

## Guidance for Non-Standard Permits

### Introduction

Colorado smoke permits come in two flavors. By far most permits have standard conditions. To find out more about standard conditions, see the worksheets linked at the end of this document and/or the smoke program's website, especially the page about [procedures](#).

Non-standard conditions are atypical but are appropriate for some burns. Non-standard conditions are tailored carefully for a specific project. As described below in kinds of non-standard conditions, the alternatives include lower, higher, or comparable smoke risk as well as other options.

### Process

Non-standard permits generally are suitable only for experienced burn planners and NWCG-qualified RXB2s. There are exceptions, including the reduced smoke risk conditions that may be given for projects conducted by landowners or agencies with limited experience.

Non-standard conditions may expose the burn's host agency, Colorado's Air Division, and most importantly the public to increased risk of smoke impacts. Because of this, especially requests for non-standard conditions that on net are less restrictive than usual need both extra smoke **mitigations** and solid **justification**, and not just one or the other. Creating a package to propose and justifying it is the responsibility of the permit applicant, not of APCD.

To request a non-standard permit, fill out a smoke permit application as usual. Then also fill in a request for non-standard conditions, available from the smoke website's [forms](#) page. There is one non-standard request form for piles and one for broadcast. The new non-standard addenda are similar to what used to be at the end of all applications and that includes permit conditions.

### Kinds of Non-Standard Conditions

#### Table of Contents

- A. Comparable Risk
- B. Unrestricted Wind Direction
- C. Tighter Constraints than Standard
- D. Elevated Smoke Risk
  - D1. Elevated Risk in Mapped Smoke-Sensitive Areas
  - D2. Burning High Smoke Risk Fuel
  - D3. Burning with a Forecast of Poor Ventilation

#### A. Comparable Risk

For some burns it makes operational sense to burn a few more acres than standard conditions provide but commit to end ignition a little earlier, or vice versa. The result is smoke risk

essentially comparable to standard conditions. These requests require only a brief explanation on a non-standard request form and typically are approved as proposed.

#### B. Unrestricted Wind Direction

Standard permit conditions for most categories include limiting wind directions to protect nearby receptors. However there are some situations where doing so is impractical. For example, a burn may be so surrounded by homes that there is no wind direction that would protect all the receptors. If you are requesting a non-standard wind direction of **'any,'** describe offsetting mitigations in the request form. Less common are situations where restricted wind directions are unnecessary. An example might be in a fuel with no potential to generate drainage smoke and significantly elevated above all surrounding homes and other receptors. Examples of offsetting mitigations are especially strong outreach, not burning at all if the day's best forecasted ventilation is fair, and/or burning fewer acres per day.

#### C. Tighter Constraints than Standard

Standard conditions are not designed to be protective in the most risky smoke possible situation that fits in each category, but for fairly typical ones. It is a mark of professionalism to recognize projects for which standard conditions are too permissive. In that case request non-standard conditions that are more restrictive, not less, than standard.

One test for a project is whether taking a particular condition to its logical allowed extreme would be unlikely ever to result in good smoke management. If you can't imagine that it would probably ever be prudent to burn a set of piles with only minimum windspeed to provide for dispersion but standard conditions would allow it, for example, request non-standard conditions.

Example situations when extra restraint has been needed in the past include:

- In especially tight or high (cold) mountain valleys
- Near or in communities intolerant of impacts below the health threshold. Towns or other places that rely heavily on tourism, are especially urban, have a high proportion of retirees or of guests from low altitudes, are removed from agriculture, and/or have been or are close to non-attainment of NAAQS may be candidates. To a large degree the smoke-sensitive areas map tries to capture these variables for broadcast burns.
- Near known smoke-sensitive individuals' homes or residential health-care facilities
- Burns tightly surrounded by homes on all sides
- Burns just west of steep high walls, including most of the Continental Divide
- Very close to interstates or other high-speed roads
- Places where daytime smoke tends to back into canyons from which it can flow out into a community at night
- Difficult or uncertain fuels, including dirty piles

Every year some of the state's most senior burn bosses submit occasional applications for conditions that are tighter than standard. You'll be in august company.

#### D. Elevated Smoke Risk

**Each application that requests more acres per day and/or later end ignition times than standard conditions provide should include offsetting smoke mitigations. It is the applicant's responsibility to propose these site-appropriate specifics.**

Each year APCD staff approve some of the requests to burn more acres per day than standard conditions provide in packages where earlier end times do not result in comparable risk. Or there may be situations where it is possible to protect air quality even if 2 in 7 or other conditions are waived. Most permits that work for aerial ignition, for example, have elevated risk. Both APCD and the land management agency accept increased risk of excessive smoke impacts in what all parties believe nevertheless is a responsible undertaking.

A place to start is with standard conditions shown on the worksheet. Think about each condition. If a non-standard alternative is more appropriate and *responsible*, request it and justify it. With an increase in acres, more mitigation should be proposed than standard.

