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Idle Iron Decommissioning Offshore California and the Need to Amend Reefing Legislation

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Abstract

This paper describes the operating status of oil and gas platforms offshore California and factors inhibiting the timely decommissioning and removal of aging oil and gas infrastructure. The paper further highlights the environmental, safety, and financial risks created by delayed decommissioning. A major factor contributing to the delay in decommissioning California platforms is the lack of a functional artificial reefing program. This, and the lack of west coast materials disposal facilities having the capability to offload and process the topsides and jackets of large platforms, creates a situation that forestalls decommissioning. This paper discusses impediments to reefing platforms under the California Marine Resources Legacy Act (CMRLA) which was enacted in 2010 and allows on a case-by-case basis, the partial removal of a federal OCS platform jacket and the conversion of the remnant jacket *in-situ* to an artificial reef managed by the California Department of Fish and Wildlife. To spur decommissioning, the authors recommend changes to the act to facilitate the reefing of platform jackets and encourage timely removal of aging offshore oil and gas infrastructure. The reefing of a single large deepwater platform jacket would preserve critical habitat for fish and invertebrate communities and generate tens to hundreds of millions of dollars in savings per platform 85 percent of which under CMRLA would be devoted to coastal marine preservation and enhancement projects.

Introduction

There are 27 California platforms, four in state waters and 23 on the federal Outer Continental Shelf (OCS). Approximately 250 miles of oil and gas pipelines have been installed in federal and state waters to transport the oil and gas produced by the platforms to onshore processing facilities. Currently, nine of the 23 federal OCS offshore are slated to be decommissioned but no final applications for decommissioning the structures have been submitted to federal regulatory authorities despite production having terminated at most of the facilities nearly 10 years ago. Prolonged delays in decommissioning aging oil and gas infrastructure create environmental, safety, and financial risks. One of the major factors contributing to the delay in decommissioning California platforms is the lack of a functional artificial reefing program. In contrast to the Gulf of Mexico (GOM), where more than 600 decommissioned platforms have been converted to artificial reefs, the State of California does not have reefing legislation considered workable by industry, nor does

it have an approved or state funded artificial reefing program which is a prerequisite under federal OCS oil and gas regulations for approving conversion of a platform jacket to an artificial reef. The "jacket" is the steel frame (steel pilings and supporting beams and crossbeams) supporting the deck and the topsides of an offshore platform (Fig. 1).

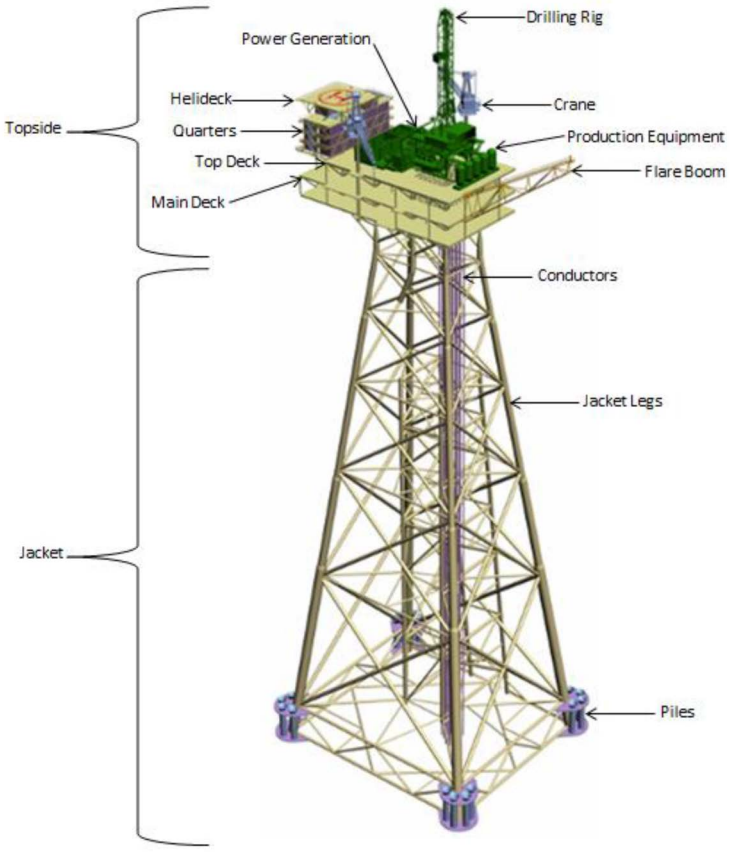

Figure 1—Typical components of a fixed jacket oil and gas platform.

In 2010, then Governor Schwarzenegger signed into law the California Marine Resources Legacy Act (CMRLA) which allows, on a case-by-case basis, the partial removal of a federal OCS platform jacket and the conversion of the remnant jacket *in-situ* to an artificial reef managed by the California Department of Fish and Wildlife (CDFW). To date, the operators of the platforms have not expressed any serious interest in reefing OCS platform jackets because they consider CMRLA unworkable in its present form due primarily to its liability provisions, inequitable cost-savings sharing requirement, and the requirement for the first reefing applicant to fund the setup costs for the artificial reefing program. This paper evaluates the impediments to reefing under CMRLA and recommends changes to the act to facilitate reefing of platform jackets and encourage timely decommissioning and the removal of aging offshore oil and gas infrastructure. The paper also describes federal OCS and state platform decommissioning regulations and environmental review procedures, factors contributing to delayed decommissioning, the risks created by delayed decommissioning, the highly productive fish habitat present at the platforms, and how liability concerns were addressed by the National Fisheries Enhancement Act.

California Oil and Gas Platforms

There are a total of 27 oil and gas platforms located off the coast of California, 23 on the federal Outer Continental Shelf (OCS) and four (Emmy, Esther, Eva, Holly) in state waters (Fig. 2, Tab. 1). The platforms

range in age from 35 years (Harmony/Heritage) to 58 years (Holly), are in water depths ranging from 22 to 1,198 feet, and range in size from small structures like Gina, having a total weight of 1,400 tons, to ultra-large structures like Heritage and Harmony having estimated removal weights ranging from 69,000 to 87,000 tons (Smith and Byrd, 2023). Ten of the platforms (Gail, Grace, Harvest, Hermosa, Hidalgo, Irene, Habitat, Hogan, Houchin, Holly) have terminated production and are in the early stages of being decommissioned. As of January 2024, BSEE reported that all the wells had been plugged and abandoned and all the conductors had been removed on Platform Harvest, Hidalgo, Hermosa, Grace, and Gail (BSEE, 2024).

