

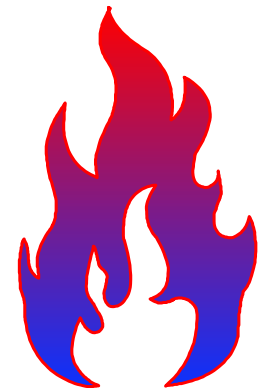
**ALBERTA NATURAL GAS
HISTORICAL DISCOVERY TRENDS
JANUARY 1990 TO DECEMBER 31, 2002**



**Petroleum Society
Petroleum Economics Meeting
November 28, 2003**

PRESENTATION ON ALBERTA NATURAL GAS HISTORICAL TRENDS AND PROJECTION TO 2014

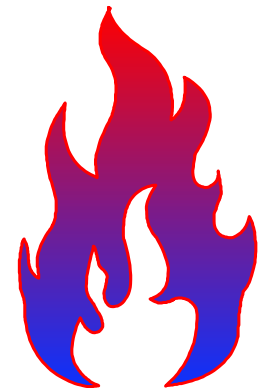
- ▶ **Review historical record and current resource base as of Dec 31, 2002.**
- ▶ **Review the discovery record, reserves additions and production for the period 1990 to 2002.**
- ▶ **Projection to 2014.**



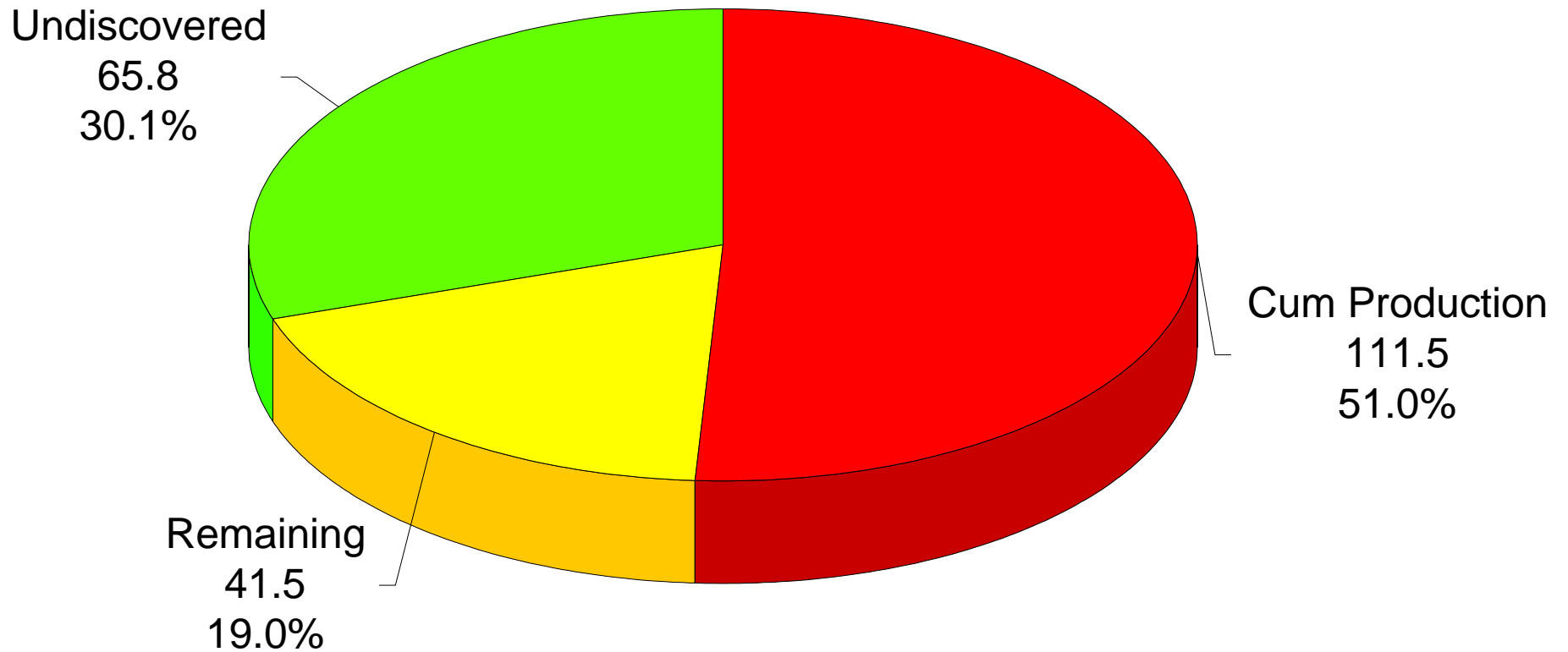
ALBERTA NATURAL GAS

December 31, 2002

- ▶ **31,524 GAS POOLS**
- ▶ **GAS-IN-PLACE - 261 TCF**
- ▶ **INITIAL MARKETABLE GAS - 153 TCF**
- ▶ **REMAINING MARKETABLE GAS - 41.5 TCF**
- ▶ **AVERAGE POOL SIZE - 4.9 BCF**
- ▶ **MEDIAN POOL SIZE - 0.7 BCF**
- ▶ **95th PERCENTILE - 10.9 BCF**

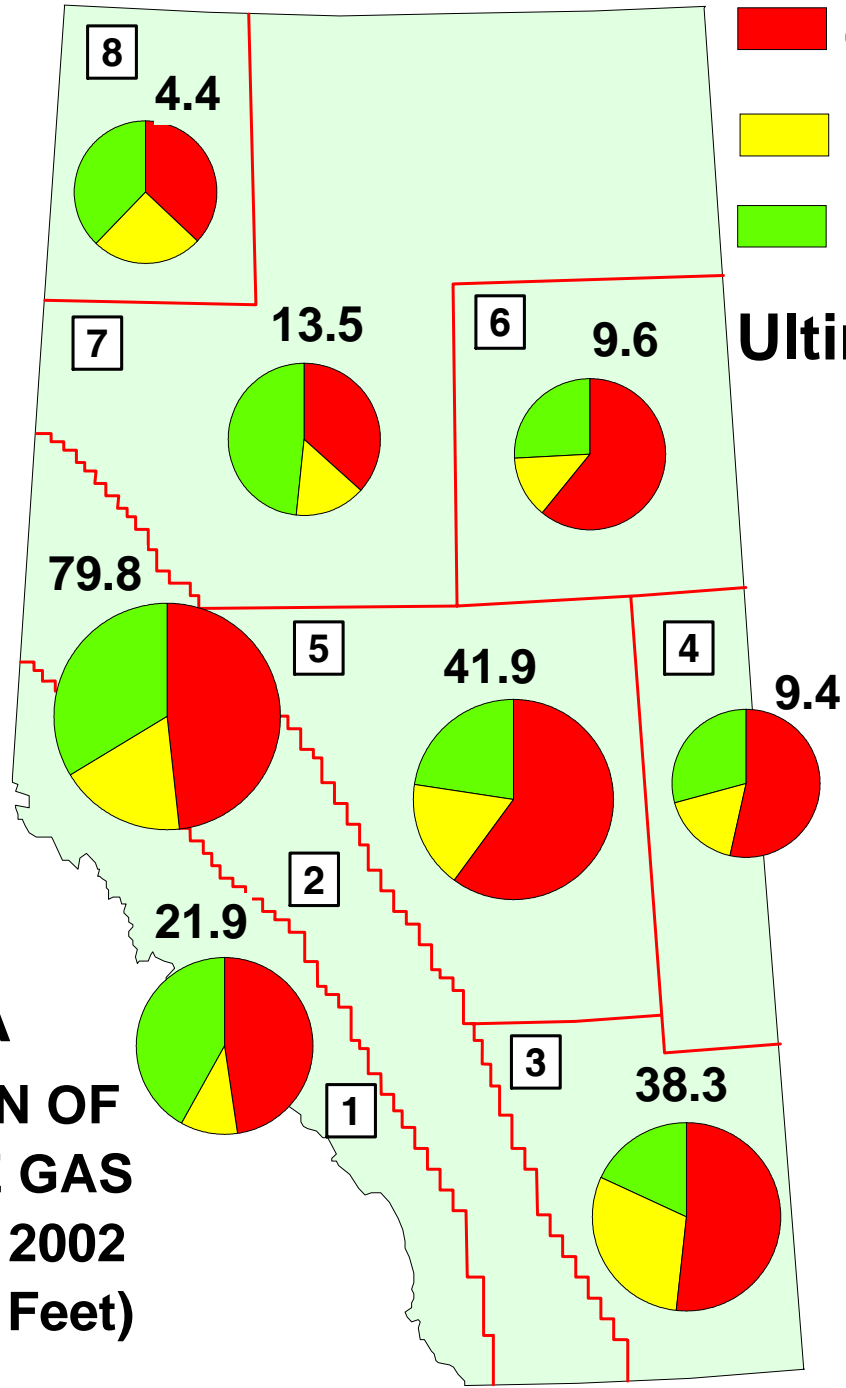


ALBERTA ULTIMATE MARKETABLE GAS (Trillion Cubic Feet)



Total: 218.8

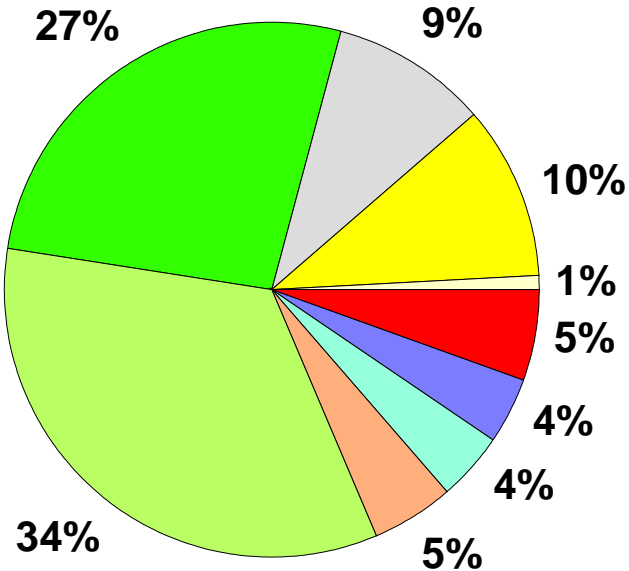
■ Cumulative 111.5
■ Remaining 41.5
■ Undiscovered 65.8
Ultimate Mkt Gas 218.8



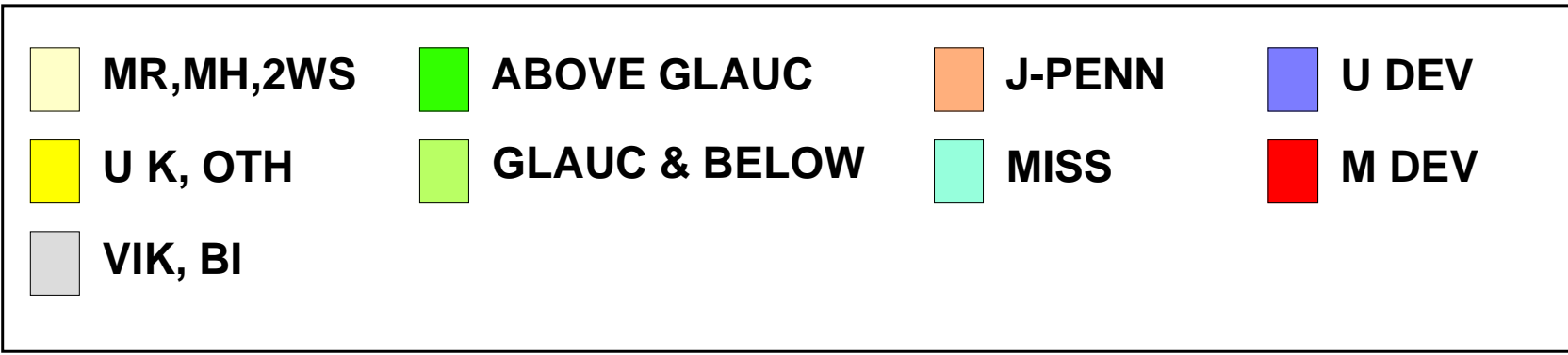
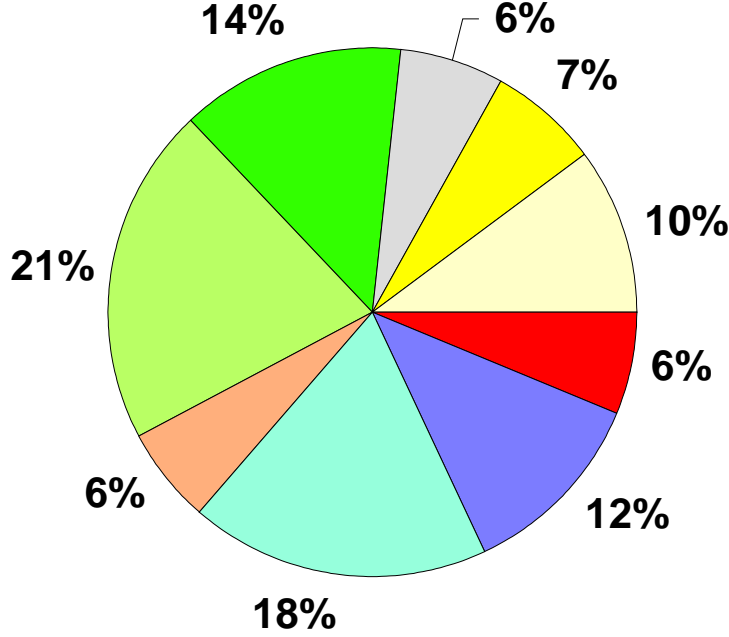
ALBERTA
DISTRIBUTION OF
MARKETABLE GAS
December 31, 2002
(Trillion Cubic Feet)

