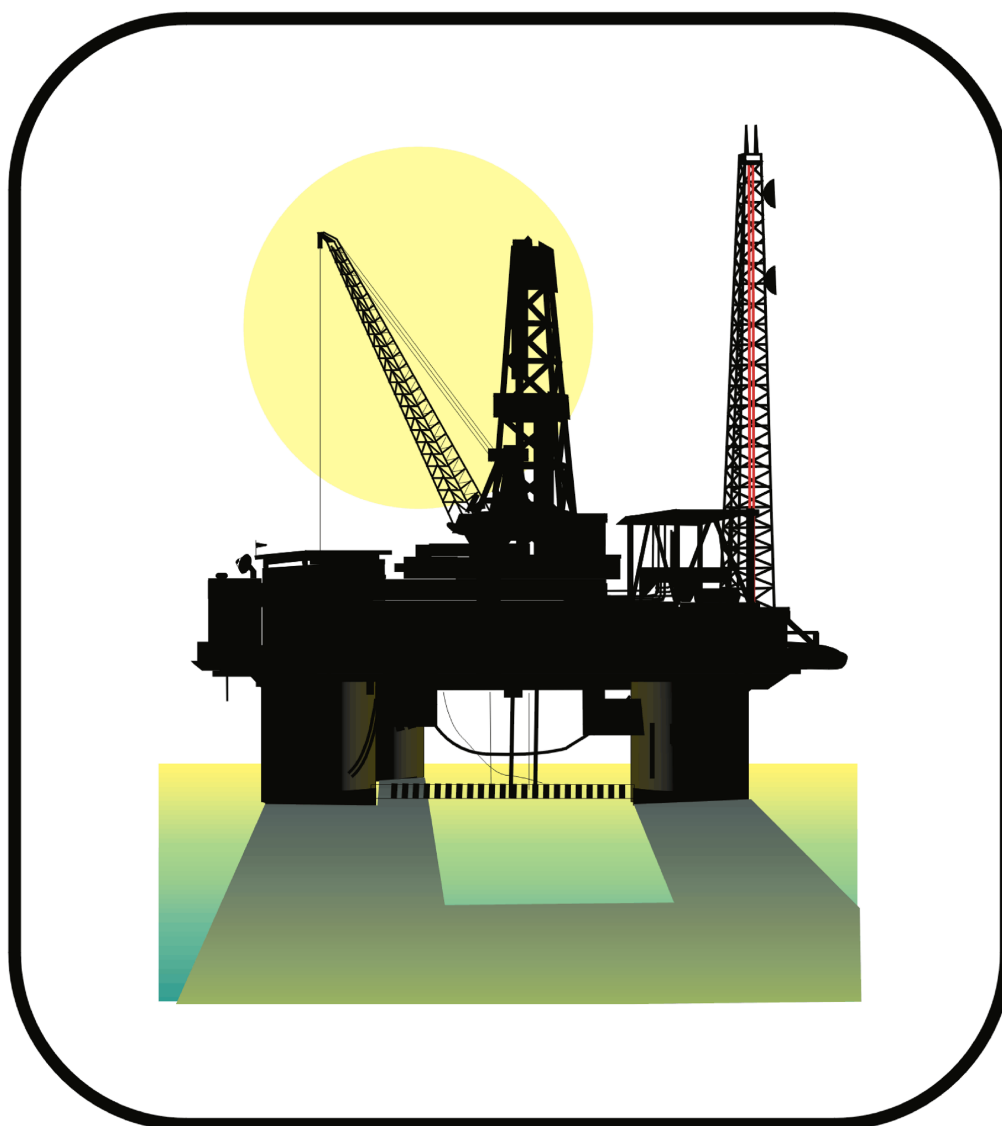


Gulf of Mexico Outer Continental Shelf Daily Oil and Gas Production Rate Projections From 2002 Through 2006



June 2002



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Table of Abbreviations

BCFPD	billion cubic feet per day
DOCD	Development Operations Coordination Document
DWRR	Deepwater Royalty Relief
EP	Exploration Plan
GOM	Gulf of Mexico
MBOPD	thousand barrels of oil per day
MMCFPD	million cubic feet per day
MMS	Minerals Management Service
OCS	Outer Continental Shelf

Introduction

This paper provides daily oil and gas production rate projections for the Gulf of Mexico (GOM) Outer Continental Shelf (OCS) for the years 2002 through 2006. These projections represent average daily oil and gas production estimates for each calendar year.

In this report, daily oil production rates include both oil and condensate production, and daily gas production rates include both associated and nonassociated gas production.

Deepwater fields are defined as those with an average water depth greater than or equal to 1,000 feet.

In recognition of an acceleration in deepwater technology and progression into deeper waters, this report also presents projections using a deepwater definition of greater than or equal to 1,500 feet. This information is included in tables and graphics in the Appendix.

In addition to providing daily oil and gas production rate projections, we include one figure and one table pertaining to leasing history and one table concerning exploration and development plan approvals. These are provided as supportive background information for our projections as well as information indicative of current interest and activity in the GOM.

Daily Production Rate Projections

The production rate projections presented in this report include high- and low-range estimates of future daily oil (oil and condensate) and gas (associated and nonassociated) production for the GOM during the years 2002-2006.

Methodology

We determined shallow-water production rates for this report using a decline analysis of historical, shallow-water GOM production rates. This decline analysis was first used in last year's report (Melancon et al., 2001). We determined deepwater production rates for this report using the same method used in preparing last year's report—a survey of operators.

The following assumptions are integral to the validity of this methodology:

1. We assume that the same factors that have influenced the cumulative shallow-water production rates over the past 20 years will similarly affect the production rates over the next 5 years. These factors include but are not limited to

- Rate of reserves replacement.
- Availability of pipelines and processing facilities to handle production.
- Ability of operators to obtain necessary equipment and personnel to develop new reserves.
- The effect that new technology has on finding and developing reserves.

2. The high-case scenarios for oil and gas assume that shallow-water production will increase at the same rate as observed during the last period of sustained shallow-water increase. This results in a 2.8 percent increase for shallow-water oil production (similar to the 1992-1997 increase) and a 4.2 percent increase for shallow-water gas production (similar to the 1986-1990 increase).

3. For the low-case oil and gas projections, we assume that shallow-water production rates will decline at the same rate as observed during the last period of sustained shallow-water declines. This results in a 6.1 percent decline for oil (1997-2000) and a 5.2 percent decline for gas (1996-2000).

4. We assume that all discovered deepwater fields that will begin production prior to 2007 were reported in our operator survey, and that the operators accurately predicted future production rates (within 7 to 8 percent) for these fields.

Low-case Production Rate Projections

The average daily low-case, shallow-water oil and gas production rates for 2002 to 2006 were calculated using the estimated average daily production rates for oil and gas in 2001 and the decline rate determined above.

We ranged the deepwater production rate projections by assuming an error range of 7 percent for oil and 8 percent for gas (Melancon and Baud, 2000).

The total projected average daily low-case production rates for 2002 to 2006 were calculated by adding low-case shallow-water production rates to the low-case deepwater production rates.

High-case Production Rate Projections

The average daily high-case shallow-water production rates for 2002 to 2006 were calculated using the average daily production rates for oil and gas in 2001 and the increase rate determined above. The average daily high-case, deepwater production rates were calculated by adding 7 percent (oil) or 8 percent (gas) to estimated production rates for deepwater projects obtained from a survey of operators. The total high-case production rate projections were then obtained by adding the high-case shallow- and deepwater estimates.

Results

Table 1 lists 56 deepwater fields that have begun production and the 30 fields projected

to begin production through the year 2006. Note that some fields listed in previous reports are absent because the average field water depth dropped below 1,000 feet (average field water depth is an arithmetic average of all wells within the field), the project was cancelled or delayed, or the operator was unwilling to release the information. Note also that some fields in this table include multiple prospects but are combined according to the manner reported by operators or the manner in which MMS defines fields.

Table 2 and Figures 1 and 2 provide the high- and low-range daily oil and gas rate projections in tabular and graphical forms, respectively. Table 3 and Figures 3 and 4 separate shallow- and deepwater production rate projections.

Undiscovered or unreported fields in any water depth coming on production by the year 2007 will further increase these daily production totals.

