similarities to the methods used by EPA for its National Emissions Inventory. MCAQD uses estimates of acres permitted for construction during 2005, which is an improvement over some approaches which are based on the dollars spent on construction projects. Overall, Pechan has three concerns about the construction activity PM-10 emission estimates in the 2005 MCAQD Inventory:

1. There is a computational error in the site preparation/land development emission estimate that results in the emissions for the Maricopa County portion of the PM-10 nonattainment area for this project type being overestimated by 2,110 tons per year. The total acre-months in Table 3.3-20 for site prep/land development should be 4,905.6, not 39,244.6. The controlled PM-10 estimate should be 301.6. Table 1 provides a revised version of Table 3.3-20 with corrected values for site prep/land development.

Table 1. Maricopa County PM-10 Nonattainment Area –
MCAQD 2005 Construction Emission Estimates
Table 3.3-20 with Pechan Corrections

Project Type	Total Acres	Duration Months	Total Acre Months	EF Tons/ Acre-Month	Uncontrolled PM	Controlled PM-10	PM-2.5
Residential: Single Family	32,632	6	195,790	0.032	6,265	3,502	350
Residential: Multi-Unit	10,877	12	130,526	0.11	14,358	8,026	803
Commercial	9,740	11	107,143	0.19	20,357	11,380	1,138
Road Construction	4,199	12	50,390	0.42	21,164	11,831	1,183
Trenching	451	1	451	0.11	50	28	3
Demolition	581	1	581	0.11	64	36	4
Weed Control	178	1	178	0.11	20	11	1
Site Prep/Land Development	4,906	1	4,906	0.11	540	302	30
Temporary Storage Yard	89	12	1,072	0.11	118	66	7
Totals	**63,652**				**62,935**	**35,181**	**3,518**

2. The 2005 MCAQD Inventory applies an emission factor of 0.42 tons/acre-month to estimate road construction emissions. This value was selected based on information from the WRAP Fugitive Dust Handbook, which advises that a 0.42 tons/acre-month emission factor be used for worst case conditions. It is not clear from the information presented by MCAQD in its report why a worst case conditions emission factor was deemed appropriate for road construction in this geographic area. For its 2002 PM-10 emission inventory, a 0.11 tons/acre-month emission factor was applied to estimate uncontrolled road construction emissions. This emission factor change alone produces a 281 percent higher PM-10 emission estimate for road construction than was estimated for the 2002 calendar year. This emission factor selection seems unjustified without evidence being presented by MCAQD for its selection.

   Pechan reviewed recent PM-10 emission calculations performed by the South Coast Air Quality Management District, where it is estimated that 25 percent of road construction is at the 0.42 tons/acre-month emission rate and 75 percent is at the 0.11 tons/acre-month rate, which is a net emission factor of 0.1875 tons/acre-month. It is suggested that MCAQD consider using the SCAQMD assumptions in its road construction emission estimates to estimate uncontrolled PM-10 emissions. Making this revision would change the road construction controlled PM-10 emission estimate in Table 3.3-20 to 5,281 from 11,831 tons per year, a reduction of 6,550 tons. This would change the Table 1 corrected PM-10 controlled emission estimate to 28,631 tons per year (from 35,181 tons per year).

3. One of the key variables in the controlled PM-10 emission estimate for road construction is the estimated rule effectiveness. Rule effectiveness in this case is a measure of the Rule 310-Fugitive Dust compliance rate in the area. The rule effectiveness guidance available from EPA during the 1990s suggested that a default rule effectiveness assumption of 80 percent be used in most cases to estimate compliance rates in cases where data were not available to estimate this value quantitatively. More recent guidance from EPA removes the previous recommendation for use of an across the board 80 percent default value. EPA's revised rule effectiveness guidance provides inventory preparers with lists of factors that are most likely

to affect RE and ranks these factors in a priority order. For nonpoint sources like construction activity, EPA provides three ranges: 86 to 100 percent, 70 to 85 percent and below 70 percent with associated importance factors to use in determining the appropriate RE to apply.

As part of its 2005 inventory development, MCAQD performed its own RE study to quantify compliance with the fugitive dust rules in the Maricopa County air quality regulatory program. One portion of this RE study examined earthmoving sources. For the earthmoving site RE study, site inspections were performed for 63 sites. MCAQD used the information from these special site visits to assign each site as either being fully compliant (100% RE) or non-compliant (0% RE or uncontrolled). The MCAQD RE study for earthmoving sites found that 31 of 63 inspected sites with no emission violation, and 32 of 63 with observed violations. This information was used to compute an overall RE value of 49 percent, which was used in the PM-10 emission calculations for this source category.

Pechan staff reviewed the inspection results for all of sites that either received a Notice to Correct (NTC) or a Notice of Violation (NOV) and matched that information with the applicable project types, which were described in the inspection reports as not being fully compliant with Rule 310. We then made judgments about which emission sources within the site were uncontrolled and adjusted only those sources. This resulted in a scoring system that assigned values in between zero and 1 when warranted by the information provided by the site inspectors. Table 2 shows how the site inspection reports were evaluated. The columns in this table are the site inspection report numbers. For each site inspection, the letters V and C are used in Table 2 to indicate the source type (project type) associated with any violation (V) or notice to correct (C). There were three sites with notices of violation that indicated widespread violations to the extent that the site was deemed fully uncontrolled (site numbers 609071, 609005, and 609007). For all other sites, the PM-10 emission rates were estimated to be uncontrolled at the sites where either a V or a C is indicated in that row. As an example, if 10 sites had a V or C for site prep/land development, then the RE was estimated to be 10/63 times zero plus 53/63 times 100 percent, or 84 percent. The denominator of 63 is the total number of earthmoving sites inspected during the MCAQD RE study. In this way, a rule effectiveness value is computed for each project type. Then, that project type-specific RE value is used to estimate 2005 emissions consistent with the methods employed by MCAQD in section 3.3.9 Construction of the 2005 Periodic PM-10 Emission Inventory.

Pechan's revised PM-10 emission estimates for the construction category using the above methods are provided in Table 3. Pechan's revised PM-10 emission estimate for construction activity in Table 3 is 10,059 tons per year, significantly lower than the MCAQD reported value. (This table uses the higher 0.42 tons/acre-month emission factor for road construction.) If the lower SCAQMD composite emission factor of 0.1875 were used, this would change the resulting construction activity PM-10 estimate to 7,882 tons per year.

Because the information in the rule effectiveness study inspection reports is organized by Rule 310 section rather than by emissions generating sub-category, an alternate analysis was performed where the NOVs and NTCs were organized by the Rule 310 sections. This analysis is

shown in Table 4. This table was constructed by taking the information in the rule effectiveness study inspection reports and noting wherever the report said that a specific rule NOC or NTC occurred. The level-of-detail provided in Table 4 for the Rule 310 requirements is designed to match the level-of-detail provided in the inspection reports.

Table 5 summarizes the results of this alternate analysis. Table 5 summarizes the total NOV plus NTCs by rule number as well as the occurrences of NOVs and NTCs separately. Then, in the right-most columns of this table, the number of occurrences is used to compute a non-compliance rate for each rule number that had an NOV or an NTC. For example, Table 5 shows that about 8 percent of inspected sites had either an NOV or an NTC for the opacity limits for dust generating operations (Section 301 of Rule 310). Therefore, for this specific section of Rule 310, the rule effectiveness survey showed a 92 percent compliance rate, and an 8 percent non-compliance rate.

For the eight rule sections in Table 5 where there were one or more NOVs/NTCs, the non-compliance rates were averaged to estimate an overall non-compliance rate of 13 percent. The non-compliance rates by rule section range from a low of 1.5 percent for unpaved haul/access piles to a high of 27 percent for stabilization. This average rule effectiveness value of 87 percent (13 percent non-compliance) computed using this alternate methodology is very close to the 84 percent estimate provided above, and serves as confirmation of the revised PM-10 emission estimates provided in the right-most column in Table 3.

Windblown Dust

Any calculation of 5 percent per year emission reductions for the PM-10 nonattainment area should use an average, or typical year emission estimate for windblown dust emissions, so more information is needed in the ENVIRON analysis, or the body of the report, about the representativeness of the PM-10 emission estimate computed using 2005 meteorological data. One of the weaknesses of the windblown dust inventory model application is the lack of accounting for rainfall (page 2-8 of Appendix 3-3). In addition, it is suggested that daily PM-10 emissions be presented in the appendix for the specific days when wind speeds exceeded 20 miles per hour and there were positive emissions for this source type. The 2005 windblown dust emissions estimate for the PM-10 nonattainment area is 1,086 tons per year.

Another concern with the approach used by ENVIRON is its suitability for estimating windblown dust PM-10 emissions for an analysis of this geographic scale. The RMC windblown dust model "is designed to estimate fugitive windblown dust emissions for regional air quality modeling." Is the model valid for smaller scale applications like this one where the relative accuracy of the estimate is more important? Has the model been validated for PM-10? It seems likely that this model has been designed primarily to estimate fine particulate windblown dust emissions over large geographic regions and may not be a good predictor of PM-10 emissions for a State Implementation Plan/regulatory analysis.

