



Colorado Department
of Public Health
and Environment

Colorado Air Pollution Control Division

Memorandum

To: Agency Smoke Liaisons, Designated Agency Contacts and All Permittees
CC: Gordon Pierce, Dan Ely, Pat McLaughlin, Sarah Gallup, Coleen Campbell (APCD/Division)
From: Paul Tourangeau, Director
Date: 6/30/2011; approved as proposed 7/27/11
Re: Proposed Incremental Changes to Colorado's Smoke Management Program

I have considered a list of incremental adjustments and changes to Colorado's Smoke Management Program (SMP) that staff developed prior to the HB1199 briefing in March and have been "in the pipeline." The proposals in this memo are consistent with my direction to APCD smoke staff to look for responsible and proactive ways to promote the use of prescribed fire while protecting air quality, and to make change in an incremental fashion consistent with experience, and weight of evidence. I want to stress that the changes proposed today may have unexpected consequences and if needed will be adjusted further as feedback and input is taken into account over time. Change is not always linear nor in one direction. APCD will continue to generate incremental changes to the smoke management program as additional data and observations are attained.

1. Very Large Piles

The proposed changes for large piles are based on APCD staff's observations of a number of such pile burns in the last couple years, many on private land. Generally, these changes are in the direction of reducing constraints for some categories of piles.

Details: Several specific provisions of standard conditions for large piles are proposed to be relaxed. The focus is on piles at least 50,000 ft³ each. For large piles some incremental increase in daily volume will be accommodated near homes. A few associated simplifications also logically follow. Details are shown in Appendix A, an excerpt of the pile worksheet marked in tracked changes. A continued or strengthened commitment by burners to vigilance about minimizing dirt in piles will be necessary to successfully implement and build on these changes.

2. Expansion of the Types of Burn Projects Eligible for Approval During Denver Metro's Winter High Particulate Season

April 2011 ends two winter seasons of experience with an initiative allowing some burns below 6400' in metro Denver during high particulate season. Overall, the effort has generally gone well, although it has proven useful for fewer burns than anticipated.

Details: APCD staff has recommended and I propose that this initiative be continued and expanded as follows:

- On-going trial status provides a mechanism for APCD to continue to grant this set of conditions only to proven, experienced smoke managers and/or to projects with especially low risk for excessive smoke impacts. Selectivity is prudent given the numbers of residents who would be affected by a burn with unexpectedly bad smoke consequences in metro Denver.
- Discontinue the past requirement that every trial burn be extensively documented.
- For smaller low-elevation burns during high particulate season, waive the requirement for a particular ventilation forecast as long as it is a 'no action' day and smoke photos are taken. "Smaller" means less than 100 acres of grass within a mile of homes, less than 200 acres of grass farther than that from homes, and at most 50 piles per day of $\leq 300 \text{ ft}^3$ each.
- The trial initiative these past winters was limited to fuels that don't smoke after 16:00. Eligible projects will now include those fuels with potential to smolder. Possible conditions in addition to those used in the last two winters may include instrumented monitoring, and ending ignition by noon for larger piles and by 15:00 for broadcast fuels. Projects and permittees will continue to be selected conservatively and conditions set individually by project for inclusion in any experiment expanded to fuels that may smolder.

3. Increase Daily Acre Limits in Smoke Sensitive Areas

Currently in mapped smoke-sensitive areas (SSAs), daily acre limits are one-fourth the limits in non-sensitive, or rural, areas. The difference is proposed to be changed to one-third, allowing for an increase in daily maximum acreage in smoke-sensitive areas of approximately 33%. Continued incremental change will be driven by experience and successful burning that demonstrably remains under the NAAQS. The Division recommends that this proposal, if finalized as is, be re-evaluated in one-year and further change considered at that time (i.e., change to one-half). Appendix B has broadcast worksheet excerpts showing the current proposed updates with tracked changes.

4. Reduce Buffer-Size Around Smoke Sensitive Areas

Buffers around smoke sensitive areas including residential health care facilities and areas with the highest population density define mapped smoke-sensitive areas where

reduced daily acres are an element of standard permit conditions. The Division's experience suggests that the current buffer size can responsibly be reduced.

