



**NORTHEAST BRITISH COLUMBIA
NATURAL GAS
HISTORICAL DISCOVERY TRENDS
JANUARY 1990 TO DECEMBER 31, 2002**



**Petroleum Society
Petroleum Economics Meeting
March 22, 2004**



PRESENTATION ON B.C. NATURAL GAS HISTORICAL TRENDS AND PROJECTION TO 2014

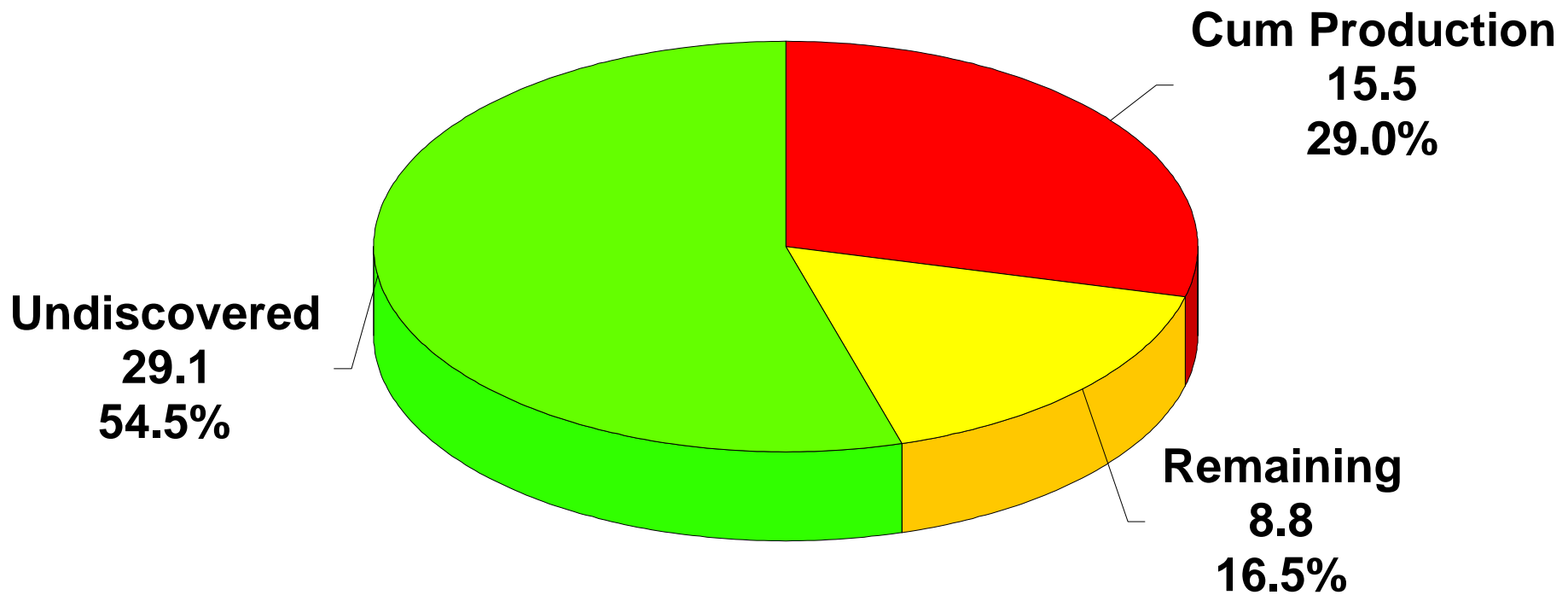
- ▶ **Review historical record and current resource base as of Dec 31, 2002.**
- ▶ **Review the discovery record, reserves additions and production for the period 1990 to 2002.**
- ▶ **Projection to 2014.**
- ▶ **Comparisons - Alberta & NWT**

N.E. BRITISH COLUMBIA NATURAL GAS

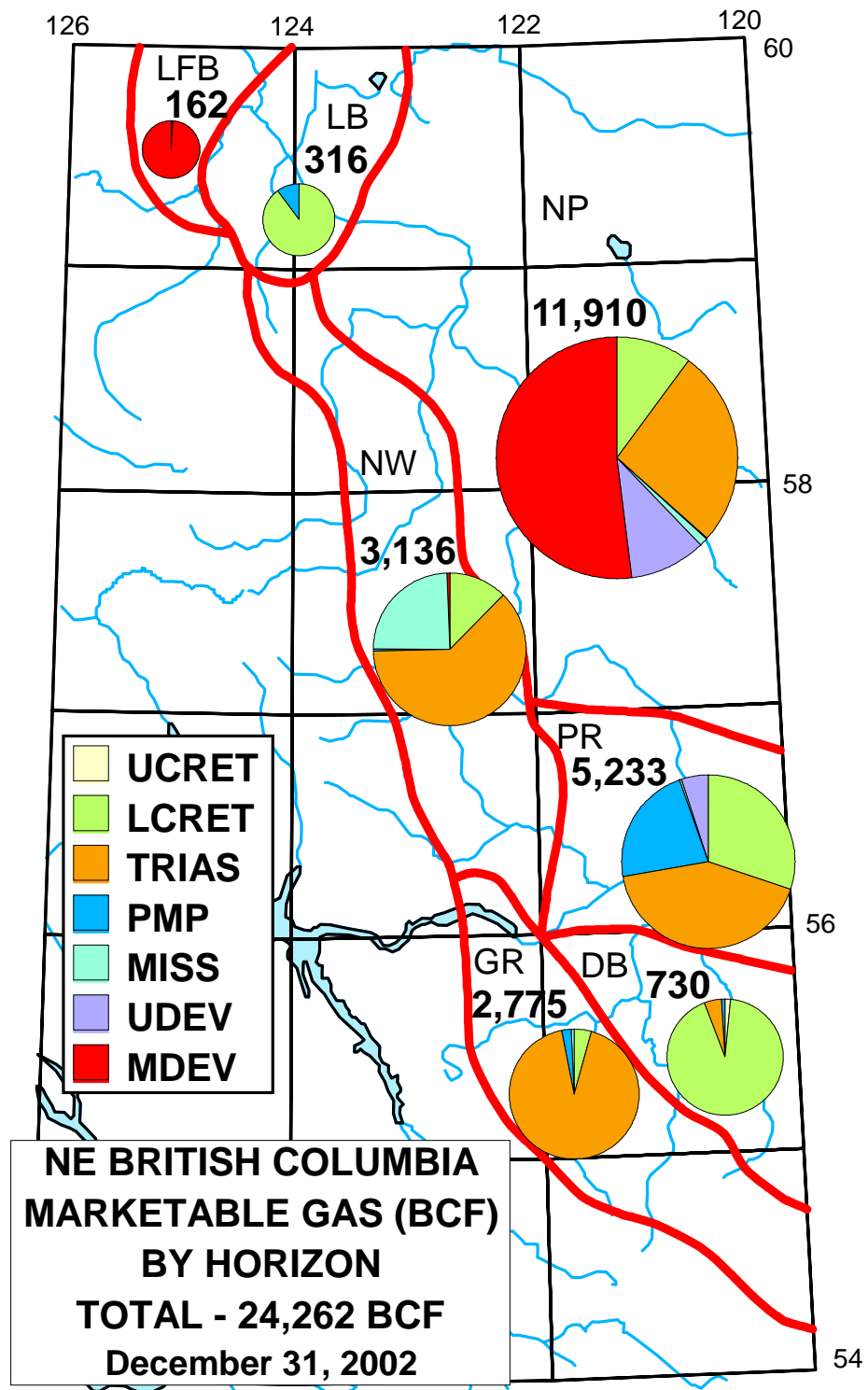
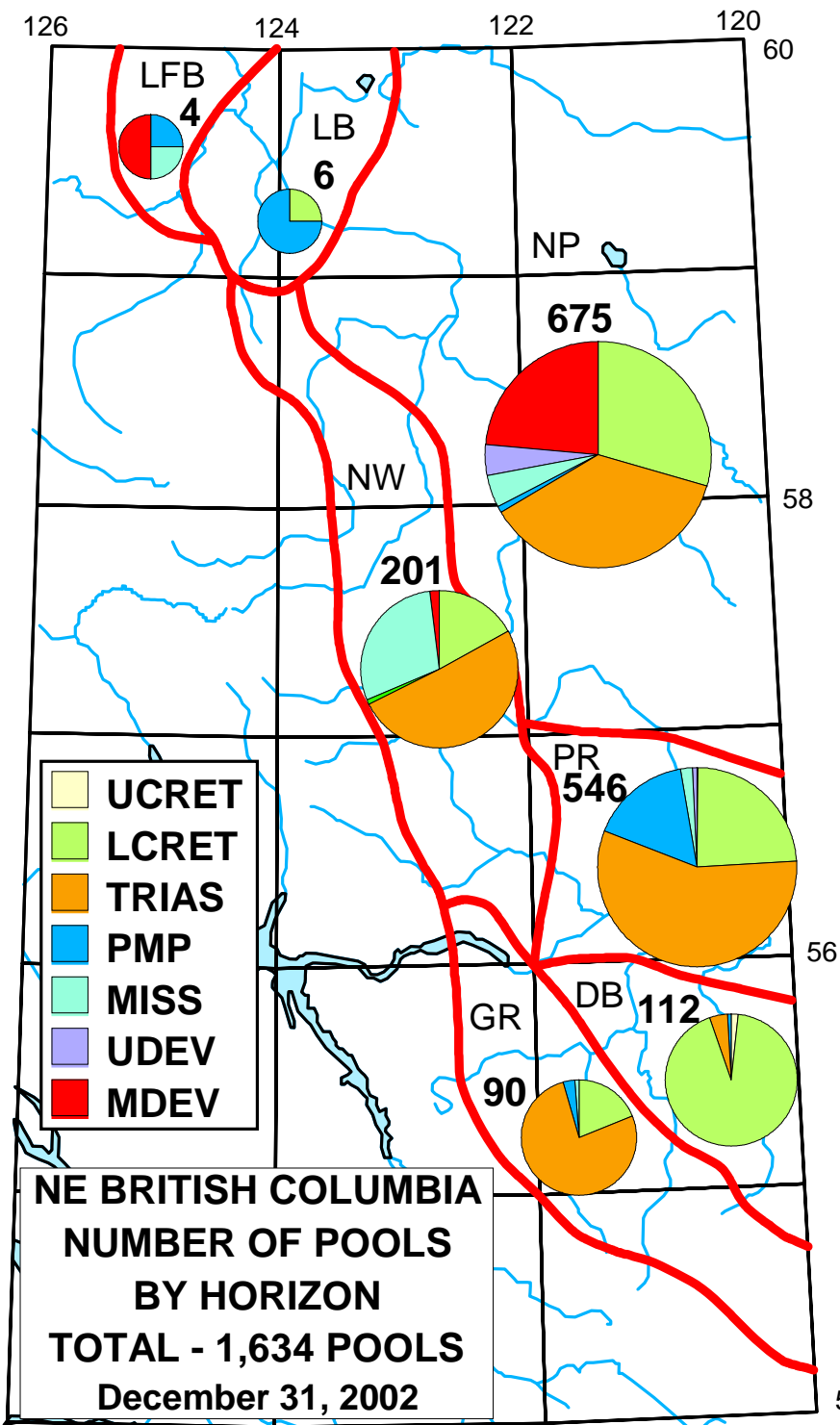
DECEMBER 31, 2002

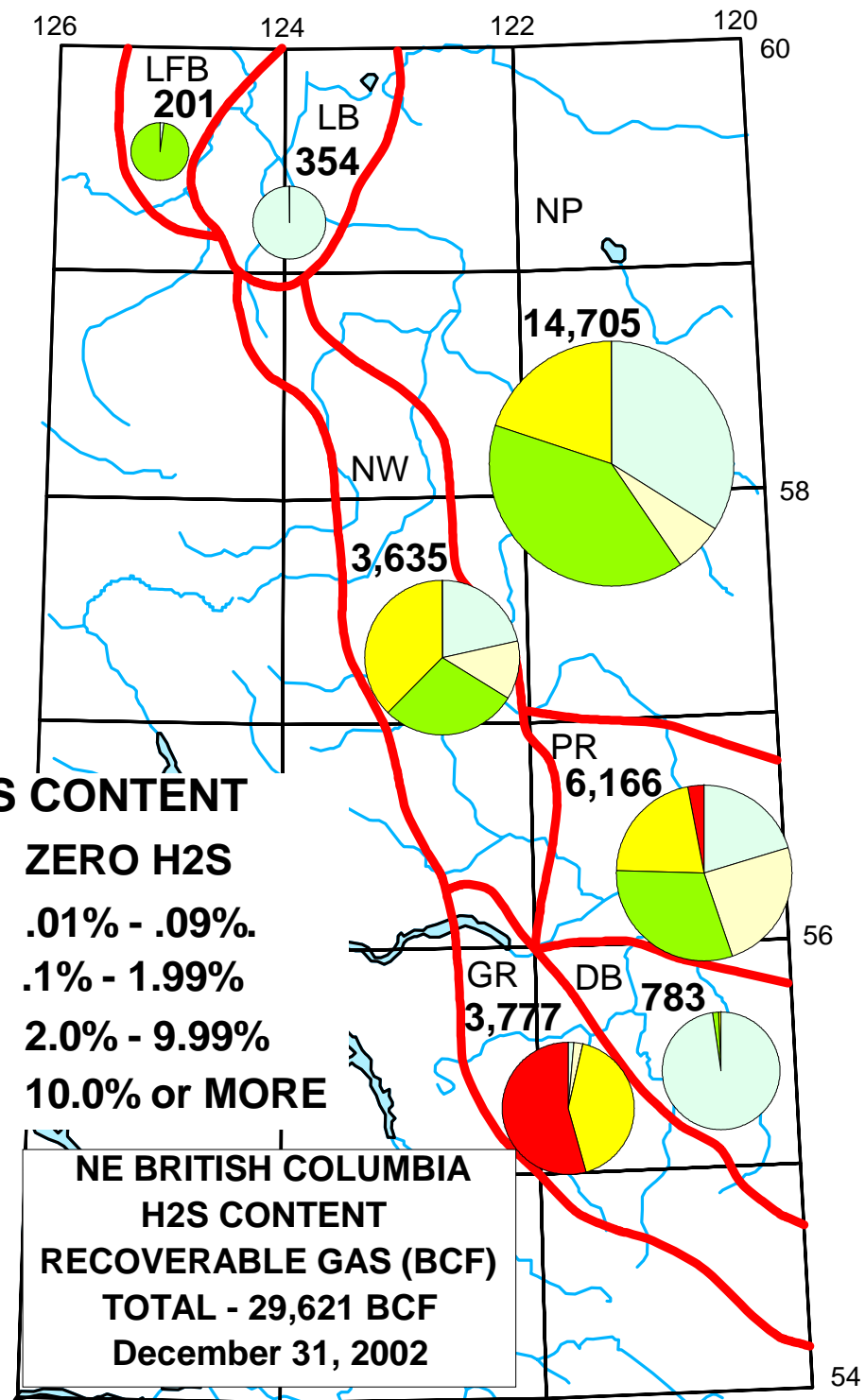
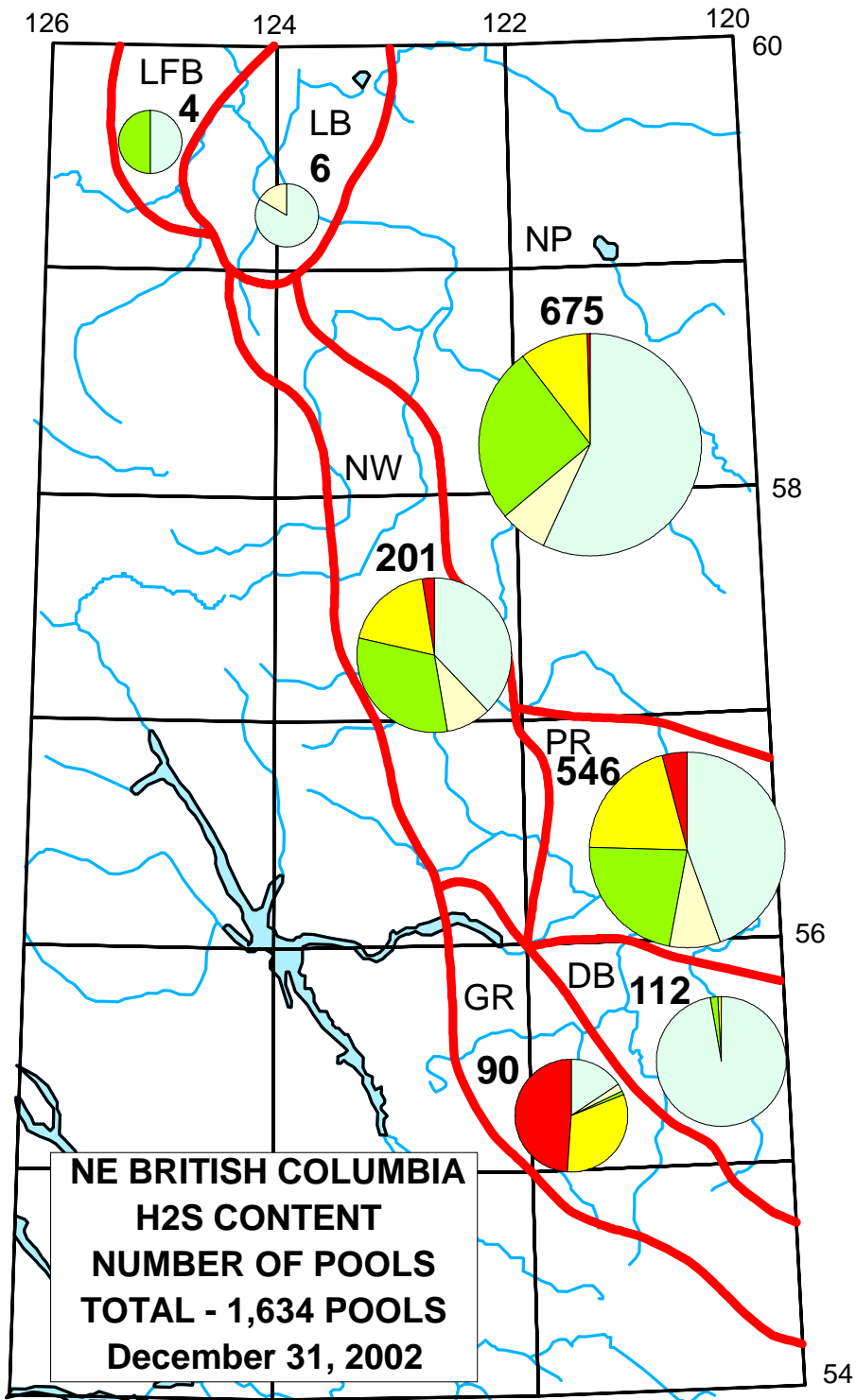
- ▶ **1,634 GAS POOLS**
- ▶ **GAS-IN-PLACE - 39.1 TCF**
- ▶ **INITIAL MARKETABLE GAS - 24.3 TCF**
- ▶ **REMAINING MARKETABLE GAS - 8.8 TCF**
- ▶ **AVERAGE POOL SIZE - 14.8 BCF**
- ▶ **MEDIAN POOL SIZE - 2.7 BCF**
- ▶ **95th PERCENTILE - 52.6 BCF**

NORTHEAST BRITISH COLUMBIA ULTIMATE MARKETABLE GAS (Trillion Cubic Feet)

