CORE
OIL SPILL RESPONSE PLAN

For Operations in the
Point Arguello and Point Pedernales Fields
Onshore Facilities and
Associated Pipelines

PXP

Plains Exploration and Production Company

Volume 1

FACILITY INFORMATION SUMMARY

Facility Name and Location

Platforms Harvest, Hermosa, and Hidalgo are located west of Point Conception approximately 45 miles west of Santa Barbara, California. The Gaviota Oil Heating Facility (GOHF) is located approximately 30 miles west of Santa Barbara, in Santa Barbara County about ¼ mile inland from the Santa Barbara Channel. Access to platforms is via helicopter. Access to the GOHF is via Highway 101.

Platform Irene lies offshore northwest Santa Barbara County. The Lompoc Oil and Gas Plant (LOGP), located north of Lompoc California in Santa Barbara County, and its related pipelines receive oil from Platform Irene. Access to the LOGP is via Harris Grade Road. Access to the platform is via helicopter or supply boats.

Hours of operation for all facilities are 24 hours a day, 7 days a week.

Owner/Operator
Plains Exploration and Production Company (PXP) 201 S. Broadway Orcutt, CA 93455 805-934-8200 24-Hr 805-739-9111 Fax 805-937-0237

Facility	Lease Number/Address	Phone	Latitude	Longitude
Harvest	Santa Barbara Channel OCS-P 0315	805-733-5615	34° 28' 06" N	120° 40' 51" W
Hermosa	Santa Barbara Channel OCS-P 0316	805-733-5630	34° 27' 15" N	120° 38' 48" W
Hidalgo	Santa Barbara Channel OCS-P 0450	805-733-5601	34° 29' 12" N	120° 42' 12" W
Gaviota Oil Heating Facility (GOHF)	17100 Calle Mariposa Reina Goleta, CA 93117	805-567-1654	34° 28' 27" N	120° 12' 04" W
Irene	Santa Maria Basin OCS-P 0441	805-733-0825	34° 36' 26" N	120° 43' 40" W
Lompoc Oil and Gas Plant (LOGP)	3602 Harris Grade Rd. Lompoc, CA 93436	805-733-2095	34° 43' 24" N	120° 26' 00" W

Qualified Individual(s)

Tom Goeres, Incident/Deputy Incident Commander	805-934-8221
David Rose, Incident/Deputy Incident Commander	805-934-8220
Steve Rusch, Incident/Deputy Incident Commander	323-298-2223
Craig Landry, Incident/Deputy Incident Commander	337-354-5007

Current Operation

PXP operates four platforms: three in the Santa Barbara Channel and one in the Santa Maria Basin in the federal OCS. The Point Arguello platforms (Harvest, Hermosa, and Hidalgo) process oil to pipeline specification offshore and ship the oil to the Gaviota Oil Heating Facility. The Santa Maria Basin Platform (Irene) ships oil to the Lompoc Oil and Gas Plant for processing.

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Connected Adjoining Facilities

The Gaviota Oil Heating Facility serves platforms Harvest, Hermosa, and Hidalgo. The platforms produce and process oil that is shipped to the Gaviota Oil Heating Facility for reheating and delivery to the All American Pipeline. Each platform generates its own power with gas turbine generating sets. The Lompoc Oil and Gas Plant serves Platform Irene. Platform Irene produces oil and gas that is shipped to the Lompoc Oil and Gas Plant for processing prior to shipment to the ConocoPhillips oil refinery and Southern California Gas Company pipeline distribution system.

Agent for Service of Process and Correspondence Contact

CT Corporation System
818 West Seventh Street
Los Angeles, CA 90017
(213) 337-4615
(213) 614-8630 (Fax)

Person to contact for more information regarding this plan:

Byron Everist
EH&S Advisor
Plains Exploration & Production Co.
210 S. Broadway
Orcutt, CA 93455
(805) 934-8219

Response Operations Center	Alternate Locations	
Plains Exploration & Production Co. 201 S. Broadway Orcutt, CA 93455 805-934-8200	Gaviota Oil Heating Facility 17100 Calle Mariposa Reina Goleta, California 93117 805-567-1654 (24 hour)	Clean Seas Support Yard 5751A Carpinteria Avenue Carpinteria, California 93013 805-684-3838 (24 hour)

OSPR Financial Responsibility Certificate Numbers:

20683-02-010 (Pt. Pedernales Pipeline)
20683-02-012 (Pt. Arguello Pipeline)
20683-02-013 (Gaviota Oil Heating Facility)

OSPR Plan Number: P4-40-0157
PHMSA Plan Number: 1692

Relevant Documents

Area Contingency Plan (ACP) Sector Los Angeles/Long Beach (Northern – ACP4 & Southern Sector – ACP5)
Environmental Protection Agency Region IX Mainland Regional Contingency Plan

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Section 1 Overview

1.1 Introduction

Plains Exploration & Production Inc. (hereafter referred to as PXP) as Owner/Operator has prepared this Oil Spill Response Plan to address oil spill response operations for all the facilities associated with the Point Arguello and Point Pedernales Fields. This volume covers all oil spill response-related activities required in the event of a spill and serves as the Response Action Plan of the Oil Spill Response Plan prepared for and approved by the Bureau of Safety and Environmental Enforcement (BSEE), the Facility Response Plan required by the U.S. Department of Transportation (DPT), the Response Action Plan required by the California Department of Fish and Game Office of Spill Prevention and Response (DFG/OSPR), and the Oil Spill Response Plans required by the Environmental Protection Agency (EPA) and Santa Barbara County. A separate volume specific to each agency is a companion to this Plan. This agency-specific volume documents compliance with sections of the response plan regulations that are not covered in this core volume of the Oil Spill Response Plan.

This **Oil Spill Response Plan (OSRP)** provides the Company's **Incident Management Team (IMT)** with specific information and guidance on the actions to take in response to an oil or hazardous material spill incident from any of the Company's platforms, offshore pipelines, onshore pipelines, or onshore facilities involved in the development of crude oil resources in the Point Arguello and Point Pedernales Fields.

1.2 Company Policy Regarding Response to Oil Spills

It is the policy of PXP to aggressively respond to an oil spill emergency in a timely manner consistent with this plan, all applicable regulations, the Area Contingency Plan and the National Contingency Plan, in coordination with qualified Federal and State On-Scene Coordinators (OSCs) participating in the Unified Command. PXP will cooperate fully with the OSCs to insure that appropriate spill response actions are taken in a timely manner to mitigate, to the maximum extent feasible, the impacts of an oil spill from any of the Company's facilities.

1.3 Relation to Other Plans

This plan is one of a number of plans that address emergency response issues related to the Company's facilities. As noted in Section 1.1, this plan serves as the core Oil Spill Response Plan. It addresses requirements common to BSEE, DOT, EPA, and the California DFG/OSPR. There is also a separate volume addressing each of the agencies unique requirements. The following sections describe the various PXP emergency plans as well as other related OSRO, county, state, and federal plans and how they relate to one another.

1.3.1 PXP Plans

PXP must prepare Oil Spill Response Plans for the BSEE (for offshore platforms and pipelines), the DOT (for pipelines in State waters and onshore), the U.S. EPA (for the Gaviota Oil Heating Facility and Lompoc Oil and Gas Plant), and OSPR (for the pipelines and facilities).

In addition, Santa Barbara County requires PXP to have an Emergency Response Plan (ERP) for both the Gaviota and Lompoc facilities which address various types of emergencies, including oil spills. The ERP is a separate document. In the case of an oil spill, in addition to referring to the checklists in the ERP, PXP personnel will also activate this Oil Spill Response Plan. This Plan includes the core response-related elements for all of the other agency oil spill response plan requirements. Volume 1 provides all responders with the information necessary to mobilize, conduct, and demobilize an oil spill response effort. Volume 2 provides regulatory compliance documentation to insure that each agency's regulations are fully satisfied.

This Core Plan together with the County Supplement to the Core Oil Spill Response Plan for Operations on the Point Pedernales Onshore 20-Inch Wet Oil Pipeline (Volume 2) also serves as the Oil Spill Contingency Plan required by Santa Barbara County PXP Point Pedernales Project Final Development Plan 94-DP-027, Permit Condition P-13. Permit Conditions F-3 and H-9 of the same Final Development Plan are also covered in this plan.

Utilization of the Core Plan during drills and exercises also fulfills Permit Condition P-14 of the Santa Barbara County Point Arguello Project Final Development Plan 85-DP-32CZ.

1.3.2 National Contingency Plan

The National Contingency Plan (NCP) (as described in 40 CFR 300) describes national priorities and organization for oil spill response. Individual company oil spill response plans are required by regulation to be consistent with the NCP. This plan has been prepared to be consistent with the NCP.

1.3.3 Area Contingency Plan

The Area Contingency Plan (ACP) is required by OPA 90 (Oil Pollution Act of 1990). It must be consistent with the NCP and it describes appropriate response actions necessary "to remove a worst case discharge of oil or a hazardous substance, and to mitigate or prevent a substantial threat of such discharge…." The ACP is periodically updated and serves as a resource for all responders within the area. In particular, the ACP contains thorough analyses and descriptions of appropriate response strategies for every segment of coastline with the area covered by the ACP. Therefore, the Los Angeles/Long Beach ACP is an essential reference document for developing response strategies for any spill from Point Arguello and Point Pedernales facilities. Where appropriate, this Plan references the Area Contingency Plan (ACP) Sector Los Angeles/Long Beach (Northern - ACP4 & Southern Sector ACP5) areas and incorporates the maps and response strategies by reference.

1.3.4 Santa Barbara County Emergency Response Plan

Santa Barbara County has required, under FDP permit condition P-3, the preparation of Emergency Response Plans (ERPs) to address all potential emergencies that could occur from the onshore pipeline and onshore facilities for the Point Arguello and Point Pedernales Fields. The ERPs addresses a wide range of emergencies in addition to oil or hazardous material spills. If any of these emergencies occur onshore, the ERP will be the primary first reference for onshore personnel. In the event of an oil or hazardous material spill, this oil spill response plan will be activated alongside the ERP.

1.4 Facility Location and Map

Figures 1-1 and 1-2 show the PXP facilities in relation to the shoreline and offshore islands of the Santa Barbara Channel and Pacific Ocean north of Point Conception. Three platforms (Hidalgo, Harvest, and Hermosa) lie approximately 6-10 miles offshore Point Conception and Point Arguello. They are interconnected by oil and gas pipelines and are ultimately connected at Platform Hermosa by two pipelines, one for sweetened gas, one for crude oil, to the Gaviota Oil Heating Facility (GOHF) that make landfall just north of Point Conception. These pipelines traverse on land between there and Gaviota. Platform Irene lies more than 5 miles offshore north and west of Point Pedernales. Three pipelines (20-inch oil, 8-inch sour gas, and 8-inch produced water) run from the platform to landfall approximately 0.5 miles north of the mouth of the Santa Ynez River and terminate at the Lompoc Oil and Gas Plant, which is 2.7 miles northeast of Lompoc.

1.5 Facility Description

This plan covers response actions for oil or hazardous material spills from any PXP facility. These facilities are listed in Table 1-1 and depicted in Figures 1-1 and 1-2.

Table 1-1. Facility Identification

FACILITY NAME	TYPE OF FACILITY	OCS LEASE #	PHONE NUMBER
Platform Harvest	Offshore Oil Drilling and Production Facility	OCS-P 0315	805-733-5615
Platform Hermosa	Offshore Oil Drilling and Production Facility	OCS-P 0316	805-733-5630
Platform Hidalgo	Offshore Oil Drilling and Production Facility	OCS-P 0450	805-733-5601
Pt. Arguello Pipeline	Pipeline from platforms to GOHF	N/A	805-567-1654
Gaviota Oil Heating Facility (GOHF)	Onshore Processing, Treatment and Transfer Facility	N/A	805-567-1654
Platform Irene	Offshore Oil Drilling and Production Facility	OCS-P 0441	805-733-0825
Pt. Pedernales Pipeline	Pipeline from platforms to LOGP	N/A	805-733-5174
Lompoc Oil and Gas Plant (LOGP)	Onshore Processing, Treatment and Transfer Facility	N/A	805-733-5174

(805) 739-9111 - is emergency phone number for *all* facilities

1.5.1 Platforms

PXP operates three platforms, Harvest, Hermosa, and Hidalgo, in the Point Arguello Field in the Federal OCS. The Point Arguello Field is located in federal waters 10-15 miles west of Point Conception. In 2003, Arguello Inc. received authorization to develop Lease 451E northeast of the Point Arguello Unit via directional drilling from Platforms Hermosa and Hidalgo. Oil developed from this lease will be produced and processed using the same equipment and systems as is the case for oil produced from the existing Field leases. No changes in platform or oil heating facility operations are required as a result of Lease 451E development. Relevant drawings for each of the platforms are included in Appendix A.

Primary separation of oil, gas and produced water takes place on the platforms. The oil produced at Hidalgo and Harvest is pipelined to Hermosa. The total oil produced at all three Platforms is pipelined from Hermosa to shore in one oil pipeline.

PXP also operates one platform, Irene, in the Point Pedernales Field in the Federal OCS. The Point Pedernales Field is located approximately 5 miles west of Point Pedernales, extending north and west for approximately 5-to-6 miles. Primary gas/liquid separation takes place on the platform. The crude oil and water are shipped together via a 20-inch pipeline to the Lompoc Oil and Gas Plant (LOGP) for dehydration. The produced gas from Platform Irene is compressed on the platform and shipped to the LOGP via an 8-inch pipeline. An additional 8-inch water pipeline is provided to transport clean produced water from the LOGP facility back to Platform Irene for disposal.

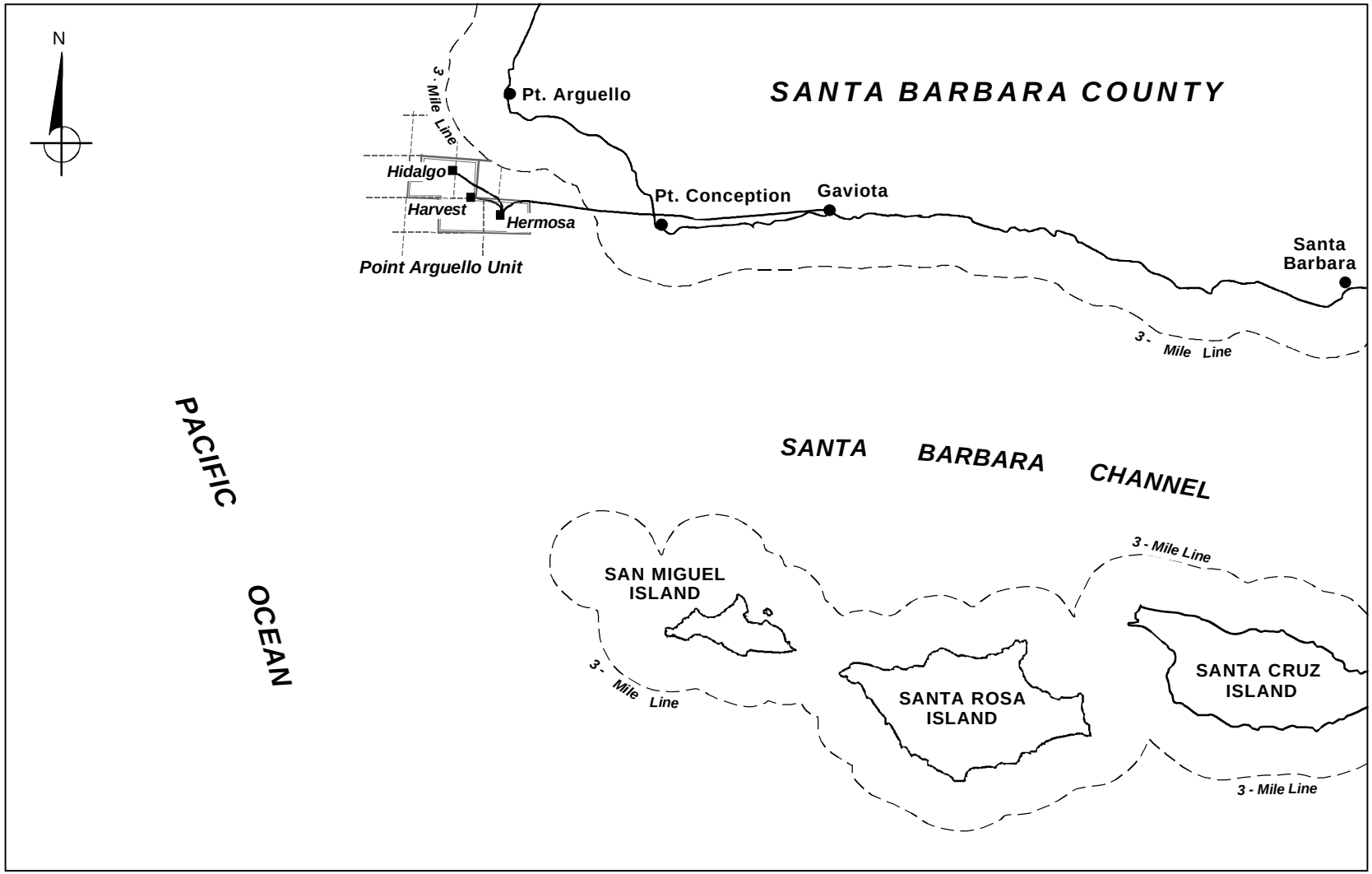

Figure 1-1. Point Arguello Facilities

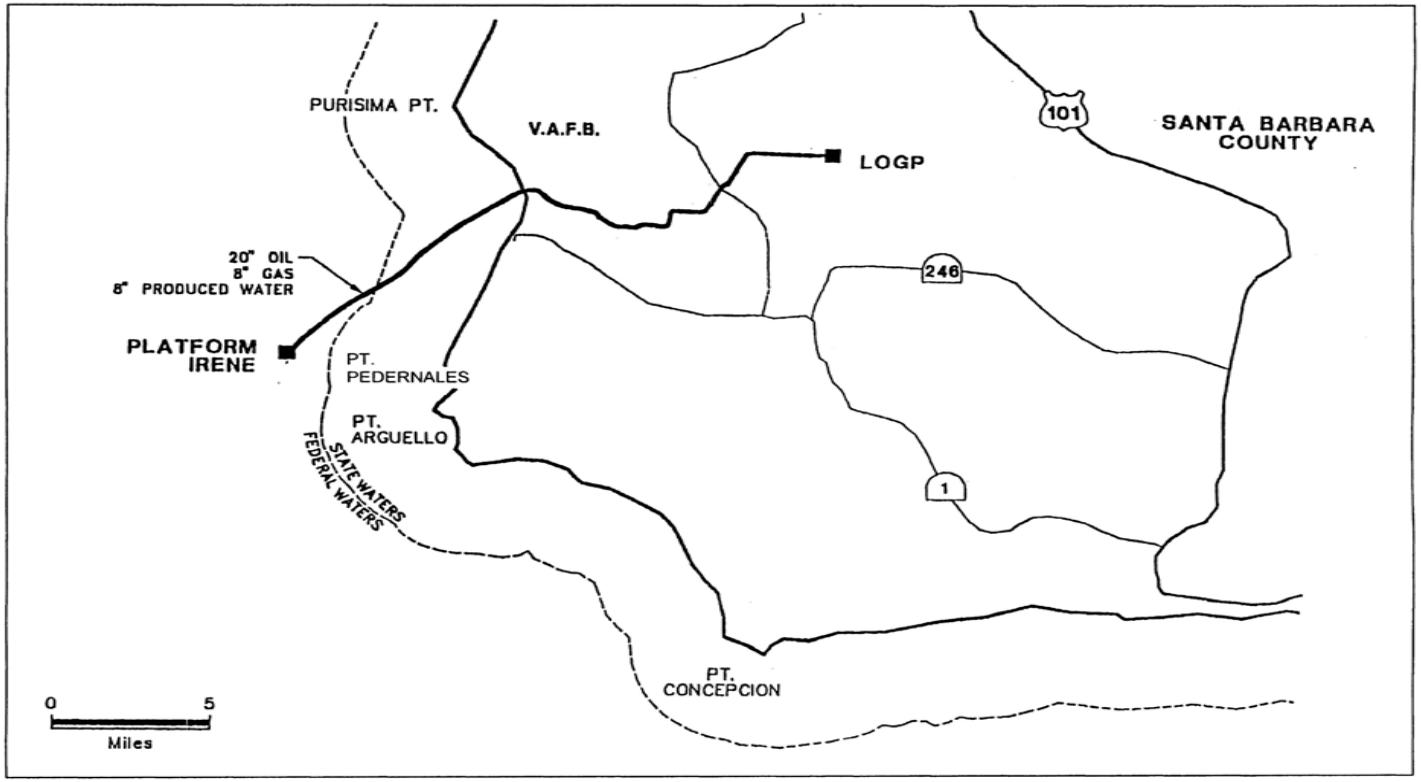

Figure 1-2 Point Pedernales Facilities

1.5.2 Pipelines

There is an oil and a gas pipeline between the Point Arguello platforms and shore. Both the pipelines run 10 miles undersea to a landfall 1.5 miles north of Point Conception. The pipelines then follow a right-of-way for 17.2 miles underground along the coastal terrace to the Gaviota Oil Heating Facility. Treated oil is transported to the Gaviota Oil Heating Facility via the oil pipeline. Gas is currently consumed on the platforms for fuel or reinjected into the reservoir. The gas pipeline is used to transport treated gas to the Gaviota Oil Heating Facility for use as fuel in facility processes and cogeneration units. The pipeline route is shown on Figure 1-1.

Oil, gas and water pipelines between Platform Irene and shore run 10.1 miles undersea to landfall 0.5 miles north of the mouth of the Santa Ynez River. The pipelines then follow a right-of-way for 12.1 miles to the Lompoc Oil and Gas Plant. Produced crude oil and water are shipped together via a 20-inch pipeline to the LOGP for dehydration. The produced gas from Platform Irene is compressed on the platform and shipped to the LOGP via an 8-inch pipeline. An additional 8-inch water pipeline is provided to transport clean produced water from the LOGP facility back to Platform Irene for disposal. The length of each of the three pipelines is approximately 22.2 miles. The pipeline route is shown on Figure 1-2.

1.5.3 Onshore Facilities

1.5.3.1 Gaviota Oil Heating Facility

The Gaviota Oil Heating Facility (GOHF) was originally designed to process crude oil and associated gas produced from the offshore Point Arguello field. The Oil Plant would remove water and hydrogen sulfide (H_2S) from the crude oil, reduce its vapor pressure, and reheat it to meet pipeline specifications. The Gas Plant would remove H_2S and carbon dioxide (CO_2) from produced gas to provide for plant fuel gas and propane for plant supply and sale.

In 1996, additional equipment was installed to dehydrate crude oil on the Point Arguello Project offshore platforms. In 1998 equipment was modified and added to give the offshore platforms the capability to process and stabilize the crude oil and re-inject the associated gas. Sweetened gas was brought ashore starting in 2001 for use as fuel in the GOHF.

The function of the GOHF is to heat the crude oil to pipeline temperature specification and to provide surge volume for the producing platforms along with pipeline monitoring and leak detection. The heated crude is then pumped to the All American Pipeline (AAPL) pump station.

1.5.3.2 Lompoc Oil and Gas Plant

The Lompoc Oil and Gas Plant (LOGP) is about 400 feet east of Highway 1 in the Lompoc Oil Field. The LOGP is a heating, separation and pumping facility designed to treat produced well fluids from Platform Irene. Dehydrated oil from LOGP is transported by pipeline to the ConocoPhillips Refinery via a ConocoPhillips pipeline. Produced water is returned via pipeline to the platform for injection.

In 1997, additional equipment was installed at LOGP to remove H_2S and carbon dioxide (CO_2) from produced gas. After processing at the LOGP, sweet natural gas of less than 4 ppm H2S and 3% CO2 is compressed and pumped into the 12-inch sales gas pipeline which runs approximately 7.5 miles to the Southern California Gas Company transfer station located near the Orcutt Hill oil field.

1.5.4 Characteristics of Crude Oil

1.5.4.1 Pt. Arguello Crude Oil

Point Arguello crude oil ranges from around 19.9 to 26.4 API gravity with a flash point of between 32 and 37 degrees F. Because it is relatively heavy, this oil is unlikely to be dispersible after a period of several hours exposure to weather and the environment and is unlikely to burn if ignited when cold. Response strategies in this Plan focus on containment and recovery rather than dispersal or burning. Table 1-2 summarizes the characteristics of Point Arguello crude oils. Appendix D contains an MSDS for crude oil and analyses of the characteristics of the different produced oils from the Point Arguello Unit.

Table 1-2. Summary of Pt. Arguello Crude Oil Characteristics

Parameter	Value
Composition	Hydrocarbon mixture
Temperature	100 – 120 ºF
Flash point	32 - 37 ºF
API gravity	Approx. 19.9 – 26.4
H_2S content (ppm wt)	< 1
Specific Gravity @ 60 ºF	0.9347 – 0.8962

1.5.4.2 Pt. Pedernales Crude Oil

The API gravity of Point Pedernales crude oil is approximately 14.5 with high asphaltene content. This low gravity, heavy crude oil is unlikely to be dispersible after a period of several hours exposure to weather and the environment and is unlikely to burn if ignited when cold. Response strategies in this Plan focus on containment and recovery rather than dispersal or burning. Table 1-3 summarizes the characteristics of Point Pedernales crude oil. Appendix D contains an MSDS for crude oil and analyses of its characteristics.

Table 1-3. Summary of Pt. Pedernales Crude Oil Characteristics

Parameter	Value
Composition	Hydrocarbon mixture
Asphaltene (wt. %)	12
Flash point	33 ºF
API gravity (@60/60 ºF)	14.5
H_2S content (ppm wt)	4.6
Specific Gravity @ 60 ºF	0.9690

1.5.5 Prevention Measures Incorporated Into PXP Facilities

The Company's paramount strategy for dealing with oil spills is to prevent their occurrence. Well-engineered facilities, good housekeeping practices, adequate equipment maintenance, and adherence to proper operational procedures will be diligently employed to reduce the likelihood of an oil spill to the lowest possible level.

There are multiple control and safety systems, standard procedures, and management programs in place which act as safeguards to prevent or mitigate an oil release. A brief description of the primary safeguards follows:

Abnormal Operating Procedures. Written instructions describing procedures to be followed during operations other than those for which the facility is designed are done when necessary.

Control Systems. Pipeline operations are regulated and monitored by a series of controls that sense pressure, level, temperature, flow rate, and pump speed. The systems monitor and visually display operating information to operators on the platforms and onshore facilities. The displays also indicate to the Operators any alarms that may be activated.

Emergency Shut-down. An automatic emergency shutdown system will stop operations if process variables exceed predetermined values or if manually activated. See Leak Detection discussion for more information.

External and Internal Corrosion Protection. To mitigate external corrosion, the subsea portion of the Arguello pipeline is coated with coal tar enamel. The Pedernales pipelines are protected externally by an extruded polyethylene type coating manufactured by Pritec. In addition, magnesium or cast on zinc anodes are installed to provide sacrificial cathodic protection. A chemical corrosion inhibitor program is utilized to help mitigate internal corrosion and is periodically revised to reflect operating experience. Corrosion coupons are installed in the pipeline to measure internal corrosion rates and to determine if the inhibitor injection level is adequate.

Isolation Valves. To prevent further spread of oil in the event of a leak or rupture, the pipelines have been equipped with isolation valves on the right-of-way. All of the pipeline isolation valves are monitored and operated by the Pipeline Operators at Gaviota and Lompoc. These valves can also be manually operated at the valve vault.

Facility Inspections. Inspections of facilities are conducted on a regular basis by platform personnel to determine if leakage or pollution is occurring. Records of the Company's daily inspection logs are kept on the platform for two years and then typically at the Administrative Office for three years. Any necessary equipment repairs or maintenance are completed immediately. Pollution response equipment is inspected regularly and records of inspections are also kept for two years.

Health and Safety Meetings. At least monthly, Health and Safety meetings are conducted and attended by Operations personnel. The topic of each meeting is different and health, safety, and environmental issues are covered.

Leak Detection. The Pt. Arguello oil pipeline to shore is equipped with a Supervisory Control and Data Acquisition System (SCADA). In addition, a leak detection system by ATMOS International acquires data from the SCADA system to monitor the pipeline for a leak. The design of ATMOS International's leak detection software utilizes statistical techniques to detect changes in the overall behavior of the flow and pressure at the inputs and discharges of the pipeline. The leak determination is based on probability calculations at regular sample intervals. The principle for the probability calculations is supported by mass conservation and hypothesis testing. The software obtains the corrected (net) oil volume measurements and pressures from the original instruments via the pipeline SCADA system. The pressure and flow rate data is combined into a single leak detection computation probability for each of the two pipeline segments. The leak probability is alarmed back on the SCADA console for the operator interaction. The Operator can then decide on an appropriate response. Automatic ESD-initiated valves can shut-in the oil pipeline in less than approximately two minutes. The time for manually-initiated valve closure is approximately 45 seconds (0.53 inches/second).

The Pt. Pedernales oil pipeline has a computerized leak detection system that is used to monitor and detect leaks in the Platform Irene oil pipeline between the platform and the LOGP. A dedicated computer running ATMO PipeLDS software continuously monitors the pipeline pressures and flowrates. The onshore section of the pipeline contains 10 intermediate valve stations (VS) that are monitored and controlled by the ABB (Asea, Brown, Boveri) computer system which is a PLC with an operator controlled base station located in the LOGP control room. VS 1, 2, 4, 7, 8, and 10 utilize Motor Operated Valves (MOVs), which can be operated locally or from the LOGP ABB system. VS 3, 5, 6, and 9 utilize check valves. Position indication of both the MOVs and check valves is transmitted to the ABB system controller at the LOGP. The LOGP is staffed at all times.

The time it would take the pipeline monitoring system to detect a release is a function of the size of the release. A large leak or rupture would most likely be detected in 30 seconds or less. Smaller leaks could take longer to detect. The valves can then be closed remotely and production shut down on Platform Irene using the Emergency Shutdown Switch (ESD). This can be accomplished in 30 seconds. Adverse weather will have no effect on leak detection and shutdown operations.

A number of tests are also conducted on the pipeline as part of the Company's pipeline preventative maintenance program. The following Table 1-4 lists some of the tests that are run on the pipeline.

Table 1-4. Preventive Maintenance Tests	
Test	**Approximate Frequency**
Pipeline Block Valve Testing	2 tests every year
Pipeline Internal Inspection - Smart Pig	1 test every 2 years (Pt. Arguello) 1 test every year (Pt. Pedernales)
Pipeline External ROV (Remote-Operated Vehicle) Survey or SSS (Side Scan Sonar) Survey	1 test every 2 years
Cathodic Protection Survey Report	1 test every year onshore and at platforms. 1 test every 2 years during ROV surveys of subsea pipelines
External Corrosion Inspection Report	1 test every year
Corrosion Coupon Analysis Testing	2 tests every year
Pig Run	1 run every month (Pt. Arguello) 1 run every week (Pt. Pedernales)
Residual Analysis Testing	1 test every year (Pt. Pedernales)
Low Pressure Switch Testing	1 test every month
High Pressure Switch Testing	1 test every month
ESD (Emergency Shutdown) Valve Testing	1 test every month (at Platforms)
PSV (Pressure Safety Valve) Testing	1 test every year
Volume Meters and Flow Computers Testing	1 test every month (Pt. Arguello) 1 test every 3 months (Pt. Pedernales)

Lockout/Tagout Procedure. Lockout/Tagout procedures are written procedures in place which personnel are required to follow during a shutdown of electrical equipment, closing valves during maintenance or leak repair, testing new or repaired equipment, or inspecting tanks. These written procedures are designed to protect life, the environment, and property.

Operator Training. Operators are required to have initial and refresher training on procedures related to the safe operation of the platform, the pipeline, and for emergency response. Operator training is accomplished through both internal and external meetings, workshops, and courses and "piggy-back" training on the job.

Overpressure Safety Devices. All oil pipelines and oil measurement facilities are protected from damage due to overpressure by use of relief valves installed at the pig receivers, the measurement facilities, the treated oil pumps, and by high pressure shutdown switches on the pump and compressor discharge lines at Platform Hermosa and Platform Irene. The oil relief system may be piped into the Gaviota Oil Heating Facility oil reject tank T-2 for the Pt. Arguello production, or the Lompoc Oil and Gas Plant oil surge tank T-280 for Pt. Pedernales production.

Visual ROW Inspections. The pipeline rights-of-way (ROWs) are visually monitored once a week, weather permitting, for abnormal conditions or potential visible leaks or sheens. The offshore ROWs are monitored by either boat or aircraft and the onshore ROWs are monitored by vehicles and aircraft (except for restricted air space over Vandenberg AFB).

Specifications. Company design standards meet or exceed requirements set forth by federal and state regulations and are intended to provide the maximum protection possible from releases.

1.6 Plan Review and Update Procedures

This OSRP will be reviewed periodically and updated as necessary. Revisions or replacements of updated materials will be provided to all plan holders when updates are completed and approved. The materials should immediately be incorporated according to the instructions accompanying the changes. Persons responsible for maintaining current plans at each facility should record having received and inserted the plan update on the form on the following Table 1-5 "Record of Changes".

Copies of the Oil Spill Response Plan are located at Company facilities as follows:

- Emergency Operations Center – 3 copies
- GOHF Control Room – 1 copy in operations and 1 copy in foreman's office
- Platform Harvest – 1 copy in operations and 1 copy in foreman's office
- Platform Hermosa – 1 copy in operations and 1 copy in foreman's office
- Platform Hidalgo – 1 copy in operations and 1 copy in foreman's office
- Platform Irene – 1 copy in operations and 1 copy in foreman's office
- LOGP Control Room – 1 copy in operations and 1 copy in foreman's office
- Qualified Individuals – 1 copy each
- Emergency Preparedness Coordinator – 1 copy
- Other locations as necessary

This plan will be reviewed following every drill or actual emergency event for which the plan was activated, and modified as necessary to address new and different operating conditions, facilities and equipment, or changes in information that must be included in the plan. The primary review mechanism is post-drill and post-spill critiques, which will be conducted within 90 days following a response to a spill incident or a drill. Drill or spill response participants evaluate the effectiveness of the plan and response actions and recommend changes, if required, to improve the effectiveness of the plan. Revisions to the plan are distributed to agencies and other plan holders, who record the revision on Table 1-5 of this document. In addition, the plan

will be modified whenever changes occur in operating conditions or equipment that would cause a significant change to the response plan. Such changes may include, but are not limited to:

- An extension of an existing pipeline or construction of a new pipeline in the response zone covered by the plan;
- Relocation or replacement of a pipeline in a way that substantially affects the information included in the response plan, such as a change to the worst case discharge volume;
- A change in the facility's configuration that materially alters the information included in the response plan;
- A significant change in the worst case discharge scenario or in the type of oil being handled, stored, or transported at the facility, if the type affects the required response resources;
- The name of the oil spill removal organization;
- A material change in the capabilities of the oil spill removal organization(s) that provide equipment and personnel to respond to discharges of oil;
- A material change in the facility's spill prevention and response equipment or emergency response procedures;
- The Qualified Individual;
- A change in the NCP or an ACP that has significant impact on the equipment appropriate for response activities;
- A change in regulations;
- The development of new oil spill response technologies as determined by the Administrator of the California Office of Spill Prevention and Response during any review of response capability standards;
- Deficiencies identified in the Administrator's (of the California Office of Spill Prevention and Response) review of all the oil spill contingency plans as part of the Coastal Protection Review;
- An oil spill;
- An oil spill drill;
- Any other changes that materially affect or reduce response capabilities or other information relating to circumstances that may affect full implementation of the plan.

The U.S. Department of Transportation requires the plan to be updated every five years (49 CFR 194.121(a)). PXP will review and resubmit the plan to PHMSA every five years from the last plan approval date or advise PHMSA that no revisions are necessary consistent with this requirement. Any modifications or revisions of the plan made prior to the end of the five year review cycle will be submitted to PHMSA for review within 30 days of completion.

The California Office of Spill Prevention and Response in the Department of Fish and Game requires every post-spill plan review to be forwarded to the Administrator [§817.02(f)(7)(A)]. As required, PXP will forward the result of the post-spill review to the Administrator within 90 days following the completion of the response and clean-up procedures.

The PXP Emergency Preparedness Coordinator is responsible for insuring that the plan is updated as required and that post-spill reviews and plan updates are completed, documented, and distributed to the appropriate agencies and company locations as required.

Table 1-5. Record of Changes			
Revision No.	**Revision Date**	**Date Entered**	**Signature Of Person Entering Revision**
2004-1	Nov 2004		
Rev.1	July 2007		
Rev. 2	July 2009		
Rev. 3	June 2011		
Rev. 4	April 2012		

Section 2 Response Organization

2.1 Introduction

The Company has developed a response organization along with procedures designed to respond to a range of spill sizes and other emergencies (i.e. fire, explosion, and personnel injury). The tiered response organizational structure allows the Incident Commander and Qualified Individual to mobilize the necessary equipment and personnel to respond to a spill or emergency event. Initial response will be initiated by onsite personnel and supervisors assisted by manpower and equipment from the local oil spill cooperative, Clean Seas (CS).

The initial response operation will be conducted under the procedures outlined for the **Initial Response Team (IRT)** as discussed in Section 2.2.2 of this response plan. Equipment available for the primary response is provided in Appendix C, while the procedures that will be implemented during these operations are discussed in Sections 3, 4, 5, and 6.

Sustained response capabilities, including management support from the **Incident Management Team (IMT)**, will be activated for larger spills or other emergencies. Working with appropriate Federal, State and Local resource agencies through the Unified Command structure, the Company Incident Command and IMT will call upon additional Company and cooperative resources. Establishment of an Emergency Operations Center (Section 4.3) and the implementation of procedures to assess the size and movement of the spill, response prioritization, resource assessment, and containment, recovery and disposal of the spill (Section 5) are outlined in this response plan.

In the event additional response resources are required, the Company Incident Commander and IMT members will call upon additional equipment and manpower from other oil spill response cooperatives, governmental organizations, and from independent contractors. Response team responsibilities and procedures for additional response resources are outlined in Duties and Responsibilities for IMT members contained in Appendix B of this volume of the response plan. Sources of equipment and manpower are provided in Appendix C of this response plan. The Area Contingency Plan (Section 5000) also supplies a list of Pacific coast oil spill response equipment.

The following section outlines the general organization of the Company's response teams, and identifies the individuals assigned to these teams. Detailed ICS job descriptions are included in Appendix B.

2.2 Response Team Organization and Personnel

2.2.1 Qualified Individual

In the event of an oil spill incident at any of the Company's platforms, pipelines, or onshore facilities, qualified persons have been designated who, through experience and training, can

assume the legally mandated responsibilities of the **Qualified Individual (QI)**. The QI is authorized to commit the resources necessary to respond to a major oil spill incident.

State and Federal regulations establish minimum qualifications for a Qualified Individual which vary somewhat between agencies. The most common requirement is that the QI be authorized to implement the response plan, commit funds to enable company and contractor resources to be used in a spill response, and to coordinate with the Federal and State On-Scene Coordinators (OSCs) to accomplish spill response. The Bureau of Safety and Environmental Enforcement and the Department of Transportation also require that the QI be English speaking and available 24 hours per day. The Federal EPA has specific requirements, shown in Table 2-1 in the form of a checklist that the QI must implement.

The following individuals are designated as Qualified Individuals. Either one could assume that responsibility based on the location of the incident and availability of personnel.

a. **Tom Goeres**
IC/Deputy IC
201 S. Broadway
Orcutt, CA 93455
Office (805) 934-8221
Home
Cell

b. **Steve Rusch**
IC/Deputy IC
5640 S. Fairfax Avenue
Los Angeles, CA 90056
Office (323) 298-2223
Home
Cell

c. **David Rose**
IC/Deputy IC
201 S. Broadway
Orcutt, CA 93455
Office (805) 934-8220
Home
Cell

d. **Craig Landry**
IC/Deputy IC
400 E. Kaliste Saloom Rd., Suite 3500
Lafayette, LA 70508
Office (337) 354-5007
Home
Cell

Upon any change in Qualified Individual, the out-going QI will brief the in-coming QI on the current status of the response, the current Incident Action Plan, and provide a rundown of the current staffing of the ICS Sections as appropriate. Both the federal and state OSCs will be notified in advance of any relief or shift change. If possible, the in-coming QI will be introduced to the Federal and State OSCs on duty at the time of the shift change.

Table 2-1. Qualified Individual Duties (EPA Required)		
The Qualified Individual (QI) or his alternate shall ensure that the following actions are taken in the event of an oil spill:		
	DUTY	INDICATE COMPLETE
(A)	Activate internal alarms and hazard communication systems to notify all facility personnel;	
(B)	Notify all response personnel, as needed:	
(C)	Identify the character, exact source, amount, and extent of the release, as well as the other items needed for notification (use Notification Form in Figure 3-1);	
(D)	Notify and provide necessary information to the appropriate Federal, State, and local authorities with designated response roles, including the National Response Center, California Emergency Management Agency, and Santa Barbara County Office of Emergency Services;	
(E)	Assess the interaction of the spilled substance with water and/or other substances stored at the facility and notify response personnel at the scene of that assessment;	
(F)	Assess the possible hazards to human health and the environment due to the release. This assessment must consider both the direct and indirect effects of the release (i.e., the effects of any toxic, irritating, or asphyxiating gases that may be generated, or the effects of any hazardous surface water runoffs from water or chemical agents used to control fire and heat-induced explosion);	
(G)	Assess and implement prompt removal actions to contain and remove substances released;	
(H)	Coordinate rescue and response actions as previously arranged with all response personnel;	
(I)	Use authority to immediately access company funding to initiate cleanup activities; and,	
(J)	Direct cleanup activities until properly relieved of this responsibility.	

2.2.2 Initial Response Team

The **Initial Response Team (IRT)** consists of onsite Company personnel and Clean Seas personnel who would act as the primary responders. In general, facility personnel would be responsible for stopping the release of oil, and if possible, containment of a minor spill at its source in order to prevent the release of oil to the marine environment. If the facility personnel are unable to contain the spill and oil is released to the marine environment, they would be responsible for monitoring the spill's movement from aboard the platform, and notifying Clean Seas, company personnel and the Person on Call (see section 2.2.2.3). As necessary, facility personnel would also be responsible for deploying tracker buoys. Clean Seas' responsibilities would include responding immediately to the spill by providing containment, recovery, and cleanup capabilities, and monitoring the spill's movement.

Primary response to an oil release will normally be provided by Clean Seas from the Point Arguello/Point Pedernales area. From this area, a Clean Seas oil spill response vessel (OSRV), boom handling boat (or similar boat), and spill response personnel provide response capability for Platforms Harvest, Hermosa, Hidalgo and Irene. Typically 6-7 personnel staff the initial Clean Seas OSRV and will be responsible for these duties. Additional personnel may be called to aid in the response if needed. The number and type of available personnel Clean Seas can respond with is shown in the table below and includes response companies that Clean Seas has Emergency Response Contract Agreements with.

Oil Spill Response Organization	Number and Type of Personnel				
	Spill Technicians	Equipment Operators	Supervisors	Industrial Hygienists	Other
Clean Seas	7	24	6		2
Fisherman's Oilspill Response Team (FORT)		80			
Patriot Environmental Services	75	25	10	10	6
National Response Corporation	100	33	19	8	12

The Clean Seas OSRV would normally be deployed under the direction of the Onsite Incident Commander, Foreman, Operator-in-Charge, Person-in-Charge, or Clean Seas personnel. When Clean Seas is called by a platform for spill response, the boom handling boat will normally be launched, weather permitting, to the spill site ahead of the OSRV. Refer to Page C-3 for approximate response times of the Clean Seas vessels.

Depending upon specific conditions, equipment deployment operations may be initiated by Clean Seas personnel during site characterization. However, containment and recovery operations (and exposure of personnel to the potential health hazards of the spill) will not begin until after the Clean Seas initial response crew has completed a site characterization. After site characterization has been completed, Clean Seas' responsibilities would include completing boom deployment, initiating skimming and recovery operations, and monitoring the spill's

movement. A skimmer would normally be deployed from the OSRV to complete the recovery of the spilled oil. As oil is recovered, the OSRV may assist in providing initial temporary storage of the recovered oil. As necessary Clean Seas will draw upon the response resources listed in Appendix C.

2.2.2.1 First Person to Observe Spill

The first person to observe an oil spill must make a rapid assessment of the situation and report immediately to the Foreman, Operator-in-Charge, or Person-in-Charge at the facility. This person will then assist the Foreman, Operator-in-Charge, or Person-in-Charge as necessary.

2.2.2.2 Foreman, Operator-in-Charge or Person-in-Charge

Upon receipt of the initial report of an oil spill or threatened spill, the Foreman, Operator-in-Charge, or Person-in-Charge will make a timely assessment of the approximate quantity and extent of the spilled oil. The Foreman, Operator-in-Charge, or Person-in-Charge is expected to make the initial assessment of the severity of the oil spill or threatened spill within a few minutes of receiving the initial report. If necessary, the Forman, Operator-in-Charge, or Person-in-Charge of the onshore facilities will call 9-1-1. The Forman, Operator-in-Charge, or Person-in-Charge will evaluate the situation, and if warranted, immediately notify Person on Call. The Person on Call will coordinate with the Foreman, Operator-in-Charge, or Person-in-Charge to notify the necessary agencies and activate the IMT. In most cases, the Foreman, Operator-in-Charge, or Person-in-Charge will assume command as IC and take control of the response to the incident until relieved by a more senior company person or a qualified agency responder.

2.2.2.3 Person on Call

Company notification is initiated via a 24-hour emergency response phone number. This 24-hour number (805-739-9111) is called for all accidents, injuries, spills or other emergencies. Facility Operators use this phone number to immediately contact the Person on Call in the Environmental Health & Safety (EHS) Department, who is available on a 24-hour basis. PXP designates several management employees to be the Person on Call on rotating weeks. This person is available 24 hours per day via office phone, cell phone, or home phone during their designated week. When notified by the facility via the above number, the Person on Call assumes responsibility for all subsequent notifications, thus relieving the on-site personnel of making notifications in addition to responding to the situation. The Person on Call also assists Operators with completing documentation, mobilizing the Company IMT, and obtaining additional resources, as necessary.

2.2.3 Sustained Response Team

The Company's Sustained Response Team is called the **Incident Management Team (IMT)**. The IMT is activated when on-site personnel are unable to adequately respond to the event or when the event will require a sustained response of more than a few hours. The IMT is responsible for facilitating the prompt and efficient activation of the Company's manpower resources during a major spill incident. The IMT oversees, manages, and directs control and/or response operations, in coordination with the Federal, State and Local OSCs, to ensure that appropriate procedures are followed and measures taken to protect human health and the environment. Members of the IMT also handle government and public relations, legal issues, and operational, logistical, planning, and financial matters related to the response effort. Figure 2-1

depicts the Company's IMT organization. Table 2-2 lists the names and telephone numbers for the members of the IMT.

2.2.3.1 Incident Commander

Early in an event, the Incident Commander will be the senior Company person on site, generally the Foreman, Operator-in-Charge or Person-in-Charge. Upon determining that a major leak or spill is possible, or that on-site resources are insufficient to accomplish an effective response, the Incident Commander will make a preliminary assessment of the situation and contact those persons from the IMT deemed necessary to initiate and sustain an effective level of response. The IC will contact and coordinate with the Qualified Individual and the Person on Call to insure that all appropriate personnel are identified and notified as described in Section 3.1.2.

2.2.3.2 Incident Management Team (IMT)

If the magnitude of the leak or spill warrants elevation of the response, the Incident Commander will consult with the Qualified Individual and authorize activation of the Incident Management Team. Depending on the circumstances of the incident, several of the functions identified in the IMT may be assigned to one individual. It is the responsibility of the Company QI and IC to ensure that the level of the response effort and the personnel involved are commensurate with incident conditions and will protect the environment to the maximum extent practicable. The IMT will be contacted according to the notification procedures described in Section 3.1.2.

The IMT is organized consistent with the Incident Command System (ICS) as shown on Figure 2-1. The ICS is a flexible response management organization that enables responders to identify which organizational positions are required for the particular response and fill those positions with persons having the appropriate qualifications. The ICS has the virtue of readily expanding or contracting as the response effort evolves over time. The following sections summarize the overall responsibilities of each section in the Incident Command System.

Operations Section

The Operations Section is responsible for the actual oil spill containment, recovery, and cleanup activities. This Section also handles all well control activities if the spill is associated with a well-upset condition.

Planning Section

The Planning Section is responsible for collecting and distributing information on the current and forecasted condition of the spill, status of the response effort, and status of resources assigned to the response. This Section is also responsible for preparing the Incident Action Plans.

Logistics Section

The Logistics Section is responsible for providing all support needs to the oil spill response effort. This Section provides supplies, facilities, transportation, communications, staging areas, lodging, and food services for the response personnel.

Finance Section

The Finance Section is responsible for developing and implementing all financial and accounting activities necessary to support the oil spill response effort. This Section also handles all compensation, claims, and insurance issues related to the oil spill and response activities.

Figure 2-1. Response Organization

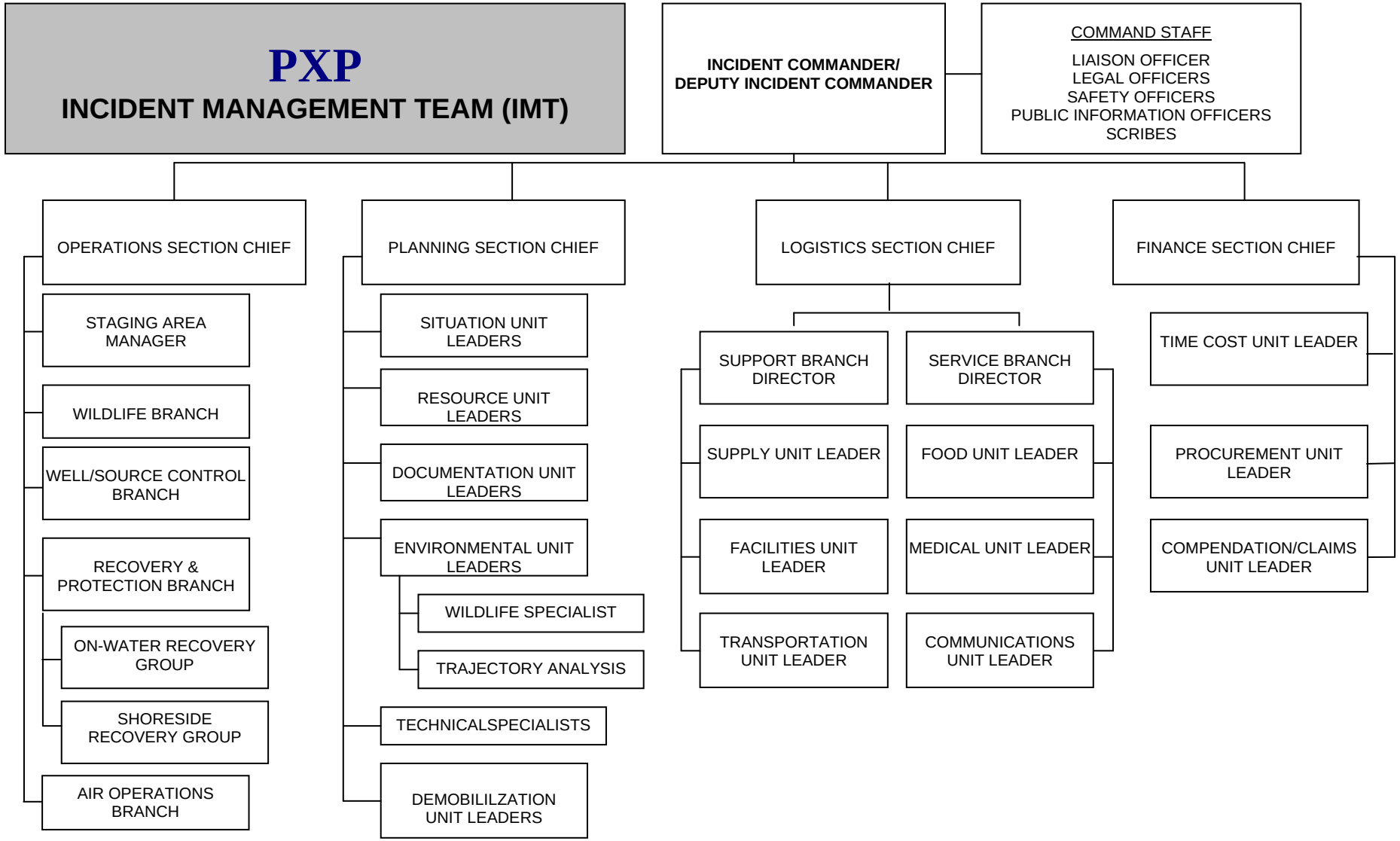

Table 2-2. Incident Management Team (IMT) Members			
IMT Position	Name	Contact Information	
Company Management			
Qualified Individuals IC/Deputy IC	Tom Goeres	Office Cell. Home	805-934-8221
	David Rose	Office Cell. Home	805-934-8220
	Steve Rusch	Office Cell. Home	323-298-2223
	Craig Landry	Office Cell. Home	337-354-5007
Command Staff			
Liaison Officers	Byron Everist	Office Cell. Home	805-934-8219
	John Martini	Office Cell.	661-395-5232
Legal Officer	Gregg Maynard	Office Cell.	713-579-6057
Safety Officers	Bruce Crane	Office Cell. Home	805-567-1615
	Brian Edwards	Office Cell.	661-395-5204
	Greg Lee	Office Cell.	661-395-5305
	Johnny Simpson	Office Cell.	661-395-5531
Public Information Officers	Steve Rusch	Office Cell. Home	323-298-2223
	John Martini	Office Cell.	661-395-5232
Scribes	Teresa O'Sullivan	Office Home	805-934-8230
	Carol Newsome	Office Home	805-934-8237

Table 2-2. Incident Management Team (IMT) Members			
IMT Position	Name	Contact Information	
Operations Section			
Operations Section Chiefs	Jerry Penny	Office Cell. Home	805-934-8264
	Kurt Koerner	Office Cell. Home	805-934-8244
	Tom Goeres	Office Cell. Home	805-934-8221
Well/Source Control Branch	Gary Hertfelder	Office Cell. Home	805-934-8227
	Steve Ensor	Office Cell. Home	805-934-8204
Staging Area Managers	Eric Vang	Office Cell. Home	805-986-1788
	Mike Morton	Office Cell.	805-986-1788
	Joe Grijalva	Office Cell.	805-986-1788
Wildlife Branch	Oiled Wildlife Care Network	Office	877-823-6926
Recovery & Protection Branch Directors	Tim Munoz	Office Cell. Home	805-733-5174
	Mike Sancho	Office Cell. Home	805-733-5618
	Dave Willis	Office Cell. Home	805-733-5633 805-354-0719
	Geary Olivera	Office Cell. Home	805-733-5633
	Bob Ryan	Office Cell. Home	805-733-5604

Table 2-2. Incident Management Team (IMT) Members		
IMT Position	Name	Contact Information
	Greg Griffin	Office 805-733-5604 Cell. Home
	Terry Tatroe	Office 805-733-5618 Cell. Home
Onshore Cleanup Group Supervisors	GOHF LOGP	Office Office
Offshore Cleanup Group Supervisors	Platform Harvest Platform Hermosa Platform Hidalgo Platform Irene	Office Office Office Office
Air Operation Branch	Rotorcraft LLC	Office

Table 2-2. Incident Management Team (IMT) Members			
IMT Position	Name	Contact Information	
Planning Section			
Planning Section Chiefs	David Rose	Office Cell. Home	805-934-8220
	K.C. Rockwell	Office Cell. Home	805-934-8211
Situation Unit Leaders	Steve Ensor	Office Cell. Home	805-934-8204
	Dale Rydberg	Office Cell. Home	805-934-8213
	Mike Portuesi	Office Cell. Home	805-934-8214
Resource Unit Leaders	Anita Burns	Office Cell.	805-934-8218
	Heather Carreno	Office Cell. Home	805-934-8212
	Melissa Daily	Office Home	805-934-8241
Documentation Unit Leaders	Irene Everett	Office Home	805-934-8224
	Teresa O'Sullivan	Office Cell. Home	805-934-8230
Environmental Unit Leaders	Bob Marsalek	Office Cell. Home	805-934-8223
	Glenn Oliver	Office Cell. Home	805-934-8216
Wildlife Specialist	Padre Associates (Contractor)	Office	805-644-2220
Trajectory Analysis	Greg Yvarra	Office Cell. Home	805-934-8232
	Clean Seas (OSRO)	Office	

Table 2-2. Incident Management Team (IMT) Members		
IMT Position	Name	Contact Information
Technical Specialists	Derrick Naruse Pete Maly Engineering Staff	Office 805-934-8263 Office 805-934-8295
Demobilization Unit Leaders	Eric Vang	Office 805-986-1788 Cell. Home
	Mike Morton	Office 805-986-1788 Cell.

Table 2-2. Incident Management Team (IMT) Members			
IMT Position	Name	Contact Information	
Logistics Section			
Logistics Section Chiefs	Steve Hicks	Office Cell. Home	805-934-8238
	Dan McClurg	Office Cell.	661-395-5466
Support Branch Directors	Stephanie Gage	Office Home	805-934-8248
Service Branch Directors	Ed Hartley	Office Cell. Home	805-934-8288
Facilities Unit Leaders	Steve Harman	Office Home	805-934-8205
Transportation Unit Leaders	Jeanne Park	Office Home	805-934-8200
	Anita Burns	Office Cell.	805-934-8218
Supply Unit Leaders	Heather Carreno	Office Home	805-934-8212
	Ed Ratto	Office Cell.	661-395-5224
Communications Unit Leaders	Sean Sullivan	Office Cell. Home	661-395-5489
	James Tinsley	Office Cell.	661-395-5209
Food Unit Leaders	Jeanne Park	Office Home	805-934-8200
	Georgia Ott	Office Home	805-934-8247
Medical Unit Leaders	Bruce Crane	Office Cell. Home	805-567-1615
	Brian Edwards	Office Cell.	661-395-5204
	Greg Lee	Office Cell.	661-395-5305
	Johnny Simpson	Office Cell.	661-395-5531

Table 2-2. Incident Management Team (IMT) Members			
IMT Position	Name	Contact Information	
Finance Section			
Finance Section Chief	Bill (Cog) Coglizer	Office Cell. Home	805-567-1632
	Eric Bruget	Office Home	805-567-1612
Time Cost Unit Leaders	Jackie Cipolla	Office Cell. Home	805-934-8231
Procurement Unit Leaders	Jackie Cipolla	Office Cell. Home	805-934-8231
	Steve Hicks	Office Cell. Home	805-934-8238
Compensation/Claims Unit Leaders	Eric Bruget	Office Home	805-567-1612
	Judy Cable	Office Cell.	805-934-8225

Emergency Operations Center:	PXP 201 S. Broadway Orcutt, CA 93455	Main Line 24-Hr E.O.C. Fax	805-934-8200
Alternate Emergency Operations:	PXP 17100 Calle Mariposa Reina Goleta, CA 93117	Main Line 24-Hr E.O.C. Fax	805-567-1601
	Clean Seas Support Yard 5751A Carpinteria Ave Carpinteria, CA 93013	24-Hr	

Section 3 Notification Procedures

An important step in the response procedure is to notify others of the incident. Notification is essential to activate the response organizations, alert company management, obtain assistance and cooperation of agencies, mobilize resources, and comply with local, state, and federal regulations.

3.1 Primary Notifications

Primary notifications are those that must be accomplished within the first minutes after an emergency has occurred. Key company personnel and agencies must be notified as soon as it is reasonably possible to do so. Remember, however, that your first responsibility as a responder is to protect human life. Do not put yourself or anyone else at risk, either to obtain more information about the event, attempt to respond to the event, or in a rush to ensure that notifications are completed.

3.1.2 Primary Company Notifications

3.1.2.1 First Person to Observe an Event

The first person to observe an oil spill or a situation that threatens to result in a spill will notify the Foreman, Operator-in-Charge, or Person-in-Charge at the facility. This person will then assist the Foreman, Operator-in-Charge, or Person-in-Charge as necessary.

3.1.2.2 Foreman Operator-in-Charge or Person-in-Charge

Upon receipt of the initial report of an oil spill or threatened spill, the Foreman, Operator-in-Charge, or Person-in-Charge will make a timely assessment of the approximate quantity and extent of the spilled oil and of prudent safety practices to implement before attempting to respond. ***No one may initiate a response*** before an adequate assessment of the site safety issues is made and, if necessary, a ***written site safety plan*** has been completed by a qualified person.

Figure 3-1 is a representative Notification Form provided to insure key information about an event that should be transmitted in notifications to company personnel and agencies. The Forman, Operator-in-Charge, or Person-in-Charge should gather as much of this information as possible before initiating notifications. However, ***do not delay notification*** if you lack information. Give what information you have and offer to have someone get back with more complete information, if necessary, when it is available. Note that the bottom of Figure 3-1 provides a log for recording required agency notifications. Refer to Table 3-1 in Section 3.1.3 for the circumstances under which it is necessary to notify specific agencies.

The Foreman, Operator-in-Charge, or Person-in-Charge will evaluate the situation, and if warranted, immediately notify a Qualified Individual and the Person on Call (see Section 3.1.2.4) and provide the information shown on Figure 3-1.

Figure 3-1 Representative Notification Form

Date of Incident	Time of Incident	Date Reported	Time Reported	Facility Name
Latitude (North)		Longitude (West)		OCS Number
N34°		W120°		OCS-P-

Observation Information

Material	Barrels	Gallons	Dimensions	Water	Land
Crude Oil:			Length (ft):		
Produced Water:			Width (ft):		
Chemical:			Depth (ft):		
Other:			Appearance/Discoloration:		

Weather and Sea Conditions

Wind Direction (from)	Current Direction (to)	Air Temperature (Deg F)
Wind Speed (kts)	Current Speed (kts)	Cloud Cover (%)
Wave Height (ft)	Water Temperature (Deg F)	
Wave Direction (from)	Sea Surface Cond. (e.g. flat, choppy)	

General Information

Description of Area Impacted
Response Action(s) Taken
Root Cause of Incident
Comment(s)

Log of Required Agency Notifications (Refer to Table 3-1 for when to notify each agency)

NRC 800-424-8802	Cal EMA 800-852-7550	SBC Emergency 9-1-1	BSEE 805-389-7775	EPA NRC will notify	Cal DFG/OSPR Cal EMA to notify
SBC OEM 805-681-5526	USCG Santa Barbara 805-962-7430	VAFB 805-606-3911			
Agency	Case No.	Reported by:	Reported to:	Date	Time

Company representative to contact regarding response:	Phone Number:

In most cases, the Foreman, Operator-in-Charge, or Person-in-Charge will then assume command as the Incident Commander and take control of the response to the incident until relieved by a more senior company official or a qualified agency responder.

3.1.2.3 Qualified Individual

The Qualified Individual (QI) will normally have been notified by the Foreman, Operator-in-Charge, or Person-in-Charge as soon as possible following assessment of the nature and severity of the event. The QI will then coordinate with the Initial Response Team's IC and the Person on Call to insure that necessary notifications are made and that all resources necessary to respond to the situation are activated in a timely manner.

3.1.2.4 Person on Call

Company notification is initiated via a 24-hour emergency response phone number **(805-739-9111)** for all accidents, injuries, spills, or other emergencies. Because using the 24-hour phone number is a key component to the initial notification process, the number with all its purpose is posted at multiple locations throughout PXP facilities. The 24-hour phone number is answered by the Orcutt office receptionist during normal working hours. At times other than normal Orcutt office business hours the 24-hour phone number is answered by a professional answering service who then forwards the call to the designated Person on Call.

PXP designates several management employees to be the Person on Call on rotating weeks. This person is available 24 hours per day via office phone, cell phone, or home phone during their designated week. When notified, the Person on Call assumes responsibility for all subsequent notifications, thus relieving the on-site personnel of making notifications in addition to responding to the situation. The Person on Call may call the facility, if necessary, to obtain more complete information as shown on Figure 3-1 to insure that subsequent notifications are as complete as possible. The Person on Call will notify all required agencies and Company Management and will assist on-site IC and company Qualified Individual with completing documentation, mobilizing the Company IMT as necessary, and obtaining additional response resources.

3.1.2.5 Oil Spill Response Organization

The Company is a member of the Clean Seas Cooperative. In the event a spill enters or threatens to enter the ocean, Clean Seas will be notified as soon as possible (within 30 minutes). This will make the resources of Clean Seas available for spill response. The Company, in coordination with the Coast Guard and/or the Office of Spill Prevention & Response, may request additional response equipment from Marine Spill Response Corporation (MSRC) if the resources provided by Clean Seas are insufficient to accomplish an effective response. MSRC can be reached at the telephone number below:

CLEAN SEAS 24-HOUR (805) 684-3838 **G.E. "Ike" Ikerd, General Manager**
MSRC 24-HOUR (Long Beach) 1-800-OIL-SPIL **Scott Morris, Area V.P.**

3.1.2.6 Incident Management Team (IMT)

If the magnitude of the leak or spill warrants, the Person on Call, in coordination with the Qualified Individual (QI) and the onsite Incident Commander (IC), will notify the members of the Incident Management Team required to undertake the response effort. Depending on the circumstances, several of the functions identified in the Incident Management Team Organization Chart may be assigned to one individual. It is the responsibility of the Company QI/IC to ensure that the level of the response effort and the personnel involved are commensurate with incident conditions and will protect the public and environment to the maximum extent practicable. When each member of the Incident Management Team is contacted, the following information will be provided:

- Nature of the Incident
- Magnitude of the Incident
- Location of the Incident
- Location of the Emergency Operations Center
- Duty location to report to

3.1.3 Primary Agency Notifications

As soon as the situation is assessed, the appropriate notifications listed in Table 3-1 *must* be accomplished according to the circumstances. Different agencies are notified under different circumstances identified in the middle column of the table. The Qualified Individual or Incident Commander will coordinate with the Person on Call to complete the required notifications as soon as practicable. Agency notifications should not take precedence over insuring the safety of initial responders. However, for the protection of the company from liability and violations of laws and regulations, it is important to insure that Primary Agency Notifications are made on a timely basis.

If a spill impacts navigable waters, notification of the National Response Center is mandatory and normally results in simultaneous notification of the U.S. Coast Guard. However, it is recommended that a call be made to the local U.S. Coast Guard office in Santa Barbara at (805) 962-7430 to expedite their response. If no one can be reached in Santa Barbara, contact the Marine Pollution phone line at the Long Beach area office at (310) 521-3801.

The National Response Center (NRC) and the California Emergency Management Agency (CAL EMA) will notify related federal and state agencies. However, this does not relieve PXP from the obligation to notify the Primary Agencies directly.

An updated estimate of the volume of oil spilled and the volume at immediate risk to spillage shall be reported to the California Emergency Management Agency whenever a significant change in the amount reported occurs, but not less than every 12 hours within the first 48 hours of response. The State Incident Commander and/or the Federal On-Scene Coordinator through the Unified Command shall have the option of increasing or decreasing this timeframe, as needed.

It is the responsibility of the Liaison Officer to make follow-up contact with regulatory agencies. Telephone numbers for agencies that may need to be notified, and a description of the circumstances when notification should occur, are included on Tables 3-1 and 3-2.

Table 3-1. Primary Agency Notifications

Jurisdiction	Circumstances	Telephone Number
National Response Center U.S. Coast Guard, EPA, DOT	Oil spill that causes a sheen on the ocean, lakes, or streams, or enters a dry creek or waterway; any onshore spill ≥ 1 bbl; any offshore chemical spill ***Within 30 minutes of spill***	(800) 424-8802
California Emergency Management Agency - Sacramento	Oil spill that causes a sheen on the ocean in State waters or streams or that enters a dry creek or waterway; any onshore spill ≥ 1 bbl; any offshore chemical spill in State waters ***Within 30 minutes of spill***	(800) 852-7550 (916) 262-1621
Santa Barbara County Emergency Center (Dispatch), Sheriff, & Fire Department	Any oil or hazardous material spill or other emergency within Santa Barbara County (Onshore or State Waters)	9-1-1
Bureau of Safety and Environmental Enforcement – California District	Oil spill to Federal waters ≥ 1 bbl; any offshore chemical spill	(805) 389-7775
BSEE – Regional Operation Section	Oil spill that involves an OCS pipeline	(805) 389-7550
U.S. Environmental Protection Agency Region IX	Oil spill that causes a sheen on the ocean, lakes, or streams, or enters a dry creek or waterway; any onshore spill ≥ 1 bbl; any offshore chemical spill	(800) 424-8802 (NRC will connect caller to EPA)
California Department of Fish and Game – OSPR	Oil spill that causes a sheen on the ocean in State waters or streams or that enters a dry creek or waterway; any onshore spill ≥ 1 bbl; any offshore chemical spill in State waters	(800) 852-7550 (California EMA will notify OSPR)
Santa Barbara County Office of Emergency Management	Any oil or hazardous material spill or other emergency within Santa Barbara County (Onshore or State Waters)	(805) 681-5526
U.S. Coast Guard Marine Safety Detachment Santa Barbara, CA	Oil spill or threat of a release that causes or threatens to cause a sheen on the ocean, lakes, or streams, or enters a dry creek or waterway; any offshore chemical spill	(805) 962-7430
Vandenberg Air Force Base	Spills on Air Base property	(805) 606-3911
Vandenberg Air Force Base	Permission to access shoreline within Air Base property	(805) 606-6873

3.2 Supplemental Notifications

Additional notifications should be made when circumstances permit and manpower is available. These notifications may or may not be critical to the initiation of response efforts, but should be made to inform other agencies, adjacent land owners, and adjacent offshore operators of the situation as soon as it is reasonably possible to do so. Table 3-2 lists the agencies and other entities that should be notified and the circumstances under which notification should occur. In addition, any of the Primary Notification Agencies that were not notified because the circumstances shown in Table 3-1 did not exist should be notified in the secondary notification round.

Supplemental notifications will typically be the responsibility of the Liaison Officer who will make the appropriate notifications or insure that they are made on his or her behalf. Primary and secondary notifications may be recorded on Table 3-3, Record of Notifications.

Table 3-2. Supplemental Notification List

Jurisdiction/Name	Circumstances	Telephone No.
United States Fish and Wildlife Service	For permit to capture oiled birds or mammals	805-644-1766
National Marine Fisheries Service	For permit to capture oiled birds or mammals	562-980-4000
State Lands Commission	Spill from facility or pipeline that is on a State Lands Lease	562-590-5201
State Fire Marshal	Spill ≥ 10 bbl from onshore pipeline	562-497-9100
California Division of Oil, Gas, and Geothermal Resources		805-937-7246
California Highway Patrol	Traffic control or highway closure required for response effort	9-1-1 805-688-5551
California Department of Transportation (CalTrans)	Highway closure required for response effort; use of highway Right of Way for response effort; damage to or spill on highway	805-568-0858 (maintenance) 831-796-2160 - CHP (after hours emergency) 805-549-3152 (encroachment permit)
Regional Water Quality Control Board	Spill to State Waters	805-549-3147
California Department of Parks and Recreation (Gaviota State Beach, Refugio State Park, El Capitan State Park)	Need for access to beaches at parks, potential oil spill contact within parks, need to evacuate parks	Days: 805-968-2943 24 hr. Dispatch: 951-443-2964

Table 3-2. Supplemental Notification List		
Jurisdiction/Name	**Circumstances**	**Telephone No.**
California Coastal Commission	Oil spill affecting state waters or shoreline	415-904-5205 415-904-5247 415-693-8375
California Air Resources Board	Potential air pollution from spill or request for In-Situ Burning	916-322-2990
California Department of Toxic Substances Control	Permits as necessary for handling and transporting waste materials	800-698-6942 (waste alert report) 916-255-4367 (permits)
California Oiled Wildlife Care Network	Oiled birds or mammals requiring recovery or rehabilitation	877-823-6926
International Bird Rescue	Oiled birds or mammals requiring recovery or rehabilitation	510-841-9086
Santa Barbara County Energy Division	Oil spill, onshore emergency, any event that requires calling 9-1-1	Deputy Director 805-886-7165
Santa Barbara County Air Pollution Control District	Potential air pollution from spill or request for In-Situ Burning	805-961-8800
Santa Barbara County Hazardous Materials Unit	Hazardous materials spill onshore within County	805-686-8170
Santa Barbara County Environmental Health Services	Hazardous materials spill onshore within County	805-681-4900
Chemtrec	Chemical and Hazardous material information	800-424-9300
Gaviota Control Room	Oil spill that enters Alcatraz or Cementario Creek	805-567-1654
Platform Heritage	If spill might affect operations on platform	805-961-4311 805-961-4302
Platform Harmony	If spill might affect operations on platform	805-961-4211 805-961-4202
Platform Hondo	If spill might affect operations on platform	805-961-4111 805-961-4102
Santa Ynez Band of Mission Indians	Local Native American contact with regard to cultural resources on Vandenberg Air Force Base	805-688-7997 805-688-8446
24-hr Number – All PXP Facilities	**For emergency -EHS Person On Call**	**805-739-9111**

Table 3-3 Record of Notifications

Name of Person Making Calls: ____

Date: _____/_____/______ Time: ____________
Agency Notified: ____
Person Contacted/Position: ____
Business Discussed: ____
____

Date: _____/_____/______ Time: ____________
Agency Notified: ____
Person Contacted/Position: ____
Business Discussed: ____
____

Date: _____/_____/______ Time: ____________
Agency Notified: ____
Person Contacted/Position: ____
Business Discussed: ____
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Date: _____/_____/______ Time: ____________
Agency Notified: ____
Person Contacted/Position: ____
Business Discussed: ____
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Date: _____/_____/______ Time: ____________
Agency Notified: ____
Person Contacted/Position: ____
Business Discussed: ____
____

Date: _____/_____/______ Time: ____________
Agency Notified: ____
Person Contacted/Position: ____
Business Discussed: ____
____

Section 4 Response Management

4.1 Incident Command System (ICS)

The Incident Command System (ICS) is widely used worldwide to organize responses to emergency situations. It is used by the local fire department as well as the U.S. Coast Guard during oil spill response. ICS is a consistently understood organizational tool that identifies the full range of duties and responsibilities for persons involved in emergency response. In the words of Section 2002 of the Regional Contingency Plan (Federal Region 9):

> The ICS organization is built around five major management functions that are applied to the response of any incident, large or small. The functions are Incident Command, Operations, Planning, Logistics, and Finance. A major advantage of the ICS organization is the *ability to expand and contract organizationally as required by the incident*. For some incidents only a few of the organization's functional elements may be required. For larger or more complicated responses, additional positions exist within the ICS framework to meet virtually any need.

4.2 Unified Command

The Unified Command manages the response to any emergency event. The Unified Command for an oil spill will normally consist of a Responsible Party Incident Commander" (usually the Qualified Individual) a Federal agency OSC (usually the Coast Guard) and a State agency OSC (usually the Office of Spill Prevention and Response). This structure is represented by a triangle at the top of the ICS organization chart. The Unified Command makes key decisions regarding the response effort and directs the entire Incident Command organization.

4.3 Emergency Operations Center

In the event of a large oil spill or any emergency that will require more than approximately 24 hours of response, an Emergency Operations Center (E.O.C.) will be established. The E.O.C. is where the IMT conducts its operations in coordination with Federal, State, and local agencies within the ICS.

The primary E.O.C. is located at the Company's office in Orcutt. The Gaviota Oil Heating Facility Administration Building or Clean Seas Support Yard Training Room will serve as alternate E.O.C. location if the primary location is unavailable. Pertinent information for all locations is provided below and in Table 4-1:

Emergency Operations Center:	**Main Phone Numbers:**
PXP	(805) 934-8200 (Reception)
Orcutt Office	(805) 739-9111 (24-hour)
201 South Broadway	(805) 937-0237 (Fax)
Orcutt, CA 93455	(805) 934-8201 (E.O.C. phone number)

Table 4-1. Orcutt Emergency Operations Center Telephone Numbers			
Section	**Phone #**	**Section**	**Phone #**
Incident Command	805-934-8282	Safety	805-934-8201
Operations Section	805-934-8283	Liaison Officer	805-934-8203
Surveillance Unit	805-934-8232	Public Information Officer	805-934-8292
Logistics Section	805-934-8278	Planning Section	805-934-8279
Finance Section	805-934-8280	Environmental Unit	805-934-8203

Alternate Locations:

PXP Gaviota Oil Heating Facility 17100 Calle Mariposa Reina Goleta, CA 93117 (805) 567-1601 (Reception) (805) 567-1654 (24-hour) (805) 567-1631 (Fax) (805) 567-1639 (E.O.C.) (805) 567-1695 (E.O.C. Speakerphone)	Clean Seas Support Yard 5751A Carpinteria Avenue Carpinteria, California 93013 (805) 684-3838 (24-hour) (805) 684-4719 (Yard) (Refer to Figure 4-1 for E.O.C. Layout)

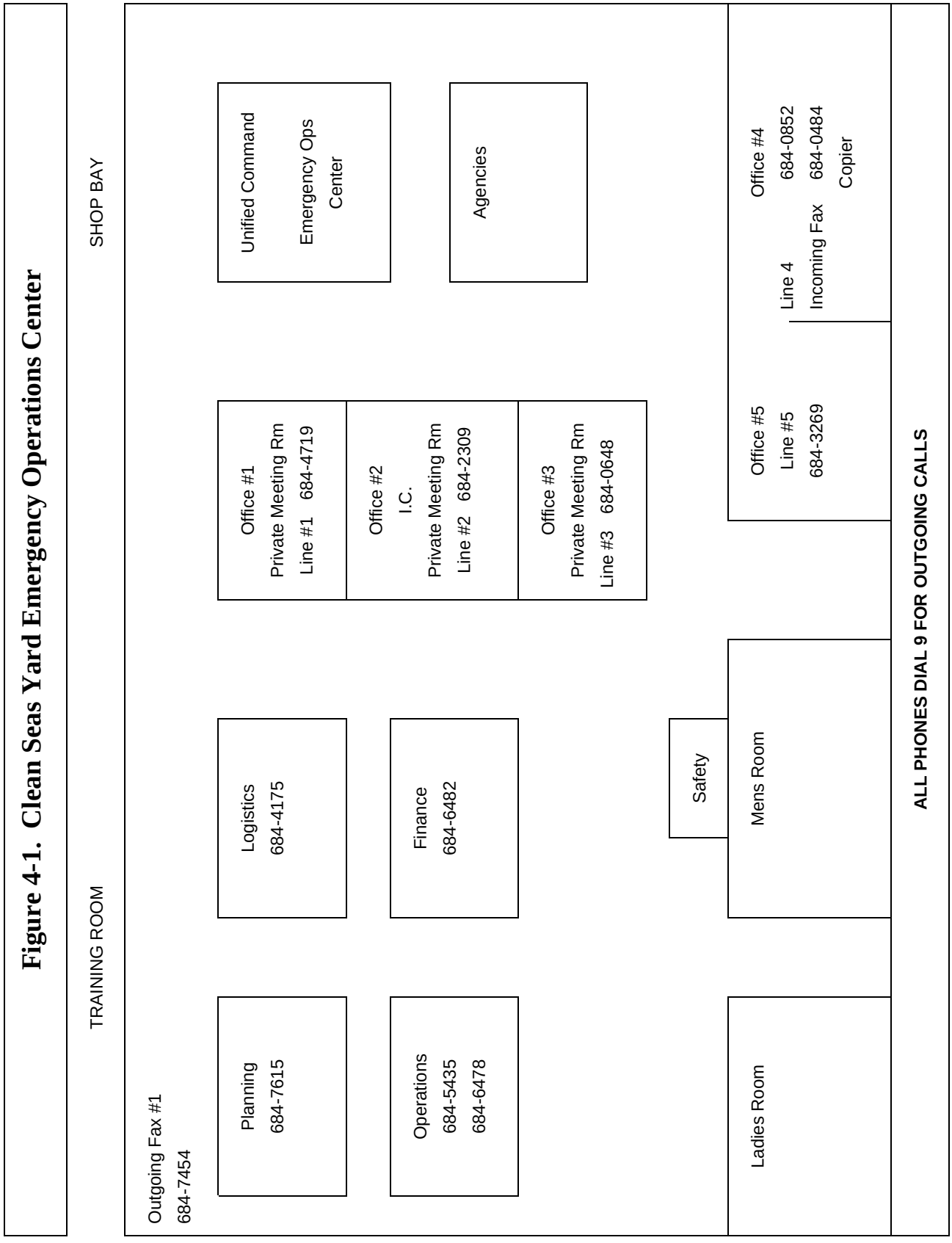
4.4 Incident Action Plan

An Incident Action Plan (IAP) is prepared for spill responses as well as drills and exercises. The IAP contains the information required for documenting the response or drill and planning future actions to take as circumstances evolve. The IAP is not a standard document but, like the Incident Command System, it is adaptable to different situations. It will contain the information that the Incident Commander and Planning Section Chief, in consultation with agency OSCs, deem is appropriate for the conditions under which the incident or drill occurs.

Depending on the circumstances, the Incident Action Plan may address the following:

- Site Safety Plan *(required in all responses)*
- Mobilizing fast response vessels and/or vehicles carrying containment boom
- Conducting aerial overflights to assess spill size and movements
- Calculating potential spill path trajectories to identify potentially vulnerable resource areas
- Evaluating applicability of mechanical containment/recovery, dispersants, or burning
- Implementing appropriate containment actions if safe and feasible
- Mobilizing recovery vessels and/or portable equipment as appropriate
- Initiating on-water oil recovery operations
- Initiating interim waste storage, treatment, and/or disposal activities

Figure 4-1. Clean Seas Yard Emergency Operations Center



4.4.1 Site Safety Plan

The Safety Officer will be responsible for preparing a Site Safety Plan as soon as possible following an incident. No personnel will be permitted to respond to an oil or hazardous material spill until a Site Safety Plan has been prepared and approved by the Incident Commander or the Unified Command. Furthermore, no work may commence in a contaminated area without implementation of decontamination procedures.

4.4.1.1 Site Safety Plan

The Site Safety Plan will evaluate the potential hazards involved in the response, determine protective equipment required and safety measures that must be observed for the response to be conducted safely, and identify decontamination procedures. A written Site Safety Plan will become part of the documentation completed for any incident and copies will be provided to all locations where response efforts are undertaken. If appropriate, more than one Site Safety Plan will be prepared where there are multiple areas of operations with different safety considerations and concerns.

Clean Seas will prepare a Site Safety Plan specific to spill response vessel operations. A copy of the Clean Seas Site Safety Plan will be transmitted to the Emergency Operations Center and will be integrated into the IAP as a supplement to the PXP Site Safety Plan.

4.4.1.2 Decontamination Procedures

During responses to spill incidents, decontamination of personnel, equipment, and the release site is essential for individual safety and to minimize movement of hazardous material into 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.

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 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.