**Table 1. — Deepwater Fields on Production or Expected to Commence Production by
Yearend 2006**

Operator	Field Nickname	Block	Water Depth (FT)	Year of First Production
Shell	Cognac	MC 194	1,023	1979
ExxonMobil	Lena	MC 281	1,017	1984
Oryx	Unnamed	GC 75	2,172	1988*
Placid	Unnamed	GC 29	1,554	1988*
Shell	Bullwinkle	GC 65	1,330	1989
Conoco	Jolliet	GC 184	1,724	1989
BP	Amberjack	MC 109	1,050	1991
Oryx	Diamond	MC 445	2,095	1993*
Tatham	Seattle Slew	EW 914	1,019	1993*
ExxonMobil	Zinc	MC 354	1,475	1993
Shell	Auger	GB 426	2,863	1994
BP	Pompano/Pompano II	VK 990	1,440	1994
Shell	Tahoe/ Tahoe II	VK 783	1,391	1994
EEX	Cooper	GB 387	2,260	1995*
Walter	Unnamed	VK 862	1,043	1995
Shell	Mars	MC 807	2,992	1996
Shell	Popeye	GC 116	2,065	1996
Shell	Rocky	GC 110	1,719	1996
Shell	Mensa	MC 731	5,276	1997
Kerr McGee	Neptune/Thor	VK 825	1,866	1997
Shell	Ram-Powell	VK 956	3,243	1997
BP	Troika	GC 244	2,679	1997
Marathon	Arnold	EW 963	1,752	1998
Amerada Hess	Baldpate	GB 260	1,604	1998
Agip	Morpeth/Klamath	EW 921	1,747	1998
Shell	Salsa	GB 171	1,121	1998
Agip	Allegheny	GC 254	3,194	1999
Shell	Angus	GC 112	1,901	1999
ExxonMobil	Diana	EB 945	4,670	1999
Mariner	Dulcimer	GB 367	1,123	1999
ChevronTexaco	Genesis	GC 205	2,597	1999
ChevronTexaco	Gemini	MC 292	3,488	1999
Shell	Macaroni	GB 602	3,691	1999
Mariner	Pluto	MC 718	2,748	1999
Walter	Unnamed	EW 1006	1,832	1999
Shell	Ursa	MC 810	3,877	1999
TotalFinaElf	Virgo	VK 823	1,136	1999
Shell	Europa	MC 935	3,880	2000
ExxonMobil	Hoover	AC 25	4,806	2000
BP	Marlin	VK 915	3,300	2000
Amerada Hess	Northwestern	GB 200	1,261	2000
ChevronTexaco	Petronius	VK 786	1,753	2000
Shell	Brutus	GC 158	2,952	2001
Shell	Einset	VK 873	3,584	2001
Shell	Crosby	MC 899	4,400	2001
ATP	Ladybug	GB 409	1,357	2001
ExxonMobil	Madison	AC 24	4,854	2001
ExxonMobil	Marshall	EB 949	4,376	2001
ExxonMobil	Mica	MC 211	4,337	2001
BP	Nile	VK 914	3,535	2001
Shell	Oregano	GB 559	3,400	2001
Argo	Prince	EW 958	1,493	2001
Shell	Serrano	GB 516	3,359	2001
ChevronTexaco	Typhoon	GC 236	2,679	2001
Walter	Unnamed	EW 878	1,585	2001
Walter	Unnamed	MC 68	1,214	2001
Amerada Hess	Tulane	GB 158	1,300	2002
BP	King/Horn Mountain	MC 84	5,385	2002
BP	King's Peak	MC 217	6,400	2002
Unreleasable	Unreleasable	Unreleasable	Unreleasable	2002

Table 1. (Continued) — Deepwater Fields on Production or Expected to Commence Production by Yearend 2006

Operator	Field Nickname	Block	Water Depth (FT)	Year of First Production
Kerr-McGee	Nansen	EB 602	3,677	2002
Kerr-McGee	N. Boomvang	EB 643	3,548	2002
Kerr-McGee	Navajo	EB 690	4,300	2002
Marathon	Camden Hills	MC 348	7,210	2002
Mariner	King Kong	GC 472	3,799	2002
Total Fina Elf	Aconcagua	MC 305	7,043	2002
Unreleasable	Unreleasable	Unreleasable	Unreleasable	2003
Mariner	Unnamed	EB 579/623	3,400	2003
Shell	Ariel/Nakika	MC 429	6,274	2003
Shell	East Anstey/Nakika	MC 607	6,590	2003
Shell	Fourier/Nakika	MC 522	6,950	2003
Shell	Herschel/Nakika	MC 520	6,739	2003
Shell	Keppler/Nakika	MC 782	5,800	2003
Total Fina Elf	Matterhorn	MC 243	3,085	2003
Unreleasable	Unreleasable	Unreleasable	Unreleasable	2004
Unreleasable	Unreleasable	Unreleasable	Unreleasable	2004
Unreleasable	Unreleasable	Unreleasable	Unreleasable	2004
Unreleasable	Unreleasable	Unreleasable	Unreleasable	2004
Unreleasable	Unreleasable	Unreleasable	Unreleasable	2004
Kerr-McGee	Gunnison	GB 668	3,124	2004
Unreleasable	Unreleasable	Unreleasable	Unreleasable	2005
Unreleasable	Unreleasable	Unreleasable	Unreleasable	2005
Unreleasable	Unreleasable	Unreleasable	Unreleasable	2005
Unreleasable	Unreleasable	Unreleasable	Unreleasable	2005
Unreleasable	Unreleasable	Unreleasable	Unreleasable	2005
Unreleasable	Unreleasable	Unreleasable	Unreleasable	2005

*Indicates fields that are no longer on production.

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

	2002	2003	2004	2005	2006
Low Oil MBOPD* (Decline Used)	1,585	1,498	1,430	1,666	2,002
High Oil MBOPD* (No Decline Used)	1,789	1,743	1,719	2,041	2,478
Low Gas BCFPD** (Decline Used)	13.50	13.26	12.57	11.98	10.97
High Gas BCFPD** (No Decline Used)	15.09	15.89	16.16	16.52	16.39

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

	2002	2003	2004	2005	2006
Low-case Deepwater Oil MBOPD*	1,003	951	917	1,184	1,550
High-case Deepwater Oil MBOPD*	1,154	1,094	1,055	1,363	1,783
Low-case Shallow-water Oil MBOPD*	582	547	513	482	453
High-case Shallow-water Oil MBOPD*	634	649	664	679	695
Low-case Deepwater Gas BCFPD**	3.40	3.69	3.50	3.37	2.81
High-case Deepwater Gas BCFPD**	3.99	4.33	4.11	3.96	3.30
Low-case Shallow-water Gas BCFPD**	10.10	9.57	9.07	8.60	8.15
High-case Shallow-water Gas BCFPD**	11.10	11.56	12.05	12.55	13.08

*Oil in MBOPD includes condensate.