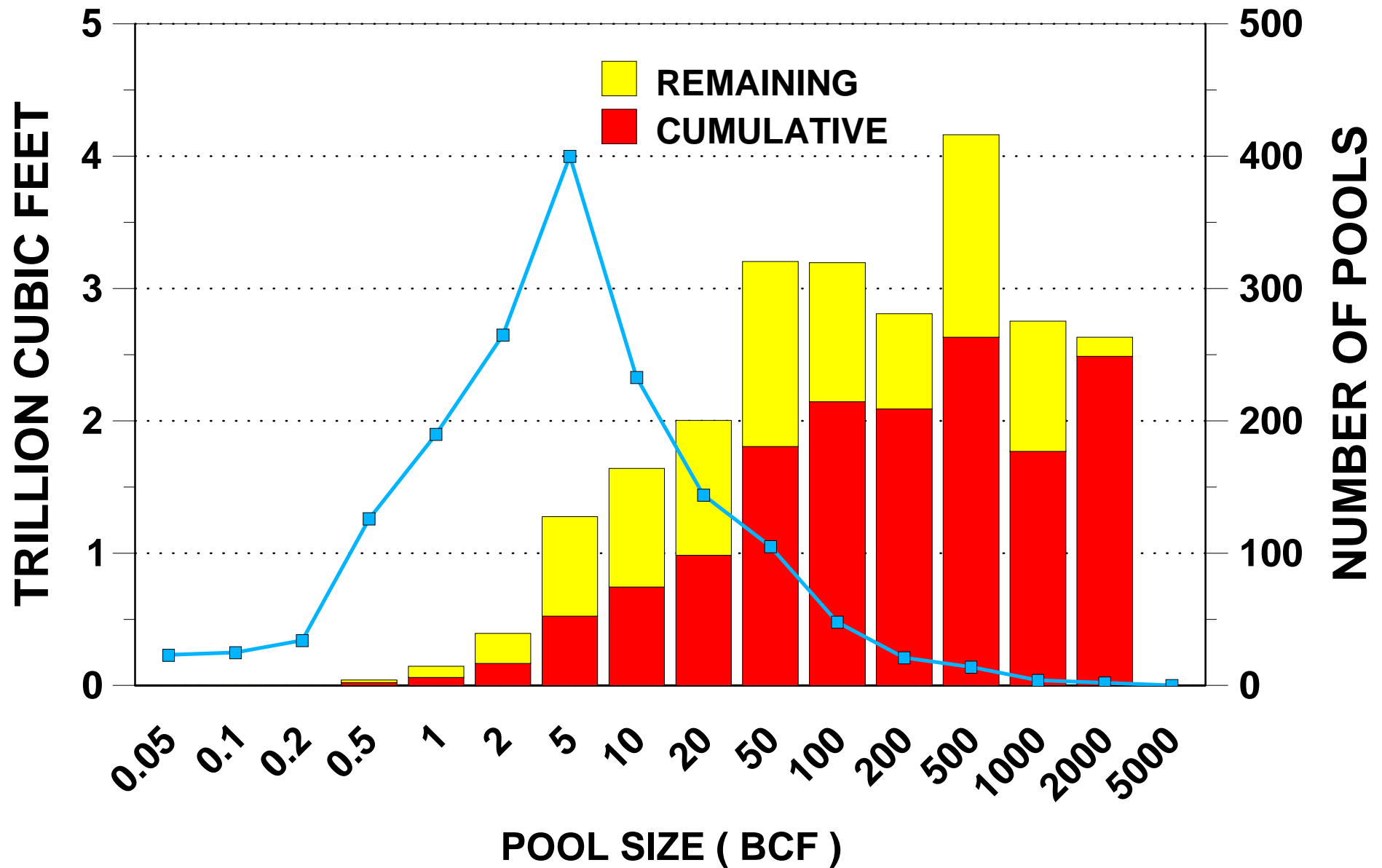


Total: 53.4

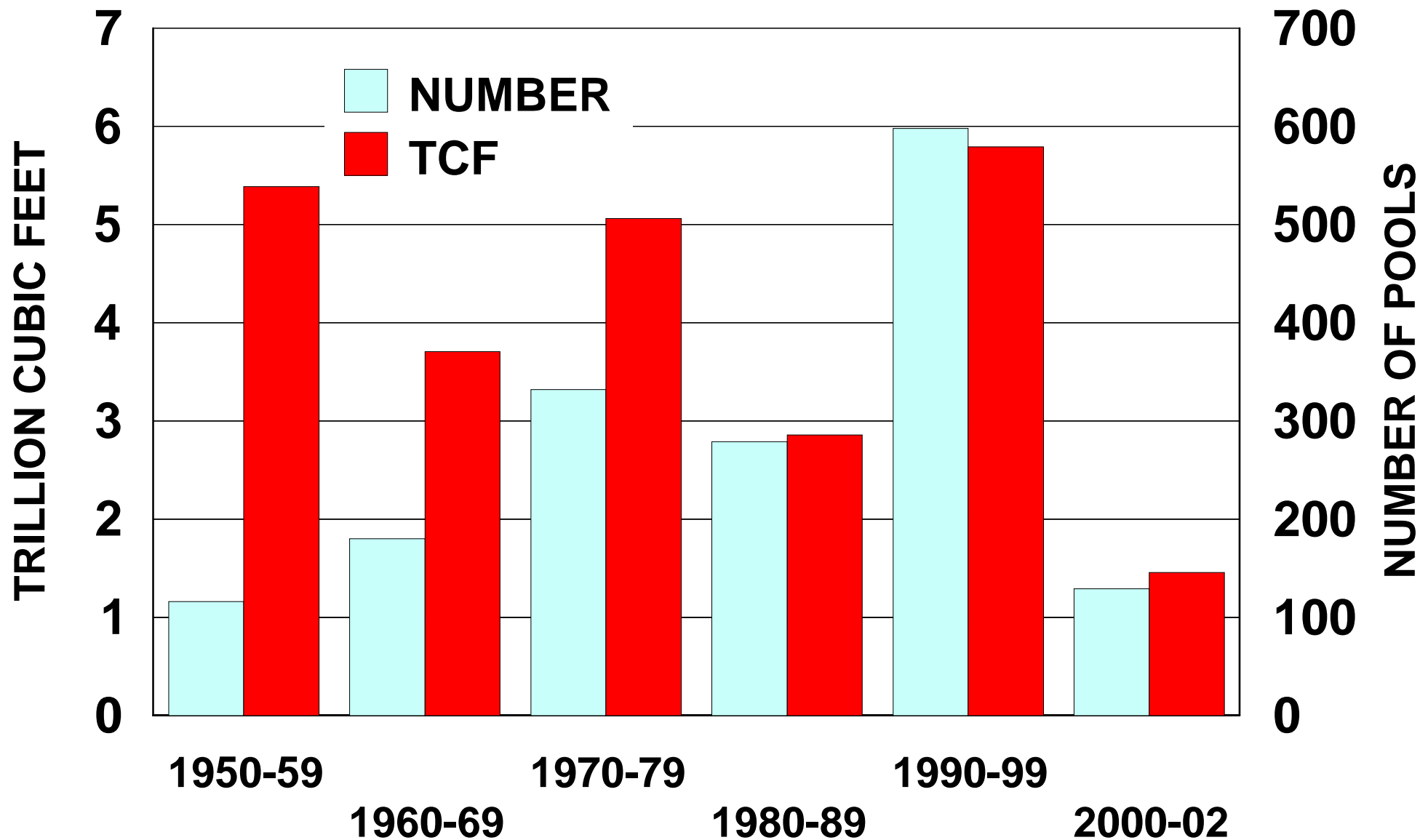




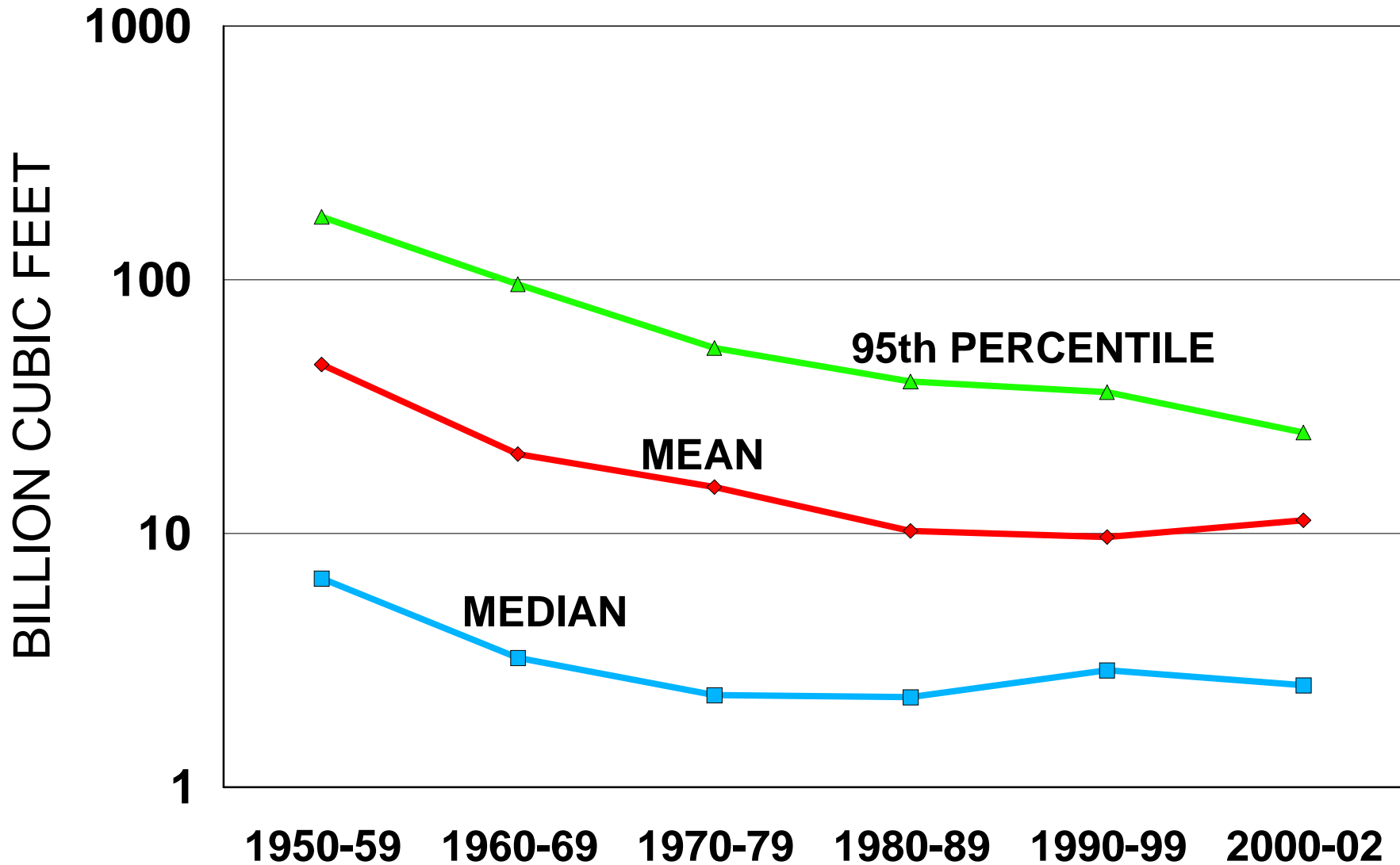
B.C. POOL SIZE DISTRIBUTION MARKETABLE GAS



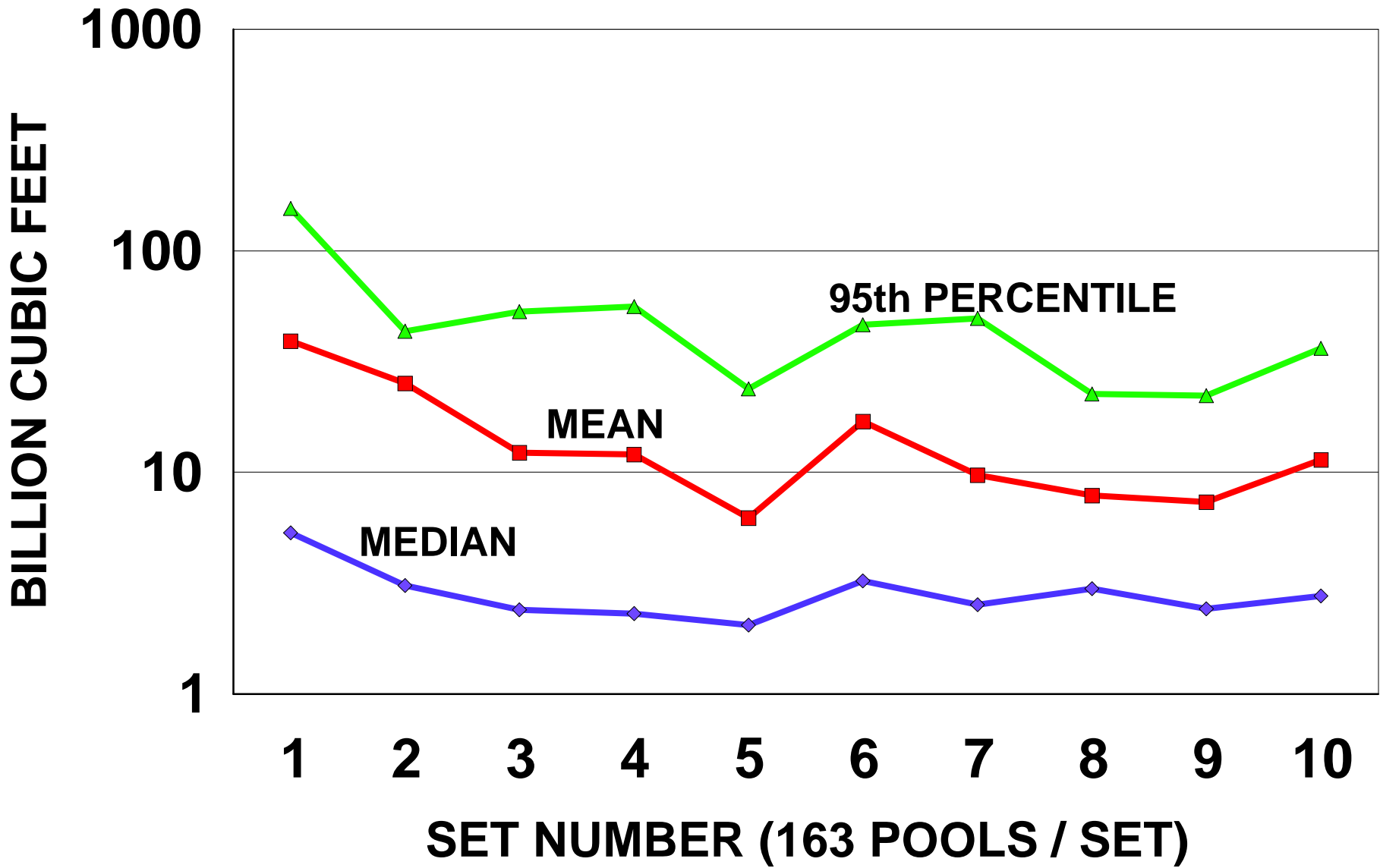
B.C.- MARKETABLE GAS BY DECADE DISCOVERED



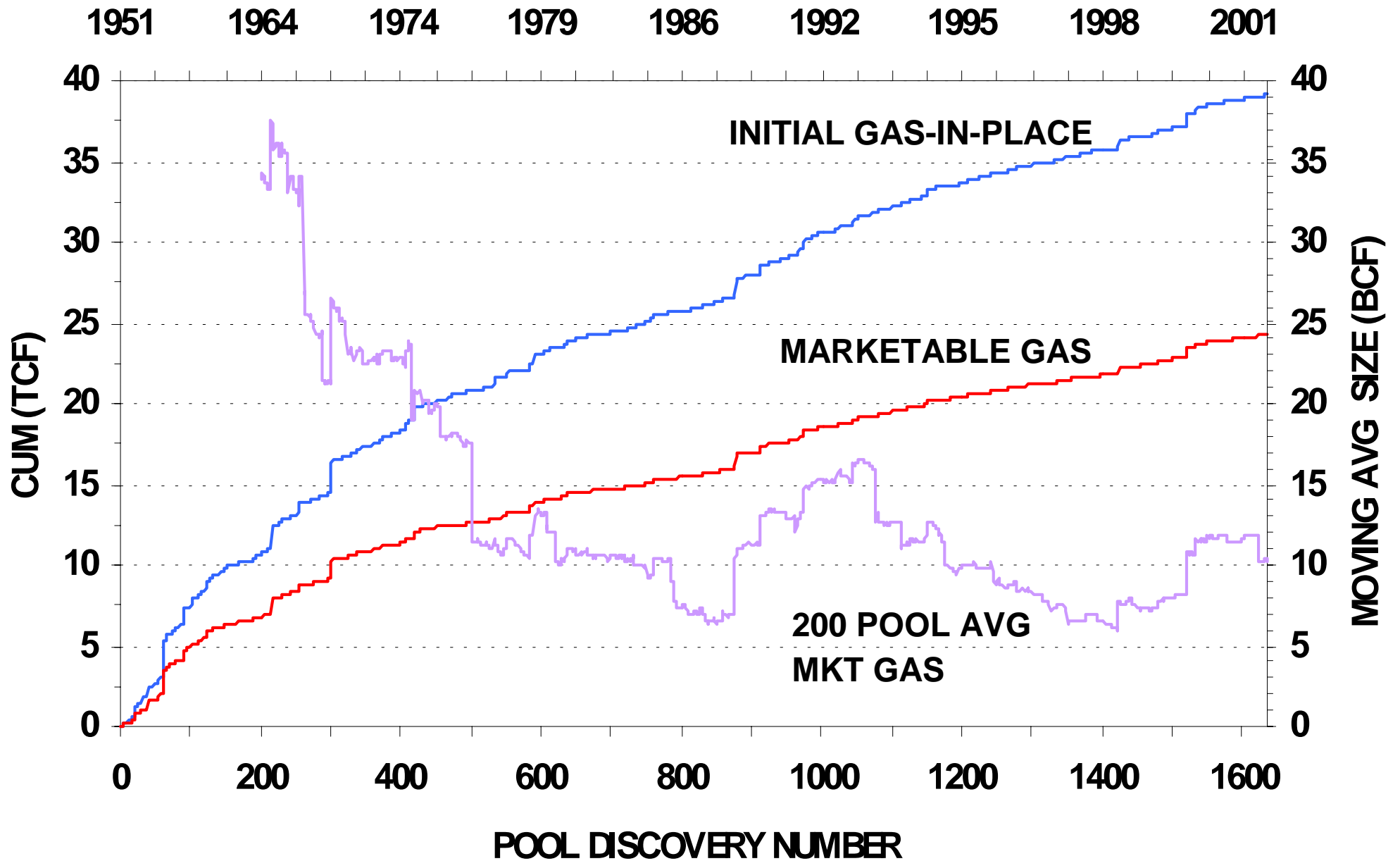
B.C.- INITIAL MARKETABLE GAS POOL SIZE BY DECADE DISCOVERED