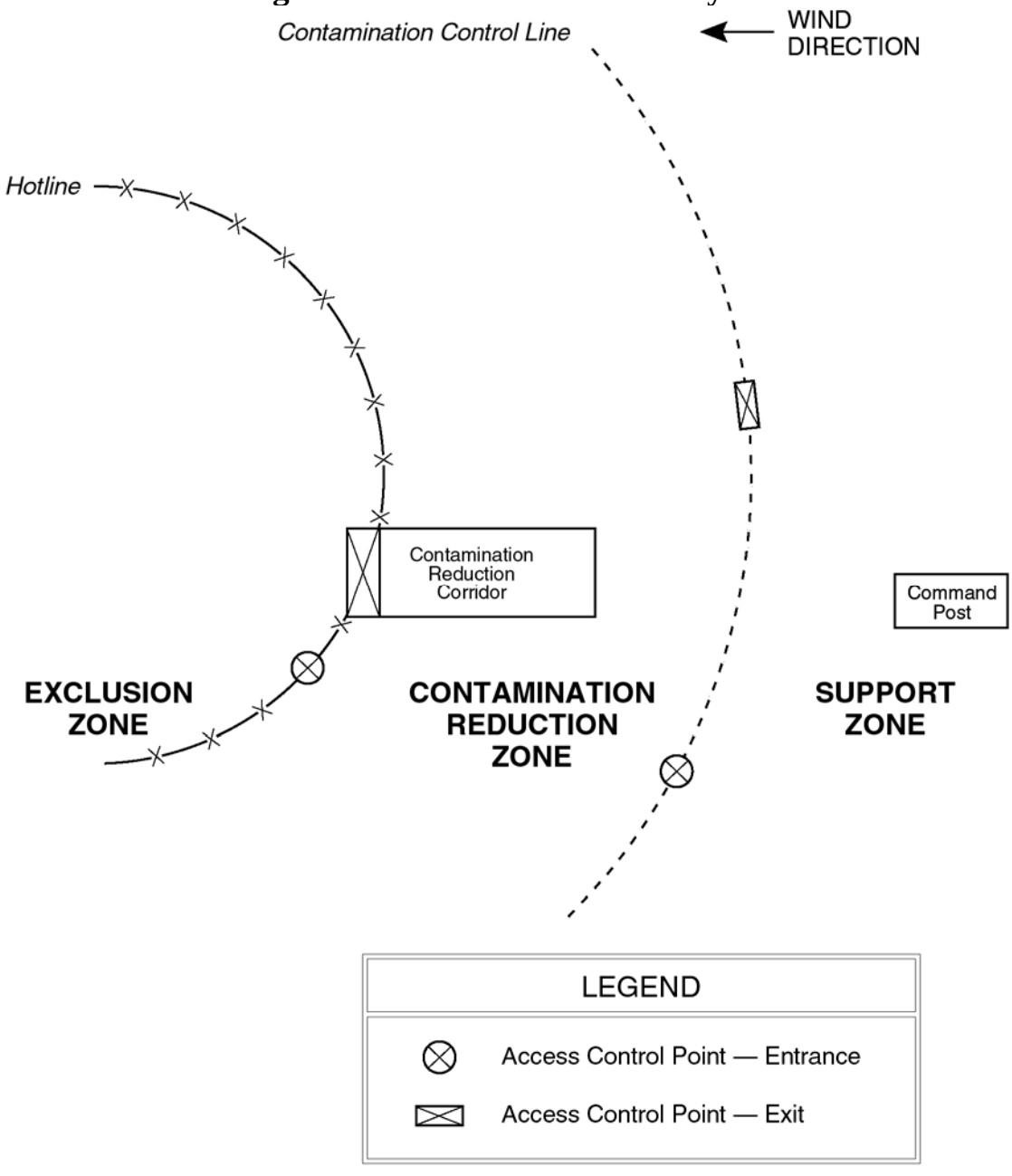
Work Zones and Access Control Points

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 (see Figure 4-2) surrounding each 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.

Figure 4-2. Site Work Zones Layout



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 4-2 for work zone descriptions.

Table 4-2. Work Zones and Access Control Points

Zone	Type	Zone Location	Contamination Level	PPE	Access Control Point
1	Exclusion	Innermost or Hot Zone	Known or expected to occur	Specified level of protection	Must establish or located 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. Decontami-nation 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 supplies permitted	None: traffic will be restricted to authorized response personnel

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 (see Figure 4-2) will be established initially:

- 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.

Procedures

The Safety Officer is responsible for routine decontamination procedures and emergency contamination procedures. Routine decon is the primary focus of this section; however, emergency decon procedures should be established and carried out if it is 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.
- During an emergency, provisions must also be made for protecting medical personnel and disposing of contaminated clothing and equipment.

Decontamination Area Site Setup

The Safety Officer will select a level site at the edge of the Exclusion/Hot Zone where an entrance to the Exclusion Zone and an exit through the Contamination Reduction Zone/Warm Zone and into the Support/Cold Zone may be located (see Figure 4-2). 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 include:

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 the outside edge of the berm. An example of a decontamination area is shown in Figure 4-3
2. Arrange all equipment in a fashion commensurate with the level of protection (e.g., Level D through A). Figure 4-4 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.
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, buckets #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 towel available.
10. Organize extra equipment and store neatly.

11. Take inventory of all 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.

Standard Decon 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. Rinse gloves in Bucket #2.
5. Have Decon Technician (in PPE) remove tape from gloves, boots, and Tyvek suits.
6. Have Decon Technician remove outer gloves (leave inner gloves on).
7. Have Decon Technician remove SCBA (if worn and when decon area is verified to be below PEL exposure limits).
8. Have Decon Technician 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 Technician deposit all throwaway PPE items in appropriate DOT drum.
12. Have Decon Technician stow all reusable PPE items neatly in temporary storage and made ready for reuse.
13. Depart through designated exit to Support/Cold Zone.

Figure 4-3. Decontamination Area Layout

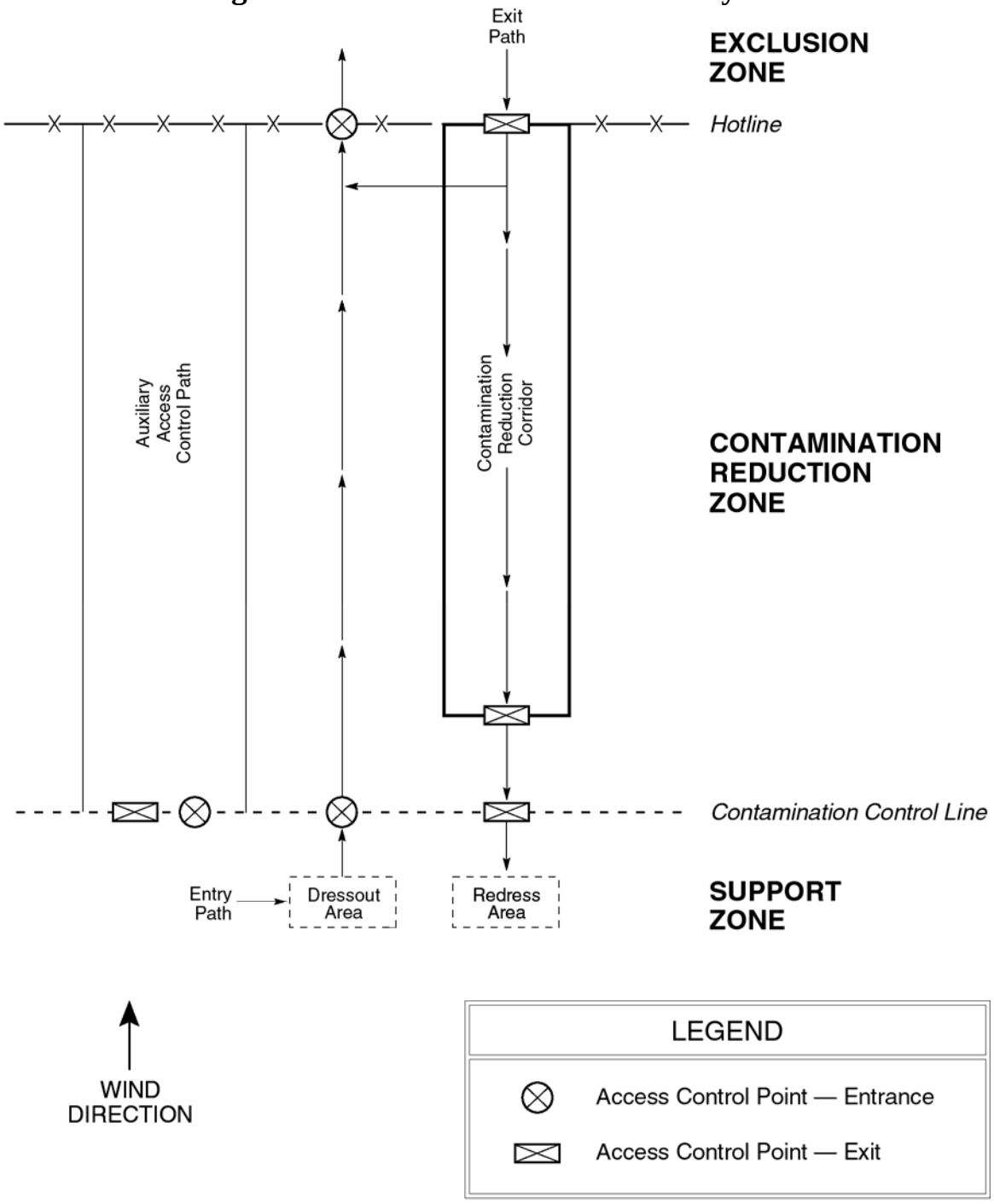
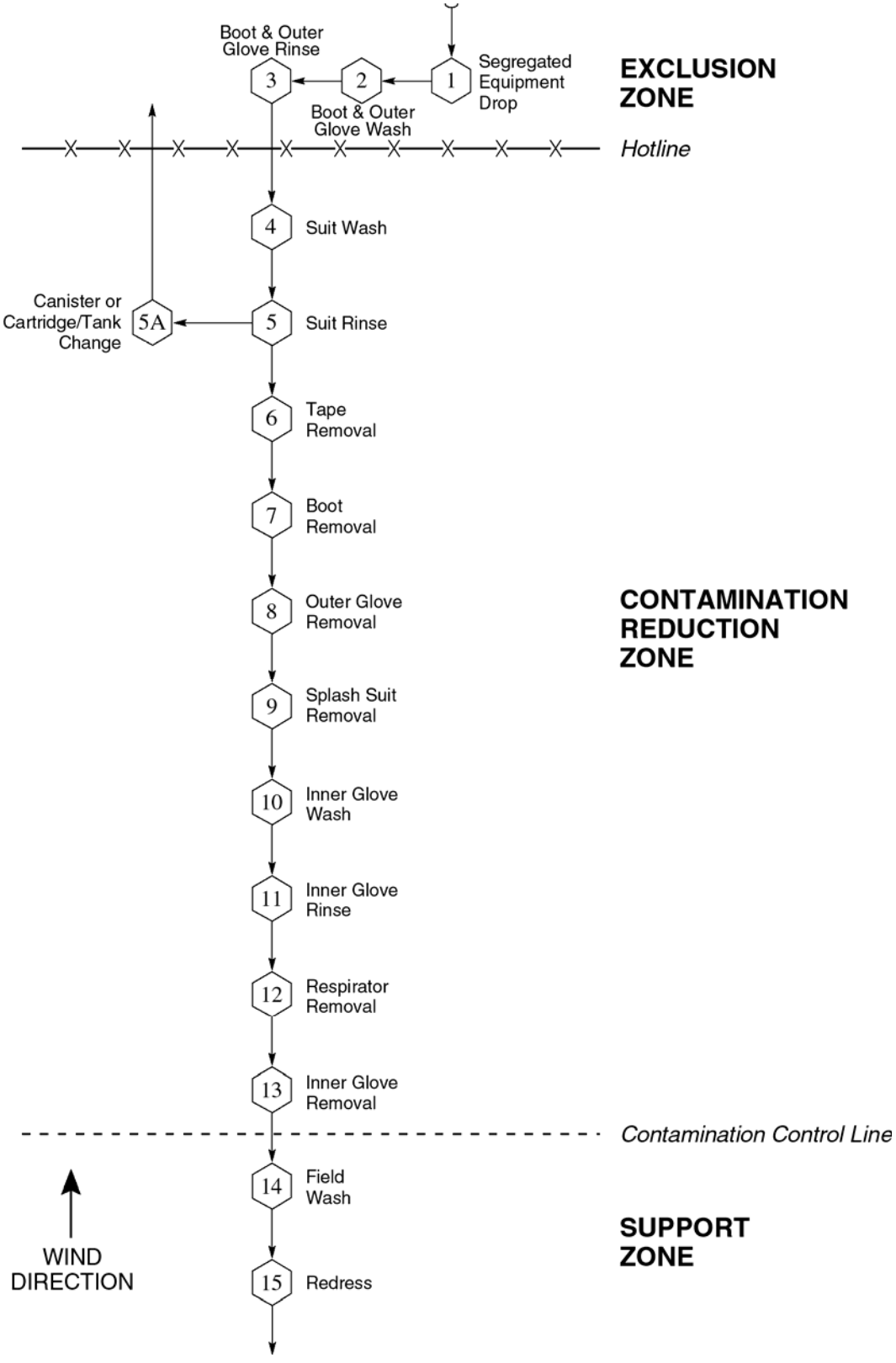


Figure 4-4. Contamination Reduction Zone Layout



4.4.2 Planning Response Efforts

An important step in planning response efforts is to evaluate whether the spill can be mechanically contained and cleaned up before it contacts shore or impacts sensitive areas. This evaluation must take into account not only the determined oil spill trajectory, but also the available oil spill skimming and containment capabilities. In addition, the capabilities of Clean Seas and other parties' resources, including the time required for these resources to arrive on the scene must be taken into account. If it is determined that sensitive areas are threatened and mechanical recovery techniques cannot stop potential contamination of these areas, then the use of diversion/protective booming or dispersants to control the slick may be warranted.

Response actions including strategies, prioritization, containment, recovery and cleanup procedures are included in Section 5.

4.4.3 Preparing the Incident Action Plan

The Incident Action Plan (IAP) will contain the Site Safety Plan and any other forms deemed by the Incident Command to be necessary to address the particular emergency situation at hand. A small event will require an IAP with only a limited scope. A larger, multi-day event will require an IAP with a broader scope. The Planning Chief, in consultation with the Unified Command, Operations, Logistics, and Finance, will oversee the preparation of the IAP in coordination with various members of the IMT. For a large spill, the initial IAP will be completed within the first few hours of the response effort. For a smaller event, the initial IAP may be completed with an hour or less.

The IAP is an evolving document. Initially, it typically is impossible to gather all the information necessary on the event to fully define the range of response actions required for the duration of the event. As the response progresses, more information is gathered and more resources become available to assess the extent and future course of the response. IAPs, therefore, will be prepared periodically as new information is gathered regarding the event, typically on a 24-hour cycle initially. The IC or Unified Command will determine the appropriate operational period for the IAP.

After the immediate response actions have been implemented and containment and recovery equipment and personnel dispatched to the spill site, a supplemental assessment of additional actions must be conducted to assist in the development of the appropriate containment and recovery strategies. The revisions to the IAP for the next operational period will document the resources applied during past operational periods, the effectiveness of those resources, and additional resources needed, if any, to insure that the response is as effective as practicable.

4.5 Documentation

Every spill response and drill or exercise must be documented. The purpose of documentation is two-fold: 1) to demonstrate to interested agencies via a written record that response actions were timely and appropriate (or, in the case of a drill, what components of the plan were exercised); and 2) to protect the Company from potential liability by documenting all aspects of the incident.

The Documentation Unit Leader is responsible for gathering and organizing a full written record of the response or drill.

4.6 Security

The proper handling of people and traffic, and the restriction of outsiders from the cleanup areas and Emergency Operations Center, is vital aspects of a response effort. Deployment of security guards and control of traffic flow should be a priority comparable to the cleanup itself.

The Gaviota Oil Heating Facility (GOHF) onshore is protected by a perimeter chain link fence topped by barbed wire. Access is controlled via an electronically controlled gate at the main plant entrance and a secured entry lobby in the Administration Building, the entrance of which is not within the fenced area. A camera and call box are located at the main gate and non-employees cannot access the facility without contacting and being permitted to enter by the Control Room. Visitors entering the Administration Building lobby must identify themselves to the Control Room Operator or call the person they are to see on the phone provided at the receptionist counter. In either case, they can only enter the rest of the building via locked doors controlled by the Control Room Operator or by employees who come to meet them. All visitors to the Control Room within the plant and the Administration Building are required to sign in and out. Agency personnel must sign in and out in the Regulatory Agency Log Book and are assigned an escort.

The Lompoc Oil and Gas Plant (LOGP) is protected by a perimeter chain link fence topped by barbed wire. Access is controlled via an electronically controlled gate at the main plant entrance. A camera and call box are located at the main gate and non-employees cannot access the facility without contacting and being permitted to enter by the Control Room. All visitors to the Control Room within the plant are required to sign in and out. Agency personnel must sign in and out in the Regulatory Agency Log Book and are assigned an escort.

GOHF and LOGP are manned 24 hours per day, seven day a week. Personnel make periodic rounds to check facility equipment function. During these rounds, security is checked and any suspicious circumstances, such as apparent tampering with gates or fences or the presence of unidentified people or objects, are reported.

The offshore platforms are secured by the dispatcher who controls access via sea or air. All personnel arriving by air are first scheduled for a flight checked prior to take off and then checked in and out on the platform. Personnel are not permitted to board aircraft without prior approval and must sign in prior to take off. Vessels are only permitted to approach the platform with clearance from the dispatcher.

Ultimate responsibility for the welfare and security of the people of the area rests with local officials. All actions regarding traffic and crowd control off Company property will be directed by local authorities. Control of access to the Emergency Operations Center and facility sites may be provided by private security services engaged by the Company. The Logistics Section, in conjunction with the Command Staff, is responsible for interacting with such agencies and ensuring that adequate security is provided.

4.7 Evacuation

During a response effort, it may be necessary to evacuate members of the public from a vulnerable location. It may also be necessary to evacuate response personnel from dangerous situations.

Evacuation Plans required by 33 CFR 146.140 are in effect for the platforms. Should an event escalate such that keeping personnel on a platform could be dangerous, the evacuation plan for the platform will be activated.

An Emergency Operations Center is located in the main office building at the Gaviota Oil Heating Facility (GOHF). An Evacuation and Shelter in Place plan is in effect for this facility (See Appendix E of the Point Arguello Onshore Emergency Response Plan) and will be used, if necessary, to ensure the safety of personnel in the Emergency Operations Center or at other GOHF locations. Figure 4-5 shows the overall onshore facility with escape routes and safe meeting areas.

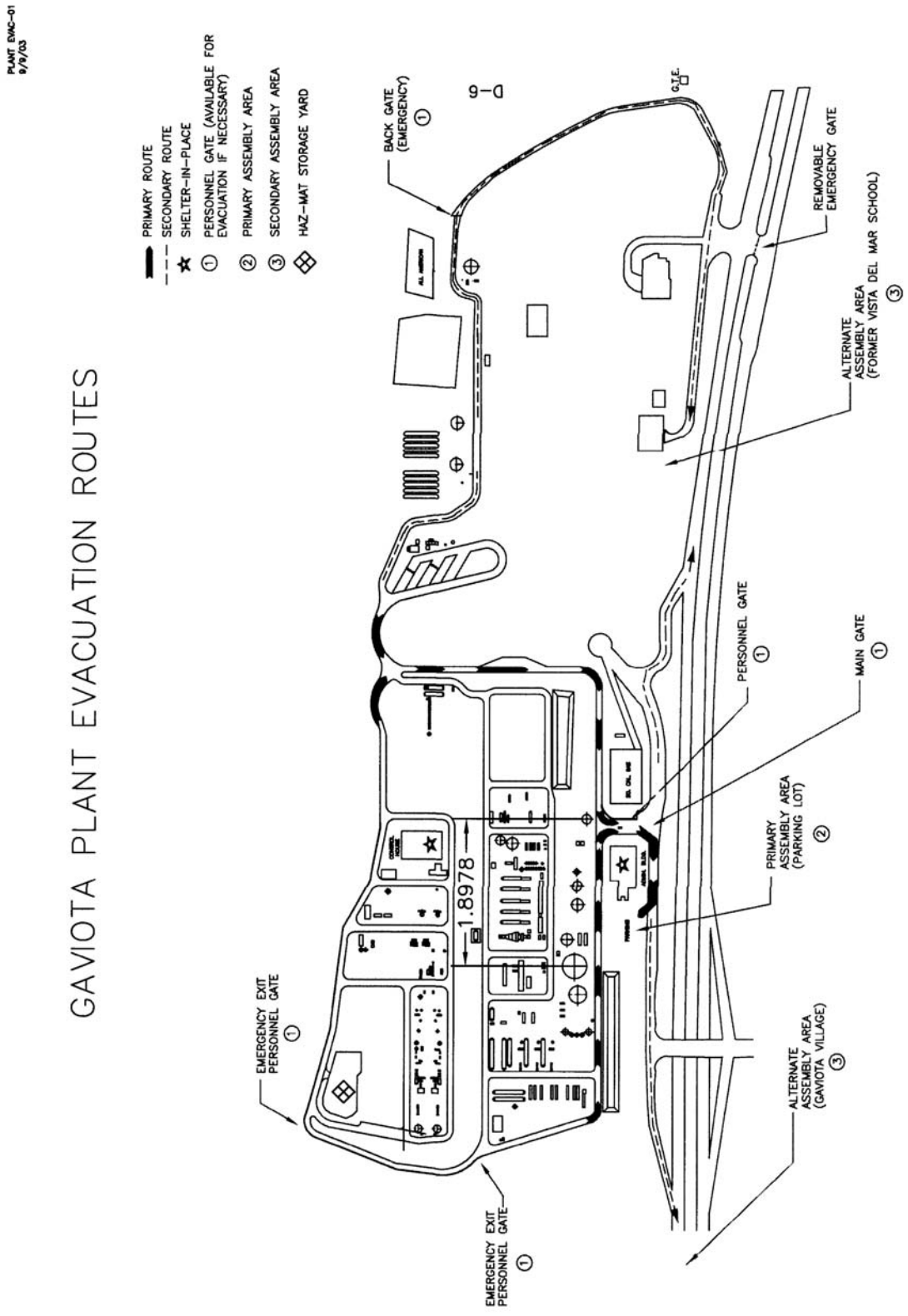
Directions for Sheltering in Place for employees, visitors and neighbors of the Lompoc Oil and Gas Plant (LOGP) are detailed in Appendix F (Section F.4) of the PXP Emergency Response Plan for the LOGP facility. Figure 4-6 shows the overall LOGP onshore facility with four Assembly Areas (A, B, C, and D) should evacuation of the facility be necessary. Evacuation routes are flexible and can be modified according to the type of emergency and the location of the cause of the evacuation. Wind socks are strategically located throughout the LOGP to assist in the safe evacuation in the event of a sour gas release. Evacuations are initiated by a public address announcement and a siren. All personnel and contractors are required to sign in at the facility office prior to beginning work and are required to sign out before leaving. Using this tool, all personnel can be accounted for following and evacuation. All new employees and contractors are briefed on the assembly areas as part of their orientation when they first come to work at the facility.

For any non-Company facilities or sites where a possibility exists that members of the public or response personnel could be exposed to hazards, site-specific evacuation plans will be prepared for those locations. In cases where oil is expected to come ashore, every effort will be made to contact people within the expected area of impact and advise them to leave, both for their own safety and to facilitate containment and cleanup efforts.

4.8 Emergency Services

The Gaviota Fire Station (Station 18) is located less than five minutes from the GOHF and the Vandenberg Village/Lompoc Fire Station (Station 51) is located approximately three miles from the LOGP. In most emergencies, fire department personnel can be on site to administer first aid or affect a rescue as quickly as PXP personnel. In addition, all facility personnel are trained in first aid and CPR and could administer first aid if the fire department were unavailable

Figure 4-5. Evacuation Routes for GOHF



INSERT FIGURE 4-6

There are fire monitors and hoses throughout the facilities. Firewater tanks are maintained on site. It is the policy of PXP that employees respond only to minor fires that can be controlled with extinguishers or similar means. Larger fires that require specialized equipment or training will be limited to the extent possible by plant process controls until the Fire Department arrives.

4.8.1 Fire Fighting Equipment

4.8.1.1 Gaviota Oil Heating Facility

The in-plant fire water system is designed to deliver 2,500 gpm at 80-150 psig at any facility fire risk area for four hours. Hose reels, monitors, and hydrants are placed throughout the plants to protect all equipment. A diesel-powered fire pump is provided as a backup in case the facility loses both its own electrical power and utility backup power. In addition, pumper truck connections are provided as further backup. Water lines are buried for protection and looped and valved throughout the Plant to provide a partially redundant water main, so that failure of one part of the line does not interrupt the water supply. The system was hydrotested at 200 psig for two hours after completion. Firewater Pumps

Two Peerless Pump firewater pumps, one electric-motor driven (P-41) and the other diesel-driven (P-40), each rated for 2,000 gpm at 113 psig and designed to deliver 2,500 gpm at 100 psig, are installed on the eastern edge of the site. The pumps are U.L. listed and meet NFPA 20 requirements. A smaller jockey pump (P-42), designed to deliver 360 gpm at 100 psig, maintains system pressure at 100 psig.

The diesel pump, diesel engine, and control panels for all three firewater pumps are installed inside a sprinklered pump house. The pumps are inspected regularly and exercised weekly. Flow tests are conducted quarterly to test the pump capacity and pressure.

Firewater Storage Tank

Located next to the firewater pumps, the firewater storage tank, T-35, is sized to supply water for a nominal four-hour supply at the 2,500 gpm capacity of the firewater system, or 14,300 bbls. The tank is fabricated of carbon steel and constructed to meet API requirements. Two 4-inch tank connections are provided to allow a pumper truck to take suction from the tank and discharge into the system. One quadramese with four 2½-inch female connections is also provided. The storage tank is located in the eastern plant area with access from the plant and an emergency access road from outside the plant.

Firewater Mains

Dual 12-inch lines carry firewater from the pumps to the center of the Gaviota facility, where the line loops between the Oil Plant and the Gas Plant. Eight- to 12-inch lines loop through the processing facilities, with four to eight-inch branch lines. The looped design allows water to reach any area in the heart of the facility through at least two routes, so that a break in the line does not prevent water from reaching a fire area. The lines are buried for added protection.

Hose Reels

Hose reels, ready-connected for immediate use by a single operator, are located near fire risk areas. Each reel has 100 feet of 1¼-inch hard rubber hose; the hose has a neoprene cover for resistance to oil and chemical deterioration, mildew, and rot. The combination nozzles are of all-brass construction and are rated for 60 gpm at 100 psi.

Firewater Monitors

Monitors are equipped with a combination nozzle rated for 300-500 gpm at 100 psi. The nozzle is brass with a stainless steel stem. Monitor stubs, with threaded connections for hookup of a County Fire Department portable monitor, are provided near tanks T-1 and T-2.

Fire Hydrants

Fire hydrants are located throughout the Plant to supplement the ready-connected hose reels and monitors. Hydrants are spaced such that fire risk areas are within reach of two hydrants with 250-foot maximum hose length on each. Hydrants are AWWA-approved models with two 2½-inch and one 4-inch hose connections, individually valved for independent control. Laterals supplying hydrants are 6-inch nominal diameter and have isolation valves.

Foam Hose Reels

Aqueous Film Forming Foam (AFFF) acts as a barrier to oxygen and suppresses evolution of fuel vapors; it is especially effective on thin layers of flammable liquids that arise from spills which have not had a long pre-burn before application of foam. Foam hose reels with stored AFFF are located at the crude charge pumps (near T-1), at crude oil storage tanks T-1 and T-2. An inventory of AFFF foam is maintained either on-site or nearby in a cooperative arrangement with other oil companies. A high back-pressure foam maker is used to inject foam solution through tank connections on T-1 and T-2.

Mobile Firefighting Equipment

Portable monitors are located within the Plant. These trailer-mounted units can be quickly moved to the fire site and connected by hose to the nearest hydrant. Hydrant-mounted monitors can also be brought to the site of a fire and connected to a hydrant.

Portable Fire Extinguishers

Portable fire extinguishers are located throughout the Gaviota facility.

- Potassium Bicarbonate dry chemical extinguishers (Ansul model CRK-30-E or equivalent) are mounted in process plants to fight flammable liquid and gas fires (U.L. Rating 120-B:C);
- Halon 1211 extinguishers (Ansul Sentry model SY-1441 or equivalent) are placed near electrical equipment (U.L. Rating 1A-10B:C or better);
- Carbon Dioxide extinguishers (15 pound, Ansul model CD-15 or equivalent) are located in the laboratory (U.L. Rating 10B:C);
- 150-pound dry chemical wheel units.

4.8.1.2 Lompoc Oil and Gas Plant

Firewater Pumps

The fire pumps have been designed to deliver 2500 gpm each at 150 psi. Both pumps are driven by diesel engines. Controllers monitor the pressure in the water main. In the event of a drop in pressure the east pump starts first automatically. If that pump fails to start or the pressure continues to drop, the west pump automatically starts. Once started, either pump continues to run until manually shut down. The fire pumps and pump controllers comply with all requirements of NFPA #20. A built in flow meter in the piping from the pumps to the fire system water tank has been provided for pump testing.

Firewater Storage Tanks

A 210,000 gallon (5000 BBL) tank and a 420,000 (10,000 BBL) tank are at the LOGP to store fire water. The tanks are kept full by an automatic level control system. The 210,000 gallon tank has a 4 inch National Standard male thread outlet for fire department engine use. The valve is an OS&Y type. The outlet is within 10 feet of the fire engine parking area. A 10 feet by 4 inch diameter hard suction hose with National Standard female thread fittings is next to the tank outlet. The tanks will be a bolted design built of galvanized steel. The tanks have been designed and built in accordance with API Specification 12B.

Firewater Mains

All water mains are 8 inch non-corrosive PVC pipe which is approved for fire service use and U.L. listed. The fire system mains comply with all requirements of NFPA #24. A quadramese with 2-1/2 inch National Standard female threads accesses the water main and is located no closer than 25 feet and no farther than 50 feet from the fire system water tank outlet.

Hose Reels

1-1/2 inch by 100 foot long hose reels with a capacity of 100 gpm are located throughout the facility near fire risk areas. The hose reels have foam capabilities as described in the section on foam systems.

Firewater Monitors

All of the monitors have approved adjustable fog nozzles attached. The three monitor-hydrants located adjacent to the south and north berm of the surge tank dike are 500 gpm. The monitor-hydrant on the north berm of the surge tank is 300 gpm.* The other monitors near the heater treaters and LPG tanks are 750 gpm. All of the monitors have foam capability as described in the section on foam systems.

*The monitor-hydrant near the inlet area is 300 gpm.

Fire Hydrants

All hydrants have one 4 inch national Standard male thread outlet and one 2-1/2 inch National

Standard male thread outlet. The hydrant monitors have two 2-1/2 inch National Standard male thread outlets in addition to the monitors described in the following section. The hydrants will be U.L. listed and installed in accordance with NFPA #24.

Foam System

The 100,000 barrel tank is protected by a fixed foam system. There are three foam chambers mounted on the tank. A header was installed outside the bermed area to control the foam application. There is a 3000 gallon atmospheric foam concentrate tank.* It is kept 1/3 full of AFFF type foam concentrate or an alternate acceptable to the Fire Department. The concentrate is pumped into a distribution loop which parallels the water mains. There is a "light water" pressure control valve and proportioner at each monitor, hose reel and the surge tank foam system. The concentrate pumps are run by an electric motor. Both pumps are a part of the emergency power system. The foam system, including foam pumps, tank, piping, proportioners, and applicators will comply with NFPA Standard #11.

Mobile Fire Equipment

The mobile fire equipment is twenty-four 20 pound Purple K dry chemical extinguishers, two 5 pound dry chemical extinguishers, seven 10 pound dry chemical extinguishers and two portable 150 pound Purple K dry chemical extinguishers. It also includes one 14 pound Halon extinguisher and one 17 pound Halon extinguisher.

4.8.2 Fire Fighting Personnel and Procedures

No employee at Gaviota or Lompoc is expected to attack a fully developed fire. If a fire develops beyond the incipient stage where it can not be extinguished with fire extinguishers or 1 ½" fire hoses, employees will clear and secure the area, ensure the activation of any automatic fire suppression equipment, and wait for the arrival of the Santa Barbara County Fire Department. The employees will be dispatched through the Incident Command System to provide support to the responding Fire Department(s) as indicated

Operation and Maintenance personnel receive fire extinguisher training annually.

Fire suppression at the Plants will be provided by the Plant operators under the direction of an Incident Commander (for incipient stage only). The County Fire Department shall be called out if it is deemed necessary by the Incident Commander.

The initial Incident Commander will normally be the Plant Foreman, but this responsibility and authority may shift as members of Plant management arrive. The first County Fire Department officer arriving at the emergency site will assume the role of Incident Commander.

*An additional 1200 gallons of foam concentrate will be stored in 55 gallon drums.

Once a fire is reported to the Control Room and 911 has been called, the Incident Commander will cause group members to be notified. If the fire is small with little potential, i.e. a dumpster fire, the group members will be notified by radio. If the fire is large and/or has potential to spread, the Plant major horn tone will be sounded and a radio announcement made on all radio channels.

Section 5 Response Actions

5.1 Response Strategies

Effectively responding to an oil spill requires a range of strategies that depend on the size and location of the spill; the environmental, economic, and cultural resources at risk; the personnel available, both initially and following activation of the response effort; the response equipment available; and the expertise of the personnel with regard to response techniques, equipment operation, and the Incident Command System. The following sections describe a range of strategies suitable for oil spill response. Each drill or actual spill event will be different and will require the judicious application of appropriate strategies and the avoidance of inappropriate ones.

5.1.1 Overall Spill Strategy

In every spill response or spill response drill, there will be certain strategies that apply in virtually all circumstances. Standard strategies are described in Table 5-1.

Table 5-1. Strategies Covering All Types of Spills

First Response To A Spill
Anyone observing a spill should immediately take action or contact the necessary qualified person to take emergency action to stop flow at the source safely. Examples of such actions are: • Ensure personnel safety. • Identify source of spill and take appropriate steps to stop the discharge. • Stop the Shipping Pumps. • Close block valves to stop line leaks. • Close blow out preventers to stop flow from wells involved in drilling or workover activities. • Stop pumps if a tank is being overfilled. • Stop fuel pumps and minimize leakage from fuel lines if a fueling leak occurs. • Evaluate and cope with immediate hazards involved.
Preventing Fire and Explosion
Fire and explosions are potential dangers during petroleum product spills. Although flammability varies dramatically with the spilled product and the circumstances of the spill, it is essential that all reasonable steps be taken as soon as possible to minimize the chance of accidental ignition of the spilled product(s). Examples of such steps are: • Extinguish open flames (e.g., welding torches) immediately. • Cease all operations involving arc welders, grinders, and other sources of sparks. • Cease all operations that vent oxygen or enriched oxygen mixtures. • Shut off electric circuits that might create a fire hazard, if possible. Under some circumstances, even a simple switch or electric motor can cause a dangerous spark. Remember that fans, blowers, electric lights, and electric pumps all have switches and/or electric motors. • Extinguish smoking materials, where appropriate.

Table 5-1. Strategies Covering All Types of Spills
General Strategies
1. Ensure personnel safety. 2. Physical removal of the oil is the preferred action in almost all cases. 3. Containment and recovery should only be attempted for crude oil, diesel fuel, lubricating oil, or fuel oils. 4. Spills reaching the water will be cleaned up by Clean Seas using materials and equipment such as skimmers, booms, and absorbent pads to contain and pick up any spilled oil or fuel. Oil-soaked absorbents and other contaminated debris will be disposed of at an approved onshore site (refer to Section 6.2, Storage, Transfer, and Disposal of Recovered Material). 5. Spills reaching the shoreline will be cleaned up by Clean Seas, or other onshore cleanup contractor using procedures and materials and equipment outlined in Section 5.6, Containment, Cleanup and Recovery.

5.1.2 Minor Spill Strategy

Spills of less than 10 barrels are generally classified as minor; such spills can normally be handled by platform/facility personnel with spill response equipment as long as the oil has not entered the marine environment. Extenuating circumstances (e.g., spillage into ocean, unfavorable weather conditions, etc.) may require additional personnel and equipment to assist the platform/facility response effort. The general strategy for responding to a minor spill is outlined in Table 5-2.

Table 5-2. Strategy for Minor Spills
In the event of a minor spill, the following general procedures may apply: • Ensure personnel safety. • Shut down operations responsible for the discharge. • Stop the flow of the spill. • Activate Oil Spill Response Plan and Clean Seas if ocean waters are threatened. • Notify appropriate Company personnel and government entities. • Assess current direction to determine possible path and containment (see Section 5.5.2., Estimating Spill Movement).
Spills of Less Than 5 Barrels (210 U.S. Gallons)
In addition to the general procedures listed above: • Direct Clean Seas to deploy containment and/or absorbent boom. Use absorbent boom and pads and/or skimming equipment to pick up oil. • Direct deployment of additional equipment and activate additional Clean Seas or other OSRO equipment, if necessary. • Maintain cleanup operations until no visible sheen is apparent.

Spills of Less Than 5 to 10 Barrels (210 to 420 U.S. Gallons)
• Call out appropriate cooperative and/or contractor equipment if it is apparent that initial response personnel cannot contain the spill before it enters the marine environment. • Assess current direction to determine possible path and containment (see Section 5.5, Spill Assessment, Movement, and Monitoring). • Direct Clean Seas to deploy containment boom or material to control the spill (see Appendix C, Response Equipment Inventories). • Direct use of absorbent boom and pads to remove traces of oil sheen.

5.1.3 Major Spill Strategy

If the IC determines that the spill cannot immediately be stopped and contained at or near the source, the IC or his representative may request equipment from the local contractors and/or oil spill response organizations (OSROs). If the magnitude of the leak or spill warrants elevation of the response, the IC will consult with the Company **Qualified Individual and/or Incident Commander** and authorize activation of all or part of the **Incident Management Team**. In a major spill, the USCG and OSPR may send representatives to monitor the spill response. These representatives will be the Federal and State On-Scene Coordinators (OSCs) and will, with the Incident Commander, form the Unified Command for the response effort. The general strategy and feasible cleanup methods for a major spill are outlined in Table 5-3. More detailed analysis of containment and cleanup methods is provided in Section 5.6

5.1.4 Immediate Emergency Services

PXP trains employees in first aid and firefighting. Employees are qualified to respond to minor incidents. Santa Barbara County Fire Department would be called upon for emergency assistance whenever on-site personnel are unqualified or unable to mount an effective response. Each platform is staffed with an Automated External Defibrillator and employees are trained in its use.

Table 5-3. Strategy for Major Spills

In the event of a major oil spill, the following procedures may apply:

- Ensure personnel safety.
- Shut down operations responsible for the discharge.
- Take appropriate actions to prevent explosion and fire.
- Stop the flow of oil, if possible.
- Activate Oil Spill Response Plan and onsite response personnel.
- Activate Clean Seas initial response personnel and equipment.
- Assess the size, type, direction, and flow of spill.
- Notify appropriate company personnel and government entities (see Section 3).
- Determine whether additional assistance is needed, and activate as appropriate. This would include activation of the IMT.

Table 5-3. Strategy for Major Spills
• If warranted, advise Incident Commander and Unified Command to request authorization for use of chemical dispersing agents or In-Situ Burning. • Assess containment efforts upon arrival of shore-based backup equipment.

Table 5-4. Feasible Cleanup Methods

Operation	Non-Dispersed Spill	Dispersed Spill
Containment at Source	Containment via rapid deployment of open ocean boom, given site characterization indicates spill safe for response operations.	N/A
Cleanup and Recovery at Source	Mechanical recovery of windrows would be ineffective or unsafe in sea states with waves ≥5 to 8 feet and winds ≥ 15 to 29 knots.	Mechanical recovery of residual oil (non-dispersed would be ineffective or unsafe in sea states with waves ≥5 to 8 feet and winds ≥15 to 29 knots.
Shoreline Protection Strategy	Diversion booming to mitigate projected impact on sensitive habitats and harbor mouths combined with all available mechanical recovery systems at leading edges of slicks threatening habitats.	All-out dispersion of slick more than 1 mile from shoreline and Channel Islands combined with all available mechanical recovery and diversion booming of projected threatened habitats. All dispersant application to be carefully monitored.
Shoreline Cleanup Strategy	Strategy is to depend on natural processes for dispersion of landed oil on most areas of islands, monitoring of mainland beaches, and mechanical/manual cleanup of residual oil.	
Time Necessary to Execute Spill Response	Diversion booms can be mobilized and set up within approximately 12 hours of notification. Clean Seas can have teams, supervisors, response vessels, and support onsite and on threatened beaches within approximately 4 to 14 hours after notification. Additional support from Clean Seas and USCG Pacific Strike Team can be onsite within approximately 6 hours after notification, with major response systems arriving within approximately 16 to 30 hours. Inventories and operational specifications of major systems are given in Appendix C, Response Equipment Inventories. Offshore containment, recovery, and dispersant application operations will be curtailed at night for safety reasons. Onshore operations can proceed on a 24-hour basis.	

5.2 Discharge Detection and Control

There are multiple control and safety systems, standard procedures, and management programs in place which will assist personnel in identifying a potential oil release. These are discussed in the following sections.

5.2.1 Control Systems

Pipeline operations for Point Arguello are regulated and monitored by a series of controls that sense pressure, level, temperature, flow rate, and pump speed. The system monitors and visually displays operating information to operators on Platform Hermosa and the Pipeline Operator at Gaviota. The display also indicates to the Operators any alarms that may be activated.

The August System monitors and controls the oil and gas processes at the LOGP in addition to monitoring the flows and pressures of the Point Pedernales oil pipeline. In addition the Point Pedernales pipelines are monitored and controlled by the ABB (Asea, Brown, Boveri) computer system which is a PLC with an operator controlled base station located in the LOGP control room.

5.2.2 Emergency Shut-down

An automatic emergency shutdown (ESD) system will stop operations if process variables exceed predetermined values or if ESD activated manually.

5.2.3 Isolation Valves

To prevent further spread of oil in the event of a leak or rupture, the Pt. Arguello pipelines are equipped with isolation valves on the right-of-way. All of the pipeline isolation valves are monitored and operated by the Pipeline Operator at Gaviota. These valves can also be manually operated at the valve vault. The valve locations are shown on drawing 2392-SK-101 in Appendix A.

The onshore section of the Point Pedernales pipeline contains ten intermediate valve stations (VS). VS 1, 2, 4, 7, 8, and 10 utilize Motor Operated Valves (MOVs), which can be operated locally or from the LOGP. VS 3, 5, 6, and 9 utilize check valves. Position indication of both the MOVs and check valves is transmitted to the August System's controller at the LOGP. The LOGP is staffed at all times. The valve locations are shown on drawing 14C 131A in Appendix A.

5.2.4 Facility Inspections

Inspections of facilities are conducted on a regular basis by platform personnel to determine if leakage or pollution is occurring. Records of the Company's daily inspection logs are kept on the platforms for two years, and then at the onshore office for three years.

5.2.5 Leak Detection

The Pt. Arguello oil pipeline to shore is equipped with a Supervisory Control and Data Acquisition System (SCADA). The SCADA system continuously monitors and controls pressure and flowrates in the pipeline. In addition, a leak detection system by ATMOS International acquires data from the SCADA system to monitor the pipeline for a leak. The design of ATMOS International's leak detection software utilizes statistical techniques to detect changes in the overall behavior of the flow and pressure at the inputs and discharges of the pipeline. The leak determination is based on probability calculations at regular sample intervals. The principle for

the probability calculations is supported by mass conservation and hypothesis testing. The software obtains the corrected (net) oil volume measurements and pressures from the original instruments via the pipeline SCADA system. The pressure and flow rate data is combined into a single leak detection computation probability for each of the two pipeline segments. The leak probability is alarmed back on the SCADA console for the operator interaction. The Operator can then decide on an appropriate response. Automatic ESD-initiated valves can shut-in the oil pipeline in less than two minutes. The time for manually-initiated valve closure is approximately 45 seconds (0.53 inches/second). If a leak is suspected, the pipeline would be shut down and a field investigation would then be initiated via aircraft, if possible, to locate the leak along the pipeline corridor. Identifying the leak location would require between 30 minutes and one hour.

In the event of a communication failure in parts of the SCADA system, alternative methods for detecting leaks are available as described in Appendix I. Flow rates are continuously monitored at the platform and onshore. If one or more redundant SCADA communications systems fails, pipeline flow rates would be monitored closely to detect potential leaks. In the event of complete SCADA system failure, the pipeline is shut down.

The Pt. Pedernales facilities have a computerized leak detection system that is used to monitor and detect leaks in the Platform Irene oil pipeline between the platform and the LOGP. A dedicated computer running ATMO PipeLDS software continuously monitors the pipeline pressures and flowrates. The program utilizes a statistical analysis of the pipeline flowing parameters to detect a leak. Typically a leak of 3.5% would be detected within 30 minutes. If a leak alarm occurs, the operator must follow the flow chart at the end of this section in order to verify the leak and perform the proper corrective action. The leak detection computer is continuously monitored by the controller at LOGP.

Pressures are monitored at Platform Irene and the LOGP. If pressure crosses high or low shutdown set points as specified in the operating manual, then Shut Down Valves (SDVs) at the Platform and the LOGP will activate automatically. The August System is monitored by the controller at the LOGP.

The time it would take the pipeline monitoring system to detect a release is a function of the size of the release. A large leak or rupture would most likely be detected in 30 seconds or less. Smaller leaks could take longer to detect. The valves can then be closed remotely and production shut down on Platform Irene using the Emergency Shutdown Switch (ESD). This can be accomplished in 30 seconds. Adverse weather will have no affect on leak detection and shutdown operations.

5.2.6 Visual ROW Inspections

The pipeline rights-of-way (ROWs) are visually monitored once a week, weather permitting, for abnormal conditions or potential visible leaks or sheens. The offshore ROWs are monitored by either boat or aircraft (except for the portion within the restricted air space of Vandenberg Air Force Base) and the onshore ROWs are monitored by vehicles or aircraft.

5.3 Response Prioritization

In the event that an oil spill occurs, response operations should be initiated immediately. Throughout all response operations, the highest priority is placed upon personnel safety. In addition, environmental resources must be taken into account in the selection of response techniques and equipment and in the conduct of response operations.

5.3.1 Response Action Prioritization

Figures 5-1 through 5-4 provide flow charts for decision making regarding initial response, marine oil spills, terrestrial oil spills, and shoreline cleanup. The Area Contingency Plan (Section 3000) provides the best available information on strategies and tactics for spill response. However, all response strategies and tactics are subject to modification based on actual conditions at the time of the spill. Variables dictating modification may include:

- Weather, including rain and wind
- Tide and current conditions, height, velocity, and direction of flow
- Amount of water and speed of flow of creeks emptying into the ocean
- Type, amount, and viscosity of oil spilled
- Seasonal or other environmental concerns not previously anticipated
- Outside influences that alter in-field priorities including political sensitivity

Figure 5-1. Flowchart for Initial Response

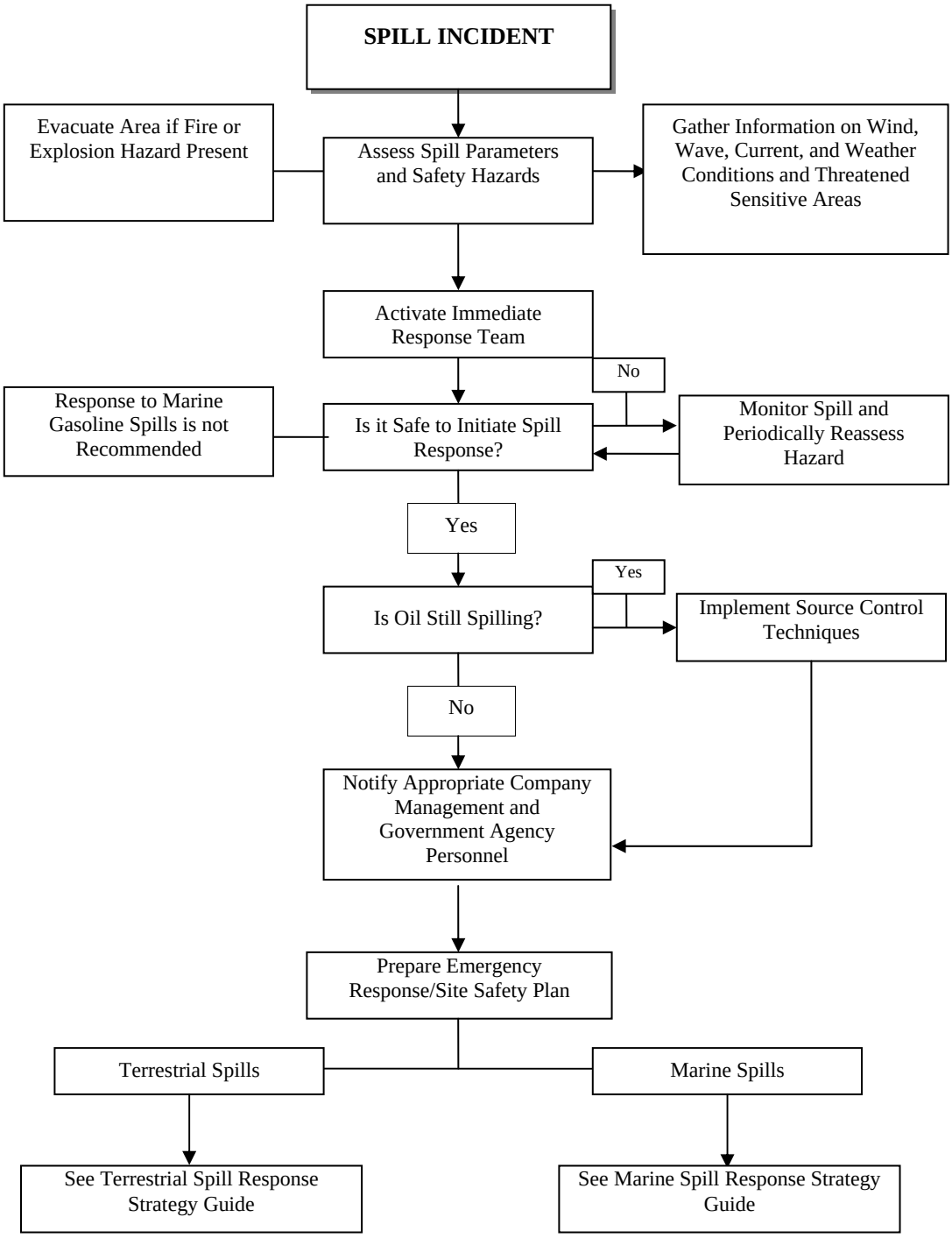


Figure 5-2. Flowchart for Marine Spill Response

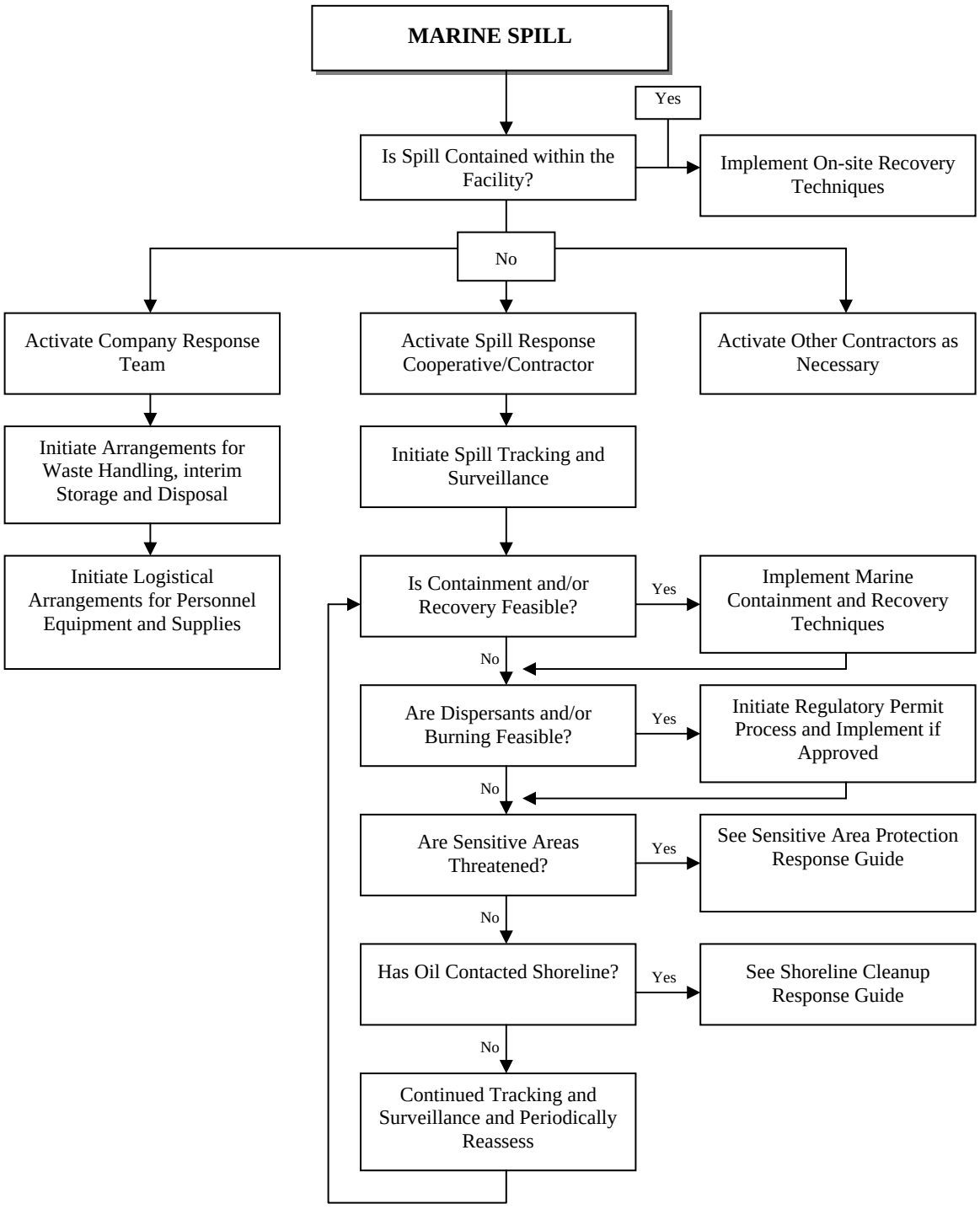


Figure 5-3. Flowchart for Terrestrial Spill Response

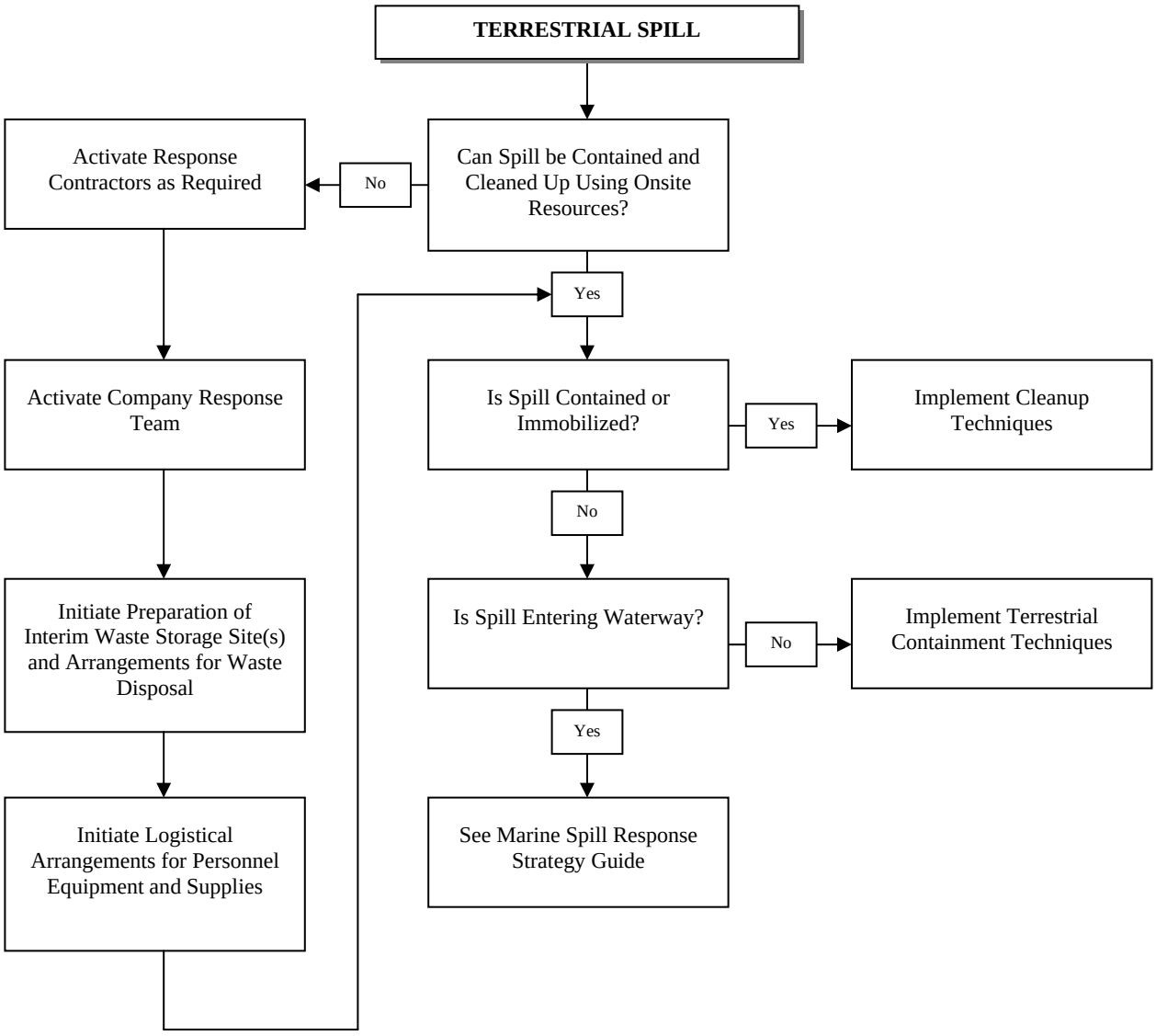
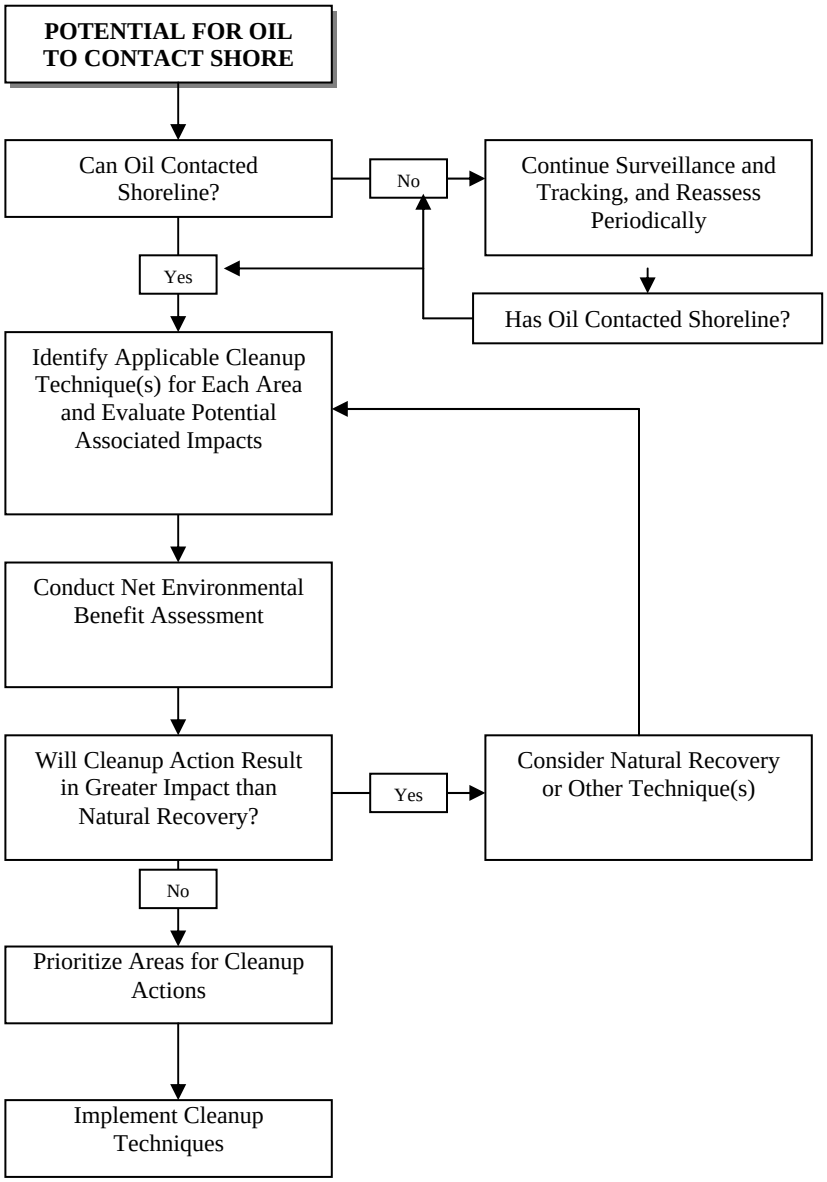


Figure 5-4. Flowchart for Shoreline Cleanup



5.3.2 Resource Protection

Coincident with the oil containment and recovery phase, sensitive shoreline areas that may be threatened by the spill must be identified and characterized. Sensitive shorelines are those containing natural resources, economic assets (such as parks and other recreational facilities), and archaeological resources. As discussed in Section 5.6.1, personnel, boom, and vessels should be mobilized to protect those areas as soon as possible. If wildlife is contacted by oil, rescue and rehabilitation operations must be implemented as appropriate.

The process of identifying and prioritizing natural, economic, and archaeological resources at risk from a spill and selecting appropriate protection measures involves the following steps:

- Determine the probable direction the spill will follow. This involves trajectory analysis as described in Section 5.5.2 and Appendix E.
- Refer to Table 5-4 on page 5-4, the ESI maps in Section 5.8, and the Vol. II of the Area Contingency Plan, to determine the environmental sensitivities of vulnerable shorelines and resources in the shoreline segments the trajectory analysis indicates may be affected by the spill.
- Rank the resources and shorelines from most sensitive to least sensitive.
  - A high ESI index indicates a shoreline with a high vulnerability to adverse effects from contact with oil and, therefore, a high priority for protection.
  - The potential presence of threatened or endangered species vulnerable to adverse effects from contact with oil also indicates a high priority for protection.
- Using the maps and accompanying material in Vol. II of the Area Contingency Plan, identify appropriate strategies, manpower needs, and equipment required to protect the highest priority sensitive resources and shorelines.
- Using Table 5-4, the Area Contingency Plan, Section 3 of this plan, and other available sources, identify parties to contact for access or permission to conduct resource protection operations (listed on the appropriate Area Contingency Plan maps). Also, identify access or safety limitations that may hinder deployment of response resources in high vulnerability shoreline segments.
- The observations of trained personnel deployed to the area to assess the actual conditions and resources at risk during the time of the spill would also be used in planning for the protection of resources. This information, in conjunction with other sensitive resource mapping and real-time spill trajectories, will be used to properly plan for protection of wildlife/habitat resources.
- Continue monitoring the actual spill trajectory and review and update response resource requirements and locations as indicated by any observed changes.

Clean Seas is the PXP contractor for shoreline protection. Clean Seas is an approved OSRO for shoreline protection and conducts the necessary training exercises on sensitive areas within the areas that could be affected by a spill from a PXP facility. All shoreline protection strategy selection and implementation will be coordinated through Clean Seas.

It is important to understand that any method for calculating trajectories involves significant uncertainties. These derive from the fact that simplifying assumptions necessarily made in models cannot represent all the details of reality and from changes that inevitably occur in the actual conditions on which trajectory calculations were based. A trajectory analysis is useful to help anticipate the areas that may be impacted and to identify the types of resources at risk, thereby assisting to predict the potential sensitive locations and the manpower, equipment, and techniques that may be needed to protect sensitive resources in those locations. However, it may not be wise, based on trajectory analysis alone, to commit resources to a particular location too early in case the situation changes. If personnel and equipment are erroneously committed to one location before the need is reasonably certain, it may be difficult to redeploy them to a different, more vulnerable location quickly enough to be effective. Continual real time monitoring of the location, direction of movement, and extent of oil slicks spreading from a spill is necessary to insure that response resources are directed to the most sensitive locations in a timely manner.

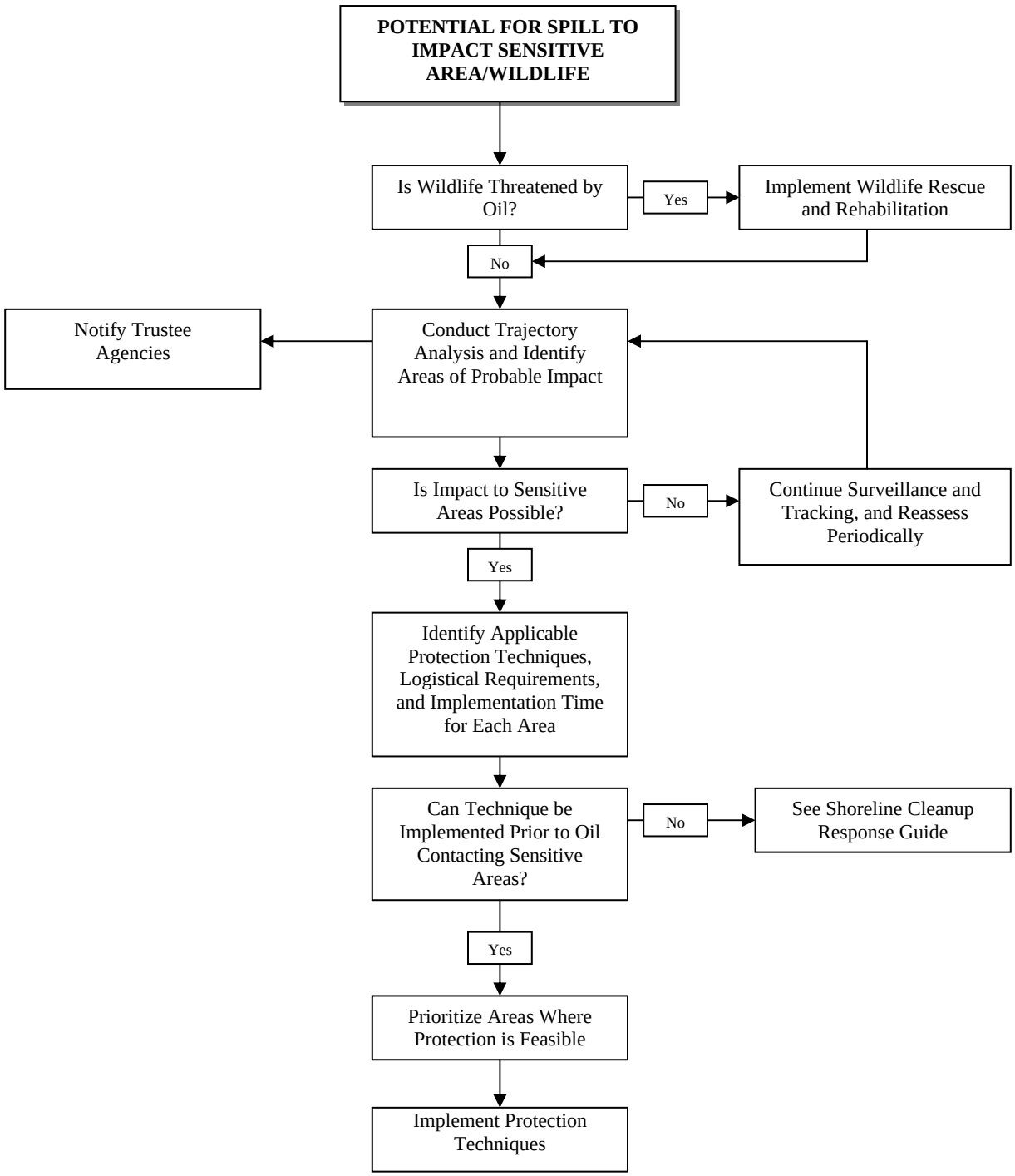
The prioritization should focus on minimizing the effects of oil reaching the shoreline before contact occurs. This is accomplished by estimating the locations where oil is likely to come ashore and protecting sensitive resources in those locations. Where feasible, the most sensitive environmental resources should receive the highest priority attention, especially early in a response when response resources are limited.

Section 5.8 of this plan contains Environmental Sensitivity Index Atlas maps, prepared by NOAA in conjunction with the California Office of Spill Prevention and Response for the areas that could be affected by a spill from Point Arguello or Point Pedernales facilities. Section 5.6.2.3 of this plan contains information on the environmental sensitivity index categories and appropriate response strategies for each index area. Figure 5-5 provides a flowchart outlining the assessment of impacts to wildlife.

For the platforms, their associated pipelines, and onshore facilities, the primary potential spill zones include the mainland shoreline areas from San Carpoforo Creek Inlet in San Luis Obispo County to Coal Oil Point in Santa Barbara County, including the Santa Barbara Channel Islands of San Miguel Island and Santa Rosa Island. An identification of each potential spill site, description of their beach substrate types, access routes to each site, natural, economic, and archaeological resources located at each site are listed in Table 5-5, which is located on the following pages.

Maps and corresponding information within the ACP (Vol. II) will be used in coordination with the RRT during a spill response. Several copies of ACP are maintained in the Emergency Operations Center for use by Response personnel.

Figure 5-5. Flowchart for Assessing Impacts to Wildlife



The Area Contingency Plan (Vol. II) (Section 9800) provides the following information regarding access, as well as descriptions of shore substrate, and the presence of archaeological sites and economic resources for sensitive shoreline areas along the California coast (a blank indicates that the ACP does not describe a resource, it does not necessarily mean that it is not present). This table includes those areas that were identified as potentially affected if an offshore release occurred. The ACP should be consulted for more detail.

Table 5-5. Natural, Cultural, and Economic Resources Cited in ACP

ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-005-A	San Carpoforo Creek Inlet	From the north: Hwy 101 south to Hwy 46 west to Hwy 1 north (or Hwy 5 south to Hwy 41 west to Hwy 46 west to Hwy 1 north). Hwy 1 north for about 25 miles. North of bridge is locked gate (private property), unpaved road to beach. From the south: Hwy 101 north to Hwy 1 Morro Bay exit in San Luis Obispo, continue as above. Boat access: Morro Bay boat ramp (~ 40 miles to south), private pier with boat hoist ~ 14 mi. south at San Simeon landing.	Small freshwater marsh, fronted by sandy beach.	Sea Otters	Brown Pelican, shorebirds, seabirds	Steelhead trout, Southwestern Pond Turtle	
4-010-A	Arroyo Hondo Creek Beach	Hwy 1, about 30 miles north of Hwy 46 junction, to small turnout area 0.4 miles south of San Carpoforo Creek bridge. Park and take foot trail (steep cliff hike may be dangerous). Boat access: Morro Bay boat ramp (~ 40 miles to south), private pier with boat hoist ~ 14 mi. south at San Simeon landing.	Sandy beach fronting creek.	Sea Otters	Snowy Plover, shorebirds, seabirds		
4-015-A	Arroyo de la Cruz Inlet	Hwy 1, ~ 4 miles north of Piedras Blancas Lighthouse. 0.3 mi. south of Arroyo de la Cruz bridge is gate (private property) and unpaved road to beach. Boat access: Morro Bay boat ramp (~ 40 miles to south); private pier with boat hoist ~ 10 mi. south at San Simeon landing; small craft boat ramp at Leffingwell Landing, ~ 15 miles south on Hwy 1.	Well-developed freshwater marsh, fronted by sandy beach.	Sea Otters	Grebes, dabbling ducks, sandpipers, Yellowlegs, shorebirds, seabirds	Steelhead trout, Southwestern Pond Turtle. Compact Cobweb Thistle, Arroyo De La Cruz Mariposa Lily, Dwarf Goldenstar	Monterey Bay National Marine Sanctuary, Sea Otter Game Refuge
4-020-A	La Cruz Rock	Hwy 1, about 10 miles north of San Simeon. Site is just south of USCG Lighthouse. Boat access: Morro Bay boat ramp (~ 40 miles to south), private pier with boat hoist ~ 14 mi. south at San Simeon landing.	Offshore rock.	Harbor Seals, Calif. Sea Lions, Sea Otters	Brown Pelicans, Western Gulls, Black Oystercatchers		Monterey Bay National Marine Sanctuary, Sea Otter Game Refuge

Table 5-5. Natural, Cultural, and Economic Resources Cited in ACP

ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-025-A	Arroyo del Oso Creek Inlet	Hwy 1. Creek is 1.2 miles north (private property) of Piedras Blancas Lighthouse. Boat access: Morro Bay boat ramp (~ 40 miles to south); private pier with boat hoist ~ 10 mi. south at San Simeon landing; small craft boat ramp at Leffingwell Landing, ~ 12 miles south on Hwy 1.	Small freshwater marsh, fronted by sandy beach.	Sea Otters		Red-legged Frogs, Southwestern Pond Turtles, Tidewater Goby	Monterey Bay National Marine Sanctuary, Sea Otter Game Refuge
4-030-A	Arroyo de Corral Creek Inlet	Hwy 1. Creek is 1 mile north of Piedras Blancas Lighthouse. Dirt road (private property). Boat access: Morro Bay boat ramp (~ 40 miles to south); private pier with boat hoist ~ 10 mi. south at San Simeon landing; small craft boat ramp at Leffingwell Landing, ~ 12 miles south on Hwy 1.	Medium to coarse grained sandy beach fronting creek. Woody debris on beach.	Sea Otters		Red-legged Frogs, Southwestern Pond Turtles, Tidewater Goby	Monterey Bay National Marine Sanctuary
4-035-B	Point Piedras Blancas	Hwy 1. Lighthouse road is at post mile marker 63.77, approx. 10 miles north of San Simeon. Site is just south of USCG Lighthouse. Boat access: Morro Bay boat ramp (~ 40 miles to south), private pier with boat hoist ~ 10 mi. south at San Simeon landing.	Offshore rocks.	Harbor Seals, Calif. Sea Lions, Steller Sea Lions, Northern Elephant Seals, Sea Otters	Brandt's & Pelagic Cormorants, Peregrine Falcons, Tufted Puffin, Black Oystercatchers, Pigeon Guillemots, Brown Pelicans, seagulls		USCG Lighthouse, Monterey Bay National Marine Sanctuary, Sea Otter Game Refuge
4-040-A	Elephant Seal Beaches South of Point Piedras Blanca	Hwy 1 north of San Simeon. Beaches are just south and north of USCG Lighthouse. Boat access: Morro Bay boat ramp (~ 40 miles to south), private pier with boat hoist ~ 10 mi. south at San Simeon landing.	Sandy pocket beaches.	Northern Elephant Seals, Sea Otters and seabirds		Red-legged Frogs, Southwestern Pond Turtles, Tidewater Goby	Monterey Bay National Marine Sanctuary, Sea Otter Game Refuge
4-045-B	William Hearst State Beach Rocky Intertidal	Hwy 1; State Beach is approx. 20 mi. north of Hwy 46 junction. Boat access: Morro Bay boat ramp (~ 35 miles to south), private pier with boat hoist ~ 5 mi. south at San Simeon landing. Small craft boat ramp at Leffingwell Landing, ~ 15 mi. south on Hwy 1.	Wave-cut rocky platform and offshore rocks.	Sea Otters	Critical habitat for Snowy plover	Red-legged Frogs, Southwestern Pond Turtles, Tidewater Goby	State Beach, Monterey Bay National Marine Sanctuary, Sea Otter Game Refuge

Table 5-5. Natural, Cultural, and Economic Resources Cited in ACP

ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-050-A	Oak Knoll Creek Inlet (or Arroyo Laguna)	Hwy 1; one mile north of Hearst Castle (approx. 20 mi. north of Hwy 46 junction); ~ 0.1 mi. north of bridge (post mile marker 59.88); turn into turnout and locked gate (Hearst Corp. private property, for access call 805-937-4610 or 415-777-0600). Boat access: Morro Bay boat ramp (~ 35 miles to south), private pier with boat hoist ~ 5 mi. south at San Simeon landing. Small craft boat ramp at Leffingwell Landing, ~ 15 mi. south on Hwy 1.	Small freshwater marsh, fronted by sandy beach.	Harbor Seals, Calif. Sea Lions, Steller Sea Lions, Northern Elephant Seals, Sea Otters	Brandt's & Pelagic Cormorants, Peregrine Falcons, Tufted Puffin, Black Oystercatchers, Pigeon Guillemots, Brown Pelicans, seagulls		Monterey Bay National Marine Sanctuary, Sea Otter Game Refuge
4-055-A	Arroyo del Puerto Inlet	Hwy 1; at Hearst Castle (post mile marker 57.82), to San Simeon Rd; to "William Hearst State Beach" parking (Hearst Corp. private property, for access call 805-937-4610 or 415-777-0600). Boat access: Morro Bay boat ramp (~ 30 miles to south), private pier with boat hoist at site.	Marsh along channel margin of inlet, fronted by sandy beach.	Sea Otters		Red-legged Frogs, Southwestern Pond Turtles, Tidewater Goby	Monterey Bay National Marine Sanctuary, Sea Otter Game Refuge
4-060-A	Broken Bridge Creek Inlet	Hwy 1, just south of Hearst Castle. Dirt road 1.2 mi. north of Little Pico Creek Bridge. Boat access: Morro Bay boat ramp (~ 30 miles to south), private pier with boat hoist at San Simeon landing.	Small saltwater marsh fronted by small pocket beach.	Sea otters		Red-legged Frog, Southwestern Pond Turtle, Tidewater Goby	Monterey Bay National Marine Sanctuary, Sea Otter Game Refuge
4-065-A	Rocks offshore Little Pico Creek	No vehicle access to beach. Vista turnout 0.2 mi. south of Little Pico Creek Bridge (Hwy 1, 1.5 mi. north of San Simeon) for parking. Boat access: Morro Bay boat ramp (~ 30 miles to south), private pier with boat hoist ~ 1.5 mi. north at San Simeon landing. Small craft boat ramp at Leffingwell Landing, ~ 3 mi. south on Hwy 1.	Offshore rock.	Sea Otters	Brown Pelicans, Brandt's Cormorants		Monterey Bay National Marine Sanctuary, Sea Otter Game Refuge
4-070-A	Little Pico Creek Inlet	No vehicle access to beach. Vista turnout 0.2 mi. south of Little Pico Creek Bridge (Hwy 1, 1.5 mi. north of San Simeon) for parking. Foot path to beach at south end of bridge. Boat access: Morro Bay boat ramp (~ 30 miles to south), private pier with boat hoist ~ 1.5 mi. north at San Simeon landing. Small craft boat ramp at Leffingwell Landing, ~ 3 mi. south on Hwy 1.	Small creek with ephemeral flow. Well-developed saltwater marsh fronted by sandy beach.	Sea Otters	Sandpipers, Yellowlegs, Grebes, Brown Pelicans, dabbling ducks	Tidewater Goby, Southwestern Pond Turtle, Steelhead Trout. Compact Cobweb Thistle	Monterey Bay National Marine Sanctuary, Sea Otter Game Refuge

Table 5-5. Natural, Cultural, and Economic Resources Cited in ACP

ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-075-A	Pico Creek Inlet	No vehicle access to beach. Hwy 1, just north of San Simeon (post mile marker at 54.75), turn left onto Pico Avenue, to parking and beach access (footpath). Boat access: Morro Bay boat ramp (~ 25 miles to south), private pier with boat hoist ~ 2 mi. north at San Simeon landing. Small craft boat ramp at Leffingwell Landing, ~ 4 mi. south on Hwy 1.	Fringing saltwater marsh seaward of Hwy 1 bridge, well-developed freshwater marsh landward of bridge, mixed sand & gravel beach.	Sea Otters	Sandpipers, Yellowlegs, Grebes, Brown Pelicans, Whimbrels, dabbling ducks	Tidewater Goby, Southwestern Pond Turtle, Steelhead Trout, Sculpin, Starry Flounder	Monterey Bay National Marine Sanctuary, Sea Otter Game Refuge
4-080-A	San Simeon Creek Inlet	Hwy 1. North of San Simeon Creek bridge (post mile marker 52.92) turn onto San Simeon Creek Road (follow campground signs). In Campground stay to right to bridge and beach. Boat access: Morro Bay boat ramp (~ 20 miles to south), private pier with boat hoist ~ 4 mi. north at San Simeon landing. Small craft boat ramp at Leffingwell Landing, ~ 2 mi. south on Hwy 1.	Freshwater marsh fronted by sandy beach.	Sea Otters	Brown Pelicans, Sandpipers, Yellowlegs, Grebes, dabbling ducks	Red-legged Frog, Southwestern Pond Turtle, Tidewater Goby, Two-Stripped Garter Snake, Steelhead Trout	Monterey Bay National Marine Sanctuary, Sea Otter Game Refuge
4-085-A	Santa Rosa Creek Inlet	No vehicle access to beach. Possible access with ATV. From Hwy 1 in north Cambria, take Windsor Blvd, to Moonstone Beach Drive to Shamel Park "Scenic View" parking. Boat access: Morro Bay boat ramp (~ 18 miles to south), private pier with boat hoist ~ 6 mi. north at San Simeon landing. Small craft boat ramp at Leffingwell Landing, ~ 0.1 mi. north.	Small bay/saltwater lagoon landward of sand spit. Creek fronted by sand & gravel beach. Driftwood debris on beach.	Sea Otters	Brown Pelicans, Sandpipers, Yellowlegs, Grebes, dabbling ducks	Red-legged Frogs, Southwestern Pond Turtles, Tidewater Goby, Two-Stripped Garter Snake, Steelhead Trout	State Park, Monterey Bay National Marine Sanctuary, Sea Otter Game Refuge
4-100-B	Cambria Air Force Base Rocky Intertidal	No access to beach. For overlook: On Hwy 1, first road north of Hwy 46. Through two locked gates, to Cambria Air Force Base , right on gravel road (need 4-wheel drive) to hill top. Boat access: Morro Bay boat ramp (~ 20 miles to south).	Wave-cut platform.	Harbor Seals, Sea Otters			Private Property
4-105-B	Rocky Intertidal North of Pt. Estero	From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south. Gate is ¼ mile south of Harmony. From south, take Hwy 101 north to Hwy 1 north, Morro Bay exit in SLO. Site is north of Pt. Estero approximately 2-3 miles. Boat access: Morro Bay boat ramp (~ 15 miles to south).	Wave-cut platform.	Harbor Seals, Sea Otters			Private Property