ALBERTA DISTRIBUTION BY HORIZON

NUMBER OF POOLS
31,524



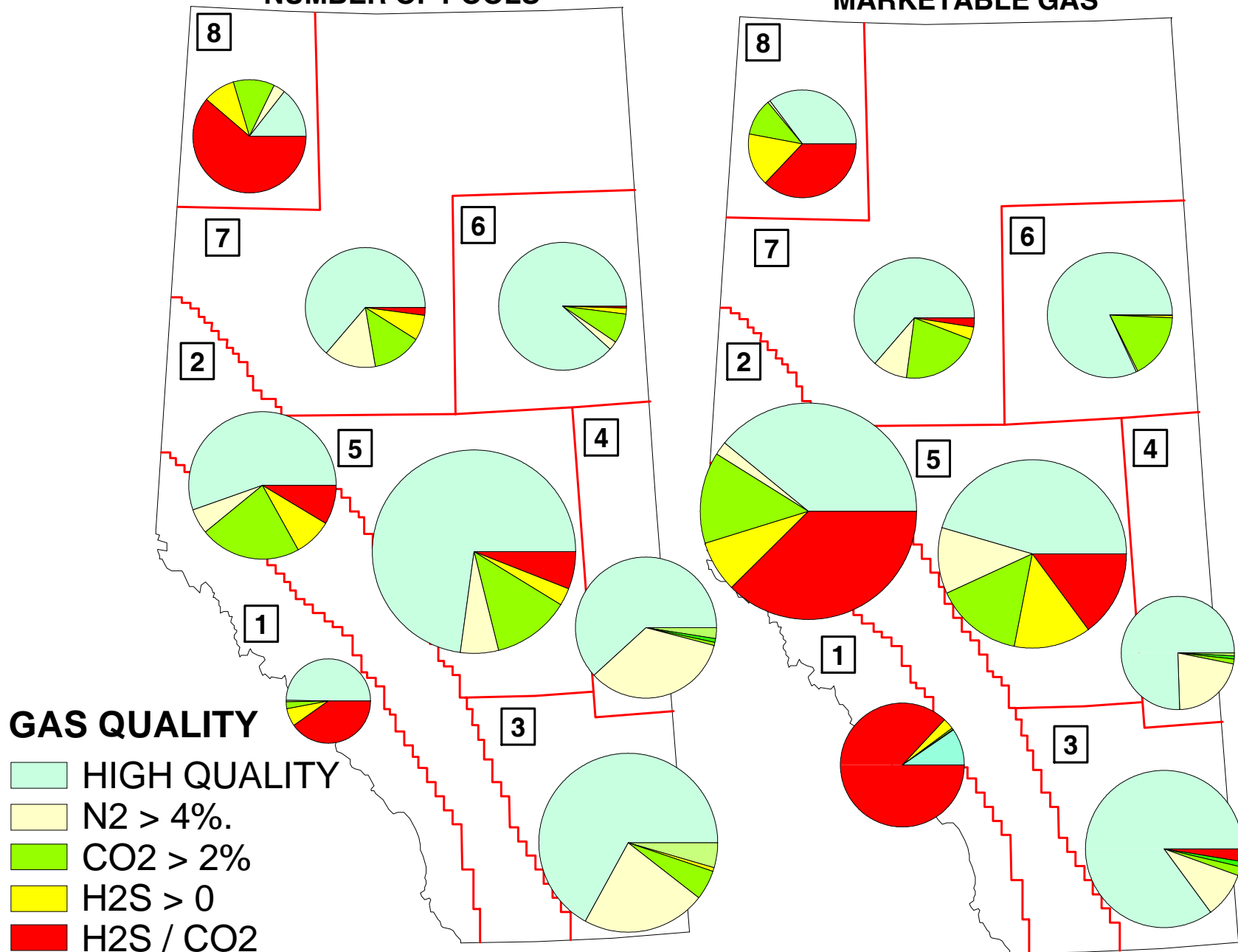
MARKETABLE GAS
153 TCF



ALBERTA - GAS QUALITY

NUMBER OF POOLS

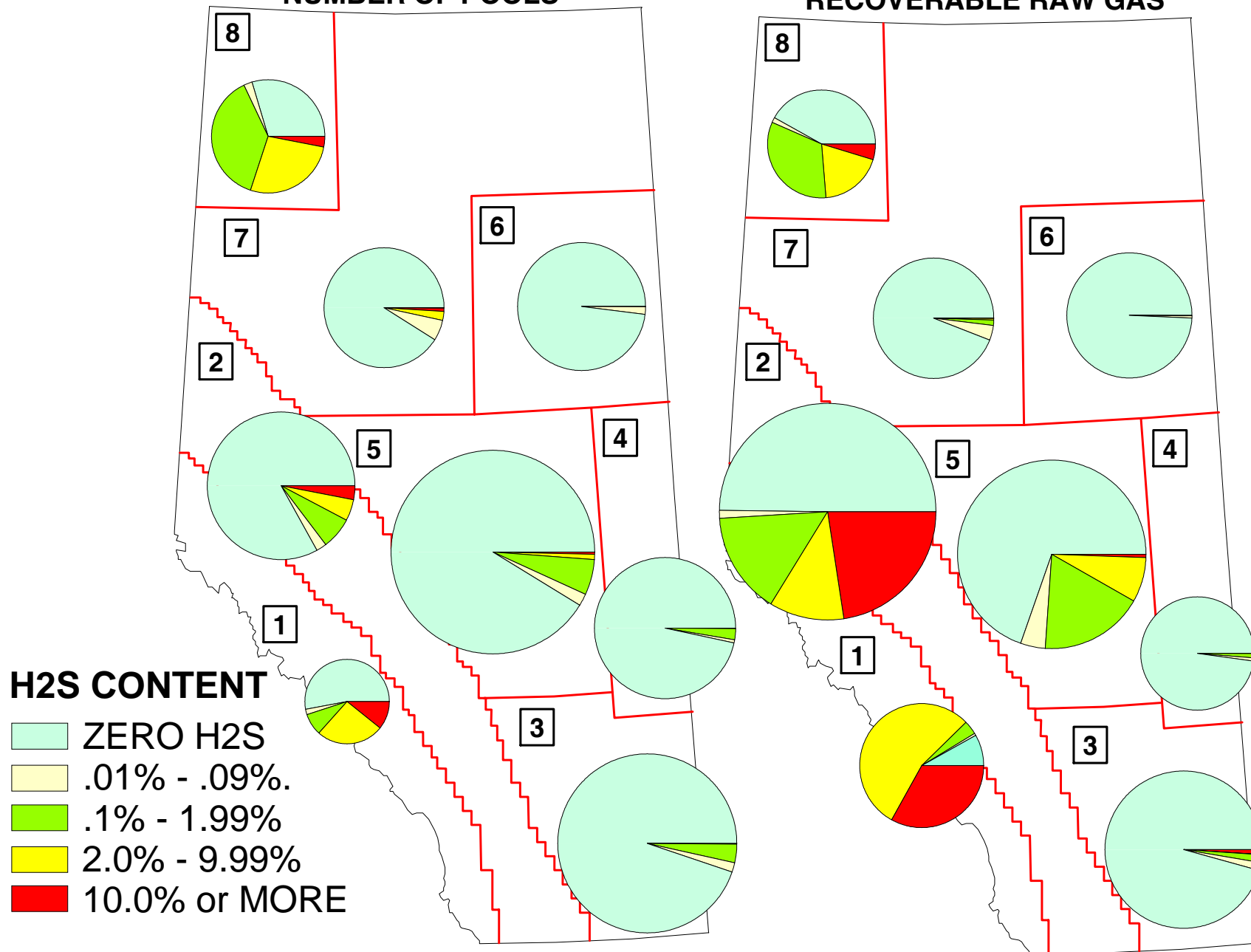
MARKETABLE GAS



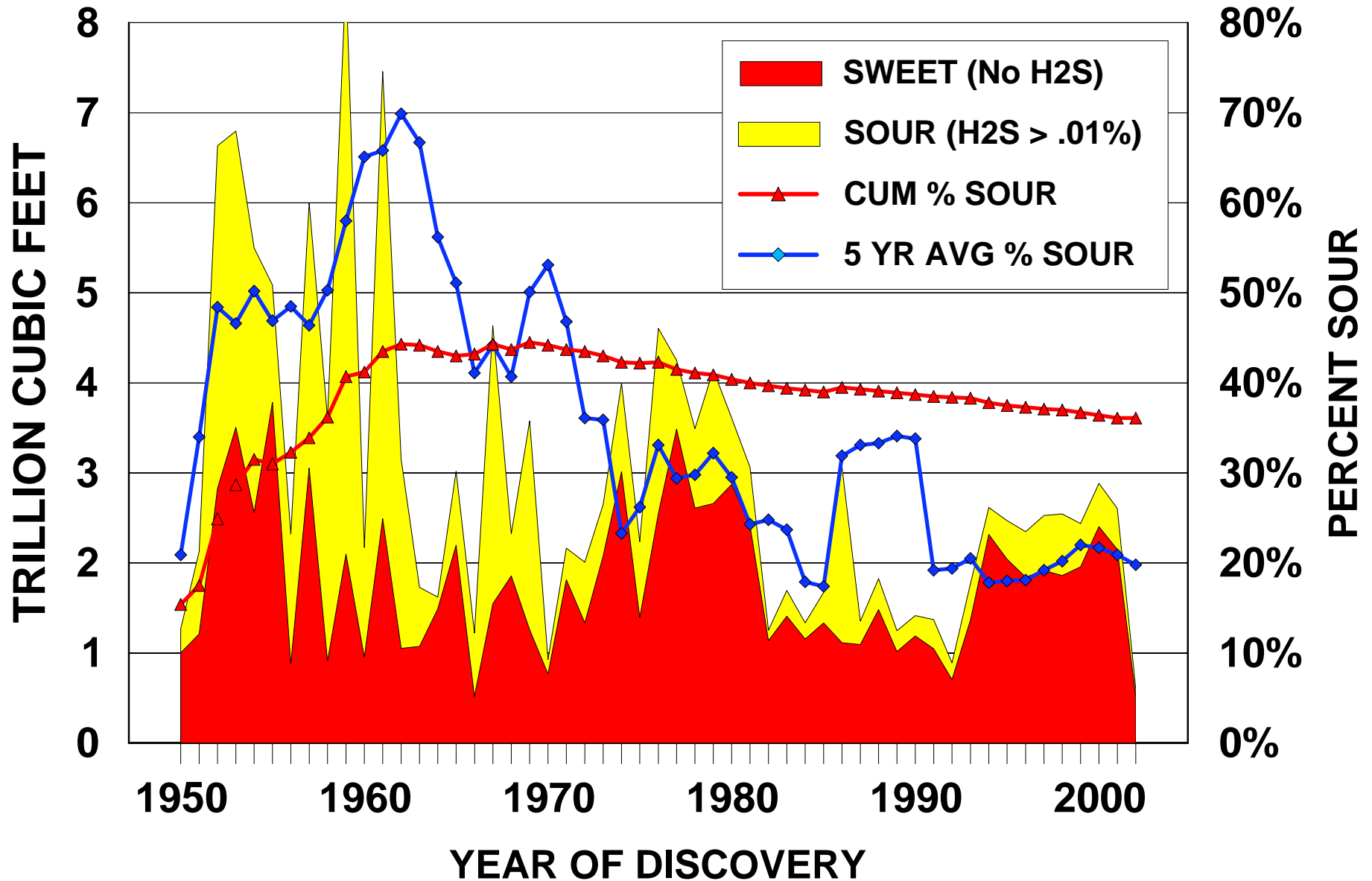
ALBERTA - H2S CONTENT

NUMBER OF POOLS

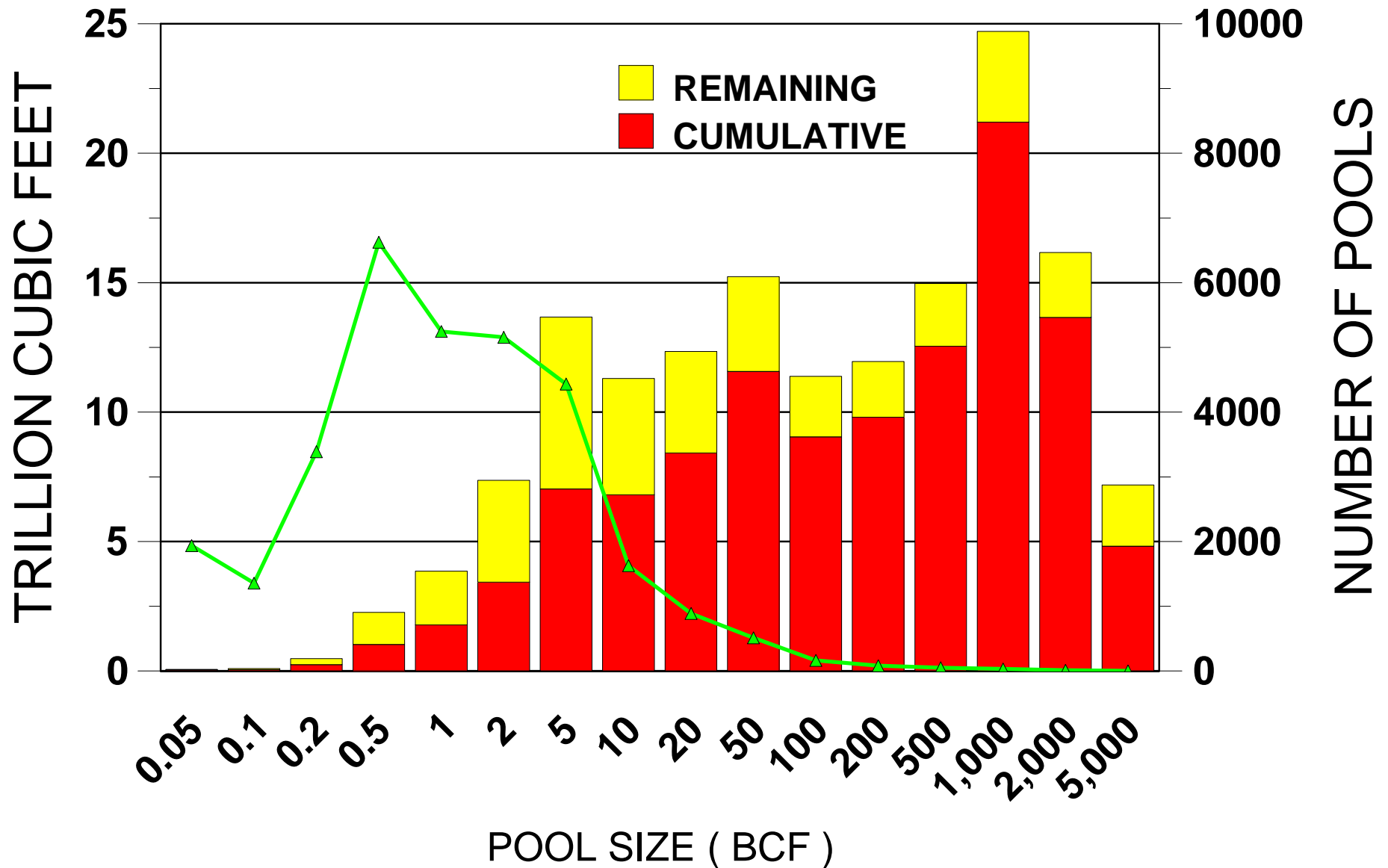
RECOVERABLE RAW GAS



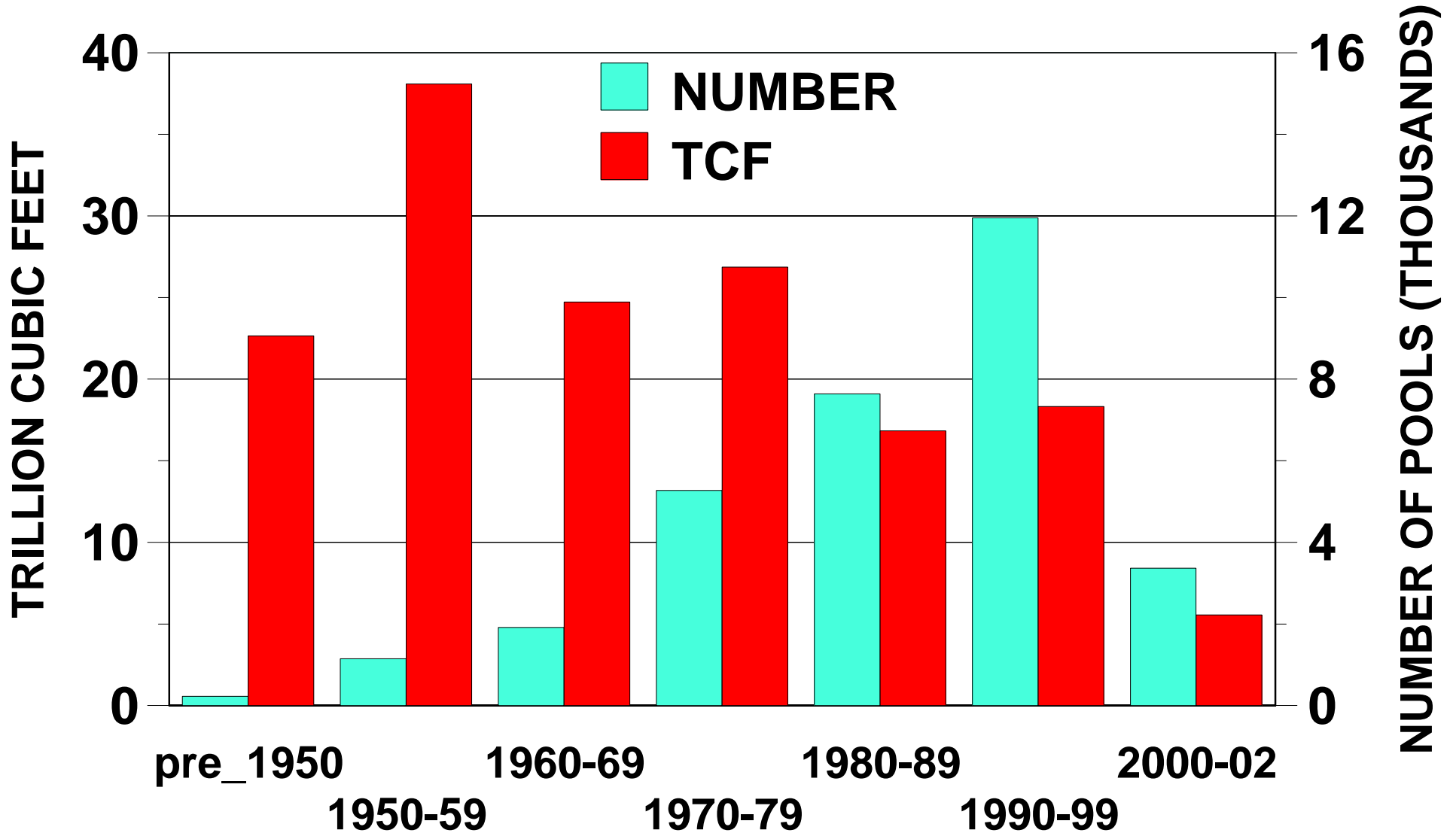
ALBERTA - DISCOVERY OF SWEET vs SOUR GAS



