Beta Unit Complex

(Platforms Elly, Ellen & Eureka, Beta Pipeline and Beta Pump Station)

Oil Spill Prevention
and
Response Plan

Revision 3, July 2016

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Oil Spill Prevention and Response Plan

BETA UNIT COMPLEX

• Platform Eureka • Platform Ellen • Platform Elly

• Beta San Pedro Bay Pipeline • Beta Onshore Pump Station

Certificates Of Financial Responsibility:

1. OSPR No. 2-2475-00-001	Beta 16" Pipeline and 10" Delivery Line to THUMS Manifold
2. MMS No. 03126	Beta Complex (Platforms Elly and Ellen)
3. MMS No. 03126	Beta Complex (Platform Eureka)
4. MMS No. 03126	Beta Complex (Production Pipeline Eureka to Elly)

Prepared By:

Beta Offshore
111 W. Ocean Blvd, Suite 1240
Long Beach, CA 90802
(562) 628-1526
Contact: Diana Lang

Revision 3
July 2016

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PLAN STATEMENT

Beta Offshore has adopted this Oil Spill Prevention and Response Plan (OSPRP) as operator of the Beta Unit Complex and San Pedro Bay Pipeline, located onshore and offshore Long Beach, California. This plan has been prepared to comply with Beta Offshore safety and environmental procedures and to satisfy applicable state and federal regulations. Beta Offshore will activate this plan according to the guidelines set forth in the plan. The Qualified Individual and Designated Alternates named in the plan are English-speaking representatives of Beta Complex. These Qualified Individuals are located in the United States, and one will be reachable on a 24-hour basis, able to arrive at the facility in a reasonable period of time, and familiar with the implementation of this plan.

The information and procedures in this Plan must be treated as guidelines only. The user should determine to what extent it is practical and advisable to follow them. This decision may involve considerations not discussed in this Plan. The information and procedures contained herein are considered to be accurate as of the date of this revision and are consistent with the National Contingency Plan (NCP) and applicable Area Contingency Plan (ACP).

A worst-case crude oil release from the DOT-regulated San Pedro Bay Pipeline could potentially cause significant and substantial harm to the environment, as defined in the Oil Pollution Act of 1990 and 49 CFR 194.5. In addition, this plan is being submitted to DOT/Office of Pipeline Safety (OPS) because the pipeline falls within the category in 49 CFR 194.101(a). The pipeline does not fall within the exemption in 49 CFR 194.101 (b)(2), because in the potential event of a worst-case discharge, that discharge could impact navigable waters within 12 hours.

I certify, to the best of my knowledge and belief, under penalty of perjury under the laws of the State of California, that the information contained in this contingency plan is true and correct, and that the plan is both feasible and executable by Beta Offshore.

Diana Lang 7-27-16

Recommended by: *Date*
Diana Lang
HSE Manager

7/27/2016

Approved by: *Date*
Bruce Berwager
Vice President of Operations

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BOOK NO.	ASSIGNED TO *	LOCATION	AFFILIATION
1.	HSE Manager	Beta Offshore Corporate – HSE Dept.	Beta Offshore
2.	Vice President of Operations	Beta Offshore Corporate - Operations	Beta Offshore
3.	Engineering Representative	Beta Offshore Corporate - Engineering	Beta Offshore
4.	Production Manager	Beta Offshore Corporate - Operations	Beta Offshore
5.	Pipeline Superintendent	Beta Offshore Corporate - Pipeline	Beta Offshore
6.	Purchasing and Logistics Mgr.	Beta Offshore Corporate - Contracts	Beta Offshore
7.	O'Brien's Response Mgmt.	O'Brien's Command Post, Slidell, LA	Contract Company
8.	Tom Haug	O'Brien's Response Management, Brea	Contract Company
9.	Platform Elly	Elly – Control Room	Beta Offshore
10.	Platform Ellen Compliance	Ellen – Compliance Office	Beta Offshore
11.	Production Supervisor	Ellen – Production Supervisor's Office	Beta Offshore
12.	Facilities Superintendent	Ellen – Facilities Superintendent's Office	Beta Offshore
13.	Platform Eureka	Eureka - Building 60 / Control Room	Beta Offshore
14.	Platform Eureka	Eureka – Production Office	Beta Offshore
15.	Beta Pump Station	Beta Station,170 N Pico Ave. Long Beach	Beta Offshore
16.	Field Copy	Beta Offshore Corporate – Go Kit	Beta Offshore
17.	Field Copy	Beta Offshore Corporate – Go Kit	Beta Offshore
18.	Field Copy	Beta Offshore Corporate – Go Kit	Beta Offshore
19.	Field Copy	Beta Offshore Corporate – Go Kit	Beta Offshore
20.	Unassigned	Beta Offshore Corporate - File Room	Beta Offshore

*Note: Upon Personnel transfers, book is to stay with the position, not move with the person.

AGENCY or OSRO			
	Mr. Christian Syre (1 CD copy) California Department of Fish & Wildlife Office of Spill Prevention and Response 4665 Lampson Avenue, Suite C Los Alamitos, CA 90720		**Ms. Marina Voskanian, P.E.** (1 CD copy) California State Lands Commission Mineral Resources Management Division 200 Oceangate, 12th Floor Long Beach, CA 90802
	Jason Langteau (2 CD copies) Senior Preparedness Analyst Bureau of Safety and Environmental Enforcement, Oil Spill Response Division 770 Paseo Camarillo, 2nd Floor Camarillo, CA 93010-6065		**Ms. Melanie Barber** (1 CD copy) US Department of Transportation Office of Pipeline Safety, Pipeline and Hazardous Materials Safety Administration. Room E22-210, 1200 New Jersey Ave. SE Washington, DC 20590
	Mr. Dale Strieter (3 CD copies) Patrot Environmental 506 E. "E" Street, Unit A Wilmington, CA 90744		**Mr. Jeff Jappe** (1 copy + 1 CD) Marine Spill Response Corporation (MSRC) 3300 E. Spring Street Long Beach, CA 90802
			MST3 Alex Corcoran (1 CD copy) US Coast Guard 111 Harbor Way Santa Barbara, CA 93109

REVISION	DATE	DESCRIPTION OF REVISION AND PURPOSE
Revision 0	November 2010	Initial plan submission (Similar to previous Pacific Energy plan, with updates to personnel, OSRO contracts and other contacts). A Health & Safety Plan Section with Decontamination Section was added (formerly in Emergency Action Plan).
Revision 1	April 2012	**Throughout Document:** Changed BOEMRE to BSEE **Title Page:** Listed current COFR numbers, updated report date **Plan Statement:** Updated signatures **Distribution List:** Updated names and addresses **Table of Contents:** Updated page numbers to reflect changes **Section 1, Introduction:** Updated Plan No., COFR numbers and throughput no.s **Section 2, Spill Response Plan (Core Plan):** Updated notification procedures to emphasize immediate notification to NRC and criteria for notification to Regional Supervisor and District Manager. Updated Table 2-2, Updated Emergency Incident Placard to correct QI references and various numbers, updated vessel names and equipment in Table 2-5 **Annex A:** Updated current throughput rates and description of intrafield pipelines (Sec. A.3 and Table A-5) to reflect new pipelines between Eureka and Elly installed in December 2011. Revised Figures A-2 and A-9. **Annex B:** Minor updates in Section B.1.1.2, Table B-1 (vessel names) **Annex C:** No changes except for Attachment C-1 (p.29, 30) **Annex D:** Clarified QIs on Page D-2, updated names throughout. Attachment D-1, page 2, revised IC designation **Annex E:** Agency name update **Annexes F and G:** No changes **Annex H:** Updated History of Spills table. Changed RSPA to PHMSA **Annex I:** Revised Worst Case Discharge for production pipeline between Eureka and Elly to reflect new 10" line. Revised page 1-7 to add discussion of dispersant and in-situ burning methods **Annex J:** No changes **Annex K:** Section K.7.1.3 Revised status of MSRC fire-resistant boom, including location and transit time.; Section K.7.1.2 Updated reference to California Dispersant Plan; Revised Response Planning Process section. **Annex L:** Updated reference to ACP (2011). **Annex M:** Updated Spill Trajectory Request Form and agency names **Annex N:** No changes **Annex O:** Updated some contact names and numbers **Annex P:** Updated equipment lists **Annex Q:** Replaced old crude oil MSDS with Beta Offshore MSDS **Annex R:** Updated agency acronyms **Annex S:** Agency names update **Annex T:** No changes
Revision 2	March 2013	Change CA Dept. of Fish and Game to CA Dept. of Fish and Wildlife, and OES to CalEMA throughout document Updated Table of Contents to match document Updated contact information – Pages ii; 1-2, 2-1, Attachment 2-1, Annex O Page 1-7: Exemption note attached to 40 CFR 112 reference Page 1-11: Updated COFR expiration dates and inserted new COFRs Page 2-6: Updated Communications chart. Page H-4: Added new leak event for 2012 Page H-12: Added Well Blowout scenario for Worst Case Discharge

REVISION	DATE	DESCRIPTION OF REVISION AND PURPOSE
Partial	August 2014	Pages Revised: Plan Statement, iii, pI-1, I-5, I-11, 2-1, D-2, D-3, D-4 to reflect new contact information and expiration dates.
Revision 3	July 2016	Change QI's, contact names/numbers, titles & signatures throughout document 1.02 Update distribution list 1.04 Update well count 1.05 Update COFR 2.3 Added new 1st bullet item for reporting any amount of oil to water; and added HSE Mgr./designee to 2nd bullet item for preparing spill report. 2.9 Update table (remove reference to lights on tracking buoys) 3.3 Update drawings 10-14 Annex A Pgs. A-36+ tables updated w/ strikethrough for out of service equipment Annex C Update IRT to IMT (Incident Management Team) Annex D Update IRT to IMT (Incident Management Team) Annex F Fix typo; Update IRT to IMT (Incident Management Team) Annex H Updated H.2 Spill History; H.2.3 Remaining Risk-Tanks-updated 2016 PHA associated with new Gerald Desmond Bridge (pg. H-14) Annex M M.2.1 Updated regulatory references to training Annex M 18.2 Updated Trajectory Request Form Annex N 2.05a Updated JSA format Annex P Updated OSRO (Patriot) DFW rating letter

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1.0 INTRODUCTION

1.1 PURPOSE

Oil Spill Prevention and Response Plan (OSPRP) addresses the Beta Unit Complex. This OSPRP provides spill prevention measures and response guidelines for use by Beta Offshore (herein referred to as the Company) personnel and its contractors in operations and in response to an emergency incident. These response guidelines are not intended to supplant the use of common sense or actions not specifically mentioned in this plan, but necessary to mitigate a problem. Depending on the incident, each response may require different or modified approaches or sequences of events to reach the primary objective of the Company; that is, to ensure the safety of life, protection of the environment, and protection of property.

1.2 FACILITY FACT SHEET

Name of Facility	Beta Unit Complex
Mailing Address and Telephone Numbers Of Facility:	Beta Offshore 111 W. Ocean Blvd, Suite 1240 Long Beach, CA 90802 (562) 628-1526
Facility Street Address:	Beta Offshore 111 W. Ocean Blvd, Suite 1240 Long Beach, CA 90802
Name, Address, and Telephone Numbers of Owner/Operator:	Beta Offshore 111 W. Ocean Blvd, Suite 1240 Long Beach, CA 90802 (562) 628-1526
Name and Telephone Numbers Of the Qualified Individuals (QI):	Diana Lang (562) 628-1529 (office) (562) 522-5095 (cell) Bruce Berwager (562) 628-1539 (office) (562) 533-4554 (cell)

Names and Telephone Numbers of the Designated Alternates for Beta Unit Complex	Yohn Rosqui (Alternate QI) (562) 606-5706 (Office) (562) 755-3137 (cell)
Name, Address, and Telephone Numbers To Whom Correspondence should be Sent:	Diana Lang HSE Manager Beta Offshore 111 W. Ocean Blvd, Suite 1240 Long Beach, CA 90802 (562) 628-1526
Name and Address of Agent for Service of Process:	Bruce Berwager Beta Offshore 111 W. Ocean Blvd, Suite 1240 Long Beach, CA 90802 (562) 628-1526
Location of Facility:	The **Beta Unit Complex** (Platforms Ellen/Elly and Eureka) is located in federal waters within Leases OCS-300 and OCS-301, approximately 9 miles southwest of Huntington Beach. The **Beta Pump Station** is located at 170 N. Pico Avenue, north of Ocean Boulevard, in Long Beach. The **San Pedro Bay Pipeline** extends for approximately 6 miles in federal waters and 9 miles in state waters. Landfall is on Pier H near the Queen Mary in Long Beach Harbor. The pipeline continues on for approximately 2 miles through Piers G and F and ties into the Beta Pump Station. 1,000 feet of buried pipeline extends from the pump station to the THUMS manifold.
Latitude and Longitude:	
Ellen/Elly OCS-300	33° 34’ 56” N, 118° 07’ 39” W
Eureka OCS-301	33° 33’ 50” N, 118° 07’ 00” W
Beta Pump Station	33° 45’ 03” N, 118° 12’ 28” W
Address:	
Beta Pump Station	170 N. Pico Avenue, Long Beach, CA 90802
Township, Range, and Section – Beta Pump Station and San Pedro Bay Pipeline:	T5S, R13W (Refer to diagrams in Annex A)

Site Characteristics:

Platform Eureka is located in approximately 700 feet of water approximately 9 miles southwest of Huntington Beach. The seafloor in the immediate area of the platform is essentially featureless, sloping to the southeast at about 3°.

Platforms Ellen/Elly are located approximately 1.5 miles northwest of Platform Eureka. In the immediate area of the platforms, the water depth is 265 feet and the seafloor is featureless, sloping to the southeast is less than 1°.

The San Pedro Bay Pipeline extends 17.3 miles both offshore and onshore from Platform Elly to the Beta Pump Station in Long Beach. Beginning at Platform Elly, the first 10.9 miles of the pipeline lies on the ocean floor. The remainder of the offshore portion of pipeline (4.4 miles) is buried 10 to 15 feet below the ocean floor until it approaches the shoreline near the Queen Mary. The onshore portion of the line is also buried 10 to 15 feet below grade along its 2-mile route to the Beta Pump Station. A 10" line carries the oil from the pump station to the THUMS manifold.

Characteristics of Beta Crude:

Gravity, API	13-16
Specific Gravity	0.95
Sulfur, % Wt.	3.78
H_2S gas/100cc	.0003
Flash Point, °F	<70 - 76
Pour Point, °F	37.4
Viscosity, cp	2,500 (at 59 °F)
Dispersibility	lightly dispersible with a dispersant-to-oil ratio of 1:20 with Corexit 9500 See also Attachment K-1 in OSPRP for more detailed information on dispersibility.

Current Operations:

Oil and gas produced from wells at Platform Ellen (drilling/production platform) is sent to Platform Elly for dehydration, gas conditioning, and water treating. Currently, there are 30 active producing wells, 11 inactive producing wells, 19 active water injection wells, 2 inactive water injection well, 1 disposal well, no gas wells, and 1 source water well (variation in well status is 20 percent).

Platform Eureka, installed to develop the southern portions of the Beta field, was returned to production in April 2008 after having been idle since June 1999. Platform Eureka is equipped with a drilling/workover rig and with production facilities for primary separation of gas from liquid and for well testing. There are currently 25 active and 5 inactive producing wells, 14 active water injection wells, 1 disposal well, and 1 inactive gas well.

All production from Platforms Ellen and Eureka is handled on Platform Elly. Crude oil is dehydrated and sent to shore via a 16-inch pipeline called the San Pedro Bay Pipeline. Dehydrated crude oil from Platform Edith (Operated by Dos Cuadras, LLC) is shipped to Platform Elly and is commingled with Platform Ellen and Platform Eureka crude oil before being sent to shore via the 16-inch pipeline.

The produced water is filtered, treated, and transported back to Platforms Ellen and Eureka for re-injection into the reservoir. Produced gas is compressed and used for fuel to power turbines for generators supplying the platform's electrical needs and pumps used for re-injection. Power is distributed to Platform Eureka via two 34.5 kv subsea cables and one standard high-voltage cable to Platform Ellen.

Oil pumped to shore reaches landfall at Pier H near the Queen Mary and continues onshore to the Beta Pump Station. Oil (15.5° API gravity) is delivered to the THUMS manifold through a 10-inch buried pipeline.

Year Platforms Installed:		
Ellen/Elly	1980	
Eureka	1984	
Diesel Fuel Storage Capacity:		
Elly	1,300 bbl	
Ellen	600 bbl	
Eureka	1,169 bbl	
Throughput:		
Ellen	1,800 to 4,000 bbl/day	oil
	5,500 to 15,000 bbl/day	water
	500 to 1,500 MCF/day	gas
Eureka	2,000 to 4,000 bbl/day	oil
	4,000 to 9,000 bbl/day	water
	200 to 900 MCF/day	gas

OSPR* Reasonable Worst Case Discharge:	3,111 bbl
*Most persistent oil handled, and the corresponding response planning volume	Group III crude oil: 3,111 bbls
BSEE Worst Case Discharge:	12,036 bbl
PHMSA Worst Case Discharge:	3,111 bbl (Beta Station)
Facility Distance to Navigable Waters:	0 – ¼ mile
Wellhead Protection Area:	Not Applicable
Standard Industrial Classification Code:	1311
Emergency Response Plan Designations:	
OSPR Plan Control Number	M5-24-3231 (formerly M5-24-2443)
DOT/OPS Plan Sequence Number	1185 (Beta Station only)
BSEE Plan Number	P.0001

1.3 EPA CERTIFICATION

EPA APPLICABILITY OF SUBSTANTIAL HARM CRITERIA

Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?

Yes [X] No [ ]

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and, within any storage area, does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation?

Yes [ ] No [X]

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula from the reference below* or a comparable formula) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments?

Yes [X] No [ ]

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula from the reference below* or a comparable formula) such that a discharge from the facility would shut down a public water intake?

Yes [ ] No [X]

Does the facility have a total storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil spill in an amount greater than or equal to 10,000 gallons within the last five years?

Yes [ ] No [X]

* Reference: 40 CFR 112, Subpart D, Appendix C, Attachment C-III

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals responsible for obtaining information, I believe that the submitted information is true, accurate, and complete.

Signature: [signature]

Name (please type or print): Bruce Berwager

Title: Vice President of Operations

Date: 7/27/2016

1.4 COMPANY PHILOSOPHY AND GOALS

Environmental, Health and Safety is an integral part of our business. Protecting the environment and safeguarding the people in our workforce and surrounding communities is essential to our long-term success. This policy reflects Beta Offshore's commitment to employees, contractors and customers and to the communities in which we operate. We will manage our EHS performance with no less than the same priority that we manage other key business objectives.

Our EHS management system is founded on the belief that all accidents and occupational illnesses can be prevented. In support of this belief, Beta Offshore is committed to:

- Ensuring that all employees, contractors and suppliers understand their roles, responsibilities and performance expectations regarding environmental compliance and safe work practices.

- Holding employees, contractors and suppliers accountable for their EHS performance, and giving recognition to those who show leadership in performance improvement.

- Setting meaningful goals to ensure continuous improvement and measuring progress toward those goals.

- Auditing our systems, processes and facilities for compliance with laws, regulations, and internal procedures.

- Learning to be more effective by routinely benchmarking our processes with others and then sharing best practices across all locations

- Maintaining effective programs for emergency preparedness at each of our locations.

- Fostering constructive dialogue with government agencies to ensure EHS regulations are cost effective and appropriate.

These commitments are in addition to our obligation to design, operate and maintain our facilities in compliance with all environmental, health and safety laws and regulations.

1.5 APPLICABLE LEGISLATION

The OSPRP for the Beta Unit Complex has been prepared and promulgated to meet the requirements of the Oil Pollution Act of 1990 (OPA 90). OPA 90 amended 311 of the Clean Water Act (CWA) to augment federal response authority, increase penalties for unauthorized spills, expand the federal response framework, and provide greater emphasis on preparedness and response activities.

Presently, the plan addresses federal and state regulations that pertain to oil spill preparedness and response; that is:

29 CFR 1910.38(a) and (b), 1910.120, and 1910.165

30 CFR Part 254

40 CFR Parts 112, 112.20, and 112.21 (EPA) *Note: 40 CFR 112.1(d)(3) exempts from this regulation any offshore facilities subject to the regulation of BSEE*

49 CFR Part 194 (DOT)

Title 8, Division 1, Chapter 4, Subchapter 7, Sections 3220 and 6184 (State of California).

Title 14, Division 1, Subdivision 4, Chapter 3, Subchapter 3, Sections 815-817 (State of California).

A cross-reference to the regulations is provided in Annex S.

1.6 SCOPE OF THE PLAN

The OSPRP for the Beta Unit Complex is based in part on the National Response Team's (NRT's) Integrated Contingency Plan Guidance for consolidating multiple plans required by a facility into one functional spill prevention and response plan (Federal Register, June 5, 1996, 61:28641-28664). The Company has modified the organization of the plan to better address the needs of its facility and to comply with both federal and state regulations. The OSPRP contains a Response Plan (Section 2.0) to serve as the Core Plan, as required by the state of California.

The OSPRP for Beta Complex Unit:

- Is consistent with the current National Contingency Plan (40 CFR Part 300) and will be revised as necessary to be consistent with the 11th District USCG Area Contingency Plan Los Angeles/Long Beach (Northern/Southern Sector) and the EPA Region IX Regional Contingency Plan.

- Identifies Qualified Individuals and Designated Alternates with full authority to implement removal actions and ability to communicate immediately with appropriate federal authorities and responders (refer to Section 1.8 for a description of the responsibilities and authority).

- Identifies and ensures availability of resources to remove, to the maximum extent practicable, a worst-case discharge.

- Describes training, testing, announced and unannounced drills, and response actions for facility personnel.

- Is updated periodically.

- Is to be resubmitted for approval of each significant change.

1.7 PLAN REVIEW AND UPDATE PROCEDURE

1.7.1 Plan Maintenance

The HSE Manager maintains the OSPRP for the Beta Unit Complex. Each recipient of the plan is encouraged to submit recommendations for corrections, additions, or revisions.

The plan will be reviewed annually (i.e., within one month of the anniversary date of agency approval of the plan) and will incorporate or reference changes to Area Contingency Plan (ACP) Sensitive Area Sites where necessary.

Revisions or amendments to the response plan will be submitted to the responsible agencies for information or approval under any of the following conditions:

- There is a change in the facility's configuration that significantly affects the information included in the plan. (Management of Change Process should trigger plan revision).

- There is a change in the type of oil handled, stored, or transported that affects the required resources.

- There is a change in the name(s) and/or capabilities in the required oil spill response organization.

- There is a change in the Qualified Individuals and/or Designated Alternates.
- There is a change in the National Contingency Plan or an Area Contingency Plan that has a significant impact on the type of equipment appropriate for response activities.
- There is a change in personnel and/or telephone numbers.
- There is a change in emergency response procedures.
- There is a change in ownership.
- There is a change that significantly affects the implementation of the plan.
- Five years has elapsed from the date of agency approval.

The OSPRP will be revised within 90 days of a change listed above. Plan holders will be provided revisions via an update notice.

1.7.2 Post-Incident / Drill Critique And Update

In order to continue to improve the Company's response program to benefit from lessons learned during actual incidents and during drills, the Beta Unit Complex will conduct a detailed evaluation of the effectiveness and efficiency of the incident or drill response with key members of the response organization. In the case of an actual spill, the HSE Manager or Operations Manager will submit the review to the OSPR Administrator within 90 days following completion of the response cleanup.

1.8 QUALIFIED INDIVIDUAL AND DESIGNATED ALTERNATES

The Qualified Individuals (QI) and designated Alternates (Alternate QI) are responsible for the implementation of the OSPRP. For shift changes or transfer of responsibilities and authorities, the QI (or Incident Commander if that is a different person) "on duty" will immediately notify the Federal On-Scene Coordinator and State Incident Commander.

The Company's QI and Alternate QI are English-speaking representatives, located in the United States, available on a 24-hour basis, and capable of arriving at the facility in a reasonable period of time but not later than 12 hours. They are thoroughly familiar with the implementation of this Plan and are trained in the responsibilities and authority of the QI and designated Alternate under this Plan (see Table 1-1) and in those procedures necessary to implement the responsibilities and authority. They have knowledge and training or experience to demonstrate competence in:

- Applicable Federal OSHA standards for emergency operations (29 CFR 1910.120) and California OSHA standards for emergency response operations (Title 8 CCR 5192).
- Implementation of the OSPRP.
- Requirements of the National Contingency Plan and the Area Contingency Plan, as required by OPA 90.
- Spill prevention and response provisions and procedures of the plan.
- Securing and authorizing resources to be committed or that could potentially be committed during an incident.
- Procedures for obtaining and obligating funds for response activities and access to persons (external and internal) to contact who would expedite such actions.
- Ability to assess the need for additional resources and to make the appropriate call-outs and contractual arrangements.
- Ability to act as a liaison between the facility and the State Incident Commander and the Federal On-Scene Coordinator.

Table 1-1. Responsibilities and Authority of the Qualified Individual / Designated Alternate.

RESPONSIBILITIES AND AUTHORITY
Implement the Oil Spill Prevention and Response Plan (OSPRP) for the Beta Unit Complex.
Notify Company management, response personnel, and government agencies as appropriate.
Assume or assign the role of Incident Commander of the Incident Management Team when activated.
Ensure that internal alarms and hazard communication systems are activated as appropriate to notify all facility personnel.
Ensure that proper and timely agency notifications are made.
Ensure that an initial incident assessment is done and provided to response personnel at the scene.
Initiate or ensure that the Incident Commander (if different from the QI) initiates timely communication with the Federal On-Scene Coordinator and State Incident Commander.
Obligate, either directly or through prearranged contracts, any funds/monies required to carry out all necessary or directed response activities.
Ensure that there is a liaison with federal, state, and local officials.
Ensure that possible hazards to human health and the environment are assessed.
Develop or ensure that the Incident Commander (if different from the QI) develops strategic objectives and directs the overall response operations.
Ensure that assessment and prompt removal actions are implemented to contain and remove the substance released.
Approve or ensure that the Incident Commander (if different from the QI) or appropriate level in the Incident Management Team approves the ordering and release of resources.
Coordinate or ensure that the Incident Commander (if different from the QI) coordinates rescue and response actions.
Review or ensure that the Incident Commander (if different from the QI) approves all press releases.

1.9 CERTIFICATES OF FINANCIAL RESPONSIBILITY

The Certificates of Financial Responsibility (COFR) that are in place and effective as of the date of this revision of the Plan, are shown below. Copies of available COFR documentation are included following this section. Future COFR updates will be made available upon request.

Facility that Certificate Covers	Number	Expires
16” Beta Pipeline and 10” Delivery Line to THUMS Manifold	2-2475-00-001	May 31, 2018
Beta Complex Platforms Elly and Ellen	MMS 03126	Oct 31, 2016
Beta Complex Platform Eureka	MMS 03126	Oct 31, 2016
Beta Complex Pipeline from Platform Eureka to Elly	MMS 03126	Oct 31, 2016

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List COFs for a Designated Applicant

MMS#: 03126
Beta Operating Company, LLC

Total Number of COFs: 4
Total Number of Active COFs: 4
Total Number of Deleted COFs: 0

~~Las Colinas Tower I, Suite 610~~
~~201 E. John Carpenter Freeway~~
~~Irving TX 75062~~

Financial Coverage	
Insurance	$ 35,000,000
Self-Insurance	$ 0
Indemnity	$ 0
Surety Bonds	$ 0
Other	$ 0
Total	$ 35,000,000

State	Lease Number	ROW/RUE Segment Number	Area/Block		Worst Case Volume	Effective Date	Expiration Date	Segments	Aliquots/ Remarks
	P00300		6C	3337	10,765	10/31/2015	10/31/2016		Beta Complex 6C (Platforms Elly & Ellen) - CI 33N 37W
	P00301		6C	3336	4,232	10/31/2015	10/31/2016		Beta Complex 6C (Platform Eureka) - CI 33N 36W
		6010301	6C	3336	1,026	10/31/2015	10/31/2016		Lease # P00301; Beta Complex 6C; 10" pipeline from Platform Eureka to Elly
		P00547	6C	3337	3,111	10/31/2015	10/31/2016		Lease # P00300; Beta Complex 6C to shore; 16" San Pedro Bay pipeline from Platform Elly to shore; Permit # OCS-P057; Segment # 2610300

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CALIFORNIA CERTIFICATE OF FINANCIAL RESPONSIBILITY (CA COFR)

OWNER OR OPERATOR:

SAN PEDRO BAY PIPELINE COMPANY

meets the financial responsibility requirements set forth in the Government Code Sections 8670.37.53 as it applies to the operation of

NAME:

CRUDE OIL PIPELINE 16" (SAN PEDRO BAY PIPE) PLATFORM ELLY (FED WATERS)

LOCATION:

TO BETA STATION; 10" BETA DELIVERY LINE 2 AND 3 - BETA STATION TO THUMS MANIFOLD

CERTIFICATE: 2-2475-00-001 **CONTROL #:** FD231

ISSUED DATE: June 01, 2016 **EXPIRATION DATE:** May 31, 2018

The holder of this document named above is subject to the provisions of California Code of Regulations, Title 14, Sections 791-797, implementing the financial responsibility requirements set forth in the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act (Act). This certificate holder has provided the necessary evidence of financial responsibility mandated by these requirements.

For the purpose of determining liability pursuant to the Act, this Certificate of Financial Responsibility is conclusive evidence that the person or entity holding the certificate is the party responsible for the specific Marine Facility.

No alterations of this certificate are permitted after issuance by the Administrator of OSPR. If there is a change in the name or ownership of the Marine Facility, the certificate holder must notify the Office of Spill Prevention and Response (OSPR) immediately. If the certificate expires, a new certificate will be required.

This certificate remains valid as long as the current method for demonstrating financial responsibility is maintained (eg. insurance). Any changes in this status must be reported to OSPR immediately.

It is the owner or operator’s responsibility to ensure that this certificate number is also included in the owner or operator’s marine oil spill contingency plan, which must be submitted to this office for approval, before operating in a location where a spill could impact California marine waters.

If you have any questions, please contact

Farina Khan

Sincerely,

Farina Khan

Financial Analyst
(916) 327-9937
Office of Spill Prevention and Response
cacofr-facilities@wildlife.ca.gov

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2.0 SPILL RESPONSE PLAN (CORE PLAN)

This portion of the OSPRP represents the "Core Plan" for response actions and contains the information necessary to direct the initial on-scene response personnel through the first 24 hours of a response. This Core Plan is designed such that it can be used as a stand-alone reference during the initial response. It is, however, supported by the studies, calculations and analyses in the full OSPRP. ***All Beta staff should become familiar with this Core Plan including all tables and attachments.***

2.1 NOTIFICATION PROCEDURES

An emergency incident or a substantial threat of an incident from Beta Complex Facilities will trigger a set of prioritized internal and external notifications. Procedures for notifying Company resources and local, state, and federal agencies are outlined below, as well as on the Emergency Incident Placard in Attachment A-1 of this Core Plan section. *Notifications to QI, Marine Spill Response Corp. (MSRC) and O'Brien's Response Management Agency Notification Process should be made immediately, but* ***no later than 30 minutes*** *after discovery of a discharge of oil or threatened discharge of oil.*

INITIAL NOTIFICATIONS

INCIDENT OBSERVER

↓

ELLY CONTROL ROOM OPERATOR and **ON-DUTY SUPERVISOR (PIC)** shall notify **O'Brien's** and **QIs** within 30 minutes of discovery of release/threatened release

→

1. Contact SoCal Ship Services to obtain vessel support (310) 519-8411 (24 hrs)

2. Activate MSRC for on-water recovery (800) 259-6772 (24 hrs)

3. Activate Witt O'Brien's, LA Agency Notification Process. (985) 781-0804 (24 hrs) **Confirm first call is to NRC!**

4. If spill >1bbl, notify BSEE Regional Supervisor without delay. (805) 384-6370 If <1 bbl, courtesy call recommended

↓

5. Notify Beta Qualified Individuals (QIs) and Incident Management Team (IMT)

Bruce Berwager (QI*)	Office (562) 628-1539		
Yohn Rosqui (QI*)	Office (562) 628-1526 Mobile (562) 755-3137	Diana Lang (QI*)	Office (562) 628-1526 Mobile (562) 522-5095
Jamie Cool (Alt QI*)	Office (562) 628-1526 Mobile (310) 902-3578	Rick Armstrong (Alt QI*)	Office (562) 628-1526 Mobile (310) 560-5281

* QI will determine the need to activate the Command Center via Answering Service Activation (562) 628-1526 [Code 'PICO Avenue']

6. PIC: Verify that NRC (800) 424-8802, Cal-OES (800) 852-7550, USCG (310) 521-3800 and BSEE (805) 384-6374 were notified.

The notification procedures must be followed to completion. If the responsible person is unable to notify a person listed, then the responsible person must make the notifications (if any) for that person. Table 2-1 (Page 2-3) is a **Beta Spill Checklist:** a step-by-step guide to assist Beta platform personnel with the notification and reporting process. It is applies to a drill also.

2.2 COMMUNICATIONS

Effective and efficient communication systems are a central requirement for emergency response at every level. The Beta Facility Communication System is summarized on Table 2-2 (Page 2-6) and additional phone numbers are provided on the Emergency Incident Notification Placard located as Attachment 2-1 at the end of Section 2.

2.3 REPORTING REQUIREMENTS

It is important to initiate proper reporting as soon as possible. Note that **initial notifications** shall not be delayed by the collection of information for reporting. Use the applicable report forms to provide accurate incident information for the initial and follow-up notifications to federal, state, and local agencies. An initial incident log is to be filled out by the On-Duty Supervisor or his designee using the Unit Log Form (Form 214). This is an observation log documenting discovery of the incident and initial assessment of cause and extent of incident. Copies of blank 214 forms and initial spill report forms are provided in Attachment 2-2 at the end of Section 2.

- Report any amount of oil discharged to the ocean.
- A Facility Spill Report will be prepared by the HSE Manager, their designee or The O'Brien's Response Mgmt. based on information provided by Facility Supervisor. Procedures to assist in assessing the spill are outlined in Sections 2.5.2 through 2.5.4 of this Core Plan.
- As information continues to develop, an Incident Briefing Form (ICS 201) will be prepared by The O'Brien's Response Mgmt. to document details regarding the spill and outline initial (completed or in progress) and proposed response activities and available resources. Platform personnel should also complete an ICS 201 and/or 214 form to document field observations during the spill event. Blank copies of ICS 201 and 214 forms are provided in Attachment 2-2 at the end of Section 2.
- Formal written reporting requirements for local, state, and federal agencies are summarized in Table 2-3 (Page 2-7).
- If a very minor spill results in a small sheen that is observed to rapidly disspiate, MSRC would not be able to recover any oil. In this case, notifications must still be made to NRC, the US Coast Guard, BSEE and corporate QI's. A report must be prepared describing the event, measures taken to stop it and prevent recurrence and total estimated volume released. The report should also contain a log of notifications made.

Table 2-1 Beta Drill/Spill Checklist.

Assumption	• The Production Supervisor and Facilities Superintendent are the only supervisory staff on board. (The IC will modify if others are on board or as they arrive)
Other	• If this is a drill and you are being observed, think out loud to make your intentions clear and to demonstrate control of the situation.
Production Supervisor or Facilities Superintendent Roles	• Initial I.C. • Safety • Planning

Step	Action	Check when done
begin	• If this is a drill, understand and/or set the expectations of the drill. Seek clarifications from the BSEE where not fully understood. All announcements and calls must specify that "**THIS IS A DRILL".** Announce the incident over the paging system. The method of response expected should be determined during the kick-off meeting. If not a drill, provide instructions to platform personnel as needed.	
1	• **Have the Control Room Operator contact the crew boat and Ship Services at 1-310-519-8411** and: • Have the crew boat respond immediately. • Request the Timber Wolf from Ship Services and have it or another available boat respond ASAP. • Remind the Control Room Operator to use the Form 214 (Attachment 2-2). The Production Supervisor should log information on the Form 214. If a Drill, remember to write **"THIS IS A DRILL"** at the top.	
2	• Call **MSRC at 1-800-259-6772** and pass on the scenario. • <u>Stay on the line</u> until you get a local "first call" in California. This could be from the Southern or Northern District. If from the Northern District, get their name and a call back number. They will call someone from the Southern District. • Log information on the 214 (Blank copies available in Attachment 2-2) • If the "first call" is from the Southern District or when you get the call back from the Southern District pass on the scenario. Log information on the 214. • Request information on the boats deployed, ETA for those boats, the name and cell phone number of the MSRC Supervisor that will be responding. • Log information on the Form 214. *(continued below…)*	

Step	Action - continued	Check when done
3	• Contact **O'Brien's Response Mgmt. at 1-985-781-0804**. Give them incident information they request and advise them that we have contacted Ship Services, MSRC and **that they need to contact NRC without delay and obtain a case number** and also contact USCG. Request that they do the spill trajectory and tracking for us. O'Brien's will fill out the Spill Report Form for us and have it available at the end of the incident.	
4	• Contact the **BSEE at 1-805-384-6370** to inform them that we have an incident in progress. Log on Form 214. If spill is > 1 bbl, the Regional Supervisor at the number above **must** be notified without delay. If < 1 bbl, a courtesy call should be made to the number above. • Determine the need to contact state and local agencies and make the appropriate notifications.	
5	• Verify that Operations has notified Beta Qualified Individuals who will determine the need to activate the IMT (See Ops Step 2 below).	
6	• If needed call the MSRC Supervisor and request his response to Platform Ellen. Consider heliflight. Confirm boats deployed and their ETA. • Establish radio contact with MSRC vessel(s) ASAP on channel 6. • Document all notifications and activities on Form 214	
7	• Expand the response as necessary. Prepare Site Safety Plan. • Log information on the Form 214.	
9	• Develop a Form 201 for overall on-scene spill and response activities and developments. Continue to update (See Attachment 2-2 for forms).	
10	• Verify the boom deployment personnel have reviewed the JSA for the boom deployment. See Attachment 2-5 for a copy of the JSA. Boom deployment procedures are presented in Table 2-6. • Log information on the 214.	
11	• When the MSRC Supervisor arrives on Platform Ellen review the current status with him. • **Hand off the on-water response to the MSRC Supervisor**. • Notify boats of the hand off. • Log information on the 214.	
12	• Request Job Site Safety Assessment and site characterization from MSRC for the 201 form. • Log information on the 214.	
13	• If not already in hand, request the spill report form from the Production Supervisor for the 201. • Log information on the 214.	
14	• If not already done, complete the 201 and log information on the 214.	
15	• After the drill has been called, facilitate & document drill critique.	
	Additional steps as needed. • Call for over flight for spill tracking and or wildlife observation. • Activate Emergency Operations Center (EOC) at MSRC offices • Follow up with O'Brien's Response Management to confirm calls to NRC/EMA and ensure that BSEE has been contacted	

Facilities Superintendent or Compliance Specialist Role	• Operations • Logistics • Sit Stat/Trajectory

Step	Action	Check when done
1	• Assure a minimum of **3 tracker buoys** are deployed. 1 every 15 minutes. • Log information on the 214.	
2	• Contact the **Beta Offshore Long Beach Office at 1-562-628-1526**. Notify them that we have a drill/spill in progress and make it clear as to whether they need to activate the "Incident Response Team" to MSRC office or not. Make sure that the HS&E Advisor (Diana Lang or designee) and the Vice President of Operations (Bruce Berwager or designee) get first notification. • Log information on the 214.	
3	• Oversee boom deployment. Refer to the Boom Deployment JSA (Attachment 2-5) and launch procedure (Table 2-6) • Log information on the 214.	
4	• After the boom is deployed report to the Production Supervisor or PIC for further direction.	
	Additional steps as needed. • Stop the source (e.g. lower tank level, isolate and shut in a line, shut the platform in)	

The steps outlined in Table 2-1 are the initial response actions to take to respond to a spill or drill and to initiate control of the source. Additional steps will be required for a sustained response and recovery of spill.

TABLE 2-2 BETA FACILITY COMMUNICATIONS SYSTEM

TYPE	LOCATION/CHANNEL	CALL SIGN	PURPOSE	FREQUENCY
Hand-held Radios	**Elly/Ellen** Compliance / 8 Safety / 8 Cranes / 8 Wellbay / 3 Operations / 3 Facilities / 3 PICs, Supervisors / 3 Elly Control Rm / 3 **Eureka** Cranes, roustabouts / 3 Wellbay / 2 Operations / 2 Supervisors / 2	Name of Person	Communicate throughout platform and between all platforms	UHF (MHz) Transmit / Receive Ch1 466.46 / 461.46 Ch2 461.46 / 461.46 Ch3 469.54 / 464.54 Ch4 464.54 / 464.54 Ch5 459.00 / 454.00 Ch6 454.00 / 454.00 Ch7 468.63 / 468.63 Ch8 455.05 / 455.05
Intercom/PA System	Throughout Platforms Elly and Ellen	NA	Paging/Announcements Communicate throughout platform	NA
Intercom/PA System	Throughout Platform Eureka	NA	Paging/Announcements Communicate throughout platform	Ext. 709 from Elly, Ellen or LB
Vessel to Platform Radios (same system as hand-helds and base-stations)	Elly Control Room Eureka Controm Rm Compliance Ellen Crane Elly Crane Crew Boat Work Boat Eureka East Crane Eureka Ctr Crane Eureka West Crane Fuel Transfer Eureka Fuel Transfer	12 19 15 3 9 43 47 284 282 283 13 19	Communication throughout and between platforms and crew/supply boats	UHF (MHz) Transmit / Receive Ch1 466.46 / 461.46 Ch2 461.46 / 461.46 Ch3 469.54 / 464.54 Ch4 464.54 / 464.54 Ch5 459.00 / 454.00 Ch6 454.00 / 454.00 Ch7 468.63 / 468.63 Ch8 455.05 / 455.05
MSRC hand-held response radio	Elly Control Room Eureka Bldg 60		Platform to MSRC response vessel	(Ch 2) UHF 454.00 MHz *Compatible with Beta Offshore hand-held Channel 6*
Marine Radio Channel	Elly Control Room Ellen Compliance Office		Communication with ships, boats, coast guard	Marine band radio 16 (VHF) 129.00 MHz
Helicopter Radio	Elly Control Room	04 Tango	Communication with Helicopter Pilots	129.00 MHz
Emergency Cell Phone	1) Elly Control Rm 2) Compliance Ofc 3) Eureka	- -	Alternate Emergency Communication (Power Failure)	1) 562-755-3396 2) 562-755-3455 3) 562-755-3419

Table 2-3 Formal Written Reporting Requirements

AGENCY	SUMMARY OF REPORT REQUIRED
National Response Center (NRC)	No written report required. Notification only.
DOT Office of Pipeline Safety – Pipeline and Hazardouse Materials Safety Administration (PHMSA)	A report must be made within 15 days to the DOT and include the following information: • Name and address of the operator • Name and telephone number of the reporter • Time of failure • Fatalities and injuries, if any • Any other significant facts that may be relevant to the release
Department of Transportation	File Accident Report (DOT Form 7000-1) no later than 30 days after discovery of accident.
California Emergency Management Agency (EMA)	Written report-using form found in Title 19 CCR, Section 2705 for releases of extremely hazardous substances or CERCLA-listed substances over the reportable quantity within 30 days.
Bureau of Safety and Environmental Enforcement (BSEE)	For any spill >1 bbl, provide BSEE District Manager with written follow-up report within 15 days after spillage has stopped. Include information on cause, location, volume, and remedial action taken. For a spill >50 bbl, include information on sea state, meteorological conditions, and size and appearance of slick.
United States Coast Guard – Long Beach	None required. There is a witness/investigator statement form that may be requested by USCG.
United States EPA – Region IX	For a facility with a SPCC Plan, provide a written report within 60 days of the spill for any spill > 1,000 gallons or when two spills, meeting the 2002 Final Rule, occur within a 12-month period.
California Coastal Commission (CCC) Energy Unit	Follow-up written application for the CDP may be required.
California Dept. of Fish and Wildlife (DFW) Office of Oil Spill Prevention and Response(OSPR)	No specific report required. Report submitted to State EMA is utilized. State EMA will submit this report to the DFW/OSPR.
California Department of Transportation “CalTrans”	None required.
California Division of Oil, Gas, and Geothermal Resources (DOGGR)	None required. The DOG utilizes the EMA report and may make inquiries of their own, if further information is required.
California Highway Patrol	None required.
California Occupational Safety and Health Administration (CAL-OSHA)	None required.
Oiled Wildlife Care Network	None required.
State Fire Marshal – Pipeline Safety Division	None required.
South Coast Air Quality Management District	For breakdown, written report within 7 days. See California EMA for CERCLA-release reporting.
Orange County Fire Department	None required.
Orange County Sanitation District	None required.

2.4 RESPONSE OBJECTIVES

The Company is committed to the use of equipment and systems that comply with government rules and regulations and/or meet industry standards, and to follow sound operational and maintenance procedures. In addition to ensure response preparedness, employees associated with operations at its facilities are required to be familiar with this plan and must participate in specified training and simulation exercises, as appropriate.

The primary objectives in responding to any emergency are:

- **To save lives and prevent injuries to personnel and the public**
- **To minimize environmental impacts**
- **To minimize property damage**

Although response actions vary depending on the incident, general priorities have been assigned to response actions for satisfying these objectives. A summary of these priorities is provided in Table 2-4.

Table 2-4. General Priorities of Spill Response Actions.

PRIORITY	ACTION
1	**Assess the situation for immediate risk to personnel or public.** **If safe**: • Identify source of release and its potential toxic or combustible nature. • Sound alarm, warn people, and evacuate site, facility, or field if required.
2	**Save lives and prevent injuries.** • Make emergency call to report a serious injury or fire, and obtain assistance as needed. • Don required PPE if necessary. • Assist in evacuation of person(s). • Provide first aid.
3	**Initiate response actions when deemed safe.** • Take immediate actions to try to stop the flow of oil, and contain it if it can be done safely and quickly. • Report the event to the Manager of Operations or On Duty Supervisor. • Notify cleanup contractor(s) to assist or stand by. • Activate the Incident Response Team. • Deploy onsite spill response equipment. • Control the effects of the incident. • Set up (a) command post(s). • Initiate ICS for a sustained response. *(continued next page...)*

PRIORITY	ACTION (CONTINUED)
4	**Assess situation and make required notifications.** • Report circumstances to Manager of Operations/On Duty Supervisor as soon as possible: - Direction of spill flow. - General extent of release. - Status of shutdown. - Status of ignition sources, potential of fire. • Notify the required agencies, as appropriate. Notify property owners/adjacent operators as necessary.
5	**Minimize damage to the environment.** • Identify and protect sensitive resources and habitats. Deploy equipment and personnel as needed. • Pre-clean shoreline areas of debris if threatened by oil as necessary. • Over-respond and stand down if necessary. • Mobilize and deploy additional manpower and equipment from private contractors and public agencies.
6	**Clean up the affected area.** • Prepare and submit cleanup and restoration plans for government approval. • Implement plans effectively and efficiently.
7	**Submit report forms.** • Prepare and submit all spill report forms, as required by the Company and/or agencies, in a timely manner, and consistent with State and federal regulations.

2.5 RAPID RESPONSE

Early detection of spilled oil or other substances, and rapid response after the discovery, are critical to ensure the health and safety of personnel and in minimize the effects on the environment. The table below shows available onsite and nearby response equipment.

Table 2-5. Company Onsite or Nearby Response Equipment and Locations

PLATFORM	EQUIPMENT	
Eureka (in Dry Storage Bldg)	15 bales sorbent pad 6 bales sorbent boom (4 per bale) 1 sorbent roll (36") 8 tracking buoys	1 or more handheld radios
Ellen (Pipe Rack & Dry Storage	2 - 750-ft sections of spill boom (model 4300 Expandi- boom – pipe rack deck) 8 tracking buoys (Dry Storage)	1 or more handheld radios
Elly (in Spill Equipment Locker)	15 bales sorbent pad 6 bales sorbent boom (4 per bale) 1 sorbent roll (36") 8 tracking buoys	1 or more handheld radios to communicate with response team
Vessel Support – SoCal Ship Services	Crewboat *Nicholas L* (24/7) Supply Boat *Kenneth Carl* available on flexible schedule	*Timberwolf* support vessel (and/or other vessels) available as alternates (24/7)

2.6 INITIAL SPILL RESPONSE PROCEDURES AND GUIDELINES

As mentioned in previous sections, the initial response procedures to an oil spill or release are to be directed by the Manager of Operations or On Duty Supervisor (PIC) and will be to:

- Evaluate immediate hazards and take action to ensure safety of Beta Offshore personnel and the public
- Identify the source of the release and try to stop the flow of oil and contain it, if it can be accomplished safely
- Initiate ICS and activate the IRT and EOC as necessary
- Call Marine Spill Response Corporation (MSRC) for assistance or to standby
- Make required government notifications including O'Brien's Response Management agency notification. Always verify that NRC will be called first!
- Decide whether or not to deploy spill boom on Ellen. If so, mobilize appropriate personnel and boats.

The following sections contain additional useful information that can be used during the initial hours of a spill. Actual spill conditions can vary substantially and the required response actions will also vary

2.6.1. Establishing A Command/Communications Post And Staging Area

The following procedures provide an outline for establishing the Central Command/Communications Post. For Beta, the Command Post (CP) will normally be initially located at the MSRC Office on Spring Street near the Long Beach airport. An alternate location for offshore/Long Beach incidents would be a hotel conference center in the Long Beach area. Supply boxes are maintained at the major CP's that provide the checklists, forms, vests, and other specific immediate needs for the group designated on the particular box.

For Beta offshore incidents, a Forward Command Post (FCP) and the Situation/Status area can readily be activated on Platform Ellen. Procurement/Logistics and Operations work cooperatively to keep this FCP at a state of readiness, and to activate it when directed to do so.

Spill Response plan regulations require that this plan describe general procedures for activitating a Command Post should one be required in an area away from the locations discussed above. We recognize that these procedures may be somewhat dependant upon the size of the incident. Hence, we first provide an outline of general procedures for establishing a

Command/Communications Post and staging areas that may be required in the event of a major spill. A major spill may require larger facilities and additional, or larger staging areas. In such a case, the exact location for establishing command and communication posts and staging areas may not be definable until the area of impact is known.

Generalized procedures are followed by predesignated locations for command and communications posts and staging areas that are designed to deal with localized and more specific oil spills.

General Procedures - Command/Communications Post

A Command Post would be established to serve as the primary location for the Command Staff activities and the various meetings and briefings held throughout response operations. The actual location of the Command/Communications Post would depend upon the incident. The MSRC Office or a hotel nearby could be utilized. The Logistics Chief would be responsible for establishing the Command Post. Command/Communications Post features should include:

- Proximity to incident location
- Sufficient size to allow response personnel to operate effectively and comfortably
- Room for conferences, Unified Command meetings and media briefings
- Situation Room with wall maps to track the spilled oil, response equipment, sensitive resource areas, personnel, phone numbers, organization charts
- Phone and fax lines
- Security
- Office support systems (e.g., facsimile machines, copiers, telephone lines, computers, internet access, file system, AM radios, VHF/UHF radios, base communication station, etc.
- Communications systems that could be used include cellular telephones, local phone system, company radios in vehicles and base stations, internet/websites, and pagers as conditions warrant.

Field Command Post

A Field Command Post may also be established at or near the scene of the incident. The primary function of the Field Command Post is to conduct all activities which are directed toward reduction of the immediate hazard, including recovery and cleanup operations.

Staging Areas

In a major spill response, numerous staging areas may be required to support containment and cleanup operations. Staging areas would need to be equipped with prime movers, cranes, and other machinery necessary to load/unload response equipment and supplies to trucks, vessels, etc. Personnel at staging areas need to establish inventory control systems to track equipment use. In selecting a suitable staging area, the following criteria should be considered:

- Direct access to impacted areas
- Adequate space to safely stage equipment and supplies
- Proximity to populated areas or environmentally sensitive areas
- Adequate Lighting

POSSIBLE STAGING AREAS		
Purpose	**Location**	**Contact Information**
Offshore support, load-out	Ship Services, Terminal Island 971 South Seaside Ave.	(310) 519-8411
Onshore/nearshore offshore support	Southshore Boat Launch 590 Queensway Dr. (24hr) across from Queen Mary	(562) 570-8636
Onshore/nearshore, offshore support	Alamitos Bay - 205 Marina Drive @ 2nd Street	(562) 570-3215
	Huntington Harbor – Sunset Aquatic Ramp (w. end of Edinger)	(714) 846-0179
Onshore/nearshore	Belmont Pier and Adjacent Beach Seal Beach Pier Area Bolsa Chica State Beach Huntington City/State Beaches Newport and Balboa Pier Areas	(562) 570-1360; (562) 570-3215 (562) 430-2613 (714) 846-3460 (714) 536-5281; (714) 536-5280 (949) 644-3047

Additional staging areas in the event of a major spill response would be somewhat dependent upon the location and size of the spill. The exact location may not be definable until the area of impact is known. There are numerous commercial piers in the area adjacent to the facilities that could provide areas for staging of equipment and personnel. Refer to the LA/LB Southern Sector Area Contingency Plan Sections 9841 (LA County) and 9842 (Orange County) for additional coastal access points and potential staging area locations.

2.6.2 Determining The Properties Of The Spill

Once the spill source is identified, the properties of the spilled product should be determined. Pertinent data are contained in Material Safety Data Sheets and laboratory analyses performed by the Company. Critical properties, which may need to be considered in determining response strategies are shown below. A copy of a MSDS for crude oil is in Annex Q.

- API Gravity 13 - 16
- Flash Point <70 – 76 °F
- Pour Point 37.4 °F
- Solubility slight
- Specific Gravity 0.95
- Viscosity 2,500 cp (at 59 °F)

2.6.3 Assessing Environmental Conditions

Determining the environmental factors that could affect a spill is important in the planning and implementation of an effective response strategy. Critical information includes:

- Oceanographic Conditions
- Meteorological Conditions
- Biological Setting
- Economic and Cultural Resources

Sensitive Natural Resources are described in Annex L. This annex also refers to protection strategies for specific sensitive sites along the Los Angeles County and Orange County shorelines. These protections strategies are detailed in the LA/Long Beach Southern Sector Area Contingency Plan (including site-specific contacts, number of personnel and the number and types of equipment required to protect each designated sensitive area).

2.6.4 Monitoring And Predicting Spill Size And Movement

Estimating Spill Volume On Water/Land

Guidelines to estimate the amount of oil spilled on water or onshore are provided in Attachment 2-4 at the end of this section.

Monitoring And Predicting Spill Movement

Utilize the following resources for monitoring and predicting oil spill movement:

Small Spills

- Use visual observations by personnel from the facility, vessels, and/or vehicles, depending on discharge location and access. Use handheld radios/cellular phones to communicate. Use tracker buoys, if available, or stationary vessels in the slick to track oil spills in poor visibility or at night.
- For method to predict spill movement, see Attachment 2-3 at the end of this section.

Larger Spills

- Begin initial tracking using tracker buoys and weather/current conditions observed at the platform or on boats in the area.
- Notify and coordinate with O'Brien's Response Mgmt. to predict spill trajectory and impact time/locations. O'Brien's Response Mgmt. indicates spill projection overlayed on NOAA-nautical charts, with numbered Sensitive Area Sites from the ACP identified. **O'Brien's Response Management's Slidell, Louisiana Command Facility can be reached at (985) 781-0804, 24 hours per day.** Request new trajectory runs when situation or wind/current change, or at periodic intervals as directed by the Incident Action Plan. Be sure trajectory output information gets to the Documentation/Situation Unit Leader and posted in Sit/Stat.
- Observe the spill from aircraft. Document GPS coordinates of leading edge and estimate spill size and appearance. Document any wildlife or other items of note. Also, take pictures if possible. Be sure to provide information from these overflights to Situation/Statues as soon as feasible. Use contracted helicopter or other aerial craft as available. If possible, use aircraft equipped with mounted sensor systems. Also, consider contacting NOAA for satellite imagery to track the spill.

Since most oils are lighter than water, most spilled oils will float on the water's surface in the form of a slick. Depending on surface currents, winds, and physical boundaries, a slick can spread into several shapes. In the absence of physical boundaries, a slick may appear circular, elliptical or triangular in shape. A circular slick is formed when there are no significant surface currents or winds, whereas an elliptical slick is formed by moderate surface currents and winds. High winds and strong currents will create a more triangular-shaped slick. Each type of slick will widen and spread as it moves away from its source. Wave action, usually caused by winds, can increasingly distort these shapes and eventually divide the slick into smaller streamers or wind rows of oil separated by sheen.

NOAA's Oil Simulation Model (OSSM) relies on four input components; namely, tides of the region, meteorological forecast data from the National Weather Service, a Monte Carlo simulation equation, and weathering and evaporation data from the slick. Information, supplemented by on-scene observations, including approximate locations of the oil slick during various time intervals, makes it possible to project spill movement onto a digitized map of the area. Different simulations are possible as real time conditions change. Maps can be obtained via fax or through direct access to NOAA trajectory analysis.

Beta Offshore's trajectory contractor, O'Brien's Response Management, normally transmits trajectories electronically and/or via fax. Their projections are displayed on NOAA Nautical Charts and/or USGS topographic maps, with ACP Sensitive Sites, significant landmarks, and projected shoreline impact time and location shown. These trajectories are well suited for display via projector, and for electronic transmission to the platform.

2.6.5 Identifying Response Priorities

Three response priorities that must be addressed during the planning process include:

- **the protection of life and health**
- **the protection of the environment, and**
- **the protection of property**

Anyone observing a spill should take action or contact the necessary qualified person to take emergency action to stop the flow at the source if it can be done safely and quickly.

The LA/LB Southern Sector Area Contingency Plan (ACP; Sec. 9840, 9841 and 9842) prioritizes and provides detailed protection information (down to the level of equipment needed) for each sensitive area. This information may be obtained from the latest version of the Southern Sector ACP.

Fire and explosion are potential dangers during petroleum product spills. Although flammability varies dramatically with the spilled product and the circumstances, it is essential that all reasonable steps be taken, as soon as possible to minimize the chance of accidental ignition of the spilled products (e.g., extinguish open flames, cease all operations which vent oxygen/enriched oxygen mixtures, shut off arc welders, grinders, etc., shut off electric circuits that might create a fire hazard).

In the event of a spill resulting from fire/explosion, the response priorities would be to ensure personnel safety, to activate all fire suppression systems, and to make the necessary notifications. If spilled oil is burning, response contractors would be forced to let it burn, in the interest of safety. Spilled oil (not burning) can only be contained and recovered when responders are not in danger from fire/explosion.

Neighboring resources that require protection or specific response strategies may include:

- Nearby population center
- Properties at risk (marinas, beaches, harbors, parks)
- Potentially affected industrial activities (e.g., water intakes)
- Economic and cultural resources
- Biological resources (e.g., sensitive habitats, commercial and recreational fish/shellfish stocks, wildlife, plant life)
- Other marine-dependent uses (e.g. mariculture, navigation). Note: Potential impacts to major shipping lanes should be brought to the US Coast Guard/Federal On-Scene Coordinator’s attention at once!

Resources that may be used to identify and prioritize sensitive resources that may be threatened or impacted by the spill and to identify protection strategies include:

- Trajectory analysis showing possible affected coastal resources
- LA/LB Southern Sector Area Contingency Plan (ACP) Section 9840, 9841 and 9842
- NOAA ESI maps ranking various shoreline types in order of increasing potential for long-term oil persistence and biological damage

2.6.6 Selecting Response Options

Every spill is different. In addition, oil properties and ambient conditions that influence the effectiveness of any response option change continuously throughout an incident. No response option (i.e., mechanical or non-mechanical) should be ruled out in advance. Alternative technologies, such as dispersants and *in-situ* burning, need to be evaluated very early in the response effort if they are to be feasible options. Additional information on general response techniques may be found in the OSPRP as follows:

General Response Technique	ICP Reference
Mechanical Methods Of Response	
On-Land Response and Cleanup Strategies	Annex K.2
On-Land Cleanup Techniques	Table K-1
Creek Response and Cleanup Strategies	Annex K.3
River Response and Cleanup Strategies	Annex K.4
Open-Water Response and Cleanup Strategies	Annex K.5
Shoreline Response and Cleanup Strategies	Annex K.6
Non-Mechanical Methods Of Response	
Dispersants	Annex K.7.1.2, Attachment K-2
In-Situ Burning	Annex K.7.1.3
Bioremediation	Annex K.7.2
Shoreline Cleaning Agents	Annex K.7.3

The use of alternative response methods will be considered when the preferred recovery methods and cleanup techniques are considered inadequate and the environmental benefit of an alternative technique outweighs any adverse effects. For an instantaneous release, a very narrow window-of-opportunity exists for dispersants or in-situ burning. For an ongoing release, the window may be somewhat larger. Therefore, consideration and approval by the Regional Response Team (RRT) would be sought almost immediately from the onset of the incident if mechanical methods are considered inadequate. Information forms would be completed by Planning and provided to the Unified Command for the FOSC to formally submit it to the RRT for review. The information form required to be completed for dispersant use is found in Attachment K-2 of the OSPRP. Response contractors would be alerted that approval will be identified and directed accordingly. Consideration should be made for a test spray if requested by the RRT, and a Safety & Health Plan is required for dispersant application.

A decision guide for selecting dispersant use over conventional mechanical means, including a discussion of the 11 decision points, is included in Attachment K-2 of the OSPRP. However, rapid completion of the Quick Approval Process forms, working via telephone with OSPR's RRT dispersant coordinator, is needed if dispersant is an option.

Once response options have been identified, it is imperative that the type, size, and amount of specific response equipment and supplies, as well as the numbers and types of personnel necessary to support the operation, be identified and mobilized.

2.6.7 Specific Response Strategies for the Beta Pump Station and Pipeline

Spills originating from the Beta Pump Station or the on-land portion of the 16" Pipeline from Platform Elly can present challenges to response and recovery efforts due to obstacles and proximity to bodies of water. Please refer to Tables 2-7 through 2-9 for specific response strategies for these facilities.

In General – For Spill Response - Do Not Delay.

Plan Ahead.

Over-respond and stand down if necessary.

Do not get behind on the curve.

Table 2-6 Beta Spill Boom Launch Procedure

Procedure Number: BETA-OPS-304 **Beta Spill Boom Launch**	**Approval date:** **Revision Date:** 2/28/05

Overview	Launch and retrieval of the Oil spill Boom
Roles and Responsibilities	**Title of Responsible Person(s):** Team Captain (PIC) and Alternate Captain (Logistics/Mechanic) **Who the person(s) report to:** Production Supervisor/Facility Superintendent or the Designated Person in Charge (PIC)
Hazards associated with procedure	**Special or Unique Hazards:** • Potential fall to water or deck from walkway. • Pinch points, hazards while spill boom is being lifted. • Being struck by Rotopack while moving off platform. • Strains and or over extension of arms, legs, backs while retrieving the WET boom. • Noise in the area and obscured line of sight. • Secure H2S monitors, radios and anything else that may be hanging from clothing to prevent in entanglement in boom while connecting two sections. **Safety Device Set points:** None **Consequences of Deviation:** Injury to personnel or damage to equipment
Required Equipment	• Release of boom deployment buoys at initial spill and every 15 minutes there after if spillage continues. • Handheld radio, one with the crane operator, at least one with deployment vessel, and or more with an observer(s) (3 total). • Standard Personal PPE: hardhat, steel-toed boots, safety flasses, H2S monitor. • Additional PPE: ear plugs (P/F Elly), gloves, work vest (flotation device), rain gear if needed. **NOTE:** **Continuous communication between the boat captain and the Platform Observers is mandatory. The safe deployment/recovery of the boom depends on communications**

WARNING!:
This operation is inherently DANGEROUS to personnel in close proximity to the spill boom apparatus while being lifted off deck.

Pre-start Conditions:

1. All participants shall be assigned specific tasks and briefed on their responsibilities.
2. Remove weather covers from Roto-pack. Roll or fold the covers. DO NOT obstruct walkways.
3. Ensure Radio(s) and spare parts tools are sealed pouch (floatable Bag)

Procedure:

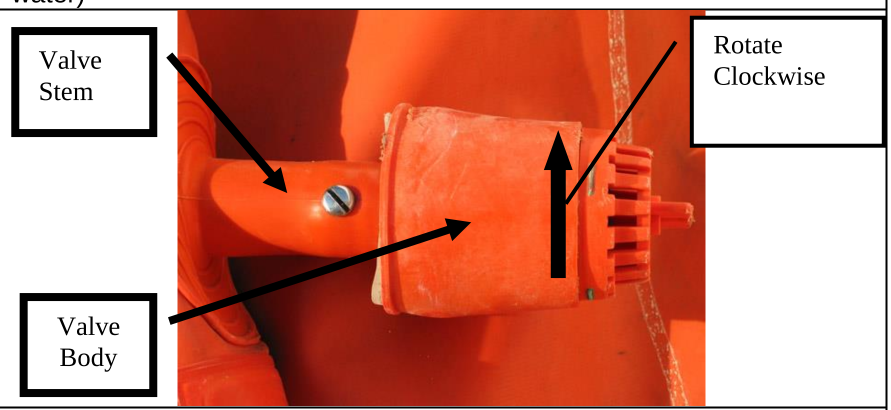
Initial Startup:

Step	Action
1	Boom deployment Team Leader will determine if conditions are 'Safe' for deployment, based on weather and available personnel / equipment.
2	Insure site entry survey has been completed

Procedure:

Normal Operations:

Boom Launch with crane

Step	Action
1	Check all valves (turn valves clockwise or turn in when going into the water)
	
2	Unwind towline from boom and set on top of boom, also attach a small buoy to it.
3	Attach (2) large buoys to boom (attach buoys to lower chain)
4	Hook-up lifting slings with a quick release hook to boom section number one (1), Place (quick release) line accessible from deployment vessel.
5	Attach tag lines to lifting slings.
6	Lift boom and place in water
7	Boat deck hands to retrieve float bag.

	
8	Once the boom is in water undo the quick release lines (boat hook may be needed at this time)
9	Bring lifting slings back on board.
10	Have tow boat take tow line from top of boom and unroll very carefully (slowly)
11	Platform personnel shall observe the boom deployment and report to boat if any section does not inflate properly. Boat crew to inspect deployed boom for proper inflation of all chambers. When returning to deploy second boom section.
12	Deploy section two (2) following this procedure.

Procedure:

Normal Operations:

Boom Section Connections

Step	Action
1	Make sure buoys are aired up and are connected to boom connectors
2	Lubricate both universal connector slide joints. Lubricate inside of the universal connector with a lite Teflon lubricant that is impervious to salt water
3	Start with (A) Male end and slide it into (B) female end. Make sure that both top end line up on the universal connectors.
4	Once you have ends together then comes a very important part. Connecting the coupler safety pin. Insert and pull safety clip over the end of the safety pin and release. This will lock both male and female universal connectors in place. At this point you are ready to start deploying the boom.

Procedure**:**

Temporary Operations: None

Procedure**:**

Emergency Shutdown: None

Procedure**:**

Emergency Operations: None

Procedure:

Normal Shutdown:

Secure the protective cover on the spool after the boom has drained.

Procedure**:**

Startup following Repairs:

Retrieval operations performed by MSRC.

Procedure:

Follow-up of Procedure:

Critique of Drill or Real deployment

Table 2-7. Beta Pump Station Response Strategy for East-Flowing Spill.

SPILL SCENARIO	POTENTIAL IMPACTS	ACTIONS TO BE TAKEN
Spill flows east towards 710 Freeway/Los Angeles River. Flow heads to storm drain at NE corner of property, but could back up at drain. Pump station on east side of freeway starts up automatically upon detecting fluid and pumps into Los Angeles River.	Flooding of oil on railroad tracks disrupting industrial commerce. Roadways shut down for safety. Commerce into Port of Long Beach disrupted. Spill to navigable waters, that is, the Los Angeles River. If tide carries upstream to Anaheim Street, could impact birds there.	Physically shut down pump on east side of freeway. Activate Clean Harbors or Patriot Environmental to assist in pump shutdown, notifications, blocking storm drains and containing spill. Notify City of Long Beach Public Works (Annex O, Table CL-5 Local). Protective booming by MSRC if spill advances into or backs up into Los Angeles River. • Entrance to Catalina Cruises berth just northwest of Queensway Bridge. • Booms off Shoreline Village Lagoon (sensitive area). • THUMS boom near Production Island Grissom to protect Long Beach Marina. Recovery/response booming at: • South of Ocean Blvd. Bridge. • South of Ocean Blvd. Bridge across to downstream edge of slough into boat launch area of Golden Shore RV Park. • Across from Reef Restaurant/Island Express Area upstream of Queen Mary to the Long Beach Marina sidewalk/parking lot. • Downstream edge of Queen Mary breakwater to Long Beach Marina sidewalk/parking lot. Potential staging areas/locations for vacuum trucks to recover fluids at: • Golden Shore RV Park. • Long Beach Marina.

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Table 2-8. Beta Pump Station Response Strategy for West-Flowing Spill.

SPILL SCENARIO	POTENTIAL IMPACTS	ACTIONS TO BE TAKEN
Spill flows west toward Pico Avenue to a storm drain located close to southeast corner of property. Storm drain flows underneath Pico Avenue towards northwest draining into berth at Pier D-51 near Forest Terminal.	Potential disruption of port activities.	Activate MSRC to deploy boom. Coordinate boom deployment with responsible agencies and the Port. Ensure notifications made to appropriate Port tenants. Potential staging areas: • CRC/Tidelands (refer to Emergency Placard for contact). • Golden Shores RV Park parking area. • Long Beach Marina.

Table 2-9. Beta Pipeline Onshore Spill Response Strategy.

SPILL SCENARIO	POTENTIAL IMPACTS	ACTIONS TO BE TAKEN
Leak from 16-inch pipeline between Queen Mary and Beta Pump Station, OR Leak in one of three 10-inch pipelines from Beta Pump Station to THUMS Manifold.	Disruption of port activities.	Identify and isolate downstream storm drain(s) to prevent/minimize gravity flow into shipping berths. Activate MSRC and other responders immediately.

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ATTACHMENT 2-1

BETA EMERGENCY INCIDENT NOTIFICATION PLACARD

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Emergency Incident Placard

Beta Offshore – BETA Unit Complex

Including Beta Pump Station, San Pedro Bay Pipeline

Immediate Response and Notifications

Beta Unit: Ellen/Elly OCS-300
Latitude 33˚34'56"N
Longitude 118˚07'39"W

Beta Unit: Eureka OCS-301
Latitude 33˚33'50"N
Longitude 118˚07'00"W

(985) 781-0804 (24 Hr. Number)
To Activate
The O'Brien's Response Management
(All or partial Activation)

Thomas Haug	562-217-3511
Dan Sobieski	714-342-6358
Joe Chirco	714-342-0460
Brea Office	714-577-2100
Fax:	714-577-2118

INCIDENT OBSERVER
↓
Manager of Operations and / or On-Duty Supervisors (PIC) ➔➔➔➔

Activate the following (24 hr availability):
1. SoCal Ship Services 310-519-8411
2. MSRC 800-259-6772 / 800 645-7745
3. O'Brien's Agency Notification 985-781-0804 Confirm 1st call is NRC!
4. BSEE if spill is >1 bbl 805-384-6370

↓

Please Notify the Qualified Individuals (QIs) below, in the event of Emergency

Yohn Rosqui	Ofc: 562-606-5706 Cell: 562-755-3137	Diana Lang	Ofc: 562-628-1529 Hm: 714-965-0297 Cell: 562-522-5095
Alternate QI		**Alternate QI**	
Jamie Cool	Ofc: 562-628-1526 Cell: 310-902-3578	Rick Armstrong	Ofc: 562-628-1526 Cell: 310-560-5281

- **PIC to call Elly Control Room** 562-606-5711
- **Courtesy call to BSEE** 805-384-6370

Potential for Media Attention Contact

Below MUST be activated by Bruce Berwager or Diana Lang:

Sam Sacco, Strategy & Comm.
Ofc: 510-594-8575
Fax: 510-594-8577
Hm: 510-547-1713
Cell: 510-541-6449

Incident Management Team Health/Safety & Environmental

Diana Lang	Ofc: 562-628-1529 Cell: 562-522-5095
Terry Mullin	Ofc: 562-606-5720 Cell: 661-747-1698

Notify Agencies

Use appropriate report form. Agencies to be notified are specific to the type and location of the event.

NRC	**800-424-8802**
Cal Office of Emer. Svcs	800-852-7550
BSEE	**805-384-6370**
BSEE # for pipeline	805-384-6370
USCG dispatch	**310-521-3800**
DF&W OSPR Dispatch	916-445-0045
DF&W	562-342-7214
DOGGR	714-816-6847
DOT/OPS	202-366-4595
FAA (24Hr.)	310-725-3300
Hunt. Bch Fire Hazmat	714-536-5469
Hunt Bch Fire Dispatch	714-536-2501
L.A. City Fire (in port)	**310- 548-7540**
L.A. County Fire Dept.	562-697-6731
Hunt. City Beach HQ	714-536-2581
Hunt. State Beach HQ	714-536-1454
Long Beach Fire Dept.	562-218-8179
Long Beach	562-980-4017
NMFS (National Marine Fisheries Svcs.)	
Orange Co. Sanitation	714-962-2411
Orange County Fire Authority:	
Hazmat Desk	714-536-5469
Dispatch	714-538-3501
RWQCB	909-782-4130
SCAQMD	800-288-7664
State Lands (SLC-Local)	714-536-3018
SLC (Long Beach)	562-590-5201
State Fire Marshal	562-497-9100

Co-Op / Contractors (Call within 30 Min.)

MSRC (spill/drill call-out)		800-259-MSRC (6772) 800-OIL-SPILL (645-7745)
MSRC LB Office		562-981-7600
Mgr. Rick Tamayo		562-981-7640
MSRC FAX		562-981-7601
Patriot Environmental		562-436-2614
Clean Harbors		800-645-8265
SoCal Ship Services	(24Hr)	310-519-8411

MSRC Command Post

562-981-7600
3300 East Spring St.
Long Beach, CA

Beta-Ellen Forward Command Post

IC/Ops	562-606-5705
Logistics/Sit-Stat	562-606-5704
Fax	562-606-5701

Offshore Adjacent Operators

Federal OCS Waters:		
Edith (DCOR)		714-960-6342
	Fax:	714-960-6343
State Waters:		
Emmy (CRC-LB)		714-969-3206
	Fax:	714-969-3287
Eva (DCOR)		714-960-6592
	Fax:	714-960-6593
Esther (DCOR)		714-960-6289
	Fax:	714-960-6299

Beta Emergency Numbers

Elly Control Room	562-606-5711
Production Supervisor	562-606-5705
Elly Fax	562-606-5727
Facility Supervisor	562-606-5706
Ellen Fax	562-606-5701
Compliance Office	562-606-5742
Eureka Fax	562-606-5719
Eureka Production Office	562-606-5783
Eureka Control Room	562-606-5732

Contract Wildlife Assistance NRDA/SCAT

MBC Applied Environmental Svcs.	
Costa Mesa	714-850-4830
Entrix	805-477-5003 925-935-9920
BBL Science	310-242-6712 562-400-4570

San Pedro Bay Pipeline & Beta Onshore Pump Station

170 N. Pico Ave. Long Beach, CA

Rick Armstrong	Cell: 310-560-5281
Elly Control Room	562-606-5711
Beta Station	562-436-0521
Mike Smith	562-755-3387

Animal Assistance

SPCA LA	888-772-2521
LA Animal Services.	888-452-7381
Animal Shelter	714-536-8480
Marine Mammal Center	310-548-5677
Pacific Marine Mammal	949-306-3326

Oiled Wildlife Care Network

Response Pager	916-556-7509
New Reporting No.	**877-823-6926**
Dr. Mike Ziccardi	Ofc: 530-754-1218 Cell: 530-979-7561 Ofc: 530-754-5701
Alternate notification No.	530-752-4167
Volunteer Coordinators	530-754-5481

Other Resources, Long Beach Port Area

CRC (THUMS)	562-624-3452
Tidelands	562-495-9392 562-436-9918
Crimson PL, Control Center	661-293-8137 866-351-7473

CEO Notification

Any accident on incident requiring company member notification likely to be recorded as lost time, injury or illness involving unconsciousness, requiring transportation by ambulance or helicopter, requiring overnight hospitalization, involving Beta Offshore or Contractor Property, Loss and damage >$25K or other's property >$10K, involving the spill or release of a hazardous substance in a reportable quantity, involving spill 1 bbl or more of crude oil into waters of US or State, any explosion, fires caused by or involving process equipment, human exposure to H2S or other gas requiring medical treatment.

Additional Resources

Mercy Air Ambulance	**800-222-3456**
LA County Sheriff(Carson)	310-830-1123
LA County Sheriff Aero Unit	562-421-2701
Orange County Sheriff	714-647-7000
LBPD	562-435-6711
LB Port Security	562-590-4185
American Red Cross	562-595-6341

Beta OFFSHORE

LONG BEACH OFFICE, PIPELINE & PLATFORMS PHONE DIRECTORY

BETA CORPORATE OFFICE

111 West Ocean Blvd., Ste 1240 Long Beach, CA 90802

Office (562)628-1526 Fax (562)628-1536 HR Fax (562)628-9595 Conference (877)366-0711

Name	Direct Line	Ext	Mobile	Dept/Title
Bruce Berwager	(562) 628-1539	326		Vice President
Casey Sbicca	(562) 685-9907	250	(760) 420-9487	Project Safety Engineer
Christian Zumaran	(562) 685-9903	303	(909) 374-2009	Facilities Engineer
Cory Klett	(562) 628-1543	259	(310) 486-4031	Drilling Engineer
Diana Lang	(562) 628-1529	370	(562) 522-5095	HSE Manager
Drew White	(562) 628-1530	224	(562) 833-3617	Purchasing Agent
George Romero	(562) 683-3492	366	(714) 423-1379	Project Engineer/ATMOS Support
Homer Teran	(562) 628-1555	262	(714) 412-7387	IT Systems Administrator
Jamie Cool	(562) 628-1550	333	(310) 902-3578	Facilities Engineer Supervisor
Jon Tuico	(310) 241-6146		(562) 458-2633	Materials Coordinator @ SCSS
Kate Conrad	(562) 685-9909	247	(310) 683-3817	HR Manager
Kim Dreiske	(562) 628-1548	300		HR Assistant
Leila Vlasko	(562) 685-9912	371	(832) 372-9345	Staff Production Engineer
Leo Aguirre	(310) 241-6146		(562) 250-7023	Materials Coordinator @ SCSS
Leo Renteria	(562) 685-9906	266	(714) 580-4934	Purchasing Agent
Lidia Carbajal	(562) 628-1537	355		Accounts Payable Supervisor
Lorraine Lopez	(562) 628-1528	225	(310) 753-4179	Purchasing&Support Services Manager
Marielle Lomax	(562) 628-1544	335	(714) 300-9286	Project Engineer
Matthew Perry	(562) 685-9901	248	(714) 343-8918	Facilities Engineer
Rick Armstrong	(562) 628-1534	227	(310) 560-5281	Pipeline Superintendent
Terry Mullin	(562) 685-9902	720	(661) 747-1698	Safety & Compliance Supervisor
Veronica Banuelos	(562) 628-1532	365		Lead Financial Accountant
Yohn Rosqui	(562) 606-5706	706	(562) 755-3137	Production Manager

CONFERENCE / LUNCH / IT ROOMS

Large Conference Room	261	Direct Line	(562) 628-1527
Engineering Conference Room	264	Direct Line	(562) 628-1533
Lunch Room	263		
IT Room	787	Direct Line	(562) 606-5787

SAN PEDRO BAY PIPELINE CO (BETA STATION)

170 N Pico Ave, Long Beach, CA 90802 Fax: (562) 437-6271

Name	Mobile	Phone	Dept/Title
Mike Smith	(562) 755-3387	(562) 436-0521	Pipeline Technician
Tom Jung	(714) 499-1700	(562) 436-0521	Pipeline Technician
Jerry Sianez	(562) 400-3010	(562) 436-0521	Pipeline Technician

MEMORIALPRODUCTION PARTNERS - EMERGENCY OPERATIONS CENTER (EOC)

500 Dallas Street, Suite 1600; Houston, TX 77002

Main Line: (713) 588-8300

Name	Direct Line	Dept	Mobile	Email
Brian Lee	(832) 408-8656	Eng	(562) 477-2771	brian.lee@memorialpp.com
Chris Cooper	(713) 588-8317	Exec	(713) 969-9997	chris.cooper@memorialpp.com
Ginny Penzell	(713) 588-8348	Risk	(713) 806-0343	gpenzell@memorialrd.com
Jason Childress	(713) 588-8369	Legal	(832) 540-4428	jchildress@memorialpp.com
Jason Folkes	(832) 408-8757	IT	(832) 813-2950	jason.folkes@memorialpp.com
John Deck	(713) 588-8379	IT	(713) 470-8971	jdeck@memorialpp.com
John Weinzierl	(713) 588-8310	Exec		jweinzierl@memorialpp.com
Katrina Nivens	(713) 588-8368	Legal	(281) 797-5464	knivens@memorialpp.com
Memorial IT Supp		IT		itsupport@memorialpp.com
Matt Hoss	(713) 490-8910	Fin	(210) 831-7499	mhoss@memorialpp.com
Michael Jordan	(832) 408-8627	Ops	(936) 645-4959	michael.jordan@memorialpp.com
Tam Dang	(713) 490-8913	Fin	(832) 270-6198	tdang@memorialpp.com
TainiaLynn Ebrecht	(832) 408-8738	HSE	(713) 838-5335	tainialynn.ebrecht@memorialpp.com
Toby Nivens	(713) 588-8393	HSE	(713) 560-3493	tnivens@memorialpp.com
Tom James	(713) 490-8957	Purch	(713) 623-3791	tjames@memorialpp.com

BETA UNIT - PLATFORMS

PHONE PREFIX (562) 606-5XXX

COMPLIANCE / SAFETY - ELLEN	
Charles Coleman Dave Slizewski	742
PLATFORM SUPERINTENDENTS	
Ed Rothenay Cell 562-755-2674 Paul Napoleone Cell 562-708-9046	705
DRILL SITE MANAGERS	
Angel Medrano Cell 805-317-5517 Ron Sisco Cell 435-817-3213	703
MAINTENANCE LEADS - ALL PLATFORMS	
Darin Lopez	704
Bob Perkins	709
PRODUCTION LEAD - EUREKA	
Alex Vasquez	783
CRANE TRAINER & INSPECTOR	
Bill Bailey	750
ELLEN - Electricans Shop	715
ELLEN - Engineering / Crane Office	708
ELLEN - Galley	713
ELLEN - Rig Safety Office	707
ELLEN - Tool Pusher/Rig Office	703 / 745
ELLEN - Training Office	718
ELLEN - Wellbay Shop	743
ELLY - ACR	702
ELLY - Control Room	711 / 712
ELLY - Facility Ops	728
ELLY - Mechanics Shop	731
EUREKA - ACR	724
EUREKA - Compliance/Safety Office	784 / 720
EUREKA - Control Room Bldg. 60	732
EUREKA - Crane Office	785
EUREKA - Electricans Shop	717
EUREKA - Gaitronics	798
EUREKA - Galley	726
EUREKA - Mechanics Shop	725
EUREKA - Tool Pusher/Rig Office	722 / 760

PLATFORM BACK-UP EMERGENCY CELL PHONES

Ellen	(562) 755-3455
Elly	(562) 755-3396
Eureka	(562) 755-3419
Platform Edith	(714) 960-6342

SO CAL SHIP SERVICES (SCSS)

971 S Seaside Ave, Terminal Island, CA 90731

1410 Barracuda St, Terminal Island, CA 90731

Phone: (310) 519-8411 Fax: (310) 519-4017

QUANTUM SOLUTIONS

Dale Frey (dfrey@qsicontrols.com)	(618) 616-2000
Darrin Hoover (dhoover@qsicontrols.com)	(314) 719-9902
Dave Menne (dmenne@qsicontrols.com)	(314) 719-9902
Eric Casciaro (ecasiaro@qsicontrols.com)	(314) 495-9321
Lance Musson (lmusson@qsicontrols.com)	(618) 420-5422
Thanh Phan (tphan@qsicontrols.com)	(618) 340-8442
Will Worth (wworth@qsicontrols.com)	(618) 340-3907

ISLAND EXPRESS HELICOPTER SERVICE

1175 Queensway Hwy, Long Beach, CA 90802

Ph: (562) 436-2012

CA EMERGENCY PHONE LISTING

Fire & Police	911
MSRC Spill Response	(800) 259-6772
Long Beach Police Department	(562) 435-6711
Long Beach Fire Department	(562) 218-8179
Cal EMA (formerly OES)	(800) 852-7550
USCG Dispatch	(310) 521-3800

ATTACHMENT 2-2

ICS 201 AND 214 FORMS

1. Incident Name	2. Prepared by: (name) Date Time:	INCIDENT BRIEFING ICS 201-OS (pg 1 of 4)

3. Map/Sketch (include maps drawn here or attached, showing the total area of operations, the incident site/area, overflight results, trajectories, Impacted shorelines, or other graphics depicting situational and response status)

1. Incident Name	**2. Prepared by:** (name) Date Time:	INCIDENT BRIEFING ICS 201-OS (pg 2 of 4)

4. Initial Incident Objectives

5. Summary of Current Actions

Time	Action/Note

1. Incident Name	**2. Prepared by:** (name) Date Time:	INCIDENT BRIEFING ICS 201-OS (pg 3 of 4)

3. Current Organization

Unified Command

FOSC ______________________

SOSC ______________________

RPIC ______________________

____

____

Safety Officer ______________________

Liaison Officer ______________________

Information Officer ______________________

Operations Section	Planning Section	Logistics Section	Finance Section

Div./Group

Div./Group

Div./Group

Div./Group

Div./Group

1. Incident Name	**2. Prepared by:** (name) Date Time:	INCIDENT BRIEFING ICS 201-OS (pg 4 of 4)

7. Resources Summary

Resources Needed	Time Ordered	Resources Identifier	ETA	On-Scene? (X)	NOTES: (Location/Assignment/Status)

1. Incident Name	2. Operational Period (Date/Time) From: To:	UNIT LOG ICS 214-CG

3. Unit Name/Designators	4. Unit Leader (Name and ICS Position)

5. Personnel Assigned

NAME	ICS POSITION	HOME BASE

6. Activity Log (Continue on Reverse)

TIME	MAJOR EVENTS

7. Prepared by: **Date/Time**

1. Incident Name	2. Operational Period (Date/Time) From: To:	UNIT LOG (CONT.) ICS 214-CG

6. Activity Log (Continue on Reverse)

TIME	MAJOR EVENTS

7. Prepared by: **Date/Time:**

UNIT LOG (ICS FORM 214-CG)

Purpose. The Unit Log records details of unit activity, including strike team activity or individual activity. These logs provide the basic reference from which to extract information for inclusion in any after-action report.

Preparation. A Unit Log is initiated and maintained by Command Staff members, Division/Group Supervisors, Air Operations Groups, Strike Team/Task Force Leaders, and Unit Leaders. Completed logs are submitted to supervisors who forward them to the Documentation Unit.

Distribution. The Documentation Unit maintains a file of all Unit Logs. All completed original forms MUST be given to the Documentation Unit.

Item #	Item Title	Instructions
1.	Incident Name	Enter the name assigned to the incident.
2.	Check-In Location	Enter the time interval for which the form applies. Record the start and end date and time.
3.	Unit Name/Designators	Enter the title of the organizational unit or resource designator (e.g., Facilities Unit, Safety Officer, Strike Team).
4.	Unit Leader	Enter the name and ICS Position of the individual in charge of the Unit.
5.	Personnel Assigned	List the name, position, and home base of each member assigned to the unit during the operational period.
6.	Activity Log	Enter the time and briefly describe each significant occurrence or event (e.g., task assignments, task completions, injuries, difficulties encountered, etc.)
7.	Prepared By	Enter name and title of the person completing the log. Provide log to immediate supervisor, at the end of each operational period.
	Date/Time	Enter date (month, day, year) and time prepared (24-hour clock).

OIL & PRODUCED WATER RELEASE REPORT FORM

(Beta Offshore – Platforms & Pipeline) Page 1

☐ **INITIAL REPORT** ☐ **FOLLOW UP REPORT #_____**

(THIS FORM MAY BE USED FOR EITHER REPORT. INITIAL REPORTS ARE SUBJECT TO REVISION AS INFORMATION IS GATHERED)

1. Company Name: Beta Offshore ____________ Date: ____________
2. ☐ Ellen/Elly OCS-300 Latitude 30°24'56"N Longitude 118°07'39"W
   ☐ Eureka OCS-301 Latitude 30°33'50"N Longitude 118°07'00"W
   ☐ Pipeline ____________
3. Distance to nearest Highway or Town ____________ Miles from ____________
4. Equipment involved: ____________
5. Est. Quantity oil spilled: ______ bbls Est. Quantity water spilled: ______ bbls In spill containment? Yes ☐ No ☐
6. Weather Conditions ____________ Sea State ____________
7. Person Discovering Release: ____________ Date/Time of Discovery ____________
8. Regulatory reporting by: ____________ Telephone Number ____________
9. Date/Time when release began (or estimate): ____________
10. Date/Time repair completed (or estimate): ____________
11. Full description of incident, to extent known, including injuries and fatalities, name of surface water impacted or dry Waterway, area contaminated ☐ Land ☐ Water ☐ Dry Waterway ____________
12. Description of action(s) taken thus far to reduce release and begin cleanup: ____________
13. Action(s) to be taken to avoid future recurrence: ____________

IF PUBLIC HEALTH OR SAFETY IS IMMEDIATELY THREATENED NOTIFY:

	Date & Time
14. ☐ "911" onshore or USCG 310-521-3800 offshore	

IF RELEASE OF OIL ENTERS FEDERAL WATERS NOTIFY:

	Control #	**Person Contacted**	**Date & Time**
15. ☐ NRC immediately 800-424-8802			
16. ☐ USCG 310-521-3800			
IF RELEASE OF >1 BARREL OIL TO FEDERAL OR STATE WATERS NOTIFY:			
17. ☐ BSEE immediately 805-389-7775			
☐ Written Report to BSEE w/in 15 days after spill stopped			
IF RELEASE ORIGINATES FROM A DOT REGULATED PIPELINE >5 BBLS OR CAUSES SIGNIFICANT INJURIES, PROPERTY DAMAGE >$50,000, FIRE OR EXPLOSION:			
18. ☐ NRC immediately 800-424-8802			
19. ☐ State Fire Marshall 818-337-9999			
IF RELEASE THREATENS STATE WATERS AND/OR THE SHORE NOTIFY:			
20. ☐ OSPR immediately 916-445-0045 or DF&W 562-342-7212			
21. ☐ Cal-EMA 800-852-7550			
22. ☐ SLC 562-590-5201 (24-hour) ☐ SLC 714-536-3018			

DF&G Department of Fish & Wildlife
SLC = State Lands Commission
NRC = National Response Center
EMA = California Emergency Mgmt Agency
BSEE = Bureau of Safety and Environmental Enforcement
DOT = Department of Transportation
USCG = United States Coast Guard
OSPR = Office of Spill Prevention and Response

OIL & PRODUCED WATER RELEASE REPORT FORM

(Beta Offshore – Platforms & Pipeline) Page 2

COMPANY NOTIFICATION AND REPORTING

23. ☐ Personnel notified within company (log call even if unable to contact)

Name/Title	Date	Time
☐ Notify Incident Management Team (Personnel Call-Out) 562-628-1526		

24. **INVESTIGATION AND FOLLOW UP:**

A. Initial assessment of primary causes (if known):

☐ Human Error ☐ Equipment Malfunction

☐ External Causes ☐ Equipment Corrosion

☐ Normal Operations ☐ Other ______

B. Briefly describe possible cause(s): ______

C. Detailed description of repairs and cleanup measures taken: ______

D. Date and time cleanup completed: ______

E. PM No. and Estimated cost required to cleanup: ______

F. Agency visits and/or follow-up comments from agencies ______

COMPANY ROUTING (Route completed form within ten days of release event):

	Signature:	**Date:**
1. PICs:		
2. Manager of Operations		
3. HSE Manager		
4. Compliance Office (original)		

DF&G Department of Fish & Wildlife
SLC = State Lands Commission
NRC = National Response Center

EMA = California Emergency Mgmt Agency
BSEE = Bureau of Safety and Environmental Enforcement

DOT = Department of Transportation
USCG = United States Coast Guard
OSPR = Office of Spill Prevention and Response

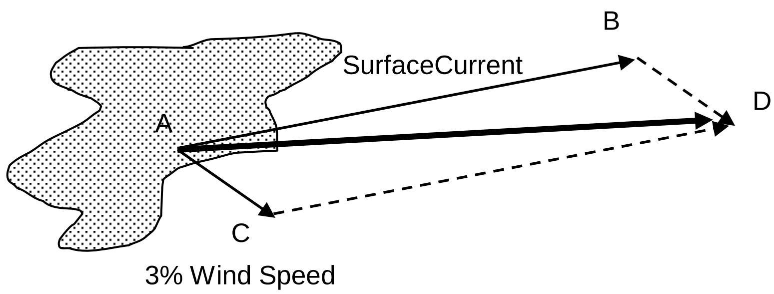
ATTACHMENT 2-3

PREDICTING AND TRACKING SPILL MOVEMENT

PREDICTING SPILL MOVEMENT

On-scene personnel can generate field estimates of oil spill movement using the vector addition method. As shown in Figure 1, slick movement can be predicted by adding the vectors of the two main motive forces influencing open water slick movement, surface currents and winds. To predict slick movement, follow these steps:

1. Estimate the direction and speed of the wind and current.
2. Calculate the “wind component”, using 3% of the wind speed.
3. Starting from the center of the slick location (A), draw a line representing the speed and direction of the current (B).
4. Starting from the center of the slick location (A), draw a line representing the wind (C).
5. Starting from (B), draw a line parallel to the wind vector (C), to (D) which is the same length and angle as the wind vector (the distance from A to C).
6. Draw a line from (A) to (D), which gives the direction and speed of the slick movement (“resultant vector”).



How to Track the Trajectory of a Beta Spill to Ocean

Purpose

This outlines the steps Beta Platforms should take to track the trajectory of a spill to the ocean

Why is this critical?

In the event of a spill to the ocean, the spill trajectory must be tracked and communicated to ICS Planning Chief to enable prompt and adequate emergency response.

Responsibilities

The table below shows the personnel involved and their respective responsibilities

Person	Responsibilities
Tracker Buoy Launcher	Launch spill tracker buoys ***Note:*** *Normally done by Electrician for Elly/Ellen and by Crane Operator for Eureka*
Trajectory Requestor	Gather required data and send trajectory requests ***Note:*** *Normally done by Electrician*
Boat Captain	Gather and report tracker buoy coordinates and wind speed and direction
O'Brien's Response Management	Projects spill trajectories and transmits to IC Sit-Stat and Beta Sit-Stat. For initial trajectory, gather available weather data from internet
Beta Sit-Stat	Ensure trajectories are promptly requested, reviewed, posted and transmitted to the Planning Chief

Getting Spill Trajectories

The procedure below describes how to secure spill trajectories

Step	Who	Does What
1	Tracker Buoy Launcher	In the event of a spill, launch leading edge tracker buoy from the +45 deck and record the exact launch time.
2	Trajectory Requestor	Using a wind meter, get the prevailing wind velocity and direction. Estimate ocean current speed and direction.
3	Trajectory Requestor	Within the first 15 minutes of a spill, fill out the Trajectory Request form and fax to The O'Brien's RM **Fax: (985) 781-0580** **E-mail: office@oopsusa.com**
4	Tracker Buoy Launcher	In 15-minute intervals, launch three more tracker buoys one at a time.
5	Trajectory Requestor	One hour after the launching of the leading edge tracker buoy, request boat captain to get and provide coordinates of the tracker buoy
6	Boat Captain	From a close but safe distance, get the coordinates of the leading edge tracker buoy and transmit data to Trajectory Requestor
7	Trajectory Requestor	Using a wind meter, get the prevailing wind velocity and direction
8	Trajectory Requestor	Fill out the Trajectory Request form and fax to The O'Brien's RM **Fax: (985) 781-0580**
9	O'Brien's Response Management	Based on the coordinates of the platform and the tracker buoy, calculate ocean current and direction
10	O'Brien's Response Management	Plot spill trajectory and then transmit to IC and Beta Sit-Stat via fax and e-mail
11	Beta Sit-Stat	Upon receipt, review the spill trajectory and clarify with The O'Brien's RM if necessary
12	Trajectory Requestor	Unless instructed otherwise, repeat Steps 5-11 every half-hour thereafter

---

Dissemination of Trajectory

Beta Sit-Stat should promptly
- Provide trajectory to Planning Chief at the Command Post
- Post the latest trajectory on the Situation Status Board

ATTACHMENT 2-4

OIL SPILL VOLUME ESTIMATION

OIL SPILL VOLUME ESTIMATION

Reports of oil spills, both oral and written, should conform to the following guidelines:

1. Basic Definitions

Sheen: The oil is visible on the water as a silvery sheen or with tints of color (rainbow colors). This is the thinnest thickness of oil.

Dark Colors: The oil is visible with dark colors; it will still have traces of the rainbow colors but is not black or dark brown.

Black/Dark Brown: Fresh oil after the initial spreading will have a black or very dark brown color. This is the greatest thickness of non-emulsified oil.

Mousse: This is a water-in-oil emulsion which is often orange to rust colored. It is very thick and viscous and may contain about 30% oil.

2. Spill Factors

The factors given in the table below will be used to estimate the volume of oil contained in the spill unless a more accurate amount is known by other means. These factors should be compared whenever possible to volumes estimated from the source of the spill, for example piping volume, sump volume, tank capacity, or compartment size. Exact calculations of the volume of a spill are not possible by visual observation of the oil on the surface of the water. For this reason, the spill volumes should be rounded off to avoid the appearance of a very accurate determination.

Spill Factor Table

Appearance of Oil on Water (This relates to the thickness of oil)	Assumed Thickness (mm)	Multiplication Factor	
		Gallons per Sq. Yard	Barrels per Sq. Nautical Mile
1. Sheen (silvery or with colors)	0.0003	0.000066	6.3
2. Dark colors	0.002	0.00044	42
3. Black/dark brown	0.1	0.022	2100
4. Mousse (Note: 30% oil)	1.0	0.066	6300

3. Estimating Procedures

(a) Estimate dimensions (length and width) of each part of the spill in yards or nautical miles (2,000 yards) for each of the four appearances that may be observed in the spill. Multiply length times width to calculate area covered by sheen, by dark colors, by black/brown oil, and by mousse.

(b) Multiply each of the areas calculated in step (a) by the appropriate factor from the Spill Factor Table. Add the individual parts together.

(c) The answer is the estimated volume of the spill in gallons or in barrels of oil. This volume is to be reported to the National Response Center and entered on the spill report form. Spills that are calculated to be less than one gallon should be reported as "less than one gallon", rather than the decimal amount. Round off the volume to the nearest gallon or 0.1 barrel for spills less than 7 barrels. For spills larger than 7 barrels, round off to the nearest barrel or to no more than two significant figures (i.e. 637 barrels would be reported as 640 barrels). Generally, any volume less than one barrel should be reported in gallons.

(d) As an alternative to using the factors, the slick volume estimator graphs shown in Figures C-1 and C-2 may be used to read the spill volume directly, once the area has been determined.

4. Example

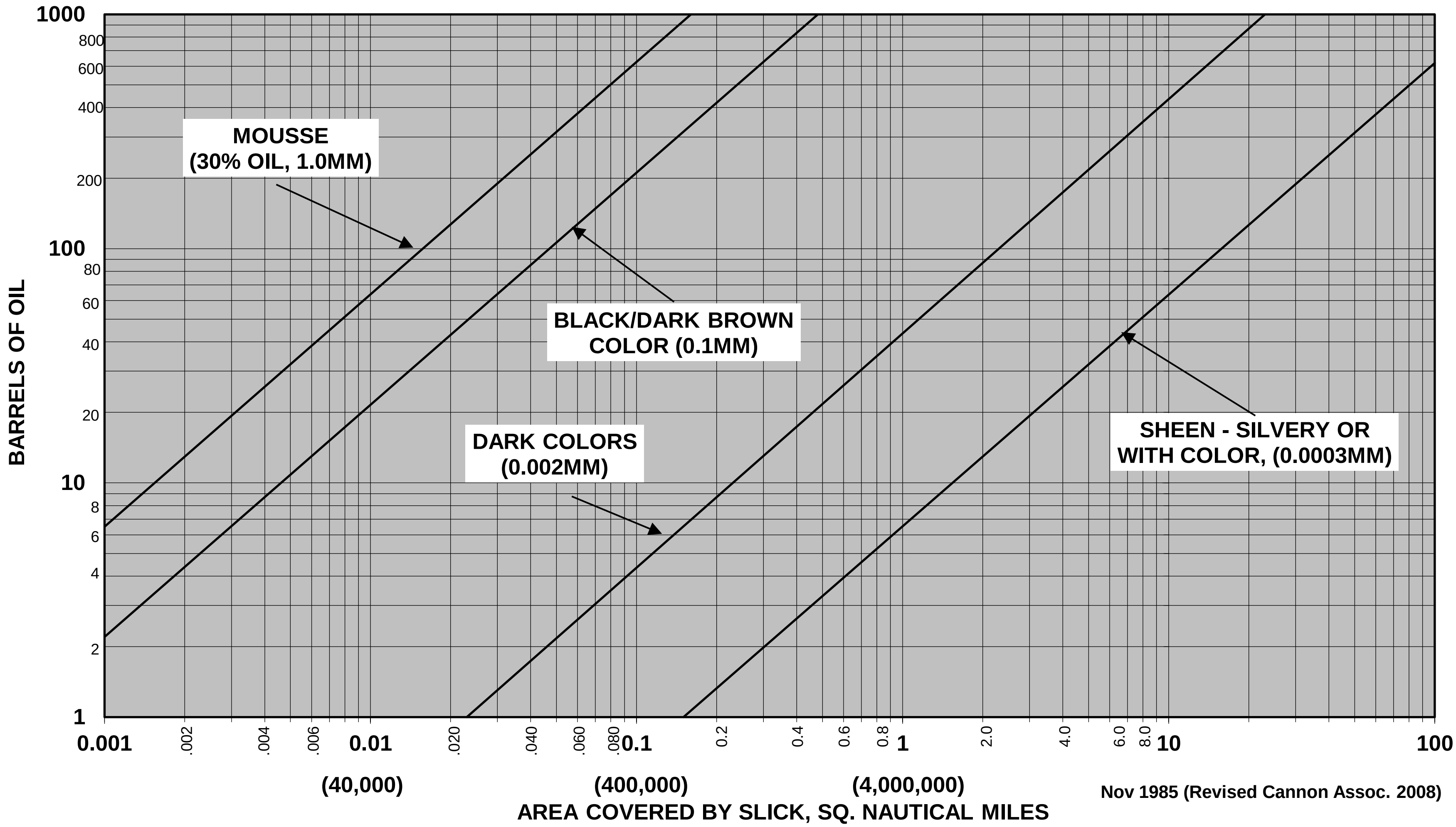
A spill has created a sheen with some rainbow color that is estimated to be one nautical mile long (2,000 yards) by an average of 30 yards wide. There is a second area of black oil that is 60 yards wide by 200 yards long.

Area 1 volume	= 2,000 yds x 30 yds x 0.000066 gal./ sq yd = 3.96 gallons; rounded to 4 gallons
Area 2 volume	= 200 yds x 60 yds x 0.022 gal / sq yd = 264 gallons
Total volume	= Area 1 + Area 2 = 4 + 264 = 268 gallons
Volume in barrels	= 268 / 42 = 6.38 bbl; rounded to 6.4 bbl

Note that almost all of the oil is contained in the black appearing area; containment and cleanup should be concentrated on such areas.

Oil Slick
Volume Estimator
Barrels

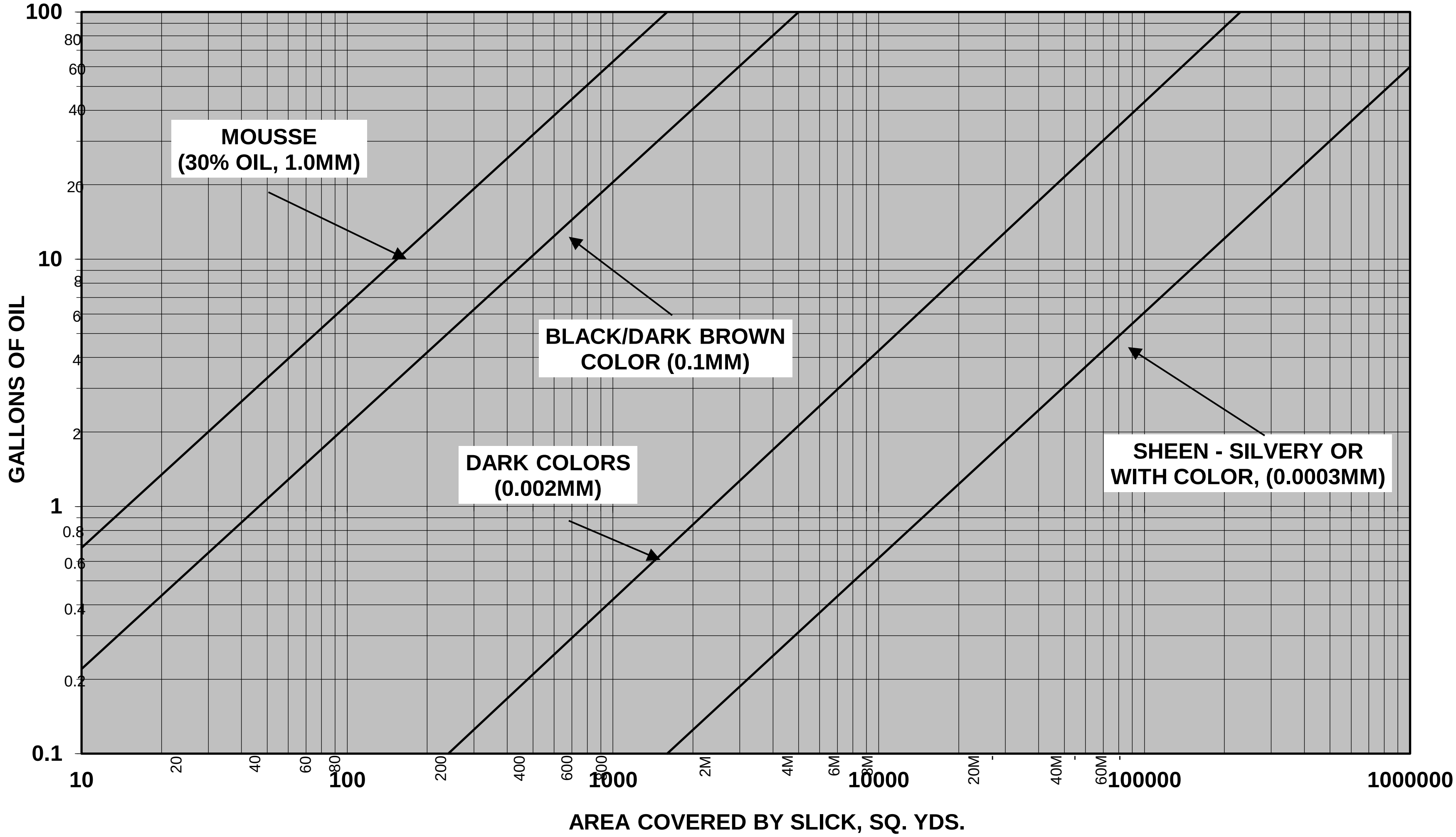
Graph 2



Nov 1985 (Revised Cannon Assoc. 2008)

Oil Slick
Volume Estimator
Gallons

Graph 1



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ATTACHMENT 2-5

SPILL BOOM DEPLOYMENT - JSA

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JOB SAFETY ANALYSIS

Work Activity (JOB): Spill Boom Deployment	Specific Location:	Date:	Page ____ of ____
Work Group (print): Beta Crew, MSRC, Ship Services	Initiator (print):	Project Lead / Foreman (print):	

Safety Equipment Required To Do This Job: ***Safe Procedures Required:***

Hard Hat (ANSI-Z89.1)	X	Work Vest (PFD)	X	Containment	N/A	Gloves – Chemical	N/A	Lockout/Tagout	N/A
Steel Toe Boots	X	Safety Harness	N/A	Fire Extinguisher	N/A	Apron - Chemical	N/A	Safe Work Permit	N/A
Safety Glasses	X	Face Shield	N/A	Fire Watch	N/A	Respirator	N/A	Hot Work Permit	N/A
H2S Monitor	N/A	Goggles	N/A	Gloves – Leather	X	SCBA	N/A	Confined Space Permit	N/A
Hearing Protection	N/A	Dust Mask	N/A	Barricade	N/A	Buddy System	N/A	Rescue Team	N/A

Consider:	The job site in three (3) dimensions, up, down, right, left, In front and behind you. Who is working near you on another project? What Process flows may affect your work? What environmental conditions may affect the work? Is containment needed to protect equipment, personnel or environment?
Stop Work Authority	***It is expected that Stop Work Authority (SWA) is exercised whenever there is imminent risk or danger to personnel or the environment. If SWA is exercised, notify the Platform PIC IMMEDIATELY.***

Sequence of Basic Job Steps	Potential Accidents or Hazards	Recommendations to Eliminate or Reduce Potential Hazards	Responsible Party
Review procedure and JSA	Inattention	Insure everyone understands procedures and scope of exercise.	
Inspect spill boom, slings, shackles, and ensure valves are in clockwise position.	Shackles not screwed together tightly, slings worn or separating.	Inspect prior to lift.	
Crane operator to perform all pre-checks on crane prior to lifting Roto-pack.	Crane brake failure, crane over swing.	Inspect and operate prior to making lift.	
Establish communication between crane and MSRC boat. MSRC has Beta radio on their boat. Designated Spotter will accompany crane operator with Beta Radio on Channel 3.	Boarding crane while in operation.	Do not board crane unless accompanied by crane operator. Do not start crane until spotter is in position.	
Crane operator to position whip line over Roto-pack.	Roustabout struck by sling hooks, roustabout not paying attention.	Establish proper communication between crane and roustabout.	
Roustabout to connect Roto-pack D rings to whip line ensuring towline is untied and is coiled on top of the Roto-pack spool for easy access to boat crew when it gets to water.	Over extension of upper back, pinched fingers. If rope is not untied, Roto-pack cannot be uncoiled safely. Crew has no access to rope.	Position D-ring next to edge of Roto-pack, keep hands free while lifting, Untie and coil tow line on top of Roto-pack spool before lift.	

JOB SAFETY ANALYSIS

Sequence of Basic Job Steps	Potential Accidents or Hazards	Recommendations to Eliminate or Reduce Potential Hazards	Responsible Party
Crane operator lifts Roto-pack and lowers into water and allows slack in slings.	Pinch points, struck by load.	Ensure proper hand placement, knowledge of surroundings	
Boat crew to position next to Roto-pack and remove slings with boat hook.	Slippery surface, fall into water.	Position boat close to Roto-pack, ensure proper footing, wear floatation device.	
Crane operator to lift sling onto platform when slings have been freed from Roto-pack	Struck by loose slings.	Boat crew to communicate with crane operator, crane operator to lift slings SLOWLY.	
Boat crew to proceed SLOWLY with un-spooling Roto-pack Section #1. The boat captain shall be in contact with the spotter positioned on the crane. The spotter shall communicate the condition of the boom to the boat captain until it is fully deployed.	Sinking Boom.	Deploy <u>SLOWLY.</u>	
Repeat #'s 4, 5, 6, 8, 9 and 10 with second spool of Roto Pack.	See above concerns.	See above recommendations.	
Boat crew to attach mating sections together and secure with pins.	Slippery surface, fall into water, strains to arms, back, etc.	Ensure proper footing, wear floatation device, good communications.	
Prior to boom recovery, slings must be lowered to a transfer vessel with sufficient deck space. Must have two way radio communications w/ crane	Getting slings hung up in antennas or mast.	Boat with open cargo deck, no fast response boats.	
Recovery to be performed by MSRC	Ensure proper footing, wear floatation device.	Follow company procedures for spooling boom onto Roto-pack.	

Signatures PLEASE SIGN AND **PRINT** NAME Initiator:	Date	Signatures PLEASE SIGN AND **PRINT** NAME	Date
		Project Lead / Foreman:	
		Control Room/ Site Supervisor:	

A.1 INTRODUCTION

The Company is responsible for the operations, maintenance, and emergency response for the offshore and onshore oil and gas production facilities known as Beta Unit Complex. These facilities are situated in the Pacific Outer Continental Shelf (OCS) in federal waters, approximately 9 miles offshore of Huntington Beach. The San Pedro Bay Pipeline traverses federal OSC waters, California marine waters, and a small section onshore in the port area of Long Beach. Also, Beta Offshore has an onshore facility at Long Beach, California. Refer to Annex A.8, Facility Diagrams.

The Beta Unit Complex consists of:

- Platform Eureka.
- Platform Ellen.
- Platform Elly.
- (3) Intra-field pipelines connecting Platforms Eureka and Elly.
- 16" San Pedro Bay Pipeline and 10" delivery line to THUMS Manifold.
- Beta Pump Station.

This Annex addresses the Beta Unit Complex's design, operation, and site description.

A.2 PLATFORMS

A.2.1 Overview

Platforms Ellen and Elly were installed in 1980 and are located in federal waters approximately nine miles offshore of Huntington Beach on OCS Lease P-300. Platform Eureka is located in approximately 700 feet of water on OCS Lease P-301. The Platform was installed in 1984 to develop the southern portions of the Beta Field.

A.2.2 Design and Operation Information

A.2.2.1 Platform Design

The drilling/production Platform Ellen is a standard eight-leg jacket located in 265 feet of water. The platform has two deck levels, each about 145 feet by 177 feet, and is equipped with a drilling/workover rig, accommodations for crew quarters, helicopter pad, and space for the drilling of up to 80 wells. At any time, the well status might vary as much as 20 percent.

The processing platform Elly is a 12-leg jacket situated in 255 feet of water. Platform Elly's lower deck has dimensions of 168 feet by 213 feet. The upper deck is 100 feet by 197 feet in dimension. A 200-foot-long bridge links Platforms Ellen and Elly.

Electric power for the three platforms is generated by dual–fueled (diesel or produced gas), turbine-driven generators located on Platform Elly. The natural gas is extracted from the field. Power from the generators is distributed from Platform Elly to Platform Eureka via two 34.5 kv subsea cables and to Platform Ellen via one standard high-voltage cable. Refer to Annex A.8 for Facility Diagrams.

A.2.2.2 Platform Processes and Equipment

Platform Eureka is equipped with a drilling/workover rig and production facilities for the primary separation of gas from liquid and for well testing. Production fluids are sent via a subsea pipeline to Platform Elly for processing.

Activities on Platform Ellen consist of well production, well injection, drilling, and well workover. The oil, water, and gas produced in the wells is sent to Platform Elly for dehydration, gas conditioning, and water treating. Waterflood injection is pumped from Platform Elly to Ellen and injected into the waterflood wells.

Platform Elly (the Central Facilities Platform) provides the majority of oil, water, and gas processing. The platform provides facilities for:

- Oil dehydration
- Oil shipping
- Water treating
- Water injection
- Vapor recovery gas compression

- Gas treating
- Electric power generation

The production facilities on Platform Elly are designed to be self-sufficient in the following manner:

- **Crude oil** is dehydrated and pipeline quality oil is pumped to shore through a 16-inch common carrier pipeline, called the San Pedro Bay Pipeline.
- **Produced water** is filtered and reinjected into the reservoir.
- **Produced gas** is compressed and used as fuel to power turbine-driven generators to supply the platform's electrical needs and pumps to reinject produced water.

Heat exchangers and separation equipment (treaters, FWKOs, etc.) treat the oil emulsion. Waste heat is recovered from the turbines and is utilized in a series of heat exchangers and vessels to assist in separating the produced oil, water, and gas streams. A generalized schematic (see Annex A.8) shows the basic flow patterns on Platform Elly. Produced water, following separation from the oil, is treated in a series of vessels and filters on Platform Elly to remove essentially all remaining oil and solids and is then reinjected into the formation.

A.2.2.3 Normal Daily Throughput

Current throughputs for the Beta Unit Complex platforms are as follows:

CURRENT THROUGHPUTS

Platform	BOPD	BWPD	MCFD (Gas)
Eureka (production)	2,000 – 4,000	4,000 – 9,000	200 – 900
Ellen (production)	1,800 – 4,000	5,500 – 15,000	500 – 1,500
Elly (processing)	3,000 – 8,000[1]	8,000 – 20,000	700 – 1,500
Notes: [1] Throughput on Platform Elly can include up to 600 barrels per day of dry oil from Platform Edith.			

Crude oil gravities for Platform Eureka range from 9° to 19° API gravity with an average composite of approximately 12.5° API gravity. Crude oil gravities for Platform Ellen range from 9° to 19° API gravity with an average composite of approximately 15° API gravity.

A.2.2.4 Hydrocarbons Handled and Transferred

The characteristics of the oil and gas produced at the platforms are summarized on the Material Safety Data Sheet (MSDS) found in Annex Q of this OSPRP. Diesel fuel is transferred (from a supply boat via a pump on the boat) through a three-inch petroleum transfer hose equipped with dry disconnect couplings to a standpipe on the platform (either Ellen or Eureka). The diesel fuel system is provided on the platforms to furnish fuel to the emergency generators, rig engines, cranes, injection turbine drivers, utility engines, and/or the main power turbine generators. Total diesel fuel usage for all three platforms can vary from 3,000 to 5,000 bbls/month. A written fuel transfer procedure is available on Platform Ellen that details personnel duties and responsibilities throughout the transfer process, emergencies, and communications. A summary of the fuel transfer procedures is provided in Annex B.1.3.1.

Except during tests, the fuel hose is not disconnected. In this configuration, the potential for fuel dripping into the sea is minimized. When the hose is changed, the line must first be flushed. Sorbent material is pre-positioned under the connection prior to changing hoses.

A.2.2.5 Bulk Storage

The production/treating process is accomplished through in-line FWKO and treater/scrubbers. Estimated hydrocarbon volumes for the platforms are provided below:

ESTIMATED HYDROCARBON VOLUMES (bbls)

Platform	Platform Piping	Tank and Vessels	Totals
Ellen	112	1,716	1,828
Elly	474	8,363	8,837
Eureka	362	3,832	4,194
Beta Station	---	10,000	10,000

Supporting documentation for estimated hydrocarbon volumes is provided at the end of this Annex in Tables A-1a/b through A-3a/b for the offshore platforms, and in Table A-4 for the Beta Pump Station.

Diesel fuel is stored on all three platforms as shown in the tank inventories. The platforms also use and store hazardous materials and lube oils. A chemical inventory is maintained on the platforms along with pertinent MSDS forms.

A.2.2.6 Secondary Containment / Drainage

In accordance with BSEE regulations, all applicable equipment is equipped with drip pans to prevent any oil from reaching the ocean. Drain and sump systems are provided on all platforms to collect deck and equipment drainage fluids. The lower deck is interconnected with solid steel plating to form a drain system covering the entire deck. Liquids collected in the drain system gravity-flow to the sumps and are then pumped back to the liquid handling system.

A.2.2.7 Fire Prevention and Detection

The fire detection system includes:

- Fusible plug loop system
- Gas detectors
- Heat detectors
- Smoke detectors
- MFAC (Master Fire Alarm Control Panel)
- Fire eyes

The fire suppression system includes:

- A looped firewater system with multiple firewater pumps. The pumps are installed at different locations so that the likelihood of simultaneous damage to both is reduced.
- Dry chemical and carbon dioxide fire extinguishers (30- and 350-pound units).
- Water deluge system on selected equipment (e.g., diesel storage tanks, well cleanup tank, wet/dry oil tanks, crude transfer pumps, drilling rig).
- Halon fire suppression system

A.2.2.8 Oil Drilling and Workover Operations

Before any drilling or well servicing operations begin, a blowout preventor assembly (BOP) and well control system capable of containing expected wellhead pressures are installed and tested. The BOP is installed in compliance with all applicable state and federal regulations, as well as Company Safe Practices for Drilling and Well Servicing Operations procedures.

A.3 INTRA-FIELD PIPELINES AND CABLES

Three pipelines and two power cables link Platform Eureka with Platform Elly located approximately one and one-half miles away. A 12-inch wet oil pipeline previously carried all liquids and some entrained gas produced on Platform Eureka to Platform Elly for separation; this line was shut in in 1999 due to leakage. The shut-in caused Platform Eureka to be cease oil production for nine years. During and prior to 1999, gas well and casing gas produced on Platform Eureka was transported to Platform Elly via a 6-inch pipeline. This 6-inch line underwent extensive testing in early 2008 and was approved by the U.S. Department of the Interior, Minerals Management Service (now BSEE) on March 27, 2008 to transport production fluids to Platform Elly. At the same time, produced gas was separated on Platform Eureka and transported to Platform Elly for use as fuel through a 10-inch line. In December 2011, two new 10-inch pipelines were installed between Platforms Eureka and Elly, one to deliver production fluids from Eureka to Elly and the other to deliver injection water from Elly to Eureka. The pipelines became active in January/February 2012 and the 6-inch pipeline was returned to gas service between Eureka and Elly. The old 10-inch line mentioned above was abandoned in place. The current configuration of the Beta intra-field pipelines (see Figure A.8, Annex A Facility Diagrams) are designed, operated, and inspected in compliance with BSEE regulations. The pipeline and cable specifications are given in Table A-5.

A.3.1 External Pressure

The pipelines are designed to withstand external loads, including hydrostatic pressures with the pipeline void and with its absolute internal pressure equal to one atmosphere.

A.3.2 Other Stresses

The pipelines were designed under applicable codes and regulations to withstand stresses that result from installation, thermal and fluid expansion effects, earthquakes and other dynamic effects, dead loads, and surges.

A.3.3 Leak Detection System

Intra-field pipelines are visually monitored for leak detection. There is a high/low pressure shutdown valve at the header. A new leak detection system was installed in early 2008 on the 6-inch intrafield pipeline between Platforms Eureka and Elly. Its function is based on comparison of fluid flow into versus out of the pipeline. Alarms are initiated if volume balance discrepancies vary beyond specific short term and long term limits.

A.3.4 Intra-field Pipeline Communication Agreement Between Platforms Edith and Elly

Communication between control rooms on Dos Cuadras Offshore Resources, LLC (DCOR) Platform Edith and Beta Offshore's Platform Elly shall be as follows:

- When Platform Edith sends a regular maintenance pig, Platform Elly will be notified at least 1 day in advance.

- When Platform Edith plans to send a gauge or smart pig, Platform Elly will be notified at least 1 week in advance.

- Anytime personnel from DCOR, or agents acting on DCOR's behalf, plan on boarding Platform Elly, advanced notice will be given to Elly's control room. Upon arrival at the platform, visiting person(s) will check in with the Compliance Office.

- Anytime Platform Edith experiences a PSH/PSL on the LACT, oil pipeline, or on the leak detection system, a phone call will be placed to Platform Elly's control room. Platform Edith's operator will:

    1. Check pipeline pressures.
    2. Check with appropriate operators to determine if pipeline flow was shut off or if a valve in the pipeline was closed unintentionally.
    3. Check the status of emergency shutdown valves or any other block valve in the pipeline that could be causing the pressure increase.
    4. If no reasonable or acceptable explanation of pressure increase can be determined; shut the pipeline down.
    5. Shut in the pipeline.
    6. Notify applicable operating personnel of conditions.
    7. Continue to investigate the cause of the high pipeline pressure until an explanation is determined.
    8. Continue to monitor equipment controls that may have caused pressure variations after normal operations are started again.

- Platform Elly's control room will notify Platform Edith's control room anytime:
    1. If, during the course of their normal surveillance rounds, it is observed that Platform Edith's oil line ESD valve on Platform Elly is closed or plans to be closed. This valve has no indicators in Platform Elly's control room and must be observed visually.
    2. Platform Elly has a planned shutdown or needs to manually close Platform Edith's oil line.
    3. Platform Elly is experiencing an ESD or fire detection, as operations allow.
    4. An operator notices any irregularities with DCOR's equipment and or pipeline aboard Platform Elly.

DCOR PLATFORM EDITH CONTROL ROOM	BETA PLATFORM ELLY CONTROL ROOM
714-960-6342	**562-606-5711 or 5712**

Table A-5. Specifications of the Beta Intra-Field Pipeline and Cable.

BETA INTRA-FIELD PIPELINE & CABLE SPECIFICATIONS		
Products to be transported		
10.75 in. OD line		New (2011) for produced oil and water
10.75 in. OD line		New (2011) for injection water
12.75 in. OD line		Out of service / shut–in
10.75 in. OD line		Out of service / shut-in
6.625 in. OD line		Use changed in 2011 to wet natural gas transport
Size, weight, and grade of the pipes		
10.75 in. OD x .594 in.	64.49 lb/ft	API5LX-grade X-52 SMLS pipe
10.75 in. OD x .594 in.	64.49 lb/ft	API5LX-grade X-52 SMLS pipe
12.75 in. OD x .625 in.	80.93 lb/ft	API5LX-grade X-42 SMLS pipe
10.75 in. OD x .594 in.	64.43 lb/ft	API5LX-grade X-42 SMLS pipe
6.625 in. OD x .375 in	25.03 lb/ft	API5LX-grade X-42 SMLS pipe
Length of the lines (J-tube to J-tube)		
10.75 in. OD line (new oil)		9449.0 ft (1.79 mi)
10.75 in. OD line (new water injection)		8994.8 ft (1.70 mi)
12.75 in OD line (out-of-service)		8220 ft
10.75 in. OD line (out-of-service)		8156 ft
6.625 in. OD line		8439 ft
Description of protective coating		
New oil and water injection lines		One–inch 5lPPFoam
All old lines		14 mils of thin-film thermosetting epoxy
Type of corrosion protection		
10.75 in. OD oil line		125# aluminum-indium anodes spaced at 550 ft
10.75 in. OD water injection line		125# aluminum-indium anodes spaced at 550 ft
12.75 in OD line		150# aluminum anodes spaced at 350 ft
10.75 in. OD line		125# aluminum anodes spaced at 350 ft
6.625 in. OD line		75# aluminum anodes spaced at 500 ft
Maximum design working pressure and capacity		
10.75 in. OD oil line		1,440 psi (MAOP)
10.75 in. OD water injection line		2,250 psi (MAOP)
12.75 in OD line		Out of service (was 1440 psi MAWP; 24,500 bpd)
10.75 in. OD line		Out-of-service (was 400 psi MAWP)
6.625 in. OD line		720 psi (MAWP) current rating for gas service

Table A-5. Specifications of the Beta Intra-Field Pipeline and Cable.

BETA INTRA-FIELD PIPELINE & CABLE SPECIFICATIONS	
Pipeline throughputs	
10" Oil line	Currently approx. 10,200 bpd
10" Water injection line	Currently approx. 12,000 bpd
12" oil/water line	Out of service / shut-in
6" gas	200 to 350 mcfd at 25 to 65 psi*
10" line	Out of service / shut-in
Elly to Edith Electric cable specifications	
Description: 35 kV, 3 conductor 1/0 AWG, EPR or TR-XLPE insulated, armored submarine power cable with two fiber-optic cables inside	
Length of circuits (J-tube to J-tube):	8500 ft end to end

A.4 (Reserved)

A.5 SAN PEDRO BAY PIPELINE AND PUMP STATION

The pipeline is a 16-inch, 17.3-mile-long common carrier pipeline installed in 1980. The pipeline delivers crude oil from Platform Elly to the onshore Beta Pump Station (which includes a 10,000 bbl breakout tank). That pump station is located at 170 N. Pico Street in Long Beach. From the Beta Pump Station, the crude oil is transferred across Pico Street to the Automatic Custody Transfer (ACT) Unit at the THUMS Pipeline Manifold through a buried 10-inch pipeline. The San Pedro Bay Pipeline is owned by the San Pedro Bay Pipeline Company, an affiliate of Beta Offshore. Specifics on that pipeline are provided in Annex A.7.

A.6 BETA UNIT COMPLEX FACILITY SITE CHARACTERISTICS

A.6.1 Offshore

The seafloor in the immediate area of the Beta Unit platforms is essentially featureless. The slope at Platform Eureka is to the southeast at about 3 degrees (see Annex A.8 – Facility Diagrams). Soils consist of medium-plasticity silty clay and clayey silt. There is no evidence of slumping or downslope movement in the strata at Platform Eureka. There is no reason to anticipate liquefaction or other ground instabilities in the vicinity of the platform.

The slope at the Ellen/Elly platform site is southeasterly at less than 1 degree. Soil samples at the sites indicate that the soils vary from gravels and sand to silts and clay and that the soil profiles are predominantly low-to-medium plasticity silty clays and clayey silts. There is no evidence of slumping or downslope movement in the strata at the platform sites. There is no reason to anticipate liquefaction or other ground instabilities in the vicinity of the platforms.

No archaeological/historical resources are known to exist at the Beta Unit Complex, along the pipeline route, or at shore facility locations.

The Beta Unit platforms are situated adjacent to the Gulf of Santa Catalina Traffic Separation Scheme; however, the platforms are east of both the shipping lanes and their buffer zones.

A.6.2 Onshore

The onshore portion of the Beta Unit Complex begins at the landfall at Pier J. The San Pedro Bay Pipeline Company line continues onshore approximately 2 miles inland to the Beta Pump Station within the City of Long Beach. This coastal area is topographically featureless. The pipeline right-of-way is near industrial/marine/commercial facilities within the Port of Long Beach, including: the Queen Mary, Cruise Ship terminal and Catalina Express, container/freight stations and warehouses, Port of Long Beach Administration Building and Fire Department Headquarters, numerous berths, Long Beach Container Terminal, railroad facilities and numerous marine-related service companies. Refer to Figure A.8 for a pipeline location map.

The Beta Pump Station is situated on one acre of land between Pico Boulevard and the Long Beach Freeway. It is in an industrial area north of the East Basin, Long Beach Harbor. The pump station area is covered with gravel, rock and asphalt paving or landscape. Refer to Annex A.8, Facility Diagrams.

A.6.3 Hydrographic and Climatic Conditions

A general understanding of weather and sea conditions is important for:

- Effective planning for oil spill contingencies.
- Making good judgments during oil spill containment and cleanup operations. This section is intended to provide a brief description of weather and sea conditions for a general understanding. Monthly statistical presentation of the occurrence of conditions at sea is contained in Climatic Study of the Near Coastal Zone, Southern California Operating Area, prepared by the Naval Oceanography Command, dated October 1983.

Climate

The general climate of Southern California is classified as a Mediterranean type, having warm, dry summers and mild, wet winters. The controlling synoptic feature is a semi-permanent high pressure system located over the eastern Pacific Ocean. This feature, called the Pacific High, migrates and changes in intensity seasonally. During the summer, the high covers the eastern North Pacific, while in winter it weakens and drifts southward. Thus, during summer, storm systems are deflected to the north, and during winter, they can reach Southern California.

The clockwise pattern of the North Pacific Ocean's surface waters generally follows the winds of the atmospheric high pressure system. Thus, California coastal surface currents generally flow southeastward.

Winds

Winds often control the direction and dispersion of an oil spill at sea. High winds have a severe effect on oil spill control and recovery operations at sea. The general wind flow pattern over Southern California is northwesterly throughout the year.

Wind speeds typically do not exceed 15 knots and the frequency of storm events is relatively low. Spatial variations in the nearshore region are typically caused by prominent topographic features such as headlands and canyons. Temporal variations result from both diurnal and seasonal effects. Diurnally, the sea breeze/land breeze cycle associated with heating and cooling of the land produces an intensification of the westerly (onshore) winds in the afternoon.

Seasonal influences on the wind field include a strengthening of the Eastern North Pacific High and an increase in solar heating of the land mass, both of which occur during the summer months. The result is an increase in the mean wind stress in the Southern California region during the summer and a decrease during the winter.

In addition to the foregoing spatial and temporal influences, the predominant westerly airflow over the Southern California region can be altered by three types of synoptic scale events: Catalina Eddies, Santa Ana Winds, and storms. The principal characteristics of each type of event are summarized below.

Catalina Eddies

The Catalina Eddy is a cyclonic cell which can form over the Southern California region at any time of year, and which typically persists for several days. The predominant westerly flow in the coastal region is replaced by weak southerly and southwesterly winds occurring on the eastern side of the eddy. In addition, the feature triggers the formation of stratus overcast throughout the Southern California region.

Santa Ana Winds

Santa Ana winds are caused by the presence of a high pressure cell over the western United States. The normal surface pressure gradient at the coast is temporarily reversed, resulting in offshore flow, elevated daytime temperatures, and cloud-free skies. Occurring most frequently during the fall and winter months, Santa Anas tend to be particularly strong at the mouths of canyons. The winds are typically unsteady, with gust velocities which can exceed 50 knots. Despite their intensity, Santa Ana winds tend to reduce incident swell and lower the coastal water level, due to their offshore orientation. Their influence on coastal processes is therefore minimal.

Storms

Storm winds in the Southern California region are most frequently associated with strong fronts that move through the area from west to east. These extratropical storms can be of either local origin or distant origin in the North Pacific. They generally occur in the late fall and winter months. Strong winds from the southerly quadrant typically precede the arrival of the front, followed by intensified northwesterlies for several days after its passage. Sustained wind speeds of 20-to-25 knots are common. Storm winds can also result from Eastern North Pacific tropical cyclones arriving from the south. Although most such storms dissipate before reaching the Southern California region, they occasionally make landfall accompanied by high winds and damaging tides.

Air and Sea Temperature

Air temperature at the offshore platforms is strongly influenced by the sea surface temperature. Table A-6 shows the air and sea temperature regime in the vicinity of the Beta Unit Complex. The annual average air temperature is 61°F and the average sea temperature is 60°F. Sea temperatures typically vary between 56° and 65°F.

Precipitation

Rainfall along the coast averages about 11 inches annually, with most rain occurring between November and April. Rainfall varies considerably both in annual quantity and in the months of occurrence. Summers are usually very dry.

Operations at sea report the occurrence of precipitation averaging 5 percent of the time in winter to only about 1 percent of the time in summer, as noted in Table A-7. Generally, precipitation at sea does not interfere with oil spill containment and cleanup operations; however, very heavy rain is expected to present some difficulties, especially in tracking the spread of oil at sea.

Table A-6. Average Temperature in °F in the Vicinity of the Beta Unit Complex.

MONTH	TEMPERATURE (°F)	
	AIR	SEA
January	56	57
February	56	57
March	57	56
April	59	56
May	59	59
June	62	60
July	65	63
August	66	64
September	65	65
October	63	63
November	62	61
December	59	59
Annual Average	**61°F Air**	**60°F Sea**

Table A-7. Cloud Cover and Precipitation in the Vicinity of the Beta Unit Complex.

MONTH	CLOUD COVER % of Time		PRECIPITATION % of Time Occurring
	2/8	5/8	
January	52	25	5
February	52	28	6
March	50	28	3
April	48	40	3
May	50	40	2
June	40	50	1
July	40	50	1
August	40	50	1
September	50	40	1
October	56	38	2
November	54	27	3
December	55	27	4
Annual Average	**50**	**37**	**3**

Visibility

Visibility is important in oil spill containment and recovery operations at sea. Low visibility may present difficulties in coordination of vessels and in tracking the movement and spread of oil slicks.

There are approximately 143 clear, 115 partly cloudy and 107 cloudy days per year along the immediate coastline. The sky cover averages about 50 percent, as shown in Table A-7. These observations are reported at the Los Angeles International Airport (LAX) located northeast of the study area. Elevation and distance from the ocean, as well as other topographical features, can influence the amount of cloud cover over the land. Fog and stratus, usually confined to the night and early morning, occur primarily during the summer. The remainder of the partly cloudy and cloudy days are associated with transitory storm systems in winter. Over the ocean, the mean daytime cloud cover is about 55 percent.

Visibility along the coast is frequently restricted by haze, fog, or smoke. Low visibilities are favored by a layer of moist marine air with warm dry air above. Low visibilities usually occur with light winds and stable atmospheric conditions, but at times strong sea breezes can transport an offshore fog bank ashore, lowering the visibility considerably. Heavy fogging resulting in visibility less than 0.25 mile occurs an average of 28 days per year at LAX. Most of these are observed during the winter months. The frequencies of lower ceiling and visibility conditions at the platform locations are expected to be somewhat higher than reported along the coast due to formation and persistence of offshore fog and low clouds.

Tides

Tides along the coast from Palos Verdes southward to Oceanside are mixed diurnal and semidiurnal. There are usually two high tides and two low tides each day. The mean tidal range in the San Pedro Bay is about 4 feet, with extremes during spring tides of 6½ feet.

Tides are factors in distributing spilled oil across the beach, churning oil throughout intertidal habitats, and thus aggravating the extent to which the oil destroys the food and breeding processes upon which myriad birds and sea creatures depend. Knowledge of and alertness to tides are essential to preventing or minimizing damage from oil.

Ocean Currents

Currents in the Southern California region have speeds generally under 4 knots, with 3 knots about the highest expected. Studies of the Southern California currents generally list three regimes of oceanic current:

- Davidson Period: December through February.
- Upwelling Period: March through June.
- Oceanic Period: July through November.

Ocean currents have some effect on oil spill trajectories, but they are generally overwhelmed by tidal currents near shore, wind-generated surface waves and surf, and the surface winds themselves.

Ocean Waves

Ocean waves are primarily the result of wind and storms. Less frequently, waves are generated by geologic activity such as earthquakes, volcanic activity, and submarine landslides. Tidal action produces another form of wave. Waves that grow in height under the influence of the wind are referred to as wind waves or seas, and the area over which they are generated is termed the fetch. Once the wind waves move out of the fetch area and continue without additional energy input, they are referred to as swell. In Southern California, wind waves are predominantly from the northwest (prevailing winds), and swells may occur from any seaward direction. Wave height and direction may be the result of several different wave trains moving through the area.

Sea surface waves range in length from fractions of an inch (capillary waves) to hundreds of miles (tides and tsunamis). Most of the wave energy transmitted on the sea surface appears in the form of wind-generated waves with periods ranging from approximately 5 to 15 seconds.

Nearly all of the Southern California coast is protected, to some degree, from swells generated outside the coastal area by the offshore islands. Certain portions of the coast are exposed to essentially unlimited fetches from the west and south, but no location is exposed to swell from all possible seaward directions. The project site lies in an area that is protected from incoming surface wave energy in all but westerly and southeasterly directions. Local wave generation is also limited because the surrounding topography reduces the length of wind fetch.

Along the coast from Long Beach to Newport Beach, most significant swells arrive from 260° to 280° and from 160° to 190° True. Even in areas that are exposed to long fetches, swells with periods greater than 10 seconds are altered, at least in direction, by refraction over banks and around the offshore islands.

The protection offered by offshore islands is generally so complete that significant waves over the shelf are mainly formed in the local area. The restricted fetches allow only the development of low waves with short wave lengths and periods. Larger waves (from 6-to-8 feet) are formed during frontal crossings, but again with short wave lengths and periods due to the limited fetch. It is only when gale winds of greater than 35 knots blow from the west that high waves are formed in the local region and travel over the shelf. These winds are most common in the San Pedro Channel where waves as high as 25 feet have occurred.

The National Weather Service (NWS) is a line office within NOAA. They are responsible for providing up-to-date weather information in response to oil spills. NWS can provide such information as:

- Wind direction.
- Wind speed.
- Air and sea temperatures.
- Direction and height of sea and swell.
- Weather forecasts.

Refer to Annex O, List of Contacts, for applicable phone numbers.

A.6.4 Physical Geography

The Beta Unit Complex is situated offshore southern California in the San Pedro Bay. The physical geography of the offshore area is discussed in Section A.6.1. The onshore components (e.g., pipeline and Beta Pump Station) are situated in the City of Long Beach, California, primarily within the Long Beach harbor area. The pipeline approaches land along the trend of the Los Angeles River, the seaward extremity of which is called Queensway Bay. It makes landfall along the west bank of this bay (referred to as Pier H), just north of the Queen Mary. This shoreline area is topographically flat and consists mainly of manmade areas (e.g., harbor areas, channels, marinas and connecting roads). The Los Angeles/Long Beach Southern Sector - Area Contingency Plan provides information on shoreline/substrate types within the immediate area.

A.6.5 Access, Command Posts, and Staging Areas

Potential spill sources and response areas within the Beta Unit Complex are accessible by City roads. Primary vehicular access is provided by:

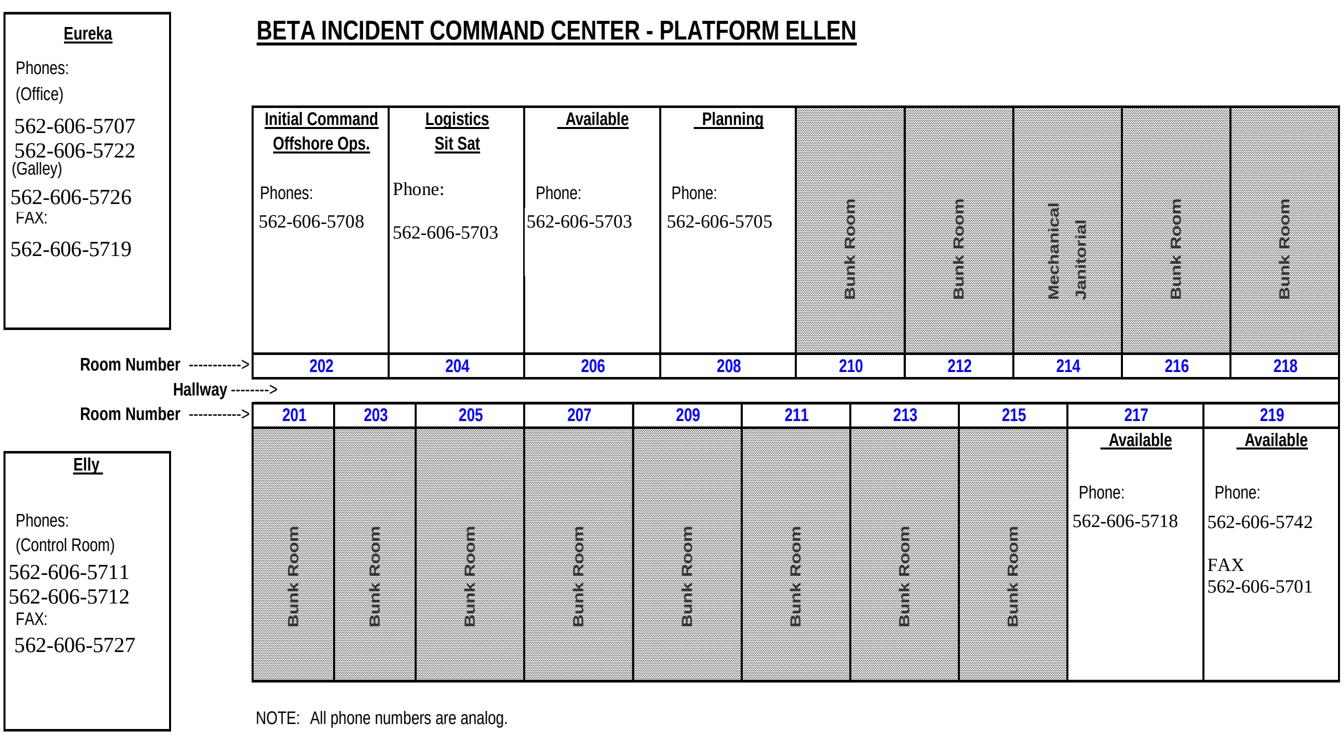
- Harbor Scenic Drive, which runs down toward the landfall of the offshore pipeline.
- Pico Avenue, which runs north-south adjacent to the Beta Pump Station.

Interstate Highway 710 (Long Beach Freeway) is the primary north/south access to the project area, while Ocean Avenue provides east/west access.

The Company has identified the following command post/staging area sites for the Beta Unit Complex:

- Marine Spill Response Corporation – Pre-designated Incident Command Center, 3300 East Spring St., Long Beach

- Forward Command Post (FCP) for offshore incidents only: Platform Ellen Forward Command Post/Situation Room



NOTE: All phone numbers are analog.

POSSIBLE STAGING AREAS:

Purpose	Location	Phone Number
Offshore support, load-out	Ship Services, 971 S, Seaside Ave., Terminal Island	(310) 519-8411
Onshore / nearshore offshore support	Southshore Boat Launch, 590 Queensway Dr. (24hr), across from Queen Mary	(562) 570-8636
Offshore / nearshore load-out	Alamitos Bay – 205 Marina Drive At 2nd Street	(562) 570-3215
	Huntington Harbor – Sunset Aquatic Ramp, Edinger Avenue	(714) 846-0179
Onshore	Cherry Ave Beach (Bluff Park) Belmont Pier and Adjacent Beach Seal Beach Pier Area Bolsa Chica State Beach Huntington City/State Beaches Newport/Balboa Pier Areas	(562) 570-1360; (562) 570-3215 (562) 570-1360; (562) 570-3215 (562) 430-2613 (714) 846-3460 (714) 536-5281/ (714) 536-5280 (949) 644-3047

Additional staging areas in the event of a major spill response would be somewhat dependent upon the location and size of the spill. The exact location may not be definable until the area of impact is known. There are numerous commercial piers in the area adjacent to the facilities that could provide areas for staging of equipment and personnel. Refer to the LA/LB Southern Sector - Area Contingency Plan, Sections 9841 (LA County) and 9842 (Orange County) for additional coastal access points and potential staging area locations.

A.7 RESPONSE ZONE APPENDIX

A.7.1 Introduction

This Response Zone Appendix has been prepared for the San Pedro Bay Pipeline Company's Department of Transportation (DOT) - regulated 16" crude oil pipeline, which transports oil from the Company's Platform Elly (OCS Lease P-300) to the onshore Beta Pump Station located in the City of Long Beach, California. At the Beta Pump Station, the oil is pumped through one of two sales Automatic Custody Transfer (ACT) Units, and then through one of two approximately 1000 feet long 10" delivery pipelines to the offsite THUMS manifold. The 10" pipelines are also owned by San Pedro Bay Pipeline Company and operated by Beta Offshore. This Response Zone Appendix has the PHMSA Sequence Number 1185 – which is the same sequence number as it was under previous ownership by Aera Energy and Pacific Energy Resources, Ltd.. The Response Zone Appendix was previously submitted for review to DOT's Office of Pipeline Safety, Pipeline and Hazardous Materials Safety Administration (PHMSA) in June 2011.

This appendix has been prepared to comply with the Department of Transportation regulations 49 CFR Part 194, *Response Plans for Onshore Pipelines* and is an Annex of Beta Offshore Oil Spill Prevention and Response Plan (OSPRP) for the Beta Complex Facilities. Initial response actions for the entire facilities are covered in Section 2 – Spill Response Plan (Core Plan) of this OSPRP. The OSPRP provides for immediate and long-term response capabilities for the Beta Facilities, including the DOT-regulated pipelines, in the event of a spill.

A.7.2 Pipeline Design and Construction

Approximately 15.29 miles of the 16" crude oil pipeline is situated offshore (6.37 miles in federal waters and 8.91 miles in State waters). The landfall is at Pier H adjacent to the Queen Mary (see Annex A.8, Facility Diagrams).

Beginning at Platform Elly, the first 10.9 miles of the pipeline lie on the ocean floor. The remainder of the offshore pipeline is buried 10-to-15 feet below the ocean floor. The onshore portion of the pipeline is buried 10-to-15 feet below grade (see Annex A.8).

The pipeline is designed in accordance with DOT regulation 49 CFR Part 195 and applicable State regulations. The riser is a 16-inch O.D. seamless steel pipe with 0.844-inch thickness. The remainder of the offshore portion is constructed of 16-inch O.D. seamless steel pipe with a 0.500 wall thickness, 82.77 lb/ft, with welded pipe joints. A concrete weight coating consisting of a 1-inch thickness of 190 lb/cu ft concrete is installed. The protective coating is a “double enamel coat system” of coal tar enamel, reinforcing glass wrap, and outer felt wrap. In addition to the enamel coating, the line is protected with sacrificial zinc anodes. Each anode weighs approximately 315 lb and is installed at intervals of 1000 feet.

A.7.3 Pipeline Throughput

The pipeline currently transports approximately 4,000 BOPD of 14.5° API crude oil from Platform Elly to the onshore Beta Pump Station. The crude is currently shipped using non-pulsating positive displacement screw pumps at pressures that vary from 250 psi to 720 psi.

A.7.4 Beta Pump Station

The onshore pump station facility is located at 170 North Pico Avenue, north of Ocean Boulevard, in Long Beach, California. The facility was installed in 1980 on one acre of land between Pico Avenue and the Long Beach Freeway (see Annex A.8). It consists of a scraper trap, custody transfer meters, a floating roof surge tank, pumps, and manifolds. The current average daily throughput is 4,000 BOPD; the maximum throughput capacity is 9,600 BOPD.

The 10,000-bbl surge tank is a welded steel tank protected by a containment wall, and provides surge control for the San Pedro Bay Pipeline shipping system. The primary function of the tank is to store or provide the oil volume necessary to account for the differential flow rate between the Platform Elly shipping pumps and the onshore pump station shipping pumps.

The surface areas under aboveground piping are contained by a 6-inch curb and covered with gravel. Rainwater in these areas percolates into the soil. The catch basins installed during construction of the pump station have been permanently deactivated. The balance of the pump station surface is covered with a rock and asphalt paving or landscaped. These areas drain offsite to the city storm water system. Drawings and diagrams are found in Annex A.8.

A.7.5 Information Summary

A.7.5.1 Operator Identification

Name of Operator:	Beta Offshore
Name of Facility:	San Pedro Bay Pipeline and Delivery System to THUMS Manifold, and Beta Pump Station
Address of Operator:	Beta Offshore 111 W. Ocean Blvd, Suite 1240 Long Beach, CA 90802
Phone Numbers:	(562) 628-1526 (Beta Offshore main office) (562) 436-0521 (Beta Pump Station office) (562) 606-5711 (24-hour offshore control room) (562) 606-5727 (Elly fax) (562) 606-5701 (Ellen fax)
Facility Street Address:	Beta Offshore/San Pedro Bay Pipeline Company Onshore Pump Station 170 S. Pico Avenue Long Beach, CA 90802

A.7.5.2 Qualified Individual (Available on a 24-Hour Basis)

The Qualified Individual (QI) / Designated Alternates (Alt QI) are responsible for the implementation of the Oil Spill Prevention and Response Plan. For shift changes or transfer of responsibilities and authorities, the QI (or Incident Commander if that is a different person) “on duty” will immediately notify the Federal On-Scene Coordinator and State Incident Commander.

The Company’s QI and Designated Alternates are English-speaking representatives, located in the United States, available on a 24-hour basis, and capable of arriving at the facility in a reasonable period of time but not later than 12 hours. They are thoroughly familiar with the implementation of this Plan and are trained in the responsibilities and authority of the QI/Designated Alternates under this Plan (see Table 1-1) and in those procedures necessary to implement the responsibilities and authority. They have knowledge and training or experience to demonstrate competence in:

- Applicable Federal OSHA standards for emergency operations (29 CFR 1910.120) and California OSHA standards for emergency response operations (Title 8 CCR 5192).
- How to implement the OSPRP.
- Requirements of the National Contingency Plan and the Area Contingency Plan, as required by OPA 90.
- Spill prevention and response provisions and procedures of the plan.
- Resources committed or that could potentially be committed during an incident.
- Procedures for obtaining and obligating funds for response activities and persons (external and internal) to contact who would expedite such actions.
- Ability to assess the need for additional resources and to make the appropriate call-outs and contractual arrangements. Ability to act as a liaison between the facility and the State Incident Commander and the Federal On-Scene Coordinator.

The responsibilities and authority of the Qualified Individual/Designated Alternates are shown below.

RESPONSIBILITIES AND AUTHORITY OF QI / DESIGNATED ALTERNATES
Implement the Oil Spill Prevention and Response Plan for the Beta Facilities.
Notify Company management, response personnel, and government agencies as appropriate.
Assume or assign the role of Incident Commander of the Incident Management Team when activated.
Ensure that internal alarms and hazard communication systems are activated as appropriate to notify all facility personnel.
Ensure that proper and timely agency notifications are made.
Ensure that an initial incident assessment is done and provided to response personnel at the scene.
Initiate or ensure that the Incident Commander (if different from the QI) initiates timely communication with the Federal On-Scene Coordinator and State Incident Commander.
Obligate, either directly or through prearranged contracts, any funds/monies required to carry out all necessary or directed response activities.
Ensure that there is a liaison with federal, state, and local officials.
Ensure that possible hazards to human health and the environment are assessed.
Develop or ensure that the Incident Commander (if different from the QI) develops strategic objectives and directs the overall response operations.
Ensure that assessment and prompt removal actions are implemented to contain and remove the substance released.
Approve or ensure that the Incident Commander (if different from the QI) or appropriate level in the Incident Management Team approves the ordering and release of resources.
Coordinate or ensure that the Incident Commander (if different from the QI) coordinates rescue and response actions.
Review or ensure that the Incident Commander (if different from the QI) approves all press releases.

A.7.5.3 Description of the Response Zone for the San Pedro Bay Pipeline

As required by 49 CFR Section 194.113(b)(3), the single Response Zone is described as the following geographical area:

Offshore Long Beach, California including Long Beach Harbor located in Los Angeles County and continues south along the Southern California coast to Newport Beach, Orange County, California.

A.7.5.4 List of Line Sections Contained in the Response Zone by Station Number

Line Section 1 commences in OCS federal waters and terminates in Long Beach Harbor located in Los Angeles County, California. Line Sections 2 through 4 are located in the City of Long Beach, County of Los Angeles, California. San Pedro Bay Pipeline line sections are shown in Table A-8 below.

Table A-8 San Pedro Bay Pipeline Line Sections

Line Section	Description	Starting Station	Ending Station
1	16-inch offshore pipeline	3+94.0	803+37.0
2	16-inch onshore from landfall to the Beta Pump Station	1+39.2	104+14.1
3	10-inch onshore pipeline from the Beta Pump Station to the THUMS Pipeline Manifold	0+00	10+00
4	Beta Pump Station	NA	NA

A.7.5.5 Basis for Determination of Significant and Substantial Harm

The San Pedro Bay Pipeline (Line Sections 1 through 4) is considered to be capable of causing significant and substantial harm to the environment in the event of a discharge of oil because of its proximity to navigable waters and adjoining shoreline areas designated as environmentally sensitive by the ACP. A statement of potential for significant and substantial harm, should a worst case discharge occur, is provided in Section 1, Page 1-5 and also in the Plan Statement on Page i.

A.7.5.6 Type of Oil and Volume of the Response Zone Worst Case Discharge

Within the response zone of the San Pedro Bay Pipeline, the worst case discharge is calculated to be 3,111 barrels of oil from the pipeline from Platform Elly to the Beta Pump Station. The gravity of the oil transported is 13° API; or Group III crude oil. The worst case discharge was determined by leak volume analysis modeling. The study determined that maximum leakage would occur if a full guillotine cut happened three miles inland from Platform Elly. Refer to Annex H (Risk and Hazard/Vulnerability Analysis) for additional spill calculation information.

A.7.5.7. Worst-Case Discharge Volume for 10,000 Barrel Tank at Beta Pump Station

Calculation methods provided by Mr. James Taylor of the Department of Transportation, Research & Special Programs Administration (now known as PHMSA), were used to arrive at a worst-case spill scenario for the Beta Station 10,000 barrel Breakout Tank.

These calculations are also consistent with DOT OPA 90 regulations, located in 49 CFR, Section 295, Part 194.

The DOT/PHMSA worst case OPA 90 spill volume for this tank has been calculated as follows:

Total Tank Volume – 10,000 barrels

Mitigating Factors	Reduction Allowed	Reduction
Secondary containment capacity greater than 100% capacity of tank	50% reduction in worst case volume	5000 bbl
Tank built, rebuilt, and repaired according to API Standard 650	10% reduction in worst case volume	1000 bbl
Automatic high-level alarms/shutdowns are designed according to NFPA/API RP 2350	5% reduction in worst case volume	500 bbl
Testing/cathodic protection designed according to API Standard 650	5% reduction in worst case volume	500 bbl

Therefore, the DOT/PHMSA worst case volume for the Beta Pump Station Breakout Tank is 3,000 bbls crude oil. The 3,111 barrel worst case for the San Pedro Bay Pipeline remains our worst case volume for this overall DOT regulated portion of the Beta Complex.

A.7.5.8 Material Safety Data Sheet (MSDS)

The MSDS for crude oil is provided in Annex Q of the OSPRP.

A.7.5.9 Location of Sensitive Resources

Sensitive resources within a 15-mile radius of the pipeline include Long Beach Harbor area and the Southern California coastline to Newport Beach, California. Refer to Annex L of this Plan for a detailed discussion of sensitive resources. Additional information is contained in the LA/LB Sourthen Sector ACP, Sections 9841 (LA County) and 9842 (Orange County).

A.7.5.10 Certification of Response Resources

The Company has identified personnel and equipment within its own organization and has contracted with private oil spill removal organizations (see Annex P of this Plan) to provide resources to respond to a worst case discharge or a substantial threat of such a discharge. If necessary, the Company will use the California Oiled Wildlife Care Network (OWCN) for wildlife response and rehabilitation.

A.7.6 NOTIFICATION PROCEDURES

The Company has in place a set of well-defined internal and external notification procedures that address notification of the Company's response organization, including its response teams, qualified individual, and response contractors, and notification of regulatory agencies and affected property owners (see Section 2 of this Plan). Key components, including an Emergency Incident Notification Placard and Environmental Report Form are readily available in Section 2 of this OSPRP.