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ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-110-B	Pt. Estero Rocky Intertidal	From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to ½ mile south of Villa Creek bridge. From south, take Hwy 101 north to Hwy 1 north, Morro Bay exit in SLO. Site is ½ mile south of Villa Creek bridge. Access from Villa Creek Ranch. Boat access: Morro Bay boat ramp (~ 15 miles to south).	Wave-cut platform.	Harbor Seals, Sea Otters			Private Property
4-115-A	Villa Creek Inlet	From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south. Property is just north of Villa Creek. From south, take Hwy 101 north to Hwy 1 north, Morro Bay exit in SLO. Site is north of Villa Creek. Boat access: Morro Bay boat ramp (~ 15 miles to south).	Villa Creek Inlet is subject to ephemeral flow. Minor marsh behind beach. Creek mouth bordered by rocky platform.	Sea Otters	Brown Pelican, shorebirds, seabirds	Tidewater Goby, wetland with pickleweed and saltgrass	Private Property Cayucus Abalone Farm just north of creek with water intake pipeline Land 3.5 miles south of creek owned by Trust for Public Lands
4-120-B	Cayucos Point & San Geronimo Creek	From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to Cayucos Point. Gate is across from San Germino Rd off Hwy 1. From south, take Hwy 101 north to Hwy 1 north, Morro Bay exit in SLO. Gate is 2 miles north of Cayucos Dr. exit on Hwy 1. Boat access: Morro Bay boat ramp (~ 8 miles to south).	Wave-cut platform. Mixed sand and gravel pocket beaches in between rocky platforms.	Sea Others, Harbor Seals	Brown Pelicans, American Black Oyster Catchers, Grebes, Pigeon Guillemots	Rocky intertidal tide pool habitat including Villa Creek and San Geronimo Creek	Private property used for cattle grazing Land 3.5 miles south of Villa Creek owned by Trust for Public Lands
4-125-A	Cayucos Creek	From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to Cayucos Drive. From south, take Hwy 101 north to Hwy 1 north, Morro Bay exit in SLO. Take Cayucos Drive exit and follow road to end. Boat access: Morro Bay boat ramp (~ 10 miles to south).	Creek is fronted by sandy beach and there is a minor saltwater marsh landward of the bridge.	Sea Otters, Harbor Seals	Brown Pelicans, Coots, Surf Scoters, Cormorants, seabirds, shorebirds	Tidewater Goby, Steelhead Trout	High recreational use area Owned by State Dept. of Parks and Rec. but managed by SLO County Parks and Rec.
4-130-A	Morro Strand State Beach, North	From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to 24th Street exit in Cayucos. From south, take Hwy 101 north to Hwy 1 north, Morro Bay exit in SLO. Take 24th Street exit to Morro Strand State Beach. Boat access: Morro Bay boat ramp (~ 5 miles to south).	Fine to medium grained sandy beach with rocky platform to the north and offshore rocks.	Sea Otters	Brown Pelicans, Marbled Godwits, Willets, Western Snowy Plovers, sandpipers, gulls	Willow Creek, archaeological sites	Highly utilized beach Proposed critical habitat for Western Snowy Plover by USFWS

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ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-135-A	Toro Creek	From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south. From south, take Hwy 101 north to Hwy 1 north, Morro Bay exit in SLO. Creek is across from Estero Bay Marine Terminal, approximately 5 miles north of Morro Bay. Vehicle beach access: across from Estero Marine Terminal, through locked area. Boat access: Morro Bay boat ramp (~ 5 miles to south).	Creek mouth opens just seaward of the marine terminal. Morro Strand State Beach is medium to coarse grained sandy beach.	Sea Otters	Brown Pelicans, Marbled Godwits, Willets, Western Snowy Plovers, sandpipers, gulls	Southwestern Pond Turtles, Tidewater Goby, archaeological sites	Highly utilized beach Proposed critical habitat for Western Snowy Plover by USFWS
4-140-A	Morro Strand State Beach, South	From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to Yerba Buena St. From south, take Hwy 101 north to Hwy 1 north, Morro Bay exit in SLO to Yerba Buena St. in Morro Bay. Vehicle beach access: can drive over dune vegetation. Boat access: Morro Bay boat ramp (~ 2 miles to south).	Fine to medium grained sandy beach.	Sea Otters	Brown Pelicans, Marbled Godwits, Willets, Western Snowy Plovers, sandpipers, gulls	Pismo Clam, California Grunion, archaeological sites	Highly utilized beach Designated critical habitat for Western Snowy Plover
4-145-A	Morro Bay Strand Beach (Pismo Clam Preserve)	From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to Main St. exit, turn right onto Beach St to Embarcadero, turn right to Coleman Park. From south, take Hwy 101 north to Hwy 1 north, Morro Bay exit in SLO to Morro Bay Blvd exit, west to Embarcadero St to Coleman Park. Vehicle beach access from Coleman Park Boat access: Morro Bay boat ramp (~1 miles to south).	Fine to medium grained sandy beach.	Sea Otters	Brown Pelicans, Curlews, Sanderlings, Willets, Western Snowy Plovers	Pismo Clam, California Grunion, archaeological sites	Designated critical habitat for Western Snowy Plover
4-150-A	Morro Rock Ecological Reserve	From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to Main St. exit, turn right onto Beach St to right on Embarcadero which turns into Coleman Drive and leads to rock. From south, take Hwy 101 north to Hwy 1 north, Morro Bay exit in SLO to Morro Bay Blvd exit, west to Embarcadero St which turns into Coleman Dr. and leads to rock. Boat access: Morro Bay boat ramp down Embarcadero St.	Rock is a bird sanctuary.	Harbor Seals, California Sea Lions, Sea Otters	Breeding pair of Peregrine Falcons, Brandts and Pelagic Cormorants, Pigeon Guillemots, Western Gulls		

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ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-200-A	Morro Bay Inlet	From south, take Hwy 101 north to Morro Bay exit, to Morro Bay Blvd. exit, go west to Embarcadero St which turns into Coleman Dr, turn into Coleman Park. From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to Main St. exit and turn right on Beach St. to Embarcadero, turn right and continue as per directions from south. Boat access: Morro Bay boat ramp down Embarcadero St.	Large expanse of salt marshes, tidal flats, and eel grass beds.	Harbor Seals, Sea Otters	Brown Pelicans, Black Rails, California Least Terns, Western Snowy Plovers, shorebirds, waterfowl and seabirds Integral part of the Pacific Flyway	Steelhead Trout, surf perch, sole, halibut, striped bass, Salt Marsh Bird's Peak	High use area Water intakes
4-205-A	Morro Bay Cannery Natural Eddy	From south, take Hwy 101 north to Morro Bay exit, to Morro Bay Blvd. exit, to Main St. and left. From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to Main St. exit and turn right. Boat access: Morro Bay boat ramp down Embarcadero St.	Natural catchment area.				
4-210-A	Inn at Morro Bay Natural Eddy	From south, take Hwy 101 north to Morro Bay exit, to Morro Bay Blvd. exit, to Main St. and left and turns into State Park Rd. From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to Main St. exit and turn right and per directions from south. Boat access: Morro Bay boat ramp down Embarcadero St.					Marina
4-215-A	State Park Marina, Morro Bay	From south, take Hwy 101 north to Morro Bay exit, to Morro Bay Blvd. exit, to Main St. and left and turns into State Park Rd. Marina is across from golf course. From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to Main St. exit and turn right. Boat access: Morro Bay boat ramp down Embarcadero St.					
4-220-A	Morro Bay Marsh Habitat	From south, take Hwy 101 north to Morro Bay exit, to Morro Bay Blvd. exit, to Main St. and left and turns into State Park Rd. Trail to marsh across from golf course. From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to Main St. exit and turn right and per directions from south. Boat access: Morro Bay boat ramp down Embarcadero St. Foot access: State Park Marina, south end of parking lot is foot path to mudflats.	Extensive marsh dominated by pickleweed with saltgrass and jaumea.		Shorebirds, seabirds, and water fowl, California Least Terns and Black Rail	Salt Marsh Bird's Beak	

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4-225-A	Chorro Creek	From south, take Hwy 101 north to Morro Bay exit, to Morro Bay Blvd. exit, to Main St. and left and turns into State Park Rd. Trail to marsh across from golf course. From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to Main St. exit and turn right and per directions from south. Boat access: Morro Bay boat ramp down Embarcadero St. Foot access: State Park Marina, south end of parking lot is foot path to mudflats.	Riparian habitat, fresh water to the estuary.		California Black Rail, numerous birds associated with riparian habitat	Steelhead Trout, Tidewater Goby, Three-Spined Stickleback, Prickly Sculpin, Southwestern Pond Turtle, Red-legged Frog	Area of special biological importance
4-230-A	Los Osos Creek	From south, take Hwy 101 north to Morro Bay exit, to Morro Bay Blvd. exit, to Main St. and left and turns into State Park Rd. Trail to marsh across from golf course. From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to Main St. exit and turn right and per directions from south. Boat access: Morro Bay boat ramp down Embarcadero St. Foot access: State Park Marina, south end of parking lot is foot path to mudflats.	Riparian habitat, fresh water to the estuary.		California Black Rail, numerous birds associated with riparian habitat	Steelhead Trout, Tidewater Goby, Three-Spined Stickleback, Prickly Sculpin, Southwestern Pond Turtle, Red-legged Frog	
4-235-A	Sweet Springs Marsh	From south, take Hwy 101 north to Los Osos Valley Rd (LOVR) exit, continue 10 miles on LOVR and right on 9th St, then left on Romona Ave. From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to South Bay Blvd. exit and continue on South Bay Blvd. turn right on Santa Ysabel to 7th St., turn left on 7th and then right on Romona. Boat access: Morro Bay boat ramp down Embarcadero St Foot access: existing foot path to shoreline.	Two freshwater, spring-fed ponds.			Red-legged Frog, Saltmarsh Bird's Beak, Southwestern Pond Turtle	
4-240-A	Cuesta by the Sea Inlet	From south, take Hwy 101 north to Los Osos Valley Rd (LOVR) exit, continue 10 miles on LOVR and right on Dorris. From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to South Bay Blvd. exit and continue on South Bay Blvd. turn right on Santa Ysabel to 7th St., turn left on 7th and then right on Romona, right on Lupine. Boat access: Morro Bay boat ramp down Embarcadero St.					Residential area

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ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-300-A	Morro Bay Sand Spit	From south, take Hwy 101 north to Los Osos Valley Rd (LOVR) exit, continue 10 miles on LOVR until it turns into Pecho Valley Rd. 2 miles to "Sand Spit Beach Access Day Use Area" turn off. From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to South Bay Blvd. exit and continue on South Bay Blvd. to LOVR, continue as per directions from south. Boat access: Morro Bay boat ramp down Embarcadero St.	Fine to medium grained sandy beach.	Harbor Seals, Sea Otters	Brown Pelicans, Peregrine Falcons, Surf Scoters, loons, grebes	Pismo Clams, Morro Bay Kangaroo Rat, Black Legless Lizard, Banded Dune Snail, Morro Bay Blue Butterfly, archaeological sites.	Morro Bay Natural Preserve within Montana De Oro State Park Designated critical habitat for Western Snowy Plover
4-305-A	Morro Dunes Ecological Reserve	From south, take Hwy 101 north to Los Osos Valley Rd (LOVR) exit, continue 10 miles on LOVR until it turns into Pecho Valley Rd. 2 miles to "Sand Spit Beach Access Day Use Area" turn off. From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to South Bay Blvd. exit and continue on South Bay Blvd. to LOVR, continue as per directions from south. Boat access: Morro Bay boat ramp down Embarcadero St.	Fine to medium grained sand back-dunes, highly vegetated.			Morro Bay Kangaroo Rat, Morro Manzanita, Morro Blue Butterfly, Morro Shoulderband Snail	Within Montana De Oro State Park
4-310-A	Islay Creek	From south, take Hwy 101 north to Los Osos Valley Rd (LOVR) exit, continue 10 miles on LOVR until it turns into Pecho Valley Rd. to the end of Spooners Cove From north, take Hwy 101 south to Hwy 46 west to Hwy 1 south to South Bay Blvd. exit and continue on South Bay Blvd. to LOVR, continue as per directions from south. Boat access: Morro Bay boat ramp down Embarcadero St.		Sea Otters	Brown Pelicans, Pigeon Guillemots, shorebirds, seabirds	Black Legless Lizard, archaeological sites	Within Montana De Oro State Park
4-315-A	Lion Rock	From south, take Hwy 101 north to Avila Beach Dr. exit, Avila Beach Dr. almost to end at PG&E Diablo Canyon Nuclear Power Plant. From north, take Hwy 101 south to Avila Beach exit, San Luis Bay Dr. to stop sign and right on Avila Beach Dr., continue as per directions from south. Boat access: from Port San Luis Hartford Pier.	Offshore rock.	Harbor Seals, California Sea Lions, Steller Sea Lions, Sea Otters	Brown Pelicans, Western Gulls, Pigeon Guillemots, American Black Oyster Catchers, cormorants		
4-320-A	PG&E Nuclear Power Plant	From south, take Hwy 101 north to Avila Beach Dr. exit, Avila Beach Dr. almost to end at PG&E Diablo Canyon Nuclear Power Plant. From north, take Hwy 101 south to Avila Beach exit, San Luis Bay Dr. to stop sign and right on Avila Beach Dr., continue as per directions from south. Boat access: from Port San Luis Hartford Pier. Foot access: to outfall via stairs to pocket gravel beach.	Wave-cut platforms, offshore rocks, small pocket gravel beach.	Harbor Seals, California Sea Lions, Steller Sea Lions, Sea Otters, Elephant Seals	Brown Pelicans, Pigeon Guillemots, American Black Oyster Catchers, cormorants, gulls		Power plant water intake system

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ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-325-B	Deer Canyon	From south, take Hwy 101 north to Avila Beach Dr. exit, Avila Beach Dr. almost to end at PG&E Diablo Canyon Nuclear Power Plant. Check in with security and take main road 5.1 miles to bluff area for foot path access trail. From north, take Hwy 101 south to Avila Beach exit, San Luis Bay Dr. to stop sign and right on Avila Beach Dr., continue as per directions from south. Boat access: from Port San Luis Hartford Pier.	Wave-cut platform.	Sea Otters, Harbor Seals			On PG&E property
4-330-B	Pecho Rock	From south, take Hwy 101 north to Avila Beach Dr. exit, Avila Beach Dr. almost to end at PG&E Diablo Canyon Nuclear Power Plant. Check in with. From north, take Hwy 101 south to Avila Beach exit, San Luis Bay Dr. to stop sign and right on Avila Beach Dr., continue as per directions from south. Boat access: from Port San Luis Hartford Pier.	Offshore rock.	California Sea Lions, Sea Otters, Harbor Seals	Brown Pelicans, Pigeon Guillemots, Western Gulls, Pelagic and Brandts Cormorants		
4-335-A	Port San Luis Breakwater	From south, take Hwy 101 north to Avila Beach Dr. exit, Avila Beach Dr. to end at Port San Luis parking. Check in with. From north, take Hwy 101 south to Avila Beach exit, San Luis Bay Dr. to stop sign and right on Avila Beach Dr., continue as per directions from south. Boat access: from Port San Luis Hartford Pier.	Rip-rap, wave-cut platforms.	Harbor Seals, Sea Otters	Brown Pelicans, gulls, cormorants		Small harbor with ~ 300 moorings
4-340-A	San Luis Obispo Creek	From south, take Hwy 101 north to Avila Beach Dr. exit, Avila Beach Dr. to end at Port San Luis parking. Check in with. From north, take Hwy 101 south to Avila Beach exit, San Luis Bay Dr. to stop sign and right on Avila Beach Dr., continue as per directions from south. Boat access: from Port San Luis Hartford Pier.	Fringe marsh, tidal flat, and small lagoon, rip-rap on east side of creek.		Brown Pelicans, Red-necked Grebe, terns, egrets, herons, cormorants, shorebirds, seabirds	Steelhead Trout, Tidewater Goby, Southwestern Pond Turtle, Red-legged Frog	Highly utilized beach
4-345-A	Avila Rock	From south, take Hwy 101 north to Avila Beach Dr. exit, Avila Beach Dr. to town of Avila and turn left on San Miguel St. to Front St. to the beach From north, take Hwy 101 south to Avila Beach exit, San Luis Bay Dr. to stop sign and right on Avila Beach Dr., continue as per directions from south. Boat access: from Port San Luis Hartford Pier.	Offshore rock, high energy rocky shoreline.	California Sea Lions, Sea Otters	Brown Pelicans		

Table 5-5. Natural, Cultural, and Economic Resources Cited in ACP

ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-400-A	Bird Rock &Rocks Offshore Margo Dodd Park	From south, take Hwy 101 north to Price St. exit in Pismo Beach, head north on Price to Cliff Ave., turn left and go to Margo Dodd Park off Cliff at the south end of Pismo Beach. From north, take Hwy 101 south to Price St. exit in Pismo Beach., continue as per directions from south. Boat access: from Port San Luis Hartford Pier (10 miles north).	Offshore rock, high energy rocky shoreline, pocket gravel beach fronting rocks.	Sea Otters	Brown Pelicans, Brandts Cormorants	Offshore rocks are part of the Coastal National Monument under jurisdiction of the BLM.	Residential area
4-405-B	Rocky Intertidal – Shell Beach	From south, take Hwy 101 north to Price St. exit in Pismo Beach, head north on Price with access by foot path at Shelter Cove Best Western. From north, take Hwy 101 south to Price St. exit in Pismo Beach., continue as per directions from south. Boat access: from Port San Luis Hartford Pier (15 miles north).	Rocky platform bordered by pocket gravel beach, some rip rap on beach, high energy rocky shoreline.	Harbor Seals, Sea Otters			
4-410-A	Pismo Creek (upstream)	From south, take Hwy 101 north to Price Canyon Rd. exit in Pismo Beach, head north on PCR., turn right on PCR and go 4 miles to Stocker Resources facility From north, take Hwy 101 south to PCR exit in Pismo Beach., turn left on PCR, continue as per directions from south. Boat access: from Port San Luis Hartford Pier (10 miles north).	Creek with lush vegetation.			Steelhead Trout, Tidewater Goby, Prickly Sculpin, Brown Bullhead, Southwestern Pond Turtle, Red-legged Frog	
4-415-A	Pismo Creek	From south, take Hwy 101 north to Pismo Beach (PCR) exit, head straight onto Dolliver St. and right on Addie St. to end. From north, take Hwy 101 south to PCR exit in Pismo Beach., left on Dolliver, continue as per directions from south. Boat access: from Port San Luis Hartford Pier (15 miles north).	Estuary.	Harbor Seals, Sea Otters, California Sea Lions	Gulls, terns, yellowlegs, herons, egrets, rails, Western Snowy Plover,	Tidewater Goby, Steelhead Trout, Southwestern Pond Turtle, Pismo Clam, archaeological sites	
4-420-A	Pismo State Beach	From south, take Hwy 101 north to Grand Ave. exit in Arroyo Grande, head west 3 miles to Pacific Blvd., go south 1 mile to Pier Ave., right to beach access, Grand Ave. is northern beach access. From north, take Hwy 101 south to Price Canyon Rd exit, left on Dolliver which turns into Pacific Blvd. at Grand Ave., continue to Pier Ave., right to beach. Boat access: from Port San Luis Hartford Pier (15 miles north).	Fine to medium grained sandy beach.	Harbor Seals, Sea Otters	Brown Pelicans, Western Snowy Plovers, Black-Crowned Night Herons, Surf Scoters, seabirds, shorebirds	Beach Spectacle Pod, Soft-leaved Indian Paint Brush, Pismo Clam, California Grunion, archaeological sites	Southern section proposed critical habitat for Western Snowy Plover

Table 5-5. Natural, Cultural, and Economic Resources Cited in ACP

ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-425-A	Arroyo Grande Creek Inlet	From south, take Hwy 101 north to Grand Ave. exit in Arroyo Grande, head west 3 miles to Pacific Blvd., go 1 mile to Pier Ave., right to beach access, creek is ½ mile south on beach. From north, take Hwy 101 south to PCR exit in Pismo Beach., left on Dolliver which turns into Pacific Blvd. at Grand Ave., continue to Pier Ave., right to beach. Boat access: from Port San Luis Hartford Pier (15 miles north).	Creek, wetland leads to Pismo Lake Natural Reserve, fine to medium grained relatively flat sand beach.		Western Snowy Plovers, herons, egrets, rails, sandpipers, grebes, dabbling and diving ducks	Pismo Clam, Steelhead Trout, archaeological sites	Part of Ocean Dunes State Vehicular Recreation Area Only creek in SLO with flood control device Highly used recreational area
4-430-A	Oceano Dunes State Vehicular Recreation Area	From south, take Hwy 101 north to Grand Ave. exit in Arroyo Grande, head west 3 miles to Pacific Blvd., go 1 mile to Pier Ave., right to beach access. From north, take Hwy 101 south to PCR exit in Pismo Beach., left on Dolliver which turns into Pacific Blvd. at Grand Ave., continue to Pier Ave., right to beach. Boat access: from Port San Luis Hartford Pier (15 miles north).	Fine to medium grained sandy beach.	Harbor Seals, Sea Otters	Brown Pelicans, Western Snowy Plovers, Black Crowned Night Herons, gulls, terns, sandpipers, Willets, California Least Terns	Pismo Clam, California Grunion,	Highly used recreational area Proposed critical habitat for Western Snowy Plover Southern end – Pismo Clam Preserve
4-435-A	Oso Flaco Creek	From south, take Hwy 101 north to Halcyon Rd. exit in Arroyo Grande, head west 3 miles to Pacific Blvd., go straight and turn left on Hwy 1, right on Oso Flaco Lake Rd., 3 miles to Conservancy gate. From north, take Hwy 101 south to Hwy 166 exit in Santa Maria., take Hwy 166 to right on Hwy 1., continue per directions above. Boat access: from Port San Luis Hartford Pier (30 miles north).	Fine to medium grained sandy beach.	Sea Otters	Brown Pelicans, Western Snowy Plovers, Black-Crowned Night Herons, Great Blue Herons, California Least Terns, Marbled Godwits, Willets, seabirds, shorebirds	Mimic Tryonia, La Graciosa Thistle, Surf Thistle, Crisp Monardella, Beach Spectacle Pod, Soft-leaved Indian Paint Brush, Short-lobed Broomrape, Marsh Sandwort	Owned and managed Oceano Dunes State Vehicular Recreation Area Proposed critical habitat for Western Snowy Plover
4-440-A	Pismo-Oceano Beach Clam Preserve & USFWS Guadalupe Nipomo Dunes Refuge	From south, take Hwy 101 north to Grand Ave. exit in Arroyo Grande, head west 3 miles to Pacific Blvd., go 1 mile to Pier Ave., right to beach access, Grand Ave. is northern beach access. From north, take Hwy 101 south to PCR exit in Pismo Beach., left on Dolliver which turns into Pacific Blvd. at Grand Ave., continue to Pier Ave., right to beach. Boat access: from Port San Luis Hartford Pier (15 miles north).	Fine to medium grained sandy beach.	Sea Otters	Brown Pelicans, Western Snowy Plovers, California Least Terns, Surf Scoters, Sanderlings, Willets, seabirds, shorebirds	Surf Thistle, Crisp Monardella	Part of Pismo-Oceano Pismo Clam Preserve and Nature Conservancy Proposed critical habitat for Western Snowy Plover

Table 5-5. Natural, Cultural, and Economic Resources Cited in ACP

ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-445-A	Guadalupe Oil Field	From south, take Hwy 101 north to Halcyon Rd. exit in Arroyo Grande, head west 3 miles to Pacific Blvd., go straight and turn left on Hwy 1, 8 miles to Thornberry Rd., right 1 mile to Unocal gate. From north, take Hwy 101 south to Hwy 166 exit in Santa Maria., take Hwy 166 to right on Hwy 1, left on Thornberry Rd. after bridge, continue per directions above. Boat access: from Port San Luis Hartford Pier (40 miles north).	Fine to medium grained sandy beach, high energy beach.	Harbor Seals, Sea Otters, Pacific Bottlenose Dolphin, California Sea Lions	Brown Pelicans, Western Snowy Plovers, California Least Terns, California Gull, Double Crested Cormorant, Long-billed Curlew, California Horned Lark, seabirds, shorebirds	Crisp Monardella, California Horned Lizard, Silvery Legless Lizard	Proposed critical habitat for Western Snowy Plover
4-450-A	Santa Maria River	From south, take Hwy 101 north to Halcyon Rd. exit in Arroyo Grande, head west 3 miles to Pacific Blvd., go straight and turn left on Hwy 1, 10 miles to Main St. in Guadalupe, right 1.2 miles to lot. From north, take Hwy 101 south to Hwy 166 exit in Santa Maria., take Hwy 166 all the way to beach parking lot. Boat access: from Port San Luis Hartford Pier (40 miles north).	365-acre wetland, north and south of river mouth sandy beaches from fine to medium to coarse grained sand beaches backed by sand dunes.	Sea Otters	Brown Pelicans, Western Snowy Plovers, California Least Terns, waterfowl, shorebirds	Steelhead Trout, Tidewater Goby, Red-legged Frog, La Graciosa Thistle	Proposed critical habitat for Western Snowy Plover
4-505-A	Pt. Sal	From Hwy 1 west of Santa Maria, take Brown Rd. west to dirt and tarmac Pt. Sal Rd., head west to parking lot, steep stairs to beach. Note –road may be impassable in winter.	Exposed rock cliffs, wave-cut platforms, cliffs with rock pinnacles, high energy.	Northern Elephant Seals, Harbor Seals, California Sea Lions, Steller Sea Lions, Northern Fur Seals	Pigeon Guillemots, Rhinoceros Auklets, Pelagic Cormorants, Western Gulls	Red and Black Abalone, Rock Crab, archaeological sites	
4-510-A	Shuman Creek	Via Vandenberg Air Force Base. Access from parking lot at Minute Man Point.	Narrow channel through costal dunes, small wetland, fine grained sand beaches and sand dunes.		California Least Terns, Western Snowy Plovers, waterfowl, shorebirds, seabirds	Tidewater Goby, Steelhead Trout	
4-515-A	San Antonio Creek	Via Vandenberg Air Force Base. Access to creek mouth is by foot & possibly ATV. Call Air Base for access at 805-606-3911 or 805-606-9961.	Creek and lagoon, fine to medium grained sand beaches.		Brown Pelicans, California Least Terns, Western Snowy Plovers, waterfowl, shorebirds, seabirds	Tidewater Goby, Unarmored Three-spined Stickleback	
4-520-A	Lion's Head, to Purisima Pt: North	Via Vandenberg Air Force Base. Call Air Base for access at 805-606-3911 or 805-606-9961.	Fine-grained sand beach backed by sand dunes.	Harbor Seals	Brown Pelicans, Western Snowy Plovers	Grunion, Surf Perch, Salmon, Pismo Clams	

Table 5-5. Natural, Cultural, and Economic Resources Cited in ACP

ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-525-A	Purisima Point	Via Vandenberg Air Force Base. Call Air Base for access at 805-606-3911 or 805-606-9961.	Exposed wave-cut platforms with gravel and sand gravel beaches backed by extensive sand dunes and rock cliffs.	Harbor Seals, Sea Otters	California Least Terns, Brown Pelicans, cormorants	Red and Black Abalone	
4-540-A	Santa Ynez River	From Lompoc: take Hwy 246 west 10 miles to Ocean Beach County Park.	Lagoon includes 400 acres of fresh and salt water marshes, fine to medium grained sand beaches backed by vegetated dunes.		California Least Terns, Brown Pelicans, Western Snowy Plovers, Peregrine Falcons, Sharp-shinned Hawks, Black Shouldered Kites, Willow Flycatchers, seabirds, waterfowl	Steelhead Trout, Tidewater Goby	
4-550-A	Ocean (Wall and Surf) Beach	Permission required for access via Vandenberg Air Force Base. This is an approximately 6 mile long stretch of beach. North of the Santa Ynez River is know as “Wall Beach” and south of the Santa Ynez River is known as “Surf Beach”.	Wide open coastal unprotected medium grained sand beaches.		California Least Tern and Western Snowy Plover		
4-555-A	La Honda Creek	Permission for access required from Vandenberg Air Force Base. Access to creek mouth is by foot & possibly ATV along trail at south end of site. Call Air Base for access at 805-606-3911 or 805-606-9961.	Narrow creek, with small coastal lagoon & wetland. Pocket beach of medium to coarse-grained sand. Steep dunes to north; steep cliffs to south.	Sea Otters	Waterfowl, wading birds	Tidewater Goby, wetland biota/vegetation	Vandenberg Air Force Base
4-560-A	Pt Pedernales & Point Arguello	Call Vandenberg Air Force Base for information. Access at south end of site ("Boat House") but very limited elsewhere. Call Air Base for access at 805-606-3911 or 805-606-9961.	Exposed rock cliffs, wave-cut platforms, fine to medium-grained sand beaches, mixed sand & gravel beaches (many are pocket beaches). Offshore wash rocks.	Sea Otters, Harbor Seals	Brown Pelican, Pigeon Guillemot, Rhinoceros Auklet, Pelagic Cormorant, Western Gull, Black Oystercatcher, shorebirds	Intertidal biota, incl. Red & Black Abalone	Vandenberg Air Force Base

Table 5-5. Natural, Cultural, and Economic Resources Cited in ACP

ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-565A	Jalama Creek	Off Hwy 1, Jalama Rd to Jalama Beach County Park.	Moderate sized creek with ~ 150 ft wide mouth. Cobble fields, often covered by fine-grained sand in Summer and Fall, surround the creek mouth. North & south of creek is a wide "crescent beach" bounded by rocky headlands.	Sea Otters, Harbor Seals	Brown Pelicans, Snowy Plovers, waterfowl	Steelhead Trout, Tidewater Goby, Southwestern Pond Turtle, Red-legged Frog	State Park
4-567-A	Point Conception & Government Point	From Hwy 1, Jalama Road to Bixby Ranch. Private access, permission necessary 805-736-7300.	Exposed rocky cliffs.	Seal pupping	Bird nesting		Private property
4-570-A	Damsite Canyon Creek	From Hwy 1, Jalama Road to Bixby Ranch. Private access, permission necessary 805-736-7300.	Small intermittent creek emptying onto medium grained sand beach			Wetland biota and habitat	Private property
4-572-B	San Augustine Creek	San Augustine Creek is on Hollister Ranch property. The site extend up the watershed from the culvert discharge point, on the beach, to the culverts on the main road east of MP 18	This is an intermittent creek.	Sea otters and pinnipeds occur in nearshore waters.	Yellow Warblers occur in terrestrial areas.	Red-legged frogs, and Western Pond Turtles	
4-575-A	Arroyo El Bolito	From Highway 101, Gaviota State Park access to Rancho Road. Private access, permission required. 805-567-5020 X16 or 805-567-5016.	Fine to medium sand beach	Sea Otters	Snowy Plovers,		Private property
4-580-A	Canada de Santa Anita (Creek)	From Highway 101, Gaviota State Park access to Rancho Road. Private access, permission required. 805-567-5020 X16 or 805-567-5016.	Mouth of creek, wetland, sand beaches	Sea Otters	Brown Pelicans, Snowy Plovers, waterfowl	Steelhead Trout, Tidewater Goby	Private property
4-585-A	Canada de Alegria	From Highway 101, Gaviota State Park access to Rancho Road. Private access, permission required. 805-567-5020 X16 or 805-567-5016.	Creek mouth closed during dry season, medium and coarse grained sand beach	Sea Otters	Brown Pelicans, Snowy Plovers, waterfowl	Steelhead Trout, Tidewater Goby	Private property

Table 5-5. Natural, Cultural, and Economic Resources Cited in ACP

ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-590-A	Canada del Agua Caliente	From Highway 101, Gaviota State Park access to Rancho Road. Private access, permission required. 805-567-5020 X16 or 805-567-5016.	Creek mouth empties into small cover with fine and medium grain sand beach and cobble	Sea Otters		Tidewater Goby	Private property
4-601-A	Gaviota Creek	From Highway 101 to Gaviota State Park entrance approximately 30 miles west of Santa Barbara.	Largest creek along the coast, flows nearly all year. Fresh and saltwater marsh.	California Sea Lions, Harbor Seals, Elephant Seals, Sea Otters	Brown Pelicans, Snowy Plovers, waterfowl	Steelhead Trout, Tidewater Goby	State park, archaeological sites along terraced bluffs west of creek
4-605-C	Canada Del Alcatraz & Cementario Creeks	From Highway 101 exit at Mariposa Reina	Two small intermittent creeks located on a pocket beach.	Sea Otters	Brown Pelicans, Gulls and terns	Watering spot for Monarch butterflies.	
4-610-A	Refugio Creek	From Highway 101 to Refugio State Park entrance approximately 20 miles west of Santa Barbara.	Creek mouth and marsh, fine to medium grained sand beaches.	Sea Otters	Shorebirds, seabirds, waterfowl	Tidewater Goby	State park, archaeological sites in vicinity
4-613-A	Corral-Las Flores Creeks	From Highway 101 take El Capitan (Exit 117) on to Calle Real heading west. Approx. 0.41 miles from El Capitan exit, turn right on Calle Real.	Canyon creeks which extend upstream a distance of 1.3 miles		Red tailed hawk, American Kestrel	Bear, mountain lion deer, coyote	Cultural, historic and archaeological sites are known to exist.
4-615-A	El Capitan Creek	From Highway 101 exit at El Capitan state beach park. El Capitan beach state park covers 1.8 miles of shore line in the creek mouth.	El Capitan is a relatively small creek (15-30’ wide) that empties out onto a mixed sand gravel, cobble, boulder point.		Terns. Gulls, Brown Pelicans and shorebirds		Cultural, historic and archaeological sites are known to exist.
4-620-A	Las Llagas (El Capitan Ranch Beach)	From Highway 101 to Refugio State Park entrance approximately 20 miles west of Santa Barbara. This inlet is located in a small private gated beach community.	Small creek empties onto mixed sand and cobble beach.		Seabirds including Brown Pelicans	Wetland biota	State park, archaeological sites in vicinity
4-625-B	Naples	From Highway 101 west of Ellwood.	Wave cut rock platforms, sand and gravel beaches, reef offshore.	Harbor Seal pupping and haul-out, Sea Otters have been observed			Private property

Table 5-5. Natural, Cultural, and Economic Resources Cited in ACP

ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-630.-C	Eagle Canyon Creek	From Highway 101 and Hollister Ave. via road to Sandpiper Golf Course, Venoco, and Bacara Resort	Intermittent creek with seasonal lagoon, sand beaches	Sea Otters			Private property
4-635-A	Tecolote Creek	From Highway 101 and Hollister Ave. via road to Sandpiper Golf Course, Venoco, past Bacara Resort to Ellwood Pier access.	Small creek with ¼ acre lagoon, sand beaches	Sea Otters	Brown Pelicans, sea birds, shore birds, waterfowl	Wetland biota, Tidewater Goby, possibly Steelhead Trout	
4-640-A	Bell Canyon Creek	From Highway 101 and Hollister Ave. via road past Sandpiper Golf Course, to Venoco Ellwood Plant.	Moderate sized creek with well-developed lagoon, fine to medium grain sand beaches.	Sea Lion haul-out area, Sea Otters have been observed	Brown Pelicans, seabirds, shorebirds, waterfowl	Salt marsh vegetation, Tidewater Goby, possibly Steelhead Trout	
4-645-A	Devereaux Slough	From Highway 101, take Storke Road toward the ocean, turn right on Slough Road at Francisco Torres dormitory, follow west to end.	45 acre wetland, salt marsh and tidal. flats, sand beaches.	Sea Otters possible	Western Snowy Plovers, California Least Terns, sea birds, shorebirds, waterfowl	Wetland biota, including waterfowl and vegetation	Known archaeological sites nearby, Ecological Reserve, recreation
4-800-A	San Miguel Island - Pt Bennett	By boat or air.	Vertical rock cliffs, exposed wave-cut rock platforms, and medium to coarse-grained sand beaches.	Harbor Seals, Northern Fur Seals, Guadalupe Fur Seals, Sea Lions, poss. Sea Otters	Brandt's Cormorants, Western Gulls, Ashy Storm-Petrels, Pigeon Guillemots, Cassin's Auklets		Channel Islands National Park and Marine Sanctuary
4-806-A	San Miguel Island - East Simonton Cove	By boat or air.	Exposed wave-cut rock platforms.	Harbor Seals, Northern Elephant Seals, Sea Lions	Brandt's & Pelagic Cormorants, Western Gulls, American Black Oystercatchers, Snowy Plovers, Peregrine Falcons	Intertidal resources, including abalone	Channel Islands National Park and Marine Sanctuary
4-812-A	San Miguel Island - Cuyler Harbor	By boat or air.	Medium to coarse-grained sand beaches.		Snowy Plovers		Channel Islands National Park and Marine Sanctuary

Table 5-5. Natural, Cultural, and Economic Resources Cited in ACP

ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-813-A	San Miguel Island - Prince Island	By boat or air.	A large, steep sided rock pinnacle.		Brown Pelicans; Pelagic, Brandt's, & Double-crested Cormorants Western Gulls, American Black Oystercatchers, Pigeon Guillemots Ashy, Leach's & Black Storm-Petrels, Cassin's & Rhinoceros Auklets, Tufted Puffins		Channel Islands National Park and Marine Sanctuary
4-815-A	San Miguel Island - Bay Point	By boat or air.	Wave-cut rock platform.	Harbor Seals	Pelagic & Brandt's Cormorants Western Gulls, American Black Oystercatchers, Pigeon Guillemots		Channel Islands National Park and Marine Sanctuary
4-818-A	San Miguel Island – South Side	By boat or air.	Exposed wave-cut rock platforms and medium to coarse-grained sand beaches.	Common Dolphin, Harbor Seal	Asy strom petral, Pelagic cormorant. Western gull, and Western snowy plover	Intertidal resources include Black Abalone and surfgrass	Channel Islands National Park and Marine Sanctuary
4-820-A/B	Santa Rosa Island – South West Beaches	By boat or air.	Exposed wave-cut rock platforms, and medium to coarse-grained sand beaches, with some offshore rock pinnacles.	Harbor Seals Elephant Seals	Western Snowy Plovers, Brandt's & Pelagic Cormorants, American Black Oystercatchers, Western Gulls	Intertidal resources including Black Abalone	Channel Islands National Park and Marine Sanctuary
4-824-A	Santa Rosa Island – North Area	By boat or air.	Exposed wave-cut rock platforms, vertical rock cliffs, a few pocket sand beaches.	Harbor Seals, Calif. Sea Lions	Western Snowy Plovers, Pelagic Cormorants, American Black Oystercatcher, Pigeon Guillemots, Western Gulls	Intertidal resources including Pismo Clams and surfgrass beds	Channel Islands National Park and Marine Sanctuary
4-826-A	Santa Rosa Island – Arlington Canyon Lagoon	By boat or air.	Northwest side of island.	Harbor Seals, Calif. Sea Lions	Waterfowl, seabirds, and shorebirds	Wetland Biota	Channel Islands National Park and Marine Sanctuary

Table 5-5. Natural, Cultural, and Economic Resources Cited in ACP

ACP Site No.	Description (Site Name)	Access	Substrate	Marine Mammals	Birds	Other Natural Resources	Cultural and Economic Resources
4-829-A	Santa Rosa Island -Skunk Point Area	By boat or air.	Medium to coarse-grained sand beaches, and wave-cut rock platforms.	Harbor Seals, Calif. Sea Lions	Western Snowy Plovers, Pelagic Cormorants, American Black Oystercatcher, Pigeon Guillemots, Western Gulls	Intertidal resources including Pismo Clams and surfgrass beds	Channel Islands National Park and Marine Sanctuary
4-834-A	Santa Rosa Island - Lagoon (East Side)	By boat or air.	Lagoon & wetland.	Calif. Sea Lions, Common Dolphin	Waterfowl, seabirds, and shorebirds	Wetland Biota	Channel Islands National Park and Marine Sanctuary
4-844-A	Santa Rosa Island -South East Beaches	By boat or air.	Vertical rock cliff habitat with a few pocket sand beaches & wave-cut rock platforms.	Harbor Seals Calif. Sea Lions	Pelagic Cormorants		Channel Islands National Park and Marine Sanctuary

5.4 Source Control

A major consideration following detection of a release is to minimize the amount of material released to the environment. Therefore, identifying and stopping the release at its source is a high priority. Activating an Emergency Shut Down (ESD) shuts down processes and pipelines and automatically closes valves to minimize movement of material once a potential release is identified. The initial reconnaissance of the site will also attempt to identify the location and nature of the release to assist the IC and others to determine the most appropriate source control strategy. Key source control strategies include:

- Containing a release within existing containment structures
- Activating block valves to prevent the entire contents of a pipeline from being released
- Constructing berms or using sorbents or other materials to create barriers between the release location and sensitive resources
- Sealing or patching ruptures through which a release is occurring if and when this can be done safely
- Removing material from the vessel or pipe from which the release is occurring by using existing pipe and pump systems or an external source, such as a vacuum truck, to redirect material away from the point of release
- Creating negative pressure within the vessel or pipe from which the release is occurring by reversing pumps, using a vacuum truck, or sealing vents to prevent the inflow of air or vapor, if this can be done safely

5.5 Spill Volume Assessment, Movement, and Monitoring

A spill to water will spread and move according to the influence of wind and currents. Therefore, it is important to assess the volume, location, and future movement of a spill as soon as possible.

5.5.1 Estimating Spill Volume

As soon as possible following the detection of a release, it is important to establish an initial estimate of the amount of material released. This estimate is subject to revision upon further investigation, but should initially be a reasonably informed guess as to the volume of material released.

If the source of the spill is known, it may be possible to estimate the volume based on the known capacity of pipes or vessels from which the oil was released. However, absent a direct method for calculating the volume spilled, it may be necessary to rely on estimates derived from the appearance of the oil on water.

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

- Basic Definitions
  - **Sheen (Barely Visible, Silver Sheen, Slight Rainbow, Bright Rainbow):** The oil is visible on the water as a silvery sheen or as rainbow colors. This is the smallest thickness of oil.

- **Dark Colors (Dull Colors, Yellowish Brown, Light Brown):** The oil is visible with dark colors; it will still have traces of the rainbow color but is not black or dark brown.
- **Dark Brown or Black:** Fresh oil after the initial spreading will have a black or very dark brown color. This is the greatest thickness of non-emulsified oil.

- Estimating Procedures

1. Determine the area (A) of the slick using either of the two formulas as follows:

   Rectangle A = (L) x (W)
   Oval (Ellipse) or Circle A = (L) x (W) x (0.7854)

   Where A=Area, L=Length, W=Width. ***"A" is to be used in Volume Formula below.***

   If dimensions given in yards or miles, *convert to feet*: 1 yd = 3 ft., 1 mile = 5280 ft.

2. Determine the oil thickness ("T") based on the appearance of oil on water by using Table 5-5. Appearance will vary with oil spilled and environmental conditions at the time of the spill. **"T" is to be used in Volume Formula below.**

Table 5-6. Thickness Factors for Spill Volume Estimation

Oil's Appearance on Water	Approximate gallons/sq. ft.= "T"	
Barely Visible	0.00000098	$9.8x10^{-7}$
Silver Sheen	0.00000245	$2.45x10^{-6}$
Slight Rainbow	0.000003675	$3.675x10^{-6}$
Bright Rainbow	0.00000735	$7.35x10^{-6}$
Dull Colors	0.0000245	$2.45x10^{-5}$
Yellowish Brown	0.000245	$2.45x10^{-4}$
Light Brown	0.00245	$2.45x10^{-3}$
Dark Brown or Black	>0.00245	$>2.45x10^{-3}$

3. If the overall slick appearance varies significantly or is not continuous (broken up or in patches), estimate the percentage ("P") of each thickness/appearance variation**. "P" is to be used in Volume Formula below.**

If appearance is constant and coverage is 100% of area, "P" = 1. In example below with 60% Bright Rainbow and 40% Silver Sheen, "P" would equal 0.6 and 0.4 respectively.

4. Estimate of oil volume in water using the formula: **V = A x T x P**

Where A = Area (#1 above), T = Thickness (#2 above), P = Percentage (#3 above).

If volume is less than a gallon, to convert to fluid ounces use:

V (gal) x 128 fl. Oz per gal. = V (fl. Oz.).

If volume more than 42 gallons, also convert to barrels using:

V (gal) ÷ 42 gal. per barrel = V (bbls).

Example: 60% Bright Rainbow and 40% Silver Sheen over 0.5 mile by 40 feet area.

Area of Slick (A) = 0.5 miles x 40 feet = 2,640 feet x 40 feet = 105,600 feet
Thickness (T) = 0.00000735 and 0.00000245 respectively
Percentage (P) = 0.6 and 0.4 respectively

V_{br} =A x T_{br} x P_{br} = 105,600 x 0.00000735 x 0.6 = 0.4657 gallons (Bright Rainbow)

V_{ss} =A x T_{ss} x P_{ss} = 105,600 x 0.00000245 x 0.4 = 0.1035 gallons (Silver Sheen)

$V_{(total)}$= 0.4657 + 0.1035 = 0.5692 gallon. To convert: 0.5692 gal. x 128 = 72.9 fluid ounces

5.5.2 Estimating Spill Movement

The Surveillance Group is responsible for assessing the spill and determining its movement on the water. On-water predictions of spill trajectory will be made utilizing either a computerized trajectory model or manually generated trajectories. Methods for trajectory prediction are described in Appendix E. Path projections will continue to be generated, distributed, and corrected throughout the event. The Surveillance Group will receive input from any or all of the following:

- Visual observations (actual location and input conditions) from
  - Platforms
  - Aerial surveillance
  - Response vessels
  - Shoreline observers
  - Other vessels
- News photography
- Meteorological reports and forecasts including real-time reports can be provided by data gathered from the internet. See Appendix E.
- Location of tracking buoys released at the time of the spill
- Cooperative surveillance system (Radiometric Oil Spill Surveillance System [ROSSS])
- Aerial photography
- Any other reliable means

The Surveillance Group will provide its most current and reliable information and observations to the National Oceanic and Atmospheric Administration (NOAA) scientists and technicians upon direction of the Federal On-Scene Coordinator, who may authorize running the NOAA Trajectory Modeling Program.

5.5.2.1 Factors Affecting Slick Movement

The movement of spilled oil on the water depends on the effects of wind and surface currents at the site of the spill. Surface currents dominate slick movement unless winds are strong. Winds cause a slick to move at approximately 3% of the wind speed in the same general direction. When currents and strong winds are absent, spreading will dictate slick movement. However, even if only weak winds or surface currents are present, they will influence slick movement more than spreading.

5.5.2.2 Methods for Predicting Slick Movements

To determine the potential impacts of an oil spill and to aid in response operations, it is important to estimate the direction of oil slick movement. This permits forecasting potential landfall locations to identify where and what protective measures may be needed. Specific techniques for estimate spill trajectories are described in detail in Appendix E. This section summarizes these techniques to provide an overview of how spill movement will be predicted.

The initial direction of a slick's movement can be determined visually. Once the direction and speed of wind and current are known, a short-term projection can be made by performing a simple vector addition analysis.

In addition, representatives from the National Oceanic and Atmospheric Administration (NOAA), who are part of the Regional Response Team, are available to conduct trajectory modeling during a major spill event. The Company will utilize all suitable trajectory modeling capabilities during response to a spill event. As the response effort proceeds, more sophisticated predictions generated by the Regional Response Team's Scientific Support Coordinator using the NOAA Oil Spill Simulation Model (OSSM) may be utilized.

The general techniques for spill movement prediction are briefly discussed below in order of increasing sophistication.

- ***Visual.*** When daylight and weather conditions permit, it is possible to visually determine the initial direction of a slick's movement in relation to sensitive coastline. In the event of a major spill, every effort will be made to enhance visual surveillance activities by placing a knowledgeable observer in a helicopter or fixed wing aircraft.
- ***Vector Addition Analysis.*** A prediction of a slick's movement can be accomplished by vector addition of the two main motive forces that influence open ocean slick movements: surface currents and winds. Vector addition analysis is described more fully in Appendix E.
- ***NOAA GNOME.*** In addition to Vector Addition Analysis, NOAA's GNOME program (General NOAA Oil Modeling Environment) can estimate oil spill trajectories based on standard Santa Barbara Channel oceanographic data. GNOME is a PC-based computer model available for download on the internet which provides a probabilistic prediction of spill trajectory along with a visual map showing the potential impacts of an oil spill. The model

provides a graphic depiction of its probabilistic output showing "splots" of oil moving on a map and fixing those "splots" when they contact a shoreline. It provides for easy user input of actual and predicted wind speed and direction information and uses three common current regimes that have been identified for the Santa Barbara Channel, depending on the season. The GNOME model does not predict the actual path of a particular oil spill. It provides a probabilistic depiction of the range and potential spread of a specific amount of oil spilled in a specific location under the specified wind and current conditions. The graphic output shows what areas of shoreline are most likely to be contacted by oil *assuming no containment or cleanup occurs*. It therefore provides a worst case prediction of what areas *could be* affected by a spill without taking any response actions into account.

- ***NOAA OSSM.*** During a major oil spill, the Incident Command may request to have trajectory information generated by the NOAA OSSM computer model. Tides for the region, meteorological forecast data provided by the National Weather Service, a diffusion equation, and estimates weathering and evaporation of the slick, supplemented by on-scene observations, can be analyzed and the approximate location of the oil slick during future time intervals projected onto a digitized map of the region. Different simulations are possible as conditions at the spill site change. These trajectory maps can then be telefaxed to the scene or be directly accessed through a computer terminal (with printer), which would be linked to the NOAA trajectory computer.

5.5.2.3 Other Spill Monitoring and Prediction Information Resources

A considerable database of published oceanographic conditions within the Santa Barbara Channel Area is available in printed and electronic formats. These databases have been developed through ongoing governmental and institutional studies, as well as direct observations and recordings on fixed structures (buoys) and mobile vessels within the region. Such resources include the National Data Buoy Center (www.ndbc.noaa.gov/index.html) which provide wave, wind and water temperature data suitable for input to computer models or simple vector addition analysis.

5.6 Containment, Recovery, and Cleanup

Containment and recovery of spilled material before it reaches sensitive resources is preferable to, and much less costly than, cleaning up contaminated resources. Therefore, every effort must be made early in a spill response to contain and recover as much material as possible.

Minor spills in which no oil has escaped the facility will normally involve a response using company personnel and equipment stored at the site. Any spill in which oil is released off-site and impacts or threatens to impact marine waters or any other sensitive environment may involve additional equipment and manpower which will be provided by contractors and oil spill cooperatives (Clean Seas). Inventories of these equipment sources are listed in Appendix C.

5.6.1 Containment and Diversion

Containment and diversion are methods that can be used to prevent spilled material from migrating offsite or reaching sensitive resources. Preventing impacts is preferable to cleaning up after impacts have occurred. The costs are much less than cleaning up, both in terms of the cleanup effort itself and the restoration and compensation for damaged resources.

Containment involves confining spilled material to as small an area as possible so that it can be recovered before contacting sensitive resources. Containment can proceed even in the absence of cleanup equipment. A spill can be contained on water within a boom even though no skimming capacity is immediately available. A spill can be contained on land within an earthen berm, sorbent boom, or other barrier even with no equipment on hand to recover the material. Quick containment can minimize the effects of a spill and greatly reduce the costs of recovery by limiting its spread. Containment strategies differ depending on whether the oil is on water, a shoreline, or on land.

Diversion involves preventing spilled material from reaching a particularly sensitive resource by diverting the flow of material away from the resource. This can be accomplished on water by deploying boom to prevent oil from moving into a sensitive area or to guide spilled material around or away from a sensitive shoreline. On land, berms can be constructed or natural drainage routes toward sensitive resources can be blocked to divert the flow of material to a location where it can be contained or to an area where impacts would be lower if containment is not feasible.

5.6.1.1 On-Water Containment and Diversion

Initial oil spill containment efforts will typically be conducted by a Clean Seas oil spill response vessel (OSRV). Containment boom will normally be deployed by the OSRV as soon as possible following a full assessment of the site. Fishermen's Oilspill Response Team (FORT) boats may also be involved in deploying containment boom.

If additional equipment is needed, other Clean Seas OSRVs, co-operative OSRVs, or contract crewboats will provide transportation to an offshore spill site. As noted in Appendix C, Clean Seas and other cooperative vessels have extensive spill response equipment onboard, as well as

additional spill response equipment stored at their respective onshore bases. Trained personnel will man and deploy equipment from the respective co-op vessels.

Personnel safety is the highest priority. Under adverse conditions (sea states, tides, winds, or currents) or in the presence of impediments that could restrict response efforts or affect the safety of personnel, the decision to deploy equipment and personnel rests with the Captains of the respective vessels as regulated by maritime law.

Actions to remove spilled oil from the water should begin as soon as possible after containment actions have been initiated, assuming weather and sea conditions permit safe operations.

Shoreline Exclusion Booming

Shoreline exclusion booming involves deploying boom in a static mode. This method involves placing or anchoring the boom between two or more stationary points primarily to prevent oil from entering estuaries, inlets, wetlands, and stream deltas. Some of these entrances or channels may have tidal currents exceeding 1 knot or surf breaking in the opening. Placement should therefore be attempted on the landward side of the entrance away from heavy surf where current velocities drop. Sand bars commonly form in this area, and their presence should be considered in booming. Any deployment in a lagoon mouth situation will require constant monitoring and removal of accumulated oil and debris.

Exclusion booming is also used to protect stream deltas from contamination. Because the stream deltas normally extend beyond the mainland at low-tide, booms deployed around the perimeter of the delta will have to be anchored at several locations in the water as well as on the shoreline. If possible, the boom should be placed seaward from the low-tide line so that it will float throughout the full tide cycle. If the area requiring protection is too large, the boom should be deployed so that the delta above the mid-tide line is protected. If oil threatens or enters the wetland interior, it may be excluded or contained with conventional booms if depths are adequate. As currents in tidal channels are commonly high, diagonal positioning of the boom is necessary. Double booming of critical areas provides an additional measure of safety.

Shoreline Diversion Booming

Diversion booming is useful for protection of sensitive areas. It is likely that a spill headed toward a sensitive area can be diverted to another shoreline location that is less sensitive and/or is easier to clean-up. In addition, diversion booming should be used where the water current is greater than 1 knot. At this velocity, containment booming techniques tend to be ineffective because oil is either driven over or under the boom by the current. Diversion booms should be deployed at an angle from the shoreline closest to the leading edge of the approaching oil slick to deflect oil towards shore. Two methods of diversion booming can be used during containment operations:

- On shorelines where little or no surf is present, one end of the diverting boom is anchored to the shoreline and the free end is angled by a vessel. The oil diverted to the shoreline is

recovered by skimmers or vacuum trucks at the point where accumulation is heaviest, often from a pit dug into the sand.

- To protect a sensitive area when available booms are inadequate for exclusion booming and the first method of diversion booming is not feasible due to excessive currents or the size of the approaching slick, the boom is deployed in the same manner as described above, except that the free end is angled away from the slick. The oil is then diverted back out to sea such that it bypasses the sensitive area.

The length of boom required for diversion booming will depend on the width of the approaching slick and/or the area of shoreline to be protected. The angle at which the boom should be deployed will depend primarily on the shape and position of the approaching slick and the velocity of currents. The angle should also be adjusted if the surface current is such that the boom will not contain the oil. As the current increases, the free end of the boom should be moved toward the shoreline.

Boom Deployment and Shore Attachment

Operations in the nearshore area should not be attempted in dangerous surf. Generally, several hundred feet of boom will be required per location for shoreline containment and protection activities. In low surf conditions, booms can be deployed from the shoreline using a small workboat. One end of the boom is secured onshore, and the other end is towed into position by the workboat. Booms should be positioned so that the ends are above the high-tide line. This will enable the boom to act as a barrier throughout the entire tidal cycle. Sorbent materials (booms, sheets, or rolls) can be placed around the boom in the intertidal area of the shoreline connection to prevent oil from seeping through at these junctions, or the boom skirt can be buried or sandbagged for the same reason.

The boom end cable can be attached to a fixed point onshore, such as a piling, a sea wall, a block of concrete with an eye bolt, steel fence post, or a piece of heavy equipment. If there is no structure onshore to secure a boom, a large concrete block with an eyebolt on the topside or a steel post driven into the ground may be used as a simple boom anchor. Because of the weight needed, a concrete anchor block can only be used in locations where there is ready access for lifting equipment.

The onshore anchoring device can be a deadman, an anchoring device that is buried at right angles to the direction of maximum force. For example, a log about 12 inches in diameter and about 6 feet long can be buried at least 4 feet deep. A cable sling can be attached to the log and, in turn, the boom to the sling. If there is no timber available, a Danforth Anchor (greater than 40 pounds) can be buried in a similar fashion.

5.6.1.2 Land-Based Containment and Diversion

On land, containment generally involves preventing spilled oil from spreading down gradient and, ultimately, into creeks or the ocean. Containment on land can involve multiple strategies since a larger variety of equipment and drainage situations is possible. The Santa Barbara County Supplement (Vol. 2) to this plan describes appropriate strategies for land-based containment and is incorporated herein by reference. The following sections summarize the key land-based

containment strategies likely to be employed in a spill from PXP land-based facilities (pipelines, LOGP, and GOHF).

Containment Berms and Blocking Dams

An earthen or sandbag berm or dam can be constructed down gradient of a spill to capture spilled material and prevent further movement down gradient. A berm can be constructed manually or using heavy equipment (grader, dozer, tractor, excavator, etc.). The natural topography should be used to advantage, if possible. If the area is nearly flat, it may be necessary to move earth to create a low spot at a point where the spilled material will naturally flow and build up the berm around the low spot with sufficient earth to contain the material. Also, a natural *dry* drainage channel can be dammed by an earthen berm or sandbags to achieve the same end. The latter may be inadvisable if rain is possible unless the containment volume so created can accommodate both the spilled oil and any rainwater. Ideally, the berm or sandbags should be covered with plastic or other impermeable material to prevent seepage into the substrate. In addition, a double layer on the bottom separated by sorbent material is advisable, if possible.

Storm Drain Blocking

Storm drains generally lead to natural or man-made channels that enter creeks or the ocean. Therefore, a spill that enters a storm drain is very likely to reach sensitive resources unless it can be blocked. Storm drains can be blocked by placing plastic tarps, plywood sheets, or some other impermeable material over the drain opening and securing it with sandbags, dirt or other heavy material. Consideration should be given to the area within which the spilled material would be trapped by such a strategy to insure that there is sufficient volume available to prevent spillage from another location if the blocked area should overflow.

Culvert Blocking

Culverts under roads or other man-made structures (e.g. railroad rights of way) can be used to capture spilled material. The upstream or downstream mouth of the culvert is blocked off with plywood, sandbags, earth and secured with boards or other material to create a reasonably impermeable barrier to the flow of spilled oil. Plastic tarps or other material may be used to enhance the impermeability of the barrier.

Interception Trenches

If the natural substrate allows and appropriate excavation equipment is available, a trench may be excavated down gradient of the spill to capture the material. The trench (or series of trenches) needs to be sufficiently large to collect the volume of spilled material without overflowing. If possible, the trench should be lined to prevent migration of spilled material into the subsurface sediments or ground water.

5.6.2 Recovery and Cleanup

Recovery and cleanup involve removing spilled oil from the environment, either from land, water, or the beach. Many techniques are common to two or more of these locations. In addition, on-water cleanup methods depend on how deep the water is. Larger OSRVs cannot safely maneuver or deploy equipment is water less than six to ten feet deep. In addition, the surge of

waves breaking on the beach creates a difficult environment for both workers and equipment in shallow areas exposed to the swell. Therefore different techniques and smaller vessels are necessary for shallow water cleanup.

5.6.2.1 Deep Water Cleanup

Clean Seas is the local offshore oil spill response organization (OSRO). Clean Seas has oil spill response vessels (OSRVs) stationed along the coastline in proximity to major potential spill sources within their area of responsibility (from Cape San Martin in San Luis Obispo County to Point Dume in Los Angeles County).

Oil Spill Response Vessels (OSRVs)

OSRVs are designed to work in open ocean environments to contain and recover oil from the sea surface. Clean Seas maintains the OSRV ***Clean Ocean*** within the Point Arguello/Point Pedernales area. The ***Clean Ocean*** is the primary deep water response vessel for this area. An inventory of equipment on this OSRV is contained in Appendix C. Section 3000 of the Area Contingency Plan contains extensive descriptions of appropriate recovery and cleanup strategies suitable for implementation by larger OSRVs including skimmers and booms and techniques for their deployment. This appendix of the ACP is incorporated herein by reference. The following sections summarize the deep water cleanup techniques most likely to be needed if there is a spill from the Point Arguello/Point Pedernales facilities.

Open Water Containment Booming

Open water containment boom can be either air-filled or foam filled. The top chamber of the boom floats on the sea surface and has a weighted "skirt" that extends below the boom from the flotation chamber. The boom is deployed from one or more vessels ahead of the oil slick and can be looped around the slick to contain it within the boom and prevent its further spread. The oil is removed from within the boom by a separate skimmer or vessel equipped with an advancing skimmer.

High winds and waves can hamper the effectiveness of open water containment boom by splashing contained oil over the boom or forcing oil under the skirt. Also, boom cannot be towed through the water at greater than about one knot because the boom tends to ride over the oil and oil then escapes under the skirt. Boom in the water offers substantial resistance for the towing vessels. Vessels with adequate towing capacity are required to deploy open water boom.

Skimmers

Skimmers are available in a number of options described in (Section 3000) of the Area Contingency Plan. The following paragraphs briefly describe the major kinds of skimmers appropriate for use on Point Arguello/Point Pedernales facility spills.

- **Advancing Skimmers.** Advancing skimmers are generally integral to an OSRV. A short length of boom is extended from the vessel to direct oil to an inlet to the skimmer. As the vessel moves forward, oil is forces to accumulate in the apex of the boom where the skimmer

is located, thereby facilitating collection of the oil by increasing the amount of oil relative to water at the skimmer.

- **Sorbtion/Oleophilic Skimmers.** This type of skimmer uses materials that will retain a high percentage of oil minimizing the amount of water collected with the oil. The skimming devices can be belts, ropes, brushes or discs that come in contact with the oil. The device then will either wring or scrape the oil from the material into a collection point for removal to a storage tank. Some belt or brush skimmers are very effective in currents exceeding 2 knots and more aggressive sea conditions (see USCG publication - Oil Spill Response in Swift Currents - high velocity skimmers.)

Weir skimmers come in several configurations. Common to all is an inlet just below the water surface. Oil floating on the water is captured in the inlet along with some water. The oil/water mixture is pumped into holding tanks as it is collected. Screw-type skimmers can recovery oil with debris entrained because they can macerate debris so it does not clog the skimmer. These skimmers are not as efficient at separating oil from water as are brush skimmers.

Portable skimmers can be deployed within containment boom to recover the oil captured within the boom. They can also be deployed at an opening at the apex of two booms being towed between two vessels to recover oil that is forced into the apex. Typically, the collected oil is pumped to a storage barge or other vessel with containment tanks stationed near the apex.

5.6.2.2 Shallow Water Cleanup

A shallow water environment (generally water depths of 6 feet or less) presents unique problems for cleanup activities. Marine response vessels, even the smaller fast response boats, are designed for service in deeper waters and may not be able to safely access shallow areas due to the danger of damaging propellers or hulls on the shallow bottom or obstructions. Response in shallow marine waters can be further complicated by wave and tidal activity as well as other factors such as kelp growth and seafloor conditions (rocks, reefs, etc.).

Contained Spill in Shallow Water

If the spill is contained within a boom near the shore, several alternatives are available:

- **Pads/Absorbent Booms.** If the spill is small, the use of absorbent pads or booms to collect oil from the water surface may be sufficient. If the use of absorbent pads or booms is not feasible, then sump and pump operations or skimmers used in conjunction with other barriers may be attempted.

- **Skimmers.** Several types of skimmers are effective in a shallow water zone. In marine environments where the zone is free of kelp and other growth, belt skimmers may be effective. If the zone contains kelp beds, a skimmer with screw pump or other type of shredding device will reduce interruptions of cleanup efforts due to equipment fouling.

- **Shallow Draft Vessel.** Skimmers may be mounted on a minimum draft vessel. This type of barge may also be equipped with storage for removed product. Clean Seas has several aluminum skimming and storage barges that can be used in shallow water. The barge operates within the contained area and does not leave the contained area until the area has been cleaned. If stored product must be removed or the barge re-fueled, the barge is moved to the boom edge where transfer operations can take place. Upon completion of service, the barge will be decontaminated within the containment area. The barge will then be removed from the contaminated area by crane for further decontamination or to another containment area for final decontamination.

- **Shore-Based Skimmers.** If barge-mounted skimmers cannot be put into service, then manually steered skimmers may be used. Manually steered skimmers are land-based units. Pumping and removed product storage is maintained onshore.

Uncontained Spill in Shallow Water

If an uncontained spill threatens shallow marine waters, the containment and diversion booming procedures set out above should be followed. As soon as the situation allows, the Containment and Diversion Procedures should be implemented.

If a shore-anchored booming procedure is used, the anchor assembly should be closely monitored for stability and effectiveness. The boom itself should also be monitored for wear or abrasion from subsurface obstacles.

If the shallow water zone contains kelp or other growth that may impair containment efforts, consideration should be given to cutting the kelp just below the water line where it will not be oiled at low tide. Once the material is contained, the shallow water cleanup procedures set out in this section should be implemented. If such procedures are precluded due to high surf or swift currents, then appropriate shoreline pre-cleanup procedures should be implemented in anticipation of the spill reaching the shoreline (refer to Shoreline Cleanup Precautions, below).

5.6.2.3 Shoreline Cleanup Procedures

Shorelines are classified for the purposes of oil spill response into ten groups based on environmental sensitivities. The ten Environmental Sensitivity Index (ESI) categories identify different shoreline types in approximately increasing order of environmental sensitivity. Low ESI numbers generally indicate shorelines that have a lower priority with regard to protection and cleanup than the high ESI numbers. If limited resources are available, they should generally be allocated first to the higher ESI category shorelines. The Unified Command will make the decision regarding the most effective and appropriate allocation of response resources based, in part, on the ESI of threatened shorelines.

The Area Contingency Plan (Vol. I) contains descriptions of cleanup techniques in Section 3000, which is incorporated into this plan by reference. Shoreline cleanup techniques likely to be required in responding to a spill from Point Arguello/Point Pedernales facilities are summarized on the following pages.

Table 5-7 identifies the characteristics of the ten ESI categories and response considerations for each. Cleanup techniques vary depending on the ESI. All the potential shoreline cleanup techniques are summarized in Table 5-8 along with the ESI categories appropriate for their use.

See also Section 5.8 which contains the NOAA ESI Atlas maps for the areas that could be impacted by a spill from Point Arguello/Point Pedernales facilities. The ESI index of each shoreline is indicated in color on the maps.

Shoreline Cleanup Safety

Shoreline cleanup should be coordinated with the USCG, the CDFG, and other regulatory agencies, as appropriate. During cleanup and restoration, it is the duty of the Onshore Cleanup Group Supervisor to ensure that all cleanup personnel adhere to the following safety policies:

- Personnel must be instructed adequately about their duties and about the associated potential health and safety risks.
- Personnel must have the required HAZWOPER training if there is a potential for them to be exposed to hydrocarbons.
- Personnel must be suitably protected from hazard by PPE and gear.
- Hazardous materials must be properly labeled.
- Personnel must be suitably clothed and protected from adverse weather conditions.
- Heavy equipment must be operated by experienced operators.

Cleanup personnel should avoid any affected wildlife and must contact the Environmental Unit Leader to deal with the animals. **[NOTE: It is generally against the law to disturb, or even touch, wildlife or birds.]** To avoid complications and insure a smooth cleanup operation, all contact with wildlife must be coordinated through the Environmental Unit Leader and trustee agency representatives.

Table 5-7. ESI Summary		
ESI Cat.	Characteristics	Response Considerations
1	Exposed rocky cliffs, including sea walls	Cleanup usually not required. Access difficult and often dangerous
2	Exposed wave-cut platforms	Cleanup usually not required. Where accessible, may be possible to remove heavy oil accumulations and debris.
3	Fine- to medium-grained sand beaches	Relatively easy to clean. Activity should be restricted to limit damage to or contamination of adjacent beach and upland areas.
4	Coarse-grained sand to granule beaches	Mechanized cleanup methods may remove too much material and mix oil deeper into sediments. Manual cleanup may be preferred.
5	Mixed sand and gravel beaches	Oil penetration into sediment may be deeper than ESI 3 or 4 due to larger granules. Mechanical methods may be used above mid-tide zone, but sediment removal should be limited as much as possible.
6	Gravel beaches and rip rap	Oil penetration into substrate may be deeper than ESI 3, 4, or 5. Sediment removal should be limited as much as possible. Low or high pressure washing or flooding may be effective
7	Exposed tidal flats	Cleanup is very difficult and possible only during low tides. Natural currents or waves may remove most oil and deposit it nearby where it may be easier to recover.
8	Sheltered rocky shores and man-made structures	Low to high pressure spraying at ambient water temperatures is most effective method. Avoid biologically rich lower intertidal zone.
9	Sheltered tidal flats	Primary response should be protective and diversion booming before spill reaches area. Cleanup is very difficult.
10	Marshes	Cleanup is very difficult. Substrate very soft. Access difficult and human and vehicle traffic can damage vegetation. Cleanup activity can mix oil deeper into sediments or damage root structures. Cutting only recommended when other resources present are at great risk from leaving oil in place.
Source: Adapted from *NOAA Environmental Sensitivity Index: Southern California* (no date, available over the Internet at http://www.governmentguide.com/)		

Shoreline Pre-Cleaning

Shoreline cleanup can be minimized by pre-cleaning the area of debris that could become contaminated. All debris that becomes contaminated increases the volume of material that must be removed and disposed of. By removing debris (drift wood, sea weed, etc.) above the reach of oil that may come ashore before oil contacts the shoreline, the volume of material that must be disposed of can be significantly reduced.

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. Such crews need not be certified as required under OSHA regulations (29 CFR 1910.120) and would only perform this task prior to the spilled oil reaching the shoreline. 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.

Pre-cleaning beaches requires an assessment of where oil is most likely to come ashore well in advance of its arrival. The methods described in Section 5.5.2 and Appendix E can be used to estimate where oil is most likely to contact the shoreline. If the predicted contact locations are areas where men or equipment have access, it may be prudent to deploy work crews to move debris from below the high tide line to a location above high tide. Section 5.6.2.2 describes precautions that should be implemented to avoid damage to sensitive resources and the environment during pre-cleaning activities.

Shoreline Cleanup Methods

Timing can be important for efficient cleanup of sand beaches. The oil-soaked sand must be picked up during a receding tide; otherwise the rising tide will wash oil into the areas that have already been cleaned. As a practical matter, each tidal cycle will bring more oil ashore until all oil has beached or been recovered offshore. Therefore, beach cleanup will likely be on-going for several tidal cycles. The Unified Command will need to decide if continual cleaning is warranted or if contamination should be allowed to collect over several tidal cycles before being recovered.

Oil that comes onshore may be in solid, semi-solid, or liquid form. Solid oil can be picked up without much beach sand adhering to it if temperatures are low enough. When temperatures rise, solids may melt, resulting in an oil and sand mixture when the oil is either raked or shoveled. If the oil is liquid, sorbents may be effective. Otherwise, it is necessary to recover a considerable volume of sand along with the oil.

The entire beach area impacted by the spill should be inspected to determine priorities for cleaning. City officials, police, and lifeguards in the area to be cleaned should be notified and their assistance should be requested in closing areas of the beach and parking lots. Permission should be requested from these officials to use parking lots as transfer stations and staging areas, when necessary.

The scope of the cleanup work should be determined, along with the development of a cleanup plan, by the Unified Command. Appropriate cleaning methods should be determined, including the best use of motorized equipment and manual labor crews. Decontamination areas for personnel and equipment must be established and clearly indicated by signage and fencing or other obvious barriers. Crews may not commence work until they have been briefed on the actions to be taken, required safety precautions, decontamination procedures, etc. and have signed off that they have been briefed.

During any cleanup activity, thorough records should be maintained on the quantity of oil recovered, location, crew size, equipment, crew work period, wind, high/low-tide times, and

temperature on a daily basis. This information can be used by persons in charge of the cleanup to forecast an increase or decrease in oil recovery activities.

Table 5-7 provides a summary of available shoreline cleanup techniques. In the table, each method is identified and described in columns 1 and 2. Column 3 describes its primary use. Column 4 notes any requirements as to personnel, equipment or agency approval. Column 5 identifies the ESI types for which the technique may be used. Finally, column 6 briefly addresses environmental considerations to be addressed if the technique is employed. An analysis of marsh cleaning techniques is provided in Table 5-8.

Final Shoreline Cleanup

Laborers with rakes, shovels, and barrels may be needed for final cleanup of beaches. In addition to the beach area, a final cleanup of piers with high-pressure hoses may also be necessary. In some cases, a final discing-in operation may be required. Access roads constructed during cleanup operations must normally be restored as close to their original state as possible when the cleanup is complete.

All damaged or contaminated property, private or public, must be restored as directed by appropriate government agencies. Repair crews may be necessary for a considerable time after cleanup of the beach is finished.

5.6.2.4 Minimizing Environmental Damage from Recovery Operations

During shoreline or near shore (tidelands, etc.) cleanup operations, the following techniques should be employed (if possible) in order to minimize damage to the environment:

Manual Removal

- Restrict heavy foot traffic to firm substrate with limited vegetation.
- In marshes or soft sediments, place boards along footpaths to reduce sediment disturbance.
- Do not cut healthy or lightly oiled vegetation.
- Restrict access to unconditioned slopes.

Mechanical Removal

- Restrict, where possible, material removal to moderate heavily oiled sediments.
- Replace excavated sediments with clean materials if shore or slope stability is compromised.
- If removal operations are conducted along the waterline, boom off the work area to contain oil that may be released into the water.
- Minimize or avoid sediment removal in marshes or heavily vegetated areas.

Table 5-8. Shoreline Cleanup Techniques

Method	Description	Primary Use	Requirements	ESI Types	Environmental Considerations
Manual Removal					
Manual Labor	Personnel with hand tools recover oil stranded on the shoreline. Recovered material is placed in storage containers or loader bucket and removed for disposal	Sand or gravel beaches where hand tools can be effective at picking up contaminated substrate.	Can be accomplished with no motorized equipment. One foreman and 8-10 HAZWOPR qualified laborers. If heavy equipment access is available, front end loaders for recovery of material and dump trucks or roll-off bins for removal.	3, 4, 5, 7, 9	Generally low impact. Decontamination area must be established. Access activity confined to prevent damage to uncontaminated beach and upland areas.
Mechanical Removal					
Motor Grader/ Elevating Scraper	Motor grader forms windrows for pickup by elevating scraper.	Used primarily on sand and gravel beaches where oil penetration is 0 to 1 inch and trafficability of beach is good. Can also be used on mudflats.	Good trafficability. Heavy equipment access.	3, 4, 5	Can remove more material than necessary. Can increase penetration and spread of contamination.
Elevating Scraper	Elevating scraper picks up contaminated materials directly off beach.	Used on sand and gravel beaches where oil penetration is 0 to 1 inch. Can also be used on mudflats. Can be used to remove tar balls or flat patties from the surface of a beach.	Fair to good trafficability. Heavy equipment access.	3, 4, 5	Can remove more material than necessary. Can increase penetration and spread of contamination.
Motor Grader/ Front-End Loader	Motor grader forms windrows for pickup by front-end loader.	Used on gravel and sand beaches where oil penetration is less than 0.5 to 1 inch. This method is slower than using a motor grader and elevating scraper but can be used when elevating scrapers are not available. Can be used on mudflats.	Good trafficability. Heavy equipment access.	3, 4, 5, 6	Can remove more material than necessary. Can increase penetration and spread of contamination.

Table 5-8. Shoreline Cleanup Techniques					
Method	Description	Primary Use	Requirements	ESI Types	Environmental Considerations
Bulldozer/ Rubber-Tired Front-End Loader	Bulldozer pushes contaminated substrate into piles for pickup by front-end loader.	Used on coarse sand, gravel, or beaches where oil penetration is deep, oil contamination is extensive, and beach trafficability is poor. Can also be used to remove heavily oil-contaminated vegetation.	Heavy equipment access. Fair to good trafficability for front-end loader.	3, 4, 5, 6	Can remove more material than necessary. Can increase penetration and spread of contamination.
Backhoe	Operates from top of a bank or beach to remove contaminated sediments and loads debris into trucks.	Used to remove oil-contaminated sediment (primarily mud or silt) on steep banks.	Heavy equipment access. Stable substrate at top of bank.	2, 3, 4, 5, 6	Can remove more material than necessary. Can increase penetration and spread of contamination.
Front-End Loader, Rubber-Tired or Tracked	Front-end loader picks up material directly off beach and hauls it to unloading area.	Used on mud, sand, or gravel beaches when oil penetration is moderate and oil contamination is light to moderate. Rubber-tired front-end loaders are preferred because they are faster and minimize the disturbance to the surface. Front-end loaders are the preferred choice for removing cobble sediments. If a rubber-tired loader cannot operate, tracked loaders are the next choice. Can also be used to remove extensively oil-contaminated vegetation.	Fair to good trafficability for rubber-tired loader. Heavy equipment access.	3, 4, 5, 6	Can remove more material than necessary. Disturbs infauna. Can increase penetration and spread of contamination. Use in vegetated areas may cause extensive damage to root systems.
Hauling Trucks	Dump trucks for removal of contaminated material.	Used on beach where trafficability is acceptable, otherwise at upland staging area.	Fair to good trafficability for rubber-tired equipment. Heavy (min 6 mil) plastic lining to prevent leakage of recovered material onto highways.	General	Temporary storage and eventual disposal must be at approved locations.

Table 5-8. Shoreline Cleanup Techniques

Method	Description	Primary Use	Requirements	ESI Types	Environmental Considerations
Dragline or Clamshell	Operates from top of contaminated area to remove oiled sediments.	Used on sand, gravel, or cobble beaches where trafficability is very poor (tracked equipment cannot operate) and oil contamination is extensive.	Heavy equipment access. Equipment reach that covers contaminated areas.	1, 2, 3, 4, 5, 6, 7, 9	Can remove more material than necessary. Disturbs infauna.
Beach Cleaner	Picks up debris and small objects from surface of substrate.	Used to remove tar balls or flat patties from surface of beach. Can also remove small quantities of contaminated debris.	Light vehicular access. Recovery equipment. Wildlife agency approval.	2, 3, 4, 5	Can remove more material than necessary.
Vacuum Trucks, Vacuum Pump, or Portable Skimmer	Oil collected from water surface in sump dug in beach or behind booms as it moves down the beach and removed by pump, vacuum truck, or portable skimmers.`	Used on firm sand or mud beaches in the event of continuing oil contamination where sufficient longshore currents exist. Also used on streams and rivers in conjunction with diversion booming.	Presence/absence of longshore or river current.	2, 3, 4, 5, 7, 9, 10	Vehicle traffic can adversely affect beach and upland area along access route. Surf or tidal fluctuation may hamper effectiveness.
Washing & Cleaning Methods					
Sandblasting	Sand moving at high velocity in forced air hose removes oil from substrate by abrasion.	Used to remove thin accumulations of oil residue from human-made structures.	Light vehicular access. Oil must be semisolid. Need supply of clean sand.	6, 8	Extreme caution is advised. Highly abrasive material damages or kills organisms on substrate.
High-Pressure Flushing (Hydroblasting)	High-pressure water streams used to remove oil from substrate. Oil and water mix is channeled to a recovery area.	Used to remove oil coatings from boulders, rock, and human-made structures. Preferred method of removing oil from these surfaces.	Light vehicular access. Recovery equipment. Wildlife agency approval. Boomed or bermed recovery area required.	1, 2, 6, 8	Caution advised. Possible damage to organisms on substrate. May be only effective method to remove contamination from deep crevices, prevent long-term leaching, and facilitate recolonization. ESI 1 natural cliff faces are dangerous.

Table 5-8. Shoreline Cleanup Techniques

Method	Description	Primary Use	Requirements	ESI Types	Environmental Considerations
Steam Cleaning	Steam removes oil from substrate by decreasing viscosity. Oil and water mix is channeled to a recovery area.	Used to remove oil coatings from boulders, rock, rip rap, and other human-made structures.	Light vehicular access. Recovery equipment. Fresh water supply for steam. Wildlife agency approval. Boomed or bermed recovery area required.	1,2,6,8	Extreme caution is advised. High temperature and pressure can kill or adversely affect organisms on substrate. May be the only effective method to remove contamination from deep within crevices, prevent long-term leaching, and facilitate recolonization.
Low-Pressure Flushing	Low-pressure water spray flushes oil from substrate where it is channeled to recovery points. Sea water or fresh water.	Used to flush light oils from lightly contaminated mud substrates, cobbles, boulders, rocks, and human-made structures, and vegetation.	Light vehicular access. Recovery equipment. Boomed or bermed recovery area required.	4, 5, 6, 7, 8, 9, 10	Can be used in areas with limited accessibility for heavy equipment. Less potential for adverse effects on organisms than high pressure or high temperature methods.
Absorptive Materials					
Sorbent Recovery	Sorbents applied manually to contaminated areas to soak up oil.	Used to remove pools of light, nonsticky oil from mud, boulders, rocks, and human-made structures.	Foot or boat access. Disposal containers for sorbents.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Creates a large volume of waste material compared to the volume of oil recovered.
Oil Mop	Various size units to be used onshore or with boats in water with little or no currents.	Used to recover oil from natural or artificial containment.	Boat or light vehicle access. Little or no current.	9, 10 also creeks and streams	Potential damage to vegetation from mop, vessel traffic, or human activity.
Vegetation Removal					
Vegetation Cutting and Removal	Oiled vegetation is cut by hand, collected, and stuffed into bags or containers for disposal.	Used on oil-contaminated vegetation when flushing or other methods are ineffective.	Foot or boat access. Cutting tools, disposal containers.	10, also creeks and streams	Extreme care is advised. Movement of personnel and equipment can cause damage to habitat that may be slow to recover.

