REVISED (2003)

# NATURAL EVENTS ACTION PLAN

FOR

# HIGH WIND EVENTS

LAMAR, COLORADO

Prepared by:

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of Public Health
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CITY OF LAMAR

PROWERS COUNTY COMMISSIONERS

# I. EXECUTIVE SUMMARY

Over the past eight years, the monitors located at the Municipal Power Plant and Municipal Building in Lamar, Colorado experienced exceedances of the 24-hour National Ambient Air Quality Standard (NAAQS) for PM10 (particulate matter having a nominal aerodynamic diameter equal to or less than 10 microns).[1] Each of these exceedances was associated with unusually high winds and blowing dust in the Lamar area.

Recognizing that certain uncontrollable natural events, such as high winds, wildfires, and volcanic/seismic activity can have on the NAAQS, the Environmental Protection Agency (EPA) issued a Natural Events Policy (NEP) on May 30, 1996. The NEP sets forth procedures through the development of a Natural Events Action Plan (NEAP) for protecting public health in areas where the PM10 standard may be violated due to these uncontrollable natural events. The guiding principles of the policy are:

- Federal, State, and local air quality agencies must protect public health;
- The public must be informed whenever air quality is unhealthy;
- All valid ambient air quality data should be submitted to the EPA Aerometric Information Retrieval System (AIRS) and made available for public access;
- Reasonable measures safeguarding public health must be taken regardless of the source of PM10 emissions; and,
- Emission controls should be applied to sources that contribute to exceedances of the PM10 NAAQS when those controls will result in fewer violations of the standards.

In response to Lamar's three exceedances of the PM10 NAAQS (two in 1995 and one in 1996), the Colorado Department of Public Health and Environment's Air Pollution Control Division (Division), in conjunction with the City of Lamar's Public Works Department, Parks and Recreation, and Prowers County Commissioners, the Natural Resources Conservation Services, the Burlington Northern Santa Fe Railroad, and other agencies developed a Natural Events Action Plan. That Plan was presented to EPA in 1998 and subsequently approved. Since 1998 it is this plan that has assisted the area in addressing blowing dust due to uncontrollable winds.

As required by the Natural Events Policy, the NEAP must be updated no less than every five years. This plan is that required update.

Both this plan and the original NEAP provide analysis and documentation of the exceedances as attributable to uncontrollable natural events due to unusually high winds. In addition, the NEAP

is designed to protect public health, educate the public about high wind events and blowing dust; mitigate health impacts on the community during future events; and, identify and implement Best Available Control Measures (BACM) for anthropogenic sources of windblown dust. These issues are also addressed in this revised NEAP.

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## II. INTRODUCTION

The City of Lamar is located in Prowers County in southeastern Colorado (see map, page 2). Situated along the Arkansas River and near the Kansas border, Lamar serves as the largest city and the agricultural center for southeast Colorado. The area surrounding Lamar consists of gently rolling to nearly level uplands where the dominant slopes are less than 3 percent.[2] The climate is generally mild and semiarid. Annual precipitation is about 15 inches. Summers are long and have hot days and cool nights. In winter and spring, windstorms are common, especially in drier years including year 2002, one of the driest periods in over 350 years. It is due to these high velocity dust storms and drought conditions that Lamar experiences most of the PM10 problems for the area.

For dates beginning in 1995 to the present, both the Lamar Power Plant and Municipal Complex recorded exceedances of the primary, 24-hour NAAQS for PM10. The PM10 concentrations were recorded on these days - as were unusually high wind speeds and no precipitation. Details can be found in the table below.

**Lamar Area PM10 Exceedances**

| Date | Site | PM10 Concentration* | Natural Event? |
|---|---|---|---|
| March 22, 1995 | Power Plant | 178 $\mu g/m^3$ | Yes |
| November 26, 1995 | Power Plant | 180 $\mu g/m^3$ | Yes |
| January 17, 1996 | Power Plant | 259 $\mu g/m^3$ | Yes |
| April 8, 1999 | Power Plant | 203 $\mu g/m^3$ | Yes |
| December 17, 2000 | Power Plant | 178 $\mu g/m^3$ | Yes |
| February 9, 2002 | Power Plant | 246 $\mu g/m^3$ | Yes |
| March 7, 2002 | Power Plant | 246 $\mu g/m^3$ | Yes |
| May 21, 2002 | Power Plant | 196 $\mu g/m^3$ | Under EPA consideration |
| May 21, 2002 | Municipal Complex | 183 $\mu g/m^3$ | Under EPA consideration |
| June 20, 2002 | Power Plant | 181 $\mu g/m^3$ | Under EPA consideration |
| June 20, 2002 | Municipal Complex | 162 $\mu g/m^3$ | Under EPA consideration |

* Recorded exceedances of the primary, 24-hour NAAQS for PM10

The circumstances surrounding the Lamar exceedances have provided adequate reason for the Division, in consultation with the City of Lamar and Prowers County, to believe the blowing dust due to high wind events have caused exceedances of the NAAQS that otherwise would not have occurred.

