OPEN FILE 84-4

ESTIMATED OIL AND GAS RESERVES FOR RIO BLANCO COUNTY, COLORADO

Compiled by
A. H. Scanlon

Funded by the Colorado Oil and Gas Conservation Commission
and the Department of Local Affairs--
Division of Commerce and Development

Colorado Geological Survey
Department of Natural Resources
State of Colorado
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Acknowledgments

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I also would like to thank the staff of the Colorado Oil & Gas Conservation Commission (C.O.G.C.C.) who provided considerable assistance during the course of this compilation, and the staff of the Colorado Geological Survey, who assisted in the manuscript preparation.

However, I assume full responsibility for any errors or omissions in these tabulations. Users of this OPEN-FILE REPORT could provide a significant service if they would inform the Colorado Geological Survey of any misinformation or omissions.

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Senior Geologist

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ESTIMATED OIL AND GAS RESERVES FOR RIO BLANCO COUNTY, COLORADO

Introduction

This report is the second* in a series of oil and gas reserve investigations undertaken for those counties in which oil and/or gas is currently being produced.

This study involves Rio Blanco County, located in northwestern Colorado, approximately 45 miles north of Grand Junction, Colorado. The major structural features in this area are the eastern edge of the Uinta Basin, the Douglas Creek Arch and the northern half of the Piceance Basin. Rio Blanco county covers 3,264 square miles. In this county oil and gas are produced from, in descending order of age, the Green River (Douglas Creek) Formation, Wasatch Sandstone, Fort Union Sandstone, Mesaverde Sandstone, Emery Sandstone, Niobrara Limestone, Mancos Shale, Dakota Sandstone, Cedar Mountain Shale, Morrison Sandstone, Sundance (Entrada) Sandstone, Shinarump Conglomerate and Weber Sandstone. Gas alone is produced from, in descending order of age, the Castlegate Sandstone, Morapas Sandstone and Buckhorn Sandstone.

There are 34 fields considered active producers as of December 31, 1982. Of these, 7 are classified as oil fields (based on cumulative gas-oil ratio (GOR) or <15:1), and 27 are classified as gas fields (based on cumulative GOR > 15:1).

Two of the oil fields are undergoing secondary recovery by injected fluids. They are Rangely Field in the Weber Sandstone and Wilson Creek Field in both the Sundance Sandstone and Morrison Sandstone. Table I shows the amounts of injected fluids for 1982 and the cumulative amount of injected fluids through 1982.

* Refer to:
OPEN-FILE REPORT 84-3: Estimated Oil and Gas Reserves for Washington County, Colorado.

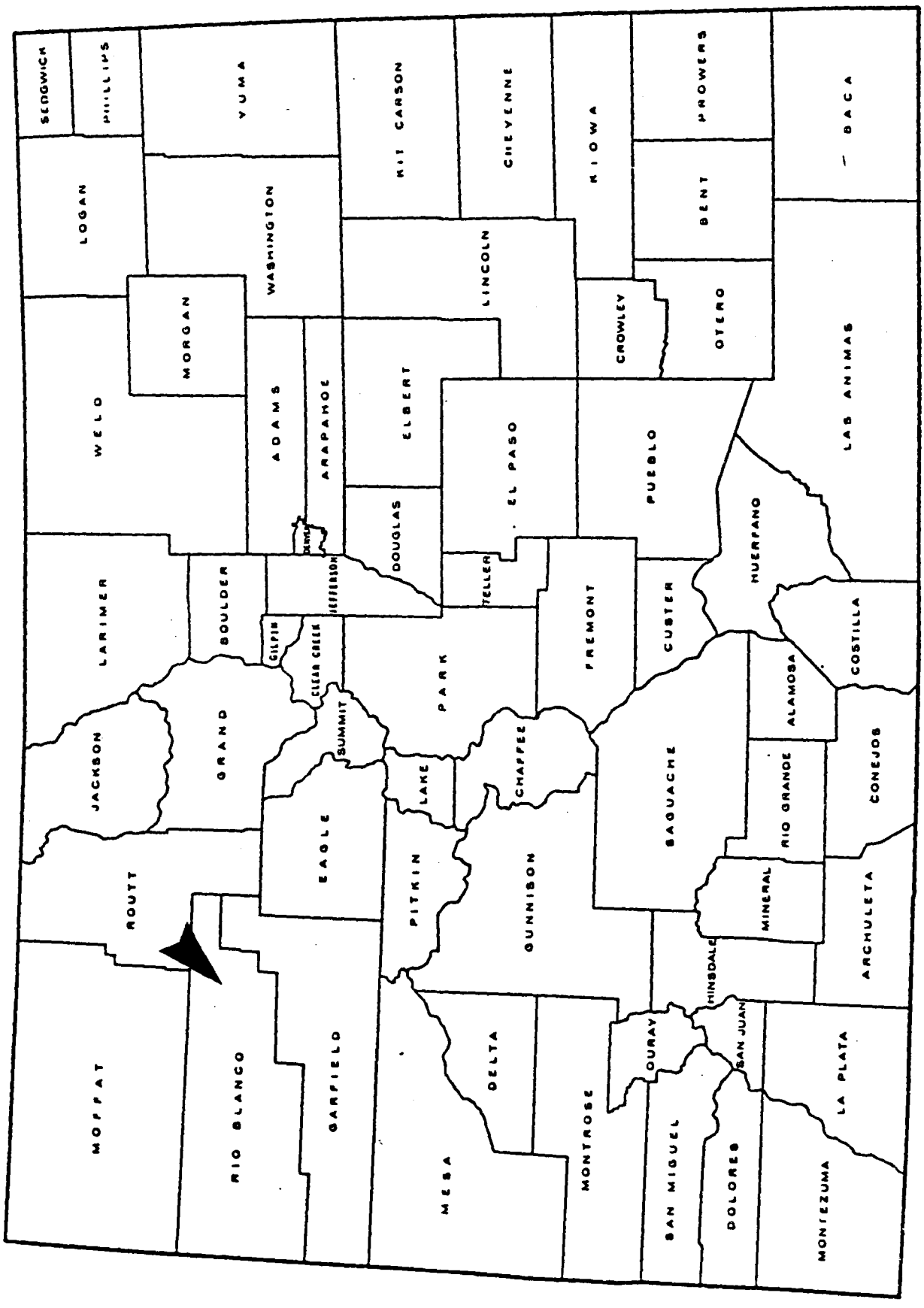

Figure 1 County Location Map

TABLE I

Summary of Secondary Recovery Projects
by Injected Fluids
for Rio Blanco County

Field Name/ Horizon	Operator	Initial Inj. Date	Injected Water (bbls or MCF) 1982	Cumulative through 1982
Rangely/ Weber Sand	Chevron Oil Co.	12-25-57	142,631,474 (bbls.)	2,113,033,473 (bbls.)
Rangely-NE Unit/ Weber Sand	Grace Pet. Corp.	2-06-77	528,747 (bbls.)	1,199,279 (bbls.)
Wilson Ck./ Morrison	Texaco Inc.	1-20-59	9,440,062 (bbls.)	150,580,438 (bbls.)
	Texaco Inc.	5-14-46		31,310,330 (MCF)
Wilson Ck./ Sundance	Texaco Inc.	3-07-61	3,758,400 (bbls.)	125,557,005 (bbls.)
			224,114 (MCF)	1,495,642 (MCF)

The most significant production in this county is from Weber Sandstone in Rangely Field. In 1981, production from the Weber in Rangely accounted for 96 percent of the county total oil production and over 50 percent of the total state oil production.

Method of Approach

Production decline curves are plotted for each currently producing horizon within each field, hereafter referred to as a field-horizon. There are 74 production decline curves plotted, one for each field-horizon. Production data were obtained from the C.O.G.C.C. annual production books. These books contain records of yearly production data, dating back to 1952. Prior to this date, no such records were kept by the Commission. Though several fields began producing prior to 1952, the decline rates applied to these reserve calculations are well established after this date, and there was no need to obtain annual production prior to 1952. All production decline curves are plotted as rate (annual production in barrels of oil or MCF of gas) versus time (in years), with the exception of Rangely Field, Weber Sandstone production, which is discussed in the following section. For each production decline curve, the rate scale was adjusted to accommodate each field-horizon.

Oil Reserve Calculations

Of the 12 oil fields-horizons, 9 decline rates were calculated based on the rate vs. time production decline curve. Two fields, Duck Creek and McHatlon, have only been producing since 1982 and therefore no reserve estimates could be made using this method. Weber Production from Rangely Field is discussed independently.

All decline rates calculated for oil except for Rocky Point Field are reasonably well established. Production from Rocky Point has been erratic since its first reported production in 1976. A 9.5 percent decline rate was assigned to this field based on the average of five nearby fields with established Mancos oil production.

Once the decline rates were determined for each of these oil field-horizons (see Table II), the remaining reserves were calculated using the equation:

$$Rr = \frac{q - qf}{-\ln(-dy)}$$

where: Rr = remaining reserves
q = current annual production
qf = final economic production rate (see note below.)
-ln = negative natural log
dy = yearly decline rate (in percent)

The ultimate recoverable was then determined by adding the estimated reserves to the cumulative production.

Note that the final economic production rate used was one barrel of oil per day per well, for one year; there 365 barrels, multiplied by the number of wells needed to keep field production economic. In most cases this was one well. The number of wells used was determined at the discretion of the author.

For associated gas production, estimated reserves were calculated in the same manner as that described in the Gas Reserve Calculations section.

Rangely Field, Weber production proved to be the exception among the oil field horizons regarding decline rates. Rangely presently produces from the Mancos, Morrison and Weber Formations, but has produced oil and/or gas from the Shinarump, Entrada and Dakota Formations. The author used the decline curve method discussed earlier for reserve estimates for production from the Mancos and Morrison Formations in Rangely Field. As seen from the rate-time production graph for the Rangely Weber (Fig. 2), it is difficult to assign a decline rate to the oil production when presented in this manner. After discussing the Weber production with Mr. Stan Walker with Chevron in Denver, it was determined that to obtain reasonably accurate reserves for this field-horizon, a plot of the water-oil ratio (WOR) versus cumulative production was needed. Water production figures were obtained from the annual production books in the C.O.G.C.C. The WOR was then calculated for each year from 1954 through 1982 and plotted against the cumulative production (Fig. 2). This curve was then extrapolated to the 98 percent WOR (economic limit for oil production), dropped vertically to the cumulative production axis to determine the ultimate recoverable amount of oil. This amounted to approximately 850,000,000 barrels of oil. This figure does not account for any recovery methods not already in progress. An annual rate of 7.5 percent was then obtained by backing into the annual production versus cumulative production plot using the equation:

$$\text{Decline rate} = \frac{\text{1982 oil production}}{\text{ultimate recoverable-cumulative production}}$$

or

$$.0746 = \frac{14{,}924{,}165}{850{,}000{,}000 - 650{,}144{,}763}$$

Present cumulative production from the Weber is $\pm$ 650 million barrels, leaving oil reserves of $\pm$ 200 million barrels.

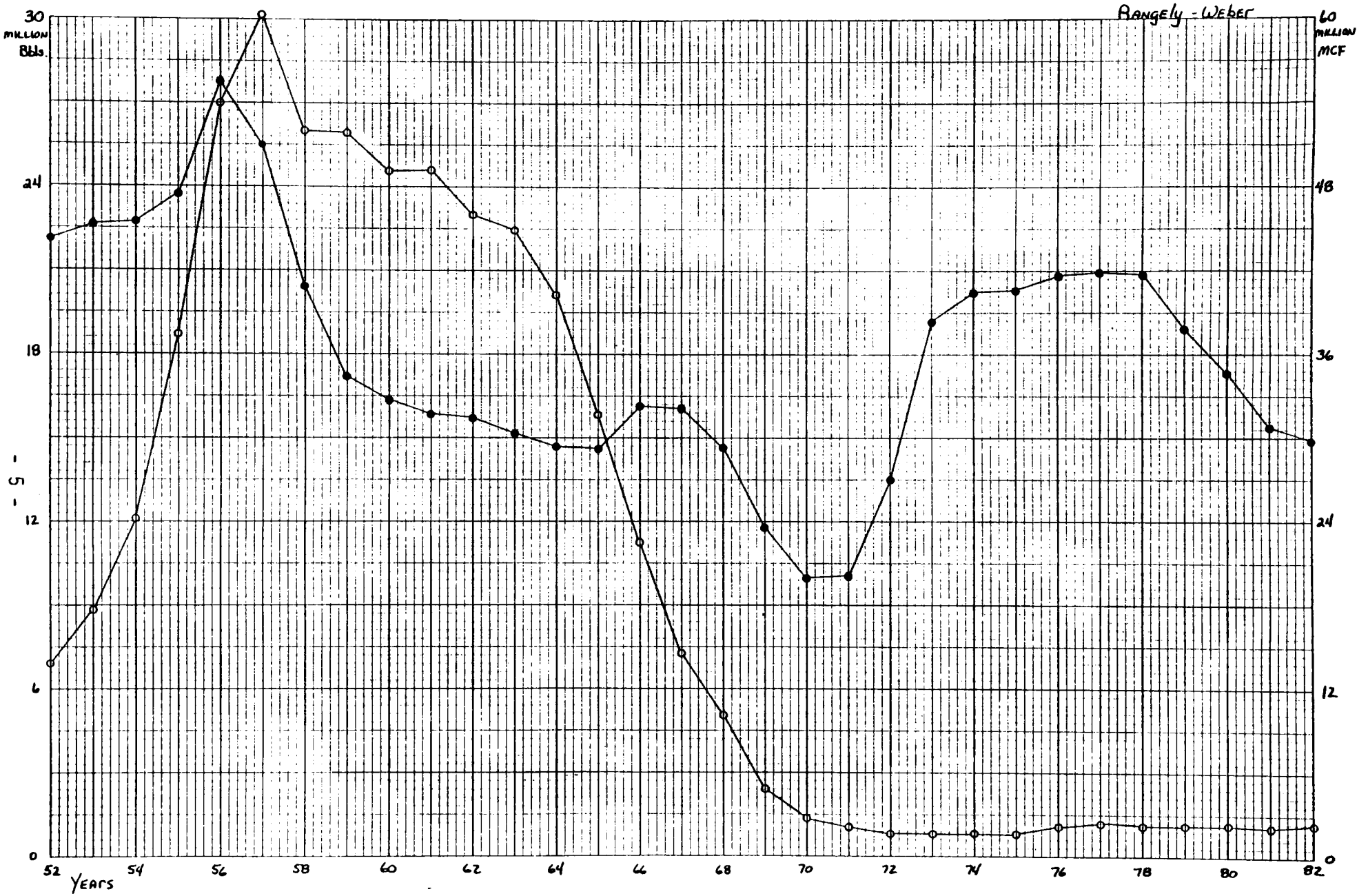

Figure 2. Rate-time historical production graph for Rangely-Weber

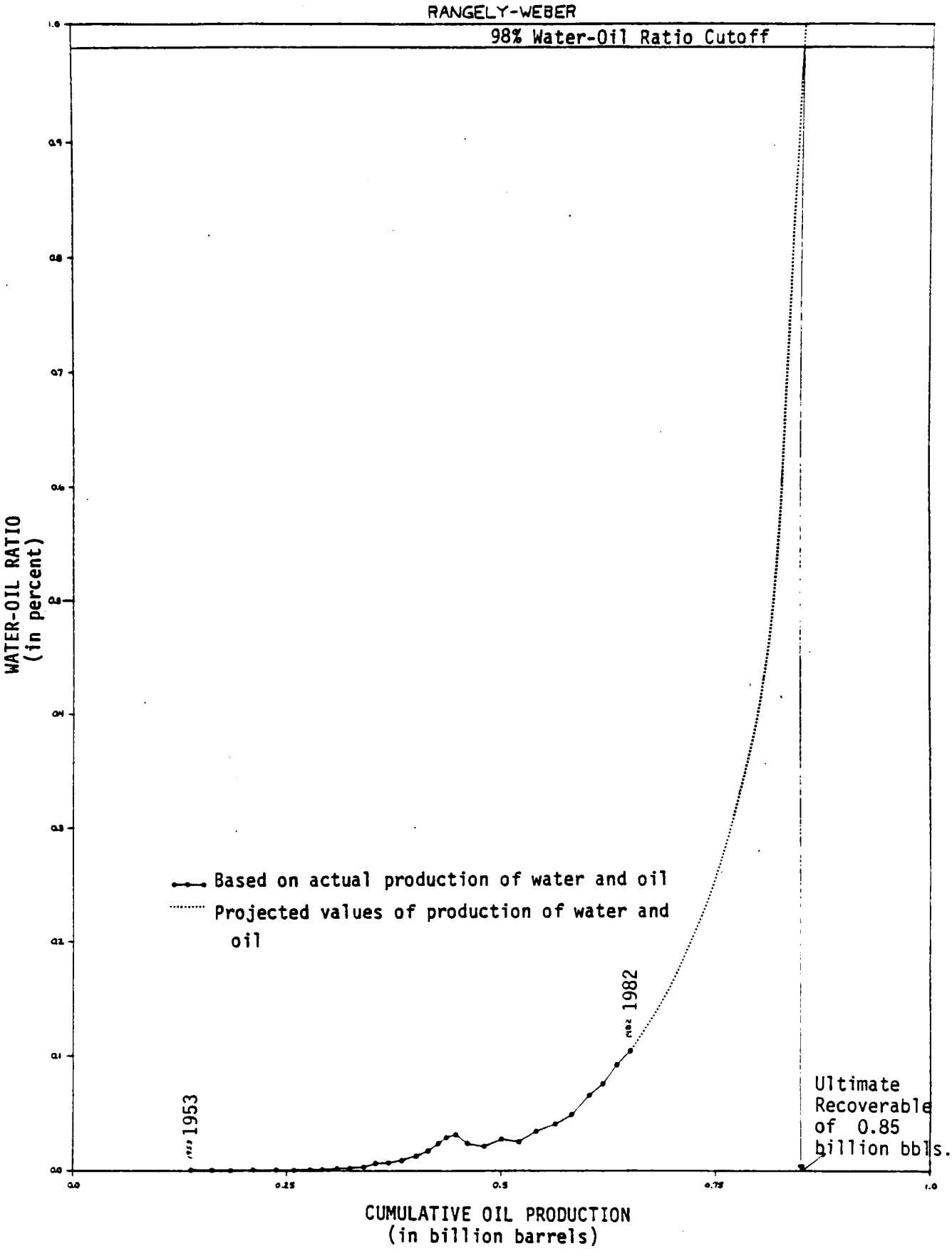

Figure 3. Water-oil Ratio versus cumulative historical production graph for Rangely-Weber.

Gas Reserve Calculations

For the 62 gas field-horizons decline rates were calculated for 41 of these based on historical production rates, and applied to the equation:

$$S = \frac{a(1-r^n)}{1-r}$$

Where: S = gas reserves
a = current annual gas production
r = (1-dy) where dy = annual decline rate
n = number of years -- 20 years was used in all cases except where noted in the remarks column of Table II.

Results can be found in Table II.

For those fields in which oil is produced with gas, it was intended that the GOR be used to determine gas reserves. These ratios were rarely found to have any consistency. In all cases, decline rates could be determined from the actual oil production decline curve. These rates were then applied to the oil reserve equation and reserve estimates calculated.

Results

The following figures are for those field-horizons for which reserves could be calculated. Estimated oil reserves for Rio Blanco County totaled 215,231,570 barrels. The Rangely-Weber production accounts for approximately 93 percent of the oil reserves for this county. Estimated gas reserves for Rio Blanco County totaled 327,581,003 MCF. Note that the gas reserve calculations are based on a 20-year projection, therefore they do not account for gas production after the year 2002.

In nine to ten years, roughly half of the estimated oil reserves in Rio Blanco County will have been produced. In seven to eight years roughly half of the gas reserves will have been produced.

Note again, that estimated oil reserves for Weber production in Rangely Field do not consider possible reserves under future secondary and tertiary recovery projects.

It should also be noted that many recent proposals dealing with secondary recovery projects for production from the Weber Sandstone in Rangely Field intend to use the gas produced from this field-horizon for future injection into this horizon. If this is the case, estimated gas reserves for this field-horizon should not be considered for tax revenue purposes, as it will not be sold, and therefore not taxed.

These figures also do not account for production increases due to secondary and/or tertiary recovery not already in progress, or account for undiscovered reserves, nor do they reflect changes in economics and demand.

In this county there are two classes of field-horizons: I) those with a long enough production history to calculate reserves with confidence, and II) those new field-horizons with essentially no production history, or for other reasons, reserves cannot be calculated.

To be able to calculate total county oil and gas reserves, it was necessary to apply the overall decline rates (6.93 percent per year for oil and 6.76 percent per year for gas) obtained from class I field-horizons to the current production from Class II field-horizons.

Using this approach on current production from Class II field-horizons (7.174 Bbls. of oil and 1,143,792 MCF of gas), additional reserves of 94,809 Bbls. of oil and 12,747,026 MCF of gas were obtained. This gives total county reserves (Class I and II) of 215,326,379 Bbls. of oil and 340,328,029 MCF of gas.

To insure that the reserve figures calculated for Class II are reasonable using this method, a comparison was made between the sources (producing horizons) of the Class I and Class II field-horizons. It was determined that there were no significant differences in the sources of production for the two groups. Therefore, it is concluded that the overall decline rates can be applied with confidence.

