

REGION III REGIONAL RESPONSE TEAM

ANNEX I

GUIDANCE TO SUPPLEMENT THE EXISTING MOU

FOR USE OF IN-SITU BURNING

IN OCEAN, COASTAL AREAS

ANNEX II IN-SITU BURNING IN INLAND ZONES, &

ANNEX III IN-SITU BURNING OF HERBACOUS

WETLANDS

Prepared for

Region III Regional Response Team
Spill Response Countermeasures Workgroup

MARCH 14, 2003

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**Region III Regional Response Team
Guidance for In-situ Burn in Ocean and Coastal
Zones, Inland Zones, and Herbaceous Wetlands**

RECORD OF CHANGES (See Attached Revision Log)

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ANNEX I

GUIDANCE FOR USE OF IN-SITU BURNING IN OCEAN AND COASTAL AREAS

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**REGION III
REGIONAL RESPONSE TEAM GUIDANCE FOR
USE OF IN-SITU BURNING
IN OCEAN AND COASTAL AREAS**

INTRODUCTION

This is the Region III Regional Response Team (RRT III) in-situ burn (ISB) guidance for ocean and coastal areas. This guidance enhances, and is a direct extension of, the 1997 Memorandum of Understanding among the U.S. Coast Guard District 5 (USCG), the U.S. Environmental Protection Agency Region III (EPA), the U.S. Department of the Interior (DOI), the U.S. Department of Commerce/National Oceanographic and Atmospheric Administration (DOC) the Delaware Department of Natural Resources and Environmental Control (DE DNREC), the Maryland Department of the Environment (MDE) and the Virginia Department of Environmental Quality (VA DEQ).

This guidance provides clearer and more concise guidance and decision-making tools to the RRT III members and to the Federal OSC with regard to ISB in the case of oil releases to ocean, coastal and inland areas. The guidance enhances the preauthorization for use of ISB by providing a framework for communication and coordination between the members of the RRT III should ISB be required to mitigate an oil release. This guidance does not replace the 1997 MOU, but rather provides additional information to enhance it.

It is structured as five sections. Section I defines the purpose, authority and scope of the guidance. Section II describes the established ocean and coastal water zones for pre-authorized and conditional in-situ burning. Section III contains protocols for conducting in-situ burning, applicable to all open water burns throughout the RRT III region. Section IV contains appendices and includes:

- A regional map showing pre-authorized burn zones. (To be determined by RRT III)
- Separate Letters of Agreement for the coastal states within Region III for which this guidance covers, which establish specific conditions for conducting any in-situ burning inside state areas and for special federally managed areas if applicable. Due to the multitude of DOI-administered properties in Region III, separate Letters of Agreement containing specific conditions for ISB for each DOI Land Manager is impractical and unlikely, thus no Letters of Agreement for DOI have been included.
- The intent of RRT III to adopt the current monitoring program for ISB operations in the RRT III region which is supported by the U.S. Coast Guard National Strike Force.
- ISB equipment lists.
- Decision tree and application/checklist form.

- Guidance covering the conditional use of in-situ burning in response to oil discharges occurring on lands within the jurisdiction of RRT III. This guidance includes protocols under which the Federal On-Scene Coordinator (FOSC) in the Inland Zone may be granted authorization for using ISB.

SECTION I

Purpose

The purpose of this document is to provide guidance to the RRT III for consideration of ISB in response to oil discharges occurring in ocean and coastal areas.

RRT III recognizes that in some instances the physical collection and removal of oil is infeasible or inadequate, and the effective use of in-situ burning as an oil spill response technique must be considered. Pre-authorization within the set guidelines of this guidance allows the FOSC to employ in-situ burning to: (1) prevent or substantially reduce a hazard to human life, (2) minimize the environmental impact of the spilled oil or, (3) reduce or eliminate economic or aesthetic losses which would otherwise presumably occur without the use of this technique.

Authority

Subpart J of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) provides that the FOSC; with the concurrence of the EPA representative to the RRT III, and with the concurrence of the State(s) with jurisdiction over affected areas, and in consultation with the DOC, as well as concurrence authority from DOI trustee representatives to the RRT III, which is derived from the agreement in the Regional Contingency Plan and the 1997 MOU; may authorize the use of in-situ burning on oil spills. Pre-authorization of in-situ burning may be adopted with concurrence from all of the above mentioned RRT III representatives.

Commandant, U.S. Coast Guard, has pre-designated the USCG Captains of the Port as On-Scene Coordinators for coastal oil spills; and has delegated authority and responsibility for compliance with Section 1321 of the Clean Water Act, as amended, to them. The EPA has delegated its authority for authorization of in-situ burning to the EPA representative of the Regional Response Team. RRT III representatives from the DOC, DOI, and the states of Pennsylvania, Delaware, Maryland, Virginia, West Virginia, and the District of Columbia have been delegated authority by their respective agencies or state governments to represent natural resource trustee concerns and to serve as consultants to the FOSC on these matters.

Scope

The USCG, EPA, DOI, District of Columbia, DOC, and the coastal states of RRT III have adopted in-situ burning as an approved tool to remove spilled or discharged oil from ocean and coastal waters within the jurisdiction of RRT III. This agreement covers protocols under which in-situ burning is pre-authorized for use by the USCG FOSC on state and federal coastal and ocean waters.

SECTION II

Pre-authorization of In-situ Burning

The term "in-situ burning" applies to operations conducted for removal of oil by burning. These operations may apply twenty-four (24) hours per day. In-situ burning operations will be conducted within the jurisdiction of the RRT III region in accordance with the MOU and this guidance and, in addition, where applicable, in accordance with protocols established in Letters of Agreement (LOA) between the USCG, EPA, DOI, DOC, and the affected state(s). The authority to authorize the use of in-situ burning provided under this guidance to the USCG FOSC may not be delegated. The following three zones have been established to specify pre-authorized locations and conditions under which burning may occur:

1) "A" ZONES -- PRE-AUTHORIZATION FOR OPEN-WATER BURNING

The "A" zone is defined as any area in Region III, falling exclusively under federal jurisdiction; and not classified as a "B", or "R" zone; which is at least 3 miles seaward from any state coastline; and seaward of any state waters, or as designated by separate LOAs with each individual state, the USCG, EPA, DOI, and DOC. In the event that state jurisdiction extends beyond 3 miles from a state shoreline, pre-approval for the "A" zone applies only to those areas outside state jurisdiction unless an LOA is in place and specifically pre-authorizes in-situ burning within those state waters.

Within "A" zones, the USCG, EPA, DOC, DOI, and the state(s) agree that the decision to use in-situ burning rests solely with the pre-designated USCG FOSC, and that no further approval, concurrence or consultation on the part of the USCG or the USCG FOSC with EPA, DOC, DOI, or the state(s) is required.

The USCG agrees with EPA, DOC, DOI, and the state(s) that the USCG will immediately notify said agencies and affected state(s) of a decision to conduct burning within the "A" zone, via RRT III representatives.

2) "B" ZONES -- WATERS REQUIRING CASE-BY-CASE APPROVAL

A "B" zone is defined as any area in the RRT III region falling under state or special management jurisdiction which is not classified as an "A", or "R" zone.

"B" zones are all areas falling: 1) anywhere within state waters, 2) waters designated as a marine reserve, National Marine Sanctuary, National or State Wildlife Refuge, unit of the National Park Service, proposed or designated Critical Habitats, Habitat areas of particular concern and 3) Coastal wetlands include aquatic vegetation and algal beds.