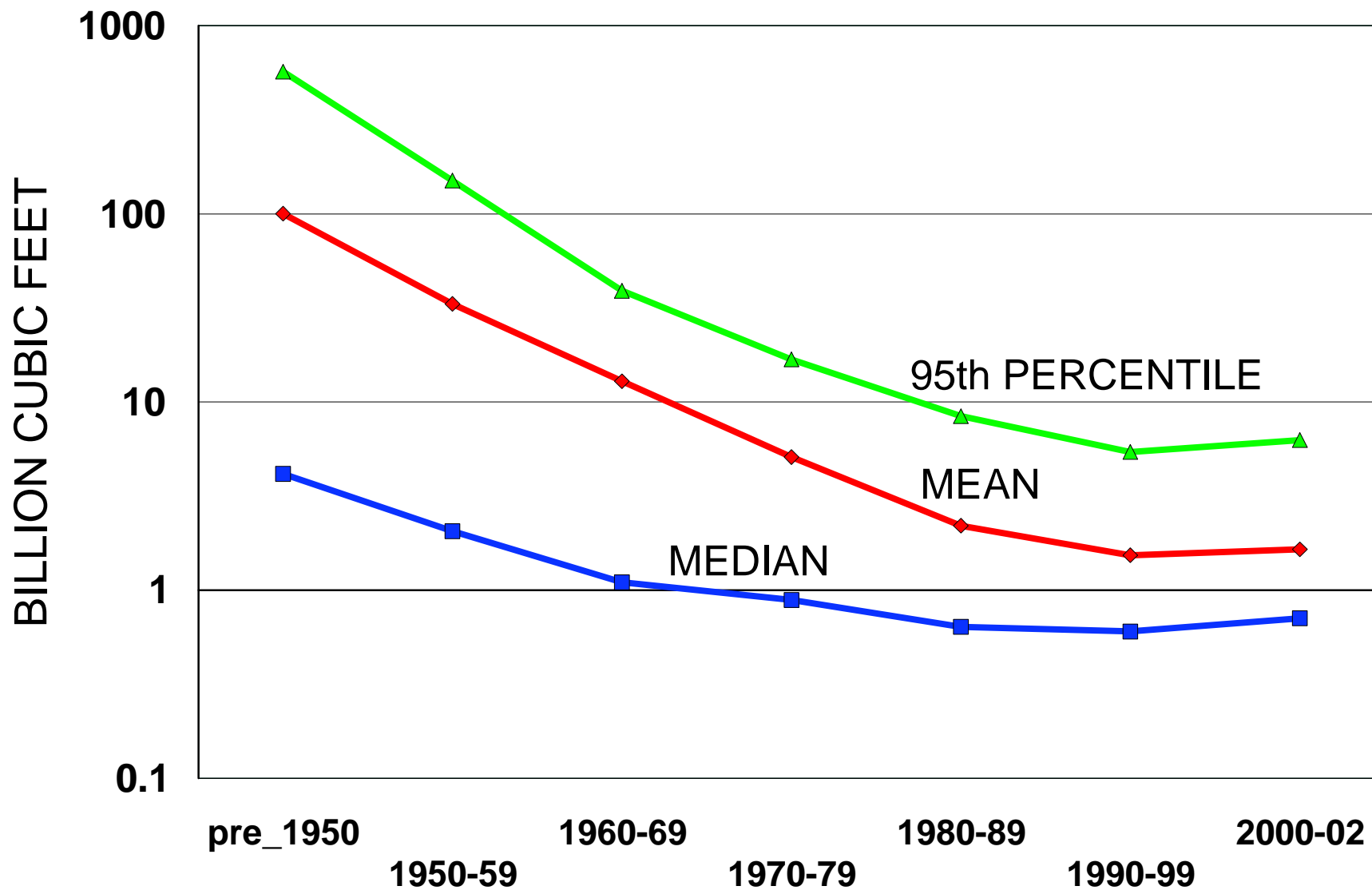
ALBERTA POOL SIZE DISTRIBUTION MARKETABLE GAS



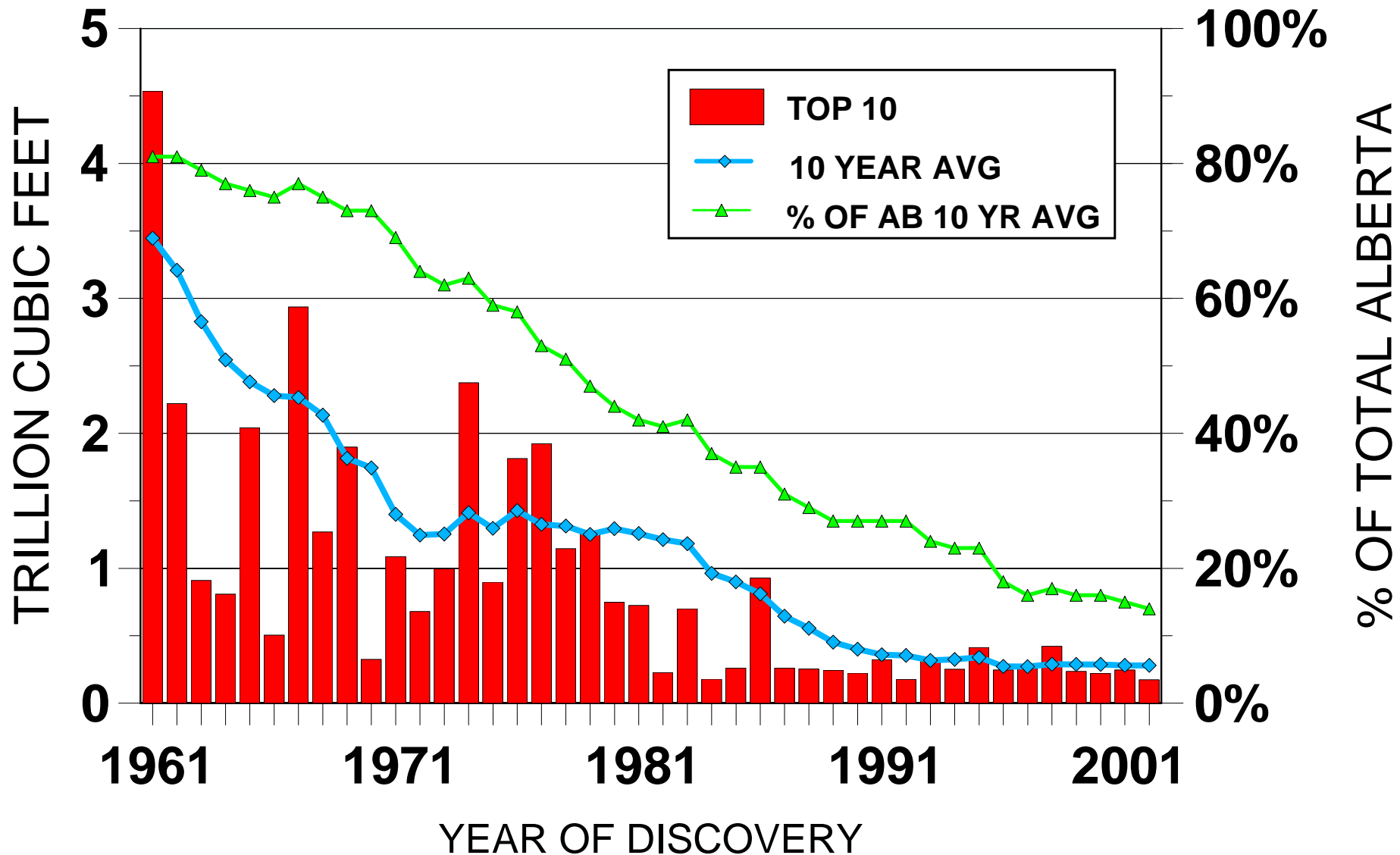
ALBERTA - MARKETABLE GAS BY DECADE DISCOVERED



