

OIL AND GAS ACTIVITY IN THE GULF OF MEXICO FEDERAL OCS FROM 1990 THROUGH DECEMBER 31, 1998

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ABSTRACT

The Minerals Management Service (MMS), an agency within the Department of the Interior, is responsible for all Outer Continental Shelf (OCS) mineral activities. The MMS mission statement is "To manage the mineral resources of the Outer Continental Shelf in an environmentally sound and safe manner and to timely collect, verify, and distribute mineral revenues from Federal and Indian lands." The 1990's have been turbulent, producing record lows and highs in some Gulf of Mexico (GOM) OCS activities. This paper will present a statistical analysis of several activities and forecast daily oil and gas production projections through the year 2002.

I. INTRODUCTION

"The MMS is a regulatory agency within the United States Department of the Interior charged with responsibility for administering the OCS oil, gas, sulphur, and marine minerals program. These responsibilities include resource assessment, competitive sales for rights to explore for and develop OCS resources, and regulating operations. In addition to these, MMS is responsible for conducting inspections of lease operations to ensure compliance with safety and environmental protection mandates."*

II. BACKGROUND

"There are three major planning areas in the GOM: Eastern, Central, and Western. The MMS holds a lease sale in each of the Central and Western GOM planning areas annually, granting exclusive mineral rights to the successful high bidder on a particular lease. Lease sales are area-wide (since 1983), offering acreage throughout the planning area."* When a company is awarded a lease, it purchases the right to explore, develop, and produce oil and/or gas from that property. The length of a primary lease term is dependent on water depth, up to 10 years for deepwater. The primary term can be extended by a suspension of operations, a suspension of production, or the continuation of production beyond the primary term. Once a lease is beyond the primary term, it will expire 180 days after production or other lease holding operations terminate. Unitization agreements can also extend the lease term. Some Gulf of Mexico OCS statistics follow (approximates as of June 30, 1998):

- 35,500 hydrocarbon wells drilled;
- 8,850 active hydrocarbon leases (1,600 producing leases);
- 3,400 producing oil wells and 3,400 producing gas wells;
- 3,900 active platforms;
- 27,800 miles (total) of pipelines;

- 33.7 million barrels of oil per month (average for 1997);
- 433 billion cubic feet of gas per month (average for 1997).

There are numerous laws and regulations that the MMS uses to manage the OCS mineral resources. These laws include the OCS Lands Act, as amended (Public Law 95-375), the National Environmental Policy Act (Public Law 91-190), and the Code of Federal Regulations, Parts 250, 251, and 256.

“The MMS has collateral responsibilities with other State and Federal agencies under the Endangered Species Act, the Clean Water Act, the Oil Pollution Act, and others. Responsibility for compliance with these laws is shared with the Environmental Protection Agency, National Marine Fisheries Service, Fish and Wildlife Service, United States Coast Guard, and coastal States.”*

Before a company can conduct initial operations on a lease, it must submit a Plan of Exploration (POE). If an operator is successful in his exploratory program, he will submit a Development Operations Coordination Document (DOCD), which outlines the development plans necessary to produce oil and/or gas from the lease.

III. ANALYSIS

The decade began with oil prices at \$20.03/stock tank barrel (STB) and natural gas prices at \$1.71/thousand cubic feet (MCF).

There were a total of 845 tracts bid on in the Central Gulf of Mexico (CGOM) and Western Gulf of Mexico (WGOM) sales in 1990, down from 1,079 the previous year (22% decrease).

There were 485 Plans of Exploration (POE) approved and 461 exploratory wells drilled.

There were 223 Development Operations
The year 1993 marked the beginning of the

Coordination Documents (DOCD) approved and 521 development wells drilled. Daily oil production averaged 752,000 STB per day (STBPD) and daily gas production averaged 13.4 billion cubic feet per day (BCFPD).

In 1991, oil prices changed to \$16.54/STB and gas prices to \$1.64/MCF. The downward trend continued for tracts bid upon with 606 tracts receiving bids in the CGOM and WGOM sales (28% decrease from the 1990 amount of 845 tracts, a 44% decrease from the 1989 amount of 1,079 tracts). POE approvals were down from 485 to 365 (25% decrease from 1990) and 308 exploratory wells were drilled, down from 461 (33% decrease). There were 179 DOCD's approved (20% decrease from 1990 amount of 223) and 358 development wells drilled (31% decrease). Daily oil production averaged 807,000 STBPD and daily gas production averaged 12.9 BCFPD.

