

REGION III SURFACE WASHING AGENTS PREAUTHORIZATION TEST AND EVALUATION PROTOCOL

I. Introduction

Guidelines for authorizing the use of chemicals listed on the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) Product Schedule are found in the NCP 40 Code of Federal Regulations (CFR) Section 300.900 (Subpart J – Use of Dispersants and Other Chemicals) and Section 300.310, Phase III. The Federal On-Scene Coordinator (FOSC) may use chemicals and other materials to restrain the spread of oil and protect public health and welfare and the environment. Section 300.910 requires that the Regional Response Team (RRT) shall, *address the desirability of using appropriate dispersants, surface washing agent, surface collecting agents, bioremediation agents, or miscellaneous oil spill control agents listed on the NCP Product Schedule. Regional Contingency Plans (RCPs) shall also include applicable preauthorization plans and address the specific contexts in which such products should and should not be used.*

In Region III, the FOSC is preauthorized to test surface washing agents (SWAs) subject to the constraints and practices identified in this document, including those identified through state permitting. Any post-test decision to operationally use SWAs must receive RRT concurrence from the United States Environmental Protection Agency (USEPA), United States Coast Guard (USCG), affected State(s), affected federally recognized Tribe(s), in consultation with Department of Interior (DOI), Department of Commerce/National Oceanic and Atmospheric Administration (DOC/NOAA), and other affected Federal trustees. This test protocol identifies specific practices to be followed for evaluating the effectiveness and biological impacts of test applications of SWAs to recover oil that has been discharged, and has adhered to surface environments within Region III.

This protocol addresses only the testing and evaluation of those products that are designated or provide a similar mechanism of action as SWA; and are listed on the NCP Product Schedule.

II. Surface Washing Agents Defined

Surface washing agents¹ are designed to clean the oil from substrates using a combination of surfactants, solvents, and/or other additives. They are not applied to surface slicks on the water; they are applied to assist in the removal of weathered oil and for oil that is trapped in inaccessible areas where wash waters can be recovered and treated. Surface washing agents come in two forms: “lift and float” products and “lift and disperse” products. Surface coatings treated with lift and float products will reintroduce oil to the surface dwelling resources in the treatment area as the treated substrates are washed off; these products should be used in conjunction with sorbent booms to recapture the oil. Lift and disperse products would change exposures from surface dwelling resources to potentially include intertidal, water column, and bottom-dwelling resources.

¹ The definition, mechanism of action and other considerations for the use of SWAs are based on information obtained from the National Response Team’s (NRT) 2009 Selection Guide for Oil Spill Response Countermeasures (print and online editions); available from <https://sg.nrt.org>.

These products often contain surfactants, solvents, and/or other additives that work to remove oil from substrates. Many products are essentially industrial cleaners that emulsify the oil, much in the same way that dishwashing soap cleans the grease off dishes. The treated oil is broken into small droplets that are kept in suspension by the surfactant.

- Lift and float SWAs are those products where the treated oil is not dispersed into the water column, but readily floats on the water surface and is recoverable.
- Lift and disperse SWAs are those for which the product literature states that the oil is dispersed, emulsified, or encapsulated. Thus, the wash water from applying these products to surface oiling should not be flushed into waterbodies or left untreated, but must be contained, recovered, and properly treated.

When to Consider for Use:

- To increase oil removal, often at lower temperature and pressure.
- To flush oil trapped in inaccessible areas.
- For coastal, nearshore, inland shorelines and substrates, fresh water, brackish water, and saltwater environments.

Target Areas:

- On hard-surface shorelines where there is a strong desire to remove oil residues.
- When the oil has weathered so that it cannot be removed from a substrate using ambient water temperatures and low pressures. Surface washing agents may be used to reduce the temperature and/or pressure needed to achieve cleanup endpoints.
- When the oil is trapped in areas inaccessible to physical removal, but which can be flushed, and *the wash waters contained*, such as in sewers, storm drains, and ravines. If physical removal is not possible, it may be difficult to properly apply the SWA.
- For volatile² fuel spills that have entered sewers, for vapor suppression, and to enhance flushing recovery, as long as all “lift and disperse” wash waters are recovered and prevented from being discharged into the environment.