Where a LOA is in effect between the USCG, EPA, DOI, DOC, and the affected state(s); the guidance for pre-authorization established under the provisions of said LOA shall preempt the guidance herein established for zones otherwise designated as falling in the "B" zone.

Established LOAs are provided in Appendix II of this document. In the event that a Letter of Agreement is not in effect for areas falling within the "B" zone, the following protocols shall

apply:

- a) If the FOSC feels that in-situ burning should be used in areas falling in a "B" zone, a request for authorization must be submitted to the RRT and the affected state(s), along with the required information listed in the in-situ burning Application/Checklist form, found in Appendix VI.
- b) The FOSC's decision to use in-situ burning shall be made after consulting with RRT III representatives of state and federal trustee agencies to ensure that the best available information pertaining to the presence or absence of natural resources at the burn site is obtained.
- c) The FOSC is only granted authority to conduct in-situ burning in the "B" zone when consent has been given by EPA and the affected state(s) and after concurrence from DOI and consultation with DOC.
- d) The RRT III designated agency representatives with authority, pursuant to the NCP, RCP, and 1997 MOU, to authorize ISB will respond to the FOSC's request for authorization to burn in zone "B" within a maximum of four hours from time the FOSC has established deliberative communication with the designated agency representative. If the RRT III has not responded to a request for authorization to burn in zone "B" within four hours, then the FOSC may proceed with ISB operations.

The USCG agrees with EPA, DOC, DOI, and the state(s) that the USCG will immediately notify said agencies and affected state(s) of a decision to initiate an approved burn within a "B" zone via RRT III representatives.

3) "R" ZONES -- EXCLUSION ZONES

An "R" zone is defined as any area in the RRT III region falling under state or special management jurisdiction which is not classified as an "A" or "B" zone.

The "R" zone is that area designated by the RRT III as an exclusion zone. No in-situ burning operations will be conducted in the "R" zone unless: 1) in-situ burning is necessary to prevent or mitigate a risk to human health and safety; and/or, 2) an emergency modification of this agreement is made on an incident-specific basis.

RRT III currently has not designated any areas as "R" zones but retains the right to include areas for exclusion at a future point in time if it feels this is warranted.

SECTION III

Protocols

The following requirements apply to the use of all burning operations under the provisions of this guidance:

1. **Health and Safety Concerns -- Operators:** Assuring workers' health and safety is the responsibility of employers and the USCG FOSC who must comply with all Occupational Health and Safety Administration (OSHA) regulations. Prior to any ISB operations, a site safety plan must be submitted and approved by the FOSC and coordinated with the affected land manager. **Public:** The burning should be stopped if it is determined that it becomes an unacceptable health and/or safety hazard due to operational or smoke exposure concerns to responders or the general public. If at any time, exposure limits are expected to exceed national federal air quality standards in nearby populated areas, as a result of in-situ burning operations, then in-situ burning operations will immediately cease. The Level of Concern (LOC) for particulate for the general public in the RRT III region is 150 ug/m³ (PM-10) averaged over 1 hour.
2. Monitors representing the USCG, EPA, federal trustee agencies, the affected state(s), OSHA, and the responsible party will have the opportunity to observe in-situ burning operations. Monitoring to establish "Continue/Discontinue" data for input to the FOSC will be conducted in accordance with protocols established by the Region III Regional Response Team and as outlined in the monitoring program contained in Appendix VI. Unless smoke plumes are predicted to cross overpopulated or environmentally sensitive areas, an inability to conduct monitoring operations will not be automatic grounds for discontinuing or prohibiting ISB operations. All burns must incorporate visual monitoring at the burn site to record the disposition of burn residues and to monitor the burn site for potential impact to any natural resource in the area. Samples of the residue will be collected if feasible.
3. Prior to any in-situ burning operations, the FOSC will apply the decision tree contained in Appendix VI.
4. The Application/Checklist form in Appendix VI shall be completed for all burns and provided to RRT III members in a timely manner for documentation and informational purposes.
5. The USCG will make every reasonable effort to continuously evaluate the decision to burn and allow RRT agencies and affected state(s) the opportunity to comment. Formal requests to discontinue a burn should be presented, in writing, to the FOSC for consideration.
6. Burning will be conducted in a way that allows for effective control of the burn, to the maximum extent feasible, including the ability to rapidly stop the burn if necessary. Contained and controlled burning is recognized as the preferred method of burning using fire-resistant boom. All practical efforts will be made to control and contain the burn and

prevent accidental ignition of the source. Generally, it is not recommended that the source or adjacent unconfined slicks be allowed to ignite during in-situ burning operations. Certain circumstances, however, may warrant consideration of carefully planned source ignition.

7. Mechanical recovery equipment shall be mobilized on-scene, when feasible, for backup and complimentary response capability. Provisions must be made for collection of burn residue following the burn(s). Residue collection efforts could compact soils, change topography and interfere with natural regeneration of wetland plants. The FOSC should consult with the natural resource trustees on how best to collect burn residue in environmentally sensitive areas.
8. In-situ burning will be conducted in accordance with any consultations approved by the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS), under Section 7 of the Endangered Species Act. Prior to beginning an ISB, a survey will be conducted to determine if any threatened or endangered species are present in the burn area or otherwise at risk from any burn operations, fire, or smoke. Appropriate natural resource specialists, knowledgeable with any special resource concern in the area and representing the resource trustee, will be consulted prior to conducting any ISB. Measures will be taken to prevent risk of injury to any wildlife, especially endangered or threatened species. Examples of potential protection measures may include: moving the location of the burn to an area where listed species are not present; temporary employment of hazing techniques, if effective; and physical removal of individuals of listed species only under the authority of the trustee agency. A survey may not be necessary if USFWS and NMFS records indicate that the burn and adjacent areas do not contain federally listed species, or lack the appropriate habitat. USFWS and/or NMFS will be contacted in order to decide if a survey is necessary.
9. In-situ burning is advised only when the meteorological and sea conditions are operationally favorable for a successful burn. The FOSC will give due consideration to the direction of the wind, and the possibility of the wind blowing precipitate over population centers or sensitive resources onshore. A safety margin of 45 degrees of arc on either side of predicted wind vectors should be considered for shifts in wind direction.
10. Any use of in-situ burning requires that a post-incident report be provided by the FOSC, or a designated member of the FOSC's staff, within 45 days of conclusion of in-situ burning operations. Recommendations for changes or modification to this guidance should be presented in the report, if appropriate. This report will be presented at a Region III RRT meeting, if requested by the RRT.
11. In emergency situations (human health or safety at immediate and serious risk), there may not be ample time to prepare a written document and submit it to the FOSC requesting that a burn be stopped. Verbal cease burn requests may be accepted in emergencies, but must be followed by an immediate written confirmation.