The ENVIRON report also lacks clarity in describing how the emission calculations were performed for each land use type, which makes it difficult to determine whether the emission estimates are correct. For example, page 2-9 of the ENVIRON report discusses surface

disturbance assumptions used in the windblown dust model that conflict with what is said later in the report on page 4-3. Some of the key assumptions mentioned on page 4-3, like those about the fraction of barren lands that are disturbed (30 percent) and the fraction of shrublands that are disturbed (8 percent) are provided with no back-up information. These assumptions and the assumptions about threshold friction velocities have a substantial effect on resulting emission estimates by land use type and should be justified and referenced.

In the end analysis, ENVIRON estimates PM-10 emissions for just four land use types: (1) agricultural lands, (2) grassland, (3) shrubland, and (4) barren lands. Urban lands are estimated to have no windblown dust emissions. When the relationship between land area, land use type and PM-10 emissions is compared (Table 3.3 and Table 5-3), the relative PM-10 emission strengths (in tons per square kilometer) are: barren land (1.14 tons per square km), shrubland (0.25 tons pre square km), and agricultural land (0.0078 tons per square km).

Table 2. Maricopa County Nonattainment Area Portion Construction Rule Effectiveness Survey Analysis

Project Type/Inspection Report No.	609073	609071	609005	609007	609024	607469	609018	605739	605740	605749	607450	607448	609074	609003	609027	607473	609030
Residential: Single Family		V	V	V													
Residential: Multi-Unit		V	V	V													
Commercial		V	V	V													
Road Construction		V	V	V			V	V	V								
Trenching		V	V	V													
Demolition		V	V	V													
Weed Control		V	V	V													
Site Prep/Land Development	V	V	V	V	V	V		V		V	V	V	V		C		
Temporary Storage Yard	V	V	V	V	V			V		V	V	V				C	
Trackout		V	V	V	V				V	V	V		V	C		C	
Opacity		V	V	V													

Project Type/Inspection Report No.	609022	609023	609015	609069	609068	605731	605735	605737	605746	605745	605744	607444	607476	607449	607447
Residential: Single Family															
Residential: Multi-Unit															
Commercial															
Road Construction															
Trenching															
Demolition															
Weed Control															
Site Prep/Land Development															
Temporary Storage Yard				C			C	C	C	C	C		C	C	C
Trackout					C	C	C		C				C	C	C
Opacity			C						C			C			

Note: V = violation, C = notice to correct

Table 3. Maricopa County PM-10 Nonattainment Area – MCAQD 2005 Construction Emission Estimates with Pechan's RE Study Analysis Changes

Project Type	Total Acres	Duration Months	Total Acre Months	EF Tons/ Acre-Month	Uncontrolled PM	Controlled PM-10	PM-2.5	NOV/NOC Count	Pechan PM-10 From RE Study
Residential: Single Family	32,632	6	195,790	0.032	6,265	3,502	350	3	895
Residential: Multi-Unit	10,877	12	130,526	0.11	14,358	8,026	803	3	2,051
Commercial	9,740	11	107,143	0.19	20,357	11,380	1,138	3	2,908
Road Construction	4,199	12	50,390	0.42	21,164	11,831	1,183	6	3,930
Trenching	451	1	451	0.11	50	28	3	1	6
Demolition	581	1	581	0.11	64	36	4	3	9
Weed Control	178	1	178	0.11	20	11	1	3	3
Site Prep/Land Development	4,906	1	4,906	0.11	540	302	30	21	216
Temporary Storage Yard	89	12	1,072	0.11	118	66	7	17	40
Totals	**63,652**				**62,935**	**35,181**	**3,518**		**10,059**

Table 4. Construction Rule Effectiveness Survey Analysis

Fugitive Dust Rule 310 Standards	Project Type/Inspection Report Number	609073	609071	609005	609007	609024	607469	609018	605739	605740	605749	607450	607448	609074	609003	609027	607473
301	Opacity Limitation				V	C	V										
302	Stabilization Requirements					C		V	V	V		V	V			C	
306	Control Measures						V	V	V	V	V	V	V	C			
308	Work Practices																
308.1	Bulk Material Hauling--Off Site																
308.2	Bulk Material Hauling--On Site																
308.3.a	Ineffective Trackout Control Device	V	V	V	V	V					V			C	C		C
308.3.b	Trackout Beyond 50 Ft	V			C					C				C	C		
308.4	Unpaved Haul/Access Roads										V						
308.6	Stockpiles Dry And Silty				V	C			V		V	V	V				C
308.7	Soil Moisture		V				V					V					

Fugitive Dust Rule 310 Standards	Project Type/Inspection Report Number	609030	609022	609023	609015	609069	609068	605731	605735	605737	605746	605745	605744	607444	607476	607449	607447
301	Opacity Limitation			C										C			
302	Stabilization Requirements	C	C		C	C			C		C	C	C		C	C	
306	Control Measures						C			C						C	C
308	Work Practices																
308.1	Bulk Material Hauling--Off Site																
308.2	Bulk Material Hauling--On Site																
308.3.a	Ineffective Trackout Control Device										C						
308.3.b	Trackout Beyond 50 Ft				C									C			
308.4	Unpaved Haul/Access Roads																
308.6	Stockpiles Dry And Silty						C	C	C						C		
308.7	Soil Moisture																

Note: V = violation, C = notice to correct

Table 5. Construction Rule Effectiveness Study Results Summary

Rule Number	Description	Total NOV+NTC	NOVs	NTC	Percentage of Sites With NOV+NTC	NOV	NTC
301	Opacity	5	2	3	0.08	0.03	0.05
302	Stabilization	17	5	12	0.27	0.08	0.19
306	Control Measures	12	7		0.19	0.11	0.00
308	Work Practices						
308.1	Bulk Material Hauling--Off Site	0	0	0	0.00	0.00	0.00
308.2	Bulk Material Hauling--On Site	0	0	0	0.00	0.00	0.00
308.3.a	Ineffective Trackout Control Device	10	6	4	0.16	0.10	0.06
308.3.b	Trackout Beyond 50 Ft.	7	1	6	0.11	0.02	0.10
308.4	Unpaved Haul/Access Roads	1	1	0	0.02	0.02	0.00
308.6	Stockpiles Dry And Silty	11	5	6	0.17	0.08	0.10
308.7	Soil Moisture	3	3	0	0.05	0.05	0.00
	Overall non-compliance rate				**0.13**		

The 2002 windblown dust PM-10 emission estimate for the nonattainment area was 10,505 tons per year. However, the 2002 PM-10 emission estimate used a threshold wind speed of 15 miles per hour and the 2005 analysis assumed a threshold wind speed of 20 miles per hour. The 2005 emission inventory report should explain why a higher threshold wind speed was used in 2005 than previously. Is this based on research within the Phoenix area on the wind speed versus emissions relationship?

Paved Road Emissions

Paved road emissions were estimated using EPA's AP-42 equations. Area-specific inputs to this equation are the paved road silt loadings and average weight of the vehicle fleet traveling on the roads. The values used for silt loadings varied by freeways, high-traffic roads, and local and low-traffic roads. The values for these silt loading values are documented in the MCAQD 1999 Serious Area Particulate Plan and appear to be reasonable values, and are also relatively close to the AP-42 defaults. The average vehicle weight assumption of 3 tons per vehicle is a default value that essentially eliminates vehicle weight from factoring into the emission factor calculation. This is generally acceptable practice. However, a more locally-specific value could be derived based on the VMT mix used in calculating the onroad exhaust emissions, by assigning an average vehicle weight to each vehicle type and weighting these values according to the VMT mix. The one significant area of concern in the paved road emissions calculations, though, is the improper calculation of PM-2.5 emissions from the PM-10 emissions. In the MCAQD 2005 inventory, the PM-2.5 paved road emissions are calculated by multiplying the PM-10 emissions by 0.15. Instead, the PM-2.5 emissions should be calculated by using the same AP-42 equation used to calculate the PM-10 emissions, but using the PM-2.5-based particle size multiplier and the PM-2.5-based correction factor that accounts for exhaust, brake wear, and tire wear. Using the appropriate equation and factors results in PM-2.5 emissions for the PM-10 modeling area of approximately 1,000 kg/day, yields a reduction of about 5,000 kg/day from the 6,360 kg/day value reported in Table 5.4-6.

The AP-42 equation for paved roads also includes an adjustment to account for the effects of precipitation on paved road emissions. MCAQD does not include this adjustment. Based on 18 days in 2002 with greater than 0.01 inches of precipitation, the PM emissions from paved roads would be reduced by approximately 1.4 percent. This would change the Table 5.5-1 PM-10 annual emissions from paved road fugitive dust for the PM-10 nonattainment area from 13,783 tons per year to 13,590 tons per year. Unless the Phoenix area experienced significantly more precipitation than this in 2005, it is not expected that applying the precipitation correction would significantly change the calculated paved road emissions.

Unpaved Road Emissions

Unpaved road emissions were also calculated using the AP-42 emission factor equation. This equation for unpaved road emissions includes terms for surface material silt content, average vehicle speed, and surface material moisture content. The values used by MCAQD are all reasonable, however, no explanation for the use of these values is provided. The average speed value modeled of 25 miles per hour should be based on actual data, as this can have a significant impact on the emissions. For example, changing the speed to 40 mph would cause the unpaved road PM-10 emissions to increase by about 26 percent. This would change the Table 5.5-1 PM-10 annual emissions from unpaved road fugitive dust for the PM-10 nonattainment area from 8,490 tons per year to 10,697 tons per year. In contrast, modeling these emissions at a speed of 15 mph would result in a decrease in PM-10 annual emissions to 6,537 tons per year. Another general concern is that the emission totals for the PM-10 modeling area reported in Table 5.4-10 cannot be duplicated using the AP-42 equation and the stated inputs. Applying the information provided by MCAQD to the AP-42 unpaved road equation results in PM-10 emissions that are about 11 percent greater than those reported in Table 5.4-10, or 23,226 kg/day.