LIST OF ABBREVIATIONS USED IN TABLE OF RESERVE DATA

'a'	annual gas production
ABD.	abandoned
Approx.	approximate, approximately
Avg.	average, averaged
Bbls.	barrels
B.W.E.	Bottom Water Encrochment
calc.	calculate, calculated
Co.(s)	county (counties)
cond.	condensate
ck.	Creek
Cum.	cumulative
Dak.	Dakota Sandstone
Deplet.	Depletion
dy	annual decline rate
Econ.	Economic
Est.	Estimated
Exp.	Expansion
g	gas
Gas Exp.	Gas Expansion
G.C.E.	Gas Cap Expansion
G.E.	Gas Expansion
GOR	Gas-Oil Ratio
Inc.	Increase, increasing, increased
Inj.	Injection, injected
Lmtd.	Limited
MCF	Thousand cubic feet
Miss.	Mississippian
Mos.	Months
Mtn.	Mountain
N	North
N.P.	New Production or less than five years production, therefore, no reliable annual decline rate could be calculated to apply to the equations to calculate reserves.
No.	number, numbers, North
o	oil
P and A	Plug (ged) and Abandon (ed)
Poss.	Possible
Prod.	Production, produced
Proj.	Projection, projected
q	current annual production of oil
qf	final economic production of oil
react.	reactivated
Rr	Remaining reserves-oil
S	Remaining reserves-gas
S.G.D.	Solution Gas Drive
S.I.(SI)	Shut-in
So	South
W	West
W.D.	Water Drive
Yr or Yrs	Year or years

TABLE II
OPEN-FILE 84-4
RESERVE DATA FOR RIO BLANCO COUNTY

FIELD NAME/ PROD. HORIZON	GENERAL LOCATION	DATE OF DISCOVER	TYPE OF DRIVE	dy (in %)	CUMULATIVE PRODUCTION 12/31/82 OIL(bbls) ()Condensate	GAS(MCF)	ESTIMATED RESERVES OIL(bbls) ()Condensate	GAS(MCF)	ULTIMATE RECOVERABLE OIL(bbls) ()Condensate	GAS(MCF)	REMARKS * *See Last Page of TABLE II for Definition of @ Code
1.Banta Ridge/ Dakota	1S-103W	1972			1,484	93,058					Only Produced in '73 and '82
2.Banta Ridge/ Mancos	1S-103W					51,359					'82 Prod. Only
3.Banta Ridge/ Mesaverde	1S-103W					102,176					'82 Prod. Only
4.Baxter Pass/ Dakota-Morrison	4S-103W	1958	Possibly Gas Exp.	8.0-g	1,178	2,694,186		16,307,071	1,178	19,001,257	Also Prod. in Garfield County May Include Mancos,Buckhorn and Mesaverde Prod.
5.Big Ridge/ Mancos	1S-100W	1981			91	2,878					'82 Prod. Only
6.Blue Cloud/ Dakota	4S-102W	1974				71,286					'82 Prod. Only
7.Blue Cloud/ Mancos	4S-102W		Gas Exp.	8.0-g		761,371		1,813,960		2,575,331	
8.Cathedral/ Dakota	3S-100W	1960		8.0-g		610,918		1,004,895		1,615,813	
9.Cathedral/ Emery	3S-100W		Depletion			49,450					'80-'82 Prod. Only
10.Cathedral/ Mancos	3S-100W		Depletion	8.0-o 8.0-g	6,433	11,211,732	20,544	22,768,470	26, 977	33,980,202	
11.Cathedral/ Mesaverde	3S-100W					954					'82 Prod. Only
12.Cathedral/ Morrison	3S-100W					30,207					'82 Prod. Only
13.Colorow Gulch /Shinarump	3N-97W	1978		20.0-g		431,489		275,862		707,351	
14.Corral Creek/ Dakota	1S-100W	1978				133,163					'81-'82 Prod. Only
15.Corral Creek/ Dakota-Morrison	1S-100W				(23)	367,896					'80-'82 Prod. Only
16.CorralCreek/ Mancos	1S-100W		Gas Expansion	7.0-g		203,367		642,211		845,578	Based on '81-'82 Prod.
17.DouglasCreek/ /Dakota	2&3 S-101&102 W	1943	G. C. E. with Bottom W. D.	11.0-g		8,597,819		161,998		8,759,817	
18.DouglasCreek/ Mancos(Emery)	2&3S-101&102W		Gas Exp.	5.0-g		15,567,658		8,937,600		24,505,258	
19.Douglas Ck. North/Dakota	1S-101 & 102 W	1956			(1,665)	445,492					'82 Prod. Only
20.Douglas Ck No /Emery(Mancos)	1S-101& 102W		Gas Exp.	5.0-g		10,805,093		38,874,829		49,679,922	
21.Dgls.Ck.No./ Morapas(Mancos)	1S-101& 102W		W. D.	6.0-g		15,390,450		823,607		16,214,057	

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22.Douglas Creek No./Morrison	1S-101& 102W				380						'82 Prod. Only
23.Douglas Creek No./Weber	1S-101& 102W		W. D.	10.0-o	27,352		18,309		45,661		
24.Douglas Creek So./Buckhorn-Morrison	3&4 S-101-102 W	1963		8.0-g	(216)	1,752,743		1,620,788	(216)	3,373,531	Also Incl.Some Dak. Prod.
25.Douglas Creek So./Mancos	3&4S-101-102W		Gas Exp.	10.0-g		845,313		1,169,058		2,014,371	
26.Douglas Creek So./Morapas	3&4S-101-102W			8.0-g		244,377		354,287		598,664	
27.Douglas Creek So./Niobrara	3&4S-101-102W			25.0-g		69,690		4,199		73,889	
28.Douglas Creek W./Mancos 'B'	2S-102 & 103 W	1953	Gas Exp.	3.0-g	(337)	22,285,442		19,846,041	(337)	42,131,483	
29.DragonTrail/ Emery(Mancos)	2 & 3 S 101&102 W	1959	Gas Exp.	16.0-o 6.0-g	9,046	106,226,475	1,623	77,191,623	1,623	183,418,098	
30.DragonTrail No./Mancos'B'	1S-101W	1961	Gas Exp.	6.0-o 10.0-g		379,781		434,284		814,065	No Oil Produced Last 2 Years
31.Duck Creek/ Wasatch	1S-97W	1982			212						'82 Prod. Only
32.Evacuation Ck./Mancos'B'	4S-102W	1977	Gas Exp.	8.0-g		728,268		2,303,573		3,031,841	Also Prod. in Garfield Co.
33.Foundation Ck./Buckhorn	4S-102W	1973		8.0-g		151,558		198,983		350,541	Also Prod. in Garfield Co.
34.Foundation Ck./Cedar Mtn.	4S-102W				(6,688)	558,083					SI in'82-dy greater than 20%, Also Prod. in Garfield County
35.Foundation Ck./Dakota	4S-102W				(6)	186,713					'81-'82 Prod. Only Also Prod. in Garfield County
36.Foundation Ck./Mancos	4S-102W		Gas Exp.	8.0-g	(32)	1,602,698		3,657,796		5,260,494	
37.LowerHorse Draw/Dakota	2S-103W	1960		8.0-g	65 (492)	1,788,304		1,980,542	65 (492)	3,768,846	Erratic decline
38.LowerHorse Draw/Mancos (Emery)	2S-103W		Gas Exp.	7.0-g	3,545 (27,785)	45,058,683		20,784,442	3,545 (27,785)	65,843,125	
39.McHatlon/ Niobrara	1N-93W	1982			2,900						'82 Production Only
40.NineMile/ Dakota	2N-92&93W	1966		11.6-o	988,440		71,063		1,059,503		
41.Philadelphia Ck./ Mancos	2S-101W	1975	Gas Exp.	20.0-g	(216)	2,537,254		3,273,346	(216)	5,810,600	
42.PiceanceCk./ GreenRiver	2&3 S-95, 96,&97W	1930	Gas Exp. & W.D.	5.0-g		51,706,059		3,524,427		55,230,486	

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43.Piceance Ck./ Mesaverde	2&3 S-95, 96,97W		Gas Exp. & W.D.	20.0-g	(10,209)	1,519,765		916,322	(10,209)	2,436,087	
44.Piceance Ck./ Wasatch 'A'	2&3S-95, 96,97W		Gas Exp. & W.D.	11.5-g	70,708,035 (7,997)	340,389		25,845,820	70,708,035 (7,997)	26,186,209	
45.Piceance Ck./ Wasatch'F'&'G'	2&3S-95, 96 & 97W		Gas Exp. & W.D.	20.0-g	(431)	513,576		247,760	(431)	761,336	
46.Piceance Ck./ Wasatch 'G'	2&3S-95, 96 & 97W		Gas Exp. & W.D.	7.0-g	(101,835)	62,317,100		9,767,863	(101,835)	72,084,963	
47.Piceance Ck. So./Douglas Ck.	3S-95&96W	1954	Gas Exp.	6.5-g	450	2,243,397		268,392	450	2,511,789	
48.Pinnacle/ Shinarump	3N-86W	1956		4.0-o	121,935	24,574	43,212		165,147	24,574	
49.Rangely/ Mancos	1&2 N-101-103 W	1902		7.5-o	13,245,250	139,134	1,061,998		14,307,248	139,134	
50.Rangely/ Morrison	1&2N-101-103W			14.0-o	50,231	1,916,308	1,631		51,862	1,916,308	
51.Rangely/ Weber	1&2N-101-103W		S. G. D. & GasCap w/ Lmtd. W. D.	7.2-o 2.0-g	650,175,073	690,130,018	200,000,000	36,832,194	850,175,073	726,962,212	
52.RockyPoint/ Mancos	2S-100W	1976	Gas Exp.	9.5-o 8.0-g	9,525	5,042	13,544	21,449	23,069	26,491	
53.Sage Brush Hills/Mancos	2S-99W	1978			(442)	118,251					
54.Sage Brush Hills/ Mesaverde	2S-99W					6,495					'80 & '82 Prod. Only, SI both years
55.SoldierCnyon /Dakota	4S-100W	1976	Gas Exp.	9.0-g		62,024		73,279		135,303	Also Prod. in Garfield County
56.SulphurCrk./ Ft. Union - Wasatch	2 & 3 S - 97-99 W	1955			122	3,575					N. P.
57.SulphurCrk./ Mesaverde	2&3S-97-99W		Exp.		229	113,735					N. P.
58.SulphurCrk./ Wasatch	2&3S-97-99W			5.5-g	(581)	3,178,290		3,209,670	(581)	6,387,960	
59.Texas Mtn./ Castlegate	3S-102W	1964		7.3-g		1,069,632		807,167		1,876,799	
60.Texas Mtn./ Castlegate-Mancos	3S-102W			25.0-g		489,567		87,346		576,913	
61.Texas Mtn./ Dakota	3S-102W			6.0-g		1,462,688		1,633,300		3,059,988	
62.Texas Mtn./ Mancos 'A'	3S-102W			10.0-g 8.0-g	62,931	289,106	13,743	97,996	76,674	387,102	
63.Texas Mtn./ Mancos	3S-102W			11.5-g		2,908,415		404,604		3,313,019	

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64. Thunder/ Dakota	4S-102W	1977		20.0-g	(997)	1,448,088		707,048	(997)	2,155,136	
65. Thunder/ Mancos	4S-102W		Gas Exp.	8.0-g		1,574,443		3,164,238		4,738,681	
66. Taiga Mtn./ Castlegate	1N-103W	1981			(72)	264,107					'82 Prod. Only
67. Taiga Mtn./ Dakota	1N-103W				(676)	81,383					'82 Prod. Only
68. TrailCanyon/ Dakota	4S-101W	1969		6.0-g		4,017,710		5,265,282		9,282,992	Also Prod. in Garfield Co.
70. TrailCanyon/ Dakota-Morrison	4S-101W				(47)	17,776					'81 - '82 Prod. Only Also Prod. in Garfield County
71. TrailCanyon/ Mancos 'B'	4S-101W		Gas Exp.	8.0-g	4,010 (248)	790,410		1,008,860	4,010 (248)	1,799,270	Also Prod. in Garfield County
72. White River/ Mesaverde	1 & 2 N - 96 & 97 W	1890	Gas Drive	14.0-o 4.0-g	13,946 (5,396)	1,373,378	550,571	763,982	564,517 (5,396)	2,137,360	Used to be called White River Dome
73. White River/ Wasatch	1&2 N-96-97W		Gas Drive	10.0-g		373,940		2,531,168		2,905,108	
74. WilsonCreek/ Morrison	2&3N-94W	1938	W.D.& Gas Drive	4.0-o 6.0-g	380,090	56,634,772	9,275,147	4,566,261	9,655,237	61,201,033	
75. WilsonCreek/ Sundance	2&3 N-94W		W. D.	2.0-o 5.0-g	27,795,170	4,945,151	4,160,185	1,407,110	31,955,355	6,352,261	

COUNTY TOTAL OF ESTIMATED RESERVES

215,231,570 BBls.
327,581,003 MCF

Reference List

Colorado Oil and Gas Conservation Commission Production Records and Injected Fluids - Water and/or Gas-File.

Crouch, M.C., III, editor, 1982 Oil and Gas Fields of Colorado, Nebraska and Adjacent Areas: Rocky Mountain Association of Geologists, vols. I and II, 791 pp.

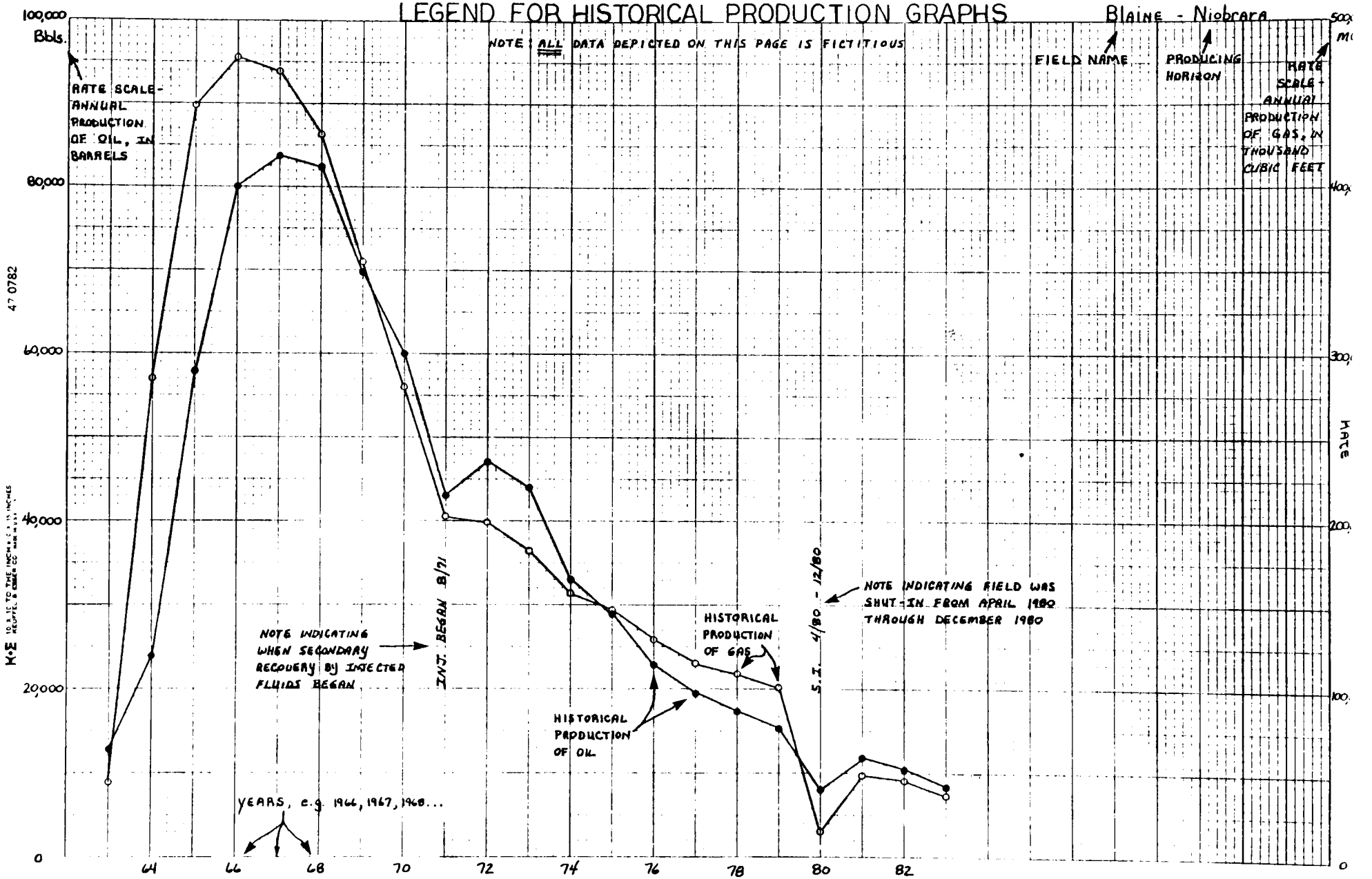
Haun, J.D., Cardwell, A.L., Herrod, W.H. and Cronoble, J.M., 1976. Oil and Gas Reserves of Colorado in Colorado School of Mines Research Institute, Mineral Industries Bulletin, v. 19, #5.

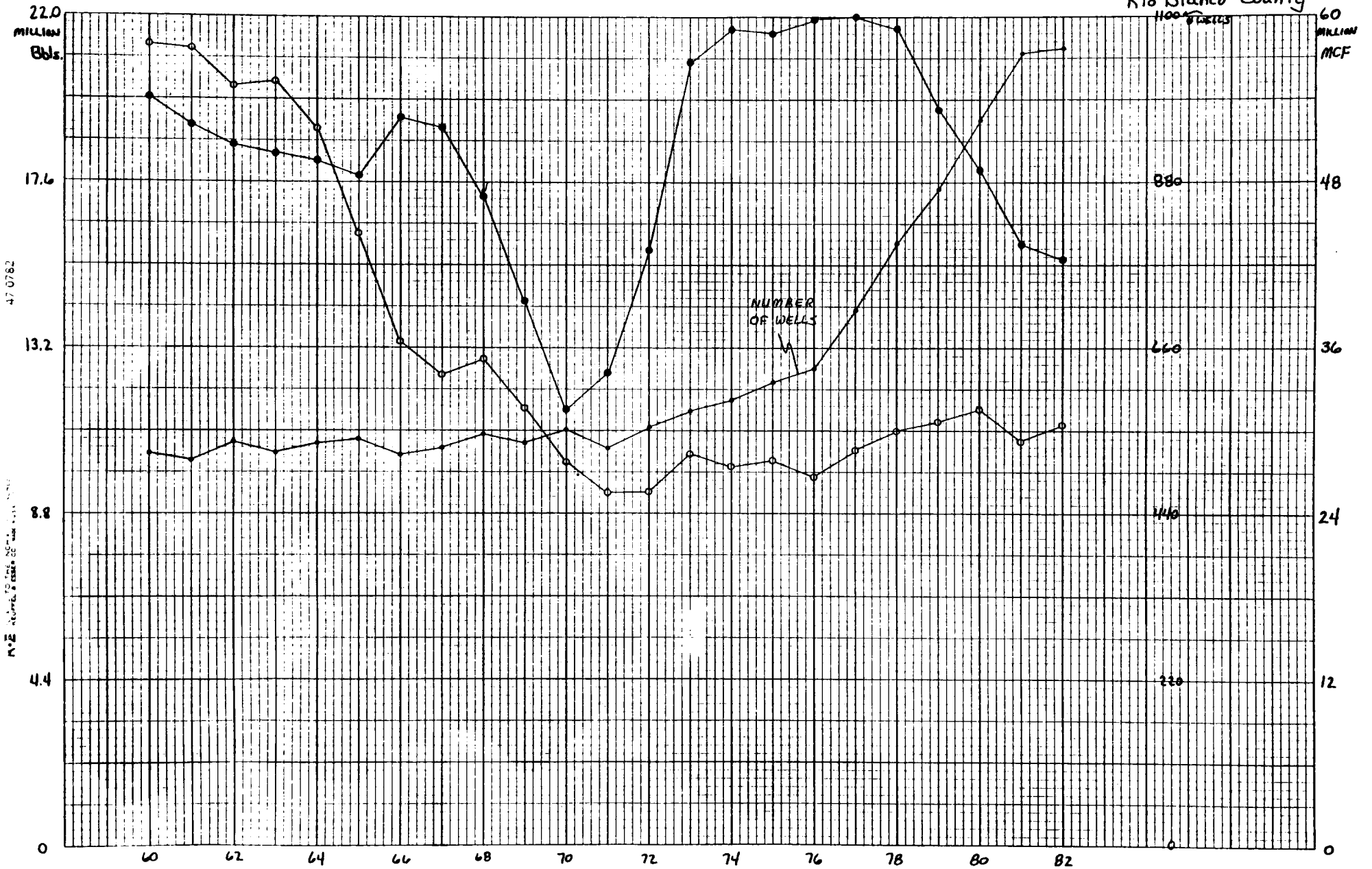
Parker, J.M., editor, 1961 Oil and Gas Field volume: Colorado-Nebraska: Rocky Mountain Association of Geologists, 389 pp.