**Gas in BCFPD includes associated or casinghead gas.

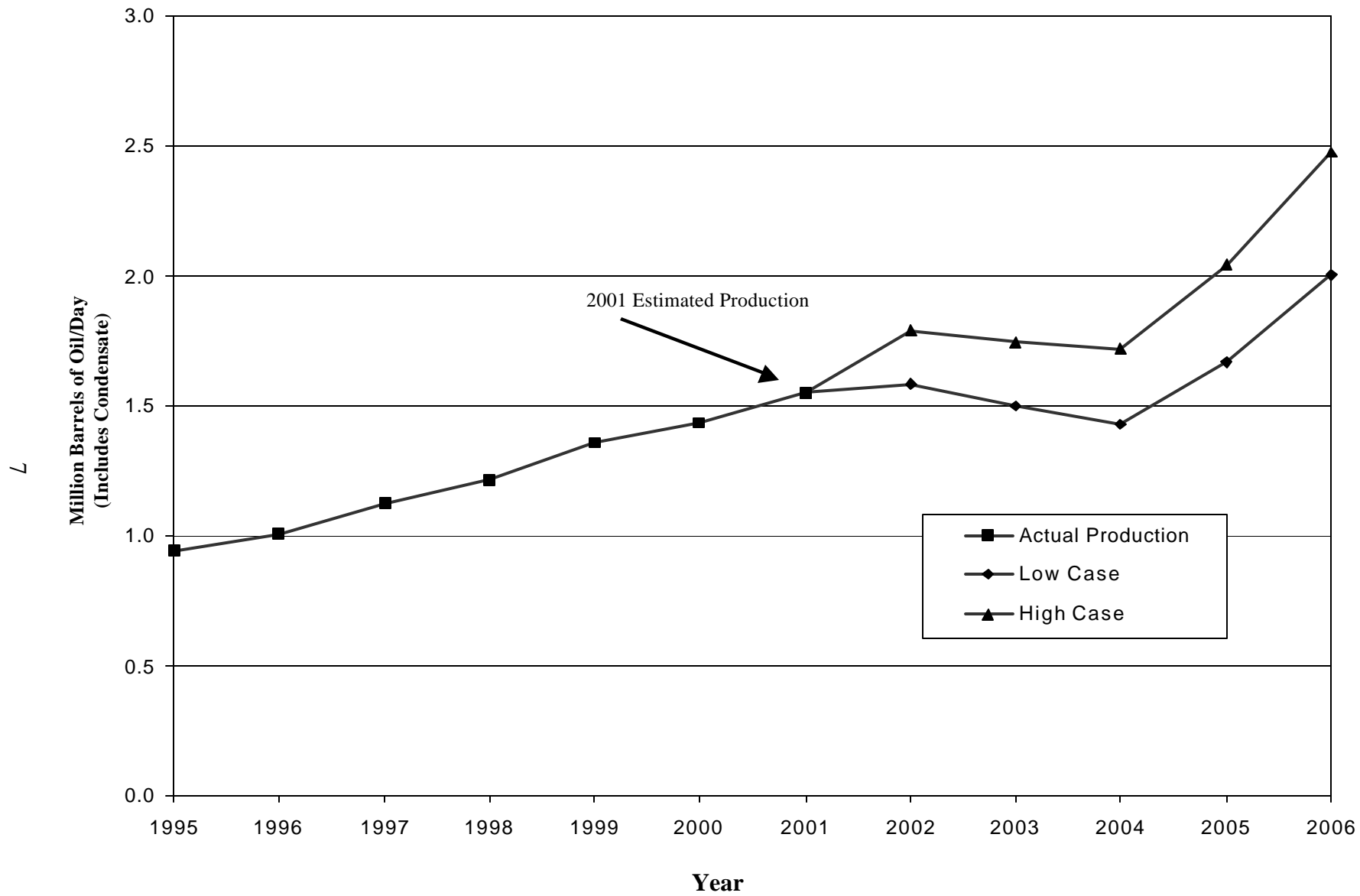


Figure 1. - Oil Production Rate Projections, Gulf of Mexico Region

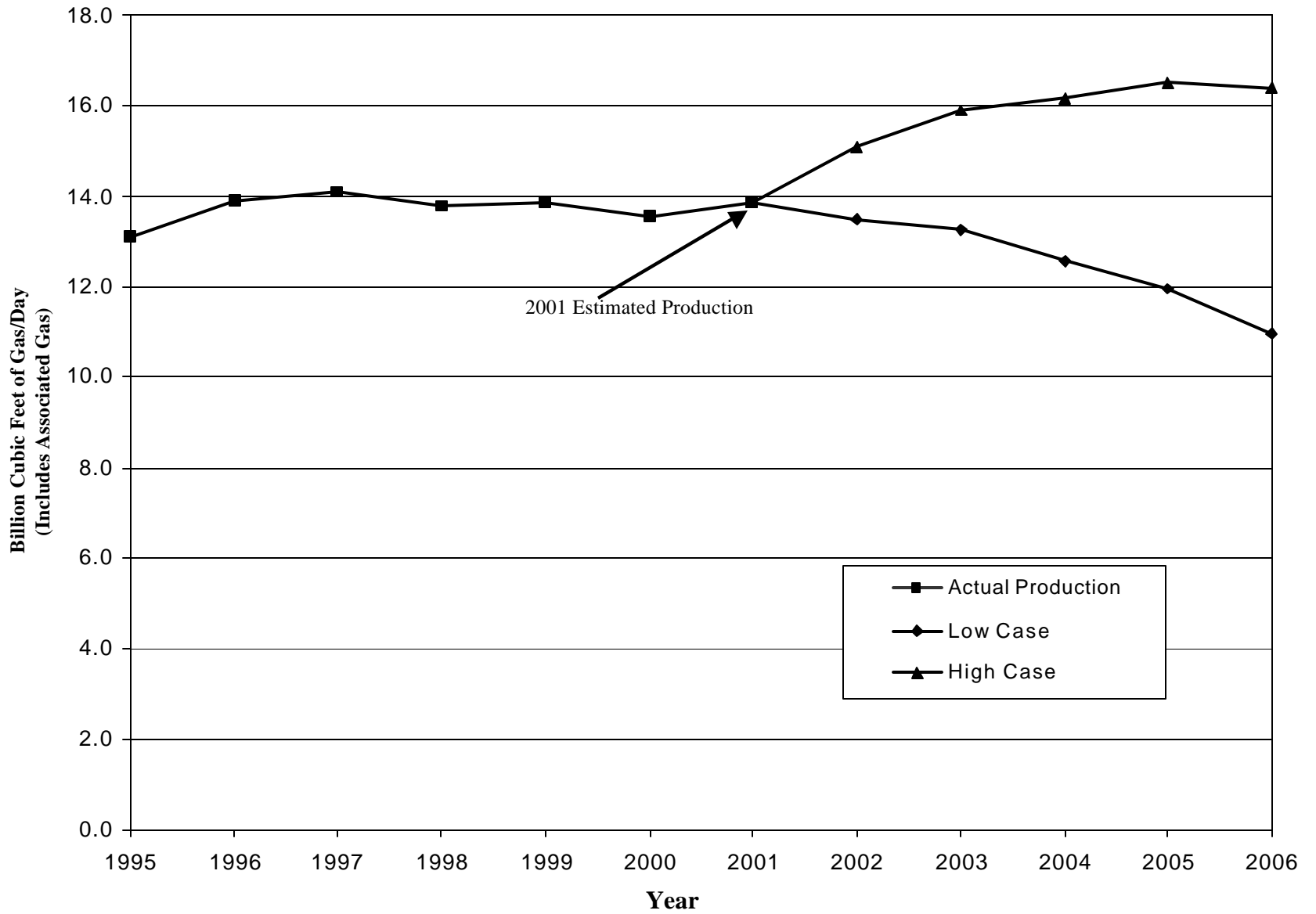


Figure 2. - Gas Production Rate Projections, Gulf of Mexico Region

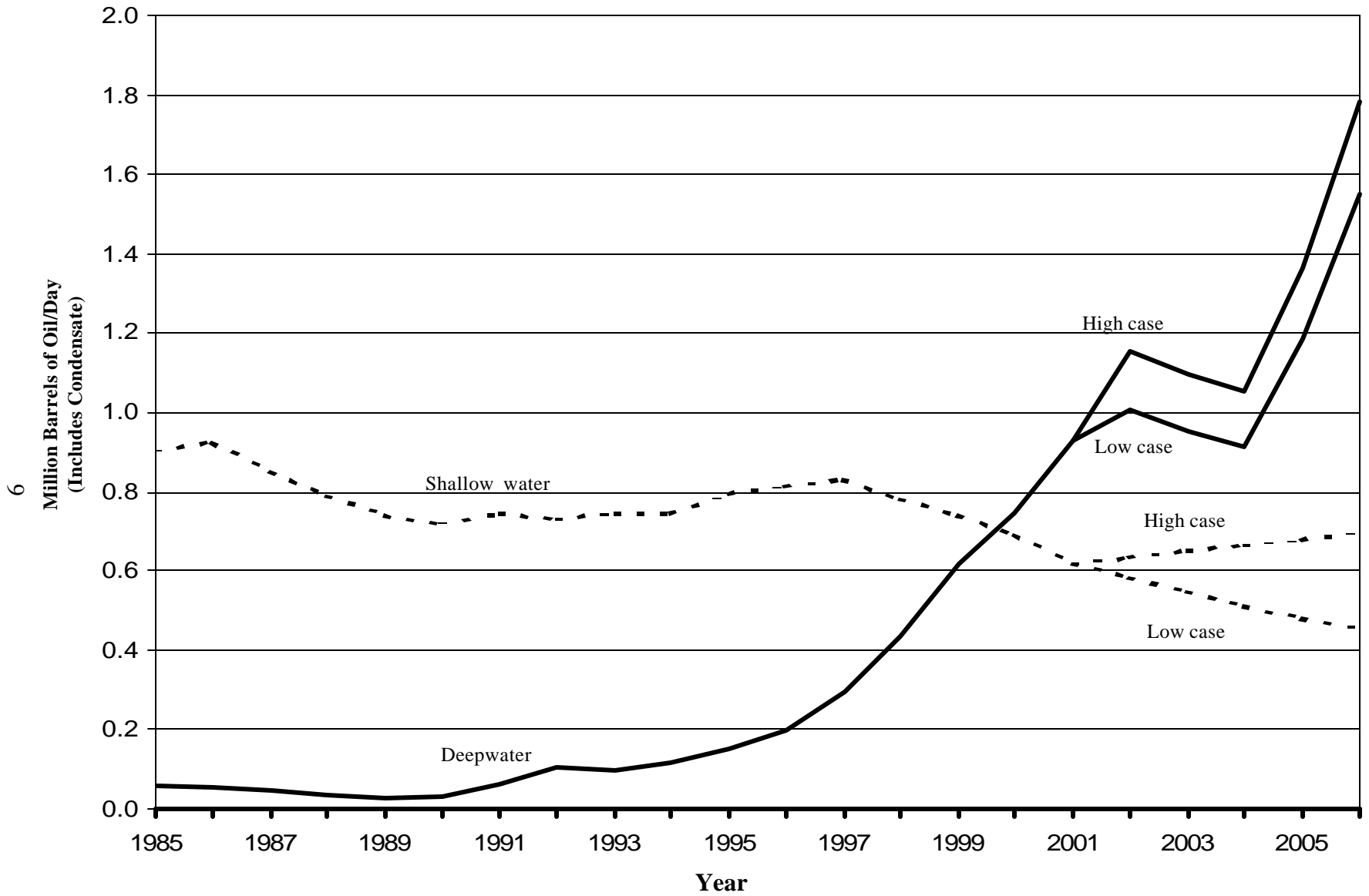


Figure 3. - Historical and Projected Oil Production Rates for Shallow and Deepwater

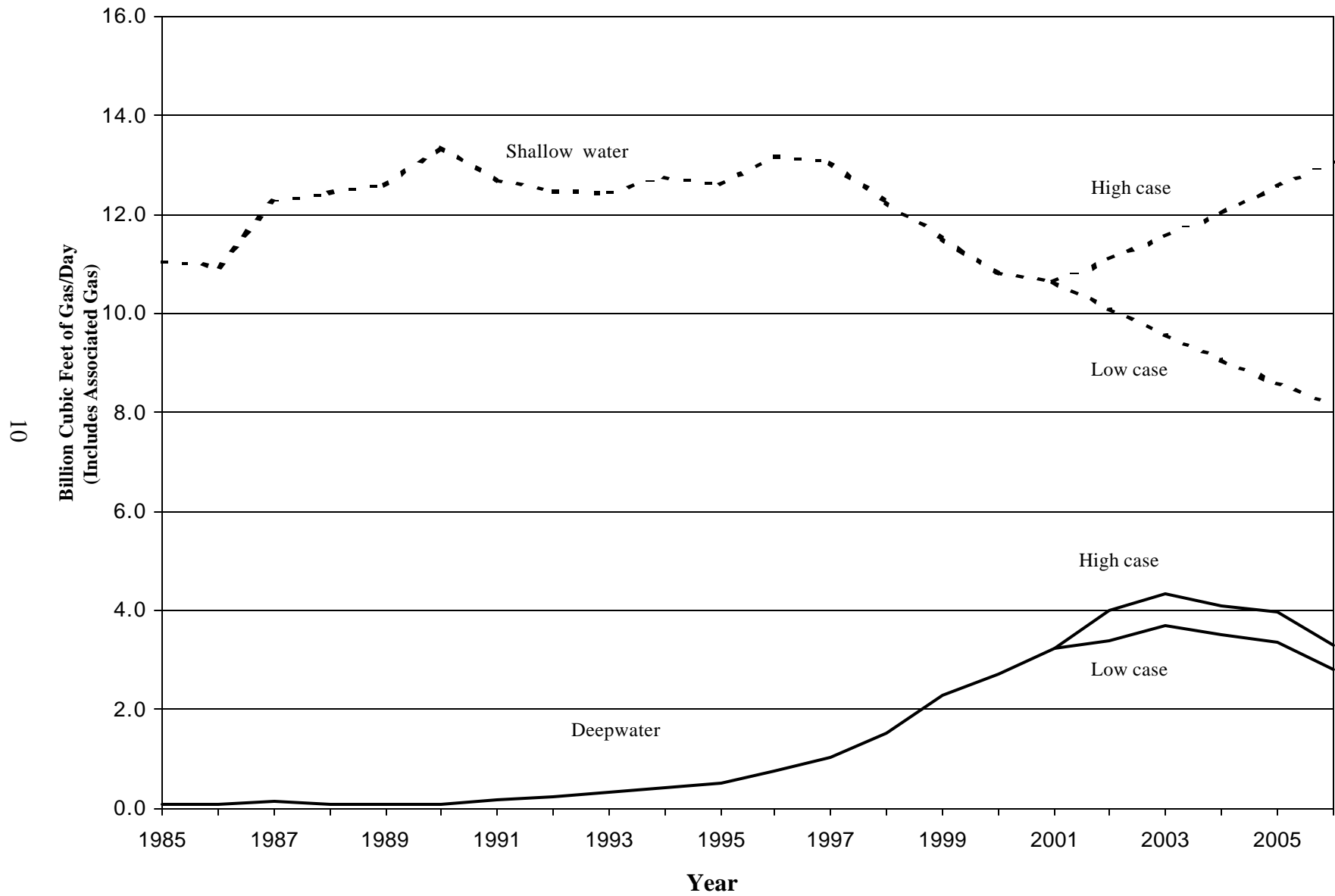


Figure 4. - Historical and Projected Gas Production Rates for Shallow and Deepwater

Analysis

Last year's report, MMS 2001-0044 (May 2001), projected yearend 2005 daily production rates of between 1,526 MBOPD and 1,967 MBOPD for oil and between 11.10 BCFPD and 16.54 BCFPD for gas. Ranging projections in this manner was necessary to account for the uncertainties in future production projections for currently producing fields. Our future production projections for the hundreds of currently producing fields are ranged because decline analysis alone may not accurately represent the effects of recompletions, new wells, workovers, etc., in offsetting field decline rates. Our projections for new fields (beginning production in 2002, 2003, etc.) are similarly ranged by applying error estimates ($\pm 7\%$ oil and $\pm 8\%$ gas) to operator predictions.

When this present report was formulated, May 2001 was the latest complete available month of production. Therefore, we cannot compare 2001 actual production to the projections in last year's report, which were between 1,376 and 1,547 MBOPD for oil and between 12.86 and 14.34 BCFPD for gas. Estimated Year 2001 total GOM production is 1,550 MBOPD for oil and 13.87 BCFPD for gas. (These estimates are based on actual production data through May 2001, reported royalty-meter volumes, and the operator survey.)

Figures 5 and 6 provide a graphical comparison of the daily oil and gas production projections from the 2001 report and this report. The estimated 2001 production rates for oil generally fall within the predicted range of last year's report. Gas rates from the 2001 report fall below projections of this report.