Figure 2—California Offshore Oil and Gas Facilities (Courtesy, Lawrence Berkeley National Laboratory)

Table 1—Oil and Gas Platforms Located Offshore California

Platform	Year Installed	Operating Status Fourth Qtr. 2024	Water Depth (feet)	Estimated Removal Weight (short tons)	Wells Drilled	OCS Operator1
San Pedro Bay – Los Angeles County						
Edith	1983	Producing	161	8,556	18	DCOR
Ellen	1980	Producing	265	11,655	63	BOC
Elly2	1980	Producing	255	9,400	0	BOC
Emmy	1963	Producing	47	2,480	64	CRC
Esther	1985	Producing	22	3,523	64	DCOR
Eureka	1984	Producing	700	33,377	50	BOC
Eva	1964	Producing	57	2,686	44	DCOR
Eastern Santa Barbara Channel – Ventura and Santa Barbara County						
A	1968	Producing	188	4,896	52	DCOR
B	1968	Producing	190	4,959	57	DCOR
C	1977	Producing	192	5,718	38	DCOR
Henry	1979	Producing	173	4,006	23	DCOR
Hillhouse	1969	Producing	190	5,834	47	DCOR
Gilda	1981	Producing	205	11,293	63	DCOR

Platform	Year Installed	Operating Status Fourth Qtr. 2024	Water Depth (feet)	Estimated Removal Weight (short tons)	Wells Drilled	OCS Operator[1]
Gina	1980	Producing	95	1,380	12	DCOR
Habitat	1981	Production terminated	290	9,611	20	DCOR
Gail	1987	Production terminated	739	37,057	28	BWEG[2]
Grace	1979	Production terminated	318	13,074	28	BWEG[2]
Hogan	1967	Production terminated	154	5,098	39	BWEG[3]
Houchin	1968	Production terminated	163	5,615	35	BWEG[3]
Western Santa Barbara Channel – Santa Barbara County						
Hondo	1976	Shut-in	842	29,478	28	Sable
Harmony	1989	Shut-in	1,198	86,513	34	Sable
Heritage	1989	Shut-in	1,075	69,192	48	Sable
Holly	1966	Production terminated	211	5,515	30	CSLC[4]
Santa Maria Basin – Santa Barbara County						
Harvest	1985	Production terminated	675	35,150	19	FMC
Hermosa	1985	Production terminated	603	30,868	13	FMC
Hidalgo	1986	Production terminated	430	23,384	14	FMC
Irene	1985	Production terminated	242	8,762	26	FMC

[1] Beta Operating Company, LLC (BOC); Dos Cuadras Offshore Resources, LLC (DCOR); Beacon West Energy Group, LLC (BWEG); Sable Offshore Corp. (Sable): Freeport McMoRan Oil, Gas, LLC (FMC), California Resources Company (CRC), California State Lands Commission (CSLC)

[2] BWEG is Chevron's Designated Agent for decommissioning purposes.

[3] BWEG is ConocoPhillips Agent for monitoring and maintaining Platforms Hogan and Houchin.

[4] Platform Holly is under the control of CSLC following the bankruptcy of Venoco Corporation.

To date, the operators of the nine non-producing OCS platforms have not submitted any final applications to the U.S. Department of Interior's (DOI) Bureau of Safety and Environmental Enforcement (BSEE) for review and approval. Most of the OCS platforms and Platform Holly are currently in a condition that is referred to as "cold staked" which is synonymous with the more familiar term "mothballed." Cold stacking is the process of shutting down the platform by permanently sealing all wells, removing hydrocarbons by purging them from tanks and piping, and removing out of service equipment. The platforms are often left unmanned but are monitored to ensure the required navigation safety lighting systems are operable. The National Environmental Policy Act (NEPA) environmental review process for removing the federal OCS platforms will begin when final decommissioning applications for the projects are approved by BSEE. The operator timelines for submitting final decommissioning applications are uncertain.

The first of the 27 remaining platforms likely to be decommissioned and removed is Platform Holly which is located on a state tidelands lease offshore Goleta, California. Platform Holly has been under the control of the California State Lands Commission (CSLC) since 2017 when Venoco, LLC filed for bankruptcy and

quitclaimed the state tidelands lease. According to the CSLC, the 30 wells on Platform Holly are expected to be permanently plugged and abandoned in 2024. After the wells are sealed the remaining conductors will be removed (CSLC, 2024). The CSLC is expected to begin preparing an Environmental Impact Report (EIR) for removing Platform Holly in late 2024 or early 2025 following the requirements of the California Environmental Quality Act (CEQA). The forthcoming CSLC decision for removing Platform Holly will likely set a precedent for the removal of other California platforms.

There could be a prolonged delay in decommissioning two of the nine OCS platforms (Hogan, Houchin) where production has terminated due to ongoing litigation. Signal Services Inc. (Signal), the former owner of the lease (OCS P-0166) for Platforms Hogan and Houchin, relinquished its lease on October 14, 2020, and informed BSEE it did not have the financial capability to decommission the platforms. On November 6, 2020, BSEE issued an order to the previous operator (ConocoPhillips) and former lessees to submit a decommissioning application for Platforms Hogan and Houchin. In response to the order, the recipients filed an appeal with the DOI's Interior Board of Land Appeals (IBLA) disputing they had accrued decommissioning obligations under the lease and OCS regulations that were enforce at the time the lease assignment was approved. The appeal was accepted, and the case is currently being litigated before the IBLA.

The upcoming deepwater (+500 ft. wd.) platform decommissioning projects in California will be unprecedented in scale and will involve removing structures that are as tall and weigh more than the Eiffel Tower (958 ft. in height and 10,100 short tons). In comparison, Platform Gail (Fig. 3) rises to a height of about 900 feet above the seabed and has an estimated removal weight of 37,057 short tons. Chevron is currently developing plans for conducting two separate decommissioning projects, one for Platforms Gail and Grace, and another for removing Harvest, Hermosa, and Hidalgo. The full removal of Platforms Gail (739 ft. wd.), Harvest (675 ft. wd.), and Hermosa (603 ft. wd.) would set world water depth records (~500 ft. wd.) for fully removing steel-jacketed platforms from the seafloor (Chevron, 2024).

Figure 3—Platform Gail (739 ft. wd.)

In addition to the platforms on terminated leases, three OCS platforms (Harmony, Heritage, Hondo) have been shut-in (inactive and not producing) since 2015 due to the rupture of the onshore pipeline that transported oil and gas produced by the platforms to processing facilities. These platforms may return to production when the pipeline is repaired, if the operator (Sable Offshore Corporation) of the platforms can obtain approval from federal, state and county regulatory agencies to reopen the pipeline and restart production. If Sable is unsuccessful in obtaining permits to restart production by January 1, 2026, ownership

of the Santa Ynez Unit platforms and onshore Las Flores Canyon processing facility would revert to ExxonMobil who would hold sole responsibility for decommissioning the facilities (Offshore, 2024).

In contrast to the North Sea and GOM where numerous oil and gas platforms have been decommissioned, there is little or no infrastructure available in California to support large oil and gas platform decommissioning operations (Smith and Byrd, 2023). There are currently no Heavy Lift Vessels (HLVs) stationed on the U.S. west coast that have capability to remove the large OCS platforms efficiently and safely. There are also no port-based facilities in California that have the capability to offload and process the topside modules and jackets of the large OCS platforms. Absent the construction of new or expanded materials disposal facilities, the topside modules and jackets can only be loaded onto cargo barges and towed to materials disposal yards in the GOM or overseas locations. Transporting the materials by barge to such distant locations would be a risky, time-consuming and expensive process.

Federal and State Decommissioning Regulations

The DOI's BSEE and Bureau of Ocean Energy Management (BOEM) jointly regulate oil and gas and renewable energy leasing, exploration, development and decommissioning activities on the federal OCS in accordance with the provisions of the OCS Lands Act (OCSLA) and its implementing regulations. BSEE is responsible for issuing permits for exploration, development and decommissioning activities, and enforcing safety and environmental regulations. BOEM is responsible for issuing and administering OCS leases, conducting environmental studies, and administering the federal OCS bonding and risk management program to ensure companies have the financial strength to fulfill their decommissioning obligations. BOEM also conducts environmental reviews of projects to support BSEE permitting decisions.

