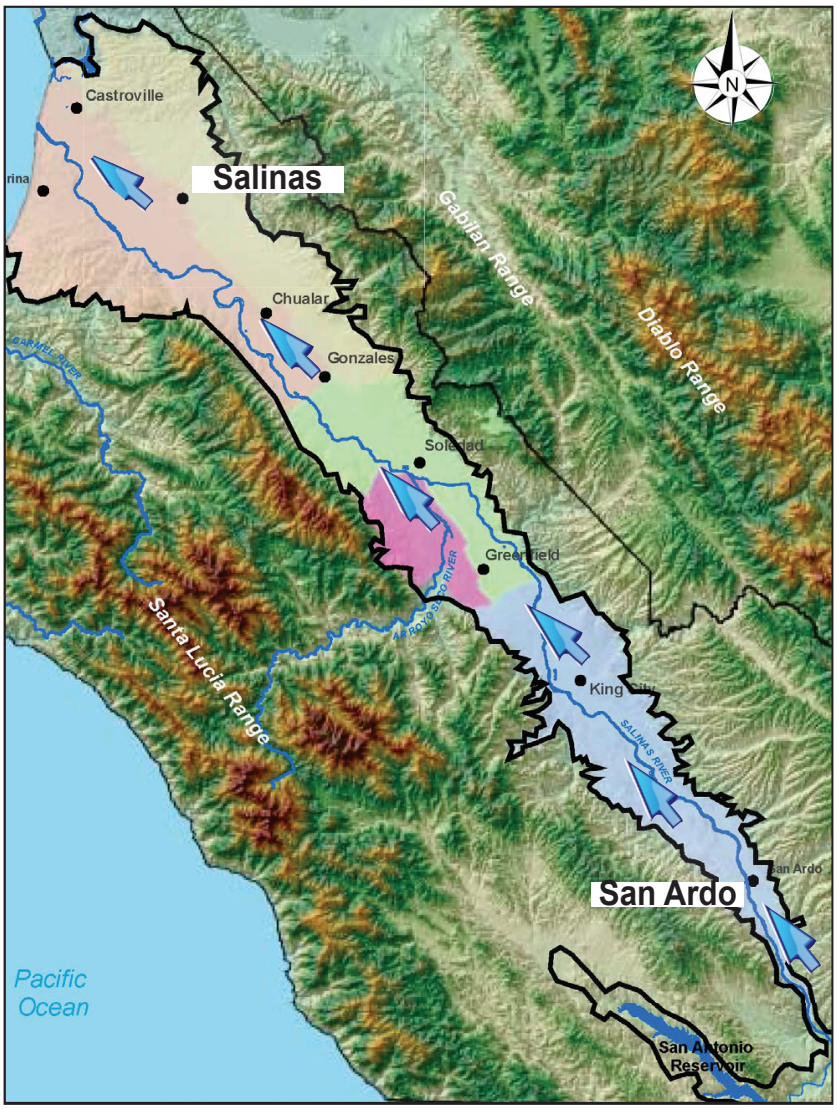
Review of Economic Impact Assessment of Monterey County Ballot Initiative

Measure Z
"Protect Our Water, Ban Fracking and Limit Risky Oil Operations"



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About the Author

Jannette M. Barth, Ph.D. is an economist and Managing Director with Pepacton Institute LLC, a research and consulting organization. She holds a B.A.in Political Economy from Johns Hopkins University. Her M.A. and Ph.D. in Economics are from the University of Maryland. Since 1974, Dr. Barth has been estimating regional and local economic impacts in the United States and the United Kingdom.

As an example of her work, Dr. Barth was retained to estimate economic impacts of the 9/11 terrorist attacks. Dr. Barth was formerly an employee of New York State, as Chief Economist of the New York Metropolitan Transportation Authority. Prior to that, she was with Chase Econometrics/Interactive Data Corporation.

Dr. Barth has lectured, written and testified extensively on the economic impacts of shale gas development. She authored a peer-reviewed article on this subject in the journal, New Solutions. She is also a co-author of the Energy Policy article, "*Examining the feasibility of converting New York State's all-purpose energy infrastructure to one using wind, water, and sunlight*."

EXECUTIVE SUMMARY

This independent review by economist Jannette M. Barth, Ph.D of a June 2016 oil and gas industry report on the economic impacts of Monterey's Measure Z, finds that the report prepared for an industry campaign group is inaccurate, incomplete, and unreliable.

This review finds that the *"Economic and County Budget Impacts of a Ballot Initiative that Would Ban Petroleum Production in Monterey County"* exaggerates economic benefits that result from oil and gas production, while underestimating or completely ignoring the significant economic costs associated with its operations.

Among the report's inaccuracies:

- It misrepresents Measure Z as a ban on oil production in Monterey County, when the initiative, in fact, bans only new oil operations.
- It ignores research on the impact of oil and gas development on other counties around the country. This research shows that oil and gas prodution is not consistently positive for local economies and that in at least one state with extensive oil and gas development, more than 25 percent of local governments have seen their costs increase.
- It ignores the cost to local government from potential water, soil and crop contamination from wastewater injection into aquifers and other oil drilling activities.
- Other costs not factored into the economic analysis include repairs to infrastructure, impacts on tourism and increased demands for first responders, police and other emergency services.
- The report exaggerates the importance of the petroleum industry to the Monterey County economy. The U.S. Census County Business Patterns database shows less than 300 petroleum production jobs in Monterey County. In contrast, agriculture supports more than 76,000 jobs in Monterey County.
- The report does not address the likely negative impact of oil production on property values.
- Nor does it address the costs of increased climate change caused by the oil and gas industry on the local community.

This review of the industry report concludes that it is unreliable, biased, and misleading. In addition to numerous inaccuracies, the review includes a critique of the highly flawed methodology used to draw its conclusions. A comprehensive economic assessment of Measure Z using accurate and verifiable data, making accurate assumptions, and taking into account the many economic costs associated with current and future oil and gas operations would be likely to draw significantly different conclusions.

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Review of Economic Impact Assessment of Monterey County Ballot Initiative

August 2, 2016

Report being reviewed: "Economic and County Budget Impacts of a Ballot Initiative that Would Ban Petroleum Production in Monterey County." The report is dated June 2016 and was prepared for Monterey County for Energy Independence by Capitol Matrix Consulting.

Review conducted by: Jannette M. Barth, Ph.D., Economist and Managing Director, Pepacton Institute LLC.

INTRODUCTION

In June 2016, at the behest of "Monterey County for Energy Independence," an oil and gas industry campaign group, Capital Matrix Consulting ("CMC") published a report entitled *Economic and County Budget Impacts of a Ballot Initiative that Would Ban Petroleum Production in Monterey County* ("Industry Report"). The Industry Report (included as Attachment A) purports to objectively evaluate the economic impacts in Monterey County of **Protect Our Water: Ban Fracking and Limit Risky Oil Operations**, a voter-sponsored countywide initiative measure ("Initiative") that will be placed before Monterey County voters at the November 2016 election.

Review of the Industry Report reveals that it is inaccurate, incomplete, and unreliable. It is similar to many other economic impact studies conducted or funded by the oil and gas industry in that it exaggerates economic benefits that result from oil and gas production while underestimating or completely ignoring the significant economic costs associated with its activities and operations.

The following analysis identifies numerous specific errors, omissions, and/or misrepresentations in the Industry Report.

ANALYSIS

1. The Industry Report misrepresents the Initiative.

The Industry report misrepresents the Initiative and its effect. This critical shortcoming is evident in the very title of the Industry Report: "Economic and County Budget Impacts of a Ballot *Initiative that Would Ban Petroleum Production in*

Monterey County" (emphasis added). In reality, the Initiative does *not* ban petroleum production in Monterey County. In fact, the Initiative expressly permits petroleum operations to continue, and states that the Initiative "does not affect oil and gas wells drilled prior to the Effective Date." (Initiative, Sec. 2.A, LU-1.23 (1), p. 9.) Thus, the Industry Report's first and most important premise—the one from which the remainder of its analysis flows—is inaccurate and flawed. (We note that the Industry Report does not even attach a copy of the Initiative that it mischaracterizes, further inhibiting voters from verifying its claims about the Initiative's impacts.) The failure to accurately characterize the Initiative it purports to study undermines the Industry Report's entire analysis.

In reality, the Initiative would do only the following three things: (1) prohibit the use of hydraulic fracturing (fracking), acidizing, and other defined "well stimulation treatments" (which do not include steam flooding, water flooding, or cyclic steaming, the current methods of production in the oil fields of Monterey County [Initiative, Sec. 2.A, LU-1.21 (2), p. 7]); (2) prohibit the storage and injection of oil and gas wastewater on the surface or underground; and (3) prohibit the drilling of new wells in the unincorporated areas of the County. It does not contain any ban on oil and gas production in Monterey County. Yet the Industry Report stretches to conclude, "The Initiative would effectively ban all existing and future oil production in the unincorporated areas of Monterey County."

The Industry Report inaccurately claims that the Initiative would ban all existing and future oil production "by prohibiting all new drilling, and by requiring that water impoundment and injection related to oil and gas production be phased out within five years." This is an inaccurate statement. The Initiative only prohibits certain harmful industry practices; it does not shut down the entire oil and gas industry.

When asserting that "the initiative would effectively ban all existing and future oil production," CMC ignores the fact that California Department of Oil Gas and Geothermal Resources (DOGGR) grants two types of oil drilling permits, new well permits and reworking permits. (See DOGGR regulations at ftp://ftp.consrv.ca.gov/pub/oil/laws/PRC10.pdf.) The Monterey Initiative does not stop oil companies from securing permits to rework or re-drill their existing 1500+ wells and thereby boost their productivity and extend their life. A survey of recent DOGGR permits shows that Monterey County oil companies have recently converted existing conventional oil & gas producer wells into cyclic steam injection and steam flooding wells (production methods that are allowed under the Initiative). Rework permits allow oil companies to utilize the latest horizontal drilling techniques that greatly increase the productivity of mature wells without incurring major capital expenses [1].

With respect to oil and gas wastewater disposal, the proponents' summary of the ballot Initiative at www.protectmontereycounty.org states that the Initiative "bans new, and phases out existing wastewater injection wells and wastewater ponds." The Initiative does not prohibit such water from being treated and reclaimed, however. The proponents' summary specifically recognizes this solution to injection and aboveground disposal and states, "The San Ardo field has demonstrated that wastewater can be cleaned using reverse osmosis."

The industry is likely to argue that the cost of treating its produced water is too expensive to allow them to survive as an industry. The oil and gas industry imposes many costs on communities and individuals in the form of externalities. This industry has never paid the full cost of producing fossil fuels nor has it acknowledged that it generates substantial economic costs that are not internalized. The cost of treating or otherwise safely dealing with wastewater, however expensive it may be, is a cost of doing business. There are additional costs that the industry omits from its balance sheets but could also be included. A number of such costs are discussed below. Net economic impacts, taking into account both the positive and the negative, should be evaluated in any comprehensive and accurate economic impact assessment.

The Industry Report's unsupported claims about the imminent shutdown of all oil and gas production in the County due to the Initiative are part of a common, but incorrect, industry narrative. Representatives from various industries have a long track record of claiming that new requirements imposed to protect human health and safety will make it far too complex or expensive for the industry to survive, yet after the requirements are imposed, the industries continue to survive. One classic example of this narrative was the automobile industry's opposition to air bags. (For a summary of other similar claims, see http://www.pewtrusts.org/~/media/assets/2011/03/industry-clean-energy-factsheet.pdf)

2. It appears that CMC did not conduct a review of peer-reviewed research regarding the economic impacts of oil and gas production.

Peer-reviewed research is the "gold standard" of objective economic analysis, and the Industry Report contains no literature review of the existing state of peer-reviewed literature regarding the economic impacts to communities of petroleum production. The Industry Report also omits the conclusions of recognized research organizations that are not funded by the oil and gas industry. This omission is significant. Peer-reviewed and independent research concludes that extractive industries including the oil and gas industry are not beneficial to county-level economic prospects in the long run. For example:

- Headwaters Economics [2] concluded that counties that were not focused on fossil fuel extraction as an economic development strategy experienced higher economic growth rates, more diverse economies, higher educational attainment of their populations, fewer disparities between high- and low-income households and more retirement and investment income.

- Freudenberg and Wilson [3] studied non-metropolitan regions, concluding that, "the areas of the United States having the highest levels of long-term poverty tend to be found in the very places that were once the site of thriving extractive industries."

Extractive industries are known for boom and bust cycles, and the negative economic consequences during the bust may exceed the positive economic impact during the boom. Black, McKinnish, and Sanders [4] studied the coal boom in the 1970s and the bust in the 1980s on local economies in the four-state region of Kentucky, Ohio, Pennsylvania, and West Virginia. They estimated that for each 10 jobs produced in the coal sector during the boom, there were fewer than 2 jobs produced in the local-good sectors of construction, retail and services. The researchers found that the spillovers from the coal bust were larger. During the coal bust, they estimated that for each 10 jobs lost in the coal sector, 3.5 were lost in the construction, retail and services sector [4]. Seydlitz and Laska studied boom-and-bust cycles of the petroleum industry in Louisiana and concluded that improved community economic health is transitory in areas with petroleum extraction, and "improvements can be lost as early as the second or third year after an increase in petroleum activity and will be lost during the bust if not sooner" [5].

3. Research and experience from other counties in the U.S. have shown that oil and gas development is not consistently positive for county budgets.

It appears that in preparing its Industry Report, CMC ignored local governments' experiences elsewhere in the country. Research on local government impacts in other locations does not confirm the rosy picture of oil and gas production's effect on local government budgets that was expressed in the Industry Report. For example, Kelsey and Ward [6], found evidence that in Pennsylvania's Marcellus Shale region, "Most local governments being affected by shale gas development are not seeing more tax revenue as a result, while 26% of the local governments indicated that related costs had increased." And other research shows that revenue is unlikely to offset burdens to state and local governments. Dutzik, Ridlington and Rumpler [7] have listed many of the economic costs of oil and gas production and show that communities and states will bear many of these costs. In California, property taxes collected from oil and gas production operations generally remain local and much of the revenue helps pay for schools, unlike some states where a severance tax is imposed and the revenue goes to the state's general fund. Whether

the tax revenue from these activities remains in the community or is allocated to the state, there are many costs that are incurred at the county level. A comprehensive and accurate economic impact assessment of county budget impacts would estimate costs to the county to determine if tax revenue from oil and gas operations outweighs the significant costs.