General Application Requirements:

- Products are sprayed either neat or diluted with water. For small applications, hand-held units such as Hudson sprayers are used; larger, diluted applications use education systems coupled with fire hoses, power washers, etc.
- Application rates vary widely and may be difficult to monitor and control.

² Volatile liquid fuel means any fuel other than diesel or biodiesel that is a liquid at atmospheric pressure and has a Reid Vapor Pressure higher than 2.0 pounds per square inch; a fuel which is easily evaporated when brought in contact with normal air. Both *Boiling Point* and *Vapor Pressure* are indicators of volatility: the higher the boiling point, the less volatile the fuel; the higher the vapor pressure, the more volatile the fuel. Vapor pressure increases with temperature so the volatility of a fuel can be increased by raising the temperature.

- There is some period for soaking or scrubbing, and then the area is flushed with water. Thus, in tidal areas, application should be timed to allow soaking before tidal inundation.
- Heated water (in both spray and flush) is sometimes required for very sticky oils.
- All released oil must be recovered; systems are needed to contain and treat the wash water from "lift and disperse" products, which can require considerable operational support.
- Wash waters from using "lift and float" products may be discharged after oil separation, although there will be site-specific requirements.
- The toxicity of the product and the recoverability of the treated oil should be carefully evaluated when determining potential impacts at the treatment site.
- Only those products which have been documented to be safe to use on vegetation (through independent field studies) should be applied to vegetated areas.
- Use may be restricted in areas with sensitive nearshore resources, such as seagrass beds, or during sensitive time periods, such as nearshore spawning or fish migration.
- Water velocity at the impacted area must be less than 1 knot. This will help ensure refloated oil does not escape containment and contaminate clean beaches down current.
- The treated area should not be exposed to breaking waves. The SWAs require a soaking time. Flushing from waves will reduce effectiveness of the agent(s).

III. Criteria for Considering the Use of Surface Washing Agents

The RRT III response guidance recognizes that in certain circumstances, the complete physical containment, collection, and removal of oil discharges may not be possible. While mechanical control and recovery techniques are the traditional response measures, other countermeasures should be considered. The use of SWAs as a component of the response may prove beneficial in preventing a substantial threat to the public health or welfare, or to minimize serious environmental damage. This protocol sets forth criteria by which SWAs may be applied to affected shorelines within Region III.

Initial evaluation of the type of oil and impacted shoreline is required prior to testing chemical agents on a spill. Surface washing agents work best with all oil types, and have been shown to be effective on weathered oils.

A bucket test is to be conducted to determine whether the oil under consideration for SWA application would likely float after application so it can be collected when re-mobilized (See Section V; Test Preparation Process). If the treated oil sinks or mixes into the water column (disperses), it will likely be more difficult to contain and recover and could adversely impact benthic or mid-water communities. Shoreline types best suited for the use of SWAs include man-made structures, rip-rap, boulders, cobble, bedrock, etc., that can be cleaned without trapping removed oil in inaccessible spaces. Surface washing agents may also be used on ships and boats that may have become oiled during the course of an oil spill.

IV. Constraints Governing Test Use of Surface Washing Agents

Physical conditions play a vital role in the overall effectiveness of SWAs, as well as the success in recovering refloated oil. The following constraints shall be observed:

1. Water Velocity: Current at the impacted area must be less than 1 knot. This will help ensure refloated oil does not escape containment and contaminate clean environments down current.
2. Wave Action: The treated area cannot be exposed to breaking waves. The cleaning agents require a soaking time and continual bombardment will reduce effectiveness of the agent(s).
3. Water Depth: A minimum of one foot of water should submerge the hose and strainer assembly of the pump configuration. Depth must be sufficient to facilitate the operation of portable pumps.
4. Accessibility: Area must be accessible to observers, monitors, sample collectors, contract workers, and equipment.
5. Precipitation: Application during heavy rain, sleet, or snow should be avoided. Heavy precipitation will greatly reduce cleaner effectiveness by impacting the soaking time.
6. Temperature: If ambient air temperature is below 50 °F, special consideration of the SWAs viscosity should be reviewed when selecting it for use. Consult the manufacturer's recommended application criteria for limitations and best practices.
7. Wind: High wind will play a vital role in the effectiveness of certain SWAs. Consult the manufacturer's recommended application criteria for limitations and best practices.

