

**TABLES  
TO THE  
ASSESSMENT OF GAS SUPPLY**

Table 1

# Success Ratio and Effectiveness of Drilling Exploratory Wells Rocky Mountain Area Colorado, Utah and Wyoming

Year	Wells Drilled				Success Ratio	Gas Target Wells	Gas Target Footage 1,000 Ft	Gas Target Wells as a % of Total	Discoveries		Effectiveness	Cumulative Exploratory Wells	Effectiveness	Exploratory Wells Drilled	Cumulative Exploratory Footage
	Oil	Gas	Dry	Total					Total Bcf	Per Gas Compl. Bcf/Well					
1990	112	332	420	864	0.514	646	1982	74.77	835	2.52	1.292	646	1.292	646	1982
1991	62	264	324	650	0.502	526	1642	80.98	513	1.94	0.975	1172	0.975	526	3624
1992	47	182	315	544	0.421	432	1329	79.48	993	5.46	2.297	1605	2.297	432	4954
1993	30	224	270	524	0.485	462	1566	88.19	1,046	4.67	2.264	2067	2.264	462	6519
1994	37	437	212	686	0.691	632	1447	92.19	960	2.20	1.518	2699	1.518	632	7966
1995	36	450	213	699	0.695	647	1545	92.59	508	1.13	0.785	3347	0.785	647	9511
1996	38	279	186	503	0.630	443	1287	88.01	688	2.47	1.554	3789	1.554	443	10798
1997	40	195	209	444	0.529	368	1431	82.98	2,377	12.19	6.452	4158	6.452	368	12229
1998	40	294	201	535	0.624	471	1901	88.02	1,352	4.60	2.871	4629	2.871	471	14131
1999	39	156	126	321	0.607	257	1630	80.00	1,855	11.89	7.224	4885	7.224	257	15760
2000	27	91	116	234	0.504	180	1299	77.12	3,051	33.53	16.907	5066	16.907	180	17059
2001	34	191	142	367	0.613	312	2139	84.89	5,076	26.58	16.293	5377	16.293	312	19199
2002	17	125	92	234	0.607	206	1521	88.03	4,735	37.88	22.987	5583	22.987	206	20720
2003	18	242	86	345	0.752	321	2,951	93.06	3402	14.09	10.596	5904	10.596	321	23670

Table 2

Success Ratio and Effectiveness of Drilling

Development

Rocky Mountain Area

Colorado, Utah and Wyoming

Year	Wells Drilled			Success Ratio	Gas Target Wells	Gas Target Footage 1,000 Ft	Gas Target Wells as a % of Total	Discoveries		Effectiveness	Effectiveness Per Well Drilled	Cumulative Development Wells	Gas Target Wells	Cumulative Development Footage
	Oil	Gas	Dry Total					Total Bcf	Per Gas Compl. Bcf/Well					
1990	409	866	184	1459	0.874	991	5068	67.92	0.17	0.151	0.000153	991	991	5068
1991	320	943	182	1445	0.874	1079	5654	74.66	0.74	0.650	0.000602	2070	1079	10722
1992	263	1468	140	1871	0.925	1587	8800	84.81	0.43	0.398	0.000251	3657	1587	19522
1993	324	2018	117	2459	0.952	2119	12671	86.17	0.46	0.438	0.000206	5775	2119	32193
1994	257	1619	138	2014	0.931	1738	10933	86.30	0.28	0.264	0.000152	7514	1738	43126
1995	310	909	128	1347	0.905	1004	6314	74.57	2.31	2.092	0.002082	8518	1004	49440
1996	325	723	148	1196	0.876	825	5112	68.99	1.49	1.302	0.001578	9343	825	54552
1997	434	1326	217	1977	0.890	1489	9254	75.34	0.16	0.144	0.000097	10833	1489	63806
1998	335	1831	134	2300	0.942	1944	12045	84.53	0.93	0.874	0.005121	12777	1944	75851
1999	100	2879	109	3088	0.965	2884	14541	96.64	0.91	0.874	0.010090	15761	2884	90393
2000	241	5731	140	6112	0.977	5865	28189	95.96	0.37	0.361	0.019578	21627	5865	118582
2001	222	7108	155	7485	0.979	7258	36212	96.97	0.13	0.130	0.000018	28885	7258	154794
2002	126	4417	114	4657	0.976	4528	25003	97.23	0.21	0.203	0.000045	33413	4528	179797
2003	231	4,266	143	4640	0.969	4401	27,935	94.86	0.24	0.231	0.000053	37814	4401	207732

5007

0.231

Table 3

**DETERMINATION OF NEW RESERVE ADDITIONS  
ROCKY MOUNTAIN AREA  
Colorado, Utah and Wyoming  
EXPLORATORY**

<b>Year</b>	<b>Wells Drilled</b>	<b>Cumulative Wells</b>	<b>Effectiveness</b>	<b>Reserve Additions</b>
	1,000	1,000	Bcf/1,000 Feet	Bcf
1990	646	646	1.29	835
1991	526	1,172	0.97	513
1992	432	1,605	2.30	993
1993	462	2,067	2.26	1,046
1994	632	2,699	1.52	960
1995	647	3,347	0.78	508
1996	443	3,789	1.55	688
1997	368	4,158	6.45	2,377
1998	471	4,629	2.87	1,352
1999	257	4,885	7.22	1,855
2000	180	5,066	16.91	3,051
2001	312	5,377	16.29	5,076
2002	206	5,583	22.99	4,735
2003	321	5,904	10.60	3,402
2004	255	6,160	16.70	4,260
2005	255	6,415	16.70	4,260
2006	255	6,670	16.70	4,260
2007	255	6,925	16.70	4,260
2008	255	7,180	16.70	4,260
2009	255	7,436	16.70	4,260
2010	255	7,691	16.70	4,260
2011	255	7,946	16.70	4,260
2012	255	8,201	16.70	4,260
2013	255	8,456	16.70	4,260
2014	255	8,711	16.70	4,260
2015	255	8,967	16.70	4,260
2016	255	9,222	16.70	4,260
2017	255	9,477	16.70	4,260
2018	255	9,732	15.03	3,834
2019	255	9,987	13.52	3,451
2020	255	10,242	12.17	3,106
2021	255	10,498	10.95	2,795
2022	255	10,753	9.86	2,516
2023	255	11,008	8.87	2,264
2024	255	11,263	7.99	2,038
2025	255	11,518	7.19	1,834
2026	255	11,773	6.47	1,651
2027	255	12,029	5.82	1,485
2028	255	12,284	5.24	1,337
2029	255	12,539	4.72	1,203
2030	255	12,794	4.24	1,083
2031	255	13,049	3.82	975
2032	255	13,304	3.44	877
2033	255	13,560	3.09	789

94,283

Table 4

**DETERMINATION OF NEW RESERVE ADDITIONS  
ROCKY MOUNTAIN AREA  
Colorado, Utah and Wyoming  
DEVELOPMENT**

<b>Year</b>	<b>Wells Drilled</b>	<b>Cumulative Wells</b>	<b>Effectiveness</b>	<b>Reserve Additions</b>
	1,000	1,000	Bcf/1,000 Feet	Bcf
1990	991	991	0.15	150
1991	1,079	2,070	0.65	701
1992	1,587	3,657	0.40	632
1993	2,119	5,775	0.44	927
1994	1,738	7,514	0.26	459
1995	1,004	8,518	2.09	2,101
1996	825	9,343	1.30	1,074
1997	1,489	10,833	0.14	215
1998	1,944	12,777	0.87	1,699
1999	2,984	15,761	0.87	2,607
2000	5,865	21,627	0.36	2,118
2001	7,258	28,885	0.13	940
2002	4,528	33,413	0.20	918
2003	4,401	37,814	0.23	1,017
2004	5,007	42,821	0.23	1,157
2005	5,007	47,829	0.23	1,157
2006	5,007	52,836	0.23	1,157
2007	5,007	57,843	0.23	1,157
2008	5,007	62,851	0.23	1,157
2009	5,007	67,858	0.23	1,157
2010	5,007	72,866	0.23	1,157
2011	5,007	77,873	0.23	1,157
2012	5,007	82,880	0.23	1,157
2013	5,007	87,888	0.23	1,157
2014	5,007	92,895	0.23	1,157
2015	5,007	97,903	0.23	1,157
2016	5,007	102,910	0.23	1,157
2017	5,007	107,917	0.23	1,157
2018	5,007	112,925	0.21	1,042
2019	5,007	117,932	0.19	937
2020	5,007	122,940	0.17	844
2021	5,007	127,947	0.15	759
2022	5,007	132,954	0.14	683
2023	5,007	137,962	0.12	615
2024	5,007	142,969	0.11	554
2025	5,007	147,977	0.10	498
2026	5,007	152,984	0.09	448
2027	5,007	157,992	0.08	404
2028	5,007	162,999	0.07	363
2029	5,007	168,006	0.07	327
2030	5,007	173,014	0.06	294
2031	5,007	178,021	0.05	265
2032	5,007	183,029	0.05	238
2033	5,007	188,036	0.04	214