Activity for unpaved roads is calculated by multiplying an average daily traffic (ADT) volume by unpaved road mileage. MCAQD uses an ADT of 4 vehicles per day on low traffic roads and 120 vehicles per day on high traffic roads. This is an assumption that appears to be carried forward from the 1994 PM inventory for Maricopa County. This value is an assumption that does not appear to have been based on any actual data. The unpaved road emissions are directly proportional to the ADT values. Thus, if the low traffic ADT is actually 40 rather than 4, then the emissions from the low traffic roads would be increased by a factor of 10. This would result in a change to the Table 5.4-10 total unpaved road PM-10 fugitive dust emissions in the modeling area from 20,954 kg/day to 48,053 kg/day. Thus, it is important that this ADT value have some basis in actuality.

The unpaved road mileage used in these calculations is also of concern. The 2005 unpaved road mileage for low traffic roads of 1,129.2 miles is essentially the same as the values used for 2001 through 2006 in the 1999 Serious Area PM-10 Plan. The mileage modeled for the 2005 inventory on high traffic unpaved roads of 224.3 represents a decrease of 54 miles from the 2006 projections in the 1999 Plan. The 2005 inventory indicates that this represents the reduction in unpaved road mileage due to the control measures in the 1999 Plan to Reduce Particulate Emissions from Unpaved Roads and Alleys. However, the documentation does not state how many miles of roads have assumed to have been paved. One of the appendices to the Revised

MCAQD 1999 Serious Area Particulate Plan for PM-10 for the Maricopa County Nonattainment Area lists commitments by several jurisdictions in the MCAQD area to pave, gravel, or stabilize emissions from unpaved roads. This list does not provide sufficient information to calculate the mileage reduced from unpaved roads. Additionally, there is no indication that growth in unpaved roads since the time of the 1999 plan has been factored into this analysis. With the growth in population and VMT in the MCAQD area, it is unrealistic to expect that the mileage of unpaved roads in the area has not increased since 1999.

As with the paved roads, the AP-42 documentation includes a precipitation adjustment. No adjustment for precipitation was applied to the unpaved roads, but, again, this is not expected to have a significant impact.

Unpaved Road ADT Estimation Methods Used in Other Areas

Due to the sensitivity of the unpaved road fugitive dust emissions to the average daily traffic volume used, information on how this value was derived in other comparable areas in the Southwest was investigated. The Clark County, Nevada, PM-10 SIP was prepared in June 2001 and estimates the ADT for unpaved roads based on traffic count data. The Clark County SIP indicates that traffic counts were taken on a representative sample of the unpaved roads in the area and these samples were then used to predict daily traffic volumes on the remaining unpaved roads. The roads were divided into four volume categories. For the first three categories, the average of the daily traffic volume range was modeled as the ADT for the roads in each category, resulting in ADTs of 25, 75, and 125 for these three categories. The fourth category included unpaved roads with ADTs estimated to be greater than 150. Because the upper end of this range was unknown, the ADT for this category was set to 151. This method of estimating ADT based on actual traffic counts is more robust than the Maricopa County method which relies on model assumptions of 4, 120, and 120 vehicles per day on low, medium, and high ADT roads, respectively. Although the MCAQD documentation does not indicate the ADT volume range for the low, medium, and high ADT unpaved road categories, a conservative assumption could be made that these roads fall in a less than 50 ADT volume category. Making the argument that the lowest ADT category of unpaved roads in Maricopa County should be comparable to those in Clark County, based on proximity and comparable geographic conditions, then it would be reasonable to assume that the ADT for the low ADT category should be increased to 25 vehicles per day. Such an assumption would increase the unpaved road fugitive dust PM-10 emissions reported in Table 5.4-10 from 20,954 kg/day to 36,762 kg/day in the PM-10 modeling area.

Agenda Item #5

Additional Control Measures that Should be Considered As Proposed by Industry

Construction

On April 7, 2004 the Maricopa County Board of Supervisors requested the Maricopa County Air Quality Department to work with stakeholders in developing a PM_{10} program for Subcontractors.

- Require the county to:
  - Develop a subcontractor program
  - Have subcontractors acquire a dust control permit
  - Give notice of violation to subcontractors
  - Allow the permit holder to accompany the control officer during an inspection and allow the permit holder 30 minutes to arrive on site.
  - Allow the permit holder an opportunity to correct within 24 hours

This measure is contingent upon No Duplicate Fines by MCAQD at the permitted site.

Other

- Require property owners within cities, towns and counties in Area A to stabilize vacant lots. Tighten up the language in Rule 310.01

- Give cities, towns and counties in Area A the authority to stabilize vacant lots when an owner fails to do so.

- Give cities, towns and the counties in Area A the authority to recoup expenses from a property owner and allow cities, town and counties in Area A lien authority on property where the city, town or county has stabilized.

- Require cities, towns and the counties in Area A to:
  - Stabilize unpaved roads and shoulders;
  - Sweep paved roads;
  - Ban the leaf blowers from blowing debris into the streets
  - Require leaf blowers rented from facilities to provide educational piece on reducing particulate matter
  - Ban all-terrain and off-highway vehicles by the public on state lands located within the jurisdiction of the city, town or county; and
  - Adopt an ordinance that requires property owners to stabilize unpaved parking lots.

- Create particulate mitigation fund with air quality fines used to pave and stabilize land surfaces of in and around high pollution areas in Area A

Agenda Item #5

February 23, 2007

TABLE 1 - PRELIMINARY DRAFT COMPREHENSIVE LIST OF MEASURES TO REDUCE PM-10 PARTICULATE MATTER

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
Agriculture The Governor's Agricultural Best Management Practices Committee is in the process of evaluating potential measures to further reduce PM-10 emissions from agriculture for consideration for the Five Percent Plan for PM-10. This Committee was established by law in 1998 (Arizona Revised Statutes, Title 49-457) to develop an agricultural PM-10 general permit that would address the need for controls on agricultural operations. The potential agricultural measures will be presented to the MAG Air Quality Technical Advisory Committee for consideration.					
Fugitive Dust Control Rules					
1. **Public education and outreach (e.g., Clark County) with assistance from local governments** - This measure would involve publicity campaigns (e.g., Bring Back Blue) that increase public awareness of the PM-10 problem and discourage citizens from participating in activities that generate airborne dust.	$7,898/ton (VMT reduction of 0.5% in the nonattainment area)	131 tons/yr (2.9% of target)	Negligible impact on the sources of PM-10 emissions near the monitors on the worst days in 2005/2006	Minor impact ,if the public routinely complains about visible dust from sources located near a PM-10	County, local govts
2. **Extensive Dust Control Training Program (e.g., Clark County)** - This measure would involve conducting more frequent dust control training classes and implementing a formal certification program. The County would provide advanced training to representatives of trade associations to qualify them to conduct classes and issue certifications.	$12,494/ton (additional water truck full-time on site)	313 tons/yr (6.8% of target) for every 1% increase in Rule 310 compliance	Large impact, when an increased compliance rate is applied to construction sources that contributed to the exceedance at the Higley monitor on 1/24/06	Moderate impact, if training reduces dust generation by construction sources near PM-10 monitors	County, private sector

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
3. **Core Dust Control Training Program with video provided to local governments and private sector** - This measure involves developing visual and written materials that would be used by the public agencies and private companies to train their employees on the dust control rules and effective dust reduction practices.	$9,990/ton (additional water truck ½ time on site)	313 tons/yr (6.8% of target) for every 1% increase in Rule 310 compliance	Large impact, when an increased compliance rate is applied to construction sources that contributed to the exceedance at the Higley monitor on 1/24/06	Moderate impact, if training reduces dust generation by construction sources near PM-10 monitors	County, local govts, private sector
4. **Dust Managers required at construction sites of 50 acres and greater (e.g., Clark County)** - This measure would require a dust manager to be present on construction sites where 50 or more acres of soil are disturbed.	$14,285/ton (additional water truck full time on site)	313 tons/yr (6.8% of target) for every 1% increase in Rule 310 compliance	Large impact, when an increased compliance rate is applied to construction sources that contributed to the exceedance at the Higley monitor on 1/24/06	Large impact, if the manager minimizes dust generation on construction sites near a PM-10 monitor and ensures that all disturbed soil is stabilized during high winds (>15 mph).	County