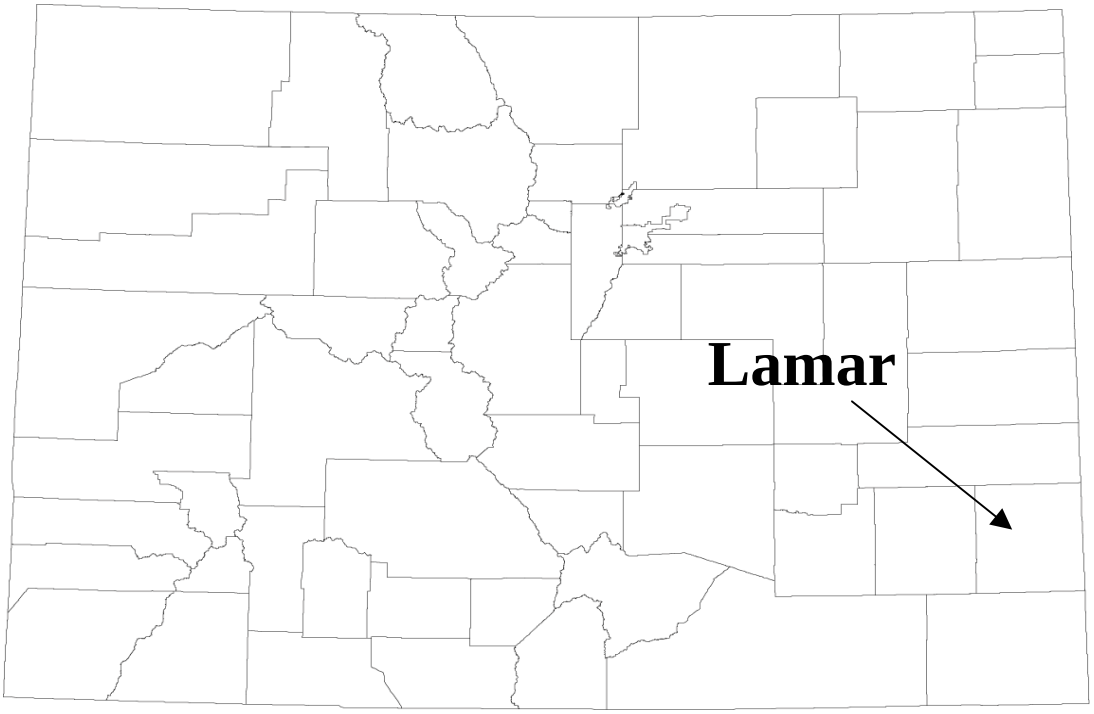
As required by the NEP, each of the exceedances has been flagged by the Division's Technical Services Program in the AIRS system. The flags appear after the recorded values in AIRS with

the descriptor code "A" for high winds. All supporting documentation of the high wind events has been submitted to EPA Region VIII and has been made available to the residents of Lamar for review and/or comment. According to EPA guidance the type and amount of documentation provided for each event should be sufficient to demonstrate that the natural event occurred, and that it impacted a particular monitoring site in such a way as to cause the PM10 concentrations measured.[3]

Recognizing the need to protect public health in areas where PM10 exceeds the NAAQS due to natural events such as the unusually high winds, a Natural Events Action Plan has been developed for the Lamar area based on the NEP guidance. This plan outlines specific procedures to be taken in response to wind blown events. In short, the purpose of the plan is to:

- Educate the public about the problem;
- Mitigate health impacts on exposed populations during future events; and
- Identify and implement Best Available Control Measures (BACM) for anthropogenic sources of windblown dust.

## Plan Area



## A. Background

High winds are common to the southeast region of Colorado. Under some conditions, these winds are strong enough to lift particulate matter into the air and cause elevated levels of PM10 above the Federal and State standards. Due to observed problems in Lamar with dirt, dust, and particulate, area monitoring of total suspended particle pollution was instituted at the Power Plant site in 1975. In June 1985, monitoring for PM10 began. A new site, the Municipal Complex, was selected in August, 1986. This site was considered to better meet the maximum siting criteria and more adequately reflect worse case population exposure. The Power Plant site was re-established in February 1992 and has since operated along with the Municipal Complex site on an everyday sampling schedule.

Lamar's monitoring history shows that the annual PM10 standard of 50 $\mu g/m^3$ averaged over an annual period has never been exceeded. The Lamar area has however experienced exceedances of the 24-hour PM10 standard of 150 $\mu g/m^3$ since 1985. The associated weather conditions on each of the exceedance days conform to a repeated pattern of regional high winds and blowing dust. In each case an intense, fast-moving, surface low-pressure system tracked through eastern Colorado. Typically these systems had surface lows that were not collocated with a closed upper low or nearly closed upper level trough. This distinction is important because the collocated or vertically "coupled" systems usually bring significant up slope snow or rain to the region. The intensity of the lows associated with the PM10 exceedances is evident in the average central pressure of 990 mb (corrected to sea level). This value is typical of a deep, well-organized system. Such well-organized systems usually generate high winds in the vicinity of the low center.[4]

The past exceedances of the PM10 NAAQS classified Lamar as a moderate nonattainment area for PM10. In response to this designation, Lamar with the assistance of the State prepared the Lamar PM10 Non-Attainment Plan and the Redesignation Request and Maintenance Plan. The Lamar PM10 Maintenance Plan was submitted to EPA in 2002 and is currently awaiting EPA approval (see Appendix for copy of the Maintenance Plan). According to EPA's Natural Events Policy, states may request that a moderate nonattainment area not be reclassified as serious if it can be demonstrated that the area would attain the standards by the statutory attainment date but for emissions caused by natural events. The NEP applies only to emissions caused by natural events that have occurred since January 1, 1994.[5] Thus, only those high wind events beginning with the March 22, 1995 event can be addressed by this NEAP. As indicated throughout this document, the revision here demonstrates commitment to the "every 5-year" requirement as indicated by the NEP.

## B. The Natural Events Policy

### 1. Background

On May 30, 1996, EPA issued the Natural Events Policy in a memorandum from Mary D. Nichols, Assistant Administrator for Air and Radiation. In this memorandum EPA announced its new policy for protecting public health when the PM10 NAAQS are violated due to natural events. Under this policy three categories of natural events are identified as affecting the PM10 NAAQS: (1) volcanic and seismic activity; (2) wildland fires; and, (3) high wind events. Only high wind events will be addressed in this NEAP. Based on EPA's natural events policy high winds are defined as uncontrollable natural events under the following conditions: (1) the dust originated from nonanthropogenic sources; or, (2) the dust originated from anthropogenic sources controlled with best available control measures (BACM). Furthermore, the conditions that create high wind events vary from area to area with soil type, precipitation, and the speed of wind gusts.[6]

Prior to EPA guidance on PM10 exceedances due to natural events, the Guideline on the Identification and Use of Air Quality Data Affected by Exceptional Events and Appendix K to 40 CFR, Part 50, were issued by EPA to address situations where natural sources strongly influence an area's air quality. Similar to EPA's natural events policy, Appendix K provides, in part, that measured exceedances of the PM10 NAAQS may be discounted from decisions regarding nonattainment area status if the data are shown to be influenced by uncontrollable events caused by natural sources of particulate matter. Then in 1990, the Clean Air Act Amendments added section 188(f) that provides EPA with discretionary statutory authority to waive either a specific attainment date or certain planning requirements for serious PM10 nonattainment areas that are significantly impacted by nonanthropogenic sources.

