

## **Appendix F**

### **Air Quality Monitoring**

SMP I – Voluntary (If there are populations, Class I Areas, or PM or CO Non-Attainment or Maintenance Areas within a 1-mile radius, visual monitoring is required), *or* SMP II requirements

SMP II – Required

Air quality monitoring is defined as successive visual and/or instrumental observations that enable an assessment of air quality impacts of smoke from fires. Air quality monitoring is conducted to quantify effects, to verify compliance with standards and visibility requirements, and to refine operational procedures.

#### **F.1. Visual Monitoring**

Visual monitoring is required for SMP II; it is also required for SMP I if the burn project is within a one-mile radius of Class I Areas, particulate matter (PM) or carbon monoxide (CO) Non-Attainment or Maintenance Areas, and/or a population(s). Visual monitoring is the simplest and most common method of monitoring fire emissions. The intent of visual monitoring is to make the burner aware of smoke dispersion. Visual monitoring can also provide documentation of conditions should complaint calls suggest that smoke was problematic.

Visual monitoring includes observing smoke plume characteristics such as direction, rise, color and density of the plume, and the time of day of these observations. Documentation of visual monitoring means recording the observations on the Visual Monitoring Form (see Form below), and taking photographs that support the observations, which means recording the date, time, location and direction of each photo. This can be done using the Photo Log Form supplied here. In addition, a simple Excel form is available on the AQB's smoke management website which also may be used ([http://www.nmenv.state.nm.us/aqb/SMP/smp\\_index.html](http://www.nmenv.state.nm.us/aqb/SMP/smp_index.html)).

#### **F.2. Instrument Monitoring**

The AQB may decide to conduct instrument monitoring on some SMP II burn projects so as to collect data on particulate concentrations at specific locations. This requirement will be established in consultation between the AQB and the burner, and may require notification two business days prior to ignition. Instrument monitoring will be undertaken either by the AQB, or by the burner, if capable.<sup>1</sup>

The need for instrument monitoring will be determined by considering a burn's proximity (within a 15-mile radius or 15 miles downwind) to Class I Areas, PM and CO Non-Attainment or Maintenance Areas, and a population(s); equipment availability; availability of trained personnel; prior air quality problems; regional impacts (smoke from other sources, pollution alerts, regional wide air stagnation, etc.); duration of the burn; location to existing monitors; prescribed wind direction; and current and forecasted weather conditions. Data from instrument monitoring can also be used for public awareness, and for comparison to data from wildfires.

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<sup>1</sup> The state currently has numerous particulate monitoring stations throughout the state. For these locations, visit the AQB monitoring website (<http://www.nmenv.state.nm.us/aqb/monitor/index.html>).

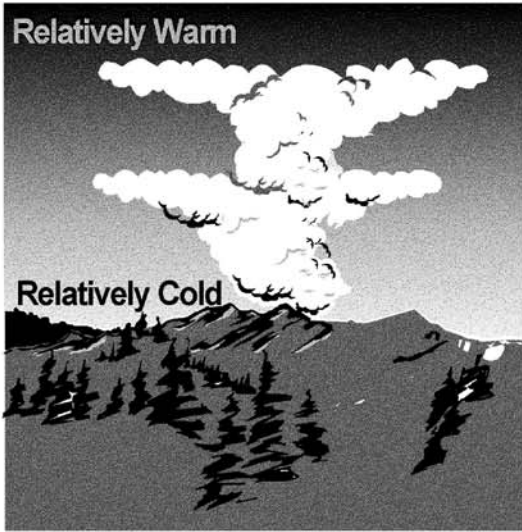
The use of real-time instruments is gaining acceptance by federal land managers as an adaptive management tool. Since instantaneous concentrations are provided in “real-time”, adjustments can be made to burning to reduce the concentrations recorded at a specific location. A guide to monitoring smoke was developed by an interagency workgroup to provide resources and tools to New Mexico burners.

### **F.3. Visibility Monitoring**

The AQB does not conduct visibility monitoring for Class I areas in New Mexico. However there is a network of visibility monitors throughout the county called IMPROVE (Interagency Monitoring of Protected Visual Environments). To learn more about visibility monitoring and to see pictures of varying degrees of visibility impairment visit their website at <http://vista.cira.colostate.edu/improve/>.

