

**Department of Fish and Wildlife  
Office of Spill Prevention and Response**

## **GUIDANCE DOCUMENT**

For use in the preparation of

**Contingency Plans**

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### **Applied Response Technology (ART) and Oil Spill Cleanup Agents (OSCA's)**

**Title 14, CCR Section 817.04(q)**

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## BACKGROUND

The *Lempert-Keene-Seastrand Oil Spill Prevention & Response Act* [the Act; Gov. C. §8670.1 *et seq.*; significantly amended in 2014 by Senate Bill 861 (SB 861)] requires the Administrator for oil spill response, acting at the direction of the Governor, to ensure the State fully and adequately responds to all oil spills in state waters and to represent the State in any coordinated response efforts with the federal government. The goal and purpose of the Act is for the Administrator to provide for the best achievable protection of waters of the state from oil spills. This includes establishing and periodically revising a California Oil Spill Contingency Plan that provides integrated and effective coordination for state agencies to address the results of major oil spills.

The Administrator must implement activities relating to oil spill response, such as emergency drills for preparedness, oil spill containment and cleanup, and financial responsibility. This also specifically includes adopting and implementing regulations governing the adequacy of oil spill contingency plans that must be prepared and implemented by vessels and facilities that could spill oil into state waters.

The Administrator has the primary authority to direct prevention, removal, abatement, response, containment, and cleanup efforts with regard to all aspects of any oil spill in waters of the state. This includes authority over the use of all response methods, such as *in situ* burning, dispersants, and other oil spill cleanup agents in connection with an oil discharge. The Administrator must cooperate with any federal on-scene coordinator, as specified in the National Contingency Plan.

The Administrator is required to establish a network of rescue and rehabilitation stations for wildlife injured by oil spills in waters of the state, including sea otters and other marine mammals. This network is known as the Oiled Wildlife Care Network (OWCN), and is administered through the Wildlife Health Center at the University of California, Davis. If a plan holder has a spill that injures wildlife, plan holders are encouraged to use a local OWCN facility if there is one in the area.

Owners or operators of facilities that have the potential to spill oil into state waters are required to prepare and submit an oil spill contingency plan (C-plan) to the Office of Spill Prevention and Response (OSPR) for approval. [Ref. CA Government Code §§8670.28, 8670.28.5, 8670.29, 8670.30.5, and 8670.31] Contingency plans are prepared and used for response activities in the event of an oil spill or threatened spill into waters of the state. The Act authorizes the Administrator to require that contingency plans provide for best achievable protection taken and that sufficient response resources are capable of arriving on-scene and equipment deployed within a certain timeframe for effective containment and response.

## DISCLAIMER

The purpose of the guidance document is to assist owner/operators in complying with the oil spill contingency plan (C-plan), drills and exercises, financial responsibility and other requirements established by the Office of Spill Prevention and Response. C-plans are mandated for certain vessels and facilities by the *Lempert-Keene-Seastrand Oil Spill Prevention & Response Act* (the Act; Gov. C. §8670.1 *et seq.*), which was significantly amended in 2014 by Senate Bill 861 (SB 861).

This document does not contain specific requirements, nor does it replace any statutory requirements established by the Act, SB 861 amendments, or regulations promulgated to implement the Act and SB 861 amendments. This guidance document helps explain how to comply with the Act and the implementing regulations. However, all applicable laws and regulations should be read before using this guidance document for the preparation of C-plans.

All guidance documents can be obtained by visiting our website at <http://www.wildlife.ca.gov/OSPR/Preparedness/Inland-Facilities-Contingency-Plan>. Guidance documents may be updated periodically without notice, as necessary, to reflect any changes in applicable laws or regulations. Comments or questions regarding a guidance document should be addressed to the OSPR Branch listed on the specific guidance document.

**The material in this Guidance Document applies to a contingency plan holder if:**

- Activities for your vessel or facility could produce a spill of hydrocarbon-based oil;
- A hydrocarbon-based spill has the potential to threaten state surface waters;
- There is a need or request to use an Oil Spill Cleanup Agent (OSCA);
- There is a need or request to use in-situ burning on any type of spill.