SECTION IV

Appendices

- I. Region III Area Zone Map**
- II. Letters of Agreement**
- III. Decision Tree, Application/Checklist**
- IV. ISB Monitoring Program Within Region III**
- V. Equipment Lists**

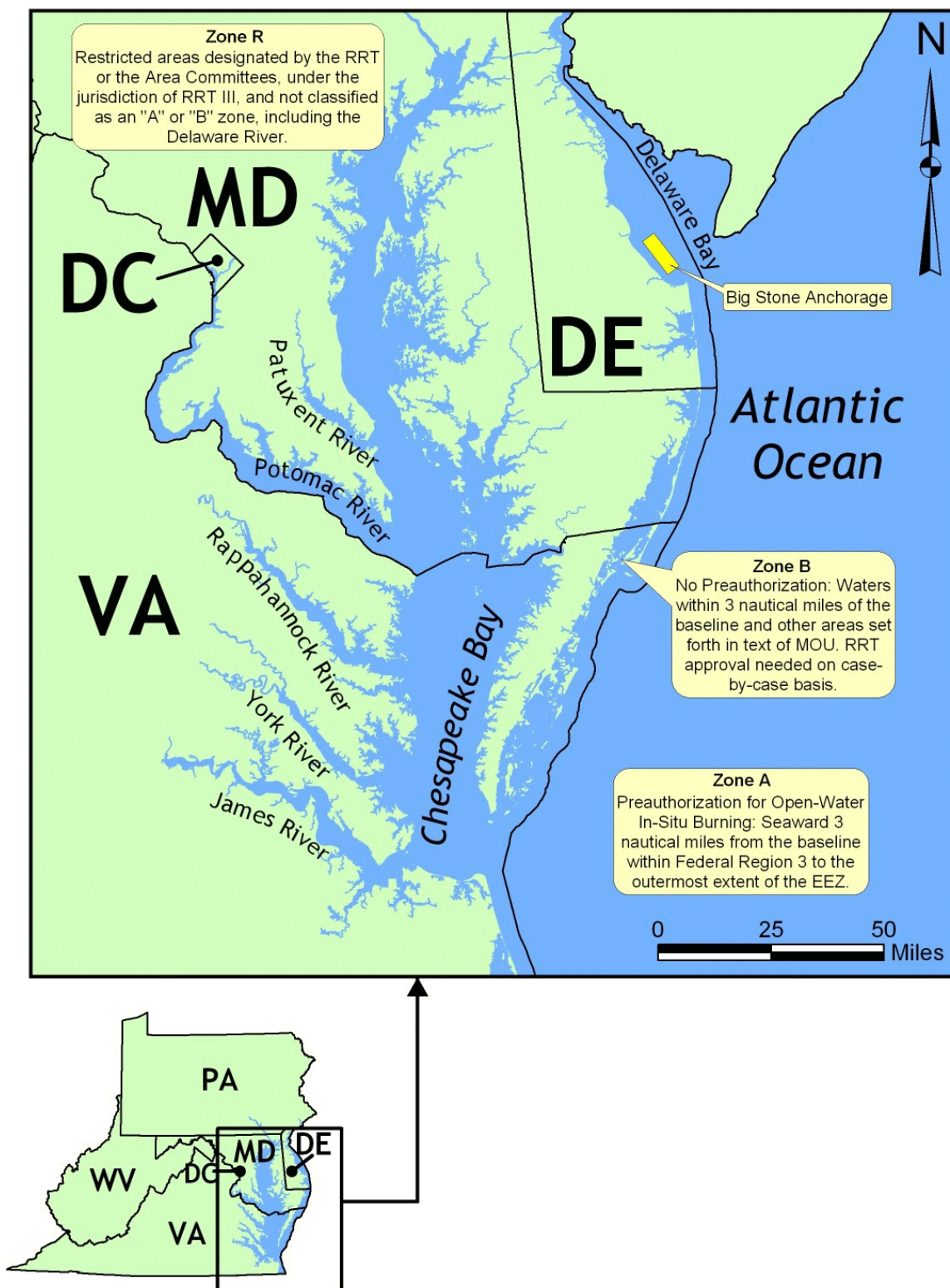
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APPENDIX I

REGION III AREA ZONE MAP

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ZONES WITHIN REGION III



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APPENDIX II

LETTERS OF AGREEMENT

Region III does not currently have Letters of Agreement between USCG, EPA, DOI, DOC, and the States. This Appendix is reserved for future Letters of Agreement.

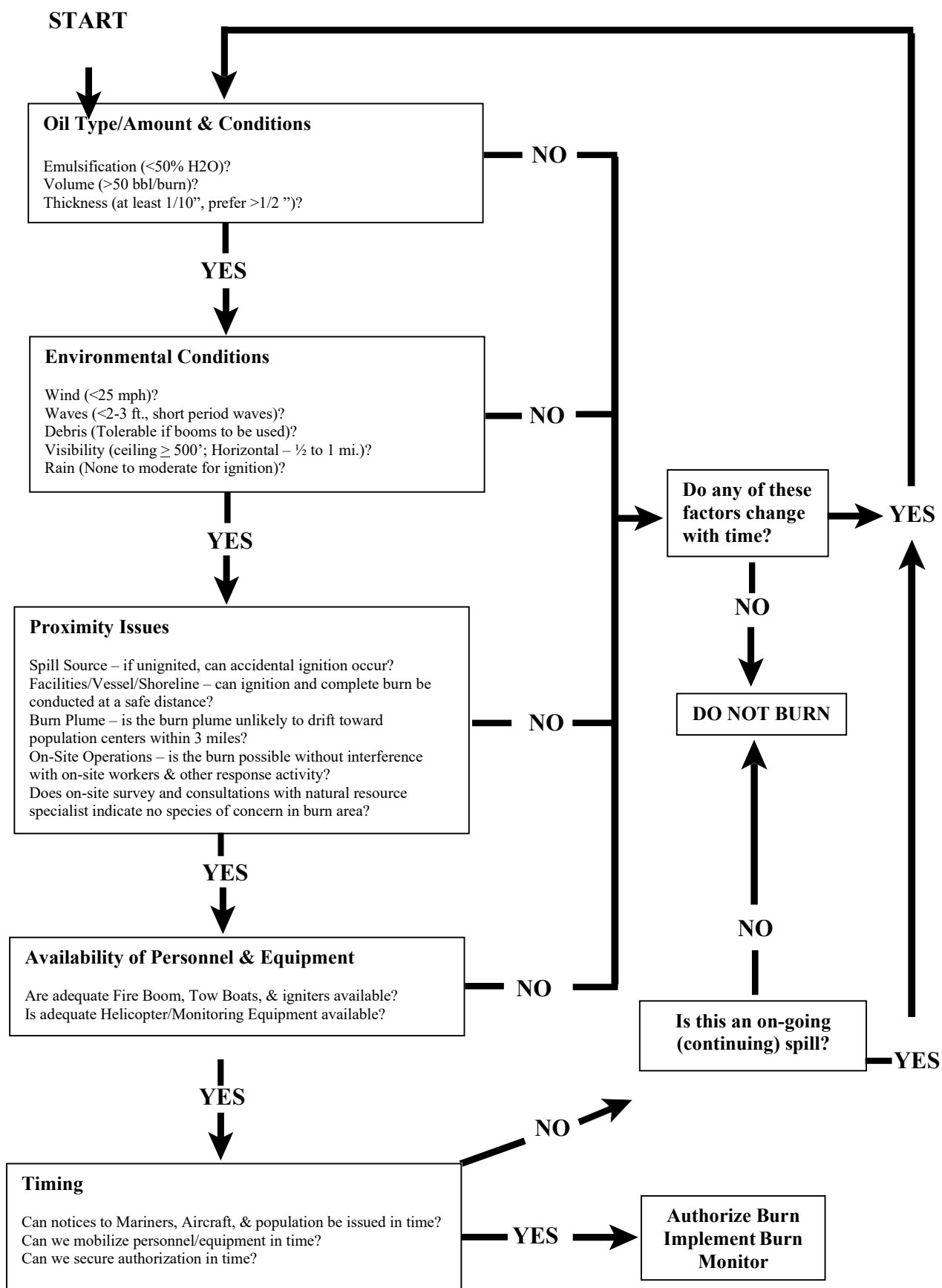
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APPENDIX III

DECISION TREE AND APPLICATION/CHECKLIST FORMS

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Decision Tree



OIL SPILL RESPONSE APPLICATION/CHECKLIST: IN-SITU BURNING

The following checklist is provided as a summary of important information to be considered by the Federal On-Scene Coordinator (FOSC) in reviewing any request to conduct in-situ burning in response to offshore oil spills within the Region 3 Regional Response Team area. This information shall be provided prior to approval of in-situ burning in all zones that are not pre-authorized. The information must be recorded for information and documentation purposes for any offshore ISB.

