Crude Awakenings

Oil Spill Prevention and Response
in Los Angeles County’s Marine Environment

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ACKNOWLEDGEMENTS

We extend our gratitude to Environment Now for providing support to update the original Crude Awakenings, written by Kristina Haddad and Steve Fleischli. Special thanks to Mara Elana-Burstein, who inspired and facilitated the support for this project. Visit http://www.environmentnow.org/

We extend our gratitude to the Los Angeles Sustainability Collaborative for filling research needs and extending further support for research and editing. Dan Freedman, Colleen Callahan, and Mara Elana-Burstein were instrumental in creating the initial momentum for this project. Visit http://lasustainability.org/

We would like to extend our special thanks to Maggie Riley for serving as primary author for chapter one; Shanee Stopnitzky for dispersants research and writing; Amanda Gruen for research and outreach, Jen McWhorter for research on marine life impacts, Kristina Haddad for great advice; Nick Sadrpour for research. We want to express our appreciation for the following experts that answered our questions: Capt. Dick McKenna, former Executive Director of the Marine Exchange of Southern California; Capt. John Betz, Port of Los Angeles Pilot Service; Mike Coyne, Oil Spill Prevention Specialist with CA OSPR; Jeff Jappe, Area Response Manager with MSRC; Margaret Zalabak, Oil Spill Coordinator with Chevron; Lt Lori Loughran, Marine and Environmental Response Branch Chief with US Coast Guard; Robin Churchill, Law Professor at Dundee and author of “The Law of the Sea”; Kevin Mercer, formerly with the California State Lands Commission; Ken Haskett, Los Angeles County Lifeguards; Capt. Kip Louttit, Executive Director of the Marine Exchange of Southern California; and Capt. Laura Kovary, Marine Facilities Division Chief at California State Lands Commission.
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EXECUTIVE SUMMARY

Los Angeles is no stranger to oil. We are accustomed to an immense volume of oil arriving from tankers to our shores every single day. Between the Ports of Los Angeles and Long Beach (the busiest port complex in the U.S. with 10,000 ship calls a year) and Chevron’s El Segundo Marine Terminal (California’s last open ocean oil terminal, ch.4), Los Angeles County has at least 50 million gallons of oil a day arriving on our shores. For perspective, the Exxon Valdez spilled over 11 million gallons of oil into Prince William Sound, causing devastation that still hasn’t fully recovered in 24 years. The spill reached Alaskan shores 600 miles away. If that much oil was spilled from a tanker off the coast of Los Angeles, the oil spill could stretch across the coastline of the entire state.

Supertankers off the coast of Los Angeles transfer millions of gallons of oil to ‘normal’ tankers in a designated lightering area just 20 miles southeast of Catalina Island, a treasured icon rich in marine life and tourism. In addition, oil is still actively drilled from shallow oil rigs and islands near Long Beach.

The Gulf of Mexico Deepwater Horizon rig failure in 2010 spilled over 210 million gallons in the worst oil spill in U.S. history. The BP spill exposed federal corruption in management, absurd response plans, confusion amongst response leaders, and new and dangerous response technologies (chemical dispersants). Studies are now showing that the combined mix of oil and dispersant is up to 52 times as toxic as dispersant or oil alone. Unprecedented volumes of dispersant were applied to the BP spill (almost 2 million gallons) in an attempt to minimize impacts to highly visible species (e.g. birds and mammals) and areas (e.g. beaches and wetlands). As time passes since the devastating spill, scientists and fisherman are slowly uncovering the impacts of the dispersed oil, from damaged deep sea coral habitats to mutated fish, crabs, and shrimp. Some marine habitats near Los Angeles have already been pre-approved for the same toxic Corexit 9500 dispersant used in the BP spill. Thousands of gallons of Corexit 9500 are currently being stored in Long Beach.

Los Angeles and the entire state of California are dependent on a healthy local ocean for tourism, recreation, fisheries, beach going and more. We cannot afford a large spill off our coast that would decimate our local environment and cripple our coastal cities. It is crucial that relevant lessons learned from the BP Deepwater Horizon spill and other spills are applied to Los Angeles County. We must demand that decision makers take extreme caution about the use of dispersants, hopefully opting for less toxic alternatives in a high-pressure time sensitive spill scenario. We must work to update our response plans and conduct oil spill drills as if our coastal economy and wildlife depend on it (they do). Stakeholders and the public can get more involved in understanding how spills are prevented, and how to get involved in the case of a major spill off our coast. Major oil spills are the sleeping dragon of environmental impacts to coastal economies. We need to prevent oil spills at all costs, yet respond to them as best as we can.
# CRUDE AWAKENINGS

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CHAPTER ONE: POLICY, REGS AND LOCAL FACILITIES

Know the players and the rules before you play the game

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INTRODUCTION

Although it has been three years since oil began spewing from the failed Macondo Well under the Deepwater Horizon drilling platform, the residents on the Gulf of Mexico’s coast are still reminded of the spill and its environmental impacts. Litigation is ongoing and will likely remain that way for years (the United States Supreme Court was hearing arguments regarding the March 1989 Exxon Valdez oil spill as recently as 2008), and new studies are continuing to be published regarding the threatened health of the Gulf and its marine life.

For people in Southern California, this spill served as an important reminder that disasters are unpredictable, and that government agencies need to be prepared to prevent and respond to complex and large-scale disasters quickly and effectively. Given the amount of oil transported along the Southern California coast, the BP Deepwater Horizon disaster provides particularly relevant and important lessons for Los Angeles and the rest of Southern California on how to prepare for, and prevent, a similarly catastrophic disaster.

Deepwater Horizon rig explosion, April 20, 2010. Source: gCaptain.com
In 2010, the people of the Gulf Coast and our environment paid dearly for lessons not yet learned. The Minerals Management Service (MMS)\(^1\) had failed in its role of enforcing environmental safety regulations, BP was pushing blame on two other companies involved in the drilling operation, Transocean and Halliburton, and the government was still being given the run around about exactly how much oil was actually leaking. In the days following the Deepwater Horizon spill, it seemed as if those who we traditionally look to for answers were confused about who was in charge of stopping the flow of the leaking oil and directing cleanup efforts. When the leak was finally plugged and the MMS re-purposed by the Obama administration in an attempt to prevent future catastrophic spill events, the country breathed a long awaited but shallow sigh of relief. Today the question still remains: did the sealing of the Macondo Well also mark the sealing of holes in oil spill prevention and response policies that exacerbated an already catastrophic event?

This question is especially important to residents of Southern California. Numerous tankers carrying crude oil and other refined oil products traverse in and out of the ports of Los Angeles and Long Beach daily and moor less than two miles off our beaches, pumping crude oil to a refinery that sits directly onshore. Active oil rigs are in operation throughout the area, from inland to offshore. The use of toxic dispersants in the event of an oil spill is already pre-approved in many marine environments of Southern California. While the BP Horizon spill is now a distant memory for most residents of the LA area, the question is, should it be? While Southern California might not currently be home to any deep ocean oil wells, the high risk remains that Southern California could face a similarly devastating oil spill just off the coast.

To better understand the scope and scale of those risks, Crude Awakenings 2013 investigates just how prepared Southern California is in 1) preventing, and 2) effectively responding to a major oil spill off the coast. It begins with chapter one investigating the regulatory and policy framework that guides Los Angeles County oil facilities, and ongoing oil spill prevention and response programs. This chapter will initially consider important federal regulations and agencies, then discuss significant California state regulations and agencies and follow with a discussion of the international agreements to which the U.S. is bound. It will conclude with an introduction to the oil facilities that must comply with all the state and federal regulations.

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\(^1\) Now called the Bureau of Safety and Environmental Enforcement, see page 6
National Regulations and Agencies

Extracting, transferring, and selling oil in Southern California is a large and complicated system. If one wishes to improve the system, it is important to first understand the policies and agencies that regulate the industry. Prevention is the only real solution to oil spills, and the laws and regulatory framework have been created primarily to prevent catastrophe. This chapter is a primer towards understanding how prevention and response have been set up at the federal and state levels. If there was a major spill off the coast of Los Angeles, the predetermined system of response is implemented. The recommendations from chapter one are based on the Deepwater Horizon lessons learned. One in particular is the lessons learned from the Minerals Management Service (MMS) corruption that resulted in a formal separation of leasing and revenue functions into three separate agencies. The California State Lands Commission, responsible for leasing and its revenues, currently shows no corruption similar to the former MMS but the structure of lease and revenue management at our state level is relatively similar to the federal management structure that failed due to corruption.

Typically following a significant human-related environmental disaster, such as an oil spill, the government will enact a new regulation or measure. When new federal or state statutes and regulations are enacted, the new rules preempt older conflicting rules. The older rules, to remain relevant, must be amended to not conflict with the new rules.¹

The world’s first major oil spill occurred in 1967 off the coast of England when the oil tanker Torrey Canyon ran aground and unleashed nearly 37 million gallons of crude oil into the water. This prompted the U.S. to enact the federal National Oil and Hazardous Substances Pollution Contingency Plan (National Contingency Plan, or NCP) of 1968. Only a year later in 1969 the U.S. suffered its first significant offshore oil spill in Santa Barbara, California, when a platform drilling in 188 feet of water suffered a blowout and spewed 200,000 gallons of crude oil into the Santa Barbara Channel. Public concern over water quality grew and the federal government subsequently enacted the National Environmental Policy Act (NEPA) of 1970.³ In the 1970s numerous studies were published citing the poor water quality of the country’s waters fueling further public outrage and spurring the passing of what is now known as the Clean Water Act of 1972.⁴ In 1989 Exxon Valdez spilled between 11 million gallons of oil into Alaska’s Prince William Sound and as a result

¹ (California Coastal Commission 2012)
³ (County of Santa Barbara Planning and Development, Energy Division 2011)
⁴ (Public Affairs Television 2010)
Congress passed the Oil Pollution Act of 1990 (OPA). The OPA is the federal government’s current comprehensive statute regarding the federal government and responsible parties’ role in oil spill response and cleanup. While there were many other regulations concerning oil pollution prior to OPA, OPA amended these statues and provisions to create a new statutory structure concerning oil pollution and new liabilities for polluters.  

Most recently BP’s Deepwater Horizon incident in 2010 was the catalyst for a whole new regime of safety regulations that oil companies must follow, and the inspection capabilities have been strengthened. One important change was the disbanding of the Interior Department’s Minerals Management Service (MMS), the agency responsible for managing the mineral and energy resources on the Outer Continental shelf. MMS was reorganized and its responsibilities were separated into three distinct organizations: the Bureau of Ocean Energy Management (BOEM), the Bureau of Safety and Environmental Enforcement (BSEE) and the Office of Natural Resources Revenue (ONRR). The goal of the reorganization was to establish a system of checks and balances so there was no longer an incentive (money for the organization) to grant oil leases. The industry, contractors, and the MMS were focused more on drilling and profits than on preparedness and oversight. The leaders of the new agencies have made it their mission to protect the public and the environment, not the industry they are charged with regulating. It is hoped the three new agencies (BOEM, BSEE, and ONRR) are able to accomplish improved safety goals to prevent future deepwater oil rig spills.

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5 (Environmental Protection Agency, Emergency Management 2011)  
6 (Bureau of Ocean Energy Management 2012)  
7 (National Academy of Engineering and National Research Council of the National Academies 2012)
Below is an overview and examination of legislation regarding oil spill prevention and response, an analysis of the requirements these policies impose upon various governmental agencies, and a discussion of how the numerous policies and regulations interact with each other.

Federal Legislation

The federal statutes and regulations are the overarching structure to which all state and local regulations must conform. The Oil Pollution Act of 1990 is the federal government’s current comprehensive statute regarding the federal government and responsible parties’ role in oil spill response and cleanup. While there were many other regulations concerning oil pollution prior to OPA, OPA amended these statutes and provisions to create a new statutory structure concerning oil pollution and new liabilities for polluters. The following highlights the primary federal legislation (pre-OPA to those amended post-OPA) and the agencies involved in prevention of and response to oil spill incidents.

National Environmental Policy Act of 1969 (NEPA)

The National Environmental Policy Act of 1969 (NEPA), officially enacted in January of 1970 after the Santa Barbara oil spill, set forth the U.S.’s general policy on the environment. The opening text of NEPA states its purpose is to “declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man...” While NEPA has lofty rhetoric, its notable feature involves requiring federal agencies to monitor their impacts on the environment by submitting environmental impact statements (EIS) or environmental assessments.

1969 Santa Barbara Oil Spill. Source: sloblogs.thetribunenews.com

\[8\quad 42\ U.S.C. \ § 4321\]
(EA) before starting a new project, emphasizing the government’s desire to make fully informed decisions about potential projects and their effects on the environment.

**Clean Water Act of 1972**

Shortly after NEPA was enacted, Congress passed what became known as the Clean Water Act (CWA) of 1972 (and later amended it five years later in 1977). It became the premier governing law in the U.S. concerning water pollution in all navigable waters\(^9\) of the United States and adjoining shorelines.\(^{10}\) The CWA was actually a major reorganization, revision and renaming of the Federal Water Pollution Control Act of 1948.\(^{11}\) The CWA prohibits discharges of oil or hazardous substances, in such quantities as may be harmful (1) into or upon navigable waters of the U.S., adjoining shorelines, or into or upon the waters of the contiguous zone or (2) which may affect natural resources in the U.S. Exclusive Economic Zone (EEZ). The CWA, which is administrated by the Environmental Protection Agency (EPA) requires the preparation and publication of a National Contingency Plan (NCP) providing for “efficient, coordinated, and effective action to minimize damage from oil and hazardous substance discharges, including containment, dispersal, and removal of oil and hazardous substances…”\(^{12}\) The same section requires designation of a Federal On-Scene Coordinator (OSC) for each area for which an Area Contingency Plan (ACP) (required

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\(^9\) Navigable waters are defined as 1) territorial seas of the United States, 2) Internal waters of the U.S. subject to tidal influence, 3) internal waters of the U.S. not subject to tidal influence that are or have been used for commerce, 4) all waters in the U.S. tributary thereto, and 5) other waters over which the federal government may exercise constitutional authority. 33 CFR § 2.36

\(^{10}\) 33 U.S.C. § 1251

\(^{11}\) (Environmental Protection Agency 2013)

\(^{12}\) 33 U.S.C. § 1251 (d)(2)
by OPA, the CWA was subsequently amended to include this provision) is prepared. These areas are established and designated by the President and include an Area Committee (AC), comprised of federal, state and local personnel. The Area Committees were designed to be a joint task force where state and local officials work together to enhance response and contingency planning and to pre-plan joint response efforts in order to ensure adequate and streamlined responses to any oil spill in the area.\textsuperscript{13} Area Contingency Plans are required to include a Fish and Wildlife Sensitive Environmental Plan (FWSEP) that addresses fish and wildlife resources, their habitat and other areas considered sensitive environments.\textsuperscript{14}

**Oil Pollution Act of 1990**

After the *Exxon Valdez* spill, consensus arose that the patchwork of environmental statutes were ineffective at preventing environmental damage from oil spill incidents.\textsuperscript{15} The Oil Pollution Act of 1990 (OPA) created a three-tiered approach to both prevention and response, first by requiring the federal government to direct all public and private response efforts, second by creating Area Committees, and last by requiring vessel owners/operators to prepare their own facility oil spill response plans and submit these plans to the appropriate government entity: the United States Coast Guard (USCG) for vessels, EPA for onshore non-transportation facilities, USCG and Department of Transportation (DOT) for onshore transportation facilities, and the newly established BSEE (under the Department of the Interior) for offshore facilities (oil/gas extraction). OPA also expanded damages recoverable after an oil spill to include monetary damages for any interim or long-term loss of use of natural resources due to a spill, not just the costs required to restore the resources.

Further, OPA was revolutionary because it allows for this recovery of solely economic losses after an oil

\textsuperscript{13} 33 U.S.C. § 1251 (j)(4)

\textsuperscript{14} 59 FR 47384-47495. September 15, 1994

\textsuperscript{15} “Arguably each law had perceived shortcomings . . . and none provided comprehensive oil spill coverage.” (J. Ramseur 2011)
spill without requiring proof of actual harm. Previously a showing of actual physical harm was required. For example, a fisherman can now claim losses for damage to his fishing grounds without having to show any actual affected fish he caught.

OPA expanded provisions designed to prevent spills, requiring all vessels operating in U.S. waters to be double-hulled by 2015.\textsuperscript{16} The provision had an international effect because it applies to any vessel entering U.S. waters, not just limited to U.S.-flagged vessels. So far, nearly all ships operating in U.S. waters have adopted the double-hull requirement early. The International Maritime Organization and the European Union soon followed with similar double hull requirements.\textsuperscript{17}

In addition, OPA requires any entity that transports oil or oil-related products in the U.S. to ensure they have adequate response capabilities in a “worst case discharge” spill to the maximum extent possible. Most companies comply with this requirement by becoming members of an association such as the Marine Preservation Association, a consortium of oil-industry related companies which fund the Marine Spill Response Corporation, a nationwide corporation with the equipment and personnel to respond to oil spills.

**National Contingency Plan**

The National Oil and Hazardous Substances Pollution Contingency Plan (National Contingency Plan, or NCP) of 1968, adopted by the U.S. after the massive *Torrey Canyon* spill in the U.K., established the federal government’s response in the event of an oil spill or release of hazardous materials into the environment.\textsuperscript{18} Last revised in 1994, the CWA and OPA both require following the NCP. Currently, the NCP requires a response headquarters, a National Response Team (NRT) and Regional Response Teams (RRT). The NRT and the RRTs are primarily involved with planning, policy, coordination, and support the response effort. They are composed of officers of the USCG and the EPA, as well as state representatives.

The NCP requires the Chair of the National Response Team to be a representative of the EPA and the vice chair a representative of the USCG. During a period of activation because of a response, the chair shall be the agency providing the On-Scene Coordinator that will direct the response efforts. The EPA is the authority responsible for oil spills that occur in and around inland waters of the U.S., while the USCG is the response authority for spills occurring in coastal waters and

\textsuperscript{16} (Exxon Valdez Oil Spill Trustee Council 2012)
\textsuperscript{17} (Europa: Summaries of EU Legislation 2011)
\textsuperscript{18} 42 U.S.C. § 9605
deepwater ports.\textsuperscript{19} Despite this wording, under OPA, the responsible party has primary responsibility for cleanup of an oil spill. The designated On-Scene Coordinator is required under the NCP to consult with the natural resource trustee, if one is available, about the appropriate removal action to be taken.\textsuperscript{20} The federal natural resource trustees for oil spills are the National Oceanic and Atmospheric Administration (NOAA), and the U.S. Department of Fish and Wildlife.

**Additional Federal Acts**

In addition to the broad acts discussed above, several other federal policies deal directly or indirectly with pollution from vessels, and many of these regulations specifically codify requirements of OPA and the Clean Water Act. The Port and Tanker Safety Act (1978) authorizes the USCG to establish and maintain vessel tracking services in order to control and supervise vessel traffic, ideally preventing vessel collisions.\textsuperscript{21} The USCG published the requirements of response plans for vessels and facilities required under OPA in a separate federal regulation.\textsuperscript{22} In 2009, the USCG updated its requirements for oil-spill removal equipment associated with the vessel response plans and marine transportation-related facility response plans.\textsuperscript{23} The Coast Guard also requires non-tanker vessels (e.g. container ships) to have vessel response plans (for the large amount of fuel onboard).

While these acts and statutes are the primary guidelines, they are just a limited overview of regulations concerning the prevention of marine incidents and responsibilities after the occurrence of an incident.

**Federal Agencies**

As is exemplified by the National Contingency Plan above, federal agencies are one of the parties responsible for implementing U.S. legislation regarding oil pollution. The two most important agencies in this regard, discussed briefly above, are the Environmental Protection Agency and the U.S. Coast Guard. However, several other agencies also have been delegated some responsibility in regards to prevention of and response to oil spill incidents.

\begin{footnotesize}
\textsuperscript{19} (Environmental Protection Agency: Emergency Management 2011)
\textsuperscript{20} 40 C.F.R. § 300.135
\textsuperscript{22} 33 C.F.R. §150 - 155
\textsuperscript{23} 74 FR 45004. 31 August 2009
\end{footnotesize}
Environmental Protection Agency

The EPA is the lead federal agency in the U.S. tasked with protecting the country’s environment. Created by President Richard Nixon in the 1970s in the wake of the Love Canal disaster, the agency covers the protection of many environmental resources, including water. In regards to oil, the EPA is the creator and enforcer of numerous spill-prevention regulations such as the Facility Response Plan regulation and the spill report regulation. It also is the principal response agency for spills occurring on land or into inland waterways.24

United States Coast Guard

The USCG, while having numerous duties, is the counterpart to the EPA when it comes to oil pollution in navigable waters. The Coast Guard has been tasked with environmental missions since 182225, and USCG environmental responsibilities have steadily increased since then. The FWPCA expansions of 1972 created Coast Guard “Strike Teams” capable of rapid response to oil spills or other disasters. OPA was the largest legislative expansion of authority of the Coast Guard. The authority between the USCG and the EPA over oil and hazardous material is shared and the jurisdictions are outlined in a Memoranda of Understanding between the two agencies. In short, the Coast Guard is responsible for spills in marine waters and ports, and the EPA for spills on land or inland waterways.26

Natural Resource Trustees

Supporting the USCG’s efforts is the National Oceanic and Atmospheric Administration and the U.S. Fish and Wildlife Service, natural resources trustees under CERCLA (the Superfund Act) and OPA that provide scientific support regarding oil spill prevention and response and other environmental impacts.

24 (United States Environmental Protection Agency 2013)
25 The Coast was active in marine environmental protection early in the history of the U.S., protecting timber resources off the coast of Florida in 1822, fur seal protection in the 1860’s, and fishery enforcement in the 1890’s (Canney 1992).
26 (United States Coast Guard 2012)
National Oceanic and Atmospheric Administration (NOAA)

NOAA is housed in the U.S. Department of Commerce and is responsible for daily weather forecasts, severe storm warnings and climate monitoring to fisheries management, coastal restoration and supporting marine commerce.\(^{27}\) Regarding oil spills, NOAA has two important divisions, the Office of Response and Restoration, and the National Marine Fisheries Service.

**NOAA Office of Response and Restoration**

NOAA’s Office of Response and Restoration (OR&R) Emergency Response Division provides scientific support to the On-Scene Coordinator for all oil and hazardous material spills, as required by the National Contingency Plan.\(^ {27}\) NOAA officials collect data to assess natural resource damage, track oil spills, and provide knowledge of at-risk resources. The OR&R does this through its Damage Assessment, Remediation and Restoration Program (DARRP), which has offices throughout the country and provides permanent expertise to assess injury to natural resources after an oil spill or hazardous substance release. DARRP conducts an assessment of damages after an incident following the Natural Resource Damage Assessment (NRDA) Process. The NRDA process includes a preliminary assessment to determine whether injury to a resource held in public trust has occurred, and then the process moves forward with an actual injury assessment and restoration planning phase and finishes off with restoration implementation.

