

Marginal Oil and Gas:

Fuel for Economic Growth

The logo for the Interstate Oil and Gas Compact Commission (IOGCC) is centered on the page. It consists of the letters "IOGCC" in a white, serif font, set within a light gray, horizontally-oriented oval background.

IOGCC

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Marginally Producing Oil and Gas Wells

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The numbers contained within these pages tell an encouraging story.

The 2004 edition of *Marginal Oil and Gas: Fuel for Economic Growth*, which surveys production from 2003, clearly shows the importance of marginal (“stripper”) oil and natural gas wells to our nation’s energy supply. The Interstate Oil and Gas Compact Commission (IOGCC) has documented production from stripper wells since 1941 and has drawn attention annually to their important contribution to the nation’s economy.

In a year in which natural gas prices have risen steadily, bolstered by projections of a tighter supply and a cold winter, it is heartening to know that the potential to increase our energy supply is in our own figurative back yard.

Natural gas production increased by almost 1 percent last year, but production from marginal natural gas wells increased over 4 percent. Marginal wells contribute over 7 percent of the natural gas production in the U.S., and the portion is over 10 percent if only onshore production is considered.

Marginal oil continues to provide about 15 percent of the domestic oil production. If you consider only onshore production in the lower 48 states, production from marginal wells provides over one quarter of the total oil production.

These marginal wells stand as a testament to ingenuity, frugality and conservation. No other nation produces as much oil and natural gas from such a source. These wells are produced and maintained not by the major oil and natural gas companies, but by (for the most part) small independent operators – “mom and pop” operations not that different from small family farms. They create jobs and economic growth that, while small when individually taken, are significant on a national basis.

Marginal wells stand as a
testament to ingenuity,
frugality and conservation.

Incentives, Research:

Fuel for Economic Growth


Incentive programs are a key factor in the development of this truly American resource. States have encouraged domestic oil and natural gas production by maintaining programs that protect the public while allowing responsible owners to operate their wells in an efficient and profitable manner.

Programs include orphan well plugging, landowner plugging grants, idle well adoption or tax incentives, which – in addition to typical financial assurance and enforcement activities – can address abandoned wells, some of which exist from pre-regulatory days. Examples can be found in the IOGCC publication, *Investments in Energy Security: State Incentives to Maximize Oil and Natural Gas Recovery*.

Research is another key to the survival of marginal wells. Unfortunately, the small, independent producers who operate these small wells do not have the means to conduct their own research. Federal and state governments and universities play a crucial role in research and development for fossil energy. Without continued funding of these research and development programs, new methods for producing domestic energy, including gas from coal seams, will remain beyond the reach of American Energy Producers.

Marginal oil and natural gas wells are an often overlooked, but vitally important, segment of the domestic petroleum industry. As demand for oil and natural gas continues to rise, America can look first to its own backyard for answers.

And that is an encouraging story.



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What is Marginal Oil?

Marginal oil is oil produced from wells that operate on the lower edge of profitability. Generally speaking, low-volume “stripper” wells — defined by the IOGCC as those wells producing 10 barrels of oil per day or less — fall into this category. The IOGCC has monitored the status of stripper wells in the United States since the 1940s, when our first stripper well surveys appeared.

Why all the concern about such small-volume wells? While each individual well contributes only a small amount of oil (2.18 barrels a day, on average), there are 393,463 of them in the United States. Combined, these stripper wells produced more than 313 million barrels of oil in 2003, 15 percent of the oil produced in the lower 48 states.

Many states have programs that allow a well to temporarily stop production. These “idle” wells are not included in the abandoned well category of this report; only wells that have been permanently plugged are included in the IOGCC’s definition. Also not included in this study’s abandoned well figures are “orphaned” wells. These are wells that are not producing, have not been plugged, and whose owners are either insolvent or cannot be located. For more information about idled and orphaned wells, order a copy of the IOGCC study on these wells, *Produce or Plug: The Dilemma over the Nation’s Idle Oil and Natural Gas Wells*.

U. S. Stripper Oil Well Data – Past 10 Years

Year	Number of Stripper Oil Wells	Stripper Oil Production (M bbls)	Average Daily Prod. Per Well (bbls)	Plugged/ Abandoned
1994	442,500	339,930	2.10	17,896
1995	433,048	332,288	2.10	16,389
1996	428,842	323,468	2.06	16,674
1997	420,674	322,090	2.10	15,172
1998	406,380	316,870	2.14	13,912
1999	410,680	315,514	2.10	11,227
2000	411,629	325,947	2.16	10,718
2001	403,459	316,099	2.15	12,234
2002	402,072	323,777	2.21	13,635
2003	393,463	313,748	2.18	14,300

U.S. State Rankings — Stripper Oil

	Number of Stripper Oil Wells	Production from Stripper Oil Wells (bbls)	Total 2003 Oil Production (Mbbbls)	Average Daily Production Per Well
1	Texas	Texas	Texas	South Dakota
2	Oklahoma	Oklahoma	California	Alabama
3	Kansas	California	Oklahoma	North Dakota
4	Ohio	Kansas	Louisiana	California
5	California	Louisiana	New Mexico	Mississippi
6	Louisiana	New Mexico	Wyoming	Utah
7	Kentucky	Illinois	Kansas	Arizona
8	Illinois	Wyoming	North Dakota	Nebraska
9	Pennsylvania	Colorado	Colorado	Texas
10	New Mexico	Ohio	Montana	Colorado
11	Wyoming	Arkansas	Mississippi	New Mexico
12	West Virginia	Michigan	Utah	Michigan
13	Colorado	Pennsylvania	Illinois	Arkansas
14	Indiana	North Dakota	Arkansas	Oklahoma
15	Arkansas	Kentucky	Michigan	Montana
16	New York	Indiana	Ohio	Kansas
17	Michigan	Montana	Alabama	Louisiana
18	Montana	Nebraska	Nebraska	Tennessee
19	Nebraska	Utah	Kentucky	Wyoming
20	North Dakota	West Virginia	Pennsylvania	Illinois
21	Utah	Alabama	Indiana	Indiana
22	Alabama	Mississippi	West Virginia	Virginia
23	Missouri	Tennessee	South Dakota	Missouri
24	Mississippi	New York	Tennessee	West Virginia
25	Tennessee	Missouri	New York	Ohio
26	South Dakota	South Dakota	Missouri	Pennsylvania
27	Arizona	Arizona	Arizona	Kentucky
28	Virginia	Virginia	Virginia	New York

NOTE: These rankings do not include Alaska, Florida and federal offshore which do not have any production from stripper wells.

Secondary Recovery of Stripper Oil

The term "secondary recovery" encompasses a variety of techniques designed to increase oil recovery from an existing well. Pressure in an underground formation pushes oil upward, allowing it to be extracted. In older wells and mature fields, this pressure has diminished over time, decreasing the flow of oil. Secondary recovery techniques permit the injection of a substance, such as water or gas, into the formation. This increases the pressure and encourages the oil to flow more easily.

Secondary Recovery of Stripper Oil As of January 1, 2004

State	Estimated Secondary Oil Produced from Stripper Wells (Mbbbls)	Percent of Total Stripper Production from Secondary
Alabama	998	86.6
Arkansas	355	10.8
Colorado	622	11.4
Kansas	12,323	49.1
Kentucky	1,511	77.8
Michigan	1,220	48.8
Missouri	80	93.0
Nebraska	1,065	64.5
New Mexico	5,592	40.8
New York	30	19.6
Ohio	41	0.90
Oklahoma	21,701	50.0
South Dakota	25	49.0
Utah	683	48.1
West Virginia	392	28.0

National Stripper Oil Well Survey As of January 1, 2004

State	Number of Stripper Oil Wells	Production from Stripper Oil Wells (bbls)	Oil Wells Plugged and Abandoned	Average Daily Production Per Well
Alabama	632	1,152,351	4	5
Arizona	18	23,303	0	3.55
Arkansas	3,615	3,302,376	63	2.5
California	25,089	36,015,129	2,457	3.93
Colorado	5,334	5,442,974	215	2.8
Illinois	*17,154	*10,600,000	*639	*1.69
Indiana	5,049	1,864,883	99	1.01
Kansas	32,883	25,103,681	2,001	2.09
Kentucky	19,272	1,942,879	248	0.28
Louisiana	20,722	15,567,256	*975	2.06
Michigan	2,578	2,500,500	111	2.66
Mississippi	437	604,800	80	3.79
Missouri	489	86,133	12	0.48
Montana	2,291	1,830,410	74	2.19
Nebraska	1,423	1,651,923	80	3.18
New Mexico	13,577	13,693,595	172	2.76
New York	2,763	152,967	79	0.15
North Dakota	1,394	2,288,191	38	4.5
Ohio	28,911	4,696,636	177	0.45
Oklahoma	48,657	43,703,475	694	2.46
Pennsylvania	*15,758	*2,466,000	~180	0.43
South Dakota	24	51,461	2	5.87
Tennessee	*385	270,827	*39	1.93
Texas	123,402	128,058,395	5,657	2.84
Utah	1,051	1,418,563	6	3.7
Virginia	7	2,502	0	0.98
West Virginia	8,200	1,400,000	27	0.47
Wyoming	12,348	7,856,791	171	1.74
TOTALS	393,463	313,748,001	14,300	2.18

* *Estimated*

~ *Does not include wells plugged under the state's abandoned and orphaned well plugging programs*

