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Challenges and Opportunities for Operating in Environmentally Sensitive Basins

Learning from the California Experience

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The views expressed in this presentation are those of the authors, and do not necessarily reflect those of the State Lands Commission or its staff.
Overview

- History of offshore oil operations
- Challenges of operating in California
- Creative solutions
- Examples
- Worldwide applications
Significance of California’s Oil & Gas Industry

- Ranks 4th in the United States in production

- California Produces 702,000 BOPD
  - 113,000 BOPD from offshore
  - 589,000 BOPD from onshore

- California Consumption ~ 2MM BOPD
  - Consumes ~10% of the United States oil consumption
  - 40% produced in California
  - 60% imported (20% from Alaska)
Platforms/Facilities Offshore California

- 23 Federal Platforms
- 4 State Platforms
- 5 Man-made Islands
1903 - Summerland

CALIFORNIA’S FIRST – A view of Summerland oil field near Santa Barbara as it appeared in 1903. Discovered in 1894, Summerland was the first offshore field developed in the United States.
California Offshore Oil & Gas History

- 1894 – Natural gas & crude oil discovered in Summerland
- 1938 – California State Lands Act is signed into law
  - State Lands Commission is created
  - Under the Act leases issued to the highest bidder
- 1969 – Blowout on federal Platform A, Santa Barbara Channel
  - Thousands of barrels of oil from seafloor rupture (caused during well kick kill procedure)
  - Offshore drilling moratorium is instituted in State waters
California Offshore Oil & Gas History

- **1970** - Environmental legislation enacted
  - Congress passes the National Environmental Policy Act (NEPA)
  - Legislature passes the California Environmental Quality Act (CEQA)
  - NEPA/CEQA require environmental analysis and public input
  - Environmental organizations (NGO) become vocal

- **1990’s** - Exodus of major oil companies
  - Opens up new opportunities for smaller operators
Offshore Facility Status

- 42 platforms/islands constructed offshore
- Today, 32 remain
- Rincon Island constructed in 1958, oldest platforms constructed in early 1960’s
Map of 4H area

Offshore Platforms / Islands

- Federal
- State
- Decommissioned
- State 3 mile limit

S.B. County
Ventura Co

Hilda
Hazel
Heidi
Hope
Drill Mud & Cutting Disposal

• Historically drill cuttings disposed beneath platforms
  - Mixed with marine growth cleaned from platform legs, creating “shell mounds”
  - Drill muds contained some heavy metals and toxins associated with the chemicals from the mining process

• CSLC policy since mid 1980’s
  - No drill cutting disposal in marine environment
  - Cuttings are contained in tanks and transported to shore for proper disposal, or liquefied and injected into non-producing formations.
Oil Field Operation Impacts on Fishing

- Platforms reduce area available for commercial and recreational fishing
- Majority of rigs possess abundant sea life (fish, sea stars, anemones, etc.)
- Post 9/11: No boats allowed near platforms
- Shell mounds not trawlable after platform removal
- Shell mound issue subject of current EIR study
Juvenile cowcod (*Sebastes levis*) and white anemones (*Metridium* sp.). Pipeline between Gail and Grace.

© Milton Love
Juvenile vermilion rockfish (Sebastes miniatus). Bottom of Platform Grace. © Donna Schroeder
Oil Facility Abandonment

• 6 platforms, one island removed since 1980’s
  - All were scrapped, no rigs to reefs to date
  - Pipelines generally abandoned in place due to burial, environmental impact of removal

• Rigs to Reefs debate since 1986 4H platform removal
  - State legislative efforts unsuccessful
  - Controversy over fish production versus attraction
  - New momentum for CA Rigs to Reefs Program
Challenges of Operating Offshore California

- Aging facilities
- Regulatory constraints
- Increased stakeholder vigilance
  - State, Counties, Local
  - Environmental groups
  - Politicians
Overcoming Challenges

• Use existing legislation
  - A new oil and gas lease can be issued if drainage is occurring from adjacent federal lands
  - The boundaries of an existing lease can be expanded to encompass all of a field partially contained in the lease
  - Revenue sharing incentive
Solutions to Operating in Offshore California

- Advanced technology
  - 3D seismic
  - Horizontal, Extended Reach, & Multi-Lateral Drilling

- Use of existing infrastructure to develop new resources

- Identify common goals/benefits for different jurisdictions

- Innovative legislation to promote revenue sharing among stakeholders
Use of Existing Infrastructure

• Drilling into Abandoned Fields
  - Belmont
  - Carpinteria

• Drilling into Undeveloped Fields
  - South Ellwood
  - T-Ridge/Vahevala
Examples of Drilling From Existing Facilities into Previously Abandoned Fields

![Map showing locations of Carpinteria and Belmont](image-url)
Drilling From Existing Facilities into Previously Abandoned Fields