According to EPA's Natural Events Policy the section 188(f) waiver provision, Appendix K, and the Exceptional Events Guidance are to be considered revised by the requirements of the May 30, 1996 NEP. Additional justification of the revisions can be found in the Appendix of EPA's natural events policy.

### 2. Content

In order for exceedances of the NAAQS to be considered as due to a natural event, a Natural Events Action Plan must be developed to address future events. The following is a summary of the specific EPA guidance regarding development of a NEAP.[7]

1) Analysis and documentation of the event should show a clear causal relationship between the measured exceedance and the natural event. The type and amount of documentation provided

should be sufficient to demonstrate that the natural event occurred, and that it impacted a particular monitoring site in such a way as to cause the PM10 concentrations measured.

2) Establish education programs. Such programs may be designed to educate the public about the short-term and long-term harmful effects that high concentrations of PM10 could have on their health and inform them that: (a) certain types of natural events affect the air quality of the area periodically, (b) a natural event is imminent, and (c) specific actions are being taken to minimize the health impacts of events.

3) Minimize public exposure to high concentrations of PM10 through a public notification and health advisory program. Programs to minimize public exposure should (a) identify the people most at risk, (b) notify the at-risk population that a natural event is imminent or currently taking place (c) suggest actions to be taken by the public to minimize their exposure to high concentrations of PM10, and (d) suggest precautions to take if exposure cannot be avoided.

4) Abate or minimize appropriate contributing controllable sources of PM10. Programs to minimize PM10 emissions for high winds may include: the application of BACM to any sources of soil that have been disturbed by anthropogenic activities. The BACM application criteria require analysis of the technological and economic feasibility of individual control measures on a case-by-case basis. The NEAP should include analyses of BACM for contributing sources. If BACM are not defined for the anthropogenic sources in question, step 5 listed below is required.

5) Identify, study, and implement practical mitigating measures as necessary. The NEAP may include commitments to conduct pilot tests of new emission reduction techniques. For example, it may be desirable to test the feasibility and effectiveness of new strategies for minimizing sources of windblown dust through pilot programs. The plan must include a timely schedule for conducting such studies and implementing measures that are technologically and economically feasible.

6) Periodically reevaluate: (a) the conditions causing violations of a PM10 NAAQS in the area, (b) the status of implementation of the NEAP, and (c) the adequacy of the actions being implemented. The State should reevaluate the NEAP for an area every 5 years at a minimum and make appropriate changes to the plan. Again, this revision directly reflects Element #6 as required under the Natural Events Policy.

7) The NEAP should be developed by the State in conjunction with the stakeholders affected by the plan.

8) The NEAP should be made available for public review and comment and may, but is not required, to be adopted as a revision to the State Implementation Plan (SIP) if current SIP rules are not revised.

9) The NEAP should be submitted to the EPA for review and comment.

The following text describes the Lamar NEAP and its conformance with the EPA guidance on natural events.

## III. NATURAL EVENTS ACTION PLAN

Element 1: Documentation & Analysis

On October 11, 1996 the Division submitted documentation to EPA Region VIII in support of the three most recent exceedances of the PM10 NAAQS in Lamar due to natural events. The documentation contained monitoring data, meteorological data, PM10 filter analysis and receptor model results, maps of the area, news accounts of the events and other miscellaneous supporting material.

The supporting documentation, however, was deemed to be incomplete by EPA Region VIII in a letter dated December 19, 1996. A request for additional information was made by EPA. This request was fulfilled through the submission of supplemental documentation on February 28, 1997. The supplemental documentation contained additional meteorological analyses on wind speed, wind direction, and precipitation data. Identification of potential anthropogenic and nonathropogenic sources in relation to the two Lamar PM10 monitor sites was also provided.

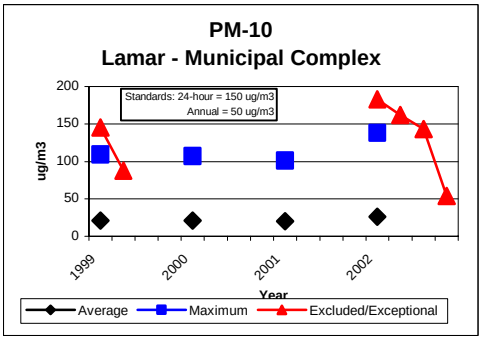
A further request from EPA for historical documentation on meteorological conditions and associated high/low PM10 values under a low/high wind speed conditions was made on March 13, 1997. The Addendum to the supplemental supporting documentation was submitted to EPA on May 7, 1997. All three documentation submittals were included in Appendix A of 1998 NEAP.

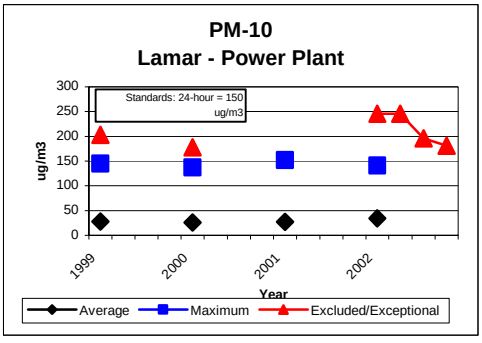
Taken together, the supporting documentation establishes a clear, casual relationship between the measured exceedances and the natural events as required by the NEP. On the days of Lamar's PM10 exceedances, unusually high winds and/or wind gusts were experienced over a prolonged period of time. On March 22, 1995 seven consecutive hours of 21-32 mph wind speeds blew from the west. The maximum hourly average wind speed was 32 mph with a maximum wind gust recorded at 62.2 mph. The November 26, 1995 exceedance experienced an hourly wind speed average of 31.1 mph and six consecutive hours of winds blowing from the west at 24 - 31.1 mph. On January 17, 1996, eleven consecutive hours of strong north winds blew from between 21-28 mph. The strongest wind gust recorded that day was 41.5 mph. No precipitation was measured either on the exceedance days, or up to seven days prior to the high wind events. At the time of the November 26, 1995 exceedance, a lack of precipitation was evident for as many days as 52 prior to the exceedance.

