NRC PRC Application

March 16, 2026

Attachment F-4 – Alternative Response Technology

Response To Terrestrial Spills Involving Petroleum

PURPOSE:

The purpose is to give guidelines to the National Response Corporation (NRC) responder when responding to an incident involving a release of petroleum on land. These procedures serve as a general framework for systematically resolving a release of petroleum on land/shoreline emergency and provide proper techniques for cleanup of the incident. The following 8 step procedure is used to guide the responder through the proper decision-making process as situations and tactics may change at each specific incident.

These procedures are not intended to conflict with or supersede recommendations made by any regulatory agency. These procedures may not be reproduced without written permission from NRC.

PROCEDURE:

1. Site Management and Control

Upon arrival of the scene the incident supervisor should:

a. Position personnel and vehicles upwind and upgrade.
b. Determine the extent of the hazard area.
c. Secure the perimeter and deny entry.
d. Control ignition sources immediately.
e. Designate Hazard Control Zones (Hot, Warm, and Cold Zones)
f. Identify and communicate to all personnel operating of the site location of the restricted area.
g. Assess the situation and designate an escape route.
h. Appoint a Site Safety Manager
i. Establish a staging area and appoint a Staging Manager to inventory and control equipment

2. Identify the Problem

After Site Management and Control have been established the site supervisor should do the following to identify the problem:

a. Identify, confirm, and verify ALL of the petroleum and/or hazardous materials involved in the incident.
b. If more than one container is involved.
c. Identify all of the properties if the substance(s) involved using available reference material.
d. Verify concentrations with flammable gas detection and monitoring instruments (PID, Colormetric Tubes, Benzene Monitor, etc.).
e. If multiple problems exist, prioritize them and make independent assignments.

3. Evaluate the Hazards and Risks

a. Evaluate health and safety hazards of the products involved. Are other hazardous materials involved.
b. Evaluate environmental conditions (ie: wind, precipitation, and topography)

c. Monitor the scene to determine the concentrations of contaminates present and their approximate location.
d. Compare the resources available vs. the level required to effectively handle the problem. Modifications to the suggested size and perimeters of the hazard control zones may be required.
e. Evaluate the overall incident situation to include:
    i. Previous and current status of the incident.
    ii. Any abnormal conditions observed immediately before the event.
f. Evaluate the overall condition of the incident scene.
g. Evaluate environmentally sensitive receptors (wetlands, wildlife, infrastructure, etc.)
h. Based upon the hazard and risk assessment evaluation, determine the manner in which the incident should be handled and evaluate the following concerns:
    i. Toxicity
    ii. Flammability
    iii. Reactivity (of other hazardous materials involved)
    iv. Physical hazards
    v. Chemical properties
    vi. Exposures

4. Select Proper Protective Clothing

a. The selection of the proper type and level of personal protective clothing and equipment will depend upon the hazards and properties of the material(s) that pose the highest threat to health and safety and the objectives to be implemented.
b. In evaluating the use of specialized protective clothing, the following factors should be considered:
    i. The hazard(s) to be encountered, including the specific tasks to be performed.
    ii. The level and type of specialized protective clothing to be utilized.
    iii. The individual(s) who will be using the PPE in a hostile environment.

5. Develop Plan of Action and Coordinate Resources

a. Verify that Hazard Control Zones have been established and that this information has been passed to all on-scene personnel.
b. Ensure that all internal and external notifications have been made.
c. Coordinate all plans for controlling the release with the container owner to assure that a coordinated plan of action is safely implemented.
d. Anticipate accidental ignition.
e. Exposures should be evaluated and prioritized so that water supplies are conserved and used correctly. Internal industrial fire brigade or Local Fire Department resources should remain on scene during cleanup operation in the event of an accidental ignition.
f. When safety and action plans have been developed, the USE site supervisor must have a safety and action plan brief with all USE on-scene responders prior to all operations.

6. Implement Response Objectives

There are several methods of responding to the release of petroleum on land/shoreline. This section covers the primary tactical objectives for stopping the spreading of petroleum impacts.

a. Diking – Diking is the process of placing a physical barrier in front of a flowing diesel spill to stop or minimize its spread. Diking can use any solid material ranging from sand to soil to sand bags. Absorbent boom can also be used around storm drains and sewage covers to stop the flow into the drains. Diking is one of the many low tech control methods. When building dikes, it is important to remember that a series of dikes is preferred to just one. Should one dike fail or is unable to hold the product, the next dike picks up the slack.

