

# ECONOMIC AND FISCAL IMPACTS OF MONTANA'S PETROLEUM AND NATURAL GAS INDUSTRIES

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## INTRODUCTION

The oil and gas industries are frequently in the news, but many people do not realize the extent to which the oil and gas industry contributes to economic activity within a region. Many other businesses and jobs are supported by the petroleum industry as a result of the economic activity created from spending by petroleum companies and their workers. The ripple effects from this spending can be measured in terms of the economic impact of the industry on the state's economy. In addition to the support for other businesses and jobs, the oil and gas industry contributes significant amounts of tax revenues to the state and county coffers. These fiscal effects stem from production taxes, royalty payments, corporate and individual income taxes. This report estimates economic and fiscal impact of the oil and natural gas industries in Montana in calendar year 2007. These impacts cover the activities of searching for oil or gas, developing well fields, producing the petroleum or gas, refining the petroleum products, and transportation of the raw materials or refined products. It does not cover retail distribution of either petroleum products or natural gas.

### *PRODUCTION*

There are nearly 4,200 oil wells in Montana, producing a total of nearly 100,000 barrels per day. This production makes Montana the 10<sup>th</sup> largest producer of crude oil in the Nation. The Williston Basin area produced the majority total oil within the state. In 2007 Montana oil production totaled more than 33 million barrels of crude oil. <sup>i</sup> Three-quarters of oil produced comes from only a handful of companies.<sup>ii</sup>

### LARGEST OIL PRODUCERS

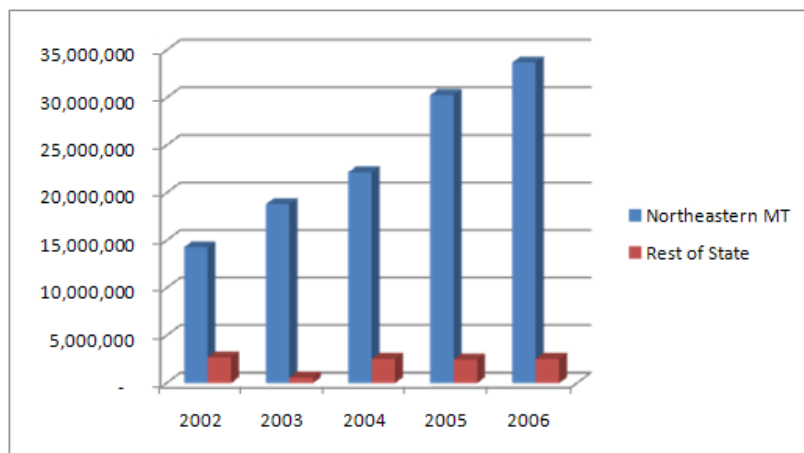
<b>Company</b>	<b>Percent of Total MT Production</b>
<b>Encore</b>	18%
<b>Enerplus</b>	14%
<b>ConocoPhillips</b>	12%
<b>Continental</b>	12%
<b>Headington</b>	10%
<b>Nance</b>	7%

Eastern Montana is the location of most oil production, with Richland County in the Northeast and Fallon County in the Southeast representing 80% of the total oil produced. There were 1,048 new wells permitted in 2006, with over 80% vertical wells and the rest (194) horizontal. Since 2002, nearly all of the growth in oil production has come from Richland County. The wells in this area produced 56 barrels per day in 2006, twice the state production average and four-times that of any other Montana region.

### *LOCATION OF MONTANA OIL PRODUCTION*

County	Production (barrels)
Richland	20,934,436
Fallon	7,868,360
Rest of State	7,420,059

## GROWTH IN MT CRUDE OIL PRODUCTION



Montana produced an estimated 105 million cubic feet of natural gas in 2007. <sup>iii</sup> Northern Montana represents 70% of gas production. Overall, four firms are responsible for two-thirds of the total gas produced.

## LARGEST NATURAL GAS PRODUCERS

Production Firm	2006 Production (Mcf)
Fidelity Exploration & Production Co.	45,819,679
Devon Energy Production Co., LP	15,440,131
Klabzuba Oil & Gas, Inc	8,210,368
Nobel Energy, Inc.	6,044,874

Fallon, Phillips, Richland, Hill, and Blaine counties represent over 70% of the total natural gas produced. In the past five years, the growth in production has been driven by increases in Northeastern Montana, where output grew to 23 mmcf. These wells produced, on averaged, 89 mcf of natural gas per day, twice the state average<sup>iv</sup>. This production increase shows the synergies between oil and natural gas production, with natural gas collection done in conjunction with oil production supplementing the natural gas totals.

