

Burn Checklist

Use this checklist to ensure everything is in place before you burn.

Tribal Burn Permit _____ Notify Neighbors _____
Type of Burn _____ Fuel Type _____
Time Dried _____
Estimated Time Needed to Complete Burn(hours) _____

Identify Smoke Sensitive Area(s)

Name _____
Distance from burn (feet) _____
Direction from burn _____

Name _____
Distance from burn (feet) _____
Direction from burn _____

Name _____
Distance from burn (feet) _____
Direction from burn _____

Fire Safety

Fire Suppression Equipment _____ Personnel _____
Phone/Radio _____
Weather Conditions _____



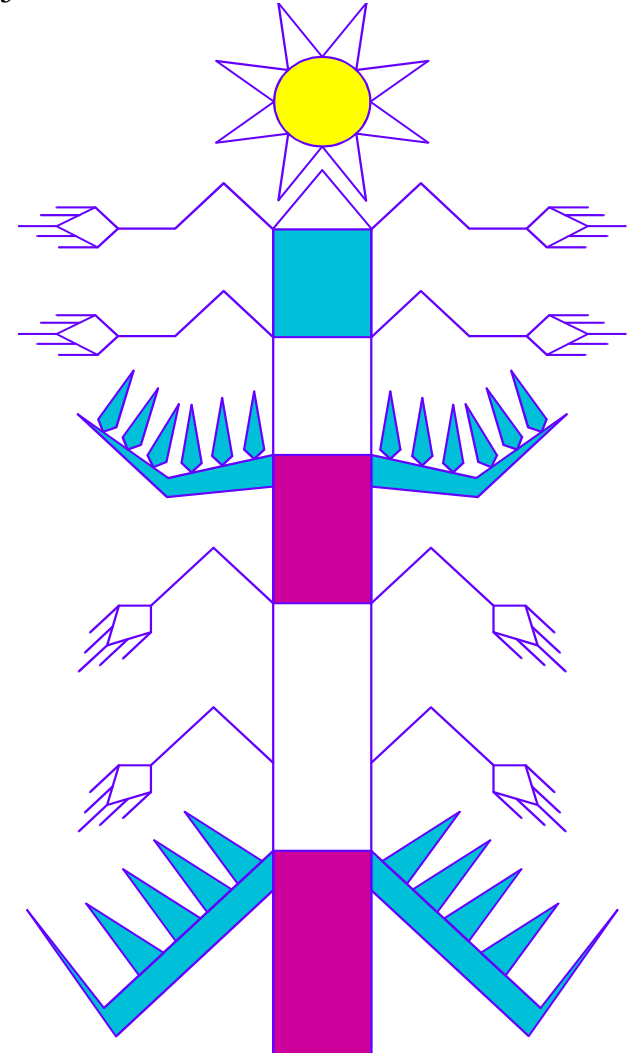
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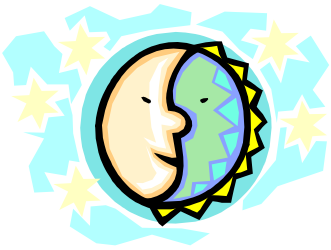
ST. REGIS MOHAWK TRIBE, ENVIRONMENT
DIVISION, CLEAN AIR PROGRAM

PERMITTED BURN GUIDELINES

Preserving Our Air for Future Generations



PROTECTING OUR AIR IS EVERYONE'S RESPONSIBILITY



Fresh clean air is the responsibility of everyone in our community. We all need clean air to live. We all like fresh, clean smelling air. Air pollution can greatly reduce our enjoyment as well as cause illness and injury. The Clean Air Program, which began in 1990, has been working hard at improving the air by working with industry

and State and Federal agencies to reduce air pollution from industry. This all takes time and hard work.

Air pollution affects all of us. Air pollution comes from industry, automobiles and many other small sources. All of this adds up and damages our health, our gardens, medicines, property and environment. Air pollution also reduces enjoyment of our homes and property.