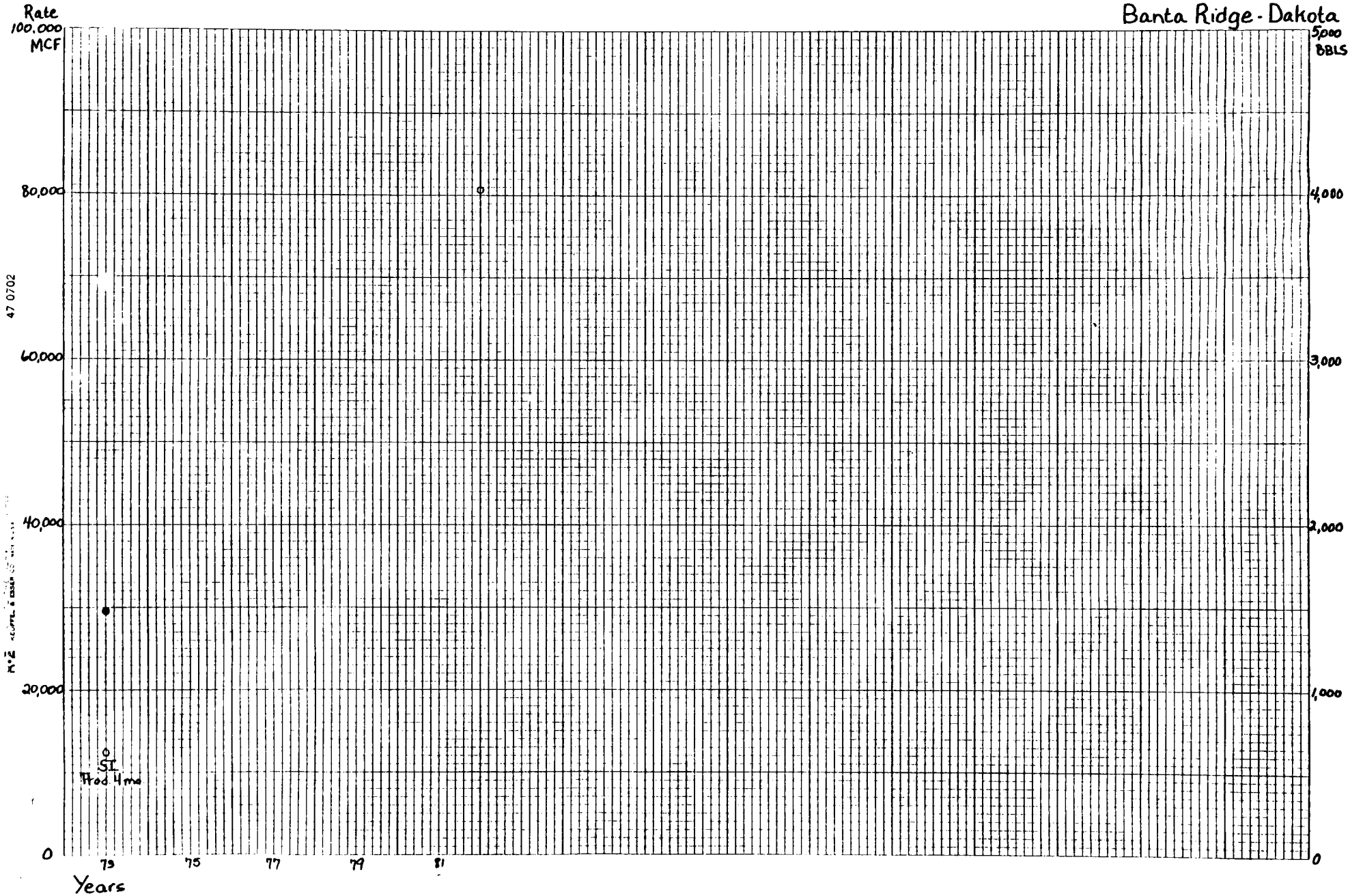
Appendix I

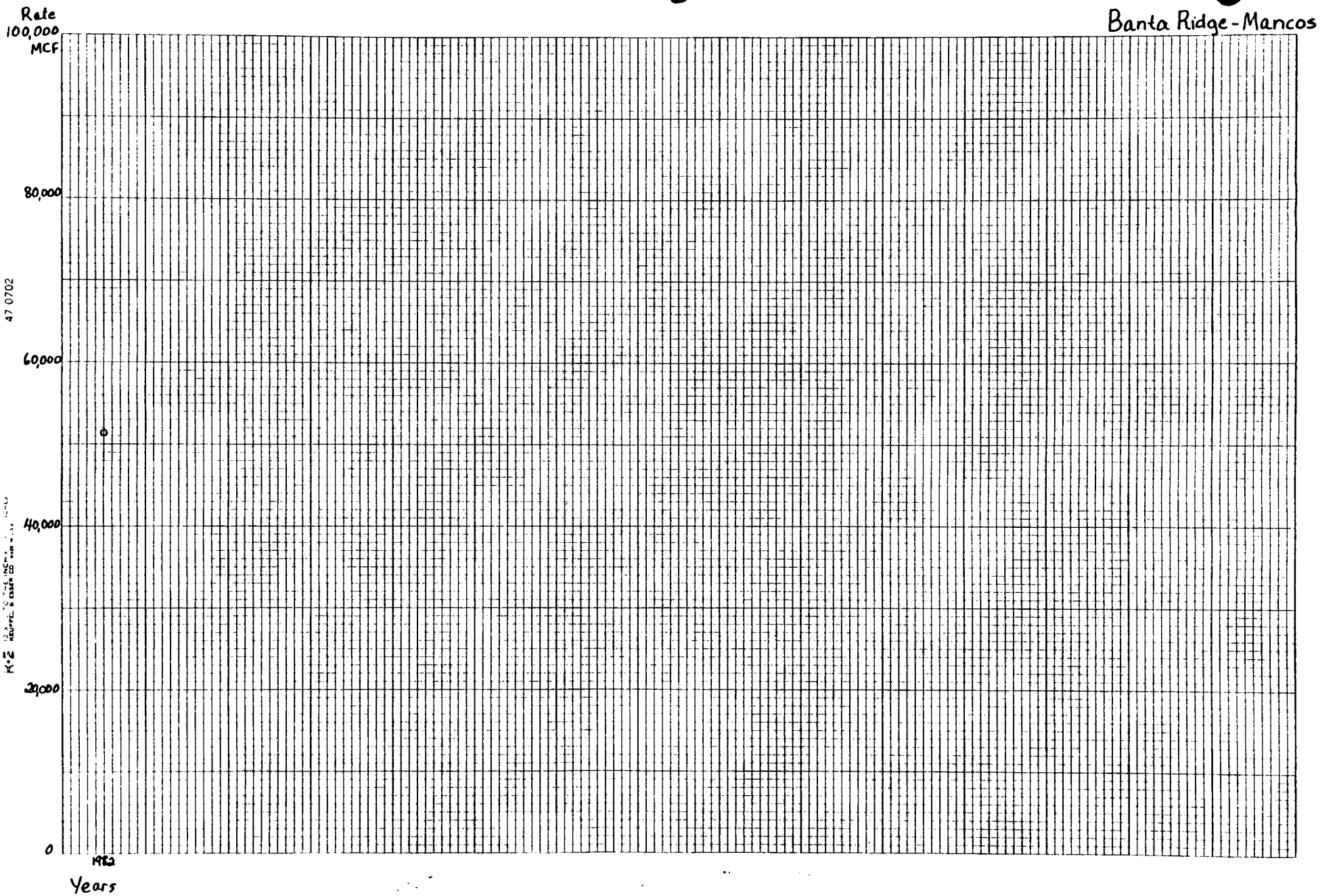
Historical production decline curve graphs for Rio Blanco County. These graphs are presented in alphabetical order by Field name and then by producing horizons within each field.

Note that only those fields actively producing as of 12-31-82 are included. Abandoned fields or field-horizons are not included.

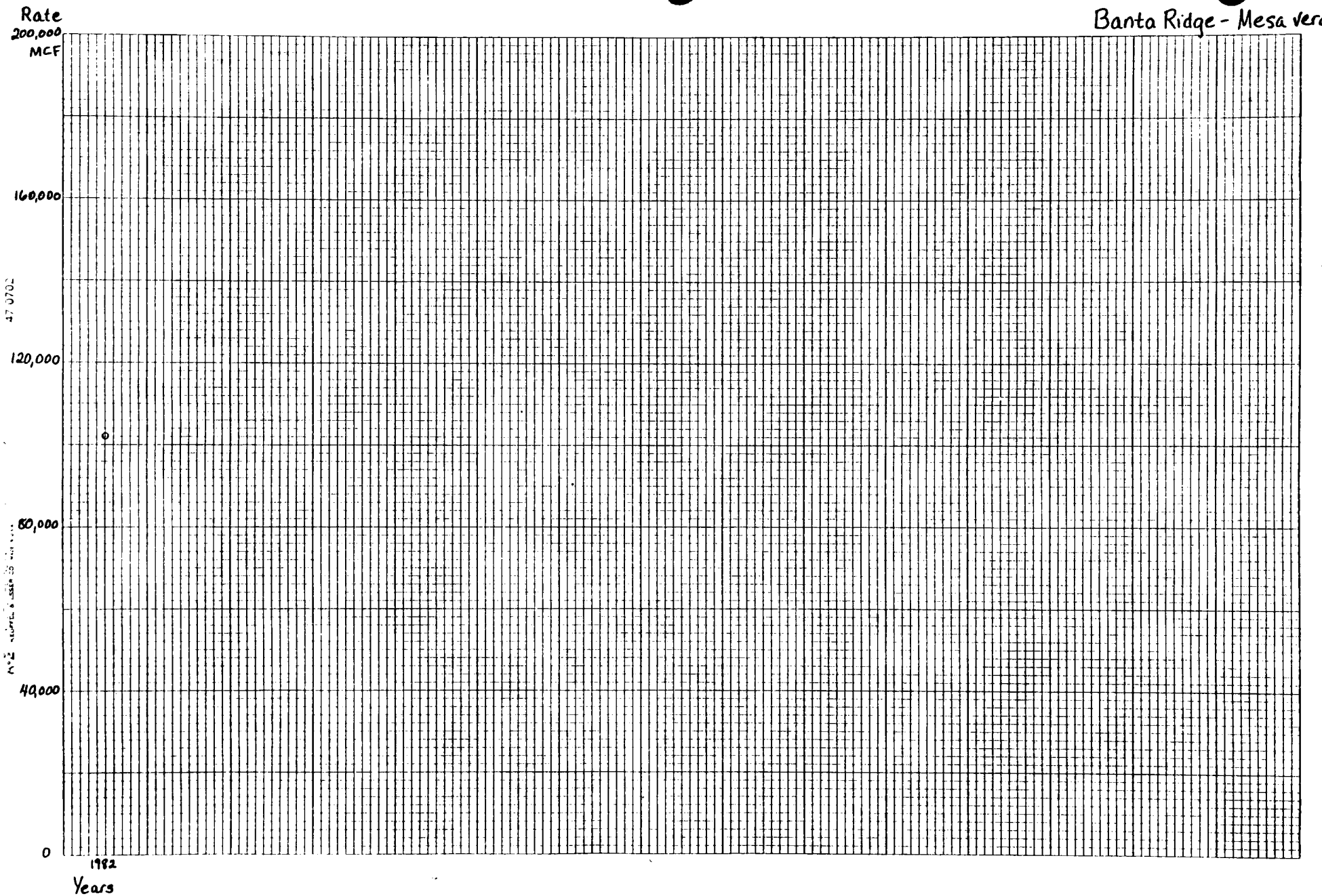

LEGEND FOR HISTORICAL PRODUCTION GRAPHS
Blaine - Niobrara
NOTE: ALL DATA DEPICTED ON THIS PAGE IS FICTITIOUS
FIELD NAME
PRODUCING HORIZON
RATE SCALE - ANNUAL PRODUCTION OF GAS, IN THOUSAND CUBIC FEET
RATE SCALE - ANNUAL PRODUCTION OF OIL, IN BARRELS
100,000 Bbls.
80,000
60,000
40,000
20,000
0
500 M
400
300
200
100
0
RATE
64
66
68
70
72
74
76
78
80
82
YEARS, e.g. 1966, 1967, 1968...
NOTE INDICATING WHEN SECONDARY RECOVERY BY INJECTED FLUIDS BEGAN
INJ. BEGAN 8/71
S.I. 4/80 - 12/80
NOTE INDICATING FIELD WAS SHUT-IN FROM APRIL 1980 THROUGH DECEMBER 1980
HISTORICAL PRODUCTION OF GAS
HISTORICAL PRODUCTION OF OIL
47 0782
K+E

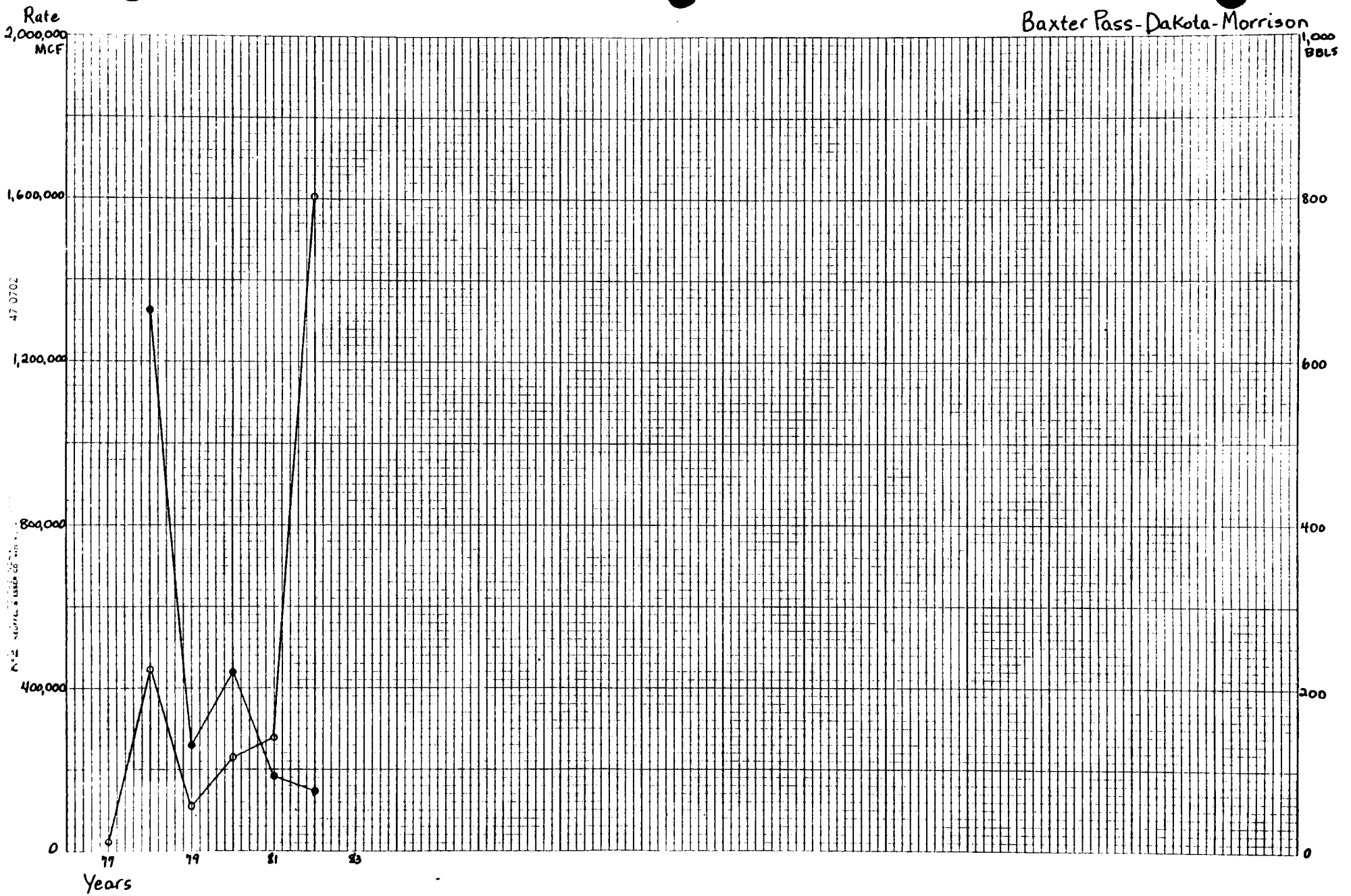

Rio Blanco County
22.0
MILLION
Bbls.
17.6
13.2
8.8
4.4
0
60
MILLION
MCF
48
36
24
12
0
1100
880
660
440
220
0
WELLS
NUMBER
OF WELLS
60
62
64
66
68
70
72
74
76
78
80
82

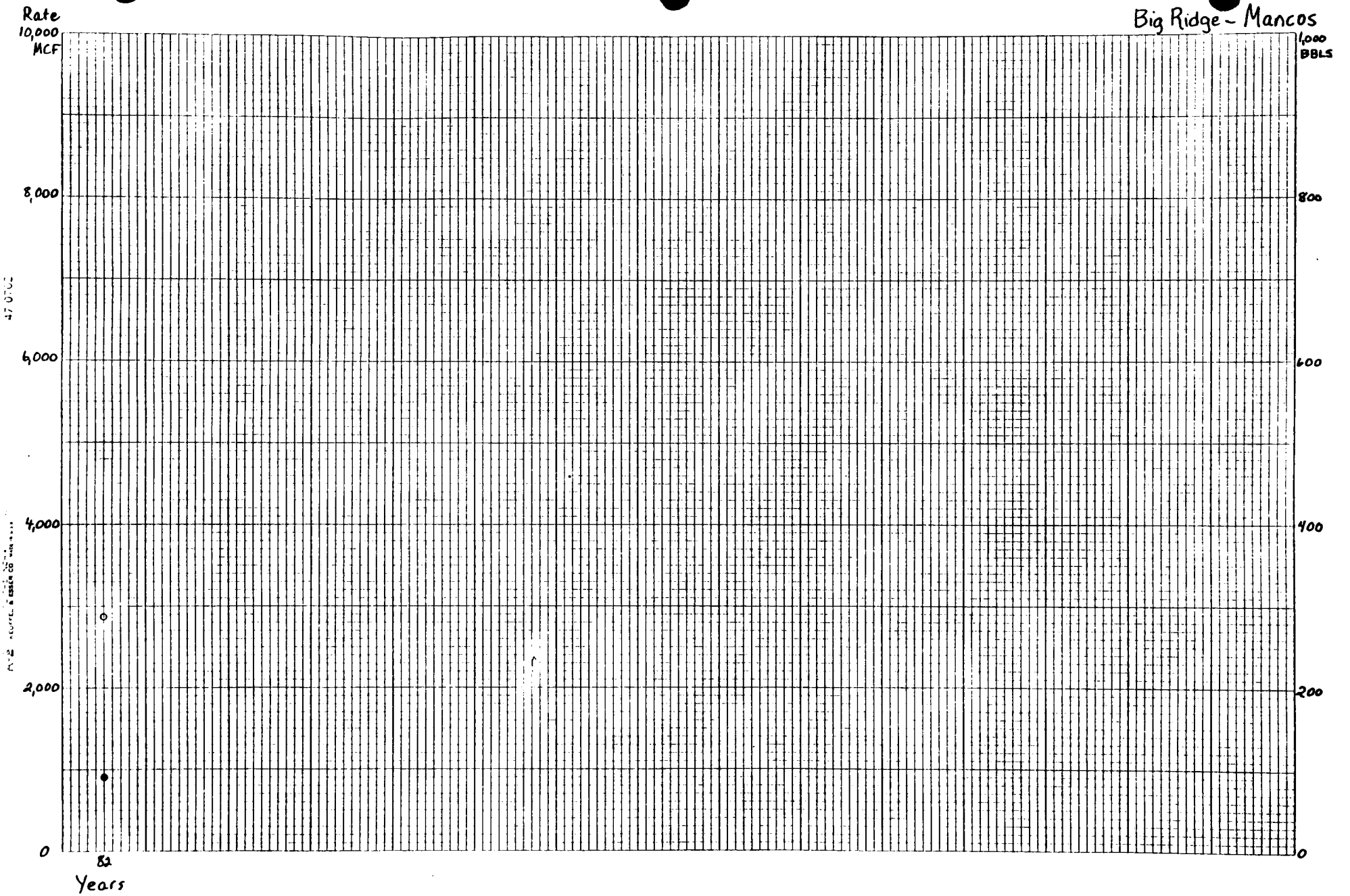

Rate
100,000
MCF
80,000
60,000
40,000
20,000
0
Banta Ridge - Dakota
5,000
BBLS
4,000
3,000
2,000
1,000
0
47 0702
SI
Mod 4 mo
73
75
77
79
81
Years