## COUNTIES WITH LARGEST NATURAL GAS PRODUCTION

<b>County</b>	<b>Total mcf 2006</b>
<b>Fallon</b>	25,298,895
<b>Phillips</b>	17,727,028
<b>Richland</b>	14,758,539
<b>Hill</b>	14,132,004
<b>Blaine</b>	13,999,816
<b>Big Horn</b>	11,729,290
<b>Rest of State</b>	16,413,669

## OIL REFINERIES

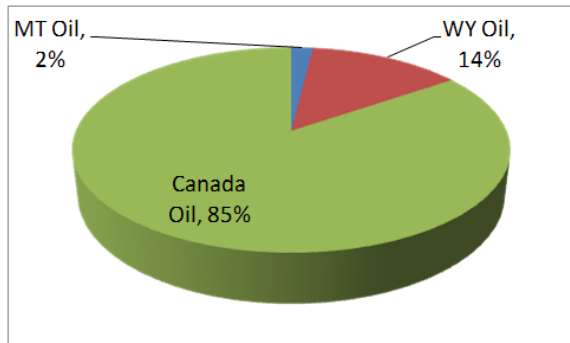
The CHS and ConocoPhillips refineries each produce around one-third of the nearly 64 million barrels refined in Montana. The ExxonMobil refinery produces 30% of the total, and the Montana Refining plant near Great Falls refines 5%. Montana refineries have been operating at near-capacity, with total output in recent years averaging 63.5 million barrels.

### *MT REFINERY OUTPUT*

<b>Company</b>	<b>Location</b>	<b>Barrels Refined in 2006</b>
<b>CHS</b>	Laurel	21,611,565
<b>Conoco</b>	Billings	21,196,330
<b>Exxon</b>	Lockwood	17,955,240
<b>Montana Refining</b>	Great Falls	3,133,970

Montana refineries are somewhat tied to different areas of oil production via the pipelines and oil fields used by their parent companies. For example, in 2006, 90% or more of the crude oil processed by the ExxonMobil and ConocoPhillips refineries came from Canadian wells, while over 40% of the crude process by the ExxonMobil refinery was from Wyoming oil wells<sup>v</sup>.

## SOURCE OF CRUDE OIL REFINED IN MONTANA (2006)

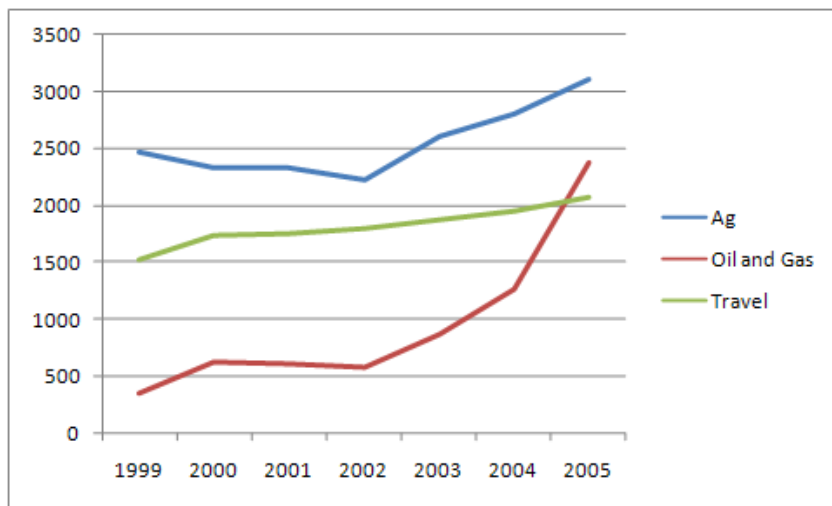


## ECONOMIC IMPACTS

The estimated value of the oil production is \$ 2.3 billion in 2007, and the value of the natural gas produced is over \$ 744 million<sup>vi</sup>. The revenue generated by companies that are drilling and operating these wells comes back to the economy in resource extraction taxes and royalty payments to Montana land owners. These tax revenues are redistributed to county governments to provide valuable funding for many communities.

The industry is growing in importance. Since 1999 gross receipts for the oil and gas industry have increased six-fold to \$2.4 billion<sup>vii</sup>, and has surpassed the Travel Industry in aggregate gross receipts.