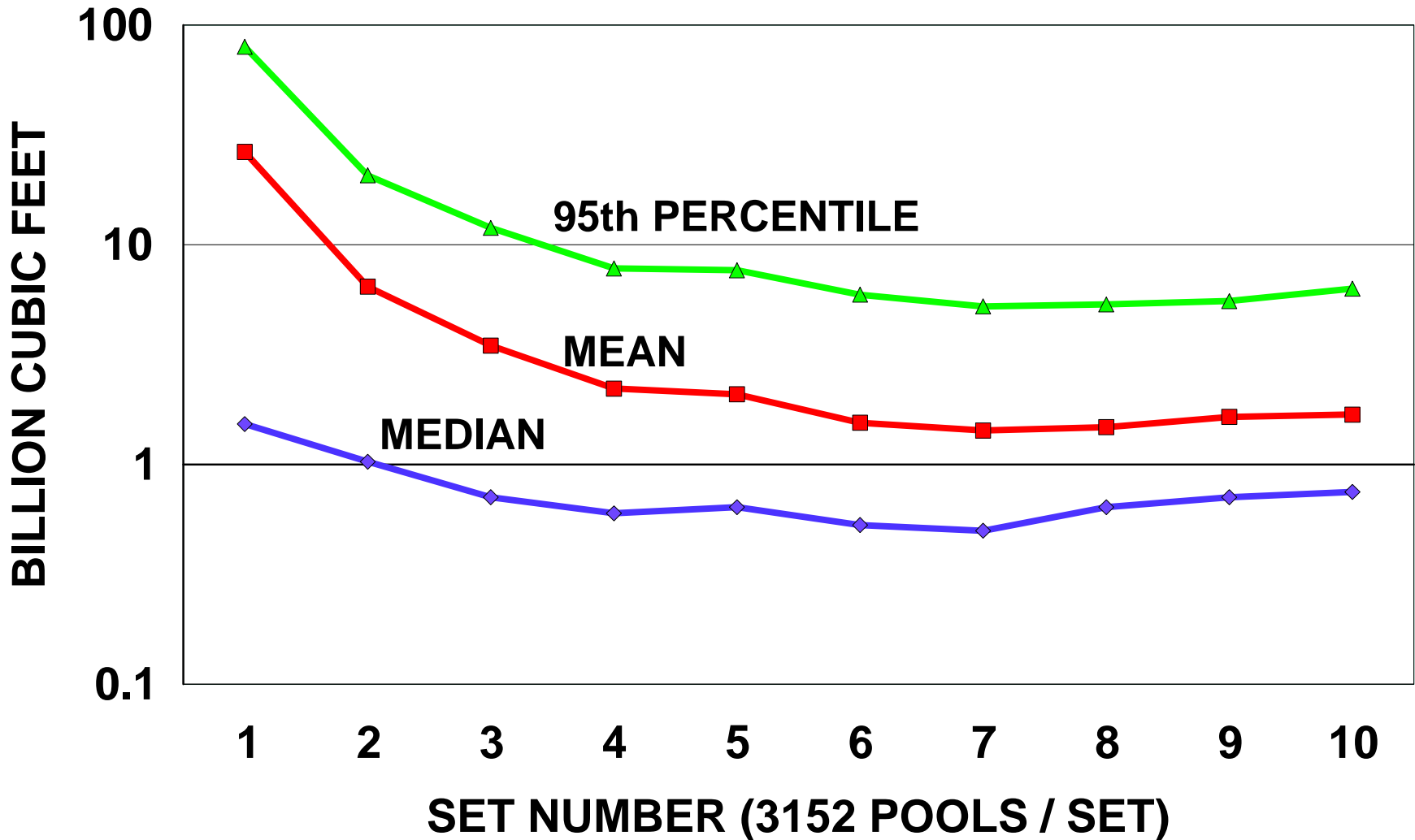
ALBERTA - INITIAL MARKETABLE GAS POOL SIZE BY DECADE DISCOVERED



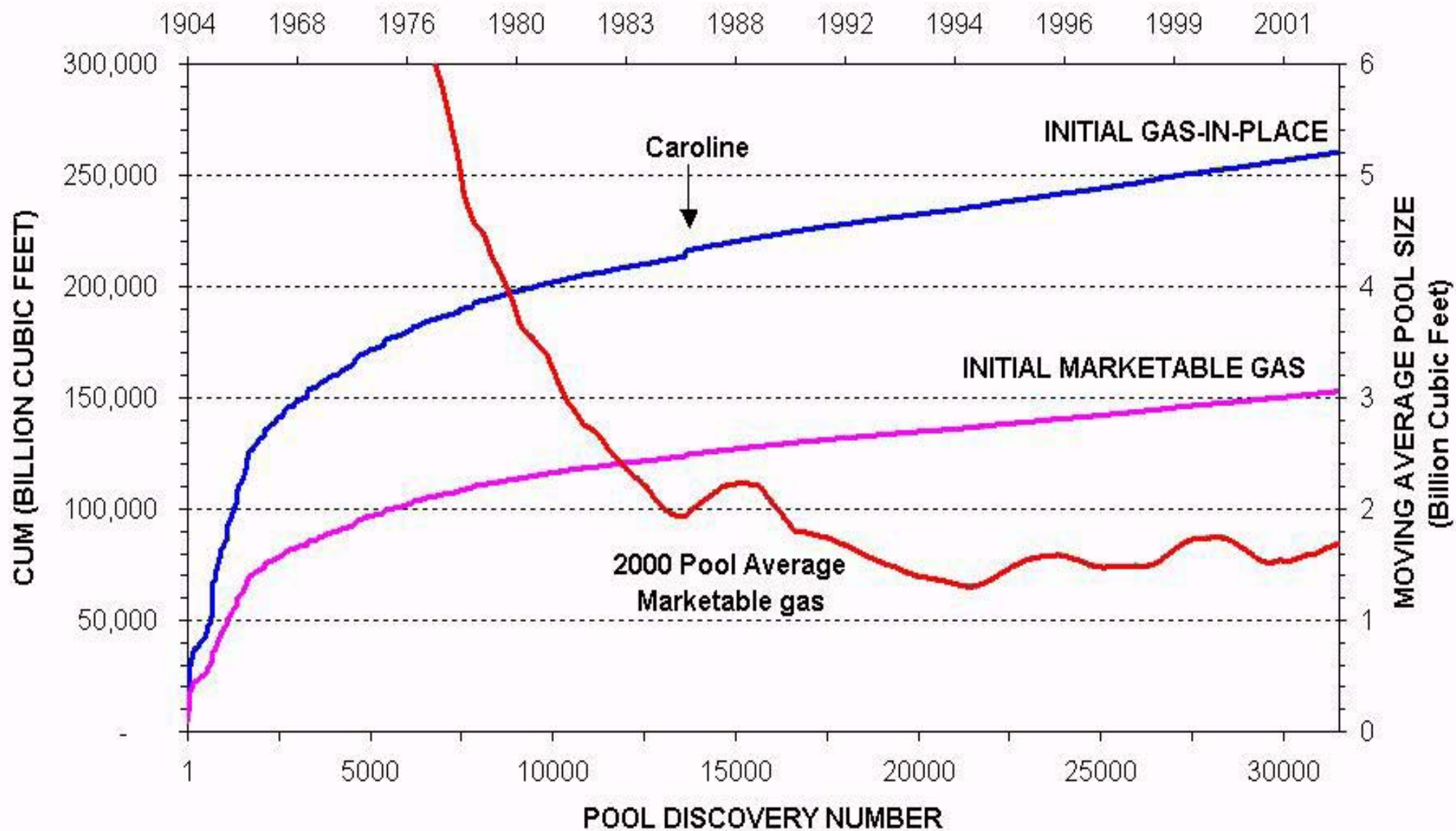
ALBERTA INITIAL MARKETABLE GAS TOP 10 POOLS BY YEAR OF DISCOVERY



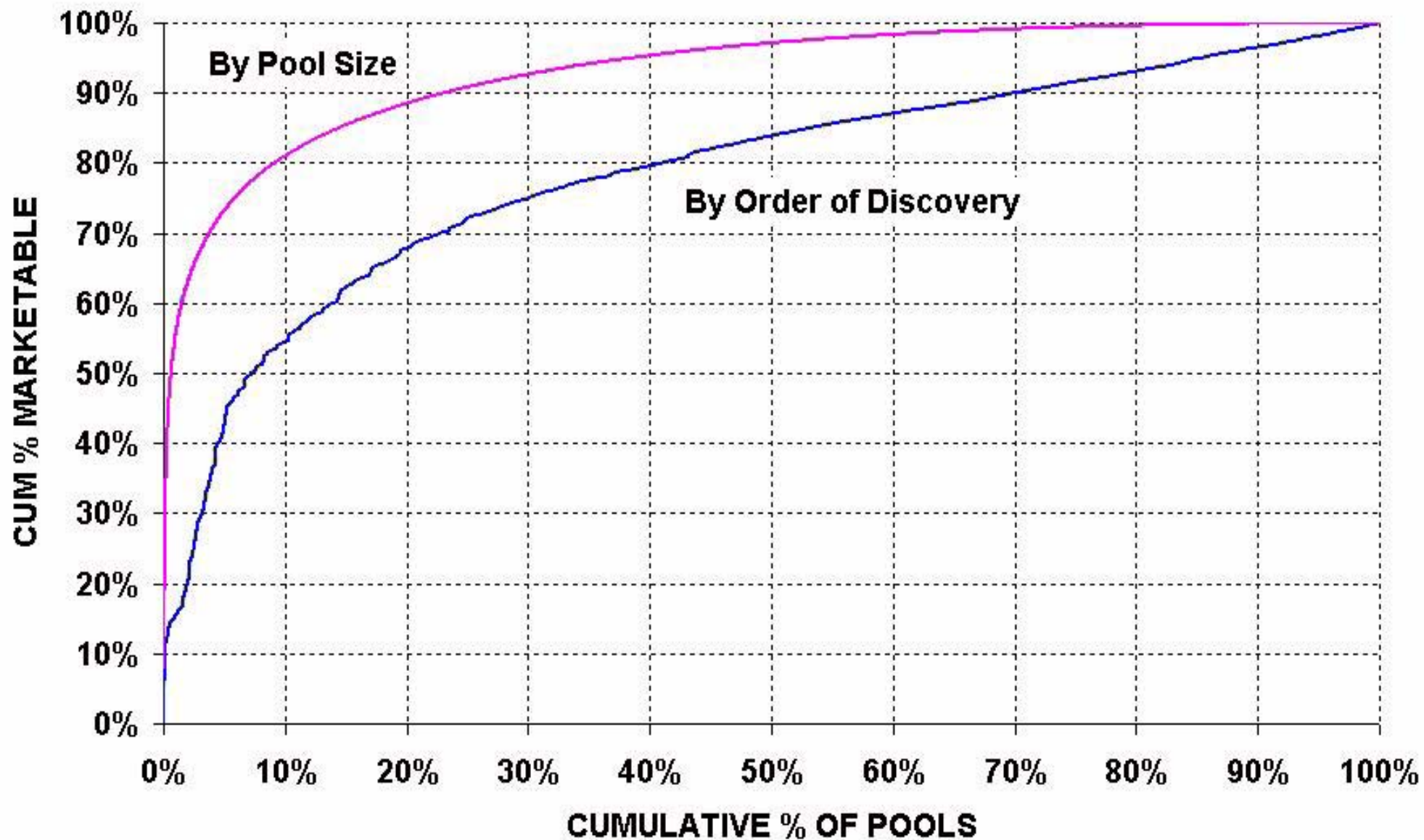
ALBERTA INITIAL MARKETABLE GAS POOL SIZES IN SETS BY DISCOVERY SEQUENCE



ALBERTA CUMULATIVE GAS DISCOVERY PLOT



ALBERTA - CUMULATIVE PERCENT MARKETABLE GAS vs NUMBER OF POOLS

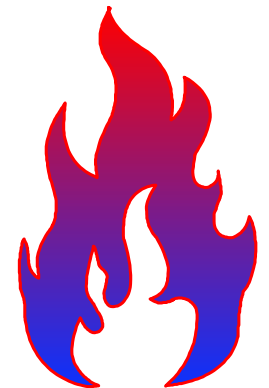


ALBERTA NATURAL GAS

JANUARY 1, 1990 - December 31, 2002

BY YEAR OF DISCOVERY

- ▶ **15,321 GAS POOLS**
- ▶ **INITIAL MARKETABLE GAS - 23.9 TCF**
- ▶ **REMAINING MARKETABLE GAS - 14.1 TCF**
- ▶ **AVERAGE POOL SIZE - 1.6 BCF**
- ▶ **MEDIAN POOL SIZE - 0.6 BCF**
- ▶ **95th PERCENTILE - 5.6 BCF**

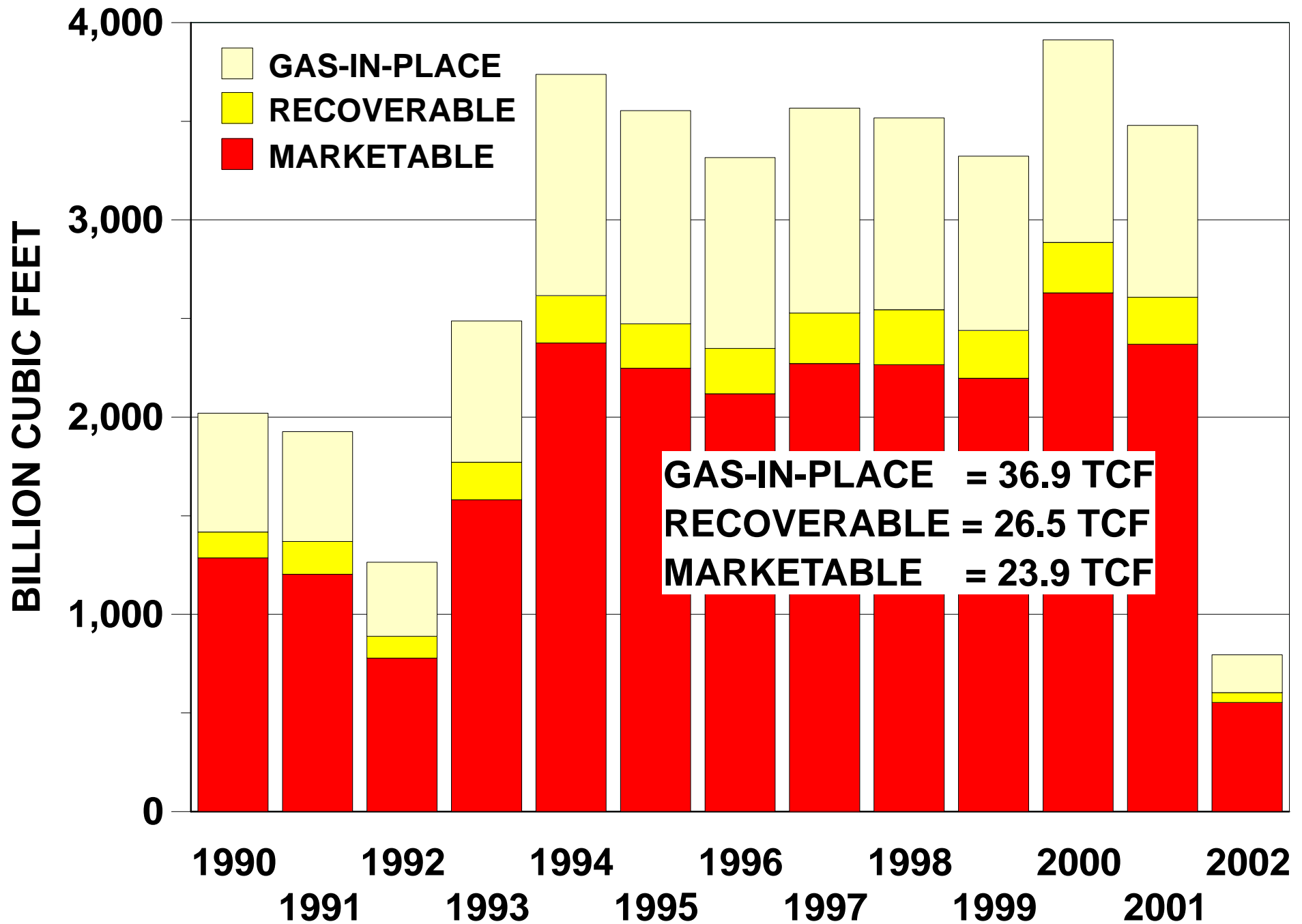


ALBERTA GAS POOLS

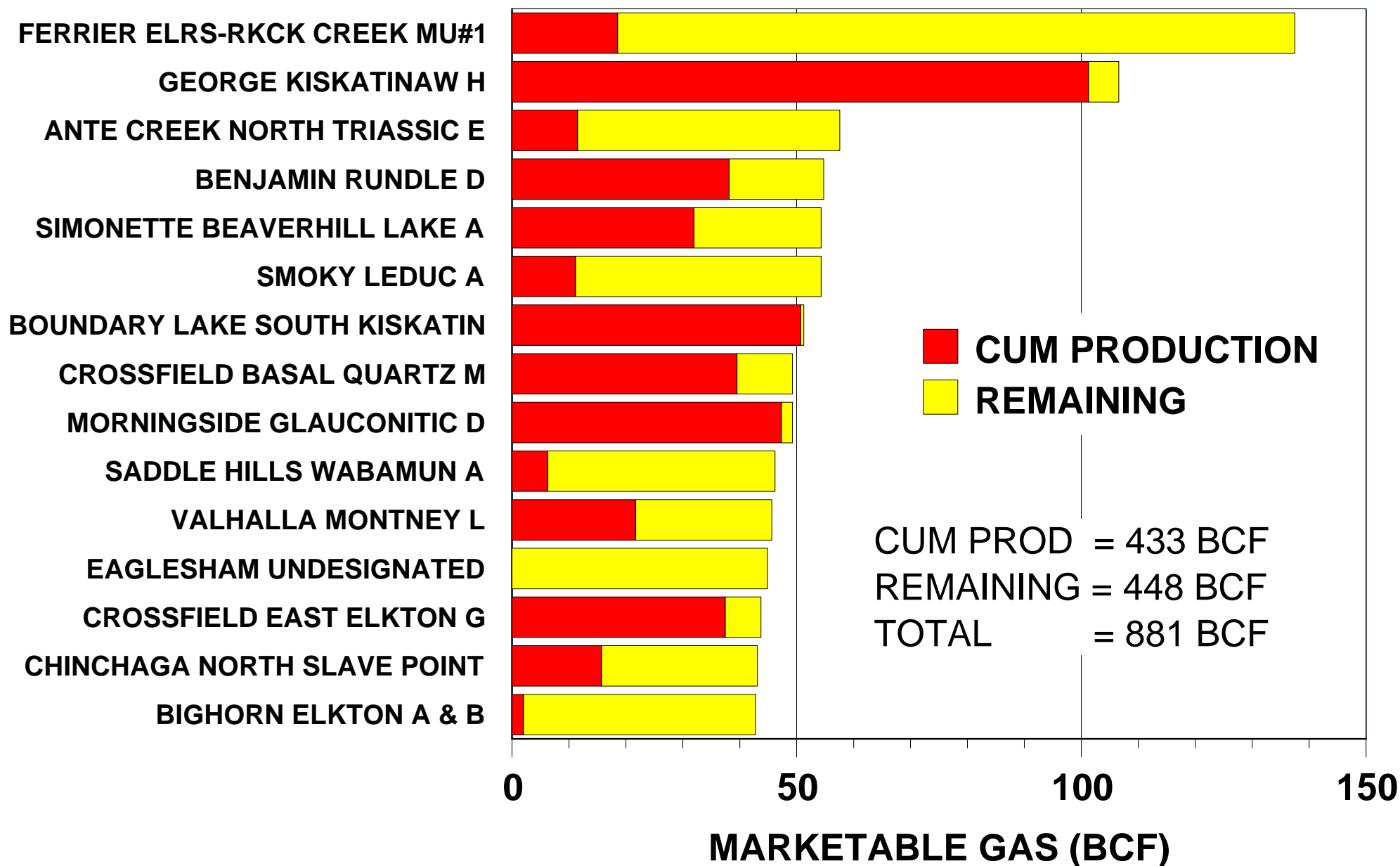
PRE-1990 vs 1990-2002

	PRE-1990	1990-2002
RECOVERY FACTORS (% Of GIP)		
RECOVERABLE	69.3%	71.8%
MARKETABLE	57.8%	64.7%
MARKETABLE GAS (BCF)		
AVERAGE POOL SIZE	8.0	1.6
MEDIAN POOL SIZE	0.8	0.6
95th PERCENTILE	18.8	5.6
AVERAGE DEPTH (FEET)	3,739	3,585
AVERAGE RECOVERABLE (MCF/AC-FT)	345	282
% POOLS WITH H₂S > 10%	1.1%	0.7%
% RECOVERABLE GAS H₂S > 10%	12.4%	3.4%
AVERAGE H₂S CONTENT	3.8%	1.0%

