

Region III Regional Response Team Guidelines for In-Situ Burning of Oil Impacted Herbaceous Wetlands

Introduction

In-situ burning is considered with growing interest as a response tool for coastal wetlands that have been impacted by oil. Burning of wetland grasses has been practiced as a vegetation management technique for many years, yet burning of oiled wetlands is relatively new. Responding to an oiled coastline can be a complex issue

The decision to conduct in-situ burning of herbaceous wetlands is the responsibility of either the Coast Guard Federal On-Scene Coordinator (FOSC) or, depending on the location of an oil spill the Environmental Protection Agency (EPA) FOSC and the Unified Command (UC). However, permission to use in-situ burning to treat oil pollution must be approved by the incident-specific Regional Response Team (RRT). This guidance document is intended to provide the FOSC, the UC and the RRT guidance and decision-making tools to support the use of in-situ burn for oil spills. Area committee members are encouraged to incorporate concepts and other information from this document into their respective Area Contingency Plans (ACP).

The following guidelines are provided for use by the Region III Regional Response Team (RRT III) for streamlining approval of in-situ burning of herbaceous wetlands.

SECTION I

Purpose

The purpose of this guidance is solely to support the FOSC's, the UC's and the RRT's decision-making when considering the use of in-situ burning for addressing treatment of spilled petroleum products in wetlands. This document describes the environmental considerations, guidelines, advantages and disadvantages of in-situ burning. It also provides an overview of Region III's In-Situ Burn Policy, provides an In-Situ Burn checklist, and Region III's In-Situ Burn Decision flow chart.

Environmental Considerations

Before deciding on a remedy, it must be determined if cleanup is necessary or desirable. Consultation with biologists, botanists, or ecologists should be conducted when assessing options. Issues that should be considered include:

- Threatened or endangered species in the area, in accordance with the 1997 Endangered Species Act Memorandum of Understanding (ESA MOU)
- Impact to migrating birds that are at high risk of being oiled.

Natural, or unassisted, recovery may be the best option when:

- Oiling is light and natural recovery is likely to occur in an acceptably short time frame
- Cleanup activities would adversely impact the wetland
- Wildlife is at a low risk of being oiled.

When properly applied in-situ burning can be used to remove oil from the impacted area without resorting to mechanical cleanup methods, which are often destructive or impossible to accomplish. Further, in-situ burning may minimize both short-term risk of further impact to natural resources from the spilled oil and long-term risks of persistent toxicity to marsh plants and biota.

In-situ burning has advantages and disadvantages. The following advantages and disadvantages should be examined when considering the in-situ burning option for oiled wetlands:

Advantages of In-Situ Burning of Wetlands:

The following are some advantages of employing in-situ burning, where conditions are appropriate:

- Minimizes physical damage: Where access is limited or mechanical/manual removal has the potential to cause unacceptable levels of impact by equipment mobilization and trampling, burning can rapidly remove oil from sensitive areas.
- Provides an alternative: In-situ burning provides a response option where oil residues will be unacceptably high in association with other options, including natural recovery. The technique can be used in conjunction with other response technologies (see National Contingency Plan (NCP) subpart J) to provide the best response to a situation.
- Removes oil quickly: It rapidly removes oil from the habitat when there is a time-critical element, such as a short-term change in the physical conditions that could cause loss of containment and further spreading (for example, rain or flooding), or a seasonal increase in wildlife use, such as arrival of large numbers of migratory waterfowl.
- Used successfully when ice and snow are present: In-situ burning can rapidly remove the oil while trees and other vegetation are dormant; presence of ice and snow assist in protecting nearby resources in marshes, wetlands, forests, etc.