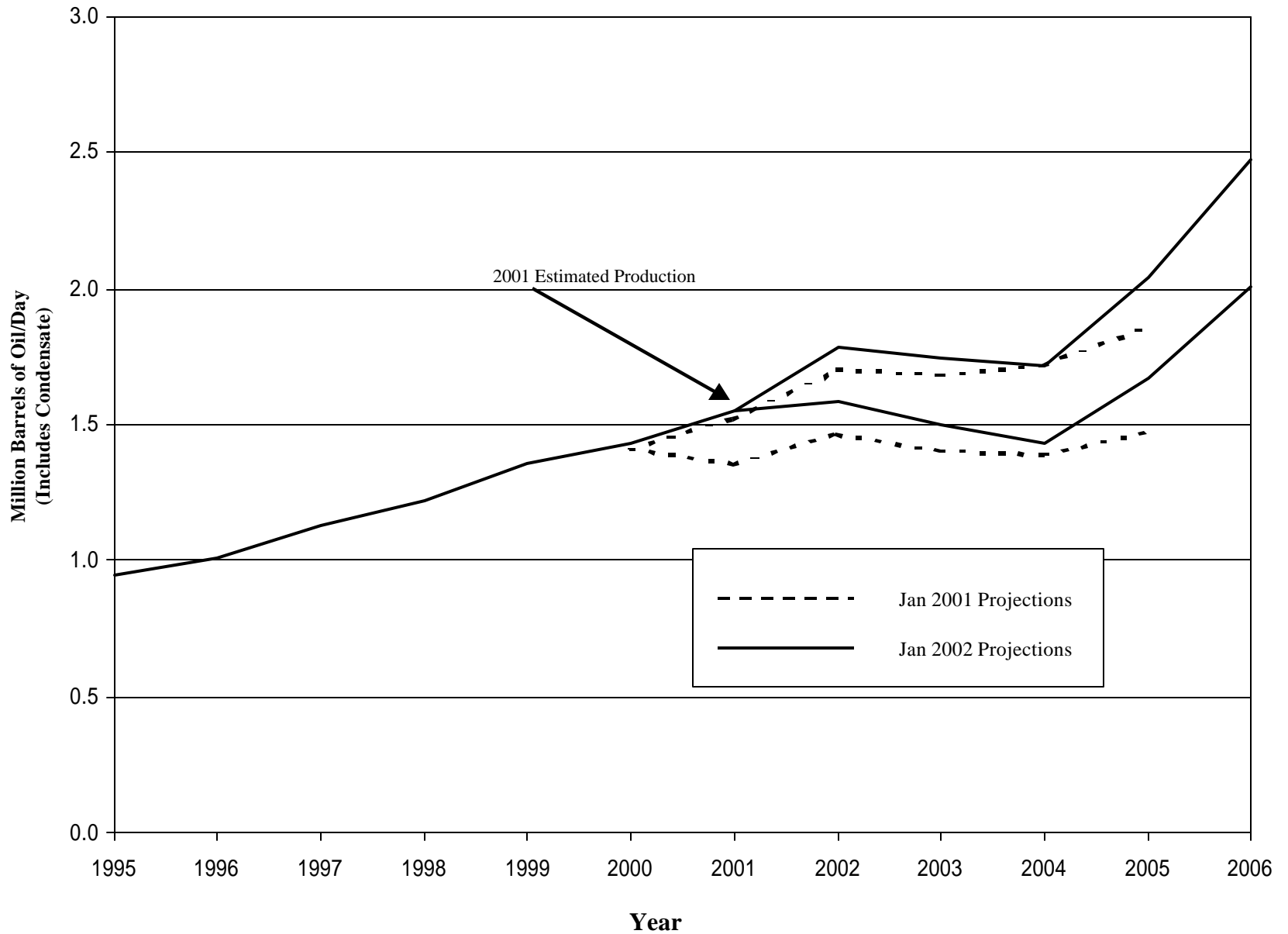


Figure 5. - Comparison of Current (January 2002) and Previous Oil Production Projections, Gulf of Mexico Region

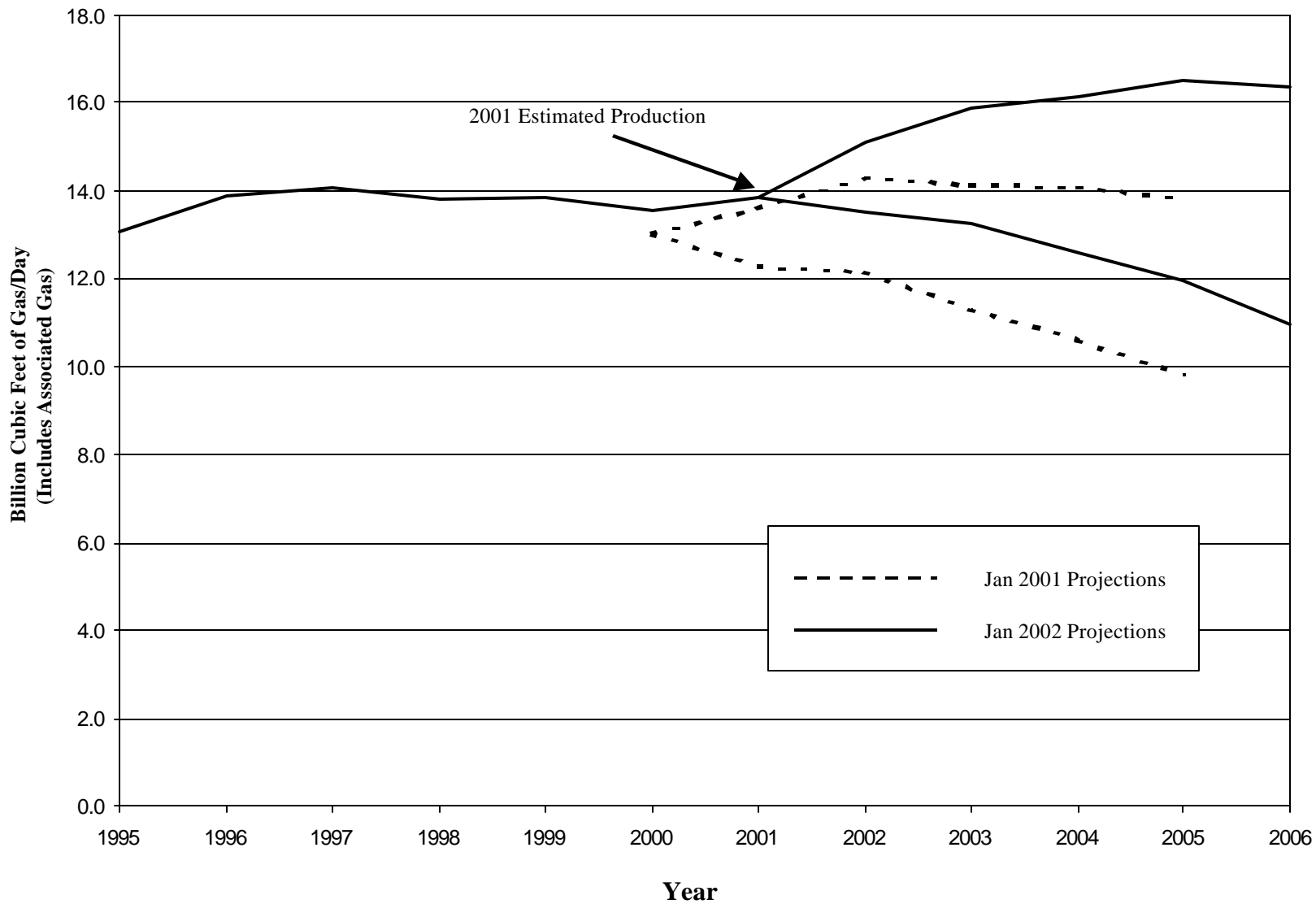


Figure 6. - Comparison of Current (January 2002) and Previous Gas Production Projections, Gulf of Mexico Region

Leasing and Development Plan Activity

The total number of tracts receiving bids in the Gulf of Mexico OCS over the last 13 years demonstrates a flurry of activity from 1996 to 1998. This activity is evident in Figure 7, which indicates that over 2.5 times as many leases received bids during this 3-year span (1996-1998) than the previous three years (1993-1995). However, leasing activity sharply declined in 1999, with a moderate but building recovery in 2000 and 2001. Notably, in 2001 the Eastern Gulf of Mexico received its first bids since 1988.

The large increase in bidding activity from 1996 to 1998 was partly attributable to the passage of Public Law 104-58, Title III, the OCS Deepwater Royalty Relief (DWRR) Act, signed on November 25, 1995. It is apparent from Table 4 that the largest increase by far was in water depths > 800 meters. During 1999-2001, however, the trend reversed.

It should be pointed out that, in addition to the positive effects of the OCS Deepwater Royalty Relief Act upon industry bidding strategies, several other factors such as high oil and gas production rates from deepwater reservoirs, the evolution of economic deepwater development technology, and the reduced risk of deepwater exploratory and development drilling, among other factors, also had a significant impact.