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
5. **Dedicated enforcement coordinator for unpaved roads, unpaved parking, and vacant lots (e.g., Clark County)** - This measure would require that additional resources be dedicated to strengthen enforcement of Rule 310.01 for unpaved roads, unpaved parking lots, and vacant disturbed lots.	$534/ton (application of dust palliatives on all 224.3 miles of high traffic unpaved roads)	45 tons/yr (1.0% of target) for every 1% increase in Rule 310.01 compliance for unpaved roads and parking lots	Moderate impact, when an increased compliance rate is applied to the unpaved roads and parking areas that contributed to exceedances at the Salt River Area monitors on 12/12/05 and 2/15/06; small impact due to higher compliance rate for vacant lots that contributed to an exceedance at the Higley monitor on 1/24/06	Large impact, if the increased enforcement of Rule 310.01reduces dust generation from unpaved roads and parking lots near a PM-10 monitor and ensures that disturbed soil on vacant lots is stabilized during high winds (>15 mph)	County
6. **Strengthen the stringency and enforcement of the trackout provisions** - This measure would strengthen the existing trackout provisions (e.g.., reduce the 50' length that requires rapid cleanup), include new provisions for dragout (e.g., no visible dust past the property line), and increase the frequency of inspections and notices of violation issued for visible trackout and dragout.	$2,499,750/ton (increased sweeping of unpaved access points by industry)	40 tons/yr (0.9% of target) for every 1% increase in Rule compliance for trackout or dragout	Large impact, when an increased compliance rate is applied to the trackout and dragout that contributed to exceedances at the Salt River Area monitors on 12/12/05 and 2/15/06.	Large impact, if the increased compliance reduces trackout on roads near a PM-10 monitor	County
7. **Increase fines for dust control violations and continue to publish the list of violators** - This measure would change ARS 49-463 and 49-513 to increase the current ceiling of $10,000 per day per violation of the County's PM-10 rules and publicize the names of violators and the dollar penalty assessed.	Unknown (elasticity of response to increased fines is not available)	Negligible impact	Negligible impact	Negligible impact	State, County

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
8. **Establish a certification program for Dust Free Developments to serve as an industry standard** - This measure would create a program to certify and publicize companies that routinely demonstrate exceptional efforts to reduce airborne dust.	$10,752/ton (80% emission reduction for participating companies)	313 tons/yr (6.8% of target) for every 1% increase in Rule 310 compliance	Large impact, when an increased compliance rate is applied to construction sources that contributed to the exceedance at the Higley monitor on 1/24/06	Minor impact, if certification results in dust reductions by sources near PM-10 monitors	State, County
9. **Better defined tarping requirements in Rule 310 to include enclosure of the bed** - This measure would modify Rule 310 to require that the cargo compartments of trucks whether loaded or empty be fully enclosed prior to traveling on paved public roads.	$14,963/ton (reduction per covered truck, assuming 13 trips/day)	313 tons/yr (6.8% of target) for every 1% increase in Rule 310 compliance	Large impact, when an increased compliance rate is applied to construction sources that contributed to the exceedance at the Higley monitor on 1/24/06	Minor impact, if better tarping reduces dust near PM-10 monitors	County
10. **Conduct just-in-time grading (i.e., once a parcel of land is cleared, stabilization or work on the parcel would be required within a certain number of days)** - This measure would require that disturbed areas (e.g., 10 acres or more) on construction sites would have to be stabilized within a short time (e.g., one week) after grading occurred.	Unknown (minimize emissions under high wind conditions)	Negligible impact; already covered by Rule 310	Negligible impact	Negligible impact	County

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
11. **Establish self-monitoring requirements for permitted sources larger than 50 acres** - This measure would require large permitted sources to conduct continuous monitoring to measure meteorological and PM-10 concentrations to determine when dust generation on-site needs to be reduced.	$21,530/ton (additional water truck full-time on site)	18 tons/yr (0.4% of target) for every 1% increase in Rule 316 effectiveness; 313 tons/yr (6.8% of target) for every 1% increase in Rule 310 compliance	Large impact, if permitted sources near the Salt River Area monitors take action to reduce dust generation and increase remediation activities (e.g., street sweeping) when PM-10 concentrations at their onsite monitor(s) exceed some threshold value,	Large impact, if monitored PM-10 values trigger reductions in emissions near a PM-10 monitor	County
12. **Conduct mobile monitoring to measure PM-10 and issue NOVs** - This measure involves deployment of a vehicle that has been instrumented to monitor PM-10 and meteorological conditions, so that sources can be identified, and immediate remediation and/or enforcement actions taken.	$54,233/ton (use of a gravel bed to control emissions from vehicles traveling on an unpaved surface)	94 tons/yr (2.0% of target) per 1% increase in compliance with dust control rules by nonpermitted sources	Large impact, when the increased compliance rate is applied to the nonpermitted sources that contributed to exceedances at the Salt River Area monitors on 12/12/05 and 2/15/06.	Large impact, if the vehicle is used to identify sources and immediately reduce visible dust near PM-10 monitors	County

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
13. **Cease dust generation activities during stagnant conditions** - This measure would require that dust generation activities be curtailed on days between November 1and February 15 when ADEQ issues a High Pollution Advisory (HPA) due to stagnant weather conditions.	Unknown (During the last 3 years, there have been an average of 8 HPA days, 9 stagnation days, and 10 PM-10 exceedance days between Nov 1 and Feb 15 of each year)	Negligible impact on annual PM-10 emission reductions due to the limited number of days involved	This measure would contribute to modeling attainment at the Salt River Area monitors on 12/12/05 and 12/13/05, but only if curtailment of activities occurred during High Pollution Watches, as well as HPAs. Adding high wind HPA days to the measure would also assist in modeling attainment at the Salt River Area monitors on 2/15/06. If High Pollution Watches on windy days were added, this measure would also be useful in modeling attainment at the Higley monitor on 1/24/06.	Moderate impact, if sources near monitors cease dust generation activities on HPA days under stagnant conditions. Impact is diluted by the fact that HPAs do not always coincide with PM-10 exceedance days.; also this measure does not address cessation of activities on high wind HPA days.	County
14. **Establish maintenance requirements for paved roads and parking lots** - This measure would modify Rule 310.01 to require that public and private paved roads and parking lots be maintained to minimize visible dust (e.g., the silt loading level on the paved surfaces should not exceed a specified threshold).	$356,350/ton (Sweep a parking lot once every two weeks)	40 tons/yr (0.9% of target) for every 1% increase in Rule compliance for trackout and dragout	Large impact, when an increased compliance rate is applied to the trackout and dragout that contributed to exceedances at the Salt River Area monitors on 12/12/05 and 2/15/06.	Large impact, if the increased maintenance of paved roads and parking lots reduces trackout and dragout near a PM-10 monitor.	County

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
15. **Conduct nighttime inspections** - This measure would involve proactive inspections of nonpermitted and permitted PM-10 sources during non-daylight hours.	$10,752/ton (2 additional water trucks and drivers per facility)	94 tons/yr (2.0% of target) per 1% increase in compliance with dust control rules by nonpermitted sources;18 tons/yr (0.4% of target) for every 1% increase in Rule 316 effectiveness; 313 tons/yr (6.8% of target) for every 1% increase in Rule 310 compliance	Large impact, when the increased compliance rates are applied to the sources that contributed to exceedances at the Salt River Area monitors on 12/12/05 and 2/15/06.	Large impact, if the pre-dawn inspections identify sources and initiate actions to immediately reduce visible dust near PM-10 monitors	County
16. **Increase inspection frequency for permitted facilities** - This measure would increase the number of proactive inspections conducted at permitted facilities.	$65,765/ton (increase watering to achieve 80% rule compliance)	18 tons/yr (0.4% of target) for every 1% increase in Rule 316 effectiveness	Moderate impact, when the increased compliance rate is applied to Rule 316 sources near the Salt River Area monitors on 12/12/05 and 2/15/06.	Moderate impact, if increased inspections result in reductions in PM-10 emissions near a monitor	County

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
17. **Increase number of proactive inspections in areas of highest PM-10 emissions densities** **- intensify training and education** **- incentive program for compliance -** This measure would focus on the areas of highest PM-10 emissions density: by increasing the number of inspectors and proactive inspections, conducting on-site training, offering incentives to reduce PM-10, and performing community outreach.	$65,900/ton (facilities are inspected twice per day; compliance response: increase haul road watering from once every two hours to once per hour)	18 tons/yr (0.4% of target) for every 1% increase in Rule 316 effectiveness	Moderate impact, when the increased compliance rate is applied to Rule 316 sources near the Salt River Area monitors on 12/12/05 and 2/15/06.	Moderate impact, if increased inspections result in reductions in PM-10 emissions near a monitor	County
18. **Notify violators more rapidly to promote immediate compliance** - This measure would require inspectors that observe visible dust (e.g., opacity or trackout levels that are approaching rule limits) to call the permit holder and make reasonable efforts to inform a person on-site, so that measures can be taken to prevent, reduce, or mitigate dust generation before a violation occurs.	$6,100/ton (for unpaved parking); $239,050/ton (for vacant lots)	313 tons/yr (6.8% of target) for every 1% increase in Rule 310 compliance; 18 tons/yr (0.4% of target) for every 1% increase in Rule 316 effectiveness	Large impact, when increased compliance rates are applied to sources that contributed to the exceedances at the Salt River Area monitors on 12/12/05 and 2/15/06 and the exceedance at the Higley monitor on 1/24/06.	Moderate impact, if the inspector's early notification efforts result in immediate dust reductions by sources near PM-10 monitors	County
Industry					
19 **Fully implement Rule 316** - This measure would enforce the provisions of Rule 316, adopted by Maricopa County in June 2005, for nonmetallic mineral processing of PM-10.	$4,802/ton (minimum for a large facility); $59,750/ton (maximum for a small facility)	18 tons/yr (0.4% of target) for every 1% increase in Rule 316 effectiveness	Moderate impact, when the increased compliance rate is applied to Rule 316 sources near the Salt River Area monitors on 12/12/05 and 2/15/06 .	Moderate impact, if new provisions of rule 316 result in reductions in PM-10 emissions near a monitor	County, private sector