Oil and gas production imposes large burdens on local infrastructure. There has been substantial damage to roads and other infrastructure in areas with oil and gas development across the United States. The Texas Department of Transportation reported that a conservative estimate of the repair costs for roads damaged by oil and gas development is $1 billion for farm-to-market roads and another $1 billion for local roads [8].

A Cornell University report by Randall (2010) stated, "In Bradford County, PA, 1,000 of 1,300 miles of roads have been damaged." They further stated, "This type of road damage will lead to extraordinary monetary cost. In Pennsylvania, tens of thousands of dollars have been spent on weight limit signs alone." And, "Arkansas State Highways have incurred over $200 million in repair costs in the Fayetteville Shale [9]."

Increased demand for social services, first responders, and police due to oil and gas operations are also costly to communities. Jill Morrison of the Powder River Basin Resource Council in Wyoming stated that there has been a 10% to 15% increase in crime and communities have had to build larger jails [10]. Fuller, in The New Yorker has described increased crime and drug use in Wyoming communities with gas development [11].

In at least four states, including Pennsylvania, Ohio, West Virginia and Texas, that have hosted the recent oil and gas boom in the United States, hundreds of complaints have been made about well-water contamination from oil or gas drilling, and pollution was confirmed in a number of them [12]. Such water contamination can be costly to communities.

Water shortages in Monterey County are of particular concern and if water quality is compromised, costs will likely multiply. Water and/or soil contamination may result in health impacts to humans, crops, and livestock; such impacts can be accompanied by high costs. Further, as discussed in more detail below, 80% of Class II Injection wells in Monterey County have illegally injected oil field wastewater into aquifers that are or should be protected based upon their relatively low concentrations of salinity. Clean-up costs that result from water and soil contamination are difficult to estimate, but they can be very high and in some cases, clean up is impossible. For example, the remediation of the Guadalupe Dunes oil spill is projected to take more than two decades to complete, at a very high financial

cost. The importance of the Salinas River Groundwater Basin should be of particular concern to Monterey County. With the San Ardo oil field located upstream in the watershed, there are contamination risks to water resources used for domestic consumption (e.g., drinking water) and agricultural irrigation.

Despite industry claims to the contrary, shale formation (source rock) development has not been the projected panacea for local, county, and state economies in Pennsylvania, Ohio or other states, and it is unlikely that this unconventional oil and gas development would bring an economic boon to California. Reports from various states confirm this.

A report from West Virginia, "The Emperor Has No Gas Boom," shows that the expected "game changing" gas boom has not materialized there [13]. Four years of shale gas drilling created only 916 jobs in West Virginia. "And the severance tax that was expected to produce tens of millions of dollars in new revenue has not grown at all." The unemployment rate in the four core drilling counties has risen from 4.4% to 6.9% since drilling began and their workforces have declined in size [13].

In Ohio, in 2014 the Columbus Dispatch published a report titled, "Fracking: So Where's the Economic Boom that was Promised?" [14] It states, oil and gas industry officials predicted in September 2011 that the growing effort to tap oil and gas in the Utica shale would lead to more than 200,000 new jobs in four years. So far, that has not panned out, even in the counties with the most drilling activity. For example, Carroll County's job market is still below pre-recession levels based on two key measures. In November, the county had 12,800 employed residents and an unemployment rate of 7.6 percent, according to the Bureau of Labor Statistics. In November 2007, the county had 13,100 employed residents and an unemployment rate of 5.7 percent [14].

And from Pennsylvania, the Philadelphia Inquirer reported in September 2013, "PA Fracking Boom goes Bust" [15].

According to the Texas Railroad Commission, which is responsible for regulating mineral extraction in Texas, there are four core gas-drilling counties in the Barnett Shale. They are Denton, Johnson, Tarrant and Wise Counties. Although there are many reasons for differences between county data and state data, and changes and trends in the data, and a comprehensive analysis should be conducted prior to making any definitive conclusions, it is interesting to compare the economic health of the people in the four core Barnett Shale counties to the economic health of the state as a whole. When unemployment rates, growth of median household income, and the number of people in poverty are considered, it appears that the Barnett Shale core counties have not done better than the rest of the state. For the period from 2003 to 2010, median household income increased by 21.2% in the state of

Texas, but median household income only increased between 10% and 16% in the four core Barnett shale counties. For the same period, the increase in the average unemployment rates for the four core counties (2 percentage points) was a little higher than the increase in the state unemployment rate (1.5 percentage points). Finally, the number of people in poverty in these four shale counties increased, in percentage terms**,** just as much as statewide. Thus, considering the number of people in poverty, the unemployment rate and median household income growth, gas intensive counties in Texas do not appear to be doing well compared to the statewide figures. (Sources of Data: U.S. Census Bureau, Small Area Estimates Branch; and Bureau of Labor Statistics)

The Monterey Shale Formation underlies a substantial portion of Monterey County and other counties in California. The Energy Information Agency estimates that the Monterey Shale holds only 600 million barrels of technically recoverable tight oil [16], which may not be economical to produce given the low price of oil and the high cost of high volume hydraulic fracturing, matrix acidizing, and other source rock development techniques [17]. However, local oil companies view the Monterey Shale as an area of potential future expansion when oil prices rise again.

While the Industry Report suggests that tax revenue is the leading argument for continuing and encouraging increased oil and gas production in Monterey County, it does not accurately assess the impacts of the oil and gas industry to Monterey County's budget. The County's budget may be negatively impacted due to the costs resulting from continued and increased production, such as the following:

- Costs of aquifer contamination from compromised wellbore integrity and injection of wastewater into Class II injection wells inappropriately permitted to inject into high quality aquifers
- Costs of potential contamination of water, soil, and crops in the extensive agricultural industry in Monterey County
- Costs resulting from declining public perception of crops being grown among oil and gas wells
- Costs due to declines in tourism attributable to confirmed and potential contamination of oil and gas development.
- Costs associated with increased demand for first responders, police and other emergency and social services
- Costs due to damage to roads and other infrastructure

In light of the many potential significant costs to the County from continued and increased oil and gas development, the net economic impact of passing the ballot Initiative would likely be positive for the County.

4. The Industry Report's analytical methodology is flawed, and the report provides insufficient data.

While the Industry Report includes a short, incomplete section on methodology, it provides very little supporting information and the brief discussion of methodology is followed by its summary of economic and fiscal impacts of the Initiative. In other words, the Industry Report's methodology is a black box because it provides no formulas or interim analytical details.

The authors of the Industry Report state that they "developed information about employment and income based on review of data from the California Employment Development Department and U.S. Census on employment and wages in Monterey County in oil extraction related industries." And they state that they supplemented the data with feedback from the companies operating in the San Ardo Field. Industry-supplied data must always be verified to ensure accuracy, yet there is no mention of such verification and quality control efforts. The report states that they reduced expenditure totals to capture the fact that most oil equipment used for oil and gas production in the San Ardo Field is manufactured elsewhere and imported into California. In theory, such an adjustment is appropriate, but nowhere does the Industry Report indicate the level of the expenditure reduction or how it was calculated. Nor does the Industry Report show specifically which employment and income data they used, so it is impossible to replicate and confirm the accuracy of their analysis.

The authors of the Industry Report state that they use the IMPLAN model to estimate indirect and induced effects. They state in a footnote, "The *direct* effects are the losses in jobs, income, and output of the companies operating in the field. The *indirect* effects are the lost jobs, income, and output in other industries (e.g. construction, utilities, transportation and engineering) and that would have supplied goods and services to operating companies. The *induced* effects are the broader county-wide losses in output, jobs and income related to lower spending by employees adversely affected by the investment cutbacks." In the same footnote they state that the IMPLAN model is widely used, but they do not mention that IMPLAN and other input-output models are often inadequate for this type of analysis. Responsible researchers normally point out potential flaws or drawbacks in the methodologies that they choose, but the authors of the Industry Report failed to do this.

Input-output models estimate the positive impacts on variables such as employment, value added, and tax revenue, but the estimates are often exaggerated and the methodology does not capture the impacts of environmental degradation, impacts to tourism, impacts to the agricultural sector, and other attributes that comprise the full costs to communities and society [18].

The application of input-output models to oil and gas development has serious drawbacks. Barth (2013) explained the many problems associated with these types of models when used for this type of economic impact analysis [18]. A few of them are described here:

> Input-output analysis assumes "constant returns to scale." This means that the [oil and] gas industry would get no volume discounts on supplies. This is an unrealistic assumption, and it inflates estimates of industry spending and thus estimates of economic impacts from the industry's activity in the community. Input-output models used in the industry-sponsored studies tend to be static in time, implying that there are no changes in coefficients over time and no allowance for price changes in factors of production such as supplies and labor. The production function is also assumed to be constant. This does not allow for input substitution or changes in the proportions of inputs as technology and/or prices change over time. Input-output models tend to be a-spatial, implying that transportation costs are not fully reflected. Transportation costs in [oil and] gas development areas may differ due to differences in availability of and proximity to fresh water supplies and wastewater disposal wells [18].

Additional weaknesses of input-output models with respect to environmental impacts include the following:

> Environmental impacts are ignored. Wassily Leontief, who received the Nobel Prize in Economic Science for his model of input-output economics, had himself stressed as early as the 1970s that environmental repercussions and externalities should be incorporated into input-output analysis [19-21]. Leontief [21] recommended that a pollution abatement industry be entered into the input-output matrix, and that the abatement industry be in the business of eliminating pollutants generated by the productive sectors, consumers, and the abatement industry itself. And Wiedmann, Lenzen, Turner, and Barrett [22] stated, "in the last few years models have emerged that use a more sophisticated multi-region, multi-sector input-output framework . . . in order to calculate environmental impacts. . . . Results demonstrate that it is important to explicitly consider the production recipe, land and energy use as well as emissions in a multi-region, multi-sector and multi-directional trade model with detailed sector disaggregation"

> [22]. The industry-sponsored studies have not addressed environmental repercussions, such as water and air contamination, or externalities such as damage to roads and costs to communities. Unless appropriate adjustments are made, input-output analysis tends to use unrealistic assumptions [18].

Other economists have further criticized the use of input-output models in estimating the economic impacts of oil and gas development [23-25].

The Industry Report also states that they performed "tax calculations to take into account average federal, state and local taxes paid in relation to personal and corporate income." Again, they provide no data or supporting figures, so it is impossible to verify the conclusions for accuracy.

Finally, the authors of the Industry Report state that they repeated the calculations assuming production is phased out following the passage of this ordinance, despite the fact that this Initiative would not ban oil and gas production. They estimate impacts of the Initiative by taking the difference in economic output, employment, income and taxes under the two scenarios of Monterey County with and without the Initiative in place. Again, they provide no calculations to enable third-party review.

The Industry Report makes assumptions about estimated declines in oil production and expenditures attributable to the measure but does not provide specific citations to the sources for these assumptions. They refer to "2015 financial statements by companies with significant oil and gas operations in Canada," but they do not provide specific source references or even the company names. As such, the reader must simply trust these assumptions with blind faith. The Industry Report's assumptions include oil production declines of 15% per year from 2017 through 2021, and total annual expenditures of $34 per barrel, rising by 4% annually.

5. The Industry Report provides a false impression of the importance of petroleum production to employment and income in Monterey County.

It is clear that petroleum production is far less important to the economy of Monterey County than implied by The Industry Report. The Industry Report concludes that 732 full time jobs will be lost annually between 2017 and 2036 if the Initiative is passed. Again, the authors fail to explain how they reach this employment number, but it greatly exceeds publicly available employment estimates. For example, the U.S. Census County Business Patterns database shows that in Monterey County, NAICS code 21, which includes Mining, Quarrying and Oil & Gas Extraction, there were 300 paid employees in 2014. (See Attachment B.) Note that these 300 employees are not just in Oil & Gas Extraction, but also in Mining and

Quarrying. Thus, it appears that 732 jobs in petroleum production may be a great exaggeration. It is unclear how the authors of the Industry Report settled on a jobs number for petroleum production that is more than twice the number of employees in all three industries in NAICS code 21. Note that the jobs number in County Business Patterns for the industry in Monterey County in 2015 was also 300 employees, indicating no growth that year.

To put the relative importance of the petroleum production industry in perspective in Monterey County, one must consider employment in other industries and total employment in the County. Total nonfarm employment in Monterey County in 2015 was 133,300. Even if CMC is correct that 732 full time jobs would be lost due to the Initiative, that represents only 0.5% of total nonfarm employment in the County. By contrast, Agriculture supports more than 76,000 jobs in the County, or more than 500 times the number of jobs in petroleum production, even using the Industry Report numbers [26]. Finally, County Business Patterns data also show that in Monterey County, employment in NAICS 21 (Mining, Quarrying and Oil & Gas Extraction) is by far the smallest of all 19 industries listed. The second smallest industry has more than twice the number of employees.

Interestingly, conclusions from peer-reviewed research confirm that economic benefits from oil and gas extraction in other locations have been quite different from the findings in the Industry Report. For example, research by Peach and Starbuck [27] found only small positive impacts on income, employment and population as a result of oil and gas extraction in New Mexico. And Weber [28], focusing on the short-term impact of a natural gas boom in Colorado, Texas and Wyoming, found only modest increases in employment, wage and salary income, and median household income. Modest increases in employment, income and tax revenue will not cover the large, often unacknowledged, costs to state and local governments that are frequently imposed by the oil and gas industry.

6. While the Industry Report provides few details of its underlying data and numerical assumptions, it overstates the data it does provide in favor of the oil industry.

The Industry Report claims to base its oil price assumptions on World Bank forecasts, specifically a World Bank commodities forecast report released in April of 2016. Attached is the World Bank release dated April 19, 2016, which shows the oil price forecast to be lower than that claimed by The Industry Report (See Attachment C). This forecast shows a per barrel crude oil price forecast (in constant dollars) of $52.6 in 2020 and $ 66.3 by 2025. The forecast used by The Industry Report was $57 per barrel by 2020 and $71 per barrel by 2025. This is yet another example of the Industry Report misrepresenting existing data to support its claims.

Another example of exaggerated costs to the oil industry concerns the cost of plugging wells. The Industry Report states on pages 9 and 10 that, "The estimates of net economic and tax revenue losses reflect the impact of the drop in oil and gas production, as well as some offsetting activity in the next several years (mainly in 2022) related to an accelerated pace of well plugging and site remediation (which averages about $75,000 per well). " The 2015 Annual Report from the Railroad Commission of Texas is referenced as the source for the cost of well plugging. Curiously, that annual report states on page 5, "During fiscal year 2015, the Commission's well plugging expenditures totaled $10,731,174. The average cost per well was $15,507, which was $11,064 less than the fiscal year 2014 average cost per well of $26,571." Both of these are far lower than the estimate of $75,000 per well assumed by The Industry Report. The Industry Report states in a footnote that they took into account the "considerable depth of the wells in the San Ardo field." However, the average depth of the wells in the San Ardo field is actually on the order of 2,500 feet, considerably more shallow than much of the oil and gas development in Texas. Moreover, the type of steam injection used in the State of California is often performed on migrated oil deposits at shallow depth. According to research by Stanford University professor Adam Brandt, "Steam injection and hot waterflooding are currently used in relatively shallow depths in California, to a maximum of approximately 5,000 feet" [29]. The Industry Report provides little or no basis for its upward revision of the cost of plugging wells.