For tailored permits the explanation of why you believe the proposed conditions are responsible is critical. Your reasons to want tailored conditions may have nothing to do with smoke. For instance they may have to do with cost-effectiveness, ease of control, or a project window that already is extra tight. While we do happen personally to care about these things, whether we agree that your reasons unrelated to smoke are important or worthy is irrelevant to what we should sign in the project's smoke permit. Instead what we must judge, and need you to write, is why the conditions are reasonable with respect to potential for smoke impacts. Justify your requests *from an air quality perspective*.

In reviewing non-standard requests, we typically look at four groups of considerations. The first two steps are similar to the structure of a burn plan's complexity analysis though probably in greater detail than tends to be provided for smoke in a burn plan appendix.

- First, what initial risk profile results from the burn's physical characteristics: location relative to receptors, fuels, topography, etc.?
- Most importantly, what offsetting mitigations are being proposed that limit smoke risk? Examples include on-site weather stations and other coordination with the National Weather Service, intensive public outreach, realistic interior cutoff lines or separate non-concurrent units as part of a smoke contingency plan, site preparation to support ignition that is both prudent and rapid, limited acres at fair or even good dispersion, second and subsequent days that are contingent on objective determinations of minimal smoke impact, etc.

One note about aerial ignition is worth saying up front. Aerial ignition sometimes is rapid, sometimes does generate more heat per acre, ever so rarely overwhelms atmospheric stability, and sometimes does end early. But our experience has been that none of these attributes are assured or even all that common.

- Third, what arrangements for communal learning about smoke will there be? From APCD's air quality perspective, the main reason for undertaking these elevated risk burns is to learn. If over time experience shows that a group of burns is in fact not especially high risk, standard conditions will evolve. Our goal is to make standard conditions as supportive of extensive burning as is responsible. The best way to move

in that direction is to take carefully considered and managed risks to learn about possible changes.

We anticipate being involved in data collection to the extent we can given other tasks. But we cannot commit in advance to be at any burn. Both for that reason and to milk the burn for as much useful information about smoke as possible, the organization doing the burning needs to commit to participate in the work of learning. That usually means you must find and pay at least one additional person to staff the burn than you otherwise would need. Data collection efforts may involve particulate monitors, photographs, coordination with formal research projects, fuel load and consumption measurements, etc. For fuel with drainage potential, photos taken between dawn and sunrise the next morning are especially important.

- The final check applies only if the three described above have been met well. To what extent has the agency unit established a strong track record of consistent and conservative adherence to smoke permit conditions, with sufficient depth of smoke experience to manage the extra smoke risk responsibly in real time? Familiarity with the site's specific air flow patterns and, if it exists, past smoke history nearby, can be important in this regard.

In short, there is considerably more work needed to prepare for high smoke risk than proposing looser conditions or justifying them on paper. It may involve increased costs to the burn agency, a longer smoke planning horizon than is otherwise necessary, and other extra effort.

For ideas of mitigations look at the non-standard permit application. Also think more generally about actions you expect to take that give *you* confidence your proposal is responsible.

It is in requesting non-standard permit conditions that you are invited to tailor your own limits. We do not invite you instead to write wide conditions on the assumption that you or another burn boss will limit yourself in the field to the only narrower subset that is responsible. As a way to judge, ask yourself whether your request is for conditions you'd want us to issue to every other burn boss and unit. Put another way, picture the conditions being stretched to their outer limits without first subjecting implementation to the 'responsible in real time' test.

If you have a project that you think is a good candidate for an elevated risk smoke permit, we suggest that you [contact us](#) before submitting a written application. It may save all of us time, and it is possible that we can help you refine your proposal. Please, however, don't ask us to build it from scratch. It is good to discuss proposals for non-standard conditions with others also, especially the senior burn bosses you most respect and admire.

Details follow about three special situations that have elevated smoke risk: daily acres higher than standard in mapped smoke-sensitive areas, burning fuel that is highest risk for smoke, and burning with a forecast of poor dispersion.

#### D1. Elevated Risk in [Mapped Smoke-Sensitive Areas](#)

A non-standard permit for a burn in a mapped smoke-sensitive area is likely to include the following conditions among its other smoke mitigations.

Category, Distance to homes - see <a href="#">worksheet</a>	Public comment <sup>1</sup>	Consult <sup>2</sup>	Instrument & Order IMET <sup>3</sup>
<b>Drainage Potential &amp; Sensitive Areas</b>			
3a. >5.0 mi.	If $\geq$ 1500 ac/day	If > 500 ac/d & within 10 miles of an occupied home	
3b. 2.0 - 5.0 mi.	If $\geq$ 1000 ac/day	If > 300 ac/d	
3c. 0 - 1.9 mi.	If $\geq$ 300 ac/day	If >150 ac/d	If >250 ac/d
<b>Highest Smoke Hazard &amp; Sensitive Areas</b>			
4a. >5.0 mi.	If $\geq$ 750 ac/day	If >250 ac/d & within 10 miles of an occupied home	
4b. 2.0 - 5.0 mi.	If $\geq$ 500 ac/day	If >150 ac/d	
4c. 0 - 1.9 mi.	If $\geq$ 150 acres/day	If >25 ac/d	If >100 ac/d

**D2. Burning High Smoke Risk Fuel**

As described on the [broadcast worksheet](#), APCD categorizes as highest smoke risk (category 4) those fuel profiles that have average depth of combined duff and litter  $\geq$  3” and/or 1000-hour fuel load  $\geq$  10 tons/acre. These burns may be in moist or dense mixed conifer, blowdown, bug-kill, low-utilization sales, chaining, thick mastication, etc.. These are difficult fuels from many perspectives. Despite the many possible forestry situations they represent, permits for only a couple category 4 broadcast burns are requested each year. We have noticed that they have a lower rate of implementation per year than is average for broadcast burns.