### MT GROSS RECEIPTS



The oil and gas industry pays above-average wages to its Montana workers when compared to many other Montana industries. The 4,500 full-time employees in the petroleum refining, pipeline transport, and oil & gas extraction industries made significantly more than the average Montana worker<sup>viii</sup>. In addition, many Montanans make a good living working in the businesses that sell goods and services to the oil and gas industry.

### *EMPLOYMENT AND EARNINGS FOR OIL AND GAS INDUSTRY GROUPS*

<b>Industry Group</b>	<b>Employees</b>	<b>Ave Annual Earnings (2006)</b>
<b>Oil and Gas Extraction</b>	605	\$74,232
<b>Support Activities for Oil and Gas Extraction</b>	2,602	\$64,056
<b>Petroleum &amp; Coal Products Manufacturing</b>	1,025	\$85,455
<b>Pipeline Transportation</b>	304	\$72,564

### *EMPLOYMENT AND EARNINGS FOR SELECTED OCCUPATIONS*

<b>Occupation</b>	<b>Employees</b>	<b>Ave Annual Earnings (2006)</b>
<b>Architectural and Engineering Services</b>	4,635	\$48,876
<b>Petroleum Engineer</b>	30	\$81,660
<b>Survey and Mapping Technicians</b>	610	\$31,000
<b>Geoscientists</b>	170	\$73,420
<b>Title Examiners, Abstractors, and Searchers</b>	390	\$37,630
<b>Derrick Operator</b>	460	\$45,120
<b>Helper</b>	250	\$31,260
<b>Mobile Heavy Equipment Mechanic</b>	860	\$38,900
<b>All Workers</b>	408,977	\$32,118

### *TAXES AND ROYALTY REVENUES*

The oil and gas industries pay a number of Montana state and local taxes and royalties, including taxes and royalties on mineral production, property taxes on the value of industrial equipment, and income taxes on corporate profits. In addition, employees of these companies pay income taxes on their industry wages and property owners of productive oil and gas lands pay taxes on their mineral production royalties. This section of the report attempts to estimate these total payments

for each area of the oil and gas industry. When possible, these estimates are given for calendar year 2007<sup>1</sup>.

## PRODUCTION TAXES

In calendar year 2007, Montana's oil production taxes totaled approximately \$184 million and natural gas production taxes totaled an estimated \$59.52 million<sup>ix</sup>. Since 2000, these production taxes have increased four-fold<sup>x</sup>.

Just less than one-half of these production taxes are returned to the county where the production occurred. The revenues returned to producing counties fund school districts as well as school retirement obligations and countywide transportation<sup>xi</sup>. Production taxes generated in Richland and Fallon counties alone provide nearly \$60 million in tax revenues for the state.

\$122 million in production taxes were retained by the state of Montana and \$108 million being returned to Montana counties<sup>xii</sup>. Of the state's share, approximately \$105 million was placed in the General Fund, where it represents 5% of its total funding, and the rest deposited in such accounts as the University Millage fund, which will receive \$3.2 million.

Production tax rates differ by well type, age, and ownership. Currently, for the first 12 months of a vertical well and the first 18 months of a horizontal well, the active participants who begin recovering oil or gas from a new well pay a production tax rate of 0.5%. After this incentive period, primary recovery is taxed at 9%. Passive investors in the drilling of these wells pay a tax rate of around 15%. On average, 85% of the value of oil and gas production flows to active participants<sup>xiii</sup>.

And, of course, there are fluctuations in the prices of oil and gas, which can move the overall tax revenue generated from oil and gas production by tens of millions of dollars.

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<sup>1</sup>Tax revenue estimates are typically reported for Fiscal Years. The Montana Fiscal Year runs July 1<sup>st</sup> through June 30<sup>th</sup>.