The Wyoming Oil and Gas Conservation Commission provides the attached graph titled, "As Wells Get Deeper, Plugging them gets more Expensive." (See Attachment D.) It shows that for wells between 2,500 and 5,000 feet in depth, the cost of plugging ranges from about $25,000 to $50,000, also less than the Industry Report's estimate. Perhaps the site remediation or clean up is causing the authors of the Industry Report to estimate the cost to be so much higher. While more specifics are required in order to evaluate whether it is a reasonable assumption, the Industry Report's estimate of the cost to plug a well remains questionable.

7. The Industry Report fails to adequately describe the economic risk to the County associated with increased oil production and the associated produced water.

There are great potential negative impacts of current and expanded oil and gas development on the industries that are most important to the economic health of Monterey County.

The agricultural industry is, by far, the largest and strongest industry in Monterey County. Monterey County's agricultural commissioner reported that the agricultural industry in the County pumps $8.12 billion into the local economy and supports more than 76,000 jobs [26]. In contrast, the Industry Report estimated that only

732 jobs would be lost due to the Initiative through 2036 and that in all, nearly 1,000 jobs would be lost. Again, as explained above, this job number is likely inflated given available data on this sector at the U.S. Census County Business Patterns database. The Initiative may result in more jobs in Monterey County due to construction and operation of additional wastewater facilities.

Further, the agricultural industry in Monterey County is exhibiting strong growth. Recent reports show that Monterey County set a new record for crop production value at $4.84 billion in 2015, up about 7.75% over the prior year and almost $1 billion since 2011. It was reported that, "Leaf lettuce retained the top spot at $869.4 million, a 12% rise," and "Strawberries were the second-highest value crop, up 21% to $861.4 million [30]."

In California, the press have been covering stories about how wastewater from expanding oil operations are putting Central Valley farms at risk [31]. Two Central Valley lawsuits illustrate how wastewater from oil operations can damage crops: The Palla Farms lawsuit alleges that groundwater used to irrigate orchards, was contaminated by local oil companies' wastewater injection, resulting in the death of hundreds of cherry trees [32]. Starrh Farms was awarded $8.5 million in damages because their cotton and almond trees were killed by contaminated irrigation water. Their neighboring oil company's wastewater ponds had leached toxins into the groundwater and into Starrh Farm's irrigation wells [33]. The experience of Central Valley farmers is a cautionary tale for Monterey farmers who now face the risk of local oil companies injecting wastewater into Monterey County's protected aquifers.

Agriculture is the largest employer in Monterey County, with the government sector coming in second and the real estate and hospitality industries coming in third and fourth, respectively. Oil and gas employment is tiny compared to employment in these industries.

Three of the top four industries in terms of employment are likely to be negatively impacted by oil and gas operations in the County.

The hospitality and real estate industries are likely to be negatively impacted from expansion of oil and gas operations. Tourism may suffer as tourists are less inclined to visit oil and gas fields compared to bucolic agricultural areas. Further, as discussed in more detail below, property values have declined near oil and gas development locations and compressor stations along pipelines. Peer-reviewed research has concluded that the perceived risk of water contamination tends to depress property values [34]. Note that if property values decline, then property tax revenues to the County also decline. So, the government sector in Monterey County, currently the second largest employer, may also suffer. As described above, in other

regions with fossil fuel development, there have been costs to communities, many of which are borne by municipalities and thus, tax payers [6-11].

Tax revenue from fossil fuel companies can be expected to decline as fossil fuels are replaced with renewables and increased energy efficiency over time, due to climate change-related policies, state, national and international regulations, advances in renewable energy technologies and associated market forces. Monterey County's General Plan itself states, "The use of solar, wind and other renewable resources for agricultural, residential, commercial, industrial, and public building applications shall be encouraged [35]."

In order to maintain a tax base, economically important industries in the County, such as agriculture and tourism, must be protected now from the negative impacts of oil and gas operations.

8. The Industry Report failed to address the likely negative impact on property values in Monterey County that would result from continued and expanded oil and gas development.

Boxall, Chan, and McMillan [36] studied the impact of oil and gas development on residential property values in Alberta, Canada, and found a negative relationship. The authors noted that three industry-funded studies (not peer-reviewed) failed to find a negative relationship between gas development and residential property values [37-39]. Again, while the impact on property values in Monterey County from future oil and gas operations is difficult to estimate, there is relevant peer-reviewed literature to consider on the topic. For example, Taylor, Phaneuf, and Liu [40] used an empirical model to identify the direct impact of environmental contamination on residential housing prices separate from land use externalities. They found that environmental contamination more than doubles the negative influence commercial properties have on neighboring residential home values.

Muehlenbachs, Spiller, and Timmins [34] found that the risk of groundwater contamination from natural gas extraction leads to "a large and significant reduction in house prices." They further found that "these reductions offset any gains to the owners of groundwater-dependent properties from lease payments or improved local economic conditions, and may even lead to a net drop in prices." The researchers also observed an increase in the likelihood of foreclosure in areas that experienced rapid growth in oil and gas development around homes that are dependent upon groundwater for domestic consumption [34].

With greater public awareness of climate change, and oil and gas infrastructure impacts, even if there were little impact on real estate values in the past from such developments, the public will be much more aware now and going forward of

deleterious impacts of these activities. Negative impacts on property values are likely to be greater in the future than they have been in the past.

9. The Industry Report exaggerates the cost to the County in connection with legal expenses if the Initiative passes.

The Industry states that, "Monterey County would face substantial administrative and litigation related costs." The Industry Report claims that the County may be in immediate jeopardy of bankruptcy due to potential lawsuits that would result from a ban. This scenario is highly unlikely in light of the fact that other jurisdictions that have passed fracking and oil and gas development bans have not experienced expensive lawsuits. It is worth noting again that this Initiative in Monterey County is not a ban on oil and gas development.

The ban on fracking and other high intensity petroleum operations in San Benito County did not generate a deluge of lawsuits. A single oil company filed a lawsuit and dropped it after a few weeks, resulting in minimal legal costs to San Benito County [41].

Following the ban on high volume hydraulic fracturing in New York State, only a single lawsuit was initiated, and that was by an independent landowner/attorney who was representing himself. It has been reported that, "he's taking up a lonely crusade when other pro-fracking groups decided not to sue [42]."

Although the Initiative does not ban petroleum production in Monterey County, the Industry Report continually uses the term "ban," and thus misrepresents the Initiative throughout the report. The Industry Report makes the baseless and preposterous statement that, "litigation costs associated with the Initiative could well reach into the tens of millions of dollars." It is the single largest number in their report and it is wildly exaggerated, especially in light of the fact that lawsuits have not materialized elsewhere, even in places where a ban (an action far more extreme than the action specified in this Initiative) has actually been passed.

The Industry Report itself stated, "It is difficult to estimate these litigation costs with certainty because complex litigation is inherently unpredictable." Experience elsewhere indicates that the Industry Report estimate of litigation costs to the County is unreasonable and unfounded. For legal reasons concerning why there will be no takings liability as a result of the Initiative, please see the legal analysis from law firm, Shute Mihaly & Weinberger LLP in Attachment E.

10. CMC has ignored the economic costs of climate change impacts even though scientists have overwhelmingly agreed that fossil fuels should be phased out due to their climate impacts.

A comprehensive risk assessment would likely determine that petroleum production in Monterey County is too risky for both the environment and the economy (locally, nationally and globally).

A comprehensive economic assessment of the ballot Initiative would take into account all costs. It is well known that there are significant health and climate change costs caused by production and use of fossil fuels regardless of specific technologies used, and these costs have not been accounted for in the Industry Report.

Climate impacts are integral to any credible economic assessment of fossil fuel operations due to the high economic costs of climate change, but the Industry Report ignores them. They are especially important for coastal jurisdictions, like Monterey County, which will be affected by sea level rise due to climate change.

Economic costs of climate change include, for example, severe storm and hurricane damage, real estate losses, energy costs, water costs, increased forest fire loss, agricultural loss, increased morbidity and mortality (due to health impacts such as increased cases of heat stress, influenza, malaria and air pollution related diseases such as cardiovascular and respiratory diseases and asthma.) These costs are rarely reflected in business or investment decisions about the production, transport and use of fossil fuels. And these costs can be large. One estimate puts these costs at $271 billion per year to the US alone by 2025 and almost $2 trillion per year by the year 2100 [43]. Moreover, recent peer reviewed research shows that the typical assessment models used to estimate the costs of climate change significantly under-estimate the actual costs [44].

Jacobson, et al., (2013) demonstrated that it is both technologically feasible and cost effective for California (and every state) to transition to 100% renewables for all purposes by 2050. They estimated that avoided health costs per year in California would be $137.9 billion, or 3% of the state GDP. And annual energy, health and climate cost savings per person in 2050 would be $7,395 [45]. Also, it is well recognized that more jobs are created from renewable energy than from fossil fuels [46]. The findings of Jacobson et al. (2013) are corroborated by more than 18 other independent, peer-reviewed studies including those out of the National Renewable Energy Lab that also conclude that it is technically feasible to move rapidly to very high renewable energy penetration with economic and infrastructure resiliency co-benefits [47].

Independent research by Wei et al. (2010) at The University of California, Berkeley found that all non-fossil fuel technologies (including renewable energy and energy efficiency) create more jobs per unit energy than coal and natural gas [48].

Other research at the University of Massachusetts, Amherst, concluded that for each million dollars spent on energy production in the US, oil and gas produce 3.7 direct and indirect jobs, whereas wind and solar produce 9.5 and 9.8 jobs, respectively [49].

The climate impact, barrel for barrel, from production in the San Ardo Field in Monterey County is worse than that of oil from the Alberta Tar Sands in Canada, which is often referred to as among the most carbon-intensive petroleum in the world [50]; the California Air Resources Board assigns a carbon intensity score to different production areas and the carbon intensity score of the San Ardo Field crude is 28.82 while the score of crude from the tar sands ranges from 21.02 to 24.49 [51]. The San Ardo oil is very heavy and high gravity, and thus requires thermally enhanced oil recovery (steam injection) to produce it. Steam injection in the San Ardo oil field requires millions of gallons of water to be heated into steam, primarily through the combustion of natural gas. The carbon emissions from this steam generation are the primary driver of the high carbon-intensity of this oil development, however, increased emissions in the refining process downstream also contribute to its poor climate performance.

Given the trend towards commitments from the State of California and increasingly internationally, the production and use of fossil fuels will likely be dramatically curtailed in the coming decades. If a price on carbon were adopted, oil and gas assets in California and elsewhere would then become worth a small fraction of their current value, and as such could become predominantly stranded assets. All counties with oil and gas reserves should plan for such a future by discouraging the expansion of oil and gas production and protecting industries that may be adversely impacted by oil and gas operations.

11. The Industry Report omits important details about the impact of oil and gas development on Monterey County's water resources and agriculture.

The Industry Report claims that the Initiative would remove needed water from the agricultural industry. The Report fails to mention, however, that while scientists have recently identified the existence of three times more ground water than previously thought beneath California's Central Valley, the same scientists are concerned that thousands of oil wells in the area may have irreversibly contaminated a third of the newly discovered aquifers [52, 53].

Contrary to the claims in the Industry Report, the Initiative would positively impact

Monterey County groundwater quality and the agricultural industry. In October 2015, the California Water Board notified Monterey County oil companies that 80% of their wastewater injection wells (34 out of 44 wells) were illegally injecting into protected aquifers, in violation of the U.S. Safe Drinking Water Act. Letters were sent by the California Water Board to Aera Energy and Chevron warning them of their violations and ordering them to start testing for groundwater contamination. Deputy Director of the California Water Board, Jonathan Bishop, testified before the state legislature, "Let me be clear, so that it's not a misunderstanding: we believe that any injection into the aquifers that are non-exempt has contaminated those aquifers." The San Ardo oil field sits "upstream" in the Salinas River Groundwater Basin which supplies water to numerous Salinas Valley cities and farms. Any contamination by wastewater injection could increase the cost for municipal water districts that may need to treat/clean the future water supply for hundreds of thousands of Monterey County residents. Contaminated water may also have a large negative impact on Monterey County's agriculture and tourism industries. Various reports have discussed a recent Stanford University study that confirms the importance of protecting California's deep aquifers, especially from oil companies that are using them as a dumping place for wastewater [54, 55, 56].

CONCLUSION

Careful review reveals that the Industry Report contains numerous errors, omissions and misrepresentations. For example, it mischaracterizes the very Initiative it purports to be analyzing. The Industry Report's conclusions are therefore unreliable, biased, and misleading. It is possible for unbiased researchers to undertake a comprehensive economic assessment of the Initiative using accurate and verifiable data and by making accurate assumptions, and taking into account the many economic costs associated with current and future oil and gas operations. The conclusions of any such unbiased report are likely to be significantly different than the unreliable, biased, and misleading conclusions of the Industry Report.

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Attachment A

Economic and County Budget Impacts of a Ballot Initiative that Would Ban Petroleum Production in Monterey County ("Industry Report")

Economic and County Budget Impacts of a Ballot Initiative that Would Ban Petroleum Production in Monterey County

June 2016

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The authors are partners with Capitol Matrix Consulting (CMC), a firm that provides consulting services on a wide range of economic, taxation, and state-and-local government budget issues. Together, they have over 80 years of combined experience in economic and public policy analysis.

Brad Williams, the primary author of this report, joined Capitol Matrix Consulting in 2011, after having served in various positions in state government for 33 years. Mr. Williams served for over a decade as the chief economist for the Legislative Analyst's Office, where he was considered one of the state's top experts on the tax system, the California economy, and government revenues. He was recognized by the Wall Street Journal as the most accurate forecaster of the California economy in the 1990s, and has authored numerous studies related to taxation and the economic impacts of policy proposals. Immediately prior to joining CMC, Mr. Williams served as a consultant to the Assembly Appropriations Committee, where he advised leadership of the majority party on proposed legislation relating to taxation, local government, labor, and banking.