1. SPILL DATA (To be completed by Responding Party and submitted to OSC)

- A. Name of incident: _____
- B. Date and time of incident: Month/Day/Year_____Time _____
- C. Incident: Grounding_____Transfer Operations_____Collision_____
Blowout_____Pipeline Rupture_____Explosion_____Other _____
- D. Did spill source ignite? Yes_____ No_____
- Is source still burning? Yes_____ No_____
- E. Spill Location: Latitude_____Longitude _____
- F. Distance (in miles) and direction to nearest land: _____
- G. Product(s) released: _____
- H. Product(s) easily emulsified? Yes _____ No _____ Uncertain _____
- I. Product(s) already emulsified upon release? No _____
- Light emulsion (0-20%) _____ Moderate emulsion (21-50%) _____
- Heavy emulsion (>51%) _____ Unknown _____
- J. Estimated volume(s) of product released: _____gals / bbls
- K. Estimated volume(s) of product that could still be released:
- _____gals _____ bbls _____
- _____gals _____ bbls _____
- L. Release status: Continuous _____ Estimated Rate _____
- Intermittent _____
- One time only ("batch" spill); flow now stopped _____

M. Estimated area of spill:

Approx. Date/Time_____ Surface Area_____Sq. Miles (Stat Naut.) Approx.
Date/Time_____ Surface Area_____Sq. Miles (Stat Naut.) Approx.
Date/Time_____ Surface Area_____Sq. Miles (Stat Naut.)

2. WEATHER AND WATER CONDITIONS AT TIME & LOCATION OF SPILL (To be completed by Responding Party and submitted to FOSC)

- A. Temperature: Air_____ (deg. F) Water_____ (deg. F)
- B. Weather: Clear _____ Partly Cloudy _____ Heavy Overcast _____
Rain _____ (heavy _____ moderate _____ light _____)
Fog _____ (type & amount at spill source _____)
(type & amount at burn site _____)
Air Quality/Ozone Alert Status (if applicable) _____
- C. Tidal Condition: Slack Tide _____ Flood _____ Ebb _____
- D. Dominant Surface Current (net drift):
Speed _____ (knots)
Direction (to) _____ (True compass heading)
- E. Wind Speed: _____ knots Wind Direction (from) _____
- F. Expected transition time between on-shore & off-shore breeze

- G. Sea State: Flat Calm _____ Light Wind-Chop _____
Wind-Waves: <1 ft _____ 1-3 ft _____ >3 ft _____
Swell (est. height in ft) _____
- H. Water Depth (in feet): _____
- I. Other Consideration:
General Visibility _____
Rip Tides/Eddies _____
Floating Debris _____
Submerged Hazards _____

Notes: See Section II Part I for weather and water conditions
forecast (to be completed by NOAA Scientific Support
Coordinator) See Section III Part II for predicted oil
behavior (to be completed by NOAA SSC)

Responding party has option of also submitting information on predicted oil behavior to OSC.

3. PROPOSED BURNING PLAN (To be completed by Responding Party)

A. Location of proposed burn with respect to spill source:

B. Location of proposed burn with respect to nearest ignitable oil slick(s):

C. Location of proposed burn with respect to nearest land:

D. Location of proposed burn with respect to commercial fishing activity, vessel traffic lanes, drilling rigs and/or other marine activities/facilities:

E. Risk of accidental (secondary) fires:

F. Risk of reducing visibility at nearby airstrip(s) or airport(s):
(Coordinate with local FAA Flight Service Station, if applicable)

G. Distance to, location and type of nearest population center(s) (e.g., recreational site, town, city, etc.):

H. Methods that will be used (prior to ignition) to notify residents in areas where smoke could conceivably drift into or over such areas (notify local Air Quality representative):

I. Type of igniter proposed for use:

J. Helicopter(s) needed to deploy igniters? No _____ Yes _____
Name of company and type of helicopter to be used:

FAA approval already granted to company for use of igniter:

Yes _____ No _____

Awaiting FAA approval or verification of prior approval _____

K. Burning promoters or wicking agents proposed for use?

Yes _____ No _____

If yes, give type and amount: _____

L. Describe proposed method of deployment for igniter(s)

Burning Promoter(s):

Wicking Agent(s):

M. Describe method for oil containment, if any:

N. Proposed location of oil containment relative to spill source:

O. Proposed burning strategy:

_____ Immediate ignition at or near source

_____ Ignition away from source after containment and movement to safe location

_____ Ignition of uncontained slick(s) at a safe distance

_____ Controlled burning in boom or natural collection site at/near shore

_____ Possible need for multiple ignition attempts

P. Estimated amount of oil to be burned:

Q. Estimated duration of each burn: _____

Total possible burn period: _____

R. Estimated smoke plume trajectory:

S. Method for collecting burned oil residue:

T. Proposed storage & disposal of burned oil residue:

4. **WEATHER AND WATER CONDITION FORECAST FROM TIME OF SPILL (To be completed by NOAA SSC)**

A. Wind Speed (knots):
24-hour projection: _____
48-hour projection: _____

B. Wind Direction (from):
24-hour projection: _____
48-hour projection: _____

C. Sea Condition:
24-hour projection:

Flat Calm _____ Light Wind-Chop _____
Wind-Waves: <1 ft _____ 1-3 ft _____ >3 ft _____

Swell (est. height in ft) _____

48-hour projection:

Flat Calm _____ Light Wind-Chop _____
Wind-Waves: <1 ft _____ 1-3 ft _____ >3 ft _____

Swell (est. height in ft) _____

D. Tidal Information:

Date _____ High (time/height) _____ / _____
Low (time/height) _____ / _____

Date _____ High (time/height) _____ / _____
Low (time/height) _____ / _____

Date _____ High (time/height) _____ / _____
Low (time/height) _____ / _____

Date _____ High (time/height) _____ / _____
Low (time/height) _____ / _____

E. Predicted Dominant Current (net drift):

Speed (knots): _____ Direction (to): _____

5. PREDICTED OIL BEHAVIOR (To be completed by NOAA SSC)

A. Unburned Oil Forecast:

Estimated trajectory (attach sketch if necessary):

B. Expected area(s) and time(s) of land fall:

Location	_____	Date/Time	_____
Location	_____	Date/Time	_____
Location	_____	Date/Time	_____
Location	_____	Date/Time	_____

C. Estimated percent naturally dispersed and evaporated:

Within first 12 hours: _____

Within first 24 hours: _____

Within first 48 hours: _____

6. RESOURCES AT RISK (To be completed by resource agencies)

A. Habitats

Sheltered Tidal Flats	_____
Coastal Marshes	_____
Critical Habitats	_____

B. Biological Resources

Are marine mammals, turtles, or concentrations of birds noted in the burn area?

Yes _____ No _____

Endangered/Threatened Species

Non-Endangered/Threatened Species

Are federally-listed plants, insects and invertebrates noted in the burn area?

Yes _____ No _____

Endangered/Threatened Species

Non-Endangered/Threatened Species

C. Historic and Archaeological Resources

D. Commercial Harvest Areas

7. ON-SCENE COORDINATOR'S EVALUATION OF RESPONSE OPTIONS (To be completed by OSC)

- A. Is in-situ burning likely to result in the elimination of significant volumes of spilled oil?