A.7.7 SPILL DETECTION AND SPILL MITIGATION PROCEDURES

A.7.7.1 Leak Detection System

An automated leak detection system continuously monitors the 16" San Pedro Bay Pipeline and the onshore Beta Pump Station. This includes:

- Automated monitoring and direct reporting of any anomalies to the control room at Platform Elly (staffed 24 hours/day).
- Beta Pump Station for surveillance and operations.
- Leak detection surveillance of the line.

- Annual regulatory surveillance of the line.

The pipeline leak detection system accumulates statistical information concerning the flow difference between inlet and outlet, and will consider generating a leak alarm when the test statistic reaches a certain limit (the alarm threshold). A pattern recognition technique is used to determine whether a leak alarm should be generated when the limit is exceeded.

Detection Time and Accuracy of Leak Rate Estimate

Assuming the following conditions:

- Steady state operations (changes less than approximately 5% from present operating conditions)
- Repeatability for the instrumentation = 0.5%
- Flow meter accuracy = 1%

The following leak size and detection time should be achievable by ATMOS PIPE

Leak Size (% of nominal flow)	Detection Time
1%	50 min
2%	25 min
5%	10 min
≥ 10%	5 min

Table 1. Estimated Detection times for a selection of leak sizes.

The leak size (% of nominal flow) is based on the observed flow rate of 260 bbls/h from data collected. Leak size estimates are expected to have an accuracy of ±10% of real leak size or better. It should be pointed out that the above performance figures may change depending on the actual instrument performance.

Leak Location Accuracy

As a general rule, the location error decreases exponentially as the leak size increases. Leak location estimation depends on the quality of the measurements. For large leaks (greater than 20% of flow), an accuracy of ±5% of the distance from nearest two pressure meters is achievable.

Surveillance of the line with this leak detection system is conducted at Platform Elly's control room, manned 24 hours per day. The control room operators recognize the alarms generated and respond to each alarm. The specific procedures used by the control room operators are contained in the Basic Operations Maintenance, and Procedures Manual. This manual lists the normal and abnormal operating procedures for the pipeline. Should the leak detection system become inoperative, routine surveillance of the pipeline is conducted until the system is repaired.

In the event of a leak, the control room operators have the ability to close the platform discharge shutdown valve (ML3). Closure of this valve automatically shuts down the shipping pumps.

A.7.7.2 Automatic Controls

The San Pedro Bay Pipeline and the Beta Pump Station have a variety of automatic controls which are monitored by Beta control room operators at Platform Elly and field personnel. In addition to these remote protection devices, the Elly control room has the ability to remotely start and stop pumps and to open and close shutdown valves.

The status of each remotely operated device is monitored in the Elly control room. The control room has a CRT display screen that identifies the location of these devices within the process flow.

Table A-9. Automatic Controls.

AUTOMATIC CONTROLS	
PLATFORM ELLY	
Shipping Pump High Pressure Shutdown Switch	
Set Pressure:	500 psig
Function:	Shuts down shipping pumps if discharge pressure reaches 862 psig
Shipping Pump Pressure Relief Valve	
Set Pressure:	1,325 psig
Function:	Relieves discharge fluid flow back to shipping tank if pressure reaches 1,325 psig
BETA STATION	
10,000 Barrel Surge Tank High-High Alarm	
Set Point:	35 feet – 0 inches
Function:	Closes main block valve at inlet to Beta Onshore Pump Station and alarms at Platform Elly
Booster Pumps – High Pressure Shutdown	
Set Point:	85 psig
Function:	Shuts down booster pumps on high pressure exceeding 85 psig
Shipping Pump Discharge Bypass to Suction	
Set Point:	1,350 psig
Function:	Bypasses discharge fluid to pump suction when pressure exceeds 1,350 psig
Delivery Line Shutdown	
Set Point:	1,350 psig
Function:	Shuts in line if pressure exceeds 1370 psig
Station Shutdown	
Set Point:	1,350 psig
Function:	Shuts down all pumps if shipping pump discharge pressure exceeds 1,370 psig

A.7.8 Inspection and Maintenance

A.7.8.1 Corrosion Protection

All buried piping (both onshore and offshore) is externally coated and subject to an impressed current cathodic protection system. All aboveground piping is maintained with an adequate protective coating to prevent corrosion.

The dry oil in the pipeline is non-corrosive. As the oil contains less than 3 percent water, the water remains suspended as small droplets in the continuous oil phase during shipping. As such, water should not come in contact with the pipe wall. As a precaution, however, a corrosion inhibitor is injected into the dry oil stream. Inhibitor residuals are checked every six months along with fluid pH to assure that the pipe wall continues to be exposed to a non-corrosive environment.

A.7.8.2 Pipeline Surveys

Surveys of the offshore portion of the pipeline are conducted annually to assure that cathodic protection potentials are adequate (more negative than -800 MV with respect to a silver/silver chloride half cell) to prevent corrosion. A survey of each end of the line is made each year, while a survey of the entire line is done every two years. A visual inspection of the line is made every two years with a remotely operated vehicle (ROV) in conjunction with the cathodic protection survey to inspect for mechanical damage to the line, the coating, and the anode bracelets. In addition, an internal caliper inspection of the line is made every two years to detect any significant changes in internal diameter.

A.7.9 Hazard Prevention Program

The Company has an established, comprehensive Hazard Prevention Measures program in place for the pipeline. The program is summarized in Table A-10.

Table A-10. Hazard Prevention Measures.

HAZARD PREVENTION PROGRAM
Preventive Maintenance *All Equipment associated with the pipeline systems are maintained/inspected with appropriate operative guidance and in accordance with agency regulations and industry standards.* **Field Inspections** *Internal self-auditing which enables the Company to:* • Assess the status of and need for corrective actions in the preventive maintenance programs. • Train and gather input from field staff. • Assess the effectiveness of operation and maintenance procedures.
Pipeline Rights-of-Way (ROW) Inspection *Performed in accordance with the Department of Transportation (DOT) Code of Federal Regulations Parts 192 and 195. (All inspections are documented.)*
1-Call Systems *The Company actively participated in 1-Call systems in states where the Company has facilities by:* • Using and helping promote the system. • Requiring contractors to use the system.
Compliance *The Company is in compliance with all applicable Department of Transportation Pipeline Safety Regulations and the California Pipeline Safety Act regarding:* • Leak detection systems, devices, equipment, and procedures. • Release prevention systems, devices, equipment, and procedures. • Testing and maintenance practices for pipelines and appurtenances. • Testing and maintenance practices for storage tanks.
Test Frequency • Valves (manual and motor-operated) – twice per year, not to exceed 7½ months. • Overpressure devices – annually, not to exceed 15 months. • Tank alarms – semiannually, not to exceed 7½ months.

A.7.10 Spill Mitigation

Information on spill response procedures, personnel and equipment, and spill mitigation procedures are provided in Section 2 and in various Annexes of this OSPRP. A Waste Management Plan is provided in Annex F of this Plan.

A.7.11 Response Activities

The responsibilities and actions of operations personnel prior to arrival of the Qualified Individual (QI) will be under the direction of the Incident Commander (IC). Priority will be directed initially on evacuating the area if needed, eliminating sources of ignition, and stopping the release. Safety is of primary concern for both Company personnel and the public.

As described in Section 2 of this OSPRP, the Incident Observer or First Responder will initiate the notification process by notifying the Manager of Operations and/or On-Duty Supervisor. The Manager of Operations or On-Duty Supervisor will activate The O'Brien's Response Management agency notification process and the QI. The QI or Designated Alternate QI will activate or supplement the onsite response personnel. For a San Pedro Bay Pipeline or a Beta Pump Station onshore incident only, MSRC personnel may fill the Incident Commander and on-site Incident Management Team until Company personnel are onsite. Responsibilities and authorities of the QI and Designated Alternate QI are described in Annex A.7.5.2 of this Plan.

The Company has identified oil spill response resources (personnel and equipment) sufficient to respond to a worst case discharge. These resources are capable of sustaining a response for the first seven days of the response as required by 49 CFR 194, Appendix A, Section 4.0. These resources are described in Annex P of this Plan.

A.7.12 List of Contacts

Persons and agencies to be notified, including the Qualified Individual and response contractors, are listed in Section 2 of this OSPRP. Additional contacts are provided in Annex O of this Plan.

A.7.13 Training Procedures

The Company has a training program to educate and train Company personnel who are assigned to immediate response and to the Incident Management Team. Training levels have been developed to provide a tailored curriculum for defined levels of response capabilities, which are designated for each individual depending on his or her specific job description. Training procedures and programs are described in Annex M of this Plan.

The Company response training program will ensure the following:

1. All Company personnel know:
    - Their responsibility under this plan.
    - The procedures for contacting, Company personnel on a 24-hour basis and the names of the Qualified Individuals.

2. Reporting personnel know:

    - The content of the Information Summary (see Annex A.7.5).
    - The toll-free telephone number of the National Response Center.
    - The notification process.

3. Persons engaged in response activities know:

    - The characteristics and hazards of the discharge.
    - The conditions that are likely to worsen emergencies, including the consequences of facility malfunctions or failures, and the appropriate corrective actions.
    - The steps necessary to control any accidental discharge and to minimize the potential for fire, explosion, toxicity, or environmental damage.
    - The proper fire fighting procedures and use of equipment, fire suits, and breathing apparatus, as appropriate.

The accountability for training facility spill response personnel lies with the Manager of Operations.

A.7.14 Firefighting Procedures and Equipment Use

The Company will rely on the City of Long Beach Fire Department for firefighting personnel and equipment. The San Pedro Bay Pipeline is buried along its entire length and will not be impacted by fire. Fire protection for the Beta Pump Station includes:

- Two City fire hydrant hookups.
- Five 30# dry chemical fire extinguishers.
- Hose reel with 200 feet of 1½-inch fire hose with adjustable nozzle and hydrant adapter.

Refer to Annex A, Section A.8, Facility Diagrams.

Emergency response for fire and/or explosion is discussed in a separate Company Emergency Action Plan (EAP). Company operations personnel receive environmental and safety training including hands-on training in first responder fire extinguishing. They also receive annual refresher classes on the principles of fire extinguishing. Company operations personnel have not received training to respond to fires beyond the incipient stage.

A.7.15 Drill Procedures

The Training and Drill procedures and programs are provided in Annex M of this Plan.

A.7.16 Plan Review and Update Procedures

The Plan will be reviewed annually. Modifications to the Plan will be performed, within 90 days of a significant change, and submitted to OSPR, PHMSA, and other agencies listed in the Distribution List. Changes addressed will include the following:

- An extension of an existing or construction of a new pipeline.
- Relocation or replacement of a pipeline that affects Plan information (including worst case discharge volumes).
- The type of oil transported if it affects the required response resources.
- The name of the oil spill removal organization.
- Emergency response procedures.
- The Qualified Individual.
- A change in ownership.
- A change in the NCP or ACP that has significant impact on the equipment appropriate for response activities.
- Any other information relating to circumstances that may affect full implementation of the Plan.

A review of the Plan will be conducted by Company management after a spill to evaluate the effectiveness of the Plan and the need for Plan amendments. Following an incident, the Company will conduct a meeting with key members of its response organization to evaluate the response effort. The Manager of Operations will prepare a critique that analyzes the results of the response and will suggest modifications to the Plan, if necessary. Upon Company management approval, results of the reviews will be forwarded to OSPR and PHMSA, as appropriate, within 90 days following the completion of response and cleanup procedures.

A.8 FACILITY DIAGRAMS

Facility diagrams are presented following Tables A-1 through A-4 (Page A-53).

Table A-1a. Platform Ellen Estimated Hydrocarbon Volumes – Pipelines.

Nominal Diameter (inches)	Description	Schedule	Inside Diameter (inches)	X-Sectional Area (sq. inches)	Length (ft.)	Volume (cu. ft.)	Volume (bbls)
3	Well flowlines – West Side/West Well Bay (typical of 17)	80	2.900	6.61	850	38.99	6.9
2	Well flowlines – West Side/West Well Bay (typical of 17)	80	1.939	2.95	850	17.43	3.1
6	"A" test treater header – West Side/West Well Bay	80	5.761	26.07	25	4.53	0.8
4	PL-005 – West Side/West Well Bay	80	3.826	11.50	25	2.00	0.4
6	"B" test treater header – West Side/West Well Bay	80	5.761	26.07	25	4.53	0.8
4	PL-006 – West Side/West Well Bay	80	3.826	11.50	25	2.00	0.4
6	Bulk header – West Side/West Well Bay	80	5.761	26.07	25	4.53	0.8
6	PL-007 – West Side/West Well Bay	80	5.761	26.07	25	4.53	0.8
6	Blowdown header – West Side/West Well Bay	80	5.761	26.07	25	4.53	0.8
3	Well flowlines – East Side/West Well Bay (typical of 13)	80	2.900	6.61	650	29.81	5.3
2	Well flowlines – East Side/West Well Bay (typical of 13)	80	1.939	2.95	650	13.33	2.4
6	"A" test treater header – East Side/West Well Bay	80	5.761	26.07	25	4.53	0.8
4	PL-008 – East Side/West Well Bay	80	3.826	11.50	25	2.00	0.4
6	"B" test treater header – East Side/West Well Bay	80	5.761	26.07	25	4.53	0.8
4	PL-009 – East Side/West Well Bay	80	3.826	11.50	25	2.00	0.4
6	Bulk header – East Side/West Well Bay	80	5.761	26.07	25	4.53	0.8
6	PL-013 – East Side/West Well Bay	80	5.761	26.07	25	4.53	0.8
6	Blowdown header – East Side/West Well Bay	80	5.761	26.07	25	4.53	0.8
3	Well flowlines – West Side/East Well Bay (typical of 12)	80	2.900	6.61	600	27.52	4.9
2	Well flowlines – West Side/East Well Bay (typical of 12)	80	1.939	2.95	600	12.30	2.2
6	"A" test treater header – West Side/East Well Bay	80	5.761	26.07	25	4.53	0.8
4	PL-011 – West Side/East Well Bay	80	3.825	11.50	25	2.00	0.4
6	"B" test treater header – West Side/East Well Bay	80	5.761	26.07	25	4.53	0.8
4	PL-012 – West Side/East Well Bay	80	3.826	11.50	25	2.00	0.4
6	Bulk header – West Side/East Well Bay	80	5.761	26.07	25	4.53	0.8
6	PL-010 - West Side/East Well Bay	80	5.761	26.07	25	4.53	0.8
6	Blowdown header - West Side/East Well Bay	80	5.761	26.07	25	4.53	0.8
3	Well flowlines – East Side/East Well Bay (typical of 15)	80	2.900	6.61	750	34.40	6.1
2	Well flowlines – East Side/East Well Bay (typical of 15)	80	1.939	2.95	750	15.38	2.7
6	"A" test treater header – East Side/East Well Bay	80	5.761	26.07	25	4.53	0.8
4	PL-014 - East Side/East Well Bay	80	3.826	11.50	25	2.00	0.4
6	"B" test treater header - East Side/East Well Bay	80	5.761	26.07	25	4.53	0.8
4	PL-015 - East Side/East Well Bay	80	3.826	11.50	25	2.00	0.4
6	Bulk header - East Side/East Well Bay	80	5.761	26.07	25	4.53	0.8

Table A-1a. Platform Ellen Estimated Hydrocarbon Volumes – Pipelines.

Nominal Diameter (inches)	Description	Schedule	Inside Diameter (inches)	X-Sectional Area (sq. inches)	Length (ft.)	Volume (cu. ft.)	Volume (bbls)
6	PL-016 - East Side/East Well Bay	80	5.761	26.07	25	4.53	0.8
6	~~Blowdown header - East Side/East Well Bay~~ removed from service	80	5.761	26.07	25	4.53	0.8
3	PL-300-J line to Blowdown Vessel	80	2.900	6.61	200	9.17	1.6
4	PL-005 “A” test treater transfer line	80	3.826	11.50	200	15.97	2.8
4	PL-006 “B” test treater transfer line	80	3.826	11.50	200	15.97	2.8
12	PL-007 bulk line	80	11.374	101.64	200	141.17	25.1
4	~~PL-301-A Blowdown Vessel discharge line~~ removed from service	80	3.826	11.50	25	2.00	0.4
3	~~PL-301-A Blowdown Vessel discharge line~~ removed from service	80	2.900	6.61	200	9.17	1.6
3	~~PL-302-H Blowdown Vessel discharge line to Completion Fluids Tank~~ removed from service	80	2.900	6.61	200	9.17	1.6
4	~~377W-A slop tank discharge line to blowdown pump~~ removed from service	80	3.826	11.50	200	15.97	2.8
4	FD-023-A diesel line from Ellen east boat landing	80	3.826	11.50	200	15.97	2.8
4	FD-021-A diesel line from diesel header to Diesel Fuel Tank V-010-L1	80	3.826	11.50	25	2.00	0.4
4	FD-022-A diesel line from diesel header to Diesel Fuel Tank V-010-L2	80	3.826	11.50	25	2.00	0.4
2	FD-025-A diesel line from Diesel Fuel Tank V-101-L2 to Elect/Welding Building	80	1.939	2.95	50	1.03	0.2
2	FD-028-A diesel line from Diesel Fuel Tank V-101-L2 to Elect/Welding Building	80	1.939	2.95	100	2.05	0.4
2	FD-026-A diesel header	80	1.939	2.95	150	3.08	0.5
2	FD-029-A diesel line from diesel header to Engine Package E-1	80	1.939	2.95	50	1.03	0.2
2	FD-027-A diesel line from diesel header to Pump Package P-1	80	1.939	2.95	50	1.03	0.2
3	FD-035-A diesel drain line from Engine Package E-1 to Diesel Fuel Tank V-010-L1	80	2.900	6.61	150	6.88	1.2
2	FD-008-A diesel switching line	80	1.939	2.95	200	4.10	0.7
4	FD-008-A diesel switching line to/from Elly	80	3.826	11.50	25	2.00	0.4
2	FD-024-A diesel switching line from Diesel Fuel Tank V-010-L1 to Pump Package P-1	80	1.939	2.95	25	0.51	0.1
3	FD-037-A diesel fuel equalizing line between Diesel Fuel Tanks V-010-L1 and V-010-L2	80	2.900	6.61	200	9.17	1.6
8	PL-106-A suction line to oil sump pump P25A	80	7.625	45.66	25	7.93	1.4
8	PL-107-A suction line to oil sump pump P25B	80	7.625	45.66	100	31.71	5.6
6	PL-081-A discharge lines from Oil Sump Pumps P-25A/P-25B to Wet/Dry Oil Tank	80	5.761	26.07	150	27.16	4.8
TOTAL							**112.4**

Table A-1b. Platform Ellen Estimated Hydrocarbon Volumes – Tanks/Vessels.

Description	Diameter (inches)	Length S/S (inches)	Shell Volume (cu. ft.)	Head Volume (cu. ft.)	Total Volume (cu. ft.)	Total Volume (bbls)
V-101 Blowdown Vessel	32	96	44.68	4.96	49.64	8.83
V-010-L2 West Main Diesel Storage Tank						307.77
V-010-L1 East Main Diesel Storage Tank						307.77
V-020-E1 Standby Diesel Day Tank						11.40
V-410-E1 Rig Engine Diesel Supply Tank						6.23
V-420-E1 Emergency Rig Diesel Supply Tank						3.06
V-010-E1 Rig Generator Diesel Day Tank						57.71
Gel Tank						56.50
Slugging Tank						23.00
Active Tank No. 3						130.00
Active Tank No. 2						131.13
Active Tank No. 1						246.00
Reserve Tank						278.50
Holding Tanks						50.00
Slop Tank						50.00
Completion Tanks						
U-18-A Oil Sump	36	180	106.03	28.27	134.30	23.88
U-18-B Oil Sump	36	180	106.03	28.27	134.30	23.88
TOTAL						**1,715.7**

Table A-2a. Platform Elly Estimated Hydrocarbon Volumes – Pipelines.

Nominal Diameter (inches)	Description	Schedule	Inside Diameter (inches)	X-Sectional Area (sq. inches)	Length (ft.)	Volume (cu. ft.)	Volume (bbls)
4	PL-026-A bypass around X-04A (Dwg. No. C6-1737)	80	3.826	11.50	50	3.99	0.7
6	PL-027-A dry oil from V-02A outlet to X-01A inlet (Dwg. No. C6-1737/C6-1736)	80	5.761	26.07	100	18.10	3.2
10	Dry oil out of X-01A to 12 PL-029-A/12” PL-101-A (Dwg. No. C6-1736)	80	9.750	74.66	150	77.77	13.8
6	Dry oil bypass around X-01A (Dwg. No. C6-1736)	80	5.761	26.07	50	9.05	1.6
12	PL-029-A dry oil to S-02B (Dwg. No. C6-1736/C6-1738/C6-1742)	80	11.374	101.64	200	141.17	25.1
4	PL-040-A wet test treater from branch to V-02A to V-02B heater treater inlet piping (Dwg. No. C6-1737/C6-1739)	80	3.826	11.50	150	11.98	2.1
3	PL-055-A wet oil from 4” PL-040-A to 6” PL-035-A (Dwg. No. C6-1739)	80	2.900	6.61	25	1.15	0.2
10	PL-031-A emulsion from X-01B crude/dry oil exchanger to X-02B crude heater (Dwg. No. C6-1738)	80	9.750	74.66	50	25.92	4.6
10	Emulsion bypass of X-01B crude dry oil exchanger to inlet of X-02B crude heater (Dwg. No. C6-1738)	80	9.750	74.66	50	25.92	4.6
10	PL-032-A from X-02B crude heater outlet to V-01B FWKO inlet (Dwg. No. C6-1738)	80	9.750	74.66	50	25.92	4.6
6	PL-032-A emulsion bypass around X-02B from outlet of X-01A crude/dry oil exchanger outlet (Dwg. No. C6-1736)	80	5.761	26.07	50	9.05	1.6
3	V-01B FWKO level gage bridle (Dwg. No. C6-1738)	80	2.900	6.61	40	1.83	0.3
3	V-01B FWKO level switch bridle (Dwg. No. C6-1738)	80	2.900	6.61	40	1.83	0.3
8	PL-033-A emulsion from V-01B FWKO to X-03B produced water/emulsion exchanger (Dwg. No. C6-1738/C6-1739)	80	7.625	45.66	100	31.71	5.6
8	V-01B FWKO bypass to 8” PL-033-A (Dwg. No. C6-1738)	80	7.625	45.66	75	23.78	4.2
6	PL-034-A emulsion from X-03B outlet to X-04B emulsion heater inlet (Dwg. No. C6-1739)	80	5.761	26.07	50	9.05	1.6
4	PL-034A bypass around X-03B (Dwg. No. C6-1739)	80	3.826	11.50	50	3.99	0.7
6	PL-035-A emulsion from X-04B to V-02B heater treater (Dwg. No. C6-1739)	80	5.761	26.07	100	18.10	3.2
4	PL-035-A bypass around X-04B (Dwg. No. C6-1739)	80	3.826	11.50	50	3.99	0.7
6	PL-036-A dry oil from V-02B outlet to X-01B inlet (Dwg. No. C6-1739/C6-1738)	80	5.761	26.07	100	18.10	3.2
10	Dry oil out of X-01B to 12” PL-029-A (Dwg. No. C6-1738)	80	9.750	74.66	150	77.77	13.8
4	Dry oil bypass around X-01B (Dwg. No. C6-1738)	80	3.826	11.50	50	3.99	0.7
2	PL-086-A rag layer blowdown header to S-02A wet oil tank (Dwg. No. C6-1736/ C6-1737/C6-1738/C6-1739/C6-1742)	80	1.939	2.95	250	5.13	0.9
2	PL-043-A rag layer blowdown from V-01A (Dwg. No. C6-1736)	80	1.939	2.95	50	1.03	0.2
2	PL-059-A rag layer blowdown from V-02A (Dwg. No. C6-1737)	80	1.939	2.95	50	1.03	0.2
2	PL-061-A rag layer blowdown from V-01B (Dwg. No. C6-1738)	80	1.939	2.95	50	1.03	0.2
2	PL-063-A rag layer blowdown from V-02B (Dwg. No. C6-1739)	80	1.939	2.95	50	1.03	0.2
3	S-02A level gage bridle (Dwg. No. C6-1742)	80	2.900	6.61	25	1.15	0.2
6	PL-051-A suction line from S-02A wet oil tank to P-03A/B wet oil recycle pumps (Dwg. No. C6-1742)	80	5.761	26.07	50	9.05	1.6
2	PL-065-A discharge line from P-03A/B wet oil recycle pumps to S-02A wet oil tank (Dwg. No. C6-1742)	80	1.939	2.95	50	1.03	0.2
4	PL-052-A discharge line from P-03A/B wet oil recycle pumps to 4” x 10” reducer (Dwg. No. C6-1742/C6-1735)	80	3.826	11.50	150	11.98	2.1
10	PL-020-A wet oil recycle from 10” x 4” reducer to 10” bypass of X-06 (Dwg. No. C6-1735)	80	9.750	74.66	100	51.85	9.2

Table A-2a. Platform Elly Estimated Hydrocarbon Volumes – Pipelines.

Nominal Diameter (inches)	Description	Schedule	Inside Diameter (inches)	X-Sectional Area (sq. inches)	Length (ft.)	Volume (cu. ft.)	Volume (bbls)
10	Emulsion out of X-06 to 10" PL-020-A (Dwg. No. C6-1735)	80	9.750	74.66	100	51.85	9.2
4	Jumper from 4" PL-052-A to 4" PL-069 (Dwg. No. C6-1742)	80	3.826	11.50	25	2.00	0.4
4	PL-069-A from jumper to 10" PL-031-A inlet to X-02B crude heater (Dwg. No. C6-1742/C6-1738)	80	3.826	11.50	200	15.97	2.8
4	PL-069-A from jumper to S-06 bulk sand storage tank (Dwg. No. C6-1742/C6-1756)	80	3.826	11.50	100	7.99	1.4
4	PL-069-A from branch to S-06 to 4" PL-044-A inlet to X-05B well test crude heater (Dwg. No. C6-1756/C66-1734)	80	3.826	11.50	150	11.98	2.1
4	Suction line from S-02B dry oil tank to P-09 dry oil recycle pump (Dwg. No. C6-1742)	80	3.826	11.50	25	2.00	0.4
2	Discharge line from P-09 dry oil recycle pump to 4" PL-052-A (Dwg. No. C6-1742)	80	1.939	2.95	75	1.54	0.3
3	Bypass from P-09 suction line to 6" PL-051-A (Dwg. No. C6-1742)	80	2.900	6.61	25	1.15	0.2
10	PL-046-A suction header to shipping pumps (Dwg. No. C6-1742/C6-1743)	80	9.750	74.66	50	25.92	4.6
6	PL-070-C suction line from 10" PL-046-A suction header to P-05A shipping pump (Dwg. No. C6-1743)	80	5.761	26.07	15	2.72	0.5
6	PL-071-C suction line from 10" PL-046-A suction header to P-05B shipping pump (Dwg. No. C6-1743)	80	5.761	26.07	15	2.72	0.5
6	PL-072-C suction line from 10" PL-046-A suction header to P-05C shipping pump (Dwg. No. C6-1743)	80	5.761	26.07	15	2.72	0.5
4	Discharge line from P-05A shipping pump to 8" PL-048-C discharge header (Dwg. No. C6-1743)	80	3.826	11.50	15	1.20	0.2
4	Discharge line from P-05B shipping pump to 8" PL-048-C discharge header (Dwg. No. C6-1743)	80	3.826	11.50	15	1.20	0.2
4	Discharge line from P-05C shipping pump to 8" PL-048-C discharge header (Dwg. No. C6-1743)	80	3.826	11.50	15	1.20	0.2
8	PL-048-C discharge header (Dwg. No. C6-1743)	80	7.625	45.66	50	15.85	2.8
4	PL-099-A dry oil bypass from PL-048-C shipping pump discharge header to 6" PL-099-A (Dwg. No. C6-1743)	80	3.826	11.50	75	5.99	1.1
6	PL-099-A dry oil bypass from 4" PL-099-A to 12" PL-029-A inlet to S-02B dry oil tank (Dwg. No. C6-1743/C6-1742)	80	5.761	26.07	75	13.58	2.4
6	"A" P.A.M. dry oil line to 8" PL-049-C (Dwg. No. C6-1743)	80	5.761	26.07	75	13.58	2.4
6	"B" P.A.M. dry oil line to 8" PL-049-C (Dwg. No. C6-1743)	80	5.761	26.07	75	13.58	2.4
8	PL-049-C to 16" dry oil pipeline to shore (Dwg. No. C6-1743/C6-1743 Supp 1)	80	7.625	45.66	150	47.56	8.5
8	PL-047-A slop oil from oil sump to oil sump pump P-23 suction (Dwg. No. C6-1791)	80	7.625	45.66	10	3.17	0.6
6	Slop oil from oil sump pump P-23 discharge (Dwg. No. C6-1791)	80	5.761	26.07	50	9.05	1.6
4	Slop oil to wet oil tank (Dwg. No. C6-1791/C6-1742)	80	3.826	11.50	100	7.99	1.4
8	PL-081-A slop oil tie-in from Ellen oil sump (Dwg. No. C6-1791/C6-1799)	80	7.625	45.66	200	63.42	11.3
8	PL-073-A liquid dump line from high pressure flare drum V-10 to oil sump U-05 (Dwg. No. C6-1794/C6-1793/C6-1791)	80	7.625	45.66	200	63.42	11.3
2	PL-073-A liquid dump line form low pressure flare drum V-09 to oil sump U-05 (Dwg. No. C6-1792)	80	1.939	2.95	25	0.51	0.1
2	Lube oil refill line from lube oil refill tank to injection pump Saturn turbine drivers (Dwg. No. 008-93-014)	80	1.939	2.95	200	4.10	0.7
2	Lube oil refill line from lube oil refill tank to 2.5 MW generator Centaur turbine drivers (Dwg. No. 008-93-014)	80	1.939	2.95	200	4.10	0.7
2	~~Lube oil refill line from lube oil refill tank to 6.5 MW generator Mars turbine drivers (Dwg. No. 008-93-014)~~ removed from service	80	1.939	2.95	200	4.10	0.7
1	~~Lube oil refill line from lube oil refill header to 6.5 MW generator Mars turbine driver ZAN-9005 (Dwg. No. 4000-F-004)~~ removed from service	80	0.957	0.72	75	0.37	0.1

Table A-2a. Platform Elly Estimated Hydrocarbon Volumes – Pipelines.

Nominal Diameter (inches)	Description	Schedule	Inside Diameter (inches)	X-Sectional Area (sq. inches)	Length (ft.)	Volume (cu. ft.)	Volume (bbls)
1	~~Lube oil refill line from lube oil refill header to 6.5 MW generator Mars turbine driver ZAN-9006 (Dwg. No. 4000-F-004)~~ removed from service	80	0.957	0.72	75	0.37	0.1
0.75	Lube oil from lube oil reservoir T-1A to shipping pump P-05A (Dwg. No. 008-93-015)	80	0.742	0.43	15	0.05	0.0
0.75	Lube oil to lube oil reservoir T-1A from shipping pump P-05A (Dwg. No. 008-93-015)	80	0.742	0.43	15	0.05	0.0
0.75	Lube oil from lube oil reservoir T-1B to shipping pump P-05B (Dwg. No. 008-93-015)	80	0.742	0.43	15	0.05	0.0
0.75	Lube oil to lube oil reservoir T-1B from shipping pump P-05B (Dwg. No. 008-93-015)	80	0.742	0.43	15	0.05	0.0
0.75	Lube oil from lube oil reservoir T-1C to shipping pump P-05C (Dwg. No. 008-93-015)	80	0.742	0.43	15	0.05	0.0
0.75	Lube oil to lube oil reservoir T-1C from shipping pump P-05C (Dwg. No. 008-93-015)	80	0.742	0.43	15	0.05	0.0
4	PL-038-A emulsion from Ellen "A" test header to X-05A well test crude heater (Dwg. No. C6-1733)	80	3.826	11.50	300	23.96	4.3
4	PL-039-A emulsion from Ellen "A" well test crude heater to "A" well test treater (Dwg. No. C6-1733)	80	3.826	11.50	100	7.99	1.4
3	PL-039-A emulsion bypass of Ellen "A" well test crude heater (Dwg. No. C6-1733)	80	2.900	6.61	25	1.15	0.2
3	Well test treater V-03A level gage bridles (Dwg. No. C6-1733)	80	2.900	6.61	25	1.15	0.2
3	PL-040-A wet oil from well test treater V-03A to piping tie-in with well test treater V-03B (Dwg. No. C6-1733/C6-1734)	80	2.900	6.61	50	2.29	0.4
3	Dry oil piping from well test treater V-03A to piping tie-in with well test treater V-03B (Dwg. No. C6-1733/C6-1734)	80	2.900	6.61	50	2.29	0.4
4	PL-044-A emulsion from Ellen "B" test header to X-05B well test crude heater (Dwg. No. C6-1734)	80	3.826	11.50	300	23.96	4.3
4	PL-045-A emulsion from Ellen "B" well test crude heater to "B" well test treater (Dwg. No. C6-1734)	80	3.826	11.50	100	7.99	1.4
3	PL-045-A emulsion bypass of Ellen "B" well test crude heater (Dwg. No. C6-1733)	80	2.900	6.61	25	1.15	0.2
3	PL-041-A wet oil from well test treater V-03B to piping tie-in with well test treater V-03A (Dwg. No. C6-1734)	80	2.900	6.61	50	2.29	0.4
3	Dry oil piping from well test treater V-03B to piping tie-in with well test treater V-03A (Dwg. No. C6-1734)	80	2.900	6.61	50	2.29	0.4
4	PL-040-A wet oil from test treaters to V-02A heater treater inlet piping (Dwg. No. C6-1737)	80	3.826	11.50	100	7.99	1.4
3	Dry oil from test treaters to dry oil tank inlet piping (Dwg. No. C6-1734/C6-1742)	80	2.900	6.61	150	6.88	1.2
12	PL-018 emulsion from Eureka to inlet to U-08 sphere receiver-oil (Dwg. No. C6-1735)	80	11.374	101.64	150	105.88	18.8
10	PL-019-C bypass line for Eureka emulsion around U-08 sphere receiver to X-06 Eureka crude heater (Dwg. C6-1735)	80	9.750	74.66	150	77.77	13.8
10	Bypass for X-06 Eureka crude heater to 18" PL-017-A (Dwg. No. C6-1735)	80	9.750	74.66	100	51.85	9.2
6	U-08 sphere receiver for Eureka emulsion bypass to 8" x 6" reducer in PL-068-A to X-02A crude heater (No. C6-1735)	80	5.761	26.07	100	18.10	3.2
8	U-08 sphere receiver bypass from 8" x 6" reducer in PL-068-A to 10" PL-023-A (Dwg. No. C6-1735/C6-1736)	80	7.625	45.66	100	31.71	5.6
8	PL-068-A from upstream of X-02A to 10" PL-032-A downstream of X-02B (Dwg. No. C6-1738)	80	7.625	45.66	100	31.71	5.6
10	Emulsion piping from X-06 Eureka crude heater to 14" PL-017-A (Dwg. No. C6-1735/ C6-1736)	80	9.750	74.66	100	51.85	9.2
2	PL-066-A from U-08 Eureka oil sphere receiver to 8" PL-068-A (Dwg. No. C6-1736)	80	1.939	2.95	200	4.10	0.7
14	PL-017-A emulsion from Ellen bulk manifold to 18" x 14" reducer	80	12.500	122.75	200	170.44	30.3
18	PL-017-A emulsion from 18" x 14" reducer to branches to X-01A and X-01B exchangers (Dwg. No. C6-1735/C6-1736)	80	16.124	204.24	300	425.50	75.7
14	PL-017-A emulsion to X-01A crude/dry oil exchanger (Dwg. No. C6-1736)	80	12.500	122.72	100	85.22	15.2

Table A-2a. Platform Elly Estimated Hydrocarbon Volumes – Pipelines.

Nominal Diameter (inches)	Description	Schedule	Inside Diameter (inches)	X-Sectional Area (sq. inches)	Length (ft.)	Volume (cu. ft.)	Volume (bbls)
10	PL-022-A emulsion from X-01A crude/dry oil exchanger to X-02A crude heater (Dwg. No. C6-1736)	80	9.750	74.66	50	25.92	4.6
10	Emulsion bypass of X-01A crude dry oil exchanger to inlet of X-02A crude heater (Dwg. No. C6-1736)	80	9.750	74.66	50	25.92	4.6
10	PL-023-A from X-02A crude heater outlet to V-01A FWKO inlet (Dwg. No. C6-1736)	80	9.750	74.66	50	25.92	4.6
6	PL-023-A emulsion bypass around X-02A from outlet of X-01A crude/dry oil exchanger outlet (Dwg. No. C6-1736)	80	5.761	26.07	50	9.05	1.6
3	V-01A FWKO level gage bridle (Dwg. No. C6-1736)	80	2.900	6.61	40	1.83	0.3
3	V-01A FWKO level switch bridle (Dwg. No. C6-1736)	80	2.900	6.61	40	1.83	0.3
8	PL-024-A emulsion from V-01A FWKO to X-03A produced water/emulsion exchanger (Dwg. No. C6-1736/C6-1737)	80	7.625	45.66	100	31.71	5.6
8	V-01A FWKO bypass to 8” PL-024-A (Dwg. No. C6-1736)	80	7.625	45.66	75	23.78	4.2
14	PL-017-A emulsion to X-01B crude/dry oil exchanger (Dwg. No. C6-1736/C6-1738)	80	12.500	122.72	200	170.44	30.3
6	PL-025-A emulsion from X-03A outlet to X-04A emulsion heater inlet (Dwg. No. C6-1737)	80	5.761	26.07	50	9.05	1.6
4	PL-025-A bypass around X-03A (Dwg. No. C6-1737)	80	3.826	11.50	50	3.99	0.7
6	PL-026-A emulsion from X-04A to V-02A heater treater (Dwg. No. C6-1737)	80	5.761	26.07	100	18.10	3.2
1.5	Lube oil piping – injection pump turbine driver skid NP-07A (Dwg. No. C6-1767)	80	1.500	1.77	50	0.61	0.1
2	Diesel fuel supply piping – injection pump turbine driver skid NP-07A (Dwg. No. C6-1767)	80	1.939	2.95	50	1.03	0.2
0.5	Diesel fuel bypass piping – injection pump turbine driver skid NP-07A (Dwg. No. C6-1767)	80	0.546	0.23	25	0.04	0.0
2	FD-016-A diesel fuel supply piping – injection pump turbine driver NP-07A (Dwg. No. C6-1767)	80	1.939	2.95	50	1.03	0.2
0.5	FD-041-A diesel fuel bypass piping – injection pump turbine driver NP-07A (Dwg. No. C6-1767)	80	0.546	0.23	25	0.04	0.0
1.5	Lube oil piping – injection pump turbine driver skid NP-07A (Dwg. No. C6-1768)	80	1.500	1.77	50	0.61	0.1
2	Diesel fuel supply piping – injection pump turbine driver skid NP-10A (Dwg. No. C6-1768)	80	1.939	2.95	50	1.03	0.2
0.5	Diesel fuel bypass piping – injection pump turbine driver skid NP-10A (Dwg. No. C6-1768)	80	0.546	0.23	25	0.04	0.0
2	FD-014-A diesel fuel supply piping – injection pump turbine driver NP-10A (Dwg. No. C6-1768)	80	1.939	2.95	50	1.03	0.2
0.5	FD-039-A diesel fuel bypass piping – injection pump turbine driver NP-10A (Dwg. No. C6-1768)	80	0.546	0.23	25	0.04	0.0
1.5	Lube oil piping – injection pump turbine driver skid NP-10B (Dwg. No. C6-1769)	80	1.500	1.77	50	0.61	0.1
2	Diesel fuel supply piping – injection pump turbine driver skid NP-10B (Dwg. No. C6-1769)	80	1.939	2.95	50	1.03	0.2
0.5	Diesel fuel bypass piping – injection pump turbine driver skid NP-10B (Dwg. No. C6-1769)	80	0.546	0.23	25	0.04	0.0
2	FD-015-A diesel fuel supply piping – injection pump turbine driver NP-10B (Dwg. No. C6-1769)	80	1.939	2.95	50	1.03	0.2
0.5	FD-040-A diesel fuel bypass piping – injection pump turbine driver NP-10B (Dwg. No. C6-1769)	80	0.546	0.23	25	0.04	0.0
2	OL-10A lube oil piping – 2.5 MW generator Centaur turbine driver skid NJ-01A (Dwg. No. C6-1776)	80	1.939	2.95	40	0.82	0.1
1	Diesel fuel supply piping – 2.5 MW generator Centaur turbine driver skid NJ-01A (Dwg. No. C6-1776)	80	0.957	0.72	40	0.20	0.0
2	OL-02A-A lube oil bypass piping – 2.5 MW generator Centaur turbine driver skid NJ-01A (Dwg. No. C6-1776)	80	1.939	2.95	25	0.51	0.1
1	FD-017-A diesel fuel supply piping – 2.5 MW generator Centaur turbine driver NJ-01A (Dwg. No. C6-1776)	80	0.957	0.72	50	0.25	0.0
2	FD-017-A diesel fuel supply piping – 2.5 MW generator Centaur turbine driver NJ-01A (Dwg. No. C6-1776)	80	1.939	2.95	150	3.07	0.5

Table A-2a. Platform Elly Estimated Hydrocarbon Volumes – Pipelines.

Nominal Diameter (inches)	Description	Schedule	Inside Diameter (inches)	X-Sectional Area (sq. inches)	Length (ft.)	Volume (cu. ft.)	Volume (bbls)
2	OL-01B lube oil piping – 2.5 MW generator Centaur turbine driver skid NJ-01B (Dwg. No. C6-1777)	80	1.939	2.95	40	0.82	0.1
1	FD-019B-A diesel fuel supply piping – 2.5 MW generator Centaur turbine driver skid NJ-01B (Dwg. No. C6-1777)	80	0.957	0.72	40	0.20	0.0
2	OL-02B-A lube oil bypass piping – 2.5 MW generator Centaur turbine driver skid NJ-01B (Dwg. No. C6-1777)	80	1.939	2.95	25	0.51	0.1
1	FD-018-A diesel fuel supply piping – 2.5 MW generator Centaur turbine driver NJ-01B (Dwg. No. C6-1777)	80	0.957	0.72	50	0.25	0.0
2	FD-018-A diesel fuel supply piping – 2.5 MW generator Centaur turbine driver NJ-01B (Dwg. No. C6-1777)	80	1.939	2.95	150	3.07	0.5
2	OL-01C lube oil piping – 2.5 MW generator Centaur turbine driver skid NJ-01C (Dwg. No. C6-1778)	80	1.939	2.95	25	0.51	0.1
1	FD-019C-A diesel fuel supply piping – 2.5 MW generator Centaur turbine driver skid NJ-01C (Dwg. No. C6-1778)	80	0.957	0.72	25	0.12	0.0
2	OL-02C-A lube oil bypass piping – 2.5 MW generator Centaur turbine driver skid NJ-01C (Dwg. No. C6-1778)	80	1.939	2.95	750	15.36	2.7
1	FD-019-A diesel fuel supply piping – 2.5 MW generator Centaur turbine driver NJ-01C (Dwg. No. C6-1778)	80	0.957	0.72	750	3.74	0.7
2	FD-019-A diesel fuel supply piping – 2.5 MW generator Centaur turbine driver NJ-01C (Dwg. No. C6-1778)	80	1.939	2.95	25	0.51	0.1
4	FD-001-A diesel fuel unloading line (Dwg. No. C6-1787)	80	3.826	11.50	100	7.99	1.4
4	FD-002-A diesel fuel unloading line (Dwg. No. C6-1787)	80	3.826	11.50	50	3.99	0.7
4	FD-008-A diesel fuel transfer line to/from Platform Ellen (Dwg. No. C6-1787/ C6-1797)	80	3.826	11.50	300	23.96	4.3
4	FD-003-A diesel fuel transfer line to suction of diesel transfer pumps P-11A/P-11B (Dwg. No. C6-1787)	80	3.826	11.50	25	2.00	0.4
4	FD-004-A diesel fuel transfer line – discharge of diesel transfer pumps to transfer filter (Dwg. No. C6-1787)	80	3.826	11.50	50	3.99	0.7
2	FD-005-A diesel fuel recycle line to diesel fuel tank (Dwg. No. C6-1787)	80	1.939	2.95	50	1.02	0.2
2	Diesel tank level gage main bridle (Dwg. No. C6-1787)	80	1.939	2.95	25	0.51	0.1
0.5	Diesel tank individual level gage piping (Dwg. No. C6-1787)	80	0.546	0.23	25	0.04	0.0
0.5	Diesel tank individual level transmitter gage piping (Dwg. No. C6-1787)	80	0.546	0.23	25	0.04	0.0
2	FD-005-A diesel fuel transfer line form transfer filter to injection pump diesel day tank (Dwg. No. C6-1787)	80	1.939	2.95	100	2.05	0.4
2	FD-005-A diesel transfer line to deck crane L-01A (Dwg. No. C6-1787)	80	1.9396	2.95	100	2.05	0.4
2	FD-005-A diesel transfer line to deck crane L-01B (Dwg. No. C6-1787)	80	1.939	2.95	100	2.05	0.4
3	FD-009-A injection pump diesel transfer header (Dwg. No. C6-1788)	80	2.900	6.61	200	9.17	1.6
3	FD-007-A diesel transfer line to generator diesel day tank (Dwg. No. C6-1787)	80	2.900	6.61	200	9.17	1.6
3	FD-010-A diesel transfer line to standby generator JZ-01X (Dwg. No. C6-1787)	80	2.900	6.61	200	9.17	1.6
3	FD-010-A generator diesel header (Dwg. No. C6-1787/C6-1788)	80	2.900	6.61	200	9.17	1.6
2	FD-038-A diesel return header (Dwg. No. C6-1787/C6-1788)	80	1.939	2.95	200	4.10	0.7
1.5	FD-050-A diesel transfer line to standby generator ZAN-9007 (Dwg. No. C6-1787/ 4000-F-006)	80	1.500	1.77	50	0.61	0.1
3	FD-008-A diesel crossover line from transfer filter to transfer line to/from Ellen (Dwg. No. C6-1787)	80	2.900	6.61	50	2.29	0.4
1.5	Diesel fuel piping on standby generator skid JZ-02X (Dwg. No. C6-1787)	80	1.500	1.77	25	0.31	0.1

Table A-2a. Platform Elly Estimated Hydrocarbon Volumes – Pipelines.

Nominal Diameter (inches)	Description	Schedule	Inside Diameter (inches)	X-Sectional Area (sq. inches)	Length (ft.)	Volume (cu. ft.)	Volume (bbls)
2	FD-045-A diesel fuel piping to Mars turbine driver for 6 MW generators (Dwg. No. C6-1787/4000-F-002)	80	1.939	2.95	200	4.10	0.7
2	Diesel fuel piping to liquid fuel booster pumps and Mars turbine driver for 6 MW generator ZAN-9005 (No. 400-F-002)	80	1.939	2.95	75	1.54	0.3
2	Diesel fuel piping to liquid fuel booster pumps and Mars turbine driver for 6 MW generator ZAN-9006 (No. 4000-F-002)	80	1.939	2.95	75	1.54	0.3
8	Dry oil line from 8” PL-049-C to inlet to U-10 sphere launcher for 16” oil line to shore (Dwg. No. C6-1743 Supp 1)	80	7.625	45.66	75	23.78	4.2
6	Dry oil line from Edith to inlet of M-4 oil pig receiver (Dwg. No. C6-1743 Supp 1)	80	5.761	26.07	75	13.58	2.4
6	1243-C-6” bypass of M-5 Edith oil pig receiver to 6” x 3” reducer	80	5.761	26.07	25	4.53	0.8
4	1249-C-4” outlet from M-5 Edith oil pig receiver to 1243-C-6” (Dwg. No. C6-1743 Supp 1)	80	3.826	11.50	25	2.00	0.4
3	1245-C-3” from 6” x 3” reducer to inlet to F-1 filter (Dwg. No. C6-1743 Supp 1)	80	2.900	6.61	10	0.46	0.1
3	1245-C-3” from F-1 filter outlet to FM M-6A meter inlet (Dwg. No. C6-1743 Supp 1)	80	2.900	6.61	10	0.46	0.1
3	1246-C-3” from 6” x 3” reducer to inlet to F-2 filter (Dwg. No. C6-1743 Supp 1)	80	2.900	6.61	10	0.46	0.1
3	1246-C-3” from F-2 filter outlet to FM M-6B meter inlet (Dwg. No. C6-1743 Supp 1)	80	2.900	6.61	10	0.46	0.1
3	1245-C-3” from FM M-6A outlet to bypass of filters/meters (Dwg. No. C6-1743 Supp 1)	80	2.900	6.61	10	0.46	0.1
3	1245-C-3” from FM M-6A outlet to bypass of filters/meters (Dwg. No. C6-1743 Supp 1)	80	2.900	6.61	10	0.46	0.1
3	Bypass of filters/meters (Dwg. No. C6-1743 Supp 1)	80	2.900	6.61	25	1.15	0.2
6	Line with Edith oil to 16” dry oil shipping line to shore (Dwg. No. C6-1743 Supp 1)	80	5.761	26.07	25	4.53	0.8
4	PL-107-A Edith oil to dry oil tanks (Dwg. No. C6-1743 Supp 1)	80	3.826	11.50	150	11.98	2.1
16	Dry oil line form U-10 sphere receiver to +12 level (Dwg. No. C6-1743 Supp 1)	80	14.312	160.92	75	83.81	14.9
2	PL-305-A liquid discharge from V-1004 35# gas scrubber to 3” PL-057 (Dwg. No. C6-1744 Supp 1/C6-1744)	80	1.939	2.95	100	2.05	0.4
3	PL-057-A from VZ-04X vapor recovery compressor suction scrubber to S-02A wet oil tank (No. C6-1744/C6-1742)	80	2.900	6.61	150	6.88	1.2
2	3” PL-057-A to U-05 oil sump (Dwg. No. C6-1744-C6-1742)	80	2.900	6.61	150	6.88	1.2
4	PL-053-A header for vessel liquid dumps to V-10 H.P. scrubber (Dwg. No. C6-1744/ C6-1745/C6-1794)	80	3.826	11.50	200	15.97	2.8
3	PL-053-A liquid dump from V-18 slug catcher to 4” PL-053-A (Dwg. No. C6-1744)	80	2.900	6.61	50	2.29	0.4
2	Liquid dump from VZ-05AX “A” fuel gas compressor suction scrubber to 4” PL-053-A (Dwg. No. C6-1745)	80	1.939	2.95	50	1.03	0.2
2	Liquid dump from VZ-06AX “A” fuel gas compressor interstage scrubber to 4” PL-053-A (Dwg. No. C6-1745)	80	1.939	2.95	50	1.03	0.2
2	PL-053-A liquid dump from VZ-05BX “B” fuel gas compressor suction scrubber to 4” PL-053-A (Dwg. No. C6-1746)	80	1.939	2.95	50	1.03	0.2
2	PL-053-A liquid dump from VZ-06BX “B” fuel gas compressor interstage scrubber to 4” PL-053-A (Dwg. No. C6-1746)	80	1.939	2.95	50	1.03	0.2
1	PL-138-B liquid out of MAK-9003 fuel gas filter separator to 1” PL-142-B (Dwg. No. 4000-F-001)	80	0.957	0.72	25	0.12	0.0
1	PL-139-B liquid out of MAK-9003 fuel gas filter separator to 1” PL-142-B (Dwg. No. 4000-F-001)	80	0.957	0.72	25	0.12	0.0
1	PL-140-B liquid out of MAK-9004 fuel gas filter separator to 1” PL-144-B (Dwg. No. 4000-F-001)	80	0.957	0.72	25	0.12	0.0
1	PL-141-B liquid out of MAK-9004 fuel gas separator to 1” PL-144-B (Dwg. No. 4000-F-001)	80	0.957	0.72	25	0.12	0.0

Table A-2a. Platform Elly Estimated Hydrocarbon Volumes – Pipelines.

Nominal Diameter (inches)	Description	Schedule	Inside Diameter (inches)	X-Sectional Area (sq. inches)	Length (ft.)	Volume (cu. ft.)	Volume (bbls)
1	PL-142-B liquid from MAK-9003 fuel gas filter separator to 2” PL-143-A (Dwg. No. 4000-F-001)	80	0.957	0.72	25	0.12	0.0
1	PL-144-B liquid from MAK-9004 fuel gas filter separator to 2” PL-143-A (Dwg. No. 4000-F-001)	80	0.957	0.72	25	0.12	0.0
1	PL-137-B liquid out of MBL-1003 fuel gas receiver to 1” PL-143-A (Dwg. No. 4000-F-001)	80	0.957	0.72	25	0.12	0.0
1	PL-143-A liquid from MBL-1003 fuel gas receiver to 2” PL-143-A (Dwg. No. 4000-F-001)	80	0.957	0.72	25	0.12	0.0
2	PL-143-A liquid dump header to 3” PL-058-A (Dwg. No. 4000-F-001/C6-1747)	80	1.939	2.95	100	2.05	0.4
3	PL-058-A liquid dump header from 2” PL-143-A to 18” PL-017 bulk manifold (Dwg. No. C6-1747/C6-1736)	80	2.900	6.61	200	9.17	1.6
2	PL-101-A V-15A fuel gas scrubber liquid dump to 3” PL-058-A (Dwg. No. C6-1747)	80	1.939	2.95	25	0.51	0.1
2	PL-102-A V-15B fuel gas scrubber liquid dump to 3” PL-058-A (Dwg. No. C6-1747)	80	1.939	2.95	25	0.51	0.1
2	PL-121-A liquid dump header to 3” PL-058-A (Dwg. No. C6-1788/C6-1747)	80	1.939	2.95	200	4.10	0.7
1	Liquid dump line from F-14A injection pump turbine fuel gas filter to 2” PL-121 (Dwg. No. C6-1788)	80	0.957	0.72	25	0.12	0.0
1	Liquid dump line form F-14B injection pump turbine fuel gas filter to 2” PL-121 (Dwg. No. C6-1788)	80	0.957	0.72	25	0.12	0.0
2	PL-120-A liquid dump header to 3” PL-058-A (Dwg. No. C6-1788/C6-1747)	80	1.939	2.95	200	4.10	0.7
1	Liquid dump line from F-13A generator turbine fuel gas filter to 2” PL-121 (Dwg. No. C6-1788)	80	0.957	0.72	25	0.12	0.0
1	Liquid dump line from F-13B generator turbine fuel gas filter to 2” PL-121 (Dwg. No. C6-1788)	80	0.957	0.72	25	0.12	0.0
TOTAL							**473.6**

Table A-2b. Platform Elly Estimated Hydrocarbon Volumes – Tanks/Vessels.

Description	Diameter (inches)	Length S/S (inches)	Shell Volume (cu. ft.)	Head Volume (cu. ft.)	Total Volume (cu. ft.)	Total Volume (bbls)
Lube oil tank – injection pump turbine driver NP-07A						1.79
Lube oil tank – injection pump turbine driver NP-10A						1.79
Lube oil tank – injection pump turbine driver NP-10B						1.79
Lube oil tank – Centaur turbine generator driver NJ-01A						5.19
Lube oil tank – Centaur turbine generator driver NJ-01B						5.19
Lube oil tank – Centaur turbine generator driver NJ-01C						5.19
~~Lube oil tank – Mars turbine generator driver ZAN-9005~~ removed from service						36.24
~~Lube oil tank – Mars turbine generator driver ZAN-9006~~ removed from service						36.24
S-10 diesel fuel tank (Dwg. No. C6-1787)						1,000.00
S-11 injection pump diesel day tank (Dwg. No. C6-1787)						150.00
S-12 generator diesel day tank (Dwg. No. C6-1787)						150.00
SZ-13X standby generator diesel day tank (Dwg. No. C6-1787)						12.62
F-07 diesel fuel unloading filter (Dwg. No. C6-1787)	10	37	1.68	0.00	1.68	0.30
F-11 diesel fuel transfer filter (Dwg. No. C6-1787)	10	37	1.68	0.00	1.68	0.30
U-05 oil sump (Dwg. No. C6-1791)	48	192	201.06	16.59	217.65	38.77
V-10 high pressure flare drum (Dwg. No. C6-1794)	72	120	282.74	56.55	339.29	60.43
V-09 low pressure flare drum (Dwg. No. C6-1792)	48	108	113.10	16.76	129.85	23.13
Turbine lube oil refill tank (Dwg. No. 008-93-014)						5.95
V-09 low pressure flare drum (Dwg. No. C6-1792)	48	108	113.10	16.76	129.85	23.13
Turbine lube oil refill tank (Dwg. No. 008-93-014)						5.95
T-1A shipping pump “A” lube oil tank (Dwg. No. 008-93-015)						0.60
T-1B shipping pump “B” lube oil tank (Dwg. No. 008-93-015)						0.60
T-1C shipping pump “C” lube oil tank (Dwg. No. 008-93-015)						0.60
X-05A well test crude heater (Dwg. No. C6-1733)						3.17
V-03A well test treater (Dwg. No. C6-1733)	96	204	854.51	134.04	988.55	176.07
X-05B well test crude heater (Dwg. No. C6-1734)						3.17
V-03B well test treater (Dwg. No. C6-1734)	96	204	854.51	134.04	988.55	176.07
U-08 sphere receiver-oil (Dwg. No. C6-1735)	12/16	12/7	20.89	0.53	21.42	3.82
X-06 Eureka crude heater (Dwg. No. C6-1735)						1.79
X-01A crude/dry oil exchanger (Dwg. No. C6-1736)	42	240	192.42	5.61	198.03	35.27
X-02A crude heater (Dwg. No. C6-1736)						0.82
V-01A FWKO (Dwg. No. C6-1736)	120	480	3,141.59	261.80	3,403.39	606.17
X-03A produced water emulsion exchanger (Dwg. No. C6-1737)						19.06
X-04A emulsion heater (Dwg. No. C6-1737)						8.78

Table A-2b. Platform Elly Estimated Hydrocarbon Volumes – Tanks/Vessels.

Description	Diameter (inches)	Length S/S (inches)	Shell Volume (cu. ft.)	Head Volume (cu. ft.)	Total Volume (cu. ft.)	Total Volume (bbls)
V-02A heater treater (Dwg. No. C6-1737)	144	540	5,089.38	452.39	5,541.76	987.03
X-01B crude/dry oil exchanger (Dwg. No. C6-1738)	42	240	192.42	5.61	198.03	35.27
X-02B crude heater (Dwg. No. C6-1738)						0.82
V-01B FWKO (Dwg. No. C6-1738)	120	480	3,141.59	261.80	3,403.39	606.17
X-03B produced water emulsion exchanger (Dwg. No. C6-1738)						19.06
X-04B emulsion heater (Dwg. No. C6-1739)						8.78
V-02B heater treater (Dwg. No. C6-1739)	144	540	5,089.38	452.39	5,541.76	987.03
S-02A wet oil tank (Dwg. No. C6-1742)						500.00
S-02B dry oil tank (Dwg. No. C6-1742)						2,500.00
M-5 Edith oil pig receiver (Dwg. No. C6-1743 Supp 1)	8	36	1.05	0.08	1.12	0.20
U-10 sphere launcher for 16” dry oil line to shore (Dwg. No. C6-1743 Supp 1)	20	138	25.09	5.09	30.18	5.37
V-1004B 35# gas scrubber	60	144	235.62	32.72	268.34	47.79
VZ-04X vapor recovery compressor suction scrubber (Dwg. No. C6-1744)	42	96	76.97	11.22	88.19	15.71
V-18 slug catcher (Dwg. No. C6-1744)	30	96	39.27	4.09	43.36	7.72
VZ-05AX “A” fuel gas compressor suction scrubber (Dwg. No. C6-1745)	30	96	39.27	4.09	43.36	7.72
VZ-06AX “A” fuel gas compressor interstage scrubber (Dwg. No. C6-1745)	30	96	39.27	4.09	43.36	7.72
VZ-05BX “B” fuel gas compressor suction scrubber (Dwg. No. C6-1746)	30	96	39.27	4.09	43.36	7.72
VZ-06BX “B” fuel gas compressor interstage scrubber (Dwg. No. C6-1746)	30	96	39.27	4.09	43.36	7.72
MAK-9003 fuel gas separator filter (Dwg. No. 4000-F-001)	22	133	29.26	0.81	30.06	5.35
MAK-9004 fuel gas separator filter (Dwg. No. 4000-F-001)	22	133	29.26	0.81	30.06	5.35
V-15A fuel gas scrubber (Dwg. No. C6-1747)	35	116	64.59	6.50	71.08	12.66
V-15B fuel gas scrubber (Dwg. No. C6-1747)	35	116	64.59	6.50	71.08	12.66
F-14A injection pump turbine fuel gas filter (Dwg. No. C6-1788)	10.75	82	4.31	0.09	4.40	0.78
F-14B injection pump turbine fuel gas filter (Dwg. No. C6-1788)	10.75	82	4.31	0.09	4.40	0.78
F-13A generator turbine fuel gas filter (Dwg. No. C6-1788)	12.75	83	6.13	0.16	6.29	1.12
F-13B generator turbine fuel gas filter (Dwg. No. C6-1788)	12.75	83	6.13	0.16	6.29	1.12
TK1000 temporary dry oil tank (Dwg. No. C6-1749) Brine Storage, not crude oil						600.00
TK1001 temporary dry oil tank (Dwg. No. C6-1749) Brine Storage, not crude oil						600.00
TOTAL						**9,562.50**

Table A-3a. Platform Eureka Estimated Hydrocarbon Volumes – Pipelines.

Nominal Diameter (inches)	Description	Schedule	Inside Diameter (inches)	Cross-Sectional Area (sq. inches)	Length (ft.)	Volume (cu. ft.)	Volume (bbls)
3	PL-701 flowlines from West Well Bay (typical of 19) (Dwg. No. 3900-F-403)	80	2.900	6.61	2,850	130.72	23.2
3	PL-731 flowlines from East Well Bay (typical of 19) (Dwg. No. 3900-F-404)	80	2.900	6.61	2,850	130.72	23.2
6	PL-813-H “B” well test manifold in West Well Bay (Dwg. No. 3900-F-403)	80	5.761	26.07	50	9.05	1.6
6	PL-103-H “B” well test header from West Well Bay to MAM-1102B (Dwg. No. 3900-F-403/404/409)	80	5.761	26.07	150	27.16	4.8
6	PL-817-H “B” well test manifold in East Well Bay (Dwg. No. 3900-F-404)	80	5.761	26.07	50	9.05	1.6
6	PL-103-H tie-in from East Well Bay “B” test manifold to 6” PL-103 well test header (Dwg. No. 3900-F-404)	80	5.761	26.07	150	27.16	4.8
6	PL-812-H “A” well test manifold in West Well Bay (Dwg. No. 3900-F-403)	80	5.761	26.07	50	9.05	1.6
6	PL-102-H “A” well test header from West Well Bay to MAM-1102A (Dwg. No. 3900-F-403/404/408)	80	5.761	26.07	150	27.16	4.8
6	PL-818-H “A” well test manifold in East Well Bay (Dwg. No. 3900-F-404)	80	5.761	26.07	50	9.05	1.6
6	PL-102-H tie-in from East Well Bay “B” test manifold to 6” PL-102 well test header (Dwg. No. 3900-F-404)	80	5.761	26.07	150	27.16	4.8
6	PL-811-H production manifold in West Well Bay (Dwg. No. 3900-F-403)	80	5.761	26.07	50	9.05	1.6
10	PL-101-H production header from West Well Bay to 10” x 12” reducer (Dwg. No. 3900-F-403/404/405/406)	80	9.750	74.66	100	51.85	9.2
6	PL-815-H production manifold in East Well Bay (Dwg. No. 3900-F-404)	80	5.761	26.07	50	9.05	1.6
10	PL-101-H tie-in from East Well Bay production manifold to 12” PL-101 production header (Dwg. No. 3900-F-404)	80	9.750	74.66	100	51.85	9.2
12	PL-101-H production header from 10” x 12” reducer to MAY-1101 (Dwg. No. 3900-F-404/405/406)	80	11.374	101.64	200	141.17	25.1
6	PL-814-H well cleanup manifold in West Well Bay (Dwg. No. 3900-F-403)	80	5.761	26.07	50	905	1.6
6	PL-1040-H well cleanup header in West Well Bay to MAY-1116 (Dwg. No. 3900-F-403/404/405)	80	5.761	26.07	150	27.16	4.8
6	PL-818-H well cleanup manifold in East Well Bay (Dwg. No. 3900-F-404)	80	5.761	26.07	50	9.05	1.6
6	PL-1040-H tie-in from well cleanup manifold in East Well Bay well cleanup header (Dwg. No. 3900-F-404)	80	5.761	26.07	150	27.16	4.8
6	Crossover from PL-103 “B” well test header to 12” PL-101 production header (Dwg. No. 3900-F-404)	80	5.761	26.07	25	4.53	0.8
6	Crossover from PL-102 “A” well test header to 12” PL-101 production header (Dwg. No. 3900-F-404)	80	5.761	26.07	25	4.53	0.8
6	Crossover from PL-1040 well cleanup header to 12” PL-101 production header (Dwg. No. 3900-F-404)	80	5.761	26.07	25	4.53	0.8
10	PL-118-E S.V. bypass from East Well Bay production manifold to downstream of shipping pumps (No. 3900-F-404/407)	80	9.750	74.66	300	155.54	27.7
6	PL-1043-A liquid outlet from MAY-1116 to ABJ-1105 well cleanup tank (Dwg. No. 3900-F-405/406)	80	5.761	26.07	150	27.16	4.8
6	PL-040-A liquid outlet from ABJ-1105 to suction of PBA-1308 solids transfer pump (Dwg. No. 3900-F-406)	80	5.761	26.07	25	4.53	0.8
4	PL-040-A liquid outlet from discharge of PBA-1308 to 6” PL-110-A (Dwg. No. 3900-F-406)	80	3.826	11.50	100	7.99	1.4
6	PL-108-A liquid outlet from ABJ-1105 to suction of PBA-1303 liquid transfer pump (Dwg. No. 3900-F-406)	80	5.761	26.07	25	4.53	0.8
6	Crossover between suction of PBA-1303 and PBA-1304 (Dwg. No. 3900-F-406)	80	5.761	26.07	25	4.53	0.8
6	PL-110-A liquid discharge from PBA-1303 to junction of PL-110-A/PL-111-A (Dwg. No. 3900-F-406)	80	5.761	26.07	50	9.05	1.6

Table A-3a. Platform Eureka Estimated Hydrocarbon Volumes – Pipelines.

Nominal Diameter (inches)	Description	Schedule	Inside Diameter (inches)	Cross-Sectional Area (sq. inches)	Length (ft.)	Volume (cu. ft.)	Volume (bbls)
6	PL-110-A from intersection with PBA-1303 discharge/6" PL-111-A to MAY-1101 inlet piping (Dwg. No. 3900-F-406)	80	5.761	26.07	100	18.10	3.2
16	PL-105-A wet oil out of MAY-1101 to inlet PAX-1301-A/B shipping pumps (Dwg. No. 3900-F-406/407)	80	16.124	204.24	150	212.75	37.8
10	PL-106-A wet oil from 16" PL-105 to ABJ-1105 (Dwg. No. 3900-F-406)	80	9.750	74.66	200	103.69	18.4
6	PL-111-A liquid from intersection with 6" PL-110-A to HBG-1103 A/B inlet piping (Dwg. No. 3900-F-406/408/409)	80	5.761	26.07	200	36.21	6.4
4	PL-139-A liquid from ABJ-1105 to utility pump suction header (Dwg. No. 3900-F-406/413)	80	3.826	11.50	150	11.98	2.1
4	Liquid from ABJ-1105 to high pressure mud pump suction header (Dwg. No. 3900-F-406/452)	80	3.826	11.50	150	11.98	2.1
8	Emulsion discharge line from PAX-1301 A/B to discharge header (Dwg. No. 3900-F-407)	80	3.826	11.50	20	1.60	0.3
6	Emulsion recycle line from discharge to suction of PAX-1301 A/B (Dwg. No. 3900-F-407)	80	5.761	26.07	20	3.62	0.6
12	PL-118-A discharge header from PAX-1301 A/B to inlet to 12" wet oil line to Elly (Dwg. No. 3900-F-407)	80	11.374	101.64	150	105.88	18.8
4	Emulsion charge line from 12" PL-118 to KAH-1603 crude oil sphere launcher (Dwg. No. 3900-F-407)	80	3.826	11.50	25	2.00	0.4
12	PL-104 emulsion bypass line around PAX-1301 A/B to PAX-1302 A/B/C suction header (Dwg. No. 3900-F-407)	80	11.374	101.64	100	70.58	12.6
6	PL-118-A suction lines to P-1302 A/B/C (Dwg. No. 3900-F-407)	80	5.761	26.07	30	5.43	1.0
6	Emulsion in discharge lines from P-1302 A/B/C to 12" discharge header	80	5.761	26.07	30	5.43	1.0
4	Emulsion recycle line from discharge to suction of PAX-1302 A/B/C (Dwg. No. 3900-F-407)	80	3.826	11.50	25	2.00	0.4
12	PAX-1302 A/B/C discharge header to tie-in with PAX-1301 A/B discharge header (Dwg. No. 3900-F-407)	80	11.374	101.64	50	35.29	6.3
8	PL-101-A production liquid return line from PAX-1302 A/B/C discharge header to MAY-1101 inlet piping (3900-F-407)	80	7.625	45.66	200	63.42	11.3
12	Wet oil pipeline to Elly from KAH-1603 to +12 level (Dwg. No. 3900-F-407)	80	11.374	101.64	75	52.94	9.4
2	Level control bridle for MAY-1101 (Dwg. No. 3900-F-407)	80	1.939	2.95	75	1.54	0.3
4	PL-115 wet oil from MAM-1102A to MBD-1104A (Dwg. No. 3900-F-408)	80	3.826	11.50	25	2.00	0.4
2	Level gage bridle for MAM-1102A (Dwg. No. 3900-F-408)	80	1.939	2.95	25	0.51	0.1
4	MAM-1102A bypass from 6" PL-2102-A to HBG-1103A inlet (Dwg. No. 3900-F-408)	80	3.826	11.50	50	3.99	0.7
4	PL-128-A bypass from 6" PL-102-A around MAM-1102A and HBG-1103A (Dwg. No. 3900-F-408)	80	3.826	11.50	50	3.99	0.7
2	PL-1018-A from MAM-1102A to suction of PBA-1102A (Dwg. No. 3900-F-408)	80	1.939	2.95	25	0.51	0.1
2	PL-103-A from PBA-1102A discharge to MAM-1102A inlet piping (Dwg. No. 3900-F-408)	80	1.939	2.95	25	0.51	0.1
2	PL-117 wet oil out of MAM-1102A to 4" PL-113-A (Dwg. No. 3900-F-408)	80	1.939	2.95	50	1.02	0.2
2	Level gage bridle for MBD-1104A (Dwg. No. 3900-F-408)	80	1.939	2.95	25	0.51	0.1
2	PL-113-A emulsion out of MDB-1104A to 4" PL-113-A (Dwg. No. 3900-F-408)	80	1.939	2.95	50	1.03	0.2
2	PL-124-A wet oil out of MBD-1104A to 4" PL-113-A (Dwg. No. 3900-F-408)	80	1.939	2.95	50	1.03	0.2
4	PL-113-A wet oil to 12" PL-101-A (Dwg. No. 3900-F-408/405)	80	3.826	11.50	100	7.99	1.4
4	PL-120 wet oil from MAM-1102B to MBD-1104B (Dwg. No. 3900-F-409)	80	3.826	11.50	25	2.00	0.4
2	Level gage bridle for MAM-1102B (Dwg. No. 3900-F-409)	80	1.939	2.95	25	0.51	0.1

Table A-3a. Platform Eureka Estimated Hydrocarbon Volumes – Pipelines.

Nominal Diameter (inches)	Description	Schedule	Inside Diameter (inches)	Cross-Sectional Area (sq. inches)	Length (ft.)	Volume (cu. ft.)	Volume (bbls)
4	MAM-1102B bypass from 6" PL-103-A to HBG-1103B inlet (Dwg. No. 3900-F-409)	80	3.826	11.50	50	3.99	0.7
4	PL-129-A bypass from 6" PL-103-A around MAM-1102B and HBG-1103B (Dwg. No. 3900-F-409)	80	3.826	11.50	50	3.99	0.7
2	PL-1014-A from MAM-1102B to suction of PBA-1102B (Dwg. No. 3900-F-409)	80	1.939	2.95	25	0.51	0.1
2	PL-102-A from PBA-1102B discharge to MAM-1102B inlet piping (Dwg. No. 3900-F-409)	80	1.939	2.95	25	0.51	0.1
2	PL-122 wet oil out of MAM-1102B to 4" PL-114-A (Dwg. No. 3900-F-409)	80	1.939	2.95	50	1.02	0.2
2	Level gage bridle for MBD-1104B (Dwg. No. 3900-F-409)	80	1.939	2.95	25	0.51	0.1
2	PL-114-A emulsion out of MDB-1104B to 4" PL-114-A (Dwg. No. 3900-F-409)	80	1.939	2.95	50	1.03	0.2
2	PL-125-A wet oil out of MBD-1104B to 2" PL-122-A (Dwg. No. 3900-F-409)	80	1.939	2.95	50	1.03	0.2
4	PL-114-A wet oil to 12" PL-101-A (Dwg. No. 3900-F-409/405)	80	3.826	11.50	100	7.99	1.4
4	CD-1003-A liquid from MBF-1106 relief scrubber to ABH-1109 oil sump (Dwg. No. 3900-F-412/414)	80	3.826	11.50	100	7.99	1.4
6	PL-131-A wet oil from ABH-1108 oil sump to suction of PBA-1304 oil sump pump (Dwg. No. 3900-F-414)	80	5.761	26.07	25	4.53	0.8
4	PL-123-A wet oil from discharge of PBA-1304 to 12" PL-101 (Dwg. No. 3900-F-414/405)	80	3.826	11.50	100	7.99	1.4
4	DF-101-A diesel fuel loading header (Dwg. No. 3900-F-427)	80	3.826	11.50	500	39.93	7.1
4	DF-100-A diesel fuel loading header to inlet of MAJ-2583/2584 (Dwg. No. 3900-F-427)	80	3.826	11.50	500	39.93	7.1
4	DF-127-A diesel fuel loading header from outlet of MAJ-2583/2584 12" pump casing (Dwg. No. 3900-F-427)	80	3.826	11.50	500	39.93	7.1
4	MAJ-2583/2584 bypass from 4" DF-100-A to 4" DF-127-A (Dwg. No. 3900-F-427)	80	3.826	11.50	50	3.99	0.7
4	DF-126-A diesel fuel from 4" DF-127-A to ABJ-2580 (Dwg. No. 3900-F-427)	80	3.826	11.50	200	15.97	2.8
2	DF-129-A diesel fuel from ABJ-2580 to 12" casing (Dwg. No. 3900-F-427)	80	1.939	2.95	200	4.10	0.7
4	DF-162-A diesel fuel from ABJ-2580 to utility pump suction header (Dwg. No. 3900-F-427-413)	80	3.826	11.50	200	15.97	2.8
2	DF-151-A diesel fuel from ABJ-2580 to PZZ-2581 diesel transfer pump suction (Dwg. No. 3900-F-427)	80	1.939	2.95	50	1.03	0.2
2	DF-153-A diesel fuel from PZZ-2581 discharge to inlet of MAJ-2585/2586 transfer filters (Dwg. No. 3900-F-427)	80	1.939	2.95	50	1.03	0.2
2	DF-154-A diesel fuel from outlet of MAJ-2585/2586 to 4" DF-200 diesel fuel header (Dwg. No. 3900-F-427)	80	1.939	2.95	50	1.03	0.2
2	DF-153-A diesel fuel bypass of MAJ-2585/2586 transfer filters (Dwg. No. 3900-F-427)	80	1.939	2.95	50	1.03	0.2
2	DF-200-A diesel fuel transport line (Dwg. No. 3900-F-427)	80	1.939	2.95	200	4.10	0.7
2	DF-201-A diesel fuel from 2" DF-200-A to V-010-E2/V-020-E2 (Dwg. No. 3900-F-427/2900-F-448)	80	1.939	2.95	200	4.10	0.7
3	DF-204-A diesel fuel from V-020-A to ABJ-2580 (Dwg. No. 2900-F-448/3900-F-427)	80	2.900	6.61	200	9.17	1.6
1	Diesel fuel transfer line from V-020-E2 to V-420-E2 standby diesel supply tank (Dwg. No. 2900-F-448)	80	0.957	0.72	100	0.50	0.1
2	Diesel fuel transfer line from V-010-E2 to V-410-E2 diesel supply tank (Dwg. No. 2900-F-448)	80	1.939	2.95	100	2.05	0.4
2	246E-H diesel fuel from V-410-E2 to EN-010/020/030-E2 (Dwg. No. 2900-F-448)	80	1.939	2.95	100	2.05	0.4
2	246E-H diesel fuel from EN-010/020/030-E2 to V-410-E2 (Dwg. No. 2900-F-448)	80	1.939	2.95	100	2.05	0.4
1.5	DF-207-A diesel fuel to standby generator (Dwg. No. 3900-F-427/435)	80	1.500	1.77	200	2.45	0.4
1	DF-1082-A diesel fuel from 2" DF-200-A to rig truss (Dwg. No. 3900-F-427/2900-F-448)	80	0.957	0.72	200	1.00	0.2

Table A-3a. Platform Eureka Estimated Hydrocarbon Volumes – Pipelines.

Nominal Diameter (inches)	Description	Schedule	Inside Diameter (inches)	Cross-Sectional Area (sq. inches)	Length (ft.)	Volume (cu. ft.)	Volume (bbls)
1	DF-160-A diesel fuel to utility pump engine (Dwg. No. 3900-F-327/413)	80	0.957	0.72	200	1.00	0.2
1	DF-161-A diesel fuel return from utility pump engine to ABJ-2580 (Dwg. No. 3900-F-413/427)	80	0.957	0.72	200	1.00	0.2
6	Suction header to utility pump (Dwg. No. 3900-F-413)	80	5.761	26.07	50	9.05	1.6
4	Discharge line from utility pump to 3" branch to disposal wells (Dwg. No. 3900-F-413)	80	3.826	11.50	100	7.99	1.4
3	Piping to disposal well 48 from 4" discharge line from utility pump (Dwg. No. 3900-F-413)	80	2.900	6.61	150	6.88	1.2
3	Piping from disposal well 48 inlet piping to disposal well 46 (Dwg. No. 3900-F-413)	80	2.900	6.61	150	6.88	1.2
2	DF-202-A diesel fuel from 2" DF-200-A to pipe rack PR-2 (Dwg. No. 3900-F-427/2900-F-448)	80	1.939	2.95	200	4.10	0.7
1	263R-H diesel fuel to crane SP-3790-PR-2 (Dwg. No. 2900-F-448)	80	0.957	0.72	200	1.00	0.2
1	262R-H diesel fuel to logging unit (Dwg. No. 2900-F-448)	80	0.957	0.72	200	1.00	0.2
2	DF-303-A diesel fuel from 4" DF-200 to pump package P-2 (Dwg. No. 3900-F-427/2900-F-448)	80	1.939	2.95	200	4.10	0.7
1	Diesel fuel line from DF-303-A to crane SP-980-P2 (Dwg. No. 2900-F-448)	80	0.957	0.72	200	1.00	0.2
1	Diesel fuel line from DF-303-A to logging unit (Dwg. No. 2900-F-448)	80	0.957	0.72	200	1.00	0.2
1	Diesel fuel line from DF-303-A to crane SP-985-P2 (Dwg. No. 2900-F-448)	80	0.957	0.72	200	1.00	0.2
1.5	~~H.P. washdown pump suction line from ABJ-2600B to tie-in with suction line from ABJ-2600A (Dwg. No. 3900-F-434)~~ removed from service	80	1.500	1.77	100	1.23	0.2
1.5	~~H.P. washdown pump suction line from ABJ-2600A to tie-in with suction line from ABJ-2600B (Dwg. No. 3900-F-434)~~ removed from service	80	1.500	1.77	100	1.23	0.2
1.5	~~H.P. washdown pump suction line downstream of ABJ-2600A/B tie-in (Dwg. No. 3900-F-434)~~ removed from service	80	1.500	1.77	200	2.45	0.4
1.25	~~H.P. washdown pump suction line from ABJ-2600B (Dwg. No. 3900-F-434)~~ removed from service	80	1.250	1.23	200	1.70	0.3
1.25	~~Line from ABJ-2600A to 1.25" line from ABJ-2600B to H.P. washdown pump suction (Dwg. No. 3900-F-434)~~ removed from service	80	1.250	1.23	50	0.43	0.1
1	~~Discharge line from H.P. washdown pump to 2" x 1" reducer (Dwg. No. 3900-F-434)~~ removed from service	80	0.957	0.72	25	0.12	0.0
1	~~H.P. washdown pump bypass from discharge to suction (Dwg. No. 3900-F-434)~~ removed from service	80	0.957	0.72	25	0.12	0.0
2	~~DW-310-D H.P. washdown pump distribution header (Dwg. No. 3900-F-434)~~ removed from service	80	1.939	2.95	400	8.20	1.5
2	LAN-2530 facilities standby generator skid diesel fuel piping (Dwg. No. 3900-F-435)	80	1.939	2.95	50	1.03	0.2
1	Lube oil fill piping from lube oil tank to facilities standby generator (Dwg. No. 3900-F-435)	80	0.957	0.72	100	0.50	0.1
1	Lube oil fill piping from lube oil tank to engine package E-2 (Dwg. No. 3900-F-435)	80	0.957	0.72	200	1.00	0.2
2	279P-A wet oil header to H.P. mud pumps P-020-P2/P-010-P2 (Dwg. No. 2900-F-452)	80	1.939	2.95	100	2.05	0.4
TOTAL							**362.2**

Table A-3b. Platform Eureka Estimated Hydrocarbon Volumes – Tanks/Vessels.

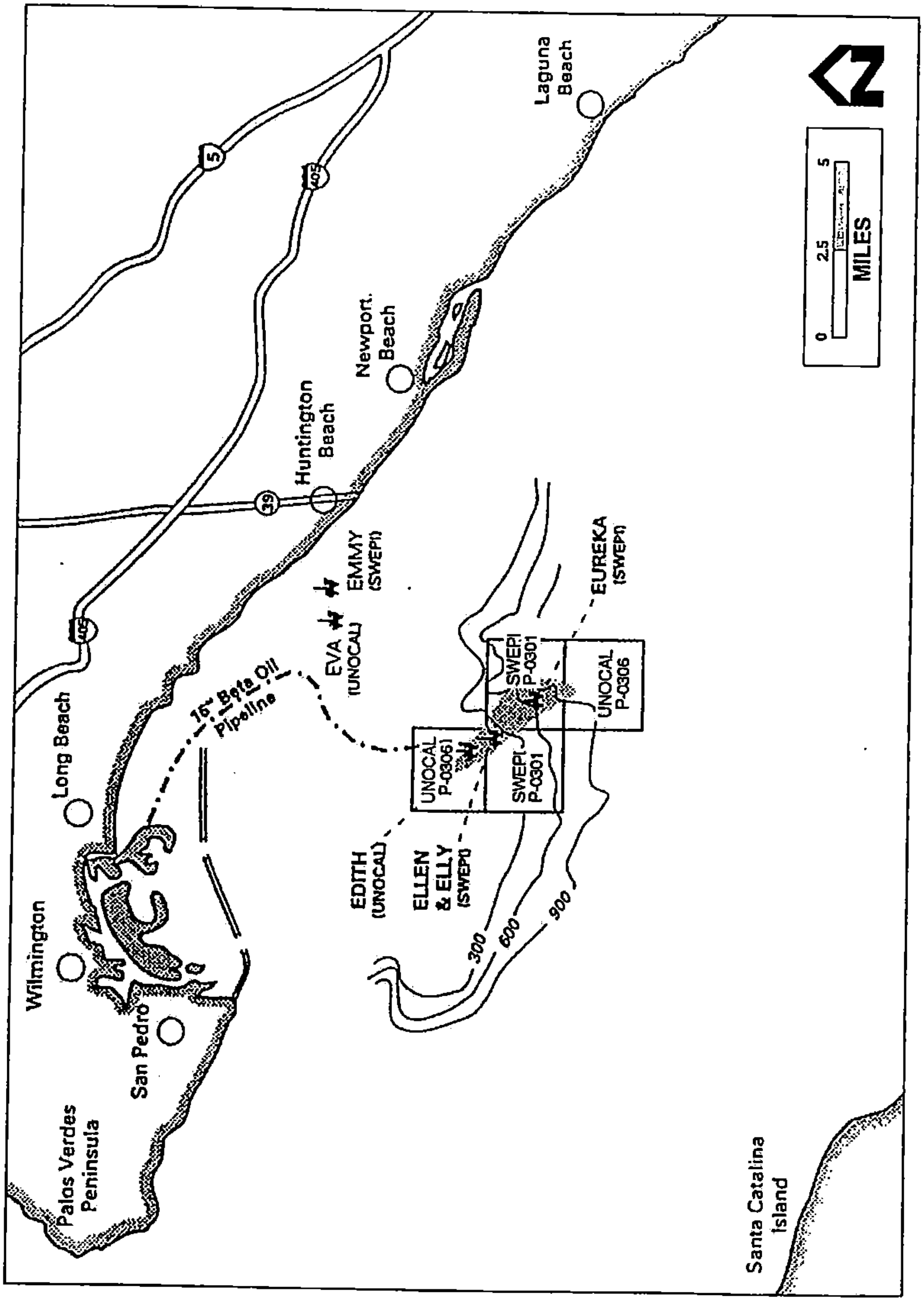
Description	Diameter (inches)	Length S/S (inches)	Shell Volume (cu. ft.)	Head Volume (cu. ft.)	Total Volume (cu. ft.)	Total Volume (bbls)
MAY-116 well cleanup surge vessel (Dwg. No. 3900-F-405)	48	108	113.10	16.76	129.85	23.13
ABJ-1105 well cleanup tank (Dwg. No. 3900-F-406)					6,525.00	1,162.15
MAY-1101 production surge vessel (Dwg. No. 3900-F-406)	144	30	282.74	452.39	735.13	130.93
KAH-1603 crude oil sphere launcher (Dwg. No. 3900-F-407)	16	106	12.33	0.62	12.95	2.31
~~MAM-1102A well test free water knockout (Dwg. No. 3900-F-408)~~ removed from service	72	180	424.11	56.55	480.66	85.61
~~MBD-1104A well test separator (Dwg. No. 3900-F-408)~~ removed from service	72	180	424.11	56.55	480.66	85.61
~~MAM-1102B well test free water knockout (Dwg. No. 3900-F-409)~~ removed from service	72	180	424.11	56.55	480.66	85.61
~~MBD-1104B well test separator (Dwg. No. 3900-F-409)~~ removed from service	72	180	424.11	56.55	480.66	85.61
MBF-1106 relief scrubber (Dwg. No. 3900-F-412)	60	120	196.35	32.72	229.07	40.80
ABH-1108 oil sump (Dwg. No. 3900-F-414)	48	192	201.06	8.38	209.44	37.30
12” diesel fuel pump casing (Dwg. No. 3900-F-427)	12	3,720	243.47	0.13	243.60	43.39
Diesel fuel storage leg A-1 (Dwg. No. 3900-F-427)						1,000.00
ABJ-2580 diesel reservoir (Dwg. No. 3900-F-427)						100.00
MAJ-2583 diesel fuel fill filter (Dwg. No. 3900-F-427)	20	4.5	0.82	1.21	2.03	0.36
MAJ-2584 diesel fuel standby fill filter (Dwg. No. 3900-F-427)	20	4.5	0.82	1.21	2.03	0.36
MAJ-2585 diesel fuel transfer filter (Dwg. No. 3900-F-427)	20	4.5	0.82	1.21	2.03	0.36
MAJ-2586 diesel fuel standby transfer filter (Dwg. No. 3900-F-427)	20	4.5	0.82	1.21	2.03	0.36
V-010-E2 diesel day tank (Dwg. No. 2900-F-448)						57.71
V-020-E2 standby generator day tank (Dwg. No. 2900-F-448)						11.40
V-420-E2 standby diesel supply tank (Dwg. No. 2900-F-448)						3.06
V-410-E2 diesel supply tank (Dwg. No. 2900-F-448)						6.23
ABJ-2530 diesel fuel day tank (Dwg. No. 3900-F-435)						17.00
~~ABJ-2600A washdown solution tank (Dwg. No. 3900-F-434)~~ removed from service						7.14
~~ABJ-2600B washdown water tank (Dwg. No. 3900-F-434)~~ removed from service						7.14
Lube oil tank for facilities standby generator (Dwg. No. 3900-F-435)						7.14
Reserve storage tank (Dwg. No. 2900-F-455)						278.50
Active Tank No. 1 (Dwg. No. 2900-F-455)						246.00
Active Tank No. 2 (Dwg. No. 2900-F-455)						131.13
Active Tank No. 3 (Dwg. No. 2900-F-455)						130.00
Slugging Tank (Dwg. No. 2900-F-455)						23.00
~~Gel Tank (Dwg. No. 2900-F-455)~~ - Removed from platform						~~23.00~~
TOTAL						**3,832.4**

Table A-4. Beta Pump Station Estimated Hydrocarbon Volumes.

Tank No.	Source	Commodity	Major Type of Failure	Capacity (bbls)	Direction of Flow	Secondary Containment Volume (bbls)
100-S-19	Crude Oil Tank (45' dia x 40')	Crude Oil	Overfill, Leak, Rupture	10,000	Primary drainage is to the containment area – Drainage outside of, or escaping containment, will flow toward the Northeast corner of the property. Drainage escaping the property would flow into storm drains.	Concrete Containment Walls/ Earthen Floor Capacity is approximately 13,900 bbl.
P/L	Station Pumps, pipe manifolds, meter facilities.	Crude Oil	P/L leak, rupture	-----	Minimal berms around pumps and piping would contain minor volumes. Product escaping berms would flow to the Northeast corner of the property. Drainage escaping the property would flow into storm drains.	-----
Misc.	Station Lines, Drums, and other Temporary Containers	Crude Oil and Misc. Products	Overfill, Leak, Rupture	-----		-----

A.8 FACILITY DIAGRAMS

Figure A-1. Beta Unit Complex Offshore Facilities.



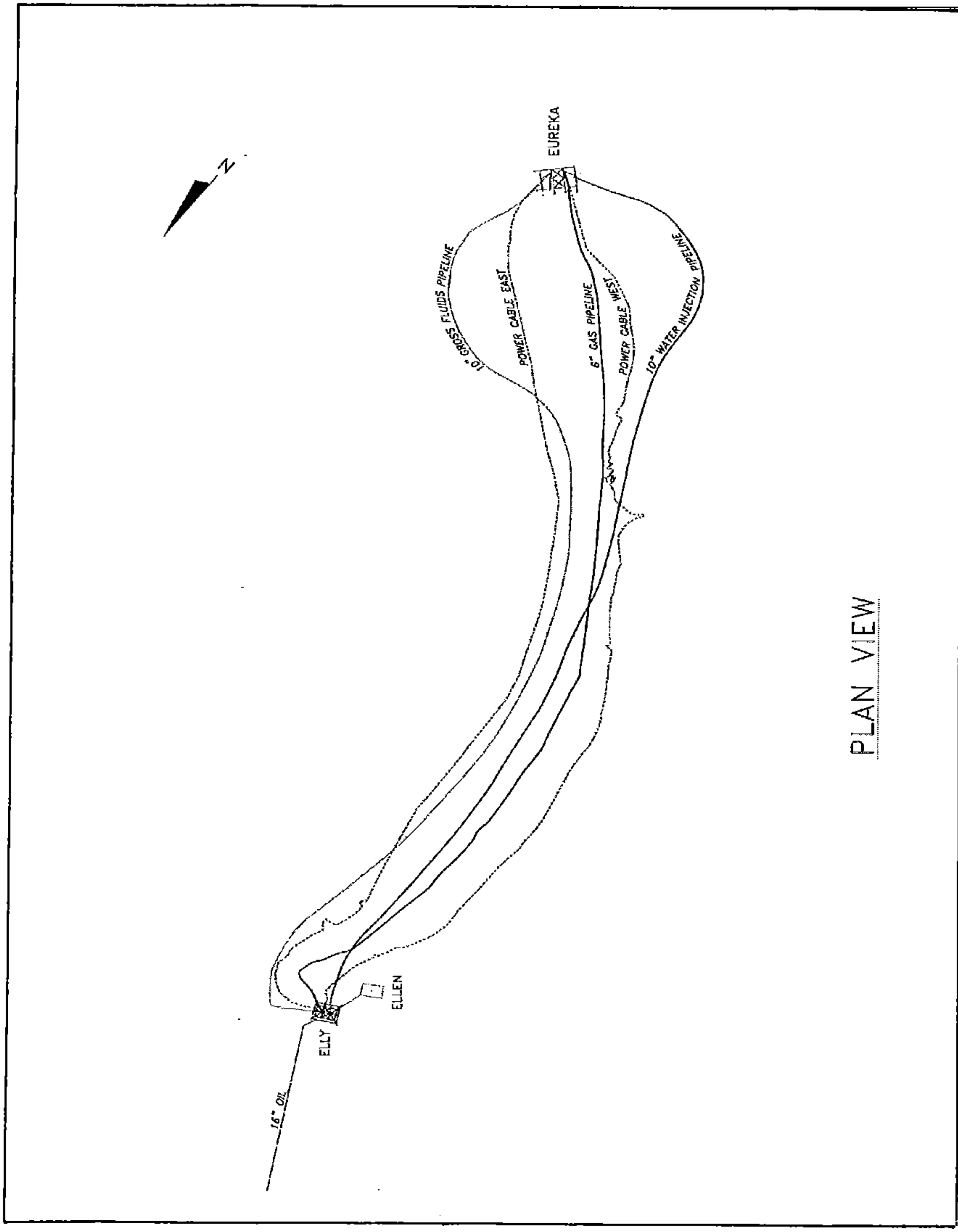
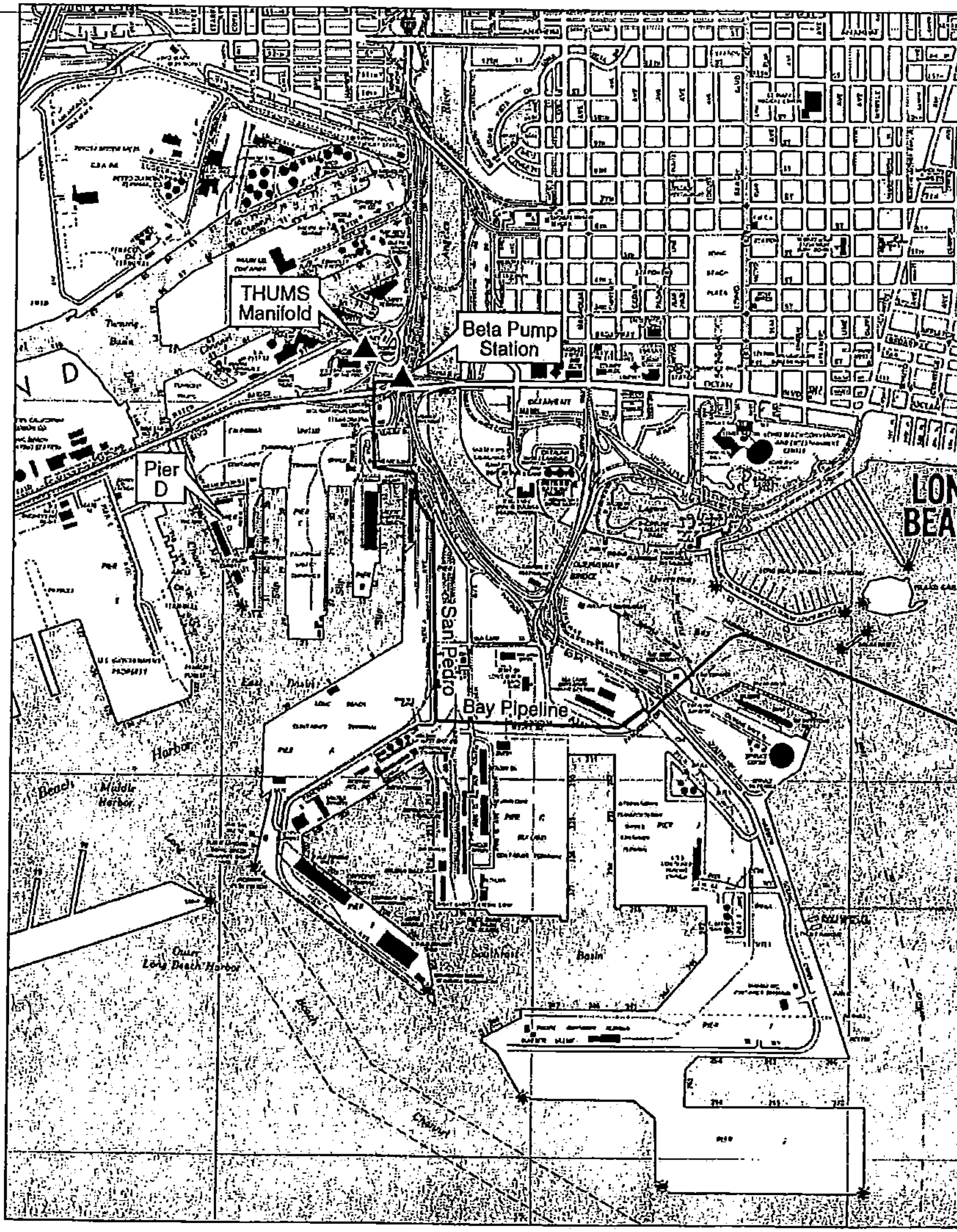


Figure A-2 . Beta Unit Complex Intrafield Pipelines and Cable Routes

Figure A-3. Beta Unit Complex Onshore Facilities.



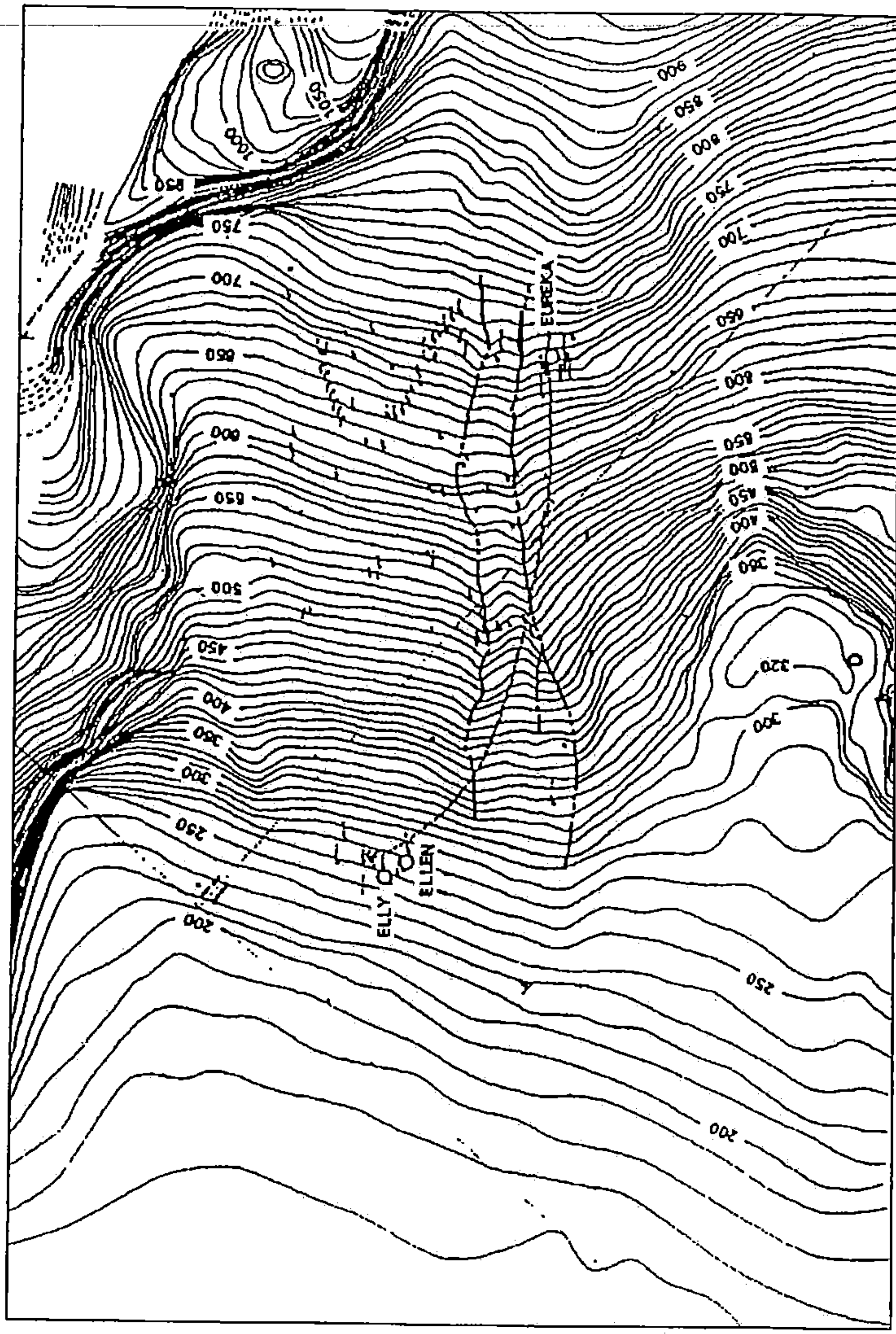


Figure A-4. Beta Unit Complex Bathymetry Map.

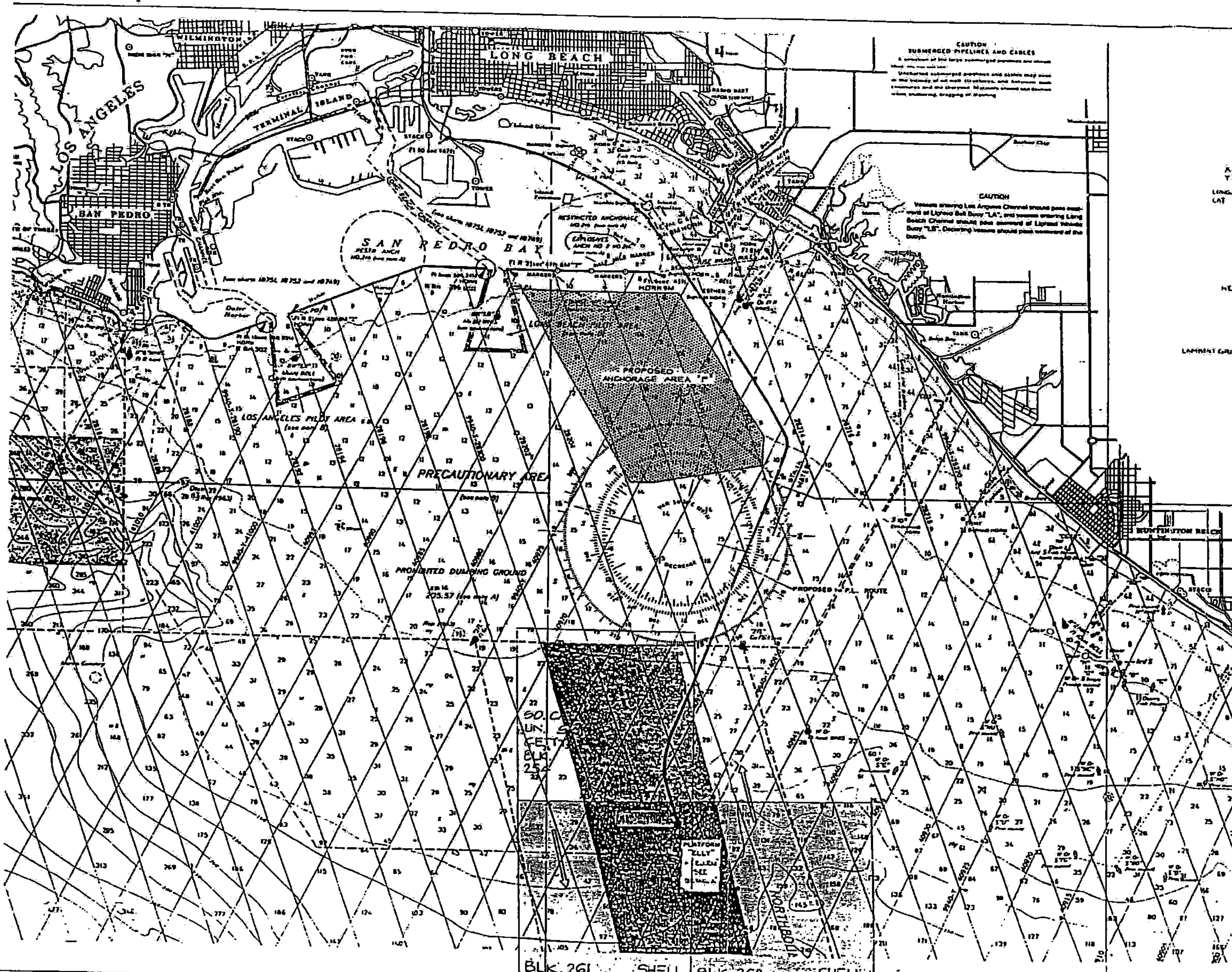
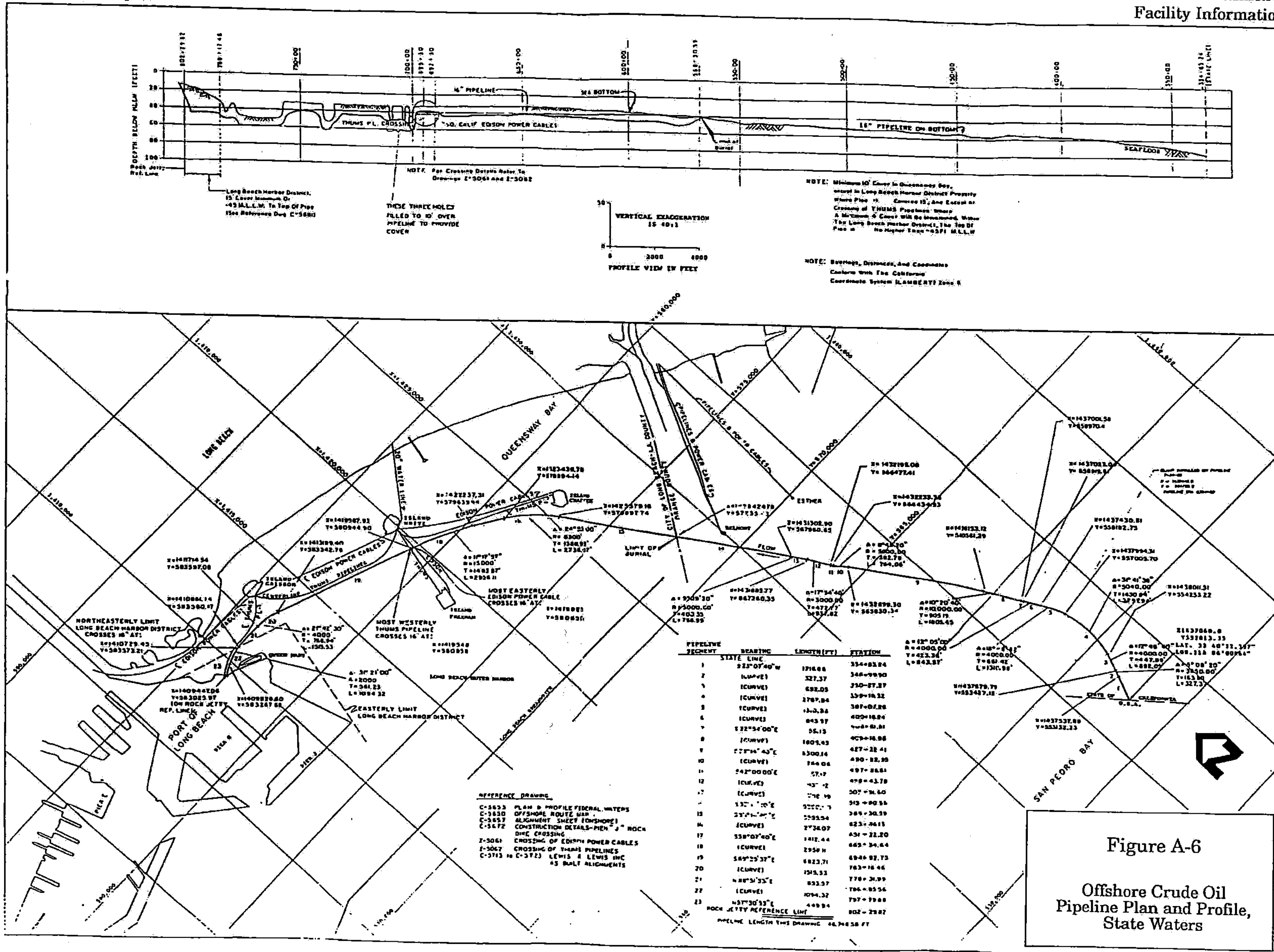


Figure A-5

Platform Elly Offshore Crude Oil Pipeline Route to Shore



PIPELINE SEGMENT	BEARING	LENGTH (FT)	STATION
	STATE LINE		354+83.84
1	S23°07'40"W	1714.66	346+99.90
2	(CURVE)	327.37	350-27.27
3	(CURVE)	632.05	359+10.32
4	(CURVE)	2707.84	387+07.28
5	(CURVE)	[illegible]	400+18.84
6	(CURVE)	843.97	[illegible]
7	S22°54'00"E	55.13	409+16.98
8	(CURVE)	1809.43	427+28.41
9	S73°14'43"E	6300.14	490-82.99
10	(CURVE)	764.06	497+38.81
11	S42°00'00"E	57.??	498+43.79
12	(CURVE)	[illegible]	507+36.60
13	(CURVE)	[illegible]	513+00.56
14	[illegible]	[illegible]	569+30.39
15	[illegible]	5593.54	623+96.13
16	(CURVE)	2734.07	651+22.20
17	S58°07'40"E	1412.44	665+34.64
18	(CURVE)	2950.11	694+97.73
19	S69°25'37"E	6823.71	763+16.46
20	(CURVE)	1515.53	778+31.99
21	N88°51'55"E	833.57	786+65.56
22	(CURVE)	1094.32	797+79.88
23	N57°30'53"E	449.94	802+29.87
	ROCK JETTY REFERENCE LINE		

PIPELINE LENGTH THIS DRAWING 46,746.58 FT

Figure A-6

Offshore Crude Oil Pipeline Plan and Profile, State Waters

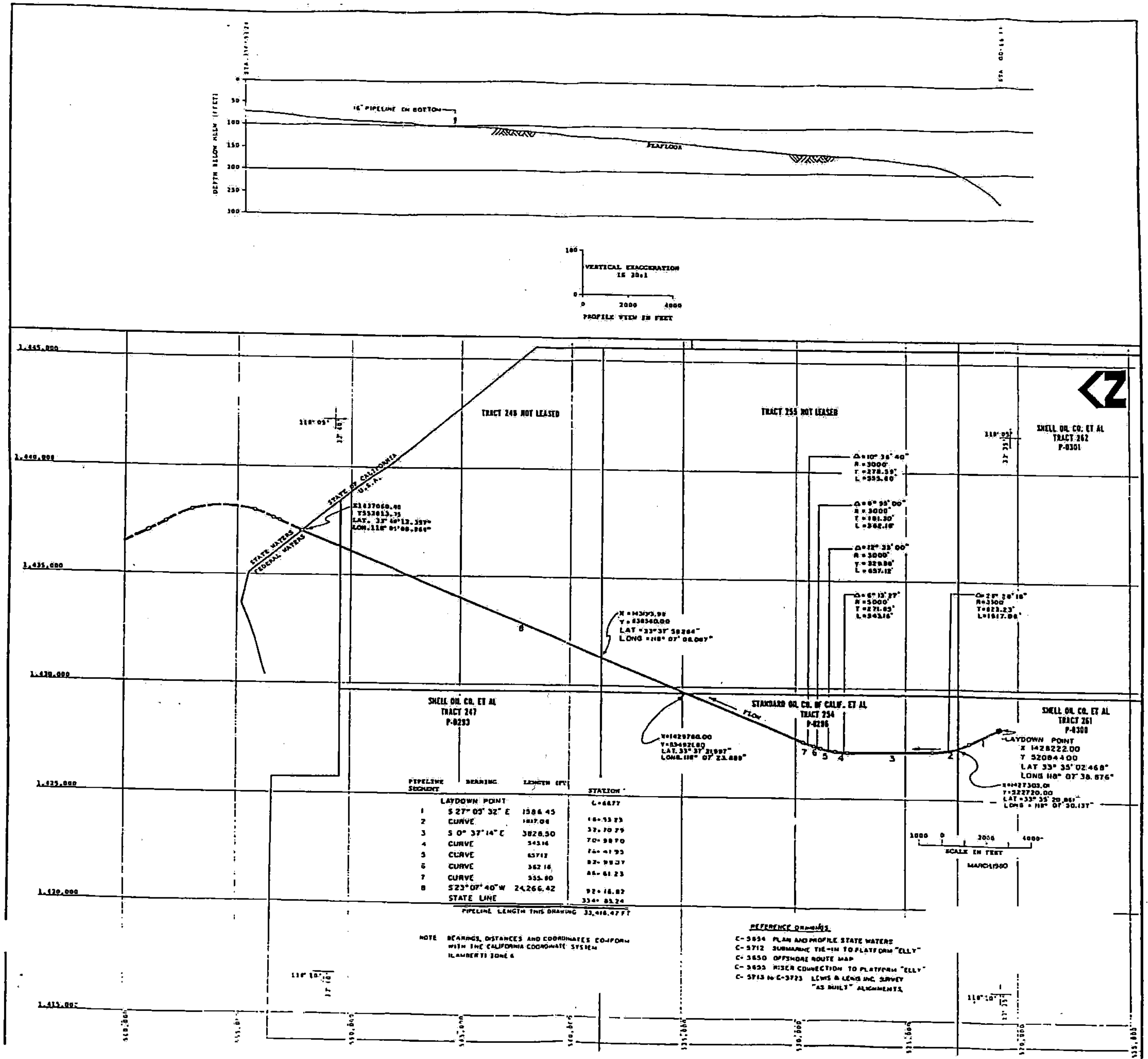


Figure A-7

Offshore Crude Oil Pipeline Plan and Profile, Federal Water

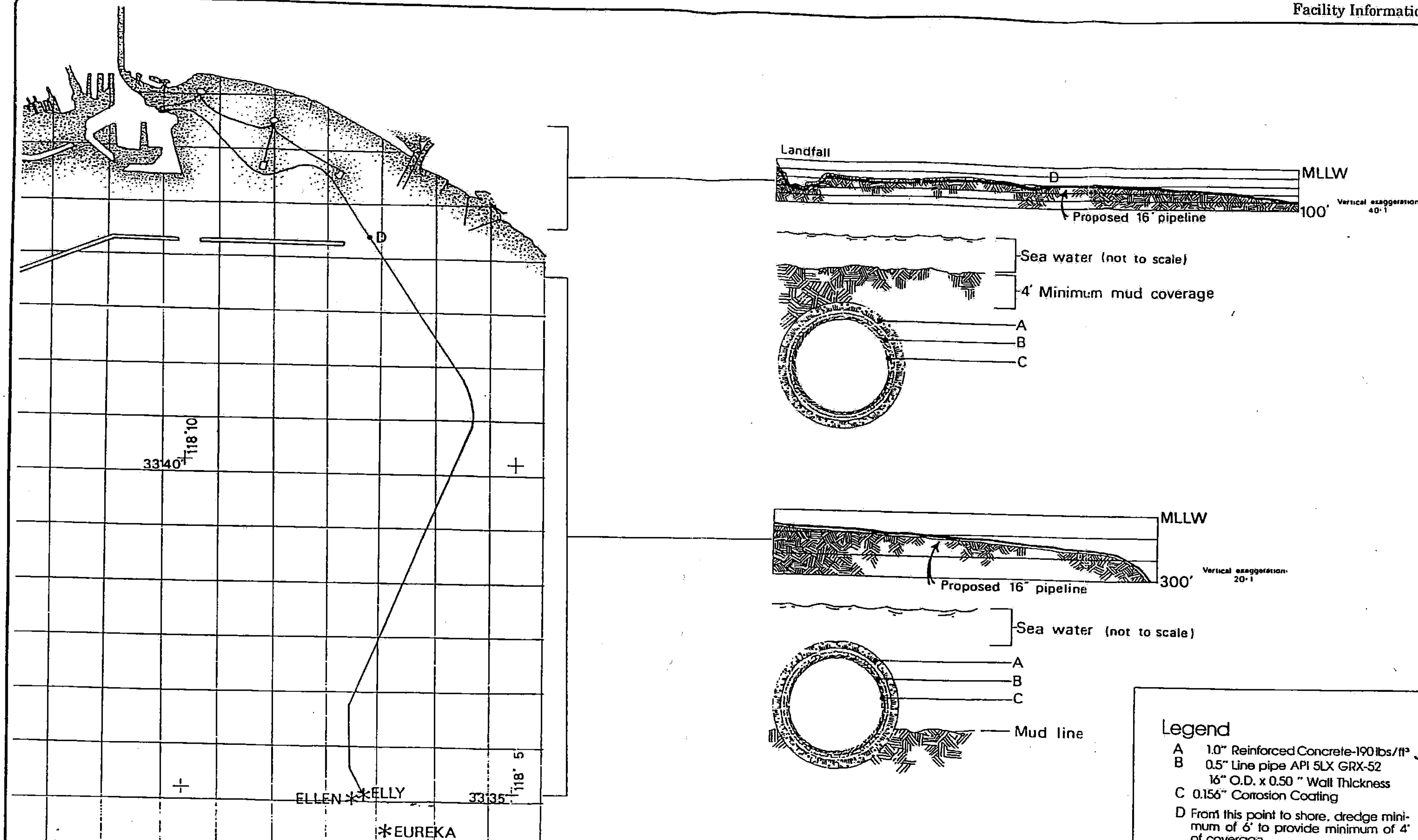


Figure A-8. Offshore Crude Oil Pipeline Alignment and Schematics

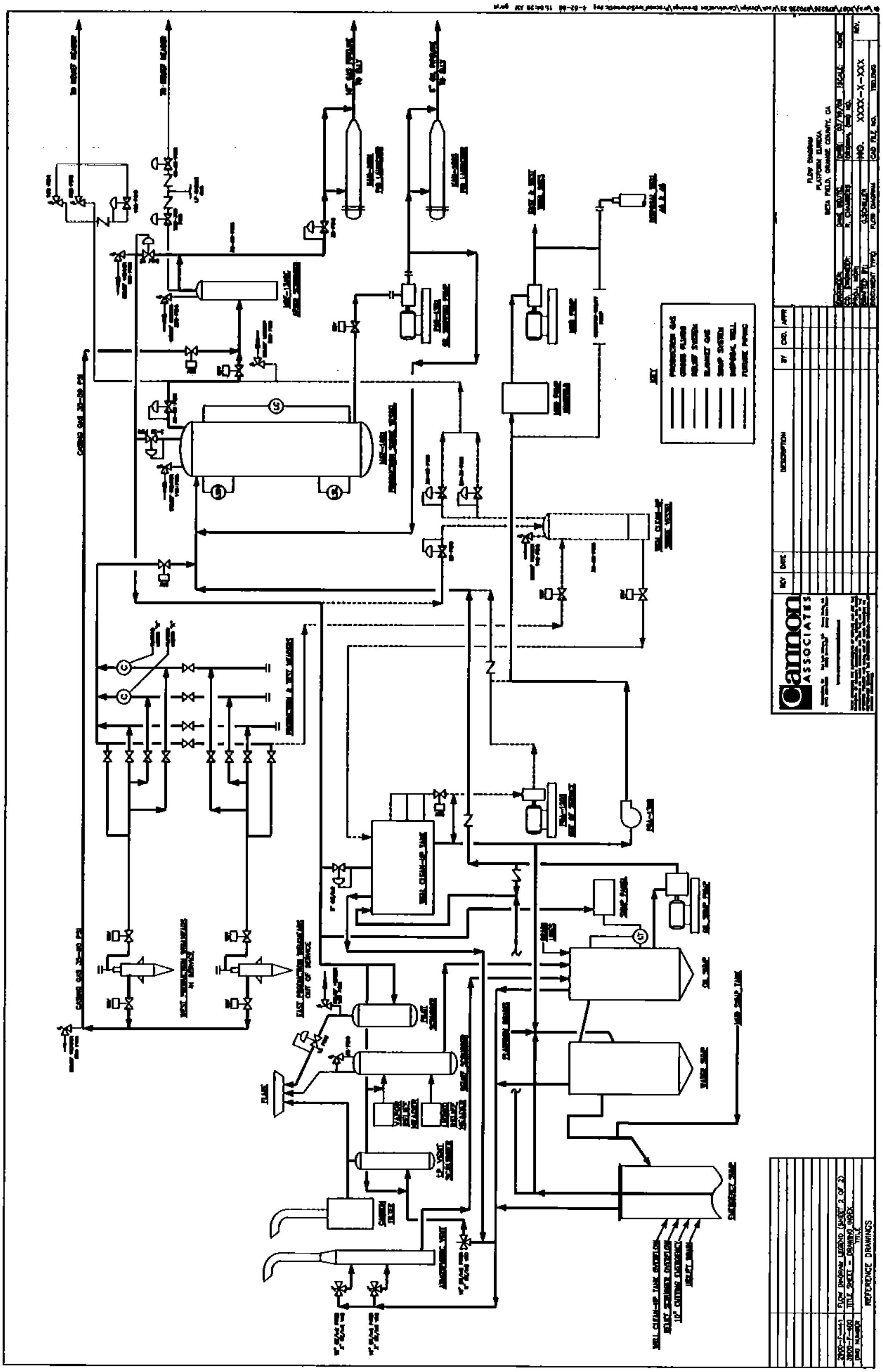


Figure A-9 Platform Eureka Flow Diagram

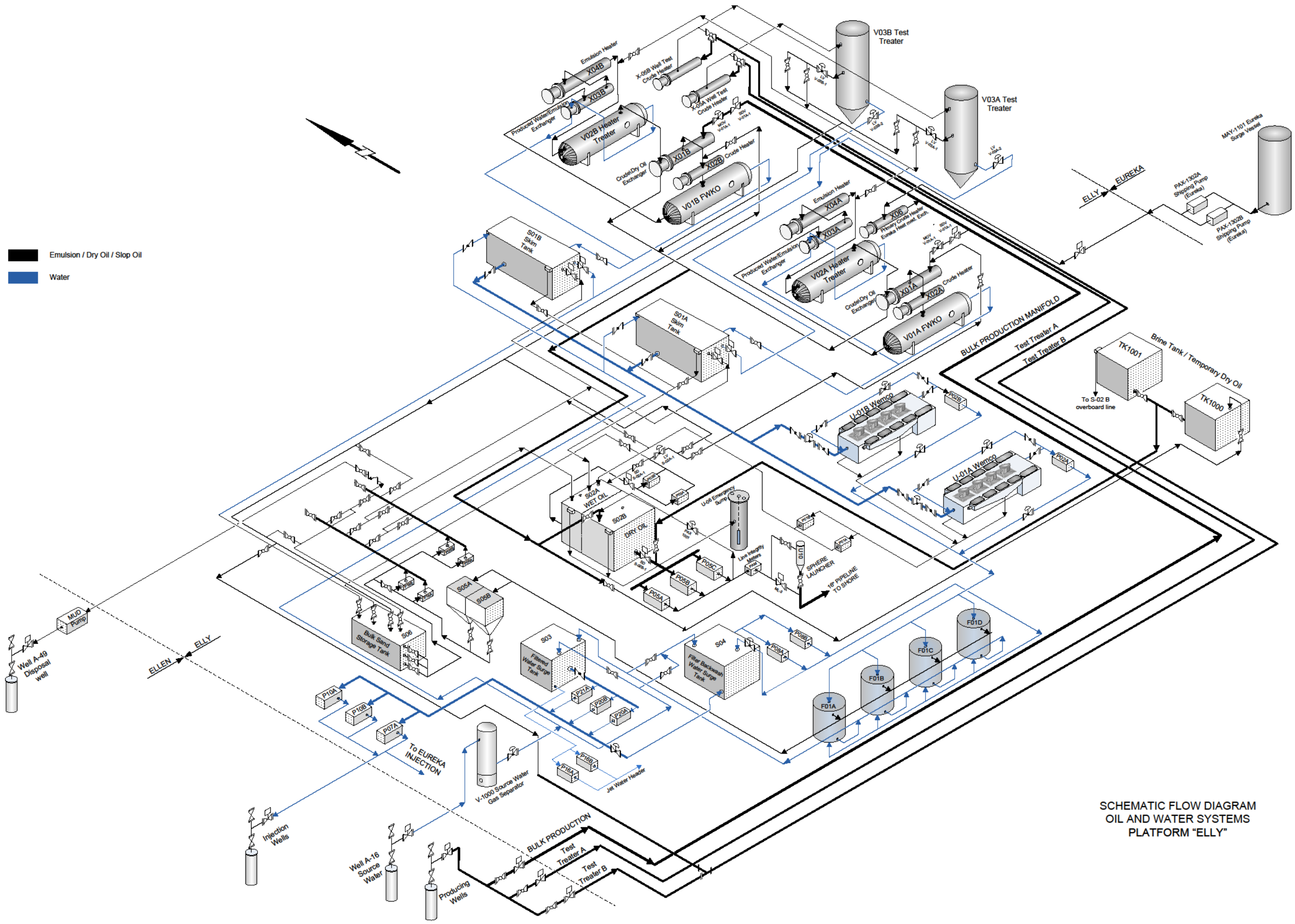


Figure A-10 Platform Elly Flow Diagram

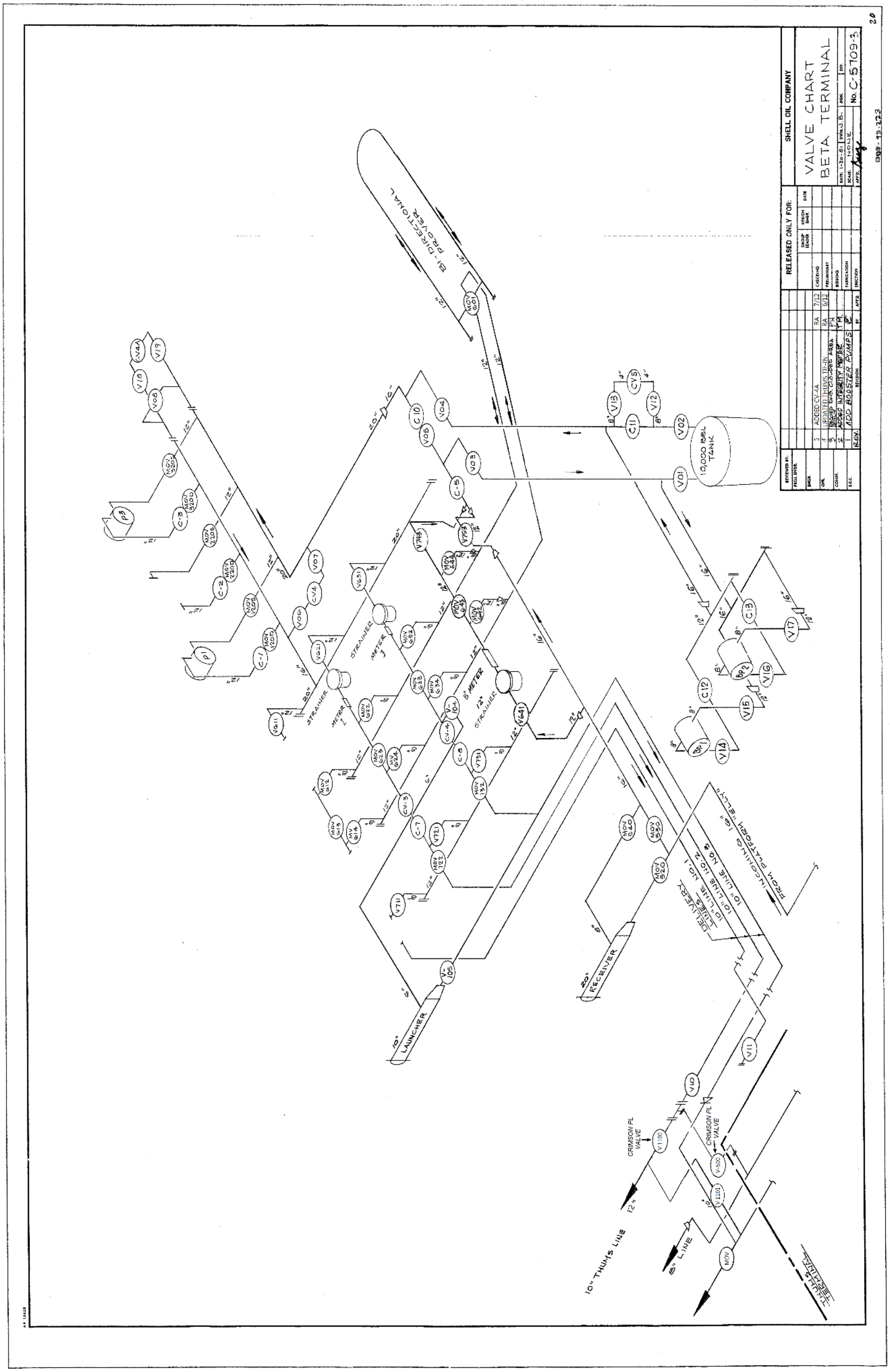

SHELL OIL COMPANY
VALVE CHART
BETA TERMINAL
No. C-5709-3
RELEASED ONLY FOR:
10,000 BBL TANK
BI-DIRECTIONAL PROVER
LAUNCHER
RECEIVER
STRAINER
METER
10" THUMS LINE
8" LINE
CRIMSON PL VALVE
DELIVERY LINE No. 1
10" LINE No. 2
10" LINE No. 1
INCOMING 16" FROM PLATFORM "ELLY"

Figure A-11

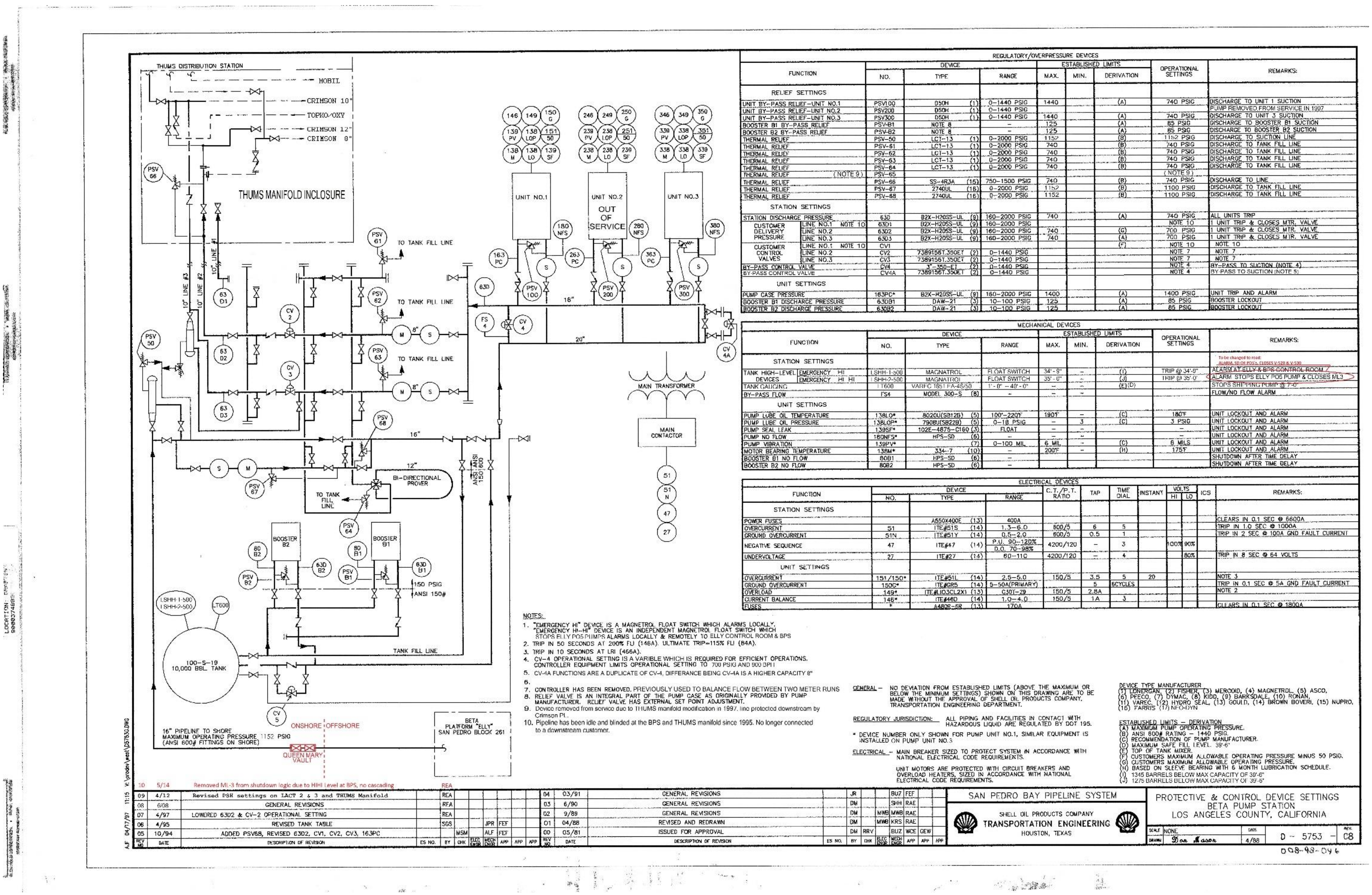


Figure A-12 Beta Pump Station Protective & Control Device Settings

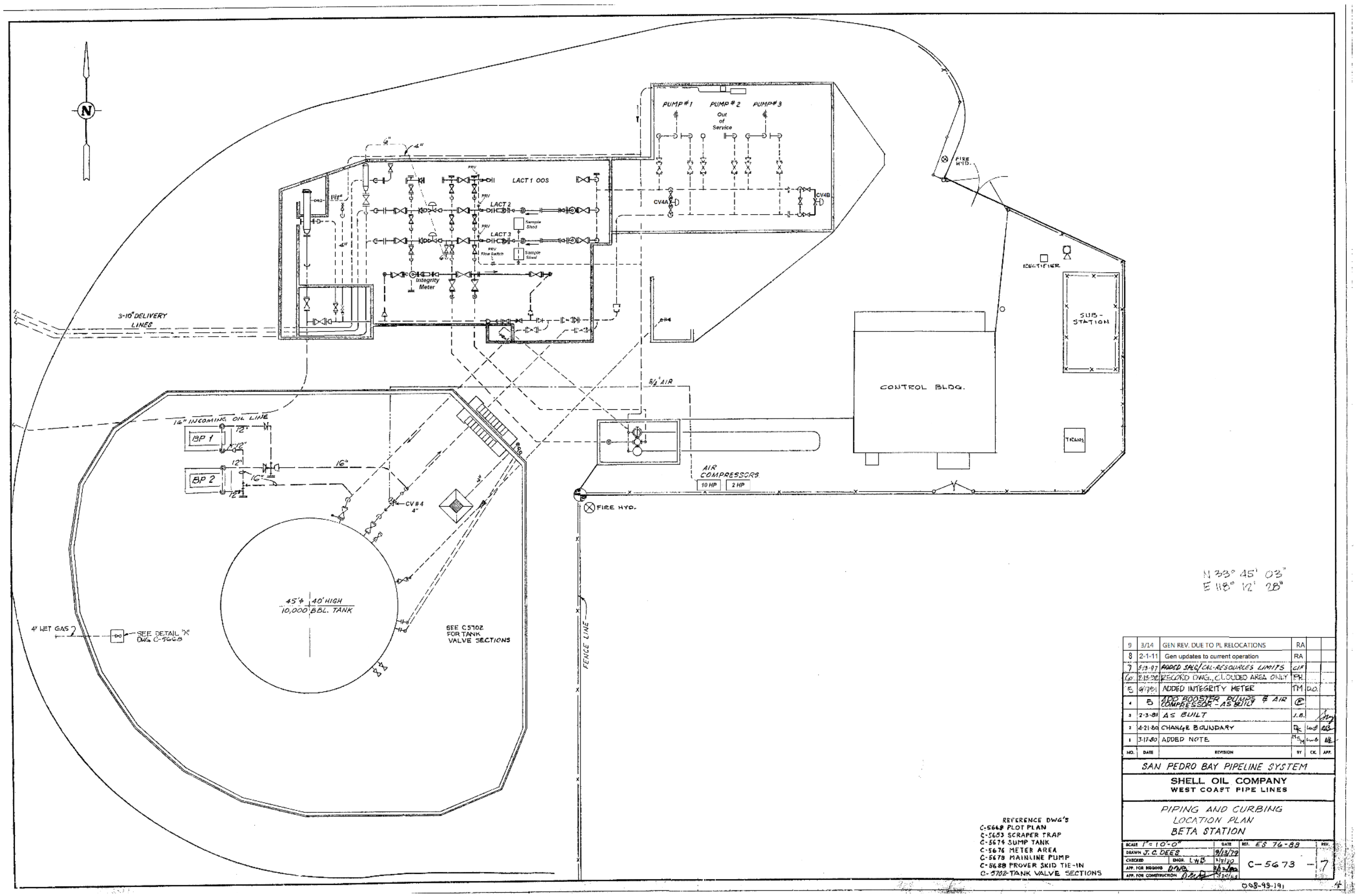


Figure A-13 Beta Pump Station Piping and Curbing Location Plan

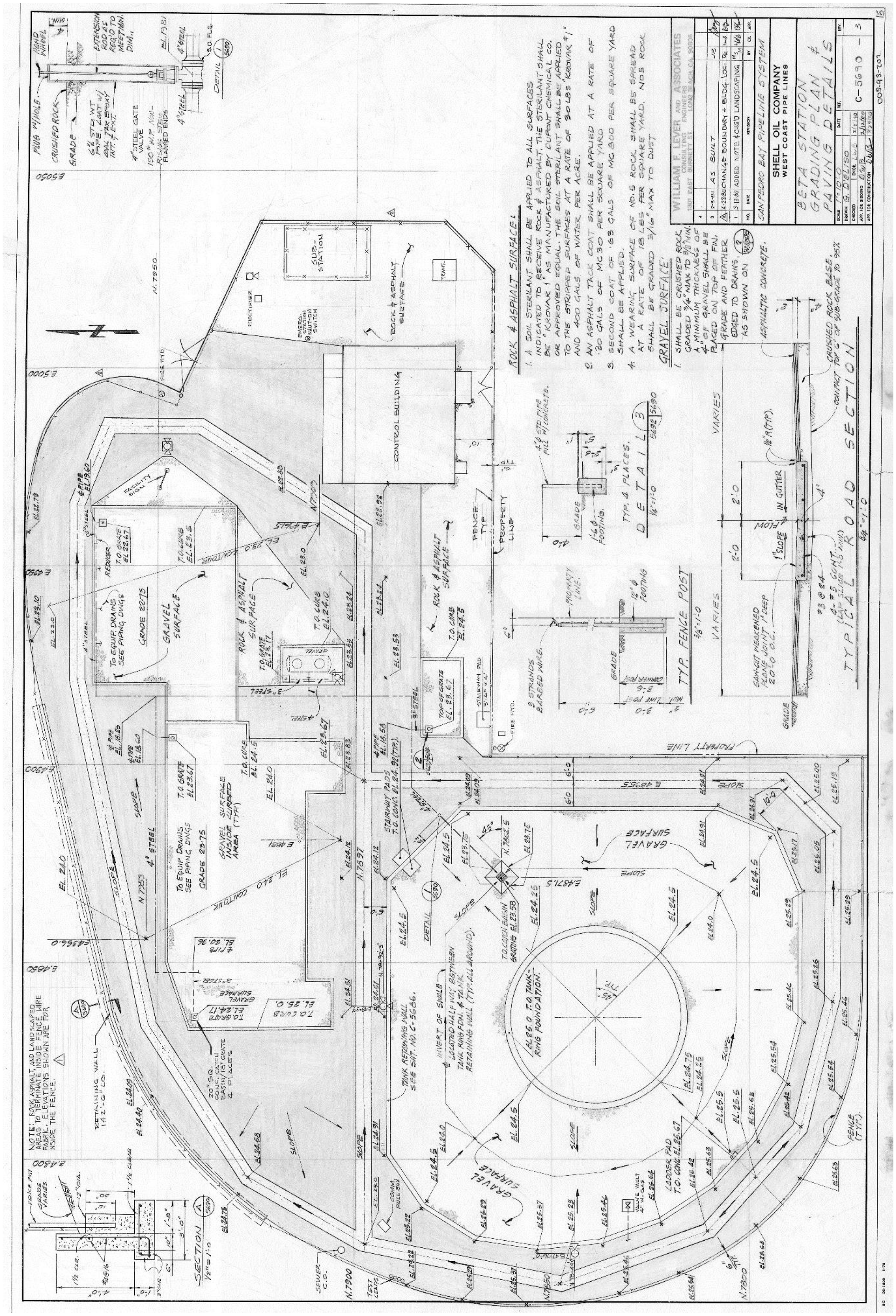

SHELL OIL COMPANY
WEST COAST PIPE LINES
BETA STATION GRADING PLAN & PAVING DETAILS
SAN PEDRO BAY PIPELINE SYSTEM
WILLIAM F. LEVER AND ASSOCIATES
C-5690
CONTROL BUILDING
SUB-STATION
GRAVEL SURFACE
ROCK & ASPHALT SURFACE
TYPICAL ROAD SECTION
TYP. FENCE POST
DETAIL
SECTION
ROCK & ASPHALT SURFACE:
GRAVEL SURFACE:

Figure A-14

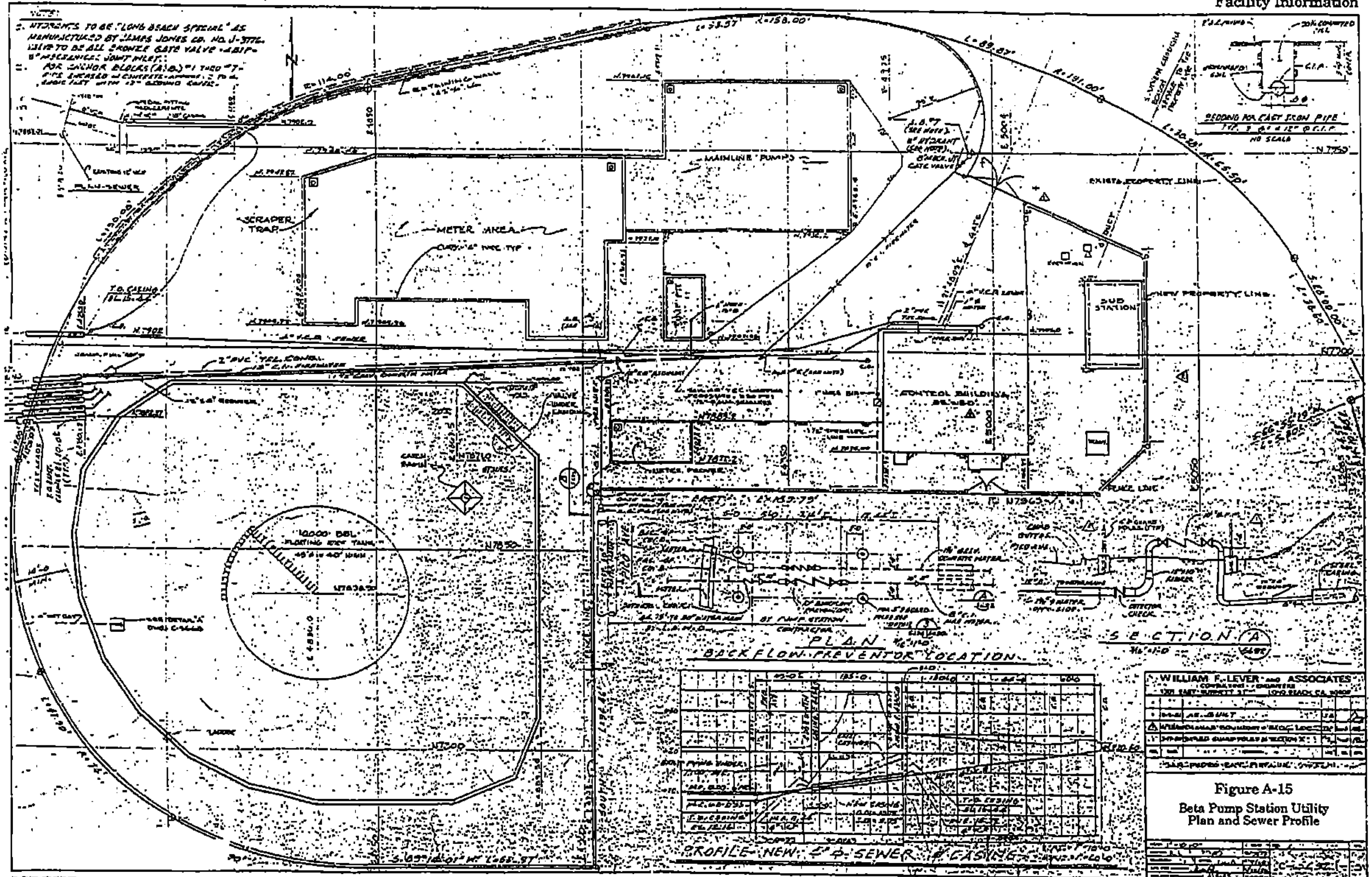


Figure A-15
Beta Pump Station Utility
Plan and Sewer Profile

B.1 REQUIRED PREVENTION MEASURES

The Company has implemented a Mitigation Plan (Annex H.2.2.3) based on the results of the risk and hazard analysis conducted for the Beta Unit Complex. Refer to Annex H for a complete discussion of the Mitigation Plan. The status of the recommended mitigation measures is briefly discussed below. All of the mitigation measures were implemented by the listed completion date.

Returning storage tank to service – A procedure should be developed to ensure that the tank inlet and outlet valves are chained and locked open prior to restart of the system to ensure that the line is not over pressured.

Mitigation completion date: 9/1/94

Power failure – Company's operating procedures should be reviewed to ensure that the system is not operated during power failure for any period of time longer than that which would result in an overfilling of the tank, assuming the tank was operating at the high level shutdown level in the tank.

Mitigation completion date: 9/1/94

Leak or rupture in the offshore pipeline – A training program for the operators should be conducted to emphasize that, in the event a leak is detected, it is essential to close the platform and onshore shut-in valves as quickly as possible after shutting down shipping pumps to minimize the volume of oil released from the line.

Mitigation completion date: 9/1/94

Even with the mitigation pressures in place, spills from the Beta Unit Complex are still possible. The remaining risk is discussed in Annex H.2.3.

The Company rigorously observes a wide range of oil spill prevention measures to reduce or mitigate potential spills from the Beta Unit Complex. Numerous safeguards, both internal and regulated, including inspection and maintenance and training programs, have been designed to improve spill prevention. These are briefly described below. For additional spill prevention measures, refer to Annex A.7, Response Zone Appendix for the San Pedro Bay Pipeline and associated onshore pump station and facilities.

The Company has instituted a prevention program that includes a combination of activities aimed at minimizing the possibility of human error and equipment failure, and maximizing employee awareness and facility operating soundness. The prevention program includes:

- Facility inspections, maintenance, testing, and prevention programs.
- Corrosion inhibitor injection into selected downhole piping.
- Corrosion coupons installed in several major lines.
- Leak detection and alarm systems.
- Frequent employee meetings and training.
- Spill containment systems.

B.1.1 Inspection, Maintenance, and Testing

Inspection and maintenance of the Beta Unit Complex and equipment is performed in accordance with:

- Company procedures.
- Industry practice.
- State, federal, and local rules and regulations.
- Inspections and testing are performed to the industry and regulatory standards.

B.1.1.1 Facility Self-Inspection

Facility self-inspections are conducted by Company personnel as a routine and continuous part of their daily operations. Any irregularities are immediately reported to management and scheduled for correction or repair. The inspection includes:

- Platform safety devices, pollution control equipment, deck drains and sumps, drip pans.
- Ocean surface (in vicinity of platform).
- Corrosion controls.
- Fire suppression systems and detection systems.
- Onshore and offshore pipeline (see Annex A.7).
- Emergency response equipment.

The inspections require two steps:

1. A checklist of things to inspect.
2. A method of recording the actual inspection and its findings.

The date of all inspections is noted and records are kept for five years.

All platform production equipment has been designed, and its associated safety equipment tested, per BSEE regulations. Inspection test records are available on each platform. Platform personnel are responsible for the equipment maintenance and testing. The safety device test/inspection frequencies are listed in the following table:

SYSTEM TEST	CHECK & REPORT INTERVALS
SCSSVs	six months
Tubing Plugs	six months
Firewater System	Weekly
PSVs	Annually
PSHLs	Monthly
LSHLs	Monthly
FSV – flowline	Monthly
FSL	Annually
BSL	Annually
SDV & SSVs	Monthly
ESDs	Monthly
TSH – compressor	six months
ASHs	six months
TSEs	six months
Containment Boom	Annually
Flow-No-Flow	Annually
INSPECTIONS	**FREQUENCY**
Pollution Control Equipment	Monthly
Platform/Ocean Surface for Pollution	Daily
Welding Equipment	each job

All drilling and production facilities, including hydrocarbon-handling equipment for testing and production, are inspected daily for pollution prevention, and all necessary maintenance and repairs are made immediately.

B.1.1.2 Response Equipment Testing/Deployment

The platforms' designated oil spill response equipment and materials are identified in Section 2, Table 2-5 of this Plan. Contractor response equipment is listed in Annex P. A Response Equipment Testing/Deployment Log is provided in Annex M. A visual inspection of the equipment is conducted monthly in accordance with 30 CFR 254.43. The objective is to determine if equipment is present, not depleted, in good working order, stored and protected and readily accessible for deployment. The storage locations and inspection/maintenance schedule for the Company equipment are shown in Table B-1.

Table B-1. Company Onsite Response Equipment Storage Location and Inspection/Maintenance and Testing Schedule.

EQUIPMENT	STORAGE	INSPECTION/ MAINTENANCE	TESTING
PLATFORM EUREKA			
15 bales sorbent pads	Onsite at Platform	Monthly	None
6 bales sorbent booms			None
1 sorbent roll			None
8 tracking buoys			Semiannually
1 or more handheld radio to communicate with MSRC and spill team members			Semiannually
PLATFORM ELLEN			
Two 750' sections Model 4300 Expandi spill boom	Onsite at Platform	Monthly	Semiannually
8 tracking buoys			Semiannually
1 or more handheld radio to communicate with MSRC and spill team members			Semiannually
PLATFORM ELLY			
15 bales sorbent pads	Onsite at Platform	Monthly	Semiannually
6 bales sorbent booms			Semiannually
1 sorbent roll			Semiannually
8 tracking buoys			Semiannually
1 or more handheld radio to communicate with MSRC and spill team members			Semiannually
The following vessels are provided by SoCal Ship Services, 971 S. Seaside Ave., Terminal Island: Crewboat *(Nicholas L)* is readily available 24/7. Supply boat *(Kenneth Carl)* is on a flexible schedule with target of 12 days/month depending upon workload. If a supply boat is needed in the event of a spill on an unscheduled day, an alternate vessel (*Timberwolf* of SoCal Ship Services) is available in San Pedro (24/7). In addition, there are multiple backup vessels available from MSRC in Long Beach (24/7).			

The inspection and maintenance of the facility-owned response equipment scheduled and inspection records are kept in the Beta Compliance Office and/or corporate files. Contract response organizations maintain and inspect their own equipment, as discussed in their response plans.

All maintenance records and inspection reports for the Beta Unit Complex will be kept for five years and will be made available to the Administrator and BSEE Regional Supervisor upon request.

B.1.2 Additional Facility Inspection, Maintenance, and Testing

Refer to Annex A.7.7 for inspection and maintenance of the San Pedro Bay Pipeline and Beta Pump Station.

- A blowout preventor assembly (BOP) and well control system capable of containing expected wellhead pressures are installed and tested before any drilling or well servicing operations are commenced. The BOP is installed in compliance with all applicable State and federal regulations as well as Company Safe Practices for Drilling and Well Servicing Operations procedures.

- Platforms Ellen/Elly and Eureka are protected from corrosion by coatings in the splash zone and above, and by cathodic protection below mean sea level. Also, an extra ¾ inch of steel is provided in the splash zone for all braces and legs.

- A conventional sacrificial anode system provides corrosion protection for the below-water portion of the platform and sacrificial anodes are installed in most of the dehydration equipment on the platforms (treating vessels, tanks, etc.).

- The existing corrosion surveillance system consists of:

  - Inspection of selected pipe spools which are physically removed and inspected for corrosion and/or scale problems.

  - Visual internal vessel inspections checking the condition of internal coating and anodes.

  - Cathodic protection surveys of platform structures.

  - Corrosometer probes.

  - Corrosion coupons.

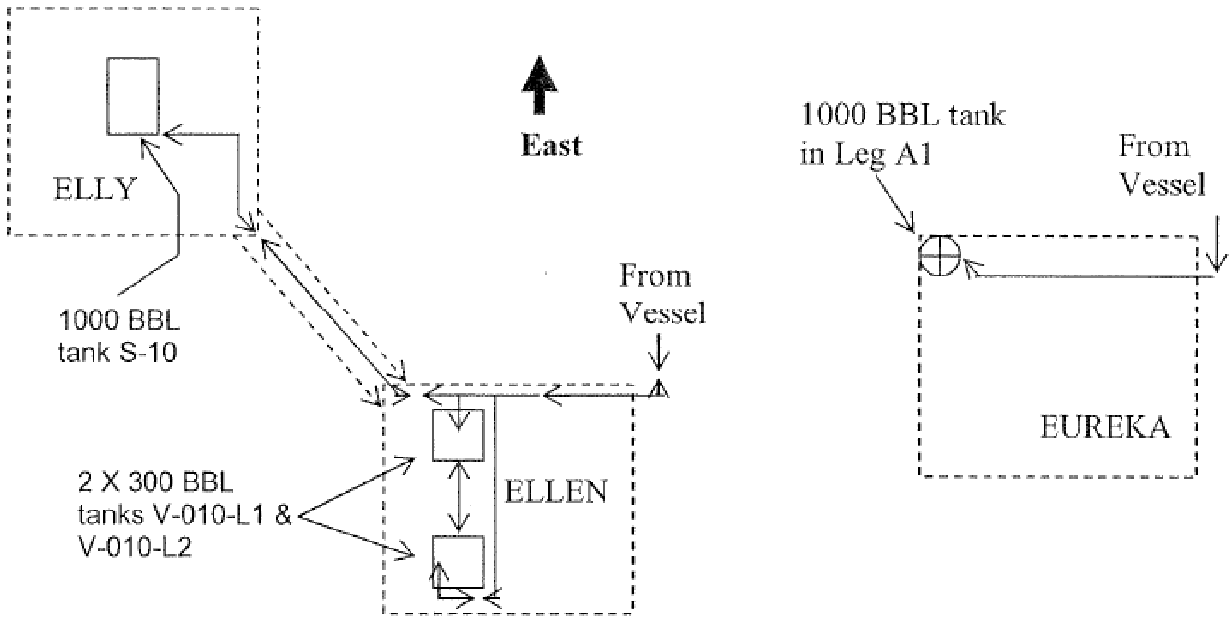
  - Ultrasound inspection of selected vessels and piping.

B.1.3 Standard Procedures for Transfers

B.1.3.1 Beta Unit Diesel Fuel Transfer Procedures

A written fuel transfer procedure is available on Platform Ellen which gives a detailed explanation of fire protection and diesel fuel systems. Listed below is a summary of the standard diesel fuel transfer procedures.

Diesel Transfer Diagram



The Diagram above depicts the basic flow path of diesel fuel when transferred from the cargo/supply vessy to the platform(s). In addition to the storage tranks depicted, there are day tanks on Elly (S-11, S-12), one on Ellen and one on Eureka (ABJ-2580, 100bbl).

Transfer Personnel and Duties

The minimum number of persons on duty during transfer operations and their duties are as follows:

- Platform
  - Person In Charge – Complete Declaration of Inspection and oversee platform operation.
  - Control room Operator – Monitor tank levels at the Central Control Panel and maintain communications between the fuel transfer PIC and the vessel.
  - Transfer surveillance – (Well bay Operator or Designated person) – Act as fueling line matchman and monitor tank fill at Ellen east/west tank(s) and Eureka leg A1.
  - Handler – Position hoses, assist in hookup and disconnect. Act as fueling line watchman.
  - Crane Operator – Position hose line for hookup and return to storage.

- Supply Boat
  - Captain – In charge of all vessel operations. Complete Declaration of Inspection.
  - Engineer – Monitor pumps.
  - Deck Hand – Handle hoses, connect/disconnect hookup; act as watchman.
- **Personnel report to Production Supervisor, Facilities Superintendent, or the Designated PIC**

Before Transfer Begins

- Fuel transfers will only take place during daylight hours. Inspect fuel transfer hoses and couplings for serviceability and correct any deficiencies prior to use (33 CFR 154.500, 145.120(i), 156.170.