According to the Natural Events Policy, “the conditions that create high wind events vary from area to area with soil type, precipitation and the speed of wind gusts.” Thus, states are to determine the conditions that define high winds in an area. Making a precise determination, however, is a complex task that requires detailed information on soil moisture, daily wind speeds, temperature, and a number of other variables that are not readily available at this time. Until such research and/or guidance is available, the Division will use the definition of high winds included in the *Guideline on the Identification and Use of Air Quality Data Affected by Exceptional Events* for the Lamar area. According to this guidance, high winds are defined as: "An hourly wind speed of greater than or equal to 30 mph or gusts equal to or greater than 40 mph, with no precipitation or only a trace of precipitation.” In all three high wind events, hourly wind speeds and/or wind gust data coupled with low precipitation levels meets this high wind definition.

For events more recent, that is, since the submittal and EPA concurrence of the 1995- 1998 high wind events, full technical descriptions for each event have been submitted to EPA. Naturally occurring blowing dust due to high wind events in Lamar meet the same strict definitions and guidelines as those events documented in the 1998 NEAP. The graphs below highlight exceedances recorded in recent years compared to the NAAQS at both the Lamar Power Plant and Municipal Complex. Data are also represented on page 1.

**Lamar Area Exceedances at Both Municipal Complex and Power Plant**




This section, alongside technical documentation provided previously, fulfills the requirement of Element #1 as described on page 4.

Element 2: Public Education Programs

The purpose of this program is to inform and educate the public about the problem. The Division has worked closely with the City of Lamar, Prowers County Commissioners, local media, and interested community groups to educate the public about the problems associated with elevated levels of PM10 in the Lamar area. Over the years numerous meetings have taken place with the City and County governments to discuss these issues and to develop a plan to address future high wind events in Lamar. Elements of the program include: informing the public when air quality in the area is unhealthy; explaining what the public can expect when high wind events occur; what steps will be taken to control dust emissions during future high wind events; and, how to minimize their exposure to high concentrations of PM10 during high wind conditions. The public notification and education programs have included but are not limited to:

- An informational and health-related brochure has been and will continue to be distributed by the local governments, the Prowers County Health Nurses, the Prowers County conservation and agricultural extension agencies to sensitive populations (elderly and local school districts) as well as the general public. Distribution of the *Blowing Dust Health Advisory Brochure* began in January 1998 (see Appendix). Additional activities/commitments of this revised (2003) NEAP include: the development of a Spanish language brochure for the non-English speaking community.

- Media press releases for both the print and local radio are conducted as needed to continually raise public awareness. Additional activities/commitments of this revised (2003) NEAP include: Division and area staff have participated in several radio interviews to further raise public awareness to air quality issues and advise local residents of opportunities to participate in the development of local air quality plans. Also, community radio polling has been completed to better identify local mitigation opportunities/considerations.

- Numerous public meetings have also been conducted. Additional activities/commitments of this revised (2003) NEAP include: 1) To gauge community understanding of air quality issues, a local focus group was convened. Through this focus group, an air quality survey was developed to further gauge community awareness and willingness to address other air quality issues. A copy of the survey is included in the Appendix, and; 2) Division staff have participated in local events (e.g., County Fair) to pass out high wind/blowing dust literature and answer questions related to the NEAP and local control strategies to minimize PM10 exposure.

- Also, blowing dust watches and health advisories have been and will continue to be issued by Lamar's Southeast Land and Environment office (local health department) during the high wind season. Thirteen (13) advisories have been issued since the last revision. Additional activities and commitments of this revised (2003) NEAP include: the adequacy and accuracy of the blowing dust watches and health advisories have been verified and quality assured on

several occasions to ensure minimization of the public's exposure.

- An Air Quality Task Force has been established in the community over the past year. Members of the task force include local health department personnel, staff from city and county, the business community, a public health nurse representative, and the Division itself. The charge before the task force is to identify any unresolved air quality issues, ensure area exceedances are minimized, and work to ensure the community is aware of ongoing air quality issues and efforts to minimize impacts. This is a new commitment/activity that was not part of the 1998 NEAP and demonstrates additional efforts by the local agencies and the Division to improve area air quality.

- Several meetings have also been held to review the requirements of and local involvement in the NEAP and its 2003 revision. Other meetings will be convened as deemed necessary by the Division and/or the local stakeholders.

- Finally, through recommendation from the air quality task force, an independent study is being conducted to better understand any impacts from an area feedlot. Results should be available in 2003/2004 for additional community address. This too is a new activity that was not part of the 1998 NEAP.

This section fulfills the requirement of Element #2 as described on page 5.

Element 3: Blowing Dust Health Advisory and Notification Program

The Blowing Dust Health Advisory Program will notify the public as to the possibility that a high wind event is imminent or currently taking place, and will include an advisory suggesting what actions can be taken to minimize exposure to high concentrations of particulate matter.

Advisories will be issued by the Lamar area Environmental Health Southeastern offices with forecasting assistance provided by the Division and the National Weather Service. The forecasting methodology - approved as part of the 1998 NEAP submittal and agreed to all parties listed elsewhere in this NEAP -alongside the public brochure and the forecasting and health advisory protocols are included in the appendix.

In addition, high winds are currently being documented to determine if the Division can better address these issues. Included in this analysis is a rudimentary review of the high wind data to identify patterns of events and possible solutions to minimize public exposure. Given the drought conditions affecting the Lamar area over the past several years, no consistent pattern (outside of extremely dry conditions and lack of rainfall) has been noted. Nonetheless, the Division is committed to continually investigating this issue and improving the advisory as possible. This is a new activity that was not part of the 1998 NEAP and demonstrates additional efforts by the

Division.

This section fulfills the requirement of Element 3 as described on page 5.

Element 4: Determination and Implementation of BACM

1. BACM Determination

According to the NEP, BACM must be implemented for anthropogenic sources contributing to NAAQS exceedances in moderate PM10 nonattainment areas. BACM for PM10 are defined in 59 F.R. 42010, August 16, 1994 as techniques that achieve the maximum degree of emissions reduction from a source as determined on a case-by-case basis considering technological and economic feasibility.