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
20. **Require private companies to use PM-10 certified street sweepers on paved areas including parking lots (e.g., Clark County) -** This measure will require paved surfaces (e.g., parking lots) owned by private companies to be swept using PM-10 certified street sweepers.	$356,350/ton (Sweep a parking lot once every two weeks)	40 tons/yr (0.9% of target) for every 1% increase in Rule compliance for trackout and dragout	Large impact, when an increased compliance rate is applied to the trackout and dragout that contributed to exceedances at the Salt River Area monitors on 12/12/05 and 2/15/06.	Large impact, if the increased maintenance of paved roads and parking lots reduces trackout and dragout near a PM-10 monitor.	State
21. **Shift hours of operation during stagnant conditions in November through February** - This measure would require that industry delay dust generation activities until 9 a.m. on days between November 1and February 15 when ADEQ issues a High Pollution Advisory (HPA) under stagnant conditions.	Unknown (During the last 3 years, there have been an average of 8 HPA days, 9 stagnation days, and 10 PM-10 exceedance days between Nov 1 and Feb 15 of each year)	No impact; emissions are deferred, but not reduced	This measure would have a large impact on modeling attainment at the Salt River Area monitors on 12/12/05 and 12/13/05, but only if High Pollution Watch days are added to HPAs; otherwise this measure would have no impact	Moderate impact, if sources near monitors cease dust generation activities on HPA days under stagnant conditions. this impact is diluted by the fact that HPAs are not always issued on PM-10 exceedance days during stagnant conditions.	State
22. **Model cumulative impacts for new or modified existing sources** - This measure would require industry to include the impacts of adjacent facilities, when modeling the PM-10 impacts of new facilities or modifications to existing facilities and obtain offsets if concentration thresholds are exceeded.	$109/ton (paving an unpaved road as an emission offset for a new or modified facility); this number will increase as low cost alternatives are selected.	No impact; emissions increases would be offset	No impact	Moderate impact, if the new or modified facility is adjacent to other large sources of PM-10 emissions and is also near a PM-10 monitor	State

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
23. **Conduct night time and weekend inspections** - This measure would involve proactive inspections of industrial and construction sources of PM-10 during non-daylight hours and on weekends.	$10,752/ton (2 additional trucks and drivers per facility)	18 tons (0.4% of target) for every 1% increase in Rule 316 effectiveness; 313 tons/yr (6.8% of target) for every 1% increase in Rule 310 compliance	Moderate impact, when the increased compliance rate is applied to sources near the Salt River Area monitors on 12/12/05 and 2/15/06.	Moderate impact, if proactive inspections reduce PM-10 emissions during pre-dawn hours under stagnant conditions near a monitor; negligible value of weekend inspections because exceedances rarely occur on weekends, except as a result of high winds	County
Nonroad Activities					
24. **Ban or discourage use of leaf blowers on high pollution advisory days** - This measure would restrict or prohibit the use of leaf blower on days when ADEQ issues a High Pollution Advisory (HPA).	$21,851/ton (deferring leaf blowing until the next scheduled visit)	0.004 tons/yr (0.0% of target) per leaf blower not used on a HPA day	Negligible impact	Negligible impact	State, County
25. **Encourage use of leaf vacuums to replace blowers -** This measure would provide incentives and publicity to encourage replacement of leaf blowers with vacuum units.	N/A (leaf vacuums are not currently designed to capture PM-10; so the emissions reduction would be zero)	No reduction in annual emissions	No impact	No impact	State, County

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
26. **Reduce off-road vehicle use in areas with high off-road vehicle activity (e.g., Goodyear Ordinance) - impoundment or confiscation of vehicles for repeat violations** - This measure would involve development and enforcement of ordinances or implementation of other actions to prevent or discourage off-road vehicle use in the PM-10 nonattainment area.	$230/ton (offroad activity in Goodyear ceased within a week)	45 tons/yr (1.0% of target) for restricting off-road vehicle use of 2.1% of the passive open space in the PM-10 nonattainment area (in Goodyear).	No impact in the Salt River Area monitors as measures to reduce off-road vehicle use have already been implemented; moderate impact if implemented in the area impacting the Higley monitor on 1/24/06.	Moderate impact if off-road vehicle use is curtailed near PM-10 monitors.	State, County, local govts
27. **Create a fund to provide incentives to retrofit nonroad diesel engines and encourage early replacements with advanced technologies** - This measure would establish funding to offer incentives for owners of older nonroad diesel equipment to retrofit or repower existing engines or replace with newer, less-polluting technology.	$44,000/ton of PM-2.5 (particulate filter); $52,000/ton of PM-2.5 (oxidation catalyst)	18 tons/yr (0.4% of target) per 500 nonroad diesel engines are retrofitted with particulate filters and oxidation catalysts	Negligible impact	Negligible impact	State
28. **Update the statutes to require ultra-low sulfur diesel fuels for nonroad equipment** - This measures would revise ARS 41-2083J to require use of ultra-low sulfur fuel in nonroad engines before the federally-mandated deadline of June 2010. (Locomotives and marine vessels do not have to use the new fuel until 2012.)	$16,000/ton of sulfates (use of ultra-low sulfur fuel in a typical nonroad engine)	37 tons/yr (0.8% of target) if **all** nonroad engines in the PM-10 nonattainment area use ultra-low sulfur diesel fuel	Negligible impact	Negligible impact	State

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
Paved Roads					
29. **Sweep streets with PM-10 certified street sweepers** - This measure would require all public paved roads in the PM-10 nonattainment area to be swept with purchased or contracted PM-10 certified sweepers.	$302/ton (marginal cost and benefit of buying a PM-10 certified instead of a noncertified sweeper)	45 tons/yr (1.0% of target) per PM-10 certified street sweeper	Negligible impact	Moderate impact, if PM-10 certified units are used to sweep streets with high silt loadings on a frequent basis near PM-10 monitors	County, local govts
30. **Retrofit onroad diesel engines with particulate filters** - This measure would establish a program with financial incentives to encourage the voluntary retrofit pre-2007onroad diesel vehicles with particulate filters and oxidation catalysts.	$107,000/ton of PM-2.5 (particulate filters); $133,000/ton of PM-2.5 (oxidation catalysts)	39 tons/yr (0.8% of target) per 1,000 vehicles retrofitted with a diesel particulate filter and oxidation catalyst.	Negligible impact	Negligible impact	State, County, local govts
31. **Repave or overlay paved roads with rubberized asphalt** - This measure would involve repaving or overlaying paved roads with materials that reduce PM-10 emissions by reducing vehicle tire wear.	$631,000/ton (for freeways); $2,681,000/ton (for arterials); $4,290,000/ton (for collectors); 50% reduction in PM-10 emissions due to reduced tire wear	0.032 tons/yr (0.0% of target) per centerline mile of repaved arterial, carrying 10,000 vehicles per day or more	Negligible impact	Negligible impact	State, County, local govts

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
Unpaved Parking Lots					
32. **Pave or stabilize existing unpaved parking lots (e.g., upgrade to Phoenix Parking Code) - strengthen enforcement** - This measure would involve strengthening and proactively enforcing dust control rules or ordinances that reduce fugitive dust and PM-10 emissions from existing unpaved parking and vehicle manuevering areas.	$1,754/ton (paving a parking lot of one-tenth of an acre); $11,292/ton (applying dust palliatives to the same size lot)	94 tons/yr (2.0% of target) per 1% increase in compliance with dust control rules/ordinances for unpaved parking lots	Large impact, when the increased compliance rate is applied to the unpaved parking areas that contributed to exceedances at the Salt River Area monitors on 12/12/05 and 2/15/06	Large impact, if the increased compliance reduces emissions from unpaved parking and vehicle manuevering areas near a PM-10 monitor	County, local govts
Unpaved Roads					
33. **Pave or stabilize existing dirt roads and alleys** - This measure would revise Rule 310.01 to require paving or stabilizing of dirt roads that carry less than 150 vehicles per day (e.g., more than 50 vehicles per day).	$109/ton (applying dust palliatives to 224.3 miles of unpaved roads averaging 120 vehicles/day)	32 tons/yr (0.7% of target) per mile of dirt road that is paved	Moderate impact, if dirt roads in the Salt River Area and the Higley modeling domain are paved by 2009.	Large impact, if dirt roads near a monitor are paved	County, local govts
34. **Limit speeds to 15 miles per hour on high traffic dirt roads** - This measure would require 15 mph speed limit signs to be posted on dirt roads in the PM-10 nonattainment area that carry 50-150 vehicles per day.	$3,337/ton (speeds are reduced from 25 to 15 mph on 224.3 miles of unpaved roads averaging 120 vehicles/day)	0.5 tons/yr (0.01% of target) per mile of dirt road with 15 mph speed limits; since this would be difficult to enforce, the assumed control effectiveness is low (i.e., 18%).	Negligible impact	Negligible impact	County, local govts

