MMS Department of the Interior

Offshore Facility Decommissioning Costs
Pacific OCS Region

September 17, 2004

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MMS Securing Ocean Energy & Economic Value for America

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Executive Summary

The Pacific OCS Region (POCSR) Offshore Facility Decommissioning Cost Team (OFDC) was formed to develop cost estimates for decommissioning offshore oil and gas facilities in the POCSR. This OFDC cost report covers operator compliance with OCS oil and gas regulations (30 CFR 250 and 256) for permanent plugging of wells; removal of well conductors and platform jackets to 15 feet below the mudline; decommissioning and removal of platform decks; decommissioning and removal of pipelines and powercables as appropriate; site clearance; and other lease and permit requirements. The report is one of the inputs used by the POCSR to determine if a Supplemental Bond is required from a lessee.

This report assumes that POCSR platforms will be completely removed and transported to shore for disposal. The decommissioning cost estimates for individual platforms are based on a decommissioning scenario that was developed by the OFDC for the 23 Pacific OCS oil and gas platforms. The scenario assumes six decommissioning projects will be conducted during the 2010-2025 period, and that 2-6 platforms will be removed during each project to minimize the high cost of mobilizing/demobilizing a heavy lift vessel from the Gulf of Mexico, North Sea, or Asia. The decommissioning scenario and methodology assumptions are described in detail in Section 2 of this report.

The decommissioning costs were developed by the OFDC based on information obtained from MMS files, oil and gas operators, consultants, and technical decommissioning studies funded by the Minerals Management Service (MMS). The decommissioning scenario developed by the OFDC for this cost study represents MMS's best professional judgment regarding the sequence and timing of future platform decommissioning activities in the POCSR. The MMS is planning to conduct a detailed update of this report every five years to incorporate new information that results from advances in technology or changes in market conditions, and Federal, State and local regulatory requirements. More frequent updates may be required if unanticipated advances in technology occur or if there is a significant change in regulatory requirements.

The cost report estimates costs for each phase of the decommissioning process: Engineering and Planning, Permitting and Regulatory Compliance, Platform Preparation, Well Plugging and Abandonment, Conductor Removal, Mobilization and Demobilization of Heavy Lift Vessels, Platform Structure Removal, Pipeline and Powercable Decommissioning, Platform Transportation and Disposal, and Site Clearance.

Platform decommissioning costs can vary widely due to factors such as location and type (complexity) of the facility, number of structures to be removed, water depth and weight associated with the structure, the number and depth of wells and conductors, removal method, and transportation and disposal options. Although water depth and weight (size) are key variables in determining the decommissioning costs for any particular activity, other factors may have significant impact on the decommissioning cost. For example, the costs of plugging and abandoning a well with deviation greater than 60 degrees will be much greater than the cost of plugging and abandoning a well with no deviation. Similarly, the cost of decommissioning a pipeline that must be removed will be much greater than the cost of decommissioning a pipeline that is approved to be abandoned in-place.

The costs of mobilizing and demobilizing a heavy lift vessel can also vary widely depending on the origin of the derrick barge and the number of platforms that are being decommissioned as a group. This cost of mobilizing and demobilizing a heavy lift vessel will be very high in POCSR due to fact that such vessels are currently stationed in the North Sea, Gulf of Mexico, or Asia. It is very unlikely that heavy lift vessels would be stationed in the POCSR unless there was a strong and prolonged market demand for such vessels. This situation is not considered likely to change in the foreseeable future.

Table 1 shows the estimated decommissioning cost for each platform in the POCSR. Appendix B shows the total cost for decommissioning for each platform by cost category.

Table 1 Platform Decommissioning Costs (2004 Dollars)

Platform	Decommissioning Cost
Platform A	$21,533,000
Platform B	$22,579,000
Platform C	$19,401,000
Edith	$22,265,000
Ellen	$33,176,000
Elly	$19,946,000
Eureka	$73,569,000
Gail	$70,191,000
Gilda	$33,906,000
Gina	$10,291,000
Grace	$27,405,000
Habitat	$23,550,000
Harmony	$129,842,000
Harvest	$71,274,000
Henry	$15,755,000
Heritage	$128,654,000
Hermosa	$64,827,000
Hidalgo	$52,859,000
Hillhouse	$20,743,000
Hogan	$21,849,000
Hondo	$77,051,000
Houchin	$21,318,000
Irene	$25,715,000
Total POCSR	$1,007,699,000

Figure 1 is a map showing the location of the POCSR platforms and pipelines. Maps showing platforms included in each decommissioning project are included in Appendix A.

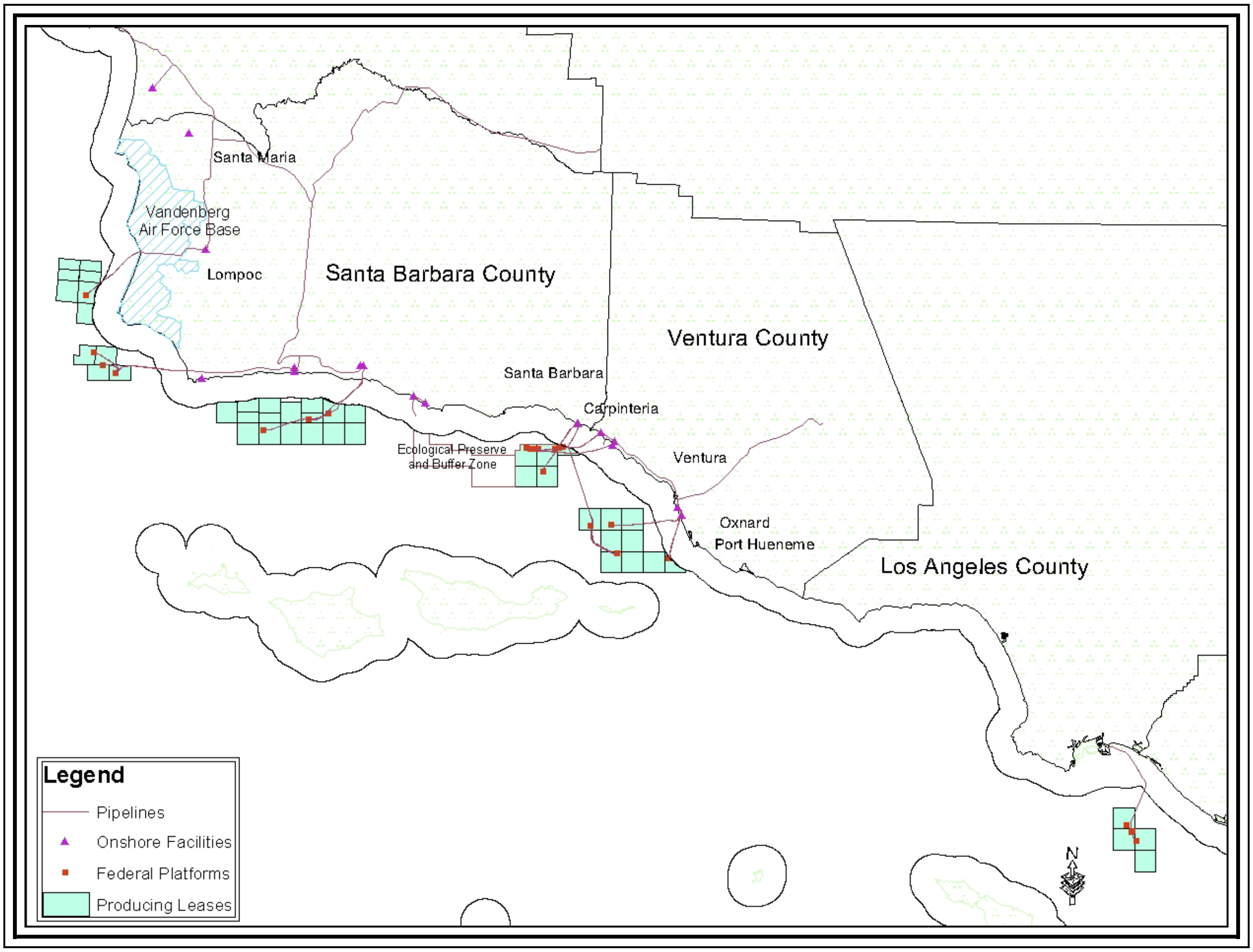

Figure 1 Federal Platforms and Pipelines in the Pacific OCS Region

Section 1: Introduction

The Pacific OCS Region (POCSR) Offshore Facility Decommissioning Cost Team (OFDC) was formed to develop cost estimates for decommissioning OCS oil and gas facilities in the POCSR. This cost study was prepared by the OFDC in accordance with Federal regulations (30 CFR 250 and 256) governing oil and gas operations decommissioning conducted on the OCS. The regulations specify requirements for plugging wells, decommissioning platforms and pipelines, and clearing a lease site. This report is one of the inputs used to determine if a lessee is required to post a Supplemental Bond to insure OCS lease decommissioning obligations are met. 30 CFR 256 and MMS Notice to Lessees No. 2003-N06 specify the requirements for Supplemental Bonds.

Development of the cost estimates required compilation of detailed and updated information on the offshore facilities in the POCSR, including: number of wells, number and weight of conductors, depth of productive interval, water depth, number of modules and weight of platform decks, depth and weight of platform jacket, location and size of pipelines, and location of powercables. The OFDC also conducted a literature review and collected cost data from industry sources. Much of the cost information presented in this report was obtained from technical decommissioning studies funded by the MMS, industry sources, and engineering and environmental consulting firms that have provided technical services to oil and gas companies in the POCSR and the Gulf of Mexico Region.

Decommissioning experience offshore California is very limited, as is information on costs. To date, only seven relatively small structures have been decommissioned; all were located in State waters. The most recent project occurred in 1996 when Chevron (now ChevronTexaco) removed Platforms Hope, Heidi, Hilda, and Hazel. These platforms were in water depths ranging from 100 to 140 feet and had an approximate total weight of 12,000 tons. In a news release dated April 17, 1996, Chevron reported that the cost of the final phase of dismantling and removing the four platforms was approximately $19 million. This cost did not include the costs to permanently plug 134 wells on the platforms. Local media coverage and industry journal articles reported that the total project cost ranged between $35 million and $40 million.

The private sector has compiled a significant amount of technical and cost data on platforms that have been decommissioned in the Gulf of Mexico. The majority of this data covers platforms that were located in water depths of less than 200 feet. From 200 to about 300 feet, there is less data available because fewer decommissioning projects have occurred in these water depths. Beyond a water depth of about 300 feet, the experience and data decline to the point where industry estimates and our cost estimates are based primarily on projections. It is clear, however, that decommissioning costs will rise steeply as decommissioning activities move from shallow water near shore to deeper water environments farther offshore.

Relative to the Gulf of Mexico, the POCSR has a high percentage of large deepwater structures. Of the 23 platforms, 14 (61%) are located in water depths exceeding 200 feet.

Moreover, 8 (35%) of OCS platforms are located in water depths that exceed 400 feet, which approximates the current worldwide water depth record for a platform removal project. The removal weight for individual platforms ranges from about 1,100 to nearly 70,000 tons. Table 1-1 provides information on water depth, weight, year installed, and field/unit for each of the 23 Pacific OCS platforms.

Each step in the decommissioning process is discussed individually in the sections that follow: Engineering and Planning, Permitting and Regulatory Compliance, Platform Preparation, Well Plugging and Abandonment, Conductor Removal, Mobilization and Demobilization, Platform and Structural Removal, Pipeline and Powercable Decommissioning, Platform Transportation and Disposal, and Site Clearance. Although water depth and weight (size) are key variables in determining the decommissioning costs for any particular activity, other factors may have significant impact on the decommissioning cost. These factors are addressed in the appropriate section.

The appendices include detailed specifications for the offshore facilities in the POCSR, estimated decommissioning cost by component for each platform, and detailed cost tables for selected decommissioning elements. Also included in the appendices are maps of the decommissioning projects used to determine the costs for this report.

The OFDC Team consisted of subject matter experts from several offices in the POCSR: Frederick L. White, Catherine Hoffman, John Smith, Michael Mitchell, Glenn Shackell, Eddie Lee Lim, and David Gebauer, with Rishi Tyagi as the team sponsor.

Table 1-1 Pacific OCS Region Platforms

Platform	Water Depth (in feet)	Estimated Removal* Weight (tons)	Year Installed**	Field/Unit
A	188	4,090	1968	Dos Cuadras
B	190	4,095	1968	Dos Cuadras
C	192	4,010	1977	Dos Cuadras
Edith	161	8,298	1983	Beta/Beta
Ellen	265	11,300	1980	Beta/Beta
Elly	255	9,400	1980	Beta/Beta
Eureka	700	34,000	1984	Beta/Beta
Gail	739	31,320	1987	Sockeye/Santa Clara
Gilda	205	9,342	1981	Santa Clara/Santa Clara
Gina	95	1,102	1980	Hueneme/Pt. Hueneme
Grace	318	9,390	1979	Santa Clara/Santa Clara
Habitat	290	8,853	1981	Pitas Point/Pitas Point
Harmony	1,198	69,920	1989	Hondo/Santa Ynez
Harvest	675	30,190	1985	Pt. Arguello/Pt. Arguello
Henry	173	3,118	1979	Carpinteria
Heritage	1,075	60,556	1989	Pescado/Santa Ynez
Hermosa	603	28,131	1985	Pt. Arguello/Pt. Arguello
Hidalgo	430	21,421	1986	Pt. Arguello/Pt. Arguello
Hillhouse	190	3,738	1969	Dos Cuadras
Hogan	154	4,110	1967	Carpinteria
Hondo	842	27,250	1976	Hondo/Santa Ynez
Houchin	163	4,637	1968	Carpinteria
Irene	242	7,652	1985	Pt. Pedernales/Pt. Pedernales Tranquillon Ridge/Tranquillon Ridge

* Estimated Removal Weight includes the weight of the jacket, deck, piles, and conductors and assumes that they are removed to a depth of 15 feet below the mudline.

** Year Installed Date is the jacket installation launch date.

Section 2: Decommissioning Cost Assumptions and Scenario

This section provides a description of the decommissioning cost assumptions and scenario used in this report to estimate decommissioning costs for POCSR platforms and associated pipelines and powercables. The decommissioning scenario assumes that the platforms will be completely removed and the materials transported to shore for recycling or disposal. The decommissioning costs were developed by the OFDC based on information obtained from MMS files, oil and gas operators, consultants, and technical decommissioning studies funded by MMS and others. The decommissioning scenario represents MMS's best professional judgment regarding the sequence and timing of future platform decommissioning activities in the POCSR. The timing and scope of future decommissioning operations could differ markedly from this scenario, due to economic, technological, and other factors.

Decommissioning Cost Assumptions

- Costs are estimated in 2004 dollars.
- Conventional state-of-the-art technology (reverse installation using heavy lift vessels) will be used to remove platforms.
- A total of 6 OCS decommissioning projects are projected to be conducted during 2010-2025; all of the POCSR oil and gas platforms (23 facilities) will be removed during this period.
- During each project a total of 2-6 platforms will be decommissioned using heavy lift vessels mobilized from the Gulf of Mexico, North Sea or Asia.
- Platforms will be completely removed and transported to shore for disposal.
- Pipelines will be decommissioned in-place, partially removed, or completely removed from the OCS as appropriate (costs are estimated on a case-by-case basis).
- Powercables will be decommissioned in-place, partially removed, or completely removed from the OCS (costs are estimated on a case-by-case basis).

Scope of Cost Analysis

This section provides a listing of the items that are included in the cost estimates presented in this report. Also listed are items for which costs were not estimated. The cost estimates presented in this report were developed to support Federal bonding decisions to cover decommissioning obligations on Federal OCS leases. The report therefore does not include cost estimates for decommissioning oil and gas facilities and equipment located onshore or in State waters. The report also does not include certain other costs which could be individually and cumulatively significant if they happen to be included in an actual decommissioning project. These other costs include environmental mitigation costs imposed by other agencies, shell mound remediation, and the cost of retaining of a decommissioning agent (e.g., a civil engineering firm) having the specialized expertise to plan and manage a decommissioning project.

The decommissioning costs for platform structure removal and pipeline and powercables include a weather contingency of 10% or 20% . The 20% contingency factor has been applied only to Platforms Harvest, Hermosa, Hidalgo, Heritage, and Irene due to the harsher oceanographic conditions that exist in the areas where these platforms are located. In addition to the weather contingency, we have applied a 20% general contingency factor to cover unanticipated problems and potential cost overruns. The weather and general contingency factors were not applied to the mobilization and demobilization portion of the decommissioning costs.

Costs Included

- Engineering and Planning
- Permitting and Regulatory Compliance (including selected environmental mitigation costs typically required)
- Platform Preparation
- Well Plugging and Abandonment
- Conductor Removal
- Mobilization and Demobilization (Mob/Demob) of Heavy Lift Vessels
- Platform Structure Removal
- Pipeline and Powercable Decommissioning
- Platform Transportation and Disposal
- Site Clearance and Verification
- General and Weather Contingency Factors

Costs Not Included

- Decommissioning of pipelines and powercables located on State Tidelands (submerged lands located 0-3 miles offshore) or onshore.
- Decommissioning of onshore pipelines and powercables.
- Decommissioning of marine terminals, piers, and other associated equipment located on State Tidelands.
- Decommissioning of associated onshore oil and gas processing facilities.
- The costs of capping or removing shell mounds at OCS platforms, since this will be reviewed on a case-by-case basis.
- The cost of retaining a Decommissioning Agent.
- Special environmental mitigation costs (e.g., air emissions/vessel engine retrofit expenses, water quality, and habitat restoration) that are difficult to estimate due to their variability and case-by-case applicability.
- Non-MMS agency permit processing fees and reimbursable expenses.

Decommissioning Scenario

This section describes the 6 decommissioning projects that are projected to be conducted during 2010-2025 (see Table 2-1.) As noted above, a total of 2-6 platforms are expected to be removed during each project. For each project, a heavy lift vessel (HLV) is assumed to be mobilized from the Gulf of Mexico, North Sea, or Asia. The HLV's projected to be used have lift capabilities of 500 tons, 2,000 tons, and 4,400 tons. The type of HLV selected for each project was determined based on the size (total weight) of each individual platform included in the project, the projected maximum lift packages, and oceanographic considerations. A number of factors were considered in developing the projects, including the size, age and geographic location of the platforms, remaining oil and gas reserves, water depth, and company operators/ownership. For each project, the HLV mob/demob costs are allocated evenly among platforms.