Dikes have different shapes and uses. For a fast moving release, a long V shaped dike is used. For a slow moving release a U shaped dike is used.

b. Diversion – Diversion is the placement of a physical barrier to change the direction of product flow. The same materials can be used for diversion as are used for diking. Diversions are often teamed up with diking to stop the flow.
c. Retention – Retention is the process of catching the released liquid in some type of holding location. Retentions are anything that can hold product. Should a hole be excavated or an existing depression in the ground be used as a retention, it is necessary to line the bottom. Lining can be a salvage cover or plastic sheeting, used to prevent the product from absorbing into the ground.
d. Adsorption – Adsorption is the process where molecules of the containment adhere to the surface of the adsorbent material (polypropylene pads). By placing the adsorbents over the top of the product it will suppress the vapors by binding the petroleum to its surface
e. Absorption – Absorption is the process of physically drawing the petroleum into the inner spaces of the absorbent. There are a wide variety of absorbents (absorbent clay, absorb X, pads, and booms). When using absorbents where diesel fuel is released on a water surface use a hydrophobic absorbent. The hydrophobic absorbent will absorb the diesel fuel and not the water.
f. Emulsification – Emulsification is the process of producing a physical suspension of two or more immiscible materials by using an emulsifier (detergent). This process is done by using a pressure washer with a mixture of detergent and a vac-truck. The surface is pressure washed using the detergent solution and all excess water and product is picked up with the vac-truck. This process is used mostly in parking lots and urban areas.
g. Soil Remediation – All soil that is contaminated will be removed and disposed of properly. Clean soil will be used to replace the contaminated soil. Soil remediation also includes the following Applied Response Technologies (ART) in certain instances where the Incident/ Unified Command, governing regulatory agency and or responsible party (RP) has reviewed and approved a specific plan to implement these strategies.
    i. Bioremediation
        1. Bioremediation process is degrading, removing, changing, immobilizing, or detoxifying various chemicals and physical pollutants from the environment through the activity of bacteria, fungi, algae and plants. Currently, the main agent USE utilizes for this process is Micro-Blaze® Emergency Liquid Spill Control Solution.
    ii. In-Situ Burning
        1. In-situ burning, is a technique sometimes used by during a response to a petroleum or other hazardous materials release. In-situ burning involves the controlled burning of oil that has spilled from a vessel or a facility, at the location of the spill. When conducted properly, in-situ burning significantly reduces the amount of petroleum on the water and or the land and minimizes the adverse effect of the petroleum on the environment.

h. Site Impact Investigation/Delineation Sampling- See NRC Field Assessment and Soil Sampling SOG # USE-ER-OPS-038 for guidelines in site investigation and delineating impacts of petroleum releases to terrestrial environments.

7. Decontamination and Clean Up Operations

a. The USE site supervisor should establish a decontamination area to ensure that all responders are properly decontaminated before leaving the scene. Even though most petroleum products present minimal decontamination concerns, consider the possibility that other hazardous constituents may be present.
b. Flushing PPE with water will remove residual product and odorants.

c. If personnel are required to make multiple entries into the hazard area using PPE and equipment, they should be observed and evaluated to assure that they are fit for re-entry. Personnel not fit for re-entry should be sent to the Rehabilitation Area.
d. A debriefing will be held for those personnel involved in the decontamination and cleanup operations as soon as practical. Exposed personnel will be provided with as much information as regarding the delayed effects of the hazardous substance(s) encountered during the operation.

8. Terminate the Operation

a. The USE site supervisor should terminate the operation when all direct threats and cleanup operations have been completed.
b. The USE site supervisor will account for all personnel before securing the site operations. The names and telephone numbers of each person who may have been exposed to hazardous materials involved in the operation will be obtained and formally documented.
c. Before leaving the scene, the USE site supervisor will ensure that all equipment and supplies used during the operation is accounted for and that all damaged equipment has been identified. Any damaged equipment will be tagged as being “Out of Service”.
d. Conduct an operation debriefing secession for all personnel involved.
Prepare and submit required reports and documentation in accordance with company policies and procedures.

References

NFPA 472-08
2020 Emergency Response Guidebook