- The respective portions of a Declaration of Inspection form (33 CFR 156.150) must be prepared by the Fuel Supply Vessel Captain and the person in charge of the transfer on the platform. The forms must be read, filled in, and signed by both the Vessel Captain and the Company person in charge of the transfer operation. Copies of completed transfers must remain on file for one month.

- Display red signal flag on vessel and on platform as a warning that fueling is in progress.

- Suspend any repair work that is in progress in the vicinity of the fueling operation that may result in unsafe conditions.

- Make sure vessel moorings are adequate to hold under all expected conditions of tide, drift, wind, etc.

- Make sure transfer hoses are long enough to allow vessel to move without placing a strain on the hose, arm, valves, or piping (Ref. 33 CFR 154.500 and 156.130).

- Close all sea valves connected to the cargo piping system.

- Extinguish open fires on the vessel and platform in any compartment adjacent to the transfer connections.

- Be sure hoses are properly supported to prevent strain.

- Make hose connections on vessel and platform secure.

- Place drip pans or other small discharge containment facilities under all temporary connections (not applicable on the platform per USCG Letter of Adequacy unless the hose is being replaced).

- Establish a clear understanding between platform personnel and vessel personnel of the steps to be taken for containment, reporting, and cleanup in the event of a spill.

- Establish a regular inspection of the water around the ship and platform prior to and during transfer operations to detect any oil leaks or seepage.

- Test vessel-platform communication system and be sure it is in working order.

- Be sure the person in charge of emergency shutdown of fuel transfer operations has tested the system.

- Alert the person in charge as to who will be on duty at all times to control operations and take appropriate action in an emergency.

- Designate sufficient personnel to properly control safe transfer operations, tend hose and mooring lines, and to react to an emergency.

- Check alignment of transfer system for commencement of the fuel transfer. Remove all kinks or points of strain.

During Transfer

- Inspect decks and water area on a regular schedule to detect any leaks or seepage.

- Check vessel for excessive movement.

- Check temporary connections, valves, etc.

- Keep a constant check on the amount of transferred fuel and suspend operations in time to avoid overfilling.

- Shut down immediately and correct any unsafe conditions or potential pollution detected.

After Transfer

- Close valves on transfer hose.

- Drain hose from platform back into vessel tanks.

- Disconnect hose from vessel.

- Blind plug hose at end and cap valves and pumps.
- Secure equipment.

<u>Emergencies During Fuel Transfer</u>

Any person onboard the supply boat or platforms who sees a situation develop which poses a spill or safety hazard may stop the operation by calling out “Stop Transfer.” All transfer activities will stop until the situation is corrected. Once notified of a leak, the diesel transfer operation would be able to be shut down almost immediately by simply shutting down the supply vessel pump and closing the isolation valves; the volume of spilled fuel would not be expected to exceed the one to five (1-5) barrel range.

<u>Communications During Fuel Transfer</u>

Two-way communications must exist at all times between the facility and the supply vessel. Communication is provided by a short-range radio system consisting of belt-clip transceivers. At any time radio communications are lost, transfer will stop until positive, visual, or voice communications are reinstated.

B.1.3.2 Shipping Pump Transfer Procedures

During normal operations, Platform Elly’s shipping pumps are operated on a full-time basis. This is due to the limited storage capabilities of the platform storage/shipping tank (SO2B). A minimum tank level of 25 percent is maintained during routine operation while ensuring that pipeline pressure restrictions are not exceeded. The 25 percent tank level setting is to allow for the inflow of production from Dos Cuadras’s LLC Platform Edith shipping tank.

<u>Pre-Startup Procedures</u>

Before startup of the platform shipping pumps, the following steps should be taken:

1. Permissives for all shipping pumps are to be set to allow shutdown of the pumps by the Master Shutdown Panel (MSP) in the Platform Elly control room.

2. Assure pump suction shutdown valve is open.

3. Assure pipeline discharge valve is open.

4. Reset local and master shutdown panels.

5. Reset shipping pump lube oil system.

6. Assure pump manual valves on suction and discharge are open.

Shipping pump startup can only be accomplished when the following criteria are met:

1. Level in the tank must reach 48 percent to allow first pump to be turned on. Pump automatically shuts down at 19 percent tank level.

2. Level in the tank must reach 60 percent to allow the second and third pumps to be turned on. Pumps automatically shut down at the 45 percent and 30 percent tank level.

Under current conditions, three-pump operation is not required. In addition, a significant volume of the fluid shipped during three-pump operation would have to be bypassed to the suction tank to avoid exceeding pipeline and pipeline shipping pump pressure limitations.

B.1.3.3 Pump Logic and Level/Pressure Control

Pump Logic

1. Pump lead/lag switch must be set to 1, 2, 3, or 4, reflecting A, B, C, or D shipping pumps. Only the pump selected in the lead position will start when pump permissive is put to normal and the tank is at the proper level (48 percent).

2. The lag pump will not start unless the permissive switch on the control room Master Shutdown Panel (MSP) is put to the “normal” position. The lag pump switch is enabled at 60 percent. This gives the final permission for the second and third (lag pumps) to start.

3. Operation of the lag pumps is staggered by shutting-in of the third lag pump at 45 percent of tank level, while the second lag pump will not shut down until the tank level reaches 30 percent.

Level Control

In lieu of the start/stop operating logic described above, an option exists to allow the operating level of the storage/shipping tank (SO2B) to be automatically maintained at a level established by the operator. This option is available by rotating the pressure/level control switch to level control on the Central Control Panel in the Platform Elly control room. Once the switch is put to level control, a digital level controller located on the Central Control Panel is set by the operator to the desired level.

The controller compares the actual tank level to the operator-selected level and sends a signal to a recycle control valve located on the pump discharge header. This signal opens or closes the recycle valve, allowing the appropriate amount of oil to be bypassed back to the storage/shipping tank (SO2B) to maintain a constant tank level.

Pressure Control

A pipeline pressure control option is also available to automatically control pipeline pressure. This option is available by rotating the pressure/level control switch to pressure control on the Central Control Panel in the Platform Elly control room. Once the switch is put to pressure control, a digital pressure controller is set to the desired pipeline pressure setting by the operator. The digital controller senses actual pipeline pressure and compares it to the operator-selected pressure. Based on this comparison, the controller sends a signal to a bypass valve located on the pump discharge header which adjusts the amount the bypass valves is open. This adjusts the amount of flow allowed to bypass back to the storage/shipping tank to maintain the desired pipeline pressure. As this option does not control tank level, periodic pressure adjustments may be needed.

Manual Shipping Pump Startup Procedures

1. Ensure pre-startup checks have been completed.

2. Set lead/lag shipping pump selection switch to desired pump setup.

3. Ensure pump control pressure/level switch, for shipping pumps, is set up for pressure control.

4. Set digital pressure controller, on the Central Control Panel, to desired pressure setting and set to automatic control.

First Pump Startup

5. Ensure minimum tank level has been reached (48 percent).

6. Turn permissive for lead pump from shutdown to normal, on the Master Shutdown Panel (MSP).

Second Pump Startup

7. Ensure minimum tank level has been reached (60 percent).

8. Allow first pump pressure to peak.

9. Turn permissive for lag pump from shutdown to normal, on the Master Shutdown Panel (MSP).

Automatic Shipping Pump Startup Procedures

1. Ensure pre-startup checks have been completed.

2. Set lead/lag shipping pumps selection switch to desired pump setup.

3. Ensure pump control pressure level switch, for shipping pumps, is set up for pressure control.

4. Set digital pressure controller, on the Central Control Panel, to desired pressure setting and set to automatic control.

5. Check tank level. If level has dropped low enough to shut down lead shipping pump, turn both lead and lag permissive switches on MSP to normal. If pumps did not shut down due to low level, follow manual startup procedures. If second pump does not start, leave it in the normal position; at 60 percent level the pump should start.

Monitoring Startup of Pumps

Once pump startup has been established, the following indicators will need to be checked:

1. Monitor pipeline pressure on the digital pressure controller readout on the Central Control Panel.

2. Monitor pipeline shipping pump pressure on strip chart on the Central Control Panel.

3. Ensure flow rate has been established through the pipeline flow meter by monitoring flow rate on digital readout located on the Central Control Panel.

In the event of failure of any digital readouts, pipeline should be notified and flow rates verified.

B.1.4 Protection Measures for Facility Areas Subject to Flooding

The Beta Unit Complex is not considered susceptible to flooding.

B.2 OTHER PREVENTION MEASURES

B.2.1 Alarm Systems, Devices, and Equipment

- All wells, including those artificially lifted, which are capable of flowing (per BSEE guidelines) are equipped with surface controlled subsurface safety valves (SCSSVs).

- All wells are also equipped with surface safety valves (SSVs). Any accidental or deliberate bleeding off of either pressure will cause these devices to close and stop any flow from the well below the device (SSV or SCSSV). Refer to Annex E for platform shutdown procedures.

Refer to Annex A.7 for the San Pedro Bay Pipeline alarm systems and devices.

B.2.2 Substance Abuse Program

The Company has developed a substance abuse program that complies with the Department of Transportation (DOT) and other applicable regulatory requirements.

B.2.3 Automatic Controls for Normal Processes, Safety Shutdown and Emergency Shutdown

- Emergency procedures are prioritized for the Beta Unit Complex and discussed in Beta Offshore's Emergency Action Plan (EAP).

- Emergency shutdown of the Beta Unit Complex is provided in Annex E of this OSPRP. Additional information is provided in Annex H, Risk and Hazard / Vulnerability Analysis.

- Procedures for startup and shutdown of the platforms and pipelines are performed from the platforms and onshore automated control rooms, or manually at specified locations.

B.2.4 Security and Surveillance Measures

Security and surveillance measures are fully described in Annex G (Security Plan).

B.2.5 Stormwater and Drainage Retention, Treatment and Discharge Systems

Drainage and containment/treatment of stormwater is discussed in Annex A.2.2.6 for the Beta Platforms and in Annex A.7 for the San Pedro Bay Pipeline and Beta Pump Station.

B.2.6 Training

- To supplement prevention methods, the Company personnel at the Beta Unit Complex are trained to comply with pollution control laws, rules, and regulations. Facility personnel may receive:
    - Spill prevention training during drills and/or safety meetings.
    - DOT operator qualification (OQ) training (for pipeline personnel only).
    - Technical schools training.
- Each operations employee is instructed in the potential causes of spills in his/her work area and the appropriate field surveillance techniques to minimize those occurrences. At a minimum, this refresher training occurs annually, concurrent with the scheduled spill drill.
- All employees are made aware of the necessity for maintaining an environmentally responsible operation.

Refer to Annex M (Training and Drills) for additional training information.

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C.1 PURPOSE AND SCOPE

The purpose of the Incident Management System (IMS) is to:

- Organize personnel to rapidly and safely execute necessary emergency actions.
- Reduce and mitigate potential impacts to the surrounding environment, community, and the public.
- Deliver accurate incident data and status to decision-makers.
- Guide government agency interaction and regulatory compliance.
- Manage externally released information.
- Restore normal business activity as soon as possible.
- Provide a management system that may be used for high-intensity planned events such as facility turnarounds.

It is important to note that implementation of IMS should not prevent line management from immediately mobilizing resources to control the physical event.

IMS' scope includes incidents of an accidental or potentially detrimental nature including:

- Aircraft/helicopter accident.
- Bomb threat.
- Fire and/or explosion.
- Gas release (toxic or nontoxic) and/or toxic material release.
- Injuries, illnesses, and fatalities.
- Loss of well control.
- Marine accident.
- Mudslide.
- Natural disasters (earthquake, mudslide, wildfire, etc.).

- Oil/hazardous material spill.
- Reservoir to surface release.
- Terrorism, sabotage, or other acts of violence.
- Other health/safety/environmental exposures or incidents.
- Situations seriously impacting/disrupting businesses that are more effectively managed with an emergency management system superceding normal business channels (includes facility or plant turnarounds).

C.2 RESPONSE ORGANIZATION

C.2.1 Overview

The IMS organizations consist of the Incident Management Team (IMT) and Emergency Operations Center (EOC) whose design is based on the Incident Command System (ICS). The IMS organizations activate in a tiered response to:

- Mobilize initial resources to over-respond to initial incident demands.
- Mobilize resources to match event conditions with rapid, responsible, and effective actions.
- Mitigate damage from incident events and moderate response actions to prevent further damage or injury.
- Manage information accurately for tactical decisions and strategic direction.
- Maintain quality public information and positive, factual government agency and news media interface.
- Maintain the Company's reputation through coordinated Company and Member communications.

The IMT is designed to perform emergency response independently, integrated with agencies, or as a Unified Command Team, and/or with the support from a partially or fully activated EOC. The EOC is a support organization that may be partially or fully activated depending on the incident type/magnitude and the support required by the IMT. The EOC organization structure matches the IMT to the extent that the EOC positions are required. The EOC supports the IMT; it does not manage the IMT. The EOC may be located at the corporate office or be relocated to the incident location.

Key performance objectives of the IMT are to execute field, facility, or unit emergency response and control actions:

- Implement the appropriate emergency response plan, Company plan, and/or spill plan.
- Coordinate site emergency services.
- Assess incident type, magnitude, and required response level.
- Select and use the appropriate site-specific <u>P</u>re-<u>I</u>ncident <u>P</u>lan and <u>E</u>mergency <u>R</u>esponse Guidelines (PIPER) or equivalent guidelines.
- Develop initial Incident Action Plan (ICS 201, 202 etc.).
- Protect the safety and health of emergency responders through implementation of a Site Safety Plan, or Site Safety and Health Plan.
- Rapidly mobilize appropriate response resources such as Co-ops and/or trained, qualified contractors specified in plans, and internal Company resources.
- Establish command post and required pre-designated positions consistent with the Incident Command System and Unified Command organizational structures for contingency/spill plans when required.
- Conduct actions to mitigate, control, secure, clean up, and recover.
- Perform required notification and reports to Company personnel and government agencies.
- Interface with on-scene response agencies and media who respond.
- Ensure early activation of the EOC or incorporation of EOC or other resources into the IMT when the incident exceeds or could exceed field IMT resources.

It is important to note that Technical Specialists from contractor or other sources may be individually called upon to join the IMT.

Key performance objectives of the EOC are to directly support IMT control actions and assist the IMT by dealing with external events.

- Establish Emergency Operations Center and required EOC positions as requested by the IMT and/or warranted by the incident.

- Develop and implement EOC Action Plan.

- Assist IMT positions with technical and planning consultation.

- Establish follow-up communications with regulatory agencies to assist the IMT, as requested.

- Support the IMT in preparing and disseminating public information and assisting with news media interface.

- Implement Public Affairs Plan in coordination with IMT Public Information Officer (PIO).

- Conduct strategic analysis of incident impacts to the Company's reputation, financial standing, and business continuity.

- Establish legal support and claims management if legal is not incorporated into IMT.

- Fulfill needs and coordinate relative contacts for Beta employees and contractor company contacts not performed by IMT.

- Assist in staffing IMT positions, as required.

- Coordinate communications as required with special external resources.

- Keep Beta upper management apprised of incident status.

It is important to note that some resources may already have been activated or requested individually by the IMT (e.g., named Specialists in regulatory spill plans).

C.2.2 Incident Management Team

The IMT is composed of five functional elements: Command, Operations, Planning/ Environmental, Logistics, and Finance. The roles and responsibilities of those elements are discussed below.

Command

Command is responsible for the overall management of the incident response and includes certain staff functions required to support the Command function. Command directs the activities of Planning, Operations, Logistics, and Finance. The Incident Commander heads up Command in the IMT. In a unified command structure, the Incident Commander works with individuals designated by government agencies to determine the objectives, strategies, and priorities of the response effort. Command staff functions include public information, safety, and liaison (government and community relations).

Operations

Operations have direct responsibility for emergency response, source control, and recovery and protection response actions. Areas of concern include not only the facilities but also the affected environment.

Planning/Intelligence

Planning/Intelligence is responsible for the collection, evaluation, and dissemination of tactical information about the incident including prioritization of mitigation measures. Planning/Intelligence maintains information on the current and forecasted situation, and on the status of resources assigned to the incident. Planning prepares the daily action plans and documents the incident. Planning also coordinates all environmental activities, including permitting, waste management planning, and the National Resource Damage Assessment (NRDA) process.

Logistics

Logistics provides all support and service needs of the response effort. The section provides purchasing services, personnel and facilities including housing and command posts(s), transportation, equipment and supplies, food and water, medical aid and transportation, and security services.

Finance

Finance provides financial services including accounting services and financial analysis/projections for incident costs. When necessary, Finance establishes a claims management system with claims contact protocols.

C.3 RESPONSE LEVELS

The following three levels of response have been identified to provide general guidance only for a response incident. Attempts to provide comprehensive classification of incident types and magnitudes and the exact response level required for each are not possible and would likely be misleading.

IF IN DOUBT ABOUT WHICH RESPONSE ACTIVATION LEVEL IS APPROPRIATE, IMPLEMENT THE HIGHER LEVEL!

- **Level 1 Field Incident**: A serious incident or accident that can be managed within the IMT with minimal support from offsite Company resources. ***Note:*** The term "field incident" may also refer to incidents that occur in the Beta Offshore office(s).
- **Level 2 Emergency Incident**: An incident with significant impact to the safety of personnel, environment, property, or production that cannot be managed by the IMT alone. The incident has potential for media exposure, escalation, or to continue for a protracted period of time. The incident requires partial EOC activation using only the functions needed.
- **Level 3 Crisis Incident**: An incident with extreme impact or with impact that requires full Company response to control, mitigate, and bring to conclusion. The IMT and a partially activated EOC are possibly overwhelmed. Requires *full* EOC activation.

C.4 DUTY SHEETS

Roles and responsibilities of IMT members are provided in Attachment C-1 to Annex C.

ATTACHMENT C-1

DUTY SHEETS OF THE IMT

UNIFIED COMMAND

Incident Commanders for oil discharges will, whenever possible and practical, be organized under the Unified Command Structure which includes, but not limited to:

- The pre-designated federal On Scene Coordinator (OSC).
- The pre-designated State Incident Commander (State IC).
- The representative of the Responsible Party (RP) or Area IC.

The Unified Command is responsible for the overall management of the incident. The Unified Command directs incident activities including the development and implementation of strategic decisions and approves the ordering and releasing of resources. The Unified Command may assign Deputy Incident Commanders to assist in carrying out Incident Command responsibilities.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Assess the situation and/or obtain incident briefing from prior Incident Commander.
c. Determine incident objectives and strategies.
d. Establish the immediate priorities.
e. Establish an Incident Command Post
f. Establish an appropriate organization.
g. Brief Command Staff and Section Chiefs.
h. Ensure planning meetings are scheduled as required. Review Meetings and Briefings.
i. Approve and authorize the implementation of an Incident Action Plan.
j. Determine information needs and advise Command and General Staff.
k. Coordinate activity for all Command and General Staff.
l. Manage incident operations.
m. Approve requests for additional resources and requests for release of resources.
n. Approve the use of trainees, volunteers, and auxiliary personnel.
o. Authorize release of information to news media.
p. Ensure incident funding is available.
q. Notify natural resource trustee(s) and coordinate with a NRDA Representative(s).
r. Coordinate incident investigation responsibilities.
s. Seek appropriate legal counsel.
t. Order the demobilization of the incident when appropriate.
u. Maintain Unit/Activity Log (ICS 214).

DEPUTY INCIDENT COMMANDER

The Deputy Incident Commander is the ongoing link between the IMT and the EOC, responding to requests and transferring information as it becomes available. Information is typically transferred to the EOC in the form of a status report. The Deputy Incident Commander facilitates Command meetings when necessary.

a. Follow common responsibilities. (Page 29)
b. Establish communications link with EOC when activated.
c. Provide EOC Director with regular status reports.
d. Transfer official information between IMT and EOC.
e. Keep IC informed on EOC's status.
f. Maintain Unit/Activity Log (ICS 214).

SAFETY OFFICER

The Safety Officer is responsible for monitoring and assessing hazardous and unsafe situations and developing measures for assuring personnel safety. The Safety Officer will correct unsafe acts or conditions through the regular line of authority, although the Safety Officer may exercise emergency authority to stop or prevent unsafe acts when immediate action is required. The Safety Officer maintains awareness and active and developing situations, ensures the preparation and implementation of the Site Safety Plan, and includes safety messages in each Incident Action Plan.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Identify hazardous or unsafe situations associated with the incident by ensuring the performance of preliminary and continuous site characterization and analysis which shall include the identification of all actual or potential physical, biological, and chemical hazards known or expected to be present on site.
c. Participate in planning meetings to identify any health and safety concerns inherent in the operations' daily work plan.
d. Review the Incident Action Plan for safety implications.
e. Exercise emergency authority to stop and prevent unsafe acts.
f. Investigate accidents that have occurred within incident areas.
g. Ensure the preparation and implementation of the site specific Health and Safety Plan (HASP) in accordance with the Area Contingency Plan (ACP) and State and Federal OSHA regulations. The HASP shall at minimum address, include, or contain the following elements:
   - Health and safety hazard analysis for each site task or operation.
   - Comprehensive operations work plan.
   - Personnel training requirements.
   - PPE selection criteria.
   - Site specific occupational medical monitoring requirements.
   - Air monitoring plan: area/personal.
   - Site control measures.
   - Confined space entry procedures "only if needed."
   - Pre-entry briefings (tailgate meetings): initial and as needed.
   - Pre-operations health and safety conference for all incident participants.
   - Quality assurance of HASP effectiveness.
h. Assign assistants and manage the incident safety organization.
i. Review and approve the medical plan.
j. Maintain Unit/Activity Log (ICS 214).

PUBLIC INFORMATION OFFICER

The Information Officer is responsible for developing and releasing information about the incident to the news media, to incident personnel, and to other appropriate agencies and organizations.

Only one Information Officer will be assigned for each incident, including incidents operating under Unified Command and multi-jurisdictional incidents. The Information Officer may have assistants as necessary, and the assistants may also represent assisting agencies or jurisdictions.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Establish a single information center. [This may be called the **Joint Information Center (JIC)**.]
c. Contact the jurisdictional agencies to coordinate public information activities.
d. Establish information collection requirements.
e. Observe constraints on the release of information imposed by The Incident Commander
f. Prepare and disseminate news releases.
g. Attend meetings to update information releases.
h. Determine from the Incident Commander if there are any limits on information release.
i. Develop material for use in media briefings.
j. Obtain Incident Commander approval for media releases.

k. Inform media and conduct media briefings.
l. Arrange for tours and other interviews or briefings that may be required.
m. Obtain media information that may be useful to incident planning.
n. Maintain current information summaries and/or displays on the incident and provide information of status of the incident to assigned personnel.
o. Resolve conflicting information and bring media concerns to the Incident Commander.
p. Maintain Unit/Activity Log (ICS 214).

LIAISON OFFICER

Incidents that are multi-jurisdiction, or have several agencies involved, may require the establishment of the Liaison Officer position on the Command Staff.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Provide a point of contact for assisting and cooperating Agency Representatives.
c. Identify Agency Representatives from each agency including communications link and location.
d. Maintain a list of assisting and coordinating interagency contracts.
e. Assist in establishing and coordinating inter-agency contracts.
f. Keep agencies supporting incident aware of incident status.
g. Monitor incident operations to identify current or potential inter-organizational issues and advise Incident Command as appropriate.
h. Participate in planning meetings; provide current resource status information, including limitations and capabilities of assisting agency resources.
i. Maintain Unit/Activity Log (ICS 214).

OPERATIONS SECTION

OPERATIONS SECTION CHIEF

The Operations Section Chief is responsible for the management of all operations directly applicable to the primary mission. The Operations Chief activates and supervises elements in accordance with the Incident Action Plan and directs its execution, activities and executes the Site Safety Plan. He directs the preparation of unit operational plans, requests, or releases resources, makes expedient changes to the Incident Action Plans as necessary and reports such to the Incident Commander.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Develop operations portion of Incident Action Plan.
c. Brief and assign orientations personnel in accordance with Incident Action Plan.
d. Supervise the execution of the Incident Action Plan for Operations.
e. Request resources needed to implement the Operation’s tactics as part of the Incident Action Plan development (ICS 215).
f. Ensure safe tactical operations.
g. Make or approve expedient changes to the Incident Action Plan during the operational period as necessary.
h. Approve suggested list of resources to be released from assigned status (not released from the incident).
i. Assemble and disassemble teams/task forces assigned to operations section.
j. Report information about changes in the implementation of the IAP, special activities, events, and occurrences to Incident Commander as well as to Planning Section Chief and Information Officer.
k. Maintain Unit/Activity Log (ICS 214).

STAGING AREA MANAGER

Under the Operations Section Chief, the Staging Area Manager is responsible for managing all activities within the designated staging areas.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Implement pertinent sections of the Incident Action Plan.
c. Establish and maintain boundaries of staging areas.
d. Post signs for identification and traffic control.
e. Establish check-in function as appropriate.
f. Determine and request logistical support for personnel and/or equipment as needed.
g. Advise Operations Section Chief of all changing situation/conditions on scene.
h. Respond to requests for resource assignments.
i. Respond to requests for information as required.
j. Demobilize or reposition staging areas as needed.
k. Maintain Unit/Activity Log (ICS 214).

RECOVERY AND PROTECTION BRANCH LEADER

The Recovery and Protection Branch Leader is responsible for overseeing and implementing the protection, containment and cleanup activities established in the Incident Action Plan. The Recovery and Protection Branch Leader reports to the Operations Section Chief.

a. Review Common Responsibilities (Page 29).
b. Participate in planning meetings as required.
c. Develop operations portion of Incident Action Plan.
d. Brief and assign operations personnel in accordance with Incident Action Plan.
e. Supervise operations.
f. Determine resource needs.
g. Review recommendations and initiate release of resources.
h. Report information about special activities, events, and occurrences to Operations Section Chief.
i. Maintain Unit/Activity Log (ICS 214).

SENSITIVE AREA PROTECTION GROUP

The Sensitive Area Protection Group is responsible for the deployment of containment, diversion, and absorbing boom in locations as directed by the Recovery and Protection Branch Leader to protect sensitive areas.

a. Obtain probable beach impact area(s) from Trajectory Analysis Specialist.
b. Coordinate protective booming to provide protection for sensitive resource areas, as directed by the Recovery and Protection Branch Leader.
c. Identify wildlife sensitivity areas, in the work area, and take appropriate measures to reduce impacts of operations.
d. Check to see potential impact areas have debris removed.
e. Determine special access and equipment deployment requirements.
f. Provide contractors with direction and supervision of equipment and manpower required for protective booming installations.
g. Provide for maintenance of installed protective booming.
h. Coordinate with Waste Coordinator for removal, storage and disposal of debris (contaminated and uncontaminated).
i. Work with Environmental Permit Specialist to obtain required authorization to perform required work.
j. Observe local conditions and direct that work is carried out so as to minimize impacts from protective measures
k. Document all actions
l. Maintain Unit/Activity Log (ICS 214).

ON WATER RECOVERY GROUP

The On Water Recovery Group is responsible for managing on water recovery operations in compliance with the Incident Action Plan. The Group may be further divided into teams, task forces and single resources.

a. Review Common Responsibilities (Page 29).
b. Implement Recovery Strategies in Incident Action Plan.
c. Direct, coordinate and assess effectiveness of on water recovery actions.
d. Modify protective actions as needed.
e. Brief the Recovery and Protection Branch Leader on activities.
f. Maintain Unit/Activity Log (ICS 214).

RESPONSE CONTRACTOR SUPERVISOR

The Response Contractor Supervisor is responsible for supervising on-water recovery operations by cooperative resources in compliance with the Incident Action Plan.

a. Implement recovery strategies in accordance with the Incident Action Plan.
b. Evaluate continuously the effectiveness of recovery strategies.
c. Provide recommendations for modifications to the Incident Action Plan when necessary.
d. Keep Recovery and Protection Branch Leader informed of activities.
e. Maintain Activity Log (ICS 214).

ON LAND RECOVERY

Under the Recovery and Protection Branch Leader, the On Land Recovery Group is responsible for managing on land cleanup operations in compliance with the Incident Action Plan. The group may be further divided into Strike Teams, Task Forces and single resources.

a. Review Common Responsibilities (Page 29).
b. Implement Recovery Strategies in Incident Action Plan.
c. Direct, coordinate and assess effectiveness of on land recovery actions.
d. Modify protective actions as needed.
e. Brief the Recovery and Protection Branch Leader on activities.
f. Maintain Unit/Activity Log (ICS 214).

SURVEILLANCE

Surveillance is responsible to collect situation information from personal observations at the incident and provide this information to the Recovery and Protection Branch Leader.

a. Review Common Responsibilities (Page 29).
b. Determine:
   - Location of assignment.
   - Type of information required.
   - Priorities.
   - Time limits for completion.
   - Method of communication.
   - Method of transportation.
c. Obtain copy of Incident Action Plan for the Operational Period.
d. Obtain necessary equipment and supplies.
e. Perform Surveillance responsibilities to include but not limited to the following:
   - Perimeters of incident.
   - Locations of oil concentration.
   - Rates of spread.
   - Weather conditions.
   - Hazards.
   - Progress of Operation resources.
f. Be prepared to identify all facility locations (e.g., Division and Branch boundaries).
g. Report information to the Recovery and Protection Branch Leader by established procedure.
h. Report immediately any condition observed which may cause danger and safety hazard to personnel.
j. Gather intelligence that will lead to accurate predictions.
k. Maintain Unit/Activity Log (ICS 214).

WASTE / DISPOSAL QUANTIFICATION GROUP

Under the Recovery and Protection Branch Leader, the Disposal Group is responsible for coordinating the on site activities of personnel engaged in collecting, storing, transporting, and disposing of waste materials. Depending on the size and location of the spill, the disposal group may be further divided into teams, task forces, and single resources.

a. Review Common Responsibilities (Page 29).
b. Implement disposal portion of Incident Action Plan.
c. Ensure compliance with all hazardous waste laws and regulations.
d. Maintain accurate records of recovered material.
e. Brief the Recovery and Protection Branch Leader on activities.
f. Maintain Unit/Activity Log (ICS 214).

WILDLIFE GROUP

The Wildlife Group is responsible for coordinating the search for collection and field tagging of dead and alive impacted wildlife and transporting them to processing center(s). This group should coordinate with Planning (Situation Unit) in conducting aerial and ground surveys of wildlife population in the vicinity of the spill. They should also deploy acoustic and visual wildlife hazing equipment as needed.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Determine resource needs.
c. Establish and implement protocols for collection and logging of impacted wildlife.
d. Coordinate transportation of wildlife to processing station(s).
e. Maintain Unit/Activity Log (ICS 214).

DECONTAMINATION GROUP

The Decontamination Group is responsible for decontamination of personnel and response equipment in compliance with approved statutes.

a. Review Common Responsibilities (Page 29).
b. Implement Decontamination Plan.
c. Determine resource needs.
d. Direct and coordinate decontamination activities.
e. Brief Site Safety Officer on conditions.
f. Brief Recovery and Protection Branch Leader on activities.
g. Maintain Unit/Activity Log (ICS 214).

SOURCE CONTROL BRANCH LEADER

Under the Operations Section Chief, the Source Control Branch Leader is responsible for managing all source activities within the operation areas.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Establish check-in function as appropriate.
c. Determine and request logistical support for personnel and/or equipment as needed.
d. Periodically advise Operations Section Chief of all changing situation/conditions on scene.
e. Respond to requests for resource assignments.
f. Develop work plan and organization to stop leak source, if necessary.
g. Obtain contractor resources and equipment supplies required for investigation and repair work.
h. Obtain Company specialist personnel needed for the required repair tasks.
i. Develop work plan and organization to affect necessary temporary/permanent repairs to eliminate spill source.
j. Oversee the safety of Company/contractor work force.
k. Direct the repairs in a manner so as to mitigate the potential of additional releases and provide for the safety of repair personnel.
l. Coordinate damage control activities with the appropriate Group (On Land Recovery/On Water Recovery) to minimize potential conflicts.
m. Maintain Unit/Activity Log (ICS 214).

SOURCE REDUCTION / ELIMINATION GROUP

Under the Source Control Branch Leader, the Source Reduction Elimination Group is responsible for managing all source reduction/elimination activities within the designated operation areas.

a. Develop work plan and organization to reduce or eliminate the leak.
b. Obtain contractor resources necessary to investigate the leak.
c. Provide report on investigation of leak.
d. Assess damage to affected facilities and attempt to minimize further damage to involved facilities or surrounding facilities.
e. Maintain Unit/Activity Log (ICS 214).

REPAIR GROUP

Under the Source Control Branch Leader, the Repair Group is responsible for managing all repair activities within the designated operation areas.

a. Develop work plan and organization to stop leak source, if necessary.
b. Obtain contractor resources and equipment supplies required for investigation and repair work.

c. Obtain Company specialist personnel needed for the required repair tasks.
d. Develop work plan and organization to affect necessary temporary/permanent repairs to eliminate spill source.
e. Oversee the safety of Company/contractor work force.
f. Direct the repairs in a manner so as to mitigate the potential of additional releases and provide for the safety of repair personnel.
g. Report successful repair and ready to return to service of effected equipment/facility to Source Control Branch Leader.
h. Provide technical assistance and liaison to Incident Management Team when effected equipment/ facility is owned/operated by others.
i. Periodically update the Source Control Branch Leader as to the progress being made.
j. Coordinate damage control activities with the appropriate Group (On Land Recovery/On Water Recovery) to minimize potential conflicts.
k. Maintain Unit/Activity Log (ICS 214).

EMERGENCY RESPONSE BRANCH LEADER

The Emergency Response Branch Leader is primarily responsible for overseeing and implementing emergency measures to protect life, mitigate further damage to the environment, and stabilize the situation.

a. Review Common Responsibilities (Page 29).
b. Participate in planning meetings as required.
c. Develop operations portion of Incident Action Plan.
d. Supervise operations.
e. Determine need and request additional resources.
f. Review suggested list of resources to be released and initiate recommendation for release of resources.
g. Report information about special activities, events, and occurrences to Incident Commander.
h. Maintain Unit/Activity Log (ICS 214).

FACILITY SPILL EQUIPMENT RESPONSE GROUP

The Facility Spill Equipment Response Group is responsible for all supplies and equipment, the service and repair of tools and equipment within the facility. The Facility Spill Equipment Response Group reports to the Emergency Response Branch Leader.

a. Review Common Responsibilities (Page 29).
b. Use Logistics to order required personnel to operate supply area.
c. Organize physical layout of the supply area.
d. Establish procedures for operating supply area.
e. Set up filing system for receiving and distribution of supplies and equipment.
f. Maintain inventory of supplies and equipment.
g. Develop security requirement for supply area.
h. Establish procedures for operating supply area.
i. Provide necessary supply records to Emergency Response Branch Leader..
j. Maintain Unit/Activity Log (ICS 214).

EMERGENCY RESPONSE GROUP

The Emergency Response Group reports to the Emergency Response Branch Leader and is responsible for performing tactical assignments assigned to the Group. The Group reports work progress, resources status, other important information and maintains work records on assigned personnel.

a. Review Common Responsibilities (Page 29).
b. Monitor work progress and make changes when necessary.
c. Coordinate activities with other Strike Teams, Task Forces, and single resources.
d. Submit situation and resource status information to Division/Group Supervisor.
e. Maintain Unit/Activity Log (ICS 214).

EMS

Under the direction of the Emergency Response Group, the Medical (EMS) Group is responsible for coordinating and directing all emergency medical services related to the incident.

a. Review Common Responsibilities (Page 29).
b. Prioritize EMS responses related to the incident.
c. Determine resource requirements.
d. Direct and coordinate EMS responses.
e. Manage dedicated EMS resources.
f. Brief Emergency Response Branch Leader on activities.
g. Maintain Unit/Activity Log (ICS 214).

HAZMAT

Under the direction of the Emergency Response Group, the HAZMAT Group is responsible for coordinating and directing all hazardous materials activities related to the incident.

a. Review Common Responsibilities (Page 29).
b. Prioritize HAZMAT responses related to the incident.
c. Determine resource requirements.
d. Direct and coordinate HAZMAT responses.
e. Manage dedicated HAZMAT resources.
f. Brief Emergency Response Group on activities.
g. Maintain Unit/Activity Log (ICS 214).

FIRE

Under the direction of the Emergency Response Group, the Fire Group is responsible for coordinating and directing all firefighting activities related to the incident.

a. Review Common Responsibilities (Page 29).
b. Prioritize responses to fires related to the incident.
c. Determine resource needs.
d. Direct and coordinate firefighting mission.
e. Manage dedicated firefighting resources.
f. Brief Emergency Response Group on activities.
g. Maintain Unit/Activity Log (ICS 214).

RESCUE

Under the direction of the Emergency Response Group, the SAR Group is responsible for prioritization and coordination of all Search and Rescue missions directly related to a specific incident.

a. Review Common Responsibilities (Page 29).
b. Prioritize Search and Rescue missions.
c. Determine resource needs.
d. Direct and coordinate Search and Rescue missions.
e. Manage dedicated Search and Rescue resources.
f. Brief Emergency Response Group on activities.
g. Maintain Unit/Activity Log (ICS 214).

PLANNING SECTION

PLANNING SECTION CHIEF

The Planning Section Chief, a member of the General Staff, is responsible for the collection, evaluation, dissemination and use of information about the development of the incident and status of resources. Information is needed to:

1) Understand the current situation,
2) Predict probable course of incident events, and
3) Prepare alternative strategies for the incident.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Activate Planning Section units.
c. Assign available personnel already on site to ICS organizational positions as appropriate.
d. Collect and process situation information about the incident.
e. Supervise preparation of the Incident Action Plan.
f. Provide input to the Incident Command and Operations Sections Chief in preparing the Incident Action Plan.
g. Participate in planning and other meetings as required.
h. Establish information requirements and reporting schedules for all ICS organizational elements for use in preparing the Incident Action Plan.
i. Determine need for any specialized resources in support of the incident.
j. Provide Resources Unit with the Planning Section's organizational structure including names and locations of assigned personnel.
k. Assign Technical Specialists where needed.
l. Assemble information on alternative strategies.
m. Assemble and disassemble teams or task forces as necessary.
n. Provide periodic predictions on incident potential.
o. Compile and display incident status summary information.
p. Provide status reports to appropriate requirements.
q. Advise General Staff of any significant changes in incident status.
r. Incorporate the incident Traffic Plan from the Transportation Support Unit and other supporting plans into the Incident Action Plan.
s. Instruct Planning Section Units in distribution and routing of incident information.
t. Prepare recommendations for release of Incident Command.
u. Maintain Section records.
v. Maintain Unit/Activity Log (ICS 214).

SITUATION UNIT LEADER

The Situation Unit Leader is responsible for the collection and evaluation of information about the current and possible future status of the spill and the spill response operations. This responsibility includes the compilation of information regarding the type and amount of oil spilled, the amount of oil recovered, the oil's current location and anticipated trajectory, and impacts on natural resources. This responsibility includes providing information to the GIS Specialist(s) for the creation of maps to depict the current and possible future situation and the preparation of reports for the Planning Section Chief.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Follow Unit Leader Responsibilities. (Page 30)
c. Obtain briefing and special instructions from the Planning Section Chief.
d. Participate in planning meetings as required.
e. Prepare and maintain Command Post display.
f. Collect and maintain most current incident data.
g. Prepare periodic predictions as requested by the Planning Section Chief.
h. Prepare, post, and disseminate resource and situation status information as required in the Incident Information Center.
i. Prepare the Incident Status Summary (ICS 209 (oil)).
j. Provide status reports to appropriate requesters.
k. Provide photographic services and maps.
l. Maintain Unit/Activity Log (ICS 214).

SITUATION STATUS DISPLAY BOARD COORDINATOR

The Situation Status Display Board Coordinator is responsible for the display of incident status information obtained from Field Observers, resource status reports, aerial and on ortho photographs and infrared data.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Determine:
   - Location of work assignments.
   - Numbers, types, and locations of displays required.
   - Priorities.
   - Map requirements for Incident Action Plan.
   - Time limits for completion.
   - Field Observer assignments and communications means.
c. Obtain necessary equipment and supplies.
d. Obtain copy of Incident Action Plan for each operational period.
e. Assist Situation Unit Leader in analyzing and evaluating field reports.
f. Develop required displays in accordance with time limits for completion.
g. Maintain Unit/Activity Log (ICS 214).

FIELD OBSERVER

The Field Observer is responsible to collect situation information from personal observations at the incident and provide this information to the Situation Unit Leader.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Determine:
   - Location of assignment.
   - Type of information required.
   - Priorities.
   - Time limits for completion.
   - Method of communication.
   - Method of transportation.
c. Obtain copy of Incident Action Plan for the Operational Period.
d. Obtain necessary equipment and supplies.
e. Perform Field Observer responsibilities to include but not limited to the following:
   - Perimeters of incident.
   - Locations of oil concentration.
   - Rates of spread.
   - Weather conditions.
   - Hazards.
   - Progress of Operation resources.
f. Be prepared to identify all facility locations (e.g., Heliports, Division and Branch boundaries).
g. Report information to Situation Unit Leader by established procedure.
h. Report immediately any condition observed which may cause danger and safety hazard to personnel.
i. Gather intelligence that will lead to accurate predictions.
j. Maintain Unit/Activity Log (ICS 214).

AIR SUPPORT

The Air Support is primarily responsible for supporting and managing helibase and helispot operations, and maintaining liaison with fixed-wing air bases. This includes providing:

1) Fuel and other supplies.
2) Maintenance and repair of helicopters.
3) Keeping records of helicopter activity.
4) Providing enforcement of safety regulations.

These major functions are performed at helibases and helispots. Helicopters during landing and takeoff and while on the ground are under the control of the air support group's Helibase or Helispot managers. The Air Support reports to the Field Observer and the Situation Unit Leader.

a. Review Common Responsibilities (Page 29).
b. Obtain copy of the Incident Action Plan from the Situation Unit Leader, including the Air Operations Summary Worksheet.
c. Participate in Situation Unit Leader planning activities.
d. Inform Situation Unit Leader of group activities.
e. Identify resources/supplies dispatched for air support group.
f. Request special air support items from appropriate sources through logistics section.
g. Identify helibase and helispot locations from the Incident Action Plan or from the Situation Unit Leader.
h. Determine need for assignment of personnel and equipment at each helibase or helispot.
i. Coordinate special request for air logistics.
j. Maintain coordination with air bases supporting the incident.
k. Coordinate activities with Situation Unit Leader.
l. Obtain assigned ground to air frequency for Helibase operations from Communication Unit or Communications Plan.
m. Inform Situation Unit Leader of capability to provide night flying service.
n. Ensure compliance with each agency's operations checklist for day and night operations.
o. Ensure dust abatement procedures are implemented at Helibase and Helispots.
p. Provide crash-rescue service for helibases and helispots.
q. Ensure that Air Traffic Control procedures are established between Helibase and Helispots.
r. Maintain Unit/Activity Log (ICS 214).

TRAJECTORY ANALYSIS SPECIALIST

The Trajectory Analysis Specialist is responsible for providing to the Unified Command projections and estimates of the movement and behavior of the spill. The specialist will combine visual observations, remote-sensing information, computer modeling as well as observed and predicted tidal, current and weather data to form these analyses. Additionally, the specialist is responsible for interfacing with local experts (weather service, academia, researchers, etc.) in formulating these analyses. Trajectory maps, over-flight maps, tides and current data, and weather forecasts will be supplied by the specialist to the Situation Unit Leader for dissemination throughout the Command Post.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Schedule and conduct spill observations/over-flights as needed.
c. Gather pertinent information on tides, currents, and weather from all available sources.
d. Provide trajectory and over-flight maps, weather forecasts, tidal and current information.
e. Provide briefing on observations and analyses to the proper personnel.
f. Demobilize in accordance with the Demobilization Plan.
g. Maintain Unit/Activity Log (ICS 214).

GEOGRAPHIC INFORMATION (GIS) SPECIALIST

The GIS Specialist is responsible for gathering and compiling updated spill information and providing various map products to the incident. The GIS team will work with the Situation Unit and the information management officer to ensure accurate and rapid dissemination of oil spill information to the ICS.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Determine resources needs.
c. Participate in planning meetings as required.
d. Gather and compile data from the different incident-sections.
e. Provide maps for various components of the incident.
f. Provide status reports to appropriate requesters.
g. Maintain Unit/Activity Log (ICS 214).

RESOURCES AT RISK (RAR) SPECIALIST

The Resource at Risk Specialist is responsible for the identification of resources thought to be at risk from exposure to the spilled oil through the analysis of known and anticipated oil movement and the location of natural, cultural, and economic resources. The Resources at Risk Specialist considers the relative importance of the resources and the relative risk to develop a priority list for protection.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Participate in planning meetings as required.
c. Determine resource needs.
d. Obtain current and forecasted status information from Situation Unit.
e. Identify natural resources at risk
f. Identify archaeo-cultural resources at risk.
g. Identify socioeconomic resources at risk.
h. Develop a prioritized list of the resources at risk for use by the Planning Section.
i. Provide status reports to appropriate requesters.
j. Maintain Unit/Activity Log (ICS 214).

RESOURCE UNIT LEADER

The Resource Unit Leader (RESTAT) is responsible for maintaining the status of all resources (primary and support) at an incident. RESTAT achieves this through development and maintenance of a master list of all resources, including check-in, status, current location, etc. This unit is also responsible for preparing parts of the Incident Action Plan (ICS 203, 204, and 207) and compiling the entire plan in conjunction with other members of the ICS, (e.g., Situation Unit, Operations, Logistics) and determines the availability of resources.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Follow Unit Leader Responsibilities. (Page 30)
c. Obtain briefing and special instructions from the Planning Section Chief.
d. Participate in Planning Meetings as required.
e. Establish check-in function at incident locations.
f. Using the Incident Briefing (ICS 201) prepare and maintain the Command Post display (organization chart and resource allocation and deployment sections of display).
g. Establish contacts which incident facilities and begin maintenance of resources status.
h. Gather post, and maintain incident resource status.
i. Maintain master roster of all resources checked in at the incident.
j. Prepare Organization Assignment List (ICS 203) and Organization Chart (ICS 207).
k. Prepare appropriate parts of assignment lists (ICS 204)
l. Provide status reports to appropriate requesters.
m. Maintain Unit/Activity Log (ICS 214).

CHECK-IN RECORDER

Check-in recorders are needed at each check-in location to ensure that all resources assigned to an incident are accounted for.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Obtain work materials, including Check-in Lists (ICS Form 211).
c. Establish communications with the Communication Unit.
d. Post signs, so that arriving resources can easily find the check-in locations.
e. Record check-in information on Check-in Lists (ICS Form 211).
f. Transmit check-in information to Resources Unit on regular pre-arranged schedule.
g. Forward completed Check-in Lists and Status Change Cards to the Resources Unit.
h. Maintain Unit/Activity Log (ICS 214).

VOLUNTEER COORDINATOR

The Volunteer Coordinator is responsible for managing and overseeing all aspects of volunteer participation including recruitment, induction and deployment. The Volunteer Coordinator is part of the Planning Section and reports to the Resources Unit Leader.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Coordinate with Resource Unit to determine where volunteers are needed.
c. Identify any necessary skills and training needs.
d. Verify minimum training needed, as necessary, with Health and Safety Officer or units requesting volunteers (if special skill is required).
e. Activate, as necessary, standby contractors for various training needs as applicable.
f. Coordinate nearby or on-site training as part of the deployment process.
g. Identify and secure other equipment, materials, and supplies as needed.
h. Induct convergent (on the scene) volunteers.
i. Activate other volunteers (individuals who have applied prior to an incident and are on file with the Volunteer Coordinator or other participating volunteer organizations).
j. Recruit additional volunteers through media appeals if needed.
k. Assess, train, and assign volunteers.
l. Coordinate with Logistics for volunteer housing and meal accommodations.
m. Assist volunteers with other special needs.
n. Maintain Unit/Activity Log (ICS Form 214).

DEMOBILIZATION UNIT LEADER

The Demobilization Unit Leader is responsible for developing the Incident Demobilization Plan and assisting Sections/Units in ensuring that an orderly, safe, and cost effective demobilization of personnel and equipment is accomplished from the incident.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Follow Unit Leader Responsibilities. (Page 30)
c. Obtain briefing and special instructions from Planning Section Chief.
d. Demobilize in accordance with the Demobilization Plan.
e. Review incident resource records to determine probable size of demobilization effort.
f. Participate in planning meetings as required.
g. Evaluate logistics and transportation capabilities required supporting demobilization.
h. Prepare and obtain approval of Demobilization Plan including required decontamination.
i. Distribute Demobilization Plan to each processing point.
j. Ensure that all Sections/Units understand their responsibilities within the Demobilization Plan.
k. Monitor implementation and assist in the coordination of the Demobilization Plan.
l. Brief the Planning Section Chief on the progress of demobilization.
m. Provide status reports to appropriate requestors.
n. Maintain Unit/Activity Log (ICS 214).

TECHNICAL SPECIALIST UNIT LEADER

The Technical Specialist Unit Leader is advisor with special skills needed to support the incident. He assigns Technical Specialists in the ICS organization. If necessary, Technical Specialists may be formed into a separate unit. The Technical Specialist Unit will maintain a list of available specialists and will assign them where needed.

a. Assist Planning Section Chief with development of Initial Action Plan by collecting data on incident status and providing guidance on anticipated future resource allocation.
b. Coordinate with Technical Specialists to provide review that technical (engineering, consulting, etc.) needs are identified and addressed.
c. Coordinate with On-Land/On-Water Group and Waste Disposal/Quantification Group on development of Protection Plan and Cleanup Plan.
d. Develop and evaluate alternative containment/cleanup strategies
e. Coordinate with all branches of the Incident Management Team to develop a Demobilization Plan, as necessary.
f. Maintain Unit/Activity Log (ICS 214).

ENGINEERING SPECIALIST

The Engineering Specialist is a person with special engineering skills or knowledge that may be applied to support incident operations. The Engineering Specialist may be assigned anywhere in the ICS organization as needed.

a. Assist Planning Chief with development of Initial Action Plan by collecting data on incident status and providing guidance on anticipated future resource allocation.
b. Coordinate with Repair Group to provide review that technical (engineering, consulting, etc.) needs are identified and addressed.
c. Coordinate with On-Land/On-Water Group and Waste Disposal/Quantification Group on development of Protection Plan and Cleanup Plan.
d. Develop and evaluate alternative containment/cleanup strategies
e. Coordinate with all branches of the Incident Management Team to develop a Demobilization Plan, as necessary.
f. Maintain Unit/Activity Log (ICS Form 214).

WASTE MANAGEMENT PLAN SPECIALIST

The Waste Management Plan Specialist is responsible for providing the Planning Section Chief with a Disposal Plan that details the collection, sampling, monitoring, temporary storage, transportation, recycling, and disposal of all anticipated response wastes.

a. Review Common Responsibilities (Page 29).
b. Determine resource needs.
c. Participate in planning meetings as required.
d. Develop a Pre-Cleanup Plan and monitor pre-cleanup operations, if appropriate.
e. Develop a detailed Waste Management Plan.
f. Maintain Unit/Activity Log (ICS Form 214).

ENVIRONMENTAL PERMIT SPECIALIST

The Environmental Permit Specialist is responsible for applying for the necessary permits to implement the response plan. These may include air, water discharge, storage, and associated fees.

a. Seek to obtain necessary permits and approval from appropriate government agencies for specific operations (i.e., dispersant use approval, permits for waste handling, storage and disposal, etc.).
b. Work with the Land Specialist to obtain permits to access government or private lands.
c. If required, obtain permits to use certain types of equipment and vehicles in restricted areas.
d. Obtain EPA I.D. number needed for waste handling if spill impacts shoreline.
e. Assist in the development, site specific, Wildlife Rehabilitation Plan, Marine Mammal Rehabilitation Plan, In-Situ Burning, Dispersant Use Plans as appropriate for completion of the Incident Action Plan.
f. Provide permitting and technical support to Planning Section Chief to inform/advise on any long-range permitting needs.
g. Provide assistance to Waste Disposal/Quantification Group
h. Obtain permits for various sites and operations as the need arises (construction, removal, hauling, etc.).
i. Recommend and implement environmental sampling plan.
j. Work with SOC experts to initiate NOAA-driven actions.
k. Maintain Unit/Activity Log (ICS Form 214).

LAND & RIGHT OF WAY SPECIALIST

The Land & Right of Way Specialist is responsible for providing assistance to the Permit Specialist to obtain all necessary permits, entry rights to public and private properties. Obtain permission for land and beach use for protection or cleanup.

a. Obtain necessary entry rights for public and/or private property.
b. Provide assistance to Permit Specialist to obtain permits to access government or private lands.
c. Advise Planning Section Chief of any real property related contract obligations.
d. Advise Incident Commander of any contractual relationships relevant to accessing lands for incident response.
e. Obtain permission for land and beach use, or access for protective booming, staging, waste handling, field command post location, etc.
f. Assist Planning Section Chief and Planning Section, as needed.
g. Advise Planning Section Chief of any obligatory landowner contacts.
h. Maintain Unit/Activity Log (ICS Form 214).

NRDA SPECIALIST

The National Resource Damage Assessment (NRDA) Specialist is responsible for coordinating NRDA needs and activities of the trustee team within the ICS spill response operations. This includes close coordination with the Liaison Officer for obtaining timely information on the spill and injuries to natural resources. The Specialist will coordinate NRDA or injury determination activities.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Attend planning meetings as required.
c. Attend appropriate meetings to facilitate communication between NRDA Team and ICS.
d. Provide status reports to appropriate requesters.
e. Identify site access, staffing, and logistical support needs of the NRDA Team to the Liaison Officer.
f. Interact with appropriate units to collect information required by the NFDA Team.
g. Obtain necessary safety clearance for access to sampling sites.
h. Coordinate with other organizations to identify personnel available for NRDA.
i. Maintain Unit/Activity Log (ICS 214).

INDUSTRIAL HYGIENE SPECIALIST

The Industrial Hygiene Specialist has the responsibility of advising, implementing, and monitoring programs to meet compliance with local, State, Federal and Company occupational health and safety standards to be followed during cleanup and demobilization operations.

a. Advise, implement and monitor mandated programs to meet compliance with local, State, Federal and Company occupational health and safety standards/practices to be followed in all cleanup operations for the incident.
b. Provide Planning Section Chief with information for the medial/health portion of the Incident Action Plans.
c. Advise for Planning Section Chief on OSHA requirements for cleanup workers.
d. Establish decontamination stations when and where requirement dictates.
e. Check that the cleanup contractor training of personnel meets at least the minimum OSHA requirements.
f. Implement program for training volunteers, if applicable.
g. Participate in investigations of occupational incidents accidents as appropriate.
h. Provide final site characterization and Site Safety & Health Plan.
i. Monitor and evaluate ambient air quality and personal monitoring data, as required. Recommend appropriate protection as monitoring or conditions dictate.
j. Monitor contractor programs.
k. Monitor volunteer programs.
l. Update plans as appropriate.
m. Maintain Unit/Activity Log (ICS Form 214).

LEGAL SPECIALIST

The Legal Specialist will act in an advisory capacity during an oil spill response.

a. Review Common Responsibilities (Page 29).
b. Participate in planning meetings if requested.
c. Advise Unified Command on legal issues relating to in-situ burning, use of dispersants and other alternative response technology.
d. Advise Unified Command on legal issues relating to Natural Resource Damage Assessment.
e. Advise Unified Command on legal issues relating to investigation.
f. Advise Unified Command on legal issues relating to finance and insurance compensation/claims.
g. Advise the Unified Command on response related issues.
h. Maintain Unit/Activity Log (ICS Form 214).

DOCUMENTATION UNIT LEADER

The Documentation Unit Leader is responsible for the maintenance of accurate, up-to-date incident files. Examples of incident documentation include: Incident Action Plan, incident reports, communication logs, injury clICS, situation status reports, etc. Thorough documentation is critical to post-incident analysis. Some of these documents may originate in other sections. This unit shall ensure each section is maintained and provides appropriate documents. Incident files will be stored for legal, analytical, and historical purposes. The Documentation Unit also provides duplication and copying services.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Follow Unit Leader Responsibilities. (Page 30)
c. Obtain briefing and special instructions from Planning Section Chief.
d. Participate in Planning Meetings as required.
e. Establish and organize incident files.
f. Establish duplication service and respond to requests.
g. File copies of all official forms and reports.
h. Check on accuracy and completeness of records submitted for files and correct errors or omissions by contracting appropriate ICS units.
i. Provide incident documentation to appropriate requesters.
j. Maintain Unit/Activity Log (ICS 214).

LOGISTICS SECTION

LOGISTICS SECTION CHIEF

The Logistics Section Chief is responsible for providing facilities, services and materials for the incident. The services may include lodging, food, drinking water, emergency medical care, toilet facilities, refueling for equipment, etc.

a. Issue contracts to acquire resources, materials, consulting services and logistical needs of all incident response team groups.
b. Maintain a log of purchases and contractual obligations, along with estimated costs in coordination with the Finance Section Chief.
c. Coordinate the establishment of off-site response centers with counterpart on Unified Command.
d. Coordinate with counterparts of the Unified Command for transportation of Incident Management Team personnel and equipment to new response center.
e. Coordinate and process requests for additional resources.
f. Provide transportation, food, toilet facilities, lighting and lodging services for Incident Management Team.
g. Coordinate with appropriate personnel to deliver materials to staging sites.
h. Coordinate activities of Communications, Staging and Procurement Leaders.
i. Coordinate with Public Information Officer to provide accommodations for press briefing (may include Unified Command) and any other PIO needs.
j. Poll section Chiefs for anticipated supplies and material requirements and shortages, and make arrangements for their timely delivery.
k. Coordinate logistics of demobilization activities.
l. Provide periodic cost expenditure and commitment reports to the Incident Commander.

SERVICE BRANCH

The Service Branch, when activated, is under the supervision of the Logistics Section Chief, and is responsible for the management of all service activities at the incident. The Service Branch supervises the operations of the Communications, Medical, Food Units and Security Units.

a. Review Common Responsibilities (Page 29).
b. Obtain working materials from Logistics Kit.
c. Determine level of service required to support operations.
d. Confirm dispatch of Branch personnel.
e. Participate in planning meetings of Logistics Section personnel.
f. Review Incident Action Plan.
g. Coordinate activities of Service Branch Units.
h. Inform Logistics Section Chief of activities.
i. Resolve Service Branch problems.
j. Maintain Unit/Activity Log (ICS 214).
k. LEAR – Assist Public Evacuation Efforts

COMMUNICATION UNIT

The Communications Unit Leader, under the direction of the Service Branch or Logistics Section Chief is responsible for developing plans for the effective use of incident communications equipment and facilities; installing and testing of communications equipment; supervision of the incident Communications Center; distribution of communications equipment to incident personnel; and the maintenance and repair of communications equipment.

a. Review Common Responsibilities (Page 29).
b. Review Unit Leader Responsibilities (Page 30).
c. Obtain briefing from Service Branch or Logistics Section Chief.
d. Determine unit personnel needs.
e. Advise on communications capabilities/limitations.
f. Prepare and implement the incident Radio Communications Plan (ICS 205).
g. Ensure the Incident Communications Center and Message Center are established.
h. Set up telephone and public address systems.
i. Establish appropriate communications distribution/maintenance locations.
j. Ensure communications systems are installed and tested.
k. Ensure an equipment accountability system is established.
l. Ensure personal portable radio equipment from cache is distributed per radio plan.
m. Provide technical information as required on:
n. Adequacy of communications systems currently in operation.
o. Geographic limitation on communications systems.
p. Equipment capabilities.
q. Amount and types of equipment available.
r. Anticipated problems in the use of communications equipment.
s. Supervise Communications Unit activities.
t. Maintain records on all communications equipment as appropriate.
u. Ensure equipment is tested and repaired.
v. Recover equipment from relieved or released units.
w. Maintain Unit/Activity Log (ICS 214).

MEDICAL UNIT

The Medical Unit, under the direction of the Service Branch or Logistics Section Chief, is primarily responsible for the development of the Medical Emergency Plan, obtaining medical aid and transportation for injured and ill incident personnel, and preparation of reports and records. The Medical Unit may also assist Operations in supplying medical care and assistance to civilian casualties at the incident, but is not intended to provide medical services to the public.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Follow Unit Leader Responsibilities. (Page 30)
c. Obtain briefing from Service Branch or Logistics Section Chief.
d. Participate in Logistics Section/Service Branch planning activities.
e. Determine level of emergency medical activities performed prior to activation of Medical Unit.
f. Activate Medical Unit.
g. Prepare the Medical Emergency Plan (ICS 206).
h. Prepare procedures for major medical emergency.
i. Declare major medical emergency as appropriate.
j. Respond to requests for medical aid.
k. Respond to request for medical transportation.
l. Respond to requests for medical supplies.
m. Prepare medical reports and submit as directed.
n. Maintain Unit/Activity Log (ICS 214).

FOOD UNIT

The Food Unit, under the direction of the Service Branch or Logistics Section Chief, is responsible for determining feeding requirements at all incident facilities; menu planning; determining cooking facilities required; food preparation; serving; providing portable water; and general maintenance of the food service areas.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Follow Unit Leader Responsibilities. (Page 30)
c. Obtain briefing from Service Branch or Logistics Section Chief.
d. Determine location of working assignment, and number and location of personnel to be fed.
e. Determine method of feeding to best fit each situation.
f. Obtain necessary equipment and supplies to operate food service facilities.
g. Set up Food Unit equipment.
h. Prepare menus to ensure incident personnel receive well-balanced meals.
i. Ensure that sufficient potable water is available to meet all incident needs.
j. Maintain Unit/Activity Log (ICS 214).

SECURITY UNIT

The Security Unit Leader is responsible to provide safeguards needed to protect personnel and property from loss or damage.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Follow Unit Leader Responsibilities. (Page 30)
c. Establish contacts with local law enforcement agencies as required.
d. Contact Agency Representatives to discuss any special custodial requirements which may affect operations.
e. Request required personnel support to accomplish work assignments.
f. Ensure that support personnel are qualified to manage security problems.
g. Develop Security Plan for incident facilities.
h. Adjust Security Plan for personnel and equipment changes and releases.
i. Coordinate security activities with appropriate incident personnel.
j. Keep the peace, prevent assaults, settle disputes through coordination with Agency Representatives.
k. Prevent theft of all government and personal property.
l. Document all complaints and suspicious occurrences.
m. Maintain Unit/Activity Log (ICS 214).

SUPPORT BRANCH

The Support Branch, when activated, is under the direction of the Logistics Section Chief, and is responsible for development and implementation of logistics plans in support of the Incident Action Plan, including providing personnel, equipment, facilities, and supplies to support incident operations. The Support Branch supervises the operation of the Supply, Facilities and Ground Support.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Obtain work materials from Logistics Kit.
c. Identify Support Branch personnel dispatched to the incident.
d. Determine initial support operations in coordination with Logistics Section Chief and Service Branch.
e. Prepare initial organization and assignments for support operations.
f. Determine resource needs.
g. Maintain surveillance of assigned unit work progress and inform Logistics Section Chief of activities.
h. Resolve problems associated with requests from Operations Section.
i. Maintain Unit/Activity Log (ICS 214).

PROCUREMENT & TIME UNIT

The Procurement Unit Leader is responsible for administering all financial matters pertaining to vendor contracts.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Follow Unit Leader Responsibilities. (Page 30)
c. Obtain briefing from Finance Section Chief.
d. Contact appropriate unit leaders on incident needs and any special procedures.
e. Coordinate with local jurisdictions on plans and supply sources.
f. Obtain Incident Procurement Plan.
g. Prepare and sign contracts and land use agreements as needed.
h. Draft memorandums of understanding.
i. Establish contracts with supply vendors as required.
j. Interpret contracts/agreements and resolve compensation/claims disputes within delegated authority.
k. Coordinate with Compensation and Claims/Insurance Unit on procedures for handling claims .
l. Finalize all agreements and contracts.
m. Coordinate use of designated funds as required.
n. Complete final processing and send documents for payment.
o. Coordinate cost data in contracts with Expenditure & Cost Control Unit.
p. Maintain Unit/Activity Log (ICS 214).

EQUIPMENT / FACILITIES

The Equipment / Facilities Group is responsible for receiving and distribution of all supplies and equipment (other than primary resources) and the service and repair of tools and equipment. The Equipment / Facilities Group is also responsible for the layout and activation of incident facilities (e.g. Base, Camp(s) and Incident Command Post). The Equipment / Facilities Group provides sleeping and sanitation facilities for incident personnel and manages base and camp operations. Each facility (base or camp) is assigned a manager who reports to the Equipment / Facilities Group and is responsible for managing the operation of the facility. The Equipment / Facilities Group reports to the Support Branch.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Follow Unit Leader Responsibilities. (Page 30)
c. Order required personnel to operate supply area.
d. Organize physical layout of the supply area.
e. Establish procedures for operating supply area.
f. Set up filing system for receiving and distribution of supplies and equipment.
g. Maintain inventory of supplies and equipment.
h. Develop security requirement for supply area.
i. Establish procedures for operating supply area.
j. Obtain briefing from the Support Branch or Logistics Section Chief.
k. Review Incident Action Plan.
l. Participate in Logistics Section/Support Branch planning activities.
m. Determine requirements for each facility to be established.
n. Determine requirements for the Incident Command Post.
o. Prepare layouts of incident facilities.
p. Notify unit leaders of facility layout.
q. Activate incident facilities.
r. Provide Base and Camp Managers.
s. Obtain personnel to operate facilities.
t. Provide sleeping facilities.
u. Provide security services.
v. Provide facility maintenance services - sanitation, lighting, clean up.
w. Demobilize base and camp facilities.
x. Maintain Facilities Unit records.
y. Maintain Unit/Activity Log (ICS 214).

CLERICAL SUPPORT

The Clerical Support Group is responsible for providing administrative support services required during response operations.

a. Review common responsibilities (Page 29).
b. Provide Command Post/EOC Center Unit with information on personnel, equipment, furniture, and supplies needed for administrative support operations.
c. Work with Support Branch Director to identify administrative support needs for all Sections.
d. Supervise the work of all Clerical Support Group personnel.
e. Provide daily updates to Support Branch Director on the status of administrative support services.
f. Maintain Unit/Activity Log (ICS 214).

TRANSPORTATION SUPPORT UNIT

The Ground Support Unit Leader is primarily responsible for 1) support out of service resources 2) coordination of transportation of personnel, supplies, food, and equipment, 3) fueling, service, maintenance and repair of vehicles and other ground support equipment, and 4) implementing the Traffic Plan for the incident.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Follow Unit Leader Responsibilities. (Page 30)
c. Obtain briefing from Support Branch or Logistic Section Chief.
d. Participate in Support Branch/Logistics Section planning activities.
e. Coordinate development of the Traffic Plan with the Planning Section.
f. Support out-of-service resources.
g. Notify Resources Unit of all status changes on support and transportation vehicles.
h. Arrange for and activate fueling, maintenance and repair of ground transportation resources.
i. Maintain inventory of support and transportation vehicles (ICS 218).
j. Coordinate transportation services.
k. Maintain usage information on rented equipment.
l. Requisition maintenance and repair supplies (e.g. fuel, spare parts).
m. Coordinate the maintenance of incident roads.
n. Submit reports to Support Branch as directed.
o. Maintain Unit/Activity Log (ICS 214).

FINANCE SECTION

FINANCE SECTION CHIEF

The Finance Section Chief, a member of the General Staff, is responsible for all financial and cost analysis aspects of the incident and for supervising members of the Finance/Administration Section.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Attend briefing with responsible agency to gather information.
c. Attend planning meetings to gather information on overall strategy.
d. Determine resource needs.
e. Develop an operating plan for Finance function on incident.
f. Prepare work objectives for subordinates, brief staff, make assignments, and evaluate performance.
g. Inform members of the Unified Command and General Staff when Sections fully operational.
h. Meet with assisting and cooperating agency representatives as required.
i. Provide input in all planning sessions on financial and cost analysis matters.
j. Maintain daily contact with agency(s) administrative headquarters on finance matters.
k. Ensure that all personnel time records are transmitted to home agencies according to policy.
l. Participate in all demobilization planning.
m. Ensure that all obligation documents initiated at the incident are properly prepared and completed.
n. Maintain Unit/Activity Log (ICS 214).

CLAIMS AND INSURANCE UNIT

The claims and Insurance Unit is responsible for the overall management and direction of all Compensation for Injury Specialist and Claims Specialists assigned to the incident.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Follow Unit Leader Responsibilities. (Page 30)
c. Obtain briefing from Finance/Administration Section Chief.
d. Establish contact with incident Safety Officer and Liaison Officer or Agency Representatives if no Liaison Officer is assigned.
e. Determine the need for Compensation for Injury and Claims Specialists and other personnel if needed.
f. Establish Compensation for Injury work area with the Medical Unit whenever feasible.
g. Review Incident Medical Plan.
h. Ensure that Compensation/Claims Specialists have adequate workspace and supplies.
i. Brief Compensation/Claims Specialists on incident activity.
j. Coordinate with Procurement & Time Unit on procedures for handling claims.
k. Periodically review all logs and forms produced by Compensation/Claims Specialists to ensure:
    - Work is complete.
    - Entries are accurate and timely.
    - Work is in compliance with Agency requirements and policies.
l. Keep Finance Section Chief briefed on unit status and activity.
m. Ensure that all Compensation for Injury and Claims Logs and Forms are up to date and routed to the proper agency for post-incident processing prior to demobilization.
n. Demobilize Unit in accordance with Demobilization Plan.
o. Maintain Unit/Activity Log (ICS 214).

EXPENDITURE & COST CONTROL UNIT

The Expenditure & Cost Control Unit is responsible for collecting all cost data, performing cost effectiveness analyses, and providing cost estimates and cost saving recommendations for the incident.

a. Follow common responsibilities for all ICS personnel. (Page 29)
b. Follow Unit Leader Responsibilities. (Page 30)
c. Obtain briefing from Finance Section Chief.
d. Coordinate with agency headquarters on cost reporting procedures.
e. Obtain and record all cost data.
f. Prepare incident cost summaries.
g. Prepare resources-use cost estimates for Planning.
h. Make recommendations for cost savings to Finance Section Chief.
i. Maintain cumulative incident cost records.
j. Ensure that all cost documents are accurately prepared.
k. Complete all records prior to demobilization.
l. Provide reports to Finance Section Chief.
m. Maintain Unit/Activity Log (ICS 214).

COMMON RESPONSIBILITIES

The following checklist is applicable to all personnel in an ICS organization.

a. Receive assignment from your agency, including:
   - Job assignment (e.g. designation, position, etc.).
   - Brief overview of type and magnitude of incident.
   - Resource order number and request number/Travel Orders (TONO).
   - Travel instructions including reporting location and reporting time.
   - Any special communications instructions (e.g. travel, radio frequency).
   - Monitor incident related information from media, internet, etc., if available.
   - Assess personal equipment readiness for specific incident and climate (e.g. medications, money, computer, medical record, etc.). Maintain a checklist of items and possibly a personal Go-Kit.
   - Inform others as to where you are going and how to contact you.
   - Review Coast Guard Incident Management Handbook.
   - Take advantage of available travel to rest prior to arrival.
b. Upon arrival at the incident, check in at the designated check-in location. Check-in may be found at any of the following locations:
   - Incident Command Post (ICP).
   - Base.
   - Staging Areas.
   - Helibases.

   Note: If you are instructed to report directly to an on-scene assignment, check in with the Division/Group Supervisor or the Operations Section Chief.
c. Receive briefing from immediate supervisor.
d. Agency representatives from assisting or cooperating agencies report to the Liaison Officer (LNO) at the ICP after check-in.
e. Acquire work materials.
f. Abide by organizational code of ethics.
g. Participate in IMT meetings and briefings as appropriate.
h. Ensure compliance with all safety practices and procedures. Report unsafe conditions to the Safety Officer.
i. Supervisors shall maintain accountability for their assigned personnel with regard as to exact location(s), personal safety, and welfare at all times, especially when working in or around incident operations.
j. Organize and brief subordinates.

k. Know your assigned communication methods and procedures for your area of responsibility and ensure that communication equipment is operating properly.
l. Use clear text and ICS terminology (no codes) in all radio communications.
m. Complete forms and reports required of the assigned position and ensure proper disposition of incident documentation as directed by the Documentation Unit.
n. Ensure all equipment is operational prior to each work period.
o. Report any signs/symptoms of extended incident stress, injury, fatigue or illness for yourself or coworkers to your supervisor.
p. Brief shift replacement on ongoing operations when relieved at operational periods or rotation out.
q. Respond to demobilization orders and brief subordinates regarding demobilization.
r. Prepare personal belongings for demobilization.
s. Return all assigned equipment to appropriate location.
t. Complete Demobilization Check-out process before returning to home base.
u. Participate in After-Action activities as directed.
v. Carry out all assignments as directed.
w. Upon demobilization, notify RESL at incident site and home unit of your safe return.

UNIT LEADER RESPONSIBILITIES

The following checklist is applicable to all personnel in an ICS organization.

a. Review common responsibilities (Page 29)
b. Upon check-in, receive briefing from Incident Commander, Section Chief, Unit Leader or Branch Director as appropriate.
c. Participate in incident meetings and briefings, as required.
d. Determine current status of unit activities.
e. Determine resource needs.
f. Order additional unit staff, as appropriate.
g. Confirm dispatch and estimated time of arrival of staff and supplies.
h. Assign specific duties to staff and supervise staff.
i. Develop and implement accountability, safety and security measures for personnel and resources.

D.1 LA BASIN FACILITIES INCIDENT MANAGEMENT TEAM (IMT)

A list of personnel for the Beta Incident Management Team (IMT) is included in Tables D-1 and D-2, including response times. Beta Offshore is contracted primarily with O'Brien's Response Management (O'Brien's) for spill management team services. O'Brien's has initial management team personnel at their office in Brea, California. Personnel are activated from additional O'Brien's personnel nationwide in the event of a sustained, large scale response. O'Brien's can supply a team of over 75 trained professional incident management personnel as needed.

D.2 TECHNICAL EXPERTS

Depending on the nature of an emergency incident, Beta Unit may call upon technical experts to assist them in a response effort. For a list of technical experts and their capabilities, refer to Table D-3.

D.3 IMT ORGANIZATION

An IMT organization for a major oil spill is shown in Attachment D-1. The organization can be modified in size and scope as needed, depending on the nature of the incident. Examples of possible IMT organizations for the following incidents are also provided in Attachment D-1:

- Emergency Medical Incident
- Medical Incident Involving Hazardous Materials
- Major Well Control Incident
- Oil Spill to Land
- Major Facility Planned Shutdown

D.4 ACTIVATION OF THE IMT

The Qualified Individuals (QIs) or designated alternate is responsible for the activation of the IMT. The extent to which the team is mobilized depends upon the nature of the incident. The QI or designee may choose to call up personnel directly, or use the dedicated IMT callout number as shown on the Emergency Incident Notification Placard. The dedicated IMT callout number triggers notification of IMT team members via Beta Offshore's 24-hour answering service. IMT callout lists and numbers are maintained with the Beta Compliance Office.

Table D-1. Initial Incident Management Team

Beta Producing Complex

POSITION	NAME	RESPONSE TIME
Emergency Response Coordinator (Incident Commander) * (Qualified Individual)	Bruce Berwager*	2 hours
	Diana Lang*	2 hours
	Yohn Rosqui*	2 hours
	Rick Armstrong*	2 hours
	Bud Kline, (Witt/O'Brien's – Slidell, LA) Ed Turner (Witt/O'Brien's – remote)	Initial Remote
	Dan Sobieski (Witt/O'Brien's)	3 hours
Public Information Officer	Leila Vlasko, James Cool	2 hours
	Sam Sacco (Consultant)	8 hours
Safety Officer	Casey Sbicca	2 hours
	Terry Mullin	3 hours
	Jon Tuico	2 hours
	Joe Chirco (Witt/O'Brien's)	3 hours
	Ray Perry (Witt/O'Brien's)	8 hours
	Bud Kline (Witt/O'Brien's – Slidell, LA)	Initial Remote
Liaison Officer	Diana Lang	2 hours
	Casey Sbicca	2 hours
	Mary Jurczak, (Witt/O'Brien's -Slidell)	Initial Remote
	Dan Sobieski (Witt/O'Brien's)	3 hours
	Bill Weber (Weber Readiness)	8 hours
	Jim Morris (Witt/O'Brien's)	12 hours
	Cheryl Surface (Witt/O'Brien's)	24 hours
Operations Section Chief	Yohn Rosqui	2 hours
	Ed Rothenay	4 hours
	Paul Napoleone	4 hours
	Jamie Cool	2 hours
	Rick Armstrong	2 hours
	Bud Kline (Witt/O'Brien's - Slidell), Ed Turner (Witt/O'Brien's, remote)	Initial Remote
	Tom Haug (Witt/O'Brien's)	2 hours
	Tom Bartlett (Witt/O'Brien's)	8 hours
	Greg Guerreiro, Pete Gardner, (Witt/ O'Brien's)	4 hours
Planning Chief*	Jamie Cool	2 hours
	Casey Sbicca	2 hours
	Diana Lang	2 hours
	Bill Weber (Weber Readiness)	8 hours
	Tom Haug (Witt/O'Brien's)	2 hours
	Dan Sobieski Witt/(O'Brien's)	3 hours
	Jim Morris (Witt/O'Brien's)	24 hours
	Cheryl Surface (Witt/O'Brien's)	24 hours

Table D-1. Initial Incident Management Team

Beta Producing Complex

POSITION	NAME	RESPONSE TIME
Logistics Section Chief	Keith Towler, Ed Turner (Witt/O'Brien's - Slidell)	Initial Remote
	Lorraine Lopez	2 hours
	Drew White	2 hours
	Leo Renteria	3 hours
	Joe Chirco (Witt/O'Brien's)	3 hours
	Jon MacArthur (Witt/O'Brien's)	8 hours
Finance Section Chief	Veronica Banuelos	2 hours
	Keith Towler (Witt/O'Brien's - Slidell)	Initial Remote
	Keith Forster (Witt/O'Brien's)	3 hours
	Randy Cook (Witt/O'Brien's)	3 hours
	Jon MacArthur (Witt/O'Brien's)	8 hours
Situation Unit Leader	George Romero	2 hours
	Cory Klett	2 hours
	Marielle Lomax	2 hours
Documentation Unit Leader	Lidia Carbajal	2 hours
	Veronica Banuelos	2 hours
	Joan Garcia (Witt/O'Brien's)	4 hours

Table D-2. Sustained Incident Management Team

Beta Producing Complex Facilities

POSITION	NAME	RESPONSE TIME
Emergency Response Coordinator (Incident Commander)	Bruce Berwager	2 hours
	Yohn Rosqui	2 hours
	Greg Guerreiro (Witt/O'Brien's)	3 hours
	Joe Chirco (Witt/O'Brien's)	3 hours
	Tom Haug (Witt/O'Brien's)	2 hours
	Bill Weber (Weber Readiness)	4 hours
Public Information Officer*	Leila Vlasko, James Cool	2 hours
	Sam Sacco (Consultant)	8 hours
	Tim O'Leary (Witt/O'Brien's)	8 hours
Safety Officer*	Terry Mullin	3 hours
	Ray Perry (Witt/O'Brien's)	6 hours
	Pete Gardner-Cox (Witt/O'Brien's)	4 hours
Liaison Officer*	Diana Lang	2 hours
	Dan Sobieski (Witt/O'Brien's)	3 hours
	Tim O'Leary (Witt/O'Brien's)	8 hours
	Chris Gregory (Witt/O'Brien's)	24 hours
Operations Section Chief*	Jamie Cool	2 hours
	Yohn Rosqui	2 hours
	Rick Armstrong	3 hours
	Tom Haug (Witt/O'Brien's)	2 hours
	Joe Chirco (Witt/O'/Brien's	4 hours
	Greg Guerreiro (Witt/O'Brien's)	4 hours
	Mike Nosbaum (Witt/O'Brien's)	10 hours
Planning Section Chief*	Jamie Cool	2 hours
	Casey Sbicca	2 hours
	Diana Lang	2 hours
	Cheryl Surface (Witt/O'Brien's)	24 hours
	Joe Chirco (Witt/O'Brien's)	4 hours
	Bill Weber (Weber Readiness)	8 hours
	Jim Morris (Witt/O'Brien's)	24 hours
	Bill Weber (Weber Readiness)	4 hours
Logistics Section Chief *	Lorraine Lopez	2 hours
	Drew White	2 hours
	Jon MacArthur (Witt/O'Brien's)	8 hours
	Joe Chirco (Witt/O'Brien's)	4 hours
	Rory Dabney (Witt/O'Brien's)	24 hours
Finance Section Chief*	Veronica Banuelos	2 hours
	Keith Forster (Witt/O'Brien's)	3 hours
	Randy Cook (Witt/O'Brien's)	3 hours
	Jon MacArthur (Witt/O'Brien's)	8 hours

*Or other designate named when the IMT is established

Operations:		
Offshore Branch*	MSRC	On Duty Immediate Off Duty 4 hours
	Tom Haug (Witt/O'Brien's)	24 hours
	Ed Boyes (Witt/O'Brien's)	24 hours
	Chris Gregory (Witt/O'Brien's)	24 hours
Operations:		
Onshore Branch*	Patriot Environmental	3 hours
	Clean Harbors	3 hours
	Greg Guerreiro (Witt/O'Brien's)	4 hours
Planning:		
Documentation/Situation Unit Leader*	George Romero, Cory Klett Dan Sobieski, Joe Chirco (Witt/O'Brien's)	2 hours 3 hours
Situation Status*	Cory Klett Ed Boyes (Witt/O/Brien's)	2 hours 3 hours
Demobilization*	John Degner (MSRC)	2 hours
	Pete Gardner-Cox (Witt/O'Brien's)	4 hours
	Rory Dabney (Witt/O'Brien's)	12 hours
Technical Specialists:		
Environmental Unit Leaders*	Kim Dreiske	2 hours
	Diana Lang	2 hours
	Joe Chirco (Witt/O'Brien's)	3 hours
	Dan Sobieski (Witt/O'Brien's)	8 hours
	Tom Haug (Witt/O'Brien's)	2 hours
	Jim Morris (O'Brien's)	24 hours
Waste*	Diana Lang	2 hours
	Clean Harbors	3 hours
	Ed Turner (Witt/O'Brien's)	10 hours
Wildlife*	MBC Applied Environmental	2 hours
	Entrix (contractors)	4 hours – 6 hours
	Oiled Wildlife Care Network	12 hours
Trajectory Contact at Beta*	Beta Operator	On Duty Immediate Off Duty - 3 hours
Trajectory* Documentation-Situation Unit Leader to request/received/display trajectory per established timeline or as weather/currents change	Witt/O'Brien's	24 hours on-call
Sampling/Mapping/Shoreline Cleanup Assessment Team (SCAT)	MBC Applied Environmental, Entrix, or contractor, The Response Group for GIS/ Mapping portion	3 hours
	Mike Nosbaum (Witt/O'Brien's)	10 hours
	Jim Morris (Witt/O'Brien's)	24 hours
National Resource Damage Assessment (NRDA)	Entrix, or local contractor	4 hours
	Polaris Applied Sciences	24 hours
	Dan Sobieski (Witt/O'Brien's)	3 hours

Logistics:*		
Procurement	Witt/O'Brien's	24 hours
Communications		
Medical		
Food		
Facilities		
Transportation		
Security		
Finance:*		
Cost	Randy Cook (Witt/O'Brien's)	3 hours
Assistance: ICS/Overall*	Witt/O'Brien's	4 hours – 24 hours

*Or other designate named when the IMT is established

Table D-3. Technical Experts Available to Beta Complex

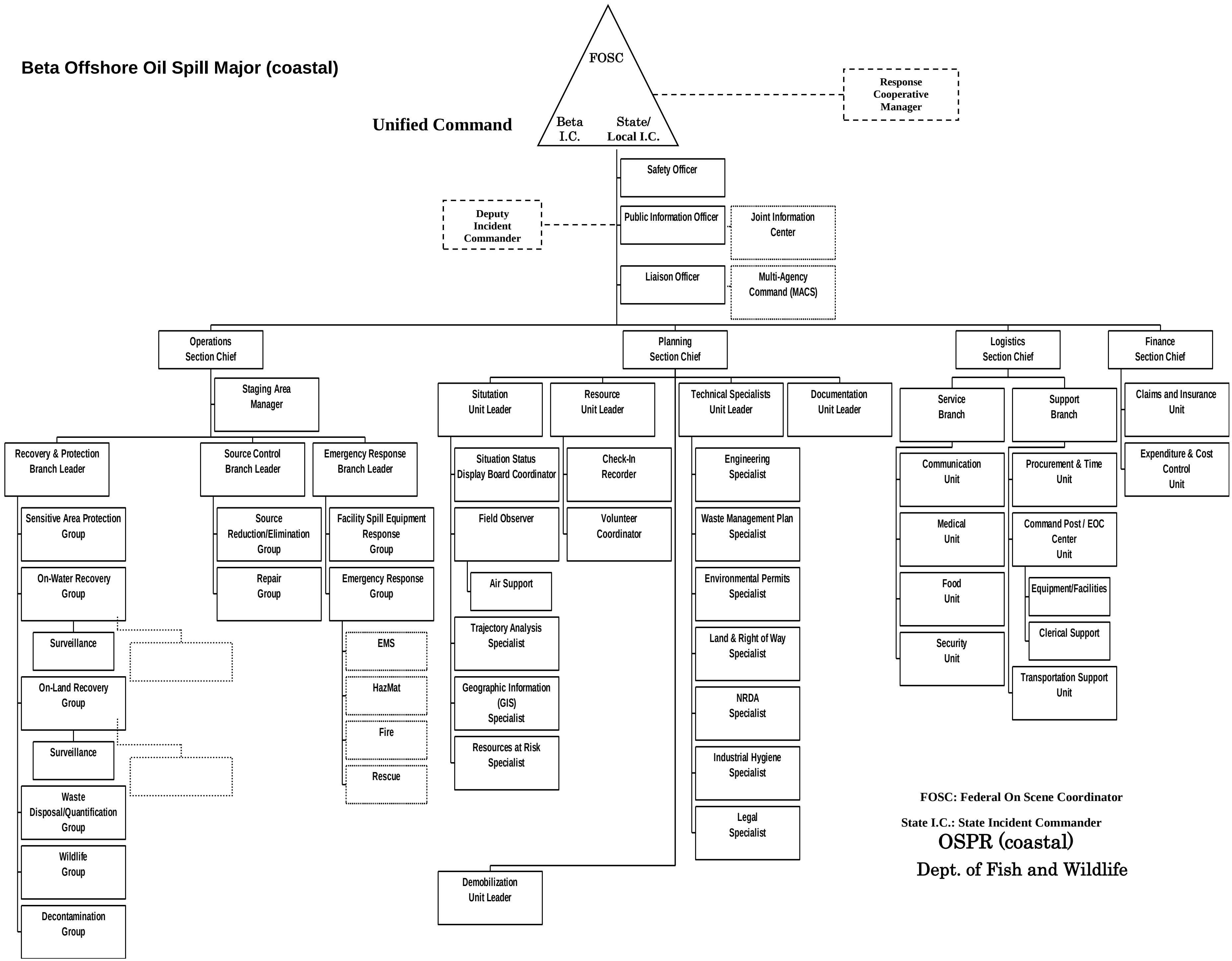
(NOTE: Phone Numbers Are Found in Annex O)

NAME	AREA(S) OF EXPERTISE
Mapping/Global Information System (GIS)	
O'Brien's Response Management	24-hr information support, trajectory assistance, documentation
Public Affairs	
Sam Sacco	Strategy & Communications
Local Experts	
Marine Spill Response Corporation (MSRC): Jeff Jappe, John Degner, Rick Tamayo	Offshore (on-water) and shallow water/wetlands/river response shoreline protection, wide expertise and resources including on-water response, trailers of equipment, cleaning equipment, detailed knowledge of Area Contingency Plan.
Clean Harbors	Shallow-water, storm drain, shoreline, onshore/canyon, HAZWOPER/decon experience, Shoreline Cleanup Assessment Team (SCAT) support, wide range of equipment, expertise, and ability to respond (including HAZMAT response for non-oil spill incidents, vacuum trucks, and tank cleaning
Patriot Environmental	Shallow-water, storm drain, shoreline, onshore/canyon, HAZWOPER/decon experience, Shoreline Cleanup Assessment Team (SCAT) support, wide range of equipment, expertise, and ability to respond.
Oiled Wildlife Care Network (OWCN)	Coastal facilities are required to call OSPR network if oiled wildlife are encountered or expected. OSPR's network has local organizations who would be used in a real event
O'Brien's Response Management (ICS Response)	ICS and spill response can fill roles or assist on teams
Entrix, (Environmental, Wildlife, or NRDA)	Wildlife, SCAT, NRDA, experienced with spill response
MBC Applied Environmental Sciences	Marine biology, Wildlife, SCAT, NRDA, and environmental permitting
Dispersant EADC Ed Rosenberg	Emergency Aerial Dispersants Consortium (EADC) aerial spray applications planning /assistance

ATTACHMENT D-1

IMT ORGANIZATIONS

Beta Offshore Oil Spill Major (coastal)



FOSC: Federal On Scene Coordinator

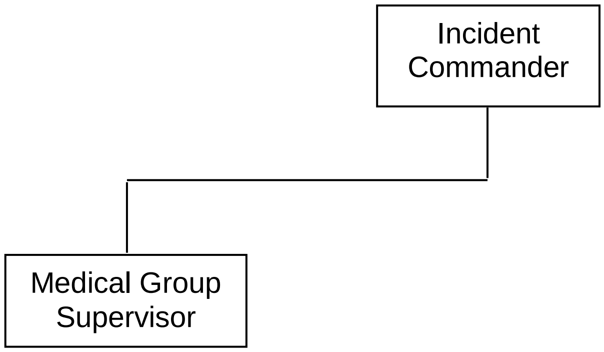
State I.C.: State Incident Commander

OSPR (coastal)

Dept. of Fish and Wildlife

ICS EXAMPLES*

Emergency Medical Incident (Non-Complex)



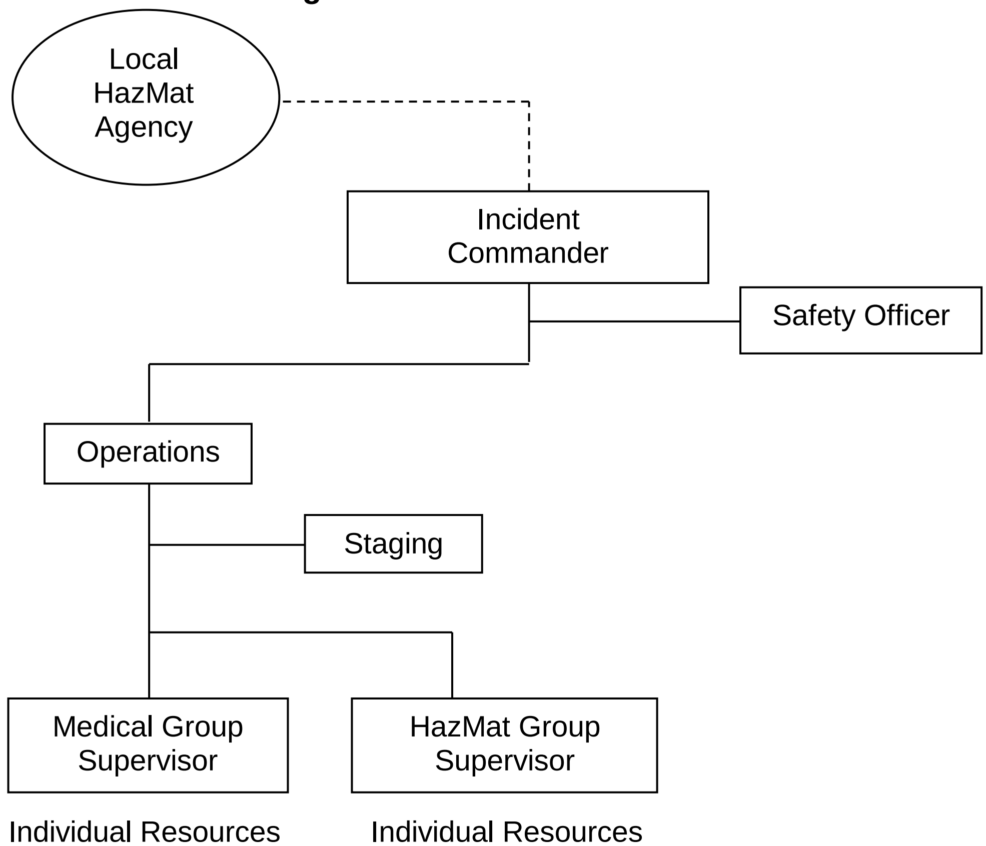
Emergency Medical Incident (Non-Complex)

An emergency medical incident, be it a traumatic injury or a personal illness, needs appropriate incident management. In this case, the **Incident Commander** has overall command of the incident, communicating with the Base Radio, 911 Operator, and/or responding agencies.

The **Medical Group Supervisor** has responsibility for the triage, treatment, and transportation of the victim. The Supervisor may be directing/assisting operations emergency response team (ERT) personnel.

* *These are examples of "possible" ICS structures for various incidents. There is no perfect structure and it should modularly expand a contract on the incident magnitude and requirements.*

Medical Incident Involving Hazardous Materials



Medical Incident Involving Hazardous Materials (Complex)

An incident involving hazardous materials where significant injuries occur becomes more complex requiring additional ICS staffing.

The **Incident Commander** has overall command and directly communicates to Operations and the Safety Officer. The **Safety Officer** has responsibility for the safety of the response personnel and has the authority to halt or suspend operations if hazardous to personnel.

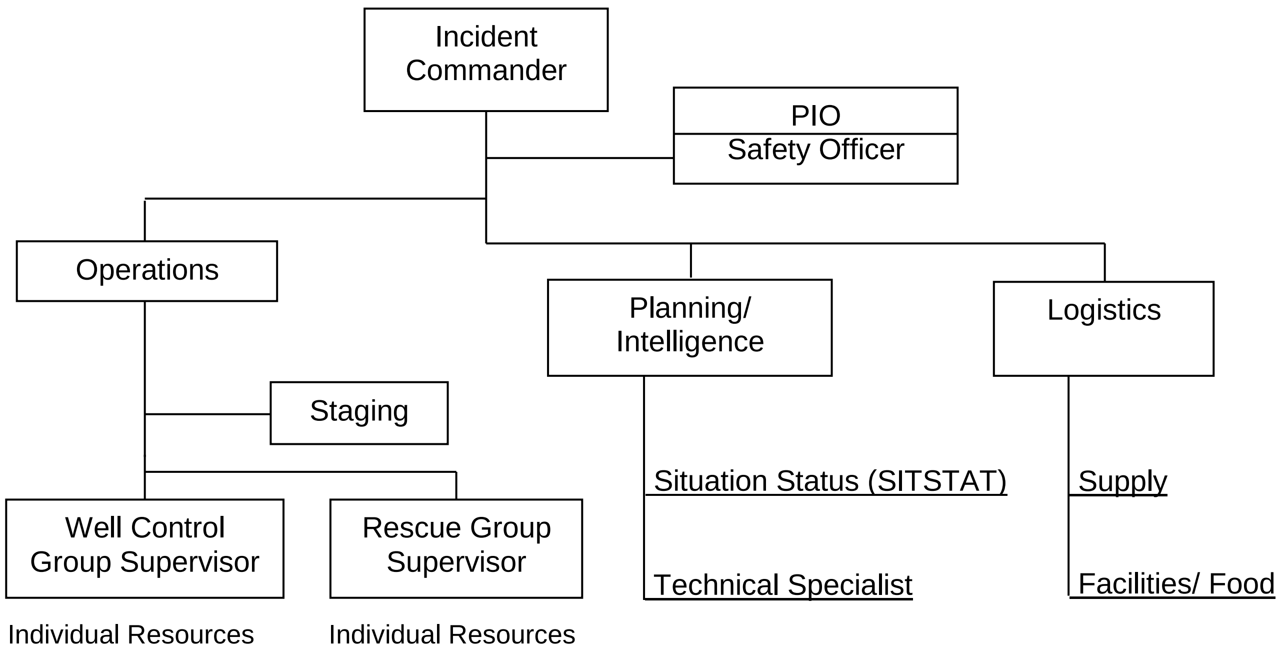
Operations Section Chief or "OPS" is responsible for directing "tactical" operations to accomplish the incident management objectives. OPS directs the Medical Group Supervisor, HAZMAT Group Supervisor, and Staging Manager.

Hazmat Group Supervisor has direct responsibility to accomplish tactical operation to ameliorate the situation involving a hazardous material. The Supervisor should be Hazwoper "Technician" Level or higher and will direct the HAZMAT team if needed.

Staging Manager or "Staging" will track, organize, and deploy resources ordered by operations. The staging area should be within 3 minutes travel time to the incident.

Medical Group Supervisor - see above

Major Well Control Incident



Major Well Control Incident

+ Previous positions already described.

A well control incident may be hazardous to personnel and/or the public and may last a protracted period of time.

Public Information Officer (PIO) will deliver press briefings that have been approved by the incident commander to the media. The PIO is the host to the media.

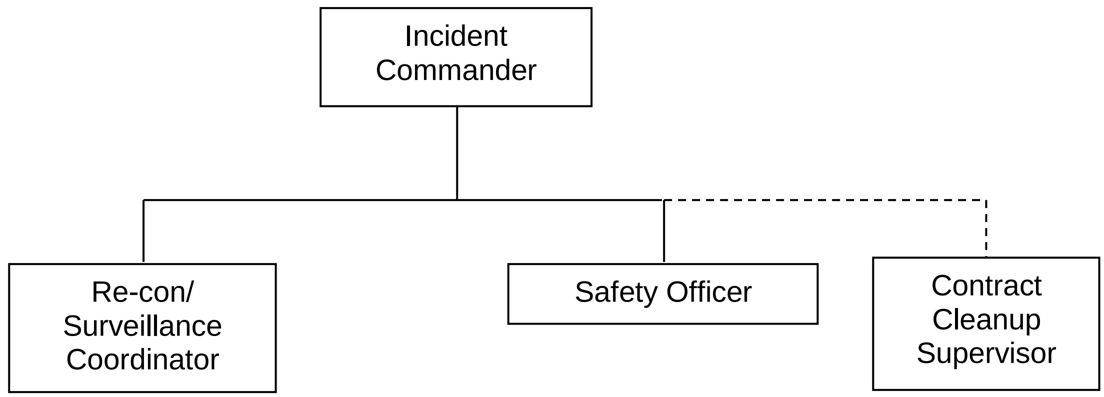
Planning/Intelligence Section Chief will develop an “Incident Action Plan” for the incident using “technical specialists” for well control, etc., and “situation status” or SITSTAT position that will assure up-to-date status of the incident.

Logistics Section Chief will assure that supplies and services are available for the response personnel. These supplies may include food, shelter, and standby medical services.

Well Control Group Supervisor (Company or Contractor) is responsible for accomplishing tactical operations to ameliorate the well control situation.

Rescue Group Supervisor is responsible for accomplishing activities concerning personnel rescue or extrication. In this example, this is a “standby” activity.

Oil Spill To Land



Oil Spill To Land

+ Previous positions already described.

The **Re-con/Surveillance Coordinator** is responsible for managing and overseeing all aspects of reconnaissance/surveillance activity, incident status and situation information. He has to provide this information to the Incident Commander.

a. Provide surveillance data to Incident Commander

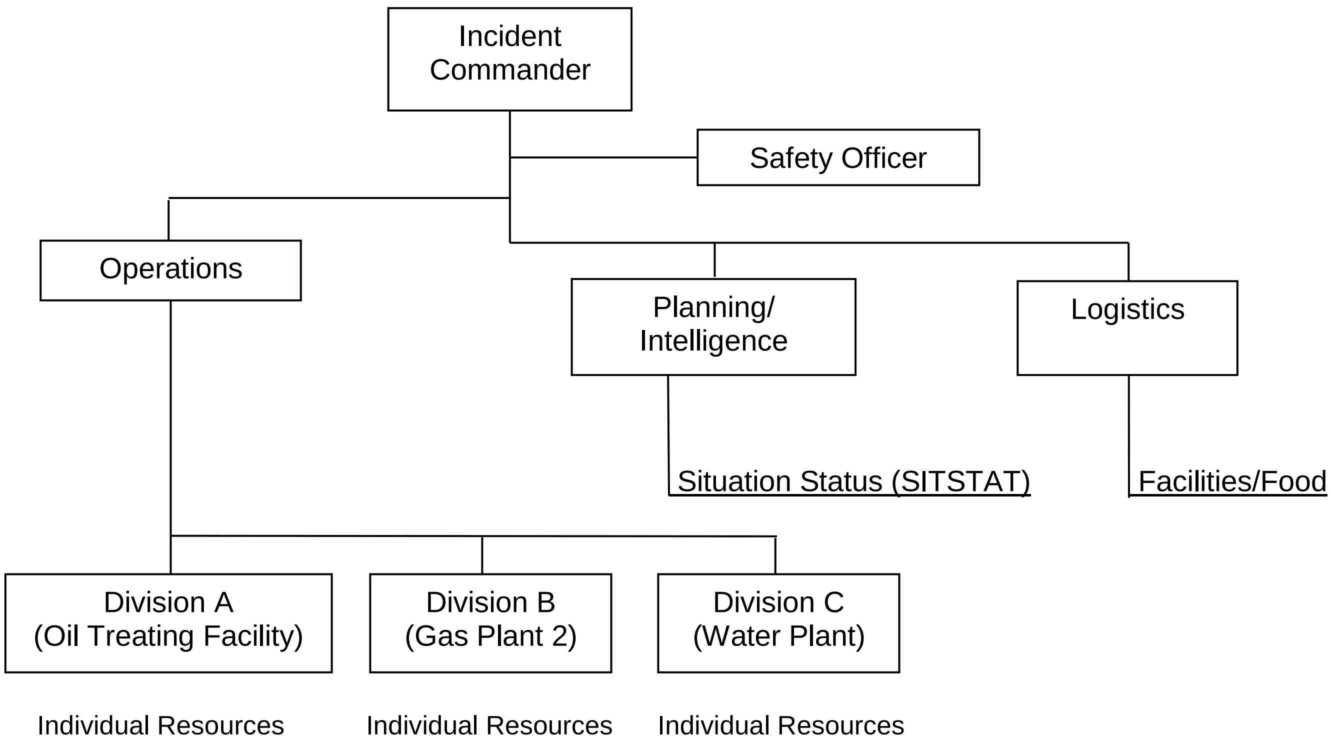
b. Provide additional observations: location of response equipment, agency vehicles, distressed wildlife, etc.

c. Maintain custody of video and still camera film.

d. Provide surveillance and video recording of test and actual dispersant applications when requested.

e. Recommend movement of containment operations to maintain integrity/effectiveness of the containment.

Major Facility Planned Shutdown



Major Facility Planned Shutdown

+ Previous positions already described.

Division A, B, C Supervisors – The term "division" is used since each supervisor will be responsible for tactical activities within a geographic area; in this example, Oil Treating Facility, the Gas Plant #2, and the Water Plant.

E.1 GENERAL PROCEDURES

Operators should confer with their supervisor prior to shutting down any facility. However, in an emergency situation, operators have the authority to shut down facilities as warranted.

E.2 BETA UNIT PLATFORMS

- All wells, including those artificially lifted, which are capable of flowing (per BSEE guidelines) are equipped with surface-controlled subsurface safety valves (SCSSVs). These devices are installed in the well below the mudline and held open by the application (from the deck of the platform) of hydraulic and pneumatic pressure. All wells are equipped with surface safety valves (SSVs) on the wellhead.

- Any accidental or deliberate bleeding off of either pressure will cause these devices to close and thereby stop any flow from the well below the device.

- The SSVs close within 45 seconds of the actuation of an ESD and the SCSSVs close two minutes after closure of the SSV.

- The pneumatic system holding open the hydraulically-operated subsurface safety devices and other safety shut-in devices on the platform equipment is located throughout the platform.

- Automatic monitors of critical functions and manual bleed-off valves at ESD stations will cause the system pressure to bleed off if an abnormal condition is detected. Accidental braking of the system piping will also cause the system to bleed off and shut in the wells.

- Detection is accomplished by the comparison of two LACT-quality meters whose measurement is measured by a computer and is independent of weather.

- Shutdown is accomplished by Control Center personnel whose performance is not impacted by adverse weather.

E.3 BETA PIPELINE

Leak detection and “soft” shutdown procedures for the Beta Pipeline are outlined in Table E-1.

Table E-1. Leak Detection and Shutdown Procedures – Beta Pipeline.

ACTIONS TO BE TAKEN	RESPONSIBLE PERSON	COMPLETED (TIME/INITIAL)
Send out alarm of leak detected.	Pipeline Controller	
Contact platform operating personnel to shut down platform shipping pumps.	Pipeline Operator	
Close platform pipeline shut-in valve.	Platform Operator	
Close onshore shut-in valve remotely.	Pipeline Controller	

The platform shipping pumps and shutdown valve on Platform Elly are also connected to the platform Emergency Shutdown System (ESD). When the ESD is activated, the shipping pumps are stopped and the pipeline valve is closed within one minute. Automatic Emergency Shutdown Systems (ESS) can be activated through the Emergency Support System as specified in OCS orders, Federal EPA and Coast Guard regulations. Manual Emergency Shutdown Systems (ESD) are located throughout the platform as specified in OCS Orders and are identified on the Platform Station Bills. Manual stations are red pull stations labeled as ESD above a 2-inch red pull knob with “Platform Shutdown” written below.

F.1 PURPOSE AND GOALS

The purpose of the Waste Management and Disposal Plan is to provide guidance to Company personnel in the proper management procedures for the handling, storage, disposal, and transport of hazardous and non-hazardous wastes generated from oil spill response operations.

The goals of this program are summarized as follows:

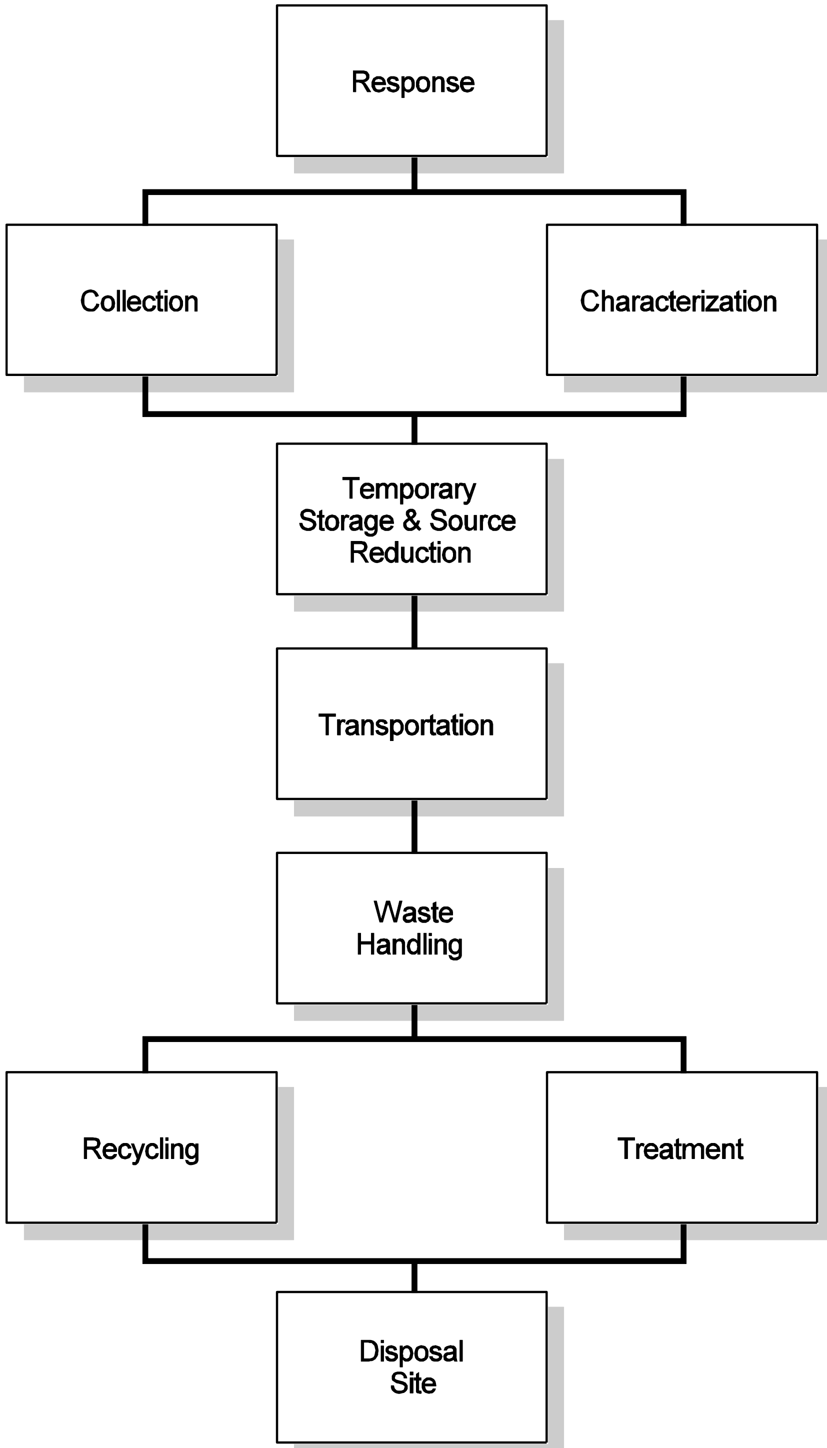
- Ensure that all Company personnel are provided with the relevant Company policies regarding waste management.
- Ensure that all wastes are properly characterized as to their hazardous and non-hazardous characteristics.
- Ensure that all waste storage, handling, disposal, and transport are conducted in accordance with all applicable federal, state, and local laws and regulations.
- Ensure that all Company personnel are provided with a full understanding of the importance of proper waste management.

The Company waste management practices include:

- Proper classification of wastes to ensure regulatory compliance with respect to the handling, treatment, temporary storage, transport, and disposal of the wastes.
- Waste minimization to the extent that is technically and economically feasible.
- Reuse and recycling of wastes (onsite or offsite) whenever appropriate and practicable.
- Evaluation of all legally appropriate and available methods of waste handling and disposal prior to the disposal of wastes to land, the least preferred method.

Figure F-1 summarizes the decision elements required for the handling and disposal of oil and oily wastes during response operations. If the IMT is activated, waste management activities will be handled by the Waste Disposal/Quantification Group.

Figure F-1. Decision Elements for Handling of Oil and Oily Wastes.



F.2 APPLICABLE REGULATIONS

The management of oil and oily waste material (i.e., recycling, treatment, storage, and disposal) must comply with the standards set forth in:

- 40 Code of Federal Regulations (CFR) Parts 261 and 265 as mandated by the Resource Conservation and Recovery Act (RCRA).
- California Code of Regulations Title 22, Division 4, Chapter 30.
- California Code of Regulations, Title 14, Division 1, Subdivision 4, Chapter 7, Subchapter 2, Determining Amount of Petroleum Hydrocarbons Recovered.

Spill response and cleanup procedures produce contaminated materials that become wastes and need to be managed properly. These materials, whether residue, contaminated soil or water, absorbent, clothing, equipment, spent chemicals, and other debris, are the responsibility of the Company from recovery to recycling and/or final disposal. Materials must be characterized for proper handling. Waste handling procedures should be preceded by several steps with an overall objective of waste minimization, cost effectiveness, minimization of impact on unaffected areas or already cleaned areas, regulatory compliance, worker safety, and proper disposal. Figure F-1 presents a flow chart which identifies the decision elements to be evaluated for the response, collection and handling, characterization, temporary storage, recovery, recycling, treatment, and disposal of oily wastes.

F.3 WASTE CHARACTERIZATION

F.3.1 Introduction

Recovered petroleum and contaminated debris that cannot be recycled must be characterized to ensure it is handled properly, in accordance with federal and state regulatory criteria. Proper classification, quantification, and disposal of wastes are very important in order to avoid severe civil and criminal penalties as well as to minimize future cleanup liabilities. It is the Company's responsibility to properly classify the waste because handling, treatment, storage, transport, and disposal will depend on this classification.

F.3.2 Hazardous Waste

In order for a substance to be considered a hazardous waste under RCRA, it must meet the following qualifications:

- The substance must be a solid waste (by definition, a solid waste can be a liquid).
- The substance must be discarded.
- The substance must not be specifically exempted or excluded.
- The substance must exhibit certain specific characteristics of a hazardous waste or be specifically listed as a hazardous waste.

RCRA defines the characteristics of a hazardous waste as ignitability, corrosivity, reactivity, and toxicity. If a substance shows one or more of these characteristics, it is classified as hazardous even if the waste is not otherwise specifically listed as a hazardous waste. Substances derived from hazardous wastes, and mixtures of solids or liquids and hazardous waste, are hazardous wastes. All wastes, defined as hazardous under RCRA, are also defined by California as hazardous. Particular attention should be directed toward the federal and state toxicity criteria. It is possible that a spill residue could be classified as a California hazardous waste but not a RCRA listed or characteristic waste.

40 CFR Part 261.3 defines hazardous wastes and provides guidelines for characterizing spilled materials. The following questions should be considered in evaluating mixtures:

1. Is the spill residue a RCRA-listed hazardous waste? [261.3(c)(2)(i)]

   There are two ways a spill residue could be a RCRA listed hazardous waste:

   - First, if any material spilled was itself a RCRA-listed hazardous material. According to the mixture rule, the resulting spilled residue is automatically a RCRA-listed hazardous waste, regardless of the amount of listed hazardous material contained in the residue.
   - Second, if the material spilled was a commercial chemical product listed in 40 CFR 261.33(e) or (f), any resulting residue that needs to be discarded is a RCRA-listed hazardous waste. As with any listed waste, or derivation from a listed waste, the spill residue is a RCRA listed hazardous waste unless de-listed by EPA and the California Department of Health Services.

2. Is the spill a RCRA-characteristic waste? [261.3(d)(1)]

   Does the spill residue exhibit any of the four defining characteristics (i.e., ignitability, corrosivity, reactivity, toxicity)? The spill residue is hazardous only if the residue exhibits a hazardous characteristic.

F.3.3 Non-Hazardous Waste

The State of California categorizes non-hazardous wastes into two categories for purposes of identifying disposal options. These categories are:

- Designated wastes.
- Non-hazardous solid wastes.

These categories are prescribed under the California Water Code and the requirements are enforced by the Regional Water Quality Control Boards (RWQCBs).

Designated waste is a non-hazardous waste which contains pollutants which could cause degradation of water quality or is a hazardous waste which has been granted a variance from hazardous waste management requirements. Examples of designated wastes include such oil production wastes as heavy oil tank bottoms, produced water, and soil contaminated with hydrocarbons. These and other wastes may be considered non-hazardous if they have been tested/reviewed to be non-hazardous. If the waste is determined to be a designated waste, certain disposal restrictions may apply. For example, designated wastes may only be taken to an approved land disposal facility. It should be noted that onsite treatment may be available for designated waste rather than disposal at a landfill. For example, soil contaminated with hydrocarbons could be treated onsite through methods such as bioremediation, vapor extraction, and chemical treatment to render the waste non-designated.

Non-hazardous solid waste generally includes rubbish, trash, and inert wastes such as concrete which do not meet the criteria of hazardous or designated wastes. Non-hazardous solid wastes must be taken to an approved solid waste disposal facility (i.e., County landfill).

F.4 WASTE MINIMIZATION AND RECYCLING OPPORTUNITIES

F.4.1 Debris Avoidance

It is generally not possible to avoid the generation of oily debris. **However, it is possible to minimize the generation of oily debris in the coastal zone if the anticipated area of oil impact can be cleaned.**

Personnel can be deployed to remove debris from beach intertidal areas to above the high tide line in order to minimize oiling of stranded debris/trash. It is important to note that such crews are not likely to be certified as required under the Occupational Safety and Health Administration (OSHA) regulations in 29 CFR 1910.120 and can only perform this task **prior to** the stranding of spilled oil. A safety/industrial hygiene specialist should be consulted regarding the limitations of those crews and the effective establishment of exclusion zones in the area of beach impact.

F.4.2 Selection of Personal Protective Equipment

Depending upon climatic conditions and material compatibilities of personal protective equipment (PPE), waste can be minimized through the selection of reusable equipment, when possible. For instance, heavy gloves and boots that can be effectively decontaminated and reused can minimize the generation of oil-contaminated disposable gloves and boots, as long as such equipment use is approved by the site safety officer. Reusable rain gear may also be used instead of disposable suits, if approved. Such decisions should be made early in the response process in order to minimize generating containerized, contaminated PPE, which is generally disposed of at Class I (California hazardous waste) facilities.

F.4.3 Recovered Oil and Oily Waste

Both oil and oily water recovered from skimming operations should be offloaded to facilities where it can be effectively recycled or managed within established process and treatment streams. Such facilities may include warehouses, refineries, commercial reclaimers and recyclers, or Company facilities. These facilities can often provide temporary tank storage when necessary.

F.4.4 Sorbent Use/Reuse

Synthetic sorbents (i.e., pads, sweeps, booms) are standard response materials used to recover spilled oil. Their oleophilic, hydrophobic character makes them efficient at separating oil and water. They are also routinely used to recover oil from solid surfaces. Since oiled sorbent material often constitutes a substantial percentage of the oily solid waste generated during a response, opportunities for minimizing this waste volume should be considered.

Some sorbents are designed to be reusable or can be recycled onsite with inexpensive gear. Sorbent manufacturers' instructions should be followed regarding the limits of effective reuse for their individual products. Sorbent sweeps and booms may be replaced with recyclable boom and other appropriate gear in circumstances where floating oil can be efficiently recovered without generating oiled sorbents. For example, in low energy shoreline areas with good access (harbors, bays, inlets), it may be possible to use containment booms and recover the trapped oil with vacuum trucks instead of contaminating large volumes of sorbent.

F.4.5 Petroleum-Contaminated Soil Recycling and Reuse

Soils may be reused as daily landfill cover if after treatment they satisfy the waste profiling requirements of the State and commercial facilities. Oil/solid residuals may also be incorporated into construction materials. The costs and benefits of such recycling (less than $100 per ton and low future liability) versus disposal in a California Class I or II disposal facility (greater than $100 per ton and moderate-to-high future liability) are substantial.

F.5 TEMPORARY STORAGE

F.5.1 Regulatory Requirements

To expedite removal of spilled oil, refined products, and contaminated material from marine waters during an emergency response, temporary storage sites may be erected at appropriate shore locations (22 CCR 66270.1(c)3).

The transportation of oil and contaminated material to temporary storage sites during the emergency response is exempt from handling and permitting requirements (22 CCR 66263.30 and/or 66263.43). The onsite California Environmental Protection Agency, Department of Toxic Substance Control (DTSC) representative or duty officer should be contacted for approval. If a Unified Command is established, OSPR will facilitate the contract with DTSC through their liaison function.

The Company will maintain responsibility for recovered oil and oily wastes generated during recovery operations. A temporary storage site may require an emergency permit from the California Coastal Commission (CCC) Oil Spill Program to respond to oil spill related matters along the coast. This program acts as the single point of contact and requests for emergency permits should be directed to the CCC Oil Spill Program Staff.

Siting of the temporary facility must be done with the concurrence of the USCG and State OSC, DTSC, the local RWQCB, and the local health, fire and emergency services departments. If a Unified Command is established, OSPR will facilitate the contact of the state and local government agencies non-command through their liaison function. Refer to Annex N, Table CL-5 for agency phone numbers.

F.5.2 Storage Methods

Oil and oily water and debris recovered during spill cleanup may be accumulated in containers of various types located at facilities near the site. Segregation of different waste streams is required to determine the amount of liquid petroleum hydrocarbons recovered in accordance with State regulations (see Annex F.6). A summary of temporary storage methods is provided in Table F-1. Temporary storage containers are available from various industry spill response cooperatives, other response organizations, and vendors. The Area Contingency Plan, Los Angeles/Long Beach (ACP) Southern Sector, and Table CL-6 in Annex O of this Plan list vendors and/or the temporary storage capabilities available.

Generally, debris will be contained in drums or 2 to 20 yard storage bins equipped with covers or capable of being covered by tarpaulins or plastic sheeting. Management and storage of non-routine waste streams (e.g., animal carcasses, illicit drugs or paraphernalia) will be conducted in conformance with guidance provided by the appropriate wildlife, health, or law enforcement agencies.

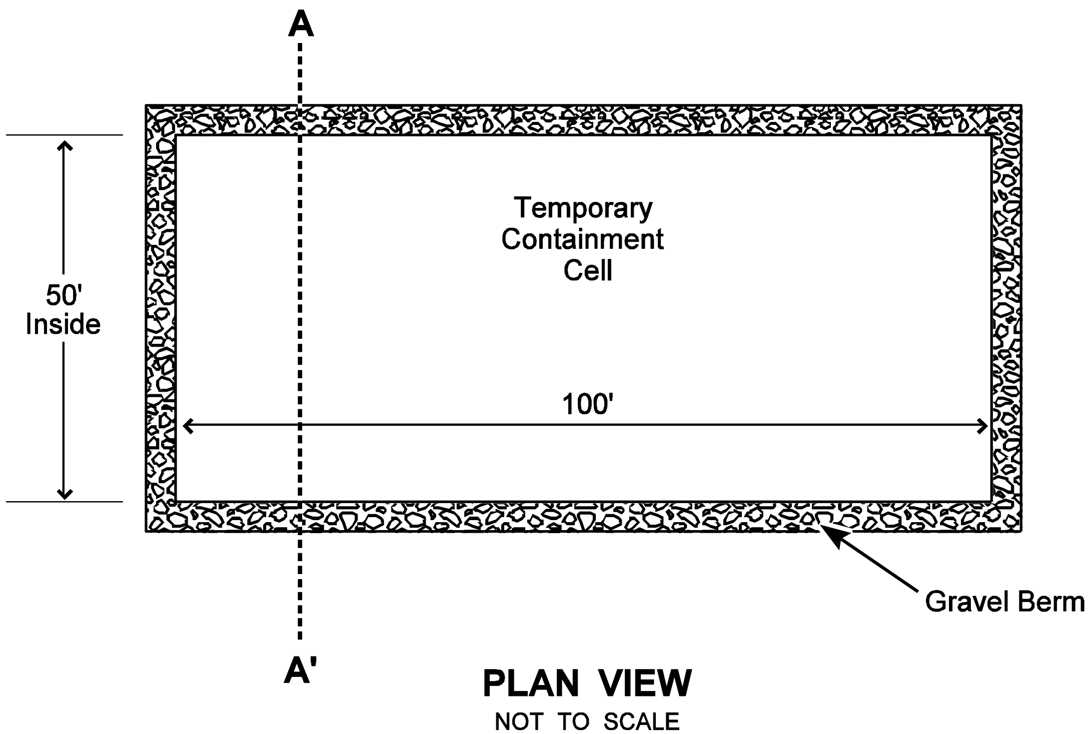
Pits or basins are not appropriate if the waste is characterized as hazardous. Non-hazardous waste can be temporarily stored in natural depressions lined with plastic. However, the time required to obtain the associated approval is difficult and may preclude their use. The construction of lined, earthen dikes constitutes another possibility for temporary onshore storage. These dikes can be made of soil, steel, or timber, but must be used only with impervious liners. Preplanning to ensure the availability of storage containers will alleviate the need to use natural depressions or diked areas, thereby minimizing the liability associated with these types of storage areas.

Table F-1. Temporary Storage Methods.

CONTAINER	ONSHORE	OFFSHORE	SOLIDS	LIQUIDS	NOTES
Drums/Roll-off Bins	X	X	X	X	May require handling devices. Must be covered and clearly marked or coded.
Plastic Bags	X	X	X		Must be clearly marked or coded.
Dump/Flatbed Trucks	X		X		Must be lined and covered. Consider flammability of vapors at mufflers.
Tank Trucks	X	X		X	Consider road access. Can be barged-mounted.
Barges		X	X	X	Liquids only in tanks. Consider venting of tanks.
Storage Tanks	X	X		X	May require special hoses or pumps for transfer.
Storage Bags	X	X		X	May require special hoses or pumps for transfer. Care not to subject to excessive motion on vessel.
Pits	X		X	X	Liners and berms required. Locate above high water mark, on level terrain, and away from streams.
Note: All storage containers arriving at temporary storage sites/staging areas should be inspected prior to use.					

Figures F-2 and F-3 demonstrate two types of temporary oily waste containment structures for non-hazardous waste. The size and dimensions of each may vary from site to site depending on volumes anticipated; the temporary structures shown can contain approximately 200-to-250 cubic yards of material. Since these storage options are temporary, segregation of materials is desirable in order to facilitate removal at a later date. For example, oiled sorbent material should be contained in one area and wood debris in another. Both types of temporary containment structure should be used primarily for non-liquid wastes rather than any liquid wastes.

Figure F-2. Above-grade Temporary Storage Cell.



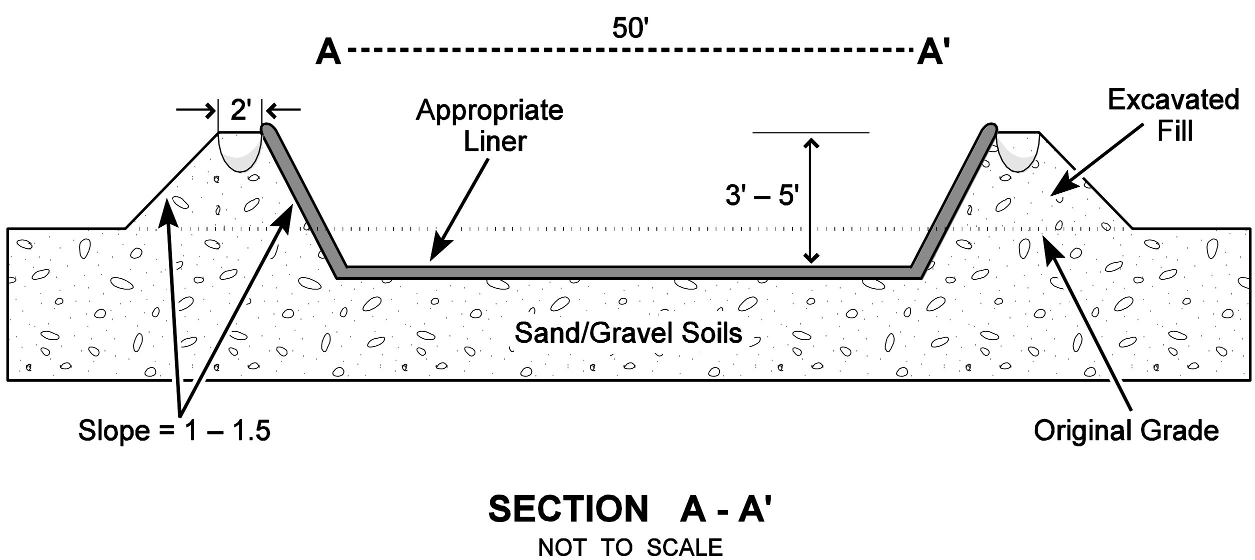
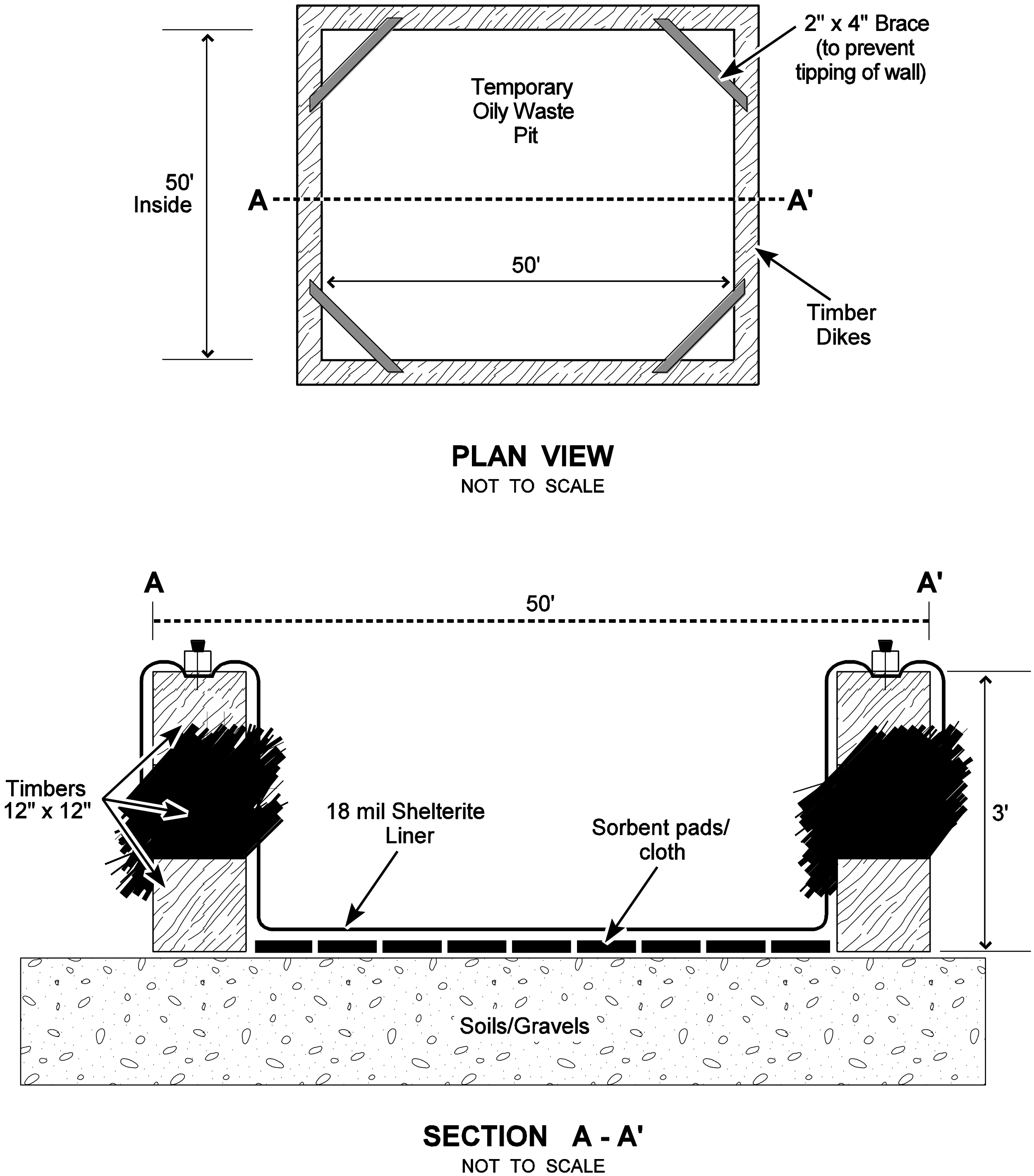


Figure F-3. Temporary Oily Waste Storage Structure.



F.5.3 Pre-identified Sites for Temporary Waste Storage

The Company has pre-identified the following sites as potential temporary waste storage site/staging areas:

- Clean Harbors (800) OIL-TANK (645-8265)
  1737 E. Denni Street, Wilmington, CA 90744

- So Cal Ship Services (310) 519-8411
  971 S. Seaside Ave. Terminal Island, CA 90731

Sites utilized for temporary storage of wastes will be selected based on the following criteria:

- Proximity to the operation generating wastes
- Access to and from the cleanup site
- Accessibility for large trucks
- Site security
- Degree of slope (for example, flat areas such as paved lots make good sites)
- Distance from the ocean or water courses (sites should be located above the high tide mark and set back from creek and river beds)

The selection of all site(s) will be subject to regulatory requirements and approvals. Additional waste storage sites/staging areas are identified in the ACP.

F.6 QUANTIFYING THE AMOUNT OF LIQUID PETROLEUM HYDROCARBONS RECOVERED

F.6.1 Overview

As required by CCR Title 14, Division 1, Subdivision 4, Office of Oil Spill Prevention and Response Chapter 7 (Enforcement), Subchapter 2, Sections 877-880, the Company must determine the number of gallons of discharged liquid petroleum hydrocarbon that are recovered and properly disposed of.

The term "disposed of" includes liquid petroleum hydrocarbon that is reprocessed, recycled, or otherwise utilized as an ingredient in the manufacture of petroleum products or other products.

The following information has been extracted from the regulations to assist in the calculation; however, there are exceptions to the rule which should be reviewed in its entirety. The Waste Disposal/Quantification Group coordinates compliance with this regulation.

F.6.2 State Regulatory Procedures

877.3 Recovery of Liquid Petroleum Hydrocarbons.

All material shall be collected and stored at locations that shall be identified and approved by the Unified Command as defined in Section 780(c)(3), Title 14, prior to use.

A storage location conforming to approved methods for the storage of liquid petroleum hydrocarbons (LPH), which is a measured volume of recovered product or crude oil, shall be pre-identified and verified by the Unified Command (UC) as empty. If it is necessary to use a storage location that already contains LPH, water, or a combination of both, the type of product shall be determined and sampled according to API approved standards in advance and pre-gauged using API approved gauging methods. The petroleum hydrocarbon mixture shall be collected and separated. Gauge readings shall be taken until two (2) gauge readings are identical.

The total volume of liquid petroleum hydrocarbons recovered shall be designated as Vl.

878. Sampling Analysis and Calculation of Petroleum Hydrocarbons in Contaminated Sediment.

(a) All contaminated material shall be collected and stored at locations that shall be identified and approved by the Unified Command prior to use.

(b) The Unified Command, or their representatives, shall develop a statistically sound sampling and analysis plan, agreed upon by all parties,that shall be used in quantifying recovered petroleum hydrocarbons. At a minimum, the sampling plan shall include, but not be limited to, the number of samples to be collected, the sampling methodology to be used, and the methods for quantifying sediment and TPH, and moisture.

(c) Samples shall be collected in pre-cleaned glass containers. Samples shall not be collected in plastic containers.

(d) For the TPH extraction method, applicable EPA or ASTM methods, such as EPA Method 3550A, shall be used.

(e) For quantification of TPH, applicable EPA or ASTM methods, such as EPA Method 8015A by gas chromatography flame ionization detector or EPA Method 8270B shall be used.

(f) The following calculation shall be used to determine the total amount of petroleum hydrocarbons:

Vs = volume of petroleum hydrocarbons recovered in contaminated sediment
Ws = total weight of sediment
Cs = concentration of petroleum hydrocarbons in sediment (from TPH analysis)
Dp = density of petroleum hydrocarbon

Vs = (Ws) x (Cs) x (1/Dp)

879. Sorbents and Debris.

(a) All contaminated material shall be collected and stored at locations that shall be identified and approved by the Unified Command prior to use. Sorbents and debris shall be segregated.

(b) Boom and Sorbents. The following methods may be used to determine the amount of recovered petroleum hydrocarbons:

1. Alternative Number 1.

   A. The petroleum hydrocarbons and water shall be extracted using pressure or other extraction method. A water deluge may be used to effect this process, subsequent to approval by the Unified Command. The petroleum hydrocarbon mixture shall be collected and separated. The petroleum hydrocarbons shall be gauged using API approved gauging methods. Gauge readings shall be taken until two (2) gauge readings are identical.

2. Alternative Number 2.

   A. The Unified Command, or their representatives, shall develop a statistically sound sampling and analysis plan, agreed upon by all parties that shall be used in quantifying recovered petroleum hydrocarbons. At a minimum, the sampling plan shall include, but not be limited to, the number of samples to be collected, and the sampling methodology to be used and the methods for quantifying the sorbent, TPH and moisture.

   B. Samples shall be collected in pre-cleaned glass containers. Samples shall not be collected in plastic containers.

   C. For the TPH extraction method, applicable EPA or ASTM methods, such as EPA Method 3550A, shall be used.

   D. For quantification of TPH, applicable EPA or ASTM methods, such as EPA Method 8015A by gas chromatography flame ionization detector or EPA Method 8270B shall be used.

   E. The following calculation shall be used to determine the total amount of petroleum hydrocarbons:

   Vsb = volume of petroleum hydrocarbons recovered in sorbents
   Cp = concentration of petroleum hydrocarbons reported in sorbent pads as TPH
   Cpb = concentration of petroleum hydrocarbons reported in sorbent boom as TPH
   Wp = total weight of sorbent pads
   Wb = total weight of boom
   Wo = total weight of other sorbent type
   Dh = density of petroleum hydrocarbons

   Vsb = {[(Cp) x (Wp)]} + {[(Cpb) x (Wb) + (Co x Wo)]} x (1/Dh)

(c) Debris. The following methods may be used to determine the amount of recovered petroleum hydrocarbons:

1. Alternative Number 1.

   A. The oily debris shall be washed using water deluge, subsequent to approval by the Unified Command. The petroleum hydrocarbon and water mixture shall be collected and separated. The petroleum hydrocarbons shall be gauged using API approved gauging methods. Gauge readings shall be taken until two (2) gauge readings are identical.

2. Alternative Number 2.

   A. The oily debris shall be collected and homogenized (by grinding or equivalent to effect total homogenization).

   B. The Unified Command, or their representatives, shall develop a statistically sound sampling and analysis plan, agreed upon by all parties, that shall be used in quantifying recovered petroleum hydrocarbons. At a minimum, the sampling plan shall include, but not be limited to, the number of samples to be collected, and the sampling methodology to be used and the methods for quantifying the oily debris, TPH and moisture.

   C. Samples shall be collected in pre-cleaned glass containers. Samples shall not be collected in plastic containers.

   D. For the TPH extraction method, applicable EPA or ASTM methods, such as EPA Method 3550A, shall be used.

   E. For quantification of TPHS, applicable EPA or ASTM methods, such as EPA Method 8015A by as chromatography flame ionization detector or EPA Method 8270B shall be used.

   F. The following calculation shall be used to determine the total amount of petroleum hydrocarbons:

   Vd = volume of petroleum hydrocarbons recovered in debris
   Cd = concentration of petroleum hydrocarbons reported as TPH
   DWd= total weight of debris
   Dh = density of petroleum hydrocarbon

   $$Vd = [(Cd) \times (DWd)] \times (1/Dh)$$

880. Calculation for Total Recovery of Petroleum Hydrocarbons.

(a) The total recovery of petroleum hydrocarbons (Vr) shall be the sum of the total volume of petroleum hydrocarbons from contaminated sediment (Vs), sorbents (Vsb), and debris (Vd), and liquid petroleum hydrocarbons (Vl) reported in gallons.

$$Vr = Vs + Vsb + Vd + Vl$$

F.7 INITIAL TREATMENT OF TEMPORARILY STORED MATERIALS

Petroleum and petroleum-contaminated cleanup materials can potentially be treated at a temporary storage site. Treatment processes include:

- Separation of water from collected petroleum with the aid of a transportable treatment unit (TTU).
- Decantation of water off petroleum materials stored temporarily in tanks.

Any water generated through the separation of petroleum and water may be discharged to a sanitary sewer system or back to marine waters. Discharging to the sanitary sewer will require a permit from the local sanitation district, which will establish effluent requirements for the discharged water. Should the sanitation district not allow the discharge of water to its system, the recovered water could either be discharged back to the adjacent waters or transported offsite for disposal. The discharge of recovered water to state waters will require an NPDES permit from the local RWQCB.

A portable incinerator may be another type of TTU available during a spill response for use with contaminated material. The use of an incinerator will require a permit from the local air quality agency. The potential use of any TTU and applicable regulatory standards must be discussed with DTSC.

F.8 TRANSPORTATION

Recovered petroleum product that is not accepted at a refinery or recycling facility and contaminated material must be transported to an approved waste management facility. The type of waste management facility selected is based on the results of the waste characterization performed.

F.8.1 Hazardous Waste

Waste classified as hazardous under either federal or state regulations must be transported to a permitted or interim status hazardous waste facility. Table CL-6 in Annex O of this Plan provides a list of the licensed hazardous waste facilities located within California. Hauling of the waste must be done by a state-licensed hazardous materials hauler. The licensed hauler must have a

U.S. EPA identification number and state transporter identification number. Prior to removal of the hazardous waste manifest (form DHS-8022A) must be prepared by the Company for recovered petroleum and other contaminated materials (22 CCR 66263.20-66263.23). Refer to Section F.10 (Waste Documentation).

All hazardous materials shipped offsite must be transported in compliance with the applicable regulations, including the RCRA regulations in 40 CFR 262-263, Department of Transportation (DOT) Hazardous Materials Regulations (49 CFR 171-178), and applicable California Highway Patrol and DTSC regulations (22 CCR 6626.20-6626.23).

F.8.2 Non-Hazardous Waste

Waste determined to be non-hazardous but designated waste (23 CCR 2522) can be transported to a Class II waste management facility. Manifesting of the waste is not required, but a Bill of Lading is required for transportation. The appropriate RWQCB and local health department should be contacted to identify the appropriate waste management facility and any additional waste testing requirements.

F.9 WASTE DISPOSAL

F.9.1 Waste Disposal Sites

The disposal, treatment, and recycling/reuse options legally available will depend on the classification of the waste. Inappropriate disposal, treatment, recycling/reuse is prohibited by law. Therefore, it is important to select the proper waste disposal options. Table F-2 summarizes the waste categories and the approved classes of facilities for each waste category. A list of waste management services is provided in Table CL-6, Annex O of this Plan.

Table F-2. Classification of Waste Facilities.

WASTE CATEGORY	APPROVED FACILITIES
Hazardous Waste	Class I Hazardous Waste TSDF.
Hazardous Waste Granted a Variance or Designated Waste	Class I Hazardous Waste TSDF or Class II Facility Permitted to Accept Designated Waste.
Non-Hazardous Solid Waste	Class III – Landfill.
Inert Waste	Landfills as approved by the Regional Water Quality Control Boards.

Recycling, reuse, onsite or offsite treatment of wastes which are classified as hazardous or designated will be reviewed on a case-by-case basis for approval. Recycling, reuse, and onsite of offsite treatment of hazardous waste will be encouraged where economically and technologically feasible.

F.9.2 Disposal Options

F.9.2.1 Crude Oil and Refined Petroleum Products

Under California law, material released or discharged to marine waters of the state is defined as waste. Once the final disposition of a specific waste is determined, the waste may be redefined as a product or material and may no longer be subject to waste management requirements.

Crude oil that is spilled into marine waters, recovered, and transported to a refinery may be considered a product and may not be subject to hazardous waste management regulations [California Health and Safety Code (CHSC), 25943.2 (sic)]. The collected crude oil may be shipped to the refinery of original destination or a refinery that can accept the spilled crude oil. Refined petroleum products that are recovered from marine waters may also be handled as product if they can be used for their originally intended purpose (i.e., fuel, fuel oil, etc.) (CHSC 25250.3).

Recycling is another option by which recovered petroleum may be managed as a material (CHSC 25143.2). This option includes using the petroleum in incineration as a fuel, as a substitute for raw material feedstock, or as an ingredient used in the production of a product (i.e., asphalt).

Recovered petroleum that is not accepted by a refinery or that cannot be recycled must be managed as a waste. In order to determine the appropriate method of management, the waste must be characterized by a state-certified laboratory to determine if the waste is hazardous or non-hazardous. It is the responsibility of the responsible party to have the waste accurately characterized for proper disposition [Title 22, Section 66260.200(c) of the California Code of Regulations (22 CCR)]. A more detailed discussion of characterization is provided in Section F.3.

F.9.2.2 Decanting of Water Separated from Recovered Oil at Sea

Oil recovered at sea typically contains significant amounts of seawater. In order to maintain the efficiency of the skimming process for recovery, this water must be separated/decanted from the oil and discharged back into the ocean during recovery operations. Separated seawater typically contains elevated levels of hydrocarbons and, thus, the discharge of this material may constitute a discharge of a pollutant. Blanket permission has been granted to decant water into a contained area in the response area. An NPDES permit is not required for this discharge if prior approval is granted by the Unified Command (UC). A written decanting proposal should be submitted and approved prior to the discharge of recovered water. The DFW, OSPR, and RWQCB have memorandum of understanding regarding this issue. The FOSC has the authority to allow decanting of recovered water; that is, the FOSC or designated representative may authorize the discharge of separated/decanted water back into the centenary area of a boom/skimming system outside state waters (three miles), with the exception of NOAA marine sanctuary waters.

A sample decanting application form is shown below:

Application for Decanting of Separated Water and Hydrocarbons from Recovery Operations
(Complete all blank fields)

Incident Name	**Date**	**Preparer (Name)**
Submitted to: **(Unified Command Agencies)**	Federal: State: Responsible Party: Other:	
	Time	☐ am ☐ pm
Approval:		

Unified Command Member (agency)	**Name**	**Telephone Number**	**Signature**

Recovery Operations: (Describe on-water recovery operations, including geographic areas and specific recovery equipment generating the need to decant)	
Decanting Procedure: (Describe method of decanting, including discharge location relative to response area, active recovery operations, etc. Include any additional prevention measures proposed to minimize possibility of oil discharge)	
Additional Information:	

F.9.2.3 Contaminated Debris

Contaminated debris, including organic material, contaminated cleanup equipment (i.e., booms, pompoms, sorbents, etc.), and other contaminated materials (clothing) that cannot be recycled must be managed as a waste. The materials must also be characterized as hazardous or non-hazardous before the appropriate waste management option is determined.

F.9.2.4 Oiled Animal Carcasses

DFW and the Oiled Wildlife Care Network (OWCN) should be notified of any dead or oiled wildlife, prior to taking any action.

Appropriate measures must be undertaken by the RP and the Unified Command to insure that dead animals are collected appropriately, identified, documented held until disposal is approved by the trustees. Oiled wildlife collection, treatment and rehabilitation are legislatively mandated and are important for humane care, spill documentation, and public relations reasons (Jessup and Mazet, 1999). In addition, the prompt removal of disabled and dead oiled animals from the environment can be critical to minimize the effects of secondary oiling such as poisoning of predators and scavengers.

DFW and/or OWCN should provide instructions on how to handle these animals and whom else to notify. Further information is available in the Wildlife Response Plan for California.

Oiled animals and carcasses collected by others should be turned over to the DFW - OSPR representatives who are responsible for wildlife rehabilitation and collection of carcasses for natural resource damage assessment (NRDA) investigations. The identification and location of OSPR representatives can be provided by the Unified Command Center. The DFW will be responsible for the disposal of the oil-contaminated carcasses.

F.10 WASTE DOCUMENTATION

Records regarding waste are extremely important. Not only is record keeping required by law for all hazardous wastes, the records also provide documentation that the Company complied with all relevant laws and regulations regarding waste management. Similarly, records will also provide the basis for hazardous waste fee computation. Table F-3 provides a summary of the records that will be maintained for waste activity.

Required records will be maintained in easily retrievable files. If, due to space constraints, records are archived in a warehouse or other storage facility, a log or memo to file will be maintained to allow for easy retrieval.

Table F-3. Waste Documentation.

RECORD	REQUIRED BY	RETENTION PERIOD
Laboratory Test Results (including Chain of Custody, Sampling Map and Methodology)	22 CCR §66262.40(c) 40 CFR §262.40(c)	3 years from date waste treated or disposed
Company Non-Hazardous Bill of Lading	Company Procedure	Indefinite period
Uniform Hazardous Waste Manifest – not yet signed by the disposal or treatment facility	22 CCR §66262.40(a) 40 CFR §262.40(a)	3 years or until signed manifest from the disposal or treatment facility is received
Hazardous Waste Manifest – ***signed*** by the disposal or treatment facility	22 CCR §66262.40(a) 40 CFR §262.40(a)	3 years minimum by law
Exception Report	22 CCR §66262.40(b) 40 CFR §262.40(b)	3 years from the due date of this report
Biennial Report	22 CCR §66262.40(b) 40 CFR §262.40(b)	3 years from the due date of the report (March 1 of each even-numbered year)
Waste Profile	Company Procedure	Indefinite period
Hazardous Waste Generator Fee Return Hazardous Waste Generator Disposal Fee Return	Company Procedure	Indefinite period
Extremely Hazardous Waste Disposal Permit	Company Procedure	Indefinite period
Incineration/Waste Destruction Certificate	Company Procedure	Indefinite period
Employee Training Records	22 CCR §66265.16(e) 40 CFR §265.16	Current Employee – Unit Facility Former Employees – 3 years

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G.1 SECURITY FOR SPILL PREVENTION

G.1.1 Beta Unit Complex Platforms

The Beta Unit Complex platforms are under 24-hour surveillance, seven days per week, 365 days per year. Twenty-four-hour surveillance through routine operations and inspections guards against unauthorized entry by boat.

The platforms are offshore (approximately 9 miles) and therefore not as vulnerable to unauthorized entry as an onshore facility. Access is limited to authorized personnel who are transported by contracted Company vessels and helicopters. Personnel planning to visit the platforms must be approved and scheduled by the Beta Compliance Office prior to visiting the platforms. The personnel will further be screened at Ship Services or Island Express Helicopters prior to being allowed to board a platform-bound ship or helicopter.

G.1.2 San Pedro Bay Pipeline and Beta Pump Station

The Beta Pump Station surveillance and operations, leak detection surveillance of the line, and the annual regulatory surveillance of the line are conducted by Beta Offshore and/or other contract pipeline services. The Beta Pump Station is surrounded by a 6-foot chain link fence topped with strands of barbed wire. When the facility is not manned, the entry gate is chained and locked closed. The station is lighted at night.

All pipelines are either buried in rights-of-way or are located aboveground in controlled-access facilities. Pipeline rights-of-way are marked except in areas where the pipeline is buried in streets or roads. Pipeline rights-of-way are patrolled on a regular basis at intervals not exceeding three weeks, but at least 26 times per year.

California regulations require anyone planning an underground excavation to utilize the “One-Call” system (Underground Service Alert, or USA) prior to beginning excavation. Beta Offshore and/or contracted pipeline service company utilizes a computerized system to review and track each USA tickets in the vicinity of the pipeline. A company/contract representative will be present during any excavation near the pipeline.

G.2 SECURITY FOR EMERGENCY RESPONSE

Experience indicates that even a relatively small spill event will draw spectators if effective countermeasures are not quickly taken to keep them a safe distance from the incident site. Site security and control is necessary to provide safeguards needed to:

- Protect personnel and property from loss or damage.
- Ensure that the general public does not interfere with the response operation.
- Ensure adequate access for personnel and equipment to the access/staging areas and command centers.

To ensure effective security, the following guidelines should be considered based on the extent of the incident:

- Work through Unified Command or USCG/FOSC to request FAA to restrict air space over the safety zone or USCG to request notification of ships/mariners appropriately.
- Request assistance from the City Police Department or Sheriff’s Department, and in the event that traffic control is required on public roads to:
  - Set up roadblocks where necessary to secure the safety zone.
  - Provide access for response equipment and personnel.
- Maintain strict control of all personnel and vehicular traffic entering the incident site by the following actions as deemed appropriate:
  - Position security personnel to effectively control non-responder access.
  - Establish entry and exit logs to reflect personnel movement.
  - Attempt to establish single point entry/exit to facilitate personnel safety.
  - Barricade lesser-traveled points with appropriate warnings against entry.
  - Establish periodic and regular checks at barricaded points to verify that site security is not compromised.
- Procure additional security personnel when needed.

For an incident of significant magnitude or impact, especially one requiring response over an extended period of time, the Company’s Incident Management Team (IMT) can be activated. The IMT includes a Security Unit Leader with specific responsibilities and duties involving security issues.

H.1 INTRODUCTION

This Annex addresses the OSPR and PHMSA requirements for a risk and hazard analysis/vulnerability analysis. The requirements of each agency are addressed separately below with referencing used to minimize repetition where possible.

H.2 OSPR

The following components of the Beta Unit fall under the OSPR regulations and are addressed in this section.

- The portion of the Offshore 16" San Pedro Bay Pipeline from Platform Elly to the onshore Beta Pump Station that falls within State jurisdiction (inside the 3-mile limit).
- Breakout/storage tank at the onshore Beta Pump Station.
- Pumps, meters, internal piping, etc. at the onshore Beta Pump Station.
- The 10" delivery lines from the onshore Beta Pump Station to the THUMS manifold.

H.2.1 History of Significant Spills

The spill history for the Beta Unit Complex is provided inTable H-2.