Special consideration areas are notable for environmental sensitivity, treatment protection, government designation, important public value, and private ownership. If testing is proposed in the following areas, additional consultation with appropriate manager or owner shall be undertaken prior to test application:

1. Vital Resources: SWA testing is not recommended near operating water intakes. Oil lifted from the substrate may disperse into the water column or escape floating containment, potentially fouling water supplies.
2. Threatened & Endangered Species (Federal and State Listed) and designated critical habitats: FOSCs shall comply with the Memorandum of Agreement (MOA) regarding Oil Spill Planning and Response Activities under the NCP and the Endangered Species Act (ESA); FOSC consultation with the federal resource trustees is required by the Federal action agency. FOSCs should also consult with the governing state agency regarding any recommended measures to avoid or minimize impacts to state-listed species and their habitats.
3. Federal, State, or local areas of significance: Pre-authorization does not apply within 1 mile or immediately adjacent to units of the National Parks Service, State or local parks; the National Wildlife Refuge System; Federal Wilderness Areas; the Wild and Scenic Rivers System; a National Marine Sanctuary; a National Estuarine Research Reserve; and the

National Forest without the prior consent of the land managing agency. Test applications on such lands are subject to all conditions imposed by the managing authorities.

4. **Tribal Governments**: Preauthorization does not apply for test applications on or immediately adjacent to tribally administered lands and waters, including lands and waters protected by treaty without the prior consent of the Tribal government. Test applications on such lands and water are subject to all conditions imposed by these authorities.
5. **Historic/Archeological Resources**: Preauthorization does not apply for test applications on or immediately adjacent to historic properties. FOSCs shall comply with the 1997 Programmatic Agreement on Protection of Historic Properties During Emergency Response to identify, avoid, and /or mitigate potential impacts.
6. **Private Landowners**: FOSCs should notify landowners of their intent to conduct test applications of SWAs on privately-owned property and give special consideration to any concerns expressed by the landowners.

V. Test Preparation Process

FOSCs shall follow this protocol to ensure the physical conditions and special considerations are met and have been adequately addressed prior to continuing consideration of testing SWAs. The following processes and procedures shall be used to guide further action:

1. Identify, notify, and coordinate with stakeholders the intent to initiate test preparation.
2. Select one or more of the NCP-listed SWAs based on environmental conditions and the incident-specific conditions.
3. Contact SWA supplier:
 - a. Determine availability.
 - b. Consider transportation requirements.
 - c. Invite SWA representative(s) to participate in the test if available.
4. Conduct a bucket test to determine if removed oil will float or sink. If the treated oil floats, note time it takes for the water column to become clear (all particles float to the surface). The SWA is not appropriate for use in open waters, or waters that drain to navigable waters, if it causes the oil to sink or be dispersed with minimal recovery.

VI. Test Application Procedures

1. Identify test areas and control area boundaries:
 - a. Select a minimum of two representative test areas that will receive no more than a 5-gallon application of product to adequately treat each area; clearly mark the areas.
 - b. Set aside a representative control area similar to the test areas for comparison.
 - c. Obtain Global Positioning System (GPS) location points defining each area where practicable. For other areas adequately mark the test areas.
 - d. Include a map of the area identifying the test and control areas.

