TEXAS A&M AGRILIFE EXTENSION

ERM-052 8/20

ON-SITE BRUSH PILE BURNING IN TEXAS

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ABSTRACT

Burning on-site brush and debris piles is an effective and efficient method to rapidly break down unwanted or dead plant material generated from land management activities such as brush chaining, grubbing, or shearing that allow for agricultural, forestry, and livestock use. However, these types of burns can be risky and volatile when conducted improperly, potentially causing unexpected wildfires with rapid rates of spread. In order to effectively manage cut and piled brush and conduct a safe brush pile burn, there are several straightforward steps that can be taken. Following regulatory guidelines, building piles that are safe to burn, actively monitoring burning brush piles, and having the right resources on hand will allow burning plant debris to continue to be an integral and safe part of rangeland and property management.

MANAGEMENT SUMMARY

Burning brush piles is very similar to conducting a prescribed burn. The same requirements, due diligence, and standards of care apply to brush piles. Adequate fire lines or firebreaks, personnel, firefighting equipment, appropriate notification requirements, safe weather forecast, and prior planning and preparation are all considerations that should be carefully thought out.

Before Burning

- Determine if the proposed burn is allowable per Texas Commission on Environmental Quality (TCEQ) regulations.
- Become familiar with TCEQ burn requirements related to disposal fires, such as designated nonattainment areas.
- Become familiar with county or other local outdoor burning rules and regulations.
- Inquire whether a burn ban is issued for the burn day and proceed accordingly, notifying local fire departments and fire dispatch. If a burn ban exemption exists, notify the requisite authorities of the intention to burn and provide all necessary information.
- Ensure the burn does not create a smoke nuisance or potential traffic hazard.
- Ensure the weather forecast will permit safe burning, adequate smoke dispersion, and will not change in a manner that creates a wildfire risk.
- Prepare a safe area to burn by establishing a clear line free of any fuel; ensure there is no fuel above or around the pile and construct piles to a manageable size (i.e., larger than a small car, but smaller than a greyhound bus).

During and After Brush Pile Burning

- Keep suppression water resources and tools handy in case the pile needs to be extinguished.
- Never leave a brush pile actively burning without appropriate supervision.
- Continuous weather monitoring during the burn is equally as important as weather monitoring before and after lighting.
- After the pile is no longer actively burning, ensure that all brush or debris is either burned completely or cold to the touch before leaving the area.
- Large logs and tree trunks may continue to smolder for weeks after the fire's flaming phase is complete. These larger fuels may still emit embers under volatile weather conditions and ignite wildfires. Be sure to look at the weather forecast before, during, and after igniting brush piles.
- Remember, safety is a priority at all times. Communicate with participating help and with suppression resources both on and off the fire. Support resources should be

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prioritized (charged cell phones, radios, wireless walkie-talkie devices, etc.). Keeping participants hydrated and alert, having a first-aid kit handy, appropriate clothing to deal with heat and smoke, etc. are important considerations that should not go overlooked.

INTRODUCTION

Burning brush and plant material is a long-standing and effective way of breaking down unwanted plant growth from Texas rangeland pastures. However, a majority of Texas wildfires are caused by the unsafe burning of brush and plant materials (Texas A&M Forest Service, 2019). This document is designed to aid landowners and property managers before, during, and after the decision-making processes of safely preparing, building, igniting, supervising, and extinguishing burning vegetative brush and debris piles.

OUTDOOR BURNING REGULATIONS

Across the state, there are generally three levels of regulations and ordinances potentially applicable to the burning of brush and plant material. First, at the state level, the TCEQ regulates all outdoor burning in Texas. Their regulations apply statewide and should be thoroughly reviewed and understood before conducting any burn in Texas. Second, there may be regulations at the county level. These primarily are in the form of a burn ban instituted by the county judge or commissioners. Finally, local municipalities commonly have restrictions or guidance on when or how to burn brush and plant debris within their city limits. Every county will vary in their outdoor burning rules and regulations; therefore, extreme regard and standards of care for county and city rules must be satisfied before igniting any brush pile.