![](image.jpg)

Dolphins observed in emulsified oil from the BP Deepwater Horizon oil spill. Source: response.restoration.noaa.gov

**NOAA National Marine Fisheries Service**

NOAA’s National Marine Fisheries Service (NMFS) is responsible for the management, conservation, and protection of living marine resources within the United States Exclusive Economic Zone (waters 3 to 200 miles offshore).\(^ {28}\) Fishery

\(^{27}\) (National Oceanic Atmospheric Administration Office of Response and Restoration 2013)

\(^{28}\) (National Oceanic and Atmospheric Administration 2013)
management issues are the primary responsibility of NMFS but serving as a natural resource trustee for oil spills is also within NMFS. Section 7 of the Endangered Species Act requires that federal agencies consult with NMFS for marine and anadromous species if they are proposing an action that may affect listed species.\textsuperscript{29} For example, the Coast Guard must consult NMFS if proposing to use dispersants that may affect white abalone populations in a nearshore kelp forest habitat.\textsuperscript{30}

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (FWS) is housed in the U.S. Department of the Interior, and is the federal agency whose primary responsibility is the conservation, protection, and enhancement of fish, wildlife, and plants for the American public. It is responsible for enforcing important environmental laws such as the Endangered Species Act, Migratory Bird Treaty Act, Marine Mammal Protection Act, among others. FWS is a natural resource trustee that serves to consult responders in the event of an oil spill.\textsuperscript{31}

In the case of an oil spill in marine waters, required under section 7 of the Endangered Species Act, the Coast Guard must consult with FWS on land species, birds, and freshwater fish. There are a few marine species that require FWS consultation, such as the sea otter, manatee, and tide water gobies.\textsuperscript{32}

\textsuperscript{29} 16 U.S.C. § 1536(a)(2)
\textsuperscript{30} The Coast Guard must consult NMFS for most anadromous fish and marine species, including marine mammals. This includes listed species of whales, dolphins, seals and sea lions.
\textsuperscript{31} (United States Fish and Wildlife Service 2008)
\textsuperscript{32} (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998)
Bureau of Ocean Energy Management, Bureau of Safety and Environmental Enforcement, and the Office of Natural Resources Revenue

The Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) was the temporary agency under the Department of the Interior (DOI) after MMS was disbanded. MMS previously had the responsibility for issuing oil and gas leases, ensuring the lease safety provisions were being complied with and collecting lease revenue on the outer continental shelf. As was the plan since its conception, BOEMRE broke up its responsibilities into three distinct agencies to accomplish the above tasks; the revenue management responsibility was transferred to the Office of Natural Resources Revenue (ONRR), and two new agencies were created: the Bureau of Safety and Environmental Enforcement (BSEE), and the Bureau of Ocean Energy Management (BOEM). This separation of functions aims to decrease the corruption that was found within the MMS. (Figure 1).
The **BOEM** is responsible for resource evaluation, planning, and leasing. The BOEM is more involved in the initial process of setting up leases including economic valuation, environmental studies and NEPA analysis\(^{33}\). Like the BSEE, the BOEM is housed in the Interior Department’s Office of the Assistant Secretary for Land and Minerals Management.

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\(^{33}\) (Bureau of Ocean Energy Management 2012)
Figure 1. Organizational chart for the new structure of the Department of the Interior after the MMS was separated into BOEM, BSEE, and ONRR. ONRR (not shown) is housed in the Assistant Secretary for Policy, Management and Budget’s Business Center. BOEM and BSEE are both housed in the Assistant Secretary for Land and Minerals Management. The aim of this restructuring was to separate the revenue from the leasing and enforcement functions of the MMS. Source: (United States Department of the Interior 2013)

The ONRR is responsible for the management of revenues associated with federal offshore and onshore mineral leases, as well as revenues received as a result of onshore and offshore renewable energy efforts. This revenue management effort is one of the federal government’s greatest sources of non-tax revenues. The ONRR is housed in the Interior Department’s Office of the Assistant Secretary for Policy, Management, and Budget (PBM). Responsibilities for the ONRR include royalty and revenue collection, distribution, auditing and compliance, investigation and enforcement, and asset management for both onshore and offshore activities.34

34 (Office of Natural Resources Revenue 2013)
The **BSEE** works to promote safety, protect the environment, and conserve resources offshore through vigorous regulatory oversight and enforcement. OPA prescribed the DOI authority over offshore facilities and associated pipelines. Those safety responsibilities of the DOI now fall to the BSEE. The BSEE is housed in the Interior Department’s Office of the Assistant Secretary for Land and Minerals Management. The BSEE is responsible for enforcing spill prevention measures, reviewing spill response plans, inspecting spill containment and cleanup equipment, reviewing spill financial liability limits and certifying spill financial responsibility. The BSEE has the authority to inspect, investigate, summon witnesses, produce evidence, levy penalties, and cancel or suspend activities.\(^{35}\)

<table>
<thead>
<tr>
<th><strong>United States Coast Guard</strong></th>
<th>Responsible for overseeing the contingency plans of vessel owners and operators and facilities located in federal waters, Federal on-Scene coordinator for any oil spill occurring in federal waters.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US Department of the Interior, Bureau of Safety and Environmental Enforcement</strong></td>
<td>Responsible for the oversight of oil and gas drilling facilities on the outer continental shelf.</td>
</tr>
<tr>
<td><strong>US Environmental Protection Agency</strong></td>
<td>Responsible for overseeing the oil spill contingency plans of any facility located on shore. Also is the Federal on-scene coordinator for any oil spill located on land.</td>
</tr>
<tr>
<td><strong>Calif. Department of Fish and Game</strong></td>
<td>Primary state authority on any oil spill within California’s navigable waters, including directing removal, abatement and cleanup efforts. OSPR must work and comply with the on-scene federal agencies, USCG or EPA.</td>
</tr>
<tr>
<td><strong>Calif. State Lands Comm.</strong></td>
<td>SLC possesses the authority and responsibility to manage and protect natural resources on public lands of the state. MFD oversees oil transfers in state waters. MRMD oversees the safety and revenue of oil and gas leases on state lands.</td>
</tr>
</tbody>
</table>

**Figure 2.** Summary table of key enforcement federal and state agencies regarding oil spills.

\(^{35}\) (Bureau of Safety and Environmental Enforcement 2013)
Since the Santa Barbara oil spill of 1969, California has been very proactive in its attempts to prevent oil spill incidents as well as to mitigate their effects. While the state must comply with federal regulations that also include state waters, the state is not prevented from enacting its own more stringent legislation in its coastal waters.

**Lempert-Keene-Seastrand Act**

On March 24, 1989 the Exxon Valdez spilled approximately 11 million gallons of crude oil in Alaska. Less than a year later on February 7, 1990 the American Trader spilled approximately 300,000 gallons of crude oil off Huntington Beach in Southern California. These events inspired the California Legislature to enact legislation in 1990 called the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act (Lempert-Keene).\(^{36}\) The most significant oil spill prevention legislation in California, Lempert-Keene led to the creation of agencies designed to prevent pollution, the Office of Spill Prevention and Response in the California Department of Fish and Wildlife (OSPR),\(^{37}\) and assigned other state agencies oversight responsibility (such as the California State Lands Commission) in regards to economic development which might pose a risk of pollution.

Lempert Keene created a statutory framework for the prevention, removal, abatement, response, containment, and cleanup of oil spills in marine waters of the state. With all the different agencies involved, state legislation has also created a committee for these agencies to work together and communicate with each other, called SIOSC (State Interagency Oil Spill Committee, described below). The following lays out the primary responsibilities of the main state agencies.

**California Department of Fish and Wildlife Office of Spill Prevention and Response (OSPR)**

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\(^{36}\) (California Department of Fish and Wildlife 2011)

\(^{37}\) See [California Public Resource Code § 8750-8751](https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?docId=8750&public=true&section_nbr=8750&label=Public%20Resource%20Code&_start=0&max=10&activeTab=full&tabType=simple&gibill=false)
In the state of California, the primary authority to direct removal, abatement, response, containment, and cleanup efforts with regard to all aspects of any oil spills within the state’s navigable waters belongs to the Administrator of the Office of Spill Prevention and Response (OSPR). OSPR is a department within the California Department of Fish and Wildlife (DFW). It is mandated that OSPR comply with OPA and that the Administrator take any action necessary and appropriate to promote the adoption of statutes and regulations required by the federal government. OSPR requires that the owner/operator of a tank vessel or marine facility operating in California must own or have a contract for on-water recovery and storage resources sufficient to respond to all spills up to a calculated amount. Most companies contract this out by hiring companies such as the Marine Spill Response Corporation (MSRC). Near Los Angeles, MSRC keeps equipment in El Segundo, Terminal Island, the Port of Long Beach, the Port of Los Angeles Harbor, Anaheim Bay and Redondo Beach. OSPR also contains an Enforcement Branch, consisting of licensed DFG wardens who have the authority to enforce both civil and criminal statutes contained in the Lempert-Keene-Seastrand Act. Additionally, OSPR maintains a legal unit to provide advice to the Administrator and enforce the civil and criminal statutes.

California Coastal Commission

The California Coastal Commission (CCC) plans and regulates the use of water as well as land in the coastal zone, a band of land anywhere from several hundred feet to five miles inland out to the state’s three miles offshore jurisdictional limit. Its authority is found primarily in the California Coastal Act of 1976 (CCA) and

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38 California Government Code, § 8670.7
39 California Code of Regulations, Title 14, Division 1, § 815.03
the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act of 1990. The CCC is the designated management agency in California that administers the federal Coastal Zone Management Act of 1972 (CZMA). The CZMA created and funded the CCC and is a voluntary federal-state partnership that gives the CCC the ability to review all federal activities and federally licensed or permitted activities if the activity affects the coastal resources of California. This includes the important ability to veto federal leasing plans on California’s outer continental shelf, an area typically governed by the federal government under the Outer Continental Shelf Lands Act (OCSLA).

The CCC maintains an Oil Spill Program with its division of Energy, Ocean Resources and Federal Consistency Division. The CCC has many duties in this program, including reviewing coastal development projects related to energy and oil infrastructure for the compliance with the California Coastal Act and the CZMA, reviewing oil spill prevention and response regulations, providing input on the regulations, reviewing oil spill contingency plans for marine facilities located in the coastal zone and oil spill response plans for facilities located on the outer continental shelf along California, among other things. In regards to an oil spill response, the CCC is responsible for issuing emergency permits for any oil spill cleanup activity that affects the coastal zone.

California State Lands Commission

California State Lands Commission (CSLC) was created in 1938 as an independent body with the authority and responsibility to manage and protect the natural and cultural resources on certain public lands in the state, including the authority to lease these lands for the extraction of oil and gas. These public lands range from submerged land out to the state seaward boundary (three miles) as well as forty lakes and one hundred twenty riverbeds.40

The Lempert-Keene-Seastrand Act of 1990 created the Marine Facilities

40 (California State Lands Commission 2010)
Division (MFD) of the CSLC. The MFD has statewide marine oil transfer oversight responsibilities at terminals and conducts inspections of these transfer terminals, this includes transfers from ships to land at the ports as well as at the Chevron El Segundo offshore facility. The MFD typically monitors between 40 and 50 percent of all transfers.\footnote{Mercer 2011}

Also part of the SLC is the Mineral Resources Management Division (MRMD), whose goals are not only to protect California’s environment and promote public safety but also to maximize revenue from the 130 oil and gas leases, covering 95,000 acres of California state lands.\footnote{California State Lands Commission 2010} The organization of the MRMD is eerily reminiscent as the now-defunct federal Mineral Management Service. Many faulted the MMS for granting too many leases without performing any due diligence because of MMS’s interest in earning revenue.\footnote{Dickinson 2010}

As the MRMD’s website states, oil and gas production is the single largest source of revenue from state owned lands. With the state’s current financial crisis, one can only hope the MRMD is not cutting safety corners in order to maximize revenue as well. The MRMD’s leasing and fees with respect to Los Angeles County operations are somewhat separated. The Long Beach office conducts lease processing and some facility inspection, while the Sacramento office’s business unit handles the fees and general fund.\footnote{Employee 2013}

**State Interagency Oil Spill Committee (SIOSC)**

*California Government Code* requires the Governor to create and maintain a State Interagency Oil Spill Committee (SIOSC). SIOSC is comprised of the Administrator of OSPR as Chairman, chairpersons from the CSLC and CCC, or their designee and representatives from 18 state agencies, including but not limited to, the CA Office of Emergency Services, CA Highway Patrol, CA Department of Fish and Game and CA Office of Environmental Affairs.\footnote{Federal Region 9 Appendix VII 2005} SIOSC is a liaison between state agencies and public and private organizations engaged in oil pollution, prevention and control.

\footnote{(Mercer 2011) \footnote{California State Lands Commission 2010} \footnote{Dickinson 2010} \footnote{Employee 2013} \footnote{Federal Region 9 Appendix VII 2005}}
INTERNATIONAL AGREEMENTS

International agreements have played an important role in influencing U.S. oil legislation and vice versa. The U.S. is party to numerous environmental treaties some of which have been executed in the U.S. through federal legislation. The U.S. has influenced international laws such as the banning of single-hull tankers in the E.U. area shortly after OPA banned them in the U.S. Below are some of the more important conventions to which the U.S. is a party beginning with MARPOL, the foremost treaty governing this area of law.

International Convention for Prevention of Pollution from Ships (MARPOL)

Because of the inherent mobility of vessels, international conventions have played an important role in developing standards with which vessels from all nations must comply. The International Maritime Organization (IMO), a specialized body within the United Nations and the primary organization for international regulations concerning shipping, promulgated the International Convention for the Prevention of Pollution from Ships (MARPOL) in 1973. Acceptance of Annex I, containing the provisions concerning oil, and Annex II, concerning noxious liquid substances (NLS) in bulk, were obligatory for all contracting parties while acceptance of the remaining annexes was deemed optional. Annex I and Annex II, both of which came into force in the U.S. in 1987, contain detailed and complex provisions to which vessels must abide. The U.S. has executed Annex I and II through the Act to Prevent Pollution from Ships (APPS). Currently, there

Oil tanker off the coast of the Port complex of Los Angeles and Long Beach. Photo courtesy of Lighthawk support: www.lighthawk.org

46 (Churchill and Lowe, The Law of the Sea 1999)
47 33 U.S.C. § 1901
are 151 contracting parties to Annex I/II and they cover almost 99% of the world’s shipping tonnage as of the end of October 2011. The U.S. has also implemented Annex III concerning Harmful Substances Carried in Package Form, Annex V concerning Garbage and Annex VI concerning Air Pollution. The U.S. has not become a party to Annex IV regarding Sewage because the U.S. has more stringent laws on sewage than Annex IV. Joining Annex IV would weaken U.S. sewage laws and regulations.

The Shipboard Oil Pollution Emergency Plans (SOPEP) provides “guidance to masters and officers on board the ship with respect to the steps to be taken when a pollution incident has occurred or is likely to occur.” Title 46 Shipping Laws provide a codified series of regulations for all things U.S. shipping, including personnel standards, inspection requirements, issuance of certificates, etc. The U.S. Act to Prevent Pollution from Ships implemented to codify the requirements of the International Convention for the Prevention of Pollution from Ships, a.ka. MARPOL (short for ‘Marine Pollution’).


According to the broad reaching United Nations Convention on the Law of the Sea (UNCLOS), which the U.S. has signed but not ratified (meaning the U.S. is not a full member to the treaty and therefore not bound by its requirements), flag states must adopt pollution regulations for their vessels that “at least have the same effect as that of generally accepted international rules and standards.” Further, a flag state may exercise jurisdiction of pollution violations of one of its vessels regardless of where the vessel is located. A coastal state may enact any legislation it sees fit in its territorial sea so long as the legislation does not have the effect of hampering innocent passage of foreign flagged vessels.

Intervention on the High Seas in Cases of Oil Pollution Casualties

The Intervention on the High Seas in Cases of Oil Pollution Casualties (the Intervention Convention) was adopted in 1969 after questions of what actions a nation-state was allowed to take in the case of a foreign-flagged vessel polluting on the high seas. The question arose because the vessel Torrey Canyon was actually in international waters when it was wrecked and its oil was reaching the coast of the United Kingdom. The U.K. bombed the Liberian-flagged vessel in hopes of setting

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48 (International Maritime Organization 2013)
49 33 C.F.R. § 151
50 33 U.S.C. § 1901
the oil cargo on fire and thereby reducing pollution.\textsuperscript{52} After adoption of the convention, parties may, if they determine there to be a “grave and imminent danger” to the coastline or related interests of their coastline from pollution or threat of pollution of the seas by the oil, take action necessary to prevent, mitigate or eliminate that grave and imminent danger, even going as far as to intentionally sink a ship.

**International Convention on Oil Pollution Preparedness, Response, and Co-operation**

In July of 1989, after the *Exxon Valdez* spill, the leading industrial nations of the United Nations' International Maritime Organization (IMO) convened and began working on what became the International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC).\textsuperscript{53} OPRC is similar to OPA in the U.S. in that it requires parties to establish measures to deal with oil pollution incidents and requires ships and offshore installations to carry onboard oil pollution emergency plans. OPRC requires vessels to report pollution incidents to coastal authorities as well as the vessel’s own flag state.

**Working Together**

The above-mentioned federal, state, local and international regulations, statutes and treaties are just a brief overview of some of the more important and well-known oil spill prevention and response regulations. Numerous more exist, such as the International Convention on Civil Liability for Bunker Oil Pollution Damage or any of the numerous laws under Title 46 Shipping Laws that address smaller, more nuanced issues.\textsuperscript{54} For a more detailed discussion of who’s in charge and how all the spill enforcement entities work together, see the ‘Los Angeles Prevention and Response’ chapter.

**Jurisdiction**

Article III, Section 2 of the United States Constitution grants federal courts jurisdiction over all cases of admiralty and maritime jurisdiction.\textsuperscript{55} The federal government has exercised this jurisdiction over navigable waters, enacting statutes relating to marine pollution as early as 1899, governing both state and federal

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\textsuperscript{52} Churchill, id 2011
\textsuperscript{53} (International Maritime Organization 2013)
\textsuperscript{54} Title 46 – Shipping Laws, 46 C.F.R. § 1-565
\textsuperscript{55} U.S. CONST. art. II, § 2
navigable waters. Since then, numerous federal measures have been passed dealing with oil and hazardous materials, and spill prevention and response. However, federal jurisdiction is not exclusive and federal measures have been supplemented by local, state and even international measures. The combination of the different levels of government regulation has created a complex web of different acts, regulations and codes, all of which are nuanced, can overlap and can sometimes even cause complications in response, for example determining who exactly is in charge of what after an oil spill. This is not unique to environmental regulations but an enduring problem to maritime law overall.

Jurisdiction over maritime matters historically has been complicated. Under the federal Submerged Lands Act, state waters generally extend three nautical miles (from here on only 'miles' is used) out from the coast (the baseline) and includes all control of all resources located in this three mile region (Figure 3). The United States federal government has complete jurisdiction over the territorial sea, which extends out to 12 miles from the baseline, which includes the first three miles also covered by state jurisdiction. The contiguous zone extends from the territorial waters up to 24 miles offshore and grants the U.S. jurisdiction over customs, immigration, sanitary and fiscal matters of any vessel in the area. The Exclusive Economic Zone (EEZ) consists of waters from the baseline up to 200 miles offshore. The U.S. federal government has jurisdiction in the EEZ over all living and non-living resources within this zone, such as fish stocks and oil resources, as well as pollution that affects these resources. If the continental shelf extends beyond the 200 mile jurisdiction of the EEZ, control of the mineral resources on or in the shelf is granted to the U.S. under the Outer Continental Lands Shelf Act. States, however, under the Submerged Lands Act, retain exclusive jurisdiction of the first three miles.

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56 The 1953 Submerged Lands Act (SLA) did give states jurisdiction over submerged lands, waters and natural resources generally up to three miles from the baseline; the federal government maintains authority to regulate commerce, navigation, national defense, power production and international affairs even within these state waters. (J. L. Ramseur April 30, 2010)
Figure 3. Map demonstrating maritime jurisdiction over coastal waters. 33 CFR 2.5, Figure 2.1
Since marine oil spills do not obey jurisdictional borders, numerous parties become involved. Under the CWA and OPA, in any spill involving U.S. coastal waters, the USCG is the lead response agency. Even though OPA is now the overarching national legislation, it does allow for states to enact more stringent laws for their own territorial waters, typically extending three miles out from the coast. Any vessel within a state’s territorial waters then must comply with the state’s rules and regulations as well as comply with the requirements of OPA.

**National Incident Management System (NIMS) and Incident Command Structure (ICS)**

The system to coordinate response efforts in place at the time of the BP Deepwater Horizon spill and still in place today is the National Response Framework. The National Response Framework utilizes the National Incident Management System (NIMS), which was created by an order issued by the Department of Homeland Security (DHS) on March 1, 2004. NIMS, utilizing Incident Command Structure (ICS), provides a national systematic framework for incident management between federal, state, tribal and local governments, non-governmental organizations and the private sector to respond to all domestic “incidents” in order to facilitate response management. ICS

[57](http://www.fema.gov/pdf/emergency/nims/NIMS_core.pdf) **National Response Framework** defines the entities and how they work together (e.g. USCG in charge during spill response or search and rescue) through the use of Emergency Support Functions (ESFs). The ESFs provide the structure for coordinating federal interagency support for a federal response to an incident. They are mechanisms for grouping functions most frequently used to provide federal support to states and federal-to-federal support, both for declared disasters and emergencies under the Stafford Act and for non-Stafford Act incidents. ESF 10 covers oil and hazardous materials response, and ESF 11 covers agriculture and natural resources. (Federal Emergency Management Agency 2008)

[58](United States Department of Homeland Security 2008)
is a common organizational structure that allows for the integration of facilities, equipment, personnel, procedures, and communications. ICS was actually developed in 1970 in California in the wake of a devastating wildfire but it has since been expanded to be applied to any type of disaster to enable responders at all levels to work together, including any type of oil spill.59

NIMS is the ability for the U.S. to enforce the use of ICS in a response. If local municipalities want federal support, they must use ICS. In California, the California Emergency Management Agency (CalEMA) is responsible for ensuring the use of ICS, mandated by NIMS. CalEMA determines the level of response needed to be in compliance with NIMS in response to any incident, including any oil spill that has the potential to impact the state of California.60

**Los Angeles County Facilities**

For most people who live in the Los Angeles area, the thought that a major oil spill could occur in their backyard does not frequently cross their minds. But there are major reminders that countywide, Los Angeles is an area highly impacted by the oil and gas industry. Most of these reminders stem from the fact that Los Angeles sits on top of the Wilmington Oil Field, the third largest oil field in the continental United States. From oilrigs disguised as buildings, pipelines crossing the county, vessels unloading oil offshore to the beachfront El Segundo refinery, L.A. has a courtside seat to nearly all aspects of the oil industry.

**Wilmington Oil Field**

All California state agencies are required to integrate NIMS principles into their response management under the Standardized Emergency Management System (SEMS), directed by then-Governor Schwarzenegger in 2005.60 In regards to oil spills, SEMS provides for a Unified Command Structure, consisting of the USCG, OSPR and the responsible party. The state of California and the USCG have entered into a Memorandum of Agreement (MOA) that formalizes this agreement and the designation of responsibilities and authority at the state and local level in regards to marine oil spill planning and response. This is especially important in the Los

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59 (Federal Emergency Management Agency 2013)
60 (California Department of Fish and Wildlife Office of Spill Prevention and Response January 2010)
Angeles area, as it is home to the third largest oil field in the contiguous U.S., the Wilmington Oil Field.\textsuperscript{61}

**Oil Rigs and Islands**

The Wilmington Field extends inland throughout the county as well as offshore into San Pedro Bay. Occidental Long Beach Incorporation (OLBI) a wholly owned subsidiary of Occidental Petroleum, has two different operations in the Wilmington Field, the THUMS Long Beach Company, operator of the four offshore man-made islands in Long Beach Harbor, and the Tidelands Oil Production Company, operator of the onshore portion.\textsuperscript{62} In California state waters there are three platforms: Esther, Eva and Emmy. The CA State Lands Commission is required to regularly inspect these facilities under the Lempert-Keene-Seastrand Act. In federal waters off LA/Orange County there are four oil platforms operated by two different companies, Edith, operated by DCOR LLC (formerly Dos Cuadras Offshore Resources LLC, operator of the well responsible for the Santa Barbara Oil Spill in 1969), and Elly, Ellen and Eureka operated by Beta Operating Company, LLC.\textsuperscript{63} Facilities in federal waters are inspected by the Coast Guard as well as the Bureau of Safety and Environmental Enforcement (BSEE), which inspects drilling equipment and the science behind the removal operation.\textsuperscript{64}

**Chevron El Segundo Marine Terminal**

The most visible oil operation in the Los Angeles area is the El Segundo Refinery operated by Chevron Corporation located practically on the beach near Los Angeles International Airport. The refinery operates an offshore marine terminal

\textsuperscript{61} (City of Long Beach 2013)
\textsuperscript{62} (Oxy 2013)
\textsuperscript{63} (Bureau of Safety and Environmental Enforcement 2009)
\textsuperscript{64} (Loughran 2011)
facility located only one-and-a-half miles offshore in the Santa Monica Bay. The terminal contains two separate berths at which an average of twenty-eight vessels moor per month while pumping oil from the ships under water to the refinery located onshore.\(^6\) In 1991, an incident occurred at the facility and 21,000 gallons of oil spilled from a tanker into the Bay. The size of vessels visiting the berths at the terminal range anywhere from 14,500 to 123,000 deadweight (metric) tons (DWTs) at one berth to 35,000 to 211,000 DWT) at the other.\(^6\) In December 2010, the California State Lands Commission extended Chevron’s lease for this facility for an additional thirty years despite protests over pollution concerns.\(^6\)

### Ports of Los Angeles and Long Beach

The ports of Los Angeles (POLA) and Long Beach (POLB), located directly adjacent to each other in southern Los Angeles County, are two of the world’s busiest seaports. If considered together, the San Pedro complex would be the sixth largest port in the world.\(^6\) POLA encompasses 270 berths, with 2,182 vessels calling in the year 2010, while the POLB adds an additional 80 berths to the complex and handled 4,898 vessel calls in 2010.\(^6\) The Vessel Traffic Service, or VTS, provides commercial vessels calling on either port with vessel traffic information. VTS is a joint public-private operation between the Marine Exchange of Southern California, the State of California, the USCG, the ports of LA and LB and the port tariffs of LA and LB (regulations concerning pilot captain requirements for vessels entering the ports). Pilot captains, individuals licensed to bring vessels into specific ports, are required for most commercial vessels entering the port of LA for safety and security reasons. Pilot captains are more familiar with the port and are required to have a strong understanding of the workings of the tides and currents within the port.