Federal OCS oil and gas decommissioning regulations are found in Title 30, Code of Federal Regulations (30 CFR §250.1700-1754). The regulations define decommissioning to be the process of *"ending oil and gas operations and returning the lease or pipeline right-of-way to a condition that meets the requirements of regulations of BSEE and other agencies that have jurisdiction over decommissioning activities."*

Under the OCS regulations, when a platform is no longer useful for operations, operators are required to:

1. Permanently plug all wells.
2. Remove all platforms and other facilities to a depth of 15 feet below the mudline.
3. Decommission all pipelines.
4. Clear the seafloor of all obstructions on the lease or pipeline Right-of-Way (ROW).

The OCS regulations require that all wells be plugged and abandoned within one year after a lease terminates. The regulations also require platforms and other facilities to be removed within one year after a lease terminates unless the lessee or ROW holder obtains BSEE approval to maintain the platform or facilities to conduct other activities. In certain cases, BSEE has allowed companies to postpone decommissioning beyond these deadlines to increase the opportunity for resale, to consider the structure for an alternate use, to allow planning and organizing multi-platform decommissioning campaigns to reduce decommissioning costs through economies of scale, or if the decommissioning project is very complex. In the Pacific Region, operators are required to submit an Initial Decommissioning Plan two years before production is expected to cease, and a Final Decommissioning Plan not longer than two years after submittal of the Initial Decommissioning Plan (BSEE, 2020).

In April of 2023, BSEE issued a final rule that clarified and formalized the obligations of predecessor operators upon receiving an order from BSEE to decommission platforms and other infrastructure on terminated leases (Federal Register, 2023). The new rule requires predecessor operators to (1) begin maintenance and monitoring within 30 days of receiving a BSEE order to perform decommissioning obligations, (2) designate an operator for decommissioning within 90 days, (3) submit a decommissioning

plan within 150 days, and (4) perform the required decommissioning in the time and manner specified by BSEE in its decommissioning plan approval.

Federal OCS oil and gas regulations also allow BSEE to grant a departure from the requirement to remove a platform if the structure is approved to be converted to an artificial reef or alternate use. In the GOM more than 600 OCS oil and gas platforms have been converted to artificial reefs that are managed by State fisheries management agencies in Louisiana, Texas, Mississippi, and Alabama (BSEE, 2024a). For BSEE to grant a departure from removing an OCS platform the following conditions must be met:

1. The structure becomes part of a State artificial reef program.
2. The responsible State agency acquires a permit from the U.S. Army Corps of Engineers (ACOE) and accepts title and liability for the structure.
3. U.S. Coast Guard navigational safety requirements for the structure are satisfied (typically platform jackets must be cut-off and removed to a depth of 85 feet below the surface of the ocean to ensure navigation safety).

California State Lands Commission (CSLC) Decommissioning Regulations

The CSLC is responsible for regulating the decommissioning of oil and gas facilities in state waters which extend from the coastline to three nautical miles offshore. Division 6 of the Public Resources Code provides the statutory requirements for decommissioning offshore oil and gas facilities (CSLC, 2024a). The primary requirements are described below.

Section 2122. Timely Removal**:** Requires timely removal of structures or facilities used for the drilling of wells that are no longer operative.

Section 2124. Surrender of Leased Premises: Upon termination of a lease, the lessee shall surrender the lease with permanent improvements in good order and condition or, at the option of the Commission, shall remove all structures and facilities as specified by the Commission.

Section 2128. Well Abandonment and Site Clearance: All casing and conductor shall be severed and removed from not more than 5 feet below ocean floor, unless other plans are approved by the staff; the ocean floor shall be cleared of any other obstructions; written staff approval of individual well abandonment programs is required prior to commencement of rig operations.

Lessees are required to notify CSLC about their intent to abandon and quitclaim a state tidelands lease and provide an economic justification supporting the non-commercial status of the lease. They are also required to submit a formal application that includes a detailed execution plan for decommissioning and removing the oil and gas facilities. When the application is deemed complete by the CSLC, the CEQA review process for preparing an Environmental Impact Report (EIR) is initiated by the CEQA lead agency (likely the CSLC) to access the environmental impacts of the proposed project and project alternatives (Interagency Decommissioning Working Group, 2019). The final EIR is then presented at a public meeting to Commission officials for certification. If the Commission certifies the EIR, and then approves the project, decommissioning operations can commence.

Federal NEPA Environmental Review Process

To support BSEE decisions on future OCS platform and pipeline decommissioning applications, BOEM is expected to prepare project specific Environmental Impact Statements (EIS) to satisfy the requirements of NEPA. The EIS process, including the time required to prepare a Record of Decision (ROD), typically requires approximately two years to complete and begins when BSEE determines an operator's Final Decommissioning Plan is complete. Operators planning to conduct a decommissioning project are also required to submit a consistency certification along with supporting information and data to the California Coastal Commission (CCC) demonstrating their project will be consistent with the state coastal zone

policies. Under the Coastal Zone Management Act (CZMA), BSEE cannot approve an operator's platform decommissioning application until the CCC has either concurred with the operator's certification, waived the need for consistency, or the Secretary of Commerce, on appeal, overrides the CCC objection to certification.

To support future NEPA analyses of platform decommissioning projects BOEM prepared a Programmatic Environmental Impact Statement (PEIS) to evaluate a broad range of environmental effects and mitigation measures associated with full and partial removal of federal OCS platforms and pipelines offshore Southern California (BOEM, 2023). The ROD for the PEIS, released on December 13, 2023, denoted full removal as the preferred alternative (BSEE, 2023). This alternative involves the complete removal of platform topsides, jackets and conductors to a depth of at least 15 feet below the natural seabed (mud line), the complete removal of pipelines, power cables, and other subsea infrastructure, and transport of the materials to shore for recycling or disposal.

The PEIS ROD does not rule out the reefing of a platform jacket. Future project specific NEPA reviews will evaluate the environmental impacts of fully removing oil and gas platforms and pipelines as well as partial removal alternatives, including possible conversion of the jacket structures to artificial reefs. If the project specific NEPA EIS determines that reefing a platform jacket is the environmentally preferred alternative and would result in a net environmental benefit as is required by the CMRLA, BSEE may approve reefing the structure if the CDFW agrees to accept ownership and liability for the structure, and ACOE permits are obtained.

Factors Contributing to the Delay in Decommissioning

There are many economic, technical, logistical, regulatory, and legal factors contributing to the delay in decommissioning California oil and gas platforms. Given the complexity of these factors, it is difficult to predict with any certainty a timeline for decommissioning specific platforms. Experience to date, however. shows the time elapsing from cessation of production to initiation of platform topsides and jacket removal operations is likely to range from a minimum of 10 years to 15 years or longer. As shown in Table 2, six of the nine OCS platforms slated for decommissioning ceased producing oil and gas in 2015, yet operators of those platforms have not submitted any Final Decommissioning Plans to BSEE for review and approval. When final plans are approved by BSEE it will likely take an additional 3-4 years to conduct environmental reviews, obtain permits, complete the contracting process for securing the services of an HLV, and mobilize the HLV to California, assuming litigation does not slow the process. Reasons for the delay in decommissioning offshore California are enumerated and discussed below. More detailed information on the decommissioning status of individual California platforms and the challenges of decommission can be found in the authors' paper presented at the 2023 Offshore Technology Conference in Houston, Texas (Smith and Byrd, 2023).