Table 5-8. Shoreline Cleanup Techniques

Method	Description	Primary Use	Requirements	ESI Types	Environmental Considerations
Burning	Upwind end of contaminated area is ignited and allowed to burn to the downwind end.	Used on any substrate or vegetation where sufficient oil has collected to sustain ignition. Used only if oil is a type that supports ignition and air pollution regulations allow it.	Light vehicular or boat access. Fire control equipment. Approval of air pollution agency.	10	Extreme care is advised. Burning can cause damage to habitat that may be slow to recover. May involve lower impacts than cutting and removal if trampling of vegetation can be avoided. Short-term air pollution.
Natural Recovery & Artificial Enhancement of Natural Recovery					
Natural Recovery	No action is taken. Oil is left to degrade naturally.	Used for oil contamination on high-energy beaches (primarily cobble, boulder, and rock) where wave action will remove most oil contamination in a shorter period of time.	Exposed high-energy environment.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Generally lowest environmental impact from cleanup activities. Not suitable for high public use areas.
Bioremediation	Nutrients and/or microorganisms are applied to accelerate the degradation of the oil.	May be used on rocky or sandy beaches, in marshlands, or on pooled oils.	Formal application for use must be obtained. Must be applied and monitored by qualified personnel.	3, 4, 5, 6, 7, 8, 9, 10	Not generally suitable for high public use areas. Long term monitoring may be necessary to assess effect of applied nutrients or organisms.
Doze contaminated substrate into surf	Bulldozer pushes contaminated substrate into surf zone to accelerate oil dispersion.	Used on contaminated cobble and lightly contaminated gravel beaches where removal of sediments may cause erosion of the beach or backshore area.	Heavy equipment access. High energy shoreline.	4, 5, 6	Not recommended on shorelines with public access. Requires energetic environment to disperse oil returned to water.
Disc into substrate	Tractor pulls discing equipment along contaminated area. May encourage natural biodegradation.	Used on nonrecreational sand or gravel beaches that are lightly contaminated.	Heavy equipment access. Fair to good trafficability. High energy environment.	4, 5, 6	Not recommended on shorelines with public access. Requires energetic environment to disperse oil returned to water.

Table 5-8. Shoreline Cleanup Techniques					
Method	Description	Primary Use	Requirements	ESI Types	Environmental Considerations
Breaking up pavement	Tractor fitted with a ripper is operated up and down the beach.	Used on: low amenity cobble, gravel, or sand beaches; beaches where substrate removal will cause erosion; or where thick layers of oil have created a pavement on the beach surface. Heavy equipment access.	Heavy equipment access. High energy shoreline.	4, 5, 6	Not recommended on shorelines with public access. Requires energetic environment to disperse oil returned to water.
In Situ Treatment	Contaminated substrate is tilled into the ground or inorganic fertilizers are applied.	Used on contaminated soils where ground water is not threatened or has been cleaned.	Heavy equipment access.	3, 4, 5, 7, 9	Same as bioremediation.
Dispersant Application					
Dispersants	Dispersant application has potential to reduce the risk of petroleum-related impacts to natural living resources when oil is on the water's surface or deposited within environmentally sensitive areas.	Environmentally sensitive areas including intertidal regions, tidal inlets, tidal marshes, and other wetland areas of the coastal islands and mainland and the surface waters where endangered marine mammals and large concentrations of sea birds might exist.	Trustee agency approval. Dispersant application plan. Must be applied and monitored by qualified personnel.	7, 8, 9, 10	Not generally used for shoreline remediation. Possible adverse effects on organisms which contact or ingest dispersant.

Table 5-9. Marsh Cleaning Techniques

Marsh Cleaning Technique	Situations for Use	Equipment Required	Environmental Impact
Low-Pressure Water Flushing	Preferred Method: Use in small channels around clumps of plants and trees and on vegetation along channel banks and the shoreline.	Small boat; small gasoline-driven pump; intake and discharge hoses; small floater skimmer; portable storage tank.	Minimal impact if flushing is done from land. Some marsh vegetation may be crushed.
Sorbents: Loose Sorbents, Pads or Rolls	Loose Sorbents: Use in small channels or pools with low currents. Pads or Rolls: Use in shallow pools and on shorelines without debris accumulations.	Light curtain boom; empty barrels for storing recovered sorbent; industrial vacuum cleaner or nets for picking up loose sorbent. Can also be herded with water spray.	Loose sorbents are difficult to retrieve. Retrieval can crush marsh grasses.
Oil Mop	Preferred Method: Use in open channels or pools with free-floating oil. Use upstream from containment boom and along marsh shorelines.	Oil mop system; portable storage tanks for recovered oil; pulleys.	Minimal impacts.
Vegetation Cutting and Removal *(NOTE: Use only when flushing fails to remove oil from plants.)*	Handcutting of vegetation in small channels. Mechanical cutting along banks of channels or shoreline.	Hand Cutting: Shears, power brush cutters or sickles; mechanical cutting: weed harvester.	Damages marsh surface. Foot traffic damages plants.
Burning *(for use on spartina-type [grass-like] marshes only.)*	Use in large contaminated areas. Can use if oil will burn. Probably suitable when marsh is in die-back stage.	Portable propane flame throwers or weed burners.	Produces considerable air pollution. Requires local approval by government agencies. Areas not contaminated by oil are subject to damage by fire.
Marsh Draining	Use when toxic and persistent oils have deeply contaminated substrata.	Pump contaminated liquids from the marsh. Using available materials, dam or divert the flow of water into the marsh area.	Major Impact: Destroys much wildlife. Restoration may occur over several years as water returns to the marsh.
Soil and Vegetation Removal	Use when toxic and persistent oils have deeply contaminated substrata.	Dragline, dredge, clamshell, front-end loader, backhoe, bulldozer.	Major Impact: Destroys marsh areas. Requires complete subsequent restoration.

5.7 Wildlife Resources

5.7.1 Wildlife Response Cautions

Cleanup personnel should avoid any affected wildlife and must contact the Environmental Unit Leader to deal with the animals. ***[NOTE: It is generally against the law to disturb, or even touch, wildlife or birds.]*** *To avoid complications and insure a smooth cleanup operation, it is reiterated that all contact with wildlife must be coordinated through the Environmental Unit Leader.*

All dead oiled animal carcasses should be collected and turned over to the California Department of Fish and Game (CDFG), Office of Oil Spill Prevention and Response (OSPR) representatives who are responsible for wildlife rehabilitation and collection of carcasses for natural resources damage assessment (NRDA) investigations. Dead carcasses should be recovered using gloves

and other appropriate protective gear, depending on the size of the animal, and placed in plastic storage bags, preferably on ice or in a cooler, if available. Any dead carcasses collected must be accompanied by documentation of the date, time of day, location, condition, and other information that will provide agency personnel with relevant data concerning the cause and location of death. Identification and location of OSPR representatives can be provided by the Incident Emergency Operations Center. The CDFG will be responsible for the disposal of oil-contaminated carcasses.

Live animals must not be disturbed except by qualified personnel with trustee agency approval.

5.7.2 Wildlife Resources at Risk

The wildlife resources most likely to be affected by an oil spill in California coastal and inland waters include seabirds, waterfowl, shorebirds, pinnipeds (seals and sea lions), and sea otters. The avian (bird) species that can be affected include a broad array of species as listed by OSPR (1993). Among the more susceptible groups are the *Alcidae, Anatidae*, *Pelecanidae, Gaviidae,* and *Podicipedidae*. Many of these species are largely pelagic (spending most of their time at sea) and may pose special problems when being held for extended periods of time in captivity.

The principle effect that spilled oil has on birds is the reduction of thermoregulatory capacity that results from fouling of their feathers. The physical structure of the feathers is disrupted such that they no longer shed water or capture an insulating layer of air. Some direct toxicity may be associated with inhalation of the more volatile fractions of some products. Toxic effects and/or digestive tract irritation is associated with the ingestion of the oil during preening.

Pinnipeds (seals and sea lions) are highly sensitive to disturbance, particularly during the breeding season. Oil spill response operations and their associated noise may cause adverse impacts to pinnipeds that exceed those associated with oil contact. For this reason, the company would work with, and receive guidance from, the NMFS on response measures conducted in close proximity to or directed at the protection of pinnipeds so as to avoid or minimize disturbance to animals.

Two families of pinnipeds are found in central and northern California - the family *Phocidae*, represented by harbor seals and northern elephant seals, and the family *Otariidae,* represented by California sea lions, northern fur seals, and Steller sea lions. Since the hind flippers of the *Phocidae* project straight back, and their front flippers are relatively short, they are not very mobile on land. On the other hand, *Otariidae* are more mobile on land and are far more aggressive when faced with capture on land.

Sea otters are primarily at risk to offshore/nearshore releases of oil and oil products. Like birds, they depend upon their fur to trap an insulating a layer of air to keep warm. Fouling by oil disrupts this ability and hypothermia (a life-threatening drop in body temperature) can be a rapid result.

Table 5-5 and the ESI Atlas maps in Section 5.8 describe the resources at potential risk and locations where they can be found.

5.7.3 Wildlife Recovery and Rehabilitation

Company personnel will not attempt to capture, transport, or rehabilitate any wildlife affected by a spill from company facilities. Employees are directed to immediately report observations of apparently oiled wildlife to the Incident Emergency Operations Center. Important information to include in this report includes:

- Location
- Type of wildlife (e.g. bird, mammal, etc.) and species, if known
- Number of animals involved (estimate)
- Apparent condition of the animals (e.g. healthy, lethargic, dead, etc.)
- Condition of the surrounding waters or land (e.g. clean, lightly oiled, heavily oiled, etc.)

The Company will use the California Oiled Wildlife Care Network to provide wildlife rehabilitation services in the event of an oil spill at any of The Company's facilities. The contact telephone number for the Oiled Wildlife Care Network is 877-823-6926. The California Oiled Wildlife Care Network (OWCN) provides the following services:

- Reasonable telephone participation in drills
- Activation and callout of OWCN resources
- Search and collection of oiled wildlife
- Stabilization and triage
- Transportation of wildlife to appropriate regional care facilities
- Medical treatment
- Rehabilitation
- Coordination of release
- Standard reporting of activities
- Certification of invoices from OWCN participants

The following discussion outlines general procedures and considerations when wildlife resources are impacted by a spill event.

The protection, rescue, and rehabilitation of wildlife endangered by the release of oil and oil products to the environment is a priority during the development and implementation of oil spill response procedures and the Incident Action Plan. The requirement for effective wildlife response during oil spills is expressed in both federal and state regulations. Wildlife rehabilitation plans are a mandated part of contingency plans and must be carried out effectively. The State of California mandates effective wildlife response in its Code of Regulations, Title 14, Division 1, Subdivision 4, Section 817.02(i). The California Department of Fish and Game Office of Oil Spill Prevention and Response (OSPR) have developed wildlife response plans with provisions for who the responders would be, where the wildlife would be treated and cared for, and how the program will be carried out.

It is critical for the Company, the trustee agencies, and (most importantly) the affected wildlife that the wildlife response does not become a point of contention. To ensure that this does not happen, contact must be made with the trustee agency representatives at the earliest possible point and all appropriate permits would be acquired.

The mounting of an effective wildlife response requires quick action on a number of fronts. The effort is labor intensive and involves large numbers of highly motivated and qualified volunteers. It is very important that unqualified personnel not be involved in capturing, transporting, or attempting to rehabilitate wildlife. Those activities are reserved for experts with the appropriate permits. The many activities involved in a wildlife response include: protection, rescue, stabilization, transport, cleaning, rehabilitation and husbandry, and release.

Contacts

Wildlife resources are considered public resources and can only be managed or treated under the authority of the following trustee agencies shown on Table 5-10.

Table 5-10. Trustee Agencies

Agency	Resource Responsibility	Address	Telephone
California Department of Fish and Game	Lead state trustee for wildlife and fish; acts as field agent for NMFS and USFWS	1933 Cliff Drive, Suite 9 Santa Barbara, CA 93109	805-568-1231/1238 Fax 805-568-1235
U.S. Fish and Wildlife Service	Lead trustee for endangered and threatened species (excepting those under NMFS). Share authority over sea otters with Cal. Dept. of Fish & Game.	2493 Portola Rd. - Suite B Ventura, CA 93003	805-644-1766
National Marine Fisheries Service	Lead trustee for Pinnipeds (seals and sea lions) and Cetaceans (whales and dolphins) - (not for sea otters)	501 W. Ocean Blvd. Long Beach, CA 90802	562-980-4000
Channel Islands National Park	Channel Islands National Park	1901 Spinnaker Drive Ventura, CA 93001	805-658-5730
Channel Islands National Marine Sanctuary	Channel Islands National Marine Sanctuary	113 Harbor Way Santa Barbara, CA 93109	805-966-7107 Cell: 805-729-1271

Responsibility for the capture and treatment of oiled wildlife is limited primarily by federal statute. Currently, the state of California does not require special permits to haze, collect, or hold species in an oil spill response. OSPR has, however, published preliminary minimum standards for oiled wildlife care and rehabilitation that must be met by any responding organization (OSPR, 1993). Company personnel are directed not to attempt to capture, transport, or rehabilitate wildlife during an oil spill.

Permits for migratory bird collection and holding are regulated under the Migratory Bird Treaty Act, and permits must be obtained from the U.S. Fish and Wildlife Service (USFWS) regional oil and hazardous substances spill response coordinator. The organization contracted for bird rescue/rehabilitation will hold its own permit.

Marine mammals are protected under the Marine Mammal Protection Act. Permits are obtained from the National Marine Mammal Protection Act, Office of Permitting in Washington, D.C. Rescue/rehabilitation efforts are generally conducted under existing Agency permits or through the Marine Mammal Stranding Network. The Marine Mammal Center of Santa Barbara (telephone 805-687-3255 is pre-authorized by National Marine Fisheries Service to capture marine mammals, if necessary.

Each of the trustee agencies has jurisdiction over the specific wildlife resources (see Table 5-9). These agencies also have the authority to initiate wildlife response. Many of the activities related to the protection, recovery, and/or rehabilitation of wildlife require either permits or permission of the trustee agencies. The establishment and conduct of an effective wildlife response therefore requires early communications between the Company and the trustee agencies.

Scope and Nature of the Wildlife Response. The size of the spill, the nature of the product spilled, and the wildlife resources present in the spill area may influence the size of the wildlife response, the location of response facilities, the expertise of the responders, etc. Guidance and agreement would be sought on these issues as early as possible.

Identification of the Wildlife Responder. The Company will utilize the California Oiled Wildlife Care Network as its designated responder. Under certain circumstances, however, local response and rehabilitation capabilities may be more effective than mobilization of larger or regionally based organizations. The Marine Mammal Center of Santa Barbara is available locally. Involvement of certain species may mandate a specific responder (see Table 5-11).

Table 5-11. Qualified Wildlife Responders

Name	Location	Qualified for:	Telephone
Oiled Wildlife Care Network/Center		Care, treatment, and rehabilitation	877-823-6926
Marine Mammal Center	Santa Barbara, CA	Recovery of marine mammals – can recover birds if requested by trustee agencies	805-687-3255

Permits. Wildlife rehabilitation facilities and/or personnel are required to have state and/or federal permits to carry out such activities. The capture, treatment, and handling of threatened or endangered species or marine mammals require special permits. Implementation of particular hazing, herding, or baiting activities can only be carried out with trustee concurrence. Company personnel do not have the necessary permits and will not be involved in such activities. Clearance on these issues would be attained.

Identification of Resources. Estimation of the numbers, locations, and identity of wildlife resources impacted, or at risk, is an important early step in the establishment of an effective

wildlife response. The trustee agencies are some of the best sources for this information and would be asked to assist the Company.

Prioritization of Actions. The overall spill response would be conducted in a manner that is sensitive to the presence of wildlife resources. Deployment of protective measures or the use of mitigation measures may greatly reduce wildlife impacts. The wildlife trustee agencies and internal wildlife experts would be included in the decision-making processes regarding the use and allocation of spill response resources.

Strategies to Minimize Wildlife Impacts

Wildlife impacts are best minimized by preventing the exposure of wildlife to spilled oil. Accordingly, the first step in wildlife protection is the identification of resources at risk. Section 5.8 contains NOAA Environmental Sensitivity Index (ESI) Atlas maps for the areas of potential impact from Company facilities. These sensitivity maps, the Area Contingency Plan (ACP), and other documents should be consulted to identify concentration areas, feeding areas, nesting sites and critical habitats. Guidance must be obtained from the wildlife trustee representatives present.

Limited resources may require the responders to prioritize protection efforts. Threatened and endangered species should generally be given the highest priority, followed by marine mammals and ecologically important species.

Protection can be achieved by the physical deflection (booming, diking, or flooding) of the oil from sensitive areas. In the early stages of the response, however, this may not be possible.

In cases where wildlife are in danger of exposure, the only effective response may be some form of hazing. Hazing involves methods to agitate, irritate, and/or frighten wildlife from the affected area. Hazing techniques may include any or all of the following:

- Vehicles such as boats, airboats, all terrain vehicles, airplanes, and helicopters may be used to herd or chase wildlife from the area.
- Sirens and other irritating noise-makers can be set up around the area.
- Propane cannons can be set to go off periodically. These may be available from co-ops, the wildlife Agencies, agricultural interests, and/or forestry supply companies.
- Scarecrows may be effective for certain species.
- Models of predators (owls, eagles, falcons) can be placed at strategic locations.

No hazing method is completely effective and wildlife becomes habituated to most hazing rather quickly. Several of these strategies might need to be employed individually or in combination. contractors to the Company would therefore seek concurrence of and necessary permits from the wildlife trustees on any hazing plan employed. Company personnel will not be involved in hazing.

Methods to attract wildlife away from contaminated areas may also be employed. Decoys, recording of mating calls, and baited fields may attract animals to areas that are out of the path of the oil.

Rescue

Wildlife rescue is the recovery of oiled animals from shores and waters. In spite of the fact that these animals are in peril, they may not be easily or safely captured and handled. These animals can do serious damage to a well meaning rescuer and they can be stressed to death by clumsy or insistent rescue attempts. Capturing struggling animals in an oily environment, on the water, or in dense vegetation can also be dangerous for the person attempting the capture. For these reasons, company personnel are advised against attempting rescues under any circumstances. Rescues will only be attempted by experienced wildlife handlers and restricted to such people.

Surveillance is required to direct the rescue effort. This surveillance can come from the clean-up crews in the form of regular wildlife reports. Surveillance can also come in the form of public reports. In certain circumstances, aircraft may be effective in rescue surveillance. Oiled animals may also move out of the spill area for some distance before they become incapacitated. Therefore, provisions should be made for surveillance outside the immediate spill zone to locate and recover oiled wildlife.

It is extremely difficult to capture pinnipeds in the water. Instead, stranded animals should be captured along the shoreline. The method used to capture stranded pinnipeds would vary according to species, the size of the animal, and the nature of the location where the animal is stranded. Table 5-12 summarizes standard methods for the capture and handling of marine mammals. Company personnel will not participate in marine mammal capture.

Table 5-12. Marine Mammal Capture Techniques

Family	Method(s)
Seals	*Method 1 - For carrying a large pinniped over a long distance.* • The animal would be rolled into a large blanket and placed in a wire stokes. • The animal would be transferred to a cage upon reaching a collection station. *Method 2 - For use with active animals that cannot be rolled into a blanket.* • A large dip net or throw net would be placed over the animal. • A blanket would be placed over the head of the animal to assist in head restraint. • The animal would be moved to a transport cage. *Method 3 - For large, strong animals that cannot be restrained.* • The animal would be herded into a cage, using herding boards to block off escape routes.

Table 5-12. Marine Mammal Capture Techniques	
Family	**Method(s)**
Sea Lions and Fur Seals	*Method 1 - For strandings on sandy beaches.* • Two or three people with herding boards would block the animal's exit to the sea. • The animal would be netted from behind. • People with herding boards would surround the animal and herd it into a cage. *Method 2 - For strandings on docks.* • Animals that weigh 150 lbs. or less would be netted with a pole net. A blanket would be placed over the head and the animal would be maneuvered into a cage. • Larger animals would be herded into a cage, or scared back into the water so that they would strand elsewhere. *Method 3 - For strandings on rocky shores.* • Two people with herding boards would be positioned one on each side of the animal. • A pole net would be used to capture the animal while the boards would be used to block the animal's exit. • The animal would be carried in the net to a level place for transfer to a cage.

Larger pinnipeds should be caged separately while undergoing transport. Harbor seal pups are the only possible exception to caged transport. If a pup is quiet, it can be placed on a blanket in the passenger section of a vehicle. However, if the pup acts in an aggressive fashion, it should be placed in a sky kennel.

As with pinnipeds, seabirds should be captured as they swim or are washed ashore. Though oiled seabirds coming ashore are likely to be in poor physical condition, they may still be difficult to capture. The guidelines described in Table 5-13 have been developed to minimize stress on seabirds during, and to ensure the safety of personnel engaged in, capture operations. Company personnel will not participate in seabird capture.

Table 5-13. Oil Seabird Capture Techniques	
Procedure	**Comments**
1. Designate Teams	Assign 2 or 3 people to each team, and each team to a specific shoreline area.
2. Seabird Herding	Conditions permitting, small boats can be used to herd seabirds in nearshore areas toward land.
3. Block Access to Water	Seabirds would be prevented from returning to the water by positioning workers between the water's edge and beached seabirds.
4. Capture Birds	Personnel would use long-handled dip nets, large towels, or their hands to pick up seabirds.
5. Cease Collection Efforts	When a seabird cannot be caught with minimum pursuit, collection attempts on that bird would be halted to minimize stress to the animal.
6. Avoid Sensitive or Dangerous Areas	Bird rescues would not be attempted in habitats where the effects of oiling would be exacerbated by foot or vehicular traffic or in areas where rescuer safety is at risk.

Stabilization

Once animals are successfully recovered, steps must be taken to improve their physical condition as quickly as possible. If the cleaning and rehabilitation center is nearby (within a 1 hour transport time), stabilization may best be achieved there. The primary issue with most oiled

wildlife is the maintenance of body temperature. They may be subject to hypothermia (cold) or hyperthermia (overheating). The animals should be protected from the elements with tents, shades, or other shelters. The animals should be placed in appropriately sized boxes or sky kennels with a supply of rags and towels. The area should be kept well ventilated. Oiled wildlife are also frequently badly dehydrated. If experienced personnel are available, liquids should be administered by tube. Company personnel will generally not participate in the stabilization of captured animals.

Some degree of triage, or sorting individuals with more or less likelihood of successful rehabilitation, may be appropriate. Priority treatment and/or transport should be undertaken on the basis of condition of the animal, potential for survival and rehabilitation, and regulatory status of the species. Animals may appear to be in very bad shape and then recover rapidly. Every animal would be stabilized and transported as quickly as possible.

Appropriate locations should be identified for stabilization and staging facilities. Wildlife care professionals should be in charge of these facilities to the greatest extent possible.

Transport

In most cases, transport can be effected by van shuttles between the stabilizing/staging facilities and the rehabilitation center. The transport vehicles should be capable of temperature control and should have adequate ventilation. The animals should be transported in appropriately sized boxes or sky kennels. The goal of transport is to get the animals from capture to the rehabilitation center within 2-to-3 hours.

Cleaning and Rehabilitation

Following capture and transportation of oiled wildlife from the field, the California Oiled Wildlife Care Network will utilize recommended techniques to clean and rehabilitate the individual species. Company personnel will generally not participate in cleaning or rehabilitation of oiled wildlife.

5.8 ESI Atlas Maps of Sensitive Resources

The maps on the following pages were obtained from the National Oceanic and Atmospheric Administration (NOAA) via the internet. They include the following:

- Guidelines for Interpreting EIS Maps

Central California

- Central California ESI Atlas Index depicting the location of each atlas map along the central California coastline;
- Legend for Central California ESI Atlas maps;
- Environmental Sensitivity Index: Central California which describes the resources within the entire central California coastline within indications of threatened or endangered species;

- Central California ESI Atlas maps, numbers 1 through 8, covering the area from Point Conception in the south to Point San Luis Obispo in the north; and
- Seasonal information regarding natural resources likely to be present on each ESI Atlas map (on the back of each map).

Southern California

- Southern California ESI Atlas Index depicting the location of each atlas map along the southern California coastline;
- Legend for Southern California ESI Atlas maps;
- Environmental Sensitivity Index: Southern California which describes the resources within the entire central California coastline within indications of threatened or endangered species;
- Southern California ESI Atlas maps, numbers 1 through 6, covering the area from Point Conception in the west to Goleta in the east, and map numbers 35 through 43 covering the three northern Channel Islands just south of that mainland; and
- Seasonal information regarding natural resources likely to be present on each ESI Atlas map (on the back of each map).

Section 6 Response Support

6.1 Supporting Response Efforts

Effective spill response requires a great deal of "behind the scenes" coordination to be effective. Recovered oil and contaminated waste must be stored, inventoried, and transported for disposal according to all applicable regulations. Personnel must be fed, housed, and provided sanitary facilities and medical support as necessary. All sections of the Incident Command System must be able to communicate among themselves to coordinate response efforts and insure timely delivery of personnel and equipment to the locations where they are needed. Personnel and equipment needs transportation to response sites and between sites. In a longer spill response, equipment will need to be maintained and/or repaired. Finally, requisitioning, purchasing, and paying for the response effort must be accomplished. Key aspects of response support are discussed in the following sections.

6.2 Storage, Transfer, and Disposal of Recovered Material

6.2.1 Recovered Oil Storage Procedures

6.2.1.1 Temporary Storage

To expedite the 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) determined in coordination with the appropriate local and state agencies. The transportation of oil and contaminated material to temporary storage sites during the emergency response may be exempt from certain handling and permitting requirements (22 CCR 66263.30 and/or 66263.43). The DTSC representative or duty officer should be contacted for approval. If a Unified Command is established, OSPR may facilitate the contact with DTSC through their liaison function.

Temporary storage sites should be available at onshore locations that are convenient to the recovery operations for the temporary storage of recovered petroleum products and contaminated materials and debris. A temporary storage site may require an emergency permit from the California Coastal Commission (CCC). PXP is responsible for temporary waste storage.

Siting of the temporary facility will be done with the concurrence of the USCG and state OSC, DTSC, the local Regional Water Quality Control Board (RWQCB), and the local health, fire and emergency services departments. If a United Command is established, OSPR will facilitate the contact of the state and local government agencies through their liaison function.

Oil and oily water and debris recovered during spill cleanup may be accumulated in containers of various types located at facilities near the site. Containers will be compatible with the waste to be stored. The spill location or other logistical restrictions may require the use of portable containers that can be brought to a central storage site or disposal site via truck, boat, or aircraft. Available portable onshore storage includes a variety of tank trucks, vacuum trucks, dump trucks, pickup trucks, and almost any other wheeled vehicle, as well as Baker tanks, bladder tanks, inflatable tanks, collapsible tanks, open-top and closed-top drums, canisters and trash bins.

In addition, oil spill response vessels and associated barges can provide short-term on-water storage. Vehicles and vessels will only be considered for short-term storage, as they will typically be needed for cleanup, transportation, or hauling.

Pits or basins are not appropriate if the waste is characterized as hazardous. Nonhazardous waste may be temporarily stored in natural depressions lined with plastic if agency approvals can be obtained. The construction of lined, earthen dikes constitutes another possibility for temporary onshore storage. These dikes can be made with soil, steel shoring, or timber, but must be used only with impervious liners. Pre-planning 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 and the restoration required following the spill.

Temporary storage containers are available from various industry spill response cooperatives, other response organizations, and vendors. Clean Seas maintains temporary storage capabilities of approximately 10,000 bbl (see Area Contingency Plan, Vol. I, Section 5000 for a complete inventory of this equipment). For more information on both short- and long-term temporary storage capabilities, please refer to Sections C.4 and C.5 of Appendix C.

Recovered fluid accumulated in the various containers will be continuously tallied in order to determine the amount petroleum hydrocarbons recovered in a spill. This information should be given to the Documentation Unit Leader for indexing into the appropriate file. As needed, the Company will coordinate with the necessary agencies to account for the total volume of temporary storage containers prior to recycling the recovered fluid back into the system.

6.2.1.2 Initial Treatment

Petroleum and petroleum-contaminated cleanup materials can potentially be treated at a temporary storage site. One of the treatment processes that may be used is a transportable treatment unit (TTU). The most likely treatment process undertaken with a TTU will be separation of seawater from collected petroleum. Another method employed for separating water is decanting the water off of petroleum materials stored in temporary storage tanks.

Any water generated through the separation of petroleum and seawater may potentially be discharged to a sanitary sewer system or back to marine waters. The sanitary sewer discharge will require a permit from the local sanitation district, which will establish effluent requirements for the discharged water. Should a sanitation district not allow the discharge of water to its system, the recovered seawater would either be discharged back to the adjacent marine waters or transported offsite for disposal. The discharge of recovered seawater 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 regulator standards must be discussed with the DTSC.

6.2.2 Waste Management

One of the major issues associated with an oil spill response is the handling of collected products and contaminated cleanup materials, soil, and debris. Each category of material/waste has its own type of response and management problems. This section focuses on a general approach to the management of the various types of wastes collected during an oil spill.

6.2.2.1 Segregate Waste Streams

Oil spill waste falls generally into three categories involving increasing regulatory oversight and expense for disposal: uncontaminated, contaminated, and hazardous. It is important to distinguish between these so that uncontaminated or non-hazardous contaminated waste is not commingled with hazardous waste. Uncontaminated waste that is commingled with contaminated waste becomes contaminated and must be disposed of accordingly at higher cost. Either uncontaminated waste or contaminated waste that is commingled with hazardous waste becomes hazardous and must be managed and disposed of at much higher cost.

Therefore, it is vitally important that waste be segregated. Separate, clearly designated areas should be established for each type of waste and strict oversight of incoming waste streams must be exercised to insure that wastes are not improperly mixed so disposal costs are minimized.

6.2.2.2 Waste Handling Options

Crude Oil

If feasible, the first option is to store the recovered liquids in separate tankage that is available at a Company facility until a final disposition of the fluids is agreed upon by the Company and the appropriate regulating agency. The Office of Spill Prevention and Response will not permit disposal of any recovered oil until its volume has been determined as the volume of recovered material is included in their assessment of fines and environmental damage. If existing tanks are not adequate, portable tanks or containers will need to be brought in from commercial tank suppliers (e.g. Baker Tanks).

Crude oil that is spilled into marine waters, recovered, and transported to a refinery may be considered a product that may not be subject to hazardous waste management regulations. The collected crude oil may be shipped to the refinery of original destination or another refinery that can accept the oil.

Recycling is another option by which recovered petroleum may be managed as a material. This option includes using the petroleum: (1) in incineration as a fuel, (2) as a substitute for raw material feedstock, or (3) as an ingredient used in the production of a product (asphalt). The California Environmental Protection Agency (CAL/EPA), Department of Toxic Substances Control (DTSC) should be consulted for more information on these and other management options.

State law requires the consideration of recycling; therefore, recycling should be a top priority and undertaken if at all possible. All waste disposal/recycling operations should be coordinated with

the Logistics Unit Leader and the Planning Section of the Incident Management Team (IMT). Recovered petroleum that is not accepted by a refinery or cannot be recycled must be managed as a waste. In order to determine the appropriate method of management, the waste must be characterized to determine whether the waste is hazardous or nonhazardous. 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]).

Disposal at Sea of Water Separated from Recovered Oil

Oil recovered at sea typically contains significant amounts of seawater. To maintain the efficiency of skimming for recovery, this water may be separated/decanted from the oil and discharged back into the ocean during recovery operations. Separated seawater typically contains elevated levels of hydrocarbons; thus, the discharge of this material may require agency approval. The "discharge" of separated/decanted water may be recognized by the FOSC as an integral part of offshore skimming operations and as a waste minimization tool. The FOSC or designated representative may authorize the discharge of separated/decanted water back into the catenary area of a boom/skimming system outside State waters (3 miles), with the exception of National Marine Sanctuary waters.

With the Monterey Bay National Marine Sanctuary, a significant portion of the coastline is now part of the National Marine Sanctuary Program. Other sanctuaries include Channel Islands (San Miguel, Santa Cruz, Santa Rosa, Anacapa, Santa Barbara Island, Richardson, and Castle Rock), and Cordel Banks. Federal law prohibits the discharge of materials (e.g., separated water) to marine sanctuaries unless permitted by the Administrator of the National Marine Sanctuary Program. Until pre-approval is obtained, a permit for the discharge of separated water must be obtained from the Assistant Administrator of the National Marine Sanctuary Program before any discharge can take place.

Contaminated Debris

Contaminated debris (including organic material), contaminated cleanup equipment (booms, pompoms, sorbents, etc.), and other contaminated materials that cannot be recycled must be managed as a waste. The materials must also be characterized before the appropriate waste management option is determined.

6.2.2.3 Waste Minimization and Recycling

Debris Avoidance

It typically is not possible to completely avoid the generation of oily debris resulting from the contact of floating oil with waterborne solids. However, it is possible to minimize the generation of oily debris in the coastal intertidal zone if the anticipated area of oil impact can be cleaned prior to stranding of the spilled oil. (See Section 5.6.2.3).

Selection of Personal Protective Equipment

Depending upon climatic conditions and material compatibilities of 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. This can function to minimize the generation of oil-contaminated disposable gloves and boots, as long as such equipment use is approved by the 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 may need to be disposed of at Class I (California hazardous waste) facilities.

Recovered Oil and Oily Water

As stated in the previous section, in order to maximize skimmer efficiency and effectiveness, it may be necessary to decant water to the spill impact area. This requires the approval of the FOSC and relevant state agency representatives. Both oil and oily water recovered from skimming operations should be off-loaded to facilities where it can be effectively recycled or managed within established process and treatment streams. Some facilities can also provide temporary tank storage when necessary. Oiled debris that is recovered with skimmed oil should be maintained in secure, temporary storage until it is sufficiently characterized for disposal. It is *critical* that accurate records of recovered oil be maintained. Measurement techniques and the record keeping process should be coordinated through the Unified Command.

Sorbent Use/Reuse

Since oiled sorbent material often constitutes a substantial percentage of the oily solid waste generated during spill response and cleanup, opportunities for minimizing this waste volume should be considered. Some sorbents are designed to be reusable or can be recycled onsite with inexpensive gear. It is also possible to replace sorbent sweeps and booms 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 skimmers or vacuum trucks instead of contaminating large volumes of sorbent.

Petroleum-Contaminated Soil Recycling and Reuse

While the volume of petroleum-contaminated soil associated with coastal spills is generally lower than inland spills, opportunities for recycling/reuse should be considered. For soils satisfying the waste profiling requirements of state and commercial facilities, reuse as daily landfill cover after appropriate treatment is a potential option in California.

6.2.2.4 Characterization of Recovered Material

Recovered petroleum and contaminated debris that cannot be recycled must be characterized to determine its waste classification before the waste can be shipped to an appropriate waste management facility for final disposal. Classification may be conducted on representative samples of each waste by a state-certified laboratory. It is the responsibility of the generator or responsible party to ensure that petroleum and contaminated material that is managed as waste is accurately classified as hazardous or nonhazardous for proper disposition (22 CCR 66260.20).

Based on waste characterization, the wastes can be further defined as one of the following:

- Federal Resource Conservation and Recovery Act (RCRA) waste (hazardous waste regulated under federal regulations)
- Non-RCRA waste (hazardous waste regulated under California regulations only)
- Nonhazardous waste, defined as designated waste per 23 CCR 25522

Once the waste is characterized, disposition options can be selected.

6.2.3 Transportation

Contaminated material and recovered petroleum product deemed not acceptable for recycling or being handed as a product must be transported to an approved waste management facility. The type of waste management facility is based on the nature of the waste and results of the waste characterization performed.

6.2.3.1 Hazardous Waste

Waste classified as hazardous under either federal or state regulations must be transported to a permitted or interim status hazardous waste facility. All hazardous materials shipped offsite must be transported in compliance with applicable regulations. These include 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). Hazardous wastes will be shipped to the following Company approved waste management facility:

Clean Harbors, Los Angeles Transfer Facility
5756 Alba Street
Los Angeles, California 90058
323-277-2500

Chemical Waste Management, Inc.
35251 Old Skyline Road
Kettleman City, CA 93239
800-222-2964 / 559-386-9711

6.2.3.2 Nonhazardous Waste

Waste determined to be a nonhazardous but designated waste (23 CCR 2522) can be transported to a Class II waste management facility. All nonhazardous industrial waste shipments must be accompanied by the appropriate shipping form. The RWQCB and local health department can be contacted to aid in determining what waste management facilities will accept the waste and any additional test requirements. Non-hazardous waste materials will be shipped to the following Company approved facilities or other licensed and approved waste management facilities:

Clean Harbors
2500 W. Lokern Road
Buttonwillow, California 93206
800-544-7199 / 661-762-6200

McKittrick Waste
56533 Highway 58 West
McKittrick, California 93251
661-762-7366

Santa Clara Waste Water
815 Mission Rock Road
Santa Paula, California 93060
805-525-8315

Cymric Road Mix Facility
3252 W. Crocker Springs Road
Fellows, California 93224
661-768-4831 (Bremer Office)

Chemical Waste Management, Inc.
35251 Old Skyline Road
Kettleman City, CA 93239
800-222-2964 / 559-386-9711

6.3 Communications

Effective and efficient communication systems are a central requirement for oil spill response effort at every level, from the initial detection of a spill until final restoration efforts are completed. Communication requirements vary with the severity of the spill. In general, a communications system is used during a response effort to gather information and status reports as well as to provide coordination and direction to widely separated work groups involved in search, containment/diversion, repair, traffic control, security, evacuation, and restoration. Several communications systems can be employed in an oil spill emergency. These systems may include:

- **Telephone circuits** - These include standard dial-up telephones as well as hard-wired "pick up" systems and facsimile systems.
- **Cellular telephones** – The cellular systems are so widespread that there are virtually no areas in California that cannot be reliably served by these networks. Units can be mounted in vehicles or hand-carried to provide for the receipt or initiation of telephone calls**.**
- **VHF-FM Two-Way Company Radio Network – The Company is licensed for and equipped with a multi-mode two-way radio system that is used for normal pipeline operation and maintenance and is available for use in an emergency.**
- **VHF-FM marine radio (156-159 MHz)** – VHF-FM radios are critical to communications with offshore response vessels.
- **VHF-AM aircraft radio (118-136 MHz)** – VHF-AM radios are critical for ground-to-air surveillance communications as well as logistics. It is important to include VHF marine radio capability on aircraft to ensure vessel-to-air surveillance communications.
- **UHF oil spill radio (451/469.000 MHz)** – UHF radios can be used for land as well as marine communications.
- **HF single sideband radio (2-20 MHz)** – HF radios can be useful for long distance marine communications if the response area extends beyond line of sight range, but are not as reliable as VHF or UHF.
- **Local amateur radio operators** – These volunteer radio communication operators provide reliable primary and secondary communications links for emergency response operations
- **Satellite** – In the event of a major communication breakdown, satellite phones have been provided to the facilities. These phones are to be utilized when normal routes of communications are not operable. These phones are maintained in the off position and must be turned on to receive and transmit calls. See Section 6.3.2 for specific satellite phone numbers for the Pt. Arguello/Pt. Pedernales facilities.
- **Paging system** – This one-way communication is useful for rapid notification of spill response personnel who are within range of the transmitter. Paging systems range from local city coverage to countrywide (major cities) and limited international.

The Company's emergency response team will utilize any or all of the available communications systems to implement oil spill response. Use of the more common communications modes are described in this section.

6.3.1 Communications Modes

6.3.1.1 Cellular Phones

Recent developments in the cellular telephone system permit unprecedented flexibility and access to the public telephone system from remote and mobile locations. This extensive system provides a semi-private mode of telephone use that is a valuable tool for emergency response. It permits immediate telephone service at non-connected locations such as in an Emergency Operations Center or at remote strategic deployment areas. Cellular telephone coverage in the Santa Barbara Channel area is imperfect. Thus, cellular connections cannot be relied upon to provide communications to all potential spill response locations.

In the event of a sustained response effort, additional vehicular mobile and hand-held cellular telephones can be purchased, installed, and activated to establish a more secure network of communications between the Emergency Operations and remote work locations, and to provide direct access to the commercial telephone system.

In the event of a widespread event affecting local power distribution and telephone service, cellular telephones may not continue to operate if the cellular repeater power source was affected. Some repeater sites are provided with backup systems. It is likely, but not assured, that cellular telephones will be in service and usable on some occasions when local telephone service has been disrupted.

6.3.1.2 Cooperative Radio Systems

An extensive radio system is available and can be utilized through Oil Spill Cooperatives. These radios operate on Federal Communications Commission frequencies that are specifically reserved and assigned for oil spill response.

The system consists of two separate networks that can be employed for tactical and operations coordination. Both systems have the ability to either operate in a repeater or direct communications mode. The systems do not allow communications between the networks. However, parties who have control of a unit from each network may relay messages between networks. Normally the Communications Unit Leader will handle message coordination between the cooperative's networks. The Incident Commander will also have access to units from both networks.

The Tactical Network will be utilized to provide communications to those members of the Response Team involved in the management, procurement, supply, and coordination of the incident. The Operational Network will be reserved to provide communications for those directly involved with the reconnaissance, diversion and containment, repair, cleanup and restoration functions which are known as field functions.

Clean Seas maintains a communication network that is capable of providing maximum operating flexibility for both minor and major spills. Clean Seas has a radio repeater located atop the Santa Ynez Peak (158.445 MHz) to cover the affected area for the emergency frequencies. Clean Seas contains a complete radio system consisting of VHF on 159.480/158.445 MHz. Clean Seas can also access channels 10 and 11 via the UHF frequencies listed below.

6.3.1.3 Company VHF/UHF Radio System

The Company is licensed for and equipped with an extensive VHF/UHF FM multi-mode two-way radio system that is used for normal pipeline operation and maintenance and is available for use in an emergency.

The following UHF frequencies are defined as the Pacific Development Unit operational network.

Frequency	Channel	Use
461.1125	1	Platform Operations
462.811	2	Platform Operations
464.5125	3	Platform Operations
466.2375	4	Platform Operations
467.8875	5	Drilling
469.5375	6	Drilling
462/467.5250	7	Pt. Pedernales (Repeater)
462.5250	8	Pt. Pedernales (Direct)
451/456.5500	9	Pt Arguello Pipeline (Repeater)
451/456.3750	10	Clean Seas (Repeater)
451.3750	11	Clean Seas (Direct)

This system provides reliable communications throughout the anticipated impact areas in the event of an emergency. It is in place and used on a daily basis to support Company operations. It will be the system that is used to support immediate response activities and will be adequate for small to moderate-sized response efforts. For sustained response, other systems may supplement this system or release it to allow its return to normal operations support.

6.3.1.4 Contractor UHF and VHF Radio Systems

Contractors likely to be employed in an oil spill response effort frequently have vehicles equipped with VHF or UHF FM mobile radio systems. While these systems are not compatible with the other systems described, they will provide communications between work groups from the same contractor and the contractor's office. Additionally, the foreman and supervisory personnel will have cellular telephones in their vehicles. These radio systems can be utilized to augment the operational radio in response efforts. Messages for contractor work groups, or for their Company representative, can be relayed through the contractor's office or their vehicles.

6.3.1.5 Marine VHF Radio

The marine VHF radio system provides local communications between vessels and between a vessel and the shore. The oil spill response vessels of the Oil Spill Cooperatives are all equipped with multi-channel marine VHF radios. Channel 16 is usually used and monitored by all vessels as a designated emergency and hailing frequency. Use Channel 16 to gain contact with a vessel, then change to a mutually agreed-upon channel for communications. This keeps the emergency and hailing frequency clear for other users. The U.S. Coast Guard port offices and vessels continuously monitor Channel 16 and can be contacted on this frequency.

When coordination and communications between vessels and the shore is required, hand-held 80-channel marine VHF transceivers or 80-channel base stations may be used. The Communications Unit Leader will obtain these units, as necessary, in the event that marine operations dictate their use.

Marine VHF radios operate on a "line of slight" principle between stations. The signal does not bend around mountains or over the horizon. Antenna height is the single most important factor in the range of the units. Accordingly, reliable communications can be accomplished by relative low-power hand-held units if you are above the level of the sea and have a clear path. The hand-held units are particularly effective for communicating with vessels operating near the shore in oil spill cleanup operations.

6.3.1.6 Air-To-Ground VHF Radios

All leased aircraft and helicopters are equipped with VHF air-to-ground radio transceivers. The air-to-ground VHF also operates on a "line of sight" basis. Because the aircraft is operating at altitude, its antenna is at a height that permits communication over a considerable range. Initial communications with aircraft and helicopters can be handled through the aviation contractor who has base units installed. Hand-held radios can be taken aboard aircraft (as well as vessels) to provide coordinated communications with the Response Team. For extended operations, arrangements can be made through the aviation contractor to use specific frequencies to communicate with the aircraft over VHF air-to-ground radios.

6.3.1.7 Amateur Radio Resources

Amateur Radio Operators are private citizens who have passed the licensing requirements of the Federal Communications Commission to hold communication privileges on various assigned frequency bands. They own and operate base stations and mobile units primarily as a hobby. Frequently these amateur radio operators, or "hams," establish reliable communication networks and undergo training and drills to establish proficiency in providing emergency communications during disasters when conventional means of communication are out of service. They have a rich history of such assistance and service in times of earthquakes, floods, hurricanes, and other natural disasters. Their communications equipment is frequently very modern and very capable.

There are two different types of emergency networks in operation by amateur radio operators. The first type is organized and sponsored by the American Radio Relay League (ARRL) and will accept and transmit radiograms routinely or in times of emergency. The messages should be

given a proper priority ("Routine", Urgent", or "Emergency") and delivered by telephone to any operator on the network. Radiogram messages should be in the form of a telegram: brief, abbreviated, and restricted to the essential message.

The second network is called Military Affiliated Radio System (MARS). It is sponsored by the military organization (Army, Air Force, etc.) and networked with powerful radio stations located at military bases. This system is primarily intended to assist personnel in the armed forces, but it will also process radiograms in times of crisis.

6.3.2 Communications Coordination

The use of the combined communication resources provides a number of redundant paths for communications between the Company and the other elements and resources likely to be employed in any large-scale response effort. The systems and their networks will be configured and used in a manner which best serves the incident at hand.

The Company's regular operational radios will be utilized for initial response. If expanded or sustained response is required, the Cooperative UHF and VHF systems will be activated, freeing the regular system for the support of regular non-emergency operations needs.

The Communications Unit Leader is responsible for coordinating the distribution and operation of the units. The Unit Leader is also responsible for maintaining assignment records for the hand-held units and chargers. Units should not be swapped or given to others for extended use without notifying the Communications Supervisor. Units requiring repair or maintenance should be turned in to the Communications Supervisor, who will log the unit as returned and issue a replacement unit. The defective unit will be tagged with a repair tag immediately upon return. The tag should be taped to the unit and turned over to the Company's repair technician or sent to a repair shop for service.

Facility Telephone Number Listing:

	Telephone	Satellite Phone
Platform Harvest	(805) 733-5615/5620	8816-3144-8752
Platform Hermosa	(805) 733-5630/5634	8816-3144-8753
Platform Hidalgo	(805) 733-5601/5605	8816-3144-8754
Platform Irene	(805) 733-0825/0536	8816-3144-8755
Gaviota Oil Heating Facility (GOHF)	(805) 567-1654	8816-3142-9415
Lompoc Oil and Gas Plant (LOGP)	(805) 733-2095	8816-3142-9532
Orcutt Office	(805) 934-8200	8816-3145-0423

Communication from Company platforms to the Company crewboat and onshore Company personnel (Options):

1. Conventional phone system
2. Two-way radio (UHF/VHF frequencies)

3. Cellular telephone.
4. Rotorcraft Helicopter Services office at (805) 937-3100. Rotorcraft will then contact the Platform dispatch offices.
5. VHF Marine Radio Channel 16.
6. Satellite Phones
7. Clean Seas office at (805) 684-3838. Clean Seas will contact Company over radio.

6.4 Transportation

Personnel and equipment require transportation to and from spill response sites. In many cases, spill response contractors will provide transportation for their own personnel and equipment. However, this may not always be the case or the most expeditious method to insure delivery on a timely basis.

The Transportation/Facilities Unit Leader is responsible for insuring the timely movement of personnel and equipment. The units will coordinate with response contractors, Incident Command, and the Planning and Operations Sections to insure that adequate transportation is provided for all spill response activities. These may include:

- Equipment delivery, movement between cleanup sites, and demobilization
- Waste hauling
- Personnel transport (vans, rental autos, FWD vehicles, etc.)
- Water taxi, crew and supply vessels

6.5 Personnel Support

In a large incident, substantial numbers of personnel may be involved in cleanup, monitoring, assessment, coordination, and other response-related activities. These people will need to be fed, provided with sleeping quarters and sanitary facilities, safety gear, and medical supplies, etc. Spill response contractors generally support the personnel they provide. However, the Company will most likely require the assistance of personnel not provided by major response contractors.

The Logistics Sections' Service and Support Branch will be responsible for personnel support. The unit will coordinate with response contractors, Incident Command, and the Planning and Operations Sections to insure all personnel are adequately supported throughout the response effort. Personnel Support services required may include:

- Lodging (hotels, motels, camping tents, etc.)
- Meals (catering services, banquet facilities, etc.)
- Sanitary facilities (portable toilets, showers, wash basins, etc.)
- Shelter (awnings or tents, wind breaks, sun protection, etc.)
- Comfort facilities (cots for resting, tables, chairs, blankets, etc.)
- Personal protective gear (Tyvek suits, boots, gloves, eye protection, hard hats, etc.)
- Medical supplies (first aid kits, over-the-counter medications, analgesics, etc.)

Medical services are available from the hospitals in Table 6-1.

Table 6-1. Hospitals		
Hospital Name	Phone	Emergency Room
Santa Ynez Cottage Hospital 700 Alamo Pintado Road Solvang, CA 93463	805-688-6431	805-686-3986
Marian Medical Hospital 1400 E. Church Street Santa Maria, CA 93454	805-739-3000	805-739-3200
Lompoc Hospital 1515 East Ocean Lompoc, CA 93436	805-737-3300	805-737-3333
Goleta Valley Cottage Hospital 351 S. Patterson Avenue Santa Barbara, CA 93111	805-967-3411	805-681-6473
Santa Barbara Cottage Hospital Pueblo & Bath Streets Santa Barbara, CA 93105	805-682-7111	805-569-7210
Sherman Oaks Burn Center 4929 Van Nuys Blvd Sherman Oaks, CA	818-981-7111	818-907-4580

Lodging is available from the following approved sources:

Table 6-2. Approved Accommodations			
Accommodation	**Phone Number**	**Location**	**Rooms**
Days Inn Windmill	805-688-8448	Buellton	108
Santa Ynez Valley Marriot	805-688-1000	Buellton	122
Best Western Pea Soup	805-688-3216	Buellton	97
Embassy Suites	805-735-8311	Lompoc	155
Lompoc Days Inn	805-735-7744	Lompoc	90
Best Western Carpinteria Inn	805-684-0473	Carpinteria	145
Cabrillo Inn	805-966-1641	Santa Barbara	40
Inn At East Beach	805-965-0546	Santa Barbara	32
Days Inn	805-963-9772	Santa Barbara	25
Best Western Beachside	805-965-6556	Santa Barbara	60
Beach House Inn & Apts.	805-966-1126	Santa Barbara	12
Extended Stay America	805-692-1882	Santa Barbara	104
Radisson Inn	805-928-8000	Santa Maria	184
Holiday Inn	805-786-9480	Santa Maria	207
Holiday Inn	805-964-6241	Goleta	160

6.6 Equipment Maintenance and Support

In a long response and cleanup, it is likely that equipment will require routine maintenance and repair to insure optimum performance and continued availability for the response effort. Spill response contractors generally will provide for routine maintenance and repair of their own equipment. However, it may be expeditious for the Company to provide suitable locations for maintenance or repair activities to occur to minimize the time a piece of equipment is out of service. The Logistics Section will insure that suitable repair and maintenance locations are established, if necessary to support an extended response or cleanup effort.

The Logistics Section's Transportation/Facilities Unit is responsible for insuring that essential equipment required for the response is maintained and repaired on a timely basis. The units will coordinate with response contractors, Incident Command, and the Planning and Operations Sections to insure that all equipment maintenance and repair is completed. Specific support activities may include:

- Providing fuel and lubricants
- Locating and providing spare parts
- Scheduling maintenance in coordination with Operations
- Identifying and procuring field service, as needed

6.7 Procurement

Once a spill response is fully under way, Planning and Operations determine what equipment, personnel, and supplies are necessary to support the response effort. Those resource needs are then communicated to the Logistics Section for processing. Logistics is responsible to insure that the resources are ordered and delivered to the appropriate location at the appropriate time to support the response effort. Logistics processes and tracks resources via requisitions, copies of which are forwarded to the Compensation/Claims/Insurance Unit within the Finance Section for tracking and accounting for spill response costs. Copies of the requisition also go to Operations (to confirm that the resources have been ordered and their estimated time of arrival) and to Planning (to verify that required resources have been requisitioned and/or deployed). In sum, the Logistics Section is responsible for ordering the equipment, personnel, and supplies necessary to accomplish the response, for executing and distributing the associated requisitions, and for following up on the status of the resources (ordered, delivered). Staging and demobilization is coordinated by the Staging Unit Leader in the Operations Section.

In some instances, Planning or Operations may initiate procurement of urgently needed resources, especially early in a spill response effort. In such cases, it is incumbent upon the Planning or Operations Sections to process a requisition and forward copies to the Compensation/Claims/Insurance Unit and the Logistics Section. Logistics is ultimately responsible for following up on the status of resources that were ordered by Planning or Operations. It is, therefore, absolutely essential that Planning and Operations process requisitions for all urgently needed resources when they have not involved the Logistics Section in the procurement process.

The Compensation/Claims/Insurance Unit is ultimately responsible for tracking the expenditure (or committed expenditure) of funds to implement the response effort. The Compensation/Claims/Insurance Unit has the following responsibilities:

- Coordinating the allocation of procurement-related tasks within the Finance Section
- Insuring that all costs are recorded
- Insuring that all vendors are authorized to participate in the response effort
- Assigning tracking numbers to all procurement activities
- Reporting a running accounting of costs for the response effort including:
  - Actual costs paid do date
  - Committed costs not yet paid to date
  - Total actual and committed costs to date
  - Projected total costs
- Processing invoices for payment
- Comparing invoices to Procurement Requests to insure consistency
- Following up as necessary on vendor payments

In addition to the purely procurement-related functions, the Finance Section also manages insurance and compensation claims. In this capacity the Finance Section will:

- Notify and activate the Company's insurance claims personnel
- Receive and process claims for compensation
- Submit claims for insured losses to the appropriate insurance carriers
- Coordinate with Company management regarding the disposition of uninsured claims

6.8 Well Control

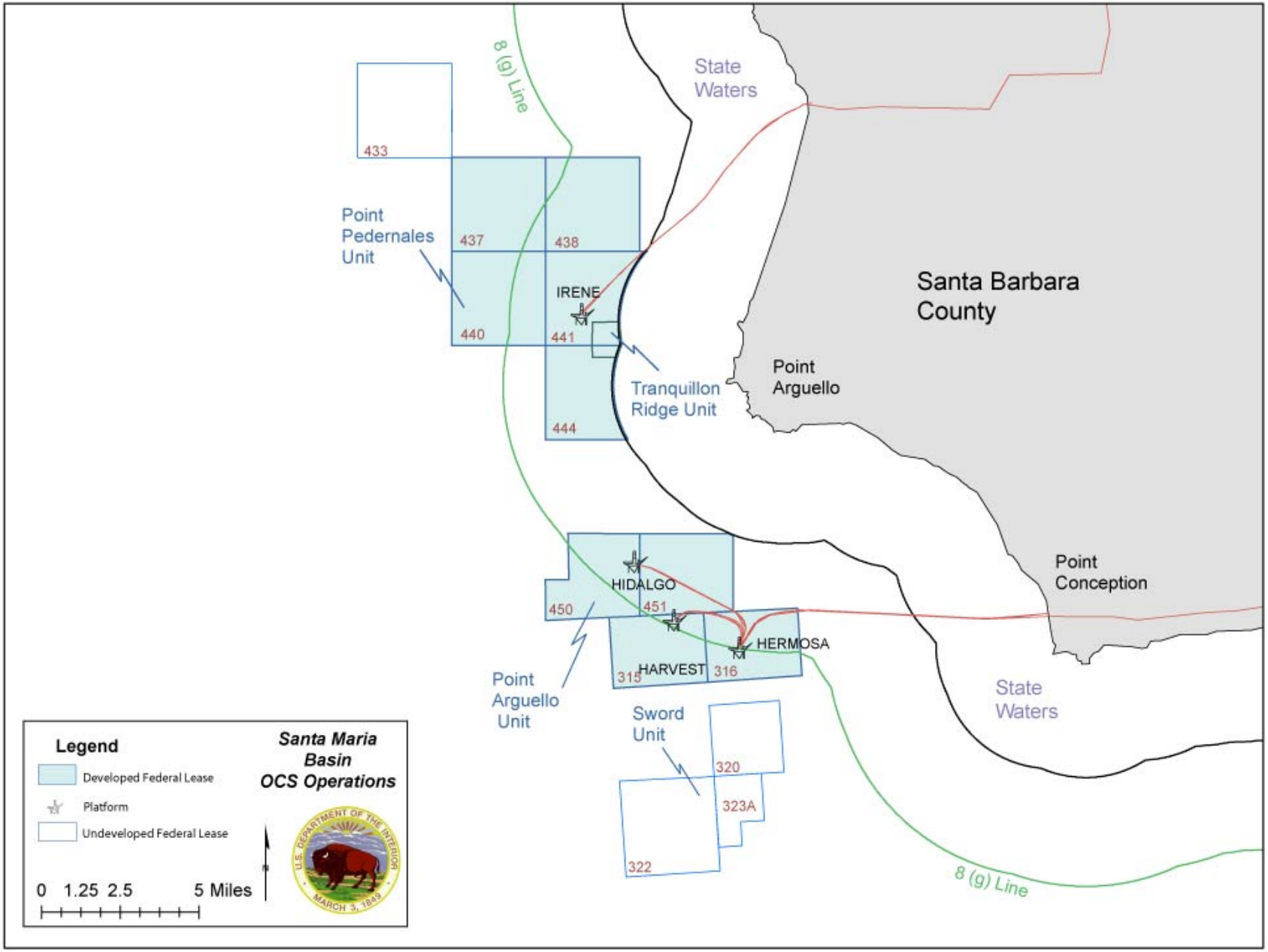
Well control problems may result in fire, explosion and the release of natural gas or H2S, flying debris, release of flammable liquids or hazardous materials. Only qualified and trained personnel should respond. The following qualified companies could be contacted if assistance is required:

Boots and Coots Services
7908 N. Sam Houston Prky-West.
Houston, TX 77064
(800) 256-9688
Fax: (281) 931-8302

Cudd Well Control
16770 Imperial Valley Dr.
Houston, TX 77060
(800) 990-2833
Fax: (713) 849-3861

Wild Well Control
2202 Oil Center Court
Houston, TX 77073
(281) 784-4700
Fax: (281) 784-4750

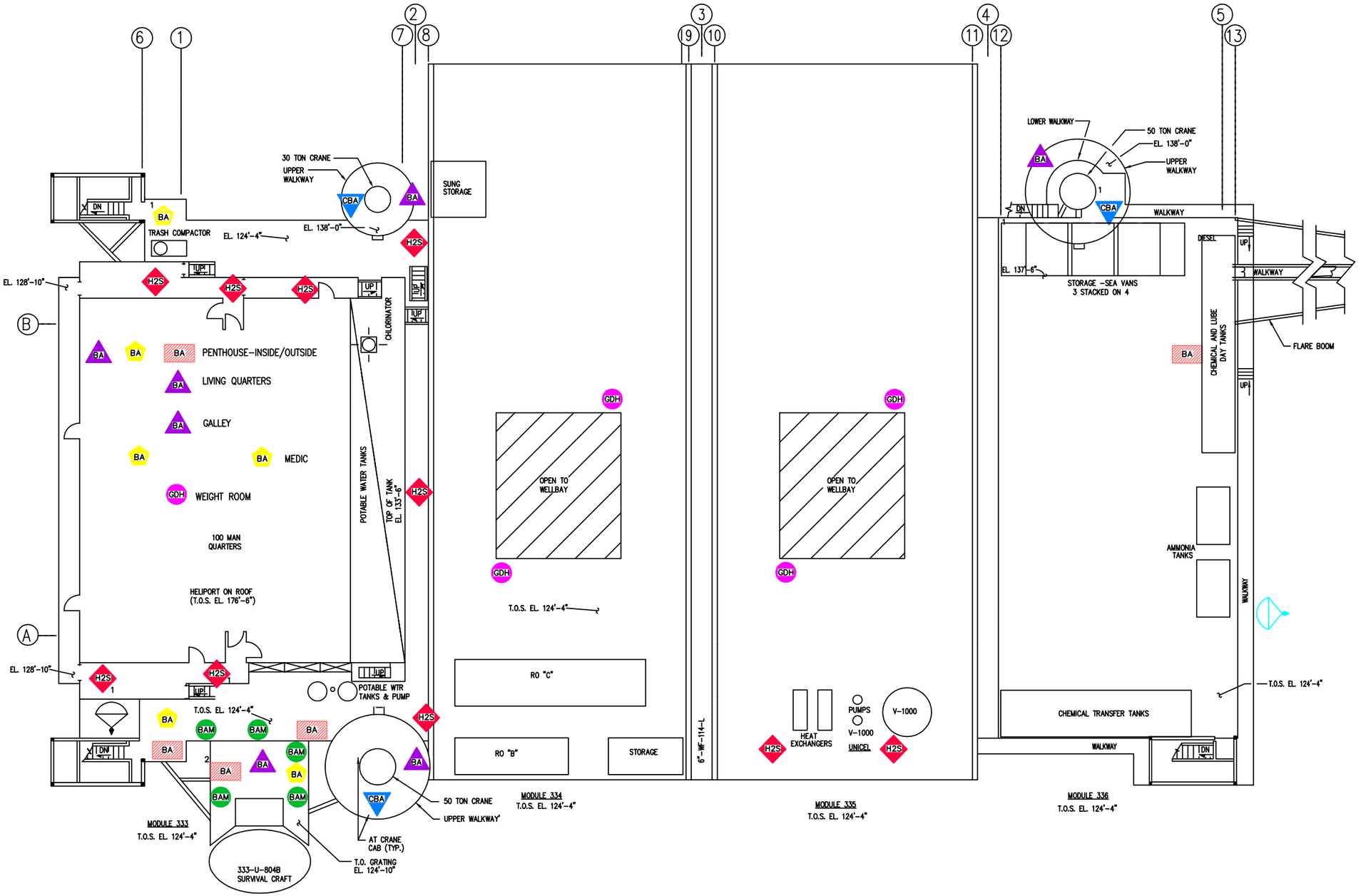
Appendix A Facility Drawings



SR 1008 04/08/11

SYMBOL LEGEND

- GDH — GAS DETECTOR HEAD
- H2S — HYDROGEN SULFIDE (H2S) DETECTOR HEAD
- CBA — CASCADE BREATHING AIR STATION NUMBER OF CYLINDERS
- BAM — BREATHING AIR MANIFOLD W/QTY OF HOOKUPS
- BA — BREATHING AIR 15 MIN. AIR PACKS
- BA — BREATHING AIR 5 MIN. AIR PACKS
- BA — BREATHING AIR 30 MIN. AIR PACKS



REFERENCE DRAWINGS

REVISIONS

2	ISSUED TO AGENCIES FOR APPROVAL 11-4-97	ACS AA		3	UPDATED BREATHING AIR QUANITIES 9-22-98	ACS AA	
4	CHANGED LOGO, GENERAL UPDATE 8/10/09	JRP		5	AS PER FIELD MARKED UP REDLINES 2/8/2012	JRP	

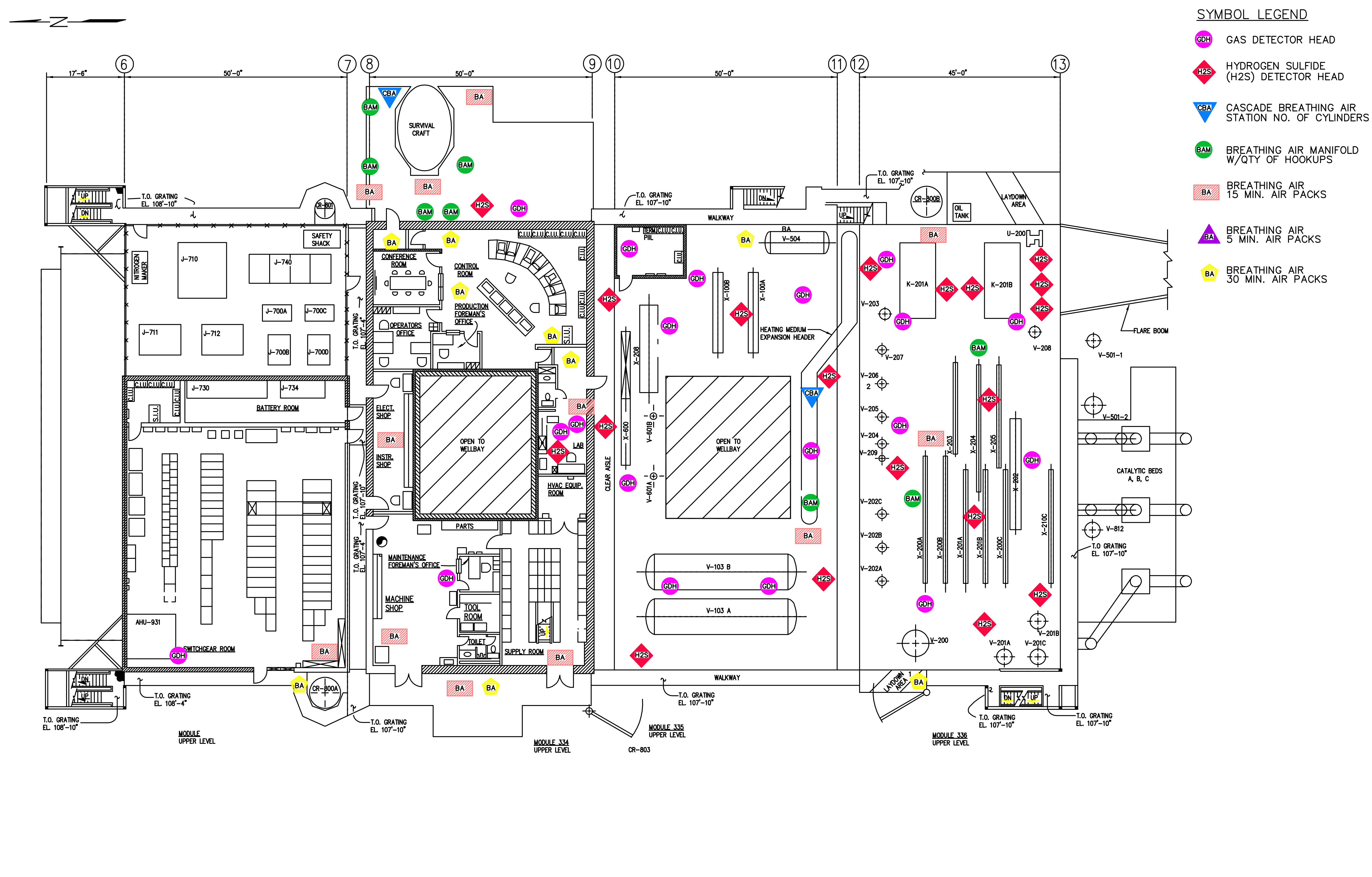
SCALE
DATE 11-4-97 DR. ACS CK.
DR. APPR. ENG.
DPR' G. DEPT. APPROVED
ENG' R. DEPT.

PXP
PLAINS EXPLORATION AND PRODUCTION COMPANY

GAS DETECTION AND BREATHING AIR SYSTEM
DRILL & QUARTERS DECK
PLATFORM HARVEST
POINT ARGUELLO, CA SHEET 1

A | C. C. | S. O. | E-SB-11222 | 5

ACS 0257N.DWG



REFERENCE DRAWINGS

REVISIONS

2	ISSUED TO AGENCIES FOR APPROVAL 11-4-97	ACS AA
3	CHANGE LOGO, GENERAL UPDATE 8/10/09	JRP
4	AS PER FIELD MARKED UP REDLINES 2/8/2012	JRP

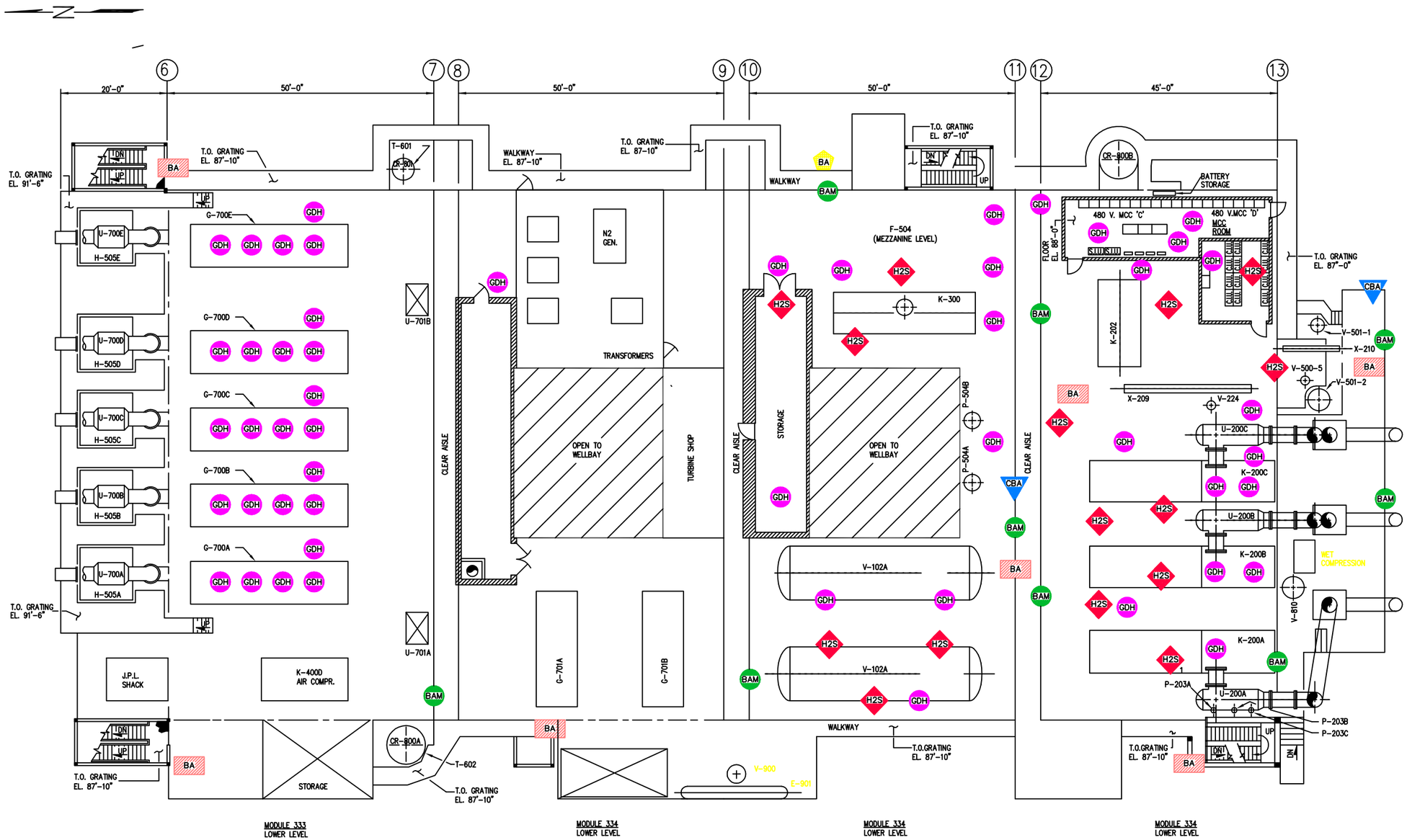
SCALE
DATE 11-4-97 DR. ACS CK.
DR. APPR. ENG.
OPR'G. DEPT. APPROVED
ENG'R. DEPT.

PXP
PLAINS EXPLORATION AND PRODUCTION COMPANY

GAS DETECTION AND BREATHING AIR SYSTEM
MODULES 333 - 336 - UPPER LEVEL
PLATFORM HARVEST
POINT ARGUELLO, CA SHEET 2

A C. C. S. O. E-SB-11222 4

ACS



REFERENCE DRAWINGS					

REVISIONS					
2 ISSUED TO AGENCIES FOR APPROVAL 11-4-97	ACS		4 AS PER FIELD MARKED UP REDLINES 2/8/2012	JRP	
3 CHANGE LOGO, GENERAL UPDATE 8/10/09	JRP		◇		

SCALE
DATE 11-4-97 DR. ACS CK.
DR. APPR. ENG.
DPR'G. DEPT. APPROVED
ENG'R. DEPT.

PXP
PLAINS EXPLORATION AND PRODUCTION COMPANY

GAS DETECTION AND BREATHING AIR SYSTEM
MODULES 333 - 336 - LOWER LEVEL
PLATFORM HARVEST
POINT ARGUELLO, CA SHEET 3

A | C. C. | S. D. | E-SB-11222 | 4

0517.DWG ACS

SYMBOL LEGEND

- GDH — GAS DETECTOR HEAD
- H2S — HYDROGEN SULFIDE (H2S) DETECTOR HEAD
- CBA — CASCADE BREATHING AIR STATION NO. OF CYLINDERS
- BAM — BREATHING AIR MANIFOLD W/QTY OF HOOKUPS
- BA — BREATHING AIR 15 MIN. AIR PACKS
- BA — BREATHING AIR 5 MIN. AIR PACKS
- BA — BREATHING AIR 30 MIN. AIR PACKS

331-J-792A T.O. GRATING EL. 60'-6" DN UP
331-J-792B T.O. GRATING EL. 60'-6" DN UP
331-U-800 T.O. GRATING EL. 60'-6" UP
332-J-793B T.O. GRATING EL. 60'-6" DN UP
WELD SHOP
C.I.U. BUILDING U-505
RED FOX
T.S.U.
U-506
W-300A
W-300B
U-301A
U-301B
PUMPS
3'-0" WALKWAY
P-308A & P-308B
ELECTRIC DRIVEN FIREWATER PUMP P-306A
DIESEL FIREWATER PUMP W/DAY TANK P-306B
DIESEL FIREWATER PUMP W/DAY TANK P-305
FIREWALL
U-303
F-302
P-302A P-302B P-302C
V-303
P-307A P-307B
P-304A P-304B
V-402
V-403
SURVIVAL CRAFT
Z-400
F-600
P-600A P-600B
V-602
U-101
U-102 U-104
U-202 U-204
X-103
U-201
P-2205
DRILLING MUD TRANSFER PUMP
Z-502
Z-508
Z-503
Z-2200
P-2250 SKID
V-101
STORAGE POLLUTION EQUIPMENT
WH-100A
WH-100B
WH-100C
WH-100D
N-21 N-16 N-11 N-6 N-1
N-22 N-17 N-12 N-7 N-2
N-23 N-18 N-13 N-8 N-3
N-24 N-19 N-14 N-9 N-4
N-25 N-20 N-15 N-10 N-5
S-1 S-6 S-11 S-16 S-21
S-2 S-7 S-12 S-17 S-22
S-3 S-8 S-13 S-18 S-23
S-4 S-9 S-14 S-19 S-24
S-5 S-10 S-15 S-20 S-25
DIFFUSER
PRODUCTION MANIFOLD
BARGE U/L STATION
C.I.U. BUILDING
LACT PNL
SCADA
SSD VRU PNL
MODICOM C.I.U.
HVAC
P-550 A & B
P-100A
P-100B
P-100C
P-100D
CHEMICAL TANK PUMP
V-212
V-211
P-201
P-200
V-500-1
V-501-1
V-600
P-505 A/B
V-501-2
Z-500
U-100
P-101B
P-101A
P-101C
V-100B
V-100A
X-101B
X-101A
Z-501
V-801
V-210
U-305
P-309A
P-309B
U-304A
U-304B
STORAGE
HEAT EXCHANGERS
RADAR ANTENNA
LAYDOWN AREA
EMERGENCY RESPONSE BOAT
CELLAR DECK T.O. STEEL EL. +60'-0"
FIELD INSTALL SPLICE
PLATFORM SPLICE LINE
MODULE 331
MODULE 332

REFERENCE DRAWINGS	REVISIONS								
	2	ISSUED TO AGENCIES FOR APPROVAL 11-4-97	ACS			4	AS PER FIELD MARKED UP REDLINES 2/9/2012	JRP	
	3	LOGO CHANGE, GENERAL UPDATE 8/10/09	AA JRP			◇			

SCALE
DATE 11-4-97 DR. ACS CK.
DR. APPR. ENG.
OPR'G. DEPT. APPROVED
ENG'R. DEPT.

PXP
PLAINS EXPLORATION AND PRODUCTION COMPANY

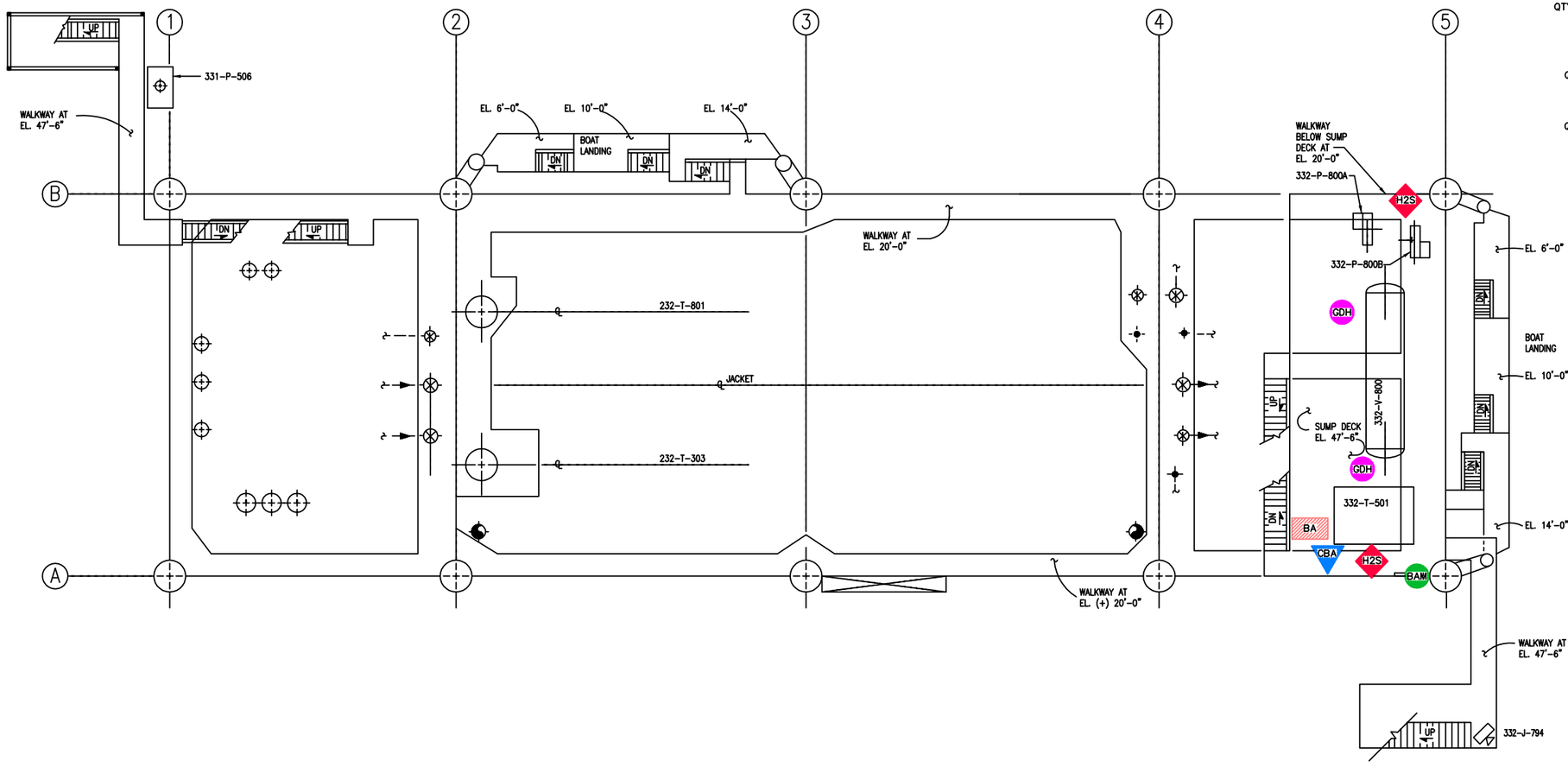
GAS DETECTION AND BREATHING AIR SYSTEM
CELLAR DECK
PLATFORM HARVEST
POINT ARGUELLO SHEET 4

A | C. C. | S. D. | E-SB-11222 | 4

057J.DWG ACS

SYMBOL LEGEND

- GDH # — GAS DETECTOR HEAD
- H2S # — HYDROGEN SULFIDE (H2S) DETECTOR HEAD
- CBA QTY — CASCADE BREATHING AIR STATION NO. OF CYLINDERS
- QTY BAM — BREATHING AIR MANIFOLD W/QTY OF HOOKUPS
- QTY BA — BREATHING AIR 15 MIN. AIR PACKS
- QTY BA — BREATHING AIR 5 MIN. AIR PACKS
- QTY BA — BREATHING AIR 30 MIN. AIR PACKS



REFERENCE DRAWINGS	REVISIONS			
	2 ISSUED TO AGENCIES FOR APPROVAL 11-4-97	ACS	4 AS PER FIELD MARKED UP REDLINES 2/9/2012	JRP
	3 CHANGE LOGO, GENERAL UPDATE 8/10/09	JRP	◇	

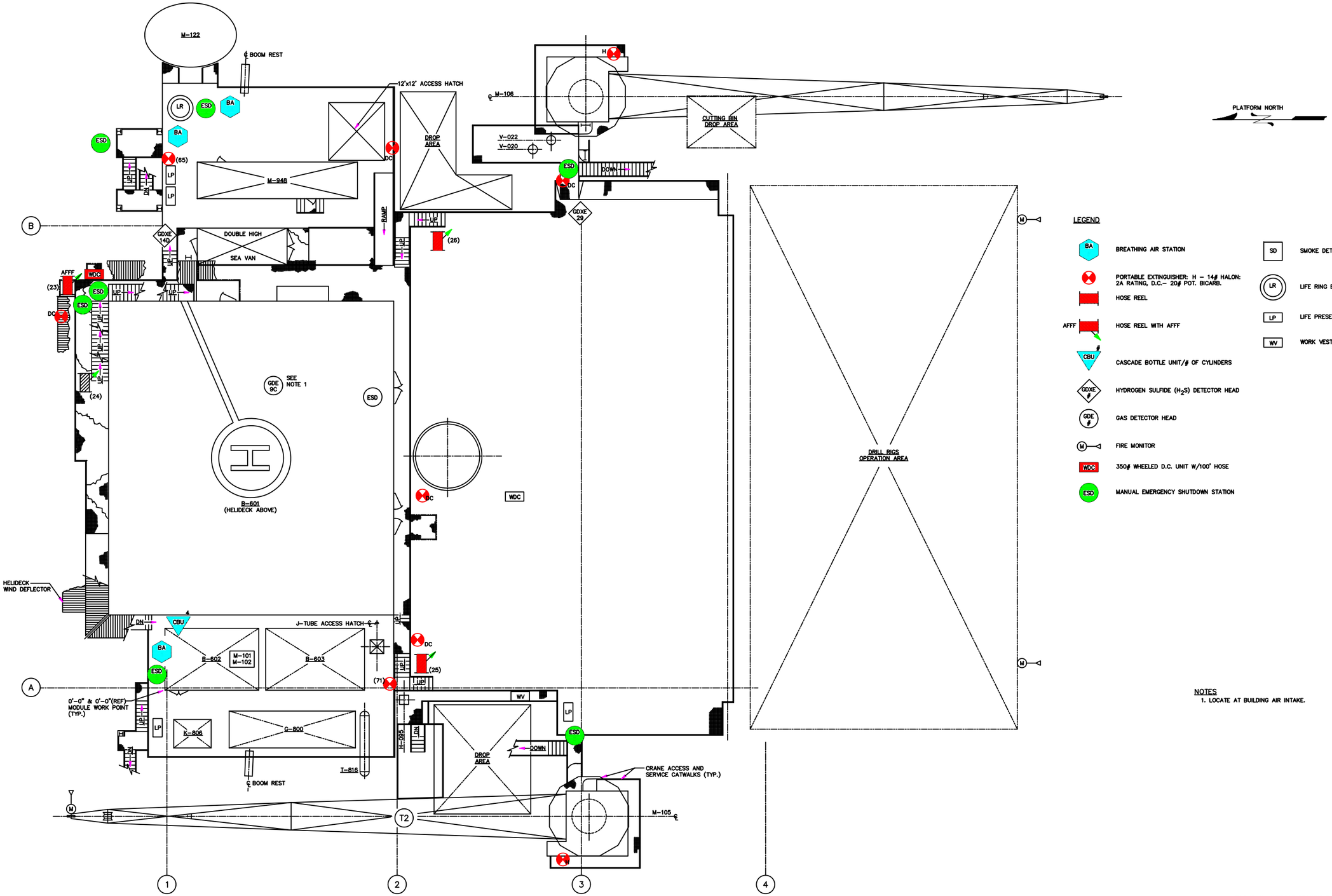
SCALE
DATE 11-4-97 DR. ACS CK.
DR.APPR. ENG.
OPR'G. DEPT. APPROVED
ENG'R. DEPT.