National Stripper Oil Well Survey As of January 1, 2004

State	Total 2003 Oil Production (Mbbbls)	Stripper Oil Well Reserves		
		Primary	Secondary (Mbbbls)	Total
Alabama	4,960	1,009	1,091	2,100
Arizona	47	191	0	191
Arkansas	7,226	36,005	30,671	66,676
California	278,196	68,241	60,515	128,756
Colorado	21,372	16,432	12,397	28,829
Illinois	*12,750	14,119	14,696	28,815
Indiana	1,865	7,944	7,632	15,576
Kansas	33,960	56,285	51,862	108,147
Kentucky	2,538	3,025	7,553	10,578
Louisiana	59,326	64,987	64,399	129,386
Michigan	6,524	16,857	11,140	27,997
Mississippi	15,666	7,118	6,449	13,567
Missouri	86	5,000	85,000	90,000
Montana	19,335	28,125	34,330	62,455
Nebraska	2,755	2,180	3,957	6,137
New Mexico	57,039	22,078	16,999	39,077
New York	157	855	211	1,066
North Dakota	29,408	25,276	24,578	49,854
Ohio	5,647	46,900	155	47,055
Oklahoma	63,300	91,285	98,104	189,389
Pennsylvania	*2,466	8,506	11,890	20,396
South Dakota	1,238	154	149	303
Tennessee	360	192	134	326
Texas	359,441	517,943	556,627	1,074,570
Utah	13,101	4,205	2,492	6,697
Virginia	18	50	50	100
West Virginia	1,400	3,932	3,595	7,527
Wyoming	52,418	38,995	36,005	75,000
TOTALS	+1,052,599	1,087,889	1,142,681	2,230,570

* *Estimated*

+ *Total represents only oil production from states with stripper wells*

Comparative Number of Stripper Oil Wells and Stripper Oil Well Production 2000 - 2001

State	2000		2001	
	Number of Stripper Wells	Production from Stripper Wells (bbls)	Number of Stripper Wells	Production from Stripper Wells (bbls)
Alabama	627	1,143,718	641	1,054,118
Arizona	20	21,083	20	25,942
Arkansas	3,286	3,211,423	3,404	3,316,454
California	22,244	31,499,570	24,303	35,133,050
Colorado	7,618	3,913,368	7,003	4,646,241
Illinois	*18,491	*10,450,000	*17,876	*10,220,000
Indiana	5,049	2,052,000	5,034	2,021,618
Kansas	35,359	25,062,955	33,886	25,178,007
Kentucky	24,585	2,372,072	19,615	2,077,228
Louisiana	21,091	15,286,171	21,024	16,126,868
Michigan	*2,550	*3,214,363	2,210	1,849,850
Mississippi	376	576,252	385	490,784
Missouri	327	106,057	308	90,919
Montana	2,312	1,775,017	2,267	1,830,438
Nebraska	1,483	1,831,497	1,475	1,765,208
New Mexico	12,642	12,823,174	13,243	13,175,602
New York	2,638	180,591	2,876	183,095
North Dakota	1,357	2,112,883	1,340	2,110,860
Ohio	28,918	5,378,100	28,887	4,904,815
Oklahoma	60,120	50,068,248	55,295	47,070,879
Pennsylvania	*15,170	*2,223,500	*15,270	*2,233,000
South Dakota	17	15,867	20	34,574
Tennessee	301	189,156	*288	241,036
Texas	126,028	135,151,385	125,823	129,017,097
Utah	943	1,418,314	1,043	1,449,051
Virginia	15	4,599	16	5,764
West Virginia	8,450	1,300,000	8,384	1,250,000
Wyoming	9,612	12,565,818	11,523	8,596,694
TOTALS	411,629	325,947,181	403,459	316,099,192

* *Estimated*

Comparative Number of Stripper Oil Wells and Stripper Oil Well Production 2002 - 2003

State	2002		2003	
	Number of Stripper Wells	Production from Stripper Wells (bbls)	Number of Stripper Wells	Production from Stripper Wells (bbls)
Alabama	639	1,141,083	632	1,152,351
Arizona	17	23,951	18	23,303
Arkansas	3,362	3,087,798	3,615	3,302,376
California	24,420	35,030,269	25,089	36,015,129
Colorado	5,384	4,643,717	5,334	5,442,974
Illinois	*17,466	*10,720,000	*17,154	*10,600,000
Indiana	4,956	1,962,078	5,049	1,864,883
Kansas	33,317	25,002,372	32,883	25,103,681
Kentucky	19,462	2,049,971	19,272	1,942,879
Louisiana	20,891	14,999,393	20,722	15,567,256
Michigan	3,428	3,397,608	2,578	2,500,500
Mississippi	442	562,190	437	604,800
Missouri	364	95,071	489	86,133
Montana	2,274	1,842,960	2,291	1,830,410
Nebraska	1,451	1,717,983	1,423	1,651,923
New Mexico	13,379	13,386,587	13,577	13,693,595
New York	2,758	174,766	2,763	152,967
North Dakota	1,384	2,263,059	1,394	2,288,191
Ohio	28,850	4,398,074	28,911	4,696,636
Oklahoma	56,673	56,299,808	48,657	43,703,475
Pennsylvania	*15,470	*2,324,000	*15,758	*2,466,000
South Dakota	22	27,345	24	51,461
Tennessee	424	246,026	*385	270,827
Texas	124,551	127,252,695	123,402	128,058,395
Utah	1,049	1,445,945	1,051	1,418,563
Virginia	13	3,428	7	2,502
West Virginia	8,210	*1,248,000	8,200	1,400,000
Wyoming	11,416	8,430,429	12,348	7,856,791
TOTALS	402,072	323,776,606	393,463	313,748,001

* *Estimated*

What is Marginal Gas?

Marginal gas is natural gas produced from a well that operates on the lower edge of profitability. Generally speaking, these are low-volume “stripper” gas wells — defined by the IOGCC as a natural gas well that produces 60 thousand cubic feet (Mcf) per day or less.

Stripper gas wells represent about 7 percent of the total natural gas produced onshore in the lower 48 states.

The table below indicates the status of stripper gas production over the past 10 years. The number of gas wells in the stripper category has steadily increased during the past decade. Total production from stripper gas wells also has steadily increased, while average daily production declined slightly.

As with stripper oil wells, “abandoned” natural gas wells are those that have been permanently plugged. Significantly, the total number of pluggings in 2003 increased for the third consecutive year, while demand for natural gas continues to rise. According to a 1999 study conducted by the National Petroleum Council, natural gas demand is likely to increase to 29 trillion cubic feet (Tcf) in 2010 and top 31 Tcf in 2015.

It is interesting to note, however, that numbers do not always tell the whole story. In Colorado, the 2002 numbers show a decline in marginal and natural gas production. That decline, in fact, can be attributed to a successful effort by producers in the Denver-Julesburg Basin to “re-frac” a number of wells — moving the wells above the 60 mcf threshold into “economic producer” status and out of this survey. Globally, projections show natural gas usage is projected to grow faster than any other primary energy source — 3.2 percent per year compared to about 2 percent for oil and coal. Much of the increase in gas usage will fuel electricity generation, particularly in industrialized countries where natural gas can replace other fossil fuels used for this purpose (Source: Energy Information Administration).

U.S. Stripper Natural Gas Well Data — Past 10 Years

Year	Number of Gas Wells	Stripper Gas Production (Mcf)	Pluggings/ Abandonments	Average Daily Production Per Well (Mcf)
1994	159,369	940,420,777	3,163	16.2
1995	159,669	925,563,034	3,189	15.9
1996	168,702	986,676,219	4,671	16.0
1997	189,756	1,042,153,002	4,661	15.0
1998	199,745	1,104,683,975	4,203	15.2
1999	207,766	1,138,979,506	3,546	15.3
2000	223,222	1,258,726,664	3,534	15.4
2001	234,507	1,353,516,378	3,600	15.8
2002	245,961	1,418,273,779	3,870	15.8
2003	260,563	1,478,105,524	3,883	15.5

U.S. State Rankings — Stripper Natural Gas

	Number of Stripper Natural Gas Wells	Production from Stripper Natural Gas Wells (Mcf)	Total 2003 Natural Gas Production (Mcf)	Average Daily Production Per Well
1	Pennsylvania	Texas	Texas	Virginia
2	West Virginia	West Virginia	Wyoming	Michigan
3	Ohio	Oklahoma	Oklahoma	Kansas
4	Texas	Pennsylvania	Colorado	Mississippi
5	Oklahoma	Kansas	New Mexico	North Dakota
6	Wyoming	New Mexico	Louisiana	Utah
7	Kentucky	Kentucky	Kansas	Alabama
8	Kansas	Ohio	Alabama	Colorado
9	Louisiana	Colorado	Utah	New Mexico*
10	New Mexico	Wyoming	West Virginia	Arkansas*
11	Colorado	Michigan	Michigan	Oklahoma
12	New York	Louisiana	Pennsylvania	Nebraska
13	Michigan	Montana	Arkansas	California
14	Montana	Alabama	Ohio	Texas
15	Indiana	Arkansas	California	South Dakota
16	Alabama	Utah	Mississippi	Montana
17	Arkansas	New York	Kentucky	Maryland
18	Utah	Mississippi	Virginia	West Virginia
19	California	California	Montana	Kentucky
20	Mississippi	Virginia	New York	Tennessee
21	Tennessee	Indiana	North Dakota	Wyoming
22	Illinois	Tennessee	Tennessee	Louisiana
23	Virginia	Nebraska	Indiana	Pennsylvania
24	Nebraska	North Dakota	Nebraska	Ohio
25	North Dakota	South Dakota	South Dakota	New York
26	South Dakota	Illinois	Arizona	Arizona
27	Maryland	Maryland	Illinois	Illinois
28	Arizona	Arizona	Maryland	Indiana

* Denotes a tie

NOTE: These rankings do not include Alaska, Florida and federal offshore which do not have any production from stripper wells.