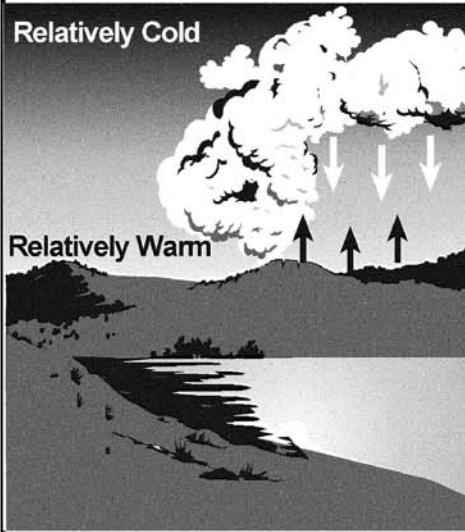


1



- Clouds grow vertically and smoke rises to great heights
- Cumulus type clouds
- Upward and downward currents gusty winds
- Good visibility
- Dust whirls

2



- Clouds in layers, no vertical motion
- Stratus type clouds
- Smoke column drifts apart after limited rise
- Poor visibility in lower levels due to accumulation of haze and smoke
- Fog layers
- Steady winds

3

- Smoke column is not observable because of nighttime conditions or observer's location is in smoke

Park/Unit 4-Character Alpha Code: \_\_\_\_\_

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PHOTOGRAPHIC RECORD SHEET

Roll ID: \_\_\_\_\_ Brand and Type of Film: \_\_\_\_\_

Camera Type: \_\_\_\_\_ Lens: mm ASA: \_\_\_\_\_

#	Fire Name/ Number	Plot ID	Subject (e.g., Q3-Q2)	Azmth	Date	Time	F-Stop	S- Speed
1	_____	_____	_____	_____	_____	_____	_____	_____
2	_____	_____	_____	_____	_____	_____	_____	_____
3	_____	_____	_____	_____	_____	_____	_____	_____
4	_____	_____	_____	_____	_____	_____	_____	_____
5	_____	_____	_____	_____	_____	_____	_____	_____
6	_____	_____	_____	_____	_____	_____	_____	_____
7	_____	_____	_____	_____	_____	_____	_____	_____
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14	_____	_____	_____	_____	_____	_____	_____	_____
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17	_____	_____	_____	_____	_____	_____	_____	_____
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19	_____	_____	_____	_____	_____	_____	_____	_____
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21	_____	_____	_____	_____	_____	_____	_____	_____
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23	_____	_____	_____	_____	_____	_____	_____	_____
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25	_____	_____	_____	_____	_____	_____	_____	_____
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34	_____	_____	_____	_____	_____	_____	_____	_____
35	_____	_____	_____	_____	_____	_____	_____	_____
36	_____	_____	_____	_____	_____	_____	_____	_____
37	_____	_____	_____	_____	_____	_____	_____	_____
38	_____	_____	_____	_____	_____	_____	_____	_____

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## **F.1. Definitions**

Adaptive management – strategy in which monitoring and evaluating the results of specific activities will determine if desired results are being achieved and if not, what needs to be changed.

Maintenance area – see Non-Attainment Area.

Monitoring – the collection and analysis of successive observations or measurements to evaluate changes in condition and progress toward meeting an objective.

Non-Attainment Area (NAA) – a geographic area in which the level of a criteria air pollutant is higher than the level allowed by the federal standards. A Maintenance Area is an area that was designated non-attainment, but for which EPA has determined that the NAAQS have been attained and has fully approved an applicable implementation plan.

Particulate matter – any liquid or solid particles suspended in or falling through the atmosphere, ranging in size from 0.1 to 100 microns.

Population(s) – the total of individuals occupying an area. This includes open campgrounds, single family dwellings, hospitals, schools in use, villages, open places of employment, etc.

Real-time monitor – there are two types of optical real time continuous monitors; 1) light scattering (nephelometers) instruments and 2) light-absorbing (aethalometers) instruments. The nephelometers measure the amount of light scattered over a known path length and use a mathematical relationship to estimate the aerosol mass concentration. The aethalometers quantify the light-absorbing aerosol (black carbon, for example) by depositing the aerosol on a quartz-fiber filter and measuring the light transmission or reflectivity.

Visibility – a measurement of the ability to see and identify objects at different distances. Visibility reduction from air pollution is often due to the presence of sulfur and nitrogen oxides, as well as particulate matter.

## **F.2. References**

### **Regional Haze Rule**

Published in the Federal Register on July 1, 1999, 64 FR 35714.

[http://www.epa.gov/ttn/oarpg/t1/fr\\_notices/rhfedreg.pdf](http://www.epa.gov/ttn/oarpg/t1/fr_notices/rhfedreg.pdf)

### **Interagency Fire Use Module Handbook**

January 2003.

### **Smoke Monitoring Guide**

Developed By The New Mexico Smoke Management MOU Monitoring Workgroup. February 2003.

<http://www.nmenv.state.nm.us/aqb/SMP/MonitoringGuide2003.pdf>

**WRAP Policy on Enhanced Smoke Management Programs for Visibility**

Approved by the Western Regional Air Partnership, November 12, 2002.

[http://www.wrapair.org/forums/fejf/documents/esmptt/policy/030115\\_ESMP\\_Policy.pdf](http://www.wrapair.org/forums/fejf/documents/esmptt/policy/030115_ESMP_Policy.pdf)

**Interagency Monitoring of Protected Visual Environments**

<http://vista.cira.colostate.edu/improve/>