Texas Outdoor Burning Exemptions

The TCEQ is the state regulatory agency regulating outdoor burning, including brush and debris piles. TCEQ regulations prohibit all outdoor burning in Texas, subject to certain exceptions (30 Texas Administrative Code § 111.201). The only scenario in which outdoor burning is allowed is if the proposed burn fits within one of the exceptions to the general prohibition on outdoor burning.

The following types of burns are allowable exceptions to the general prohibition on outdoor burning:

- Fire training;
- Fires for recreation, ceremony, cooking, and warmth;
- Disposal fires (including domestic waste, diseased animal carcasses, veterinarian disposal of animal remains, on-site burning of plant growth, at a site designated for consolidated burning of waste generated from specific residential properties, crop residue burning for agricultural management purposes when no practical alternative exists, and plant growth detrimental to public health and safety conditions that is burned by a county or municipal government at a government-owned site upon receiving site and burn approval from the executive director);
- Prescribed burning;
- Hydrocarbon burning (methane, butane, propane, hexane, natural gas, and other fuels); and
- Executive director approval of otherwise prohibited outdoor burning.

See 30 Texas Administrative Code (TAC) §§ 111.205–111.215.

Disposal Fires

Typically, on-site burning of trees, brush, grass, leaves, branch trimmings, or other plant growth by the owner of the property or any other authorized person when the plant material is generated only from that property is considered an exemption for outdoor burning as a disposal fire—not a prescribed burn. Therefore, this publication will only focus on the rules related to the exemption provided for disposal fires and, in particular, on-site burning of plant growth. The owner or person authorized by the owner must follow and meet all of the prescribed burning requirements found in 30 TAC Sections 111.209(4) and 111.219(3, 4, 6, and 7).

Accepted Plant Material

A landowner of the property or any other person authorized by the owner of the property may conduct on-site burning of plant material generated only from that property if the plant material being burned consists strictly of:

- Trees;
- Brush;
- Grass;
- Leaves;
- Branch trimmings; or
- Other plant growth.

See 30 TAC § 111.209(4).

Importantly, only material generated on the property may legally be burned on-site. Note that this exemption to the general burning prohibition is applied only to a limited class of vegetation.

Identify Certain Categories of Vegetation

Although trees, brush, grass, leaves, branch trimmings, or other plant growth may be burned on-site if generated from the property, there are additional limitations on burning that may exist for certain areas if the vegetation was generated as a result of right-of-way maintenance, land-clearing operations, and maintenance along water canals; see 30 TAC § 111.209(4)(A)–(B) for more information. Thus, prior

to burning plant material, a person must determine if the material was generated as a result of one of these categories.

A "land-clearing operation" is defined as "the uprooting, cutting, or clearing of vegetation in connection with conversion for the construction of buildings, rights-of-way, residential, commercial, or industrial development, or the clearing of vegetation to enhance property value, access, or production. It does not include the maintenance burning of on-site property wastes such as fallen limbs, branches, or leaves, or other wastes from routine property clean-up activities, nor does it include prescribed burning or burning following clearing for ecological restoration" (30 TAC § 111.203[3]).

Given the breadth of this definition, many agricultural-related burns of brush piles will likely fall within the definition of land clearing and, therefore, be subject to additional requirements. Burns of accepted plant materials not falling within these three categories are not subject to the requirements related to attainment status.

For example, consider the burning of a brush pile consisting of tree limbs. If a landowner cut the limbs to enable easier access to the property, that would likely constitute as land clearing, and the additional attainment status requirements would apply. If, however, the pile was created by a landowner who gathered up fallen tree limbs after a storm, it would not be considered land clearing, and the additional requirements related to attainment status would be inapplicable. Of course, in either scenario, TCEQ's general requirements for allowable outdoor burning (30 TAC § 111.219), as well as any county or local rules, would apply.