Odor and smoke are two primary complaints that people have about air pollution. Smoke from open burning is the greatest source of complaints. Regulations have been instituted by the Tribe to control materials being burned through solid waste ordinances and open burning regulations. There are some things that should never be burned because of the toxic materials they release, but sometimes burning can be allowed. Also, if burning is done properly, odor and smoke can be kept to a minimum.

While government can help to make things better it is really up to each one of us as individuals to do our part in keeping our air clean or making it cleaner. The Air Program has developed Tribal Burn Regulations to prohibit certain types of burning and to allow burning in other instances through a permit system.

This brochure is designed to assist burn permittee with ensuring that they remain in compliance with their permit to minimize air pollution and reduce impacts to friends and neighbors when a burn must be conducted.

WHAT IS A PERMITTED BURN

A permitted burn is any burn, under the Tribal Burn Regulation that a person has written approval for conducting. Under the Tribal Burning Regulation the only burning that can occur under a permit are:

(a) Land Clearing Materials. Burning of organic non-hazardous material generated by land clearing or demolition; for the construction or modification of, including but not limited to, any highway, railroad, pipeline, or power or communication line; or for the development or modification of a recreational area or park; provided that such burning is done on-site or at an appropriate designated burning area and in accordance with a permit issued by the Director after written application. (b) Community Burning Allowed by Permit. Burning at an appropriate designated burning area serving the community, of yard wastes consisting of trees, tree trimmings, leaves, and brush. (c) Specifically Designated Burning Areas. Burning on-site of tree trimmings, leaves, or lawn and garden debris in areas of the reservation to be designated by the Director. (d) Burning at an appropriate designated site of toxic, explosive, or dangerous materials; provided that such burning is done only in accordance with a permit that will be issued by the Director after written application. Such permit may only be issued after the Director determines that there is no other safe or economical method of disposal. Such permit will be for a specific period and shall contain such conditions as are deemed necessary in the interest of health or safety.

BURNS THAT DON'T NEED A PERMIT

You are **NOT required** to have a permit for the following types of burning:

Cooking of food – Fire Pits or Barbecue pits.

Providing warmth for human beings – Bonfires.

Fires for recreation – Campfires, fishing (except for tires).

Orchard heaters – Used to protect fruit trees.

Ceremonial fires or fires for sweats.

Fire for fire department and criminal enforcement training.

Emergency control fires.



BURNS THAT ARE NOT ALLOWED

The Tribal Burn Regulations **DO NOT ALLOW** the burning of:

Food Garbage – Food waste from food preparation.

Solid Waste – Includes garbage, refuse and sludges.

Municipal Solid Waste – Includes solid waste and also appliances, tires, batteries and non-durable goods.

Household Hazardous Waste – Substances that are harmful to human health, living organisms or the environment, such as paints, aerosol cans, etc.

Refuse – Includes dead animals, offal (butchering wastes), and street sweepings.

Rubbish – Includes paper and paper products, rags, furniture, plastics, chemicals auto parts, oils and petroleum products.

Broadcast Fires – fields, lawns, hayfields, crop fields.

You may also not start a permitted or unpermitted fire using prohibited materials.

(Please refer to Tribal Burn Regulations and Solid Waste Code for complete definitions and restrictions).

CONDUCTING A PERMITTED BURN

It is important that you understand what was outlined previously regarding materials that may or may not be burned because you do not want to introduce any prohibited materials into a permitted burn, either to start it or to fuel it.



Follow these steps to ensure that you are in compliance with your burn:

1. Read and understand the permit.

2. Understand and follow all permit conditions.

3. If you have any questions about the permit or conditions, please contact the Environment Division.

If you manage a burn which emits enough smoke into the air to cause people downwind to complain, you will be subject to the Tribe's burning regulations which prohibits the discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any person, persons or to the public. You may be cited if your smoke causes visibility or other problems at the ground level. It's far better to plan your burn carefully and curtail burning if the weather is not cooperating.

Please be considerate of neighbors, friends and other facilities nearby when conducting a burn. The issuance of a burn permit is not permission to cause a nuisance to anyone else. Please talk to your friends and neighbors to let them know of your plans to burn so they know what is going on.