Project I – Eastern Santa Barbara Channel

- Platforms Hogan and Houchin are projected to be removed during 2010-2015.
- An HLV with a lift capability of 500 tons will be mobilized from Asia.
- The estimated mob/demob time is 100 days.

Project II – South Coast (Los Angeles/Orange County)

- Platforms Eureka, Elly, Ellen and Edith are projected to be removed during 2010-2015.
- An HLV with a lift capability of 2,000 tons will be mobilized from Asia.
- The estimated mob/demob time is 100 days.

Project III – Eastern Santa Barbara Channel

- Platforms A, B, C, Henry, Hillhouse and Gina are projected to be removed during 2010-2015.
- An HLV with a lift capability of 2,000 tons will be mobilized from Asia.
- The estimated mob/demob time is 100 days.

Project IV – Eastern Santa Barbara Channel

- Platforms Gilda, Irene and Habitat are projected to be removed during 2010-2015.
- An HLV with a lift capability of 2,000 tons will be mobilized from Asia.
- The estimated mob/demob time is 100 days.

Project V – Southern Santa Barbara Channel/Santa Maria Basin

- Platforms Gail, Grace, Hermosa, Harvest, and Hidalgo are projected to be removed during 2015-2020.
- An HLV (dynamically positioned mono-hull) with a lift capability of 4,400 tons will be mobilized from the Gulf of Mexico or North Sea.
- The estimated mob/demob time is 200 days.

Project VI – Western Santa Barbara Channel

- Platforms Hondo, Harmony, and Heritage are projected to be removed during 2020-2025.
- An HLV (dynamically positioned mono-hull) with a lift capability of 4,400 tons will be mobilized from the Gulf of Mexico or North Sea.
- The estimated mob/demob time is 200 days.

Table 2-1 Projected Decommissioning Projects

Platform	Year Installed	Water Depth (feet)	Deck Weight (tons)	Jacket Weight* (tons)	Projected Removal Timeframe	Projected HLV Lift Capability (tons)
Project I – Eastern Santa Barbara Channel						
Hogan	1967	154	2,259	1,263	2010-2015	500
Houchin	1968	163	2,591	1,486	2010-2015	500
Project II – South Coast (Los Angeles/Orange County)						
Eureka	1984	700	8,000	19,000	2010-2015	2,000
Elly	1980	255	4,700	3,300	2010-2015	2,000
Ellen	1980	265	5,300	3,200	2010-2015	2,000
Edith	1983	161	4,134	3,454	2010-2015	2,000
Project III – Eastern Santa Barbara Channel						
A	1968	188	1,357	1,500	2010-2015	2,000
B	1968	190	1,357	1,500	2010-2015	2,000
C	1977	192	1,357	1,500	2010-2015	2,000
Henry	1979	173	1,371	1,311	2010-2015	2,000
Hillhouse	1969	190	1,200	1,500	2010-2015	2,000
Gina	1980	95	447	434	2010-2015	2,000
Project IV – Santa Barbara Channel/Southern Santa Maria Basin						
Gilda	1981	205	3,792	3,220	2010-2015	2,000
Irene	1985	242	2,500	3,100	2010-2015	2,000
Habitat	1981	290	3,514	2,550	2010-2015	2,000
Project V – Santa Barbara Channel/Southern Santa Maria Basin						
Gail	1987	739	7,693	18,300	2015-2020	4,400
Grace	1979	318	3,800	3,090	2015-2020	4,400
Hermosa	1985	603	7,830	17,000	2015-2020	4,400
Harvest	1985	675	9,024	16,633	2015-2020	4,400
Hildalgo	1986	430	8,100	10,950	2015-2020	4,400
Project VI – Western Santa Barbara Channel						
Hondo	1976	842	8,450	12,200	2020-2025	4,400
Harmony	1989	1,198	9,826	42,900	2020-2025	4,400
Heritage	1989	1,075	9,839	32,420	2020-2025	4,400

* Jacket Weight is the weight of the jacket only and does not include the weight of the deck, conductors or piles.

Section 3: Decommissioning Methodology

This section describes the methodology on which the decommissioning costs in this report are based. The methodology is consistent with the cost assumptions previously described and with MMS decommissioning requirements (30 CFR Parts 250 and 256) and standard industry practice.

Well Plugging and Abandonment

- All unplugged and temporarily abandoned wells will be permanently plugged and abandoned (P & A) consistent with MMS requirements.
- An existing platform rig or an acquired rig will be used to P & A wells (rigless methods will not be used except on Platform Grace).
- This work will be completed prior to arrival of the heavy lift vessel (HLV).

Conductor Removal

- All conductors will be removed to 15 feet below the original mudline.
- Mechanical cutting methods will be used to sever the conductors below the mudline.
- Casing jacks will used to make the initial lift to confirm that conductors have been completely severed below the mudline.
- The platforms drilling rig and crane or a combination of the rig and jacks or portable leapfrog cranes will be used to pull conductors.
- Mechanical cutting methods will be used to cut the conductors into 40-foot-long segments.
- The platform crane will place the cut sections on a workboat for transport to an onshore disposal site.
- This work will be completed prior to arrival of the HLV.

Platform Preparation

- A platform inspection, above and below the water line, will be conducted to determine the condition of the platform and identify potential problems with salvage. The inspection will be conducted by divers or by a combination of divers and remotely operated vehicles.
- All piping and equipment on the platform that contained hydrocarbons will be flushed and cleaned.
- All modules to be removed separately from the deck will be detached from the platform structure using oxygen-acetylene cutting torches.
- The piping, electrical, and instrumentation connections between modules will also be cut.
- Modules and captrusses (support frames) will be prepared for removal; new padeyes and lift supports will be installed; welds around bearing joints will be removed; and external equipment obstructing module lifts will be removed.
- It is assumed that 50% of the number of padeyes necessary for making the deck structure lifts must be fabricated and installed.

- Diving crews will use 10,000 psi water blasters to remove marine growth from the jacket to a water depth of approximately 100 feet; the dive spread will be set up on the platform; this work will be completed prior to the arrival of the HLV.
- The remaining marine growth attached to the deeper jacket sections will be removed after the HLV places the sections on the cargo barges; topside crews will use high-pressure water blasters to remove the marine growth.

Pipeline Decommissioning

- All pipelines will be flushed and cleaned
- Divers or an ROV will then expose the ends of the pipeline and cut the line above the riser bend and approximately 10 feet from the base of the jacket.
- Pipelines will be evaluated by MMS on a case-by-case basis during the permitting process, to determine whether they will be approved to be left in place or required to be partially or totally removed.
- Pipelines approved to be left in place will be required to be capped and their ends buried 3 feet below the mudline or covered with protective mats (e.g., articulated concrete mats).
- Pipelines or pipeline segments that have the potential to present an obstruction to other users will be removed.
- Pipeline segments that are removed will be transported to shore, cut into smaller segments, and transported to a disposal site.
- A small crane barge will be mobilized from the southern California area to remove pipelines if necessary.

Powercable Decommissioning

- Powercables that an operator has committed to removing will be removed (e.g., ExxonMobil's Santa Ynez Unit powercables).
- Other powercables will be evaluated on a case-by-case basis by MMS to determine whether they may be left in place or will be required to be partially or totally removed.
- Powercables or segments of powercable determined to have the potential to present an obstruction to other users will be removed.
- Powercable segments that are removed will be transported to shore, cut into segments, and transported to a disposal site.
- Powercables approved to be left in place will be required to have their ends capped and buried 3 feet below the mudline, or covered with protective coverings (e.g., articulated concrete mats).
- A special cable lay/retrieval vessel will be mobilized from the east coast of the U.S., Europe, or Asia to remove large segments of cable if necessary.

Mobilization and Demobilization of Vessels

- HLV's and their anchor handling tugs will be mobilized from the Gulf of Mexico, North Sea or Asia.
- Cargo barges will be mobilized from California or the Pacific Northwest

- Cargo barges will be outfitted at a fabrication yard with steel pads (load spreaders) to support the point loads of the deck modules and jacket sections.
- Support vessels and dive boats will be mobilized from southern California.
- Local crew boats and workboats will be utilized to the maximum extent practicable.

Topsides Removal

- Topside modules will be removed (reverse installation) and placed on cargo barges.
- The deck section or support frames (captrusses) will be removed by cutting the welded connections between the piles and the deck legs with oxygen-acetylene torches.
- Slings will be attached to the deck/captrusses lifting eyes and to the HLV crane.
- The HLV crane will lift the deck sections from the jacket and position the sections in load spreaders.
- The deck sections will be secured by welding steel pipe from the deck legs to the deck of the cargo barge.

Topsides Transport and Onshore Disposal

- Tugboats and cargo barges will transport the topside modules and deck structures to a scrap yard located in the United States, Mexico, or Asia.
- Possible U.S. west coast destinations are Los Angeles, Long Beach, San Diego, San Francisco, California and Portland, Oregon.
- The modules will be lifted off the cargo barges by dockside cranes or skidded off the barge.
- All of the structural components will be cut into small pieces and transported to a scrap yard.
- Non-metallic materials (cement, plastics, wood, etc.) will be transported to shore for disposal in a landfill.

Jacket Removal

- Jackets will be sectioned in situ (in place) and removed.
- Piles and skirt piles will be severed 15 feet below the original mudline by explosives or abrasive cutting tools.
- Divers will be deployed to sever structural members and section the jackets.
- Saturation diving techniques will be required below 150 foot water depths.

Jacket Transport and Onshore Disposal

- Tugboats and cargo barges will transport the jacket sections to an onshore scrap yard located on the west coast of the U.S., in Mexico, or in Asia.
- Possible U.S. west coast destinations are Los Angeles, Long Beach, San Diego, San Francisco, California and Portland, Oregon.
- The jacket sections will be lifted off the barges by dockside cranes or skidded off the barge.
- The jacket sections will be cut into small pieces and transported to a scrap yard.

Site Clearance

- The seafloor impacted as a result of oil and gas exploration, development, production, and decommissioning operations will be restored to a condition that ensures the area has been cleared of all obstructions to other activities.
- Site clearance procedures will include the following elements:
    1. Pre-decommissioning high resolution side-scan survey (SSS)
    2. Post-decommissioning high resolution SSS
    3. ROV/diver target identification and recovery of obstructions
    4. Test-trawling
- The pre-decommissioning SSS will cover all areas of the lease where operations occurred, including pipeline and powercable routes, and anchoring and mooring locations to identify any potential oil and gas related obstructions.
- The post-decommissioning SSS will cover all areas where decommissioning activities occurred to identify debris and obstructions resulting from decommissioning operations.
- A dive boat/ROV spread will be deployed to inspect and retrieve debris or obstructions identified during the SSS surveys.
- Test trawling will be conducted to verify that all potential obstructions have been cleared from the OCS lease(s).

Section 4: Engineering and Planning

The engineering and planning phase of the decommissioning process typically begins two to three years before production ceases and involves (1) a review of contractual obligations, (2) engineering analysis, (3) operational planning, and (4) contracting. The first step involves conducting a detailed review of all records and decommissioning requirements including lease, operating, production/unit, pipeline, and production sales agreements. A detailed engineering analysis is also conducted of drilling records, as-built drawings, construction reports, maintenance records and inspection reports. Field inspections are done to verify the structural integrity of the platform and examine the present condition of the wellheads and equipment. Based on this information, detailed engineering plans are developed for plugging and abandoning the wells, severing the conductors and piles, removing the topsides and jacket, and disposing of the materials. Concurrently, a comprehensive survey of decommissioning vessels and equipment is made to determine their availability and cost. Bids are then solicited and contractors selected.

Due to the limited availability of heavy lift vessels, contracting for such vessels is typically done two to three years in advance. Although some engineering functions can be conducted in-house if expertise exists, many steps in the decommissioning process require specialized expertise and the company must contract for this expertise. These steps include mechanical, abrasive, or explosive cutting services, civil engineering services to design and prefabricate the modules for individual lifts, and diving services. In addition, the services of firms having project management and engineering expertise specific to decommissioning are often secured to manage the complex logistics of the overall project.

Cost Assumptions

The costs of engineering and planning for decommissioning an offshore structure can vary widely, depending on the type of structure, its size and water depth, removal procedures, and transportation and disposal options. The costs can also vary widely depending on the degree to which costs can be internalized due to the availability of in-house engineering expertise. For this study, engineering and planning costs are estimated to be 8%, 10%, or 12% of the total structure removal cost which is calculated at $1,200 per ton (total platform removal weight). The percentage varies with platform water depth/size and is applied in the following manner: 0-200 foot water depths 12%, 201-450 foot water depths 10%, and >450 feet of water 8%. The $1,200 per ton cost figure was based on data obtained from a civil engineering company that compiles annual cost data on oil and gas platform decommissioning projects in the Gulf of Mexico. The cost figure represents the average cost of platform structure removal in 2002, the most recent year for which data was available.

Cost Estimates

The range of costs for the engineering and planning cost component is shown in Table 4-1. The costs range from a low of $159,000 to a high of $6.7 million. The tonnage figure is based on MMS's projection of the total weight to be removed during the dismantlement and removal phase of the project. The $1,200 per ton figure does not include well plugging and abandonment and conductor removal.

Table 4-1 Engineering and Planning Costs

Platform	Water Depth (feet)	Factor	Total Weight (tons)*	Total Costs
A	188	0.12	4,090	$589,000
B	190	0.12	4,095	$590,000
C	192	0.12	4,010	$578,000
Edith	161	0.12	8,298	$1,195,000
Ellen	265	0.10	11,300	$1,356,000
Elly	255	0.10	9,400	$1,128,000
Eureka	700	0.08	34,000	$3,264,000
Gail	739	0.08	31,320	$3,007,000
Gilda	205	0.10	9,342	$1,122,000
Gina	95	0.12	1,102	$159,000
Grace	318	0.10	9,390	$1,127,000
Habitat	290	0.10	8,853	$1,063,000
Harmony	1,198	0.08	69,920	$6,713,000
Harvest	675	0.08	30,190	$2,899,000
Henry	173	0.12	3,118	$449,000
Heritage	1,075	0.08	60,556	$5,814,000
Hermosa	603	0.08	28,131	$2,701,000
Hidalgo	430	0.10	21,421	$2,571,000
Hillhouse	190	0.12	3,738	$539,000
Hogan	154	0.12	4,110	$592,000
Hondo	842	0.08	27,250	$2,616,000
Houchin	163	0.12	4,637	$668,000
Irene	242	0.10	7,652	$919,000
Total	-	-	-	$41,659,000

* Total Weight is the estimated platform removal weight and includes the weights of the jacket, deck, piles, and conductors being removed to 15 feet below the mudline.

Section 5: Permitting and Regulatory Compliance

Permitting and regulatory compliance costs are incurred in obtaining the necessary Federal, State, and local permits required to conduct decommissioning operations and prepare the environmental documentation to satisfy the requirements of the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The costs to satisfy special environmental mitigation requirements that typically are placed on the project by regulatory agencies are also included in this cost component. Examples include marine mammal protection measures, air emission mitigation measures, commercial fishermen preclusion agreements, and pre- and post-decommissioning biological surveys. For decommissioning projects offshore California, these costs can be significant.

Federal agencies that have regulatory authority over various aspects of decommissioning projects include the MMS, National Marine Fisheries Service, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, U.S. Coast Guard, and the U.S. Department of Transportation, Office of Pipeline Safety. State and local agencies having regulatory jurisdiction over decommissioning operations in California include the California Coastal Commission, California State Lands Commission, California Department of Fish and Game, California Division of Oil, Gas and Geothermal Resources, California State Fire Marshal, County Planning and Resource Management Departments, and local Air Pollution Control Districts. Due to the numerous permits required and the complexity of the process, companies that have decommissioned structures offshore California have typically contracted with local consulting firms to obtain technical, environmental and administrative support services.

Information on permitting and regulatory compliance costs for decommissioning projects is limited. To develop information on these costs, we surveyed public literature and contacted several local consulting firms that have provided technical, environmental, and administrative services for decommissioning projects in southern California. Based on this survey, we determined that the majority of the costs were for air emission mitigation measures, marine mammal mitigation measures, agency administrative fees, environmental consultants, and commercial fishermen preclusion agreements. Much of the information that is available pertains to the removal of Platforms Hope, Heidi, Hilda, and Hazel, commonly referred to as the Chevron 4-H Project, which was completed in 1996. Table 5-1 provides a perspective on some of the major permitting and regulatory compliance costs associated with this project:

Table 5-1 Chevron 4-H Permitting and Regulatory Compliance Costs

Permitting and Regulatory Cost Elements	Cost
Santa Barbara County Air Emission Offset Fees	$450,000
California State Lands Commission Administrative Fees	$450,000
Marine Mammal and Wildlife Protection Plan	$200,000
Environmental Consultants	$200,000
Commercial Fishermen Preclusion Agreements	not available

The costs of air emission offsets were obtained from the Chevron news release dated April 17, 1996. The California State Lands Commission (SLC), Marine Mammal and Wildlife Protection Plan, and environmental consultant cost estimates were provided by SLC, Chevron, and environmental consulting firms. The $450,000 paid by Chevron to SLC was required to cover the SLC's engineering and CEQA environmental document preparation fees and mitigation monitoring expenses. Chevron also developed and implemented a comprehensive marine mammal and wildlife protection plan for the project. Chevron estimated that it cost approximately $200,000 to develop and implement the plan, which equates to $50,000 per platform.

Companies conducting oil and gas projects offshore California typically provide compensation to commercial fishermen who are precluded from fishing in areas they commonly fish due to the presence of barges, workboats, and other construction related vessels. The cost of preclusion agreements is contingent upon the scope, location, and duration of the project. The costs are considered proprietary by the companies and fishermen.

Cost Assumptions

For this study, we have included costs for NEPA and CEQA environmental documentation, marine mammal observers, environmental consultants, pre- and post construction biological surveys, and compensating fishermen for being precluded from fishing in the area where decommissioning operations are conducted. The MMS estimates that it would cost $1.2 million dollars to prepare a NEPA Environmental Impact Statement for a decommissioning project that would involve removing two or more platforms. For the purposes of this study, we have assumed the costs of NEPA/CEQA environmental documentation will total $300,000 per platform. For marine mammal monitoring, we estimate that the costs will be $50,000 per platform. As noted earlier, explosives are likely to be used to sever the pilings of the structure. We have also assumed that this cost would be incurred even if explosives were not used, since marine mammal mitigation measures have been required for many recent offshore projects that did not involve the use of explosives. We have estimated the cost of environmental consultants to be $100,000 per platform, the cost of biological surveys to be $50,000 per platform and the cost of compensating fishermen to be $50,000 per platform. It should be noted that this report does not attempt to estimate costs for other potential environmental mitigation measures such as air emission/vessel engine retrofit expenses, and habitat restoration. Air emission offset fees were not considered applicable due to the fact that a state law was enacted subsequent to the Chevron 4-H Project that prohibits local Air Pollution Control Districts from imposing such fees.