**The material in this Guidance Document specific to the use of Oil Spill Cleanup Agents (OSCA) will not apply to a contingency plan holder if:**

- The product spilled is not petroleum-based;
- A spill is confined to land (e.g., rail beds, rail yards) and/or and managed such that there is no actual or potential threat of run-off to state waters;
- The use of an OSCA is entirely within a self-contained setting (e.g., vessel fuel or cargo tank, storage tanks, tank farm), on water bodies entirely on facility property (e.g., holding ponds with no outlet to state waters), self-contained oil/sediment cleaning machines, or structurally sound vessel/rail fuel or cargo tanks, or in a manner (e.g., hand cleaning of hard surfaces) that prevents run-off oil oily waste to state waters;
- A spill could only affect groundwater (State Water Resources Control Board or Division of Oil Gas and Geothermal Resources should instead be contacted).

## **A. Applied Response Technologies – Overview of Uses and Approvals**

Approval for the use of ART on oil spills to state waters rests exclusively with the OSPR Administrator and the Region IX Regional Response Team (RRT), respectively. Response decision-making is triggered by federal (National Response Center) and state (Cal-Office of Emergency Services) spill reporting and is supported by state and federal ART Technical Specialists. The decision to use an ART approach or OSCA on oil spills does not reside with the contingency plan holder, although the contingency plan holder should know how to make the proper notifications, can make a request of the OSPR Administrator and/or RRT for consideration of a particular ART approach, and can and should provide operational support, as appropriate, for an oil spill response using ART.

ART includes two categories of response technology: 1) The use of various chemical or biologically based oil spill cleanup agents (OSCA), which can include sorbents, surface washing agents, bioremediants, dispersants, herding agents, solidifying agents, and demulsifiers and, 2) The use of in-situ burning of oil on water or land. Not all OSCAs are formulated for use in all situations, so product selection is crucial to determining whether a net environmental benefit can be reasonably expected from the use of any particular product.

Mechanical containment and recovery is always used as the primary and preferred response option, whenever appropriate to the type, location and scale of the oil spill. However, oil removal via mechanical means may not remove enough oil, particularly from hard-to-reach or sensitive areas, dynamic water environments, or shorelines and other hard surfaces. When appropriate, applied response technologies are evaluated as additional response tactics, and tailored to the needs posed by each oil spill incident.

BEFORE any OSCA is used on oil spills to state waters, the OSCA producer/provider must have their product:

1. Reviewed by OSPR and given an OSPR license or exemption. Information on California state licensing is provided by the OSPR Administrator in the “Procedures and Forms for the California State Licensing, Renewal and Exemption of Oil Spill Cleanup Agents (OSCA)”.
2. Reviewed by the federal EPA and listed on the federal National Contingency Plan (NCP) Product Schedule, or given a letter of exemption by the federal EPA.

Any approval for the actual use of a licensed OSCA is made on a case-by-case basis. Although a product may receive a state license for use, that does not guarantee it can or will be used to address all circumstances. It is at the discretion of the IC/UC to determine the appropriateness of any particular OSCA to address any particular spill situation. The use of any chemical cleanup countermeasure must also be approved by the Regional Response Team.

OSCA licenses issued by the OSPR are valid for five years, with renewals necessary to maintain current product listing. A list of products currently licensed by the state, or determined to be license-exempt, can be provided by the OSPR Applied Response Technologies staff person.

More detail on types of OSCAs and the federal and state use and approval processes are described in the sections below.

## **B. General Description of Various OSCAs and In-Situ Burning**

### **1. Sorbents**

Sorbents are materials that soak up liquids. Those used for oil spills should be oil attractive (oliophilic) and water repellent (hydrophobic). Although the use of sorbent products is probably the second most commonly used oil recovery technique, they are not intended for recovering the main volume of a spill. Since oil is often defined as a hazardous waste, any sorbent coated with oil (even one considered biodegradable) would also be considered a hazardous waste.

Sorbent materials should be easy to apply and recover as well as strong enough to be handled without coming apart. Sorbents used on water should be able to take on large

amounts of oil without sinking. Sorbents will be reviewed for specific advantages and disadvantages based on product type.