25,704

Table 5

# **DETERMINATION OF NEW RESERVE ADDITIONS** **ROCKY MOUNTAIN AREA**

Colorado, Utah and Wyoming

*Volumes in Bcf*

Year	New Exploratory Additions	New Development Additions	New Total Additions	Accumulated Ultimate Reserves	Percent of Ultimate Resources	Cumulative Prod to 12/31/2002	46,188
2000	3,051	2,118	5,169		-	Remaining Reserves at 12/31/2002	38,550
2001	5,076	940	6,016		-	Ultimate Reserves at 12/31/2002	84,738
2002	4,735	918	5,653	84,738	44.9	PGC Potential Resources	104,130
2003	3,402	1,017	4,419	89,157	47.2	Ultimate Resources at 12/31/2002	188,868
2004	4,260	1,157	5,418	94,575	50.1		
2005	4,260	1,157	5,418	99,992	52.9		
2006	4,260	1,157	5,418	105,410	55.8		
2007	4,260	1,157	5,418	110,827	58.7		
2008	4,260	1,157	5,418	116,245	61.5		
2009	4,260	1,157	5,418	121,662	64.4		
2010	4,260	1,157	5,418	127,080	67.3		
2011	4,260	1,157	5,418	132,497	70.2		
2012	4,260	1,157	5,418	137,915	73.0		
2013	4,260	1,157	5,418	143,332	75.9		
2014	4,260	1,157	5,418	148,750	78.8		
2015	4,260	1,157	5,418	154,167	81.6		
2016	4,260	1,157	5,418	159,585	84.5		
2017	4,260	1,157	5,418	165,002	87.4		
2018	3,834	1,042	4,876	169,878	89.9		
2019	3,451	937	4,388	174,266	92.3		
2020	3,106	844	3,949	178,216	94.4		
2021	2,795	759	3,554	181,770	96.2		
2022	2,516	683	3,199	184,969	97.9		
2023	2,264	615	2,879	187,848	99.5		
2024	2,038	554	2,591	190,439	100.8		
2025	1,834	498	2,332	192,771	102.1		
2026	1,651	448	2,099	194,870	103.2		
2027	1,485	404	1,889	196,759	104.2		
2028	1,337	363	1,700	198,459	105.1		
2029	1,203	327	1,530	199,989	105.9		
2030	1,083	294	1,377	201,366	106.6		
2031	975	265	1,239	202,606	107.3		
2032	877	238	1,115	203,721	107.9		
2033	789	214	1,004	204,725	108.4		
	93,494	25,489	118,983				

Table 6

## PRODUCTIVE CAPACITY ROCKY MOUNTAIN AREA

Colorado, Utah, Wyoming, Montana and North Dakota

Year	Productive Capability 1999 Reserves  MMcf/day	Productive Capability 2000 - 2002 And Future Reserves  MMcf/day	Productive Capability Total  MMcf/day	Actual Production  MMcf/day
1999				6,113
2000	6,216	3,621	9,837	6,547
2001	5,463	5,977	11,440	6,393
2002	4,898	7,160	12,058	7,357
2003	4,395	7,247	11,642	8,015
2004	4,019	8,279	12,298	
2005	3,579	8,971	12,550	
2006	3,328	9,525	12,853	
2007	3,014	9,995	13,009	
2008	2,763	10,406	13,169	
2009	2,512	10,771	13,283	
2010	2,323	11,100	13,424	
2011	2,135	11,400	13,535	
2012	2,009	11,676	13,685	
2013	1,821	11,931	13,752	
2014	1,695	12,167	13,863	
2015	1,633	12,389	14,021	
2016	1,385	12,597	13,982	
2017	1,266	12,792	14,059	
2018	1,157	12,604	13,761	
2019	1,058	12,260	13,318	
2020	967	11,839	12,805	
2021	883	11,378	12,262	
2022	807	10,902	11,709	
2023	738	10,422	11,160	
2024	674	9,948	10,623	
2025	616	9,486	10,103	
2026	563	9,040	9,603	
2027	515	8,611	9,126	
2028	470	8,201	8,672	
2029	430	7,812	8,242	
2030	393	7,336	7,729	
2031	359	6,866	7,225	
2032	328	6,428	6,756	
2033	300	6,036	6,336	

Table 7

# **ULTIMATE REMAINING GAS RESOURCES**

*Volumes in Trillion Cubic Feet*

		Rocky Mountain
		Area
		Colo, Utah and Wyo
1	Cumulative Production to 12/31/1988	23.96
2	Incremental Production 1989 to 12/31/2002	22.23
3	Remaining Proved Reserves at 12/31/2002	38.55
4	Potential Gas Resources Estimated at 12/31/2002	104.13
5	Ultimate Estimated Resources (12/31/2000)	188.87
6	Gas Discoveries to 12/31/2002	84.74
7	Percent Remaining to be Discovered	55.13

Table 8

**Estimate of Potential Gas Resources  
As of End of 2002  
Volumes in Bcf**

Producing Province	Resource Estimate						Total Resource Estimate
	Growth in Reserves			New Fields			
	0-15,000 Feet	15,000-30,000 Ft	CBM	0-15,000 Feet	15,000-30,000 Ft	CBM	
Powder River Basin	1,435	-	6,672	2,153	-	20,015	30,275
Big Horn Basin	672	170	-	530	616	25	2,013
Wind River Basin	2,115	1,527	-	4,497	3,401	50	11,590
Greater Green River Basin	8,632	979	-	5,940	5,696	375	21,622
Denver Basin and Environs	1,380	-	-	1,012	-	-	2,392
Uinta/Piceance Basin and Environs	14,568	500	133	14,922	200	4,115	34,438
Thrust Belt	800	-	-	1,000	-	-	1,800
Total Colorado, Utah and Wyoming	29,602	3,176	6,805	30,054	9,913	24,580	104,130
Williston Basin	653			931	98		1,682
Sweetgrass Arch	435			945			1,380
Montana Folded Belt				4,000			4,000
Total Montana and North Dakota	1,088			5,876	98		7,062

Source: Potential Gas Committee

Note: CBM - Coalbed Methane

Table 9

# **ESTIMATED PRODUCTION ROCKY MOUNTAIN AREA**

Colorado, Utah and Wyoming

Year	Estimated Production 1999 Reserves  MMcf/day	Estimated Production 2000 - 2002 And Future Reserves MMcf/day	Estimated Production Total  MMcf/day	Actual Production  MMcf/day
1999				6,033
2000	6,109	3,564	9,674	6,438
2001	5,369	5,895	11,264	6,279
2002	4,814	7,083	11,896	7,227
2003	4,320	7,155	11,474	7,879
2004	3,950	8,166	12,116	
2005	3,518	8,845	12,362	
2006	3,271	9,389	12,660	
2007	2,962	9,851	12,813	
2008	2,715	10,255	12,970	
2009	2,468	10,614	13,083	
2010	2,283	10,938	13,222	
2011	2,098	11,233	13,332	
2012	1,975	11,505	13,479	
2013	1,790	11,755	13,545	
2014	1,666	11,988	13,655	
2015	1,605	12,206	13,811	
2016	1,362	12,411	13,772	
2017	1,244	12,604	13,848	
2018	1,137	12,412	13,549	
2019	1,039	12,066	13,105	
2020	950	11,642	12,592	
2021	868	11,179	12,047	
2022	793	10,700	11,493	
2023	725	10,218	10,943	
2024	663	9,742	10,405	
2025	606	9,278	9,884	
2026	554	8,830	9,383	
2027	506	8,399	8,905	
2028	462	7,988	8,450	
2029	423	7,596	8,019	
2030	386	7,120	7,506	
2031	353	6,650	7,003	
2032	323	6,211	6,534	
2033	295	5,819	6,114	

Table 10

# **PRODUCTIVE CAPACITY ROCKY MOUNTAIN AREA**

Montana and North Dakota

Year	Productive Capability 1999 Reserves  MMcf/day	Productive Capability 2000 - 2002 And Future Reserves MMcf/day	Productive Capability Total  MMcf/day	Actual Production  MMcf/day
1999	113			80
2000	107	57	170	109
2001	94	82	188	114
2002	84	77	171	130
2003	76	92	177	136
2004	69	113	189	
2005	62	126	195	
2006	57	136	197	
2007	52	144	201	
2008	48	151	203	
2009	43	157	204	
2010	40	162	205	
2011	37	167	207	
2012	35	171	208	
2013	31	175	210	
2014	29	179	210	
2015	28	183	212	
2016	24	186	214	
2017	22	189	213	
2018	20	192	213	
2019	18	194	214	
2020	17	197	215	
2021	15	199	216	
2022	14	202	217	
2023	13	204	218	
2024	12	206	219	
2025	11	208	220	
2026	10	210	221	
2027	9	212	222	
2028	8	214	223	
2029	7	216	224	
2030	7	216	223	
2031	6	216	223	
2032	6	217	223	
2033	5	217	222	