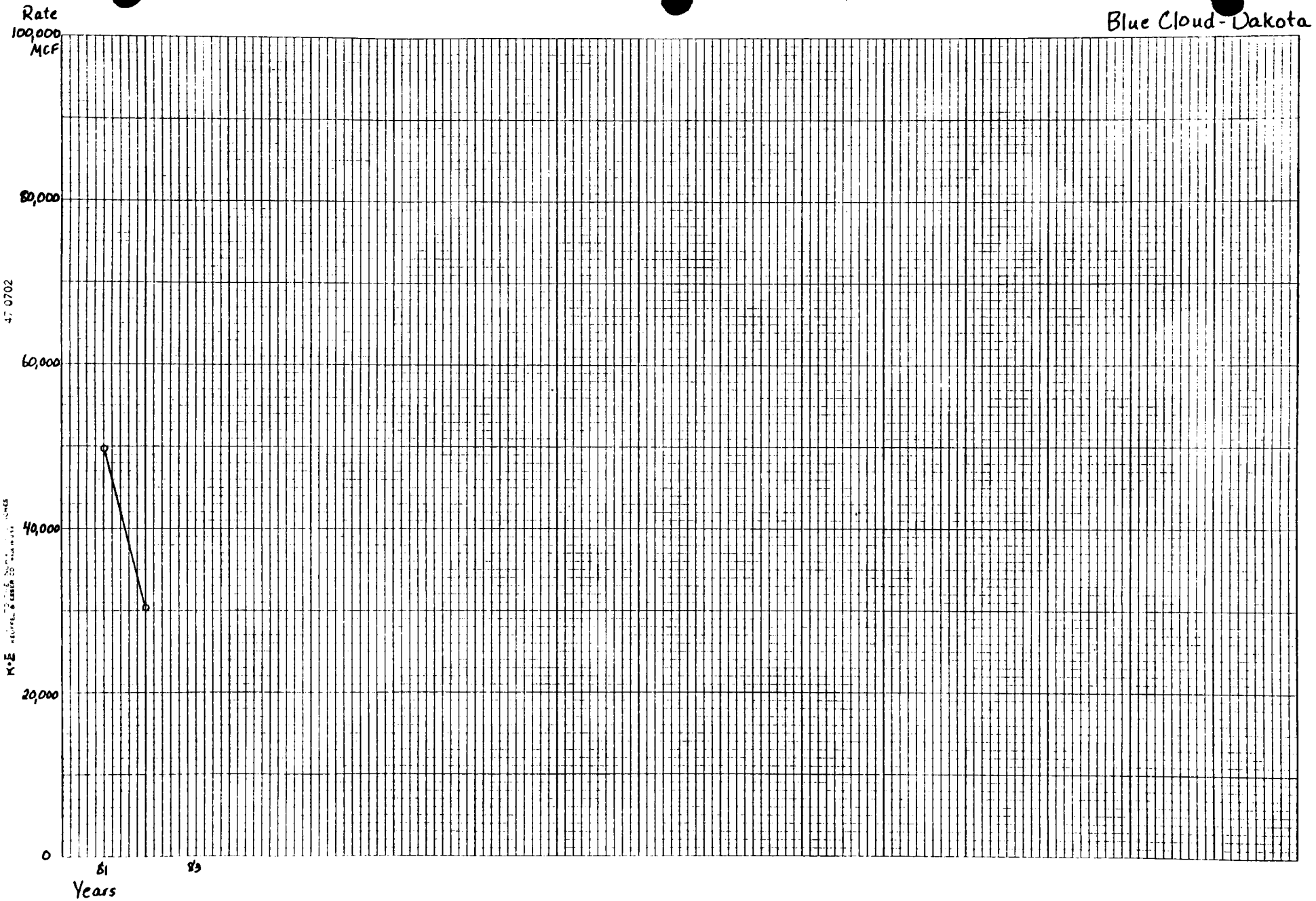

Rate
100,000
MCF
80,000
60,000
40,000
20,000
0
1982
Years
Banta Ridge - Mancos
47 0702

Banta Ridge - Mesa Verde

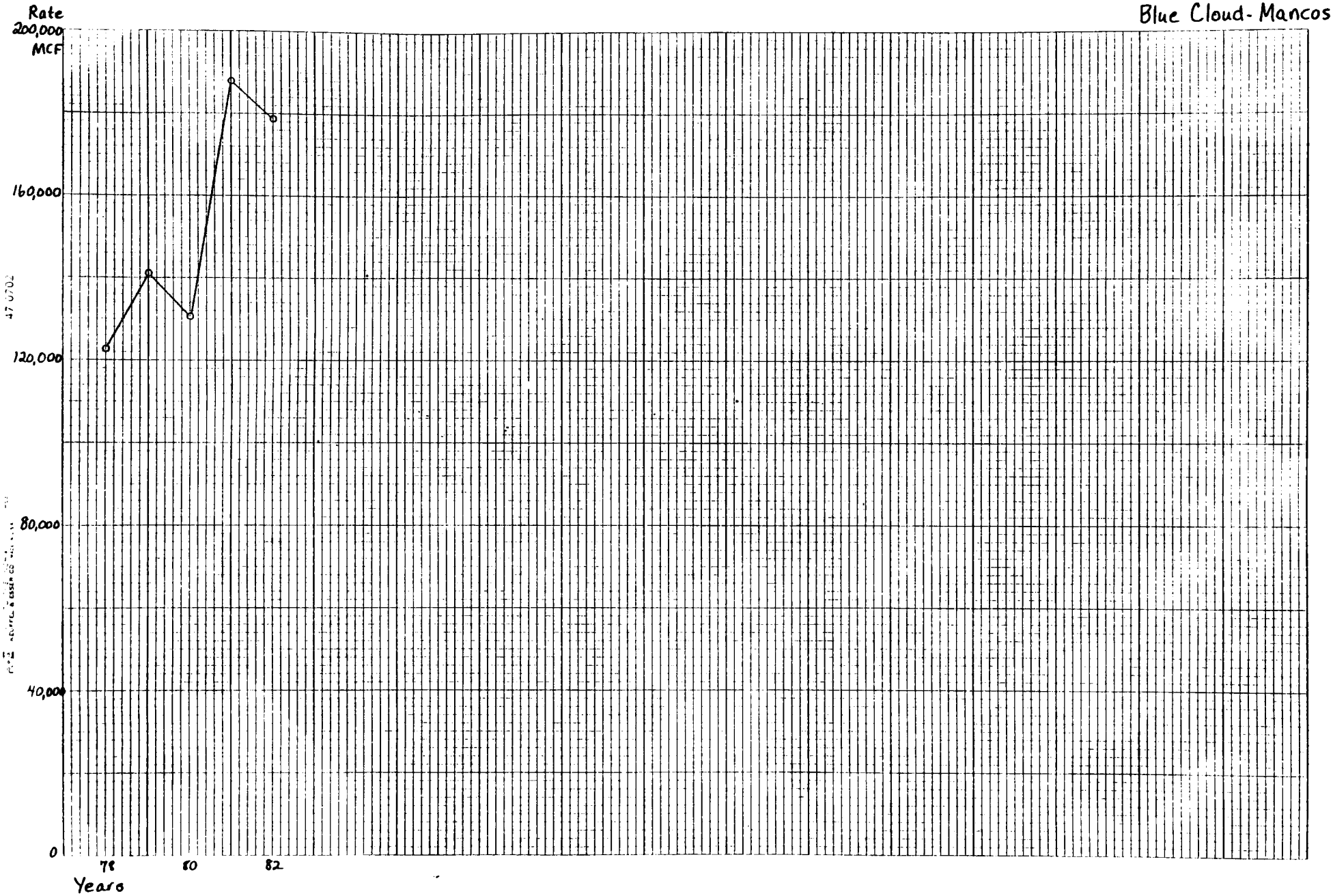


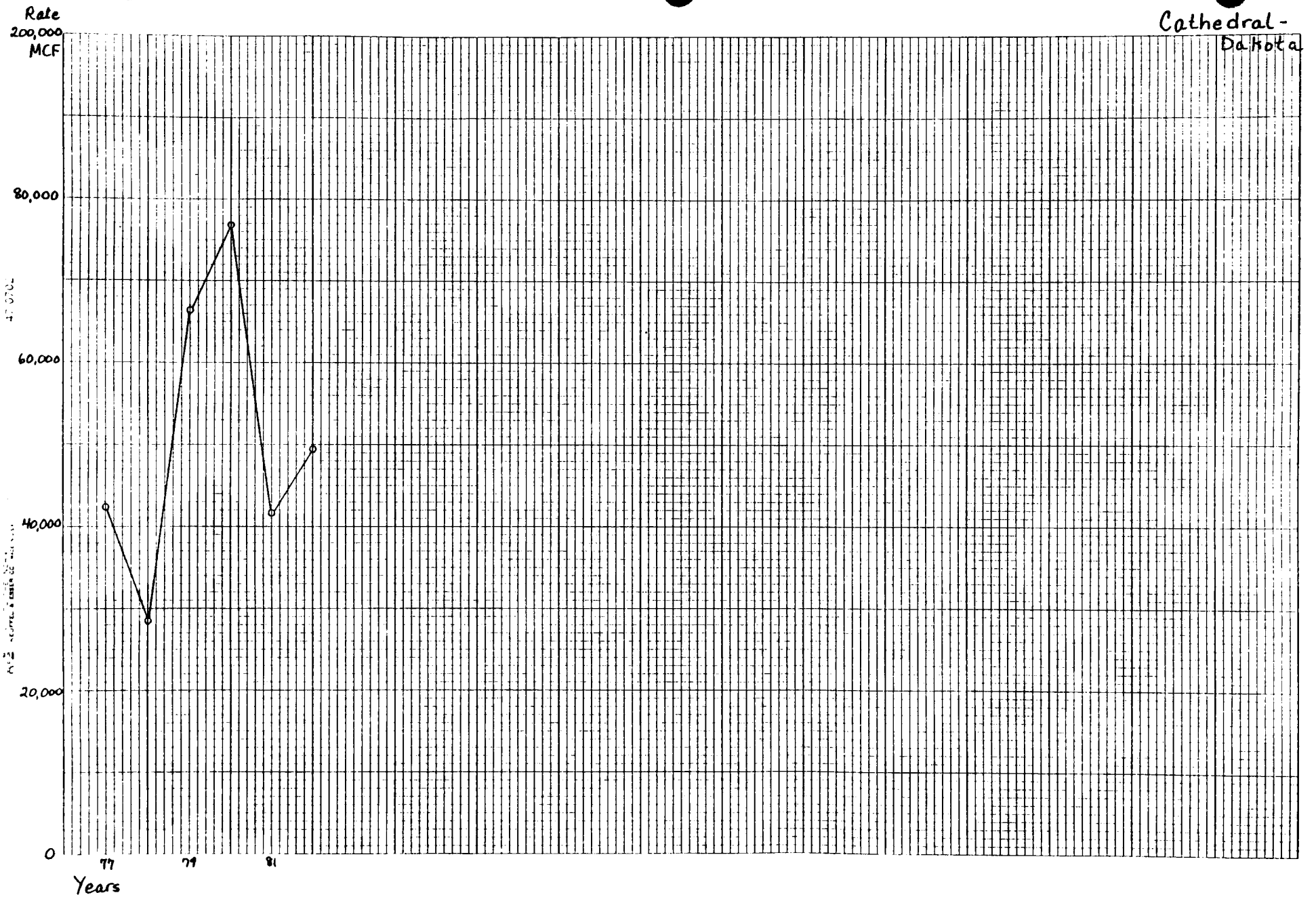

Rate
2,000,000 MCF
1,600,000
1,200,000
800,000
400,000
0
1,000 BBLS
800
600
400
200
0
77
79
81
83
Years
Baxter Pass-Dakota-Morrison

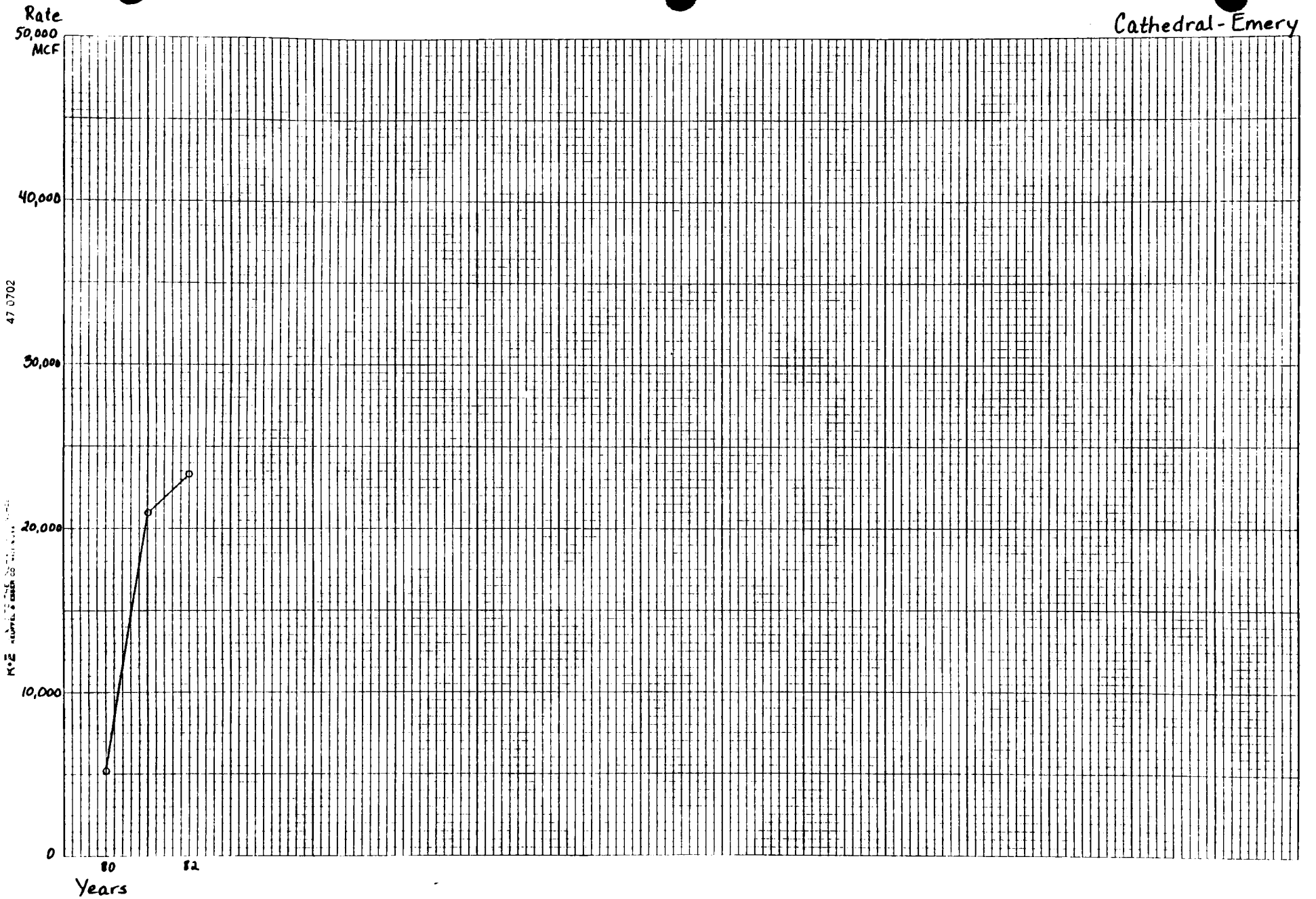

Rate
10,000
MCF
8,000
6,000
4,000
2,000
0
1,000
BBLS
800
600
400
200
0
82
Years
Big Ridge - Mancos