1. Very high and uncertain decommissioning costs.
2. Economic incentives to defer decommissioning.
3. Large deepwater oil and gas platforms.
4. Lack of onshore processing and disposal options.
5. High HLV mobilization costs.
6. Complex regulatory framework and risk of litigation.
7. Bankruptcies and contested decommissioning obligations.
8. An unworkable reefing law and lack of a State approved artificial reef program.

Table 2—Status of Decommissioning Applications for OCS Platforms

Platform	OCS Operator[1]	Operating Status Fourth Qtr. 2024	COP (Year)	Status of Decommissioning Applications
Habitat	DCOR	Prod. terminated	2015	Final decommissioning application pending
Gail	BWEG[2]	Prod. terminated	2015	Final decommissioning application pending
Grace	BWEG[2]	Prod. terminated	2015	Final decommissioning application pending
Hogan	BWEG[3]	Prod. terminated	2020	ConocoPhillips has appealed BSEE order to decommission
Houchin	BWEG[3]	Prod. terminated	2020	ConocoPhillips has appealed BSEE order to decommission
Harmony	Sable	Shut-in	2015	Production may resume if pipeline permits are approved
Heritage	Sable	Shut-in	2015	Production may resume if pipeline permits are approved
Hondo	Sable	Shut-in	2015	Production may resume if pipeline permits are approved
Harvest	FMC	Prod. terminated	2015	Final decommissioning application pending
Hermosa	FMC	Prod. terminated	2015	Final decommissioning application pending
Hidalgo	FMC	Prod. terminated	2015	Final decommissioning application pending
Irene	FMC	Prod. terminated	2023	Final decommissioning application pending

[1] Beta Operating Company, LLC (BOC); Dos Cuadras Offshore Resources, LLC (DCOR); Beacon West Energy Group, LLC (BWEG); Sable Offshore Corp. (Sable): Freeport McMoRan Oil, Gas, LLC (FMC)

[2] BWEG is Chevron's Designated Agent for decommissioning purposes.

[3] BWEG is ConocoPhillips Agent for monitoring and maintaining Platforms Hogan and Houchin

Very High and Uncertain Decommissioning Costs

Due to the lack of platform decommissioning that has taken place offshore California there are no recent projects that provide reliable benchmarks for estimating the costs that would be incurred if platforms and pipelines were required to be fully removed. The most recent platform decommissioning project occurred over 30 years ago in 1994 when Chevron removed Platforms Hope, Heidi, Hilda, and Hazel in State waters. However, these platforms were much smaller and in shallower water than the existing 23 federal OCS platforms. The lack of benchmarks and relevant experience creates a high level of risk for operators in terms of being able to estimate projected decommissioning costs with any degree of certainty (Byrd, et. al., 2018). A comparison of recent cost estimates for decommissioning Platform Holly with cost estimates for OCS platforms (A, B, C, Hillhouse, Hogan, Houchin) comparable in size (~5,000 tons), and water depth (~200 ft.) to Holly is instructive in that regard. The BSEE 2020 decommissioning cost report estimated the cost to plug and abandon the wells and fully remove the six OCS platforms and pipelines ranged between $40 to $50 million per platform (BSEE, 2020a). In contrast, CSLC reported the full removal of Platform Holly and restoration of the seafloor could cost as much as $475 million (Yamamora, 2022), a ten-fold difference.

The ten-fold difference in costs reflects how preliminary cost estimates based on limited information and optimistic assumptions significantly underestimated the actual cost of decommissioning. The cost estimates reported by CSLC for Platform Holly are based on actual costs incurred to date and detailed engineering and cost studies conducted by ExxonMobil for fully removing the platform and pipelines. The BSEE cost estimates, in contrast, were based on a cursory assessment of platform engineering drawings and plans, and well conditions. The BSEE costs are also what is referred to as ALARP – "As Low as Reasonably Possible" cost estimates that could be achieved under good circumstances where the platform wells, drilling rig, and topside and jacket are well maintained and in good condition for decommissioning, no problems or delays

are encountered, and all the work can be conducted in a very efficient and timely manner. This is rarely if ever the case for decommissioning projects, particularly for older platforms. The BSEE report also did not include any costs for refurbishment of the platforms or drill rigs, structural reinforcements required for lifting operations, and site remediation expenses. These costs can be substantial as has been demonstrated at Platform Holly where the CSLC reported approximately $23.2 million was spent refurbishing the platform and drilling rig to prepare and make the platform safe for plugging and abandoning the 30 wells on the platform (CSLC, 2021).

Economic Incentives to Defer Decommissioning

The high cost to decommission platforms provides a strong incentive for operators to defer decommissioning as long as possible, particularly if there are no options to save costs by converting the structures to artificial reefs. By delaying decommissioning, companies can improve their balance sheets and devote cash and human resources to exploration and development and other revenue generating activities.

Large Deepwater Oil and Gas Platforms

Approximately one-third of the 23 OCS oil and gas platforms exceed 10,000 tons in weight and are in water depths exceeding 400 feet. Seven of the platforms are in water depths exceeding 500 feet which approximates the world water depth record for fully removing a conventional steel platform jacket from the seafloor. Three of the OCS platforms (Gail, Harvest, Hermosa) in the early stages of being decommissioned by Chevron are in water depths exceeding 600 feet. These platforms have massive footings that were not designed to be removed. The full removal of these structures will pose significant engineering and safety challenges. Detailed engineering studies will be required to ensure the decommissioning work can be safely conducted.

Lack of Onshore Processing and Disposal Options

There are very limited onshore disposal options for platform topside and jacket materials in southern California. The only port-based facilities that process scrap metal in the region are operated by SA Recycling, LLC at Berths 210-211 on Terminal Island at the Port of Los Angeles, and Berth 118 at the Port of Long Beach. The facilities collect and process heavy metal scrap and recycle ferrous and nonferrous metals recovered from automobiles, appliances, and rail cars (Byrd et al., 2018). The facilities are relatively small-scale operations, encompassing areas of 16 and 26 acres respectively, and neither have the crane capacities and open storage space required to offload and stack the large topside modules and jacket sections of deepwater platforms.

High HLV Mobilization Costs

There are currently no HLVs stationed on the west coast that have the lifting capacities to both safely and efficiently remove the topsides modules and jackets of the large deep-water platforms. To remove the large deepwater platforms, large HLVs having dual cranes with a combined lifting capacity of 3,600 tons like the *Gretha* (Fig. 4) will likely be mobilized from the North Sea, GOM, Asia Pacific or other distant locations at great expense (Smith and Byrd, 2023). The day rates of the HLVs historically have ranged from $200,000 to $600,000 per day or higher, and the round-trip mobilization times could range from 80 to 110 days depending on the transit speed of the HLV and distance travelled. Using these durations and day rates, total HLV roundtrip mobilization costs to California would range from $16 million to $66 million.