- e. Complete photo-documentation of the two test sites and the representative control area before, during, and after application and treatment.
2. Effectiveness criteria and monitoring procedures:
 - a. Estimates of effectiveness of SWAs for removing oil are determined by comparing results from tests of oiled surface with and without application of a candidate SWA(s). Therefore, washing the representative control set-aside with on-site water in a manner equivalent to the treated test area with the SWA application should be compared for a measure of effectiveness.
 - b. Chemically clean 8-ounce (oz.) (125-milliliter [ml]) sample jars should be used to collect run-off wash water from all areas where the SWA was applied for quantifying estimated effectiveness. Note the relative difference of floating oil in the jars from the two areas. Photo-documentation of jars will be needed.
 3. Water and sediment sampling in control and test areas for Total Petroleum Hydrocarbon (TPH) analysis³.
 - a. Where applicable, using chemically clean 32 oz. (1-liter) sample jars, collect a background water sample in adjacent non-impacted area in addition to subsurface⁴ water samples from inside and outside of the boom in the test areas and down gradient of boomed area immediately prior to SWA application. During washing operations, collect 1-liter subsurface water samples from inside and outside of the boom in the test areas and down gradient of the boomed areas at 10-minute increments until 30 minutes after final wash process.
 - b. Label water sample jars with a unique identifier and include media type, date, time, collector's name (initials), location (GPS) where practicable, depth, and SWA used, and store in a cool to cold container for shipment to USEPA-approved laboratory for quick turnaround analysis in accordance with USEPA-approved protocol.
 - c. For areas where the water depth is greater than 2 feet, sediment samples are not required. For areas where the water depth is less than 2 feet, sediment samples are to be taken. Using chemically clean 8-oz. (250-ml) jars, collect sediment samples in test areas immediately prior to SWA application and follow washing process.
 - d. Label sediment sample jars with a unique identifier and include media type, date, time, collector's name (initials), location (GPS) where practicable, depth, and SWA used, and store in a cool to cold container for shipment to USEPA-approved laboratory for quick turnaround analysis in accordance with USEPA-approved protocol.
 - e. Document the process and interpret analytical results. Photographic documentation is also recommended.

³ TPH analysis is appropriate for emergency response/field screening, but is not appropriate for final removal cleanup reporting in Pennsylvania. See Section VII. Reporting - Appendix A: Commonwealth of Pennsylvania for more information or contact the PADEP.

⁴ "Subsurface" in this instance refers to water depths 0 to 1 meter below the surface so not to include any of the surface slick. Refer to USEPA 1979. Methods for chemical analysis of water and wastes. EPA-600-4-79/020. USEPA Environmental Monitoring Systems Laboratory, Office of Research and Development, Cincinnati, Ohio.

4. Toxicity procedures to evaluate SWA impact to aquatic life (NOTE: the SWA pre-authorization is not dependent upon obtaining toxicity and TPH data before conducting SWA testing or operational use—collection of toxicity data and TPH should be part of the best management practices for the response) can include:
 - a. Chose an accredited laboratory to run the aquatic toxicity tests.
 - b. Collect one-gallon (4-liter) subsurface water samples in brown glass containers at each application site.
 - c. Collect a water sample from an unimpacted area (background/control), from an area near the shoreline to be treated inside containment (boom), and from an area downstream outside of containment prior to the application of the SWA.
 - d. Collect a water sample inside and outside the containment area and sample downstream after the SWA is washed from the shoreline into the surface water.
 - e. Label sample jars with a unique identifier and include date, time, location (GPS), depth, and SWA used, and store in a cool to cold container for shipment to USEPA-approved laboratory for quick turnaround analysis in accordance with USEPA-approved protocol.
 - f. Ask the laboratory to conduct 48-hr Effective Concentration 50%/Lethal Concentration 50% (EC50/LC50) acute toxicity tests and 7-day chronic toxicity test for *Ceriodaphnia dubia* using the ASTM International (ASTM) guidelines.
 - g. Compare the results from the 48-hour EC50/LC50 and the 7-day tests to assess whether application of the SWA had the potential to adversely affect aquatic life.
 - h. Document the process and interpret analytical results for the response.
5. Containment and recovery procedures:
 - a. Identify current direction and velocity.
 - b. Use a float to determine distance of boom placement from the shoreline based on the time it takes for the oil in the bucket test to float to the top and the water to become clear.
 - c. Install a double containment around the test and control areas at the appropriate distance.
 - d. Use appropriate absorbent material inside containment for oil recovery and if possible utilize more aggressive removal equipment (i.e., vacuum pumps, portable skimmer, etc.) to recover floating oil.
6. Site-specific product application procedures are to be in accordance with the manufacturer's recommended application procedures.