Details: The buffers for residential health care facilities and areas with high population density have radii of 5 miles and 10 miles respectively. The proposal is to reduce the buffer distances to 3 and 5 miles. A map both comparing existing and reduced buffers and showing updated facility locations is included as Appendix C.

Standard permit conditions still vary by forecasted dispersion, which still is anticipated to limit unacceptable impacts to any particular SSA from any specific burn. The Division believes that the proposed buffers are adequate to protect from NAAQS violations and protect public welfare and visibility.

5. Changes on Permit Forms

A. 1000-Hour Moisture: The Division proposes to drop maximum 1000-hour fuel moisture as a standard condition for "drainage potential burns" within two miles of a home, and for all broadcast projects whose fuel rates as highest hazard. This will slightly simplify the standard condition forms for broadcast burning.

Details: The purpose of the condition is to prompt a considered decision for each targeted project whether high fuel moisture is a needed smoke mitigation. This condition has proven to be necessary so infrequently during the several years it has been addressed that it has been less useful than anticipated. Though dropped as a standard condition it will be retained as a potential condition for non-standard broadcast permits.

Appendix D shows the proposed changes to the broadcast application form that implement both this revision and the following one.

B. Fire Department with Jurisdiction: Related to challenges with the mountain pine beetle epidemic, permit application forms are proposed to be amended to strengthen APCD's support of local agencies responsible to make decisions about fire control permits. For projects on private land, the applicant will be asked for the name, agency, and email address of the person or entity locally responsible to issue, or indicate lack of a need to issue, a fire control permit for the project. APCD will forward the completed smoke permit to the person listed as a courtesy to aid in local coordination and challenges with managing the considerable increase in burning piles on private lands.

Details: Some form of notification has been requested by two fire departments and APCD is considering how best to respond. Anticipated consequences are to add slightly to a private-land applicant's preparatory work, and to increase compliance with requirements to obtain fire control permits. The latter benefits good smoke management by strengthening APCD's collaboration with agencies that are well-placed to advise potential burners about smoke permit requirements and to assist burners with managing smoke responsibly on the ground.

6. Monitoring and Data Collection

APCD has repeatedly heard from land managers, especially the USDA Forest Service, that it should endeavor to do what it can to drive change toward the potential of increased responsible use of prescribed fire. APCD has also consistently noted that change will need to be based on information, experience, and weight of evidence. The burns that provide the most potential to produce meaningful information about smoke impacts are (1) burns with standard or non-standard conditions at which at least 50% of standard acres are burned on one day and (2) non-standard condition burns with significantly less restrictive conditions. The more information collected, the more opportunity there is for shared learning about permit conditions and outcomes. APCD staff resources in the Smoke Management Program are insufficient to be present at all or even most relevant burns and to collect information where data for evaluating conditions is the most needed to drive potential change at a faster pace.

Therefore, I am proposing that staff require of all projects with substantially less restrictive conditions that those burn days be documented photographically, and to consider for each of these projects what instrumented particulate concentration monitoring may be appropriate. I am instructing them that, barring special circumstances or impracticalities, photographic and instrumented monitoring be required for each of these types of burns. While APCD will provide guidance about both photographic and instrumented monitoring and may occasionally assist, the permittee will be responsible to do this work. This requirement may be applied as an amendment to some existing 2011 permits where the permit is substantially less restrictive than standard conditions.

The Division recognizes there will be some increased burden on permittees who conduct burns with less restrictive conditions than standard, which constitute APCD's experimental prescribed fire permits. The Division is concerned about creating a disincentive for burn bosses to undertake non-standard burns of the type required to be monitored and is interested in comment on this issue. The hoped for and expected consequence is mutually beneficial and faster shared learning about permit conditions as requested by land managers without unreasonable burden to individual permittees.

Notes: RMCG's fuels committee is considering reviving the list on their website of portable particulate monitors that may be available for loan. The Division has also ordered a second DustTrak monitor including for use by permittees. The new DustTrak replaces a failed DataRam and so maintains the number of Division field-quality smoke monitors.