Yes _____ No _____

- B. Will the use of in-situ burning interfere with (or in any way reduce the effectiveness of) mechanical recovery and/or dispersant application?

Yes _____ No _____

Can in-situ burning be used safely, and with an anticipated overall reduction in environmental impact (compared with the decision not to burn)?

8. ON-SCENE COORDINATOR'S DECISION REGARDING IN-SITU BURNING (To be completed by FOSC)

- B. _____ Do not conduct ISB
- C. _____ ISB may be conducted in limited or selected areas
- D. _____ ISB may be conducted as requested

Note: If the OSC approves of in-situ burning, local media and residents in areas within the potential smoke plume trajectory must be notified prior to initiating the burn.

Signature of OSC: _____

Printed Name of OSC: _____

Time and Date of Decision: _____

Concurrence of DOI (If ISB is considered in B and R Zones): _____

Time and Date of Concurrence: _____

APPENDIX IV

ISB MONITORING PROGRAM WITHIN REGION III

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ISB Monitoring Program within Region III

In-situ burning means the controlled burning of oil "in place." While this technique requires specialized equipment, it requires less labor than most other techniques and can be applied in areas where other methods cannot be used. In-situ burning is subject to some of the same limitations as mechanical removal; since a boom is used to contain the oil, the same wind and sea limitations apply. Burning can quickly remove large quantities of oil, and the need for recovery and storage is minimized.

In-situ burning of oil primarily produces carbon dioxide and water vapor. About 90% to 95% of the carbon product is released to the atmosphere as carbon dioxide, while particulates commonly account for about 5% to 10% of the original volume burned. In addition, about half of the particulates are soot. Soot is responsible for the black appearance of the smoke plume. Gaseous pollutants are emitted, such as carbon monoxide, sulfur dioxide, and nitrogen, in minor amounts. Some polynuclear aromatic hydrocarbons (PAHs) are emitted. The amount released is less than the amount in the original oil.

The Region III RRT has adapted the current USCG National Strike Force monitoring program for ISB operations to allow for timely utilization of this response tool and to ensure the availability of the monitoring results to the FOSC and the Federal, State, and Tribal Trustees involved in the response. This program is designed for assets and logistical capabilities that are provided in this region by the scientific support team.

The USCG National Strike Force has been chosen for this task because of their proven ability to quickly respond to the FOSC's technical needs during an oil spill incident with properly trained and equipped personnel and logistical support. Having a government agency accomplish this task is partially dictated by the operational need for such monitoring data sets to remain in the public domain in order to insure timely availability and objective presentation of the data to the FOSC.

The USCG National Strike Force will perform the actual on-site monitoring to collect the raw data with the guidance of the scientific support team. The scientific support team will assist in monitoring, analysis of the data, and forwarding of the results to the FOSC in a timely manner.

The monitoring program is designed to enhance the decision making process undertaken by the FOSC during the use of in-situ burning in fulfillment of his/her responsibility to insure appropriate and timely response to mitigate the effects of oil spills, as established by the Clean Water Act and defined by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. This monitoring program is established to attempt to provide the FOSC with logical "Continue/Discontinue" input during actual operations involving in-situ burning.

Since the monitoring protocols are constantly undergoing revision and change due to improvements and enhancements made to the available technology and monitoring practices, the actual monitoring procedures and process are held under separate cover; however, a general description of the ISB monitoring process is provided in the following paragraphs.

The use of optional response technologies, such as dispersants and in-situ burning among others,

needs to be monitored while the operation is underway. Region III has adopted the Special Monitoring of Advanced Response Technologies (SMART) as the program that will be implemented whenever an in-situ burning, dispersant operation is authorized in Region III. SMART establishes monitoring protocols for advanced or optional response technologies used in an oil spill. However, those operations will not be delayed pending availability of personnel or equipment needed to operate SMART.

SMART will be continually updated as more information becomes available, especially as decisions are made to use other chemical technologies. Until SMART contains protocols for other chemical countermeasures, Region III used the monitoring guidance contained in Vol. 1 of the Job Aid for Spill Countermeasure Technologies.

The purpose of the SMART is to establish a system for: (1) rapid collection of scientifically-based information that provides the Unified Command with a measure of the success of an advanced response technology, and (2) improving our knowledge and sharing information about them. The SMART program mandate is to identify the best response personnel, equipment and methods that meet the scientific and operational demands of an oil spill response. SMART modules are designed to assist and not hinder the response decision-making process. The SMART might be modified, depending upon the incident-specific conditions and concerns.

A more detailed description of the SMART process can be found at the National Oceanographic and Atmospheric Administration's website, at the following location:

<http://response.restoration.noaa.gov/oilaid/SMART/SMARTtour/SMARTtour.html>

APPENDIX V

EQUIPMENT LISTS

In-Situ Burn equipment for Regions II and III is housed and managed by NRC and MSRC in their Clermont and Perth Amboy New Jersey locations.

NRC:

Fire Boom System	EL-FB-02	500 ft	NRC	Clermont	NJ
Fire Boom System	EL-FB-03	500 ft	NRC	Clermont	NJ

Sub Total Fire Boom: 1000 ft

MSRC:

Fire Boom System		500 ft	MSRC	Perth Amboy	NJ
Fire Boom System		500 ft	MSRC	Perth Amboy	NJ

Sub Total Fire Boom: 1000 ft

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ANNEX II

GUIDANCE FOR USE OF IN-SITU BURNING IN THE INLAND AREAS

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In-Situ Burning in the Inland Zone

The USCG, EPA, DOI, DOC, and the states have adopted in-situ burning as a tool to remove spilled oil from inland waters and lands within the jurisdiction of RRT III. For the purposes of this guidance, the Inland Zone is comprised of all non-coastal land areas, not including coastal marine estuaries, and land areas which fit the description given in 40 CFR 300.5, specifically *"the environment inland of the coastal zone excluding the Great Lakes and specified ports and harbors on inland rivers."* The precise boundaries of the Inland Zone are determined by agreements between the EPA and the USCG.

Description

- This guidance covers the case-by-case use of in-situ burning in response to oil discharges occurring on inland waters and lands within the jurisdiction of the RRT III. This guidance includes protocols under which the FOSC in the inland zone may be granted authorization for using ISB.

Authority Required

- The FOSC, with the concurrence of the EPA, DOI and the USCG representatives to the RRT III, and with the concurrence of the state(s) and tribe(s) with jurisdiction over affected resources, and in consultation with the land manager/owner (private, state, federal), and DOC trustees' representatives to the RRT III, may authorize the use of ISB on oil spills.
- The FOSC must complete the Region III Inland ISB Evaluation and Response Checklist and submit it to RRT III for approval.

General Application Requirements

- ISB will be allowed only when it may enhance overall cleanup or protection efforts; or, after mechanical recovery is shown to be inadequate, infeasible, or may cause unacceptable additional impact to sensitive resources and habitats.
- Burn residue may need to be collected and disposed of following a burn. If this is the case, provisions must be made for collection and disposal of burn residue following the burn. Attachment 1 describes factors that may determine whether residue sinks or floats.
- ISB will be allowed only under the direction of a fire ecologist/practitioner. Burning will be conducted utilizing safe fire management techniques. All practical efforts will be made to control and contain the burn and prevent accidental or unplanned ignition of adjacent areas.
- ISB will occur primarily in wetland areas, inland waters, agricultural lands, lands void of vegetation, and grasslands. Burning will not occur in bottom land hardwood swamps or in forested areas unless otherwise recommended by the fire ecologist, the land manager/owner, and approved by the RRT.