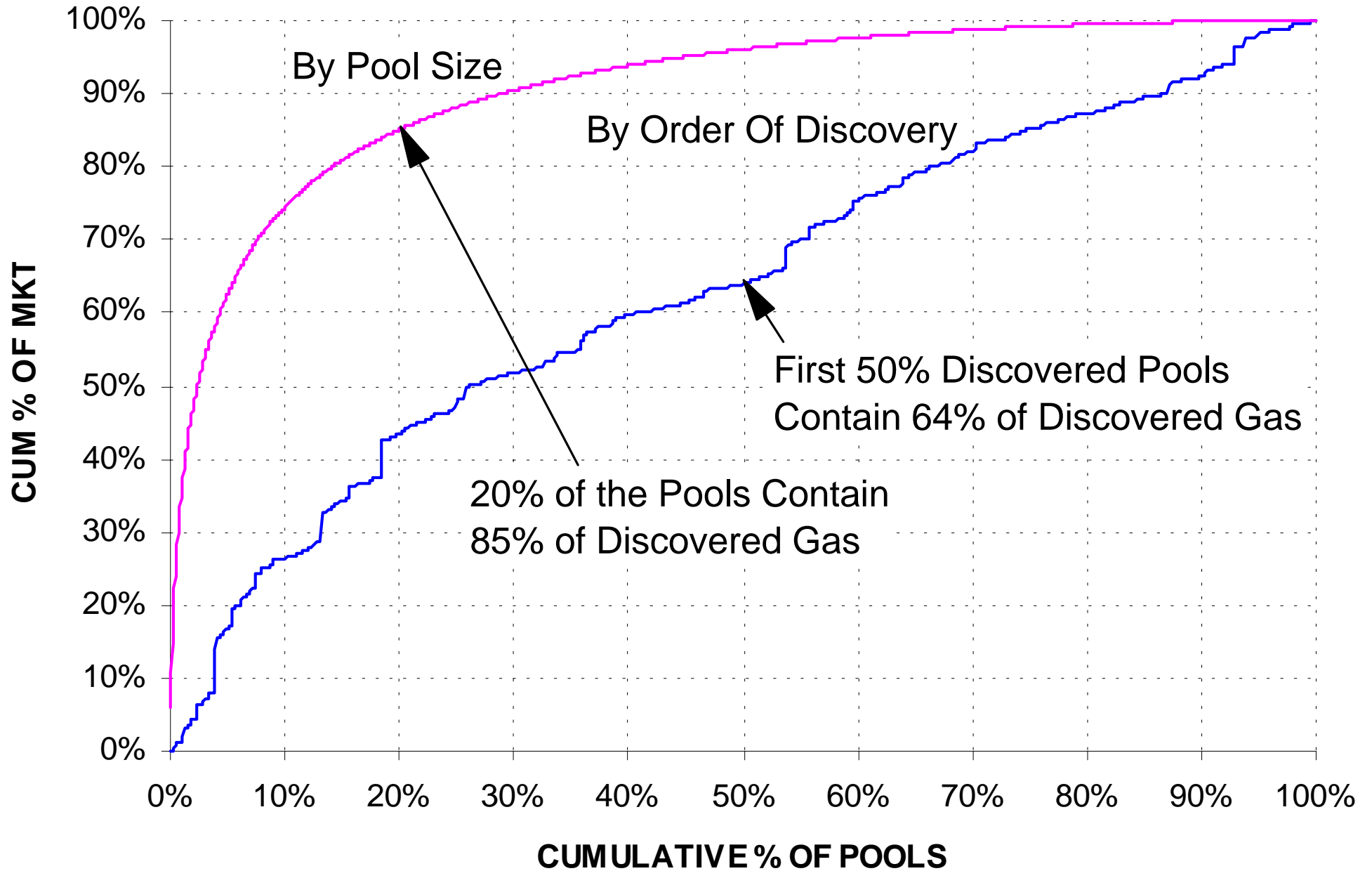
B.C. INITIAL MARKETABLE GAS POOL SIZES IN SETS BY DISCOVERY SEQUENCE

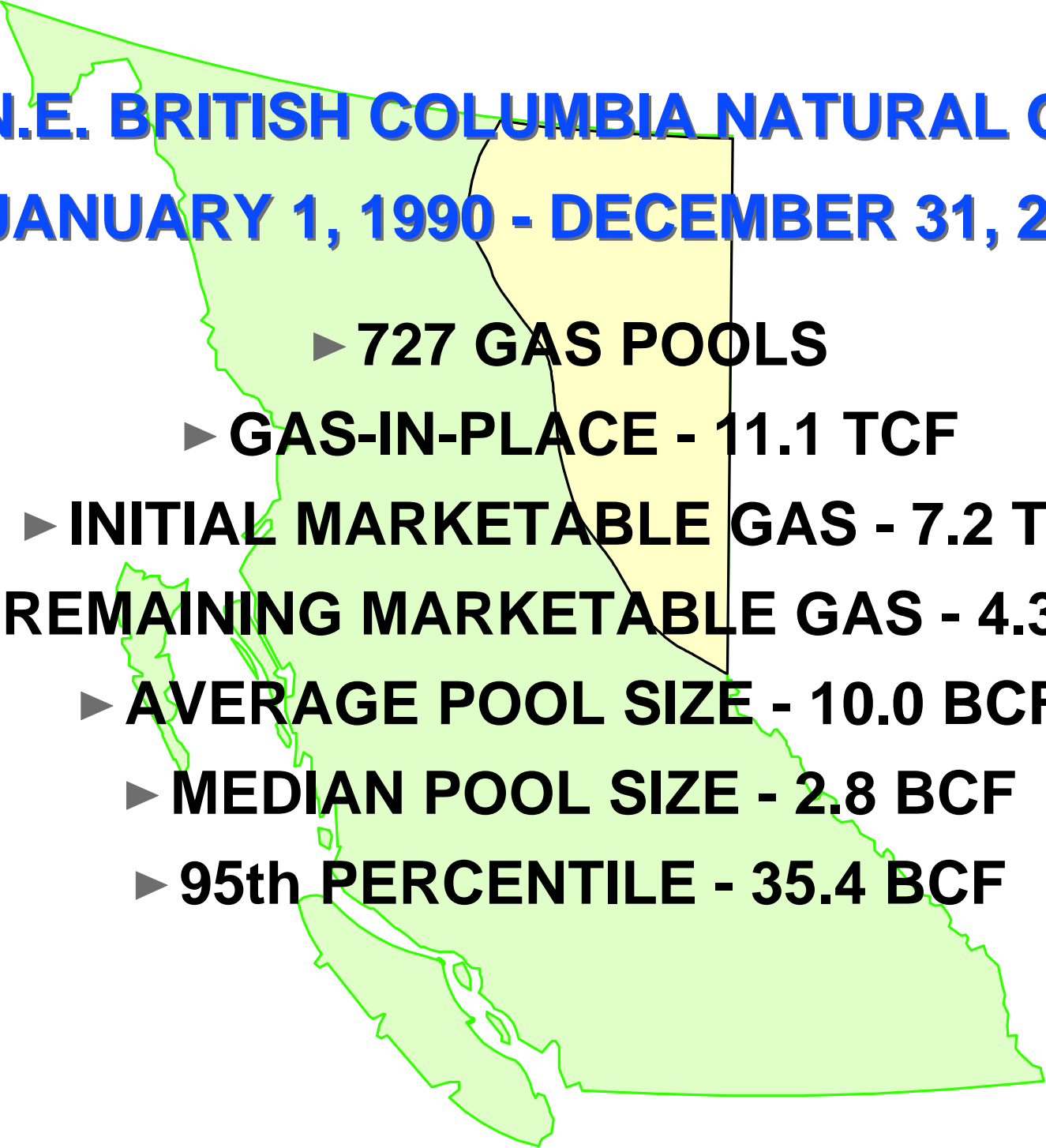


BRITISH COLUMBIA CUMULATIVE GAS DISCOVERY PLOT



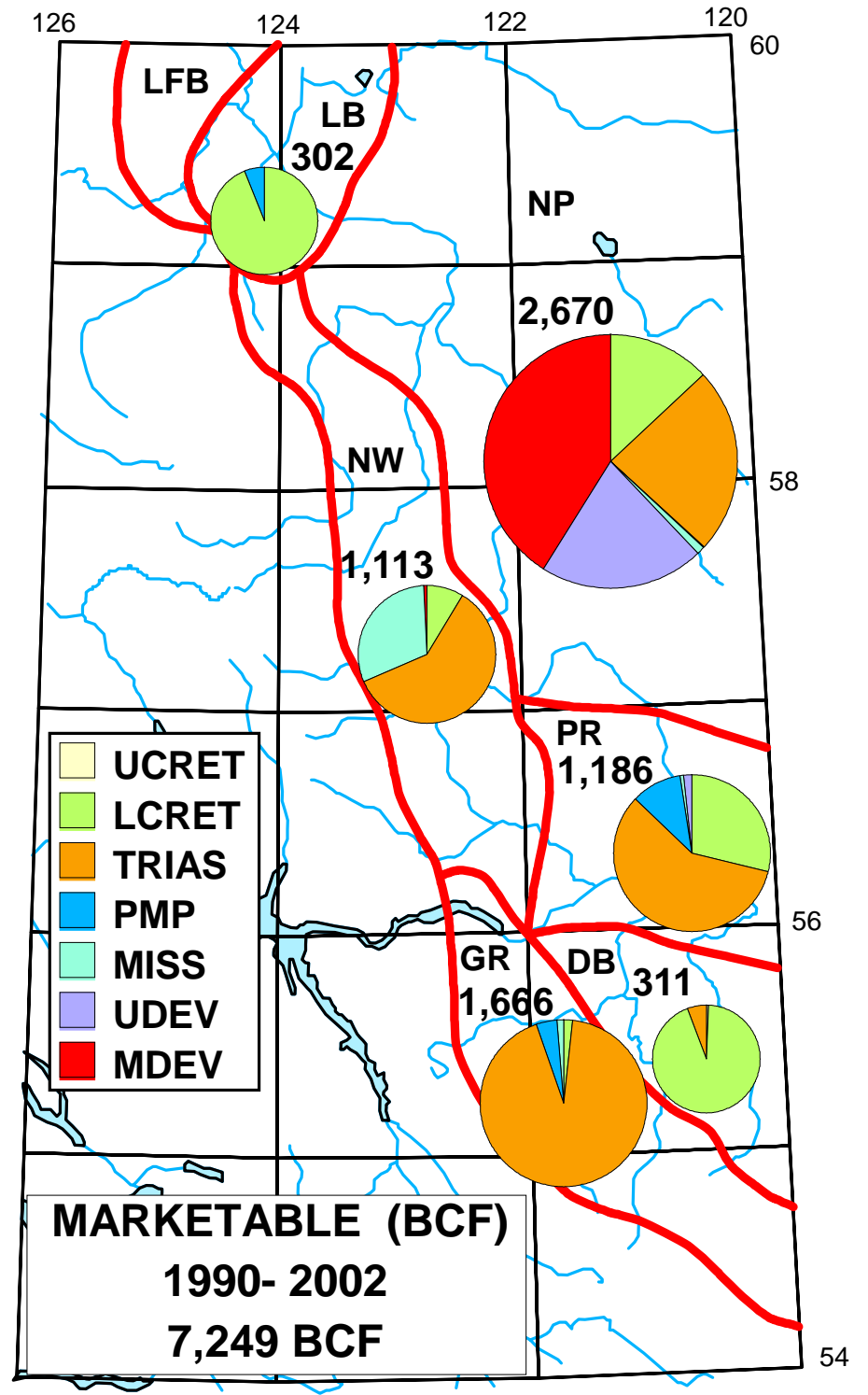
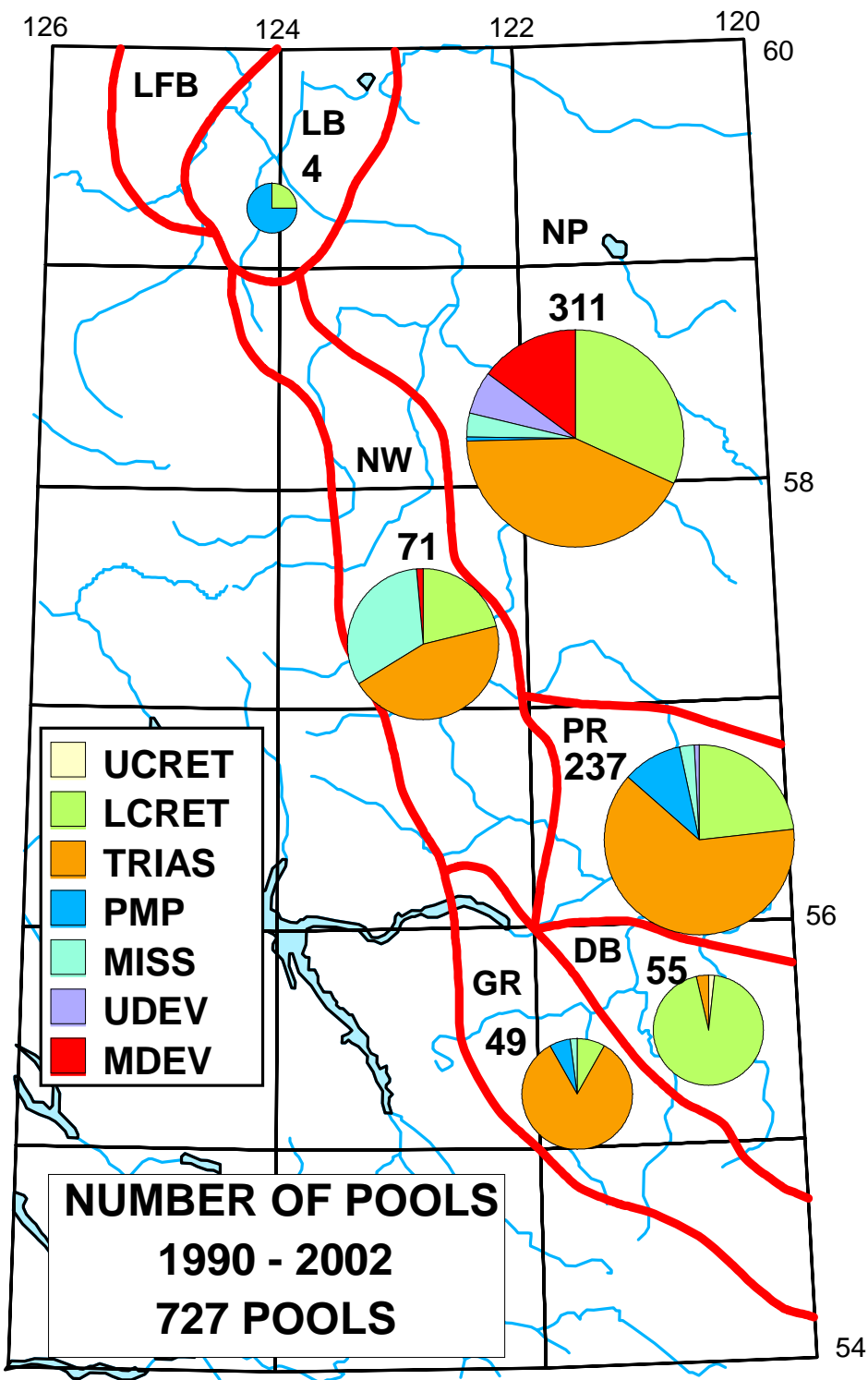
BRITISH COLUMBIA - CUMULATIVE PERCENT MARKETABLE GAS vs NUMBER OF POOLS

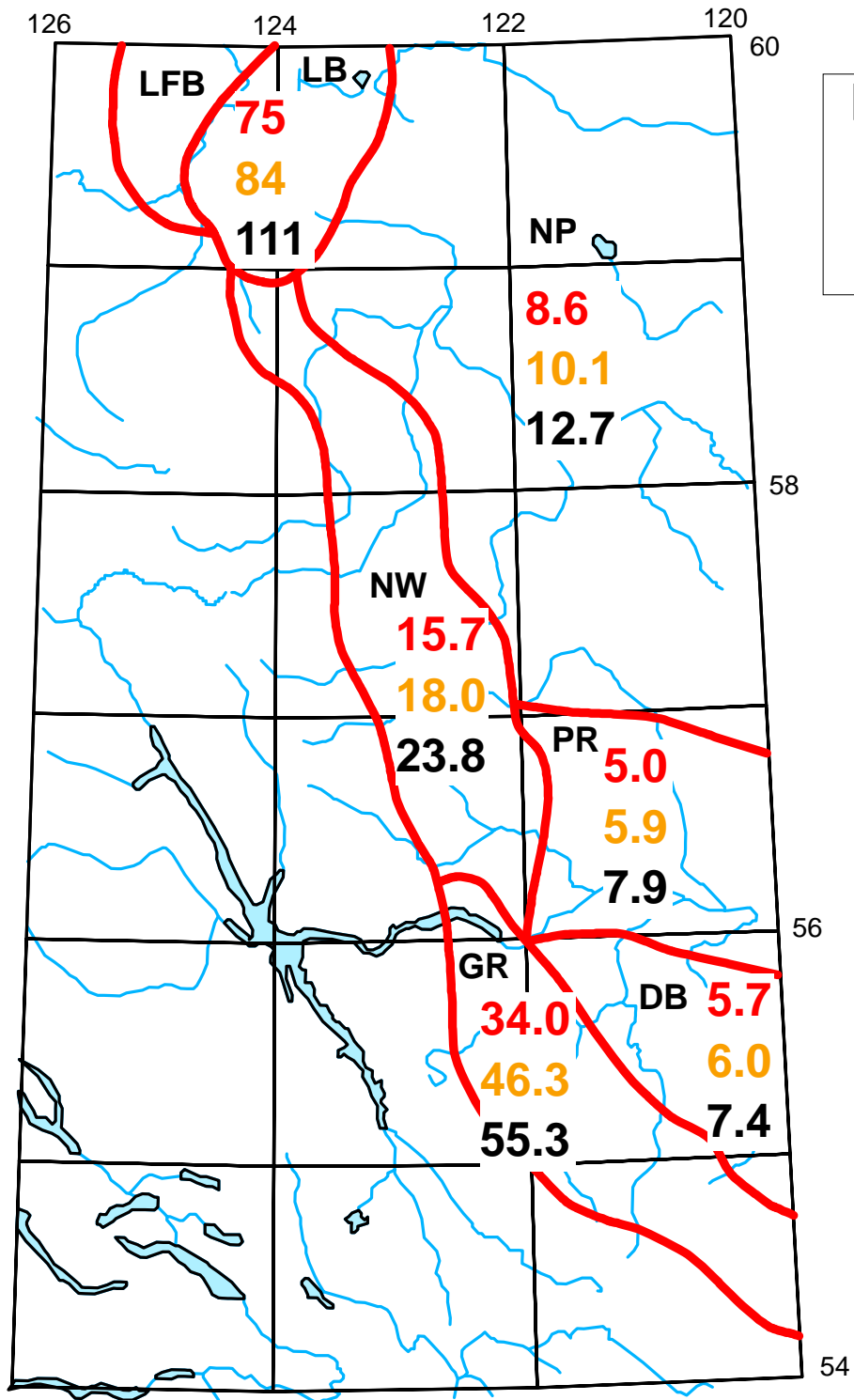




**N.E. BRITISH COLUMBIA NATURAL GAS
JANUARY 1, 1990 - DECEMBER 31, 2002**

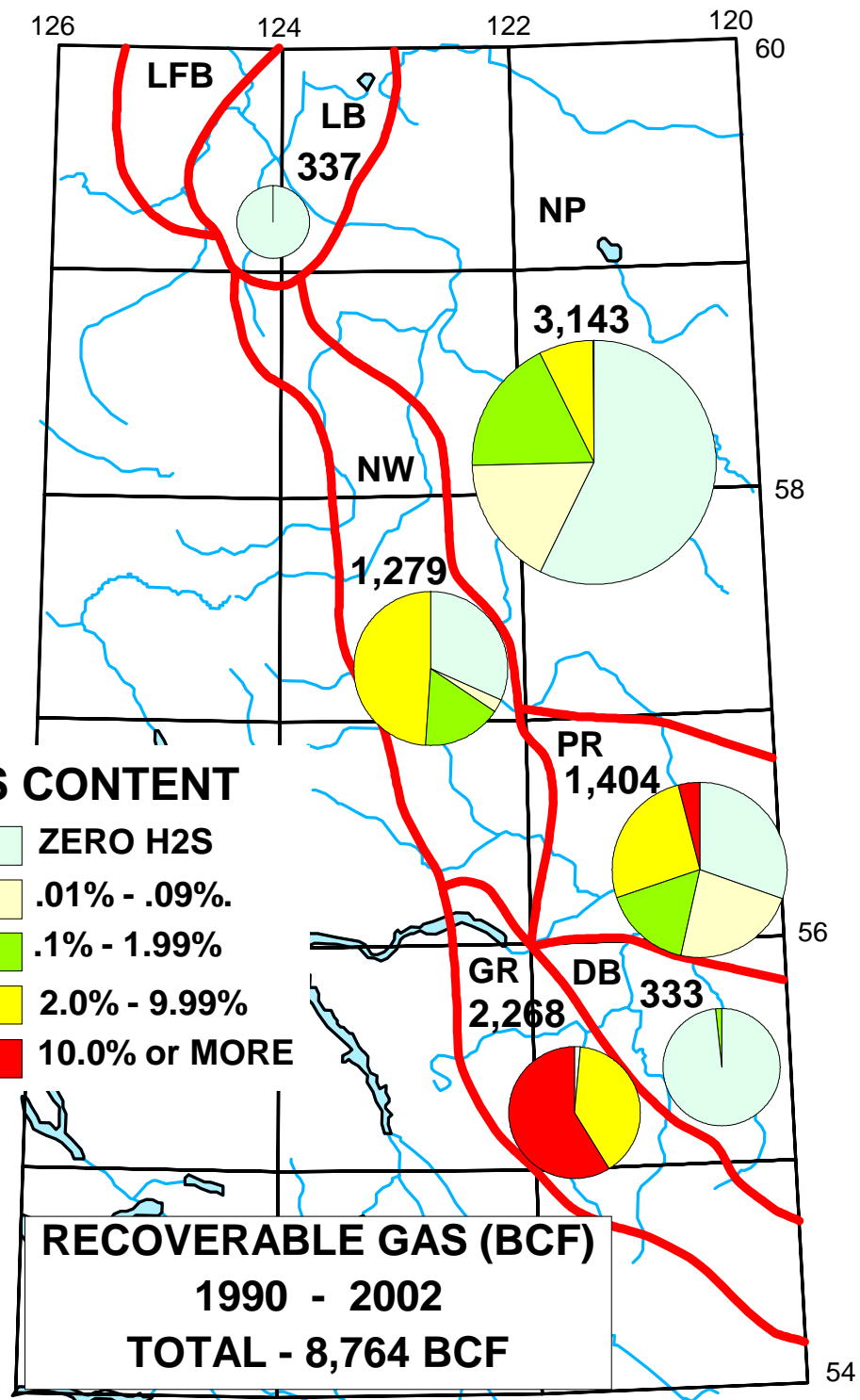
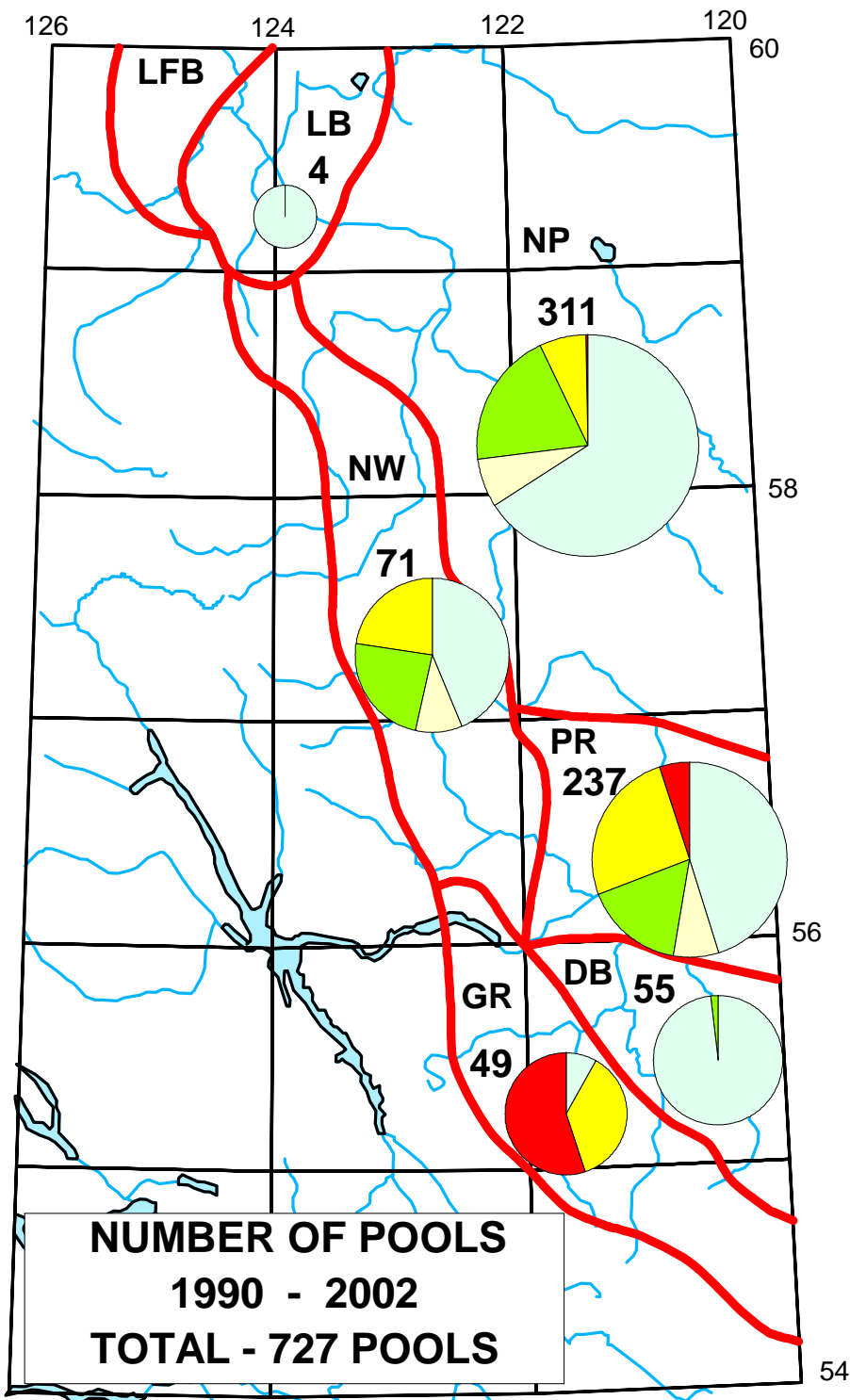
- ▶ **727 GAS POOLS**
- ▶ **GAS-IN-PLACE - 11.1 TCF**
- ▶ **INITIAL MARKETABLE GAS - 7.2 TCF**
- ▶ **REMAINING MARKETABLE GAS - 4.3 TCF**
- ▶ **AVERAGE POOL SIZE - 10.0 BCF**
- ▶ **MEDIAN POOL SIZE - 2.8 BCF**
- ▶ **95th PERCENTILE - 35.4 BCF**



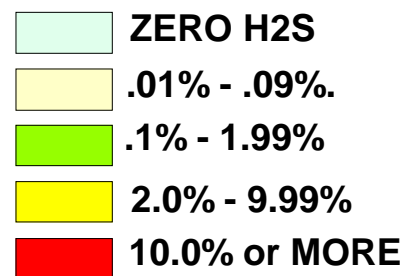


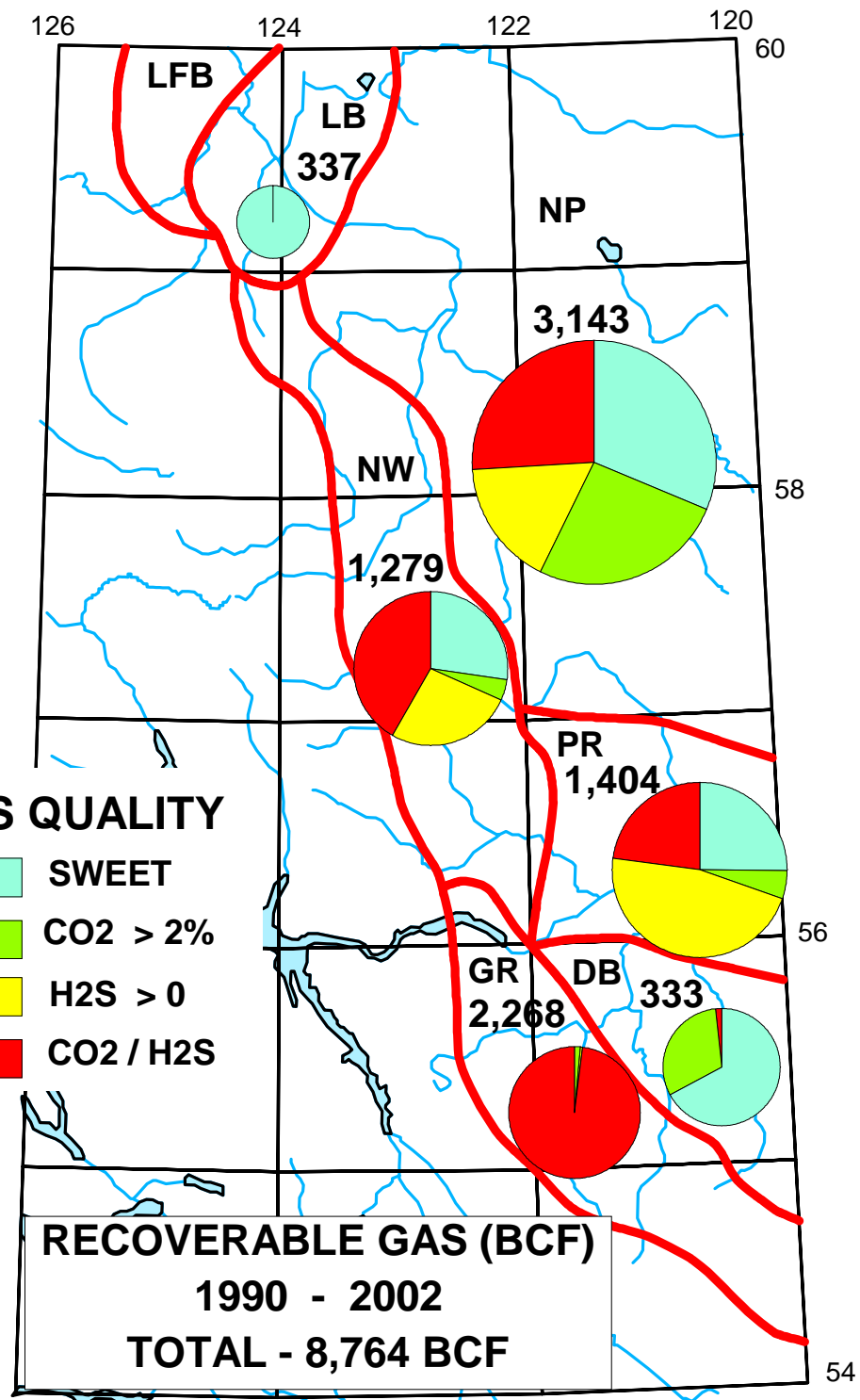
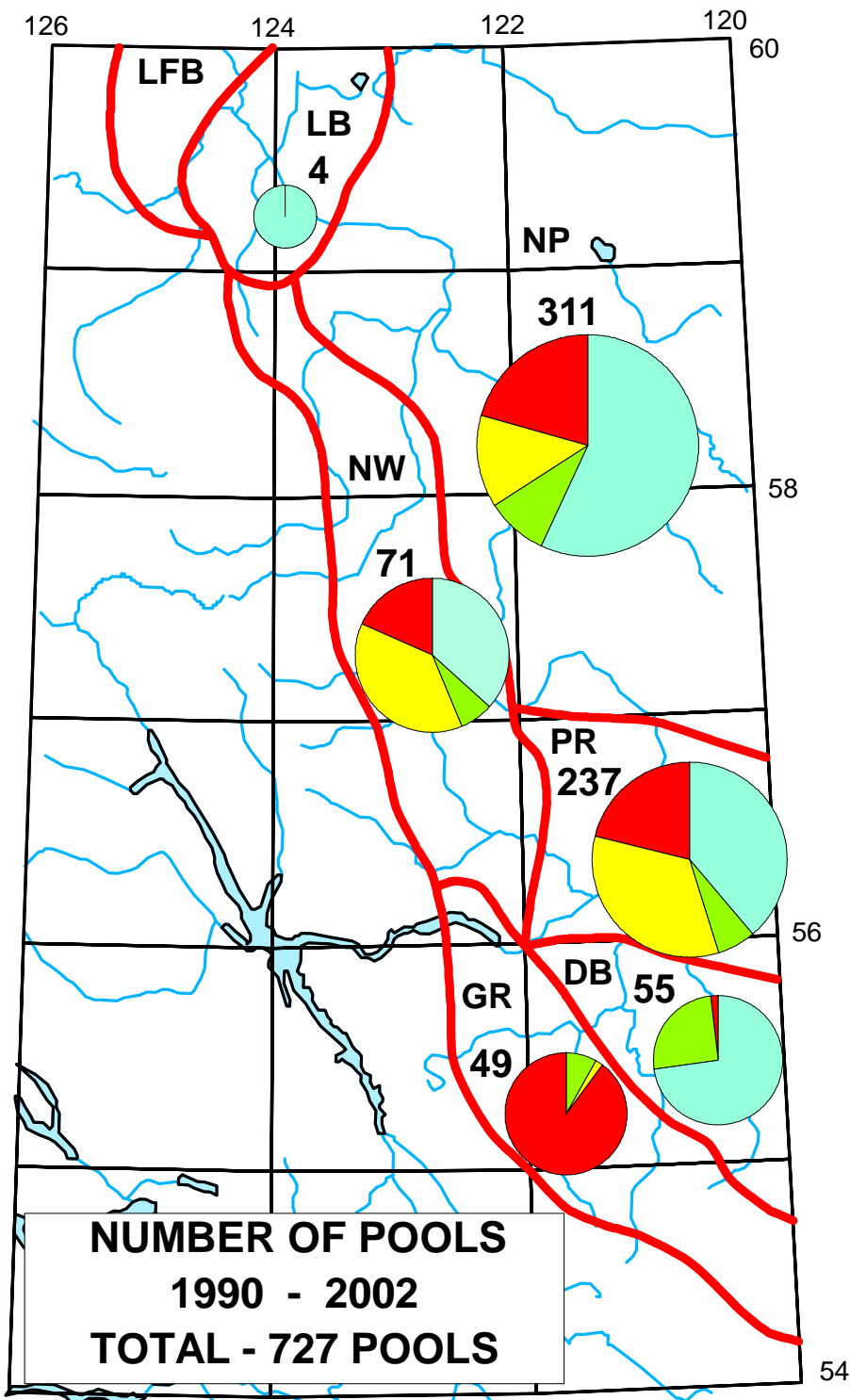
**NE BRITISH COLUMBIA
AVERAGE SIZE (BCF)
1990- 2002**