**FIGURES  
TO THE  
ASSESSMENT OF GAS SUPPLY**

Figure 1

# TYPICAL DISCOVERY - PROCESS FINDING RATE

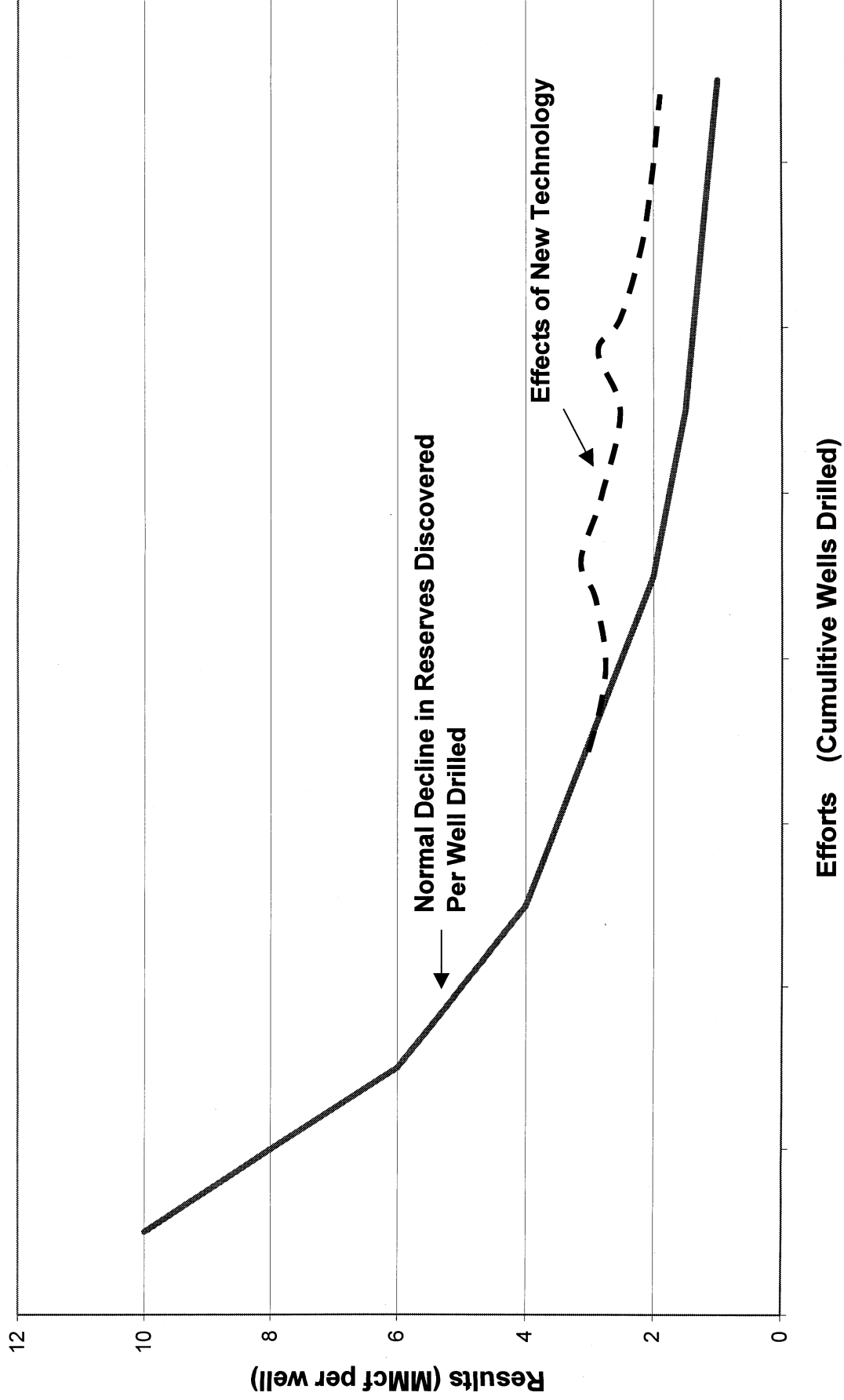


Figure 2

# NEW FIELD DISCOVERIES Wyoming

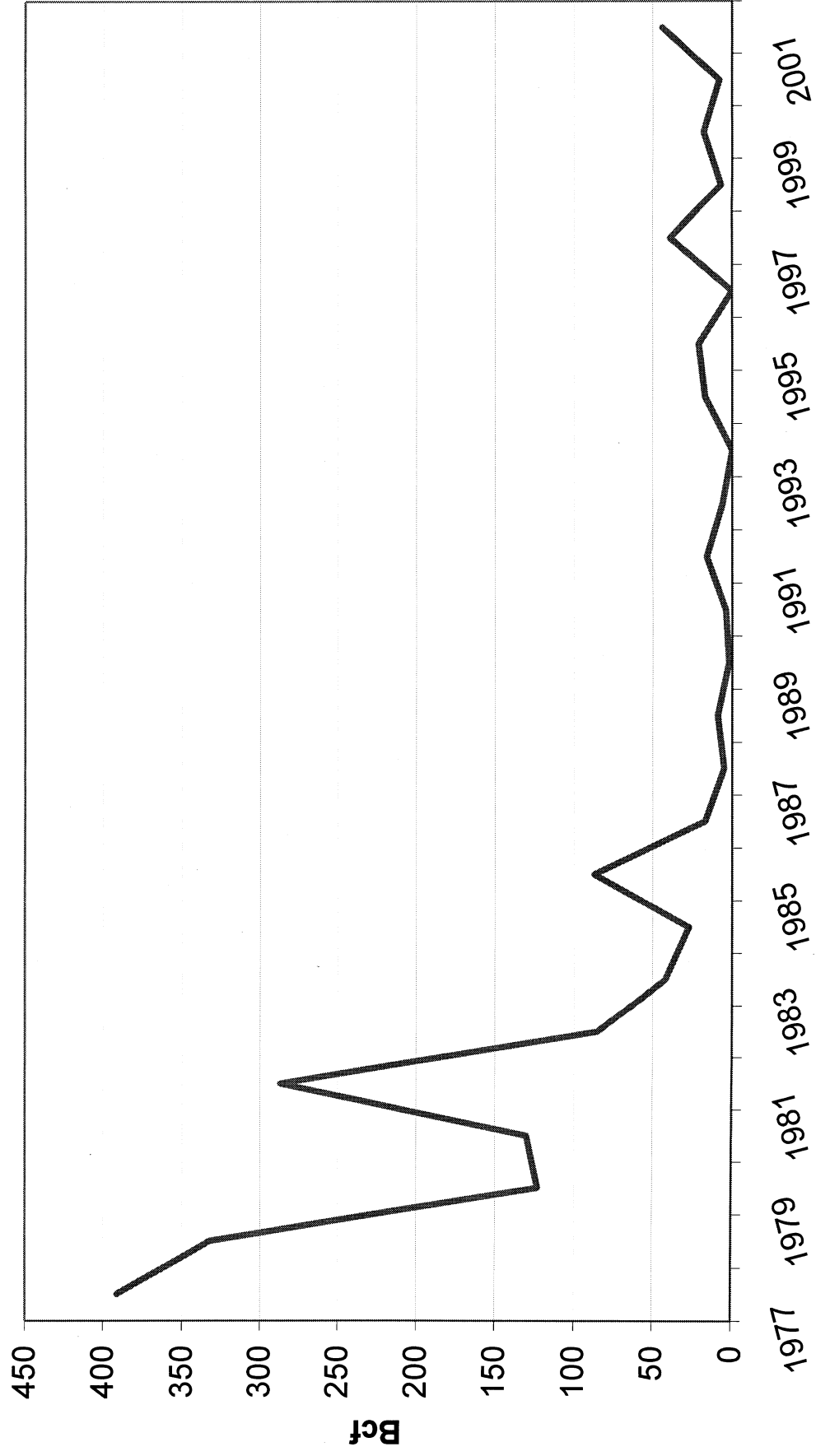
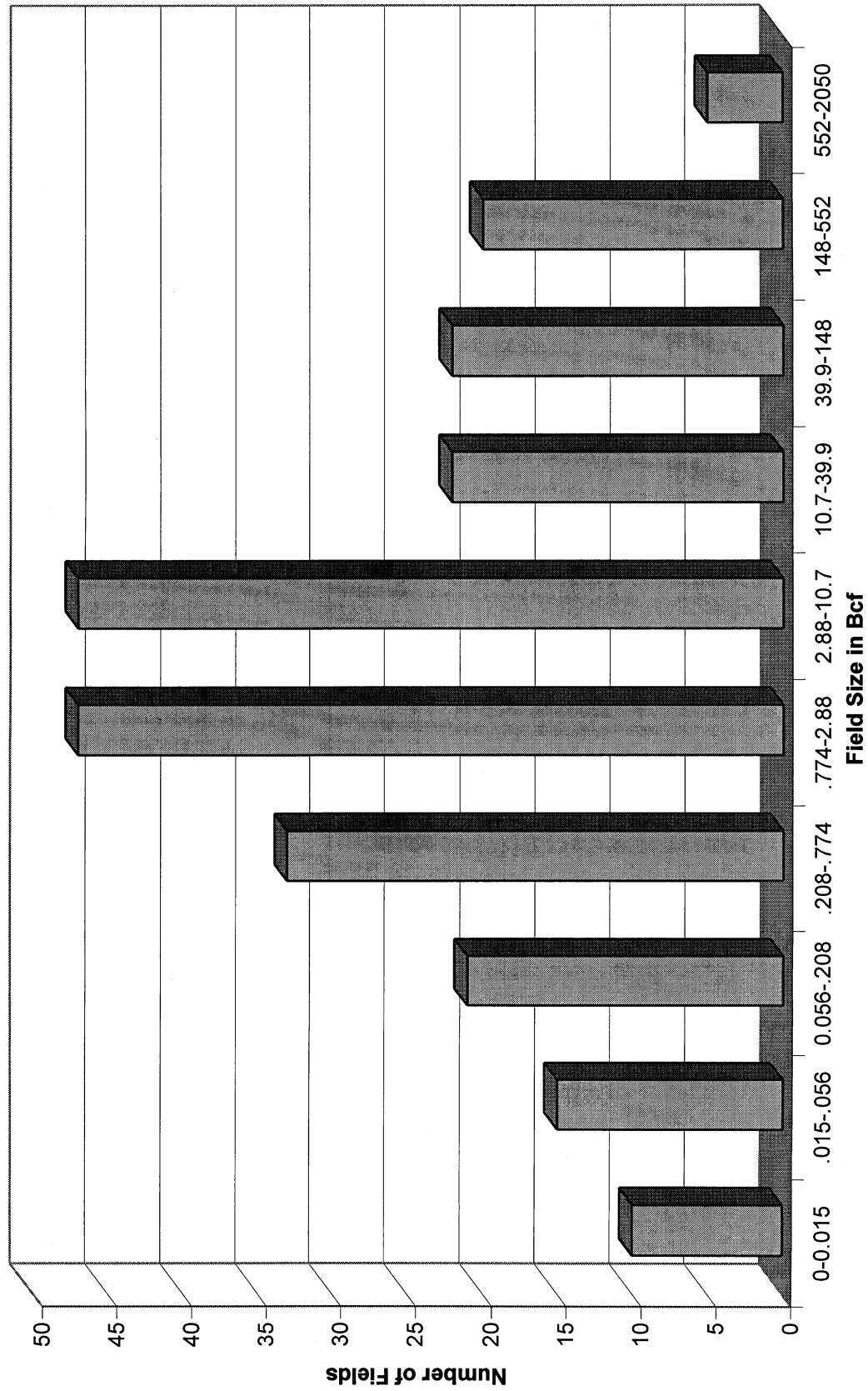