VII. Reporting

1. The following outline is recommended for the after-action report:
 - a. Cover
 - Title

- Date
 - Agency
 - Preparer
- b. Introduction:
- Spill Summary
 - Test Date
 - Test Location
 - Landowner(S) Notified
 - Physical Conditions
 - Surface Washing Agent(S) Tested
 - Test Participants
- c. Test Procedures:
- Bucket Test
 - Field Test
 - Measuring Effectiveness
 - Sampling for TPH
 - Toxicity Testing
 - Booming and Recovery
- d. Results:
- Effectiveness of Bucket Test
 - Effectiveness of Field Test and Recovery
 - TPH
 - Toxicity
- e. Test Conclusions:
- Oil Recovered/Not Recovered
 - Oil Dispersed/ Not Dispersed
 - Oil-Cleaner Mix Toxic/Not Toxic
- f. Recommendations
- Proceed No Further
 - Coordinate/Consult for Operational Use
 - Conditions
2. Lessons Learned:
- a. Following each use of the protocol, the FOSC (or his designee) will provide observations, lessons learned, and suggested changes to the Region III Co-chairs on the SWA pre-authorization document. Changes to this document will be made as appropriate. Lessons learned from each application of this protocol will be submitted for inclusion in the Selection Guide for Oil Spill Response Countermeasures.

Appendix A: State Regulatory Requirements Pertaining to the Use of Surface Washing Agents

State of Delaware

[To Be Provided]

District of Columbia

[To Be Provided]

State of Maryland

[To Be Provided]

Commonwealth of Pennsylvania

1. 25 PA Code Chapter 93. Water Quality Standards

The Division of Water Quality (DWQ) includes several programs to protect and manage clean water and public health (<https://www.pacode.com/secure/data/025/chapter93/chap93toc.html>). The water quality program implements portions of the Pennsylvania Clean Streams Law (P.L. 1987, Act 394 of 1937, as amended (35 P.S. §§ 691.1 et seq.)) and the federal Clean Water Act (33 U.S.C. §1251 et seq. (1972)).

Water quality standards are used to assess whether Pennsylvania's rivers and lakes are clean and pure enough to support fish and other aquatic life; recreation; water supply for drinking, agriculture, and industry; and other protected uses. In addition, the water standards are implemented by other Bureau of Clean Water (BCW) programs as regulatory tools to prevent pollution of the Commonwealth's waters.

The Water Quality Standards Section coordinates activities involving the development, review, and maintenance of statewide and site-specific water quality standards, and develops rulemaking in support of triennial review of water quality standards and stream redesignations. It coordinates federal Clean Water Act Section 316 activities to ensure compliance with program directives, and activities involving the review, implementation, and development of the Antidegradation Policy and directives.

The addition of a cleaning agent is considered to be violating the Water Quality Criteria; however, if the use of a cleaning agent is part of a removal action utilizing adequate containment and removing it from the waterway along with the oiled debris etc., then it would be allowable. Consult with the Pennsylvania Department of Environmental Protection for further guidance.

2. Land Recycling and Environmental Remediation Standards Act (Act 2)

Pennsylvania 25 PA Code Chapter 250. Administration of Land Recycling Program (Act 2) (<https://www.pacode.com/secure/data/025/chapter250/chap250toc.html>) establishes environmental remediation standards for cleanups required under environmental statutes in Section 106 (35 P.S. § 6026.106). Remediation and the resulting liability relief provided by Act 2 is specific to the contamination identified at each specific site or sites. Consult with the Pennsylvania Department of Environmental Protection for further guidance.

a. Act 2 – Remediation Process, Immediate Response⁵

If an immediate hazard exists or is discovered at a site, prompt action is necessary to abate the hazardous condition and prevent future or further release of regulated substances. Act 2 does not prevent or impede an immediate response to such emergencies. Section 307 of Act 2 (35 P.S.