**MARKETABLE
RECOVERABLE
GAS-IN-PLACE**

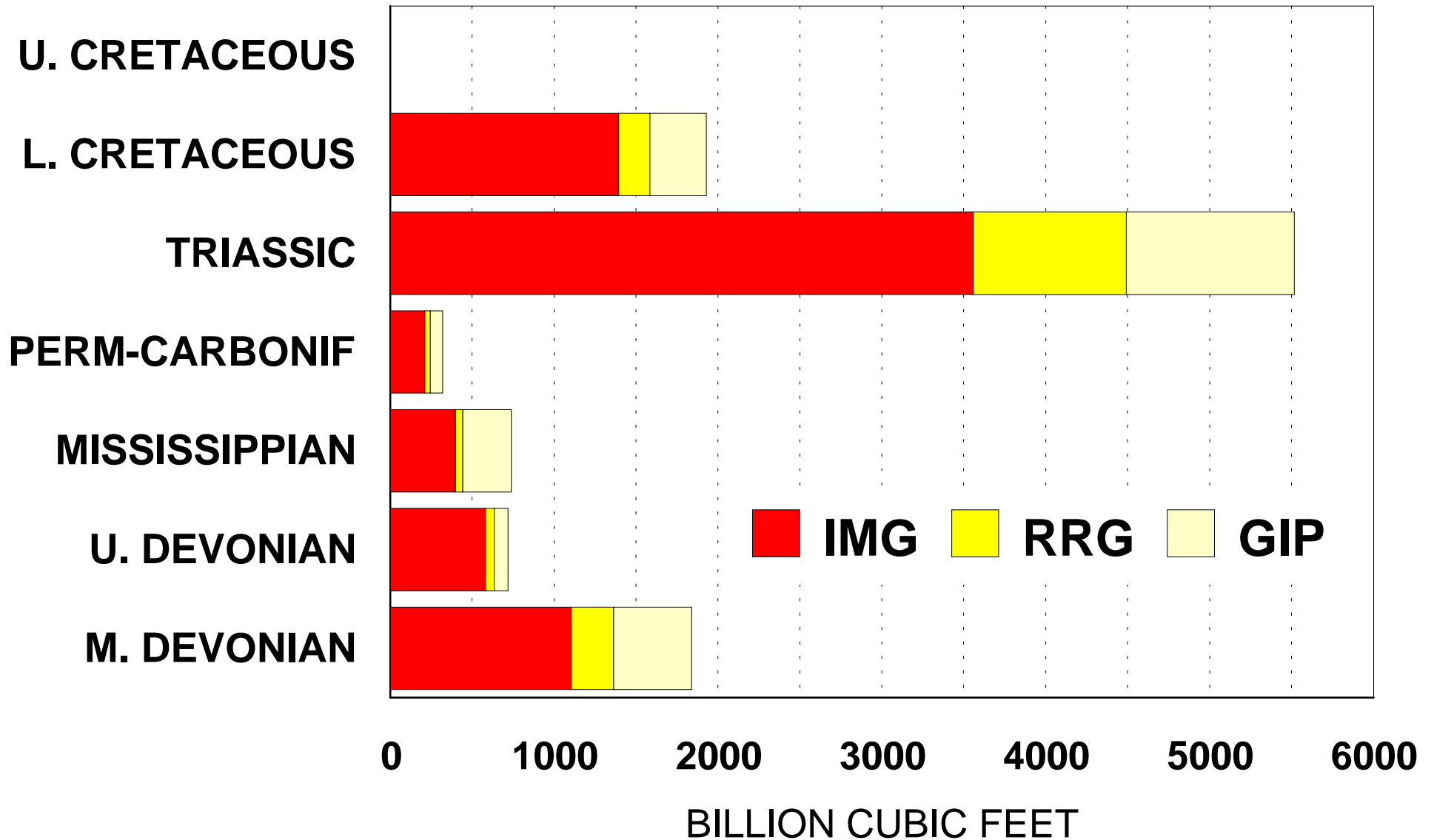


H2S CONTENT

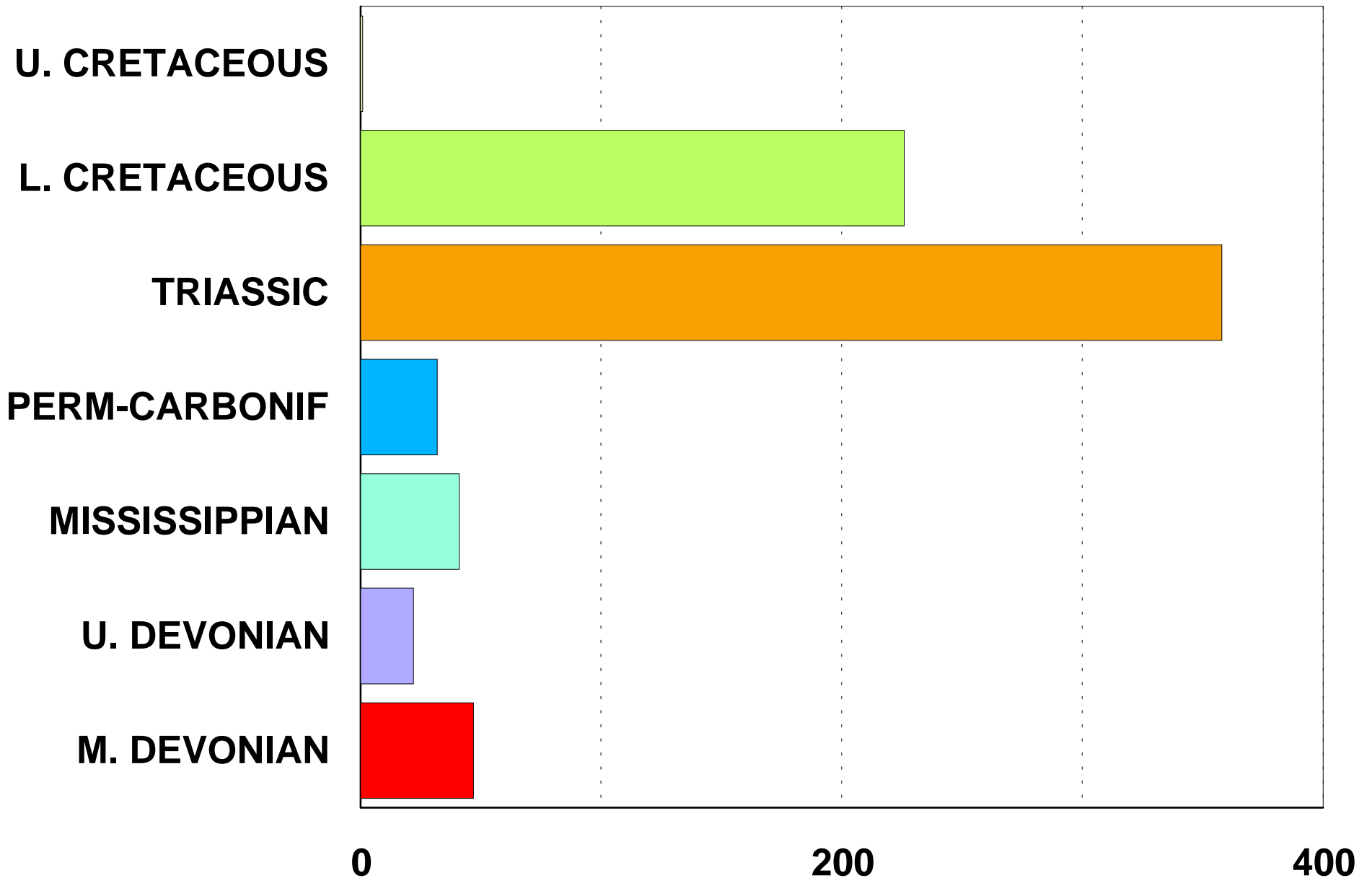




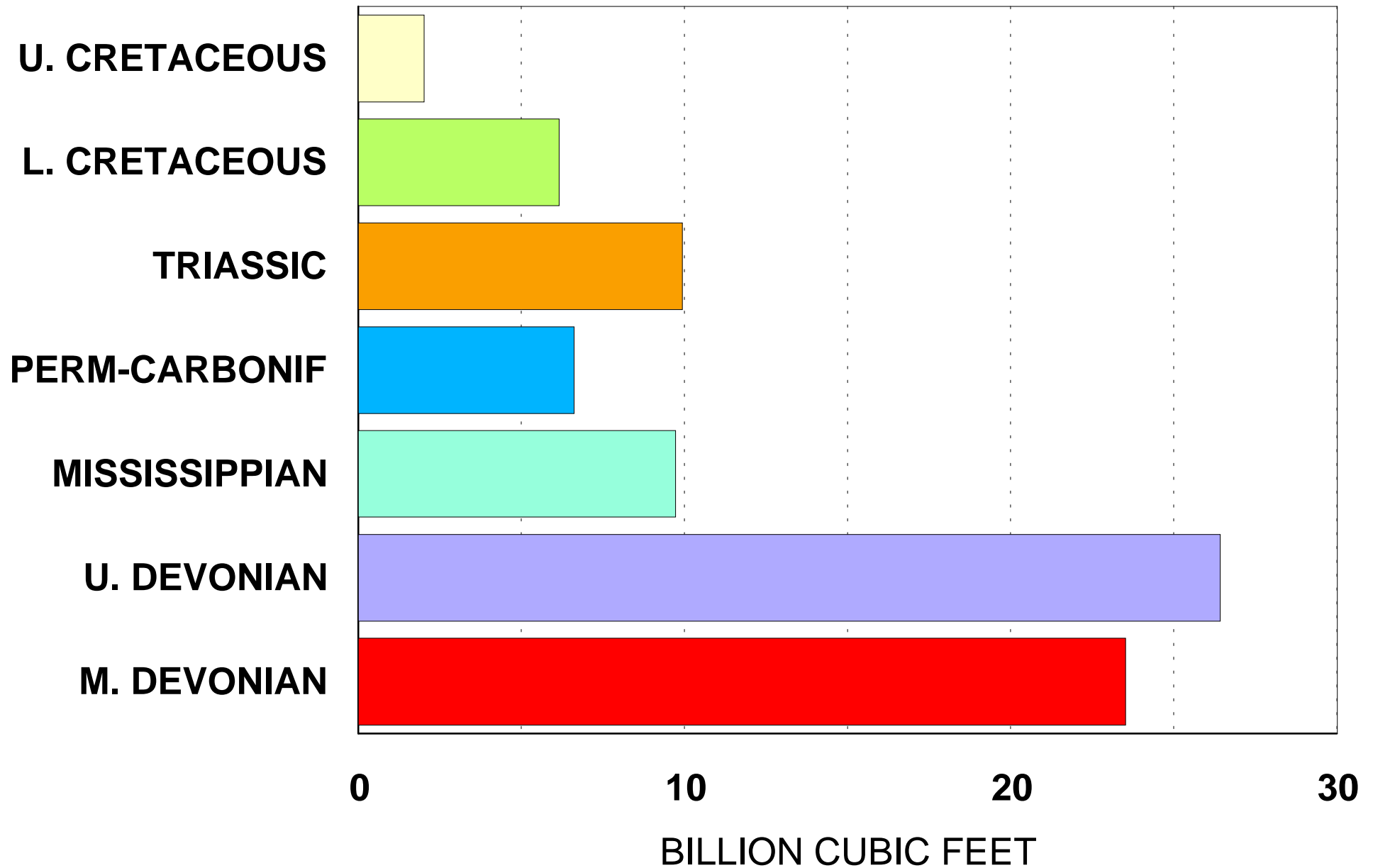
N.E. BRITISH COLUMBIA 1990 - 2002 GAS BY STRATIGRAPHIC HORIZON



N.E. BRITISH COLUMBIA 1990 - 2002 NUMBER BY STRATIGRAPHIC HORIZON



N.E. BRITISH COLUMBIA 1990 - 2002 AVERAGE SIZE (MARKETABLE) BY HORIZON

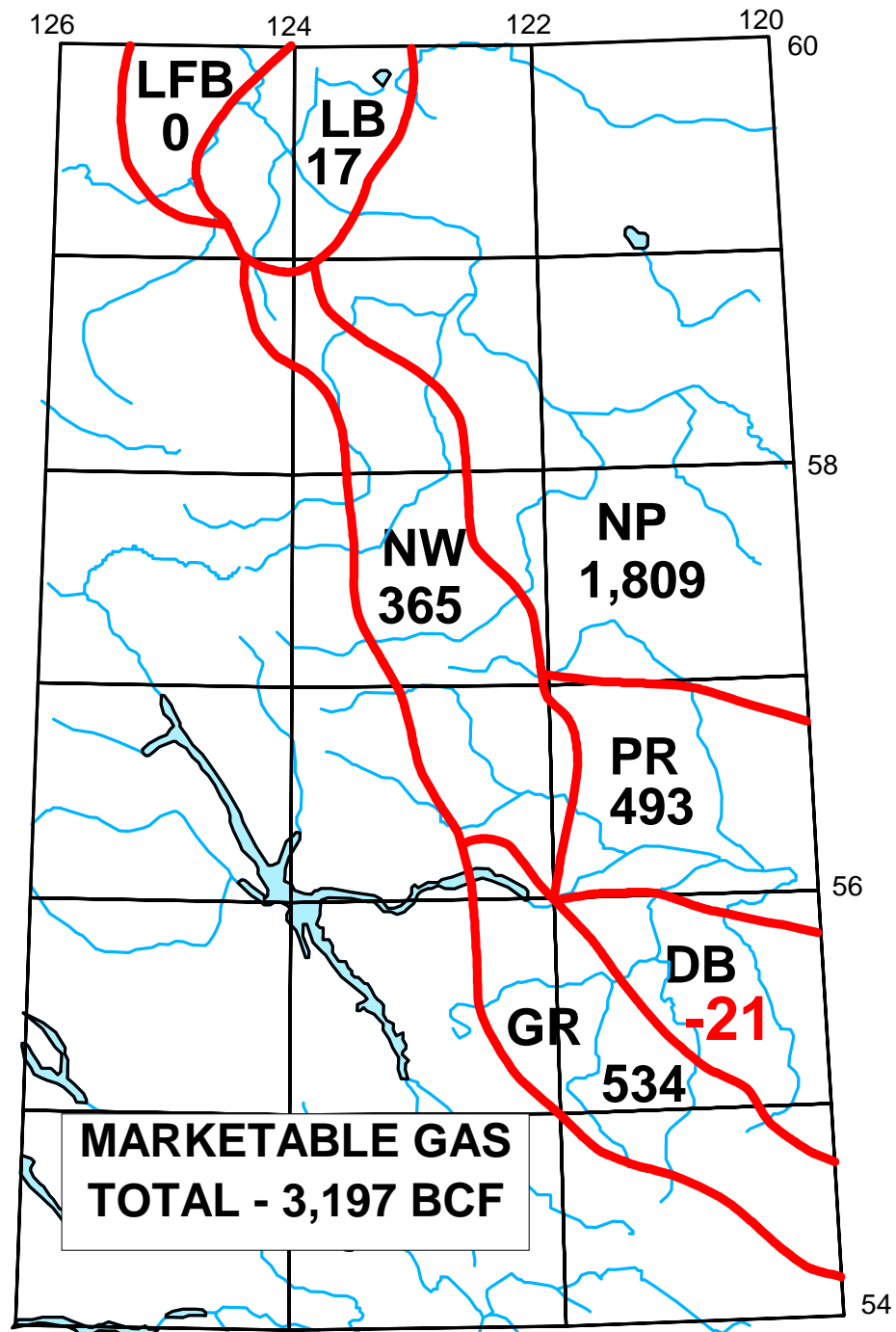
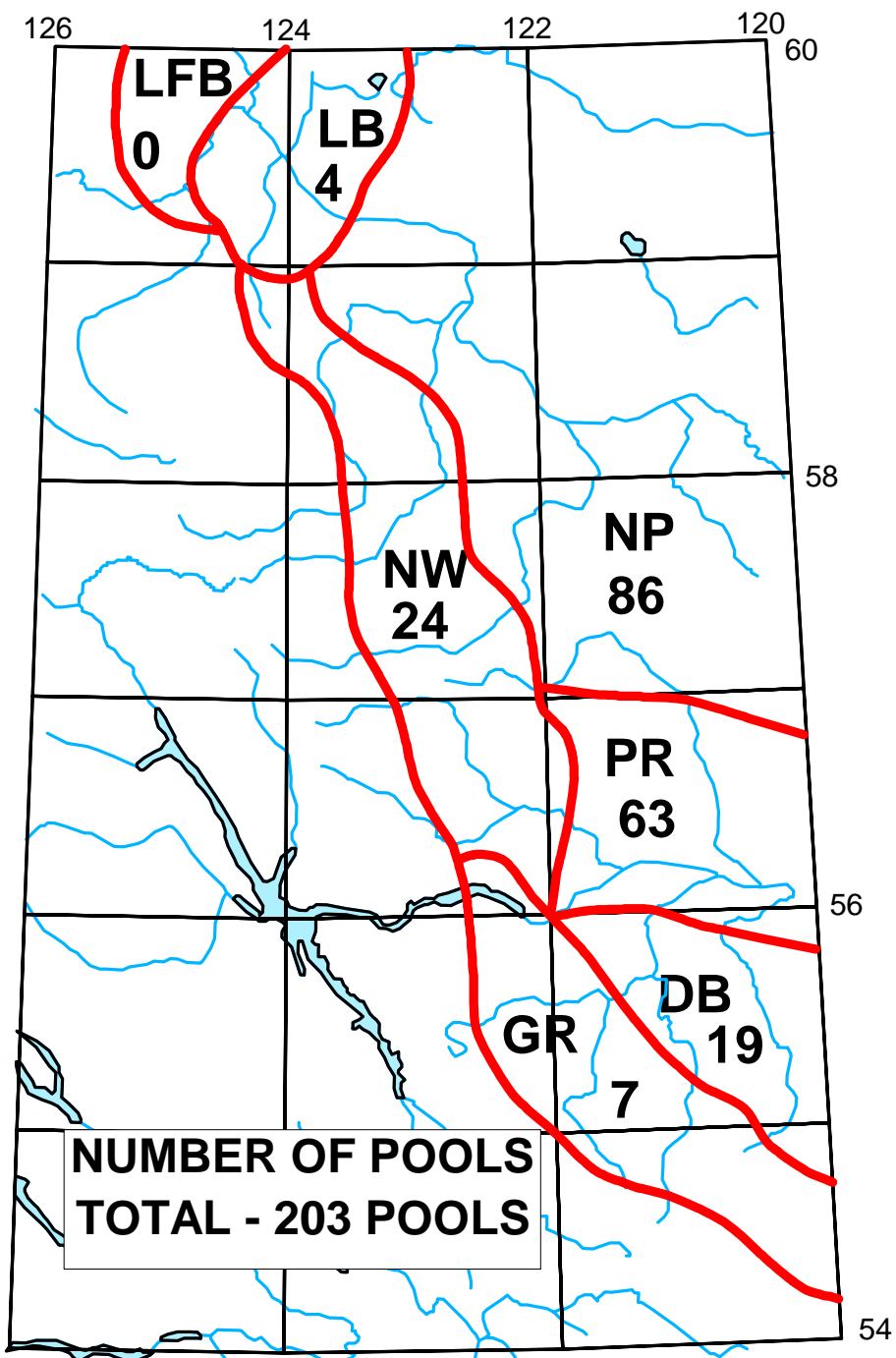