PXP
PLAINS EXPLORATION AND PRODUCTION COMPANY

GAS DETECTION AND BREATHING AIR SYSTEM
BELOW CELLAR DECK
PLATFORM HARVEST
POINT ARGUELLO, CA SHEET 5

A | C.C. | S.O. | E-SB-11222 | 4

ACS 0580.DWG



LEGEND

BA	BREATHING AIR STATION
	PORTABLE EXTINGUISHER: H – 14# HALON: 2A RATING, D.C.– 20# POT. BICARB.
	HOSE REEL
AFFF	HOSE REEL WITH AFFF
CBU	CASCADE BOTTLE UNIT/# OF CYLINDERS
GDXE #	HYDROGEN SULFIDE (H_2S) DETECTOR HEAD
GDE #	GAS DETECTOR HEAD
M	FIRE MONITOR
WDC	350# WHEELED D.C. UNIT W/100' HOSE
ESD	MANUAL EMERGENCY SHUTDOWN STATION
SD	SMOKE DETECTOR
LR	LIFE RING BUOY W/STROBE LIGHT
LP	LIFE PRESERVER CABINET (2)
WV	WORK VEST CABINET W/4 WORK VESTS

NOTES
1. LOCATE AT BUILDING AIR INTAKE.

THIS IS AN AUTOCAD DRAWING DO NOT REVISE MANUALLY.

REFERENCE DRAWINGS

REVISIONS

		SWH	PGL	RJF
6	REDRAWN ON AUTOCAD & ISSUED AS-BUILT 1-10-92			
7	REMOVED BULK TANKS. ASBUILT AS OF NOV. 1993 1-18-94	SLH		JFC

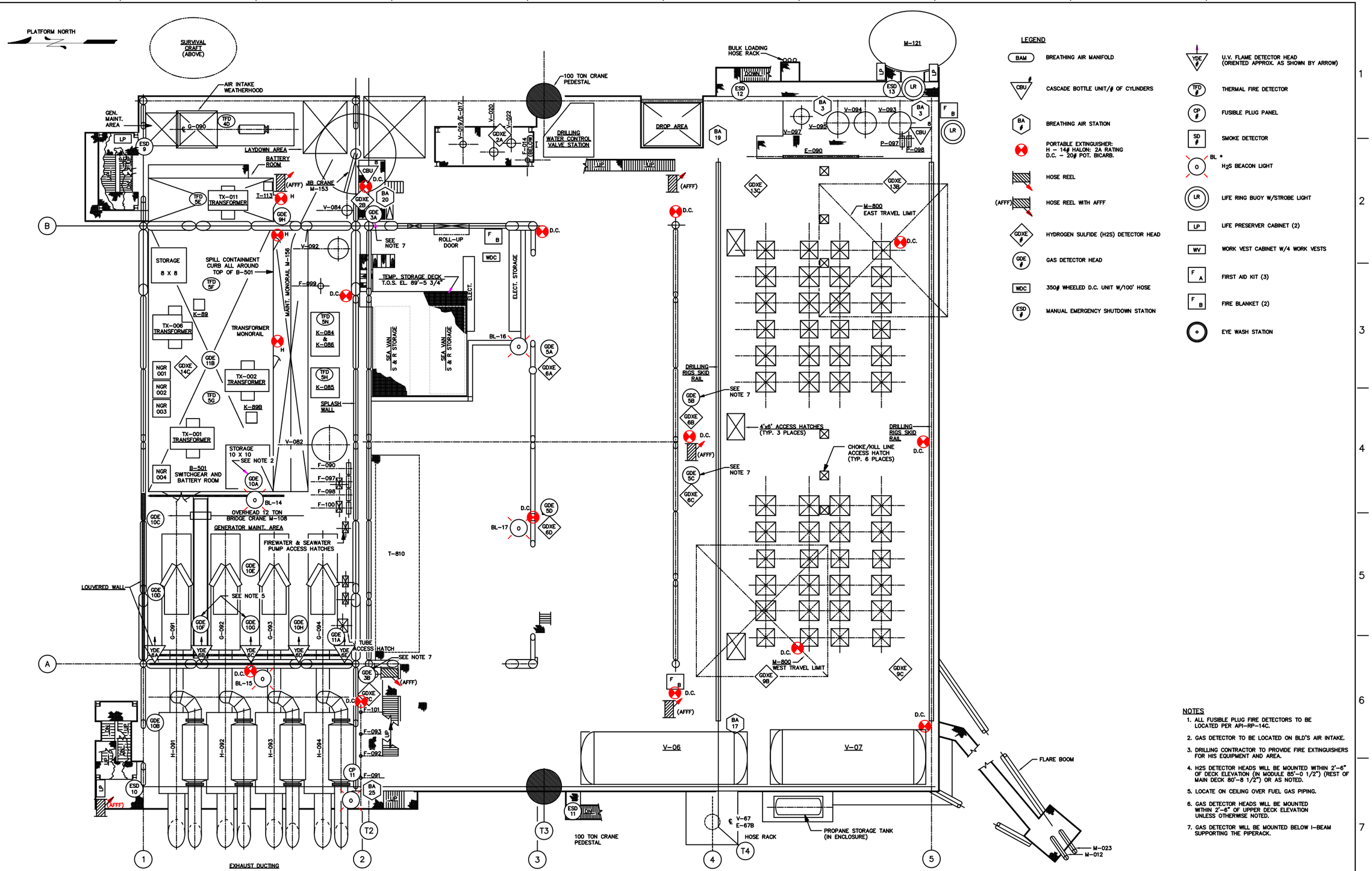
SCALE 1/8" = 1'-0"
DATE 11/18/91 DR. L.J.C. CK. PGL
DR.APPR. ____ ENG. ____
OPR'G. DEPT. ____ APPROVED
ENG'R. DEPT. ____

PXP

ESD, FIRE AND GAS PROTECTION SYSTEM
UPPER DECK AND PIPERACK
DRILLING AND PRODUCTION PLATFORM HERMOSA
OCS PARCEL P-0316 POINT ARGUELLO, CALIFORNIA

J C.C. ____ E-SB-30-7074E-7
S.O. ____

ASSIGN



LEGEND

- BAM — BREATHING AIR MANIFOLD
- CBU # — CASCADE BOTTLE UNIT/# OF CYLINDERS
- BA # — BREATHING AIR STATION
- PORTABLE EXTINGUISHER: H – 14# HALON: 2A RATING; D.C. – 20# POT. BICARB.
- HOSE REEL
- (AFFF) HOSE REEL WITH AFFF
- GDXE # — HYDROGEN SULFIDE (H_2S) DETECTOR HEAD
- GDE # — GAS DETECTOR HEAD
- WDC — 350# WHEELED D.C. UNIT W/100' HOSE
- ESD # — MANUAL EMERGENCY SHUTDOWN STATION
- YDE # — U.V. FLAME DETECTOR HEAD (ORIENTED APPROX. AS SHOWN BY ARROW)
- TFD # — THERMAL FIRE DETECTOR
- CP # — FUSIBLE PLUG PANEL
- SD # — SMOKE DETECTOR
- BL # — H_2S BEACON LIGHT
- LR — LIFE RING BUOY W/STROBE LIGHT
- LP — LIFE PRESERVER CABINET (2)
- WV — WORK VEST CABINET W/4 WORK VESTS
- F A — FIRST AID KIT (3)
- F B — FIRE BLANKET (2)
- EYE WASH STATION

NOTES

1. ALL FUSIBLE PLUG FIRE DETECTORS TO BE LOCATED PER API-RP-14C.
2. GAS DETECTOR TO BE LOCATED ON BLD'S AIR INTAKE.
3. DRILLING CONTRACTOR TO PROVIDE FIRE EXTINGUISHERS FOR HIS EQUIPMENT AND AREA.
4. H_2S DETECTOR HEADS WILL BE MOUNTED WITHIN 2'-6" OF DECK ELEVATION (IN MODULE 85'-0 1/2") (REST OF MAIN DECK 80'-8 1/2") OR AS NOTED.
5. LOCATE ON CEILING OVER FUEL GAS PIPING.
6. GAS DETECTOR HEADS WILL BE MOUNTED WITHIN 2'-6" OF UPPER DECK ELEVATION UNLESS OTHERWISE NOTED.
7. GAS DETECTOR WILL BE MOUNTED BELOW I-BEAM SUPPORTING THE PIPERACK.

REFERENCE DRAWINGS

REVISIONS

10	AS-BUILT ADDED STORAGE BLD. TO B-501 & REMOVED TX-007 9-27-94	SWH ACS		8	REDRAWN ON AUTOCAD & ISSUED AS-BUILT 1-10-92	SWH	PGL RJF
				9	ADDED S&R SEA TRAINS/STORAGE DECK, REMOVED SULFA-SCRUB EQUIPMENT, ASBUILT AS OF NOV. 1993 1-13-94	SLH	JFC

SCALE 1/8" = 1'-0"
DATE 11/19/91 DR. L.J.C. CK. PGL
DR.APPR. ____ ENG. ____
OPR'G. DEPT. ____ APPROVED
ENG'R. DEPT. ____

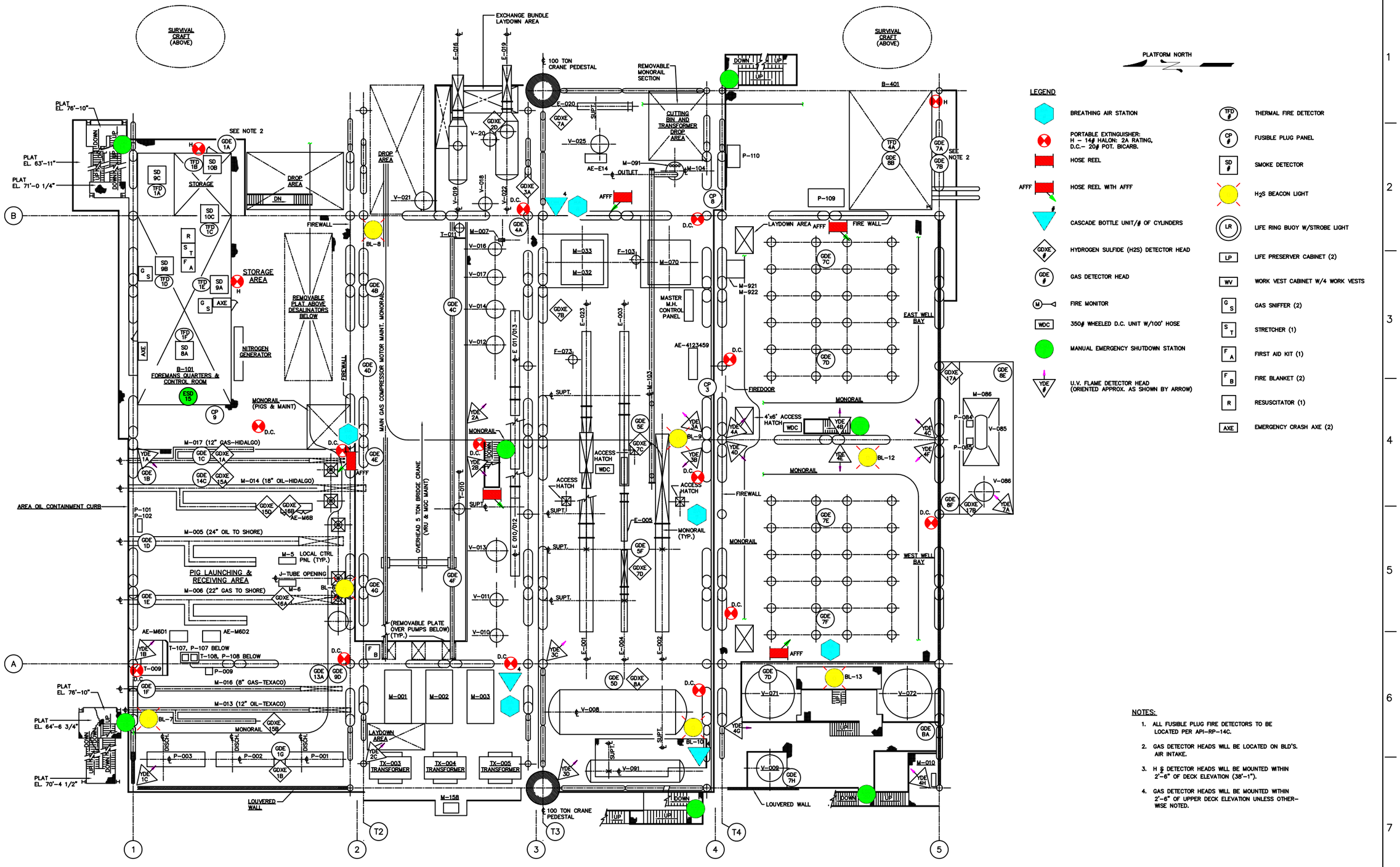
THIS IS AN AUTOCAD DRAWING DO NOT REVISE MANUALLY.

PXP

ESD, FIRE AND GAS PROTECTION SYSTEM
MAIN DECK EL. 80'-8 1/2"
DRILLING AND PRODUCTION PLATFORM HERMOSA
OSC PARCEL P-0316 POINT ARGUELLO, CALIFORNIA

J C.C. ____ S.O. ____ E-SB-30-7074D-10

ASSIGN



PLATFORM NORTH

LEGEND

- BREATHING AIR STATION
- PORTABLE EXTINGUISHER: H – 14# HALON: 2A RATING, D.C.– 20# POT. BICARB.
- HOSE REEL
- AFFF — HOSE REEL WITH AFFF
- CASCADE BOTTLE UNIT/# OF CYLINDERS
- GDXE # — HYDROGEN SULFIDE (H2S) DETECTOR HEAD
- GDE # — GAS DETECTOR HEAD
- M — FIRE MONITOR
- WDC — 350# WHEELED D.C. UNIT W/100' HOSE
- MANUAL EMERGENCY SHUTDOWN STATION
- YDE # — U.V. FLAME DETECTOR HEAD (ORIENTED APPROX. AS SHOWN BY ARROW)
- TFD # — THERMAL FIRE DETECTOR
- CP # — FUSIBLE PLUG PANEL
- SD # — SMOKE DETECTOR
- H_2S BEACON LIGHT
- LR — LIFE RING BUOY W/STROBE LIGHT
- LP — LIFE PRESERVER CABINET (2)
- WV — WORK VEST CABINET W/4 WORK VESTS
- G S — GAS SNIFFER (2)
- S T — STRETCHER (1)
- F A — FIRST AID KIT (1)
- F B — FIRE BLANKET (2)
- R — RESUSCITATOR (1)
- AXE — EMERGENCY CRASH AXE (2)

NOTES:

1. ALL FUSIBLE PLUG FIRE DETECTORS TO BE LOCATED PER API-RP-14C.
2. GAS DETECTOR HEADS WILL BE LOCATED ON BLD'S. AIR INTAKE.
3. H S DETECTOR HEADS WILL BE MOUNTED WITHIN 2'-6" OF DECK ELEVATION (38'-1").
4. GAS DETECTOR HEADS WILL BE MOUNTED WITHIN 2'-6" OF UPPER DECK ELEVATION UNLESS OTHERWISE NOTED.

THIS IS AN AUTOCAD DRAWING DO NOT REVISE MANUALLY.

REFERENCE DRAWINGS

REVISIONS

6	REDRAW ON AUTOCAD & ISSUED AS-BUILT 1-10-92	SWH	PGL	RJF
7	ADDED NITROGEN GENERATOR 1-14-94	SLH		JFC

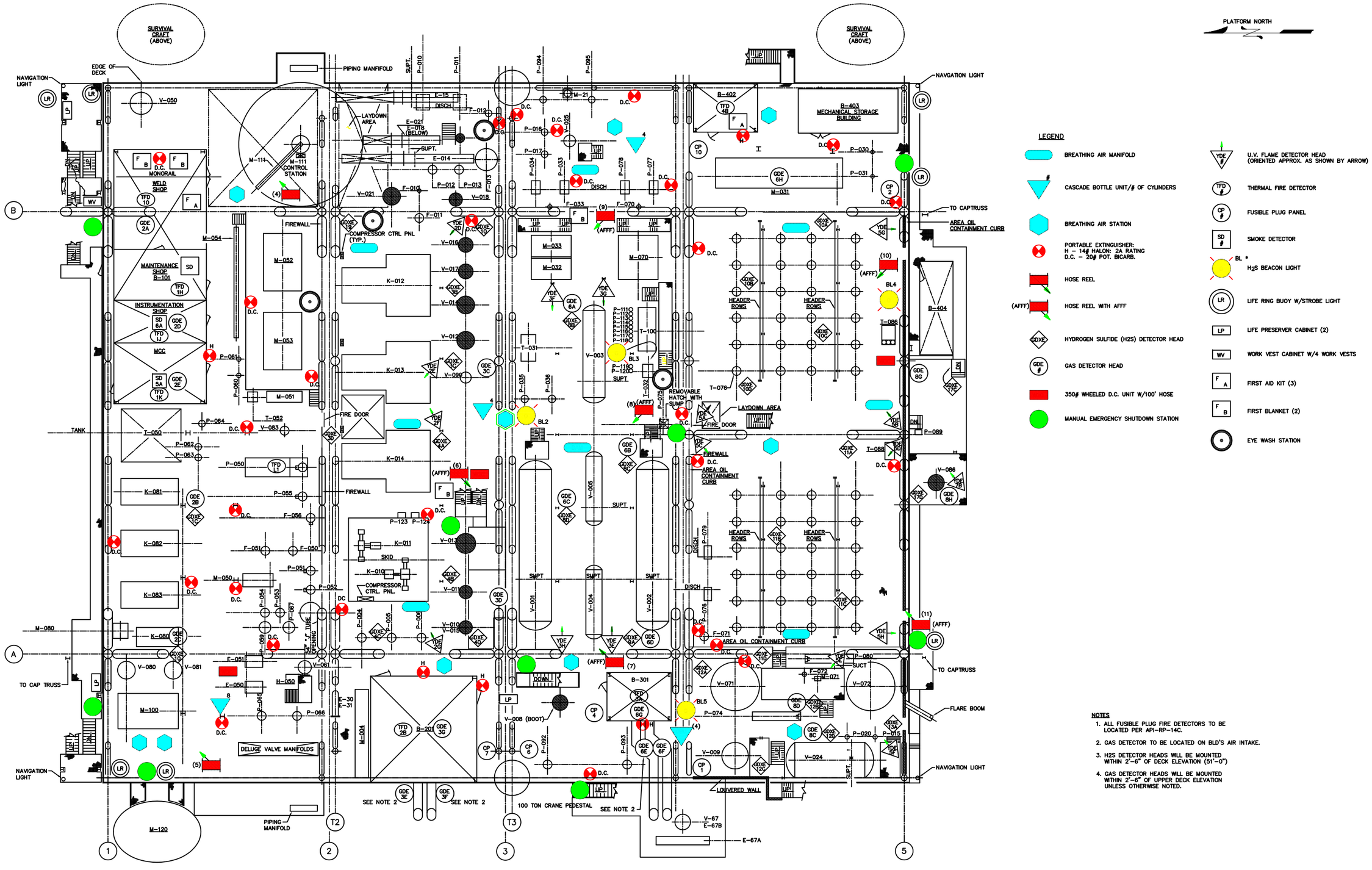
SCALE 1/8" = 1'-0"
DATE 11/19/91 DR. L.J.C. CK. RGL
DR. APPR. ____ ENG. ____
OPR'G. DEPT. ____ APPROVED
ENG'R. DEPT. ____

PXP

ESD, FIRE AND GAS PROTECTION SYSTEM
MEZZANINE DECK EL. 63'-11"
DRILLING AND PRODUCTION PLATFORM HERMOSA
OCS PARCEL P-0316

J | C.C. ____ | S.O. ____ | E-SB-30-7074C-7

ASSIGN



NOTES

1. ALL FUSIBLE PLUG FIRE DETECTORS TO BE LOCATED PER API-RP-14C.
2. GAS DETECTOR TO BE LOCATED ON BLD'S AIR INTAKE.
3. H2S DETECTOR HEADS WILL BE MOUNTED WITHIN 2'-6" OF DECK ELEVATION (51'-0")
4. GAS DETECTOR HEADS WILL BE MOUNTED WITHIN 2'-6" OF UPPER DECK ELEVATION UNLESS OTHERMISE NOTED.

THIS IS AN AUTOCAD DRAWING DO NOT REVISE MANUALLY.

REFERENCE DRAWINGS	REVISIONS					
	7	REDRAWN ON AUTOCAD & ISSUED AS-BUILT 1-10-92	SWH	PGL	RJF	

SCALE 1/8" = 1'-0"
DATE 11/19/91 DR. L.J.C. CK. PGL
DR.APPR. ENG.
OPR'G. DEPT. APPROVED
ENG'R. DEPT.

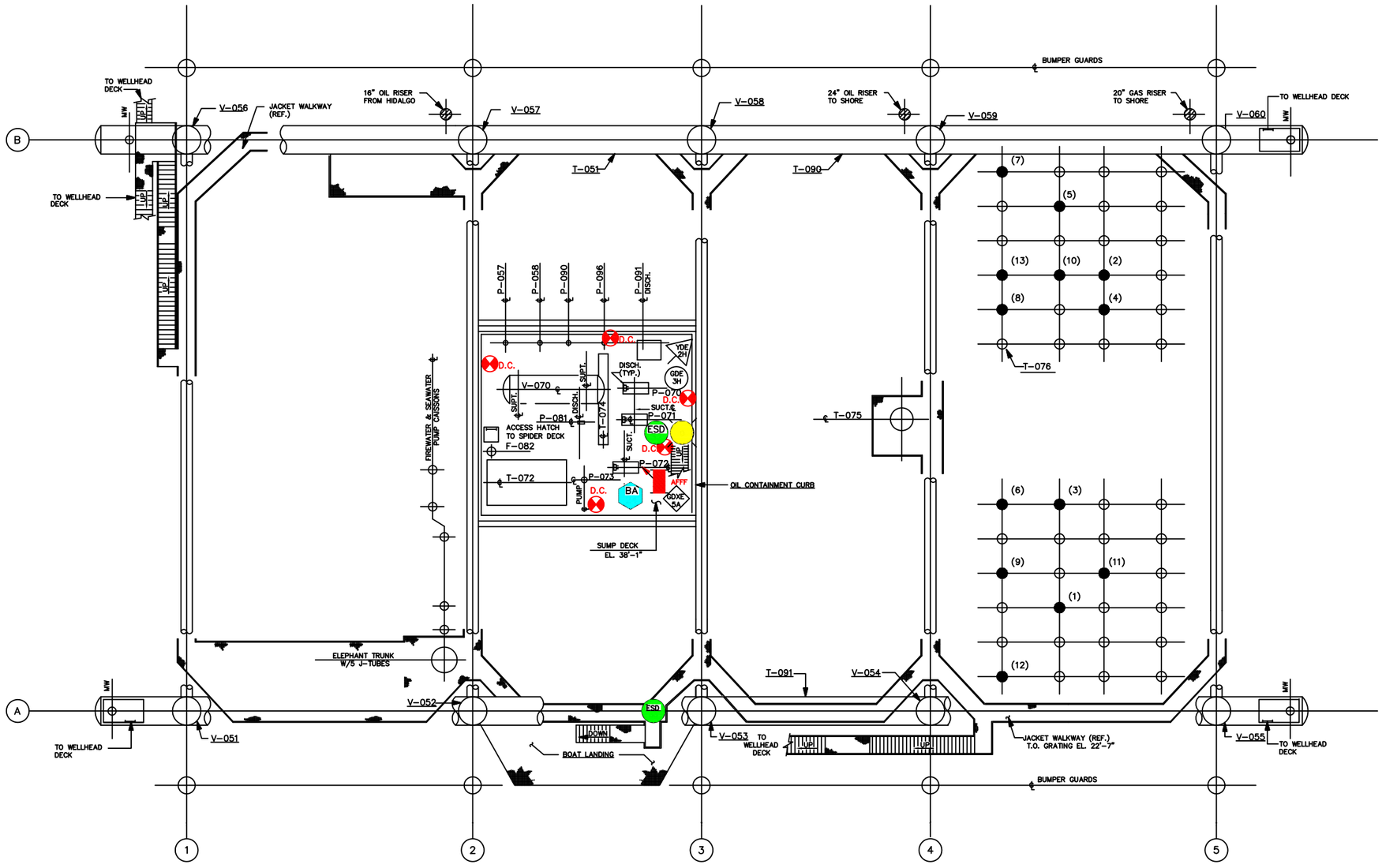
PXP

ESD, FIRE AND GAS PROTECTION SYSTEM
WELLHEAD DECK EL. 51'-0"
DRILLING PRODUCTION PLATFORM HERMOSA
OSC PARCEL P-0316 POINT ARGUELLO, CALIFORNIA
J C.C. S.O. E-SB-30-7074B-7

PLATFORM NORTH

SURVIVAL CRAFT (ABOVE)

SURVIVAL CRAFT (ABOVE)



SURVIVAL CRAFT (ABOVE)

LEGEND

- BA — BREATHING AIR STATION
- PORTABLE EXTINGUISHER: H – 14# HALON: 2A RATING D.C.– 20# POT. BICARB.
- AFFF — HOSE REEL WITH AFFF
- ESD — MANUAL EMERGENCY SHUTDOWN STATION
- YDE — U.V. FLAME DETECTOR HEAD (ORIENTED APPROX. AS SHOWN BY ARROW)
- TFD — THERMAL FIRE DETECTOR (SEE NOTE 1)
- H_2S BEACON LIGHT
- GDXE — HYDROGEN SULFIDE (H_2S) DETECTOR HEAD
- GDE — GAS DETECTOR HEAD

NOTES:

1. ALL FUSIBLE PLUG FIRE DETECTORS TO BE LOCATED PER API-RP-14C.
2. H_2S DETECTOR HEADS WILL BE MOUNTED WITHIN 2'-6" OF DECK ELEVATION (38'-1").
3. GAS DETECTOR HEADS WILL BE MOUNTED WITHIN 2'-6" OF UPPER DECK ELEVATION UNLESS OTHERWISE NOTED.
4. ● (*) INDICATES WELL NUMBER.

THIS IS AN AUTOCAD DRAWING DO NOT REVISE MANUALLY.

REFERENCE DRAWINGS					

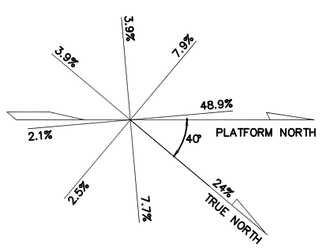
REVISIONS					
		6	REDRAWN ON AUTOCAD & ISSUED AS-BUILT 1-10-92	SWH	PGL RJF

SCALE 1/8" = 1'-0"
DATE 12-11-91 DR. SWH CK. PGL
DR.APPR. ____ ENG. ____
OPR'G. DEPT. ____ APPROVED
ENG'R. DEPT. ____

PXP

ESD, FIRE AND GAS PROTECTION SYSTEM
SUMP DECK & JACKET WALKWAY
T.O.S. EL. 38'-1" T.O. GRATING EL. 22'-7"
DRILLING AND PRODUCTION PLATFORM HERMOSA

J C.C. ____ S.O. ____ E-SB-30-7074A-6



WIND ROSE
(WIND: % OCCURRANCE FROM)

DRILL RIGS
OPERATIONS AREA

FIRE
MONITOR

PIPE RACK

M-105
BOOM REST

G-901

Generator

WEST AREA
SAFETY BRIEFING

DOWN

J-TUBE ACCESS
HATCH

STACK STORAGE AREA

IN HELIPORT

HELIDECK ABOVE
CREW QUARTERS

IN MEDIC OFFICE

PRIMARY
SAFETY BRIEFING
IN GALLEY

IN QUARTERS

B-502

EAST AREA
SAFETY BRIEFING

AFFF

B-902

B-904
(BELOW)

B-505
(ABOVE)

V-22
V-20
V-19 & E-17

DROP AREA

DROP AREA

50 MAN
WHITTAKER

UPPER DECK
EL. 123'-0"

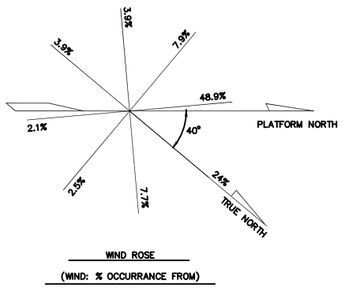
SYMBOL LEGEND

- QUANITY OF AIR PACKS AT LOCATION → BA — BREATHING AIR 15 MIN. AIR PACKS
- QUANITY OF AIR PACKS AT LOCATION → BA — BREATHING AIR 5 MIN. AIR PACKS
- QUANITY OF AIR PACKS AT LOCATION → BA — BREATHING AIR 30 MIN. AIR PACKS
- BA — BREATHING AIR CASCADE BOTTLES
- H — H2S ALARM BEACON LIGHT
- FIRE EXTINGUISHER DRY CHEMICAL
- FIRE EXTINGUISHER HALON 1211 OR CO2
- AFFF — FOAM/FIREWATER HOSE REEL
- FIREWATER ONLY HOSE REEL
- ESD — EMERGENCY SHUT-DOWN STATION
- S — EMERGENCY SHOWER STATION
- L — LIFE JACKETS
- S — STRETCHER
- FIRST AID KITS
- R — RESUSCITATORS

0 2' 6' 10' 15' 18' 22' 26' 30'
FEET
1/8" = 1'-0"

ESB11173/9-22-98/ACS

REFERENCE DRAWINGS	REVISIONS								SCALE 1/8" = 1'-0"	PXP	SAFETY EQUIPMENT ARRANGEMENT
	1 ADDED LIFE JACKETS AND STRETCHER LOCATION PER PLATFORM RED LINES.			3 UPDATED BREATHING AIR QUANTIES 9-22-98	ACS				DATE 2-5-96 DR. SLN CK.		UPPER DECK PIPERACK EL. 123'-0"
	2 ISSUED TO AGENCIES FOR APPROVAL 11-4-97	ACS		◇	AA				DR. APPR. ENG.		DRILLING & PRODUCTION PLATFORM HIDALGO
		AA							DPR' G. DEPT. APPROVED		OCS PARCELL P-0450 POINT ARGUELLO, CALIFORNIA
									ENG' R. DEPT.		A C. C. E-SB-11173 3 S. D.



WIND ROSE
(WIND: % OCCURRANCE FROM)

50 MAN WHITTAKER
BA
6
BA
BA
ESD
LOADING HOSE LAYDOWN
AFFF
ESD
LOADING HOSE RACKS
DN
100 TON CRANE PEDESTAL
EXHAUSTING DUCTING
F-92
F-94
FUEL FILTERS
F-91
F-93
AFFF
UP
H-94
SILENCER
H-93
SILENCER
H-92
SILENCER
H-91
SILENCER
AFFF
H
L
ESD
DOWN
UP
A
B
TURBO EXPANDER MODULE
MAINTENANCE TRAILER
STORAGE & SUPPLIES
STORAGE & SUPPLIES
S
AFFF
H
J TUBE ACCESS HATCH
G-94
G-93
G-92
G-91
ROTOR REMOVAL AREA
F-100
M-108
F-98
F-97
F-90
1
BA
TX-005
LB-1
NGR 091
NGR 092
NGR 093
NGR 094
NGR 095
TURBIN ELECT. VAN
MAINT. MONORAIL 15 TON
7 FT AISLE
TX-006
MONORAIL
2
BA
B-501
2
BA
TX-002
MONORAIL
MCC LUBE OIL
T-10
IV-84
TX-001
S
S
B-503
H-90
L
S
UP
DOWN
AFFF
ESD
G-90
DROP AREA
V-20
V-22
V-19
DRILLING WATER CONTROL VALVE STATION
CUTTING BIN DROP AREA
S
M-13
M-12
M-12
2
BA
H
ESD
AFFF
PEDESTAL
100 TON CRANE
1
2
3
MAIN DECK
4
5

SYMBOL LEGEND

QUANITY OF AIR PACKS AT LOCATION — X — BA — BREATHING AIR 15 MIN. AIR PACKS

QUANITY OF AIR PACKS AT LOCATION — X — BA — BREATHING AIR 5 MIN. AIR PACKS

QUANITY OF AIR PACKS AT LOCATION — X — BA — BREATHING AIR 30 MIN. AIR PACKS

BA — BREATHING AIR CASCADE BOTTLES

H — H2S ALARM BEACON LIGHT

FIRE EXTINGUISHER DRY CHEMICAL

FIRE EXTINGUISHER HALON 1211 OR CO2

AFFF — FOAM/FIREWATER HOSE REEL

FIREWATER ONLY HOSE REEL

ESD — EMERGENCY SHUT-DOWN STATION

S — EMERGENCY SHOWER STATION

L — LIFE JACKETS

S — STRETCHER

FIRST AID KIT

0 2' 6' 10' 15' 18' 22' 26' 30'
FEET
1/8" = 1'-0"

ESB11174/11-4-97/ACS

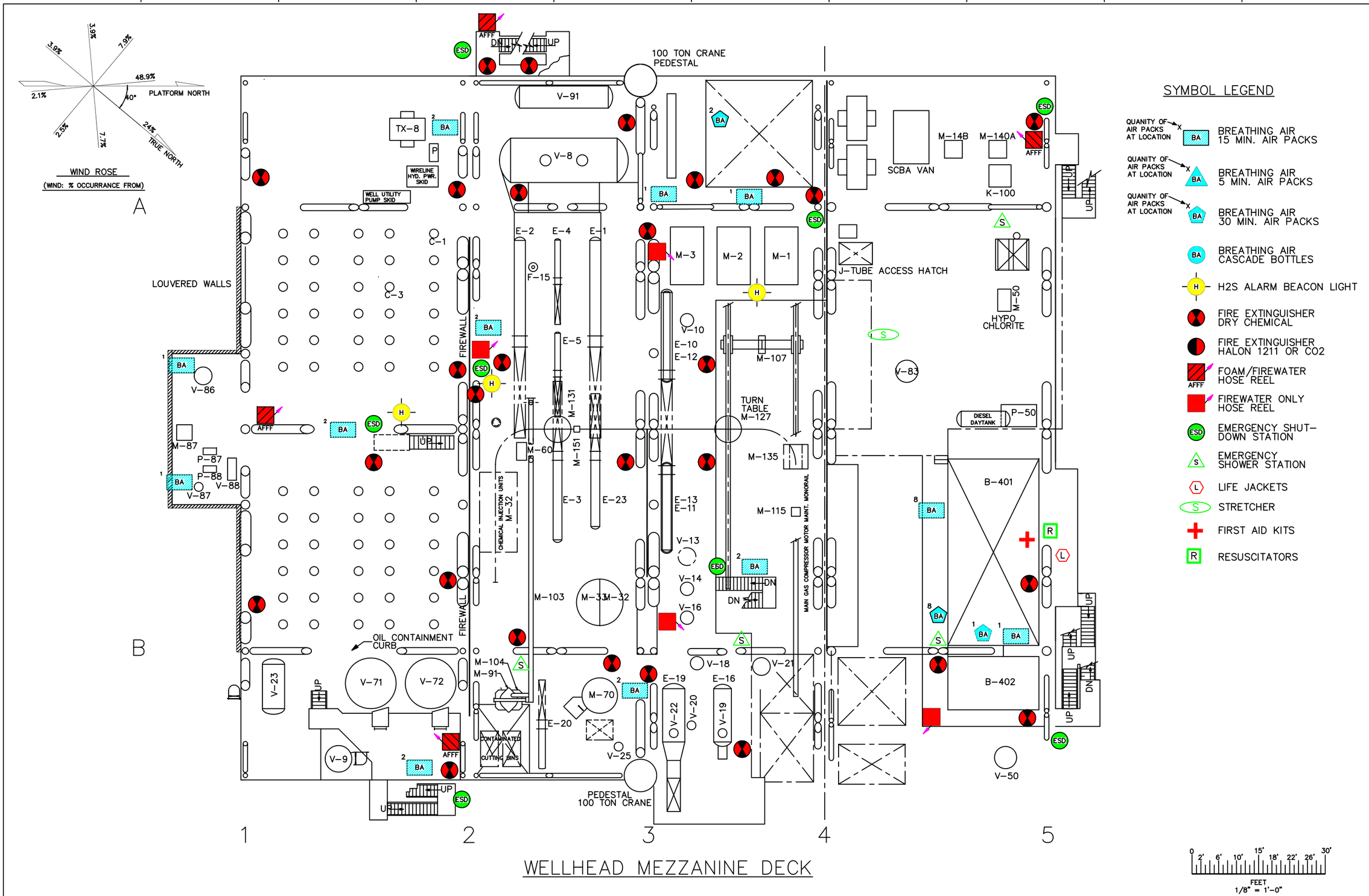
REFERENCE DRAWINGS	REVISIONS			
	1 ADDED LIFE JACKETS AND UPDATED EQUIPMENT PER PLATFORM MARK-UPS 4-18-96	ACS		
	2 ISSUED TO AGENCIES FOR APPROVAL 11-4-97	ACS AA		

SCALE 1/8" = 1'-0"
DATE 2-5-96 DR. SLN CK.
DR. APPR. ENG.
OPR' G. DEPT. APPROVED
ENG' R. DEPT.

PXP

SAFETY EQUIPMENT ARRANGEMENT
MAIN DECK AND POWER EL. 95'-3"
DRILLING & PRODUCTION PLATFORM HIDALGO
OCS PARCELL P-0450 POINT ARGUELLO, CALIFORNIA

A | C. C. | S. D. | E-SB-11174 | 2



SYMBOL LEGEND

- QUANITY OF AIR PACKS AT LOCATION — BA — BREATHING AIR 15 MIN. AIR PACKS
- QUANITY OF AIR PACKS AT LOCATION — BA — BREATHING AIR 5 MIN. AIR PACKS
- QUANITY OF AIR PACKS AT LOCATION — BA — BREATHING AIR 30 MIN. AIR PACKS
- BA — BREATHING AIR CASCADE BOTTLES
- H — H2S ALARM BEACON LIGHT
- FIRE EXTINGUISHER DRY CHEMICAL
- FIRE EXTINGUISHER HALON 1211 OR CO2
- AFFF — FOAM/FIREWATER HOSE REEL
- FIREWATER ONLY HOSE REEL
- ESD — EMERGENCY SHUT-DOWN STATION
- S — EMERGENCY SHOWER STATION
- L — LIFE JACKETS
- S — STRETCHER
- FIRST AID KITS
- R — RESUSCITATORS

WELLHEAD MEZZANINE DECK

0 2' 6' 10' 15' 18' 22' 26' 30'
FEET
1/8" = 1'-0"

REFERENCE DRAWINGS	REVISIONS		
	1 ADDED LIFE JACKETS AND REVISED PER PLATFORM MARK-UPS		
	2 ISSUED TO AGENCIES FOR APPROVAL 11-3-97	ACS AA	

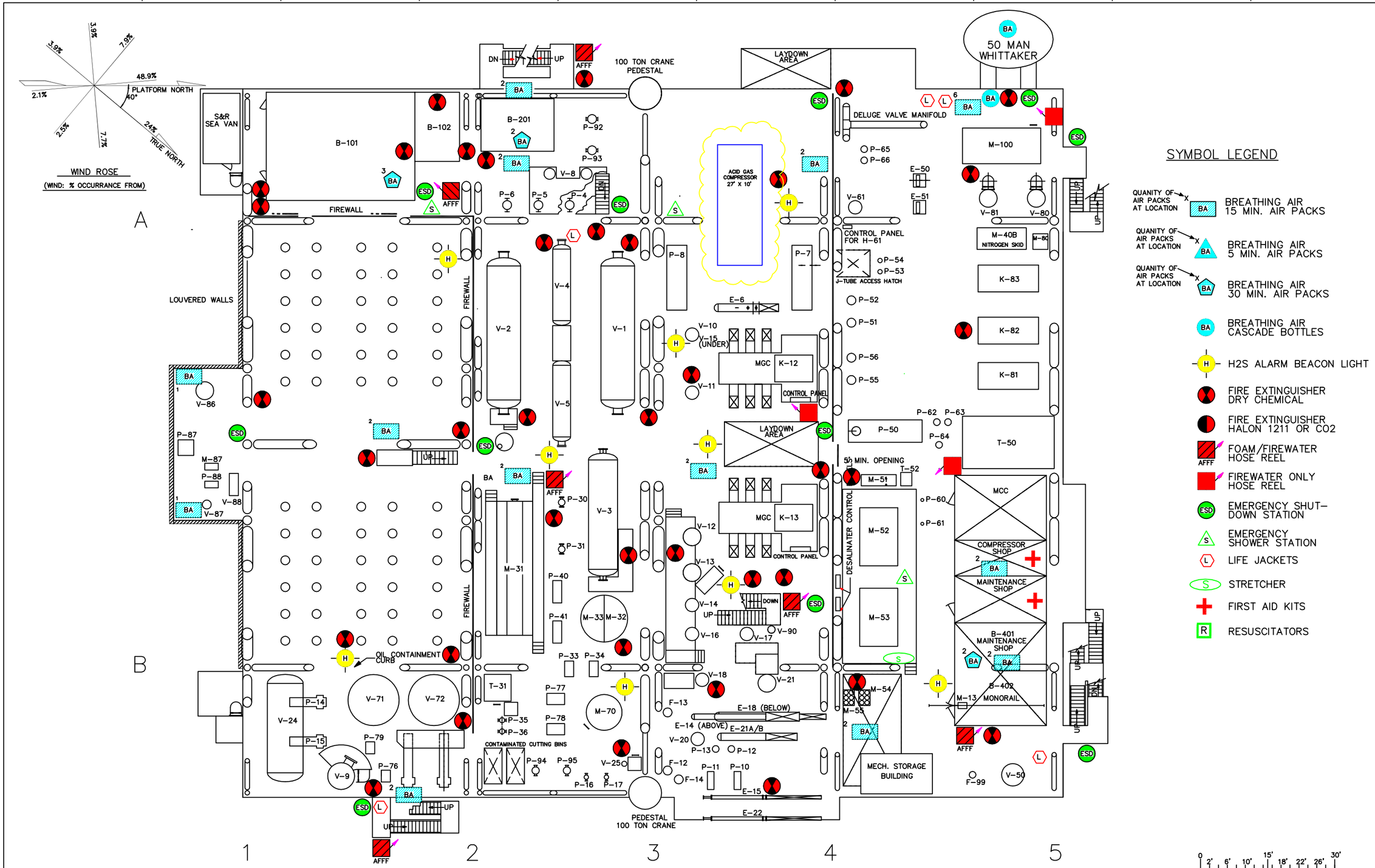
SCALE 1/8" = 1'-0"
DATE 2-5-96 DR. ACS CK.
DR. APPR. ____ ENG. AAA
DPR' G. DEPT. ____ APPROVED
ENG' R. DEPT. ____

PXP

SAFETY EQUIPMENT ARRANGEMENT
WELLHEAD DECK MEZZANINE EL. 77'-3"
DRILLING & PRODUCTION PLATFORM HIDALGO
OCS PARCELL P-0450 POINT ARGUELLO, CALIFORNIA

A | C. C. ____ S. D. ____ | E-SB-11175 | 2

11175/11-4-97/ACS



WELLHEAD DECK

REFERENCE DRAWINGS	REVISIONS				
	1 ADDED LIFE JACKETS AND REVISED PER PLATFORM MARK-UPS		3 UPDATED BREATHING AIR QUANITIES	ACS	
				AA	
	2 ISSUED TO AGENCIES FOE APPROVAL 11-4-97	ACS AA	4 9-22-98 ADD ACID GAS COMPRESSOR 5/28/2012	JRP	KK

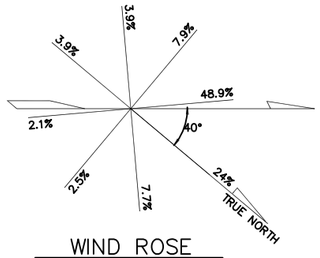
SCALE 1/8" = 1'-0"
DATE 2-6-96 DR. ACS CK.
DR. APPR. ENG.
DPR'G. DEPT. APPROVED
ENG'R. DEPT.

PXP

SAFETY EQUIPMENT ARRANGEMENT
WELLHEAD DECK EL. 62'-6"
DRILLING & PRODUCTION PLATFORM HIDALGO
OCS PARCELL P-0450 POINT ARGUELLO, CALIFORNIA

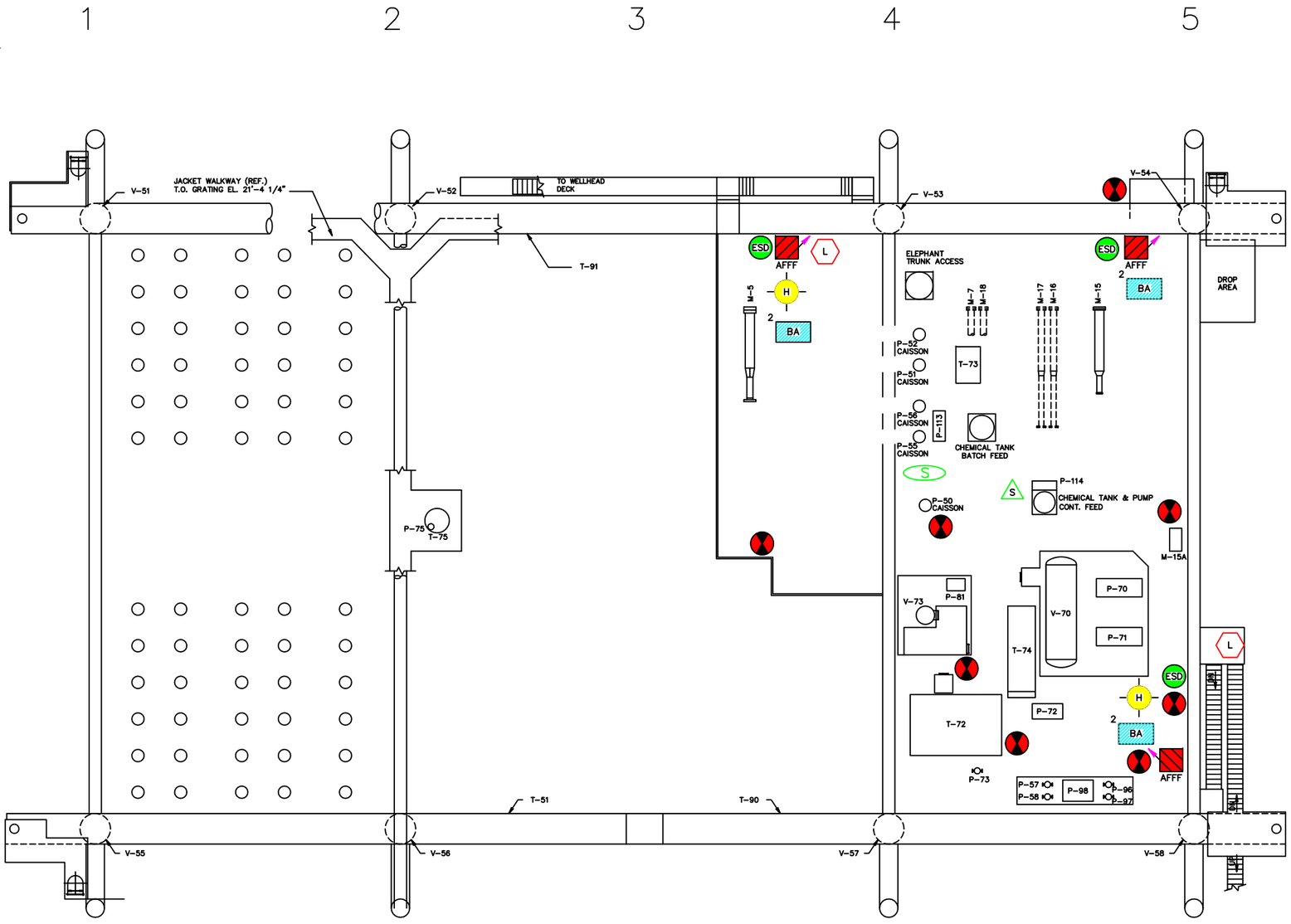
A | C. C. | S. D. | E-SB-11176 | 4

ESB11176/9-22-98/ACS



WIND ROSE

(WIND: % OCCURRANCE FROM)



SUMP DECK

EL. 45'-0"

SYMBOL LEGEND

- QUANITY OF AIR PACKS AT LOCATION → X, BA — BREATHING AIR 15 MIN. AIR PACKS
- QUANITY OF AIR PACKS AT LOCATION → X, BA — BREATHING AIR 5 MIN. AIR PACKS
- QUANITY OF AIR PACKS AT LOCATION → X, BA — BREATHING AIR 30 MIN. AIR PACKS
- BA — BREATHING AIR CASCADE BOTTLES
- H — H2S ALARM BEACON LIGHT
- FIRE EXTINGUISHER DRY CHEMICAL
- FIRE EXTINGUISHER HALON 1211 OR CO2
- AFFF — FOAM/FIREWATER HOSE REEL
- FIREWATER ONLY HOSE REEL
- ESD — EMERGENCY SHUT-DOWN STATION
- S — EMERGENCY SHOWER STATION
- L — LIFE JACKETS
- S — STRETCHER

0 2' 6' 10' 15' 18' 22' 26' 30'

1/8" = 1'-0"

REFERENCE DRAWINGS	REVISIONS		
	1 ADDED LIFE JACKETS AND REVISED PER PLATFORM MARK-UPS		
	2 ISSUED TO AGENCIES FOR APPROVAL 11-4-97	ACS AA	

SCALE 1/8" = 1'-0"
DATE 2-6-96 DR. ACS CK.
DR. APPR. ENG.
DPR' G. DEPT. APPROVED
ENG' R. DEPT.

PXP

SAFETY EQUIPMENT ARRANGEMENT
SUMP DECK AND JACKET WALKWAY
DRILLING & PRODUCTION PLATFORM HIDALGO
OCS PARCELL P-0450 POINT ARGUELLO, CALIFORNIA

A | C. C. | S. D. | E-SB-11177 | 2

ESB11177/11-4-97/ACS

Hidalgo

PLATFORM HILDAGO
LAT: 34° 29' 42.05"
LONG: 120° 42' 08.24"

SAFETY ZONE
147.1110 (see note A)

10" GAS
TOC ID NO.

PLATFORM HARVEST
LAT: 34° 28' 08.89"
LONG: 120° 40' 50.94"

SAFETY ZONE
147.1110 (see note A)

16" CRUDE
TOC ID NO.

8" GAS
TOC ID NO.

Platform "Harvest"
Fl 10s 75ft 17M
RACON ---

Fl 2s

Y "A"
Fl (5)
Navy

12" CRUDE
TOC ID NO.

Hermosa
Priv

SAFETY ZONE
147.1109 (see note A)

PLATFORM HERMOSA
LAT: 34° 27' 19.83"
LONG: 120° 38' 47"

MAGNETIC

VAR 14° 30' E (1995)

ANNUAL DECREASE 1°

9940-Y-41800

ZONE 7

334.1730 (see note A)

MP 10.8
SDV--OVB1 OIL
SDV--GVB1 GAS
LANDFALL

Fl 30s 133ft 26M
HORN

Kelp

Cojo Anchorage

Well (covered 3½ fms)

Numerous mooring

24" PAPCO OIL
TOC ID NO.

20" PANGLCO GAS
TOC ID NO.

MP 17.8
SDV-GVB2 GAS
SAN AUGUSTINE

MP 21.3
SDV-OVB2 OIL
SANTA ANITA

MP 26.4
SDV-OVB4 OIL
101

MP 25.3
SDV-GVB3 GAS
STATE PARK

MP 24.7
SDV-OVB3 OIL
HOLLISTER

MP 27.95
SDV-22102 OIL
SDV-52109 GAS

GAVIOTA OIL HEATING
FACILITY
LAT: 34° 28' 18"
LONG: 120° 12' 57"

Numerous mooring and marker buoys

W Or
Fl 4s

Well (covered 17 fms)

Well Heads
(covered 13½ fms)

Subsurface

Well Heads (covered 6½ fms)

Well Head
(covered 19 ft)

Well Head
29 (covered

well heads (covered 15 fms)
(Marker buoys)

1"=4000'

REV. NO.	DATE	REVISED (DESTROY ALL PRINTS BEARING EARLIER DATE)	REV. BY	CKD. BY	APP'D
A	01/05/01	ISSUED FOR REVIEW	TM	TM	
B	11/15/01	REVISED & REISSUED FOR REVIEW	XD	TM	

APPROVED FOR CONSTRUCTION: A. F. E. | DATE | SIGNED

DRAWN BY TCM
CHECKED BY
TRACED BY
TRAC'G. CKD
APP'D
APP'D
SCALE AS SHOWN
DATE 01/02/01

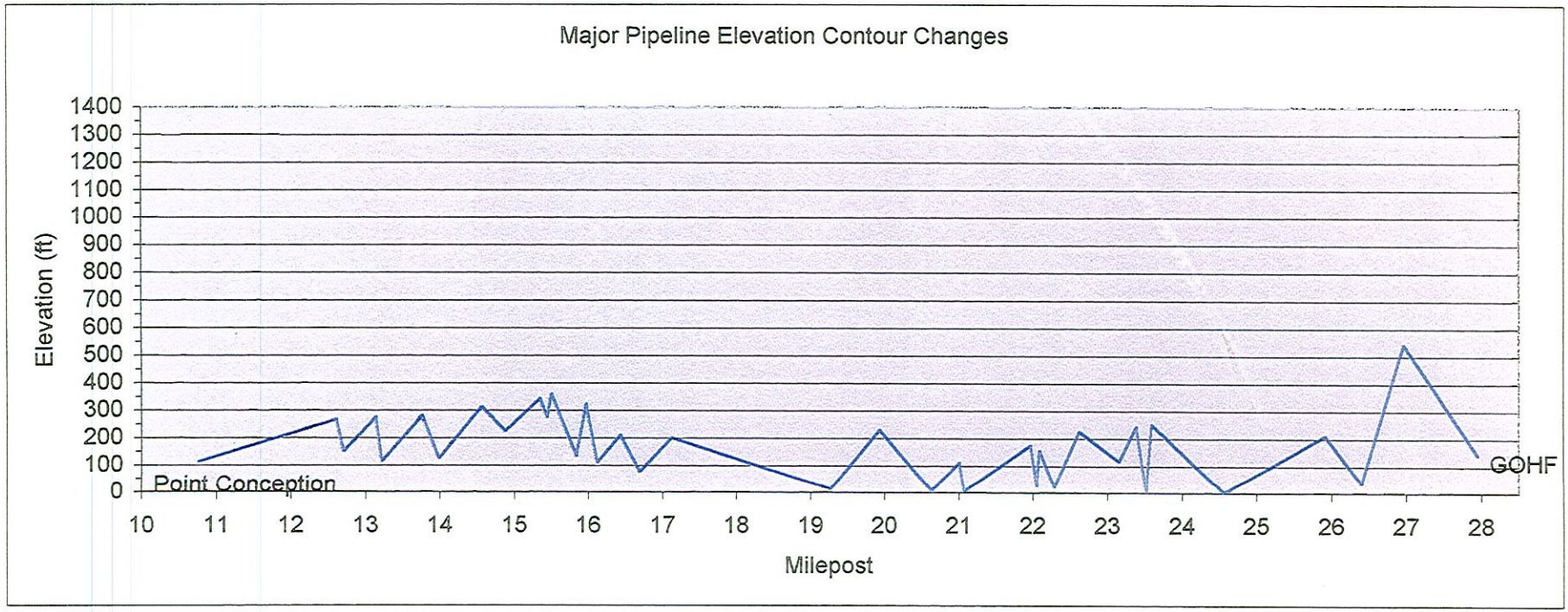
SPEC Services, Inc.
17101 Bushard Street
Fountain Valley, CA 92708
(714) 963-8077
K:\2392SK01:2000

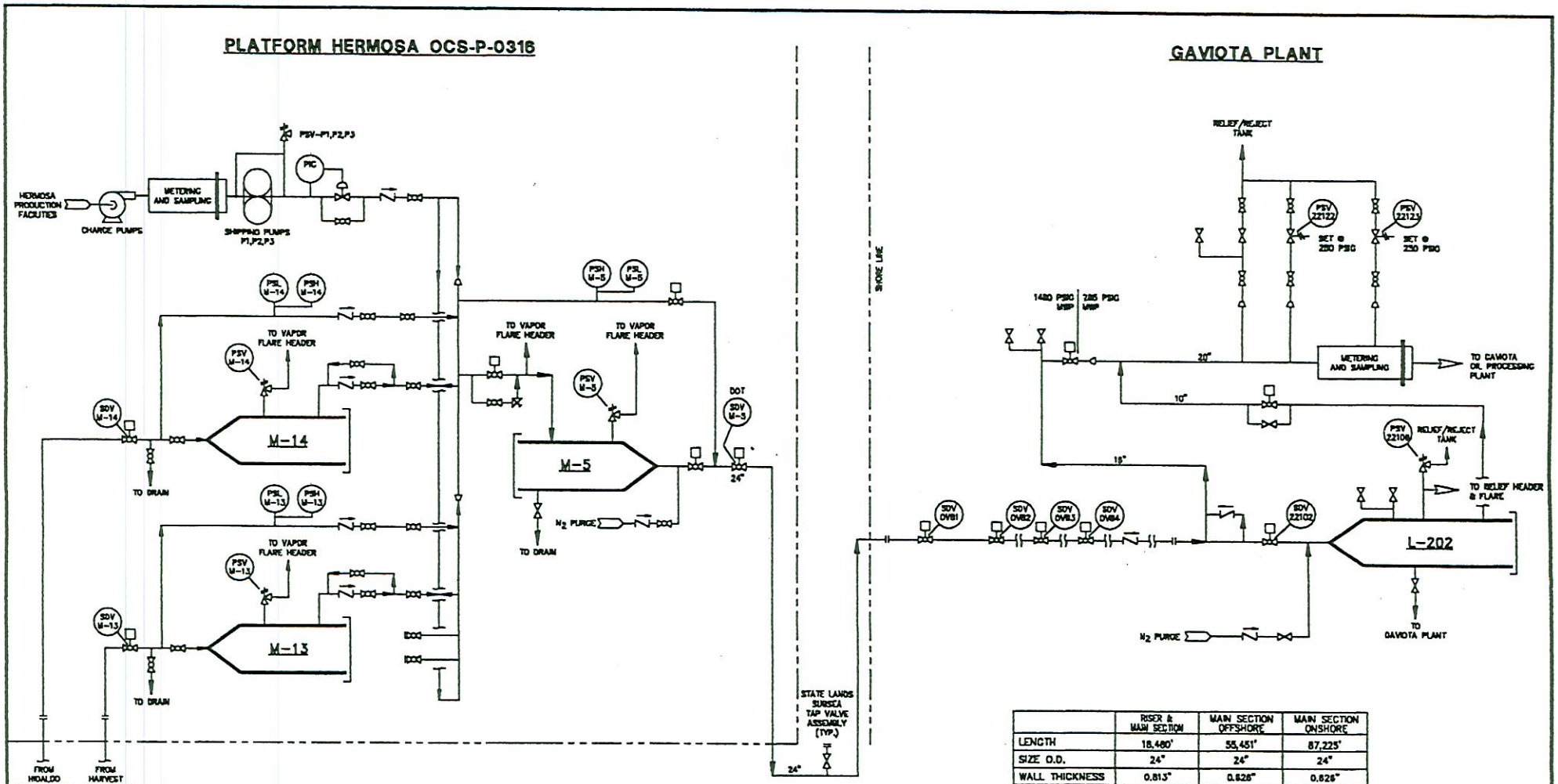
ARGUELLO OFFSHORE PIPELINES
FROM PLATFORMS HILDAGO, HARVEST, & HERMOSA

ARGUELLO INC.

DRAWING NO. 2392-SK-101

SHEETS


Major Pipeline Elevation Contour Changes
Elevation (ft)
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
Point Conception
GOHF
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
Milepost



	RISER & MAIN SECTION	MAIN SECTION OFFSHORE	MAIN SECTION ONSHORE
LENGTH	18,480'	55,451'	87,225'
SIZE O.D.	24"	24"	24"
WALL THICKNESS	0.813"	0.626"	0.626"
GRADE	API 5LX X60	API 5LX X60	API 5LX X60
PIPE COATING	CONC. HEVICOTE	CONC. HEVICOTE	COAL TAR ENAMAL TYPE I
DATE INSTALLED	1987	1987	1987

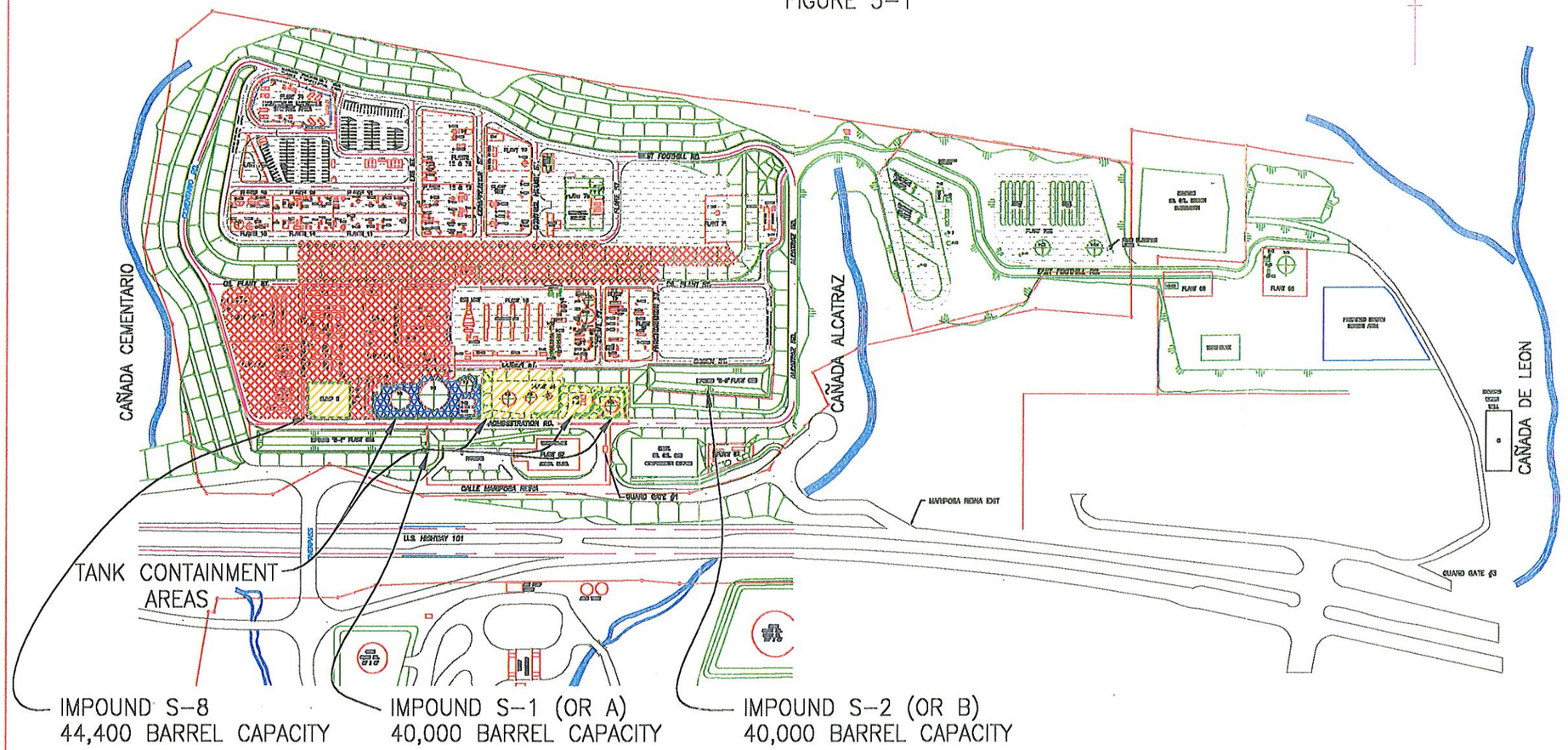
REV.	DATE	REVISION	REV. BY	CKD. BY	APP'D
1	9/28/00	REVISIONS PER REDLINE DRAWING	RR	RFM	

DRAWN BY: RR DATE: 9/13/00
CHECK BY: RFM DATE:
DESIGN BY: DATE:
FILE NAME: PFHE240IL

ARGUELLO INC.
PLATFORM HERMOSA TO GAVIOTA PLANT
24" OIL PIPELINE (PAPCO)

SCALE:	DWG NO:	SHT:	REV. NO.
NONE	PFHE-GAV-24	1	1

ARGUELLO GAVIOTA PROCESSING FACILITY
CONTAINMENT AND DRAINAGE SYSTEM
FIGURE 5–1



PERIMETER ROADS AND OFF–PLOT DRAINAGE
DRAIN INTO CAÑADAS

REVISIONS				
0	REDRAWN ON CAD	4/21/98	LL	JJPE

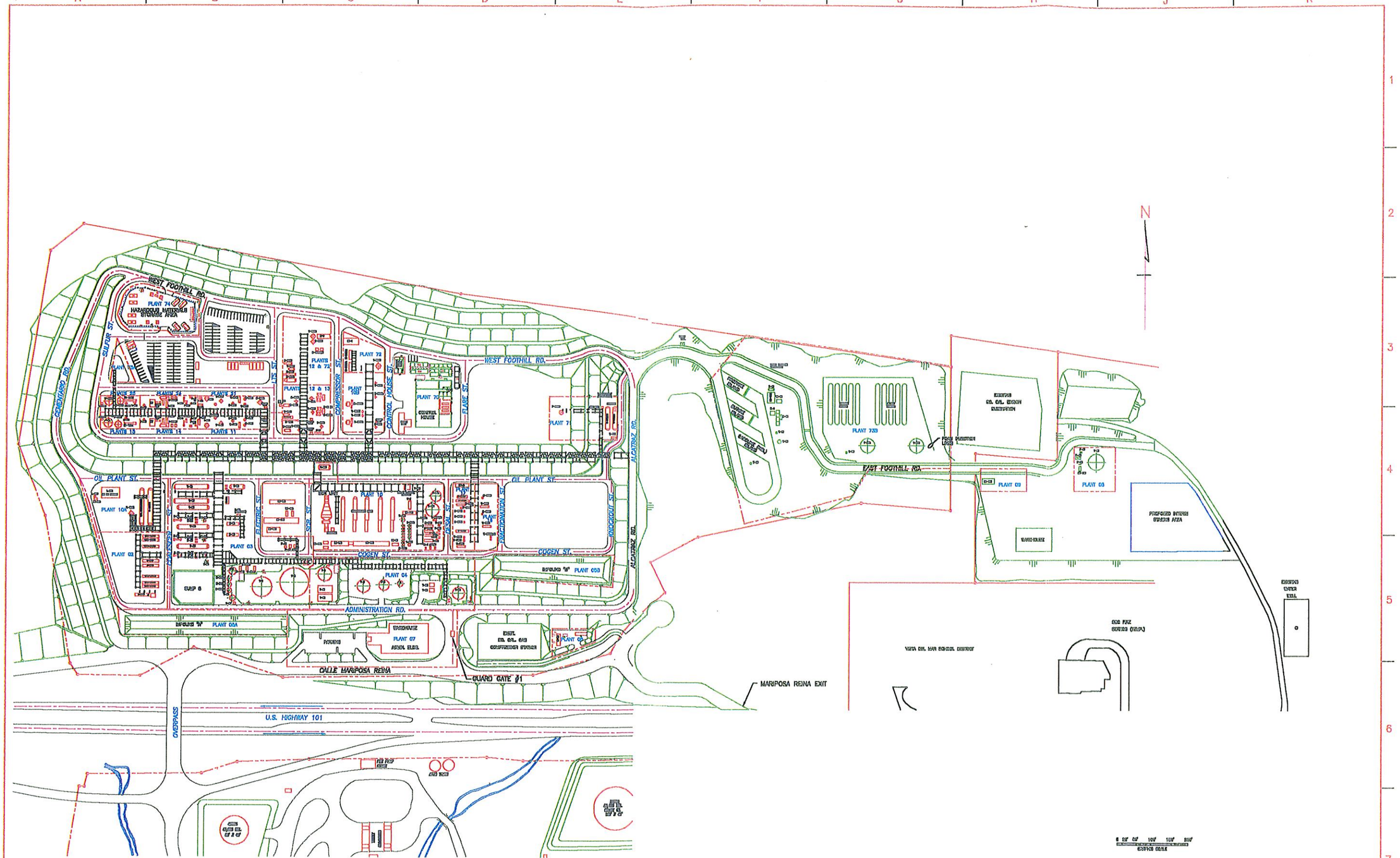
ARGUELLO

SITE PLAN
STORM WATER DRAINAGE SYSTEM
GAVIOTA OIL AND GAS PLANT
SANTA BARBARA COUNTY, CALIFORNIA

DR LUKE CH. _____
DR APP. _____
ENGR. JJPE
OPR'G. DEPT. _____ APPROVED
ENG'R. DEPT. JJPE

SCALE AS SHOWN DATE 4/21/98
A
C.C. UC290G80Y
W.O. 9700586
00–A–61043 SHEET 1
0

C:\CADGROUP\A\00–1\A\ 61047\001–00.DWG 4/21/98



REFERENCE DRAWINGS

REVISIONS

1 REDRAWN TO SCALE. REVISED TITLE BLOCK. AS-BUILT FOR PLANT 74 AND SPCC. 02-08-94 DCGSPD

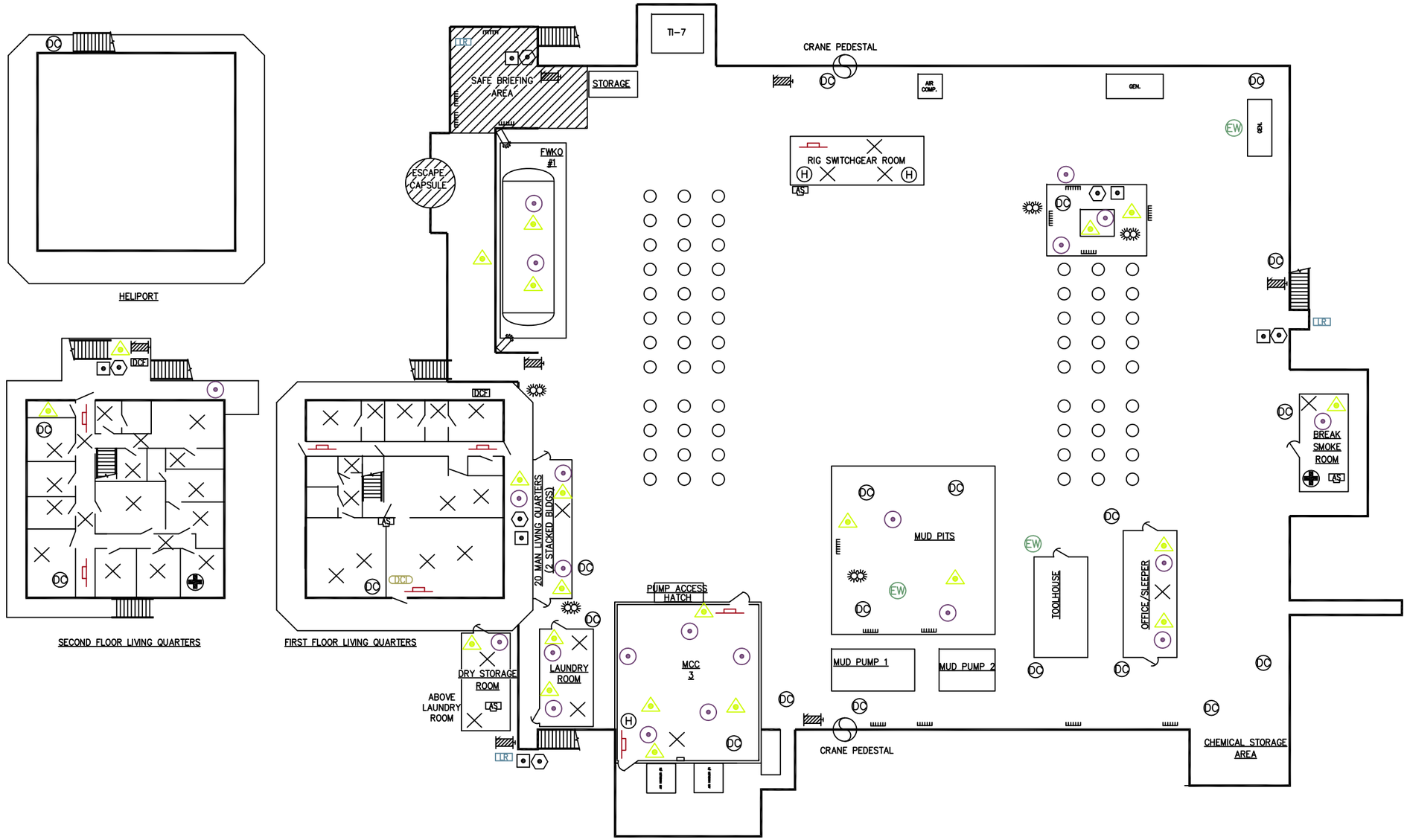
SCALE 1"=100'
DATE 5/21/82 DR. RCJ CK.
DR.APPR. ENG.
OPR'G. DEPT. APPROVED
ENG'R. DEPT.