Cost Estimates

Based on the above information, permitting and regulatory compliance costs are estimated to total $550,000 per platform. The costs are itemized in Table 5-2.

Table 5-2 Permitting and Regulatory Compliance Costs

Permitting and Regulatory Cost Elements	Cost
NEPA/CEQA costs	$300,000
Marine Mammal Monitoring	$50,000
Environmental Consultants	$100,000
Special Biological Surveys	$50,000
Commercial Fishing Preclusion Agreements	$50,000
Total Per Platform	$550,000

Section 6: Platform Preparation and Marine Growth Removal

Platform preparation includes the procedures associated with shutting down and preparing the facility for removal. Normally a crew paid on a day rate prepares the structure for decommissioning after the wells have been permanently plugged and abandoned. Above water and below water inspections are generally conducted to determine the condition of the structure and to identify any problems to removal. Divers and/or remotely operated vehicles (ROV's) assist in the inspections. On the surface, the work includes the flushing/cleaning and degassing/purging of tanks, processing equipment and piping, disposal of residual hydrocarbons, removal of platform equipment, cutting of piping and cables between deck modules, separation of modules into individual units, installation of padeyes for deck module lifting, removal of obstructions to lifting, and structural reinforcement. Below the water surface, the jacket can be prepared to aid in jacket facilities removal, including the removal of marine growth from the structure.

The key factors affecting the cost of platform preparation include structure size and complexity, topsides equipment (especially amount of processing equipment), and age of the facility. The costs can vary widely depending on the type of facility, removal procedures, and transportation and disposal options. The costs can also vary depending upon the degree to which costs can be internalized due to the availability of in-house manpower and expertise.

For this study, we assumed that marine growth will be removed from the structure, including the conductors and boat landings, by divers down to approximately 100 feet below the ocean surface. This will remove most of the heavy, hard marine growth. The balance of the marine growth will be removed using topside crews and high-pressure water blasters and/or fixed firewater monitors (nozzles) once the jacket or jacket section is on the deck of the barge. The in-water cleaning operations will be completed with the dive equipment set up on the platform to eliminate the need and added cost that would be incurred if the operations were conducted from a dedicated dive vessel.

Range of Costs and Assumptions

MMS has reviewed past Technology Assessment and Research Program studies, other studies conducted by various companies and contractors, and technical publications to assist us in estimating platform preparation costs. We also consulted with engineering firms that conduct such cost studies and a company that conducts marine growth cleaning operations. Table 6-1 shows our estimate of the number of days and platform preparation spread rate, marine growth removal cost, and total cost that would be required to prepare each of the 23 POCSR platforms for decommissioning as described above, including removing the marine growth from each structure. We assumed that a platform removal preparation spread would consist of a utility boat, helicopter use (1 trip/3 days), a preparation crew and materials and supplies. A higher spread rate and cost, due to a larger platform preparation crew and more equipment, was assumed for the larger, more complex topside structures based upon previous cost studies.

Table 6-1 Platform Preparation and Marine Growth Removal Costs

Platform	Platform Prep. Days	Prep. Spread Rate	Marine Growth Removal	Total Cost*
A	19	$19,000	$400,000	$761,000
B	19	$19,000	$400,000	$761,000
C	19	$19,000	$400,000	$761,000
Edith	18	$19,000	$600,000	$942,000
Ellen	20	$19,000	$600,000	$980,000
Elly	46	$19,000	$600,000	$1,474,000
Eureka	31	$45,000	$850,000	$2,245,000
Gail	43	$45,000	$850,000	$2,785,000
Gilda	44	$19,000	$600,000	$1,436,000
Gina	22	$19,000	$150,000	$568,000
Grace	35	$19,000	$600,000	$1,265,000
Habitat	39	$19,000	$600,000	$1,341,000
Harmony	59	$45,000	$1,500,000	$4,155,000
Harvest	55	$45,000	$850,000	$3,325,000
Henry	31	$19,000	$400,000	$989,000
Heritage	55	$45,000	$1,200,000	$3,675,000
Hermosa	55	$45,000	$850,000	$3,325,000
Hidalgo	47	$45,000	$700,000	$2,815,000
Hillhouse	32	$19,000	$400,000	$1,008,000
Hogan	19	$19,000	$400,000	$761,000
Hondo	50	$45,000	$850,000	$3,100,000
Houchin	19	$19,000	$400,000	$761,000
Irene	35	$19,000	$600,000	$1,265,000
Total	-	-	$14,800,000	$40,498,000

*Total Cost is the Platform Prep. Cost (Platform Prep. Days times Prep. Spread Rate) plus Marine Growth Removal Cost.

Section 7: Well Plugging and Abandonment

Requirements

One of the major cost components of a decommissioning project is the plugging and abandonment of platform wells. Regulations covering this area are contained in Subpart Q of 30 CFR 250 and are summarized below:

- All wells shall be abandoned in a manner to assure downhole isolation of hydrocarbon zones, protection of freshwater aquifers, clearance of sites so as to avoid conflict with other uses of the Outer Continental Shelf (OCS), and prevention of migration of formation fluids within the wellbore or to the seafloor.

Procedures

Planning and operations are two distinct phases in the well plugging process. The planning and actual abandonment process entails: data collection (including review of existing well design encompassing degree of deviation, maximum angles, and dog leg severities, past performance, and present geological and reservoir conditions), preliminary inspection (including inspection of wellhead and tree to verify that valves and gauges are operational, with repairs made as necessary), selection of abandonment methods(s) (including consideration of using either rig methods, rigless methods, or coiled tubing methods, or a combination of these three methods), and submittal of an application for MMS approval.

The actual well abandonment operation involves: well entry preparations (including skidding the rig to the appropriate well slot, installation of back pressure valve, and the nippling-up and testing of blowout prevention equipment), use of slickline unit (including confirmation of the presence or absence of wellbore obstructions, verification of measured depths, and the pulling of downhole safety valves), filling the well with fluid (including establishing an injection rate into open perforations, and pressuring-up the tubing and annulus to verify integrity), removal of downhole equipment (including the pulling of packers, pumps, and tubing strings), cleaning out the wellbore (utilizing casing scrapers and a variety of special purpose fluids), plugging open-hole and perforated intervals(s) at the bottom of the well (including squeeze cementing, setting cast-iron bridge plugs, or the placement of cement plugs), plugging casing stubs (where casing has been cut and recovered), plugging of annular space (using squeeze cementing techniques), placement of a surface plug, and placement of fluid between plugs. Figure 7-1 provides a schematic view of the typical wellbore configuration.

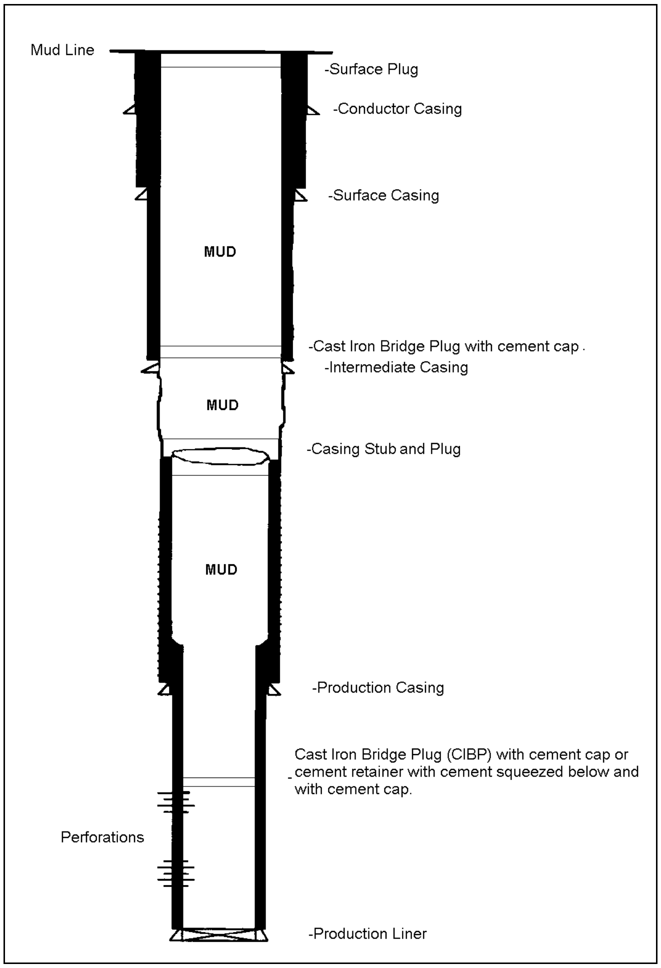

Figure 7-1 Schematic View of the Typical Wellbore Configuration

Cost Factors

The primary factor in determining costs to plug wells is the time required to complete the operation, which depends on the difficulty of each well. Table 7-1 shows the average daily cost for well plugging and abandonment.

Table 7-1 Average Daily Well Plugging and Abandonment Costs

Cost Item	Cost/Day
Workover rig and crew and supervision	$18,000
Mud/Mud Engineering	$2,000
Boat and helicopter support	$4,500
Cementing crew and cement	$3,000
Wireline unit and crew; perforations; rentals, tanks and other consumables	$7,500
Total	$35,000

The difficulty of each plugging and abandonment procedure is tied to the complexity of the well. For this study, four cost categories are used in estimating well plugging and abandonment costs.

- A low cost well will be a straightforward well without deviation problems or sustained annular pressures, and without pumps. A well of this type could be plugged in two to three days.
- A medium low cost well would be more complex with mid-range horizontal displacements with deviations less than 50° at the surface casing shoe. A medium low cost well could have minor complications such as stuck pipe or short-term milling or fishing operations. A medium low cost well can be plugged in three to four days.
- A medium high cost well could have high deviations between 50° and 60° at the surface casing shoe or extended reach wells. They may contain electric submersible pumps or sucker rod pumps. A medium high cost well would have greater operational difficulties and time delays due to hydrogen sulfide concerns, longer fishing or milling operations. A medium high cost well would take four to five days to plug.
- A high cost well could have high deviations with greater than 60° maximum angles, severe dog legs or extended reach. A high cost well can have operational difficulties including sustained annular pressures, parted casing, long term fishing or milling work, repeated trips in and out of the hole, etc. A high cost well would take six to ten days or longer to plug.

In all four cases it is assumed that a rig method would be used (most POCSR platforms have rigs on them that are capable of performing plugging and abandonment operations). Regardless of the technique used, plugs must be tagged to ensure proper placement and/or pressure-tested to verify integrity. Table 7-2 shows the average cost of plugging and abandoning a well for each cost category. Table 7-3 provides data regarding the number of wells, average well depth, number of conductors, and water depth for each platform in the POCSR. Total well plugging and abandonment costs by platform are shown in Table 7-4. There are 687 wellbores that require plugging and abandonment in the POCSR. The cost to plug and abandon these wells is estimated to total $89 million. Appendix C provides a detailed breakdown of well costs for each platform.

Table 7-2 Average Well Plugging and Abandonment Costs by Cost Category

Cost Category (Level of Complexity)	Cost/Well
Low cost well (2-3 days to plug and abandon)	$87,500
Med low cost well (3-4 days to plug and abandon)	$122,500
Med high cost well (4 – 6 days to plug and abandon)	$175,000
High cost well (6 – 10 days to plug and abandon)	$280,000

Table 7-3 Well and Conductor Details

Platform	Number of Wells to Plug	Average Well Depth (in Feet)	Number of Conductors to Remove	Water Depth (in Feet)	Conductor Length (in Feet)
A	52	2,500	55	188	268
B	57	2,500	55	190	270
C	38	2,500	43	192	272
Edith	18	4,500	23	161	241
Ellen	61	6,700	64	265	345
Elly	0	0	0	0	0
Eureka	50	6,500	60	700	780
Gail	21	8,400	22	739	819
Gilda	63	7,900	64	205	285
Gina	12	6,000	12	95	175
Grace	26	N/A	35	318	398
Habitat	20	12,000	20	290	370
Harmony	26	11,900	51	1,198	1,278
Harvest	19	10,000	21	675	755
Henry	23	2,500	24	173	253
Heritage	27	10,300	49	1,075	1,155
Hermosa	13	9,500	16	603	683
Hidalgo	10	10,700	10	430	510
Hillhouse	47	2,500	52	192	272
Hogan	40	5,400	40	154	234
Hondo	29	12,700	28	842	922
Houchin	36	5,100	36	163	243
Irene	24	9,800	24	242	322

Well depth is a less significant cost factor than plugging difficulty. Deeper wells involve longer tripping times and may include additional cement volumes. Measured depths of productive intervals for wells in the POCSR range from less than 1,000 feet to more than 17,000 feet.

Service and supply companies are highly competitive and offer substantial discounts (up to 35%) for multiple well packages. Costs associated with plugging of wells in all four well categories are based on multiple-well price packages, and represent the lowest daily unit costs for some goods and services.

There are 687 wellbores requiring plugging in the POCSR for a total abandonment cost of over $89 million. The average costs of plugging each well is $129,000. Table 7-3 shows the average cost for the different levels of complexity. Appendix C shows the detailed breakdown of well costs for each platform. Total well plugging and abandonment costs by platform are shown on Table 7-4.

Table 7-4 Well Costs

Platform	Total Well Cost
A	$5,005,000
B	$5,478,000
C	$3,710,000
Edith	$1,995,000
Ellen	$7,158,000
Eureka	$6,335,000
Elly	$0
Gail	$2,748,000
Gilda	$8,068,000
Gina	$1,435,000
Grace	$1,033,000
Habitat	$2,678,000
Harmony	$5,390,000
Harvest	$3,850,000
Henry	$2,328,000
Heritage	$5,565,000
Hermosa	$2,590,000
Hidalgo	$1,960,000
Hillhouse	$4,568,000
Hogan	$3,885,000
Hondo	$5,443,000
Houchin	$3,535,000
Irene	$4,305,000
Total	$89,062,000

Section 8: Conductor Removal

Requirements
Regulations for well plugging and abandonment are found in Subpart Q of 30 CFR 250, in subsections 250.1703 and 1728, and are summarized below.

- All platform components including conductor casings shall be removed by the lessee to a depth of at least 15 feet below the ocean floor or to a depth approved by the Regional Supervisor based upon the type of structure or ocean-bottom conditions.

Procedures
Conductor casing removal combines three distinct procedures: severing, pulling, and offloading. Severing of the conductor casings requires the use of explosive, mechanical, or abrasive cutting methods. Casing jacks are utilized to make the initial lift to confirm that conductors have been completely severed prior to pulling. Pulling the conductor casings entails utilization of the platform rig to pull the conductors which are unscrewed or cut into 40 feet-long segments. Offloading involves utilization of the platform crane to lay down each conductor casing segment in a platform staging area and then offloading to a boat.

Cost Factors
The primary factor in determining conductor casing removal costs is water depth. Water depths in the POCSR range from 95 feet to 1,198 feet. The number of conductors to be removed from each platform in the POCSR ranges from 10 to 64. Table 7-2 provides data regarding the number of wells, average well depth, number of conductors, and water depth for each platform in the POCSR.

Mechanical cutting methods are the most expensive of the three severing alternatives considered. This cost was used in our calculations because mechanical cutting is the most commonly used method. The cost to plug the wells and to remove the conductors is essentially the same regardless of whether all wells are plugged before any of the conductors are removed, or if individual conductors are removed immediately after each well is plugged. Because most POCSR platforms have derricks and cranes capable of performing conductor casing removal operations, we assumed that a derrick barge will not be used.

Conductor casings are assumed to be coated with marine growth which will be removed as they are pulled. Conductors extend approximately 65 feet above the water line to the wellhead on the platform. The average size and weight of conductors are assumed to be 24 inches outside diameter and 100 pounds per foot, respectively. Transportation and disposal costs are not included in these estimates but are included in the Transportation and Disposal Section. There have been well-documented studies that place the cost of conductor removal at $200 per linear foot. This study has verified that this cost continues to be accurate. Using $200/foot, conductor removal costs range from $35,000 to $255,600 per conductor. Table 8-1 shows total conductor removal costs by platform.

Table 8-1 Total Conductor Removal Costs

Platform	Conductor Removal Cost
A	$2,948,000
B	$2,970,000
C	$2,340,000
Edith	$1,109,000
Ellen	$4,416,000
Elly	$0
Eureka	$9,360,000
Gail	$3,604,000
Gilda	$3,648,000
Gina	$420,000
Grace	$2,786,000
Habitat	$1,480,000
Harmony	$13,036,000
Harvest	$3,171,000
Henry	$1,215,000
Heritage	$11,319,000
Hermosa	$2,186,000
Hidalgo	$1,020,000
Hillhouse	$2,829,000
Hogan	$1,872,000
Hondo	$5,164,000
Houchin	$1,750,000
Irene	$1,546,000
Total	$80,189,000

Section 9: Mobilization and Demobilization

Mobilization and demobilization (mob/demob) costs cover the transit time required to bring a heavy lift vessel (HLV) to the project site and return the HLV to its point of origin. In the POCSR, the infrastructure required to support decommissioning operations is severely lacking. There are currently no HLV's on the west coast capable of removing large deepwater platforms. The HLV's would be mobilized to southern California from the North Sea, Gulf of Mexico, Southeast Asia or other distant locations. It is very unlikely that HLV's would be stationed in the POCSR unless there was a strong and prolonged market demand for such vessels. This situation is not likely to change in the foreseeable future.

Cost Assumptions

This report assumes HLV's having 500, 2,000 and 4,400 ton lift capabilities will be mobilized from Southeast Asia, the North Sea, or the Gulf of Mexico (see Section 2). The mob/demob time for HLV's having lift capabilities of 500 and 2,000 tons is estimated to be 100 days. These HLV's would likely be mobilized from Southeast Asia. The mob/demob time for HLV's having 4,400 ton lift capabilities is estimated to be 200 days. These HLV's would likely be mobilized from the North Sea or Gulf of Mexico.

The current day rates for the HLV's that are projected to be used to remove POCSR platforms are: 500 ton lift capability - $80,000; 2,000 ton lift capability - $185,000; 4,400 ton lift capability - $225,000. This cost also covers the HLV's accompanying anchor handling tug. For cost estimating purposes, we have assumed that a rate of 90% of the day rate (rate charged during onsite operations) would be charged for mob/demob time.