Development plan (DOCD) approvals increased substantially from 1993 through the end of 1997, but decreased in 1998 and 1999 as shown in Table 5. Exploratory plan (EP) approvals also increased from 1993 through 1997. However, the decrease in exploratory plan approvals was minimal in 1998 and 1999 when compared with the drop in development plan approvals. Development and Exploratory Plan approvals increased in 2001.

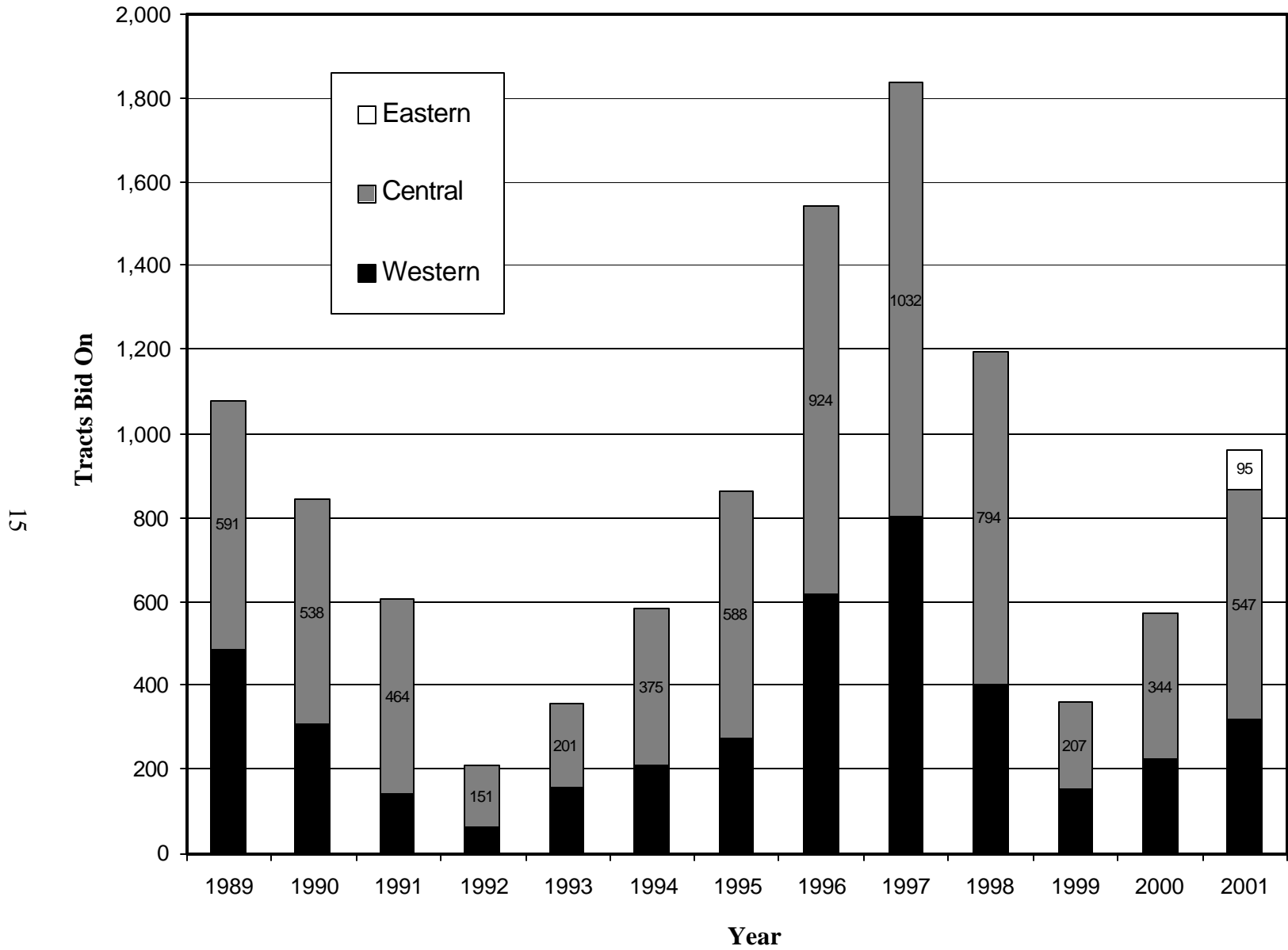


Figure 7. - 13 Year Bidding Trend in the Gulf of Mexico

**Table 4. — Gulf of Mexico OCS Bids 1994-2001; Before and After Royalty Relief
(Years 1996 through 2001 include Royalty Relief)**

Water Depth	1994	1995	1996	1997	1998	1999	2000	2001
<200M	490	516	637	542	279	173	331	453
200-400M	18	50	69	52	38	16	14	33
400-800M	28	83	113	104	61	18	28	74
>800M	49	214	722	1,138	817	153	197	382
	585	863	1,541	1,836	1,195	360	570	942

**Table 5. — Exploration Plans (EP) and Development Operations Coordination
Documents (DOCD) by Calendar Year**

<u>Calendar Year</u>	<u>EP's Approved</u>	<u>DOCD's Approved</u>
1993	337	220
1994	366	336
1995	351	301
1996	420	347
1997	439	370
1998	409	280
1999	396	265
2000	424	364
2001	431	403

Conclusions

Deepwater oil and gas production rates were at an all-time high in 2001. Deepwater oil production continues to exceed shallow-water production. The projected deepwater oil production increases through 2006. Consequently, the peak in deepwater oil production is not expected within the next five years.

The Gulf of Mexico OCS should increase its daily oil production from 945 MBOPD in 1995 to a range between 2,002 MBOPD and 2,478 MBOPD by yearend 2006. The 1995 daily gas production rate of 13.09 BCFPD should change to a range between 10.97 BCFPD and 16.39 BCFPD by yearend 2006.

The Deep Gas Initiative, which began in March 2001 (Sale 178), offers royalty-relief incentives on shallow-water (< 200 meters) gas production from new reservoirs below 15,000-ft. subsea. This report does not reflect

the potential impact of these incentives because there are not enough data available yet to quantify their effect.

Furthermore, since the deepwater oil and gas projections are based on a survey of oil and gas lease operators, leases which begin production by the year 2006 not identified in the survey will also increase oil and gas production beyond these projections.

By yearend 2006, production from deepwater fields (greater than or equal to 1,000 feet) will account for 77 percent of the daily oil production and 26 percent of the daily gas production in the low case scenario, and 72 percent of the daily oil production and 20 percent of the daily gas production in the high case scenario.

Contributors

This report includes contributions from the following Minerals Management Service personnel:

Pat Bryars
Janice Todesco
Mike Tolbert

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Agip Petroleum Inc.
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EEX Corporation
El Paso Production
ExxonMobil Corporation
Kerr-McGee Corporation
Marathon Oil Company
Mariner Energy, Inc.
Murphy Exploration & Production Company
Shell Offshore Inc.
Total Fina Elf E&P USA, Inc.

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Melancon, J. M., Bongiovanni, R., and Baud, R. D., 2001, *Gulf of Mexico Outer Continental Shelf Daily Oil and Gas Production Rate Projections From 2001 Through 2005*, U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, OCS Report MMS 2001-044, New Orleans, 20 p.

Appendix

The following tables and graphs present projections of oil and gas rates for the Gulf of Mexico by employing a deepwater definition of greater than or equal to 1,500 feet.

Table A-1. — Daily Oil and Gas Production Rate Projections – GOM (deepwater \geq 1,500 Feet)

	2002	2003	2004	2005	2006
Low Oil MBOPD* (Decline Used)	1,583	1,512	1,445	1,689	2,031
High Oil MBOPD* (No Decline Used)	1,780	1,763	1,758	2,087	2,537
Low Gas BCFPD** (Decline Used)	13.66	13.53	12.86	12.28	11.35
High Gas BCFPD** (No Decline Used)	15.24	16.23	16.58	17.02	17.04

Table A-2. — Daily Oil and Gas Production Rate Projections Separated into Deepwater (1,500 Feet) and Shallow-water Fields.