## *TOTAL MONTANA OIL AND GAS PRODUCTION TAXES*

<b>2006</b>			
<b>County</b>	Total Production Taxes	Returned to County	Kept by State
<b>Richland</b>	\$60,252,633.84	\$28,297,289.19	\$31,955,344.65
<b>Fallon</b>	\$46,454,897.02	\$19,305,239.82	\$27,149,657.20
<b>Sheridan</b>	\$9,936,555.25	\$4,738,514.35	\$5,198,040.90
<b>Phillips</b>	\$9,872,570.69	\$5,271,715.66	\$4,600,855.03
<b>Blaine</b>	\$8,703,776.26	\$5,069,916.32	\$3,633,859.94
<b>Roosevelt</b>	\$8,189,694.92	\$3,767,568.13	\$4,422,126.79
<b>Big Horn</b>	\$6,982,018.61	\$3,220,413.93	\$3,761,604.68
<b>Hill</b>	\$6,656,981.40	\$4,334,607.49	\$2,322,373.91
<b>Wibaux</b>	\$4,508,956.80	\$2,199,763.90	\$2,309,192.90
<b>Toole</b>	\$3,923,959.18	\$2,243,456.81	\$1,680,502.37
<b>Glacier</b>	\$3,663,055.49	\$2,318,715.85	\$1,344,339.64
<b>Carbon</b>	\$3,282,149.37	\$1,600,985.33	\$1,681,164.04
<b>Dawson</b>	\$2,412,846.89	\$1,189,207.45	\$1,223,639.44
<b>Liberty</b>	\$1,858,225.79	\$1,101,881.27	\$756,344.52
<b>Rosebud</b>	\$1,712,050.18	\$664,698.08	\$1,047,352.10
<b>Valley</b>	\$1,558,928.48	\$815,711.60	\$743,216.88
<b>Chouteau</b>	\$1,376,944.59	\$795,271.97	\$581,672.62
<b>Powder River</b>	\$1,019,169.43	\$630,789.20	\$388,380.23
<b>Musselshell</b>	\$978,159.21	\$496,213.94	\$481,945.27
<b>Pondera</b>	\$814,588.41	\$545,660.75	\$268,927.66
<b>Prairie</b>	\$542,511.26	\$216,321.36	\$326,189.90
<b>Petroleum</b>	\$372,331.98	\$197,803.17	\$174,528.81
<b>Teton</b>	\$231,728.88	\$111,085.05	\$120,643.83
<b>Golden Valley</b>	\$131,818.65	\$75,999.09	\$55,819.56
<b>Garfield</b>	\$114,603.49	\$55,335.88	\$59,267.61
<b>Yellowstone</b>	\$83,442.57	\$39,877.45	\$43,565.12
<b>Custer</b>	\$77,048.94	\$60,237.23	\$16,811.71
<b>Fergus</b>	\$72,663.52	\$57,601.07	\$15,062.45
<b>McCone</b>	\$64,180.56	\$33,448.57	\$30,731.99
<b>Daniels</b>	\$61,869.27	\$30,924.25	\$30,945.02
<b>Stillwater</b>	\$51,983.18	\$28,132.54	\$23,850.64
<b>Sweet Grass</b>	\$51,808.49	\$31,413.76	\$20,394.73
<b>Montana</b>	\$186,014,152.60	\$89,545,800.46	\$96,468,352.14

### PROPERTY TAXES

Companies involved in the oil and gas industry make up 20 of the 175 largest property owners in Montana, with a combined market value of over \$1.1 billion and a taxable value of over \$90

million<sup>xiv,xv</sup>. As significant property owners, these companies contribute heavily to the tax revenues collected by Montana.

Montana collects property taxes on the pipelines that are used to transport crude oil, refined products and natural gas throughout the state. Pipelines owned and operated by a single company have different tax rates than do firms owning pipelines that connect to long-distance transmission lines. Large holdings can be centrally-assessed, meaning that the state sets a property tax rate, while smaller pipeline properties may pay different tax assessments in the different counties they operate in.

The market value of centrally-assessed pipeline property was over nearly \$800 million in fiscal year 2006, according to the Montana Dept. of Revenue<sup>xvi</sup>. Over \$40 million was levied in Pipeline Real, Personal, and Mileage property taxes. Owners of non-centrally assessed pipelines paid \$117 million in property taxes in fiscal year 2006, 12% of all property tax collections for the state<sup>xvii</sup>. Over \$2.7 million in property taxes were paid on Oil and Gas Field Equipment and Flow lines.

### *OIL AND GAS ROYALTIES ON FEDERAL LANDS*

One half of the federal oil and gas royalties paid to the federal government are returned to Montana. Of these returned funds, 75% is deposited into the state General Fund and the rest put in a special fund for local governments to use for mineral impacts. In fiscal year 2006, an estimated \$52 million in federal royalty payments were returned to Montana from the federal government's collection of oil and gas royalties on federal lands<sup>xviii</sup>.