Through a series of meetings beginning in 1997 between the Division and Lamar officials representing the City of Lamar, Prowers County Commissioners, local farmers, a county health specialist, the local media, the Natural Resources Conservation Service, the county extension office, and concerned citizens, issues were discussed surrounding the NEAP and its efforts. Specifically covered were issues of the meteorological data, monitoring data, potential contributing sources to the high wind events, and potential candidate BACM. The community meetings, coupled with the analyses of the supporting documentation, identified two distinct set of circumstances that lead to Lamar's high wind exceedances of the PM10 NAAQS:

- High concentrations of $PM_{10}$ caused by a mixture of anthropogenic and nonanthropogenic sources coming largely from outside the nonattainment area under high wind conditions - from about the 270 degree to 360 degree wind directions (west, northwest, and north directions); and,

- Prolonged climatic conditions of low precipitation over an extended period of time that act to dry area soils making them more susceptible to airborne activity under high wind conditions.

The meetings also identified potential BACM candidates including the Burlington Northern Santa Fe rail line, agricultural lands, other open areas, limited construction activity (which has been since completed), the city landfill, and area gravel pit. Specific documentation for these candidate BACM can be found in the 1998 NEAP.

**BACM Options Considered**

To determine the most appropriate and viable control measures for the community, both a review of the area emission inventory and consideration of all BACM was undertaken. Note that numerous other BACM options have been considered for the revised NEAP that were not part of the original (1998) NEAP.

Based on the contributing source analysis and in review with community stakeholders, the following BACM options were considered as possible PM10 control measures for the community:

a) Street Sweeping Activities- Community Street sweeping programs have demonstrated effectiveness in other communities. Such activities were considered as a local control measure. Expanding the current street sweeping program and purchasing additional, more effective equipment were also reviewed.

b) Construction/Demolition Activity – local ordinances to control emissions from construction and demolition sites have been implemented in other parts of the state with good success. Also, several work practice could be applied to reduce emissions from the site including watering, a track out policy, and an area land use plan. Based on the contributing source analysis, this option was discussed with the City of Lamar and Prowers County officials as part of the 1998 NEAP as well.

c) Wind Erosion of Open Areas – several practices were reviewed regarding the wind erosion of open areas, including both local and regional efforts. Recommendations under consideration included sodding of local parks, tree breaks planted at the area transfer station, gravel/chips along railroad corridor, and chemical stabilization applied by the city along the railroad corridor in a two-block area. Based on the contributing source analysis, this option was discussed with the City of Lamar and Prowers County officials as part of the 1998 NEAP as well.

d) Control of Stationary Source Emissions- as identified elsewhere in this NEAP, a review of stationary sources and their relative contribution to overall PM concentrations was completed. It was determined that few PM10 sources exist in the area, appearing to contribute a very small amount of particulate matter to the overall inventory.

e) Road Stabilization- In a effort to better understand the effects of road stabilization, several options were reviewed including the use of chemical stabilizers and water as a stabilizing measure.

Also, periodic assessments to determine if traffic levels on unpaved roads surpass Colorado Regulation No. 1 limits were considered. If daily traffic counts exceed 200 trips per day on unpaved roads, state regulations apply that reduce PM10 emissions from those roads. Specifically, periodic assessments of traffic levels on unpaved roads within the city limits and

within one mile of the city limits were considered. State regulation calls for a road traffic count and dust control plan for roads that exceed the 200 trips threshold.

In addition, Lamar currently suggests that drivers maintain their vehicles at a slow speed on unpaved roads and other dirt surfaces to reduce dust emissions. This information is disseminated throughout the community.

f) Woodburning Curtailment Programs- the possibility of instituting a citywide curtailment program was reviewed and considered. This has been a consideration for the community and includes discouraging wood burning on high wind days.

g) Open Burning- The usefulness of imposing and maintaining an open burning curtailment program during high wind events was reviewed. Current state air pollution control laws and regulations provide some guidance on the effort.

h) Avoidance of Dust Producing Equipment- The effectiveness of avoiding the use of dust producing equipment has also been considered. Currently Lamar discourages the use of dust-producing equipment (e.g., leaf blowers) in an effort to reduce PM10 emissions and does so through public education and outreach efforts.

(i) Reducing or Postponing Tilling and Plowing or Other Agricultural Practices that Contribute to PM10 Emissions- It is well recognized that dust-producing activities such as tilling, plowing, and other agricultural practices increase the amount of PM10 released. As such, these control measures were discussed as part of the effort to reduce PM10 impacts on Lamar. Review of existing and potentially future control practices were considered at the local, regional, state, and federal (e.g., Natural Resources Conservation Service) level.

j) Wind Break- Various trees are found throughout Lamar. However, the placement of one row of barrier trees (e.g., Russian Olives) would block potential contributing sources. The Russian Olive is a quick growing large shrub/small tree will do well given the windy climate of Lamar. According to section 3.5.2.1 of EPA guidance entitled Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, dated September 1992, one-row of trees is considered an effective windbreak.

k) Vegetative Cover/Sod- Efforts elsewhere in the State have demonstrated the usefulness of using a vegetative cover at sites where dust is known to blow. Efforts to use this control measure were reviewed for applicability and effectiveness.

l) Railroad Corridor - Two categories of surface treatments were considered to control fugitive dust emissions lifted from the 400'-wide railroad corridor under dry, high wind conditions. This option was fully explored in the 1998 NEAP and details of this option can be found there.

**Lamar Stationary Sources Emission Inventory**

To ensure that significant changes in PM10 emissions from local stationary sources are not a significant contributing factor to area exceedances, an emission inventory was prepared and reviewed. The following table demonstrates their limited impacts on the total emission inventory. Note how this relatively minor value compares to the approximately 12,700 pounds per day emission inventory prepared as part of the area's Maintenance Plan (circa 2000 inventory). That is, the stationary source emission inventory accounts for less than 2% of the total PM10 emission inventory. For more information regarding the Maintenance Plan and its inventory, please see the PM10 Redesignation Request and Maintenance Plan for the Lamar Area. A copy of the Plan is available in the Appendix.