Prior to ISB:

- 1) An aerial, on water, and or ground survey as appropriate will be conducted to determine if threatened or endangered species and state listed species are present in the burn area or otherwise at risk from ISB operations. Appropriate specialists knowledgeable of threatened and endangered species and habitats in the area, will be consulted prior to conducting any ISB, and the conduct of surveys for the presence of federally listed species will be coordinated with the USFWS and the NMFS and state listed species with the appropriate state office. A survey may not be necessary if USFWS and NMFS and state records indicate that the burn and adjacent areas do not contain federally or state listed species or lack the appropriate habitat. USFWS and/or NMFS and States will be contacted in order to decide if a survey is necessary.
 - 2) Compliance with the 1997 Programmatic Agreement on the Protection of Historic Properties during Emergency Response Under the NCP will occur.
 - 3) The DOI, where appropriate, may assist with monitoring the effects of in-situ burning on biota.
- Any use of in-situ burning requires that a post-incident report be provided by the FOSC, or a designated member of the FOSC's staff, within 45 days of conclusion of in-situ burning operations.
 - Residue collection efforts could compact soils, change topography and interfere with natural regeneration of wetland plants. The FOSC should consult with the natural resource trustees on how best to collect burn residue in environmentally sensitive areas.

Health and Safety Issues

- The FOSC will notify and receive concurrence from adjacent land managers/owners and/or DOI land managers that administer properties adjacent to any ISB operation, prior to any ISB operation. The FOSC will also coordinate with State Air Quality representatives (State OSC or Regional Emergency Response Program Manager, or designee) in situations where ISB may occur in a designated Air Basin or outside of an Air Basin where smoke and/or odors may cross property lines.
- Operators: Assuring workers' health and safety is the responsibility of employers and the FOSC who must comply with all Occupational Safety and Health Administration (OSHA) regulations. Prior to any ISB operations, a site safety plan must be prepared and approved by the FOSC.

Public: The burning should be stopped if it is determined that it becomes an unacceptable health hazard due to operational or smoke exposure concerns to responders or the general public. If at any time, exposure limits are expected to exceed national federal air quality standards in nearby populated areas, as a result of in-situ burning operations, then in-situ burning operations will immediately cease. The Level of Concern (LOC) for particulates for the general public is 150 ug/m³ (PM-10) averaged over 1 hour.

- Burning will occur at a minimum of three miles from sensitive human population centers (i.e., hospitals, schools, day care, retirement, nursing homes). The FOSC will give due consideration to the direction of the wind, and the possibility of the wind blowing precipitate over population centers or sensitive resources. A safety margin of 45 degrees of arc on either side of predicted wind vectors should be considered for shifts in wind direction.

When to Use

- Consider in-situ burning under these conditions:
 - To remove oil to prevent it's spread to sensitive sites or over large areas.
 - To reduce the generation of oily wastes, especially where transportation or disposal options are limited.
 - Where access to the site is limited by shallow water, soft substrates, thick vegetation, or the remoteness of the location.
 - As a removal technique, when other methods begin to lose effectiveness or become too intrusive.
- Favorable conditions include:
 - Remote or sparsely populated sites (at least 3 miles from populated areas).
 - Fresh crudes or light/intermediate refined products which burn more readily and efficiently.
 - Mostly herbaceous vegetation, though some shrubs and trees are fire tolerant.
 - Areas void of vegetation, such as dirt roads, ditches, dry streambeds, idle cropland.
 - In wetlands, with an adequate water layer (at least 1") covering the substrate (prevents thermal damage to soil and roots and keeps oil from penetrating substrate). However, a water layer is not mandatory, at a minimum, the soils should be water saturated (at least 70%).

Limiting Factors/Environmental Constraints

- Heavy, weathered, or emulsified oils may not ignite.
- A crust or residue is often left behind after burning and may need to be broken up or removed to speed restoration.

- Prolonged flooding of a burned wetland may kill surviving plants if they are completely submerged.
- Erosion may be a problem in burned areas if plant cover is reduced; short-term erosion control measures may be needed.
- The site may need protection from overgrazing, especially since herbivores may be attracted to new growth at burned sites.
- Thickness of the oil to be burned must be 2 to 3 mm.

Monitoring

- Monitoring in-situ burning for effectiveness is the responsibility of the FOSC; monitoring for effects on biota may be conducted by the trustees.
- All burns must incorporate visual monitoring at the burn site for safety and fire control and to record the disposition of burn residue. The burn site will be monitored for potential impact to natural resources in the area. Samples of the residue will be collected if feasible.
- Monitoring to establish "Continue/Discontinue" data for input to the FOSC will be conducted utilizing a tiered approach as outlined in the plan. An inability to conduct monitoring operations, except for visual monitoring, will not be grounds for discontinuing or prohibiting ISB operations.
- Describe and photograph the burn site before and after the burn, record detailed information on the burn, including duration, residue type and volume, water depth before/after the burn, visible impacts, post-burn activities (e.g., residue removal methods), restoration efforts and results, etc.

Waste Generation and Disposal Issues

- In-situ burning should significantly reduce the amount of oily wastes generated. Burn residue that is collected must be properly disposed of after the burn is completed.

Attachment 1

Residues from In-Situ Burning of Oil

Results from larger-scale laboratory and meso-scale field tests suggest that the most important factors determining whether an ISB residue will float or sink are:

1. Water Density

Burn residues that are denser than the receiving waters are likely to sink. The density of fresh water is 0.997 g/cm³ at 25 degrees Celsius, and the density of seawater is 1.025 g/cm³.

2. Properties of the Starting Oil

Studies predict that burn residues will sink in sea water when the burned oils have a) an initial greater density than about 0.0865 g/cm³ (or API gravity less than about 32) or b) a weight percent distillation residue (at >1000 F) greater than 18.6%. When these correlations are applied to 137 crude oils, 38% are predicted to sink in seawater, 20% may sink, and 42% will float.

3. Thickness of the Oil Slick

Residues from burns of thick crude oil slicks are more likely to sink than residues from burns of thin slicks of the same crude oils, because higher-molecular weight compounds concentrate in the residue as the burn progresses.

4. Efficiency of the Burn

Factors affecting burn efficiency include original slick thickness, degree of emulsification and weathering, areal coverage of the flame, wind speed, and wave choppiness. For efficient burns, removal efficiencies are expected to exceed 90% of the collected and ignited oil. Rules of thumb for predicting residue thickness are:

- Un-emulsified crude oil up to 10-20mm thick, residue will be about 1mm thick.
- Thicker slicks result in thicker residues (up to 3-6mm thick).
- Emulsified oils can produce much thicker residues.
- Light/medium refined products, the residue will be about 1mm thick, regardless of slick thickness.
- Burn residues sink only after cooling. Models of cooling rates predict that ambient water temperature will be reached in less than five minutes for 3mm-thick residues, and in 20-30 minutes for 7mm-thick residues.