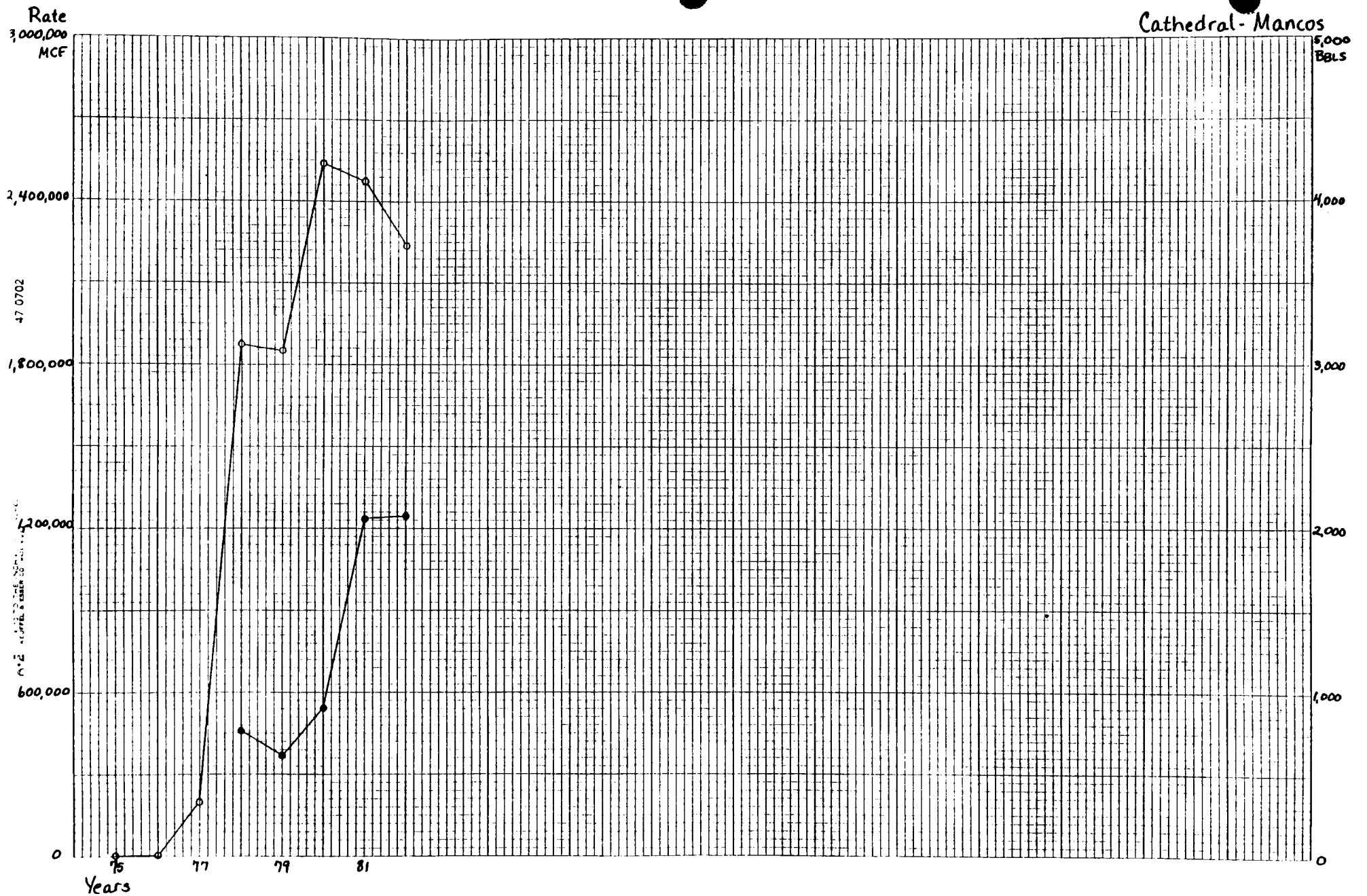

Rate
100,000 MCF
80,000
60,000
40,000
20,000
0
81
89
Years
Blue Cloud - Dakota

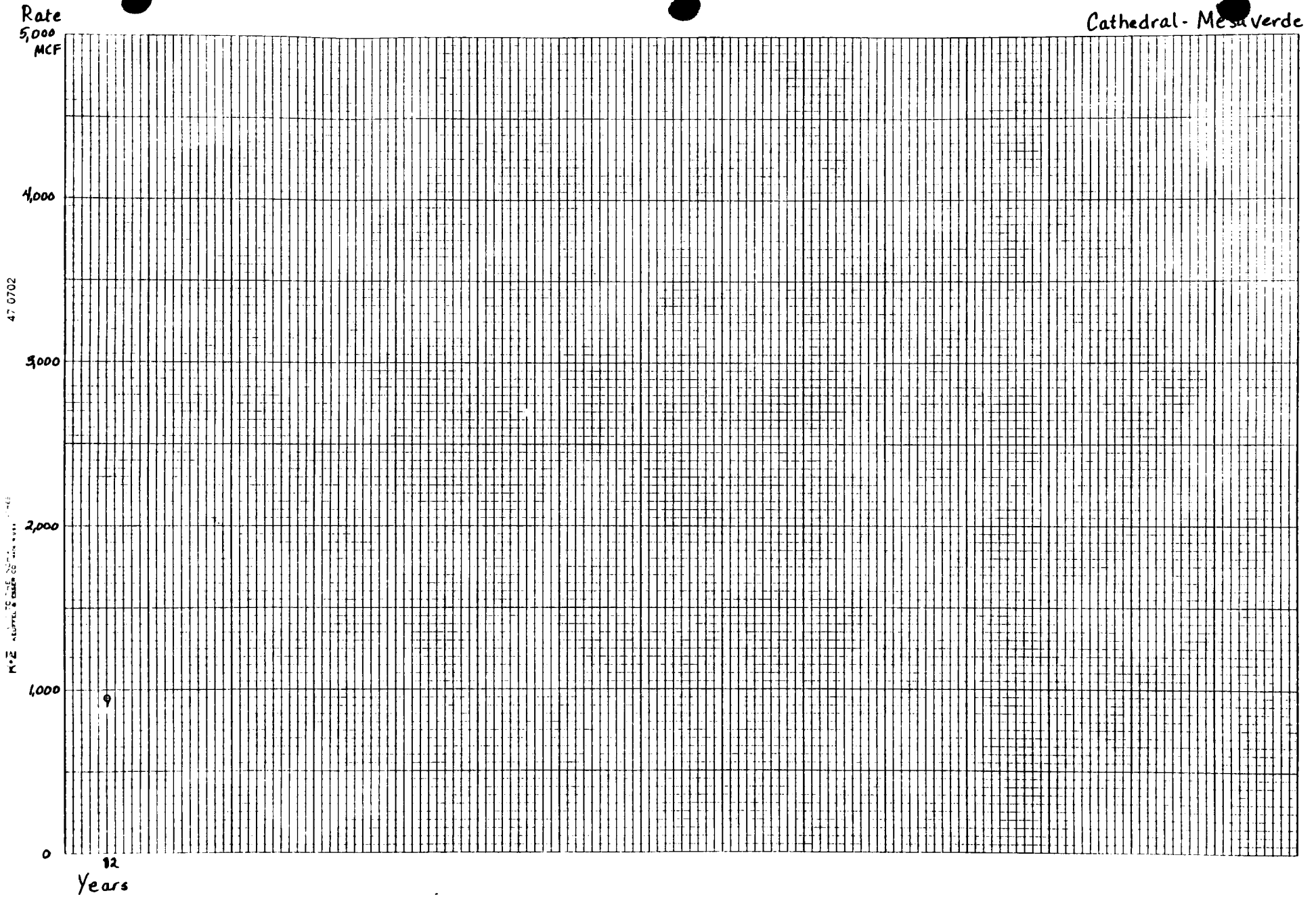
Blue Cloud - Mancos

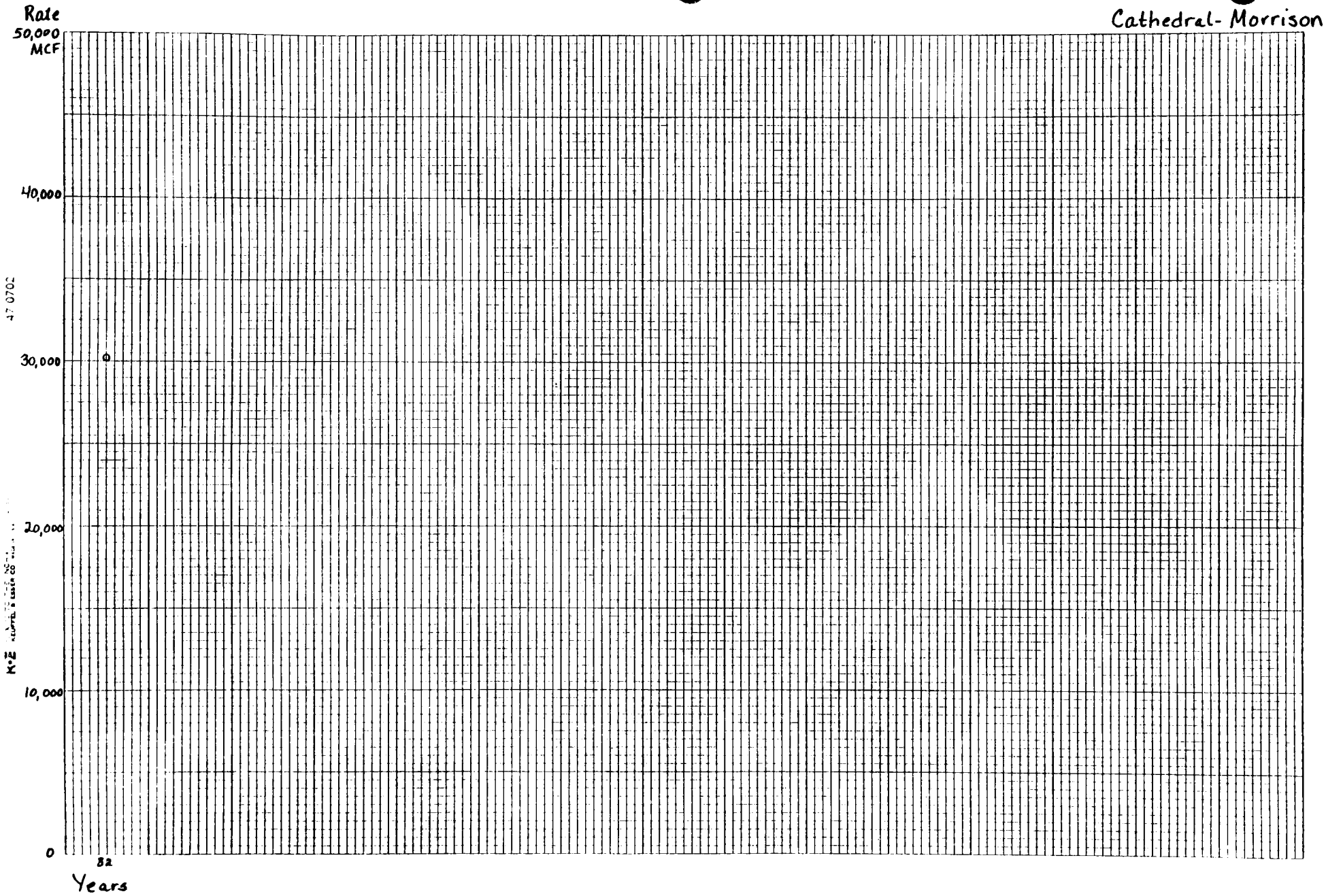


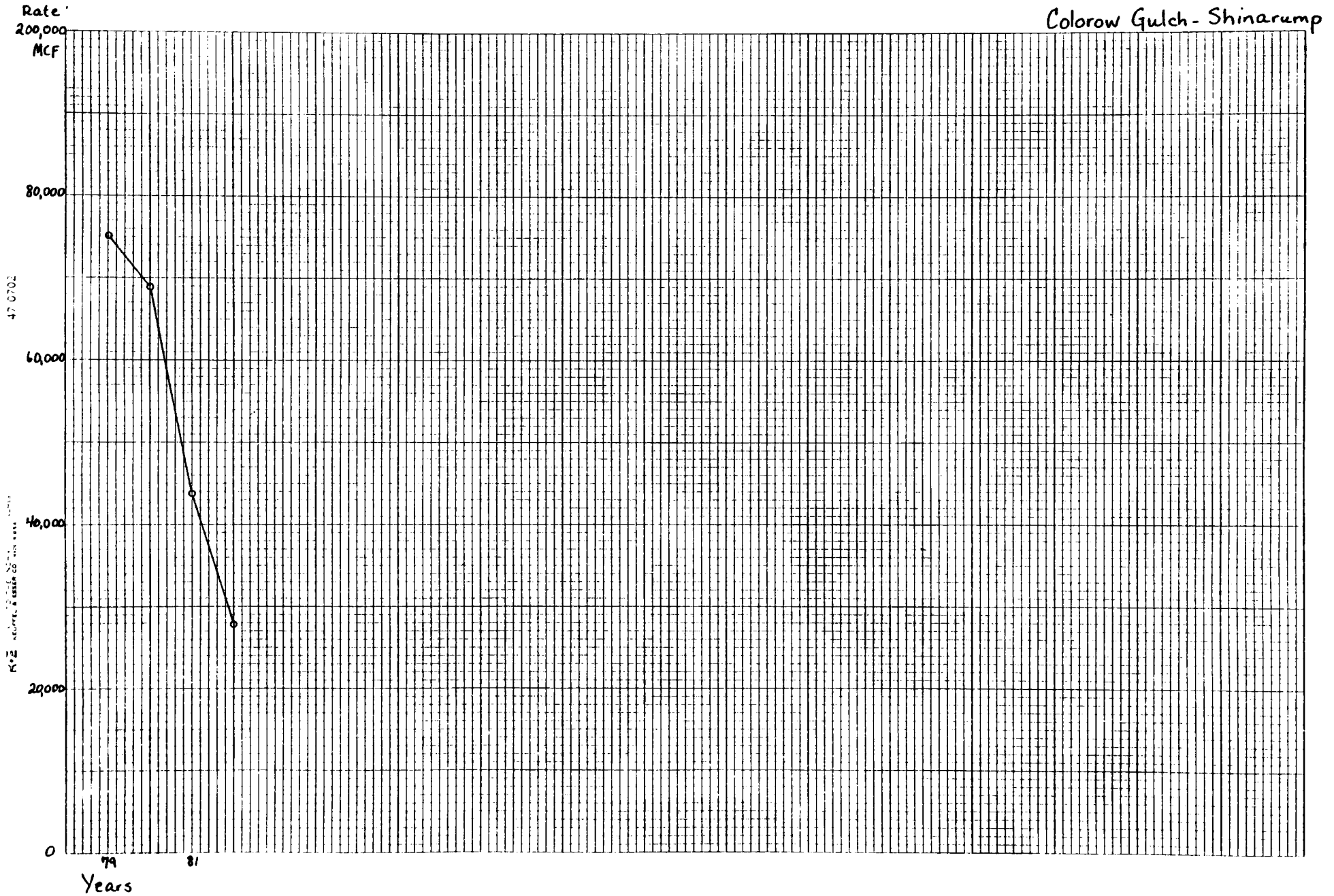

Rate
200,000
MCF
80,000
60,000
40,000
20,000
0
77
79
81
Years
Cathedral -
Dakota


Rate
50,000
MCF
40,000
30,000
20,000
10,000
0
80
82
Years
Cathedral - Emery
47 0702

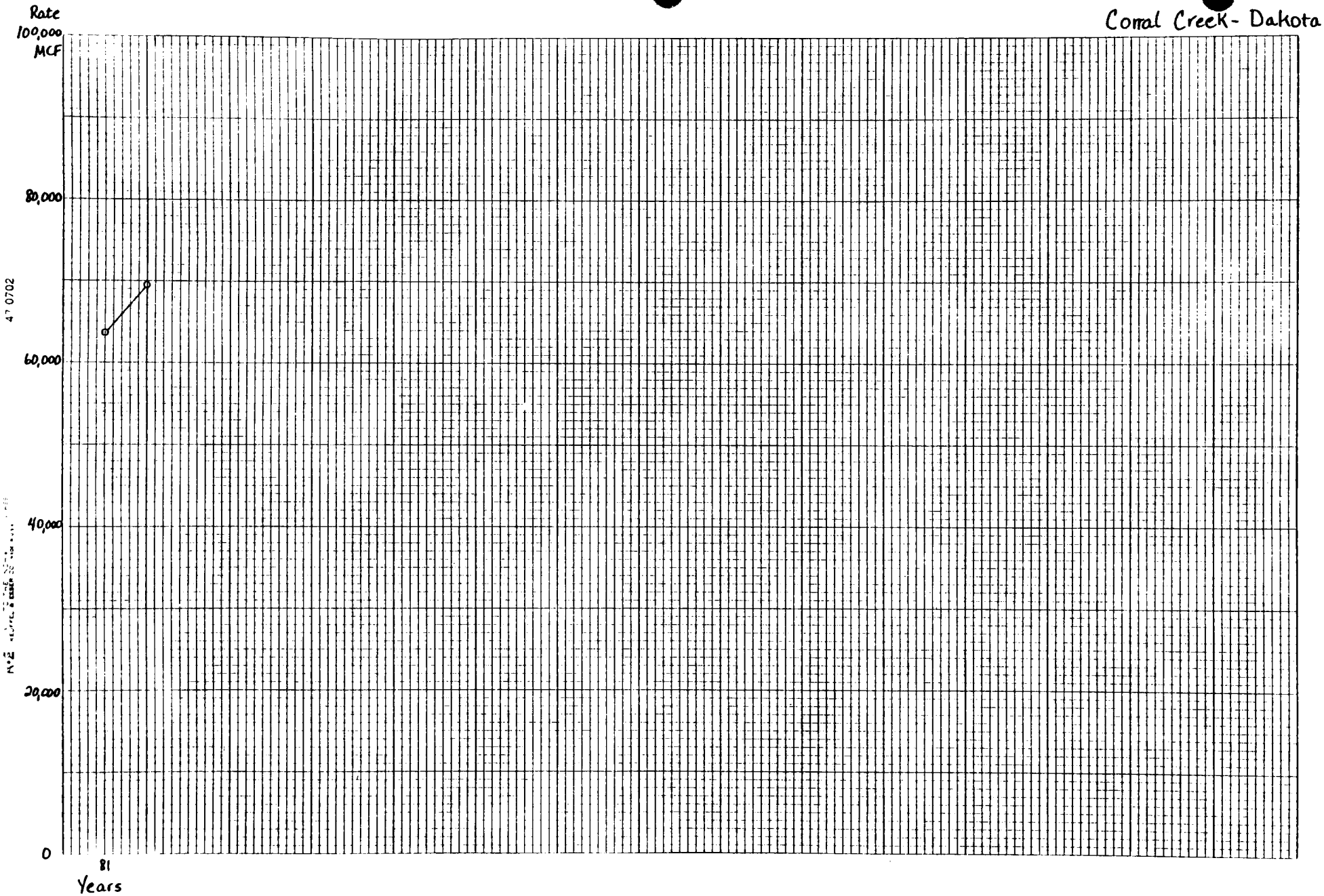

Rate
3,000,000
MCF
2,400,000
1,800,000
1,200,000
600,000
0
Cathedral - Mancos
5,000
BBLS
4,000
3,000
2,000
1,000
0
75
77
79
81
Years

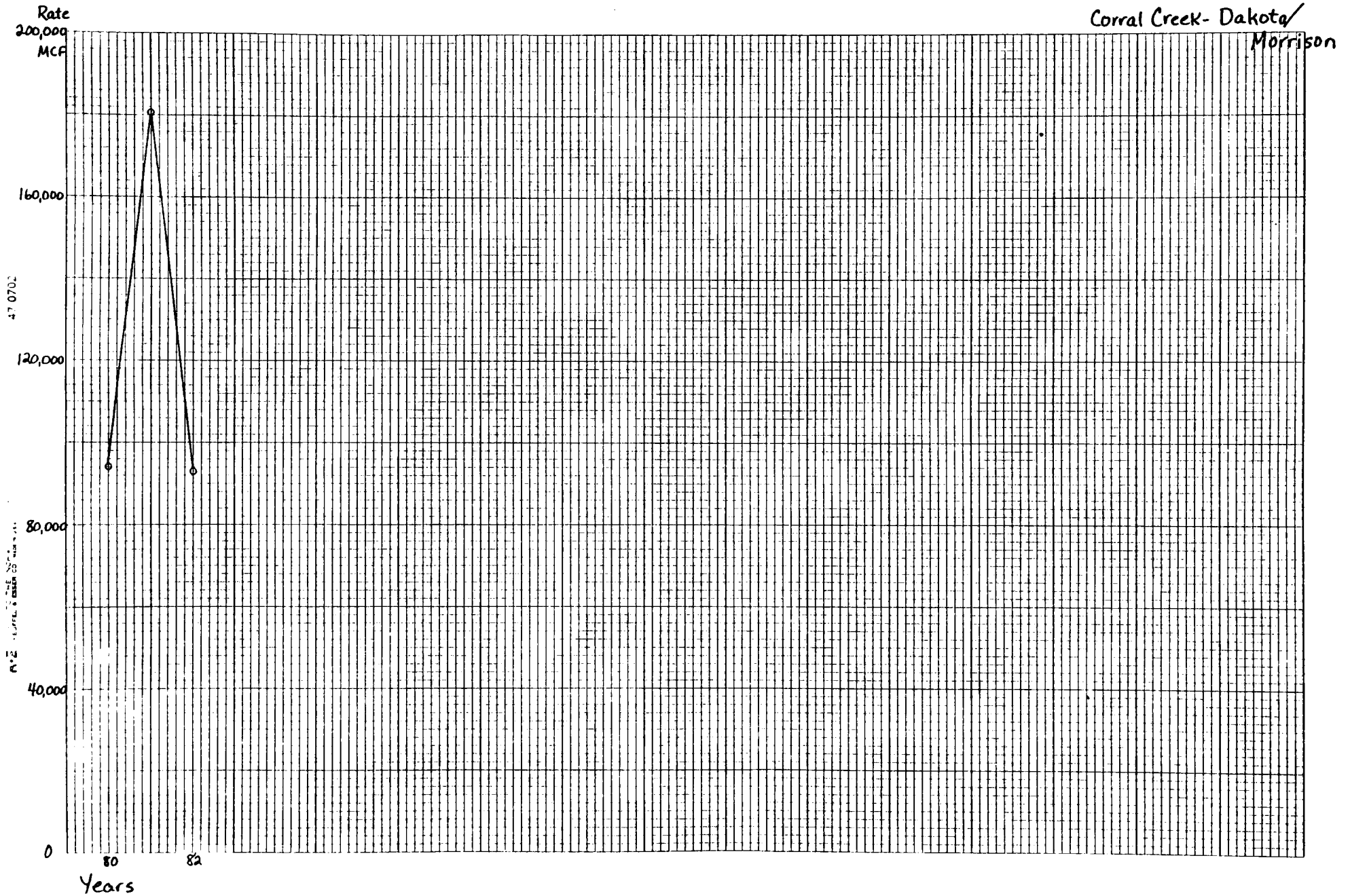

Rate
5,000
MCF
1,000
5,000
2,000
1,000
0
9
12
Years
Cathedral - Mesa Verde

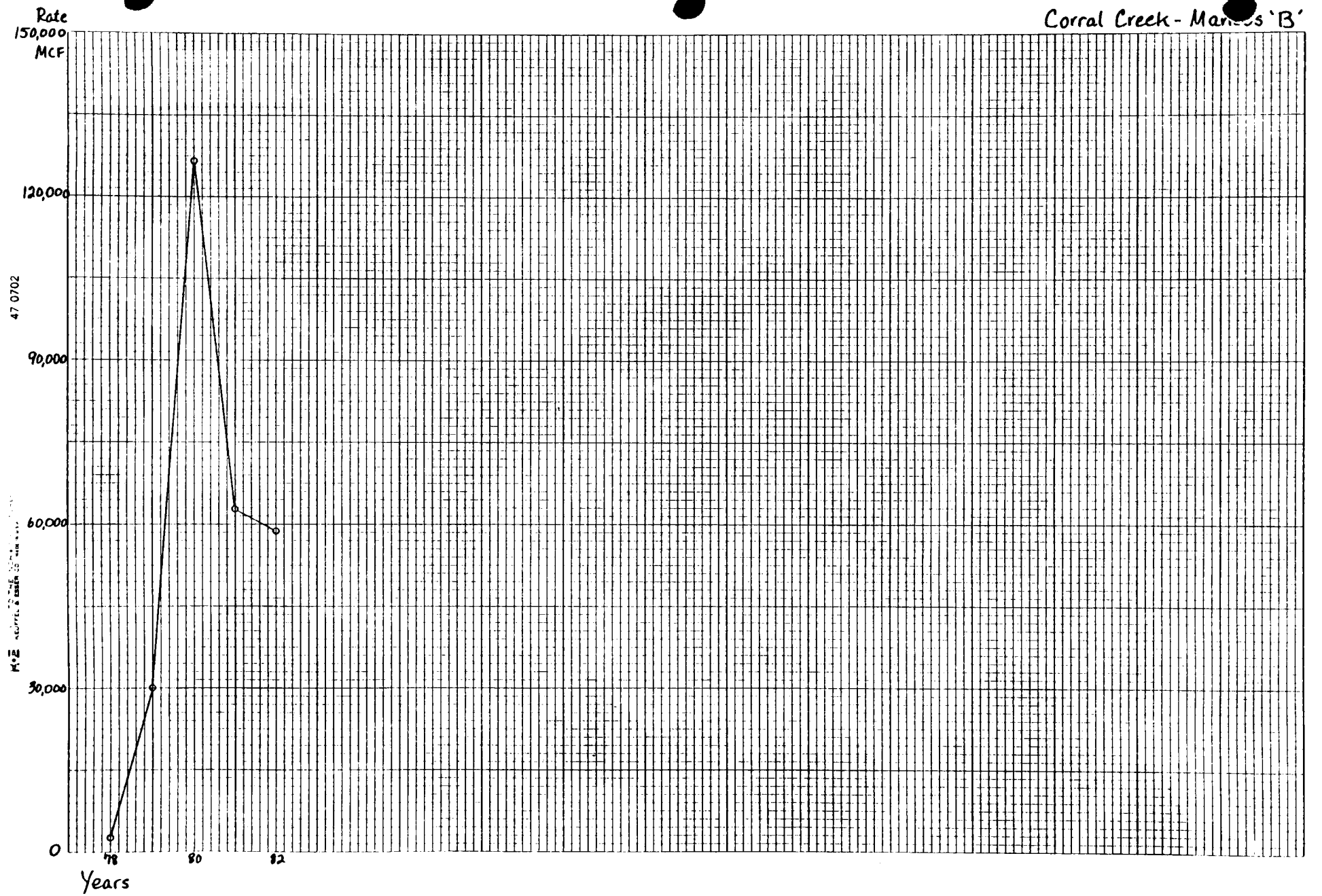

Rate
50,000 MCF
40,000
30,000
20,000
10,000
0
82
Years
Cathedral- Morrison

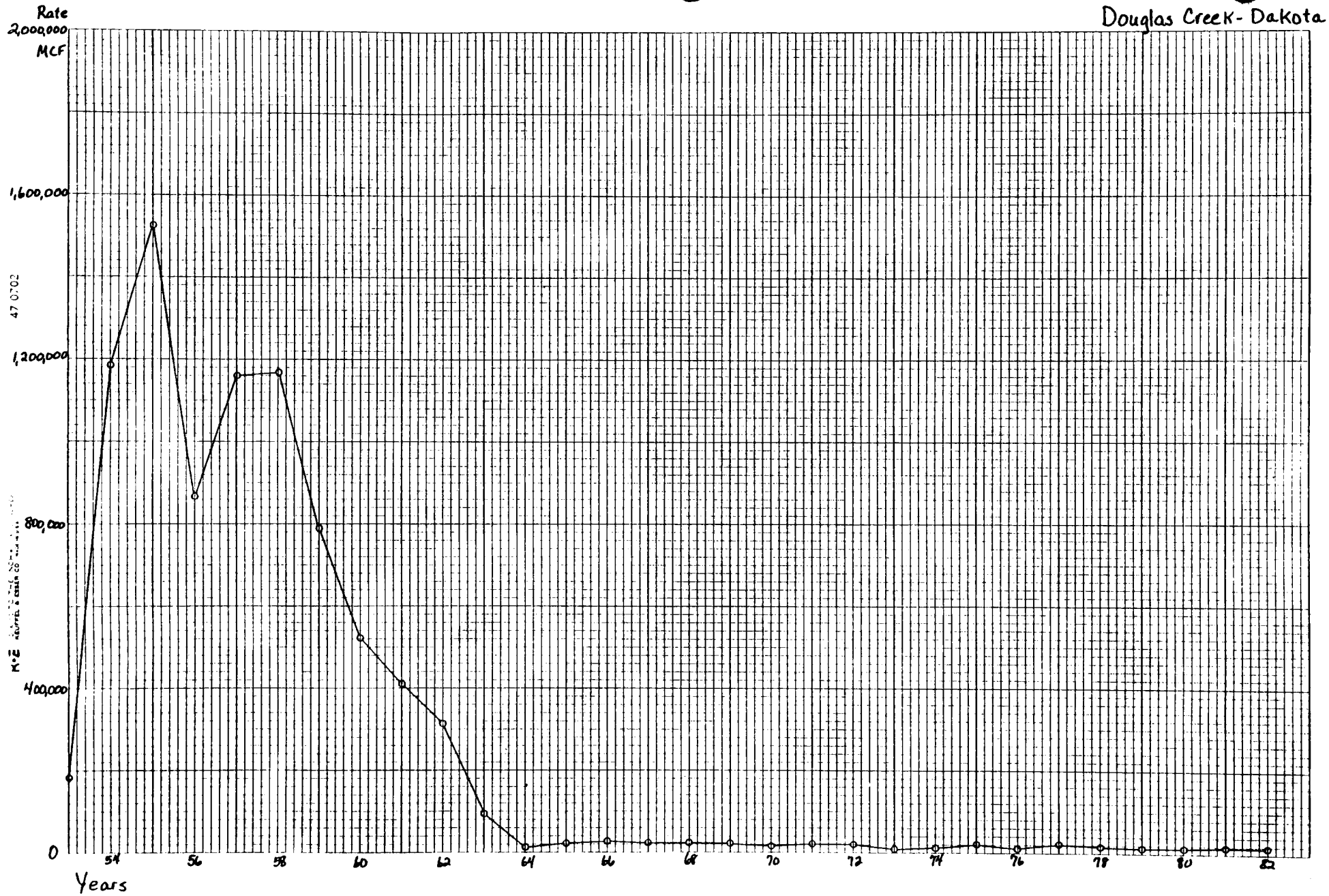

Rate
200,000
MCF
80,000
60,000
40,000
20,000
0
79
81
Years
Colorow Gulch - Shinarump