7. Internal Review of Non-Standard Conditions Permit Applications with Significantly Less Restrictive Conditions.

Internal Committee Review: APCD proposes establishing a group of APCD staff to review, condition, and approve any permits with less restrictive permit conditions, rather than the current single reviewer and informal consultation among staff. This will improve parity and thoughtful review from a variety of perspectives on the most challenging projects. I will also expect this group to consider appropriate monitoring requirements, and means and opportunities to share information subsequently collected. This internal review will increase turnaround times somewhat on high-risk

projects, but will not change the 30-day deadline APCD uses for determination of approval or denial of a completed permit application.

Appendix A: Excerpt of Pile Worksheet Showing Potential Changes

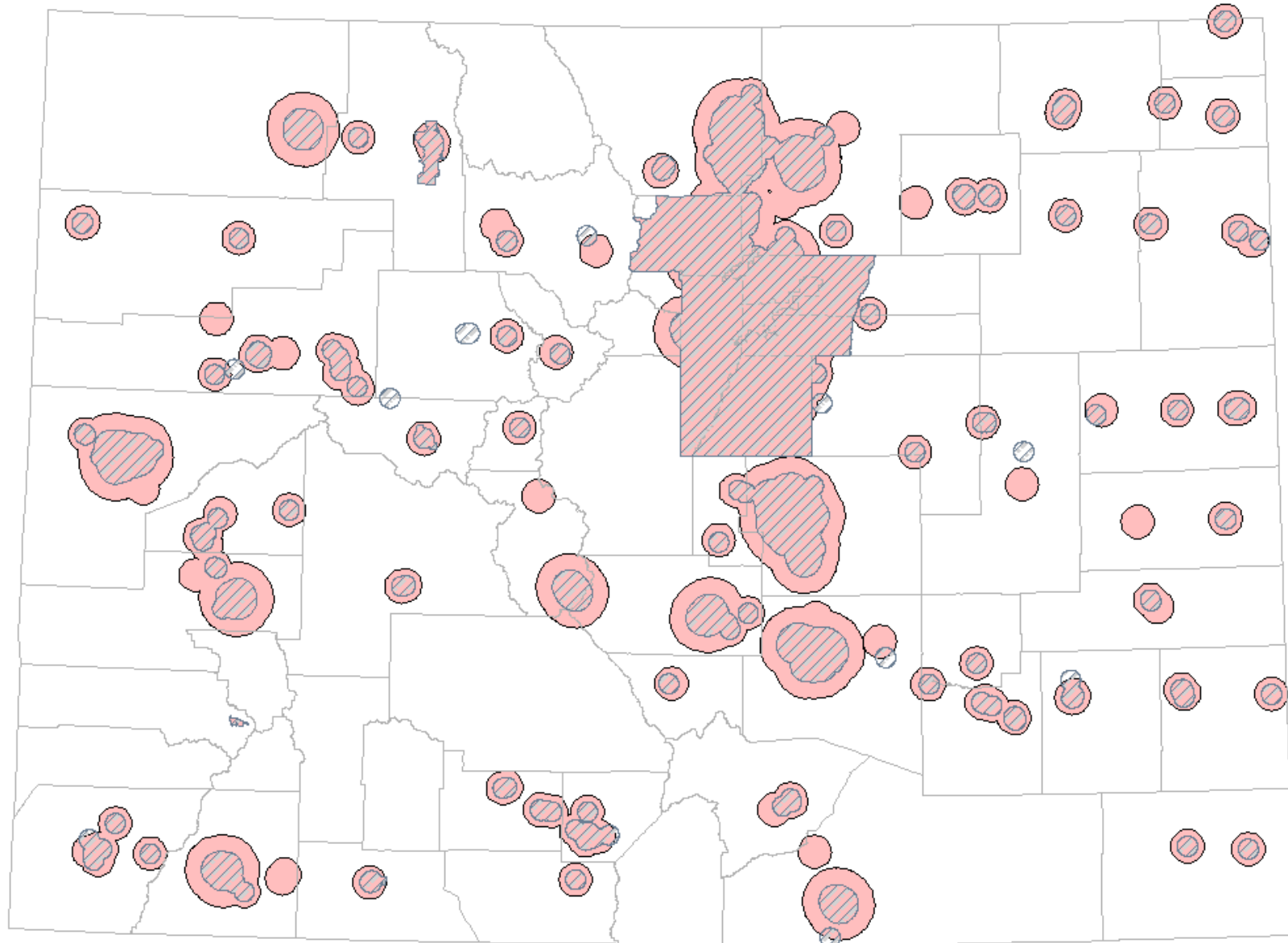
Construction and Typical <u>Size</u> of a Pile:	> 5.0 Miles from an Occupied Home	0.6 - 5.0 Miles from an Occupied Home	≤ 0.5 Miles from an Occupied Home
hand or rake: 2,001 - 7,100 ft ³ blade: 501 - 2,000 ft ³ examples: 30' x 30' x 20' mound = 7,068 ft ³ 20' x 20' x 12' mound = 1,885 ft ³	<i>Pile Category 3a:</i> Weather: fair(+), snowing, or storm End ignition 1 hr before sunset. Daily Max: no limit	<i>Pile Category 3b:</i> Weather: good(+), snowing, or storm End ignition 3 hrs before sunset. Max. daily vol.: storm: no limit good (+) or snowing: 300,000 ft ³ Monitor first (test) pile closely for potential impacts.	<i>Pile Category 3c:</i> Weather: good(+) or storm End ignition 4 hrs before sunset. Max. daily vol.: good (+) 100,000 ft ³ storm 200,000 ft ³ <u>Max. footprint in all directions is:</u> <u>If fewer than 10 homes within one mile, 50';</u> <u>Otherwise, 30'</u> Once fire's heat allows, chunk at least daily until smoke production ends.
