

## **Appendix C**

### **Alternatives to Burning**

SMP I – Voluntary

SMP II – Required (Wildland fire use is exempt from consideration of alternatives to burning)

An alternative to burning is any method of removing or reducing fuels by mechanical, biological, or chemical treatments that replaces the use of fire for at least three years. Non-burning alternatives should, if they are to be satisfactory treatments, mimic at least some of the effects for which prescribed burning is typically used.

The definition for the purposes of this SMP draws a distinction between alternatives to fire and emission reduction techniques (ERT). There are cases where a technique or action can be either an alternative to fire or an ERT. For example, thinning can be used as an alternative to fire, but it is also a way to reduce emissions by reducing the amount of fuel burned. The difference between an alternative and an ERT is time. If an action or technique replaces fire on a piece of land for at least three years it becomes an alternative to fire. If the same action simply reduces fuels, and is used in conjunction with fire over a period less than three years, it is considered an ERT (see Appendix D for more on ERTs).

To meet the requirement of this element, which is also a requirement of the Regional Haze Rule, alternatives to fire must be considered and the rationale for why one was not chosen must be included on the Registration Form. The consideration of alternatives to burning is subject to the feasibility criteria of economics, efficiency, law, emission reduction opportunities, land management objectives, reduction of visibility impact, burner and public safety, and tribal traditional and cultural activities. The AQB will work with burners to identify administrative barriers to utilizing alternatives to burning, so as to enable their removal where possible.

#### **C.1. List of Alternatives to Burning**

The following list provides examples of some possible alternatives to burning. This list is not all-inclusive nor is it intended to suggest that any of these methods are preferable. References are listed below and provide additional information.

Manual/Hand – picking up and moving limbs, brush, residues as well as cutting downed and standing materials using hand tools or chainsaws.

- Cut and scatter – material is scattered throughout the site to change the vertical and horizontal continuity of the fuel load and allows the material to decay naturally.
- Pile – cut material is piled redistributing the fuel load rather than reducing it.

Mechanical – employs equipment as the primary means of modifying or removing the fuels

Fuel Modification – machinery is used to process the material into smaller pieces that can then be redistributed on the ground surface or removed from the site.

- Masticate/Mow/Crush – processing of standing or downed material where it occurs. Mastication is suitable for woody fuels, mowing is suitable for grass and crops and crushing is suitable for shrub lands. Material is processed into smaller pieces that can be redistributed on the surface or removed from the site.
- Chip/Grind/Cut – material is processed into smaller pieces through the equipment and can easily be removed from the site.
- Pile – cut material is piled redistributing the fuel load rather than reducing it
- Leave residue in place – it can be incorporated into the soil or left as mulch
- Biomass utilization – this can include any method of removal and taking the material to a landfill, burn facility, a power generation facility, an ethanol production facility, a redistribution facility, a fiberboard and/or particleboard facility, used as a compost or mulch, used as animal feed or bedding, for erosion control, use in specialty products, etc.

Tree Removal – there are numerous methods of tree removal that have developed with the timber industry.

- Tree trunk removal – trees are felled either by hand or mechanically and removed from the site for processing.
- Whole tree yarding – trees are felled either by hand or mechanically, and then taken to a staging area where they are processed. Suitable for trees 9”-18” diameter.
- Cut-to-length logging – cuts and processes entire tree on site in the forest.

Chemical – chemical treatments do not remove fuel, but kill existing vegetation or inhibit growth. This is appropriate for weedy vegetation under power lines or rights-of-way. Species specific chemicals are a good option for non-native invasive plants.

Biological – there are several possibilities of biological methods including grazing, the use of insects, composting, and the use of bacteria. For more information on composting visit the New Mexico organic recycling web page (<http://www.nmrecycle.org/nmoro.htm>) and for an organics recycling factsheet visit [http://www.nmrecycle.org/pdf/factsheet\\_organics.pdf](http://www.nmrecycle.org/pdf/factsheet_organics.pdf).

Scientific Improvements – by selecting genetically improved plants so there is less residual fuel, better insect and disease resistance, etc., so there is a reduced need to burn.

Alternative Land Uses – this can include planting vegetation that does not need to be burned, conservation tillage practices, land conversion to a non-agricultural use or use that does not require burning etc.

