

STATE OF CALIFORNIA
Budget Change Proposal - Cover Sheet
 DF-46 (REV 08/15)

Financial Year 2016/17	Business Unit 3480	Department Conservation	Priority No. 7
Budget Request Name 3480-007-BCP-BR-2016-GB		Program 2425 - OIL, GAS, AND GEOHERMAL RESOURCES	Subprogram 2425010 - REGULATION OF OIL AND GAS OPERATIONS

Budget Request Description
 Oil and Gas Studies

Budget Request Summary

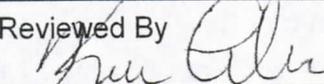
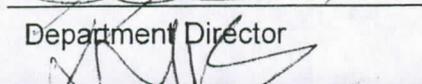
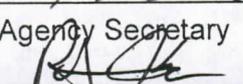
The Department of Conservation's Division of Oil, Gas, and Geothermal Resources (Division) requests a two-year limited-term appropriation of \$2,950,000 in 2016/17, and \$2,500,000 in 2017/18 from the Oil, Gas and Geothermal Administrative Fund. Funding will be used to contract for services to conduct and complete additional Independent Scientific Studies.

Requires Legislation <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Code Section(s) to be Added/Amended/Repealed	
Does this BCP contain information technology (IT) components? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>If yes, departmental Chief Information Officer must sign.</i>	Department CIO	Date

For IT requests, specify the date a Special Project Report (SPR) or Feasibility Study Report (FSR) was approved by the Department of Technology, or previously by the Department of Finance.

FSR SPR Project No. Date:

If proposal affects another department, does other department concur with proposal? Yes No
 Attach comments of affected department, signed and dated by the department director or designee.

Prepared By 	Date 2/5/16	Reviewed By 	Date 2/5/16
Department Director 	Date 2/5/16	Agency Secretary 	Date 2/8/16

Department of Finance Use Only

Additional Review: Capital Outlay ITCU FSCU OSAE CALSTARS Dept. of Technology

BCP Type: Policy Workload Budget per Government Code 13308.05

PPBA	Original Signed By: Ellen Moratti	Date submitted to the Legislature 4-1-16
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Analysis of Problem

A. Budget Request Summary

The Department of Conservation's Division of Oil, Gas, and Geothermal Resources (Division) requests a two-year limited-term appropriation of \$2,950,000 in 2016/17, and \$2,500,000 in 2017/18 from the Oil, Gas and Geothermal Administrative Fund. Funding will be used to contract for services to conduct and complete additional Independent Scientific Studies.

B. Background/History

As specified in Chapters 1 and 4, Division 3, of the Public Resources Code, the Division regulates onshore and offshore oil, gas, and geothermal well operations throughout the State by enforcing laws for the conservation of petroleum and geothermal resources. The Division's mission is to prevent damage to life, health, property, the environment, and natural resources by ensuring that wells are properly drilled, operated for production and injection purposes, repaired, and plugged and abandoned.

Chapter 313, Statutes of 2013 (SB 4) required the Secretary of the California Natural Resources Agency to conduct and complete an independent scientific study on well stimulation treatments. The study would evaluate potential hazards and risks that all aspects of well stimulation treatments pose to natural resources and public, occupational, and environmental health and safety. The study must follow the well-established standard protocols of the scientific profession, including, but not limited to, the use of recognized experts, peer review, and publication.

The California Natural Resources Agency commissioned the California Council on Science and Technology (CCST) to conduct the independent scientific assessment of well stimulation treatments, including hydraulic fracturing, in California. The purpose of the report was to synthesize and assess the available scientific information associated with well stimulation treatments in California. The review surveyed hydraulic fracturing, matrix acidizing, and acid fracturing as they are applied both onshore and offshore for oil and gas production in the State. The CCST released the report to the public on July 9, 2015.

Resource History
(Dollars in thousands)

Program Budget	2011/12	2012/13	2013/14	2014/15	2015/16
Authorized Expenditures	28,957	34,278	35,882	52,483	53,699
Actual Expenditures	27,643	32,264	35,724	48,473	-
Revenues	29,055	30,552	30,932	61,606	70,409
Authorized Positions	177.9	195.9	194.9	244.9	265.9
Filled Positions	141.8	153.2	176.5	169.0	184.0
Vacancies	36.1	42.7	18.4	75.0	81.0

C. State Level Considerations

Oil and gas production in California is a \$34 billion annual industry, employing more than 25,000 people with an annual payroll of over \$1.5 billion. California is the fourth largest oil-producing state in the nation, producing about 625,000 barrels per day. Property and other tax payments to state and local governments from the industry amount to about \$800 million annually. There are approximately 90,000 active or idle production and injection wells in the State.

Well stimulation has been an integral part of California's oil and gas operations for over 50 years. Recent information indicates that over 700 wells are hydraulically fractured every year, with perhaps another 1,100 wells receiving other types of well stimulation techniques.