Figure 3

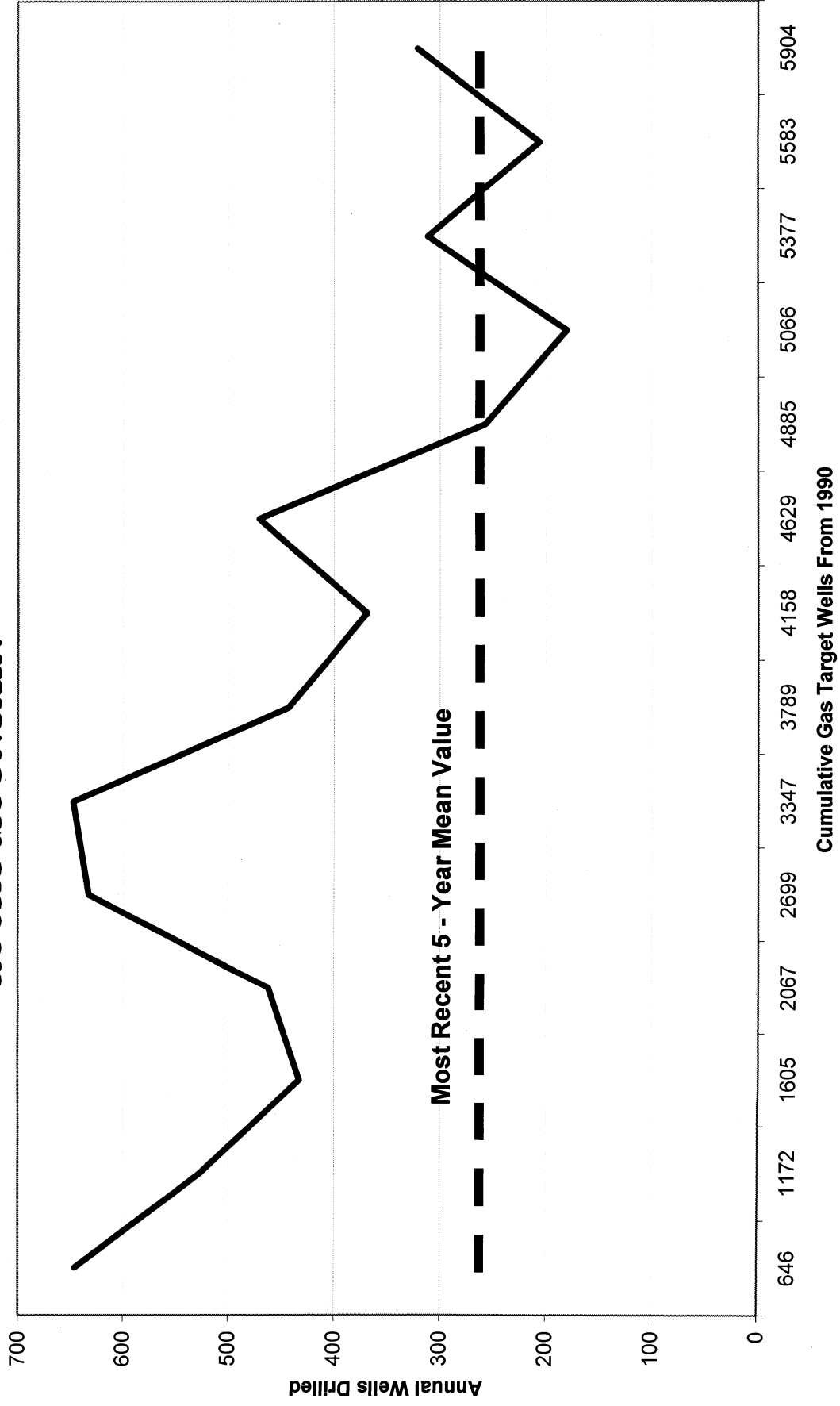
## Size Distribution of Gas Fields Green River Basin



# GAS TARGET EXPLORATORY WELLS

Figure 4

## ROCKY MOUNTAIN



# **GAS TARGET DEVELOPMENT WELLS ROCKY MOUNTAIN AREA**

Figure 5

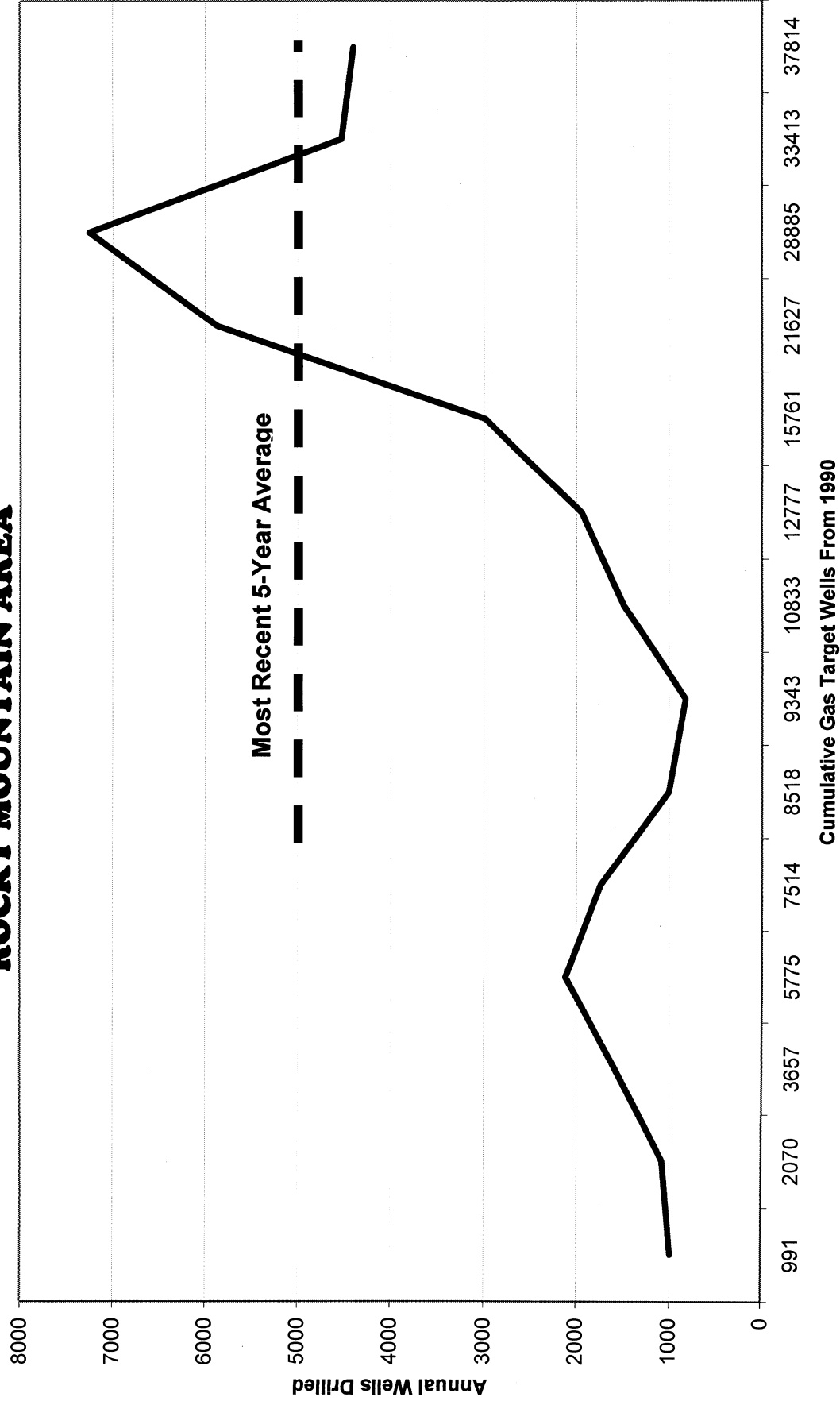
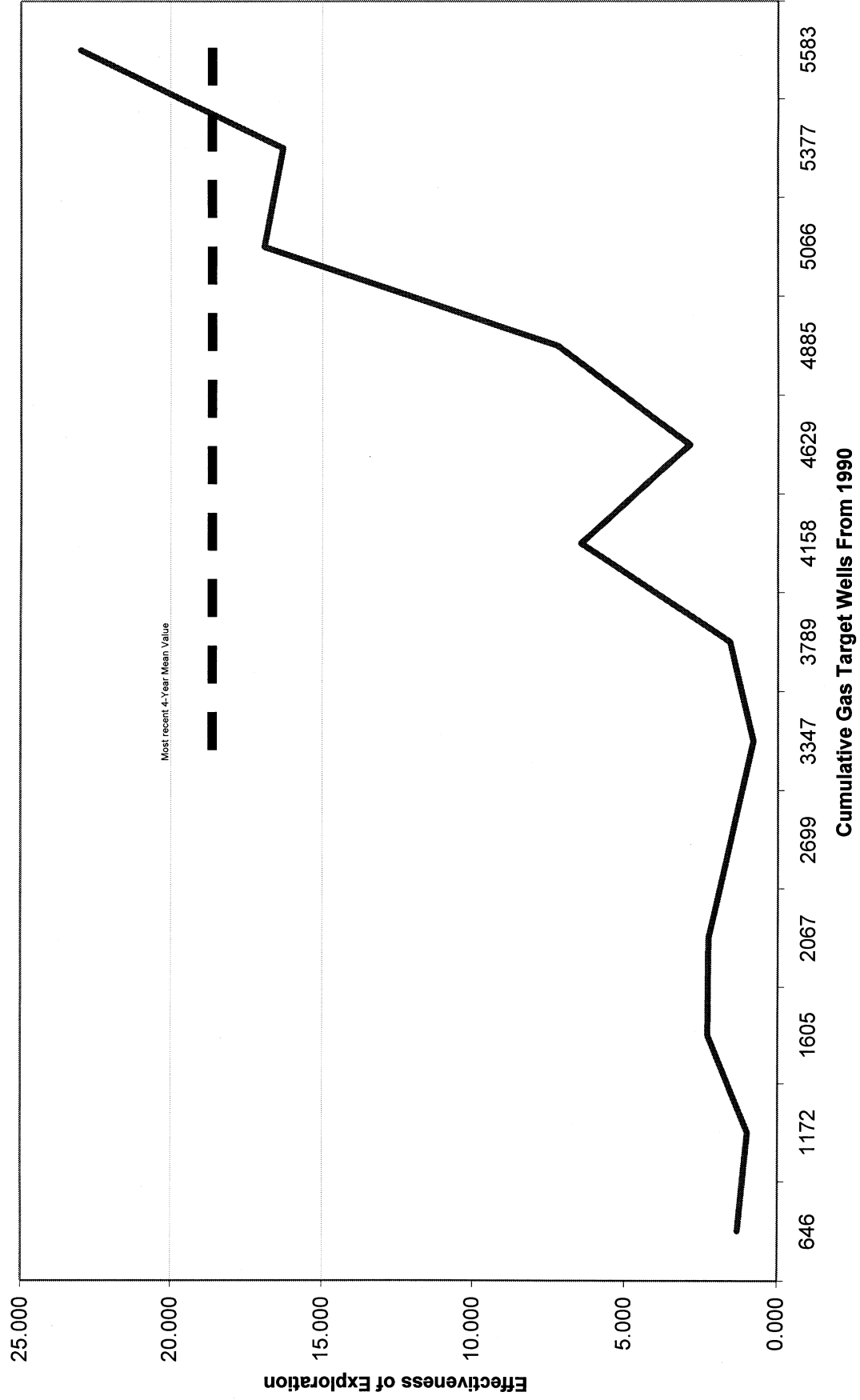