BRITISH COLUMBIA GAS POOLS

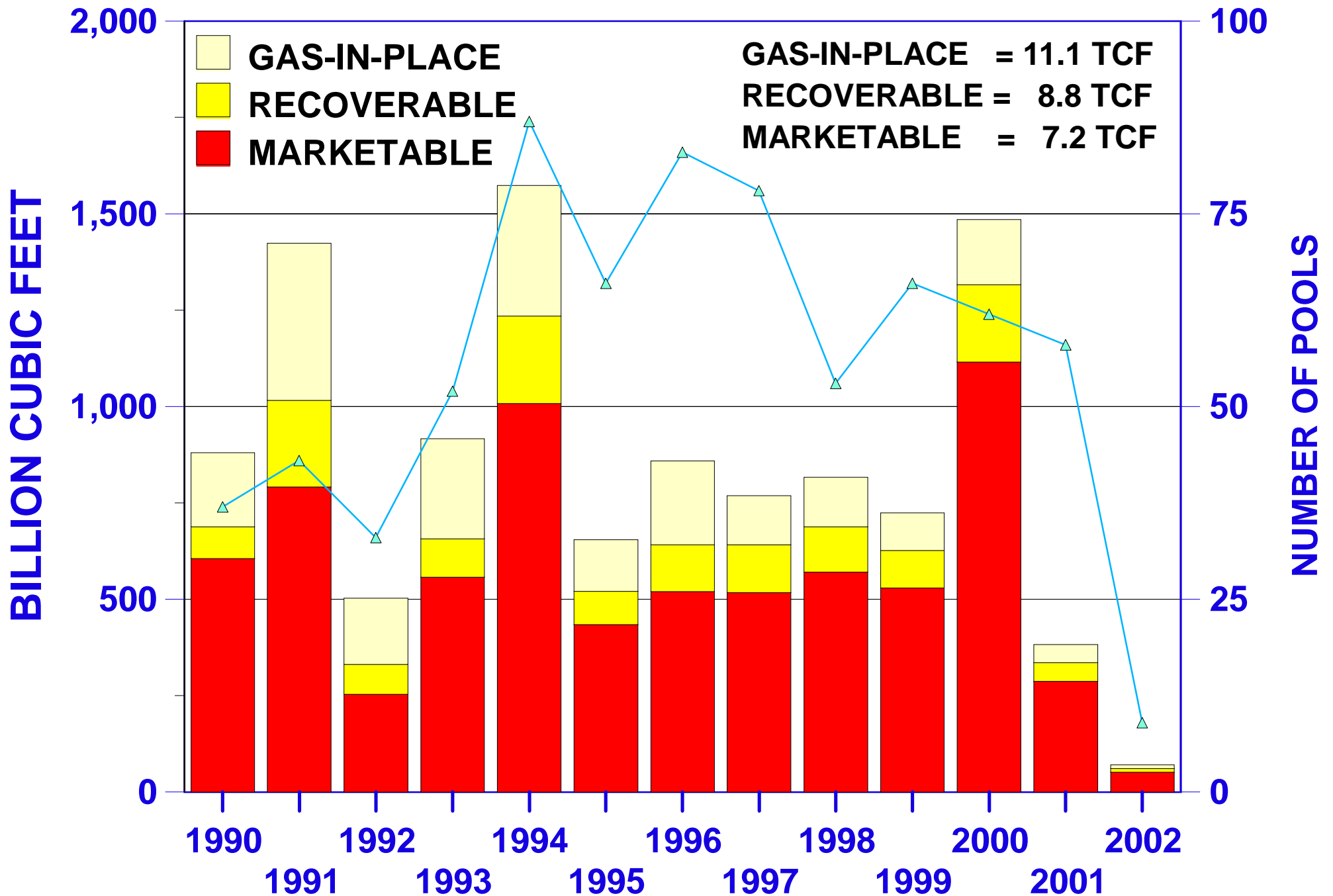
PRE-1990 vs 1990-2002

	PRE-1990	1990-2002
RECOVERY FACTORS (% Of GIP)		
RECOVERABLE	74.4%	79.2%
MARKETABLE	60.7%	65.5%
MARKETABLE GAS (BCF)		
AVERAGE POOL SIZE	18.8	10.0
MEDIAN POOL SIZE	2.7	2.8
95th PERCENTILE	62.9	35.4
AVERAGE DEPTH (FEET)	5,391	5,434
AVERAGE RECOVERABLE (MCF/AC-FT)	945	460
% POOLS WITH H₂S > 10%	3.9%	5.5%
% RECOVERABLE GAS H₂S > 10%	4.0%	15.9%
AVERAGE H₂S CONTENT	2.0%	3.9%

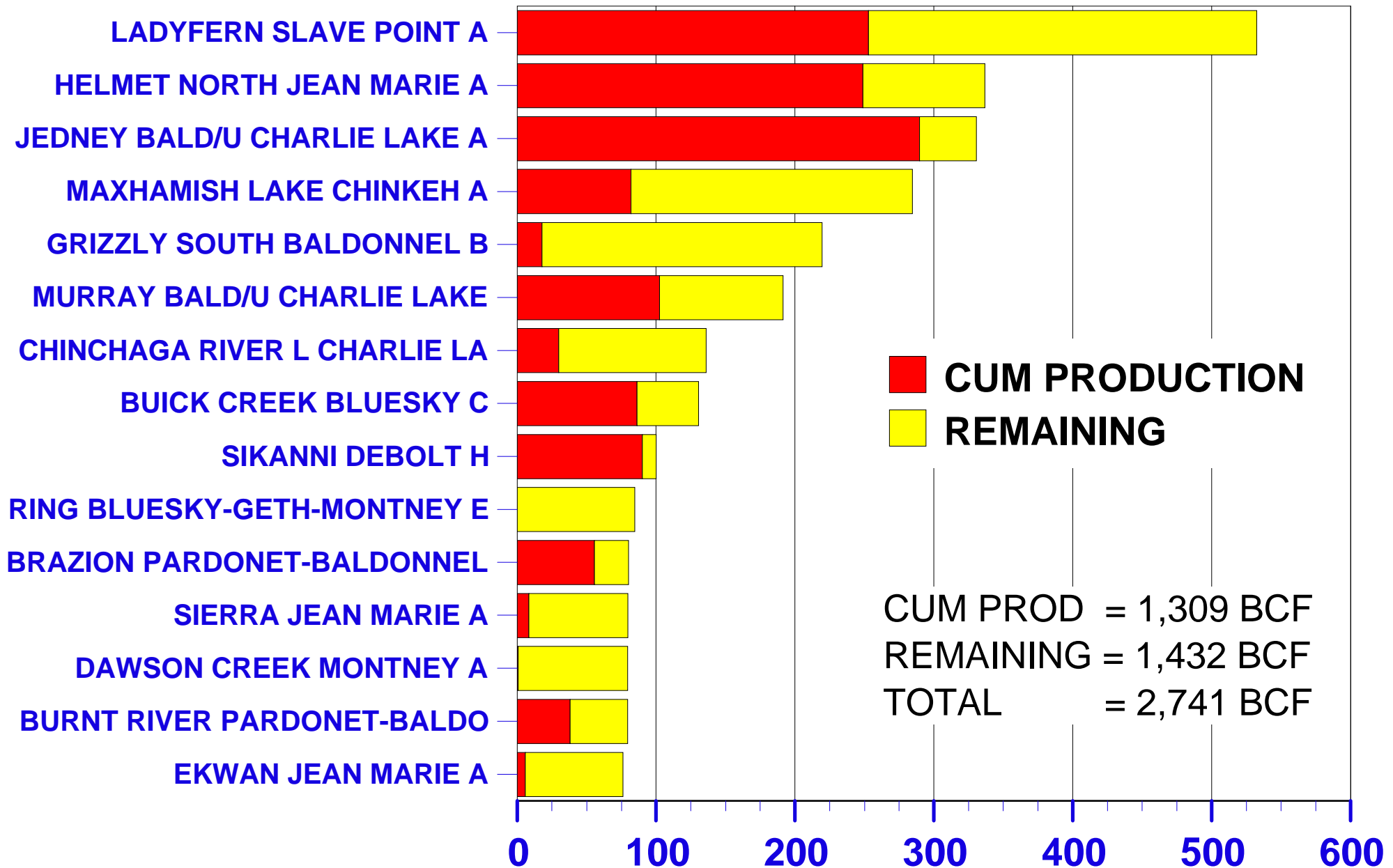
B.C. CHANGES JAN, 2000 - DEC, 2002



B.C. GAS BY YEAR OF DISCOVERY



B.C. - TOP 15 GAS POOLS 1990 - 2002

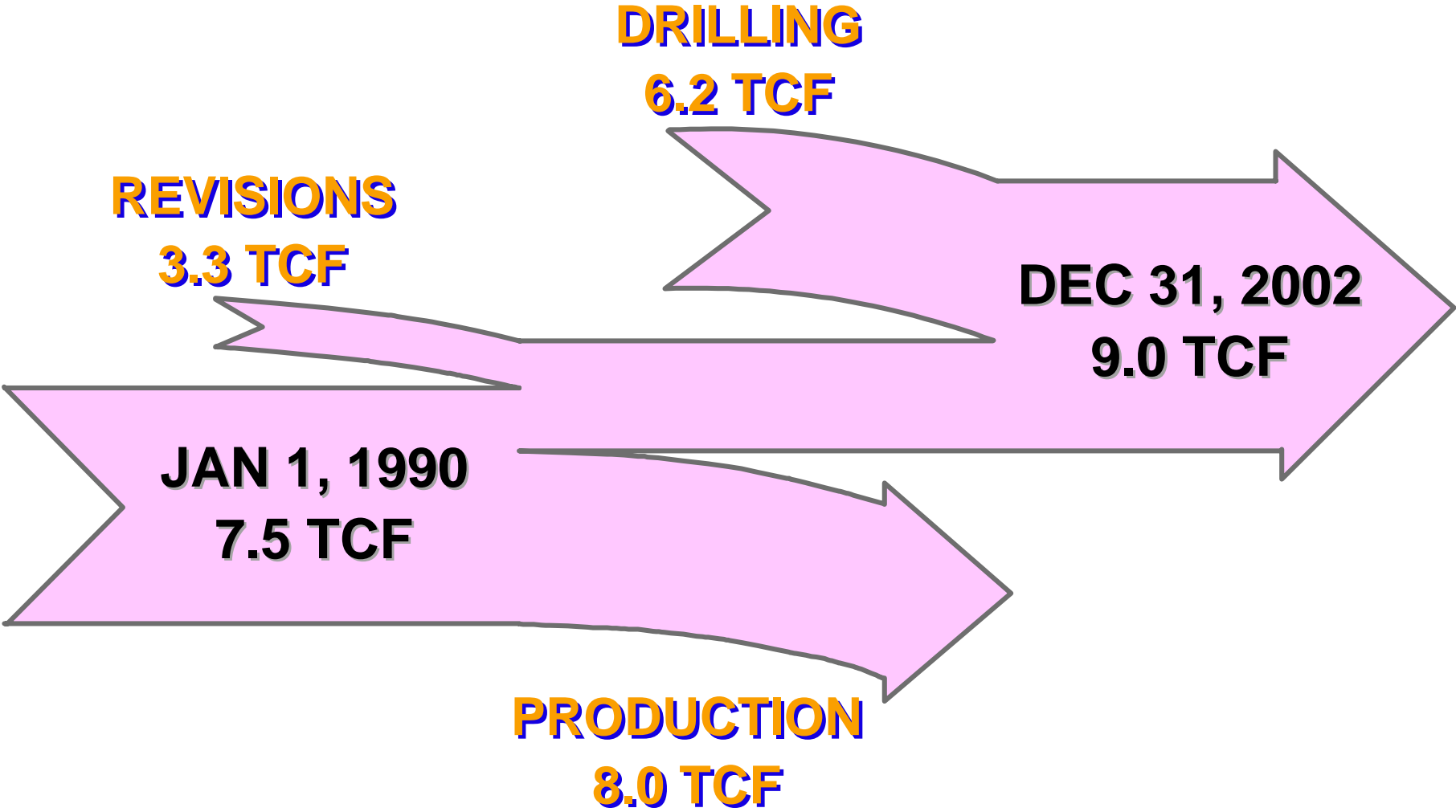


B.C. MARKETABLE GAS OGC YEAR-END REPORTS

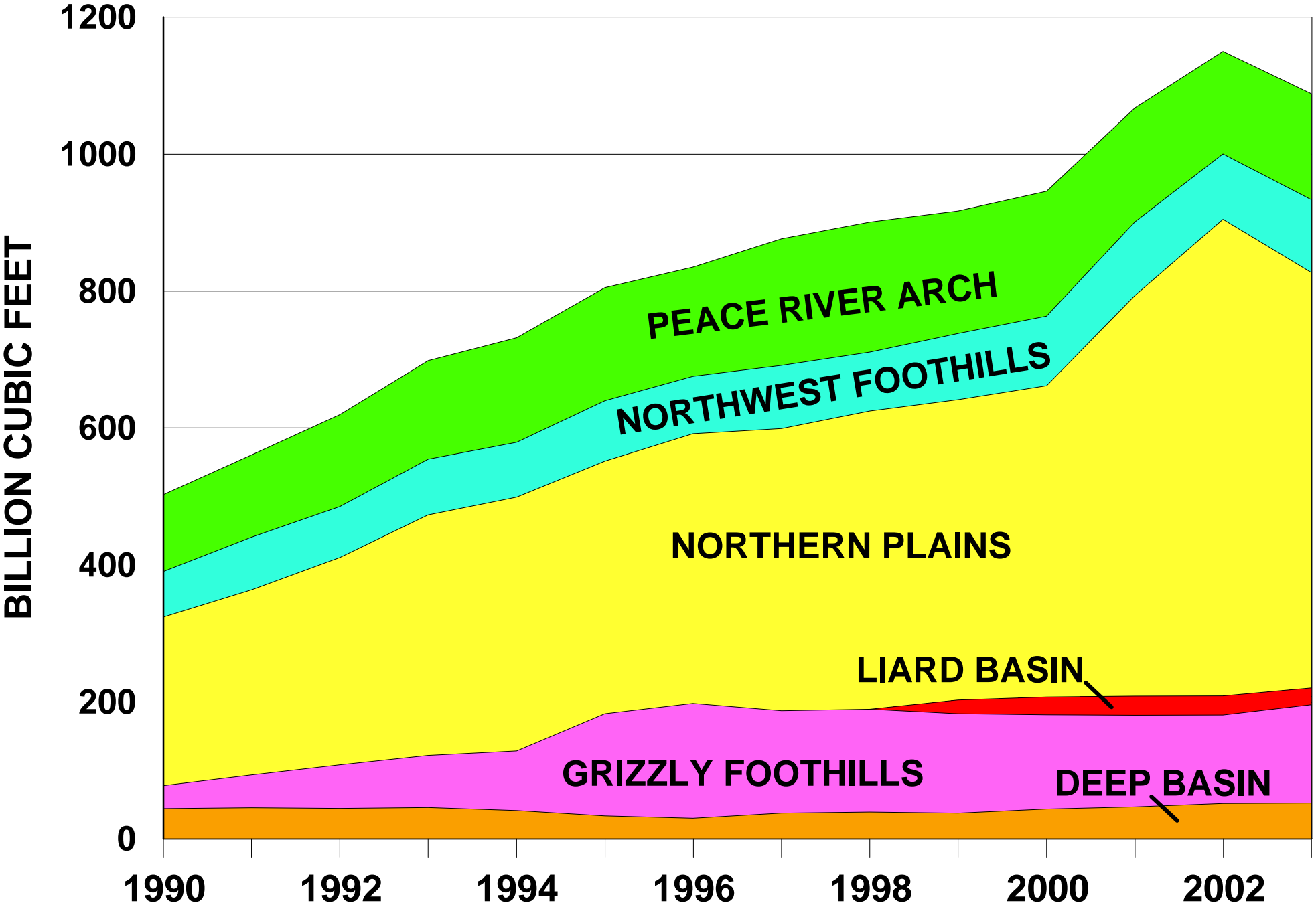
	JAN 1 1990	DEC 31 2002	ADDED 1990-2002	PER YEAR
NUMBER OF POOLS	905	1,634	729	56
INITIAL MARKETABLE (TCF)	15.0	24.5	9.5	0.733
REMAINING MARKETABLE (TCF)	7.5	9.0	1.5	0.122
CUM. PRODUCTION (TCF)	7.5	15.5	8.0	0.610

BRITISH COLUMBIA SUMMARY 1990 - 2002

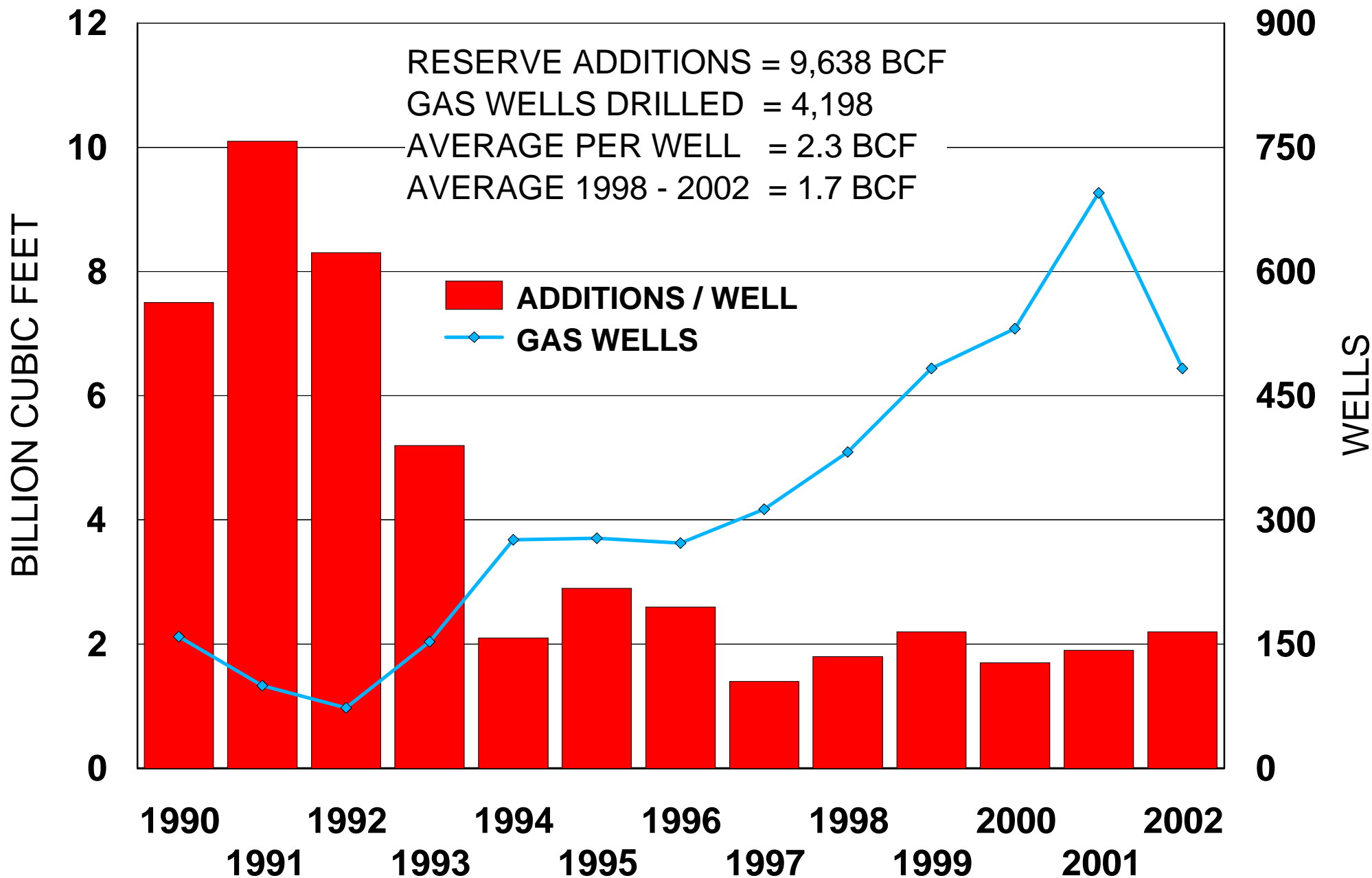
REMAINING MARKETABLE GAS RESERVES



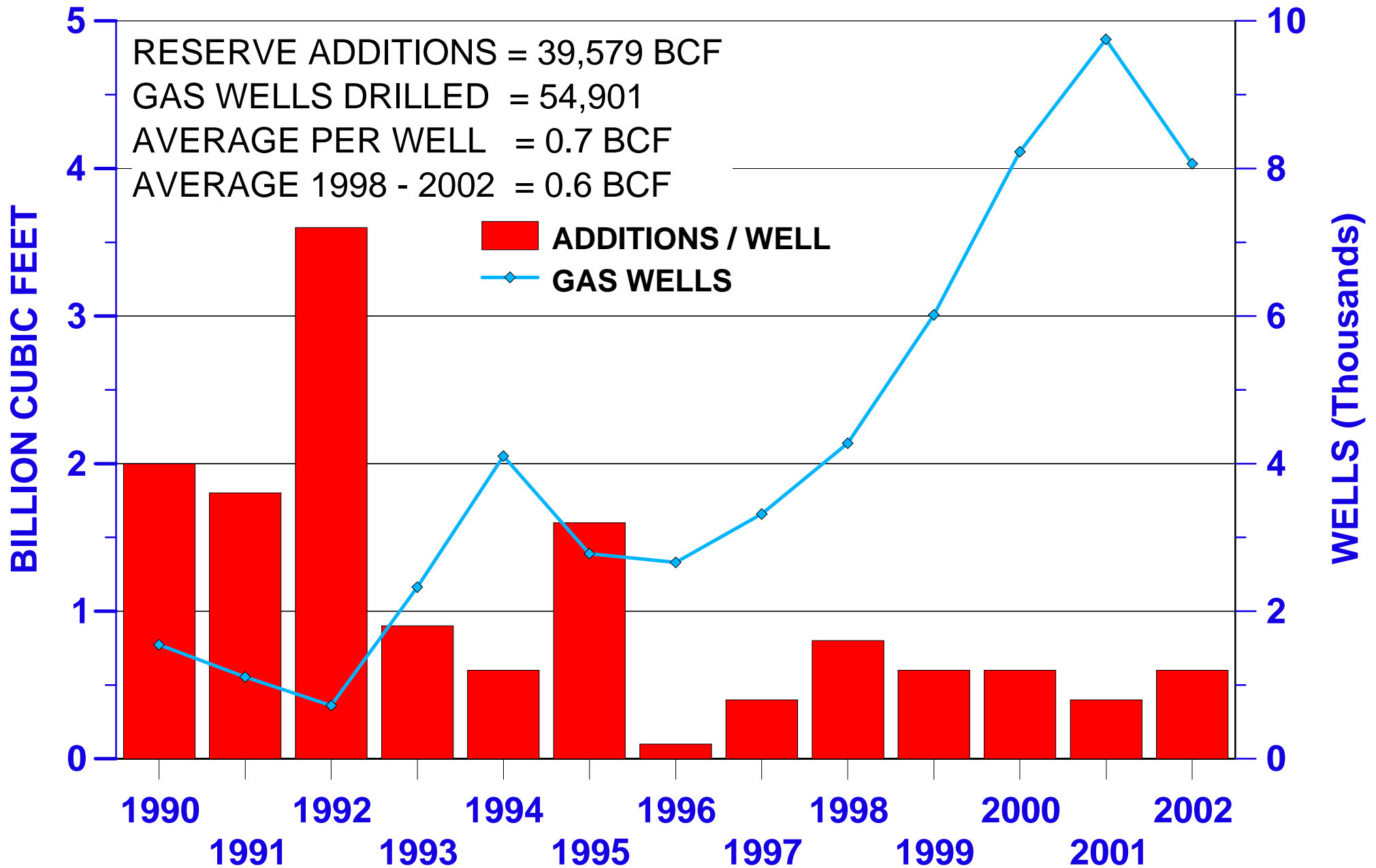
BRITISH COLUMBIA GAS PRODUCTION BY STRUCTURAL AREA