Figure 4—Gretha Semi-submersible Crane Vessel Courtesy, OOS International Group

Complex Regulatory Framework and Risk of Litigation

There are more than 20 federal, shore and local regulatory agencies that issue permits or approvals over various aspects of platform decommissioning projects, including pipelines and power cables that are routed to shore, and associated onshore processing and support facilities. The NEPA and CEQA environmental review processes are also lengthy, typically ranging from one to two years for the preparation of a project-specific EIS and/or an EIR to support permitting decisions by BSEE, CSLC and other regulatory agencies. Agency permitting approvals can also be appealed and litigated by environmental groups and other parties further delaying the planned commencement of the decommissioning project.

Bankruptcies and Contested Decommissioning Obligations

Operator bankruptcies can result in prolonged delays in the decommissioning of wells and offshore oil and gas platforms, particularly when predecessor operators, lessees and interest right holders appeal their decommissioning obligations. When there are multiple predecessor operators, lessees, and interest-right holders in the chain of ownership the process for determining who is responsible for decommissioning can become very complicated. As was discussed earlier in this paper, the decommissioning of Platform Hogan and Houchin, the first two platforms installed on the OCS offshore California, has been delayed due to the failure of the prior lease holder (Signal) to meet its decommissioning obligations, and an appeal filed by the predecessor operator and former lessees who are disputing that they have accrued decommissioning obligations. The appeal process is lengthy, often taking more than five years due to backlog of cases within the IBLA. The IBLA's decision can also be challenged by the plaintiff resulting in further court proceedings.

An Unworkable Reefing Law and Lack of a State Approved Artificial Reef Program

In contrast to the GOM where more than 600 decommissioned platforms have been converted to artificial reefs, the State of California does not have reefing legislation that is considered workable by industry, nor does it have an approved and funded artificial reefing program (Aquarium of Pacific, 2020). This is a prerequisite under OCS oil and gas regulations for approving conversion of an OCS platform jacket to an artificial reef. In 2010, the State legislature enacted CMRLA which allows, on a case-by-case basis, the partial removal of a federal OCS platform jacket and the conversion of the jacket *in-situ* to an artificial reef managed by CDFW. Since CMRLA was enacted, no platforms have been removed offshore California and no applications to convert the platform jackets to reefs have been submitted to BSEE. The prevailing view

among many offshore operators is CMRLA is unworkable in its present form due to its liability provisions, high cost-sharing requirements, and the high or possibly indeterminate set-up costs for establishing a CDFW managed artificial reefing program. Absent amendments to CMRLA and the establishment of approved and funded state artificial reefing program, it is unlikely any of the OCS platform jackets will be converted to artificial reefs.

Risks of Delayed Decommissioning

This section describes the potential environmental, safety, and financial risks created by delayed decommissioning of oil and gas platforms. The risks were highlighted in a 2024 GAO report (GAO, 2024) to Congress entitled *"Interior Needs to Improve Decommissioning Enforcement and Mitigate Related Risks."* As shown in Table 2, nine of the 23 OCS offshore California are no longer producing oil and gas. Production terminated at many of the platforms nearly10 years ago. There is currently no definitive timeline for decommissioning the platforms.

Environmental Risks

When decommissioning is delayed for a prolonged period, platforms and pipelines become increasingly vulnerable to damage and deterioration from the wear and tear of wind and waves, storms, seismic events, and the corrosive effects of saltwater. This can lead to the structural integrity of the platform jacket being compromised, which in a worst-case scenario, could result in the toppling of a platform during a seismic event or strong storm. Serious corrosion could also damage tanks, piping, and equipment on the platform leading to leaks and spills of hydrocarbons and other hazardous materials to the marine environment. Aging and deteriorating pipelines also increase the risks of oil spills which can damage sensitive marine habitats and have detrimental impacts on commercial and recreational fishing, tourism and the coastal economy. Delays in permanently plugging and abandoning wells can also increase the potential for the release of harmful greenhouse methane gas emissions from the wells.

The GAO report noted that two OCS platforms (Hogan, Houchin) slated for decommissioning have severe corrosion problems (Fig. 5) and pose serious safety, environmental and financial risks (GAO, 2024). The deteriorated condition of the platforms and well heads was also reported to be causing significant safety concerns in a report issued by the Santa Barbara Air Pollution Control District (APCD) in 2023 (Santa Barbara APCD, 2023).

Figure 5—Corrosion on Platform Hogan (GAO, 2024)

Safety Risks

If platforms are not properly maintained platform deterioration can make the structure more susceptible to structural failure and increase safety risks to personnel working on an operating platform, or personnel who will be involved in the platform dismantling and removal process. Degraded structures increase the potential for accidents and injuries if walkways and handrails are not properly maintained. Platform deterioration was also a factor in an industrial accident on OCS Platform Gilda in December of 2020 when two workers fell through the flooring of the galley approximately 80 feet into the ocean resulting in one death and one serious injury (BSEE, 2021). The flooring was being repaired due to moisture damage.

The potential for dropped objects during lifting operations poses a major risk if the structural integrity of the lift is compromised by poorly maintained platform components. To ensure the safety of personnel significant investments in repairs may be required prior to conducting decommissioning, which can further delay the commencement of decommissioning operations. The CSLC reported that due to the poor condition of Platform Holly when the state tidelands leases were quitclaimed to CSLC in April of 2017 a total of $23.2 million was spent to repair and retrofit Platform Holly to render it safe for well plugging and abandonment (CSLC, 2021). Cold-stacked or shut-in platforms, many of which are typically unmanned, also can pose a collision hazard for boats and ships, particularly if their navigational aid lights become nonfunctional.

Financial Risks

Delays in decommissioning resulting from lessees who default on their decommissioning obligations, or predecessor lessees who dispute their obligations, can create significant financial risk to the federal government and taxpayers, who may be required to cover those expenses. This is a distinct possibility if BOEM has failed to require, or the operator of the platform has not provided sufficient financial assurance to cover the decommissioning costs. In its 2023 budget request to Congress, BSEE asked for $30 million to begin issuing contracts to perform decommissioning services on oil and gas infrastructure orphaned by bankrupt operators in the GOM where there were no other jointly or severally liable parties (BSEE, 2023a). In the Pacific Region, the predecessor operator (ConocoPhillips) and lease owners of OCS Lease P-0166 have filed appeals with the IBLA disputing their decommissioning obligations for Platforms Hogan and Houchin. The BSEE website reports there is an estimated $10 million deficit in financial assurance to cover the costs of decommissioning 21 orphaned sidetrack wells on the platforms (BSEE, 2024). These costs will likely be borne by the federal government and taxpayer because there is no financial assurance available to cover those costs. Moreover, the amount of uncovered liability could grow substantially if the IBLA and courts rule the predecessor operator (ConocoPhillips) and lessees are not responsible for the full cost of decommissioning the platforms.

Platform Jackets Provide Highly Productive Fish Habitat

There have been a series of scientific studies conducted over the past three decades which have documented the biological habitats and ecology of the California oil and gas platforms (BOEM, 2019). One of the most noteworthy studies used fish density and size data from scuba and submersible surveys to compare the secondary (i.e. fish) production of California platforms and natural reefs with that of other marine and estuarine systems (Claisse et al. 2014). The study found that *"oil and gas platforms off the coast of California have the highest secondary fish production per unit area of seafloor of any marine habitat that has been studied."* This was due in part to the often-high densities of fast-growing young rockfishes and the likely lower predation rates on these fishes at platforms compared to natural reefs.