Oil and gas prices changed in 1992 to \$15.99/STB and \$1.74/MCF. The number of tracts bid upon in the CGOM and WGOM sales reached an all time low, 212, since the advent of area-wide leasing in 1983. This represented a 65 percent drop in tracts bid upon from the previous year and a 75 percent drop from the number of tracts bid upon in 1990. POE approvals went down to 250 (32% decrease from 1991), and the number of exploratory wells drilled dropped to 181 (41% decrease from 1991). DOCD approvals fell to 128 (28% decrease from 1991), and the number of development wells dropped to 263 (27% decrease from 1991). Daily oil production averaged 835,000 STBPD, and daily gas production averaged 12.7 BCFPD .

It was at this point that the Gulf of Mexico was dubbed the “dead sea” in oil and gas circles.

turnaround for the GOM. The Mahogany

(Ship Shoal Block 359) and Teak (South Timbalier Block 260) shelf subsalt discoveries helped create interest for shallow (<1,000 ft. water depth) and deepwater (\geq 1,000 ft. water depth) GOM subsalt prospects. Three dimensional seismic must also be given credit for identifying numerous subtle prospects attracting new independent bidders. Oil prices continued a downward trend to \$14.25/STB while gas prices increased by 17 percent to \$2.04/MCF. The number of tracts bid on increased from 212 to 358 (69% increase from 1992). POE approvals bounced back to 318 (27% increase over 1992) with 297 exploratory wells drilled (64% increase over 1992). DOCD approvals numbered 187 (46% increase over 1992), and development wells drilled numbered 506 (92% increase over 1992). Daily oil production averaged 845,000 STBPD, and daily gas production averaged 12.8 BCFPD.

Several new deepwater fields began production in the early 1900's (BP Exploration-Amberjack, 1991; BP Exploration-Pompano, 1994; Exxon-Zinc, 1993; Exxon-Alabaster, 1992; Oryx-Diamond, 1993; Shell-Auger, 1994; and Tatham-Seattle Slew, 1993). Shell's Auger field would prove to be of significant importance to deepwater GOM bidding activity, exploration, development, and production over the next few years. The Auger development was initially designed for 45 wells. But as Shell drilled, completed, and began production from each well, much higher than anticipated production rates were sustained, resulting in platform production capacity being achieved with fewer development wells and, hence, a smaller required capital investment. Advances In 1995, oil prices rebounded to \$14.62/STB (increase of 11% over 1994). However, gas prices dropped to their lowest level of the decade at \$1.55/MCF (a 16% decrease from 1994 and a 9% decrease from the 1990 level

in deepwater production platform technology (TLP's and Spar's) also resulted in substantial cost savings, contributing to an improved economic climate for GOM deepwater development. These advances, coupled with subsea technology (previously used more extensively in other offshore arenas), all worked in concert to create sizeable cost reductions in deepwater development and production scenarios.

The year 1994 saw oil prices continue a downward trend to \$13.19/STB (a 7% decrease from the previous year and a 34% decrease from 1990). Gas prices edged downward to \$1.85/MCF (a 7% decrease from the previous year but a 6% increase from the 1990 value of \$1.71/MCF). This strengthening of gas prices relative to oil prices from 1990 to 1994 also contributed to the GOM comeback, since GOM production is approximately two-thirds gas and one-third oil on a barrel of oil equivalent (BOE) basis. The number of tracts bid upon for the CGOM and WGOM surged to 585 (a 63% increase from the previous year and a 176% increase from the 1992 level of 212). POE approvals and the number of exploratory wells drilled increased to 345 and 360, representing increases of 8 percent and 21 percent, respectively, over the previous year. DOCD approvals jumped to 282 (a 51% increase over the previous year), while the number of development wells drilled, 514, represented a slight increase, 2 percent, from the 1993 level of 506 development wells drilled. Daily oil production averaged 860,000 STBPD and daily gas production averaged 13.2 BCFPD.