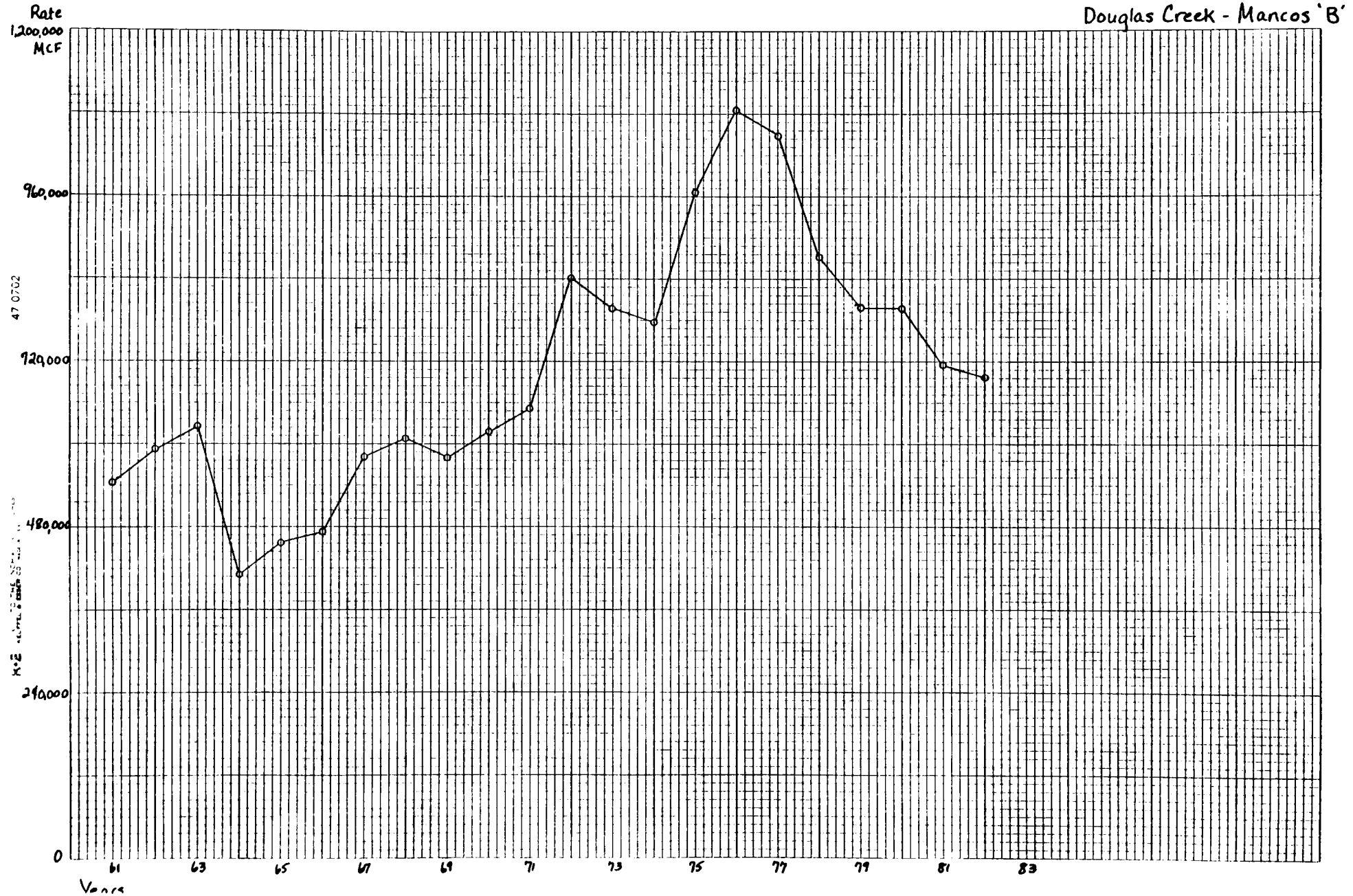
Coral Creek - Dakota

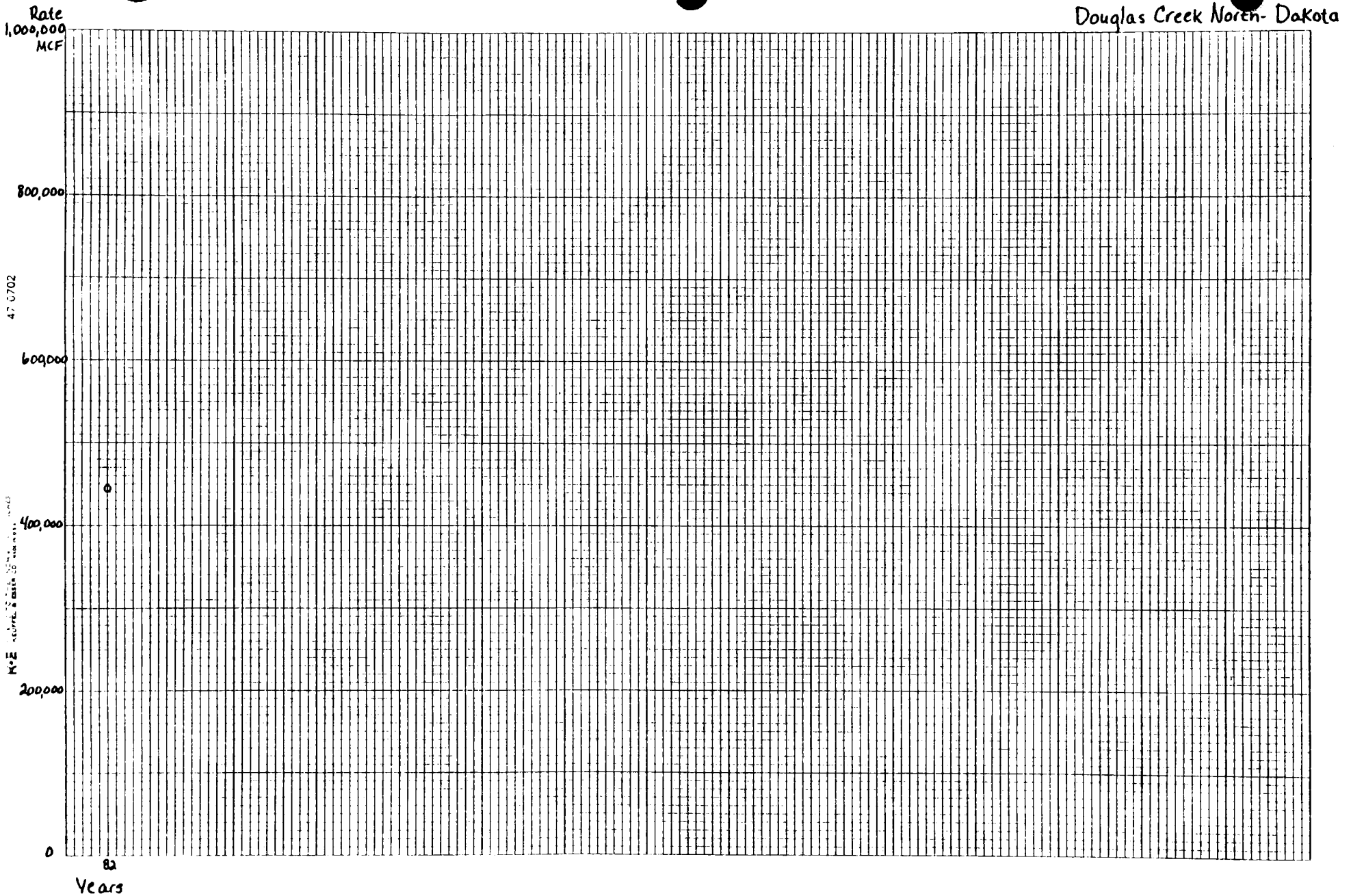


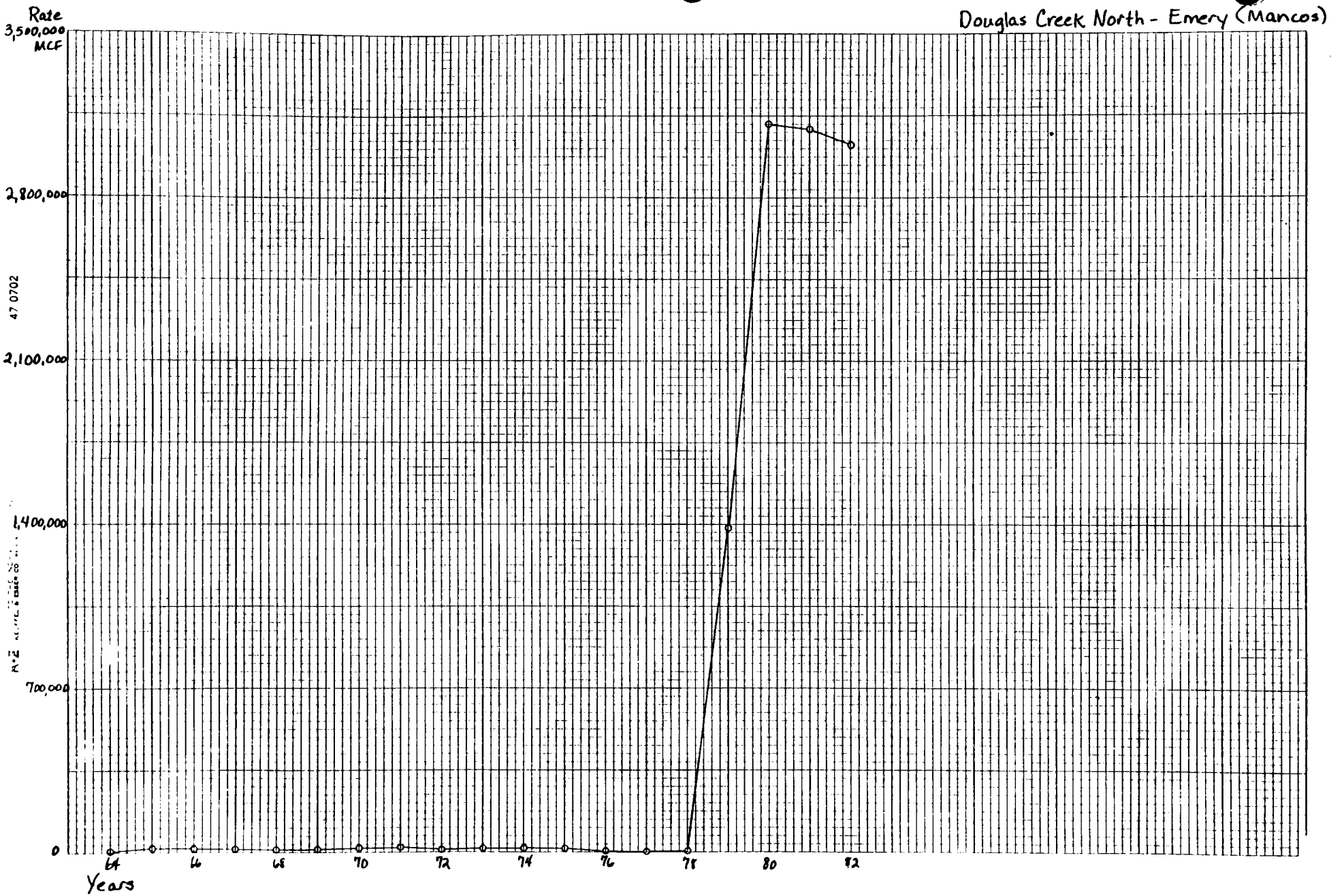

Rate
200,000
MCF
160,000
120,000
80,000
40,000
0
80
82
Years
Corral Creek- Dakota/
Morrison


Rate
150,000 MCF
120,000
90,000
60,000
30,000
0
78
80
82
Years
Corral Creek - Mar[illegible]s 'B'
47 0702

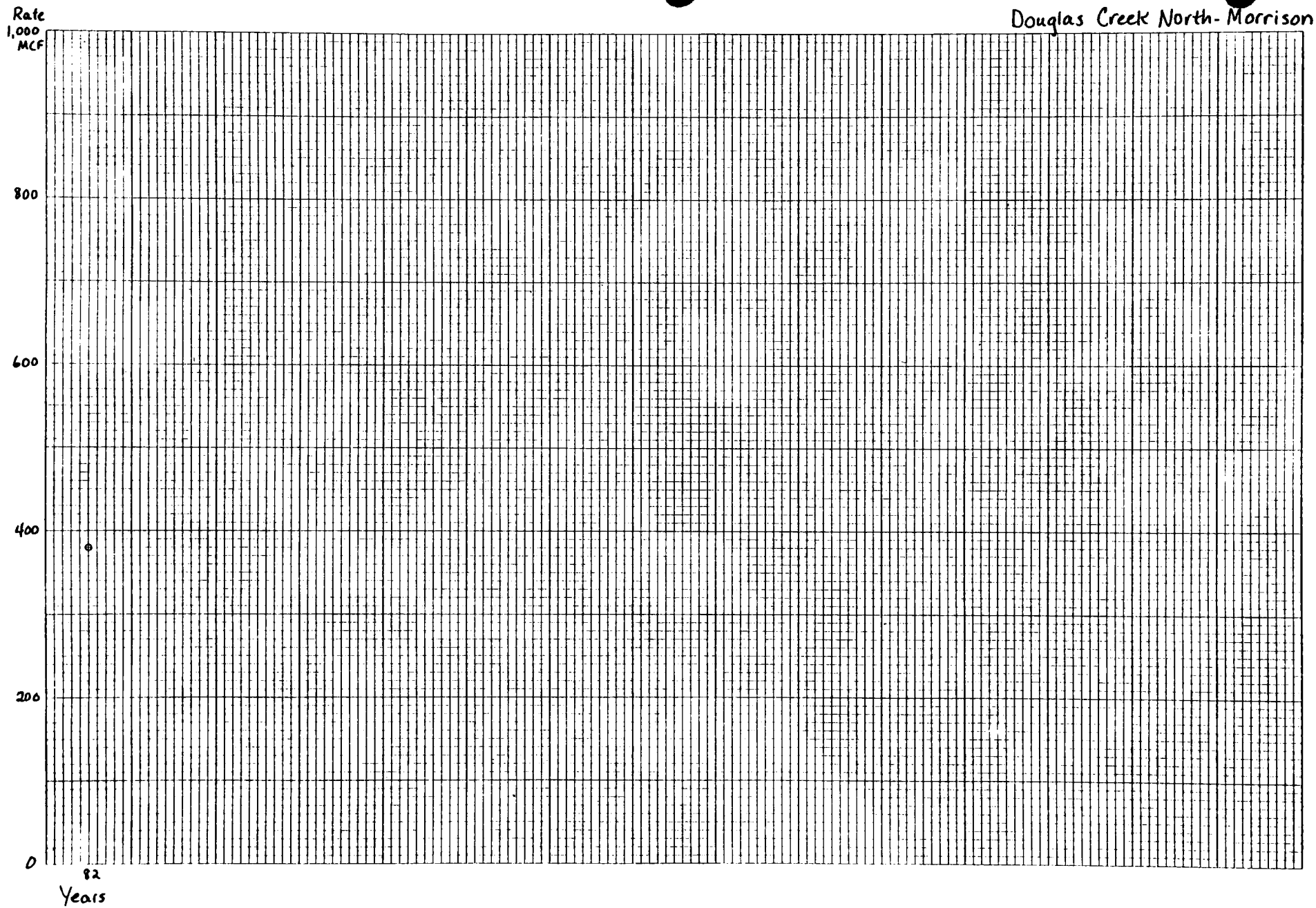

Douglas Creek - Dakota
Rate
MCF
2,000,000
1,600,000
1,200,000
800,000
400,000
0
47 0702
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

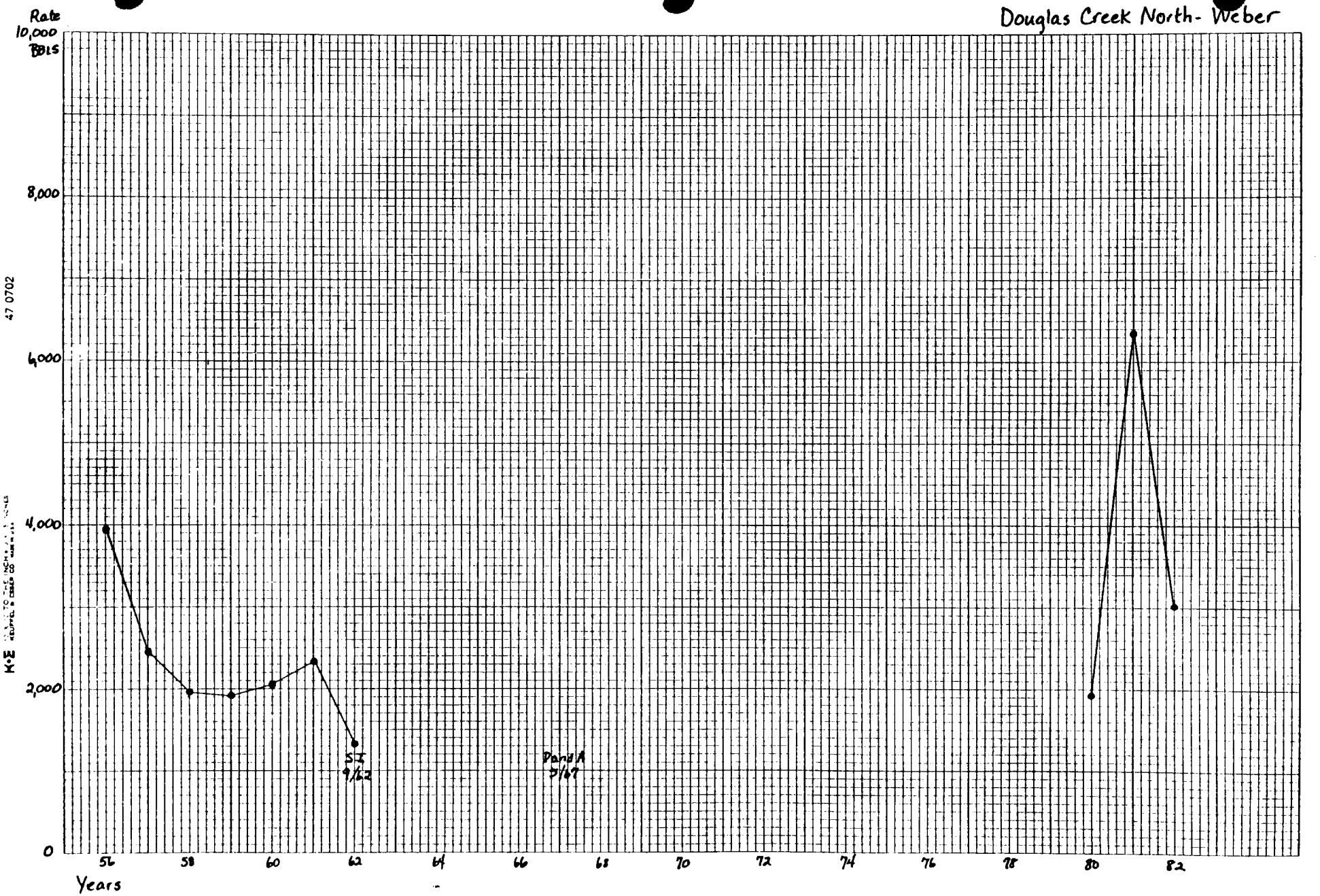

Douglas Creek - Mancos 'B'
Rate
1,200,000
MCF
960,000
720,000
480,000
240,000
0
61
63
65
67
69
71
73
75
77
79
81
83
Years