National Stripper Natural Gas Well Survey As of January 1, 2004

State	Number of Stripper Wells	Production from Stripper Gas Wells	Gas Wells Plugged and Abandoned	Average Daily Production Per Well (Mcf)	Total 2003 Gas Production (MMcf)
Alabama	**1,931	**20,885,970	**30	29.6	372,952
Arizona	1	1,177	0	3.2	262
Arkansas	1,847	16,252,825	45	24.1	158,005
California	468	3,855,523	44	22.6	90,789
Colorado	7,342	73,077,507	0	27.3	1,399,590
Illinois	209	184,860	20	2.4	248
Indiana	2,291	1,464,372	3	1.8	1,464
Kansas	9,906	118,418,079	269	32.8	421,950
Kentucky	16,139	77,865,801	64	13.2	87,608
Louisiana	9,772	*40,329,957	*525	11.3	1,247,235
Maryland	7	34,943	0	13.7	35
Michigan	4,950	66,782,258	66	37	180,614
Mississippi	387	4,477,027	26	31.7	88,691
Montana	3,754	26,158,548	95	19.1	78,125
Nebraska	99	833,513	1	23.1	1,174
New Mexico	9,616	84,488,076	91	24.1	1,365,683
New York	5,723	11,518,289	36	5.5	36,007
North Dakota	67	762,017	2	31.2	14,831
Ohio	33,367	75,109,000	323	6.2	93,641
Oklahoma	**20,321	**178,200,970	362	24	**1,502,205
Pennsylvania	*42,437	*133,455,545	148	8.6	*159,827
South Dakota	56	415,523	0	20.3	550
Tennessee	*310	1,411,060	*47	12.5	1,803
Texas	33,312	268,891,683	1,245	22.1	4,911,782
Utah	1,099	11,928,457	11	29.7	257,177
Virginia	150	2,042,666	*60	37.3	81,067
West Virginia	38,240	188,000,000	300	13.5	204,500
Wyoming	**16,762	**71,259,878	70	11.6	**1,628,131
TOTALS	260,563	1, 478, 105,524	3,883	15.5	+14,385,946

* *Estimated*

** *Includes natural gas from coal seams*

+ *This figure represents only states with stripper natural gas production; does not include production figures from states without stripper natural gas production*

Comparative Number of Stripper Gas Wells and Stripper Gas Well Production 2000 - 2001

State	2000		2001	
	Number of Stripper Wells	Production from Stripper Wells (Mcf)	Number of Stripper Wells	Production from Stripper Wells (Mcf)
Alabama	**1,416	**14,389,992	**1,562	**16,426,849
Arizona	5	39,937	4	12,494
Arkansas	1,609	14,926,696	1,685	14,384,737
California	369	2,832,541	422	3,661,981
Colorado	10,196	57,973,752	9,696	117,016,679
Illinois	101	88,000	84	84,000
Indiana	1,502	829,000	1,533	1,063,673
Kansas	8,701	94,148,749	6,350	74,416,072
Kentucky	13,855	72,477,105	15,492	72,635,394
Louisiana	9,645	26,899,000	9,481	37,344,000
Maryland	7	34,036	10	49,442
Michigan	3,165	41,586,990	3,423	44,411,120
Mississippi	449	1,652,289	237	2,040,032
Montana	3,267	23,043,552	3,411	24,194,551
Nebraska	94	746,111	97	779,443
New Mexico	8,534	77,671,921	8,844	78,022,278
New York	5,446	11,091,622	5,530	11,049,922
North Dakota	63	347,476	65	341,700
Ohio	33,352	74,484,000	33,306	72,905,000
Oklahoma	11,554	120,014,250	13,550	126,632,440
Pennsylvania	35,337	125,191,000	39,480	130,853,000
South Dakota	54	460,942	61	475,009
Tennessee	191	1,065,860	405	1,059,499
Texas	29,302	238,351,492	31,018	249,667,163
Utah	626	6,016,921	751	7,445,472
Virginia	133	2,053,579	150	2,238,136
West Virginia	36,816	220,000,000	37,539	221,662,000
Wyoming	7,433	30,309,851	10,321	42,644,292
TOTALS	223,222	1,258,726,664	234,507	1,353,516,378

** Includes natural gas from coal seams

Comparative Number of Stripper Gas Wells and Stripper Gas Well Production 2002 - 2003

State	2002		2003	
	Number of Stripper Wells	Production from Stripper Wells (Mcf)	Number of Stripper Wells	Production from Stripper Wells (Mcf)
Alabama	**1,696	**18,139,406	**1,931	**20,885,970
Arizona	1,719	15,574,407	1,847	16,252,825
Arkansas	4	3,387	1	1,177
California	446	3,506,947	468	3,855,523
Colorado	6,701	60,945,434	7,342	73,077,507
Illinois	172	184,860	209	184,860
Indiana	1,545	1,309,120	2,291	1,464,372
Kansas	10,437	124,877,543	9,906	118,418,079
Kentucky	16,010	78,444,980	16,139	77,865,801
Louisiana	9,595	*40,835,950	9,772	*40,329,957
Maryland	6	13,446	7	34,943
Michigan	4,100	55,623,429	4,950	66,782,258
Mississippi	260	2,718,961	387	4,477,027
Montana	3,533	25,286,348	3,754	26,158,548
Nebraska	99	750,809	99	833,513
New Mexico	9,232	81,059,390	9,616	84,488,076
New York	5,442	10,637,283	5,723	11,518,289
North Dakota	55	449,971	67	762,017
Ohio	33,345	75,993,000	33,367	75,109,000
Oklahoma	**17,676	**153,207,218	**20,321	**178,200,970
Pennsylvania	*40,830	*131,800,000	42,437	*133,455,545
South Dakota	56	396,482	56	415,523
Tennessee	401	1,586,127	*310	1,411,060
Texas	32,200	258,983,600	33,312	268,891,683
Utah	929	9,359,853	1,099	11,928,457
Virginia	127	1,807,834	150	2,042,666
West Virginia	37,528	*208,775,000	38,240	188,000,000
Wyoming	**11,817	**56,002,994	**16,762	**71,259,878
TOTAL	245,961	1,418,273,779	260,563	1,478,105,524

* Estimated

** Includes natural gas from coal seams

The Economic Impact of Stripper Wells in the United States

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Executive Summary

As of the writing of this report, the Wall Street Journal reports that “Oil Prices Reach 21-Year High on Yukos Woes¹.” As a net importer of crude oil, a disruption of the crude supply anywhere in the world has an immediate impact on oil prices in the United States, regardless of whether the problem is with an import source or not. To the economist, oil is a perfect commodity, in the sense that a barrel of oil is interchangeable with any other barrel of oil. The refiner knows that this is not true – refineries are set up to process crude of a particular grade, and cannot easily switch without expensive modifications to the refinery equipment. But in the broader sense, the economist is right. Refined products of crude oil are interchangeable, despite gasoline marketing efforts to convince consumers otherwise.

Natural gas is even more perfect than oil. Once the impurities are removed, a volume of natural gas is indistinguishable from any other natural gas, regardless of its source. Natural gas was once thought of as a commodity that could only be economically transported long distances by pipeline, thus limiting U.S. imports to either Canada or Mexico. Liquefied Natural Gas (LNG) transport ships have demonstrated the technological feasibility of overseas transport, and gas prices have demonstrated the economic feasibility. In 2003, 2.3 percent of U.S. natural gas consumption came from LNG imports, and more import terminals are under consideration.

The implication of import disruptions has a large impact on U.S. energy policy and a direct impact on stripper wells. The U.S. currently imports over two-thirds of our oil needs, and over 16 percent of the natural gas consumption. High energy prices, over \$40 per barrel and almost \$6 per MCF² at the preparation of this report, give stripper wells a real opportunity to contribute to the domestic energy market. There are over 654,000 stripper wells in the U.S., and they contributed over 10 percent of the total U.S. oil and gas production in 2003. As the presidential election draws closer, domestic energy policy and reduced dependency on foreign oil sources are frequent campaign speech topics. Given the U.S. dependency on gasoline as a motor fuel and natural gas for both a home heating and electricity generating fuel, it is not likely that either can be supplanted by any current technology in the short term. Support of the stripper well industry is one of the few feasible short term options available.

This year’s report incorporates updated Department of Commerce economic multipliers. The economic impact calculated by these multipliers show that, although domestic production continues to decrease in the U.S., the stripper wells continue to have a major impact in both energy production and economic benefit.

The purpose of this study is to quantify the economic impact of marginal domestic oil and gas production. Each barrel of oil and MCF of natural gas that is produced represents an energy asset that the U.S. does not have to import. The actual profitability of these wells is not considered nor implied in this report. Energy production conducted at an economic loss to the well owner still represents a positive economic activity to the surrounding community and an asset to the country.

¹ Wall Street Journal, July 29, 2004, page C1.

² MCF = 1,000 standard cubic feet, the basic measurement unit for natural gas.

Development of Report Findings

Using data from the IOGCC's 2003 National Stripper Oil Well Survey and 2003 National Stripper Gas Well Survey, Table 1 shows that the 11 survey states have 284,894 stripper oil wells, or over 72 percent of the total reported stripper oil wells in the U.S. These wells produced over 89 percent of stripper oil well production. Oil wells in the survey states averaged 2.7 barrels of oil per day (BOPD), better than the overall national average of 2.2 BOPD. In 2003, 14,300 oil wells were plugged and abandoned; an increase over last year's total of 13,635 oil wells plugged.

Looking at the stripper gas wells, Table 1 shows the 11 survey states have almost 41 percent of the total 260,563 stripper gas wells in the U.S. The number of stripper gas wells increased significantly from last year by 26,056 wells, whereas the number of stripper oil wells decreased by 8,609 wells. Our original 11 survey states were based on the largest producers of stripper oil, which excluded the Appalachian states from consideration. The Appalachian Basin accounts for over 53 percent of the stripper gas well count and over 33 percent of the stripper gas produced. In order to preserve the comparability of this report, the stripper gas wells use the same survey states as the oil wells, as any error that may be introduced is not thought to be materially significant due to the higher relative value of stripper oil to stripper gas production.