Mike Genest founded Capitol Matrix Consulting (originally Genest Consulting) in 2010 after concluding a 32-year career in state government, which culminated as Director of the California Department of Finance (DOF) under Governor Arnold Schwarzenegger. Prior to his four-year stint as the Governor's chief fiscal policy advisor, Mr. Genest held top analytical and leadership positions in both the executive and legislative branches of government. These included Undersecretary of the Health and Human Services Agency, Staff Director of the Senate Republican Fiscal Office, Chief of Administration of the California Department of Corrections and Rehabilitation, and Director of the Social Services section of California's Legislative Analyst's Office.

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Executive Summary

On February 23, 2016, a proposed initiative was filed with the Monterey County Registrar of Voters that would place major restrictions on — and soon end — all oil and gas operations in the county. Both the title and the findings section of the initiative focus on "fracking" and "well stimulation treatments" normally associated with certain methods of production. ***However, the initiative would effectively ban all existing and future oil production in the unincorporated areas of Monterey County.*** It would do so by prohibiting all new drilling, and by requiring that water impoundment and injection related to oil and gas production be phased out within five years. Capitol Matrix Consulting (CMC) was commissioned by Monterey County for Energy Independence to estimate the potential economic and fiscal impacts of the measure on the County. Our key findings are highlighted in Figure Exec-1 and discussed below:

Figure Exec-1
Key Effects of Proposed Initiative

Economic Impacts:	**Average Annual Loss: 2017-2036**
Output	$186 million
Jobs	732 (full time jobs)
Labor income	$73 million
Impacts on Taxes paid	**Average Annual Loss: 2017-2036**
Federal	$38 million
State and local	$35 million
Impacts on County Government Expenses	**Total Costs**
Administrative costs, County Planning Commission	Low millions
Litigation costs, defending lawsuits	Low tens of millions
Litigation liability ("takings" lawsuits)	**Total Costs**
Baseline oil price forecast	$675 million
High oil price forecast	$950 million

- **A ban would have substantial economic impacts.** For the 2017 through 2036 period, the county would experience average reductions of $186 million in economic output, 732 in jobs (and nearly 1,000 jobs once the ban is fully effective), and $73 million in labor income. The discounted present value of the cumulative loss in economic output during this period would be $1.8 billion. These estimates include the direct effects of the ban on oil extraction operations as well as the multiplier effects of reductions in these operations on other sectors of the economy.
- **It would also have substantial impacts on taxes paid to state and local governments.** A ban would reduce federal taxes by $38 million, and state and local taxes by $35 million per year during the same period. These estimates reflect the loss in tax payments tied directly to field operations (e.g. property taxes on the field's reserves and equipment, and sales taxes on purchases of equipment, fuel, and other tangible property). They also reflect losses related to fewer workers and less income in the county once production is phased out. The ban would have a significant fiscal impact on local agencies in Monterey County that rely on the property tax to fund services. For example, when combined, property taxes from the two primary operators of the San Ardo field

(which accounts for the great majority of oil production in Monterey County) comprise the single largest source of County property taxes paid in 2014-15.

- **Monterey County would face substantial administrative and litigation related costs.** These include potentially a few millions of dollars in administrative costs to the County Planning Commission related to its duties to consider exemption requests from the ban on a case-by-case basis, and up to the low tens of millions of dollars in litigation costs incurred in defending "takings" and other lawsuits from oil companies, the approximately 170 individual owners of mineral rights in the San Ardo Field, and other interested parties.
- **"Takings" lawsuits could bankrupt the County, resulting in severe service reductions.** By far, the main threat to the county would be litigation liability that would result from a judgment in favor of the plaintiffs in "takings" lawsuits. As indicated in Figure 8 (on page 13), we calculate the value of the San Ardo oil reserves to be about $890 million under our baseline oil price forecast, and as much as $1.2 billion under our high-end oil price projection. If following voter approval of the initiative, we assume that (1) production continues for five years (at declining rates because of the ban on drilling), then (2) production ceases once the impoundment and injection prohibitions of the initiative take hold, the loss in value of the oil reserves would be $675 million under our baseline oil price forecast. The loss in value would be $950 million under the high oil-price forecast (which we consider the most likely alternative to our baseline). There is a substantial likelihood that the courts will rule that the initiative constitutes a "taking" of property rights (i.e., the future profits of the owners of the mineral rights). Repayment of these takings would be massive compared to the size of the county's budget, amounting to about three to five times the county's annual discretionary tax revenues ($193 million in 2015-16). As a result, the loss of such lawsuits would put the county in immediate jeopardy of bankruptcy, followed by a severe reduction in public services such as roads and public safety.
- **Ban would have negative effects on groundwater and agriculture.** In 2006, Chevron constructed a major water reclamation facility in the San Ardo field. Chevron's oil extraction operations in the field result in 184,000 barrels of produced water each day, a portion of which is treated in the reclamation facility and discharged through constructed wetlands and impoundments for aquifer recharge of the Salinas River groundwater basin. The initiative's prohibition of facilities treating, injecting, and impounding water related to oil and gas production appears to prohibit operation of this facility. This would result in a loss of up to 6.4 acre-ft per day (about 2,300 acre feet per year) of water that is permitted to be treated and discharged into the basin.[1] The reduction is important because (1) groundwater from the basin is the major source of water for the agricultural industry, and (2) this basin faces major challenges related to years of overdraft. The loss of the San Ardo reclamation operations would aggravate problems facing the water basin, putting agriculture, the County's largest industry, at greater risk in the years ahead.

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Introduction and Background

Monterey County has been the location of oil and gas development since the late 1940s, and the industry has been a substantial source of economic activity during the intervening years. As shown in Figure 1, we estimate that oil production directly and indirectly accounts for $249 million in economic output, nearly 1,000 jobs, $87 million in labor income, $35 million in federal taxes, and $28 million in state and local taxes in the County in 2016.

Figure 1
Current Economic Impact of Oil and Gas Extraction on Monterey County: 2016
(**Dollars in Millions**)

	Economic Output	Employment (jobs)	Labor income	Federal Taxes	State/Local Taxes
Direct	$180.7	459.4	$52.0	NA	NA
Indirect	332.3	191.2	15.9	NA	NA
Induced	36.1	336.7	18.9	NA	NA
Total	**$249.1**	**987.3**	**$86.9**	**$34.8**	**$28.3**

The oil industry is highly regulated by the California State Department of Conservation, Division of Oil, Gas & Geothermal Resources (DOGGR). Among its responsibilities, DOGGR is charged with well permitting and testing, safety inspections, oversight of production and injection projects, environmental lease inspections, idle-well testing, and inspections of tanks and pipelines.

Almost all the petroleum produced in Monterey comes from the San Ardo Field, which is located in the Southern part of the County, about 24 miles south of King City. According to DOGGR, oil production in San Ardo was 7.8 million barrels in 2015, making it the 13th largest producing field in California, and the 46th largest field in the U.S. One indication of the importance of this field to Monterey's overall economic and fiscal health is that the property taxes paid by the two primary operators of the San Ardo field combined represented Monterey County's single largest source of property taxes in 2014-15.[2] The field has a sandstone reservoir that produces heavy crude oil through mature steam flood operations. According to information from DOGGR, the field has about 720 oil producing wells.[3]

One of the major byproducts of oil and gas extraction is water, which is commonly referred to as "produced water." As shown in Figure 2 (next page), produced water production in the San Ardo field totaled nearly 120 million barrels in 2015, or about 15 times the amount of oil produced during the year. The produced water is naturally high in salts and other dissolved solids. It is filtered, treated, and then is either turned into steam to support further oil and gas production, injected for disposal, or treated further and used to recharge an aquifer that is used for crop irrigation. All of these dispositions of the produced water require surface facilities or constructed post-treatment wetlands and recharge basins that would be prohibited by the proposed initiative.

[2] Source: "Monterey County Tax Rates For Fiscal Year 2014-2015," Michael J. Miller, Auditor-Controller. County of Monterey.

[3] Some of the wells in San Ardo produce limited amounts of associated natural gas, which is used exclusively for powering steam generation facilities and other internal operations in the field.

Figure 2
Summary of Oil, Water, and Gas Production In San Ardo Field (Monterey County)

Year	Oil (Bbl)*	Produced Water (Bbl)*	Water/Oil Ratio	Gas(BOE)**
2015	7,795,661	119,858,249	15.4	170.43
2014	7,684,307	116,627,449	15.2	169.32
2013	7,229,422	110,324,962	15.3	187.05
2012	7,272,511	114,416,133	15.7	200.73
2011	6,886,541	118,001,173	17.1	218.97
2010	6,048,571	112,754,894	18.6	263.98
2009	5,273,250	113,192,704	21.5	211.62
2008	4,173,214	103,911,477	24.9	120.19
2007	3,436,801	82,056,394	23.9	65.27
2006	3,150,545	83,400,838	26.5	56.45
2005	3,502,933	83,338,195	23.8	56.48
2004	3,989,088	79,324,837	19.9	65.08
2003	4,497,657	80,313,100	17.9	67.91
2002	4,650,659	80,206,661	17.2	62.89
2001	4,661,865	75,535,921	16.2	57.06
2000	4,753,224	71,665,653	15.1	38.37
1999	4,195,009	65,538,158	15.6	28.54
1998	4,446,062	65,790,584	14.8	36.60
1997	4,643,255	71,604,110	15.4	29.79
1996	4,512,158	66,266,136	14.7	24.05

*Bbl is barrels.
**Natural gas totals converted to barrels of oil equivalent (BOE) using a ratio of 1 BOE equals 6,000 cubic feet of natural gas.

Figure 2 also shows oil production rose from 3.2 million barrels in 2006 to 7.8 million barrels in 2015. This increase reflects large investments made during the past decade in enhanced oil recovery projects, such as steam injection, which have boosted recovery from the field's reservoirs and reversed a downward trend in production that had been in place for many years.

Based on our review of data on drilling permits for San Ardo over the prior decade, it appears that an average of 95 new wells were drilled per year to replace or augment production from existing wells. This has two implications.

- One, under current law, oil companies will continue to make significant investments in the San Ardo field. When combined with ongoing expenditures for operations, water reclamation, transportation, repair and maintenance, these investments will translate into economic output, jobs, and tax payments for many years to come.
- Two, a ban on new drilling will cause production in San Ardo to drop off quickly, as new wells are no longer brought on line to augment declining production from existing wells in the field. Thus, a ban on new oil drilling alone will immediately cause a major decline in oil production — even before the other prohibitions imposed by the initiative take effect (discussed below).

The Proposed Restrictions on Oil and Gas Operations

On February 23, 2016, a proposed initiative was filed with the Monterey County Registrar of Voters that would place major restrictions on—and soon end—oil and gas operations in Monterey County. On March 9, 2016, pursuant to the requirements of the California Elections Code, the Monterey County Counsel issued a title and summary of the initiative for purposes of petition circulation. The measure is entitled, "Initiative to Prohibit Fracking and Oil and Natural Gas Well Stimulation Treatments, Prohibit Oil and Natural Gas Wastewater Injection and Impoundment, and Limit New Oil and Natural Gas Operations in Unincorporated Monterey County." The initiative summary provides that the measure:

- Prohibits the use of land within the County's unincorporated (non-city) areas for hydraulic fracturing treatments ("fracking"), acid well stimulation treatments, and other well stimulation treatments. The measure excludes from the definition of "well stimulation treatment" steam flooding, water flooding, cyclic steaming or well maintenance work.
- Prohibits new, and phases out existing, land uses that utilize oil and gas wastewater injection and impoundment facilities or operations. The initiative requires a five-year phase out for these non-conforming land uses, but allows the County Planning Commission to grant exemptions, on a case-by-case basis, of up to 10 years for those with vested rights.
- Prohibits the drilling of *any* new oil and gas wells in the County's unincorporated areas.

Initiative Effectively Bans All Future Production

This initiative would effectively ban all existing oil and gas production in the unincorporated areas of Monterey County. Two provisions are responsible for this result: First, the measure immediately prohibits drilling any new oil or gas wells, which means there can be no replacement for the declining production from existing wells.

Second, it phases out oil and gas wastewater injection and impoundment over five years. Given the large amount of water produced as part of the oil extraction process in San Ardo, a prohibition on treatment, injection and impoundment of water would make well operations impossible. The prohibition against impoundment of produced water would likely also eliminate a substantial source of treated water that can otherwise be used for agricultural purposes within Monterey County. Specifically, it appears to prohibit the produced water treated through the Chevron water reclamation facility from being used to recharge an aquifer that is used for crop irrigation in the County.

The Economic and Tax Effects of the Proposed Ban

A ban on oil production would have significant economic and tax-related consequences for the County. It would significantly reduce economic output, employment and income, as well as federal, state, and local taxes paid by Monterey County residents. In this section we discuss the magnitude of these effects. Specifically, we first describe the methodology we used to develop the estimates, then highlight the key assumptions underlying the estimates, and then present our results.

Methodology

Our estimates were developed using the following steps:

- **Calculation of expenditures under current law (absent the ban).** These calculations start with assumptions about current and future levels of oil prices and production, as well as estimates regarding annual expenditures for operations and capital investment in the San Ardo field. We then

developed information about employment and income related to these operations, based on our review of data from the California Employment Development Department and U.S. Census on employment and wages in Monterey County in oil extraction related industries. We supplemented these with feedback from the companies on specific elements of the San Ardo operations. For purposes of our estimates of economic impacts on Monterey County, we reduced the expenditure totals to capture the fact that most oil equipment used for oil and gas production in the San Ardo Field is manufactured elsewhere and imported into California.

- **Calculation of the multiplier effects of these expenditures.** After determining the direct effects in step 1, we then calculated the indirect and induced effects of these expenditures on economic output, jobs and income levels on the broader Monterey County economy using multipliers derived from the IMPLAN input-output model of Monterey County.[4]
- **Calculation of taxes paid on these expenditures.** Our tax calculations take into account average federal, state, and local tax taxes paid in relation to personal and corporate income, using data from the U.S. Census of State and Local Governments, the California Board of Equalization (for property and sales taxes) and the Franchise Tax Board (for income taxes). The estimates include both the taxes paid by operators in the San Ardo field (including their property taxes, sales taxes on purchases of tangible property, and taxes on profits), as well as income taxes paid by royalty owners. The estimates also include the taxes paid related to the direct, indirect, and induced effects of the field operations on employment, output and income generated in the County.
- **Calculation of the economic and tax measures under the ban.** In this step we repeat the above calculations assuming that production in the field is phased out following the ban. Our estimates of losses resulting from the ban reflect the differences in economic output, employment, income, and taxes under the two scenarios.