Disadvantages of In-Situ Burning of Wetlands:

- Plant Damage: In-situ burning techniques can cause substantial initial plant damage because the surface water vegetation is removed.
- Long term impact: In-situ burning can cause long-term impacts to vegetation when the fire is significantly hot or water level is too low, and the subsurface plant parts are killed.
- Oil penetration: There is potential for burning to increase oil penetration into the substrate, when there is no standing water.
- Damage to biota: Any non-mobile organisms present and unable to escape (such as gastropods on clean vegetation above the oiled area) will be killed.
- Residues: Heavy fuel oils, when burned, produce residues that may be difficult to remove.
- Habitat and cover loss: In-situ burning techniques can cause habitat and cover loss for wildlife within the burned area. This is important in evaluating threatened or endangered species.

In-Situ Burning Guidelines for Herbaceous Wetlands

Prescribed burns in wetland areas have been conducted by natural resource managers for a number of reasons, some of which include:

- Rejuvenation of wetlands that have accumulated high litter loads
- Generation of green vegetation or open spaces to attract wildlife
- Release of nutrients
- Restoration of habitats in areas that are historically dependent on frequent wildfires to sustain those ecosystems.

The presence of oil in a wetland may have two important effects including 1) high amounts of energy released from heating or burning the oil may increase the temperature and heat penetration of the burn, and 2) oil residue may remain after the burn, which can cause harmful effects. However, the experiences of ecologists, and practitioners have contributed to the development of guidelines for burning wetlands as a spill-response strategy. Based on discussions with National Wildlife Refuge staff from the U.S. Fish and Wildlife Service (USFWS) about fire management duties, the following list of facts were developed for burning specific types of wetland habitats:

Wooded Swamps (facts were developed from the Southeast Okefenokee Swamp)

- Burns in winter may cause less damage in terms of species mortality
- Burns in late summer may result in higher mortality to the larger plants and hardwoods than other times of the year in part because they are more susceptible to stress, and the soil tends to be drier, resulting in higher rates of acute mortality from heat
- Spring and summer burns are more likely to cause changes in species composition; species that are promoted by burning tend to grow vigorously after the burn, out-competing the slower growing or less resistant species
- Moisture levels are extremely important. Although high moisture levels make starting the burn more difficult, these conditions are less likely to cause plant mortality or a change in species composition
- Greater damage to vegetation results from burns during dry seasons, when the fire is more likely to burn deeper into organic soils and cause higher damage to roots. When the soils are wet, only the above ground vegetation is burned off.

Fresh-to-Brackish Impoundment Marshes (data is from Merritt Island National Wildlife Reserve)

Based on the very limited data on effectiveness and effects of burning in oiled wetlands and marshes, the following environmental guidelines are proposed:

- Prescribed burns should be scheduled for periods when they occur naturally, namely in the dry or lightning season.
- Contain and control the fire; extinguishing a fire in a vegetated wetland is difficult. Fire may spread to un-oiled vegetation, which will not act as a fire-break. Consider the possibility of fire to spread to un-oiled areas.
- Burning of oiled woody wetland vegetation (compared to herbaceous vegetation) should not be considered.

Impacts to subsurface vegetation are likely to be less if a water layer exists between the oil and the substrate. However, in some instances, a layer of standing water a few inches deep may get hot enough to kill or damage the roots. Little information on this relationship has been compiled, along with seasonal effects on the ability of burned, oiled vegetation to recover. This type of data should be collected during future monitoring efforts, to be used in future events.

Burning of muddy substrates may alter their physical properties (for example, make them hard) thus degrading their biological productivity. Burning will not reduce the toxic effect of oil that occurred prior to the burn, but may reduce the extent and degree of

additional impacts by removing the standing oil. Burning is not effective in removing oil that has penetrated the soil. The following items need to be considered before a wetland burn:

- Burning in late fall to early spring, when the vegetation is dormant and prior to new plant growth is often the best time to employ in-situ burning techniques to impacted wetlands
- Light fuel oils and crude oils burn more efficiently and generate fewer residues, which should reduce the potential for long-term impacts
- Snow and ice conditions in wetlands slow natural weathering processes and may extend the window of opportunity for in-situ burn. Additional burns may be necessary as snow and ice thaws, as melting ice and snow can limit the heat transfer process and extinguish the fire
- Burning should be evaluated as a response once manual and mechanical oil recovery efforts are not possible to perform. Burning is more effective if done soon after the oil release, although in-situ burning in wetlands has been effective months after the release in most cases
- Biologists, botanists, or ecologists must be consulted prior to the use of burning as a response technique in a wetland. Since every wetland is different in terms of the wetland type, plant species composition, environmental parameters, and the known or estimated tolerance of that type of system to physical and chemical disturbances
- It is important to attempt to record pre and post-burn observations to evaluate the effectiveness of the remedy and to support the selection of this method at other sites. These observations could include: extent of oiling, amount of water on surface, soil and vegetation types, duration of burn, soil conditions, amount of oil remaining, and area burned
- Biological monitoring of burned areas should be conducted to determine effects on faunal communities residing within burn areas.

Safety Considerations

Because of the intense heat generated by burning oil and plant matter, the smoke plume will usually rise anywhere from several hundred to several thousands of feet. It will then proceed to level off and be blown by the wind in a narrow, and often meandering band attenuating in accordance with weather conditions at the time. Several parts of the plume occasionally dip back down toward the surface, but the majority of the smoke usually stays well up in the air.

Special Monitoring of Applied Response Technologies (SMART) monitoring by the Atlantic Strike Team and the applicable State Air Quality Department or Division can assist in the evaluation of the burn plan to determine the level of public exposure to

particulates. Concentrations of small particulates in the smoke plume dissipate and are generally with the standard 150 micrograms per cubic meter of air, averaged over 24 hours, within one to three miles from the burn. In most cases, 3 miles from the populated areas is considered to be a reasonably safe distance in case the plume dips down to land.

At night, wind conditions usually are more stable. Burning may be done under stable wind conditions, however data on inversion layers should be known. Optimal wind conditions are 5 to 10 knots, preferably not exceeding 20 knots. Burning may be done with winds exceeding 20 knots; however, the lofting effect will be reduced and the smoke may cling to the ground. This condition is acceptable if the plume is not expected over a population center.

The risk that in-situ burning may pose to the general public located downwind should be considered before any burning is initiated. If the risk is deemed unacceptable, in-situ burning should not be performed. To minimize the risk, sheltering the public in place or evacuating the public should be considered.

Burning must be safe and practical in light of spill status and spill source stabilization. Burning must be compatible with mechanical cleanup operations. It is assumed that the responsible party will implement a site safety work plan with a section specifically addressing in-situ burning. Personnel conducting the burn should be trained, provided the necessary protective equipment, and monitored as needed.

Operational Considerations

The type and condition of the oil must be sufficiently combustible. Very heavy or weathered oils may not support combustion. Some type of wicking agent might be necessary.

State and local air quality regulations for burning must be followed and the appropriate agency must be contacted. Burning may be restricted to daylight hours. It is also recommended to call the Federal Aviation Agency (FAA) with proposed burn times and locations.

SECTION II

Regional Response Team III In-Situ Burn Policy

The RRT III In-Situ Burn Policy is applicable to spill responses under the direct oversight of a FOOSC. This policy authorizes the FOOSC to use in-situ burning as a response countermeasure to an oil discharge when he or she believes it is appropriate after key members of the RRT III have been consulted and concur. In some circumstances this policy is overridden by State laws and in the case of the use of burning agents during in-situ burning, by the NCP (40 Code of Federal Regulations (CFR) 300.910). To the extent that this policy applies, the following summarizes the appropriate situations where concurrence and consultation should take place:

Requirements

The requirements of this policy apply only to responses under the direct oversight of the FOOSC, but its general application is strongly encouraged.

State Approval

The appropriate State's approval is always required. In Region III, the use of in-situ burning in wetlands as a response tool will always be within State waters and inland areas and consequently be subject to State law and policy. The State representative should consider consulting the State Forestry Department or Division, who will often conduct prescribed burns, for assistance in developing the burn plan. The State should also consider consultation with their Wildlife Department or Division to review potentially impacted species.