ALBERTA GAS BY YEAR OF DISCOVERY



ALBERTA - TOP 15 GAS POOLS 1990 - 2002

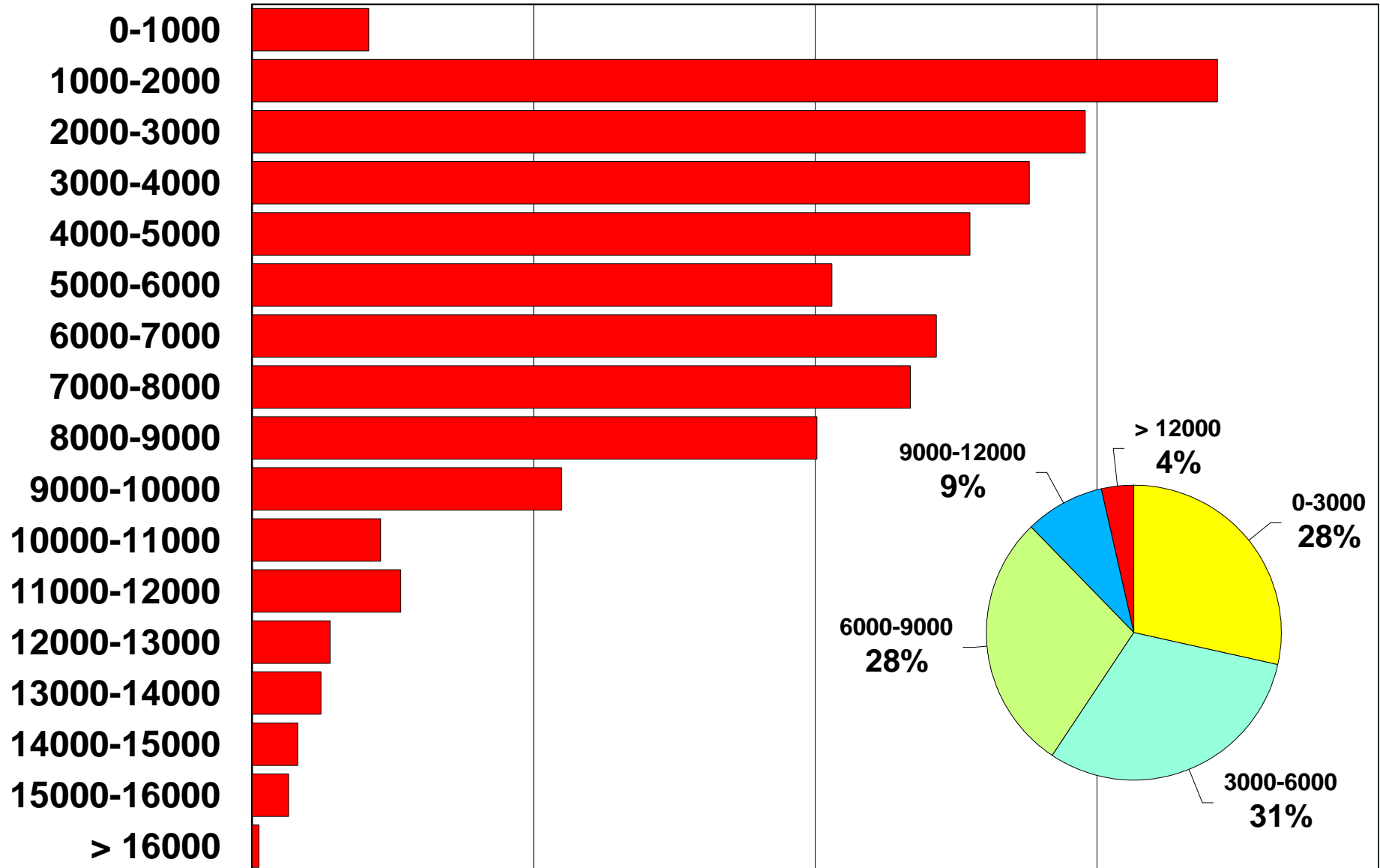


ALBERTA GAS DISCOVERIES 1990 - 2002

MARKETABLE (BCF)

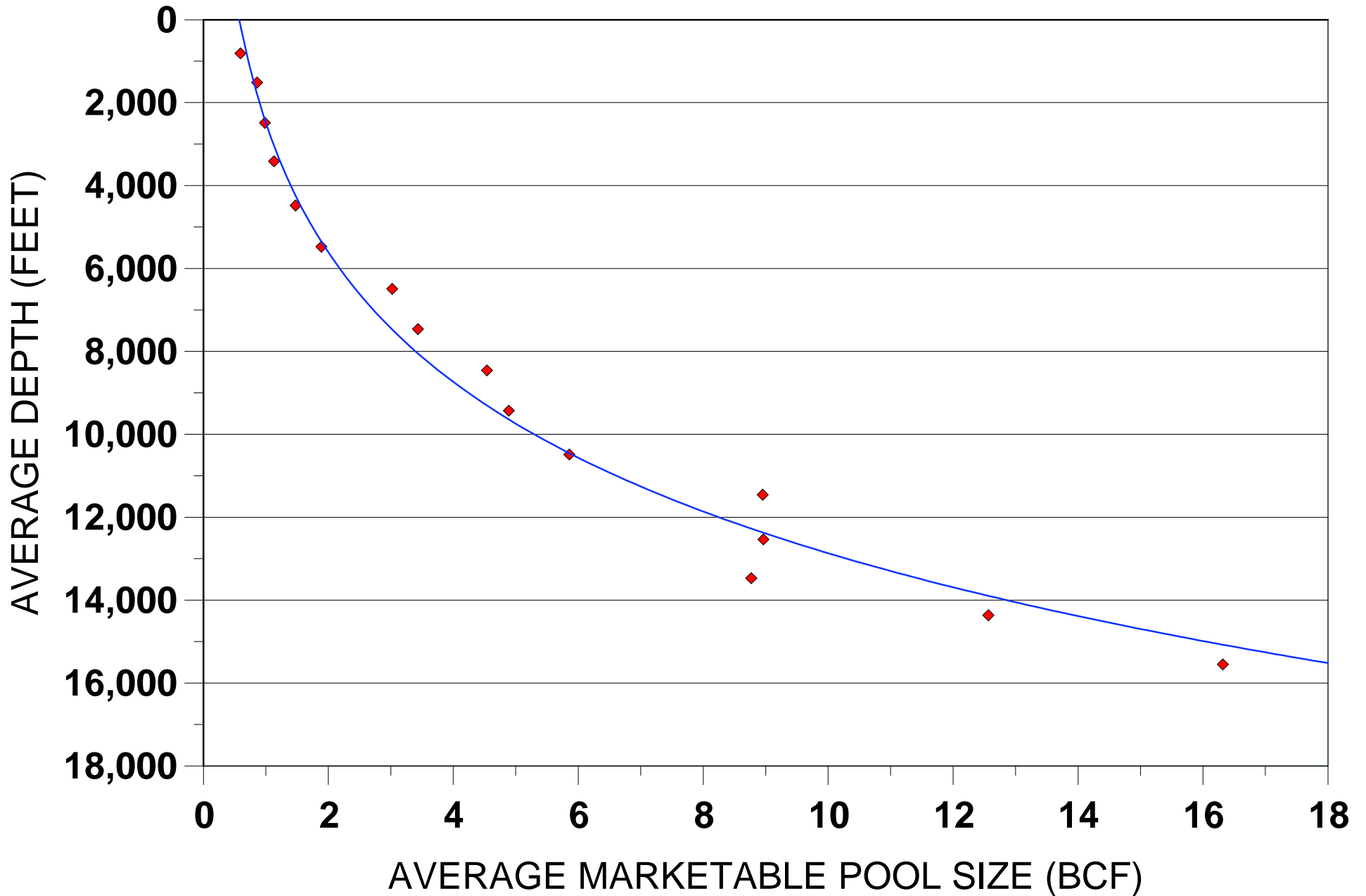
0 1000 2000 3000 4000

DEPTH CLASS (FEET)



ALBERTA GAS DISCOVERIES 1990 -2002

POOL SIZE vs DEPTH - AVERAGES BY DEPTH CLASS

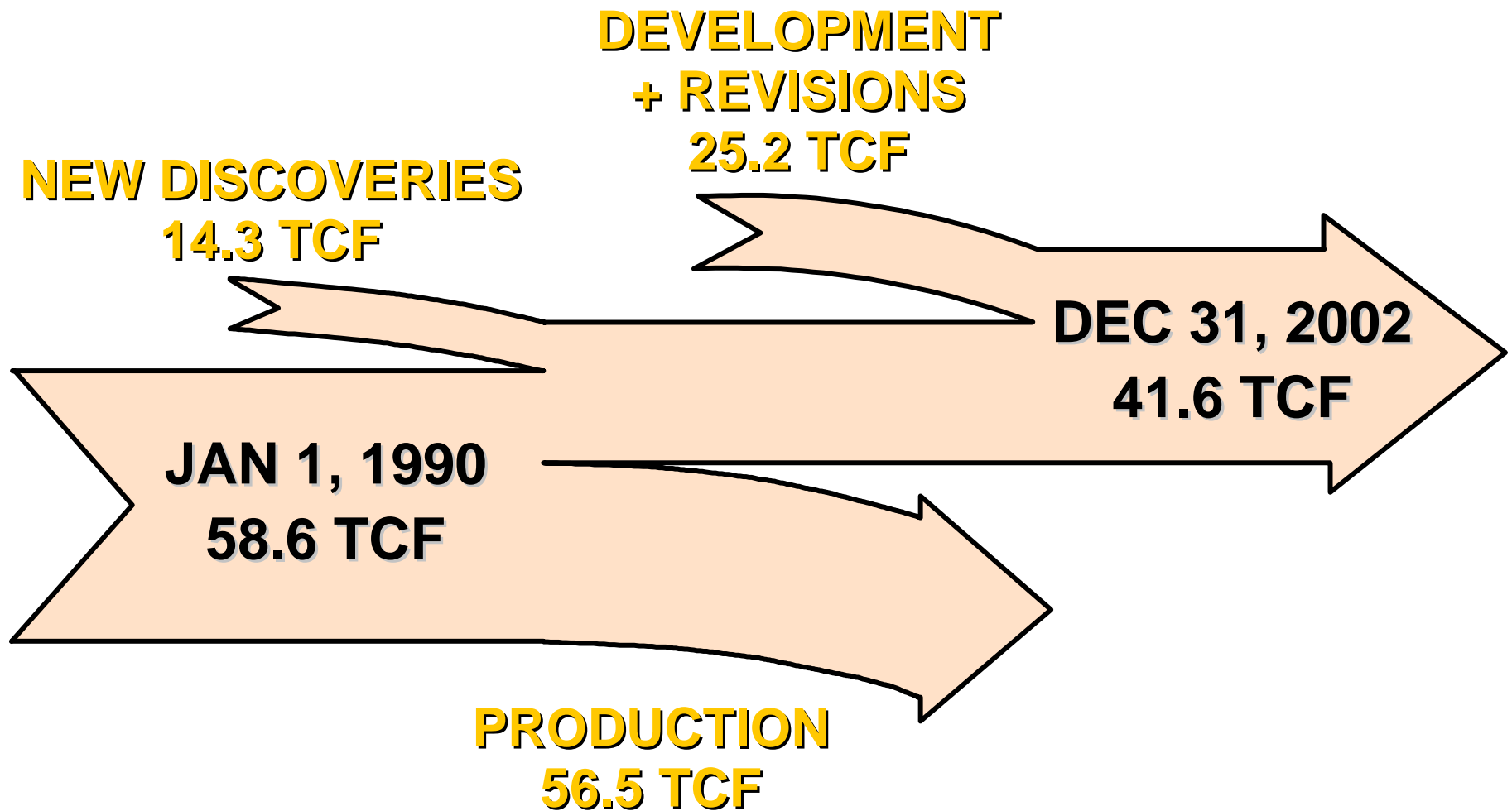


ALBERTA MARKETABLE GAS EUB YEAR-END REPORTS

	JAN 1 1990	DEC 31 2002	ADDED 1990-2002	PER YEAR
NUMBER OF POOLS	21,676	31,482	9,876	760
INITIAL MARKETABLE (TCF)	113.5	153.0	39.5	3.0
REMAINING MARKETABLE (TCF)	58.6	41.6	-17.0	-1.4
CUM. PRODUCTION (TCF)	55.0	111.5	56.5	4.3