• **Belmont Offshore**
  - Belmont Island abandoned by Exxon (28MMBO)
  - Drilling from existing THUMS Island Chaffee
  - 8 production wells and 4 injector wells drilled to date
    - Measured depth ~ 8000-9000’
    - Horizontal displacement ~ 6000’
    - Kickoff angle ~ 87 degrees
    - Formation depth 3000’, thickness at least 300’
  - Lease production is approximately 1500 BOPD
  - Potential for additional 4 - 6 MMBO
  - Revenue to State since 6/2005 exceeds $6.7MM
Belmont Offshore

- **Oxy agreements**
  - City of Long Beach gets a percentage for pass-thru, overriding royalty, tax/bbl
  - Long Beach Unit is compensated for use of facilities, equipment, and personnel
  - State of California receives royalty
Belmont Field: Top M1 Structure

Possible injector

C-236 Drilling

C-332A

C-232

C-301

C-247

Redrill injector

C-230I

C-234I

C-237I

Map supplied by OXY
3-D View of Long Beach Unit & Belmont Offshore Field Wellpaths

Grissom
White
Chaffee
Belmont
Pier J
Freeman
Two Dimensional Well Plans
Drilling From Existing Facilities into Previously Abandoned Fields

- Carpinteria Offshore
  - Two platforms abandoned by Chevron in the 1990’s
  - DOE study confirmed 10-25 MMBO recoverable oil left in place
  - Up to 25 extended reach wells from federal platform Hogan into 3 state leases
Carpinteria Redevelopment

**Status:**

- State and Feds reviewing latest structural analysis to determine platform stability and recertification
- State CEQA review in progress
- MMS NEPA review
Examples of Drilling From Existing Facilities into Undeveloped Fields

- Tranquillon Ridge
- South Ellwood
South Ellwood Field Extension
Drilling From Existing Facilities
Into Undeveloped Fields

- **South Ellwood Extension**
  - Drilling up to 40 new wells & redrills from State Platform Holly into adjoining State tidelands
  - Construction of onshore oil pipeline
  - Decommission of marine terminal
  - Upgrade Ellwood Onshore Facility
South Ellwood Extension

• The CEQA EIR process is in action and may be completed by the end of the year

• Multi-jurisdictional project involving the State, County of Santa Barbara, and the City of Goleta
Drilling
Into Undeveloped Fields

• **T-Ridge / Vahevala**
  
  - Drilling from Federal Platform Irene into State tidelands
  
  - Drilling from onshore Air Force base into State Tidelands
Examples of Drilling From Existing Facilities into Undeveloped Fields

- Tranquilllon Ridge
- South Ellwood
PXP T-Ridge Project

• Development adjacent to Pt. Pedernales from federal platform Irene
• Requires new offshore lease
• Possible drainage from federal side
• Project calls for 22 extended reach wells
• Processing oil at the existing onshore facility at Lompoc
• Multi-jurisdictional CEQA/NEPA review – State, County of Santa Barbara and MMS
Exxon/Sunset - Vahevala

- Proposes to develop the same structure of T-Ridge, but from an onshore location on Vandenberg Air Force Base
- Requires new lease, and Base approval
- Project calls for 30 extended reach wells with up to 30,000 feet horizontal displacement
Exxon/Sunset - Vahevala

- Calls for 25 acre onshore drillsite and production facility
- Construction of onshore processing facility to the Lompoc facility
- Multi-jurisdictional EIR/EIS – State, County of Santa Barbara, Air Force
- Application filed and under review
New Project Potential

• Additional production for State
  - Potential recovery of 150 to 300 MMBO

• Additional royalty revenue to State
  - Potential to generate $1.5 billion to $3 billion
Worldwide Applications

• **Environmental**
  - Use existing infrastructure
  - Reduce environmental upsets

• **Legislative/Governmental**
  - Increase local government stake
  - Maintain a safe and secure operation
    • generates goodwill and trust

• **Opportunities**
  - High oil prices
    • sustains infrastructure
    • creates new economic opportunities
    • promote innovation
Innovative and creative methods used to enhance production while minimizing environmental impacts have proven to be successful in California’s constrained operating environments -- and our experience can be applied in other parts of the world.
California State Lands Commission Regulations Governing Contractor Selection


Marine Oil Terminal Regulations
- Article 5. Marine Terminal Inspection and Management (updated 02/27/06)
- Article 5.1 Marine Terminal Physical Security
- Article 5.3 Marine Terminal Personnel Training and Certification
- Article 5.5 Marine Oil Terminal Pipelines

Ballast Water Regulations
- Article 4.5. Marine Invasive Species Control Fund Fee
- Article 4.6. Ballast Water Regulations for Vessels operating within the Pacific Coast Region

Mineral Resources Regulations
- Chapter 3. Oil and Gas and Mineral Leases


Oil and Gas Operations:
- Article 3. Oil & Gas Leases, Exploration Permits, & Operating Requirements
- Article 3.2. Oil & Gas Drilling Regulations
- Article 3.3. Oil & Gas Production Regulations
- Article 3.4. Oil & Gas Drilling & Production Operations; Pollution Control
- Article 3.5. Disposal of Royalty Oil, Gas or Other Hydrocarbons

Leasing and Permits Regulations:
- Article 2. Leasing or Other Use of Public Lands
- Article 2.9. Exploration Permits