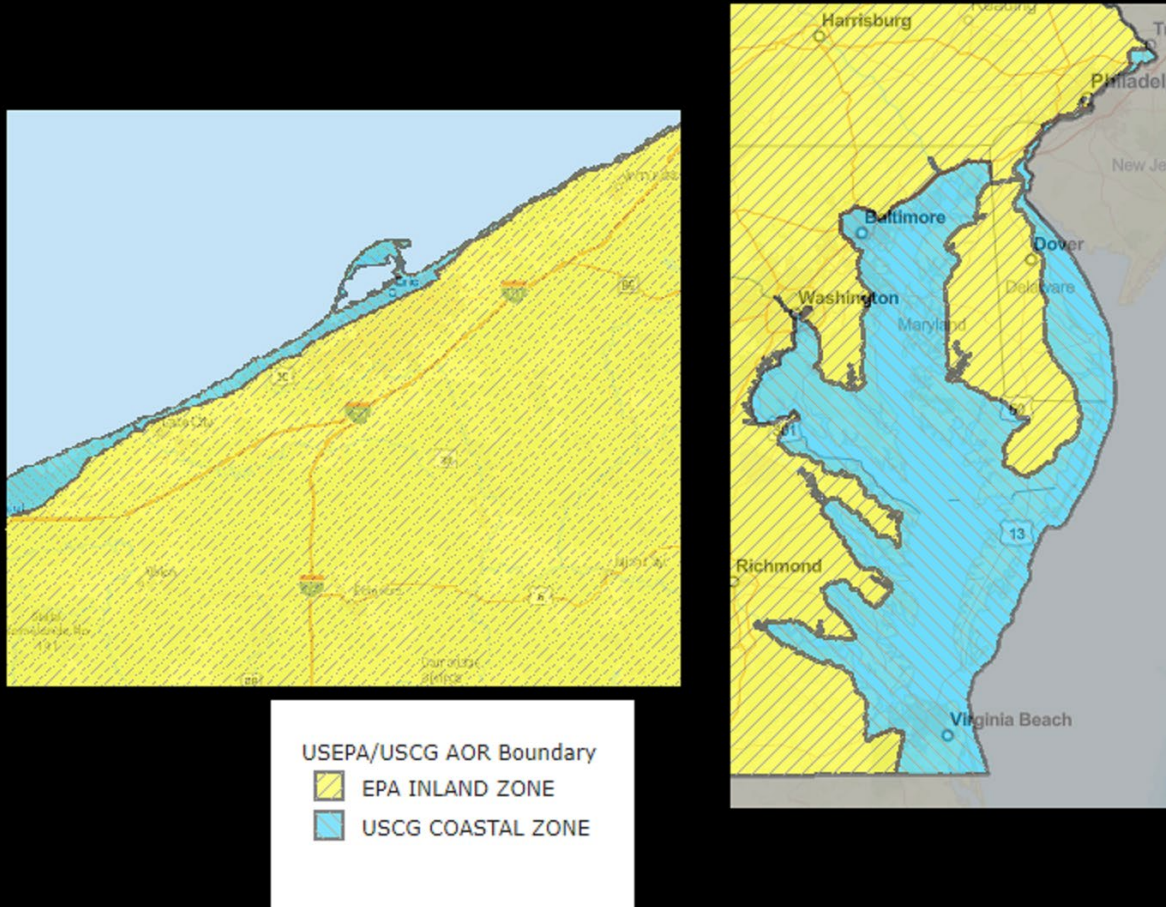
Attachment 2

Emission Rates from the NOBE Test Burns and Other Known Sources.

Substance	Average Emission Factor for NOBE (g/kg, fuel burned)	Emission Rate (kg/hr)	Comparable Emissions from Other Known Sources
CO ₂	2,800	75,600	approx. 2-acre slash burn
CO	17.5	470	approx. 0.1a slash burn or ~1,400 wood stoves
SO ₂	-15	405	7400 kg/hr. (avg. coal-fired power plant)
Total smoke particle	150	4,050	approx. 9-acre slash burn or ~58,000 wood stoves
Sub-3.5 micro-meter smoke particle	113	3,050	approx. 9-acre slash burn
Sub-3.5 micro-meter soot	55	1,480	approx. 38-acre slash burn
PAHs	0.04	1.1	Approx. 7-acre slash burn or ~1,800 wood stoves

Attachment 3

USCG/EPA Boundary Map



Region III Inland ISB Evaluation and Response Checklist

STEP 1: EVALUATING THE NEED FOR BURNING

Nature, Size, and Type of Product Spilled

- A. Name of incident: _____
- B. Date and time of incident: _____
- C. Type of Incident: _____ Grounding
_____ Transfer Operations
_____ Explosion
_____ Vehicle Accident
_____ Blowout
_____ Pipeline
_____ Other
- D. Did source burn? Yes _____ No _____
Is source still burning? Yes _____ No _____
- E. Spill location: _____
- F. Distance and direction to nearest human use areas: _____
(i.e., schools, hospitals, recreation areas, surface water intakes, public wells, etc.)
- G. Product(s) released: _____ Heavy Crude
_____ Bunker C/#6 fuel oil
_____ Medium crude
_____ Diesel/#2 fuel oil
_____ Jet fuels/gasoline
_____ Other
- H. Estimated volume of released product: _____ gals _____ bbls
- I. Estimated volume of potential release: _____ gals _____ bbls
- J. Release status: _____ Continuous _____ Intermittent
One time only, now stopped? Yes _____ No _____

If continuous or intermittent, specify rate of release:
_____ gals/bbls per hour
- K. Estimated surface area covered _____ acres/sq. ft.

Weather: Current and Forecasted

- A. Current Weather: ☐ Clear
☐ Partly Cloudy
☐ Overcast
☐ Rain/Snow/Fog
☐ Inversion

24-hour projection: _____

48-hour projection: _____

- B. Wind speed and direction are generally looked at three levels: Surface (measured at the site); 20 foot (these are usually the forecasted winds); and the transport winds. The transport winds determine where and how fast the smoke will go. These winds are generally given by the state forestry agency in the daily-prescribed fire or smoke management forecast. Transport wind speed, direction and mixing heights are critical components.

	<u>Surface</u>	<u>Forecasted</u>	<u>Transport</u>
Current Wind Speed (mph):	_____	_____	_____
Direction (from):	_____	_____	_____
24-hour projection (mph):	_____	_____	_____
Direction (from):	_____	_____	_____
48-hour projection (mph):	_____	_____	_____
Direction (from):	_____	_____	_____

Evaluation of Response Operations

- A. Considering spill size, forecasted weather and trajectories, amount of available equipment, is there time to deploy mechanical recovery equipment? Yes___No ___
- B. Considering spill size, forecasted weather and trajectories, amount of available equipment, is there time to conduct burning operations? Yes___No ___
- C. Why is in-situ burning necessary?(check all that apply)
- ☐ To remove oil to prevent it's spread to sensitive sites or over large areas.
- ☐ To reduce the generation of oily wastes, especially where transportation or disposal options are limited.
- ☐ Access to the site is limited by shallow water, soft substrates, thick vegetation, or the remoteness of the location.
- ☐ Other removal methods have lost effectiveness or have become too intrusive.
- ☐ Other (specify): _____

STEP 2: BURNING FEASIBILITY CHECKLIST

Weather and Oil Conditions

- A. Are weather conditions acceptable to conduct burn operations? Yes___No ___
- B. Visibility: Sufficient to see oil, containment systems, and suitable for aerial overflight for burn observation? Yes___No ___
- C. Oil Condition: 1. Fresh oil,< 2-3 days exposure. Yes___No___
2. >2-3 mm, (0.1 inch) thickness. Yes___No ___

Habitats Impacted and Resources at Risk

- A. Local public health official/agency notified and consulted? Yes___No ___

Name:_____

Address:_____

Phone: _____

- B. Land Owner/Manager (federal/tribal/state/private) notified and consulted?
Yes No ___

Name:_____

Address:_____


Phone: _____

- C. Local Fire Management Officer/Fire Ecologist/State Forestry Commission consulted?
Yes No ___