**Current Lamar PM10 Emission Inventory (circa 2003)**

| Source | Emissions in lbs/day (also 1998 emissions) |
|---|---|
| Carder * | 4.1 (1170.6) |
| Utility Board of Lamar | 17.5 (44.9) |
| SE Colorado Co-Op | 0.3 (0.5) |
| Valco | 1.5 (1.7) |
| Neoplan | 0.9 (4.2) |
| Fiberglass Component | 0.0 (0.3) |
| All Rite | 28.0 (28.2) |
| Hog Slat | 15.3 (15.3) |
| City of Lamar | 0.0 (4.9) |
| Lamar Community College | 0.1 (1.2) |
| Ranch Manufacturing * | 0.9 (0.0) |
| National Swine Builders* | 35.6 (0.0) |
| Colorado Mills, LLC * | 67.4 (0.0) |
| **Total** | **171.6 (1271.8)** |

* Emissions include "Potential to Emit," not necessarily actual emissions, for 1998.
Sources with zero emissions in 1998 not part of the inventory then or doing business under a different name (emissions not available at the time of this documentation, though anticipated as "low").

**BACM Options Discounted**

Several BACM options were discounted from consideration based on the meteorological analysis, on site inspection and discussion with area residents and local government officials. A complete discussion of these previous efforts can be found in the 1998 NEAP.

For this revised Plan however, the community is committed to meet BACM in all instances,

where feasible. For example, meetings with local officials coupled with the use of an area focus group indicated that the ongoing regional drought significantly impacts the amount of water available as a control measure (e.g., watering of area roads to reduce PM10). With that, water restrictions (and related economic impacts of the drought) will likely dictate the utility of this control measure.

BACM Implementation
Refer to the stakeholder agreements for details on the selected BACM.

## III. STAKEHOLDER AGREEMENTS

The City of Lamar and Prowers County have been working hard to identify contributing sources and to develop BACM for those sources as required by NEP. The following descriptions include BACM that has either already been put into place or will be phased in as economically and technically feasible.

### City of Lamar

The City of Lamar has been very active in addressing potential PM10 sources within the Lamar area through efforts such as sodding baseball fields, implementing and enhancing a street sweeping program, and chip-seal paving of many unpaved roads. In addition to these type of control measures already taken by the City, the Public Works Department implemented the following BACM within the area:

1. *Wind Break*

Beginning in the Spring of 1997, a wind break of trees was planted north of the Power Plant monitoring site. The Russian Olive tree wind break is located approximately one half mile north of the Power Plant monitoring site and will block potential contributing sources such as the Lamar Transfer Station and other unpaved equipment traffic areas to the north. The Russian Olive is a quick growing large shrub/small tree will do well given the semi-arid and windy climate of Lamar. According to section 3.5.2.1 of EPA guidance entitled Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, dated September 1992, one-row of trees is considered an effective windbreak.

In addition to this commitment, more recent efforts include: the installation of a drip irrigation system to irrigate these tree groves.

2. *Landfill Shutdown*

The East Lamar Landfill is located approximately six (6) miles east of the city limit. According

to section 3.5.1 of the "Operations and Closure Plan for the East Lamar Landfill", the Director of the Public Works Department and/or the landfill operator is required to do the following litter control measures under high wind conditions:

- Soil cover is required to be placed on the working face of the landfill daily during periods of wind in excess of 30 mph; and,

- The landfill must be closed down when sustained winds reach 35 mph or greater.

An on-site wind gauge is used to monitor wind speeds at the landfill. Operators have radios in their equipment connecting them with the main office so that when the decision to close the landfill is made, it can take place immediately. According to the previous Director of Public Works, landfill operators have been directed to close the landfill at their discretion. Because paper begins to lift and blow into the debris fences at wind speeds of 25 to 30 mph, the operator usually closes the landfill prior to wind speeds reaching 30 mph. The City of Lamar has agreed to make the closure of the Lamar landfill mandatory when wind speeds reach 30 mph. This also reduces wind blown dust from the landfill as earth moving activities are reduced or eliminated during periods of shut down.

In addition to this commitment, more recent efforts include: the placement of chain link fencing and various debris fences in place of the previous litter entrapment cage. This effort is to better minimize the release of materials during high wind conditions.

3. *Vegetative Cover/Sod*

The Lamar Recreation Department installed 100,000 square feet of sod at a recreational open space called Escondido Park. Escondido Park is located in northwest Lamar at 11th and Logan Streets. A sprinkler system has also been installed by the Parks and Recreation Department. The sod provides a vegetative cover for the open area. This dense, complete cover provides an effective control against wind blown soil from the open area of the park.

In addition to the commitment above, more recent efforts include: the commitment by the Lamar Public Works Department to stabilize the entrance road leading to and from Escondido Park to reduce track out onto city streets and minimize additional releases of PM10.

4. *Additional Public Works Projects*

In addition to the PM10 control efforts of the original NEAP, new Public Works projects to further reduce emissions of PM10 include:

- The recent purchase of a TYMCO regenerative air street sweeper which is much more effective in reducing dust during street sweeping activities. Use of this sweeper allows for

improved cleaning of the streets (e.g., sweeps the gutter and street);

- The fencing of an area around the City Shop to reduce vehicle traffic that may be responsible for lifting dust off of the dirt area between the railroad tracks and the Shop;
- The stabilization of a large dirt and mud hole on the north side of the City Shop. This project is credited with keeping mud from being tracked out into the street and becoming airborne by vehicular traffic;
- The ongoing commitment to search for other stabilization projects that benefit the community and improve area air quality, and;
- The relocation of the Municipal Tree Dump (formerly located in the northeastern corner of the city) to approximately six miles east of the city (now housed at the Municipal Landfill). This relocation eliminates a major source of smoke from agricultural burns that may have previously affected the community.

## Burlington-Northern/Santa Fe Rail Line

The rail line running east-west of the Power Plant monitoring site was deemed to be an important PM10 source during conditions of high winds and low precipitation. Vehicle traffic which damages vegetation and break up the hard soil surfaces, highwinds, and passing trains re-entrains the dust into the air. This area is particularly problematic in the two block area immediately west of the Power Plant monitoring site. Control of this open area requires a close working agreement between the Burlington-Northern/Santa Fe Railroad Company (BNSF), the Division, and the City of Lamar Public Works Department. The purpose of this BACM is to reduce the amount of particulate matter susceptible to wind erosion under high wind conditions and general re-entrainment of dust in the ambient air as a result of local train traffic passing in close proximity of the PM10 monitor.