SMOKE MANAGEMENT AND POLLUTION REDUCTION

These guidelines have been designed for permitted open burning allowed under the SRMT Open Burning permit regulation. These guidelines can help you learn about air pollutants in smoke and how to burn materials to reduce smoke and impacts to the environment and community.

Smoke contains carbon monoxide, water vapor and products of incomplete combustion. The pollutant of concern is "inhalable" particulate matter, PM-10, ten microns in diameter or smaller. Most smoke particles are very small droplets of condensed organic vapors (wood tars and gases), unburned fuel, which escaped the fire. Over 90% are smaller than one micron (one millionth of a meter), light enough to stay airborne for weeks, and to travel deep into the lungs, causing irritation and coughing. Smoke particles may be trapped in your lungs for years, contributing to lung changes, chronic lung disease, and cancer.

Carbon monoxide is the most abundant pollutant emitted by open burning. Dilution usually occurs rapidly enough to reduce its health

hazard. Other pollutant gases include nitrogen dioxide (NO₂) and volatile organic compounds (VOCs, some toxic).

Smoke contains Toxic Pollutants

Smoke from open burning also contains VOCs, which have been changed in the fire into irritating, toxic and/or cancer-causing substances such as benzene, formaldehyde and benzo-a-pyrene, a polycyclic aromatic hydrocarbon (PAH). VOCs are concentrated in the tar droplet PM₁₀ particles and also adhere to the surface of soot (unburned carbon) particles.



Odor and smoke are two primary complaints that people have about air pollution. Smoke from open burning is the greatest source of complaints. Regulations have been instituted by the Tribe to control materials being burned through solid waste ordinances and open burning regulations. There are some things that should never be burned because of the toxic materials they release, but sometimes burning can be allowed. Also, if burning is done properly, odor and smoke can be kept to a minimum.

Managing smoke and reducing air pollution from a permitted burn is a condition to a permit as is the prevention of a nuisance to friend and neighbor. By following time proven methods and practices in conducting a burn there should be little trouble in conducting and completing the burn successfully.

Burning should be done when wind will carry smoke away from public roads, airports, and populated areas. Do not burn if a smoke-sensitive area is within ½ mile downwind of the burn.

Efficient Burning

To promote efficient burning, and reduce smoke and pollutants it is the responsibility of the person responsible for the burn to assure that all combustible material is dried to the extent practicable and loosely stacked or windrowed to eliminate dirt, rocks and other non-combustible materials. You may have to periodically restack or feed the burning pile to enhance combustion.

Materials may also have to be covered prior to burning to protect the material from moisture such as rain and snow.

Stages of Burning and Smoke Production

Each piece of fuel goes through the following four stages to burn. Some stages of burning emit more smoke than others.

1. Pre-ignition - Smoky - Fuel pieces heat, water vapor moves to the surface and escapes. Pyrolysis (chemical decomposition) begins as fuel temperature rises and VOCs vaporize; steam and the unburned flammable VOCs from pyrolysis stream out of the fuel and condensate into smoke.
2. Flaming - Less Smoky - Fuel temperatures rise rapidly, accelerating pyrolysis. The hot flammable VOCs mix with oxygen and ignite, burning (oxidizing) them. Heat, CO₂ and water vapor are emitted, along with some PM₁₀ tar droplets and soot particles (smoke).
3. Smoldering - Very Smoky - VOC production and temperature drop, causing flames to go out. Flammable VOCs continue to stream out and condense into tar droplets less than one micron in size, appearing as smoke. PM₁₀ emissions are now double those of the flaming stage.
4. Glowing - Not Smoky - No more flammable VOCs are left to stream out, so more oxygen can reach the fuel surface. Surface of charcoal (solid carbon fuel) now burns, glowing yellow, and CO is the major pollutant emitted.

Some fuel pieces will be drier than others when you burn. Smaller pieces dry out (and get wet again if it rains) more quickly, depending on their size, shape and distance from the soil surface. Schedule burning when the targeted fuel sizes are driest.