Determine Attainment Status

If the brush or debris pile is generated as a result of the categories discussed above—right-of-way maintenance, land-clearing operations, or maintenance along water canals—then county attainment status must be determined, and additional restrictions may apply.

An area's status will either be designated as "attainment" or "nonattainment." This distinction is based upon the concentration of criteria pollutants in an area and whether they exceed the regulated levels of established National Ambient Air Quality Standards. If any of the criteria pollutants are over the regulated allowable amount, the area is deemed nonattainment. Alternatively, an area where all criteria pollutants are below the regulated allowable level would be considered attainment.

Landowners may determine current attainment status for a respective county by visiting https://www.tceq.texas.gov/airquality/sip, which provides an interactive map of Texas counties and current information on attainment status. Clicking on a specific county or area will generate attainment status information for that specific county or area and will include a summary table of the federal criteria pollutants for nonattainment status. Landowners should look at the "Designation" column of the report. A listing of attainment/unclassifiable, unclassifiable, or attainment (maintenance) would be considered an attainment status. A designation for any listed pollutant as nonattainment would deem the area a designated nonattainment area for the purposes of this regulation. Attainment status can also be determined by calling any TCEQ regional office.

Brush piles should be contained with a bladed line down to bare mineral soil in order to prevent any escapes through adjacent fine fuel, such as dormant grass. *(Image courtesy of Morgan Treadwell)*

Additionally, TCEQ regulations provide that if a burn is conducted in a county that contains any part of a municipality that extends into a designated nonattainment area, the burn will be considered to occur in an attainment area (30 TAC § 111.209[4][A]–[B]).

Result of Attainment or Nonattainment Status

If a landowner conducts a burn of vegetation that falls into one of the three categories listed above—right-of-way maintenance, land-clearing operations, or maintenance along water canals—the following additional regulations apply.

For burns falling in these three categories in a nonattainment area: burns are allowed only "when no practical alternative exists" (30 TAC § 111.209[4][A]). TCEQ regulations define "practical alternative" as an "economically, technologically, ecologically, and logistically viable option" (30 TAC § 111.203[5]). Thus, a landowner in a nonattainment area may burn only if there is not a practical alternative to dispose of the vegetation. Any such burns must be conducted in accordance with the TCEQ General Requirements for Outdoor Burning (30 TAC § 111.219) discussed below. Commission notification or approval is not required for such burns (30 TAC § 111.209[4][A]).

For an attainment area: burns falling within these three categories are allowed without having to prove the lack of a practical alternative. Such burns in an attainment area are subject to local ordinances that prohibit burning inside

the corporate limits of a city or town and are consistent with the Texas Clean Air Act, Subchapter E, Authority of Local Governments. Additionally, these burns are subject to the General Requirements for Allowable Outdoor Burning Sections 111.219(3, 4, 6, 7), discussed below. See 30 TAC § 111.209(4)(B).

Requirements for Certified and Insured Prescribed Burn Managers

Please note that if the landowner or landowner's representative igniting the brush pile is a Certified and Insured Prescribed Burn Manager from the Texas Department of Agriculture, the "Requirements for Certified and Insured Prescribed Burn Managers" found in 30 TAC Section 111.217 apply.

General Requirements for Allowable Outdoor Burning

The TCEQ regulations list several requirements applicable to all outdoor burns. These requirements are as follows:

1. Prior to prescribed or controlled burning for forest management purposes, the Texas Forest Service shall be notified.
2. Burning must be outside the corporate limits of a city or town except where the incorporated city or town has enacted ordinances which permit burning consistent with the Texas Clean Air Act, Subchapter E, Authority of Local Governments.
3. Burning shall be commenced and conducted only when wind direction and other meteorological conditions are such that smoke and other pollutants will not cause adverse effects to any public road, landing strip, navigable water, or off-site structure containing sensitive receptor(s).
4. If at any time the burning causes or may tend to cause smoke to blow onto or across a road or highway, it is the responsibility of the person initiating the burn to post flag-persons on affected roads.
5. Burning must be conducted downwind of or at least 300 feet (90 meters) from any structure containing sensitive receptors located on adjacent properties unless prior written approval is obtained from the adjacent occupant with possessory control.
6. Burning shall be conducted in compliance with the following meteorological and timing considerations:
   a. The initiation of burning shall commence no earlier than one hour after sunrise. Burning shall be completed on the same day not later than one hour before sunset and shall be attended by a responsible party at all times during the active burn phase when the fire is progressing. In cases where residual fires and/or smoldering objects continue to emit smoke after this time, such areas shall be extinguished if the smoke from these areas has the potential to create a nuisance or traffic hazard condition. In no case shall the extent of the burn area be allowed to increase after this time.
   b. Burning shall not be commenced when surface wind speed is predicted to be less than six miles per hour (mph) (five knots) or greater than 23 mph (20 knots) during the burn period.
   c. Burning shall not be conducted during periods of actual or predicted persistent low-level atmospheric temperature inversions.
7. Electrical insulation, treated lumber, plastics, non-wood construction/demolition materials, heavy oils, asphaltic materials, potentially explosive materials, chemical wastes, and items containing natural or synthetic rubber must not be burned.

See 30 TAC § 111.219.

Allowable Burn Locations

Burning that is otherwise allowed based on the regulations discussed above may generally be conducted only outside of the corporate limits of a city or town; see 30 TAC § 111.219(2). Burning will be allowed within the corporate limits of a city or town if the city or town has enacted an ordinance allowing burning consistent with the Texas Clean Air Act, Subchapter E, Authority of Local Governments; see 30 TAC § 111.219(2).

Potential Liability

Finally, TCEQ regulations make it clear that compliance with these regulations does not excuse a person conducting a burn from any consequences, damages, or injuries resulting from the burn; see 30 TAC § 111.221. In other words, these regulations do not offer limited liability for landowners who can prove compliance. Landowners should take care to ensure they do not act negligently when conducting a burn and should confirm liability insurance coverage before undertaking a burn.

TIME OF YEAR

Whether growing or dormant season, the time of year is a crucial factor in brush pile burning. Growing-season months—April to June—are generally the best times of the year to burn brush piles to minimize the risk of escape. Early to late spring is best, as the surrounding vegetation—both cool- and warm-season plants—is usually actively growing with high moisture content. Burning brush piles during early to late spring significantly reduces potential ignition or fire spread. If a brush pile does expand beyond the designated area, fire behavior, flame length, and intensity are manageable due to high amounts of fuel moisture from actively growing vegetation. These types of fires are much easier to suppress due to slower rates of spread and shorter flames. However, if the current year's growth is green, residual fuel accumulation from the previous year's growth

is likely, and a fire will still carry and burn. This is the primary reason and justification for constant monitoring of actively burning piles and ensuring adequate and appropriate suppression equipment is on-site to successfully extinguish a burning pile if need be. In Texas, it is not recommended to burn piles during the winter following a recent rain or snow due to the dormant and cured-out surrounding vegetation, even with high soil moisture. Dry and dormant fine fuels will rapidly lose moisture, even during the winter after a snow event. Fine fuels, such as grasses, are considered 1-hour time lag fuels. One-hour fuels represent a fuel lag category of one hour for fine fuels to equalize to the same moisture content as the surrounding atmospheric conditions. This is important, as the dry weather during winter and changing wind conditions may result in the spread of a previously contained fire since brush piles can smolder and are at risk to become open flames for up to several days or even weeks once ignited (Oklahoma Cooperative Extension Service, 2017).