When a vessel calls upon the port, VTS updates the vessel with traffic and other imperative navigation information, including other concerns such as the

\(^6\) (California State Lands Commission, Marine Research Specialists August 2010)
\(^6\) (Archibold 1993)
\(^6\) (Gold 2010)
\(^6\) (Port of Long Beach 2013)
\(^6\) (Port of Los Angeles 2013)
location of whales. The VTS has authority to direct a vessel if there is a risk of collision, grounding, or other accident. Upon direction from the VTS, a vessel MUST follow directions:

*Under certain circumstances, a VTS may issue directions to control the movement of vessels in order to minimize the risk of collision between vessels, or damage to property or the environment.*

VTS tracks all incidents involving vessels within this area of responsibility, from near-misses to loss of propulsion incidents. For example, from January 2011 to October 2011, there were 78 loss of propulsion incidents alone, luckily none of them ending in a collision.

**Recommendations**

In response to environmental catastrophes, such as Exxon Valdez of 1989, the political response has been to enact new statutes and regulations designed to prevent similar catastrophes from occurring. With the implementation of OPA, the federal government hoped to fix this problem. However, the Deepwater Horizon spill of April 2010 was strong evidence that numerous problems still exist. The response to this incident exposed a lack of real oversight of BP’s contingency plan or clarity in who was in charge of the immediate cleanup. The government hopes to have solved this problem at least on the outer continental shelf by restructuring the now dissolved MMS into the three distinct organizations, BOEM, BSEE and ONRR. Whether this restructuring will work and oversight will again be in place for oil wells on the outer continental land shelf is something that will not be revealed until the next incident occurs. Until then, the different levels of government will require members of the industry to establish thorough and comprehensive contingency plans, and if an incident does occur, it is hoped all players can work together using the principles of the National Incident Management System (NIMS) to conduct a quick, efficient and thorough cleanup of any oil spill.

As with the disbanding of the Mineral Management Service (MMS) described above, California’s equivalent, the responsibilities of the Mineral Resources Management Division (MRMD) of the State Lands Commission (SLC) could similarly be divided up into distinct agencies. From an environmentalist’s perspective, the problem at the federal level of one agency being monetarily compensated for granting oil and gas leases could also occur at the state level here.

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70 33 CFR §161.1
71 (Service 2011)
in California. The MRMD could function to manage the leases in a similar way to the BOEM, and arrange the fee payments and processing through another state agency, similar to the responsibilities of the ONRR. If California follows the federal example, then a third office would be responsible for the safety and enforcement of the leases, similar to the BSEE. This could reduce the incentive to allow oil and gas drilling in risky situations where a spill is likely to occur. It is important to note that this recommendation is not based on past evidence of MMS-type corruption in the SLC, but more of a precautionary principle based on the current configuration of the SLC. Ironically, a 2011 California audit showed just the opposite trend, where the SLC lost millions in revenue for California’s General Fund due to mismanagement of oil and gas leases.72

Many state and federal statutes and regulations have been created and maintained toward the improved prevention and response of oil spills. It is paramount that we continue to spend time and resources creating and improving policies and regulations that create well-organized and effective systems to protect our environments and coastal economies. It is clear from the Deepwater Horizon spill and former Minerals Management Service that some of that vigilance was lost, and it begs the need for increased effort to implement the lessons learned where it is deemed relevant and an improvement to the protection of our marine resources.

72 (California State Auditor 2011)
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CHAPTER TWO: CHEMICAL DISPERSSANTS

On April 24th, 2010 when Unified Command knew a leak existed and impacts to the Gulf Coast were likely, Admiral Landry told reporters: “We have one-third of the world’s supply of dispersants on standby...our goal is to fight this oil spill as far away from the coastline as possible.” One Coast Guard captain called it “a tradeoff of bad choices” between spraying chemicals on the water and watching more oil reach the shore.1

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1 (National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling January 2011)
INTRODUCTION

Chemical dispersants were a major point of controversy during the Deepwater Horizon oil spill of 2010 because despite the potential impacts to human health and the marine environment, dispersants were liberally applied in the months that followed the spill in an attempt to reduce the amount of oil that reached the shore. Oil dispersants are chemical agents that emulsify, disperse, or solubilize oil into the water column or promote the surface spreading of oil slicks to facilitate dispersal of the oil into the water column.\(^2\) Dispersant formulas are primarily hydro-treated light petroleum distillates and include propylene glycol, an organic sulfonate, and numerous other chemicals. Dispersants work by breaking the surface tension of the oil, and the smaller oil droplets are then mixed into the water column by natural water movement from waves. Dispersants are commonly used in large-scale oil spills, despite limited research into toxicity effects on humans, marine organisms, and entire marine ecosystems.

Wind and waves naturally disperse spilled oil; chemical dispersants do not remove oil but allow it to better mix with water. The dispersed oil is diluted as it mixes in the water column vertically and horizontally. The potential benefits of dispersants are 1) less oil will reach shorelines and fragile nearshore habitats like marshes, wetlands, and reefs; 2) birds and animals that use the ocean’s surface encounter less oil; 3) dispersants may accelerate the rate of oil biodegradation; and 4) spill responders can use dispersants when bad weather and sea state may

\(^2\) (United States Environmental Protection Agency 2012)
prevent skimming oil off the surface and/or burning. The potential threats of using dispersants are 1) less oil on the ocean’s surface means more oil in the water column, and spread over a larger area, potentially increasing toxic exposure for marine life; 2) the dispersants themselves, especially when mixed with oil, can have both short and long term toxic effects; and 3) some studies have found that dispersant use may not increase the rate of biodegradation, but instead inhibit biodegradation.  

It is important to understand that an oil company’s use of dispersants can reduce their liability and mitigation costs by reducing the amount of crude oil on the ocean surface that is measurable with remote sensing and reduces the amount of oil that reaches shorelines and damages highly visible fauna (e.g. birds and mammals). Evidence of damage to shorelines, nearshore habitat, birds and mammals are easier to observe, measure, and record by scientists and the local community than damage to open ocean and deep ocean environments that are far more difficult to access.

The Corexit brand series of dispersants produced by Nalco were used in the British Petroleum (BP) Deepwater Horizon (Corexit 9500A and 9527A formulas) and Exxon Valdez (Corexit 9580) oil spills. During the Gulf of Mexico spill BP reported using an unprecedented 1,070,000 gallons of Corexit at the surface of the spill (Figure 1) and 771,000 gallons of dispersant injected directly into the oil plume as it spewed from the Macondo well at a water depth of 4,130 feet. The BP spill response effort sets the record for the most dispersants ever used on an oil spill in U.S. history, combined with the effects of the largest oil spill in U.S. history.1,3

Prior to the 2010 BP spill several chemicals in dispersants were analyzed and showed acute toxicity for fish and other aquatic organisms, with a high risk of bio-accumulation in the food. Studies conducted prior to the 2010 BP spill have also highlighted the destructive effects of combining dispersants and oil. Dispersed oil emulsions caused during the mixing process are known to be more toxic than oil or the dispersant alone.4 A toxicity test of Corexit 9500A and crude oil combined was found to be up to 52 times more toxic than crude oil or 9500A alone5 The BP spill raised public concerns that dispersant, crude oil, and a combination of dispersant and oil (hereafter ‘dispersed oil’) could contaminate shellfish and seafood habitat, with implications for human health.

3 During the Exxon Valdez oil spill approximately 4,000 gallons of Corexit 9580 were dumped from a helicopter but the Coast Guard ultimately decided against using dispersants for that spill because it was determined they were ineffective, likely due to temperature and lack of wave action (Environmental Protection Agency 2011).
5 (Rico-Martinez, Snell and Shearer February 2013)
Much of the uncertainty surrounding these chemicals stems from a lack of transparency from the companies that produce and distribute dispersants. For example, the Corexit formulas have historically been proprietary. Public pressure during the BP spill forced Nalco to release the ingredients but not the concentrations of chemicals contained in Corexit 9500A. The wide variety of dispersants available with varying toxicity levels underscores the importance of full disclosure of chemicals and concentrations in each dispersant.

It is difficult to properly recommend and select dispersants at the onset of an oil spill without knowing the details of each dispersant’s effectiveness in varying conditions, and impacts to human health and marine life. Decision makers must take extreme caution when selecting and using dispersants in Southern California due to the large human population and important marine habitats. In fact, a lawsuit brought against the Environmental Protection Agency and the United States Coast Guard April 18th, 2012 by the Center for Biological Diversity, Surfrider Foundation, and Pacific Environment demands that federal agencies assess potential impacts to threatened and endangered species listed under the Endangered Species Act before dispersants are authorized for use. In applying the lessons learned from the BP spill, this report recommends that spill responders and decision makers in California modify the regional, state, and area (i.e. local) contingency plans with regard to the pre-approval, selection for use, and actual use of dispersants during a large oil spill.

California sunfish, or *Mola mola*, frequent the marine waters off the coast of Los Angeles County, utilizing surface waters and deeper open ocean habitat.

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6 (Toxipedia and Earthjustice August 2011)
7 (Complaint for Declaratory and Injunctive Relief 2012)
Figure 1. Dispersants being applied to the 2010 BP Deepwater Horizon oil spill. Dispersants were applied at unprecedented levels on both the ocean surface and deep sea at the mouth of the Macondo well at a depth of about 5,000 ft, damaging the marine food web. Source: US News (Kari Huus 2012)

DATA GAPS

It is important to emphasize that limited scientific research has been conducted on the toxicity effects of the component ingredients found in Corexit, and even fewer studies have been completed for specific Corexit formulas, particularly the newer Corexit 9500A used in large quantities during the 2010 Deepwater Horizon spill. In the past few decades, the scientific community has produced laboratory studies on the effects of dispersants, crude oil, and the combined dispersant and crude oil mixture (dispersed oil), many showing high toxicity levels. The research described below has generally investigated the effects of dispersants on specific organisms in labs, and has not addressed long-term impacts on these organisms or impacts to species assemblages and the broader ecosystem over short and long time periods.

Despite the lack of available research, an unprecedented amount of dispersants were injected at a depth of 5,000 feet on the ocean floor directly into BP’s Macondo well, where oil was spewing into the Gulf of Mexico. Because of the high quantity of dispersants applied at the surface and at the seafloor as oil spewed from the Macondo well, scientists are now learning some of the acute and long term impacts to marine life from large scale Corexit 9500A and 9527A dispersant use.
Although more studies are needed, scientists have been able to conclude that Corexit 9500A and Corexit 9527A pose an environmental and human threat.

**ENVIRONMENTAL IMPACTS**

The potential toxicity of dispersant use to marine life in general has been known for decades based on laboratory studies and it is important to consider the potential damage to California marine ecosystems if dispersants are applied to a large oil spill.

Surfactant chemicals in dispersants can bind to and disrupt lipid bi-layers, thereby degrading cell membranes and altering the gradient of sodium necessary for cell health. This action has the potential to cause harm to exposed gills and respiratory systems and the skin and outer layers of organisms that do not have protective tissue or shells.\(^8\) Other documented harmful effects include heart dysfunction in fishes,\(^9\) reduced feeding and reproductive output in bivalves (e.g. clams, oysters, and mussels),\(^10\) fish and crustaceans,\(^8\) and particular toxic sensitivity to spore, embryo and larval life stages of organisms.\(^11\)\(^,\)\(^8\) Resistance generally increases after metamorphosis, but prolonged exposure can cause irreversible membrane damage at any life stage. Negative effects on marine organisms are variable between taxa and depend strongly on the concentration of the oil and dispersant mixture, as well as on the length of exposure.\(^8\) Some animals, as in studied bivalves, have exhibited delayed mortality after exposure to dispersants\(^12\) which further complicates assessing impacts and suggests that sub-lethal effects may be even more difficult to identify over long time periods.

Studies investigating the effects of dispersants on microbial communities have found significant shifts in community structure from typically abundant phytoplankton and zooplankton to dominance by microflagellates and bacteria.\(^13\)\(^,\)\(^14\) Due to the 2010 Deepwater Horizon spill, we are beginning to understand the *in situ* environmental effects from large scale dispersant use. *Current studies in the Gulf of Mexico are showing a significant reduction in bacteria that can normally degrade crude oil when not mixed with dispersants.* Reducing this critical ecological process

\(^9\) (Kiceniuk, Penrose and Squires 1978)
\(^10\) (Avolizi and Nuwayhid 1974)
\(^11\) (Wilson 1977)
\(^12\) (Swedmark, Granmo and Kollberg 1973)
\(^13\) (Harrison, et al. 1986)
\(^14\) (Parsons, et al. 1984)
of naturally degrading oil is effectively diminishing the environment’s ability to bioremediate the spill.\textsuperscript{15}

Phytoplankton, the base of the entire pelagic food web, are affected by the underwater plume of dispersed oil. It was shown in 2010 that oil carbon made its way into planktonic food webs in the Gulf of Mexico due to the BP spill.\textsuperscript{16} The reduction in primary productivity and nutrient uptake rates\textsuperscript{14} has the potential to affect ecosystem energy dynamics throughout the food web. Toxicologists state that it may take years for the contamination that has begun in phytoplankton to make its way up the food chain into seafood and human consumption.\textsuperscript{17}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure2.png}
\caption{Deep sea corals 11km southwest of the Macondo Well were affected by the dispersed oil. Shown here is a brittle star on an affected deep coral. Studies are still uncovering the extent of the damage to the deep-sea community from dispersant use. Source: NOAA, (White, et al. 2012)}
\end{figure}

A major deep ocean study found that chemicals in the dispersant formula were found in deep water approximately 300 km from the well 64 days after the deep water dispersant applications ceased – a slow biodegradation rate.\textsuperscript{18} Another

\begin{itemize}
\item[\textsuperscript{15}] (Kirby III 2012), (Hamdan and Fulmer 2011)
\item[\textsuperscript{16}] (Graham, et al. 2010)
\item[\textsuperscript{17}] (Harish 2012)
\item[\textsuperscript{18}] (Kujawinski, et al. 2011)
\end{itemize}
A major deep ocean study gives compelling evidence that deep water corals near the Macondo well of the BP spill were damaged by dispersed oil (Figure 2). Many corals have been found dead or dying, and the full extent of the damage is still being assessed.\(^{19}\)

Dispersants are known mutagens, and unfortunately many mutated shrimp, fish, crabs, and more are being found across the Gulf of Mexico, where scientists are attributing it to the dispersant usage. Shrimp are being born without eyes, fish with lesions, fish with oozing sores, fish without gill covers, eyeless crabs, crabs with soft shells, adult crabs one-fifth their normal size, and clawless crabs to name just a few examples. Before the gulf oil spill 0.001% of fish sampled had lesions. After the spill almost 50% of fish sampled carried lesions. It is believed that Polycyclic Aromatic Hydrocarbons (PAHs) released from the submerged oil are likely the cause of the mutations.\(^{20}\)

Unfortunately, due to the depths of the habitats and the deep water plume, the extent of the damage may never be fully assessed due to the extreme scale of the spill and dispersant use. Research is still ongoing in the Gulf from the dispersants used on the BP spill and it remains uncertain if scientists can comprehensively document the damage to the sub-surface and deep ocean habitats, but most independent scientists expect major findings of damage to fisheries, birds, dolphins, marine mammals, fish, invertebrates and algae in both open-ocean and wetland habitats.\(^{21}\)

**Human Impacts**

The BP Spill had major human impacts to the Gulf of Mexico community including human health and economic. Economic impacts include decreased tourism at Northern Gulf of Mexico beaches and halted or declined fisheries. The U.S. Travel Association projected that the economic impact from the Deepwater Horizon spill could exceed approximately $23 billion in a region that supports over 400,000 jobs in the travel industry that generates approximately $34 billion annually.\(^{22}\) Because of the ecological mechanisms described above (Environmental Impacts heading), Louisiana’s $2.3 billion fishing industry is at risk, with oyster, shrimp, crab, trout, and other fisheries seeing sharp declines since the spill.\(^{20}\)

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\(^{19}\) (White, et al. 2012)
\(^{20}\) For more information, see article (Jamail 2012)
\(^{21}\) (National Wildlife Federation April 2012), (Harish 2012)
\(^{22}\) (Oxford Economics 2010)
medical and economic class action lawsuit was settled in December 2012, with BP expected to pay $7.8 billion to over 100,000 individuals.23

Unfortunately it may take years to comprehensively understand the combined effects of dispersants and oil to human health, but some impacts are already being discovered. Findings from a study performed in 2011 show that Polycyclic Aromatic Hydrocarbons (PAHs) in residual tar product from crude released from the Macondo well of the BP spill arrived at Gulf beaches, resisted biodegradation, potentially contaminated groundwater, and may continue to threaten long-term human health to those exposed.24 The tar product was found most often in ‘good weather’ conditions of low waves, where it was found to settle in the surf zone in sampled areas from Florida to Louisiana, maximizing exposure to swimmers and waders. High energy waves remobilized the tar product. In analyzing the PAH levels in the tar product it was found that weathered tar product sourced from crude oil dispersed with Corexit brand chemical dispersants were found to have PAH concentrations consistently in excess of the IDLH limits (Immediately Dangerous to Life or Health, 80 mg/m³).24

![Figure 3](image-url) Kirby (2012) conducted UV skin tests that indicate exposure to the dispersed oil of the BP spill. The skin tested was dry, showing that the chemicals were directly absorbed into human skin.

Certain species of bacteria have the ability to degrade crude oil, yet the Corexit dispersants used are also toxic to two main species of bacteria that degrade crude oil in situ, hindering the biodegradation process and allowing the toxic

23 (CSP Daily News 2012)
24 (Kirby III 2012)
dispersed oil to persist in the environment. The Corexit dispersants provide a mechanism for leaching of PAH compounds (found in tar product) into the deeper layers of beach sediment, potentially leading to groundwater contamination. Finally, the Corexit dispersants act as an absorbency accelerant with regard to human skin. **Wet skin dermal contact with dispersed oil tar product results in immediate absorption into the skin.** To clarify, toxic dispersed oil chemicals are not adhering on the outside of the skin, but are rapidly absorbed directly into human skin on contact (Figure 3).

Toxicological studies about dispersed oil effects on seafood consumption are in progress. In addition, response workers or coastal communities inhaling dispersants may have neurotoxic and pulmonary health effects.

The Toxipedia and Earthjustice analysis of the 57 chemical constituents of Corexit 9500A and 9527A identified the following potential health risks to humans: five carcinogens, 33 skin toxins, 33 eye irritants, 11 respiratory toxins, 10 kidney toxins, eight reproductive toxins, seven liver toxins, six neurotoxins, five immune system toxins, four blood toxins, three chemicals associated with asthma and one chemical thought to be toxic to the endocrine system. Anecdotal accounts from cleanup workers at the Deepwater Horizon oil spill have reported respiratory ailments, headaches, memory loss, skin irritation and other symptoms that are characteristic of the toxins analyzed in Corexit.

Dispersed oil was found on beaches throughout Northern Gulf of Mexico, and the effects of dispersants and dispersed oil to the environment and human health were vastly understated. The full risks to human health are not currently understood and need to be investigated in detail. Without extensive research into the combined toxicity of oil and dispersants, as well as exposure concentrations and times, causality cannot be fully established. The National Institute of Health is currently conducting a study of more than 25,000 members of response crews deployed to the Gulf to determine whether their health suffered from exposure to crude oil and dispersants. It will be the largest human health study due to an oil spill in history.

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25 (Rotkin-Ellman, Wong and Solomon 2012)
27 (Toxipedia and Earthjustice August 2011)
28 (Raines 2012)
LOS ANGELES COUNTY AND DISPERSANTS

If a catastrophic-sized spill were to happen off the coast of Los Angeles County, it is highly likely that dispersants would be used, which could potentially expose communities and ecosystems to the severe risks discussed above. There were a couple formal risk assessments completed around 2001 but unfortunately they are now outdated and did not predict the damage of a large spill such as BP 2010. Although shown to be toxic, Corexit 9500A and 9527A have been pre-approved for use in California pre-approval zones, which includes federal waters offshore of Los Angeles County’s coast. Depending on oceanic conditions, other dispersant products can be more effective and less toxic than Corexit 9500A and 9527A, and any plans that incorporate the use of these Corexit products must be reconsidered.

Because Corexit 9500A and 9527A are the two dispersants pre-approved in California, and using these dispersants on a large scale can lead to extensive damage to marine life and human health, **dispersant use in and around Los Angeles County should be limited to special scenarios for the protection of endangered species**, such as the least tern, snowy plover, black abalone, etc. as well as the protection of key economies that rely on marine resources, such as tourism, recreational businesses, and recreational and commercial fishing industries.

**Risk Assessments**

There are a small handful of California-based environmental risk assessments available that aim to predict the ecological effects of various response alternatives in California, including the application of chemical dispersants to an oil spill. Mearns et al in 2001 used models to determine that using dispersants in the Gulf of the Farallones induced several hours of toxicity for larval fish, zooplankton, and adult fish and crustaceans. The model also predicts that the use of dispersants ultimately spared marine life from the full effects of crude oil. The risk assessment

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29 (Mearns, Watabayashi and Lankford 2001)
performed by S.L. Ross Environmental Research in 2002 ran scenarios for using dispersants on a spill in the Santa Barbara Channel. Similar to conclusions in Mearns 2001, S.L. Ross 2002 predicts a net environmental benefit from using dispersants in Southern California from a tanker spill. Regarding the selection of dispersants for an oil spill, S.L. Ross (2002) does caution that crude oils have different properties, environmental conditions vary, and different chemical dispersants should be considered for the wide variety of factors in any ocean spill. Although both of these risk assessments failed to predict the potential impacts that dispersants can have on a subsea community, to their credit they were conducted well before the BP spill, and dispersant effects on the environment were mostly theoretical.

Although the damage from dispersed oil in the BP spill of 2010 is still being assessed, based on initial studies the level of environmental damage is orders of magnitude worse than the predicted damage level of these relatively benign risk assessments.

**Pre-Approval Zones**

There are waters off the California coast that fall under dispersant ‘pre-approval zones.’ These zones are in federal waters that are generally defined as waters between 3 and 200 nautical miles from mainland shore, not including state waters and other important ecological areas. The areas off the coast of California that are NOT pre-approved (which means a more lengthy approval process in order to apply dispersants) are:

1. Marine waters within three miles from shore (all California state waters)
2. Waters within three miles of Oregon or Mexican borders
3. Designated National Marine Sanctuaries (e.g. Channel Islands National Marine Sanctuary)
4. Waters within one mile of anadromous fish streams during times of emigration or immigration (e.g. salmon, steelhead trout)

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30 (S.L. Ross Environmental Research Ltd. 2002)
31 (Region IX Regional Response Team Fall 2008)
All areas listed above (1 through 4) are categorized as Regional Response Team Approval Required Zones, which require Regional Response Team IX approval. Regional Response Team IX (RRT IX) is a formal organization with member representatives from federal, state, and tribal agencies. RRT IX is responsible for ensuring federal and state resources are available for emergency response efforts in Region IX, the inland and coastal zones of California, Nevada, Arizona, and the 146 tribal nations. Co-chaired by the Coast Guard and the EPA, RRT IX is also responsible for ensuring that multi-agency relationships and coordination systems exist to support these emergency response efforts. If an oil spill is located within three miles from shore or within six miles from the Channel Islands shores, then the Federal On-Scene Coordinator (the Coast Guard, described below) must get approval from RRT IX before dispersants are applied to nearshore habitats.