Name/Agency:_____

Address:_____

Phone: _____

- D. State  Historic Property Office pursuant to the Programmatic Agreement on Protection of Historic Properties During Emergency Response contacted? Yes No ___

Name:_____

Address:_____

Phone: _____

E. State Natural Resource Agency notified and consulted? Yes ___ No ___

Name/Agency: _____

Address: _____

Phone: _____

F. Federal Natural Resource Trustees notified and consulted

___ Department of the Interior

___ Tennessee Valley Authority

___ U.S. Forest Service

___ Department of Energy

___ Department of Defense

___ National Oceanic and Atmospheric Administration/Dept of Commerce

___ National Aeronautics and Space Administration

___ Other:

G. Native American interests present? Yes ___ No ___ Unknown ___

Tribal contact:

Name: _____

Address: _____

Phone: _____

Bureau of Indian Affairs contact:

Name: _____

Address: _____

Phone: _____

H. Surface water intakes and wells (public and private): Yes No ___

I. Habitat Type(s) Impacted:

___ Wetlands

___ Estuarine

___ Riverine

___ Lacustrine

___ Palustrine

___ Agricultural lands

___ Other (specify):

J. Seasonal concerns: Yes ____ No ____
Comments:

K. Biological Resources Present:
(Describe significant issues such as large concentrations, breeding activities, rookeries, designated critical habitat, etc.)

1. ____ Threatened and Endangered Species, including plants (list):
2. ____ Mammals
3. ____ Waterfowl
4. ____ Wading Birds
5. ____ Diving Birds
6. ____ Shore Birds
7. ____ Raptors
8. ____ Fish
9. ____ Reptiles
10. ____ Amphibians
11. ____ Other
12. ____ Comments/Attachments (i.e., ESI Maps)

L. Natural Areas (list)

1. ____ National Park:
2. ____ National Wildlife Refuge:
3. ____ National Forest:
4. ____ State Park:
5. ____ State Wildlife Area:
6. ____ Other Natural Areas:
7. ____ Comments

M. Historic, Cultural, and Archeological Resources

___ Unknown
___ Not Present
___ Present

Equipment & Personnel

- A. Has the burn area been isolated (e.g., by fire breaks)? Yes___No___
Is there an approved site safety plan in place? Yes___No___
Have local fire and police departments been notified? Yes___No___
- B. Are the appropriate firefighting gear and personnel on-scene?
Yes___No___
- C. Is aircraft for ignition and aerial observation required? Yes___No___
If yes, are they available? Yes___No___(Flight requirements: daylight hours; visibility >1 mile; ceiling >500 feet, FAA certified for Heli torch)
- D. Ignition System: 1. Available? Yes___No___
2. Type/method to be used? _____
3. Burn Promoters? Yes___No___
- E. Personnel trained, equipped with safety gear, & covered by site health and safety plan? Yes___No___
- F. Communications System to communicate with aircraft and fire fighters available and working?
Yes___No___
- G. Is access to the site restricted to response personnel only? Yes___No___

Proposed Burn Plan

- A. Proposed burning strategy (circle appropriate responses)
1. Ignition away from source after containment
2. Immediate ignition at or near source
3. Ignition of uncontained slick(s) at a safe distance
- B. Estimated amount of oil to be burned: surface area_____sq ft
volume_____gal/bbl
- C. Estimated duration of burn in minutes: _____
- D. Are simultaneous burns planned? Yes___No___If yes how many? _____
- E. Are sequential or repeat burns planned (not simultaneous)? Yes___No___

F. Method for terminating the burn:

G. Proposed method for ignition:

H. Ability to collect burned oil residue: Yes___No ___

I. Estimated smoke plume trajectory (miles): _____

J. Monitoring protocols contained in SMART will be applied as appropriate.

Is additional monitoring required? Yes___No___If yes, attach additional monitoring needs and specify responsible agency.

STEP 3: IS BURNING ACCEPTABLE?

Evaluation of Anticipated Emissions

A. Using an appropriate chart, plot and calculate the following locations and distances:

1. Location of proposed burn in reference to source.
2. If on water, location of proposed burn in reference to nearest ignitable oil slick.
3. Location of proposed burn in reference to nearby human habitation/use areas,(e.g. towns, recreational use areas, airports/strips, roads, daycare centers, schools, hospitals, etc.).

B. Populations of special concern:

1. Schools _____
2. Hospitals _____
3. Retirement communities _____
4. Nursing/convalescence homes _____
5. Day care centers _____
6. Other _____

C. Determine the following:

1. Distance between proposed burn and spill source _____ (miles)
2. Distance between burn and human habitation/use area _____ (miles)
3. Approximate surface area of the proposed burn or burns_____(sq. ft.)
4. Will impairment of visibility affect airports and/or highways? Yes___No ___

- D. Can burning be conducted in a controlled fashion? Yes___No___
Explain measures to reduce and/or control secondary fires.

- E. Using distance, measured in miles, with the forecasted wind and transport wind direction, plot the estimated smoke plume with particulate concentration >150 ug/m3.
- F. Are additional pollutants of concern present in the smoke plum?
Yes___No___If yes, what are the projected concentrations to human habitation areas?
* Consultation with local air and health authorities may be necessary.
- G. Will the anticipated smoke plume disperse before reaching populated areas? Yes___No___

Determination of Acceptability

- A. Does the estimated smoke plume potentially impact a populated area with particulate concentrations averaged over one hour exceeding 150 ug/m3? Yes___No___

If No, Burning is Acceptable, proceed to Step 4.

If Yes, continue with B.

- B. Can the impacted population be temporarily relocated prior to burn?
Yes___No___

If Yes, initiate warning or evacuation and authorize burning AFTER population is protected, proceed to Step 4. If No, do NOT authorize burning!

STEP 4: CONTROLS & CONDITIONS

Operational Controls, Required for All Burns

- A. Forecasted weather, winds and atmospheric stability class obtained?
Yes___No___
- B. A trial burn may be necessary to observe and confirm anticipated smoke plume behavior.
* Trial burns must have RRT approval.
- C. Safe downwind distance validated, or expanded if winds are inconsistent with anticipated forecast?
Yes___No___
- D. Burn extinguishing measures in place and available? Yes___No___

Public Notifications

Public notification (e.g. radio broadcast to public, safety zone broadcast to mariners, road closure, etc.) implemented? Yes ____ No ____

Unified Command Request to the RRT For In-situ Burning

Additional conditions that apply: Yes____(Attached) No _____

Signature of Federal On-Scene Coordinator

Printed Name

Signature of State On-Scene Coordinator

Printed Name

Does Land Owner/Manager Concur? Yes_____No _____

Signature of Land Owner/Manager

Printed Name

RRT Decision Regarding In-situ Burning

- A. _____ Do not conduct ISB
B. _____ In-situ burning may be conducted pursuant to attached conditions
C. _____ In-situ burning may be conducted as requested in Step #3

Signature of EPA Co-Chair

Printed Name

Signature of USCG Co-Chair

Printed Name

Signature of DOI Representative

Printed Name

Signature of Affected State(s)

Printed Name

Signature of Other Federal Trustee(s)

Printed Name

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ANNEX III

GUIDANCE FOR IN-SITU BURNING OF OIL IMPACTED HERBACEOUS WETLANDS

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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 **Natural Resources Trustees**, 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. **Prior to ISB operations a site safety work plan will be developed and approved by the UC 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 FOSC. This policy authorizes the FOSC 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 FOSC, 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 **and habitat**.

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 FOSC. The responsibility of concurrence is given to DOI because of its authorities, and

potential assistance to the FOSC, 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: _____