Figure 6

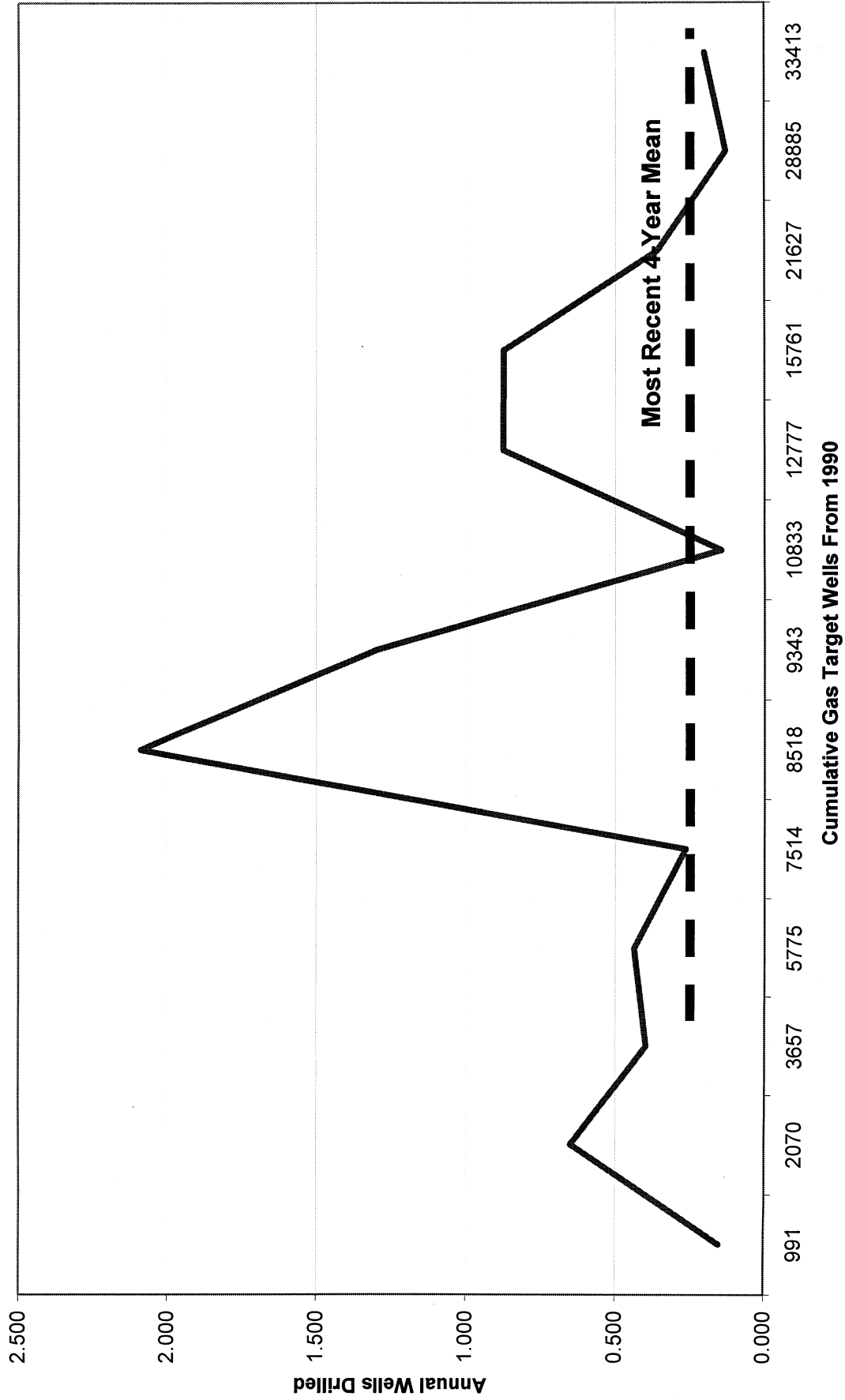
# FINDING RATE OF EXPLORATION

ROCKY MOUNTAIN AREA



# **FINDING RATE OF DEVELOPMENT** **ROCKY MOUNTAIN AREA**

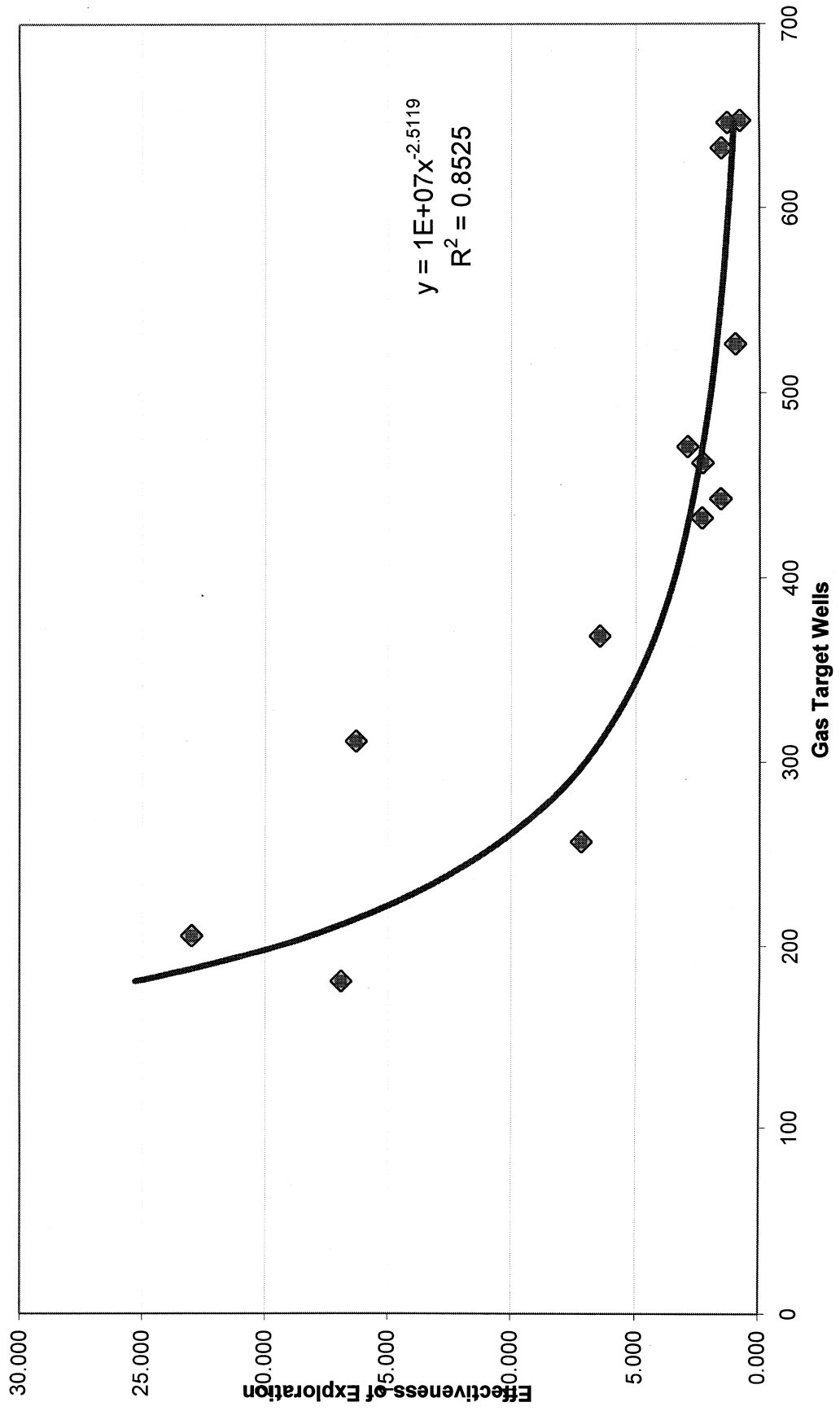
Figure 7



**RELATIONSHIP BETWEEN GAS TARGET EXPLORATORY FOOTAGE DRILLED