**Pre-Approved Dispersants**

There are two dispersants that are pre-approved for use in waters off the California coast: Corexit 9500A and 9527A. These two dispersants were used at unprecedented levels in the BP spill and, when combined with crude oil, cause

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(Regional Response Team IX 2005)
documented human health, economic, and environmental impacts (described above), with the extent of the impacts still being uncovered. These two dispersants are the two most commonly available and best studied dispersants, they are both on the National Contingency Plan Product Schedule (maintained by the EPA, explained below), and are both licensed by the State of California for use in oil spill response.\textsuperscript{31}

Regional response teams, which authorize use of dispersants during an oil spill in specific contexts (Pre-Approval Zones or RRT Approval Zones, described above), rely on the EPA’s determination that the listed dispersant’s use is effective and safe in order to authorize the use of a given dispersant as part of their oil spill response plans. Due to the toxicity levels of oil combined with Corexit 9500A and 9527A, and the importance and sensitivity of marine species in Los Angeles County and Southern California waters, we need more chemical dispersant product options readily available to the Coast Guard and other first responders that are effective and less harmful to marine life.

**National Contingency Plan Product Schedule**

The National Contingency Plan (NCP) Product Schedule is a list maintained by the EPA that identifies dispersants and other chemicals that are eligible for use in oil spill response. No dispersant can be used anywhere in U.S. waters unless it is listed on the NCP Product Schedule. At the time of the April 2010 Macondo well blowout in the Gulf of Mexico there were 14 dispersants listed on the NCP Project Schedule and available for potential selection and use in the BP spill.\textsuperscript{33} Currently there are 22 dispersants listed on the NCP Product Schedule.\textsuperscript{34}

A dispersant is approved by the EPA for listing on the NCP Product Schedule if it fulfills two primary requirements based on effectiveness and toxicity testing. The first priority is that the dispersant must achieve an effectiveness rating of 45% (determined by the Swirling Flask Dispersant Effectiveness Test using two types of oil). Dispersants that meet the effectiveness threshold then undergo a toxicity test using only two species, a silverside estuary fish and a marine mysid shrimp. The test is only an acute test, and does not determine sub-lethal effects, long term effects, effects on other species, impacts to sensitive or at-risk species (coral and macroalgae), or ecosystem effects. Furthermore, a dispersant does not have to meet a pre-determined toxicity level to be approved for the NCP Product Schedule; the only requirement is that the acute test is merely performed.\textsuperscript{34}

\begin{flushright}
\textsuperscript{33} (Toxipedia and Earthjustice August 2011) \\
\textsuperscript{34} (Environmental Protection Agency 2012)
\end{flushright}
For listing a dispersant on the National Product Schedule, the dispersant producer is also required to provide details about the dispersant, usage recommendations, and components of the dispersant formula. However, many dispersant components are not fully disclosed because Subpart J of the National Contingency Plan allows a dispersant producer to claim that the component information is categorized as Confidential Business Information (CBI).

The process in pre-approving Corexit 9500A and 9527A was apparently incomplete because the Environmental Protection Agency (EPA) did not comply with the Endangered Species Act consultation requirements. There is now a lawsuit brought to the EPA and Coast Guard dated April 18th, 2012 by the Center for Biological Diversity, Surfrider Foundation, and Pacific Environment demanding Endangered Species Act consultation regarding the listing and use of dispersants in California. The suit seeks to force the EPA and Coast Guard to comply with the Endangered Species Act and examine the impacts of these toxins on endangered wildlife and consult with the National Marine Fisheries Service and U.S. Fish and Wildlife Service. The groups want the EPA to immediately study the effects of dispersants on endangered and threatened species in all U.S. waters, including threatened and endangered whales, sea turtles, salmon and seabirds in the Pacific Ocean and polar bears and walruses in the Arctic Ocean. The groups are also asking the government to apply lessons learned from the Deepwater Horizon disaster to oil spill response plans for the California coast, where dispersants have been pre-approved for vast areas of the Pacific. They want the agencies to re-examine Federal Region IX Regional Contingency Plan created by Regional Response Team IX (described below) to determine whether these toxins would harm endangered wildlife.

**Regional and Area Contingency Plans**

Once a dispersant is listed on the National Contingency Plan Product Schedule, the Los Angeles/Long Beach Area Committee and Regional Response Team IX can incorporate the use of that dispersant into their respective response

\[35 \text{(Complaint for Declaratory and Injunctive Relief 2012)}\]
\[36 \text{(Center for Biological Diversity 2012)}\]
plans, the Federal Region IX Regional Contingency Plan and the Los Angeles/Long Beach Area Contingency Plan (the Region IX plan includes the California Dispersant Plan). Those two contingency plans address the specific contexts in which a specific dispersant should and should not be used. If there are any desired changes to the uses of dispersants in LA County, Southern California, and California as a whole, the changes must first be made in those two response plans. Please see the next chapter for further information on response and contingency plans.

**Dispersant Recommendations**

These recommendations, some taken as lessons learned from the 2010 BP spill offer precautionary advice regarding the pre-approval, selection, and application of dispersants in the event of a large oil spill off the coast of Los Angeles County.

1. In order to prevent the harmful use of or selection of toxic dispersants at the local level, the EPA must change how a dispersant gains listing on the National Contingency Plan Product Schedule.
   a. Due to the potential environmental and human health impacts of dispersant use, we need full public disclosure of what is known about dispersants, including chemical ingredients and concentrations in each dispersant formula.
      i. Dispersant manufacturers should not be permitted to claim that the specific chemical components and concentrations in their products are Confidential Business Information (CBI), and withhold that information from the public.
   b. We need to establish safety criteria for dispersants before they are listed on the NCP Product Schedule.
   c. We need more rigorous toxicity testing requirements to be listed on the NCP Product Schedule. It is not sufficient to allow a dispersant to be listed simply by conducting a test for acute effects alone without setting limits for toxicity.
      i. Dispersant efficacy and toxicity data should be confirmed with independent testing that directly compares products.
      ii. Dispersant manufacturers should be required to disclose efficacy and toxicity data on their products.
   d. Per the CBD, Surfrider, Pacific Environment lawsuit above, the EPA and Coast Guard need to ensure the listing and use of dispersants on the NCP Product Schedule comply with Endangered Species Act consultation requirements.
2. In order to prevent the harmful use of or selection of toxic dispersants at the local level, Regional Response Team IX must change the Federal Region IX Regional Contingency Plan immediately.
   a. The Region IX Contingency Plan and Appendix VII “California Dispersant Plan” need to include and pre-approve other dispersants that are effective and less toxic than Corexit 9500A and 9527A. Many believe Corexit 9500A and 9527A were the wrong choices of dispersant in the BP spill.
   b. We need a multi-faceted approach to deciding which dispersants to use for a spill. The emergency selection process should incorporate more factors such as species and habitats present, ecosystem effects, and human community impacts in addition to factors already considered, such as type of oil released, water temperature, depth of subsea application, and prevailing winds and currents.

3. In order to prevent the harmful use of or selection of toxic dispersants at the local level, the LA/LB Area Committee must change the LA/LB Area Contingency Plan immediately, limiting toxic dispersants for use only with specific scenarios, such as the protection of endangered species and/or critical habitats.

4. We need a deeper and more comprehensive scientific understanding of the human and ecological hazards from using large quantities of dispersant products on and below the ocean’s surface.
   a. Increased funding for comprehensive independent studies of the human and environmental hazards of dispersant use.
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Chapter Three: Los Angeles Prevention and Response

If there was a large oil spill right now off the coast of Los Angeles County, what would we do? Who is in charge? Will they apply dispersants and how? How do you volunteer to help, and for what? How can citizens get involved to prevent a major spill from happening in the first place?

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INTRODUCTION

The most recent spill in California that required a major response was in November 2007 when the container ship Cosco Busan collided with the San Francisco Bay Bridge, punctured the hull, and spilled 53,569 gallons (1,276 barrels) of intermediate fuel oil into the San Francisco Bay. Transportation, recreation, tourism, and local fisheries were affected.\(^1\) The prevention of an oil spill is vital for our local economic and ecological livelihood, and public opportunities in prevention are given. If a spill occurs, oil spill contingency plans are put into action, and this section describes the various plans with specific recommendations given, including the dispersant approval process. This section also describes the coordinated response effort between government agencies, oil companies, response contractors, non-governmental organizations, and volunteers.

Actions taken by the local community and volunteer involvement are important aspects of oil spill response in Los Angeles. Various volunteer opportunities are covered in this section, both in oil spill response and prevention. It is crucial that local non-profit environmental organizations, local community leaders, and active volunteers are aware of the various volunteer opportunities, aware of the coordinated response system (Incident Command Structure), and have received the basic training for working around hazardous substances.

\(^{1}\) (Office of Spill Prevention and Response 2013)
GOVERNMENT AND INDUSTRY RESPONSE

In any U.S. location, the initial notifications for response to an oil spill incident are initially the same. Immediately after an incident occurs, the National Response Center (NRC) is notified of a spill. The National Response Center is the single point of contact for reporting pollution and hazardous material incidents in the U.S. An “incident” for purposes of notifying the NRC includes any discharge of oil that “violate[s] applicable water quality standards; or cause[s] a film or sheen upon or discoloration of the surface of the water...”2 The NRC also serves as the communications center for the U.S. National Response Team.3 For a marine spill in U.S. waters, the NRC immediately notifies the U.S. Coast Guard, who will serve as the Federal On-Scene Coordinator (FOSC, a.k.a. Captain of the Port) in the Unified Command Structure. The FOSC makes an assessment of the spill, and is generally in charge of the response effort. The other Unified Command members for a major oil spill in California would be the State On-Scene Coordinator (California Department of Fish and Wildlife, Office of Spill Prevention and Response, or OSPR) and the Responsible Party (oil industry, agency, or individual).4 Unified Command is an important element in multi-jurisdictional or multi-agency domestic incident management, providing guidelines to enable different agencies and entities to coordinate, plan, and interact effectively.5 Unified Command is a component of the National Incident Management System (NIMS), a comprehensive, nationwide, systematic approach to incident management. NIMS provides the framework to enhance the ability of responders, including the private sector and NGOs, to work together more effectively.6

It is often helpful to consider spill scenarios to understand how the Unified Command Structure would operate off the coast of Los Angeles. The response to a spill in state waters (within three nautical miles from shore) and a spill in federal waters may differ. If a spill is in federal waters, such as the oil rigs off the coast of Santa Barbara, the FOSC (Coast Guard) will coordinate the response with the

2 40 C.F.R. §110.1 (2010)
3 The National Response Team is an organization of 15 federal departments and agencies responsible for coordinating emergency preparedness and response to oil and hazardous substance pollution incidents. The National Response Center’s emergency number: (800) 424-8802. The NRC now has an online reporting tool at http://www.nrc.uscg.mil
4 (Office of Spill Prevention and Response n.d.)
5 (Federal Emergency Management Agency 2004)
6 NIMS was an improvement to the standardization and flexibility of our national response system, and was implemented in 2004. (U.S. Department of Homeland Security 2004). NIMS works hand in hand with the National Response Framework (NRF), which provides the structure and mechanisms for incident management. The National Response Framework replaced the National Response Plan in 2005 (Federal Emergency Management Agency 2013).
National Response Team (NRT) and the Regional Response Team (RRT) for special circumstances outside the direct scope of the FOSC (e.g. dispersants in California state waters). The NRT is involved mostly for spills of national significance.\(^7\) Although outside state waters, a spill in federal waters will still be monitored by California Department of Fish and Wildlife Office of Spill Prevention and Response (OSPR) if California wildlife or habitat may be threatened.\(^8\)

If a marine oil spill occurs inside state waters, including the artificial THUMS oil islands\(^9\) in San Pedro Bay or Chevron’s El Segundo Marine Terminal, the U.S. Coast Guard is still in charge of the response, under the Federal Oil Pollution Act of 1990 (OPA). However, substantial state and local response would be incorporated into the Coast Guard’s response efforts. It is important to note that although the Coast Guard is in charge of the spill response, **under OPA 1990 the Responsible Party (e.g. oil company, individual, and agency) has primary responsibility for the cleanup of an oil spill.**

To ensure effective communication and a rapid coordinated response the Incident Command Structure (ICS) will be used during response to a major spill. ICS is the command and management component of NIMS. ICS has become the standard for emergency management across the country, and is mandated by NIMS to be used when an incident requires response from multiple local emergency management and response agencies and effective cross-jurisdictional coordination. For example, during a California oil spill response, all individuals and response entities would be organized using the ICS components of Command, Operations, Logistics, Finance, and Planning. ICS is based on decades of lessons learned and is important to use, because in general more incident responses fail due to poor management than from insufficient resources.\(^10\)

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\(^7\) **Regional Response Team IX (RRT IX)** is a formal organization with member representatives from federal, state, and tribal agencies. RRT IX is responsible for ensuring federal and state resources are available for emergency response efforts in Region IX, the inland and coastal zones of California, Nevada, Arizona, and the 146 tribal nations. Co-chaired by the Coast Guard and the EPA, RRT IX is also responsible for ensuring that multi-agency relationships and coordination systems exist to support these emergency response efforts. The **National Response Team** and the RRTs are primarily involved with planning, policy and coordination regarding spills. They are composed of officers of the USCG and the EPA, as well as state representatives. (United States Coast Guard PACAREA Eleventh Coast Guard District Command Center, Environmental Protection Agency Region 9 2005)

\(^8\) (Office of Spill Prevention and Response Department of Fish and Game 2010)

\(^9\) For more on THUMS oil islands, see Wikipedia [http://en.wikipedia.org/wiki/THUMS_Islands](http://en.wikipedia.org/wiki/THUMS_Islands)

\(^10\) ICS is a standardized, on-scene, all hazards management approach to incident management that enables a coordinated response amongst various jurisdictions and agencies (both public and private); establishes common processes for planning and managing resources; and allows for the integration of facilities, equipment, personnel, procedures, and

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*footnote continued on following page*
Cosco Busan

California had the chance to test its response systems in 2007 when the vessel Cosco Busan, a 900-foot container ship, hit the San Francisco Bay Bridge and released 53,569 gallons (1,276 bbls) of intermediate fuel oil into the San Francisco Bay.\(^{11}\) The National Transportation Safety Board (Board) said Capt. John Cota’s "degraded cognitive performance," as a result of his use of prescription drugs, was a primary reason for the crash, as was the lack of communication between Cota and the ship’s Chinese captain, Mao Cai Sun. The Board could not come to a decision about whether the Coast Guard’s Vessel Traffic Service could have prevented the collision by ordering the ship to change course in the fog away from the bridge. Also, the Coast Guard was questioned for not previously revoking the captain’s license for myriad medical issues and a history of accidents.\(^{12}\)

The spill was marked by a breakdown in communication onboard the ship, between the Coast Guard and the ship’s pilot, and the notification of the incident, evidenced by the lack of notification to the National Response Center (over an hour communications operating within a common organizational structure (Federal Emergency Management Agency, USDHS 2012)\(^{11}\) (Office of Spill Prevention and Response 2013)\(^{12}\) (Lee 2009)
after the collision) and to the local government (several hours after the collision). This failure to report is a violation of the Clean Water Act of 1972 (CWA).

The responsible parties are Fleet Management and Regal Stone. Fleet Management, a Hong Kong-based ship management firm, pleaded guilty to a criminal violation of the Oil Pollution Act of 1990 (OPA) as well as felony obstruction of justice and false statement charges for creating false and forged documents after the crash at the direction of shore-based supervisors with an intent to deceive the U.S. Coast Guard. The Coast Guard released two incident reports on the spill, which provided over 200 recommendations, many relating to increasing communication between different agencies. A recommendation in the report relevant to Los Angeles states the need to integrate trained, experienced organizations into the Area Contingency Plan (described below) and response drills. Local non-profit organizations can assist with volunteer coordination and be an outlet for volunteer interest. The Coast Guard has since streamlined the process by which it keeps track of the medical status of bay pilots. As a result of the spill, 2,000 birds were killed, the Dungeness crab fishery was significantly delayed, and other impacts to marine transportation, recreation, tourism and marine life occurred.

After Cosco Busan and the BP Deepwater Horizon incident, it is hoped the State of California’s oil spill prevention and response agencies and industry will implement Coast Guard recommendations, including improved communication.

Description of Contingency Plans

After Exxon Valdez in 1989, the federal Oil Pollution Act of 1990 (OPA) and the California Lempert-Keene-Seastrand Oil Spill Prevention and Response Act of 1990 (a.k.a. Lempert-Keene) were passed and required contingency planning for both state and federal governments. A spill response is likely to be quick and organized if the response measures are planned ahead of time. Contingency plans are proactive efforts to efficiently and effectively deal with varying sizes and locations of spills. They should clearly describe what needs to happen before, during and after an emergency response. An oil spill contingency plan assesses all the possibilities of what can go wrong, and dependent on actual events during the spill response, includes the contacts, resource lists, sensitive sites, and strategies of

13 (Worth 2011)
14 (Department of Justice, Office of Public Affairs 2010)
15 One good example of a volunteer program is the Gulf of Farallones National Marine Sanctuary Beach Watch Volunteer Program, which was involved in the Safe Seas drill in 2006 (Moore, et al. 2008)
16 (Papp Jr. and al. 2011)
17 (Office of Spill Prevention and Response n.d.)
response to a spill. Despite their complexity, contingency plans should be easy to follow.

Although contingency plans can differ in what they include, they usually share four major elements: hazard identification, vulnerability analysis, risk assessment, and response actions.  

- **Hazard identification** includes location of oil storage and transportation, types of oil involved, location of response equipment and known extreme weather conditions.

- **Vulnerability analysis** provides information about natural resources and human communities that could be harmed from a spill. It includes lists of sensitive habitats, recreational areas, schools, hospitals, residential areas, etc.

- **Risk Assessment** is conducted by contingency planners by comparing the hazard identification with the vulnerability analysis to assess the specific risks to communities and habitats.

- **Response Actions** address the risks and describe major actions to be taken immediately following a spill to minimize ecological, economic and human health damage. The following response actions should be included in a contingency plan:
  
  o Notifying all private companies or government agencies that are responsible for the cleanup effort
  o Getting trained personnel and equipment to the site quickly
  o Defining the size, position, and content of the spill; its direction and speed of movement; and its likelihood of affecting sensitive habitats
  o Ensuring the safety of all response personnel and the public
  o Stopping the flow of oil from the ship, truck, or storage facility, if possible, and preventing ignition
  o Containing the spill to a limited area
  o Removing the oil
  o Disposing of the oil once it has been removed from the water or land

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18 (Environmental Protection Agency, Office of Emergency and Remedial Response 1999)
This section will focus on contingency plans relevant to marine waters off Los Angeles County, which are covered by the Los Angeles/Long Beach Area Contingency Plan. National, Regional, and Area contingency plans are intended to work with one another, and not conflict between different levels (Figure 1). For example, the National Contingency Plan provides a response framework that can still be utilized at the area or local level.

The National Contingency Plan or the National Oil and Hazardous Substances Pollution Contingency Plan is the federal government’s blueprint for responding to both oil spills and hazardous substance releases. Key provisions include establishment of the National Response Team within the National Response Framework, general responsibilities of the Federal On-Scene Coordinator (FOSC), establishes the Unified Command Structure, and defines the objective, authority, and scope of the national, regional, and area contingency plans.7

The Region IX Contingency Plan covers Arizona, Nevada, California, and 146 tribal nations, and includes the California Dispersant Plan, which addresses the use of dispersants in California waters. Regional Response Team IX (RRT IX) is responsible for maintaining and updating the Region IX Contingency Plan. RRT IX includes member representatives from federal, state, and tribal agencies.7
Figure 1. Contingency plans range from general to very specific. Source: (Environmental Protection Agency, Office of Emergency and Remedial Response 1999)

Area Contingency Plans give detailed response information and actions at the local level. The Area Contingency Plans (ACPs) are living documents, and the respective Area Committees meet regularly to update, review, and revise the document as needs become apparent. This planning process is open to the public, includes all stakeholders, and has involved representatives from over 50 agencies, including federal agencies, state agencies, local government agencies, as well as industry and environmental groups. Area Contingency Plans (ACPs) around the country share a similar format, with information for spill response organized by respective Incident Command Structure (ICS) function: Command, Operations, Logistics, Finance, and Planning.

The Los Angeles/Long Beach Area Contingency Plan includes the coastal zone, generally the ocean side of the Pacific Coast Highway from the Orange County and San Diego County border to the San Luis Obispo County and Monterey County border. The U.S. Coast Guard and the California Department of Fish and Wildlife Office of Spill Prevention and Response (OSPR) agreed to joint preparation of contingency plans for marine waters through co-chairing the three Port Area Committees for Contingency Planning: Coast Guard Port Areas for San Francisco, Los
Angeles/Long Beach, and San Diego. Generally, the EPA is responsible for the zone that is located inland of this border.

California OSPR has created and funded Harbor Safety Committees for the state’s busiest ports. The **Los Angeles/Long Beach Harbor Safety Plan** is a local plan aiming to reduce the risk of accidents in the ports of Los Angeles and Long Beach. Improving vessel transit and terminal safety reduces the risk of spills, environmental damage, and human and property safety. Harbor Safety Committee meetings are open to the public and include public comment to address any local concerns.

Los Angeles County Lifeguards are currently working on the **Los Angeles County Contingency Plan** that would organize other agencies, such as Lifeguards, Fire, Beaches and Harbors, State Parks, and more. The LA County plan is a separate plan from the Los Angeles and Long Beach Area Contingency Plan. The emergency response is governed by the ACP, and any peripheral response measures that can be taken by municipalities and local agencies are covered in the Los Angeles County plan. This plan should help coordinate many entities that could contribute personnel and resources to an oil spill effort. This plan is currently being revised and the Coast Guard is providing its expertise on this project to avoid redundancy with the LA/LB Area Contingency Plan. Ideally, coastal cities are involved in the planning and updating of LA County’s Plan, and this process is also being improved.

In addition, any facility that is involved in oil storage or transportation must create and maintain a **Facility Response Plan** (FRP). Chevron has an FRP for the El Segundo Marine Terminal for specific response measures for the facility. Tanker vessels calling at the Marine Terminal and any terminal in California must have **Vessel Response Plans** up to date and onboard the vessel in case of an oil spill originating from the vessel itself. Non-tanker vessels (e.g. container ships) are also required to have Vessel Response Plans.

**ERMA**

The use of Geographic Information Systems (GIS) is an improvement in response technology used during a spill. The National Oceanic and Atmospheric Administration’s (NOAA) GIS tool for response is the Emergency Response Management Application (ERMA). ERMA serves as a quick reference tool for oil spill

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19 (Office of Spill Prevention and Response 2012)  
20 (Region IX Regional Response Team Fall 2008)  
21 (Lifeguard 2012)  
22 (Environmental Protection Agency, Office of Emergency and Remedial Response 1999)
responders and coastal zone managers. ERMA is an online mapping tool with static data layers that include geographically referenced natural and human resources (habitats, nesting sites, public beaches, etc.). It also integrates both static and real-time data, giving current conditions of weather, winds, currents, ship locations, etc. There are many options with ERMA, including downloads in various formats and software (from GIS to pdf to freeware) to view the data layers with most Windows or Mac operating systems. ERMA can be used to help define the extent of environmental impacts, guide cleanup and restoration efforts, and assist the Natural Resource Damage Assessment process used by NOAA and other trustees to assess the environmental damage from an incident. Currently there is publicly available information as well as information that is secure, available only for select response personnel. ERMA was created from a partnership between NOAA, University of New Hampshire, U.S. Environmental Protection Agency, U.S. Coast Guard, and the Department of the Interior.

![ERMA Image]

**Figure 2.** NOAA’s Environmental Response Management Application (ERMA) is an online mapping tool useful for spill responders and decision makers to plan response actions and protect sensitive environmental and public resources. ERMA was first used in California during a full-scale oil spill drill in 2013.

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23 To access ERMA for Southern California, go to https://www.erma.unh.edu/southwest/erma.html

24 (National Oceanic and Atmospheric Administration, Office of Response and Restoration 2013)
2011 located near the Northern Channel Islands. In March of 2010, ERMA was first used in the U.S. for the 2010 Spill of National Significance exercise. One month later it was used in the Deepwater Horizon spill in the Gulf of Mexico.