Range of Costs

The mob/demob costs for the HLV's projected to be used to remove POCSR platforms are shown in Table 9-1. The costs range by project from $2.8 million to $13.5 million per platform. The calculation was made by taking 90% of the day rate of the HLV, multiplying that figure by the mob/demob time (100 or 200 days), and dividing by the number of platforms that would be removed during the project.

Table 9-1 Average Mob/Demob Cost by Project

Project	HLV Lift Capability	Mob/Demob Cost Calculation	Average Cost Per Platform
Project I	500 ton	$80,000 x 0.90 x 100 days ÷ 2 platforms	$3,600,000
Project II	2,000 ton	$185,000 x 0.90 x 100 days ÷ 4 platforms	$4,163,000
Project III	2,000 ton	$185,000 x 0.90 x 100 days ÷ 6 platforms	$2,775,000
Project IV	2,000 ton	$185,000 x 0.90 x 100 days ÷ 3 platforms	$5,550,000
Project V	4,400 ton	$225,000 x 0.90 x 200 days ÷ 5 platforms	$8,100,000
Project VI	4,400 ton	$225,000 x 0.90 x 200 days ÷ 3 platforms	$13,500,000

Section 10: Platform and Structural Removal

MMS regulations on the decommissioning of OCS platforms are covered in 30 CFR 250.1700 through 1754.

The depth of removal requirements for platforms and other facilities are at 30 CFR 250.1728 and are as follows:

(a) Unless the Regional Supervisor approves an alternate depth under (b) of this section, you must remove all platforms and other facilities (including templates and pilings) to at least 15 feet below the mudline.

(b) The Regional Supervisor may approve an alternative removal depth if:

  (1) The remaining structure would not become an obstruction to other users of the seafloor or area, and geotechnical and other information you provide demonstrate that erosional processes capable of exposing the obstructions are not expected; or

  (2) You determine, and MMS concurs, that you must use divers and the seafloor sediment stability poses safety concerns; or

  (3) The water depth is greater than 800 meters (2,624 feet).

In this report, we assume that platforms and other structures will be removed to a depth of 15 feet below the ocean floor (or mudline) and that sections will be removed in the reverse order in which they were installed. Figures 10-1 and 10-2 provide schematics representative of typical platform deck and jacket configurations.

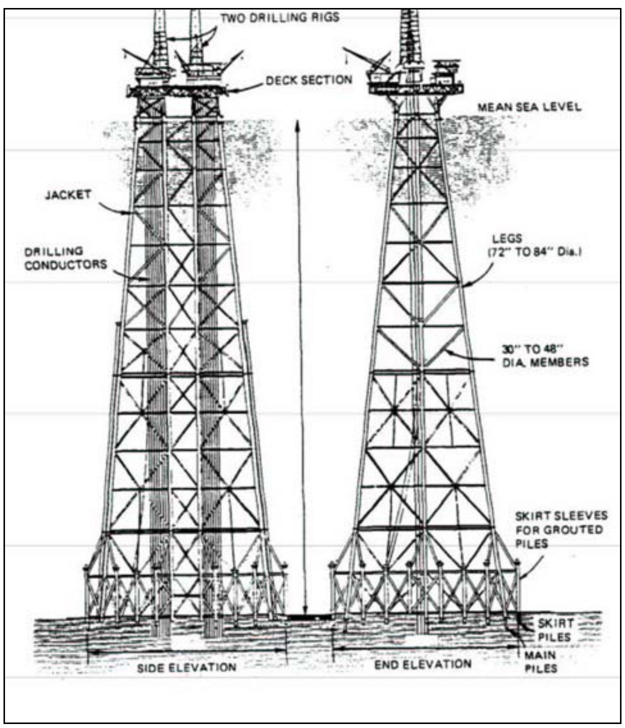

Figure 10-1 Deepwater Platform

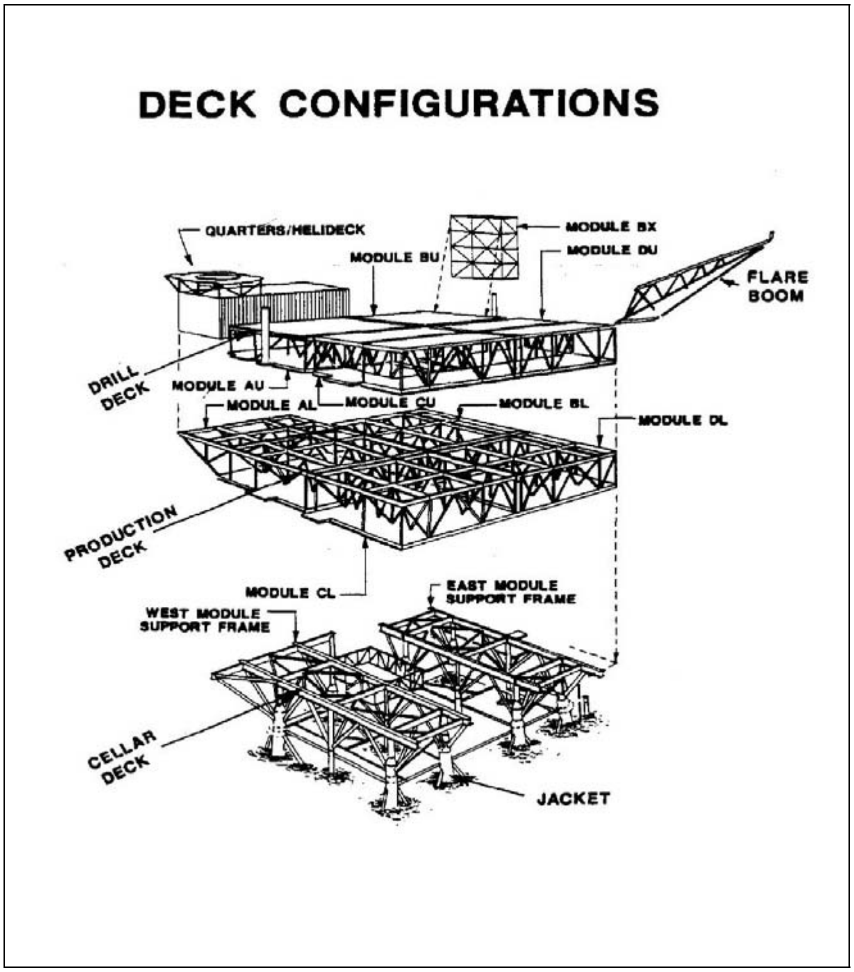

Figure 10-2 Deck Configurations

Deck/Topside Removal

The removal of topside facilities is one of the first steps in any decommissioning activity for an offshore platform. Topsides can vary significantly in size, functionality and complexity, so we have identified a range of decommissioning options. The diversity and range of complexity suggest that no one option is likely to be the most appropriate in all cases. In the POCSR, we have identified platforms that have topside facilities that range in weight from approximately 447 to almost 10,000 tons. Generally between 6 and 17 lifts were required to install these topsides. The largest lift for the modules or the modular support structures was approximately 2,000 tons.

Topsides may be integrated, modular, or hybrid in design. Integrated topside refers to a system where the process facilities are installed in the deck structure in the fabrication yard. Integrated facilities are usually installed by a single offshore lift. A modular design is used for larger topsides where the deck structure is subdivided into modules that can be lifted by the derrick barge. The modules are typically supported on the jacket by a modular support frame. Many of the very large topsides use a combined approach.

Topsides can be removed by any of the following methods:

- Removal in one piece
- Remove groups of modules together
- Removal in reverse order to installation
- Removal by small pieces

Removal of the entire topsides in one piece requires a heavy lift crane vessel (HLV) with sufficient lifting capacity, or a large specialized decommissioning vessel, or an alternative heavy lift technology such as the Versatruss lifting system, GM Heavy Lift Vessel, or other innovative lifting systems that are still in the developmental stage. One piece removal is more practical for small platforms. Major problems in removing large topsides this way are both how and where to offload the topsides onshore where crane lift capability is limited and how to dismantle these large structures once onshore.

The removal of combined modules is another method to remove the topsides. The advantage of this method is in reducing the time the heavy-lift vessels are required since fewer lifts are needed. Additional strengthening to allow for combined lifting will probably be needed. The position of the modules on the platform and their weight will dictate whether or not combined removal is possible and which modules may be lifted at one time.

Reverse installation is another method of topside removal. This involves dismantling the topsides in the reverse order in which they were installed. If the topsides were installed as modules, they would be removed as modules. If they were not installed as modules, topside structural components would be removed in the reverse order that they were installed. Discussions with civil engineering firms that work on many decommissioning projects indicate that reverse installation is the most likely method of platform removal on the west coast for the foreseeable future. For purposes of this study, we assume that topsides will be decommissioned using this method for this report.

Removal of the topsides by reducing them to small pieces is another method of removal. In this method the topsides are dismantled using mechanical and other cutting devices along with platform cranes, temporary deck mounted cranes or other cranes and a small HLV. The advantage of this method is that a smaller HLV would be required, and thus costs are substantially reduced.

Platform/Structural Removal

This aspect of platform decommissioning is the costliest operation in the field abandonment process, due to the large and expensive equipment that is required for the lifting and removal operations. Some of the major considerations that have to be made when evaluating the cost of removal are the weight and size of the structure, the oceanographic conditions of the area where the platforms are located, the heavy lifting method used, the method of cutting the main piles and skirt piles, piling access for the cutting operations, diving requirements, water depth, tie-down and transportation considerations of each removed component, and the planned disposition of the salvaged equipment and structure. Extensive saturation diving can add greatly to the cost of any removal project. Jacket removal is initiated after bottom cuts have been made below the mudline on the piles. The entire jacket is removed in sections or as a single lift. Single lifting of the jacket is not likely except for the smaller structures located in less than 200 feet water depth.

In the POCSR, platform jacket weights range from approximately 400 tons to almost 43,000 tons. The platforms are located in 95 to 1,198 feet of water, respectively. In Appendix D we have listed the projected weight that will be required to be removed when the POCSR platforms are decommissioned. These numbers are only approximate as additional modifications (i.e., deck extensions, equipment additions or removals, etc.) have been made at many facilities. We have listed the jacket and deck weights and calculated roughly the weight of the piles and conductors that will have to be removed assuming that they will be removed to a depth of 15 feet below the mudline. Some of the weights are our best estimates, as detailed information was not readily available. We used the best sources that we had, such as the design, installation, load-out, or fabrication reports, installation manuals, operator correspondence, seismic analyses, etc. A deck and jacket specification table in Appendix E details the background information that we obtained from our records and used for this report. In some cases in this specification table, not all the information and numbers for every block in the table were available for each platform. We did however list which numbers that we were able to obtain for each of the 23 POCSR platforms to use as a source of background information. We used our best professional judgment concerning which numbers to use in the various sections of this decommissioning cost report.

Since the derrick barge is usually the highest cost item on location, the use of less expensive support equipment to minimize the heavy lifting equipment time is often justifiable. Reducing the derrick barge time is one of the best ways to reduce overall removal costs. Heavy lifting equipment must be evaluated for its lifting capability at the required working radius and oceanographic conditions in which it is to operate, and also for its height capability. Safety must always be the prime consideration in any removal project. Deepwater structures present much greater challenges for complete removal. The immense weight and extreme water depth of many of the structures on the west coast places a one step removal outside the limits of current proven and demonstrated technology.

A method known as progressive transport or jacket hopping was considered by some operators and engineering consultants at one time, but because of the difficulty of clearing large areas of the ocean floor to set down the jacket and reset the HLV anchors, this methods appears unlikely to be used on the west coast. Jacket hopping, however, would reduce the risk to divers as less diving time would be needed compared to in-situ dismantlement. In the hopping method, the structure would be rigged up and lifted after severing the piles. The jacket would be winched vertically off the bottom and moved into shallower water and set down. The upper portion of the jacket would then be cut and the rigging reattached underwater for another lift. The process is repeated until the structure is completely removed. In the future it may be possible to re-float the jacket or use additional buoyancy assist to remove some of the deepwater structures, but the technology is still in the developmental stage at this time.

Other alternative heavy lift vessels/systems are being considered for lifting the large jackets such as Offshore Shuttle, MPU, Pieter Schelte, Versatruss, and various buoyancy systems, such as the Control Variable Buoyancy System (CVBS). These approaches are currently undergoing test trials and may eventually be proposed to decommission these large structures.

The most common method of jacket removal is dismantlement in place (in-situ) in which the jacket is cut (with divers using cutting torches, diamond wire cutting tools, or other systems) into manageable pieces at the site and removed piece by piece with the HLV. The jacket can be cut up into small or large pieces. For this study, we assumed that the small piece (1,000 tons or less) removal method will be used for removing the very large structures in the POCSR, jackets located in deep water (water depth greater than 400 feet), as this method appears to be the most likely method to be used based on current information. In addition, smaller HLV's would be needed to do the work. Except for Platforms Hogan and Houchin, we are making the assumption that smaller jackets (1,500 tons or less) located in less than 200 feet water depth would be removed in a single lift with the 2,000 ton HLV after the topsides are removed. We are making the assumption that Platforms Hogan and Houchin would be removed using a 500 ton HLV, as the operator has only 2 platforms and it would be more costly to use a larger HLV. If a 500 ton HLV is used to remove these platforms, the jackets would be cut in-situ into lighter than 300 ton sections for removal.

Pile Severing

Piles can be cut using explosives, mechanical means, abrasive technology, or torches. Use of explosives has been the most reliable, most economical, and safest method for many years. The bottom cut required to remove the jacket must be clean to allow for a safe lift from the surface. A barge making such a lift at sea may exceed its lift capability if an incomplete cut left the load secured to the sea floor. The use of torches places divers at risk as piles are to be removed to at least 15 feet below the ocean floor. Abrasive and other similar technologies do not yet have a reliable means to verify that a complete pile cut has been made, but continue to evolve and may prove to be a preferred technique for cutting applications in the future. They are being used increasingly to sever piles in the Gulf of Mexico and other parts of the world. We assume that some of the piles would be cut using abrasives and others may require the use of explosives.

Range of Costs and Assumptions

Based upon the sizes and weights of the structures, the number of modules, the number of lifts needed and other factors, as described above, including the maximum weights of the lifts that will be needed, we believe all the POCSR platforms can be removed using HLV's with 500, 2,000, and 4,400 ton capabilities in groupings of platforms that we call projects. A number of other factors were also considered in developing the scenario that we are using including the age and oceanographic location of the platforms, remaining oil and gas reserves, water depth, and company operators/ownership. Our decommissioning scenario anticipates six decommissioning projects taking place between 2010 and 2025 (See Table 2-1). A total of 2 to 6 platforms are projected to be removed during each project. The HLV's needed for these projects will have the following lift capabilities: 500 tons (Project I), 2,000 tons (Projects II, III, & IV) and 4,400 tons (Projects V & VI). The costs and method of removal of the very large structures in deep water are very speculative and await further advances in technology as to the approach that would be needed for complete removal. We made cost projections for planning purposes only, assuming in-situ dismantlement of these jackets.

In addition to the barge and anchor-handling tug costs, we have included related diver support, survey and other related vessels and equipment, including ROV and severing equipment spread, which we estimate could be $40,000 per day for Platform Gina in 95 feet of water and $55,000 per day for Platforms Hogan and Houchin in 154 and 163 feet water depth, respectively. All other platforms would be in deeper water and we estimate $65,000 per day for all of their support services. We assumed that it would take 6 hours to cut and remove each platform main or skirt pile. We assumed that topside module removal would take approximately 1/2 day per module in most cases. Topsides that do not have modules would take longer and be cut up into manageable pieces for removal. Generally, we assumed approximately 1 day for each of these sections.

Table 10-1 details the formulas that were used to project platform decommissioning costs and contains an example of calculations for each of the projects. See Table 10-2 Platform Deck and Jacket Decommission Costs, for the projected costs for each of the 23 POCSR platforms. We have increased estimated costs by 10% to 20 % to allow for weather contingency depending on the area in which the platforms are located. We used 20% for Platforms Heritage, Harvest, Hermosa, Hidalgo, and Irene and 10% for all other platforms due to the harsher oceanographic conditions that these five platforms encounter. Appendix F shows the cost calculations for each platform by Decommissioning Project.

Table 10-1 Examples of Platform Deck and Jacket Decommissioning Cost Calculations

Project	Cost Calculation Formula	Cost Example
Project I -500 ton HLV	($80,000/day + $55,000/day + 10% weather contingency) x number of days	Platform Hogan Example: $135,000 x 1.1 x 28 days = $4,158,000
Projects II, III, & IV-2000 ton HLV	($185,000/day + $65,000/day + 10% weather contingency) x number of days	Platform Henry Example: $250,000 x 1.1 x 10 days = $2,750,000
Projects V & VI - 4400 ton HLV	($225,000/day + $65,000/day + 10% or 20% weather contingency) x number of days	Platform Heritage Example: $290,000 x 1.2 x 104 days = $ 36,192,000

Table 10-2 Platform, Deck and Jacket Decommissioning Costs

Platform	Platform, Deck, and Jacket Removal Costs
A	$3,025,000
B	$3,025,000
C	$3,025,000
Edith	$4,400,000
Ellen	$3,850,000
Elly	$4,125,000
Eureka	$20,075,000
Gail	$24,244,000
Gilda	$3,575,000
Gina	$1,485,000
Grace	$4,785,000
Habitat	$3,025,000
Harmony	$36,047,000
Harvest	$24,708,000
Henry	$2,750,000
Heritage	$36,192,000
Hermosa	$22,620,000
Hidalgo	$17,748,000
Hillhouse	$2,750,000
Hogan	$4,158,000
Hondo	$21,054,000
Houchin	$4,158,000
Irene	$3,600,000
Total	$254,424,000

Section 11: Pipeline and Powercable Decommissioning

Requirements

The MMS regulations at 30 CFR 250.1750 allow an operator to decommission a pipeline in place if the MMS determines that the "pipeline does not constitute a hazard (obstruction) to navigation and commercial fishing operations, unduly interfere with other uses of the OCS, or have adverse environmental effects." If the MMS determines that the pipeline is an obstruction, then the decommissioned pipeline must be removed per the regulations at 30 CFR 250.1752.

Procedures

Since 1990, the POCSR has required pipeline operators to conduct biennial ROV pipeline surveys to assess a pipeline's external integrity and to monitor 3rd party impacts. The surveys have verified that the pipelines historically have not been obstructions and could therefore be decommissioned in place. However, a decision on the final disposition of a specific pipeline cannot be made until a thorough technical and environmental review is conducted during the decommissioning permitting process.