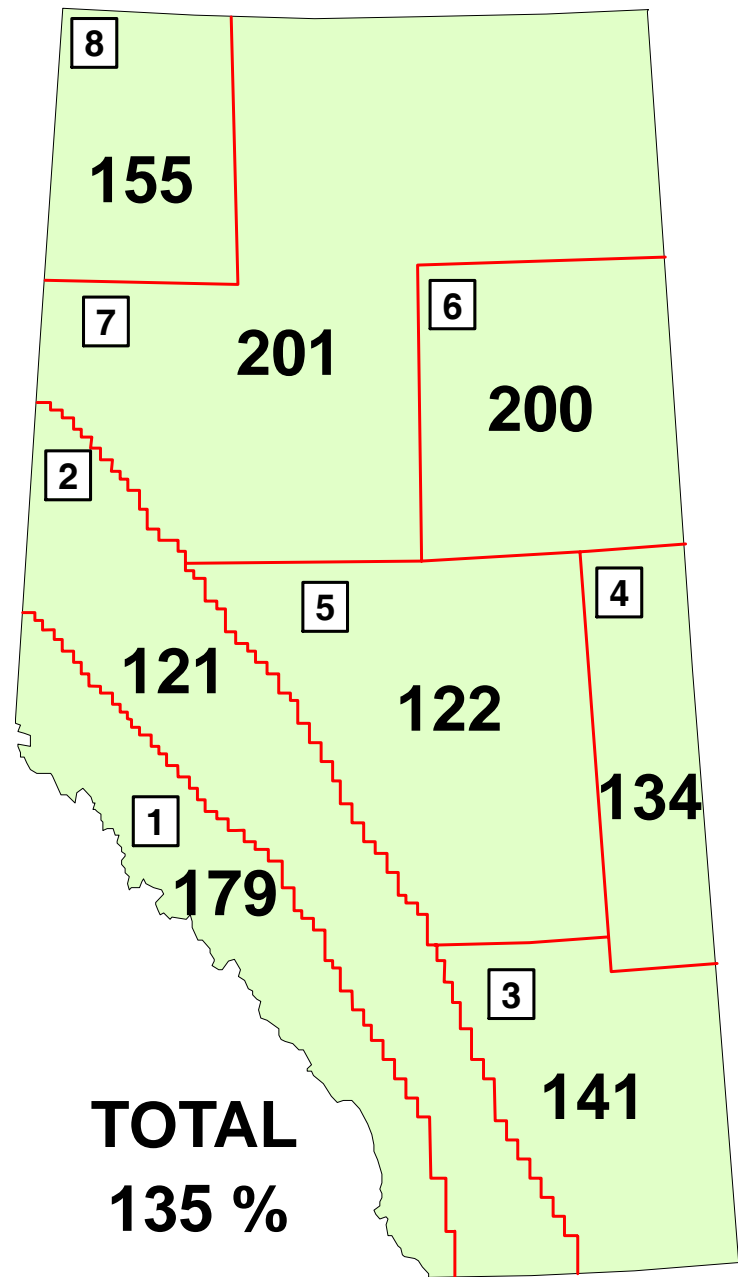
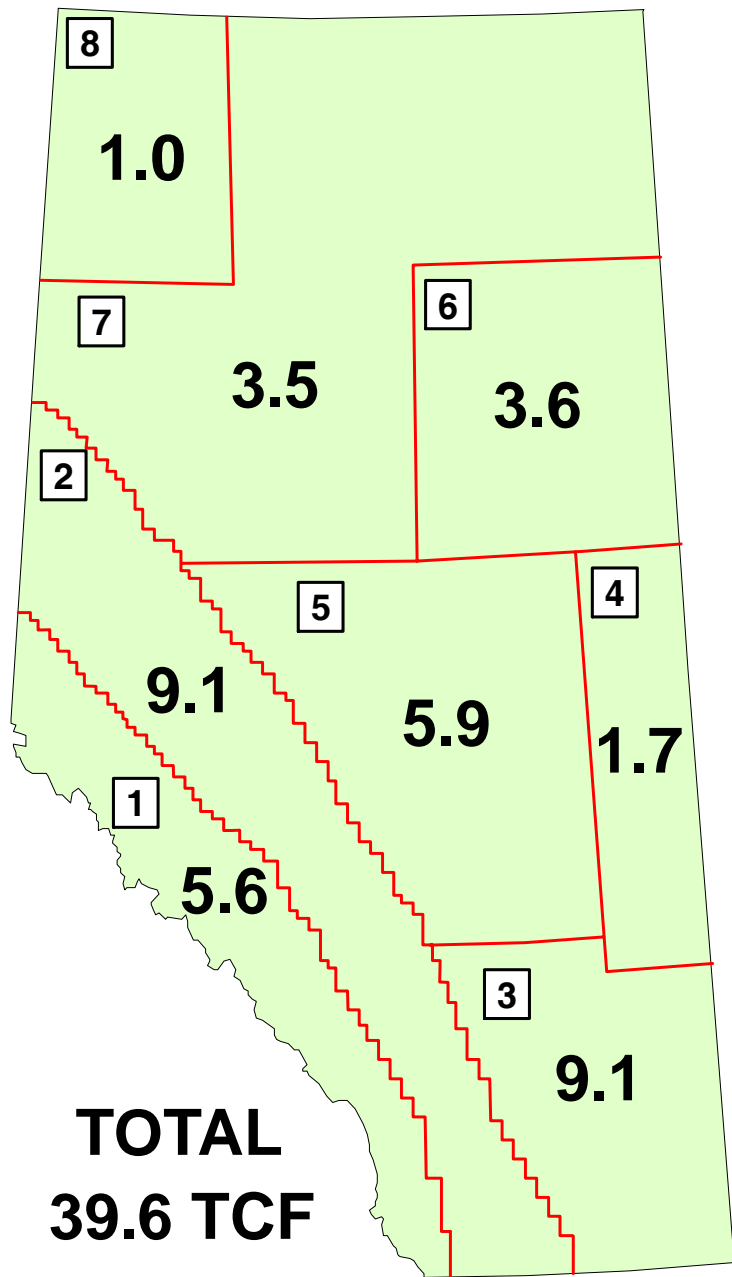
ALBERTA SUMMARY 1990 - 2002

REMAINING MARKETABLE GAS RESERVES



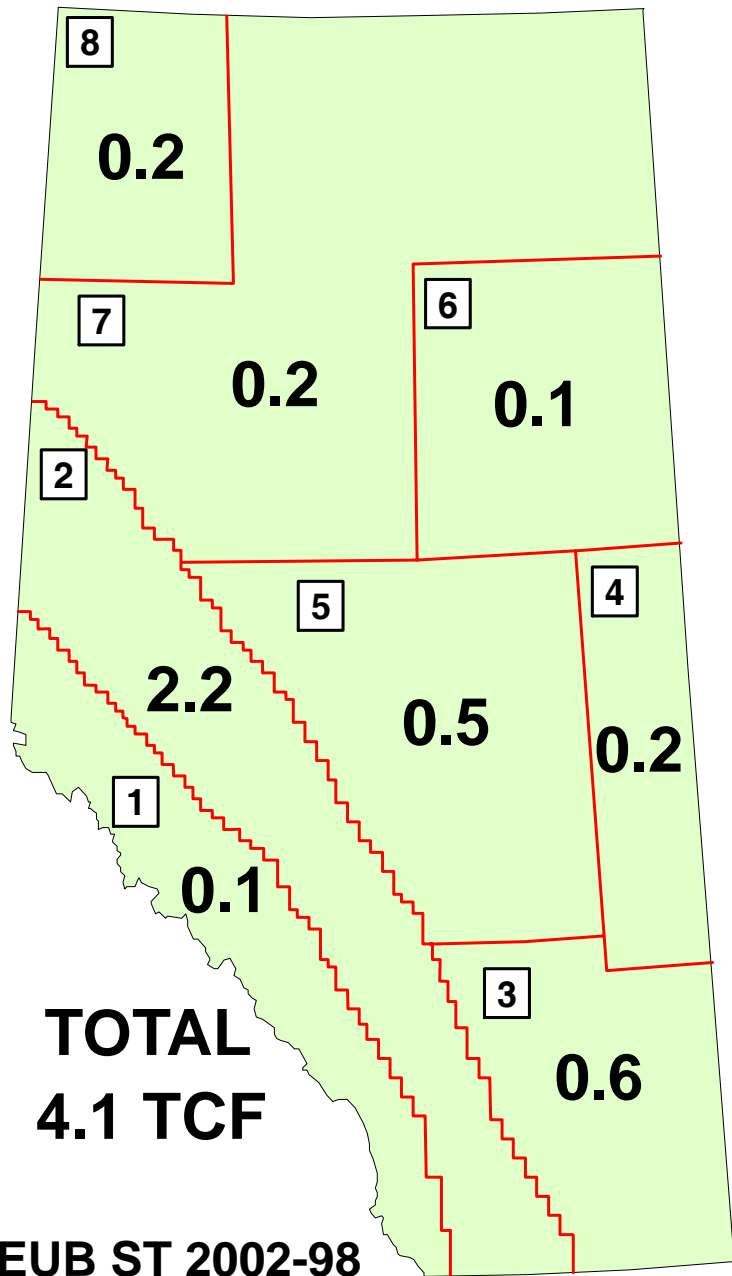
MARKETABLE GAS RESERVES ADDITIONS

TCF 1990 - 2002 % OF 1990

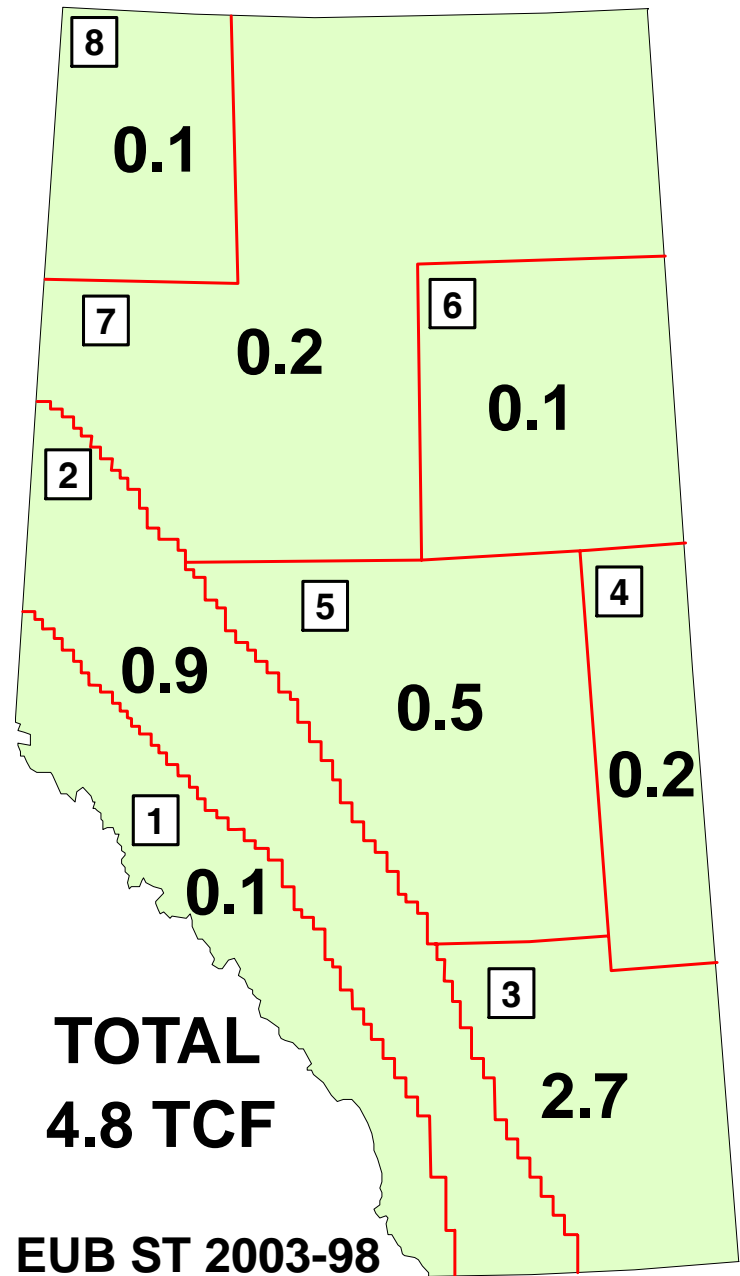


MARKETABLE GAS RESERVES ADDITIONS (TCF)