Department of the Interior Approval

The U.S. Department of Interior (DOI) must also concur with the decision to burn during a spill response overseen by a FOOSC. The responsibility of concurrence is given to DOI because of its authorities, and potential assistance to the FOOSC, regarding the ESA and potential representation of Federally recognized Native American communities. Furthermore, DOI has significant responsibilities as a Federal natural resource trustee.

Department of Commerce/National Oceanic and Atmospheric Administration Approval

As a natural resource trustee, the Department of Commerce (DOC/National Oceanic and Atmospheric Administration (NOAA) should be consulted when considering an in situ burn. Notification should be from the RRT III Co-Chairs via the DOC RRT III member. Additionally, the NOAA Scientific Support Coordinator (SSC) for coastal areas and the Emergency Response Team (ERT) for inland areas could be contacted to assist in the decision-making process.

Native American Community Consultation

Native American community officials must be consulted on any decision to use in-situ burning when a burn would reasonably be expected to impact those designated areas of Native American interests.

Army Corps of Engineers

The U.S. Army Corps of Engineers (ACOE) regulates the introduction of dredge material into marshes, but does not have jurisdiction over cutting or burning of wetlands. No ACOE permit would be required.

Adjoining States and Local Officials

Finally, this approval must also be in concert with adjoining States and local officials with approving jurisdictions, where deemed appropriate or necessary.

Special Note on Notification: *Once notified by the FOSC, DOI must develop and communicate its position on the proposed wetland burn to the FOSC within 4 hours of that notification. The point of contact for the DOI is the Regional Environmental Officer (REO) in Philadelphia who is accessible via cell phone 24 hours a day, 7 days a week. If the FOSC attempts to notify the Philadelphia REO are unsuccessful, the FOSC shall attempt to notify the RRT III DOI alternate representative, i.e., the REO in Atlanta, GA. (also accessible via cell phone 24 hours a day, 7 days a week). In the highly unlikely event that FOSC notification attempts to both REOs fail, or no DOI position is communicated to the cell phone-accessible FOSC within the requisite 4 hours, the FOSC shall document the unsuccessful notification actions and may consider the obligation to seek DOI concurrence on proposed in-situ burning fully satisfied. However, the FOSC remains responsible for complying with applicable consultation and protection requirements contained in the 2001 "Inter-agency Memorandum of Agreement Regarding Oil Spill Planning and Response Activities Under the Federal Water Pollution Control Act's National Oil and Hazardous Substances Contingency Plan and the Endangered Species Act.*

Wetland In-Situ Burn Evaluation Checklist (From RRT III's Regional Contingency Plan)

Purpose and Summary:

The following checklist, created with input from the Region III RRT, provides a summary of important information to be considered by the Unified Command (UC), consisting of the FOSC, state On-Scene Coordinator (SOSC), and responsible party representative (RP) when planning for the use of in-situ burning in response to an oil spill in marine waters of Region III. The document is intended to allow UC verification of a decision, rather than an information distribution sheet or an approval form.

Each section of the checklist provides a series of "limiting factors" questions for each of the decision points on the Region III In-Situ Burning Decision Flowchart. Some sections also contain a "worksheet" for important information that may be necessary to answer limiting factor questions; the user is encouraged to attach forms that already contain this information if they are readily available.

Questions in the limiting factors section that are answered with a "Yes/Optimal" support the decision to conduct an in-situ burn. However, spill response involves numerous tradeoffs, and any less-than-ideal conditions that are represented by a "No/Sub-Optimal" answer may be balanced by other benefits of in-situ burning in a given situation. Not every question of the worksheet must be answered. It is acceptable for the Unified Command to make a decision based on incomplete information, provided the information gaps are understood and considered.

In Situ Burn Decision:

Federal On-Scene Coordinator Decision: _____

Approve Signature: _____

State On-Scene Coordinator Decision: _____

Concur Signature: _____

Responsible Party Decision: _____

Concur Signature: _____

Agency/Contact Concurrence/consultation.