Well stimulation is frequently used in the State, but is typically limited to specific areas and conditions associated with the production of oil and gas. For the effective use of well stimulation in California, it is critical to ensure the competency of the reservoir and the integrity of the wells. The potential increased use of well stimulation into the Monterey Formation also presents new public health and safety risks, especially

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in fields with older wells. These risks include groundwater contamination, as well as potential risks to sensitive receptors. A sensitive receptor is a fixed location such as a building, a house, other premises or open areas where health or property is affected by emissions, pollutions, or contaminations that increase concentration of emitted parameters (contaminants or pollutants) above background levels. Additionally, urban encroachment on, or around, older oil and gas wells raises additional health and public safety concerns.

ENVIRONMENTAL PROTECTION INDICATORS FOR CALIFORNIA (EPIC): This proposal does have an effect on an Environmental Indicator. Carbon dioxide emissions are a Type I indicator in the Trans-boundary Indicators category. The source of the emissions, pollutions, or contaminations could be any gas, liquid, solid, or energy waste (or a combination of wastes) that is surplus to, or unwanted from any industrial, commercial, domestic or other activity, whether of value or not. Well stimulation treatment could be such an industrial activity.

D. Justification

SB 4 required the California Natural Resources Agency to conduct an independent scientific study to assess current and potential future well stimulation practices and impact of well stimulation technologies. In the study, the CCST collaborated with the steering committee and made several recommendations for future studies based on the findings of the original study.

Study 1 – Identify opportunities for water conservation and reuse in the oil and gas industry - With the implementation of SB 1281, data is being collected on water use and disposition from oil and gas operations. CCST recommends that once a year's worth of water data becomes available, the State should begin an early assessment of these data to evaluate water sources, water production, reuse, and disposal for the entire oil and gas industry. This early assessment will shed light on the adequacy of the data reporting requirements and identify additional requirements that could include additional information about the quality of the water.

Study 2 – Determine if there is a relationship between wastewater injection and earthquakes in California - Conduct a comprehensive multiyear study to determine if there is a relationship between oil and gas-related fluid injection and any of California's numerous earthquakes. In parallel, CCST recommends that the State develop and apply protocols to monitor, analyze, and manage produced water injection operations to mitigate the risk of induced seismicity. Phase 1 (\$249,000) of a three-phase approach has been contracted with Lawrence Berkeley National Lab and will conclude January 2017. Phase 1 focuses on identifying and characterizing induced seismicity in California by analysis of correlations between wastewater injection and earthquake occurrence. Phases 2 and 3 will follow and include additional data analysis and a comprehensive field experiment and data analysis and modeling to characterize the mechanics of induced seismicity in California and will include additional project partners.

Study 3 – Subsidence in California due to oil and gas operations - The study would be to evaluate potential for subsidence to damage public and/or private structures including roads, utilities, and buildings and the impact of subsidence on well construction and integrity, thus impacting possible casing damage and oil and gas leaks due to casing damage. Conducting this study would also attempt to determine whether subsidence can create pathways for migration of injected fluids from approved zones, into Underground Sources of Drinking Water (USDW). The output of this study would be to consider the commutative amount, rate, and risk to make recommendations for subsidence monitoring and recommendations to reduce or prevent subsidence. This study could make recommendations for changes to current regulations. Without this study, the Division would not have the scientific support for recommendations for changes to existing regulations or required monitoring to reduce or prevent subsidence; thus impacting oil production, damage to structures, or causing environmental concerns related to USDW. USDW is becoming increasingly important as drought continues to plague California.

Study 4 - Analysis and consultation - The Division currently has a contract with Lawrence Livermore National Lab (LLNL) for ongoing "topical" analysis and consultation providing the division with technical support in evaluating oil field operations and testing activity to better understand geomechanical response and associated phenomena resulting from the various operations and geological settings, utilizing the GEOS system to simulate fracture networks resulting from fluid pressure (re-injection) and subsurface operations such as hydraulic stimulation. This study is also a multiphase approach with an in-depth

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analysis to follow in subsequent phases. Phases 2 and 3 are estimated to be \$500K for FY 2016/17 and \$1M for FY 2017/18.

The CCST study called for further analysis and understanding of the fracture networks caused by well stimulations and injections operations. The LLNL will assist with analyzing the fracture data that is submitted under SB4. Such analysis will assist in better analyzing applications for well stimulation reviewed by the Division and other agencies.

Study 5 – Oil Production Wastes – Contract with Department of Toxic Substances Control (DTSC) to conduct a waste study for the purposes of identifying oil production wastes that may be impacted by or contain well stimulation chemicals and to determine whether they exhibit hazardous waste characteristics (Title 22). The last time the DTSC did a study on oil and gas operations was 2005. None of the fields sampled had undergone well stimulation treatments.