### *FEDERAL ROYALTIES, RENTS, AND BONUSSES*

	<b>Production Volume</b>	<b>Sales Value (millions)</b>	<b>Royalties or Revenues</b>
<b>Coal Bed Methane (mmcf)</b>	3.6	\$18.3	\$1.69 million
<b>Gas Plant Products (gal)</b>	2.98	\$3.56	\$323 thousand
<b>Oil (bbl)</b>	4.38	\$230	\$27.0 million
<b>Processed Gas (mcf)</b>	1.32	\$7.81	\$0.49 million
<b>Unprocessed Gas (mcf)</b>	27.8	\$154	\$17.6 million
<b>Production Bonuses</b>			\$1.52 million
<b>Other Revenues</b>			\$0.32 million
<b>Rents</b>			\$3.50 million
<b>TOTAL</b>			\$51.7 million

### INCOME TAXES

Based on an effective state income tax rate of 5.8% for the average income range found in the oil and gas industry, workers paid state income taxes of \$18.6 million. Excise taxes and corporate income license taxes paid by Montana Oil and Gas industry participants also represents tens of millions of dollars annually.

All royalty payments, minus a 15% production tax, become taxable income for the mineral owner. Previous research has estimated that approximately \$24 million in state income tax revenues accrue in this way<sup>xix</sup>.

### *OTHER REVENUES*

There were almost 1.8 million acres of state trust land leased for Oil and Gas exploration and production in Fiscal Year 2007. Oil and Gas production on these leases created \$26.6 million in Rentals, Bonuses, Penalties, and Royalties revenues for the state. This was over 85% of the total revenues received for mining or production on all of Montana's trust lands<sup>xx</sup>.

## 2007 ECONOMIC IMPACT

One method of looking at the importance of an industry to an area's economy is economic impact analysis. Economic impact refers to the fact that people and businesses spend much of their income with local businesses, and that each additional dollar that enters the area's economy is spent and re-spent until the time comes when the holder must buy something that isn't offered locally, and thus that dollar disappears from the area economy. This web of spending between local companies differs in size and complexity based upon the industry, and the economic impact is a measure of how many jobs and how much money in the local economy is indirectly associated with that industry.

To estimate the total economic impact of the oil and gas industry to the Montana economy, we used an input-output model<sup>xxi,xxii</sup>. This model lets us follow that dollar of additional spending as it flows to other firms and industries. One result of this model is a set of multiplier coefficients which estimate the total change in economic activity caused by the direct change in oil and gas employment or output. This multiplier captures the effects of business-to-business and local consumer spending by these other businesses' employees that are created with each dollar's spending by the primary industry. For example, an output multiplier of 1.5 would mean that for each \$1 million increase in output, other industries in Montana saw their business increase by a total of \$500,000<sup>2</sup>. The estimated output multipliers for segments of Montana's oil and gas industry range from 1.3 (Support Activities for Oil and Gas Production) to 1.8 (Pipeline Transportation).<sup>xxiii</sup>

In 2007 the total value of oil and gas produced in Montana was over \$2.4 billion. An additional \$5.0 billion worth of refinery output was produced in the state<sup>xxiv</sup>. Applying the appropriate multipliers, the total value of output produced in Montana is more than \$9 billion. Similarly, the 4,500 jobs

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<sup>2</sup> Multipliers are a good tool for evaluating industries, but they have their limitations. One limitation of output multipliers is that they are tied to a price level. For example, that \$1,000,000 in increased production value would have to be due to pumping more oil, not simply because the value of a barrel of oil has increased.

directly supported by these industries support more than 7,500 additional jobs elsewhere in the state economy, for a total impact of over 12,000 positions in Montana.

We can also use this model to estimate how an area’s economy will benefit from an expansion in an industry. Assuming that oil production was to increase by one million barrels per year, Montana’s economy could see, among other benefits, 85 more full-time jobs, \$18.5 million in additional labor income<sup>xxv</sup>.

*ECONOMIC IMPACT OF AN ADDITION 1 MILLION BARRELS OF OIL PRODUCED*

	<b>Direct Impact</b>	<b>Total Impact</b>
<b>Value of Sales</b>	\$53.0 Million	\$72.7 Million
<b>Employment</b>	83.3 Full-Time Positions	85.8 Full-Time Positions
<b>Labor Income</b>	\$11.5 Million	\$18.5 Million

The potential impact for increased drilling is even more significant. A 10% increase in drilling activity could lead to as many as 315 additional jobs either inside the industry or in the state economy as a whole<sup>xxvi</sup>.

In terms of which industries would benefit from expansions in Montana’s oil industry, many industries you would not think of as tied to oil benefit a great deal from its presence in Montana. The following table shows the estimated number of additional workers that would be needed in several of the Montana industries that would most benefit from oil industry expansion. Some of these industries benefit because the oil industry would increase its local spending on supplies, and other industries benefit because much of the new wages earned due to the oil industry expansion will be spent locally.