AND  
THE FINDING RATE OF EXPLORATION**

**Figure 8**

**ROCKY MOUNTAIN AREA**



**RELATIONSHIP BETWEEN GAS TARGET EXPLORATORY FOOTAGE DRILLED AND  
THE FINDING RATE OF DEVELOPMENT**

**Figure 9**

**ROCKY MOUNTAIN AREA**

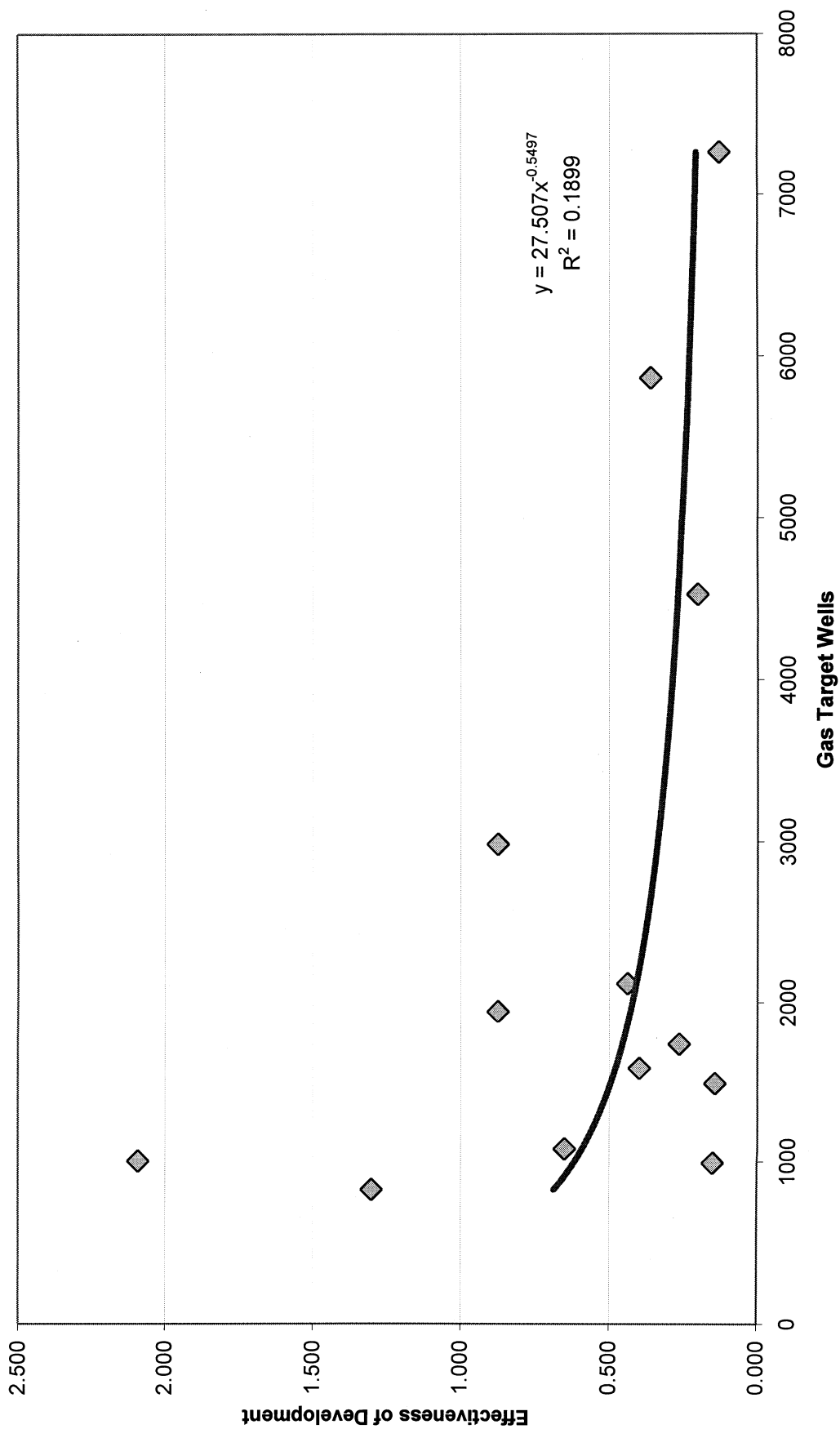


Figure  