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
35. **Prohibit new dirt roads including those associated with lot splits** - This measure would prevent the construction of new dirt roads (e.g., prohibit wildcat subdivisions; require paving of roads before issuing a building permit) in the PM-10 nonattainment area.	$2,646/ton (paving one mile of new dirt road)	Without this measure, projected 2007-2009 PM-10 emissions for unpaved roads will increase each year	Moderate impact if new dirt roads are created in the Salt River Area or in the modeling domain for the Higley monitor before 2009.	Moderate impact, if new dirt roads are created near monitors.	State, County
Unpaved Shoulders					
36. **Pave or stabilize unpaved shoulders** - This measure would require paving or stabilizing dirt shoulders on paved public roads that carry a high level of traffic (e.g.., more than 2,000 vehicles or 50 heavy duty trucks per average weekday).	$18,452/ton (paving of 8-foot dirt shoulders)	40 tons/yr (0.9% of target) for every 1% increase in Rule compliance for trackout and dragout	Large impact, when an increased compliance rate is applied to dragout and trackout emissions from unpaved shoulders that contributed to exceedances at the Salt River Area monitors on 12/12/05 and 2/15/06 and the Higley monitor on 1/24/06.	Large impact, if the increased compliance reduces trackout and dragout emissions attributable to unpaved shoulders near a PM-10 monitor	County, local govts

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
Unpaved Access Points					
37. **Pave or stabilize unpaved access to paved roads** - This measure would require additional measures to reduce trackout and dragout from vehicles accessing paved public roads via unpaved access points (e.g., require paving of access points onto roads with high traffic, e.g., 5,000 vehicles or 50 heavy duty trucks per average weekday).	$168,025/ton (gravel pad plus grizzly used by 40 heavy duty trucks exiting a facility with one unpaved access point each day)	40 tons/yr (0.9% of target) for every 1% increase in Rule compliance for trackout and dragout	Large impact, when an increased compliance rate is applied to the dragout and trackout emissions from unpaved access points that contributed to exceedances at the Salt River Area monitors on 12/12/05 and 2/15/06 and the Higley monitor on 1/24/06.	Large impact, if the increased compliance reduces trackout and dragout emissions attributable to unpaved access points near a PM-10 monitor	County, local govts
Vacant Lots					
38. **Strengthen and increase enforcement of Rule 310.01 for vacant lots** - This measure would increase the frequency of inspections and enforcement actions to reduce dust emitted by vacant lots.	$239,000/ton (100% reduction in trespass rates on vacant lots due to placement of barriers)	3 tons/yr (0.07% of target) for every 1% increase in Rule compliance for vacant lots	Small impact, when an increased compliance rate is applied to vacant lots that contributed to the exceedances at Salt River Area monitors on 2/15/06 and the Higley monitor on 1/24/06.	Moderate impact, if the increased inspections and enforcement make the soil on vacant lots near monitors less erodible during high winds	County

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
39. **Restrict vehicular use and parking on vacant lots (e.g., Phoenix)** - This measure would strengthen existing rules and ordinances that prohibit vehicle trespass on vacant land.	$230,700/ton (100% reduction in trespass rates on vacant lots due to placement of barriers)	3 tons/yr (0.07% of target) for every 1% increase in Rule compliance for vacant lots	Small impact, when an increased compliance rate is applied to vacant lots that contributed to the exceedances at Salt River Area monitors on 2/15/06 and the Higley monitor on 1/24/06.	Moderate impact, if the strengthened requirements make the soil on vacant lots near monitors less erodible during high winds	County, local govts
40. **Enhanced enforcement of trespass ordinances and codes** - This measure would increase the enforcement of vehicle trespass ordinances and codes for vacant lots.	$51,600/ton (75% reduction in trespass rate due to posting of signs)	3 tons/yr (0.07% of target) for every 1% increase in Rule compliance for vacant lots	Small impact, when an increased compliance rate is applied to vacant lots that contributed to the exceedances at Salt River Area monitors on 2/15/06 and the Higley monitor on 1/24/06.	Moderate impact, if the enhanced enforcement of vehicle trespass on vacant lots near monitors decreases soil erosion during high winds	County, local govts
41. **Vacant lots stabilized by County if owners do not respond, liens put on property if necessary (e.g., Clark County)** - This measure would give the County the authority to place a lien against a property owner in order to recover the costs of stabilizing a vacant disturbed lot.	$235,700/ton (100% reduction in trespass rate due to placement of barriers)	3 tons/yr (0.07% of target) for every 1% increase in Rule compliance for vacant lots	Small impact, when an increased compliance rate is applied to vacant lots that contributed to the exceedances at Salt River Area monitors on 2/15/06 and the Higley monitor on 1/24/06.	Large impact, if the authority to place liens is used to stabilize vacant lots near monitors so that soil erosion is minimized during high winds.	State, County

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
Traffic Flow Improvements					
42. **Schedule improvements on parallel streets to retain alternate route options along major north/south and east/west corridors** - This measure would involve providing and publicizing alternate routes to divert traffic around road construction projects; with the objective of improving traffic flow and reducing vehicle idling.	Unknown (decreases in idling and increases in speeds have no impact on PM-10 emissions, except sulfates)	Negligible impact	Negligible impact	Negligible impact	Local govts
Transit					
43. **Build park and ride lots earlier** - This measure would accelerate the construction of park and ride lots to increase transit ridership and carpooling.	Unknown (PM-10 from bus exhaust and fugitive dust emissions can be higher than cars; need to carpool or achieve 75% bus occupancy to reduce PM-10 emissions)	Negligible impact	Negligible impact	Negligible impact	Local govts
44. **Coordinate public transit services with Pinal County** - This measure would involve coordination between Pinal County and public transit agencies in Maricopa County to provide transit service and reduce the number of vehicle trips between the two counties.	Unknown (PM-10 from bus exhaust and fugitive dust emissions can be higher than cars; need to achieve 75% bus occupancy to reduce PM-10 emissions)	Negligible impact	Negligible impact	Negligible impact	Local govts

MEASURE	COST-EFFECTIVENESS OF PM-10 EMISSIONS REDUCED (BASIS FOR CALCULATION)	FIVE PERCENT EMISSIONS REDUCTION TARGET = 4,594 TONS OF PM-10 PER YEAR (% OF TARGET)	MODELING ATTAINMENT AT THE SALT RIVER AREA AND HIGLEY MONITORS ON THE HIGHEST PM-10 DAYS IN 2005/2006	ATTAINING PM-10 STANDARD AT ALL MONITORS IN THE NONATTAINMENT AREA IN 2007, 2008 AND 2009	POTENTIAL IMPLEMENT-ING ENTITY
Woodburning					
45. **Increase fines for open burning (currently $25)** - This measure would increase the maximum fine for open burning in ARS Title 49-501 from $25 per occurrence to a level that would serve as a deterrent (e.g., $500 per occurrence).	Unknown (No data on # or size of nonpermitted burns; complaints are twice the number for controlled burns; the latter represent 0.01% of the 2005 PM-10 emissions inventory)	Negligible impact	Large impact on modeling attainment at the West 43rd Avenue monitor on 12/12/05 and 12/13/05	Large impact, if open burning near PM-10 monitors can be curtailed by the imposition of higher penalties	County
46. **Restrict use of outdoor fireplaces and pits and ambience fireplaces in the hospitality industry** - This measure would prohibit burning in outdoor fireplaces, outdoor pits, and ambience fireplaces in the hospitality industry, and ban other nonessential woodfires on days during the period November 1 - February 15 when ADEQ issues a High Pollution Advisory (HPA).	$132,000/ton (restrict use on HPA days), $190,000/ton (retrofit fireplace with EPA-approved device)	Negligible impact	Large impact on modeling attainment at the West 43rd Avenue monitor on 12/12/05 and 12/13/05, but only if outdoor burning is banned during High Pollution Watches, as well as HPAs.	Moderate impact, if restrictions on outdoor burning on HPA days are enforced near PM-10 monitors; this impact is diluted by the fact that HPAs do not always coincide with PM-10 exceedance days	County