In September 1997, the City chemically stabilized exposed lands north of the rail line between Fourth and Second Street where there was evidence of vehicle traffic. All other lands on either side of the rail road tracks between Main Street (Fifth) and Second Street and extending westward have either natural, undisturbed ground cover or it is used for commercial/recreation purposes that do not allow for significant re-entrainment (BNSF is responsible for maintaining 50 feet of property on either side of the main track). Most of these lands are leased by the City. After September 1997 the City negotiated the lease of these lands. Once acquired, a long term plan, will be developed for these lands such as restricting vehicle access, permanently stabilizing lands with vegetation and gravel, increasing park and recreational use, and using the lands for city maintenance and storage activities.

According to John Meldrum, Manager of Environmental Operations for BNSF, the railroad company owns the main rail line and 200 feet on either side of the track. Much of this property has been sold or leased under private contracts. At this time BNSF is responsible only for the main rail line and for 50 feet of property on either side of the main track. All property sold or

under contract is not the responsibility of BNSF. As a result, BNSF has stabilized the railroad corridor 50 feet on either side of the main rail line.

In May 1997, Burlington Northern Santa Fe placed chips (gravel) 50 feet on either side of the main track from Main Street to Second Street (three blocks) to control fugitive dust emissions from this section of the track. Graveling exposed surfaces not exposed to regular vehicle traffic is considered a permanent mitigation measure. Details of this arrangement can be found in the documentation under the 1998 submittal.

## USDA: NATURAL RESOURCES CONSERVATION SERVICE

1. *Conservation Reserve Program*

Prowers County is a predominately agricultural area that is made up of over one million acres of land area - 882,165 acres (or 84.6%) of which is land in farms.[8] Of the farm land acreage, cropland accounts for over half of the total (467,650 acres). Water, and often the lack of it, coupled with the frequent high winds experienced during late fall and early spring can destroy crops, encourage pests, and damage soil surfaces lending them susceptible to wind erosion. Most of Prowers County cropland acreage is farmed using dryland practices (versus irrigated) and consists of soils classified as highly-erodible-land (HEL) by the Department of Agriculture.

Recognizing the problems associated with erodible land and other environmental-sensitive cropland, the U.S. Department of Agriculture (USDA) included conservation provisions in the Farm Bill. This legislation created the Conservation Reserve Program (CRP) to address these concerns through conservation practices aimed at reducing soil erosion and improving water quality and wildlife habitat.

The CRP encourages farmers to enter into contracts with USDA to place erodible cropland and other environmentally-sensitive land into long-term conservation practices for 10-15 years. In exchange, landowners receive annual rental payments for the land and cost-share assistance for establishing those practices.

The CRP has been highly successful in Prowers County by placing approximately 146,000 acres of Prowers County cropland, or 28% of total cropland, under contract. Most of this land has been planted with a perennial grass cover to protect the soil and retain its moisture. Strong support of the program by Prowers County farmers continues as 38% of the counties HEL cropland has been offered for conservation practices.

While the following initiatives are not meant to be enforceable, many efforts are underway that further reduce blowing dust and its impacts. These include:

- The CRP has moved to include all available area lands into area contracts. These contracts are good through 2007. Success of the CRP initiatives is measured through ongoing monitoring of the contracts to ensure ample grass coverage to minimize blowing dust.

- CRP sends out information several times per year through radio and the area newspaper to further reach farmers interested in topsoil protection.

- In response to the significant Colorado drought the CRP is working with multiple parties in extensive annual planning efforts to limit blowing dust and its impacts. These planning efforts change year to year depending on the severity of the drought.

2. *Limestone-Graveyard Creeks Watershed Project*

A watershed improvement project is currently underway in the Limestone-Graveyard Creeks Watershed. This project covers approximately 60,000 acres of land north of the Arkansas River between Hasty (Bent County) and Lamar. An estimated 44,500 acres of the watershed area are classified as priority land due to the highly erodible nature of the soil. Over 2,000 acres of agricultural cropland northwest of Lamar are included in this watershed project.

Working with the NRCS, each farmer will create their own conservation plan with costs for improvements split equally between farmers and the federal government. The 15-year project will help reduce soil erosion and improve water quality and efficiency through conservation tillage practices and/or other conservation efforts. In short, the Limestone-Graveyard Creeks Watershed Project will help to reduce soil erosion and lower the impacts of blowing soils during future high wind events.

More recently (since the 1998 NEAP submittal), the Watershed project has been evaluated and is seen as an ongoing successful program as most eligible acres are signed up.

3. *New Initiatives*

While the following initiatives are not meant to be enforceable, the Natural Resources Conservation Service has many efforts underway that further reduce blowing dust and its impacts. These include:

- A comprehensive rangeland management program;
- Tree planting program;
- Drip irrigation purchase program, and;
- A multi-party drought response planning effort coordinated through the State of Colorado

Governor's office.

These are but a few of the efforts at the local, county, and regional level underway to reduce emissions of PM10 and limit impacts.

## COLORADO STATE UNIVERSITY CO-OP EXTENSION OFFICE

While the following initiatives are not meant to be enforceable, the CSU Co-Op Extension Office has many efforts underway that further reduce blowing dust and its impacts. These include:

- Crop residue efforts that encourage no- or low-till practices. These have been deemed appropriate and useful in reducing blowing dust.
- Ongoing outreach efforts to educate area agricultural producers on soil management programs. These include one-on-one visitations and annual meetings with various corn and wheat programs to discuss crop management.
- Drought workshops to protect topsoil throughout the county.

## PROWERS COUNTY

*Prowers County Land Use Plan*

Beginning in 1997, Prowers County with the assistance of local officials, environmental health officers, the general public, etc. began preparing a County Land Use Plan. The Prowers County Land Use Plan is designed to have wide-reaching impacts on the City of Lamar and Prowers County for a myriad of land use issues involving building (construction sites), siting, health, fire, environmental codes, and other social concerns. The early work on the Land Use Plan was seen as a diverse set of administrative, code, and enforcement activities brought together into one process.

While the Plan has undergone extensive draft and local consideration since that time, the Plan was never fully implemented. This was due to the community's interest in identifying the most appropriate approach for holistically addressing County issues.