ARGUELLO

OVERALL SITE PLAN
CAVIOTA OIL AND GAS FACILITY
SANTA BARBARA COUNTY, CALIFORNIA
A C.C. S.O. 00-F-60645-1

LEGEND

	EMERGENCY SHUTDOWN STATION
	HOSE REEL
H	HALON FIRE EXTINGUISHER
DC	20# ABC DRY CHEMICAL FIRE EXTINGUISHER
	GENERAL ALARM / PA
A	300 GALS. ANSUL
	FIRE ALARM PULL
	COMBUSTIBLE GAS DETECTOR
	FIRE UV DETECTOR
DCF	150# DRY CHEMICAL FIRE EXTINGUISHER 100 GAL. AFF FOAM HELIDECK
DC 30	ANSUL 30# DRY CHEMICAL RESTAURANT SYSTEM
	DELUGE SPRINKLER SYSTEM
AS	FIRE LITE ALARM SYSTEM / MINISCAN 424A
	SMOKE DETECTOR AND OR HEAT SENSOR
DC 150	ANSUL 150# DRY CHEMICAL PRODUCTION DECK
	SURVIVAL CAPSULES AND BRIEFING AREA
	BREATHING APPARATUS SYSTEM
EW	EYE WASH / SHOWER
LR	LIFE RING
	FIRE MONITORS
	H2S GAS DETECTOR
DCD	DRY CHEMICAL INJECTION
	FIRST AID
	H2S WARNING LIGHTS
15 MAN LIFE RAFT	15 MAN LIFERAFT



REV	DATE	BY	REVISIONS	CHKD	ENGR	APPR	CLIENT
0	11/29/11	JRP	REVISE FIRE AND SAFETY PLAN	JRP		JRP	
A	2/15/08	JRP	AS-BUILT	JRP		JRP	

PETRA CONSULTANTS INCORPORATED
202 Rue Iberville
Suite 300 West
Lafayette, La. 70508

DESIGNED BY:	2/15/08
DRAWN BY:	2/15/08
CHECKED BY: JRP	2/15/08
APPROVED BY:	X/X/XX
SCALE:	PROJECT #: 25988

PXP

PLAINS EXPLORATION AND PRODUCTION COMPANY

PLATFORM IRENE

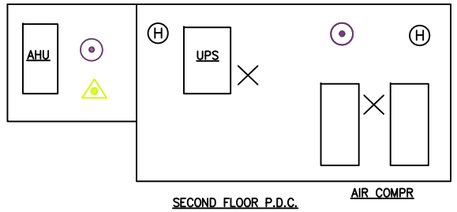
OCS-P-0441

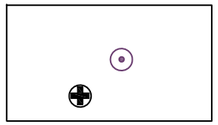
FIRE AND SAFETY PLAN
DRILLING DECK

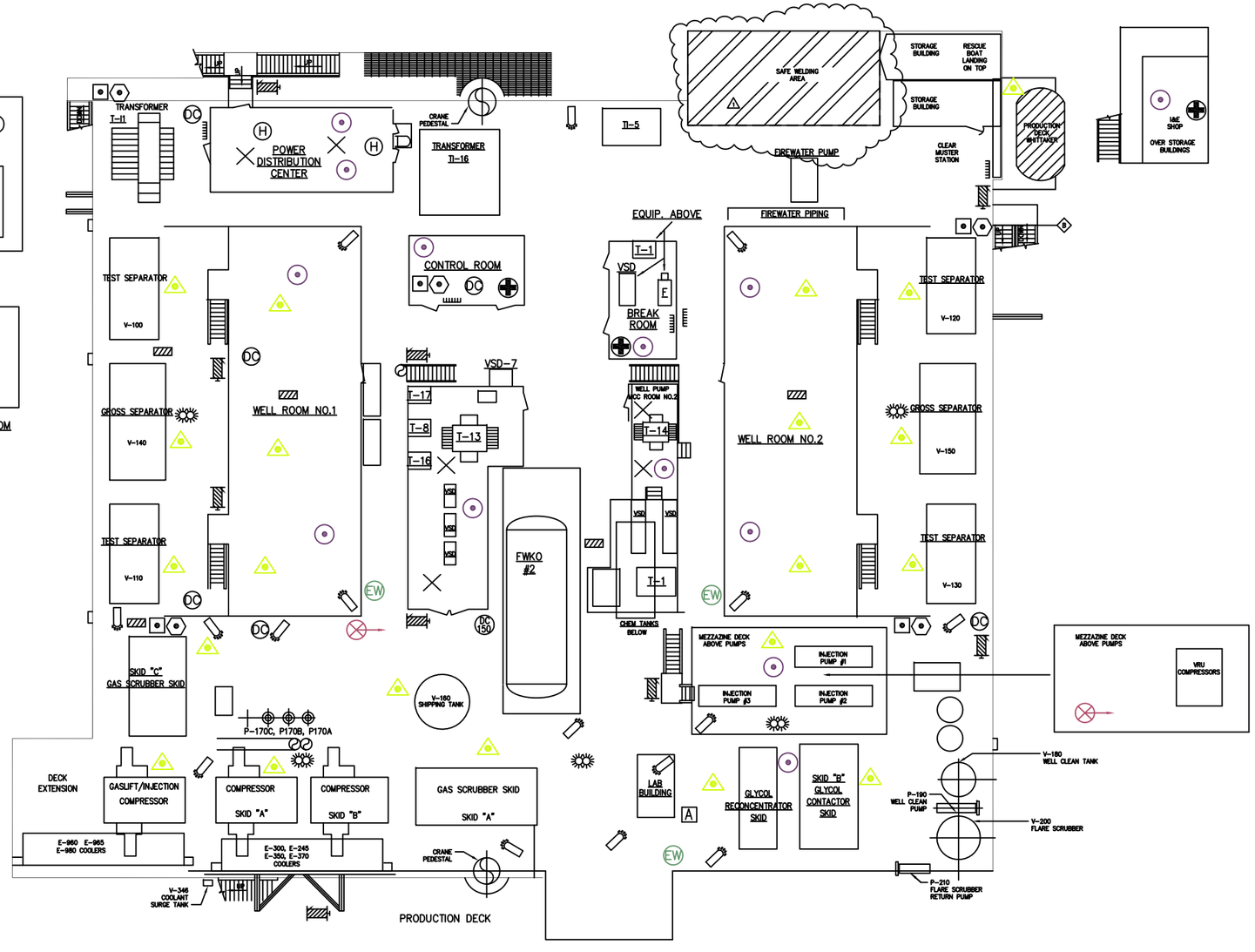
DRAWING NO.: 25988-0201 REV. 0

LEGEND

	EMERGENCY SHUTDOWN STATION
	HOSE REEL
H	HALON FIRE EXTINGUISHER
DC	20# ABC DRY CHEMICAL FIRE EXTINGUISHER
	GENERAL ALARM / PA
A	300 GALS. ANSUL
	FIRE ALARM PULL
	COMBUSTIBLE GAS DETECTOR
	FIRE UV DETECTOR
DCF	150# DRY CHEMICAL FIRE EXTINGUISHER 100 GAL. AFF FOAM HELIDECK
DC 30	ANSUL 30# DRY CHEMICAL RESTAURANT SYSTEM
	DELUGE SPRINKLER SYSTEM
FAS	FIRE LITE ALARM SYSTEM / MINISCAN 424A
	SMOKE DETECTOR AND OR HEAT SENSOR
DC 150	ANSUL 150# DRY CHEMICAL PRODUCTION DECK
	SURVIVAL CAPSULES AND BRIEFING AREA
	BREATHING APPARATUS SYSTEM
EW	EYE WASH / SHOWER
LR	LIFE RING
	FIRE MONITORS
	H2S GAS DETECTOR
DCD	DRY CHEMICAL INJECTION
	FIRST AID
	H2S WARNING LIGHTS
15 MAN LIFE RAFT	15 MAN LIFERAFT







REV	DATE	BY	REVISIONS	CHKD	ENGR	APPR	CLIENT
1	12/15/11	JRP	ADD SAFE WELDING AREA	JRP		JRP	
0	11/29/11	JRP	REVISE FIRE AND SAFETY PLAN	JRP		JRP	
A	2/15/08	JRP	AS-BUILT	JRP		JRP	

PETRA CONSULTANTS INCORPORATED
202 Rue Iberville
Suite 300 West
Lafayette, La. 70508

DESIGNED BY: 2/15/08
DRAWN BY: 2/15/08
CHECKED BY: JRP 2/15/08
APPROVED BY: X/X/XX
SCALE:
PROJECT #: 25988

PXP
PLAINS EXPLORATION AND PRODUCTION COMPANY

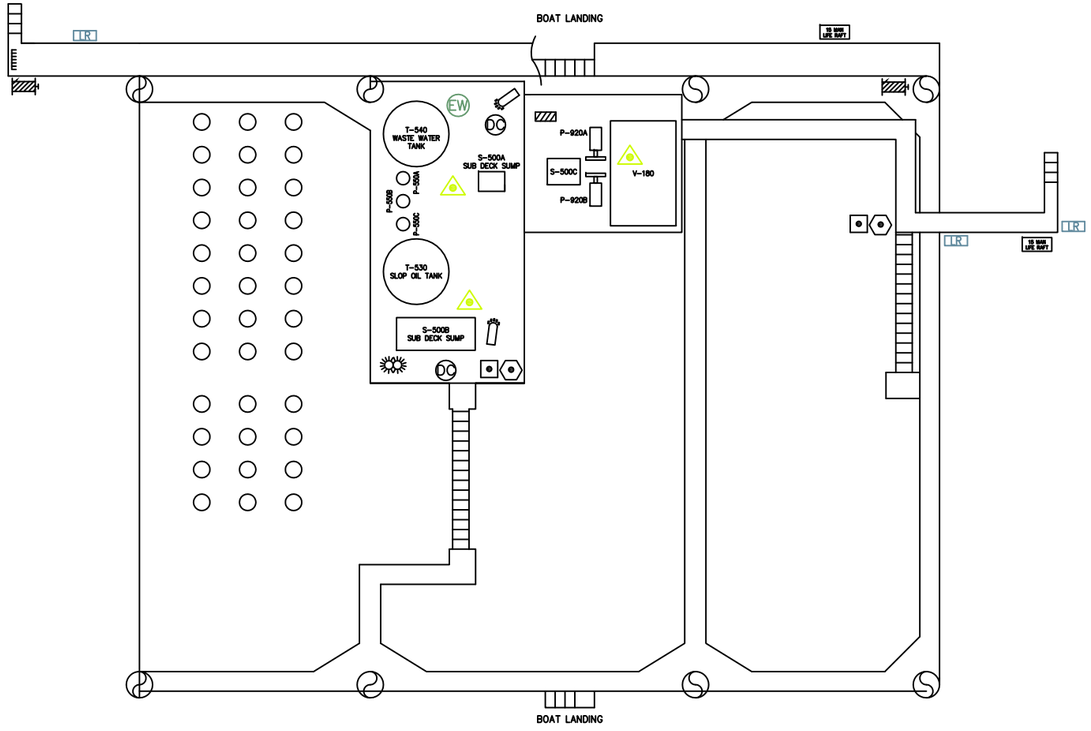
PLATFORM IRENE
OCS-P-0441

FIRE AND SAFETY PLAN
PRODUCTION DECK

DRAWING NO.: 25988-0202
REV. 1

LEGEND

	EMERGENCY SHUTDOWN STATION
	HOSE REEL
H	HALON FIRE EXTINGUISHER
DC	20# ABC DRY CHEMICAL FIRE EXTINGUISHER
	GENERAL ALARM / PA
A	300 GALS. ANSUL
	FIRE ALARM PULL
	COMBUSTIBLE GAS DETECTOR
	FIRE UV DETECTOR
DCF	150# DRY CHEMICAL FIRE EXTINGUISHER 100 GAL. AFF FOAM HELIDECK
DC 30	ANSUL 30# DRY CHEMICAL RESTAURANT SYSTEM
	DELUGE SPRINKLER SYSTEM
AS	FIRE LITE ALARM SYSTEM / MINISCAN 424A
	SMOKE DETECTOR AND OR HEAT SENSOR
DC 150	ANSUL 150# DRY CHEMICAL PRODUCTION DECK
	SURVIVAL CAPSULES AND BRIEFING AREA
	BREATHING APPARATUS SYSTEM
EW	EYE WASH / SHOWER
LR	LIFE RING
	FIRE MONITORS
	H2S GAS DETECTOR
	DRY CHEMICAL INJECTION
	FIRST AID
	H2S WARNING LIGHTS
15 MAN LIFE RAFT	15 MAN LIFERAFT



REV	DATE	BY	REVISIONS	CHKD	ENGR	APPR	CLIENT
0	11/29/11	JRP	REVISE FIRE AND SAFETY PLAN	JRP		JRP	
A	2/15/08	JRP	AS-BUILT	JRP		JRP	

PETRA CONSULTANTS INCORPORATED
202 Rue Iberville
Suite 300 West
Lafayette, La. 70508

DESIGNED BY:	2/15/08
DRAWN BY:	2/15/08
CHECKED BY: JRP	2/15/08
APPROVED BY:	X/X/XX
SCALE:	PROJECT #: 25988

PXP

PLAINS EXPLORATION AND PRODUCTION COMPANY

PLATFORM IRENE

OCS-P-0441

FIRE AND SAFETY PLAN
SUB-CELLAR DECK

DRAWING NO.: 25988-0203

REV. 0

Zone 3

Zone 4

PLATFORM IRENE
LAT: 34° 38' 37.51"
LONG: 120° 43' 45.94"

"IRENE"

LAT: 34° 42' 15.88"
LONG: 120° 35' 15.68"

LAT: 34° 42' 13.07"
LONG: 120° 36' 17.61"

LAT: 34° 41' 36.83"
LONG: 120° 37' 37.97"

LAT: 34° 41' 51.59"
LONG: 120° 37' 13.91"

LAT: 34° 40' 51.75"
LONG: 120° 38' 30.44"

LAT: 34° 39' 46.58"
LONG: 120° 39' 33.84"

LAT: 34° 39' 26.71"
LONG: 120° 39' 58.85"

LAT: 34° 37' 54.95"
LONG: 120° 42' 13.81"

LAT: 34° 37' 19.22"
LONG: 120° 42' 59.83"

LAT: 34° 37' 02.97"
LONG: 120° 43' 19.69"

20" OIL
OSFM ID NO. 1600A-0533
ID NO. 30

8" GAS
ID NO. 31

8" WATER
ID NO. 32

LAT: 34° 42' 14.23"
LONG: 120° 35' 59.90"

LAT: 34° 41' 47.69"
LONG: 120° 35' 17.07"

LAT: 34° 41' 29.15"
LONG: 120° 33' 57.48"

LAT: 34° 41' 10.76"
LONG: 120° 33' 35.49"

LAT: 34° 41' 36.95"
LONG: 120° 34' 25.10"

LAT: 34° 41' 02.34"
LONG: 120° 33' 10.47"

LAT: 34° 43' 36"
LONG: 120° 28' 55.64"

LAT: 34° 42' 32.24"
LONG: 120° 29' 41.35"

LAT: 34° 41' 00.78"
LONG: 120° 32' 08.77"

LAT: 34° 41' 38.64"
LONG: 120° 31' 20.30"

LAT: 34° 41' 36.41"
LONG: 120° 30' 20.12"

LAT: 34° 41' 08.85"
LONG: 120° 31' 38.20"

LAT: 34° 41' 00.72"
LONG: 120° 32' 38.82"

LAT: 34° 42' 39.36"
LONG: 120° 29' 30.70"

LAT: 34° 43' 31.03"
LONG: 120° 26' 33.58"

LOMPOC
OIL & GAS
PLANT
LAT: 34° 43' 27.00"
LONG: 120° 26' 00"

20" OIL
OSFM ID NO. 1600A-0533
ID NO. 30

8" GAS
ID NO. 31

8" WATER
ID NO. 32

VALVE SITE NO. 1
VALVE SITE NO. 2
VALVE SITE NO. 3
VALVE SITE NO. 4
VALVE SITE NO. 5
VALVE SITE NO. 6
VALVE SITE NO. 7
VALVE SITE NO. 8
VALVE SITE NO. 10

BURTON MESA
VANDENBERG AIR FORCE BASE
JESUSITA
LA PURISIMA
LOMPOC
POINT ARGUELLO
US NAVAL MISSILE FACILITY
TERRACE
SANTA YNEZ
RANCHO SAN ANTONIO

1"=3000' 3000' 0' 3000' 6000'

SPEC Services, Inc.
17101 Bushard Street
Fountain Valley, CA 92708
(714) 963-8077

REV. NO.	DATE	REVISED (DESTROY ALL PRINTS BEARING EARLIER DATE)	REV. BY	CKD. BY	APP'D
A	11/01/00	ISSUED FOR REVIEW	TM		
B	11/06/00	ISSUED FOR REVIEW	TM		
C	11/17/00	REVISED & REISSUED FOR REVIEW	TM		
D	12/01/00	REVISED & REISSUED FOR REVIEW	TM		
E	02/15/01	REVISED BORDER & REISSUED FOR REVIEW	TM		
F	02/21/01	REVISED NAME & REISSUED FOR REVIEW	TM		

APPROVED FOR CONSTRUCTION

A. F. E.	DATE	SIGN(S)

DRAWN BY TCM
CHECKED BY
TRACED BY
TRAC'G. CKD
APP'D
APP'D
SCALE
DATE

NUEVO OFFSHORE PIPELINE FROM PLATFORM IRENE TO LOMPOC PLANT

NUEVO ENERGY COMPANY

DRAWING NO. 2365-SK-201
SHEETS

SYMBOLS AND TERMS USED ON PIPELINE ROUTE MAPS

LEGEND:

- ℄ RIGHT OF WAY
- PROPERTY LINE
- HIGH PRESSURE GAS LINE
- SEWER
- COMMUNICATION CABLE
- AERIAL
- UTILITY POLE

PARCEL INDENTIFICATION:

XX–XXX–XX ← ASSESSOR PARCEL NO.
XXX–XX, XXXX
ZONING
COMPREHENSIVE PLAN

STREAM DESCRIPTION:

- P PERENNIAL
- I INTERMITTENT
- E EPHEMERAL

ZONING TERMS USED:

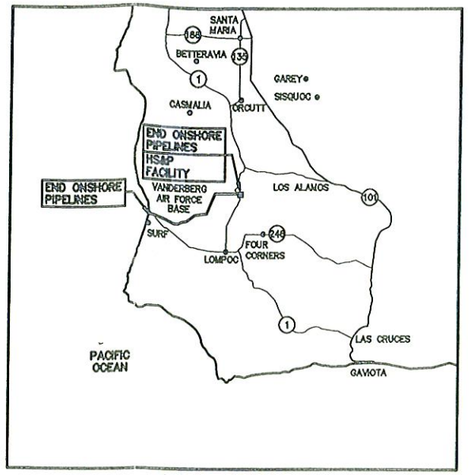
100–AL–O	=	LIGHT AGRICULTURE, OIL OVERLAY
100–AG	=	100 ACRE MINIMUM PARCEL
	=	GENERAL AGRICULTURE
10–R–1	=	RESIDENTIAL, SINGLE FAMILY, 10,000 SQ. FT.
M–1	=	RESTRICTED LIGHT INDUSTRIAL
U	=	UNLIMITED AGRICULTURE

PARCEL EXCLUDED FROM COMPREHENSIVE PLAN:

VAFB	=	VANDENBERG AIR FORCE BASE
USP	=	UNITED STATES FEDERAL PENITENTIARY
SPE	=	SOUTHERN PACIFIC RAILROAD

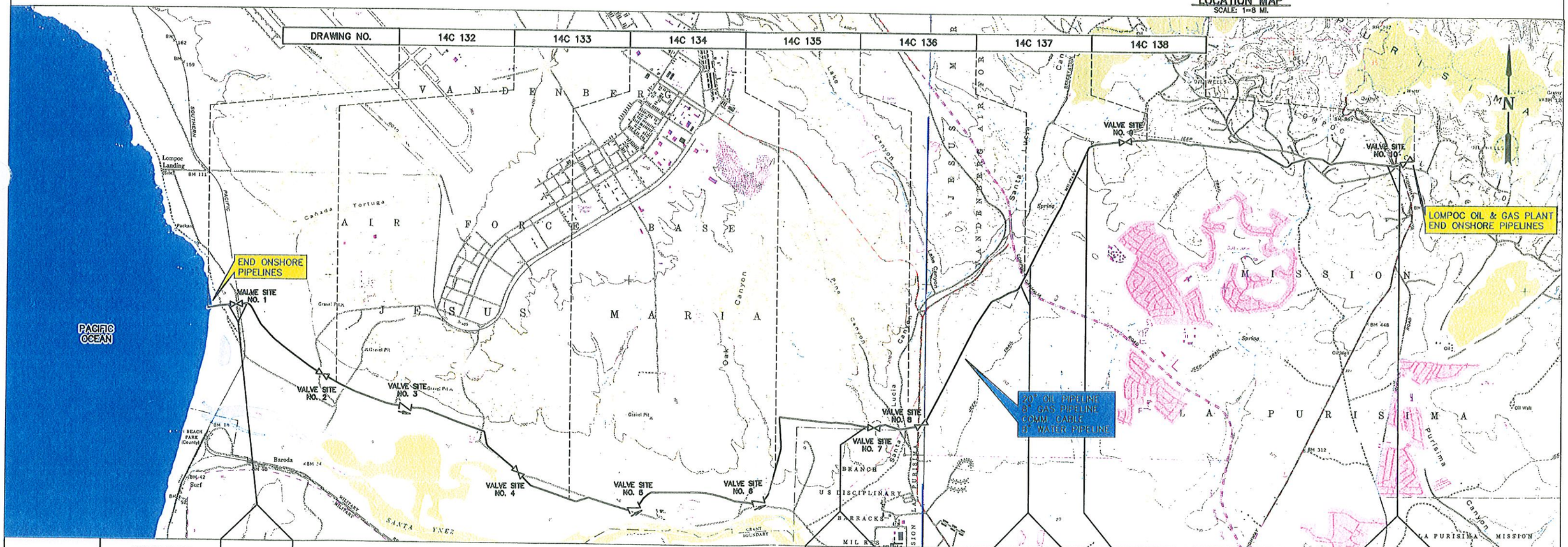
COMMPREHENSIVE PLAN LAND USE DESIGNATION:

A–11	=	AGRICULTURAL, 40 TO 320 ACRE PARCELS
A–11–100	=	AGRICULTURAL, 100 ACRE MINIMUM PARCEL



LOCATION MAP
SCALE: 1=8 MI.

DRAWING NO.	14C 132	14C 133	14C 134	14C 135	14C 136	14C 137	14C 138



RIGHT–OF– WAY	VANDENBERG AIR FORCE BASE	SOUTHERN PACIFIC RAILROAD	VANDENBERG AIR FORCE BASE	U.S. FEDERAL PENITENTIARY	VANDENBERG AIR FORCE BASE	COUNTY OF SANTA BARBARA	VAFB	NUEVO ENERGY CO.	CALTRANS	NUEVO ENERGY CO.

1"=2000' 2000' 0' 2000' 4000'

REV. NO.	DATE	REVISED (DESTROY ALL PRINTS BEARING EARLIER DATE)	REV. BY	CKD. BY	APP'D	APPROVED FOR CONSTRUCTION A. F. E.	DATE	SIGNED
A	01/05/01	ISSUED FOR REVIEW	XD	TM				
B	02/14/01	REVISED & REISSUED FOR REVIEW	XD	TM				

SPEC SERVICES
SPEC Services, Inc.
17101 Bushard Street
Fountain Valley, CA 92708
(714) 963–8077
K:\2373\ALIGN\2373C131A

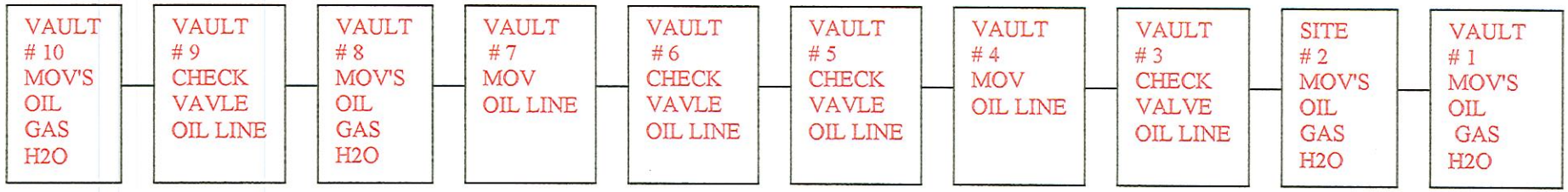
DRAWN BY TCM
CHECKED BY
TRACED BY
TRAC'G. CKD
APP'D
APP'D
SCALE AS SHOWN
DATE 01/27/88

ONSHORE PIPELINE ROUTE
OCS TRACT P–0441, LOMPOC AREA
LOCATION MAP

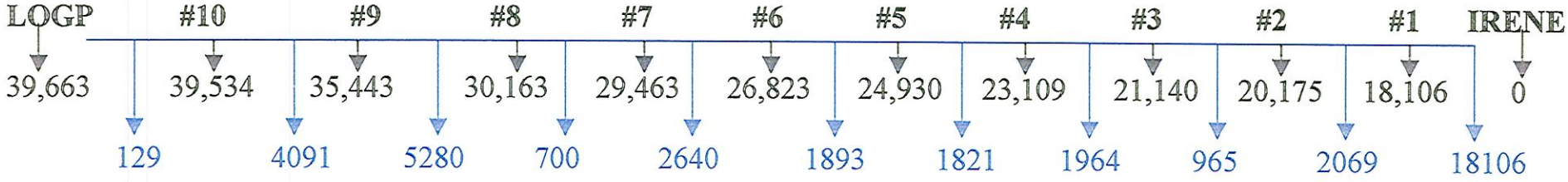
NUEVO ENERGY COMPANY

DRAWING NO. 14C 131A
SHEETS

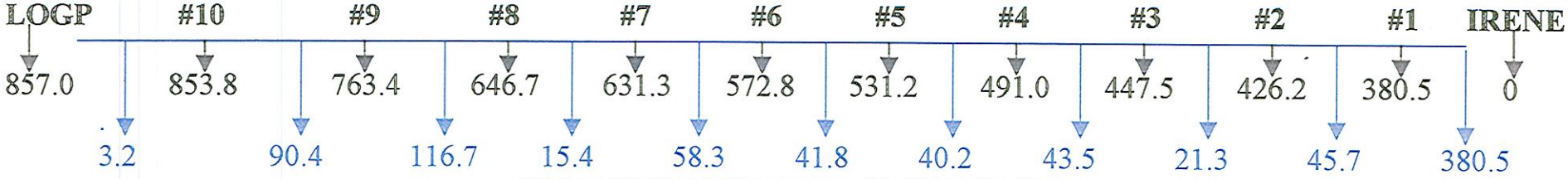
IRENE TO LOGP PIPELINE CAPACITYS



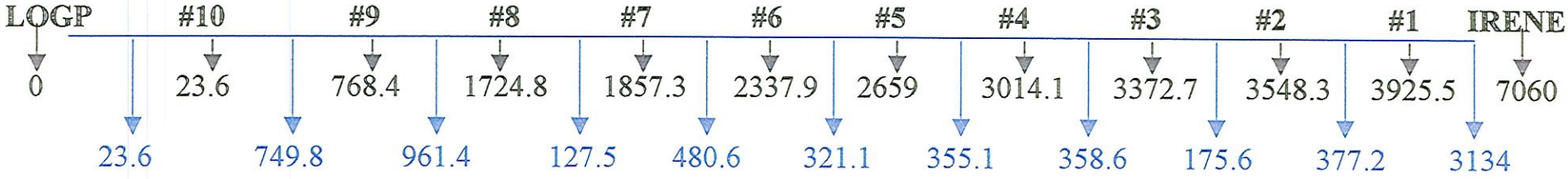
20" OIL LINE CAPACITY 39,663 BBL



8"GAS LINE CAPACITY 857 MCF @ 300 PSIG & 55 DEGREES F

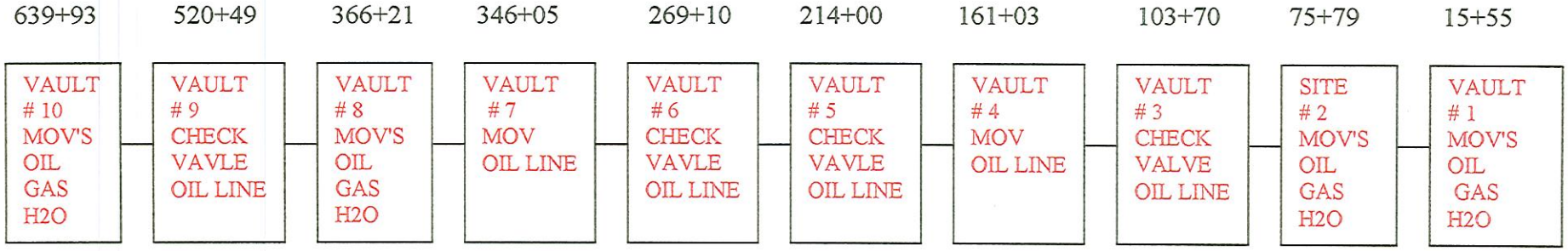


8" WATER LINE CAPACITY 7060 BBL

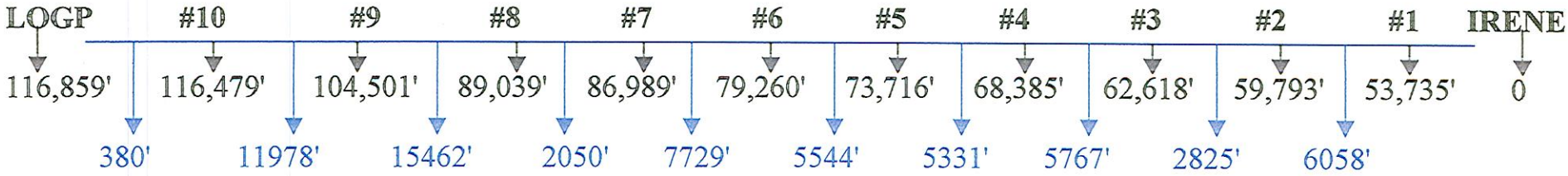


IRENE TO LOGP PIPELINE
DISTANCES

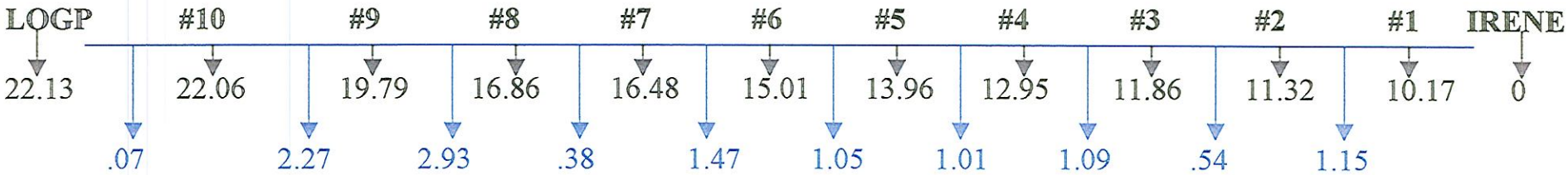
STATION NUMBERS

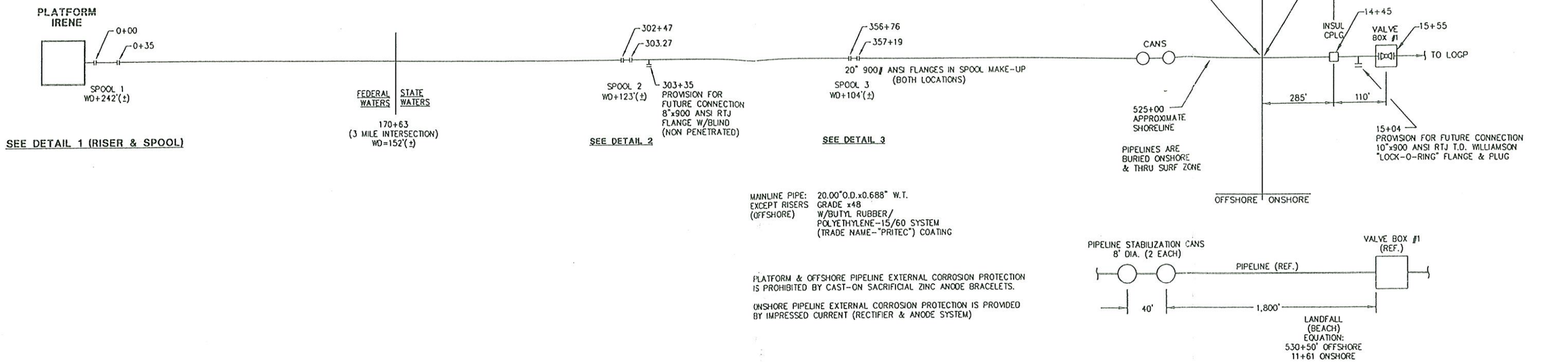


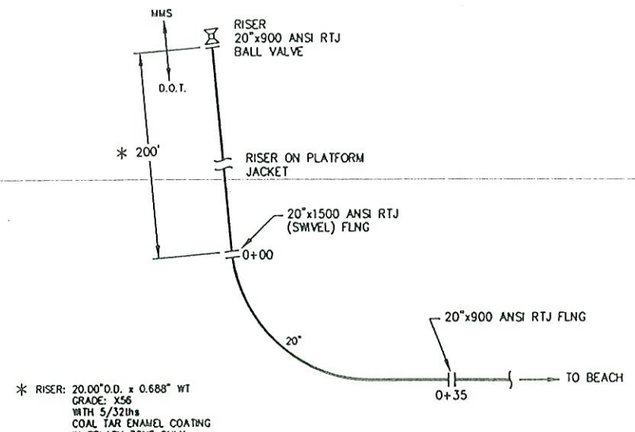
FOOTAGE TOTAL 116,859'



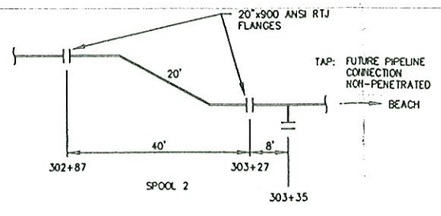
MILEAGE TOTAL 22.13



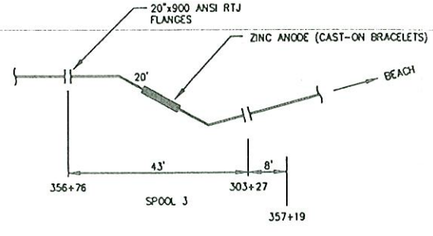




DETAIL 1
RISER & SPOOL



DETAIL 2
INTERMEDIATE SPOOL



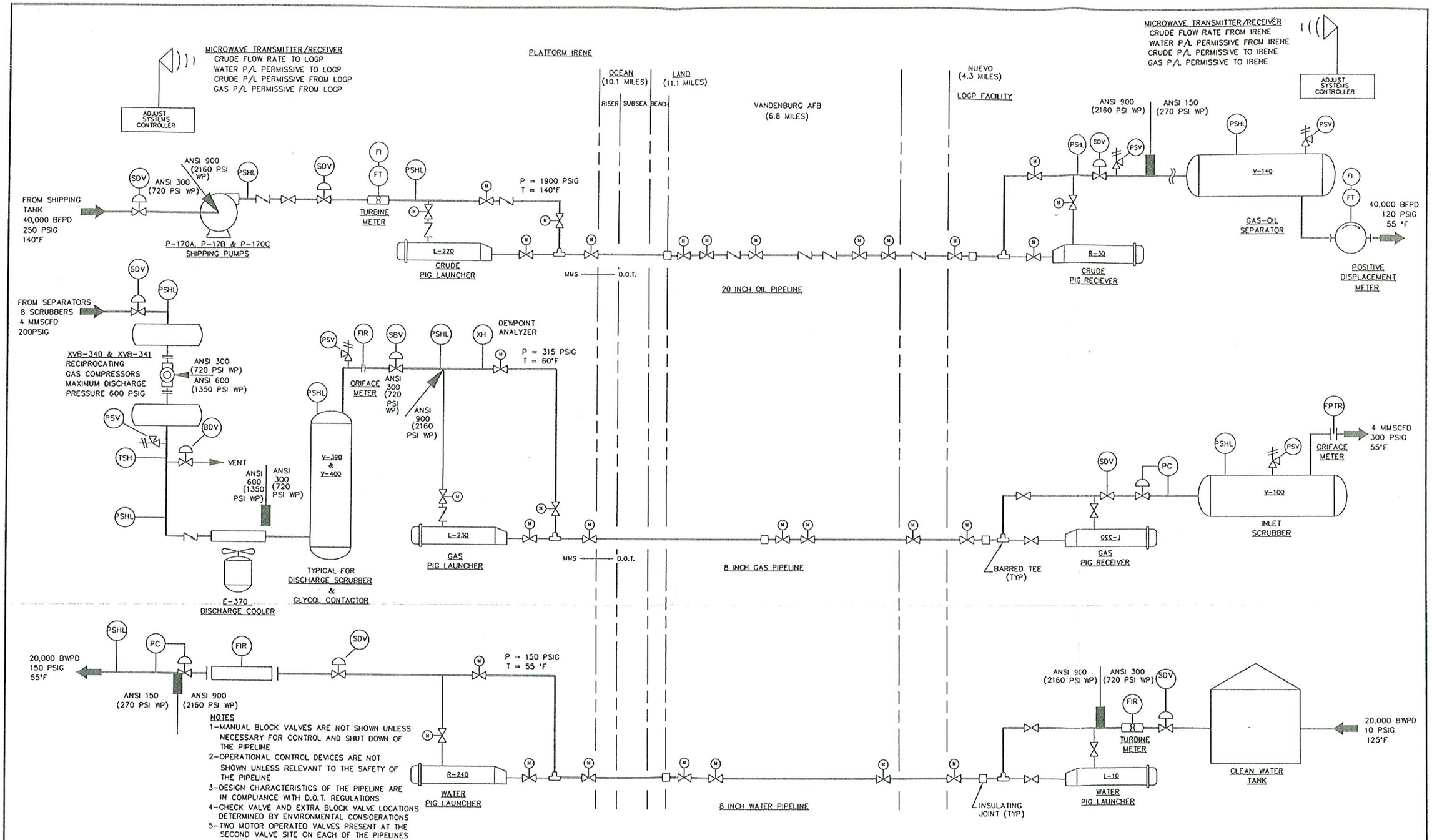
DETAIL 3
INTERMEDIATE SPOOL

REV. NO.	DATE	REVISED	REV. BY	CKD. BY	APP'D
1	11/01/01	SHOW D.O.T. & MMS JURISDICTION	RR		

DRAWN BY R.R.
CHECKED BY R.G.S.
TRACED BY
TRAC'G CHK'D
APP'D.
APP'D.
SCALE
DATE 6/27/91

PLATFORM IRENE TO LANDFALL
20" OIL LINE
PIPELINE ALIGNMENT

DWG NO: IRE-SURF.DWG
REV. NO. 1



NOTES

1-MANUAL BLOCK VALVES ARE NOT SHOWN UNLESS NECESSARY FOR CONTROL AND SHUT DOWN OF THE PIPELINE

2-OPERATIONAL CONTROL DEVICES ARE NOT SHOWN UNLESS RELEVANT TO THE SAFETY OF THE PIPELINE

3-DESIGN CHARACTERISTICS OF THE PIPELINE ARE IN COMPLIANCE WITH D.O.T. REGULATIONS

4-CHECK VALVE AND EXTRA BLOCK VALVE LOCATIONS DETERMINED BY ENVIRONMENTAL CONSIDERATIONS

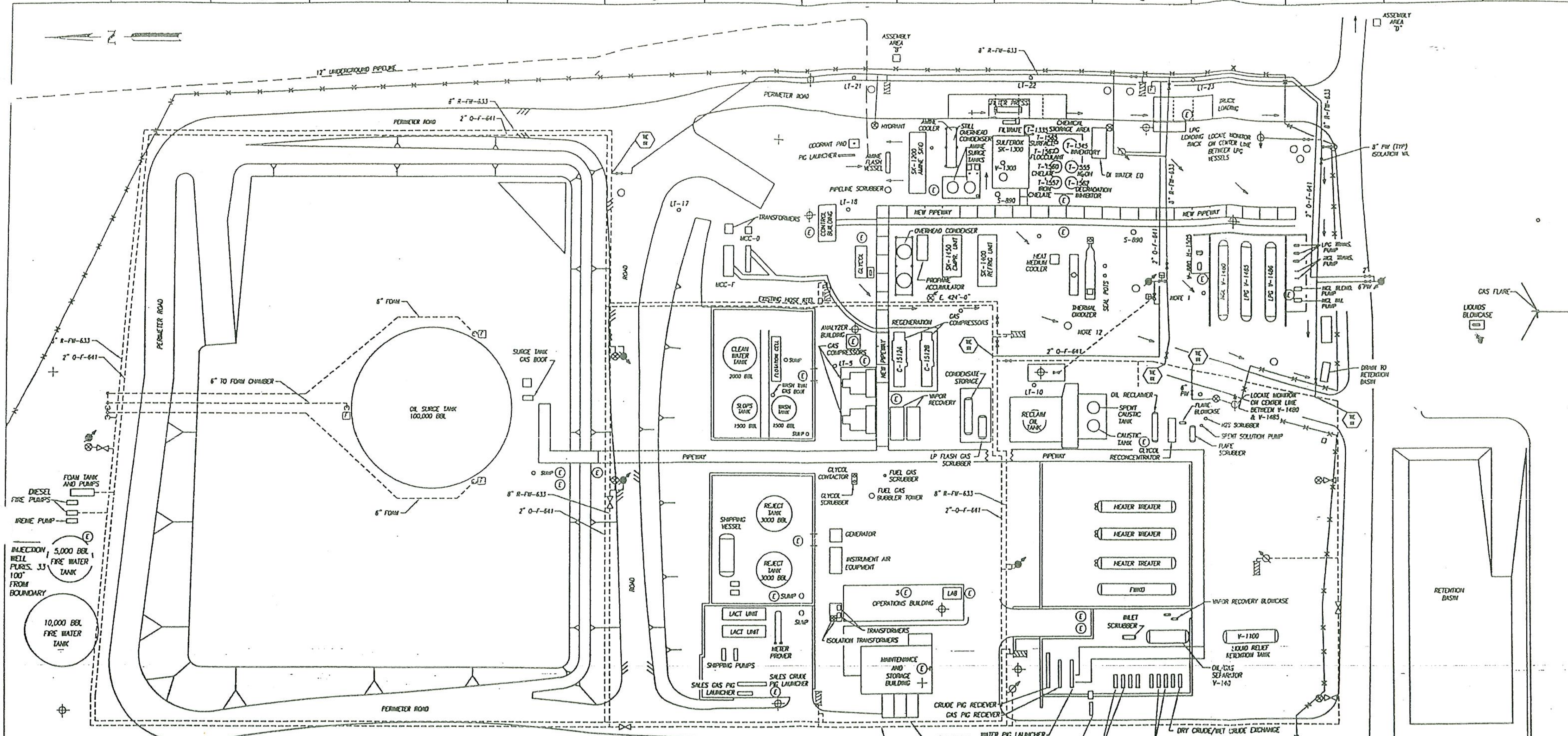
5-TWO MOTOR OPERATED VALVES PRESENT AT THE SECOND VALVE SITE ON EACH OF THE PIPELINES

REV. NO.	DATE	REVISED	REV. BY	CKD. BY	APP'D
1	12/14/01	REVISED FROM HS&P TO LOGP	RR	RFM	

DRAWN BY R.R.
CHECKED BY R.F.M.
TRACED BY
TRAC'G CHK'D
APP'D
APP'D
SCALE
DATE

PIPELINE SYSTEM SCHEMATICS PLATFORM IRENE TO LOGP

DWG NO:	SHT:	REV. NO.
IRE-LOGP	1	1



NOTES:

1. REMOTE ACTUATED MONITOR SHALL BE ANSUL WOM-3 OR EQUAL WITH 4" BETWEEN FLANGE FOAM PROPORTIONER, RANGE 200-1600 gpm OF 3% AFFF.
2. MANUAL MONITORS SHALL BE ANSUL MM-1000 3" OR EQUAL.
3. NOZZLES FOR MONITORS SHALL BE ANSUL SPITFIRE OR EQUAL, 750 GPM @ 100 PSIG.
4. HOSE REELS SHALL BE 1 1/2" x 100 FOOT CONTINUOUS; ONE REEL EQUIPPED WITH FOAM PROPORTIONER 2 1/2" THREADED; RANGE 35-400 gpm OF 3% AFFF.
5. HYDRANTS SHALL BE UL LISTED WET BARREL, 175 psig MAWP, CI BODY, BRONZE TRIM, EPOXY LINED, WITH TWO 2 1/2" NH STD. THREAD FIRE HOSE OUTLETS & ONE 4" NH STD. THREAD PUMPER OUTLET; 6" 125# FF INLET FLANGE, YELLOW ENAMEL FINISH.
6. POST INDICATOR VALVES SHALL BE 8" UL LISTED GATE, 125# FF, CI BODY WITH BRONZE TRIM, RESILIENT WEDGE, ADJUSTABLE POST FOR 4 ft. TRENCH DEPTH.
7. FOR GENERAL CONSTRUCTION NOTES SEE DWG. 16-C-200. FOR PIPING NOTES SEE DWG 16-P-209. FOR ELECTRICAL NOTES SEE DWG. 16-E-270.
8. FOR DETAILED ROUTING OF NEW FOAM AND FIREWATER LINES, SEE DWGS. 16-P-217, 219 & 221.
9. PRIOR TO HYDROTESTING, SBFD SHALL BE CONTACTED TO WITNESS THE HYDROTEST. AT LEAST 24 HOUR NOTICE SHALL BE GIVEN.
10. 24 HOUR NOTICE SHALL ALSO BE GIVEN PRIOR TO POURING ANY CONCRETE THRUST BLOCKS.
11. ALL ABOVE GROUND FIRE SYSTEM EQUIPMENT AND PIPING TO BE PAINTED RED.
12. EMERGENCY SHUTDOWN AND SHUTOFF VALVE FOR FOAM MONITOR ARE ON SAME PANEL 2.

LEGEND

FOAM MONITOR	SURFACE DRAINAGE
MONITOR	EMERGENCY SHUTDOWN
HYDRANT MONITOR	POST INDICATOR VALVE
HYDRANT	ASSEMBLY AREA
FOAM DEVICE	POSSIBLE STAGING AREA
HOSE REEL	IRENE'S FIREWATER VALVE
DRY CHEMICAL EXTINGUISHER	

AREA PLAN SYMBOLS

- NEW FIRE WATER PIPING (UNDERGROUND)
- EXISTING PIPING (UNDERGROUND)
- EXISTING EQUIPMENT
- NEW EQUIPMENT

PREVAILING WIND DIRECTION

NUMBER	REFERENCE DRAWINGS

PROCESSES UNLIMITED INTERNATIONAL

DCN: 16FW001

REV. NO.	DATE	REVISED	REV. BY	CHD BY	APP'D
6	10/3/00	REVISED DRY CHEMICAL EXTINGUISHER LOCATIONS	JAS		
5	8/28/00	ADDED INDICATOR VALVE, ASSEMBLY & STAGING AREA LABELS	AGM		
4	8/13/97	AS-BUILT			
3	7/8/97	ADDED LAUNCHER, ODORANT & DI WATER EQ.			
2	5/19/97	ADDED LABELS AND ESD			
1	3/19/97	ISSUED FOR S.B. CO. FIRE DEPT. COMMENTS			
0	3/12/97	ISSUED FOR CONSTRUCTION			

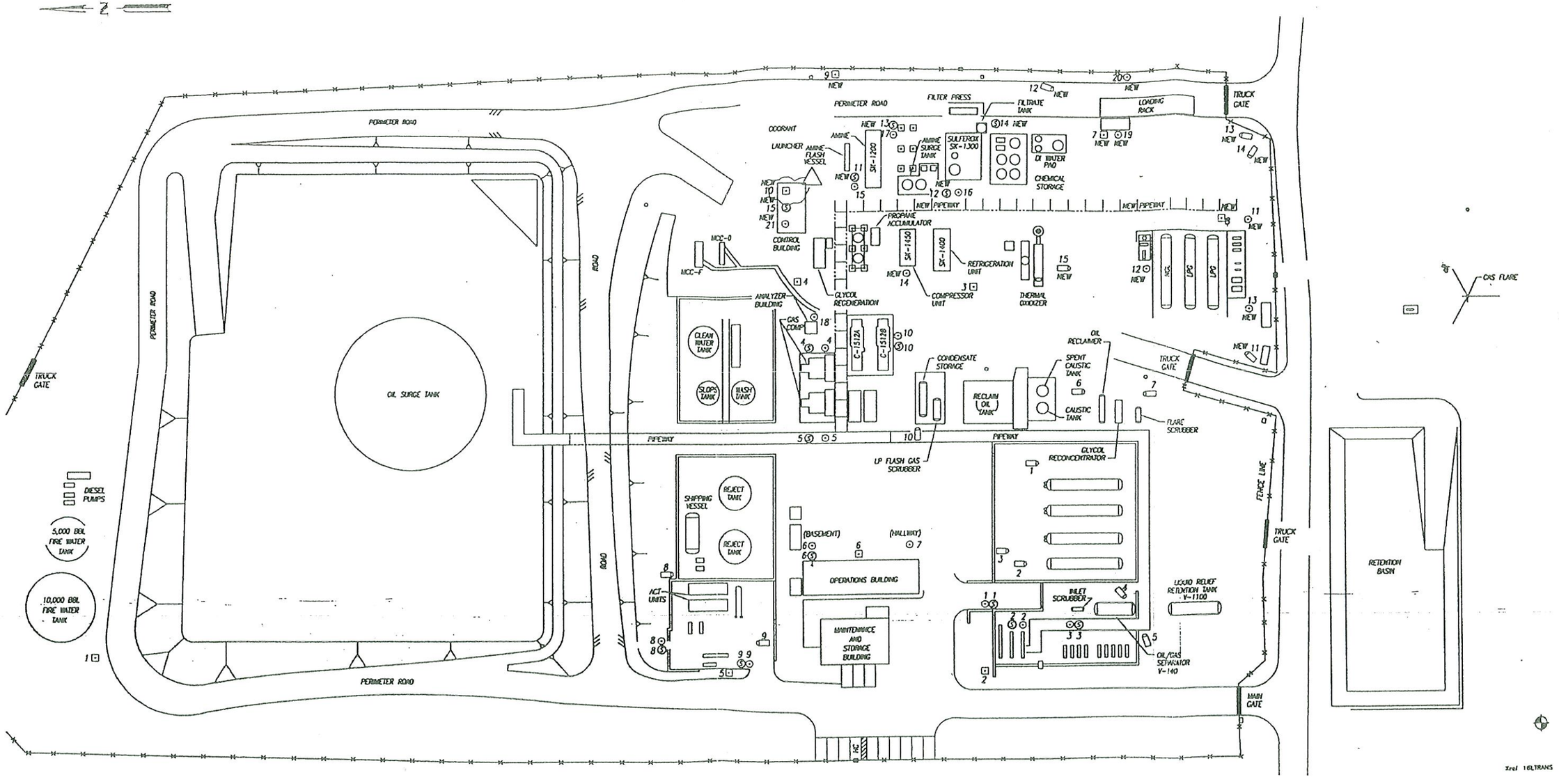
NUEVO ENERGY COMPANY

A. JUAREZ	3/12/97	
C. BLACK	3/12/97	
J. GUENTHER	3/12/97	

FIRE PROTECTION PLAN/PLOT PLAN
FIRE WATER & FOAM SYSTEM
LOMPOC OIL & GAS PLANT (LOGP)
LOMPOC, CALIFORNIA

SCALE	DWG NO.	REV. NO.
1"=40'-0"	16-FW-001	6

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



NOTES:

1. UV FLAME DETECTORS ARE LOCATED WITH RESPECT TO THE EQUIPMENT ELEVATION AND THE 90 DEGREE CONE OF VISION. MAXIMUM MONITOR DISTANCE SHALL BE LIMITED TO 80 FEET ALONG THE PRIMARY AXIS, AND 45 FEET AT 45 DEGREES OFF THE SAME AXIS. REFER TO THE DETAIL OF STANCHION MOUNTED FLAME DETECTOR. REFER TO UV FLAME DETECTOR MOUNTING DETAIL NO. 1 ON DWG. NO. 16-E-293.

2. GAS DETECTORS ARE LOCATED SO AS TO DETECT A LIGHTER THAN AIR GAS. LOCATE DETECTORS IN PROJECTED ARCHE, ABOVE THE MAINTENANCE SOURCE OF GAS, WITH THE SENSOR PORTED DOWNWARD. REFER TO THE GAS DETECTOR MOUNTING DETAIL NO. 2 ON DWG. NO. 16-E-293.

AREA PLAN SYMBOLS

- FENCE LINE
- COMBUSTIBLE GAS DETECTOR
- S — H_2S GAS DETECTOR
- U.V. FLAME DETECTOR
- EMERGENCY SHUTDOWN STATION
- 1 — DEVICE REFERENCE

NUEVO ENERGY COMPANY

ELECTRICAL – EQUIPMENT LOCATION
FIRE & GAS DETECTION PLAN
LOMPOC OIL & GAS PLANT

DWG NO. 16 – E – 265

SCALE NONE

SHEET 1 OF 1

Appendix B Spill Management Team Job Descriptions

B.1 Initial Response Team – Duties and Responsibilities

B.1.1 Company Personnel

B.1.1.1 Foreman or Operator-in-Charge

The Foreman or Operator-in-Charge is responsible for ensuring the safety of all personnel, assessing the status of the incident, initiating response operations, and initiating the initial spill notifications. Whenever possible, the Foreman should look for opportunities to delegate tasks to subordinates. The Foreman's or Operator-in-Charge's primary duties include:

- Account for all personnel and assure their safety.
- Receive an initial report from person who observed spill.
- Assume the roll of Incident Commander (IC) until relieved by a more senior company employee or authorized agency representative.
- Estimate spill volume, evaluate the spill magnitude (minor or major), and determine if oil has been released to the environment.
- If spill impacts the marine environment ensure **Clean Seas** is notified at **(805) 684-3838**.
- Notify the Qualified Individual (QI) and **EH&S 24 hour compliance number at (805) 739-9111** or the Person on Call according to the posted schedule.
- Prepare or direct someone qualified to prepare a Site Safety Plan.
- Brief the members of the Initial Response Team (IRT) on the status of the incident, review team assignments, review Site Safety Plan, and discuss the response strategy.
- Supervise on-site containment and recovery operations.
- Advise the Incident Command if additional resources are needed.

B.1.1.2 Platform/Facility Personnel

In the event of an oil spill, all platform/facility personnel report to the Foreman or Operator-in-Charge for a briefing and instructions. The platform/facility personnel duties may include, but are not limited to:

- Obtain briefing from and carry out instructions of the Platform Foreman or Operator-in-Charge.
- If safe to do so, stop the release of oil, and if possible, contain the spill at its source in order to prevent the release of oil to the marine environment.
- As necessary, assist Company and/or Clean Seas personnel in deployment of containment boom.

Additional personnel at the platform/facility and adjacent platforms (if the spill is offshore) may be called upon to assist in the response effort. These persons may be required to maintain radio contact with equipment operators, monitor containment and recovery operations, and/or assist in spill control activities from the platform (sorbent application, boom placement).

B.1.2 Clean Seas Personnel

Clean Seas will provide equipment and personnel to respond to minor spills or provide response capabilities to larger spill events. The primary responsibilities of the Clean Seas response crews, who will be under the direction of their managers and the Incident Command, are outlined in the following paragraphs.

B.1.2.1 Initial Response Vessel Personnel

An initial response vessel will normally provide immediate response to a spill event. This vessel will be guided by platform or Clean Seas personnel monitoring the spill movement to the leading edge of the spill. Upon reaching the spill, initial response vessel personnel will conduct a site characterization to determine if a risk of explosion or H_2S gas is present. Response personnel will continue to monitor spill movement and request additional equipment as necessary.

B.1.2.2 Oil Spill Response Personnel

A Clean Seas Oil Spill Response Vessel (OSRV) will provide necessary spill containment and recovery capabilities and will be mobilized immediately upon detection of the spill. Assisted by platform personnel and initial response vessel crew members, the OSRV will deploy the necessary containment boom and recovery equipment at the spill site. Recovery operations will continue as necessary under the direction of Clean Seas personnel and the Incident Command.

B.2 Incident Management Team Duties and Responsibilities

Each member of the IMT organization has specific duties and responsibilities. This section outlines the organization of the individual IMT sections and provides a brief job description for each IMT position.

B.2.1 Command Section

The Command Section is responsible for directing the overall response effort, interfacing with the public and government agencies, providing for the safety and welfare of all response personnel and addressing the legal issues associated with the response effort. This Section consists of the Incident Commander and his deputy and five sub-functional areas: clerical, legal, government affairs, public information, and safety. Job descriptions for each of the members of the Command Staff, with the exception of legal, are provided on the following pages.

B.2.1.1 Incident Commander (IC)

The Incident Commander (IC) is responsible for the overall management of all oil spill incident activities. On many incidents, the command activity is carried out by a single IC. The IC is selected based on qualifications and experience. Duties include:

- Prioritizing the work and supervision of Command Staff and Section Chiefs.
- Approving and authorizing the implementation of the Incident Action Plan.
- Coordinating the development of response strategies and approving the ordering and release of resources.

The IC is the manager of the oil spill response operation, and thus, managing his time well is critical to the response effort. The IC should look for opportunities to delegate duties to the Deputy Incident Commander or to the Section Chiefs.

The major responsibilities of the IC are:

- Obtaining an incident briefing from the Initial Response Team personnel or prior IC (201 Briefing).
- Determine Incident Objectives and general direction for managing the incident. Be cognizant of the primary objectives for oil spill response activities.
  - Ensure the safety of citizens and response personnel.
  - Control the source of the spill.
  - Manage a coordinated response effort.
  - Maximize protection of environmentally sensitive areas.
  - Contain and recover spilled material.
  - Recover and rehabilitate injured wildlife.
  - Remove oil from impacted areas.
  - Minimize economic impacts.
  - Keep stakeholders informed of response activities.
  - Keep the public informed of response activities.
- Establish priorities.
- Establish an Incident Command Post.
- Brief Command Staff and Section Chiefs.
- Establish an appropriate organization.
- Ensure planning meetings are scheduled as required.
- Approve and authorize the implementation of the Incident Action Plan.
- Ensure that adequate safety measures are in place.
- Coordinate activity for all Command and General Staff.
- Coordinate with key people and officials.
- Approve requests for additional resources or for the release of resources
- Keep agency administrator informed of incident status.
- Approve the use of trainees, volunteers and auxiliary personnel.
- Authorize release of information to the news media.
- Ensure Incident Status Summary (ICS-209) is completed and forwarded to appropriate higher authority.
- Order the demobilization of the incident when appropriate.
- Maintain Unit Log (ICS 214)

B.2.1.2 Deputy Incident Commander

The Deputy Incident Commander is responsible for assisting the Incident Commander in managing the oil spill incident. The Deputy Incident Commander's specific duties and responsibilities are those delegated to him by the Incident Commander. The Deputy Incident Commander may be requested to manage any of the Incident Commander's responsibilities or relieve him, and therefore, should be thoroughly familiar with those responsibilities.

Duties for the Deputy Incident Commander include:

- Obtain briefing from the Incident Commander.
- Assume responsibility for those components of the oil spill incident management as directed by the Incident Commander.
- Attend regular briefings with the Incident Commander.
- Maintain personal notes of all relevant actions and decisions.

B.2.1.3 Public Information Officer (PIO)

The Public Information Officer (PIO) is responsible for the development and releasing information about the incident to the news media, to incident personnel and to other appropriate agencies and organizations.

Only one PIO will be assigned for each incident, including incidents operating under the Unified Command and multi-jurisdictional incidents. Agencies have different policies and procedures relative to the handling of public information.

The major responsibilities of the PIO are:

- Determine from the IC if there are any limits on information release.
- Develop material for use in media briefings.
- Obtain IC approval of media releases.
- Inform media and conduct media briefings.
- Arrange for tours and other interviews or briefings that may be required.
- Manage a Joint Information Center (JIC) if established.
- Obtain media information that may be useful to incident planning.
- Maintain current information summaries and/or displays on the incident and provide information on the statue of the incident to assigned personnel.
- Ensure that all required agency forms, reports and documents are completed prior to demobilization.
- Brief Command on PIO issues and concerns.
- Have briefing sessions with the IC prior to demobilization.
- Maintain Unit Log (ICS 214)

B.2.1.4 Liaison Officer (LNO) or Government Affairs Officer

The Liaison Officer is responsible for communicating with local, state, and federal government agencies. If these regulatory agencies assign representatives to the oil spill incident, the LNO will coordinate their activities and relieve the Incident Command of as much government affairs work as practical. The LNO reports to the Incident Command.
The major responsibilities of the LNO are:

- Be a contact point for Agency Representatives.

- Maintain a list of assisting and cooperating agencies and Agency Representatives, including name and contact information. Monitor check-in sheets daily to ensure that all Agency Representatives are identified.
- Assist in establishing and coordinating interagency contacts.
- Keep agencies supporting the incident aware of incident status.
- Monitor incident operations to identify current or potential inter-organizational problems.
- Participate in planning meetings, providing limitations and capability of assisting agency resources.
- Coordinate response resource needs for Natural Resource Damage Assessment and Restoration (NRDAR) activities with the OSC during oil and HAZMAT responses.
- Coordinate response resource needs for incident investigation activities with the OSC.
- Coordinate activities of visiting dignitaries.
- Ensure that all required agency forms, reports and documents are completed prior to demobilization.
- Brief Command on agency issues and concerns.
- Have debriefing session with the IC prior to demobilization.
- Maintain Unit Log (ICS 214).

B.2.1.5 Safety Officer (SOFR)

The Safety Officer (SOFR) 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 officer may exercise emergency authority to stop or prevent unsafe acts when immediate action is required. The SOFR function is to develop and recommend measures for assuring personnel safety and to assess and/or anticipate hazardous and unsafe situations. Only one primary SOFR will be assigned for each incident.

The SOFR may have assistants, as necessary, and the assistants may also represent assisting agencies or jurisdictions. Safety assistants may have specific responsibilities, such as air operations, hazardous materials, etc.
The major responsibilities of the SOFR are:

- Obtain a briefing from the Incident Command.
- Participate in tactics and planning meetings, and other meetings and briefings as required.
- Identify hazardous situations associated with the incident.
- Review the IAP for safety implications.
- Provide safety advice in the IAP for assigned responders.
- Exercise emergency authority to stop and prevent unsafe acts.
- Investigate accidents that have occurred within the incident area.
- Assign assistants, as needed.
- Review and approve the Medical Plan (ICS 206).
- Develop the Site Safety Plan and publish Site Safety Plan Summary (ICS 208) as required.
- Develop the Work Safety Analysis Worksheet (ICS-215a) as required.

- Ensure that all required agency forms, reports and documents are completed prior to demobilization.
- Brief Command on safety issues and concerns.
- Have debriefing session with the IC prior to demobilization.
- Maintain Unit Log (ICS 214).

B.2.1.6 Scribe

The Scribe is responsible for ensuring that key incident information is recorded and available to the Incident Command, Section Chiefs, and agency representatives. The Scribe reports to the Incident Command. Duties for the Scribe include:

- Obtain a briefing from the Incident Command.
- Manage administrative support personnel assigned to the Command Section.
- Provide direct administrative support to the Incident Command.

B.2.2 Operations Section

The Operations Section is responsible for oil spill containment, recovery and cleanup activities. This Section also handles all well control activities if the spill is associated with a well-upset condition. Job descriptions for each of the members of the Operations Section are provided below.

B.2.2.1 Operations Section Chief

The OSC, a member of the General Staff, is responsible for the management of all tactical operations directly applicable to the primary mission. The OSC will normally be selected from the organization/agency with the most jurisdictional responsibility for the incident. The OSC activates and supervises organization elements in accordance with the IAP and directs its execution. The OSC also directs the preparation of operational plans; requests or releases resources, monitors operational progress and makes expedient changes to the IAP, as necessary; and reports such to the IC.

The OSC may have Deputy OSC's, who may be from the same agency or from an assisting agency. The Deputy OSC must have the same qualifications as the person for whom they work, as they must be ready to take over that position at any time. In complex incidents, the OSC may assign a Deputy OSC to supervise on-scene operations while the OSC participates in the incident planning process.

The major responsibilities of the OSC are:

- Obtain briefing from IC.
- Evaluate and request sufficient Section supervisory staffing for both operational and planning activities.
- Supervise Operations Section field personnel.
- Implement the IAP for the Operations Section.

- Evaluate on-scene operations and make adjustments to organization, strategies, tactics, and resources as necessary.
- Ensure the Resources Unit is advised of changes in the status of resources assigned to the section.
- Ensure that Operations Section personnel execute work assignments following approved safety practices.
- Monitor need for and request additional resources to support operations as necessary.
- Assemble/dissemble task force/strike teams as appropriate.
- Identify/utilize staging areas.
- Evaluate and monitor current situation for use in next operational period planning.
- Convert operational incident objectives into strategic and tactical options. These options may be documented on a Work Analysis Matrix (ICS- 234).
- Coordinate and consult with the PSC, SOFR technical specialists, modeling scenarios, trajectories, etc., on selection of appropriate strategies and tactics to accomplish objectives.
- Identify kind and number of resources required to support selected strategies.
- Subdivide work areas into manageable units.
- Develop work assignments and allocate tactical resources based on strategic requirements (i.e. develop the ICS-215).
- Coordinate planned activities with the SOFR to ensure compliance with safety practices.
- Participate in the planning process and the development of the tactical portions (ICS 204 and ICS 220) of the IAP.
- Assist with development of long-range strategic, contingency, and demobilization plans.
- Develop recommended list of Section resources to be demobilized and initiate recommendation for release when appropriate.
- Receive and implement applicable portions of the incident Demobilization Plan.
- Participate in operational briefings to IMT members as well as briefings to media, and visiting dignitaries.
- Maintain Unit Log (ICS 214).

B.2.2.2 Well/Source Control Coordinator

Well/Source Control Coordinator is responsible for overseeing the development and implementation of any required well control strategy. If the oil spill incident is related to a well upset, the Well/Source Control Coordinator will monitor the status of the well and contain the well if it is flowing. If the oil spill incident is not related to a well upset, the Well/Source Control Coordinator will take appropriate action to ensure that the well activities will not interfere with the cleanup effort. The Well/Source Control Coordinator reports to the Operations Section Chief.

Duties for the Well/Source Control Coordinator include:

- Obtain a briefing from the Incident Command.
- Assess status of well and make recommendation on course of action.
- Take necessary actions to control the well.
- If spill is unrelated to any well work being conducted, take necessary action to ensure that well activities do not threaten or hamper oil spill response activities.

- Provide periodic progress reports to Operations Section Chief.
- Maintain personal notes of all relevant actions and decisions.

B.2.2.3 Oil Spill Cleanup Branch Director

The Oil Spill Cleanup Branch Director is responsible for all oil spill cleanup activities. He supervises the Oil Spill Cleanup Group Supervisors (onshore and offshore), and the Surveillance Group Supervisors. He is responsible for implementing the overall cleanup strategy. The Oil Spill Cleanup Branch Director reports to the Operations Section Chief.

Duties for the Oil Spill Cleanup Branch Director include:

- Obtain briefing from person relieving.
- Receive briefing from the OSC.
- Identify Divisions, Groups, and resources assigned to the Branch.
- Ensure that Division and/or Group Supervisors (DIVS) have a copy of the IAP.
- Implement IAP for the Branch.
- Develop with subordinates alternatives for Branch control operations.
- Review Division/Group Assignment Lists (ICS 204-CG) for Divisions/Groups within the Branch. Modify lists based on effectiveness of current operations.
- Assign specific work tasks to DIVS.
- Supervise Branch operations.
- Resolve logistic problems reported by subordinates.
- Attend planning meetings as requested by the OSC.
- Ensure through chain of command that Resources Unit is advised of changes in the status of resources assigned to the Branch.
- Report to OSC when: the IAP is to be modified; additional resources are needed; surplus resources are available; or hazardous situations or significant events occur.
- Approve accident and medical reports (home agency forms) originating within the Branch.
- Consider demobilization well in advance.
- Debrief with OSC and/or as directed at the end of each shift.
- Maintain Unit Log (ICS 214).

B.2.2.4 Cleanup Group Supervisors

The Cleanup Group Supervisors are responsible for supervising all offshore and near shore response cleanup activities. Depending on the nature of the incident, different Cleanup Group Supervisors may be assigned for offshore and onshore operations. They are responsible for implementation of the assigned portion of the IAP, assignment of resources within the group and reporting on the progress of control operations and status of resources within the group. They ensure that available resources are being used efficiently during the oil spill incident. They are also responsible for overseeing and directing the activities of the oil spill cooperatives and Fishermen's Oilspill Response Team. The Cleanup Group Supervisors report to the Oil Spill Cleanup Branch Director.

Duties for the Cleanup Group Supervisors include:

- Obtain briefing and special instructions from the Oil Spill Cleanup Branch Director.
- Obtain briefing from person relieving.
- Identify resources assigned to the Division/ Group.
- Provide the IAP to subordinates, as needed.
- Review Division/Group assigned tasks and incident activities with subordinates.
- Implement IAP for Division/Group.
- Supervise Division/Group resources and make changes as appropriate.
- Ensure through chain of command that Resources Unit is advised of all changes in the status of resources assigned to the Division/ Group.
- Coordinate activities with adjacent Division/ Group.
- Determine need for assistance on assigned tasks.
- Submit situation and resources status information to the Branch Director or the OSC as directed.
- Report hazardous situations, special occurrences, or significant events, e.g., accidents, sickness, discovery of unanticipated sensitive resources, to the immediate supervisor.
- Maintain Unit Log (ICS 214).
- Ensure that assigned personnel and equipment get to and from assignments in a timely and orderly manner.
- Resolve logistics problems within the Division/ Group.
- Participate in the development of Branch plans for the next operational period, as requested.
- Consider demobilization well in advance.
- Debrief as directed at the end of each shift.
- Maintain Unit Log (ICS 214).

B.2.2.5 Staging Area Manager (STAM)

The Staging Area Manager (STAM) is under the direction of the OSC and is responsible for managing all activities within a Staging Area.

The major responsibilities of the STAM are:

- Proceed to Staging Area.
- Obtain briefing from person you are relieving.
- Establish Staging Area layout.
- Determine any support needs for equipment, feeding, sanitation and security.
- Establish check-in function as appropriate.
- Ensure security of staged resources.
- Post areas for identification and traffic control.
- Request maintenance service for equipment at Staging Area as appropriate.
- Respond to request for resource assignments. (Note: This may be direct from the OSC or via the Incident Communications Center.)

- Obtain and issue receipts for radio equipment and other supplies distributed and received at Staging Area.
- Determine required resource levels from the OSC.
- Advise the OSC when reserve levels reach minimums.
- Maintain and provide status to Resource Unit of all resources in Staging Area.
- Maintain Staging Area in orderly condition.
- Demobilize Staging Area in accordance with the Incident Demobilization Plan.
- Debrief with OSC or as directed at the end of each shift.
- Maintain Unit Log (ICS 214).

B.2.3 Logistics Section

The Logistics Section is responsible for providing all support and services needs to the oil spill response effort. This Section provides supplies, facilities and transportation, communications, and food services for the response personnel. Job descriptions for each of the members of the Logistics Section are provided on the following pages.

B.2.3.1 Logistics Section Chief (LSC)

The LSC, a member of the General Staff, is responsible for providing food, facilities, services, and material in support of the incident. The LSC participates in the development and implementation of the IAP and activates and supervises the Branches and Units within the Logistics Section.
The LSC may have Deputy LSC's, who may be from the same agency or from an assisting agency. The Deputy LSC must have the same qualifications as the person for whom they work, as they must be ready to take over that position at any time.

The major responsibilities of the LSC are:

- Plan the organization of the Logistics Section.
- Assign work locations and preliminary work tasks to Section personnel.
- Notify the Resources Unit of the Logistics Section Units activated, including names and locations of assigned personnel.
- Assemble and brief Logistics Branch Directors and Unit Leaders.
- Determine and supply immediate incident resource and facility needs.
- In conjunction with Command, develop and advise all Sections of the IMT resource approval and requesting process.
- Review proposed tactics for upcoming operational period for ability to provide resources and logistical support.
- Identify long-term service and support requirements for planned and expected operations.
- Advise Command and other Section Chiefs on resource availability to support incident needs.
- Provide input to and review the Communications Plan, Medical Plan and Traffic Plan.
- Identify resource needs for incident contingencies.
- Coordinate and process requests for additional resources.

- Track resource effectiveness and make necessary adjustments.
- Advise on current service and support capabilities.
- Request and/or set up expanded ordering processes as appropriate to support incident.
- Develop recommended list of Section resources to be demobed and initiate recommendation for release when appropriate.
- Receive and implement applicable portions of the incident Demobilization Plan.
- Ensure the general welfare and safety of Logistics Section personnel.
- Maintain Unit Log (ICS 214).

B.2.3.2 Support Branch Director (SUBD)

The SUBD, when activated, is under the direction of the LSC, and is responsible for the development and implementation of logistics plans in support of the Incident Action Plan. The SUBD supervises the operations of the Supply, Facilities, Ground Support and Vessel Support Units.

The major responsibilities of the SUBD are:

- Obtain briefing and special instructions from the Logistics Section Chief.
- Obtain work materials.
- Identify Support Branch personnel dispatched to the incident.
- Determine initial support operations in coordination with the LSC and SVBD.
- Prepare initial organization and assignments for support operations.
- Assemble and brief Support Branch personnel.
- Determine if assigned Branch resources are sufficient.
- Maintain surveillance of assigned Units work progress and inform the LSC of their activities.
- Resolve problems associated with requests from the Operations Section.
- Maintain Unit Log (ICS 214).

B.2.3.3 Transportation / Facilities Unit Leader

The Transportation / Facilities Unit Leader is responsible for providing the ground, water and air transportation, and facilities (sleeping quarters, work areas, etc.) to support an oil spill incident. The Transportation / Facilities Unit Leader ensures that transportation resources are adequately fueled, serviced and repaired, and that facilities are properly maintained. The Transportation / Facilities Unit Leader reports to the Support Branch Director (if activated) or the Logistics Section Chief.

Duties for the Transportation / Facilities Unit Leader include:

- Obtain briefing and special instructions from Support Branch Director or Logistics Section Chief.
- Participate in the preparation of the Air Operations component for the Incident Action Plan.
- Ensure that a sufficient number of aircraft are available to support the response effort, and activate additional aircraft contracts if necessary.

- Determine the availability of commercial transportation services to/from the incident area and maintain a list of available services, schedules, etc.
- Assess the feasibility of using alternative transportation modes (i.e., fishing vessels, other companies' vessels, charters, etc.) and organize their involvement/assistance if feasible.
- Coordinated with the Compensation/Claims/Insurance/Procurement Unit Leader to arrange transportation to get response personnel, equipment, supplies, and materials to the incident area or other response facilities.
- Work with local authorities to set up land, sea, and air routes which will expedite the movement of personnel, equipment, materials and supplies to the spill scene and waste products from the spill scene.
- Request declaration or cancellation of restricted air space through USCG and FAA and coordinate request through Government Affairs Officer.
- Formulate procedures for prioritization of emergency and non-tactical use of transportation resources.
- Maintain adequate reports and records of transportation resource utilization.
- Establish wildlife cleaning and rehabilitation centers if necessary.
- Make arrangements for adequate housing, sanitation, and decontamination facilities for incident response personnel.
- Ensure adequate personnel are available to operate and maintain the facilities.
- Provide security services for all facilities that limit access to authorized personnel.
- Maintain Unit Log (ICS 214).

B.2.3.4 Supply Unit Leader (SPUL)

The SPUL is primarily responsible for receiving, storing and distributing all supplies for the incident; maintaining an inventory of supplies; and storing, disbursing and servicing non-expendable supplies and equipment. The SPUL reports to the Support Branch Director (if activated) or the Logistics Section Chief.

The major responsibilities of the SPUL are:

- Obtain briefing and special instructions from Support Branch Director or Logistics Section Chief.
- Participate in Logistics Section/Support Branch planning activities.
- Determine the type and amount of supplies enroute.
- Review the IAP for information on operations of the Supply Unit.
- Develop and implement safety and security requirements.
- Order, receive, distribute and store supplies and equipment.
- Receive and respond to requests for personnel, supplies and equipment.
- Maintain an inventory of supplies and equipment.
- Service reusable equipment.
- Submit reports to the SUBD.
- Maintain Unit Log (ICS 214).

B.2.3.5 Service Branch Director (SVBD)

The SVBD can be established by the LSC if necessary or warranted by the magnitude of the incident. Until activated, the Logistics Section Chief is responsible for managing the activities of all communications and food personnel involved in the incident. The SVBD, when activated, is under the supervision of the LSC and is responsible for the management of all service activities at the incident. The Branch Director supervises the operations of the Communications, Medical and Food Units.

The major responsibilities of the SVBD are:

- Obtain briefing and special instructions from the Logistics Section Chief.
- Obtain working materials.
- Determine the level of service required to support operations.
- Confirm dispatch of Branch personnel.
- Participate in planning meetings of Logistics Section personnel.
- Review the IAP.
- Organize and prepare assignments for Service Branch personnel.
- Coordinate activities of Branch Units.
- Inform the LSC of Branch activities.
- Resolve Service Branch problems.
- Maintain Unit Log (ICS 214).

B.2.3.6 Communications Unit Leader (COML)

The COML 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. The COML reports to the SVBD (if activated) or the LSC.

The major responsibilities of the COML are:

- Obtain briefing and special instructions from Service Branch Director or Logistics Section Chief.
- Determine Unit personnel needs.
- Prepare and implement the Incident Radio Communications Plan (ICS 205).
- Ensure the Incident Communications Center and the Message Center is established.
- Establish appropriate communications distribution/maintenance locations within the Base.
- Ensure communications systems are installed and tested.
- Ensure an equipment accountability system is established.
- Ensure personal portable radio equipment from cache is distributed per Incident Radio Communications Plan.
- Provide technical information as required on:

  - Adequacy of communications systems currently in operation.
  - Geographic limitation on communications systems.
  - Equipment capabilities/limitations.
  - Amount and types of equipment available.
  - Anticipated problems in the use of communications equipment.
- Supervise Communications Unit activities.
- Maintain records on all communications equipment as appropriate.
- Ensure equipment is tested and repaired.
- Recover equipment from Units being demobilized.
- Maintain Unit Log (ICS 214).

B.2.3.7 Food Unit Leader (FDUL)

The FDUL is responsible for supplying the food needs for the entire incident, including all remote locations, e.g., Staging Areas, as well as providing food for personnel unable to leave tactical field assignments.. The FDUL reports to the SVBD (if activated) or LSC.

The major responsibilities of the FDUL are:

- Obtain briefing and special instructions from Service Branch Director or Logistics Section Chief.
- Determine food and water requirements.
- Determine the method of feeding to best fit each facility or situation.
- Obtain necessary equipment and supplies.
- Ensure that well-balanced menus are provided.
- Order sufficient food and potable water from the Supply Unit.
- Maintain an inventory of food and water.
- Maintain food service areas, ensuring that all appropriate health and safety measures are being followed.
- Supervise Food Unit personnel as appropriate.
- Maintain Unit Log (ICS 214).

B.2.4 Planning Section

The Planning Section is responsible for collecting and distributing information on the current and forecasted condition of the spill, status of the response effort and status of resources assigned to the response. This Section is also responsible for preparing the Incident Action Plans. Job descriptions for each of the members of the Planning Section are provided on the following pages.

B.2.4.1 Planning Section Chief (PSC)

The PSC, a member of the General Staff, is responsible for the collection, evaluation, dissemination and use of incident information and maintaining status of assigned resources. Information is needed to:

1) Understand the current situation;

2) Predict probable course of spill events;
3) Prepare strategies, plans and alternative strategies and plans for the incident; and
4) Submit required incident status reports.

The PSC reports directly to IC. When the Planning Section is divided into units, the PSC appoints Unit Leaders as needed and the Unit Leaders appoint staff as needed to fulfill their functions. The PSC may have Deputy PSC's, who may be from the same agency or from an assisting agency. The Deputy PSC must have the same qualifications as the person for whom they work, as they must be ready to take over that position at any time

Duties for the PSC may include, but are not limited to:

- Obtain briefing on current status of the response from Incident Command.
- Collect, process, and display incident information.
- Assist OSC in the development of response strategies.
- Supervise preparation of the IAP.
- Facilitate planning meetings and briefings.
- Supervise the tracking of incident personnel and resources through the Resources Unit.
- Assign personnel already on-site to ICS organizational positions as appropriate.
- Establish information requirements and reporting schedules for Planning Section Units (e.g., Resources, Situation).
- Determine the need for any specialized resources in support of the incident.
- Establish special information collection activities as necessary (e.g., weather, environmental, toxics, etc.).
- Assemble information on alternative strategies.
- Provide periodic predictions on incident potential.
- Keep IMT apprised of any significant changes in incident status.
- Compile and display incident status information.
- Oversee preparation and implementation of the Incident Demobilization Plan.
- Incorporate plans (e.g., Traffic, Medical, Communications, and Site Safety) into the IAP.
- Develop other incident supporting plans (e.g., salvage, transition, security).
- Maintain Unit Log (ICS 214).

B.2.4.2 Resource Unit Leader (RESL)

The RESL is responsible for maintaining the status of all assigned tactical resources and personnel at an incident. This is achieved by overseeing the check-in of all tactical resources and personnel, maintaining a status- keeping system indicating current location and status of all these resources.

The major responsibilities of the RESL are:

- Obtain briefing and special instructions from Planning Section Chief.
- Establish the check-in function at incident locations.
- Prepare Organization Assignment List (ICS 203) and Organization Chart (ICS 207).

- Prepare appropriate parts of Division Assignment Lists (ICS 204).
- Maintain and post the current status and location of all tactical resources.
- Maintain master roster of all tactical resources checked in at the incident.
- Attend meetings and briefings as required by the PSC.
- Maintain Unit Log (ICS 214).

B.2.4.3 Situation Unit Leader (SITL)

The Situation Unit Leader is responsible for collecting, processing and organizing incident information relating to the growth, mitigation or intelligence activities taking place on the incident. The SITL may prepare future projections of incident growth, maps and intelligence information.

The major responsibilities of the SITL are:

- Obtain briefing and special instructions from Planning Section Chief.
- Begin collection and analysis of incident data as soon as possible.
- Prepare, post, or disseminate resource and situation status information as required, including special requests.
- Prepare periodic predictions or as requested by the PSC.
- Prepare the Incident Status Summary Form (ICS-209).
- Provide photographic services and maps if required.
- Conduct situation briefings at meetings and briefings as required by the PSC.
- Develop and maintain master chart(s)/map(s) of the incident.
- Maintain chart/map of incident in the common area of the ICP for all responders to view.
- Maintain Unit Log (ICS 214).

B.2.4.4 Documentation Unit Leader (DOCL)

The DOCL is responsible for the maintenance of accurate, up-to-date incident files. Examples of incident documentation include: Incident Action Plan(s), incident reports, communication logs, injury claims, situation status reports, etc. Thorough documentation is critical to post-incident analysis. Some of the documents may originate in other sections. The DOCL shall ensure each section is maintaining and providing appropriate documents. The DOCL will provide duplication and copying services for all other sections. The Documentation Unit will store incident files for legal, analytical, and historical purposes. The Documentation Unit Leader reports to the PSC.

The major responsibilities of the DOCL are:

- Obtain briefing and special instructions from Planning Section Chief.
- Set up work area; begin organization of incident files.
- Establish duplication service; respond to requests.
- File all official forms and reports.
- Review records for accuracy and completeness; inform appropriate units of errors or omissions.

- Provide incident documentation as requested.
- Organize files for submitting final incident documentation package.
- Maintain Unit Log (ICS 214).

B.2.4.5 Environmental Unit Leader (ENVL)

The ENVL is responsible for identifying all environmental issues associated with the oil spill incident, response and clean-up. He or she gives advice and recommendations on dispersant use, oily waste disposal, and cleanup techniques involved in the oil spill response. The Environmental Unit Leader participates in planning session activities, collects area environmental information and prioritizes mitigation measures. The Environmental Unit Leader reports to the PSC.

Duties for the Environmental Unit Leader include:

- Obtain briefing and special instructions from Incident Command.
- Establish staffing requirements for the Unit and assign duties to personnel.
- Collect and maintain existing, relevant environmental baseline data from the incident and potentially affected areas.
- Assess potential environmental effects of the spill and response efforts and communicate these to Incident Command using available sources of information and trustee agency representatives.
- Prepare Environmental Operations component of the Incident Action Plan.
- Coordinate with Government Affairs Officer to obtain necessary government agency approvals for dispersant use.
- Be familiar with existing environmental regulations and restrictions within the incident area and obtain necessary permits and approvals for work associated with the oil spill incident.
- Assess the environmental damage to contaminated areas and potential impact of cleanup activities to support recommendation on cleanup methods.
- Develop recommendations for protection of key environmental areas and appropriate cleanup methodologies.
- Implement and monitor plans for wildlife protection and, if necessary, capture, cleaning and rehabilitation.
- Develop and implement plans for the temporary storage (if applicable) and disposal of recovered oily waste and debris.
- Maintain personal notes of all relevant actions and decisions.

B.2.4.6 Trajectory Analysis Technical Specialist

The Trajectory Analysis Technical Specialist is responsible for providing to the UC, projections and estimates of the movement and behavior of the spill. The specialist will combine visual observations, remote sensing information, and 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 for dissemination throughout the ICP.

Duties for the Trajectory Analysis Technical Specialist include:

- Schedule and conduct spill observations/overflights, as needed.
- Gather pertinent information on tides, currents and weather from all available sources.
- Provide a trajectory and over-flight maps, weather forecasts, and tidal and current information.
- Provide briefing on observations and analyses to the proper personnel.
- Demobilize in accordance with the Incident Demobilization Plan.
- Maintain Unit Log (ICS 214-CG).

B.2.4.7 Technical Specialist (THSP)

Certain incidents or events may require the use of THSP's who have specialized knowledge and expertise. THSP's may function within the Planning Section or be assigned wherever their services are required.

The major responsibilities of the THSP are:

- Provide technical expertise and advice to Command and General Staff as needed.
- Attend meetings and briefings as appropriate to clarify and help to resolve technical issues within area of expertise.
- Maintain Unit Log (ICS 214).

Other major responsibilities that might apply to the THSP as appropriate:

- Provide technical expertise during the development of the IAP and other support plans.
- Work with the Safety Officer to mitigate unsafe practices.
- Work closely with Liaison Officer to help facilitate understanding among stakeholders and special interest groups.
- Be available to attend press briefings to clarify technical issues.
- Research technical issues and provide findings to decision makers.
- Troubleshoot technical problems and provide advice on resolution.
- Review specialized plans and clarify meaning.

B.2.4.8 Engineering Support Unit Leader

The Engineering Support Unit Leader provides the Planning Chief and Incident Command with engineering-based information regarding the response effort. He or she gives advice and recommendations on source control, leak repair, structural integrity, etc. associated with the spill response effort. The Engineering Support Unit Leader participates in Planning Section activities, designs repairs, and evaluates source control alternatives, and provides engineering-related advice to the Incident Command. The Engineering Support Unit Leader reports to the Planning Section Chief.

The responsibilities of the Engineering Support Unit Leader include:

- Obtain briefing on current status of the response from the Planning Section Chief and Incident Command.
- Assist in preparing engineering aspects of the Incident Action Plan.
- Establish staffing requirements for the Unit and assign duties to personnel.
- Communicate with Incident Command, other Sections, and response contractors to insure that suitable engineering requirements and procedures are employed in the response effort.
- Design appropriate strategies as necessary for controlling the release.
- Maintain personal notes of all relevant actions and decisions.

B.2.4.9 Demobilization Unit Leader (DMOB)

The DMOB is responsible for developing the Incident Demobilization Plan. On large incidents, demobilization can be quite complex, requiring a separate planning activity. Note that not all agencies require specific demobilization instructions. The DMOB reports to the PSC.

The major responsibilities of the DMOB are:

- Review incident resource records to determine the likely size and extent of demobilization effort and develop a resource matrix.
- Coordinate demobilization with Agency Representatives.
- Monitor the on-going Operations Section resource needs.
- Identify surplus resources and probable release time.
- Establish communications with off-incident facilities, as necessary.
- Develop an Incident Demobilization Plan that should include:
  - General information section
  - Responsibilities section
  - Release priorities
  - Release procedures
  - Demobilization Checkout Form (ICS-221)
  - Directory
- Prepare appropriate directories (e.g., maps, instructions, etc.) for inclusion in the demobilization plan.
- Distribute demobilization plan (on and off-site).
- Provide status reports to appropriate requestors.
- Ensure that all Sections/Units understand their specific demobilization responsibilities.
- Supervise execution of the Incident Demobilization Plan.
- Brief the PSC on demobilization progress.
- Review DMOB Job Aid.
- Maintain Unit Log (ICS 214).

B.2.5 Finance Section

The Finance Section is responsible for the development and implementation of all financial and accounting activities necessary to support the oil spill response effort. This Section also handles all compensation, claims and insurance issues related to the oil spill and response activities. Job descriptions for each of the members of the Finance Section are provided on the following pages.

B.2.5.1 Finance Section Chief (FSC)

The FSC, a member of the General Staff, is responsible for all financial, administrative and cost analysis aspects of the incident and for supervising members of the Finance/Admin Section. The FSC may have Deputy FSC's, who may be from the same agency or from an assisting agency. The Deputy FSC must have the same qualifications as the person for whom they work, as they must be ready to take over that position at any time.