Agenda Item #5

Table 2 - Draft List of Measures Ranked by Increasing Cost Effectiveness

Measure No.	Measure	Cost-Effectiveness ($/ ton of PM_{10} reduced)	Degree of Confidence in Ranking	PM_{10} Emissions Category Impacted by the Measure	Draft 2005 PM_{10} Emissions Inventory (tons/yr)	%	2002 Salt River SIP Inventory (tons/yr)	%
22	Model Cumulative Impacts	$109	M	Industry	4,142	5%	301	12%
33	Pave or Stabilize Existing Dirt Roads & Alleys	$109	M	Unpaved Roads	8,490	9%	0	0%
26	Reduce Off-Road Vehicle Use	$230	H	Off-Road Vehicle Dust	2,159	2%	0	0%
29	PM-10 Certified Street Sweepers	$302	M	Paved Road Dust	13,783	15%	1,482	60%
5	Dedicated Coordinator for Unpaved Roads/Vacant Lots	$534	M	Unpaved Rds+Vacant Lots	11,499	13%	1	0%
35	Prohibit New Dirt Roads and Lot Splits	$2,646	H	Unpaved Roads	8,490	9%	0	0%
34	Limit Speeds to 15 mph on Dirt Roads	$3,337	H	Unpaved Roads	8,490	9%	0	0%
32	Pave or Stabilize Existing Unpaved Parking Lots	$6,523	M	Unpaved Parking Lots	3,009	3%	1	0%
1	Public Education & Outreach	$7,898	M	Construction	37,572	41%	337	14%
3	Core Dust Control Training Program	$9,990	M	Construction	37,572	41%	337	14%
8	Certification Program for Dust-Free Developments	$10,752	M	Construction	37,572	41%	337	14%
15	Conduct Nighttime Inspections	$10,752	M	Construction + Industry	41,714	46%	638	26%
23	Conduct Nighttime and Weekend Inspections	$10,752	M	Construction + Industry	41,714	46%	638	26%
2	Extensive Dust Control Training Program	$12,494	M	Construction	37,572	41%	337	14%
4	Dust Managers at Large Construction Sites	$14,285	M	Construction	37,572	41%	337	14%
9	Better-Defined Rule 310 Tarping Requirements	$14,963	M	Construction	37,572	41%	1,747	70%
28	Require Ultra-Low Sulfur Diesel for Nonroad Equipment	$16,000	H	Nonroad Exhaust	1,855	2%	341	14%
36	Pave or Stabilize Unpaved Shoulders	$18,452	M	Unpaved Shoulders	13,783	15%	52	2%
11	Self-Monitoring for Sources Over 50 Acres	$21,530	M	Construction + Industry	41,714	46%	638	26%
24	Ban or Discourage Leaf Blowers on HPA Days	$21,851	H	Leaf Blower Dust	843	1%	0	0%
19	Fully Implement Rule 316	$32,276	M	Industry	4,142	5%	301	12%
27	Incentives for Nonroad Diesel Engine Retrofits	$48,000	H	Nonroad Exhaust	1,855	2%	341	14%
40	Enhanced Enforcement of Trespass Ordinances & Codes	$51,600	L	Vacant Lots	1,087	1%	0	0%
12	Mobile Monitoring to Measure PM-10 and Issue NOVs	$54,233	M	Construction + Industry	41,714	46%	903	36%
16	Increase Inspection Frequency for Permitted Facilities	$65,765	M	Industry	4,142	5%	301	12%
17	Increase Inspections in Highest PM-10 Density Areas	$65,900	M	Industry	4,142	5%	301	12%
30	Retrofit Onroad Diesel Engines	$120,000	H	Onroad Mobile	1,041	1%	36	1%
18	Notify Violators More Rapidly to Promote Immediate Complianc	$122,575	NA	Construction + Industry	41,714	46%	638	26%
46	Restrict Use of Outdoor Fireplaces & Pits	$161,000	H	Woodburning	231	0%	0	0%
37	Pave or Stabilize Unpaved Access to Paved Roads	$168,025	M	Paved Road Dust	13,783	15%	265	11%
39	Restrict Vehicular Use & Parking on Vacant Lots	$230,700	L	Vacant Lots	1,087	1%	1	0%
41	Vacant Lots Stabilized by County if Owners Do Not Respond	$235,700	L	Vacant Lots	1,087	1%	0	0%
38	Increase Enforcement of Rule 310.01 for Vacant Lots	$239,000	L	Vacant Lots	1,087	1%	0	0%
14	Maintenance Requirements for Paved Roads & Parking Lots	$356,350	H	Industry	4,142	5%	1,483	60%
20	Use PM-10 Certified Sweepers on Private Paved Areas	$356,350	H	Industry	4,142	5%	301	12%
6	Strengthen Stringency & Enforcement of Trackout Provisions	$2,499,750	L	Paved Road Dust	13,783	15%	265	11%
31	Repave or Overlay Paved Roads with Rubberized Asphalt	$2,534,000	H	Paved Roads - Tire Wear	305	0%	4	0%
25	Encourage Use of Leaf Vacuums to Replace Blowers	NA	H	Leaf Blower Dust	843	1%	0	0%
7	Increase Fines for Dust Control Violations & Publish Violators L	Unknown	NA	Construction + Industry	41,714	46%	638	26%
10	Conduct Just-In-Time Grading	Unknown	NA	Construction	37,572	41%	337	14%
13	Cease Dust Generation Activities During Stagnation Conditions	Unknown	NA	Construction + Industry	41,714	46%	952	38%
21	Shift Hours of Operation During Stagnant Conditions Nov-Feb	Unknown	NA	Industry	4,142	5%	566	23%
42	Schedule Improvements on Streets to Retain Alternate Routes	Unknown	NA	Onroad Mobile	1,041	1%	0	0%
43	Build Park and Ride Lots Earlier	Unknown	NA	Onroad Mobile	1,041	1%	0	0%
44	Coordinate Public Transit Services with Pinal County	Unknown	NA	Onroad Mobile	1,041	1%	0	0%
45	Increase Fines for Open Burning (Currently $25)	Unknown	NA	Woodburning	231	0%	0	0%

Table 3 - Draft List of Measures Ranked by Impact on Five Percent Reduction

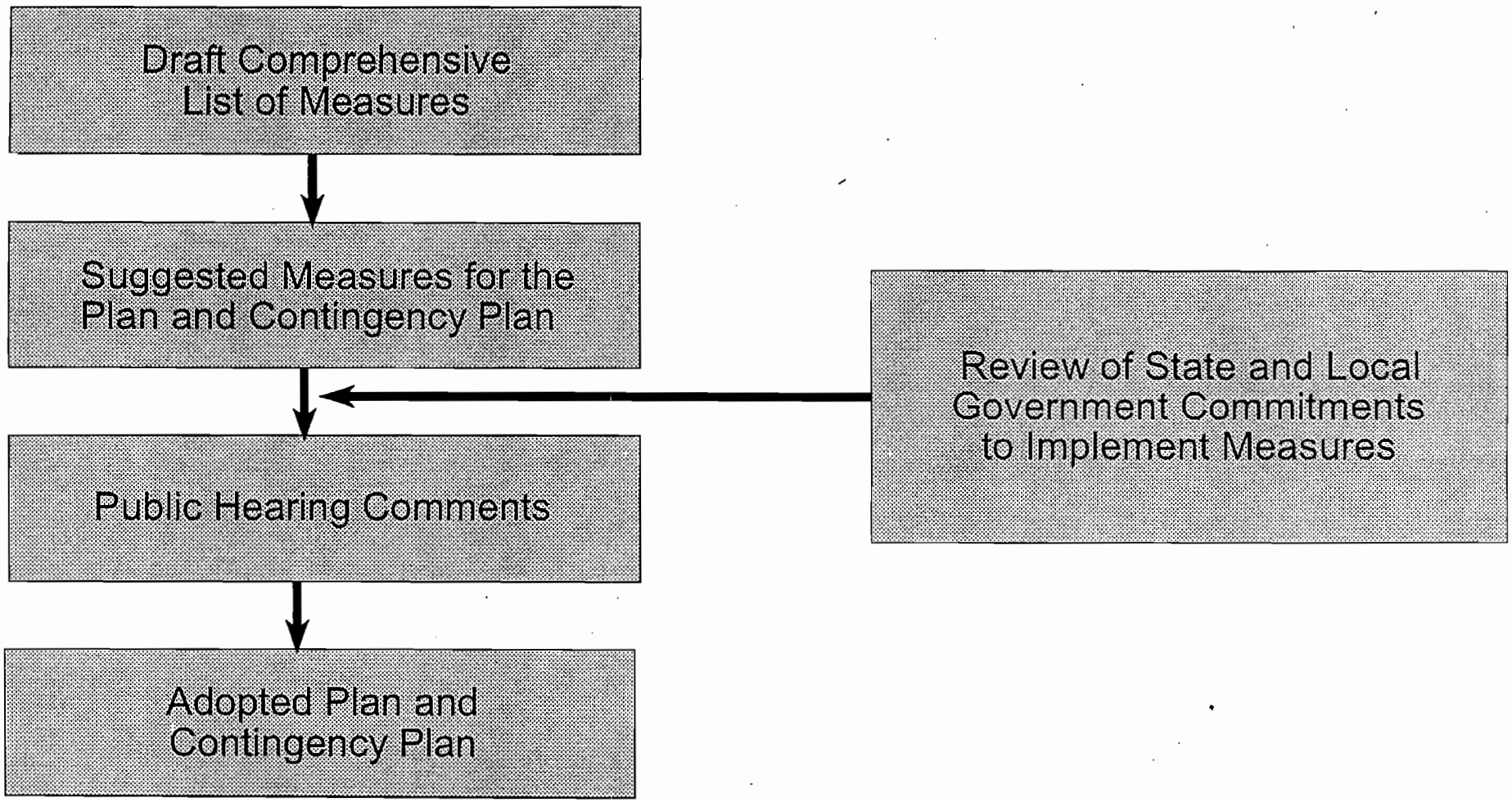
Measure No.	Measure	Estimated Impact on 5% Emissions Reduction (tons/yr)	5% Target = 4,594 tons\yr (% of target)
15	Conduct Nighttime Inspections	425	9.3%
11	Self-Monitoring for Sources Over 50 Acres	331	7.2%
18	Notify Violators More Rapidly to Promote Immediate Compliance	331	7.2%
23	Conduct Nighttime and Weekend Inspections	331	7.2%
2	Extensive Dust Control Training Program	313	6.8%
3	Core Dust Control Training Program	313	6.8%
4	Dust Managers at Large Construction Sites	313	6.8%
8	Certification Program for Dust-Free Developments	313	6.8%
9	Better-Defined Rule 310 Tarping Requirements	313	6.8%
1	Public Education & Outreach	131	2.9%
12	Mobile Monitoring to Measure PM-10 and Issue NOVs	94	2.0%
32	Pave or Stabilize Existing Unpaved Parking Lots	94	2.0%
5	Dedicated Coordinator for Unpaved Roads/Vacant Lots	45	1.0%
26	Reduce Off-Road Vehicle Use	45	1.0%
29	PM-10 Certified Street Sweepers	45	1.0%
6	Strengthen Stringency & Enforcement of Trackout Provisions	40	0.9%
14	Maintenance Requirements for Paved Roads & Parking Lots	40	0.9%
20	Use PM-10 Certified Sweepers on Private Paved Areas	40	0.9%
36	Pave or Stabilize Unpaved Shoulders	40	0.9%
37	Pave or Stabilize Unpaved Access to Paved Roads	40	0.9%
30	Retrofit Onroad Diesel Engines	39	0.8%
28	Require Ultra-Low Sulfur Diesel for Nonroad Equipment	37	0.8%
33	Pave or Stabilize Existing Dirt Roads & Alleys	32	0.7%
16	Increase Inspection Frequency for Permitted Facilities	18	0.4%
17	Increase Inspections in Highest PM-10 Density Areas	18	0.4%
19	Fully Implement Rule 316	18	0.4%
27	Incentives for Nonroad Diesel Engine Retrofits	18	0.4%
38	Increase Enforcement of Rule 310.01 for Vacant Lots	3	0.1%
39	Restrict Vehicular Use & Parking on Vacant Lots	3	0.1%
40	Enhanced Enforcement of Trespass Ordinances & Codes	3	0.1%
41	Vacant Lots Stabilized by County if Owners Do Not Respond	3	0.1%
34	Limit Speeds to 15 mph on Dirt Roads	0.5	0.0%
31	Repave or Overlay Paved Roads with Rubberized Asphalt	0.032	0.0%
24	Ban or Discourage Leaf Blowers on HPA Days	0.004	0.0%
35	Prohibit New Dirt Roads and Lot Splits	Benefits base case emissions	NA
7	Increase Fines for Dust Control Violations & Publish Violators List	Negligible	NA
10	Conduct Just-In-Time Grading	Negligible	NA
13	Cease Dust Generation Activities During Stagnation Conditions	Negligible	NA
42	Schedule Improvements on Streets to Retain Alternate Routes	Negligible	NA
43	Build Park and Ride Lots Earlier	Negligible	NA
44	Coordinate Public Transit Services with Pinal County	Negligible	NA
45	Increase Fines for Open Burning (Currently $25)	Negligible	NA
46	Restrict Use of Outdoor Fireplaces & Pits	Negligible	NA
21	Shift Hours of Operation During Stagnant Conditions Nov-Feb	None	NA
22	Model Cumulative Impacts	None	NA
25	Encourage Use of Leaf Vacuums to Replace Blowers	None	NA