of \$1.71/MCF). The deepwater technological revolution had already begun, however, and bidding and activity levels were increasing. Tracts bid upon in the CGOM and WGOM sales totaled 863, an increase of 48 percent

over the previous year and slightly above the 1990 bidding activity level of 845 tracts. The number of POE's approved dropped slightly to 325 (a 6% decrease from 1994), as did the number of exploratory wells drilled, 353 (a 2% decrease from the 1994 level of 360). DOCD approvals similarly dropped slightly to 253 (a 10% decrease from 1994), while the number of development wells drilled increased to 602 (a 17% increase over the 1994 level of 524). Daily oil production averaged 945,000 STBPD and daily gas production averaged 13.1 BCFPD.

November 28, 1995, became a historic day for the CGOM and WGOM planning areas. On that day President Clinton signed Public Law 104-58. Title III of this law, Outer Continental Shelf Deep Water Royalty Relief, became known as the Deep Water Royalty Relief (DWRR) Act. This legislation, while providing DWRR for leases in existence prior to November 28, 1995, through an application process, really provided a major incentive for bidders to purchase tracts in the CGOM and WGOM planning areas from 1996 through 2000. This incentive involves automatic royalty relief in the amounts of 17.5 MMBOE in water depths from 200 to 400 meters, 52.5 MMBOE in water depths from 400 to 800 meters, and 87.5 MMBOE in water depths >800 meters. Coupled with higher oil and gas prices in 1996, \$18.46/STB and \$2.17/MCF (a 26% increase in oil prices and a 40% increase in gas prices), record bidding levels were achieved in 1996. The number of tracts bid upon in the CGOM sale in 1996 was 924, an increase of 57 percent over the 588 bid upon in the CGOM sale in 1995. The WGOM sale in 1996 experienced an even more dramatic increase, with 617 tracts receiving bids compared to 275 in 1995, a startling 125 percent increase. The number of POE Oil prices plummeted in 1998, reaching the lowest levels in over 10 years, when prices

approvals increased from 325 in 1995 to 415 in 1996 (a 27% increase), with exploratory wells drilled increasing to 394 (a 12% increase over the 353 drilled in 1995). DOCD approvals increased from 253 in 1995 to 345 in 1996 (a 36% increase) with development wells drilled increasing to 639 (a 6% increase over the 602 drilled in 1995). Daily oil production averaged 1,010,000 STBPD, and daily gas production averaged 13.9 BCFPD.

In 1997, oil prices dropped slightly to \$17.24/STB (down from \$18.46 in 1996, a 7% decrease), while gas prices jumped to their highest level of the 1990's at \$2.42/MCF (up from \$2.17/MCF in 1996, a 12% increase). Additional deepwater fields came on production from 1995 through 1997 (BP Exploration-Pompano II, 1996; Enserch-Cooper, 1995; Oryx-Neptune/Thor, 1997; Shell-Rocky, 1996; Shell-Popeye, 1996; Shell-Mensa, 1997; Shell-Mars, 1996; Shell-Ram Powell, 1997; and Walter Oil and Gas-VK 862, 1995). The advances in deepwater exploration, development, and production technology continued to gain momentum. Now in the second year of sales with automatic DWRR, the CGOM set a new record with 1,032 tracts receiving bids (a 12% increase over the 924 tracts receiving bids in 1996) as did the WGOM, with 804 tracts receiving bids (a 30% increase over the 617 tracts receiving bids in 1996). POE approvals increased to 439 (a 6% increase over 1996) with exploratory wells drilled reaching their highest level in the 1990's at 481. DOCD approvals increased to 370 (a 7% increase over 1996), with development drilling also reaching its highest level in the 1990's at 789. Daily oil production averaged 1,123,000 STBPD, and daily gas production averaged 14.1 BCFPD.