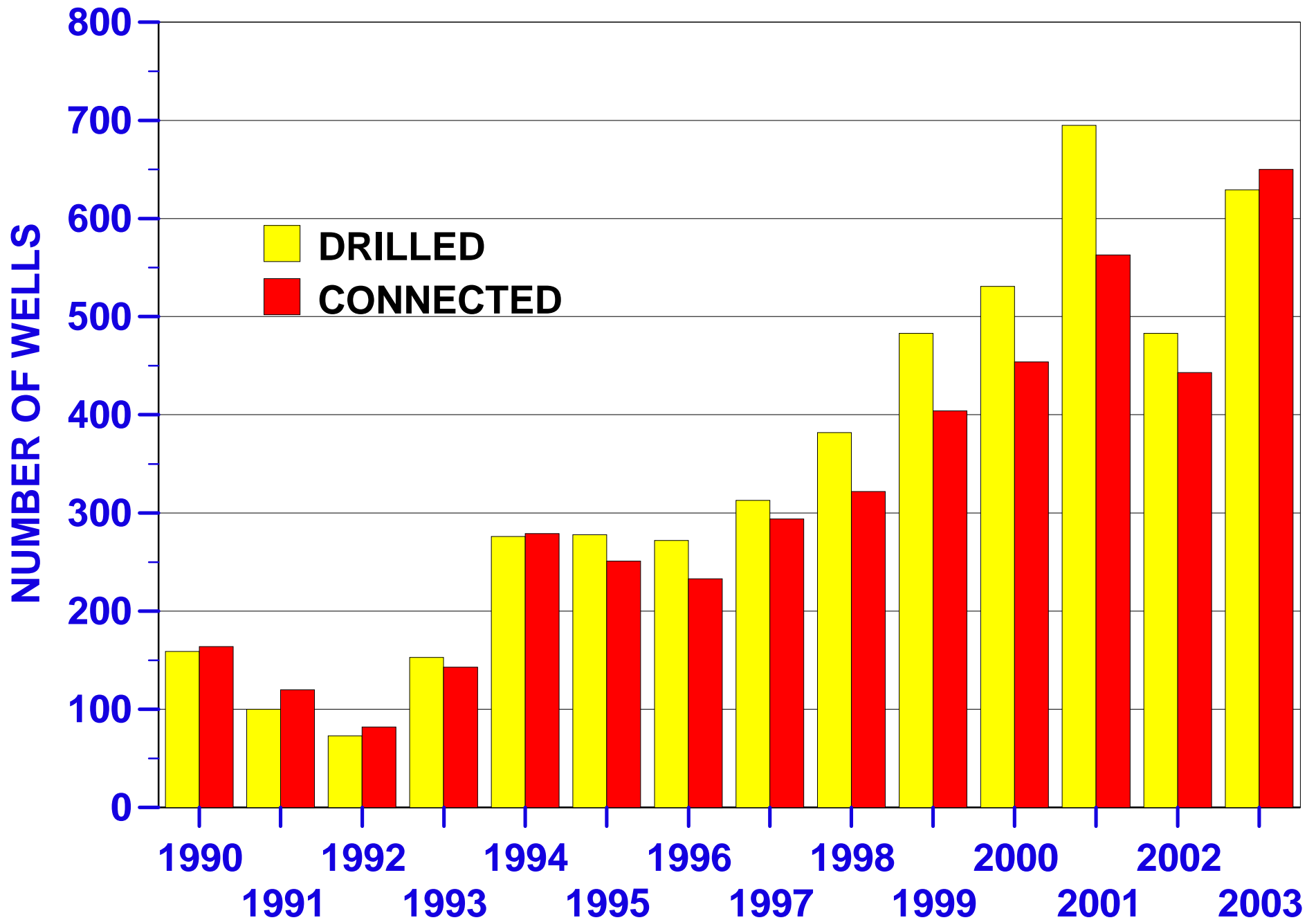
NORTHEAST BRITISH COLUMBIA - MARKETABLE GAS RESERVE ADDITIONS PER GAS WELL DRILLED



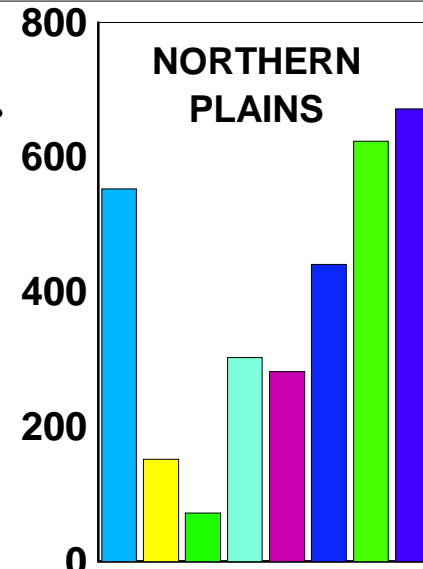
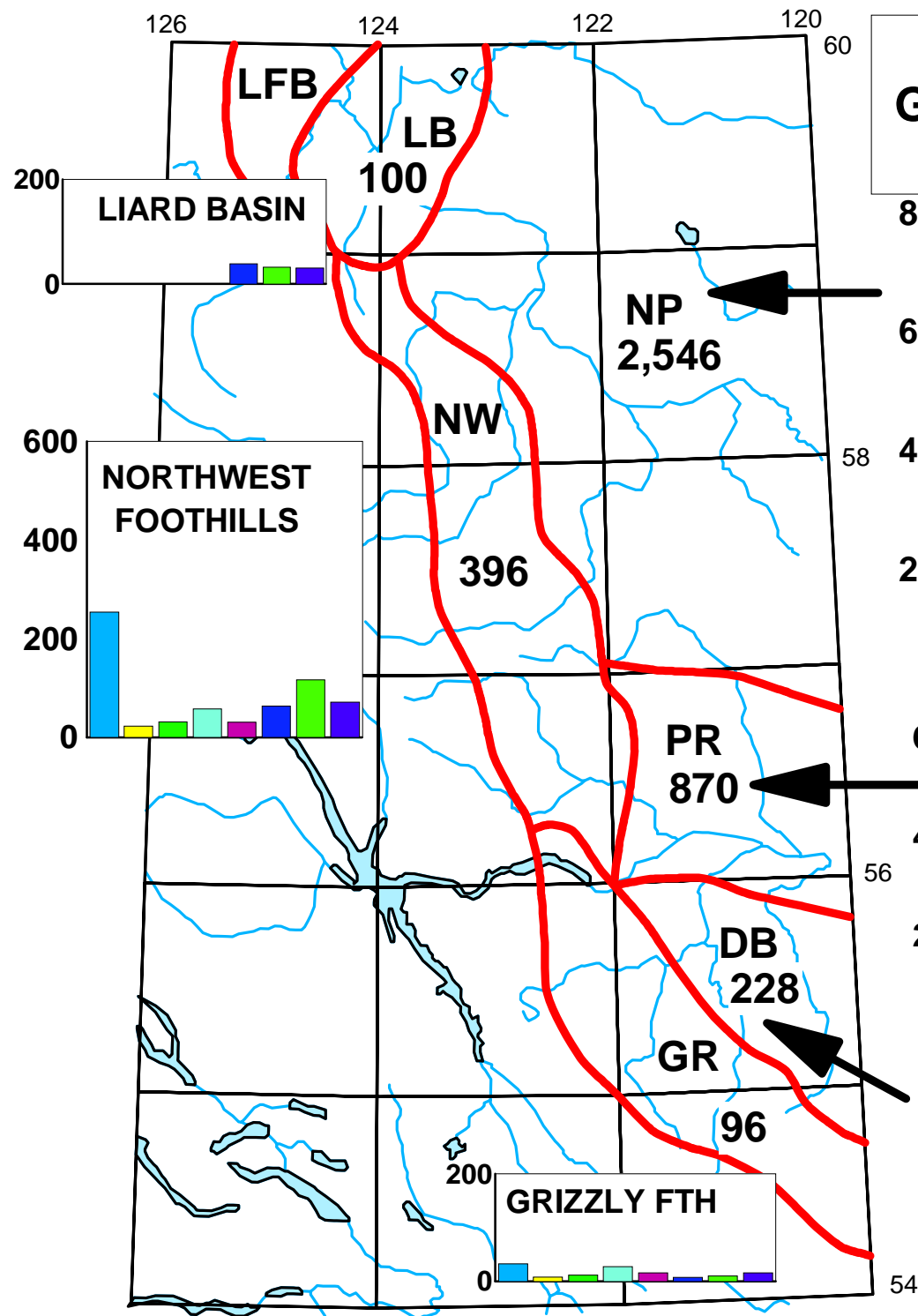
ALBERTA - MARKETABLE GAS RESERVE ADDITIONS PER GAS WELL DRILLED



B.C. GAS WELLS DRILLED AND CONNECTED

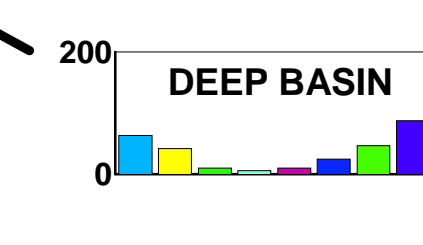
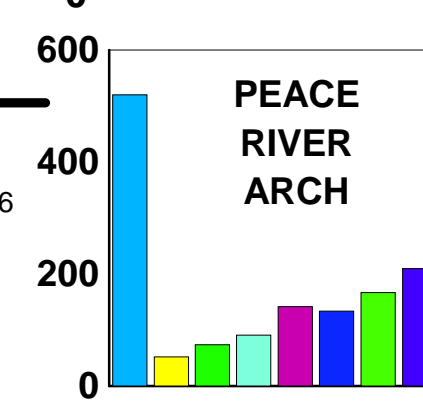


NE BRITISH COLUMBIA GAS WELL CONNECTIONS 1990 - 2003



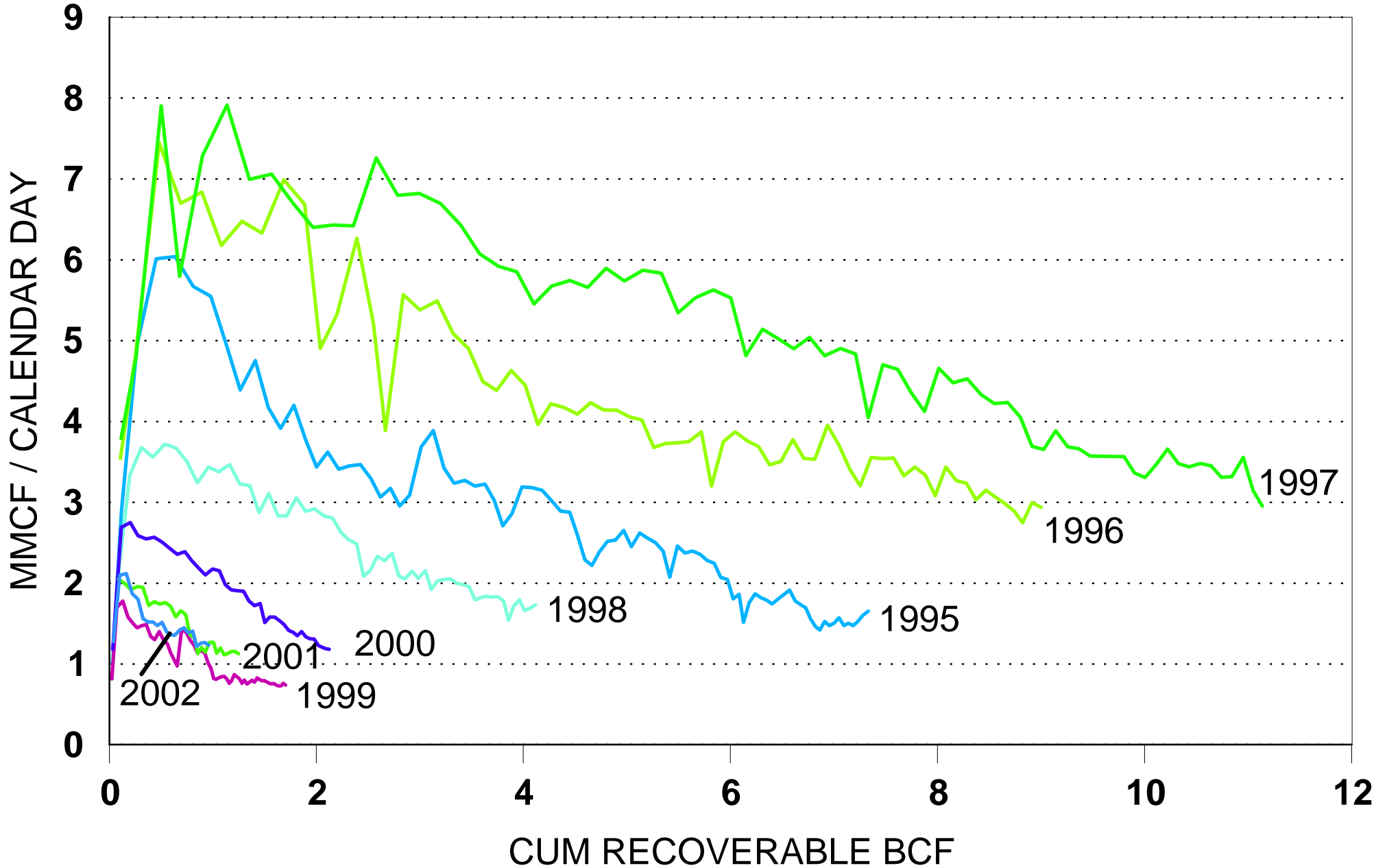
PRE-1990
1,431 (25%)

1990-2003
4,236 (75%)