Complete Combustion Cannot Be Accomplished in Open Burning. VOCs need sufficient residence time in the flames, with enough oxygen, to burn completely. In the open, VOCs can escape the flames, to cool and condense into smoke. The constant heat loss (to incoming fresh air and to vaporize fuel moisture) and fuel loss reduce flaming, encourage smoldering and increase smoke production.

Burning should be done with a minimum of smoke. The heated air plume from a flaming hot fire helps carry the pollutants high into the air, out of breathing range, and scatters them over a wider area.

Materials Targeted For Burning Should Be:

1. Free of Prohibited Materials –no tar paper, demolition debris, petroleum wastes, tires, tar, metal salvage, plastics, treated wood, trash, household garbage, etc.
2. Arranged so as to Allow Air to Circulate Freely. Pile loosely. Let that oxygen in there! Fuel pieces should be far enough apart for air to move freely between them, but not so far from each other that they can't sustain flaming.
3. Free of Dirt or Excess Surface Moisture. Dirt won't burn. It hinders drying, and it keeps air and oxygen away from the fuel. And surface moisture will have to be boiled off before the fuel can heat up enough to burn without any excess smoke.
4. Dried For at Least the Minimum Drying Periods. If your fuel is too green, you are wasting your time and extra ignition fuel to get it to burn. You are wasting fuel energy to boil off water in the fuel, and you will generate more smoke.



Smoke Management

Smoke Management means conducting a burn only under predetermined fuel moisture and weather condition, pacing ignition and using fire techniques that will minimize smoke production and prevent smoke accumulation beyond acceptable limits.

Listed below are four key areas where you can modify your practices to reduce air pollution emissions and minimize your smoke's impact on air quality.

1. Avoidance - Don't burn when smoke will not disperse well or will be carried toward smoke sensitive areas. These are populated areas,

roads or highways, or any place where smoke can adversely affect visibility or the public's health, safety and welfare.

2. Dilution - Reduce smoke concentration by staggering ignitions and/or burning when there is good lift and dispersion. Burn some areas at different times of the year, in addition to those burn seasons traditionally chosen. Cover piles with waterproof Kraft paper when they are dry and burn them when the area is wet or snow-covered.
3. Emission Reduction - Reduce the amount of pollutants emitted by burning only the parts of the site needing it, by reducing the fuel loading (remove some fuels prior to burning), or by lowering fuel consumption (burn when some fuels are too wet to ignite). Lower emissions by maximizing the flaming phase during your burn. Use alternatives to burning, such as chipping and soil incorporation.
4. Schedule Restriction - Honor periods of no burning, such as overnight, weekends, and especially holidays.

Pile Lighting Techniques

- Pile fuels loosely and allow ample air spaces.
- Ignite many spots around the base of the pile.
- Avoid pushing dirt into the pile if using heavy equipment.
- Don't make the pile too large, include only what will burn before dark.

Warning: Don't leave your fire unattended: It may escape, or smolder and emit more smoke once the finer fuels burn and the fire temperature drops. Reform the pile to promote flaming when burning is partially completed.

WEATHER AND TERRAIN EFFECTS ON WINDS

Meteorological data has determined that certain weather condition will allow the smoke to rise up and disperse, while other weather conditions will cause stagnation over a large area, with little movement or ventilation and smoke will not disperse well at all.

A Tribal burn permit will identify any weather conditions during which a burn can be allowed, if the weather changes to unfavorable conditions for smoke dispersal, then the burn, under the conditions of the permit, must not take place.

Predicting wind (and smoke) behavior accurately may take years of study and field experience. Be sure you learn about the local, small-scale daily wind patterns in your area, their relation to surface features, and how various weather fronts can affect them.

Poor Smoke Dispersion Likely

Stagnant weather conditions.

High Pressure Area - Atmosphere is stable.

Clear Skies, or layered, Flat Clouds

Weak or No Winds, Hazy Conditions

Temperature Inversion, Shallow mixing layer

Good Smoke Dispersion!