To decommission a pipeline in place, the pipeline must first be cleaned by flushing water through the pipeline. The pipeline is then disconnected from the OCS platform, and filled with sea water. The cut end is plugged and buried at least 3 feet below the seafloor or covered with protective concrete mats. In addition to cutting and burying the ends, all pipeline valves/fittings, pipeline crossings and spanned areas that could unduly interfere with other uses of the OCS must be removed from the pipeline, and the cut ends plugged and covered or buried at least 3 feet below the seafloor.

Cost Factors

Appendix G shows the estimated pipeline and powercable decommissioning costs. The factors used to calculate the cost estimates are based on information provided by MMS and operator decommissioning studies, and contractors. There are three worksheets in Appendix G which are titled "Pipelines and Powercables," "Pipelines," and "Powercables," respectively.

"Pipelines and Powercables" and "Pipelines" Worksheets/Tables

The cost estimates for the "Pipelines" and the "Pipelines and Powercables" worksheets assume that all project vessels (small crane barge, dive boat, etc.) would be available locally. The costs incurred during the decommissioning operations reflect both fixed (e.g., mobilization/demobilization) and hourly rates for vessels (small crane barge and support vessels) and diver-related services. The two factors which have the greatest influence on the cost estimates are the water depth and the number of obstructions per pipeline that would have to be removed.

The estimated costs rely on data input values for: 1) mobilization/demobilization, 2) daily rate for on-site operations, 3) estimated time to complete the decommissioning activity, and 4) disposal costs. Below is a description of the type of work included in each of the data input values.

The mobilization/demobilization cost includes the mobilization/demobilization of the diving support vessel, diving system equipment, small crane barge(s), and any required third party equipment needed; planning and engineering; pigging and testing the pipeline(s); mooring installation/removal; and miscellaneous equipment or work needed.

The on-site daily rate includes 24-hour diving operations from a diving support vessel, 24-hour barge with crane, tug and construction crew, materials barge for transport and onshore support and project management.

The estimated time to complete a pipeline decommissioning is based on the number of risers and pipeline sections that would need to be cut out, rigged and lifted to a barge. The time is also dependent on the water depth in which the work is to take place. For this exercise, the amount of pipe that would be removed is based on Appendix A-4 of the 1999 Offshore Facility Decommissioning Costs Report. The Appendix provides information on the removal lengths for spans, pipeline crossings, and subsea tie-ins. With the exception of the Point Arguello Unit platforms, and Platforms Irene and Heritage, a 10% weather contingency was calculated into the estimated time. A 20% weather contingency was applied to the Point Arguello Unit platforms and Platforms Irene and Heritage due to the harsher oceanographic conditions in these areas.

The disposal costs include dockside wharfage fees and crane services, transportation of pipeline by truck to the disposal site, and disposal fees for cleaned pipe and hazardous materials. It is assumed for the purposes of these estimates that the removed pipelines and powercables could not be recycled.

"Beta and Santa Ynez Powercable Complete Removal" Worksheet/Table
The Beta Unit and Santa Ynez Unit (SYU) powercables will most likely be removed completely. The biennial ROV surveys of the Beta Unit show considerable evidence of third party impacts to the two powercables that run from Platforms Eureka to Ellen. There has been no evidence that the SYU powercables are interfering with other OCS users; however, ExxonMobil, operator of the SYU, has committed to the Santa Barbara County as part of a recent power system repair project that it will remove all powercables at the eventual end of the SYU development and production project life.

This table shows the estimated costs for completely removing the SYU and Beta Unit powercables using both local infrastructure and a cable removal vessel mobilized from outside the west coast. Using local infrastructure, the powercables would be cut into sections and lifted onto a barge. It is assumed that the cutting could be done using an ROV, and that divers will not be necessary. A cable removal vessel would simply pull the powercable up onto a reel. Although there is considerable time saved by using a cable removal vessel, the cost to mobilize a vessel from other areas is so great that it is far more economical to use equipment available locally and spend more time doing the work. Recycling of the powercable is highly unlikely and was therefore not taken into account.

Table 11-1 shows pipeline and powercable decommissioning costs by platform.

Table 11-1 Pipeline and Powercable Removal Costs

Platform	Pipelines	Powercables	Total Cost
A	$0	$44,165	$45,000
B	$364,537	$53,512	$419,000
C	$160,536	$53,512	$215,000
Edith	$340,245	$160,776	$502,000
Ellen	$0	$0	$0
Elly	$217,254	$1,100,345	$1,318,000
Eureka	$574,051	$0	$575,000
Gail	$441,523	$0	$442,000
Gilda	$316,307	$105,436	$422,000
Gina	$88,330	$44,165	$133,000
Grace	$210,871	$0	$211,000
Habitat	$133,813	$114,508	$249,000
Harmony	$490,573	$767,012	$1,258,000
Harvest	$231,355	$0	$232,000
Henry	$160,536	$53,512	$215,000
Heritage	$341,485	$6,447,317	$6,789,000
Hermosa	$212,041	$0	$213,000
Hidalgo	$231,355	$0	$232,000
Hillhouse	$107,024	$53,512	$161,000
Hogan	$577,861	$94,458	$673,000
Hondo	$330,073	$1,967,702	$2,298,000
Houchin	$311,415	$103,805	$416,000
Irene	$379,496	$106,021	$486,000
Total	$6,220,681	$11,269,758	$17,504,000

Section 12: Platform Transportation and Disposal

There are three primary methods of disposal for steel and other materials associated with dismantling a platform: refurbish and reuse, scrap and recycle, and dispose of in designated landfills. Opportunities for refurbishing and reusing facilities in the POCSR are very limited due to the age of many of the platforms, the current lack of additional oil and gas development in the POCSR, and inherent limitations associated with meeting the strict technical standards now required. Thus, it is assumed that the steel and other materials removed from platforms will be transported to shore for scrapping and recycling or disposal in landfills.

Due to the limited number of offshore decommissioning projects that have occurred in the POCSR, information pertaining to transportation and disposal costs is limited to that which was made available by Chevron in the 4-H Project. As noted earlier, the project involved the decommissioning of four platforms having a combined weight of approximately 12,000 tons. The materials were transported by barge from the Santa Barbara Channel a distance of 100 miles to San Pedro, California. Chevron reported that the steel was sold as scrap for $330,000 and that it cost $1.3 million to process the steel, resulting in a net loss of $1.0 million or $333.00 per ton of steel. In addition, Chevron had to dispose of 3,000 tons of marine growth ($800,000), 1,000 tons of cement ($275,000), and 300 tons of drilling muds and cuttings ($275,000) which aggregates to approximately $1.4 million for disposal materials other than steel. The costs for disposal of these other materials therefore approximated about $350,000 per platform.

Materials disposal and transportation costs in the POCSR are higher than in the Gulf of Mexico and other areas due to the lack of onshore disposal infrastructure. The local (San Pedro) scrap yard that was used by Chevron is no longer in service and existing scrap yards in southern California do not have the capability to process the large quantity of steel present in platforms. Due to consolidated ownership of scrap yards on the west coast and environmental constraints in southern California, scrap yards having the capability to process the quantity of steel present in offshore platforms are not likely to re-open in the foreseeable future. The nearest scrap yard facilities having such capability are located in the San Francisco Bay area (400 miles away) and Portland, Oregon (1,000 miles away).

Cost Assumptions

This report assumes that platform structures will be transported by barge from southern California to offloading facilities/scrap yards located along the west coast of the U.S., Mexico, or possibly Asia. It is assumed that other materials (nonferrous metals, cement, plastics, wood, etc.) will be transported to landfills in southern California for disposal. For steel, the disposal cost is estimated to be $400 per ton. This cost does not include any credit for scrap steel. This cost was estimated by MMS based on information presented in technical decommissioning studies of POCSR platforms conducted by engineering consultants for MMS and industry. The cost covers transportation, site preparation, and platform topsides and jacket offloading, demolition, and scrapping. For the purposes of this study we have assumed that the cost to dispose of other materials (nonferrous metals, cement, plastics, wood, etc.) will total $350,000 per platform for platforms in less than

400 feet of water, and $700,000 per platform for larger platforms located in greater than 400 feet of water. This cost is based on cost estimates provided by Chevron for the Chevron 4-H Project and information presented in technical decommissioning studies funded by MMS. Table 12-1 shows the platform transportation and disposal costs for each platform.

Table 12-1 Platform Transportation and Disposal Costs

Platform	Total Weight tons)*	Steel Disposal Cost	Misc. Disposal	Total Cost
A	4,090	$1,636,000	$350,000	$1,986,000
B	4,095	$1,638,000	$350,000	$1,988,000
C	4,010	$1,604,000	$350,000	$1,954,000
Edith	8,298	$3,319,200	$350,000	$3,670,000
Ellen	11,300	$4,520,000	$350,000	$4,870,000
Elly	9,400	$3,760,000	$350,000	$4,110,000
Eureka	34,000	$13,600,000	$700,000	$14,300,000
Gail	31,320	$12,528,000	$700,000	$13,228,000
Gilda	9,342	$3,736,800	$350,000	$4,087,000
Gina	1,102	$440,800	$350,000	$791,000
Grace	9,390	$3,756,000	$350,000	$4,106,000
Habitat	8,853	$3,541,200	$350,000	$3,892,000
Harmony	69,920	$27,968,000	$700,000	$28,668,000
Harvest	30,190	$12,076,000	$700,000	$12,776,000
Henry	3,118	$1,247,200	$350,000	$1,598,000
Heritage	60,556	$24,222,400	$700,000	$24,923,000
Hermosa	28,131	$11,252,400	$700,000	$11,953,000
Hidalgo	21,421	$8,568,400	$700,000	$9,269,000
Hillhouse	3,738	$1,495,200	$350,000	$1,846,000
Hogan	4,110	$1,644,000	$350,000	$1,994,000
Hondo	27,250	$10,900,000	$700,000	$11,600,000
Houchin	4,637	$1,854,800	$350,000	$2,205,000
Irene	7,652	$3,060,800	$350,000	$3,411,000
Total		$158,369,200	$10,850,000	$169,225,000

* Total Weight is the estimated total platform removal weight and includes the weights of the jacket, deck, piles, and conductors being removed to a depth of 15 feet below the mudline.

Section 13: Site Clearance

Site clearance operations are performed to ensure that the post-decommissioning lease and operational area surrounding platforms is free of obstructions that would interfere with other uses of the OCS, such as commercial trawling operations. OCS oil and gas decommissioning requirements including clearing a lease site are at 30 CFR 250.1700-1754.

Site clearance procedures for decommissioning a platform and associated pipelines and powercables in the POCSR will typically involve the following four step process (1) pre-decommissioning survey, (2) post-decommissioning survey, (3) Remotely Operated Vehicle (ROV)/diver target identification and recovery, and (4) test trawling. A survey vessel equipped with high-resolution sidescan sonar is used to conduct the pre- and post-decommissioning surveys. The pre-decommissioning survey documents the location and quantity of suspected debris targets. The survey is also used to map the location of pipelines, powercables, and sensitive environmental habitats (hard bottom areas and kelp beds) to ensure that the deployment and retrieval of anchors is done in a safe and environmentally sound manner. The post-decommissioning survey identifies debris lost during the project and documents any impacts from the operations such as anchor scars. An ROV and divers are deployed to further identify and remove any debris that could interfere with other uses of the area. Test trawling is conducted to verify that the area is free of any potential obstructions.

Cost Assumptions

Site clearance costs can vary significantly from project to project due to factors such as: water depth; the size of the area to be cleared and verified; the quantity, size, and type of debris; and weather conditions. The site clearance cost estimates presented below include costs for pre- and post-decommissioning sidescan-sonar surveys (SSS), ROV deployment, diving spreads, test trawl operations, and shell mound geotechnical and biological sampling. The costs do not include any expenses that would be incurred to remove shell mounds or mitigate impacts to commercial trawlers who may be precluded from trawling areas where shell mounds are located. The subject of shell mounds is still under study, in order to generate information on all aspects of the issue that will assist in the preparation of a thorough environmental assessment and appropriate decision on their final disposition based on a case-by-case review. The costs are based on information obtained from oil and gas companies and contractors that have conducted site clearance programs in the POCSR.

For platforms located in water depths up to 300 feet, we assumed that an air/gas diving spread would be used. For platforms located in water depths exceeding 300 feet, we assumed a saturation diving spread will be required. We also assumed that the time required to conduct ROV and test trawl operations will increase from 7 days for platforms located in less than 300 feet of water to 14 days for platforms located in greater than 300 feet of water.

Site Clearance Costs
The estimated costs for site clearance and verification are $722,000 for platforms in less than 300 feet of water depth and $1,139,000 for platforms in greater than 300 feet of water. The cost calculations are shown in Table 13-1 below.

Table 13-1 Site Clearance Cost Calculations

Platform Water Depth (<300 feet)		**Platform Water Depth (>300 feet)**	
Pre-Decommissioning SSS		Pre-Decommissioning SSS	
3 days x $11,000	$33,000	3 days x $11,000	$33,000
Mob/Demob	$12,000	Mob/Demob	$12,000
Data Analysis	$10,000	Data Analysis	$10,000
	$55,000		$55,000
Post-Decommissioning SSS		Post-Decommissioning SSS	
3 days x $11,000	$33,000	3 days x $11,000	$33,000
Mob/Demob	$12,000	Mob/Demob	$12,000
Data Analysis	$10,000	Data Analysis	$10,000
	$55,000		$55,000
ROV Deployment		ROV Deployment	
7 days x $11,000	$77,000	14 days x $11,000	$154,000
Diving Spread (air/gas diving)		Diving Spread (saturation diving)	
10 days x $30,000	$300,000	10 days x $60,000	$600,000
Test Trawl Program		Test Trawl Program	
7 days x $5,000	$35,000	14 days x $5,000	$70,000
Shell Mound Surveys		Shell Mound Surveys	
Geotechnical & Biological	$200,000	Geotechnical & Biological	$200,000
Total Cost	$722,000	Total Cost	$1,134,000