Oil Spill Drills and Exercises

It is essential that government and industry employees actually test the contingency plans, and conduct oil spill drills for a variety of facilities and conditions. Every three years a full-scale open water drill is performed in Southern California between a Responsible Party and the government (National Preparedness for Response Exercise Program, or NPREP). A full-scale exercise deploys existing equipment as if a spill occurred. On May 13th and 14th, 2013 the NPREP oil spill exercise, a full-scale exercise with equipment in the water, was performed at the Chevron El Segundo Marine Terminal. Chevron volunteered to be the Responsible Party, and used the opportunity to run a drill and continue to improve the coordinated response with the Coast Guard, California OSPR, Oil Spill Response Organizations (OSROs), trustees, and others. There is a planning team and an environmental unit where qualified representatives from non-profit environmental organizations may have the opportunity to participate pending the approval of the Coast Guard and the responsible party. In addition, a Community Day is included in the drill for public outreach with booths from all involved entities, and a viewing platform to observe the activities conducted offshore (booming). Attending Community Day for a PREP full-scale exercise is an opportunity for concerned individuals to learn about the response personnel, equipment, and response plan for a particular location.

Palos Verdes Peninsula and the ACP

Palos Verdes has many sensitive sites rich with marine life that are currently not listed as sensitive sites in the ACP. Located offshore of the north side of Palos Verdes Peninsula are extensive rocky reefs that include diverse kelp forests, surfgrass beds, deep rocky reefs (rare in Southern California), soft bottom habitat, and rocky intertidal habitats that would all be destroyed by a major oil spill.

Out of all the plans listed above, it is the Los Angeles/Long Beach Area Contingency Plan (ACP) that spill responders will primarily use to prioritize protection and cleanup for ecologically sensitive sites (e.g. Malibu Lagoon, Ballona Wetlands). In Los Angeles County, the ACP includes response strategies for sites in Malibu, Venice Beach, Marina Del Rey Breakwater, King Harbor Breakwater, Cabrillo Beach, Los Angeles/Long Beach port locations, and sites around Catalina Island. Unfortunately this plan does not currently include any sites along the entire stretch of the Palos Verdes Peninsula, which is composed of critical habitats like rocky tidal pools, surfgrass beds, kelp forests, and deep rocky reefs. In addition, Marine Protected Areas (MPAs) were established off Palos Verdes and Malibu as of January
1st, 2012. If Palos Verdes sites are not included in the ACP then it is unlikely that they will be prioritized for protection during an actual oil spill response, damaging miles of rocky coastline and important marine habitats that are home to hundreds of important species.

The ACP must include a “Fish and Wildlife Sensitive Environments Plan” that is prepared in consultation with the federal trustees, National Oceanic and Atmospheric Administration (NOAA) and the United States Fish and Wildlife Service (USFWS). For this “Sensitive Sites Plan” the LA/LB Area Committee incorporates input from state and federal trustees, and stakeholders (industry, spill response co-ops and contractors, non-profit environmental groups and other organizations) to form consensus on the appropriate site protection strategies and response resources. The committee revises response strategies based on new knowledge and changing conditions.

Aerial view of the Palos Verdes Peninsula, with Santa Catalina Island in the background. Palos Verdes is home to kelp forests, surfgrass beds, rocky intertidal, submarine canyons, and more. Source: Tom Boyd

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25 (California Department of Fish and Wildlife 2013)
26 (United States Coast Guard, California Department of Fish and Game 2011)
Palos Verdes would be difficult to protect and clean up from land, because of steep rocky shores, and limited access. It would also be difficult to deploy boom across a stretch of coast off Palos Verdes and expect it to prevent oil from reaching near shore. Palos Verdes has few areas ideal for booming, like the Malibu Lagoon, where boom can be deployed across the lagoon opening in relatively calm water, creating a relatively effective method of preventing oil from polluting the lagoon. Towing boom arrays is listed as a response measure for other sites in the ACP, and might work off the coast of Palos Verdes in calm conditions. It is possible in calm open ocean conditions to try and surround a patch of oil with boom, and tow it out to sea using response vessels. The Palos Verdes Peninsula’s abundance and diversity of marine life is worth the extra effort.

If a primary aim of the ACP is to protect critical habitat for hundreds of species, including some endangered species (e.g. abalone), then it is imperative that Palos Verdes be included with other sensitive sites in the plan.

**Chemical Dispersants, the ACP, and the California Dispersant Plan**

Due to the large number of sensitive sites in LA County and Southern California, it is recommended that the ACP and the California Dispersant Plan be modified to reflect the inherent hazards associated with toxic dispersants and restrict dispersant use to protect endangered species or their critical habitats (see ‘dispersants’ chapter for details).

Due to the inherent ecological, economic, and human health issues associated with the combined effects of oil and dispersants, it is important to be aware of who makes the critical decision to apply dispersants. For any oil spill in marine waters off California, the Coast Guard is authorized to evaluate the use of chemical dispersants. In addition, the Coast Guard is responsible for coordinating, mobilizing, and directing the services of all federal agencies and their resources. During a spill, if the Coast Guard is considering dispersant use in Pre-Approval Zones (discussed in previous section) they must consult the pre-authorization plan entitled ‘Pre-Approval Zone Dispersant Use Checklist’ found in the California Dispersant Plan (Appendix VII in Region IX Contingency Plan). If the Coast Guard can say “yes” to the first five questions of this checklist then dispersants can be applied in the Pre-

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27 The authorization of dispersant use as delegated by the Region IX RRT to the designated FOSC (Coast Guard) was completed within a Unified Command Structure and agreed upon by the State On-Scene Coordinator (California Fish and Wildlife Office of Spill Prevention and Response) and the representative of the Responsible Party (Region IX Regional Response Team Fall 2008).
Approval Zones if dispersant tests of toxicity and effectiveness have been completed.\textsuperscript{28} In addition, the FOSC would consult with the RRT regarding dispersant application.\textsuperscript{29} In addition, it is likely the U.S. Coast Guard, acting as the Federal On-Scene Coordinator (FOSC) in the Unified Command Structure, would be motivated to use dispersants in an effort to decrease highly visible harm to birds, mammals, and nearshore habitats (see ‘dispersants’ chapter for details).

\textsuperscript{28} Field testing for dispersant use and other technologies is completed by trained SMART technicians before dispersants are applied (Special Monitoring of Advanced Response Technologies). (Region IX Regional Response Team Fall 2008)

\textsuperscript{29} Five questions for dispersant use in pre-approval zones (Region IX Regional Response Team Fall 2008):

1. Dispersant use being considered?
2. Can spilled oil be chemically dispersed with an approved and available agent on both the NCP Product List and the State OSCA licensing list?
3. Are oceanographic and/or weather conditions potentially conducive to dispersant use?
4. Is the spilled oil proposed for dispersant treatment at least 3 miles from shore, 3 miles from CA/Mexican borders, and not within National Marine Sanctuary boundaries?
5. Can dispersant be applied safely from an appropriate platform?
Consider a spill in waters outside of Pre-Approval Zones, for example inside state waters at the Chevron El Segundo Marine Terminal in the Santa Monica Bay. At the Marine Terminal, dispersant authorization falls under a case-by-case decision from the Regional Response Team IX (RRT IX). The Coast Guard must seek approval of the RRT IX Environmental Protection Agency (EPA) representative, state representatives, and be in consultation with the Natural Resource Trustees (U.S. Fish and Wildlife and National Oceanic and Atmospheric Administration representatives). RRT IX must approve the use of dispersants in addition to the type of dispersant. The specific dispersant used must be listed on the National Contingency Plan (NCP) Product Schedule (see ‘dispersants’ chapter), and be approved by the California Department of Fish and Wildlife Office of Spill Prevention and Response (OSPR).

Because decisions regarding dispersants and other critical decisions must be made quickly during the spill, the consultations that occur with the FOSC in an emergency scenario are rapid. From an environmentalist’s perspective, the rapid decision-making that takes place during an oil spill is precisely why a thorough assessment and evaluation of potential dispersant use on marine life and habitats must be completed beforehand and be represented in the ACP. For example deep reef habitat exists in Santa Monica Bay at depths over 150 feet at Point Dume, Redondo Canyon, and Short Bank that could be impacted by the use of dispersants (Figure 3). These deep reefs are currently not included in the ACP. Numerous fish and invertebrate species have been scientifically documented to inhabit the area in and around Short Bank. It is recommended to add deep benthic habitats to the LA/LB as sensitive sites that could be harmed by the combination of dispersants and oil.

**COMMUNITY INVOLVEMENT AND VOLUNTEERING**

*Interested in making a difference during an emergency response?* It is important to be pre-trained. In the event of a major spill, timing of response is crucial and volunteers who are pre-trained can help the response effort immediately. Be ready and get started now on ICS training and classes, find your favorite environmental organization that works on oil spill issues, such as Los Angeles Waterkeeper, and begin the process to help protect local marine life and important sites.

How does a concerned citizen of Los Angeles County volunteer towards improved prevention and response of a major oil spill that could threaten our coast?

30 (Toxipedia and Earthjustice August 2011)
31 Notable fish species include rockfishes, flatfishes, croakers, and more (Deets and Cash 2006).
Volunteers have different options that range from cleaning oiled birds, attending public committees and conferences, and working with local non-profit environmental organizations in outreach, education, and advocacy. In response to an oil spill, volunteering will be chaotic and unorganized unless a volunteer plan in the ACP is up to date.

Figure 3. U.S. Geological Survey image of bottom type in Santa Monica Bay using multi-beam acoustic mapping techniques. White areas represent harder materials like rock, shell, and course sand. Darker areas indicate softer materials like mud and silt. The harder bottom area in the middle of the Bay is commonly called Short Bank (United States Geological Survey 2005). This report recommends that the LA/LB Area Contingency Plan (ACP) include habitats like Short Bank and the Redondo Canyon in the sensitive site strategies list in relation to dispersant use.

**Prevention and Planning**

Avoiding damage to species and habitats during a major oil spill is impossible. However, it is imperative that a significant amount of effort and resources is invested in prevention and reduction of environmental damage. There are a variety of ways that concerned citizens can get involved in prevention and planning. For example, there are at least two active decision-making bodies that regularly accept public comment on these issues: The Los Angeles and Long Beach Harbor Safety Committee and the Los Angeles/Long Beach Area Committee.
The LA/LB Harbor Safety Committee is responsible for its associated Harbor Safety Plan. This committee is dedicated to promoting safety and preventing accidents that may become environmental hazards, such as oil spills. There are two seats on this committee currently held by representatives of environmental groups: Los Angeles Waterkeeper and Orange County Coastkeeper. Any concerns about any safety or environmental issue with regards to the Los Angeles and Long Beach ports should be taken to either environmental organization or the Harbor Safety Committee.

There are also conferences that focus on the prevention of oil spills: Clean Pacific Conference (an expo format) and Prevention First. Prevention First is hosted by State Lands Commission and is a symposium held every two years to keep professionals and the public together receiving the latest in technology and operations regarding oil spill prevention and response.

Response

In the tragic occurrence of a major spill in Southern California, volunteer work may be extremely useful in minimizing damage to the environment and improving the effectiveness of the cleanup. There is a wide variety of volunteer options in oil spill response, with some requiring training and being affiliated with a volunteer organization before a spill occurs.

The number one meeting to attend for all citizens that are concerned with the local response to an oil spill is the Los Angeles and Long Beach Area Committee. The LA/LB Area Committee is responsible for updating its associated LA/LB Area Contingency Plan. This planning group welcomes public comment regarding any and all issues related to oil spill response in and around LA County. For example, a member of the public can give public comment at an Area Committee meeting if they are concerned that the ACP does not include an important location to protect in the ACP’s response strategies, such as the Palos Verdes Peninsula. In addition to the Area Committee, the Regional Response Team, responsible for the Region IX Contingency Plan, is the group to approach for more broad scale concerns. The Regional Response team can address issues that are relevant to response methods anywhere in California, such as chemical dispersant use and selection.

The ACP also includes a volunteer plan that will be crucial for utilizing the surge of public participation that often occurs in large oil spills. It is crucial the

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volunteer plan be comprehensive and up to date. The LA/LB ACP is currently being updated, as it is a living document. A volunteer plan was made for the San Francisco Area Contingency Plan and might be used as a possible model.34

Wildlife or Non-Wildlife Volunteering?

Volunteer opportunities are often categorized between wildlife and non-wildlife opportunities, and divided into pre-spill and post-spill tasks (Table 1). During a spill, care must be taken when managing a volunteer unit; the benefit of volunteer efforts must be weighed against concerns for volunteer safety. Safety considerations include the level of volunteer training provided, the availability of volunteer coordinators, and the current volunteer needs.

If an oil spill reaches the shoreline, helping oiled wildlife can directly save the lives of affected birds, mammals, or other animals. Volunteers wishing to work with oiled wildlife will need to volunteer for a member of the Oiled Wildlife Care Network (OWCN), a network of member organizations setup to handle oiled wildlife.35

34 For more info about the volunteer plan in the San Francisco Area Contingency Plan https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=16089&inline=true
35 In LA County the OWCN members are (from North to South):
• California Wildlife Center in Malibu: http://www.cawildlife.org/
• International Bird Rescue Los Angeles in San Pedro: http://www.bird-rescue.org/
• Marine Mammal Care Center in San Pedro: http://www.marinemammalcare.org/
• Aquarium of the Pacific in Long Beach: http://www.aquariumofpacific.org/
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<td>Pre-removal of species (e.g. abalone)</td>
<td>Pre-cleaning shore</td>
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<td>Hazing - scaring wildlife away</td>
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<td></td>
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<td>Runners</td>
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<td>Beach monitoring</td>
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<td></td>
<td>Beach gate keepers</td>
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</table>

Table 1. Examples of volunteer opportunities in the event of a large oil spill in or around Los Angeles County. Volunteers will be separated between wildlife and non-wildlife workers, with a distinction between pre-impact and post-impact tasks.

The training and hazards of working with oiled wildlife is not for everyone. It is possible to work with non-oiled wildlife during an oil spill, and still make a difference in the response or cleanup. Opportunities such as hazing, or scaring wildlife away from a site that is expected to receive oil can save the lives of birds or mammals unaware of the spill. Also, trained volunteers may have the opportunity to conduct pre-removal of particular species like abalone, to prevent them from being oiled. An important non-wildlife volunteer position is pre-cleaning beaches, where kelp and other debris washed ashore or littered is moved above the high tide line. It is easier to clean the beach of oil if it is comprised of mostly sand and free of any debris that could be oiled. One critical position for public health is beach monitoring and gate keeping; informing people that the beach is closed and collecting various types of data. In addition, the Incident Command Post where major response decisions are made may need help with setup and might need runners for information and documents.

Volunteer unit leaders or supervisors who are involved in the Unified Command or Incident Command Structure during spill response should take the basic courses, offered online or in class: Incident Command System (ICS) 100, 200,
and 700.\textsuperscript{36} Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) 24 hour training is required of any volunteer working around oiled wildlife or oiled areas.\textsuperscript{37}

\textsuperscript{36} Basic ISC classes are offered online for free by the Federal Emergency Management Institute at \url{http://training.fema.gov/IS/}

\textsuperscript{37} For more info, visit \url{http://www.osha.gov/Publications/3172/3172.html} and \url{http://www.vetmed.ucdavis.edu/owcn/volunteer_info/index.cfm} and \url{http://www.osha.gov/dte/training_faq.html}
During a spill, volunteers will also be distinguished as ‘affiliated’ or ‘non-affiliated’ volunteers. Affiliated volunteers are active volunteers with a particular organization before a spill occurs. Non-affiliated volunteers are members of the public that may or may not have volunteered in the past but want to contribute to the oil spill response effort. For example, a current volunteer for the California Wildlife Center is considered an affiliated volunteer, and could be put to work immediately on oiled wildlife assuming the training has been completed. For efficiency and improved response it is beneficial to have affiliated and trained volunteers on a contact list before a spill occurs.

Interested in making a difference during an emergency response? Get started now on ICS training and classes, find your favorite environmental organization that works on oil spill issues, such as Los Angeles Waterkeeper, and begin the process to being ready to help if a large oil spill hits the Los Angeles coast.
RECOMMENDATIONS

Prevention

1) Concerned citizens should frequent the most important meeting in the Los Angeles area for oil spill prevention: the Los Angeles/Long Beach Harbor Safety Committee. There are also other meetings and conferences where oil spill prevention is highlighted: the Clean Pacific Conference, and the California State Lands Commission’s Prevention First Conference.38

2) The Coast Guard should continue to implement the lessons learned from the Cosco Busan fuel spill in San Francisco Bay to the ports of Los Angeles and Long Beach (POLA/POLB) and the Chevron El Segundo Marine Terminal, especially with regards to improved communication between ships and Vessel Traffic Service.

   a) The Coast Guard should implement similar improvements to pilots’ medical oversight in POLA/POLB as was completed in the San Francisco Bay.

Response

1) Concerned citizens should frequent the most important meeting in the Los Angeles area for oil spill response: the Los Angeles/Long Beach Area Committee meeting.39 The Prevention First and Clean Pacific Conferences mentioned above also highlight oil spill response.

2) Deep rock habitats in Santa Monica Bay, such as Short Bank, should be included in the LA/LB ACP for consideration when considering the use of chemical dispersants that may impact deep ocean habitats.

3) The LA/LB Area Contingency Plan should be amended to include the Palos Verdes Peninsula within the listing of sensitive sites protected during an oil spill.

4) The coastal cities should be familiar with the ACP and the LA County Plan, and how they fit into the response framework.


39 Link to ACP information: http://www.dfg.ca.gov/ospr/los_angeles_plan.aspx. For the Coast Guard the following address can be copied into a web browser: https://homeport.uscg.mil/la lb
5) Local environmental scientists, professionals, and biologists should be familiar with the ACP and NOAA's Emergency Response Management Application (ERMA) and continually update and verify habitat and species information is complete and correct. This will help ensure the sensitive sites list is always accurate and up to date, towards improved protections of local habitats.

6) The volunteer plan in the LA/LB Area Contingency Plan should be brought up to date with current organizations, contacts, and opportunities. An improved volunteer plan will help avoid hazardous situations and chaos in the event of a spill. Updating the volunteer plan is also a Coast Guard recommendation from the Cosco Busan spill of 2007.

   a) Integrate trained, experienced organizations into the LA/LB Area Contingency Plan and response drills. Local non-profit organizations can assist with volunteer coordination and be an outlet for volunteer interest.

      i) In addition to the Oiled Wildlife Care Network, community organizations can prepare volunteers for an oil spill and provide training for non-oiled wildlife volunteer opportunities, such as pre-cleaning beaches, beach monitoring, and runners for the incident command post.

7) Community organizations should be empowered and encouraged to educate stakeholders and the Los Angeles County public about the local threat of oil spills, potential impacts, and areas where more advocacy is needed, such as in communicating the potential dangers associated with the wrong selection and/or misuse of chemical dispersants.

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Lifeguard, Los Angeles County, interview by Brian Meux. Conversation via phone call (July 2012).


United States Coast Guard PACAREA Eleventh Coast Guard District Command Center, Environmental Protection Agency Region 9. *Federal Region 9 Regional Contingency Plan.* 2005

United States Coast Guard, California Department of Fish and Game. *USCG Sector Los Angeles - Long Beach Area Contingency Plans (ACP) Volume I.* 11 18, 2011.


Chapter Four: Terminals, Tankers, and Boom

Featuring Chevron’s El Segundo Marine Terminal: California’s last offshore terminal

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INTRODUCTION

It is not often that we have significant oil spills off the coast of Los Angeles, but it has occurred in the past. In 1991, Chevron had an oil spill from the El Segundo offshore marine terminal (hereafter Marine Terminal); when the tanker Omi Dynachem ripped open an underwater oil pipeline with its anchor at the Chevron terminal, spilling 27,720 gallons (660 barrels) of oil. This mistake resulted in oil hitting Topanga and Malibu beaches (about 12 miles away) a day later on Sunday night. The accident, which occurred at 7:05 p.m. on a Saturday night but was not made public until nearly 11 hours later, forced the closure of the Marina Del Rey harbor as a 13-mile "safety zone" was declared from Venice to Manhattan Beach. Protective booms were placed in front of Marina Del Rey harbor and the mouths of Malibu and Ballona creeks to protect sensitive habitat. Boat traffic without Coast Guard authorization was banned in the zone. Swimmers and surfers were advised to stay out of the water, but most ignored the warnings. Luckily, high winds pushed most of the oil offshore, avoiding populated beaches. The spill of diesel-like oil mixture killed at least 20 birds and injured several others, including threatened species. Chevron pleaded no contest to criminal violations and was fined $500,000 for the incident.

In addition to the Omi Dynachem spill, on December 28th, 1980 the John McCone oil tanker spilled 105,000 gallons (2,500 bbls) of heavy crude off El Segundo due to a hole in the ship’s bottom.

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1 27,720 gal (660 bbls) of oil is considered a medium-sized discharge at the El Segundo Terminal. A large, or worst case discharge at the El Segundo Terminal (described below) is calculated at 726,390 gal (17,295 bbls) (Chevron Products Company 3-1-2011)
2 (Stammer and Becklund 1991)
3 (Archibold 1993)
4 The John McCone was a single-hulled ship, which is no longer allowed at Chevron’s Marine Terminal (described in further detail below). According to California State Lands Commission, the hole was not related to operations associated with the Marine Terminal (California State Lands Commission, Marine Research Specialists August 2010)
The Omi Dynachem spill was not Southern California’s first oil spill from an oil tanker that caused environmental damage with its own anchor at an offshore marine terminal. One year earlier in 1990 the oil tanker American Trader passed over its own anchor and gouged itself twice off Huntington Beach and spilled 400,000 gallons (9,524 bbls) of Alaskan crude oil onto 15 miles of Orange County beaches (Figure 1). Chartered by BP America, Inc., the American Trader was in the process of tying up to an offshore terminal during the accident. This was the first major oil spill in Southern California after the 1969 spill of over three million gallons of oil spewed for eleven days from the ocean floor at an oil rig off the coast of Santa Barbara.

5 (City of Huntington Beach Emergency Services Office 1992) (Haddad and Fleischli 2000)
6 Like the BP 2010 Deepwater Horizon spill, the advances in responding to and stopping the gushing well fell short of our technology to extract the oil. The 1969 spill is the third largest U.S. oil spill in history, following Deepwater Horizon and Exxon Valdez. New environmental policy, regulations, agencies, and a passionate environmental movement were a direct consequence of the Santa Barbara spill. The 1969 Santa Barbara spill led to the first Earth Day in 1969, and 100,000 signatures were collected by Get Oil Out to ban offshore drilling; the Environmental Defense Center was founded, and the first Environmental Studies Program was started at UC Santa Barbara; the California Coastal Commission was founded from a statewide initiative, and the State Lands Commission banned offshore drilling for 16 years until Reagan took office; Nixon signed the National Environmental Policy Act, leading the way to 1970 establishment of the Environmental Protection Agency; California Environmental Quality Act became law, and federal and state regulations governing oil drilling were strengthened (Clarke and Hemphill 2002).
Offshore marine terminals were more commonly used in the past to transfer oil from tankers to shore or vice versa. The Chevron El Segundo Marine Terminal is the last offshore marine oil terminal in California used for commercial purposes. Modern day standards of prevention and response are often difficult to implement at an offshore terminal because the location of the oil transfer berths are often exposed to storms, swell and winds. All other offshore oil terminals in California have already been decommissioned as of 2013, with commercial oil transfers in California occurring inside ports and harbors with the exception of Chevron’s marine terminal.