Brush piles may smolder for several days after ignition due to heavy fuel loads of 100-hour or 1,000-hour fuel loads. Brush piles should be monitored after being consumed by the fire due to lingering heat effects from heavy fuel loads. *(Image courtesy of Morgan Treadwell)*

SMOKE MANAGEMENT

Burning must only occur when smoke does not present a hazard to a public road, waterway, landing strip, or any sensitive receptors, such as residences, hospitals, schools, etc. The landowner or landowner representative who ignited the brush pile is solely responsible for wherever the brush pile smoke disperses (6 Texas Natural Resources Code § 153). Wind direction is an important weather factor to continuously monitor due to ember wash and potential ignition downwind of the burning brush pile. Atmospheric dispersal should be taken into consideration when managing smoke. Cloudy, rainy, high-humidity days provide stable atmospheric conditions, which are poor days for smoke dispersal. Avoid burning during inversions that will trap smoke close to the surface—typically early morning or early evening conditions, or near surface water areas. Igniting a very small test fire to ensure the smoke is dispersing is a good test to determine wind direction and lift. These negative smoke effects can be minimized by burning dry brush, burning under appropriate smoke dispersal weather conditions, and by sizing piles to appropriately manage smoke plumes. Brush piles should be built to a realistic, manageable size. For example, if a brush pile is too tall, it could potentially collapse and send an ember wash into adjacent fuels.

WEATHER CONDITIONS

Current weather conditions are the top concern when burning brush piles. When contemplating and planning for brush pile burns, wind speed should be the first weather condition checked prior to burning. According to Texas A&M Forest Service (2019), burning brush piles during gusty and high-wind days is the major contributor to wildfires and rapid rates of spread, especially during the dormant or winter season. Additionally, piles should not be ignited when the wind speed is over 15 miles per hour and winds are steady in the days following ignition. A general rule-of-thumb is to target burn days that are 40 percent or greater in relative humidity in order to mitigate ember wash, spotting, and potential fire escapes. Verifying that any steady winds are below 15 mph and from a consistent direction while the relative humidity is 40 percent or greater will ensure a safe burn with brush piles that contain tree limbs and trunks, as these are considered 100-hour or 1,000-hour time lag fuels. These time lag fuel categories will require 100 or 1,000 hours to become as dry as the surrounding atmospheric conditions (Oklahoma Cooperative Extension Service, 2017). Therefore, burning brush piles on high-humidity days or even during a light rain can be accomplished due to the fuel lag for larger fuel types, taking into consideration smoke management, especially if the larger fuels have been dry for an extended period of time. It is critical to recognize the positive relationship between relative humidity and fuel moisture to successfully conduct a brush pile fire while minimizing the threat of a potential wildfire. Keep in mind that outdoor burning is prohibited prior to or during a low-pressure atmospheric inversion, often occurring overnight or during cold fronts.

Once a day is selected, frequently check the weather forecast in the days leading up to the burn. Keep in mind that many brush piles may take several days to burn completely. Piles that contain large amounts of soil will cause slower and less complete fuel combustion (Oklahoma Cooperative Extension Service, 2017). Due to the potential time to burn down 100-hour or 1,000-hour fuel types and soil in the brush pile, piles can potentially burn and smolder for several days or even weeks. In order to mitigate any fire spotting or escape, weather conditions must be appropriate for safe conditions while the piles burn. If winds become unfavorable or relative humidity drops for an extended period of time, brush pile burning should be delayed until the forecast improves for the duration of the burn.

BUILDING ON-SITE BRUSH AND PLANT DEBRIS PILES

When chaining or grubbing standing brush, it is often convenient to make large windrows of piled plant debris. While this may be an easy solution on the tractor or bulldozer, it can be a major safety and liability issue when it comes time to burn it. Brush piles are best built small and dense—picture a small car versus a greyhound bus—which allows fire to quickly spread throughout the pile, increasing its intensity. As a result, this reduces the time it takes to burn and shortens the time that the pile is emitting and lofting firebrands and embers into the air. Small and compact brush piles will reduce the overall intensity of the burn, the size of the flame, and the amount of smoke produced, making the pile much more manageable on burn days. Even though building many small brush piles adds more piles to burn, it makes the process more manageable while minimizing the risk of a wildfire and allowing for better smoke management, which should be a priority (Oklahoma Cooperative Extension Service, 2017). Therefore, when building brush piles, be sure to plan ahead for potential ignition. Look up, look down, and look around for potential hazards and flammable material. Burning beneath a tree canopy has a high risk of igniting the canopy and causing the fire to escape the managed brush pile area.