TABLE H-2				BETA SPILL HISTORY	
DATE	LEASE	BO	BW	DESCRIPTION/CAUSE	NRC Number
01/04/1991	ELLY	<1 CUP		DRIP PAN OVERFILLED ON EAST CRANE INTO OCEAN	
09/12/1991	ELLY	<1 CUP	0.1	AN OIL/WATER MIXTURE FR. WET/DRY OIL TANK SPILT OVERBOARD	
09/15/1991	ELLY	1 TBSP.	0.1	VALVE ON PRESSURE MED SYSTEM HAD SLOW LEAK-MECH. FAILURE	
09/16/1991	ELLY	0.67	0	PILOT GAS LINE LADEN W/OIL, SPILL TO OCEAN - HUMAN ERROR	
09/24/1991	ELLEN	0.03	0	SAMPLE VALVE LEFT OPEN - HUMAN ERROR	
10/29/1991	ELLEN	0.214	0	FAILED CHECK VALVE - MECH. FAILURE	
03/28/1992	ELLEN	0.01	0	HIGH PRESSURE MUD LINE PULLED APART-MECH. FAILURE	
04/23/1992	EUREKA	<1 CUP	0	SOURCE UNCONFIRMED-POSSIBLY FR. SOLIDS LOOSEN AT EMERG. PUMP	
12/23/1992	EUREKA	0.03	1.5	HOLE IN DRAIN SYSTEM PIPING-INT. CORR.	
02/01/1993	EUREKA	1 TSP.	0	OIL SUMP PUMP STRAINER LEAKED-MECH. FAILURE	
01/29/1994	EUREKA	<1 CUP	0	BELIEVED DRILL CUTTINGS LOOSEN FR EMERG. SUMP BY EARTHQUAKE	
02/17/1994	ELLEN	3 TBSP	0	FAILURE OF PRESSURE GAUGE, OIL SPILLED, WIND SWEPT IT AWAY	
02/23/1994	EUREKA	2 CUPS	0	RESIDUE OIL LEFT ON EMERG. PUMP LEAKED	
11/22/1994	EUREKA	0.03	0	LEAKY SEAL ON PUMP - MECH FAILURE	
03/10/1995	ELLY	2 TBSP	0	CRANE DRAIN PAN CONNECTION LOOSEN, DRIPPING OIL-MECH FAIL.	
09/25/1995	ELLEN	2 CUPS	0	INCORRECT PRESSURE ON TUBING CAUSED VALVE TO BLOW OFF-HUM ERROR	
10/05/1995	EUREKA	1 CUP	0	SHEEN OCCURRED ON SUMP DUE TO TIMER FAILURE-MECH FAILURE	
11/04/1995	ELLEN	<1 CUP	0	OIL COMING FR. DRILLING MUD CUTTINGS	
11/14/1995	EUREKA	1 TSP	0	LEAK IN DIESEL TRANSFER HOSE-EQUIP. MALFUNCTION	
11/22/1995	EUREKA	1 TBSP	0	CONTAINMENT NOT PROPERLY INSTALLED-HUMAN ERROR	
11/29/1995	ELLEN	2 CUPS	0	POSSIBLE SKIM PILE	
11/30/1995	EUREKA	<1 CUP	0	FITTING BROKE REPLACING TRANSFER HOSE	
04/26/1996	EUREKA	7 TBSP.	0	LEVEL TO LOW IN DRAIN LINE, INT. CORR.	338565
04/28/1996	ELLY	1 TSP.	0	4" LINE, PRESSURE ELIMINATED BY SHUTDOWN OF TURBINE	338863
05/04/1996	EUREKA	1 PT.	0	6" DRAIN LINE, TEMP CONTAINMENT FAILED DURING LINE REPLACEMENT	339748
07/17/1996	Not known	.25 Bbl		DIESEL RINSE WATER	

DATE	LEASE	BO	BW	DESCRIPTION/CAUSE	NRC No.
10/09/1996	ELLY	<1 GAL.	0	OVER PRESSURE/TEMP OF HEAT MEDIA SYSTEM - HUMAN ERROR	363816
12/05/1996	EUREKA	< 1 CUP	0	STRIPPING RUBBERS ON SANDLINE, WIND CAUSE OIL OUT OF CONTAIN. AREA	369544
03/23/1997	EUREKA	3 TBSP.	0	OIL DRIPPED OFF OILY EQUIP WHEN TRANSPORTING TO WORK BOAT	381257
04/11/1997	ELLY	2 TBSP.	0	BAD SEAL ON DECK DRAIN ALLOWED SPILL, EQUIP. MALFUNCTION	383365
05/21/1997	ELLY	0	0.8	HEAT/PRES IN HEAT EXCHG. SYSTEM, DISCHRG TO PRESS RELIEF VALVE	None
08/24/1997	ELLY	1 QRT.	0.1	SYSTEM OVERHEATED/OVERPRESSURED & RELIEVED-HUM. ERROR	400764
10/04/1997	EUREKA	0.12	0	DISCHARGE FR. EMERGENCY SUMP- DUE TO SEA GROWTH	406237
11/10/1997	ELLEN	1 TBSP	0	LEAK IN SEAWATER EXCHANGER - MECHANICAL FAILURE	410862
12/12/1997	ELLY	2 OZ.	0	FUEL TRANSFER FROM PUMP DISHARGED-EQUIP MALFUNCTION	415660
12/24/1997	PIER D	5 OZ.	0	FUEL DIESEL RAN OUT OF DUMPSTER	417140
04/13/1998	EUREKA	<1	0	OILY RESIDUE IN OVERBOARD LINE FR. PRIOR OPERATION	432329
05/15/1998	PUMP STATION	10	0	PICO & OCEAN, 2" LINE BLEW OUT (did not reach water)	
06/25/1998	EUREKA	8 OZ.	N/A	8 OZ. DIESEL FROM RIG EXHAUST INTO OCEAN	443249
02/16/1999	ELLY	20 DROPS	0	DIESEL/MOTOR OIL FR. ENGINE EXHAUST	474118
03/16/1999	EUREKA	8 OZ.	0	RIG ENGINE LEAKED MOTOR OIL INTO SEAWATER-EQUIPMENT MALFUNCTION	477112
03/20/1999	EUREKA	1/2 CUP	0.5	PIN HOLE LEAK IN DISCHARGE PIPING	477551
04/26/1999	EUREKA	30 DROPS	0	DIESEL SPLASHED INTO OCEAN WHILE PULLING DIESEL FILTERS FROM THEIR HOUSING.	481789
06/05/1999	EUREKA	1 BBL	0.5	HOLES IN EUREKA GROSS PRODUCTION LINE	486321
06/13/1999	ELLY	3-4 DROPS	0	CONDENSATION FROM CRUDE-CONTAMINATED HEAT MEDIUM VAPOR.	
09/24/1999	ELLEN	<1 CUP	0	OVER PRESSURED PIPELINE & PUMP WHICH ALLOWED SEAL TO LIFT IN THE SEA	500056
10/27/1999	EUREKA	7.14 GAL	0	PUMPING PRESSURE DURING PIGGIND CAUSED OIL TO LEAK THROUGH HOLES IN 12” PIPELINE	503881
09/15/2000	ELLEN	½ PT.	0	PRESSURE GAUGE O-RING BLEW OUT SPRAYING FLUID OUT	542289
11/06/2000	ELLY	2 GAL.	0	ENGINE LUBE OIL LINE FAILURES	547396
03/02/2001	ELLEN	1 PT.	0	4” HOSE BLEW OUT OF SWACO UNIT	558394
03/12/2001	ELLEN	6 OZ.	0	DIESEL TRANSFER HOSE LEAK	559292
03/16/2001	ELLEN	¼ CUP	0	DIESEL LEAKED WHILE REMOVING TRANSFER HOSE	559850
03/21/2001	ELLEN	4 OZ.	0	TUGGER TIPPED OVER ON +15 SPILLING GEAR OIL	560263
09/03/2001	ELLEN	12 OZ.	0	DIESEL TANK DRAIN PAN OVERFLOWED WHILE TAKING ON DIESEL FUEL	578688
06/29/2002	ELLEN	1 GAL.	?	LEAK 2” B TEST LINE SPRAYED PRODUCED FLUID	614865
10/14/2002	ELLEN	2 DRPS	0	RIG ENGINE #2 EXHAUST LEAK (LUBE OIL?)	626215
12/21/2002	ELLY	3 TBS	2 TBS	INSECURED NEEDLE VALVE DIESEL FUEL LEAK	632480

DATE	LEASE	BO	BW	DESCRIPTION/CAUSE	NRC No.
06/04/2003	ELLY	<1 GAL.	0	CONDENSATE DRIPPINGS FROM VENT LINE	646875
10/08/2003	EUREKA	1 TSP	0	CRANE LOAD CELL LINE WAS CUT RELEASING HYDRAULIC FLUID	701933
10/13/2003	EUREKA	½ TSP	½ TSP	HEATED LUBE GREASE ON CRANE LIVE MAST BRIDLE SHEAVES DRIPS INTO WATER	702349
12/07/2003	ELLEN	<1 GAL.	<1 GAL.	OILY WATER ESCAPES CLAMP/PACKING AND RUNS DOWN CONDUCTOR WHILE CLEANING	707354
12/09/2003	ELLY	<1 TBSP	0	LEAK IN 3" DIESEL SUPPLY LINE ON THE +45 DECK	707616
08/01/2004	ELLY-EL	5 DROPS	0	RELEASED 4-5 DROPS LUBE OIL FROM E.CRANE PAN	
09/12/2005	ELLEN	1 CUP	0	BLEW HOLE IN DRAIN LINE WHILE SANDBLASTING CAUSING DIESEL LEAK	772210
10/22/2005	ELLEN	<1 CUP	0	PIN HOLE LEAK IN DRAIN LINE	777148
10/25/2005	EUREKA	<1 GAL.	<1 GAL.	PAINT OVERSPRAY FROM MIANTENANCE OPERATION AT THE +15 DECK	777440
06/01/2006	ELLEN	1 CUP		SEAL ON ELLEN CRANE FAILED, RELEASE OIL TO FLOOR, WIND CARRIED ABOUT 1 CUP TO OCEAN	
08/24/2006	ELLY-EL	1 PT.		OIL RELEASED FROM PIN HOLE IN DRAIN LINE	
10/05/2006	ELLY-EL	10 GAL	3 GAL	PAINT OVERSPRAY FROM MAINTENANCE OPS, +15 DECK	
06/11/2007	ELLY	SHEEN >20' DIA.	0	DIESEL DRIPS FROM EMERGENCY GENERATOR DRAIN PAN ORIGINATING FROM A FLANGE	
07/20/2007	ELLEN	<5 GAL.	0	TEMPORARY DRAIN PLUG FAILED ON ELLEN DRAIN SYSTEM	842814
02/25/2008	EUREKA	1 QT.	0	SUMP DRAIN VALVE KICKED OPEN, LEAK IN CONTAINMENT VESSEL	863316
05/12/2008	ELLY	.05 GAL.	0	HYDRAULIC LINE ON UNDERSIDE OF WEST CRANE BROKE	870672
12/03/2008	EUREKA	<2 GAL	0.2	OILY WATER DISCHARGE FROM WHITAKER DURING LOADING	891569
12/11/2008	ELLEN	SHEEN	NA	CONDUCTED SYSTEM CHECK AND FOUND NO LEAKS	892255
06/01/2009	EUREKA	0.4 OZ.	2 QT.	HYDRAULIC LEAK ON EUREKA DRILLING RIG CAUSED DISCHARGE INTO OCEAN	907459
10/20/2010	EUREKA	SHEEN 10' x 15' 0.001 gal		THREADED CAP CAME OFF SHIPPING PUMP STUFFING BOX RELEASING A SPRAY OF OIL AND WATER EMULSION	957189
04/18/2011	Beta Station	Est. 30 bbl		RELEASE OF OIL FROM SHIPPING PUMP #3 DURING PUMP REPAIR JOB	CAL-EMA #11-2433
09/28/2011	EUREKA	2 DRPS	0	CLEANING EDGE OF PLATFORM	991125
11/28/2011	EUREKA	SHEEN 40'	0	BLACK PLASTIC BAGS WITH OILY RAGS & FILTERS SPOTTED FLOATING IN THE PACIFIC	996653
05/03/12	ELLY	DROPS	0	OIL DROPLETS RISING UP FROM SUBSURFACE 14" OVER-FLOW LINE TO EMERGENCY SUMP. PINHOLE LEAK FOUND	1010337
05/10/12	ELLY	0	0	LINE ABOVE WAS CLEANED. ADDITIONAL HOLES ID'D	1011137
06/10/12	ELLY	<1 GAL	NA	RELEASE OF OIL THROUGH FLARE BOOM AT ELLY	1014119
11/19/12	ELLY	5 drops	NA	OIL DRIPPED FROM THE OUTSIDE OF A SMALL METAL BUCKET ONTO GRATING AND FROM GRATING TO OCEAN	1031077
3/23/13	ELLEN	1 TSP	0	DIESEL ON +45 DECK SEEPED THROUGH A CRACK AT A DECK PENETRATION STRUCTURE, DRIPPING TO OCEAN	1041918
5/21/13	ELLY	1 GAL	0	HIGH-LEVEL SAFETY DEVICE IN FWKO-V01A FAILED SENDING OIL TO THE FLARE. MSRC RESPONSE USED	1047881

DATE	LEASE	BO	BW	DESCRIPTION/CAUSE	NRC No.
5/23/13	ELLY	½ CUP	0	RESIDUAL OIL IN FLARE PILOT GAS LINE ESCAPED TO OCEAN	1048241
6/06/13	ELLEN	2 TBSP	0	MINOR RELEASE FROM ELLEN WELLBAY DRAIN HOSE	1049535
11/12/13	ELLY	15-20 drp		4" SUMP LINE MISSING GASKET FOLLOWING MAINTENANCE ALLOWED DROPS OF OIL TO BE RELEASED TO OCEAN. REPAIRED. NO RESPONSE NEEDED.	1065578
		5 GAL			
01/28/14	ELLEN			RESIDUAL OIL FROM 6" SUMP LINE UNDERGOING DEMOLITION LEAKED OUT OVERNIGHT WHEN TEMPORARY PLUG WAS PULLED OUT BY HIGH TIDE AND ROUGH WATER. MSRC RESPONSE USED.	1072312
		1 TSP.			
02/03/16	EUREKA			OIL DRIPPED FROM A PINHOLE IN DRAIN PAN INTO OCEAN	1139670

H.2.2 Risk and Hazard Analysis

The risk and hazard analysis for the Beta (San Pedro Bay Pipeline Company) Pipeline System was conducted on January 21, 1994, using the "checklist" methodology. The system consists of the 16-inch diameter pipeline from Platform Elly to the Beta Pump Station, the Beta Pump Station including the storage tank, pumps, meters, internal piping, etc., and the three 10-inch delivery lines beginning at the pump station and ending at the THUMS manifold located approximately 1,000 feet from the Beta Pump Station. The system was divided into four subsystems, or nodes, for analysis purposes. The analysis examined each node to determine how much oil could be released and, if released, could it reach the Pacific Ocean.

H.2.2.1 Methodology

The "checklist" analysis technique as described in the American Institute of Chemical Engineers' *Guidelines for Hazard Evaluation Procedures* was utilized to conduct the risk and hazard analysis. A unique Hazard Analysis Checklist was developed and used for each node. A summary of the questions included in the checklists is provided in Table H-1. The checklist form provided for three responses to each question: yes, no, or not applicable. In addition, the forms included areas to record information such as production flow rate, vessel capacity, and component throughput. The four components listed earlier were analyzed separately and are referred to as nodes.

The risk and hazard analysis was conducted at Anaheim, California on January 21, 1994. **Mr. Greg Meisinger** of CalResources (later became Aera Energy LLC) served as the team leader during the analysis exercise. Mr. Meisinger, at the time of the analysis, had over 12 years of experience in facilities engineering and health, safety, and environmental issues, and had participated in previous hazard and operability studies (HAZOPs). Other participants in the January 21 analysis, together with their pertinent experience, are listed below.

- **Mr. John Fanta** was a Staff Facilities Engineer for CalResources. He is a registered Professional Mechanical Engineer in the State of California with over 19 years of experience in the oil and gas industry.

- **Mr. Larry Alexander** was the West Coast Area Technical Supervisor for Shell Pipe Line Corporation. He is a Professional Engineer and has 14 years of pipeline experience.

- **Mr. John McCain** had over 25 years of experience with Shell in operations and maintenance of warehouses and pipelines. Experience included the Los Angeles Terminal and Anaheim Control Center.

- **Mr. Don Herman** was an Operations Foreman for the West Coast Division of Shell Pipe Line Corporation. He had over 13 years of experience with pipeline construction, corrosion control, measurement, and regulations.

- **Mr. Tim Chambers** of Reese-Chambers Systems Consultants, Inc. had over 14 years of experience conducting risk and hazard analyses and had served as team leader for the conduct of nine previous HAZOPs. Mr. Chambers' role was to assist the team leader and to document the results for inclusion in the spill plans.

In conducting the risk and hazard analysis, each node was analyzed using the Hazard Analysis Checklist. Each question was discussed and the answer verified. Whenever the answer to one of the questions indicated that a release could foreseeably reach the ocean, an Oil Spill Prevention and Response Hazard Analysis Worksheet was filled out. A copy of this worksheet is included as Figure H-1.

The probability of the incident resulting in an uncontained oil spill and the amount of oil that could be released was then estimated. The appropriate box in Chart 1 of the worksheet was then checked. The probability of an uncontained oil spill was estimated to be either Probable, Potential, or Unlikely. The estimated size of the spill was put in one of three sizes: less than 1 bbl, between 1 bbl and 250 bbls, and greater than 250 bbls. A potential release falling outside the shaded area in Chart 1 was not considered to require mitigation. A potential release falling in the shaded area was considered a potential candidate for further mitigation. A final determination of the necessity for further mitigation was made based on the results obtained by completing Chart 2.

Chart 2 of the worksheet was filled out for each incident. Chart 2 was used to estimate the probability that the spill could actually reach the ocean. This risk was broken down into the following four categories: Probable, Potential, Unlikely, and Very Unlikely. A potential release falling in the shaded area of this chart was considered a candidate for further mitigation.

Table H-1. Summary of Questions in Hazard Analysis Checklists.

A. GENERAL

1. Does the component overhang or come into contact with tidal waters?

B. DESIGN

1. Do the wells free flow?
2. Is the wellhead rating appropriate?
3. Are there sufficient valves to isolate the component?
4. Is the component fabricated out of appropriate material?
5. Does the component have adequate local containment?
6. Does the component have adequate regional containment?
7. Does the component have a high pressure shutdown?
8. Does the component have a high level shutdown?
9. Does the component have a high level alarm?
10. Does the component have a high pressure alarm?
11. Does the component have a proper pressure relief valve?
12. Where does the pressure relief valve go?
13. Is the relief valve processing equipment properly designed?
14. Is the component constructed of proper material?
15. Does the component/containment have a drain?
16. Where does the drain go?
17. Is the drain processing equipment adequately designed?
18. Does the component have leak detection?

C. ACTS OF GOD

1. Does the weather pose a hazard?
2. Is the component appropriate designed for earthquakes?

D. HUMAN ERROR

1. What happens if a valve is inadvertently opened?
2. What happens if a valve is inadvertently closed?
3. Is the component adequately protected from mechanical damage?
4. Does maintenance/servicing represent a risk of spill?
5. Are personnel adequately trained in the operation/maintenance of the component?
6. Is there adequate surveillance of the component?

E. MECHANICAL FAILURE

1. What happens if the component fails/rupture?
2. Does the component instrumentation failsafe on power failure?
3. Does the component instrumentation failsafe on instrument air failure?

F. CORROSION

1. Is the component adequately protected from corrosion?

G. OTHER

1. Is the component adequately protected from fire?
2. Is the component adequately protected from vandalism?
3. Are there any other hazards?

Figure H-1. Hazard Analysis Worksheet.

DATE:

HAZARD ANALYSIS SHEET ID:

FIELD LOCATION:

FACILITY ID:

EQUIPMENT ID:

RISK ID:

RISK DESCRIPTION:

CHART 1

PROBABILITY OF UNCONTAINED OIL

	<1	1+	>250
PROBABLE			
POTENTIAL			
UNLIKELY			

Barrels

CHART 2

PROBABILITY OF OIL REACHING TIDAL WATERS

	<1	>1 but <10	>10 but <250	> 250
PROBABLE				
POTENTIAL				
UNLIKELY				
VERY UNLIKELY				

Barrels

Reasonable Risk to be addressed in risk & hazard analysis

RATIONALE FOR RISK CLASSIFICATION:

RECOMMENDATIONS TO REDUCE RISK:

REACTION TIME:

SPILL VOLUME:

REVIEWERS:

H.2.2.2 Inventory of Hazards Identified

Potential hazards were identified during the conduct of the risk and hazard analysis that were classified as having a Probable, Potential, or Unlikely probability of one or more barrels of oil reaching tidal waters. Each of these is discussed below.

- **Returning storage tank to service –** The inlet and outlet valves on the storage tank are chained and locked open to prevent accidental closure during routine operations. However, it is possible, though very unlikely, that one or both of the valves could be inadvertently left closed upon restarting the system after returning the tank to service after it has been shut down for maintenance. In this case, the Platform Elly shipping pumps would briefly pump against a closed system before shutting down on high pressure at 1,300 psig. This could result in pressures in excess of the 280 psig rating of the ANSI #150 valves and flanges, thereby causing a leak. The tank is located in a secondary containment system that can contain 140 percent of the tank volume.

- **Power failure** – The level in the tank is monitored 24 hours a day by the Elly Control Room Operator. The tank instrumentation fails "as is" on power failure and thus an overfilling of the tank could go undetected during a power failure. Again, the tank is located in a reinforced concrete containing wall.

- **Leak or rupture in the offshore pipeline** – The amount of any release from the offshore pipeline in the event of a leak or rupture is a function of the amount of time required to close the platform shutdown valves.

H.2.2.3 Mitigation Plan

Although no significant hazards were identified that could result in oil reaching marine waters, the following measures were recommended to mitigate the Very Unlikely events described above. All of these mitigation measures were implemented by the listed completion date.

- **Returning storage tank to service –** A procedure should be developed to ensure that the tank inlet and outlet valves are chained and locked open prior to re-start of the system to ensure that the line is not overpressured.

  Mitigation completion date: 9/1/94

- **Power failure** –Operating procedures should be reviewed to ensure that the system is not operated during power failure for any period of time longer than that which would result in an overfilling of the tank, assuming the tank was operating at the high level shutdown level in the tank.

  Mitigation completion date: 9/1/94

- **Leak or rupture in the offshore pipeline** – A training program for the operators should be conducted to emphasize that, in the event a leak is detected, it is essential to close the platform and onshore shut-in valves as quickly as possible after shutting down shipping pumps to minimize the volume of oil released from the line.

Mitigation completion date: 9/1/94

H.2.3 Remaining Risk

For oil to reach marine waters, two things must happen: (1) oil is released, and (2) it flows to marine waters. The risk and hazard analysis addressed each system component that could potentially release oil, identified what type events (e.g., material failure, operational error) could lead to a release, and estimated how much oil could be released. The analysis then addressed where the released oil would flow, whether it would be contained by local and/or regional containment, and how much, if any, could reach marine waters. Based on this analysis, mitigation measures were recommended as appropriate. These measures either addressed reducing the potential for a spill (e.g., equipment additions, operational procedures) or preventing the spill from reaching marine waters. While it is believed that the risk of oil reaching marine waters has been mitigated to the maximum extent feasible, it is impossible to entirely eliminate this possibility. Thus, reasonably foreseeable worst case spill volumes for each facility component were calculated and recorded on the Hazard Analysis Sheets. The largest reasonably foreseeable worst case spill that could potentially reach marine waters has been used to define the remaining risk and to drive the spill response planning effort. The assumptions presented below were used in determining the reasonable worst case spills for each of the facility components. It is emphasized here that the probability of spills of this magnitude occurring and reaching marine waters is extremely remote.

Pipelines

The total amount of oil that can be released from the offshore and onshore pipelines was calculated as the sum of the following three factors:

- The volume of oil released prior to detection of a leak.
- The volume of oil released during the response time required to shut-in the line.
- The volume of oil that drains from the line after shut-in.

The volume of oil released prior to detection of a leak was calculated considering the sensitivity of the pipeline monitoring system in detecting volume, flow, and pressure deviations. The volume of oil that can be released during the response time required to shut-in the line was calculated by multiplying the maximum flow rate expected by the length of the response time. The volume of oil that can drain from the offshore pipeline after shut-in was calculated considering hydraulic forces of the seawater column above the rupture point. The volume of oil that can drain from the onshore pipeline was assumed to be the volume of the pipeline since there are no mitigating hydraulic forces.

Tanks

The worst case spill from a tank was based on the catastrophic failure of the tank. The worst case spill volume of the tank was assumed to be the maximum oil volume contained in the tank during normal operation. In addition, the oil throughput of the tank was multiplied by the number of hours between surveillance tours. This volume of oil was then added to the oil contained in the tank to determine the reasonable worst case spill. If more than one tank performed the same function and the multiple tanks were normally operated in parallel, the combined volumes of the tanks were used to calculate the reasonable worst case spill.

If a tank did not have a containment berm with a volume equal to 110 percent of the tank volume, the volume of the reasonable worst case spill was considered to be the oil volume of the tank and the tank throughput as discussed above. In most cases, if the tank had a containment berm with a volume greater than or equal to 110 percent of the tank volume, the berm was considered to contain 75 percent of the tank volume. This deration of the containment volume is a conservative estimate to account for fluid splashing over the side of the berm and any potential deterioration in the berm. If the tank was located in a reinforced concrete containment system capable of containing the tank volume plus the tank throughput multiplied by the number of hours between surveillance tours, then it was assumed that the worst case spill could be contained and no oil could reach tidal waters. However, if the release
could overflow the containment area before being detected by surveillance, then the worst case spill is assume to be the amount of oil that could overflow the containment prior to isolating the tank.

H.2.4 Worst Case Spill Calculations

The worst case spill calculations for the system pipelines and tank are presented below.

Pipelines

In accordance with the methodology described in Section H.2.3, the worst case release from the 16" San Pedro Bay Pipeline has been calculated to be 3,111 bbls of oil. The details of the calculations are contained in a report Attachment H-1 located at the end of this Annex.

The worst case spill calculations for the 16" pipeline, the piping at the pump station, and the delivery lines are presented below.

- **16-inch pipeline from Platform Elly to the Beta Pump Station** - The worst case spill has been calculated to be 3,111 bbls of oil. The details of the calculations, which were revised in February 1999, are contained in the above mentioned studies.

- **Pump Station Piping –** The worst case spill calculations assume that a leak is detected in two minutes, and the throughput is 7,000 BOPD. This equates to a spill of 10 bbls, which would most likely be contained by onsite curbing.

  (7,000 BOPD / 24 hours / 60 minutes) * 2 minutes = 10 bbls

- **Delivery lines –** There are three lines, all approximately 1,000 feet long and 10 inches in diameter. Based on current production, the maximum throughput of each of the lines is 2,800 BOPD at a pumping rate of 810 barrels per hour (BPH); a rupture would be detected by the leak detection system within 5 minutes and the pumps will be shut-in. Thus, the worst case spill would be:

  800 BPH / 60 min/hr x 5 min + 1,000 feet x 0.09 bbl/ft = 156.6 bbls

Tanks

The worst case spill from the storage tank was determined to be 0 bbls of oil (see discussion below). This was calculated in accordance with the methodology described in Section H.2.3 as follows:

- The maximum throughput to the tank is 7,000 BOPD.
- The volume of the tank is 10,000 BOPD.
- The capacity of the containment area is 14,000 BOPD. It is a reinforced concrete containment system capable of containing the tank volume plus an additional 13 hours of throughput.
- The tank is equipped the following safety controls that are monitored 24 hours a day by the control room.

  Level monitors - these show the Platform Elly control room operators the level of oil in the tank. This is monitored to see when to start and stop shipping through one of the 10-inch sales line. In the event of a tank failure the level of oil inside the tank will decrease. This unexplained decrease in oil level will cause the automatic control system to shut the pump in at the Platform and personnel will be activated to investigate the situation.

  Tank High Level Switches – If the level gets too high, the 16” pipeline from Platform Elly will be shut in automatically, and personnel will be mobilized to investigate the situation.

Taking into account the above items and the mitigation plans referenced in Section H.2.2.3, the worst case discharge would be 0 bbls that could reach marine waters from the tank.

DOT/PHMSA required a 3000 bbl prescribed worst case discharge calculation for the tank (refer to Section A.7.5.7)

Therefore, as earlier addressed in Annex H.2.3, the largest reasonably foreseeable worst case spill that could potentially reach marine waters for OSPR calculations is 3,111 bbls of oil from the 16” San Pedro Bay Pipeline from Platform Elly to the Beta Pump Station. As described in the report, the likelihood specific of a full guillotine pipe break at the point where 3,111 barrels could be released (based on science and engineering calculations) is almost nil in real world application.

Note: In 2016, Beta Offshore retained Risk Management Professionals, Inc. to identify the risks posed in the Port of Long Beach, Gerald Desmond Bridge Replacement Project, and the proximity of the new ramps to Beta Pump Station Facility. The Gerald Desmond Bridge Replacement

Project will widen and relocate the southern ramp, and add a second elevated ramp to the facility's northern boundary, greatly increasing the exposure of the facility's process equipment and piping to impacts from falling debris from the ramps. Therefore, a high level risk assessment was commissioned to determine the acceptability of the risks posed by the changes and addtions to the ramp configuration. The results were presented to the Port of Long Beach after the assessment was completed.

H.2.5 Documentation

The documentation and materials (drawings, diagrams, plot plans, etc.) used in the risk and hazard analysis are maintained in the Company office in Long Beach, California. The point of contact and address are:

Diana Lang
HSE Manager
Beta Offshore
111 W. Ocean Blvd, Suite 1240
Long Beach, CA 90802

(562) 628-1526

H.3 PHMSA

The 16-inch pipeline between Platform Elly and the Beta Pump Station is a DOT PHMSA-regulated pipeline with the response plan requirements presented in 49 CFR 194. The regulations require the calculation of the worst case discharge, which is 3,000 bbls. The methodology used to determine the worst case discharge is contained in Section A.7.5.6. and is consistent with DOT/PHMSA requirements.

H.4 Worst Case Discharge Analysis

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ATTACHMENT H-1

WORST CASE DISCHARGE ANALYSIS

EQUILON
ENTERPRISES LLC
Shell & Texaco Working Together

02/03/99

Mr. Steve S. Shehorn
Aera Energy LLC
5060 California Avenue
Bakersfield, CA
93309

(Reference appropriate Service Agreements between our companies)

Dear Steve:

Per your recent request to Westhollow Technology Center, we have reviewed the data relative to the worst case spill scenario for the Beta pipeline. Drs. Moye Wicks and Bela James reviewed the historical information, and recalculated the worst case. Based on their assumptions and calculations, they have estimated that the worst case would occur if a break/leak occurred approximately three miles from the platform. In this case, it is estimated that up to 3111 barrels (2985 from this study, plus 126 barrels estimated in the original Shell Civil Engineering report) could be lost. It should be noted that this worst case location is in federal waters (i.e., beyond the 3 mile limit), at a depth of approximately 120 feet, and in the vicinity of the northbound shipping fairway (i.e., coastwise traffic lane) where anchoring would not normally occur.

As the pipeline gets closer to shore, the potential volumes lost due to pipeline leakage would decrease. This is due to the decreasing oil temperature and pipeline slope, and the increasing oil viscosity. The attached report includes the assumptions and calculations used to generate this revised worst case spill estimate for the Beta pipeline.

If you have further questions regarding these estimates, please contact me.

Sincerely,

Jim Ray

James P. Ray, Manager
Environmental Sciences

Cc: F. Cummings
L. Miller
M. Steube
C. Williamson (BreitBurn)

Westhollow Technology Center
Environmental Sciences
3333 Highway 6 South
Houston, TX 77082-3101

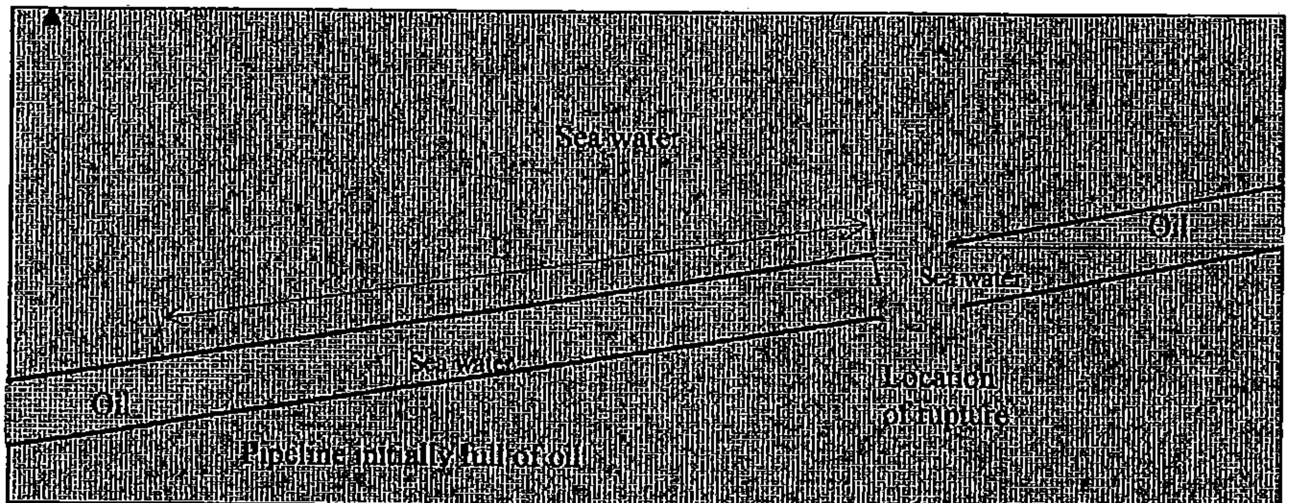
Attachment 1

Summary of Calculated Results for Cases Considered

Background

The Beta pipeline connects Platform Elly to the California coast receiving facilities near Long Beach via a 16" pipeline 17.3 miles in length through San Pedro Bay. About 10.9 miles of the pipeline runs along the ocean floor. 4.4 miles are buried 15 ft below the ocean floor, and the remaining 2 miles are onshore. The platform base rests in 265 ft of water. An analysis was requested of how much oil would leak out of the pipeline in the event of a pipeline rupture. Oil level in the tanks on the platform is at an elevation of some 45 ft above sea level, so when the pumps are stopped and before the shut-off valves are closed, there is a period of time when oil pressure in the line exceeds the local static pressure of seawater. An earlier study[1] made an estimate of the oil volume lost from an underwater leak during this period. The volumes quoted here should be added to those found in the earlier study. I address here other events which will happen, illustrated in the sketch below:

Sea Level



Water begins falling into the pipe, displacing the less dense oil up-slope, into the ocean. Oil in the pipe on the uphill side of the break is not lost, with the exception of a small amount equal to that pushed out of a one diameter slice, as illustrated above. S~~ee the sequence of photographs in Figure 1 which were taken in this laboratory to help visualize leakage from an underwater pipelin~~e.

Eventually all of the oil down slope between the break and the location of the first bend, of height equal to one diameter or more, will leak out into the water. The Beta pipeline contains about 1/5 barrel of oil per foot of length, or 1,051 barrels per mile. In the entire line, there are 18,180 barrels of oil. Estimating leakage rate requires assumptions of where the leak occurs and determination of how fast the oil migrates—the latter, in turn, strongly dependent on the oil's viscosity at pipeline temperature and the local slope near the leak.

Leak Volume Analysis & Results

A model was developed to calculate the speed of oil migration and the fraction of the pipe cross-section oil occupies. With these two quantities, the volumetric flow rate of oil can be calculated. Knowing response time, leak volumes are then calculated. This model is presented in Attachment 2.

The model was used with various premised leak locations and oil temperatures. The results are shown in Table 1. As the table shows, if a leak were to occur anywhere past three miles from the platform, the oil volume leaked will be from 36 to 600 barrels during the 120 hour interval premised for stopping the leak. If the leak is at the base of the platform, the volume leaked will be close to zero, as the oil floats upward on both sides of the leak. If the leak is shore-ward from the platform, the oil on the platform side of the leak will float in the pipe toward the leak; the oil on the shore side of the leak will try to float, but it has no place to escape. Close to the platform, the oil is still hot and has greater mobility. Maximum leakage volume would occur if a leak happened to be at a distance of three miles from the platform: we estimate 2985 barrels would escape during the 120 hour interval in that instance.

Summary of Computed Results

Leak's Distance From "Elly" Ft	Local Oil Temp. Deg F	Oil Viscosity Mu Cp	Pipe Up-slope Degrees	269.1 Bbl = 3000 Ft Time Hours	Total Bbl Leaked : Convection in 120 Hr.
3000	147.9	223.6	1.489	2.77	597
6000	135.7	346.7	0.347	16.75	1194
9000	125.8	511.3	0.1146	63.13	1791
12000	117.2	735.0	0.347	35.42	2388
15000	110.2	1004.9	0.2292	69.78	2985
18000	104.1	1345.7	0.1146		207
21000	98.8	1749.2	0.347	84.18	597
24000	94.4	2200.7	0.2292		218
27000	90.4	2720.3	0		65.1
30000	86.9	3311.2	0.1146		103.3
33000	83.9	3930.5	0.2292		132.9
36000	81.3	4567.3	0.1146		82.1
39000	78.8	5326.5	0.2292		103.8
42000	76.7	6112.5	0		43.8
45000	74.8	6929.5	0.1146		61.2
48000	73.1	7758.6	0		38.3
51000	71.6	8577.2	0		36.4

Table 1
Summary of Computed Results

Attachment 2

Summary of Analysis of Leak Rate From an Underwater Pipeline

Consider the sketch in Attachment 1. Call the average flow velocity in the oil (upper) phase V_U, and that in the water (lower) phase V_L. Consider the water phase inside the pipe and the forces acting on it. The mass of the water phase is m_L, its density is ρ_L and its cross-sectional flow area is A_L. The sum of the forces acting on the water is equal to its time rate of change of momentum, according to Newton's law of motion:

$$\sum F = \frac{1}{g_C}\frac{d}{dt}(m_L V_L)$$

Water mass inside the pipe is related to its density, cross sectional area (which is constant as discussed below), and length L:

$$m_L = \rho_L A_L L$$

Substitution above shows:

$$\sum F = \frac{\rho_L A_L}{g_C}\frac{d}{dt}(L V_L)$$

The forces acting on the water are due to:

- Pressure difference $(P_1 - P_2) A_L$ from the water entry to its distance of penetration L,
- Shear stress resistance $\tau_W P_L L$ at the pipe wall, where P_L is the wall perimeter in contact with water,
- Shear stress resistance $\tau_I P_I L$ at the interface, where P_I is the chord length of the oil/water interface, and
- Interfacial tension of the oil/water/steel contact line.

The Individual Forces

Pressure difference across the water phase inside the pipe is due to hydrostatic pressure differences, at the low velocities of interest here:

$$(P_1 - P_2) = (\rho_L - \rho_U)\frac{g}{g_C}\left(\frac{h}{Cos\,\theta} + L\,Sin\,\theta\right)$$

where h is the thickness of the lower phase in the pipe, and θ is the pipe's angle of inclination.

Shear stress at the wall is expressed as the product of friction factor f_L and the kinetic energy of the flow:

$$\tau_{WL} = \frac{f_L}{4}\frac{\rho_L V_L^2}{2 g_C}$$

(The 4 in the denominator is associated with the Moody friction factor definition.) In our case, the flows are all in the laminar range where f_L is given by:

$$f_L = \frac{64}{\left(\dfrac{D_{EL} V_L \rho_L}{\mu_L}\right)}$$

which gives the following for shear stress at the wall in the lower phase:

$$\tau_{WL} = \frac{8\mu_L V_L}{g_C D_{EL}}$$

where D_{EL} is the equivalent diameter pipe, defined as that which gives the same wall shear stress at the same flow velocity for the same fluid. D_E is calculated as 4 times the area of flow divided by the wetted perimeter[2]. These values are related to the height of the lower liquid phase and the diameter of the pipe by the following formulas:

$$A_L = R^2\left[ArcCos\left(1-\frac{h}{R}\right)-\left(1-\frac{h}{R}\right)\sqrt{1-\left(1-\frac{h}{R}\right)^2}\right]$$

$$P_L = 2R\left[ArcCos\left(1-\frac{h}{R}\right)+\sqrt{1-\left(1-\frac{h}{R}\right)^2}\right]$$

Interfacial shear stress or drag of the upper phase on the lower is given similarly, by:

$$\tau_{IL} = \frac{8\mu_U(V_U+V_L)}{g_C D_{EU}}$$

where the sum of the velocities is used since the two phases are in countercurrent flow.

Interfacial tension force at the lower end of the water phase is the interfacial tension σ multiplied by the interface's radius of curvature, assumed to be the pipe radius R. The interfacial tension force is thus $\sigma * R$.

Conservation of Volume in the Pipe

An additional requirement is that the net volumetric flow of water into the pipe must just balance that of the oil outflow:

$$V_L A_L = V_U A_U$$

Interfacial height of the lower phase h must be specified in order to solve these equations for velocity V_L at various values of length L. We will assume that, during the interval before the entering water reaches the nearest bend, layer thickness is constant, consistent with visual observations noted in Figure 1. Although no measurements were made in these tests, the layers appeared to divide the flow region nearly equally, with an impression that the lower phase was slightly thicker.

Benjamin[3] analyzed this problem for the case of ideal (frictionless) fluids. The velocity and height of the lower phase from his analysis are given by the formulas:

$$V_L = 0.767\sqrt{\frac{\Delta\rho}{\rho}\,g\,R}$$

$$h = 1.154\ R$$

for slope angles near horizontal. We will use these relations in our solution. The V_L formula, we believe, applies for the very early times of migration before the viscous forces become active; consequently we use this relationship as the initial condition for V_L, i.e., in the first increment of penetration length, and allow the equations and their numerical solution to determine all subsequent values.

Consistent with Benjamin's analysis and experiments of Zukoski[4] with (mostly) gas and liquid flowing counter-currently, we use h given above as constant throughout the entire length of pipe. Physical evidence from our own tests (see Figure 1) showed this to be a good assumption until the lower phase reached the bottom end of the pipe. After this, the upper phase continued to thin as it leaked out from the pipe break, and the lower phase became thicker. For our application, this will not happen in the 120 hour window of interest unless the leak occurs near the platform's base.

Solution for Phase Velocity and Leak Volume

When the above relations are substituted and simplified, the resulting equation is as follows:

$$\frac{d(LV_L)}{dt} = \frac{\rho_L - \rho_U}{\rho_L} g\left(\frac{h}{Cos\theta} + L\,Sin\theta\right) - \frac{8\mu_L P_L L V_L}{\rho_L D_{EL} A_L} - \frac{8\mu_U P_I\left(\frac{A_L}{A_U}+1\right) L V_L}{\rho_L D_{EU} A_L} - \sigma R$$

This equation can be simplified to:

$$\frac{d(LV_L)}{dt} = A + BL - CLV_L$$

by substituting:

$$A \equiv \frac{\rho_L - \rho_U}{\rho_L}\frac{g\,h}{Cos\theta} - \frac{\sigma R g_C}{\rho_L A_L} \qquad B \equiv \frac{\rho_L - \rho_U}{\rho_L} g\,Sin\theta$$

$$C \equiv \frac{8}{\rho_L A_L}\left[\frac{\mu_L P_L}{D_{EL}} + \frac{\mu_U P_I\left(\frac{A_L}{A_U}+1\right)}{D_{EU}}\right]$$

The time derivative of LV_L is:

$$\begin{aligned} \frac{d(LV_L)}{dt} &= L\frac{dV_L}{dL}\frac{dL}{dt} + V_L\frac{dL}{dt} \\ &= LV_L\frac{dV_L}{dL} + V_L^2 \end{aligned}$$

which, when substituted above gives:

$$LV_L\frac{dV_L}{dL} + V_L^2 = A + BL - CLV_L$$

It is possible to solve this equation numerically for V_L as a function of L using, for example, the Runge-Kutta[5] formulas. In the case at hand this is not necessary, however, since we are not interested in the very early part of the leak where V is changing rapidly with L, but rather in the long-time region where V changes very slowly with L. Consequently, we may drop the derivative term and solve the quadratic directly for V at assigned values of L:

$$V_L^2 + CLV_L - (A + BL) = 0$$

The solution is as follows:

$$V_L = \frac{1}{2}\left[-CL + \sqrt{(CL)^2 + 4(A + BL)}\right]$$

with A, B, and C defined above. This formula was coded into an Excel spreadsheet and the results plotted for various values of fluid properties and pipe size. Typical results are shown in Figure 2 and Table 2. Results showed clearly that the choice of temperature has a profound effect on volume leaked because of the steep dependence of oil viscosity on temperature. It is therefore very important to choose the correct temperature.

Oil Temperature

Oil leaves the platform at a temperature in the neighborhood of 165 degrees F, and arrives to shore facilities at about 66 degrees F, having cooled substantially during its passage through the cold waters of San Pedro Bay. At the point of the leak, oil temperature depends on the cumulative amount of cooling which has taken place. (We need not be concerned with the variability of oil temperature while the leak occurs, since the distance oil moves during the maximum time of 120 hours to repair the leak is relatively short.) We will use the results of a rather thorough analysis by V. R. Kruka[6] of heat loss and resulting temperature profile. His results are reproduced in Table 3 and Figure 3.

Line Slope

The leak might occur anywhere from the platform to shore. Nineteen possible leak points one-thousand yards apart were examined. The temperature at each point was determined from Kruka's study. Corresponding viscosity was read from a careful interpolation of the data table reported in the Shell Civil Engineering study, since these are already in possession of the MMS. Pipe slope was read from line layout and water depth charts belonging to and with the help of Mr. Bela James.

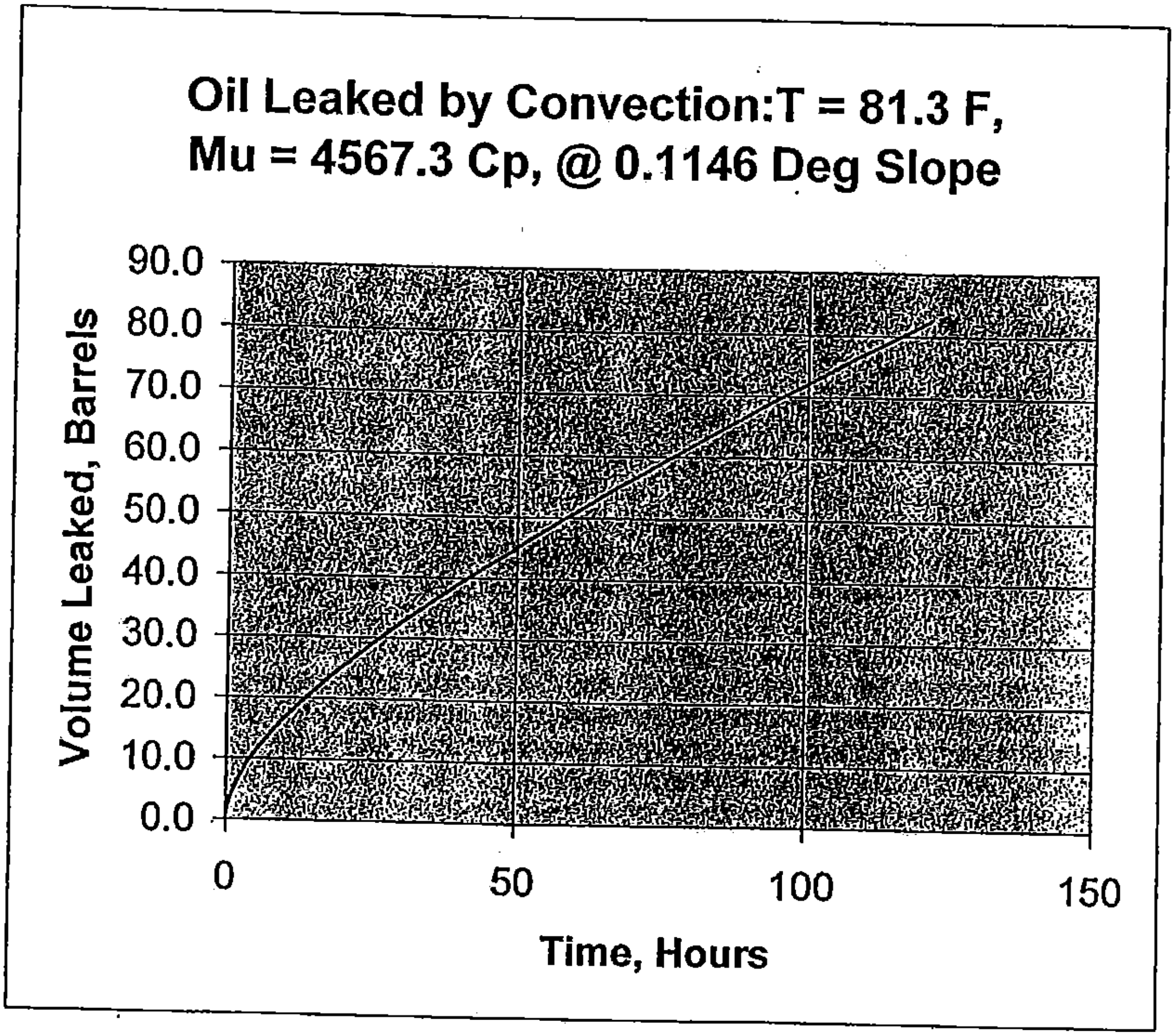


Figure 2
Leakage versus Time at 36,000 Ft from Platform Elly

Table 2
Example of Computed Results at 36,000 Ft from Platform Elly

Inclined Flow Conditions

Constants

Alpha	1.28696	MuU	4567.3 Cp
BetaL	0.000747	K	0.549805
BetaU	2.34001	Const	2.340757
Gamma	0.000902	Theta	0.1146 Degrees
A_11	0.885023		
B_11	0.002574		

X Ft	t Sec	Vinf Ft/Sec	T Minutes	Time Hours	Q Leaked Bbls Oil
0	0		0.0	0	0.0
20	1000	0.0200	16.7	0.28	1.8
40	2896	0.0106	48.3	0.80	3.6
60	5598	0.0074	93.3	1.56	5.4
80	9031	0.0058	150.5	2.51	7.2
100	13129	0.0049	218.8	3.65	9.0
120	17835	0.0043	297.2	4.95	10.8
140	23097	0.0038	385.0	6.42	12.6
160	28873	0.0035	481.2	8.02	14.4
180	35123	0.0032	585.4	9.76	16.1
200	41811	0.0030	696.9	11.61	17.9
220	48908	0.0028	815.1	13.59	19.7
240	56384	0.0027	939.7	15.66	21.5
260	64216	0.0026	1070.3	17.84	23.3
280	72379	0.0025	1206.3	20.11	25.1
300	80854	0.0024	1347.6	22.46	26.9
320	89621	0.0023	1493.7	24.89	28.7
340	98663	0.0022	1644.4	27.41	30.5
360	107966	0.0021	1799.4	29.99	32.3
380	117514	0.0021	1958.6	32.64	34.1
400	127294	0.0020	2121.6	35.36	35.9
420	137295	0.0020	2288.2	38.14	37.7
440	147504	0.0020	2458.4	40.97	39.5
460	157912	0.0019	2631.9	43.86	41.3
480	168509	0.0019	2808.5	46.81	43.1
500	179285	0.0019	2988.1	49.80	44.9
520	190234	0.0018	3170.6	52.84	46.6
540	201346	0.0018	3355.8	55.93	48.4
560	212614	0.0018	3543.6	59.06	50.2
580	224032	0.0018	3733.9	62.23	52.0
600	235594	0.0017	3926.6	65.44	53.8
620	247293	0.0017	4121.6	68.69	55.6
640	259125	0.0017	4318.7	71.98	57.4
660	271082	0.0017	4518.0	75.30	59.2
680	283162	0.0017	4719.4	78.66	61.0
700	295358	0.0016	4922.6	82.04	62.8
720	307667	0.0016	5127.8	85.46	64.6
740	320085	0.0016	5334.7	88.91	66.4
760	332607	0.0016	5543.4	92.39	68.2

780	345230	0.0016	5753.8	95.90	70.0
800	357950	0.0016	5965.8	99.43	71.8
820	370764	0.0016	6179.4	102.99	73.6
840	383669	0.0015	6394.5	106.57	75.4
860	396662	0.0015	6611.0	110.18	77.2
880	409739	0.0015	6829.0	113.82	78.9
900	422899	0.0015	7048.3	117.47	80.7
920	436138	0.0015	7269.0	121.15	82.5

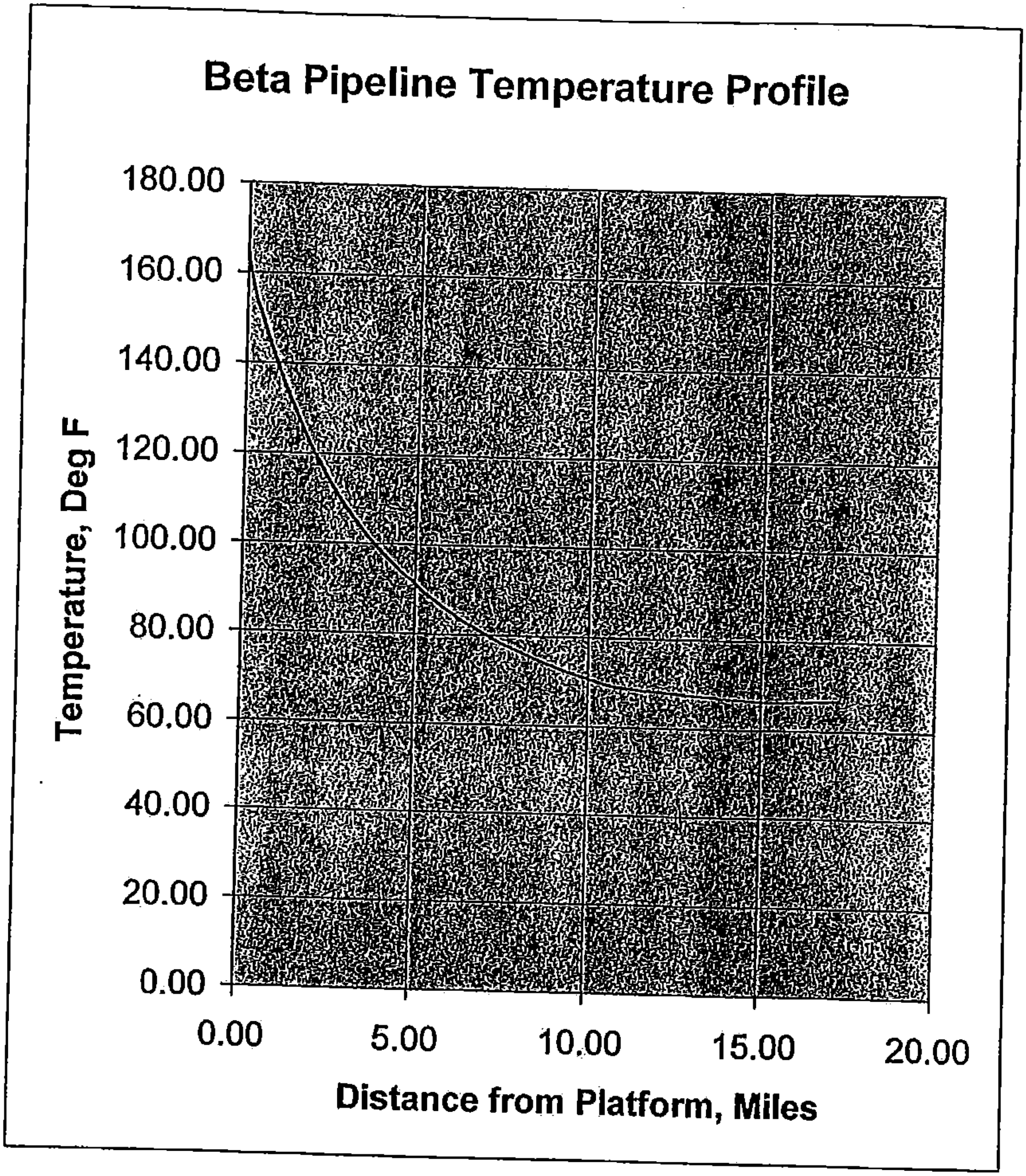


Figure 3
Beta Pipeline Oil Bulk Temperature Profile

Table 3
Beta Pipeline Oil and Wall Temperature Profile

LENGTH (ft)	BULK T (Deg.F)	WALL T (Deg.F)
260	162.23	62.84
520	160.29	60.93
780	158.49	60.19
1040	157.07	68.22
1300	155.70	67.55
1560	154.42	66.49
1820	153.23	65.49
2080	152.12	64.56
2340	150.89	65.78
2600	149.69	55.55
2860	148.51	65.28
3120	147.35	66.03
3380	146.21	64.78
3640	145.09	64.53
3900	143.99	64.30
4160	142.91	64.07
4420	141.84	63.85
4680	140.80	63.65
4940	139.77	63.42
5200	138.76	63.21
5460	137.76	63.01
5720	136.79	62.81
5980	135.82	62.62
6240	134.88	62.43
6500	133.95	62.25
6760	133.03	62.07
7020	132.13	61.89
7280	131.24	61.72
7540	130.37	61.56
7800	129.61	61.39
8060	128.66	61.24
8320	127.83	61.08
8580	127.01	60.93
8840	126.20	60.78
9100	125.40	60.63
9360	124.62	60.49
9620	123.85	60.35
9880	123.09	60.22
10140	122.34	60.08
10400	121.60	59.95
10660	120.87	59.82
10920	120.16	59.70
11180	119.45	59.58
11440	118.76	59.46
11700	118.07	59.34
11960	117.40	59.22
12220	116.73	59.11
12480	116.07	59.00
12740	115.43	58.89
13000	114.79	58.79
13260	114.16	58.68
13520	113.54	58.56
13780	112.93	58.48
14040	112.33	58.38
14300	111.73	58.29
14560	111.15	58.19
14820	110.57	58.10
15080	110.00	58.01
15340	109.43	57.92
15600	108.88	57.83
15860	108.33	57.75
16120	107.79	57.67
16380	107.26	57.5
16640	106.73	57.5
16900	106.21	57.42
17160	105.70	57.34
17420	105.19	57.27
17680	104.70	57.1
17940	104.20	57.1
18200	103.72	57.0
18460	103.24	56.98
18720	102.76	56.91
18980	102.30	56.84
19240	101.84	56.77
19500	101.38	56.70
19760	100.93	56.64
20020	100.49	56.58
20280	100.05	56.51
20540	99.61	56.45
20800	99.19	56.39
21060	98.76	56.33
21320	98.35	56.27
21580	97.93	56.22
21840	97.53	56.16
22100	97.12	56.10
22360	96.73	56.05
22620	96.34	55.99
22880	95.95	55.94
23140	95.56	55.89
23400	95.19	55.84
23660	94.81	55.79
23920	94.44	55.74
24180	94.08	55.69
24440	93.72	55.64
24700	93.36	55.60
24960	93.01	55.55
25220	92.66	55.50
25480	92.32	55.46
25740	91.98	55.41
26000	91.64	55.37
26260	91.31	55.33
26520	90.98	55.29
26780	90.66	55.24
27040	90.34	55.20
27300	90.02	55.16
27560	89.70	55.12
27820	89.39	55.08
28080	89.09	55.05
28340	88.78	55.01
28600	88.49	54.97
28860	88.19	54.93
29120	87.90	54.90
29380	87.61	54.86
29640	87.32	54.83
29900	87.04	54.79
30160	86.76	54.76
30420	86.48	54.73
30680	86.20	54.69
30940	85.93	54.66
31200	85.67	54.63
31460	85.40	54.60
31720	85.14	54.56
31980	84.88	54.53
32240	84.62	54.50
32500	84.37	54.47
32760	84.12	54.44
33020	83.87	54.42
33280	83.62	54.39
33540	83.38	54.36
33800	83.14	54.33
34060	82.90	54.30
34320	82.66	54.28
34580	82.43	54.25
34840	82.20	54.22
35100	81.97	54.20
35360	81.74	54.17
35620	81.52	54.15
35880	81.30	54.12
36140	81.08	54.10
36400	80.86	54.07
36660	80.65	54.05
36920	80.44	54.03
37180	80.23	54.00
37440	80.02	53.98
37700	79.81	53.96
37960	79.61	53.94
38220	79.41	53.91
38480	79.21	53.89
38740	79.01	53.87
39000	78.81	53.85
39260	78.62	53.83
39520	78.43	53.81
39780	78.24	53.79
40040	78.05	53.77
40300	77.86	53.75
40560	77.68	53.73
40820	77.50	53.71
41080	77.32	53.69
41340	77.14	53.67
41600	76.96	53.65
41860	76.78	53.63
42120	76.61	53.62
42380	76.44	53.60
42640	76.27	53.58
42900	76.10	53.56
43160	75.93	53.55
43420	75.77	53.53
43680	75.60	53.51
43940	75.44	53.50
44200	75.28	53.48
44460	75.12	53.46
44720	74.96	53.45
44980	74.81	53.43
45240	74.65	53.42
45500	74.50	53.40
45760	74.35	53.39
46020	74.19	53.37
46280	74.05	53.36
46540	73.90	53.34
46800	73.75	53.33
47060	73.61	53.31
47320	73.46	53.30
47580	73.32	53.28
47840	73.18	53.27
48100	73.04	53.26
48360	72.90	53.24
48620	72.77	53.23
48880	72.63	53.22
49140	72.50	53.20
49400	72.36	53.19

49660	72.23	53.18
49920	72.10	53.17
50180	71.97	53.15
50440	71.84	53.14
50700	71.71	53.13
50960	71.59	53.12
51220	71.46	53.11
51480	71.34	53.09
51740	71.22	53.08
52000	71.09	53.07
52260	70.97	53.06
52520	70.85	53.05
52780	70.74	53.04
53040	70.62	53.03
53300	70.50	53.02
53560	70.39	53.01
53820	70.27	52.99
54080	70.16	52.98
54340	70.05	52.97
54600	69.94	52.96
54860	69.83	52.95
55120	69.72	52.94
55380	69.61	52.93
55640	69.50	52.92
55900	69.39	52.91
56160	69.29	52.91
56420	69.18	52.90
56680	69.08	52.89
56940	68.98	52.88
57200	68.94	61.81
57460	68.90	61.51
57720	68.86	61.50
57980	68.83	61.48
58240	68.79	61.46
58500	68.75	61.44
58760	68.72	61.42
59020	68.68	61.40
59280	68.65	61.38
59540	68.61	61.36
59800	68.57	61.34
60060	68.54	61.32
60320	68.50	61.30
60580	68.47	61.28
60840	68.43	61.26
61100	68.40	61.24
61360	68.36	61.22
61620	68.33	61.20
61880	68.29	61.19
62140	68.26	61.17
62400	68.23	61.15
62660	68.19	61.13
62920	68.16	61.11
63180	68.12	61.09
63440	68.09	61.07
63700	68.06	61.05
63960	68.02	61.04
64220	67.99	61.02
64480	67.96	61.00
64740	67.92	60.98
65000	67.89	60.96
65260	67.86	60.95
65520	67.82	60.93
65780	67.79	60.91
66040	67.76	60.89
66300	67.73	60.88
66560	67.70	60.86
66820	67.66	60.84
67080	67.63	60.82
67340	67.60	60.81
67600	67.57	60.79
67860	67.54	60.77
68120	67.51	60.75
68380	67.47	60.74
68640	67.44	60.72
68900	67.41	60.70
69160	67.38	60.69
69420	67.35	60.67
69680	67.32	60.65
69940	67.29	60.64
70200	67.26	60.62
70460	67.23	60.60
70720	67.20	60.59
70980	67.17	60.57
71240	67.14	60.56
71500	67.11	60.54
71760	67.08	60.52
72020	67.05	60.51
72280	67.02	60.49
72540	66.99	60.48
72800	66.96	60.46
73060	66.93	60.45
73320	66.91	60.43
73580	66.88	60.41
73840	66.85	60.40
74100	66.82	60.38
74360	66.79	60.37
74620	66.76	60.35
74880	66.73	60.34
75140	66.71	60.32
75400	66.68	60.31
75660	66.65	60.29
75920	66.62	60.28
76180	66.60	60.26
76440	66.57	60.25
76700	66.54	60.23
76960	66.51	60.22
77220	66.49	60.21
77480	66.46	60.19
77740	66.43	60.18
78000	66.41	60.16
78260	66.38	60.15
78520	66.35	60.13
78780	66.33	60.12
79040	66.30	60.11
79300	66.27	60.09
79560	66.25	60.08
79820	66.22	60.06
80080	66.20	60.05
80340	66.17	60.04
80600	66.14	60.02
80860	66.16	67.93
81120	66.18	67.95
81380	66.19	67.96
81640	66.21	67.97
81900	66.22	67.98
82160	66.24	67.99
82420	66.26	68.00
82680	66.27	68.01
82940	66.29	68.02
83200	66.30	68.03
83460	66.32	68.04
83720	66.34	68.04
83980	66.35	68.05
84240	66.37	68.06
84500	66.38	68.07
84760	66.40	68.08
85020	66.41	68.09
85280	66.43	68.10
85540	66.44	68.11
85800	66.46	68.12
86060	66.48	68.13
86320	66.49	68.13
86580	66.51	68.14
86840	66.52	68.15
87100	66.54	68.16
87360	66.55	68.17
87620	66.57	68.18
87880	66.58	68.19
88140	66.60	68.20
88400	66.61	68.20
88660	66.63	68.21
88920	66.64	68.22
89180	66.66	68.23
89440	66.67	68.24
89700	66.69	68.25
89960	66.70	68.26
90220	66.71	68.26
90480	66.73	68.27
90740	66.74	68.28
91000	66.76	68.29
91260	66.77	68.30

References

1. Shell Civil Engineering Study, Attachment A, "Engineering Calculations for the Worst Case Spill From the 16-Inch Offshore Beta Pipeline".
2. Taitel, Y. & A. E.Dukler, "A Model for Predicting Flow Regime Transitions in Horizontal & Near-Horizontal Gas-Liquid Flow", A.I.Ch.E. Jour., 22, pp. 47-55 (1976).
3. Benjamin, T. B., "Gravity Currents and Related Phenomena", J. Fluid Mech. (1968), vol. 31, part 2, p. 222.
4. Zukoski, E. E., "Influence of Viscosity, Surface Tension, and Inclination Angle on Motion of Long Bubbles in Closed Tubes", J. Fluid Mech. (1966), part 4, pp. 821-837.
5. Burden, R.L., and J. D. Faires, "Numerical Analysis", 3rd Ed., Prindle, Weber, & Schmidt, Boston, 1985, pp. 225-237.
6. Kruka, V. R., "San Pedro Pipeline Analysis", Shell Development Co., Technical Information Record No. WRC-1027, August, 1985.

1986 Shell Civil Engineering Study Beta Pipeline Release

(superseded by 1999 report by Equilon Enterprises)

DOCUMENT2

ENGINEERING CALCULATIONS FOR THE WORST CASE SPILL FROM THE 16-INCH OFFSHORE BETA PIPELINE

SB 2040 OIL SPILL ANALYSIS
SAN PEDRO BAY PIPE LINE

1.0 INTRODUCTION

The San Pedro Bay Pipe Line is a 16 inch pipe line which runs for 17.3 miles from SWEPI's Platform Elly (located nine miles offshore from Huntington Beach in San Pedro Bay) to Long Beach. Approximately 15.3 miles of the line are located offshore of which 10.9 miles runs along the ocean floor with the remainder buried approximately 15 feet below the ocean floor as the line nears Long Beach. Starting at Platform Elly, the first 6.4 miles of the offshore section of the line are located in Federal waters. The remaining 8.9 miles are located offshore in State of California waters.

This analysis will evaluate the amount of oil that could be released from the San Pedro Bay Pipe Line in the event of a complete rupture of the line at an offshore location. This analysis, in attempt to define worst case spill volume scenarios, will make conservative assumptions where assumptions are required.

In the event of a rupture of the San Pedro Bay Pipe Line, the total amount of oil discharged can be described as follows:

Discharged Volume = Volume of Oil Released Prior to Detection of a Leak
+ Volume of Oil Released During Response Time Prior to Initial Shut In of Line
+ Volume of Oil that Drains from Line After Initial Shut In

An analysis of the oil volumes released during each of these three phases follows.

2.0 VOLUME OF OIL RELEASED PRIOR TO DETECTION

The San Pedro Bay Pipe Line Leak Detection System measures the cumulative differential volume of oil shipped offshore from Platform Elly and received onshore at the Beta Pump Station during a moving sixty minute window. In addition, the system monitors the flow rates measured offshore at Platform Elly and onshore at the Beta Pump Station and compares any difference in these rates. Between these two monitoring systems, the maximum volume that could be released prior to detection is 35 barrels.

3.0 VOLUME OF OIL RELEASED DURING RESPONSE PRIOR TO SHUT-IN

The maximum volume of oil that could be released during the response period prior to initiation of pipe line shut-in procedures after a leak is detected is calculated by multiplying the maximum flow rate expected by the length of the response time. Current forecasts project a peak shipping rate from Platform Elly of 11,000 barrels per day, or 7.64 barrels per minute. Assuming a maximum response time of 10 minutes from first alarm to shut-in, the maximum amount of oil released during the response time is 76.4 barrels.

4.0 VOLUME OF OIL THAT DRAINS FROM LINE AFTER INITIAL SHUT-IN

4.1 General Analysis

Left unabated, oil will drain from the pipe line until the hydraulic forces from the static column of oil above the rupture point are balanced by the hydraulic force of the sea water column above the rupture point. However, during the process of shutting down the shipping pumps and shutting-in the pipe line, the hydraulic equilibrium level that will be assumed by the pipe line will change. The actual shift is between the hydraulic equilibrium level assumed by the pipe line immediately after shutting down the shipping pumps, but before the line is blocked in at both the Platform and onshore, and after the line blocked in both onshore and at the platform. In the initial case, atmospheric pressure acts on both the fluid column causing oil to drain from the line as well as the fluid column above the rupture opposing the drainage of oil from the line. In this case, the atmospheric pressure forces balance each other and need not be considered in calculating the hydraulic equilibrium level that would be assumed by the fluids in the pipe line. In the latter case, the shut-in valves at the platform and onshore seal the fluid column in the piping which causes the oil to drain from the line from atmospheric pressure. However, the fluid column above the rupture opposing drainage is still exposed to atmospheric pressure. Therefore, the atmospheric pressure term creates an additional force opposing the drainage of oil from the pipe line and must be considered when calculating the revised hydraulic equilibrium level assumed once the line is shut-in.

Due to the viscosity of the 13 degree API gravity crude in the San Pedro Bay Pipe Line, the rate of release of the oil draining from the pipe line is relatively slow. As a result, it will be necessary to calculate the amount of oil that would drain from the pipe line at the initial hydraulic equilibrium level to determine what, if any, additional drainage will occur after the line is shut-in and the new hydraulic equilibrium level is established. In addition, depending on the length of time required to reach the revised hydraulic equilibrium level, it may be possible to employ emergency measures to temporarily plug the pipe line at the point of rupture to abate the total amount of oil that drains from the pipe line before hydraulic equilibrium is reached.

We will examine the amount of oil that would be released from the pipe line and the amount of time that it would take for that volume of oil to be released for the following three cases:

1) A rupture at the base of Platform Elly
2) A rupture at the three mile limit between State and Federal waters
3) A rupture immediately prior to the pipe line being buried near Long Beach Harbor

This analysis will require that separate evaluations be made for the pipe line segment on the platform side of the rupture and for the pipe line segment on the shore side of the rupture.

It is estimated that approximately two minutes will be required between shut-down of the pumps and shutting-in the pipe line. We will calculate the length of time required for the line to drain to the initial hydraulic equilibrium and compare that to the two minute shut-in time required. If the initial hydraulic equilibrium level is not reached within the two minute time period, we will calculate the revised hydraulic equilibrium level and calculate what, if any additional oil will be released while reaching this level and how long it will take for this to occur.

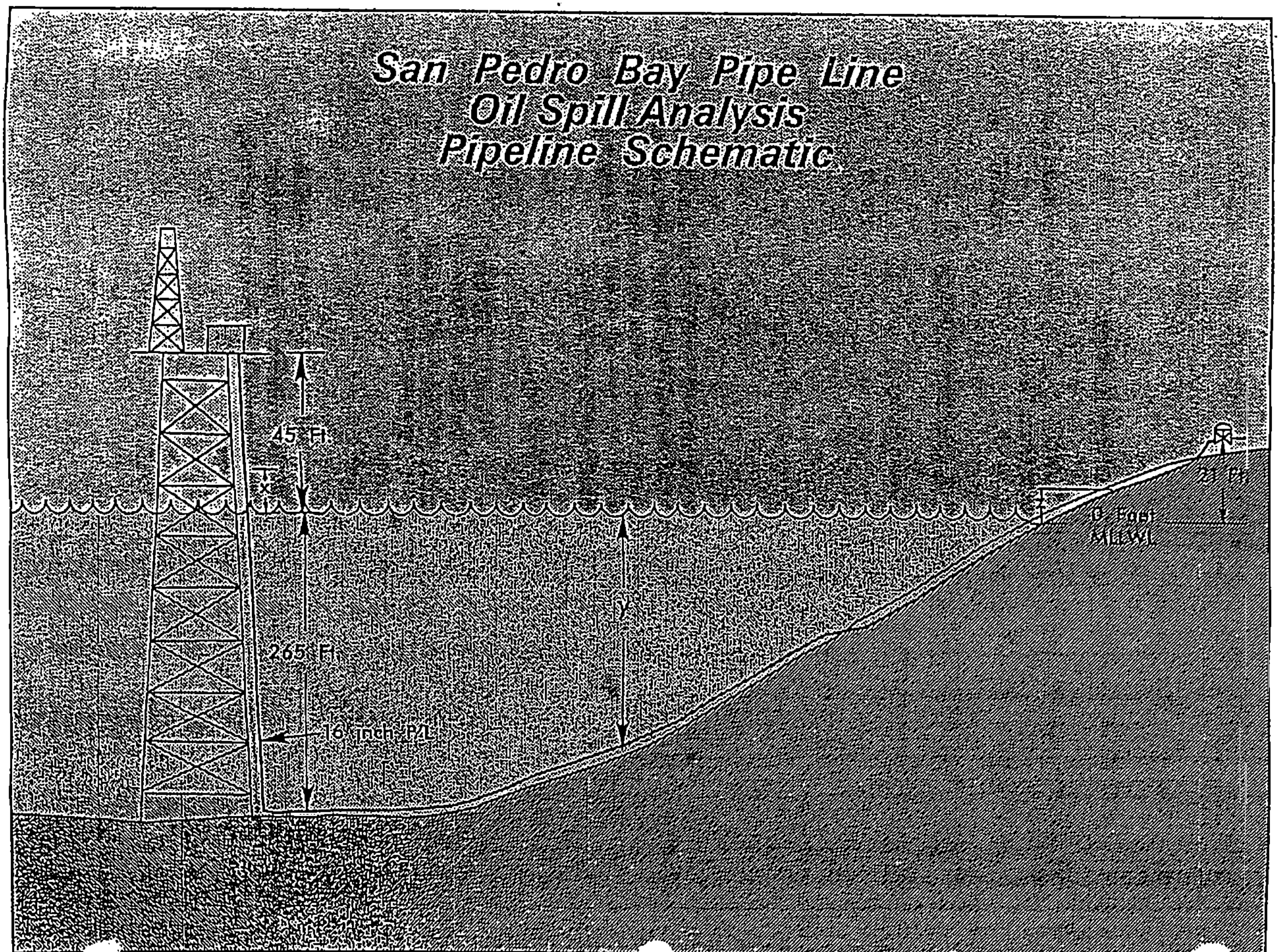
As mentioned previously, it is possible that oil will drain so slowly from the line while reaching the revised hydraulic equilibrium level, that emergency abatement measure can be implemented to stop the release of oil before the revised hydraulic equilibrium level is reached. Given the time required to develop temporary abatement plans, obtain the necessary agency approvals to implement the temporary abatement plans, mobilize response crews, and implement the abatement procedures, it is estimated that the pipe line would continue to drain for up to five days (120 hours) before abatement efforts could be implemented to stop oil drainage from the line. Therefore, all estimates of oil drainage from the line will be curtailed after 120 hours of line drainage if the line has not reached its revised hydraulic equilibrium level.

In developing the hydraulic equilibrium equations for the pipe line segments in the three identified cases, the following variables will be used:

Let y = depth from 0 feet MLLWL to ocean floor at any point above pipe line
Let x = height of pipe line riser at platform above 0 feet MLLWL to which oil will drain before reaching hydraulic equilibrium
Let z = vertical height of pipe line at shore above 0 feet MLLWL to which oil will drain before reaching hydraulic equilibrium

4.1 Baseline Data

Fresh Water at 60 degrees F.:	1 foot of head = 0.434 psi S.G. = 1.0
13 degree API Gravity Oil:	1 foot of head = 0.425 psi S.G. = 0.9792
Sea Water:	1 foot of head = 0.443 S.G. = 1.02 (conservative, some values are listed as 1.03)
Depth of Water at Platform:	-265 feet MLLWL



San Pedro Bay Pipe Line
Oil Spill Analysis
Pipeline Schematic
45 Ft
X
265 Ft
16 inch P/L
Y
21 Ft
0 Feet
MLLW

10488

4.3 Rupture at Base of Platform Elly

4.3.1 Analysis of Platform Segment

Hydraulic forces acting at point of rupture to cause oil to escape:

Oil Column in pipe line riser above 0 feet MLLWL =		0.425 x psi
Oil Column in pipe line from 0 feet MLLWL to Ocean Floor at -265 feet =	(0.425)(265) =	112.625 psi

Hydraulic forces acting to oppose oil from escaping at point of rupture:

Sea Water Column from 0 feet MLLWL to Ocean Floor at Point of Rupture =	(0.443)(265) =	117.395 psi

$0.425x + 112.625 = 117.395$
$0.425x = 4.77$

$x = 11.22$ feet

We can conclude that all the oil downstream from the shut-in valve on Platform Elly to an elevation of + 11.22 feet MLLWL will drain from the line if the rupture is allowed to leak long enough and the platform shut-in valve remains open. Before determining the rate at which the line will drain, we will first calculate the amount of oil released if this segment of line is allowed to drain until the initial hydraulic equilibrium is reached.

Volume of line downstream of the Platform Elly block valve:

100.00 feet - 8 inch, schedule 80	Volume = 5.65 barrels
10.00 feet - 16 inch, schedule 80	Volume = 1.99 barrels
33.78 feet - 16 inch, schedule 80	Volume = 6.72 barrels
TOTAL VOLUME DRAINED IF LINE REACHES INITIAL HYDRAULIC EQUILIBRIUM LEVEL	**Volume = 14.36 barrels**

Since frictional forces are velocity dependent, they will not change the final equilibrium level but will determine how long it takes for the line to drain to the equilibrium level. Frictional forces or pressure drop due to friction for laminar flow can be calculated using Poiseuille's Equation which is given on the next page.

Poiseuille's Equation:

$$\Delta P_{friction} = \frac{0.000668\mu L v}{d^2}$$

where μ = absolute, or dynamic, viscosity in centipoise
L = length of line in feet
v = fluid velocity in feet per second
d = pipe internal diameter in inches

In order to use this equation we must understand the variation of the oil viscosity with temperature. Data for the viscosity of 13 degree API gravity oil over a range of temperatures is given below.

Temperature, degrees F.	Dynamic Viscosity, centipoise
50	39,000
60	19,000
80	4,926
90	2,779
100	1,644
110	1,014
120	650
130	431
140	295
150	208
160	150

Calculating $\Delta P_{friction}$ for the various pipe sections upstream of the rupture at the base of the platform:

The average temperature in the 8 inch, schedule 80 pipe is 160 degrees F. Therefore

$$\Delta P_{friction}\text{ (8 inch, sch. 80)} = \frac{(0.000668)(150)(100)v}{7.625^2}$$

$$= 0.172v \text{ psi}$$

The average temperature in the 16 inch, schedule 80 pipe down to 0 feet MLLWL is 160 degrees F. Therefore

$$\Delta P_{friction}\text{ (16 inch, sch. 80)} = \frac{(0.000668)(150)(55)v}{14.314^2}$$

$$= .027v \text{ psi}$$

The average temperature in the 16 inch, schedule 80 pipe from 0 feet MLLWL to -265 feet is 120 degrees F. Therefore:

$$\Delta P_{friction}\ (16\ \text{inch, sch. }80) = \frac{(0.000668)(650)(265)v}{14.314^2}$$

$$= 0.562v\ \text{psi}$$

Adding the terms for each segment of the pipe line: **$\Delta P_{friction}$ (total) = 0.761v psi**

To determine the amount of time required for the line to reach hydraulic equilibrium, the total frictional pressure drop term must be added to the general hydraulic equation describing the system at any moment:

$$0.425\,x + 112.625 = 0.443y + 0.761v$$

This equation can be approximately solved and value found for v by calculating one foot increments as shown in Table 1 below. While the solution method is somewhat inexact (as it does not account for the frictional resistance resulting from the shear forces acting on the oil as it flows into the water), it does provide a conservative or worst case analysis. As such, the indication that the oil above the initial hydraulic equilibrium level will drain within eleven seconds is somewhat inaccurate. However, it does clearly indicate that essentially all of the oil above the initial hydraulic equilibrium level, 14.36 barrels, would be expected to drain from the piping downstream of the platform shut-in valve before the system assumed a revised hydraulic equilibrium level when the platform shut-in valve is closed and isolates the oil column from atmospheric pressure. Therefore, there is no need to calculate a revised hydraulic equilibrium level.

TABLE 1

[illegible]

[illegible]	[illegible]	[illegible]	VELOCITY	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	VELOCITY	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

4.3.2 Analysis of Shore Side Segment

Hydraulic forces acting at point of rupture to cause oil to escape:

Oil Column in the onshore segment of the pipe line above 0 feet MLLWL = **0.425 z** psi
Oil Column in the pipe line from 0 feet MLLWL to Ocean Floor
at -265 feet = (0.425)(265) = **112.625** psi

Hydraulic forces acting to oppose oil from escaping from pipe line:

Sea Water Column from 0 feet MLLWL to Ocean Floor at -265 feet =
(0.443)(265) = **117.395** psi

$$0.425z + 112.625 = 117.395$$
$$0.425z = 4.77$$

z = 11.22 feet

As before, we can conclude that all the oil from downstream of the shut-in valve located at an elevation of +21 feet MLLWL at the Beta Onshore Station to an elevation of + 11.22 feet MLLWL will drain from the line if the rupture is allowed to leak long enough and the onshore shut-in valve remains open. Before determining the rate at which the line will drain, we will first calculate the amount of oil released if this segment of line is allowed to drain until hydraulic equilibrium is reached. In order to approximate this we will assume that the line has a constant gradient between the Beta Onshore Station and 0 feet MLLWL. As the onshore segment of the pipe line is 1.9724 miles (10,414 feet) long, assuming a constant gradient, the line will decrease one foot in elevation every 495.9 feet. To achieve the 9.78 foot drop in elevation required to reach the hydraulic equilibrium elevation of 11.22 feet MLLWL, it will take 4,850 feet of line. The capacity of this length of line is 1096 barrels. If allowed to drain long enough, this volume would be released at the point of rupture.

Using Poiseuille's equation again, we can calculate the frictional forces in the various line segments on the shore side of the rupture.

The onshore section of line is 16 inch, schedule 30 (0.375 inch wall thickness) and is buried. Because the line is buried the oil temperature in the line is approximately 60 degrees F. Therefore:

$$\Delta P_{friction}\text{ (16 inch, sch. 30, onshore)} = \frac{(0.000668)(19{,}000)(10{,}414)v}{15.25^2}$$

$$= 568.34v$$

The initial offshore segment is 16 inch, schedule 40 (0.500 inch wall thickness) and is buried for a distance of 23,400 feet. The temperature in this segment of line is also 60 degrees F. Therefore:

$$\Delta P_{\text{friction}}\ (\text{16 inch, sch. 40, buried offshore}) = \frac{(0.000668)(19{,}000)(23{,}400)v}{15.00^2}$$

$$= 1{,}319.97v$$

The next segment of the pipe line lays on the ocean floor for 14,421 feet out to the three mile limit between State and Federal Waters. This section of pipe is 16 inch, schedule 40 with an average fluid temperature of 50 degrees F. Therefore:

$$\Delta P_{\text{friction}}\ (\text{16 inch, sch. 40, on bottom offshore}) = \frac{(0.000668)(39{,}000)(14{,}421)v}{15.00^2}$$

$$= 1{,}669.76v$$

The final segment of pipe lays on the ocean floor for 33,416 feet out to Platform Elly. This section of pipe is 16 inch, schedule 80 (0.844 inch wall thickness), with an average fluid temperature of 50 degrees F. Therefore:

$$\Delta P_{\text{friction}}\ (\text{16 inch, sch. 80, on bottom offshore}) = \frac{(0.000668)(39{,}000)(33{,}416)v}{14.314^2}$$

$$= 4{,}248.87v$$

Adding the terms for each segment of the pipe line: $\Delta P_{\text{friction}}\ \textbf{(total)} = 7{,}806.94v$

To determine the amount of time required for the line to reach hydraulic equilibrium, the total frictional pressure drop term must be added to the general hydraulic equation describing the system at any moment:

$$0.425z + 112.625 = 0.443y + 7{,}806.94v$$

This equation can be approximately solved by calculating solutions for v at constant incremental vertical elevation intervals as shown in Table 2 on the next page. Assuming a constant gradient in elevation, the volume of oil in each incremental elevation drop can be calculated and the time to release that volume of oil calculated based on the value of v determined. While the solution method is somewhat inexact (as it does not account for the frictional resistance resulting from the shear forces acting on the oil as it flows into the water), it does provide a conservative or worst case analysis.

TABLE 2
RUPTURE AT PLATFORM
SHORE SIDE SEGMENT

HORIZONTAL DISTANCE OF PIPE DRAINED (FEET)	DISTANCE ABOVE 0 FEET MLLWL (Z – FT)	DEPTH TO POINT OF RUPTURE (Y – FT)	VELOCITY (FT/SEC)	TIME TO DRAIN TEN HORIZ. FEET (SEC)	CUM. DRAIN TIME (HRS)	VOLUME OF PIPE DRAINED (BBLS)	CUM. VOLUME OF PIPE DRAINED (BBLS)
10	21.00	265	0.000532	18789.27	5.22	2.26	2.26
20	20.98	265	0.000531	18828.10	10.45	2.26	4.52
30	20.96	265	0.000530	18867.10	15.69	2.26	6.78
40	20.94	265	0.000529	18906.26	20.94	2.26	9.04
50	20.92	265	0.000528	18945.58	26.20	2.26	11.30
60	20.90	265	0.000527	18985.06	31.48	2.26	13.56
70	20.88	265	0.000526	19024.71	36.76	2.26	15.82
80	20.86	265	0.000525	19064.53	42.06	2.26	18.08
90	20.84	265	0.000523	19104.51	47.37	2.26	20.34
100	20.82	265	0.000522	19144.66	52.68	2.26	22.60
110	20.80	265	0.000521	19184.98	58.01	2.26	24.86
120	20.78	265	0.000520	19225.47	63.35	2.26	27.12
130	20.76	265	0.000519	19266.14	68.70	2.26	29.38
140	20.74	265	0.000518	19306.97	74.07	2.26	31.64
150	20.72	265	0.000517	19347.98	79.44	2.26	33.90
160	20.70	265	0.000516	19389.16	84.83	2.26	36.16
170	20.68	265	0.000515	19430.52	90.23	2.26	38.42
180	20.66	265	0.000514	19472.05	95.63	2.26	40.68
190	20.64	265	0.000512	19513.76	101.05	2.26	42.94
200	20.62	265	0.000511	19555.66	106.49	2.26	45.20
210	20.60	265	0.000510	19597.73	111.93	2.26	47.46
220	20.58	265	0.000509	19639.98	117.39	2.26	49.72
230	20.56	265	0.000508	19682.42	122.85	2.26	51.98
240	20.54	265	0.000507	19725.04	128.33	2.26	54.24
250	20.52	265	0.000506	19767.84	133.82	2.26	56.50
260	20.50	265	0.000505	19810.83	139.33	2.26	58.76
270	20.48	265	0.000504	19854.01	144.84	2.26	61.02
280	20.46	265	0.000503	19897.38	150.37	2.26	63.28
290	20.44	265	0.000501	19940.93	155.91	2.26	65.54
300	20.42	265	0.000500	19984.68	161.46	2.26	67.80
310	20.40	265	0.000499	20028.62	167.02	2.26	70.06
320	20.37	265	0.000498	20072.76	172.60	2.26	72.32
330	20.35	265	0.000497	20117.08	178.19	2.26	74.58
340	20.33	265	0.000496	20161.61	183.79	2.26	76.84
350	20.31	265	0.000495	20206.33	189.40	2.26	79.10
360	20.29	265	0.000494	20251.25	195.03	2.26	81.36
370	20.27	265	0.000493	20296.38	200.66	2.26	83.62
380	20.25	265	0.000492	20341.70	206.31	2.26	85.88
390	20.23	265	0.000491	20387.22	211.98	2.26	88.14
400	20.21	265	0.000489	20432.95	217.65	2.26	90.40
410	20.19	265	0.000488	20478.89	223.34	2.26	92.66
420	20.17	265	0.000487	20525.03	229.04	2.26	94.92
430	20.15	265	0.000486	20571.38	234.76	2.26	97.18
440	20.13	265	0.000485	20617.95	240.48	2.26	99.44
450	20.11	265	0.000484	20664.72	246.22	2.26	101.70
460	20.09	265	0.000483	20711.70	251.98	2.26	103.96
470	20.07	265	0.000482	20758.90	257.74	2.26	106.22
480	20.05	265	0.000481	20806.32	263.52	2.26	108.48
490	20.03	265	0.000480	20853.95	269.32	2.26	110.74
500	20.01	265	0.000478	20901.80	275.12	2.26	113.00
510	19.99	265	0.000477	20949.87	280.94	2.26	115.26
520	19.97	265	0.000476	20998.16	286.77	2.26	117.52
530	19.95	265	0.000475	21046.68	292.62	2.26	119.78
540	19.93	265	0.000474	21095.42	298.48	2.26	122.04
550	19.91	265	0.000473	21144.38	304.35	2.26	124.30
560	19.89	265	0.000472	21193.58	310.24	2.26	126.56
570	19.87	265	0.000471	21243.00	316.14	2.26	128.82
580	19.85	265	0.000470	21292.66	322.06	2.26	131.08
590	19.83	265	0.000469	21342.54	327.99	2.26	133.34
600	19.81	265	0.000467	21392.66	333.93	2.26	135.60
610	19.79	265	0.000466	21443.02	339.88	2.26	137.86
620	19.77	265	0.000465	21493.62	345.85	2.26	140.12
630	19.75	265	0.000464	21544.45	351.84	2.26	142.38
640	19.73	265	0.000463	21595.53	357.84	2.26	144.64
650	19.71	265	0.000462	21646.85	363.85	2.26	146.90
660	19.69	265	0.000461	21698.41	369.88	2.26	149.16
670	19.67	265	0.000460	21750.22	375.92	2.26	151.42
680	19.65	265	0.000459	21802.27	381.98	2.26	153.68
690	19.63	265	0.000458	21854.58	388.05	2.26	155.94
700	19.61	265	0.000456	21907.14	394.13	2.26	158.20
710	19.59	265	0.000455	21959.95	400.23	2.26	160.46

Extrapolating the data from Table 2 on the previous page, it can be seen that approximately 0.6 gallons of oil (0.014 barrels) would have drained from the shore segment of the pipe line before the onshore shut-in valve is closed. As this represents a negligible reduction in the height oil column, we will need to calculate the revised hydraulic equilibrium level to determine what, if any additional oil drainage will occur before the revised hydraulic equilibrium level is reached and how long this will take to occur.

Hydraulic forces acting at point of rupture to cause oil to escape:

Oil Column in the onshore segment of the pipe line above 0 feet MLLWL = $0.425\,z$ psi

Oil Column in the pipe line from 0 feet MLLWL to Ocean Floor at -265 feet = $(0.425)(265) =$ **112.625** psi

Hydraulic forces acting to oppose oil from escaping from pipe line:

Sea Water Column from 0 feet MLLWL to Ocean Floor at -265 feet = $(0.443)(265) =$ **117.395** psi

Atmospheric Pressure acting on Sea Water Column above rupture = **14.7** psi

$0.425z + 112.625 = 117.395 + 14.7$

$0.425z = 19.47$

$z = 45.81$ feet

This level is more than 24 feet higher than the elevation of the onshore shut-in valve. Therefore, once the onshore shut-in valve is closed, no additional oil drainage from the pipe line will occur.

4.3.3 Total Release After Shut In

Platform Segment:	14.36 barrels
Shore Side Segment:	0.01 barrels

Total Release After Shut In: 14.37 barrels

4.4 Rupture at Three Mile Limit

4.4.1 Analysis of Platform Segment

Hydraulic forces acting at point of rupture to cause oil to escape:

Oil Column in the pipe line riser at the platform above 0 feet MLLWL =		0.425 x psi
Oil Column in the pipe line riser at the platform from 0 feet MLLWL to Ocean Floor at -265 feet =	(0.425)(265) =	112.625 psi

Hydraulic forces acting to oppose oil from escaping at point of rupture:

Sea water Column from 0 feet MLLWL to Ocean Floor Depth of y at Point of Rupture =	0.443 y psi
Oil Column in the pipe line from -265 feet to Depth y at Point of Rupture =	0.425 (265 -y) psi

Therefore:

$$0.425x + 112.625 = 0.443y + 112.625 - 0.425y$$

At three mile limit y = 65 feet. Therefore

$$0.425x + 112.625 = 28.795 + 112.625 - 27.625$$

$$x = 2.75 \text{ feet}$$

As we have done previously, we can conclude that all the oil from downstream of the shut-in valve on Platform Elly to an elevation of + 2.75 feet MLLWL will drain from the line if the rupture is allowed to leak long enough and the platform shut-in valve remains open. Before determining the rate at which the line will drain, we will first calculate the amount of oil released if this segment of line is allowed to drain until hydraulic equilibrium is achieved.

Volume of line downstream of the block valve:

100.00 feet - 8 inch, schedule 80	Volume = 5.65 barrels
10.00 feet - 16 inch, schedule 80	Volume = 1.99 barrels
42.24 feet - 16 inch, schedule 80	Volume = 8.41 barrels
TOTAL VOLUME DRAINED IF LINE REACHES INITIAL HYDRAULIC EQUILIBRIUM LEVEL	**Volume = 16.05 barrels**

Using Poiseuille's equation again, we can calculate the frictional forces in the various pipe sections upstream of the rupture at the three mile limit:

The average temperature in the 8 inch, schedule 80 pipe is 160 degrees F. Therefore

$$\Delta P_{friction} \text{ (8 inch, sch. 80)} = \frac{(0.000668)(150)(100)v}{7.625^2}$$

$$= 0.172v \text{ psi}$$

The average temperature in the 16 inch, schedule 80 pipe down to 0 feet MLLWL is 160 degrees F. Therefore

$$\Delta P_{friction} \text{ (16 inch, sch. 80)} = \frac{(0.000668)(150)(55)v}{14.314^2}$$

$$= .027v \text{ psi}$$

The average temperature in the 16 inch, schedule 80 pipe from 0 feet MLLWL to -265 feet is 120 degrees F. Therefore

$$\Delta P_{friction} \text{ (16 inch, sch. 80)} = \frac{(0.000668)(650)(265)v}{14.314^2}$$

$$= 0.562v \text{ psi}$$

The final segment of pipe lays on the ocean floor from Platform Elly to the three mile limit for a distance of 33,416. This section of pipe is 16 inch, schedule 80 (0.844 inch wall thickness), with an average fluid temperature of 50 degrees F. Therefore:

$$\Delta P_{friction} \text{ (16 inch, sch. 80, on bottom offshore)} = \frac{(0.000668)(39{,}000)(33{,}416)v}{14.314^2}$$

$$= 4{,}248.87v$$

Adding the terms for each segment of the pipe line: $\Delta P_{friction}$ **(total) = 4,249.631v**

To determine the amount of time required for the line to reach hydraulic equilibrium, the total frictional pressure drop term must be added to the general hydraulic equation describing the system at any moment:

$$0.425\,x = 0.443y - 0.425y + 4{,}249.631v$$

This equation can be approximately solved and value found for v by calculating one foot increments as shown in Table 3 below. While the solution method is somewhat inexact (as it does not account for the frictional resistance resulting from the shear forces acting on the oil as it flows into the water), it does provide a conservative or worst case analysis. As such, the indication that the oil above the hydraulic equilibrium point will drain within thirty hours is somewhat inaccurate. It does indicate that only a limited amount of oil will drain from this pipe line segment before the line is shut-in and assumes a new hydraulic equilibrium level.

TABLE 3
RUPTURE AT THREE MILE UNIT
PLATFORM SEGMENT

NUMBER OF FEET OF PIPE DRAINED	DISTANCE ABOVE 0 FEET MLLW (X – FT)	DEPTH TO POINT OF RUPTURE (Y – FT)	VELOCITY (FT/SEC)	TIME TO DRAIN ONE FOOT (SEC)	CUM. DRAIN TIME (HRS)	NUMBER OF FEET OF PIPE DRAINED	DISTANCE ABOVE 0 FEET MLLW (X – FT)	DEPTH TO POINT OF RUPTURE (Y – FT)	VELOCITY (FT/SEC)	TIME TO DRAIN ONE FOOT (SEC)	CUM. DRAIN TIME (HRS)
1	45	65	0.0042	234.84	0.07	77	45	65	0.0042	234.84	5.06
2	45	65	0.0042	234.84	0.13	78	45	65	0.0042	234.84	5.13
3	45	65	0.0042	234.84	0.20	79	45	65	0.0042	234.84	5.19
4	45	65	0.0042	234.84	0.26	80	45	65	0.0042	234.84	5.26
5	45	65	0.0042	234.84	0.33	81	45	65	0.0042	234.84	5.33
6	45	65	0.0042	234.84	0.39	82	45	65	0.0042	234.84	5.39
7	45	65	0.0042	234.84	0.46	83	45	65	0.0042	234.84	5.46
8	45	65	0.0042	234.84	0.53	84	45	65	0.0042	234.84	5.52
9	45	65	0.0042	234.84	0.59	85	45	65	0.0042	234.84	5.59
10	45	65	0.0042	234.84	0.66	86	45	65	0.0042	234.84	5.65
11	45	65	0.0042	234.84	0.72	87	45	65	0.0042	234.84	5.72
12	45	65	0.0042	234.84	0.79	88	45	65	0.0042	234.84	5.78
13	45	65	0.0042	234.84	0.85	89	45	65	0.0042	234.84	5.85
14	45	65	0.0042	234.84	0.92	90	45	65	0.0042	234.84	5.92
15	45	65	0.0042	234.84	0.99	91	45	65	0.0042	234.84	5.98
16	45	65	0.0042	234.84	1.05	92	45	65	0.0042	234.84	6.05
17	45	65	0.0042	234.84	1.12	93	45	65	0.0042	234.84	6.11
18	45	65	0.0042	234.84	1.18	94	45	65	0.0042	234.84	6.18
19	45	65	0.0042	234.84	1.25	95	45	65	0.0042	234.84	6.25
20	45	65	0.0042	234.84	1.31	96	45	65	0.0042	234.84	6.31
21	45	65	0.0042	234.84	1.38	97	45	65	0.0042	234.84	6.38
22	45	65	0.0042	234.84	1.45	98	45	65	0.0042	234.84	6.44
23	45	65	0.0042	234.84	1.51	99	45	65	0.0042	234.84	6.51
24	45	65	0.0042	234.84	1.58	100	45	65	0.0042	234.84	6.57
25	45	65	0.0042	234.84	1.64	101	45	65	0.0042	234.84	6.64
26	45	65	0.0042	234.84	1.71	102	45	65	0.0042	234.84	6.71
27	45	65	0.0042	234.84	1.78	103	45	65	0.0042	234.84	6.77
28	45	65	0.0042	234.84	1.84	104	45	65	0.0042	234.84	6.84
29	45	65	0.0042	234.84	1.91	105	45	65	0.0042	234.84	6.90
30	45	65	0.0042	234.84	1.97	106	45	65	0.0042	234.84	6.97
31	45	65	0.0042	234.84	2.04	107	45	65	0.0042	234.84	7.03
32	45	65	0.0042	234.84	2.10	108	45	65	0.0042	234.84	7.10
33	45	65	0.0042	234.84	2.17	109	45	65	0.0042	234.84	7.17
34	45	65	0.0042	234.84	2.24	110	45	65	0.0042	234.84	7.23
35	45	65	0.0042	234.84	2.30	111	44	65	0.0041	242.42	7.30
36	45	65	0.0042	234.84	2.37	112	43	65	0.0040	244.44	7.37
37	45	65	0.0042	234.84	2.43	113	42	65	0.0039	254.77	7.44
38	45	65	0.0042	234.84	2.50	114	41	65	0.0038	261.44	7.51
39	45	65	0.0042	234.84	2.56	115	40	65	0.0037	264.45	7.59
40	45	65	0.0042	234.84	2.63	116	39	65	0.0036	273.84	7.66
41	45	65	0.0042	234.84	2.70	117	38	65	0.0035	283.69	7.74
42	45	65	0.0042	234.84	2.76	118	37	65	0.0034	291.87	7.82
43	45	65	0.0042	234.84	2.83	119	36	65	0.0033	300.73	7.91
44	45	65	0.0042	234.84	2.89	120	35	65	0.0032	310.06	7.99
45	45	65	0.0042	234.84	2.96	121	34	65	0.0031	320.00	8.08
46	45	65	0.0042	234.84	3.02	122	33	65	0.0030	330.58	8.17
47	45	65	0.0042	234.84	3.09	123	32	65	0.0029	341.89	8.27
48	45	65	0.0042	234.84	3.16	124	31	65	0.0028	353.90	8.37
49	45	65	0.0042	234.84	3.22	125	30	65	0.0027	366.94	8.47
50	45	65	0.0042	234.84	3.29	126	29	65	0.0026	380.94	8.57
51	45	65	0.0042	234.84	3.35	127	28	65	0.0025	396.05	8.68
52	45	65	0.0042	234.84	3.42	128	27	65	0.0024	412.38	8.80
53	45	65	0.0042	234.84	3.48	129	26	65	0.0023	430.12	8.92
54	45	65	0.0042	234.84	3.55	130	25	65	0.0022	448.46	9.04
55	45	65	0.0042	234.84	3.62	131	24	65	0.0021	470.61	9.17
56	45	65	0.0042	234.84	3.68	132	23	65	0.0020	493.84	9.31
57	45	65	0.0042	234.84	3.75	133	22	65	0.0019	519.31	9.44
58	45	65	0.0042	234.84	3.81	134	21	65	0.0018	547.99	9.61
59	45	65	0.0042	234.84	3.88	135	20	65	0.0017	578.78	9.77
60	45	65	0.0042	234.84	3.94	136	19	65	0.0016	615.44	9.94
61	45	65	0.0042	234.84	4.01	137	18	65	0.0015	655.81	10.12
62	45	65	0.0042	234.84	4.08	138	17	65	0.0014	701.84	10.32
63	45	65	0.0042	234.84	4.14	139	16	65	0.0013	754.82	10.53
64	45	65	0.0042	234.84	4.21	140	15	65	0.0012	816.45	10.75
65	45	65	0.0042	234.84	4.27	141	14	65	0.0011	849.04	11.00
66	45	65	0.0042	234.84	4.34	142	13	65	0.0010	973.81	11.27
67	45	65	0.0042	234.84	4.40	143	12	65	0.0009	1081.33	11.57
68	45	65	0.0042	234.84	4.47	144	11	65	0.0008	1212.45	11.91
69	45	65	0.0042	234.84	4.54	145	10	65	0.0007	1378.73	12.29
70	45	65	0.0042	234.84	4.60	146	9	65	0.0006	1600.81	12.74
71	45	65	0.0042	234.84	4.67	147	8	65	0.0005	1903.44	13.27
72	45	65	0.0042	234.84	4.73	148	7	65	0.0004	2334.37	13.92
73	45	65	0.0042	234.84	4.80	149	6	65	0.0003	3079.44	14.77
74	45	65	0.0042	234.84	4.87	150	5	65	0.0002	4449.88	16.01
75	45	65	0.0042	234.84	4.93	151	4	65	0.0001	8018.17	18.24
76	45	65	0.0042	234.84	5.00	152	3	65	0.0000	40477.64	29.44

Extrapolating the data from Table 3 on the previous page, it can be seen that only 0.51 feet of the 8 inch, schedule 80 section of the pipe line segment drains prior to the line assuming its revised hydraulic equilibrium level. Therefore, we will need to calculate the revised hydraulic equilibrium level to determine how much oil will be released from the platform segment.

Hydraulic forces acting at point of rupture to cause oil to escape:

Oil Column in the pipe line riser at the platform above 0 feet MLLWL =		**0.425 x psi**
Oil Column in the pipe line riser at the platform from 0 feet MLLWL to Ocean Floor at -265 feet =	(0.425)(265) =	**112.625 psi**

Hydraulic forces acting to oppose oil from escaping at point of rupture:

Sea water Column from 0 feet MLLWL to Ocean Floor Depth of y at Point of Rupture =	**0.443 y psi**
Oil Column in the pip line from -265 feet to Depth y at Point of Rupture =	**0.425 (265 -y) psi**
Atmospheric Pressure acting on the Sea Water Column =	**14.7 psi**

Therefore:

$0.425x + 112.625 = 0.443y + 112.625 - 0.425y + 14.7$

At three mile limit y = 65 feet. Therefore

$0.425x + 112.625 = 28.795 + 112.625 - 27.625 + 14.7$

x = 37.34 feet

As we have done previously, we can conclude that all of the oil from downstream of the platform shut-in valve on Platform Elly to +37.34 feet MLLWL will drain from the line if allowed to leak long enough. Again referring to Table 3 and extrapolating the data therein, we can see that this will occur in less than eight hours, which is an insufficient amount of time to effect any abatement measures. Therefore, based on the revised hydraulic equilibrium level, the amount of oil released from the platform pipe line segment in this case is:

100.00 feet - 8 inch, schedule 80	Volume = 5.65 barrels
10.00 feet - 16 inch, schedule 80	Volume = 1.99 barrels
7.66 feet - 16 inch, schedule 80	Volume = 1.52 barrels
TOTAL VOLUME DRAINED IF LINE REACHES THE REVISED HYDRAULIC EQUILIBRIUM LEVEL	**Volume = 9.16 barrels**

4.4.2 Analysis of Shore Side Segment

Hydraulic forces acting at point of rupture to cause oil to escape:

Oil Column in onshore pipe line segment above 0 feet MLLWL =	0.425z psi
Oil Column in onshore pipe line segment from 0 feet MLLWL to Ocean Floor at -65 feet = (0.425)(65) =	27.625 psi

Hydraulic forces acting to oppose oil from escaping from pipe line:

Sea water Column from 0 feet MLLWL to Ocean Floor at -65 feet = (0.443)(65) =	28.795 psi

$$0.425z + 27.625 = 28.795$$
$$0.425z = 1.17$$

$$z = 2.75 \text{ feet}$$

As before, we can conclude that all the oil from downstream of the shut-in valve located at an elevation of +21 feet at the Beta Onshore Station to an elevation of + 2.75 feet MLLWL will drain from the line if the rupture is allowed to leak long enough and the onshore shut-in valve remains open. Before determining the rate at which the line will drain, we will first calculate the amount of oil released if this segment of line is allowed to drain until hydraulic equilibrium is achieved. In order to approximate this volume, we will again assume that the line has a constant gradient between the Beta Onshore Station and 0 feet MLLWL. As before, the onshore segment of the pipe line is 1.9724 miles (10,414 feet) long. Assuming a constant gradient, the line will decrease one foot in elevation every 495.9 feet. To achieve the 18.25 foot drop in elevation required to reach the hydraulic equilibrium elevation of 2.75 feet MLLWL, it will take 9,049 feet of line. The capacity of this length of line is 2,044 barrels. If allowed to drain until hydraulic equilibrium is reached, this volume would be released at the point of rupture.

Using Poiseuille's equation again, we can calculate the frictional forces in the various segments if the line on the onshore side of the rupture.

The onshore section of line is 16 inch, schedule 30 (0.375 inch wall thickness) and is buried. Because the line is buried the oil temperature in the line is approximately 60 degrees F. Therefore:

$$\Delta P_{\text{friction}}\ (\text{16 inch, sch. 30, onshore}) = \frac{(0.000668)(19{,}000)(10{,}414)v}{15.25^2}$$

$$= 568.34v$$

The initial offshore segment is 16 inch, schedule 40 (0.500 inch w.t.) and is buried for 23,400 feet. The temperature in this segment of line is also 60 degrees F. Therefore:

$$\Delta P_{friction}\text{ (16 inch, sch. 40, buried offshore)} = \frac{(0.000668)(19{,}000)(23{,}400)v}{15.00^2}$$

$$= 1{,}319.97v$$

The next segment of the pipe line lays on the ocean floor for 14,421 feet out to the three mile limit between State and Federal Waters. This section of pipe is 16 inch, schedule 40 with an average fluid temperature of 50 degrees F. Therefore:

$$\Delta P_{friction}\text{ (16 inch, sch. 40, on bottom offshore)} = \frac{(0.000668)(39{,}000)(14{,}421)v}{15.00^2}$$

$$= 1{,}669.76v$$

Adding the terms for each segment of the pipe line: $\Delta P_{friction}$ **(total) = 3,558.07v**

To determine the amount of time required for the line to reach hydraulic equilibrium, the total frictional pressure drop term must be added to the general hydraulic equation describing the system at any moment:

$$0.425z = 1.17 + 3{,}558.07v$$

This equation can be approximately solved by calculating solutions for v at constant incremental vertical elevation intervals as shown in Table 4 on the next page. Assuming a constant gradient in elevation, the volume of oil in each incremental drop in pipe line elevation can be calculated and the time to release that volume of oil calculated based on the value of v determined. While the solution method is somewhat inexact (as it does not account for the frictional resistance resulting from the shear forces acting on the oil as it flows into the water), it does provide a conservative or worst case analysis.

TABLE 4
RUPTURE AT THREE MILE LIMIT
SHORE SIDE SEGMENT

HORIZONTAL DISTANCE OF PIPE DRAINED (FEET)	DISTANCE ABOVE 0 FEET MLLWL (Z – FT)	DEPTH TO POINT OF RUPTURE (Y – FT)	VELOCITY (FT/SEC)	TIME TO DRAIN TEN HORIZ FEET (SEC)	CUM. DRAIN TIME (HRS)	VOLUME OF PIPE DRAINED (BBLS)	CUM. VOLUME OF PIPE DRAINED (BBLS)
10	21.00	65	0.002180	4588.10	1.27	2.26	2.26
20	20.98	65	0.002177	4593.17	2.55	2.26	4.52
30	20.96	65	0.002175	4598.26	3.83	2.26	6.78
40	20.94	65	0.002172	4603.36	5.11	2.26	9.04
50	20.92	65	0.002170	4608.47	6.39	2.26	11.30
60	20.90	65	0.002168	4613.59	7.67	2.26	13.56
70	20.88	65	0.002165	4618.72	8.95	2.26	15.82
80	20.86	65	0.002163	4623.87	10.24	2.26	18.08
90	20.84	65	0.002160	4629.02	11.52	2.26	20.34
100	20.82	65	0.002158	4634.19	12.81	2.26	22.60
110	20.80	65	0.002155	4639.37	14.10	2.26	24.86
120	20.78	65	0.002153	4644.56	15.39	2.26	27.12
130	20.76	65	0.002151	4649.76	16.68	2.26	29.38
140	20.74	65	0.002148	4654.97	17.97	2.26	31.64
150	20.72	65	0.002146	4660.20	19.27	2.26	33.90
160	20.70	65	0.002143	4665.44	20.56	2.26	36.16
170	20.68	65	0.002141	4670.69	21.86	2.26	38.42
180	20.66	65	0.002139	4675.95	23.16	2.26	40.68
190	20.64	65	0.002136	4681.22	24.46	2.26	42.94
200	20.62	65	0.002134	4686.50	25.76	2.26	45.20
210	20.60	65	0.002131	4691.80	27.06	2.26	47.46
220	20.58	65	0.002129	4697.11	28.37	2.26	49.72
230	20.56	65	0.002127	4702.43	29.68	2.26	51.98
240	20.54	65	0.002124	4707.76	30.98	2.26	54.24
250	20.52	65	0.002122	4713.10	32.29	2.26	56.50
260	20.50	65	0.002119	4718.46	33.60	2.26	58.76
270	20.48	65	0.002117	4723.83	34.91	2.26	61.02
280	20.46	65	0.002115	4729.21	36.23	2.26	63.28
290	20.44	65	0.002112	4734.60	37.54	2.26	65.54
300	20.42	65	0.002110	4740.01	38.86	2.26	67.80
310	20.40	65	0.002107	4745.43	40.18	2.26	70.06
320	20.37	65	0.002105	4750.86	41.50	2.26	72.32
330	20.35	65	0.002102	4756.30	42.82	2.26	74.58
340	20.33	65	0.002100	4761.76	44.14	2.26	76.84
350	20.31	65	0.002098	4767.22	45.47	2.26	79.10
360	20.29	65	0.002095	4772.70	46.79	2.26	81.36
370	20.27	65	0.002093	4778.20	48.12	2.26	83.62
380	20.25	65	0.002090	4783.70	49.45	2.26	85.88
390	20.23	65	0.002088	4789.22	50.78	2.26	88.14
400	20.21	65	0.002086	4794.75	52.11	2.26	90.40
410	20.19	65	0.002083	4800.30	53.44	2.26	92.66
420	20.17	65	0.002081	4805.85	54.78	2.26	94.92
430	20.15	65	0.002078	4811.42	56.12	2.26	97.18
440	20.13	65	0.002076	4817.00	57.45	2.26	99.44
450	20.11	65	0.002074	4822.60	58.79	2.26	101.70
460	20.09	65	0.002071	4828.21	60.13	2.26	103.96
470	20.07	65	0.002069	4833.83	61.48	2.26	106.22
480	20.05	65	0.002066	4839.46	62.82	2.26	108.48
490	20.03	65	0.002064	4845.11	64.17	2.26	110.74
500	20.01	65	0.002062	4850.77	65.51	2.26	113.00
510	19.99	65	0.002059	4856.45	66.86	2.26	115.26
520	19.97	65	0.002057	4862.14	68.21	2.26	117.52
530	19.95	65	0.002054	4867.84	69.57	2.26	119.78
540	19.93	65	0.002052	4873.55	70.92	2.26	122.04
550	19.91	65	0.002049	4879.28	72.28	2.26	124.30
560	19.89	65	0.002047	4885.02	73.63	2.26	126.56
570	19.87	65	0.002045	4890.77	74.99	2.26	128.82
580	19.85	65	0.002042	4896.54	76.35	2.26	131.08
590	19.83	65	0.002040	4902.32	77.71	2.26	133.34
600	19.81	65	0.002037	4908.12	79.08	2.26	135.60
610	19.79	65	0.002035	4913.93	80.44	2.26	137.86
620	19.77	65	0.002033	4919.75	81.81	2.26	140.12
630	19.75	65	0.002030	4925.59	83.18	2.26	142.38
640	19.73	65	0.002028	4931.44	84.55	2.26	144.64
650	19.71	65	0.002025	4937.31	85.92	2.26	146.90
660	19.69	65	0.002023	4943.18	87.29	2.26	149.16
670	19.67	65	0.002021	4949.08	88.67	2.26	151.42
680	19.65	65	0.002018	4954.98	90.04	2.26	153.68
690	19.63	65	0.002016	4960.90	91.42	2.26	155.94
700	19.61	65	0.002013	4966.84	92.80	2.26	158.20
710	19.59	65	0.002011	4972.79	94.18	2.26	160.46
720	19.57	65	0.002009	4978.75	95.56	2.26	162.72
730	19.55	65	0.002006	4984.73	96.95	2.26	164.98
740	19.53	65	0.002004	4990.72	98.33	2.26	167.24
750	19.51	65	0.002001	4996.73	99.72	2.26	169.50
760	19.49	65	0.001999	5002.75	101.11	2.26	171.76
770	19.47	65	0.001996	5008.78	102.50	2.26	174.02
780	19.45	65	0.001994	5014.84	103.90	2.26	176.28
790	19.43	65	0.001992	5020.90	105.29	2.26	178.54
800	19.41	65	0.001989	5026.98	106.69	2.26	180.80
810	19.39	65	0.001987	5033.07	108.09	2.26	183.06
820	19.37	65	0.001984	5039.18	109.49	2.26	185.32
830	19.35	65	0.001982	5045.31	110.89	2.26	187.58
840	19.33	65	0.001980	5051.45	112.29	2.26	189.84
850	19.31	65	0.001977	5057.60	113.70	2.26	192.10
860	19.29	65	0.001975	5063.77	115.10	2.26	194.36
870	19.27	65	0.001972	5069.95	116.51	2.26	196.62
880	19.25	65	0.001970	5076.15	117.92	2.26	198.88
890	19.23	65	0.001968	5082.36	119.33	2.26	201.14
900	19.21	65	0.001965	5088.59	120.75	2.26	203.40
910	19.19	65	0.001963	5094.84	122.16	2.26	205.66
920	19.16	65	0.001960	5101.10	123.58	2.26	207.92
930	19.14	65	0.001958	5107.37	125.00	2.26	210.18
940	19.12	65	0.001956	5113.67	126.42	2.26	212.44
950	19.10	65	0.001953	5119.97	127.84	2.26	214.70
960	19.08	65	0.001951	5126.29	129.26	2.26	216.96
970	19.06	65	0.001948	5132.63	130.69	2.26	219.22
980	19.04	65	0.001946	5138.98	132.12	2.26	221.48
990	19.02	65	0.001944	5145.35	133.55	2.26	223.74
1000	19.00	65	0.001941	5151.74	134.98	2.26	226.00

Extrapolating the data from Table 4 on the previous page, it can be seen that approximately 2.49 gallons of oil (0.06 barrels) would have drained from the shore segment of the pipe line before the onshore shut-in valve is closed. As this represents a negligible reduction in the oil column, we will need to calculate the revised hydraulic equilibrium level to determine what, if any additional oil drainage will occur before the revised hydraulic equilibrium level is reached and how long this will take to occur.

Hydraulic forces acting at point of rupture to cause oil to escape:

Oil Column in onshore pipe line segment above 0 feet MLLWL =	**0.425z psi**
Oil Column in onshore pipe line segment from 0 feet MLLWL to Ocean Floor at -65 feet = (0.425)(65) =	**27.625 psi**

Hydraulic forces acting to oppose oil from escaping from pipe line:

Sea Water Column from 0 feet MLLWL to Ocean Floor at -65 feet = (0.443)(65) =	**28.795 psi**
Atmospheric Pressure acting on Sea Water Column =	**14.7 psi**

$0.425z + 27.625 = 28.795 + 14.7$
$0.425z = 15.87$

z = 37.34 feet

This level is more than 16 feet higher than the elevation of the onshore shut-in valve. Therefore, once the onshore shut-in valve is closed, no additional oil drainage from the pipe line will occur.

4.4.3 Total Release After Shut In

Platform Segment:	9.16 barrels
Shore Side Segment:	0.06 barrels
Total Release After Shut In:	9.22 barrels

4.5 Rupture at Point of Burial

4.5.1 Analysis of Platform Segment

Hydraulic forces acting at point of rupture to cause oil to escape:

Oil Column in pipe line riser at platform above 0 feet MLLWL =		0.425 x psi
Oil Column in pipe line riser at platform from 0 feet MLLWL to Ocean Floor at -265 feet =	(0.425)(265) =	112.625 psi

Hydraulic forces acting to oppose oil from escaping at point of rupture:

Sea water Column from 0 feet MLLWL to Ocean Floor Depth of y at Point of Rupture =	0.443 y psi
Oil Column from -265 feet to Depth y at Point of Rupture =	0.425 (265 -y) psi

Therefore:

$$0.425x + 112.625 = 0.443y + 112.625 - 0.425y$$

At point of burial y = 40 feet. Therefore

$$0.425x + 112.625 = 17.72 + 112.625 - 17.00$$

x = 1.69 feet

As we have done previously, we can conclude that all the oil from downstream of the shut-in valve on Platform Elly to an elevation of + 1.69 feet MLLWL will drain from the line if the rupture is allowed to leak long enough and the platform shut-in valve remains open. Before determining the rate at which the line will drain, we will first calculate the amount of oil released if this segment of line is allowed to drain until hydraulic equilibrium is achieved.

Volume of line downstream of the block valve:

100.00 feet - 8 inch, schedule 80	Volume = 5.65 barrels
10.00 feet - 16 inch, schedule 80	Volume = 1.99 barrels
43.31 feet - 16 inch, schedule 80	Volume = 8.62 barrels
TOTAL VOLUME DRAINED IF LINE REACHES INITIAL HYDRAULIC EQUILIBRIUM LEVEL	**Volume = 16.26 barrels**

Using Poiseuille's equation again, we can calculate the frictional forces in the various line segments upstream of the rupture at the point of burial:

The average temperature in the 8 inch, schedule 80 pipe is 160 degrees F. Therefore

$$\Delta P_{\text{friction}}\ (8\ \text{inch, sch. } 80) = \frac{(0.000668)(150)(100)v}{7.625^2}$$

$$= 0.172v \text{ psi}$$

The average temperature in the 16 inch, schedule 80 pipe down to 0 feet MLLWL is 160 degrees F. Therefore

$$\Delta P_{\text{friction}}\ (16\ \text{inch, sch. } 80) = \frac{(0.000668)(150)(55)v}{14.314^2}$$

$$= .027v \text{ psi}$$

The average temperature in the 16 inch, schedule 80 pipe from 0 feet MLLWL to -265 feet is 120 degrees F. Therefore

$$\Delta P_{\text{friction}}\ (16\ \text{inch, sch. } 80) = \frac{(0.000668)(650)(265)v}{14.314^2}$$

$$= 0.562v \text{ psi}$$

The first segment of pipe that lays on the ocean floor runs from Platform Elly to the three mile limit for a distance of 33,416. This section of pipe is 16 inch, schedule 80 (0.844 inch wall thickness), with an average fluid temperature of 50 degrees F. Therefore:

$$\Delta P_{\text{friction}}\ (16\ \text{inch, sch. } 80\text{, on bottom offshore}) = \frac{(0.000668)(39{,}000)(33{,}416)v}{14.314^2}$$

$$= 4{,}248.87v$$

The last segment of the line upstream of the rupture lays on the ocean floor for 14,421 feet from the three mile limit between State and Federal Waters to the point of burial. This section of pipe is 16 inch, schedule 40 with an average fluid temperature of 50 degrees F. Therefore:

$$\Delta P_{\text{friction}}\ (16\ \text{inch, sch. } 40\text{, on bottom offshore}) = \frac{(0.000668)(39{,}000)(14{,}421)v}{15.00^2}$$

$$= 1{,}669.76v$$

Adding the terms for each segment of the pipe line: $\Delta P_{friction}$ **(total) = 5,919.391v**

To determine the amount of time required for the line to reach hydraulic equilibrium, the total frictional pressure drop term must be added to the general hydraulic equation describing the system at any moment:

$$0.425\,x = 0.443y - 0.425y + 5{,}919.391v$$

This equation can be approximately solved and value found for v by calculating one foot increments as shown in Table 5 below. While the solution method is somewhat inexact (as it does not account for the frictional resistance resulting from the shear forces acting on the oil as it flows into the water), it does provide a conservative or worst case analysis. As such, the indication that the oil above the hydraulic equilibrium point will drain within thirty eight hours is somewhat inaccurate. It does indicate that only a limited amount of oil will drain from this pipe line segment before the line is shut-in and assumes a new hydraulic equilibrium level.

TABLE 5
RUPTURE AT POINT OF BURIAL
PLATFORM SEGMENT

NUMBER OF FEET OF PIPE DRAINED	DISTANCE ABOVE 0 FEET MLLW (X – FT)	DEPTH TO POINT OF RUPTURE (Y – FT)	VELOCITY (FT/SEC)	TIME TO DRAIN ONE FOOT (SEC)	CUM. DRAIN TIME (HRS)	NUMBER OF FEET OF PIPE DRAINED	DISTANCE ABOVE 0 FEET MLLW (X – FT)	DEPTH TO POINT OF RUPTURE (Y – FT)	VELOCITY (FT/SEC)	TIME TO DRAIN ONE FOOT (SEC)	CUM. DRAIN TIME (HRS)
1	45	40	0.0031	321.83	0.09	78	45	40	0.0031	321.83	6.97
2	45	40	0.0031	321.83	0.18	79	45	40	0.0031	321.83	7.06
3	45	40	0.0031	321.83	0.27	80	45	40	0.0031	321.83	7.15
4	45	40	0.0031	321.83	0.36	81	45	40	0.0031	321.83	7.24
5	45	40	0.0031	321.83	0.45	82	45	40	0.0031	321.83	7.33
6	45	40	0.0031	321.83	0.54	83	45	40	0.0031	321.83	7.42
7	45	40	0.0031	321.83	0.63	84	45	40	0.0031	321.83	7.50
8	45	40	0.0031	321.83	0.71	85	45	40	0.0031	321.83	7.59
9	45	40	0.0031	321.83	0.80	86	45	40	0.0031	321.83	7.68
10	45	40	0.0031	321.83	0.89	87	45	40	0.0031	321.83	7.77
11	45	40	0.0031	321.83	0.98	88	45	40	0.0031	321.83	7.86
12	45	40	0.0031	321.83	1.07	89	45	40	0.0031	321.83	7.95
13	45	40	0.0031	321.83	1.16	90	45	40	0.0031	321.83	8.04
14	45	40	0.0031	321.83	1.25	91	45	40	0.0031	321.83	8.13
15	45	40	0.0031	321.83	1.34	92	45	40	0.0031	321.83	8.22
16	45	40	0.0031	321.83	1.43	93	45	40	0.0031	321.83	8.31
17	45	40	0.0031	321.83	1.52	94	45	40	0.0031	321.83	8.40
18	45	40	0.0031	321.83	1.61	95	45	40	0.0031	321.83	8.49
19	45	40	0.0031	321.83	1.70	96	45	40	0.0031	321.83	8.58
20	45	40	0.0031	321.83	1.79	97	45	40	0.0031	321.83	8.67
21	45	40	0.0031	321.83	1.88	98	45	40	0.0031	321.83	8.76
22	45	40	0.0031	321.83	1.97	99	45	40	0.0031	321.83	8.85
23	45	40	0.0031	321.83	2.06	100	45	40	0.0031	321.83	8.94
24	45	40	0.0031	321.83	2.14	101	45	40	0.0031	321.83	9.02
25	45	40	0.0031	321.83	2.23	102	45	40	0.0031	321.83	9.11
26	45	40	0.0031	321.83	2.32	103	45	40	0.0031	321.83	9.20
27	45	40	0.0031	321.83	2.41	104	45	40	0.0031	321.83	9.29
28	45	40	0.0031	321.83	2.50	105	45	40	0.0031	321.83	9.38
29	45	40	0.0031	321.83	2.59	106	45	40	0.0031	321.83	9.47
30	45	40	0.0031	321.83	2.68	107	45	40	0.0031	321.83	9.56
31	45	40	0.0031	321.83	2.77	108	45	40	0.0031	321.83	9.65
32	45	40	0.0031	321.83	2.86	109	45	40	0.0031	321.83	9.74
33	45	40	0.0031	321.83	2.95	110	45	40	0.0031	321.83	9.83
34	45	40	0.0031	321.83	3.04	111	44	40	0.0030	329.27	9.92
35	45	40	0.0031	321.83	3.13	112	43	40	0.0029	337.10	10.01
36	45	40	0.0031	321.83	3.22	113	42	40	0.0028	343.54	10.11
37	45	40	0.0031	321.83	3.31	114	41	40	0.0028	354.33	10.21
38	45	40	0.0031	321.83	3.40	115	40	40	0.0028	362.80	10.31
39	45	40	0.0031	321.83	3.49	116	39	40	0.0027	373.30	10.41
40	45	40	0.0031	321.83	3.58	117	38	40	0.0026	383.83	10.52
41	45	40	0.0031	321.83	3.67	118	37	40	0.0025	394.60	10.63
42	45	40	0.0031	321.83	3.75	119	36	40	0.0025	405.99	10.74
43	45	40	0.0031	321.83	3.84	120	35	40	0.0024	418.10	10.86
44	45	40	0.0031	321.83	3.93	121	34	40	0.0023	431.33	10.98
45	45	40	0.0031	321.83	4.02	122	33	40	0.0022	444.90	11.10
46	45	40	0.0031	321.83	4.11	123	32	40	0.0022	458.30	11.23
47	45	40	0.0031	321.83	4.20	124	31	40	0.0021	473.30	11.36
48	45	40	0.0031	321.83	4.29	125	30	40	0.0020	492.00	11.50
49	45	40	0.0031	321.83	4.38	126	29	40	0.0020	510.87	11.64
50	45	40	0.0031	321.83	4.47	127	28	40	0.0019	531.44	11.79
51	45	40	0.0031	321.83	4.56	128	27	40	0.0018	550.28	11.94
52	45	40	0.0031	321.83	4.65	129	26	40	0.0017	573.03	12.10
53	45	40	0.0031	321.83	4.73	130	25	40	0.0017	597.87	12.26
54	45	40	0.0031	321.83	4.82	131	24	40	0.0016	621.41	12.44
55	45	40	0.0031	321.83	4.91	132	23	40	0.0015	653.72	12.62
56	45	40	0.0031	321.83	5.00	133	22	40	0.0015	683.91	12.81
57	45	40	0.0031	321.83	5.09	134	21	40	0.0014	721.44	13.01
58	45	40	0.0031	321.83	5.18	135	20	40	0.0013	760.85	13.22
59	45	40	0.0031	321.83	5.27	136	19	40	0.0012	804.81	13.44
60	45	40	0.0031	321.83	5.36	137	18	40	0.0012	854.77	13.68
61	45	40	0.0031	321.83	5.45	138	17	40	0.0011	908.86	13.93
62	45	40	0.0031	321.83	5.54	139	16	40	0.0010	973.53	14.20
63	45	40	0.0031	321.83	5.63	140	15	40	0.0010	1044.73	14.50
64	45	40	0.0031	321.83	5.72	141	14	40	0.0009	1121.81	14.81
65	45	40	0.0031	321.83	5.81	142	13	40	0.0008	1221.32	15.15
66	45	40	0.0031	321.83	5.90	143	12	40	0.0007	1331.44	15.52
67	45	40	0.0031	321.83	5.98	144	11	40	0.0007	1490.86	15.94
68	45	40	0.0031	321.83	6.07	145	10	40	0.0006	1670.86	16.41
69	45	40	0.0031	321.83	6.16	146	9	40	0.0005	1902.41	16.94
70	45	40	0.0031	321.83	6.25	147	8	40	0.0005	2204.73	17.55
71	45	40	0.0031	321.83	6.34	148	7	40	0.0004	2655.81	18.29
72	45	40	0.0031	321.83	6.43	149	6	40	0.0003	3324.84	19.10
73	45	40	0.0031	321.83	6.52	150	5	40	0.0003	4213.86	20.35
74	45	40	0.0031	321.83	6.61	151	4	40	0.0002	6040.79	22.03
75	45	40	0.0031	321.83	6.70	152	3	40	0.0001	10463.37	24.96
76	45	40	0.0031	321.83	6.79	153	2	40	0.0000	44333.71	37.84
77	45	40	0.0031	321.83	6.88						

Extrapolating the data from Table 5 on the previous page, it can be seen that only 0.37 feet of the 8 inch, schedule 80 section of the pipe line segment drains prior to the line assuming its revised hydraulic equilibrium level. Therefore, we will need to calculate the revised hydraulic equilibrium level to determine how much oil will be released from the platform segment.

Hydraulic forces acting at point of rupture to cause oil to escape:

Oil Column in pipe line riser at platform above 0 feet MLLWL =		**0.425 x psi**
Oil Column in pipe line riser at platform from 0 feet MLLWL to Ocean Floor at -265 feet =	(0.425)(265) =	**112.625 psi**

Hydraulic forces acting to oppose oil from escaping at point of rupture:

Sea water Column from 0 feet MLLWL to Ocean Floor Depth of y at Point of Rupture =	**0.443 y psi**
Oil Column from -265 feet to Depth y at Point of Rupture =	**0.425 (265 -y) psi**
Atmospheric Pressure acting on Sea Water Column =	**14.7 psi**

Therefore:

$0.425x + 112.625 = 0.443y + 112.625 - 0.425y + 14.7$

At point of burial $y = 40$ feet. Therefore

$0.425x + 112.625 = 17.72 + 112.625 - 17.00 + 14.7$

$x = 36.28$ feet

As we have done previously, we can conclude that all of the oil from downstream of the platform shut-in valve on Platform Elly to +36.28 feet MLLWL will drain from the line if allowed to leak long enough. Again referring to Table 5 and extrapolating the data therein, we can see that this will occur in less than eleven hours, which is an insufficient amount of time to effect any abatement measures. Therefore, based on the revised hydraulic equilibrium level, the amount of oil released from the platform pipe line segment in this case is:

100.00 feet - 8 inch, schedule 80	Volume = 5.65 barrels
10.00 feet - 16 inch, schedule 80	Volume = 1.99 barrels
8.72 feet - 16 inch, schedule 80	Volume = 1.73 barrels
TOTAL VOLUME DRAINED IF LINE REACHES THE REVISED HYDRAULIC EQUILIBRIUM LEVEL	**Volume = 9.37 barrels**

4.5.2 Analysis of Shore Side Segment

Hydraulic forces acting at point of rupture to cause oil to escape:

Oil Column in the onshore pipe line segment above 0 feet MLLWL =		0.425z psi
Oil Column in the onshore pipe line segment from 0 feet MLLWL to Ocean Floor at -40 feet =	(0.425)(65) =	17.000 psi

Hydraulic forces acting to oppose oil from escaping from pipe line:

Sea water Column from 0 feet MLLWL to Ocean Floor at -40 feet =	(43)(65) =	17.720 psi

$$0.425z + 17.000 = 17.720$$
$$0.425z = 0.72$$

$$z = 1.69 \text{ feet}$$

As before, we can conclude that all the oil from downstream of the shut-in valve located at an elevation of +21 feet at the Beta Onshore Station to an elevation of + 1.69 feet MLLWL will drain from the line if the rupture is allowed to leak long enough and the onshore shut-in valve remains open. Before determining the rate at which the line will drain, we will first calculate the amount of oil released if this segment of line is allowed to drain until hydraulic equilibrium is achieved. In order to approximate this volume, we will again assume that the line has a constant gradient between the Beta Onshore Station and 0 feet MLLWL. As before, the onshore segment of the pipe line is 1.9724 miles (10,414 feet) long. Assuming a constant gradient, the line will decrease one foot in elevation every 495.9 feet. To achieve the 19.31 foot drop in elevation required to reach the hydraulic equilibrium elevation of 1.69 feet MLLWL, it will take 9,576 feet of line. The capacity of this length of line is 2,163 barrels. If allowed to drain until hydraulic equilibrium is reached, this volume would be released at the point of rupture.

Using Poiseuille's equation again, we can calculate the frictional forces in the various line segments on the shore side of the rupture.

The onshore section of line is 16 inch, schedule 30 (0.375 inch wall thickness) and is buried. Because the line is buried the oil temperature in the line is approximately 60 degrees F. Therefore:

$$\Delta P_{\text{friction}}\text{ (16 inch, sch. 30, onshore)} = \frac{(0.000668)(19{,}000)(10{,}414)v}{15.25^2}$$

$$= 568.34v$$

The initial offshore segment is 16 inch, schedule 40 (0.500 inch wall thickness) and is buried for a distance of 23,400 feet. The temperature in this segment of line is also 60 degrees F. Therefore:

$$\Delta P_{friction} \text{ (16 inch, sch. 40, buried offshore)} = \frac{(0.000668)(19.000)(23.400)v}{15.00^2}$$

$$= 1{,}319.97v$$

Adding the terms for each segment of the pipe line: $\Delta P_{friction}$ **(total) = 1,888.31v**

To determine the amount of time required for the line to reach hydraulic equilibrium, the total frictional pressure drop term must be added to the general hydraulic equation describing the system at any moment:

$$0.425z = 1.17 + 1{,}888.31v$$

This equation can be approximately solved by calculating solutions for v at constant incremental vertical elevation intervals as shown in Table 6 on the next page. Assuming a constant gradient in elevation, the volume of oil in each incremental elevation drop can be calculated and the time to release that volume of oil calculated based on the value of v determined. While the solution method is somewhat inexact (as it does not account for the frictional resistance resulting from the shear forces acting on the oil as it flows into the water) it does provide a conservative or worst-case analysis.

Extrapolating the data from Table 6, it can be seen that approximately 4.68 gallons of oil (0.11 barrels) would have drained from the shore segment of the pipe line before the onshore shut-in valve is closed. As this represents a negligible reduction in the oil column, we will need to calculate the revised hydraulic equilibrium level to determine what, if any additional oil drainage will occur before the revised hydraulic equilibrium level is reached and how long this will take to occur.

RUPTURE AT POINT OF BURIAL
SHORE SIDE SEGMENT

HORIZONTAL DISTANCE OF PIPE DRAINED (FEET)	DISTANCE ABOVE 0 FEET MLLWL (Z – FT)	DEPTH TO POINT OF RUPTURE (Y – FT)	VELOCITY (FT/SEC)	TIME TO DRAIN 30 HORIZ. FEET (SEC)	CUM. DRAIN TIME (HRS)	VOLUME OF PIPE DRAINED (BBLS)	CUM. VOLUME OF PIPE DRAINED (BBLS)
30	21.00	40	0.004107	7304.67	2.03	6.78	6.78
60	20.94	40	0.004093	7329.17	4.07	6.78	13.56
90	20.88	40	0.004080	7353.83	6.11	6.78	20.34
120	20.82	40	0.004066	7378.26	8.16	6.78	27.12
150	20.76	40	0.004052	7403.05	10.21	6.78	33.90
180	20.70	40	0.004039	7428.01	12.28	6.78	40.68
210	20.64	40	0.004025	7453.13	14.35	6.78	47.46
240	20.58	40	0.004012	7478.43	16.42	6.78	54.24
270	20.52	40	0.003998	7503.90	18.51	6.78	61.02
300	20.46	40	0.003984	7529.54	20.60	6.78	67.80
330	20.40	40	0.003971	7555.36	22.70	6.78	74.58
360	20.33	40	0.003957	7581.36	24.81	6.78	81.36
390	20.27	40	0.003943	7607.54	26.92	6.78	88.14
420	20.21	40	0.003930	7633.90	29.04	6.78	94.92
450	20.15	40	0.003916	7660.44	31.17	6.78	101.70
480	20.09	40	0.003903	7687.16	33.30	6.78	108.48
510	20.03	40	0.003889	7714.08	35.44	6.78	115.26
540	19.97	40	0.003875	7741.18	37.60	6.78	122.04
570	19.91	40	0.003862	7768.47	39.75	6.78	128.82
600	19.85	40	0.003848	7795.96	41.92	6.78	135.60
630	19.79	40	0.003835	7823.64	44.09	6.78	142.38
660	19.73	40	0.003821	7851.52	46.27	6.78	149.16
690	19.67	40	0.003807	7879.60	48.46	6.78	155.94
720	19.61	40	0.003794	7907.88	50.66	6.78	162.72
750	19.55	40	0.003780	7936.37	52.86	6.78	169.50
780	19.49	40	0.003766	7965.06	55.08	6.78	176.28
810	19.43	40	0.003753	7993.95	57.30	6.78	183.06
840	19.37	40	0.003739	8023.06	59.52	6.78	189.84
870	19.31	40	0.003726	8052.38	61.76	6.78	196.62
900	19.25	40	0.003712	8081.92	64.01	6.78	203.40
930	19.19	40	0.003698	8111.67	66.26	6.78	210.18
960	19.12	40	0.003685	8141.65	68.52	6.78	216.96
990	19.06	40	0.003671	8171.84	70.79	6.78	223.74
1020	19.00	40	0.003658	8202.27	73.07	6.78	230.52
1050	18.94	40	0.003644	8232.91	75.36	6.78	237.30
1080	18.88	40	0.003630	8263.79	77.65	6.78	244.08
1110	18.82	40	0.003617	8294.90	79.96	6.78	250.86
1140	18.76	40	0.003603	8326.25	82.27	6.78	257.64
1170	18.70	40	0.003589	8357.83	84.59	6.78	264.42
1200	18.64	40	0.003576	8389.66	86.92	6.78	271.20
1230	18.58	40	0.003562	8421.73	89.26	6.78	277.98
1260	18.52	40	0.003549	8454.04	91.61	6.78	284.76
1290	18.46	40	0.003535	8486.60	93.97	6.78	291.54
1320	18.40	40	0.003521	8519.42	96.33	6.78	298.32
1350	18.34	40	0.003508	8552.49	98.71	6.78	305.10
1380	18.28	40	0.003494	8585.81	101.09	6.78	311.88
1410	18.22	40	0.003481	8619.40	103.49	6.78	318.66
1440	18.16	40	0.003467	8653.25	105.89	6.78	325.44
1470	18.10	40	0.003453	8687.37	108.30	6.78	332.22
1500	18.04	40	0.003440	8721.76	110.73	6.78	339.00
1530	17.98	40	0.003426	8756.42	113.16	6.78	345.78
1560	17.91	40	0.003412	8791.36	115.60	6.78	352.56
1590	17.85	40	0.003399	8826.58	118.05	6.78	359.34
1620	17.79	40	0.003385	8862.08	120.51	6.78	366.12
1650	17.73	40	0.003372	8897.87	122.99	6.78	372.90
1680	17.67	40	0.003358	8933.95	125.47	6.78	379.68
1710	17.61	40	0.003344	8970.32	127.96	6.78	386.46
1740	17.55	40	0.003331	9006.99	130.46	6.78	393.24
1770	17.49	40	0.003317	9043.96	132.97	6.78	400.02
1800	17.43	40	0.003304	9081.24	135.50	6.78	406.80
1830	17.37	40	0.003290	9118.82	138.03	6.78	413.58
1860	17.31	40	0.003276	9156.72	140.57	6.78	420.36
1890	17.25	40	0.003263	9194.93	143.13	6.78	427.14
1920	17.19	40	0.003249	9233.46	145.69	6.78	433.92
1950	17.13	40	0.003235	9272.32	148.27	6.78	440.70
1980	17.07	40	0.003222	9311.51	150.85	6.78	447.48
2010	17.01	40	0.003208	9351.02	153.45	6.78	454.26
2040	16.95	40	0.003195	9390.88	156.06	6.78	461.04
2070	16.89	40	0.003181	9431.08	158.68	6.78	467.82
2100	16.83	40	0.003167	9471.62	161.31	6.78	474.60
2130	16.77	40	0.003154	9512.51	163.95	6.78	481.38
2160	16.70	40	0.003140	9553.76	166.61	6.78	488.16
2190	16.64	40	0.003127	9595.36	169.27	6.78	494.94
2220	16.58	40	0.003113	9637.33	171.95	6.78	501.72
2250	16.52	40	0.003099	9679.67	174.64	6.78	508.50
2280	16.46	40	0.003086	9722.38	177.34	6.78	515.28
2310	16.40	40	0.003072	9765.46	180.05	6.78	522.06
2340	16.34	40	0.003058	9808.95	182.78	6.78	528.84
2370	16.28	40	0.003045	9852.81	185.51	6.78	535.62
2400	16.22	40	0.003031	9897.07	188.26	6.78	542.40
2430	16.16	40	0.003018	9941.73	191.02	6.78	549.18
2460	16.10	40	0.003004	9986.79	193.80	6.78	555.96
2490	16.04	40	0.002990	10032.26	196.59	6.78	562.74
2520	15.98	40	0.002977	10078.15	199.38	6.78	569.52
2550	15.92	40	0.002963	10124.46	202.20	6.78	576.30
2580	15.86	40	0.002950	10171.20	205.02	6.78	583.08
2610	15.80	40	0.002936	10218.37	207.86	6.78	589.86
2640	15.74	40	0.002922	10265.98	210.71	6.78	596.64
2670	15.68	40	0.002909	10314.04	213.58	6.78	603.42
2700	15.62	40	0.002895	10362.54	216.46	6.78	610.20
2730	15.56	40	0.002881	10411.51	219.35	6.78	616.98
2760	15.49	40	0.002868	10460.94	222.25	6.78	623.76
2790	15.43	40	0.002854	10510.85	225.17	6.78	630.54
2820	15.37	40	0.002841	10561.23	228.11	6.78	637.32
2850	15.31	40	0.002827	10612.10	231.06	6.78	644.10
2880	15.25	40	0.002813	10663.46	234.02	6.78	650.88
2910	15.19	40	0.002800	10715.31	236.99	6.78	657.66
2940	15.13	40	0.002786	10767.68	239.98	6.78	664.44
2970	15.07	40	0.002772	10820.56	242.99	6.78	671.22
3000	15.01	40	0.002759	10873.96	246.01	6.78	678.00

Hydraulic forces acting at point of rupture to cause oil to escape:

Oil Column in the onshore pipe line segment above 0 feet MLLWL =		0.425z psi
Oil Column in the onshore pipe line segment from 0 feet MLLWL to Ocean Floor at -40 feet =	(0.425)(65) =	17.000 psi

Hydraulic forces acting to oppose oil from escaping from pipe line:

Sea water Column from 0 feet MLLWL to Ocean Floor at -40 feet =	(43)(65) =	17.720 psi
Atmospheric Pressure acting on Sea Water Column =		14.7 psi

$0.425z + 17.000 = 17.720 + 14.7$
$0.425z = 0.72 + 14.7$

$z = 36.28$ feet

This level is more than 15 feet higher than the elevation of the onshore shut-in valve. Therefore, once the onshore shut-in valve is closed, no additional oil drainage from the pipe line will occur.

4.5.3 Total Release After Shut In

Platform Segment:	9.37 barrels
Shore Side Segment:	0.11 barrels
Total Release After Shut In:	9.48 barrels

5.0 SUMMARY OF RELEASE SCENARIOS

Table 7 on the next page gives a summary of the oil volume released for each of the three rupture sites. The data indicates that the amount of oil released is essentially constant with only a very slight increase as the rupture site moves towards shore. This occurs for three primary reasons:

1) Approximately ninety percent of the oil released in each case occurs prior to initiation of any shut-in procedures.

2) The volume of oil in the platform piping downstream of the platform shut-in valve is relatively small (14.36 barrels) compared to the volume released prior to initiation of shut-in procedures (111.4 barrels). Therefore the limited changes in the levels of hydraulic equilibrium do not significantly change the amount of the release.

3) Due to its viscosity, the amount of oil that drains from the onshore pipe line segment prior to shut-in of the onshore valve is limited (approximately 0.1 barrels). Once the onshore valve is closed, there is no additional drainage from the onshore line segment because the revised hydraulic equilibrium level is above the level of the onshore valve.

TABLE 7
OIL SPILL VOLUME SUMMARY

VOLUME RELEASED (BBLS)	RUPTURE SITE		
	BASE OF PLATFORM ELLY	THREE MILE LIMIT	POINT OF BURIAL
PRIOR TO DETECTION	35.00	35.00	35.00
DURING RESPONSE PERIOD PRIOR TO INITIATION OF SHUT-IN PROCEDURES	76.40	76.40	76.40
FROM PLATFORM SEGMENT AFTER SHUT DOWN OF PUMPS AND PRIOR TO CLOSING SHUT-IN VALVE	14.36	0.03	0.02
FROM PLATFORM SEGMENT AFTER CLOSING SHUT-IN VALVE	0.00	9.13	9.35
FROM ONSHORE SEGMENT AFTER SHUT DOWN OF PUMPS AND PRIOR TO CLOSING SHUT-IN VALVE	0.01	0.06	0.11
ОM ONSHORE SEGMENT AFTER CLOSING SHUT-IN VALVE	0.00	0.00	0.00
TOTAL OIL RELEASED	125.76	120.56	120.77

I.1 INTRODUCTION

This Annex describes the information and analysis required to determine the worst-case discharge volumes and response planning volumes in accordance with OSPR, BSEE, and DOT-PHMSA requirements. The requirements of each agency are addressed separately below with referencing used as appropriate to minimize repetition.

I.2 OSPR

I.2.1 Worst Case Discharge

Section 817.02(d)(1) of the OSPR regulations defines the reasonable worst case spill for marine facilities. This methodology was employed in the Risk and Hazard Analysis to calculate the reasonable worst case spill volume.

The Risk and Hazard Analysis summarized in Annex H (Sections H.2.4 and H.5) determined that the worst case spill from the pipeline system and pump station would be 3,111 bbl of Group 3 oil.

I.2.2 Response Planning Volume Analysis

The regulations define two distinct response planning volumes (RPVs), one for on-water containment and recovery (on marine waters), and one for shoreline protection and cleanup. The planning volumes are the worst case spill volumes adjusted for the persistence and emulsification characteristics of the oil that could be spilled. The regulations define four different product and crude oil groups, based primarily on specific gravity, for which response planning volumes are required. It should be recognized that this analysis is for planning purposes only; actual response requirements may vary.

The worst case spill of 3,111 bbls would be Group 3 oil. The on-water and shoreline planning volumes of the worst case spill are calculated below in accordance with the regulations using an on-water persistence factor of 0.50, a shoreline persistence factor of 0.70, and an emulsification factor of 1.4.

On-water Containment and Recovery Response Planning Volume = 3,111 x 0.50 x 1.4 = 2,178 bbls

Shoreline Protection and Cleanup Response Planning Volume = 3,111 x 0.70 x 1.4 = 3,049 bbls

I.2.3 Resource Requirement Analysis

The analysis was conducted in two parts. The first analyzes on-water containment and recovery and protection resources; the second analyzes shoreline response and cleanup resources. Both analyses are summarized below.

On-Water Resource Requirements

On-water resources are those required to respond to a spill on marine waters, including resources that would be deployed to protect sensitive areas. Resources for on-water containment and protection are similar and will in many cases be obtained from the same sources. The following paragraphs describe the steps employed to develop reasonable on-water and protection resource requirements.

When considering on-water response, some equipment, such as open ocean boom or deep draft vessels, is not suited for use in shallow water. Section 817.02(d)(3)(A) requires the identification of equipment "appropriate for use in that area given the limitations of geomorphology, shoreline types and other local environmental conditions." To assure adequate shallow water response resources are available, the response planning volume developed in Section I.2.2 was divided into open water (> 6 ft depth) and shallow water fractions based on applicable federal regulations provided in 33 CFR 154 Appendix C. These regulations recommend that 10 percent of the containment and recovery resources be suitable for shallow water response if the spill occurs offshore and that 20 percent be shallow water equipment or nearshore facilities (i.e., facilities within 12 miles of the shoreline). Since the pipeline is also on shore, 20 percent of the on-water response capability should be suitable for shallow water.

Therefore, the largest (shoreline) RPV of 3,049 barrels was distributed as follows:

Shallow Water (20%): 610 barrels
Open Water (80%): 2,439 barrels

The Beta Unit Complex is located in a high-volume port and hence, must be able to mobilize 311 bbls/day recovery capacity within 2 hours.

The primary response contractor for offshore spills is Marine Spill Response Corporation (MSRC). MSRC has an extensive inventory of response equipment including three large response vessels, seven fast response boats, boom, skimmers, storage containers, etc. Annex P lists the MSRC and other contractor resources and substantiates the contractual arrangements. Table I-1 lists MSRC's major response resource categories and demonstrates they have the necessary capability to respond to the 2,178 bbl on-water planning volume.

Table I-1. Response Resources for Worst Case Discharge.

Delivery Time (hours)	Derated Recovery Capability (bpd)	Shoreline Protection (boom feet)	Temporary Storage (bbl)
6	19,814	5,250	3,725
30	29,721	15,750	6,608
54	52,628	54,780	506,608

MSRC has enough skimmers, boom, and small boats to effectively respond to the worst case shallow water planning volume of 610 bbls. This is illustrated by the equipment list contained in Annex P.

Shoreline Resource Requirements

The primary onshore/shoreline response contractor for the Beta Unit Complex would be Patriot Environmental and Clean Harbors. A list of contractor resources is presented in Annex P. The contractual arrangements with Patriot and Clean Harbors are also presented in Annex P. The extensive resources of these contract responders are adequate to meet the 3,049 bbl onshore planning volume requirement.

Non-Cascadable Equipment

The primary response contractor for offshore spills is Marine Spill Response Corporation (MSRC). OSPR regulations require each plan to "nominate a certain amount of equipment identified [in the on-water resource requirements analysis] as non-cascadable outside the risk zone in which the facility is located." The resources of MSRC are sufficient to provide for the maximum planning volume of 2,178 barrels for the Beta Unit Complex, and are so nominated.

I.3 BSEE

I.3.1 Worst Case Discharge

The worst case discharge has been calculated in accordance with 30 CFR §254.47. It consists of the greatest of the worst case discharges from each of the three platforms, the pipelines, and from exploratory drilling operations. Since all the pipelines are connected to the platforms, their worst case discharges are included in the platforms and hence, are not considered separately.

The worst case discharge from each platform consists of the sum of the following:

- The maximum capacity of all oil storage tanks and flowlines on the platform.
- The volume of oil calculated to leak from a break in any pipelines connected to the pipeline considering shutdown time and the effect of hydrostatic pressure, gravity, frictional wall forces, and other factors.
- The daily production volume from an uncontrolled blowout of the highest capacity well associated with the platform. The reservoir characteristics, casing/ production tubing sizes, and historical production and reservoir pressure data must be considered in determining the daily discharge rate.

For exploratory or development drilling operations, the worst case discharge is the daily volume possible from an uncontrolled blowout. If known, the reservoir characteristics must be considered in determining the daily discharge rate.

Platform Vessel and Line Volumes

Tables I-4, I-5, and I-6 (at the end of this Annex) present the vessel volumes for the three platforms. In addition, a detailed analysis was performed to determine the volume of the piping on each of the platforms. The volume calculated was then increased by 10 percent to compensate for any uncertainties. The piping and tank/vessel volumes for each of the platforms is presented below.

Platform	Piping Volume (bbls)	Tank and Vessel Volume (bbls)
Ellen	124	1,716
Elly	562	8,363
Eureka	400	3,832

Pipeline Release

A detailed analysis of the 16-inch diameter pipeline from Platform Elly to the Beta Pump Station onshore was conducted in February 1999, to determine the highest possible volume of oil that could leak from a break in the line. This leak analysis model (See Attachment H-1) was used with various premised leak locations and oil temperatures. The analysis concluded that the worst case discharge would be 2,985 bbls during a 70-hour interval, if a full guillotine cut of the line occurred at a point 15,000' inland from Platform Elly. At any other point, the worst case release volume would be less than 2,985 barrels. As the report points out, a full guillotine cut of the line at that point is very unlikely. Aera Energy added 126 bbls from an original Shell Civil Engineering study to the 2,985 bbls to arrive at **3,111 bbls** as the total worst-case release volume. This amount is the agency-accepted worst-case volume and Beta Offshore will continue to use this value.

A 10-inch diameter intra-field pipeline is currently being used to transfer oil and water from Platform Eureka to Platform Elly. This pipeline is approximately 1.8 miles long. Since a detailed analysis of this line has not been conducted, it has conservatively been assumed that the entire contents of the line could be released. This would result in a worst-case discharge of approximately 1,026 bbls.

Daily Production Volume from Highest Producing Well

The existing production wells have been producing from their reservoir zones for two to three decades and must be pumped to produce. The production wells are therefore not considered to be potential sources of significant discharge. The section below describes the potential worst case discharge from a blowout associated with a newly drilled well.

Well Blowout Scenario

In 2010, BOEMRE (now BSEE) requested that OCS operators conduct an investigation to arrive at a theoretical Worst Case Discharge (WCD) from a well blowout. A study was conducted in April 2011 for Beta Offshore by InterAct of Ventura, California. InterAct utilized a prototypical future development well labeled “Pseudo Well A-38, assumed to have similar construction and be subject to similar geologic characteristics as are present with existing Platform Ellen Well A-38. Pseudo Well A-38 is also considered to be a valid representation of a future infill well drilled from Platform Eureka toward Platform Ellen. The target producing zone for Pseudo Well A-38 is within the most prolific area of the Beta Field between platforms Ellen and Eureka. A nodal analysis was conducted for Pseudo Well A-38 and predicted an initial outflow rate of 45 bopd and 105 bwpd. Based on an estimated 27 day timeframe to plan and drill a relief well using the existing rig on the opposite platform (Eureka’s rig would be used to drill a relief well for a well drilled from Ellen and vice versa), a WCD volume of 1,215 barrels of oil and 2,835 barrels of water were calculated. The following assumptions were factored into the WCD calculation:

- Pseudo Well A-38 would initially have a 20% annual decline rate
- 7 days are required to plan and prepare for drilling the relief well
- 20 days are required to drill, intersect and complete the shut-off/plugging operations on the blowout well

BSEE Worst Case Discharge

Component	Platform		
	Eureka	Ellen	Elly
A. Piping (bbls)	400	124	562
B. Tanks & Vessels (bbls)	3,832	1,716	8,363
C. Pipeline (bbls)	1,026	0	3,111
D. Well Blowout (bbls)	1,215	1,215	0
Total in bbls (A+B+C)	**6,473**	**3,055**	**12,036**

Analysis:

A. Piping volumes are calculated volumes plus 10%

C. The 10-inch pipeline between Eureka and Elly is the source of the 1,026 bbls shown in the table above. The 16-inch line from Elly to shore is the source of the 3,111 bbl volume

WCD is the largest sum of the components (A, B, C and D) of a single platform including the pipeline(s). The **WCD** is **12,036 bbls** from Platform Elly**.** This assumes total release of all piping, tanks and vessels together with the worst-case discharge of the 16-inch pipeline – an extremely unlikely scenario.

I.3.2 Resource Requirements Analysis

Determination of the planning volumes for on water/onshore recovery and the quantity of response resources necessary for the three-tiered response to a worst case discharge is provided in Table I-2. Response resources that have been contracted by Beta Offshore to meet the three-tiered planning volumes and response times are shown in Table I-3. Equipment lists and contracts for response contractors are provided in Annex P. The inspection/maintenance and testing schedule for the Company's response equipment is provided in Table B-1. Cooperatives are also committed to maintaining their equipment in good working order such that it can perform according to specifications. The BSEE is authorized to require performance testing of response equipment to verify its capabilities if the equipment has been modified, damaged and repaired, or has a questionable claimed effective daily recovery capacity.

Initial response in the event of a spill from the Beta Unit Complex could involve deployment of the 1,500 feet of Expandi Boom (Model 4300) from Platform Ellen/Elly with assistance from the SoCal Ship Services crew boat or work boat, and/or MSRC, to begin containment of the spill within approximately one hour. MSRC can respond with *Recovery 1,* or its equivalent, 24 hours a day, seven days a week, to initiate recovery operations within two hours of discovery of a spill, contingent on weather and safety (site characterization and entry timing). Its skimmer can be deployed in adverse weather and sea conditions. Beta Offshore will rely on MSRC to provide secondary and tertiary oil spill response. Note: The work boat/supply boat can help un-spool the boom but are not mentioned or qualified to deploy the boom in the “hot zone” (crude oil) due to OSHA HAZWOPER requirements. MSRC or Ship Services will conduct required site characterization before any vessels enter the HAZWOPER “hot zone”.

Under a worst-case discharge scenario, an evaluation can be made regarding the efficacy of alternatives to mechanical recovery. The two primary alternatives are the use of dispersants and in-situ burning. Both of these methods can remove significant quantities of oil from the ocean surface, preventing the oil from reaching sensitive shoreline areas. Both methods must undergo an approval process. Dispersant use in the vicinity of the Beta Platforms should follow the federal “pre-approval zone” process as outlined in the California Dispersant Plan. MSRC’s response time for dispersant application is a minimum of six hours following Federal On-Scene Coordinator (FOSC) approval, and requires daylight and favorable weather/oceanographic conditions for application. Use of in-situ burning requires a “case-by-case zone” evaluation, consisting of following a decision tree with seven decision-making points. If this decision process results in a “yes” recommendation for using in-situ burning, the recommendation must be forwarded to the EPA representative to the Regional Response Team (RRT), as well as to the California Department of Fish & Wildlife (state) representative to the RRT for approval. MSRC maintains two 500-foot Pyrotech Fire-Boom systems in Everett, Washington. Transit time of this equipment for local deployment is 34 hours. Additional equipment exists in the Gulf of Mexico states and could take even longer to obtain and deploy. In-situ burning is typically undertaken within a small window of time following the release of oil.

Table I-2. Planning Volumes and Resources Required For BSEE Worst Case Discharge.

<table>
<tr><th>Factors</th><th colspan="3">Values</th></tr>
<tr><td>Worst Case Discharge Volume of Oil</td><td colspan="3">12,036 bbls</td></tr>
<tr><td>Type of Petroleum Handled</td><td colspan="3">Group III</td></tr>
<tr><td>Facility-Specific Operating Area</td><td colspan="3">High Volume Port</td></tr>
<tr><td>Emulsification Factor (EF)</td><td colspan="3">1.4</td></tr>
<tr><td>Percent Recovered Floating Oil</td><td colspan="3">50</td></tr>
<tr><td>Percent Oil Onshore</td><td colspan="3">70</td></tr>
<tr><td>Percent Lost To Natural Dissipation</td><td colspan="3">10</td></tr>
<tr><td>Mobilization Factors (MFs)</td><td colspan="3">0.15 (Tier 1); 0.25 (Tier 2); 0.40 (Tier 3)</td></tr>
<tr><th colspan="4">Planning Volumes For On-Water Recovery (OWP)</th></tr>
<tr><td colspan="4">(Worst Case Discharge) X (Percent Recovered Floating Oil) X (Emulsification Factor)</td></tr>
<tr><td colspan="4">(12,036) X (0.50) X (1.4) = 8,425 bbls</td></tr>
<tr><th colspan="4">Planning Volume For Onshore Recovery</th></tr>
<tr><td colspan="4">(Worst Case Discharge) X (Percent Oil Onshore) X (Emulsification Factor)</td></tr>
<tr><td colspan="4">(12,036) X (0.70) X (1.4) = 11,795 bbls</td></tr>
<tr><th colspan="4">Necessary Resources For On-Water Recovery</th></tr>
<tr><td>(OWP) X (MF) = (8,425) X (MF)</td><td>Tier 1 (0.15)</td><td>Tier 2 (0.25)</td><td>Tier 3 (0.40)</td></tr>
<tr><td>bbls/day</td><td>1,264</td><td>2,106</td><td>3,370</td></tr>
<tr><td colspan="4">Conclusions:

Beta has contracted with response resources capable of handling a 12,036-bbl shoreline cleanup.

Beta has contracted response resources for 1,264 bpd for Tier 1; 2,106 bpd for Tier 2; and 3,370 bpd for Tier 3.

Beta has contracted temporary storage resources for 2,528 bpd for Tier 1; 4,212 bpd for Tier 2; and 6,740 bpd for Tier 3.