	2002	2003	2004	2005	2006
Low-case Deepwater Oil MBOPD*	911	881	862	1,132	1,508
High-case Deepwater Oil MBOPD*	1,048	1,013	991	1,303	1,735
Low-case Shallow-water Oil MBOPD*	672	631	593	557	523
High-case Shallow-water Oil MBOPD*	732	749	767	784	802
Low-case Deepwater Gas BCFPD**	2.96	3.38	3.24	3.16	2.70
High-case Deepwater Gas BCFPD**	3.47	3.97	3.80	3.71	3.17
Low-case Shallow-water Gas BCFPD**	10.71	10.15	9.62	9.12	8.65
High-case Shallow-water Gas BCFPD**	11.77	12.26	12.78	13.31	13.87

*Oil in MBOPD includes condensate.

**Gas in BCFPD includes associated or casinghead gas.

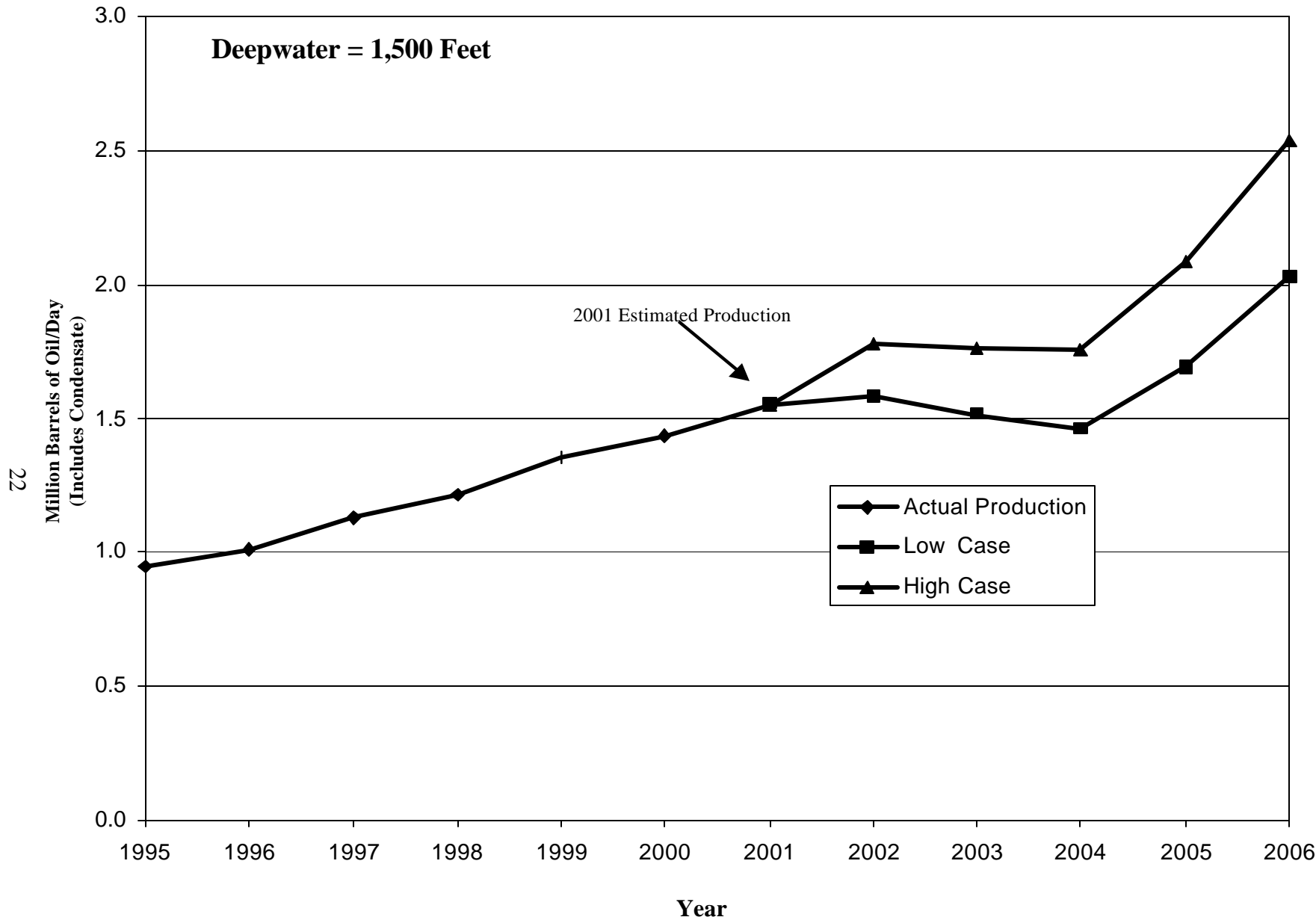


Figure A1. - Oil Production Rate Projections, Gulf of Mexico Region

