

Utah
Enhanced Smoke Management Plan

August 11, 2003

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I. PURPOSE

The purpose of this Utah Enhanced Smoke Management Plan (ESMP) is to identify the responsibilities of the Utah Division of Air Quality (UDAQ) and Federal, and State land managers (Land Managers) to coordinate procedures that mitigate the impacts of prescribed fire and wildland fire used for resource benefits (WFURB) on visibility in mandatory Class I areas. This plan is designed to meet the requirements of Section 309 of the federal Regional Haze Rule (Rule). As burning activity increases, Land Managers and UDAQ may consider strengthening the ESMP as needed to reduce impacts on visibility in Class I areas.

This ESMP is an addendum to the Utah Smoke Management Plan (Utah SMP) and may be revised as needed at the end of the 2004 burning season and each year thereafter with the concurrence of all signatories to the Utah SMP.

II. GOALS

- To minimize or prevent smoke impacts to such a degree as possible to protect visibility in mandatory Class I areas
- To develop an ESMP that is based on the criteria of efficiency, economics, law, emission reduction opportunities, land management objectives, and reduction of visibility impacts in accordance with the Rule

III. SCOPE

The ESMP provides direction and operating procedures for Land Managers involved in the use of prescribed fire and WFURB fires. The ESMP was developed cooperatively by all signatories to the Utah SMP and applies to those signatories uniformly across the state of Utah.

IV. DEFINITIONS (In addition to definitions in Utah SMP)

Annual Emissions Goal – the annual establishment of a planned quantitative value of emissions reductions from prescribed fire.

Emission Reduction Techniques – techniques for controlling emissions from prescribed fires to minimize the amount of emission output per unit or acre burned.

Non-burning Alternatives to Fire – non-burning techniques that are used to achieve a particular land management objective, including but not limited to reduction of fuel loading, manipulation of fuels, enhancement of wildlife habitat, and ecosystem restructuring. These alternatives are designed to replace the use of fire for at least the next five years.

V. ELEMENTS OF UTAH ENHANCED SMOKE MANAGEMENT PLAN

A. Actions to Minimize Emissions from Fire

There are a variety of different methods to use to minimize emissions from fire depending upon the fire source and management objectives. Utah's ESMP focuses on three general approaches that are designed to minimize emissions: use of emission reduction techniques, establishing emissions goals, and use of existing burn manager qualification programs.

Emission Reduction Techniques

An emission reduction technique is a technique for controlling emissions from prescribed fires to minimize the amount of emissions produced per acre or unit burned. Research has shown that fire emissions can be minimized through the use of emission reduction techniques that increase combustion efficiency and reduce the smoldering stage of burning. There are six general categories of emission reduction techniques: reduce the area burned, reduce fuel load, reduce fuel production, reduce fuel consumed, schedule burning before new fuels appear, and increase combustion efficiency. Under the ESMP, Land Managers will utilize the above emission reduction techniques as appropriate to minimize fire emissions and provide documentation of the techniques used in the Daily Emissions Report. The Annual Emission Goals for Fire will specify the types of emission reduction techniques to be utilized on a project specific basis.

Emissions Goals

As required by the Rule, an annual emission goal will be established to minimize emission increases from fire. The emission goal will be established prior to the beginning of the fire season, either at the beginning of the year or before the year begins. The emission goal will be established for the upcoming fire projects and in cooperation with states, federal land management agencies, and private entities.

The quantified benefit from the use of emission reduction techniques constitutes the annual emission goal. To establish the goal, emission reduction techniques will be determined using feasibility criteria for the upcoming prescribed fire projects, and then the benefit from using the technique(s) will be quantified. At the end of the fire season, an assessment will be made of the techniques applied during the previous fire season to verify application.

Burn Manager Qualification Programs

Burn manager qualification programs have been developed by federal and state land management agencies that use prescribed fire as a management tool. These burn manager qualification programs include information on emission reduction techniques and alternative burning practices as well as implementation issues. The benefit of a burn manager qualification program is to certify that the land manager is knowledgeable of alternative burning practices and emission reduction techniques and has the experience to implement them. Under the ESMP, Land Managers will update the information presented on alternative burning practices and emission reduction techniques as research improves.

B. Evaluation of Smoke Dispersion

Under the ESMP, smoke dispersion techniques such as dilution (burning during periods of good atmospheric dispersion) and avoidance (transporting smoke away from sensitive areas) will be used to reduce impacts on visibility in Class I areas. An evaluation of smoke dispersion will be made using the following tools and methods: scheduling or burn authorization of prescribed fires to minimize cumulative effects of smoke from fires on visibility in Class I areas, burner qualification and certification programs, use of dispersion modeling (to assist in the evaluation of dispersion conditions), and use of field level data, (e.g., wind direction, distance to receptors).

Burn Authorization Process

Under the Utah SMP, burn authorization decisions are based on meteorological information, national fire databases, information sharing efforts between adjoining states, and air quality monitoring information from UDAQ monitoring stations.