Permits for category 4 fuels are automatically non-standard because they involve fuels that both vary significantly and have high potential for significant smoke impacts. Among other considerations, we will almost certainly be looking for robust documentation of drainage smoke. Our starting assumption is that category 4 burns tend to have typical high-end smoke risk if half as many acres are burned per day as are standard for drainage potential.

<sup>1</sup> For information about **public comment** periods, [contact us](#). [Regulation 9](#) requires public comment opportunities on the highest smoke risk permits.

<sup>2</sup> ‘**Consult**’ means consultation with the National Weather Service fire weather lead or other forecaster that the lead names. Consults must occur at least 2 weeks before burning and after the forecaster has received the burn plan and project maps. Also, weather observations from within the project area are required. Only APCD may approve substituting off-site weather observations. Consultations must be completed before a permit is finalized.

<sup>3</sup> ‘**Instrument**’ means to set out a DataRam, eSampler, or similar real-time particulate monitoring equipment at the nearest occupied downdrainage home or other location and timing as agreed with APCD.

‘**Order IMET**’ means to place a resource order for an incident meteorologist for burn day(s). The IMET will decide whether they would be most effective on site or in their office, but should be dedicated to (which probably means paid by) the project for the day. If you place an order at least 3 days ahead and the order can’t be filled (UTF), you have done your best to meet permit conditions and can burn anyway.

Beyond that, please refer to general guidance for elevated smoke risk burns (section D) above.

**D3. Burning with a Forecast of Poor Ventilation**

Generally, a forecast of ‘poor’ dispersion means a no-burn day in Colorado. Following is an option intended to provide a very limited opportunity for blacklining on some burns on days when otherwise no burning at all could occur. There is no place in Colorado so remote that the intent is to provide for full-scale production burning when dispersion will remain poor all day.

For burning with an unrestricted ventilation forecast:

<u>Burn Unit Characteristics - must meet all</u>	<u>Conditions</u>	<u>Application Procedure</u>
<ul style="list-style-type: none"> <li>▪ Max. site 1000-hr fuel load 5 tons/acre</li> <li>▪ Outside of the mapped ‘smoke-sensitive communities’</li> <li>▪ Min. 1 mile from nearest home</li> <li>▪ In a 30° cone downdrainage, min. 5 miles from nearest home</li> </ul>	<ul style="list-style-type: none"> <li>▪ Burn max. 15 acres per day.</li> <li>▪ Burn with min. eye-level wind 4 mph, measured as for piles.</li> <li>▪ End ignition by 3 hrs before sunset.</li> <li>▪ Close all open line (un-extinguished edge of fire, including interior) by 1 hr before sunset.</li> <li>▪ Send smoke monitoring report with photos within 1 week.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Receive approval min. 48 hrs before ignition.</li> <li>▪ Estimate fuel loads on Form A with photo series or transects.</li> <li>▪ Request unrestricted ventilation in a supplemental freeform narrative. Include a robust justification. Describe how fire edges will be held and at what kind of feature.</li> <li>▪ Send map(s) showing (a) boundaries of unit(s) proposed for unrestricted ventilation burning, (b) 1-mile buffer, (c) homes or areas of homes within the 1 mile buffer, and (d) 5-mile downdrainage cone.</li> </ul>

For reference in relation to blacklining, 15 acres equals one chain wide by 1.8 miles long [(15\*43560)/(66\*5280)].

**Related Documents**

Pile Burn	Broadcast Burn
<a href="#">pile worksheet</a>	<a href="#">broadcast worksheet</a>
<a href="#">pile application</a>	<a href="#">broadcast application</a>
<a href="#">pile non-standard supplement</a>	<a href="#">broadcast non-standard supplement</a>

Basic instructions are embedded in the forms as hover hints and should suffice for most burns. The [hints are available also as a .pdf](#).

[Detailed Instructions for Smoke Application Forms](#). Not needed for most basic permit applications

[Glossary](#). Consolidated list of terms specific to Colorado's smoke program. Each term's definition also appears in some other place where the term is used.

[Guidance for Non-Standard Permits](#) (this document). For experienced burn bosses working with especially complex projects

Smoke program [manual](#). Addresses in detail formal requirements, program concepts, and background about individual permit conditions. The manual might be useful if you have a specific question or are terribly interested in Colorado's smoke program.