Stripper gas wells produced 1,478 billion cubic feet (BCF) in 2003, over 4 BCF per day. Each well averaged 15.5 thousand cubic feet per day (MCFD). Of the total stripper gas wells, 1.5 percent, or 3,883 wells were plugged and abandoned in 2003. Given that oil production is more mature in the U.S. than gas production, the increases in stripper gas wells compared to the decreases in the numbers of stripper oil wells is reasonable in terms of overall oil versus gas activity.

Wellhead Prices for Oil and Natural Gas

Wellhead prices shown in Table 2 are derived from data gathered directly from the various state agencies and the U.S. Department of Energy's Energy Information Administration (EIA). These statistics show that the weighted average wellhead price was \$28.53 per barrel of oil, versus last year's average of \$22.51 per barrel. The average price for gas was \$4.97 per MCF, versus last year's average of \$2.95 per MCF. In order to prepare this report in time for the IOGCC's use, estimates for average prices were made for several states where data is not yet available, a process that has been necessary at times in the past. This was particularly true for natural gas, where a national average for 2003 is available, but state-by-state averages are not. For the purposes of this report, the percentage difference observed between the state average and the national average for 2002 was used to determine the state average for 2003. The potential difference between the estimated prices and the actual prices is not expected to make a material difference in the calculations made in this report.

Effects of Stripper Oil and Gas Well Abandonment

Using the values from Tables 1 and 2, Tables 3A and 3B show the gross value associated with stripper wells. Assuming the average stripper well producing rates for each state, Table 3A shows that the oil and gas wells plugged and abandoned in the survey states during 2003 would have produced oil and gas valued at \$ 471 million. The total value of oil and gas lost due to abandonments during 2003 for all states was \$ 528.7 million.

It should be noted that, by attributing the average production rates of existing wells to abandoned wells, the actual productivity of abandoned wells may be slightly overstated. While no data was found to estimate the average production rates at the time of abandonment, the IOGCC and U.S. Department of Energy estimate that the range is between one and two BOPD, and the equivalent rate of 10 to 20 MCFD is assumed for gas wells.

**TABLE 1
STRIPPER WELL DATA**

OIL				
STATE	No. of Stripper Oil Wells	2003 Production from Stripper Wells (Bbls.)	2003 Abandonments	2003 Average Daily Production Per Well - BOPD
California	25,089	36,015,129	2,457	3.9
Colorado	5,334	5,442,974	215	2.8
Kansas	32,883	25,103,681	2,001	2.1
Louisiana	20,722	15,567,256	975	2.1
Mississippi	437	604,800	80	3.8
New Mexico	13,577	13,693,595	172	2.8
North Dakota	1,394	2,288,191	38	4.5
Oklahoma	48,657	43,703,475	694	2.5
Texas	123,402	128,058,395	5,657	2.8
Utah	1,051	1,418,563	6	3.7
Wyoming	12,348	7,856,791	171	1.7
SUBTOTAL	284,894	279,752,850	12,466	2.7
ALL OTHERS	108,569	33,995,151	1,834	0.9
TOTAL U.S.	393,463	313,748,001	14,300	2.2

GAS				
STATE	No. of Stripper Gas Wells	2003 Production from Stripper Wells (MCF)	2003 Abandonments	2003 Average Daily Production Per Well - MCFD
California	468	3,855,523	44	22.6
Colorado	7,342	73,077,507	-	27.3
Kansas	9,906	118,418,079	269	32.8
Louisiana	9,772	40,329,957	525	11.3
Mississippi	387	4,477,027	26	31.7
New Mexico	9,616	84,488,076	91	24.1
North Dakota	67	762,017	2	31.2
Oklahoma	20,321	178,200,970	362	24.0
Texas	33,312	268,891,683	1,245	22.1
Utah	1,099	11,928,457	11	29.7
Wyoming	16,762	71,259,878	70	11.6
SUBTOTAL	109,052	855,689,174	2,645	21.5
ALL OTHERS	151,511	622,416,350	1,238	11.3
TOTAL U.S.	260,563	1,478,105,524	3,883	15.5

OIL & GAS	No. of Stripper Wells		2003 Abandonments	
SUBTOTAL	393,946		15,111	
ALL OTHERS	260,080		3,072	
TOTAL U.S.	654,026		18,183	

**TABLE 2
WELLHEAD PRICES**

	2003 Total Oil Value \$ x 1,000	2003 Total Oil Production BBL x 1,000	2003 Weighted Average Wellhead \$/BBL	2003 Total Gas Value \$ x 1,000	2003 Total Gas Production MCF x 1,000	2003 Weighted Average Wellhead \$/MCF
California	\$6,607,500	250,000	\$26.43	\$1,674,862	339,773	\$4.93
Colorado	\$648,257	21,109	\$30.71	\$3,888,286	955,727	\$4.07
Kansas	\$973,514	33,944	\$28.68	\$1,850,151	419,913	\$4.41
Louisiana	\$2,750,188	90,111	\$30.52	\$7,412,817	1,372,227	\$5.40
Mississippi	\$455,644	16,593	\$27.46	\$702,757	136,043	\$5.17
New Mexico	\$1,952,158	66,130	\$29.52	\$6,990,994	1,545,243	\$4.52
North Dakota	\$861,890	29,406	\$29.31	\$279,508	55,561	\$5.03
Oklahoma	\$1,942,380	65,356	\$29.72	\$8,282,765	1,668,863	\$4.96
Texas	\$11,820,983	405,801	\$29.13	\$28,155,024	5,277,904	\$5.33
Utah	\$378,212	13,096	\$28.88	\$909,051	270,600	\$3.36
Wyoming	\$1,395,598	52,407	\$26.63	\$6,861,799	1,505,452	\$4.56
SUBTOTAL	\$29,786,325	1,043,953	\$28.53	\$67,008,013	13,547,306	\$4.95
ALL OTHERS	\$2,134,467	74,788	\$28.54	\$30,220,516	6,006,392	\$5.03
TOTAL U.S. *	\$31,920,792	1,118,741	\$28.53	\$97,228,529	19,553,698	\$4.97

* Excludes Alaska, Federal Offshore Oil; includes Federal Offshore Gas due to changes in EIA reporting

To illustrate the overall economic impact on the U.S. economy, Table 3B assumes the abandonment of all stripper wells. This shows a theoretical loss value of \$12.2 billion for the survey states or \$16.3 billion for the total of U.S. in 2003.

If the stripper oil and gas production represented in Table 3B were indeed lost to the U.S., this would represent about 860 thousand barrels of oil and 4.0 BCF of gas each day. Using the weighted average wellhead prices for stripper production, the daily amount that would have to be spent on imports would be \$44.7 million each day.

In 2003, American Petroleum Institute (API) statistics show that we imported 4.439 billion barrels of crude oil and products. If the oil production from stripper wells active in 2003 did not exist, imports would have increased 6.9 percent to make up for the shortage. Energy Information Administration (EIA) statistics show that 2003's total gas production was 20,030 BCF. (Note: this figure includes federal offshore gas production.) Stripper gas wells contributed 7 percent of the total production. EIA statistics also show the total of 2003 natural gas imports was 3,928 BCF, an amount equal to 19.6 percent of natural gas production. If stripper gas wells did not exist, imports to make up the shortage would bring the level up to 26.6 percent of production.

RIMS II Multipliers

Prior year's reports were based on RIMS II multipliers provided by the Bureau of Economic Analysis (BEA) for industry number 8.0000, crude petroleum and natural gas. This year's report utilizes updated multipliers based on the BEA's 1997 national and 2001 regional accounts. The RIMS II multipliers based on this updated work were first released in May of 2004. The multipliers have been re-categorized to Industry 211000, Oil and Gas Extraction. A comparison of these new factors against the old shows that the overall multiplication effect has, on average increased for output and earnings for all of the survey

TABLE 3A
EFFECT OF 2003's ABANDONMENT

OIL							
STATE	No. of Stripper Wells	2003 Production From Stripper Wells (Bbls.)	2003 Abandonments	2003 Average Daily Production Per Well - BOPD	Lost Annual Production BBLs	2003 Average \$/BBL	
California	25,089	36,015,129	2,457	3.93	3,527,011	\$26.43	
Colorado	5,334	5,442,974	215	2.80	219,392	\$30.71	
Kansas	32,883	25,103,681	2,001	2.09	1,527,612	\$28.68	
Louisiana	20,722	15,567,256	975	2.06	732,462	\$30.52	
Mississippi	437	604,800	80	3.79	110,719	\$27.46	
New Mexico	13,577	13,693,595	172	2.76	173,477	\$29.52	
North Dakota	1,394	2,288,191	38	4.50	62,375	\$29.31	
Oklahoma	48,657	43,703,475	694	2.46	623,347	\$29.72	
Texas	123,402	128,058,395	5,657	2.84	5,870,459	\$29.13	
Utah	1,051	1,418,563	6	3.70	8,098	\$28.88	
Wyoming	12,348	7,856,791	171	1.74	108,804	\$26.63	
SUBTOTAL	284,894	279,752,850	12,466	2.69	12,963,756	\$28.53	
ALL OTHERS	108,569	33,995,151	1,834	0.86	880,670	\$28.54	
TOTAL US *	393,463	313,748,001	14,300	2.18	13,844,426	\$28.53	

GAS

STATE	No. of Stripper Wells	2003 Production From Stripper Wells (MCF)	2003 Abandonments	2003 Average Daily Production Per Well - MCFD	Lost Annual Production MCF	2003 Average \$/MCF
California	468	3,855,523	44	22.57	362,485	\$4.93
Colorado	7,342	73,077,507	0	27.27	0	\$4.07
Kansas	9,906	118,418,079	269	32.75	3,215,674	\$4.41
Louisiana	9,772	40,329,957	525	11.31	2,166,724	\$5.40
Mississippi	387	4,477,027	26	31.69	300,782	\$5.17
New Mexico	9,616	84,488,076	91	24.07	799,544	\$4.52
North Dakota	67	762,017	2	31.16	22,747	\$5.03
Oklahoma	20,321	178,200,970	362	24.03	3,174,487	\$4.96
Texas	33,312	268,891,683	1,245	22.11	10,049,536	\$5.33
Utah	1,099	11,928,457	11	29.74	119,393	\$3.36
Wyoming	16,762	71,259,878	70	11.65	297,589	\$4.56
SUBTOTAL	109,052	855,689,174	2,645	21.50	20,508,961	\$4.95
ALL OTHERS	151,511	622,416,350	1,238	11.25	6,380,533	\$5.03
TOTAL US *	260,563	1,478,105,524	3,883	15.54	26,889,494	\$4.97