Make sure to avoid building brush piles under tree canopies, power or transmission lines, on buried or exposed gas lines, or within close proximity to hydrogen sulfide (H_2S) gas. Gas lines are susceptible to leaking and may potentially overheat, and smoke from the burning pile can cause electricity to arc on powerlines.

Always consider the capacity to safely and effectively burn brush when building piles. Maintain a general idea of the water and equipment available to completely extinguish the burning pile. Wind and weather can change rapidly, sending smoke and embers in undesirable directions. Unforeseen weather shifts are always a possibility and may rapidly increase fire behavior, flame length, and rate-of-spread of the burning pile. Maintaining control and capacity to safely extinguish the burning brush pile is critically important.

Burning smaller brush piles reduces the risk of fire escapes while still burning faster than large piles. *(Image courtesy of Chase T. Brooke)*

After building the brush pile, it is also important to take the time to clear the area around the brush pile of dormant fine fuel or other materials that may ignite—this includes the proximity to adjacent brush piles. Mowing or disking a ring around the pile can greatly reduce the chance of fire creeping away from the main brush pile. Prior to igniting piles, a wet line can be applied around the brush pile to decrease the chances of a creeping fire.

IGNITING BRUSH PILES

The safe ignition of brush piles should be treated with considerable care. Several different types of equipment exist for ignition, although the primary tool is a drip torch. Other tools that can be used safely include a fusee, or a road flare, a propane torch, or placing flammable fine fuel, such as lighting hay or paper, in the brush pile. Igniting piles soaked with flammable liquids with a match should be avoided. However, liquids such as kerosene, an equal mixture of diesel and gasoline, or charcoal lighter fluid can be effective if they are safely used due to their less-flammable nature (Oklahoma Cooperative Extension Service, 2017). If flammable liquids are necessary, only use them sparingly on smaller sections of the brush pile before igniting (Oklahoma Cooperative Extension Service, 2017). If the brush pile does not ignite due to high moisture conditions or large fuel categories, ensure all flames are extinguished before adding more drip torch fuel or flammable liquid. A good practice is to drip the fluid out away from the pile, giving the burner adequate space and time to distance themselves from the brush pile.

Gasoline is highly flammable, has a low flash point, and releases a vapor that is denser than air; therefore, it should not be used to ignite brush piles (Oklahoma Cooperative Extension Service, 2017). Gasoline can easily cause serious burns and injury to the person igniting it or nearby bystanders.

In addition to the equipment or liquid used to ignite brush piles, the ignition method and location also play a critical role. Igniting a brush pile with a goal to reduce the intensity of the fire and length of the flame should be prioritized, minimizing any chance of escape or wildfire. Therefore, when igniting a brush pile, start with ignitions on the downwind side. This will create a backfire—a fire moving or burning into the wind—causing slower consumption of the brush pile with minimized fire behavior, flame length, and fire intensity. This ignition method may take longer for the brush pile to be consumed, but it is a safe and reliable method to ensure containment.

If a significant number of brush piles exist, have a plan before ignition as to how many brush piles can be effectively and safely managed at one time or over the course of a single day. The span of control is crucial, even when it comes to lighting brush piles. Do not spread resources too thin.

AFTER THE FIRE

After the pile is consumed, there are still several considerations landowners must keep in mind. The main post-fire issue is that large logs and tree trunks may continue to smolder for weeks after the flaming phase of the fire is complete. These larger fuels may still emit embers under volatile weather conditions and ignite wildfires. Be sure to look at the weather forecast before, during, and after igniting brush piles. Do not burn if a red flag warning is issued or other volatile or unpredictable weather conditions are forecasted within 24 hours of burning. Once most of the brush pile is consumed, use water or a tool, such as a shovel, to wet or scrape any embers until smoldering ceases, and the residual brush pile is cool to the touch.