Appendix A: Maps of the Decommissioning Projects

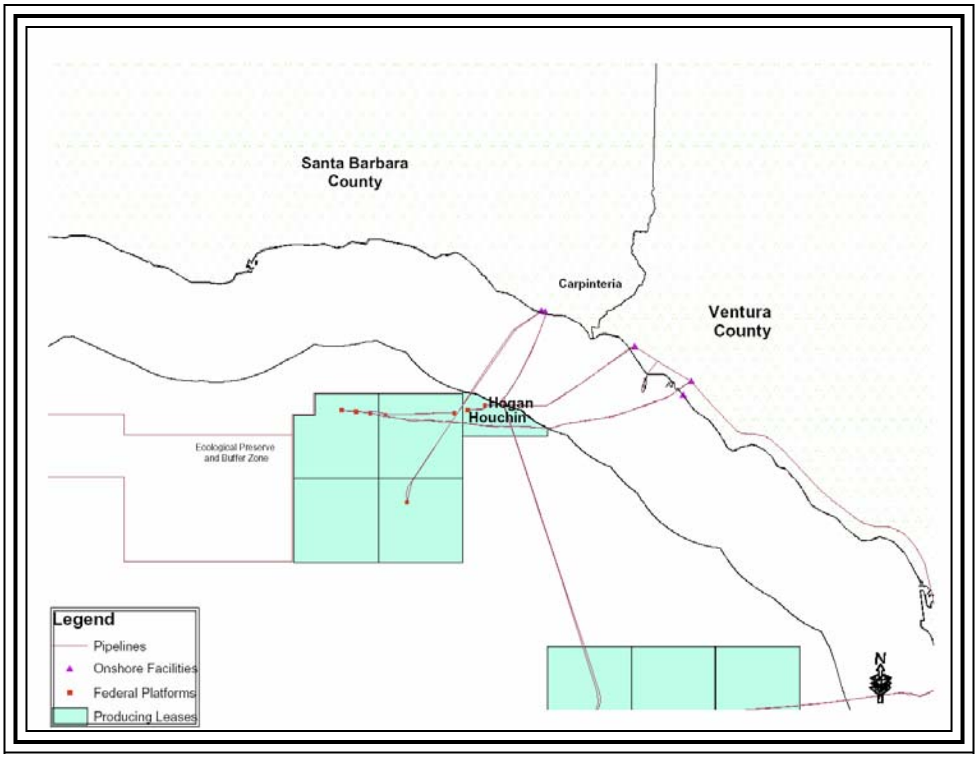

Figure A-1 Project I Eastern, Santa Barbara Channel

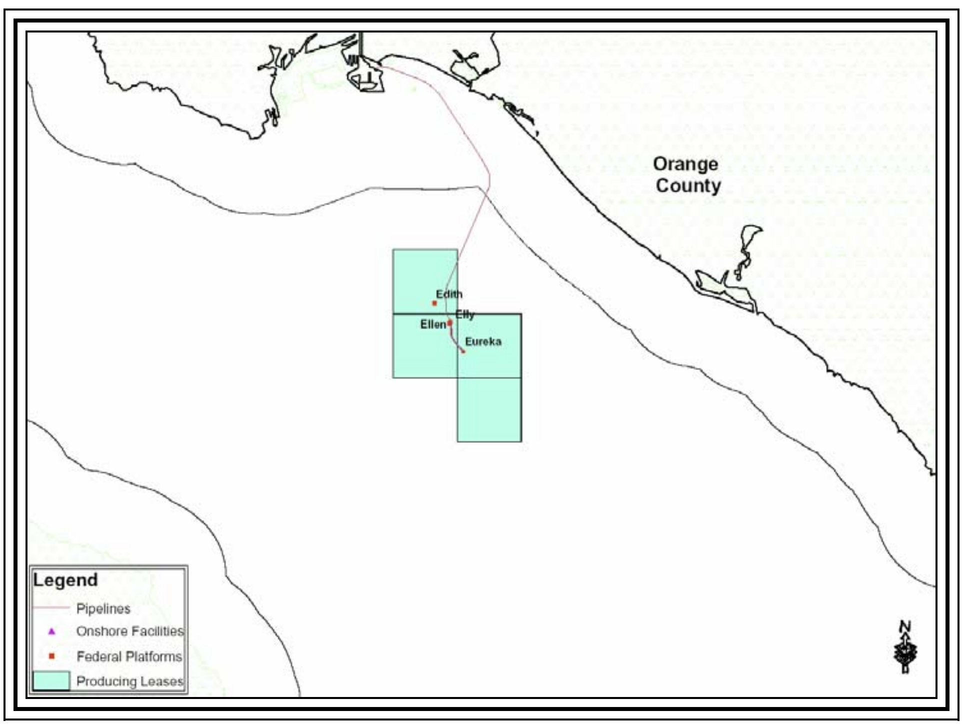

Figure A-2 Project II, South Coast

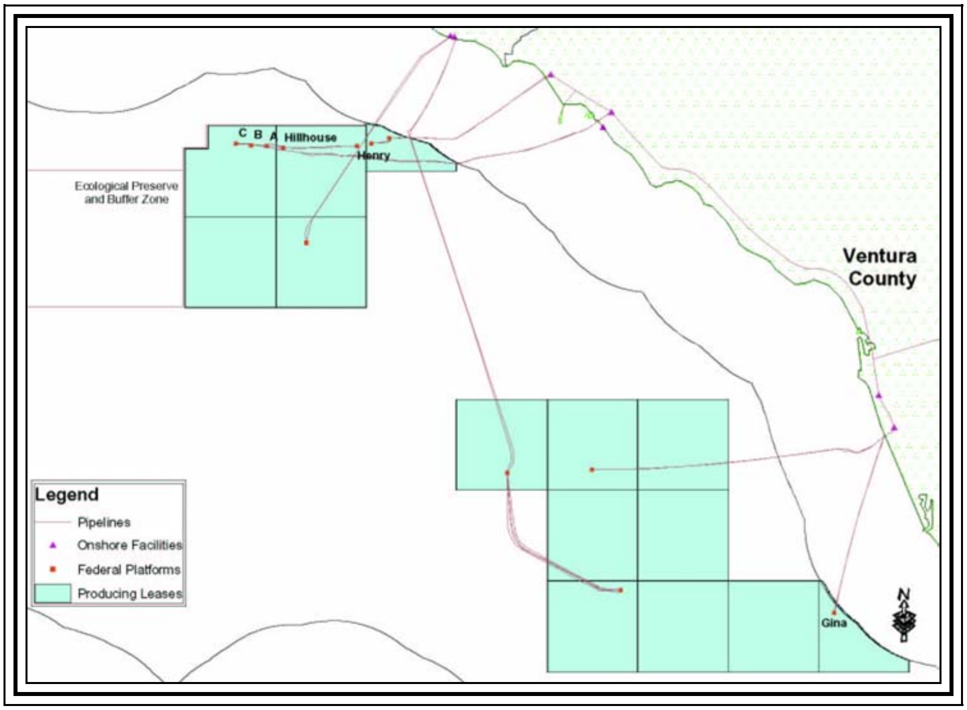

Figure A-3 Project III, Eastern Santa Barbara Channel

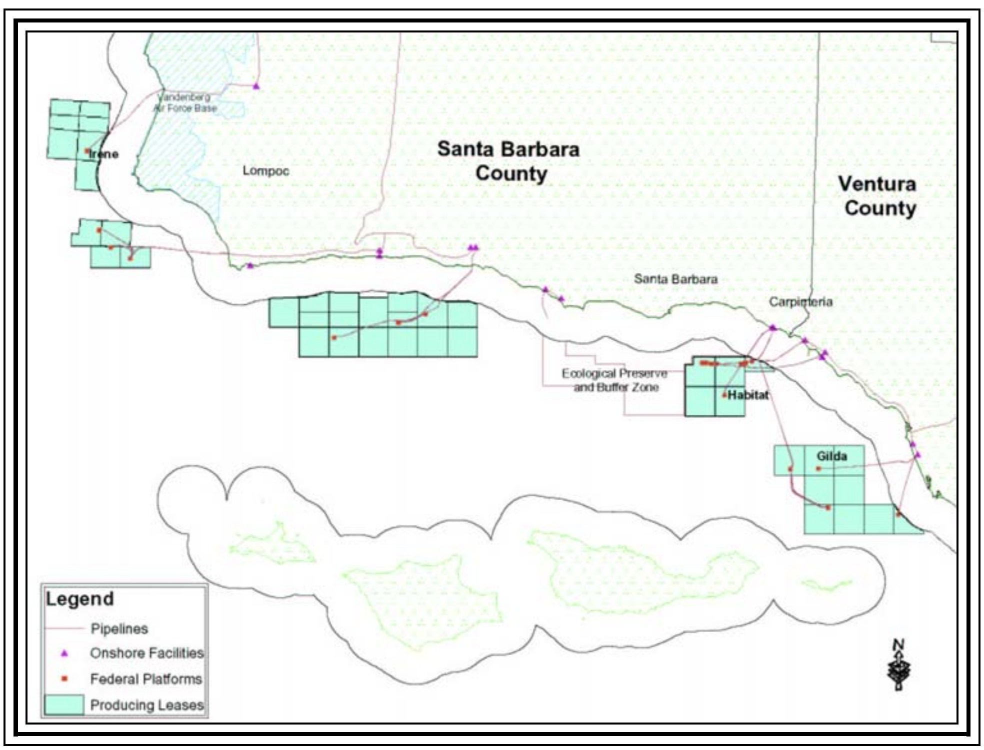

Figure A-4 Project IV, Santa Barbara Channel-Southern Santa Maria Basin

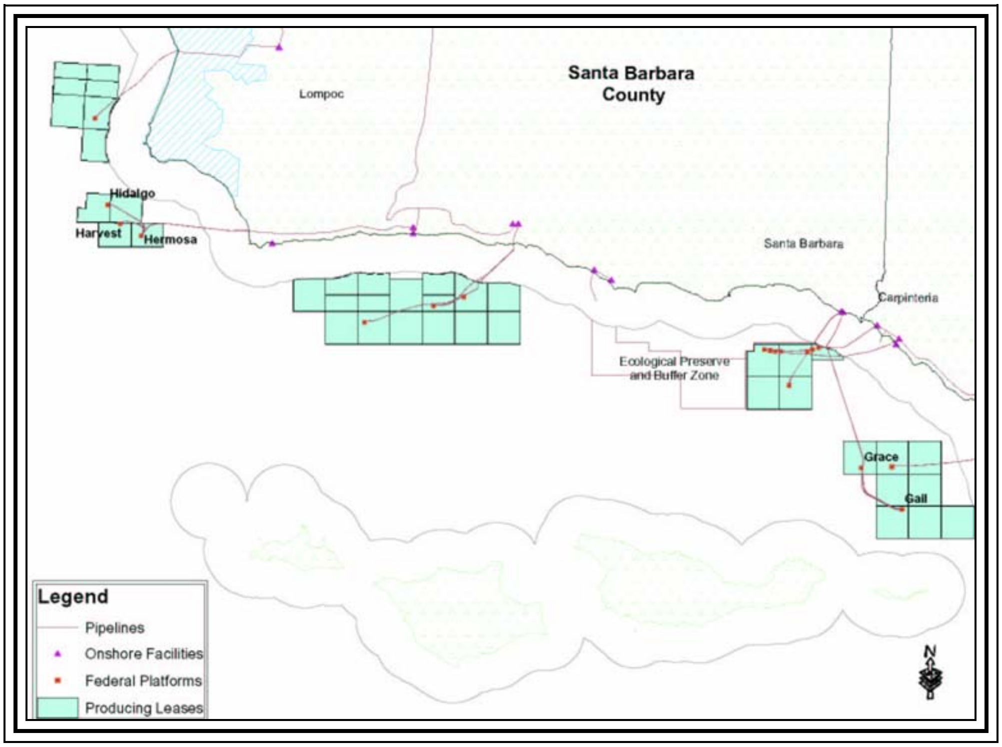

Figure A-5 Project V, Santa Barbara Channel-Santa Maria Basin

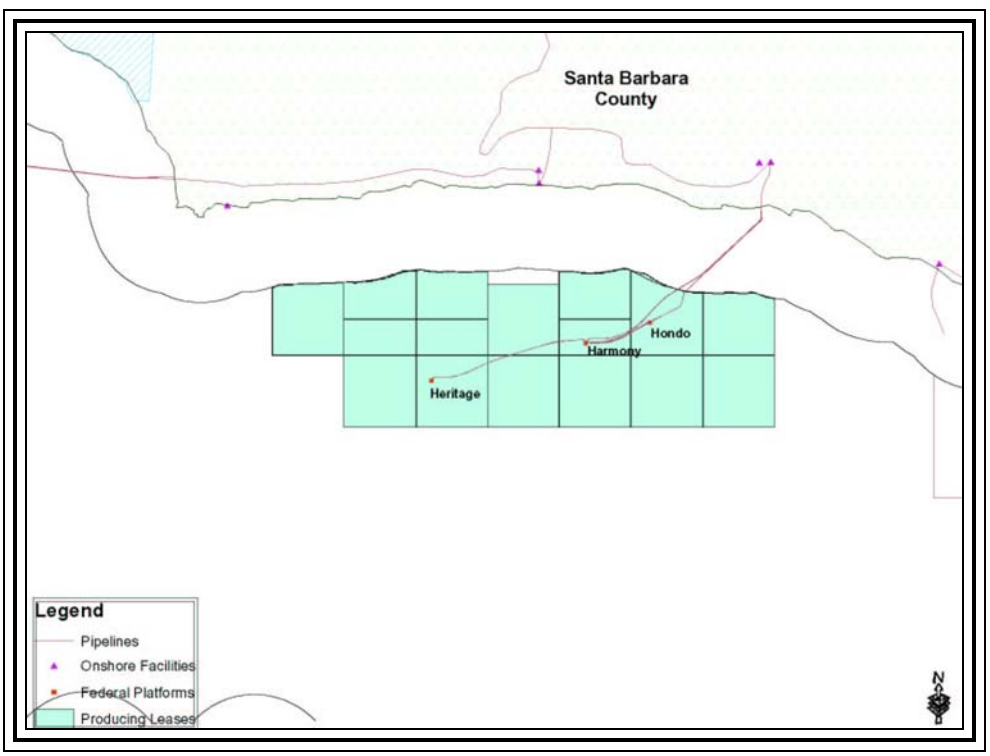

Figure A-6 Project VI, Western Santa Barbara Channel

Appendix B: Total Cost by Decommissioning Category

	Platform A	Platform B	Platform C	Edith	Ellen	Elly
Engineering & Planning	$589,000	$590,000	$578,000	$1,195,000	$1,356,000	$1,128,000
Permitting	$550,000	$550,000	$550,000	$550,000	$550,000	$550,000
Platform Preparation	$761,000	$761,000	$761,000	$942,000	$980,000	$1,474,000
Well P&A	$5,005,000	$5,478,000	$3,710,000	$1,995,000	$7,158,000	$0
Conductors	$2,948,000	$2,970,000	$2,340,000	$1,109,000	$4,416,000	$0
Mobilization & Demobilization	$2,775,000	$2,775,000	$2,775,000	$4,163,000	$4,163,000	$4,163,000
Platform & Structural Removal	$3,025,000	$3,025,000	$3,025,000	$4,400,000	$4,125,000	$3,850,000
Pipelines & Power Cables	$45,000	$419,000	$215,000	$502,000	$0	$1,318,000
Transportation & Disposal	$1,986,000	$1,988,000	$1,954,000	$3,670,000	$4,870,000	$4,110,000
Site Clearance	$722,000	$722,000	$722,000	$722,000	$722,000	$722,000
MMS Estimate w/o Contingency	$18,406,000	$19,278,000	$16,630,000	$19,248,000	$28,340,000	$17,315,000
Contingency Factor (20% does not apply to Mob/demob)	$3,127,000	$3,301,000	$2,771,000	$3,017,000	$4,836,000	$2,631,000
MMS Total Estimate	$21,533,000	$22,579,000	$19,401,000	$22,265,000	$33,176,000	$19,946,000

	Eureka	Gail	Gilda	Gina	Grace	Habitat
Engineering & Planning	$3,264,000	$3,007,000	$1,122,000	$159,000	$1,127,000	$1,063,000
Permitting	$550,000	$550,000	$550,000	$550,000	$550,000	$550,000
Platform Preparation	$2,245,000	$2,785,000	$1,436,000	$568,000	$1,265,000	$1,341,000
Well P&A	$6,335,000	$2,748,000	$8,068,000	$1,435,000	$1,033,000	$2,678,000
Conductors	$9,360,000	$3,604,000	$3,648,000	$420,000	$2,786,000	$1,480,000
Mobilization & Demobilization	$4,163,000	$8,100,000	$5,550,000	$2,775,000	$8,100,000	$5,550,000
Platform & Structural Removal	$20,075,000	$24,244,000	$3,575,000	$1,485,000	$4,785,000	$3,025,000
Pipelines & Power Cables	$575,000	$442,000	$422,000	$133,000	$211,000	$249,000
Transportation & Disposal	$14,300,000	$13,228,000	$4,087,000	$791,000	$4,106,000	$3,892,000
Site Clearance	$1,134,000	$1,134,000	$722,000	$722,000	$1,134,000	$722,000
MMS Estimate w/o Contingency	$62,001,000	$59,842,000	$29,180,000	$9,038,000	$25,097,000	$20,550,000
Contingency Factor (20% does not apply to Mob/demob)	$11,568,000	$10,349,000	$4,726,000	$1,253,000	$3,400,000	$3,000,000
MMS Total Estimate	$73,569,000	$70,191,000	$33,906,000	$10,291,000	$28,497,000	$23,550,000

	Harvest	Henry	Heritage	Hermosa	Hidalgo	Hillhouse
Engineering & Planning	$2,899,000	$449,000	$5,814,000	$2,701,000	$2,571,000	$539,000
Permitting	$550,000	$550,000	$550,000	$550,000	$550,000	$550,000
Platform Preparation	$3,325,000	$989,000	$3,675,000	$3,325,000	$2,815,000	$1,008,000
Well P&A	$3,850,000	$2,328,000	$5,565,000	$2,590,000	$1,960,000	$4,568,000
Conductors	$3,171,000	$1,215,000	$11,319,000	$2,186,000	$1,020,000	$2,829,000
Mobilization & Demobilization	$8,100,000	$2,775,000	$13,500,000	$8,100,000	$8,100,000	$2,775,000
Platform & Structural Removal	$24,708,000	$2,750,000	$36,192,000	$22,620,000	$17,748,000	$2,750,000
Pipelines & Power Cables	$232,000	$215,000	$6,789,000	$213,000	$232,000	$161,000
Transportation & Disposal	$12,776,000	$1,598,000	$24,923,000	$11,953,000	$9,269,000	$1,846,000
Site Clearance	$1,134,000	$722,000	$1,134,000	$1,134,000	$1,134,000	$722,000
MMS Estimate w/o Contingency	$60,745,000	$13,591,000	$109,461,000	$55,372,000	$45,399,000	$17,748,000
Contingency Factor (20% does not apply to Mob/demob)	$10,529,000	$2,164,000	$19,193,000	$9,455,000	$7,460,000	$2,995,000
MMS Total Estimate	$71,274,000	$15,755,000	$128,654,000	$64,827,000	$52,859,000	$20,743,000

	Hogan	Hondo	Houchin	Irene	Regional Liability
Engineering & Planning	$592,000	$2,616,000	$668,000	$919,000	$41,659,000
Permitting	$550,000	$550,000	$550,000	$550,000	$12,650,000
Platform Preparation	$761,000	$3,100,000	$761,000	$1,265,000	$40,498,000
Well P&A	$3,885,000	$5,443,000	$3,535,000	$4,305,000	$89,062,000
Conductors	$1,872,000	$5,164,000	$1,750,000	$1,546,000	$80,189,000
Mobilization & Demobilization	$3,600,000	$13,500,000	$3,600,000	$5,550,000	$138,152,000
Platform & Structural Removal	$4,158,000	$21,054,000	$4,158,000	$3,600,000	$254,424,000
Pipelines & Power Cables	$673,000	$2,298,000	$416,000	$486,000	$17,504,000
Transportation & Disposal	$1,994,000	$11,600,000	$2,205,000	$3,411,000	$169,225,000
Site Clearance	$722,000	$1,134,000	$722,000	$722,000	$20,314,000
MMS Estimate w/o Contingency	$18,807,000	$66,459,000	$18,365,000	$22,354,000	$863,677,000
Contingency Factor (20% does not apply to Mob/demob)	$3,042,000	$10,592,000	$2,953,000	$3,361,000	$145,114,000
MMS Total Estimate	$21,849,000	$77,051,000	$21,318,000	$25,715,000	$1,008,791,000

Appendix C: Total Well Cost

Well Complexity									
	Low		Med Low		Med High		High		
Platform	# of Wells	Total Cost	# of Wells	Total Cost	# of Wells	Total Cost	# of Wells	Total Cost	Total Platform Cost
A	45	$3,937,500	5	$612,500	1	$175,000	1	$280,000	$5,005,000
B	49	$4,287,500	6	$735,000	1	$175,000	1	$280,000	$5,478,000
C	33	$2,887,500	3	$367,500	1	$175,000	1	$280,000	$3,710,000
Edith	12	$1,050,000	4	$490,000	1	$175,000	1	$280,000	$1,995,000
Ellen	18	$1,575,000	39	$4,777,500	3	$525,000	1	$280,000	$7,158,000
Elly	0	$0	0	$0	0	$0	0	$0	$0
Eureka	6	$525,000	38	$4,655,000	5	$875,000	1	$280,000	$6,335,000
Gail	1	$87,500	18	$2,205,000	1	$175,000	1	$280,000	$2,748,000
Gilda	8	$700,000	47	$5,757,500	6	$1,050,000	2	$560,000	$8,068,000
Gina	7	$612,500	3	$367,500	1	$175,000	1	$280,000	$1,435,000
Grace*	0	$0	1	$122,500	3	$525,000	0	$0	$1,033,000
Habitat	1	$87,500	16	$1,960,000	2	$350,000	1	$280,000	$2,678,000
Harmony	0	$0	0	$0	18	$3,150,000	8	$2,240,000	$5,390,000
Harvest	0	$0	0	$0	14	$2,450,000	5	$1,400,000	$3,850,000
Henry	20	$1,750,000	1	$122,500	1	$175,000	1	$280,000	$2,328,000
Heritage	0	$0	0	$0	19	$3,325,000	8	$2,240,000	$5,565,000
Hermosa	0	$0	0	$0	10	$1,750,000	3	$840,000	$2,590,000
Hidalgo	0	$0	0	$0	8	$1,400,000	2	$560,000	$1,960,000
Hillhouse	40	$3,500,000	5	$612,500	1	$175,000	1	$280,000	$4,568,000
Hogan	35	$3,062,500	3	$367,500	1	$175,000	1	$280,000	$3,885,000
Hondo	0	$0	1	$122,500	24	$4,200,000	4	$1,120,000	$5,443,000
Houchin	31	$2,712,500	3	$367,500	1	$175,000	1	$280,000	$3,535,000
Irene	0	$0	2	$245,000	20	$3,500,000	2	$560,000	$4,305,000
TOTALS	306	$26,775,000	195	$23,887,500	139	$24,325,000	47	$13,160,000	$89,058,000

*1 Unplugged well 25 Wells temporarily abandoned, 3 of which need to be reentered. Total cost includes $385,000 for Permanent Plugging of the remaining 22 wells.