The major responsibilities of the FSC are:

- Obtain briefing on current status of the response from Incident Command.
- Participate in incident planning meetings and briefings as required.
- Review operational plans and provide alternatives where financially appropriate.
- Manage all financial aspects of an incident.
- Provide financial and cost analysis information as requested.
- Gather pertinent information from briefings with responsible agencies.
- Develop an operating plan for the Finance/ Admin Section; fill supply and support needs.
- Determine the need to set up and operate an incident commissary.
- Meet with Assisting and Cooperating Agency Representatives, as needed.
- Maintain daily contact with agency(s) administrative headquarters on Finance/Admin matters.
- Ensure that all personnel time records are accurately completed and transmitted to home agencies, according to policy.
- Provide financial input to demobilization planning.
- Ensure that all obligation documents initiated at the incident are properly prepared and completed.
- Brief agency administrative personnel on all incident-related financial issues needing attention or follow-up prior to leaving incident.
- Develop recommended list of Section resources to be demobed and initial recommendation for release when appropriate.
- Receive and implement applicable portions of the incident Demobilization Plan.
- Maintain Unit Log (ICS 214).

B.2.5.2 Time Unit Leader (TIME)

The TIME is responsible for equipment and personnel time recording and for managing the commissary operations. The TIME reports to the FSC.

The major responsibilities of the TIME are:

- Obtain briefing and special instructions from Finance Section Chief.
- Determine incident requirements for time recording function.
- Determine resource needs.
- Contact appropriate agency personnel/ representatives.
- Ensure that daily personnel time recording documents are prepared and in compliance with agency(s) policy.
- Establish time unit objectives.
- Maintain separate logs for overtime hours.
- Establish commissary operation on larger or long term incidents, as needed.
- Submit cost estimate data forms to the Cost Unit, as required.
- Maintain records security.
- Ensure that all records are current and complete prior to demobilization.
- Release time reports from assisting agency personnel to the respective Agency Representatives prior to demobilization.
- Brief the FSC on current problems and recommendations, outstanding issues and followup requirements.
- Maintain Unit Log (ICS 214).

B.2.5.3 Procurement Unit Leader (PROC)

The PROC is responsible for administering all financial matters pertaining to vendor contracts, leases and fiscal agreements. The PROC reports to the FSC.

The major responsibilities of the PROC are:

- Obtain briefing and special instructions from Finance Section Chief.
- Review incident needs and any special procedures with Unit Leaders, as needed.
- Coordinate with local jurisdiction on plans and supply sources.
- Obtain the Incident Procurement Plan.
- Prepare and authorize contracts, building and land-use agreements.
- Draft memoranda of understanding as necessary.
- Establish contracts and agreements with supply vendors.
- Provide for coordination between the ORDM and all other procurement organizations supporting the incident.
- Ensure that a system is in place that meets agency property management requirements.
- Ensure proper accounting for all new property.
- Interpret contracts and agreements; resolve disputes within delegated authority.
- Coordinate with the Compensation/Claims Unit for processing claims.
- Complete final processing of contracts and send documents for payment.
- Coordinate cost data in contracts with the COST.
- Brief the FSC on current problems and recommendations, outstanding issues and followup requirements.
- Maintain Unit Log (ICS 214).

B.2.5.4 Compensation/Claims Unit Leader (COMP)

The COMP is responsible for the overall management and direction of all administrative matters pertaining to compensation for injury and claims related activities (other than injury) for an incident. The COMP reports to the FSC.

The major responsibilities of the COMP are:

- Obtain a briefing from the FSC.
- Establish contact with the incident MEDL, SOFR and LNO (or Agency Representatives if no LNO is assigned).
- Determine the need for Compensation for Injury and Claims Specialists and order personnel as needed.
- Establish a Compensation for Injury work area within or as close as possible to the Medical Unit.
- Review Incident Medical Plan (ICS 206)
- Ensure that CLMS's have adequate workspace and supplies.
- Review and coordinate procedures for handling claims with the Procurement Unit.
- Brief the CLMS's on incident activity.
- Periodically review logs and forms produced by the CLMS's to ensure that they are complete, entries are timely and accurate, and that they are in compliance with agency requirements and policies.
- Ensure that all Compensation for Injury and Claims logs and forms are complete and routed to the appropriate agency for post-incident processing prior to demobilization.
- Keep the FSC briefed on Unit status and activity.
- Demobilize unit in accordance with the Incident Demobilization Plan.
- Maintain Unit Log (ICS 214).

B.2.5.5 Cost Unit Leader (COST)

The COST is responsible for collecting all cost data, performing cost effectiveness analyses and providing cost estimates and cost saving recommendations for the incident. The COST reports to the FSC.

The major responsibilities of the COST are:

- Obtain a briefing from the FSC.
- Coordinate with agency headquarters on cost reporting procedures.
- Collect and record all cost data.
- Develop incident cost summaries.
- Prepare resources-use cost estimates for the Planning Section.
- Make cost-saving recommendations to the FSC.
- Ensure all cost documents are accurately prepared.

- Maintain cumulative incident cost records.
- Complete all records prior to demobilization.
- Provide reports to the FSC.
- Maintain Unit Log (ICS 214).

Appendix C Response Equipment Inventories

C.1 Primary Response Equipment

Responses to small spills contained on a platform will initially use onsite equipment. Onsite equipment for all the Company facilities located in the OCS area includes sorbent pads and spill tracking buoys. Typically, each platform maintains:

Table C-1. Onsite Equipment

Facility	Onsite Equipment
Harvest	5 spill tracking buoys 35 bags of sorbent pads (100 pads per bag)
Hermosa	5 spill tracking buoys, 8 bags of sorbent pads (100 pads per bag)
Hidalgo	5 spill tracking buoys, 10 bags of sorbent pads (100 pads per bag)
Irene	5 spill tracking buoys, 18 bags of sorbent pads (100 bags per bag)
Gaviota Oil Heating Facility	Detailed in facility Emergency Response Plan
Lompoc Oil and Gas Plant	Detailed in facility Emergency Response Plan

Supplementary equipment for small spills and primary and supplementary equipment for large spills at company OCS area facilities will be provided by Clean Seas for spills reaching the ocean. Clean Seas also provides primary response for shoreline protection. Onshore cleanup will involve various cleanup contractors, depending on the location and nature of the cleanup activities required. The inventory of equipment and materials maintained by Clean Seas is sufficient to meet the resources required by the Oil Pollution Act of 1990 (OPA 90) and the Lempert-Keene Seastrand Oil Spill Prevention and Response Act (also known as California Senate Bill 2040 [SB 2040]). Clean Seas is certified as an Oil Spill Responder by the U.S. Coast Guard.

Clean Seas and its member companies and contractors have an extensive inventory of spill containment and recovery equipment, response vessels, vehicles, sorbents, and miscellaneous support equipment. From its office and storage yard in Carpinteria, Clean Seas provides equipment and personnel for the protection of the California coast between Cape San Martin to the north and Point Dume to the south. This area includes the offshore islands and waters extending to the Outer Continental Shelf. To facilitate a rapid response to a spill emergency, Clean Seas' equipment is stationed throughout the Area of Responsibility at and on response vessels. The Support Yard is Clean Seas' primary equipment maintenance and storage facility. It is located in Carpinteria off of Carpinteria Avenue. The address is:

Clean Seas Support Yard – G.E. "Ike" Ikerd, General Manager
5751A Carpinteria Avenue
Carpinteria, California 93013
(805) 684-3838 (24-hour phone number)

The Yard is managed by a crew that supports ongoing land and sea operations for Clean Seas and member companies upon request. The personnel maintain a continual readiness for responding to an oil spill emergency through ongoing training exercises and maintaining the preparedness of all Clean Seas equipment.

Primary response to an oil release will be by Clean Seas. A Clean Seas OSRV will normally be located in the Point Arguello/Point Pedernales area. During adverse weather and/or sea conditions or for safety reasons, the vessel may move at the Vessel Master's discretion to safe moorage (i.e., at Cojo Bay). Transit to and from the offshore area should be made during daylight hours and during the normal work period. The vessel may also temporarily relocate to other areas due to crew change or resupply. If the vessel needs to temporarily move out of the area for reasons other than those stated above, the Company or Clean Seas will provide notification to the BSEE and other appropriate agencies prior to the vessel movement.

Clean Seas equipment and resources, including the OSRVs and the SRVs, are summarized throughout in Section 5000 of the Area Contingency Plan (Vol. I). Pertinent information on the OSRV most likely to aid in primary (and secondary) response is listed below:

Table C-2. Oil Spill Response Vessel (OSRV) 'Clean Ocean'

Type	Size/Model	Quantity/Capacity	Manufacturer
Oil Spill Response Vessel	145' x 36'	1	N/A
Boom – Ocean	60" Reel Pack	1,500'	Kepner
Boom – Ocean	43" SPI auto-boom	3,000'	Oil Stop
Boom – Sweep	20/40 Sea Sentry	120'	Eng. Fabrics Corp.
Storage – TSC	Internal tanks	1400 bbls	N/A
Skimmer	4 Chain Brush	2 @ 4,952 = 9,904 EDRC	Lamor
Skimmer	GT-185	2 @ 1,371 = 2,742 EDRC	Pharo Marine
Boat	RHIB	7 meter	Willard Marine
Transfer Pump	DOP 250	629 bph	Desmi
Transfer Pump	DOP 250	629 bph	Desmi
Transfer Pump	DOP 250	629 bph	Desmi
Transfer Pump	DOP 250	629 bph	Desmi
Hydraulic Power Unit	DA 50	1/50 gpm	Diesel America
Absorbent boom	8"	10 @ 40' each = 400'	3M
Dispersant	9527	1,000 gals.	Nalco
Dispersant Spray Arms	Distribution System	2	N/A
Site Entry Kit	4 gas/benzene chip	1	Industrial Sc./Dragger
Tracking Buoys	DFB	2	Fastrack
Infrared Camera System	M626L	1	FLIR
Radios	P400	4/158.445 + VHF Marine	Motorola
Radios	VHF Base	1/158.445 + VHF Marine	Motorola
Radios	VHF Mobile	Marine	Motorola
Cellular Phone	(805) 455-5501	1	
Computer w/broadband crd.		1	Dell/ATT

*This list is not intended to correspond to temporary relocation and/or movement of equipment within Clean Seas' Area of Response nor to periods when equipment is out of service for repairs or maintenance.

The Company's initial spill response procedures are designed to focus personnel on those operations they are specially trained in. There are personnel at each facility 24 hours per day 7 days a week to provide assistance in initial spill response operations. If safe to do so, initial response operations by facility personnel will be directed to identifying the source, stopping the release, notifying and mobilizing Clean Seas, and, if possible, containing the released oil. Additionally, platform personnel will monitor spill movement and coordinate the initial response operations by Clean Seas vessels to the leading edge of the spill.

When called by a facility for spill response, a boom handling boat will normally be launched, weather permitting, and proceed to the spill site ahead of the OSRV. Depending on actual conditions (i.e., weather/sea conditions, maintenance activities), response to the spill site for initial site characterization and investigation should be within the response times listed below. Depending upon specific conditions, equipment deployment operations may be initiated by Clean Seas personnel simultaneously with the site characterization. However, containment (and exposure of personnel to the potential health hazards of the spill) will not be initiated until after the Clean Seas initial response crew has completed a site characterization.

Once the site has been cleared to initiate response operations, facility personnel will continue to conduct operations associated with stopping any additional spill release. The specially trained Clean Seas personnel will be engaged in spill containment and recovery operations. The OSRV has advancing skimmer units and accessory equipment, booms on a hydraulic reel, 10-ton or larger crane, dispersant system with dispersant, absorbent boom and pads, oil transfer pumps, site characterization kit, infrared camera system, and oil storage.

Based upon Clean Seas' estimated response times for their OSRV normally located near Platform Harvest, containment and recovery equipment can be mobilized to the Company's OCS area platforms in the following approximate timeframes:

Hidalgo	0.5 hrs.
Harvest	Immediately
Hermosa	0.5 hrs.
Irene	Less than 1 hr.

If the OSRV is at Cojo Bay due to adverse conditions, containment and recovery equipment can be mobilized from Cojo Bay to the Company's platforms in the following approximate timeframes:

Hidalgo	1.1 hrs.
Harvest	Less than 1 hr.
Hermosa	Less than 1 hr.
Irene	2 hrs.

Actual timeframes may vary due to sea/current conditions and/or activities engaged in at the time of the call (i.e., re-supply, refueling, training, minor maintenance). Response times are based on an average vessel speed of 10 knots for the primary responding OSRV, including an allowance for approximately 20 minutes for engine warm-up and getting off the mooring buoy. It is important to note that these response times are not meant to be used as a measure of performance during a spill or a drill, but instead as a tool to estimate estimated time of arrivals.

C.2 Secondary Response Equipment

Clean Seas is also considered the secondary responder for spills entering marine waters in the area because of their extensive capability to deploy additional equipment. A complete listing of response equipment is provided in Section 5000 of the Area Contingency Plan (Vol. I) and is hereby incorporated by reference to this plan.

In April 2012 Cleans Seas placed two new 65' OSRVs in service. These vessels replaced the retired Mr. Clean III and will initially serve as secondary oil spill response equipment to the Point Arguello/Point Pedernales area. The two new OSRV are named the ***Ocean Scout*** and ***Ocean Guardian***. These OSRVs have advancing skimmer units and accessory equipment, booms on a hydraulic reel, 4.5-ton crane, dispersant system with dispersant, absorbent boom and pads, oil transfer pumps, site characterization kit, infrared camera system, and oil storage. The vessels are capable of reaching speeds of 26 knots. Table C-3 summarizes some of the key equipment available from Clean Seas on these vessels.

Table C-3. Oil Spill Response Vessel (OSRV) 'Ocean Scout'

Type	Size/Model	Quantity/Capacity	Manufacturer
Oil Spill Response Vessel	65' x 22'	1	Rozema
Boom – Ocean	43" Kepner Reel Pack	1,500'	Kepner
Boom – Sweep	LAMOR	40'	Eng. Fabrics Corp.
Storage – TSC	Internal tanks	215 bbls	N/A
Skimmer	3 Chain Brush	2 @ 3,710 = 7,420 EDRC	Lamor
Infrared Camera	M-Series	1	FLIR
Absorbent boom	8"	5 @ 40' each = 200'	3M
Dispersant	9500	250 gals.	Nalco
Integrated Dispersant System	Application System	2	N/A
Site Entry Kit	4 gas/benzene chip	1	Industrial Sc./Dragger
Tracking Buoys	RDF	2	Fastrack
Radios	P400	4/158.445 + VHF Marine	Motorola
Radios	VHF Base	1/158.445 + VHF Marine	Motorola
Radios	VHF Mobile	Marine	Motorola
Cellular Phone	(805) 455-5503	1	
Computer w/broadband crd.		1	Dell/ATT

*This list is not intended to correspond to temporary relocation and/or movement of equipment within Clean Seas' Area of Response nor to periods when equipment is out of service for repairs or maintenance.

Table C-3. Oil Spill Response Vessel (OSRV) 'Ocean Guardian'			
Type	**Size/Model**	**Quantity/Capacity**	**Manufacturer**
Oil Spill Response Vessel	65' x 22'	1	Rozema
Boom – Ocean	43" Kepner Reel Pack	1,500'	Kepner
Boom – Sweep	LAMOR	40'	Eng. Fabrics Corp.
Storage – TSC	Internal tanks	215 bbls	N/A
Skimmer	3 Chain Brush	2 @ 3,710 = 7,420 EDRC	Lamor
Infrared Camera	M-Series	1	FLIR
Absorbent boom	8"	5 @ 40' each = 200'	3M
Dispersant	9500	250 gals.	Nalco
Integrated Dispersant System	Application System	2	N/A
Site Entry Kit	4 gas/benzene chip	1	Industrial Sc./Dragger
Tracking Buoys	RDF	2	Fastrack
Radios	P400	4/158.445 + VHF Marine	Motorola
Radios	VHF Base	1/158.445 + VHF Marine	Motorola
Radios	VHF Mobile	Marine	Motorola
Cellular Phone	(805) 455-5503	1	
Computer w/broadband crd.		1	Dell/ATT

*This list is not intended to correspond to temporary relocation and/or movement of equipment within Clean Seas' Area of Response nor to periods when equipment is out of service for repairs or maintenance.

C.2.1 Other Response Vessel/Support Vessels/Support Equipment

Table C-4. Spill Response Vessel (SRV) 'Clean Sweep'			
Type	**Size/Model**	**Quantity/Capacity**	**Manufacturer**
Spill Response Vessel	32' x 11'	1	Kvickak Marine
Boom – Sweep	26" Sweep	30'	Lamor
Storage -TSC	Internal tanks	29 bbls.	
Skimmer	3 Chain Brush	3710 EDRC	Lamor
Site Entry Kit	4 gas/benzene chip	1	Industrial Sc./Dragger
Radios	VHF Base	1/158.445 + VHF Marine	Motorola
Radios	VHF Mobile	Marine	Motorola
Marine Booming/Support Vessels			
Type	**Size/Model**	**Quantity/Capacity**	**Manufacturer**
'Ajax'	32' x 8'	1	WorkBoats N.W.
'Comet'	32' x 8'	1	WorkBoats N.W.
'Sea Ark'	21' x 7.5'	1	Sea Ark Boats
Shoreline Protection Skiffs			
Aluminum Skiff on trailer	16' w/outboard motor (15+ HP)	12	N/A
Hydraulic Power Units			
Hydraulic Power Unit	DA45	2 – 45 gpm	Diesel America
Hydraulic Power Unit	DA33	2 – 35 gpm	Diesel America
Hydraulic Power Unit	DA30	4 – 30 gpm	Diesel America
Hydraulic Power Unit	DA10	5 – 10 gpm	Diesel America

C.2.2 Containment Equipment

In addition to the 7,500 of containment boom stored on the three OSRVs Clean Seas maintains and additional inventory of ocean boom and shoreline protection boom in readily available trailers and storage bins at the Carpinteria yard.

Table C-5. Ocean and Shoreline Protection Boom			
Type	**Size/Model**	**Quantity/Capacity**	**Manufacturer**
Boom - Ocean	43" SPI auto-boom	3,000'	Oil Stop
Boom - Ocean	43" Solid Foam	4,500'	CCB Company
	Non OSRV Ocean Boom	7,500'	
Shoreline Protection Boom			
Type	**Size/Model**	**Quantity/Capacity**	**Manufacturer**
Boom	10"	3,000'	Oil Stop
Boom	18"	1,100'	American Marine
Boom	20"	18,600'	Kepner
Boom	30"	8,600'	Kepner
	Total Shoreline Boom	31,300'	

C.2.3 Recovery Equipment

Various skimmers are stored at the Clean Seas yard, or pre-staged on vessels near deployment sites. The ***Clean Ocean*** has enough skimming capacity to equal an Effective Daily Recovery Capacity (EDRC) of 12,646 barrels. The ***Ocean Scout*** and ***Ocean Guardian*** each have 7,420 barrels of EDRC, and the ***Clean Sweep*** has 3,710 barrels of EDRC. A total of 13 additional skimmers with the total EDRC of 40,081 are also available for use on both light and heavy viscosity oils, in open sea and protected environments.

Table C-6. Skimmers (Open Ocean, Nearshore & Inland)			
Type	**Size/Model**	**Quantity/Capacity**	**Manufacturer**
Weir	Terminator	2 @ 3,017 = 6,034 EDRC	Desmi
Weir	GT-185	2 @ 1,371 = 2,742 EDRC	Pharo Marine
Weir	GT-260	1 @ 3,019 = 3,019 EDRC	Pharo Marine
Drum/Weir	Roto-30	2 @ 3,017 = 6,034 EDRC	Roto-Trading
Oleophillic Brush	2 – Brush	4 @ 2,472 = 9,888 EDRC	Lamor
Oleophillic Brush	5 – Brush	2 @ 6,182 = 12,364 EDRC	Lamor
	Total Non OSRV/SRV (EDRC) Skimming	40,081 bbls. EDRC	
Transfer Pumps			
Type	**Model**	**Quantity/Capacity**	**Manufacturer**
Pump	Framo TK 150	2 – 36,000 bph	Moen
Pump	DOP 250	629 bph	Desmi
Pump	Master	3 – 125 bph	Desmi
	Total Pumping Capacity	73,004 bph	

C.2.4 Temporary Storage Equipment

In addition to the 1,400 barrels of storage capacity on the ***Clean Ocean***, 215 barrels (each) of storage capacity on the ***Ocean Scout*** and ***Ocean Guardian***, and 29 barrels of storage capacity on the ***Clean Sweep***, Clean Seas maintains an additional 10,526 barrels of storage capacity in the Santa Barbara Harbor and Carpinteria areas.

Table C-7. Oil Spill Response Storage

Type	Size/Model	Quantity/Capacity	Manufacturer
'Tide Mar VII' - Oil Spill Response Barge	160' x 39'	1	N/A
Storage –TSC	Internal tanks	7840 bbls.	
Transfer Pump	DOP 250	629 bph	Desmi
Towable Storage Bladders	Kepner 120	3 @ 120 bbls. = 360 bbls.	Kepner
Towable Storage Bladders	Kepner 590	1 @ 590 bbls. = 590 bbls.	Kepner
Towable Storage Bladders	Kepner 28	4 @ 28 bbls. = 112 bbls.	Kepner
Towable Storage Bladders	Dunlop Dracone	1 @ 140 bbls. = 140 bbls.	Dunlop UK
Rigid Dracone Barges	Eagle Aluminum	8 @ 100 bbls. = 800 bbls.	Eagle Marine
Portable (land)	Fastank-1200	12 @ 57 bbls. = 684 bbls.	Fastank
	Temporary Storage Cap.	10,526 bbls.	

C.2.5 Dispersants, Application Equipment and Absorbent Boom

In addition to the 1,100 gallons of Corexit 9527 dispersant aboard the ***Clean Ocean***, and 250 gallons of Corexit 9500 dispersant aboard the ***Ocean Scout*** and ***Ocean Guardian*** (each), Clean Seas maintains a large inventory of dispersants at their storage yard in Carpinteria. Clean Seas also maintains absorbents including 9,600' of 8" absorbent boom, and absorbent pads. Inventories are stored in the Carpinteria Yard and the OSRVs. Additional quantities are available as back-up supplies from different vendors throughout the state.

Table C-8. Dispersants

Type		Quantity/Capacity	Manufacturer
Corexit 9527		7,150 gals.	Nalco
Corexit 9500		9,900 gals	Nalco
	Total Non OSRV Dispersant	17, 050 gals.	

Clean Seas also maintains a contract with Aspen Helicopter Inc., located in Oxnard California, and may utilize its services for aerial application of dispersants as well as to assess and track marine oil spills and coordinate marine oil spill response vessels. Aspen Helicopters Inc. has trained on numerous occasions with Clean Seas aerial dispersant spray buckets from the Oxnard airport and remote landing zones throughout the Clean Seas area of response. Aerial dispersant application and surveillance equipment includes:

Table C-9. Aerial Dispersant Applicant Equipment
Bell 206 L-III (Long Ranger) Helicopter
Bell 206 B-III (Jet Ranger) Helicopter
Bell 212 Medium Twin Helicopter
2 - Simplex helicopter dispersant spray unit with 250-gallon capacity and 32’ spray boom
Aerial Surveillance/Tracking
2 – Partenavia P68–C
1 – Partenavia P68-OBS
2 – Piper Chieftain PA-31-350

C.2.6 Vehicles/Trailers

An assortment of trucks and response vehicles are available for immediate response operations and contracts are in place for additional equipment as needed.

Table C-10. Motor Pool (Trucks, Cranes, Forklifts & Trailers)			
Type	**Model**	**Quantity/Capacity**	**Manufacturer**
Crane Truck	F-800	1 – 12 Ton	Ford
Stake Bed truck	F-550	1	Ford
Stake Bed Truck	F-350	1	Ford
4x4 Passenger Truck	F-350	1	Ford
Passenger Vehicle	Expedition	1	Ford
Passenger Truck	F-150	1	Ford
Passenger Truck	Ranger	1	Ford
ATV	Big Bear	2	Yamaha
Forklift	V330	1 – 33,000 lbs.	Caterpillar
Forklift	M8	1 – 8,000 lbs.	Wiggens
Mobile Ops. Field Office	22’ Attitude	1	Southwind
Open Deck Trailer	18’	1	Texas Trailer Co.

C.2.7 Radio Communications System

Clean Seas maintains a complete radio system consisting of VHF/UHF equipment providing solid communication throughout the Clean Seas Area of Response.

C.2.8 Miscellaneous

Clean Seas maintains portable response trailers for decontamination, shoreline protection and dispersant support for remote operations.

C.3 Supplemental Response Resources

C.3.1 Marine Spill Response Corporation (MSRC) - Long Beach

Marine Spill Response Corporation is a non-profit organization formed by member companies. This response organization and its member companies and contractors have an extensive inventory of spill containment and recovery equipment, response vessels, vehicles, sorbents, and miscellaneous support equipment. The Coast Guard (through a Non Standard Ordering Agreement) and/or the Office of Spill Prevention & Response (through the Orphan Spill Agreement), may request additional response equipment from MSRC if the amount of resources provided by Clean Seas are insufficient to accomplish an effective response. Marine Spill Response Corporation can be reached at the address and telephone number below:

Marine Spill Response Corporation
3300 E. Spring Street
Long Beach, CA 90802
24-hour phone: 1-800-OIL-SPIL
(562) 981-7601 (fax)

Equipment inventory and located information are contained in Section 5000 of the Area Contingency Plan (Vol. I) and is incorporated herein by reference.

C.3.2 Private Onshore Contractor – Patriot Environmental Services

Patriot is a leading oil spill and hazardous material release responder offering rapid emergency response services on both land and water. The Company may use Patriot as necessary if local resources are insufficient to accomplish an effective response. Patriot Incident Response Team members have an extensive spill response background having responded to nearly every type of spilled material, volume of release, and remote location. Patriot has been rated by the U.S. Coast Guard and California Department of Fish and Game's Office of Spill Prevention and Response as an approved Oil Spill Removal Organization (OSRO). In addition, Patriot has an agreement with Clean Seas through which the Company may activate Patriot's services.

Patriot maintains a work force of 8 full-time personnel in Ventura, in the event of an incident Patriot can mobilize up to 40 Long Beach employees and up to 100 HAZWOPER trained technicians from their Company and contracted labor forces in the greater Southern California areas.

In the event an onshore or shoreline response is required which exceeds the capabilities of the resources available locally, the Company Incident Commander or his representative has the option to call upon Patriot Environmental Services using the following 24-hour telephone number:

Patriot Environmental Services **(800) 624-9136**

Upon receiving the call, the Patriot Dispatcher will coordinate with the Company's Logistics Section to get support personnel and equipment to the spill site or sites. Patriot support would typically come from the Ventura or Wilmington locations, and could be in the Point Arguello/Point Pedernales area within approximately four to eight hours. These response times would vary based on actual conditions, such as weather, traffic, etc. The locations of Patriot equipment and personnel are listed below:

Address	Telephone	Fax
2457 N Ventura Boulevard, Unit F, Ventura, CA 93001	805-921-1112	805-921-1116
508 E. E Street, Wilmington, CA 90744	562-436-2614	562-436-2688
2600 Springbrook Avenue, Unit 107, Saugus, CA 91350	661-287-3737	661-287-3998
7120 Golden State Highway, Bakersfield, CA 93308	661-414-9075	661-392-7367

Location:	**Equipment and Personnel:**
Ventura Facility:	Hazwoper Trained Response Personnel (in 4-8 hours)
	1- Storage Bladders @ 1,000 bbl.
	Vacuum Truck @ 70 bbl. each
	Skimmer @ 2,741 EDRC, Skimmer @ 651 EDRC
	Spill Response Trailer
Wilmington Facility:	Additional Hazwoper Trained Response Personnel (in 4-8 hours)
	6- Storage Bladders @ 1,000 bbl. each
	Multiple Pressure Washer
	Logistical Support Trailer
	Portable Command Post Trailer 30’
	All-Terrain Vehicles- 2
	Vacuum Trucks @ 70 & 120 bbl. each
	Skimmers @ 101,607 EDRC in bbl. (total)

C.4 Government Entities

C.4.1 U.S. Navy Supervisor of Salvage – Port Hueneme

The U.S. Navy Supervisor of Salvage (SUPSALV) maintains an inventory of oil spill response equipment in Port Hueneme, California. The equipment is packaged and designed to be easily transportable by road, military air, or sea. Equipment includes boom, skimmers, support craft, portable storage, logistics support systems, lightering systems, cleaning systems, and various systems to support this specialized mission.

A team of highly trained personnel organizes drills and exercises and conducts training in both equipment operation and spill management. A process of continual modification and improvement keeps SUPSALV and the Navy at the forward edge of spill response technology. SUPSALV is also the DoD representative on the National Response Team.

Port Hueneme Command Duty Officer: (805) 228-0566
Washington D.C. NAVSEA Duty Officer: (202) 781-3889

C.4.2 USCG Pacific Strike Team

The USCG Pacific Strike Team has been organized, staffed, and equipped to provide rapid response capability to contain and recover marine oil spills. The Pacific Strike Team is intended to be used in the absence of local commercially available spill response resources or to complement locally available resources in large spill situations.

The Strike Force is a military organization, with the Pacific Strike Team having approximately 39 men and women assigned. The crews are cross-trained and most individuals are capable of deploying and operating all of the Pacific Strike Team equipment.

USCG Pacific Strike Team
Hangar 2, Hamilton Field
Novato, California 94949-5082
(415) 883-3311
(415) 883-7814 (fax)

C.4.3 Supplemental Contractor

Supplemental contractors, equipment suppliers, co-ops and service companies are generally referred to as resources. One such example of an available supplemental contractor is:

National Response Corporation (NRC) Environmental Services
3777 Long Beach Blvd.
Long Beach, CA 90807
(800) 337-7455

C.4.4 Additional Resources

In the event that additional spill response equipment is required to address the needs of an actual spill response, the Company is well prepared to locate and mobilize the needed equipment in short order. For spill response resource requirements that surpass the resources referenced herein, or those that can be accessed by the response contractors listed herein, the Company will work with other spill co-ops, and other industry representatives to acquire additional resources.

C.5 Agency Notification Requirements

The OSRV must, from time to time, leave its area for spill response, participation in drills, re-supply, maintenance, or changing equipment. The Company, likely through Clean Seas, will notify the BSEE California District Manager and other appropriate agencies when its major equipment, including the OSRV, is to be removed from the response area or from service for planned major maintenance, dry-docking, or cascading to another location for an actual oil spill response. Except for emergency situations (i.e., oil spill response efforts and/or life threatening emergencies), agency notification will be made at least 24 hours in advance. For the times the equipment or OSRV must temporarily leave the response area for reasons stated above, Clean Seas will provide replacement equipment or a replacement vessel.

The Plan shall remain valid during the time that equipment has been removed from service for maintenance or repair if the BSEE California District Manager and OSPR Administrator have approved such movement.

C.6 Response Equipment Inspection and Maintenance Procedures

Inspection and maintenance of the onsite spill response equipment on each Platform is done on a monthly basis and is the responsibility of the Safety Inspector. Records of such inspections, training, and drills are typically maintained in the Production Foreman's office on each Platform and are on file for a minimum of two years.

Clean Seas provides response to all oil spill incidents in the Point Arguello/Point Pedernales OCS area. Clean Seas inspects and maintains their oil spill equipment so as to be available for use when needed. All spill equipment on the OSRVs and other response vessels is inspected on a monthly basis and, where applicable, operated regularly to ensure the equipment is in a constant state of readiness. Response drills, which include boom deployment, are conducted routinely. Records of inspection and maintenance activities along with spill drill exercises are maintained onboard the respective vessels and at the Clean Seas Yard.

As specified in the previous section, the BSEE will be notified prior to scheduled maintenance periods for any of the Clean Seas vessels. Prior to the movement of the dedicated Clean Seas OSRV, the Company will ensure that the appropriate agencies review and approve the proposed replacement OSRV. If one of the OSRVs is incapacitated, and must be removed from service for unscheduled maintenance or repairs, the appropriate agencies will be notified immediately.

Response equipment available through oil spill cooperatives, private oil spill response contractors, and specialized service companies is maintained and inspected under the direction of each individual cooperative or contractor, respectively. Records of equipment inspection are expected to be maintained by each individual contractor or cooperative.

Appendix D Characteristics of Oil and MSDS

D.1 Overview

Table D-1 provides information of the type and characteristics of the oil handled, stored and/or transported by each of the facilities covered by this plan. The data are the results of analyses conducted in June of 2009 by Oilfield Environmental Compliance, Inc. (OEC).

Table D-1. Characteristics of Oil Handled, Stored or Transported

Test Description	Units of Measure	Harvest	Hermosa	Hidalgo	Irene
Air Toxics					
Benzene	Wt. %	0.45	0.50	0.042	0.58
Ethylbenzene	Wt. %	0.092	0.087	0.079	0.10
Hexane	Wt. %	0.52	0.74	1.0	0.21
Methyl Ethyl Ketone	Wt. %	ND*	ND*	ND*	ND*
Methyl Isobutyl Ketone	Wt. %	ND*	ND*	ND*	ND*
Naphthalene	Wt. %	0.033	0.030	0.029	0.014
Toluene	Wt. %	0.14	0.13	0.12	0.18
Para-xylene	Wt. %	0.14	0.14	0.13	0.15
Meta-xylene	Wt. %	0.14	0.14	0.13	0.15
Ortho-xylene	Wt. %	0.066	0.063	0.060	0.086
API Gravity	@ 60/60 Deg. F	19.9	23.4	26.4	14.5
Asphaltene	Vol. %	40	24	32	12
Flashpoint	Deg. F	34.0	37.0	32.0	33.0
Heptane Insolubles	Wt. %	11.7	9.1	7.5	10.6
Hydrogen Sulfide, as Sulfur	ppm wt.	ND*	ND*	10	4.6
K Factor	constant	8.0	10.4	5.5	6.3
Viscosity	100 Deg. F	174 Cst.	61 Cst.	24 Cst.	1352 Cst.
Pour Point	Deg. F	-24.0	-14.0	-28.0	4.0
Specific Gravity	@ 60 Deg. F	0.9347	0.9138	0.8962	0.9690
Sulfur, total by x-ray fluorescence	Wt. %	3.1	3.7	2.4	4.7

*ND – Analyte not detected at or above the reporting limit.

D.2 Material Safety Data Sheet

The following pages contain a crude oil Material Safety Data Sheet that applies to crude produced from the company's platforms.

Figure D-1. Crude Oil Material Safety Data Sheet

CRUDE OIL

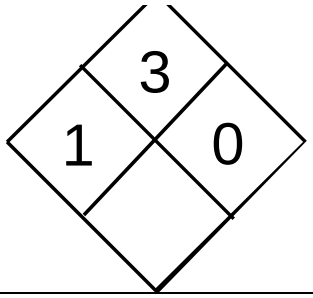
DATE ISSUED: 08/09/95
Date Revised: 12/30/02

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT.

Plains Exploration & Production Company **323-298-2200**
5640 South Fairfax Avenue
Los Angeles, CA 90056

I PRODUCT IDENTIFICATION



PRODUCT NAME
Crude Oil

CHEMICAL NAME **CAS NUMBER**
Crude Oil 8002-05-9

PRODUCT APPEARANCE AND ODOR
Dark liquid, strong hydrocarbon solvent odor.

II COMPONENTS AND HAZARD INFORMATION

The criteria for listing components in this section is as follows: carcinogens are listed when present at 0.1% or greater; components which are otherwise hazardous according to OSHA are listed when present at 1.0% or greater; non-hazardous components are listed at 3.0% or greater. This is not intended to be a complete compositional disclosure.

PRODUCT	CAS NUMBER	RANGE IN %
Crude Oil	8002-05-9	98 - 100%
Hydrogen Sulfide	7783-06-4	0.0 - 1.0%
Sulfur	7704-34-9	0.0 - 4.0%
Benzene	71-43-2	0.0 - 2.0%

EXPOSURE LIMITS

PRODUCT	ACGIH TLV-TWA	OSHA PEL
Crude Oil	None established	
Hydrogen Sulfide	10 ppm	10 ppm
Sulfur	2 ppm	2 ppm
Benzene	10 ppm	1 ppm

III HAZARD IDENTIFICATION

DANGER! FLAMMABLE LIQUID

Aspiration hazard if swallowed. May vent harmful concentrations of hydrogen sulfide (H_2S) gas, which is harmful or fatal if inhaled. H_2S is irritating to the eyes and respiratory tract. H_2S may accumulate in confined spaces. Contains benzene, which may cause cancer based on animal data or be toxic to blood forming organs.

III HAZARD IDENTIFICATION (continued)

EFFECTS OF OVEREXPOSURE

Health studies have shown that many petroleum hydrocarbons pose potential human health risks, which may vary, from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

Acute

Eyes: May cause slight eye irritation.

Skin: Prolonged, repeated exposure may cause dermatitis, folliculitis or oil acne.

Inhalation: High vapor concentrations may produce headache. Giddiness, vertigo and anesthetic stupor. If high concentrations of H_2S are present, can cause irritation to eyes, throat and respiratory tract, headache, dizziness, nausea, vomiting, diarrhea and pulmonary edema. At concentrations above 300 ppm, respiratory paralysis, causing unconsciousness and death.

Ingestion: If more than several mouthfuls are swallowed, abdominal discomfort, nausea and diarrhea may occur. Aspiration may occur during swallowing or vomiting resulting in lung damage.

Chronic

Repeated inhalation may cause lung damage. Prolonged and repeated exposure to benzene has been associated with aplastic anemia and acute myelogenous leukemia in humans.

Medical Conditions Aggravated by Exposure

Because of its irritating properties, repeated skin exposure may aggravate an existing dermatitis.

IV FIRST AID MEASURES

Eyes: Immediately flush with copious amounts of clear water for at least 15 minutes or until irritation subsides. If symptoms or irritation persist, call a physician.

Skin: Wash skin with soap and large amounts of water until all traces of material are removed. Remove and clean contaminated clothing. If symptoms or irritation persist, call a physician.

Inhalation: Move person to fresh air. If not breathing or in respiratory distress, start artificial respiration. If no heartbeat, start CPR. With a physician's advice, give supplemental oxygen using a bag-valve mask. In all cases, if symptoms or irritation occur with any exposure, call a physician.

Ingestion: Do not induce vomiting and do not give liquids. Immediately call a physician or local poison control center.

Other: Inhalation exposure may result in respiratory tract injury, delayed onset of pulmonary edema and may predispose patient to secondary respiratory infection. Persons exposed to high concentrations should be hospitalized for observation. Contact a Poison Control Center for additional treatment information.

Warning! Rescue of persons overexposed should be attempted only after notifying others of the emergency and only if appropriate personal protective equipment and positive pressure self-contained breathing apparatus (SCBA) is available.

Remove and dry-clean clothing soaked with this material before reuse.

V FIRE FIGHTING MEASURES

Flammable Properties

Flash Point: <100°F
Ignition Point: Not determined
Flammable Limits: (Estimated Values) Lower Flammable Limit: 0.6% Upper Flammable Limit: 15%

Extinguishing Media and Fire Fighting Procedures

Foam, water spray (fog), dry chemical, carbon dioxide (CO_2) and Halon may all be suitable for extinguishing fires involving this product. Fire fighting should be performed only by those adequately trained.

Special Fire Fighting Instructions

Avoid using solid water streams. Water spray and foam must be applied carefully to avoid frothing. Avoid excessive application. Water can be used to cool exposed surfaces.

Wear special chemical protective clothing and positive pressure self-contained breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues.

VI ACCIDENTAL RELEASE MEASURES

Eliminate all ignition sources, including internal combustion engines and power tools. Ventilate area. Barricade the immediate hazard area. Stay upwind and warn of possible downwind hazard. Avoid breathing vapor. Avoid contact with skin, eyes or clothing. Pressure demand supplied air respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown or outside acceptable limits. Otherwise, wear protective equipment appropriate for the potential exposure hazard. Shut off source of leak if possible to do so without hazard.

VII HANDLING AND STORAGE

Product should be handled in accordance with industry accepted practices. Comply with all applicable OSHA, NFPA and consistent local requirements. Use appropriate bonding and grounding practices. Store in properly closed containers that are labeled correctly. Do not expose to heat, open flame, oxidizers or other sources of ignition. Avoid skin contact. Exercise good personal hygiene including removal of soiled clothing and prompt washing with soap and water. Harmful concentrations of hydrogen sulfide (H_2S) gas can accumulate in excavations and low-lying areas as well as the vapor space of storage and bulk transport compartments. Stay upwind and vent open hatches before unloading. Avoid repeated or prolonged skin contact.

VIII EXPOSURE CONTROL / PERSONAL HYGIENE

Engineering Controls

Local or general exhaust required in enclosed areas or with inadequate natural ventilation. Use explosion proof electrical equipment (API RP-500B).

Respiratory Protection

Not normally required for routine operations. Supplied air respirators, with pressure demand regulators and egress bottles, should be used if operating conditions create airborne concentration which exceed exposure limits for any individual component (including H_2S). SCBA must be used for firefighting or rescue operations. DO NOT USE AIR PURIFYING RESPIRATOR TO PROTECT FROM HYDROGEN SULFIDE EXPOSURE.

Skin Protection

Protective clothing such as coveralls or lab coats should be worn. Gloves and boots resistant to petroleum products (neoprene or nitrile best material) required.

Eye Protection

Use chemical (splash resistant) goggles or faceshield if product may splash.

IX PHYSICAL AND CHEMICAL PROPERTIES

The following data are approximate or typical values and should not be used for precise design purposes.

Appearance:	Brown/black viscous liquid
Odor:	Petroleum odor
Boiling Point:	101 - 1300°F
Melting/Freezing:	Not applicable
Specific Gravity:	0.6 - 1.0 (Water = 1.0)
Vapor Density:	>1.0 (Air = 1.0)
Vapor Pressure:	<1300 mmHg
% Soluble in H_2O:	Negligible
pH:	Essentially neutral
% Volatile:	Not available

X REACTIVITY

This product is stable. Hazardous polymerization will not occur. Avoid contact with strong oxidizers such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite. When subjected to heat or combustion, toxic levels of carbon monoxide, irritating aldehydes and ketones may be produced. Also may evolve hydrogen sulfide and other sulfur containing compounds.

XI TOXICOLOGICAL INFORMATION

(Animal Toxicity Data)

Median Lethal Dose

Oral: LD_{50} believed to be >5.00 g/kg (rat) Practically Non-toxic
Inhalation: Not determined
Dermal: LD_{50} believed to be >3.00 g/kg (rabbit) Practically Non-toxic

Irritation Index

Skin: (Draize) Believed to be >0.50 - 3.0 / 8.0 (rabbit) Slightly irritating
Eyes: (Draize) Believed to be >15.0 - 25.0 / 110 (rabbit) Slightly irritating
Sensitization: Not determined

Other

Prolonged and repeated exposure to benzene has caused enemia, lymphoma and other cancers in laboratory animals. Benzene has been shown to cause embryo/fetal toxicity and birth defects in laboratory animals, but only at doses which cause maternal toxicity (i.e., illness to the mother).

Petroleum oils that are not severely refines have shown to cause skin cancer when repeatedly applied to mouse skin without any effort to remove the material between applications.

XII DISPOSAL CONSIDERATIONS

Dispose of materials in accordance with applicable local, state and Federal regulations.

XIII TRANSPORT INFORMATION

Proper Shipping Name:	Petroleum Crude Oil
Hazard Classification:	3
Identification Number:	UN 1267
Packing Group:	PG II
Label Required:	Flammable Liquid

XIV REGULATORY INFORMATION

SARA Title III Sections 302, 304, 312 and 313. The following regulations apply to this product:

Section 302 - Extremely Hazardous Substances:
40 CFR Parts 300 and 355. This product contains the following component(s) identified in Appendix A and B of the Extremely Hazardous Substance list:

Component: Hydrogen Sulfide RQ: 100 pounds TPQ: 500 pounds

Section 304 - Emergency Release Notifications
40 CFR Part 355 This product may contain the following components(s) identified as either an Extremely Hazardous Substance (see Section 302) or a CERCLA Hazardous Substance 40 CFR 302 which in case of a spill or release may be subject to reporting requirements under Section 304 of Title III:

Component: Hydrogen Sulfide

Section 311 and 312 - Material Safety Data Sheet Requirements:
40 CFR Part 370 Depending on local, state and Federal regulations, Material Safety Data Sheets or lists of MSDS's (product names) may be required to be submitted to the state emergency response commission, local emergency planning commission and local fire department if you have:

10,000 pounds or more of an OSHA Hazardous Substance
500 pounds or the Threshold Planning Quantity (TPQ), whichever is less, of an Extremely Hazardous Substance.

This product is covered under the criteria defined in OSHA's Hazardous Communication Standard 29 CFR 1910.1200 and should be reported under the following EPS Hazard Categories:

XX Immediate (Acute) Health Hazard
XX Delayed (Chronic) Health Hazard
XX Fire Hazard
Sudden Release of Pressure Hazard
Reactive Hazard

Section 313 - Toxic Release Reporting
40 CFR part 372 This product contains the following component(s) (at a level of 1% or greater if hazardous; 0.1% or greater if carcinogenic)
Chemical Name: Benzene CAS Number: 71-43-2 Concentration: 0.0 - 2.0%

XV OTHER

This information and recommendations contained herein are to the best of PXP's knowledge and belief, accurate and reliable as of the date issued. PXP does not warrant or guarantee their accuracy or reliability and PXP shall not be liable for any loss or damage arising out of use thereof.

The information and recommendations are offered for the user's consideration and examination and it is the user's responsibility to satisfy that they are suitable and complete for its particular use. If buyer packages this product, legal counsel should be consulted to insure proper health, safety and other necessary information is included on the container.

The Environmental Information included under Section H thereof as well as the National Fire Protection Association (NFPA) rating have been included by PXP in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of the rating systems, together with PXP's interpretation of the available data.

For Additional Information Contact:
V.P. Environmental, Safety and Health
Plains Exploration & Production Co.
5640 S. Fairfax Ave.
Los Angeles, CA 90056
(323)298-2200

Appendix E Spill Trajectory Calculation

E.1 Vector Analysis Using Data from the Internet

E.1.1 Wind Vector

There are several ways to access weather forecasts for wind direction/speed as well as wave and swell information. The most direct is:

http://www.ndbc/noaa.gov/data/Forecasts/FZUS56.KLOX.html

This will give the data for the waters from Pt. Piedras Blancas to Pt. Arguello and westward. Besides the wind direction and speed, wind wave heights and swell heights/periods are also given.

Another source can be accessed from the PXP Intranet homepage. Under the title “my Links”, click on “myWeather”.

A map of the US will appear on the next screen. Click on the area of interest and local map will appear on the following screen. A series of buoys are shown along the California coast. Click on the buoy in the desired area of interest and the conditions for the area will appear (the most likely buoy will usually be buoy 23 because it is within the area of the PXP platforms).

Wind direction is given as the direction it is coming from while vector direction is toward.

Example: Given “NW winds 10-20 kts” (315°)
Direction toward is 180° opposite = 135° or S45°E*

*this will be used in vector analysis.

If given a range of wind speed, use the maximum speed (20 kts* in example) for vector analysis, not the average.

E.1.2 Current Vector

The ocean surface current direction and speed can be obtained from the HF RADAR Network. SCCOOS is the Southern California Coastal Ocean Observing System.

http://www.sccoos.org/data/hfrnet/

The SCCOOS home page will have a Southern Californian Coastal map. Click on “View Full Page” located below coastal map and the map (with a control panel on the left) will fill the screen.

Double click on the area of interest and the map will expand. Continue to double click on the area of interest until the map is the desired size. The cursor appears as a hand and the map view can be dragged about by the cursor.

At the bottom of the control panel to the left of the map, is the “Coordinate Locator” box. Enter the latitude and longitude of the area of interest.

Example: Irene is located at Lat. 34° 36' 37.512" N, Long., 120° 43' 45.938" W. It can be entered as a decimal (34.610420, -120.729427) or as N 34 36 37.5, W 120 43 45.9.

For a quick reference, Pt. Arguello/Pt. Pedernales platform locations are:

Harvest: Lat. N 34 28 8.90, Long. W 120 40 50.94 (34.469139, -120.680817)

Hermosa: Lat. N 34 27 19.83, Long. W 120 38 46.99 (34.455508, -120.646387)

Hidalgo: Lat. N 34 29 42.07, Long. W 120 42 8.26 (34.495018, -120.702295)

Irene: Lat. N 34 36 37.51, Long. W 120 43 45.94 (34.610420, -120.729427)

Click on "Locator" button below latitude/longitude entries and the surface current data will appear in balloon box with the arrow pointed at the closest available vector to the selected site.

Note: Resolution works at 6 km. Also note the current circulation pattern for input in the GNOME Program (Upwelling, Convergent or Relaxation State).

Within the data balloon, the actual coordinates of the vector will appear at the top. Below that is the resolution and states if it is a 25 hour average. The current vectors are given in east/-west (U:) and north/-south (V:) components and the resultant (final) vector magnitude in cm/s. The magnitude is also given in knots and the direction (to) in degrees from north (this will be used in vector analysis).

Example: U:-12.86, V:-35.67, Mag: 37.92 cm/s, 0.737 kts, Dir: 199.83° from N*

*this will be used in vector analysis.

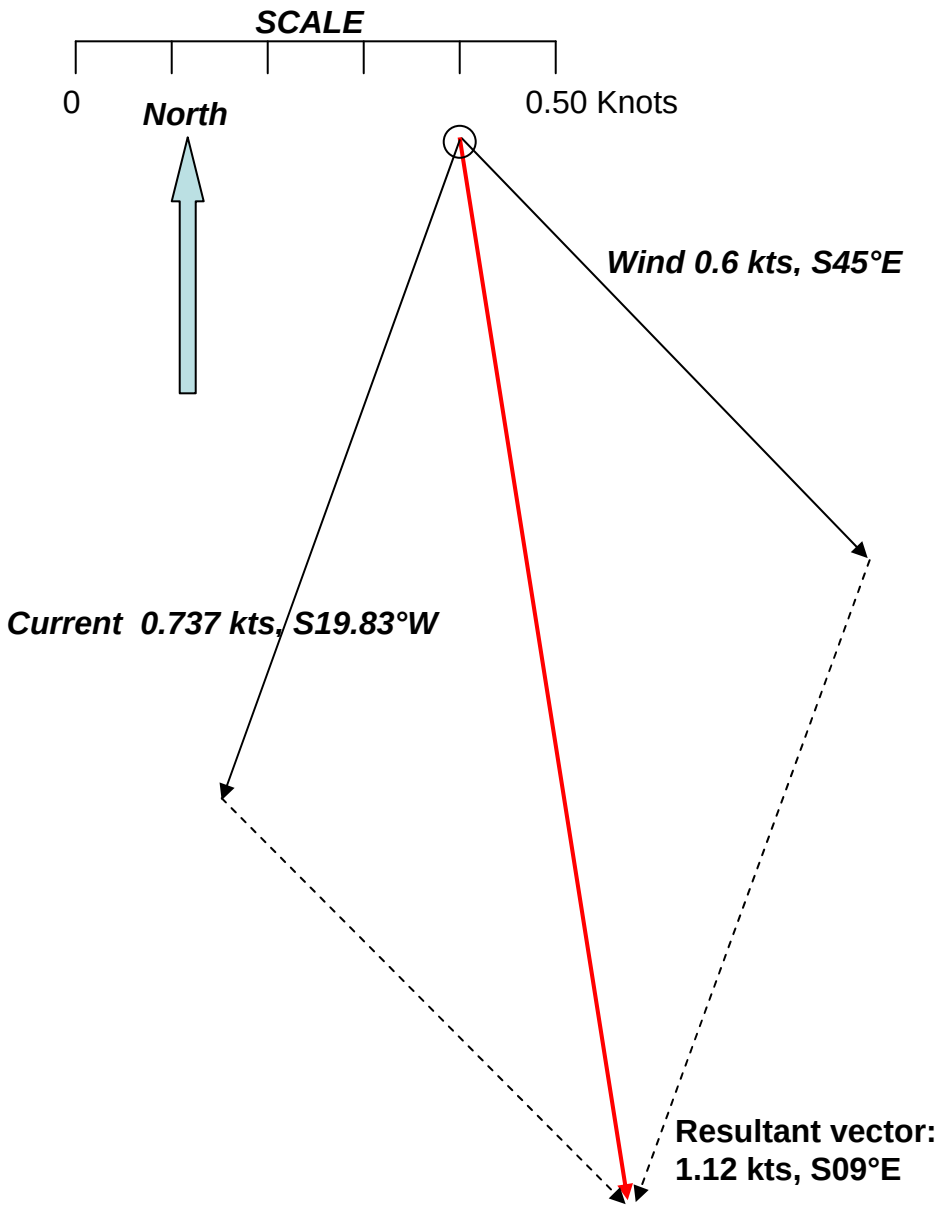
E.1.3 Vector Analysis Sketch

Current and wind derived from radar and buoy data (see sections E.1.1 and E.1.2 above).

Current speed 0.737 kts Current direction S19.83°W (199.83° toward)
Wind speed 10-20 kts** Wind direction NW (from) / S45°E (135° toward)

**Wind component for vector analysis is 3% of wind speed

Example: 20 kts X 0.03 = 0.6 kts
Scale vectors to speed (any scale)



Draw the same plot on a navigation chart/map at the origin of the spill. Then determine the possibility of shore impact. The resultant vector's direction, speed and distance to shore will determine time of impact and location. See E.2 Vector Analysis Using Predicted Multiple Wind and Current Conditions for vector solutions.

If map is 1:100,000 scale, use 1" = 1.37 nautical miles. (0.729" = 1 nautical mile)
If map is 1:232,188 scale, use 1" = 3.18 nautical miles. (0.314" = 1 nautical mile)

E.2 Vector Analysis Using Predicted Multiple Wind and Current Conditions

Scenario for example: Spill at Platform Harvest, reported at 0902 hours, March 6, 2002

Given: 0800-1200 hrs	**wind, SE (from) 10-15 kts; current, 130° (to) <0.10 kts**
1200-1800 hrs	wind, SE (from) 15-25 kts; current 320° (to) 0.10-0.25 kts
1800-2400 hrs	wind, SW (from) 10-15 kts; current 320° (to) 0.20-0.10 kts

For wind's vector component, change wind direction to opposite direction (wind toward, i.e. Wind from SE is wind *to NW*).

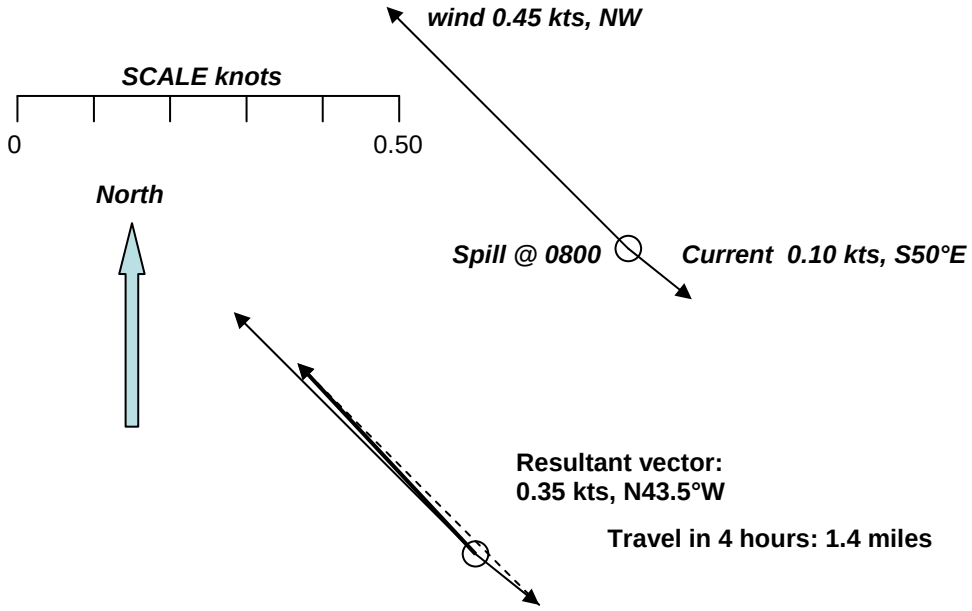
Wind's vector component is *3% of given wind speed*.

Assume the maximum when given a range of wind and/or current speeds.

Scale vectors to speed (any scale)

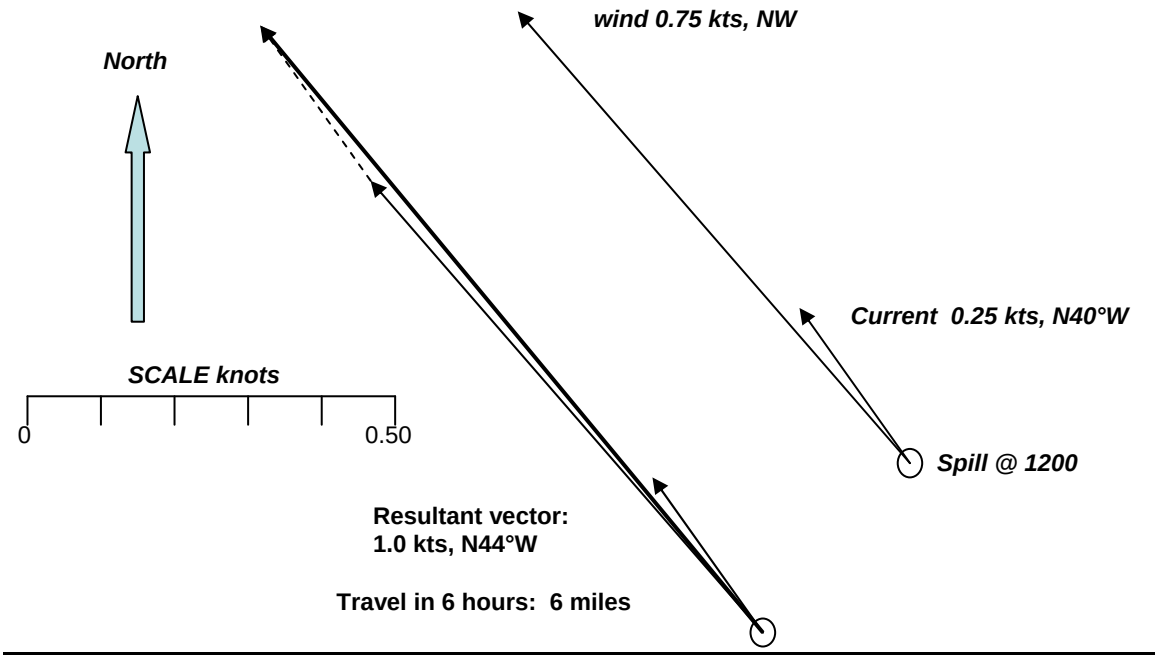
Example, Part 1, given above data.

0800-1200 hrs: wind: 15 kts X .03 = 0.45 kts to NW
current: 0.10 kts to SE (130°)



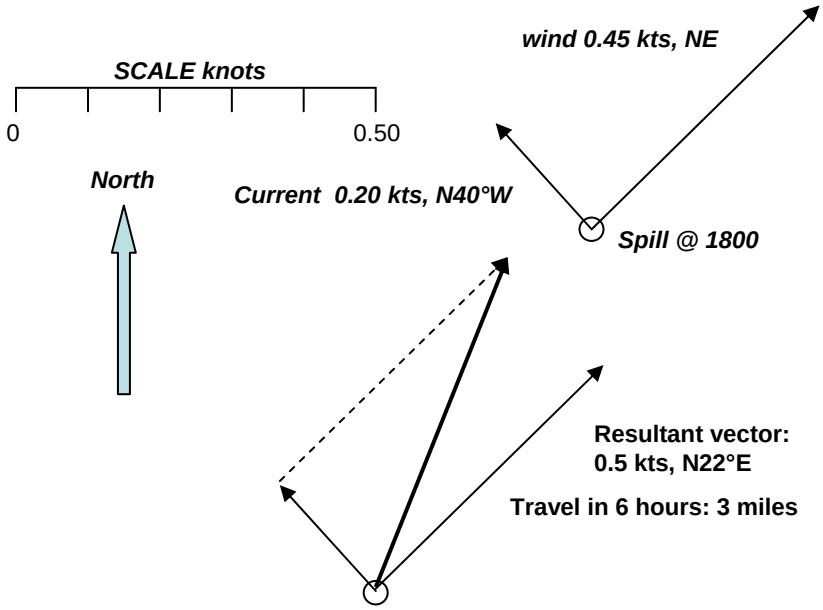
Example, Part 2, given above data.

1200-1800 hrs: wind: 25 kts X .03 = 0.75 kts to NW
current: 0.25 kts to NW (320°)

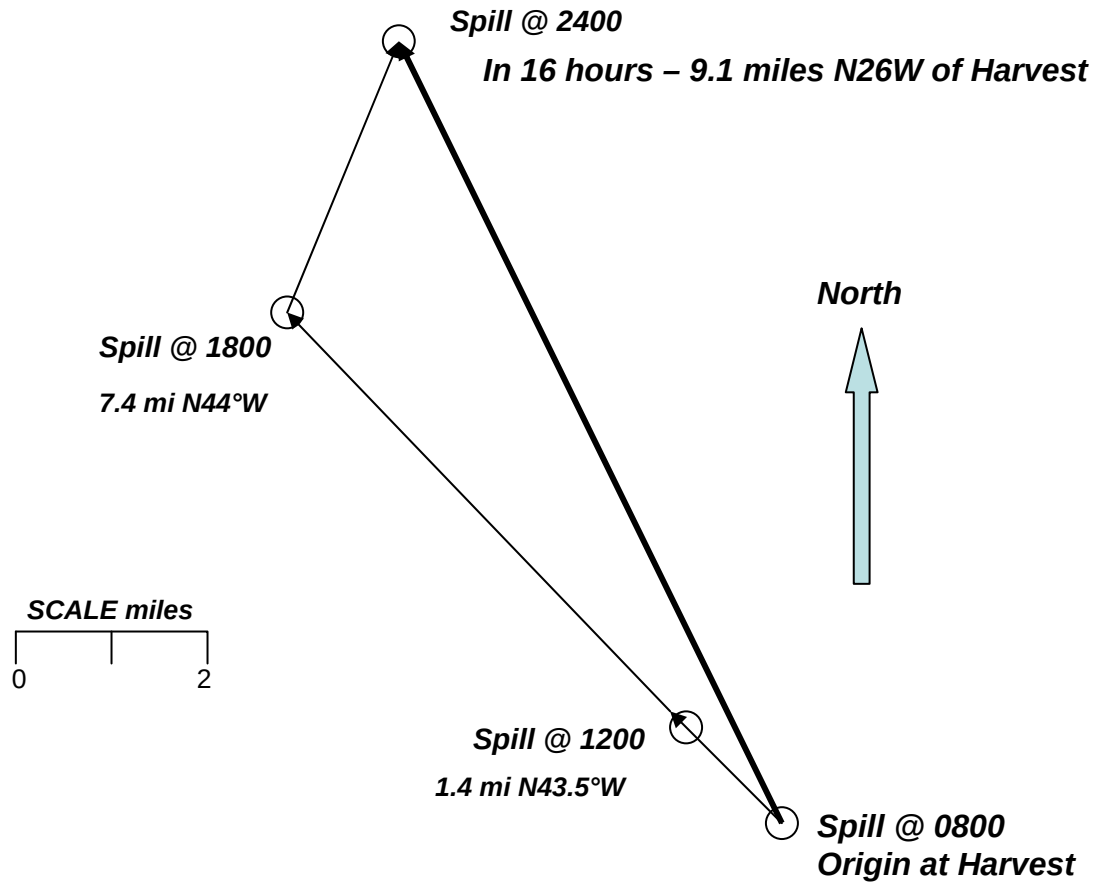


Example, Part 3, given above data.

1800-2400 hrs: wind: 15 kts X .03 = 0.45 kts to NE
current: 0.20 kts to NW (320°)



Plot the results of all the vector analyses together as shown below. Draw the same plot on a navigation chart/map at the origin of the spill. Then determine the possibility of shore impact. The resultant vector's direction, speed and distance to shore will determine time of impact and location.



E.3 GNOME Model

E.3.1 Downloading the Model

Click** into downloaded GNOME program located on the L drive**:

(L:\EH&S\Gnome Model files\Gnome Setup)

If the L drive is not accessible, program is available at:

http://response.restoration.noaa.gov/software/gnome/gnomeinfo.html

E.3.2 Running the Model

1. Dialog box appears – "Welcome to GNOME". ***Click** on "Agree"*.

2. Dialog box appears – "Selecting a Location file". ***Click** on "Select file"*. Location file is located on L drive. ***Select and open***:

   L:\common\Gnome Model Files\Santa Barbara Channel.loc

3. Dialog box appears – "Welcome to Santa Barbara". ***Click** on "Next>>"*.

4. Dialog box appears – "Model Settings". *Enter desired date, start time and duration.* ***Click** on "Next>>"*.

   The program will ask for wind and current conditions.

   For this example the given wind is: 2.24 knots 320^{o} (from)

5. Dialog box appears – "Selecting a Current Pattern". ***Click** on the appropriate selection. Choice of 3 – see user's guide). In the example above, "upwelling" would be selected.* ***Click** on "Next>>"*.

   See user's guide (L:\common\Gnome Model Files\SB Channel User's Guide) to determine the correct current circulation pattern for input.

6. Dialog box appears – "Choosing Wind Type". Constant or variable*. *In the example above, "constant" would be selected.* ***Click** on "Next>>".* ****See Note 1***

7. Dialog box appears – "Constant Wind". *Enter speed and direction (from). In the example above, "2.24 kts" and "320°" would be entered.* ***Click** on "Next>>"*.

8. Dialog box appears – "Please Note". ***Click** on "Next>>"*.

9. Dialog box appears – "Almost Done". ***Click*** *on "To the map window".*

10. Map of the Santa Barbara Channel and Santa Maria Basin appears.

11. On the tool bar above the map, make sure "spill" button (ship icon) is highlighted. ***Click*** *the cursor on approximate location of spill on the map.* ****See Note 2***

12. Dialog box appears – "Spill Information". *Enter the amount of barrels released (for this example, 100 bbls is used), start time and the Latitude and Longitude (if a more specific location is available).* ***Click*** *on "OK".*

    For a quick reference, Pt. Arguello/Pt. Pedernales platform locations are:

    Harvest: *Lat. Deg 34, min 28, sec 8.90 North*
    Long. Deg 120, min 40, sec 50.94 West

    Hermosa: *Lat. Deg 34, min 27, sec 19.829 North*
    Long. Deg 120, min 38, sec 46.993 West

    Hidalgo: *Lat. Deg 34, min 29, sec 42.065 North*
    Long. Deg 120, min 42, sec 8.261 West

    Irene: *Lat. Deg 34, min 36, sec 26 North*
    Long. Deg 120, min 43, sec 40 West

13. Map appears with spill located as a cross. ***Click*** *"Run" button on tool bar above map.*

    If a "snap shot" is desired at some point before the end of the duration's run, ***click*** *"Pause" button.*

    Click *"Pause" button again to resume and complete run.*

Notes:

1. With **"variable"** option, dialog box "Variable Winds" appears. *Enter speed, direction (from) and increment time of that wind condition.* ***Click*** *"Add New Record" button and enter wind changes. Repeat for each predicted change, then* ***click*** *"Next>>".*

2. With "Spill" button highlighted, for **linear spills**, ***click*** *cursor on approximate location on map then drag cursor the approximate length and direction of spill.* Dialog box appears for entry of end points (in latitude & longitude) if specific points are available. ***Click*** *"OK" if coordinates are okay.* "Spray Can" button will allow the entry of a spill in any location and any size or shape. Dialog box appears for entry of spill amount. ***Click*** *"OK".*

3. ***"Minimum Regret"*** accounts for typical errors in wind/current input. Model runs *without* "minimum regret" solution represent "best guess", most likely, solution. It is suggested running model *first without "minimum regret"* entered. This is the most likely scenario, "best guess", and appears as a black area.

After the initial run, "best guess" only, **click** *"Include the Minimum Regret" solution box in the column to the left of the map* (this includes both best guess in black and "uncertainty" solution in red). ***Click*** *"Run" button.*

E.3.3 Attachments

The following pages are six model examples utilizing the three current patterns in the GNOME database for two different time durations.

Appendix F Dispersant Use Plan

Dispersant application has the potential to reduce the risk of petroleum-related impacts to natural resources when oil is on the water's surface or deposited within environmentally sensitive areas. In California, environmentally sensitive areas include the productive intertidal regions, tidal inlets, tidal marshes and other wetland areas of the coastal islands and mainland and the surface waters where endangered marine mammals and large concentrations of sea birds might exist.

The use of dispersants may be advantageous when environmentally sensitive areas are threatened by dispersible oils and when:

- Spills occur at offshore or remote areas where the use of skimming vessels may be limited or response time protracted;
- Sea states where skimmer vessels may not be able to operate; or
- Aerial application of dispersants can quickly address larger areas of spilled petroleum than skimmer technology.

As indicated in Appendix D, Table D-1, the heavier crude oil produced from the Point Arguello/Point Pedernales OCS Area is typically low gravity (heavy), and high asphaltene. Such crudes are generally poorly suited for chemical dispersion due to these chemical properties. However, the crude transported by pipeline from the platform to shore is blended with lighter crudes to pipeline quality (in the case of the Pt. Arguello oils) and, if released to the environment, may initially have properties suitable for chemical dispersion. The Pt. Pedernales crude oil is in the form of an oil water emulsion and if released to the environment may initially provide suitable properties for chemical dispersion also.

The Company will initiate dispersant use as one of many spill response alternatives. Early consultation with the Federal On-Scene Coordinator and other members of the Unified Command regarding the use of chemical dispersants will also be conducted. In the event the release meets the necessary criteria for effective use of dispersants, this early assessment and consultation process will reduce potential delays in gaining approval and implementing dispersant application procedures.

F.1 Inventory and Location of Dispersants

Clean Seas maintains an inventory of dispersants and dispersant application equipment. Appendix C in this plan identifies this equipment. Section 3260 of the Los Angeles/Long Beach Area Contingency Plan provides current information regarding the use of dispersants, and Appendix XII of the Regional Contingency Plan provides additional information. The paragraphs below describe pertinent information on the chemical dispersants Corexit 9527 and Corexit 9500 that may be employed by the Company.

F.1.1 Corexit 9527

Corexit 9527 is a concentrated and highly effective oil spill dispersant for use on a wide range of oils. Corexit 9527 is a self-mixing dispersant that is biodegradable and of low toxicity. Based on laboratory tests, Corexit 9527 is effective on most spreading oils.

As with all dispersants, timely application ensures the highest degree of success. Early treatment with Corexit 9527, even at reduced treat rates, can reduce the "mousse" forming tendencies of the spilled oil.

Corexit 9527 is on the EPA's NCP Product Schedule and is, therefore, consistent with and authorized for use by the NCP. Corexit 9527 has been tested and accepted by Environment Canada, and approved by the UK Ministry of Agriculture, Fisheries and Food as a Type 2 and 3 dispersant. It has also been approved in Norway, France, Singapore, Indonesia, and other countries.

For application equipment, Corexit 9527 is compatible with stainless steel, carbon steel, aluminum, HDPE, polypropylene, natural and synthetic rubbers; PTFE, Viton, Teflon, and Kalrez. Compatibility with plastic materials varies.

F.1.2 Corexit 9500

Corexit 9500 is a high-performance oil spill dispersant that is effective on a wide range of oils, including the heavier, more weathered oils and emulsified oils. Corexit 9500 contains the same well-proven, biodegradable, and low toxicity surfactants present in Corexit 9527 with a new improved oleophilic solvent delivery system.

The unique oleophilic nature of Corexit 9500 enhances the penetration of the surfactants, which is particularly important for dispersion of heavy oils. Based on laboratory tests, Corexit 9500 is effective on all spreading oils.

As with all dispersants, timely application ensures the highest degree of success. Early treatment with Corexit 9500, even at reduced treat rates, can also counter the "mousse" forming tendencies of the spilled oil. Thus, with the enhanced penetration capability and emulsion fighting properties, the "window of opportunity" to successfully treat the spill is increased with Corexit 9500.

Corexit 9500 is on the EPA's NCP Product Schedule and is, therefore, consistent with and authorized for use by the NCP. Corexit 9500 has been tested and accepted by Environment Canada, and approved by the UK Ministry of Agriculture, Fisheries and Food as a Type 2 and 3 dispersant. It has also been approved in Norway, France, Singapore, Indonesia, and other countries.

For application equipment, Corexit 9500 is compatible with stainless steel, carbon steel, aluminum, high-density polyethylene (HDPE), polypropylene, PTFE, natural and synthetic rubbers; Viton, Teflon, and Kalrez. Compatibility with plastic materials varies.

F.2 Toxicity Data

Only dispersants and chemicals accepted by the U.S. EPA and the CDFG (representing the State of California) shall be used. The application and use of oil spill cleanup agents in California shall comply with Article Three (Sections 2332 through 2336) of California Code of Regulation, Title 23.

Table F-1 shows the relative toxicity of 2 common dispersants, Corexit 9527 and 9500. Both of these dispersants, Corexit 9527 and Corexit 9500, are on the EPA Approved List. Corexit 9527 is currently stocked in quantity by Clean Seas and other co-ops. Marine Spill Response Corporation (MRSC) is scheduled to stock approximately 11,000 gallons of Corexit 9500 in El Segundo, Ca in the fall of 2007. Table F-2 shows some characteristics of Corexit 9527 and 9500. When applied at 5 gallons per acre, the actual amount of Corexit 9527 in the water is far below any lethal concentration (LC).

Dispersants work effectively on oils with viscosities up to about 2,000 centipoise. As oil viscosity approaches this limit, dispersant effectiveness decreases even as dosage is increased. This limit (±30%) represents a viscosity range where dispersant effectiveness becomes questionable. Other factors, such as asphaltene, wax content, and pour point, also influence the dispersibility of spilled oil.

Table F-1. Relative Toxicity of Chemical Dispersants

Dispersant	Species Tested	48-Hour LC_{50}[(1)] (25°C) ppm	96-Hour LC_{50}[(1)] (25°C) ppm	Constant exposure LC_{50}[(1)] mg/L	Spiked exposure LC_{50}[(1)] mg/L
Corexit 9527	Menidia beryllina (common name – Inland silverside)		14.57*	52.3**	58.3**
	Mysidopsis bahia (common name – Opossum shrimp)	24.14*		29.2**	>1014**
	Crassostrea gigas (common name – Oyster)			3.09**	13.9**
	Holmesimysis costata (common name – Kelp)			9.74**	195**
Corexit 9500	Menidia beryllina (common name – Inland silverside)		25.20*		
	Mysidopsis bahia (common name – Opossum shrimp)	32.23*		35.9**	>789**
	Scophthalmus maximus (Common name – Turbot)			74.7**	>1055**

(1)	LC_{50} is the concentration that will kill 50% of a specified biological sample during that specific time exposure. Larger numbers indicate lower toxicity.
Source:	Handout at the EPA Region 9 Oil Dispersants Workshop, February 7-9, 1984, Santa Barbara, California, that was sponsored by the Region 9 Regional Response Team. (modified 9/1/00) *www.epa.gov/oilspill/ncp/corex952/950.htm, last updated on December 20, 2006.
Source:	An abstract paper presented at the 2001 International Oil Spill Conference, James R. Clark, Gail E. Bragin, Eric J. Febbo, and Daniel J Letinski, Exxon Mobil Biomedical Sciences, Inc. ***Continuous exposure test followed standard testing protocols for 96-hour and 48-hour duration, according to demands of the test species. Spiked exposures reflect continuous dilution of water column concentrations (half-life 107 minutes), as observed in the field when oil is dispersed into open waters.***

Table F-2. Characteristics of Corexit 9527 & 9500

Name:	Corexit 9527	Corexit 9500
Manufacturer:	Nalco Energy Services	Nalco Energy Services
When Available:	Immediately	2 – 10 hours
Locations:	Carpinteria, CA	Carpinteria, CA
Amounts:	1,100 gallons on Clean Ocean, 7,150 gallons in Carpinteria Support Yard	250 gallons on Ocean Scout and Ocean Guardian (each), 9,900 gallons in Clean Seas Support Yard
Physical Properties:	Flash Point: 163 F Pour Point: less than -40 F Viscosity: 160 cst at 32 F Specific Gravity: 0.98 – 1.02 pH: 6.1	Flash Point: 181.4 F Pour Point: less than -71 F Viscosity: 22.5 cst at 104 F Specific Gravity: 0.949 at 60 F pH: 6.2
Reactions:	Non-reactive with steel equipment	
Applicability:	Successful in lab/field tests on fresh crude oil. Moderately successful on lab tests of heavy crude when very fresh.	
Application Methods:	Spray from helicopter, fixed-wing aircraft, or spray boat.	

F.3 Application Equipment

Refer to Appendix C in this plan, and to Appendix XII (Section II) of the Regional Contingency Plan for information on application equipment for Corexit dispersants. Corexit 9527 is maintained aboard the Clean Seas Oil Spill Response Vessel ***Clean Ocean*** which would be the first OSRV on scene. Therefore, dispersant material is available within approximately two hours' time from the notification to the Clean Seas vessel to respond to a spill. This is less than the time expected to be necessary to obtain approval for dispersant use. Therefore, once approval is obtained to spray dispersant from a vessel, the Clean Seas OSRV will be in a position to commence application almost immediately.

Clean Seas also maintains a large supply of Corexit 9527 and Corexit 9500 in their Carpinteria yard (See Table F-2) that can be applied via helicopter. In the case of the Point Arguello/Point Pedernales Platforms, mobilizing a helicopter and transporting dispersant to a location from which a helicopter could be deployed and would require a minimum of two hours following notification to deploy.

There currently are no large aircraft or dispersant application apparatus available in California for large scale application from fixed wing aircraft. Therefore, the mobilization of suitable aircraft from distant locations, such as Louisiana or Alaska, would require many hours to days and renders this application alternative unattractive.

F.4 Application Procedures

Dispersant stored onboard Clean Seas vessels is a concentrated formulation that can be applied either undiluted or diluted with seawater and is self-mixing (i.e., it requires little or no agitation after application). For manual applications, this type is typically applied in a pre-diluted form.

Clean Seas currently stocks Corexit 9527 should application approval be obtained. Corexit 9527 has a dispersant-to-oil ratio of 0.1 (1 part dispersant to 10 parts oil). If needed, additional Corexit 9527 can be airlifted from the manufacturing plant in Houston and be onsite within approximately 12 hours of the time of request.

F.4.1 Manual Application

Manual application is typically limited to use in very small spills or confined areas and could be performed from a Clean Seas vessel, supply boats, launches, or docks. The equipment consists of 3- to 5-gallon garden sprayers (usually the backpack type) or portable pumps with hand-carried nozzle sprayers. For applying dispersants, the equipment should be fitted with nozzles producing a coarse spray that is applied directly to the slick.

The rate of manual application is difficult to measure, and must be based on the appearance of the dispersion created. Several minutes may be required for full dispersant activation. Overdosing should be avoided. As with vessel application, dispersant should be applied manually in a premixed 2% to 10% solution.

F.4.2 Vessel Application

Application systems fitted to the Clean Seas OSRVs are of the bow spray type. This system uses two booms fitted with spray nozzles that are mounted near the bow of the vessel, whose patterns overlap slightly at the surface. Water is pumped from the sea and supplied to the booms extending off the side of the vessel. Dispersants are introduced into the water stream using an eductor. The dispersant/water solution is applied to the oil in a coarse spray as the vessel moves through the water.

Dosage from the vessel application system is controlled primarily by the rate of eduction of the dispersant into the water stream and the vessel speed. Typically, dispersant is applied as a 2% to 10% aqueous solution (usually closer to 10%) and is controlled by the adjustment on the eductor. Dosage can be calculated by multiplying the swath width by the vessel speed to compute the coverage rate in units per minute. The output of the system is multiplied by the percentage of dispersant in the solution to determine the discharge rate of the dispersant. The discharge rate is divided by the coverage rate to yield the dosage in gallon per acre.

Adjustment of the dosage is facilitated primarily by altering the speed of the vessel. Natural wave action should provide sufficient agitation.

Clean Seas has Corexit 9527 in both 55-gallon drums and in portable tanks. The OSRV would normally not leave the spill site to return to port for additional dispersant supplies. The additional drums could normally be at the spill location in advance of receiving the initial approval to apply dispersant. The portable tanks are intended to support aerial application equipment. The tanks would normally be transported to the nearest airport and used to re-stock the application aircraft. Typically application from vessels is for smaller spills (e.g., < 150 bbl.) and for testing in advance of aerial application, which is usually for larger spills.

F.4.3 Aerial Application

Aerial application available to the Company through Clean Seas is a helicopter-based system. This helicopter system is an individual unit consisting of booms, tank, and pump that is slung underneath the helicopter. The dispersant is typically applied undiluted to the oil in a very coarse

spray. Appendix XII (page C-8) of the Regional Contingency Plan describes the Clean Seas helicopter chemical dispersant spray unit available for aerial application of dispersants.

F.5 Application Requirements

Subject to regulatory approval, the manufacturer's recommendations should be used to determine the initial dispersant application rate. Specific information on determining application dosages is given later in this section. The effectiveness of the initial (or test) application should be observed, and dosage should be adjusted if necessary. Some increases or reductions of the initial dosage may be required to suit a particular situation. Oil is being effectively dispersed when the dispersed oil droplets do not coalesce on the surface after treatment. No floating or reforming of oil should be detected. The time required for dispersion may vary from instantaneous to several minutes, depending on the product and mixing energy. Increased dosage beyond this point is not cost-effective and, although it may speed up the dispersion rate slightly, should not be conducted. Reducing the dispersant dosage should be tried until ineffective dispersion (oil drops remaining on surface) is observed.

Various performance aspects of any application system may be estimated using the nomograph in Figure F-1. The nomograph permits estimation of potential areas treatable for any system, the time required for treatment, the coverage rate, and the required dosage for fixed-wing aircraft or the required speed for helicopters or vessels.

By testing various combinations of systems and application characteristics (speed, swath width, capacity, etc.), an approximation of the number of systems required to treat a given spill in a given time period can be made. (Any time calculations require addition of reloading, transit, and maintenance requirements, and consideration of darkness.)

To use the nomograph:

1. Find system capacity in gallons on Line A.
2. Use recommended dosage in gal/acre on Line B.
3. Line these up and note number of acres that can be treated per sortie on Line C. Mark this point.
4. Go to Line G and find the speed (in statute miles per hour [mph]) of the spraying vehicle.
5. Align the point on Line G with the appropriate effective swath width on Line F.
6. Read the coverage rate in acres per minute on Line E. Mark this point.
7. Line up the marks on Lines C and E and the time on target will be where this line crosses Line D.