OIL & GAS

	No. of Stripper Wells	2003 Abandonments
SUBTOTAL	393,946	15,111
ALL OTHERS	260,080	3,072
TOTAL US *	654,026	18,183

* Excludes Alaska, Federal Offshore Oil; includes Federal Offshore Gas due to changes in EIA reporting

**TABLE 3B
EFFECT OF HYPOTHETICAL ABANDONMENT OF ALL STRIPPER WELLS**

OIL							
STATE	No. of Stripper Wells	2003 Production From Stripper Wells (Bbls.)	Hypothetical Abandonments	2003 Average Daily Production Per Well - BOPD	Lost Annual Production BBLs	2003 Average \$/BBL	
California	25,089	36,015,129	25,089	3.93	36,015,129	\$26.43	
Colorado	5,334	5,442,974	5,334	2.80	5,442,974	\$30.71	
Kansas	32,883	25,103,681	32,883	2.09	25,103,681	\$28.68	
Louisiana	20,722	15,567,256	20,722	2.06	15,567,256	\$30.52	
Mississippi	437	604,800	437	3.79	604,800	\$27.46	
New Mexico	13,577	13,693,595	13,577	2.76	13,693,595	\$29.52	
North Dakota	1,394	2,288,191	1,394	4.50	2,288,191	\$29.31	
Oklahoma	48,657	43,703,475	48,657	2.46	43,703,475	\$29.72	
Texas	123,402	128,058,395	123,402	2.84	128,058,395	\$29.13	
Utah	1,051	1,418,563	1,051	3.70	1,418,563	\$28.88	
Wyoming	12,348	7,856,791	12,348	1.74	7,856,791	\$26.63	
SUBTOTAL	284,894	279,752,850	284,894	2.69	279,752,850	\$28.53	
ALL OTHERS	108,569	33,995,151	108,569	0.86	33,995,151	\$28.54	
TOTAL US *	393,463	313,748,001	393,463	2.18	313,748,001	\$28.53	

GAS

STATE	No. of Stripper Wells	2003 Production From Stripper Wells (MCF)	Hypothetical Abandonments	2003 Average Daily Production Per Well - MCFD	Lost Annual Production MCF	2003 Average \$/MCF
California	468	3,855,523	468	22.57	3,855,523	\$4.93
Colorado	7,342	73,077,507	7,342	27.27	73,077,507	\$4.07
Kansas	9,906	118,418,079	9,906	32.75	118,418,079	\$4.41
Louisiana	9,772	40,329,957	9,772	11.31	40,329,957	\$5.40
Mississippi	387	4,477,027	387	31.69	4,477,027	\$5.17
New Mexico	9,616	84,488,076	9,616	24.07	84,488,076	\$4.52
North Dakota	67	762,017	67	31.16	762,017	\$5.03
Oklahoma	20,321	178,200,970	20,321	24.03	178,200,970	\$4.96
Texas	33,312	268,891,683	33,312	22.11	268,891,683	\$5.33
Utah	1,099	11,928,457	1,099	29.74	11,928,457	\$3.36
Wyoming	16,762	71,259,878	16,762	11.65	71,259,878	\$4.56
SUBTOTAL	109,052	855,689,174	109,052	21.50	855,689,174	\$4.95
ALL OTHERS	151,511	622,416,350	151,511	11.25	622,416,350	\$5.03
TOTAL US *	260,563	1,478,105,524	260,563	15.54	1,478,105,524	\$4.97

OIL & GAS

	No. of Stripper Wells	Hypothetical Abandonments
SUBTOTAL	393,946	393,946
ALL OTHERS	260,080	260,080
TOTAL US *	654,026	654,026

* Excludes Alaska, Federal Offshore Oil; includes Federal Offshore Gas due to changes in EIA reporting

states, although the employment, while up on average, is not up for all states. The basic implication of these changes is that the economic activity generated by stripper well production has a larger impact on the U.S. economy under the revised multipliers, assuming no change in price levels. The magnitude of that impact is dependant on the prices received for the oil and gas.

The multipliers are shown in Table 4. The Final Demand Multipliers shown in the first three columns represent the total economic impact on the region relative to a change in demand of the output, which, in this case, is expressed as the value of stripper oil production. The same oil and gas values can be used to determine the total impact on earnings and employment for the region. These final demand multipliers include output, earnings, and employment not only within the crude petroleum and natural gas industry, but from secondary interrelated industries that are impacted in the region. Examples of these secondary sectors could be non-oilfield equipment manufacturers, local retailers, and health care professionals that provide goods and services to both the oil sector and other sectors. Please refer to the Appendix for a more complete discussion about RIMS.

The direct effect multipliers shown in the fourth and fifth columns represent the total impact relative to a direct change in household earnings or employment. They are used whenever changes in household earnings or employment are known. As presented, they are not directly applicable for the purposes of this study. However, they represent the ratio between the industry specific multiplier and the final demand multiplier. This relationship allows the calculation of earnings and employment multipliers for the oil and gas industry alone (sixth and seventh columns), without regard to the earnings and employment levels of any secondary industries.

**TABLE 4
RIMS II MULTIPLIERS**

	FINAL DEMAND MULTIPLIERS			DIRECT EFFECT MULTIPLIERS		CALCULATED O&G INDUSTRY MULTIPLIERS	
	OUTPUT	EARNINGS	EMPLOYMENT	EARNINGS	EMPLOYMENT	EARNINGS	EMPLOYMENT
California	1.9891	0.4319	9.5	2.4103	2.7602	0.1792	3.4506
Colorado	2.0627	0.4337	8.6	2.5391	4.5789	0.1708	1.8861
Kansas	1.9466	0.3788	14.1	2.1995	2.0271	0.1722	6.9618
Louisiana	1.8321	0.3628	8.8	2.3102	3.7887	0.1570	2.3275
Mississippi	1.6049	0.3035	9.3	2.0655	2.4289	0.1469	3.8365
New Mexico	1.6563	0.3487	10.0	2.0363	2.6812	0.1712	3.7421
North Dakota	1.7441	0.3538	11.0	2.0231	2.4251	0.1749	4.5305
Oklahoma	2.0400	0.4224	11.5	2.3894	3.6824	0.1768	3.1144
Texas	2.0853	0.4334	8.4	2.4727	5.3808	0.1753	1.5675
Utah	1.8940	0.4018	11.6	2.4387	3.1276	0.1648	3.7026
Wyoming	1.7344	0.3242	7.9	1.8970	2.9567	0.1709	2.6753

Impact of Stripper Oil and Gas Production on the U.S. Economy

Tables 5A and 5B show the economic impact of stripper oil and gas production. Using the values determined from Table 3A and the multipliers from Table 4, Table 5A shows that the 18,183 stripper oil and gas wells plugged and abandoned in 2003 resulted in a reduction of total economic output of \$1,067 million, earnings reductions of \$221 million, and lost employment of 5,112 jobs. In 2003 the oil and gas industry alone lost \$92.3 million of earnings and 1,519 jobs.

Table 5B shows the economic impact of the theoretical abandonment of all stripper oil and gas wells. Economic output would decline by \$32.4 billion; earnings would decrease by \$6.66 billion, and 159,894 jobs would be lost. Within the oil and gas industry alone, \$2,826 million of earnings and 46,335 jobs would be lost.

**TABLE 5A
ECONOMIC EFFECT OF 2003's ABANDONMENT**

OIL	2003 Revenue Lost From Abandonment Million \$	Final Demand Multipliers Output	Final Demand Multipliers Earnings	Final Demand Multipliers Employment	OVERALL EFFECT IN				Direct Effect Multipliers Earnings	Direct Effect Multipliers Employment	1 Ea Mi
					FINAL DEMAND						
					Lost Output Million \$	Lost Earnings Million \$	Lost Employ- ment				
California	\$93.219	1.98910	0.4319	9.5	\$185.422	\$40.261	888	0.1792	3.4506	\$1	
Colorado	\$6.738	2.06270	0.4337	8.6	\$13.898	\$2.922	58	0.1708	1.8861	\$	
Kansas	\$43.812	1.94660	0.3788	14.1	\$85.284	\$16.596	618	0.1722	6.9618	\$	
Louisiana	\$22.355	1.83210	0.3628	8.8	\$40.956	\$8.110	197	0.1570	2.3275	\$	
Mississippi	\$3.040	1.60490	0.3035	9.3	\$4.879	\$0.923	28	0.1469	3.8365	\$	
New Mexico	\$5.121	1.65630	0.3487	10.0	\$8.482	\$1.786	51	0.1712	3.7421	\$	
North Dakota	\$1.828	1.74410	0.3538	11.0	\$3.189	\$0.647	20	0.1749	4.5305	\$	
Oklahoma	\$18.526	2.04000	0.4224	11.5	\$37.793	\$7.825	212	0.1768	3.1144	\$	
Texas	\$171.006	2.08530	0.4334	8.4	\$356.600	\$74.114	1,442	0.1753	1.5675	\$2	
Utah	\$0.234	1.89400	0.4018	11.6	\$0.443	\$0.094	3	0.1648	3.7026	\$	
Wyoming	\$2.897	1.73440	0.3242	7.9	\$5.025	\$0.939	23	0.1709	2.6753	\$	
SUBTOTAL	\$369.885	2.00590	0.4169	9.6	\$741.971	\$154.218	3,542	0.1739	2.8800	\$6	
ALL OTHERS*	\$25.135	2.00590	0.4169	9.6	\$50.417	\$10.479	241	0.1739	2.8800	\$	
TOTAL	\$395.020	2.00590	0.4169	9.6	\$792.388	\$164.696	3,783	0.1739	2.8800	\$6	