The contracted resources will be located such that they can arrive on scene within 6, 30, and 54 hours of discovery of an oil discharge for Tier 1, Tier 2, and Tier 3, respectively.</td></tr>
</table>

Table I-3. Response Resources For Worst-Case Discharge Planning Volumes.

Tier	Response Resource	De-rated Recovery Capability (bpd)	Containment/ Shoreline Protection (boom feet)	Temporary Storage (bbls)
1	Beta Offshore		1,500	
1	MSRC	19,814	5,250	3,725
	Total Tier 1	**19,814**	**6,750**	**3,725**
2	MSRC	9,907	10,500	2,883
	Total Tiers 1 + 2	**29,721**	**17,250**	**6,608**
3	MSRC	22,907	39,030	506,608
3	MSRC CA	78,767	56,246	106,200
3	MSRC OR	60,520	17,311	45,200
3	MSRC WA	55,377	33,731	45,200
	Total Tiers 1 + 2 + 3	**247,292**	**163,568**	**703,208**

Note:
Federal tiers for high volume port: 6-hr at 12.5K bpd, 30-hr at 25K bpd, and 54-hr at 50K bpd.
MSRC can respond with *Recovery 1* or equivalent 24-hours per day to provide skimming capability within 2 hours.

I.4 DOT- PHMSA

I.4.1 Worst Case Discharge

The worst-case discharge for the 16-inch dry oil delivery pipeline has been determined to be 3,111 bbls in accordance with 49 CFR Part 194. (See Section H.2.4)

I.4.2 Response Planning Volume Analysis

The crude oil to be transported through the pipeline is “Group 3” oil. The inland onshore response planning volume is 3,111 bbls. The on-water response planning volume is 3,111 bbls x 0.5 (on-water persistence factor) x 2.0 (emulsification factor) = 3,111 bbls. The shoreline response planning volume is 3,111 bbls x 0.5 (shoreline persistence factor) x 2.0 (emulsification factor) = 3,111 bbls.

I.4.3 Resource Requirement Analysis

It has been shown in Sections I.2 and I.3 that the Beta Unit Complex has the necessary resources under contract to respond to releases much larger than the response planning volumes for the pipeline. Annex P lists the resources and substantiates the contractual arrangements with MSRC and the other response contractors.

Table I-4. Platform Ellen Tank/Vessel Capacities.

Description	Tanks/Vessels					
	Diameter (inches)	**Length S/S (inches)**	**Shell Volume (cu. ft.)**	**Head Volume (cu. ft.)**	**Total Volume (cu. ft.)**	**Total Volume (bbls)**
V-101 Blowdown Vessel – Out of Service	32	96	44.68	4.96	49.64	8.83
V-010-L2 West Main Diesel Storage Tank						307.77
V-010-L1 East Main Diesel Storage Tank						307.77
V-020-E1 Standby Diesel Day Tank						11.40
V-110-E1 Rig Engine Diesel Supply Tank						6.23
V-120-E1 Emergency Rig Diesel Supply Tank						3.06
V-010-E1 Rig Generator Diesel Day Tank						57.71
Gel Tank						56.50
Slugging Tank						23.00
Active Tank No. 3						130.00
Active Tank No. 2						131.13
Active Tank No. 1						246.00
Reserve Tank						278.50
Holding Tanks						50.00
Slop Tank						50.00
Completion Tanks						
U-18-A Oil Sump	36	180	106.03	28.27	134.30	23.88
U-18-B Oil Sump	36	180	106.03	28.27	134.30	23.88
TOTALS						**1,715.70**

Table I-5. Platform Elly Tank/Vessel Capacities.

Description	Tanks/Vessels					
	Diameter (inches)	Length S/S (inches)	Shell Volume (cu. ft.)	Head Volume (cu. ft.)	Total Volume (cu. ft.)	Total Volume (bbls)
Lube Oil Tank – Injection Pump Turbine Driver NP-07A						1.79
Lube Oil Tank – Injection Pump Turbine Driver NP-10A						1.79
Lube Oil Tank – Injection Pump Turbine Driver NP-10B						1.79
Lube Oil Tank – Centaur Turbine Generator Driver NJ-01A						5.19
Lube Oil Tank – Centaur Turbine Generator Driver NJ-01B						5.19
Lube Oil Tank – Centaur Turbine Generator Driver NJ-01C						5.19
Lube Oil Tank – Mars Turbine Generator Driver ZAN-9005						36.24
Lube Oil Tank – Mars Turbine Generator Driver ZAN-9006						36.24
S-10 Diesel Fuel Tank (Drawing No. C6-1787)						1,000.00
S-11 Injection Pump Diesel Day Tank (Drawing No. C6-1787)						150.00
S-12 Generator Diesel Day Tank (Drawing No. C6-1787)						150.00
SZ-13X Standby Generator Diesel Day Tank (Drawing No. C6-1787)						12.62
F-07 Diesel Fuel Unloading Filter (Drawing No. C6-1787)	10	37	1.68	0.00	1.68	0.30
F-11 Diesel Fuel Transfer Filter (Drawing No. C6-1787)	10	37	1.68	0.00	1.68	0.30
U-05 Oil Sump (Drawing No. C6-1791)	48	192	201.06	16.59	217.65	38.77
V-10 High Pressure Flare Drum (Drawing No. C6-1794)	72	120	282.74	56.55	339.29	60.43
V-09 Low Pressure Flare Drum (Drawing No. C6-1792)	48	106	113.10	16.76	129.85	23.13
Turbine Lube Oil Refill Tank (Drawing No. 008-93-014)						5.95
T-1A Shipping Pump “A” Lube Oil Tank (Drawing No. 008-93-015)						0.60
T-1B Shipping Pump “B” Lube Oil Tank (Drawing No. 008-93-015)						0.60
T-1C Shipping Pump “C” Lube Oil Tank (Drawing No. 008-93-015)						0.60
X-05A Well Test Treater (Drawing No. C6-1733)	96	204	854.51	134.04	988.55	176.07
X-05B Well Test Crude Heater (Drawing No. C6-1734)						3.17

Table I-5. Platform Elly Tank/Vessel Capacities.

Description	Tanks/Vessels					
	Diameter (inches)	Length S/S (inches)	Shell Volume (cu. ft.)	Head Volume (cu. ft.)	Total Volume (cu. ft.)	Total Volume (bbls)
V-03B Well Test Treater (Drawing No. C6-1734)	96	204	854.51	134.04	988.55	176.07
U-06 Sphere Receiver-Oil (Drawing No. C6-1735)	12/16	12/7	20.89	0.53	21.42	3.82
X-06 Eureka Crude Heater (Drawing No. C6-1735)						1.79
X-01A Crude/Dry Oil Exchanger (Drawing No. C6-1736)	42	240	192.42	5.61	198.03	35.27
X-02A Crude Heater (Drawing No. C6-1736)						0.82
V-01A FWKO (Drawing No. C6-1736)	120	480	3,141.59	261.80	3,403.39	606.17
X-03A Produced Water Emulsion Exchanger (Drawing No. C6-1737)						19.06
X-04A Emulsion Heater (Drawing No. C6-1737)						8.78
V-02A Heater Treater (Drawing No. C6-1737)	144	540	5,089.38	452.39	5,541.76	987.03
X-01B Crude/Dry Oil Exchanger (Drawing No. C6-1736)	42	240	192.42	5.61	198.03	35.27
X-02B Crude Heater (Drawing No. C6-1738)						0.82
V-01B FWKO (Drawing No. C6-1738)	120	480	3,141.59	261.80	3,403.39	606.17
X-03B Produced Water Emulsion Exchanger (Drawing No. C6-1736)						19.06
X-04B Emulsion Heater (Drawing No. C6-1739)						8.78
V-02B Heater Treater (Drawing No. C6-1739)	144	540	5,089.38	452.39	5,541.76	987.03
S-02A Wet Oil Tank (Drawing No. C6-1742)						500.00
S-02B Dry Oil Tank (Drawing No. C6-1742)						2,500.00
M-5 Edith Oil Pig Receiver (Drawing No. C6-1743 Supp 1)	8	36	1.05	0.08	1.12	0.20
U-10 Sphere Launcher for 16" Dry Oil Line to Shore (Drawing No. C6-1743 Supp 1)	20	138	25.09	5.09	30.18	5.37
V-1004 35# Gas Scrubber	60	144	235.82	32.72	268.34	47.79
VZ-04X Vapor Recovery Compressor Suction Scrubber (Drawing No. C6-1744)	42	96	76.97	11.22	88.19	15.71
V-18 Slug Catcher (Drawing No. C6-1744)	30	96	39.27	4.09	43.36	7.72
VZ-05AX "A" Fuel Gas Compressor Suction Scrubber (Drawing No. C6-1745)	30	96	39.27	4.09	43.36	7.72

Table I-5. Platform Elly Tank/Vessel Capacities.

Description	Tanks/Vessels					
	Diameter (inches)	Length S/S (inches)	Shell Volume (cu. ft.)	Head Volume (cu. ft.)	Total Volume (cu. ft.)	Total Volume (bbls)
VZ-06AX "A" Fuel Gas Compressor Interstage Scrubber (Drawing No. C6-1745)	30	96	39.27	4.09	43.36	7.72
VZ-05BX "B" Fuel Gas Compressor Suction Scrubber (Drawing No. C6-1746)	30	96	39.27	4.09	43.36	7.72
VZ-06BX "B" Fuel Gas Compressor Interstage Scrubber (Drawing No. C6-1746)	30	96	39.27	4.09	43.36	7.72
MAK-9003 Fuel Gas Separator Filter (Drawing No. 4000-F-001)	22	133	29.26	0.81	30.06	5.35
MAK-9004 Fuel Gas Separator Filter (Drawing No. 4000-F-001)	22	133	29.26	0.81	30.06	5.35
V-15A Fuel Gas Scrubber (Drawing No. C6-1747)	35	116	64.59	6.50	71.08	12.66
V-15B Fuel Gas Scrubber (Drawing No. C6-1747)	35	116	64.59	6.50	71.08	12.66
F-14A Injection Pump Turbine Fuel Gas Filter (Drawing No. C6-1788)	10.75	82	4.31	0.09	4.40	0.78
F-14B Injection Pump Turbine Fuel Gas Filter (Drawing No. C6-1788)	10.75	82	4.31	0.09	4.40	0.78
F-13A Generator Turbine Fuel Gas Filter (Drawing No. C6-1788)	12.75	83	6.13	0.16	6.29	1.12
F-13B Generator Turbine Fuel Gas Filter (Drawing No. C6-1788)	12.75	83	6.13	0.16	6.29	1.12
TOTALS						**8,362.50**

Table I-6. Platform Eureka Tank/Vessel Capacities.

Description	Tanks/Vessels					
	Diameter (inches)	Length S/S (inches)	Shell Volume (cu. ft.)	Head Volume (cu. ft.)	Total Volume (cu. ft.)	Total Volume (bbls)
MAY-116 Well Cleanup Surge Vessel (3900-F-405)	48	108	113.10	16.76	129.85	23.13
ABJ-1105 Well Cleanup Tank (3900-F-406)					6,525.00	1,162.15
MAY-1101 Production Surge Vessel (3900-F-406)	144	30	282.74	452.39	735.13	130.93
KAH-1603 Crude Oil Sphere Launcher (3900-F-407)	16	106	12.33	0.62	12.95	2.31
MAM-1102A Well Test Free Water Knockout (3900-F-408)	72	180	424.11	56.55	480.66	85.61
MBD-1104A Well Test Separator (3900-F-408)	72	180	424.11	56.55	480.66	85.61
MAM-1102B Well Test Free Water Knockout (3900-F-409)	72	180	424.11	56.55	480.66	85.61
MBD-1104B Well Test Separator (3900-F-409)	72	180	424.11	56.55	480.66	85.61
MBF-1106 Relief Scrubber (3900-F-412)	60	120	196.35	32.72	229.07	40.80
ABH-1108 Oil Sump (3900-F-414)	48	192	201.06	8.38	209.44	37.30
12” Diesel Fuel Pump Casing (3900-F-427)	12	3,720	243.47	0.13	243.60	43.39
Diesel Fuel Storage Leg A-1 (3900-F-427)						1,000.00
ABJ-2580 Diesel Reservoir (3900-F-427)						100.00
MAJ-2583 Diesel Fuel Fill Filter (3900-F-417)	20	4.5	0.82	1.21	2.03	0.36
MAJ-2584Diesel Fuel Standby Fill Filter (3900-F-427)	20	4.5	0.82	1.21	2.03	0.36
MAJ-2585 Diesel Fuel Transfer Filter (3900-F-427)	20	4.5	0.82	1.21	2.03	0.36
MAJ-2586 Diesel Fuel Standby Transfer Filter (3900-F-427)	20	4.5	0.82	1.21	2.03	0.36
V-010-E2 Diesel Day Tank (2900-F-448)						57.71
V-020-E2 Standby Generator Day Tank (2900-F-448)						11.40
V-420-E2 Standby Diesel Supply Tank (2900-F-448)						3.06
V-410-E2 Diesel Supply Tank (2900-F-448)						6.23
ABJ-2530 Diesel Fuel Day Tank (3900-F-435)						17.00
ABJ-2600A Washdown Solution Tank (3900-F-434)						7.14

Table I-6. Platform Eureka Tank/Vessel Capacities.

Description	Tanks/Vessels					
	Diameter (inches)	Length S/S (inches)	Shell Volume (cu. ft.)	Head Volume (cu. ft.)	Total Volume (cu. ft.)	Total Volume (bbls)
ABJ-2600B Washdown Water Tank (3900-F-434)						7.14
Lube Oil Tank for Facilities Standby Generator (3900-F-435)						7.14
Reserve Storage Tank (2900-F-455)						278.50
Active Tank No. 1 (2900-F-455)						246.00
Active Tank No. 2 (2900-F-455)						131.13
Active Tank No. 3 (2900-F-455)						130.00
Slugging Tank (2900-F-455)						23.00
Gel Tank (2900-F-455)						23.00
TOTALS						**3,832.40**

J.1 INTRODUCTION

This section provides the trajectory and offsite consequence analysis required by Section 817.02(c)(2) of the OSPR regulations. The trajectory analysis defines the geographic region that could be affected by an oil spill. The offsite consequences of such a spill are then assessed based on the sensitivity of resources identified within the affected area.

The remainder of this section describes three relevant methodologies used in the trajectory analyses and identifies the resources that exist within the potential area of oil spill impact. Resource of concern include environmental (organisms, habitat, etc.), economic (parks, mariculture operations, tourism, etc.), and cultural (Native American and historic sites).

J.2 TRAJECTORY ANALYSIS (Beta Complex and pipelines)

The worst case OSPR discharge is 3,111 bbls from the crude oil pipeline running from Platform Elly to the Beta Pump Station in the Port of Long Beach area (i.e., the San Pedro Bay Pipeline). This pipeline comes ashore just north of the bow of the Queen Mary, near the mouth of the Los Angeles River, crosses near the Port Administration Building and then follows Pico Avenue north to the Beta Pump Station. Although not under the jurisdiction of OSPR, a trajectory analysis has been conducted for the BSEE (MMS) OPA '90 worst case discharge from the Beta platforms (12,036 bbl).

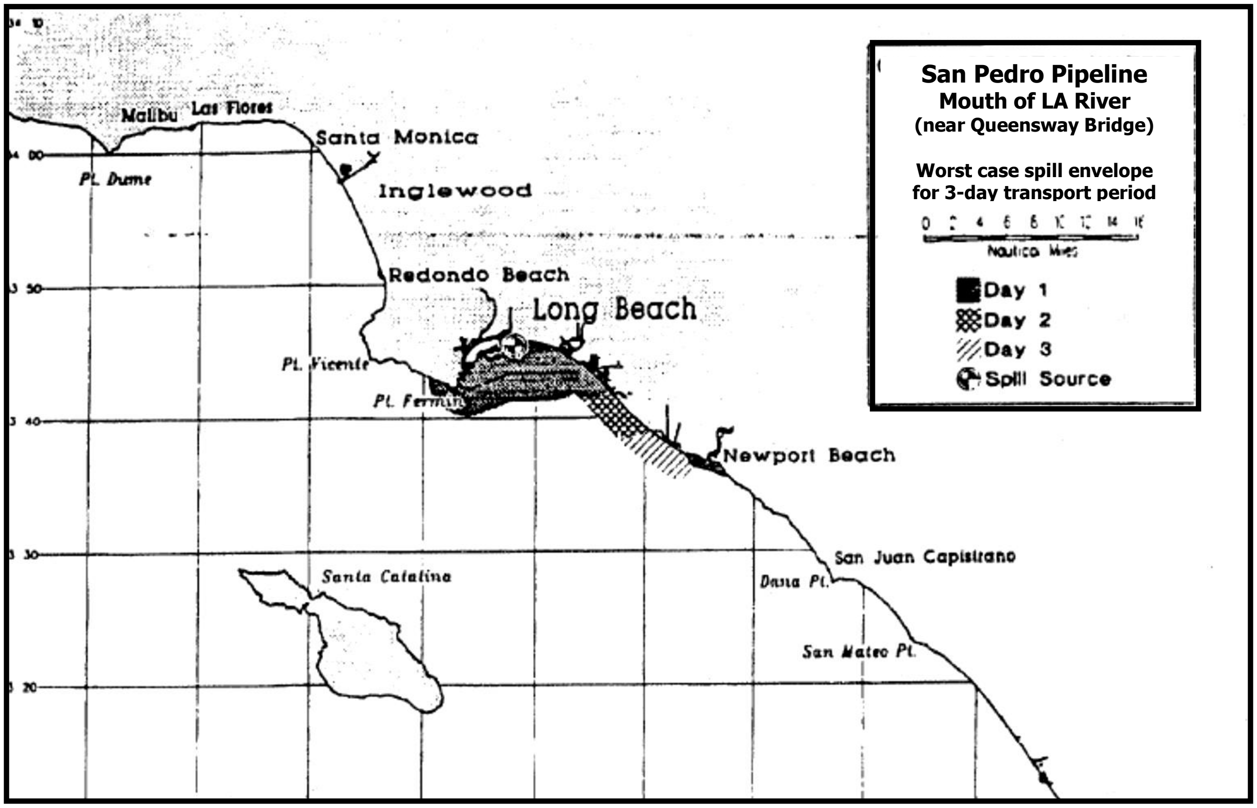
The following figures provide the results of trajectory analyses based on a 2,000 bbl spill located at the mouth of the Los Angeles River (Latitude 33º 45.6' N, Longitude 118º 11.9' W), a 1,000 bbl spill located along the pipeline between the Beta Unit Complex and shore within the three-mile limit outside the harbor breakwater (Latitude 33º 37.2' N, Longitude 118º 06.7' W), and a 5,000 bbl spill located at Huntington Beach (Latitude 33º 39.0' N, Longitude 117º 58.5' W). These trajectories are incorporated here because they are representative of potential worst case OSPR spill scenarios from the Beta Unit Complex, as documented in Annex H.

Figure A. San Pedro Bay Pipeline, 2000 bbl worst case envelope

Figure B. Pipeline from Elly to shore, 1000 bbl worst case envelope

Figure C. Huntington Beach, 5,000 bbl worst case envelope

Figure A. San Pedro Bay Pipeline 2,000 bbl worst case envelope.

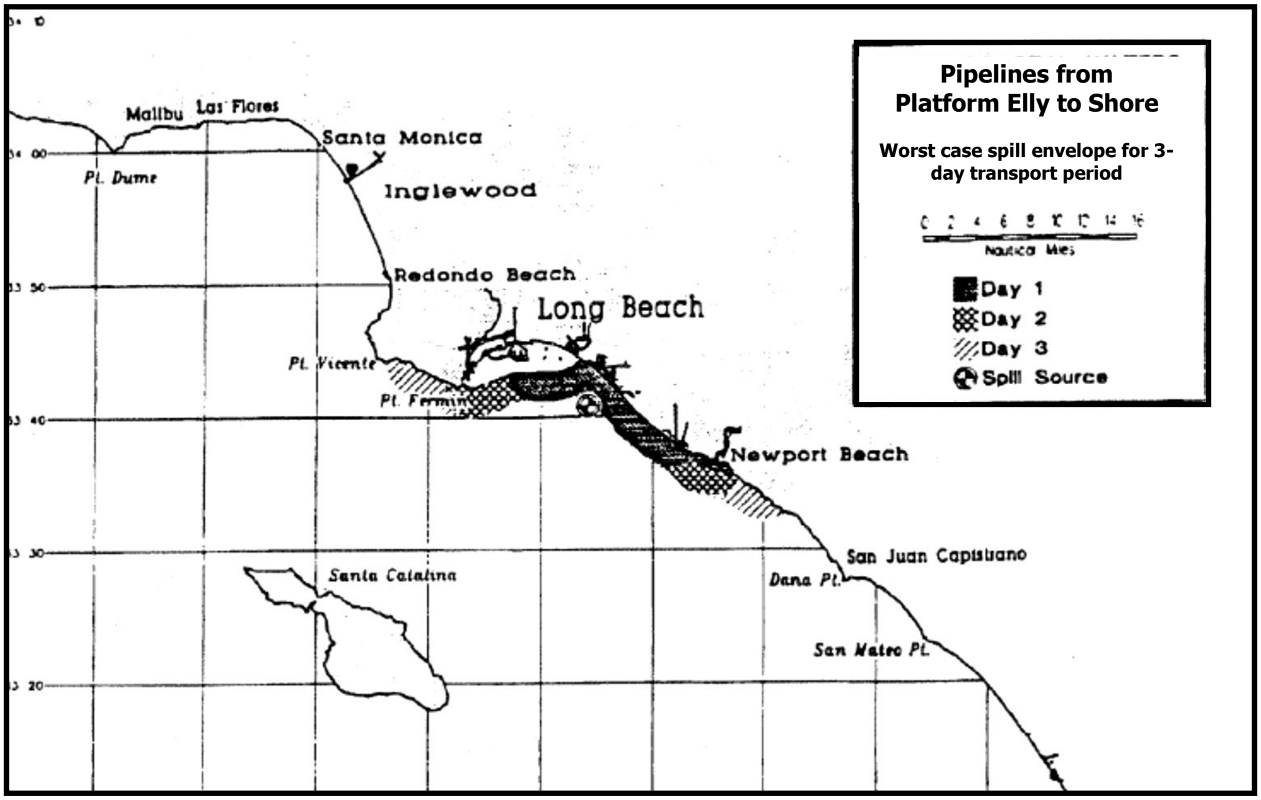


This spill trajectory envelope was developed for a facility hazard located near the mouth of the Los Angeles River (near the Queensway Bridge). The analysis considered oil transport by wind stress, tidal currents and spreading by physical processes including gravity, surface tension and tidal dispersion.

Circulation and spill transport in the shallow waters of San Pedro Bay is dominated by wind stress. Tidal current within the bay, usually no more than 0.1-0.2 knots and rotary in nature, are much less important than wind stress and probably would not contribute significantly to spill transport.

Tidal currents, wind stress, and spreading could transport oil either northward up the Los Angeles River during periods of low river flow or southward towards the waters of San Pedro Bay. Should the spill travel southward of the Los Angeles River mouth, westerly or northwesterly winds could drive the spill as far as the eastern end of the Long Beach breakwater. Easterly or southeasterly winds could drive a spill westward as far as the mouth of the Los Angeles Harbor main channel. Under these conditions, it is possible for oil to be transported outside the San Pedro Bay breakwater. With northwesterly winds, a spill could be transported as far south as Sunset Beach, about 10 nautical miles southeast of the Long Beach breakwater over a 3-day period.

Figure B. Pipeline from Elly to shore 1000 bbl worst case envelope



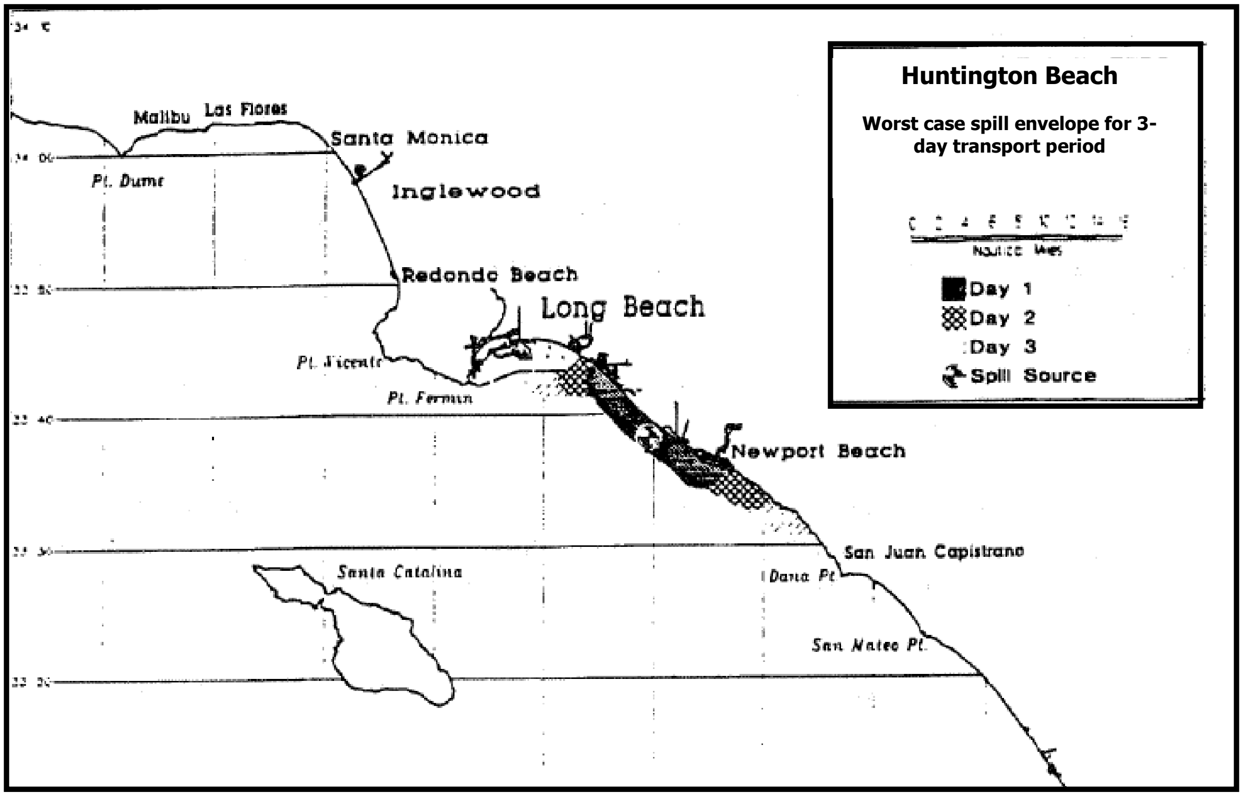
This spill trajectory envelope was developed for a facility hazard located at the pipeline crossing from Platform Elly located about 3 nautical miles west of Huntington Beach shore. The analysis considered oil transport by wind stress, tidal currents and spreading by physical processes including gravity, surface tension and tidal dispersion.

Tidal currents are considered but not included in the analysis because they are weak in this region of the coast. The Southern California Countercurrent runs northward offshore for most of the year. Surface currents, which affect oil spill transport, are dominated by wind stress.

Southerly and southeasterly winds could transport a spill 12 nautical miles northwestward of the spill site across the San Pedro Bay breakwater. It is likely that oil would infiltrate the San Pedro Bay harbor entrances over a 3-day period. This could result in significant oiling of a large part of San Pedro Bay.

Northerly and northwesterly winds could transport a spill about 12 nautical miles southward to Corona del Mar in 3-days.

Figure C. Huntington Beach, 5000 bbl worst case envelope



This spill trajectory envelope was developed for a facility hazard located near Huntington Beach. The analysis considered oil transport by wind stress, tidal currents and spreading by physical processes including gravity, surface tension and tidal dispersion.

Tidal currents are considered but not included in the analysis because they are weak in this region of the coast. The Southern California Countercurrent runs northward offshore for most of the year. Surface currents, which affect oil spill transport, are dominated by wind stress.

Southerly and southeasterly winds could transport a spill 11 nautical miles northward of the spill site across the San Pedro Bay breakwater. It is likely that oil would infiltrate the San Pedro Bay harbor entrances over a 3-day period. This could result in significant oiling of a large part of San Pedro Bay.

Northerly and northwesterly winds could transport a spill about 12 nautical miles southward to Laguna Beach in 3-days.

J.2.1 Trajectory Analysis Methodology

Each of the trajectory analyses develops a “spill envelope” which encompasses a segment of coastline over which spilled oil may impact the coast over time based on a variety of environmental conditions, and the chemical and mechanical properties of the substance spilled. No single spill could possibly impact the coastline over the entire spill envelope, since the envelopes were calculated by considering the entire range of possible spill trajectories. A single spill could not simultaneously move along all of the trajectories used to develop the spill envelope.

The spill envelopes are based on three-day scenarios with the potential maximum spread of oil indicated for each successive day. Many facility spill volumes are much less than the available daily cleanup capacity for the facility. For these facilities, it is likely, however, that spill response and cleanup would occur within one day. Therefore, the spill envelopes probably overstate the extent of contamination from a spill from the Beta Unit Complex by a wide margin.

The model accounts for wind stress, tidal advection and dispersion, large-scale oceanic currents, and reverine effect. Calculations are based on typical California crude oil, which is comparable to the oil produced by the Beta Unit Complex. The model does not account for recovery, standing, dispersion in higher energy waves, or other removal, or the effects of oil contaminating and remaining upon areas within the envelope. The three-day scenario was chosen on the assumption that most, but not all, of the oil from a nearshore spill would beach within the three-day period.

The spill envelopes were developed by combining a series of individual trajectories using assumptions of regional extremes of climate, tide, current, and wind. The envelopes were developed specifically to fulfill the requirement of Section 817.02(c)(2) of the OSPR regulations to provide a “basis for determining the areas and shoreline types for which Response Strategies must be developed.” The envelopes intentionally overstate the extent to which any single spill could contaminate the shoreline, but are useful planning tools to identify the shoreline areas that may be affected by a spill.

Some additional trajectory modeling was conducted in the 1980's by Dames & Moore to represent probability of landfall by the month. The above trajectory analysis and the Dames & Moore analyses are primarily useful for planning purposes.

Trajectory analysis based upon environmental conditions was conducted at the suggestion of the Minerals Management Service. The scenarios for this analysis utilized the areas three historical current regimes coupled with concurrent statistical winds. Results from this type of analysis are most useful during actual spills, because the results indicate the probable time frame and landfall areas under specific spill conditions.

J.2.2 Dames & Moore Analysis

Several oil spill sources may be associated with platform operations, including small diesel spills associated with transfer operations, small crude oil spills associated with drilling and processing operations, and the BSEE OPA '90 worst case discharge of 12,036 bbls of crude oil.

A set of monthly oil spill trajectories were run to estimate the frequency with which the various sections of the coastline would be impacted by the oil during each month. Each monthly trajectory shows changes in direction of the centroid of the release over the course of its simulated 72-hour trajectory or until shore contact. Physical factors considered to be the predominant driving forces in the model are geostrophic and tidal currents and winds. Trajectory results are not dependent on oil spill volumes or mass dependent effects (e.g., spreading, evaporation, dissolution, dispersion, emulsification, sedimentation, biodegradation, and auto-oxidation). However, because interpretation of the model results becomes increasingly difficult with increasing spill volumes (and associated greater spreading diameter), the model is only considered valid for spill volumes of 10,000 bbls or less.

The trajectory model employs a vectoral addition of wind and current forces to drive the centroid of a two-dimensional surface oil slick. Second order forces, such as waves and wind-wave current interaction, are not considered. Similarly, physiochemical processes such as evaporation, sinking, dissolution, and emulsification also are neglected. These assumptions give conservative results with respect to impact probabilities and eliminate the need to use input data that are not readily available. The model assumes that, in the absence of surface currents, the centroid of an oil slick moves in the direction of the wind at about 3 percent of the wind velocity.

A surface slick on a moving stream of water in the absence of waves moves with the currents at the surface current velocity. For modeling purposes, surface currents offshore San Pedro are divided into two components: a geostrophic surface current and a tidally induced surface current. During any trajectory simulation, the net geostrophic surface current component is assumed to remain constant in time, while the tidal current component is phased with the tide.

In the oil slick trajectory model, the slick centroid is calculated to move at the instantaneous velocity as the vectoral sum of the underlying surface currents, plus 3 percent of the wind velocity vector.

Application of the trajectory oil spill model requires a grid system to be superimposed on the study area. A three-mile square grid resolution was chosen and used as the basis for input of wind and current information. The definitions of shoreline impact locations are also based on this grid. A trajectory can be generated by using appropriate values of wind and current data over a sequence of time steps until the centroid reaches the shoreline or the outer boundary of the grid system, or until an upper limit on time is reached.

The meteorology of the Southern California Bight region has been classified into a number of readily discernible, frequently occurring wind regimes. Each regime has a characteristic seasonal frequency of occurrence and an average and maximum duration. For each type, the generalized wind pattern can be described for certain periods of the day for each three-mile square. For the remainder of the 24-hour cycle, the wind pattern must be described by interpolation in the time intervals between the known wind patterns.

During the period that a particular wind regime is applicable, its hourly wind patterns can be used in sequence to move the centroid of the spill. During each session, the wind regimes themselves can also be sequenced according to the actual frequency of occurrence of each type. The frequency of occurrence of these regimes can be controlled so that the actual average duration of each type is observed.

By varying the combinations of spill time, spill location, tidal currents, and environmental data, a frequency distribution can be assembled from the deterministic runs to show the percentage of distribution of impact points along the shoreline. The average and minimum time for the slick centroid to reach the shore is tabulated for each shoreline grid location.

J.2.2.1 Meteorological Flow Regimes

The most prevalent wind pattern offshore of Southern California is one of northwest winds in the outer area, modified nearshore by local topography and the land-sea breeze phenomenon. Several other wind flow regimes are also relatively common in the region. To quantify these flow regimes for use in the oil spill trajectory model, an 11-year record of daily weather conditions and events was categorized *(Strange, 1983)*. Additional references used in categorizing these flow regimes included de Violine *(1974)* and DeMarrais et al. *(1965)*. Four basic meteorological types were distinguished for offshore Southern California. These types are listed below:

Meteorological Type	Subtypes
Sea Breeze	Summer; Winter
Northwester	Outer Waters; Entire Area
Southeaster	Entire Area
Santa Ana	Northern Waters; Entire Area

Each of the flow regimes exhibits unique spatial and temporal characteristics. Vector plots of the wind patterns associated with each wind regime, by time of day, were utilized in the model.

J.2.2.2 Currents

Water movement in the coastal region can be considered the result of a number of forces. These include geostrophic forces that produce large-scale surface currents, tidal forces which result in oscillatory motions, and wave forces which drive longshore currents. The relative magnitude (and hence importance) of these forces varies over time and with distance from the shoreline. Wave forces dominate the longshore currents within the surf zone, but they have negligible influence in deep water. Hence, wave-induced currents are an important consideration in a nearshore oil spill model but can be ignored in an offshore model. Geostrophic forces are damped in shallow waters, but tend to dominate all other oceanic forces far offshore. Tidal forces mainly influence the nearshore regions. The model utilized both surface and tidal currents.

J.2.2.3 Results of Dames & Moore Analysis

In the Dames & Moore study, oil spill trajectory analyses were carried out on a monthly basis for the oil spill release location which was assumed to be the center point of planned and existing production in OCS Leases P-0300 and P-0301. At the release site, 200 trajectories were initiated each month (i.e., 2,400 trajectories per site, per year). The number 200 was arrived at by a statistical assessment of the variables involved in the methodology. For each trajectory, the starting wind type, time of day, and duration are determined by entering the monthly frequency and duration tables with uniformly distributed random numbers. The starting tidal current phase, and hence velocity and direction, is also selected by a random number. The surface current pattern to be used is determined by month. The transition between wind types during a trajectory is determined by entering a monthly transition matrix of wind type and wind tables were assembled from the 11 years of data collected. The trajectories were run until either a land or water boundary was contacted or 72 hours passed.

The results of the oil spill trajectory analysis for the release site are shown at the end of this section on Figures J-1 through J-12. In each figure, a trajectory of a spill arriving at the shore segment with the greatest impact percentage is shown. The average and minimum times to shore contact are expressed in hours. Also shown on each figure is the percentage of all trajectories reaching a land boundary (as opposed to those spills that remain at sea after 72 hours or reach a water boundary).

In the summer months, the greatest percentages of shoreline contacts are in the region from Newport Beach to Huntington Beach. This is due to the dominance of southeastward winds during these months. In the winter months, when a greater percentage of northward wind and current regimes occur, the largest percentages of contacts are recorded in the Long Beach area.

Average annually, 63.5 percent of all trajectories contact land. The monthly percentage of contacts ranges from 100 percent in the summer months to a minimum of 10 percent in October. No trajectories reached the shoreline within 6 hours. The minimum time to contact of 12 hours occurs in March and April.

J.2.3 Trajectory Analysis for Selected Environmental Conditions

SpillNet (Morris Environmental) used the Applied Science Associates' (ASA's) OilMap model to simulate spill trajectories. Two sets of trajectories were run; one set with the spill origin at Platform Elly and the second set with the spill origin from the pipeline just seaward of the three-mile line. Scenarios for both sets utilized the three historical current periods and coupled them with the three most common wind directions for each of the three current seasons. This provides nine trajectories for each starting location. The model also was run from each of the two locations using the two current periods most likely to also have moderately strong wind periods that would direct the trajectory towards Catalina Island. These scenarios produced two trajectories for each starting location. A total of 22 trajectories are presented [(9 x 2) + (2 x 2)] in Attachment J-1.

J.2.3.1 Simulated Currents

Direction of the currents were mapped using the three historical current periods: Davidson Period (December through February), Upwelling Period (March through) June), and Oceanic Period (July through November). The surface currents associated with these three Periods are illustrated in Attachment J-2. Current speeds used in all the trajectories were as follows: from shore out to the three-mile line current speed was 0.1 knots; from the three-mile line out to the distance of Platform Elly the currents were proportionally increased from 0.1 knots to 0.3 knots; and current speeds offshore from Platform Elly were 0.3 knots.

J.2.3.2 Simulated Winds

Wind speed and direction were quarried from the Catalina RDG Buoy (Station Id: 46025). Four years of hourly reported data (December 1994 through November 1998) were downloaded from the Internet (http://www.nws.fsu.edu/B/buoy?46025) and spurious data were removed. Data for each year were divided into periods corresponding to the current periods delimited above (December-February, March-June, and July-November) For each period, the three most common wind directions and the 75 percentile highest wind speeds were determined and are presented below.

Period	Wind Direction	Wind Speed (knots)
Davidson (Dec/Feb)	NW, W, SE	4.9 to 8.6
Upwelling (Mar/Jun)	W, NW, SW	5.0 to 5.6
Oceanic (Jul/Nov)	W, NW, SE	3.7 to 4.5

J.2.3.3 Scenarios

Results from the chosen scenarios are most useful in the event of actual spills, because the results indicate the probable time frame and landfall areas under specific spill conditions. The model was run until initial landfall or for 72 hours, which ever occurred first. The following table gives the parameters for the 22 scenarios (see Attachment J-1). The Start Time shown on the trajectory figures was chosen to indicate the Period, i.e., 1/15/8 is Davidson (Jan 15, 8AM); 5/1/8 is Upwelling (May 1, 8AM); and 9/15/8 is Oceanic (Sep 1, 8AM). The Current Time indicates the time at which the model stopped due to initial contact with land or at 72 hours.

Trajectories from Elly		
Current	**Wind Dir**	**Wind Speed**
Davidson	NW	7
Davidson	W	7
Davidson	SE	7
Upwelling	W	5
Upwelling	NW	5
Upwelling	SW	5
Oceanic	W	4.5
Oceanic	NW	4.5
Oceanic	SE	4.5
Davidson*	NW	12
Upwelling*	NW	12
Trajectories from Pipeline		
Current	**Wind Dir**	**Wind Speed**
Davidson	NW	7
Davidson	W	7
Davidson	SE	7
Upwelling	W	5
Upwelling	NW	5
Upwelling	SW	5
Oceanic	W	4.5
Oceanic	NW	4.5
Oceanic	SE	4.5
Davidson*	NW	12
Upwelling*	NW	12

* Directed at Catalina Island with a sustained wind speed in the 95 percentile range.

Trajectory Projection

In a drill or spill event on water, Beta Offshore will deploy tracker buoys as appropriate. Beta Offshore has contracted with a 24-hour company to prepare trajectories. Normally, this will be initiated at the Platform Elly Control Room.

J.3 OFFSITE CONSEQUENCE ANALYSIS

The consequences of an oil spill in marine waters will depend on the shoreline type and the natural and economic resources within the impact area. Shoreline type determines the cleanup techniques, equipment, and personnel most appropriate for responding to a spill. Resources of concern include natural habitats and organisms, economic resources (mariculture operations, recreational sites, marinas, etc.), and cultural resources. The following sections characterize the resources of concern within the potential impact area.

Geographic Region of Concern (ACP Area 5 Los Angeles and Orange County)

The geographic region that could be affected is the coastline between the Palos Verdes Peninsula and San Clemente, including San Pedro Bay and Los Angeles and Long Beach Harbors. It is also very remotely possible that Santa Catalina Island could be impacted by a spill from a platform during the winter months. The area of concern includes those segments of the coast shown in ACP Section 9840.

Shoreline Characterization

The ACP for Los Angeles/Long Beach contains maps of the potentially affected shoreline together with site strategy and site summary sheets that describe the characteristics of the shoreline and strategies to be used to protect the shoreline from oil and to clean up oil that reaches the shoreline.

Natural Resources

The ACP also lists natural resources for each segment of shoreline. Environmental sensitivity rankings are presented on the maps to help in prioritizing response efforts. An inventory of potentially affected natural resources is presented in Table L-2.

Economic and Cultural Resources (ACP Sec. 9841.3 LA and 9842.3 Orange County)

Economic resources include marinas, mariculture operations, recreational and tourist facilities, parks, and the like. The ACP contains a discussion of economically significant areas in Sections 4620 and 4622. This discussion describes the criteria for priority response using three codes to indicate relative priority for protection. Codes A, B, and C apply to natural resources. The codes applicable to economic resources are defined as follows:

- D = Economic activities and resources that require high water quality for their operation or existence.
- E = Facilities, businesses, or resources that directly use coastal or bay waters within their economic activity, and which are at risk of oiling from a spill in marine waters.
- F = This category contains marine associated facilities, businesses, and resources.

The economic resources that may be affected are summarized in Table L-3.

Consequence Summary

Table J-1 summarizes the vulnerability of aquatic ecosystems to the toxic effects of oil. This summary is based on research conducted by the U.S. Fish and Wildlife Service National Wetlands Research Center.

Table J-1. Vulnerability of Aquatic Ecosystems to Spilled Oil.

HABITAT IMPORTANCE VULNERABILITY TO OIL DISCHARGES	
HABITAT	**VULNERABILITY**
Intertidal Shore	
Sandy Beach	Moderate
Rocky Shore	High
Tidal Flat bird nesting and feeding	High
Intertidal Wetlands	
Marshes breeding for nursery grounds	Low – High
Subtidal Systems	
Seagrass fish feeding and nursery	High
Soft bottom stabilization	High
Rocky	Moderate
Fisheries	
Offshore commercial fisheries	Low (except spawning)
Nearshore	Moderate – High
SOURCE: U.S. Department of the Interior, Fish and Wildlife Service, National Wetlands Research Center.	

Effects on economic resources are generally temporary. They include:

- Possible direct effects on mariculture operations and commercial fisheries such as contamination of fish, shellfish, or vegetation. These effects may impact the value of the products or make them unfit for sale, and may thereby adversely impact the operators and fishermen. Fishermen may be compensated if they assist in oil spill response through cooperative vessel of opportunity programs that would offset reduced earnings from fishing.

- Possible damage or adverse aesthetic effects to boats, on-water equipment, shore-based industrial operations, marinas, piers, and the like. These effects generally require cleaning of the contaminated boats or equipment to remove the oil. In certain circumstances, oil may be taken into mechanical or cooling systems in vessels or shore-side equipment, and this may require cleaning or overhaul of the equipment prior to returning it to service.

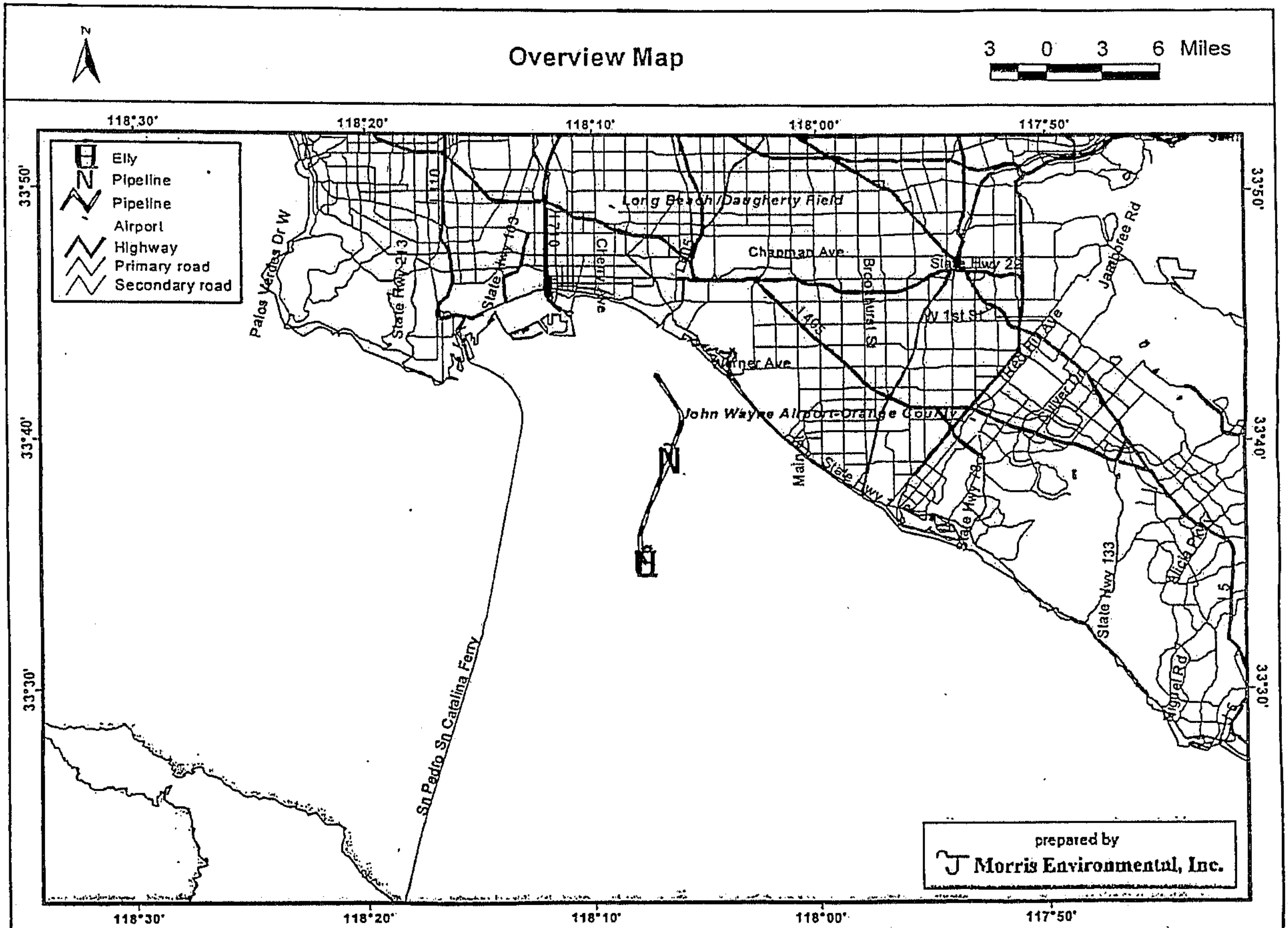
- Possible reduced tourism and park attendance and reduced revenues for the local economy from tourism. The existence of a spill may deter potential visitors from visiting the area during and, for a period of time, after the spill. Also, a spill may prevent visitors who do come from engaging in some activities that require using beaches, harbors, piers, or other shore-side amenities while spill cleanup operations are in progress. However, spill cleanup does create a demand for local labor and temporary housing which may compensate somewhat for other lost revenues.

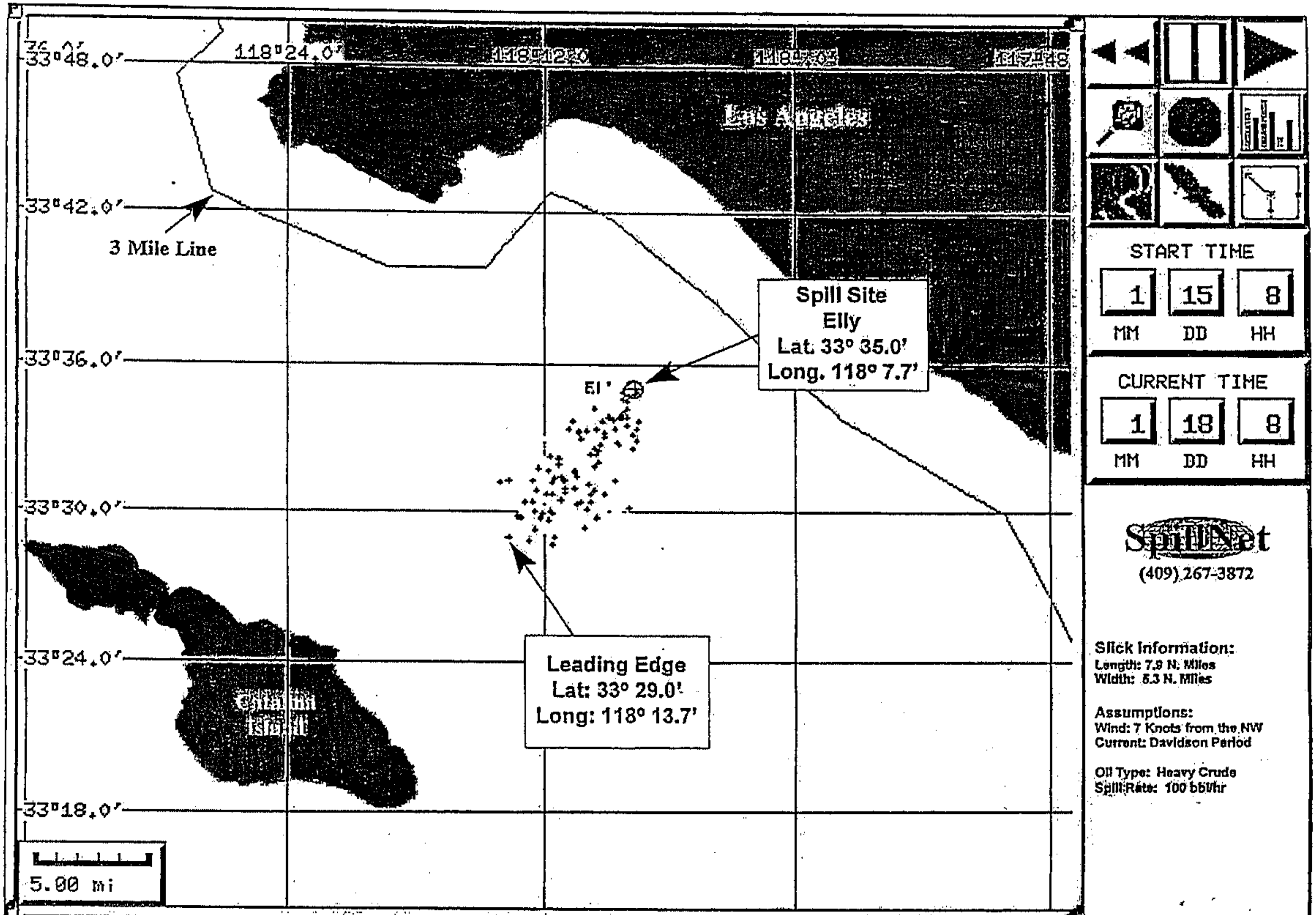
Attachment J-1a

Trajectories from ASA's OilMap Model

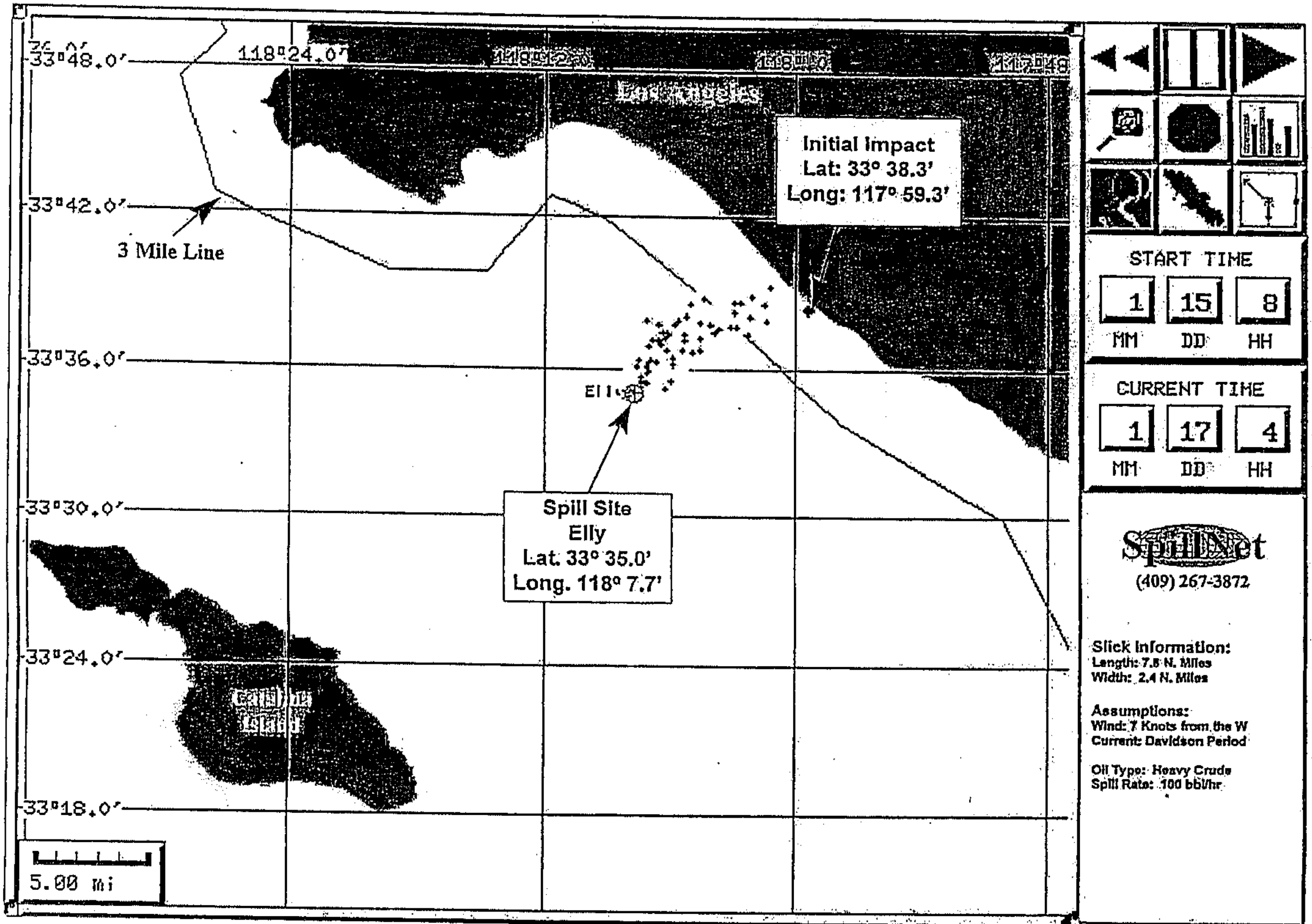
From Platforms

Overview Map

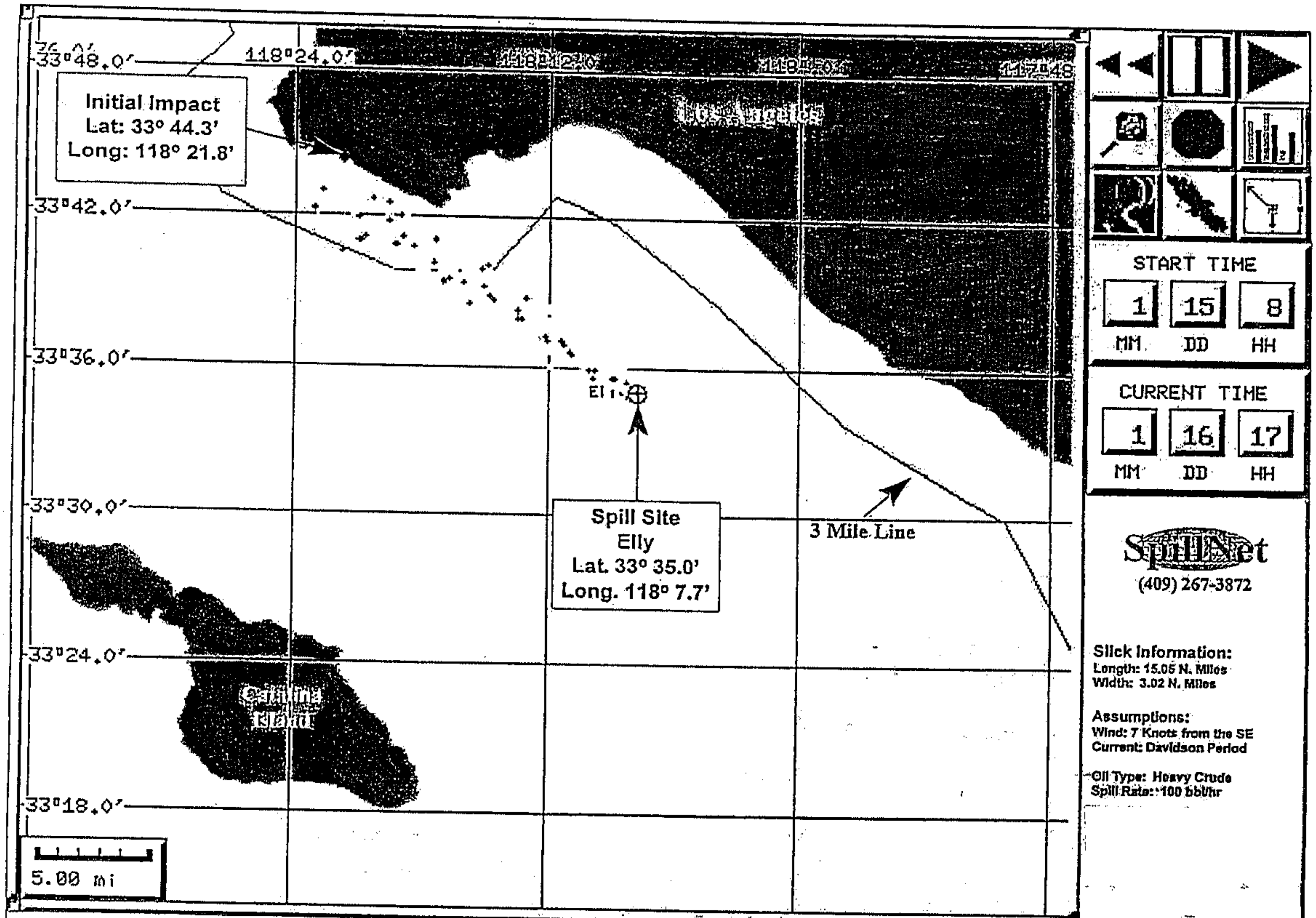




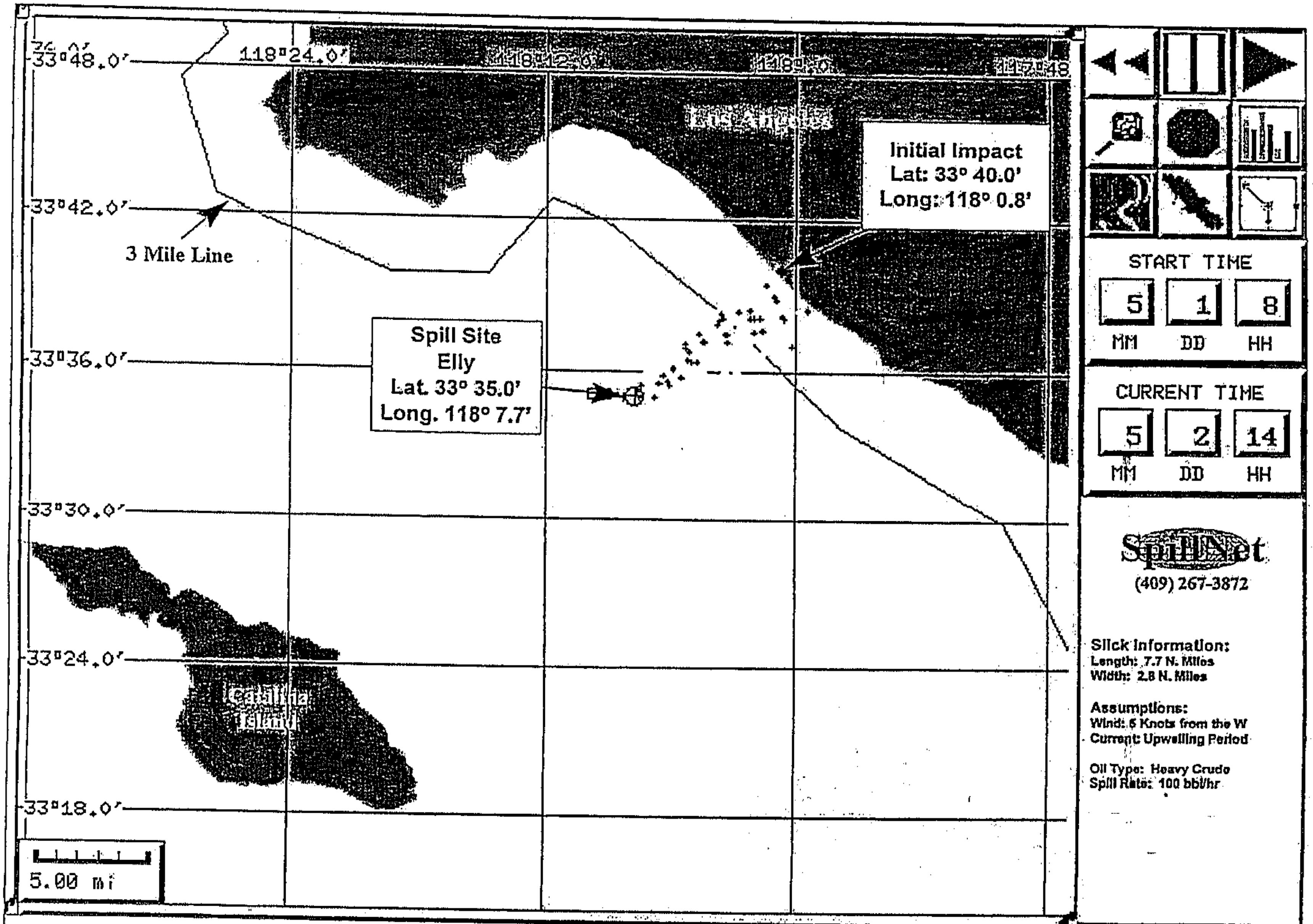
Trajectory showing no shoreline impact within 72 hours



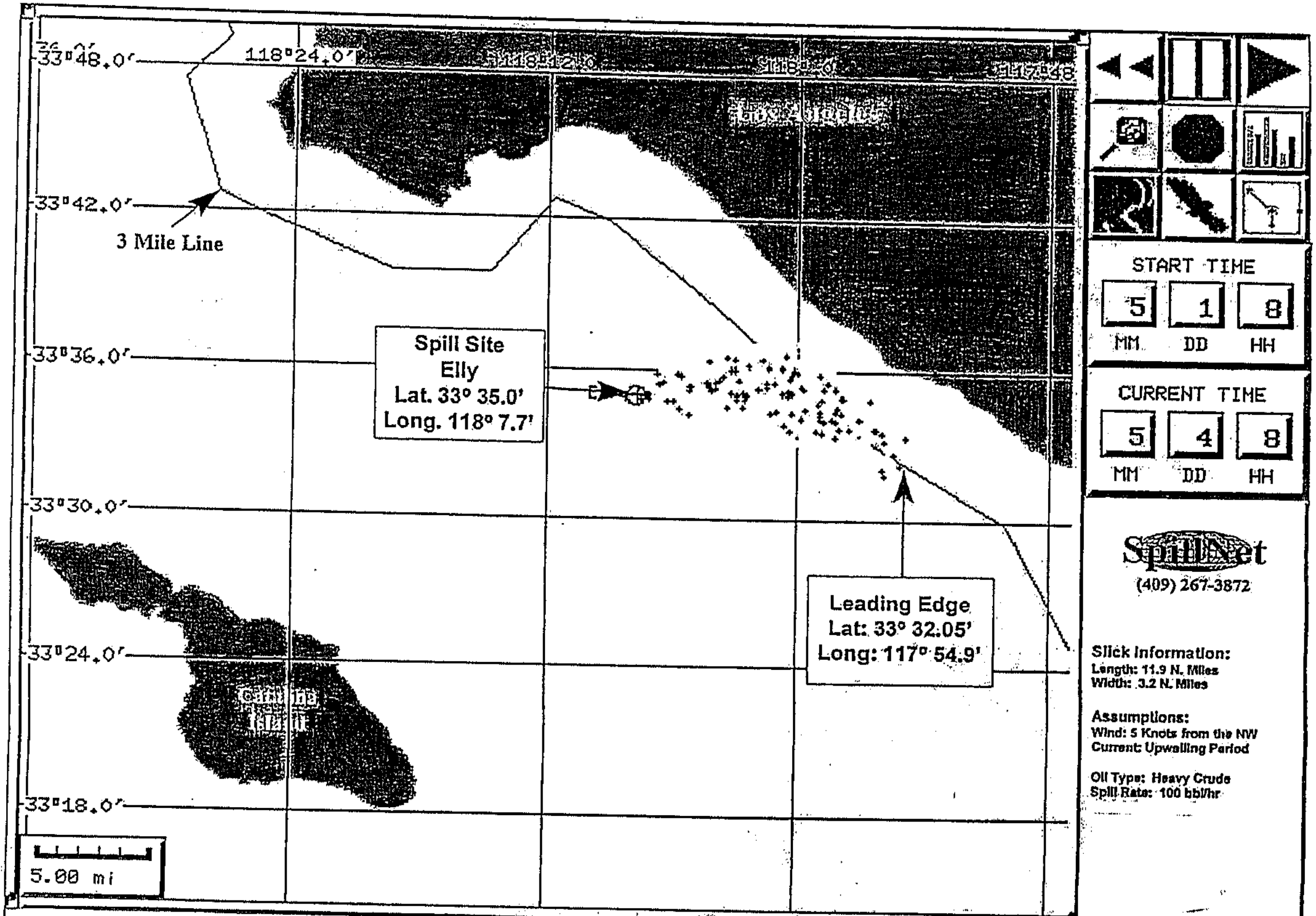
Trajectory showing initial shoreline impact in 44 hours



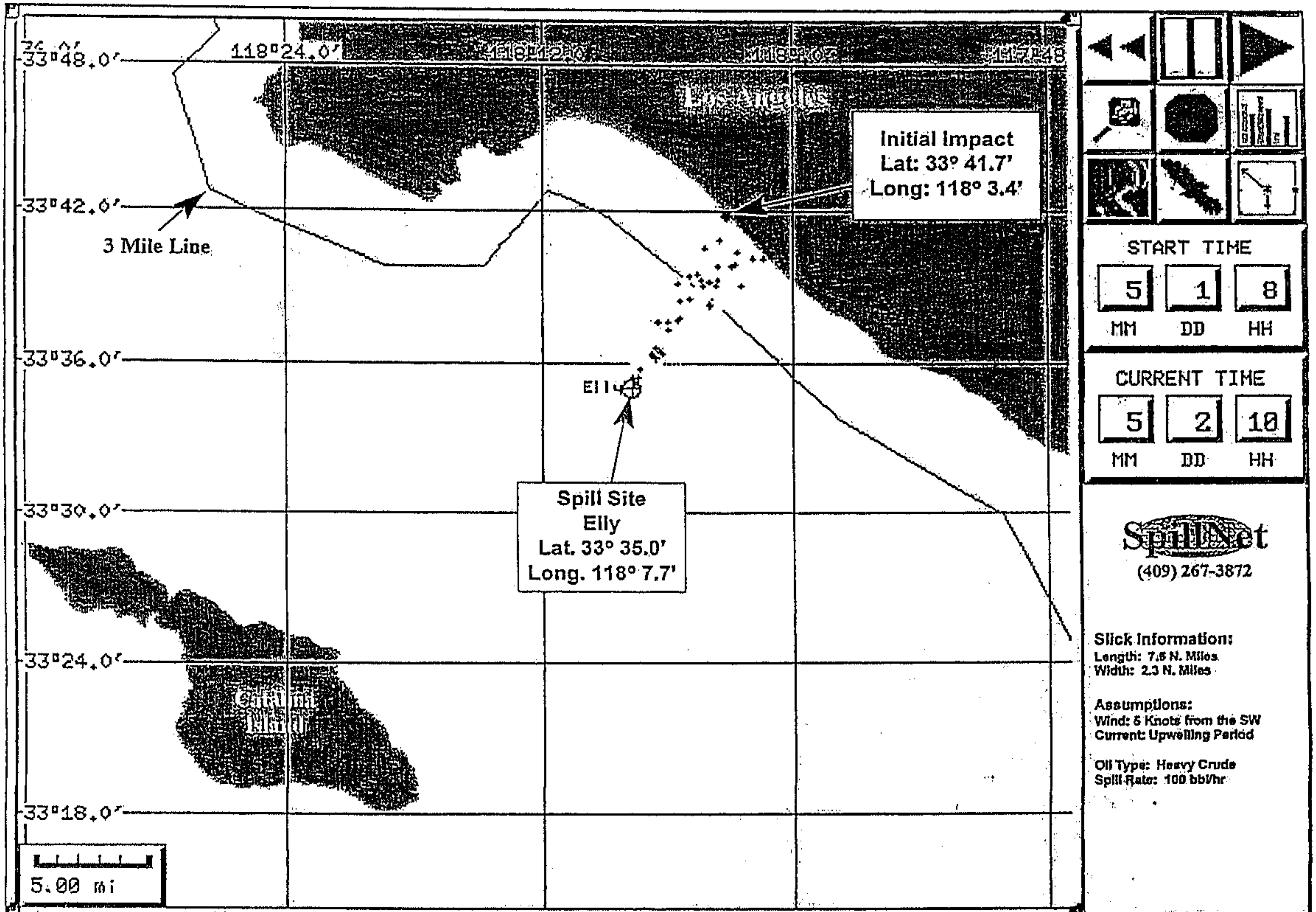
Trajectory showing initial shoreline impact within 33 hours



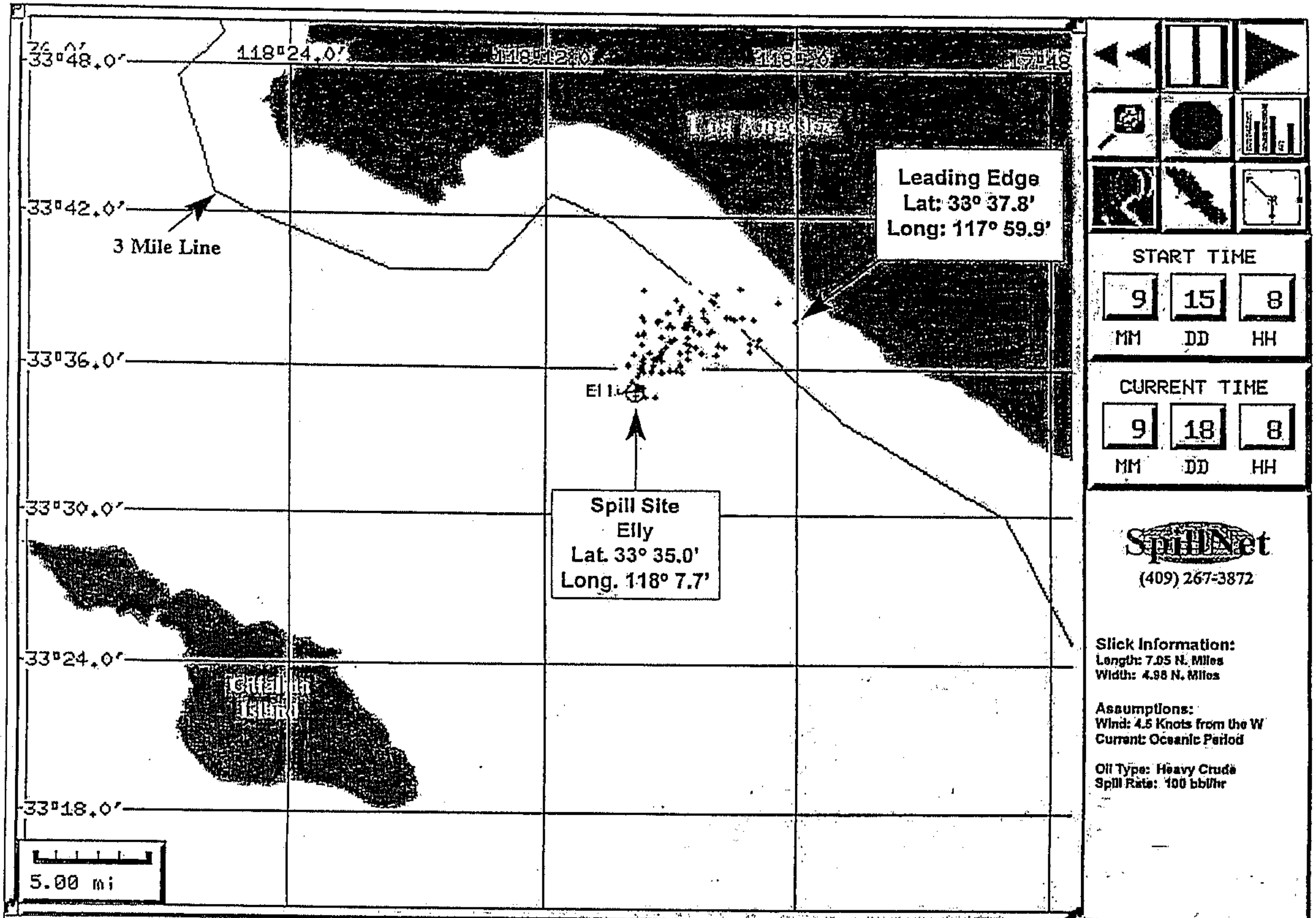
Trajectory showing initial shoreline impact within 30 hours



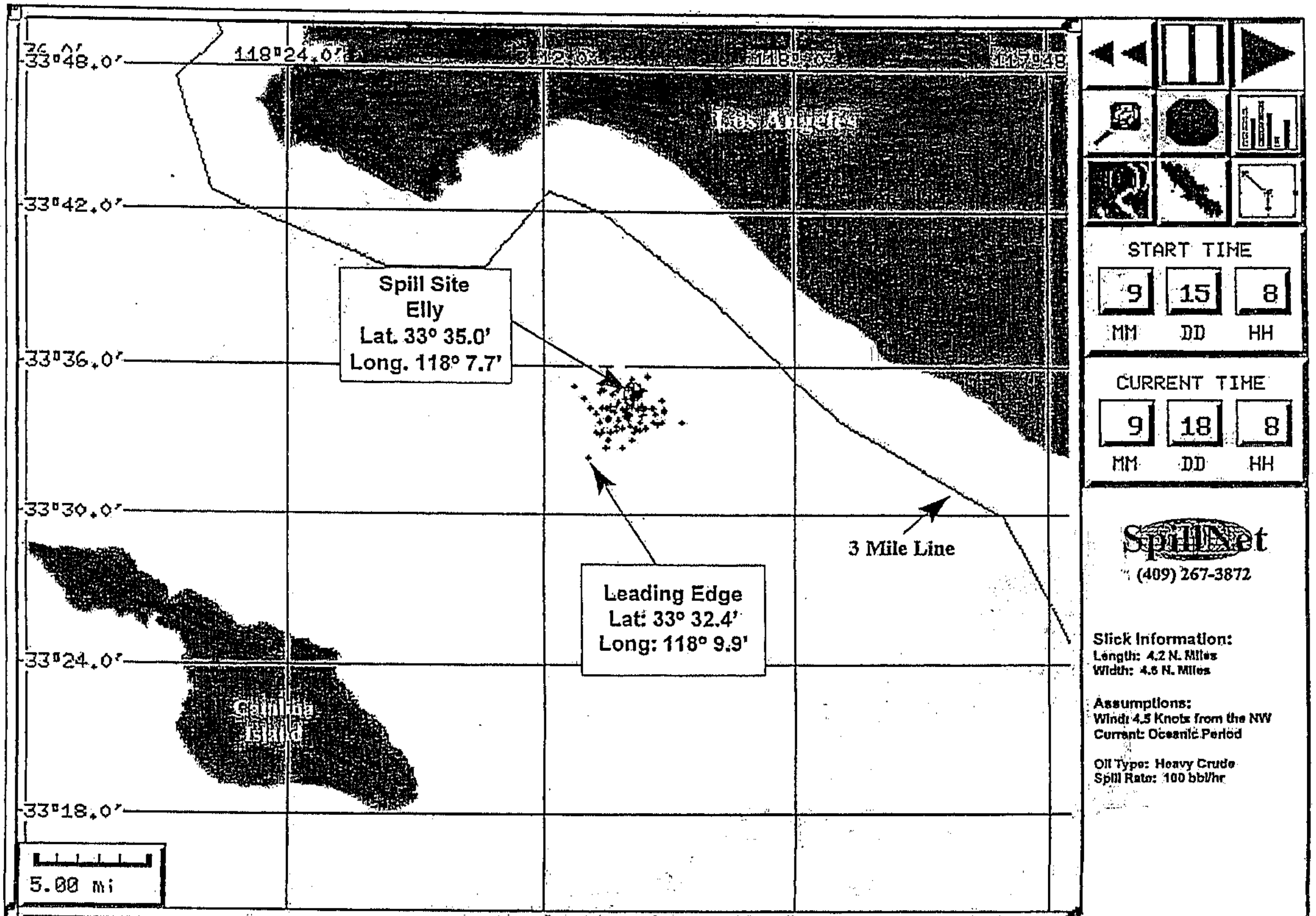
Trajectory showing no shoreline impact within 72 hours



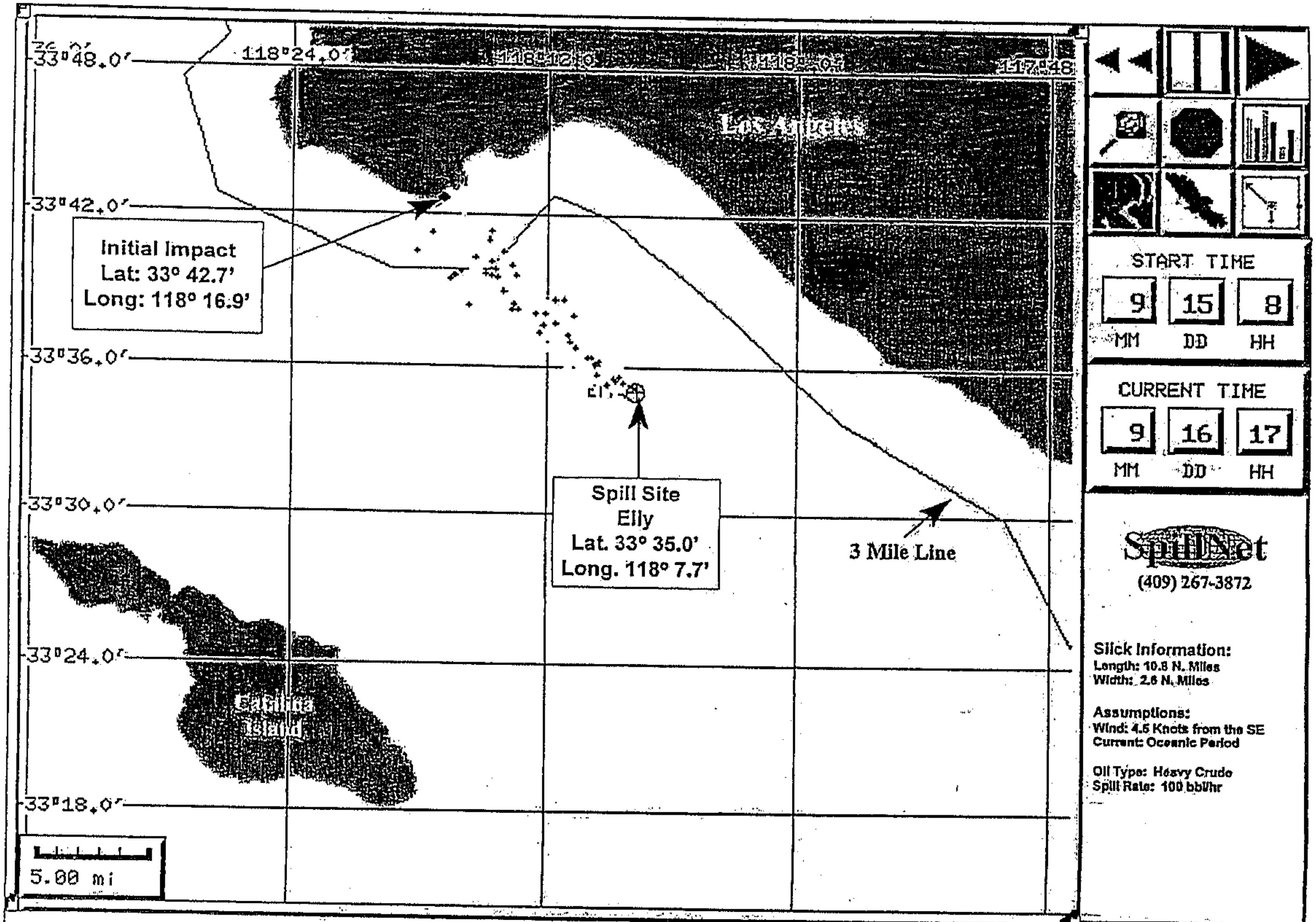
Trajectory showing initial shoreline impact in 26 hours



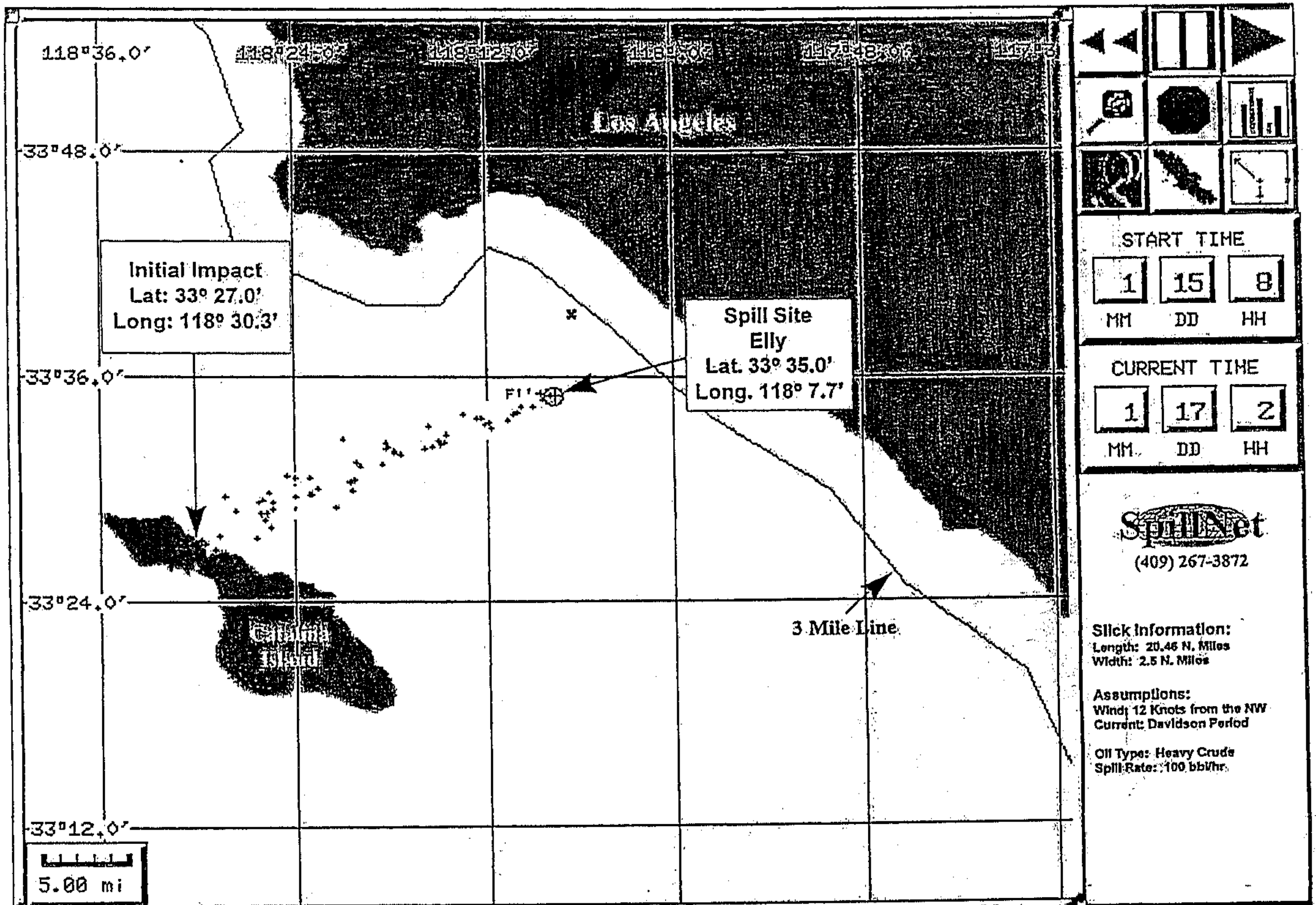
Trajectory showing no shoreline impact within 72 hours



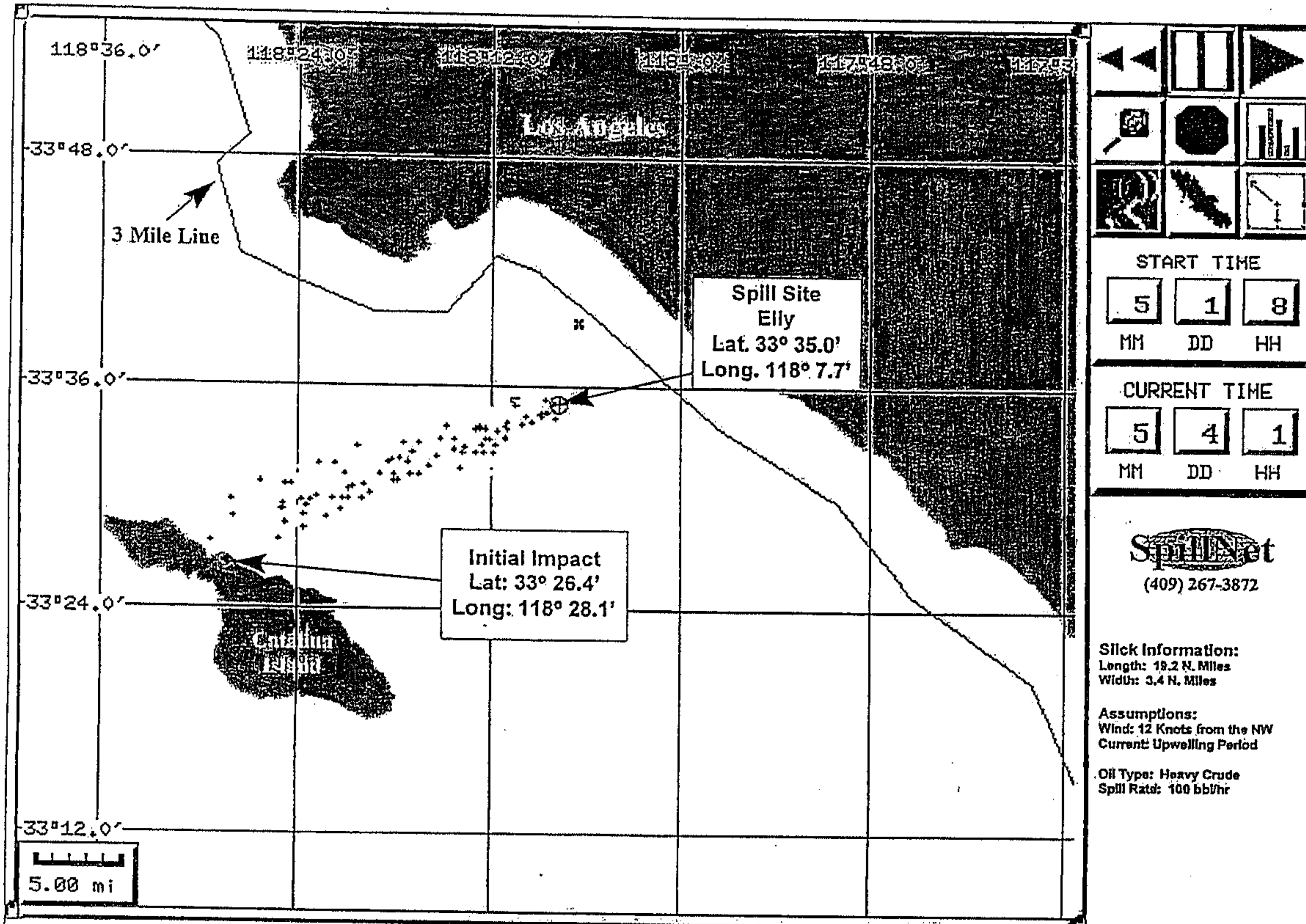
Trajectory showing no shoreline impact within 72 hours



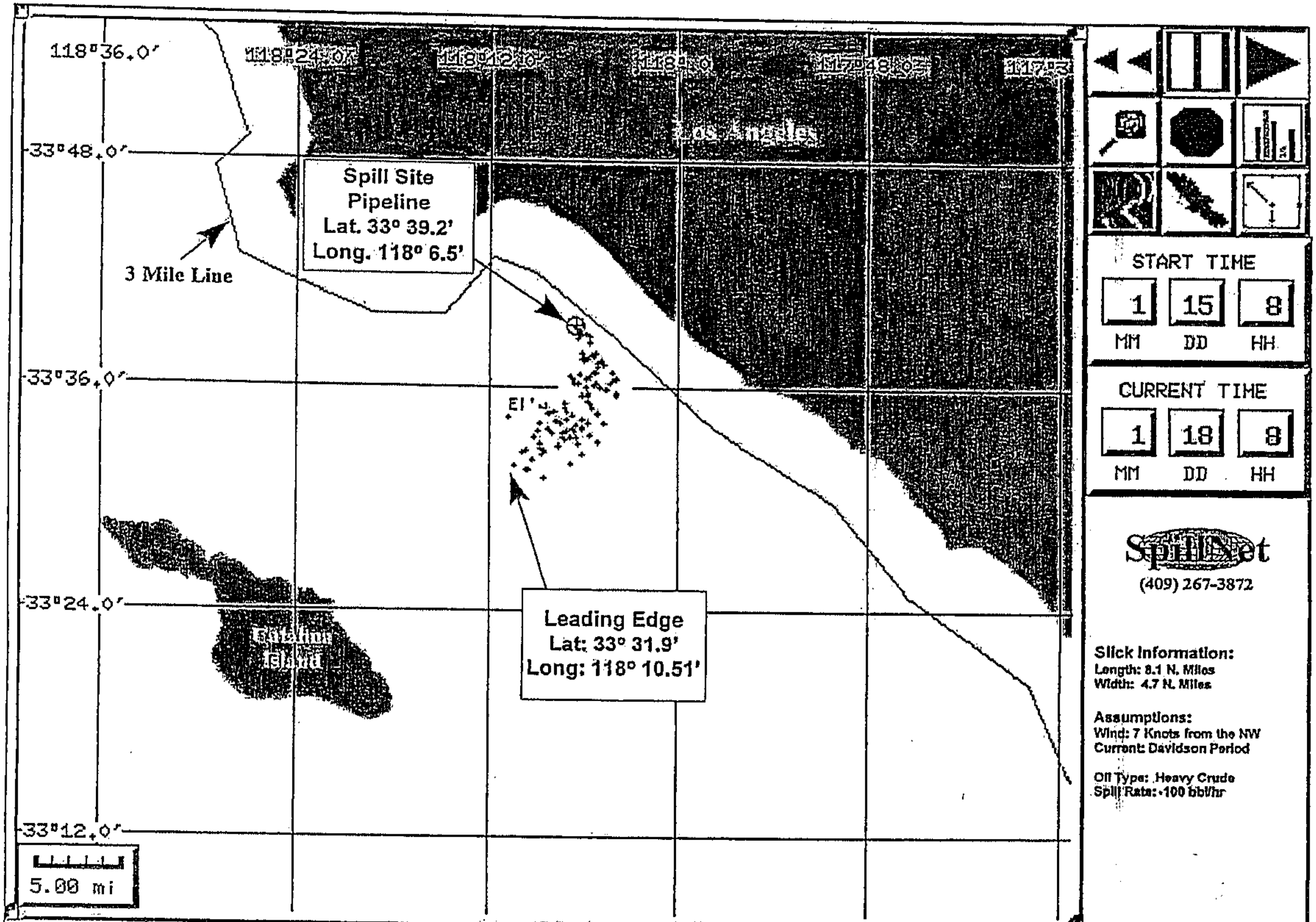
Trajectory showing initial shoreline impact in 33 hours



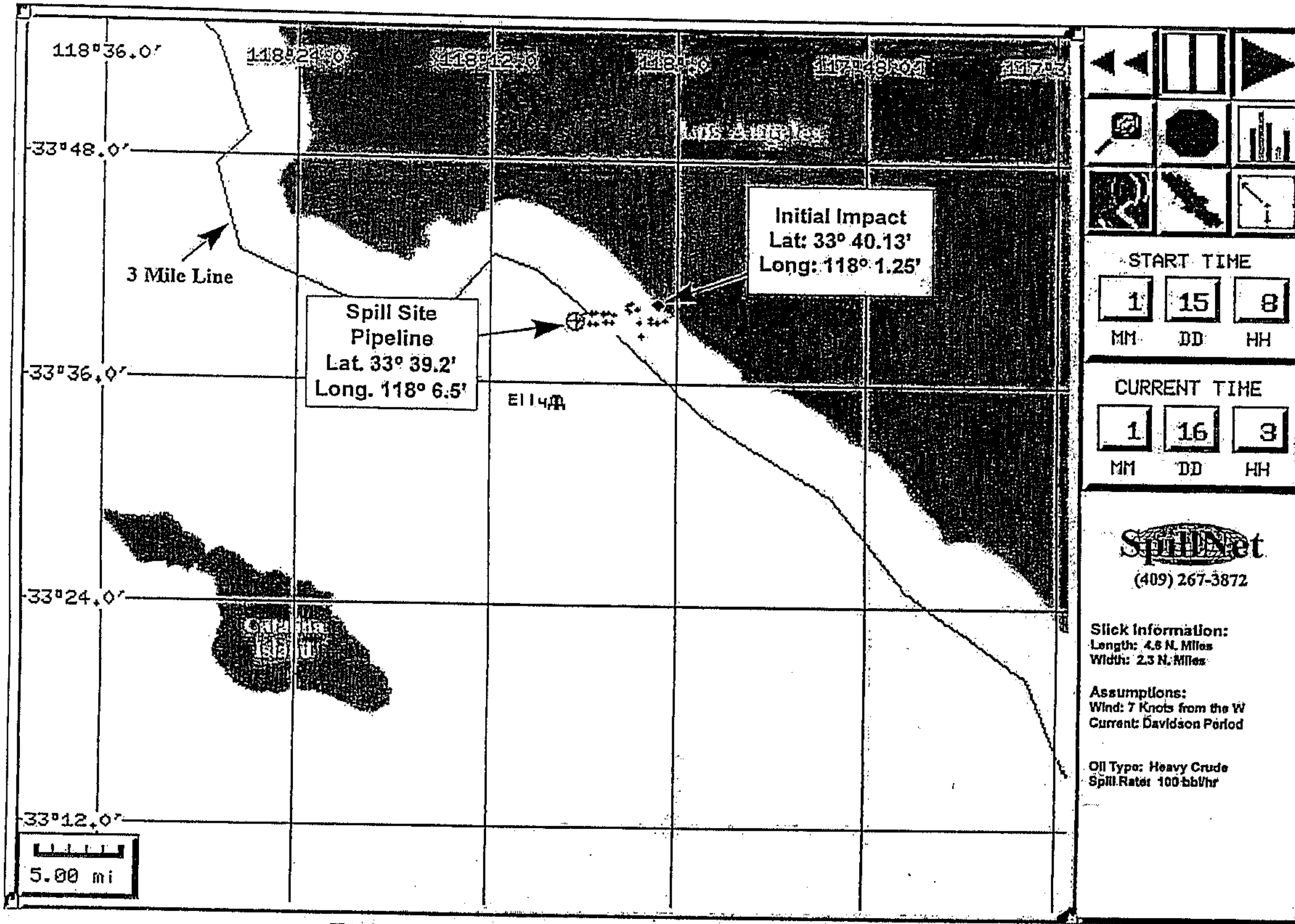
Trajectory showing initial shoreline impact in 42 hours



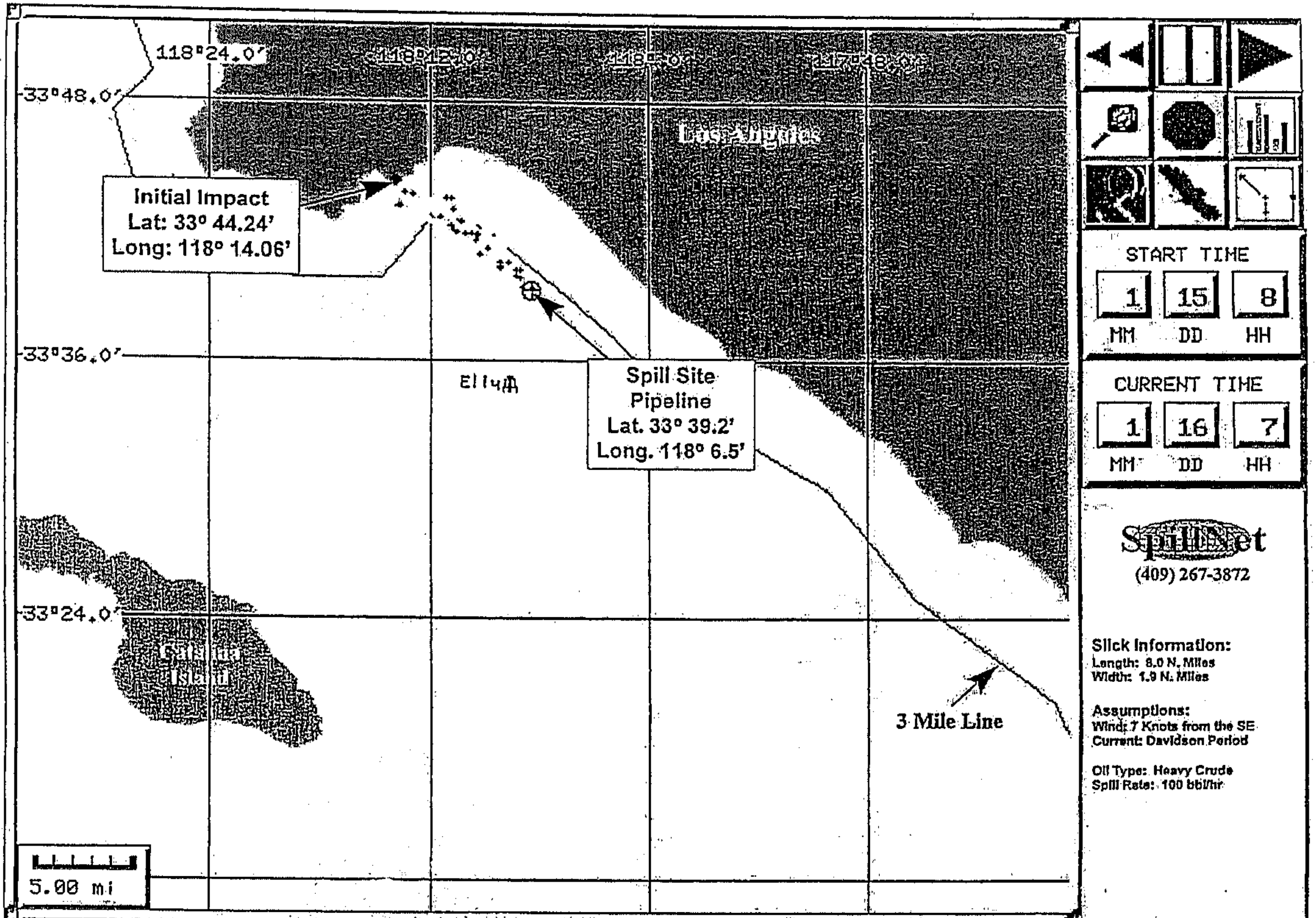
Trajectory showing initial shoreline impact in 65 hours



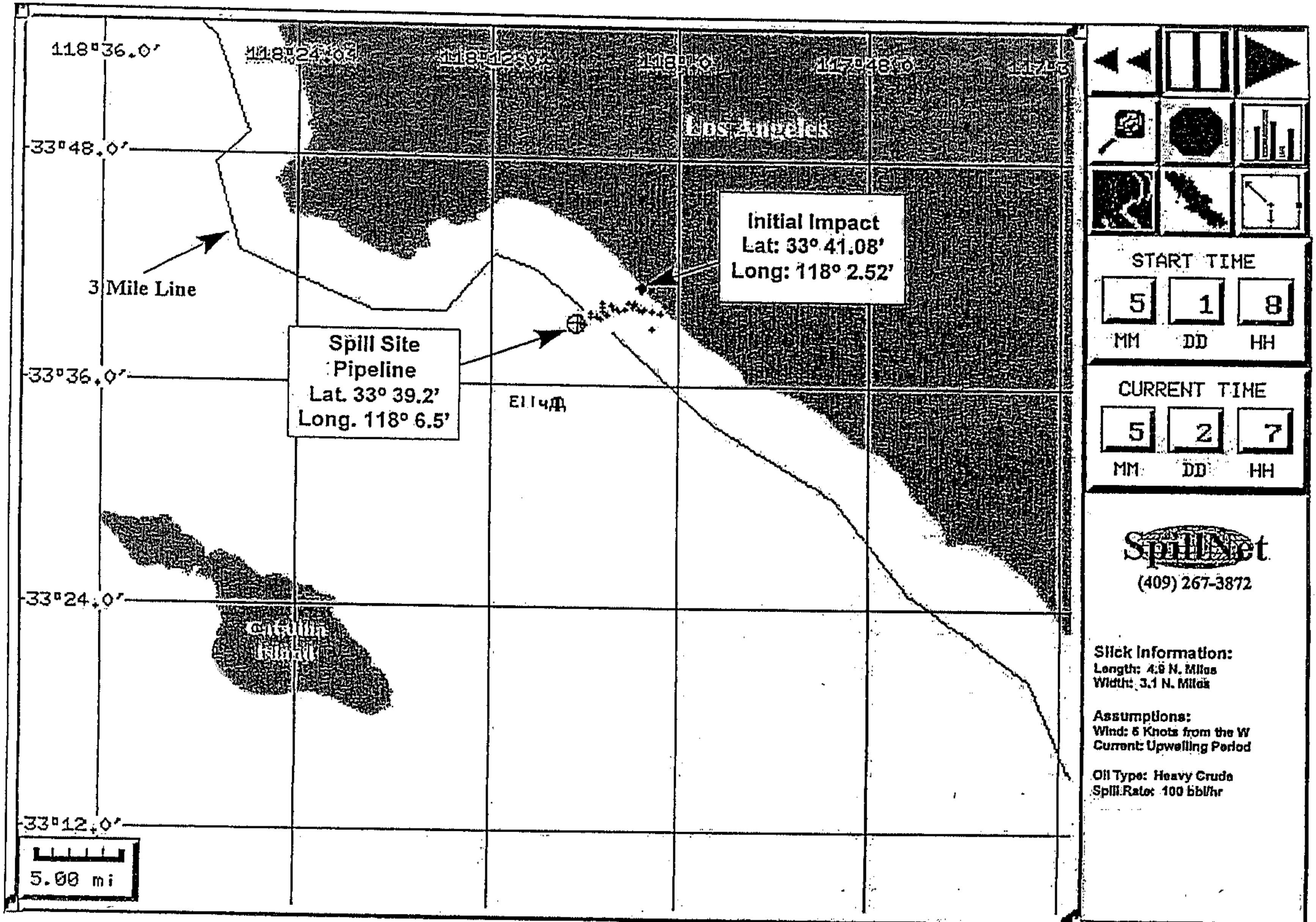
Trajectory showing no shoreline impact within 72 hours



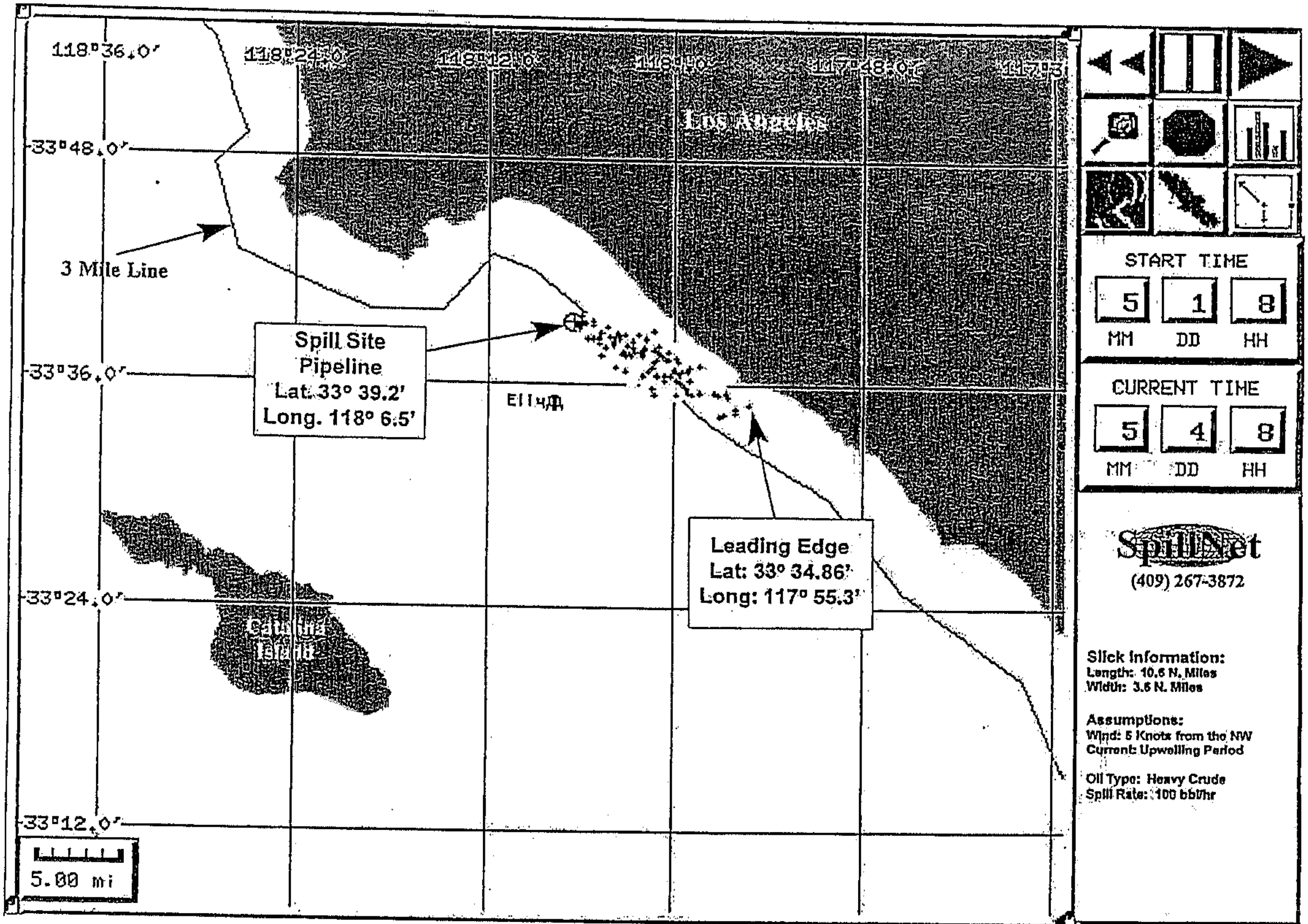
Trajectory showing initial shoreline impact in 19 hours



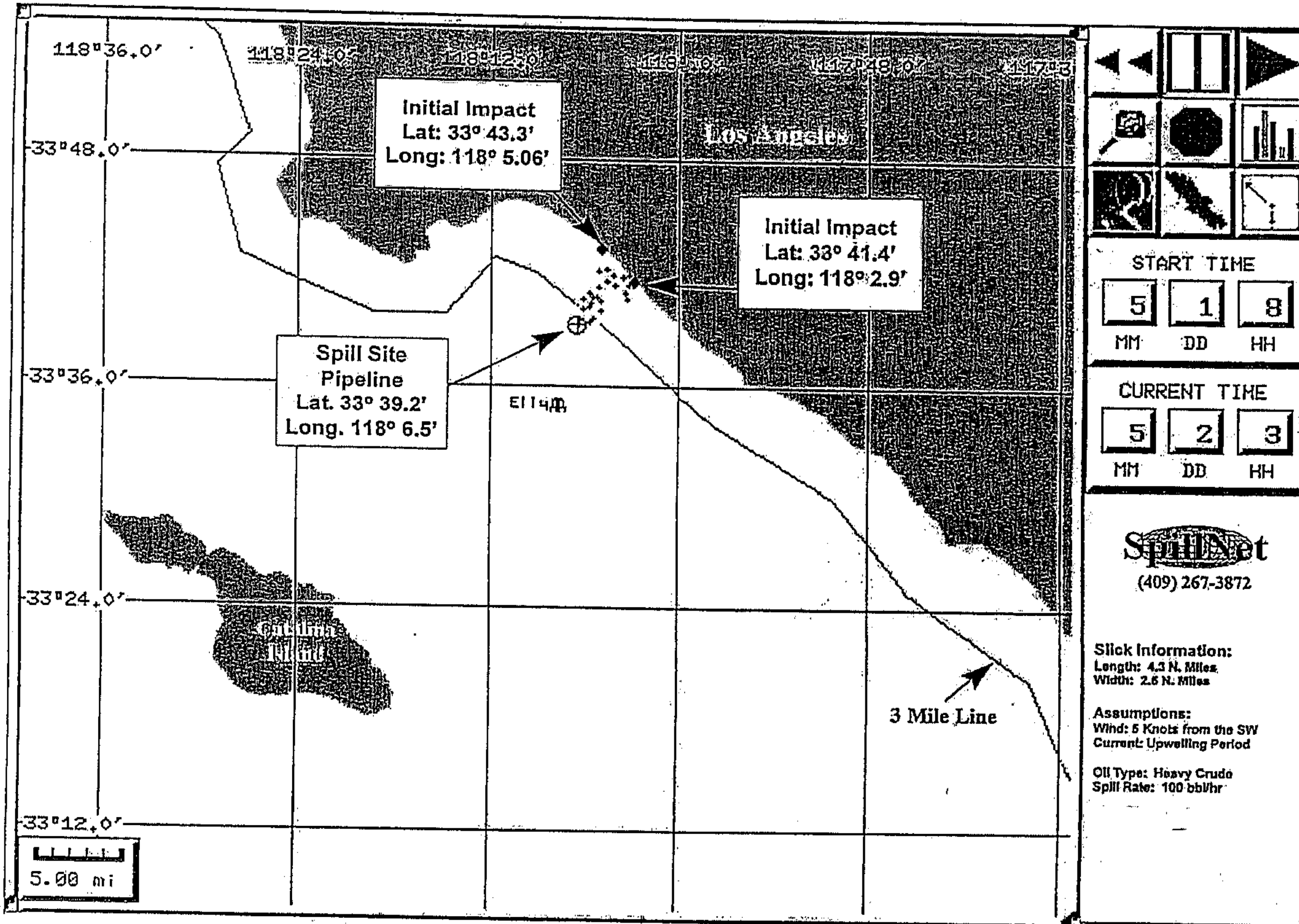
Trajectory showing initial shoreline impact in 23 hours



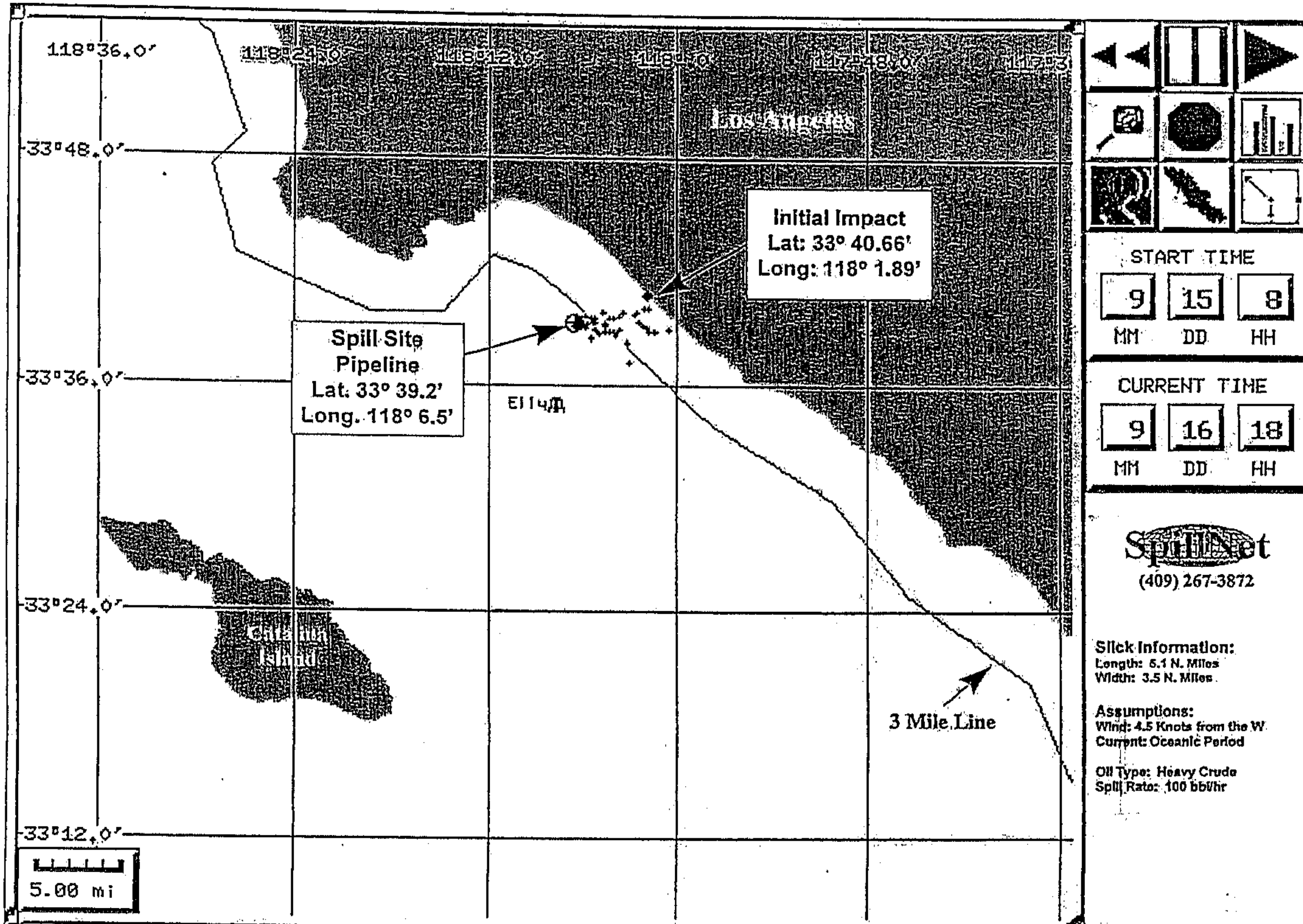
Trajectory showing initial shoreline impact in 23 hours



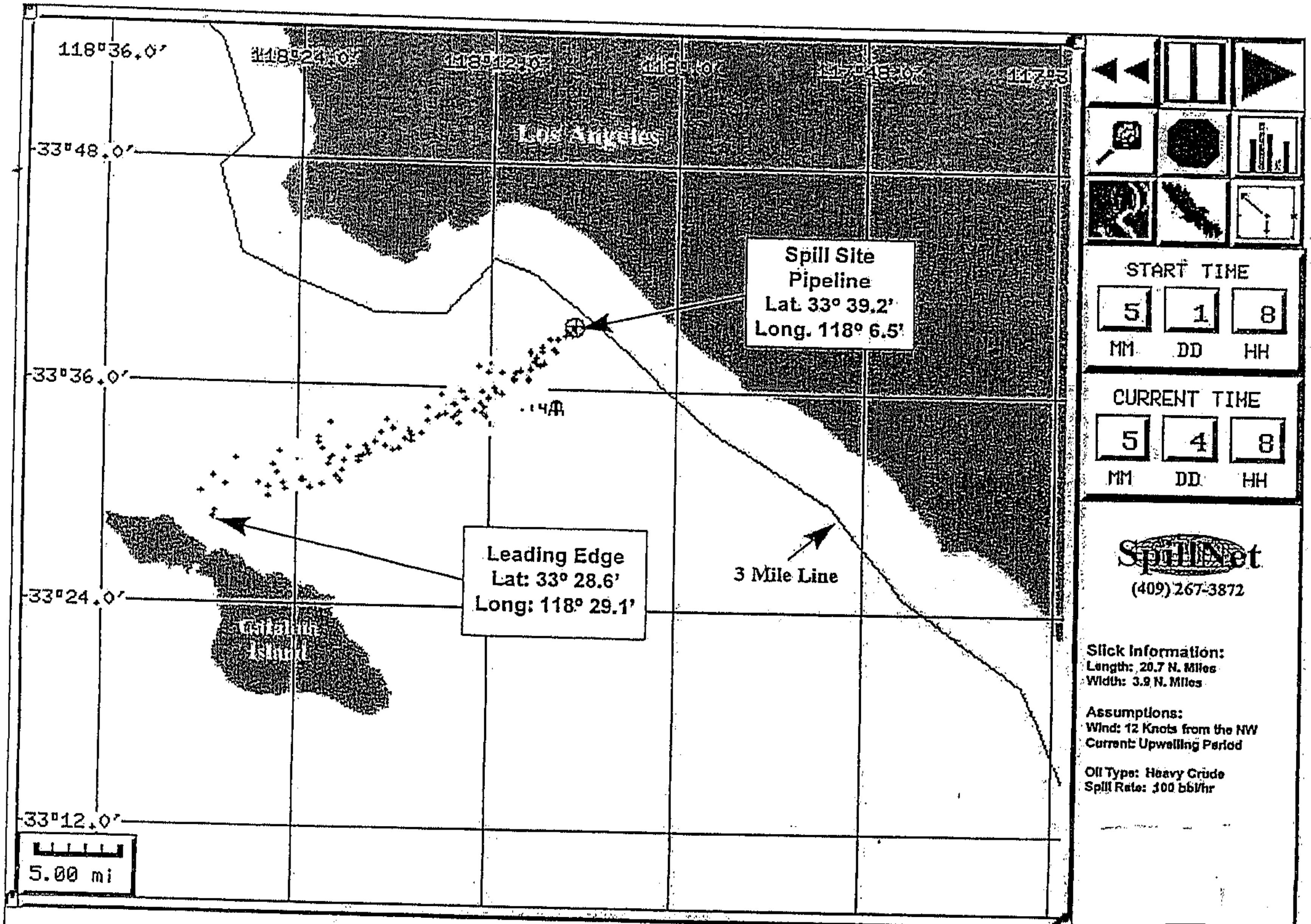
Trajectory showing no shoreline impact within 72 hours



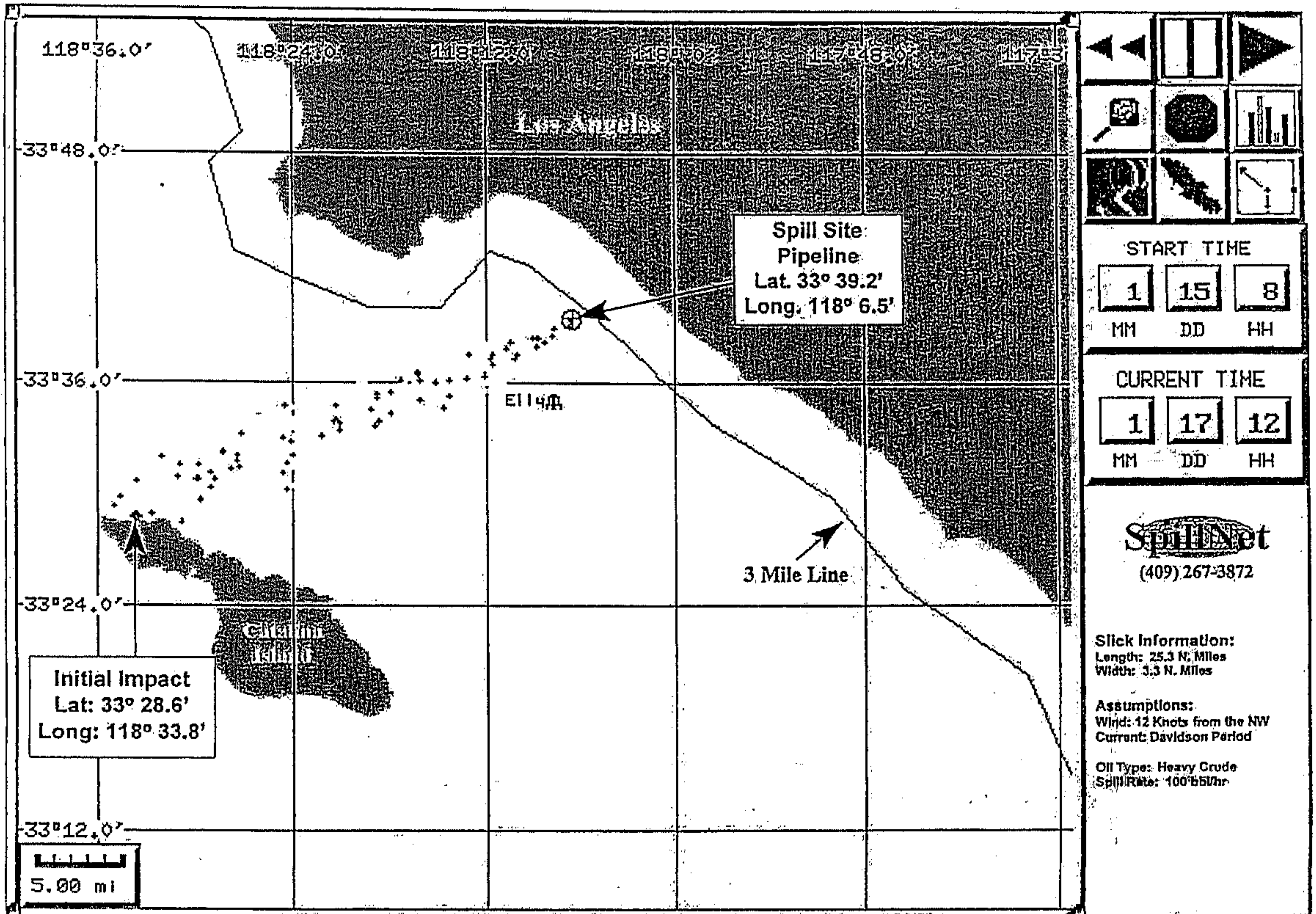
Trajectory showing initial shoreline impact in 19 hours



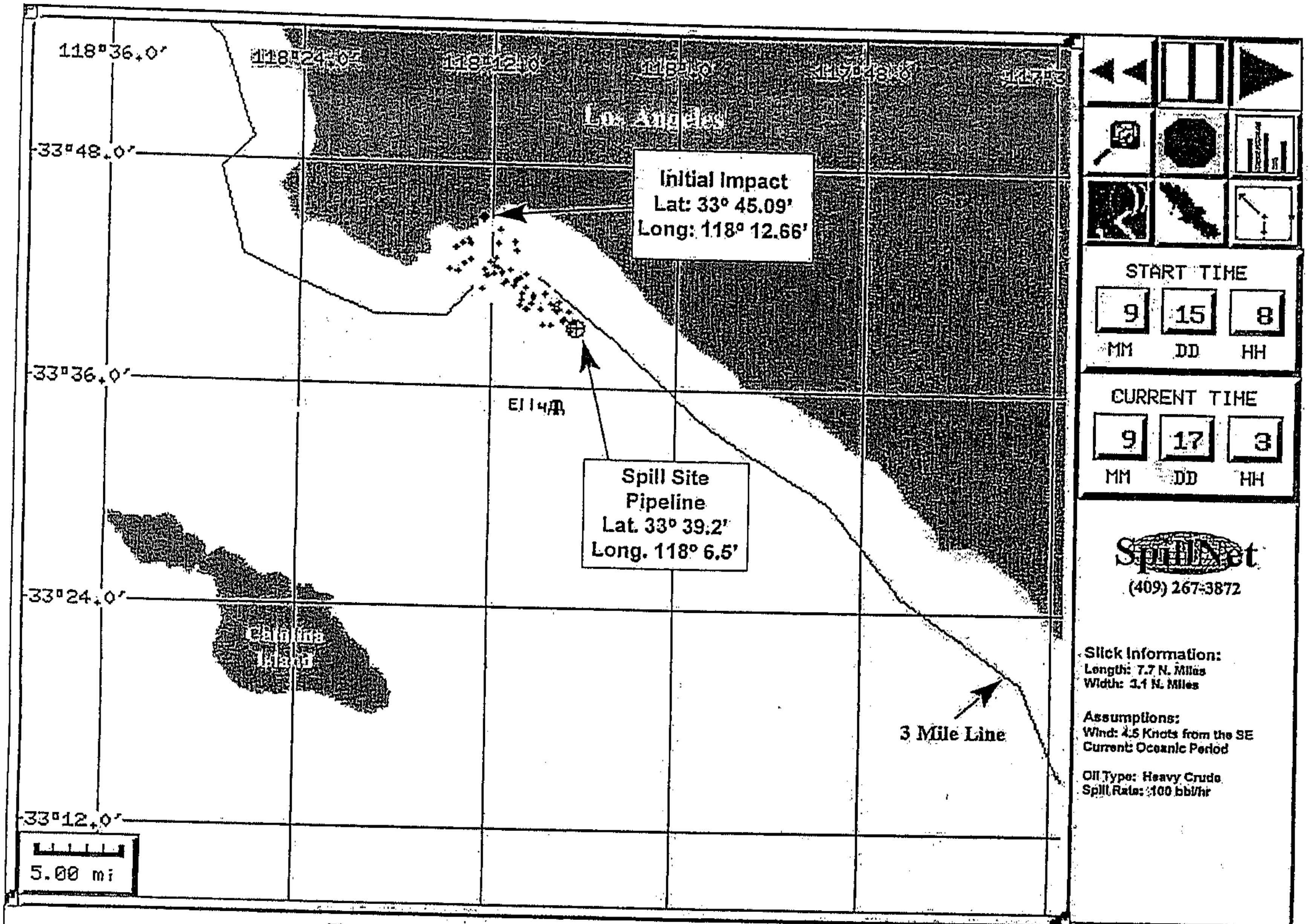
Trajectory showing initial shoreline impact in 34 hours



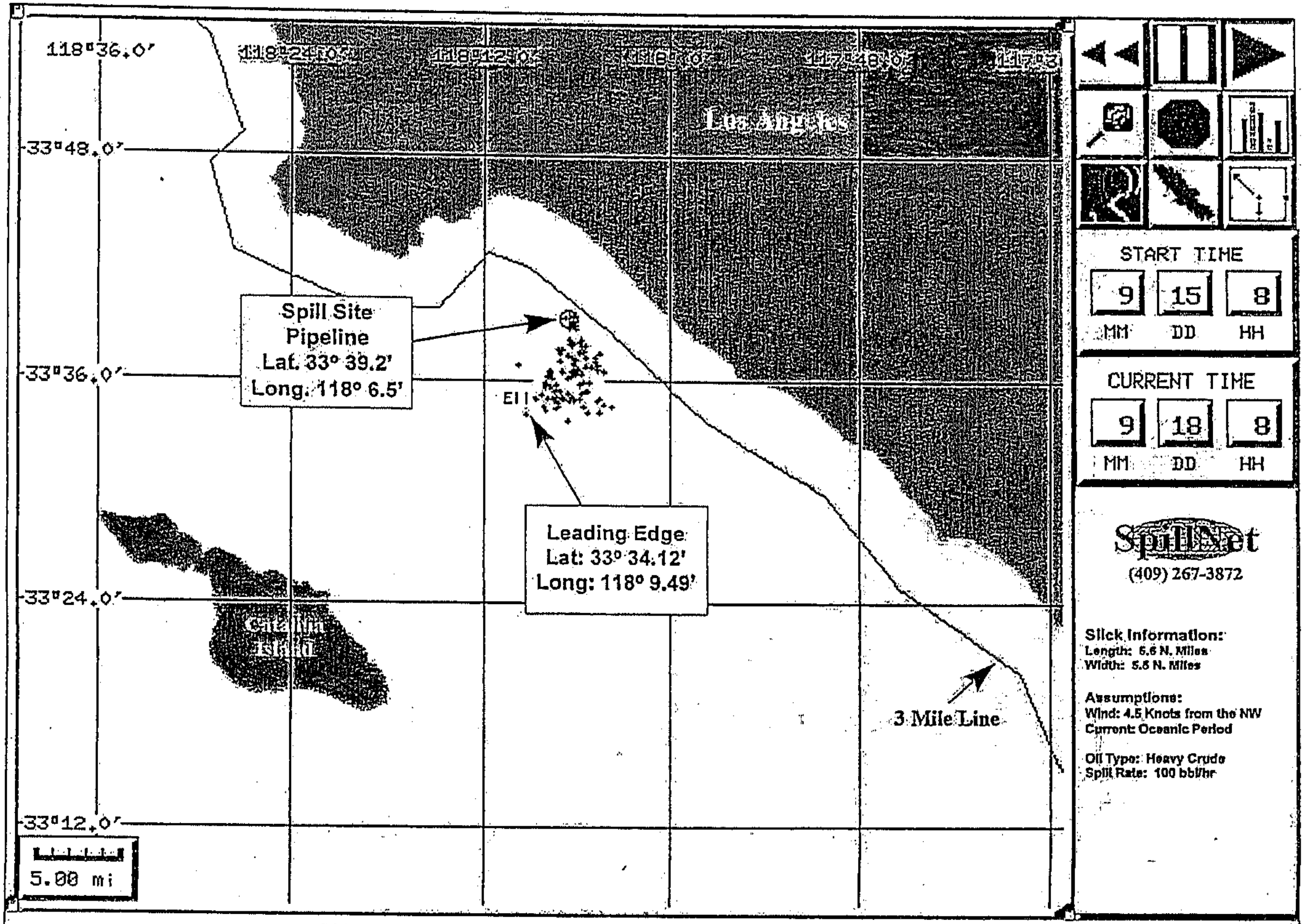
Trajectory showing no shoreline impact within 72 hours



Trajectory showing initial shoreline impact in 52 hours

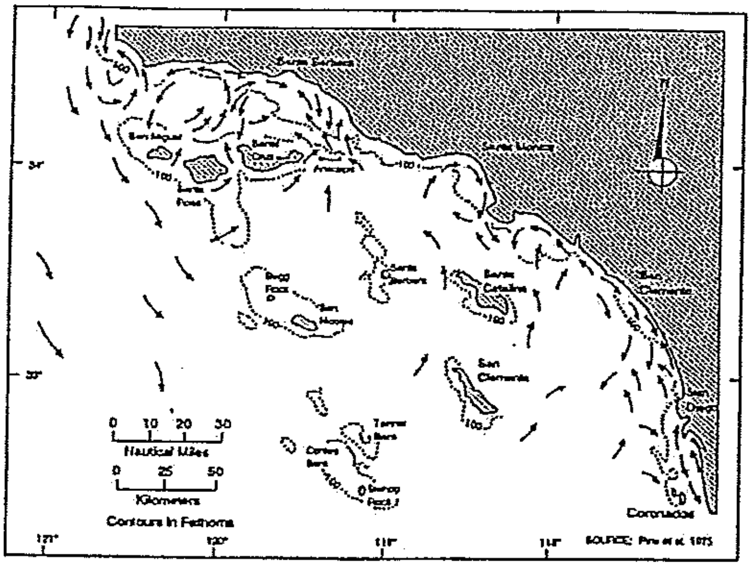


Trajectory showing initial shoreline impact in 43 hours

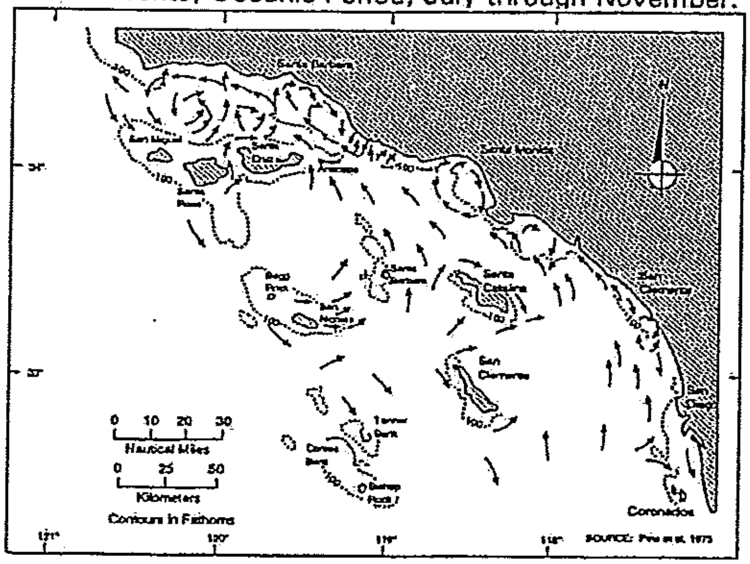


Trajectory showing no shoreline impact within 72 hours

Ocean Currents, Upwelling Period, March through June.



Ocean Currents, Oceanic Period, July through November.



Ocean Currents, Davidson Period, December through February

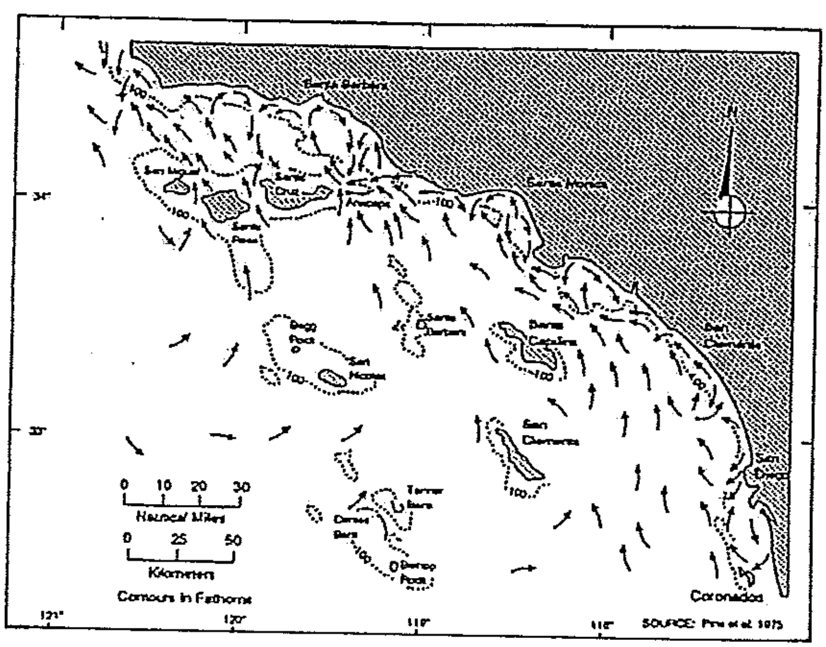


Figure J-1. Distribution of Shoreline Contacts – OSC #P-0300, P-0301 – January.

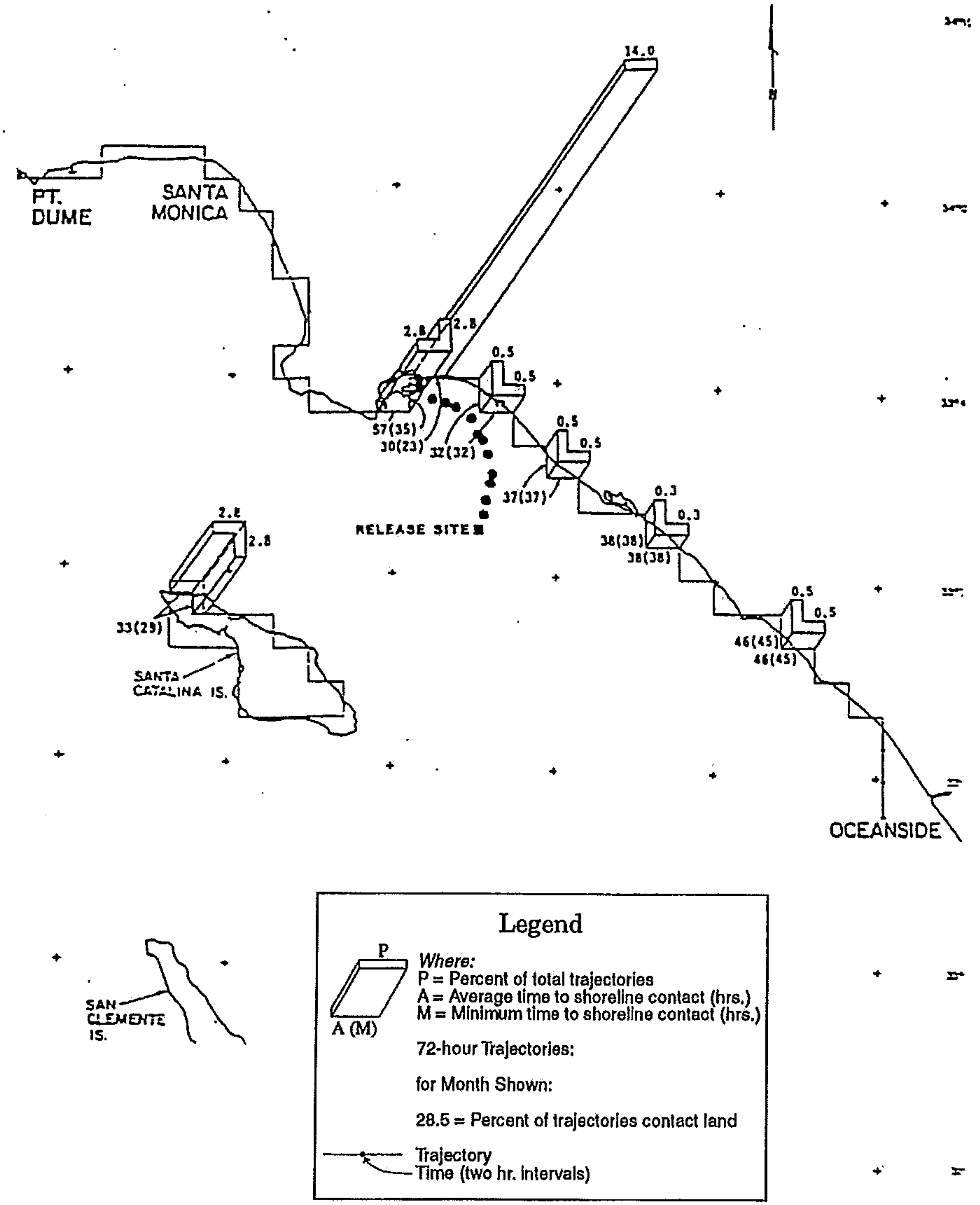
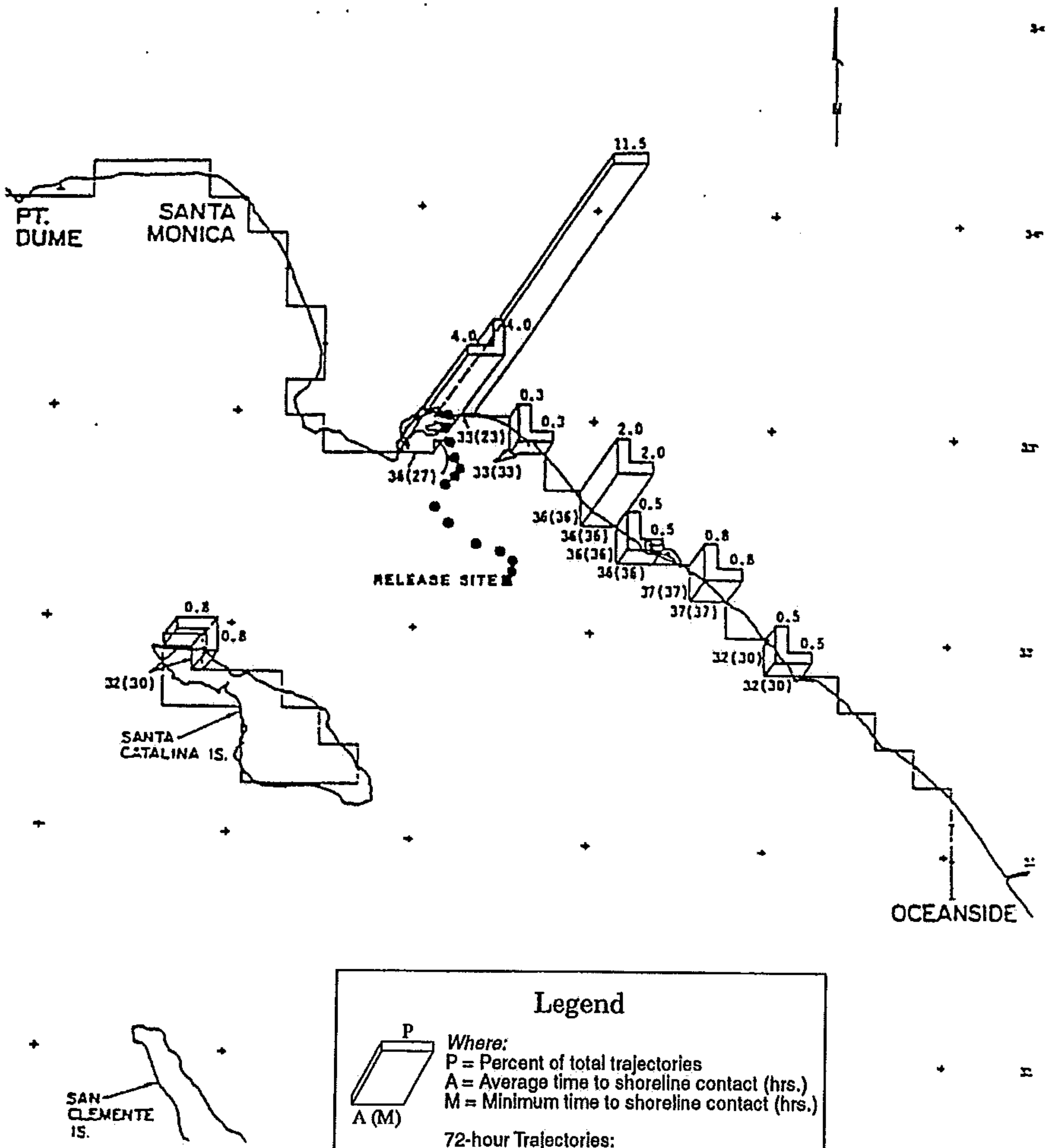


Figure J-2. Distribution of Shoreline Contacts – OSC #P-0300, P-0301 – February.



P
A (M)

Legend

Where:
P = Percent of total trajectories
A = Average time to shoreline contact (hrs.)
M = Minimum time to shoreline contact (hrs.)

72-hour Trajectories:

for Month Shown:

28.5 = Percent of trajectories contact land

Trajectory
Time (two hr. intervals)

Figure J-3. Distribution of Shoreline Contacts – OSC #P-0300, P-0301 – March.

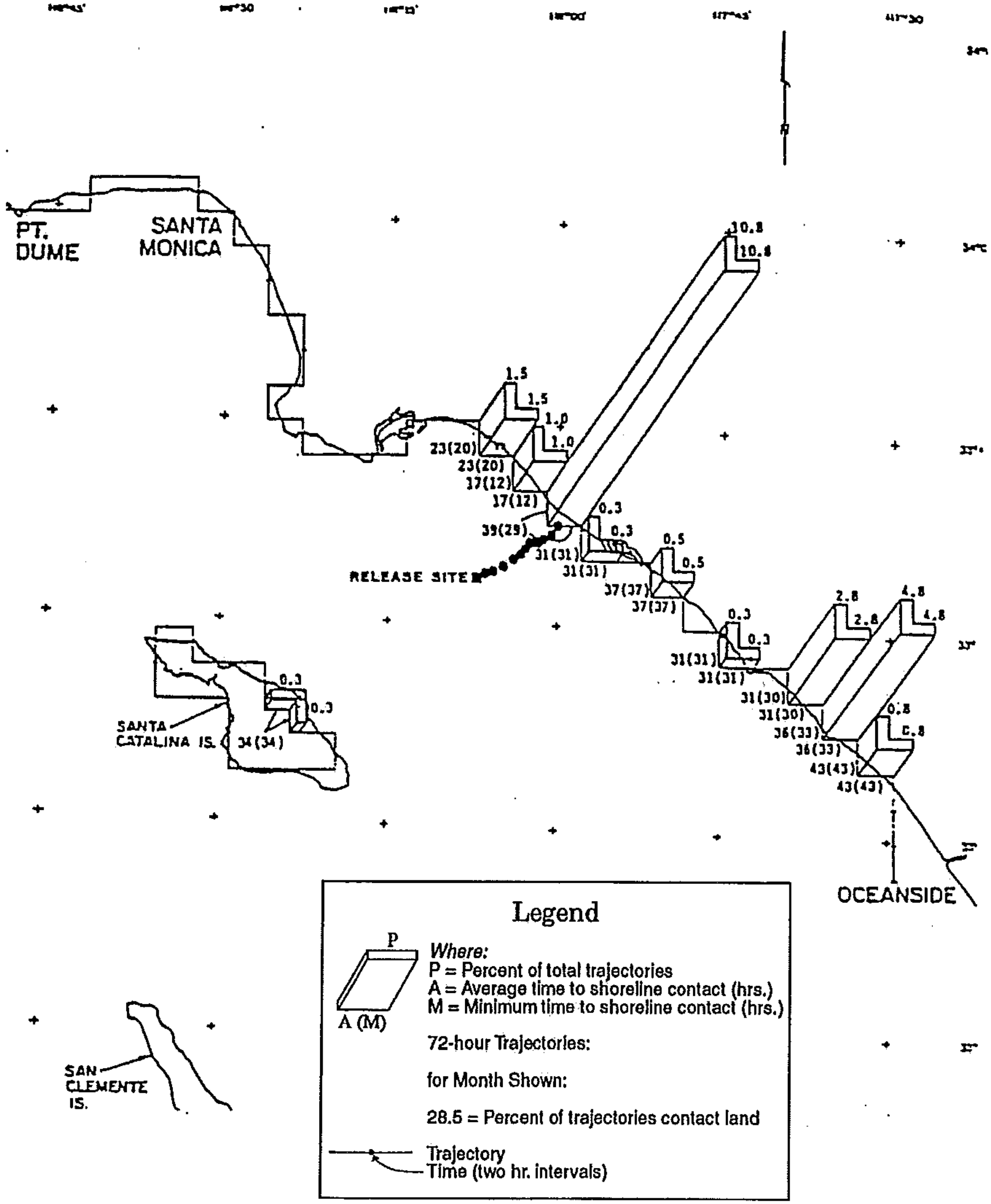


Figure J-4. Distribution of Shoreline Contacts – OSC #P-0300, P-0301 – April.

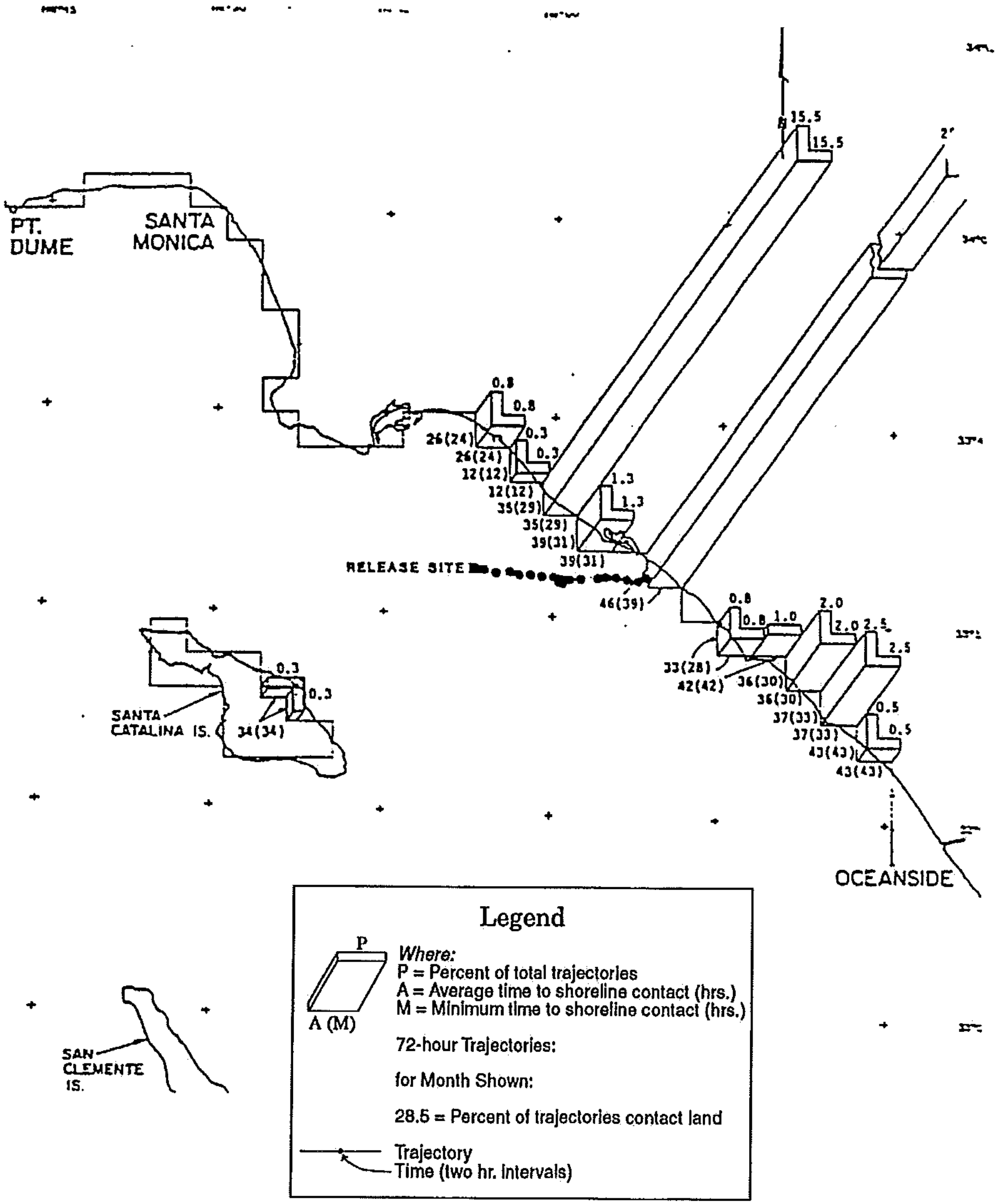


Figure J-5. Distribution of Shoreline Contacts – OSC #P-0300, P-0301 – May.

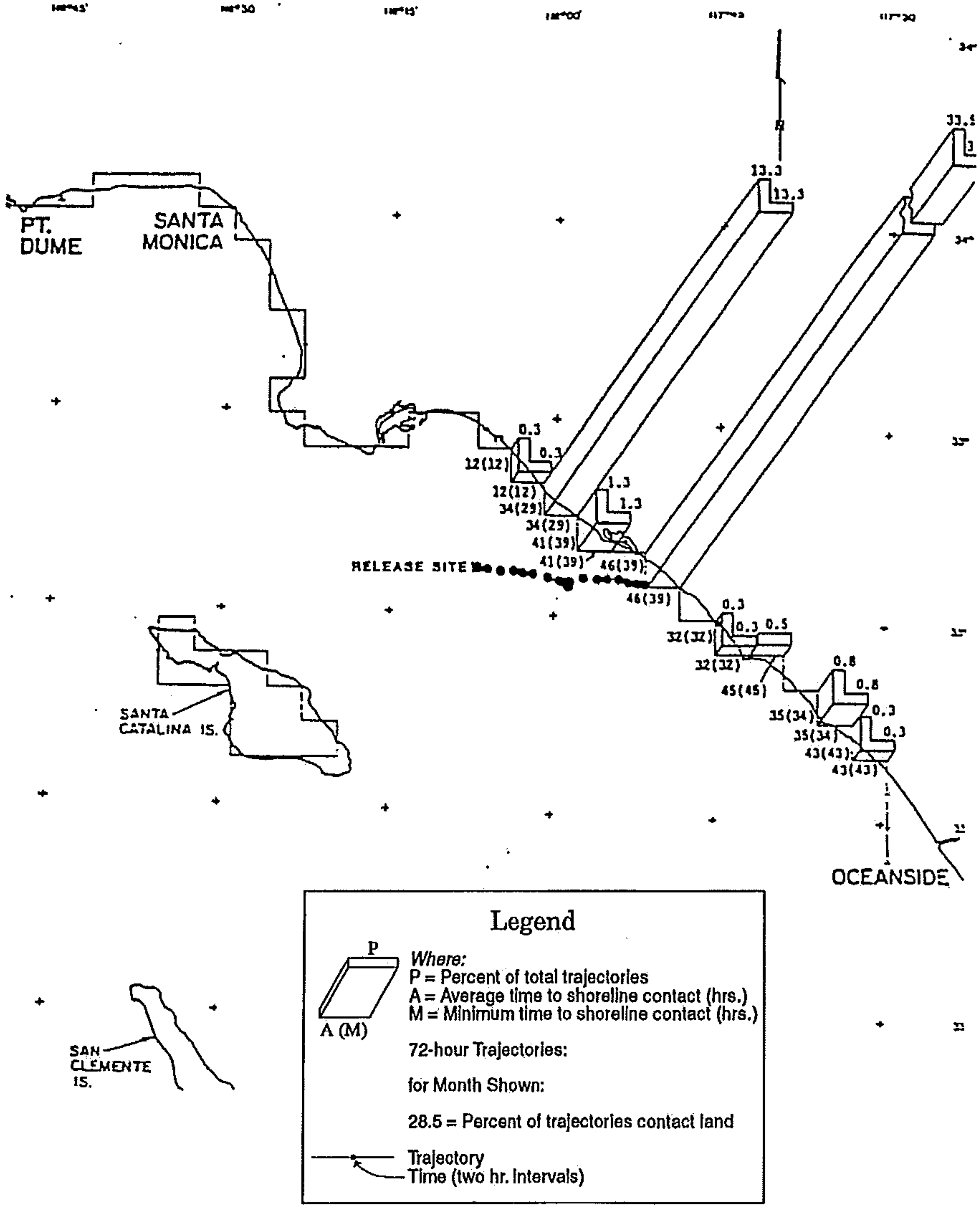


Figure J-6. Distribution of Shoreline Contacts – OSC #P-0300, P-0301 – June.