*WHERE THE ADDITIONAL JOBS WOULD BE FOUND*

<b>Industry</b>	<b>Jobs</b>
<b>Oil and Gas Extraction</b>	86
<b>Food Services</b>	15
<b>Hospitals</b>	7
<b>Support Activities for Oil and Gas Operations</b>	6
<b>Wholesale Trade</b>	4
<b>Food and Beverage Stores</b>	4
<b>Real Estate</b>	4
<b>Legal Services</b>	4
<b>Sales of Motor Vehicle and Parts</b>	3
<b>Banks</b>	3
<b>Hotels and Motels</b>	3
<b>Daycare</b>	2

## CONCLUSION

With a total economic impact of over \$9 billion, and over 12,000 jobs directly or indirectly supported, Montana's oil and gas industries are a significant force in Montana's economy. While production is concentrated in the eastern and northern parts of the state, over \$450 million in taxes and revenues feed into state and county budgets, which benefits everyone.

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i GENERAL FUND REVENUE UPDATE FISCAL 2008, BY TERRY JOHNSON, PRINCIPAL FISCAL ANALYST AND STAFF, LEGISLATIVE FISCAL DIVISION, STATE OF MONTANA

ii Montana Board of Oil and Gas On-Line Statistics

iii MONTANA BOARD OF OIL AND GAS ON-LINE STATISTICS

iv CENTRAL MT WELLS ARE MOST PRODUCTIVE, AT 107 MCF PER DAY, BUT THERE ARE ONLY 130 OF THEM, COMPARED TO THE 4,424 IN THE NORTHERN REGION.

v Oil and Gas Conservation Division Annual Review 2006, Board of Oil and Gas Conservation

vi GENERAL FUND REVENUE UPDATE FISCAL 2008, BY TERRY JOHNSON, PRINCIPAL FISCAL ANALYST AND STAFF, LEGISLATIVE FISCAL DIVISION, STATE OF MONTANA

vii MT ECONOMIC AND DEMOGRAPHIC DATABOOK 2007

viii QUARTERLY CENSUS OF EMPLOYMENT AND WAGES, U.S. BUREAU OF LABOR STATISTICS.

ix This estimate was calculated by applying an effective oil production tax value of 8.0674%, which is the average of the FY07 and FY08 values used by the Legislative Fiscal Division's 2009 Budget Analysis, to the calendar year 2007 oil production estimate of 33.575 million barrels and average price per barrel in calendar year 2007 of \$67.86, both reported in the General Fund Revenue Update for Fiscal Year 2008.

x MT DOR

xi MT REGULATION TITLE 15, CHAPTER 36, PART 3, MCA

xii MONTANA DEPT OF REVENUE BIENNIAL REPORT 2004-2006

xiii In the Montana 2007 budget, it is estimated that the overall tax rate for production from all oil wells averages 7.75% and the overall average tax rate for production from all natural gas wells is 5.5%.

xiv FROM BIG SKY BUSINESS JOURNAL, JAN 15TH, 2003. DATA COMPILED FROM MT DEPT. OF REVENUE DATA.

xv TAXABLE VALUE IS BASED UPON DEPRECIATED VALUE OF ASSETS. SOME UNDERCOUNTING IS PROBABLE GIVEN THAT SOME OF THESE COMPANIES HAD HOLDINGS IN A NUMBER OF DIFFERENT TAX DISTRICTS.

xvi BUSINESS AND INCOME TAXES DIVISION – COMPLIANCE AND COLLECTIONS FISCAL YEAR END 2007 REPORT

xvii MONTANA DEPT OF REVENUE BIENNIAL REPORT 2004-2006

xviii EIA

xix Economic and Fiscal Impacts of MT's Oil and Gas Industry, 2005.

xx DNRC MINERALS MANAGEMENT BUREAU ANNUAL REPORT FOR FISCAL YEAR 2007

xxi IMPLAN PROFESSIONAL 2.0, MINNESOTA IMPLAN GROUP, INC.

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xxii MODEL CUSTOMIZATIONS INCLUDED ADJUSTING REGIONAL PURCHASE COEFFICIENTS TO REFLECT THE RESULTS OF MPA'S SURVEY OF OIL AND GAS INDUSTRY OPERATIONS.

xxiv Assuming \$1.85 per gallon net value of refined product (EIA average 2002 estimate).

xxv ASSUMING \$58 PER BARREL OIL.

xxvi MT OIL AND GAS CONSERVATION DISTRICT DATA AND CAER ANALYSIS.