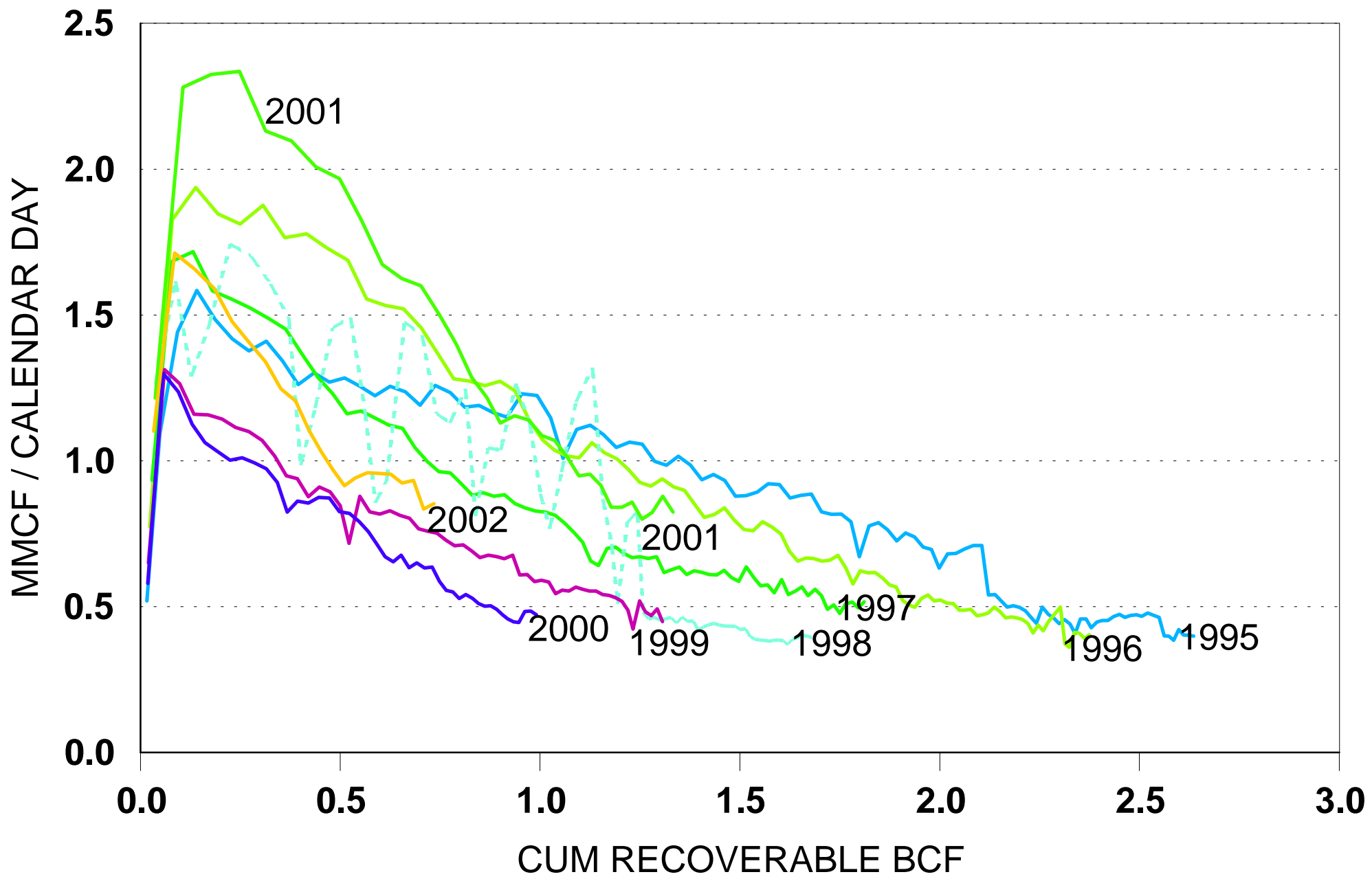


- 2002-03
- 2000-01
- 1998-99
- 1996-97
- 1994-95
- 1992-93
- 1990-91
- pre-1990

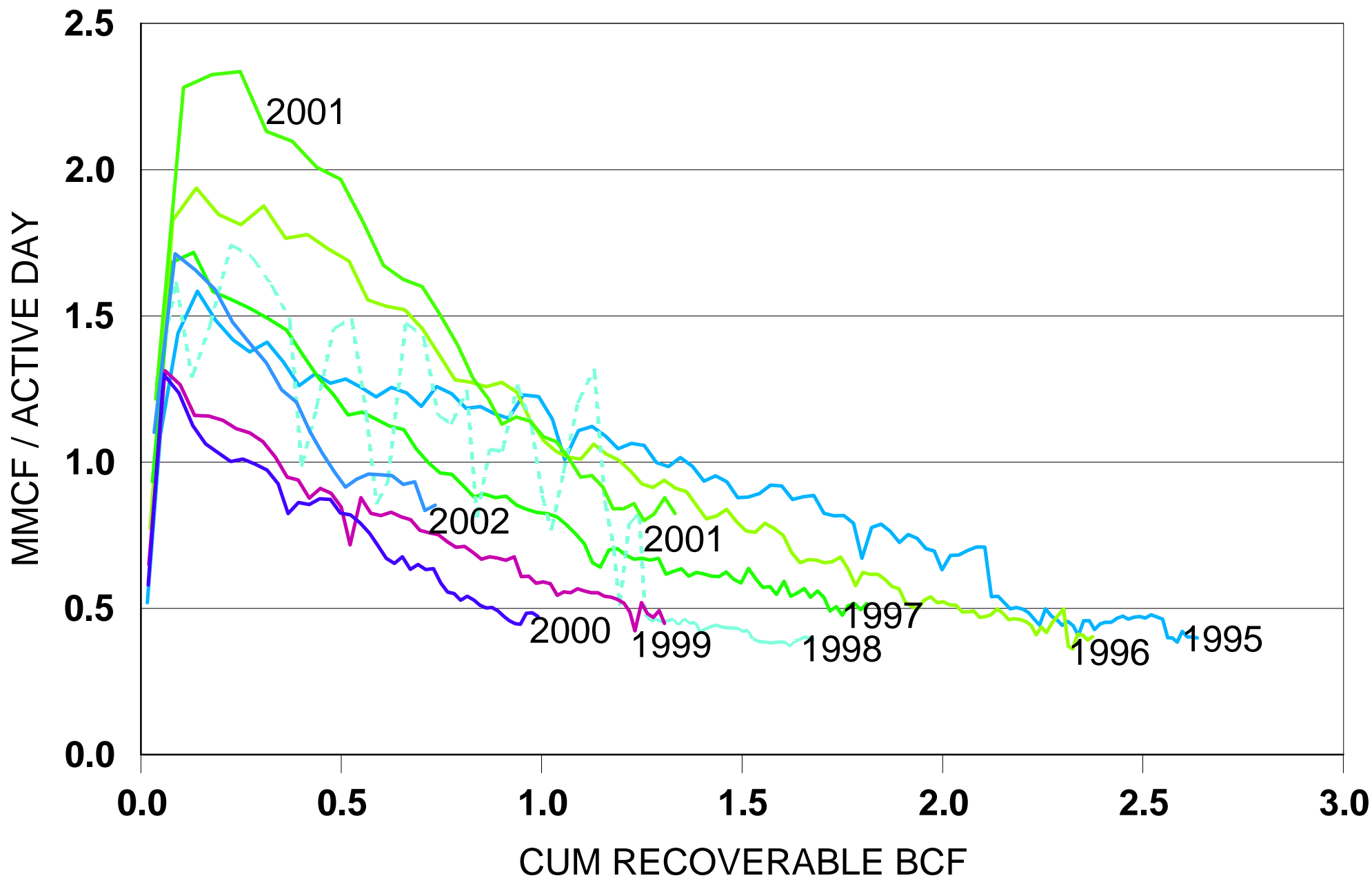
BRITISH COLUMBIA FOOTHILLS GAS WELL PERFORMANCE BY YEAR CONNECTED



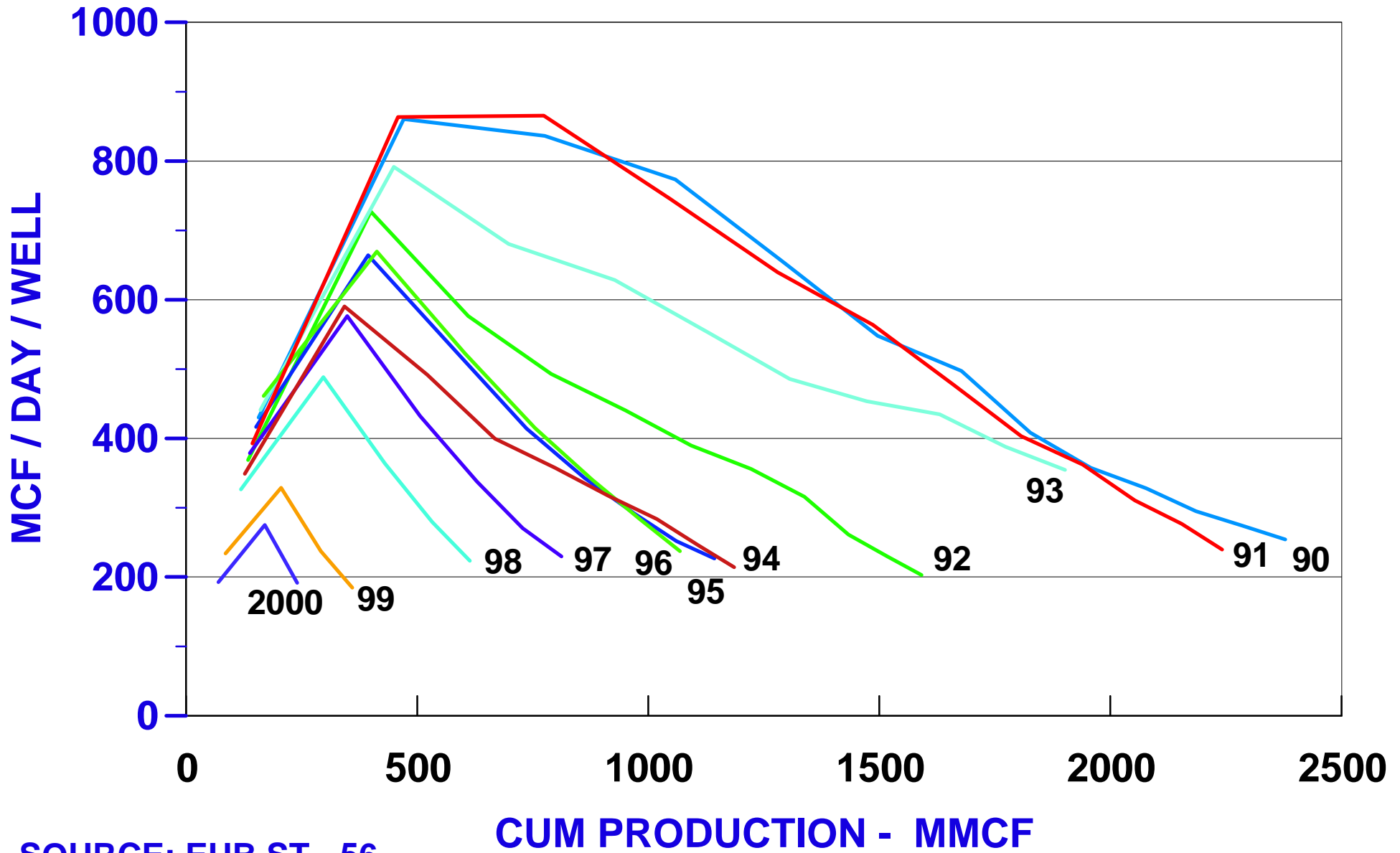
BRITISH COLUMBIA PLAINS GAS WELL PERFORMANCE BY YEAR CONNECTED



NORTHEAST BRITISH COLUMBIA GAS WELL PERFORMANCE BY YEAR CONNECTED

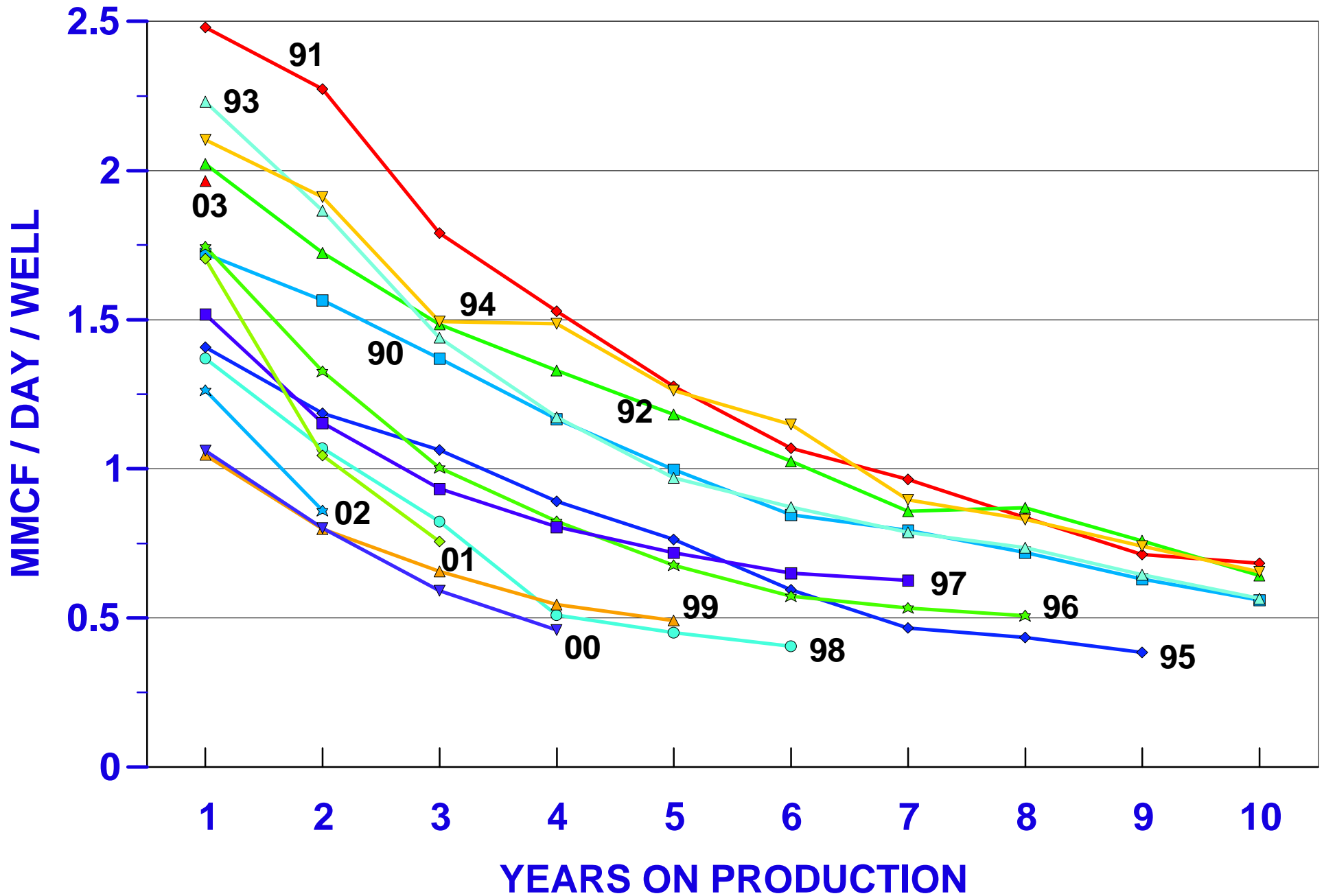


ALBERTA AVERAGE GAS WELL PRODUCTION BY ON PRODUCTION YEAR

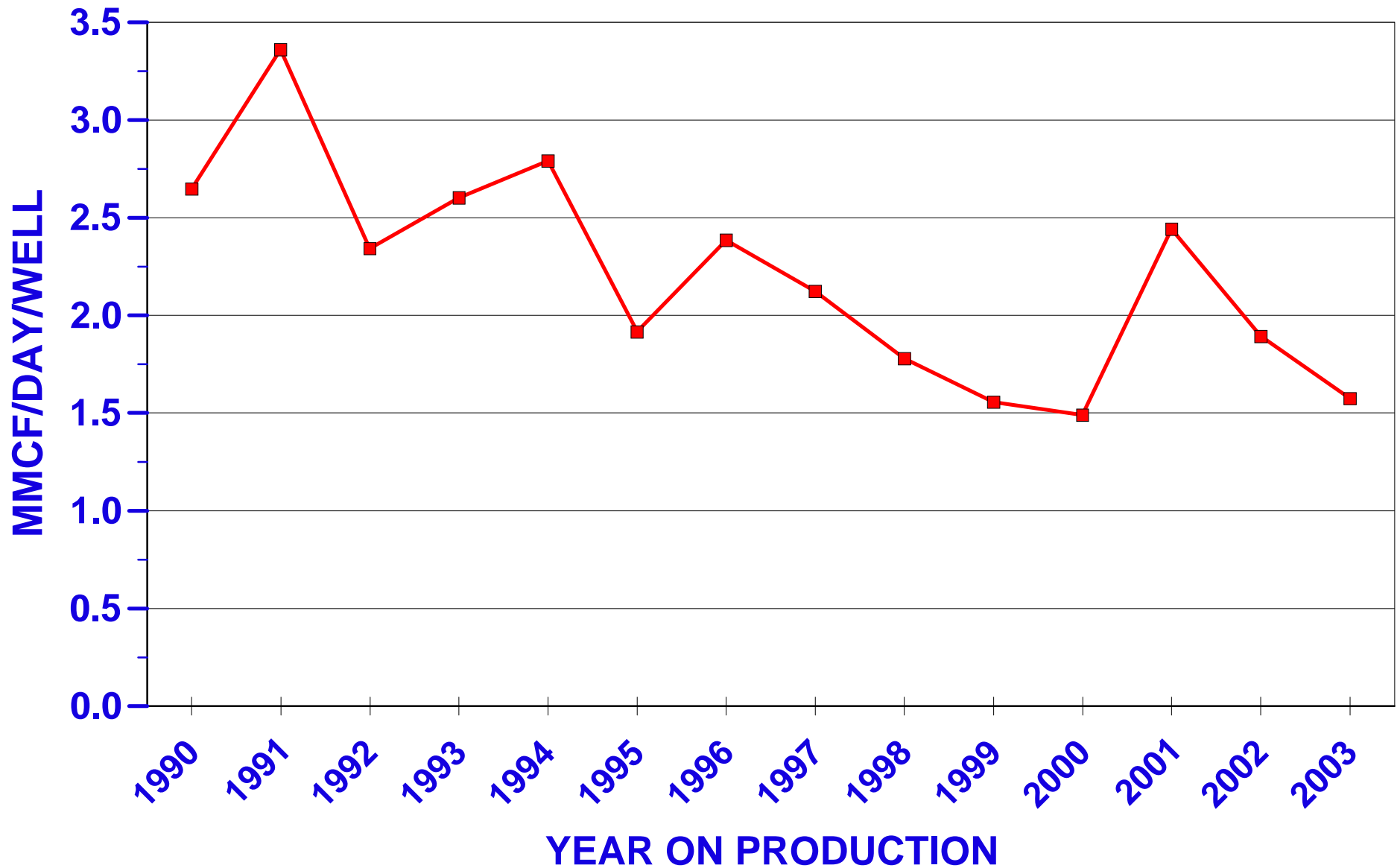


SOURCE: EUB ST - 56

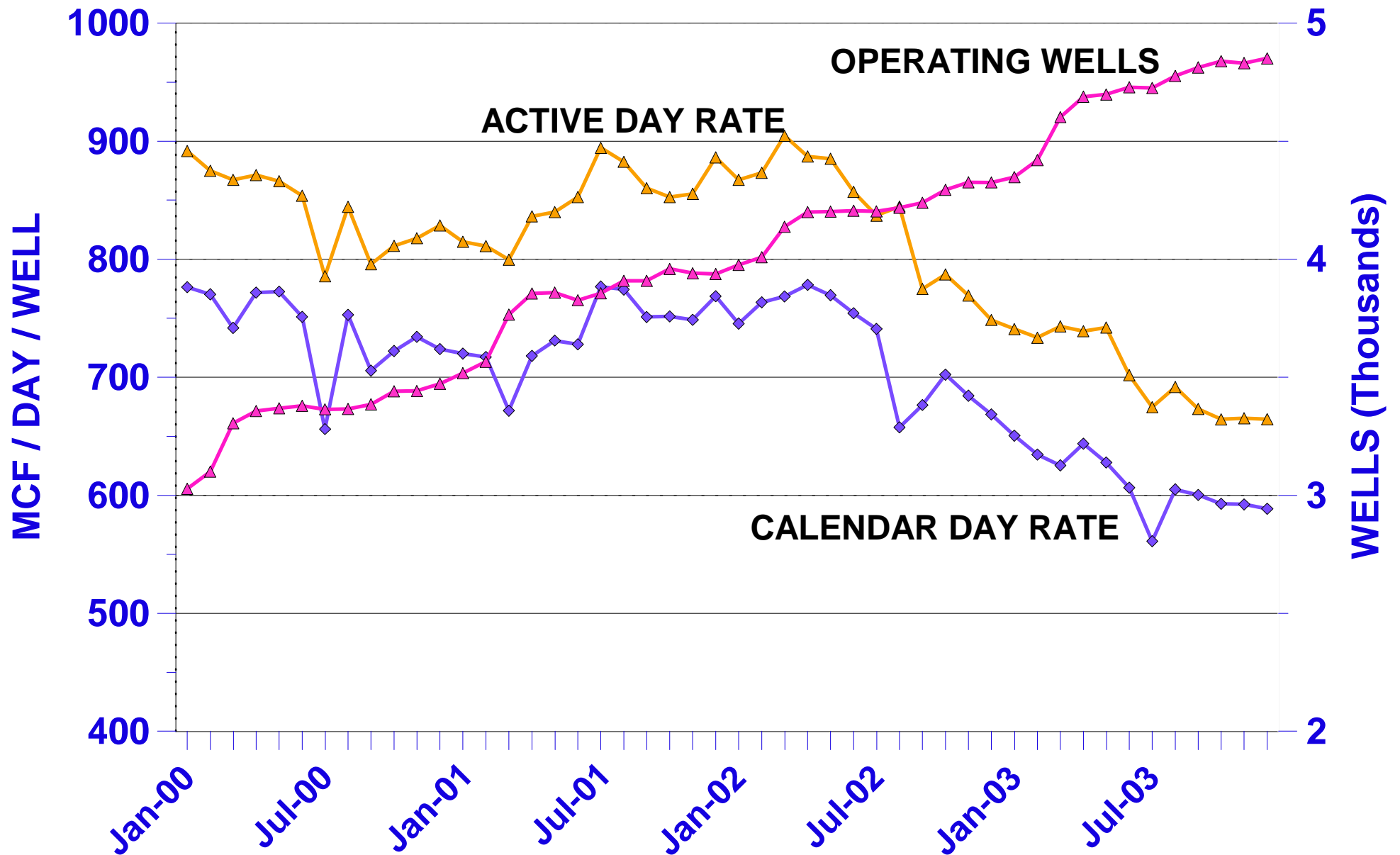
B.C. AVERAGE GAS WELL PRODUCTION BY ON PRODUCTION YEAR



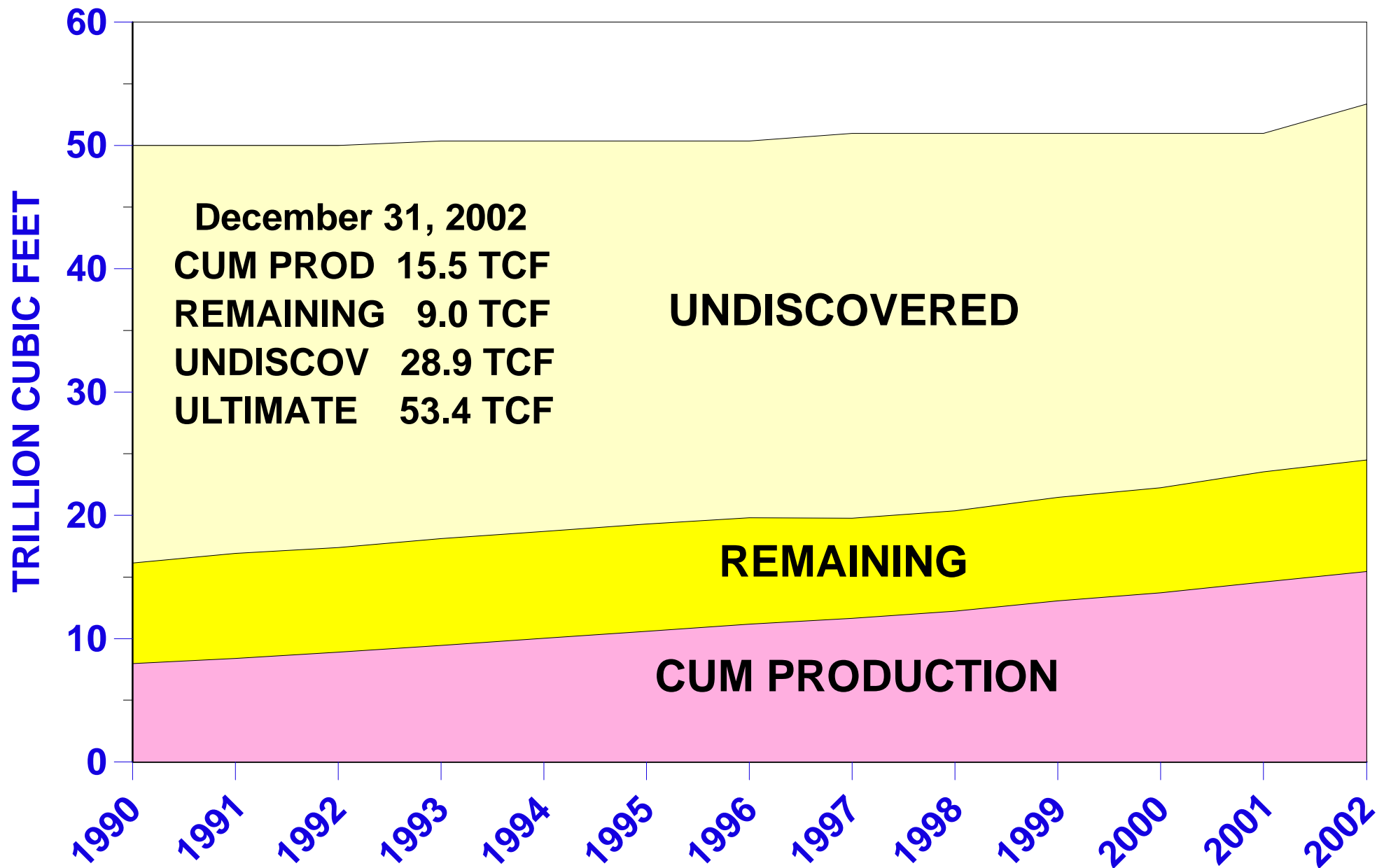
B.C. INITIAL GAS WELL PRODUCTIVITY AVERAGE ACTIVE DAY RATE - FIRST 3 MONTHS



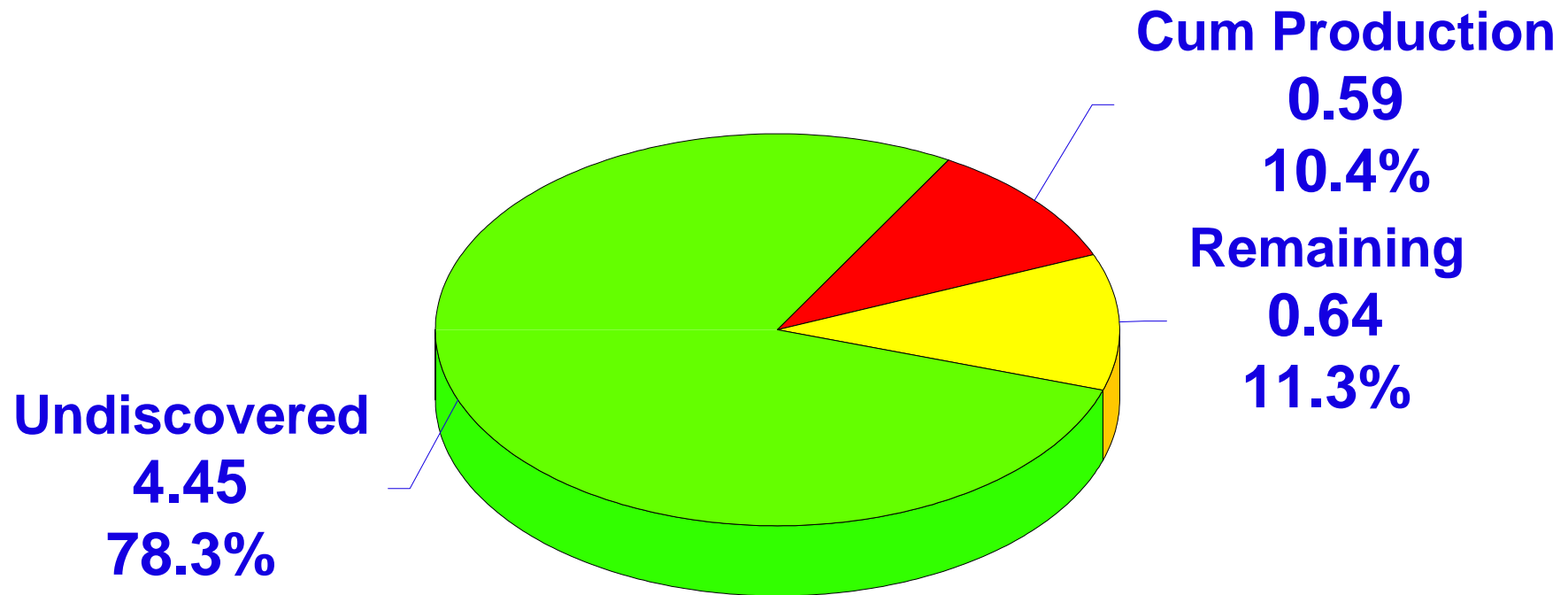
BRITISH COLUMBIA GAS WELLS AVERAGE PRODUCING WELL RATE



NORTHEAST BRITISH COLUMBIA ULTIMATE NATURAL GAS



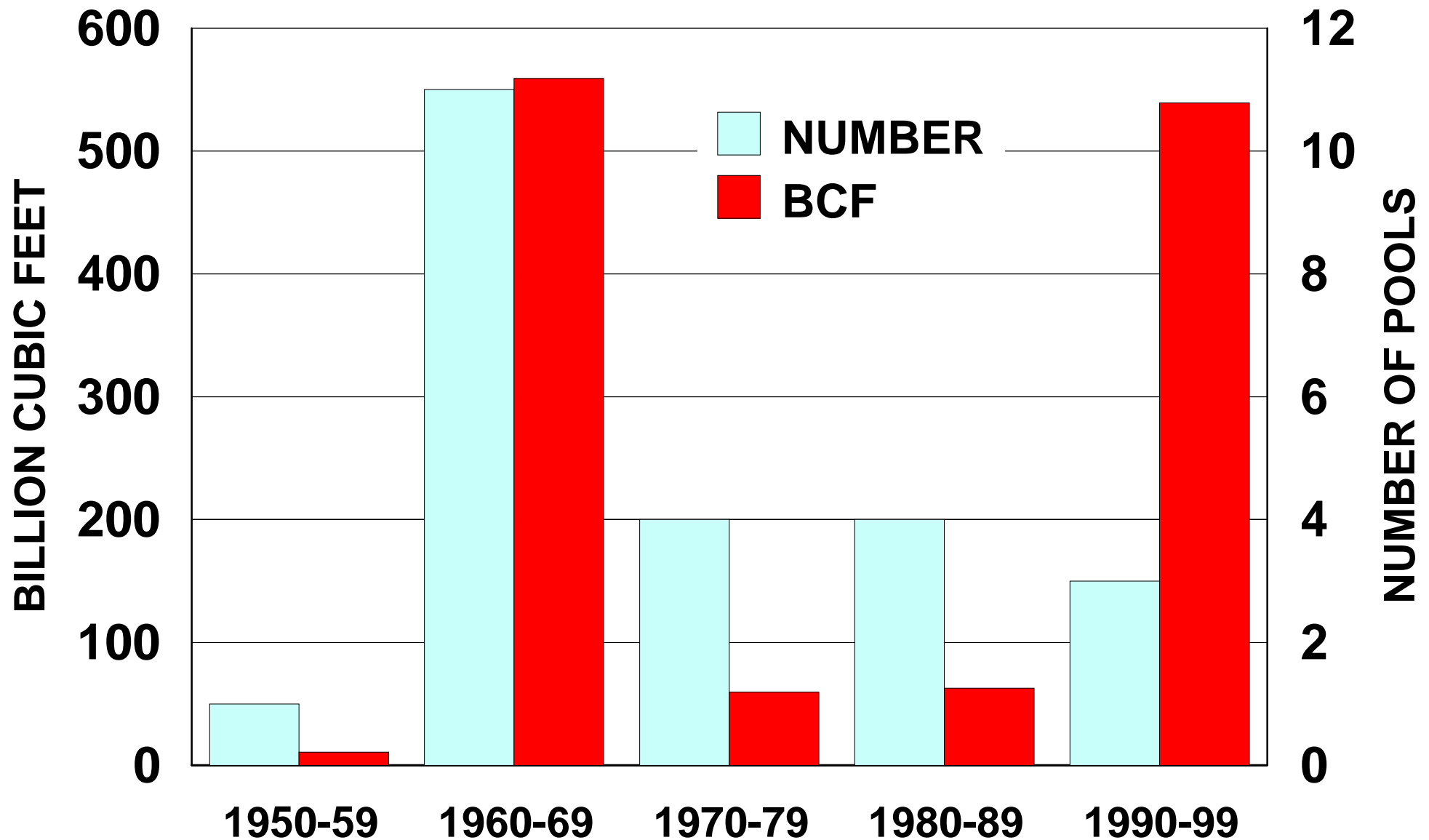
LIARD PLATEAU / SOUTHERN TERRITORIES ULTIMATE MARKETABLE GAS (Trillion Cubic Feet)