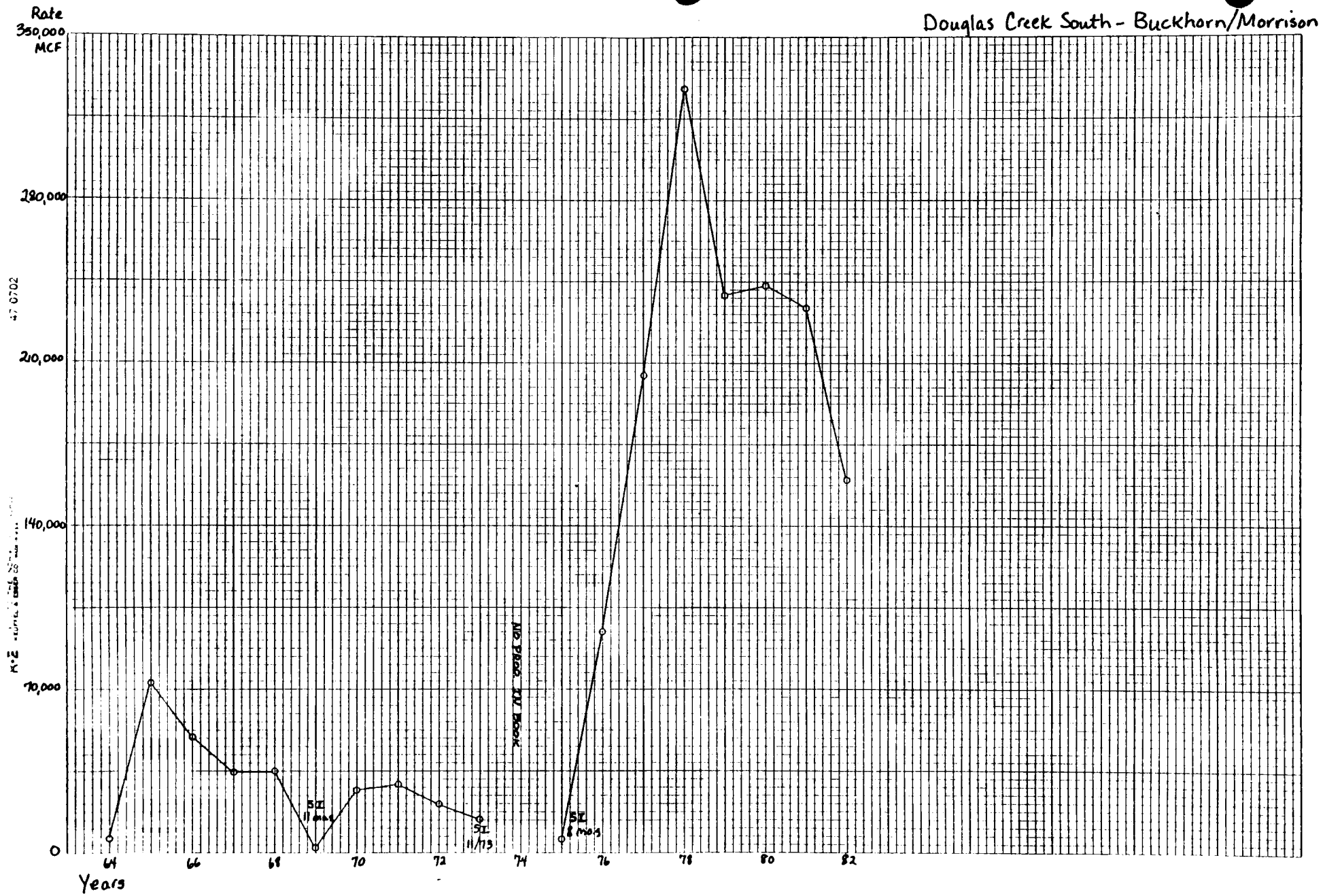

Douglas Creek North- Dakota
Rate
1,000,000
MCF
800,000
600,000
400,000
200,000
0
82
Years

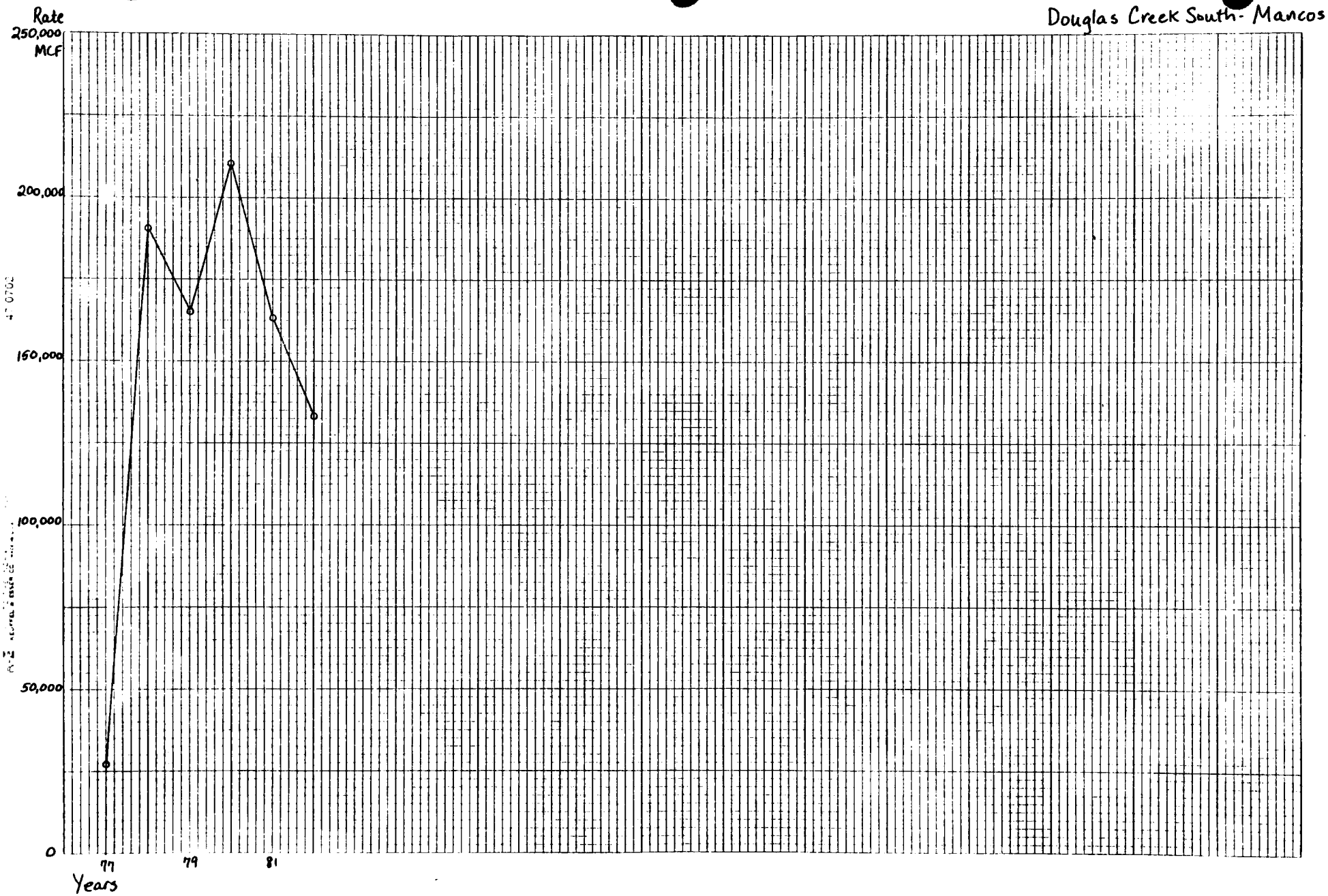

Douglas Creek North - Emery (Mancos)
Rate
3,500,000 MCF
2,800,000
2,100,000
1,400,000
700,000
0
64
66
68
70
72
74
76
78
80
82
Years

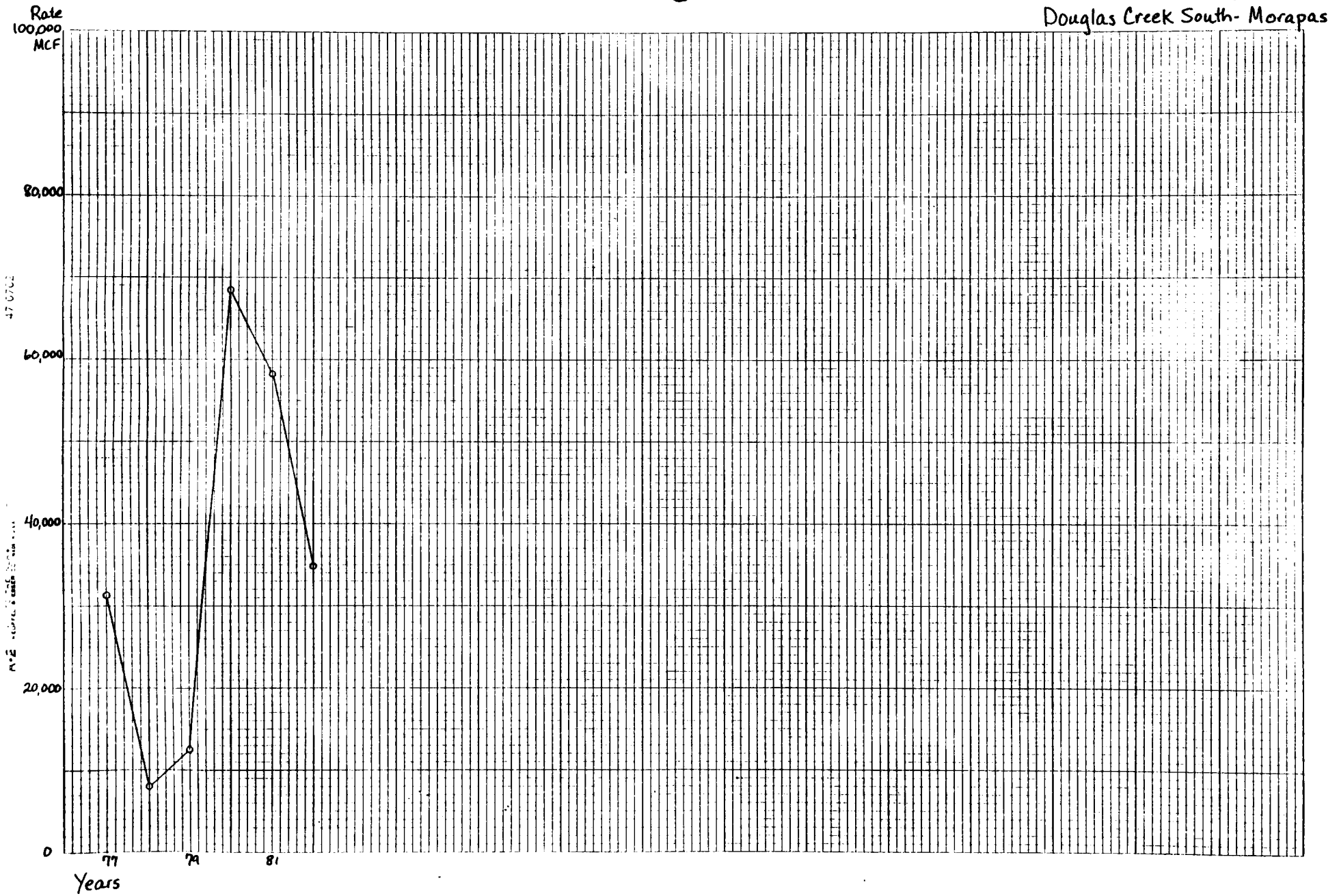

Douglas Creek North- Morapos (Mancos)
Rate
1,500,000
MCF
1,200,000
900,000
600,000
300,000
0
59
61
63
65
67
69
71
73
75
77
79
81
83
Years


Douglas Creek North- Morrison
Rate
1,000
MCF
800
600
400
200
0
82
Years

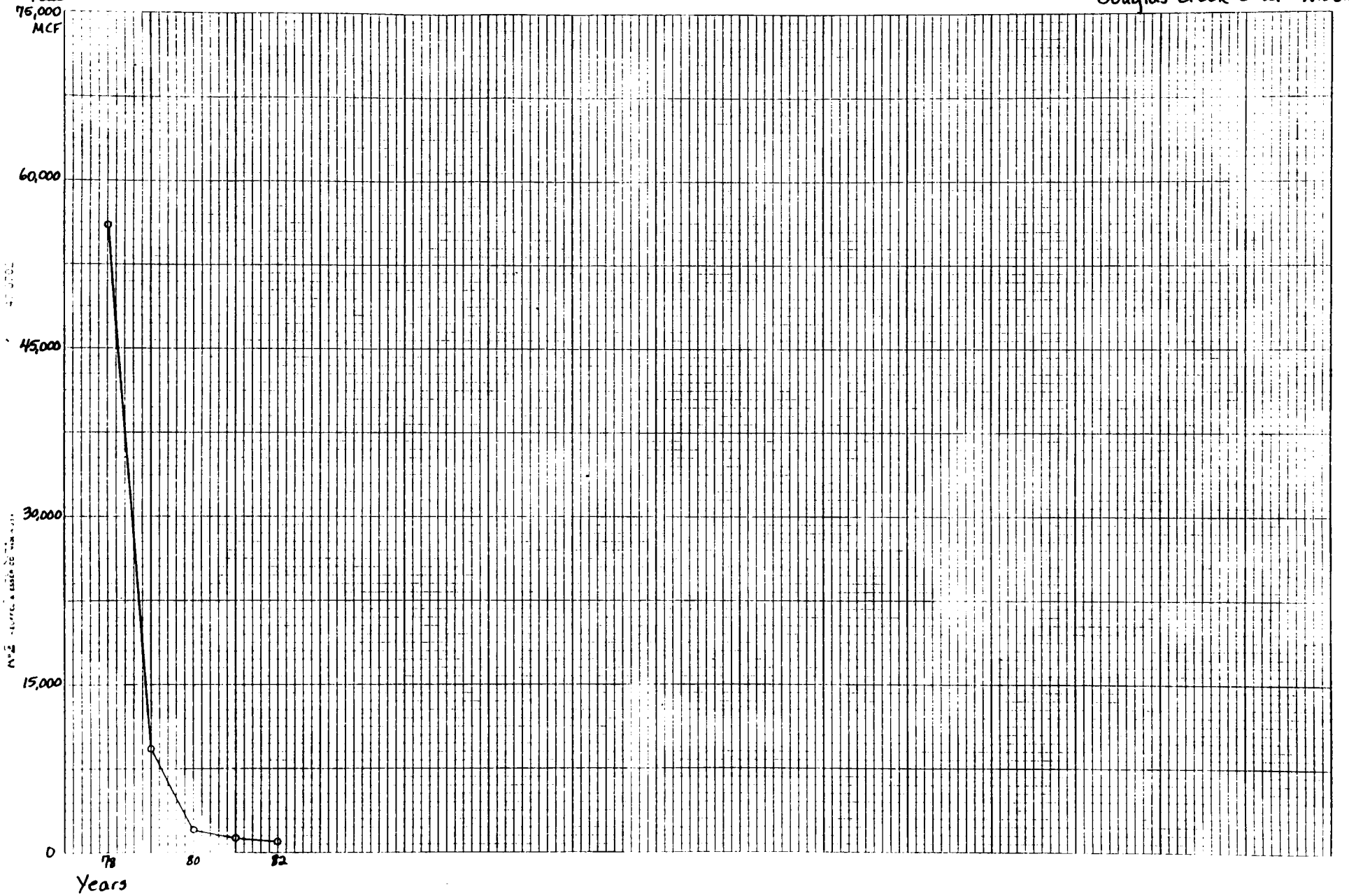

Douglas Creek North- Weber
Rate
10,000
BBLS
8,000
6,000
4,000
2,000
0
SI
9/62
Dang A
5/67
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

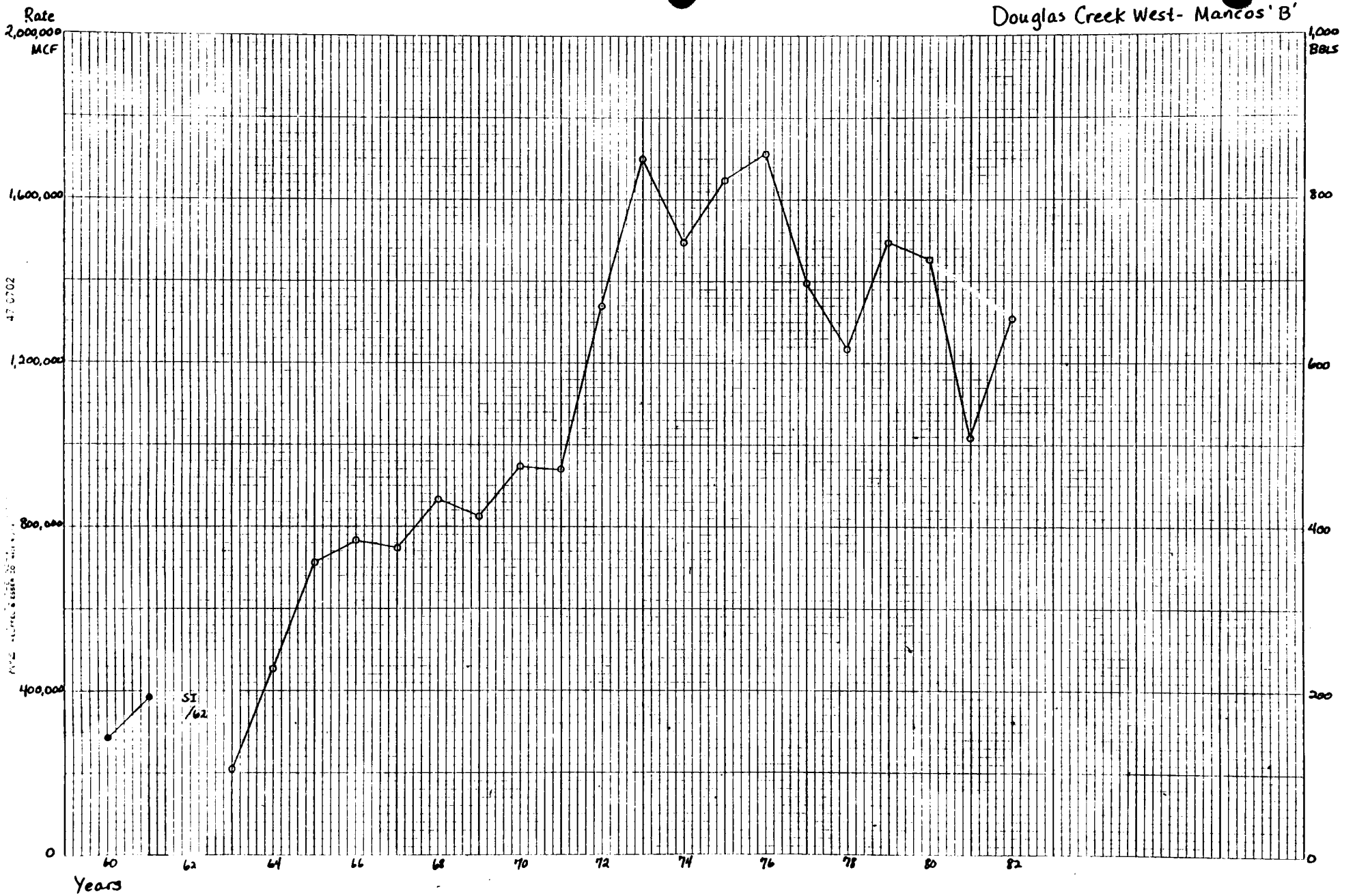

Douglas Creek South - Buckhorn/Morrison
Rate
350,000 MCF
280,000
210,000
140,000
70,000
0
64
66
68
70
72
74
76
78
80
82
Years
SI 11 mos
SI 11/73
SI 8 mos
No prod. on book


Douglas Creek South - Mancos
Rate
250,000
MCF
200,000
150,000
100,000
50,000
0
77
79
81
Years

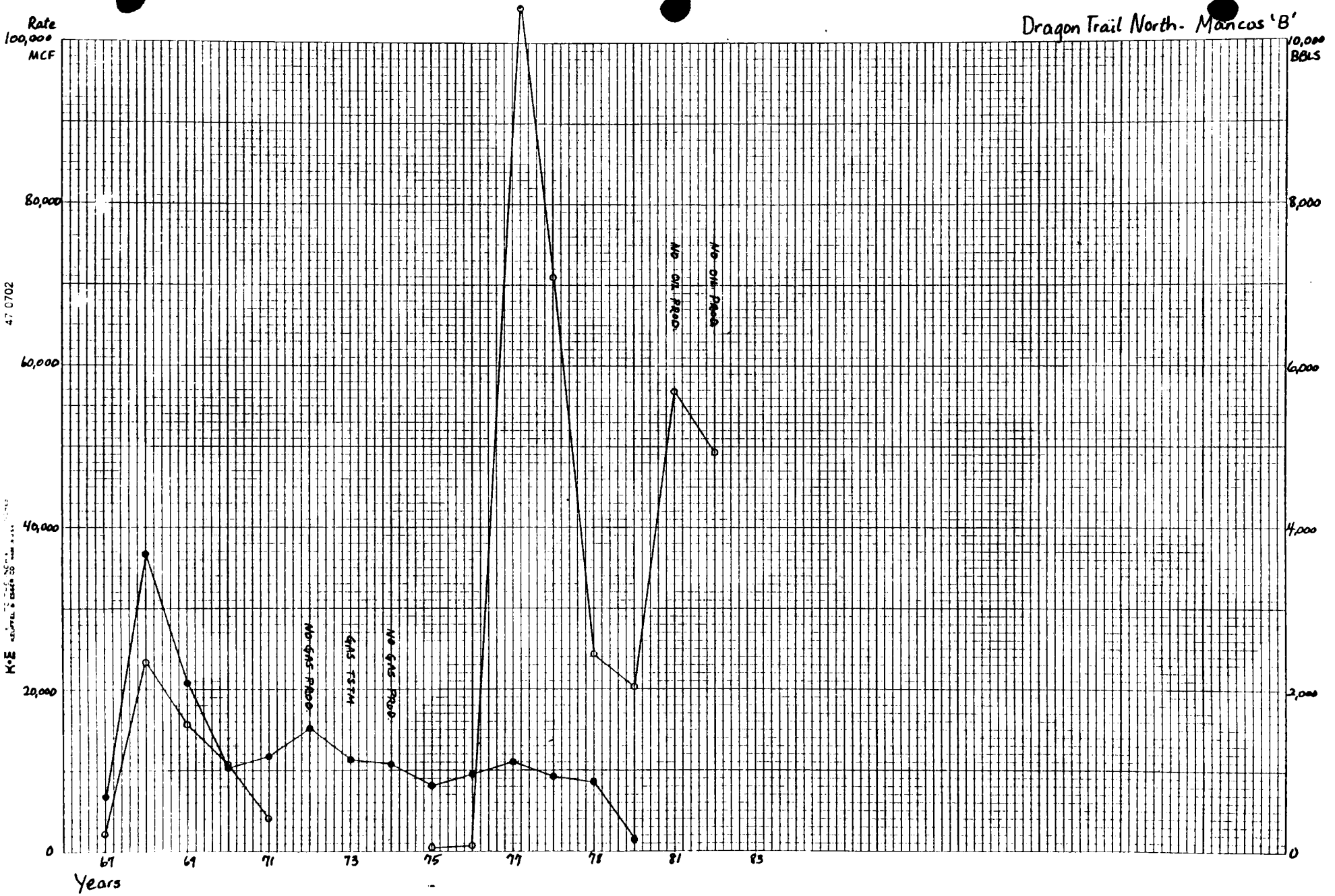

Douglas Creek South- Morapas
Rate
100,000
MCF
80,000
60,000
40,000
20,000
0
77
79
81
Years