Time/Date Method (verbal, written)

Points of Contact for Checklist

Name	Position	Telephone
Federal		
State		
Responsible Party		
Scientific team		
Other		
Other		
Other		

Incident information (To be completed by Requesting Party)

Incident Name _____

Current date/time _____

Anticipated burn date/time _____

Location of spill (descriptive) _____

Location of burn (descriptive) _____

Type of oil and amount _____

Spill Location/Trajectory (To be completed by Scientific Support Team)

Trajectory (Graphic Attached) _____ Yes _____ No -or- Text:

Overflight Map (Graphic Attached) _____ Yes _____ No -or- Text:

To be completed by OSC representative:

Consultations/Concurrence based on location of approval area of burn _____ Yes, _____ No, Comments:

RRT co-chair concur with burn? _____

State(s) RRT representative concur with burn? _____

Concurrence with DOI RRT representative? _____

Concurrence with NOAA RRT representative? _____

Adjoining RRT consultation/concurrence if burn to impact neighboring Region?

Notifications planned as described in MOU (EPA, DOI, NOAA, State(s))?
Attachments/Additional Information:

To be completed by Scientific Support Team:

Optimal Sub-Optimal Oil Burnability _____
_____ Yes or _____ Probable No or Unlikely Comments:

Anticipate oil to remain ignitable (fresh, not highly emulsified)? _____
Attachments/Additional Information:

To be completed by Scientific Support Team:

Optimal Sub-Optimal _____
Weather Yes _____ or Probable No _____ or Unlikely Comments

Weather forecast precipitation-free (affects ignition)? _____

Winds/forecast winds less than 25 knots? _____

Visibility sufficient for burn operations/observations (greater than 500 feet vertical, 1/2 mile horizontal)? _____
Attachments/Additional Information:

To be completed by Requesting Party:

Optimal Sub-Optimal _____

Operational feasibility _____ Yes or _____ Probable No or _____ Unlikely

Is an operational plan written or in process? (if available, attach) _____

Is needed air support available? _____

Are personnel properly trained, equipped with safety gear, and covered by a site safety plan which specifically address the worker health and safety needs for the ISB?

Are all necessary communications possible? _____

Can all necessary equipment be mobilized during window of opportunity (i.e. fire boom, igniter, tow boats, residue collection equipment)? _____

Can undesirable secondary fires be avoided? _____

Can burn be safely extinguished or controlled? _____

Can aircraft pilots and mariners be adequately notified, as necessary?

Is equipment and personnel available for residue recovery? _____

If ignition from a helicopter, FAA approved equipment? _____

Attachments/Additional Information:

To be completed by OSC/SOSC staff in consultation with meteorologists/modelers as appropriate:

Optimal Condition Sub-Optimal Condition _____

Human and Environmental Impacts _____ Yes or _____ Probable No or
_____ Unlikely Comments

Public exposure to PM-10 (particulates <10µm) not expected to exceed 150 µg/m³ averaged over 1 hour as a result of burn? (current NRT planning guideline)

Can burning be conducted at a safe distance from other response operations, and public, recreational and commercial activities? _____

Is particulate (hour-averaged PM-10) monitoring available? _____

Can public be adequately notified of burn? _____

Trustees consulted if threatened or endangered species in immediate burn area? (If No, explain why consultation did not occur.) _____

Attachments/Additional Information:

Public Health/Plume Worksheet:

Distance / direction to nearest population relative to burn: _____ miles to the _____
(direction)

Distance / direction to nearest downwind population: _____ miles to the _____
(direction)

Forecast wind speed / direction (24 hour): _____ mph from the _____ (direction)

Forecast wind speed / direction (48 hour): _____ mph from the _____ (direction)

Estimated plume trajectory (text or attached graphic): _____

Other comments/issues: _____

Regional Response Team II In-Situ Burning Decision Flow Chart