Funding Plan for Additional Studies

(Dollars in thousands)

Study	2016/17	2017/18
1 – Water Conservation in oil and gas industry	\$500	
2 – Correlation of wastewater injection and earthquakes in CA	\$750	\$750
3 – Subsidence in CA due to oil and gas operations	\$750	\$750
4 – Analysis and consultation	\$500	\$1,000
5 – Oil Production Wastes	\$450	
TOTALS	\$2,950	\$2,500

E. Outcomes and Accountability

The Division will conduct all five studies to identify opportunities for water conservation and reuse in the oil and gas industry, determine if there is a relationship between wastewater injection and earthquakes in California, subsidence in California due to oil and gas operations, evaluate oil field operations and testing activity to better understand geomechanical response and associated phenomena resulting from the various operations and geological settings, utilizing the GEOS system to simulate fracture networks resulting from fluid pressure (re-injection) and subsurface operations such as hydraulic stimulation, and to conduct a waste study for the purposes of identifying oil production wastes that may be impacted by or contain well stimulation chemicals and to determine whether they exhibit hazardous waste characteristics (Title 22).

F. Analysis of All Feasible Alternatives

Alternative 1 – Do not approve this request.

Pros:

- There would be no additional fiscal impact to the Oil, Gas and Geothermal Administrative Fund.

Cons:

- The Division cannot identify opportunities for water conservation and reuse in the oil and gas industry.
- The Division cannot determine if there is a relationship between wastewater injection and earthquakes in California.
- The Division cannot determine if there is subsidence in California due to oil and gas operations.
- The Division cannot evaluate oil field operations and testing activity to better understand geomechanical response and associated phenomena resulting from the various operations and geological settings, utilizing the GEOS system to simulate fracture networks resulting from fluid pressure (re-injection) and subsurface operations such as hydraulic stimulation.

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- The Division cannot conduct a waste study for the purposes of identifying oil production wastes that may be impacted by or contain well stimulation chemicals and to determine whether they exhibit hazardous waste characteristics (Title 22).

Alternative 2 – Approve a two-year limited-term appropriation of \$2,950,000 in 2016/17, and \$2,500,000 in 2017/18 from the Oil, Gas and Geothermal Administrative Fund.

Pros:

- The Division can identify opportunities for water conservation and reuse in the oil and gas industry.
- The Division can determine if there is a relationship between wastewater injection and earthquakes in California.
- The Division can determine if there is subsidence in California due to oil and gas operations.
- The Division can evaluate oil field operations and testing activity to better understand geomechanical response and associated phenomena resulting from the various operations and geological settings, utilizing the GEOS system to simulate fracture networks resulting from fluid pressure (re-injection) and subsurface operations such as hydraulic stimulation.
- The Division can conduct a waste study for the purposes of identifying oil production wastes that may be impacted by or contain well stimulation chemicals and to determine whether they exhibit hazardous waste characteristics (Title 22).

Cons:

- There would be a fiscal impact to the Oil, Gas and Geothermal Administrative Fund.

G. Implementation Plan

The Division will contract to conduct these studies upon enactment of the 2016 Budget Act.

H. Supplemental Information

None.

I. Recommendation

Alternative #2: Provide a two-year limited-term appropriation of \$2,950,000 in 2016/17, and \$2,500,000 in 2017/18 from the Oil, Gas and Geothermal Administrative Fund.

BCP Fiscal Detail Sheet

BCP Title: Oil and Gas Studies

DP Name: 3480-307-BCP-DP-2016-A1

Budget Request Summary

	FY16					
	CY	BY	BY+1	BY+2	BY+3	BY+4
Operating Expenses and Equipment						
5340 - Consulting and Professional Services - External	0	2,950	2,500	0	0	0
Total Operating Expenses and Equipment	\$0	\$2,950	\$2,500	\$0	\$0	\$0
Total Budget Request	\$0	\$2,950	\$2,500	\$0	\$0	\$0

Fund Summary

Fund Source - State Operations						
3046 - Oil, Gas, and Geothermal Administrative Fund	0	2,950	2,500	0	0	0
Total State Operations Expenditures	\$0	\$2,950	\$2,500	\$0	\$0	\$0
Total All Funds	\$0	\$2,950	\$2,500	\$0	\$0	\$0

Program Summary

Program Funding						
2425010 - Regulation of Oil and Gas Operations	0	2,950	2,500	0	0	0
Total All Programs	\$0	\$2,950	\$2,500	\$0	\$0	\$0

Other Resources

Revenue						
3046 - Oil, Gas, and Geothermal Administrative Fund	0	2,950	2,500	0	0	0
Total Revenue - All Funds	\$0	\$2,950	\$2,500	\$0	\$0	\$0