Chevron generally runs a relatively responsible operation without major human and environmental catastrophes in the recent past, but the company is unfortunately relying on an oil transferring method now abandoned elsewhere in

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7 The navy still uses small oil barges that offload oil at San Nicolas Island and San Clemente Island, but the scale and frequency of transfers is a few orders of magnitude less than the oil being transferred at El Segundo. Venoco Ellwood Marine Terminal is no longer operational as of Tuesday, February 21st, 2012. Santa Barbara community members advocated for the end of this system, now replaced by a pipeline on land, where barges were transporting oil produced in Santa Barbara to other refineries in the region (State Lands Commission staff member 2012)
California. Most offshore oil terminals, including the Chevron El Segundo Marine Terminal, have environmental disadvantages when compared to a modern day port. Modern day standards of prevention and response that occur in protected ports and harbors are often infeasible at an offshore terminal (see Table 1). For example, ports and harbors do not rely on subsea pipelines to transfer crude oil underwater over one mile from tanker to shore facilities. Due to the exposed location of the Marine Terminal a number of standard prevention measures are infeasible, such as pre-booming oil transfers and transferring oil over shorter distances in waters more protected from the elements. The ability to respond to and clean up a major oil spill is generally improved in ports and harbors. Although our recommendation would be to move Chevron’s oil transferring operations inside the Ports of Los Angeles and Long Beach, the State Lands Commission approved a new 30 year lease for the Marine Terminal as is, in 2010. This report offers recommendations for improving the response in the unfortunate event a major oil spill occurs from the Marine Terminal.
<table>
<thead>
<tr>
<th>Item</th>
<th>Environmental Advantage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prevention</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vessel Traffic Service</td>
<td>neutral</td>
<td>Both the Marine Terminal and the Ports of Los Angeles/Long Beach (POLA/LB) benefit from VTS.</td>
</tr>
<tr>
<td>Double Hull Requirement</td>
<td>Marine Terminal, until 2015</td>
<td>By 2015, double hulls are required on all tanker vessels calling on terminals in the U.S. (OPA 90). Most tankers in U.S. waters now have double hulls.</td>
</tr>
<tr>
<td>Pre-booming</td>
<td>Port</td>
<td>All oil transfers in POLA/LB are required to pre-boom. It is infeasible to pre-boom oil transfers at the Marine Terminal.</td>
</tr>
<tr>
<td>Oil transfer pipelines</td>
<td>Port</td>
<td>The Marine Terminal flexible hose and the connecting pipelines are underwater, which makes access, detection, and response to a problem more difficult at the Marine Terminal than the average port terminal.</td>
</tr>
<tr>
<td>Onshore Power</td>
<td>Port</td>
<td>Port terminals may have electrical sources on shore for the tanker to plug in, reducing emissions from tankers burning fossil fuels (often diesel) to power the pumping or electrical equipment onboard. This is currently being phased into POLA/LB.</td>
</tr>
<tr>
<td>Offshore Lightering</td>
<td>Port</td>
<td>Currently both the Marine Terminal and POLA/LB utilize lightering. Supertankers or VLCCs (Very Large Crude Carriers) are unable to berth at the Marine Terminal, however, POLB has a deep draft terminal at Berth T121 (max depth 76 ft) that can berth tankers with a deeper draft and up to 320,000 dwt. 8</td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td></td>
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</tr>
<tr>
<td>Response time for large spill</td>
<td>Port</td>
<td>Most response resources are located in POLA/LB, increasing the response time at the Marine Terminal. Resources in King Harbor can respond to a small spill at the Marine Terminal relatively quickly, making the environmental advantage of response time for a small spill relatively equal between POLA/LB and Marine Terminal.</td>
</tr>
<tr>
<td>General ease of containment and recovery</td>
<td>Port</td>
<td>The Marine Terminal is about 1.5 miles offshore located in open ocean conditions, making the recovery of oil more difficult than the relatively calm and protected waters of POLA/LB.</td>
</tr>
<tr>
<td>Potential for spill to spread over wide area</td>
<td>Port</td>
<td>A catastrophic spill located inside the breakwaters and jetties of POLA/LB could be more easily contained within the port boundaries. A catastrophic spill at the Marine Terminal could, and has, spread throughout Southern California.</td>
</tr>
</tbody>
</table>

**Table 1.** A comparison of various oil spill prevention and response environmental advantages between the Chevron El Segundo Marine Terminal and the ports of Los Angeles and Long Beach (POLA/LB). Generally, there are significantly more environmental advantages to conducting oil transfer operations in a modernized port, compared to an offshore terminal. For further discussion of each prevention and response factor, please see the associated section in this chapter.

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Chevron El Segundo Marine Terminal Description

Located 1.5 miles offshore of Dockweiler State Beach, the Chevron El Segundo Marine Terminal has two open ocean berths where tankers are tied off to moorings and oil is transferred to the refinery onshore via underwater pipelines (Figure 2 and Figure 3). The berths range in depths from 63 to 76 feet, and the Marine Terminal is capable of operating 24 hours a day, 7 days a week. The onshore refinery processes up to 270,000 barrels of crude oil per day (11,340,000 gallons). Current imports include crude oil and other feedstocks to be refined by Chevron. Approximately 80% of the crude oil received at the refinery comes from offshore tankers, with 20% coming from pipelines of onshore oil fields. Exports of the refinery include refined petroleum products and components such as diesel fuel, gas oil, number 6 fuel oil, commercial jet fuel, fluidized catalytic cracker light cycle oil, crude oil residuum, motor gasoline, and motor gasoline components. The refined products are primarily exported by pipeline (80%) and truck and rail, with approximately 4% being transported to tankers moored at Chevron’s Marine Terminal. In addition, most Los Angeles refineries are connected via pipeline (Line 63).

The State Lands Commission 2010 final Environmental Impact Report regarding the renewal of their Marine Terminal 30-year lease states that the number of tankers visiting the port is expected to increase approximately one percent per year until the lease term expires in 2040. The vessel calls in 2006 were 347 vessels, expected to increase to 487 vessel calls per year by 2040. The vessels calling on the Marine Terminal range from 14,500 to 211,000 dead weight metric tons (DWT). Three types of tanker vessels call at the terminal:  

- Large tankers (greater than 80,000 DWT), capacity of 21 to 42 million gallons
- Small tankers (20,000 to 80,000 DWT), capacity of 2.1 to 21 million gallons
- Barges (14,500 to 20,000 DWT), capacity of 2.1 to 6.3 million gallons

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9 (California State Lands Commission, Marine Research Specialists August 2010)
10 (California State Lands Commission, Marine Research Specialists November 2010)
Large tankers typically transport crude oil, and the small tankers and barges may be used to import or export crude oil, components, or refined products. From 2006 to 2008, an average of 172 large tankers per year visited the marine terminal. 53% of the tankers were the large tanker type, each carrying 21 million gallons to 42

Figure 2. Chevron’s marine terminal is located 1.5 miles from the shore of El Segundo where the refinery is located. The marine terminal is composed of two sea berths and an onshore section. Oil and petroleum products can be transferred in either direction via underwater pipes from the onshore component of the terminal to the sea berths. (California State Lands Commission, Marine Research Specialists August 2010)
million gallons of crude oil. By comparison, the Exxon Valdez spilled almost 11 million gallons of crude oil. The worst-case scenario spill described in Chevron’s marine terminal contingency plan is a pipeline spill that connects one of these large tankers to the onshore refinery.

Figure 3. Chevron’s marine terminal offshore facilities include active berths 3 and 4, consisting of moorings and pipelines that connect the active berths to the onshore pumping and storage areas. Mooring buoys located in a circle around a vessel hold it in a fixed position, while hydrocarbons are pumped to the refinery’s tanks or received from onshore tanks. Each independent berth has a main and a circulation pipeline. Circulating pipelines are used to flush the main pipelines after each successful oil transfer. These two pipelines are connected at the berth to a Pipeline End Manifold (PLEM). A flexible hose connects the PLEM to the vessel. Once the vessel is secured to the mooring buoys at the berth, the flexible hose is lifted from the bottom of the bay, connected to the vessel, pressure tested prior to loading and unloading the oil. (California State Lands Commission, Marine Research Specialists August 2010)

11 (Chevron Products Company 2008)
Prevention

Chevron does implement many safety requirements and precautions to avoid large oil spills, such as the double hull requirement discussed below. Unfortunately, the concept and design of an offshore marine terminal has significant environmental disadvantages with regards to spill prevention when compared to some port and harbor oil transfer terminals. For example, because of the size of the marine terminal’s berths and their offshore location, pre-booming an oil transfer operation is not a practical or effective preventative measure. Pre-booming is a preventative measure to limit the movement of oil in the event of an oil spill and a practice that is now standard in all modern day oil transfers in ports and protected waters. In addition, discussed below are other environmental liabilities, such as air pollution that can potentially be better mitigated in a modern port rather than an outdated marine terminal design with inherent environmental disadvantages.

The response to a major spill in open waters outside a protected port is costly and often ineffective, making the prevention of a large spill from Chevron’s offshore marine terminal extremely important. Some modern day standards of transferring oil and measures of prevention are more easily attainable in protected ports compared to offshore terminals. The ports of Los Angeles and Long Beach (‘POLA/LB’) are good examples of high volume oil transfer operations that currently implement, or plan to implement common safety measures that aim to prevent oil spills.12 Below is a list of expected measures of prevention that can be achieved in modern day ports with oil facilities such as POLA/LB and a comparison with the Marine Terminal.

Vessel Traffic Service

Vessel Traffic Service (VTS) uses radar, ship tracking technology, and communications to advise tankers in avoiding collisions and other vessels or groundings. The VTS is a public-private partnership and is jointly operated between the U.S. Coast Guard and the Marine Exchange of Southern California. The combination of the Coast Guard’s Captain of the Port Authority and the insight of the maritime industry creates a service that helps to prevent ships and tankers from

12 The Los Angeles and Long Beach ports combined together rank first in the U.S. and sixth in the world overall for container volume (National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling January 2011)
colliding and causing large spills. The primary function of VTS is for the ship traffic in and out of POLA/LB, but ship traffic to the Marine Terminal also benefits from VTS. The marine terminal approach is located within the VTS San Pedro Sector (the operational radius of VTS is 25 nautical miles from the center on Point Fermin, Palos Verdes Peninsula). Vessels entering or leaving the berths at the Marine Terminal must report to the VTS personnel on duty.

**Double Hull Requirement**

Fortunately, for the duration of Chevron’s new 30-year lease (renewed in 2010), all vessels that call at the Marine Terminal are required to have a double hull. Vessels with a double hull have two complete watertight hull surfaces. The outer layer forms the normal hull and the inner layer, usually a few feet inside the outer layer, forms a redundant hull to contain the oil in case of damage to the outer hull. The space between the two hulls is commonly used to store ballast water.

Double hulls can prevent leakage in the event of a small accident, but in the event of a larger accident, it is possible for both hulls to be penetrated. The Exxon Valdez had a double bottom, which is a double hull for just the bottom of the ship, with single hulls on the side of the ship. The double hull bottom was still penetrated in the Exxon Valdez.

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13 For more details on the Los Angeles and Long Beach Vessel Traffic Service, please visit: [http://www.mxsocal.org/](http://www.mxsocal.org/)
14 (Marine Exchange of Southern California 2013)
15 (California State Lands Commission, Marine Research Specialists November 2010) section SSR-2e
showing that the double hull technological requirement should not be expected to solve all spill related threats of large oil tankers. The Oil Pollution Act of 1990 (OPA) requires that all tankers in U.S. Waters will have double hulls by 2015, a historical improvement towards the prevention of large oil spills. In addition to the requirements of Chevron’s Marine Terminal, most tankers in U.S. waters now have double hulls.

**Pre-booming**

Booms are floating barriers used to prevent the spread of oil by surrounding the spill at the water’s surface and containing the floating oil. Pre-booming is the task of deploying boom in the water surrounding the tanker before the oil transfer is commenced. Once the oil is contained during a spill it can often be recovered by equipment like skimmers and pumps before it has a chance to further harm marine life or foul important habitats. Booms come in many forms for varying situations (e.g. harbor, open ocean, swamp), and are basically long cylindrical shaped floats with a skirt that hangs into the water.

Pre-booming is required during all oil transfers in California ports and harbors, including POLA/LB. It is more effective in these protected waters because ports have relatively calmer water than an offshore terminal. In addition, in the case of a major spill, response personnel can boom the entrances to the port to contain the spill inside the port and avoid the spread of oil to natural habitats located outside the port.

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16 (The T/V Exxon Valdez) (The National Response Team May 1989)
Pre-booming is also practiced at the Valdez Marine Terminal in Alaska, an oil terminal that is not located in a port but is more protected from offshore elements due to natural landforms. Tanker vessels tie into a berth at a pier, where they hook into loading arms at the Valdez terminal, enabling pre-booming, quicker response, and greater capability to contain spilled oil.\(^{17}\)

The inability to pre-boom oil transfers at the Marine Terminal is an environmental disadvantage of the Marine Terminal. Below is a paraphrased list regarding infeasibility of pre-booming in the final Environmental Impact Statement for the 2011 renewal of the 30-year SLC lease (Pg. 4-43 in Chevron’s Final EIR).

Chevron agrees that “pre-booming vessels while at the El Segundo Marine Terminal during on and off loading is not practical for several reasons”:

- It is not possible to encircle the ship while it is tied up in the moorings since the mooring lines from the buoys to the ship would interfere with the boom boat.
- Boom would have to be deployed outside the mooring buoys to pre-boom and encircle the ship, which would require an approximate 4,700-foot circle of boom.
- If swell or wind increased, the boom could jump over the buoys, entangling the boom and mooring lines and rendering the boom useless.
- Oil containment boom is not designed to rub up against mooring buoys, even in calm weather.
- In the event of a spill, response operations need flexibility and the option to move resources to adjust to changing ocean conditions.
- Mooring at the Marine Terminal is completely different from mooring inside a harbor at a facility where pre-booming is required and makes sense from a spill response viewpoint.
- Pre-booming in a port can be done safely and effectively contain spilled oil
- A response boat at the terminal with 1,000 feet of boom can respond quicker than boats in Marina Del Rey or King Harbor, and can contain small spills.
- For larger spills, booms are available on response vessels in Marina Del Rey and King Harbor, at the Chevron Refinery, and at the POLA/LB.

Instead of pre-booming oil transfer operations at Chevron’s Marine Terminal, 1,000 feet of boom is stored on a vessel near the two open ocean berths of the marine terminal during oil transfer operations. The response vessel is the acceptable alternative per the conditions of the State Lands Commission 30-year lease. It is apparent that pre-booming is not effective in the open ocean environment, and containing a large oil spill at the Marine Terminal with only 1,000 feet of boom would be challenging. Thus, boom from Marina Del Rey, King Harbor

\(^{17}\) (Alyeska Pipeline Service Company 2011)
and the Ports of Los Angeles and Long Beach are the expected measure to contain a large oil spill. Response vessels must try to contain the oil slick once it has had a chance to spread away from the tankers. Even with well-qualified response personnel, responding with boom in the open ocean is less effective than surrounding a tanker in a port with boom, where in most cases oil spills could be contained in an area between the tanker’s hull and the boom.

One main reason why the Marine Terminal and many other offshore terminals are environmentally disadvantaged compared to modern day ports is because the ‘best achievable technology’ of pre-booming that is more easily achieved in ports is infeasible at the Marine Terminal. The Lempert-Keane-Seastrand Act directs that the Administrator of the California Department of Fish and Wildlife Office of Spill Prevention and Response (OSPR) provides not only for the “Best Achievable Protection” for the state but also for the “Best Achievable Technology.” Section 8670.3 (d) of the Act states:

“Best Achievable Technology” means that technology which provides the greatest degree of protection taking into consideration (1) processes which are being developed, or could feasibly be developed anywhere in the world, given overall reasonable expenditures on research and development, and (2) processes which are currently in use anywhere in the world. In determining what best achievable technology is, the Administrator shall consider the effectiveness and engineering feasibility of the technology.

The Lempert-Keane-Seastrand Act mandates the best achievable technology be used towards the best achievable protection. If it is infeasible to pre-boom the tanker mooring system then the best achievable protection is not being achieved like it is during oil transfer operations in ports currently in use around the world. 4,700 feet of boom is a massive length of boom that is impractical and time consuming in open ocean conditions, and may not even be effective in the event of a large spill in bad weather or unfavorable ocean conditions. This is a major environmental disadvantage of the offshore terminal when compared to modern day port operations such as those found in POLA/LB.

Given that this standard measure of environmental protection is not being achieved at offshore terminals like the Marine Terminal, combined with the challenging response effort needed to clean up a large oil spill in ocean waters close to shore, it is absolutely vital to prevent a major oil spill at the Marine Terminal.
Oil Transfer Pipelines

Transferring oil from a tanker to shore is critical due to the risk of oil pollution during transfer. Typically most crude terminals use metal loading arms (a.k.a. chiksans), and in some cases flexible hoses, for discharging the oil from tankers to port.\textsuperscript{18} Depending on the terminal, the oil is transferred from the loading arm to other pipelines or storage. The pipelines used to transfer oil from a tanker to shore in port are much shorter than a pipeline needed for an offshore terminal. The El Segundo Marine Terminal pipeline must carry oil underwater 1.5 miles before it reaches shore. Once a tanker vessel is secured to the mooring buoys at the Marine Terminal, a flexible hose is lifted from the bottom of the bay, connected to the

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{oiltankers}
\caption{Oil Transfer Pipelines: El Segundo Marine Terminal buoys that mark subsea pipelines. The subsea lines are used to transfer oil and petroleum products from the Marine Terminal to the onshore refinery (seen in background).}
\end{figure}

\textsuperscript{18} (Committee on Oil Spill Risks from Tank Vessel Lightering 2003)
vessel, pressure tested prior to loading and unloading the oil (see terminal description above).  

Although typical port operations and the Marine Terminal may both use flexible hoses to connect pipeline manifolds to tanker manifolds, the major difference is that the Marine Terminal flexible hose and the connecting pipelines are underwater, which makes access, detection, and response to a problem more difficult at the Marine Terminal than the average port terminal.

Onshore Power

Some ports may have electrical sources on shore for the tanker to plug in, reducing emissions from tankers burning fossil fuels (often diesel) to power the pumping or electrical equipment onboard. Onshore electricity, often termed cold ironing, is becoming more and more available at ports and harbors around the world in an effort to decrease air pollution. The ports of Los Angeles and Long Beach are currently installing electrical connections in many berths so ships can use shore power when in port, enabling them to completely shut down their diesel engines. Unfortunately not all berths or ships and tankers in POLA/LB are equipped to provide shore power, with tanker air pollution still harming nearby communities. In addition to the benefits to air quality, shore power could also facilitate other modern day improvements in ports, such as shore side pumping, drain dry pumping pipelines and storage systems.

19 (California State Lands Commission, Marine Research Specialists August 2010)
20 For an educational video about best practices for oil transfers, see http://www.oilspilltaskforce.org/bunker/bunkering_video.htm
21 (USC Sea Grant 2013)
22 (Warren 2011)
23 (California State Lands Commission, Marine Research Specialists August 2010)
One disadvantage to offshore terminals, including the Marine Terminal, is the lack of shore power options for tankers at berth. Some onshore pumping occurs at the Marine Terminal in addition to tanker pumps, but currently there is no option for tankers at the Marine Terminal to plug in to shore power.\textsuperscript{24}

\begin{center}
\begin{figure}
\includegraphics[width=\textwidth]{example_lightering_operation.png}
\caption{Example of present day lightering operations. Oil is transferred from the supertanker, or VLCC to a smaller tanker that is physically able to dock at a marine terminal or port. Source: \url{http://neptunenation.blogspot.com/2011_03_01_archive.html}}
\end{figure}
\end{center}

\textbf{Offshore Lightering}

Lightering is the process of transferring oil from a supertanker, called a Very Large Crude Carrier (VLCC, up to 84,000,000 gal (2,000,000 bbls) capacity), to relatively smaller tankers (21,000,000 to 42,000,000 gal capacity (500,000 to

\textsuperscript{24} Regarding pumping at Chevron’s Marine Terminal, there is one 1,500-horsepower (hp) booster pump and one standby 500 hp booster pump, located near the center of the Marine Terminal’s onshore facilities, and is used in conjunction with on-board ship pumps to convey oils to and from Berth 3. A separate vacuum pump is designed to keep the system under slight vacuum when the pipeline is idle, during vessel maneuvering, and until the hose end is connected to the ship’s manifold immediately before loading begins. A 15-hp injection pump maintains pressure on the underwater hoses to avoid kinking as they are lifted off the ocean bottom, laid across the ship’s rail, and connected to the ship’s manifold. The pump operates similarly when the hoses are disconnected and replaced on the ocean bottom (California State Lands Commission, Marine Research Specialists August 2010).
that are the appropriate size for an average port terminal. Currently VLCCs are unable to berth at the Chevron Marine Terminal but there is a deep draft terminal at the Port of Long Beach (Berth T121, see later section in this chapter, ‘Alternatives to an Offshore Terminal’). The VLCCs lightering area is approximately 20 miles west off the coast of north San Diego County (Figure 4). From 2006 to 2008 the annual average number of these supertankers visiting the lightering area was 46, with an average of 1.87 tankers per lightering event bound for the Marine Terminal. 25 A deep draft terminal for VLCCs reduces the need for offshore lightering from these supertankers, thus minimizing the amount of offshore oil transfers and generally decreasing the risk of oil spills.

With respect to the environmental impact of lightering, the Port of Long Beach possesses an environmental advantage over the Marine Terminal. POLA could reduce the potential for environmental impact with the construction of a deep draft terminal that could berth VLCCs rather than have them undergo offshore lightering. Currently, lightering operations are a source for both the Marine Terminal and POLA/LB. 25

A major spill from the lightering area could potentially affect many shorelines in Southern California. Fortunately the lightering operations off the West Coast of the United States (from San Diego to Alaska to Hawaii) have a relatively clean environmental record to date. U.S. Coast Guard incident records from 1984 to 2006 show five spills occurring in that time period, with the largest spill of 50 gallons occurring in Honolulu, HI in 1993. The average size of the five spills was 19.2 gallons. 26

25 (California State Lands Commission, Marine Research Specialists August 2010)
26 (Committee on Oil Spill Risks from Tank Vessel Lightering 2003)
Figure 4. Chevron Southern California lightering operations are conducted in an area known as Echo-PAL. The Echo-PAL location is USCG-approved and is a minimum of 20 miles (32.2 km) offshore to a maximum of approximately 30 miles (48.3 km) offshore of the San Diego County coastline. This area is outside of the South Coast Air Quality Management District (SCAQMD) jurisdiction and is within the U.S. Exclusive Economic Zone. The Echo-PAL area is not exclusive for Chevron use; it also serves other terminals in the area. Sometimes, only a portion of the cargo from the VLCC is offloaded and delivered to the Marine Terminal and some of the cargo may be offloaded and delivered to POLA/LB terminals operated by other companies. Source: (California State Lands Commission, Marine Research Specialists August 2010).
**Response**

A major environmental disadvantage of an offshore terminal is the potential for a large spill spreading quickly and polluting miles of shoreline and nearshore habitat. Figure 5 and Figure 6 model possible worst-case scenario spill trajectories from a major spill originating at or near the Marine Terminal. One scenario depicts oil spreading along Los Angeles beaches and offshore to Anacapa Island in as little as six days.  

The Chevron El Segundo Marine Terminal’s State Lands Commission lease was renewed in 2010 for 30 more years, meaning the Marine Terminal will presumably continue to be a major oil transfer operation until 2040. As previously discussed the Marine Terminal’s design has environmental disadvantages compared to modern day port terminals. However, in the unfortunate event a major spill occurs, a coordinated system of oil spill response can be activated to contain as much oil as is possible. It is a significant issue that not all response equipment is as effective in the open ocean as it is in a protected port. Given this physical limitation and the potential ecological and economic ramifications of a major spill in Santa Monica Bay, it is crucial to invest time and resources into the planning and readiness for a coordinated, swift, and effective response.  

An offshore terminal presents formidable challenges in cleaning up oil spills in an open ocean environment. A worst-case scenario oil spill is described below to show the possible direction and extent of a major spill. During a spill, response personnel and leaders will refer to the various response plans. The Coast Guard’s Area Contingency Plan is critical but beyond the scope of this chapter (please see chapter “LA Prevention and Response”). Chevron is required to maintain a Facility Response Plan that includes an Emergency Response Action Plan (ERAP) for the Marine Terminal and Submarine Lines. As part of this plan, Chevron has invested in hiring response personnel and response equipment. There are recommendations in this section that aim to improve planning, communications, and readiness to a major spill with regard to updating and accessibility of the ERAP, with a word of caution about containment boom effectiveness off LA County’s coast.

27 (California State Lands Commission, Marine Research Specialists August 2010)
Figure 6. A worst-case scenario from a spill originating from the Chevron Marine Terminal location 1.5 miles offshore El Segundo. Due to the prevailing winds and waves, in this model oil would be pushed east to the beaches, proceeding alongshore either north or south depending on conditions. Image source: (California State Lands Commission, Marine Research Specialists August 2010), Figure 4.1-3.