Sorbent products are available in a great many forms, including 1) roll, sheet, pad, blanket, or web, 2) loose, or 3) particulates or foam enclosed in boom, sock, pillow or other similar fabric or web-bound constructions, or strips bound into sorbent pom-poms to act as “sweeps”. Criteria for selecting sorbents for a particular use may include consideration of 1) how oliophilic (oil attracting) and hydrophobic (water rejecting) the product is, 2) rate of sorption, 3) surface area, 4) buoyancy, 5) oil retention, 6) reusability, 7) ease of retrieval, 8) disposal options, 9) storage, and 10) cost.

There have been proponents for the use of other types of inexpensive “organic” sorbent boom and mat material (e.g. pet or human hair, other cellulose products such as straw or hay), but these too can be problematic in their use, especially if used on water. Hay can introduce seed that could be considered invasive depending on environment of use, and hair may potentially and unnecessarily introduce additional skin oils and residual chemicals into the spill environment.

Conventional sorbent materials are more effective, do not pose leaching concerns, are readily available, and are strongly preferred. All products should be pH neutral, seed free, and self-contained for use on or near water.

The State of California will review each sorbent product to determine if requires a license, or can be exempted from the state license requirements. OSPR Administrator spill-specific approval will apply to sorbents that are licensed, but not to sorbents that receive an exemption.

The federal EPA offers a categorical exemption for all sorbents from the NCP Product Schedule, so generally no further federal or RRT approval is required before the use of an exempted sorbent in an oil spill response that affects water. However, both the State and the RRT have policies limiting or prohibiting the use of any sorbent in a loose and/or broadcast form, so additional RRT approval may be required before an otherwise federally exempt sorbent can be used loose.

## 2. Elasticity Modifying Agents

Elasticity modifiers, vasoelastizers, solidifiers and gelling agents are products which, when mixed with oil, turn the oil into a more coherent mass. They are usually available in liquid or dry granular form, specifically designed to bond with petroleum. Unlike sorbents that physically soak-up liquid, the solidifiers and similar agents bond the liquid into a mass with minimal volume increase, and retain the liquid for easy removal. The bonded material also eliminates dripping, as often happens with sorbents, and thereby minimizes residue or contamination. Some types of solidifiers can actually convert the oil to a rubber-like substance. The reaction of these types of products is not reversible, so if it is used in an enclosed area (e.g., storage or fuel tank), that tank will probably have to be sacrificed.

These agents appear to be most useful for treating lighter oils (such as gasoline, diesel, kerosene and fuel oil) to increase their recoverability. The mechanical strength of these bonded products is weak, and they do not solidify the oil. Thus, while they can be broken down and the oil returned to its original liquid state, they have a more limited use in oil spill response.

The effectiveness of a these types of products is based on the amount of product and time it takes to "fix" a given volume of oil. Effectiveness is likely to decrease for emulsified, weathered, thick, or heavy oils due to difficulties in mixing.

Final products can be solid mat (as with solidifiers), formed usually within one hour after application, but final consistencies may also range down to an incomplete, gel-like substance. In some previous lab tests, salinity did not have an effect on solidification.

Similar to the policies related to sorbent use, the RRT IX and the State of California also have policies that restrict the use of particulate solidifiers; they cannot be used in a loose or broadcast form, but they can be used (and sometime pre-approved for use) if the same material is bound into a boom or other self-contained construction. Self-contained solidifiers fill a niche in spill response, with few remaining concerns about efficacy or environmental toxicity. The policies that limit use of solidifiers to self-contained forms have successfully managed concerns over recovery of oiled material or possible effects on wildlife, although their greater expense compared to conventional sorbents is still a factor in how often they get used.

Liquid elasticity modifiers and gelling agents are limited to use in a self-contained vessel (e.g., ship or land-based tank) where material will not leak to water. If it can be demonstrated that there will be no threat to state waters, use will not require additional OSPR Administrator or RRT approval.

### 3. Surface Washing Agents (SWAs)

The principal use of surface washing agents is to lift stranded oil from surfaces (sand, rocks, constructed walls and surfaces) and flush it into areas where it can be more completely recovered. SWAs can also be wiped on oiled surfaces with rags, and then the contamination wiped off, to reduce worries about contaminated product running into nearby waters.