10

# Natural Gas Productive Capacity

## Colorado, Utah, Wyoming, Montana and North Dakota

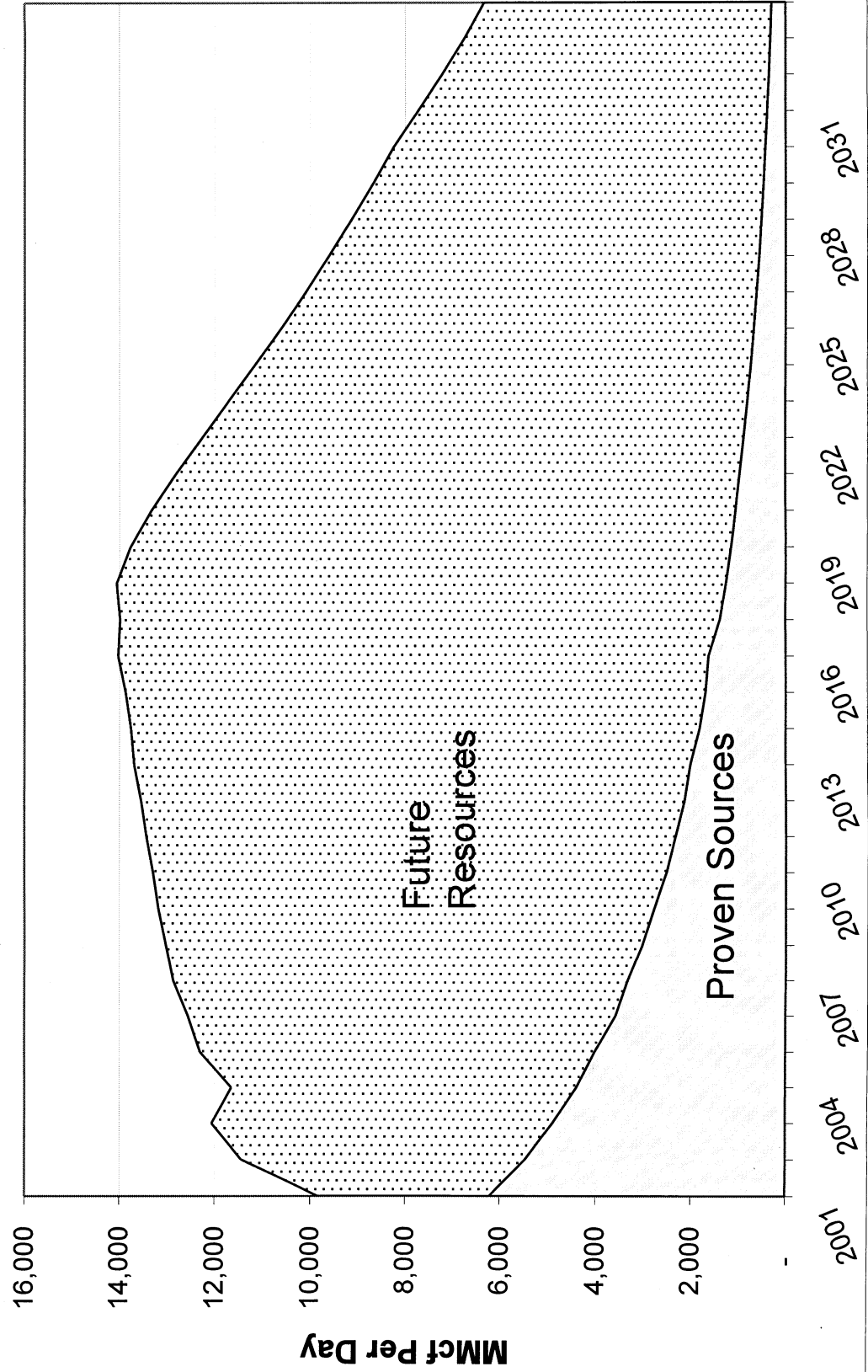


Figure 11

# NATURAL GAS PRODUCTION

Rocky Mountain Area

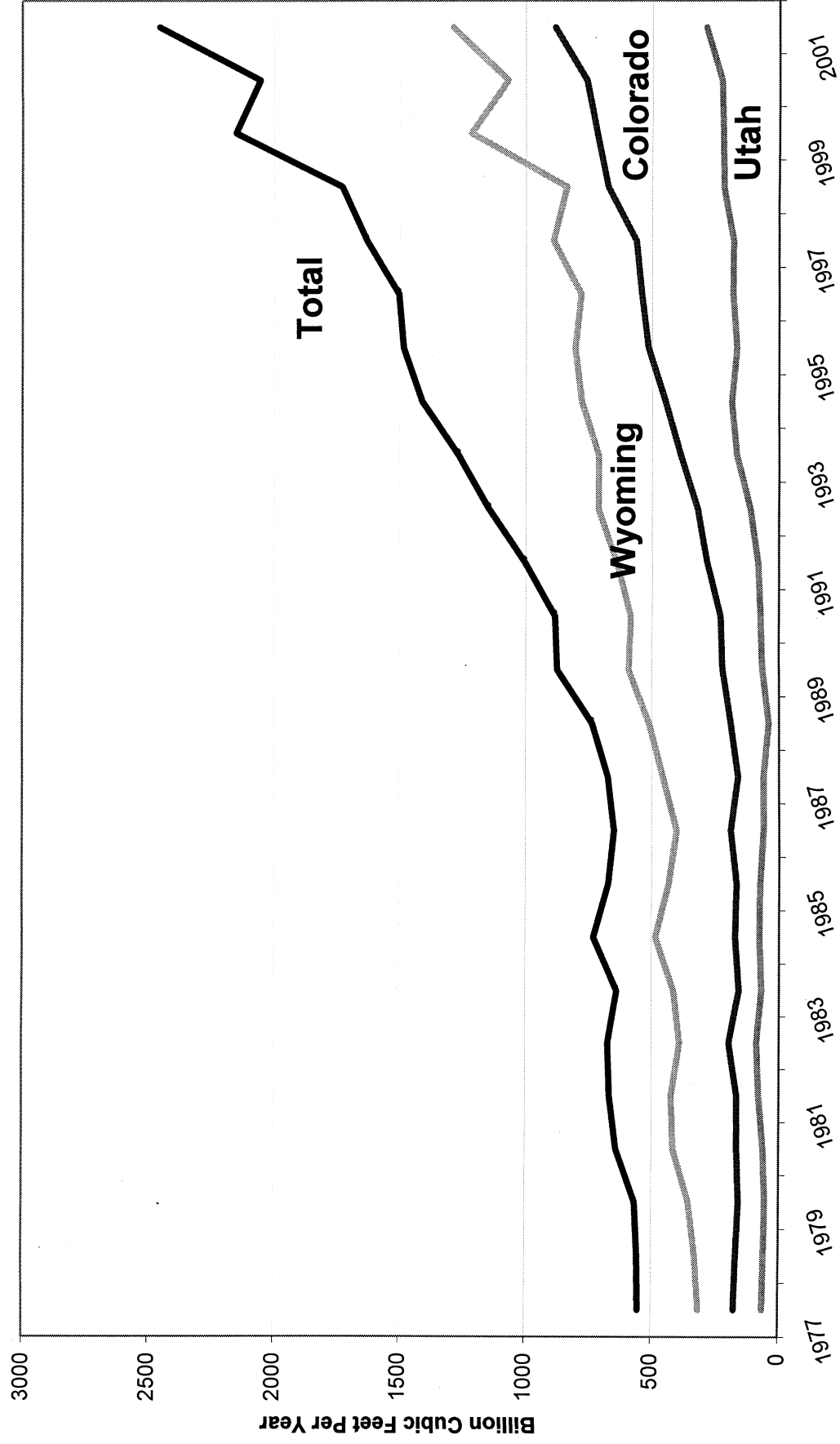
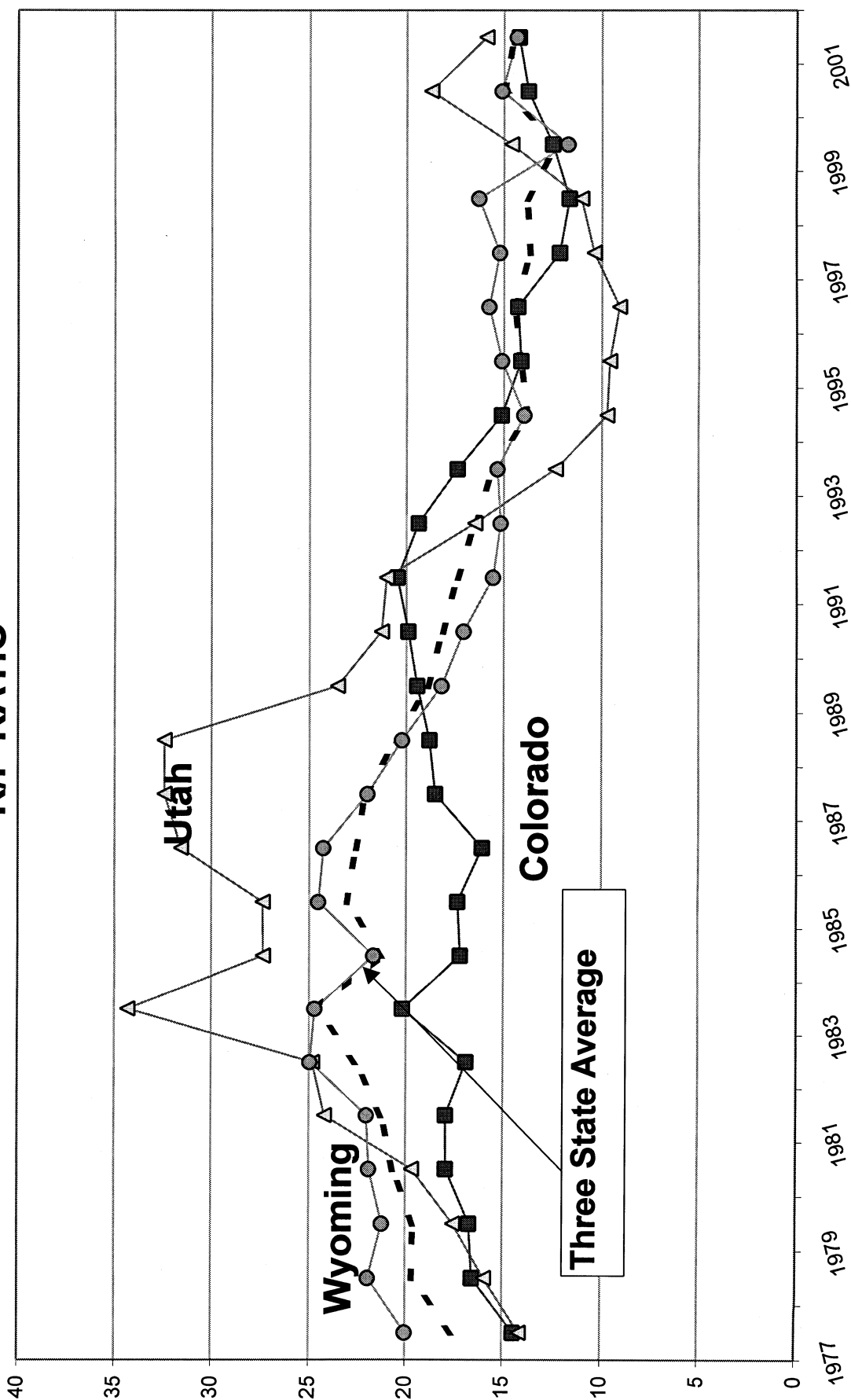