Meteorological information is gathered from the National Weather Service (NWS), University of Utah modeling programs, and various satellites. The NWS office issues the Utah Airshed Clearing Indices, a predictor of how quickly pollutants dissipate in an area, and other weather forecast information. The University of Utah provides a link to the MM5 modeling program that supplies ventilation data. Satellite information gives various views of cloud development and paths, and progress of frontal systems.

Daily reports from national fire databases such as the National Incident Coordinator Center (NICC) supplies information on wildland fires including WFURB fires throughout the country.

Air quality monitoring information is gathered from the UDAQ's Monitoring Center's website that provides readings of particulate matter levels in the Wasatch Front.

All of the above information is utilized in the burn authorization process that is an essential element of the Utah SMP. Under state administrative rule, R307-204, Land Managers are required to submit pre-burn information including information on proximity to Class I areas, and burn requests to the executive secretary prior to conducting a burn. No prescribed fires requiring a burn plan can be ignited before the executive secretary approves or conditionally approves the burn request.

Under the ESMP, Land Managers are required to submit information on the proximity of Class I areas to the proposed burns to allow for the scheduling of prescribed burns to reduce impacts on visibility in Class I areas and the generation of regional haze.

Burner Qualification and Certification Programs

Burner qualification and certification programs have been developed and are being used by federal and state land management agencies that use prescribed fire as a management tool. These burn manager qualification programs include information on the relationships between weather and smoke dispersion. The benefit of a burn manager qualification program is to certify that the land manager is knowledgeable of and understanding of the factors affecting smoke behavior and, therefore, may make better

decisions on when and when not to burn to reduce smoke impacts on visibility in Class I areas. Under the ESMP, Land Managers will update the information presented on weather and smoke dispersion as research improves.

Dispersion Modeling

Under the ESMP, smoke dispersion modeling may be conducted by Land Managers to evaluate smoke behavior if there is a concern about potential smoke impacts from a proposed prescribed burn(s). This tool could be used in the planning and implementation process for burning for determining cumulative effects of multiple burns.

Field Level Data

State administrative rule, R307-204, requires Land Managers to submit pre-burn information for approval prior to ignition. The pre-burn information identifies any sensitive receptor, including any Class I or Non-attainment area within 15 miles, distance and direction of the sensitive receptor in degrees from the project site, and a map that shows the daytime and nighttime smoke path and down-drainage flow for a minimum of 15 miles from the burn site. This map in addition to the fire prescription that is prepared by the Land Manager provides field level data that is essential for supporting the dispersion estimation process.

C. Alternatives to Fire

Alternatives to fire are techniques that replace fire as a means to achieve a particular land management objective (e.g., reduction of fuel-loading, manipulation of fuels, enhancement of wildlife habitat, ecosystem restoration, etc.). Under the ESMP, non-burning alternatives do not include techniques used in conjunction with fire.

Land Managers typically evaluate the use of alternatives to fire in programmatic or long-term management plans. Federal land managers evaluate non-burning alternatives in programmatic plans as a requirement of the National Environmental Policy Act (NEPA). Therefore, the decision to use fire or non-burning alternatives has been determined prior to development of the operational-level plan or burn plan.

Under the Utah ESMP, the types of non-burning alternatives and the acres treated during the previous calendar year will be summarized annually using newly developed land manager databases. The summary will provide documentation of the types of non-burning alternatives utilized by the Land Managers annually and the acres treated.

D. Public Notification

The Utah SMP and state administrative rule, R307-204, emphasize the importance of public notification by requiring Land Managers to notify the public of upcoming fire activities. In addition, public notification information is a component of burn plans that are developed by state and federal land managers.

Under the Utah ESMP, a one-stop information center will be added to the existing Utah SMP website to provide a list of upcoming projects as a means to notify the public about prescribed fire or wildland fire projects. This tool would provide another means for information dissemination.

E. Air Quality Monitoring

The Utah SMP and state administrative rule, R307-204, requires land managers to monitor the effects of prescribed fires on smoke sensitive receptors, and visibility in Class I areas using either visual monitoring or sampling equipment.

Under the ESMP, visual monitoring will be used in areas of little burn activity or areas located farther away from Class I areas. UDAQ in cooperation with Land Managers may consider conducting a more widespread and comprehensive monitoring program as fire activity increases. The use of cameras, satellite imagery and aerial monitoring to track and document smoke movement could be considered. The use of IMPROVE monitored data may have to be supplemented by air quality monitoring outside of Class I areas to track smoke movement.

Under the ESMP, a description of the monitoring equipment that is available, location of equipment, and equipment training opportunities will be added to the existing Utah SMP website as an aid to Land Managers.

F. Surveillance and Enforcement

State administrative rule, R307-204, establishes by rule the procedures that Land Managers are required to follow to mitigate impacts on public health and visibility of prescribed fire and wildland fire. Failure to comply with the state rule may result in an enforcement action, such as a notice of violation or cease and desist order.