Air Curtain Incinerator (ACI) – use of an air curtain incinerator improves combustion and reduces emissions by introducing high velocity air into a combustion environment. As the air continuously rotates in and over the environment, a “curtain” is created over the fire thus trapping smoke and particulate matter. Constant airflow into and over the combustion environment allows temperatures to remain high, resulting in relatively complete combustion of all emission products. ACIs can burn a wider variety of materials from green fuel to red slash and produce lower smoke emissions compared to pile or broadcast burning. They also reduce risk from an escaped fire since the fire is contained and can be quickly extinguished if necessary.

## C.2. Definitions

Air Curtain Incinerator (also known as Air Curtain Destructor) – an incinerator that operates by forcefully projecting a curtain of air across an open chamber or pit in which combustion occurs. This results in a more complete combustion process that produces little smoke and reduces emissions and particulates.

Alternatives to Burning – treatments employing manual, mechanical, chemical, or biological methods to manage vegetation and/or fuel loads or land management practices that treat vegetation (fuel) without using fire. For the purposes of the NM Smoke Management Plan, if a technique is used and the area is fire free for three years or more, the technique is an alternative to burning; if fire is used within three years, the technique is considered an emission reduction technique.

Burn Project – in prescribed burning and wildland fire use, an area that is contiguous and is being treated for the same land management objective(s).

Emission Reduction Technique (ERT) – a strategy for controlling smoke from prescribed fires that minimize the amount of smoke output per unit of area treated or other objective unit of accomplishment. This strategy is used in conjunction with fire and is not a replacement for fire. For the purposes of the NM Smoke Management Plan, if a technique is used within three years of a burning operation, the technique is considered an ERT; if the technique replaces fire for three years or more, the technique is considered an alternative to burning.

Fuel continuity – the degree or extent of continuous or uninterrupted distribution of fuel particles in a fuel bed thus affecting a fire's ability to sustain combustion and spread. This applies to aerial fuels as well as surface fuels.

Pile – materials that have been relocated either by hand or machinery and heaped together.

Piling-and-burning – piling slash resulting from logging or fuel management activities and subsequently burning the individual piles.

Red slash – a condition of the logging/thinning slash usually conifers, reached when the needles turn reddish-brown while still attached to the limbs.

Residue – the remains after the merchantable material/vegetation has been taken, separated, or removed.

Windrow – slash that has been piled into long continuous rows.

### C.3. References

#### **EPA Prescribed Burning Background Document and Technical Information Document for Prescribed Burning Best Available Control Measures**

EPA-450/2-92-003, September 1992.

<http://www.epa.gov/ttncaaa1/t1bid.html>

#### **EPA Interim Air Quality Policy on Wildland and Prescribed Fires**

U.S. EPA, Office of Air Quality Planning and Standards, Interim Air Quality Policy on Wildland and Prescribed Fires, April 23, 1998.

<http://www.epa.gov/ttn/oarpg/t1/memoranda/firefnl.pdf>

#### **New Mexico Organics Recycling Organization**

<http://www.nmrecycle.org/nmoro.htm>

[http://www.nmrecycle.org/pdf/factsheet\\_organics.pdf](http://www.nmrecycle.org/pdf/factsheet_organics.pdf) (Organics Recycling Factsheet)

#### **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)

#### **Smoke Management Guide for Prescribed and Wildland Fire**

National Wildfire Coordination Group. PMS420-2. 226 pages. 2001.

<http://www.nwcg.gov/pms/pubs/large.html> (large document – long download time)

#### **The Use of Air Curtain Destructors for Fuel Reduction. Fire Management Tech Tips**

USDA Technology Development Program. 0251 1317-SDTDC. September 2002.

<http://www.fs.fed.us/eng/pubs/html/02511317/02511317.htm>

#### **Understory Biomass Reduction Methods and Equipment**

USDA Forest Service Technology and Development Program Missoula, Montana. Tech Rep. 0051-2826-MTDC. 2000.

<http://www.fs.fed.us/vegtools/techniques/mtdc.php>

#### **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)

#### **Non-burning Alternatives on Agricultural Lands**

Western Regional Air Partnership, 2000.

<http://www.wrapair.org/forums/fejf/tasks/FEJFtask4.html>

#### **Nonburning Alternatives to Prescribed Fire on Wildlands in the Western United States**

Western Regional Air Partnership, February 2004.

<http://www.wrapair.org/forums/fejf/tasks/FEJFtask3.html>