Key Assumptions

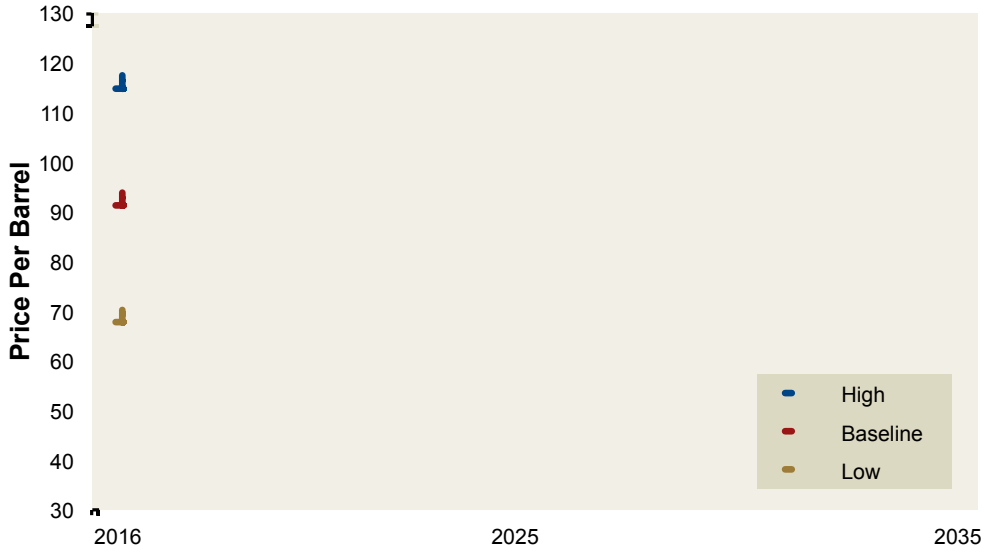
The estimates of economic and tax losses are sensitive to several assumptions, including those about future oil prices, production levels, and expenditures made each year in the San Ardo field (with and without the ban). Our key assumptions are:

Oil prices Our main (baseline) estimate assumes future oil prices that are consistent with projections made by the World Bank in April of this year.[5] Under this forecast, prices rebound from recent lows but remain well below the peaks reached earlier this decade. As indicated in Figure 3 (next page), the World Bank forecast assumes inflation-adjusted prices will rise to $57 per barrel by 2020, $71 per barrel by 2025. Assuming modest growth thereafter, prices continue to rise to $87 per barrel by 2030 and $94 per barrel by 2035. We also constructed two alternate scenarios for purposes of our estimates of the value of San Ardo oil reserves — one which assumes future oil prices that are 25 percent higher than our baseline forecast, and the other which assumes oil prices are 25 percent lower than the baseline.

[4] IMPLAN is a widely used input output modeling system that enables users to calculate the direct, indirect, and induced effects of increases or decreases in spending in one industry on other industries and the broader economy. In terms of a reduction in output in San Ardo field, the *direct* effects are the losses in jobs, income, and output of the companies operating in the field. The *indirect* effects are the lost jobs, income, and output in other industries (e.g. construction, utilities, transportation, and engineering) that would have supplied goods and services to operating companies. The *induced* effects are the broader county-wide losses in output, jobs and income related to lower spending by employees adversely affected by the investment cutbacks.

[5] Source: "Commodity Markets Outlook," World Bank Group, April 2016.

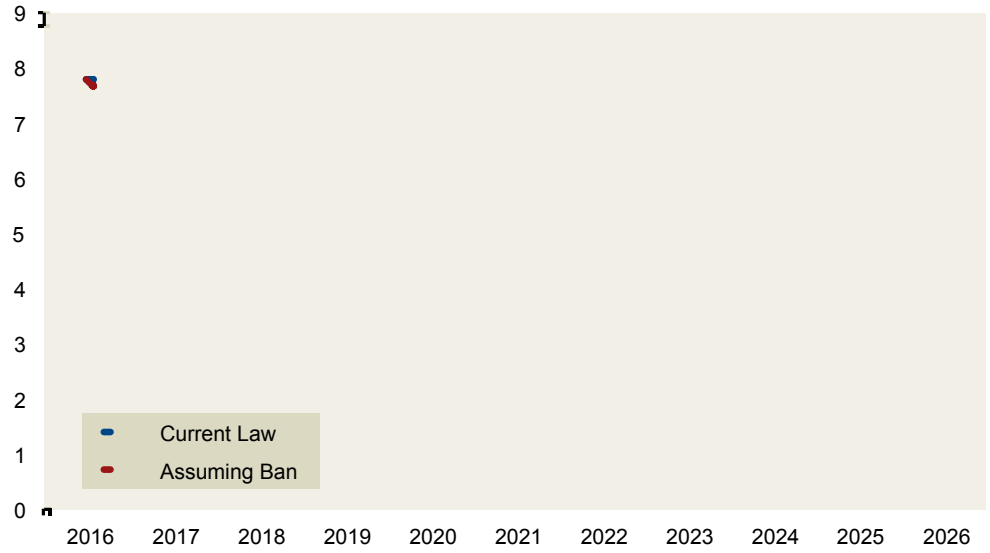
Figure 3
CMC Oil Price Forecast Assumptions
(Constant 2016 Dollars)



Oil Production. As noted above, oil production in the San Ardo field has risen over the past decade due to major investments by the oil and gas companies operating in the field. Our projections assume that production under current law (absent the ban) will hold steady for two years, then transition to an annual decline rate of about 4 percent per year over the remaining life of the field. This rate is typical for mature sandstone fields using steam flooding operations. Given the maturity of operations in the field, our projection assumes that future investments will be focused primarily on drilling of new or replacement wells and operational improvements to optimize recovery of existing oil and gas reserves.

We assume that passage of the initiative will cause production to decline by 15 percent per year from 2017 through 2021 (due to the ban on drilling of new and replacement wells), then drop to zero once the restrictions on produced water treatment, impoundment and injection take effect. Our estimates of production before and after the ban are shown in Figure 4 (next page).

Figure 4
Assumed Oil Production
(Millions of Barrels)



Operating and investment-related expenditures. We assume total annual expenditures of $34 per barrel, consisting of $21 per barrel for production-related costs and $13 per barrel for capital expenditures (including drilling, construction of wells, and acquisition of new equipment). The combined amount is consistent with per-barrel expenditures reported on 2015 financial statements by companies with significant oil and gas operations in California. These amounts are increased by 4 percent annually in future years to reflect rising costs of oil production as reserves are depleted.

Results

Figure 5 shows the effects of the ban on Monterey County. It expresses the losses in two ways. The left column shows the average annual reduction from 2017 through 2036, and the right column shows the present value of the combined annual reductions for the same period. All monetary values are inflation-adjusted and expressed in constant 2016 dollars.

Figure 5

Summary of Economic and Fiscal Impacts of Ban

Measure	Annual Average Losses from Ban	Present Value of Combined 2017-2036 Losses*
Economic output (Dollars in Millions)	$186.4	$1,807.3
Employment (Full time equivalent jobs)	732	—
Labor Income (Dollars in Millions)	$72.5	$687.9
Federal taxes (Dollars in Millions)	$37.6	$351.6
State and local taxes (Dollars in Millions)	$34.9	$325.1

*Estimates use a real (inflation-adjusted) discount factor of 7 percent.

The figures indicate that the ban would have a substantial impact on Monterey County. Over the next two decades, the average annual loss in economic output would be $186 million, totaling $1.8 billion in present value terms. Annual labor income would fall by $73 million, for a total of loss of $688 million during the next two decades. The county would experience job reduction averaging 732 jobs over the full 2017-2036 period. In addition, federal taxes paid by county residents would decline by $38 million per year, while state and local taxes would decline by an average of $35 million.

The reduction in revenues available for public services in the County would be significant. For example, just property taxes paid by the two primary operators in the San Ardo field totaled about $8.8 million in 2014-15 (see Figure 6). Of this total, $5.3 million went to local schools, $2.7 million went to cities and the County to support public safety, roads, social services, and other local priorities, and $750,000 went to special districts, including fire districts, parks and recreation districts, and resource conservation.[6]

Figure 6

Allocation of Property Taxes Paid By Primary Operators in San Ardo Field

Local Agency	Amount in 2014-15
School Districts	$5,300,000
Cities and County	$2,700,000
Special Districts	$750,000
Total, Monterey County	$8,750,000

The estimates of net economic and tax revenue losses losses reflect the impact of the drop in oil and gas production, as well as some offsetting activity in the next several years (mainly in 2022) related to an

[6] Property taxes paid and percentage allocations based on "Monterey County Tax Rates For Fiscal Year 2014-2015," Michael J. Miller, Auditor-Controller. County of Monterey.

accelerated pace of well plugging and site remediation (which averages about $75,000 per well[7]) that would result from an early shutdown of operations. The estimates also reflect the multiplier effects of spending in the county by the oil and gas operators, as well as their employees and independent contractors.

Figure 7 provides the annual detail behind the estimates for the first 7 years following the ban.

Figure 7
Annual Economic and Tax Impacts of San Ardo Shutdown on Monterey County (Assuming Baseline Oil Price Forecast)

	2016	2017	2018	2019	2020	2021	2022	2023
Economic Output (Millions):								
Current Law	$249.1	$253.9	$258.8	$261.2	$261.0	$258.2	$254.1	$248.8
Shutdown	$249.1	$216.7	$188.5	$162.6	$138.9	$117.7	$47.1	-
Difference	-	-$37.2	-$70.2	-$98.6	-$122.0	-$140.5	-$207.0	-$248.8
Employment								
Current Law	987.3	1005.9	1024.9	1034.2	1033.4	1022.5	1006.7	986.2
Shutdown	987.3	860.9	751.3	650.1	558	475.3	323.4	-
Difference	-	-145.1	-273.6	-384.1	-475.4	-547.2	-683.3	-986.2
Labor Income (Millions)								
Current Law	$86.9	$89.4	$92.0	$93.7	$94.6	$94.5	$94.0	$93.0
Shutdown	$86.90	$76.50	$67.40	$58.80	$51.00	$43.80	$27.90	-
Difference	-	-$12.90	-$24.60	-$34.90	-$43.70	-$50.70	-$66.10	-$93.00
Federal Taxes (Millions)								
Current Law	$34.8	$38.8	$40.6	$42.1	$43.2	$43.4	$44.0	$44.4
Shutdown	$34.8	$33.0	$29.3	$25.9	$22.6	$19.3	$6.1	-
Difference	-	-$5.8	-$11.2	-$16.2	-$20.6	-$24.1	-$37.9	-$44.4
State and Local Taxes (Millions)								
Current Law	$28.3	$33.2	$35.1	$36.7	$38.0	$38.5	$39.6	$40.5
Shutdown	$28.3	$28.2	$25.3	$22.5	$19.9	$17.1	$2.6	-
Difference	-	-$5.0	-$9.7	-$14.1	-$18.2	-$21.4	-$37.0	-$40.5

The full statewide magnitude of economic and tax losses resulting from the shutdown of San Ardo field operations would be greater than those shown in Figures 5 and 7. This is because the shutdown would affect jobs associated with administrative, payroll, engineering and accounting activities that are performed in the companies' facilities in other locations in California. Similarly, the produced oil is moved to refineries or storage facilities in other counties using two rail shipments and seventy-five truck shipments per day. A shutdown would reduce those operations and thus affect workers living and working on both ends of the shipment routes. We estimate that the additional economic output losses occurring outside of Monterey County, but within California, would likely be in the mid- to high tens of millions of dollars per year.

[7] This cost estimate is based on feedback from industry officials, and takes into account the considerable depth of wells in the San Ardo field. For general information on costs of well plugging and remediation, see "Oil Field Cleanup Program Annual Report - Fiscal Year 2015," Oil and Gas Division, Railroad Commission of Texas.

County Costs Related To The Initiative

The county will incur potentially major costs in three main areas: (1) administrative costs related to evaluating and ruling on "vested rights" exemptions from the ban on production; (2) litigation costs related to defending the county in lawsuits that will likely stem from the production ban; and (3) potentially massive litigation liability that will occur if courts rule in favor of the plaintiffs in cases related to "takings" or interference with vested rights.

County Administrative Costs

The county will have to establish a process for reviewing a large number of ban exemption requests. This review will include both technical and legal staff and also involve the County Board and its planning department staff to some extent. These costs are difficult to estimate, but will certainly reach millions of dollars.

County Litigation Costs

The county will undoubtedly face several types of lawsuits related to the ban. Examples of the types of lawsuits that might be expected include:

- Facial challenges to the initiative, on preemption, takings and/or other grounds, brought by persons or entities aggrieved by the ban;
- Claims by entities who have "vested rights," making them exempt from the ban, but whose rights the county refuses to recognize;
- Lawsuits brought under the California Environmental Quality Act challenging the environmental review of particular applications of the initiative;
- Lawsuits brought under California's "rule of capture" doctrine, to adjudicate claims arising from neighboring landowners barred by the ban from protecting their interests;
- As-applied challenges to the ban on takings grounds unless the County grants exemptions to owners and operators that allow them to engage in production activities prohibited by the Initiative; and,
- Challenges brought by proponents of the ban or other third parties against individual grants of exemptions from the terms of the initiative, should the county grant such exemptions, on the grounds that the county has not properly enforced the law.

It is difficult to estimate these litigation costs with certainty because complex litigation is inherently unpredictable, but they are expected to be very high. There are two primary operating companies and approximately 170 individual owners of mineral rights in the San Ardo Field that would be negatively affected by the initiative. The legal costs for lawsuits relating to takings claims alone, given the amounts at stake and costs associated with lawsuits of similar nature and scope, would very likely exceed $2 million per lawsuit[8], not including the substantial costs (as distinguished from attorneys' fees) associated with litigation, including expert witness fees[9]. Accordingly, litigation costs associated with the initiative could well reach into the tens of millions of dollars. To put such costs into perspective, the entire proposed

[8] This per-lawsuit cost estimate is conservative and actual costs could be much higher. It is based on the assumption that the county will need to turn to outside counsel to defend these cases, which is most common in situations involving complex and specialized litigation: (1) outside counsel at a blended rate of $1,675 per hour (assuming minimal staffing of one partner ($550/hr) and three associates ($375/hr), per rates from the American Bar Association Journal) for 1,200 hours; and (2) County Counsel at an assumed $350 per hour for 1,200 hours per lawsuit.

[9] Due to the nature of takings cases, it is anticipated that each of these lawsuits will require the retention and compensation of qualified expert witnesses.

budget for the Monterey County Counsel's office in 2016-17 is $31.5 million, and only $3.2 million of that is from general purpose revenues.