Table 3 shows the biological productivity ratings for 24 of the 27 California platforms, as measured by fish biomass and somatic production. The physical characteristics (water depth, footprint, size) of the platforms are shown along with their geographic location. Total platform biomass ranged from a high of 71,900 lbs. for Platform Eureka to a low of low of 700 lbs. for Platform Henry. Somatic production ranged from a high

of 11,000 lbs./yr. for Platform Grace to 180 lbs./yr. for Platform Houchin. Although there are exceptions, the larger mid to deepwater structures had the highest biomass and somatic production levels. This is primarily due to the vertical profiles of the jackets in the water column, which for the mid to deepwater jackets provide more habitat for fish populations than the smaller, shallow water platforms.

Table 3—Biological Productivity Ratings of California Oil and Gas Platforms Based on Fish Biomass and Somatic Production (Source: Clarisse et.al 2014 and 2015)

Platform	Water Depth (ft.)	Jacket Base Footprint (sq. ft.)	Jacket Volume (cu. ft.)	Mean Biomass (lbs.)	Mean Somatic Production (lbs./yr.)
San Pedro Bay and Orange County					
Edith	161	31,000	4,000	12,200	1,500
Ellen	265	27,000	4,700	41,900	8,300
Elly	255	31,700	5,000	40,100	3,300
Emmy	47	7,200	300	N.A.	N.A.
Esther	22	7,200	250	N.A.	N.A.
Eureka	700	49,900	19,900	71,900	8,400
Eva	57	7,200	400	N.A.	N.A.
Eastern Santa Barbara Channel – Ventura and Santa Barbara County					
A	188	20,700	2,700	6,400	1,300
B	190	20,700	2,700	3,400	1,000
C	192	20,700	2,700	3,000	1,000
Henry	173	16,200	2,700	700	200
Hillhouse	190	21,100	2,700	2,400	800
Gilda	205	25,200	3,400	9,200	2,100
Gina	95	6,000	400	1,400	240
Habitat	290	24,600	4,200	6,300	2,200
Gail	739	57,300	23,700	9,000	1,900
Grace	318	33,300	7,100	39,400	11,000
Hogan	154	15,500	2,400	1,700	250
Houchin	163	15,500	2,400	950	180
Western Santa Barbara Channel – Santa Barbara County					
Harmony	1,198	114,200	58,600	5,500	1,200
Heritage	1,075	114,200	52,600	23,700	3,600
Hondo	842	50,000	20,800	31,600	4,600
Holly	211	18,600	2,400	3,100	700
Santa Maria Basin – Santa Barbara County					
Harvest	675	63,100	24,100	15,900	3,800
Hermosa	603	55,300	21,200	17,200	3,600
Hidalgo	430	44,700	12,900	7,100	1,300
Irene	242	28,300	4,400	17,700	6,900

Notes – Numbers in the table have been rounded to facilitate ease of comparison. N.A. denotes fish survey data not available. Limited survey data (one season) was available for Harmony, Heritage and Houchin.

In a follow-up study, Claisse et. al (2015) estimated fish biomass and somatic production for 24 California platforms under three possible platform jacket decommissioning scenarios: (1) leave in place, (2) partial removal of the upper portion of the jacket to a depth of 85 feet, and (3) complete removal of the jacket and underlying shell mound. The study found that complete removal of a platform resulted in 95 percent or more reduction in the average fish biomass and annual somatic production at the site, while partial removal resulted in far smaller losses, averaging 10 percent or less. The study also reported the full removal of all the platforms and shell mounds would result in an estimated total loss of approximately 62,000 lbs. of fish biomass and 10,300 lbs. of annual somatic fish production. To put these numbers into context, the study noted 78,231 lbs. of rockfish valued at $357,106 were landed in Santa Barbara Harbor in 2017.

The results of these studies show the full removal of many platforms would result in a substantial loss of fish stock. This underscores the importance of conducting case-by-case net environmental benefit analyses for each platform to determine whether the jackets should be converted to artificial reefs rather than being fully removed.

The California Marine Resources Legacy Act (CMRLA)

This section describes the policy and provisions of the CMRLA (CMRLA, 2010) and summarizes the requirements for converting the jackets of California oil and gas platforms to artificial reefs managed by the CDFW. The section also discusses previous proposals to amend the act and the major provisions in CMRLA that operators consider unworkable.

CMRLA was enacted in 2010 following extensive debates and negotiations among members of the California legislature. The legislative process was supported by the California Department of Natural Resources who partnered with California Ocean Science Trust (OST), a 501(c)(3) nonprofit public benefit corporation, to conduct a study that evaluated alternatives for decommissioning California oil and gas platforms (OST, 2010).

The enactment of CMRLA established State policy that allows, on a case-to-case basis, the partial removal of the upper portion of platform jacket to a depth (typically -85 ft.) below the surface of the ocean that meets U.S. Coast Guard requirements to ensure safe navigation, and the conversion of the jacket to an artificial reef managed by the CDFW. The reefing program is voluntary and platforms in both state and federal waters are eligible to be reefed. CMRLA also requires certain conditions to be met before reefing is considered. These include, among others, that the creation of the reef results in a *"net environmental benefit to the marine environment",* and that a portion of the cost savings to the platform owner from partial, as opposed to full removal, will be deposited in the California Endowment for Marine Preservation. The act now mandates that 80 percent of the cost savings to be shared by donors with the State of California. In the GOM, the Texas and Louisiana Artificial Reef Programs donors generally share 50 percent of the cost savings with the agencies responsible for managing the state artificial reef programs. These savings are used for maintenance and development of the program, as well as for biological research (Louisiana Department of Wildlife and Fisheries, 2018). In actual practice, the GOM state programs negotiate their share of the savings on a case-by-case basis because it is often very difficult to determine what the actual cost savings would be for complex decommissioning projects.

Under CMRLA, six separate State entities have responsibility for administering various aspects of the reefing program:

1. California Department of Fish and Wildlife (CDFW): has the primary authority for implementing the program and is responsible for reviewing and approving reefing applications, preparing, updating, and approving reef management plans, holding public hearings to solicit public input on reefing proposals, and managing and operating the reef.
2. California Natural Resources Agency (CNRA): serves as the lead agency for conducting environmental reviews of reefing proposals in accordance with CEQA.

3. California Ocean Protection Council (OPC): is responsible for determining whether the partial removal of a platform would result in a net environmental benefit and developing criteria to make that determination.
4. California State Lands Commission (CSLC): is responsible for determining the amount of cost savings that would be saved by reefing as compared to full removal.
5. State Coastal Conservancy: is responsible for developing an advisory spending plan for the cost savings deposited in an endowment.
6. California Coastal Commission (CCC): has authority for approving coastal development permits for reefs located in state waters and conducts consistency reviews of decommissioning and reefing activities in federal waters that could affect coastal zone resources.

CMRLA also requires companies submitting reefing applications to cover the costs incurred by agencies to process the application, including the costs required to support preparation of environmental documents required to comply with CEQA. The act also requires the first reefing applicant to cover CDFW costs to set up the reefing program. In 2017, the California Senate Appropriations Committee estimated it would cost $4-$6 million to set-up the reefing program (California Senate Rules Committee, 2017). The cost estimates included funds for staffing and preparing CEQA environmental documents for reefing platform jackets.