rake: 7,101 - 50,000 ft ³ blade 2,001 - 50,000 ft ³ examples: 55' x 55' x 20' upright cylinder = 47,500 ft ³ 30' x 20' x 100' half cylinder = 47,124 ft ³ 20' x 15' x 200' half-cylinder = 47,124 ft ³	<i>Pile Category 4a:</i> Weather: fair(+) or storm End ignition 2 hours before sunset. Daily Max: no limit	<i>Pile Category 4b:</i> Weather: good(+) or storm End ignition 3 hours before sunset. Max. daily vol.: storm: no limit good(+): 300,000 ft ³ if width ≤ 30' OR 75,000 ft ³ if width > 30'. Monitor first (test) pile closely for potential impacts.	<i>Pile Category 4c:</i> [These permit constraints may be hard to meet. Alternative disposal or smaller piles may be better options.] Weather: storm only End ignition 4 hours before sunset. Max. daily vol.: 200,000 ft ³ Max. (windrow) width: <u>30'50'</u> Once fire's heat allows, chunk at least daily until smoke production ends.
Larger, any construction method	<u>Piles this large and wider than the windrow widths shown below may not be burned in Colorado. Exceptions may be made for piles built before 2007 and, as described below, in some cases more than 5 miles from a home.</u>		
	<i>Pile Category 5a:</i> <u>Weather: storm or good(+)</u> <u>Options:</u> (1) Weather: good(+) or storm —End ignition <u>by</u> 3 hours before sunset. — Windrow width	<i>Pile Category 5b:</i> Weather: storm only End ignition by noon. <u>No volume limit</u> <u>Max: 2,000 lineal feet/day</u> <u>Max. (windrow) width 30'.</u> Maintain ready access to heavy equipment. Chunk daily once fire's heat allows.	<i>Pile Category 5c:</i> [While long windrows may be burned near homes under very tight conditions, alternative disposal or smaller piles instead are strongly encouraged.] Weather: storm only End ignition by noon. Max. daily vol.: 400 <u>200</u> ,000 ft ³ Max. (windrow) width: <u>30'50'</u> . Ignition plan, described in narrative, must be aggressive.