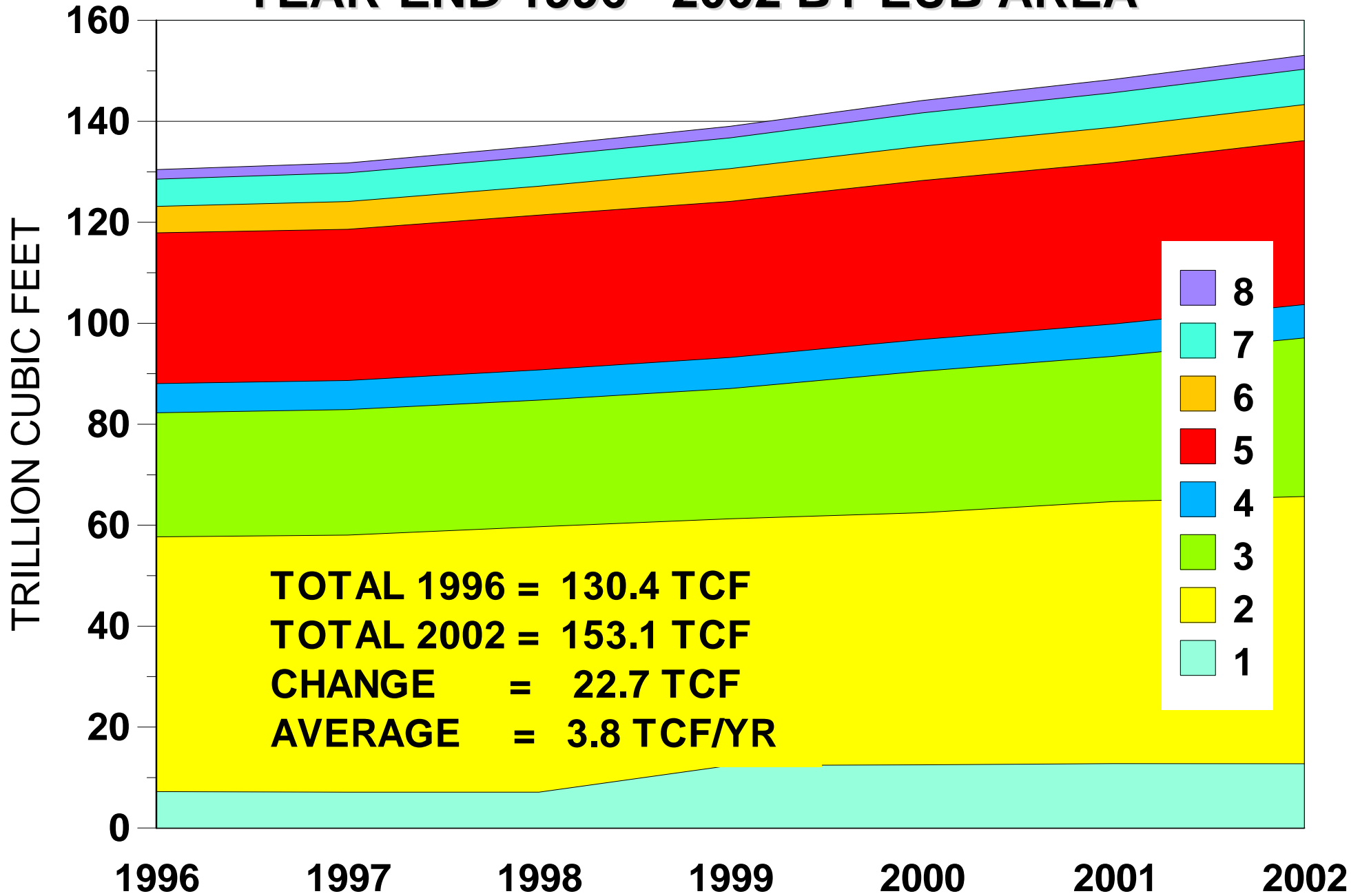
2001



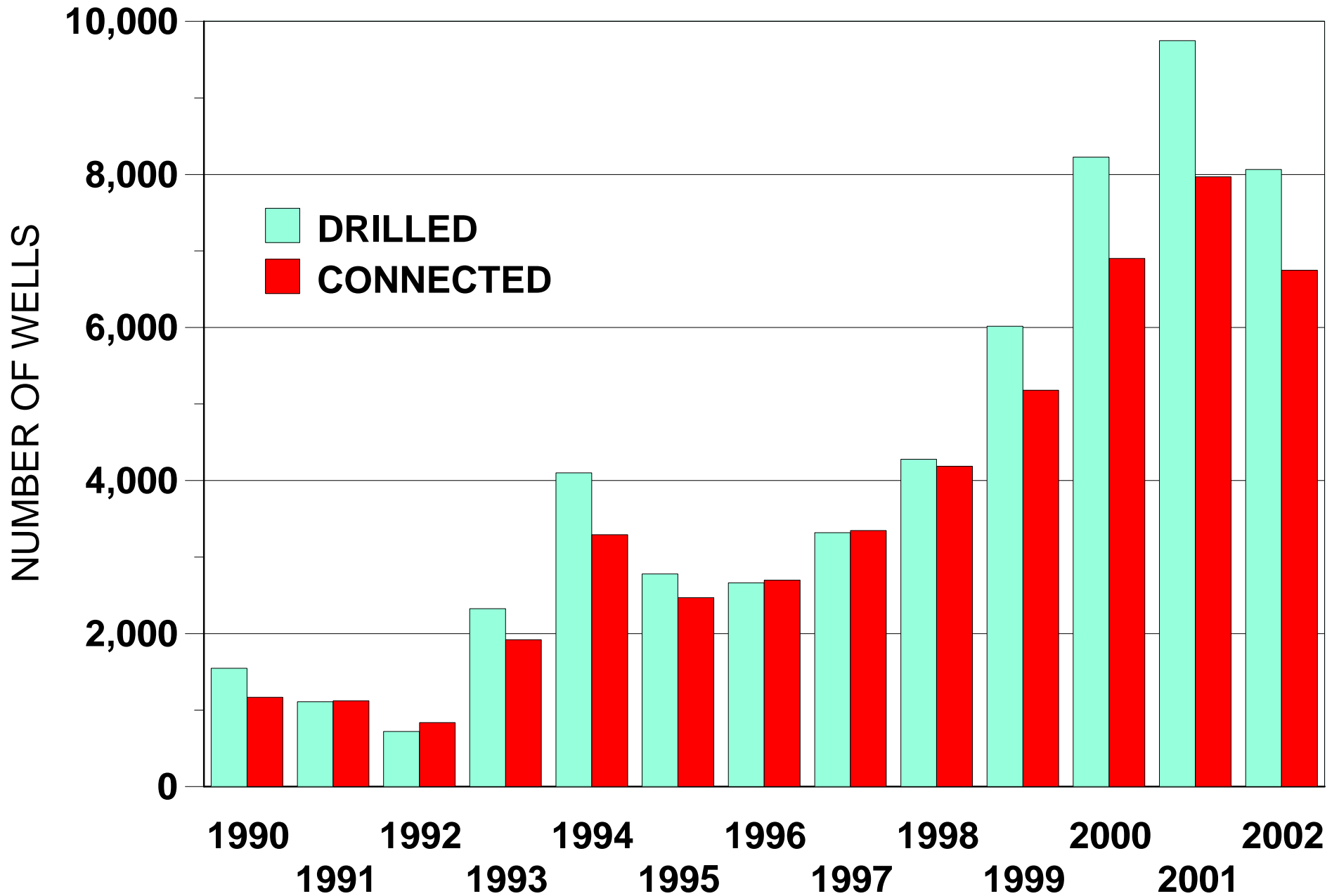
2002



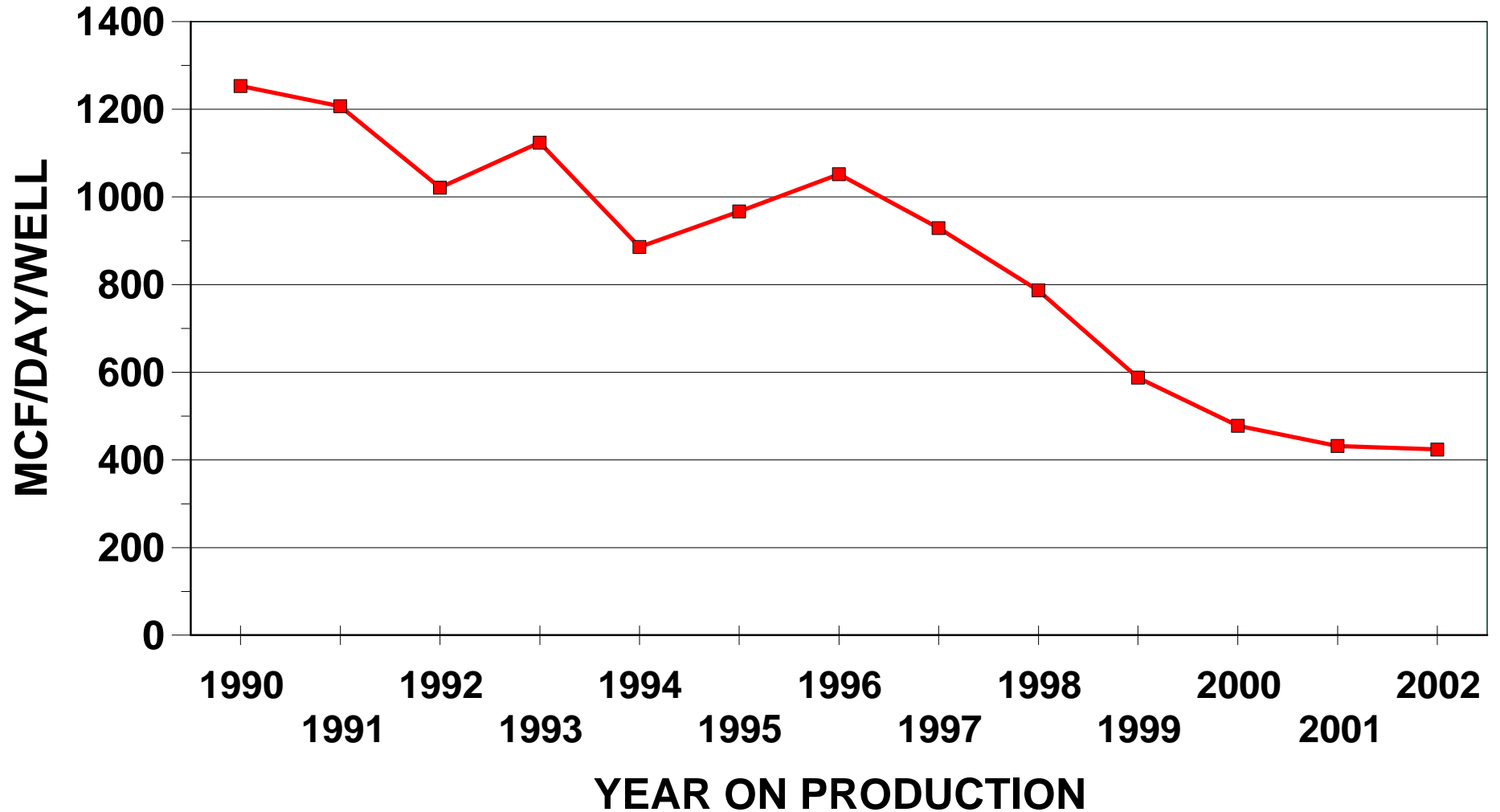
ALBERTA INITIAL MARKETABLE GAS YEAR-END 1996 - 2002 BY EUB AREA