Low Pressure
Area-Unstable



Tall, Puffy Cumulus Clouds

Strong, Gusty Winds, Good Visibility

Good Lift and Deep Mixing Layer

Surface winds are strongly affected by the shape of the underlying ground and by local day and night heating and cooling differences. Caution: Upper level transport winds may be blowing horizontally in another direction entirely, limiting plume rise by wind shear, or moving smoke into sensitive areas.

Learn about your local, small-scale weather patterns. Understand that they can't be predicted using only the widely spaced regional forecasts that are available.

Heating & Cooling Effects on Wind Direction

All sloping ground will have local changing winds. Warm airflow up slope by day on sun-heated slopes. Down slope winds begin soon after the first slopes go into shadow and surface cooling begins; by sundown cooling air is flowing down all slopes.

Hours

The burn permit will also restrict hours available for a burn. Ordinarily, no burns will be permitted which will start or burn into after dark hours.

Air temperature normally decreases with height above ground level, allowing heated air and smoke to rise. A temperature inversion is an increase of air temperature with height, which inhibits vertical air movement and mixing.

Night inversions will form in sheltered basins (low areas), given little wind and clear night skies. The ground cools first at night, cooling the air in contact with it, while the air aloft may remain near daytime temperatures. The cooled surface air (with any smoke in it) gets dense and flows down slope as it cools further. It collects on the valley floor, leaving shallow cold air layers on the slopes and deep, cold (and smoky) air layers and a temperature inversion in the valley.

By late afternoon any residual smoke coming from your burn will stay at ground level, cool, and begin to drain downhill. Time your burn early enough in the day so that it won't still be smoldering as night falls and impacting sensitive areas.

But don't burn too early in a low area. After sunrise, surface heating of the valley wall by the sun warms the cold air next to the ground. As surface heating destroys the inversion on the slope, up slope winds begin, pulling the inversion lid down the valley as the warmed air flows up slope. Your smoke will stay under the inversion lid and will not rise until the sun warms the land and lifts the inversion.

Use test fires to confirm smoke behavior before proceeding.

FIRE SAFETY

The Environment Division determines if outdoor burning can be done safely and without undue fire risk to neighbors or the community. When deciding if it is safe to burn on any given day, the Environment Division considers factors such as: vegetation moisture levels, temperatures, relative humidity and winds.

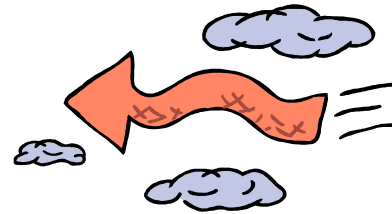
The Environment Division, in cooperation with appropriate fire control agencies, monitor certain fuel conditions and weather factors to determine if a general community wide or regional prohibition is required on burning. Once conditions warrant a prohibition the Environment Division provides recommendation to the Tribal Council who may declare outdoor burning as unsafe and establish a ban of all fires until conditions become safe. Announcements for burn ban and burn ban lifting will be provided in the local media. Please keep alert to any announcements.



Three weather factors are considered in determining a ban:

1. Temperature of 95 degrees F or above
2. Relative humidity of 30% or below

3. Wind speeds of 15 miles per hour or higher



Fire Safety Considerations when burning are:

1. Do not leave burning fires unattended.
2. Plan the burn well so that the fire is out before dark.
3. Do not conduct a burn if it is questionable.
4. Ensure that there is uninterrupted access around the burn perimeter for firefighting equipment.
5. Ensure that personnel needed to control the fire are available and on site.
6. Monitor weather and wind conditions. Verify these conditions from a reliable source.
7. Have appropriate fire suppression equipment available such as shovels and water.
8. Plan manageable burns. Do not conduct large burns or build large piles that can become uncontrollable.
9. Use fireguards, such as bare soils (bladed or tilled), and streams or ponds to help control the fire.
10. Have identified escape routes for all personnel in case you lose control of your fire. A large grass fire can make it so hot that people will need at least 200 feet of distance to get away from the heat.
11. Have telephones or radios available to call for help in necessary.