Figure 12

R/P RATIO



**Relationship Between Wellhead Price and Exploratory Drilling  
Rocky Mountain Area**

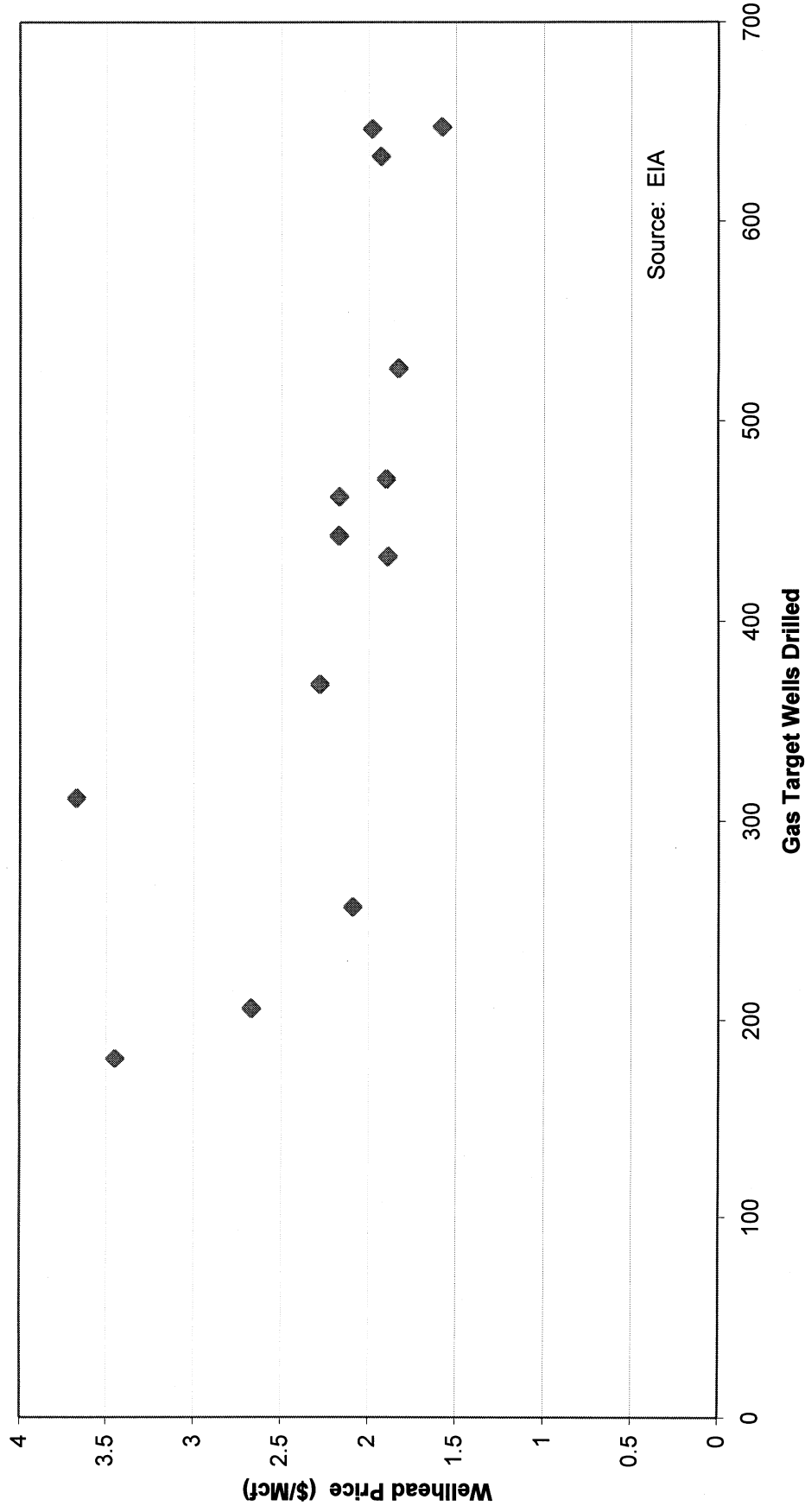


Figure 14

# Relationship Between Wellhead Price and Development Drilling Rocky Mountain Area

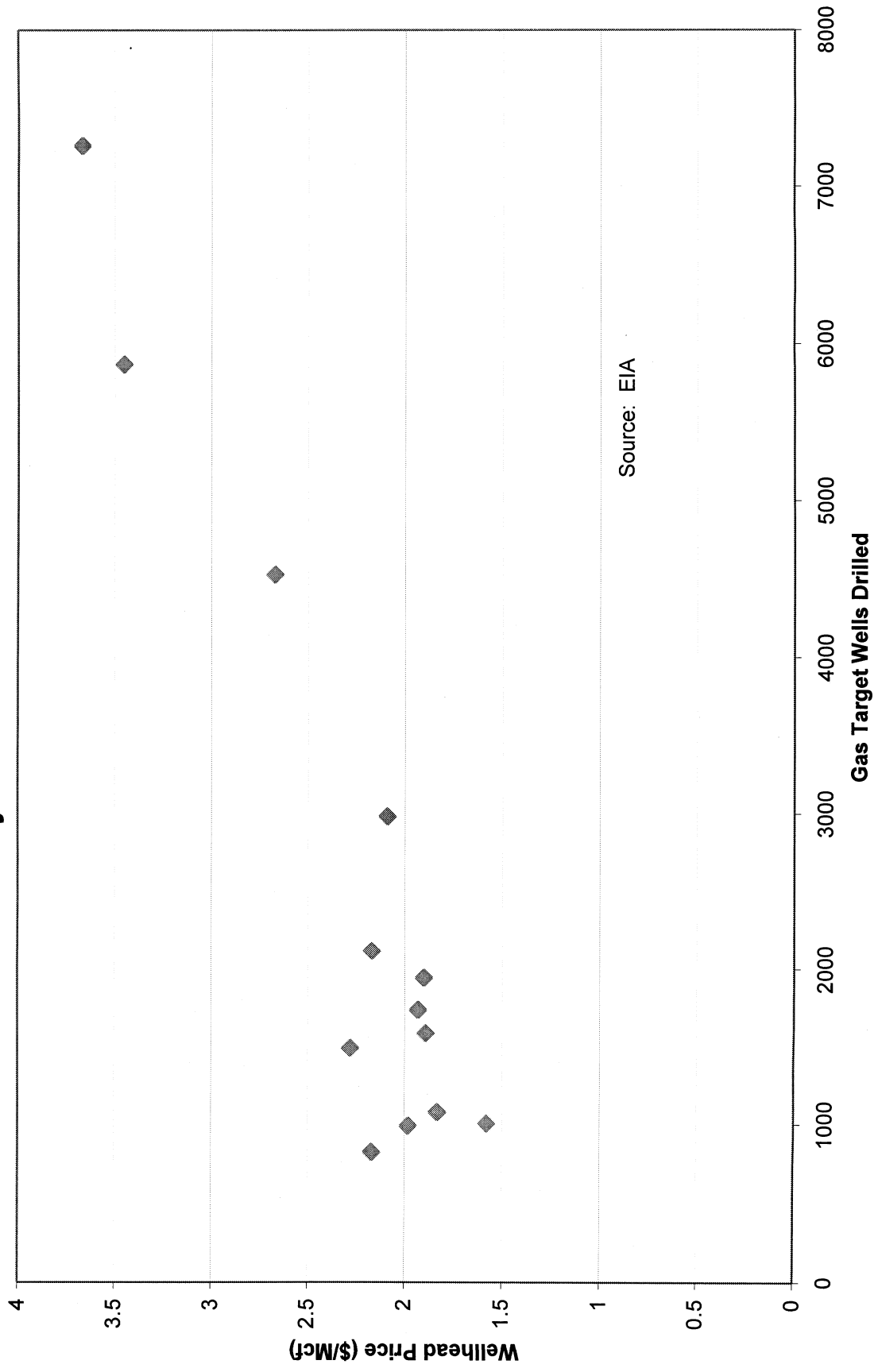


Figure 15

# Hyperbolic Productive Capacity Rocky Mountain Region Gas Wells

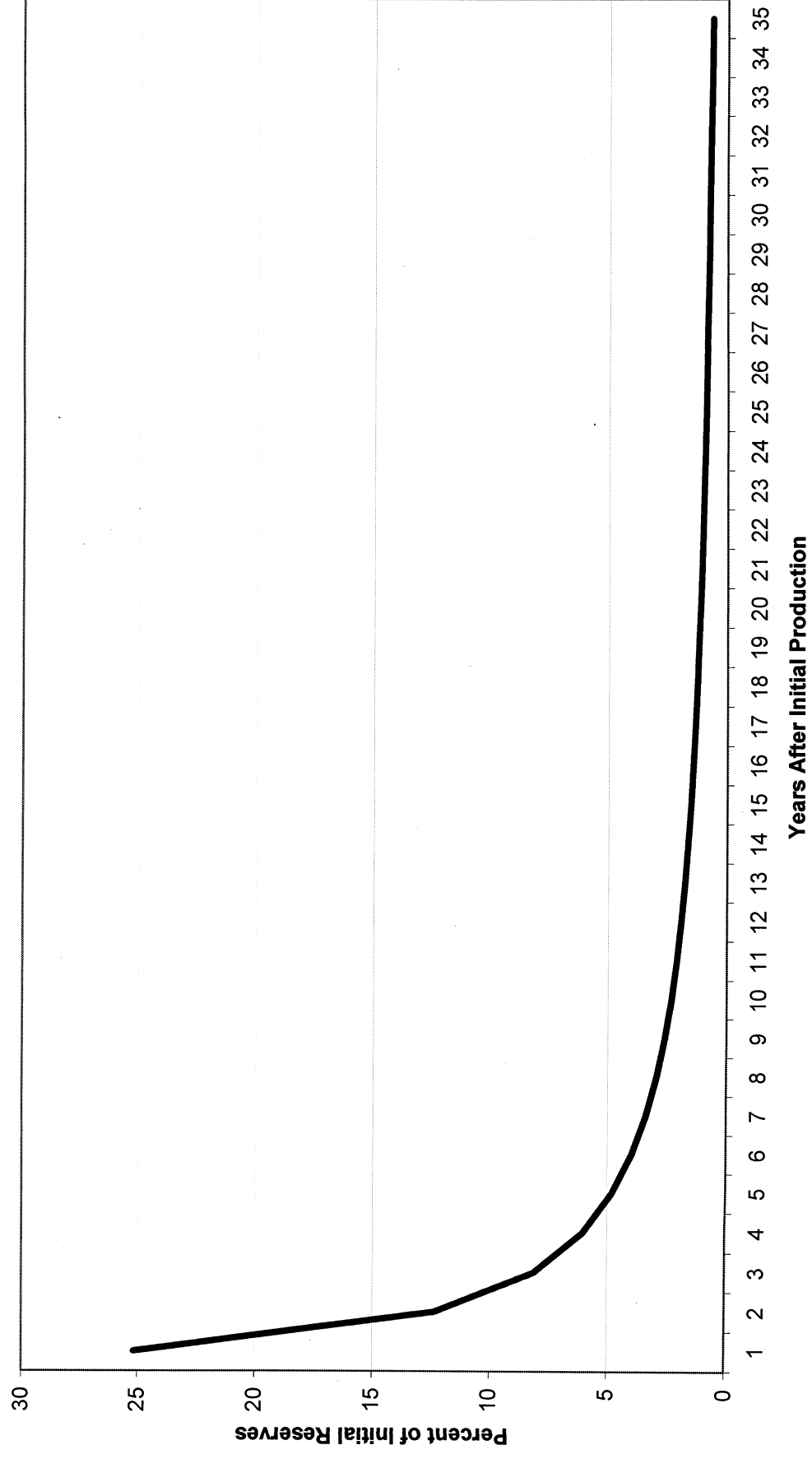


Figure 16

## Production Rate Rocky Mountain Area