Under the ESMP, Land Managers will permit UDAQ staff to enter and inspect burn sites before, during, and after burns to verify the accuracy of the burn plan and compliance with the burn plan, if appropriate. For safety purposes, site inspection procedures will be coordinated by the UDAQ through the land manager prior to any site inspections.

G. Program Evaluation

The ESMP will be reviewed for effectiveness by the UDAQ in cooperation with the Land Managers on an annual basis. In addition, the Rule requires progress reports every five years to EPA describing how well the enhanced smoke management program is being implemented as needed to meet reasonable further progress requirements. Annual evaluations of the overall smoke management program will provide the information needed for periodic reports.

The following elements of the ESMP will be evaluated during annual evaluations:

- Implementation
- Burn activity summaries
- Smoke complaint summaries
- Compliance and enforcement
- Sections needing clarification or improvement
- Progress towards goals including visibility improvement/impact reduction
- Recommendation for revisions
- Scientific advancements

H. Burn Authorization

State administrative rule, R307-204, requires Land Managers to submit pre-burn information for approval by the Executive Secretary prior to ignition of prescribed fires. This inter-state burn authorization program utilizes meteorological information, prescribed burn information, and updates of fire activity in adjoining states to schedule burns to avoid impacts of smoke on public health. Under the ESMP, Land Managers are required to identify whether a Class I area may be impacted by a burn prior to ignition. This additional information on potential impacts on visibility in Class I areas will be utilized within the burn authorization program to prevent cumulative impacts of smoke to visibility in Class I areas from prescribed burns and WFURB fires within Utah boundaries.

I. Regional Coordination

Under the SMP, notification of upcoming prescribed fires and approved WFURB projects is provided to adjoining states for coordination purposes. This process of information sharing is important to help adjoining states with burn authorization programs prioritize their prescribed burn projects.

Likewise, information on upcoming prescribed, WFURB, and wildland fire projects in neighboring states is utilized for burn scheduling purposes

within Utah boundaries to reduce smoke impacts on public health. This information is gained from national databases such as the National Incident Coordination Center (NICC) report, and phone calls and emails from adjoining states.

Under the ESMP, information on prescribed, WFURB, and wildland fire projects in neighboring states will be utilized for burn scheduling purposes within Utah boundaries to reduce cumulative smoke impacts on visibility in Class I areas within Utah. Smoke from wildland fires are more likely to be of longer duration and have the greater potential for impacts on visibility in Class I areas and generating regional haze.

In the future, it may be necessary to develop and implement a regional coordination center to prioritize burns in areas that would be most likely to create cross-jurisdictional impacts. To do so, regional meteorological and air quality information would be shared with the result being regional approval and real-time tracking of burns and their smoke impacts.

New modeling tools, such as BlueSKY, are being developed that provide smoke column footprints and estimates of smoke concentrations that will be useful for regional coordination efforts.

J. Evaluation Criteria

According to the Rule, enhanced smoke management programs are to be based on the criteria of efficiency, economics, law, emissions reduction opportunities, land management objectives, and reduction of visibility impacts. These criteria will determine the extent to which individual elements of the enhanced smoke management program are applied or the level of effort that is possible. The enhanced smoke management program criteria are listed below including some options on how to apply each criterion:

Efficiency: Consider the resources, infrastructure, networking, workforce, and information necessary to reduce visibility impairment in mandatory Class I areas. It may be feasible to share these items with another group in order to reduce redundancy or build on existing expertise.

Economics: After evaluating the items listed under Efficiency, consider the costs and incentives of those items. If possible, quantify the improvements to regional haze in a local area. Consider the economic trade-off of moving fuels off-site to be converted to another use or burned elsewhere. Consider the economic costs to a landowner to look for emission reduction alternatives. Consider the economic gains from improved habitats, functioning watersheds, species diversity and healthy

ecosystems. Consider the economic losses to a community associated with impairment.

Law: Consider the federal, state, tribal ordinances, local rules or statutes that prohibit mechanical treatments or prohibit the regulation of burning. Consider conflicts with management or law pertaining to the Threatened and Endangered Species Act and/or the Wilderness Act.

Emission Reduction Opportunities: Consider opportunities for reducing emissions through mechanical, biological, or chemical means. Consider places where reducing emissions will be best done through smoke management techniques rather than moving fuels off-site or manipulating fuels through chemicals or biological decomposition or a combination of mechanical treatments and maintenance burning.

Land Management Objectives: Consider whether manipulating fuels is not an option because of land management objectives, e.g. tribal cultural values, wildlife habitat, crop requirements, residue removal constraints, or inaccessible terrain. Consider whether manipulating fuels is more conducive to the land management objective, e.g., areas targeted for commodity production, watershed protections or tribal cultural activity sites. Consider whether restoration of ecosystem function is a high priority.

Reduction of Visibility Impacts: Consider how the ESMP will decrease visibility impacts on Class I areas, using the current information and science that is available.