CMRLA also sets forth several important agreements that must be enforced between the applicant and CDFW before conditional approval of a reef is granted. These include agreements between the owner/applicant and CDFW to (a) support the overall management of the reef, (b) to indemnify and protect the State from liability, and (c) for CDFW to take title to the reefed structure.

Attempts to Amend CMRLA

There have been several attempts to amend CMRLA since its enactment in 2010, one of the most significant of which was an initiative led by then State Senator Robert Hertzberg who introduced Senate Bill 588 (SB 588) in 2017 (Hertzberg, 2017). The stated purpose of the bill was to move the rigs-to-reef program forward by streamlining the acts cumbersome permitting process and implementing provisions encouraging oil companies to start shutting down their rigs and eliminate the danger posed by their aging structures. The proposed amendments would have improved CMRLA in several important areas by:

1. Streamlining the permitting process by transferring CEQA responsibilities from CNRA to CSLC.
2. Updating and adjusting the donation timing and cost sharing formula.
3. Addressing industry liability concerns.
4. Including consideration of air emissions and impacts on global warming in the net environmental benefit analysis.
5. Deleting the requirement that the first reefing applicant cover the full cost of setting up the reefing program and replacing it with a provision authorizing funding from the State to develop the start-up program.

SB 588 did not come up for a formal vote in the legislature because the initiative to amend the act died in committee. Renewed interest in amending CMRLA is expected as plans for decommissioning California platforms move forward.

National Fisheries Enhancement Act Liability Provisions

Prior to 1984, operators in the GOM were reluctant to donate platforms for reefing due to concerns over their long-term liability risks. Congress addressed industry's liability concerns in 1984 when it enacted the National Fisheries Enhancement Act (NFEA) (Public Law 98-623—Nov. 8, 1984) to promote reefing of platforms and enhance fishery resources and commercial and recreational fishing opportunities. Section 203 of NFEA established standards for artificial reef development requiring artificial reefs be sited,

constructed, monitored and managed in a manner that (1) enhances fisheries resources, (2) facilitates access by recreational and commercial fishermen, (3) minimizes conflicts with other ocean users, (4) minimizes environmental and safety risks to personnel and property, and (5) is consistent with international law and does not create any unreasonable obstruction to navigation. NFEA also directed the U.S. Department of Commerce (DOC) to create a National Artificial Reef Plan (NARP) to provide state and local artificial reef program managers, policy makers, and interested parties with guidelines on siting, design, construction, development, management, and monitoring of artificial reefs. The first NARP was issued by the DOC National Marine Fisheries Service in 1985; the most recent update of NARP was in 2007 (NMFS, 2007).

NFEA specifies ownership of an artificial reef must be transferred to a permittee (e.g., CDFW) and that the permittee must obtain permits from the ACOE and accept liability for the reefed structure. Section 205 (1) (a) (3) of NEFA mandates that proof of financial ability to assume liability must be presented to the ACOE by the permit applicant before a permit for artificial reef construction may be issued. Section 205 (2) (c) of NFEA also specifies that a permittee shall not be liable for damages caused by activities required to be undertaken under any terms and conditions of the permit if the permittee has complied with such terms and conditions. NFEA also specifies the doner of the reefing materials shall not be liable for damages arising from the use of such materials in an artificial reef, if such materials meet applicable requirements of the NARP and are not otherwise defective at the time title is transferred. The federal government is also excluded from liability under NFEA.

As noted previously, more than 600 oil and gas platforms have been converted to artificial reefs in the GOM in accordance with rigs-to-reef statutes enacted by Louisiana, Texas, Alabama, and Mississippi (Bull and Love, 2019). The reefing legislation enacted by GOM coastal states and the deeds of donation through which the donors transfer title to the platform to the state explicitly mirror NFEA language that limits the liability exposure of the state, reef management agencies, and donors of reef materials. Since NFEA was passed more than 40 years ago, the authors were not able to identify any cases where the managers of GOM reefing programs had been found liable for problems or incidents related to platform jackets that were converted to artificial reefs. Despite this positive record, there remain lingering concerns among some reefing managers that the state could be found liable for injuries, losses, or damage claims resulting from the permitting, construction, or maintenance of an artificial reef (Texas Parks and Wildlife Department, 1990). Such claims could be filed by recreational divers, commercial fishermen and other parties. These cases, if filed, would ultimately be decided by the courts based upon NFEA, federal admiralty law, and/or state tort law. To minimize the risk of litigation, indemnity provisions have been included in reefing legislation (e.g., CMRLA) and contractual Deeds of Donation documents used by GOM reefing management agencies.

Based on the long experience in reefing platforms in the GOM, the reefing of platform jackets offshore California is unlikely to create any significant liability risk for the CDFW. The greatest risk is from hydrocarbon contaminants released to the marine environment from improperly sealed oil and gas wells or the residual shell mounds composed of discharged drilling muds and cuttings that have formed at or near the base of some platform jackets. Former OCS operators/lessees retain liability in perpetuity for oil spills from blowouts and improperly sealed wells under the Oil Spill Prevention Act [33 U.S.C. § 1702 (a)]. Under OCS oil and gas regulations, if a plugged and abandoned well did begin to leak oil, BSEE can order the operator to take all remedial measures necessary to properly seal the well. If platform jackets are partially removed, the shell mounds would remain undisturbed. Conversely, if the platforms are required to be fully removed, the jacket legs and pilings would normally be removed to a depth of 15 feet below the mudline resulting in significant disturbance to the shell mounds and the potential release of hydrocarbon contaminants to the marine environment.

Recommendations for Amending CMRLA

Although CMRLA has been in force since 2010, there has been no serious interest expressed by the operators of California platforms in reefing the jackets of platforms despite the fact many platforms have stopped production and have sat idle for 10 or more years. Industry sources say this is primarily due to three factors: (1) CMRLA liability provisions, (2) the very high 80 percent cost sharing requirement, and (3) the requirement for first reefing applicant to fund the setup costs for the artificial reefing program. To make CMRLA workable and encourage the removal of aging infrastructure the authors recommend the act be amended to:

1. Modify the liability provision.
2. Reduce the cost sharing requirement to 50 percent of the cost savings.
3. Delete the provisions requiring the first applicant to cover program startup costs.
4. Delete the provisions requiring donors to fund operations and management costs.

Modify the Liability Provision

Section 6616 (f) of CMRLA requires the reefing applicant to enter into an agreement with the CDFW that: *"indemnifies the state and the department, to the extent permitted by law, against any and all liability that may result, including, but not limited to, active negligence, and including defending the state and the department against any claims against the state for any actions the state undertakes pursuant to this article."*

This provision is considered unworkable by operators because it creates an indeterminate and unacceptable level of risk by requiring donors of the platforms to be responsible for any-and-all liability, including operations conducted on the reefed structure by the CDFW after the donor transfers ownership of the platform to CDFW. Such operations could involve the use of vessels and personnel commissioned by CDFW to inspect, maintain, monitor, or alter the reef by adding new materials to enhance its habitat value. These types of marine activities are inherently risky and could result in accidents and injuries to offshore personnel. Under Section 6616 of CMRLA donors could also be held liable for actions taken by CDFW that are inconsistent with reefing guidelines established by NARP. Such actions could include augmenting the artificial reef with materials that do meet the standards set by NARP.