SWAs with surface-active agents can be further divided into two categories: those that could lift and disperse oil into a nearby water column, and those that lift and float the oil onto the water surface where it can be recovered. Only products that provide lift and float action are licensed for use in California.

The actual rate of mobilization of oil from substrates will depend on the type of oil spilled, the state of oil weathering, and the air and water temperature. Surface washing agents can be used alone, applied with mechanical equipment or hand sprayers, with either low- or high-pressure washing equipment, or with ambient or heated water.

Consideration of, and approvals for, the use of surface washing agents on hard, constructed surfaces (especially if oily runoff can be avoided entirely or at least contained and recovered) is considerably less difficult than approvals for use in wetland or marsh habitats. In these latter situations, worker access to the sites can be damaging, and flushing of oil from vegetation can disturb underlying mud and root structures if too forceful, and inadvertently haze birds and other wildlife into oiled areas.

Surface washing agents have sometimes been combined with mechanical cleaning equipment as a way to clean contaminated sediment. In this process, oil contaminated material is removed by earth moving equipment and deposited in a sediment washing machine. Heated water is sometimes used, but a cleaning agent may also be added to strip the oil from the sediment. After the sediment is determined to be sufficiently cleaned and rinsed to levels that meet regional and state standards for any residual oil or cleaner, it is moved back to the area from which it came. The process, though it cleans the contaminated sediment, also destroys the biological community present in the excavated material. However, if that material had already been heavily oiled, then cleaning it will not provide significantly greater loss to those populations than would have occurred in the absence of those supplemental cleaning efforts.

RRTs would not normally be involved in approvals to use surface washing agents within an otherwise self-contained system, as long as the sediment was cleaned to the ppm (parts per million) thresholds established by regional and state agencies, and the rinse water disposed of properly. However, baseline and follow-up monitoring of the sediments inside and outside the treated area may be advised.

Properly used, surface washing agents can effectively improve oil spill cleanup. However, many products listed on the NCP Product Schedule are not appropriate for use on natural substrates if there will be release of oil and washing agents to water bodies. They may be appropriate for use on constructed or other hard surfaces (e.g., roadways, parking lots, rip rap, pier pilings, ship decks and hulls). Use on cobble or sandy beaches may also be considered in limited cases.

Only two products (CytoSol, Accell Clean SWA) are currently licensed for use in or near California state waters. Both of these are "lift and float" products that are considered relatively non-toxic to workers and environmental resources. However, approval for their use is limited to settings in which treated run-off oil can be prevented from entering the water entirely, or if unavoidable, run-off can be collected in contained areas at the water surface and picked up using skimmers and sorbents. There appear to be a limited number of lift-and-float surface washing agent products available that can meet the approval criteria.

#### 4. Dispersants

Dispersants are chemicals that are applied directly to spilled oil. The key components in chemical dispersants are surface active agents called surfactants. Chemical dispersants assist with breaking up the oil into small particles ranging in size from a few micrometers to a few millimeters.

Although there are no explicit zones in California where the use of dispersants is explicitly prohibited, there are few anticipated situations in which they could meet the thresholds and criteria for OSPR Administrator or RRT approval. Existing state and federal regulations and policy prohibit the use of dispersants on shorelines or in intertidal areas, or on the surface waters of streams and rivers. Dispersants could theoretically be approved for use on freshwater lakes and reservoirs (although if those lakes and reservoirs are a drinking water supply, then additional approval from the State Water Resources Control Board is also required). However, dispersants are not recommended for use on spills of light-weight oils such as diesel and gasoline, or on sheens, and these are the most likely types of spills that would occur in lakes and reservoirs. There are also no dispersants currently licensed for use in California that are formulated for freshwater use, although if the need arose, a one-time emergency use of a freshwater dispersant that is on the NCP Product Schedule could be approved by the OSPR Administrator and the RRT.

The chemical dispersants currently licensed for use in California are limited to use in marine waters.

#### 5. Bioremediants/Biodegradation Enhancement

Use of biological countermeasures, or bioremediation, involves the use of specially developed organisms, or environmental or chemical enhancement of indigenous bacteria. They are used to break down oil more quickly than would occur without their introduction into the area of a spill. Bioremediation is a treatment technology that enhances existing biological processes to accelerate the decomposition of petroleum hydrocarbons and some hazardous wastes.