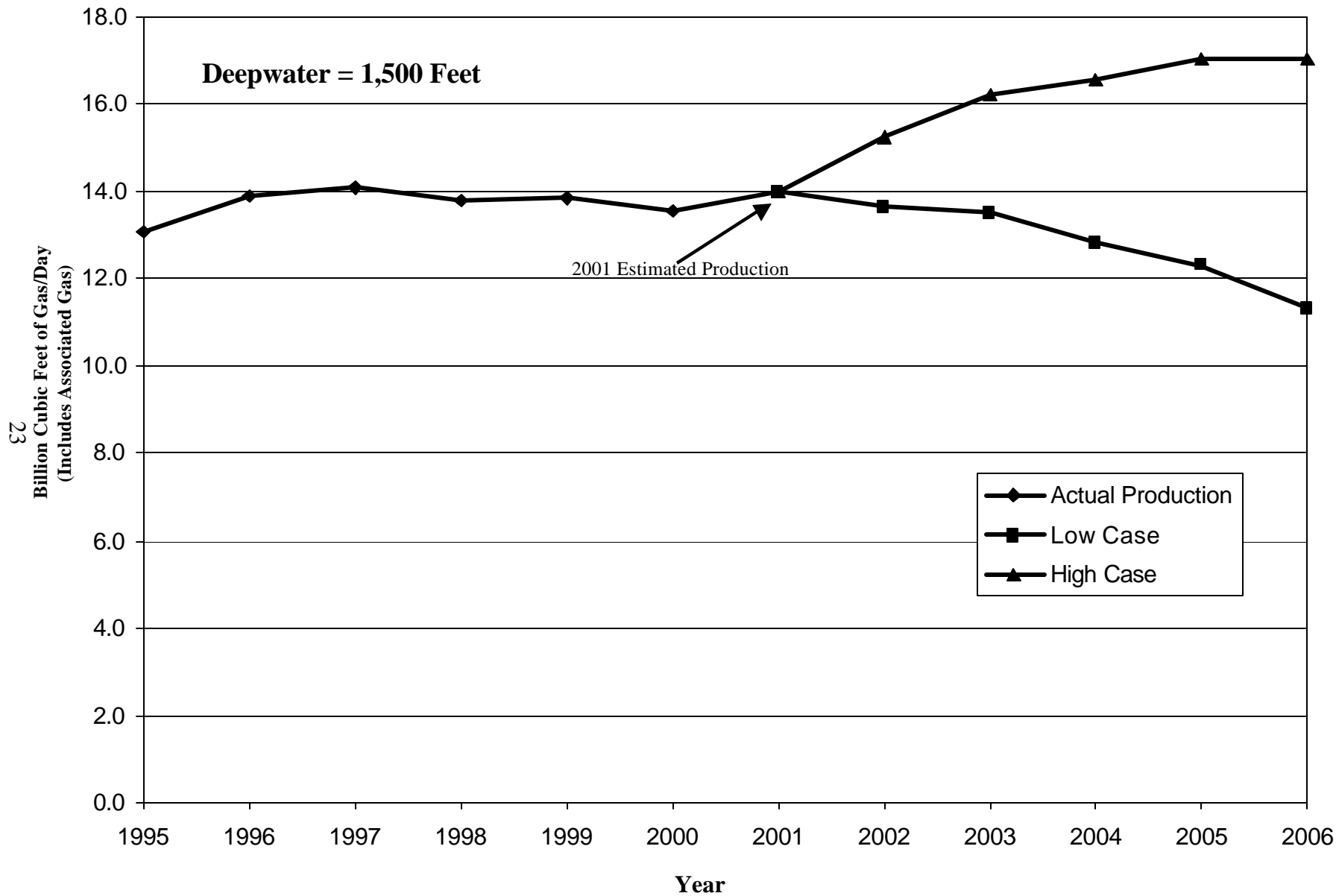


Figure A2. - Gas Production Rate Projections, Gulf of Mexico Region

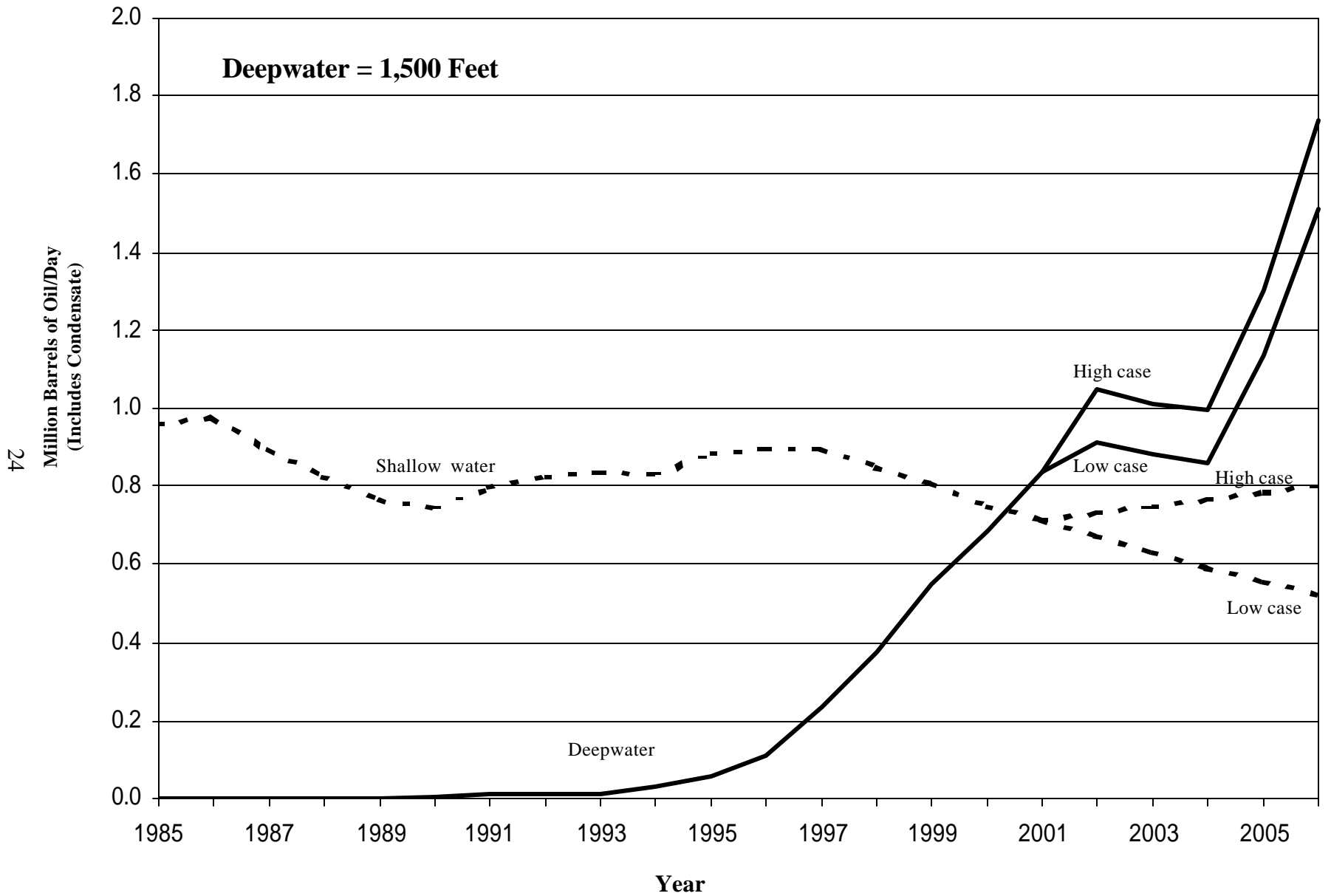


Figure A3. - Historical and Projected Oil Production Rates for Shallow and Deepwater

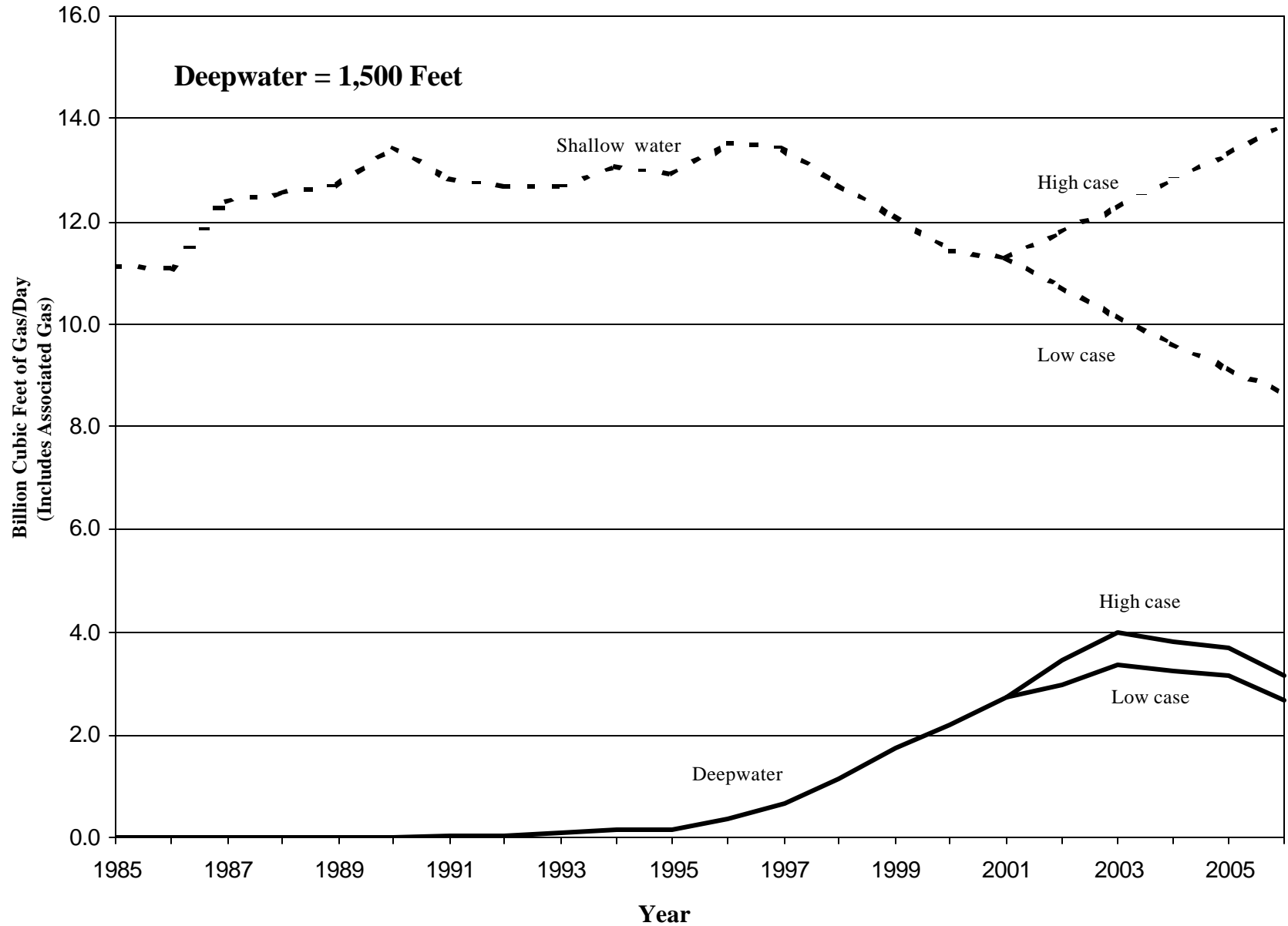


Figure A4. - Historical and Projected Gas Production Rates for Shallow and Deepwater

Notice

Please contact the Regional Supervisor, Production and Development, Gulf of Mexico OCS Region, Minerals Management Service, 1201 Elmwood Park Boulevard, New Orleans, Louisiana 70123, to communicate any questions you have or ideas for consideration in our next report. The telephone number is (504) 736-2675.