GAS

	2003 Revenue Lost From Abandonment Million \$	Final Demand Multipliers Output	Final Demand Multipliers Earnings	Final Demand Multipliers Employment	OVERALL EFFECT IN FINAL DEMAND				Direct Effect Multipliers Earnings	Direct Effect Multipliers Employment	1 Ea Mi
					Lost Output Million \$	Lost Earnings Million \$	Lost Employ- ment	Lost Employ- ment			
California	\$1.787	1.98910	0.4319	9.5	\$3.554	\$0.772	17	0.1792	3.4506	\$	
Colorado	\$0.000	2.06270	0.4337	8.6	\$0.000	\$0.000	0	0.1708	1.8861	\$	
Kansas	\$14.168	1.94660	0.3788	14.1	\$27.580	\$5.367	200	0.1722	6.9618	\$	
Louisiana	\$11.705	1.83210	0.3628	8.8	\$21.444	\$4.246	103	0.1570	2.3275	\$	
Mississippi	\$1.554	1.60490	0.3035	9.3	\$2.494	\$0.472	14	0.1469	3.8365	\$	
New Mexico	\$3.617	1.65630	0.3487	10.0	\$5.991	\$1.261	36	0.1712	3.7421	\$	
North Dakota	\$0.114	1.74410	0.3538	11.0	\$0.200	\$0.040	1	0.1749	4.5305	\$	
Oklahoma	\$15.755	2.04000	0.4224	11.5	\$32.141	\$6.655	181	0.1768	3.1144	\$	
Texas	\$53.609	2.08530	0.4334	8.4	\$111.792	\$23.234	452	0.1753	1.5675	\$	
Utah	\$0.401	1.89400	0.4018	11.6	\$0.760	\$0.161	5	0.1648	3.7026	\$	
Wyoming	\$1.356	1.73440	0.3242	7.9	\$2.353	\$0.440	11	0.1709	2.6753	\$	
SUBTOTAL	\$101.442	2.05350	0.4169	9.6	\$208.308	\$42.649	1,020	0.1769	2.8600	\$1	
ALL OTHERS*	\$32.103	2.05350	0.4169	9.6	\$65.923	\$13.384	308	0.1769	2.8600	\$	
TOTAL	\$133.705	2.05100	0.4169	9.6	\$274.231	\$56.033	1,329	0.1767	2.8600	\$2	

OIL & GAS

	2003 Revenue Lost From Abandonment Million \$	Final Demand Multipliers Output *	Final Demand Multipliers Earnings *	Final Demand Multipliers Employment *	OVERALL EFFECT IN FINAL DEMAND				Direct Effect Multipliers Earnings	Direct Effect Multipliers Employment	1 Ea Mi
					Lost Output Million \$	Lost Earnings Million \$	Lost Employ- ment	Lost Employ- ment			
SUBTOTAL	\$471.327	2.01618	0.4177	9.7	\$950.278	\$196.867	4,562	0.1746	2.8752	\$8	
ALL OTHERS*	\$57.237	2.03260	0.4169	9.6	\$116.341	\$23.862	549	0.1756	2.8688	\$1	
TOTAL	\$528.725	2.01734	0.4175	9.7	\$1,066.619	\$220.729	5,112	0.1746	2.8736	\$9	

* Weighted averages used for RIMS II Multipliers; excludes Alaska, Federal Offshore Oil; includes Federal Offshore Gas due to changes in EIA

**TABLE 5B
ECONOMIC EFFECT OF HYPOTHETICAL ABANDONMENT OF ALL STRIPPER WELLS**

	2003 Revenue Lost From Abandonment Million \$	Final Demand Multipliers Output	Final Demand Multipliers Earnings	Final Demand Multipliers Employment	OVERALL EFFECT IN FINAL DEMAND				Direct Effect Multipliers Earnings	Direct Effect Multipliers Employment	I Ear Mil
					Lost Output Million \$	Lost Earnings Million \$	Lost Employ- ment	Lost Employ- ment			
California	\$951.880	1.9891	0.4319	9.5	\$1,893.384	\$411.117	9,066	0.1792	3,4506	\$1	
Colorado	\$167.154	2.0627	0.4337	8.6	\$344.788	\$72.495	1,444	0.1708	1,8861	\$	
Kansas	\$719.974	1.9466	0.3788	14.1	\$1,401.501	\$272.726	10,160	0.1722	6,9618	\$1	
Louisiana	\$475.113	1.8321	0.3628	8.8	\$870.454	\$172.371	4,190	0.1570	2,3275	\$	
Mississippi	\$16.608	1.6049	0.3035	9.3	\$26.654	\$5.040	155	0.1469	3,8365	\$	
New Mexico	\$404.235	1.6563	0.3487	10.0	\$669.534	\$140.957	4,056	0.1712	3,7421	\$	
North Dakota	\$67.067	1.7441	0.3538	11.0	\$116.971	\$23.728	737	0.1749	4,5305	\$	
Oklahoma	\$1,298.867	2.0400	0.4224	11.5	\$2,649.689	\$548.642	14,896	0.1768	3,1144	\$2	
Texas	\$3,730.341	2.0853	0.4334	8.4	\$7,778.880	\$1,616.730	31,463	0.1753	1,5675	\$6	
Utah	\$40.968	1.8940	0.4018	11.6	\$77.594	\$16.461	474	0.1648	3,7026	\$	
Wyoming	\$209.226	1.7344	0.3242	7.9	\$362.882	\$67.831	1,655	0.1709	2,6753	\$	
SUBTOTAL	\$7,981.977	2.0286	0.4195	9.8	\$16,192.331	\$3,348.097	78,296	0.1763	2,7800	\$1.4	
ALL OTHERS*	\$970.230	2.0286	0.4195	9.8	\$1,968.208	\$407.011	9,508	0.1763	2,7800	\$1	
TOTAL	\$8,952.103	2.0286	0.4195	9.8	\$18,160.539	\$3,755.109	87,804	0.1763	2,7800	\$1.5	

	2003 Revenue Lost From Abandonment Million \$	Final Demand Multipliers Output	Final Demand Multipliers Earnings	Final Demand Multipliers Employment	OVERALL EFFECT IN FINAL DEMAND				Direct Effect Multipliers Earnings	Direct Effect Multipliers Employment	I Ear Mil
					Lost Output Million \$	Lost Earnings Million \$	Lost Employment	Lost Employment			
California	\$19,005	1.9891	0.4319	9.5	\$37,803	\$8,208	181	0.1792	3,4506		
Colorado	\$297,309	2.0627	0.4337	8.6	\$613,259	\$128,943	2,568	0.1708	1,8861		
Kansas	\$521,754	1.9466	0.3788	14.1	\$1,015,646	\$197,640	7,363	0.1722	6,9618		
Louisiana	\$217,864	1.8321	0.3628	8.8	\$399,148	\$79,041	1,921	0.1570	2,3275		
Mississippi	\$23,127	1.6049	0.3035	9.3	\$37,116	\$7,019	216	0.1469	3,8365		
New Mexico	\$382,241	1.6563	0.3487	10.0	\$633,106	\$133,288	3,835	0.1712	3,7421		
North Dakota	\$3,833	1.7441	0.3538	11.0	\$6,686	\$1,356	42	0.1749	4,5305		
Oklahoma	\$884,433	2.0400	0.4224	11.5	\$1,804,242	\$373,584	10,143	0.1768	3,1144		
Texas	\$1,434,405	2.0853	0.4334	8.4	\$2,991,165	\$621,671	12,098	0.1753	1,5675		
Utah	\$40,072	1.8940	0.4018	11.6	\$75,897	\$16,101	464	0.1648	3,7026		
Wyoming	\$324,800	1.7344	0.3242	7.9	\$563,333	\$105,300	2,569	0.1709	2,6753		
SUBTOTAL	\$4,232,430	1.9321	0.3951	9.8	\$8,177,403	\$1,672,152	41,400	0.1696	2,9100		
ALL OTHERS*	\$3,131,621	1.9321	0.3951	9.8	\$6,050,605	\$1,237,303	30,690	0.1696	2,9100		
TOTAL	\$7,349,711	1.9359	0.3959	9.8	\$14,228,008	\$2,909,456	72,090	0.1699	2,9200	\$1.2	

	2003 Revenue Lost From Abandonment Million \$	Final Demand Multipliers Output *	Final Demand Multipliers Earnings *	Final Demand Multipliers Employment *	OVERALL EFFECT IN FINAL DEMAND				Direct Effect Multipliers Earnings	Direct Effect Multipliers Employment	I Ear Mil
					Lost Output Million \$	Lost Earnings Million \$	Lost Employment	Lost Employment			
SUBTOTAL	\$12,214,408	1.9952	0.4110	9.8	\$24,369,735	\$5,020,250	119,696	0.1740	2,8265	\$2.1	
ALL OTHERS*	\$4,101,851	1.9549	0.4009	9.8	\$8,018,813	\$1,644,315	40,198	0.1712	2,8793	\$7	
TOTAL	\$16,301,814	1.9868	0.4088	9.8	\$32,388,547	\$6,664,564	159,894	0.1734	2,8423	\$2.8	

* Weighted averages used for RIMS II Multipliers, excludes Alaska, Federal Offshore

* Weighted averages used for RIMS II Multipliers; excludes Alaska, Federal Offshore Oil; includes Federal Offshore Gas due to changes in EIA ref

Severance and Ad Valorem Tax

RIMS II multipliers do not take into consideration any impact on state or local government. Therefore, the economic impact predictions do not include any payments of state or local severance taxes or any local ad valorem taxes.