County Litigation Liability

According to legal analysis in this specific area of law, there is a substantial probability that the courts would rule that the initiative would constitute a "taking" by the county[10]. Under the takings theory, the county would be required to pay the companies and owners of the mineral rights affected by the initiative the present value of the lost profits from the oil and gas that would no longer be recovered in these fields. Thus, the initiative will create a substantial liability for the county. In fact, this liability is potentially the major fiscal impact of the initiative on the county.

As shown in Figure 8, we estimate that, absent the ban, the reserves in the San Ardo field are worth about $890 million under our baseline oil price forecast scenario. Under our low-end oil price forecast, the value of reserves could fall to $530 million. However, the value rises to $1.2 billion if future oil prices match our high end forecast.

These estimates of the reserves' value are based on the present value of after-tax cash flows (i.e. revenues minus operational and investment costs) generated from annual production in the San Ardo field over the next three decades. The revenue and cost assumptions underlying these cash-flow estimates are identical to those described in the *Economics and Tax Effects* section of the report. For purposes of this calculation, we used a discount rate of 15 percent, which is consistent with rates used by county assessors to discount future cash flows from a typical mature oil field in California. These estimates attempt to represent the full value of reserves under current law to all potential claimants, including both the companies operating in the field and the royalty owners.

The actual size of the county's potential liability will depend on how much of the current value of reserves is diminished by the initiative, which in turn depends on how quickly production is curtailed following the initiative's enactment. Under the assumption that (1) production falls by about 15 percent per year through 2021 due to the ban on new well replacement, then (2) drops to zero once the restrictions on water injection and impoundment make all production impossible, the value of the recoverable reserves drops to just $215 million under our baseline oil price forecast. The difference between the baseline value under current law and the reduced value under the initiative is $675 million, which represents the loss in value to claimants and the potential liability to the county. As indicated in Figure 8, this loss in value would expand to $950 million if oil prices match our high-end forecast, or fall to $380 million under our low-end oil price forecast.

Liability would have a major financial impact on County. In all cases, the potential liability is enormous given the size of Monterey County. For example, the $675 million loss occurring under our baseline oil price scenario is significantly greater than the total general fund revenues received by the county in 2015-16 ($565 million), and more than three times the amount of discretionary revenues received during the same year ($193 million).[11]

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[10] Santa Barbara County Measure P (November, 2014) sought to institute similar restrictions on oil and gas operations which, like the initiative now facing Monterey County, would have largely shut down production in that county. In memoranda submitted to Santa Barbara County, takings law experts from the Latham & Watkins LLP, Manatt Phelps & Phillips LLP, and Day Carter Murphy LLP law firms each independently concluded that the initiative would have constituted a regulatory taking of mineral rights holders' property. The rationale for the conclusion regarding Santa Barbara Measure P appears to apply equally to the Monterey County initiative.

[11] Source: "Budget in Brief, 2015-16" County of Monterey. The $193 million is the total non-program revenues in the budget. The document describes general fund revenues as consisting of both program and non-program revenues. Program revenues are defined as those devoted to designated or statutorily required spending, whereas non-program revenues are defined as "discretionary funds, critical in addressing local priorities and providing matching funds to leverage federal and state monies to meet maintenance of effort requirements."

A liability of this magnitude would likely require the county to immediately seek bankruptcy protection and have devastating effects on public services.

Figure 8
Potential County Liability for Loss In Value of San Ardo Oil Production

Discounted Present Value of San Ardo Oil Reserves ($ Millions)	Oil Price Forecast Scenario		
	Low	Baseline	High
Value Under Current Law	$530	$890	$1,245
Reduced Value Under Initiative	$150	$215	$295
Difference (Potential County Liability)	**$380**	**$675**	**$950**

Effects on Agriculture

The single largest industry in Monterey County is agriculture, which employs about 20,000 workers and produces about $4.5 billion worth of crops each year. Farmers in the county produce almost two-thirds of the nation's lettuce, half of its broccoli and celery, and similarly large shares of cauliflower, strawberries, and artichokes.

One of the major challenges facing agriculture in Monterey County is water for irrigation. Because the Salinas Valley receives only modest amounts of annual rainfall, and the region is not linked to the federal or state water projects, virtually all of its water comes from groundwater in the Salinas River groundwater basin. Despite years of conservation efforts by farmers and investment in irrigation efficiency, the basin is one of the most over drafted in the state. According to a 2014 analysis, the inflows into the basin are 504,000 acre feet annually, while outflows (mostly pumping) are about 550,000 acre feet per year.[12] The consequences of continued over drafting are seawater contamination of coastal farmlands, the necessity to drill deeper and more expensive wells, and at some point the loss of the only currently feasible water source for agriculture.

Against that backdrop, as part of its effort to remove excess water produced by its oil recovery operations, Chevron built a reverse osmosis facility with post-treatment wetland and recharge basins in the San Ardo field in 2006. The operation enables excess water to be removed from the oil reservoirs, thereby improving the effectiveness of steam flooding, and hence oil recovery. A key environmental benefit of this process is that up to 2,300 acre feet of water per year is permitted to be treated and released through shallow wetlands into aquifer recharge basins that replenish the Salinas River basin.

The initiative's prohibition on injection or impoundment of "oil and gas wastewater" would appear to prohibit the operation of the Chevron reclamation facility. The initiative states that "oil and gas wastewater" includes "produced water," which is water that exists in subsurface formations with oil and gas, distinct from groundwater, and is brought to the surface during oil and gas production. By prohibiting the use of surface impoundments to manage produced water, the initiative appears to jeopardize a major source of water currently available for agricultural uses. By doing so, the measure would aggravate the over drafting problem faced by farmers in the valley, putting the $4.5 billion agricultural industry at greater risk of future water shortages and seawater intrusion.

[12] Source: "State of the Salinas River Groundwater Basin Report," Brown and Caldwell, December 10, 2014.

Conclusion

Passage of the initiative by Monterey County voters would have substantial and far-reaching effects on the economy. These include a major loss of economic output, employment, income and tax payments in the County. It would also result in a reduction in an important contributor of water discharged into the Salinas River groundwater basin — the single main source of water to the County's $4.5 billion agriculture industry and one which is threatened by continuous over drafting. It would also create substantial new costs for the County, which would have to set up an administrative process to deal with numerous exemption requests and other issues related to vested rights of well operators, and defend numerous lawsuits related to the ban. Most importantly, the ban would put the County at major risk of a successful "takings" lawsuit (or series of lawsuits) by the parties affected by the ban, which would result in a County liability potentially approaching $1 billion - an amount that is five times the County's revenues available for discretionary purposes and which would put the County in immediate jeopardy of bankruptcy.

Attachment B

County Business Patterns Employment
Monterey County

CB1400A11

Geography Area Series: County Business Patterns
2014 Business Patterns

Release Date : 04/21/2016

NOTE: Data based on the 2014 County Business Patterns. CBP html tables and download files can be found at the County Business Patterns Website.
For information on confidentiality protection, sampling error, nonsampling error, and definitions, see Survey Methodology.
Data in this table represent those available when this report was created; data may not be available for all NAICS industries or geographies. Excludes most government employees, railroad employees, and self-employed persons.

Table Name	Geography Area Series: County Business Patterns: 2014
Release Schedule	The data in this file were released on April 21, 2016.
Key Table Information	Beginning with reference year 2007, CBP data are released using the Noise disclosure methodology to protect confidentiality. See Survey Methodology (http://www.census.gov/econ/cbp/methodology.htm) for complete information on the coverage and methodology of the County Business Patterns data series.
Universe	The universe of this file is all operating establishments with one or more paid employees. This universe includes most establishments classified in the North American Industry Classification System (NAICS) Codes 11 through 813990. For specific exclusions and inclusions, see Industry Classification of Establishments.
Geography Coverage	The data are shown at the U.S. level and by State, County, Metropolitan and Micropolitan Statistical Areas, and Congressional District. Also available are data for the District of Columbia, Puerto Rico, and the Island Areas (American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, and the U.S. Virgin Islands) at the state and county equivalent levels.
Industry Coverage	The data are shown at the 2- through 6-digit NAICS code levels for all sectors with published data.
Data Items and Other Identifying Records	This file contains data on the number of establishments, total employment, first quarter payroll and annual payroll.
Sort Order	Data are presented in ascending geography by NAICS code sequence.
FTP Download	Download the entire table at http://www2.census.gov/econ2014/CB/sector00/CB1400A11.zip.
Contact Information	U.S. Census Bureau Economy-Wide Statistics Division Enterprise Statistics Branch Tel: (301)763-2580 Email: ewd.county.business.patterns@census.gov

Versions of this table are available for the following years:

- 2014
- 2013
- 2012
- 2011
- 2010
- 2009
- 2008
- 2007
- 2006
- 2005

1 - 42 of 42

Geographic area name	2012 NAICS code	Meaning of 2012 NAICS code	Year	Number of establishments	Paid employees for pay period including March 12 (number)	First-quarter payroll ($1,000)	Annual payroll ($1,000)
California	00	Total for all sectors	2014	889,646	13,838,702	198,039,069	797,045,734
California	11	Agriculture, forestry, fishing and hunting	2014	1,861	26,328	202,002	964,302
California	21	Mining, quarrying, and oil and gas extraction	2014	839	27,276	685,098	2,476,183
California	22	Utilities	2014	1,213	l	D	D
California	23	Construction	2014	67,545	644,977	8,490,986	37,140,817
California	31-33	Manufacturing	2014	38,293	1,149,707	18,548,614	73,088,749
California	42	Wholesale trade	2014	59,379	840,397	17,655,769	70,148,986
California	44-45	Retail trade	2014	107,469	1,638,332	11,395,460	47,758,980
California	48-49	Transportation and warehousing	2014	22,057	463,483	5,483,681	22,747,515
California	51	Information	2014	22,148	645,036	19,986,129	75,839,782
California	52	Finance and insurance	2014	50,011	585,304	18,632,384	62,303,896
California	53	Real estate and rental and leasing	2014	50,938	281,169	4,009,352	15,821,178
California	54	Professional, scientific, and technical services	2014	120,366	1,226,321	25,740,417	106,180,123
California	55	Management of companies and enterprises	2014	5,259	302,742	10,007,228	39,982,508
California	56	Administrative and support and waste management and remediation services	2014	42,862	1,300,624	13,294,790	57,276,223
California	61	Educational services	2014	13,574	395,407	3,642,757	15,226,825
California	62	Health care and social assistance	2014	106,503	1,818,568	23,684,715	99,154,431
California	71	Arts, entertainment, and recreation	2014	22,627	321,658	2,911,002	15,512,620
California	72	Accommodation and food services	2014	81,819	1,537,438	7,164,757	30,514,709
California	81	Other services (except public administration)	2014	72,217	568,661	4,314,399	17,878,611
California	99	Industries not classified	2014	2,666	h	15,982	83,160
Monterey County, California	00	Total for all sectors	2014	8,420	102,790	1,035,826	4,397,355
Monterey County, California	11	Agriculture, forestry, fishing and hunting	2014	76	1,296	16,410	79,566
Monterey County, California	21	Mining, quarrying, and oil and gas extraction	2014	9	300	5,195	21,375
Monterey County, California	22	Utilities	2014	24	741	25,609	81,316
Monterey County, California	23	Construction	2014	835	4,525	48,205	208,847
Monterey County, California	31-33	Manufacturing	2014	256	6,750	78,447	349,896
Monterey County, California	42	Wholesale trade	2014	386	5,124	84,147	350,985
Monterey County, California	44-45	Retail trade	2014	1,319	16,669	111,213	470,578
Monterey County,	48-49	Transportation and warehousing	2014	265	2,531	25,338	115,924

Attachment C

World Bank Commodities Forecast

World Bank Commodities Price Forecast (constant US dollars)