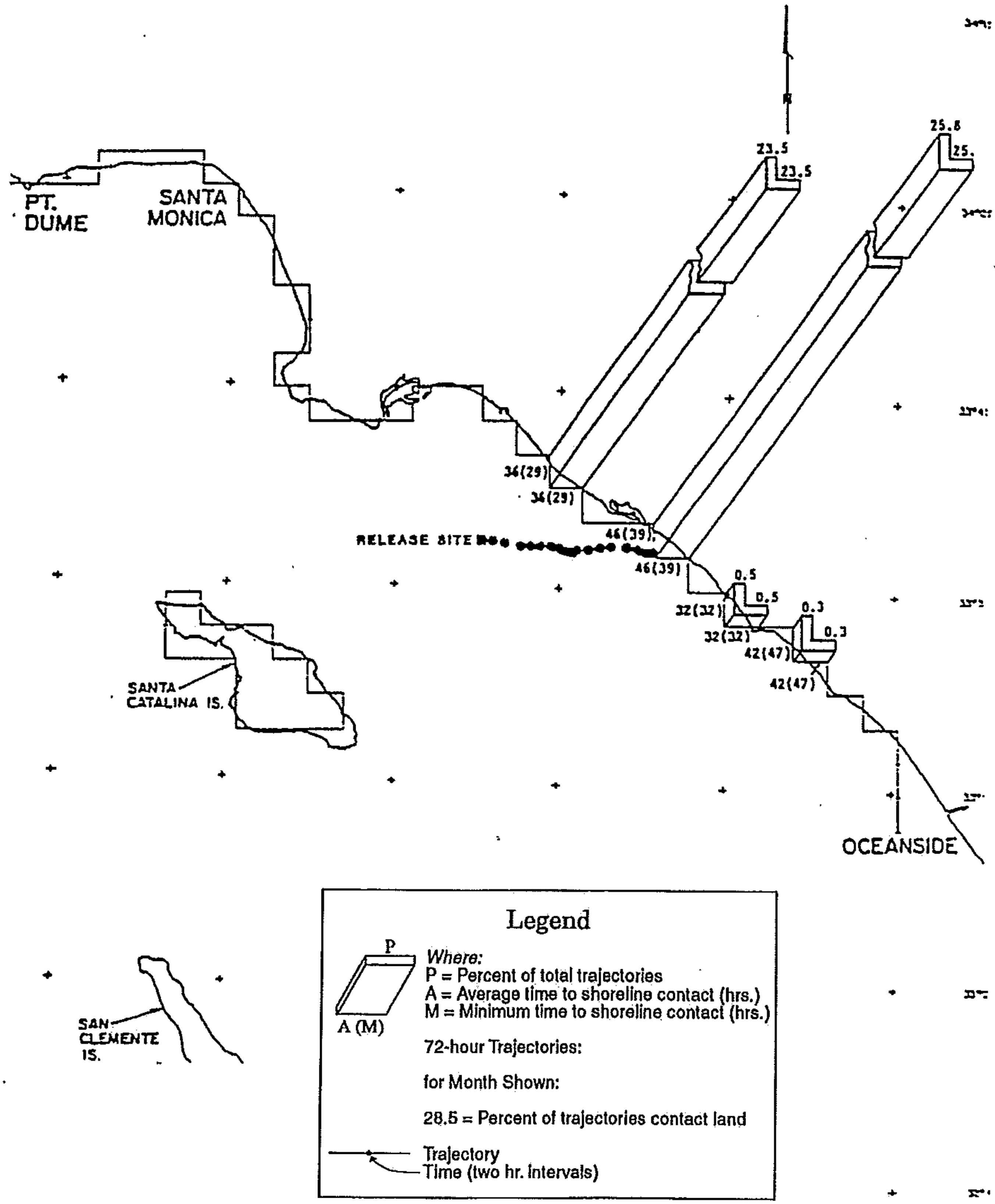


Figure J-7. Distribution of Shoreline Contacts – OSC #P-0300, P-0301 – July.

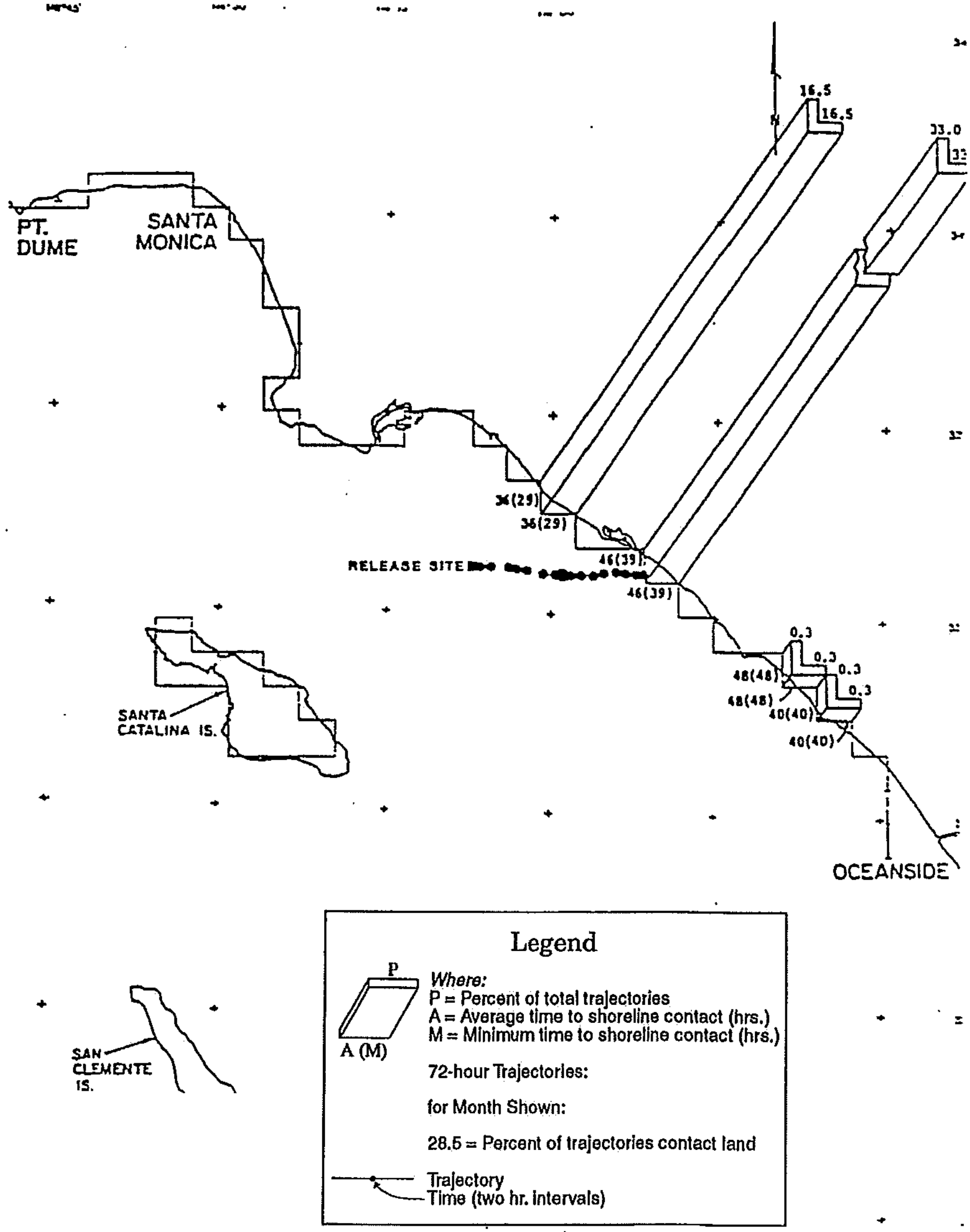


Figure J-8. Distribution of Shoreline Contacts – OSC #P-0300, P-0301 – August.

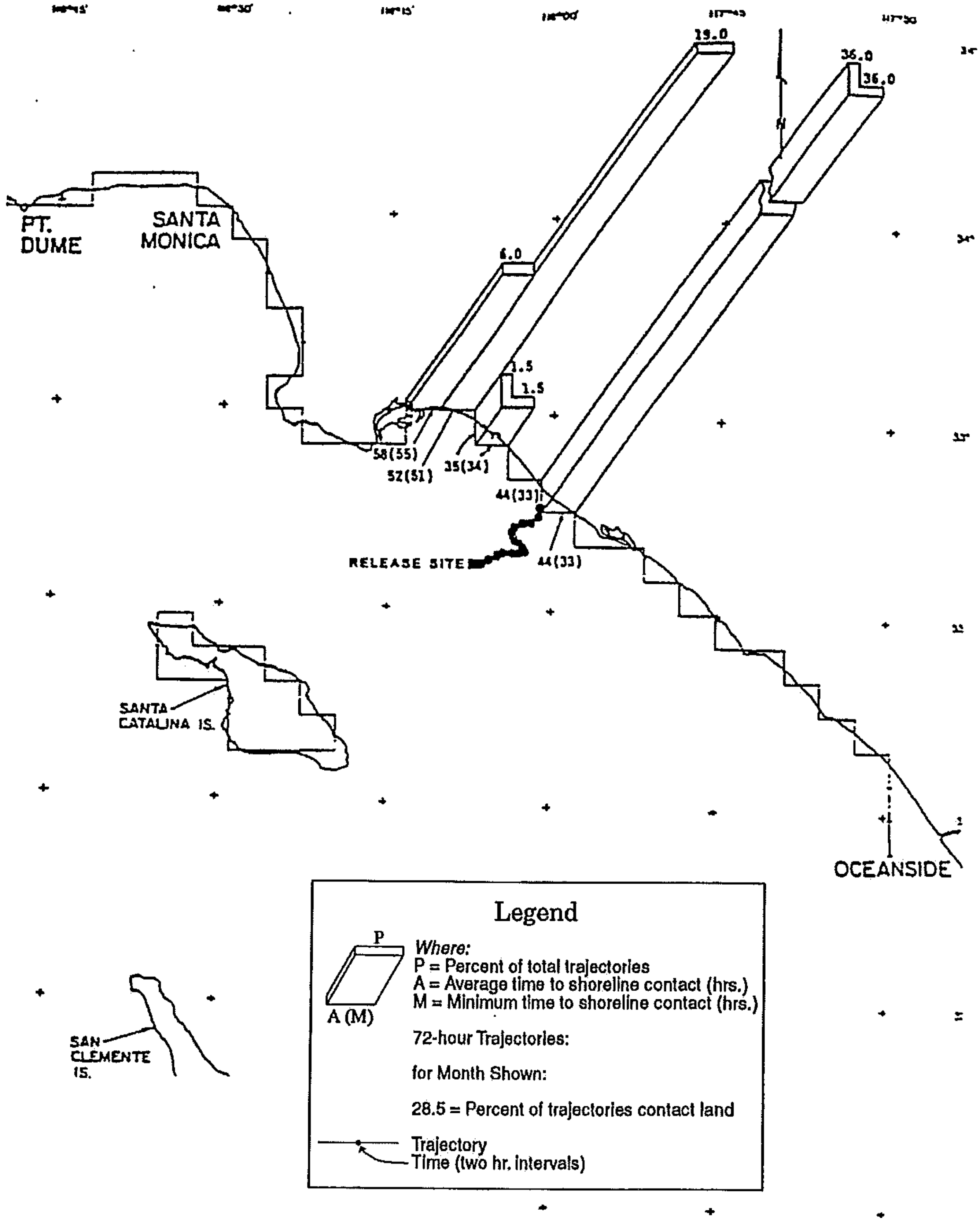


Figure J-9. Distribution of Shoreline Contacts – OSC #P-0300, P-0301 – September.

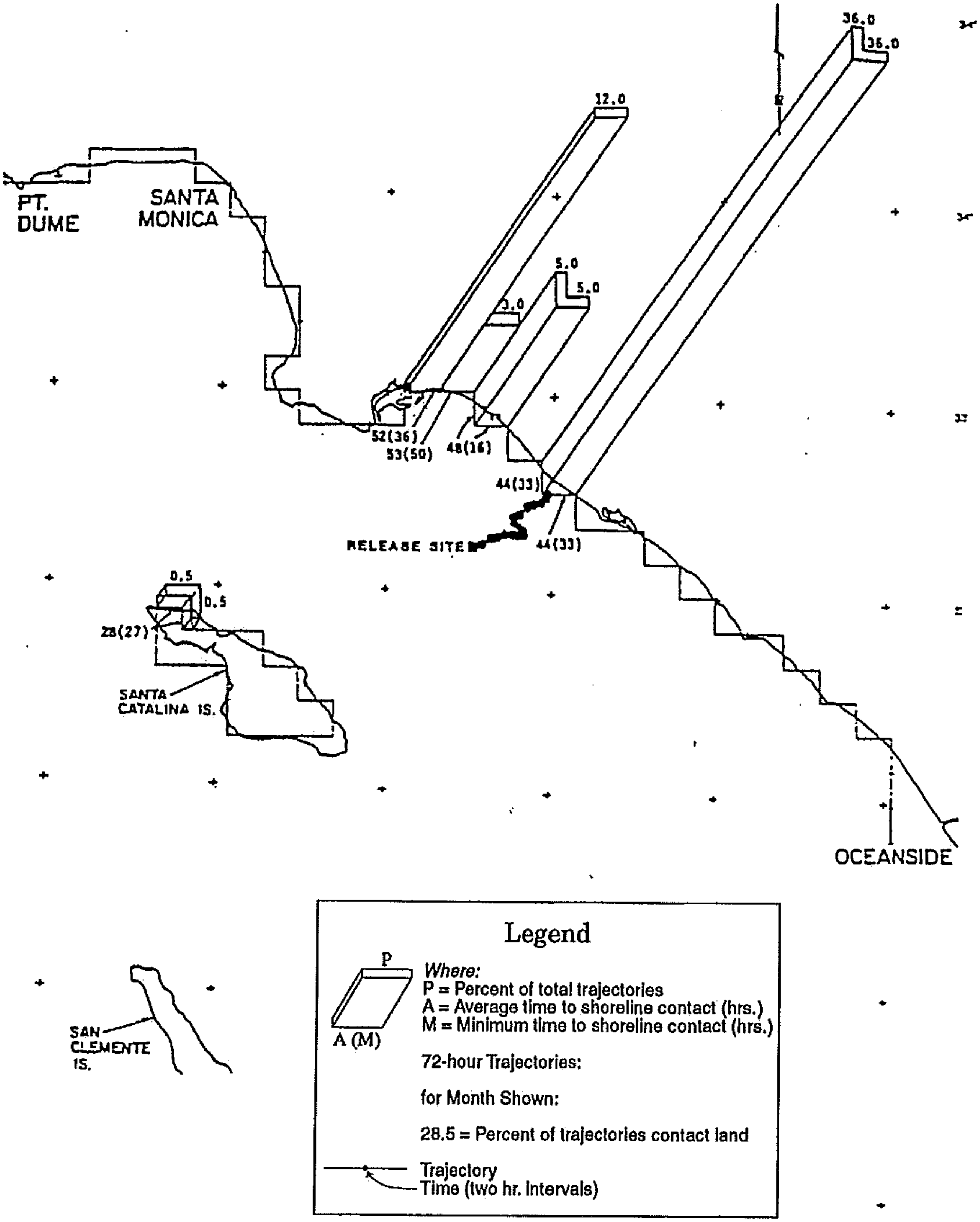


Figure J-10. Distribution of Shoreline Contacts – OSC #P-0300, P-0301 – October.

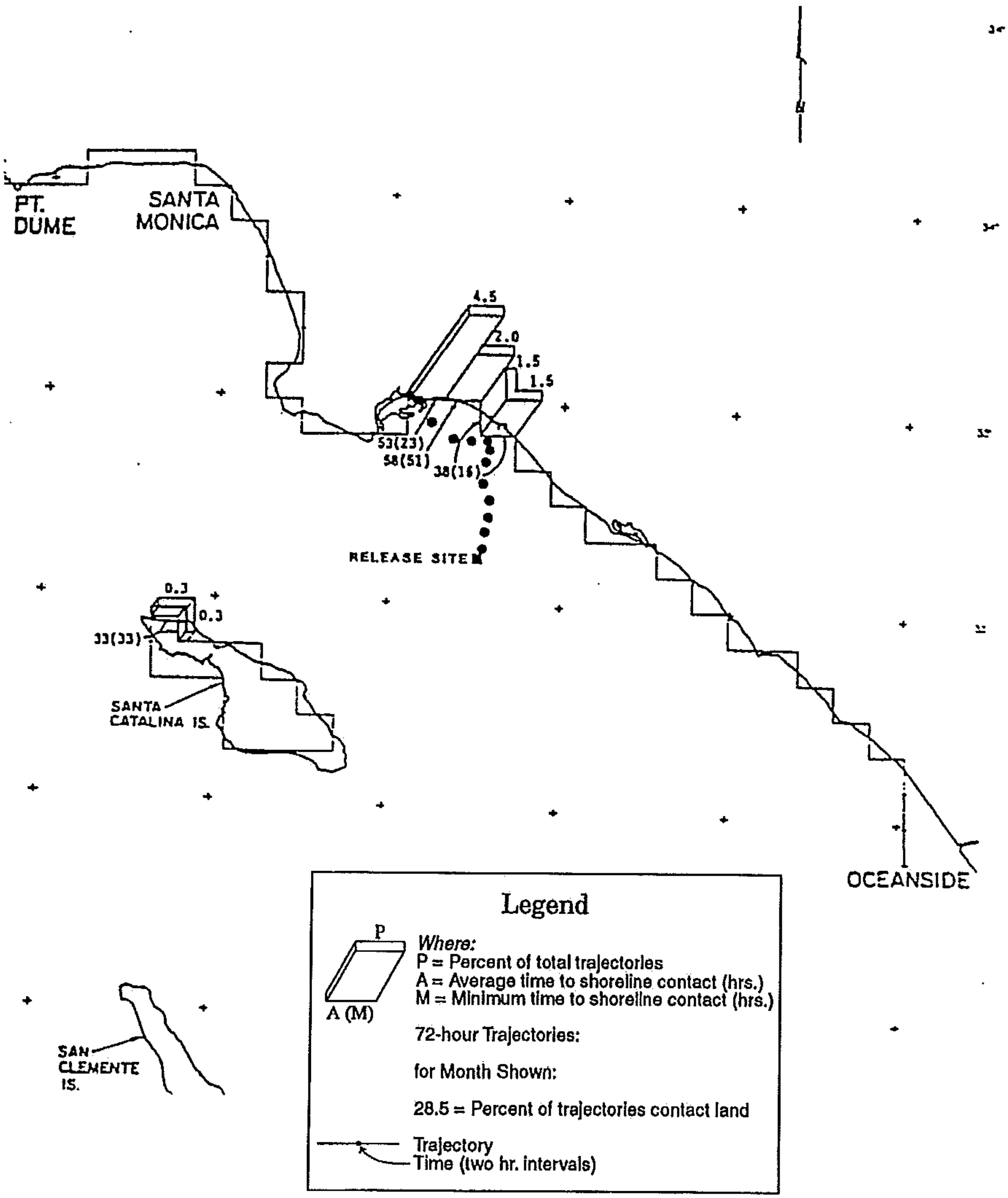


Figure J-11. Distribution of Shoreline Contacts – OSC #P-0300, P-0301 – November.

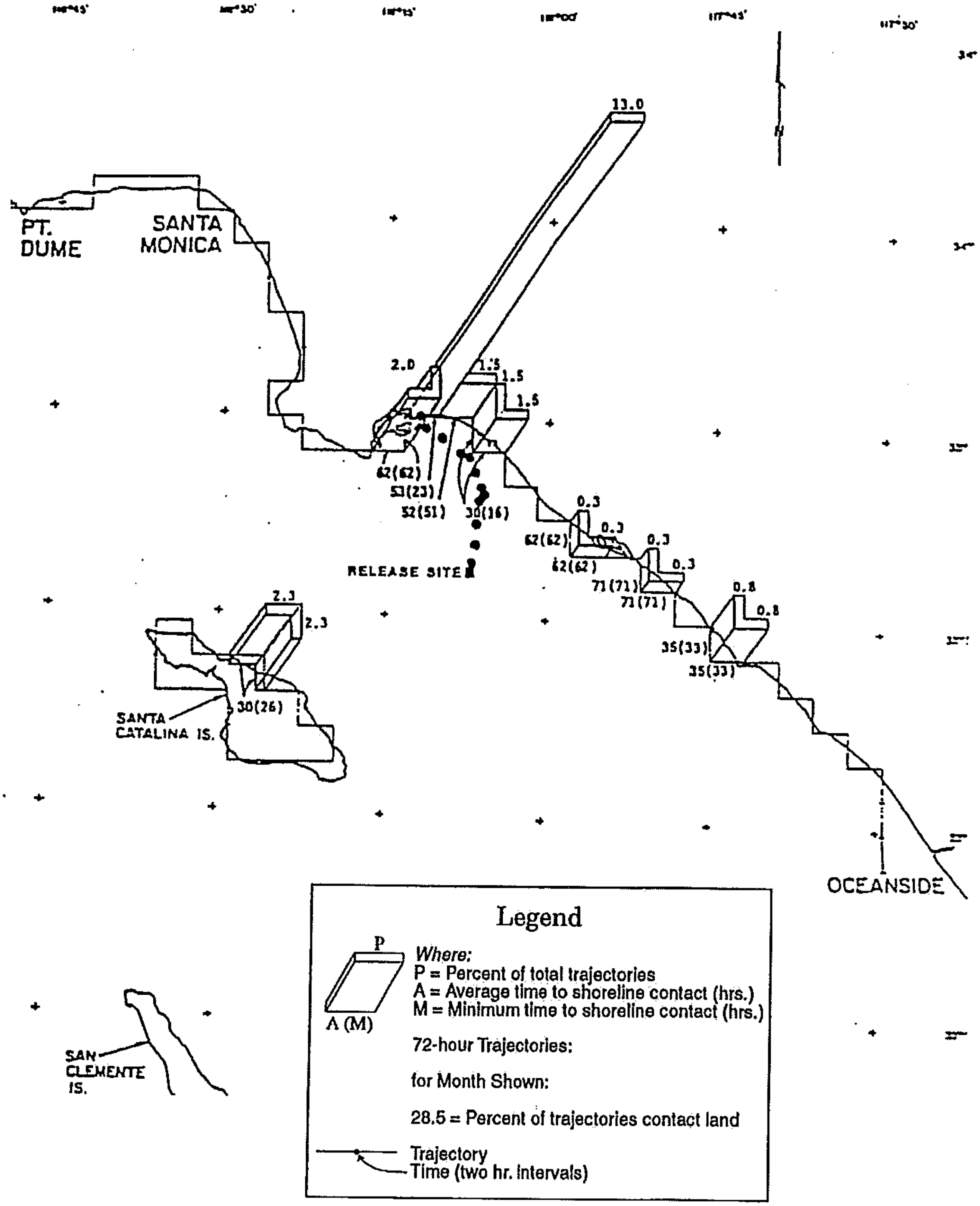
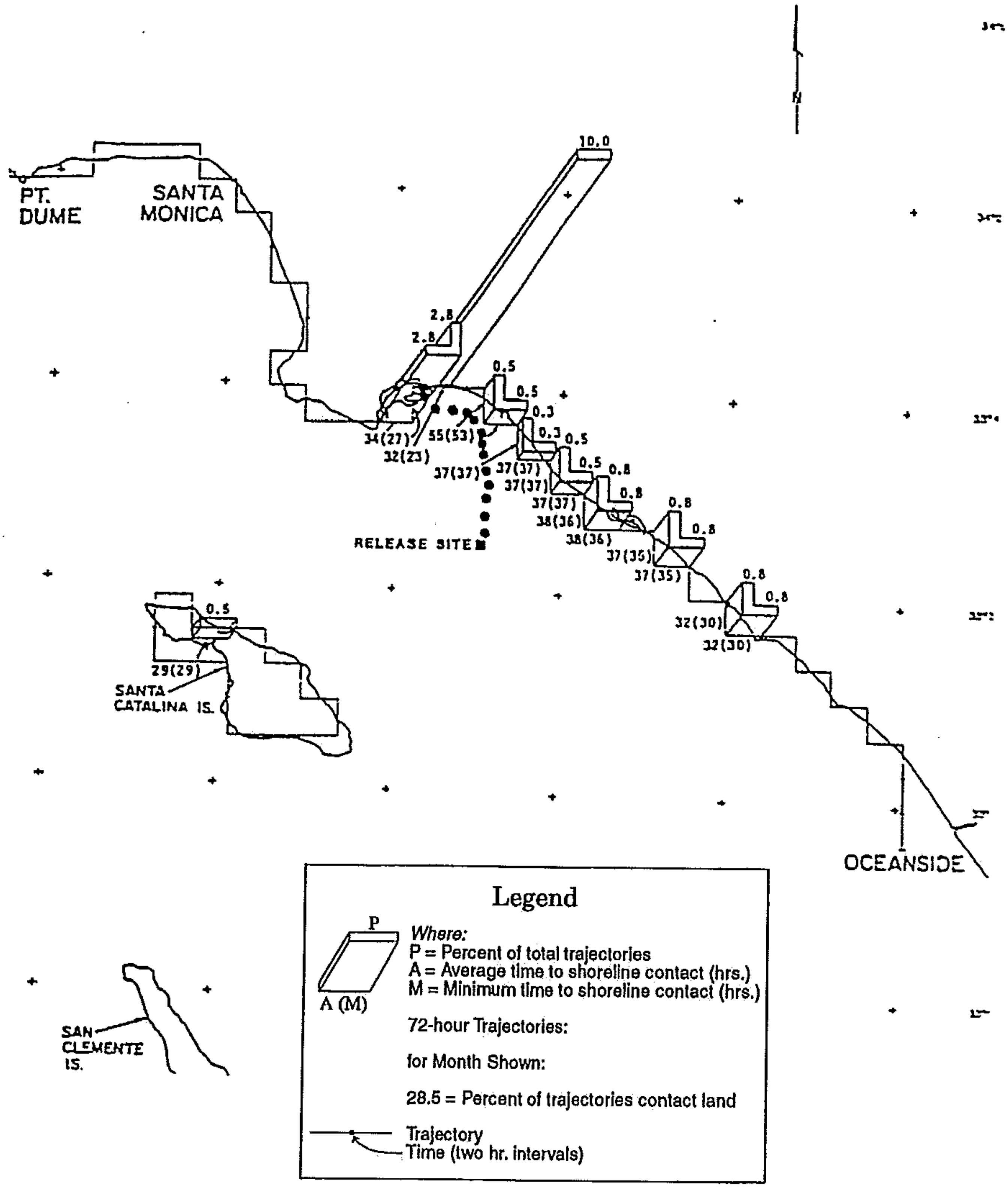


Figure J-12. Distribution of Shoreline Contacts – OSC #P-0300, P-0301 – December.



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K.1 INTRODUCTION

The feasibility of effectively implementing containment and recovery techniques is generally dependent on the size of the spill, type of spilled material, available logistical resources, implementation time, and environmental conditions in the spill area. The procession of each major stage of spill response operations from spill discovery to completion of cleanup is shown in Figure K-1.

The Company's strategy is to use onsite containment equipment and cooperative/contractor equipment and expertise to contain and recover spilled oil. Equipment lists and contractual agreements are provided in Annex P. Alternative response technologies will be considered when appropriate.

The Area Contingency Plan (ACP), Section 3000, provides a description of the various oil containment, recovery and removal methods available to the Unified Command (UC) during a spill response. Utilizing the equipment owned and operated by the Company, coupled with contracted resources, the following methods for containing spilled oil and removing it from the environment will be used, if safe to do so. Refer to Section 2 for detailed response procedures for the Beta Unit Complex.

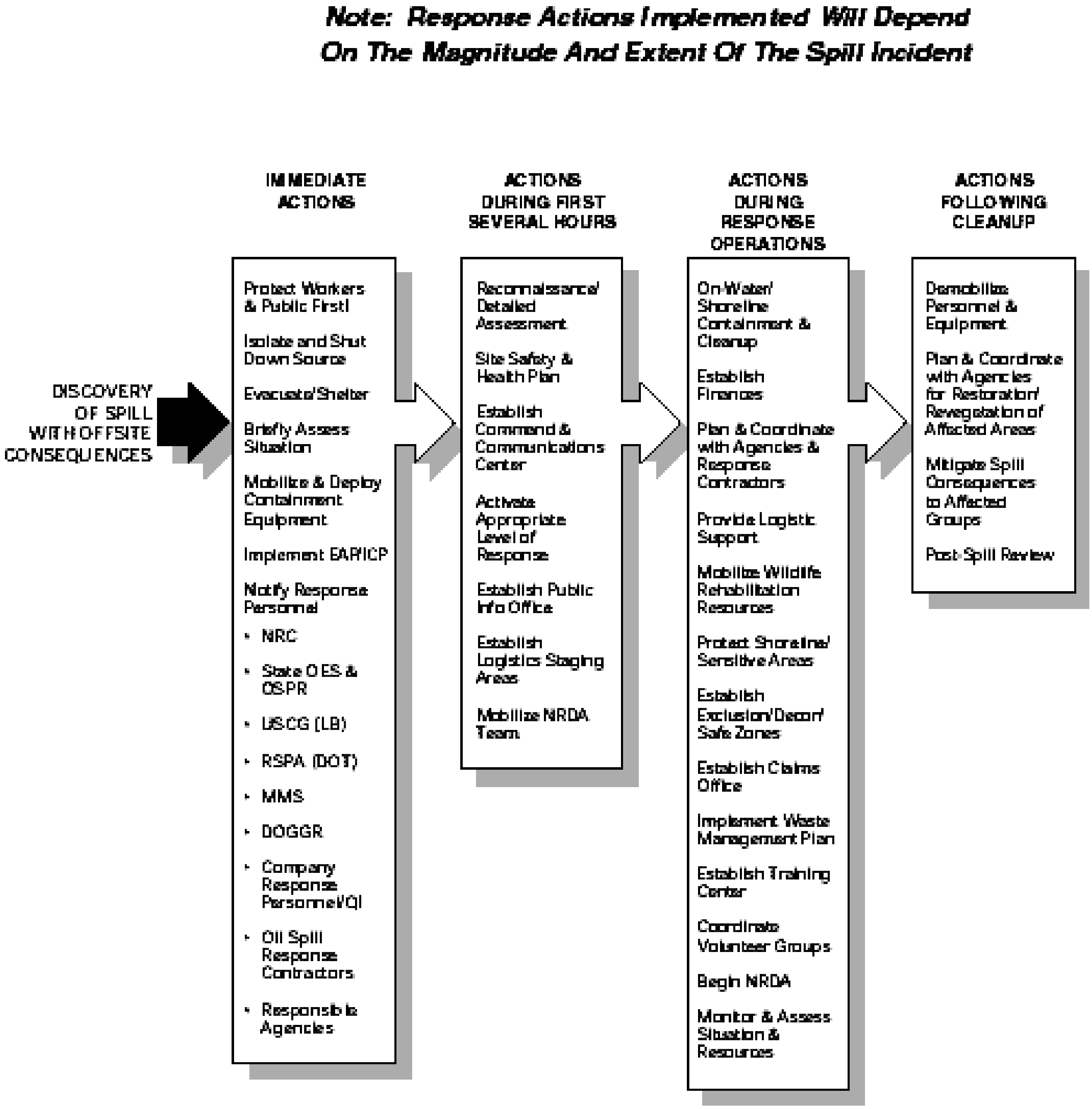
K.2 ON-LAND RESPONSE AND CLEANUP STRATEGIES

K.2.1 Source Control

Containment and control of an oil spill are the first and primary critical activities of any response effort. The object of source control is to stop the discharge, which may involve:

- Closing a valve.
- Plugging a hole.
- Facility shutdown.
- Righting an overturned vehicle.

Figure K-1. Oil Spill Response Flowchart.



This is done to meet the primary goal of protection of the public, personnel, wildlife, and habitats.

Oil spill response and cleanup equipment and materials are available onsite at the platforms. Additional assistance is available from Marine Spill Response Corporation (MSRC), Patriot Environmental and Clean Harbors.

K.2.2 On-Land Containment and Recovery Strategies

General on-land response and recovery strategies are outlined below:

K.2.2.1 Earthen Berms or Dikes

Construct earthen dikes, using whatever equipment is necessary to contain the oil in a readily accessible area. The collection point should allow vehicle access whenever possible.

K.2.2.2 Culverts

If an oil spill enters a small canal or dry waterway, a nearby downstream culvert can provide an efficient place to contain the spill. If the culvert has wing walls, it already restricts the channel and will provide good support for damming the flow. A solid covering can be used to block a pipe opening or a box type opening. The contained oil can be removed by using a vacuum truck and/or absorbent material.

K.2.2.2.1 Culverts: Upstream End

The following type of device, materials, and installation strategies are suggested:

- For each culvert, a simple plywood panel of size sufficient to block the culvert and to fit flush with the culvert surface between the wing walls can be used.
- Stakes can be driven into the ground about 3 feet up-slope from the top of the culvert concrete. The panel can be lowered into place with handling lines using the stakes as braces and then fixed in position.
- A supply of about 20 sandbags would be needed. These sandbags can be placed upstream of the blocking panel to aid in holding it in place and sealing the edges.
- If water is flowing in the creek at the time of an oil spill, a space under the panel would be used to permit water to continue down the creek while the oil is blocked.

K.2.2.2.2 Culverts: Downstream End

Panels of the same size and structure as those prepared for the culverts at the upstream end, are suitable for the downstream end; however, supporting timbers may be needed to hold the panels in place over the ends of the culverts against the flow of oil.

K.2.2.3 Storm Drain and Street Diversion

If a release of any type of oil occurs in an urban area, there is a high probability that the oil would enter a municipal storm drain system. If the oil is heading toward a storm drain inlet, it can be blocked with sandbags. Construct sandbag dams across the street to restrict the oil from spreading and to reduce the area subject to cleanup.

If the oil has already entered a storm drain, remove the closest storm drain manhole cover and determine the flow direction of the system. If the released oil is flowing in the storm drain:

- Contact Public Works for assistance.
- **If this is the LA River storm drain from the Beta Pump station, ensure that stormwater pump is shut off. Don't wait on Public Works**.
- Continue reconnaissance of the manholes downstream of the release until there no evidence of oil.
- Dam the storm drain on the downstream side with absorbent material to stop further migration.
- Begin removal of the oil with a vacuum truck.
- Flush the drain with water, beginning at the point the oil entered the system.
- Continue to flush the drain.
- Recover the oily water until there is no longer a sheen of oil on the water.
- Flush the drain with the minimum amount of water needed to ensure recovery, thereby minimizing disposal of oily material.

When containment is accomplished:

- Recover the oil using excelsior and/or vacuum truck.
- Clean the area in a manner acceptable to governmental authorities.

- Dispose of all oil-soaked cleaning materials as required by law (see Annex F, Waste Management and Disposal Plan).
- Implement government-approved Restoration Plan.

K.2.3 On-Land Cleanup Techniques

Terrestrial (on-land) cleanup techniques are provided in Table K-1.

Table K-1. Terrestrial Cleanup Techniques.

TECHNIQUE	EQUIPMENT	PERSONNEL	OTHER RESOURCES	UNIT AREA
Containment/ Diversion Berming	bulldozer or grader or front end loader, vacuum truck	supervisor equip. operators 4-5 laborers	hoses, plastic liner, soil, sandbags, sorbents, warning tape, protective clothing, fuel & maintenance for equipment	each containment location
Interception Trench	backhoe, vacuum pump	supervisor equip. operators 2-3 laborers	hoses, visqueen/plastic liner, sorbents, storage containers, plastic bags, barrier supports, protective clothing, fuel & maintenance for equipment	each containment location
Storm Drain Blocking	none or support pickup truck with tools	supervisor 1-3 laborers	plastic sheeting, tarps, boards/ plywood, dirt and/or sand, protective clothing, fuel and maintenance for vehicle	multiple drain locations, depends on size and accessibility
Blocking Dams	bulldozer or backhoe or front end loader, pickup truck with tools, possible vacuum pump or truck, skimmer, dump truck(s) for removal	supervisor operators 2-3 laborers	plastic liner, geotextiles, soil, sandbags, 3-4" underflow pipe, barrier supports, sorbents, storage containers, protective clothing, fuel and maintenance for equipment	each dam location
Culvert Blocking	backhoe or front end loader, pickup truck with tools	supervisor operators 2-3 laborers	plywood, sheet metal, inflatable plugs (if available), soil, sandbags, barrier supports, nails, stakes, lumber, hose and fittings, plastic bags, storage containers, protective clothing, fuel and maintenance for equipment	each culvert location
Manual Removal/ Vegetation Cutting	dump truck, debris box, possible pressure pump for washing vegetation	2 crews with 1 supervisor and 5-10 laborers per crew	cutting tools, rakes, shovels, pitchforks, plastic bags, plastic sheet, sorbent pads, protective clothing, fuel and maintenance for equipment	approximately 50K sq. ft. (1+ acre) per 8-hour shift

K.3 CREEK RESPONSE AND CLEANUP STRATEGIES

The Company's operations personnel and equipment will divert, control and contain any spill into water, if safe to do so, until appropriate contract resources can respond to adequately handle the emergency.

K.3.1 Blocking Creek Beds

An earthen dam or berm may be constructed downstream of the oil if the creek bed is dry. However, if the creek is flowing, then diversion booms, overflow booms, and/or water bypasses can be used. Figure K-2 illustrates a procedure that can be employed to contain oil in creek beds. If water flow rate allows, intermittent berms can be placed in position with earthmoving equipment. The booms between the berms must permit water flowing in the creeks to escape under the oil and continue flowing. Allowing the water to escape diminishes the extent that the collected oil spreads beyond the creek bed. Figures K-3 and K-4 illustrate an overflow berm that can be placed downstream of oil contained upstream of another boom in a creek bed. If such a berm is placed in a creek bed, a water bypass must be made by which water can escape and flow in the creek as illustrated in Figures K-5 and K-6.

Figure K-2. Diversion Booms with Berms.

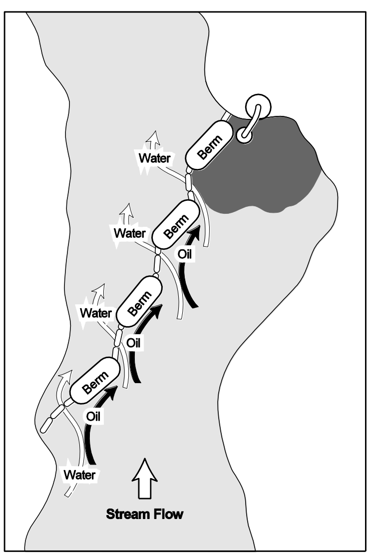


Figure K-3. Overflow Berm Map View.

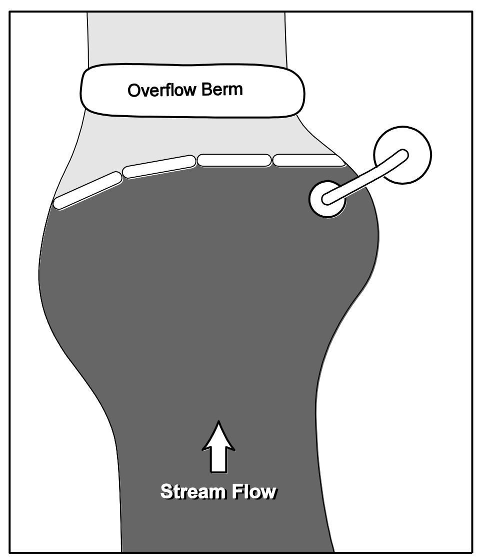


Figure K-4. Overflow Berm.

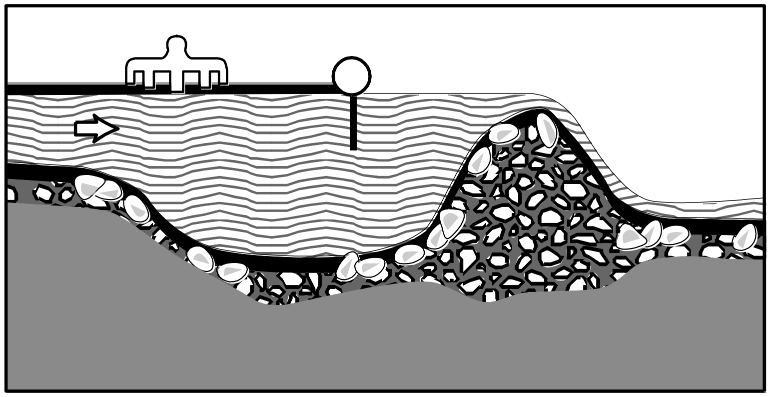


Figure K-5. Water Bypass with Inclined Tube.

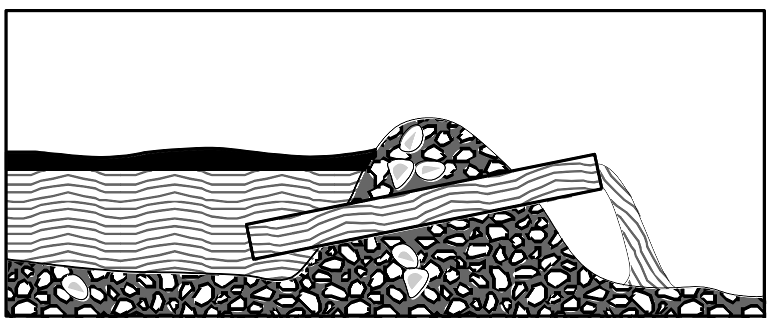
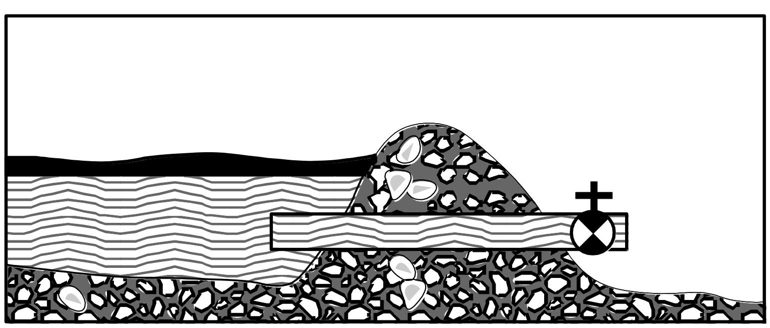


Figure K-6. Water Bypass with Valved Pipe.



K.3.2 Creek Cleanup Techniques

Steps required to clean up a creek include:

- Remove contained oil using excelsior, absorbent pads, and vacuum truck as needed.
- Clean the banks and surrounding area in a manner acceptable to governmental authorities.
- Dispose of all oil-soaked cleaning materials as required by law (see Annex F, Waste Management and Disposal Plan).
- Implement government-approved restoration plan.

Additional cleanup techniques are described in Annex K.4.4, River Cleanup Techniques.

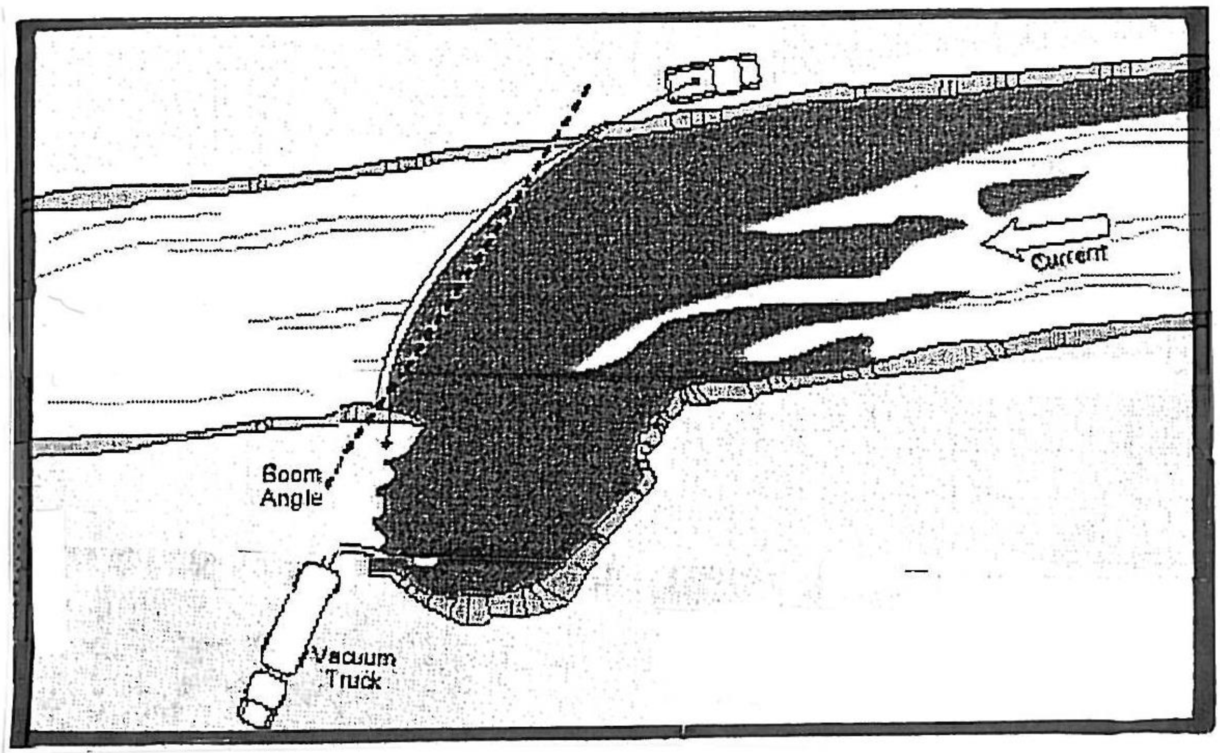
K.4 RIVER RESPONSE AND CLEANUP STRATEGIES

K.4.1 River Containment Booming

The techniques and strategies employed in any river will vary depending on the season and the presence or absence of stream flow. If the riverbed is dry or has very low flow, containment/diversion berming or damming techniques may be appropriate and may be sufficient to prevent oil from reaching wetlands or marine waters. If there is moderate to high level flow, various in-stream diversion and containment techniques would be required. In high stream flow conditions, oil may very likely reach the wetland area and marine waters, and shoreline containment booming and cleanup techniques would be needed.

Containment booming of a narrow or shallow river channel can be accomplished without a boat. A boom (such as a light-duty or absorbent boom) can be positioned by hand or by using a motor vehicle, if the shoreline allows (see Figure K-7). Figure K-7 also depicts a collection sump dug along the riverbank. Depending on the size of the sump required, the riverbank may need to be adequate for vehicle traffic. Booming and protection strategies for the coastal area are shown in the LA/LB Southern Sector ACP.

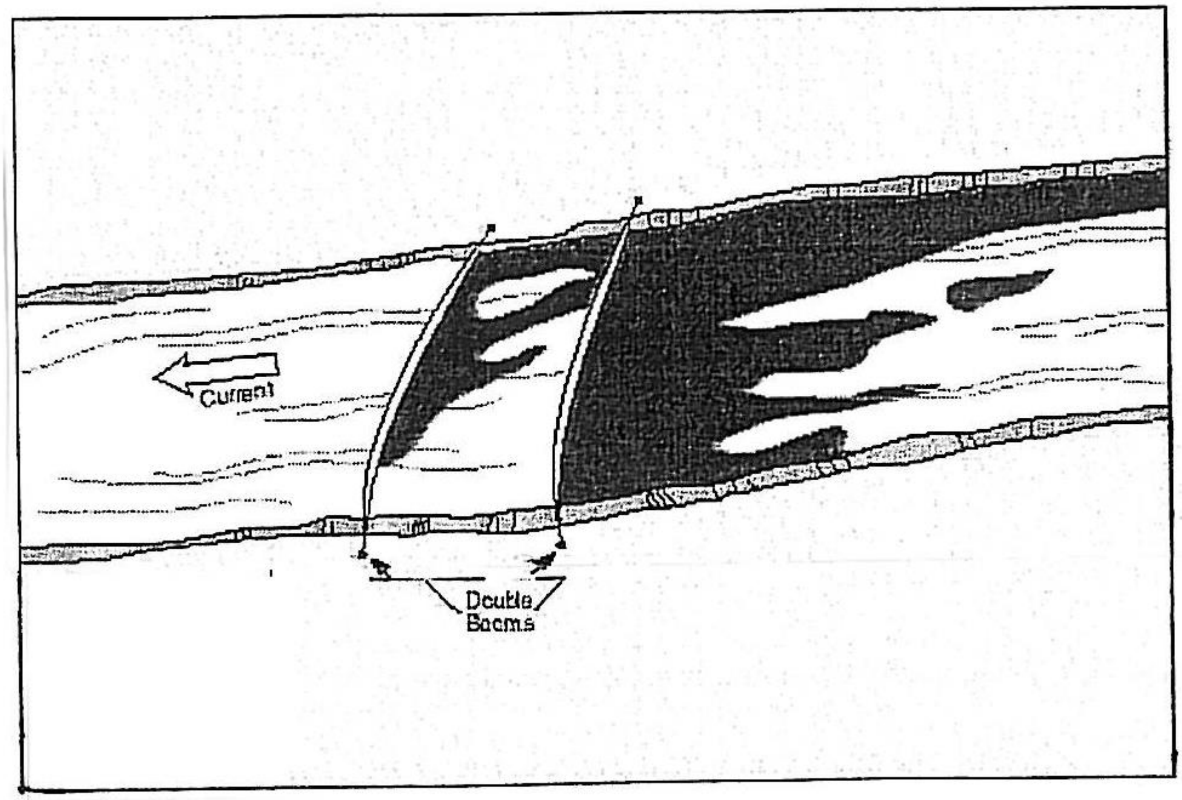
Figure K-7. River Containment Boom.



K.4.2 Double Booming of Narrow Rivers and Channels

Protection of a narrow river or channel can be accomplished by utilizing a double string of boom across the entire width of the channel as depicted in Figure K-8. The first string of boom will contain most of the oil slick and the second string of boom should contain any oil escaping the first boom. This booming technique is best accomplished by using an absorbent boom as the second boom and is most effective in channels having weak currents.

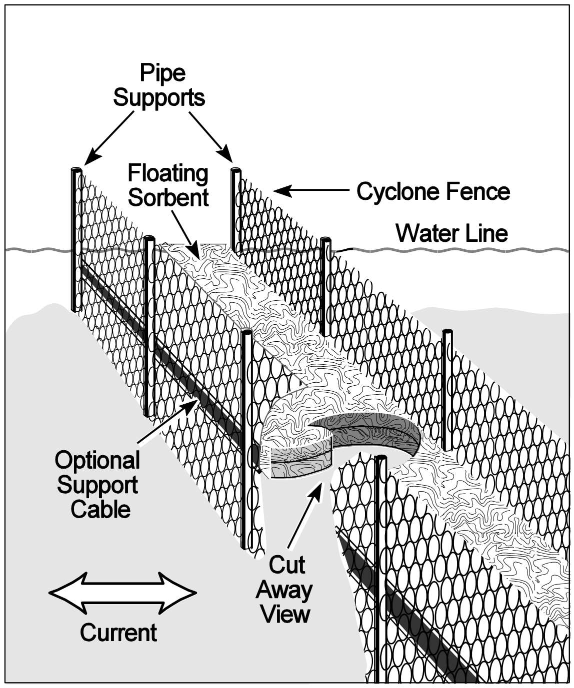
Figure K-8. Double Booming.



K.4.3 Absorbent Barrier

In the event of an oil spill that causes a chronic release of oil into a body of water, a barrier can be constructed of cyclone fence and absorbent material as shown in Figure K-9. The absorbent material will contain and collect the oil and can be exchanged with fresh material as needed. Because of the labor and time required to construct and maintain this type of barrier, it can only be justified for a chronic release.

Figure K-9. Absorbent Barrier.



K.4.4 River Cleanup Techniques.

Table K-2 provides a matrix of suggested techniques and resources appropriate for a river spill response.

Table K-2. River Cleanup Techniques.

TECHNIQUE	EQUIPMENT	PERSONNEL	OTHER RESOURCES	UNIT AREA
Containment/ Diversion Berming	bulldozer or grader or front end loader, vacuum truck, pickup truck and hand tools	supervisor equip. operators 4-5 laborers	hoses, plastic liner, soil, sandbag, sorbents, warning tape, protective clothing, fuel and maintenance for equipment	each containment location
Interception Trench	backhoe, vacuum pump	supervisor equip. operators 2-3 laborers	hoses, visqueen/plastic liner, sorbents, storage containers, plastic bags, barrier supports, protective clothing, fuel and maintenance for equipment	each containment location
Narrow Channel Containment Booming	12-18 foot boat with 25+ hp motor, 100-300 feet boom with anchors/floats, backhoe, vacuum truck or pump, pickup truck and hand tools	supervisor 2 boat operators equip. operators 4-6 laborers	anchor line, extra rope, hand tools, sorbents, containment drums, plastic bags, protective clothing, fuel and maintenance for equipment	each containment location
Sorbent Barriers	100-200 feet chain link fence, 10-20 fence posts, pickup truck and hand tools	supervisor 2-3 laborers	rebar, bailing wire, cable and cable ties, containment drums, protective clothing	each containment location
Manual Removal/ Vegetation Cutting	dump truck, debris box, possible 12-18 foot boat with 25+ hp motor, pickup truck	2 crews with 1 supervisor and 5-10 laborers per crew	cutting tools, rakes, shovels, pitchforks, plastic bags, plastic sheet, sorbent pads, ground cover/boards, protective clothing, fuel and maintenance for equipment	approximately 50K sq. ft. (1+ acre) per 8-hour shift
Sediment Dike	bulldozer or grader or front end loader	supervisor equip. operators 2 laborers	soil, sandbags, 4-6 inch drain pipe, protective clothing, fuel and maintenance for equipment	each location
Shoreline Containment Booming	15-25 foot boat with 50+ hp motor, 800 ft harbor boom, 4-6 anchors and buoys. Possible skimmer or vacuum truck, grader or bulldozer, and 2-3 front end loaders or elevating scrapers and 5-10 dump trucks (depending on haul distance)	supervisor 2-3 boat operators 2-3 laborers	anchor line, extra rope, sorbents, hand tools, protective clothing, fuel and maintenance for equipment	river mouth

K.5 OPEN-WATER RESPONSE AND CLEANUP STRATEGIES

Should a spill reach the sea, or occur from a platform, pipeline, or supply vessel, rapid containment is vital to minimize the spread of oil. Containment booms that can be rapidly deployed are available on Platform Ellen and through MSRC (stored on response vessels and on-land trailers). Refer to Annex P for a listing of MSRC's equipment. Once the spill reaches the ocean, it will generally move in the direction of the wind and/or current. The spill could move offshore and/or along the shoreline.

Offshore or open water response and recovery at the platforms is accomplished by deploying the containment boom using the platform crewboat or a MSRC vessel.

K.5.1 Open-Water Cleanup

Oil removal/recovery in open water is accomplished through the use of skimming devices once the oil has been contained. MSRC will provide the expertise and personnel for open water oil recovery.

K.5.1.1 Open-Water Cleanup for Contained Spills

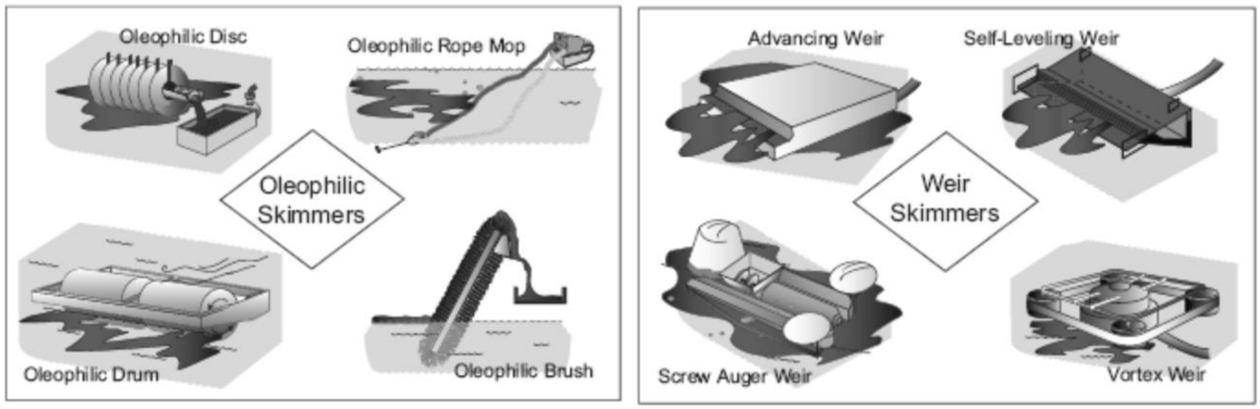
A spill that is fully contained by booms is best cleaned up by a floating skimmer placed inside the boomed area. The oil will tend to concentrate against the boom in the direction of the wind and current. The skimmer should be placed in this area and continually moved to skim the thickest area. When skimming becomes inefficient (after most of the spill has been removed, or for small spills, i.e., less than one barrel), sorbent booms, pads or rolls may be used. Loose sorbent materials should be avoided.

K.5.1.2 Open-Water Cleanup for Uncontained Spills

Uncontained spills form slicks which will continue to spread and move freely according to the prevailing winds and currents. The primary method of recovering large, uncontained spills involves the use of high capacity, oleophilic or weir skimming systems. An onboard pumping system is used to transfer the recovered oil into an oil/water separator or storage tank.

In advancing skimmers, booms are deployed in a "U" shape from both sides of the response vessel, with the outer ends of the barriers attached to outrigger booms. The booms are fixed to the rails of the vessel and secured by guy wires fore, aft, and vertically to a mast at the center of the vessel. Skimming speeds should not exceed 1 to 1.5 knots to avoid entrainment of oil under the barrier.

Skimming should begin on the downwind side of the slick and move across the slick, staying on the downwind side.



Skimming equipment that can be used for open water skimming of uncontained spills, with booms, is available from MSRC response vessels or storage locations.

K.6 SHORELINE RESPONSE AND CLEANUP STRATEGIES

K.6.1 Area of Potential Impact

Potential spill trajectories and spill pathways are discussed in Annex J (Trajectory Analysis) for the Beta Unit Complex. The trajectory analyses are based on spills located at the mouth of the Los Angeles River, along the pipeline corridor between the pipelines and shore, and in the Long Beach Harbor.

K.6.2 Shoreline Protection

The ability to predict the direction and rate of movement of spilled oil is critical to identifying sensitive resources that may be impacted and determining the type of shoreline protection strategies to implement. Beta Offshore has contracted with a 24-hour service to prepare trajectories to assist in prioritizing sensitive areas. That service can fax or email trajectories. Turnaround time for these trajectories is approximately 1-hour. The Company's Sensitive Area Protection Group is responsible for providing response operations with daily information on:

- Probable beach impact area(s).
- Protective booming to provide protection of sensitive resource areas.
- Wildlife sensitivity areas.
- Debris removal.
- Special access and equipment deployment requirements.
- Protective booming installations and maintenance.

Table K-3 summarizes the applicability and resource requirements for the following shoreline protection techniques:

- Diversion booming.
- Exclusion booming.
- Containment booming.
- Sorbent booms/barriers.
- Beach berming.
- Beach sumps.

In the event that an area or areas are threatened as a result of a spill from the Beta Unit Complex, the Company will rely on the expertise of MSRC to plan and implement shoreline protection response actions. The Company understands that all response actions will be subject to approval of the Unified Command which includes, in addition to the Company, the Federal On-Scene Coordinator, the State Incident Commander (DFW/OSPR), and the Local Government Incident Commander.

Table K-3. Applicability and Resource Requirements for Shoreline Protection Techniques.

RESPONSE TECHNIQUE	APPLICABILITY	RESOURCE REQUIREMENTS
Diversion Booming	• Low energy shorelines in currents exceeding one knot • Deflect/divert oil to/away from shoreline	• Curtain boom (approximately 1,500 ft, length depends on width of approaching slick and/or area of shoreline to be protected) • Boom deployment boat (shallow draft) • Anchors, tension cables, hand tools • Sorbents and plastic bags • 9 people
Exclusion Booming	• Entrances to harbors, marinas, breakwaters, inlets	• Curtain boom (1,000 to 1,500 ft) • Boom deployment boat (20 ft) • Anchors, tow lines, hand tools • Truck • Sorbent and plastic bags; skimmer, pump and storage tanks • 9 people
Containment Booming	• Open water to surround approaching oil slick	• Containment boom • Boom deployment and tending boats • Anchors, tow lines, hand tools • Skimmer, pumps, storage tanks • 9 people
Sorbent Booms/ Barriers	• Entrance to wetlands • Control entrance of oil into wetlands and movement of oil within wetlands	• Sorbent boom/barrier (four times as long as the width of the waterway when currents present) • Small boat • Fencing, pipe supports, cable, sorbent, hand tools, plastic bags • 6 people
Beach Berming	• Mid intertidal zone of a beach • Prevent spread of oil contamination to backshore areas • Only effective for one or two tidal cycles	• Motor grader • Bulldozer • Hand tools • 3 people
Beach Sumps	• Shoreline with some longshore drift, wave action cannot be extreme, small tidal range • Prevent oil migration down beaches	• Backhoe • Vacuum truck • Tank truck • Hand tools, suction hoses • 3 people

K.6.3 Shoreline Cleanup

Once a shoreline area is affected by spilled oil, it will be necessary to determine the most effective cleanup technique to use, while at the same time minimizing secondary environmental impacts. The technique selected will depend on a number of factors, including:

- Safety considerations
- Characteristics of the oil (e.g., degree of emulsification, weathering)
- Type of shoreline affected
- Degree and extent of oiling of the affected shoreline
- Accessibility of the shoreline
- Sensitivity of the shoreline

Both the LA/LB Southern Sector Area Contingency Plan and Region IX Regional Contingency Plan provide guidance on the types of cleanup techniques that could be applied to shorelines. The extent (in miles) of different shoreline types from Inspiration Point to Abalone Point originally presented in a guidance document by the DFW/OSPR is summarized in Table K-4.

Table K-4. Shoreline ESI Type Summary – Inspiration Point to Abalone Point.

Area Name	Total Miles	ESI TYPE[1]										
		1	2	3	4	5	6	7	8	9	10	Onshore
Inspiration Pt to LA Gate	7.7	4.2	1.2	0.0	0.5	0.1	1.7	0.0	0.0	0.0	0.0	0.0
LA Gate to Alamitos Lt.	5.5	0.0	0.0	0.0	0.0	0.0	5.5	0.0	0.0	0.0	0.0	0.0
LA/LB Inside Breakwater	61.9	0.0	0.0	0.2	0.0	0.0	0.0	0.0	61.0	0.7	0.0	0.0
Grissom Isl. to SG River	12.5	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.3	9.0	0.0	0.0
Alamitos Bay	12.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	9.9	0.1	1.1	0.0
SG River to Anaheim Bay	4.0	0.1	0.0	0.5	1.2	0.0	2.2	0.0	0.0	0.0	0.0	0.0
Anaheim Bay	32.6	0.0	0.0	0.5	0.0	0.0	0.0	0.0	11.5	11.0	9.6	0.0
Anaheim Bay to SA River	12.3	0.1	0.0	0.0	10.2	0.0	1.0	0.0	0.0	1.0	0.0	0.0
SA River to Newport Bch.	11.7	0.2	0.0	0.0	5.2	0.0	0.0	0.0	0.0	2.4	3.9	0.0
Newport to Abalone Pt.	5.3	0.0	1.8	0.0	2.7	0.0	0.8	0.0	0.0	0.0	0.0	0.0
TOTAL	**165.6**	**5.6**	**3.0**	**1.2**	**23.0**	**0.1**	**11.2**	**0.0**	**82.7**	**24.2**	**14.6**	**0.0**
%	**100%**	**3%**	**2%**	**1%**	**14%**	**0%**	**7%**	**0%**	**50%**	**15%**	**9%**	**0%**

[1] **ESI Types**: — **Persistence Potential**:

	ESI Type	Persistence Potential
1	Exposed Wave-cut Cliffs, Seawalls, and Piers	Low
2	Exposed Wave-cut Platforms	Low
3	Fine to Medium-grained Sand Beaches	Low
4	Coarse-grained Sand to Gravel Beaches	Moderate
5	Mixed Sand and Gravel (or Shell) Beaches	Low
6	Gravel Beaches and Rip-rap Structures	High
7	Exposed Tidal Flats	Moderate
8	Sheltered Rocky Shores and Sheltered Manmade Structures	High
9	Sheltered Tidal Flats	Moderate
10	Salt Marshes	Very High

SHORELINE CHARACTERIZATION SUMMARY:

		Rock/Manmade	Sand/Gravel/Mud	Cobble	Onshore
ESI Types		1, 2, 8	3, 4, 5, 7, 9	6	+10
TOTAL		91.3	48.5	11.2	14.6
100%		55%	29%	7%	9%
Of which is inaccessible (estimate)	Mi		3	1.5	
	%		2%	1%	
Balance accessible	%		27%	6%	

Source: OSPR Guidance Document, Section 8, Pages 21, 22

DFW/OSPR has also prepared a matrix showing the shoreline cleanup techniques to be used on the various shoreline types (see Table K-5). A summary of the resources required to implement these cleanup techniques is provided in Table K-6. Irrespective of the shoreline cleanup technique employed, the following general principles should be observed:

- Proper safety procedures should be followed. All workers must receive safety training, including appropriate HAZWOPER training in accordance with OSHA regulations.
- Oil trapped in booms should be picked up prior to the next tidal cycle.
- All food, trash, and waste should be removed from the shoreline daily, if possible, to minimize attracting scavengers into the contaminated area.
- All state and federal laws/policies, pertaining to wildlife protection and the collection of live and dead animals, and animal parts from protected species, should be observed.
- Sensitive areas should be clearly delineated prior to the deployment of equipment and personnel. Activity in a sensitive area should be restricted.
- All signs of human activity should be removed upon completion of treatment.
- Unaffected areas adjacent to shoreline treatment areas should be boomed off, where possible, to protect them from oiling during treatment operations.
- Impact to lower intertidal areas should be minimized. Sorbents should be employed below oiled upper beach faces to protect the lower intertidal zone from oiling.

K.6.4 Restoration

Once cleanup has been completed, it may be necessary to restore areas impacted by a spill. Severe impacts include significant soil contamination, site disturbance that significantly alters the contour of the location, cleaning of contaminated vegetation, or removal of vegetation killed or seriously damaged by oil.

Typical restoration involves one or more of the following actions:

- Remove contaminated soil and dispose of it at an approved disposal site.
- Re-contour a site that was disturbed in cleanup activities, which may involve the importation of soil if substantial amounts have had to be removed.
- Wash vegetation to remove light oil residues.

- Cut and trim vegetation to remove more heavily contaminated foliage.
- Remove vegetation that is dead or not expected to recover.
- Re-seed or plant replacement vegetation if a significant fraction of the existing ground cover was removed.
- Implement erosion control measures, such as applying jute mesh or hay bales, contour grading, seeding to stabilize slopes, applying rip-rap to erosion-prone locations, etc.

Professional arborists, botanists, and/or landscape architects would be employed as appropriate to advise the Company in consultation with government agencies in the development and implementation of the Site Restoration Plan.

Table K-5. Cleanup Techniques and Shoreline Types.

CLEANUP TECHNIQUE[2]	SHORELINE TYPES[1]									
	1	2	3	4	5	6	7	8	9	10
(1) No Action	P	P	X	X	X	X	A	X	A	A
(2) Manual Debris Removal	P	A	R	R	R	R	P	R	P	P
(3) Passive Collection (sorbents)	R	R	R	R	R	R	R	R	R	R
(4) Debris Removal with Heavy Equipment	X	X	A	A	A	P	X	A	X	A
(5) Trenching (recovery wells)	X	X	P	P	P	P	X	X	X	X
(6) Sediment Removal	X	X	S	P	P	P	X	X	X	X
(7) Cold Water Flooding (deluge)	A	A	A	A	A	A	A	A	A	A
(8) Cold Water Washing	X	X	X	X	X	X	X	X	X	X
(a) Low Pressure (<50 psi)	A	A	X	P	P	A	X	A	X	P
(b) High Pressure (50-100 psi)	A	X	X	P	P	A	X	X	X	X
(9) Warm Water Washing (ambient to 90°F)	A	A	X	P	P	A	X	A	X	X
(10) Hot Water Pressure Washing (> 90°F)	A	X	X	X	X	P	X	X	X	X
(11) Slurry Sandblasting	A	X	X	X	X	P	X	X	X	X
(12) Vacuum	A	A	A	A	A	A	A	A	A	A
(13) Cutting Vegetation[3]	X	X	X	X	X	X	X	P	X	P
(14) Chemical Treatment[4]	X	X	X	X	X	X	X	X	X	X
(a) Oil Stabilization	X	X	P	P	P	X	P	X	X	X
(b) Protection of Beaches	X	P	P	P	P	P	X	P	X	X
(c) Cleaning of Beaches	X	P	P	P	P	P	X	P	X	X

Table K-5. Cleanup Techniques and Shoreline Types.

CLEANUP TECHNIQUE[2]	SHORELINE TYPES[1]									
	1	2	3	4	5	6	7	8	9	10
(15) Burning[4]	A	A	A	A	A	P	X	X	X	P
(16) Nutrient Enhancement	X	X	A	A	A	X	P	A	A	P
(17) Microbial Addition[4]	X	X	A	A	A	X	P	A	A	P
(18) Sediment Reworking[4]	X	X	A	P	P	P	X	X	X	X
(19) Shore Removal and Replacement[4]	X	X	P	P	P	X	X	X	X	X

[1] Shoreline Types:

1 Exposed Wave-cut Cliffs, Seawalls, and Piers
2 Exposed Wave-cut Platforms
3 Fine to Medium-grained Sand Beaches
4 Coarse-grained Sand to Gravel Beaches
5 Mixed Sand and Gravel (or Shell) Beaches
6 Gravel Beaches and Rip-rap Structures
7 Exposed Tidal Flats
8 Sheltered Rocky Shores and Sheltered Manmade Structures
9 Sheltered Tidal Flats
10 Salt Marshes

[2] Key:

R Recommended – May be preferred alternative. Method which best achieves the goal of minimizing destruction or injury to the environment.
A Applicable – Variable and possibly useful but may result in limited adverse effects to environment.
P Possible – Effectiveness and possible harm to environment would have to be carefully evaluated.
X Do not use.

[3] Cutting will depend upon time of year. Consider only if re-oiling of birds is possible.

[4] Requires State approval for all cases. RRT approval also required for federalized spills.

Reference: Based on California Department of Fish and Wildlife, Office of Oil Spill Prevention and Response, Guidance Document, Marine Facility and Vessel Oil Spill Contingency Plans, For Natural Resource Protection and Oil Spill Countermeasures, December 1993.

Table K-6. Resource Requirements for Shoreline Cleanup Techniques.

CLEANUP TECHNIQUE	RESOURCE REQUIREMENTS
Manual Debris Removal	• Debris boxes, plastic bags, bins, hand tools (shovels, rakes, hand pumps) • Light vehicle, shallow craft, helicopter • 10-100 people per mile • 1-3 supervisors per mile
Passive Collection (Sorbents)	• Snare boom • Fencing, pipe supports, cable, sorbent, hand tools, plastic bags • Small boat • 6 people
Sediment/Debris/Shore Removal with Heavy Equipment	• Dump trucks • Motor graders • Bulldozers • Elevating scrapers • Front end loaders • 1 equipment operator for each piece of equipment • 1 supervisor
Trenching	• Motor graders • Bulldozers • Dump trucks • 1 equipment operator for each piece of equipment • 1 supervisor
Shoreline Washing – Low Pressure (cold or warmer water)	• Low pressure flushing unit • Seawater supply • Vacuum system • Sorbents pads • Storage for contained oil • Light vehicle • Two boats • 3 operators per site
Shoreline Washing – High Pressure (cold water)	• High pressure flushing unit • Seawater supply • Vacuum system and 100 ft of boom • Sorbent pads • Storage for contained oil • Water heaters, power supply, header base, intake hoses • Vehicles • 2 small boats • 3 operators per site
Shoreline Washing – High Pressure (warm water)	• High pressure hot water pumps • 1,000-6,000 ft of boom • Light and heavy oil skimmers • 400-2,000 ft of hose with various diameters • 3 operators per site

Table K-6. Resource Requirements for Shoreline Cleanup Techniques.

CLEANUP TECHNIQUE	RESOURCE REQUIREMENTS
Slurry Sandblasting	• Sandblasting unit • Compressor • Sand supply truck • Front end loader • Sand • Light vehicle, shallow craft, helicopter • 5 to 8 people
Vacuum Pumping	• Vacuum truck with suction hoses • Suction head, pump, storage tanks • Power source for portable units • 2 to 3 people per unit
Vegetative Cutting	• Cutting tools, collecting tools, plastic or burlap bags, rolls of ground cover • Light vehicle, shallow craft, helicopter • 5 crews of 10 workers each (4 workers with cutting tools and 6 with collecting tools) • 1 supervisor
Bioremediation	• Landing craft, crew boats, light vehicle • Air compressors, 5,000-gallon chemical storage tank, airless sprayer, portable spray units • Self-contained electric heat trace • Bioremediation agent • 15 to 20 people
Burning	• Flame thrower, burning agents • Firefighting equipment • Shallow craft, helicopter • 2 to 3 workers • 1 supervisor

K.7 NON-MECHANICAL METHODS OF RESPONSE

Physical removal of the oil is the preferred method. However, conventional mechanical recovery and removal may be limited by equipment capability, weather and sea conditions, and the size and location of the spill.

The use of alternative countermeasures may be considered when the preferred recovery, cleanup, or remediation techniques are inadequate and the environmental benefit of their use outweighs any adverse effects. Alternative countermeasures include:

- Dispersants

- In situ burning
- Bioremediation
- Shoreline cleaning agents

K.7.1 Dispersants and *In Situ* Burning

K.7.1.1 Overview

The use of dispersants and *in situ* burning are typically used for large offshore oil discharges. The National Contingency Plan (NCP), Section 300.910 authorizes the use of dispersants on all waters threatened by the release or discharge of oil. Section 300.910 also authorizes the use of *in situ* burning on a case-by-case basis, with approvals from federal and state agencies.

The Beta Unit Complex consists of three platforms situated in federal waters (12 miles from shore), a pipeline from those platforms to an onshore Pump Station at Long Beach, and an onshore transportation-related oil breakout tank and pump station in the Long Beach port area. Due to the environmental sensitivity of the facilities' local environment, the use of non-mechanical methods would generally be extremely unlikely. However, early-on in a response, evaluation must be done and submitted to the Federal On-Scene Coordinator (USCG representative in Unified Command) for consideration of alternative response technologies by the appropriate stakeholder agencies.

K.7.1.2 Dispersants (Region IX Regional Contingency Plan Appendix XII)

Application Methods

Dispersants are typically applied to offshore slicks to promote dispersion of oil into the water column as very small (20-to-70 μm) droplets. The amount of spilled oil that might otherwise enter sensitive areas and/or reach shore is decreased. In this way, dispersants can often eliminate or reduce potential impacts to sensitive natural resources and economic resources.

Dispersants offer advantages over skimming technology when addressing dispersible oils. These advantages include:

- Dispersants can be applied in offshore or remote areas where the use of skimming vessels may be limited or response times protracted.
- Dispersants can be used more effectively in sea states where skimming vessels may not be able to operate.
- Aerial application of dispersants can more quickly address larger areas of spilled petroleum than skimming technology.
- Dispersants can be used in concert with mechanical skimming devises to increase the rate of surface oil removal.

Dispersant application equipment can be divided into two groups (according to the method of application) as follows:

1. Vessel Application Equipment

Boat-mounted spray systems are very useful for small spills closer to land or in confined areas. This is due to the relatively slow transit times, low coverage rate and limited swath width of vessel-based systems. These systems are normally the least costly and most easily procured application method. In addition, boat-mounted applications generally have less impact on ongoing mechanical recovery operations than aerial application equipment, which due to personnel protection can require interruption or suspension of mechanical recovery for personnel protection while dispersant is being applied. In any event, a Site Safety & Health Plan for (1) dispersant application; and (2) continued on-water operations in the vicinity of the dispersant application must be considered and developed/implemented as appropriate.

2. Aerial Application Equipment

Aerial application of dispersants is achieved through the use of rotary or fixed-wing aircraft. Fixed winged applications incorporate the use of dedicated aircraft, which have been specifically modified to apply dispersants, or aircraft of opportunity equipped with Aerial Dispersant Delivery System (ADDS). Rotary aircraft (a commercial helicopter with cargo hook) may be used with an underslung portable spray system for small applications or to conduct a test application prior to RRT approval for full dispersant use.

Factors affecting dispersant and application equipment selection include:

- **Marine Conditions:** Sea conditions, temperature, water movement, depth and salinity will determine which, if any dispersants can be used effectively. Marine conditions can also limit application methods. In southern California, Corexit 9500 is the dispersant stockpiled by cooperatives.

- **Biological Resources:** Dispersants should minimize ecological impacts. The effects of dispersing slicks into the water column must be evaluated against the impacts of allowing the oil to remain on the surface and recovered by mechanical means.
- **Type and Condition of Oil:** Oils that are relatively fresh and still able to spread or film out further are best suited for dispersion. As viscosity increases and other effects of weathering occur over time, the effectiveness of dispersants is reduced.
- **Size and Location of Spill:** The amount of dispersant required and the distance between the application site and the staging area will determine the feasibility of various methods of application.
- **Response Resources:** The availability of application equipment and qualified contractors, the proximity of the staging areas, and approximate cost need to be considered when evaluating the dispersant response option. Its effectiveness and manpower and equipment requirements should be evaluated in comparison with those of mechanical recovery and *in-situ* burning.

Dispersant Toxicity

A recent review of dispersant toxicity studies suggests that the present generation of dispersants do not themselves present a significant threat to marine life. The primary threat to the environment comes from the dispersion of spilled oil constituents into the water column. However, studies show that the acute toxicity associated with dispersed oil is likely to be short term as the dispersed oil is typically diluted within hours to levels below those expected to produce impacts on the water column community. These findings, coupled with the potentially severe consequences to natural living resources when oil is on the water's surface or deposited within the productive intertidal regions, suggest that, when possible, the dispersion of oil may be the best choice after an oil spill has occurred.

Corexit 9500

Corexit 9500 is a highly concentrated, biodegradable dispersant with a unique self-mix property. It is on the EPA National Contingency Plan Product Schedule and on the State of California list of licensed cleanup agents. A summary of its physical properties is provided on the following page. Physical Properties of this dispersant product is included on the Materials Safety Data Sheets (MSDS) in Attachment K-1

Corexit 9500 displays a low toxicity. The risk characterization for this product, when used as recommended is 'moderate' for humans and 'low' for the environment. Corexit 9500 is described as having low toxicity, although specific toxicity data are not available. Corexit 9500 does not require respiratory protection during application.

Corexit 9500 is usually packaged in 55-gallon, lined, non-returnable drums. Bulk shipments are available from Nalco/Exxon Energy Chemicals, LP. The dispersant can be stored in stainless steel, aluminum, fiberglass, high-density polyethylene, or double-coated, epoxy phenolic or lined carbon steel.

Corexit 9500 is classified as a combustible liquid by DOT. A licensed hauler may only transport the chemical. Shipping papers are required if more than 500 lb of dispersant is transported. In addition, the vehicle must be placarded when shipping more than 1,000 lb.

Efficacy of Corexit 9500 on Beta Crude

Dispersant efficacy laboratory tests were conducted on Beta crude and State Platform Emmy crude oils in June, 2004. The EXDET Procedure recommended by Exxon/Nalco (dispersant manufacturer) was used. Detailed results and test procedures are in Attachment K-3.

A summary of the results is below:

Crude Oil	Dispersibility Classification using Corexit 9500
Beta Platform Ellen	Good*
Beta San Pedro Bay Pipeline	Good*

*Excellent = >80% oil dispersed at a dispersant to oil ratio (DOR) of 1:20
Good = 60 – 79% oil dispersed at a DOR of 1:20
Average = 45 – 59% oil dispersed at a DOR of 1:20

Availability/Logistics of Corexit 9500

MSRC has contracted with International Air Response and Dynamic Air (IARDA) of Coolidge, Arizona for aerial application of dispersant from a fixed-wing aircraft. The 24-hour contact for aerial dispersant services is MSRC at 800-259-MSRC (6772).

IARDA maintains a fully operational C-130 spray aircraft for immediate deployment. The aircraft, located in Coolidge, Arizona, is on a 4-hour “wheels up” recall. The aircraft has a dispersant capacity of 3,250 gallons. The C-130 will handle initial call outs for dispersant spray service in Southern California with approximate travel time of 2 hours. MSRC currently maintains stockpiles of Corexit 9500 in both Long Beach and Richmond.

Characteristics of C-130 spraying platform

Application system	Payload (gallons)	Pump rate (gpm)	Swath width (feet)	Average transit speed (knots)	Average Start-up time (hours)	Average Spray speed (knots)	Average Repositioning time (minutes)	Average Resupply time (hours)	Average Range
C-130/ADDS-pack	5500	600	100	214	24	140	2	1	7 hours

MSRC Long Beach has in excess of a 24-hour supply of Corexit 9500 for the aircraft. There is in excess of a week's supply of Corexit 9500 from West Coast sources and a continuous supply can be produced by Nalco/Exxon after 48 hours of notification. Clean Seas can deliver its supply of Corexit for Day 2, 3, and 4 of operations. Other sources listed below could provide Corexit 9500 from Day 5 onward.

Sources For Corexit 9500

Source	Location	Amount Available (gallons)	Likely Transport Mode To Long Beach Airport
MSRC	Long Beach, CA	12,870	Truck
Clean Seas	Carpinteria, CA	Corexit 9527 – 9,500 gallons Corexit 9500 – 9,500 gallons	Truck
MSRC	Richmond, CA	10,725	Truck
Nalco/Exxon	Sugar Land, TX	Continuous supply > 48 hours	Truck/Air

Availability/Logistics of Corexit 9500

Corexit 9500 was previously not readily available on the West Coast. Because many of the previously remaining stockpiles of Corexit 9527 were used up during the 2010 Deepwater Horizon spill response in the Gulf of Mexico, only Corexit 9500 is now available from MSRC. Corexit 9500 is also available from Coolidge, Arizona; Sugarland, Texas; and Alaska. Dispersant efficacy of Corexit 9500 on Beta crude is better than that of the former Corexit 9527.

Resource Protection

The primary objective of oil spill abatement and cleanup is to reduce the effect of spilled oil on the environment. However, mechanical recovery may be limited by equipment capability, weather, sea conditions, and spill magnitude. Use of chemical, oil spill cleanup agents may be considered when the preferred recovery techniques are inadequate and the environmental benefit of chemical use outweighs its adverse effects. The California Dispersant Plan (CDP) will be used as the primary resource for determining dispersant use:

Personnel Protection

For dispersant test application and full-scale dispersant use, the Site Safety & Health Plan for the on-water response must be adjusted if appropriate. In addition, there should be a standard Site Safety & Health Plan provided by the response co-op/contractor for the physical application of the dispersant. On-water mechanical recovery operations may have to be modified for dispersant sprays. This must be considered and the Site Safety & Health Plan for the response adjusted if dispersant is to be used.

California Dispersant Plan (Region IX Regional Contingency Plan Appendix XII)

The California Dispersant Plan outlines the Dispersant Use Plan for state and federal marine waters within the Region IX Regional Response Team (RRT) area of operations.
This policy authorizes and provides guidelines to allow the federally pre-designated U. S. Coast Guard (USCG) Federal On-Scene Coordinator (FOSC) and/or the Unified Command to use dispersants in a timely manner to: 1) prevent or substantially reduce a hazard to human life; 2) minimize the adverse environmental impact of the spilled oil; and 3) reduce or eliminate the economic or aesthetic losses of recreational areas. This dispersant use plan will address the use of dispersants for each of two zones: Dispersant Pre-Approval Zones; and, RRT Approval Required Zones.

Subpart J of the National Contingency Plan (NCP) provides that the FOSC, with the concurrence of the EPA representative to the Regional Response Team and the State with jurisdiction over the navigable waters threatened by the oil discharge, and in consultation with the U.S. Department of Commerce (DOC) and U.S. Department of the Interior (DOI) natural resource trustees, when practicable, may authorize the use of dispersants on oil discharges; provided, however, that such dispersants are listed on the NCP Product Schedule. The EPA has been delegated authority to maintain a schedule of chemical countermeasures that may be authorized for oil discharges in accordance with procedures set forth in Section 300.900 of the NCP.

The USCG Eleventh District Commander has pre-designated the three USCG Captains of The Port (COTP) as the FOSCs for oil discharges in their respective COTP zones (as defined in 33 CFR Part 3 and subject to joint response boundary agreements with EPA described in Section 1400 of the three California Area Contingency Plans), and has delegated to each COTP the authority and responsibility for compliance with the Federal Water Pollution Control Act (FWPCA).

The Governor of the State of California has designated the Administrator of the Department of Fish and Wildlife - Office of Oil Spill Prevention and Response (DFW-OSPR) the authority and responsibility for providing approval for the use of dispersants for control of oil spills in or affecting California waters.

The USCG, EPA, DOI, DOC/NOAA, and DFW-OSPR agree that one of the primary methods of controlling discharged oil shall be the physical removal of the oil by mechanical means. These agencies recognize that in certain instances timely, effective physical containment, collection and removal of the oil may not be possible, and the use of dispersants, alone or in conjunction with other removal methods, may be considered to minimize substantial threat to public health or welfare, or minimize serious environmental damage. This document establishes the policy under which dispersants listed on the NCP Product Schedule may be used in Federal waters off California by FOSCs.

The Response Planning Process

The National Oil and Hazardous Substances Pollution Contingency Plan (National Contingency Plan – NCP) directs the RRTs and Area Committees to address, as part of their planning activities, the desirability of using appropriate dispersants, surface washing agents, surface collecting agents, bioremediation agents, or miscellaneous oil spill control agents listed on the NCP Product Schedule, and the desirability of using appropriate burning agents. Regional Contingency Plans and Area Contingency Plans shall, as appropriate, include applicable authorization plans and address the specific contexts in which such products should and should not be used (40 CFR § 300.910). The October 2008 *California Dispersant Plan – Pre-Approval Zones* provides tools to the FOSC to guide the decision process for dispersant use.

Purpose of the California Dispersant Plan (CDP)

In its current form, the CDP includes an updated Federal On-Scene Coordinator (FOSC) checklist, and a series of discussion and decision boxes to facilitate the FOSC decision. To provide the greatest likelihood that this CDP will not only train but serve the Coast Guard regardless of which personnel are in the FOSC position in the future, it includes a number of appended materials that put oil, dispersant, natural resource and response resource information close at hand in one document. The CDP also includes a number of blank forms that can be removed, duplicated as needed, and used in the field during a spill response to provide orderly and timely information to the FOSC as the spill unfolds and a decision whether or not to use dispersants becomes imminent. Other report forms document bird and mammal presence, dispersant application methods, and dispersant effectiveness.

The CDP is not a lengthy discussion of the relative merits of any response tool, of dispersant or dispersed oil toxicity, or the details of Net Environmental Benefit Analyses (although key points on several of these topics is embedded in the Discussion Notes on the FOSC checklist, or in the appendices). It is not a primer on oil spill response in general, or the Incident Command System. The CDP instead assumes that an oil spill has occurred and all agency notifications have been made, various response agencies are on scene and using the Incident Command System to structure the response, and that dispersant use is under active consideration by the FOSC. The CDP takes over from there, offering tools to the FOSC to guide that decision.

The CDP primarily focuses on the federal offshore waters that have been designated as "pre-approved" for dispersant use. To date, this includes the waters 3 – 200 nautical miles from shore and not within a National Marine Sanctuary. The CDP also addresses waters closer than 3 miles from shore or within a National Marine Sanctuary, which fall, until further notice, under the RRT Approval Process.

The CDP has several potential uses: 1) In its current form it can serve as a single, statewide, stand-alone collateral response plan to all of California's three Area Contingency Plans, and/or 2) each of the three Captain of the Port (COTP) areas can remove the few pages of Appendix B that do not pertain to their area, and transform this CDP into their regional Area Dispersant Plan, and 3) the CDP, in whole or in part, could go in each Area Contingency Plan and/or the Regional Contingency Plan. Regardless of the multiple purposes for which the CDP may be used, it's primary value is that it is a central, portable repository of all information that will guide the FOSC in a dispersant-use decision for pre-approval areas in federal offshore waters, regardless of which COTP pre-approval area the spill occurs and for which dispersants are being considered.

Monitoring Dispersant Effectiveness

Information in this section is based on the SMART (Special Monitoring of Advanced Response Technologies) Guidelines – a joint project of the U.S. Coast Guard, National Oceanic and Atmospheric Administration (NOAA), US Environmental Protection Agency (EPA), the Centers for Disease Control and Prevention and the Minerals Management Service. Additional information is from the NOAA HAZMAT Report 96-7.

- It is essential to monitor the effectiveness of dispersant applications on oil dispersion.
- It is desirable to monitor the fate of oil, and to assess the impact of dispersed oil on the environment.
- Monitoring intensity should reflect spill size and prevailing conditions, as well as the potential effects of the spill, and logistical and physical constraints. Monitoring intensity should increase with spill size as follows:

Spill size	Visual monitoring	Water column monitoring and sample collection 1 m depth	multiple depths
Small	✓		
Medium	✓	✓	
Large	✓	✓	✓

- Visual observation of dispersant effectiveness is the minimum acceptable level of monitoring.
- Termination of dispersant operations should, wherever possible, be based on real-time on-site water column monitoring results from at least one depth.
- Monitoring at multiple depths (either with real-time data or samples collected for later analysis) will provide the best information on dispersant effectiveness and the fate of dispersed oil.

Mobilizing Monitoring Resources

- It is imperative that monitoring teams and technical advisors are notified of possible dispersant use, and are mobilized as soon as possible.
- Dedicated monitoring staff should be appointed and should not be expected to perform other operational functions.

Visual Observation

- Visual observation from aircraft is the most reliable technique for detecting and mapping oil distribution.
- General aerial observation objectives include mapping the distribution and appearance of the oil, verifying the modeled forecast of oil movement, providing responders with an overview of the incident, and directing cleanup operations.
- Observations should be made using the General Observation Guidelines available in the Regional Contingency Plan appendix for dispersant application (RCP Appendix D.4), Dispersant Observation Checklist (RCP Appendix D.5) and Dispersant Observation Report Form (RCP Appendix D.6).
- Observations should be photographed and/or videotaped for comparison and documentation.
- Oil close to the coastline is best viewed from a helicopter, ideally with a door or window removed allowing the observer to look straight down on the oil.
- For oil further offshore, multi-engine aircraft provide a longer range, higher speeds and wider margin of safety.
- As a minimum, the aircraft should have space for two observers (excluding the pilot), visibility from both sides, pilot-observer communications, and sufficient navigational aids to follow the proposed flight path.

- Prior to take-off, the observer should be aware of aircraft safety procedures, be familiar with the general spill area, have appropriate maps or nautical charts to record spill details, and know the environmental conditions likely to be encountered.
- Visibility, surface wind speed and direction, and sea state are all important for predicting oil movement and interpreting visual observations. Poor viewing conditions (*e.g*., fog, rain, or over washing in rough seas) can prevent observers from seeing the entire spill. Strong winds could indicate emulsification rates may be more rapid than anticipated.
- Advanced sensing instruments (*e.g*., infrared thermal imaging, side-looking airborne radar, laser fluorescence, microwave radiometer, infrared-ultraviolet line scanner, LANDSAT satellite systems) can provide a high degree of sensitivity in determining dispersant effectiveness. Problems associated with each of these systems preclude their exclusive use during oil spills. Visual observations cannot always confirm that the oil is dispersed, and physical sampling of water beneath the slick may also be required.

Water Column Fluorometry and Water Samples

Dispersant effectiveness can be confirmed in real-time by monitoring hydrocarbons in the water column using fluorometry. For medium and large spills, on-site monitoring is the preferred method for determining whether there is a significant difference between natural and chemical dispersion, and for deciding when dispersant operations should cease. It also provides the best means for determining the volume of chemically dispersed oil.

Samples should ideally be collected at multiple depths from:

- Water free of oil contamination (reference or control sites)
- Water beneath the oil spill before dispersant application (pre-treatment)
- Water beneath the oil spill after dispersant application (post-treatment)

The time of sampling, instrument readings, relevant observations at selected time intervals and the exact position of each reading (preferably using Global Position System) must be recorded. Documentation of fluorometer calibration and verified instrument response should also be available. The sampling regime will depend on the availability of monitoring resources, the spill size and the logistical constraints of the response. At a minimum, sufficient samples are needed to characterize pre- and post-treatment differences relative to reference sites. As fluorometry measures natural fluorescence and not just oil, water samples should also be collected to allow fluorometry results to be related to measured oil concentrations. Fluorometry measures should be made using a continuous flow fluorometer. Water samples should be collected at the outlet port of the flow-through water duct, past the fluorometer cell. Water samples should be kept in a cool dark place prior to laboratory analysis.

Fate of Dispersed Oil

Monitoring the track of the dispersed oil plume at several depths allows the dilution rate for the dispersed oil to be assessed, and the determination of the rate that hydrocarbon levels in the water column return to background levels. Trajectory models should be used where available to assist in tracking the plume. Dye markers can also be used.

Oil fate monitoring requires:

- Simultaneous monitoring from a single vessel using independent set-ups from at least two depths.
- Collection of water samples to validate the fluorometer readings.
- Wherever possible, measurement of water quality parameters (*e.g.*, temperature, conductivity, dissolved oxygen, pH, turbidity) to help explain the behavior of the dispersed oil.

Using and Interpreting Monitoring Results

- Fluorometry readings will vary widely, reflecting the patchiness and inconsistency of the dispersed oil plume.
- Real-time data are essential if monitoring results are being used to guide dispersant operations and to determine when a response is no longer effective.
- An increase in the fluorometer signal trend beneath chemically dispersed oil of five times or greater than that of readings beneath untreated oil and reference sites is a good indication of dispersion occurring.
- It is important that actual oil concentrations are also measured so that the rate of natural dispersion can be compared to the rate of chemically enhanced dispersion, to determine the actual effect of dispersant use.

General Observation Guidelines

Wherever possible, use observers trained and experienced in identifying and quantifying oil floating on the sea. Use standard reporting terms (see below) and common guidelines to maintain consistency among observers.

STANDARD TERMS TO DESCRIBE OIL FLOATING ON THE WATER		
1	**Light sheen**	A light, almost transparent layer of oil. Sometimes confused with windrows and natural sheen resulting from biological processes.
2	**Silver sheen**	A slightly thicker layer of oil that appears gray, silvery or shimmers.
3	**Rainbow sheen**	Sheen that reflects colors
4	**Brown oil** (heavy or dull sheen)	Water-in-oil emulsion. Thickness typically 0.1 to 1.0 mm. Can vary depending on wind and current conditions.
5	**Mousse**	Water-in-oil emulsion. Colors can range from orange or tan to dark brown.
6	**Black oil**	Sometimes with a latex texture. Can look like kelp and other natural phenomena.
7	**Windrows** (fingers, stringers, streamers)	Oil or sheen oriented in lines or streaks. Brown oil and mousse can be easily confused with algal scum collecting in convergence lines, algae patches, or kelp.
8	**Tar balls**	Oil weathered into a pliable ball up to 30 cm. Sheen may or may not be present.
9	**Tar mats**	Non-floating mats of oily debris (usually sediment and/or plant matter) found on beaches or just offshore in shallow water.
10	**Pancakes**	Isolated patches of mostly circular oil (size range a few centimeters to 100s of meters in diameter). Sheen may or may not be present.

Oil on the water

- Oil is best viewed with the sun behind the observer, flying at a 30-degree angle to the slick.
- Mid-morning or mid-afternoon viewing is generally best, avoiding midday glare off the water and the limited contrast encountered in early morning or early evening.
- Overall spill dimensions are generally best viewed from an altitude of 1000-2000 feet.
- Estimating oil coverage and color are best from an altitude of 200-300 feet or less.
- Oil surface slicks and plumes can appear different for many reasons including oil or product characteristics, sun angles, viewing angles, type of observation platform, weather, light conditions, sea state, and dispersion rate.
- Waves, kelp beds, natural organics, pollen, plankton blooms, cloud shadows, jellyfish and algae can all look like oil under certain conditions.
- Low-contrast conditions (*e.g.*, overcast, twilight, haze) make observations difficult.

Dispersant applications

- May have variable effectiveness where different oil concentrations (spill thicknesses) result in variable oil/dispersant ratios being applied.
- May cause herding, temporarily "pushing" the oil together and making the slick appear to shrink, or to disappear from the sea surface for a short time.
- May change the color of an emulsified slick by reducing water content and viscosity.
- May change the shape of the slick, due to the de-emulsification action of the dispersant.
- May modify the spreading rates of oils (treated slicks can cover larger areas).

Dispersed oil plumes

- May not form immediately after dispersant application, especially if the oil is emulsified or there is low mixing energy.
- May not form or be visible at all.
- May be masked by surface oil and sheen or hidden by poor water clarity.
- May be mistaken for other things such as suspended solids.
- Are often highly irregular in shape and concentration.
- Can range in appearance from brown to white or cloudy.

Dispersant effectiveness

- A visible cloud in the water column indicates the dispersant is working
- Differences in the appearance of treated and untreated slicks indicate dispersion is likely.
- Boat wakes may physically part oil, falsely indicating successful dispersion.

Dispersant Observation Checklist

To be completed by dispersant observers on aircraft and vessels before departure

Incident name: ______________________________ Report number:_____

This report by: ____________________ Organization: __________________ Date: _____ Time: _____

Observer name(s) and organizations: ____
____

Observation platform: Helicopter / aircraft / boat / other (specify): ______________________
Application platform: Helicopter / aircraft / boat / other (specify): ______________________

COMMUNICATIONS

	VHF	UHF	Other
Air to air:	____________	____________	____________
Air to vessel:	____________	____________	____________
Air to ground:	____________	____________	____________
Ground to vessel:	____________	____________	____________
Vessel to vessel:	____________	____________	____________

	Aircraft/personnel names	Call sign	ETD to spill	ETA at spill
Sprayer 1:	____________	____________	______	______
Sprayer 2:	____________	____________	______	______
Spotter:	____________	____________	______	______
Observer:	____________	____________	______	______
Command Center:	____________	____________	______	______

DISPERSANT

Name: ____________________ Dispersant : oil ratio: ____________________
Application altitude (ft): ____________________ Dilution prior to application (if any): ____________________
Observation altitude (ft): ____________________ Application rate: ____________________
Circle one: gallons/acre, gallons/km², liters/hectare

WEATHER ❑ Sunny ❑ Overcast ❑ Cloudy ❑ Rain ❑ Fog
(Circle units used)

Sea state:	__________	Wind speed:	_________ knots or mi/hr	Air temp:	______ °C/°F
Wave height:	__________ m/ft	Wind direction:	_________ °true/°magnetic	Sea temp:	______ °C/°F
Water depth:	__________ m/ft	Current speed:	_________ knots or mi/hr	Salinity:	______ ppt
Visibility:	__________ nm	Current direction:	_______ °true/°magnetic	Tide:	______(flood/ebb/slack)

DISPERSANT OBSERVATION EQUIPMENT AND SAFETY CHECKLIST

Observation
- Basemaps, charts
- Clipboard, notebook, reporting forms, checklists
- Pens, pencils
- GPS, spare batteries
- Job aids for visual observation
- Camera, spare film
- Video camera, spare batteries
- Binoculars

Personal safety
- Lifejacket (and exposure suit if required)
- Survival equipments (*e.g.*, flares, locator beacon)

Safety brief
- Safety brief with pilot/skipper
- Purpose of mission
- Operational constraints
  - Area orientation, observation plan
- Trip duration
- Landing or mooring sites
- Radio frequencies and reporting schedule
- Safety features (*e.g.*, emergency locator beacon, fire extinguishers, first aid kit, radios)
- Emergency exit procedures
- Gear deployment (*e.g.*, current drogue, dye)

From Cawthron, 2000

Dispersant Observations Report Form

For recording dispersant observations from aircraft and vessels

Incident name: ____________________ Report number:_____

This report by: ____________ Organization: ____________ Date: ______ Time: ______

Application start time: ____________ (military time) Viewing difficulties (if any): ____________
Application finish time: ____________ (military time) ____________

VISUAL APPEARANCE OF SLICK (use standard definitions and visual guides of oil on water)

Before application	Immediately after application	20 minutes after application
____________	____________	____________
____________	____________	____________
____________	____________	____________
____________	____________	____________
____________	____________	____________
____________	____________	____________
Film roll #: ____________	Film roll #: ____________	Film roll #: ____________
Photo #: ____________	Photo #: ____________	Photo #: ____________

Dispersion cloud observed? ❑ Yes ❑ No
Time taken for cloud to form: ________ minutes

Did oil re-appear (re-coalesce)? ❑ Yes ❑ No
Time taken to reappear: ________ minutes

% of slick treated: ________
% overspray: ________
Estimated % efficiency: ________

Describe any variation in effectiveness across slick:

Describe differences between treated and untreated areas:

Describe any biota present and any effects observed:

General comments/problems encountered:

Recommendations for future applications:

Start position
Latitude: ____________ north
Longitude: ____________ west
Distance from shore: ____________ km or miles

Finish position
Latitude: ____________ north
Longitude: ____________ west
Distance from shore: ____________ km or miles

From Cawthron, 2000

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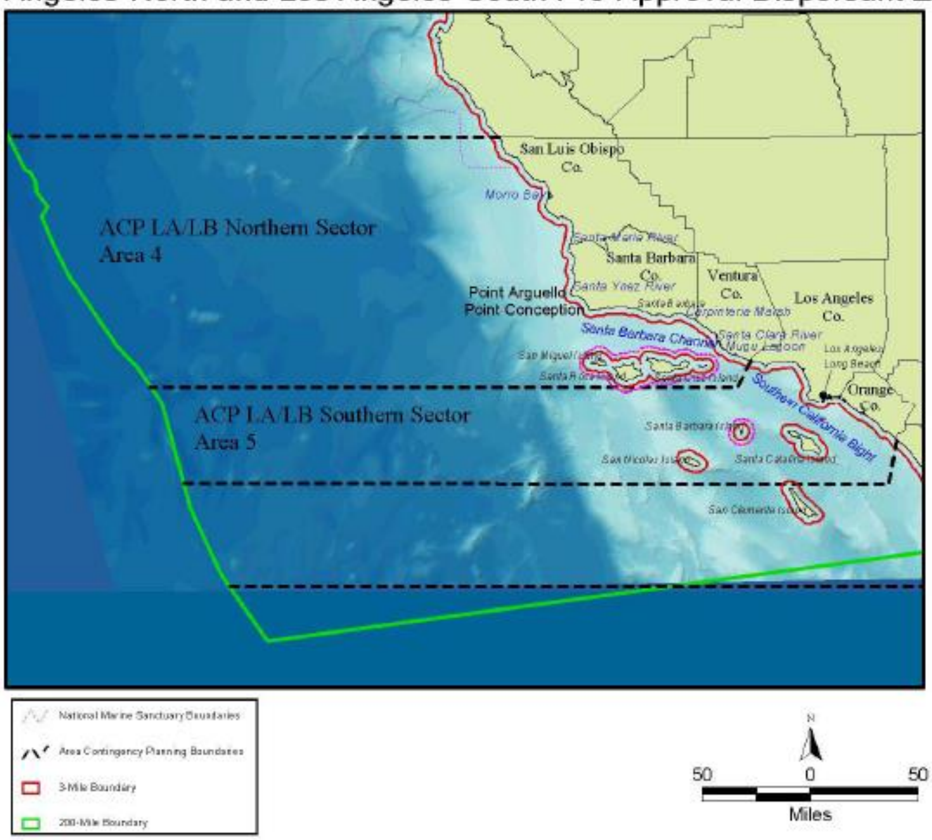
Pre-Approval Zone

The Los Angeles (north and south) dispersant use pre-approval area includes all waters seaward of the 3-mile state waters line (shown in red), shoreward of the 200-mile line (shown in green) and outside the Channel Islands National Marine Sanctuary (shown in magenta). Areas inside state waters or National Marine Sanctuaries are "RRT Approval Required"; RRT approval will be case-specific.

Los Angeles-North and Los Angeles-South Pre-Approval Dispersant Zone



Wildlife Resources Summary (CDP Appendix B)

Seabirds off California are generally most abundant in nearshore waters over the continental shelf; abundance drops off dramatically over the continental slope and deep offshore waters. High concentrations of seabirds occur in nearshore waters from Morro Bay to Point Arguello and the Santa Barbara Channel. Sea birds seasonally tend to concentrate near upwelling zones, in and "down stream" of offshore current jets associated with headlands, along temperature and salinity gradients, and along the shelf break. Both seabirds and marine mammals concentrate in these regions due to the high abundance of food.

Seabird densities are typically highest during the late summer through fall and winter periods (July through January) and lowest in April to June when birds are concentrated on their colonies. In general, seabird densities decrease when moving from the inshore to the offshore environment, dropping off considerably seaward of the continental shelf break.

Although over 100 species of seabirds have been reported from the region, the majority of individuals are composed of about 30 species. In the offshore waters (water depth > 200m), common seabird species occurring seasonally include sooty shearwaters, phalaropes, Leach’s storm petrel, northern fulmar, black-legged kittiwake, gulls (herring, Bonaparte’s, western and California), auklets (Cassin’s and rhinoceros) and common murres. Nearshore (water depth <200m), common species include sooty shearwaters, phalaropes, common murres, loons, western grebes and western, California and Bonaparte’s gulls. In addition, endangered species including brown pelicans, marbled murrelets (northern area of region), western snowy plovers, and least terns occur seasonally in the nearshore area and would be at risk from oil entering this area.

Breeding seabirds are especially vulnerable to oil spills. Seabird colonies occur on the Channel Islands and along the mainland from Pt. Conception north; few, if any, seabirds nest on the mainland south of Pt. Conception. The most common breeding species in this area include storm petrels (Leach’s, ashy, and black), California brown pelican, cormorants (Brandt’s, double-crested, and pelagic), western gulls and alcids (pigeon guillemot, Cassin’s auklet, rhinoceros auklet). Although breeding seasons also vary from species to species, one or more species is generally conducting some aspect of reproduction (nest building, egg laying, chick rearing, etc.) from April through August. In 1989-1991, the total breeding seabird population of the project area was estimated at over 100,000 birds, representing about 16 percent of the total California seabird population.

Shorebirds are another important component of the avifauna of the Los Angeles-Long Beach area. More than 40 shorebird species have been recorded in central and southern California; however, many of these are extremely rare, and only about 24 species occur regularly in the area. Almost all shorebirds migrate to the area from northern breeding sites; very few shorebirds breed in this area. Although the majority of shorebirds occupy coastal wetlands, including estuaries, lagoons, and salt and freshwater marshes, they also occupy other coastal habitats, including sandy beaches and rocky shores. Common shorebird species in the area include black-bellied plover, willet, whimbrel, marbled godwit, black turnstone, sanderling, western sandpiper, least sandpiper, dunlin, and dowitchers. Breeding shorebirds are limited to black oystercatcher, black-necked stilt, American avocet, killdeer, and the threatened western snowy plover, which nests and winters on sandy beaches. Because of their migratory nature and the fact that few breed in the area, shorebirds are most abundant from fall through spring; comparatively few shorebirds remain during the summer months. Important shorebird use areas include Mugu Lagoon, Santa Clara River mouth, Carpentaria Marsh, Goleta Slough, the Santa Ynez River mouth, and the Santa Maria River mouth. Shorebird densities are not available for these areas, but they are generally considered to be lower than heavily used areas, such as the San Francisco Bay. Although densities are not available, shorebirds occupying sandy beaches in nearby Ventura County averaged about 44 birds per linear kilometer of beach.

A number of marine mammal species are potentially at risk from spilled oil in this region of the coast. At least 34 species of marine mammals inhabit or visit California waters. These include six species of pinnipeds (seals and sea lions), 27 species of cetaceans (whales, porpoises, and dolphins), and the sea otter. Pinnipeds breed on the Channel Islands and on offshore rocks and isolated beaches along the mainland coast; thousands also move through the area during their annual migrations. Cetaceans, including a number of endangered species, use area waters as year-round habitat and calving grounds, important seasonal foraging grounds, or annual migration pathways. The sea otter, a year-round resident of the mainland coast north of Point Conception, is appearing in increasing numbers in the western Santa Barbara Channel and around the northern Channel Islands.

The threatened or endangered marine mammal species found in southern California waters include six whales (blue, humpback, fin, sei, right, and sperm whales), two pinnipeds (Guadalupe fur seal and Steller sea lion), and the southern sea otter. The two threatened pinniped species do not breed in the area and presently are uncommon in southern California waters.

Marine mammals vary in their susceptibility to the effects of oiling. Since oil can destroy the insulating qualities of hair or fur, resulting in hypothermia, marine mammals that depend on hair or fur for insulation are most likely to suffer mortality from exposure. Sea otters, which rely almost entirely on maintaining a layer of warm, dry air in their dense underfur as insulation against the cold, are among the most sensitive marine mammals to the effects of oil contamination. Most vulnerable to the direct effects of oiling among the pinnipeds are fur seals and newborn pups, which lack a thick insulating layer of fat. Cetaceans, which rely on layers of body fat and vascular control rather than pelage to retain body heat, are considered less vulnerable to the effects of oiling than pinnipeds.

Sea otters would be at high risk from an oil spill if oil were to reach nearshore waters of the region. Depending on the time of year, heavy oiling of intertidal and upland areas of the mainland coast could also threaten harbor seal and northern elephant seal pups. Similar contact to the northern Channel Islands, particularly San Miguel Island, could have significant impacts on California sea lion, northern fur seal, northern elephant seal, and harbor seal pups, and possibly on adult fur seals as well.
At least 554 species of California marine fishes inhabit or visit California waters. The high species richness is probably due to the complex topography, convergence of several water masses, and

changeable environmental conditions. Point Conception is widely recognized as a faunal boundary with mostly cold-water species found to the north and warm-water species found to the south, though extensive migrations do occur as a result of fluctuating environmental conditions. In fact, warm- and cool-water events in the Southern California Bight (SCB) affect fish recruitment and can alter the composition of some fish assemblages for years. The SCB is located in the transition area between Pacific subarctic, Pacific equatorial, and North Pacific central water masses, and the fish fauna contains representatives from each of these sources. Of the 554 species of California marine fishes, 481 species occur in the SCB.

The pelagic realm is the largest habitat in the SCB and the home of 40 percent of the species and 50 percent of the families of fish. The pelagic zone includes the water column covering the shelf and the upper 150 to 200 m of water overlying the slope and deep basins. The fish from this zone represent a mix of permanent residents and periodic visitors. The important pelagic species of southern and central California include northern anchovy, albacore tuna, jack mackerel, Pacific mackerel, Pacific bonito, Pacific sardines, Pacific whiting, Pacific herring, salmon, steelhead trout, swordfish, and thresher shark. Most of these species are widely distributed in the SCB, and it is unlikely that an oil spill will harm enough individuals, their prey, or habitat to significantly decrease the population of a given species. However, northern anchovy are of concern since their restricted distribution during parts of their life cycle make them vulnerable to impacts from spilled oil. Another species that is abundant in the epipelagic zone and is vulnerable to impact is the market squid. Although during most of their life cycle squid are widely distributed offshore, squid congregate inshore in very large numbers during spawning. Monterey Bay and the northern Channel Islands are the most important spawning areas, but large spawning aggregations are known to occur along the entire coast from San Diego to Monterey.

Both rocky and sandy shallow habitats are at risk from spilled oil when it comes ashore. Abalone are an especially at-risk gastropod species of the shallow rocky habitat. Currently, all major species of abalone in central and southern California are severely depleted. Their depleted condition and life histories make abalone in shallow habitats especially vulnerable (at the population level) to impacts from spilled oil.

As oil comes on shore, the rocky intertidal habitat, as well as coastal wetlands and mud flats adjacent to river mouths are at significant risk both from the beached oil and from most of the cleanup procedures used to remove the oil. Of special concern in the coastal marsh/wetland areas is the potential for oiling many species of resident or visiting birds, mammals, young-of-the-year endangered Coho salmon, and steelhead trout.

K.7.1.3 *In Situ* Burning (Region IX Regional Contingency Plan – Appendix XIII)

Application

Burning has distinct advantages over other oil spill countermeasures. It offers the potential to rapidly convert large quantities of oil into its primary combustion products with a small percentage of other unburned and residue byproducts. This technique could be most effective in dealing with a large spill at sea. In addition, removing large quantities of oil from the marine environment before it comes ashore. Although limited by the ability to contain oil, *in-situ* burning might be the best option in areas where it is imperative to remove large quantities of oil quickly to protect on-water resources.

Typically, *in-situ* burning involves burning a certain thickness of oil (i.e. >2mm but preferably several cm) within a fireproof boom. *In-situ* burning systems are typically composed of:

- Fire-resistant containment boom specifically designed to be heat-resistant and fire-resistant. This boom permits the collection of significant quantities of oil at thicknesses that allow self-sustained combustion.

- Conventional boom and towing cable used to aid in the containment and collection of spilled oil, but kept away from burning oil. It may be about three times longer than the fire-resistant boom and attached to its ends.

- Oil ignition system used to ignite a pool of collected oil. Various alternatives include the Heli-torch (a helicopter-mounted gelled gasoline unit), burning rafts, and timed ignition devices.

- Support subsystems include boom tow vessels to collect and direct fragmented oil slicks into the mouth of the fire-resistant boom, monitoring vessels to ensure safety of operations, safety equipment, skimming vessels, and aircraft to monitor spill conditions and burn operations.

Fire-resistant booms are available from a number of boom manufacturers and are sold in a range of sizes from 18 in (46 cm) for calm water use up to 43 in (109 cm) for open ocean use. Fire-resistant booms function generally like conventional booms and therefore their selection criteria should include construction features, in addition to overall height, which allow optimum application in the sea conditions where their use is anticipated.

The oil-removal (or elimination) rates for *in-situ* burning can be quite high compared to mechanical removal (e.g., 80-to-90% for films 2-to-10 mm thick and 98-to-99% for films 10-to100-mm thick); however, the success of burning depends on a number of factors.

Factors that inhibit combustion include:

1. Insufficient film thickness (<1-to-2 mm).
2. Aged oil with low volatile content.
3. Emulsification. Ignition is difficult if water content is >15-to20%. Wicking agents may be required if water content is >50%.
4. Adverse weather conditions such as clouds, rain, poor visibility, and/or winds (in excess of 12 mph)
5. Adverse sea conditions such as waves exceeding 1 m and/or strong currents
6. Oil submersion or entrainment
7. Vapor loss

Factors that promote combustion include

1. Oil layer thickness >2-to-3 mm
2. Fresh oil with high volatile content
3. High oil-to-water ratio (e.g. low emulsification with water, presence of wicking agent or combustion promoters)
4. Favorable weather conditions (i.e., sunny, warm, light winds, good visibility)
5. Favorable sea conditions (i.e., calm to light seas, no current)

In-situ burning may be possible if personnel and equipment are available on short notice and can be dispatched to the spill within a relatively narrow "window of opportunity." This "window" may consist of only a few hours to a day or two depending on the nature of the spill, the characteristics of the oil, and the prevailing wind and sea conditions at the spill site. The proximity of the oil to be burned to shorelines, sensitive natural resources, population centers, etc., will also play an important role in determining the practicality and the time available for *in-situ* burning.

Currently, MSRC maintains two 500-foot sections of fire-resistant boom in Everett, Washington with a transit time to southern California of 34 hours by truck.

Resource Protection

Use of *in*-situ burning may be considered when preferred techniques are inadequate and the environmental benefit of *in*-situ burning outweighs its adverse effects. A decision to conduct an *in-situ* burn should address the following:

- Burning operation must be timed and coordinated with other spill response operations and in conjunction with regulatory agencies
- Health and safety of response personnel and the public
- The threat posed to nearby facilities (e.g., terminals, marinas, and piers)
- Public concerns (e.g., air quality, disruption of normal activities)
- Environmental impacts to sensitive habitats and natural resources
- Disposal of combustion products (e.g., soot, burn residue and debris)
- Recovery or elimination of oil by other means (i.e., mechanical or non-mechanical)

Permits, Approvals, or Authorizations

Use of *in-situ* burning may be considered by the FOSC when the preferred recovery techniques are inadequate and *in-situ* burning will lessen the environmental impacts of the spill. The National Contingency Plan (Section 300.910) authorizes the FOSC, with concurrence of the EPA representative to the RRT and as appropriate with the concurrence of the State representative to the RRT (In the case of California, the Governor has delegated this role to the Administrator of OSPR.) with jurisdiction over navigable waters threatened by the release of discharge of oil and in consultation with DOC and DOI natural resource trustees, when practicable, to authorize the use of *in-situ burning* on a case-by-case basis.

A Pre-approval Zone (35-to-200 miles off the California coast and the areas around special jurisdictions, such as marine sanctuaries, national parks, national wildlife refuges), has been designated in a Letter of Agreement (LOA) among the USCG, EPA, DOC, and DOI. The FOSC must determine if conditions are met to authorize an *in-situ* burn as delineated in the LOA and notify the RRT and DFW representing the State of California.

Areas not within the pre-approval zone are defined as case-by-case areas. In these instances, the FOSC will obtain approval from the EPA representative to the RRT and CDW representing the State of California. The Case-By-Case Checklist is used by the Unified Command to determine whether a request should be forwarded to the RRT for consideration. If any of the questions on the checklist are answered with a “no”, further information must be gathered and summarized to support the position that an *in-situ* burn should be considered.

K.7.2 Bioremediation (Region IX Regional Contingency Plan – Appendix XIV)

Bioremediation is a treatment technology that enhances existing biological processes to accelerate the decomposition of petroleum hydrocarbons and some hazardous wastes. Section 300.910 of the NCP authorizes the use of biological additives for the dispersion/ abatement of oil spills.

Shoreline treatment by nutrient enhancement can significantly increase degradation rates of oil when compared to untreated shoreline areas. However, the technology is time-consuming and probably best suited to the treatment of specific types of shorelines and marsh habitats. Currently, bioremediation should be viewed as a polishing agent for the final stages of cleanup, rather than as a primary response tool, especially considering the slow degradation rates. Refer to the ACP, Section 4554 for guidelines for the use of biological additives for the dispersion/abatement of oil spills.

K.7.3 Shoreline Cleaning Agents (Region IX Regional Contingency Plan – Appendix XI)

Shoreline cleaning agents applied to shorelines generally are designed either to prevent adherence (stranding) of oil or to release already stranded oil. The NCP, Section 300.910, authorizes the use of chemical agents to respond to discharges of oil. The efficiency of mechanical cleanup operations may be enhanced by the use of shoreline cleaning agents by assisting with the re-floating of oil or preventing its subsequent stranding. However, the potential for toxic responses in indigenous fauna or flora to the cleaning agent must be considered. Shoreline cleaning agents often remain undiluted for prolonged periods of time and consequently can have a greater impact upon the indigenous biological and geological resources. Refer to the Regional Contingency Plan – Appendix XIV for guidelines in using chemical agents to respond to discharges of oil.

K.8 OIL MOVEMENT AND TRACKING METHODS

The Company would use the following equipment and resources for tracking oil spill movement:

- Visual observation by personnel, vessels, and aircraft
- Internal trajectory projections using contract trajectory service (The Response Group)
- Rapid notification and coordination with the NOAA Scientific Support Coordinator

Once the spilled oil is discovered, onsite personnel in vehicles or aircraft, depending on discharge location and access, would visually monitor it. Personnel would use handheld radios and/or cellular phones for communications and reporting the spill location and direction of oil movement.

K.9 TRANSPORTATION OF REQUIRED EQUIPMENT, PERSONNEL AND OTHER RESOURCES TO THE SPILL SITE

The procedures for transporting Company personnel available to respond to an oil spill are as described below:

K.9.1 Personnel

- Beta Offshore and contract personnel comprising the Incident Management Team (IMT) will arrive by personal vehicle, Company vehicles, or aircraft.
- MSRC, Patriot, and other contract cleanup companies will arrive by personal vehicle, company vehicles, and aircraft, as discussed in their respective response plans.

K.9.2 Equipment

- MSRC, Patriot, and other contract cleanup companies' response equipment will be transported (towed) to the spill site by trucks. The equipment is strategically stationed within their sphere of responsibility.
- Cooperative Oil Spill Response Vessels (OSRVs) can provide all on-water transportation to the spill site, if necessary. Response vessels may be called from local harbors. These vessels have extensive spill response equipment onboard. Trained personnel operate and deploy the OSRVs. If MSRC's "California Responder" OSRV is used, a helicopter can land on that vessel.

Refer to Annex I, Response Planning for additional response resource information.

K.9.3 Transportation During Adverse Environmental Conditions

Adverse environmental conditions (i.e., weather, sea state, tides, wind, and currents) are not expected to affect response efforts most of the year. The climate is typically mild, wet winters and warm, dry summers. Winds are normally light to moderate. The currents along the West Coast are dominated by the southward flowing California Current with a mean speed of about 0.2 to 0.5 knots. Waves are usually less than 2 feet high and have periods of less than 9 seconds. Winter waves tend to be 6 feet or less. For additional information regarding environmental conditions, see Annex A.6.3 of this Plan.

During adverse weather periods when sea states, tides, winds, and/or currents are adverse, the transportation of personnel and equipment may be hampered or halted altogether. The presence of debris or other obstacles in the water (including channels, rivers, or ocean) and along the shoreline could restrict response efforts. The decision to deploy personnel and equipment in inclement weather will ultimately rest with the Unified Command with input from and the Captains of the OSRVs and the Safety Officer.

While waiting for the adverse environmental condition(s) to subside, the Incident Commander and response personnel will prepare and plan for response operations by monitoring the status of the spill. He/she will then stage equipment and/or personnel at strategic areas that are safe to access, protecting sensitive areas that may be impacted, if safe to do so, and removing debris from potential impact areas.

K.9.4 Procurement and Response Times for Oil Spill Response Organizations (OSROs)

Procurement and response times for Marine Spill Response Corporation (MSRC) are provided in Table K-7. The Company, together with MSRC, has the necessary resources to provide the required three-tiered response to a worst case discharge. Response times for MSRC's oil spill response vessels (OSRVs) and fast response vessels (FRVs) are described in Attachment K-4 at the end of this annex.

Table K-7: Procurement and Response Times for Oil Spill Response Organizations

OSRO	Location	Procurement Time for Containment Recovery, and Storage Equipment	Procurement Time for Equipment Transportation Vessels	Equipment Loadout Time	Travel Time to Deployment Site	Equipment Deployment Time
MSRC	Long Beach / Carson	5-to-10 minutes	Included in equipment procurement	0.3-to-4.0 hours	0.75-to-2.0 hours	0.25-to-2.0 hours
Notes: Times provided are best estimates and may vary depending on weather and other circumstances. Procurement for equipment and vessel(s) is made with a single call to the OSRO.						

The Company has contracts in place with Patriot Environmental and Clean Harbors to provide shoreline protection cleanup services. Patriot's local office in Wilmington and Clean Harbors' offices in Wilmington and Rancho Dominguez (north Long Beach) allows them to respond efficiently in the event of an incident.

Clean Harbors has response equipment located in several California staging areas, ready to be deployed where needed. Availability of resources and response times for the Los Angeles/Long Beach area (referred to as Area 5) are provided in more detail in Clean Harbors' California OSRO application (herein incorporated by reference).

Mobilization times for equipment and personnel of other response contractors are included in a general listing at the Western Response Resource List (WRRL) website: www.wrrl.us. This website is provided by USCG to provide an equipment inventory site with information provided by participating Oil Spill Removal Organizations (OSRO's) and other organizations with response equipment. OSRO's can subscribe and maintain and update a list of their response equipment at their discretion.

Attachment K-1

COREXIT 9500 Dispersant

MSDS Sheet

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SAFETY DATA SHEET

PRODUCT

COREXIT® EC9500A

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours)   CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **COREXIT® EC9500A**

APPLICATION : OIL SPILL DISPERSANT

COMPANY IDENTIFICATION : Nalco Environmental Solutions LLC
7705 Highway 90-A
Sugar Land, Texas
77478

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours)   CHEMTREC

NFPA 704M/HMIS RATING
HEALTH : 2 / 2   FLAMMABILITY : 1 / 1   INSTABILITY : 0 / 0   OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme * = Chronic Health Hazard

2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Distillates, petroleum, hydrotreated light	64742-47-8	10.0 - 30.0
Propylene Glycol	57-55-6	1.0 - 5.0
Organic sulfonic acid salt	Proprietary	10.0 - 30.0

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING
May cause serious eye damage if not treated promptly.
Keep away from heat. Keep away from sources of ignition - No smoking. Keep container tightly closed. Do not get in eyes, on skin, on clothing. Do not take internally. Avoid breathing vapor. Use with adequate ventilation. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of soap and water.
Wear suitable protective clothing.
Low Fire Hazard; liquids may burn upon heating to temperatures at or above the flash point. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of sulfur (SOx) under fire conditions.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
May cause serious eye damage if not treated promptly.

SKIN CONTACT :
May cause skin irritation.

INGESTION :
Not a likely route of exposure. In the event of oral ingestion, may cause nausea and vomiting. Can cause chemical pneumonia if aspirated into lungs following ingestion.

INHALATION :
Repeated or prolonged exposure may irritate the respiratory tract.

SYMPTOMS OF EXPOSURE :
Acute :
A review of available data does not identify any symptoms from exposure not previously mentioned.
Chronic :
Frequent or prolonged contact with product may defat and dry the skin, leading to discomfort and dermatitis.

AGGRAVATION OF EXISTING CONDITIONS :
Skin contact may aggravate an existing dermatitis condition.

4. FIRST AID MEASURES

EYE CONTACT :
Flush affected area with water. Get medical attention.

SKIN CONTACT :
Flush affected area with water. If symptoms develop, seek medical advice.

INGESTION :
Do not induce vomiting: contains petroleum distillates and/or aromatic solvents. If conscious, washout mouth and give water to drink. Get medical attention.

INHALATION :
Remove to fresh air, treat symptomatically. Get medical attention.

NOTE TO PHYSICIAN :
Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT : 181.4 °F / 83 °C (PMCC)

This product does not sustain combustion per the method outlined in 49 CFR Appendix H.

LOWER EXPLOSION LIMIT : Not flammable

UPPER EXPLOSION LIMIT : Not flammable

EXTINGUISHING MEDIA :
Alcohol foam, Carbon dioxide, Foam, Dry powder, Other extinguishing agent suitable for Class B fires, For large fires, use water spray or fog, thoroughly drenching the burning material.
Water mist may be used to cool closed containers.

UNSUITABLE EXTINGUISHING MEDIA :
Do not use water unless flooding amounts are available.

FIRE AND EXPLOSION HAZARD :
Low Fire Hazard; liquids may burn upon heating to temperatures at or above the flash point. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of sulfur (SOx) under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :
Restrict access to area as appropriate until clean-up operations are complete. Stop or reduce any leaks if it is safe to do so. Ventilate spill area if possible. Do not touch spilled material. Remove sources of ignition. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP :
SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Clean contaminated surfaces with water or aqueous cleaning agents. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :
Do not contaminate surface water.

7. HANDLING AND STORAGE

HANDLING :
Use with adequate ventilation. Keep the containers closed when not in use. Do not take internally. Do not get in eyes, on skin, on clothing. Have emergency equipment (for fires, spills, leaks, etc.) readily available.

STORAGE CONDITIONS :
Store away from heat and sources of ignition. Store separately from oxidizers. Store the containers tightly closed.

SUITABLE CONSTRUCTION MATERIAL :
Stainless Steel 304, Stainless Steel 316L, Aluminum, Hastelloy C-276, MDPE (medium density polyethylene), HDPE (high density polyethylene), PVC, Plexiglass, Perfluoroelastomer, PTFE, TFE, FEP (encapsulated)

UNSUITABLE CONSTRUCTION MATERIAL :
Mild steel, Carbon steel, Buna-N, Brass, Copper, Natural rubber, Polyethylene, Polypropylene, Ethylene propylene, EPDM, Neoprene, Nitrile, Polyurethane, Fluoroelastomer, Chlorosulfonated polyethylene rubber, Polytetrafluoroethylene/polypropylene copolymer

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :
Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

Substance(s)	Category:	ppm	mg/m3	Non-Standard Unit
Propylene Glycol (Aerosol.)	WEEL/TWA		10	
Hydrotreated Light Distillate as total hydrocarbons (Vapour.)	MANUFACT/TWA	165	1,200	
Oil Mist (Mineral)	OSHA Z1/PEL		5	
	ACGIH/TWA		5	

ENGINEERING MEASURES :
General ventilation is recommended.

RESPIRATORY PROTECTION :
Where concentrations in air may exceed the limits given in this section, the use of a half face filter mask or air supplied breathing apparatus is recommended. A suitable filter material depends on the amount and type of chemicals being handled. Consider the use of filter type: Multi-contaminant cartridge. with a Particulate pre-filter. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

HAND PROTECTION :
Nitrile gloves PVC gloves

SKIN PROTECTION :
Wear standard protective clothing.

EYE PROTECTION :
Wear chemical splash goggles.

HYGIENE RECOMMENDATIONS :
Keep an eye wash fountain available. Keep a safety shower available. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

HUMAN EXPOSURE CHARACTERIZATION :
Based on our recommended product application and personal protective equipment, the potential human exposure is: Low

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Clear Hazy Amber
ODOR	Hydrocarbon
SPECIFIC GRAVITY	0.95 @ 60 °F / 15.6 °C
DENSITY	7.91 lb/gal
SOLUBILITY IN WATER	Miscible
pH (100 %)	6.2
VISCOSITY	177 cst @ 32 °F / 0 °C 70 cst @ 60 °F / 15.6 °C
POUR POINT	< -71 °F / < -57 °C
BOILING POINT	296 °F / 147 °C
VAPOR PRESSURE	15.5 mm Hg @ 100 °F / 37.8 °C

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

CONDITIONS TO AVOID :
Heat and sources of ignition including static discharges.

MATERIALS TO AVOID :
Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors.

HAZARDOUS DECOMPOSITION PRODUCTS :
Under fire conditions: Oxides of carbon, Oxides of sulfur

11. TOXICOLOGICAL INFORMATION

SENSITIZATION:
This product is not expected to be a sensitizer.

CARCINOGENICITY:
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION:
Based on our hazard characterization, the potential human hazard is: Low

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TOXICOLOGICAL INFORMATION RELATED TO THE WHOLE PRODUCT AND ITS COMPONENTS:

Acute mammalian toxicity studies have been conducted under laboratory conditions that test the toxicity of the product following exposure that would not reflect those for humans under normal use situations. This information is provided below. Other information is also provided from third party sources related to the mammalian toxicity for the six components in the product.

ACUTE TOXICITY OF THE PRODUCT MIXTURE:

ORAL (Rat): LD50 > 5,000 mg/kg
DERMAL (Rabbit): LD50 > 5,000 mg/kg
DERMAL IRRITATION (Rabbit): Mild irritant. No clinically significant effects beyond 10 days post-application.
INHALATION (Rat): LC50 > 5.35 mg/L
EYE IRRITATION (Rabbit): In 2/3 rabbits, some corneal opacity and conjunctival effects still present at day 21; initial iritis effects resolved by day 21.

ACUTE ORAL TOXICITY FOR THE COMPONENTS:

Component:	Polyol ester
Species:	Rat
LD50:	> 16,000 mg/kg
Remarks:	This data was sourced from the supplier MSDS.

Component:	Distillates, petroleum, hydrotreated light
Species:	Rat
LD50:	> 5,000 mg/kg
Remarks:	This data was sourced from an IUCLID Dataset searched on 6/2/2010.

Component:	Glycol Ether
Species:	Rat
LD50:	4,000 mg/kg
Remarks:	This data was sourced from an IUCLID Dataset searched on 6/2/2010.

Component:	Glycol Ether
Species:	Mouse
LD50:	2,160 mg/kg
Remarks:	This data was sourced from an IUCLID Dataset searched on 6/2/2010.

Component:	Oxyalkylated Fatty Acid Derivative

Species:	Rat
LD50:	> 38,000 mg/kg
Remarks:	This data was sourced from the supplier MSDS.

Component:	Oxyalkylate Polymer
Species:	Rat
LD50:	> 36,400 mg/kg
Remarks:	This data was sourced from the supplier MSDS.

Component:	Organic Sulfonic Acid Salt
Species:	Rat
LD50:	4,620 mg/kg
Remarks:	This data was sourced from an IUCLID Dataset searched on 6/2/2010.

ACUTE DERMAL TOXICITY FOR THE COMPONENTS:

Component:	Distillates, petroleum, hydrotreated light
Species:	Rabbit
LD50:	> 3,160 mg/kg
Remarks:	This data was sourced from an IUCLID Dataset searched on 6/2/2010.

Component:	Glycol Ether
Species:	Rat
LD50:	> 2,000 mg/kg
Remarks:	This data was sourced from an IUCLID Dataset searched on 6/2/2010.

Component:	Organic Sulfonic Acid Salt
Species:	Rabbit
LD50:	10,000 mg/kg
Remarks:	This data was sourced from an IUCLID Dataset searched on 6/2/2010.

ACUTE INHALATION TOXICITY FOR THE COMPONENTS:

Component:	Distillates, petroleum, hydrotreated light
Species:	Rat
LD50:	> 290 mg/l (4 hrs)
Remarks:	This data was sourced from an IUCLID Dataset searched on 6/2/2010.

Component:	Glycol Ether
Species:	Rat
LD50:	42.1 mg/l (4 hrs)
Remarks:	This data was sourced from an IUCLID Dataset searched on 6/2/2010.

Component:	Organic Sulfonic Acid Salt
Species:	Rat
LD50:	20 mg/l (96 hrs)
Remarks:	This data was sourced from an IUCLID Dataset searched on 6/2/2010.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

The following results are for the product, unless otherwise indicated.

Acute Fish Results :

Species	Exposure	Test Type	Value	Test Descriptor
Inland Silverside	96 hrs	LC50	25.2 mg/l	Product
Common Mummichog	96 hrs	LC50	140 mg/l	Product
Turbot	96 hrs	LC50	75 mg/l	Product

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	Test Type	Value	Test Descriptor
Artemia	48 hrs	LC50	20.7 mg/l	Product
Mysid Shrimp (Mysidopsis bahia)	48 hrs	LC50	32.23 mg/l	Product
Acartia tonsa	48 hrs	LC50	2 mg/l	Product

MOBILITY :
The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.
If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	10 - 30%	50 - 70%

The portion in water is expected to be soluble or dispersible.

BIOACCUMULATION POTENTIAL
Based on a review of the individual components, utilizing U.S. EPA models, this material is not expected to bioaccumulate. The product is readily eliminated.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION
Based on our hazard characterization, the potential environmental hazard is: Moderate
Based on our recommended product application and the product's characteristics, the potential environmental exposure is: Low

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous waste, it is not subject to federal regulation. Consult state or local regulation for any additional handling, treatment or disposal requirements. For disposal, contact a properly licensed waste treatment, storage, disposal or recycling facility.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

LAND TRANSPORT :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Distillates, petroleum, hydrotreated light : Irritant
Propylene Glycol : Exposure Limit
Organic sulfonic acid salt : Irritant

CERCLA/SUPERFUND, 40 CFR 302 :
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :
This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :
Our hazard evaluation has found this product to be hazardous. The product should be reported under the following indicated EPA hazard categories:

X	Immediate (Acute) Health Hazard
-	Delayed (Chronic) Health Hazard
-	Fire Hazard
-	Sudden Release of Pressure Hazard
-	Reactive Hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :
This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

CLEAN AIR ACT, Sec. 112 (Hazardous Air Pollutants, as amended by 40 CFR 63), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
Components listed under this regulation may be present at trace levels.

CALIFORNIA PROPOSITION 65 :
Substances listed under California Proposition 65 are not intentionally added or expected to be present in this product.

MICHIGAN CRITICAL MATERIALS :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

STATE RIGHT TO KNOW LAWS :
The following substances are disclosed for compliance with State Right to Know Laws:

Propylene Glycol	57-55-6

INTERNATIONAL CHEMICAL CONTROL LAWS :

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :
The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

AUSTRALIA
All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA
All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

EUROPE
The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

JAPAN
All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

KOREA
All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

PHILIPPINES
All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

16. OTHER INFORMATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

* The human risk is: Low

* The environmental risk is: Low

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version),
Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH,
(TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight™ (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department
Date issued : 03/01/2012
Version Number : 4.3

ATTACHMENT K-2

DISPERSANT
APPROVAL ASSESSMENT
FORM

(Region IX - California Dispersant Plan)

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FINAL

California Dispersant Plan and Federal On-Scene Coordinator (FOSC) Checklist

for

California Federal Offshore Waters

Fall 2008

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California Dispersant Plan Document Quick-Find

Acknowledgements

The principal organizer and compiler of this report was Ellen Faurot-Daniels (CCC), with critical conceptual input and resource information support provided by Yvonne Addassi (OSPR). Creating this draft California Dispersant Plan would not have proceeded smoothly or successfully without the contributions of thought, effort and review provided by many others.

We relied extensively on work already completed by other authors and institutions. Leigh Stevens of Cawthron Institute, New Zealand, led the way by allowing us to use his “Oil Spill Dispersants: Guidelines for Use in New Zealand” as an extremely helpful model for our document. We also drew from various dispersant guidelines provided by Regional Response Teams throughout the U.S., dispersant guidelines published by ExxonMobil, the Cutter Information Corporation’s “Oil Spill Dispersants: From Technology to Policy”, the “Assessment of the Use of Dispersants on Oil Spills in California Marine Waters” by S.L. Ross, and various oil spill job aids available from the NOAA web site. Please see the References Cited section in this document for the full citations.

Beyond the use of these reports was the steadfast assistance of those we worked with in our own agencies and those on the Los Angeles Area Committee, dispersant subcommittee, dispersant workgroups, and various interested parties watching and assisting from outside the immediate working groups. Randy Imai of OSPR provided the charts in this report, Al Allen (Spilltec) provided the information, figures and formulas for dispersant dosage rates and relating those rates to dispersant application systems, and the oil spill clean-up cooperatives in California provided updated information on dispersant application resources. Members of the Los Angeles workgroups reviewed early drafts of this document, with John Day (Santa Barbara County) and Craig Ogawa (Minerals Management Service) providing especially helpful comments along the way. Ben Waltenberger (NOAA), Ken Wilson (OSPR), Melissa Boggs (OSPR) and Ellen Faurot-Daniels (CCC) pitched in to draft the Wildlife Aerial Observation Protocols, and Melissa Boggs led the workgroup addressing public outreach.

We also extend particularly heartfelt thanks our colleagues in our own agencies who supported our efforts all along the way, and to the members of the Regional IX Regional Response Team and the U.S. Coast Guard who had the first vision of a California Dispersant Plan.

SECTION I: Pre-Approval Zones

Table of Contents

Page

OVERVIEW

PRE-APPROVAL ZONES

Purpose and authority

This document outlines the Dispersant Use Plan for state and federal marine waters within the Region IX Regional Response Team (RRT) area of operations.

This policy authorizes and provides guidelines to allow the federally pre-designated U. S. Coast Guard (USCG) Federal On-Scene Coordinator (FOSC) and/or the Unified Command to use dispersants in a timely manner to: 1) prevent or substantially reduce a hazard to human life; 2) minimize the adverse environmental impact of the spilled oil; and 3) reduce or eliminate the economic or aesthetic losses of recreational areas. This dispersant use plan will address the use of dispersants for each of two zones: Dispersant Pre-Approval Zones; and, RRT Approval Required Zones.

Subpart J of the National Contingency Plan (NCP) provides that the FOSC, with the concurrence of the EPA representative to the Regional Response Team and the State with jurisdiction over the navigable waters threatened by the oil discharge, and in consultation with the U.S. Department of Commerce (DOC) and U.S. Department of the Interior (DOI) natural resource trustees, when practicable, may authorize the use of dispersants on oil discharges; provided, however, that such dispersants are listed on the NCP Product Schedule. The EPA has been delegated authority to maintain a schedule of chemical countermeasures that may be authorized for oil discharges in accordance with procedures set forth in Section 300.900 of the NCP.

The USCG Eleventh District Commander has pre-designated the three USCG Captains of The Port (COTP) as the FOSCs for oil discharges in their respective COTP zones (as defined in 33 CFR Part 3 and subject to joint response boundary agreements with EPA described in Section 1400 of the three California Area Contingency Plans), and has delegated to each COTP the authority and responsibility for compliance with the Federal Water Pollution Control Act (FWPCA).

The Governor of the State of California has designated the Administrator of the Department of Fish and Game Office of Oil Spill Prevention and Response (CDFG-OSPR) the authority and responsibility for providing approval for the use of dispersants for control of oil spills in or affecting California waters.

The USCG, EPA, DOI, DOC/NOAA, and CDFG-OSPR agree that one of the primary methods of controlling discharged oil shall be the physical removal of the oil by mechanical means. These agencies recognize that in certain instances timely, effective physical containment, collection and removal of the oil may not be possible, and the use of dispersants, alone or in conjunction with other removal methods, may be considered to minimize substantial threat to public health or welfare, or minimize serious environmental damage. This document establishes the policy under which dispersants listed on the NCP Product Schedule may be used in Federal waters off California by FOSCs.

The response planning process

The National Oil and Hazardous Substances Pollution Contingency Plan (National Contingency Plan –

NCP) directs the RRTs and Area Committees to address, as part of their planning activities, the desirability of using appropriate dispersants, surface washing agents, surface collecting agents, bioremediation agents, or miscellaneous oil spill control agents listed on the NCP Product Schedule, and the desirability of using appropriate burning agents. Regional Contingency Plans and Area Contingency Plans shall, as appropriate, include applicable authorization plans and address the specific contexts in which such products should and should not be used (40 CFR § 300.910). Additional information on how this plan was directed and developed is included in Appendix I.

What is in the California Dispersant Plan (CDP)

In its current form, the CDP includes an updated Federal On-Scene Coordinator (FOSC) checklist, and a series of discussion and decision boxes to facilitate the FOSC decision. To provide the greatest likelihood that this CDP will not only train but serve the Coast Guard regardless of which personnel are in the FOSC position in the future, it includes a number of appended materials that put oil, dispersant, natural resource and response resource information close at hand in one document. The CDP also includes a number of blank forms that can be removed, duplicated as needed, and used in the field during a spill response to provide orderly and timely information to the FOSC as the spill unfolds and a decision whether or not to use dispersants becomes imminent. Other report forms document bird and mammal presence, dispersant application methods, and dispersant effectiveness.

This document is not a lengthy discussion of the relative merits of any response tool, of dispersant or dispersed oil toxicity, or the details of Net Environmental Benefit Analyses (although key points on several of these topics is embedded in the Discussion Notes on the FOSC checklist, or in the appendices). It is not a primer on oil spill response in general, or the Incident Command System. All this information is available from other resources, much of which was considered in developing the zone recommendations and CDP. This CDP instead assumes that an oil spill has occurred and all agency notifications have been made, various response agencies are on scene and using the Incident Command System to structure the response, and that dispersant use is under active consideration by the FOSC. This CDP takes over from there, offering tools to the FOSC to guide that decision.

This CDP primarily focuses on the federal offshore waters that have been designated as "pre-approved" for dispersant use. To date, this includes the waters 3 – 200 nautical miles from shore, not within a National Marine Sanctuary, and not within 3 miles of the California-Mexico border. This CDP also addresses waters closer than 3 miles from shore, within a National Marine Sanctuary, and within 3-miles of the California-Mexico borders, under the RRT Approval Process.

This CDP is a central, portable repository of all information that will guide the FOSC in a dispersant-use decision for pre-approval areas in federal offshore waters, regardless of which COTP pre-approval area the spill occurs and for which dispersants are being considered.

Quick Guide to Forms, Worksheets and Checklists

The CDP is designed primarily to assist the FOSC in making a dispersant use decision at the time of an incident. Many forms, worksheets, and checklists are included as a part of the CDP to facilitate information gathering, decision-making and providing supporting documentation, as necessary. These worksheets and forms should assist the Unified Command in making a dispersant use decision, not hinder the process with unnecessary paperwork.

As a part of the dispersant pre-approval zone decision-making process, please use the quick guide to forms, worksheets and checklists outlined below.

1) Dispersant Assessment Worksheet **Not Required by RRT**

This document was designed to assist in the gathering and organization of pertinent information necessary to make a dispersant use decision.

2) Pre-Approval Zone Dispersant Use Checklist **Required by RRT**

This checklist was designed to provide an overview of the pre-approval decision-making process and to provide a "dispersant decision summary" for the Incident, detailing the decisions made. Once this form is completed and the FOSC decides to use dispersants, the checklist should be faxed to the RRT as soon as feasible.

3) Dispersant Pre-approval Record of Decision **Required by RRT**

This form was designed to provide a record of decision regarding the evaluation and authorization of dispersant use, consistent with the pre-approval criteria provided in the "pre-approval zone dispersant use checklist." The record of decision is to be signed by all members of the Joint Unified Command and should be faxed with the dispersant use checklist to the RRT as soon as feasible.

4) Checklist Documentation and Support Form **Not Required by RRT**
Boxes #1 - #12

This form was designed as a support tool to evaluate the information required in the pre- approval zone dispersant use checklist. This form guides the user through each decision- making point, allowing evaluation of each question that is a part of the dispersant use decision-making process. This form also cross-references the appendices, as needed, where additional information can be found.

DISPERSANT ASSESSMENT WORKSHEET

(Two pages)

Information gathered to complete this form will facilitate the dispersant pre-approval use determination; complete as much as possible without inadvisably delaying a dispersant use decision.

This report made by: ______________ Organization: ______________ Date: ________ Time: ________
Phone: (   )__________ Fax: (   )__________ Mobile: (   )__________ Pager: (   )__________

On-Scene Commander: ______________ Agency: ______________
Phone: (   )__________ Fax: (   )__________ Mobile: (   )__________ Pager: (   )__________

Caller: ______________ Organization: ______________ Date: ________ Time: ________
Phone: (   )__________ Fax: (   )__________ Mobile: (   )__________ Pager: (   )__________
Street: ______________ City ______________ State ______ Zip Code ________

OES Control #______________ **NRC #** ______________

SPILL

Date of spill: ____________(month/day/year) Time of spill: ______________(PST, 24-hr clock)
Location: Latitude: ______________N Longitude: ______________W

Spill source and cause: ______________________________
____

Amount spilled: __________(gal or bbl) Type of release: ☐ Instantaneous ☐ Continuous
Flow rate if continuous flow (estimate): ________
Oil name: ______________ API: ______ Pour point: ________ (ºF)

Information source: ______________________________

ON-SCENE WEATHER, CURRENTS AND TIDES

(If not immediately available contact NOAA Scientific Support Coordinator (206-321-3320) or other resources noted in Appendix A).

Wind (from) direction: ______________ Next low tide: ______ (ft) at ______ (hrs)
Wind speed: ______________ (knots) Next high tide: ______ (ft) at ______ (hrs)

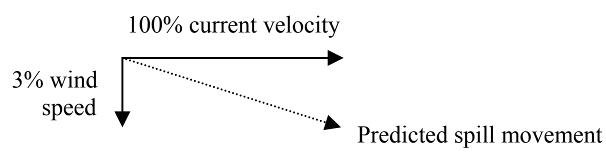
Current velocity: ________ (kts) Current (to) direction: ________ (ºtrue/magnetic)
Predicted slick speed: ________ (kts) Predicted slick direction: ________ (ºtrue magnetic)

Visibility: __________ (nautical miles) Ceiling: ______ (feet) Sea state:______ (wave height in feet)

Information source:______________________________

PREDICTING SPILL MOVEMENT

Plot spill movement on appropriate nautical chart. Using the information from the box above, predict slick direction and speed using 100% of current velocity and 3% of wind speed.



Estimated distance to shore/sensitive area: ________ (nm)
Estimated time to shore/sensitive area: ________ (hrs)

ESTIMATING OIL SPILL VOLUME

Extent of spill:

(a) Length of spill ______(nm) x Width of spill ______(nm) = Total spill area _________(nm^2)

(b) Estimate what proportion (%) of the total spill area is covered by oil: _______ (Express as decimal, % x 100)

(c) Estimate slick area: ________________ x ________________ = ___________________

Total slick area (a) % oil cover (b) Estimated slick area

Estimated spill volume:

You can make this estimate using any of the following approaches:

- Get a thickness estimate from the ADIOS oil weathering model (call the NOAA SSC (**206-321-3320**) for assistance);
- Generate your own volume estimate of spilled oil and the area it covers (convert both volume and area to metric units and then divide the volume by the area to estimate the thickness. Use the unit conversions found in Appendix K). Convert thickness to millimeters to use Appendix D.1).
- Use your knowledge of the approximate number of barrels of oil or emulsion per acre of slick.

POTENTIAL RESOURCE IMPACTS

Using the predictive spill and weather information from the boxes above, ADIOS, the NOAA SSC, other RRT trustee agencies, aerial wildlife observers and regional resource information noted in **Appendix B**, briefly describe potential coastal areas and resources that could be impacted from this spill.

DISPERSANT SPRAY OPERATION

Information from **Appendices C.5 – C.8 and D.1** will be helpful.

Dispersant spray contractor name: ___________________________________
Dispersant name: _______________________ Quantity available: _________

Street: ____________________________
City: ____________________________
State: ________ Zip Code: _____________
Phone: ( ) ________________________

Platform: Aircraft type: ☐ Multi-engine ☐ Single-engine
Boat type: ___________________________________
Other: ___________________________________
Dispersant load capability (gal): ______________________

Estimate:

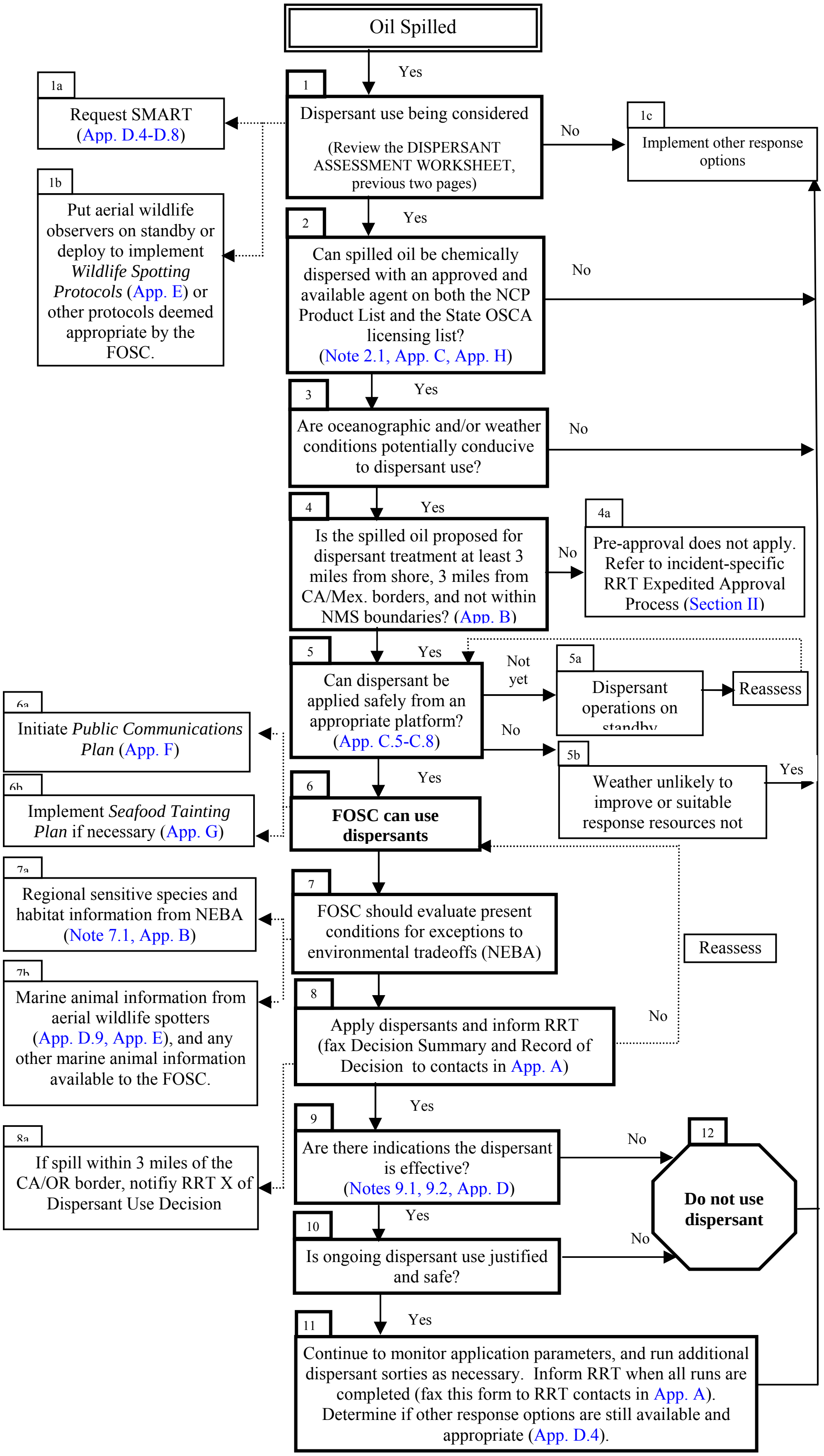
"Window of opportunity" for getting dispersant on the oil (App. C-10)__________________ (hrs from first report of spill)
Number of daylight hours available for first day of dispersant application:_______________ (hrs from first report of spill)

Time to first drop on the oil: ____ (hrs from first report of spill)

Can dispersants to be effective after day one of the spill? YES / NO / Cannot determine at this time (circle one)

Note: It might be appropriate to conduct a small dispersant test before proceeding to a full application.

PRE-APPROVAL ZONE DISPERSANT USE CHECKLIST



Pre-Approval Zones

Dispersant Decision Summary

Spill location: ____________________

FOSC Name: ____________________

FOSC Signature: ____________________

Box	Decision	Time:	Date:	Initials:
1	Yes/No	____	______	______
2	Yes/No	____	______	______
3	Yes/No	____	______	______
4	Yes/No	____	______	______
5	Yes/No	____	______	______
6	Yes/No	____	______	______
7	Yes/No	____	______	______
8	Yes/No	____	______	______
9	Yes/No	____	______	______
10	Yes/No	____	______	______
11	Yes/No	____	______	______
	Run 2	____	______	______
	Run 3	____	______	______
	Run 4	____	______	______
	Run 5	____	______	______
	Run 6	____	______	______
	All done	____	______	______
12	Do not use	____	______	______

Supplemental Decisions:

Box	Decision	Time	Date	Initials
1a	Yes/No	____	______	______
1b	Yes/No	____	______	______
5a	Yes/No	____	______	______
5b	Yes/No	____	______	______
6a	Yes/No	____	______	______
6b	Yes/No	____	______	______
7a	Yes/No	____	______	______
7b	Yes/No	____	______	______

Record of Decision:

If dispersant use is approved, sign and fax the Dispersant Pre-Approval Record of Decision with this Summary Sheet to the RRT.

Comments:

....
....
....
....

The following boxes and checklists are to support decision-making. Complete as appropriate given time and information constraints. Do not allow completing each check-box to inadvisably delay decision-making.

BOX 1 **IS DISPERSANT USE BEING CONSIDERED?**

Dispersant use should be considered if one or more of the situations listed below exist:

❒ Oil is likely to significantly impact birds, marine mammals, or other flora and fauna at the water surface
❒ Natural dispersion is limited
❒ Other response techniques are unlikely to be adequate, effective, or economical
❒ The oil could emulsify and form mousse or tar balls
❒ Oil is likely to significantly impact shorelines, structures and facilities (*e.g.*, marinas, wharves)
❒ Oil is likely to significantly impact economically important resources (*e.g.*, shellfish beds, tourist beaches)
❒ Other ……

Decision: Consider dispersant use?

❒ Yes Make notifications in **Box 1a**
Make notifications in **Box 1b**
❒ No Go to **Box 1c**

Make a note of the decision on Dispersant Use Checklist (Page I-9)

From Cawthron, 2000

Discussion Note 1.1 **KEY BENEFITS OF DISPERSANT USE**

- Dispersant use minimizes the effects of an oil spill principally by dispersing oil before it reaches shorelines or sensitive areas (*e.g.*,wetlands, estuaries).
- Removing oil from the surface of the water reduces the potential for impacts to birds and marine mammals, and limits the action of wind on spill movement.
- Dispersants can prevent oil from sticking to solid surfaces, and enhance natural degradation.
- Dispersants can effectively treat large spills more quickly and inexpensively than most other response methods.
- Dispersants can be effective in rough water and strong currents where mechanical responses are limited.
- Effective dispersant responses can greatly reduce the quantity of oil requiring recovery and disposal.
- Dispersant use is often the only feasible response to spills that exceed mechanical response capabilities.
- Dispersant use does not generally limit other options, except oleophilic mechanical responses.
- Dispersed oil that cannot be mechanically recovered generally poses few significant environmental problems.

From Cawthron, 2000

BOX 1a **REQUEST SMART**

Immediately deploy USCG Strike Team to the spill site if dispersant use is likely. Every attempt should be made by the FOSC and the Strike Team to implement the on-water component of the SMART (Special Monitoring of Advance Response Technologies) monitoring protocols in every dispersant application. **Dispersant application should <u>not</u> be delayed should sea conditions, equipment failure, or other unavoidable circumstances preclude the positioning of SMART monitoring equipment and personnel**. However, at a minimum, Tier 1 (visual) monitoring should occur by trained observers during any dispersant operation approved in accordance with this California Dispersant Plan. Tier 2 (on-site water column monitoring) and Tier 3 (fate and transport of the dispersed oil) SMART monitoring will be deployed as appropriate. Other information on monitoring dispersant effectiveness, including additional SMART background information, tools and report forms, is presented in **Appendices D.4 – D.8**.

Decision: Deploy SMART?

❒ Yes Use contact information in Appendix A. **Estimated arrival time**: ……………………………..………..
Go to **Box 1b**.
❒ No Note reason why not deployed. ………………………………………………………………………….……

Make a note of the decision on Dispersant Use Checklist (Page I-9)

Go to **Box 1b** or **Box 1c** as appropriate.

BOX 1b **PUT AERIAL WILDLIFE OBSERVERS ON STANDBY OR DEPLOY TO IMPLEMENT THE *WILDLIFE SPOTTING PROTOCOLS***

Consider deploying trained wildlife spotters in initial spill overflight aircraft so that they can determine if the presence of marine animals in the spill or dispersant application zones could influence spray pattern decisions by the FOSC. The goal is to minimize over-spray onto unaffected animals. Wildlife spotters should use the forms and procedures given in the *Wildlife Spotting Protocols* (**Appendix D.9 and Appendix E**). The FOSC will decide how subsequent and systematic wildlife spotting efforts can be safely conducted with the aerial resources available.

Decision: Notify/deploy aerial wildlife spotters?

❒ Yes Use wildlife spotter contact information in **Appendix E.2**. Go to **Box 2**.
❒ No Note reason why wildlife spotters not deployed ....
....

Make a note of the decision on Dispersant Use Checklist (Page I-9)

Reconsider under **Box 7**.

BOX 1c **IMPLEMENT OTHER RESPONSE OPTIONS**

Consider all response options to identify which option, or combination of options, is most appropriate. The following options are described in the Area Contingency Plan (Section 1640) and the Regional Contingency Plan (Section 1007.05).