Many states have reduced severance tax rates for wells that qualify for stripper status under their guidelines. For the purposes of this report, it was assumed that all of the stripper production reported for a given state would qualify for stripper status tax reductions at the lowest level of stripper status granted. No additional tax reductions for secondary or tertiary production were assumed for the states that grant such reductions. Several states have additional taxes levied on production for the purpose of funding conservation, environmental, or maintenance related activities. These taxes have been included in the severance tax calculations.

Based on the average oil and gas prices and stripper production from Table 6, severance taxes collected for stripper production were \$697 million during 2003. Furthermore, the production loss from stripper oil and gas well abandonments in 2003 would represent a \$19.28 million loss in severance taxes assuming average stripper production rates.

**TABLE 6
PRODUCTION TAXES**

	Stripper Oil Severance Tax Rate	Other Taxes (Conservation, Environmental, etc.)	2003 Average Oil \$/BBL	2003 Production from Stripper Wells (Bbls.)	Annual Total Stripper Oil Production Tax Revenue	2003 Lost Production Bbls	Annual Lost Stripper Oil Production Tax Revenue	Stripper Gas Severance Tax Rate	Other Taxes (Conservation, Environmental, etc.)	2003 Average Gas \$/MCF
Alabama	6.00%		\$28.97	1,152,351	\$2,003,017	7,293	\$12,677	6.00%		5.87
Alaska	15.00%	\$0.034	\$23.91	0	\$0	0		10%	\$ 0.00008	3.60
Arizona	3.125%		\$0.00	23,303	\$0	0	\$0	3.125%		4.39
Arkansas	4.00%	\$0.045	\$26.57	3,302,376	\$3,658,372	57,552	\$63,756	\$0.003	\$0.005	7.48
California	0.00%	\$0.0443	\$26.43	36,015,129	\$1,595,791	3,527,011	\$156,278	0.00%	\$0.0044	4.93
Colorado	0.00%	0.12%	\$30.71	5,442,974	\$200,584	219,392	\$8,085	0.00%	0.12%	4.07
Florida	5.00%		\$29.12	0		0		\$0.191		0.00
Illinois	0.00%		\$29.10	10,600,000	\$0	394,858	\$0	0.00%		0.00
Indiana	1.00%		\$28.38	1,864,883	\$529,254	36,566	\$10,378	1.00%		5.25
Kansas	0.00%	\$0.0273	\$28.68	25,103,681	\$684,577	1,527,612	\$41,658	0.00%	\$0.0058	4.41
Kentucky	4.50%		\$27.21	1,942,879	\$2,378,958	25,002	\$30,613	4.50%		5.08
Louisiana	3.125%		\$30.52	15,567,256	\$14,847,270	732,462	\$698,585	\$0.013		5.40
Maryland	0.00%		\$0.00	0		0		7.00%		7.01
Michigan	4.00%	1%	\$29.18	2,500,500	\$3,648,230	107,663	\$157,080	5.00%	1%	3.65
Mississippi	6.00%	\$0.044	\$27.46	604,800	\$1,023,080	110,719	\$187,291	6.00%	\$0.005	5.17
Missouri	0.00%		\$29.25	86,133	\$0	2,114	\$0	0.00%		0.00
Montana	9.00%	0.30%	\$28.66	1,830,410	\$4,878,738	59,123	\$157,585	11.00%	0.30%	4.03
Nebraska	2.00%	1%	\$28.63	1,651,923	\$1,418,837	92,870	\$79,766	3.00%	1%	2.57
Nevada	\$0.05		\$28.48	0		0		\$0.001		0.00
New Mexico	7.09%		\$29.52	13,693,595	\$28,660,256	173,477	\$363,082	8.19%		4.52
New York	0.00%		\$28.91	152,967	\$0	4,374	\$0	0.00%		5.12
North Dakota	5.00%		\$29.31	2,288,191	\$3,353,344	62,375	\$91,411	\$0.0772		5.03
Ohio	\$0.100		\$28.18	4,696,636	\$469,664	28,754	\$2,875	\$0.025		7.63
Oklahoma	7.195%	\$0.002	\$29.72	43,703,475	\$93,540,908	623,347	\$1,332,937	7.195%	\$0.0001	4.96
Oregon	6.00%		\$0.00	0		0		6.000%		6.70
Pennsylvania	0.00%		\$29.60	2,466,000	\$0	28,169	\$0	0.00%		0.00
South Dakota	4.74%		\$28.94	51,461	\$70,592	4,288	\$5,883	4.74%		7.34
Tennessee	3.00%		\$29.25	270,827	\$237,651	27,434	\$24,074	3.00%		5.76
Texas	4.60%	\$0.1906	\$29.13	128,058,395	\$196,006,820	5,870,459	\$8,985,353	7.50%	\$0.0033	5.33
Utah	0.00%	0.20%	\$28.88	1,418,563	\$81,936	8,098	\$468	0.00%	0.20%	3.36
Virginia	0.50%		\$29.12	2,502	\$364	0	\$0	3.00%		0.00
West Virginia	5.00%		\$28.06	1,400,000	\$1,964,200	4,610	\$6,467	5.00%		4.98
Wyoming	4.00%	0.06%	\$26.63	7,856,791	\$8,494,590	108,804	\$117,636	6.00%	0.06%	4.56
TOTAL				313,748,001	\$369,747,031	13,844,426	\$12,533,940			

Note: Many states have different or multiple production level cut-offs in determining stripper status. The rates shown here assume the lowest tax applicable to a stripper well producing at the lowest production level cut-off. Source: www.spee.org

Ad valorem taxes are property taxes assessed by local government entities, and a stripper well may be subject to multiple overlapping taxing entities. As noted in prior reports, a survey of ad valorem taxation approaches in oil and gas producing states shows that the tax assessment process differs widely among the states and sometimes also within a state, with corresponding varying tax rates. While we are not aware of any published data that allows a reasonable estimate for stripper well ad valorem tax expense, our experience suggests that the ad valorem tax expense is probably a value of similar magnitude to the severance taxes.

Conclusion

The results of this study serve to quantify the economic impact of stripper oil and gas well production on the U.S. economy. In 2003, total domestic production, including Alaska and the federal offshore areas was 2.07 billion barrels of oil and 20.03 trillion cubic feet of gas. Stripper oil production accounted for 314 million barrels, or 15 percent of total oil. Stripper gas production accounted for 1.48 TCF, or 7 percent of total gas production. The use of RIMS II multipliers show that every dollar of stripper oil and gas production creates an additional \$1.01734 of economic activity throughout the economy, and that 9.7 jobs are dependent on every \$1 million of stripper oil and gas produced.

While this report does not consider the economics of stripper well operation, the high oil and gas prices currently experienced certainly helps the stripper well operator. Stripper wells are generally owned by small, local operators. Because of their marginal economics, the large oil companies usually sell these wells to smaller companies who can provide the necessary attention required to maintain production without the large company overhead burden. So not only does high prices ensure the viability of these marginal producers, but the economic activity tends to be focused on a local or regional level rather than concentrated in the large cities that are the centers of international oil production activity.

The cumulative impact of stripper production over the twelve years that this report has been prepared is summarized in Table 7 — 5.9 billion barrels of oil equivalent production has been achieved from these marginal producers. The lost output of the wells abandoned during this time would have represented \$6.5 billion of economic activity and almost 35,000 jobs.

**TABLE 7
STRIPPER WELLS - CUMULATIVE IMPACT ON U.S. ECONOMY**

OIL	No. of Stripper Wells	Stripper Well Production Million Bbls.	Abandonments	Avg. Daily Production Per Well (BOPD)	Lost Annual Production Million Bbls.	Lost Output Million \$	Lost Earnings Million \$	Lost Employment	Lost Severance Taxes Million \$
1992	453,277	368,132	16,211	2.23	15,659	\$416,935	\$55,372	2,385	\$10,443
1993	452,248	355,961	16,914	2.16	15,210	357,783	47,614	2,026	10,101
1994	442,500	339,930	17,896	2.10	16,153	359,506	48,065	2,019	10,577
1995	433,048	332,288	16,389	2.10	15,322	374,833	50,019	2,133	10,310
1996	428,842	323,468	16,674	2.06	16,452	497,243	66,086	2,829	13,688
1997	420,674	322,090	15,172	2.10	14,049	387,536	51,427	2,220	9,912
1998	406,380	316,870	13,912	2.14	11,984	216,490	28,874	1,231	5,992
1999	410,680	315,514	11,227	2.10	9,616	247,871	33,059	1,483	6,140
2000	411,629	325,947	10,718	2.16	10,122	429,997	57,505	2,333	10,618
2001	403,459	316,099	12,234	2.15	11,295	397,960	53,149	2,268	8,348
2002	402,072	323,777	13,635	2.21	13,157	468,723	62,571	2,621	10,113
2003	393,463	313,748	14,300	2.18	13,844	792,388	164,696	3,783	12,534
TOTAL		3,953,824	175,282		162,865	\$4,947,265	\$718,437	27,331	\$118,777

GAS	No. of Stripper Wells	Stripper Well Production BCF	Abandonments	Avg. Daily Production Per Well (MCFD)	Lost Annual Production BCF	Lost Output Million \$	Lost Earnings Million \$	Lost Employment	Lost Severance Taxes Million \$
1992									
1993									
1994	159,369	940,421	3,163	16.17	21,256	\$61,758	\$8,112	376	\$1,608
1995	159,669	925,563	3,189	15.87	23,053	51,853	6,771	315	1,518
1996	168,702	986,676	4,671	16.01	39,978	137,092	18,065	804	4,860
1997	189,756	1,042,153	4,661	15.72	35,839	122,772	16,192	729	3,947
1998	199,745	1,104,684	4,203	15.55	29,258	92,721	12,286	549	3,128
1999	207,766	1,138,980	3,546	15.56	24,407	80,846	10,707	481	2,799
2000	223,222	1,258,727	3,534	15.40	23,806	274,231	56,033	1,329	6,745
2001	234,507	1,353,516	3,600	15.81	24,655	397,960	53,149	909	4,716
2002	245,961	1,418,274	3,870	15.75	27,261	128,329	16,997	765	4,335
2003	260,563	1,478,106	3,883	15.54	26,889	274,231	56,033	1,329	6,745
TOTAL		11,647,099	38,320		276,401	\$1,621,793	\$254,344	7,585	\$40,400