To address these concerns, the authors recommend Section 6616 be amended to clarify and limit the liability responsibilities of companies following the transfer of ownership from the donor to the CDFW. This can be done by inserting the language "e*xcept for negligence on the part of state agencies demonstrated to be inconsistent with reefing guidelines established by the National Artificial Reef Plan"* at the end of the provision cited above. Alternatively, Section 6616 of CMRLA could be amended as shown below by inserting new language in the act that mirrors the language in hold-harmless clauses of OCS oil and gas leases.

"The permittee shall indemnify the donor for, and hold it harmless from, any claim, including claims for loss or damage to property or injury to persons caused by or resulting from any operation on the artificial reef structure conducted by or on behalf of the permittee following transfer of the title and ownership of the structure to the permittee."

Amending the Section 6616 liability provision in this manner would be consistent with NFEA and mirror the liability provision language in the contractual "Acts of Donation and Title Transfer" agreements between donors and artificial reef management agencies in the GOM (see Appendix 2 of OST report).

To address lingering concerns among State policy decision makers and reefing mangers that the state could be found liable for injuries, losses, or damage claims that could be filed by recreational divers, commercial fishermen or other parties, the authors recommend setting a limit on the value of the indemnity (e.g., $5-$10 million) the donor is required to secure under CMRLA to defend the State in court and cover the payments of any resulting judgements against the State. The authors also recommend CMRLA be amended to allow the State to reduce or waive altogether donor liability levels after a specified period (e.g., 5-10 years)

if monitoring programs over that period show the structure does not pose a significant risk to navigation, divers, commercial and recreational fishing, and other ocean users. In the United Kingdom, companies are required to monitor oil and gas infrastructure approved to remain in place on the seabed following guidance issued by the Department for Business, Energy, and Industrial Strategy (BEIS, 2018). The monitoring programs are risk-based and developed collaboratively by the operator and regulatory authorities on a case-by-case basis.

Reduce the Cost Savings Share Percentage Target to 50 Percent

Section 6618 (c) (3) of CRMLA now requires 80 percent of the cost savings to the platform owner from partial, as opposed to full removal, to be shared with the State. This exceeds the 50 percent cost savings donors generally share with the GOM coastal states and provides very little financial incentive for companies to donate their platform jackets to the CDFW for inclusion in the State artificial reefing program. The authors recommend CMRLA be amended to reduce the cost share to 50 percent to incentivize reefing of platform jackets and the early decommissioning and removal of platforms and other aging oil and gas infrastructure. According to a study conducted by the authors of this paper, the potential total cost savings achieved by reefing all 23 OCS platform jackets *in-situ* as compared to full removal would range between $894 million to $2 billion (Smith and Byrd, 2020). For large deepwater (+400 ft. wd.) platforms the cost savings ranged from $36 million for Platform Hidalgo (430 ft. wd.) to $494 million for Platform Harmony (1,198 ft. wd.). If the 50 percent cost share requirement was in effect, the State would receive a total of $265 million ($18 million for Hidalgo + $247 million for Harmony) if the jackets of Hidalgo and Harmony were approved to be converted to artificial reefs. Under CMRLA most of the money (85 percent) would be deposited in the California Endowment for Marine Preservation where it can be used to conserve, protect, restore, and enhance the open coastal and marine resources of the state. To put these cost savings into context, the Governor's total proposed 2024-2025 budget for the CDFW was approximately $800 million (CDFW, 2024).

Delete Provision Requiring the First Applicant to Cover Startup Costs

Section 6612 (c) of CMRLA requires the first company filing an application to partially remove a platform to pay, in addition to the costs relating to review the project and management and maintenance of the structure, the startup costs incurred by CDFW, OPC, CSLC and CCC to implement the program. This provision penalizes the first reefing applicant and is unnecessary given the cost savings projected to be shared with the state of California. The authors recommend Section 6612 (c) CMRLA be deleted and be replaced by amendment language in Section 6604 of SB 588 that was introduced by former Senator Robert Hertzberg in the legislature on February 17, 2017 (California Senate, 2017). The proposed amendment deleted the requirement that the first applicant cover startup costs and replaced it with a provision making State of California appropriated funds available to CDFW to cover startup costs.

Delete Provision Requiring Donors to Fund Operations and Maintenance Costs

Section 6612 (a) (1) of CMRLA requires the applicant to provide bonding or other financial assurance when their reefing application is determined to be complete to ensure all obligations are fulfilled including implementation of the reef management plan and ongoing maintenance of the structure after CDFW takes title to the reefed structure. The authors recommend Section 6612 (a) (1) of CMRLA be amended to delete the language in the provision requiring financial assurance to cover the costs of implementing the reef management plan, and ongoing maintenance costs. In the GOM, management and maintenance of the reef structure becomes the responsibility of the designated artificial reef management agency when ownership and title to the structure is transferred to the agency. The cost savings shared by operators with the GOM coastal states have proven to be sufficient to cover program startup costs and management and maintenance costs. This is also expected to be the case in California where the cost savings generated by reefing the

jackets of platforms are expected to dwarf those for reefing platforms in the GOM. According to a CMRLA analysis conducted for the Senate Appropriations Committee in 2017, the costs to start up the artificial reefing program, including preparation of a Programmatic EIR, were estimated to range between $4-$5 million; annual staffing and contracting costs were projected to range between $1.5-$2.0 million annually (California Senate Rules Committee, 2017). These costs pale in comparison to the cost savings that operators would share with the state.

Summary and Conclusions

There are 27 oil and gas platforms offshore California, ranging from 35 to 58 years in age, that will eventually be required to be decommissioned and either fully or partially removed. There has been a prolonged delay in decommissioning despite production having terminated at many of the platforms nearly 10 years ago. One of the actions legislators can take to spur decommissioning is to amend the California Marine Resources Legacy Act (CMRLA) to make it easier to convert platform jackets to artificial reefs and entice operators to move forward with platform decommissioning projects. To accomplish that objective, we recommend CMRLA be amended to modify its onerous liability provisions, reduce its cost savings sharing requirement to 50 percent, and provide State appropriated funding to the CDFW to cover startup costs for developing an artificial reefing program for platform jackets. Due to the lack of decommissioning infrastructure, the cost to decommission will be very high in California. Studies have shown converting the jacket of a large deepwater (+400 wd) platform to an artificial reef by partially rather than fully removing the jacket could result in tens to hundreds of millions of dollars in savings that would be shared with the State for reefing a single deepwater platform jacket. Amending CRMLA to make it easier to reef a platform jacket would also serve to spur decommissioning because it will significantly reduce the environmental, safety, and financial risks of decommissioning compared to the risks operators would face if they were required to fully remove platforms. The importance of cost risk reduction can't be overemphasized. The situation that exists today with decommissioning offshore California provides a strong incentive for the operators of the larger platforms to defer decommissioning indefinitely because the cost risk for complete platform removal is simply too high. Amending CMRLA to make it workable for partial platform removal would spur decommissioning, speed up the removal of aging oil and gas infrastructure, and preserve the highly productive fish habitats that exist at many of the platforms. Absent amendments to CMRLA, the status quo will likely prevail with operators continuing to defer decommissioning as long as possible.

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