Once the fire is extinguished, there may be a residual fire scar left on the ground. While potentially unsightly, these scars will naturally be reclaimed by grasses and forbs in upcoming years with adequate rainfall and rest. Brush pile scars on the soil's surface can be mitigated by the season of burn, such as during periods of high fuel moisture content or relative humidity. Keep in mind the need for smoke management and dispersion, as well as increased time for complete combustion of the brush pile. Brush pile scars or more areas with bare ground following the brush pile burn are temporary and will create an opportunity for different plants to become established, such as forbs and secondary-succession plant species. Plant succession will eventually attract certain species of wildlife, livestock, or pollinators back to their native plant community (Oklahoma Cooperative Extension Service, 2017). Larger piles will leave burn scars that last longer, but reclamation can be enhanced by re-seeding the area with desirable grass and forb species. Small-acreage properties may necessitate permanent burning locations to reduce the loss of grazeable area from brush pile burn sites.

Once the fire is extinguished, there may be a residual fire scar left on the ground. While potentially unsightly, these scars will naturally be reclaimed by grasses and forbs in upcoming years with adequate rainfall and rest. *(Image courtesy of Morgan Treadwell)*

CONCLUSION

Burning on-site brush piles can benefit landowners when conducted carefully and in accordance with all legal requirements. Before burning plant material, landowners should review and understand all applicable TCEQ regulations and determine if any county or local ordinances are applicable.

Finally, there is no substitute for common sense and an abundance of caution. Anyone conducting a brush pile burn should use best management practices such as having and executing a well-thought-out burn plan, checking weather conditions, being aware of any forecast changes, and being in contact with neighbors and local fire departments.

RESOURCES

TCEQ Attainment Status Website: https://www.tceq.texas.gov/airquality/sip

Outdoor Burning in Texas (2015). Texas Commission on Environmental Quality. Publication RG-049

National Ambient Air Quality Standards: https://www.epa.gov/criteria-air-pollutants/naaqs-table

REFERENCES

Oklahoma Cooperative Extension Service. (2017). *NREM-2894: Managing Brush Piles* [Fact sheet]. Retrieved from http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-9405/NREM-2894web.pdf

Texas A&M Forest Service. (2019). *Preparing for Wildfires.* Retrieved from https://tfsweb.tamu.edu/PreventWildfire/

30 Texas Administrative Code Chapter 111, Subchapter B (Sections 111.201–111.221). Retrieved from https://texreg.sos.state.tx.us/public/readtac$ext.ViewTAC?tac_view=5&ti=30&pt=1&ch=111&sch=B&rl=Y

6 Texas Natural Resources Code Chapter 153. Retrieved from https://statutes.capitol.texas.gov/Docs/NR/htm/NR.153.htm

Highlights

- Review and comply with all applicable state, county, and local regulations or ordinances.
- The best time to burn brush and debris piles is April through June, when the surrounding vegetation is green.
- Have adequate suppression equipment available.
- Be certain participants are healthy and vigilant. Have communication devices, adequate hydration, and first-aid supplies readily accessible.
- Watch the extended weather forecast and ensure that the winds will be less than 15 miles per hour and that the relative humidity is greater than 40 percent.
- Notify local volunteer fire departments, neighbors, required regulatory state agencies, and sensitive smoke areas or receptors.

Acknowledgment

The authors express heartfelt appreciation to Drs. Bill Rogers, Doug Tolleson, and Joe Veldman for their time, enthusiasm, and efforts in reviewing this manuscript.

Disclaimer

This manuscript is specific to Texas Laws and Regulations for Outdoor Burning. However, it is potentially applicable to other states or regions, particularly regarding methodology and safety. Burn managers should confer with their various state regulators for specific regulations and restrictions that may vary.