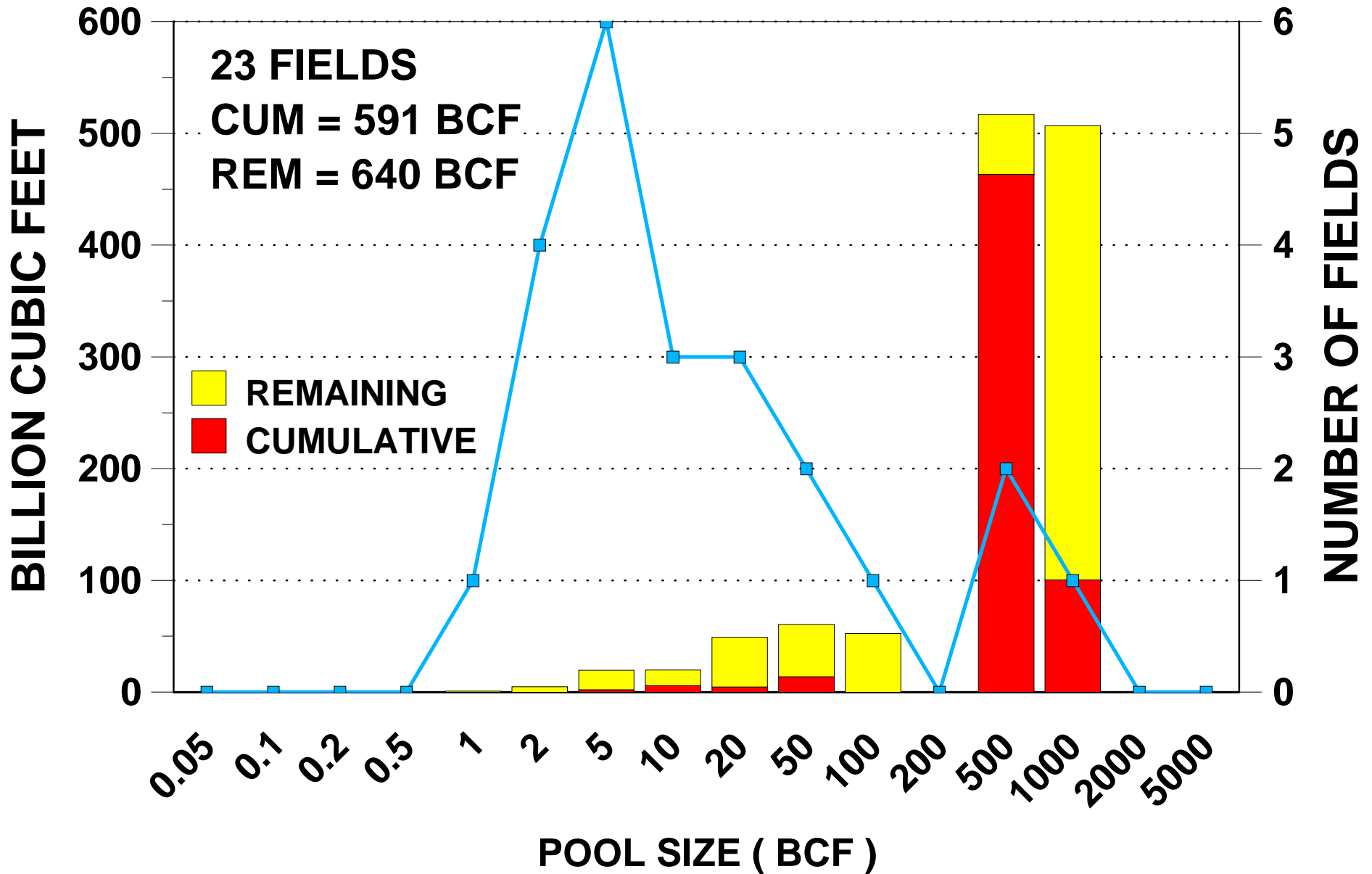
Total: 5.68

December 31, 2003

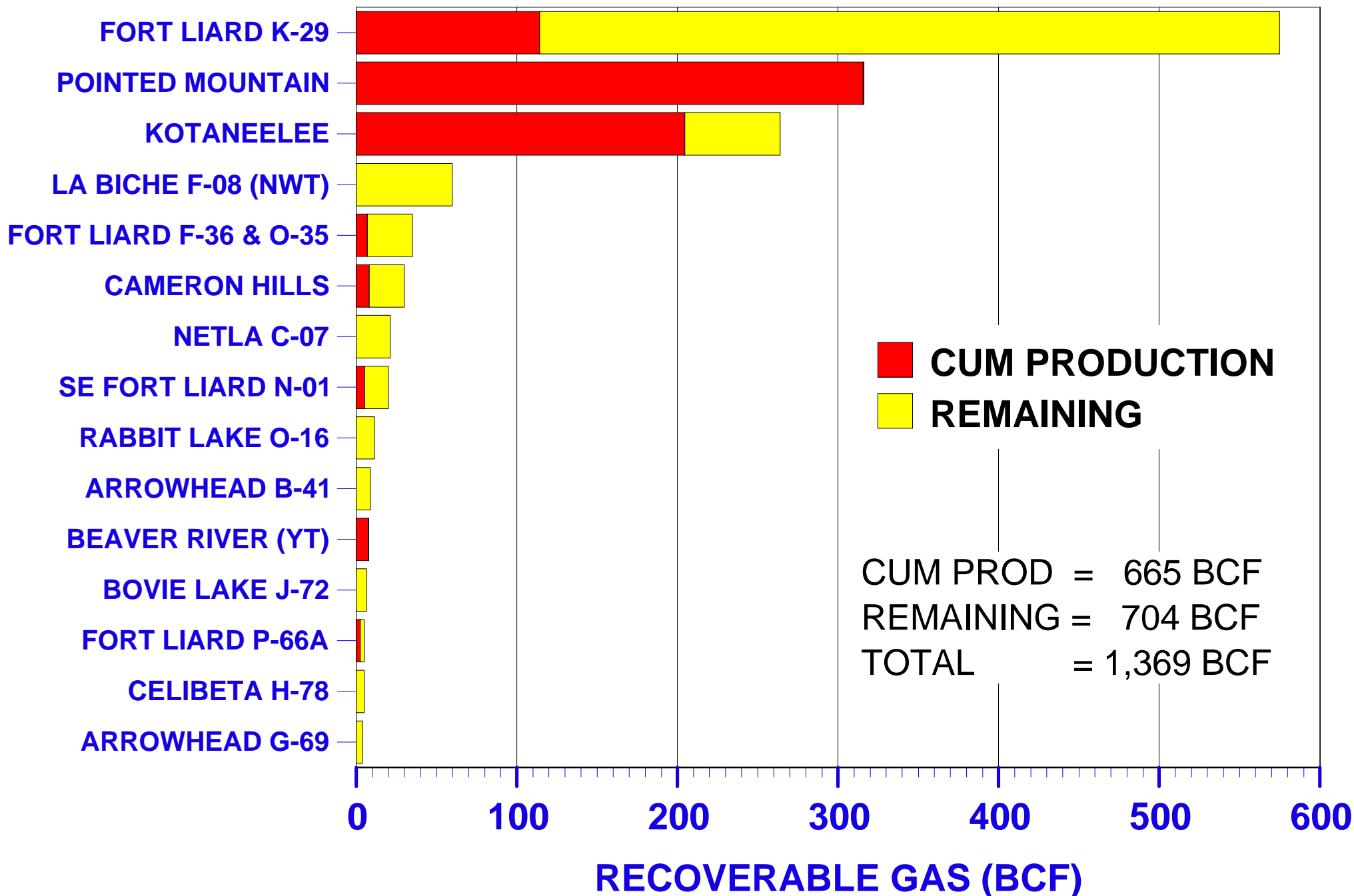
LIARD/S. NWT- MARKETABLE GAS BY DECADE DISCOVERED



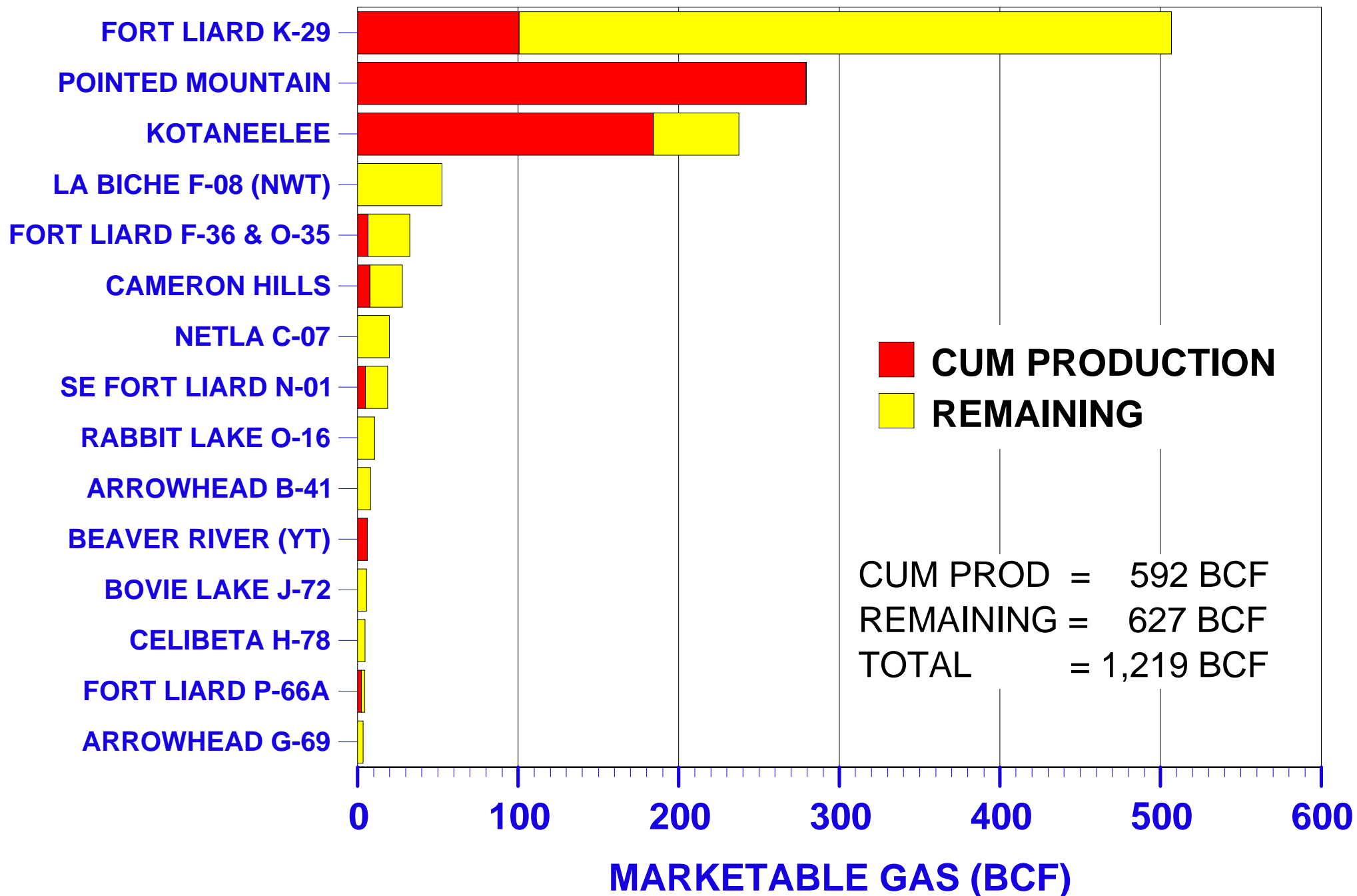
LIARD / SOUTHERN TERRITORIES MARKETABLE GAS FIELD SIZE DISTRIBUTION



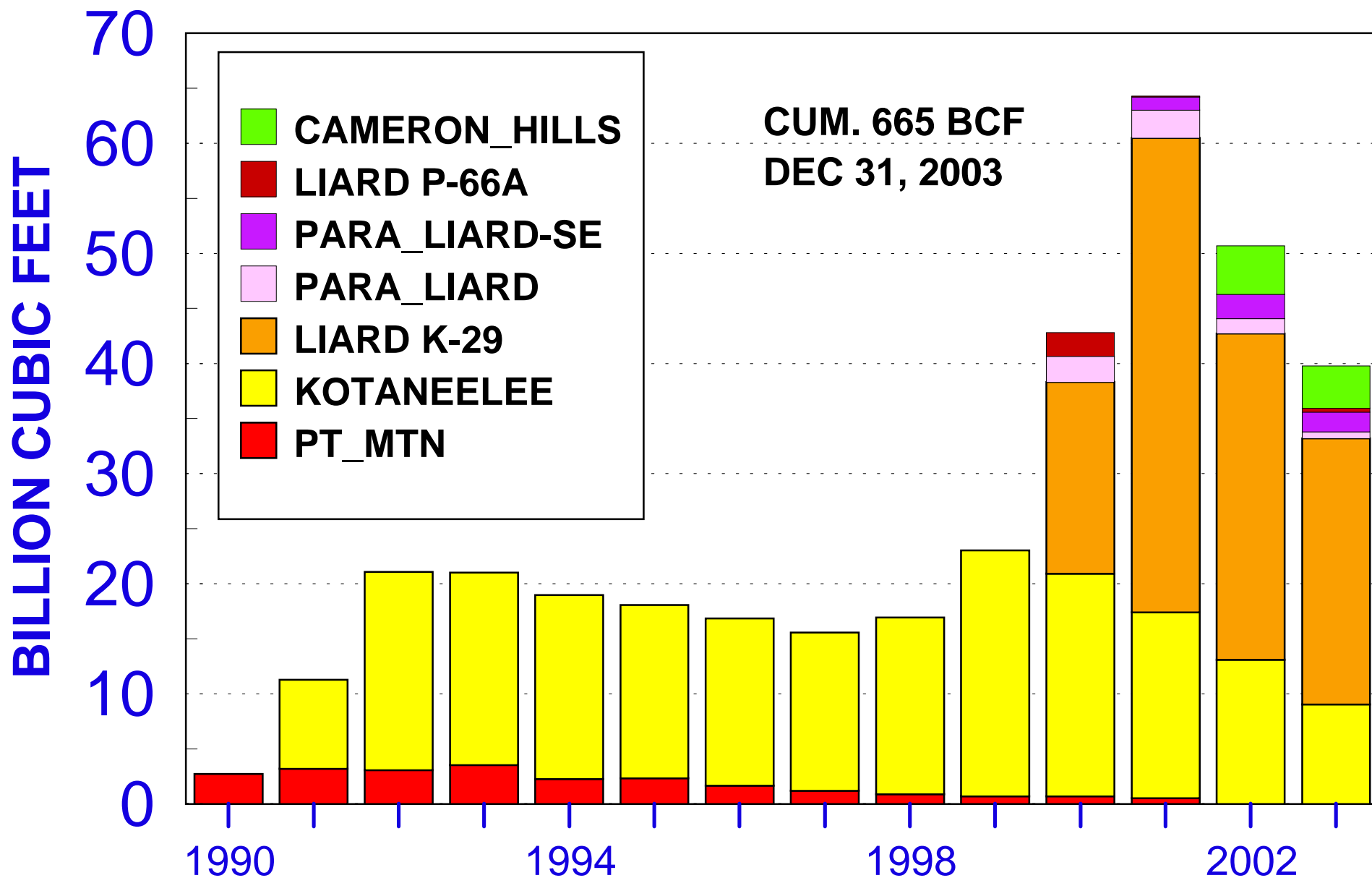
LIARD / S. NWT - TOP 15 GAS FIELDS



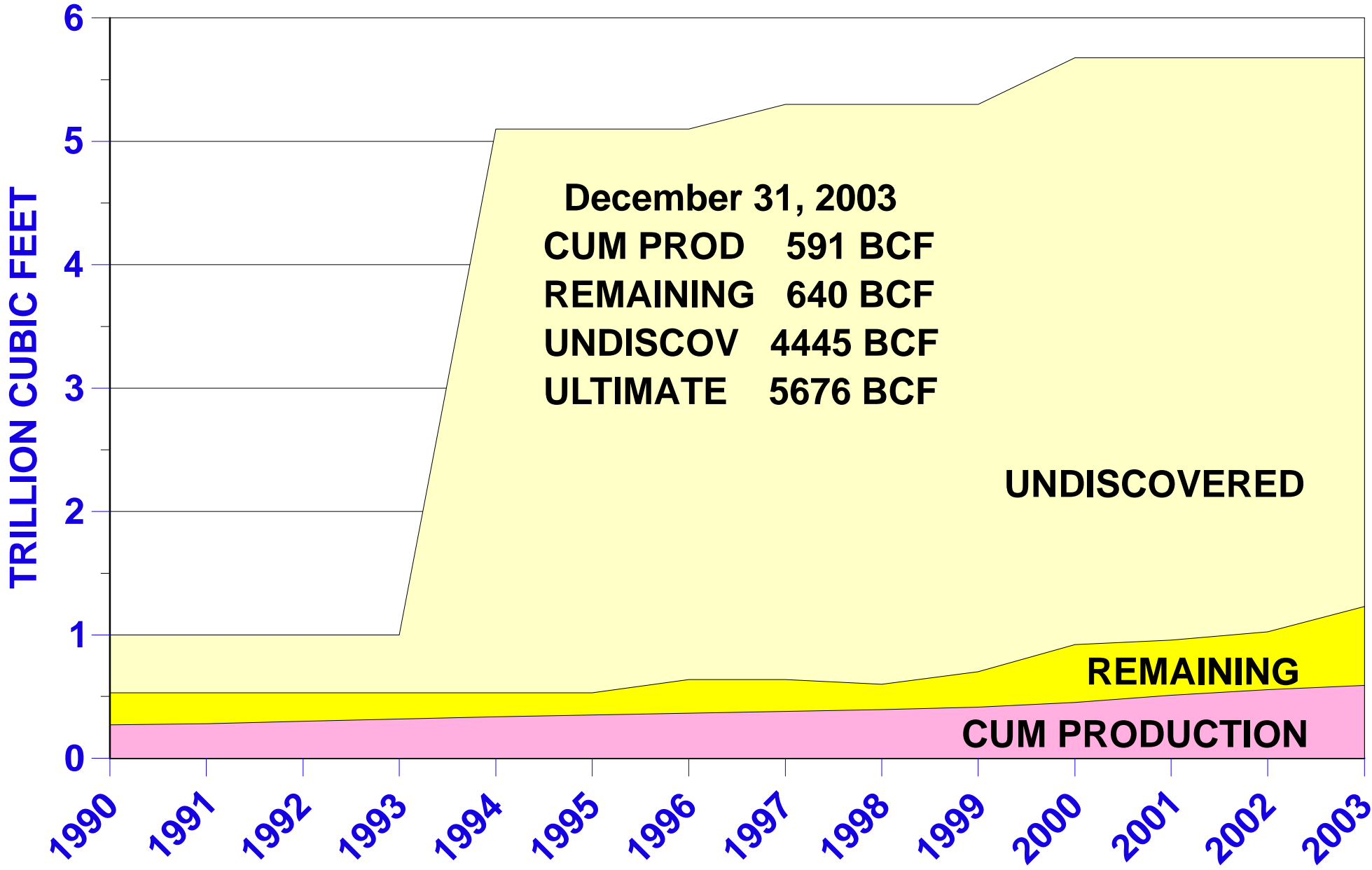
LIARD / S. NWT - TOP 15 GAS FIELDS



LIARD/ SOUTHERN NWT ANNUAL RAW GAS PRODUCTION



LIARD / SOUTHERN NWT ULTIMATE MARKETABLE GAS



B.C. - ALBERTA GAS POOLS 1990-2002

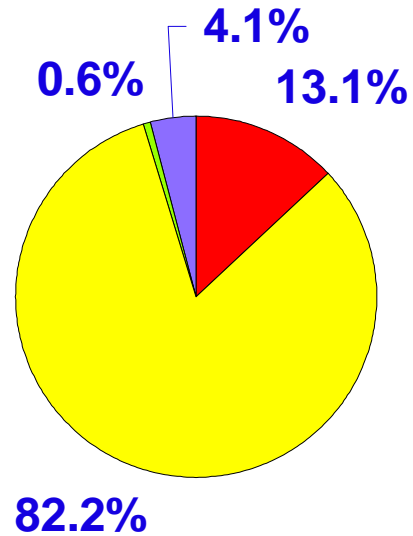
	B.C.	ALBERTA
RECOVERY FACTORS (% Of GIP)		
RECOVERABLE	79.2%	71.8%
MARKETABLE	65.5%	64.7%
MARKETABLE GAS (BCF)		
NUMBER OF POOLS	727	15,321
MARKETABLE GAS	7,249	23,878
AVERAGE POOL SIZE	10.0	1.6
MEDIAN POOL SIZE	2.8	0.6
95th PERCENTILE	35.4	5.6
AVERAGE DEPTH (FEET)	5,434	3,585
AVERAGE RECOVERABLE (MCF/AC-FT)	460	282
AVERAGE MARKETABLE / GAS WELL (BCF)	2.3	0.7
% POOLS WITH H₂S > 10%	5.5%	0.7%
% RECOVERABLE GAS H₂S > 10%	15.9%	3.4%
AVERAGE H₂S CONTENT	3.9%	1.0%

WESTERN CANADA SEDIMENTARY BASIN MARKETABLE GAS RESOURCES

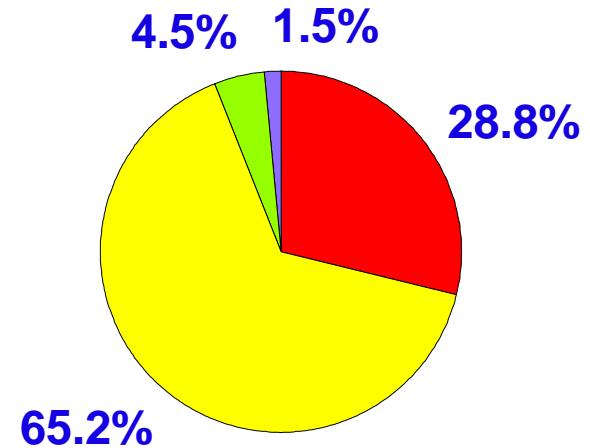
(TCF)	B.C.	ALBERTA	S.YT/NWT	SASK	WCSB	%
ULTIMATE	53.4	218.8	5.7	9.1	287.0	100%
DISCOVERED	24.3	153.0	1.2	7.6	186.1	64.8%
UNDISCOVERED	29.1	65.8	4.5	1.5	100.9	35.2%
CUM PRODUCTION	15.5	111.5	0.6	4.9	132.5	46.2%
REM. RESERVES	8.8	41.5	0.6	2.7	53.6	18.7%
REM. RESOURCE	37.9	107.3	5.1	4.2	154.5	53.8%
MATURITY	46%	70%	21%	84%	65%	
% REM. RESOURCE	24.5%	69.4%	3.3%	2.7%	100%	

WCSB MARKETABLE GAS

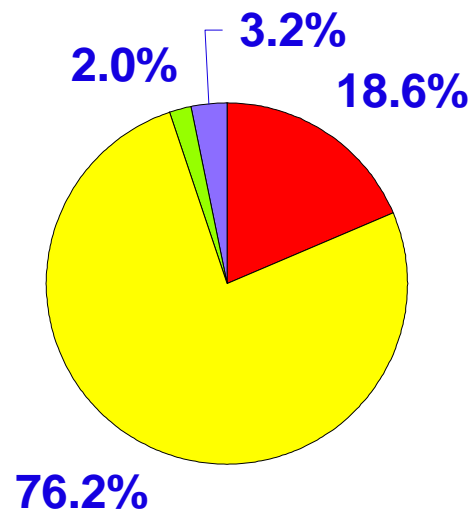
DISCOVERED



UNDISCOVERED



ULTIMATE



CONCLUSIONS

- ▶ **HISTORICAL TRENDS IN RESERVES ADDITIONS FOR THE PERIOD 1990 TO 2002 ARE REMARKEABLY CONSTANT.**
- ▶ **A LITTLE OVER HALF OF BRITISH COLUMBIA'S ULTIMATE GAS RESOURCE REMAINS TO BE DISCOVERED.**
- ▶ **AS OF DECEMBER 31, 2003 31% OF BRITISH COLUMBIA'S ESTIMATED ULTIMATE GAS RESOURCE HAS BEEN PRODUCED AND BY 2015 IT IS ESTIMATED TO BE 58%.**
- ▶ **B.C. GAS PRODUCTION WILL REMAIN FAIRLY CONSTANT FOR THE FORECAST PERIOD AS RESOURCE ADDITIONS SHOULD BE ABLE TO SUSTAIN PRODUCTION LEVELS.**