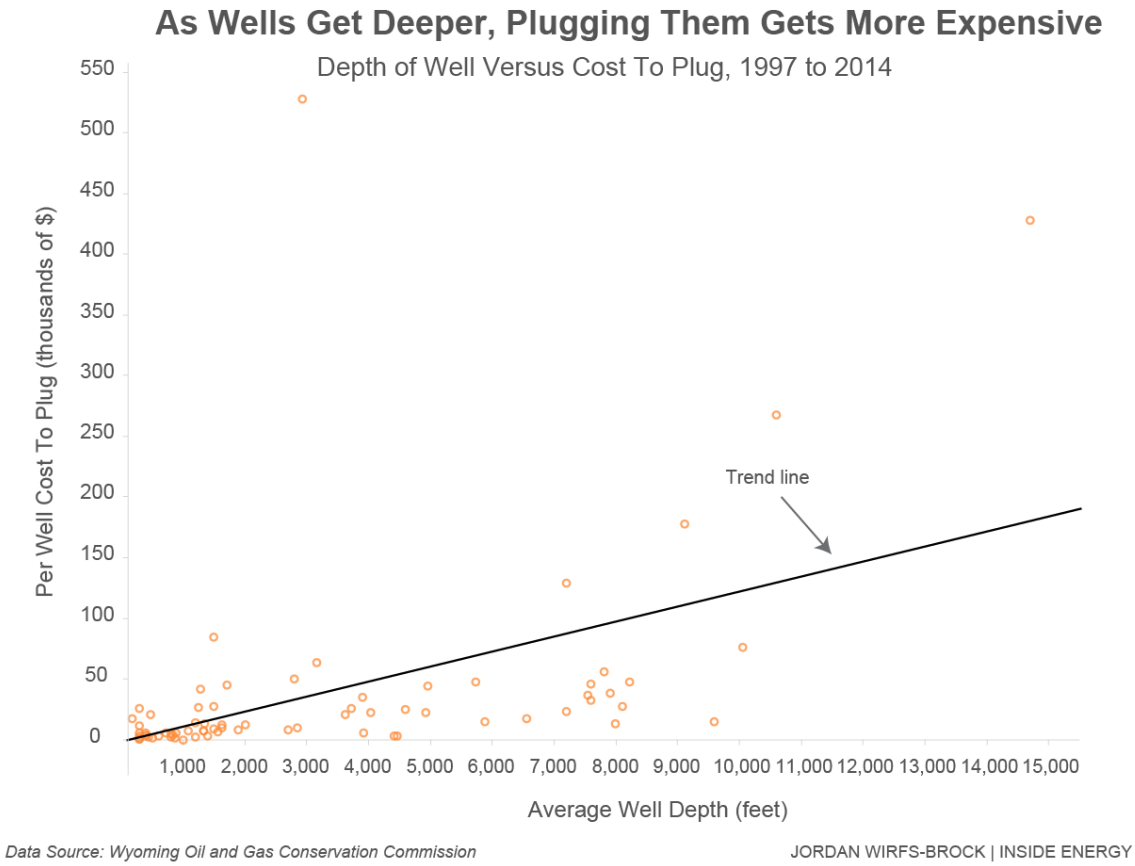
Released: April 19, 2016

Commodity	Unit	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy														
Coal, Australia	$/mt	79.7	66.2	54.4	46.5	46.6	46.8	47.2	47.3	47.5	47.6	47.8	48.0	48.1
Crude oil, avg, spot	$/bbl	98.1	96.9	48.0	38.1	45.7	47.9	49.7	52.4	54.7	56.9	58.7	60.6	62.5
Natural gas, Europe	$/mmbtu	10.1	9.3	6.9	4.2	4.4	4.6	4.8	5.1	5.3	5.6	5.8	6.1	6.4
Natural gas, US	$/mmbtu	3.5	4.1	2.5	2.3	2.7	3.1	3.3	3.4	3.5	3.6	3.7	3.9	4.0
Natural gas LNG, Japan	$/mmbtu	15.0	15.1	9.8	7.4	7.5	7.6	7.6	7.7	7.8	7.8	7.9	8.0	8.0
Non Energy Commodities														
Agriculture														
Beverages														
Cocoa	$/kg	2.30	2.89	2.97	2.88	2.76	2.64	2.59	2.41	2.41	2.41	2.41	2.40	2.39
Coffee, Arabica	$/kg	2.50	4.13	3.54	3.27	3.04	3.01	2.98	2.95	2.92	2.90	2.87	2.84	2.81
Coffee, robusta	$/kg	1.96	2.07	1.84	1.58	1.57	1.57	1.56	1.56	1.55	1.54	1.52	1.53	1.52
Tea, auctions (3) average	$/kg	2.70	2.57	2.56	2.42	2.42	2.43	2.44	2.45	2.46	2.47	2.47	2.48	2.49
Food														
Fats and Oils														
Coconut oil	$/mt	887	1,269	1,350	1,268	1,154	1,103	1,055	1,008	964	921	880	840	802
Groundnut oil	$/mt	1,672	1,240	1,265	1,258	1,224	1,247	1,259	1,276	1,294	1,312	1,329	1,346	1,365
Palm oil	$/mt	809	775	589	585	597	598	601	611	617	623	630	636	642
Soybean meal	$/mt	511	459	374	316	323	330	338	345	353	361	369	377	385
Soybean oil	$/mt	966	859	716	720	729	738	747	756	766	775	784	793	802
Soybeans	$/mt	508	464	370	367	368	374	380	386	392	399	405	411	417
Grains														
Barley	$/mt	191	180	184	172	171	169	168	167	166	164	163	162	160
Maize	$/mt	245	182	161	153	156	158	161	163	166	169	171	174	176
Rice, Thailand, 5%	$/mt	477	359	365	343	346	344	342	340	338	336	334	332	329
Wheat, US, HRW	$/mt	294	269	194	167	172	177	182	188	193	199	205	211	217
Other Food														
Bananas, EU	$/kg	0.87	0.88	0.91	0.93	0.91	0.88	0.86	0.84	0.82	0.80	0.78	0.76	0.74
Meat, beef	$/kg	3.84	4.67	4.19	3.53	3.51	3.49	3.48	3.46	3.45	3.43	3.41	3.39	3.37
Meat, chicken	$/kg	2.16	2.09	2.09	2.02	2.01	2.01	2.01	2.00	2.00	1.94	1.88	1.82	1.76
Oranges	$/kg	0.91	0.74	0.64	0.65	0.66	0.67	0.69	0.70	0.71	0.72	0.74	0.75	0.76
Shrimp, Mexico	$/kg	13.05	16.29	13.59	10.22	10.21	10.27	10.32	10.32	10.35	10.36	10.39	10.41	10.43
Sugar, World	$/kg	0.37	0.35	0.28	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Raw Materials														
Timber														
Logs, Cameroon	$/cum	437	439	368	362	366	371	375	380	384	388	393	397	401
Logs, Malaysia	$/cum	288	266	253	247	256	247	245	241	254	259	264	268	273
Sawnwood, Malaysia	$/cum	804	845	789	748	750	756	763	770	777	783	790	796	802
Other Raw Materials														
Cotton A Index	$/kg	1.88	1.74	1.47	1.44	1.47	1.52	1.54	1.58	1.61	1.65	1.69	1.73	1.78
Rubber, Malaysian	$/kg	2.63	1.85	1.78	1.25	1.37	1.37	1.43	1.49	1.55	1.62	1.70	1.77	1.84
Tobacco	$/mt	4,327	4,774	4,676	4,645	4,517	4,393	4,274	4,158	4,044	3,932	3,823	3,715	3,609
Fertilizers														
DAP	$/mt	419	445	434	334	356	339	341	343	345	347	349	351	353
Phosphate rock	$/mt	142	104	111	111	109	106	103	101	98	96	93	91	88
Potassium chloride	$/mt	352	281	284	264	263	267	262	258	256	254	252	251	249
TSP	$/mt	363	367	364	288	288	288	288	289	289	289	289	289	289
Urea, E. Europe, bulk	$/mt	321	259	258	209	207	209	211	213	216	218	220	222	225
Metals and Minerals														
Aluminum	$/mt	1,741	1,764	1,576	1,486	1,507	1,529	1,551	1,573	1,595	1,618	1,640	1,662	1,684
Copper	$/mt	6,913	6,482	5,216	4,615	4,741	4,847	4,952	5,060	5,170	5,280	5,390	5,502	5,611
Iron ore	$/dmt	127.5	97.5	52.8	46.5	47.0	47.5	48.3	49.0	49.5	50.3	52.9	51.5	52.1
Lead	$/mt	2,019	1,979	1,693	1,684	1,670	1,697	1,713	1,736	1,758	1,780	1,802	1,823	1,845
Nickel	$/mt	14,178	15,955	11,228	8,547	9,166	9,834	10,352	11,322	12,147	13,027	13,966	14,969	16,041
Tin	$/mt	21,070	20,683	15,207	13,936	14,305	14,697	15,089	15,497	15,915	16,336	16,767	17,202	17,645
Zinc	$/mt	1,801	2,041	1,928	1,672	1,699	1,726	1,754	1,783	1,811	1,840	1,868	1,897	1,925
Precious Metals														
Gold	$/toz	1,331	1,155	1,099	1,068	1,035	1,003	972	942	913	884	856	829	802
Silver	$/toz	22.5	18.0	14.9	13.9	13.8	13.7	13.6	13.5	13.3	13.2	13.1	13.0	12.8
Platinum	$/toz	1,487	1,387	997	888	913	946	979	1,014	1,050	1,087	1,125	1,163	1,203

Next update: July 2016

Attachment D

Depth of Well versus Cost to Plug


As Wells Get Deeper, Plugging Them Gets More Expensive
Depth of Well Versus Cost To Plug, 1997 to 2014
Per Well Cost To Plug (thousands of $)
550
500
450
400
350
300
250
200
150
100
50
0
Trend line
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
13,000
14,000
15,000
Average Well Depth (feet)
Data Source: Wyoming Oil and Gas Conservation Commission
JORDAN WIRFS-BROCK | INSIDE ENERGY

Attachment E

Legal Analysis of Takings Liability

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M E M O R A N D U M

TO: Protect Monterey County

FROM: Catherine C. Engberg, Andrew W. Schwartz, and Peter J. Broderick

DATE: August 2, 2016

RE: Monterey County will not be liable for takings from the *Protect Our Water: Ban Fracking and Limit Risky Oil Operations Initiative*

INTRODUCTION

On June 1, 2016, Protect Monterey County qualified the *Protect Our Water: Ban Fracking and Limit Risky Oil Operations Initiative* ("Initiative") to appear on the ballot for the November 8, 2016 election in Monterey County. The Initiative proposes to restrict certain land uses relating to oil and gas extraction and production on unincorporated lands within the County.

Several counties throughout California have adopted similar restrictions on oil and gas land uses, either through voter initiative or by act of the legislative body. For example, voters in San Benito, Mendocino, and Butte Counties have passed initiatives that prohibit or limit various land uses associated with oil and gas production. In 2014, the Santa Cruz County Board of Supervisors banned all oil and gas activities in that county, and in 2016 the Alameda County Board of Supervisors banned high-intensity oil and gas operations countywide.

In apparent response to the strong public support for the Initiative in Monterey County, oil and gas industry opponents of the measure produced a report (misleadingly) entitled *Economic and County Budget Impacts of a Ballot Initiative that Would Ban Petroleum Production in Monterey County* (June 2016) ("Industry Report"), that purports to objectively evaluate the economic impacts of the Initiative. Unsurprisingly, the report hurries to conclude that the Initiative would be disastrous for the County.

The centerpiece of the Industry Report's economic analysis is its astounding claim that the County will be liable to property owners for nearly *$1 billion* in damages if the Initiative passes, which, the Industry Report threatens, "could bankrupt the County."

Industry Report at 2. The Industry Report identifies this as the Initiative's "main threat to the [C]ounty." *Id.* However, this claim finds no support in existing law, and the Industry Report is pointedly devoid of any legal analysis to support it.

It is highly unlikely that the Initiative, which does not ban oil and gas extraction or production in the County, would effect a so-called "regulatory taking" for which the County would be required to pay compensation. In the unlikely event that a property owner could establish that the Initiative effected such a taking, the County would not have to pay compensation because the Initiative expressly permits the County to grant limited exceptions to the Initiative's provisions to avoid paying such compensation. Local governments applying land use regulations have long used this safety valve, even where the relevant legislation does not expressly provide for it.

We explain below that County voters' adoption of the Initiative will *not* subject the County to liability for takings damages.

ANALYSIS

I. Contrary to the Industry Report's Claims, the Initiative Restricts Some, But Not All, Oil and Gas Production Activities.

The Initiative would add three new policies to the Land Use Element of the Monterey County General Plan.[1] Each of these policies addresses and restricts a different land use associated with oil and gas extraction in the County. These policies apply only in the County's unincorporated areas; the Initiative does not affect offshore oil and gas production activities.

Policy LU-1.21 prohibits land uses in support of "well stimulation treatments," which include hydraulic fracturing treatments ("fracking") and acid well stimulation treatments. The Initiative tracks state law—SB 4 (Pavely 2013)—in defining these terms, and expressly provides that they do not include routine well maintenance activities, which are not prohibited by the Initiative.

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[1] The Initiative adds identical versions of these three policies to the County's Fort Ord Master Plan and to each of the Area Plans that together make up the County's Local Coastal Program. Initiative Sections 3, 4. It also adopts minor conforming amendments to Area Plans and the Fort Ord Master Plan, to ensure internal consistency among the various sections of those documents. Initiative Section 5.

Policy LU-1.22 prohibits land uses in support of the injection or impoundment of "oil and gas wastewater," which it defines as "wastewater brought to the surface in connection with oil or natural gas production, including flowback fluid and produced water." The policy provides an amortization period of 5 years after the effective date of the Initiative, with a possible extension of 10 additional years, during which time property owners with a vested right to conduct these activities may continue them.

Policy LU-1.23 prohibits the drilling of new oil and gas wells. It has no effect on wells already existing at the time the Initiative takes effect and does not prohibit the reworking or redrilling of existing wells.

The authors of the Industry Report and opponents of the Initiative overstate the Initiative's reach and effect in an attempt to paint it as an unreasonable and sweeping effort to extinguish the oil and gas industry and "ban all existing and future oil production" in Monterey County. Industry Report at 1. In reality, the three new policies strike a balance: as explained below, they are carefully crafted to restrict the practices that pose the greatest threat to the health, safety, and welfare of Monterey citizens, while allowing existing operations to continue, with some limitations.

A. The Initiative Prohibits Land Uses In Support of Well Stimulation Treatments.

Industry representatives often claim that local bans on the use of well stimulation treatments (which bans are becoming more common throughout California) would prohibit all oil and gas development. But well stimulation treatments have not yet been used with great frequency in Monterey County; rather, oil and gas operations in the County typically involve enhanced oil recovery operations, such as steam flooding, water flooding, or cyclic steam injection, that are not prohibited by the Initiative.[2] Although this policy is necessary to ensure that Monterey County's residents and groundwater are not subjected to the use of well stimulation treatments in the future, its effect on existing operations will be minimal.

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[2] *See generally* Jane C. S. Long et al., An Independent Scientific Assessment of Well Stimulation in California. Volume I: Well Stimulation Technologies and their Past, Present, and Potential Future Use in California, California Council on Science and Technology (2016), *available at*: http://ccst.us/publications/2015/160708-sb4-vol-I.pdf.

B. The Initiative Prohibits Land Uses In Support of Oil and Gas Wastewater Injection and Impoundment.

The Initiative prohibits land uses in support of the storage or disposal of oil and gas wastewater via subsurface injection or impoundment (the use of percolation or evaporation ponds). Oil and gas wastewater is defined as wastewater brought to the surface in connection with oil or natural gas production. The Industry Report states that "[g]iven the large amount of water produced as part of the oil extraction process in San Ardo, a prohibition on treatment, injection and impoundment of water would make well operations impossible." Industry Report at 5.

The Industry Report overstates the Initiative's effect. While the Initiative prohibits the storage or disposal of oil and gas wastewater through injection or impoundment, it does *not* prohibit the treatment and/or reclamation of oil and gas wastewater.[3] While requiring oil and gas operators to treat the oil and gas wastewater they produce to protect Monterey County residents might increase production costs, it is not a de facto ban on oil and gas operations in the County. Existing oil and gas wastewater treatment and reclamation facilities using reverse osmosis in the County are a testament to the financial feasibility of treating oil and gas wastewater.

In any event, the Initiative provides for a five-year "phase-out" period after the Initiative's effective date, during which time property owners may continue oil and gas wastewater injection and impoundment as a nonconforming land use. This five-year period may be extended for up to ten additional years by the Planning Commission, upon application of a property owner. Thus, those property owners most affected by this provision may not have to comply for fifteen years.