dropped on the spot market below \$10.00/STB for a few days. Gas prices have

remained reasonably strong. Bidding activity in the CGOM sale exhibited a 23 percent decrease from 1997 (1,032 tracts receiving bids in 1997 vs. 794 tracts receiving bids in 1998). The WGOM sale exhibited an even larger decrease in bidding activity, 50 percent, from 804 tracts receiving bids in 1997 vs. 402 tracts receiving bids in 1998. The number of POE approvals decreased from 439 in 1997 to 413 in 1998 (a 6% decrease) with exploratory wells drilled increasing to 490, an increase of 2 percent from the 481 drilled in 1997. DOCD approvals demonstrated a decreasing trend from 370 in 1997 to 282 in 1998 (a 24% decrease) with development wells drilled decreasing to 638 (a 19% decrease from the 789 drilled in 1997). At the time of writing this article, MMS had complete monthly production figures through September 1998. Average daily production figures through September 1998 are 1,220,000 STBPD for oil and 13.8 BCFPD for gas. Production from some GOM fields was shut in for part of September because of hurricane activity. Oil and gas production for September is noticeably lower on a per-day basis than August's production. For the purposes of this report, however, September's oil and gas production totals were added to the production totals for the previous eight months and divided by 273 days. Exploratory wells drilled were the only activity measurement factor demonstrating an increase in 1998.

Throughout this paper, average daily oil and gas production figures were provided without comment. These figures illustrate how Gulf of Mexico OCS Federal production steadily increased during the 1990's. Further, the increasing impact of deepwater activity is evident. In 1990, the percent of daily oil and gas production from deepwater fields was 4 percent and <1 percent, respectively. By 1994, those percentages increased to 10 percent for daily oil production and

4 percent for daily gas production and, in 1997, those percentages further increased to 25 percent for daily oil production and 8 percent for daily gas production. Through September 1998, 35 percent of the daily oil production and 11 percent of the daily gas production is attributable to the deepwater GOM.

MMS Report 99-0016 provides GOM OCS daily oil and gas production rate projections from 1999 through 2003. Tables 2 and 3 from that report are reproduced here:

Table 2. -- Daily Oil and Gas Production Rate Projections-GOM

	1999	2000	2001	2002	2003
Low Oil MBOPD* (Decline Used)	1,488	1,514	1,537	1,434	1,381
High Oil MBOPD* (No Decline Used)	1,731	1,825	1,910	1,846	1,836
Low Gas BCFPD** (Decline Used)	13.15	12.78	12.27	11.56	10.91
High Gas BCFPD** (No Decline Used)	15.66	16.26	16.59	16.60	16.61

*Oil in MBOPD includes condensate

**Gas in BCFPD includes associated or casinghead gas

Table 3. -- Daily Oil and Gas Production Rate Projections Separated into Deepwater and Shallow-water Fields

	1999	2000	2001	2002	2003
Low-case Deepwater Oil MBOPD*	781	862	937	881	872
High-case Deepwater Oil MBOPD*	898	992	1,078	1,013	1,003
Low-case Shallow-water Oil MBOPD*	707	651	600	553	509
High-case Shallow-water Oil MBOPD*	833	833	833	833	833
Low-case Deepwater Gas BCFPD**	2.43	2.91	3.17	3.18	3.19
High-case Deepwater Gas BCFPD**	3.03	3.63	3.96	3.97	3.98
Low-case Shallow-water Gas BCFPD**	10.72	9.87	9.10	8.38	7.72
High-case Shallow-water Gas BCFPD**	12.63	12.63	12.63	12.63	12.63

*Oil in MBOPD includes condensate

**Gas in BCFPD includes associated or casinghead gas

IV. SUMMARY

The 1990's witnessed the transformation of the Gulf of Mexico OCS from the "dead sea" to "the place to be," from record lows in some activities in 1992 to record highs in 1997. Daily oil and gas production projections indicate record Gulf of Mexico OCS production levels through 2001 and possibly later. This, of course, could change if oil prices continue to remain depressed for an extended period of time. The deepwater technological revolution, coupled with automatic DWRR for CGOM and WGOM sales through the year 2000 and long-term

deepwater drilling commitments by GOM operators, should ensure continued robust activity levels in the Gulf of Mexico OCS into the first few years of the new millennium.

*Regg, Jim. "Gulf of Mexico Activities and OCS Regulatory Trends," <http://www.gomr.mms.gov/homepg/whatsnew/speeches/segrnt98/segrnt98.html>, March 27, 1998 (Accessed August 4, 1998).