Construction and Typical <u>Size</u> of a Pile:	> 5.0 Miles from an Occupied Home	0.6 - 5.0 Miles from an Occupied Home	≤ 0.5 Miles from an Occupied Home
	<p>maximum: 50' and no limit on number or length of piles</p> <p>OR (2) no house within 10 miles in the same drainage, then snowstorm only, and no other limits. <u>No volume limit</u></p>		<p>Maintain ready access to heavy equipment.</p> <p>Once fire's heat allows, chunk at least daily until smoke production ends.</p> <p>Site check for dirt in piles may be required.</p> <p>If feasible (and not a permit requirement), Advise APCD 36(+) hrs. before ignition.</p>

Appendix B: Excerpt of Broadcast Worksheet Showing Proposed Changes

Category, Distance to homes	Ventilation	Daily acre limits		
		not sensitive (rural)	CURRENT sensitive area	PROPOSED sensitive area
Light Smoke				
1a. >5.0 mi.	v gd/exc	10,000	2,500	3,500
	good	4,500	1,125	1,500
	fair	3,000	750	1,000
1b. 2.0 - 5.0 mi.	v gd/exc	5,000	1,300	1,750
	good	2,200	640	750
	fair	1,500	375	500
1c. 0 - 1.9 mi.	v gd/exc	3,500	900	1,200
	good	1,500	375	500
	fair	1,000	250	350
Brief Smoke				
2a. >5.0 mi.	v gd/exc	3,500	900	1,200
	good	1,500	375	500
	fair	1,000	250	350
2b. 2.0 - 5.0 mi.	v gd/exc	1,750	400	600
	good	750	200	250
	fair	640	125	175
2c. 0 - 1.9 mi.	v gd/exc	1,300	300	400
	good	640	125	175
	fair	(325)	(80)	(120)
Drainage Potential				
3a. >5.0 mi.	v gd/exc	1,000	250	350
	good	450	100	150
	fair	300	75	100
3b. 2.0 - 5.0 mi.	v gd/exc	525	125	175
	good	225	50	75
	fair	150	40	50
3c. 0 - 1.9 mi.	v gd/exc	350	100	125
	good	150	40	50
	fair	(100)	(25)	(35)
Highest Smoke Hazard				
4a. >5.0 mi.	v gd/exc	500	100	175
	good	225	50	75
	fair	150	40	50
4b. 2.0 - 5.0 mi.	v gd/exc	275	65	90
	good	125	25	40
	fair	75	20	25
4c. 0 - 1.9 mi.	v gd/exc	175	50	60
	good	75	20	25
	fair	(50)	(15)	(20)

Appendix C: Current and Proposed Smoke-Sensitive Areas Map



 (proposed) SSAs with Updated Facilities and Reduced Buffers
 (old) SSAs as of May, 2011

Appendix D: Excerpt of Broadcast Application Showing Proposed Changes

I. Form change due to deletion of information about thousand-hour moisture. Pink row is deleted.

BRIEF DESCRIPTION OF FUELS

SMOKE FUEL CATEGORY _____ DOMINANT NFDRS FUEL MODEL _____
IGNITION METHOD(S): GROUND ONLY _____ AERIAL ONLY _____ or BOTH _____
MINIMUM 1000-HR FUEL MOISTURE (%) _____ METHOD:
Sample on-site _____ or calculate _____
METHOD(S) USED TO ESTIMATE FUEL LOADS

II. Form change due to addition of area for information about local fire department. Blue rows are added.

The hover hint for fire department says "For federal public land ignore this section." Federal land managers are the responsible fire control authority for the land they oversee.

CONTACT PERSON _____ PHONE _____
ADDRESS _____ CELL _____
EMAIL _____ FAX _____

BILLING ALLOCATION:

	Agency	Percent	Agency	Percent

FIRE DEPARTMENT: Agency Name: _____
Department's contact person for fire control permits: _____ Contact person's email: _____

MILES TO NEAREST OCCUPIED HOME, actual _____ and mitigated distance, if relevant: _____