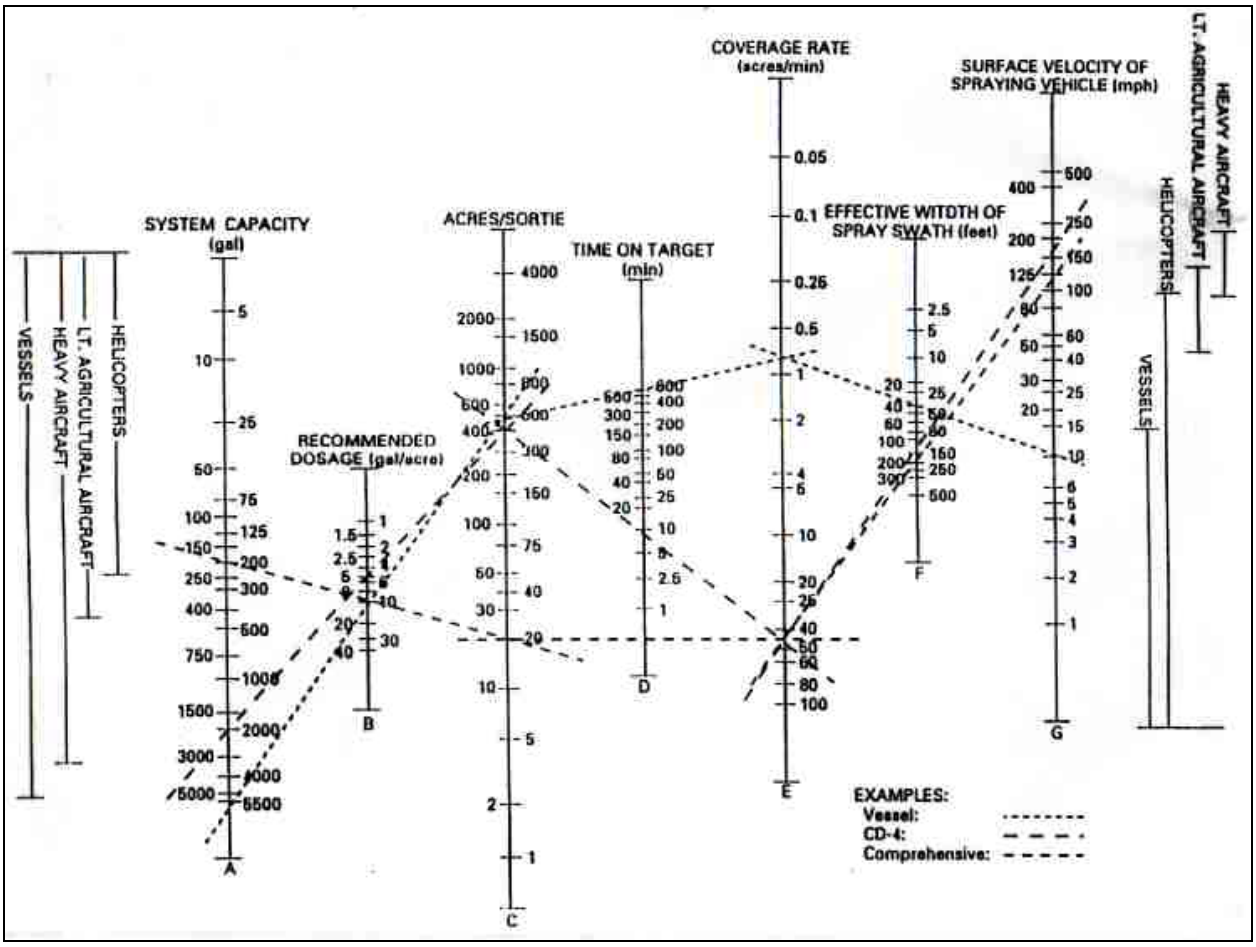


Figure F-1. Dispersant Application Systems Performance Nomograph

NOTE: Time on target (t_{TARGET}) represents the amount of time during which the entire system capacity is to be applied. Dividing the system capacity (v_{SYSTEM}) by the time on target yields the required discharge rate:

$$r_{DISCHARGE} = v_{SYSTEM} / t_{TARGET}$$

Example

A boat with a capacity of 5,000 gal (Column A) and a swath width of 40 ft (Column F) must apply dispersant at a dose rate of 10 gal/acre (Column B). Using Columns A, B, and C of Figure D-2, this yields a coverage of 500 acres/sortie. If a long, single crew shift of 10 hours (600 minutes) is chosen for time on target (Column D), the coverage rate is slightly less than 1 acre/min. (Column E), and the required speed is 12 mph, or about 10 knots (Column G). If a shorter time on target is required, then vessel speed will need to be increased.

Comprehensive Example

Determine the performance of a helicopter spraying system flying at a ground speed of 55 knots mph. The aircraft has a dispersant capacity of 300 gal and a swath width of 80 ft. It is desired to apply dispersant at a dosage of 10 gal/acre. A coverage of 20 acres/sortie is found to correspond to 45 acres/min. This yields a time on target of 0.5 min. If there are 12 hours of daylight, and if it takes 45 minutes to complete a round trip and resupply the aircraft (one sortie), approximately 320 acres/day can be treated.

(12 hours x 20 acres/sortie) ÷ ¾ hour/sortie = 320 acre/day

Schedule Of Dispersant Operation: Begin on authorization at first light until dusk. One trip per hour each helicopter.

Location Of The Area To Be Treated: Dependent on spill occurrence and season.

Surface Area Of The Slick That Can Be Treated In The Scheduled Time Period: 400 acres/sortie with DC-4 at 5 gal/acre; 60 acres/sortie each helicopter.

F.6 Conditions for Use

The properties of Point Arguello/Point Pedernales crude oils (e.g. low API gravity), render them difficult to disperse if dispersant is not applied very soon after a spill. Therefore, the window of opportunity for obtaining approval and deploying equipment to apply dispersants is very short. Considerations necessary for the approval of dispersants are discussed in Section F.7.

Conditions under which dispersants may be applied offshore California are described in the Regional Contingency Plan (Appendix XII California Dispersant Plan) and in Section F.8. Key constraints include, but are not limited to:

- Suitable weather conditions (poor visibility makes dispersant application difficult);
- Water depths greater than 60 feet;
- Minimum of 0.5 miles from a shoreline; or
- Minimum of 0.5 miles from a kelp bed.

Because of the short approval window and possibly limited effectiveness of dispersants on Point Arguello/Point Pedernales Crude oils, the circumstances under which dispersant use would be requested are also limited. The following conditions may be conducive to considering dispersant use:

- Large release moving away from the shoreline combined with sub-optimal conditions for mechanical recovery; or
- Slick threatening Channel Islands or other environmentally sensitive shorelines where dispersing oil into the water column is considered environmentally preferable to permitting undispersed oil to contact the shoreline.

F.7 Dispersant Use Approval Procedures

Sections 1007 and 4007 of the Regional Contingency Plan discuss alternative technologies in reducing or removing spilled oil from water and shorelines, including the use of dispersants (Sections 1007.05 and 4007.05). Federal regulations (see 40 CFR 300.84) provide that the Environmental Protection Agency (EPA) and the State of California may authorize the use of

chemical agents (i.e., National Contingency Plan (NCP) Product Schedule.) Corexit 9527, stocked by Clean Seas, is on this approved list.

Guidelines have been developed for Region IX to consolidate federal and state policies and to streamline the approval process without compromising the need to gather and analyze data and information needed: (1) to determine the effectiveness of (a) chemical agent(s) on the type of oil spilled; (2) the potential environmental, economic and social impacts associated with introducing (a) chemical agent(s) into the marine environment; and (3) whether the chemical agent(s) and application equipment are available to carry out application procedures in a timely and effective fashion.

The California Coastal Commission (CCC) and California Department of Fish & Game, Office of Spill Preparedness & Response (OSPR) prepared the California Dispersant Plan, which details the procedures that the Federal On Scene Coordinator (FOSC) would employ in order to receive an expeditious dispersant decision. The ultimate goal (as with all response options) being to (1) prevent or substantially reduce a hazard to human life, (2) minimize the adverse environmental impact of the spilled oil, (3) and reduce or eliminate the economic or aesthetic losses of recreational areas.

F.8 Dispersant Application Procedures and Forms

The following attachments are excerpts from the Regional Contingency Plan (Appendix XII California Dispersant Plan) describing the process of approving the use of dispersants. The pages include a decision tree and forms to complete that provide the information necessary to assess the suitability of dispersant application in a particular situation. These pages will be used to prepare an application to the FOSC for review and approval of dispersant use when appropriate.

Prior to requesting the use of dispersants, a brief summary of spill and environmental conditions (weather, currents, etc.) should be prepared. This will facilitate a pre-approval use determination. The information can be entered on the "Dispersant Assessment Worksheet" (**F.10, Section I / Page I-7**). [Real-time information on currents in Pt. Pedernales/Pt. Arguello area can be obtained at http://www.icess.ucsb.edu/iog/realtime/index.php.

Pre-Approval Zone Criteria: (1) Waters more than 3 miles from shore, and (2) not in a National Marine Sanctuary. The Federal On-Scene Coordinator (FOSC) can authorize use of dispersants providing the appropriate conditions prevail, as required on the "Pre-approval Zone Dispersant Use Checklist" (**F.10, Section I / Page I-9**).

RRT Expedited Approval Zones: If dispersant are being considered within 3 miles of shore, or within a National Marine Sanctuary, approval by the RRT (Regional Response Team) is required. The request for approval is made by faxing the "Dispersant Assessment Worksheet" and the "Dispersant Use Checklist: RRT Expedited Approval Required Zones" (**F.10, Section II / Page II-7 through II-24**).

Contact information for the RRT is provided in Table F.3.

Table F-3. Regional Response Team (RRT) Members

Member	Phone
Environmental Protection Agency:	
RRT Mainland Co-Chair	(415) 972-3132
RRT Mainland Alternate Co-Chair	(415) 972-3072
Coast Guard:	
RRT Mainland Co-Chair	(510) 437-5754
RRT Mainland Alternate Co-Chair	(510) 437-2794
Department of Interior:	
U.S. DOI Member	(510) 817-1477
U.S. DOI Alternate	(510) 817-1477
Department of Commerce (NOAA):	
Primary Representative	(510) 437-5344
Alternate	(206) 499-1118
State Office of Spill Prevention & Response:	
Primary Representative	(916) 445-9326
Alternate	(831) 649-2888

F.9 Dispersibility of PXP Crude Oils

PXP produces a relatively heavy (low API gravity) crude at its Pt. Arguello/Pt Pedernales facilities. In general, the heavier the oil, the less effective dispersants will be. Several other characteristics of oil are useful in predicting the dispersibility of crude oils, for example, pour point and viscosity. Table F-4 compares several characteristics of oil produced from PXP facilities with other oils. In several cases, direct comparison of some attributes is difficult because they have been measured at different temperatures; but still, a general picture is possible.

Dispersant effectiveness as been tested on most of the PXP oils. These are also noted on Table F-4. The data in Table F-4 also shows that, even on their most effective targets, dispersants will not be a replacement for mechanical recovery. For minimization of environmental impacts, all the tools in the toolbox need to be considered.

Because the PXP oils are relatively low gravity, they are generally poorly suited for chemical dispersion due to these chemical properties.

The Company will initiate the dispersant use as one of many spill response alternatives. Early consultation with the Federal On-Scene Coordinator and other members of the Unified Command regarding the use of chemical dispersants will also be conducted. In the event the release meets the necessary criteria for effective use of dispersants, this early assessment and consultation process will reduce potential delays in gaining approval and implementing dispersant application procedures.

Table F-4. Comparison of PXP Oils with Others Evaluated for Dispersibility

Crude oil name (Unit) / Platform	Data	API Gravity	Specific Gravity	Flash Point (ºC / ºF)		Fresh oil pour point (ºC / ºF)		Oil viscosity @ 15 ºC (59 ºF) at various weathered states (cSt)			Emulsion formation tendency	Dispersant "Window of Opportunity"	% Dispersed w/ Corexit 9500	% Dispersed w/ Corexit 9527
Pt Pedernales (Irene)	2 **3** 4	11.2 **14.7**	**0.9677**		**80**		**22**	67226	**5750** [2]			Very narrow	**14** 9, 12[3]	**15**
Hueneme	2	14.8				-9	16	4131	20990		Yes @ 0%	Very narrow		
Gina	3 4	12.7	0.9815	28	82		12	3970[2] 4969					33 18, 42[4]	19
Beta	2	13.7												
Elly	4							5628					28, 35[5]	
Edith		17.5		18	65	-9	15	206[1]						
Pt. Arguello Heavy (Harvest)	2 **3**	18.2 **19.1**	**0.9394**		**68**	-4	25 **-25**	3250 **663**[2]		4953000	Yes @ 0%	Very narrow	**72**	**54**
Sockeye Sour	2	18.8				-22	-8	821	8708	475200	Yes @ 0%	Very narrow		
Hondo	2	19.6				-15	5	735	9583	449700	Yes @ 0%	Very narrow		
Harmony	4								2613				33, 74[6]	
Eva		21.1		<16	<60	-23	-10	65[1]						
Pt. Arguello Commingled (Hermosa)	2 **3**	21.4 **22.1**	**0.9214**		**58**	-12	10 **-12**	533 **198**[2]	41860	2266000	Yes @ 0%	Very narrow	**74**	**63**
Maya	2	21.8				-20	-4	299	99390		Yes @ 0%	Very narrow		
Santa Clara	2	22.1				-3	27	304	1859	22760	Yes @ 0%	Very narrow		
Gilda	3 4	14.5	0.9163	21	70	3	38	5424				" "	29 37, 46[7]	21
Carpinteria	2	22.9				-21	-6	164	3426		Yes @ 11%	Narrow		
Henry	3	22.9	0.9163	22	72		7	81[2]				"	80	64
Esther		23.8		18	65	-37	-35	29[1]						
Dos Cuadras	2	25.6				-30	-22	51	187	741	Yes @ 11%	Narrow		
A	3	24.4	0.9074	18	68		4	43[2]				"	64	78
B	3	23.1	0.9154	22	71		6	61[2]				"	83	86
C	3	22.9	0.9163	20	68		7	83[2]				"	77	82
Hillhouse	3	23.9	0.9105	24	75		4	54[2]				"	86	78
Pt. Arguello Light (Hidalgo)	2 **3**	30.3 **25.6**	**0.9009**		**78**	-22	-8 **-33**	22 **48**	183	671	Yes @ 0%	Very narrow	**71**	**81**
Pitas Point– Habitat	2	38.0				<-60	<-76	2		2	No	Very wide		
Diesel	2	39.5				-30	-22	8	25	100	No	Very wide		

DATA

2. Table C.3 (and C.1) from draft California Dispersant Plan (12-04), sorted by API Gravity.
3. Laboratory tests performed by Oilfield Environmental and Compliance Inc.
4. SL Ross Environmental Research. 2006. "Dispersant Effectiveness Testing on Viscous, U.S. Outer Continental Shelf Crude Oils." (Viscosity converted from dynamic viscosity)

FOOTNOTES

(1) Viscosity tested at 104°F (40°C)
(2) Viscosity tested at 75°F (24°C)
(3) Oil 57,57°F, Water 52,50°F (14,14°C & 11,10°C)
(4) Oil 57,68°F, Water 55,55°F (14,20°C & 13,13°C)
(5) Oil 54,63°F, Water 55,59°F (12,17°C & 13,15°C)
(6) Oil 54,64°F, Water 55,57°F (12,17°C & 13,14°C)
(7) Oil 52,55°F, Water 54,55°F (11,13°C & 12,13°C)

The following information is also listed above in Table F-4. It is specific to the oil produced from the Point Arguello/Point Pedernales platforms. The information contains the dispersability of the oil as conducted in laboratory test by Oilfield Environmental and Compliance Inc. in June of 2005.

Oil Type/Name: **Platform Harvest Crude Oil**
Specific / API Gravity: 0.9394/19.1 Flash Point: 68° F
Pour Point: -25° F Viscosity: @ 75° = 663 Centistokes

C. Dispersant Information

Laboratory Data on Dispersability of Oil	In laboratory tests Corexit 9500 dispersed 72% of the oil. Corexit 9527 dispersed 54% of the oil.

Oil Type/Name: **Platform Hidalgo Crude Oil**
Specific / API Gravity: 0.9009/25.6 Flash Point: 78° F
Pour Point: -33° F Viscosity: @ 75° = 48 Centistokes

C. Dispersant Information

Laboratory Data on Dispersability of Oil	In laboratory tests Corexit 9500 dispersed 71% of the oil. Corexit 9527 dispersed 81% of the oil.

Oil Type/Name: **Platform Hermosa-GOHF Crude Oil**
Specific / API Gravity: 0.9214/22.1 Flash Point: 58° F
Pour Point: -12° F Viscosity: @ 75° = 198 Centistokes

C. Dispersant Information

Laboratory Data on Dispersability of Oil	In laboratory tests Corexit 9500 dispersed 74% of the oil. Corexit 9527 dispersed 63% of the oil.

Oil Type/Name: **Platform Irene-LOGP Crude Oil**
Specific / API Gravity: 0.9677/14.7 Flash Point: 80° F
Pour Point: 22° F Viscosity: @ 75° = 5750 Centistokes

C. Dispersant Information

Laboratory Data on Dispersability of Oil	In laboratory tests Corexit 9500 dispersed 14% of the oil. Corexit 9527 dispersed 15% of the oil.

F.10 Dispersant Attachments

The following Forms and Flowcharts/Checklists are from the California Dispersant Plan (Appendix XII of the Regional Contingency Plan). Appendices referenced within these attachments are those in the California Dispersant Plan.

"Dispersant Assessment Worksheet" (**F.10, Section I / Page I-7**)
"Pre-Approval Zone Dispersant Use Checklist" (**F.10, Section I / Page I-9**)
"Overview RRT Expedited Approval Zones" (**F.10, Section II / Page II-4**)

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)

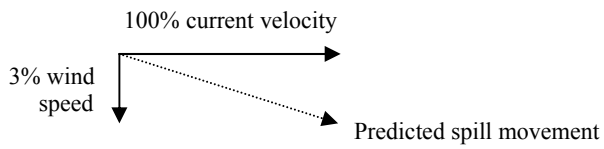
Current velocity: _____ (kts) Current (to) direction: _____ (ºtrue/magnetic)
Predicted slick speed: _____ (kts) Predicted slick direction: _____ (ºtrue magnetic)

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: _____ (Total slick area (a)) x _____ (% 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: _____ Street: _____
Dispersant name: _____ Quantity available: _____ City: _____
State: _____ Zip Code: _____
Phone: ( ) _____

Platform: Aircraft type: ☐ Multi-engine ☐ Single-engine
Boat type: _____
Other: _____
Dispersant load capability (gal): _____

Estimate:

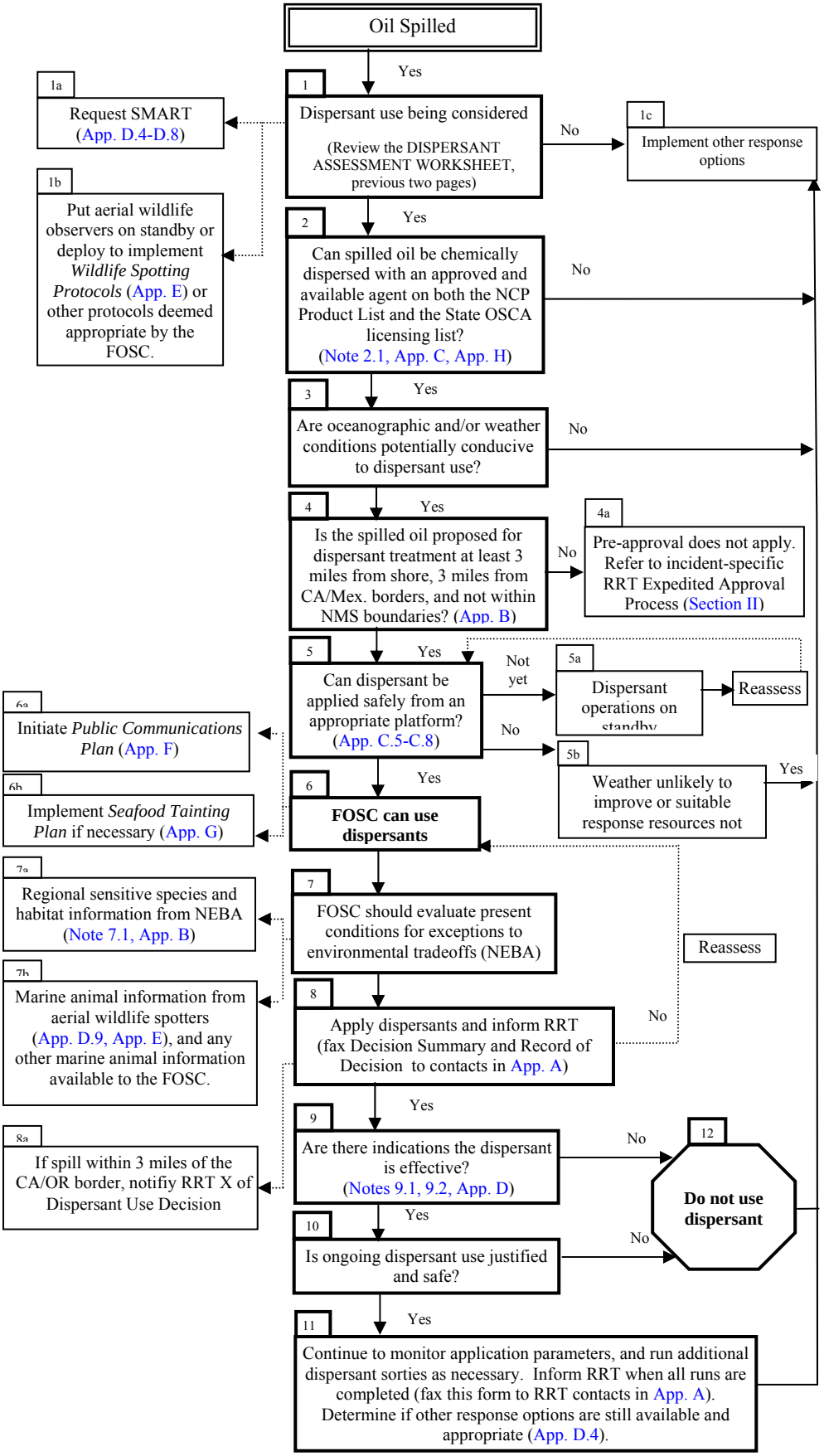
"Window of opportunity" for getting dispersant on the oil (App. C-10)_____ (hrs from first report of spill)
Number of daylight hours available for first day of dispersant application:_____ (hrs from first report of spill)

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:

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: _____
Amount spilled: _____ (gal or bbl)
Type of release: Circle one
- ❑ Instantaneous
- ❑ Continuous

Wind speed: _____ (knots)
Wave height: _____ (m)
Water temp.: _____ (ºC)
Water salinity: _____ (ppt)

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**.

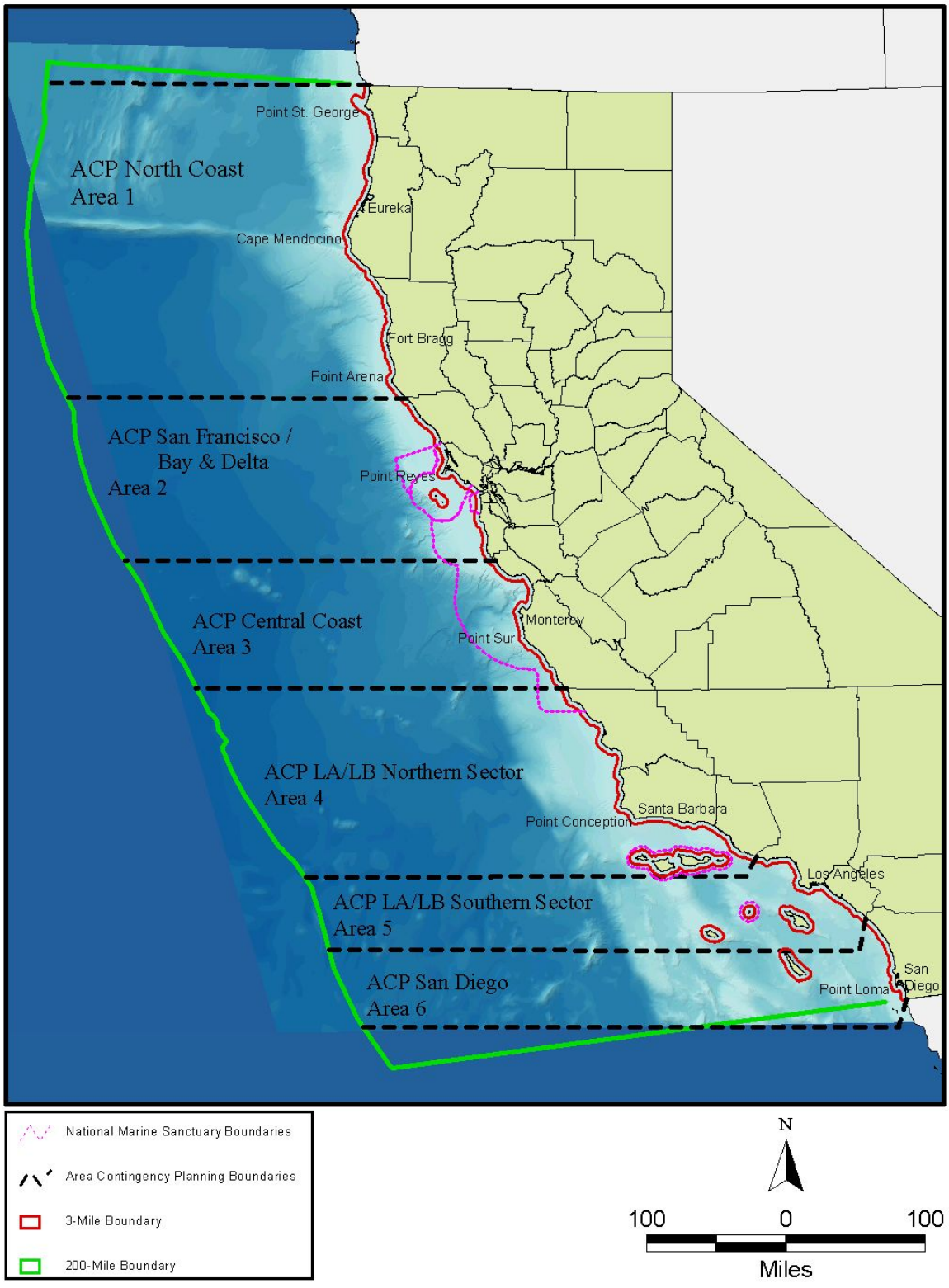
Make a note of the decision on Dispersant Use Checklist (Page I-9)

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 Net Environmental Benefit 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:

$$\mathbf{10^4 \times Area\ (hectare) \times Thickness\ (mm) = Volume\ (liters)}$$

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 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 Responsible Party Representative
Office of Spill Prevention and
Response
State of California

_____ _____

Date Date

REFERENCES CITED

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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.

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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 (web links of 12/18/03)	http://response.restoration.noaa.gov/job_aid/glossary.html
	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

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)

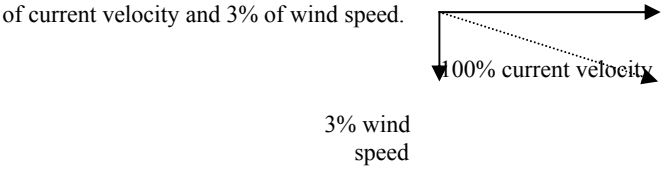
Current velocity: _____ (kts) Current (to) direction: _____ (°true/magnetic)
Predicted slick speed: _____ (kts) Predicted slick direction: _____(°true/magnetic)

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: _____ (Total slick area (a)) x _____ (% 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: _____ Street: _____
Dispersant name: _____ Quantity available: _____ 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:

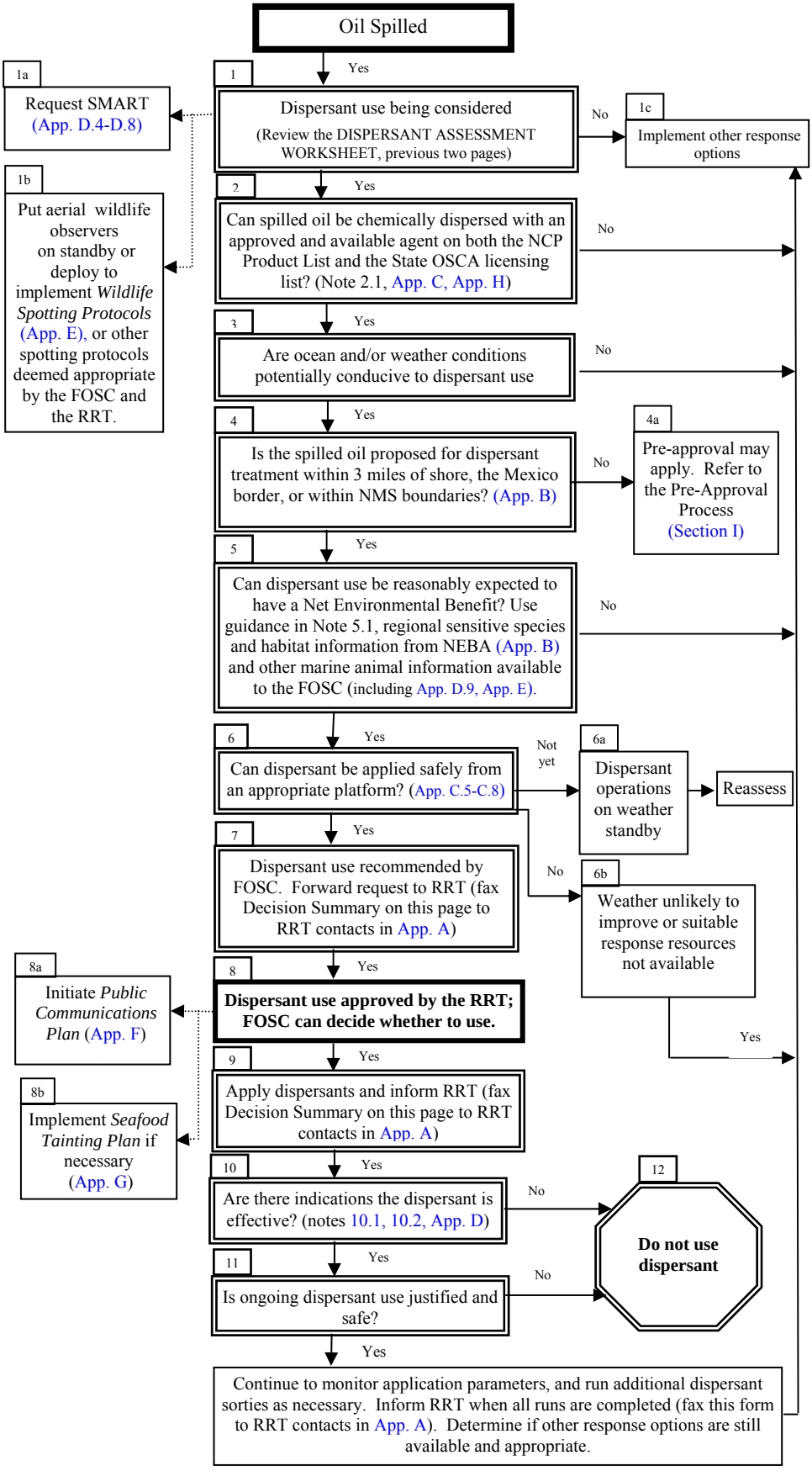
Shallow Subtidal Resources

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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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 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, 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 Responsible Party Representative
Office of Spill Prevention and Response
State of California

_____ _____

Date Date

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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 G In-Situ Burning Plan

G.1 Overview

Currently, California does not permit the burning of oil within the State or on State waters. California Health and Safety Code, Article 2, Section 41800 states that, "no person shall use open outdoor fires for the purpose of disposal or burning of petroleum wastes…" In-situ burning can be used in the State of California and its waters by Federal preemption of this Code, which is only possible under specific circumstances. The *in-situ* burning us policy is delineated in Regional Contingency Plan (Appendix XIII, In-Situ Burn Guidance for Region IX).

In-situ burning may be considered in waters beyond three miles of the shore which are under Federal jurisdiction. The **Federal On-Site Coordinator (FOSC)** must obtain approval from the Environmental Protection Agency (EPA) representative to the **Regional Response Team (RRT)**. Concurrence from the State of California is necessary only when navigable waters under the jurisdiction of the State of California are threatened by the discharge of oil. In all cases, the State of California will be notified of the use of in-situ burning. When appropriate and practicable, the EPA representative to the **RRT** shall consult with the Department of Commerce and Department of Interior Natural Resource Trustees, and Sanctuary Managers, if applicable.

Preliminary laboratory testing has been conducted on the crude oil currently being produced at the Company's facilities. The results of these tests indicate that the crude oil has a low percentage of volatile components that would cause difficulty to ignite the oil. Therefore, in-situ burning of discharged oil may not be an appropriate mitigation measure.

G.2 In-Situ Burning Equipment

Currently no in-situ burning equipment is available within the Clean Seas area of interest. However, the Company has access to in-situ burning equipment through Marine Spill Response Corporation (MSRC) (note: MSRC has no formal agreement with the Company, but can rent equipment on an as-needed basis). The following equipment can be flown in from each of eight locations (Port Angeles, WA; Galveston, TX; Pascagoula, MS; Miami, FL; Chesapeake City, MD; Edison, NJ; Honolulu, HI; St. Croix, Virgin Islands):

- 500 ft of burn boom (12" freeboard, 18" draft)
- 400 ft of guide boom
- Floating igniters
- Accessories including boom reel, diesel-driven hydraulic power supply and tow bridle assemblies

In the event additional equipment is required, identification and mobilization will be coordinated through the Federal On-scene Coordinator.

G.3 In-Situ Burning Procedures

Typically, in-situ burning involves collecting oil within a fireproof boom (preferably several centimeters [cm] thick). Two vessels towing approximately 500 feet of fireproof boom plus additional sections of conventional boom and towing cables at less than 1 knot collect oil until it

fills one-half to one-third of the fireproof boom. The oil is ignited using a Heli-torch suspended from a helicopter which uses gelled gasoline to ignite the slick or other methods of ignition such as flare pistols, fused igniters, or floating plastic bags of gelled fuel (e.g., gasoline, diesel, jet fuel).

The use and results of in-situ burning will be recorded visually. This will be accomplished using film or video footage taken from either a vessel or the air. Visual observations can also be made by a trained observer. Visual or video documentation should be done without causing delay to the in-situ burning operation.

In-situ burning is applicable for removing oil contained by fire booms on open water or for small spills on land. While it can eliminate a substantial amount of oil in a very short time, it is not a complete disposal technique. A tar-like residue, which still needs to be removed manually is generally left after combustion. The residue and any remaining debris must be disposed of properly.

Care will be taken throughout an in-situ burn operation to ensure that all personnel and equipment are protected from any harmful exposure to heat and/or combustion products. Anyone that could be exposed will be provided with adequate personal protective equipment (e.g., respirators, masks, goggles, protective clothing, etc.) Federal OSHA standards for the assessment of hazards and standard operating procedures will be used for the selection of proper personal protective equipment.

With respect to heat exposure, safe operating distances for the separation of operating personnel and a contained fire will be specified by project supervisors.

The safety of response and non-response personnel will strongly depend on strict adherence to the Site Specific Safety Plan(s) and the availability and proper use of reliable communications equipment prior to and throughout any in-situ burn program. Such communications will be needed to warn all participants, observers, government representatives, and the general public about the intent to burn oil. Proper notification will help present the unexpected movement of aircraft and vessels into predestinated restriction zones. In addition, routine status reports to airplanes, boats, radio and television stations, etc. will help reduce confusion that may occur during such highly visible activity.

G.4 Environmental Effects of In-Situ Burning Activities

The primary objective of oil spill abatement and cleanup is to reduce the effect of spilled oil on the environment. Physical removal is generally the preferred method; however, mechanical recovery may be limited by equipment capability and spill magnitude. Use of in-situ burning may be considered when the preferred techniques are judged to be inadequate and the environmental benefit of in-situ burning outweighs its adverse effects.

The key environmental advantage to In situ burning is its ability to remove large fractions of the spilled oil from the sea surface. In the combustion process, the oil is converted to soot and gases that dissipate into the atmosphere rather than into the marine environment. Residual un-burned

material remains and must be recovered mechanically, but the volume requiring recovery from the sea surface can be reduced by up to 95%. Also, not all the oil from a spill will be amenable to burning. In order for burning to occur, an adequate thickness of oil must be present and collectable within the containment booms. Once oil has spread out significantly, it becomes difficult to collect a sufficient thickness to burn effectively. Thin slicks or windrows that have escaped initial capture may never be collectable in sufficient thickness to permit burning.

Although In-situ burning may be deemed preferable to other methods in certain circumstances, it is not without adverse environmental effects. The primary effect is air pollution caused by burning oil which emits particulate matter and other combustion by-products into the atmosphere. The black smoke plume also creates a potential for adverse public reaction to the response effort. According to the ACP, "Preliminary data from recent test burns indicate the airborne emissions are not a serious concern at distances greater than a few miles, given the proper atmospheric conditions."

G.5 Guidelines for Well Control and Personnel Safety

In-situ burning will not commence in the case of a well blow-out until full well control has been accomplished.

In-situ burning will not be used without authorization. The authorization process is discussed in Sections G.7 and G.8 and recognizes resources at risk from mechanical and non-mechanical measures.

- Only accepted, approved or licensed products and methods will be utilized.
- In-situ burning will be carried out by qualified individuals.
- In-situ burning will be carried out only in locations authorized by the FOSC.
- In-situ burning will be carried out when site-specific safety procedures have been established to protect those involved in conducting the burn..

The Company will work closely with the regulatory agencies in monitoring and documentation of the in-situ burning operations.

In the event the Company determines that in-situ burning was a desirable response alternative, the initiation of burning procedures will be coordinated through Clean Seas and in consultation with the Federal On-scene Coordinator (see approval process below). A checklist is provided in Appendix XIII of the 2005 Regional Contingency Plan and is presented in Section G.8. This checklist is to be completed if and when it appears appropriate to consider an in-situ burning option.

G.6 Circumstances for Use

Generally, Point Arguello/Point Pedernales crude oil is not expected to be a likely candidate for in-situ burning. It is heavy and the environmental conditions are such that the oil temperature would rapidly cool to that of ambient sea water (approximately 15ºC) which would further reduce its already limited ignitability. Also, environmental conditions, both winds and seas, are

not favorable for burning much of the time. High winds and seas make it difficult or impossible to capture the oil, control the booms, and sustain combustion.

A research paper entitled "Results of Laboratory Tests on the Potential for using *In Situ Burning* on 17 Crude Oils" written by James McCourt and Ian Buist of S.L. Ross Environmental Research Ltd. was presented at the 2001 International Oil Spill Conference. Among the oils tested was Point Arguello oil from California. The results of the testing indicated that the Point Arguello oil had an API gravity of 21 and formed stable emulsions even when fresh and was unignitable when emulsified. Emulsions breakers also worked poorly on these oils. Further comment in the research paper concluded that "Oils produced off the coast of California tend to be very heavy and appear to be poor candidates for *in situ* burning. As stated in Appendix D, Table D-1, Point Pedernales crude oil has an API gravity of 14.7 and therefore would also be a poor candidate for the in situ burning process.

It may be desirable to deliberately ignite a floating gas or oil spill in order to prevent the spread of the slick and reduce the risk or more widespread damage or accidental ignition. For gasoline spills, a burning aid may not be necessary but for heavier oils the cooling effect of the water reduce the oil's ability to continue burning.

G.7 In-Situ Burn Approval Procedures & Guidelines

There are no Company facilities in the "In-Situ Burning Pre-Approval Zone" described in Section 1007.06.1 of the RCP (Regional Contingency Plan): those areas further than 35 miles from the coastline. Therefore, the FOSC must follow the Guidelines described below.

In recognition that *in-situ* burning is a viable option, the U.S. Environmental Protection Agency, Department of Interior, and Department of Commerce entered into a Letter of Agreement to provide guidelines (provided below) to allow the Federal On-Scene Coordinator to approve the use of *in-situ* burning.

The Company would use these guidelines, as well as those provided in the NCP and ACP to develop an *in-situ* burn plan. Such a plan would be prepared and submitted to the FOSC for review and approval.

GUIDELINES
(from Appendix XIII of RCP)

1 . As per the NCP, 40 CFR Part 300.120, the authority to use in-situ burning of oil discharges in accordance with this Agreement is vested in the pre-designated USCG FOSC. The pre-designated USCG FOSCs along the California Coast are the Captain of the Port of San Francisco, the Captain of the Port of Los Angeles-Long Beach, and the Captain of the Port San Diego. This authority may not be delegated.

2. The USCG FOSC may authorize the use of in-situ burning without obtaining the concurrence of the USEPA representative or the Federal natural resource trustee representatives to the RRT-IX Mainland, when, in the FOSC's judgment, human life is threatened or when all of the following three conditions are met:

A. In-situ burning is a viable option for oil removal; and

B. The potential plume caused by the burn will not expose unprotected human populations to more than 150 µg/m^3 of particulates less than 10 microns in diameter averaged over a one-hour period as determined by the FOSC (on-scene worker safety shall be addressed by the Site Safety Plan, meeting OSHA requirements); and

C. The plume or heat from the burn will not result in greater impact to sensitive wildlife resources than would the spilled oil (in-situ Burning Checklist information shall be compiled by the FOSC in advance of the burn).

3. Mechanical recovery equipment shall be mobilized on scene, when feasible, as a backup capability should in-situ burning prove ineffective

4. Wind patterns will be predicted by the NOAA SSC, and will be monitored in real time prior to and during the burn by the FOSC. If the prevailing wind direction is either parallel to the shore or away from the shore, it will be assumed that there is no unprotected human exposure above 150 µg/m^3 of particulates less than 10 microns in diameter averaged over a one-hour period as determined by the FOSC.

5. A designated Federal agency representative will be on scene to observe the burn and the prevailing wind direction. If practical, so as not to create an unnecessary delay, monitors from the DOI and DOC-NOAA will be provided to observe the burn and record results. Any of these observers/monitors has the authority to halt any burn if he observes that the conditions in Paragraph 2 are no longer true. The protocol for observing and halting a burn is described in the In-situ Burning Monitoring Plan.

6. In any case where the circumstances do not meet the criteria set forth in Paragraph 2, the pre-authorized use of in-situ burning is not authorized.

7. If the FOSC feels in-situ burning should be used in areas not met by Paragraphs 2.A., 2.B., 2.C., or in areas not part of the pre-authorized geographical boundaries, the FOSC must request approval from the pertinent RRT-IX Mainland member agencies, in accordance with the NCP requirements. The FOSC shall submit the request along with the required information listed in the provided in-situ Burning Checklist.

8. Burning will be conducted by trained professionals using recognized techniques and technology.

9. Burning will be conducted in a way that allows for rapid controlling and stopping of the burn to account for wind shifts. When a decision is made to conduct a burn operation, the FOSC shall notify the USCG Co-Chair for the RRT-IX Mainland. The Co-chair shall notify the signatories of this agreement immediately.

10. Contained burning is recognized as the preferred method of burning, using burn resistant boom or similar technology. The ignition of slicks is not permitted if there is a significant chance of igniting the source or if there is a significant hazard to adjacent structures or vessels.

G.8 ACP In-Situ Burning Plan Checklist

The following pages contain the In-Situ Burning Plan checklist referred to in item 2.C of the Guidelines. The Checklist and the Support Information form will be used in the event that In-situ burning is deemed a viable response strategy.

IN-SITU BURNING CHECKLIST

(from Appendix XIII of 2005 Regional Response Plan)

The Case-by-Case Checklist is used by the Unified Command to determine whether a request should be forwarded to the Regional Response Team for *In-Situ* Burning Use. If the answer to any of the questions is no, further information must be gathered and summarized to support the position that an *in-situ* burn should be considered. This information, as well as all other information, should be forwarded to the RRT (see contact information in Table F-3 of this Plan).

1. Is the spilled petroleum burnable? Y / N

2. Can the appropriate equipment be made available in a timely manner to effectively conduct an in-situ burn? Y / N

3. Are weather and oceanographic conditions favorable for an in-situ burn? Y / N

4. Does the in-situ burn pose less of an environmental risk than leaving the petroleum on the water surface? Y / N

5. If required, have state and international boundary considerations been addressed? Y / N

6. Has the local air district recommended the use of in-situ burning? Y / N

7. Has the ART Unit of the spill response team recommended the use of in-situ burning? Y / N

Basic information regarding the spill (weather, location of slick, type of oil, trajectory analysis, resources at risk, etc.) - see attached forms.

Phone Call List (refer to the contact list in *APPENDIX F*)

EPA	Y / N
USCG	Y / N
DOC	Y / N
DOI	Y / N
CALIFORNIA	Y / N
AIR DISTRICTS	Y / N

Support Information for Case-by-Case

1. Spill Information

A. Incident Information:

Cause of Spill _____

Date and Time of Spill _____

Location _____

Volume and Type of Release (Continuing vs Instantaneous) _____

Potential Volume to be Released _____

B. Characteristics of Spilled Oil:

Oil Type/Name

Specific/API Gravity _____ Flash Point _____

Pour Point _____ Viscosity _____

C. Weather and Water Conditions/Forecast

Water Temp. _____ Air Temp. _____

Current Information _____

Wind Speed/Direction (present a 48-hr projection) _____

Sea- State and 48 hr Projection _____

Tide Information and 48-hr Projection _____

Comments _____

D. Oil Trajectory Information

Surface Area of Slick _____

24-hr Slick Trajectory _____

48-hr Slick Trajectory _____

Expected Land Fall (Location/Time) _____

Comments _____

2. Biological Resources at Risk

(Provided by OSPR in Consultation with Federal Trustee Agencies)

A. On-Water Resources

B. Shallow Subtidal Resources

C. Intertidal Resources

D. Anadromous Resources

E. Significant Surface Microlayer Resources

Below, please detail any reservations that may exist on the part of the local air district or any other technical specialists with respect to a proposed in-situ burn.

1. Nature of the Objections and Organization Raising the Objection: _____

2. Overriding Concerns to the Objection and Proponent of this Position: _____

Appendix H Acronyms

AAPL	All American Pipeline Company
APCD	Air Pollution Control District
API	American Petroleum Institute
BPD	Barrels per day
BOPD	Barrels of oil per day
BS&W	Bottoms, Sediment, and Water
BSEE	Bureau of Safety and Environmental Enforcement
CAER	Community Awareness and Emergency Response
CHP	California Highway Patrol
CO_2	Carbon Dioxide
Cogen	Cogeneration
CPR	Cardio-Pulminary Resuscitation
EAS	Emergency Alert System
EMS	Emergency Medical Services
ERP	Emergency Response Plan
ES&RC	Environmental Safety and Regulatory Compliance
FAA	Federal Aviation Administration
FeS	Iron Sulfide
FWKO	Free Water Knockout System
GOHF	Gaviota Oil Heating Facility
GPM	Gallons per Minute
gpm/ft^2	Gallons per Minute per Square Foot
H_2S	Hydrogen Sulfide
H_2SO_4	Sulfuric Acid
HAZWOPER	Hazardous Waste Operations and Emergency Response
HP	High Pressure
HVAC	Heating, Ventilation, and Air Conditioning
IAP	Incident Action Plan
IC	Incident Commander
ICS	Incident Command System
IMT	Incident Management Team
I.D.	Inner Diameter
LACT	Lease Automatic Custody Transfer
LOGP	Lompoc Oil & Gas Plant
LEL	Lower Explosive Limit
LFL	Lower Flammability Limit
LP	Low Pressure
LPG	Liquid Petroleum Gases
mg/m^3	Milligrams per Cubic Meter
MMSCFD	Million Standard Cubic Feet per Day
MSDS	Material Safety Data Sheet
N_2	Nitrogen
NACG	Native American Ceremonial Grounds
$NaHSO_3$	Sodium bisulfite

NG	Natural Gas
NGL	Natural Gas Liquids
NH_3	Ammonia
NOx	Nitrogen Oxide
NPDES	National Pollutants Discharge Elimination System
OEM	Office of Emergency Management
OWS	Oily Water Sewer
PATC	Point Arguello Terminal Company
P&D	Santa Barbara County Planning and Development
P/A	Public Address
PC	Personal Computer
PIO	Public Information Officer
PPE	Personal Protective Equipment
ppm	parts per million
ppmv	parts per million by volume
psi	Pounds per Square Inch
psia	Pounds per Square Inch Absolute
psig	Pounds per Square Inch Gauge
PXP	Plains Exploration and Production Company
ROW	Right-of-Way (Pipeline)
RV	Recreational Vehicle
RWT	Raw Water Treating
SBCFD	Santa Barbara County Fire Department
SBSD	Santa Barbara Sheriff Department
SCADA	Supervisory Control and Data Acquisition
SCBA	Self-Contained Breathing Apparatus
SCE	Southern California Edison
SCR	Selective Catalytic Reduction
SO_2	Sulfur Dioxide
SOPs	Standard Operating Procedures
TRIM	Training Records Information Management
UPRR	Union Pacific Railroad
UPS	Uninterrupted Power System
USCG	U.S. Coast Guard
VIPs	Very Important Persons
VRU	Vapor Recovery Unit

Appendix I Pipeline Leak Decision Process

I.1 Point Arguello Pipelines

The oil pipeline to shore is equipped with a Supervisory Control and Data Acquisition System (SCADA). The SCADA system continuously monitors and controls pressure and flowrates in the pipeline. In addition, a leak detection system by ATMOS International acquires data from the SCADA system to monitor the pipeline for a leak. The design of ATMOS International's leak detection software utilizes statistical techniques to detect changes in the overall behavior of the flow and pressure at the inputs and discharges of the pipeline. The leak determination is based on probability calculations at regular sample intervals. The principle for the probability calculations is supported by mass conservation and hypothesis testing. The software obtains the corrected (net) oil volume measurements and pressures from the original instruments via the pipeline SCADA system. The pressure and flow rate data is combined into a single leak detection computation probability for each of the two pipeline segments. The leak probability is alarmed back on the SCADA console for the operator interaction. The Operator can then decide on an appropriate response. All ESD-initiated valves will shut-in the oil pipeline in approximately 45 seconds (0.53 inches/second).

The pipeline operator, stationed in the Gaviota Plant control room, will ESD the oil pipeline when he has determined that an oil leak has occurred on the ROW. The operator's decision to ESD the pipeline is based on the wet oil leak detection system, SCADA-input, and the operator's knowledge. The following pages contain a series of flow charts describing the system in place to detect leaks on the pipelines between the Point Arguello field platforms and the Gaviota Oil Heating Facility (GOHF).

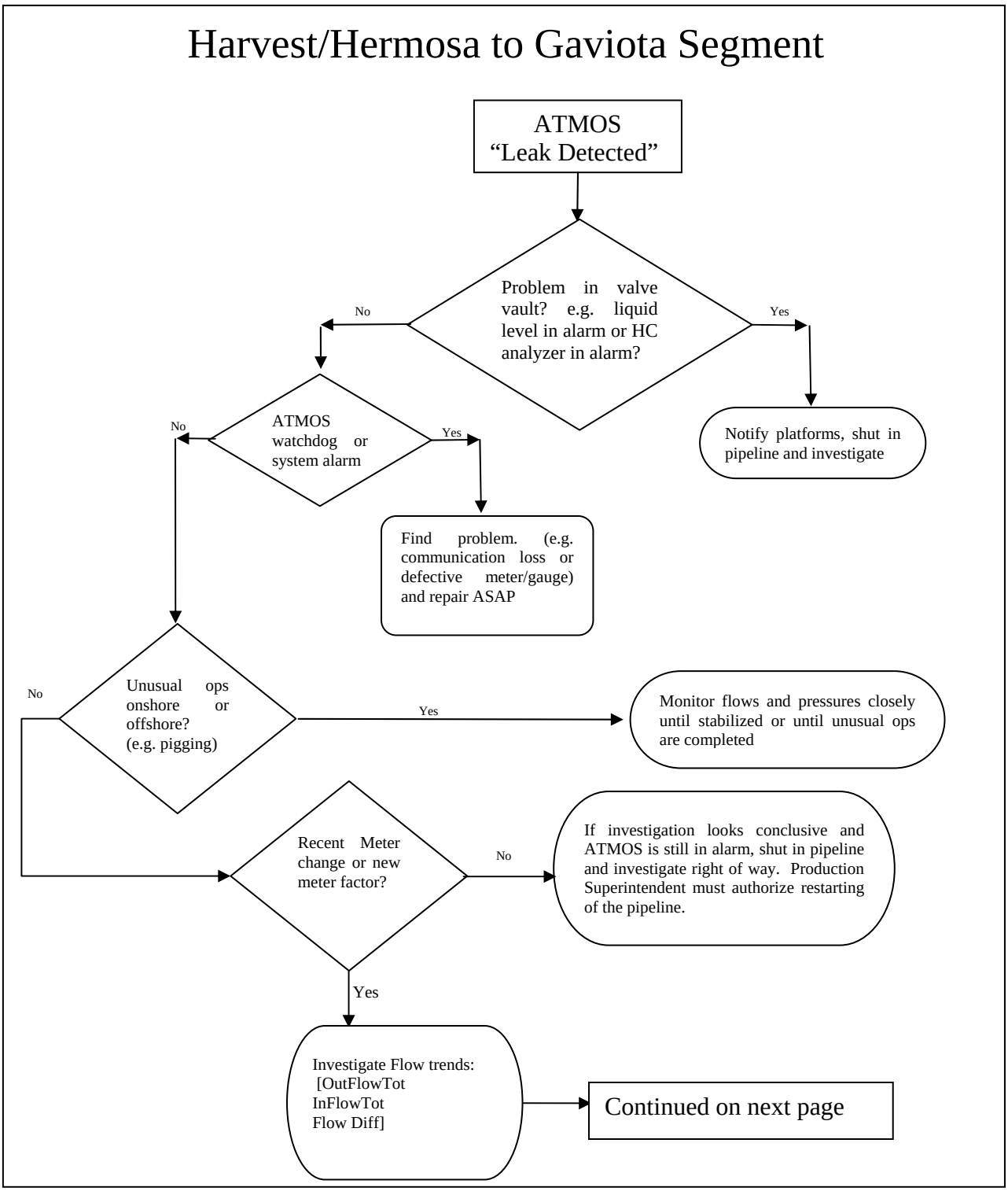
The SCADA system can immediately detect a pipeline leak in a block valve vault via liquid level and gas detectors. A potential leak in a pipeline segment would tentatively be identified by evaluating all of the above parameters utilizing the respective flow matrixes on the following pages. Where the analysis indicates a potential for a pipeline leak, the pipeline is shut down immediately and not re-started without supervisory approval. A field investigation would then be initiated via aircraft, if possible, to locate the leak along the pipeline corridor. Identifying the leak location would require between 30 minutes and one hour.

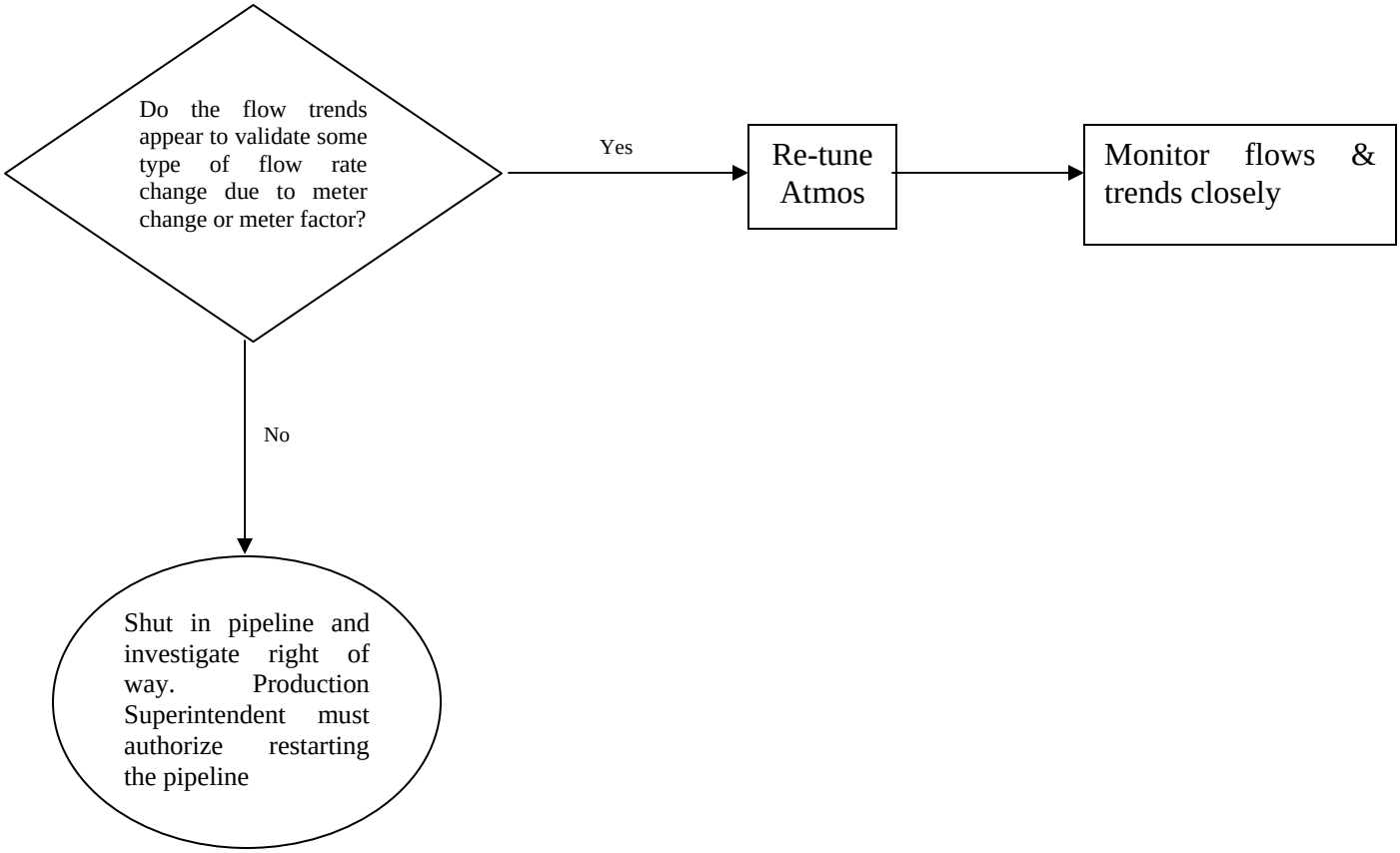
The oil pipeline will also undergo an ESD when the plant issues an ESD #1- Oil Plant Block, which blocks in all process inlets and outlets to oil processing equipment, or an ESD #3- Oil Plant Bleed, which depressurizes the free water knockout.

The SCADA system is based on redundant microwave transmitters and receivers at the platforms and pipeline landfall and a hard-wired system along the onshore pipeline ROW. The platform and landfall systems are separate from the ROW system, so it is unlikely both would fail simultaneously. If the onshore ROW system failed (e.g. by being severed or washed out), the platform, landfall, and plant receiving systems would continue to function permitting the operator to monitor flow rates and detect a potential leak.

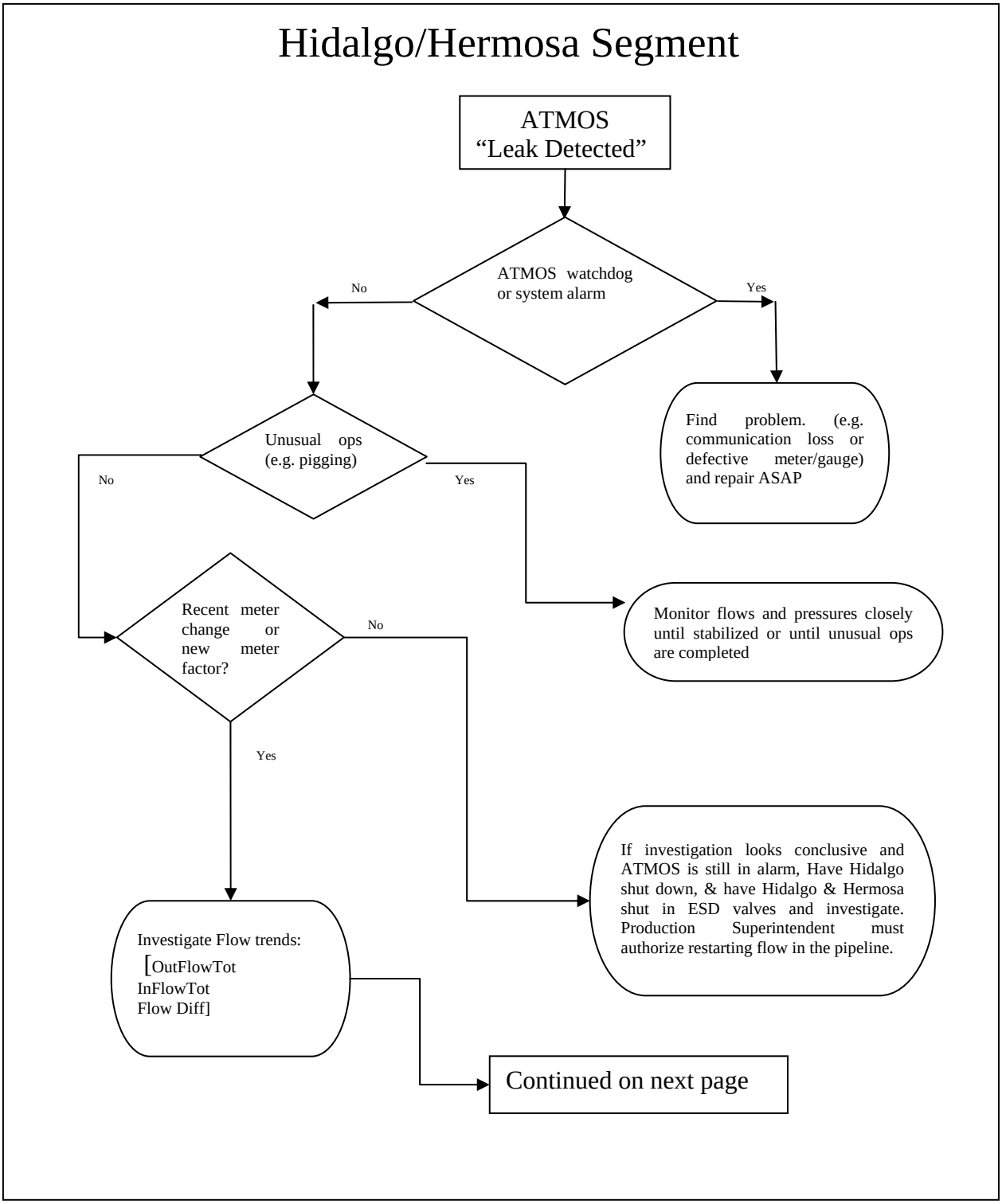
In the event of a complete SCADA system failure, the pipeline will be shut down. Appropriate valves will be closed, isolating sections of the pipeline. An ESD alarm is sent to the offshore platforms to allow for safe shutdown of the wells.

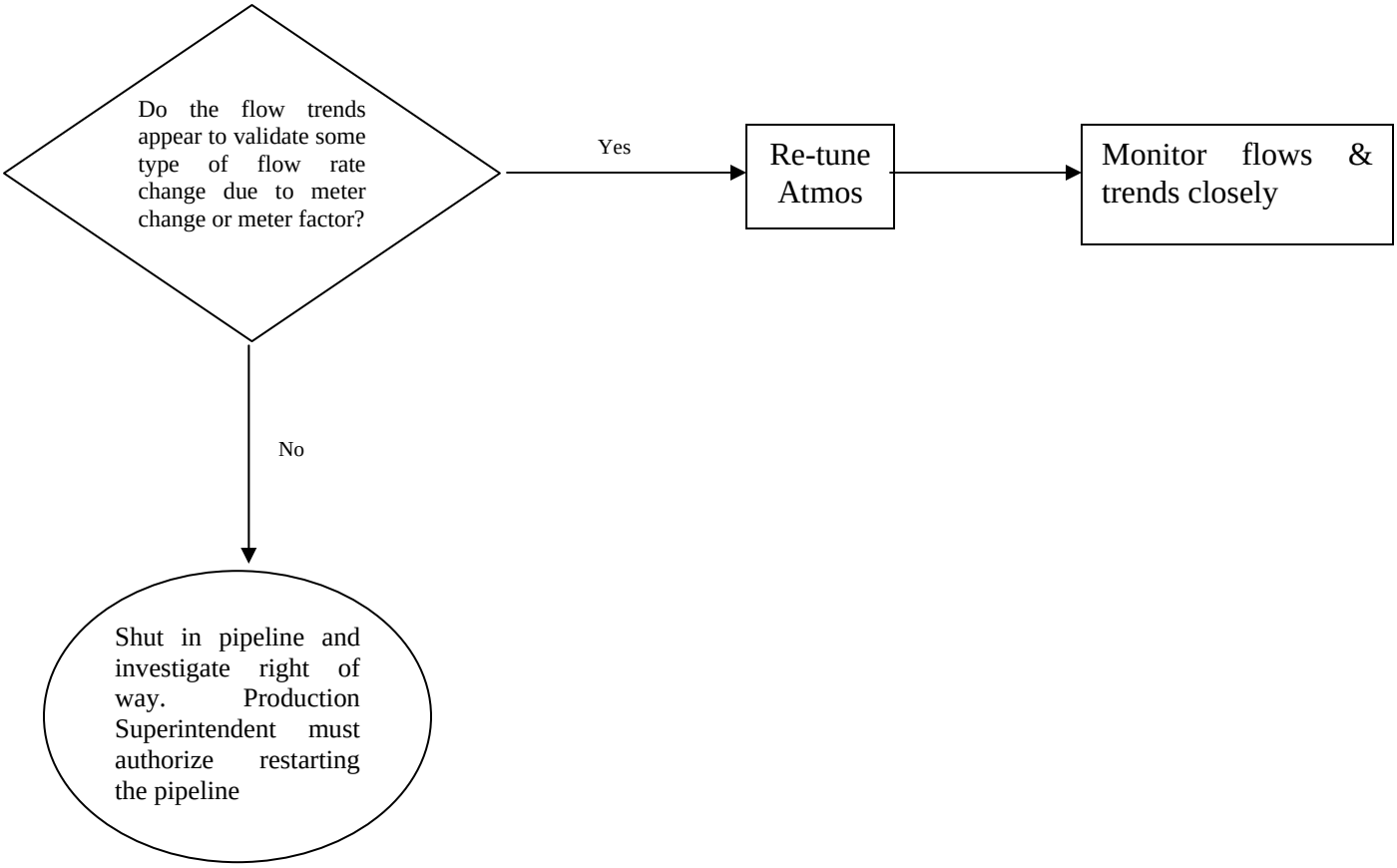
In addition to routine air patrol observations, hourly logging of over/short volume readings, continuous comparison of offshore/onshore flow rates and monitoring of the valve vault safety devices by the pipeline operator, ATMOS provides us with a SCADA based leak detection system that will provide the pipeline operator with an audible alarm if a leak is suspect on the PAPCO pipeline.




Do the flow trends appear to validate some type of flow rate change due to meter change or meter factor?
Yes
Re-tune Atmos
Monitor flows & trends closely
No
Shut in pipeline and investigate right of way. Production Superintendent must authorize restarting the pipeline

Hidalgo/Hermosa Segment




Do the flow trends appear to validate some type of flow rate change due to meter change or meter factor?
Yes
Re-tune Atmos
Monitor flows & trends closely
No
Shut in pipeline and investigate right of way. Production Superintendent must authorize restarting the pipeline

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I.2 Point Pedernales Pipelines

I.2.1 Abnormal Pipeline Operating Conditions

This section discusses with the Operator's response to abnormal operating conditions. Conditions which develop on pipeline systems that are not intended or expected and are not immediately identified as emergencies are referred to as Abnormal Operating Conditions. An abnormal operating condition would also include any condition occurring on a pipeline system that exceeds the normal operating limits. In some instances, these abnormal operating conditions or occurrences can be the early stages of a pipeline emergency. Therefore such situations should be handled with concern.

Nearly all variations in pipeline flow and pressure will be routinely and automatically dealt with. However, it is typically the responsibility of the Operator to correct and report any faults and variations and, in the process, verify the condition of equipment/instruments reporting abnormal operating conditions. The following paragraphs provide some response guidelines for various abnormal guidelines.

I.2.1.1 Abnormal Pressures or Flow Rates

The operator shall operate the pipeline through observation of the displayed pressures and flow rates. Any device or control, which does not operate within defined normal operating limits, is considered to be operating abnormally and the appropriate action shall be taken immediately. These actions may require shutting the down the facility/pipeline.

I.2.1.2 Pressure Increases

Pressure increases will be identified by the pipeline pressure transmitters at Platform Irene, Valve Station 2, and the LOGP. The most likely causes of a pressure increase are the following:

- Closure of Oil Pig Launcher Bypass MOVs at Platform Irene.
- Closure of Pipeline MOVs at Valve Stations 1, 2, 4, 7, 8, or 10.
- Closure of Crude Pig Receiver Bypass MOV at the LOGP.
- Process upset at the LOGP reducing the crude oil throughput. If the process upset is severe enough to cause a level or pressure shutdown in the Gas Oil Separator, Shipping Vessel or Flare Scrubber, SDV-40 at the LOGP will automatically close and the crude oil pipeline will be shut-in.
- An "Oil Process Stop" shutdown or an Emergency Shutdown at the LOGP.
- Pressure transmitter calibration error or failure.
- A pig stuck in the pipeline. The most likely places would be the check valves at Valve Stations 3, 5, 6, and 9.
- Loss of emulsion breaker chemical injection at Platform Irene.
- Surge during startup.

In the event of a pressure increase the operator should do the following:

- Use the ABB System to verify that all Pipeline MOVs are open. Verify the Crude Pig Receiver Bypass MOV is open on the August Systems controller. See page I-13 for information concerning the ABB System
- Check the level and pressure in the Gas Oil Separator and the differential pressure across the Wet Crude Heat Exchangers to determine if a process upset condition is beginning.
- Contact the Platform Irene Operator and verify a pipeline pig has not been launched.
- Check the pressure readings from the transmitters at Platform Irene, Valve Station 2 and the LOGP. If only one transmitter is indicating high pressure and there are no other indications of problems, dispatch LOGP personnel to verify the transmitter.
- Reduce the flow rate of shipping station.
- Monitor pressures and flow rates until stabilization occurs.
- If stabilization does not occur, shutdown the affected line and notify the supervisor, and dispatch appropriated field personnel.

I.2.1.3 Pressure Decreases

Pressure decreases will be identified by the pipeline pressure transmitters at Platform Irene, Valve Station 2 and the LOGP. The most likely causes of a pressure decrease are the following:

- Oil Shipping Pump failure or control valve failure at Platform Irene
- A process upset in the Platform Irene Gross Separators or one or more production wells being shut-in at the platform.
- An Emergency Shutdown of Platform Irene.
- Closure of Pipeline MOVs at Valve Stations 1, 2, 4, 7, 8, or 10.
- A pipeline leak.
- Pressure transmitter calibration error or failure.
- A pig stuck in the pipeline or a slug of water behind the pig. The most likely places for a pig to get stuck are the check valves at Valve Stations 3, 5, 6, and 9.
- A slug of water in the crude oil pipeline

In the event of a pressure decrease the Operator should do the following:

- Use the ABB System to verify that all Valve Stations are open.
- Contact the Platform Irene Operator and find out if a process upset, Oil Shipping Pump failure or Platform ESD has occurred. Also confirm if a pig has been launched.
- Check the crude oil flow rate measured at the LOGP versus the flow rate measured at Platform Irene. Check the Leak Detection Computer for any alarms. If a leak is present, follow the Irene to LOGP flow chart at the end of this section to determine the proper corrective action. If a low pressure pipeline shutdown also occurs at the LOGP, the Operator shall close all the Pipeline MOVs in order to minimize the volume of oil that can leak. Dispatch LOGP personnel to survey the right-of-way for a possible leak and check the pressure in each isolated line segment. If there is a leak, the pressure in the leaking pipeline section will be significantly below the pressure in the adjacent segments.

- Check the pressure readings from the transmitters at Platform Irene, Valve Station 2 and the LOGP. If only one transmitter is indicating low pressure and there are no other indications of problems, dispatch LOGP personnel to verify the transmitter.
- Monitor pressures and flow rates until stabilization occurs.
- If stabilization does not occur, shutdown the affected line and notify the supervisor, and dispatch appropriated field personnel.

I.2.1.4 Flow Rate Increase

A flow increase will be identified by the crude oil meters at Platform Irene and the LOGP. The most likely causes of a flow rate increase are the following:

- Meter malfunction.
- Leak downstream of the meter.
- A change in product gravity.

In the event of a flow rate increase the operator should so the following:

- Monitor for a decrease in pressure. A decrease in pressure could indicate a leak. If a low pressure pipeline shutdown also occurs at the LOGP, the Operator shall close all the Pipeline MOVs in order to minimize the volume of oil that can leak. Dispatch LOGP personnel to survey the right-of-way for a possible leak and check the pressure in each isolated line segment.
- If pressures remain stable, this could indicate a meter malfunction, and the appropriate field technician should be informed.

I.2.1.5 Flow Rate Decrease

A flow decrease will be identified by the crude oil meters at Platform Irene and the LOGP. The most likely causes of a flow decrease are the following:

- Loss of gas lift, Oil Shipping Pump failure or control valve failure at Platform Irene.
- A process upset in the Platform Irene Gross Separators or one or more production wells being shut-in at the platform.
- An Emergency Shutdown of Platform Irene.
- Closure of Oil Pig Launcher Bypass MOVs at Platform Irene
- Closure of Pipeline MOVs at Valve Stations 1, 2, 4, 7, 8, or 10.
- Closure of Crude Pig Receiver Bypass MOV-31 at the LOGP.
- Process upset at the LOGP reducing the crude oil throughput. If the process upset is severe enough to cause a level or pressure shutdown in the Gas Oil Separator, Shipping Vessel or Flare Scrubber, SDV-40 at the LOGP will automatically close and the crude oil pipeline will be shut-in.
- An “Oil Process Stop” shutdown or an Emergency Shutdown at the LOGP.
- A pig stuck in the pipeline. The most likely places would be the check valves at Valve Stations 3, 5, 6, and 9.

- A pipeline leak. Check the Leak Detection Computer for any alarms. If a leak is present, follow the Irene to LOGP flow chart at the end of this section to determine the proper corrective action.
- Flow meter calibration error or failure.

In the event of a flow decrease the operator should do the following:

- Use the ABB System to verify that all Pipeline MOVs are open. Also confirm that the LOGP MOVs and SDV-40 are open and the Wet Crude Heat Exchangers and Gas Oil Separator are operating normally.
- Contact the Platform Irene Operator and find out if a process upset, Gas Lift Compressor failure, Oil Shipping Pump failure or Platform ESD has occurred. Also confirm if a pig has been launched.
- If a leak is suspected, the Operator should use the ABB System to close all the Pipeline MOVs. LOGP personnel should survey the pipeline right-of-way for a possible leak and check the pressure in each isolated line segment. If there is a leak, the pressure in the leaking pipeline section will be significantly below the pressure in the adjacent segments.
- Check the pressure readings from the transmitters at Platform Irene, Valve Station 2 and the LOGP. If no transmitter is indicating low pressure and there are no other indications of problems, dispatch LOGP personnel to checkout the meter. Have the meter recalibrated if a problem is suspected.

I.2.2 PLM (Pulse Meter) Imbalance

I.2.2.1 System Over

If either the short and/or long-term alarms are indicating an overage (extra barrels), verify the pulse meter is working on the shipping end of the system. Also, check Daniels meter on the receiving end against actual flow rate.

I.2.2.2 System Short

When the system is indicating a short and/or long-term point shortage and is in an alarm condition, immediate steps are to be taken to ascertain if the condition is caused from communication problems or an actual loss of product.

Check for a pressure loss and/or flow changes; verify this with Platform Irene and the LOGP. If a pressure loss has occurred, or you are unable to determine the cause, shut down and notify the Foreman to cover the line.

Check for possible loss of meter pulses at Platform Irene. If the line is shut down and the problem is still not determined, a stand-up pressure test will be needed before resuming operations.

I.2.3 Unintended Station Shutdowns

Unintended station shutdowns are potentially serious situations and in all cases the Foreman should be notified unless the operator is confident that the situation has been cleared and will not reoccur and that no station damage has occurred. An unintended shutdown of the 20" crude oil pipeline can occur because of (1) an unintentional ESD at Platform Irene or the LOGP, (2) an unauthorized or accidental closure of a pipeline MOV or (3) a malfunction of the automatic pressure shutdown system at Platform Irene or the LOGP. Prior to restarting the pipeline verify that the ESD or valve closure was a mistake and a process upset or pipeline leak did not occur. If the valve closure occurred at one of the Valve Stations, send LOGP personnel to the site to verify the valve position and confirm the valve controls and RTU communications link equipment are working properly. Finally, if a malfunction of the automatic pressure shutdown system caused the unintended shutdown, replace/recalibrate the failed component prior to restarting the pipeline. Do not attempt to operate the crude oil pipeline without the pressure shutdown system as this is the primary safety and leak detection system for the pipeline.

I.2.3.1 Unintended Movement of Valves

Unintended closure of a pipeline MOV could be caused by an errant communications signal or unauthorized closure. The open/close status of the pipeline MOVs is displayed on the ABB System at the LOGP. As a result, any unintended valve closure should be easily corrected from the ABB System. If the valve will not respond to the ABB System command, dispatch LOGP personnel to the site to determine the actual valve position and the cause of the problem.

The pipeline MOVs and most of the MOVs at the LOGP and Platform Irene will not change their open/close position if an AC power failure, RTU communications failure, or instrument air/nitrogen system failure occurs. The only valves that fail close on loss of AC power or instrument air are SDV-171 on Platform Irene and SDV-40 at the LOGP.

The pipeline MOVs are not provided with an automatic leak detection system to initiate automatic valve closure. The only automatic valve closure is caused by the high/low pressure shutdown systems at Platform Irene and the LOGP.

I.2.3.2 Operation of Safety Devices

The 20" crude oil pipeline is not provided with any pressure safety valves. The maximum discharge pressure that can be produced by the centrifugal oil shipping pumps on Platform Irene exceeds the new 1194 MAWP. A redundant high pressure switch has been added downstream of the oil pig launcher to provide a second level of protection above PSH-171 (810 psi). PSH-172 is tied into the emergency shutdown and is set at 948 psi. The crude oil pipeline is also protected by an automatic high low pressure detection system. If high or low pressure is detected at Platform Irene or the LOGP, this system automatically closes the shutdown valve at the facility where the abnormal pressure is detected.

The pig launcher and receiver at each end of the crude oil pipeline are provided with small, 3/4" x 1" thermal relief valves. These relief valves only protect a blocked in launcher or receiver from overpressure caused by thermal expansion.

Pipeline Alarms

ABB System

All the Valve Stations are provided with trouble alarms monitored by the ABB (Asea, Brown, Boveri) System at the Lompoc LOGP. Alarms are evident to the operator by:

- Visual flashing of the abbreviation on screen.
- Visual and audible printing of the alarm on the event logger.
- An audible high-pitched horn from the control panel.

At Valve Stations 1, 2, 4, 7, and 8 alarms are provided for AC power failure and low nitrogen pressure for the MOV actuator. Valve Station 10 receives electric power from the LOGP so only a low nitrogen pressure alarm is provided. LOGP personnel should immediately be sent to the valve site to verify the problem occurred and either initiate electrical repairs or change out the primary nitrogen cylinders. Reserve nitrogen cylinders and DC backup batteries are provided at each Valve Station so remote valve operation and open/close status indication to the ABB System is maintained.

Valve Station 2 is also equipped with pressure sensors which transmit the local pipeline pressure of the following pipelines to the LOGP Control Room Operator.

- 20" Oil Pipeline
- 8" Gas Pipeline
- 8" Water Pipeline

Valve Stations 3, 5, 6 and 9 have check valves instead of isolation (ball) valves. These valve stations do not require nitrogen so only an AC power failure alarm is provided.

The underground valve vaults at Valve Stations 1, 3, and 4 as well as above ground Valve Station 2 are equipped with H2S gas detectors. The ABB System displays the H2S PPM level and initiates a high H2S alarm when a 20 ppm concentration is detected. Valve Stations 1, 2, 4, 7, 8, and 10 also have a Valve Sequence Failure Alarm. If the pipeline MOV at one of these valve stations fails to respond to an open/close command from the ABB System within 30 seconds, the Valve Sequence Failure Alarm will be actuated. LOGP personnel should be immediately dispatched to the valve site to determine if the alarm is due to a RTU System communications problem, valve failure, nitrogen system failure or an electrical problem.

Pipeline Leak Detection System

The Pt. Pedernales facilities have a computerized leak detection system that is used to monitor and detect leaks in the Platform Irene oil pipeline between the platform and the LOGP. A dedicated computer running ATMO PipeLDS software continuously monitors the pipeline pressures and flowrates. The program utilizes a statistical analysis of the pipeline flowing parameters to detect a leak. Typically a leak of 3.5% would be detected within 30 minutes. If a leak alarm occurs, the operator must follow the flow chart at the end of this section in order to

verify the leak and perform the proper corrective action. The leak detection computer is continuously monitored by the controller at LOGP.

Pressures are monitored at Platform Irene and the LOGP. If pressure crosses high or low shutdown set points as specified in the operating manual, then Shut Down Valves (SDVs) at the Platform and the LOGP will activate automatically. The August System is monitored by the controller at the LOGP.

The time it would take the pipeline monitoring system to detect a release is a function of the size of the release. A large leak or rupture would most likely be detected in 30 seconds or less. Smaller leaks could take longer to detect. The valves can then be closed remotely and production shut down on Platform Irene using the Emergency Shutdown Switch (ESD). This can be accomplished in 30 seconds. Adverse weather will have no affect on leak detection and shutdown operations.

Variation from Normal Operations

It is recognized that conditions may occur from time to time which may not be explicitly covered in the operational procedures. Variation from Normal Operating Procedures will not be allowed unless, in the judgment of the Operator, any of the following conditions exist which cannot be handled by defined procedures.

- Immediate threat to the safety or well-being of Company personnel, contractors, or the general public or environment.
- Immediate threat to Company property.
- Immediate threat of crude oil contamination.

The Foreman should be notified immediately upon variation from normal operating procedures. When possible, such notification should be in advance of the variation.

Returning to Normal Operation

After an abnormal operation has ended, field personnel shall be requested to remain at the affected facility or site to visually monitor the return to normal operation. The operator will monitor pressure and flow rates at the affected site and also the up and downstream locations at regular intervals to ensure a return to normal stabilized pipeline operations.

In addition to routine air patrol observations, hourly logging of over/short volume reading and continuous comparison of offshore/onshore flow rates by the pipeline operator, ATMOS provides us with a SCADA based leak detection system that will provide the pipeline operator with an audible alarm if a leak is suspect on the pipeline.

Irene to LOGP