⁵

<http://www.depgreenport.state.pa.us/elibrary/PDFProvider.ashx?action=PDFStream&docID=1420617&chksum=&revision=0&docName=03+SECTION+II%3A++ACT+2+REMEDIATION+PROCESS&nativeExt=pdf&PromptToSave=False&Size=3885410&ViewerMode=2&overlay=0>

§ 6026.307) provides that the provisions under Chapter 3 of the statute, relating to remediation standards and review procedures, shall not prevent or impede applicable emergency or interim responses. Section 307 of Act 2 provides that the remediation standards established for final remediation do not prevent or impede immediate responses. It is the responsibility of the appropriate person to act in a timely manner to abate immediate threats. The remediator still needs to follow the notification requirements of the Clean Streams Law or Solid Waste Management Act.

Mitigation measures may include, but are not limited to, the following:

- Limiting public access to the release area.
- Containing the released material to prevent immediate migration into uncontaminated areas.
- Installing drainage controls to prevent runoff.
- Stabilization and maintenance of containment structures.
- Actions to prevent the further migration of regulated substances, including removal and disposal.
- On-site treatment.

3. Total Petroleum Hydrocarbons (TPH) Tests in Pennsylvania

In Pennsylvania, the use of TPH test for field screening to determine the effectiveness of a containment system is acceptable. There are some instances, like removals and waste disposal/profiling, where Pennsylvania Department of Environmental Protection (PADEP) have moved from a TPH test to a more specific analysis to identify the base components of the petroleum hydrocarbon and the concentration of each part, instead of the just the TPH test. PADEP does still specify the use of a TPH test on some Waste Management forms for soils contaminated with virgin product being sent to a landfill; TPH testing is used in limited circumstances. If a Responsible Party (RP) wanted to pursue an Act 2 cleanup / remediation they would need to have an approved sampling plan as part of their cleanup proposal to the program and TPH would not be specific enough. Consult with the PADEP for further guidance on the use of the TPH test.

Commonwealth of Virginia

1. Code of Virginia, Title 62.1 – Waters of the State, Ports and Harbors, Chapter 3.1 State Water Control Law

Virginia's water control law (water law) specifically prohibits unpermitted discharges into state waters. The applicable statute § 62.1-44.5 (<https://law.lis.virginia.gov/vacode/62.1-44.5/>), **Prohibition of waste discharges or other quality alterations of state waters except as authorized by permit; notification required.**

This statute prohibits discharges into state waters. If the request to use SWAs is part of an emergency response as opposed to a cleanup, the likely outcome is that Virginia Department of Environmental Quality (VDEQ) would exercise enforcement discretion regarding any SWA discharge to surface water. There are no requirements specified in the statute addressing SWAs (see below).

§ 62.1-44.34:23. Exceptions.

A. Nothing in this article shall apply to: (i) normal discharges from properly functioning vehicles and equipment, marine engines, outboard motors or hydroelectric facilities; (ii) accidental discharges from farm vehicles or noncommercial vehicles; (iii) accidental discharges from the fuel tanks of commercial vehicles or vessels that have a fuel tank capacity of 150 gallons or less; (iv) discharges authorized by a valid permit issued by the Board pursuant to § 62.1-44.15 (5) or by the United States Environmental Protection Agency; (v) underground storage tanks regulated under a state program; (vi) releases from underground storage tanks as defined in § 62.1-44.34:8, regardless of when the release occurred; (vii) discharges of hydrostatic test media from a pipeline undergoing a hydrostatic test in accordance with federal pipeline safety regulations; or (viii) discharges authorized by the federal on-scene coordinator and the Executive Director or his designee in connection with activities related to the recovery of spilled oil where such activities are undertaken to minimize overall environmental damage due to an oil spill into or on state waters. However, the exception provided in clause (viii) shall in no way reduce the liability of the person who initially spilled the oil which is being recovered.

If the use of SWAs is not related to an immediate threat to human health or the environment, there would have to be discussion between VDEQ and the RP concerning the proposed use of SWAs to see if the use is truly necessary. VDEQ would want to pursue the option that is most protective of the environment regardless of cost to the RP or length of cleanup.

State of West Virginia

[To Be Provided]