Agenda Item #5

MEASURE SELECTION PROCESS FOR THE MAG FIVE PERCENT PLAN FOR PM-10

November 30, 2006

MEASURE SELECTION PROCESS FOR MAG AIR QUALITY PLANS



TENTATIVE SCHEDULE FOR THE MEASURE SELECTION PROCESS FOR THE MAG FIVE PERCENT PLAN FOR PM-10

- **December 7, 2006** - MAG Air Quality Technical Advisory Committee (AQTAC) will review the Preliminary Draft Comprehensive List of Measures and new emissions inventories.

- **January 11, 2007** - Preliminary data from the MAG PM-10 Source Attribution and Deposition Study will be presented to the AQTAC.

- **February 1 and February 15, 2007** - Report describing the measures on the Draft Comprehensive List will be discussed with the AQTAC.

- **March 1, 2007** - AQTAC may recommend a Suggested List of Measures for the Five Percent Plan for PM-10 to the MAG Management Committee. Justification for measures not recommended may also be provided by the AQTAC (e.g., technologically and economically infeasible, otherwise unreasonable).

- **March 14, 2007** - MAG Management Committee may make a recommendation on the Suggested List of Measures to the MAG Regional Council.

- **March 28, 2007** - MAG Regional Council may approve the Suggested List of Measures for the Five Percent Plan for PM-10.

- **April - June 2007** - Local governments and the State may review the measures under their respective authorities for possible implementation. Each implementing entity determines which measures are feasible for implementation by that entity.

- **June 2007** - Commitments to implement measures from the local governments are due to be submitted to MAG for analysis and inclusion in the adopted plan.

MAG COMMITTEE STRUCTURE

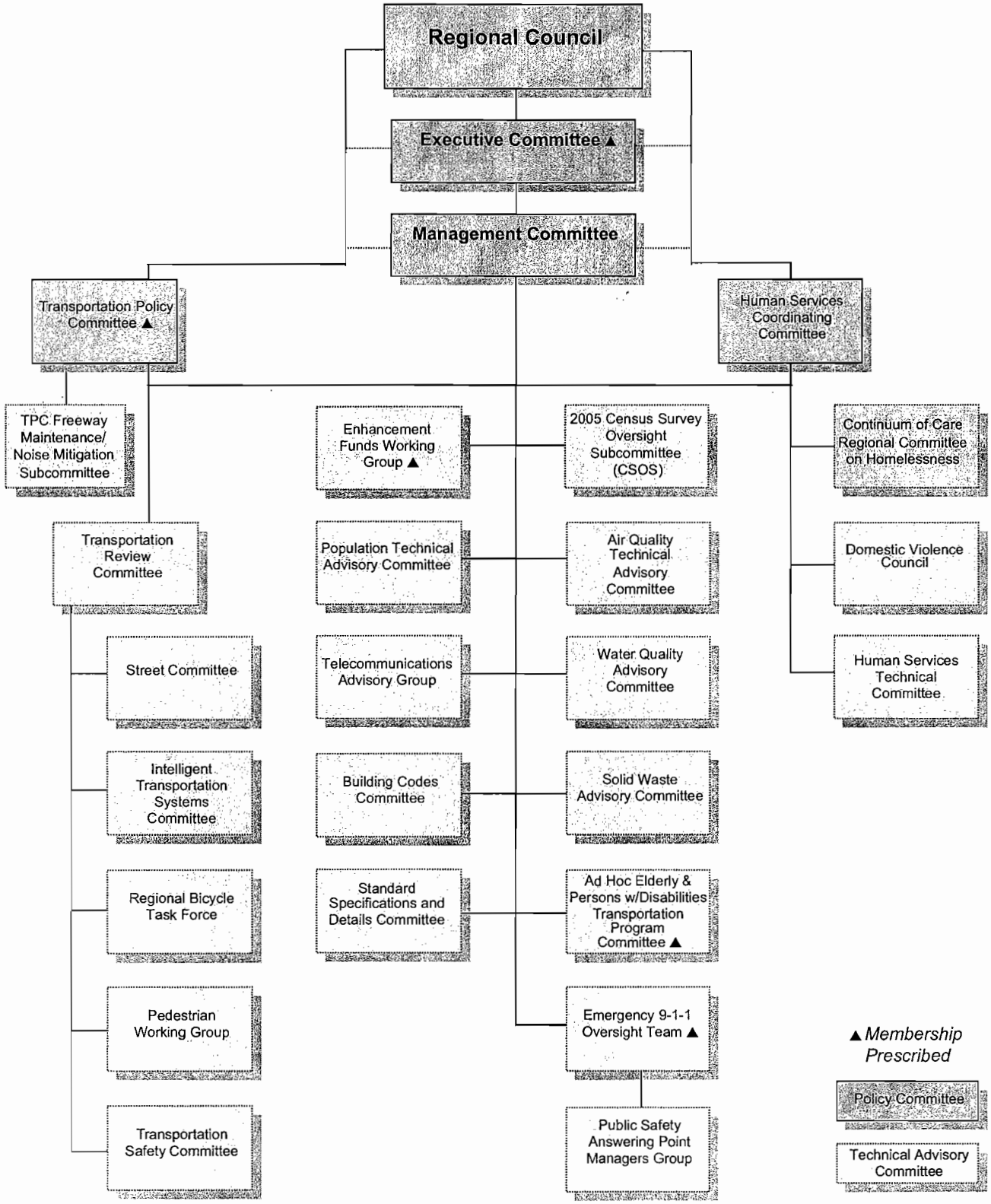


Figure 7: MAG Committee Structure

HOW LOCAL GOVERNMENTS COMMIT TO IMPLEMENT MEASURES

STEP 1

MAG Regional Council approves a Suggested List of Measures

- State measures
- Local government measures

STEP 2

Each MAG member agency reviews local government portion of list and decides what measures to implement

STEP 3

Each Council passes resolution* describing the measures to be implemented

- Measure description
- Legal authority for implementation
- Funding for measure
- Enforcement

STEP 4

Each MAG member agency also describes reasons* for rejecting any local government measures

- Technologically or economically infeasible
- Otherwise unreasonable

STEP 5

Each MAG member agency submits the resolution and reasons for rejection to MAG for the plan

*Guidance will be provided by MAG staff.