Appendix D: Platform Removal Weights (tons)*

Platform	Water Depth (feet)	Jacket	Piles	Conductors	Deck	Total Weight*
A	188	1,500	600	633	1,357	4,090
B	190	1,500	600	638	1,357	4,095
C	192	1,500	600	553	1,357	4,010
Edith	161	3,454	450	260	4,134	8,298
Ellen	265	3,200	1,100	1,700	5,300	11,300
Elly	255	3,300	1,400	0	4,700	9,400
Eureka	700	19,000	2,000	5,000	8,000	34,000
Gail	739	18,300	4,000	1,327	7,693	31,320
Gilda	205	3,220	1,030	1,300	3,792	9,342
Gina	95	434	125	96	447	1,102
Grace	318	3,090	1,500	1,000	3,800	9,390
Habitat	290	2,550	1,500	639	3,514	8,853
Harmony	1,198	42,900	12,350	4,831	9,839	69,920
Harvest	675	16,633	3,383	1,150	9,024	30,190
Henry	173	1,311	150	286	1,371	3,118
Heritage	1,075	32,420	13,950	4,360	9,826	60,556
Hermosa	603	17,000	2,500	802	7,830	28,131
Hidalgo	430	10,950	2,000	371	8,100	21,421
Hillhouse	190	1,500	400	638	1,200	3,738
Hogan	154	1,263	150	438	2,259	4,110
Hondo	842	12,200	2,900	3,700	8,450	27,250
Houchin	163	1,486	150	410	2,591	4,637
Irene	242	3,100	1,500	552	2,500	7,652

* Total Weight is the estimated platform removal weight and includes the weights of the jacket, deck, piles and conductors and assumes that they are removed to a depth of 15 feet below the mudline.

Appendix E: Deck and Jacket Specifications

Platform	Jacket Weight (tons)	Total Pile Weight (tons)	Total Conductor Weight (tons)	Total Jacket Weight (tons)	Module Weights or Lift Weights (tons)	Total Deck Weight (tons)	Total Platform Weight (tons)	Number Jacket Legs	Number Main Piles and Size	Number Skirt Piles and Size	Number Lifts to Install Decks
Gina 95 ft. water depth	434	253			Deck 418 Helideck 29 Others ---	447	1,500 Approx.	6	6/42" to 140' BML*	0	
Hogan 154 ft water depth	1,263			1,566 Incl. Piles	Drilling Deck & Equip. 302 Workover Rig 315 Prod. Deck & Equip. 649 Deck Structure 997	2,259	3,825 w/workover rig	12	12/36"	0	12 main lifts
Edith 161 ft. water depth	3,454	1,048 Incl. boat landing		4,502	Mod 1-471 Piperacks 246 2-466 Helipad 118 3-522 Quarters 438 4-585 Cap trusses 341 5-473 Flare 19/ 6-455	4,134	8,636	12	12/54" 200 to 280' BML	0	6 modules 2 cap trusses misc. other lifts
Houchin 163 ft. water depth	1,486			1,786	Drlg. Deck Structure 432 Prod. Deck Structure 314 Drilling Rig 220 Pipecrack & Equip. 289 Other item of Equip.	2,591	4,376	8	8	0	9 main lifts
Henry 173 ft. water depth	1,311 launch load w/appurtenances				Drilling Deck 465 Prod. Deck #1 356 Prod. Deck #2 550 (incl. some equip. but exclude rig & other equip.)	1,371 Excludes rig & other equip.		8	8/42" w/36" inserts to 170' BML	0	

*Below Mud Line

Platform	Jacket Weight (tons)	Total Pile Weight (tons)	Total Conductor Weight (tons)	Total Jacket Weight (tons)	Module Weights or Lift Weights (tons)	Total Deck Weight (tons)	Total Platform Weight (tons)	Number Jacket Legs	Number Main Piles and Size	Number Skirt Piles and Size	Number Lifts to Install Decks
A 188 ft. water depth	1,500				Drill Deck Structure 425 Drilling Rig 237 Production Deck 325 Pipe Rack 370 36 Items Total	1,357		12	12/40" to 80' BML	0	
B 190 ft. water depth	1,500					1,357		12		0	
Hillhouse 190 ft. water depth	1,500					1,357		8		0	
C 192 ft. water depth	1,500					1,200		12		0	
Gilda 205 ft. water depth	3,220	1,030 tons BML	4,830	9,080 (w/cond.) 4,250 (w/o cond.)	Drill Deck Equip. 1,004 Drill Deck Steel 260 Drill Rig 227 Prod. Deck Equip. 798 Prod. Deck Steel 305 Vert. added mass 1,192	3,792	12,872 (w/cond) 8,042 (w/o cond.)	12	12/48" 150 to 190' BML	0	

Platform	Jacket Weight (tons)	Total Pile Weight (tons)	Total Conductor Weight (tons)	Total Jacket Weight (tons)	Module Weights or Lift Weights (tons)	Total Deck Weight (tons)	Total Platform Weight (tons)	Number Jacket Legs	Number Main Piles and Size	Number Skirt Piles and Size	Number Lifts to Install Decks
Irene 242 ft. water depth	3,100	2,537		5,637 (w/o cond.)	West Section 1,000 tons E Section 860 Quarters 220 Cranes 30 Flare 25 Misc.	2,500		8	8/60"	0	
Elly 255 ft. water depth	3,300	2,600	0 No conductors	5,900	Cap trusses 395 Prod. Skid 441 SW deck 495 Gen. Bld. 348 NW deck 436 Comp. Skid 295 E deck 697 Control Bld. 260 C deck 496 Others ---- Prod. Skid 418	4,700	10,600	12	4-48" to 250' BML 2-42" interior to 220' BML 6-48" exterior to 220' BML	0	16 main lifts 10 modules
Ellen 265 ft. water depth	3,200	1,960	2,940	8,100	E Deck 867 Quarter 505 W Deck 816 Mud pumps 707 C Deck 813 Sub St. 1-445 Misc. --- Sub St. 2-445	5,300	13,400	8	4/66" to 260' BML 4/48" to interior 230' BML	0	17 main lifts 12 modules
Habitat 290 ft. water depth	2,550				Skid Base 70 Derrick w/ sub. 562 Pump Package 1,363 Engine Package 639 Quarters 200 Reser. Mud/P Tank 680	3,514		8			
Grace 318 ft. water depth	3,090 w/appurtenances	1,822		4,912 (w/o cond.)		3,800		12	12/42"	8/48"	

Platform	Jacket Weight (tons)	Total Pile Weight (tons)	Total Conductor Weight (tons)	Total Jacket Weight (tons)	Module Weights or Lift Weights (tons)	Total Deck Weight (tons)	Total Platform Weight (tons)	Number Jacket Legs	Number Main Piles and Size	Number Skirt Piles and Size	Number Lifts to Install Decks
Hidalgo 430 ft. water depth	10,950			11,600	W/H Mod. 1,378 Prod. Mod 1,254 Comp. Mod 1,171 Util Mod. 955 Power Mod. 1,233 Pipe rack 266 Cap truss 1,071 Crew Quarters ----	7,500 - 8,100	19,100 - 19,700	8	8/60"	8/72"	8 main lifts
Hermosa 603 ft. water depth	17,000			18,500	W/h Mod. 1,203 Prod. Mod. 1,269 Comp. Mod. 1,113 Util Mod. 1,150 Power Mod. 1,297 Pipe rack 320 Cap truss 777 Crew Quarters 700	7,830	26,330	8	8/60"	12/72"	9 main lifts
Harvest 675 ft. water depth	16,633	3,383 Piles to 15' BML	2,334 Conductors from 60' above water to15' BML	22,350	N Deck 1,698 Comp. 1,445 S Deck 1,425 Flare 50 G/SG 1,429 Quarters 921 C/U 931 Prod. 1,125 Total 9,024	9,024	31,374	8	8/60" to 255' BML	20/72" to 235' BML	
Eureka 700 ft. water depth	19,000	5,000	6,000		Modules up to 1,200 tons	2,000 Deck 6,000 Equip. 8,000 Total	38,000	8	0	24/60"	10 modules

Platform	Jacket Weight (tons)	Total Pile Weight (tons)	Total Conductor Weight (tons)	Total Jacket Weight (tons)	Module Weights or Lift Weights (tons)	Total Deck Weight (tons)	Total Platform Weight (tons)	Number Jacket Legs	Number Main Piles and Size	Number Skirt Piles and Size	Number Lifts to Install Decks
Gail 739 ft. water depth	18,300	8,370			East Deck 1,894 West Deck 1,850 Driling Mod. 953 Comp. Mod. 869 Gen. SG Mod. 1,178 Flare 77 Crew Quarters 873	7,693		8	8/60"	12/72"	7 main lifts
Hondo 842 ft. water depth	12,200	5,300	3,700	21,200		8,450	29,650	8	8/48" & 42" inserts to 340' BML	12/54" & 48" inserts to 250' BML	30 lifts
Heritage 1,075 ft. water depth	32,420	20,750	10,250	63,420	WMSF 509 AU Mod. 1,040 EMSF 403 Quarters 947 AL Mod. 886 CU/DU 804/800 CL Mod. 861 BU 1,310 BL 1,050 BX 237 DL 854 Flare 125	9,826	73,246	8	8/72"	26/84"	13 main lifts
Harmony 1,198 ft. water depth	42,900	18,750	11,200	72,850	WMSF 509 AU 1,025 EMSF 403 CU 804 AL Mod. 896 Quarters 957 CL 866 BU 1,310 BL 1,046 DU 800 DL 854 BX 242 Flare 127	9,839	82,689	8	8/72"	20/84"	13 main lifts

Appendix F: Platform, Deck and Jacket Removal Cost Calculations

	Project I	
Platform Name	Hogan	Houchin
Water Depth (feet)	154	163
Derrick Barge Capacity (tons)	500	500
Rig Up/Rig Down Days	2	2
Deck Weight (tons)	2,259	2,591
Deck Modules		
Max Weight Per module (tons)	350	430
Number of Modules	8	9
Days per Module	1.3	1.2
Total Deck Removal Days	10	11
Jacket Weight (tons)	1,263	1,486
Jacket Sections		
Max Weight per Section (tons)	300	300
Number of Sections	5	5
Days per Section	2.5	2.5
Total Jacket Removal Days	13	13
Number of Piles	12	8
Pile Cut/Removal Days	3	2
Total HLV Days	28	28
HLV Cost Per Day	$80,000	$80,000
Support Services/Day Cost	$55,000	$55,000
Total Cost w/o Weather Contingency	$3,780,000	$3,780,000
Total Cost w/ 10%Weather Contingency	$4,158,000	$4,158,000

Project II

Platform Name	Edith	Elly	Ellen	Eureka
Water Depth (feet)	161	255	265	700
Derrick Barge Capacity (tons)	2000	2000	2000	2000
Rig Up/Rig Down Days	2	2	2	2
Deck Weight (tons)	4,134	4,700	5,300	8,000
Deck Modules				
Max Weight Per module (tons)	585	697	867	1,200
Number of Modules	12	10	12	10
Days per Module	0.5	0.5	0.5	0.5
Total Deck Removal Days	6	5	6	5
Jacket Weight (tons)	3,454	3,300	3,200	19,000
Jacket Sections				
Max Weight per Section (tons)	1,200	1,100	1,600	1,000
Number of Sections	3	3	2	19
Days per Section	1.7	1.7	2	3.2
Total Jacket Removal Days	5	5	4	60
Number of Piles	12	12	8	24 skirt
Pile Cut/Removal Days	3	3	2	6
Total HLV Days	16	15	14	73
HLV Cost Per Day	$185,000	$185,000	$185,000	$185,000
Support Services/Day Cost	$65,000	$65,000	$65,000	$65,000
Total Cost w/o Weather Contingency	$4,000,000	$3,750,000	$3,500,000	$18,250,000
Total Cost w/ 10% Weather Contingency	$4,400,000	$4,125,000	$3,850,000	$20,075,000

Project III

Platform Name	Gina	A	B	C	Henry	Hillhouse
Water Depth (feet)	95	188	190	192	173	190
Derrick Barge Capacity (tons)	2,000	2,000	2,000	2,000	2,000	2,000
Rig Up/Rig Down Days	2	2	2	2	2	2
Deck Weight (tons)	447	1,357	1,357	1,357	1,371	1,200
Deck Modules						
Max Weight Per module (tons)	418	425	425	425	550	425
Number of Modules	2	4	4	4	4	4
Days per Module	1	1	1	1	1	1
Total Deck Removal Days	2	4	4	4	4	4
Jacket Weight (tons)	434	1,500	1,500	1,500	1,311	1,200
Jacket Sections						
Max Weight per Section (tons)	434	1,500	1,500	1,500	1,311	1,200
Number of Sections	1	1	1	1	1	1
Days per Section	1	2	2	2	2	2
Total Jacket Removal Days	1	2	2	2	2	2
Number of Piles	6	12	12	12	8	8
Pile Cut/Removal Days	1	3	3	3	2	2
Total HLV Days	6	11	11	11	10	10
HLV Cost Per Day	$185,000	$185,000	$185,000	$185,000	$185,000	$185,000
Support Services/Day Cost	$40,000	$65,000	$65,000	$65,000	$65,000	$65,000
Total Cost w/o Weather Contingency	$1,350,000	$2,750,000	$2,750,000	$2,750,000	$2,500,000	$2,500,000
Total Cost w/ 10% Weather Contingency	$1,485,000	$3,025,000	$3,025,000	$3,025,000	$2,750,000	$2,750,000

Project IV

Platform Name	Gilda	Irene*	Habitat
Water Depth (feet)	205	242	290
Derrick Barge Capacity (tons)	2,000	2,000	2,000
Rig Up/Rig Down Days	2	2	2
Deck Weight (tons)	3,792	2,500	3,514
Deck Modules			
Max Weight Per module (tons)	1,004	1,000	1,363
Number of Modules	6	5	6
Days per Module	0.5	0.5	0.5
Total Deck Removal Days	3	3	3
Jacket Weight (tons)	3,220	3,100	2,550
Jacket Sections			
Max Weight per Section (tons)	1,100	1,600	1,300
Number of Sections	3	2	2
Days per Section	1.7	2.5	2
Total Jacket Removal Days	5	5	4
Number of Piles	12	8	8
Pile Cut/Removal Days	3	2	2
Total HLV Days	13	12	11
HLV Cost Per Day (dollars)	$185,000	$185,000	$185,000
Support Services/Day Cost	$65,000	$65,000	$65,000
Total Cost w/o Weather Contingency	$3,250,000	$3,000,000	$2,750,000
Total Cost w/ Weather Contingency	$3,575,000	$3,600,000	$3,025,000

Weather Contingency is 10% unless marked with an asterisk* in which case it is 20 %

Project V

Platform Name	Grace	Hidalgo*	Hermosa*	Harvest*	Gail
Water Depth (feet)	318	430	603	675	739
Derrick Barge Capacity (tons)	4,400	4,400	4,400	4,400	4,400
Rig Up/Rig Down Days	2	2	2	2	2
Deck Weight (tons)	3,800	8,100	7,830	9,024	7,693
Deck Modules					
Max Weight Per module (tons)	1,000	1,378	1,269	1,698	1,894
Number of Modules	6	8	8	9	7
Days per Module	0.5	0.5	0.5	0.5	0.5
Total Deck Removal Days	3	4	4	5	4
Jacket Weight (tons)	3,090	10,950	17,000	16,633	18,300
Jacket Sections					
Max Weight per Section (tons)	1,100	1,000	1,000	1,000	1,000
Number of Sections	3	11	17	17	19
Days per Section	1.7	3.7	3.2	3.4	3.4
Total Jacket Removal Days	5	41	55	57	65
Number of Piles	12 main 8 skirt	8 main 8 skirt	8 main 8 skirt	8 main 20 skirt	8 main 12 skirt
Pile Cut/Removal Days	5	4	4	7	5
Total HLV Days	15	51	65	71	76
HLV Cost Per Day	$225,000	$225,000	$225,000	$225,000	$225,000
Support Services/Day Cost	$65,000	$65,000	$65,000	$65,000	$65,000
Total Cost w/o Weather Contingency	$4,350,000	$14,790,000	$18,850,000	$20,590,000	$22,040,000
Total Cost w/ Weather Contingency	$4,785,000	$17,748,000	$22,620,000	$24,708,000	$24,244,000

Weather Contingency is 10 % unless marked with an asterisk* in which case it is 20 %

Project VI

Platform Name	Hondo	Heritage*	Harmony
Water Depth (feet)	842	1075	1198
Derrick Barge Capacity (tons)	4,400	4,400	4,400
Rig Up/Rig Down Days	2	2	2
Deck Weight (tons)	8,450	9,826	9,839
Deck Modules			
Max Weight Per module (tons)	1,310	1,310	1,310
Number of Modules	13	13	13
Days per Module	1	1	1
Total Deck Removal Days	7	7	7
Jacket Weight (tons)	12,200	32,420	42,900
Jacket Sections			
Max Weight per Section (tons)	1,000	1,000	1,000
Number of Sections	13	33	43
Days per Section	4	2.6	2.2
Total Jacket Removal Days	52	86	97
Number of Piles	8 main 12 skirt	8 main 26 skirt	8 main 20 skirt
Pile Cut/Removal Days	5	9	7
Total HLV Days	66	104	113
HLV Cost Per Day	$225,000	$225,000	$225,000
Support Services/Day Cost	$65,000	$65,000	$65,000
Total Cost w/o Weather Contingency	$19,140,000	$30,160,000	$32,770,000
Total Cost w/ Weather Contingency	$21,054,000	$36,192,000	$36,047,000

Weather Contingency is 10 % unless marked with an asterisk * in which case it is 20 %