Figure 5. A spill scenario from one tanker located near the El Segundo Marine Terminal and into the shipping lanes near Santa Monica Bay. Within the time frame of one day in this model, oil could reach the shorelines of Palos Verdes. Source: (California State Lands Commission, Marine Research Specialists August 2010) Figure 4.1-6.
Response Plans

Response plans are vital planning tools that are critical for effective response. They generally indicate the equipment available, storage location, personnel and responsibilities, chain of command, up to date contact information, sensitive site strategies, and more. To achieve a coordinated and rapid response to minimize oil spill impacts, the response plans should generally be up to date, comprehensive, and regularly practiced by every entity that could be involved. It is important to note the Oil Pollution Act of 1990 mandates that all Facility Response Plans be approved by the U.S. Coast Guard. Chevron’s Response Plan for the Marine Terminal is approved by the Coast Guard, and most comments here are based on the State Lands Commission conditions for their lease renewal.28 There are two important documents to note in this section. The first is the El Segundo Marine Terminal Facility Response Plan, which contains general facility information, and the second being the emergency response plan (Emergency Response Action Plan, or ERAP), which includes training and exercises, and plan review, and updating procedures.29

Accessibility of Response Plans

It seems apparent that in order to prepare for a highly coordinated, swift, and effective spill response it is important to make the El Segundo Marine Terminal’s Emergency Response Action Plan (ERAP) available to all entities that may be involved in a large scale response effort. This is crucial for training as well as communication between the entities involved. Lack of transparency may, in some cases, lead to confusion and misunderstandings in the response community. It may be beneficial to make the ERAP available to those entities on the internet.

Unfortunately, the ERAP for the Marine Terminal is not easy to access. It is currently sent from Chevron response personnel to relevant Chevron personnel and state and federal agencies.29 Others that may be mentioned in the plan or on the notification list that wish to review this document may not automatically receive updates, according to the current plan. An interested member of the public must go through the process of a Public Records Act request to acquire it, which may take over 10 days despite the requirement of the law. It would be beneficial for all involved, directly or indirectly, if this were available as a living document, just as the Area Contingency Plans are publicly available online.30

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28 (California State Lands Commission, Marine Research Specialists November 2010)  
29 (Chevron Products Company 3-11-2011)  
30 http://www.dfg.ca.gov/ospr (California Department of Fish and Wildlife 2012)
A good example of the importance of plan accessibility was an unexpected public statement during the State Lands Commission 30-year lease approval hearing on 12/10/2010. During public comment at the hearing, a 26-year veteran of the El Segundo Fire Department and president of the El Segundo Firefighters Association (over 50 members), gave testimony that their unit was unaware of their listing on the ERAP, and that no communication between Chevron and the El Segundo Fire Department had taken place regarding the Marine Terminal prior to the State Lands Commission approval meeting. El Segundo Fire Department’s jurisdiction is 3 miles offshore, an area that includes the Marine Terminal. Trainings with El Segundo Fire for the onshore refinery should occur regularly but according to the fire veteran no training had EVER occurred between Chevron and El Segundo Fire. Below is an excerpt from his public comment that day:

“Today, there is no way [to know] if the marine terminal’s existing fire control plan, even with the proposed mitigation measures, is likely to work. There's no way to know. I liken the fire control plan to British Petroleum's now infamous regional spill plan, the Gulf of Mexico, and its site-specific plan for the ill-fated Deep Horizon rig. We know now that the Gulf spill plan vastly understated the dangers posed by the rig. We learned that BP vastly overstated the company's preparedness to dig or to deal with the rig catastrophe. And it's clear that the federal government rubber stamped a spill plan that was riddled with omissions and glaring errors. The CSLC [California State Lands Commission] must not make the same mistake with the Chevron marine terminal. Even though we have identified the fire control plan’s numerous shortcomings, the proposed mitigation measures still leave many unanswered questions. In the event of an explosion or a fire at the marine terminal, what is expected of the El Segundo Fire Department in its role as incident commander or first responders? What about the roles of mutual aid agencies that’s listed in the report that would respond? Granting a new 30-year lease extension without making Chevron develop a comprehensive, tested, fire control plan first is irresponsible.”

This public comment is a reflection of the plan not being made available to the entities involved, and it is essential to keep the response plan updated, provide increased access to the ERAP, and increase communication between those that would be involved in the ERAP. These recommendations are also similar to the Incident Specific Preparedness Review (ISPR) of the 2010 BP Gulf of Mexico spill. The ISPR is an independent study chartered by the U.S. Coast Guard to evaluate the

spill response and provide lessons learned for future benefit. The ISPR also recommends that coastal regions determine pathways of providing financial support for local elected officials and non-governmental organizations to participate in oil spill response planning. The more involved and educated our public representatives are regarding oil spill prevention and response, the more potential for clearer understanding between agencies, industry, and the public during an emergency situation.\(^32\)

The State Lands Commission 2010 lease renewal initially required that lessons learned from the response and cleanup of the 1997 Platform Irene and 2010 Deepwater Horizon oil spills be incorporated into the response plan. However, lessons learned are not included in the ERAP.\(^33\) For lessons learned, this report recommends the U.S. Coast Guard’s BP Deepwater Horizon’s Oil Spill Incident Specific Preparedness Review (ISPR) and the National Commission on the BP Deepwater Horizon Oil Spill.\(^34\)

After discussions with Chevron, State Lands Commission, and Coast Guard personnel, it is apparent that the lessons learned relating to offshore drilling are irrelevant for Chevron’s El Segundo operations and the ERAP, but lessons learned relating to general planning, coordination, and communications could help improve our prevention and response systems on the West Coast of the U.S. This information could be included in the ERAP, but likely more so in Chevron’s general approach to the response community and the updating and availability of the ERAP. With regard to public availability of the ERAP, Chevron has safety concerns, such as potential terrorists accessing contact information and equipment locations. In this case, perhaps sensitive information could be blacked out in the online version. Or, perhaps create a password for response personnel. The response process would still be available in unforeseen circumstances and would be available if response personnel that are located offsite at the time of the emergency need to access it remotely.

In May 2013, Chevron volunteered to conduct the National Preparedness for Response Exercise Program, or PREP oil spill exercise, at the El Segundo Marine Terminal. The El Segundo Fire Department was involved, and one of the authors of this chapter was invited to observe the oil spill exercise in progress. This was a national level drill, with all the key response personnel involved, including but not

\(^{32}\) (United States Coast Guard January 2011)
\(^{33}\) Facility Response Plan and ERAP sent to Los Angeles Waterkeeper as a result of a Public Records Act request. (Chevron ERAP 2013)
\(^{34}\) (United States Coast Guard January 2011), (National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling January 2011)
limited to the Coast Guard, California Department of Fish and Wildlife Office of Spill Prevention and Response, Chevron response personnel, response contractors (e.g. MSRC, Patriot), National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Fish and Wildlife (and the Los Angeles Waterkeeper of course).\textsuperscript{35} It is absolutely critical that resources are spent on regular and frequent oil spill exercises. These drills and exercises are crucial for response personnel to stay familiar with emergency contacts, resources, and protocols.

Worst Case Discharge: Pipeline Spill

For effective and timely cleanup, an offshore terminal’s design depends on a very large and capable response effort in the event of major spill. Because the terminal is a significant distance away from POLA/LB where most of the response personnel and equipment are located, questions arise about the required response capability: How much and where are the nearest personnel, response vessels and equipment that will be the first responders to a major spill at the terminal? Worst case, medium, and small discharge response plans are described below.

In Chevron’s Emergency Response Action Plan (ERAP)\textsuperscript{36} the calculated Worst Case Discharge of 726,390 gallons (17,295 bbls) of oil in Chevron’s response plan is based on a \textit{complete rupture of a transfer pipeline} during transfer operations between tankers and the Terminal.\textsuperscript{37} The layout of pipelines, moorings, and berths is previously detailed in \textbf{Figure 3}. The Worst Case Discharge and other levels of discharge are calculated in (\textbf{Figure 7}). In this Worst Case Discharge, oil would be flowing out of the pipeline into the area of the offshore terminal until personnel are aware of the spill and able to shut down the pumping units.

\textsuperscript{35} NPREP Exercise, May 13, 2013. Thanks to Coast Guard and Chevron personnel for putting trust in the Los Angeles Waterkeeper observer. We hope it made the oil spill exercise more realistic to incorporate representatives from local environmental NGOs.
\textsuperscript{36} (Chevron Products Company February 2013)
\textsuperscript{37} The discharge planning volumes are calculated following the U.S. Coast Guard method in Appendix C of 33 CFR Part 154, dated July 26, 1993.
The California Department of Fish and Wildlife Office of Spill Prevention and Response has requirements for the response equipment and personnel that the owner/operator (i.e. Chevron) must have ready or on contract with oil spill response organizations (OSROs).\textsuperscript{38} For the planned volumes in (Figure 7) the requirements are as follows:\textsuperscript{39}

A small discharge (Average Most Probable Discharge, or AMPD) is considered to be 2,100 gallons (50 bbls) or less. The required response equipment resources are:

- 1,000 feet of containment boom and a means of deploying it within one hour of discovery of the spill;
- oil recovery devices with an effective daily recovery rate of 2,100 gallons (50 bbls) per day or more which is available at the Facility within two hours of the detection of the spill; and
- oil storage capacity for recovered oily material of two times the daily recovery rate or 4,200 gallons (100 bbls) per day.

A medium discharge (Maximum Most Probable Discharge, or MMPD) is considered to be the lesser of 36,000 gallons (857 bbls) or 10% of the Worst Case Discharge, or WCD (17295 bbls x 0.1 = 1730 bbls).\textsuperscript{40} Therefore the medium discharge planning volume is 857 bbls. The required response equipment resources are:

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{DischargePlanningVolumeCalculations.png}
\caption{Discharge planning volume calculations for Average Most Probable, Maximum Most Probable, and Worst Case Discharges. Taken from (Chevron Products Company 3-1-11).}
\end{figure}

\textsuperscript{38} Response standards established by Cal OSPR (817.02(d) (3) (B))
\textsuperscript{39} (Chevron Products Company February 2013)
\textsuperscript{40} Chevron’s Emergency Response Action Plan (ERAP) gives two figures for the Maximum Most Probable Discharge (MMPD), 36,000 gallons and 143 bbls (which is 6,006 gal). This report -footnote continues on next page-
● sufficient quantity of containment boom and a means of deploying to arrive at the Facility within six hours of the detection of the spill;
● oil recovery devices with an effective daily recovery rate of 50% of the medium discharge planning volume, $857 \text{ bbls} \times 0.5 = 428 \text{ bbls per day}$ or more which is available at the Facility within six hours of the detection of the spill; and
● oil storage capacity for recovered oily material of two times the daily recovery rate or 428 bbls per day.

The Worst Case Discharge (WCD) planning volume is 726,390 gallons (17,295 bbls). The resources required to respond to this WCD will be obtained from MSRC and other contracted resources. The containment boom and oil recovery devices needed to meet the above requirements would be drawn from Chevron, MSRC, and other contracted resources. Chevron certifies that sufficient numbers of trained personnel, boats, aerial spotting aircraft, containment boom, sorbent materials, boom anchoring materials, and supplies are available under contract or through mutual agreement to the contracted spill response organizations to sustain response operations to completion. All the required spill response equipment and resources outlined above are less than those identified and under contract by Chevron. Any additional personnel or equipment may be obtained through the contracted response organizations. Chevron and contracted personnel participate in training and drills to exercise oil spill response.

The tables below describe the response resources owned by Chevron and are taken from Chevron’s Marine Terminal Response Plan. It appears Chevron is ready for a small to medium discharge with Chevron resources at the Marine Terminal and at King Harbor. Today there are four response vessels in King Harbor owned by Chevron and two more vessels owned by Foss that could help with boom or other tasks. A response vessel is a boat or ship that is specifically designed to be part of a response system, from laying out boom and launching skimmers that suck up oil to barges that store the collected oil. The newest boat ‘Duke’ that is not listed in the vessels list below also has 1,000 feet of boom onboard and is capable of more rapid response to the Marine Terminal (approximately 20 minutes in boat travel) compared to the older Chevron boats in King Harbor (i.e. Duke is capable of speeds in excess of 30 knots, whereas Boomer is only capable of 15-20 knots).

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41 Assumes that the ERAP intended 36,000 gal (857 bbls) for the MMPD. (Chevron Products Company February 2013)
41 Thanks to Chevron response personnel, one of the authors was invited on a tour of Chevron owned response vessel ‘Duke’ 3-7-13 to observe response capability at the El Segundo Marine Terminal.
The tables below are from Chevron’s response plan (Table E2.6), updated February 2013. The equipment and supplies listed below are provided by Chevron as preparation for a small discharge, a.k.a. an Average Most Probable Discharge (AMPD) of 2,100 gallons, or 1% of the Worst Case Discharge, whichever is less.

### EL SEGUNDO REFINERY VESSELS

<table>
<thead>
<tr>
<th>Operational Status</th>
<th>Quantity</th>
<th>Type</th>
<th>Year Purchased</th>
<th>Storage Location</th>
<th>Time to Access and Respond</th>
<th>Inspection / Maintenance Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational</td>
<td>1</td>
<td>55-foot Rozema (Boomer) 1,200' boom</td>
<td>2003</td>
<td>King Harbor</td>
<td>30 minutes to 1 hour</td>
<td>Weekly</td>
</tr>
<tr>
<td>Operational</td>
<td>1</td>
<td>35-foot Munson Boat (VANGUARD)</td>
<td>1990</td>
<td>King Harbor</td>
<td>30 minutes to 1 hour</td>
<td>Weekly</td>
</tr>
<tr>
<td>Operational</td>
<td>1</td>
<td>Utility 1</td>
<td>1988</td>
<td>King Harbor</td>
<td>30 minutes to 1 hour</td>
<td>Weekly</td>
</tr>
</tbody>
</table>

**BOATS** (Note: Vessels are operated weekly by the On Water Recovery Group Leader)

### EL SEGUNDO REFINERY COMMUNICATION EQUIPMENT

<table>
<thead>
<tr>
<th>Operational Status</th>
<th>Quantity</th>
<th>Type</th>
<th>Year Purchased</th>
<th>Storage Location</th>
<th>Time to Access and Respond</th>
<th>Inspection / Maintenance Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational</td>
<td>15</td>
<td>Beach Hand Radios (VQI-79/KHS42)</td>
<td>1995</td>
<td>Fire Department</td>
<td>30 minutes to 1 hour</td>
<td>Monthly</td>
</tr>
<tr>
<td>Operational</td>
<td>3</td>
<td>VHF Radios</td>
<td>1992</td>
<td>Oil Spill Boats, King Harbor</td>
<td>30 minutes to 1 hour</td>
<td>Monthly</td>
</tr>
</tbody>
</table>
### EL SEGUNDO REFINERY

#### BOOM

<table>
<thead>
<tr>
<th>Operational Status</th>
<th>Number</th>
<th>Type</th>
<th>Year</th>
<th>Size / Length (ft)</th>
<th>Containment Area</th>
<th>Storage Location</th>
<th>Time to Access and Respond</th>
<th>Inspection / Maintenance Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational</td>
<td>1</td>
<td>18&quot; Contractor Boom (6&quot; diameter &amp; 12&quot; skirt)</td>
<td>400 ft</td>
<td>Ballona Creek Santa Monica Bay</td>
<td>Ballona Creek</td>
<td>1 to 2 hours</td>
<td>Monthly</td>
<td></td>
</tr>
<tr>
<td>Operational</td>
<td>2</td>
<td>20&quot; Contractor Boom (8&quot; diameter &amp; 12&quot; skirt)</td>
<td>900 ft</td>
<td>Marina Del Rey Harbor</td>
<td>Marina Del Rey</td>
<td>1 to 2 hours</td>
<td>Monthly</td>
<td></td>
</tr>
<tr>
<td>Operational</td>
<td>3</td>
<td>18&quot; Contractor Boom (6&quot; diameter &amp; 12&quot; skirt)</td>
<td>450 ft</td>
<td>King Harbor</td>
<td>King Harbor</td>
<td>1 to 2 hours</td>
<td>Monthly</td>
<td></td>
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<tr>
<td>Operational</td>
<td>4</td>
<td>Kepner Plastics Sorbent Boom</td>
<td>2,000</td>
<td>Santa Monica Bay</td>
<td>Oil Spill Warehouse</td>
<td>1 to 2 hours</td>
<td>Monthly</td>
<td></td>
</tr>
<tr>
<td>Operational</td>
<td>5</td>
<td>Snare Boom OS-15R 300/S (50 ft. ropes)</td>
<td>1,000 ft in 20 cartons</td>
<td>Santa Monica Bay</td>
<td>Oil Spill Warehouse</td>
<td>1 to 2 hours</td>
<td>Monthly</td>
<td></td>
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</table>

#### EL SEGUNDO REFINERY

#### SKIMMERS / PUMPS / BLADDERS

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<thead>
<tr>
<th>Operational Status</th>
<th>Number</th>
<th>Type / Model</th>
<th>Year</th>
<th>Capacity (gal/min)</th>
<th>Hourly Effective Recovery Rate</th>
<th>Storage Location</th>
<th>Time to Access and Respond</th>
<th>Inspection / Maintenance Frequency</th>
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</thead>
<tbody>
<tr>
<td>Operational</td>
<td>1</td>
<td>Gas Powered Diaphragm Pumps</td>
<td>1992</td>
<td>42</td>
<td>80 bbls/hour</td>
<td>King Harbor</td>
<td>30 min. to 1 hour</td>
<td>Monthly</td>
</tr>
<tr>
<td>Operational</td>
<td>2</td>
<td>Diesel Spale Pump/Mini Max Brush Skimmer</td>
<td>2003</td>
<td>42</td>
<td>123.3 bbls/hour</td>
<td>Oil Spill Warehouse</td>
<td>30 min. to 1 hour</td>
<td>Monthly</td>
</tr>
<tr>
<td>Operational</td>
<td>3</td>
<td>Kepner Plastics Bladder</td>
<td>2011</td>
<td>33.3 Bbls</td>
<td>N/A</td>
<td>King Harbor</td>
<td>30 min. to 1 hour</td>
<td>Monthly</td>
</tr>
</tbody>
</table>

#### EL SEGUNDO REFINERY

#### SORBENT

<table>
<thead>
<tr>
<th>Operational Status</th>
<th>Type</th>
<th>Year Purchased</th>
<th>Size</th>
<th>Amount</th>
<th>Absorption Capacity (gal)</th>
<th>Storage Location</th>
<th>Time to Access and Respond</th>
<th>Inspection / Maintenance Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational</td>
<td>3M 156 Oil Sorbent Pads</td>
<td>1992</td>
<td>17&quot; x 19&quot;</td>
<td>70 each, 100 sheet bags</td>
<td>Per manufacturers specifications</td>
<td>Oil Spill Warehouse</td>
<td>30 minutes to 1 hour</td>
<td>Monthly</td>
</tr>
</tbody>
</table>

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Chapter 4: Terminals, Tankers, and Boom
In the case of an emergency, it is important to keep the plan updated to clarify details for all involved in the response effort. The response plan should be updated to reflect the addition of the rapid response vessel ‘Duke’. The Plan also describes 2,000 feet of boom stored at an ‘Oil Spill Warehouse’ along with another 1,000 feet of snare boom in 20 cartons. There are other pieces of response equipment located at the Oil Spill Warehouse, such as an oil skimmer and 700 oil sorbent pads; however the location of the Warehouse is not clearly given in the response plan. It would seem useful to all involved in a response to clearly describe the location of the Oil Spill Warehouse.

Chevron has stated in the response plan that in the case of a large spill or Worst Case Discharge additional response equipment and personnel will be obtained from Marine Spill Response Corporation (MSRC) and other contracted resources. MSRC and other contracted resources have a large amount of vessels and equipment that are located in the Ports of Los Angeles and Long Beach. Because of the location of the El Segundo Marine Terminal, a large effort from the response contractors would inevitably require more time compared to a spill from an oil terminal located in the ports. However, this report also acknowledges Chevron’s investment of response equipment on standby at King Harbor that is sufficient for small to medium sized spills that can be used in conditions where boom is usable (see boom section below).

Vessel Collisions and Groundings

A collision of a large tanker at or near the marine terminal would potentially spill more oil volume than a pipeline spill, but is not included in Chevron’s Marine Terminal Emergency Response Action Plan (ERAP). Including collisions and groundings in the ERAP was initially required as part of the State Lands Commission lease renewal in 2010. A major spill from a collision or grounding could potentially create an oil slick that would stretch along the entire coast of California (in the Exxon Valdez spill, oil reached shorelines 600 miles southwest of Bligh Reef).42

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42 (Alaska Department of Environmental Conservation June 1993)
Chevron committed to updating the Marine Terminal’s Facility Response Plan (which includes the ERAP) as part of the 2010 30-year lease renewal for California State Lands Commission (SLC). Currently the response equipment that Chevron is required to maintain or contract is based on the Worst Case Discharge from a pipeline leak (726,390 gal., detailed below). Chevron’s investment in response resources could significantly increase if the Worst Case Discharge for the El Segundo Marine Terminal was based on a catastrophic tanker collision or grounding. It appears that the California State Lands Commission was mistaken in the response requirements when drafting the lease requirements in 2010. Chevron is not required by U.S. or California regulations to include vessel collisions or

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44 The Coast Guard is taking the risk of tanker collision seriously. Another major oil spill threat outside the scope of this report is the scenario of oil tankers losing propulsion and control at sea while switching to low-sulfur fuel. The U.S. Coast Guard’s 2011 large scale oil spill drill (National Preparedness for Response Exercise Program, or NPREP) was based on this exact scenario of two vessels colliding in the fog near the Northern Channel Islands of Santa Barbara. Recent California regulations that aim to decrease air pollution now require all ships and harbor craft to use low-sulfur fuel within 24 nautical miles from the California coast (United States Coast Guard Sector Los Angeles/Long Beach October 2011) (California Air Resources Board 2012)
groundings in their response plans for the Marine Terminal. The State of California requires each individual tanker vessel to be prepared for or contract resources for such a large-scale event if it calls at any California facility, such as the El Segundo Marine Terminal. Prevention measures and procedures for collisions, groundings, and similar incidents are required in each tanker’s Vessel Response Plan (VRP).\footnote{CAL CODE, tit.14, §815.02-8.18.03 (2011)} Chevron personnel have verified that tankers calling at the marine terminal include response plan procedures and contracted resources for collisions and groundings, including salvage personnel and equipment.\footnote{(Personnel 2013)}

Because Chevron is not required to include tanker vessel collisions or groundings in the ERAP, it significantly changes the estimated Worst Case Discharge, which is currently calculated at 726,390 gallons (17,295 bbl.).\footnote{(Chevron Products Company February 2013)} The storage capacity of the tankers that call on the Marine Terminal can reach up to 42 million gallons of oil.\footnote{(California State Lands Commission, Marine Research Specialists August 2010)} When Exxon Valdez grounded, it discharged over 10 million gallons of oil into the marine environment. \textit{It is important to note that the amount and type of required response equipment is based on the planned volume of the Worst Case Discharge, and increasing the WCD’s volume may increase the costs to purchase, maintain, or contract response equipment and personnel.}

It is clear that the Marine Terminal’s Worst Case Discharge planned spill volume of 726,390 gallons is significantly less than the catastrophic possibility of a tanker collision or grounding. Chevron is required to maintain contracted Oil Spill Response Organizations (OSROs) that go to work in the event of a spill. Equipment and personnel are located in the Port of Los Angeles/Long Beach, King Harbor, and Marina del Rey.\footnote{(Personnel 2013)} It is hoped that, although not required by law, the planning for this unfortunate occasion is still included in Chevron’s calculations when contracting response personnel.

A large oil spill from a tanker that is operating in Santa Monica Bay would be catastrophic to Los Angeles’ coastal ecology and economy. If a tanker is in the Santa Monica Bay solely to transfer oil at the El Segundo Marine Terminal, then it would be in Chevron’s interest to act in the public trust and invest in enough oil spill response equipment and personnel to effectively respond to a tanker accident in the Bay.