ALBERTA GAS WELLS DRILLED AND CONNECTED

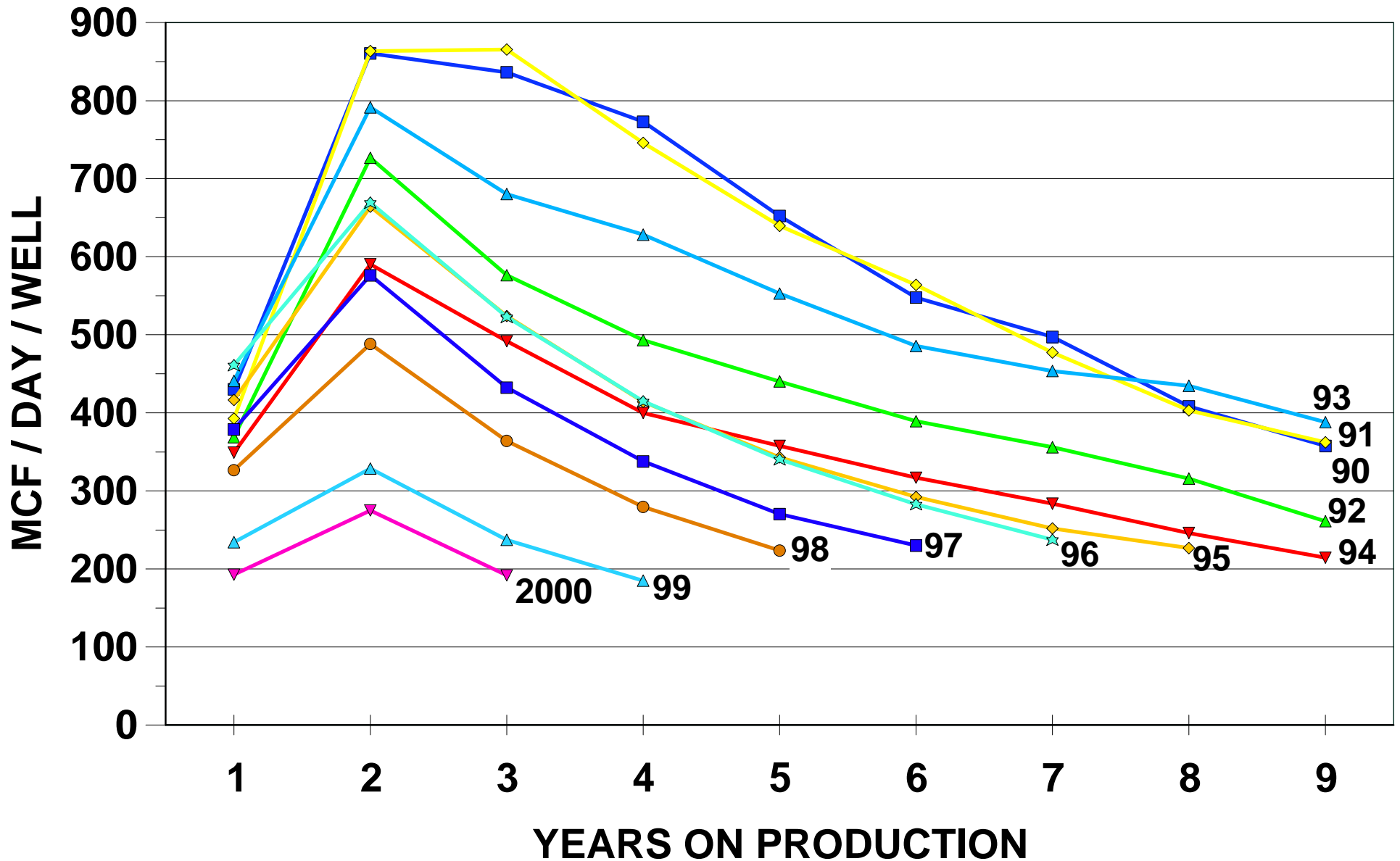


ALBERTA INITIAL GAS WELL PRODUCTIVITY OPERATING DAY RATE



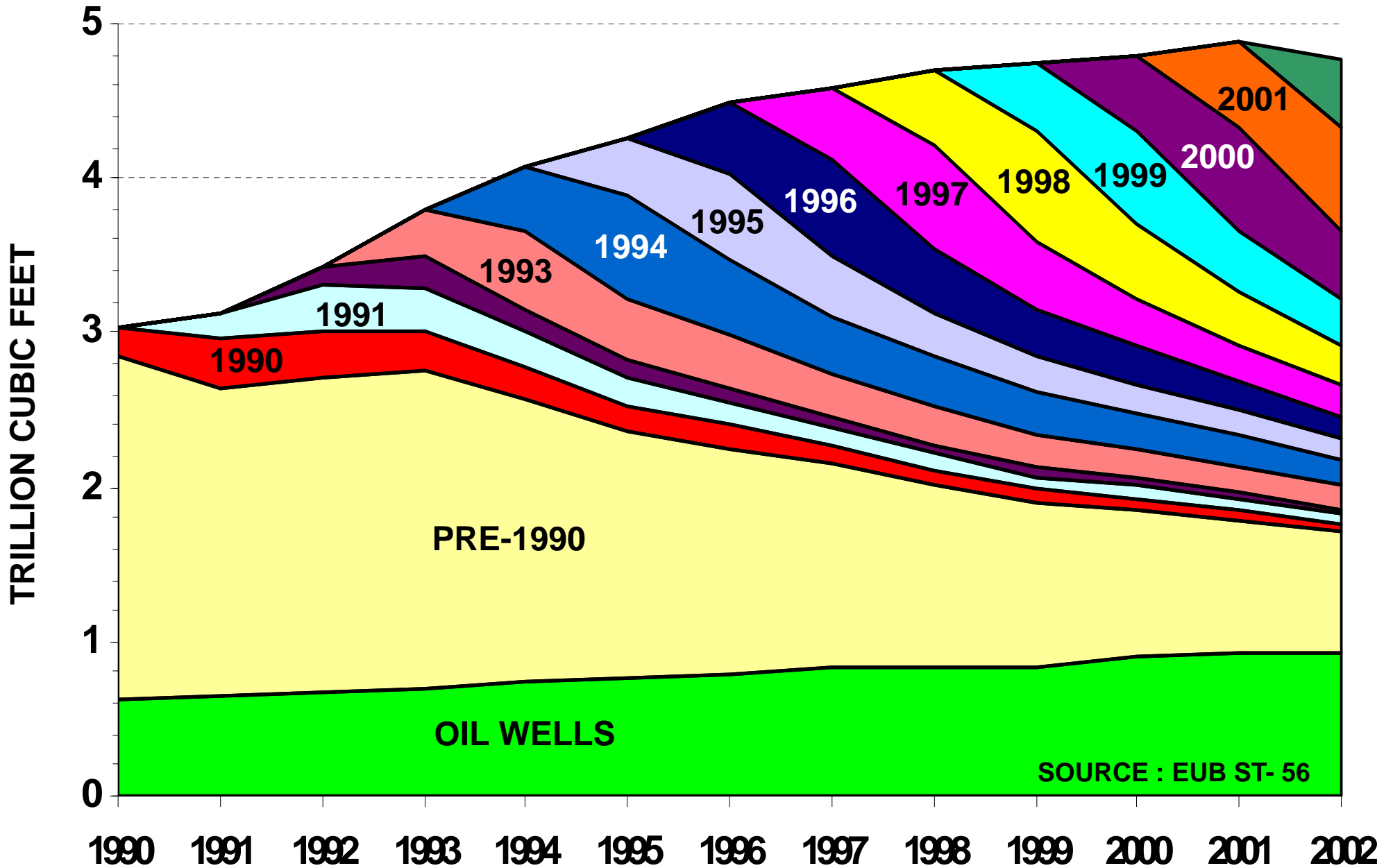
SOURCE: EUB ST-56

ALBERTA AVERAGE GAS WELL PRODUCTION BY ON PRODUCTION YEAR



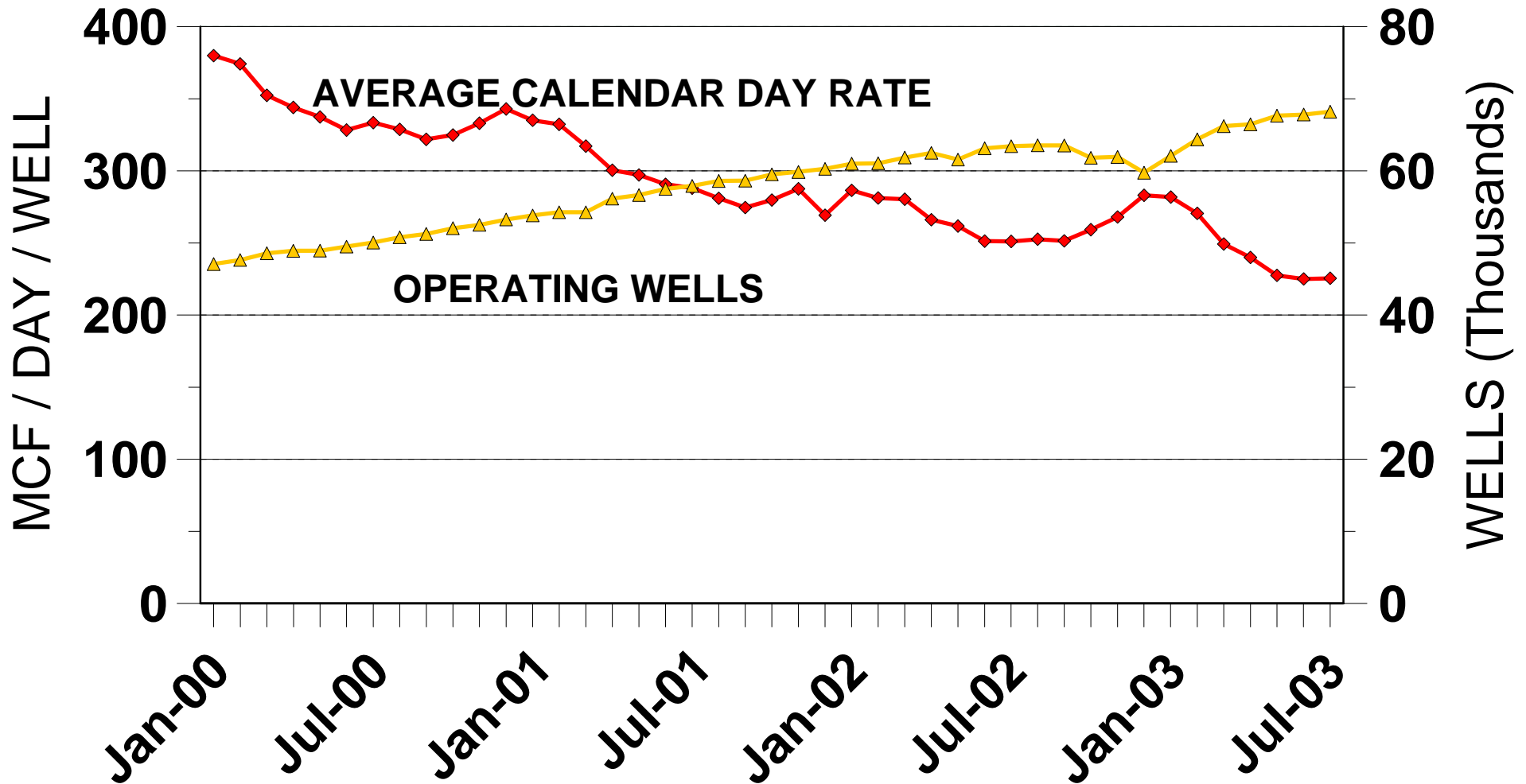
SOURCE: EUB ST - 56

ALBERTA RAW GAS PRODUCTION BY CONNECTION YEAR



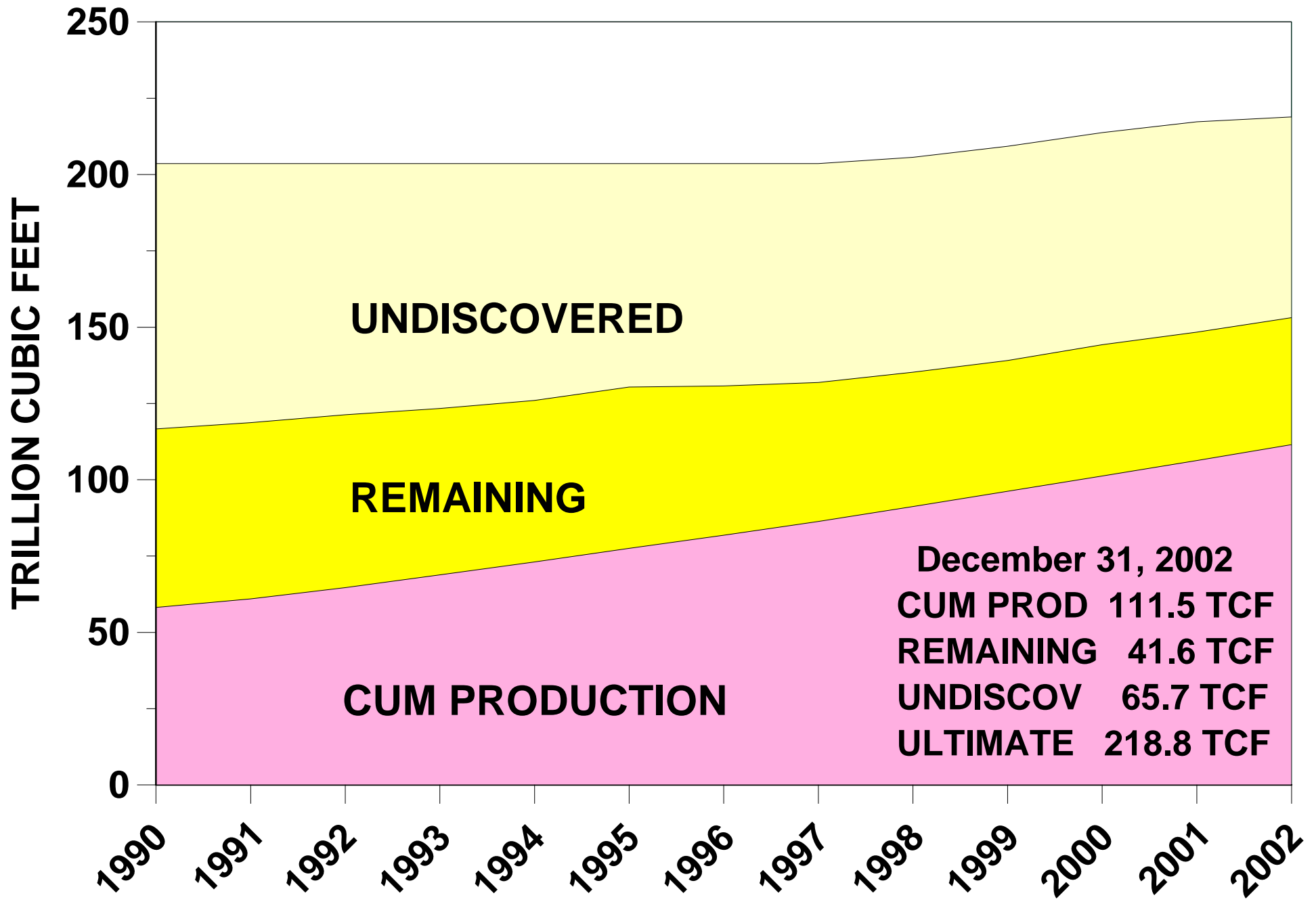
SOURCE : EUB ST- 56

ALBERTA GAS WELLS AVERAGE CALENDAR DAY RATE



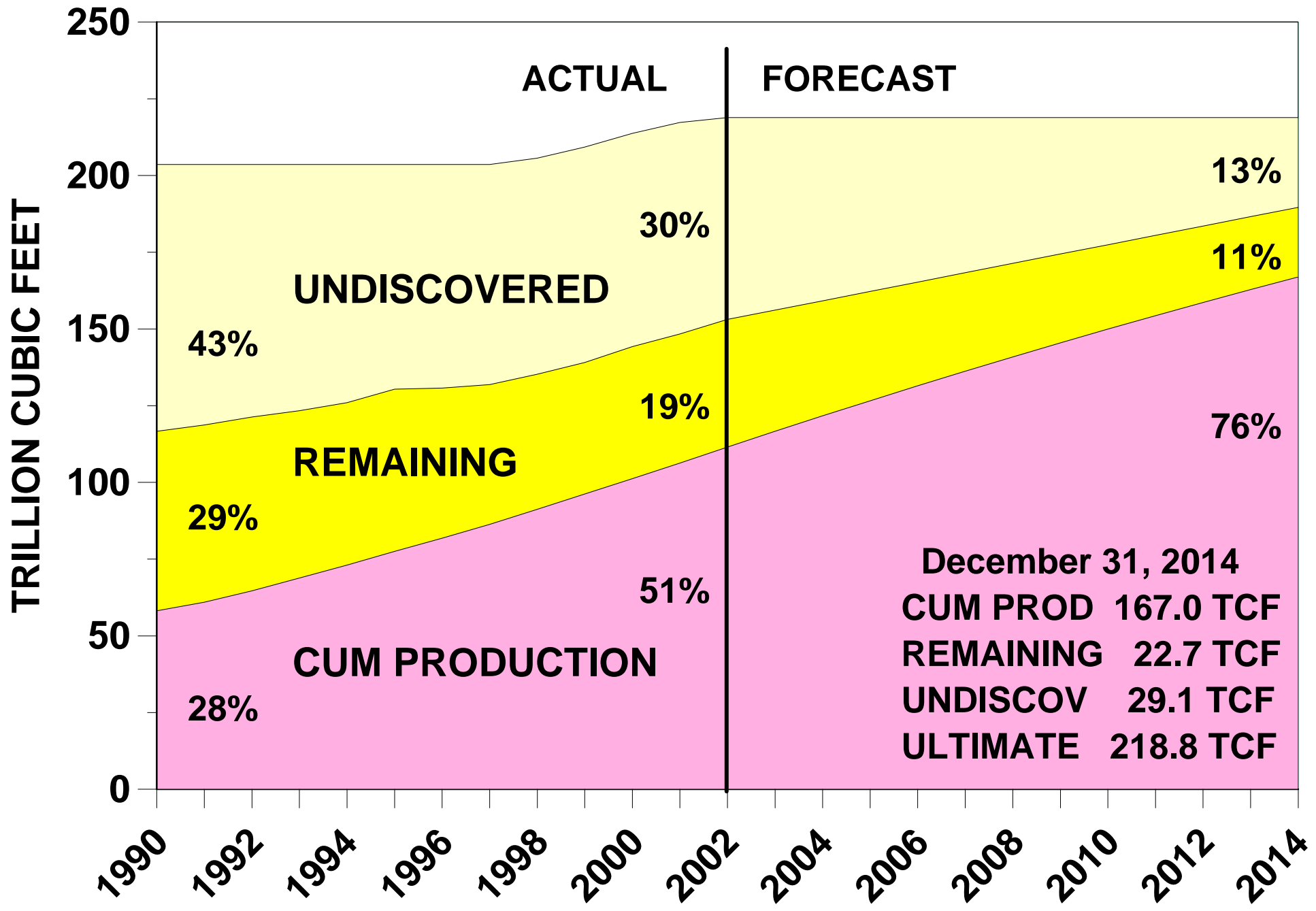
SOURCE: EUB ST- 3, ST- 59

ALBERTA ULTIMATE NATURAL GAS



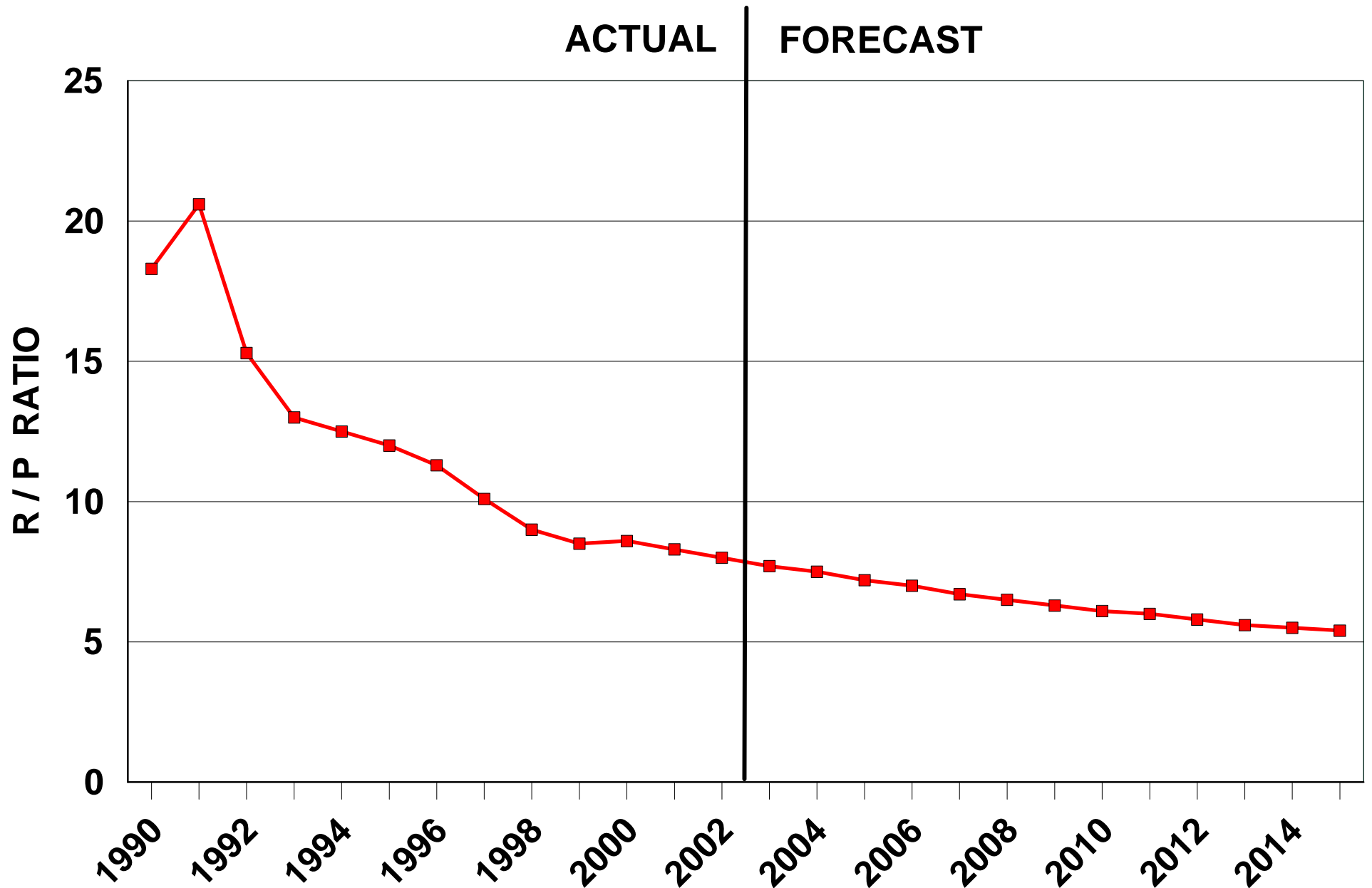
December 31, 2002
CUM PROD 111.5 TCF
REMAINING 41.6 TCF
UNDISCOV 65.7 TCF
ULTIMATE 218.8 TCF

ALBERTA ULTIMATE NATURAL GAS



December 31, 2014
 CUM PROD 167.0 TCF
 REMAINING 22.7 TCF
 UNDISCOV 29.1 TCF
 ULTIMATE 218.8 TCF

ALBERTA MARKETABLE NATURAL GAS RESERVES TO PRODUCTION RATIO



CONCLUSIONS

- ▶ **HISTORICAL TRENDS IN RESERVES ADDITIONS FOR THE PERIOD 1990 TO 2002 ARE REMARKEABLY CONSTANT.**
- ▶ **THE DISCOVERY RECORD OF THE MORE RECENT YEARS IS A GOOD FORECASTER FOR THE FUTURE WITH SIMILAR LEVELS OF ACTIVITY.**
- ▶ **AS OF DECEMBER 31, 2002 HALF ALBERTA'S ESTIMATED ULTIMATE GAS RESOURCE HAS BEEN PRODUCED AND BY 2014 IT COULD BE 76%.**
- ▶ **GAS PRODUCTION FROM ALBERTA WILL DECREASE AND ADDITIONAL GAS RESOURCES WILL BE NEEDED TO SUSTAIN PRODUCTION LEVELS.**