C. The Initiative Prohibits Drilling New Oil and Gas Wells.

The Initiative prohibits the drilling of new oil and gas wells in the unincorporated areas of the County, but expressly states that this Policy "does not affect oil and gas wells drilled prior to the Effective Date." At the time the Initiative was submitted there were

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[3] In fact, the Initiative's Findings expressly approve of the existing reverse osmosis treatment facility in the County, *see* Initiative Section 1(C)(5), offering this treatment up as an exemplary alternative to the use of injection or ponds to dispose of oil and gas wastewater.

more than 1,500 active oil and gas wells in Monterey County.[4] The California Department of Oil Gas and Geothermal Resources ("DOGGR") regularly issues permits for redrilling or "reworking" existing wells. *See* Cal. Code Regs., tit. 14, § 1714. The Initiative does not ban the reworking, redrilling, or deepening of existing wells. The industry's claims that this provision will immediately shut down oil and gas operations in the County are therefore not credible. In fact, the industry for years has been reworking existing wells to improve oil production and repurpose them for cyclic steam injection, steam flooding and other enhanced oil recovery methods (production methods that are allowed under the Initiative).[5] In addition, reworking and redrilling would allow operators to use horizontal drilling methods and other new technologies which could in some circumstances further increase the productivity of existing wells. Accordingly, under the Initiative, oil and gas operators can continue producing well into the future using the 1,500 existing oil and gas wells.

In sum, the Initiative does not ban or prohibit all oil and gas production in the County, despite the industry's claims to the contrary.

II. The Initiative Will Not Effect Regulatory Takings.

The Industry Report asserts that enforcement of the Initiative will effect a "regulatory taking" of the property of businesses involved in the production of oil and gas. This contention has no support in the law and is without merit.

The U.S. and California constitutions prohibit government from "taking" private property for public use without just compensation. *See* U.S. Const., 5th Amend., Cal. Const., art Article I, § 19. The takings clause was originally intended to apply only to direct condemnation, called eminent domain, where the government takes physical possession of private property. *Legal Tender Cases* (1870) 79 U.S. (12 Wall.) 457, 551-52, *Lucas v. South Carolina Coastal Council* (1992) 505 U.S. 1003, 1014. The regulatory takings doctrine has evolved since the Fifth Amendment was enacted, now allowing compensation for government regulation of the *use* of property, but only in the narrowest of circumstances. Land use regulations do not effect a taking simply because landowners or businesses will be financially affected. As the United States Supreme Court has held, a

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[4] Division of Oil, Gas, and Geothermal Resources (2016), Well Search, *available at*: https://secure.conservation.ca.gov/WellSearch/.

[5] *See* Long, et al., *supra*; *see also* Division of Oil, Gas, and Geothermal Resources, Well Search, *supra*.

regulatory taking can be found only where a regulation of the use of property is so extreme that it is the "functional equivalent" of eminent domain. *Lingle v. Chevron, U.S.A., Inc.* (2005) 544 U.S. 528, 539.

Because few regulations are so extreme as to resemble eminent domain, regulatory takings are rare. *See Galland v. City of Clovis* (2001) 24 Cal.4th 1003, 1026 ("Police power legislation results in a confiscatory 'taking' only when the owner has been deprived of substantially all reasonable use of the property.… Even a significant diminution in value is insufficient to establish a confiscatory taking."). Under the exacting test laid out by the Supreme Court, a regulatory taking occurs only where: (a) a regulation deprives the property owner of 100 percent of the economic value of the property, *Lucas*, 505 U.S. 1003, 1018, called a "categorical taking,"[6] or (b) the value of the property is severely diminished, *Penn Cent. Transp. Co. v. City of New York* (1978) 438 U.S. 104, 124 ("*Penn Central*"), called a "*Penn Central* taking."

Property owners in Monterey County that are affected by the Initiative will not meet the high bar the courts have required for a regulatory taking claim.

A. The Initiative Will Not Cause a "Categorical Taking."

Where a claimant successfully demonstrates that government regulation "denies all economically beneficial or productive use of land," the action amounts to a "categorical taking." *Lucas*, 505 U.S. at 1015, 1018; *see also Tahoe-Sierra Pres. Council v. Tahoe Reg'l Planning Agency* (2002) 535 U.S. 302 (emphasizing that the rule applies only in the exceptional case in which a regulation truly leaves a property with no use or value whatsoever). The Initiative would not effect a categorical taking because it would not deprive landowners of the viable economic use of their property. In all areas of the County, landowners would remain free to devote their land to other allowable and economically profitable uses, such as farming, grazing, or development. Moreover, property owners who have already developed oil and gas reserves, including holders of mineral estates or leases, would be free to continue producing oil on their property, using existing wells. Although the Initiative may restrict oil and gas production, it would nonetheless leave substantial value in the properties.

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[6] The Supreme Court in *Lucas* also held that a government regulation that allows the physical appropriation of property can also constitute a regulatory taking. *Lucas*, 505 U.S. at 1015. The Initiative does not allow government to take physical possession of private property; it merely regulates the use of that property. Accordingly, the Initiative cannot be challenged as a physical taking.

Local jurisdictions have frequently passed, and courts have long upheld, outright bans on oil and gas production, including by initiative. *See Hermosa Beach Stop Oil Coalition v. City of Hermosa* (2001) 86 Cal.App.4th 534, 555 ("Enactment of a city ordinance prohibiting exploration for and production of oil, unless arbitrary, is a valid exercise of the municipal police power."), *Higgins v. City of Santa Monica* (1964) 62 Cal.2d 24, 27 (upholding local initiative measure banning oil and gas drilling or prospecting and all incidental operations within City limits).

B. The Initiative Will Not Cause a "*Penn Central* Taking."

Outside of "categorical takings," where the regulation erases all value of a property, courts assess regulations that come close to eliminating all value under the three-factor test articulated in *Penn Central.* 438 U.S. 104, 124 (holding no taking occurred where regulation prohibited redevelopment of Grand Central Terminal because the owner could continue the property's existing use). This analysis is based on the particular facts before the court. *Id*. Like categorical takings, however, the aim of the *Penn Central* test is to identify regulatory actions that have extreme impacts on property value, akin to the direct appropriation of property by eminent domain. *Lingle*, 544 U.S. at 539. Takings claimants in Monterey County will fare no better under the *Penn Central* test.

In applying *Penn Central*, courts consider: (1) the economic effect of the regulation, (2) the regulation's interference with reasonable investment-backed expectations, and (3) the character of the governmental action. *See Penn Central*, 438 U.S. at 124. California courts applying the test have determined that they may dispose of a takings claim on the basis of any one of these three factors. *See Allegretti & Co. v. County of Imperial* (2006) 138 Cal.App.4th 1261, 1277, *Bronco Wine v. Jolly* (2005) 129 Cal.App.4th 988, 1035. Property owners affected by the Initiative will be unable to make the requisite showing under any of the three factors to demonstrate that the Initiative amounts to a regulatory taking.

1. The Economic Impact Factor Fails to Support a Regulatory Takings Claim.

The Initiative's economic impact on property owners, even were it to significantly decrease the value of their holdings, will not support a regulatory taking claim. The Supreme Court's taking cases "have long established that mere diminution in the value of property, however serious, is insufficient to demonstrate a taking." *Concrete Pipe & Prods. of Cal., Inc. v. Construction Laborers Pension Trust* (1993) 508 U.S. 602, 645. For example, reductions of as much as 95% of the value of the property have still been found not to rise to the level of a taking. *See William C. Hass & Co. v. City and County of*

San Francisco (9th Cir. 1979) 605 F.2d 1117 (reduction in value from $2 million to $100,000 was not a taking, even though owner could not recover initial $2 million investment).

Even accepting at face value the industry's assertion that the prohibition on oil and gas wastewater injection and impoundment "would make well operations impossible," Industry Report at 5, operators that held only mineral estates would be able to continue producing from existing wells for up to fifteen years. Depending on the parcel and wells in question, unlimited future production from existing wells, including five to fifteen years of unrestricted oil and gas wastewater injection or impoundment (with the subsequent possibility of treating the oil and gas wastewater) would leave substantial value for a property owner. The economic impact will be less severe in the cases in which the property owner owns the surface estate and can put the property to other productive uses.

2. The Reasonable Investment-Backed Expectations Factor Further Undercuts Industry's Takings Argument.

Takings claimants will not be able to show that the Initiative impermissibly interferes with their reasonable investment-backed expectations. The Industry Report reveals its authors' misunderstanding of contemporary takings law when it states that "There is substantial likelihood that the courts will rule that the initiative constitutes a 'taking' of private property rights (i.e., the future profits of the owners of the mineral rights)." Industry Report at 2. Regulatory changes do not require compensation merely because they frustrate economic expectations. There is no guaranteed property right in "future profits." As the U.S. Supreme Court observed in *Andrus v. Allard*, "loss of future profits—unaccompanied by any physical property restriction—provides a slender reed upon which to rest a takings claim." (1979) 444 U.S. 51, 66.

Showing that the Initiative's restrictions impermissibly interfere with property owners' reasonable investment-backed expectations would be especially difficult given the highly speculative nature of oil and gas exploration. Estimates of the value of oil deposits can change drastically. For example, in 2014 the U.S. Energy Information Administration abruptly reduced its previous estimate of the amount of recoverable shale oil contained in the Monterey Shale Formation, which underlies parts of Monterey County, by approximately 96 percent.[7] Although property owners and oil and gas

[7] *See* Los Angeles Times, "U.S. officials cut estimate of recoverable Monterey Shale oil by 96%" (May 21, 2014).

producers may speculate about the existence and profitability of oil reserves, they have no reasonable expectation that the land uses prohibited by the Initiative will yield economically profitable returns on their holdings. Given this uncertainty, courts are unlikely to conclude that implementing the Initiative unduly interferes with an individual landowner's reasonable expectations of profit. *See Allegretti*, 138 Ca.App.4th at 1279 ("A 'reasonable investment-backed expectation' must be more than a 'unilateral expectation or an abstract need.'").

Further, property owners operating in a "heavily regulated industry" must reasonably expect new regulation. *See* Douglas Kendall et al., Takings Litigation Handbook: Defending Takings Challenges to Land Use Regulations (2000) 152-55 (citing *Ruckelshaus v. Monsanto Co.* (1984) 467 U.S. 986 and subsequent cases). Oil and gas production activities have long been regulated by state and local agencies. In many counties other than Monterey, robust local permitting and siting schemes govern these activities, and many local jurisdictions have imposed significant restrictions or outright bans on oil and gas land uses. *See Hermosa Beach Stop Oil Coalition*, 86 Cal.App.4th 534. By all accounts, this is a "heavily regulated" industry. In this unique regulatory environment, oil and gas producers cannot reasonably expect to drill new wells or use certain production practices indefinitely. And owners of mineral estates who have not yet undertaken exploration or development of those interests cannot be said to have expectations that are fully investment-backed.

3. The Character of the Governmental Action Fails to Support a Takings Claim.

Under the character of the governmental action factor, a regulation can be deemed a taking if it is akin to a "physical invasion by government, " as opposed to a "public program adjusting the benefits and burdens of economic life to promote the common good." *Penn Central*, 438 U.S. at 124. Regulations that do not require public possession of property, but rather prevent harm or protect public health and safety do not constitute takings. *See, e.g., Appolo Fuels, Inc. v. United States* (Fed.Cir. 2004) 381 F.3d 1338, 1350-51, *Maritrans Inc. v. United States* (Fed.Cir. 2003) 342 F.3d 1344, 1356 (citing *Creppel v. United States* (Fed. Cir. 1994) 41 F.3d 627, 631).

The Initiative's express purpose, as detailed in its Purpose and Findings, is to "protect Monterey county's water, agricultural lands, air quality, scenic vistas, and quality of life" by restricting land uses that pose a threat to the environment and public health. Initiative Section 1(A). Given this purpose, the Initiative cannot warrant compensation. The character of the governmental action factor weighs heavily in favor of the County.

In sum, the law of regulatory takings does not support the industry's broad claims that passage of the Initiative will effect compensable regulatory takings of private property under the U.S. and California Constitutions.

III. The Initiative Expressly Authorizes the County to Make Exceptions to Avoid a Taking.

Section 6(C) of the Initiative, called a "Savings Clause," provides that the Initiative shall not apply to the extent that it would effect an unconstitutional taking of property under the U.S. or California Constitutions. Under this provision, a property owner may request an exception to the application of the Initiative. If the Board of Supervisors finds that the application of any provision of the Initiative would constitute a taking, it may grant the request, but only to the minimum extent necessary to avoid a taking. A vote of the people is not required to invoke the Savings Clause.

In the improbable event that the Initiative as applied to a particular property would effect a taking, the Savings Clause will eliminate the risk that the Initiative could require compensation. Courts have endorsed Savings Clauses as a means to avoid government takings liability. *See San Mateo County Coastal Landowners' Ass'n v. County of San Mateo* (1995) 38 Cal.App.4th 523, 547 (recognizing that land use initiative's savings clause gave county flexibility to avoid potentially unconstitutional application of its requirements), *Home Builders Ass'n v. City of Napa* (2001) 90 Cal. App. 4th 188, 199 (upholding an exemption procedure that allowed city officials to reduce, modify or waive the requirements of the ordinance to avoid constitutional due process and takings concerns); *see also* Institute for Local Government, *Regulatory Takings and Land Use Regulation: A Primer for Public Agency Staff* (July 2006) 46 (endorsing the use of such "economic variance" procedures to avoid compensable takings). Thus, even if the Initiative should effect a taking in some unforeseen circumstance, the claimant's remedy would be to seek an authorized exception. A property owner would not be able to seek judicial relief until it had sought this exception from the County and had been denied. In the unlikely event that application of the Initiative could effect a regulatory taking, the County could avoid paying compensation by relaxing the Initiative's restrictions to the minimum extent required to avoid the risk that a court would find the regulation to effect a taking.

Further, even in the absence of express savings clauses like Section 6(C) of the Initiative, local governments always have the option of allowing exceptions to a regulatory scheme after a court ruling finding a taking and thus can avoid paying damages for a permanent taking. *Hensler v. City of Glendale* (1994) 8 Cal.4th 1, 11 (citing *Lucas*, 505 U.S. 1003). In the unlikely event of a successful as-applied takings challenge to the Initiative in court brought after a property owner applied for, and was

denied, an exception from the County, the County would be free to reconsider its decision and craft a necessary exception. For example, by extending the maximum amortization period for wastewater injection and impoundment for a particular property after a court ruling finding that the Initiative has taken the property, the County could limit or avoid paying any compensation, because the property owner would not have incurred actual damage. *See id.*

CONCLUSION

Industry claims of staggering liability for the County in compensation for regulatory takings as a result of the Initiative are wholly unsupported. The Initiative will not effect regulatory takings of private property. On the remote chance that a property owner can present a credible case that the Initiative meets the high standards for a taking, or a court finds in favor of a takings claim, the County would retain the authority to grant an exception to avoid compensating a landowner. Industry threats of alleged future damages that would "bankrupt" the County should not be given any weight.