❒ No action other than monitoring
❒ Mechanical containment and recovery of oil at sea
❒ Clean-up of oil from shorelines
❒ *In situ* burning

From Cawthron, 2000

BOX 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?**

A NCP Product List may be found in **Appendix H**. Updated NCP Product Lists can be accessed via the EPA representative on the RRT (**Appendix A**), by calling the Emergency Response Division of the U.S. EPA (202-260-2342) or accessing the Internet at http://www.epa.gov/oilspill/ncp/dsprsnts.htm

The State OSCA licensed dispersants may also be found in **Appendix H,** calling the State OSPR representative on the RRT (**Appendix A**) or accessing the Internet at http://www.dfg.ca.gov/ospr/reg_com/osca.html

Decision: Can this oil be dispersed with an approved and available agent?

❒ Yes Go to **Box 3.**
❒ No Go to **Box 1c**

Make a note of the decision on Dispersant Use Checklist (Page I-9)

Taken in part from Cawthron, 2000

Discussion Note 2.1 **OIL DISPERSIBILITY (Also see App. C.10 for Window of Opportunity)**

Three types of oils are typical of those produced or transported in California offshore waters: a) crude oils produced in California Outer Continental Shelf (OCS) waters; b) oils imported from Alaska and foreign countries into California ports; and c) fuel oils that could be spilled from a variety of marine industrial activities (*e.g*., fuel tanks from ships, cargoes of small tankers). Dispersants only work if the spilled oil has a relatively low viscosity at the time of treatment.

Appendices C.1 and C.2 show the California platform-produced oils and tankered oils, respectively.

Most oils produced from offshore platforms are heavy, and border on the range of oils that are considered to be difficult or impossible to disperse. The oils transported by tanker include two-three dozen different types of oil (only the most common are listed in **Appendix C.2**). The most important is Alaska North Slope crude, which represents 50% of each annual total. Based on API gravity information, these oils appear to be dispersible when fresh.

- The most important criterion for dispersant use is whether the oil is dispersible.
- The best indication of oil dispersibility is from specific oil weathering and dispersion data from field trials (see **Appendix C.3** for some tested and modeled oils).
- Potential dispersibility can be *estimated* from physical properties of oils, under different oil weathering and spill scenarios (*e.g*., ADIOS, Table 2.1 below). The ADIOS computer database predicts oil dispersion based on physical and chemical properties of spilled oil under specified spill conditions.
- Dispersant use should not be rejected exclusively on the basis of predictive models.

Generally, if:

- Oil is able to spread on the water, it is likely to be dispersible.
- Viscosity is < 2000 cSt, dispersion is probable.
- Viscosity is >2000 cSt, dispersion is possible.
- Viscosity is >5000 cSt, dispersion is possible with concentrated dispersant (*e.g*., Corexit 9500).
- Sea temperature is <10º C or below oil pour point, dispersion is unlikely.

Potential dispersion may also be assessed using tables in Appendix C.

Limitations of predicting dispersion:

- Using generic values of viscosity and/or pour point to predict dispersion (*e.g*., ADIOS, **Appendices C.3 and C.4**) can underestimate the potential for oil to be dispersed.
- Most models are based on limited oil weathering, emulsification or dispersion data, therefore estimated windows of opportunity may be inaccurate.

Taken in part from Cawthron, 2000 and S.L. Ross, 2002

Table 2.1 **ADIOS (AUTOMATED DATA INQUIRY FOR OIL SPILLS) COMPUTER DATABASE**

Use the **DISPERSANT ASSESSMENT WORKSHEET** and the NOAA SSC (**206-321-3320**) for the information needed by ADIOS, or use the form below. The NOAA SSC should also be able to assist with ADIOS.

Copies of ADIOS are available from the NOAA website:
http://response.restoration.noaa.gov/software/adios/adios.html

Oil/product name:	____________		Wind speed:	____________	(knots)
Amount spilled:	____________	(gal or bbl)	Wave height:	____________	(m)
Type of release:		Circle one	Water temp.:	____________	(ºC)
❑ Instantaneous			Water salinity:	____________	(ppt)
❑ Continuous					

Important limitations on the use of ADIOS: ADIOS predicts dispersibility based on estimates of oil properties (including emulsification) under different conditions. As emulsification data are scarce, **predicted rates of dispersion may be different than actual rates of dispersion**. ADIOS is intended for use with floating oils only, and does not account for currents, beaching or containment of oil. ADIOS is unreliable for very large or very small spills. It is also unreliable when using very high or very low wind speeds in modeling the spill.

From Cawthron, 2000

BOX 3 **ARE OCEANOGRAPHIC AND/OR WEATHER CONDITIONS POTENTIALLY CONDUCIVE TO DISPERSANT USE?**

Does the available technical information indicate that the existing oceanographic (*e.g*., surface current direction and speed, wave and chop height) and weather (*e.g*., wind direction and speed, visibility, ceiling height) conditions are suitable for a successful dispersant application?

Use the following resources:

❒ Information on the DISPERSANT ASSESSMENT WORKSHEET
❒ Consultation with the NOAA Scientific Support Coordinator (**206-321-3320**)
❒ Information resources and web sites noted in **Appendix A**
❒ Information from aerial overflights
❒ Information from ADIOS

Decision: Are ocean and weather conditions potentially suitable for a dispersants application?

❒ Yes Go to **Box 4**.
❒ No Go to **Box 1c**

Make a note of the decision on Dispersant Use Checklist (Page I-9)

BOX 4 **IS THE SPILLED OIL PROPOSED FOR DISPERSANT TREATMENT AT LEAST 3 MILES FROM SHORE, NOT WITHIN NMS BOUNDARIES, AND NOT WITHIN 3 MILES OF THE CA/MEXICO BORDER?**

A full-page statewide chart indicating the area three nautical miles from shore and the areas within National Marine Sanctuaries (Gulf of the Farallones, Cordell Banks, Monterey, Channel Islands) is in Chart 4.1 below. Regional charts, with pre-approval dispersant zones noted, are in **Appendix B**.

Decision: Is the spilled oil within a Pre-Approval zone?

❒ Yes Go to **Box 5**.
❒ No Pre-Approval does not apply. Go to **Box 4a**.

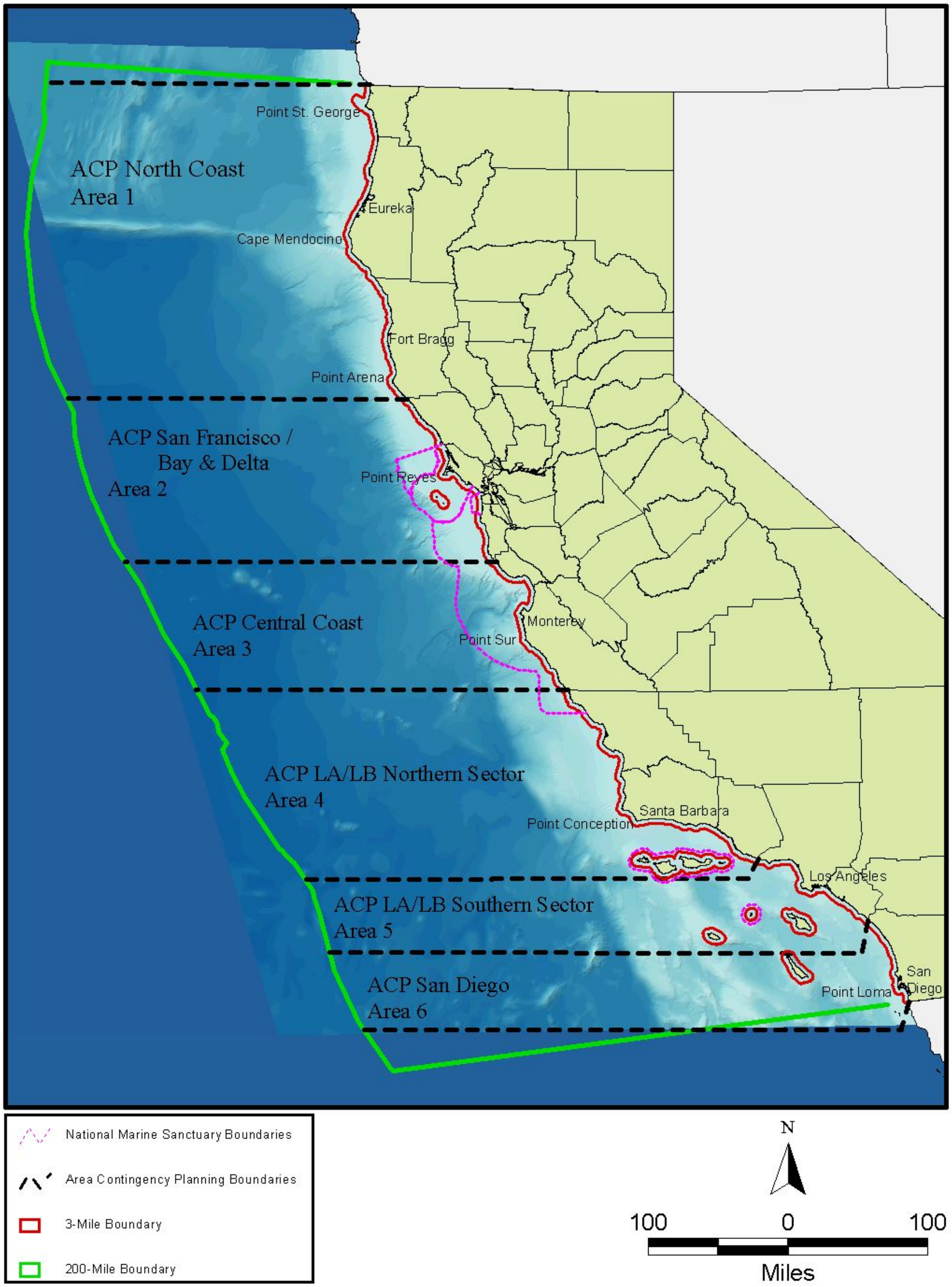
Make a note of the decision on Dispersant Use Checklist (Page I-9)

BOX 4a **PRE-APPROVAL DOES NOT APPLY; REFER TO RRT APPROVAL PROCESS.**

The request for dispersant use does not qualify under the pre-approval guidelines for the use of dispersants in RRT Regional IX. Contact the NOAA SSC (**206-321-3320**) and begin the dispersant *RRT Approval Process*, **Section II**.

Chart 4.1

California Marine Waters Pre-Approval Dispersant Zone



BOX 5 **CAN DISPERSANT BE APPLIED SAFELY FROM AN APPROPRIATE PLATFORM?**

Use the information in the **DISPERSANT ASSESSMENT WORKSHEET** to evaluate which application platform(s) will be most effective, given the following particular considerations:

- The amount of oil spilled;
- The location of the operational area;
- The volume of available dispersants;
- The timeframe in which the required equipment can be on-scene.

Assume for planning purposes that the weather information on the **DISPERSANT ASSESSMENT WORKSHEET** will remain the same during the timeframe in which this decision is operating. At the earliest opportunity, contact the NOAA SSC (**206-321-3320**) for more detailed and updated weather information, but do not delay this decision process for the NOAA SSC weather input. Weather information may also be available from resources noted in **Appendix A**. See **Appendices C.5 – C.8** for specific information on dispersant application platforms.

Decision: Is there a safe and appropriate application platform for a dispersant operation?
(See Discussion Note 5.2 below for important safety information)

	Yes	(Type)	No	(Why not appropriate?)
C-130/ADDS Pack	☐		☐	....
DC-4	☐		☐	....
Other large multi-engine airplane	☐	....	☐	....
Cessna AT-802	☐		☐	....
Other single-engine airplane	☐	....	☐	....
Helicopter	☐	....	☐	....
Work boat	☐	....	☐	....
	Go to **Box 6**		Go to **Box 5a and/or 5b**	

Make a note of the decision on Dispersant Use Checklist (Page I-9)

Discussion Note 5.1 **CURRENT LOGISTICS FOR A CALIFORNIA DISPERSANT APPLICATION**

Use the information on the **DISPERSANT ASSESSMENT WORKSHEET** to consider the following:

- ❒ Is the selected dispersant available in the quantity needed?
- ❒ Can the estimated "window of opportunity" for getting the dispersant on the oil be met?
- ❒ Can the dispersant and application resources get to the spill scene on time?
- ❒ Will there be enough daylight hours for an effective dispersant application?

Refer to **Appendix C** for more specific regional dispersant resource information.

Discussion Note 5.2 **GENERAL SAFETY ISSUES**

- The FOSC is responsible for ensuring that health and safety requirements are adequately addressed during a response.
- Individuals should not engage in activities that they are not appropriately trained to perform.
- Individuals are expected to adhere to safety procedures appropriate to the conditions they are working under and/or are included in a dispersant-specific Site Safety Plan Annex.
- Vessel/aircraft operators are expected to define appropriate operational limits and safety and maintenance requirements for their craft.
- Vessels and response resources should be properly maintained and undergo proper decontamination procedures.
- Apply dispersants only if there is no significant risk to response personnel (*e.g*., ignition risk, operational hazards).
- Ensure the appropriate personal protective equipment (PPE) is available.
- Ensure that application aircraft and vessels remain within standard operating limits.
- Each person involved in a response is required to take personal responsibility for his or her safety. The FOSC may appoint a Safety Officer and request development of a specific Site Safety Plan Annex. Key safety aspects to be considered in the plan may include:
  - Physical hazards (*e.g*., waves, tides, unstable or slippery surfaces)
  - Heavy machinery and equipment
  - Chemical hazards (*e.g*., oil and dispersant exposure)
  - Atmospheric hazards (*e.g*., fumes, ignition risks)
  - Confined spaces
  - PPE
  - Noise
  - Fatigue
  - Heat/cold stress
  - Wildlife (bites/stings)
  - Cleanup facilities
  - Medical treatment

HUMAN SAFETY OVERRIDES ALL OTHER CONSIDERATIONS DURING A RESPONSE

From Cawthron, 2000

BOX 5a **DISPERSANT OPERATIONS ON WEATHER STANDBY**

Consult with appropriate RRT IX members (USCG/District 11 Co-Chair, EPA, DOI, DOC and OSPR (See **Appendix A** for contact information) to notify them that dispersants are being considered, but delayed due to weather.

Decision: Has the weather improved to the point where dispersants can be applied?

❒ Yes Go to **Box 6**
❒ No Continue to **reassess** (until/unless time window for successful application closed) or Go to **Box 5b**

Make a note of the decision on Dispersant Use Checklist (Page I-9)

BOX 5b **WEATHER UNLIKELY TO IMPROVE OR SUITABLE RESPONSE RESOURCES NOT AVAILABLE**

There will be spill situations where dispersant use may be appropriate but weather conditions and available resources will not allow dispersants to get on the oil within the appropriate weather window. In these cases, dispersant use will need to be abandoned and other response options considered instead.

Go to **Box 1c**

BOX 6 **FOSC CAN USE DISPERSANTS**

DISPERSANTS APPROVED FOR USE BY THE FOSC NEED TO BE APPLIED USING THESE RRT IX GUIDELINES:

- ❒ Pre-approval zones are only in waters no closer than 3 nautical miles from the nearest shoreline, not within 3 miles of the CA/Mexico borders, and not within the boundaries of a National Marine Sanctuary.
- ❑ Dispersants cannot be applied to any diesel spill.
- ❒ The SMART controller/observer should be over the spray site before the start of the operation. If possible, a DOI/DOC-approved marine mammal/turtle and pelagic/migratory birds observation specialist (see **Appendix E.2** for list) will accompany the SMART observer. However, the operation will not be delayed for either function.
- ❒ The marine wildlife observer, or the person functioning as that observer, is strongly encouraged to use the Wildlife Observation Report Form (**Appendix D.9**) and the Wildlife Spotting Protocols (**Appendix E**). However, the operation will not be delayed for this function
- ❒ Personnel protective equipment for personnel on-site will conform to the appropriate dispersant's Material Safety Data Sheet (MSDS).
- ❒ Dispersant application aircraft will maintain a minimum 1000-foot horizontal separation from rafting flocks of birds. Caution will be taken to avoid spraying over marine mammals and marine turtles (see **Appendix A** for resource agency contact information).
- ❒ If the dispersant application platform is a boat, see Discussion Note 8.3.

BOX 6a **INITIATE *PUBLIC COMMUNICATIONS PLAN***

Once a decision to use dispersants is made, it is critical that a public communications plans be implemented (**Appendix F**). The general public as well as stakeholders must be made aware of any decision to use dispersants and a mechanism created for reliable and continuous updates.

An initial press conference should be held which outlines the decision to use dispersants, provides background and scientific information, and addresses any other environmental and safety considerations expressed by the public. A sample press release is in **Appendix F.1**, with other public meeting and risk communication tips offered throughout **Appendix F**.

A public meeting should be scheduled as soon as possible to provide a mechanism for sharing information and addressing public concerns and fears**.** **Appendix F** provides guidelines for preparing and conducting a public meeting. Areas that must be adequately addressed during the meeting include:

- Seafood tainting concerns posed by dispersants (**Appendix G**).
- Risk communication (**Appendix F.2 and Appendix G**).
- Results of net environmental benefit analyses, and species of special concern (summarized in **Appendix B**).
- Monitoring policies established for the spill (tools used from **Appendix D**).

BOX 6b **IMPLEMENT *SEAFOOD TAINTING PLAN* IF NECESSARY**

Refer to **Appendix G** for key points to consider regarding seafood tainting, as well as information on accessing NOAA and state resources for assessing the tainting risk.

BOX 7 **FOSC SHOULD EVALUATE PRESENT CONDITIONS FOR EXCEPTIONS TO ENVIROMENTAL TRADEOFFS (NEBA)**

This FOSC Checklist applies only to those California offshore waters pre-approved for dispersant use (waters 3 – 200 nautical miles from shore, not within a National Marine Sanctuary, and not within 3 miles of the CA/OR or CA/Mexico borders); see **Box 4**. However, dispersant use even in the pre-approval areas must follow certain guidelines (**Box 6)** and may be further limited by federal agencies with responsibility for endangered marine animal management (**Appendix J**).

Pre-approval dispersant zone recommendations do not presume the absence of sensitive species, other marine species, or impacts to species on the water surface or in the upper water column. It does presume that there will be impacts from the spilled oil, and from dispersant use, to some of those species. However, based on the natural resource information used in the planning stage, it was determined that there could be a net environmental benefit to the use of dispersants.

However, at the time of an actual spill and a decision to use dispersants, real-time information on marine animal presence (**Box 1b** and **Box 7b**), the potential impacts from the spill (**DISPERSANT ASSESSMENT WORKSHEET**), and important supplemental information (**Appendix B** and **Boxes 7a-b**) should all be considered and weighed by the FOSC in making a final decision to use dispersants, probable impacts, and where the net environmental benefits will occur.

The FOSC may use the regional sensitive species and habitat information from **Appendix B** for each major coastal area in which dispersant use may have an impact in order to consider:

- ❒ The type and value of habitat potentially affected.
- ❒ The sensitivity of affected resources to oil, and to different oil response strategies.
- ❒ Natural recovery rates of affected species and habitats.
- ❒ Likely oil persistence and degradation rates with and without dispersant use.
- ❒ Potential oil toxicity on surface water species compared to water column and/or seafloor species.

Dispersant use is generally not appropriate in areas with limited water circulation and flushing, near aquaculture facilities, shellfish beds and fish-spawning grounds, and around seawater intakes.

The central question to be answered in assessing <u>Net Environmental Benefit</u> is:

Will dispersant use significantly reduce the impact of the spilled oil?

- Rapid decisions on use are essential as dispersant must be applied quickly to be effective.
- Decision-makers must consider the various environmental, social, economic, political and cultural factors unique to each spill.
- Tradeoffs will be necessary, as no response is likely to satisfy all parties and protect all resources. The ecological impacts of oil are generally longer-lasting and more persistent than most other impacts.
- Ecological effects will be due primarily to the spilled oil. Dispersant applied at recommended rates is unlikely to cause significant adverse effects, even in multiple applications.
- Oil dispersed into water depths greater than 10m will quickly dilute to levels where acute toxic effects are unlikely.
- Few acute toxic effects have been reported for crude oil dispersed into less than 10m of well-flushed water.
- Small spills of light fuels seldom require dispersant use.

BOX 7a REGIONAL SENSITIVE SPECIES AND HABITAT INFORMATION FROM NEBA

At the time of an actual oil spill or a decision to use chemical dispersants on the oil, marine species are expected to be on the water surface or in the upper water column. Before using chemical dispersants, the FOSC will have decided that there may be a net environmental benefit from dispersant use. Information on regional sensitive species and habitat information from the Net Environmental Benefit Analyses (NEBA), summarized for each region in **Appendix B**, can help the FOSC determine which species might actually be in the area and scouted for by the aerial observers (**Box 1b** and **Box 7c**). This additional information can provide further validation and justification to a FOSC that impacts of chemical dispersant application will be minimized wherever possible, and net environmental benefit maximized.

BOX 7b MARINE ANIMALS INFORMATION FROM AERIAL WILDLIFE SPOTTERS

The FOSC can take additional information and advantage from the Aerial Wildlife Observers if they have been deployed (**Box 1b**), or information from the Wildlife Aerial Survey Form (**Appendix D.9**) available from other aerial spotters, or information from wildlife spotters (**Appendix E.2**) available to the FOSC from other data collection forms or notes used by those spotters. Any of these resources will provide real-time or near real-time information on marine seabird and mammal presence, and can guide the FOSC on dispersant application parameters that may minimize impacts to those resources.

BOX 8 APPLY DISPERSANTS AND INFORM RRT

- ❑ Use the information on estimated oil spill volume from the DISPERSANT ASSESSMENT WORKSHEET and Discussion Note 8.1 below to:
  - Determine the dispersant application ratio (usually 1:20), and
  - Calculate the volume of dispersant required (**Appendices D.1 and D.2**).
- ❑ Record the details on the Dispersant Application Summary Form (**Appendix D.4**);
- ❑ Mobilize application team;
- ❑ If not already done, mobilize SMART. Some blank SMART forms are included in **Appendix D** for use by other trained professionals, if appropriate and when approved by the FOSC.
- ❑ Inform RRT (see **Appendix A** for contact information).

Decision: Dispersants applied?

❑ Yes Go to **Box 9**
❑ No Explain.

Make a note of the decision on Dispersant Use Checklist (Page I-9)

Reassess as necessary and appropriate.

Discussion Note 8.1 **GENERAL APPLICATION INFORMATION**

- The FOSC has final responsibility for operational aspects of dispersant applications.
- Dispersant must only be applied by experienced spray applicators and in accordance with manufacturer instructions.
- The persons applying dispersant are responsible for the calibration and operation of the spraying system, and the safety and maintenance of the application platform.
- Droplet size is the key variable influencing dispersant effectiveness. Undersized droplets (*e.g*., fog or mist) will be lost through drift and evaporation. Oversized droplets will punch through the oil and be lost in the water column.
- Dispersants pre-diluted in water are less effective than undiluted dispersant.
- Only undiluted concentrate dispersant is applied from aircraft. Dispersant should, where possible, be applied into the wind and parallel with the slick.
- Dispersant should be applied in a methodical and continuous manner to ensure the entire target area is treated.
- Spraying effort should concentrate on the thickest sections, and/or the leading edges, of oil that threaten sensitive areas.
- Thick portions of the slick may require several applications.
- Oil sheen should not be sprayed with dispersant.

Regarding the relationship between Dispersant-to-Oil Ratio (DOR) and the concentration of oil being treated:

- Regardless of DOR ratios suggested by dispersant manufacturers, there are many factors that influence dispersibility (*e.g*., oil characteristics, degree of weathering, water salinity, sea state) that may make it very difficult to select an appropriate DOR for the conditions faced on the day of a specific spill
- The variability of slick thickness (or oil concentration) is such that one can never really characterize the actual oil concentration for more than a few seconds within the speed and swath constraints of a particular application system.
- With most application systems, one is usually overdosing and underdosing as the system moves through light, heavy and sometimes “no” oil on the water surface.
- The best estimate of the average oil thickness (or average volume of oil per unit are) must be used.
- Given that precise spray parameters are extremely difficult to achieve, dispersant applicators generally use about 5 gallons of dispersant per acre on their first run.
- Area, volume and thickness can be related with the following expression:

$$10^4 \text{ x Area (hectare) x Thickness (mm) = Volume (liters)}$$

or

$$\text{Volume (liters/Area (hectares)} = 10^4 \text{ x Thickness (mm)}$$

►To convert liters/hectare to gallons/acre, multiply by 0.107. To convert liters/hectare to gallons/square kilometer, multiply by 26.42.

►These values (in any units) multiplied by the DOR (as a fraction, *e.g*., 1:5 = 1/5 or .2) will then yield the Desired Dosage (in those units) for that value of DOR.

►Refer to Appendix D.1 for some pre-calculated values.

From Cawthron, 2000 and Al Allen (Spilltec), 2003 personal communication

Discussion Note 8.2 **AERIAL APPLICATION**

This general aerial application guide is intended simply to highlight key issues. The FOSC will coordinate and oversee operational aspects of aerial dispersant applications.

- Aircraft applications should always include pump-driven spray units.
- Dispersant droplet size should be between 400 and 1000 microns.
- Commercial aircraft spray nozzles generally range between 350 and 700 microns.
- 1000-micron spray nozzles may be needed for use on viscous oils.
- Nozzles should achieve an application rate of 5.3 gallons per acre if using a 1:20 ratio.
- Spray nozzles should be installed to discharge directly aft.
- Underslung buckets on helicopters should be mounted so the pilot can see the ends of the spray booms in flight.
- The altitude of the aircraft should be as low as possible.

From Cawthron, 2000

Discussion Note 8.3 **BOAT APPLICATION**

- Spray booms should be mounted as far forward as possible to prevent oil being moved aside by the bow wave before being sprayed. This then uses the mixing energy of the bow wave to break up the oil.
- Spraying systems should be set so that the spray pattern is flat, striking the water in a line perpendicular to the direction of the boat's travel.
- The fan-shaped sprays from adjacent nozzles should be set as low as possible, overlapping just above the oil/water surface, with the inboard spray striking the hull just above the waterline.

Undiluted dispersants

- Air blast sprayers and modified spray pumps can be used to apply undiluted concentrated dispersants and conventional dispersants.
- Treatment rate is usually constant and determined by nozzle size and spray pressure.
- Calibration and use of an appropriate droplet size is critical to effective applications.

Pre-diluted dispersants

- Concentrated dispersants can be applied after pre-dilution in seawater, but will be less effective.
- The dispersant : water ratio should be equal to, or greater than, 10%
- Applications through ship's fire-fighting equipment are controlled by opening or closing the dispersant supply. Vessel speed is used to control the treatment rate.
- Dual pump systems for dispersant and seawater-supplying spray booms allow the dilution rate to be adjusted.
- Boat speed is the main determinant of dispersant dose rate (reduce boat speed to increase the dose rate).
- Boat speed should be in the order of 5 knots for fresh spills of liquid crude or fuel oil, which assumes that the oil has spread to 0.1 mm thick.
- With reduced boat speeds, the required application rate per acre or km^2 can be maintained by reducing pump speed.

The following ASTM standards apply to systems involving spray arms or booms that extend over the edge of the boat and have fan-type nozzles that spray dispersant in a fixed pattern:

- ASTM F 1413-92: Standard Guide for Oil Spill Dispersant Application Equipment: Boom and Nozzle Systems
- ASTM F-1460-93: Standard Practice for Calibrating Oil Spill Dispersant Application Equipment Boom and Nozzle Systems
- ASTM F 1737-96: Standard Guide for use of Oil Spill Dispersant Application Equipment During Spill Response: Boom and Nozzle Systems.

Boat-based systems using a fire monitor and/or fire nozzle shall avoid a straight and narrow "firestream" flow of dispersant directly into the oil. There are no applicable ASTM standards for these systems at this time (December 2003).

In part from Cawthron, 2000

BOX 8a **NOTIFICATION OF RRT IX OF DISPERSANT USE WITHIN 3 MILES OF THE OR/CA BORDER**

The FOSC can approve the use of dispersants within the 3 miles zone of the California/Oregon border. Once a dispersant use decision is made, the FOSC should contact the RRT IX-X Liaison of the decision as soon a possible and should also endeavor to fax the Dispersant Record of Decision as well. Contact information can be found in **Appendix A.**

BOX 9 **ARE THERE INDICATIONS THE DISPERSANT IS EFFECTIVE?**

- ❑ Acquire information from dispersant monitoring team (SMART team or other FOSC-designated monitors).
- ❑ Review dispersant monitoring results after each dispersant application.
- ❑ Determine if chemical dispersion is significantly greater than natural dispersion.
- ❑ Assess whether changing application parameters could make the application more effective.

Decision: Are there indications the dispersant is effective?

❑ Yes Go to **Box 10**
❑ No See Discussion Note 9.2 and return to **Box 8**, or Go to **Box 12**

Make a note of the decision on Dispersant Use Checklist (Page I-9) *From Cawthron, 2000*

Discussion Note 9.1 **ASSESSING DISPERANT EFFECTIVENESS**

- Dispersant applications must be monitored to confirm whether or not dispersant use is effective, and to determine the fate and transport of treated oil.
- Dispersant applications should not be delayed simply because monitoring is not in place.
- Visual observation is the minimum level of monitoring. Observations teams may use the forms in **Appendix D**.
- There will be very few instances where a dispersant application is possible but visual monitoring is not.
- Because dispersed oil plumes are often highly irregular in shape and thickness, it can be difficult to accurately estimate dispersant efficiency.
- The appropriate dispersant application dose depends on the oil thickness (see **Appendices D.1 and D.2** for common dose rates based on oil thickness). Slicks are generally not of uniform thickness, and it is not always possible to distinguish among thicker and thinner portions of the same slick. It is therefore possible to apply too much or too little dispersant to some parts of a slick. Because over- and under-dosing can lead to variations in effectiveness, these variations should be noted.
- On-site monitoring of oil dispersed in the water column should support visual monitoring whenever possible. See **Appendix D** for additional information and forms.
- Decisions to terminate operations due to poor effectiveness should ideally be based on on-site monitoring results.
- A visible coffee-colored cloud in the water column indicates the dispersant is working.
- A milky-white plume in the water column can indicate excessive dispersant application.
- When dispersant is working, oil remaining on the water surface may also change color.
- A difference in the appearance of treated and untreated slicks indicates dispersion is likely.
- Absence of a visible cloud in the water column makes it difficult to determine whether the dispersant is working. When the water is turbid, you may not be able to see a plume. Oil remaining at the surface and sheens can also obscure an ability to see oil dispersing under the slick.
- Successful dispersion can occur with no visible indication of dispersion.
- A subsurface plume may not form instantly once dispersant has been applied. In some cases (*e.g.*, emulsified oil) it can take several hours for a plume to form. In other cases, a visible plume may not form, and you may wish to use sampling to learn whether dispersion has occurred.
- Boat wakes may physically part oil, falsely indicating successful dispersion. Mechanically dispersed oil will re-coalesce and float to the surface.
- Dispersants sometimes have a herding effect on oil after initial applications, making a slick appear to be shrinking when, in fact, the dispersant is "pushing" the oil together. The effect results from the surfactants in the dispersant, which causes a horizontal spreading of thin oil films. This can cause parts of a slick to seem to disappear from the sea surface for a short time.

From Cawthron 2000 and NOAA Oil Spill Job Aids

Discussion Note 9.2 **WHEN DISPERSANT IS NOT EFFECTIVE**

If monitoring shows dispersion does not appear effective, review all aspects of the application and monitoring for possible reasons why. Aspects to consider include:

- Dispersant formulation
- Application ratios (increase or decrease oil: dispersant ratio)
- Application methods
- Monitoring methods
- Interpretation of monitoring results
- Oil weathering
- Weather conditions

From Cawthron, 2000

BOX 10 **IS ONGOING DISPERSANT USE JUSTIFIED AND SAFE?**

All of the following must apply to justify ongoing dispersant use:

- ❑ The spill can be chemically dispersed with an approved and available agent (see **Box 2** and **Appendix H**); Oceanographic and weather conditions are potentially conducive to dispersant use (see **Box 3** and DISPERSANT ASSESSMENT WORKSHEET);
- ❑ The spilled oil is at least 3 nautical miles from shore, not within the boundaries of a National Marine Sanctuary (see **Box 4**), and not within 3 miles of the CA/OR of CA/Mexico borders;
- ❑ The dispersant will have a net environmental benefit (see **Box 7a**);
- ❑ The dispersant can be applied safely (see **Box 5**), with suitable weather (**Box 5a**) and available resources (**Box 5b**);
- ❑ There are indications the dispersant continues to be effective (see **Box 9**).

Decision: Continue with dispersant use?

- ❑ Yes Go to **Box 11**
- ❑ No Go to **Box 12**

Make a note of the decision on Dispersant Use Checklist (Page I-9)

THERE WILL BE A POINT WHEN DISPERSANTS ARE NO LONGER EFFECTIVE.

BOX 11 **CONTINUE TO MONITOR APPLICATION PARAMETERS AND RUN ADDITIONAL DISPERSANT SORTIES AS NECESSARY**

More than one dispersant sortie (run) may be necessary to effectively treat the oil spill. Continue to monitor information on the spill extent, dispersant effectiveness, continued availability of suitable weather “windows” and dispersant application equipment and personnel, and perform addition applications as necessary.

- ❒ Record information from each sortie on the Dispersant Decision Summary.
- ❒ Inform RRT when all runs are completed (fax Dispersant Decision Summary form to RRT contacts in **Appendix A**).

THERE WILL BE A POINT WHEN DISPERSANTS ARE NO LONGER EFFECTIVE.

BOX 12 **DO NOT USE DISPERSANT**

Pre-approval to use dispersants does not apply if **any** of the following occur:

- ❑ The spill cannot be chemically dispersed with an approved and available agent (see **Box 2** and); Oceanographic and weather conditions are not potentially conducive to dispersant use (see **Box 3** and DISPERSANT ASSESSMENT WORKSHEET);
- ❑ The spilled oil is closer than 3 nautical miles from shore, within the boundaries of a National Marine Sanctuary (see **Box 4**), or within 3 miles of the CA/OR or CA/Mexico borders. Approval to use dispersants within 3 miles of landfall or CA borders, or within a National Marine Sanctuary, does not fall within the Pre-Approval guidelines, and will instead need to be considered under the RRT Approval Process (see **Box 4a** and **Appendix I**);
- ❑ The dispersant will not have a net environmental benefit (see **Box 7a**);
- ❑ The dispersant cannot be applied safely (see **Box 5**), with suitable weather (**Box 5a**) or available resources (**Box 5b**);
- ❑ The dispersant is not significantly more effective than natural dispersion or other response options (see **Box 9**).

IF DISPERSANT USE IS CONSIDERED INAPPROPRATE, CONSIDER OTHER RESPONSE OPTIONS.

Go to **Box 1a**.

DISPERSANT PRE-APPROVAL

RECORD OF DECISION

Subpart J of the National Contingency Plan (NCP) provides that the FOSC, with the concurrence of the EPA representative to the Regional Response Team and the State with jurisdiction over the navigable waters threatened by the oil discharge, and in consultation with the U.S. Department of Commerce (DOC) and U.S. Department of the Interior (DOI) natural resource trustees, when practicable, may authorize the use of dispersants on oil discharges; provided, however, that such dispersants are listed on the NCP Product Schedule. The EPA has been delegated authority to maintain a schedule of chemical countermeasures that may be authorized for oil discharges in accordance with procedures set forth in Section 300.900 of the NCP.

The Region IX, Regional Response Team has established dispersant pre-approval zones within waters 3 – 200 miles along the California coast, as designated and has provided policies and procedures for a FOSC to authorize the use dispersants consistent with these pre-approval zones. For purposes of this record of decision, the designated FOSC has completed the "Pre-Approval Zone Dispersant Use Checklist" and has determined that the oil spill, *Name of Oil Spill Incident*, meets the pre-approval criteria as outlined and that dispersant use is authorized.

________________ ________________

Federal On-Scene Coordinator — Date

United States Coast Guard

California statute requires that emergency response operations utilize the Incident Command System. For marine oil spill response, a joint Unified Command Structure is implemented consisting of the Federal On-Scene Coordinator, the State On-Scene Coordinator and the Response Party and outlined in the Memorandum of Understanding between the United States Coast Guard and the California Department of Fish and Game, Office of Spill Prevention and Response. For purposes of this record of decision, the authorization of dispersant use as delegated by the Region IX RRT to the designated FOSC was completed within a Unified Command Structure and agreed upon by the State On-Scene Coordinator and the representative of the Responsible Party.   The Joint Unified Command has completed the "Pre-Approval Zone Dispersant Use Checklist" and has determined that the oil spill, *Name of Oil Spill Incident*, meets the pre-approval criteria as outlined and that dispersant use is authorized.

________________	________________
State On-Scene Coordinator Office of Spill Prevention and Response State of California	Responsible Party Representative
________________	________________
Date	Date

SECTION II: RRT Expedited Approval Zones

Table of Contents

OVERVIEW
RRT EXPEDITED APPROVAL ZONES

Protocols for dispersant use

The FOSC shall arrive at a decision to use dispersants using the information-gathering and decision-making process outlined below, and, using the checklists and procedures attached to this document, forward this information to the RRT for approval. These protocols presume that the FOSC has previously determined that a proposed dispersant use does not meet the criteria of pre-approval, but that dispersant use under a case-by-case RRT approval authority is being pursued.

RRT approval required for dispersant use

For those spill situations that are not addressed by the pre-approval process, FOSC authorization to use dispersants requires the concurrence of the RRT Co-Chairs (the U.S. Coast Guard and U.S. EPA) and State representatives to the RRT and in consultation with the DOI and DOC representatives. The RRT must approve the use of dispersants at the time of a spill for all scenarios within the designated marine waters:

- Marine waters within 3 nautical miles from the coastline, waters designated as a part of a National Marine Sanctuary, or waters that are within three miles of the borders of the Country of Mexico;

- Marine waters one mile from anadromous fish streams during times of emigration and immigration.

Once an FOSC determines to pursue the use of dispersants in a non-pre-approval zone, a formal evaluation of the trade-offs associated with this proposed dispersant use must be conducted. The forms and checklists found in the **DISPERSANT ASSESSMENT WORKSHEET** and **DISPERSANT USE CHECKLIST** below are designed to assist the FOSC or his/her designee in making this determination. The following is an overview of pertinent decision-making points:

- The spilled oil must be amenable to chemical dispersion. Diesel is strictly prohibited from dispersant-use;
- Oceanographic conditions allow for the effective and safe use of dispersants;
- The use of dispersants provides a net environmental benefit. Of special concern are kelp beds and marine waters less than 60 feet deep;
- Appropriate dispersants, dispersant application equipment and personnel are available.

Once the FOSC has filled out the checklists and forms and has determined dispersant use would be a viable and appropriate response option, the FOSC must put in a formal request for approval to the RRT. A spill-specific RRT conference call will be conducted in which all aspects of the dispersant-use request will be evaluated. The RRT will provide the FOSC with an answer regarding the dispersant approval request within 2 hrs of the formal request. The decision to use dispersants will be with approval of the RRT co-chairs and the representative of the State of California with consultation from the DOI and DOC. It is likely that the RRT will address similar stipulations as outlined in the pre-approval process, such as the following;

- Dispersants should not be applied directly to marine mammals within or outside of an oil slick;
- Dispersants will be applied in such a way as to avoid, to the maximum extent practicable, the spraying of seabirds outside the oil slick being treated;
- During the actual dispersant application operations, the sea surface area designated for dispersant application should be assessed by trained wildlife observers in the spotter aircraft for the presence of marine birds and mammals to avoid inadvertent spraying.
- The effectiveness of the dispersant application should be monitored at a minimum by observers trained is dispersant use and if possible with the Special Monitoring of Applied Response Technologies (SMART) monitoring program.

Quick Guide to Forms, Worksheets and Checklists

The CDP is designed primarily to assist the FOSC in making a dispersant use decision at the time of an incident. Many forms, worksheets, and checklists are included as a part of the CDP to facilitate information gathering, decision-making and providing supporting documentation, as necessary. These worksheets and forms should assist the Unified Command in making a dispersant use decision, not hinder the process with unnecessary paperwork.

As a part of the dispersant pre-approval zone decision-making process, please use the quick guide to forms, worksheets and checklists outlined below.

1) Dispersant Assessment Worksheet Not Required by RRT

This document was designed to assist in the gathering and organization of pertinent information necessary to make a dispersant use decision.

2) Pre-Approval Zone Dispersant Use Checklist Required by RRT

This checklist was designed to provide an overview of the pre-approval decision-making process and to provide a "dispersant decision summary" for the Incident, detailing the decisions made. Once this form is completed and the FOSC decides to use dispersants, the checklist should be faxed to the RRT as soon as feasible.

3) Dispersant Request Record of Decision Required by RRT

This form was designed to provide a record of decision regarding the evaluation and request for dispersant use, consistent with the criteria provided in the "expedited dispersant use zone checklist." The record of decision is to be signed by all members of the Joint Unified Command and should be faxed with the dispersant use checklist to the RRT.

3) Checklist Documentation and Support Form Not Required by RRT
Boxes #1 - #12

This form was designed as a support tool to evaluate the information required in the pre- approval zone dispersant use checklist. This form guides the user through each decision- making point, allowing evaluation of each question that is a part of the dispersant use decision-making process. This form also cross-references the appendices, as needed, where additional information can be found.

DISPERSANT ASSESSMENT WORKSHEET

Information gathered to complete this form will facilitate the RRT dispersant use determination; complete as much as possible without inadvisably delaying RRT decision-making.

This report made by: ______________ Organization: ______________ Date: ________ Time: ________
Phone: ( ) ________ Fax: ( ) ________ Mobile: ( ) ________ Pager: ( ) ________

On-Scene Commander: ______________ Agency: ______________
Phone: ( ) ________ Fax: ( ) ________ Mobile: ( ) ________ Pager: ( ) ________

Caller: ______________ Organization: ______________ Date: ________ Time: ________
Phone: ( ) ________ Fax: ( ) ________ Mobile: ( ) ________ Pager: ( ) ________
Street: ______________ City ______________ State ______ Zip Code ________

OES Control # ______________ **NRC #** ______________

SPILL

Date of spill: ________ (month/day/year) Time of spill: ________ (PST, 24-hr clock)
Location: Latitude: ________ N Longitude: ________ W

Spill source and cause: ______________
____

Amount spilled: ________ (gal or bbl) Type of release: ❑ Instantaneous ❑ Continuous
Flow rate if continuous flow (estimate): ________
Oil name: ______________ API: ______ Pour point: ______ (ºC)

Information source: ______________

ON-SCENE WEATHER, CURRENTS AND TIDES

(If not immediately available contact NOAA Scientific Support Coordinator (206-321-3320) or other resources noted in Appendix A).

Wind (from) direction: ________ Next low tide: ______ (ft) at ______ (hrs)
Wind speed: ________ (knots) Next high tide: ______ (ft) at ______ (hrs)

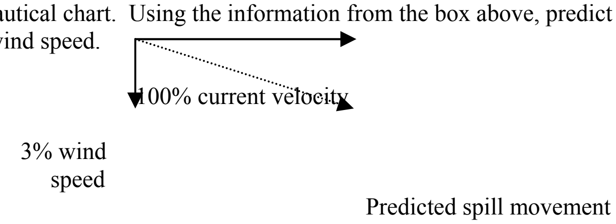
Current velocity: ______ (kts) Current (to) direction: ______ (°true/magnetic)
Predicted slick speed: ______ (kts) Predicted slick direction: ______ (°true/magnetic)

Visibility: ________ (nautical miles) Ceiling: ______ (feet) Sea state: ______ (wave height in feet)

Information source: ______________

PREDICTING SPILL MOVEMENT

Plot spill movement on appropriate nautical chart. Using the information from the box above, predict slick direction and speed using 100% of current velocity and 3% of wind speed.



Estimated distance to shore/sensitive area: ________ (nm)
Estimated time to shore/sensitive area: ________ (hrs)

ESTIMATING OIL SPILL VOLUME

Extent of spill:

(a) Length of spill ______(nm) x Width of spill ______(nm) = Total spill area _________(nm^2)

(b) Estimate what proportion (%) of the total spill area is covered by oil: _______ (Express as decimal, % x 100)

(c) Estimate slick area: _______________ x _______________ = _________________

Total slick area (a) | % oil cover (b) | Estimated slick area

Estimated spill volume:

You can make this estimate using any of the following approaches:

- Get a thickness estimate from the ADIOS oil weathering model (call the NOAA SSC (**206-321-3320**) for assistance);
- Generate your own volume estimate of spilled oil and the area it covers (convert both volume and area to metric units and then divide the volume by the area to estimate the thickness. Use the unit conversions found in Appendix K). Convert thickness to millimeters to use Appendix D.1).
- Use your knowledge of the approximate number of barrels of oil or emulsion per acre of slick.

DISPERSANT SPRAY OPERATION

Dispersant spray contractor name: ____________________________________

Dispersant name: ______________________ Quantity available: _________

Street: ___________________________

City: ___________________________

State: ________ Zip Code: ____________

Phone: (   )______________________

Platform: Aircraft type: ❑ Multi-engine ❑ Single-engine

Boat type: ________________________________

Other: ________________________________

Dispersant load capability (gal): ____________________

FOSC Complete:

"Window of opportunity" for getting dispersant on the oil (App. C 10): ____________________ (hrs from first report of spill)

Number of daylight hours available for first day of dispersant application:________________ (hrs from first report of spill)

Time to first drop on the oil: ____ (hrs from first report of spill)

Can dispersants to be effective after day one of the spill? YES / NO / Cannot determine at this time (circle one)

Note: It might be appropriate to conduct a small dispersant test before proceeding to a full application.

POTENTIAL BIOLOGICAL RESOURCE IMPACTS

Using the predictive spill and weather information from the boxes above, ADIOS, the NOAA SSC, other RRT trustee agencies, aerial wildlife observers and regional resource information noted in **Appendix B**, briefly describe potential coastal areas and resources that could be impacted form this spill.

When the spill is in a National Marine Sanctuary, Sanctuary representatives can assist with valuable resource information.

On-Water Resources:____

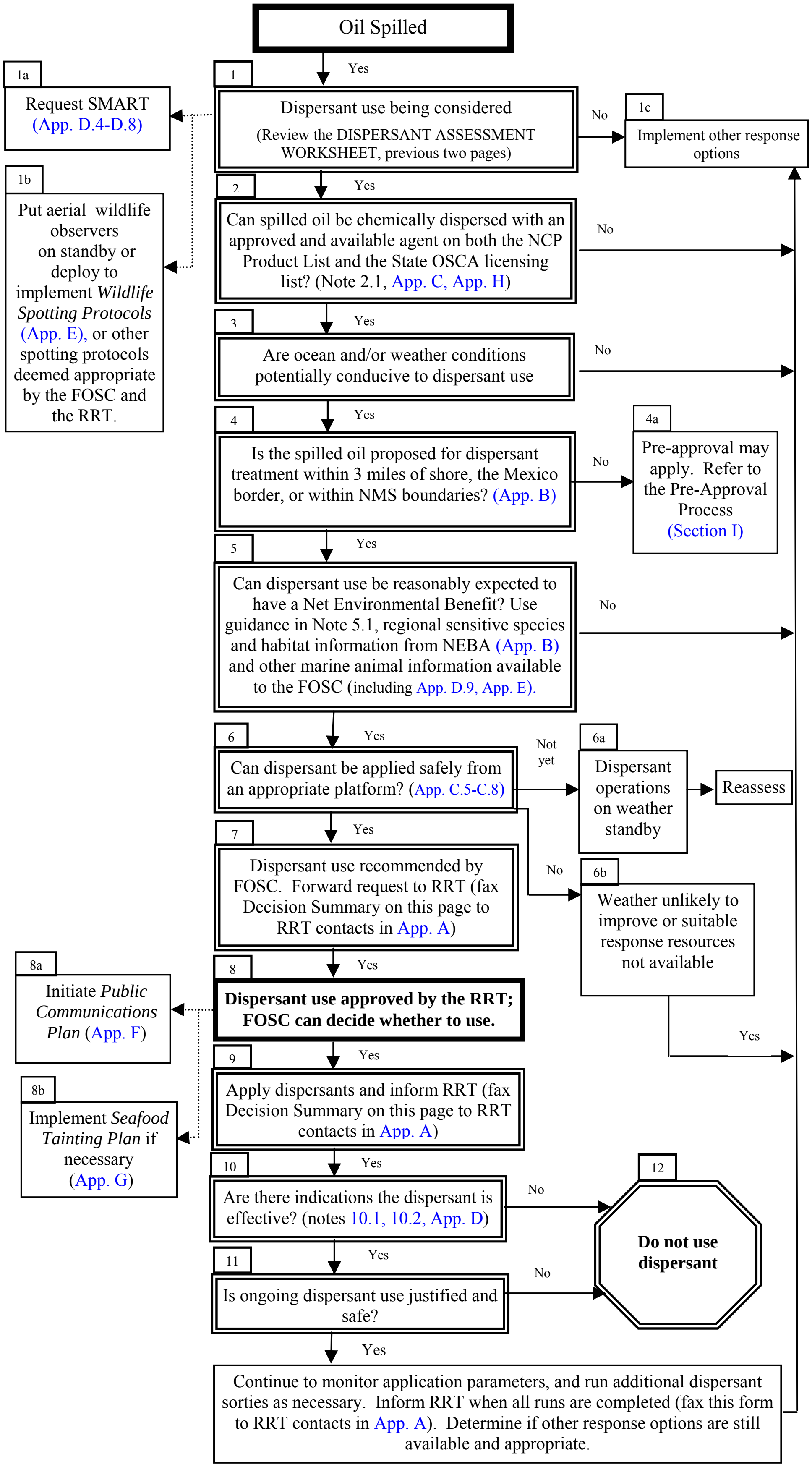
Shallow Subtidal Resources ____

Intertidal Resources:

Anadromous Resources:

Significant Water Column Resources: ____

DISPERSANT USE CHECKLIST: RRT EXPEDITED APPROVAL REQUIRED ZONES



RRT Approval Zones

Dispersant Decision Summary

Spill location: ____________________

Decisions approved by: ________________

Box	Decision	Time:	Date:	Initials:
1	Yes/No	____	________	________
2	Yes/No	____	________	________
3	Yes/No	____	________	________
4	Yes/No	____	________	________
5	Yes/No	____	________	________
6	Yes/No	____	________	________
7	Yes/No	____	________	________
8	Yes/No	____	________	________
9	Yes/No	____	________	________
10	Yes/No	____	________	________
11	Yes/No	____	________	________
	Run 2	____	________	________
	Run 3	____	________	________
	Run 4	____	________	________
	Run 5	____	________	________
	Run 6	____	________	________
	All done	____	________	________
12	Do not use	____	________	________

Supplemental Decisions:

1a	Yes/No	____	________	________
1b	Yes/No	____	________	________
4a	Yes/No	____	________	________
6a	Yes/No	____	________	________
6b	Yes/No	____	________	________
8a	Yes/No	____	________	________
8b	Yes/No	____	________	________

Comments:

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....
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....
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....
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....

The following boxes and checklists are to support decision-making. Complete as appropriate given time and information constraints. Do not allow completing each check-box to inadvisably delay an RRT decision.

BOX 1 **IS DISPERSANT USE BEING CONSIDERED?**

Dispersant use should be considered if:

- ❐ Oil is likely to significantly impact birds, marine mammals, or other flora and fauna at the water surface
- ❐ Natural dispersion is limited
- ❐ Other response techniques are unlikely to be adequate, effective, or economical
- ❐ The oil could emulsify and form mousse or tar balls
- ❐ Oil is likely to significantly impact shorelines, structures and facilities (*e.g*., marinas, wharves)
- ❐ Oil is likely to significantly impact economically important resources (*e.g*., shellfish beds, tourist beaches)
- ❐ Other ……………………………………………………………………………………………………

Decision: Consider dispersant use?

❐ Yes Make notifications in **Box 1a**
Make notifications in **Box 1b**
❐ No Go to **Box 1c**

Make a note of the decision on Dispersant Use Checklist (Page II-10)

From Cawthron, 2000.

Discussion Note 1.1 **KEY BENEFITS OF DISPERSANT USE**

- Dispersant use minimizes the effects of an oil spill principally by dispersing oil before it reaches shorelines or sensitive areas (*e.g*.,wetlands, estuaries).
- Removing oil from the surface of the water reduces the potential for impacts to birds and marine mammals, and limits the action of wind on spill movement.
- Dispersants can prevent oil from sticking to solid surfaces, and enhance natural degradation.
- Dispersants can effectively treat large spills more quickly and inexpensively than most other response methods.
- Dispersants can be effective in rough water and strong currents where mechanical responses are limited.
- Effective dispersant responses can greatly reduce the quantity of oil requiring recovery and disposal.
- Dispersant use is often the only feasible response to spills that exceed mechanical response capabilities.
- Dispersant use does not generally limit other options, except oleophilic mechanical responses.
- Dispersed oil that cannot be mechanically recovered generally poses few significant environmental problems.

From Cawthron, 2000

BOX 1a **REQUEST SMART**

Immediately deploy USCG Strike Team SMART to the spill site if dispersant use is likely. Every attempt should be made by the FOSC and the Strike Team to implement the on-water component of the SMART monitoring protocols in every dispersant application. **Dispersant application should <u>not</u> be delayed should sea conditions, equipment failure, or other unavoidable circumstances preclude the positioning of monitoring equipment and personnel.** However, at a minimum, Tier 1 (visual) monitoring should occur by trained observers during any dispersant operations approved in accordance with the California Dispersant Plan. Tier 2 (on-site water column monitoring) and Tier 3 (fate and transport of the dispersed oil) SMART monitoring will be deployed as appropriate. Other information on monitoring dispersant effectiveness, including additional SMART background information, tools and report forms, is presented in **Appendices D-4 – D.8**.

Decision: Deploy SMART?

❐ Yes Use contact information in Appendix A. Go to **Box 1b**. **Estimated arrival time**: ____________
❐ No Note reason why not deployed. ………………………………………………………..……………
Go to **Box 1b** or **Box 1c** as appropriate.

Make a note of the decision on Dispersant Use Checklist (Page II-10)

BOX 1b **PLACE AERIAL WILDLIFE OBSERVERS ON STANDBY OR DEPLOY THEM TO IMPLEMENT THE *WILDLIFE SPOTTING PROTOCOLS***

Consider deploying trained wildlife spotters in initial spill overflight aircraft so that they can determine if the presence of marine animals in the spill or dispersant application zones could influence spray pattern decisions by the FOSC. The goal is to minimize over-spray onto unaffected animals. Wildlife spotters should use the forms and procedures given in the *Wildlife Spotting Protocols* (**Appendix E** and **Appendix D.9**). The FOSC will decide how subsequent and systematic wildlife spotting efforts can be safely conducted with the aerial resources available.

Decision: Notify/deploy aerial wildlife spotters?

❒ Yes Use wildlife spotter contact information in **Appendix E**. Go to **Box 2**.
❒ No Note reason why wildlife spotters not deployed ……………………………
…………………………………………………………………………………

Make a note of the decision on Dispersant Use Checklist (Page II-10)

Reconsider under **Box 8**.

BOX 1c **IMPLEMENT OTHER RESPONSE OPTIONS**

Consider all response options to identify which option, or combination of options, is most appropriate. The following options are described in the Area Contingency Plan (Section 1640) and the Regional Contingency Plan (Section 1007.05).

❒ No action other than monitoring
❒ Containment and recovery of oil at sea
❒ Clean-up of oil from shorelines
❒ *In situ* burning

From Cawthron, 2000

BOX 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?**

A NCP Product List may be found in **Appendix H**. Updated NCP Product Lists can be accessed via the EPA representative on the RRT (**Appendix A**), by calling the Emergency Response Division of the U.S. EPA (202-260-2342) OR ACCESSING THE Internet at http://www.epa.gov/oilspill/ncp/dsprsnts.htm

The State OSCA licensed dispersants may also be found in **Appendix H** , by calling the State OSPR representative on the RRT (**Appendix A**) or) or accessing the Internet at http://www.dfg.ca.gov/ospr/reg_com/osca.html

Decision: Can this oil be dispersed with an approved and available agent?

❒ Yes Go to **Box 3.**
❒ No Go to **Box 1c**

Make a note of the decision on Dispersant Use Checklist (Page II-10)

Taken in part from Cawthron,

Discussion Note 2.1 **OIL DISPERSIBILITY (Also see App. C.10 for Window of Opportunity)**

Three types of oils are typical of those produced or transported in California offshore waters: a) crude oils produced in California Outer Continental Shelf waters; b) oils imported from Alaska and foreign countries into California ports; and c) fuel oils that could be spilled from a variety of marine industrial activities (*e.g*., fuel tanks from ships, cargoes of small tankers). Dispersants only work if the spilled oil has a relatively low viscosity at the time of treatment.

Appendices C.1 and C.2 show the California platform-produced oils and tankered oils, respectively.

Most oils produced from offshore platforms are heavy, and border on the range of oils that are considered to be difficult or impossible to disperse. The oils transported by tanker (1999-2001 data) include two-three dozen different types of oil (only the most common are listed in Appendix C.2). The most important is Alaska North Slope crude, which represents 50% of each annual total. Based on API gravity information, these oils appear to be dispersible when fresh.

- The most important criterion for dispersant use is whether the oil is dispersible.
- The best indication of oil dispersiblity is from specific oil weathering and dispersion data from field trials.
- Potential dispersibility can be *estimated* from physical properties of oils, under different oil weathering and spill scenarios (*e.g*., ADIOS, Table 2.1 below). The ADIOS computer database predicts oil dispersion based on physical and chemical properties of spilled oil under specified spill conditions.
- Dispersant use should not be rejected exclusively on the basis of predictive models

Generally, if:

- Oil is able to spread on the water, it is likely to be dispersible.
- Viscosity is 2000 cSt, dispersion is probable.
- Viscosity is >2000 cSt, dispersion is possible.
- Viscosity is >5000 cSt, dispersion is possible with concentrated dispersant (*e.g*., Corexit 9500).
- Sea temperature is >10º C below oil pour point, dispersion is unlikely.

Potential dispersion may also be assessed using tables in Appendix C.

Limitations of predicting dispersion:

- Using generic values of viscosity and/or pour point to predict dispersion (*e.g*., ADIOS, Appendix tables C.3 and C.4) can underestimate the potential for oil to be dispersed.
- Most models are based on limited oil weathering, emulsification or dispersion data, therefore estimated windows of opportunity may be inaccurate.

Taken in part from Cawthron, 2000 and S.L. Ross, 2002

Table 2.1 **ADIOS (AUTOMATED DATA INQUIRY FOR OIL SPILLS) COMPUTER DATABASE**

Use the **DISPERSANT ASSESSMENT WORKSHEET** and the NOAA SSC (206-321-3320) for the information needed by ADIOS, or use the form below. The NOAA SSC should also be able to assist with ADIOS.

Copies of ADIOS are available from the NOAA website: http://response.restoration.noaa.gov/software/adios/adios.html

Oil/product name: _____________ Wind speed: _____________ (knots)
Amount spilled: _____________ (gal or bbl) Wave height: _____________ (m)
Type of release: Circle one Water temp.: _____________ (ºC)
❑ Instantaneous Water salinity: _____________ (ppt)
❑ Continuous

Important limitations on the use of ADIOS: ADIOS predicts dispersibility based on estimates of oil properties (including emulsification) under different conditions. As emulsification data are scarce, **predicted rates of dispersion may be different than actual rates of dispersion**. ADIOS is intended for use with floating oils only, and does not account for currents, beaching, or containment of oil. ADIOS is unreliable for very large or very small spills. It is also unreliable when using very high or very low wind speeds in modeling the spill.

BOX 3 **ARE OCEANOGRAPHIC AND/OR WEATHER CONDITIONS POTENTIALLY CONDUCIVE TO DISPERSANT USE?**

Does the available technical information indicate that the existing oceanographic (*e.g*., surface current direction and speed, wave and chop height) and weather (*e.g*., wind direction and speed, visibility, ceiling height) conditions are suitable for a successful dispersant application?

Use the following resources:

- ❒ Information on the DISPERSANT ASSESSMENT WORKSHEET
- ❒ Consultation with the NOAA Scientific Support Coordinator (206-321-3320)
- ❒ Information resources and web sites noted in **Appendix A**
- ❒ Information from aerial overflights
- ❒ Information from ADIOS

Decision: Are ocean and weather conditions suitable for a dispersants application?

❒ Yes Go to **Box 4**.
❒ No Go to **Box 1c**

Make a note of the decision on Dispersant Use Checklist (Page II-10)

BOX 4 **IS THE SPILLED OIL WITHIN 3 MILES FROM SHORE, A FEDERAL BOUNDARY OR WITHIN NMS BOUNDARIES?**

A full-page statewide nautical chart indicating the area three nautical miles from shore and the areas within National Marine Sanctuaries (Gulf of the Farallones, Cordell Banks, Monterey, Channel Islands) is in Chart 4.1 below. Regional charts, with dispersant approval zones noted, are in Appendix B.

Plot the position of the spill on the appropriate nautical chart, draw a circle around the spill source with a 10 nautical mile radius as a worst-case scenario for surface movement. Hash mark any area within the circle that is in waters 3 nautical miles from shore or within a National Marine Sanctuary. This is considered the dispersant operational area.

Decision: Is the spilled oil within an RRT Expedited Approval Required zone?

❒ Yes Go to **Box 5**.
❒ No Pre-Approval may apply. Go to **Box 4a**.

Make a note of the decision on Dispersant Use Checklist (Page II-10)

BOX 4a **PRE-APPROVAL MAY APPLY; REFER TO THE PRE-APPROVAL PROCESS.**

The request for dispersant use may not require a case-by-case RRT approval and may fall within the parameters of the pre-approval guidelines for the use of dispersants in RRT Regional IX. Review the Pre-Approval Guidelines and begin the pre-approval process if appropriate (see Section I).

NEW CHART FOR RRT EXPEDITED APPROVAL ZONES IS BEING DEVELOPED

BOX 5 **CAN DISPERSANT BE REASONABLY EXPECTED TO HAVE A NET ENVIRONMENTAL BENEFIT?**

Use the regional sensitive species and habitat information from the Net Environmental Benefit Analyses for each major coastal area in which dispersant use may have an impact.

Consider:

- ❒ The type and value of habitat potentially affected.
- ❒ The sensitivity of affected resources to oil, and to different oil response strategies.
- ❒ Natural recovery rates of affected species and habitats.
- ❒ Likely oil persistence and degradation rates with and without dispersant use.
- ❒ Potential oil toxicity on surface water species compared to water column and/or seafloor species.

Dispersant use is generally not appropriate in areas with limited water circulation and flushing, near aquaculture facilities, shellfish beds and fish-spawning grounds, and around seawater intakes.

Decision: Will the dispersant use have a net environmental benefit?

- ❒ Yes Go to **Box 6**.
- ❒ No Go to **Box 1c**.

Make a note of the decision on Dispersant Use Checklist (Page II-10)

Discussion Note 5.1 **ASSESSING NET ENVIRONMENTAL BENEFIT**

The most important question to answer is: **Will dispersant use significantly reduce the impact of the spilled oil**?

- Rapid decisions on use are essential as dispersant must be applied quickly to be effective.
- Decision-makers must consider the various environmental, social, economic, political and cultural factors unique to each spill.
- Tradeoffs will be necessary, as no response is likely to satisfy all parties and protect all resources. The ecological impacts of oil are generally longer-lasting and more persistent than most other impacts.
- Ecological effects will be due primarily to the spilled oil. Dispersant applied at recommended rates is unlikely to cause significant adverse effects, even in multiple applications.
- Oil dispersed into greater than 10m or water will quickly dilute to levels where acute toxic effects are unlikely.
- Few acute toxic effects have been reported for crude oil dispersed into less than 10m of well-flushed water.
- Small spills of light fuels seldom require dispersant use.

BOX 6 **CAN DISPERSANT BE APPLIED SAFELY FROM AN APPROPRIATE PLATFORM?**

Use the information in the **DISPERSANT ASSESSMENT WORKSHEET** to evaluate which application platform(s) will be most effective, given the following particular considerations:

- The amount of oil spilled;
- The location of the operational area;
- The volume of available dispersants;
- The timeframe in which the required equipment can be on-scene.

Assume for planning purposes that the weather information on the **DISPERSANT ASSESSMENT WORKSHEET** will remain the same during the timeframe in which this decision is operating. At the earliest opportunity, contact the NOAA SSC (206-321-3320) for more detailed and updated weather information, but do not delay this decision process for the NOAA SSC weather input. Weather information may also be available from resources noted in **Appendix A.** See **Appendix C** for specific information on dispersant application platforms.

Decision: Is there an appropriate application platform for a dispersant operation?

	Yes	(Type)	No
C-130/ADDS Pack	☐		☐
DC-4	☐		☐
Other large multi-engine airplane	☐	……………………	☐
Cessna AT-802	☐		☐
Other single-engine airplane	☐	…………………	☐
Helicopter	☐	…………………	☐
Work boat	☐	…………………	☐
	Go to **Box 7**		Go to **Box 6a**

Make a note of the decision on Dispersant Use Checklist (Page II-10)

Taken in part from Cawthron, 2000 and S.L. Ross, 2002

Discussion Note 6.1 **CURRENT LOGISTICS FOR A CALIFORNIA DISPERSANTS APPLICATION**

Use the information on the **DISPERSANT ASSESSMENT WORKSHEET** to consider the following:

- ❒ Is the selected dispersant available in the quantity needed?
- ❒ Can the estimated "window of opportunity" for getting the dispersant on the oil be met?
- ❒ Can the dispersant and application resources get to the spill scene on time?
- ❒ Will there be enough daylight hours for an effective dispersant application?

Refer to **Appendix C** for more specific regional dispersant resource information.

Discussion Note 6.2 **GENERAL SAFETY ISSUES**

- The FOSC is responsible for ensuring that health and safety requirements are adequately addressed during a response.
- Individuals should not engage in activities that they are not appropriately trained to perform.
- Individuals are expected to adhere to safety procedures appropriate to the conditions they are working under and/or are included in a dispersant-specific Site Safety Plan Annex.
- Vessel/aircraft operators are expected to define appropriate operational limits and safety and maintenance requirements for their craft.
- Vessels and response resources should be properly maintained and undergo proper decontamination procedures.
- Apply dispersants only if there is no significant risk to response personnel (*e.g*., ignition risk, operational hazards).
- Ensure the appropriate personal protective equipment (PPE) is available.
- Ensure that application aircraft and vessels remain within standard operating limits.
- Each person involved in a response is required to take personal responsibility for his or her safety. The FOSC may appoint a Safety Officer and request development of a specific Site Safety Plan Annex. Key safety aspects to be considered in the plan may include:

  - Physical hazards (e.g., waves, tides, unstable or slippery surfaces)
  - Heavy machinery and equipment
  - Chemical hazards (e.*g*., oil and dispersant exposure)
  - Atmospheric hazards (*e.g*., fumes, ignition risks)
  - Confined spaces\PPE
  - Nose
  - Fatigue
  - Heat/cold stress
  - Wildlife (bites/stings)
  - Cleanup facilities
  - Medical treatment

HUMAN SAFETY OVERRIDES ALL OTHER CONSIDERATIONS DURING A RESPONSE

From Cawthron, 2000

BOX 6a **DISPERSANT OPERATIONS ON WEATHER STANDBY**

Consult with appropriate RRT IX members (USCG/District 11 Co-Chair, EPA, DOI, DOC and OSPR (See **Appendix A** for contact information) to notify them that dispersants are being considered, but delayed due to weather.

Decision: Has the weather improved to the point where dispersants can be applied?

		Date	Time
❒ Yes	Go to **Box 7**	……….	……….
❒ No	Continue to **reassess** (until/unless time window for successful application closed) or Go to **Box 6b**	……….	……….

BOX 6b **WEATHER UNLIKELY TO IMPROVE OR SUITABLE RESPONSE RESOURCES NOT AVAILABLE**

There will be spill situations where dispersant use may be appropriate but weather conditions and available resources will not allow dispersants to get on the oil within the appropriate weather window. In these cases, dispersant use will need to be abandoned and other response options considered instead.

	Date	Time
Go to **Box1c**	……….	……….

BOX 7 DISPERSANT USE RECOMMENDATION FORWARDED BY THE FOSC TO THE RRT FOR REVIEW AND APPROVAL

Once the FOSC has completed as much as possible of the DISPERSANT ASSESSMENT WORKSHEET and the DISPERSANT USE CHECKLIST and completed the dispersant decision summary, the FOSC will forward a request, along with any other requested data, to the RRT via a phone conference. Based on the information provided, the RRT will provide an approval/disapproval decision for dispersant use within 2 hours of the request.

A dispersant use approval will be made with the concurrence of the U.S. Environmental Protection Agency and the U.S. Coast Guard representatives to the RRT and the State of California, and in consultation with the U.S. Department of Commerce and U.S. Department of the Interior natural resource trustees.

BOX 8 DISPERSANT USE APPROVED BY THE RRT

DISPERSANTS APPROVED FOR USE BY THE FOSC NEED TO BE APPLIED USING THESE RRT IX GUIDELINES AS WELL AS ANY CASE-SPECIFIC GUIDELINES ISSUED BY THE RRT AS PART OF THE APPROVAL:

- ❒ The SMART controller/observer should be over the spray site before the start of the operation. If possible, a DOI/DOC-approved marine mammal/turtle and pelagic/migratory birds observation specialist will accompany the SMART observer, but in any event, operations will not be delayed for these individuals.
- ❑ Dispersants cannot be applied to any diesel spill in the San Diego Area Contingency Plan area.
- ❒ Personnel protective equipment for personnel on-site will conform to the appropriate dispersant's Material Safety Data Sheet (MSDS).
- ❒ Dispersant application aircraft will maintain a minimum 1000-foot horizontal separation from rafting flocks of birds. Caution will be taken to avoid spraying over marine mammals and marine turtles (see Appendix A for resource agency contact information).
- ❒ If the dispersant application platform is a boat:
  - The following ASTM standards apply to systems involving spray arms or booms that extend over the edge of the boat and have fan-type nozzles that spray dispersant in a fixed pattern:
    - ASTM F 1413-92: Standard Guide for Oil Spill Dispersant Application Equipment: Boom and Nozzle Systems
    - ASTM F-1460-93: Standard Practice for Calibrating Oil Spill Dispersant Application Equipment Boom and Nozzle Systems
    - ASTM F 1737-96: Standard Guide for use of Oil Spill Dispersant Application Equipment During Spill Response: Boom and Nozzle Systems.
  - Boat-based systems using a fire monitor and/or fire nozzle shall avoid a straight and narrow "firestream" flow of dispersant directly into the oil. There are no applicable ASTM standards for these systems at this time (December 2003).

BOX 8a **INITIATE *PUBLIC COMMUNICATIONS PLAN***

Once a decision to use dispersants is made, it is critical that a public communications plans be implemented (**Appendix F**). The general public as well as stakeholders must be made aware of the decisions to utilize dispersants and a mechanism must be put into to for reliable and continuous updates (**Appendix F.3**).

An initial press conference should be held which outlines the decision to utilize dispersants, provides background and scientific information as well as any environmental and safety considerations. Press packet information can be found in **Appendix F.1**.

A town hall meeting should be scheduled as soon as to provide a mechanism for sharing of information as well as addressing public concerns and fears. **Appendix F.2** provides guidelines for preparation of a town hall meeting. Areas that must be adequately addressed include the following;

- Seafood tainting concerns posed by the use is dispersants (**Appendix G**).
- Risk communication (**Appendix F.2**)
- Net environmental benefit analysis conducted and species of special concern.
- Monitoring policies established for the spill.

BOX 8b **CONSULT SEAFOOD TAINTING PLAN**

- Refer to **Appendix G** for key points to consider regarding Seafood tainting, as well as information on accessing NOAA and State of California resources for assessing the tainting risk

BOX 9 **APPLY DISPERSANTS AND INFORM RRT**

❒ Using the information on estimated oil spill volume from the **DISPERSANT ASSESSMENT WORKSHEET** and Discussion Note 9.1 below to:

- Determine the dispersant application ratio (usually 1:20), and
- Calculate the volume of dispersant required (**Appendix D.1**).

❒ Record the details on the Dispersant Application Summary Form (**Appendix D.2**);
❒ Mobilize application team;
❒ If not already done, mobilize SMART. Some blank SMART forms are included in **Appendix D** for use by other trained professionals, if appropriate and when approved by the FOSC.
❒ Inform RRT (see **Appendix A** for contact information).

Decision: Dispersants applied?

❒ Yes Go to **Box 10**.
❒ No Explain.

Make a note of the decision on Dispersant Use Checklist (Page II-10)

In part from Cawthron, 2000

Discussion Note 9.1 **GENERAL APPLICATION INFORMATION**

- The FOSC has final responsibility for operational aspects of dispersant applications.
- Dispersant must only be applied by experienced spray applicators.
- Dispersant must be applied in accordance with manufacturer instructions, unless approved otherwise by the FOSC.
- The persons applying dispersant are responsible for the calibration and operation of the spraying system, and the safety and maintenance of the application platform.
- Droplet size is the key variable influencing dispersant effectiveness. Undersized droplets (*e.g*., fog or mist) will be lost through drift and evaporation. Oversized droplets will punch through the oil and be lost in the water column.
- Dispersants pre-diluted in water are less effective than undiluted dispersant.
- Only undiluted concentrate dispersant is applied from aircraft. Dispersant should, where possible, be applied into the wind and parallel with the slick.
- Dispersant should be applied in a methodical and continuous manner to ensure the entire target area is treated.
- Spraying effort should concentrate on the thickest sections, and/or the leading edges, of oil that threaten sensitive areas.
- Thick portions of the slick may require several applications.
- Oil sheen (oil less than approximately .001 inch or .02 mm thick) should not be sprayed with dispersant.

Regarding the relationship between Dispersant-to-Oil Ratio (DOR) and the concentration of oil being treated:

- Regardless of DOR ratios suggested by dispersant manufacturers, there are may factors that influence dispersibility (*e.g*., oil characteristics, degree of weathering, water salinity, sea state) that may make it very difficult for any "user" to select an appropriate DOR for the conditions faced on the day of a specific spill
- he variability of slick thickness (or oil concentration) is such that one can never really characterize the actual oil concentration for more than a few seconds within the speed and swath constraints of a particular application system.
- With most application systems, one is usually overdosing and underdosing as the system moves through light, heavy and sometimes "no" oil on the water surface.
- The best estimate of the average oil thickness (or average volume of oil per unit are) must be used.
- Crude oil that is dark in color and thick enough to merit any response is generally between .001 inch (.017 mm) thick and .01 inch (0.25 mm). Crude oil emulsion begins to form at .01 inch (0.25 mm), and tar balls at .1 inch (2 mm). See Appendix D.1 for more information.
- Given that precise spray parameters are extremely difficult to achieve, dispersant applicators generally use about 5 gallons of dispersant per acre on their first run. This is a "middle-of-the-road" concentration in most situations of 2 to 3 barrels of oil per acre (or ~ 100 gallons per acre) following the initial rapid spreading phase. With a common accepted DOR of 1:20, the recommended dosage would be 1/20 x 100, or 5 gallons of dispersant per acre.
- Area, volume and thickness can be related with the following expression:

$$\mathbf{10^4 \times Area\ (hectare) \times Thickness\ (mm) = Volume\ (liters)}$$

or

$$\mathbf{Volume\ (liters/Area\ (hectares) = 10^4 \times Thickness\ (mm)}$$

►To convert liters/hectare to gallons/acre, multiply by 0.107
►To convert liters/hectare to gallons/square kilometer, multiply by 26.42

►These values (in any units) multiplied by the DOR (as a fraction, e.g., 1:5 = 1/5 or .2) will then yield the Desired Dosage (in those units) for that value of DOR.

- Refer to **Appendix D.1** for some pre-calculated values.

From Cawthron, 2000 and Al Allen (Spilltec), 2003 personal communication

Discussion Note 9.2 **AERIAL APPLICATION**

This general aerial application guide is intended simply to highlight key issues. The FOSC will coordinate and oversee operational aspects of aerial dispersant applications.

- Aircraft applications should always include pump driven spray units.
- Dispersant droplet size should be between 400 and 1000 microns.
- Commercial aircraft spray nozzles generally range between 350 and 700 microns.
- 1000 micron spray nozzles may be needed for use on viscous oils.
- Nozzles should achieve an application rate of between 5.3 gallons per acre (1:20 ratio)
- Spray nozzles should be installed to discharge directly aft.
- Underslung buckets on helicopters should be mounted so the pilot can see the ends of the spray booms in flight.
- The altitude of the aircraft should be as low as possible.

From Cawthron, 2000

Discussion Note 9.3 **BOAT APPLICATION**

- Spray booms should be mounted as far forward as possible t prevent oil being moved aside by the bow wave before being sprayed. This then utilizes the mixing energy of the bow wave to break up the oil.
- Spraying systems should be set so that the spray pattern is flat, striking the water in a line perpendicular to the direction of the boat's travel.
- The fan-shaped sprays from adjacent nozzles should be set as low as possible, overlapping just above the oil/water surface, with the inboard spray striking the hull just above the waterline.

Undiluted dispersants

- Air blast sprayers and modified spray pumps can be used to apply undiluted concentrated dispersants and conventional dispersants.
- Treatment rate is usually constant and determined by nozzle size and spray pressure.
- Calibration and use of an appropriate droplet size is critical toe effective applications.

Pre-diluted dispersants

- Concentrated dispersants can be applied after pre-dilution in seawater, but will be less effective.
- The dispersant : water ratio should be equal to, or greater than, 10%
- Applications through ship's fire-fighting equipment are controlled by opening or closing the dispersant supply. Vessel speed is used to control the treatment rate.
- Dual pump systems for dispersant and seawater supplying spray booms allow the dilution rate to be adjusted.
- Boat speed is the main determinant of dispersant dose rate (reduce boat speed to increase the dose rate).
- Boat speed should be in the order of 5 knots for fresh spills of liquid crude or fuel oil, which assumes that the oil has spread to 0.1 mm thick.
- With reduced boat speeds, the required application rate per acre or km^2 can be maintained by reducing pump speed.

From Cawthron, 2000

BOX 10 ARE THERE INDICTIONS THE DISPERSANT IS EFFECTIVE?

- ❑ Acquire information from dispersant monitoring team (SMART team or other FOSC-designated monitors).
- ❑ Review dispersant monitoring results after each dispersant application.
- ❑ Determine if dispersant application is effective.
- ❑ Determine if chemical dispersion is significantly greater than natural dispersion.
- ❑ Assess whether changing application parameters could make the application more effective.

Decision: Is the dispersant effective?

- ❑ Yes Go to **Box 11**
- ❑ No See Discussion Note 10.2 and return to **Box 9**, or Go to **Box 12**

Make a note of the decision on Dispersant Use Checklist (Page II-10)

From Cawthron, 2000

Discussion Note 10.1 ASSESSING DISPERANT EFFECTIVENESS

- Dispersant applications must be monitored to confirm whether or not dispersant use is effective, and to determine the fate and transport of treated oil.
- Dispersant applications should not be delayed simply because monitoring is not in place.
- Visual observation is the minimum level of monitoring. Observations teams may use the forms in **Appendix D**.
- There will be very few instances where a dispersant application is possible but visual monitoring is not.
- Because dispersed oil plumes are often highly irregular in shape and thickness, it can be difficult to accurately estimate dispersant efficiency.
- The appropriate dispersant application dose depends on the oil thickness (see **Appendix D.1** for common dose rates based on oil thickness). Slicks are generally not of uniform thickness, and it is not always possible to distinguish among thicker and thinner portions of the same slick. It is therefore possible to apply too much or too little dispersant to some parts of a slick. Because over- and under-dosing can lead to variations in effectiveness, these variations should be noted.
- On-site monitoring of oil dispersed in the water column should support visual monitoring whenever possible. See **Appendix D** for additional information and forms.
- Decisions to terminate operations due to poor effectiveness should ideally be based on on-site monitoring results.
- A visible coffee-colored cloud in the water column indicates the dispersant is working.
- A milky-white plume in the water column can indicate excessive dispersant application.
- When dispersant is working, oil remaining on the water surface may also change color.
- A difference in the appearance of treated and untreated slicks indicates dispersion is likely.
- Absence of a visible cloud in the water column makes it difficult to determine whether the dispersant is working. When the water is turbid, you may not be able to see a plume. Oil remaining at the surface and sheens can also obscure an ability to see oil dispersing under the slick.
- Successful dispersion can occur with no visible indication of dispersion.
- A subsurface plume may not form instantly once dispersant has been applied. In some cases (*e.g.*, emulsified oil) it can take several hours for a plume to form. In other cases, a visible plume may not form, and you may wish to use sampling to learn whether dispersion has occurred.
- Boat wakes may physically part oil, falsely indicating successful dispersion. Mechanically dispersed oil will re-coalesce and float to the surface.
- Dispersants sometimes have a herding effect on oil after initial applications, making a slick appear to be shrinking when, in fact, the dispersant is "pushing" the oil together. The effect results from the surfactants in the dispersant, which causes a horizontal spreading of thin oil films. This can cause parts of a slick to seem to disappear from the sea surface for a short time.

From Cawthron 2000 and NOAA Oil Spill Job Aids

Discussion Note 10.2 **WHEN DISPERSANT IS NOT EFFECTIVE**

If monitoring shows dispersion does not appear effective, review all aspects of the application and monitoring for possible reasons why. Aspects to consider include:

- Dispersant formulation
- Application rations (increase or decrease oil: dispersant ratio)
- Application methods
- Monitoring methods
- Interpretation of monitoring results
- Oil weathering
- Weather conditions

From Cawthron, 2000

BOX 11 **IS ONGOING DISPERSANT USE JUSTIFIED AND SAFE?**

All of the following must apply to justify ongoing dispersant use:

- ❑ The spill can be chemically dispersed with an approved and available agent (see **Box 2** and **Appendix H**);
- ❑ Oceanographic and weather conditions are potentially conducive to dispersant use (see **Box 3** and DISPERSANT ASSESSMENT WORKSHEET);
- ❑ The dispersant will have a net environmental benefit (see **Box 5**);
- ❑ The dispersant can be applied safely (see **Box 6**), with suitable weather (**Box 6a**) and available resources (**Box 6b**);
- ❑ The dispersant is effective (see **Box 10**).

Decision: Continue with dispersant use?

- ❑ Yes Go to **Box 9**
- ❑ No Go to Box 12

There will be a point when dispersants are no longer effective.

BOX 12 **DO NOT USE DISPERSANT**

Dispersants should not be used if **any** of the following apply:

- ❑ The spill cannot be chemically dispersed with an approved and available agent (see **Box 2** and);
- ❑ Oceanographic and weather conditions are not potentially conducive to dispersant use (see **Box 3** and DISPERSANT ASSESSMENT WORKSHEET);
- ❑ The dispersant will not have a net environmental benefit (see **Box 5**);
- ❑ The dispersant cannot be applied safely (see **Box 6**), with suitable weather (**Box 6a**) or available resources (**Box 6b**);
- ❑ The dispersant is not significantly more effective than natural dispersion or other response options (see **Box 10**).

IF DISPERSANT USE IS CONSIDERED INAPPROPRATE, CONSIDER OTHER RESPONSE OPTIONS.

DISPERSANT EXPEDITED APPROVAL REQUEST
RECORD OF DECISION

Subpart J of the National Contingency Plan (NCP) provides that the FOSC, with the concurrence of the EPA representative to the Regional Response Team and the State with jurisdiction over the navigable waters threatened by the oil discharge, and in consultation with the U.S. Department of Commerce (DOC) and U.S. Department of the Interior (DOI) natural resource trustees, when practicable, may authorize the use of dispersants on oil discharges; provided, however, that such dispersants are listed on the NCP Product Schedule. The EPA has been delegated authority to maintain a schedule of chemical countermeasures that may be authorized for oil discharges in accordance with procedures set forth in Section 300.900 of the NCP.

The Region IX, Regional Response Team has established dispersant expedited approval zones within waters of the State, any waters within a marine sanctuary waters and all waters within three miles of landfall. Any dispersant use within these zones requires that the designated Federal On-Scene Coordinator request approval by the RRT. For purposes of this record of decision, the designated FOSC has completed the "Expedited Dispersant Use Checklist" and has determined that the oil spill, *Name of Oil Spill Incident,* meets the criteria outlined within the checklist and formally requests a dispersant use decision from the RRT.

________________	________________
Federal On-Scene Coordinator United States Coast Guard	Date

California statute requires that emergency response operations utilize the Incident Command System. For marine oil spill response, a joint Unified Command Structure is implemented consisting of the Federal On-Scene Coordinator, the State On-Scene Coordinator and the Response Party and outlined in the Memorandum of Understanding between the United States Coast Guard and the California Department of Fish and Game, Office of Spill Prevention and Response. For purposes of this record of decision, request for the use of dispersants is formally requested by FOSC and the dispersant use checklist was completed within a Unified Command Structure and agreed upon by the State On-Scene Coordinator and the representative of the Responsible Party.

____________________________	____________________________
State On-Scene Coordinator Office of Spill Prevention and Response State of California	Responsible Party Representative
________________	________________
Date	Date

REFERENCES CITED

Etkin, Dagmar Schmidt. 1999. Oil Spill Dispersants: From Technology to Policy. Cutter Information Corp, Arlington, MA.

ExxonMobil Dispersant Guidelines. 2000. ExxonMobil Research and Engineering Company.

Mearns, A.J. & R.Yender, 1997. A summary of a NOAA workshop on management of seafood issues during an oil spill response. Proc. Arctic and Marine Oil Spill Program Technical Seminar. Environment Canada, Vancouver, pp. 203-214.

Reilly, T.I. and R.K York. 2001. Guidance on Sensory Testing and Monitoring of Seafood for Presence of Petroleum Taint Following an Oil Spill. NOAA Technical Memorandum NOS OR&R 9.107pp.

Ross, S.L. 2002. Assessment of the Use of Dispersants on Oil Spills in California Marine Waters. S.L. Ross Environmental Research, Ltd. for Minerals Management Service, Herndon, VA.

State of California, Office of Emergency Services. 2001. Risk communication Guide for State and Local Agencies. 17pp.

Stevens, Leigh. 2000. Oil Spill Dispersants: Guidelines for use in New Zealand. Prepared for Maritime Safety Authority of New Zealand.

Wildlife Response Plan Appendices of the California Area Contingency Plan. Version 2, October 2003.

Yender,R., J. Michel, and C. Lord. 2002. Managing Seafood Safety After an Oil Spill Seattle: Hazardous Materials Response Division., Office of Response and Restoration, National Oceanic and Atmospheric Administration. 72 pp.

Resources from Internet World Wide Web sites:

NOAA Oil Spill Job Aids	http://response.restoration.noaa.gov/job_aid/glossary.html
(web links of 12/18/03)	http://resposne.restoration.noaa.gov/oilaids/spiltool
	http://response.restoration.noaa.gov/disp_aid/remember.html
	http://response.restoration.noaa.gov/disp_aid/checklist.html
	http://response.restoration.noaa.gov/oilaids/OilatSea.pdf
	http://response.restoration.noaa.gov//oilaids/SMART/SMART.html

APPENDIX A

CONTACT NUMBERS AND RELEVANT WEB SITES

A.1 Agencies and Institutions

	Web Address	Phone
To Report Marine Pollution/Spills		800-424-8802
California Office of Emergency Services		800-852-7550
U.S. Coast Guard		
Marine Safety Offices		
San Francisco	http://homeport.uscg.mil/sanfrancisco	510-437-2956
Los Angeles-Long Beach	http://homeport.uscg.mil/lalb	310-732-2000
San Diego	http://homeport.uscg.mil/sandiego	619-683-6500
Weather and surf		619-289-1212
National Oceanic and Atmospheric Administration & NOAA National Weather Service		
Scientific Support Coordinator for California (Jordan Stout)		206-321-3320
Pager		800-759-8888 pin 5798818
Mobile		206-321-3320
Ocean Prediction Center	http://www.opc.ncep.noaa.gov or http://tidesandcurrents.noaa.gov/	
Tide Predictions and Coastal Water Temperature Guide	http://tidesandcurrents.noaa.gov/	
Nautical Charts	http://www.nauticalcharts.noaa.gov	
Physical, Chemical and Geological Ocean Data	http://www.ngdc.noaa.gov or http://www.ncddc.noaa.gov	
NOAA Trajectories, ESI maps, Job aids, etc.	http://response.restoration.noaa.gov	
National Weather Service – Local Offices and Forecasts		
Eureka	http://www.wrh.noaa.gov/eka/	707-443-6484
SF/Monterey	http://www.wrh.noaa.gov/mtr	831-656-1725
Oxnard/Los Angeles	http://www.nwsla.noaa.gov/buoy.html	805-988-6610
San Diego	http://www.wrh.noaa.gov/sgx	858-675-8700

APPENDIX A, continued

	Web Address	Phone
Other Measured Currents and Wind Data Sources		
UC San Diego	http://sdcoos.org/index.php	
Scripps	http://facs.scripps.edu/surf/weatherbody.html	
Regional Response Team (Region 9)	http://www.rrt9.nrt.org/ (tentatively will change in 2009)	
Coast Guard:	http://www.uscg.mil/D11/	
Command Center		510-437-3700
Captain Douglas Kaup: (RRT 9 Co-Chair)		510-437-5754
Susan Krala: Coast Guard RRT Coordinator		
Environmental Protection Agency:		
Daniel Meer (RRT 9 Co-Chair)		415-972-3132
Kay Lawrence (EPA alternate)		
Bill Robberson (EPA RRT Coordinator)		415-972-3072
Pager		800-759-8888 pin 2832870
Department of Interior:	http://www.doi.gov/	
Patricia Port (DOI representative)		510-817-1476
John Perez (alternate)		510-817-1477
Department of Commerce:	http://response.restoration.noaa.gov/	
Jordan Stout (primary representative)		206-321-3320
Doug Helton (alternate)		206-890-7760
State Office of Spill Prevention and Response	http://www.dfg.ca.gov/ospr/	
Yvonne Addassi (primary representative – Marine)		916-324-7626
Office		916-864-4906
Mobile		916-956-1162
National Marine Sanctuaries		
Channel Islands	http://channelislands.noaa.gov/	
24-hour pager		877-982-2617
Sanctuary Office		805- 966-7107
Ben Waltenberger		805-729-3082
Chris Mobley, Sanctuary Superintendent		805-259-6540
Andrea Hrusovsky		805-729-2388

APPENDIX A, continued

	Web Address	Phone
Monterey Bay	http://montereybay.noaa.gov/	
24-hr pager		888-902-2778
Main office phone		831-647-4201
Gulf of the Farallones & Cordell Bank	http://farallones.noaa.gov/	
Main office phone		415-561-6622
Superintendent: Maria Brown		415-561-6622 x 301
NMS Washington, D.C.		
Lisa Symons (pager)		800-218-1232

RRT10 – Contact through the Command Center 206-220-7001.

California Department of Health Services http://www.dhs.ca.gov/home/contactinfo/programcontacts.html

Division of Drinking Water and Environmental Management	916-449-5577
Environmental Health Investigations Branch	510-622-4500

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ATTACHMENT K-3

DISPERSANT EFFICACY LAB TESTING

BETA & EMMY CRUDES

JULY, 2004

In July 2004, Aera Energy LLC ("Aera") had dispersant efficacy testing conducted on our offshore California crudes, using both Corexit 9527 and 9500. Mr. Kenneth Becker, retired Exxon/Nalco laboratory chemist who now runs his own laboratory, was recommended by Exxon/Nalco as an expert in this analysis.

Summary of Test Results

Mr. Becker's report stated the following:

> "Dispersibility tests were conducted on Beta, Beta San Pedro Pipeline, and Emmy crude oils using dispersants Corexit 9500 and 9527 at a 1:20 dispersant to oil ratio (DOR). Corexit 9500 was more effective on the Beta and Beta San Pedro Bay Pipeline oils (performance classification of Good). Corexit 9527 was best on the Emmy crude oil, its performance classified as Excellent".

(As of approximately 2011, Corexit 9527 is no longer being used or available for use)

DISPERSANT TEST PROCEDURE

EXDET
"OIL SPILL DISPERSANT PERFORMANCE TEST"

This test is designed to simulate the effectiveness of various oil spill dispersants in actual sea conditions on a specific crude or a range of crude oils. The salinity of the water, the dispersant-to-oil ratio, and the speed of shaking can all be varied to match specific local environmental conditions.

EQUIPMENT AND SUPPLIES*

- Four standard 250 mL glass separatory funnels (Kimble 29048-250 or VWR 30352-062) The 250 mL line should be approximately at the widepoint of the flask. (Funnels of about 8" from neck base to stopcock should be used. **Do not** use the shorter "squatty" separatory funnels). Each funnel must be stoppered to prevent contents from splashing out.
- Four standard 500 mL separatory funnels with glass stoppers. (Kimble 29048-500 or VWR 30352-084)
- Glass syringes, 1 mL and 5 mL, w/o needles (BD 5292 and BD 5293)
- Positive displacement pipette, 1000 microliters, (Digital micro-dispensers, positive displacement operation)
- Spectrophotometer (Spectronic 21 or better), and adequate supply of appropriately matched sample tubes.
- Chloroform (or methylene chloride), for extraction. Certified Optima spectrophotometer quality.
- Sea water or other brines, as needed. (Sea Salt ASTM D-1141-52, Lake Products Co., Maryland Hts., Missouri, recommended for artificial sea water)
- Sorbent pads, e.g., 3M, cut in 1.5 x 1.5 inch pieces.
- Bottletop dispenser, 50 mL (Brinkman 50-10-050-2 or VWR 53519-825). Desirable for dispensing aliquots of chloroform when many tests are being run. (optional)
- Burrell Wrist-Action Shaker, Model 75 (VWR 57040-049, 110V and 230V available) with arms holding 4 clamps on each side (total of 8). For convenience, and since timing is important, it is best to use only the 4 front clamps. Add packing between separatory funnel and clamp to assure funnels remain upright and tightly secured.

*Part manufacturer and VWR catalog numbers are provided for reference

Crude Oil Dispersion
EXDET Procedure, Direct Add
Aera Energy LLC
Huntington Beach, CA

Beta Crude Oil, Platform Ellen

Product	DOR	Water	Temp., F	% Oil Dispersed	Ave.
1. Corexit 9500	1 : 20	Sea	72 – 74	68	
2. “	“	“	“	69	63
3. “	“	“	“	47	
4. “	“	“	“	66	
5. Corexit 9527	1: 20	“	“	66	
6. “	“	“	“	53	56
7. “	“	“	“	40	
8. “	“	“	“	64	

Conclusion: Dispersibility of crude oil sample Beta at a DOR of 1:20 is classified as “ good “ with Corexit 9500 and as “ average “ with Corexit 9527.

Notes:

1. The EXDET procedure was developed in 1989 and has since been used to evaluate dispersant effectiveness and to determine if specific crude oils and fuels are dispersible. These data assist in the development of a spill contingency plan and response capability.

2. DOR – Dispersant to Oil Ratio

3. Direct Addition – Dispersant added to the surface of the oil on water.

Evaluation Criteria

% Oil Dispersed	Dispersability Classification
80% plus	Excellent
60 to 79	Good
45 to 59	Average
30 to 44	Poor
0 to 29	unsatisfactory

Crude Oil Dispersion
EXDET Procedure, Direct Add
Aera Energy LLC
Huntington Beach, CA
Beta San Pedro Bay Pipeline* Crude Oil

Product	DOR	Water	Temp., F	% Oil Dispersed	Ave.
1. Corexit 9500	1 : 20	Sea	72 – 74	66	
2. “	“	“	“	49	60
3. “	“	“	“	62	
4. “	“	“	“	62	
5. Corexit 9527	1: 20	“	“	57	
6. “	“	“	“	46	54
7. “	“	“	“	54	
8. “	“	“	“	60	

Conclusion: Dispersibility of crude oil sample Beta + Edith at a DOR of 1:20 is classified as “ good “ with Corexit 9500 and as “ average “ with Corexit 9527.

Evaluation Criteria

% Oil Dispersed	Dispersability Classification
80% plus	Excellent
60 to 79	Good
45 to 59	Average
30 to 44	Poor
0 to 29	unsatisfactory

Notes:

1. The EXDET procedure was developed in 1989 and has since been used to evaluate dispersant effectiveness and to determine if specific crude oils and fuels are dispersible. These data assist in the development of a spill contingency plan and response capability.
2. DOR – Dispersant to Oil Ratio
3. Direct Addition – Dispersant added to the surface of the oil on water.

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ATTACHMENT K-4

MSRC

RESPONSE TIMES

MSRC Equipment Response Times

Equipment response times for OSRV's and FRB's are based on established speeds of 10 and 20 knots respectively. Adverse weather conditions are not considered in these estimates and may add additional response time. After normal working hours, 1 and 2 hours additional response time is required to mobilize personnel (except for the California Responder which is manned around the clock). The response time for location inside Long Beach Harbor and to the Pilot Station is approximately 45 minutes.

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L.1 INTRODUCTION

A number of sensitive and unique marine and coastal habitats occur in the Southern California coastal area that could be affected by a spill event. These resources are recognized with respect to their economic and cultural importance, and their environmental sensitivity by governmental agencies.

L.2 ENVIRONMENTALLY SENSITIVE AREAS (LA/LB Area Contingency Plan Section 9841 for LA County and 9842 for Orange County).

Environmentally sensitive resources include:

- Shoreline types and associated marine resources.
- Presence of migratory and resident marine birds.
- Mammal migration routes and breeding, nursery, stopover, haul-out, and population concentration areas by season.
- Presence of aquatic resources.
- Presence of natural terrestrial animals, and plant resources in marine associated environments.
- Presence of state/federal-listed rare, threatened or endangered species.
- Commercial and recreational fisheries including aquaculture sites, kelp leases, and other harvest areas.

Sensitive resources are identified and/or mapped in the following documents:

- Area Contingency Plan (ACP) for Los Angeles/Long Beach (Southern sector) 2011.

The Company maintains copies of these documents in electronic format and in the corporate office command post.

Sensitive resources are identified on ACP maps (Section 9841 for LA County and 9842 for Orange County). The area of potential impact is ACP Area 5 LA/Orange County.

Sensitive areas are mapped and prioritized (Codes A, B, and C) according to an environmental sensitivity ranking. A Site Summary Sheet is provided for each sensitive site and includes information on:

- Location: U.S.G.S. quad, longitude and latitude
- Physical features
- Access
- Seasonal concerns
- Resources of primary concern
- Trustee Agency/Local Expert contacts

A second sheet for each sensitive area, the Site Strategy Sheet, specifically addresses protection, containment, and cleanup strategies, including recommended techniques, equipment considerations, and access and logistics information.

Coastal Operational Divisions are presented in the ACP as front-loaded information to assist in rapid response planning to provide for quickly organized operational objectives and assignments along affected shorelines. The operational divisions have been developed in conjunction with the US Coast Guard, California Department of Fish and Wildlife - OSPR, and various Oil Spill Response Organizations. Experience has demonstrated that in the earliest stages of spill response, having organizational issues such as this prepared in advance is very useful to the response team.

The coastal operational divisions are organized around County boundaries and logical geo-political features such as coastal physical characteristics and land ownership/management issues combined with an attempt to provide for manageable sized coastline segments generally about ten miles in length, although some variation may occur. Divisions can be easily subdivided (as necessary) by the Operations Section management to provide for appropriate work assignment effort. Coastal operational divisions are labeled from north to south in each County using a single alpha character (A to Z). It is recommended that offshore operational divisions be identified with double alpha characters (AA to ZZ) to distinguish them.

A cross reference and maps for the sensitive sites listed in the ACP maps is provided in Table L-1.

Table L-1. Environmentally Sensitive Areas.

ACP Area 5 Sensitive Sites		
Sensitivity	**Site No.**	**Sensitive Site Name**
A	5-210-A	Cabrillo Beach Wetlands
A/C	5-220-A/C	Los Angeles Harbor Breakwater
A/C	5-230-A/C	Middle Breakwater
A/C	5-240-A/C	Long Beach Harbor Breakwater
A	5-250-A	Golden Shore Marine Reserve
A/C	5-260-A/C	Alamitos Bay/Los Cerritos Wetlands
A	5-310-A	Anaheim Bay (Seal Beach National Wildlife Refuge)
A	5-320-A	Bolsa Chica
A	5-325-A	Bolsa Chica – Restored Wetlands
A	5-330-A	Talbert Marsh
A	5-340-A	Newport Slough Wetland
A	5-350-A	Santa Ana River
A	5-360-A	Lower Newport Bay
A	5-365-A	Upper Newport Bay
A	5-370-A	Aliso Creek
A	5-380-A	Dana Point
A/C	5-385-A/C	Dana Point Breakwater
A	5-390-A	San Juan Creek

Using OSPR maps, sensitive areas are mapped and prioritized (Codes A, B, and C) according to an environmental sensitivity ranking. A Site Summary Sheet is provided for each sensitive site and includes information on the sites:

- Location: U.S.G.S. quad, longitude and latitude
- Physical features

- Access
- Seasonal concerns
- Resources of primary concern
- Trustee Agency/Local Expert contacts

A second sheet for each sensitive area, the Site Strategy Sheet, specifically addresses protection, containment, and cleanup strategies, including recommended techniques, equipment considerations, and access and logistics information.

Natural resources of concern in the Beta Unit Complex coastal area are summarized in Table L-2.

L.3 ECONOMIC AND CULTURAL RESOURCES (ACP 2011, Sections 9841.2 and 9841.3)

Economic and cultural resources include:

- Public beaches, parks, marinas, boat ramps, and diving areas
- Industrial and drinking water intakes, power plants, salt pond intakes
- Offshore oil and gas leases and associated drilling platforms
- Historical/archaeological sites
- Areas of cultural or economic significance to Native Americans
- Major waterways and vessel traffic patterns that are likely to be impacted

The ACP contains a discussion of economically significant areas in a similar fashion as addressed for environmentally sensitive areas in Section L.2. Priority ranking codes D, E, and F are used to signify lower priorities for protection.

Table L-2. Inventory of Potentially Affected Coastal Natural Resources.

INVENTORY OF POTENTIALLY AFFECTED COASTAL NATURAL RESOURCES	
Marine Mammals Harbor Seal California Sea Lion ***Mammals*** Salt Marsh Harvest Mouse (SE,FE) Pacific Pocket Mouse (FE) ***Seabirds*** Brown Pelican (SE, FE) California Least Tern (SE, FE) Western Snowy Plover (FT) California Black Rail (ST) Light-Footed Clapper Rail (SE, FE) Belding’s Savannah Sparrow (SE) Peregrine Falcon (SE) Black Skimmer ***Fin Fish*** California Barracuda White Sea Bass Yellowtail Halibut (nursery) Corbina (nursery) White Croaker Bonita Jack Mackerel Thresher Shark Northern Anchovy (bait fish) Corbina	***Shellfish*** Spiny Lobster (commercial fishery) Crab (commercial fishery) Red Rock Shrimp Abalone (commercial fishery) ***Habitat/Reserves*** Abalone Cove Ecological Reserve Point Fermin Marine Life Refuge Anaheim Bay Bolsa Chica Ecological Preserve Huntington Beach Wetlands Upper Newport Bay Newport Beach Marine Life Refuge Irvine Coast Marine Life Refuge Laguna Beach Marine Life Refuge Heisler Park Ecological Reserve Corona del Mar (ASBS) Crystal Cove (ASBS) Laguna Beach, Recreation Point (ASBS) Dana Point Marine Life Refuge Niguel Marine Life Refuge San Juan Creek South Laguna Marine Life Refuge Eelgrass Wetland Creek and River Mouths
Sources: *CCWRRM, ACP, OSPR Guidance Documents, CDFW CA Natural Diversity Database* *Key: SE: State Endangered; FE: Federal Endangered; ST: State Threatened; FT: Federal Threatened*	

The coastal economic resources that may be affected, along with the appropriate priority ranking code for each resource, are summarized in Table L-3. Further information can be obtained from the ACP, Sections 4620, 4622, and 4623.

Table L-3. Inventory of Potentially Affected Coastal Economic Resources.

INVENTORY OF POTENTIALLY AFFECTED COASTAL ECONOMIC RESOURCES	
***Mariculture Areas – D*[1]**	***Marine Services & Commercial Fishing – E*[1]**
Newport Bay/Balboa Beach	Los Angeles Harbor (various wharfs & marinas)
Corona Del Mar Kelp Lease Area	Long Beach Harbor (various wharfs & marinas)
Laguna Beach Kelp Lease Area	
South Laguna Kelp Lease Area	***Long Beach***
Mussel Point Kelp Lease Area	Downtown Marina
	Shoreline Marina
***Parks – E*[1]**	Alamitos Bay Marina
Palos Verdes Shoreline Park	Anaheim Bay
Abalone Cove Beach	Huntington Harbor
Royal Palms State Beach	Newport Bay
Friendship County Regional Park	Several Commercial Fisheries
Point Fermin Park and Lighthouse	
Lookout Point Park	***Tourist Areas – F*[1]**
Cabrillo Beach	Los Angeles International Hostel
Shoreline Park	Cabrillo Fishing Pier
Long Beach City Beach	Cabrillo Marine Museum
Bixby Park	Ports O' Call Village
Bluff Park	John S. Gibson Jr. Park
Belmont Shore	Catalina Terminal
Alamitos Peninsula	Queen Mary
Alamitos Bay Beach	Queensway Bay
Naples	Terminal for Long Beach/Catalina Cruises
Marine Park	Long Beach Waterfront
Seal Beach	Belmont Pier
Surfside Beach	Seal Beach
Trinidad Island	Seal Beach Pier
Sunset Aquatic Regional Park	Sunset Beach
Bolsa Chica State Beach	Huntington Beach
Huntington City Beach	Colonial Inn Hostel
Huntington State Beach	Huntington Beach Internat'l Surfing Museum
Santa Ana River County Beach	Huntington Pier
Parks – E*[1] *(continued)	***Tourist Areas – F*[1] *(continued)***
Newport Beach	Newport Beach and Pier
Bayside Drive County Beach	Balboa Beach and Pier
China Cove Beach	West Jetty View Park

Table L-3. Inventory of Potentially Affected Coastal Economic Resources.

INVENTORY OF POTENTIALLY AFFECTED COASTAL ECONOMIC RESOURCES	
Rocky Point Corona Del Mar State & City Beach Little Corona Beach Crystal Cove State Park Crescent Bay Point Park Laguna Main Beach Ruby Street Viewpoint Aliso County Beach	Balboa Pavilion Corona Del Mar Laguna Beach South Laguna ***Cultural Resources*** None identified (a cultural resources specialist would advise the spill response team as necessary)
Sources: *ACP, OSPR Guidance Documents*	

[1]**Priority Rankings:**

D = Economic activities and resources which require high water quality for their operation or existence.

E = Facilities, businesses, or resources which directly use coastal or bay waters within their economic activity and which are at risk of oiling from a spill in marine waters.

F = Marine-associated facilities, businesses, and resources.

This Plan does not attempt to identify the location of sites or areas of importance to Native Americans. Many coastal areas of significance to Native Americans are known or have been identified in the public literature; however, some are often confidential. Many confidential locations are held at regional Information Centers throughout the state and by local Native American organizations. There are numerous public agencies and individuals that should be contacted during a significant oil spill incident. Refer to the ACP, Section 9841.2 (LA County) and Section 9842.2 (Orange County) for the contact lists.

L.4 WILDLIFE CARE AND REHABILITATION

L.4.1 Introduction

The protection, rescue, and rehabilitation of wildlife which are or may be endangered by a release of oil to the environment is a high-priority issue during the development and implementation of spill response procedures. Information on wildlife response is contained in the Wildlife Response Plan for California (June 30, 2005). To address statutory mandates, the Wildlife Response Plan for California (Wildlife Plan) has been developed by a group of federal and state agencies and other interested parties. The Wildlife Plan is part of the Regional Response Plan/Area Contingency Plan for California, a joint document of U.S. Coast Guard (USCG) and California Department of Fish and Wildlife, Office of Spill Prevention and Response (OSPR). The Wildlife Plan details the Wildlife Operations Branch purposes, goals, objectives, responsibilities, and structure. The Wildlife Operations Branch is in the Operations Section of the Incident Command System for oil spill response. The Wildlife Operations Branch structure needed in California and detailed in this plan is expanded beyond that described in the USCG Incident Management Handbook at the Group level. As is always true, the structure may be expanded or contracted to fit the need, but the mission remains unchanged. In California, the principal objectives of Wildlife Operations during a spill response are to:

- Protect wildlife and habitats from contamination,
- Minimize injuries to wildlife and habitats from the contamination,
- Minimize injuries to wildlife from the cleanup,
- Provide best achievable care for injured wildlife, and,
- Document adverse effects that result from the spill and cleanup.

L.4.2 Contacts

Beta Offshore is a member of the Oiled Wildlife Care Network (OWCN). The OWCN maintains personnel, equipment and facilities for implementation of wildlife capture, collection, treatment and recovery. The Oiled Wildlife Care Network strives to ensure that wildlife exposed to petroleum products in the environment receive the best achievable treatment by providing access to permanent wildlife rehabilitation facilities and trained personnel that are maintained in a constant state of readiness for oil spill response within California.

Wildlife resources are considered public resources and can only be managed, manipulated, or treated under the authority of the following trustee agencies:

- California Department of Fish and Wildlife
- U.S. Fish and Wildlife Service
- National Marine Fisheries

The federal permits required for hazing, collecting, or holding live animals are presented in Table L-4. Each of the trustee agencies has jurisdiction over specific wildlife resources. Many of the activities related to the protection, recovery, and/or rehabilitation of wildlife require either permits or permission of the trustee agencies.

Table L-4. Federal Permits Required

FEDERAL PERMITS REQUIRED				
Wildlife Resource	**U.S. Fish and Wildlife Service**		**National Marine Fisheries Service**	
	Collect and Hold	**Haze**	**Collect and Hold**	**Haze**
Migratory Birds	Yes	No*	No	No
Sea Otters	Yes	Yes	No	No
Whales, porpoises, seals, and sea lions	No	No	Yes	Yes
Terrestrial Mammals, Fishes, and Non-threatened Reptiles	No	No	No	No
Threatened or Endangered Sea Turtles	No	No	Yes	Yes
* A USFWS permit is needed to haze species managed by the USFWS under the Endangered Species Act.				

The establishment and execution of an effective wildlife response therefore requires early communications between the Company and the trustees. These communications should include:

- Scope and nature of the wildlife response
- Identification of the wildlife responder
- Identification of wildlife resources

- Prioritization of actions

The Company has designated the California Oiled Wildlife Care Network (OWCN) as its wildlife responder. Beta Offshore is authorized to activate OWCN, or Unified Command may do so. This was required to meet OSPR Best Achievable Protection Standards. The OWCN facilities and associated personnel provide rehabilitation for seabirds, sea otters, other mammals, and sea turtles in the event of an oil spill in waters and will be maintained in a constant state of preparedness. All activities of the Network, including rescue, triage, treatment, cleaning, rehabilitation, and release is subject to approval of the federal and state trustee agency representatives.

A discussion of wildlife rehabilitation requirements as required by Title 14, Subsection 817.02(i) is included in Section 306 of CCWRRM (Wildlife Rehabilitation).

L.5 NATURAL RESOURCE DAMAGE ASSESSMENT (NRDA) PROCESS

The overall goals of the NRDA process are to restore the injured environment and its components to pre-spill conditions and to obtain compensation for all documented losses. In general, a lengthy period of time may be required to complete each phase. The phases of the NRDA process generally include:

- Documenting injuries
- Assessing damages
- Settling claims
- Undertaking restoration

M.1 OVERVIEW

The Company's Facility Training/Drill program has been developed to ensure facility personnel are properly prepared to perform their response duties and to conform with regulatory requirements. Training/drill levels have been developed to provide a tailored curriculum for defined levels of response capabilities. These programs are designed to train personnel so they can carry out the responsibilities and duties associated with immediate and sustained response to an incident.

The training of the response team in the prompt and effective response to an oil spill/ emergency incident is an integral part of the Company's environmental, health, and safety philosophy. The Company has developed a multi-faceted training/drill program for the members of its response organization that consists of classroom instruction, field briefings, exercises and drills.

The Company will invite appropriate agencies to participate in both the equipment deployment drills and the management team tabletop drills. After each of these drills, participants will debrief and critique the drill.

M.2 TRAINING

M.2.1 Training Program Summary

Beta Offshore's spill response training consists of several courses that are part of an overall Environmental Safety Training proram. The courses include Hazard Communication Training (HAZCOM), basic Hazardous Waste Operations & Emergency Response training (HAZWOPER), Hazardous Materials Transportation, ICS, and other safety and environmental-related topics. Reference: 29 CFR 1910.1200 & 1910-38, 30 CFR 250.1915, 33 CFR Subpart N §143-146, Title 8 CCR §3220 & 5194.

Training provided to select individuals in addition to the above courses for emergency and spill response includes:

1. Basic introduction to the Incident Command System (ICS) and to the Oil Spill Prevention and Response Plan (OSPRP) – O'Brien's Response Management or equivalent course.
2. Facilitated training sessions on the use of ICS and the OSPRP.
3. Annual Tabletop (command post, simulation) drills – coaches, experts, contractors recommended to attend in addition to facility Incident Management Team, in accordance with the Federal National Preparedness and Response Exercise (PREP) Guidelines. The training in (1) and/or (2), listed above, along with other training, as appropriate, may be conducted on the same day as the annual tabletop drill.

In addition, each crew will attend annual "hands-on" boom deployment training, conducted by MSRC or another outside spill organization, per BSEE requirements.

Often, outside experts will be brought in to assist in training, facilitating or coaching the response team at the annual tabletop drill.

M.2.2 HAZWOPER COMPLIANCE

In the event a cleanup operation is required and third party personnel are needed, the Company will use fully qualified contractors or co-ops to perform the work. If contractors or co-ops subcontract to labor pools, documentation as to the training of casual laborers will be required. At the time cleanup operations are initiated, documentation from the contractor or co-op regarding the HAZWOPER qualification of their personnel will be obtained.

Prior to entry to an affected site, Company personnel reviews the following information with contractor management through the use of a Site Safety Plan:

- Hazard Communications:
  - Material adverse health characteristics.
  - Material reactivity characteristics.
  - Material flammability, explosivity characteristics.
  - General site characteristics.

  - Potential work site personal safety hazards.

  - Location of first aid assistance.

  - Decontamination facility, if required.

- Personal Protective Equipment:

  - PPE requirements as identified by the material being handled and the activities being performed.

  - Location where they will be working.

  - Work they will perform.

M.2.3 Use and Training of Volunteers and Temporary Help

All persons, including casual laborers and volunteers, who respond to oil spills in any capacity, as deemed appropriate by the Federal OSC, must receive training in compliance with 29 CFR 1910, Subpart L and 29 CFR 1910.12(q). The Company will not use volunteers in a response but rather refer any volunteers to the State Agency Volunteer Coordinator through the State Incident Commander (OSPR). Volunteers may be used as deemed appropriate by the State Agency Coordinator (Section 8574.3 of the Government Code). It should be noted that volunteer workers are recognized as employees of the State during oil spill cleanup operations and are covered by Worker's Compensation benefits under Section 3350 *et seq.* of the Labor Code.

Typically, volunteers will be assigned to tasks that have minimal safety risks such as wildlife rehabilitation (in coordination with appropriate organizations), beach surveillance, and logistics support. Persons involved in wildlife rehabilitation must complete a 24-hour course meeting the OSHA requirements of response technician level.

M.3 RESPONSE TEAM EXERCISES

Company IMT and possibly EOC Response Team members, various agencies, contractors and other response resources will participate in emergency response exercises per the "National Preparedness for Response Exercise Program" (PREP). The company will utilize announced and unannounced notification exercises, equipment deployment exercises, tabletop exercises, and/or various combinations to ensure that each component of the Plan is exercised within a 3-year cycle, to the extent required by PREP. Manager, Emergency Planning and Environmental Affairs and the Manager of Operations will coordinate exercise planning and logistics in accordance with the following guidelines. Table M-1 depicts the minimum triennial cycle for exercises at the facility.

Table M-1. Response Exercise Program.

Annual PREP Exercises		
Total Number	**Frequency**	**Exercise Type/Description**
4	**Quarterly**	**QI Notification Exercise**
		Scope: Exercise communication between facility personnel and the QI(s) and/or designated alternate(s). At least once each year, one of the notification exercises should be conducted during non-business hours. **Objective**: Contact must be made with a QI or designated alternate, as identified in the Plan. **General**: All personnel receiving notification shall respond to the notification and verify their receipt of the notification. Personnel who do not respond should be contacted to determine whether or not they received the notification.
1	**Annual**	**Spill Management / Command Post Team Tabletop Exercise**
		Scope: Exercise the response team's organization, communication, and decision making in managing a spill response. Per BSEE requirements, the Beta spill management team will conduct an annual tabletop exercise and maintain PREP objectives. The spill management team exercised is made up of representative personnel from both Beta Offshore and O'Brien's Response Mgmt. **Objective**: Exercise the response team in a review of the following: • Knowledge of the Plan • Proper notifications • Communication systems • Ability to access an OSRO • Coordination of internal spill response personnel **General**: A minimum of one Response Team Tabletop Exercise in a triennial cycle will involve simulation of the Worst Case Discharge scenario. Manager, Emergency Planning and Environmental Affairs and a unit designee will plan and coordinate these exercises.
1 (+1 non-deployment)	**Annual for each Ellen and Eureka**	**Unannounced Facility-Owned Equipment Deployment Exercise** BSEE will conduct only 1 annual unannounced "hands-on" equipment deployment exercise of the boom on Platform Ellen for either a Eureka or an Elly/Ellen scenario. In addition to this deployment exercise, BSEE will conduct one additional unannounced response exercise, but will not require hands-on boom deployment. It will be up to Beta to conduct a second deployment exercise during the year. MSRC normally participates/assists in these exercises.

Table M-1. Response Exercise Program.

Annual PREP Exercises		
Total Number	**Frequency**	**Exercise Type/Description**
1	**Semiannual**	**Announced Facility-Owned Equipment (or Equivalent) Deployment Exercise** BSEE requires 1 annual announced "hands-on" equipment deployment exercise involving the Beta Facility for either a Eureka scenario or an Ellen/Elly scenario. MSRC normally participates/assists in these exercises. Between this announced deployment and the unannounced deployment mentioned above, Beta Offshore must participate in two boom deployments per year using the Platform Ellen boom for exercise purposes.
1	**Annual**	**OSRO Equipment Deployment Exercise** (or OSRO's documentation of deployment for OSRO owned equipment)
		Review: Primary OSROs contracted by Beta will complete the equipment deployment exercise requirements and maintain the necessary documentation. The OSRO is not required to deploy equipment at the Beta facility, they may deploy equipment at any similar location. **Scope**: OSRO shall deploy and operate response equipment (OSRO) identified in the response plan. The equipment to be deployed must include the following at a minimum: • 1,000 feet of each representative type of boom (solid log flotation, air inflated, self inflated, fire boom, and special purpose boom) • One (1) each of each type of skimming system.
When initiated by Agency (surprise drills)	**When initiated by Agency (surprise drills)**	**Government initiated Unannounced Exercise at the government's discretion.** Under the laws and regulations of EPA, DOT/PHMSA, BSEE (where applicable), and OSPR, an unannounced drill may be called at any time. With satisfactory performance during the drill, another unannounced drill will not be called within the next 36 months.
Note**: Beta Offshore contracts MSRC for on-water spill response. MSRC's drill and exercise program assures that shoreline protection strategies for potentially impacted sensitive sites identified in the Company's off-site consequence analysis are exercised.* ***Each component of the response plan must be exercised at least once a 3-year (triennial) cycle, per the Federal PREP specifications.		

M.4 RECORD KEEPING

M.4.1 Exercise Records

These exercises should be documented (following the PREP guidelines) and should contain the following information:

- The type of exercise.
- Date and time of the exercise.
- A description of the exercise.

- List of specific equipment deployed during the exercise
- The objectives met in the exercise.
- The components of the response plan exercised.
- Lessons learned.

Critique or improvement items should be routed to the HSE Manager. Training and drill records will be entered into Beta Offshore training records system, and records of exercises should also be maintained on file in the Long Beach corporate offices. After a drill, lessons learned will typically be reviewed with appropriate field personnel and management, and where action items for improvement (if any) will be assigned. Completion of action items will be tracked through completion.

M.4.2 Substitution / Drill Credits

The Company may request OSPR credits for drills conducted for an agency other than OSPR. OSPR may be invited to participate if the drill meets all the following conditions:

1. The drill tests one or more of the following:
   - The facility's spill management team and spill response organization,
   - Deployment of facility-owned response equipment (if any);
   - Deployment of other response resources identified in the facility's plan, ***and***
2. The drill is conducted with other State or Federal agencies, ***and***
3. The company has obtained prior approval for the drill substitution from the appropriate agency, **if feasible**.

Following unannounced drills, the company must submit a written request to the OSPR Administrator within 90 days of the drill, requesting drill credit substitution and specifying which drill requirements were satisfied.

The company will document full or partial credits to meet federal OPA ’90 and OSPR drill requirements as appropriate under PREP if the company participates in any of the following:

- Other company drills.
- Mutual aid association drills.
- Local government emergency response organizational drills.
- Announced and unannounced state and federal drills.
- Contractor drills exercising response equipment.
- Response to an actual release.

The Manager of Operations or HSE Manager designee shall prepare or cause to be prepared sufficient documentation to qualify the exercise. He/she or a designee shall ensure that the documentation is properly submitted to the appropriate OSPR office for review and granting of drill credits. In the event of federal drills, submit documentation also to BSEE.

M.4.3 Post-Spill or Drill Reports and Evaluation

After the completion of a spill response, an equipment deployment, or a tabletop drill, a final report or evaluation will be compiled. This report should be compiled for the Company management and the administrating agency. These reports and evaluations may be formulated by using participant debriefing forms, Incident Event Logs, agency personnel comments, personal observations of participants, and any other documentation pertaining to the spill or drill. This information may be used by the participants to evaluate the response to the spill or drill, as appropriate. A “sign-in sheet”, the drill team organization chart, and an ICS 201 and/or Incident Action Plan (IAP) for the drill should be maintained as part of the drill documentation.

M.4.4 Training and Drill Related Forms

Copies of selected training and drill-related forms are provided following this section.

This Annex includes the following forms:

- Trajectory Request Form
- Response Equipment Testing/Deployment Log
- Qualified Individual Notification Drill Evaluation Form
- Spill Management Team Tabletop Exercise Evaluation Form
- Response Equipment Drill Evaluation Form
- Personnel Response Training Log
- Discharge Prevention Meeting Log

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October 20th, 2015

Trajectory Request Form

To request Witt O'Brien's Trajectory Modeling Services, please provide the following information to: John LaCaze (jlacaze@wittobriens.com – 281-907-1483 or Bud Kline (ckline@wittobriens.com - 985-960-0585)

General information required for surface spills

Location; Latitude (DMS, DD) ______________, Longitude (DMS, DD) _______________
Date of spill _____________, Time _____________(AM/PM), Time Zone ______
Simulation length_________________(hours or days)
Total amount of release _________________ (Barrels, Liters, M^3, Tonnes, Gallons)
Release rate and duration ________________ /(hours, days) for _______(days, hours)
Type of oil _______________________, API° ___________

Additional parameters for subsurface spills (OILMAPDeep)

Release depth _____________ (meters)
Gas/Oil ratio ______________ (m^3/m^3, scf/bbl)
Methane hydrate formation____(Y/N)
Opening diameter __________ (meters, inches)
Discharge Temp ______(^{0}C, ^{0}F)

RESPONSE EQUIPMENT TESTING / DEPLOYMENT LOG

Last inspection or Response Equipment Test Date:
Inspection Frequency:
Last Deployment Drill Date:
Deployment Frequency:
Oil Spill Removal Organization Certification *(if applicable)*:

QUALIFIED INDIVIDUAL NOTIFICATION DRILL EVALUATION FORM

1. Facility: ____________________

Location of Exercise: ____________________

Date of Exercise: ____________________

Time of Exercise: ____________________

2. Objectives Evaluated:

a. Was timely contact made with QI? ☐ Yes ☐ No

b. Elapsed time: __________ Minutes

c. Was notification procedure effective? ☐ Yes ☐ No

If no, explain: ____________________

____

____

____

3. Corrective Action – *if necessary*

Explain: ____________________

____

____

____

Target Complete Date: ____________________

Person Accountable: ____________________

4. Approved: ____________________ **Title:** ____________________

Date: ____________________

SPILL MANAGEMENT TEAM TABLETOP EXERCISE EVALUATION FORM

1. Facility: ______________________________

Location of Exercise: ______________________________

Date of Exercise: ______________________________

Time of Exercise: ______________________________

2. Is this drill unannounced? ☐ Yes ☐ No

3. Check below if components are covered in this exercise.

Organizational Design

1. Notifications	☐ Yes	☐ No
2. Staff mobilization	☐ Yes	☐ No
3. Ability to operate within the response management system described in the plan	☐ Yes	☐ No

Operational Response

4. Discharge control	☐ Yes	☐ No
5. Assessment of discharge	☐ Yes	☐ No
6. Containment of discharge	☐ Yes	☐ No
7. Recovery of spilled material	☐ Yes	☐ No
8. Protection of economically and environmentally sensitive areas	☐ Yes	☐ No
9. Disposal of recovered product	☐ Yes	☐ No

Response Support

10. Communications	☐ Yes	☐ No
11. Transportation	☐ Yes	☐ No
12. Personnel support	☐ Yes	☐ No
13. Equipment maintenance and support	☐ Yes	☐ No
14. Procurement	☐ Yes	☐ No
15. Documentation	☐ Yes	☐ No

4. Objectives

- Exercise of the Spill Management Team in a review of:

- Knowledge of the response plan	☐ Yes	☐ No
- Proper notifications	☐ Yes	☐ No
- Communications system	☐ Yes	☐ No
- Ability to access OSRO	☐ Yes	☐ No
- Coordination of organization/agency personnel with responsibility for spill response	☐ Yes	☐ No
- Ability to effectively coordinate spill response activity with National Response System infrastructure	☐ Yes	☐ No
- Ability to access information in Area Contingency Plan for location of sensitive areas, resources available within the area, unique condition of area, etc.	☐ Yes	☐ No

- If no, explain ______________________________

5. Corrective Action – *if necessary* ______________________________

____

____

Target Completion Date: ______________________________

6. Approved: ______________________________ **Title:** ______________________________

Date: ______________________________

RESPONSE EQUIPMENT DRILL EVALUATION FORM

1. Facility: ____________________

Location of Exercise: ____________________

Date of Exercise: ____________________

Time of Exercise: ____________________

2. Equipment owned by:

☐ Facility *(complete all items)*
☐ Contractor/Co-op *(skip to 7)*

3. Is this current drill unannounced? ☐ Yes ☐ No

4. Date of previous equipment deployment: ____________________

(Exercises should be at least 4 months apart)

5. Date of last unannounced equipment deployment: ____________________

6. Objectives:

a. ***Was equipment deployed/operated as identified in OPA 90?*** ☐ Yes ☐ No

If no, explain: ____________________

____

____

____

Corrective action: ____________________

____

Target Completion Date: ____________________

Person Accountable: ____________________

b. ***Is undeployed equipment included in maintenance/training program?*** ☐ Yes ☐ No

If no, explain: ____________________

____

Corrective action: ____________________

____

____

Target Completion Date: ____________________

Person Accountable: ____________________

7. Contractor/Co-op: ____________________

Attach documentation certifying last deployment, etc.

Approved: ____________________ **Title:** ____________________

Date: ____________________

PERSONNEL RESPONSE TRAINING LOG

Name	Response Training Date and Number of Hours	Prevention Training Date and Number of Hours

DISCHARGE PREVENTION MEETING LOG

Date: ______________________________

Attendees: ______________________________

Subject/Issue Identified	Required Action	Implementation Date

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N.1 COMPANY PHILOSOPHY

Environmental, Health and Safety (EHS) Policy

Environmental, Health and Safety performance is an integral part of our business. Protecting the environment and safeguarding the health and safety of the people in the workforce and surrounding communities is essential to long-term success. Beta Offshore's policy reflects a commitment to our employees, contractors, and customers and to the communities in which we operate. Beta Offshore will manage EHS performance with the same priority that we manage other key business objectives.

Beta Offshore's EHS management system is founded on the belief that all accidents and occupational illnesses can be prevented. In support of this belief, Beta Offshore is committed to:

- Ensuring that all employees, contractors and suppliers understand their roles, responsibilities and performance expectations regarding environmental compliance and safe work practices.
- Holding employees, contractors and suppliers accountable for their EHS performance, and giving recognition to those who show leadership in performance improvement.
- Setting meaningful goals to ensure continuous improvement and measuring progress toward those goals.
- Auditing our systems, processes and facilities for compliance with laws, regulations, and internal procedures.
- Learning to be more effective by routinely benchmarking our processes with others and then sharing best practices across all locations
- Maintaining effective programs for emergency preparedness at each of our locations.
- Fostering constructive dialogue with government agencies to ensure EHS regulations are cost effective and appropriate.

These commitments are in addition to our obligation to design, operate and maintain our facilities in compliance with all environmental, health and safety laws and regulations.

Bruce Berwager
Vice President

Diana Lang
HSE Manager

N.2 APPLICABLE REGULATORY REQUIREMENTS

The Occupational Safety and Health Administration (OSHA) has promulgated two sets of regulations that are applicable to oil spill response operations. They are:

- Hazard communications regulations (29 CFR §1910.1200).
- Hazardous waste operations and emergency response or HAZWOPER regulations (29 CFR §190.120).

The hazard communications regulations require that workers be informed of any hazards associated with the materials that they may come into contact with during the conduct of response operations. Hazardous waste operations and emergency response regulations require the preparation of a Site-Specific Safety and Health Plan, and that workers be properly trained to carry out response operations in a safe and healthful manner.

N.3 MANAGER OF OPERATIONS RESPONSIBILITIES

The Manager of Operations is responsible for giving safety and loss prevention primary consideration with other factors that affect daily decisions. He/she is responsible for actively supporting safety and loss prevention performance in their areas by the following actions:

- Communicate safe rules and standards to Company and contractor employees.
- Create an atmosphere in which safety issues can be proactively discussed and resolved.
- Strictly enforce safety rules and standards, and routine safety inspections.
- Report and investigate incidents, injuries, and potentially serious incidents.
- Promptly correct unsafe conditions.
- Hold and document regular safety meetings.
- Provide safety training.
- Award contracts using past safety performance as a criterion.

- Ensure that all visitors and customers are escorted by Company personnel while onsite, and that each individual is equipped with the proper safety gear.

N.4 EMPLOYEE RESPONSIBILITIES

Each employee must have a positive attitude toward injury prevention and safety. The employee should believe that all injuries can be prevented and act accordingly. The employee is responsible for the following actions:

- Perform the job safely, for personal safety, safety of fellow workers, and protection of facilities. This includes the proper use of safety equipment and devices, as well as safe work practices.
- Report every injury, as well as unsafe conditions or practices (including contractors), to his/her supervisor.
- Participate in all safety meetings.
- Assist in reporting and investigating incidents, injuries, and potentially serious incidents.
- Review and become familiar with the contents of safety manuals, handbooks, and publications.

N.5 CONTRACTOR RESPONSIBILITIES

Contractors will take all necessary precautions for the safety of all persons on the work site. Contractors shall comply with Company safety rules and regulations, and applicable federal, state, and local safety laws, rules, and regulations necessary to prevent injury to persons or damage to property. In addition, contractors will:

- Ensure that their employees are trained in Company safety rules and practices and in job-specific procedures.
- Perform all work in a safe, workmanlike manner.
- Provide required safety equipment for their employees.
- Report injuries, near misses, and incidents, no matter how slight (including property damage) immediately (within 24 hours) to the Company supervisor or designated alternate.

- Not operate valves or equipment without the Company supervisor's or designated alternate's approval, except in a life-threatening emergency situation.

- Hold a pre-job safety meeting and other safety meetings as needed during the execution of the job.

- Communicate with the Company supervisor or designated alternate before beginning work.

N.6 CHAIN OF COMMAND

Overall responsibility for safety and health issues during response operations rests with the Incident Commander. In a minor spill or the initial stages of a sustained response, the Manager of Operations (QI) or, in the case of a sustained response, the Safety Officer is responsible for safety and health matters. These safety-and-health-related activities are:

- Ensure that all response personnel receive the necessary level of training required under the HAZWOPER regulations.

- Ensure that all company safety policies, procedures, and practices, and regulations are known and strictly adhered to during the conduct of response operations.

- Assist in personnel exposure monitoring.

- Prepare Site-Specific Safety and Health Plan.

- Ensure that there is an adequate supply of protective clothing and equipment for all personnel involved in response operations, and that personal protective equipment is properly utilized throughout operations.

- Ensure that all personnel are aware of, and take all appropriate actions to protect themselves from all situations that pose a threat to their safety and health.

- Suspend any activity that poses a threat to personnel safety and health that cannot be avoided or mitigated through the use of protective clothing or the adoption of a safe operating procedure.

- Determine where first aid stations will be located, arrange for qualified staffing at these stations, see that adequate first aid supplies are available, and assure that the locations of first aid stations are clearly posted.

- Maintain regular communications with emergency medical teams and first aid stations.

- Issue Safety and Health Bulletins, as appropriate.
- Maintain a record of all job-related injuries, including their cause, nature, and any corrective actions taken.
- Serve as the principal point of contact for OSHA representatives assigned to monitor response operations.
- Ensure that decontamination stations are established and that all personnel are decontaminated before leaving their work stations during breaks and at the end of each shift (refer to Section 10).

N.7 COORDINATION WITH GOVERNMENT AGENCIES

During the conduct of response operations, the Incident Commander will meet, on a regular basis, with the Federal On-Scene Coordinator and the State Incident Commander. Safety and health considerations will be among the issues addressed at these meetings, particularly with regard to matters relating to the incident-specific application of relevant safety and health laws, rules and regulations, policies, practice, and procedures.

The Safety Officer will coordinate all Company activities with federal and state government safety and health personnel. Additionally, the Safety Officer will prepare Site-Specific Safety and Health Plan(s) that will be kept onsite and will address the safety and health hazards of each phase of site operations and include requirements and procedures for worker protection. All site personnel will be required to read the plan and acknowledge that they are aware of and fully understand its contents in accordance with 29 CFR □1910.120.

N.8 PERSONAL PROTECTION EQUIPMENT REQUIREMENTS

N.8.1 Introduction

Personal Protection Equipment (PPE) appropriate to the exposure hazards of any emergency response incident must be worn at all times while potential or actual exposure exists. Prior to exposure, positive identification of the contaminants must be gained. Until a positive identification is made, no entry in less than “Level B” protective devices shall be allowed.

The Safety Officer or Advisor will prepare a Site-Specific Safety and Health Plan based upon a site assessment, monitoring results, and knowledge of job tasks and processes. The Plan will contain recommendations for PPE required to prevent employee exposure to chemical or physical hazards at the incident site.

N.8.2 PPE Level Definitions

The federal OSHA has defined four levels of PPE from Level A, providing the highest level of protection, to Level D which is the minimal protection used for nuisance contamination. Table N-1 provides the protective clothing required for the four levels of PPE.

When donning PPE, observe the following:

- No employee/contractor should conduct any operations in areas not directly visible to other personnel.
- Operations requiring entry to such areas will be conducted using the "buddy system" and the Manager of Operations or Safety Officer should be notified.
- Establish and maintain communications with your supervisor for the duration of such activities.
- Continue to monitor conditions, anticipate changes in:
  - Weather that may affect safety.
  - Wind changes that could affect safe areas.
  - Temperature that may affect work conditions and worker safety. Be alert for signs of heat stress, heat rash, heat cramps, heat exhaustion, heat stroke.
- During break or rest periods, remove PPE to facilitate cooling, as needed.
- All injuries, no matter how minor, must be reported to the Manager of Operations or Safety Officer as soon as possible, but no later than the end of that shift.
- All requests for emergency or life saving medical treatment are to be made through the local Fire Department, via 911.

Federal OSHA requirements at 1910.120(q)(10), Chemical Protection and Equipment, should be reviewed during HAZWOPER training to ensure they are familiar with the proper PPE for potential hazardous material releases.

Table N-1. Personal Protective Equipment Requirements

CLOTHING/EQUIPMENT	PPE LEVEL[1]			
	A	B	C	D
Totally encapsulating chemical protective suite (TECPS)	Y			
Chemical resistant clothing (i.e., overalls and long-sleeved jacket, hooded one- or two-piece chemical splash suit, or disposable chemical resistant clothing		Y	Y	
Coveralls				Y
Pressure demand (positive pressure), full face SCBA or airline unit with escape SCBA	Y	Y		
Half face piece, air purifying respirator with appropriate canister or cartridges			Y	
Inner chemical resistant gloves	Y			
Inner and outer chemical resistant gloves		Y	Y	
Chemical resistant safety shoes/boots	Y	Y	Y	
Safety shoes				Y
Full-time two-way communications	Y	Y		
Safety glasses or chemical splash goggles				Y
Hardhat		Y	Y	Y

[1] Level A use: When dealing with a release of highly concentrated H_2S material or extremely corrosive material.

Level B use: When handling material requiring the greatest respiratory protection and skin protection, but not to TECPS standards.

Level C use: When handling material requiring chemical resistant clothing such as rubber boots, rain gear, safety glasses, and air purifying respirators.

Level D use: Recommended for personnel responding to crude oil cleanup. Level D is appropriate only if there is no known or suspected hazardous air contaminants and no potential for skin contact with hazardous materials.

PPE for Company employees is available at the production facilities, or aboard the various co-op vessels. For large-scale cleanup operations, PPE is available from various contractors. The Safety Officer will verify that sufficient PPE is provided to the workforce by the contractors.

N.9 DECONTAMINATION PROCEDURES

During responses to emergency incidents, decontamination of personnel, equipment, and the release site is essential for individual safety and to minimize the movement of hazardous material to unaffected areas. To minimize the transfer of hazardous substances from the site as a result of response activities, contamination control and decontamination procedures are needed.

N.9.1 Contamination Control

The Safety Officer will establish control at a contaminated response site to reduce the possibility of exposure to any contaminants including their transport by personnel and/or equipment from the site. Procedures include:

- Set up security and physical barriers (e.g., hazard tape, rope, road cones, or a combination of these restraints) to exclude unnecessary personnel and visitors from the contaminated area.
- Minimize the number of personnel and equipment onsite consistent with effective operations.
- Establish work zones within the site to reduce the migration of hazardous substances.
- Establish control points to regulate access to work zones.

N.9.1.1 Work Zones and Access Control Points

Work zones will be used to prevent or reduce the migration of contamination from a site where operations occur. Access control points will be used to limit the movement of personnel and equipment between work zones and onto the site itself.

The **Safety Officer** will establish three contiguous work zones surrounding every separate contaminated area on the site where response operations will occur. These zones are:

- Zone 1: Exclusion Zone.
- Zone 2: Contamination Reduction Zone.
- Zone 3: Support Zone.

An example of a work zone plan is shown in Figure 10-1. Movement of personnel and equipment into and out of the contaminated areas and between zones will be limited to access control points located upwind of the contaminated area. Refer to Table 10-1 for Work Zone descriptions.

The physical size of the zones will be determined by the:

- Nature of the released material.
- Climatic conditions of the area.
- Topography of the area.

The Hot Line shown in Figure 10-1 will initially be established by:

- Visually surveying the immediate area of the release.
- Determining the location(s) of the involved hazardous substance(s).
- Studying monitoring data obtained during the initial site survey.

The boundary may be modified and adjusted over time as more information becomes available.

Figure N-1. Site Work Zones Layout.

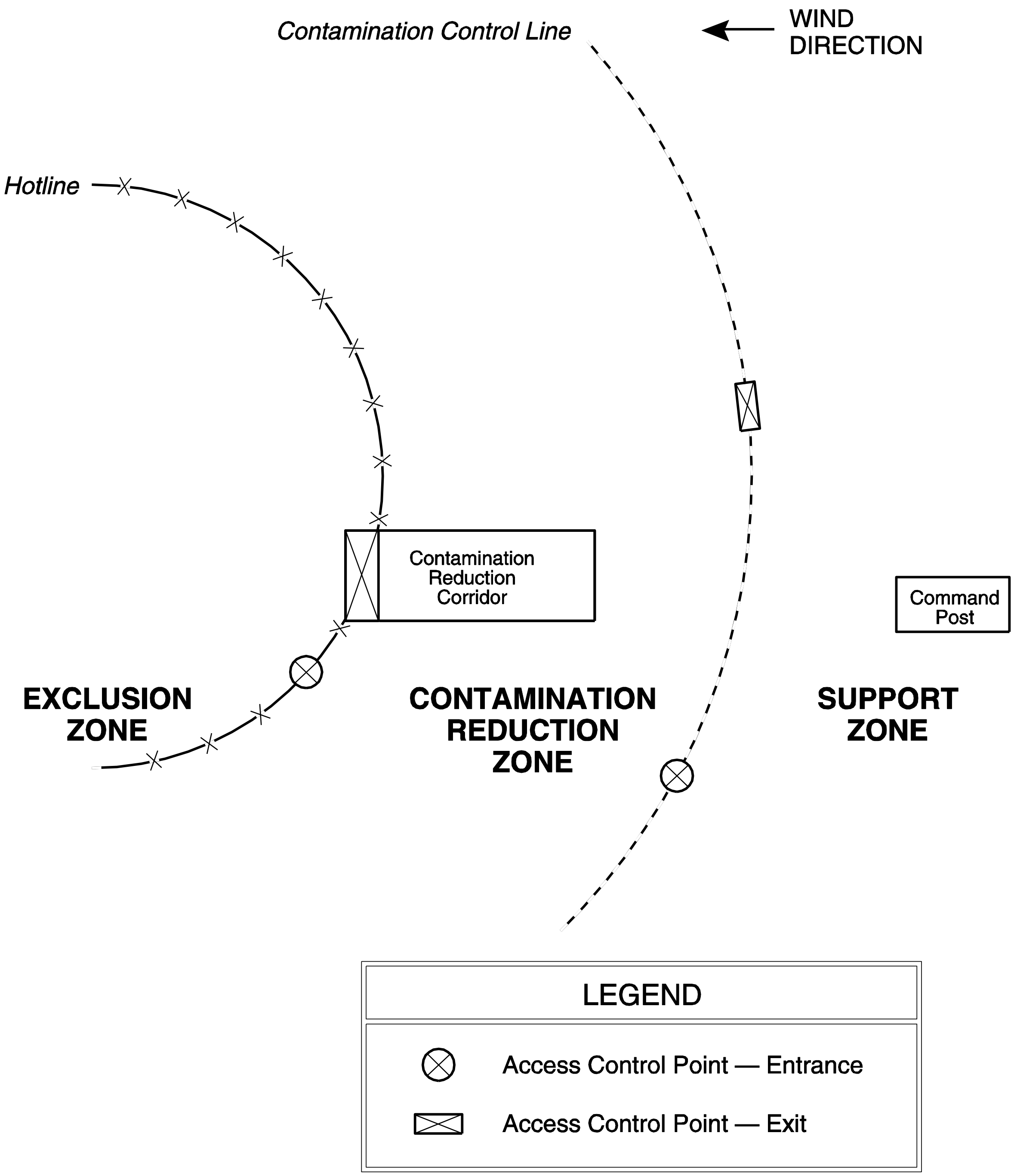


Table N-2. Work Zones and Access Control Points.

ZONE	TYPE	ZONE LOCATION	CONTAMINATION LEVEL	PPE	ACCESS CONTROL POINT
1	Exclusion	Innermost or Hot Zone	Known or suspected to occur	Specified level of protection	Must establish/ locate upwind of the contaminated area(s) along the outer boundary (i.e., the Hot Line)
2	Contamination Reduction or Warm Zone	Between the Exclusion and Support Zones	Clean Area – designed to provide a transition between Zones 1 and 3	Prescribed level of protection. Decontamination of PPE will occur at a series of stations	Entry and exit between Zones 2 and 3 will be restricted to access control points upwind of Zone 1 on the Contamination Control Line
3	Support or Cold Zone	Outermost – may include Field Command Post, transport vehicles, equipment, supplies, etc.	Clean Area	Normal work clothes; no contaminated clothing, equipment, or samples will be permitted	None; traffic will be restricted to authorized response personnel

N.9.2 DECONTAMINATION

N.9.2.1 Overview

The Safety Officer is responsible for routine decontamination procedures and emergency decontamination procedures. Routine decon is the primary focus of this sections; however, emergency decon procedures should be established and carried out if safe to do so.

In an emergency, the primary concern is to prevent loss of life or severe injury to site personnel. If immediate medical treatment is required to save a life, decon should be delayed until the victim is stabilized. Consider the following:

- If decon can be performed without interfering with essential lifesaving techniques or first aid, decon must be performed immediately.

- If an emergency due to a heat-related illness develops, protective clothing should be removed from the victim as soon as possible to reduce heat stress.

- During an emergency, provisions must also be made for protecting medical personnel and disposing of contaminated clothing and equipment.

N.9.2.2 Decontamination Area Site Setup

The Safety Officer will select a level site at the edge of the Exclusion Zone/Hot Zone where an entrance from the Exclusion Zone may be located, and an exit through the Contamination Reduction Zone/Warm Zone and into the Support Zone/Cold Zone may be located (see Figure N-1). The site selected should be away from the travel of equipment and supplies and not of value or needed for any future activities during the response. Steps for the design of the area are as follows:

1. Construct a low berm around the decon site. Lay a sheet of visqueen over the entire surface area and over the berm. Weight sheet with soil around outside edge of berm. An example of a decontamination area layout is shown in Figure 10-2 on page 10-7.

2. Arrange all equipment in a fashion commensurate with the level of protection (e.g., Level D through A). Figure 10-3 on page 10-8 represents decontamination levels associated with Level A protection.

3. Lay down sorbent pads at decon entrance and near all tubs, buckets, and paths of travel where liquids may be tracked or deposited.

4. Set marker stakes and tape off decon area consistent with marking used for Exclusion/ Hot Zone.

5. Post entrance and exit signs.

6. Label all waste containers appropriately. Have containers for contaminated debris and uncontaminated wrappings or trash (refer to Annex F of the OSPRP, Waste Management and Disposal Plan).

7. Set up boot washing tubs or pools, tub #1 containing Simple Green or other biodegradable soap and tub #2 containing clear water. An optional tub may also be used between tubs #1 and #2 with a milder soap concentration. Provide scrub brushes in each tub.

8. Set up a glove washing area on a table, bucket #1 containing soap and bucket #2 containing clear water. An optional bucket may also be used between #1 and #2 with a milder soap concentration. Provide rags or towels on the table.

9. If SCBAs are used in the Exclusion/Hot Zone, set up one bucket with mild bleach solution for mask washing, one with soap for mask washing, one for rinse, and have wipes or towels available.

10. Organize extra equipment and store neatly.

11. Take inventory of all personal protective equipment (PPE) and decon equipment upon mobilization of decon. Log all PPE and equipment as it is resupplied or used on the response. Take inventory of PPE and decon equipment upon demobilization. Create a report of PPE used and status of equipment inventory at the end of the response.

12. ***KEEP DECON AREA NEAT AND CLEAN AT ALL TIMES!***

The number of stations will depend on the amount and type of PPE. The maximum number of decontamination stations will be required for Level A protections. Decontamination procedures for lower levels of protection will consist of fewer decontamination stages for the amount of equipment worn or involve the elimination of wash and rinse stations when disposing of clothing.

Figure N-2. Decontamination Area Layout.

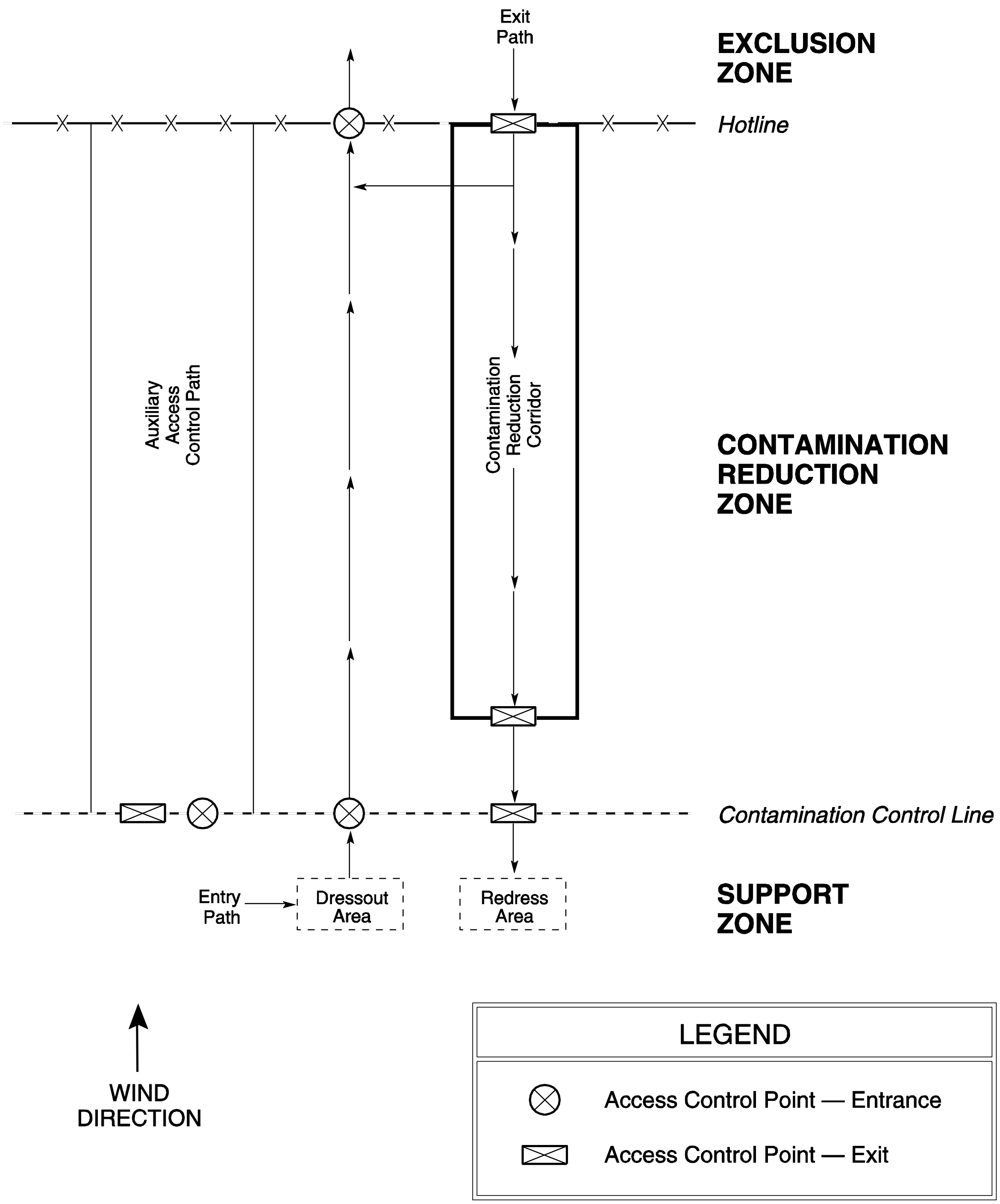
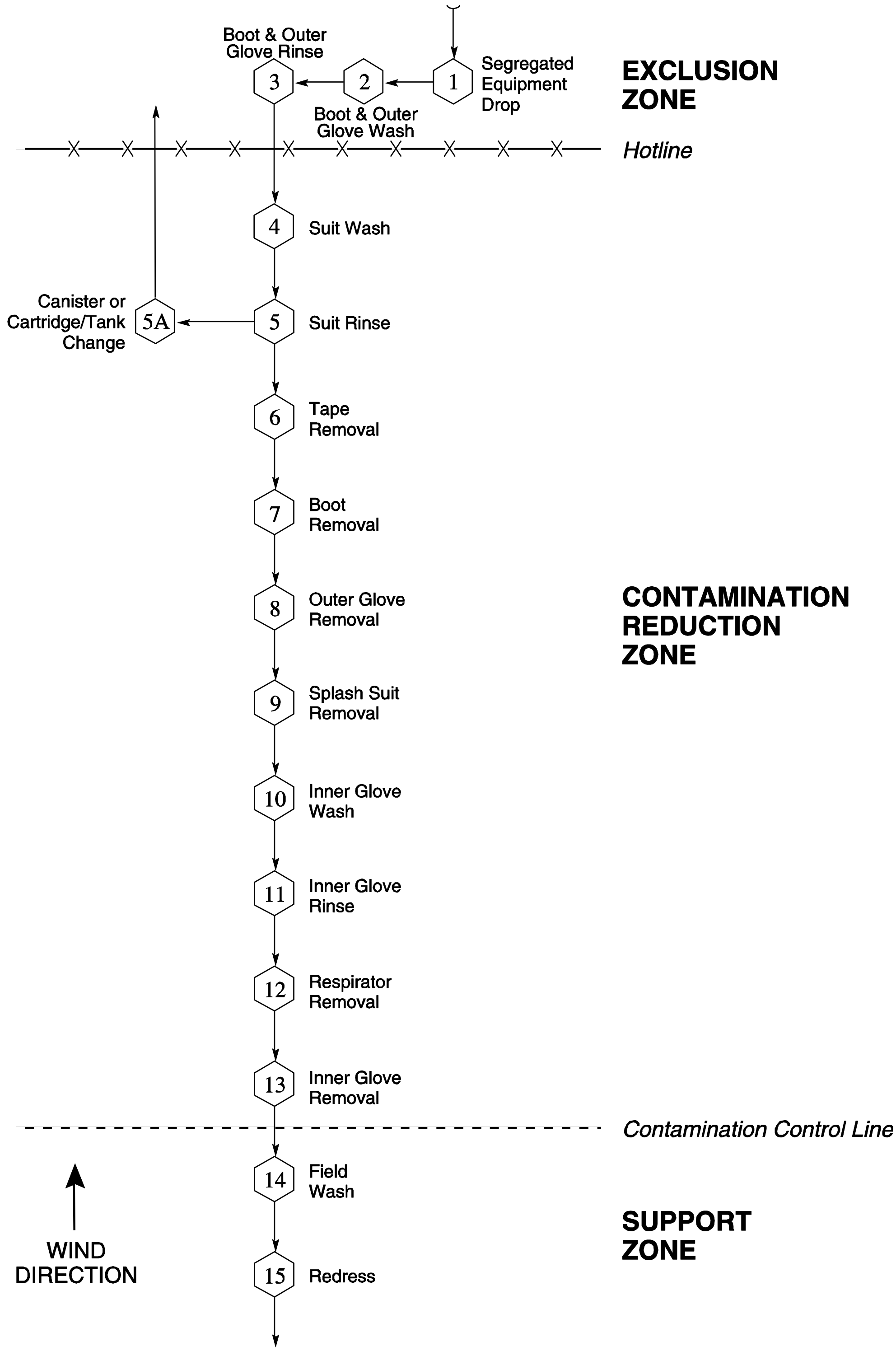


Figure N-3. Contamination Reduction Zone Layout.



N.9.2.3 Standard Decontamination Procedures for PPE Up To and Including Level B

Enter Decontamination Area from Exclusion/Hot Zone entrance and proceed through the following steps and stations:

1. Clean boots in Tub #1 using scrub brush.
2. Rinse boots in Tub #2 using scrub brush.
3. Clean gloves in Bucket #1.
4. Clean gloves in Bucket #2.
5. Have Decon Technician (Decon Tech in PPE) remove tape from gloves, boots, and Tyvek suits.
6. Have Decon Tech remove outer gloves (leave inner gloves on).
7. Have Decon Tech remove SCBA (if worn and when decon area is verified to be below PEL exposure limits).
8. Have Decon Tech unzip Tyvek suit and assist removal of boots first, then Tyvek suit. Step into own shoes when clear of boots and suit.
9. If applicable, wash SCBA mask in Bucket #3 and rinse in Bucket #4. Dry mask.
10. Remove inner gloves, being careful not to touch outer surfaces.
11. Have Decon Tech deposit all throwaway PPE items in appropriate DOT drum.
12. Have Decon Tech stow all reusable PPE items neatly in temporary storage and made ready for reuse.
13. Depart through designated exit to Support/Cold Zone.

This Appendix provides call lists of persons, facilities, and entities that may be contacted in the event of a spill or emergency incident. This information is organized as follows:

Table CL-1. Company Facilities, Personnel, and Technical Experts.

LA BASIN FACILITIES PHONE LIST Corporate Office – 111 W. Ocean Blvd, Ste 1240 Long Beach, 90802 Ph: **562-628-1526**	
Facility	**Phone Number (Area Code 562-606-5***)**
Crewboat (Ship Services)	310-519-8411 (24 hour)
ELLEN FAX	**562-606-5701**
ELLEN – Compliance Office	**742**
ELLEN – Rig Office	**703**
ELLEN – Production Supervisor	**705**
ELLEN – Facility Superintendent	**706**
ELLEN – Operations Manager / Engineer's Office	**708**
ELLEN – Safety Office	**710**
ELLEN – Galley	**713**
ELLEN – Electrician's Shop	**715**
ELLEN – Training Manager	**718**
ELLEN – Wellbay Shop	**743**
ELLY – Control Room	**711 / 712**
ELLY – ACR Shop	**702**
ELLY FAX	**727**
ELLY – Mechanic's Shop	**731**
ELLY - BMACS / ELLEN WELLS	**735**
EUREKA – Control Room Bldg 60	**732**
EUREKA FAX / MAIN	**719**
EUREKA – Drilling / Rig Office	**707 / 783**
EUREKA FAX – Bldg 60	**716**
EUREKA – Paging System	**709**
EUREKA – Electrician's Shop	**717**
EUREKA – ACR Shop	**724**
EUREKA – Mechanic's Shop	**725**
EUREKA – Galley	**726**
EUREKA – BMACS / EUREKA WELLS	**730**
BETA STATION	**562-436-0521**
BETA SAFETY	**710**
FAX MACHINES	
Location	**Fax Number**
Beta Pump Station	562-437-6271
Platform Ellen	562-606-5701
Platform Elly	562-606-5727
Platform Eureka	562-606-5716

Table CL-1 (continued). Company Facilities, Personnel, and Technical Experts.