TOTAL OIL & GAS	No. of Stripper Wells	Stripper Well Production MMMBOE (6:1)	Abandonments	Avg. Daily Production Per Well (BOEPD)	Lost Annual Production MMMBOE (6:1)	Lost Output Million \$	Lost Earnings Million \$	Lost Employment	Lost Severance Taxes Million \$
1992	453,277	368,132	16,211	2.23	15,659	\$416,935	\$55,372	2,385	\$10,443
1993	452,248	355,961	16,914	2.16	15,210	\$357,783	\$47,614	2,026	\$10,101
1994	601,869	496,667	21,059	4.80	19,695	\$421,264	\$56,177	2,395	\$12,185
1995	592,717	486,549	19,578	4.75	19,164	\$426,686	\$56,790	2,448	\$11,828
1996	597,544	487,914	21,345	4.73	23,115	\$634,335	\$84,151	3,633	\$18,548
1997	610,430	495,782	19,833	4.72	20,023	\$510,308	\$67,619	2,949	\$13,859
1998	606,125	500,984	18,115	4.73	16,861	\$309,211	\$41,160	1,780	\$9,120
1999	618,446	505,344	14,773	4.70	13,684	\$328,717	\$43,766	1,964	\$8,939
2000	634,851	535,735	14,252	4.73	14,090	\$704,228	\$113,537	3,661	\$17,363
2001	637,966	541,685	15,834	4.78	15,404	\$795,920	\$106,298	3,177	\$13,064
2002	648,033	560,156	17,505	4.83	17,701	\$597,052	\$79,568	3,386	\$14,448
2003	654,026	560,099	18,183	4.77	18,326	1,066,619	220,729	5,112	19,278
TOTAL		5,895,007	213,602		208,932	\$6,569,058	\$972,781	34,916	\$159,177

Note: Table 7 includes prior year statistical revisions

Appendix – Background of RIMS

The U.S. department of Commerce’s Bureau of economic Analysis prepares regional input-output multipliers that allow the estimation of the total economic impact of the addition or removal of industries or projects to a given region. The IOGCC’s annual stripper well study uses these multipliers to investigate the economic impact of stripper well production on 11 states and extrapolates those findings to determine the economic impact of stripper oil and gas well abandonments to both the overall economy and the oil and gas industry specifically.

Recognizing the need for a basis of estimating the economic impacts of projects and programs on a regional basis, the Bureau of Economic Analysis (BEA) developed RIMS, or the Regional Industrial Multiplier Systems, in the mid-1970s. Enhancements to RIMS in the mid-1980s led to RIMS II (Regional Input-Output Modeling System).

RIMS II multipliers show the interdependence of economic activity throughout a given region, where a region comprises one or more counties. Multipliers are provided for output, earnings, and employment, considering final demand and direct effect. These multipliers plus assumptions of projects or programs introductions into a region can be used to calculate variables such as the increase in the output value, i.e. gross receipts or sales. Multipliers plus assumptions are also instrumental in calculating earnings income such as wages, salaries or proprietor’s income less any contributions to private pension funds, and employment levels for all other industries in that region.

In some situations RIMS II multipliers have certain limitations. For instance, the multipliers are best used when total demand changes are relatively small compared to the economy of the region under consideration. Interrelations with adjacent regions are another potential source of error when the regions under consideration are small. The multipliers do not consider the possible subsequent incremental economic activity that may be associated with economic impacts of considerable relative magnitude to a region, although if such activity can be predicted, the RIMS II multipliers can be added for the expected activity to show a cumulative effect. Demand substitution can affect the RIMS II estimates, in that the multipliers assume an adequate supply of resources and labor exists within the region under study. The multipliers are static in the sense that the changes predicted are overall changes with no regard to the timing. The multiplier estimate short-term economic effects that often change over the long term. For example, multipliers may overstate job losses in the long term, as displaced employees find new jobs.

Since RIMS II multipliers are limited to the private sector, they exclude the economic impacts on state and local governments. For the proper consideration of economic impact from stripper oil and gas production, state severance taxes and local and ad valorem taxes must be added to any estimates derived from RIMS II.

The U.S. Department of Commerce Bureau of Economic Analysis was able to provide the RIMS II multipliers for the 12 largest oil producing states: Alaska, California, Colorado, Kansas, Louisiana, Mississippi, New Mexico, North Dakota, Oklahoma, Texas, Utah and Wyoming. However, Alaska has no stripper well production reported. Its inclusion in U.S. production statistics can significantly skew the analysis results, due to the large volume of North Slope production with its corresponding low wellhead value. Therefore, the IOGCC analysis excludes Alaska. The remaining 11 states used for this study (referred to as the “survey states”) account for the majority of stripper oil and gas production. Average values applied for the remaining states reflect weighted averages.

The use of state level RIMS II multipliers is most accurate when the economic activity is evenly distributed across the state. This appears to be a reasonable assumption for the majority of the states considered in this study. In California, the oil and gas industry is not evenly distributed and significant other economic activity is present. These factors suggest that the potential for error in the RIMS II estimate is

greater for states such as California, whereas accuracy should be better in states with more evenly geographically distributed production, such as Louisiana.

Since the RIMS II multipliers used for this study are aggregations of regional data at the state level, it is expected that any errors introduced by the limitations previously discussed will be minimized. While RIMS II does not consider timing, many of the effects predicted in this report are based on annual values. It would follow that some portions of the predicted areas impacted, such as annual severance tax collections, could be considered as time dependent.

All previous editions of this report utilized RIMS II factors that were calculated from data gathered in the late 1980's. The U.S. Department of Commerce released updated RIMS II factors in April of 2004, and these updated factors were used in this report. The old factors were aggregated into industry 8.000, Crude Petroleum and Natural Gas. The new factors are grouped into Industry 211000, Oil and Gas Extraction. The new factors are generally higher than the old factors, showing that the industry activity has a larger impact on the overall economy than what would have been calculated using the old factors. Because of the time interval between the development of the multipliers and the possible changes in the scope of what is encompassed in the industry category, it cannot be determined to what extent the old multipliers are directly comparable with the new.

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Marginal Well Commission

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Frequently Used Abbreviations

Oil

bbls = barrels

Mbbls = one thousand barrels (1,000 barrels)

MMbbls = one million barrels (1,000,000 barrels)

BOPD = barrels of oil per day

BOEPD = barrels of oil equivalent per day

MMBOE = million barrels of oil equivalent (1,000,000 barrels of oil equivalent)

Natural Gas

Mcf = one thousand cubic feet (1,000 cubic feet)

Bcf = one billion cubic feet (1,000,000,000 cubic feet)

MCFD = one thousand cubic feet per day (1,000 cubic feet per day)

MMCF = one million cubic feet (1,000,000 cubic feet)

MMCFD = one million cubic feet per day (1,000,000 cubic feet per day)

Source: Langenkamp, Robert D., ed. *The Illustrated Petroleum Reference Dictionary*. 4th ed. PennWell Books: Tulsa, 1994.

About the Interstate Oil and Gas Compact Commission

The IOGCC is the only organization of its kind. It represents the governors of states that produce more than 99 percent of the domestic onshore oil and natural gas.

The organization's mission is to promote the conservation and efficient recovery of domestic oil and natural gas resources, while protecting health, safety and the environment.

Since its creation in 1935, the IOGCC has assisted states in balancing a multitude of interests - maximizing domestic oil and natural gas production, minimizing the waste of irreplaceable natural resources and protecting human and environmental health - through sound regulatory practices. The IOGCC plays an active role in Washington D.C., serving as the voice of the states on oil and natural gas issues and advocating states' rights to govern the resources found within their borders.

About the Oklahoma Commission on Marginally Producing Oil and Gas Wells

The Oklahoma Commission on Marginally Producing Oil and Gas Wells is an Oklahoma state agency, funded by the oil and natural gas industry, with a purpose of protecting and promoting Oklahoma production of crude oil and natural gas. We are here to serve the operator with our technology transfer programs; to serve the state by making sure that our most vital resource is continuously produced and not prematurely abandoned; and to serve the public as an information source regarding the importance of the industry to their lives and the state in which they live.

For more information, visit www.marginalwells.com.

Member States

Alabama	(1945)
Alaska	(1957)
Arizona	(1955)
Arkansas	(1941)
California	(1974)
Colorado	(1935)
Florida	(1945)
Illinois	(1935)
Indiana	(1947)
Kansas	(1935)
Kentucky	(1942)
Louisiana	(1941)
Maryland	(1959)
Michigan	(1939)
Mississippi	(1948)
Montana	(1945)
Nebraska	(1953)
Nevada	(1955)
New Mexico	(1935)
New York	(1941)
North Dakota	(1953)
Ohio	(1943)
Oklahoma	(1935)
Pennsylvania	(1941)
South Dakota	(1955)
Texas	(1935)
Utah	(1957)
Virginia	(1982)
West Virginia	(1945)
Wyoming	(1955)

Associate States

Georgia	(1946)
Idaho	(1960)
Missouri	(1995)
North Carolina	(1971)
Oregon	(1954)
South Carolina	(1972)
Washington	(1967)

International Affiliates

Alberta	(1996)
British Columbia	(2002)
Egypt	(1999)
Republic of Georgia	(2001)
Newfoundland and Labrador	(1997)
Nova Scotia	(1997)
Venezuela	(1997)