Appendix G: Pipelines and Powercables Spreadsheets

Pipelines and Powercables – Identified To Be Left In Place

Input Data	Water Depth		
	Less than 200'	200 ' to 500'	Greater than 500 '
Mob/Demob Rate ($)	766000	1060000	1060000
On-Site Operations ($/day)	97600	93600	93600
Decommissioning Time (Hours)			
Cut and Bury a Pipeline End	2	2	2
Cut and Lift 120' pipe (powercable) section	5	6	7
Disposal/Miscellaneous ($/mile pipeline)	116025	116025	116025
Weather Contingency (%)*	10	10	10
* Pt. Arguello Unit, Heritage and Irene is	20		

Project I-Eastern Santa Barbara Channel

Number of Pipelines 7

Number of Powercables 2

Pipeline	Deepest Water Depth (ft)	Platform Disconnect	Add'l Sections-Removal[1]	Days for OCS Work (with contingencies)	Mob/Demob	Dive Operations	Disposal/Misc.	Total OCS Cost
Houchin to Hogan Oil	163 / 154	2		0.14	85111	13420	5274	103805
Houchin to Hogan Gas	163 / 154	2		0.14	85111	13420	5274	103805
Houchin to Hogan Gas Lift	163 / 154	2		0.14	85111	13420	5274	103805
Hogan to Shore Emulsion	154	1	2	0.53	85111	51443	7911	144465
Hogan to Shore Gas	154	1	2	0.53	85111	51443	7911	144465
Hogan to Shore Water	154	1	2	0.53	85111	51443	7911	144465
Hogan to Shore Gas Lift	154	1	2	0.53	85111	51443	7911	144465
Powercable								
Houchin to Hogan	1	2		0.14	85111	13420	5274	103805
Hogan to Shore	154	1		0.07	85111	6710	2637	94458
Total				**2.73**	**766000**	**266163**	**55376**	**1087539**

Project II-South Coast (Los Angeles/Orange County)

Number of Pipelines	6
Number of Powercables	1

Pipeline	Water depth (ft)	Platform Disconnect	Add'l Sections-Removal[1]	Days for OCS Work (with contingencies)	Mob/Demob	Dive Operations	Disposal/Misc.	Total OCS Cost
Eureka to Elly Oil	700 / 225	2		0.14	151429	12870	5274	169572
Eureka to Elly Gas	700 / 225	2	2	0.78	151429	72930	10548	234906
Eureka to Elly Water	700 / 225	2		0.14	151429	12870	5274	169572
Edith to Elly Oil	161 / 225	2		0.14	151429	13420	5274	170122
Edith to Eva Gas	161 / ?	2		0.14	151429	13420	5274	170122
Elly to Shore Oil	255	1	2	0.62	151429	57915	7911	217254
Powercable								
Edith to Shore	161	1		0.07	151429	6710	2637	160776
Elly to Eureka	Complete Removal-See "Powercable Removal" Spreadsheet							
TOTAL				**2.02**	**1060000**	**190135**	**42191**	**1292326**

Project III-Eastern Half of Santa Barbara Channel

Number of Pipelines 15

Number of Powercables 7

Pipeline	Water depth (ft)	Platform Disconnect	Add'l Sections-Removal[1]	Days for OCS Work (with contingencies)	Mob/Demob	Dive Operations	Disposal/Misc.	Total OCS Cost
"C" to "B" Oil	192 / 190	2		0.1	34818	13420	5274	53512
"C" to "B" Gas	192 / 190	2		0.1	34818	13420	5274	53512
"C" to "B" Water	192 / 190	2		0.1	34818	13420	5274	53512
"B" to "A" Oil	190 / 188	2	1	0.4	34818	35787	7911	78516
"B" to "A" Gas	190 / 188	2	1	0.4	34818	35787	7911	78516
Hillhouse to "A" Oil	190 / 188	2		0.1	34818	13420	5274	53512
Hillhouse to "A" Gas	190 / 188	2		0.1	34818	13420	5274	53512
Henry to Hillhouse Oil	173 / 190	2		0.1	34818	13420	5274	53512
Henry to Hillhouse Gas	173 / 190	2		0.1	34818	13420	5274	53512
Henry to Hillhouse Water	173 / 190	2		0.1	34818	13420	5274	53512
"B" to Shore Oil	190	1	1	0.3	34818	29077	5274	69169
"B" to Shore Gas	190	1	1	0.3	34818	29077	5274	69169
"B" to Shore Water	190	1	1	0.3	34818	29077	5274	69169
Gina to Shore Gas	95	1		0.1	34818	6710	2637	44165
Gina to Shore Oil/Water	95	1		0.1	34818	6710	2637	44165
Powercable								
"C" to "B"	192 / 190	2		0.1	34818	13420	5274	53512
"B" to "A"	190 / 188	2		0.1	34818	13420	5274	53512
Hillhouse to "A"	190 / 188	2		0.1	34818	13420	5274	53512
Henry to Hillhouse	173 / 190	2		0.1	34818	13420	5274	53512
"A" to Shore	188	1		0.1	34818	6710	2637	44165
Gina to Shore	95	1		0.1	34818	6710	2637	44165
TOTAL				**3.55**	**731182**	**346683**	**105477**	**1183342**

Project IV-Santa Barbara Channel/Southern Santa Maria Basin

Number of Pipelines 7

Number of Powercables 4

Pipeline	Water depth (ft)	Platform Disconnect	Add'l Sections-Removal[1]	Days for OCS Work (with contingencies)	Mob/Demob	Dive Boat	Disposal/Misc.	Total OCS Cost
Gilda to Shore Oil	205	1		0.07	96364	6435	2637	105436
Gilda to Shore Gas	205	1		0.07	96364	6435	2637	105436
Gilda to Shore Water	205	1		0.07	96364	6435	2637	105436
Irene to Shore Oil	242	1		0.08	96364	7020	2637	106021
Irene to Shore Gas	242	1	1	0.38	96364	35100	5274	136738
Irene to Shore Water	242	1	1	0.38	96364	35100	5274	136738
Habitat to Shore Gas	290	1	1	0.34	96364	32175	5274	133813
Powercable								
Gilda to Shore	205	1		0.07	96364	6435	2637	105436
Irene to Shore	242	1		0.08	96364	7020	2637	106021
Habitat to "A"	290 / 188	2		0.14	96364	12870	5274	114508
TOTAL				**1.66**	**963636**	**155025**	**36917**	**1155578**

Project V-Santa Barbara Channel Souther Santa Maria Basin

Number of Pipelines 11

Number of Powercables 0

Pipeline	Water depth (ft)	Platform Disconnect	Add'l Sections-Removal[1]	Days for OCS Work (with contingencies)	Mob/Demob	Dive Boat	Disposal/Misc.	Total OCS Cost
Gail to Grace Oil	739 / 318	2	1	0.46	96364	42900	7911	147174
Gail to Grace Gas	739 / 318	2	1	0.46	96364	42900	7911	147174
Gail to Grace Gas (sour)	739 / 318	2	1	0.46	96364	42900	7911	147174
Harvest to Hermosa Oil	675 / 603	2		0.15	96364	14040	5274	115678
Harvest to Hermosa Gas	675 / 603	2		0.15	96364	14040	5274	115678
Hidalgo to Hermosa Oil	430 / 675	2		0.15	96364	14040	5274	115678
Hidalgo to Hermosa Gas	430 / 675	2		0.15	96364	14040	5274	115678
Grace to Shore Oil	318	1		0.07	96364	6435	2637	105436
Grace to Shore Gas	318	1		0.07	96364	6435	2637	105436
Hermosa to Shore Oil	603	1		0.08	96364	7020	2637	106021
Hermosa to Shore Gas	603	1		0.08	96364	7020	2637	106021
TOTAL				**2.26**	**1060000**	**211770**	**55376**	**1327146**

Project VI-Western Santa Barbara Channel

Number of Pipelines 7

Number of Powercables 4

Pipeline	Water depth (ft)	Platform Disconnect	Add'l Sections-Removal[1]	Days for OCS Work (with contingencies)	Mob/Demob	Dive Boat	Disposal/Misc.	Total OCS Cost
Hondo to Harmony Oil	842 / 1198	2		0.14	151429	12870	5274	169572
Heritage to Harmony Oil	1075 / 1198	2		0.15	151429	14040	5274	170742
Heritage to Harmony Gas	1075 / 1198	2		0.15	151429	14040	5274	170742
Harmony to Hondo Gas	1198 / 842	2		0.14	151429	12870	5274	169572
Harmony to Shore Oil	1198	1		0.07	151429	6435	2637	160501
Harmony to Shore Water	1198	1		0.07	151429	6435	2637	160501
Hondo to Shore Gas	842	1		0.07	151429	6435	2637	160501
Powercable								
Heritage to Harmony	Complete Removal-See "Powercable Removal" Spreadsheet							
Harmony to Hondo	Complete Removal-See "Powercable Removal" Spreadsheet							
Hondo to Harmony A	Complete Removal-See "Powercable Removal" Spreadsheet							
Hondo to Harmony B	Complete Removal-See "Powercable Removal" Spreadsheet							
Hondo to Salm	Complete Removal-See "Powercable Removal" Spreadsheet							
Heritage to Shore	Complete Removal-See "Powercable Removal" Spreadsheet							
Harmony to Shore A	Complete Removal-See "Powercable Removal" Spreadsheet							
Harmony to Shore B	Complete Removal-See "Powercable Removal" Spreadsheet							
TOTAL				**0.78**	**1060000**	**73125**	**29006**	**1162131**

Pipelines – Identified For Total Removal

Input Data	Water Depth		
	Less than 200'	200 ' to 500'	Greater than 500 '
Mob/Demob Rate ($)	766000	1060000	1060000
On-Site Operations ($/day)	97600	93600	93600
Decommissioning Time (Hours)			
Cut and Bury a Pipeline End	2	2	2
Cut and Lift 120' pipe (powercable) section	5	6	7
Disposal/Miscellaneous ($/mile pipeline)	116025	116025	116025
Weather Contingency (%)*	10	10	10
* Pt. Arguello Unit, Heritage and Irene is	20		

Project I-Eastern Santa Barbara Channel

Number of Pipelines 7

Number of Powercables 2

Pipeline	Deepest Water Depth (ft)	Platform Disconnect	Add'l Sections-Removal[1]	Days for OCS Work (with contingencies)	Mob/Demob	Dive Operations	Disposal/Misc.	Total OCS Cost
Houchin to Hogan Oil	163 / 154	2		0.14	85111	13420	5274	103805
Houchin to Hogan Gas	163 / 154	2		0.14	85111	13420	5274	103805
Houchin to Hogan Gas Lift	163 / 154	2		0.14	85111	13420	5274	103805
Hogan to Shore Emulsion	154	1	2	0.53	85111	51443	7911	144465
Hogan to Shore Gas	154	1	2	0.53	85111	51443	7911	144465
Hogan to Shore Water	154	1	2	0.53	85111	51443	7911	144465
Hogan to Shore Gas Lift	154	1	2	0.53	85111	51443	7911	144465
Total				**2.52**	**595778**	**246033**	**47465**	**889276**

Project II-South Coast (Los Angeles/Orange County)

Number of Pipelines 6

Number of Powercables 1

Pipeline	Water depth (ft)	Platform Disconnect	Add'l Sections-Removal[1]	Days for OCS Work (with contingencies)	Mob/Demob	Dive Operations	Disposal/Misc.	Total OCS Cost
Eureka to Elly Oil	700 / 225	2		0.14	151429	12870	5274	169572
Eureka to Elly Gas	700 / 225	2	2	0.78	151429	72930	10548	234906
Eureka to Elly Water	700 / 225	2		0.14	151429	12870	5274	169572
Edith to Elly Oil	161 / 225	2		0.14	151429	13420	5274	170122
Edith to Eva Gas	161 / ?	2		0.14	151429	13420	5274	170122
Elly to Shore Oil	255	1	2	0.62	151429	57915	7911	217254
TOTAL				**1.95**	**908571**	**183425**	**39554**	**1131550**

Project III-Eastern Half of Santa Barbara Channel

Number of Pipelines 15

Number of Powercables 7

Pipeline	Water depth (ft)	Platform Disconnect	Add'l Sections-Removal[1]	Days for OCS Work (with contingencies)	Mob/Demob	Dive Operations	Disposal/Misc.	Total OCS Cost
"C" to "B" Oil	192 / 190	2		0.1	34818	13420	5274	53512
"C" to "B" Gas	192 / 190	2		0.1	34818	13420	5274	53512
"C" to "B" Water	192 / 190	2		0.1	34818	13420	5274	53512
"B" to "A" Oil	190 / 188	2	1	0.4	34818	35787	7911	78516
"B" to "A" Gas	190 / 188	2	1	0.4	34818	35787	7911	78516
Hillhouse to "A" Oil	190 / 188	2		0.1	34818	13420	5274	53512
Hillhouse to "A" Gas	190 / 188	2		0.1	34818	13420	5274	53512
Henry to Hillhouse Oil	173 / 190	2		0.1	34818	13420	5274	53512
Henry to Hillhouse Gas	173 / 190	2		0.1	34818	13420	5274	53512
Henry to Hillhouse Water	173 / 190	2		0.1	34818	13420	5274	53512
"B" to Shore Oil	190	1	1	0.3	34818	29077	5274	69169
"B" to Shore Gas	190	1	1	0.3	34818	29077	5274	69169
"B" to Shore Water	190	1	1	0.3	34818	29077	5274	69169
Gina to Shore Gas	95	1		0.1	34818	6710	2637	44165
Gina to Shore Oil/Water	95	1		0.1	34818	6710	2637	44165
TOTAL				**2.86**	**522273**	**279583**	**79108**	**880964**

Project IV-Santa Barbara Channel/Southern Santa Maria Basin

Number of Pipelines 7

Number of Powercables 4

Pipeline	Water depth (ft)	Platform Disconnect	Add'l Sections-Removal[1]	Days for OCS Work (with contingencies)	Mob/Demob	Dive Boat	Disposal/Misc.	Total OCS Cost
Gilda to Shore Oil	205	1		0.07	96364	6435	2637	105436
Gilda to Shore Gas	205	1		0.07	96364	6435	2637	105436
Gilda to Shore Water	205	1		0.07	96364	6435	2637	105436
Irene to Shore Oil	242	1		0.08	96364	7020	2637	106021
Irene to Shore Gas	242	1	1	0.38	96364	35100	5274	136738
Irene to Shore Water	242	1	1	0.38	96364	35100	5274	136738
Habitat to Shore Gas	290	1	1	0.34	96364	32175	5274	133813
TOTAL				**1.38**	**674545**	**128700**	**26369**	**829615**

Project V-Santa Barbara Channel Southern Santa Maria Basin

Number of Pipelines 11

Number of Powercables 0

Pipeline	Water depth (ft)	Platform Disconnect	Add'l Sections-Removal[1]	Days for OCS Work (with contingencies)	Mob/Demob	Dive Boat	Disposal/Misc.	Total OCS Cost
Gail to Grace Oil	739 / 318	2	1	0.46	96364	42900	7911	147174
Gail to Grace Gas	739 / 318	2	1	0.46	96364	42900	7911	147174
Gail to Grace Gas (sour)	739 / 318	2	1	0.46	96364	42900	7911	147174
Harvest to Hermosa Oil	675 / 603	2		0.15	96364	14040	5274	115678
Harvest to Hermosa Gas	675 / 603	2		0.15	96364	14040	5274	115678
Hidalgo to Hermosa Oil	430 / 675	2		0.15	96364	14040	5274	115678
Hidalgo to Hermosa Gas	430 / 675	2		0.15	96364	14040	5274	115678
Grace to Shore Oil	318	1		0.07	96364	6435	2637	105436
Grace to Shore Gas	318	1		0.07	96364	6435	2637	105436
Hermosa to Shore Oil	603	1		0.08	96364	7020	2637	106021
Hermosa to Shore Gas	603	1		0.08	96364	7020	2637	106021
TOTAL				**2.26**	**1060000**	**211770**	**55376**	**1327146**

Project VI-Western Santa Barbara Channel

Number of Pipelines 7

Number of Powercables 4

Pipeline	Water depth (ft)	Platform Disconnect	Add'l Sections-Removal[1]	Days for OCS Work (with contingencies)	Mob/Demob	Dive Boat	Disposal/Misc.	Total OCS Cost
Hondo to Harmony Oil	842 / 1198	2		0.14	151429	12870	5274	169572
Heritage to Harmony Oil	1075 / 1198	2		0.15	151429	14040	5274	170742
Heritage to Harmony Gas	1075 / 1198	2		0.15	151429	14040	5274	170742
Harmony to Hondo Gas	1198 / 842	2		0.14	151429	12870	5274	169572
Harmony to Shore Oil	1198	1		0.07	151429	6435	2637	160501
Harmony to Shore Water	1198	1		0.07	151429	6435	2637	160501
Hondo to Shore Gas	842	1		0.07	151429	6435	2637	160501
TOTAL				**0.78**	**1060000**	**73125**	**29006**	**1162131**

Cut Up and Retrieval Method

Input Data		
Mob/Demob Rate (dollars)	500000	
Removal Rate	0.43	mi/day
Day Rate	39600	$/day
Disposal/Miscellaneous	98475	/ mile
Weather Contingency*	10	%
*Platform Heritage	20	%

Project VI- Western Santa Barbara Channel (Santa Ynez Unit) Powercables-Cut Up and Retrieve

Number of Powercables 9

Powercables	Length (miles)	Days for Work (with contingencies)	Mob/Demob	Removal Costs	Disposal/Misc.	Total Cost
Heritage to Harmony	1	2.80	55556	110880	98475	264911
Harmony to Hondo	1	2.57	55556	101640	98475	255671
Hondo to Harmony A	4	10.27	55556	406560	393900	856016
Hondo to Harmony B	4	10.27	55556	406560	393900	856016
Hondo to Salm	1	2.57	55556	101640	98475	255671
Heritage to Shore	17	47.60	55556	1884960	1674075	3614591
Heritage to Shore (failed cable)	12	33.60	55556	1330560	1181700	2567816
Harmony to Shore A	1	2.57	55556	101640	98475	255671
Harmony to Shore B	1	2.57	55556	101640	98475	255671
					TOTAL=	**9182030**

Project II- South Coast (Los Angeles/Orange County Beta Unit) Powercables-Cut Up and Retrievel

Number of Powercables 2

Powercables	Length (miles)	Days for Work (with contingencies)	Mob/Demob	Removal Costs	Disposal/Misc.	Total Cost
Elly to Eureka East	1.5	3.85	250000	152460	147713	550173
Elly to Eureka West	1.5	3.85	250000	152460	147713	550173
					TOTAL=	**1100345**

The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Minerals Revenue Management** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.

MMS Securing Ocean Energy & Economic Value for America