The promise of bioremediation providing increased rates of oil degradation with minimal input of human effort to clean up the spilled oil is attractive. However, the technology is time consuming, unproved in open water environments, and is probably best suited to the treatment of specific types of shorelines (e.g., marsh, intertidal regions) and certain inland habitats. At present, bioremediation should be viewed as a polishing agent for the final stages of cleanup rather than as a primary response tool - especially considering the slow rates of reaction to degrade the oil.

#### 6. Other Miscellaneous OSCA Categories (Herding Agents, Emulsifiers, De-Emulsifiers)

These categories of OSCAs are much less commonly considered for use in oil spill response, so are not further described here. Further definitions and descriptions may be found in the OSPR "Procedures and Forms for the California State Licensing, Renewal and Exemption of Oil Spill Cleanup Agents (OSCA)".

## 7. In-Situ Burning

In-situ burning means burning the oil in place as a means of removal. For on-water in-situ burn operations, oil must be contained in order to maintain a minimum burn thickness. As a result, the technology is limited by any adverse weather or water conditions that limit oil containment. In-situ burning removes the surface oil by driving much of it into the atmosphere in the form of combustion gases and soot. In-situ burning does have the potential to accelerate cleanup of spilled petroleum on the surface of the water or land, and at the same time reduce the risk of petroleum-related impacts on environmentally sensitive areas. The problem for decision makers is to compare the effects of burning versus not burning and choose the option that provides the greatest net benefit to the environment, without causing undue public health impacts.

The Unified Command determines whether in-situ burning should be considered for use on an oil spill and approval must be granted by the RRT, either by satisfying specific pre-approval criteria or by a case-by-case consideration process.

### **C. Federal and State Policies Directing the ART Use and Approval**

#### 1. Federal

The Unified Command can request the use of ARTs by submitting a formal request to the RRT. It is the policy of the RRT to respond to all such requests within 2 hours.

##### a. Regional Response Team (RRT) Approval for Use

During an oil spill, the Federal On-Scene Coordinator (FOSC) can request the use of an OSCA. This is done through a formal request by the FOSC to the RRT. The FOSC may consult with the UC to make sure they are also in support of the request. All applied response technologies must be approved by the RRT in advance of their use. Approvals are only given to a FOSC; they are not given to any other member of the Unified Command, or directly to the Responsible Party (RP).

RRT IX pre-approval policies may exist for some OSCAs, which indicate that sufficient pre-planning and risk/consequence analyses has allowed the RRT and federal Service agencies (NMFS, USFWS) to review those limited uses ahead of time. Pre-approval policies allow the FOSC to skip the incident-specific RRT consultation if all pre-approval conditions have been met. The Regional Contingency Plan for RRT Region IX provides guidelines and helpful forms the UC can use to facilitate RRT IX review and approval of OSCAs during a specific incident:

[http://www.dfg.ca.gov/ospr/response/acp/marine/2005RCP/Appendices/Appx\\_XI\\_OSCA.pdf](http://www.dfg.ca.gov/ospr/response/acp/marine/2005RCP/Appendices/Appx_XI_OSCA.pdf)

Regardless of whether an oil spill cleanup agent use is being considered for state or federal waters offshore California, and regardless of zone or use type (RRT Pre-Approval, RRT Expedited Approval) the OSPR ART Lead Technical Specialist will be

available to assist the FOSC in consulting with the various trustee agencies, gathering incident-specific information on environmental resources at risk, and determining if any OSCA use can be expected to result in a “net environmental benefit”, when considered against all other available oil spill response options.

## 2. State

### a. OSPR Administrator Approval for Use

OSPR is a member of the Region IX RRT, and will be one of the incident-specific members of the RRT approving use of applied response technologies (including use of OSCAs) when considered for use in, on, near or threatening state waters.

Per Government Code Section 8670.7(f), and separate from his/her role on the RRT, the OSPR Administrator has an additional responsibility to review and approve the use of any applied response technology in, on, near or threatening state waters.