More recently (since the 1998 submittal), the Prowers County Land Use Plan has undergone significant review and re-draft (as part of the County's broader Comprehensive 2003 Plan). In short, the original County sub-division regulations and zoning ordinances are being legally reviewed and enhanced to address community needs. Regulations and ordinances of the Land Use Plan specific to reducing blowing dust and its impacts include:

- Additional regulations on development of fragile lands and vegetation to protect topsoil;

- Development of performance standards and best management practices to prevent soil erosion;
- Development of best management practices to reduce blowing sands and movement of area sand dunes across the county;
- Development of new special use permits to address the siting of animal feedlots and feed yards;
- Development of special use permits for other future stationary sources. The special use permits will also likely include the requirement for comprehensive fugitive dust control plans for both construction and operation of facilities;
- Consideration and review of enforcement capabilities through the area zoning ordinances, and;
- Planned public review and comment processes following the legal update of the draft County Land Use Plan.

The draft strategies described above are at the county level and are informational only. The descriptions are meant only to capture the regional considerations being made to address blowing dust and its impacts. The County's Comprehensive Plan should be available by October 31, 2003. The Division commits to sending this final land use plan to EPA Region 8 as an addendum to this NEAP upon completion.

This section fulfills the requirement of Elements #4 as described on page 5.

## PUBLIC REVIEW AND PERIODIC EVALUATION

This section describes the public process used to develop this NEAP and the commitment made to periodically evaluate the plan.

### Stakeholder Involvement

The EPA's NEAP development guidance states that the NEAP should be developed by the State in conjunction with the stakeholders affected by the Plan. The Division worked with stakeholders mentioned throughout this document. Numerous meetings and telephone conversations occurred with stakeholders, and the final agreement here reflects strategies offered as part of the NEAP.

### Public Review

The Division made this documentation available for, and presented the NEAP to, the public to ensure ample public review and comment. Examples of these efforts, beginning with the earliest community involvement, include:

- "Air Quality Documentation in Support of High Wind Events in Lamar available for Public

Review/Comment at the Lamar Public Library…" February 1997

- Briefing of the Prowers County Board of Commissioners, February 1997
- "Media Advisory" notifying the public of upcoming Lamar City Council meeting to discuss the NEAP, January 1998
- Briefing the Lamar City Council, January 1998
- Dissemination of the "Blowing Dust Health Advisory Brochure - Lamar Area" through the Southeast Land and Environment offices, January 1998 through the present
- Briefing of the Colorado Air Quality Control Commission, February 1998
- "Lamar Area Air Quality Natural Events Action Plan to be Available for Public Review" at the Lamar Public Library and Lamar City Complex - February 6 through March 6, 1998" this notice was published in the Lamar Daily News on February 6, 1998
- Briefing of the Lamar City Council on the PM10 Maintenance Plan, including a discussion of the Maintenance Plan's relationship to attainment status and the use of other air quality tools (e.g., Lamar NEAP), August 2000
- "Media Advisory" notifying the public of an upcoming Lamar area meeting to discuss air quality issues. This notice ("Lamar Air Quality Topic of Public Meeting Tonight") was published in the Lamar Daily News, August 29, 2000
- Local meeting with public to discuss air quality issues in the Lamar area including the planned PM10 Maintenance Plan, the area Natural Events Action Plan, and other initiatives to reduce blowing dust and its impacts on the public, August 2000
- Briefing of the Prowers County Board of Commissioners on the PM10 Maintenance Plan including a discussion of the Maintenance Plan's relationship to attainment status and the use of other air quality tools (e.g., Lamar NEAP), August 2000
- Briefing of the Lamar City Council on the Update to the Draft PM10 Maintenance Plan and its relationship to attainment status and the use of other air quality tools (e.g., Lamar NEAP), February 2001
- Briefing of the Lamar City Council on the Update to the Final PM10 Maintenance Plan and its relationship to attainment status and the use of other air quality tools (e.g., Lamar NEAP), August 2001

- Briefing of the Colorado Air Quality Control Commission, May 2002
- Briefing of the Lamar Air Quality Task Force, May 2002
- Briefing of the Colorado Air Quality Control Commission, January 2003
- Public Notice, "Revised (2003) Natural Events Action Plan for Lamar, Colorado" Available for Public Review and Comment at the Lamar Public Library, April 2003
- Briefing the Lamar City Council, April 2003

**Periodic Evaluation**

EPA's Natural Events Policy guidance requires the state to periodically reevaluate: 1) the conditions causing violations of the PM10 NAAQS in the area, 2) the status of implementation of the NEAP, and 3) the adequacy of the actions being implemented. The State has reevaluated the NEAP for Lamar at the five-year mark and has made appropriate changes to the plan here within. The plan presented here represents the first 5-year revision to the original NEAP dated April 1998.

Evaluation of the effectiveness of the NEAP included several key strategies to ensure protection of public health and a robust plan. Strategies included: review of Natural Events Policy in specific relation to the Lamar community, review of the effectiveness/appropriateness of ongoing control strategies, consideration of new/additional control options, review of meteorological and climatological conditions leading to blowing dust, review of local and regional PM10 monitoring data, discussions with other States (e.g., South Dakota, Washington) and Federal (US EPA) personnel regarding NEAP updates and protocols, use of community surveys, establishment of a area air quality task force, review of the established emission inventory and identification of any new emission sources, review of the blowing dust advisory protocol and notification records, public/stakeholder meetings and community outreach/education efforts, initiation of special studies to better understand possible impacts from certain sources (e.g., feedlots), etc.

The Division commits to continually review the effectiveness of the Lamar Natural Events Action Plan and improve the effort, where feasible.

**Submittal to EPA**

The original NEAP was submitted to EPA in April 1998. This revised NEAP is submitted according to the Natural Events Policy five-year revision schedule.

This section fulfills the requirement of Elements #6, 7, 8, and 9 as described on page 5.

1. Natural Events Policy (NEP). EPA, May 30, 1996, p. 1.

2. Soil Survey: Prowers County Colorado. USDA, Soil Conservation Service. April 1966, p. 140.

3. NEP. p. 8.

4. Colorado State PM10 Natural Events Report: Technical Support Document. Colorado Department of Public Health and Environment, Air Pollution Control Division, Technical Services Program. October 6, 1996. p. 14.

5. NEP. p. 9.

6. NEP. p. 5.

7. NEP. p. 5.

8. 1987 Census of Agriculture. Vol. 1: Geographic Area Series, Part 6 Colorado State & County Data. U.S. Dept. Of Commerce: Bureau of Census.