NAME	OFFICE	HOME	CELLULAR	PAGER
TECHNICAL EXPERTS				
PUBLIC AFFAIRS/PUBLIC INFORMATION OFFICER				
Sam Sacco	510-594-8575		510-541-6449	510-541-6449
OIL SPILL TRAJECTORY SERVICE				
O'Brien's Response Management	714-577-2100 985-781-0804 24 hour			
LOCAL RESOURCES - RESPONSE				
O'Brien's Response Management	714-577-2100 985-781-0804 24 hour		Tom Haug 562-217-3511	
MSRC 3300 E. Spring Street, Long Beach, CA 90806	562-981-7600 800-OILSPIL [800-645-7745]		805-207-7856	
SoCal Ship Services (Terminal Island) Mark Wrobel or on-call supervisor	310-519-8411 (24 hour)			
Patriot Environmental 508 East E Street, #A Wilmington, CA 90744	800-624-9136 24 hour		562-436-2614 Fax 562-436-2688	855-666-4299
ENVIRONMENTAL – OTHER (WASTE MANAGEMENT, DISPOSAL, ETC.)				
Clean Harbors Envt'l 2500 E. Victoria Street Compton, CA 90220	310-835-9998 310-764-5851 800-645-8265			
ENVIRONMENTAL / WILDLIFE / SCAT				
MBC – Applied Environmental Science	714-850-4830 714-850-4840 fax	3000 Redhill Ave. Costa Mesa, CA 92626		
Entrix Matt Carpenter	805-477-5003 800-476-5886	Corporate office 925-935-9920 Walnut Creek	805-750-9962	
OWCN – Oiled Wildlife Care Network Dr. Mike Ziccardi	530-752-4167 530-754-5701		916-556-7509 www.owcn.org 530-979-7561	

Table CL-2. Emergency Services.

LOCATION	HOSPITAL OR CLINIC	TELEPHONE
Huntington Beach	Huntington Beach Hospital 17772 Beach Blvd. Huntington Beach, CA 92647	714-843-5000 24 hr Emergency
	Hoag Memorial Hospital Presbyterian One Hoag Drive Newport Beach, CA 92663	949-764-4624
Long Beach	St. Mary's Medical Center 1050 Linden Avenue Long Beach, CA 90813	562-491-9000
	Long Beach Memorial Medical Center 2801 Atlantic Avenue Long Beach, CA 90806 *(Major medical and trauma center, primary hospital for Mercy Air)*	562-933-2000 24 hr Emergency 562-933-2133

Table CL-3. Response Cooperatives and Contractors.

COMPANY	CONTACT	TELEPHONE
Marine Spill Response Corporation (MSRC) 3300 E. Spring Street Long Beach, CA 90806	Scott Morris Jeff Jappe Rick Tamayo	*(24-hour*) 800-OIL-SPIL 800-645-7745 925-895-1845 morris@msrc.org 562-981-7600 (Long Beach Office) 805-798-1813 562-254-8293 562- 981-7601 (Fax)
Clean Harbors LA Service Ctr. 2500 E. Victoria Street, Compton, CA 90220	Mike Delatorre, Mgr. Rafael Villalobos Steven Ramos	800-645-8265 24 hr. 310-764-5851 24 hr 310-764-5863 fax
Patriot Environmental Services 508 East E Street, Unit A Wilmington, CA 90744	Dale Strieter Wilbert Canto	800-624-9136 (emergency) 562-244-2205 562-244-2204
West Coast Environmental Solutions, 2650 Lime Ave. Signal Hill, CA 90755 (under contract to MSRC)	Bea Esparza	562-448-9525 office 562-244-1211 cell 562-490-9615

Table CL-4. Property Owners and Adjacent Operators.

OWNER/OPERATOR	TELEPHONE	NOTES
CRC Long Beach Platform Emmy (State Waters)	714-969-3206 714-969-3287 (fax)	Operator, Platform Emmy
CRC Long Beach Company **(former OXY,THUMS &Tidelands facilities)** 111 W. Ocean Blvd, Suite 800 Long Beach, CA 90802	562-624-3452	Dispatcher, Port of Long Beach area
Dos Cuadras Offshore Resources, LLC (DCOR) 290 Maple Ct. Suite 290 Ventura, CA 93003	805-739-9111	
Spill Coordinator	805-535-2072	
Platform Edith	714-960-6342 714-960-6343 fax	
Platform Eva (State Waters)	714-960-6592 714-960-6593 fax	
Platform Esther (State Waters)	714-960-6289 714-960-6299 fax	

Table CL-5. Regulatory Agencies.

JURISDICTION	AGENCY	TELEPHONE
FEDERAL	**National Response Center** Washington, D.C.	800-424-8802 (24-hour)
	United States Coast Guard: Marine Safety Office Los Angeles/Long Beach 1001 South Seaside Avenue, Building 20 Terminal Island (San Pedro), CA 90731	310-521-3600 800-221-8724 (24-hour) 310-521-3639 fax
	Department of Transportation Office of Pipeline Safety - PHMSA 1200 New Jersey Ave, SE, Room E22-210 Washington, DC 20590	202-366-4595
	Environmental Protection Agency Region 9 75 Hawthorne Street San Francisco, CA 94105	800-300-2193 (24-hour) 213-244-1800 So Cal field office

Table CL-5. Regulatory Agencies.

JURISDICTION	AGENCY	TELEPHONE
FEDERAL *(cont'd)*	**Federal Aviation Administration** 15000 Aviation Blvd. Lawndale, CA. 90261	310-725-3300 (24-hour) 310-725-6849 (fax)
	For initial reporting of spill, contact: **Bureau of Safety and Environmental Enforcement** Pacific Region Camarillo District Office 770 Paseo Camarillo Camarillo, CA 93010 Craig Ogawa (OSPA)	805-384-6370 (24-hour) 805-384-6370 (pipeline) 805-384-6331
	Flight Service Station *(Weather)* Long Beach, CA Hawthorne, CA Orange County, CA	800-992-7433 (National - Toll Free) 562-424-0572 310-973-8930 714-424-0590
	National Marine Fisheries Service (NOAA) Marine Mammals 501 West Ocean Blvd., Suite 4200 Long Beach, CA 90802-4213	562-980-4000 562-980-4081 (Spill > 100 bbl)
	National Oceanic and Atmospheric Administration (NOAA): Channel Islands National Marine Sanctuary 113 Harbor Way Santa Barbara, CA 93109	805-966-7107
	NOAA *(cont'd)* Injury Assessment Coordinator (Miki Hirano) 501 West Ocean Blvd., Suite 4470 Long Beach, CA 90802	562-980-4081 562 980-4005
	Scientific Support Coordinator Alameda, CA	510-437-5344 (office) 510-437-5345 (fax)
	NOAA Trajectory Analysis 7600 Sandpoint Way NE Bin C15700 Seattle, WA 98115	206-526-6317 (office) 206-526-6329 (fax) 800-759-8888, PIN 579-8808 (pager) 206-526-4911 (emergency #)
	National Weather Service Oxnard (for Long Beach)	805-988-6620
	U.S. Fish and Wildlife Service Endangered Species Recovery 2730 Loker Avenue West Carlsbad, CA 92008	760-431-9440
FEDERAL *(cont'd)*	**U.S. Fish and Wildlife Service**	916-414-6600

Table CL-5. Regulatory Agencies.

JURISDICTION	AGENCY	TELEPHONE
	OCS Coordinator (Steve Schwarzbach) 2800 Cottage Way, Room W-2605 Sacramento, CA 95825-6430	
STATE	**Emergency Management Services** 3650 Schriever Avenue Rancho Cordova, CA 92655	800-852-7550 *(24-hour spills)* 916-845-8510
	California Coastal Commission 45 Fremont Street, Suite 2000 San Francisco, CA 94105-2291	800-262-7848 415-904-5200 (office) 415-904-5216 (fax)
	CCC-South Coast District Office 200 Oceangate Blvd., 10th floor Long Beach, CA 90802	562-590-5071 562-590-5084 (fax)
	Cal-EPA Dept. Toxic Substance Control 5796 Corporate Ave. Cypress, CA 90630	714-484-5300 800-852-7550 (Office of Emer. Services)
	CHP (California Highway Patrol) 13200 Goldenwest Westminster, CA	714-892-4426
	CalOSHA 10350 Heritage Park Drive, Suite 201 Santa Fe Springs, CA 90670	800-963-9424 hotline
	CalTrans 1120 “N” Street, Room 3200 Sacramento, CA 95814	916-653-3442 *(24-hour)*
	District 7 – Los Angeles County 100 S. Main Street Los Angeles, CA 90012	213-897-3656
	District 12 – Orange County 3337 Michelson, Suite CN-380 Irvine, CA 93612	949-724-2000
	Department of Fish and Wildlife - OSPR 4665 Lampson Ave. Suite C Los Alamitos, CA 90720	562-342-7212
	OSPR Administrator: Thomas Cullen 1700 “K” Street, Suite 250 Sacramento, CA 95814	916-445-9326 916-324-8829 (fax)
	Division of Oil and Gas and Geothermal Resources 5816 Corporate Avenue Cypress, CA 90630-4731	714-816-6847 714-816-6853 (fax)
	Governor’s Office State Capitol Building Sacramento, CA 95814	916-445-2841

Table CL-5. Regulatory Agencies.

JURISDICTION	AGENCY	TELEPHONE
STATE *(cont'd)*	**Governor's Office** **LEPC** (Emergency Planning) Region 1	562-795-2900 562-795-2877 (fax)
	California Highway Patrol	911 *(24-hour)*
	Los Angeles County: (Region 4) **Regional Water Quality Control Board** 320 W. 4th Street, Los Angeles 90013 ***Orange County: (Region 8)*** **Regional Water Quality Control Board** 3737 Main, Suite 500 Riverside, CA 92501	213-576-6600 951-782-4130
	State Fire Marshal Pipeline Safety Division 3950 Paramount Blvd., Suite 210 Lakewood, CA 90712	562-497-9103 562-497-9104 (fax)
	State Lands Commission **Minerals Resource Management** ARCO Towers 200 Oceangate, 12th Floor Long Beach, CA 90802-4471	562-590-5201 *(24-hour)*
	1700 Pacific Coast Highway Huntington Beach, CA 92648	714-536-3018
	Marine Inspection Division 200 Oceangate, Suite 900 Long Beach, CA 90802	562-499-6348
	State Parks/Beaches Angeles District 1925 Las Virgenes Road Calabasas, CA	818-880-0350
	Calif. State Parks North Sector 18331 Enterprise Lane Huntington Beach, CA 92648 • Huntington State Beach: West of PCH, Beach Blvd. to Santa Ana River in Huntington Beach • Bolsa Chica State Beach: West of PCH, south of Warner Avenue in Huntington Beach • Huntington City Beach	800-444-PARK (7275) 714-536-1454 714-377-2481 714-536-5280

Table CL-5. Regulatory Agencies.

JURISDICTION	AGENCY	TELEPHONE
STATE *(cont'd)*	Rich Haydon, Ranger II Calif. State Parks – Orange Coast District 8471 Pacific Coast Highway Laguna Beach, CA 92651 • Crystal Cove State Park: West of PCH, south of Corona Del Mar	949-366-4895 949-494-3539
	Steve Long, Lifeguard Supervisor Calif. State Parks – Pendleton Coast District 3030 Avenida Del Presidente San Clemente, CA 92672 • Doheny State Beach • San Clemente State Beach: Off Avenida Calafia in San Clemente • San Onofre Beach, includes the Bluffs, Trestles, and Surf Beach: Southwest of I-5 at Basilone Road	714-492-0802 949-496-6171 949-492-3156 949-492-4872
LOCAL	<u>**County of Orange**</u> **Coastal Weather** Dana Point Newport Harbor	http://forecast.weather.gov
	Environmental Management Agency Flood Control Maintenance Flood Channel Maintenance Harbors, Beaches & Parks Dana Point Harbor Patrol Newport Beach Harbor Patrol	 714-834-6192 714-567-6300
	Fire Authority	714-573-6000 (main line) **911** or 714-538-3501(emergency)
	Integrated Waste Management	714-834-4000
	Sanitation District	714-962-2411 (24 hr.)
	Sheriff-Coroner Division Emergencies Emergency Management Sheriff	714-647-7400 **911** 714-834-7255 714-647-7000
	South Coast Air Quality Management District	909-396-2000 800-288-7664 (24 hr.)
	<u>**City of Huntington Beach**</u> **Emergency Preparedness**	 714-536-5980

Table CL-5. Regulatory Agencies.

JURISDICTION	AGENCY	TELEPHONE
LOCAL *(cont'd)*	**Fire Department** Emergencies Other Oilfield Inspection	 **911** 714-536-5411 714-536-5676
	Parks- Ron Kilborn **Scott Smith- Beach Operations Supv.** City of Huntington Beach 103 Pacific Coast Highway Huntington Beach, CA 92648 • Huntington City Beach: west of PCH, Beach Blvd. to Bolsa Chica State Park in Huntington Beach Emergencies Administration	714-615-0016 714-536-5614 714-536-5287 714-298-1661 (cell) 714-536-5281
	Public Works	714-536-5431
	<u>**City of Long Beach**</u> **Emergency Preparedness**	 562-570-9250
	Engineering & Public Works Harbor Department (Port of LB Dispatch) Water Department	562-570-6383 562-437-0041 562-570-2300
	Fire Department Emergencies Headquarters Marine Safety – Lifeguard Division	 **911** or 562-436-8211 562-570-2500 562-570-1286
	Harbor Department	562-437-0041
	Police Department Emergencies Non-Emergencies	 **911** 562-435-6711
	Port of Long Beach Harbor Patrol Dispatcher	562-437-0041 562-590-4185

Table CL-6. Waste Management Services.

SERVICE	COMPANY	TELEPHONE
Disposal (Class I)	Chemical Waste Management Kettleman Hills Facility 35251 Old Skyline Blvd. Kettleman City, CA 93727	559-386-9711

Table CL-6. Waste Management Services.

SERVICE	COMPANY	TELEPHONE
Disposal (Class II) / Transport	Clean Harbors Buttonwillow, LLC 2500 W. Lokern Road Buttonwillow, CA 93206 Clean Harbors Environmental Services 1715 East Denni Street Wilmington, CA 90744	661-762-6200 800-544-7199 310-835-9998
Labs	Calscience Environmental Laboratories 7440 Lincoln Way, Garden Grove, CA Advanced Technology Laboratories 3275 Walnut Avenue, Signal Hill, CA	714-895-5494 562-989-4045 562-898-6348 fax
Recycling[1] (batteries)	Kinsburasky Bros. Inc. 1314 N. Lemon Street Anaheim, CA 92801	714-738-8516
Storage/Transport	Ecology Control Industries 20846 Normandie Avenue Torrance, CA 90502	310-320-2555 *(24-hour)*
Storage/Transport	Patriot Environmental Services 508 East E Street, Unit A Wilmington, CA 90744	800-624-9136 *(24-hour)* 562-436-2614

[1] Hazardous wastes sent to a recycling facility must be accompanied by a hazardous waste manifest. In most cases, a waste sample must be sent to the recycler for analysis prior to shipment.

Table CL-7. Outside Services and Resources.

SERVICE	COMPANY	TELEPHONE
Air Transport	Island Express Helicopter 1175 Queens Highway Long Beach, CA 90802	310-510-2525 562-436-2012 (dispatch)
Air Transport (Emergency)	Mercy Air P.O. Box 2532 Fontana, CA	800-222-3456
Air Transport (Emergency)	Clay Lacy Aviation 7435 Valjean Van Nuys, CA	800-423-2904 818-989-2900
Ambulance	American Medical Response Huntington Beach, CA Long Beach, CA	562-808-2100

Table CL-7. Outside Services and Resources.

SERVICE	COMPANY	TELEPHONE
Auto Rental	Avis Rent A Car	800-331-1212
Auto Rental	Budget Rent A Car	800-527-0700
Auto Rental	Hertz Rent A Car	800-654-3131
Auto Rental	Enterprise Rent A Car	800-736-8222
Auto Rental	National Car Rental	800-227-7368
Aviation	Island Express Helicopter 1175 Queens Highway Long Beach, CA 90802	562-436-2012 (dispatch) 310-510-2525
Bus Charter	Operation Shuttle 1400 E. 29th Street Signal Hill, CA	562-988-2636 562-988-2631 (fax)
Bus Charter	California Charter 3333 E. 69th Long Beach, CA 90805	562-634-7969
Cleaning Service (Vessels, Small)	Clean Harbors LA Service Ctr. 2500 E. Victoria Street Compton, CA 90220	800-645-8265 24 hr. 310-764-5851 24hr 310-764-5863 fax
Consultants: Air/Environmental/Safety	Entrix previously listed (Page O-2)	
Consultants: Environmental	Goldberg Environmental Services 2922 Paseo Tranquillo Santa Barbara, CA 93105 Contact: N. Goldberg	805-687-6046 805-687-1068 (fax) sparkink@west.net (e-mail)
Dispersant Aerial Application Permit & Assistant	EADC Ed Rosenberg	888-EADC14U 888-323-2148
COREXIT 9500 Dispersant:	MSRC Long Beach Airport Various Locations Nationwide	800-OIL-SPIL Long Beach 562-432-1415 Concord 510-685-2800
COREXIT 9500 Dispersant:	Clean Seas 990 Cindy Lane, Unit B Carpinteria, CA 93013 Contact: Kyle Hanson	805-684-3838
COREXIT 9500 (EC9500A)	Nalco/Exxon Energy Chemicals, LP P.O. Box 87 Sugar Land, TX 77487-0087	Customer Services: Phone: 630-305-2659 Fax: 281-263-7149 Mobile: 713-854-1658 (Mr. Paul Hey)

Table CL-7. Outside Services and Resources.

SERVICE	COMPANY	TELEPHONE
Dispersant: Corexit 9500	Exxon – Mobil Donnie Ellis, Emergency Response Coordinator –XOM Tommy Tomblin Baytown Refinery	281-654 1038 985-630-7090 Cell 888-245-4540 Pager 281-834-4528
COREXIT 9500 (EC9500A) Type of Product: Oil Spill Dispersant	Nalco/Exxon Energy Chemicals, L.P. P.O. Box 220 Long Beach, CA 90801	630-305-2659
Equipment Rental	United Rentals 16300 Gothard Street Huntington Beach, CA 92647 2020 W. Pacific Coast Hwy Long Beach, CA 5860 Paramount Blvd. Long Beach, CA	 714-842-7765 714-843-2029 (fax) 562-432-2954 562-663-1500
Food Service	McDonald's 640 Long Beach Blvd. Long Beach, CA	562-437-6168 (24 hour)
Food Service	Denny's 601 Long Beach Blvd. Long Beach, CA	562-437-1992 (24-hour)
Food Service	LAbite.com Food Delivery Service from >900 restaurants	562-229-6000 310-446-5512 (fax)
Food Service	Harbor House Café (24-hour) 16341 Pacific Coast Hwy Huntington Beach (Sunset Beach) CA 92649	562-592-5404 (24-hour)
Media: Newspapers	Los Angeles Times Long Beach Bureau	714-966-5600
Media: Newspapers	Orange County Register 625 N. Grand Avenue Santa Ana, CA	714-796-7951
Media: Radio	KFI (AM 640) Los Angeles	323-225-5534 213-385-7076 (fax)
Media: Radio	KFWB (FM 980) Los Angeles	323-900-2098

Table CL-7. Outside Services and Resources.

SERVICE	COMPANY	TELEPHONE
Media: Radio	KLON (FM 88.1) Long Beach	562-985-5566 562-985-2982 (fax)
Media: Radio	KNX (AM 1070) Los Angeles	323-900-2070 323-964-8329 (fax)
Media: Television	KABC-TV, Channel 7 Los Angeles	818-863-7500
Media: Television	KCAL (Channel 9) Los Angeles	213-460-3316 213-464-2526 (fax)
Media: Television	KNBC-TV (Channel 4) Burbank	818-840-4444 818-840-3535 (fax)
Media: Television	KTLA (Channel 5) Los Angeles	323-460-5500
Media: Wire Service	United Press International pressreleases@upi.com	
Hotel	Waterfront Hilton 21100 Pacific Coast Highway Huntington Beach, CA	714-960-7873
Motel	Best Western– Huntington Beach 800 Pacific Coast Highway Huntington Beach, CA	714-536-7500
Motel	Best Western Regency 19360 Beach Blvd. Huntington Beach, CA	714-962-4244
Motel	Best Western of Long Beach 1725 Long Beach Blvd. Long Beach, CA	562-599-5555
Motel	Courtyard by Marriott 500 E. 1st Long Beach, CA	562-435-8511
Motel	Long Beach Marriott 4700 Airport Plaza Drive Long Beach, CA	562-425-5210
Motel	Sheraton Long Beach 333 E. Ocean Blvd. Long Beach, CA	562-436-3000

Table CL-7. Outside Services and Resources.

SERVICE	COMPANY	TELEPHONE
Operations	West Coast Environmental Sol. 2650 Lime Ave, Signal Hill, CA 90755 Bea Esparza	562-448-9525 (office) 562-244-1211 562-490-9615
Operations	Barr Lumber 2541 Anaheim. Long Beach, CA	562-438-1124
Operations	California Conservation Corps: 1719 24th Street Sacramento, CA 95816	916-341-3160 (statewide, 24-hr emergency dispatch)
Operations	Crowley Towing and Transportation Oakland, CA	510-251-7500 corp. office
Operations	Patriot Environmental Services 508 East E Street, Unit A Wilmington, CA 90744	800-624-9136 (24-hr) 562-436-2614
Portable Toilets	United Site Services Orange County	800-638-1233
Portable Toilets	National Sanitation	800-647-6244
Rail	Amtrak	800-872-7245
Trajectory (Oil Spill) Modeling	O'Brien's Response Mgmt. Slidell, LA Brea, CA Brendan Geraghty	985-781-0804 714-577-2100 (Main) 562-217-0791
Trailer Rental	ModSpace 18010 S. Figueroa Gardena, CA 90248	800-523-7918 310-532-0053
Trailer Rental	Mobile Mini	866-308-7242
Trailer Rental	Commercial Mobile Systems	800-788-2502
Truck Rental	Penske Truck Rental @MiniUStorage, Huntington Bch @Neils Rentals, Long Beach	800-736-7531 714-536-6430 562-439-8873
Truck Rental	Ryder	800-297-9337 714-848-8159 562-989-0015

Table CL-7. Outside Services and Resources.

SERVICE	COMPANY	TELEPHONE
Truck Rental	United Rentals 16300 Gothard Street Huntington Beach, CA 92647 U-Haul -19261 S. Beach Blvd.HB 18961 Gothard, Hunt. Bch. 319 Olive Ave, Long Beach 3303 E. 7th St., Long Beach	714-842-7765 714-843-2029 (fax) 714-960-2414 714-842-9718 562-432-0712 562-930-9148
Utility	Southern California Edison Co.	800-990-7788 800-611-1911 *(emergencies)*
Utility	Southern California Gas Co.	800-427-2000
Wildlife Care – California Oiled Wildlife Care Network (OWCN)	OWCN Response Pager OSPR Dispatch Dr. Mike Ziccardi, Director Kathy Collins, Manager Administrative Coordinator Volunteer Coordinator-Cindy Murphy	916-556-7509 (pager) **877-823-6926 hotline** 530-752-4167 530-979-7561 (cell) 530-754-5701 (office) 530-754-9032 530-752-3854 530-754-5481 800-228-4544
Wetlands & Wildlife Care Center San Francisco Oiled Wildlife Care International Bird Rescue Research Center (IBRRC)	21900 PCH, Huntington Beach, CA 92646 Fairfield, CA Southern California Bird Center	714-374-5587 707-207-0380 310-514-2573
Wildlife Care	Marine Mammal Care Center 3601 South Gaffey Street (Fort MacArthur) San Pedro, CA	310-548-5677
Wildlife Care	Pacific Marine Mammal Center 20612 Laguna Beach, CA	949-494-3050
Wildlife Care	Santa Barbara Wildlife Care Network	805-966-9005
Non-oiled wildlife rescue	California Wildlife Center (CWC) PO Box 2022 Malibu, CA 90265 Admin Office	310-458-9453 (emergency) 818-591-9453 818-222-2658
Wildlife Contractors (Marine Biologists) Orange County	MBC Applied Environmental Sciences 3000 Redhill Avenue Costa Mesa, CA 92626	714-850-4830 714-850-4840 (fax)

P.1 INTRODUCTION

For detailed response equipment inventories and delivery times please refer to the California OSRO applications for each listed contractor. All contractors are USCG and OSPR rated and/or approved for response in California:

- Marine Spill Response Corporation (MSRC)
- Patriot Environmental Services
- Clean Harbors

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MARINE SPILL RESPONSE CORPORATION
SERVICE AGREEMENT

EXECUTION INSTRUMENT

The MSRC SERVICE AGREEEMENT attached hereto (together with this execution instrument, the "Agreement"), a standard form of agreement amended and restated as of September 27, 1996, is hereby entered into by and between

Beta Operating Company, LLC d/b/a Beta Offshore
[Name of COMPANY]

a Delaware Limited Liability Company
[Type of entity and place of organization]

with its principal offices located at 111 W. Ocean Blvd. Ste 1240 Long Beach, CA 90802 (the "COMPANY"), and MARINE SPILL RESPONSE CORPORATION, a nonprofit corporation organized under the laws of Tennessee ("MSRC"), and shall be identified as

SERVICE AGREEMENT No. 6MPA 291 [This is to be provided by MSRC.]

IN WITNESS WHEREOF, the parties hereto each have caused this Agreement to be duly executed and effective as of MAY ~~8~~ 19th, 20 10

Beta Offshore [COMPANY]

By: [signature] [signature]

Steve Liles [print name]

Title: Executive Vice President
& Chief Operating Officer

Address: 111 W. Ocean Blvd., Ste 1240
Long Beach, CA 90802

Telephone: (562) 628-1526 Fax: (562) 628-1536

MARINE SPILL RESPONSE CORPORATION:

By: [signature]
Judith ~~R. Norell~~ A. Roos
Vice President
Marketing, Customer Services & Corporate Relations
220 Spring Street, Suite 500
Herndon, VA 20170
(703) 326-5617; Fax: (703) 326-5660

Beta OFFSHORE

List of Facilities to be covered under the MSRC Agreement

1. Platform Ellen and all attached equipment
2. Platform Elly and all attached equipment
3. Platform Eureka and all attached equipment
4. Bridge connecting Platform Ellen & Elly
5. 16" San Pedro Bay Pipeline (oil line) running between Platform Elly and Long Beach
6. 10" water line running between Platform Elly & Platform Eureka (current gas line)
7. 6" gas line running between Platform Elly & Platform Eureka (current gross fluids)
8. 10" oil line running between Platform Elly & Platform Eureka (idle)

111 W. Ocean Blvd., Ste 1240 | Long Beach, CA 90802 | Office: 562-628-1526 | Fax: 562-628-1536

FINANCIAL RESPONSIBILITY CERTIFICATION

In accordance with Section 2.01(a) of Schedule 2 to the MSRC Service Agreement, the undersigned, being a duly authorized officer of Beta Offshore [*insert name of the "COMPANY" that is the party to the Service Agreement*] ("COMPANY"), does hereby certify to the best knowledge and belief of the undersigned, that the COMPANY meets the requirements of Schedule 2 and:

(i) the method relied on by the COMPANY to establish financial responsibility for each Vessel and Facility owned or operated within the Operational Area by the COMPANY or its affiliates is as follows (*see Section 2.02 (a) through (c) of Schedule 2 for the available methods*):

The company carries a liability insurance to a maximum amount of $101 Million

[Attach additional sheets if necessary]

(ii) the applicable Financial Responsibility Amount for each Vessel and Facility owned or operated within the Operational Area by the COMPANY or its affiliates is as follows (*see the definitions in Section 2.03 of Schedule 2 for the proper calculation of Financial Responsibility Amount*):

Required Insurance: MMS Oil spill Financial Responsibility
$35 Million OPA

Estimated Pipeline Responsibility
$12,500 x 1000 BBL = $12.5 Million Onshore

[Attach additional sheets if necessary]

Capitalized terms used in this Certificate and not defined have the meaning ascribed to such terms under the Service Agreement.

IN WITNESS WHEREOF, the undersigned has executed this Certificate in the name and on behalf of the COMPANY as of MAY 5, 2010.

Beta Offshore
[*COMPANY NAME*]

BY: [signature]
[*signature of duly authorized officer*]

Name: Steve Liles
[*print name of officer signing*]

Title: Executive VP & Chief Operating Officer
[*print title of officer signing*]

Location	OSRV/OSRB/ SkimVsl/Boom Boats	Skimmers	Effective Daily Recovery Capacity BBL/Day	Boom	Storage, SBS, Small Boats
Port Hueneme, CA	**MSRC 320**	**1 Stress I**	**15,840**	**660 ft. Sea Sentry II**	**1 - 32,000 barrel offshore barge**
	Other Equipment	1 GT-185	1,371		
Site Totals		2	17,211	660	
Terminal Island, CA High Volume Port	**California Responder**	**1 Transrec 350** **1 Stress III**	**10,567** **9,043**	**5,280 ft. Sea Sentry II**	**1 - 4,000 barrel OSRV Storage***
	Other Equipment			990 ft. Reelpack	
Site Totals		2	19,610	6,270	
Long Beach, CA Berth 53 & 57	**Sea Strike**	**1 GT-185/w adap** **1 Stress I**	**1,371** **15,840**	**3,600 ft. 43" Expandi** **90 ft. 58" Troil** **90 ft. 43" Troil**	**1,267 bbls TS on Sea Strike**
	Recovery 1	**2 Lori Lors**	**9,908**	**1,500 ft. 43" Expandi** **52 ft. 60" Fence Boom**	**2,215 bbls on Recovery 1**
	Recovery 2	**2 Lori Lors**	**9,908**	**1,500 ft. 43" Expandi** **52 ft. 60" Fence Boom**	**2,215 bbls on Recovery 2**
		2 GT-185	**2,742**	**2,000 ft. 20" Harbor Boom**	
	Response 3	**1 LAMOR Multi**	**1,603**		**15 bbls on Response 3**
	Recon 3			**1,000 ft. 43" Reelpack**	
	Recon 4			**1,000 ft. 43" Reelpack**	
	Response 1				
	Response 2				
	Other Equipment	1 Queensboro 1 Elastec Drum	905 288	60 ft. Simplex 1,980 ft. Sea Sentry II	1 - Shallow Water Barge (non-self propelled/400 bbls) 1 - 500 bbl towable storage bladder 2 -18' Small boats
Site Totals		11	42,565	12,924	
El Segundo, CA		1 Walosep W4 2 Queensboro 1 GT-185 w Adap 1 WP-1	3,562 1,810 1,371 3,017	7,700 ft. Sea Sentry II 6,000 ft. Texa Boom 180 ft. Simplex	3 - Shallow Water Barges (non-self propelled/400 bbl) 1 - Lori Barge; 100 bbls TS 2 - 500 bbl towable storage bladders

Location	OSRV/OSRB/ SkimVsl/Boom Boats	Skimmers	Effective Daily Recovery Capacity BBL/Day	Boom	Storage, SBS, Small Boats
Site Totals		5	9,760	13,880	

Location	OSRV/OSRB/ SkimVsl/Boom Boats	Skimmers	Effective Daily Recovery Capacity BBL/Day	Boom	Storage, SBS, Small Boats
Long Beach, CA (W/H & Yard)		4 GT-185 2 Lori Side Colle 3 Lori Bow Colle 1 Komara K-12	5,484 4,954 7,431 275	7,400 ft. 18" Harbor Bo 600 ft. 20' Solid fill B 3,150 ft. 43" Expandi 400 ft. 24" Solid fill B 500 ft. Marsh Boom 110 ft Sea Sentry 2,500 ft. 18" Amer Marine	Lori Barges (2); 100 bbls on each Lori Barge, total 20 2 - (16'- 22') Small boats 4- 57 bbl Fastanks, total 228 2 - 8 bbl tank 4 - Shallow Water Pushboats (3-28' Munson, 1-26' M 9 - 10 bbl Fastanks, total 90 bbls
Site Totals		10	18,144	14,660	
Long Beach, CA (Berth 35)				7,000 ft. 43" Amer Marine	
Site Totals				7,000	
Long Beach, CA (Berth 85)- Tesoro					12,870 Gallons Corexit 9500 dispersant (39 totes)
Site Totals					
Anaheim Bay, CA				3,800 ft. 36" Amer Marine 1,500 ft. 24" Amer Marine 2,000 ft. 10" Solid Boom 3,075 ft. Marsh Boom	
Site Totals				10,375	
Los Angeles Harbor, CA (Berth 151)				2,400 ft. 36" Amer Marine	
Site Totals				2,400	
Los Angeles Harbor, CA Berth 301 - Harley Marine				2,000 ft. 18" Harbor Boom	
Site Totals				2,000	
Alamitos Bay, CA				800 ft. 24" Amer Marine	
Site Totals				800	

MSRC's Major Equipment - California Region

Revised: 4/2/2012

Location	OSRV/OSRB/ SkimVsl/Boom Boats	Skimmers	Effective Daily Recovery Capacity BBL/Day	Boom	Storage, SBS, Small Boats
LB Fire Boat Sta #15				1,200 ft. 24" Amer Marine	
Site Totals				1,200	
LB Fire Boat Sta #20				1,200 ft. 24" Amer Marine	
Site Totals				1,200	
Platform Edith (offshore)				1,500 ft. 43" Expandi	
Site Totals				1,500	
Platform Eva (offshore)				1,500 ft. 43" Expandi	
Site Totals				1,500	
Platform Esther (offshore)				1,500 ft. 43" Expandi	
Site Totals				1,500	
Platform Emmy (offshore)				750 ft. 43" Expandi	
Site Totals				750	

Location	OSRV/OSRB/ SkimVsl/Boom Boats	Skimmers	Effective Daily Recovery Capacity BBL/Day	Boom	Storage, SBS, Small Boats
San Diego, CA	**Recon 2**	**1 Stress III**	**9,043**	**2,000 18' Amer Marine**	**1 - Shallow Water Barge (self propelled/400 bbl)**
	Other Equipment	1 Walosep WM 1 Desmi Terminat 1 Queensboro 1 ïT-185 w Adapt	336 3,017 905 1,371	1,900 ft. Qualitech Boon 120 ft. Simplex 5,600 ft. 24" Amer Mari 1,950 Texa Boom	1 - Shallow Water Barge (non-self propelled/400 bbl) 1 - 500 bbl towable storage bladder 1 - 21' Small boat; 7 bbls storage 1 - Shallow Water Push Boat (28' Munson) 2 - 3,000 bbl towable storage bladders 4 - 57 bbl Fastanks, total, 228 bbls
Site Totals		5	14,672	11,570	
Mesa, AZ	C-130 Dispersant Spray AC				3,330 Gallons Corexit 9500 Dispersant (1 ISO Tank,
Chandler, AZ		1 ArdVac	3,840		
Site Totals		1	3,840		
McCarren, NV		1 ArdVac	3,840		
Site Totals		1	3,840		
Total Equipment		86 Skimmers	270,674	###### Feet	2 - Responder Class OSRVs with a total of 8,000 bbls 10 - Smaller OSRVs with a total of 8,107 bbls storage 1 - FRV with 50 bbls storage 2 - Offshore Barges with 77,000 bbls storage 11 - Shallow Water Barges (non-self propelled) (4,40(3 - Shallow Water Barges (self propelled) (1,200 bbls 11 - Shallow Water Push Boats 16 - Towable Storage Bladders (15,500 bbls storage) 6 - Mini Towable Storage Bladders (324 bbls storage) 12 - Tanks/Seabags (472 bbls storage) 7 - Small skimming vessels 9 - Small barges (900 bbls storage) 12 - Small boats (8 - Boom boats) 54,800 ft Ocean Boom 26,955 Gallons Corexit 9500 Dispersant

Bold entries denote resources associated with a vessel
*USCG OSRO Temp Stor, 14,000 barrels
CA OSPR OSRO Ten 12,901 barrels

NOTES & DISCLAIMERS:

(1) FOR PLANNING PURPOSES ONLY. INFORMATION SUBJECT TO CHANGE WITHOUT NOTICE.

(2) The above lists the resources potentially available. Actual availability depends on circumstances, including commitments to prior spill responses. U availability of specific equipment will also depend on local conditions, availability of contractors, traffic, weather, safe navigation and other conditions p

(3) Resources may be deployed in various combinations as directed by customer and circumstances. For example, skimmers and boom may be deployed different vessels than those listed above.

(4) Estimates provided re: resources (EDRC, storage capacity, etc.) are not performance guarantees or warranties. Actual recovery rates, storage capac will depend on the specifics of the individual response, the type of oil involved, etc.

(5) EDRC is the Coast Guard and BOEMRE-prescribed measurement of skimming capability for planning purposes, and may not represent actual per

(6) Preparation and implementation of plans remains the responsibility of the planholder.

MSRC's Major Equipment - California Region

This Master Service Agreement ("agreement") is entered into on May 31, 2011, between:

Operator: Beta Offshore
Address: 111 W. Ocean Blvd., Suite 1240
Long Beach, CA 90802-4645

Contractor: Patriot Environmental Services
Address: PO Box 1091
Long Beach, CA 90801

The parties agree as follows:

1. Background

A. Operator regularly and customarily enters into contracts with independent contractors for the performance of service relating to the Operator's business.

B. Contractor represents that it has adequate equipment in good working order and fully trained personnel capable of efficiently and safely operating such equipment and performing services for Operator.

2 **Hazards:** The equipment and work areas involved in the work under this agreement are in and part of a producing oilfield offshore California and may contain hazards, including without limitation, flammable, corrosive and/or toxic liquids or gases. Contractor acknowledges that it must take extreme care in performing its work hereunder and accepts the entire risks of such hazards to the employees, tools, equipment and materials of Contractor and its subcontractors.

3. **Safety:** While performing work under this agreement, Contractor shall provide and maintain a safe working environment for, and shall adequately protect the health and safety of, the employees and representatives of Operator, Contractor, Contractor's subcontractors, and all third parties. Contractor acknowledges receiving a copy of Operator's Contractor Environmental Health and Safety Requirements, and Contractor agrees to comply with these minimum requirements, but such minimum requirements shall in no way limit Contractor's obligations to prescribe and enforce appropriate environmental, safety and health standards for the work which shall comply with all applicable federal, state and local safety and health laws and regulations. Contractor shall be solely responsible for notifying its employees, and those of its subcontractors, of all health and safety hazards to which they may be exposed, and Contractor hereby assumes the responsibility to train them in accordance with federal and state OSHA requirements and to provide all necessary protective clothes and equipment for them.

4. **Acceptance and Period of Performance:** Execution of this agreement by Contractor, the shipment of any articles hereunder by Contractor, or the commencement of any work hereunder by Contractor shall constitute Contractor's acknowledgement that it is a party to this agreement, and Contractor's agreement to be bound by its terms. No contrary or additional terms or conditions shall apply notwithstanding any oral or written statement made by Contractor. This agreement applies to all work and/or services performed by or on behalf of Contractor for Operator. Unless otherwise provided in writing by the Contractor and Operator, this agreement shall remain in full force and effect continuously until either party cancels the agreement with a minimum of 30 days advance notice in writing to the other party.

Initial: 5/11/11 Date: MQS

5. **Title and Quality:** Contractor warrants the title to all articles sold and materials supplied hereunder and warrants that all articles sold and materials and work supplied hereunder are of good quality, free of any defects and in full accord with all Operator specifications. All manufacturers' warranties or guarantees shall specifically extend to Operator and shall be furnished to Operator, but such extension and furnishing shall in no way relieve Contractor of any of its obligations hereunder. Should Contractor's title to any article or material fail, or should any article, material or work, in Operator's sole opinion, not be of good quality, not be free of defects, or not conform to Operator's specifications, Contractor shall promptly replace same at Contractor's sole expense and subject to the provisions hereof. Payment or acceptance by Operator shall not constitute a waiver of the foregoing. Nothing herein contained shall be construed to exclude or limit any warranties implied by law.

6. **Taxes:** Unless otherwise provided, Contractor assumes exclusive liability for, and shall pay before delinquency, all sales, use, excise and other taxes, charges or contributions of any kind now or hereafter imposed on, with respect to, or measured by, the articles sold or materials or work furnished hereunder or the wages, salaries, or other remunerations paid to persons employed in connection with the performance of the work hereunder, and Contractor shall indemnify and hold Operator harmless from any liability and expense by reason of the Contractor's failure to pay such taxes, charges, or contributions. Goods purchased under the agreement may be for delivery and use on Operator's Beta Unit platforms located offshore in Federal waters. Because the State of California requires strict compliance with certain tax provisions allowing exemptions for these items, invoices and delivery documents must show a delivery address reflecting the final offshore destination to ensure compliance with state law.

7. **Compliance with Laws, Permits:** In activity connected with performance under this Agreement, Contractor shall comply fully with all applicable laws, regulations, ordinances, rules, and permits. When requested, Contractor shall furnish evidence satisfactory to Operator of such compliance, including, but not limited to laws relating to equal employment opportunity, including: Executive Order 11246 and the regulations, orders and rules issued thereunder; the Rehabilitation Act of 1973 and regulations, orders and rules issued thereunder; the Vietnams Era's Veterans' Readjustment Assistance Act of 1974, as amended, and the regulations, orders and rules issued thereunder; the Equal Opportunity Clause (41 C.F.R. 60-1.4) the Affirmative Action and Non Discrimination Clause for Individuals with Disabilities (41 C.F.R. 60-741.5); the Affirmative Action and Non-Discrimination Clause for Special Disabled and Vietnam Era Veterans (41 C.F.R. 60-250.4); Utilization of Small, Small Disadvantaged and Women Owned Small Business Subcontracting Plan (FAR 52.219.9); and other applicable sections contained in 41 C.F.R. Chapter 60.

8. **Patent Infringements:** Contractor shall defend, indemnify and hold Operator, its affiliates and subsidiaries, and their respective officers, directors, shareholders, members, managers, employees, subcontractors, consultants and agents, harmless from and against any and all loss, liability or expense by reason of any claim or suit for alleged infringement of any copyright, trademark, or patent, resulting from or arising in connection with the manufacture, sale, use or other disposition of any article or material furnished hereunder, or the performance of any work hereunder, and shall defend any such claim or suit and pay all costs and expenses incidental thereto; provided, however, that Operator shall have the right, at its option, to participate in the defense of any such claim or suit, without relieving Contractor of any obligations hereunder.

9. **Assignments and Subcontracts:** Any assignment, whether by operation of law or otherwise, of this agreement or of any claim against Operator arising directly or indirectly out of or in connection with this agreement and any subcontract of any obligation hereunder, whether by operation of law or otherwise, shall be void without the prior written consent of Operator.

10. **Default:** Notwithstanding the provisions for Condition for Excuses of Non-performance hereof, if Contractor shall fail, neglect, refuse or be unable at any time to provide ample equipment or labor to perform the work at a rate of progress deemed reasonably sufficient by Operator or, if Contractor or any subcontractor shall breach any provision hereof, shall become insolvent, enter voluntary or involuntary bankruptcy or receivership proceedings, or make an assignment for the benefit of creditors, Operator shall have the right (without limiting any other rights or remedies which it may have hereunder or by operation of law) to terminate this agreement by written notice to Contractor, whereupon Operator shall be relieved of all further obligation hereunder except only the obligation to pay the reasonable value of Contractor's prior performance. Time is of the essence hereof.

11. **Withholding of Payments:** Operator shall have the right (but no duty) to withhold any monies payable by it to Contractor hereunder and apply same to the payment of any obligations of Contractor to Operator or any other parties.

12. **Prices:** Unless otherwise specified in any applicable supplement hereto, Operator shall pay Contractor, for the complete performance of Contractor's obligations, the prices quoted by Contractor, of if there are no such prices quoted then in accordance with applicable posted or published price lists or schedules, or if there are no such lists or schedules then in accordance with the prices of Contractor in effect on the date of shipment of any article covered hereby or the date of any work performed hereunder, less applicable discounts. If this agreement is based upon a bid of Contractor as awarded by Operator, any attached schedules or rates may be changed only pursuant to any provisions for such change set forth in Operator's request for bid. Any other schedules of rates may be changed from time to time by Contractor filing revised and dated schedules of rates, in duplicate, with Operator, which revised schedules of rates, shall become effective only after written approval thereafter by Operator. Provided Operator's authorized representative has given prior approval for Contractor to furnish any item through a third party or on a subcontracted basis, Operator shall pay Contractor for same at Contractor's net cost (after applicable discounts) plus a handling charge as set forth in any applicable supplement hereto. Contractor's billings for such items shall be supported by copies of third party subcontractor invoices.

13. **Excuses for Non-performance:** Except as provided in Condition for Default hereof, either party shall be absolved from its obligations under the agreement when and to the extent that performance is delayed or prevented (and in Operator's case when and to the extent that its need for the articles, materials or work to be supplied hereunder is reduced or eliminated) by reason of acts of God, fire, explosion, war, riots, strikes, or governmental laws, order or regulations.

14. **Audit:** If any payment provided for hereunder is to be made on the basis of Contractors cost, rates or other flexible billing basis, Operator shall have the right to audit Contractors books and records pertinent thereto. Contractor agrees to maintain such books and records for a period of two (2) years from the date of invoice to Operator and to make such books and records available to Operator at any reasonable time or times within the two-year period for Operator's use in making such audits.

15. **Conflict:** Should any conflict exist between this agreement and any document attached to or incorporated in this agreement, the provisions of this agreement shall control.

16. **Applicable Law:** This agreement shall be governed by and interpreted in accordance with the laws of the State of California including all matters of construction, validity, performance and enforcement, without giving effect to principles of conflict of law.

Initial: MQS Date: 5/11/11

17. Performance: Contractor shall diligently and carefully perform all work in a good and workmanlike manner and shall be fully responsible for all work and services performed by any subcontractors. Contractor shall conduct all operations in Contractor's own name as an independent Contractor and not in the name of, or as agent for, Operator. Operator shall have no voice in the control of Contractor's employees, representatives or subcontractors, nor shall it have any right to direct or control Contractor in the method of performance or the means of accomplishing the desired result. Contractor shall be responsible for the results

18. Liability and Indemnity: Contractor shall defend, indemnify and hold harmless Operator, its affiliates and subsidiaries, and their respective officers, directors, shareholders, members, managers, employees, subcontractors, consultants and agents from and against any and all claims, demands, causes of action, damages, awards, settlements, penalties, fines, liabilities, losses, costs and expenses (including, without limitation, court costs and reasonable attorneys' fees) ("Losses") arising from or in connection with the actions or omissions of Contractor, or Contractor's employees, agents or subcontractors (without regard to the negligence of any party or parties), including without limitation, property damage, personal injury or death. Contractor's indemnity under this agreement shall be without regard to and without any right to contribution from any insurance maintained by Contractor. In the event any action or proceeding is brought against Operator by reason of any such claim, Contractor, upon notice from Operator, shall defend it at Contractor's expense by counsel satisfactory to Operator. If it is judicially determined that the monetary limits of contractually required insurance or of the indemnities assumed under this agreement (which Contractor and Operator hereby agree with, will be supported either by available liability insurance, or voluntarily self-insured, in part or in whole) exceed the maximum limits permitted under applicable law, it is agreed that such insurance requirements or indemnities shall automatically be amended to conform to the maximum monetary limits permitted under such law. Operator shall defend, indemnify and hold harmless Contractor, its affiliates and subsidiaries, and their respective officers, directors, shareholders, members, managers, employees, subcontractors, consultants and agents from and against any and all Losses arising from or in connection with the actions or omissions of Operator, or Operator's employees, agents or subcontractors (without regard to the negligence of any party or parties), including without limitation, property damage, personal injury or death. Operator's indemnity under this agreement shall be without regard to and without any right to contribution from any insurance maintained by Operator. In the event any action or proceeding is brought against Contractor by reason of any such claim, Operator, upon notice from Contractor, shall defend it at Operator's expense by counsel satisfactory to Contractor. If it is judicially determined that the monetary limits of contractually required insurance or of the indemnities assumed under this agreement (which Contractor and Operator hereby agree with, will be supported either by available liability insurance, or voluntarily self-insured, in part or in whole) exceed the maximum limits permitted under applicable law, it is agreed that such insurance requirements or indemnities shall automatically be amended to conform to the maximum monetary limits permitted under such law. Notwithstanding any other provision in this agreement, gross negligence or willful misconduct shall not be included in any indemnity obligation. It is expressly understood and agreed that each party's gross negligence or willful misconduct shall be the sole and exclusive responsibility of the actor and his employer. It is further understood that any monetary and or property damages incurred as a result of such party's gross negligence or willful misconduct shall be the sole and exclusive responsibility of the actor and his employer.

19. Use of Premises: Contractor shall perform all work in such manner as to cause a minimum of interference with Operator's operations and the operations of other contractors on the premises, shall take all necessary precautions to protect the premises and all persons and property thereon from damage or injury, and shall assume responsibility for the taking of such precautions by Contractor's and any subcontractor's employees, agents, licenses, permittees and subcontractors. Upon completion of the work, Contractor shall leave the premises clean and free of all tools, equipment, waste materials and rubbish.

Initial: MQS Date: 5/11/11

20. **Payments of Bills and Liens:** Contractor shall pay promptly all indebtedness for labor, materials, tools and equipment furnished by Contractor and any subcontractors in the performance of this agreement. Before Contractor shall be entitled to receive payment, Contractor shall, when requested by Operator, furnish evidence satisfactory to Operator of the full payment of such indebtedness. Contractor shall not permit any lien or charge to attach to the work or the premises upon which the work is being performed. Should any lien attach, Contractor shall promptly procure its release and shall indemnify Operator for all loss, cost, damage, fees, or expense incidental thereto.

21. **Changes in Work:** Changes in the work may be required from time to time by Operator. Should changes be so required, they shall not be commenced until Contractor is given written instruction from Operator which shall specify the changes, the sums (or the method of determining the sums) to be added to or subtracted from the agreed price as a result of such changes, and the effect, if any, of such changes on the completion or delivery dates. Should Contractor dispute any of the provisions of the instructions it shall notify Operator within forty-eight (48) hours and the parties shall settle their differences by negotiation.

22. **Insurance:** At all times during the term of this agreement, Contractor shall carry insurance in accordance with the attached Insurance Coverage Requirements. All such insurance shall be evidenced by the completion, execution and delivery to Operator of an Insurance Certificate.

23. **Invoicing and Payment:** Contractor shall promptly prepare and submit invoices according to the terms and conditions of the attached Invoicing and Payment Requirements.

24. **Recovery of Litigation Costs:** In any legal action, arbitration or alternate dispute resolution proceeding based upon or concerning this agreement, the successful or prevailing party shall be entitled to recover its actual attorney fees and costs incurred in that action or proceeding, in addition to all other relief to which it is entitled, regardless of whether the proceeding is concluded by settlement, award or judgment.

PATRIOT ENVIRONMENTAL SERVICES INC.

Printed Name of Contractor

Michael G Sull

Signature of Officer of the Contractor

05/11/2011

Date

Beta Offshore

Printed Name of Operator

Signature of Officer of the Operator

5-31-11

Date

Initial: MGS Date: 5/11/11

Patriot Environmental Services

BOOM 819.02 (b) (1) (A)

Total of 21,400' of 6" x 12" Harbor Boom.

BOOM 819.02 (b) (1) (B-F)

LENGTH	MAKE/MODEL	FREEBOARD / DRAFT	CONNECTOR TYPE	OPERATING ENVIRONMENT	ANCHORING SYSTEM	LOCATION	STORED
2000'	Kepner / Seacurtain	6" / 12"	ASTM F2438-04	Rivers, Lakes,Harbor	Danforth	W	Trailer
2000'	Kepner / Seacurtain	6" / 12"	ASTM F2438-04	Rivers, Lakes,Harbor	Danforth	W	Trailer
2000'	Kepner / Seacurtain	6" / 12"	ASTM F2438-04	Rivers, Lakes,Harbor	Danforth	W	In Harbor on P1 Barge
2000'	Kepner / Seacurtain	6" / 12"	ASTM F2438-04	Rivers, Lakes,Harbor	Danforth	SD	Trailer
2000'	Kepner / Seacurtain	6" / 12"	ASTM F2438-04	Rivers, Lakes,Harbor	Danforth	SD	Trailer
2000'	Kepner / Seacurtain	6" / 12"	ASTM F2438-04	Rivers, Lakes,Harbor	Danforth	SD	Trailer
1000'	Kepner / Seacurtain	6" / 12"	ASTM F2438-04	Rivers, Lakes,Harbor	Danforth	SD	Vessel
2000'	Kepner / Seacurtain	6" / 12"	ASTM F2438-04	Rivers, Lakes,Harbor	Danforth	BF	Trailer
1000'	Kepner / Seacurtain	6" / 12"	ASTM F2438-04	Rivers, Lakes,Harbor	Danforth	IE	Trailer
1000'	Kepner / Seacurtain	6" / 12"	ASTM F2438-04	Rivers, Lakes,Harbor	Danforth	IE	Trailer
400'	Kepner / Seacurtain	6" / 12"	ASTM F2438-04	Rivers, Lakes,Harbor	Danforth	BF	Trailer
2000'	Kepner / Seacurtain	6" / 12"	ASTM F2438-04	Rivers, Lakes,Harbor	Danforth	V	Trailer
2000'	Kepner / Seacurtain	6" / 12"	ASTM F2438-04	Rivers, Lakes,Harbor	Danforth	V	Trailer

Abbreviations for Chart above: W-Wilmington, SD-San Diego, BF-Bakersfield, IE-Inland Empire, SC-Santa Clarita, V-Ventura

All Boom above is dedicated Patriot OSRO-owned and controlled.

Patriot Environmental Services

SKIMMERS **19.02 (b) (2) (A-I)**

QUANTITY LOCATION	MAKE/MODEL	OPERATING ENVIRONMENT	CURRENT	TYPE	NAMEPLATE CAPACITY PER UNIT	EDRC	SKIMMER STORAGE CAPACITY	SKIMMER EXTERNAL CAPACITY	DRAFT
1 / W	Skim Pak/4300	Rivers, Lakes,Harbor	< 2 KNOTS	ST*	3257 B/D	651 B/D	0	1000 + BBL	6.6"
1 / W	Skim Pak/4300	Rivers, Lakes,Harbor	< 2 KNOTS	ST*	3257 B/D	651 B/D	0	1000 + BBL	6.6"
1 / W	Elastec/Drum Magnum 100	Rivers, Lakes,Harbor	< 2 KNOTS	ST*	3428 B/D	2742 B/D	0	1000 + BBL	20"
1 / W	Elastec/Drum Magnum 100G	Rivers, Lakes,Harbor	< 2 KNOTS	ST*	6857 B/D	5484 B/D	0	1000 + BBL	20"
1 / SD	Elastec/Drum Magnum 100G	Rivers, Lakes,Harbor	< 2 KNOTS	ST*	6857 B/D	5484 B/D	0	1000 + BBL	20"
1 / V	Elastec/Drum Magnum 100G	Rivers, Lakes,Harbor	< 2 KNOTS	ST*	6857 B/D	5484 B/D	0	1000 + BBL	20"
1 / W	Komara/K12 Disc	Rivers, Lakes,Harbor	< .5 KNOTS	ST*	2712 B/D	542 B/D	0	1000 + BBL	16"
1 / W	Desmi/ Terminator	Rivers, Lakes,Harbor	< 2 KNOTS	ST* / AD*	15085 B/D	3017 B/D	0	1000 + BBL	28"
1 / W	Desmi/ Terminator	Rivers, Lakes,Harbor	< 2 KNOTS	ST* / AD*	15085 B/D	3017 B/D	0	1000 + BBL	28"
1 / W	Desmi/ Terminator	Rivers, Lakes,Harbor	< 2 KNOTS	ST* / AD*	15085 B/D	3017 B/D	0	1000 + BBL	28"
1 / W	HIB	Ocean,Rivers, Lakes,Harbor	< 5 KNOTS	ST* / AD*	100000 B/D	70000 B/D	0	1000 + BBL	24"
1 / SD	Skim Pak/4300	Rivers, Lakes,Harbor	< 2 KNOTS	ST*	3257 B/D	651 B/D	0	1000 + BBL	6.6"
1 / SD	Skim Pak/4300	Rivers, Lakes,Harbor	< 2 KNOTS	ST*	3257 B/D	651 B/D	0	1000 + BBL	6.6"
1 / BF	Elastec/Drum Magnum 100	Rivers, Lakes,Harbor	< 2 KNOTS	ST*	3428 B/D	2742 B/D	0	1000 + BBL	20"
1 / BF	Skim Pak/4300	Rivers, Lakes,Harbor	< 2 KNOTS	ST*	3257 B/D	651 B/D	0	1000 + BBL	6.6"
1 / V	Skim Pak/4300	Rivers, Lakes,Harbor	< 2 KNOTS	ST*	3257 B/D	651 B/D	0	1000 + BBL	6.6"

Abbreviations for Chart above: W-Wilmington, SD-San Diego, BF-Bakersfield, V-Ventura

* ST- Stationary *AD-Advancing

All Skimmers above are dedicated Patriot OSRO-owned and controlled.

Patriot Environmental Services

RESPONSE VESSELS 819.02 (b) (3) (A-J)

VESSEL NAME/ LOCATION	LENGTH/ BEAM/DRAFT	DESIGN	DOC/REG	OPERATING ENVIRONMENT	TOW ABILITY	HP	BOOM STOWED	PUMP RATE	DESIGN LIMITS
308 Colorado (W)	21'/8'6"/24"	WORK	CF7229UH	HARBOR, LAKES, RIVERS	Boom Only	150	0	N/A	INLAND/ NEARSHORE
310 Oregon (W)	26'/8'6"/26"	WORK	CF7231UH	OCEAN,HARBOR,LAKES,RIVER	Boom Only	TWIN 90	0	N/A	INLAND/ NEARSHORE
311 Jersey (W)	24'/9'6"/42"	WORK	CF7233UH	OCEAN,HARBOR,LAKES,RIVER	Boom Only	TWIN 150'S	0	N/A	INLAND/ NEARSHORE
300 MAKO (W)	21'/7'9"/24"	WORK	CF4713KB	HARBOR, LAKES, RIVERS	Boom Only	225	0	N/A	INLAND/ NEARSHORE
SKIFFS (W) 8 TOTAL	14'/55"/15"	WORK	Pending	HARBOR, LAKES, RIVERS	Boom Only	9.9	0	N/A	INLAND
307 Texas (SD)	26'/8'6"/25"	WORK	DL3513Z	OCEAN,HARBOR,LAKES,RIVER	Boom Only	150	800'	N/A	INLAND/ NEARSHORE
313 Delaware (SD)	28'/10'/30"	WORK	CF7159UH	OCEAN,HARBOR,LAKES,RIVER	Boom Only	TWIN 90	0	N/A	INLAND/ NEARSHORE
305 California (SD)	20'/954"/20"	WORK	CF2433PD	HARBOR, LAKES, RIVERS	Boom Only	150	0	N/A	INLAND/ NEARSHORE
SD 25 WORKSKIFF (SD)	20'/95"/25"	WORK	Pending	HARBOR, LAKES, RIVERS	Boom Only	25	0	N/A	INLAND/ NEARSHORE
SKIFF (SD)	14'/55"/15"	WORK	Pending	HARBOR, LAKES, RIVERS	Boom Only	N/A	0	N/A	INLAND/ NEARSHORE
312 Nevada (BF)	17'/60"/20"	WORK	WN5986RN	HARBOR, LAKES, RIVERS	Boom Only	60	0	N/A	INLAND/ NEARSHORE
Baker 25 (BF)	20'/95"/20"	WORK	Pending	HARBOR, LAKES, RIVERS	Boom Only	25	0	N/A	INLAND/ NEARSHORE
SKIFF (BF)	14'/55"/15"	WORK	Pending	HARBOR, LAKES, RIVERS	Boom Only	8	0	N/A	INLAND/ NEARSHORE
Vent 25 WORKSKIFF (V)	20'/95"/20"	WORK	Pending	HARBOR, LAKES, RIVERS	Boom Only	25	0	N/A	INLAND/ NEARSHORE
301 Arizona (V)	27'/8'6"/20"	WORK	CF4920NP	OCEAN,HARBOR,LAKES,RIVER	Boom Only	TWIN 200'S	0	N/A	INLAND/ NEARSHORE

Patriot Environmental Services

<u>**RECOVERED OIL STORAGE**</u> **819.02 (b) (4) (A-E)**

TYPE/NAME/ LOCATION	OFFICIAL #	LENGTH / BEAM/ DRAFT	MAX CAPACITY BBLS
TANK/ THOMPSON/ BF	T-3	N/A	120
TANK/ STAINLESS/ W	T-4	N/A	120
TANK/PERTON/V	T-5	N/A	120
TANK/ THOMPSON/ SC	T-6	N/A	120
TANK/HEIL/SC	T-7	N/A	120
TANK/ACRO/SC	T-8	N/A	120
TANK/ACRO/SD	T-9	N/A	120
TANK/WRIGHT/ W	T-10	N/A	120
TANK/WRIGHT/ W	T-11	N/A	120
TANK/WRIGHT/ W	T-12	N/A	120
TANK/WRIGHT/ W	T-13	N/A	120
TANK/WRIGHT/ W	T-14	N/A	120
TANK/HEIL/IE	T-15	N/A	120
TANK/HEIL/SD	T-16	N/A	120
TANK/ THOMPSON/BF	T-20	N/A	120
Truck/Ford/W	50	N/A	50
Truck/Peterbilt/V	70	N/A	70
Truck/Peterbilt/W	70	N/A	70
Truck/Peterbilt/ SD	70	N/A	70
Truck/Peterbilt/ SD	70	N/A	70

Patriot
Environmental Services

<u>RECOVERED OIL STORAGE</u> *cont..* **819.02 (b) (4) (A-E)**

TYPE/NAME/ LOCATION	OFFICIAL #	LENGTH / BEAM/ DRAFT	MAX CAPACITY	QUANTITY
BLADDER/FLEXI TANK/W	B2	30X60X4	1000 BBL	1
BLADDER/FLEXI TANK/W	B3	30X60X4	1000 BBL	1
BLADDER/FLEXI TANK/W	B5	30X60X4	1000 BBL	1
BLADDER/FLEXI TANK/W	B6	30X60X4	1000 BBL	1
BLADDER/FLEXI TANK/W	B7	30X60X4	1000 BBL	1
BLADDER/FLEXIT ANK/W	B11	80X80X5	3500 BBL	1
BLADDER/FLEXI TANK/V	B8	30X60X4	1000 BBL	1
BLADDER/FLEXI TANK/V	B4	30X60X4	1000 BBL	1
BLADDER/FLEXI TANK/SD	B1	30X60X4	1000 BBL	1
BLADDER/FLEXI TANK/W	B9	30X60X4	1000 BBL	1
BLADDER/FLEXI TANK/W	B10	30X60X4	1000 BBL	1

Abbreviations for Chart above: W-Wilmington, SD-San Diego, BF-Bakersfield, V-Ventura, SC-Santa Clarita, IE-Inland Empire

All storage tanks, bladders and trucks are Patriot dedicated OSRO Owned and Controlled.

State of California -The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Office of Spill Prevention and Response
1700 K Street, Suite 250
Sacramento, California 95811
Telephone: (916) 445-9338
www.wildlife.ca.gov/ospr

EDMUND G. BROWN, JR., Governor
CHARLTON H. BONHAM, Director

August 10, 2015

RECEIVED
AUG 18 2015

Dale Strieter
Technical Services Manager
Patriot Environmental Services
508 East E Street, Unit A
Wilmington, California 90744

SUBJECT: Oil Spill Response Organization (OSRO) Rating Modification

Dear Mr. Strieter:

The Office of Spill Prevention and Response received a modified OSRO application from Patriot Environmental Services on May 11, 2015. It provides information regarding the new office in Richmond, California. In addition, Patriot is applying for a new OSRO rating in ACP 2/GRA 3, 4, 5, 6, 7, 8, 9 & 10. The 0 and 1 hour ratings for which Patriot is applying require a 24-hour advanced notice. OSPR conducted an announced inspection to verify the oil spill resources described in their modified OSRO application.

Patriot is hereby notified that their OSRO Rating in ACP 2 is modified to reflect a rating for containment boom, on-water recovery and storage with 24-hour advanced notice.

Attached is the modification to Patriot's OSRO Rating Matrix.

As you know, OSRO's seeking a Rating are subject to announced and unannounced inspections any time prior and subsequent to receiving a Rating to verify the response services cited in the application. {Ref. Title 14 CCR section 819.03(c)}

If you have any questions, you may contact Mr. Jeff Poteet at telephone number (916) 323-6285 or by e-mail at Jeff.Poteet@willdlife.ca.gov.

Sincerely,

Thomas M. Cullen, Jr.
Administrator

OSRO RATING RESPONSE MATRIX	**NAME: Patriot Environmental Services**								**Expires: November 5, 2017**	
Hours	**0 1**	**1**	**2**	**4**	**6**	**12**	**18**	**24**	**36**	**60**
ACP 1 North Coast										
Containment Boom (Feet)										
Recovery (Bbls)										
Storage (Bbls)										
Shoreline Protection										
ACP 2 / GRA 1 SF Coastal Region										
Containment Boom (Feet)	1,000	1,000				6,000	20,000	20,000	20,000	20,000
Recovery (Bbls)						13,710	19,194	19,194	19,194	19,194
Storage (Bbls)						11,500	16,500	21,500	21,500	21,500
Shoreline Protection	No									
ACP 2 / GRA 2 South SF Bay										
Containment Boom (Feet)	1,000	1,000				6,000	20,000	20,000	20,000	20,000
Recovery (Bbls)						13,710	19,194	19,194	19,194	19,194
Storage (Bbls)						11,500	16,500	21,500	21,500	21,500
Shoreline Protection	No									
ACP 2 / GRA 3 Anchorage 9										
Containment Boom (Feet)	1,000	1,000				6,000	20,000	20,000	20,000	20,000
Recovery (Bbls)						13,710	19,194	19,194	19,194	19,194
Storage (Bbls)						11,500	16,500	21,500	21,500	21,500
Shoreline Protection	No									
OPRA:										
San Mateo Bridge										
Oakland/ Anchorage 9										
ACP 2 / GRA 4 Central SF Bay										
Containment Boom (Feet)	1,000	1,000				6,000	20,000	20,000	20,000	20,000
Recovery (Bbls)						13,710	19,194	19,194	19,194	19,194
Storage (Bbls)						11,500	16,500	21,500	21,500	21,500
Shoreline Protection	No									
OPRA:										
SF Bay Bridge										
SF Central Bay										
Richmond										
ACP 2 / GRA 5 San Pablo Bay										
Containment Boom (Feet)	1,000	1,000				6,000	20,000	20,000	20,000	20,000
Recovery (Bbls)						13,710	19,194	19,194	19,194	19,194
Storage (Bbls)						11,500	16,500	21,500	21,500	21,500
Shoreline Protection	No									
OPRA:										
Deep Water Channel										
ACP 2 / GRA 6 Suisun Bay										
Containment Boom (Feet)	1,000	1,000				6,000	20,000	20,000	20,000	20,000
Recovery (Bbls)						13,710	19,194	19,194	19,194	19,194
Storage (Bbls)						11,500	16,500	21,500	21,500	21,500
Shoreline Protection	No									
OPRA:										
Benicia Bridge										
ACP 2 / GRA 7 West Delta										
Containment Boom (Feet)	1,000	1,000				6,000	20,000	20,000	20,000	20,000

OSRO RATING RESPONSE MATRIX	NAME: Patriot Environmental Services							Expires: November 5, 2017		
Hours	**0 [1]**	**1**	**2**	**4**	**6**	**12**	**18**	**24**	**36**	**60**
Recovery (Bbls)						13,710	19,194	19,194	19,194	19,194
Storage (Bbls)						11,500	16,500	21,500	21,500	21,500
Shoreline Protection	No									
ACP 2 / GRA 8										
North Delta										
Containment Boom (Feet)	1,000	1,000				6,000	20,000	20,000	20,000	20,000
Recovery (Bbls)						13,710	19,194	19,194	19,194	19,194
Storage (Bbls)						11,500	16,500	21,500	21,500	21,500
Shoreline Protection	No									
ACP 2 / GRA 9										
South Delta										
Containment Boom (Feet)	1,000	1,000				6,000	20,000	20,000	20,000	20,000
Recovery (Bbls)						13,710	19,194	19,194	19,194	19,194
Storage (Bbls)						11,500	16,500	21,500	21,500	21,500
Shoreline Protection	No									
ACP 2 / GRA 10										
East Delta										
Containment Boom (Feet)	1,000	1,000				6,000	20,000	20,000	20,000	20,000
Recovery (Bbls)						13,710	19,194	19,194	19,194	19,194
Storage (Bbls)						11,500	16,500	21,500	21,500	21,500
Shoreline Protection	No									
ACP 3										
Central Coast										
Containment Boom (Feet)										
Recovery (Bbls)										
Storage (Bbls)										
Shoreline Protection										
ACP 4 LA/LB NORTH										
San Luis Obispo										
Containment Boom (Feet)	1,000	1,000			4,000	10,000	20,000	20,000	20,000	20,000
Recovery (Bbls)					16,452	21,936	25,842	25,842	25,842	25,842
Storage (Bbls)					13,500	13,500	16,500	21,500		
Shoreline Protection	YES									
Port Hueneme										
Containment Boom (Feet)	1,000	1,000			4,000	10,000	20,000	20,000	20,000	20,000
Recovery (Bbls)					16,452	21,936	25,842	25,842	25,842	25,842
Storage (Bbls)					13,500	13,500	16,500	21,500		
Shoreline Protection	YES									
Ventura / Santa Barbara										
Containment Boom (Feet)	1,000	1,000			4,000	10,000	20,000	20,000	20,000	20,000
Recovery (Bbls)					16,452	21,936	25,842	25,842	25,842	25,842
Storage (Bbls)					13,500	13,500	16,500	21,500		
Shoreline Protection	YES									
ACP 5 LA/LB SOUTH										
LA / Orange										
Containment Boom (Feet)	1,000	1,000	2,000	4,000	6,000	10,000	20,000	20,000	20,000	20,000
Recovery (Bbls)			5,484	10,968	16,452	21,936	25,842	25,842	25,842	25,842
Storage (Bbls)			1,000	4,000	13,500	13,500	16,500	21,500		
Shoreline Protection	YES									
OPRA:	NO									
Queens Gate										
ACP 6										
San Diego										
Containment Boom (Feet)	1,000	1,000			6,000	10,000	20,000	20,000	20,000	20,000
Recovery (Bbls)					16,452	21,936	25,842	25,842	25,842	25,842
Storage (Bbls)					13,500	13,500	16,500	21,500		
Shoreline Protection	YES									

* 24 hr Advanced Notice Required

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FIELD SERVICE ADDENDUM

Amendment 1

This Amendment 1 to the Waste Transportation and Disposal Agreement between Clean Harbors Environmental Services, Inc. ("Clean Harbors or CHES") and Beta Offshore ("Customer") (the "Agreement"), executed on June 11, 2010 is intended to supplement and modify the Agreement as stated herein, . Clean Harbors is willing to provide On-Site Confined Space Rescue Services ("CSR"), Field Services ("FS") and Emergency Response Services ("ERS") under the following terms and conditions.

A. CSR

The Agreement shall be amended and modified to include the following terms and conditions in all instances where Clean Harbors performs CSR for Customer,

1. DUTIES OF BETA OFFSHORE

Customer will ensure that all persons involved in the entry or other services (non CHES) are compliant with all Cal OSHA and Federal OSHA requirements pertaining to applicable H&S requirements. This shall include customer's subcontractors and/or employees have the appropriate written procedures, training, medical clearance etc. To perform the type of work required by Customer.

All equipment necessary to perform the CSR or other shall be provided by Customer (or their sub-contractor). CHES will not be responsible for supplying any of the entry equipment other than specific equipment required for rescue services.

2. DUTIES OF CLEAN HARBORS

Clean Harbors shall provide all personnel and equipment as deemed necessary to provide hole watch and confined space rescue services as needed. This equipment may include but not be limited to the following:

Supplied air equipment (SCBA or Supplied Airline Systems with egress bottles)
Body Harnesses
Mechanical Retrieval equipment
Basic First-Aid Kit.

Each confined space entry is unique and prior to initiating entry into any vessel CHES personnel shall develop a rescue plan for that particular space. The plan shall be documented and discussed with all personnel prior to beginning the entry.

3. INDEMNIFICATION

Customer acknowledges that the services provided herein are specialized and rescue actions are only made necessary when an incident involving independent third Party(ies) has or have occurred. In light of the specialized circumstances, Customer shall indemnify, defend, release and hold harmless Clean Harbors, its parent and affiliated companies and their respective directors, officers, employees and agents from and against any and all costs, liabilities, claims, demands and causes of action including, without limitation, any bodily injury to or death of any person or destruction of or damage to property which Clean Harbors may suffer, incur, or pay out, that arise out of, or are in any way related to, the services provided herein, except to the extent such liabilities, claims, demands and causes of action result from Clean Harbors' willful misconduct or gross negligence.

The foregoing indemnity shall only apply to those claims, liabilities or causes of action arising, during, or as a result of the performance of CSR. The indemnity contained in the Agreement shall govern the rights and obligations of the parties with regard to the transportation or disposal of waste materials by contractor.

Except as specifically amended herein, all other terms and conditions contained in the Agreement shall remain in full force and effect.

B. FS

The Agreement shall be amended and modified to include the following terms and conditions in all instances where Clean Harbors performs FS for Customer;

1. SCOPE OF WORK

The scope of work may include, but is not necessarily limited to:
Remediation and Remedial Systems
Site Construction
Custom Fabrication/Welding
Mobile Treatment Services
Site Operations, Monitoring & Maintenance
Well Maintenance and Video Inspection Services

2. CHANGE ORDERS

It is understood that the price set forth in Clean Harbors's quotation letter or bid for the Scope of Work is Clean Harbors's best estimate based on information provided to it, or made available, by the Customer. If, during the performance of the work, changes are made in the scope or character of the work or the limits of the project are revised, a Customer designated individual shall be authorized to issue, and shall so issue, the appropriate change order(s). The cost or credit to the Customer resulting from such change order(s) shall be determined in one or more of the following ways:

2.1 by mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

2.2 by unit prices stated in Clean Harbors's quotation letter or bid or as subsequently agreed upon;

2.3 by cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee.

3. SUBSURFACE/LATENT CONDITIONS

If Clean Harbors encounters (a) subsurface or latent physical conditions at the site which differ materially from those indicated by a reasonably diligent inspection or (b) unknown physical conditions at the site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inherent in work of the character as provided for in this Agreement and/or applicable purchase or work order and/or Scope of Work, equitable adjustment to the price and/or schedule shall be mutually agreed to by the parties before Clean Harbors shall proceed with the work.

4. CUSTOMER DELAYS

If the performance of all or any part of the project work is delayed or interrupted

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4.1 by an act of the Customer in the administration of the Agreement or project that is not expressly or impliedly authorized by the Agreement and/or any purchase or work order and/or Scope of Work definition (hereafter, collectively, the "SOW"), or

4.2 by a failure of Customer to act within the time specified in the SOW, or within a reasonable time if not specified,

Then, an adjustment shall be made for any increase in the cost of performance of SOW caused by the delay or interruption and the SOW shall be modified in writing accordingly. Adjustment shall also be made in the delivery or performance dates and any other contractual term or condition affected by the delay or interruption. However, no adjustment shall be made under this section for any delay or interruption to the extent that performance would have been delayed or interrupted by any other cause, including the fault or negligence of Clean Harbors, or for which an adjustment is provided or excluded under any other term or condition of this Agreement.

5. COMPLIANCE WITH LAWS AND REGULATIONS

Clean Harbors warrants that it has, or will secure by the time the project commences, all permits or approvals which are required for servicing the waste or for the services to be performed by Clean Harbors which are the subject of the SOW. Clean Harbors shall furnish to Customer, upon request, proof of all such permits and approvals. Customer warrants that Clean Harbors will be authorized by the appropriate agencies to utilize necessary permits or approvals previously secured by the Customer. Customer shall furnish to Clean Harbors, upon request, proof of such authority.

6. CLEAN HARBORS WARRANTIES

Clean Harbors warrants that:

6.1 All procedures, methods and work finished pursuant to the SOW to be free from defects in construction or workmanship for a period of one (1) year and in full compliance with all laws, rules and regulations of any government entity or agency applicable to the work to be performed hereunder; and

6.2 product, material, equipment or supplies used or installed pursuant to the SOW to be free from defects only to the extent of warranty provided by the respective manufacturer or supplier of such product, material, equipment or supplies. Copies of all applicable manufacturer's or supplier's warranties and limitations, if applicable, shall be provided to Customer.

This warranty is in lieu of all other warranties, express, implied or statutory, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose, with respect to any product, material, equipment or supplies used or installed by clean harbors under the sow and all such warranties are expressly disclaimed. Representatives of Clean Harbors have no authority to make any additional warranties and any such warranties are expressly disclaimed.

7. TERMINATION

7.1 Termination. Clean Harbors may, by seven (7) days' written notice to the Customer, terminate a remedial work/purchase order for any of the following reasons:

7.1.1 the failure of the Customer to make timely payments pursuant to Section 3 of the Agreement;

7.1.2 if the work to be performed is stopped for a period of fifteen (15) days under an order of any court or other public authority having jurisdiction, or as a result of an act of government, such as a declaration of a national emergency making materials unavailable;

7.1.3 If the work to be performed is stopped, delayed or rendered impracticable for a period of five (5) days or more because of action by the Customer and the parties are unable to agree on adequate and fair compensation occasioned by the cessation or delay.

7.1.4 The Customer shall pay Clean Harbors the allowable costs incurred prior to termination and any other costs reasonably incurred by Clean Harbors to implement the termination.

7.2 Termination by Customer. The Customer may, by seven (7) days written notice to Clean Harbors, terminate a remedial work/purchase order for the following reason:

Field (

7.2.1 the persistent or repeated refusal or failure to pursue the work set forth in the SOW or to comply with laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction over Clean Harbors which are material to the performance of this Agreement

Except as specifically amended herein, all other terms and conditions contained in the Agreement shall remain in full force and effect.

C. ERS

The Agreement shall be amended and modified to include the following terms and conditions in all instances where Clean Harbors performs ERS for Customer,

1. SCOPE OF EMERGENCY RESPONSE SERVICES

1.1 Upon execution of this Emergency Response Services Rider ("Rider"), Clean Harbors agrees to provide Emergency Response Services ("Services") for the Customer's accidental discharges of oil or other hazardous substances. Services may include, but are not limited to the following: Containment, recovery, repackaging and removal of materials; Site evaluation, decontamination and restoration; Transportation, storage, treatment or disposal of wastes; Technical services, including sampling, laboratory analysis, and other related services; Standby of personnel and equipment in anticipation of imminent activation; and Training and mock spill drill deployments.

2. COMPENSATION

2.1 The payment terms set forth herein are contingent upon the approval of Contractor's Credit Department. In the event of a change in Customer's financial condition, Clean Harbors reserves the right to alter, change, or modify payment terms, and to immediately stop work. The failure of Clean Harbors to exercise its rights under this article at any time shall not constitute a waiver of Contractor's continuing right to do so.

2.2 Customer agrees to pay Clean Harbors for Services in accordance with Contractor's Rate Schedule for emergency response work ("Rates") in effect at the time Services are rendered. Customer hereby assigns to Clean Harbors all rights to any insurance payments that Customer may be entitled to receive to pay for the Services provided under this Agreement and hereby authorizes its insurance Customer or agent to pay Clean Harbors directly. Customer's obligation to pay amounts due pursuant to this Agreement shall not be conditioned upon or limited by the types, amounts or availability of insurance coverage.

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2.3 Clean Harbors will present its first invoice to Customer as soon as possible following commencement of Services provided hereunder, and may issue subsequent invoices every five (5) days thereafter. Customer agrees to pay the full amount of each invoice amount within fifteen (15) business days of the date of receipt of said invoice by Customer's Representative.

2.4 Customer agrees that interest shall accrue and will be paid to Clean Harbors on any unpaid balance of any invoice after fifteen (15) business days of receipt of invoice by Customer at the rate of one and one half percent (1.5%) per month or the maximum amount allowed by law.

2.5 In the event that legal or other action is required to collect unpaid balances of invoices due Contractor, Customer agrees to pay all costs of collection, litigation or settlement incurred by Contractor, including reasonable attorneys fees. "Legal or other action" as used above shall include bankruptcy and insolvency proceedings.

2.6 In the event that work is suspended or terminated for any reason prior to the completion of the Services, Customer agrees to pay for labor, equipment, materials, disposal and other costs incurred by Clean Harbors at the Rates and for reasonable demobilization costs.

2.7 Customer agrees to pay Clean Harbors in accordance with the Rates for any litigation support or testimony provided by Clean Harbors in connection with, or arising out of, the work performed by Clean Harbors hereunder.

3. INDEMNIFICATION

3.1 Clean Harbors shall indemnify, defend and hold harmless Customer, its parent and affiliated companies and their respective directors, officers, employees and agents from and against any and all costs, liabilities, claims, demands and causes of action including, without limitation, bodily injury to or death of any person or destruction of or damage to any property, except natural resource and other damages as provided in Section 3.3, which Customer may suffer, incur, or pay out, to the extent such are caused by the negligence or willful misconduct of Clean Harbors, its agents or employees during the performance of the Agreement or Clean Harbors' failure to comply with any laws, regulations or lawful authority, or failure to comply with its obligations under this Agreement; except to the extent such liabilities, claims, demands and causes of action result from (i) Customer's failure to comply with any laws, regulations or other lawful authority; (ii) Customer's failure to comply with its obligations under the Agreement or (iii) the negligence or willful misconduct of Customer, its employees or agents.

3.2 Customer shall indemnify, defend and hold harmless Clean Harbors, its parent and affiliated companies and their respective directors, officers, employees and agents from and against any and all costs, liabilities, claims, demands and causes of action including, without limitation, any bodily injury to or death of any person or destruction of or damage to property which Clean Harbors may suffer, incur, or pay out, to the extent such are caused by the negligence or willful misconduct of Customer, its employees or agents or the failure of Customer to comply with any laws, regulations or other lawful authority or the failure of Customer to comply with its duties or obligations under the Agreement; except to the extent such liabilities, claims, demands and causes of action result from (i) Clean Harbors' failure to comply with any laws, regulations or lawful authority; (ii) Clean Harbors' failure to comply with its obligations under the Agreement; or (iii) the negligence or willful misconduct of Clean Harbors, its employees or agents.

3.3 Notwithstanding the foregoing, Customer shall indemnify, defend and hold harmless Clean Harbors, its parent and affiliated companies and their respective directors, officers, employees, agents and subcontractors from and against any and all costs, liabilities, claims, demands and causes of action for pollution damages; contamination or adverse effects on the environment; destruction of, damage to, or loss of, whether actual or alleged, any property or natural resources, including the cost of assessing the damage; injury to or economic losses resulting from destruction of real or personal property; damages for loss of subsistence use of natural resources; damages equal to the loss of profits or impairment of earning capacity due to the injury, destruction or loss of real property, personal property or natural resources; damages for net costs of providing increased or additional public services; removal costs; and any other costs assessable under the Oil Pollution Act of 1990, the Comprehensive Environmental Response, Compensation and Liability Act or other local, state or Federal law or lawful authority applicable to discharges or releases of oil or hazardous substances which Clean Harbors, individually or collectively, may suffer, incur, or pay out in connection with, or arising out of, the release of oil or hazardous substances by Customer.

The foregoing indemnity shall only apply to those claims, liabilities or causes of action arising, during, or as a result of, emergency response activities. The indemnity contained in the Agreement shall govern the rights and obligations of the parties with re gard to the transportation or disposal of waste materials by Clean Harbors.

4. TERMINATION

4.1 Work Orders issued for performance of services under this Rider may be terminated by either party upon forty-eight (48) hours prior notice to the other party.

Except as specifically amended herein, all other terms and conditions contained in the Agreement shall remain in full force and effect.

D. MISCELLANEOUS

To the extent there are any conflicts between the terms contained in this Amendment and those contained in the Agreement, the terms set forth in the specific subsection of this Amendment which modifies the Agreement as it pertains to the specific services performed, shall control. This Amendment shall become effective upon its execution by both parties. No modification of this Amendment or the Agreement shall be binding on Customer or Clean Harbors unless in writing and signed by both parties. This Amendment may be executed in several counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument representing the agreement of the parties hereto.

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.	CUSTOMER:
By: William O'Connor	By:
Its: Senior Vice President	Its: Exec VP & COO
Date: 9/7/2010	Date: 8-13-10

CleanHarbors ENVIRONMENTAL SERVICES, INC.

WASTE TRANSPORTATION & DISPOSAL AGREEMENT*

Beta Offshore

This Agreement is between the Customer identified below ("Customer"), and Clean Harbors Environmental Services, Inc. ("Clean Harbors"). In consideration of the mutual covenants contained herein, the parties agree as follows:

Article 1. Term

This Agreement shall have an initial term of one (1) year from the date hereof and shall continue in effect from year to year thereafter provided. Either party may terminate this Agreement at any time upon thirty (30) days prior written notice.

Article 2. Services*

This Agreement shall govern all labpack, transportation and disposal services ("Services") provided by Clean Harbors to Customer. **This agreement does not apply to emergency response services.**

Article 3. Waste Materials

Waste materials to be handled pursuant to this Agreement shall be agreed upon in advance in writing by Clean Harbors and Customer. At the time Customer requests the Services of Clean Harbors, Customer shall provide a Waste Profile Sheet or similar document ("Waste Profile") to Clean Harbors completely and accurately describing the waste materials.

Article 4. Transfer of Waste and Title

Waste materials which are discovered to be non-conforming may be rejected by Clean Harbors. Title, risk of loss and all other incidents of ownership to non-conforming wastes shall remain at all times with Customer. Waste materials shall be considered non-conforming if the waste materials are not properly packaged or labeled; or if the waste materials contain constituents or have characteristics or properties not disclosed on the Waste Profile. Customer shall pay Clean Harbors for the handling, transporting, storing and caring for and, if applicable, disposing of such non-conforming waste materials.

Article 5. Payment Terms thirty (30) SL

Payment terms shall be net ~~fifteen (15)~~ days from the date of invoice. Interest will be charged at the rate of 1.5% per month, or the maximum amount allowed by law, on all amounts outstanding more than ~~fifteen (15)~~ thirty (30) days. Customer shall be responsible for all costs incurred by Clean Harbors to collect any payments due under this Agreement, **including reasonable attorneys' fees.** SL

Article 6. Customer Warranties

Customer warrants that it has legal title or authority to waste; that the description of the waste materials on the Waste Profile is accurate and complete; that waste materials will conform to such description; that containers of waste materials will be marked, labeled and otherwise conform with all applicable law; and that it has communicated to Clean Harbors those hazards known by the Customer to be associated with the handling, transportation, treatment, storage and disposal of the waste materials.

Article 7. Indemnification

Each Party ("Indemnifying Party") agrees to indemnify, save harmless and defend the other Party ("Indemnified Party") from and against any and all losses, liabilities, claims, penalties, forfeitures, suits, and the cost and expenses incident thereto (including cost of defense, settlement and reasonable attorneys, fees) which the Indemnified Party may hereafter incur, or pay out as a result of death or bodily injuries to any person, destruction or damage to any property, contamination of or adverse effects on the environment or any violation of applicable federal, state and local laws, regulations, by-laws or ordinances to the extent caused by: (1) the Indemnifying Party's breach of any term of this Agreement, or (2) the negligence or willful misconduct of Indemnifying Party, its employees or agents. Clean Harbors shall not be liable to Customer for indirect, incidental, consequential, or special damages, including loss of use or lost profits.

Article 8. Insurance

Clean Harbors shall maintain at its own expense during the term of this Agreement the following insurance coverages:

COVERAGE	LIMITS
a. Worker's Compensation	Statutory
b. Employer's Liability	$500,000
c. General Commercial Liability	$1 million per occurrence $3 million aggregate
d. Automobile	$1 million per occurrence $1 million per annual aggregate
e. Environmental Impairment for Clean Harbors' TSD Facilities	$3 million per occurrence $6 million annual aggregate

Article 9. Excuse of Performance

The performance of this Agreement, except for the payment of money for Services already rendered, may be suspended by either party in the event performance of this Agreement is prevented by a cause(s) beyond its reasonable control.

Article 10. Additional Provisions

Entire Agreement - This Agreement represent the entire understanding and agreement between the parties. Additional, conflicting or different terms on any Purchase Order or other preprinted document issued by Customer shall be void and are hereby expressly rejected by Clean Harbors. Any modifications to this Agreement shall be in writing and shall be signed by Customer and Clean Harbors.

Law to Apply - The validity, interpretation and performance of this Agreement shall be governed and construed in accordance with the Laws of the Commonwealth of Massachusetts and the parties agree to submit to the jurisdiction of the courts of the Commonwealth of Massachusetts for any disputes arising under this Agreement.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their duly authorized representatives.

CUSTOMER:	CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.
Beta Offshore	
Signature	Signature
Steve Liles	William F O'Conner
Print Name	Print Name
Executive VP & COO	SVP
Title	Title
Date: 6-10-10	Date: 6/11/2010

Customer to complete shaded area.

OGC/02/02

LOS ANGELES SERVICE CENTER	**24-Hr. #**	**310.764.5851**
2500 East Victoria Street	**24-Hr. #**	**800.645.8265**
Compton, CA 90220	**Fax #**	**310.764.5863**

Mike Delatorre, General Manager EPA / Federal ID #: N/A

Personnel Authorized to release equipment / materials / manpower, etc:

Mike Delatorre
Rafael Villalobos
Steven Ramos
Wilbert Canto

40-Hour OSHA Trained Personnel:

Supervisor	4
Foreman	7
Equipment Operator	9
Field Technician	20
Site Safety Officer	1

Equipment List **Item Description / Manufacturer**	**Location**	**Capacity / Size / Key Features**	**# of Units**	**A**	**T**	**P**	**D**
(1) Vessels & Marine Support Equipment							
Power Workboat, Custom Flat	Compton	22', 115 HP, LA6458, V245	1	Y	Y	N	N
Power Workboat, Gregor	Compton	14', 9.9 HP, L229492, V220	1	Y	Y	N	N
Jon Boat, Lowe	Compton	12', No Motor, GEN30493A505, V263	1	Y	Y	N	N
Jon Boat, G3	Compton	12', No Motor, OMC10908J899, V	1	Y	Y	N	N
(2) Motor Vehicles & Vacuum Equipment							
E.R. Spill Trailer, Wells Cargo	Compton		1	Y	Y	N	Y
Vacuum Trailer, Acro	Compton	120-bbl Stainless Steel	1	Y	Y	N	N
Vacuum Trailer, Huber	Compton	120-bbl Stainless Steel	1	Y	Y	N	N
Roll-Off Trailer, Bobco	Compton		2	Y	Y	N	N
Equipment Trailer, Zieman	Compton		1	Y	Y	N	N
Straight Vacuum Truck, International	Compton	70-bbl Black Iron	1	Y	Y	N	N
High Powered Vacuum Truck/Cusco	Compton	70-bbl Stainless Steel	1	Y	Y	N	N
Tractor, Volvo	Compton		1	Y	Y	N	N
Tractor, Freightliner	Compton		3	Y	Y	N	N
Stake Body/Utility Truck, Ford	Compton	F850	2	Y	Y	N	N
Emergency Response Van, GMC	Compton		1	Y	Y	N	Y
Box Truck, Ford	Compton	F250	1	Y	Y	N	N
Crew Cab Pickup, F-350/F-250	Compton	F350/F250	12	Y	Y	N	N
Pickup Truck, F550	Compton	F550	1	Y	Y	N	N
(3) Pumps and Pressure Equipment							
Pressure Washer	Compton	American	2	Y	Y	N	N
Portable Pressure Washer	Compton	Hydro Tek	2	Y	Y	N	N
Pressure Washer	Compton	Propane	1	Y	Y	N	N
Double Diaphragm Pump	Compton	Weldon, Chemical	1	Y	Y	N	N
Trash pump	Compton	Honda	3	Y	Y	N	N

A=Available, T=Transportable, P= Packaged, D=Dedicated

Equipment List Cont. Item Description / Manufacturer	Location	Capacity / Size / Key Features	# of Units	A	T	P	D
(4) Oil Spill Containment Booms							
Oil Containment Boom	Compton	18", American Marine, On Trailer	1500	Y	Y	N	Y
Oil Containment Boom	Compton	18", American Marine, On Trailer	1500	Y	Y	N	Y
Oil Containment Boom	Compton	18", American Marine, Staged	1800	Y	Y	N	Y
(5) Environmental Monitoring Equipment							
PID Meter, HNU	Compton	12.2eV PID	3	Y	Y	N	N
Drager CMS Unit	Compton	Chip Reader	1	Y	Y	N	N
Bacharch Mercury Meter	Compton	MV-2 Vapor Meter	1	Y	Y	N	N
Ludlum Radiation Detector	Compton	Model 3	2	Y	Y	N	N
MSA Sirius PID Meter	Compton	5-Gas Meter	3	Y	Y	N	N
GASTEC	Compton	GV-100	3	Y	Y	N	N
Dexsil PetroFLAG	Compton	Petroleum Hydrocarbon	1	Y	Y	N	N
Chlor-N-Soil 50 Test Kits	Compton	PCB Soil	2	Y	Y	N	N
(6) Recovery Equipment							
Skimmer, Crucial	Compton	25 GPM, Model # 1D18P24, 2" Discharge	1	Y	Y	N	Y
Skimmer, Crucial	Compton	35 GPM, Model # 1D18P36, 2" Discharge	1	Y	Y	N	Y
Mercury Vacuum, Nikro	Compton		2	Y	Y	N	N
Hepa Vacuum, Pullman Holt	Compton		4	Y	Y	N	N
Wet/Dry Vacuum, Dayton	Compton		4	Y	Y	N	N
(7) Beach or Earth Cleaning and Excavating Equipment							
Skid Steer Loader, CAT	Compton		1	Y	Y	N	N
(8) Generators / Compressors / Light Towers							
Tow Behind Compressor, IR	Compton	185 CFM	3	Y	Y	N	N
Portable Compressor, Rigid	Compton	10 CFM	2	Y	Y	N	N
Tow Behind Light Tower / Generator	Compton		3	Y	Y	N	N
Portable Generator, Briggs & Stratton	Compton		2	Y	Y	N	N
(9) Health and Safety Equipment							
SCBA, MSA/Drager	Compton		11	Y	Y	N	N
Supplied Air Systems, MSA/Drager	Compton		15	Y	Y	N	N
Mechanical Extraction Device	Compton		4	Y	Y	N	N
(10) Communications							
(11) Miscellaneous							

Emergency Response Subcontractors

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The following MSDSs are included in this appendix:

- Beta Offshore Crude Oil
- Beta Offshore Produced Gas
- Diesel Fuel

The MSDSs for Exxon/Nalco Corexit 9500 are in Annex K

Safety Data Sheet

Material Name: Crude Oil

* * * Section 1 - Product and Company Identification * * *

Manufacturer Information

Beta Offshore
111 W. Ocean Blvd.
Suite 1240
Long Beach, CA 90802

Phone: 562-628-1526

Emergency # 562-606-5711 or 5712

* * * Section 2 - Hazards Identification * * *

GHS Classification:

Flammable Liquids - Category 2
Carcinogenicity - Category 1B
Specific Target Organ Toxicity Repeat Exposure - Category 2

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

Danger

Hazard Statements

Highly flammable liquid and vapor.
May cause cancer.
May cause damage to organs (liver, kidneys, blood, nervous system, and skin) through prolonged or repeated exposure.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust/fume/gas/mist/vapors/spray
Wear protective gloves/protective clothing/eye protection/face protection.

Response

IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF exposed or concerned: Get medical advice/attention.
In case of fire: Use water spray, fog or fire fighting foam.

Storage

Store in a well-ventilated place. Keep cool.
Store locked up.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
8002-05-9	Petroleum distillates (naphtha)	100
7783-06-4	Hydrogen sulfide	Varies
8006-14-2	Natural gas	Varies
71-43-2	Benzene	Varies
110-54-3	Hexane	Varies

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

Flush eyes with plenty of water for 15 minutes while holding eyelids open. Get medical attention.

First Aid: Skin

Remove contaminated clothing/shoes and wipe excess from skin. Flush skin with water. Follow by washing with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned.

First Aid: Ingestion

Do not induce vomiting. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. Get medical attention.

First Aid: Inhalation

Effects from overexposure may be delayed. Act quickly! Unconscious victims can die if not removed from contaminated Area as soon as possible. Put on NIOSH approved air-supplied pressure demand respirator before entering contaminated area. Move victim to fresh air. Give artificial respiration if not breathing. Get medical attention as soon as possible. Keep victim quiet and warm. Vaporization of H2S that has been trapped in clothing can be dangerous to rescuers. Maintain respiratory protection to avoid contamination from victim to rescuer.

First Aid: Notes to Physician

Amyl nitrite perles by inhalation and sodium nitrite by IV may be effective antidotes. Consult a poison control center. If more than 2.0 ml/kg has been ingested and vomiting has not occurred, emesis should be induced with supervision. Keep victim's head below hips to prevent aspiration. If symptoms such as loss of gag reflex, convulsions or unconsciousness occur before emesis, gastric lavage using a cuffed endotracheal tube should be considered.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.
Containers exposed to intense heat from fires should be cooled with water to prevent vapor pressure buildup which could result in container rupture. Container areas exposed to direct flame contact should be cooled with large quantities of water as needed to prevent weakening of container structure. Sulfur oxides and hydrogen sulfide, both of which are toxic, may be released upon combustion.

Hazardous Combustion Products

Carbon monoxide, sulfur oxides and other unidentified organic compounds may be formed upon combustion.

Extinguishing Media

Use water fog, foam, dry chemical or CO2. Do not use a direct stream of water. Product will float and can be reignited on surface of water.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

Clear fire area of unprotected personnel. Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves and rubber boots), including a positive pressure NIOSH approved self-contained breathing apparatus. Cool fire exposed containers with water.

* * * Section 6 - Accidental Release Measures * * *

Recovery and Neutralization

Shut off source of leak only if safe to do so.

Materials and Methods for Clean-Up

Eliminate all ignition sources. Handling equipment must be grounded to prevent sparking.

Small spills: Take up with an absorbent material and place in non-leaking containers; seal tightly for proper disposal.

Large spills: Evacuate the hazard area of unprotected personnel. Wear appropriate respirator and protective clothing. Shut off source of leak only if safe to do so. Dike and contain. If vapor cloud forms, water fog may be used to suppress; contain run-off. Remove with vacuum trucks or pump to storage/salvage vessels. Soak up residue with an absorbent such as clay, sand or other suitable material; place in non-leaking containers for proper disposal. Flush area with water to remove trace residue; dispose of flush solutions as above.

Emergency Measures

Isolate area. Keep unnecessary personnel away.

Personal Precautions and Protective Equipment

Wear appropriate personal protective equipment as outlined in Section 8 when handling spills.

Environmental Precautions

Do not allow the spilled product to enter public drainage system or open water courses.

Prevention of Secondary Hazards

None

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all vapors are gone. Containers, even those that have been emptied, can contain explosive vapors. Do not cut, drill, grind, weld or perform similar operations on or near containers. Static electricity may accumulate and create a fire hazard. Ground fixed equipment. Bond and ground transfer containers and equipment. Wash with soap and water before eating, drinking, smoking or using toilet facilities. Launder contaminated clothing before reuse. Dispose of oil-soaked leather articles including shoes which cannot be decontaminated.

Storage Procedures

Keep liquid and vapor away from heat, sparks and flame. Surfaces that are sufficiently hot may ignite even liquid product in the absence of sparks or flame.

Incompatibilities

Strong oxidizing agents.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Component Exposure Limits

Petroleum distillates (naphtha) (8002-05-9)

OSHA:	400 ppm TWA; 1600 mg/m3 TWA
NIOSH:	350 mg/m3 TWA
	1800 mg/m3 Ceiling (15 min)

Benzene (71-43-2)

ACGIH:	0.5 ppm TWA
	2.5 ppm STEL
	Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA:	5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA
NIOSH:	0.1 ppm TWA
	1 ppm STEL

Hydrogen sulfide (7783-06-4)

ACGIH:	1 ppm TWA
	5 ppm STEL
OSHA:	10 ppm TWA; 14 mg/m3 TWA
	15 ppm STEL; 21 mg/m3 STEL
NIOSH:	10 ppm Ceiling (10 min); 15 mg/m3 Ceiling (10 min)

Hexane (110-54-3)

ACGIH:	50 ppm TWA
	Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA:	50 ppm TWA; 180 mg/m3 TWA
NIOSH:	50 ppm TWA; 180 mg/m3 TWA

Natural gas (8006-14-2)

ACGIH:	1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)

Engineering Measures

Use ventilation as required to control vapor concentrations.

Personal Protective Equipment: Respiratory

Use NIOSH approved respiratory protection as required to prevent overexposure to oil mist, vapor, or fumes and H2S. Do not enter storage compartments unless equipped with a NIOSH approved self-contained breathing apparatus with a full facepiece operated in a positive pressure mode.

Personal Protective Equipment: Hands

Wear chemical resistant gloves as required to minimize skin contact.

Personal Protective Equipment: Eyes

No special eye protection is routinely necessary.

Personal Protective Equipment: Skin and Body

Wear protective clothing as required to minimize skin contact.

Hygiene Measures

Eye wash fountain and emergency showers are recommended.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Black	**Odor:**	Moderate hydrocarbon
Physical State:	Liquid	**pH:**	ND
REID Vapor Pressure per Method D323:	1.6 psi	**Vapor Density:**	NA
Boiling Point:	<100°F	**Pour Point (deg F):**	21°F
Solubility (H2O):	Slight	**Specific Gravity:**	>0.7
Evaporation Rate:	NA	**VOC:**	ND
Octanol/H2O Coeff.:	ND	**Flash Point:**	<100°F
Flash Point Method:	PMCC	**Upper Flammability Limit (UFL):**	ND
Lower Flammability Limit (LFL):	ND	**Burning Rate:**	ND
Auto Ignition:	ND		

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Heat, sparks, flame and other ignition sources.

Incompatible Products

Strong oxidizing agents.

Hazardous Decomposition Products

Thermal decomposition products are highly dependent on the combustion conditions. A complex mixture of airborne solid, liquid, particulates and gases will evolve when this material undergoes pyrolysis or combustion. Carbon monoxide, sulfur oxides and other unidentified organic compounds maybe formed upon combustion.

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

May be irritating to eyes and skin. Inhalation of vapors may cause respiratory tract irritation and possible asphyxiation. Harmful if swallowed.

B: Component Analysis - LD50/LC50

Petroleum distillates (naphtha) (8002-05-9)

Oral LD50 Rat >4300 mg/kg; Dermal LD50 Rabbit >2000 mg/kg

Benzene (71-43-2)

Inhalation LC50 Rat 13050-14380 ppm 4 h; Oral LD50 Rat 1800 mg/kg

Hydrogen sulfide (7783-06-4)
Inhalation LC50 Rat 0.701 mg/L 4 h; Inhalation LC50 Rat 0.99 mg/L 1 h

Hexane (110-54-3)
Inhalation LC50 Rat 48000 ppm 4 h; Oral LD50 Rat 25 g/kg; Dermal LD50 Rabbit 3000 mg/kg

Natural gas (8006-14-2)
Inhalation LC50 Rat 658 mg/L 4 h

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Based on the presence of light hydrocarbons crude oil is presumed to be moderately irritating to the skin. Prolonged and repeated contact may cause various skin disorders such as dermatitis, folliculitis, oil acne or skin tumors. Contact with hot product may result in thermal burns.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Based on the presence of light hydrocarbons crude oil is presumed to be moderately irritating to the eyes. Contact with hot product may result in thermal burns.

Potential Health Effects: Ingestion

Based on the presence of light hydrocarbons, ingestion of crude oil may result in vomiting; aspiration (breathing) of vomitus into the lungs must be avoided as even small quantities may result in aspiration pneumonitis.

Potential Health Effects: Inhalation

Warning. Hydrogen sulfide (H2S), natural gas, and other hazardous vapors may evolve and collect in the headspace of storage tanks or other enclosed vessels. Hydrogen sulfide is an extremely flammable, toxic gas. Natural gas is extremely flammable and a simple asphyxiant. Inhalation of other light hydrocarbons may cause pulmonary irritation and result in CNS depression. Prolonged and repeated exposure to benzene may cause serious injury to blood forming organs and is linked to the later development of acute myelogenous leukemia. Prolonged and repeated inhalation of n-hexane may produce peripheral neuropathy.

Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

Generative Cell Mutagenicity

Some crude oils and crude oil fractions have been positive in mutagenicity studies.

Carcinogenicity

A: General Product Information

Several long term skin painting studies in experimental animals have shown crude oil to produce skin cancer. Benzene is identified as a chemical causally associated with cancer (acute myelogenous leukemia) in humans.

B: Component Carcinogenicity

Petroleum distillates (naphtha) (8002-05-9)

IARC: Monograph 45 [1989] (Group 3 (not classifiable))

Benzene (71-43-2)

ACGIH:	A1 - Confirmed Human Carcinogen
OSHA:	5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA
NIOSH:	potential occupational carcinogen
NTP:	Known Human Carcinogen (Select Carcinogen)
IARC:	Monograph 100F [in preparation]; Supplement 7 [1987]; Monograph 29 [1982] (Group 1 (carcinogenic to humans))

Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any specific target organ general toxicity single exposure effects.

Specified Target Organ General Toxicity: Repeated Exposure

May cause damage to organs (liver, kidneys, blood, nervous system and skin) through prolonged or repeated exposure.

Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

In high concentrations, this product may be dangerous to aquatic life and fouling to shorelines.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Petroleum distillates (naphtha) (8002-05-9)

Test & Species		Conditions
96 Hr LC50 Salmo gairdneri	258 mg/L [static]	
24 Hr EC50 Daphnia magna	36 mg/L	
48 Hr EC50 Daphnia magna	<0.26 mg/L [Static]	

Benzene (71-43-2)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	10.7-14.7 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	5.3 mg/L [flow-through]	
96 Hr LC50 Lepomis macrochirus	22.49 mg/L [static]	
96 Hr LC50 Poecilia reticulata	28.6 mg/L [static]	
96 Hr LC50 Pimephales promelas	22330-41160 µg/L [static]	
96 Hr LC50 Lepomis macrochirus	70000-142000 µg/L [static]	
72 Hr EC50 Pseudokirchneriella subcapitata	29 mg/L	

Test & Species		Conditions
48 Hr EC50 Daphnia magna	8.76 - 15.6 mg/L [Static]	
48 Hr EC50 Daphnia magna	10 mg/L	

Hydrogen sulfide (7783-06-4)

Test & Species		Conditions
96 Hr LC50 Lepomis macrochirus	0.0448 mg/L [flow-through]	
96 Hr LC50 Pimephales promelas	0.016 mg/L [flow-through]	
96 Hr LC50 Gammarus pseudolimnaeus	0.022 mg/L	

Hexane (110-54-3)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	2.1-2.98 mg/L [flow-through]	
24 Hr EC50 Daphnia magna	>1000 mg/L	

Persistence/Degradability

No information available.

Bioaccumulation

No information available.

Mobility in Soil

No information available.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 14 - Transportation Information * * *

DOT Information

Shipping Name: Petroleum Crude Oil
UN #: 1267 **Hazard Class:** 3

* * * Section 15 - Regulatory Information * * *

Regulatory Information

US Federal Regulations

Safety Data Sheet

Material Name: Crude Oil

Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Benzene (71-43-2)

CERCLA: 10 lb final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule); 4.54 kg final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule)

Hydrogen sulfide (7783-06-4)

SARA 302: 500 lb TPQ
CERCLA: 100 lb final RQ; 45.4 kg final RQ

Hexane (110-54-3)

CERCLA: 5000 lb final RQ; 2270 kg final RQ

State Regulations

Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Petroleum distillates (naphtha)	8002-05-9	No	Yes	Yes	Yes	Yes	No
Benzene	71-43-2	Yes	Yes	Yes	Yes	Yes	No
Hydrogen sulfide	7783-06-4	Yes	Yes	Yes	Yes	Yes	No
Hexane	110-54-3	No	Yes	Yes	Yes	Yes	No
Natural gas	8006-14-2	No	Yes	No	No	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.
WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

Additional Regulatory Information

Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Petroleum distillates (naphtha)	8002-05-9	Yes	DSL	EINECS
Benzene	71-43-2	Yes	DSL	EINECS
Hydrogen sulfide	7783-06-4	Yes	DSL	EINECS
Hexane	110-54-3	Yes	DSL	EINECS
Natural gas	8006-14-2	Yes	DSL	EINECS

* * * Section 16 - Other Information * * *

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

Literature References

None

Other Information

The information herein is presented in good faith and believed to be accurate as of the effective date given. However, no warranty, expressed or implied, is given. It is the buyer's responsibility to ensure that its activities comply with Federal, State or provincial, and local laws.

End of Sheet

Eureka Casing Gas / Pad Gas

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision date: 03/26/2013 Version: 1.0

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product Identifier

Product form: Mixture

Trade name: Eureka Casing Gas / Pad Gas

1.2. Intended Use Of The Product

Use of the substance/preparation: Fuel

1.3. Name, Address, And Telephone Of The Responsible Party

Beta Offshore
111 West Ocean Blvd.
Suite 1240
Long Beach, CA 90802

(562) 628-1526

www.betaoffshore.com

1.4. Emergency telephone number

Emergency number : (562) 606-5711

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (GHS-US)

Simple Asphy.
Flam. Gas 1 H220
Compressed gas H280

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) : May displace oxygen and cause rapid suffocation
H220 - Extremely flammable gas
H280 - Contains gas under pressure; may explode if heated

Precautionary statements (GHS-US) : P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - Eliminate all ignition sources if safe to do so
P410+P403 - Protect from sunlight. Store in a well-ventilated place

2.3. Other hazards

Other hazards not contributing to the classification: Contact with the product may cause cold burns or frostbite.

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	Classification (GHS-US)
Natural gas, debutanizer residues (A complex combination of hydrocarbons separated from	(CAS No.) 125471-80-9	0.837 - 6.577	Not classified

natural gas by distillation. It consists predominantly of saturated aliphatic hydrocarbons having carbon numbers primarily in the range of C3 to C7, predominantly pentanes and hexanes.)			
Butane	(CAS No.) 106-97-8	0.528 - 4.841	Flam. Gas 1, H220 Compressed gas, H280
Propane	(CAS No.) 74-98-6	0.972 - 4.496	Simple Asphy., H380 Flam. Gas 1, H220 Compressed gas, H280 STOT SE 3, H336
Carbon dioxide	(CAS No.) 124-38-9	3.276 - 4.191	Simple Asphy., H380 Compressed gas, H280
Isopentane	(CAS No.) 78-78-4	0.307 - 3.625	Flam. Liq. 1, H224 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411
Pentane	(CAS No.) 109-66-0	0.187 - 2.886	Flam. Liq. 2, H225 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411
Isobutane	(CAS No.) 75-28-5	0.39 - 2.541	Flam. Gas 1, H220 Compressed gas, H280
Ethane	(CAS No.) 74-84-0	0.89 - 1.643	Simple Asphy., H380 Flam. Gas 1, H220 Compressed gas, H280

Full text of H-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation: Seek medical attention immediately. When symptoms occur: go into open air and ventilate suspected area.

First-aid measures after skin contact: Rinse with plenty of water.

First-aid measures after eye contact: Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persist.

First-aid measures after ingestion: Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries: Natural Gas is an asphyxiant. Lack of oxygen can be fatal.

Symptoms/injuries after inhalation: Asphyxia by lack of oxygen: risk of death. Vapors are heavier than air and may cause asphyxia by reduction of the oxygen content. In high concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.

Symptoms/injuries after skin contact: If frostbite or freezing occurs, immediately flush with plenty of lukewarm water to GENTLY warm the affected area. Do not use hot water. Do not rub affected area. Get immediate medical attention.

Symptoms/injuries after eye contact: None expected under normal conditions of use.

Symptoms/injuries after ingestion: Ingestion is not considered a potential route of exposure.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Dry chemical, carbon dioxide, water spray, fog, foam.

Unsuitable extinguishing media: Halons.

5.2. Special hazards arising from the substance or mixture

Fire hazard: Extremely flammable gas.

Explosion hazard: May form flammable/explosive vapor-air mixture.

Reactivity: Readily forms explosive mixtures with air or oxygen in the presence of an ignition source. It will also burn or explode in the presence of chlorine, bromine pentafluoride, oxygen difluoride and nitrogen trifluoride. It will spontaneously ignite in the presence of chlorine dioxide.

5.3. Advice for firefighters

Firefighting instructions: Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Do not allow run-off from fire fighting to enter drains or water courses. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. In case of leaking gas fire, eliminate all ignition sources if safe to do so. Remove containers from fire area if this can be done without risk. Extinguish/cool from behind cover/unmanned monitors.
Protection during firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.
Other information: Evacuate danger area. Remove and isolate contaminated clothing and shoes at the site and place in metal container filled with water. Fire hazard if allowed to dry.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures: Use special care to avoid static electric charges. Eliminate every possible source of ignition. Keep away from heat/sparks/open flames/hot surfaces - No smoking.

6.1.1. For non-emergency personnel

Protective equipment: Use appropriate personal protection equipment (PPE).
Emergency procedures: Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment: Equip cleanup crew with proper protection.
Emergency procedures: Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up: Clear up spills immediately and dispose of waste safely.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed: Extremely flammable gas. Product to be handled in a closed system. Handle empty containers with care because residual vapors are flammable.
Precautions for safe handling: Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Securely chain cylinders when in use and protect against physical damage.
Hygiene measures: Handle in accordance with good industrial hygiene and safety procedures.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures: Proper grounding procedures to avoid static electricity should be followed. Comply with applicable regulations.
Storage conditions: Ensure cylinder valve is closed and not leaking after each use. Store tightly closed in a dry, cool and well-ventilated place. Keep in fireproof place.
Incompatible products: Strong oxidizers. Halogens (F, Cl, Br, I).
Storage area: Store in a well-ventilated place.

7.3. Specific end use(s)

Fuel.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Butane (106-97-8)		
USA ACGIH	ACGIH TWA (ppm)	1000 ppm

Propane (74-98-6)		
USA ACGIH	ACGIH TWA (ppm)	1000 ppm
USA OSHA	OSHA PEL (TWA) (mg/m3)	1800 mg/m³

USA OSHA	OSHA PEL (TWA) (ppm)	1000 ppm

Ethane (74-84-0)		
USA ACGIH	ACGIH TWA (ppm)	1000 ppm

Isobutane (75-28-5)		
USA ACGIH	ACGIH TWA (ppm)	1000 ppm

Isopentane (78-78-4)		
USA ACGIH	ACGIH TWA (ppm)	600 ppm

Pentane (109-66-0)		
USA ACGIH	ACGIH TWA (ppm)	600 ppm
USA OSHA	OSHA PEL (TWA) (mg/m3)	2950 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	1000 ppm

Carbon dioxide (124-38-9)		
USA ACGIH	ACGIH TWA (ppm)	5000 ppm
USA ACGIH	ACGIH STEL (ppm)	30000 ppm
USA OSHA	OSHA PEL (TWA) (mg/m3)	9000 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	5000 ppm

8.2. Exposure controls

Appropriate engineering controls : Gas detectors should be used when flammable gases/vapours may be released. If exposure can exceed the PEL/TLV standard, use only approved supplied air respirator operated in a positive pressure mode.

Personal protective equipment : Respiratory protection of the dependent type. Insulated gloves. Protective goggles.

Respiratory protection : An approved supplied air or self-contained breathing apparatus must be used when vapour concentration exceeds applicable exposure limits. Gas filters do not protect against oxygen deficiency.

Other information : When using, do not eat, drink or smoke.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Odor : No data available

Odor threshold : No data available

pH : No data available

Relative evaporation rate (butyl acetate=1) : No data available

Melting point : No data available

Freezing point : No data available

Boiling point : No data available

Flash Point : No data available

Auto-ignition temperature : No data available

Decomposition Temperature : No data available

Flammability (solid, gas) : No data available

Vapor pressure : No data available

Relative vapor density at 20 °C : No data available

Relative density : No data available

Solubility : No data available

Log Pow : No data available

Log Kow : No data available

Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	No data available
Explosive limits	:	Not applicable

9.2. Other information
No additional information available

SECTION 10: Stability and reactivity

Reactivity Readily forms explosive mixtures with air or oxygen in the presence of an ignition source. It will also burn or explode in the presence of chlorine, bromine pentafluoride, oxygen difluoride and nitrogen trifluoride. It will spontaneously ignite in the presence of chlorine dioxide.

Chemical Stability Extremely flammable gas

Possibility Of Hazardous Reactions Hazardous polymerization will not occur.

Conditions To Avoid Open flame. Overheating. Heat. Sparks. Direct sunlight. Extremely high or low temperatures. Exposure to fire may cause containers to rupture/explode.

Incompatible Materials Halogens (F, Cl, Br, I). Strong oxidizing agents.

Hazardous Decomposition Products Carbon oxides (CO, CO2)

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Butane (106-97-8)	
LC50 inhalation rat (mg/l)	658 mg/l (Exposure time: 4 h)

Propane (74-98-6)	
LC50 inhalation rat (mg/l)	658 mg/l (Exposure time: 4 h)

Ethane (74-84-0)	
LC50 inhalation rat (mg/l)	658 mg/l (Exposure time: 4 h)

Isobutane (75-28-5)	
LC50 inhalation rat (mg/l)	658 mg/l (Exposure time: 4 h)

Isopentane (78-78-4)	
LC50 inhalation rat (mg/l)	280000 mg/m³ (Exposure time: 4 h)

Pentane (109-66-0)	
LD50 oral rat	> 2000 mg/kg
LD50 dermal rabbit	3000 mg/kg
LC50 inhalation rat (mg/l)	364 g/m³ (Exposure time: 4 h)

Skin corrosion/irritation: Not classified
Serious eye damage/irritation: Not classified
Respiratory or skin sensitization: Not classified
Germ cell mutagenicity: Not classified
Carcinogenicity: Not classified
Reproductive toxicity: Not classified
Specific target organ toxicity (single exposure): Not classified
Specific target organ toxicity (repeated exposure): Not classified
Aspiration hazard: Not classified
Symptoms/injuries after inhalation: Asphyxia by lack of oxygen: risk of death. Vapors are heavier than air and may cause asphyxia by reduction of the oxygen content. Asphyxia by lack of oxygen: risk of death. In high concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.
Symptoms/injuries after skin contact: If frostbite or freezing occurs, immediately flush with plenty of lukewarm water to GENTLY warm the affected area. Do not use hot water. Do not rub affected area. Get immediate medical attention.
Symptoms/injuries after eye contact: None expected under normal conditions of use.
Symptoms/injuries after ingestion: Ingestion is not considered a potential route of exposure.

SECTION 12: Ecological information

12.1. Toxicity

Isopentane (78-78-4)	
EC50 Daphnia 1	2.3 mg/l (Exposure time: 48 h - Species: Daphnia magna)

Pentane (109-66-0)	
LC50 fish 1	9.87 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss)
EC50 Daphnia 1	9.74 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 fish 2	11.59 mg/l (Exposure time: 96 h - Species: Pimephales promelas)

12.2. Persistence and degradability

Eureka Casing Gas / Pad Gas	
Persistence and degradability	Not established.

12.3. Bioaccumulative potential

Eureka Casing Gas / Pad Gas	
Bioaccumulative potential	Not established.

Butane (106-97-8)	
Log Pow	2.89

Propane (74-98-6)	
Log Pow	2.3

Ethane (74-84-0)	
Log Pow	<= 2.8

Isobutane (75-28-5)	
BCF fish 1	1.57 - 1.97
Log Pow	2.88 (at 20 °C)

Isopentane (78-78-4)	
Log Pow	3.2 - 3.3

Pentane (109-66-0)	
Log Pow	3.39

Carbon dioxide (124-38-9)	
BCF fish 1	(no bioaccumulation)
Log Pow	0.83

12.4. Mobility in soil
No additional information available

12.5. Other adverse effects
Other information : Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Waste disposal recommendations: Dispose of waste material in accordance with all local, regional, national, and international regulations.
Additional information: Handle empty containers with care because residual vapors are flammable. Empty gas cylinders should be returned to the vendor for recycling or refilling.
Ecology - waste materials: Avoid release to the environment.

SECTION 14: Transport information

In accordance with ICAO/IATA/DOT/TDG

14.1. UN number
UN-No.(DOT) : 1971
DOT NA no. UN1971

14.2. UN proper shipping name

DOT Proper Shipping Name : Natural gas, compressed (with high methane content)

Department of Transportation (DOT) Hazard Classes : 2.1 - Class 2.1 - Flammable gas 49 CFR 173.115

Hazard labels (DOT) : 2.1 - Flammable gas.

DOT Packaging Exceptions (49 CFR 173.xxx) : 306

DOT Packaging Non Bulk (49 CFR 173.xxx) : 302

DOT Packaging Bulk (49 CFR 173.xxx) : 302

14.3. Additional information

Emergency Response Guide (ERG) Number : 115

Other information : No supplementary information available.

Overland transport No additional information available

Transport by sea No additional information available

DOT Vessel Stowage Location : E - The material may be stowed ‘‘on deck’’ or ‘‘under deck’’ on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length, but is prohibited from carriage on passenger vessels in which the limiting number of passengers is exceeded.

DOT Vessel Stowage Other : 40 - Stow ‘‘clear of living quarters’’

Air transport

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : Forbidden

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 150 kg

SECTION 15: Regulatory information

15.1. US Federal regulations

Butane (106-97-8)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Propane (74-98-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ethane (74-84-0)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Isobutane (75-28-5)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Isopentane (78-78-4)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Pentane (109-66-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
EPA TSCA Regulatory Flag	T - T - indicates a substance that is the subject of a Section 4 test rule under TSCA.

Carbon dioxide (124-38-9)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.3. US State regulations

Neither this product nor its components appear on lists for the State of California.

SECTION 16: Other information

Other information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

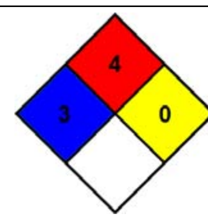
GHS Full Text Phrases:

Acute Tox. 3 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 3
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Asp. Tox. 1	Aspiration hazard Category 1
Carc. 1A	Carcinogenicity Category 1A
Compressed gas	Gases under pressure Compressed gas
Flam. Gas 1	Flammable gases Category 1
Flam. Liq. 1	Flammable liquids Category 1
Flam. Liq. 2	Flammable liquids Category 2
Muta. 1B	Germ cell mutagenicity Category 1B
Ox. Gas 1	Oxidizing gases Category 1
Repr. 1A	Reproductive toxicity Category 1A
Simple Asphy.	Simple Asphyxiant
STOT RE 1	Specific target organ toxicity (repeated exposure) Category 1
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H220	Extremely flammable gas
H224	Extremely flammable liquid and vapor
H225	Highly flammable liquid and vapor
H270	May cause or intensify fire; oxidizer
H280	Contains gas under pressure; may explode if heated
H304	May be fatal if swallowed and enters airways
H331	Toxic if inhaled
H336	May cause drowsiness or dizziness
H340	May cause genetic defects
H350	May cause cancer
H360	May damage fertility or the unborn child
H372	Causes damage to organs through prolonged or repeated exposure
H411	Toxic to aquatic life with long lasting effects

NFPA health hazard : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

NFPA fire hazard : 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability : 4 Severe Hazard

Physical : 0 Minimal Hazard

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

SDS US (GHS HazCom) - US

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R.1 ACRONYMS

ACP	Area Contingency Plan
ACTI	Advanced Cleanup Technologies, Inc.
AFFF	Aqueous Film Forming Foam
AMP	Average Most Probable
API	American Petroleum Institute
AQMD	Air Quality Management District (also known as SCAQMD)
AWT	Automatic Well Test
BBL(S)	Barrel(s)
BOP	Blowout Preventor
BOPD	Barrel(s) of Oil Per Day
BSEE	Bureau of Safety and Environmental Enforcement (previously known as Bureau of Ocean Energy Management, Regulation and Enforcement and Minerals Management Service [MMS])
CALTRANS	California Department of Transportation
CCC/BCDC	California Coastal Commission/San Francisco Bay Conservation and Development Commission Joint Oil Spill Program
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CHP	California Highway Patrol
COTP	Captain of the Port
CSDOC	County Sanitation District of Orange County
CWA	Clean Water Act
DFW	California Department of Fish and Wildlife
DHS	Department of Health Services
DOGGR	Division of Oil and Gas and Geothermal Resources
DOI	Department of the Interior
DOT	Department of Transportation
DPIC	Designated Person In Charge
DTSC	Department of Toxic Substance Control
DPR	Department of Parks and Recreation
EAP	Emergency Action Plan
EEZ	Exclusive Economic Zone
EHS	Environment, Health and Safety Division
EOC	Emergency Operations Center

EMA	California Emergency Management Agency (formerly OES)
ESD	Emergency Shutdown Device
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FOSC	Federal On-Scene Coordinator
FWKO	Free Water Knockout
GPM	Gallon(s) Per Minute
HAZWOPER	Hazardous Waste Operations and Emergency Response
HS&E	Health, Safety and Environmental
H_2S	Hydrogen Sulfide
IBRRC	International Bird Rescue and Research Center
ICP	Integrated Contingency Plan
ICS	Incident Command System
IRT	Incident Response Team
JIC	Joint Information Center
LACT	Lease Automatic Custody Transfer
LEL	Lower Explosive Limit
LPG	Liquefied Petroleum Gas
MAC	Multi-Agency Coordinator
MHz	Megahertz
MMP	Maximum Most Probable
MMS	Minerals Management Service (See BSEE)
MMSCFD	Million Standard Cubic Feet per Day
MSDS	Material Safety Data Sheets
MSO	Marine Safety Office
MSRC	Marine Spill Response Corporation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NGL	Natural Gas Liquid
NIMS	National Incident Management System
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPREP	National Preparedness for Response Exercise Program
NRC	National Response Center

NRDA	Natural Resource Damage Assessment
NRT	National Response Team
NWS	National Weather Service
OES	Office of Emergency Services (Now known as Cal EMA – see EMA)
OPA 90	Federal Oil Pollution Act of 1990
OSHA	Occupational Safety and Health Administration
OSPR	Office of Spill Prevention and Response in the California Department of Fish and Wildlife
OSRO	Oil Spill Response Organization
OSRV	Oil Spill Response Vessel
OWCN	Oiled Wildlife Care Network
PFD	Personal Flotation Device
PHA	Process Hazard Assessment
PHMSA	Pipeline and Hazardous Materials Safety Administration (under DOT, formerly known as RSPA)
PIO	Public Information Officer
PIPER	Pre-Incident Planning and Emergency Response
PPE	Personal Protective Equipment
PREP	Preparedness for Response Exercise Program
PSD	Production Shutdown
PST	Pacific Strike Team
QI	Qualified Individual
RCRA	Resource Conservation and Recovery Act of 1976
RP	Responsible Party
RRT	Regional Response Team
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act
SCF	Standard Cubic Feet
SCSSV	Surface Controlled Subsurface Safety Valve
SLC	State Lands Commission
SPCC	Spill Prevention Control and Countermeasures
SPOCC	Supervised Pump Off Control Center System
SSC	Scientific Support Coordinator
SSV	Surface Safety Valve
SWRCB	State Water Resources Control Board

UCS	Unified Command System
UHF	Ultra-High Frequency
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USDL	U.S. Department of Labor
USDOD	U.S. Department of Defense
USDOE	U.S. Department of Energy
USDOI	U.S. Department of Interior
USDOJ	U.S. Department of Justice
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USHHS	U.S. Department of Health and Human Services
USN	U.S. Navy
VHF	Variable High Frequency
WCD	Worst Case Discharge

R.2 DEFINITIONS

Abandoned Waste – Materials which are disposed of, burned or incinerated, or accumulated, stored, or treated.

Access/Staging Areas – Designated areas near the spill site accessible for gathering and deploying equipment and/or personnel.

Adverse Weather – The weather conditions considered when identifying response systems and equipment in a contingency plan for the applicable operating environment. Factors considered include wind, significant wave height, temperature, weather-related visibility, and the tides and currents.

Agency Representative – Individual assigned to an incident from an assisting or cooperating agency with full authority to make decisions on all matters affecting that agency's participation.

Barrel (bbl) – A barrel of oil equals 42 gallons (U.S.) at 60 degrees Fahrenheit.

Biological Additives – Microbiological cultures, enzymes, or nutrient additives that are deliberately introduced into an oil discharge for the specific purpose of encouraging biodegradation to mitigate the effects of a discharge.

Bioremediation – An oil spill cleanup technique using nutrients or a mixture of nutrients and bacteria to facilitate the degradation of the oil by microorganisms.

Burning Agents – Those additives that through physical or chemical means, improve the combustibility of the materials to which they are applied.

California Designated Waste – Any non-hazardous waste which contains pollutants which could cause degradation of water quality of a hazardous waste which has been granted a variance from hazardous waste management requirements. Examples of designated wastes include such oil production wastes as heavy oil tank bottoms, drilling muds, produced water, and soil contaminated with hydrocarbons.

California Extremely Hazardous Waste – Any hazardous waste or mixture of hazardous waste "which, if human exposure should occur, may likely result in death, disabling personal injury or serious illness."

California Hazardous Waste – Any hazardous waste which, due to its quantity, concentration, or physical, chemical or infectious characteristics, may either cause an increase in mortality or serious illness, or pose a substantial threat to health or environment when improperly handled.

California Hazardous Waste Control Law – State Law governing hazardous waste identification, handling, transportation, treatment, and disposal.

California Restricted Hazardous Waste – As of May 8, 1990, all hazardous wastes in California were to be prohibited from land disposal without prior treatment to reduce their toxicity. However, various extensions of the deadline have been provided by the State.

Captain of the Port Zone – A zone specified in 33 CFR Part 3 and the seaward extension of that zone to the outer boundary of the exclusive economic zone.

Cascadable – The movement of response equipment to the scene of a spill in multi-tiered stages.

Chemical Agents – Those elements, compounds, or mixtures that coagulate, disperse, dissolve, emulsify, foam, neutralize, precipitate, reduce, oxidize, concentrate, congeal, entrap, fix, make the pollutant mass more rigid or viscous, or other facilitate the mitigation of deleterious effects or the removal of the pollutant from the water.

Claim – A request, made in writing for a sum certain, for compensation for damages or removal costs resulting from an incident.

Coastal Waters – This designation includes all U.S. waters subject to the tide, U.S. waters of the Great Lakes, specified ports and harbors on the inland rivers, waters of the contiguous zone (12 n.mi.) or other waters subject to discharges in connection with activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act. These waters include those contained within the exclusive economic zone (200 n.mi.).

Coastal Zone – Means all United States waters subject to the tide, United States waters of the Great Lakes, specified ports and harbors on inland rivers, waters of the contiguous zone, other waters of the high seas subject to the NCP, and the land surface or land substrata, ground waters, and ambient air proximal to those waters. The term coastal zone delineates an area of federal responsibility for response action. Precise boundaries are determined by EPA/USCG agreements and identified in federal regional contingency plans.

Command Post/Center – A location in proximity to the spill scene which serves as the central location for meetings and briefings and the base for all planning, logistics, and finance support activities.

Containment Boom – A vertical barrier which floats above water supporting a subsurface skirt and serves as one of the first lines of defense against the spreading of an oil spill. Due to the scope of utilization across land and sea environments, containment booms are designed for specific applications, such as long-term deployment and rapid deployment, as well as for operations in rough open water, moderate and calm seas, and in quiet, protected waters (e.g., harbors).

Cultural Resources – Current, historic, prehistoric, and archaeological resources which include deposits, structures, ruins, sites, buildings, graves, artifacts, fossils, or other objects of antiquity which provide information pertaining to the historical or prehistoric culture of people in the State as well as to the natural history of the State.

Damage Assessment – The process of determining and measuring damages and injury to the human environment and natural resources including cultural resources. Damages include differences between the conditions and use of natural resources and the human environment that would have occurred without the incident, and the conditions and use that ensued following the incident. Damage assessment includes planning for restoration and determining the costs of restoration.

Decontamination – The removal of hazardous substances from personnel and equipment necessary to prevent adverse health effects.

Demobilization – The deactivation of equipment, personnel, and other resources involved in response operations.

Derated Capacity – The manufacturer's rating for the recovery capacity of a piece of skimming equipment has been reduced to reflect the limitations of response equipment efficiency as a result of such variables as weather, sea state, current velocity, hours of operation per day, or visibility. The derated capacity shall be calculated as 20% of the manufacturer's rated skimming capacity (SC) for the equipment for a 24-hour period [(SC x 24 hours) x 20% = derated capacity].

Discarded – Any substance which is abandoned, recycled, or "inherently waste like."

Dispersants – Chemicals that can be applied to an oil spill to aid the natural process in breaking up the oil. There are three types of dispersants: water-based, solvent-based, and concentrates. Use of dispersants is subject to OSC approval, with approval of the EPA representative to the RRT and the concurrence of the State with jurisdiction over the navigable waters polluted by the spill.

Federal Hazardous Waste – As defined by RCRA, a solid discarded waste which is not specifically exempt or excluded, and which exhibits certain specific characteristics of a hazardous waste or is specifically listed as a hazardous waste.

Federal On-Scene Coordinator – USCG (coastal waters) or EPA (inland waters and land) representative who provides overall coordination of cleanup activities.

Federal Restricted Hazardous Waste – The 1984 Hazardous and Solid Waste Amendments to RCRA essentially banned all RCRA hazardous wastes from land disposal as of May 8, 1990, unless the wastes have been treated to a specified standard to reduce their toxicity. Once treatment has been completed, the waste can be disposed of in a hazardous waste disposal facility.

Hazardous Material – Any hazardous substance, pollutant, or contaminant including natural gas, natural gas liquids, liquefied natural gas, or synthetic natural gas usable for fuel (or mixtures of natural gas and such synthetic gas), and any substance designated under the authority of any of the following laws and regulations and the subsequent implementing regulations:

- Section 311(b)(2) of the Clean Water Act: 40 CFR 116.4, Tables 116.4A and 116.4B, Lists of Hazardous Substances; and 40 CFR 117.3, Reportable Quantities of Hazardous Substances Designated Pursuant to Section 311 of the Clean Water Act.
- Section 102 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA): 40 CFR 302.4, Table 302.4, List of Hazardous Substances and Reportable Quantities.
- Section 3001 of the Solid Waste Disposal Act: 40 CFR 261.3, Definition of Hazardous Waste; 40 CFR 261.32, Hazardous Wastes from Specific Sources; and 40 CFR 261.33, Discarded Commercial Chemical Products, Off-Specification Species, Container Residues, and Spill Residues Thereof.
- Section 307(a) of the Clean Water Act: 40 CFR 129.4, Toxic Pollutants.
- Section 112 of the Clean Water Act: 40 CFR 61.01, Lists of Pollutants and Applicability of Part 61.
- Section 7 of the Toxic Substance Control Act: 40 CFR 716.120, Substances and Listed Mixtures to Which This Part Applies.
- Section 302 of the Emergency Planning and Community Right-to-Know Act: 40 CFR 355, Appendices A and B, Extremely Hazardous Substances.
- Transportation regulations in 49 CFR 171.8, Hazardous Materials Regulations: 49 CFR 172.101, Hazardous Materials Table; Appendix A, Table 1, Hazardous Substances Other Than Radionuclides; Appendix A, Table 2, Radionuclides; and Appendix B, List of Marine Pollutants.
- Marine transportation regulations in 33 CFR 126 and 160: 126.07, Dangerous Cargo; 160.230, Certain Dangerous Cargo; 126.09, Designated Dangerous Cargo; and 126.10, Cargo of Particular Hazard.
- Section 6.95 of the California Health and Safety Code, Hazardous Materials Release Response Plans and Inventory.
- Section 6.6 of the California Health and Safety Code, Safe Drinking Water and Toxic Enforcement Act of 1986 (commonly referred to as Proposition 65).

HAZWOPER – Hazardous Waste Operations and Emergency Response (29 CFR □1910.120). Regulations developed by OSHA that cover the health and safety of workers at hazardous waste sites, including emergency response operations at oil spills.

Incident – An occurrence or event, either human-caused or natural phenomenon, that requires action by emergency service personnel to prevent or minimize loss of life or damage to property and/or natural resources.

Incident Commander – The individual responsible for the management of all incident operations.

Incident Command System – A combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure, with responsibility for the management of assigned resources of an incident. This system was developed through a cooperative interagency effort and its organization structure is based upon a large fire organization that was developed over time by federal fire protection agencies.

Interim Storage Site – A site used to temporarily store recovered oil or oily wastes until the recovered oil or oily waste is disposed of at a permanent disposal site.

Marine Safety Office – USCG Safety Office located in most U.S. ports. There is a MSO in Los Angeles-Long Beach.

Maximum Extent Practicable – The planning values derived from the planning criteria used to evaluate the response resources described in the response plan to provide the on-water recovery capability and the shoreline protection and cleanup capability to conduct response activities for a worst-case discharge from a facility in adverse weather.

National Contingency Plan – The plan prepared under the Federal Water Pollution Control Act (33 United States Code §1321 *et seq.*) and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 United States Code §9601 *et seq.*), including revisions.

Natural Resources – Includes land, fish, biota, wildlife, air, water, groundwater, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States (including the resources of the exclusive economic zone), any state or local government or Indian tribe, or any foreign government.

Nearshore Area – The area extending seaward 12 miles from the boundary lines defined in 46 CFR Part 7, except in the Gulf of Mexico. In the Gulf of Mexico, it means the area extending seaward 12 miles from the line of demarcation (COLREG lines) defined in 33 of the CFR §§ 80.740 – 80.850.

Non-Hazardous Waste – Any rubbish, trash, and inert wastes such as concrete which do not meet the criteria of hazardous or designated wastes.

Non Petroleum Oil – Oil of any kind that is not petroleum-based. It includes, but is not limited to, animal and vegetable oils.

Non-Routine Waste – Wastes which are not regularly generated, or have not been previously profiled. Examples of non-routine wastes include contaminated soil resulting from hydrocarbon or chemical spills, or the cleanup of previously contaminated soils, chemical or other containers which are no longer in use, demolition of structures containing asbestos, and from other non-routine operations.

Oil – Oil of any kind or in any form. Including but not limited to: petroleum, fuel oil, sludge, oil refuse, and mixed with wastes (other than dredged spoils).

Oil Spill Response Organization – An exclusive team referring to all internal and external manpower resources involved in response operations and response support activities.

Oily Debris – Includes sorbent pads/boom, protection clothing/gear, soil, sand, rocks, logs, kelp, plastics, mousse, oil/water mixture, and animal carcasses.

Persistent Oil – A petroleum-based oil that does not meet the distillation criteria for a non-persistent oil. Persistent oils are further classified based on specific gravity as follows:

- Group II **–** specific gravity less than .85
- Group III **–** specific gravity between .85 and less than .95
- Group IV **–** specific gravity .95 to and including 1.0
- Group V **–** specific gravity greater than 1.0

Primary Response Contractor(s) – An individual, company, or cooperative that has contracted directly with the plan holder to provide equipment and/or personnel for the containment or cleanup of spilled oil.

Qualified Individual(s) – An English-speaking representative(s) of the facility identified in the plan, located in the United States, available on a 24-hour basis, familiar with implementation of the facility response plan, and trained in his or her responsibilities under the plan. This person has full written authority to implement the facility's response plan. This includes: (1) activating and engaging in contracting with identified oil spill removal organization(s); (2) acting as a liaison with the pre-designated Federal On-Scene Coordinator; and (3) obligating, either directly or through prearranged contracts, funds required to carry out all necessary directed response activities.

Recyclable Materials – Oilfield waste such as spent lead-acid batteries being reclaimed, scrap metal, and oil reclaimed at a petroleum refinery from hazardous waste resulting from normal oilfield activities.

Regional Response Team – The federal response organization (consisting of representatives from selected federal and state agencies) which acts as a regional body responsible for planning and preparedness before an oil spill occurs and providing advice to the FOSC in the event of a major or substantial spill.

Resources – All personnel and major items of equipment available, or potentially available, for assignment to incident tasks on which status is maintained.

Response Contractors – An individual, organization, association, or cooperative that provides or intends to provide equipment and services for oil spill containment, cleanup, and/or removal activities.

Response Priorities – Mechanism used to maximize the effective use of manpower and equipment resources based upon their availability during an operational period.

Risk and Hazard Analysis – A study in which process hazards and potential operating problems that could lead to oil spills are identified using systematic method(s) as recommended by the

American Institute of Chemical Engineers, or other means approved by the Administrator. This is the study referred to as the Hazard and Operability Study in Section 8670.28 of the Government Code.

Routine Waste – Wastes which are regularly generated on an annual basis. Routine wastes include drilling muds, tank bottoms and other similar wastes. These wastes have been, to a large extent, pre-classified through the waste profile program. Waste profiling is required prior to acceptance at a waste disposal facility. All wastes must be "profiled" or tested prior to disposal; however, certain routinely generated wastes which result from ongoing operations and processes will be tested or "profiled" once per year to maintain their classification.

Sheen – An iridescent appearance on the surface of the water.

Skimmer – An oil recovery device designed to "skim" floating oil from the oil/water surface. Skimmers employ a variety of mechanism methods to maximize the amount of oil extracted from the water's surface while attempting to minimize the intake of water into recovery systems and hoses. Various types of skimmers are designed to perform under specific conditions, such as heavy, moderate, or light seas, and to recover certain grades of oil, such as high, medium, or low viscosity oils. Stationary and portable skimmers, usually deployed within an oil containment boom, are designed solely to recover oil; while advancing skimmers can perform the dual functions of oil containment and oil recovery in a single operation.

Solid Waste – Any garbage, refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining and agricultural operations, and from community activities. It is important to remember that, by definition, a solid waste does not have to be solid.

Sorbent – A sorbent is any material that absorbs oil or to which oil adheres. A sorbent should be oleophilic and hydrophobic (i.e., it should absorb petroleum products from 20 to 25 times its weight and repel water). Sorbents are available in many forms: sheets, booms, sweeps, blankets, and loose materials. Sorbents may be made of polymer beads, synthetic hydrocarbon polymers, cellulose, plastic fiber, and even straw.

Source Control – Any number of procedures that may be employed to stop, curtail, and/or inhibit the source of a spill.

Technical Specialists – Personnel with special skills who are activated only when needed.

Unified Command – A method for all agencies or individuals who have jurisdictional responsibility, and in some cases, those who have functional responsibility at the incident to contribute to determining overall objectives for the incident and selecting a strategy to achieve the objectives.

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This annex contains cross-index tables that cross-reference applicable federal regulations with related sections of this Company's Oil Spill Prevention and Response Plan (OSPRP) These tables are as follows:

- Table S-1 is a cross-index for OSPR regulations.
- Table S-2 is a cross-index for OSHA regulations.
- Table S-3 is a cross-index for BSEE regulations.

Table S-1. OSPR Cross Index (Title 14 CCR 817.02)

OIL SPILL PREVENTION AND RESPONSE	CROSS REFERENCE[1]	
TITLE 14 CCR 817.02	**OSPRP**	**ACP**
(a) Introductory Material		
(1) Facility information	Title Page Plan Statement 1.1	
(2) Qualified Individual	1.1	
(3) Agent for service of process	1.1	
(4) Copy of OSRO contract	Annex P	
(b) Facility Description		
(1) Design and operation	A.2.2, A.3, A.4, A.5 Annex T	
(2) Facility site and surrounding area	A.6 Annex N	
(c) Prevention Measures		
(1) Risk and hazard analysis	H.2.2	
(2) Offsite consequence analysis	J.2, J.3	
(3) Resources at risk	J.3 L.2, L.3	9841, 9842
(4) Required prevention measures	A.2.2, A.3, A.4, A.5 B.1, B.1.1, B.1.2, B.1.3, B.1.4 Annex T: Sections 2, 5, and 6 of SPCC plans	
(5) Other prevention measures	B.2 G.1	
(d) On-Water Containment and Recovery		
(1) Reasonable worst case spill	I.2.1	
(2) Persistence and emulsification factors	I.2.2	
(3) Response capability standards	I.2.3	
(4) Non-cascadable equipment	I.2.3	

[1] Source:
OSPRP: Oil Spill Prevention and Response Plan
ACP: Area Contingency Plan - Los Angeles/Long Beach Southern Sector, 2011

Table S-1. OSPR Cross Index (Title 14 CCR 817.02)

OIL SPILL PREVENTION AND RESPONSE	CROSS REFERENCE[1]	
TITLE 14 CCR 817.02	OSPRP	ACP
(5) On-water equipment and services	B.1.1.2 I.2.3 K.7, K.8, K.9 Annex A, N, and P	3000
(6) On-water response and recovery strategies	K.3, K.4, K.5, K.7, K.8	3210, 3220
(e) Shoreline Protection and Cleanup		
(1) Shoreline response planning volume	I.2.1, I.2.2	
(2) Shoreline protection equipment and services	I.2.3 Annex A, B, and N	
(3) Reserved		
(4) Shoreline protection and cleanup strategies	K.3, K.4, K.6	3000, 3230, 9841, 9842
(f) Response Procedures		
(1) Response organization (ICS)	Annex D	
(2) Establishment of command sites	A.2.6.5	5000
(3) Cleanup stages chart/decision tree	K.1	
(4) Provision of emergency services	A.2.2.7	
(5) Methods/equipment to minimize spill	Annex K, Annex P	
(6) Methods, equipment, and lines of communication		
(7) Post-spill review	Annex M	
(8) Access/contamination control		
(9) Completion of site safety plan		
(g) Notification Procedures		
(1) List of contacts	Annex O	
(2) Immediate notification	(Emergency Placard) 4	
(3) Call-out procedure	(Emergency Placard)	

[1] Source:
OSPRP: Oil Spill Prevention and Response Plan
ACP: Area Contingency Plan - Los Angeles/Long Beach Southern Sector, 2011

Table S-1. OSPR Cross Index (Title 14 CCR 817.02)

OIL SPILL PREVENTION AND RESPONSE	CROSS REFERENCE[1]	
TITLE 14 CCR 817.02	**OSPRP**	**ACP**
(4) Checklist for reported information	Appendix C	
(5) Reporting not delayed	4	
(6) Updating report of spill	4	
(h) Temporary Storage and Waste Management		
(1) ID sufficient temporary storage	F.5.3	
(2) ID party to maintain recovered oil/oily waste	F.5.1	
(3) ID site criteria to select temporary storage sites	F.5.3	
(4) ID permits required	F.5.1 Annex N	
(5) Methods to expedite state permitting process	F.5.1	
(i) Oiled Wildlife Care Requirements		CA Wildlife Response Plan
(1) Utilize OWCN	L.4.2	
(2) Or ID procedures		
(j) Training		
(1) Response training	M.2.1, M.2.3, M.2.4	
(2) Operational risk reduction training	B.2.6 Annex T	
(3) Safety training	M.2.1, M.2.2	
(4) Record maintenance	M.4.1	
(k) Drills and Exercises		
(1) Drills and exercises program	M.3	
(2) Training as creditable drills	M.4.3, M.4.4	
(3) Equipment deployment drill requirement	M.3	
(4) Design of drills	M.3	
(5) Record maintenance	M.4.2	

[1] Source:
OSPRP: Oil Spill Prevention and Response Plan
ACP: Area Contingency Plan - Los Angeles/Long Beach Southern Sector, 2011

Table S-2. OSHA Emergency Response Plans Cross Index (29 CFR Part 1910.38a)

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION	CROSS REFERENCE[1]	
29 CFR PART 1910.38(a)	OSPRP	ACP
(2) Elements		
(i) Emergency escape procedures and route assignments		
(ii) Procedures followed by employees who remain to operate critical plant operations before they evacuate		
(iii) Procedures to account for all employees after emergency evacuation has been completed		
(iv) Rescue and medical duties for those employees who are to perform them		
(v) Preferred means of reporting fires and other emergencies		
(vi) Names or regular job titles of persons or departments who can be contacted for further information or explanation of duties under plan		
(3) Alarm System		
(i, ii) Compliance with Section 1910.165	Annex E	
(4) Evacuation		
(5) Training	M.2, M.3	

[1] Source:
OSPRP: Oil Spill Prevention and Response Plan
ACP: Area Contingency Plan - Los Angeles/Long Beach Southern Sector, 2011

Table S-3. BSEE Cross Index: 30 CFR Part 254, Subparts B and C, 254.21 through 254.47 – Oil Spill Response Plans for Outer Continental Shelf Facilities.

254.21 thru 254.47	DESCRIPTION	LOCATION / TITLE Oil Spill Prevention and Response Plan (OSPRP)	ACP/RCP
254.22	INTRODUCTION AND PLAN CONTENTS		
(a)	Identification of the facility the plan covers, including its location and type	Title Page 1.1	
(b)	A table of contents	Table of Contents (tabbed section)	
(c)	A record of changes made to the plan	Record of Revisions (tabbed section)	
(d)	A cross-reference table	Table R-3	
254.23	EMERGENCY ACTION PLAN		
(a)	Qualified Individual information	1.1, 1.8	
(b)	Spill Management Team information	D.2, D.3	
(c)	Description of spill response operating team	D.2, D.3	
(d)	Location of spill response operations center/communications systems		
(e)	Characteristics of the oil handled, stored, or transported	1.1	
(f)	Procedures for the early detection of a spill	A.3.3, A.7.7.1, A.7.7.2, A.7.8, A.7.9, A.7.13 B.1.1 G.1.1, G.1.2	
(g)(1)	Procedures for internal/external notification	C.1, C.2 Annex N	
(g)(2)	Methods to monitor and predict spill movement		
(g)(3)	Methods to identify and prioritize natural ,economic, and environmental resources	J.2.3, Attachment J-1, L.2, L.3	ACP: 9800, 9841, 9842
(g)(4)	Protection strategies for sensitive resources	K.6	ACP: 9841, 9842
(g)(5)	Methods to ensure containment , recovery, and response resources mobilized and deployed at spill site	K.2, K.3, K.4, K.5, K.6, K.9	

[1] Source:
OSPRP: Oil Spill Prevention and Response Plan
ACP: Area Contingency Plan - Los Angeles/Long Beach Southern Sector, 2011

Table S-3. BSEE Cross Index: 30 CFR Part 254, Subparts B and C, 254.21 through 254.47 – Oil Spill Response Plans for Outer Continental Shelf Facilities.

254.21 thru 254.47	DESCRIPTION	LOCATION / TITLE Oil Spill Prevention and Response Plan (OSPRP)	ACP/RCP
(g)(6)	Methods to ensure adequate storage of recovered oil	F.4, F.5 Table I-3	3230.4, 3240.18.6
(g)(7)	Methods to remove oily debris and wildlife rehabilitation	F.4.1 K.2, K.6, K.9 L.4	RCP; California Wildlife Response Plan
(g (8)	Waste management procedures	F.1, F.3, F.4, F.5, F.6, F. 7, F.8, F.9, F.10	
(g)(9)	Methods to implement Dispersant Use Plan and *In Situ* Burning Plan	K.7.1.2, K.7.1.3 Attachments K-2, K-3	RCP Appendix XII, XIII
254.24	RESPONSE EQUIPMENT		
(a)	Inventory – identify supplier, location and telephone numbers	Annex P Table CL-3 (Annex N)	
(b)	Inspection and maintenance of spill response equipment	B.1.1.2 Annex O	
254.25	CONTRACTUAL AGREEMENTS	Annex P	
254.26	WORST CASE DISCHARGE SCENARIO		
(a)	Volume determined using MMS criteria and include supporting calculations	I.3.1	
(b)	Trajectory analysis	J.2	
(c)	List of resources of special economic or environmental importance	J.3 Table L-2, Table L-3	ACP: 9841, 9842
(d)(1)	Response to worst case discharge scenario in adverse weather conditions (includes description of response equipment, effective daily recovery capacities)	I.3.2, Table I-1, Table I-2, Table I-3 Annex P	
(d)(2)	Support equipment, transportation, personnel support	Annex P	
(d)(3)	Description of oil storage, transfer, and disposal equipment	Table I-3 Annex P	
(d)(4)	Procurement and Response Times	K.9.1, K.9.2, K.9.3, K.9.4	ACP: 5510.1 CCWRRM: 506

[1] Source:
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ACP: Area Contingency Plan - Los Angeles/Long Beach Southern Sector, 2011

Table S-3. BSEE Cross Index: 30 CFR Part 254, Subparts B and C, 254.21 through 254.47 – Oil Spill Response Plans for Outer Continental Shelf Facilities.

254.21 thru 254.47	DESCRIPTION	LOCATION / TITLE Oil Spill Prevention and Response Plan (OSPRP)	ACP/RCP
254.27	DISPERSANT USE PLAN	Attachment K2	ACP; 3260 RCP; Appendix XII
(a)	Inventory and location of dispersants	K.7.1.2	RCP: CA Dispersant Plan
(b)	Summary of toxicity data	K.7.1.2	
(c)	Description and application of application equipment; estimated time to commence application after approval	K.7.1.2	
(d)	Application procedures	K.7.1.2	RCP: CA Dispersant Plan
(e)	Conditions under which product use may be requested	K.7.1.2	RCP: CA Dispersant Plan
(f)	Procedures for obtaining approval	K.7.1.2 Attachment K2	RCP: CA Dispersant Plan
254.28	*IN SITU* BURNING PLAN		
(a)	Description of equipment, availability, location, and owner	K.7.1.3	
(b)	Procedures, provisions for ignition of an oil spill	K.7.1.3	ACP; 3260
(c)	Environmental effects	K.7.1.3	
(d)	Guidelines for well control and safety of personnel and property	K.7.1.3	
(e)	Circumstances in which *in situ* burning may be appropriate	K.7.1.3	ACP; 3260
(f)	Guidelines for ignition	K.7.1.3	
(g)	Approval process	K.7.1.3	RCP: Appendix XIII
254.29	TRAINING AND DRILLS		
(a)	Identify and include the dates of the training provided to spill response team	M.2.1, M.2.2, M.2.3, Table M-1, M.4.1 Annex O	

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Table S-3. BSEE Cross Index: 30 CFR Part 254, Subparts B and C, 254.21 through 254.47 – Oil Spill Response Plans for Outer Continental Shelf Facilities.

254.21 thru 254.47	DESCRIPTION	LOCATION / TITLE	ACP/RCP
		Oil Spill Prevention and Response Plan (OSPRP)	
(b)	Satisfying exercise requirements	M.3, Table M-2, M.4.2, M.4.3, M.4.4 Annex O	
254.30	PLAN REVISIONS	1.7	
254.40	RECORDS	M.4	
254.41	TRAINING YOUR RESPONSE PERSONNEL		
(a)	Spill response operating team and hands on training with response equipment	M.1, M.2, M.2.3	
(b)	Spill Management Team training	M.1, M.2.1, M.2.3	
(c)	Qualified Individual Training	1.8, Table M-1	
(d)	Training Certificates and Records	M.4.1	
254.42	EXERCISES FOR YOUR RESPONSE PERSONNEL AND EQUIPMENT		
(a)	Triennial exercise	M.3, Table M –2, M.4.2	
(b)	Criteria to satisfy triennial exercise	M.3, Table M-2	
(c)	Exercises must simulate area conditions	M.3, Table M-2	
(d)	Documentation required for credit	M.4.2	
(e)	Maintenance of records	M.4.2	
(f)	Notification of an exercise	Table M-2	
(g)	Unannounced drills	Table M-2	
(h)	Regional Supervisor may require changes in frequency or location of required exercises, equipment deployed and operated, or deployment procedures and strategies	M.1	
(i)	Compliance with PREP	M.3	
254.43	MAINTENANCE AND PERIODIC INSPECTION OF RESPONSE EQUIPMENT		
(a)	Monthly inspection of response equipment and proper maintenance	B.1.1.2	
(b)	Maintenance of inspection and maintenance records	B.1.1.2	
254.44	CALCULATING RESPONSE EQUIPMENT EFFECTIVE DAILY RECOVERY CAPACITIES	Table I-3 Annex P	
254.45	VERIFYING THE CAPABILITIES OF YOUR RESPONSE EQUIPMENT	I.3.2	

[1] Source:
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Table S-3. BSEE Cross Index: 30 CFR Part 254, Subparts B and C, 254.21 through 254.47 – Oil Spill Response Plans for Outer Continental Shelf Facilities.

254.21 thru 254.47	DESCRIPTION	LOCATION / TITLE	ACP/RCP
		Oil Spill Prevention and Response Plan (OSPRP)	
254.46	NOTIFICATION OF AN OIL SPILL		
(a)	Notify NRC	C.1, C.2	
(b)	Notify BSEE	C.1, C.2	
(c)	Notify BSEE and RP of spill at another facility	Table C-1, Table C-2	
254.47	WORST CASE DISCHARGE VOLUME CALCULATION	I.3.1	

[1] Source:
OSPRP: Oil Spill Prevention and Response Plan
ACP: Area Contingency Plan - Los Angeles/Long Beach Southern Sector, 2011

All regulatory correspondence documentation is available through the Corporate Office for the Beta Facility. Document retention is 3 years or greater.

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