Containment Boom Effectiveness

Containment boom is often the first response to an oil spill and a common type of oil spill equipment. It can be placed to exclude oil from a sensitive stretch of shoreline, such as coastal wetlands, lagoons, rocky intertidal, and beach habitats. It can also be placed around a vessel that is leaking oil to prevent oil from spreading. Boom may also be towed behind boats to collect oil and take it away from sensitive ecological habitats or important shorelines. Boom often facilitates the removal of oil, concentrating oil spills where it can be more easily collected with skimmers or burned.49

Response professionals understand that containment boom is not always effective or even usable in some open ocean conditions. Boom is certainly not effective in large storms, and the safety of the crew can be jeopardized during the deployment operation. All boom types are greatly affected by the conditions on the water, and the higher the waves generally the less effective the booms become.50 The forces of wind, waves, and current may significantly impair the boom’s ability to contain spilled oil. Wind and waves can force oil over the top of the boom’s freeboard, and currents may wash oil beneath a boom’s skirt. Most booms perform well in calm seas with smooth, shallow, long waves. Rough and choppy water is likely to contribute to boom failure. Generally, booms will not operate properly when waves are higher than one meter or currents are moving faster than one knot.50

49 (National Oceanic and Atmospheric Administration 2010)
50 (Environmental Protection Agency 2011)
If boom effectiveness begins to decline as wave swell increases over one meter in height, then it is useful to estimate the percentage of time in Santa Monica Bay when boom may not be effective. Using the historical data summary products of Scripps’ Coastal Data Information Program\(^{51}\), the mean wave height and period can be calculated for buoys located in Santa Monica Bay. Buoy 028 located in the center of Santa Monica Bay is representative of average ocean conditions in Santa Monica Bay, or conditions that response crews would face using boom to try and tow the spilled oil away from the beaches to subsequently burn or use dispersants, depending on conditions and oil type.

Using daily averages of wave height from buoy 028 from the years 2000 to 2013, the average wave height is 1.02 meters, with daily averages rarely dropping below 0.6 meters or over 1.4 meters wave height. Maximum wave height values at this buoy are on the order of approximately 4 meters\(^{51}\). Using the daily averages,....

\(^{51}\) (Scripps Institute of Oceanography Integrative Oceanography Division 2013). Note: there are larger swell conditions associated with longer wave period and minimal wind velocity where some ocean boom equipment would still be able to contain oil. Although the large swell, long period, low wind scenario is possible in Santa Monica Bay, it is rarely observed.
41% of the days from 2000 to 2013 experienced daily average wave heights over one meter. 1% of the days experienced wave height averages of exactly one meter, leaving 58% of the days experiencing average wave heights of less than one meter. Based on this analysis it can be assumed that boom will most likely be unable to effectively contain oil approximately 41% of the time based on daily average ocean conditions surrounding the Marine Terminal.

If boom generally becomes ineffective in surface current speeds in excess of one knot, then it is useful to determine what percentage of time surface currents in Santa Monica Bay exceed speeds of one knot. An analysis of surface currents was completed using data from NOAA’s National Oceanographic Data Center. 25 hour averages over a one year period from 2006 to 2007 were used based on a point with a 10km radius (N33.864, W118.4916) which encompasses the Marine Terminal. The average surface current speed was 0.12 knots. During that time period no 25-hour average exceeded one knot. If boom is rendered ineffective in surface currents that exceed one knot, based on this analysis it can be assumed that average surface currents will not impair boom function at the Marine Terminal (with the exception of stormy conditions of course).

Chevron has their own response resources in combination with contracted resources to respond to a major spill. Discussed above in ‘Prevention,’ pre-booming oil transfers at the open ocean location of the Marine Terminal is infeasible and the

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52 (Otero 2007)
inability to pre-boom is an environmental disadvantage of its design. In addition, approximately 41% of the time boom is not completely effective at containing spilled oil. Boom is what necessitates the collection of the oil using skimmers, which suck up the oil for storage. The infeasibility of booming at offshore terminals and the difficulty of oil containment and recovery in the open ocean are two key disadvantages of open ocean marine terminals compared to oil terminals located inside modern port facilities.

Aerial photo of the Ports of Los Angeles (foreground) and Long Beach (background). Source: Gwen Noda

**Alternatives to an Offshore Terminal**

The offshore terminal design has environmental disadvantages compared to a modern day port, which is one reason why the El Segundo Marine Terminal is the last of its kind in California. A natural step for any company looking to the future would be the relocation of the offshore terminal’s operations to a protected port or harbor. All other offshore terminals in California have completed some version of this relocation. In addition to the improved oil spill prevention and response aspects of modern ports, other environmental protection measures are more easily achieved compared to an offshore terminal.
Most importantly, a significant oil spill in the ports can be more easily prevented, contained, recovered, and cleaned up than an offshore terminal. All oil transfers in the Port of Los Angeles and Long Beach (POLA/LB), are required to deploy boom before any oil transfer (pre-booming) as a precaution to any oil spills. There is an overall greater speed and quantity of response to tankers in the ports compared to the Marine Terminal. Besides fire boats located in POLA/LB, there are Oil Spill Response Organizations (OSROs) located in POLA/LB, including Marine Spill Response Corporation (MSRC),^53^ Patriot Environmental Services; Ancon Marine; National Response Corporation; SoCal Ship Services; Clean Harbors; and Double Barrel.^54^

In 1982 the Port of Long Beach built Berth T121, a deep draft terminal that can accommodate supertankers, or Very Large Crude Carriers (VLCCs, 200,000 to 320,000 dead weight tons, or dwt). Instead of that oil being transferred at sea, the VLCCs are able to dock directly in port, potentially decreasing the risk of spills.^55^ Transferring oil directly from docked VLCCs to oil terminals is an environmentally preferred option, because it decreases the amount of lightering, or oil transfers at sea, to smaller tankers. This reduction of offshore transfers reduces the risk of an oil spill in open ocean conditions in Southern California. Tesoro is now the operator of Berth T121 (formerly operated by BP), and once the oil is unloaded from the pre-boomed and securely docked ship, pipelines carry crude oil from Berth T121 to the Tesoro refinery in Carson, as well as the ConocoPhillips and Valero refineries in Wilmington. Berth 121 is also capable of cold ironing, or shore side electricity provided to the ship to reduce emissions. It also has four shore side booster pumps to reduce the amount of onboard pumping.^56^

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^53^ MSRC has the largest standby oil spill response program in the U.S., including open water, shoreline, and mid-continent river operations. (Marine Spill Response Organization 2013)

^54^ (California Department of Fish and Wildlife Office of Spill Prevention and Response, 2013)

^55^ (Science Applications International Corporation (SAIC); US Army Corps of Engineers, Los Angeles District; Los Angeles Harbor Department November 2008)

^56^ A note on cold ironing – Only two tankers regularly use the cold ironing facility. Two Alaska Tanker Company (ATC) vessels have the capability to cold iron at Berth T121. Most tankers will call at Long Beach once or twice in their lifetimes due to the fact that tankers are usually spot chartered and not on a certain trade run. The ATC tankers are U.S. Flagged and were built specifically for the Alaska/California trade route. These tankers are about 190,000 dwt. (Berth 121 info from Personal Communication, 5/5/14, State Lands Commission Marine Facilities Division Chief, Captain Laura Kovary.)
Berth T121 in the Port of Long Beach is a deep draft terminal that can accommodate supertankers, aka Very Large Crude Carriers (VLCCs, up to 320,000 dwt). This decreases the number of open ocean transfers, or lightering operations that are necessary in southern California offshore waters.

Many new developments are planned for the Port of Los Angeles/Long beach, one example was a project proposed for Pier 400 at Port of Los Angeles. The Pacific L.A. Marine Terminal LLC Pier 400 project was initiated in 2003 to provide a deep water port. The project completed the CEQA (California Environmental Quality Act) process, but unfortunately in November 2012 Plains All American Pipeline, L.P. decided not to continue with the project. Plains cited project delays, the economic downturn, regulatory and permitting matters, a challenging refining environment in California, and an industry shift in the outlook for availability of domestic crude oil.\(^{57}\) The Pier 400 project was planned to offer features to reduce air emissions, including alternative marine power (cold ironing), shore-side pumping that reduces the need for vessels to generate power to operate vessel cargo pumps, fire-fighting system and vapor recovery. The proposed project would have included a stormwater collection system and allow the endangered least tern nesting

grounds to persist. Unfortunately, most of these environmental protection measures cannot be achieved at an offshore terminal like the El Segundo Marine Terminal. It is hoped that Plains or another company is able to provide leadership and renew much needed progress in the Port of Los Angeles on an important project that could further reduce environmental impacts associated with oil transfer activities.

Chevron’s undersea pipelines were installed in 1962 and 1970, and Chevron understands that repair and maintenance will be needed in the next 30 years of their State Lands Commission lease. Pipeline replacement is needed, which includes construction of new pipelines, transport to the offshore site via barge, removal of existing pipeline segments, and installation of new pipelines. Instead of replacing old pipeline at the terminal and the associated environmental impact, one option is to relocate the Marine Terminal to a new facility in POLA/LB.

Regrettably the relocation of a major offshore terminal has complications and disadvantages. The most important concern is constructing a new pipeline that would transport varieties of crude oil through coastal cities to the El Segundo refinery, potentially carrying hazardous substances through business and residential areas. Transporting such large volumes of oil through business and residential districts could have a detrimental impact on those communities and pose serious environmental justice concerns. Although oil pipelines are already part of the Los Angeles landscape, it is highly likely that new pipelines would need to be constructed to connect the El Segundo Refinery with an oil terminal in the port complex. However, affected communities will have an increased chance of a spill with more pipelines built. As of yet, there are no proposed solutions or alternatives to this other than moving the refinery to POLA/LB, if possible. Chevron’s El Segundo refinery is one of the largest on the West Coast of the United States; it measures approximately 1 x 1.5 miles wide. There simply isn’t space available for a similar operation at POLA/LB.

One question that arises is ‘how can the current infrastructure be improved or expanded in the most environmentally responsible way to allow oil to be transferred from POLA/LB to the El Segundo Refinery?’ The State Fire Marshall is responsible for regulating pipelines on land. If it is decided to decommission the El Segundo Marine Terminal, perhaps there is a future and beneficial collaboration between various stakeholders, such as California State Department of Fish and Wildlife Office of Spill Prevention and Response (OSPR), the Division of Oil, Gas, and

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58 (California State Lands Commission, Marine Research Specialists November 2010)
Geothermal Resources (DOGGR), State Lands Commission, State Fire Marshall, and other relevant agencies to pursue a new El Segundo-Port pipeline.

For now, it appears that the key to environmental protection regarding the Marine Terminal is to prevent spills in the first place. In the event of a major spill, it is imperative that response personnel execute a coordinated, swift, and capable response system that would set an example for any response team in the nation. Chevron, U.S. Coast Guard, California agencies, coastal cities, local communities, environmentalists, and native marine species all have one thing in common: nobody wants a major spill at the El Segundo Marine Terminal. Our coastal economy, local communities and natural habitats depend on a commitment to excellence by all involved in oil spill prevention and response at the Marine Terminal.

Blue whale surfaces in Santa Monica Bay, with the Palos Verdes Peninsula in the background. Source: Tom Boyd
RECOMMENDATIONS FOR ENVIRONMENTAL PROTECTION

Since the 1991 Omi Dynachem spill there has not been a significant spill at Chevron’s El Segundo Marine Terminal. There is much Chevron does to prevent spills that are not included in the scope of this report for sake of brevity. These recommendations are intended not to publicly shame or place blame on Chevron. Chevron is the operator of the last commercial marine terminal in California, and it is the inherent design of the offshore terminal in general that is the primary source of the environmental concerns in this chapter. It is hoped that this report can serve as an educational tool and a written contribution to the existing body of work that aims to improve oil spill prevention and response in and around Los Angeles County.

Prevention

1. When compared with modern day port oil transfer operations, offshore terminals have significant environmental disadvantages with regard to oil spill prevention. The only way to completely avoid a worst-case scenario spill off the coast of El Segundo is to begin a business plan to transfer the Marine Terminal operations inside a protected port like the POLA/LB.
   a. Perhaps in the future there is a beneficial collaboration to thoroughly engage stakeholders such as California State Department of Fish and Wildlife Office of Spill Prevention and Response (OSPR), the Division of Oil, Gas, and Geothermal Resources (DOGGR), State Lands Commission, State Fire Marshall, and other relevant agencies to pursue a new El Segundo-Port pipeline with the utmost environmental responsibility.
   b. The Port of Long Beach and Tesoro deserve credit for the deep draft terminal at Berth T121. It is unfortunate that progress on the Pier 400 project in the Port of Los Angeles was halted by Plains All American Pipeline L.P. It is hoped that Plains or another oil company is able to follow the lead of the Port of Long Beach’s Berth 121 and provide industry leadership and renew much needed progress on an important project that could further reduce environmental impacts and risk associated with oil transfer activities.

2. If relocation of the Marine Terminal is not an option, then prevention of a spill at the terminal is critical. Chevron has avoided a regionally catastrophic spill to date. Preventative measures include maintaining the system at the highest standards, repairing and replacing equipment ahead of schedule, minimizing human error, and avoiding complacency. Chevron is already utilizing some preventative measures that are available to the Marine Terminal, such as the Vessel Traffic Service and tankers with double hulls.
Response

1. Because of the difficulty of containing and collecting oil in the average conditions of Santa Monica Bay, Chevron could invest more into planning and communications for a more coordinated, swift, and effective response to a major spill.

   a. Begin with making the Emergency Response Action Plan more easily accessible. It would be beneficial for response if this were available as a living document, just as the Area Contingency Plans are publicly available online.\(^59\) If security is an issue, perhaps there is information that could be blacked out for the public, but available to response personnel.

      i. Continue and expand community outreach plans to ensure all entities are aware of their role in response: involving Fire Departments, Lifeguards, Los Angeles County, coastal cities and municipalities, non-profit organizations, and volunteers.

      ii. Continue to invest in and conduct critically important drills, such as the National Preparedness for Response Exercise Program (PREP). These drills are crucial for response personnel to stay familiar with emergency contacts, resources, and protocols.

   b. Although not required to do so, Chevron should invest in response resources to effectively respond to tanker collisions and grounding for tankers operating at or near the El Segundo Marine Terminal.

   c. Offer preparedness for response workshops and trainings to interested organizations and individuals.

2. Continue to update the Emergency Response Action Plan (ERAP) for the Marine Terminal.

   a. Chevron has invested in response and could better communicate the response resources available in the ERAP.

\(^{59}\) http://www.dfg.ca.gov/ospr/los_angeles_plan.aspx
i. Increased clarity would benefit response. For example, the ERAP describes response equipment located at an Oil Spill Warehouse; however the location of the Warehouse is not clearly given.
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CHAPTER ONE: POLICY AND REGULATIONS

In response to environmental catastrophes, such as Exxon Valdez of 1989, the political response has been to enact new statutes and regulations designed to prevent similar catastrophes from occurring. With the implementation of OPA, the federal government hoped to fix this problem. However, the Deepwater Horizon spill of April 2010 was strong evidence that numerous problems still exist. The response to this incident exposed a lack of real oversight of BP’s contingency plan or clarity in who was in charge of the immediate cleanup. The government hopes to have solved this problem at least on the outer continental shelf by restructuring the now dissolved MMS into the three distinct organizations, BOEM, BSEE and ONRR. Whether this restructuring will work and oversight will again be in place for oil wells on the outer continental land shelf is something that will not be revealed until the next incident occurs. Until then, the different levels of government will require members of the industry to establish thorough and comprehensive contingency plans, and if an incident does occur, it is hoped all players can work together using the principles of the National Incident Management System (NIMS) to conduct a quick, efficient and thorough cleanup of any oil spill.

As with the disbanding of the Mineral Management Service (MMS) described above, California’s equivalent, the responsibilities of the Mineral Resources Management Division (MRMD) of the State Lands Commission (SLC) could similarly be divided up into distinct agencies. From an environmentalist’s perspective, the problem at the federal level of one agency being monetarily compensated for granting oil and gas leases could also occur at the state level here in California. The MRMD could function to manage the leases in a similar way to the BOEM, and arrange the fee payments and processing through another state agency, similar to the responsibilities of the ONRR. If California follows the federal example, then a third office would be responsible for the safety and enforcement of the leases, similar to the BSEE. This could reduce the incentive to allow oil and gas drilling in risky situations where a spill is likely to occur. It is important to note that this recommendation is not based on past evidence of MMS-type corruption in the SLC, but more of a precautionary principle based on the current configuration of the SLC. Ironically, a 2011 California audit showed just the opposite trend, where the SLC lost millions in revenue for California’s General Fund due to mismanagement of oil and gas leases.
Many state and federal statutes and regulations have been created and maintained toward the improved prevention and response of oil spills. It is paramount that we continue to spend time and resources creating and improving policies and regulations that create well-organized and effective systems to protect our environments and coastal economies. It is clear from the Deepwater Horizon spill and former Minerals Management Service that some of that vigilance was lost, and it begs the need for increased effort to implement the lessons learned where it is deemed relevant and an improvement to the protection of our marine resources.

CHAPTER TWO: CHEMICAL DISPERSANTS

These recommendations, some taken as lessons learned from the 2010 BP spill offer precautionary advice regarding the pre-approval, selection, and application of dispersants in the event of a large oil spill off the coast of Los Angeles County.

1. In order to prevent the harmful use of or selection of toxic dispersants at the local level, the EPA must change how a dispersant gains listing on the National Contingency Plan Product Schedule.

   a. Due to the potential environmental and human health impacts of dispersant use, we need full public disclosure of what is known about dispersants, including chemical ingredients and concentrations in each dispersant formula.

      i. Dispersant manufacturers should not be permitted to claim that the specific chemical components and concentrations in their products are Confidential Business Information (CBI), and withhold that information from the public.

   b. We need to establish safety criteria for dispersants before they are listed on the NCP Product Schedule.

   c. We need more rigorous toxicity testing requirements to be listed on the NCP Product Schedule. It is not sufficient to allow a dispersant to be listed simply by conducting a test for acute effects alone without setting limits for toxicity.

      i. Dispersant efficacy and toxicity data should be confirmed with independent testing that directly compares products.
ii. Dispersant manufacturers should be required to disclose efficacy and toxicity data on their products.

d. Per the CBD, Surfrider, Pacific Environment lawsuit above, the EPA and Coast Guard need to ensure the listing and use of dispersants on the NCP Product Schedule comply with Endangered Species Act consultation requirements.

2. In order to prevent the harmful use of or selection of toxic dispersants at the local level, Regional Response Team IX must change the Federal Region IX Regional Contingency Plan immediately.

   a. The Region IX Contingency Plan and Appendix VII “California Dispersant Plan” need to include and pre-approve other dispersants that are effective and less toxic than Corexit 9500A and 9527A. Many believe Corexit 9500A and 9527A were the wrong choices of dispersant in the BP spill.

   b. We need a multi-faceted approach to deciding which dispersants to use for a spill. The emergency selection process should incorporate more factors such as species and habitats present, ecosystem effects, and human community impacts in addition to factors already considered, such as type of oil released, water temperature, depth of subsea application, and prevailing winds and currents.

3. In order to prevent the harmful use of or selection of toxic dispersants at the local level, the LA/LB Area Committee must change the LA/LB Area Contingency Plan immediately, limiting toxic dispersants for use only with specific scenarios, such as the protection of endangered species and/or critical habitats.

4. We need a deeper and more comprehensive scientific understanding of the human and ecological hazards from using large quantities of dispersant products on and below the ocean’s surface.

   a. Increased funding for comprehensive independent studies of the human and environmental hazards of dispersant use.
CHAPTER THREE: LOS ANGELES COMMUNITY PREVENTION AND RESPONSE

Prevention

- Concerned citizens should frequent the most important meeting in the Los Angeles area for oil spill prevention: the Los Angeles/Long Beach Harbor Safety Committee. There are also other meetings and conferences where oil spill prevention is highlighted: the Clean Pacific Conference, and the California State Lands Commission’s Prevention First Conference.¹

- The Coast Guard should continue to implement the lessons learned from the Cosco Busan fuel spill in San Francisco Bay to the ports of Los Angeles and Long Beach (POLA/POLB) and the Chevron El Segundo Marine Terminal, especially with regards to improved communication between ships and Vessel Traffic Service.
  
  o The Coast Guard should implement similar improvements to pilots’ medical oversight in POLA/POLB as was completed in the San Francisco Bay.

Response

- Concerned citizens should frequent the most important meeting in the Los Angeles area for oil spill response: the Los Angeles/Long Beach Area Committee meeting.² The Prevention First and Clean Pacific Conferences mentioned above also highlight oil spill response.

- Deep rock habitats in Santa Monica Bay, such as Short Bank, should be included in the LA/LB ACP for consideration when considering the use of chemical dispersants that may impact deep ocean habitats.

- The LA/LB Area Contingency Plan should be amended to include the Palos Verdes Peninsula within the listing of sensitive sites protected during an oil spill.


² Link to ACP information: [http://www.dfg.ca.gov/ospr/los_angeles_plan.aspx](http://www.dfg.ca.gov/ospr/los_angeles_plan.aspx). For the Coast Guard the following address can be copied into a web browser: [https://homeport.uscg.mil/lalb](https://homeport.uscg.mil/lalb)
• The coastal cities should be familiar with the ACP and the LA County Plan, and how they fit into the response framework.

• Local environmental scientists, professionals, and biologists should be familiar with the ACP and NOAA’s Emergency Response Management Application (ERMA) and continually update and verify habitat and species information is complete and correct. This will help ensure the sensitive sites list is always accurate and up to date, towards improved protections of local habitats.

• The volunteer plan in the LA/LB Area Contingency Plan should be brought up to date with current organizations, contacts, and opportunities. An improved volunteer plan will help avoid hazardous situations and chaos in the event of a spill. Updating the volunteer plan is also a Coast Guard recommendation from the Cosco Busan spill of 2007.

  o Integrate trained, experienced organizations into the LA/LB Area Contingency Plan and response drills. Local non-profit organizations can assist with volunteer coordination and be an outlet for volunteer interest.

    ▪ In addition to the Oiled Wildlife Care Network, community organizations can prepare volunteers for an oil spill and provide training for non-oiled wildlife volunteer opportunities, such as pre-cleaning beaches, beach monitoring, and runners for the incident command post.

• Community organizations should be empowered and encouraged to educate stakeholders and the Los Angeles County public about the local threat of oil spills, potential impacts, and areas where more advocacy is needed, such as in communicating the potential dangers associated with the wrong selection and/or misuse of chemical dispersants.
CHAPTER FOUR: TERMINALS, TANKERS, AND BOOM

Since the 1991 Omi Dynachem spill there has not been a significant spill at Chevron’s El Segundo Marine Terminal. There is much Chevron does to prevent spills that are not included in the scope of this report for sake of brevity. These recommendations are intended not to publicly shame or place blame on Chevron. Chevron is the operator of the last commercial marine terminal in California, and it is the inherent design of the offshore terminal in general that is the primary source of the environmental concerns in this chapter. It is hoped that this report can serve as an educational tool and a written contribution to the existing body of work that aims to improve oil spill prevention and response in and around Los Angeles County.

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   a. Perhaps in the future there is a beneficial collaboration to thoroughly engage stakeholders such as California State Department of Fish and Wildlife Office of Spill Prevention and Response (OSPR), the Division of Oil, Gas, and Geothermal Resources (DOGGR), State Lands Commission, State Fire Marshall, and other relevant agencies to pursue a new El Segundo-Port pipeline with the utmost environmental responsibility.

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ahead of schedule, minimizing human error, and avoiding complacency. Chevron is already utilizing some preventative measures that are available to the Marine Terminal, such as the Vessel Traffic Service and tankers with double hulls.

**Response**

1. Because of the difficulty of containing and collecting oil in the average conditions of Santa Monica Bay, Chevron could invest more into planning and communications for a more coordinated, swift, and effective response to a major spill.
   
   a. Begin with making the Marine Terminal Facility Response Plan more easily accessible. It would be beneficial for all involved, directly or indirectly, if this were available as a living document, just as the Area Contingency Plans are publicly available online.³
      
      i. Expand community outreach plans to ensure all entities are aware of their role in response: involving Fire Departments, Lifeguards, Los Angeles County, coastal cities and municipalities, non-profit organizations, and volunteers.
      
      ii. Continue to invest in and conduct critically important drills, such as the National Preparedness for Response Exercise Program (PREP). These drills are crucial for response personnel to stay familiar with emergency contacts, resources, and protocols.
   
   b. Offer workshops and trainings to interested organizations and individuals.

2. Continue to update the Emergency Response Action Plan (ERAP) for the Marine Terminal.
   
   a. Chevron has invested in response and could better communicate the response resources available in the ERAP.
      
      i. Increased clarity would benefit response. For example, the ERAP describes response equipment located at an Oil Spill Warehouse; however the location of the Warehouse is not clearly given.

³ [http://www.dfg.ca.gov/ospr/los_angeles_plan.aspx](http://www.dfg.ca.gov/ospr/los_angeles_plan.aspx)