Douglas Creek South-Niobrara

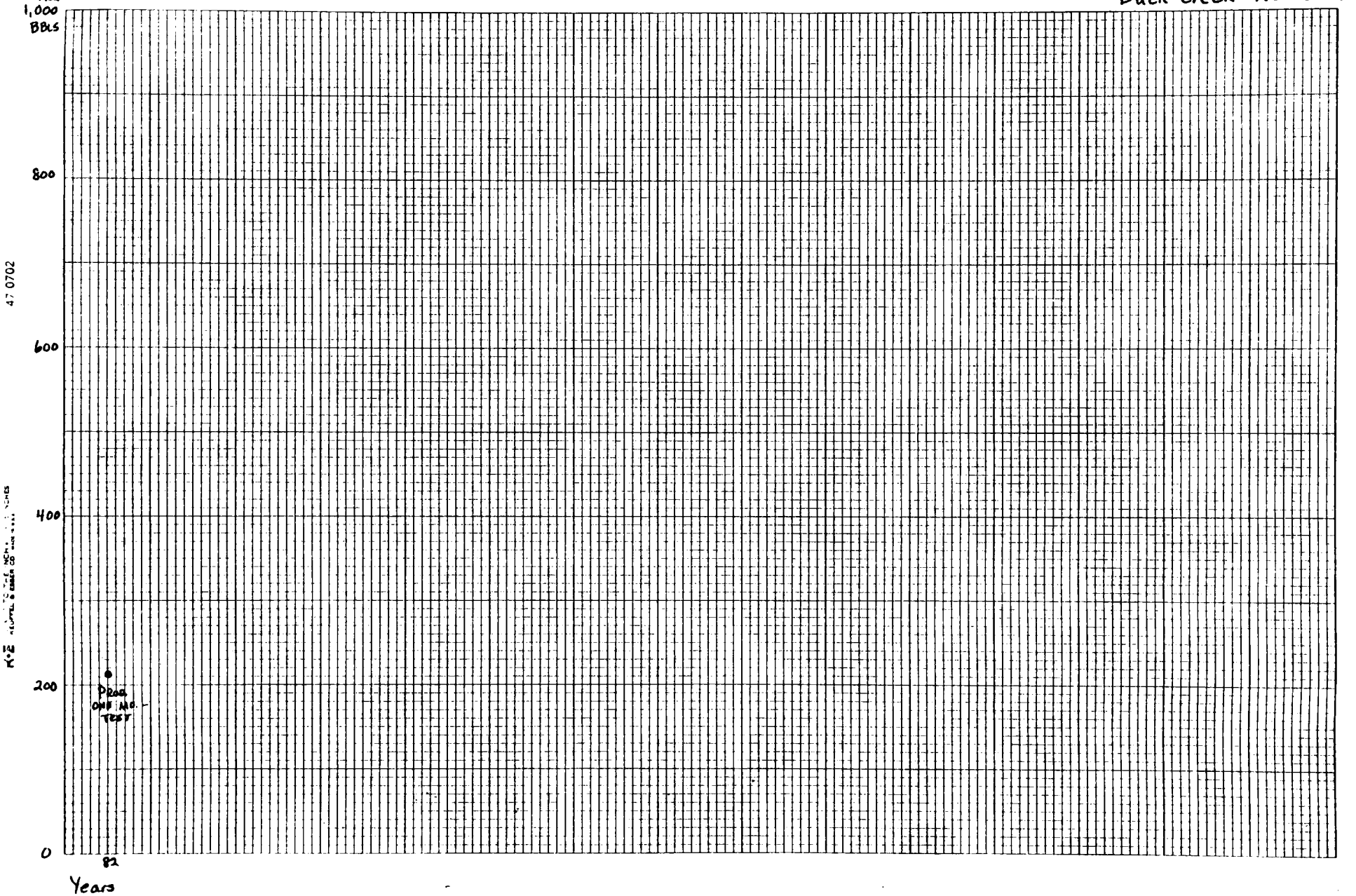



Rate
2,000,000 MCF
1,600,000
1,200,000
800,000
400,000
0
1,000 BBLS
800
600
400
200
0
Douglas Creek West- Mancos 'B'
SI /62
60
62
64
66
68
70
72
74
76
78
80
82
Years


Rate
Dragon Trail - Emery (Mancos)
8,000,000
MCF
6,400,000
4,800,000
3,200,000
1,600,000
0
5,000
BBLS
2,400
1,800
1,200
600
0
62
64
66
68
70
72
74
76
78
80
82
Years


Dragon Trail North- Mancos 'B'
Rate
100,000 MCF
80,000
60,000
40,000
20,000
0
10,000 BBLS
8,000
6,000
4,000
2,000
0
NO GAS PROD
GAS TEST
NO GAS PROD
NO OIL PROD
NO OIL PROD
67
69
71
73
75
77
79
81
83
Years
47 0702

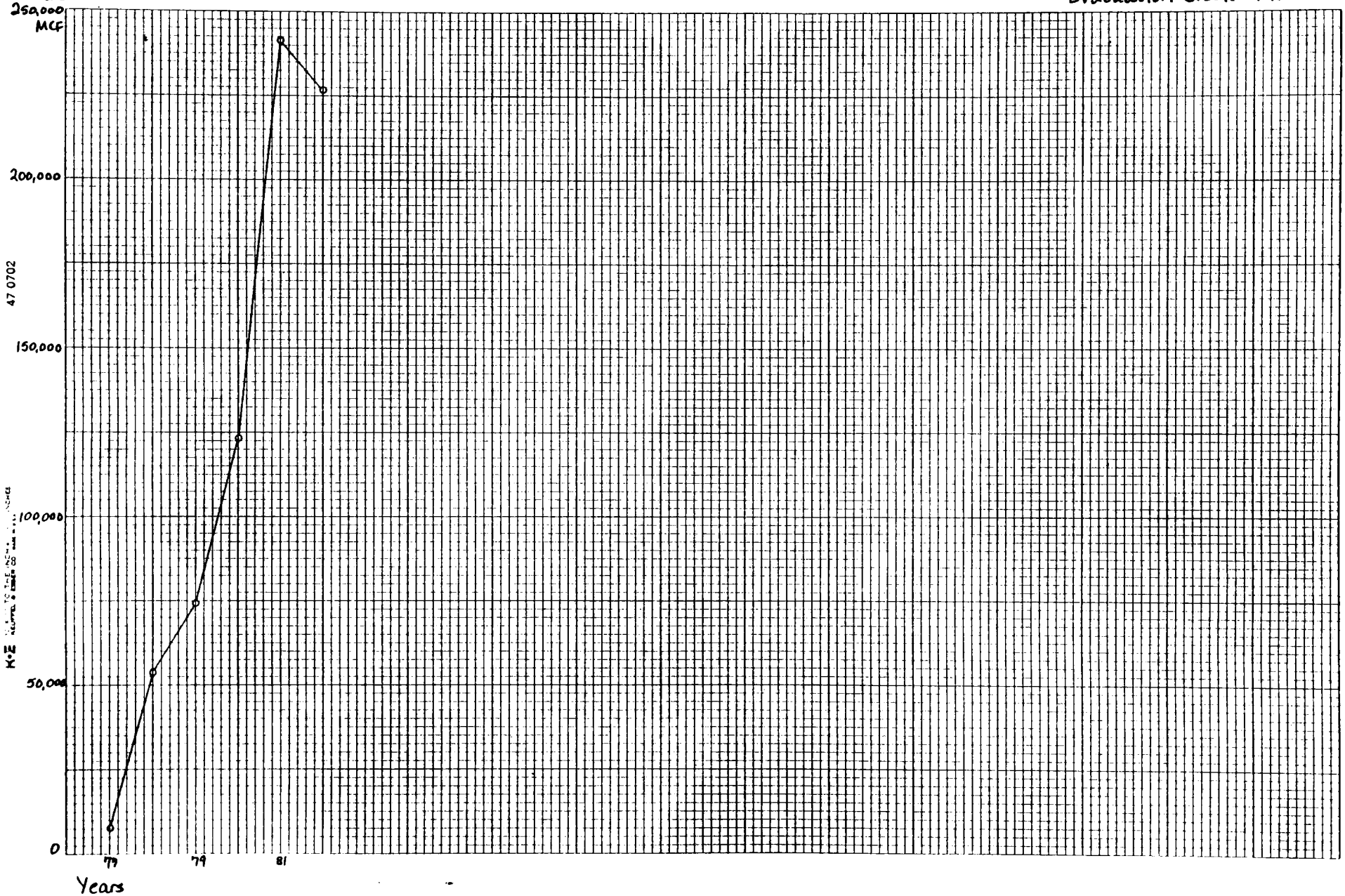
Duck Creek- Wasatch

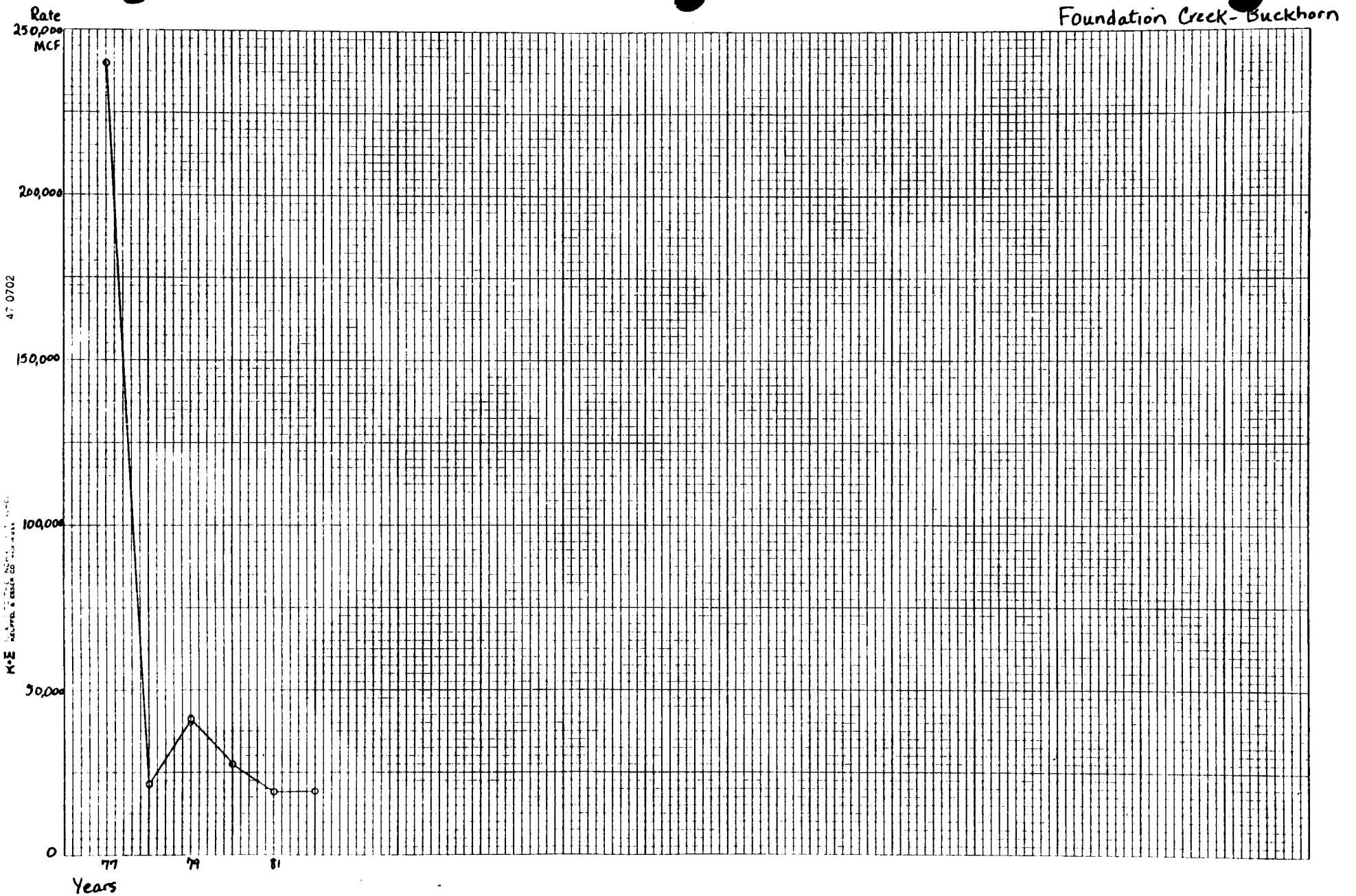


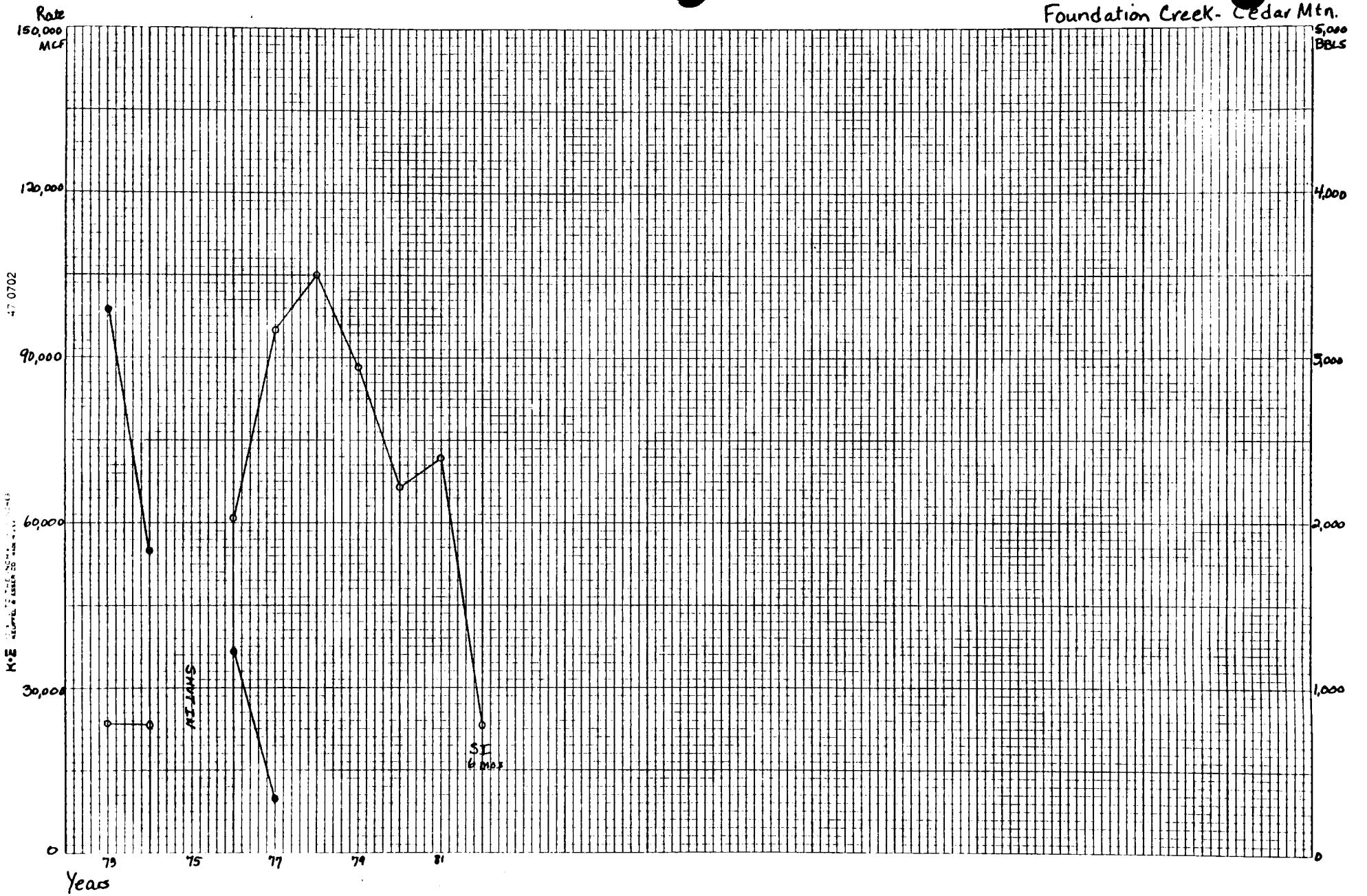
47 0702

K·E

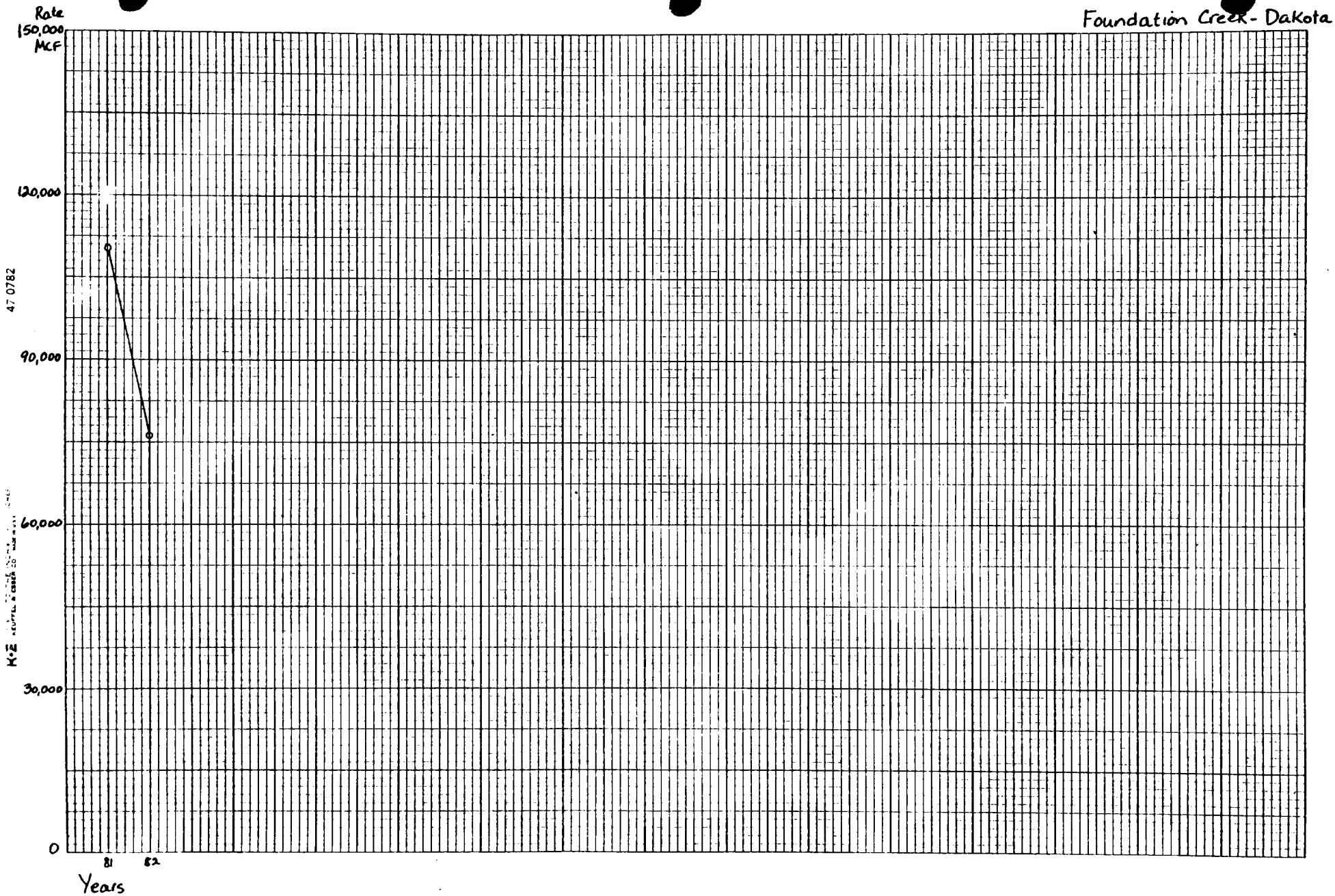
Evacuation Creek - Mancos 'B'

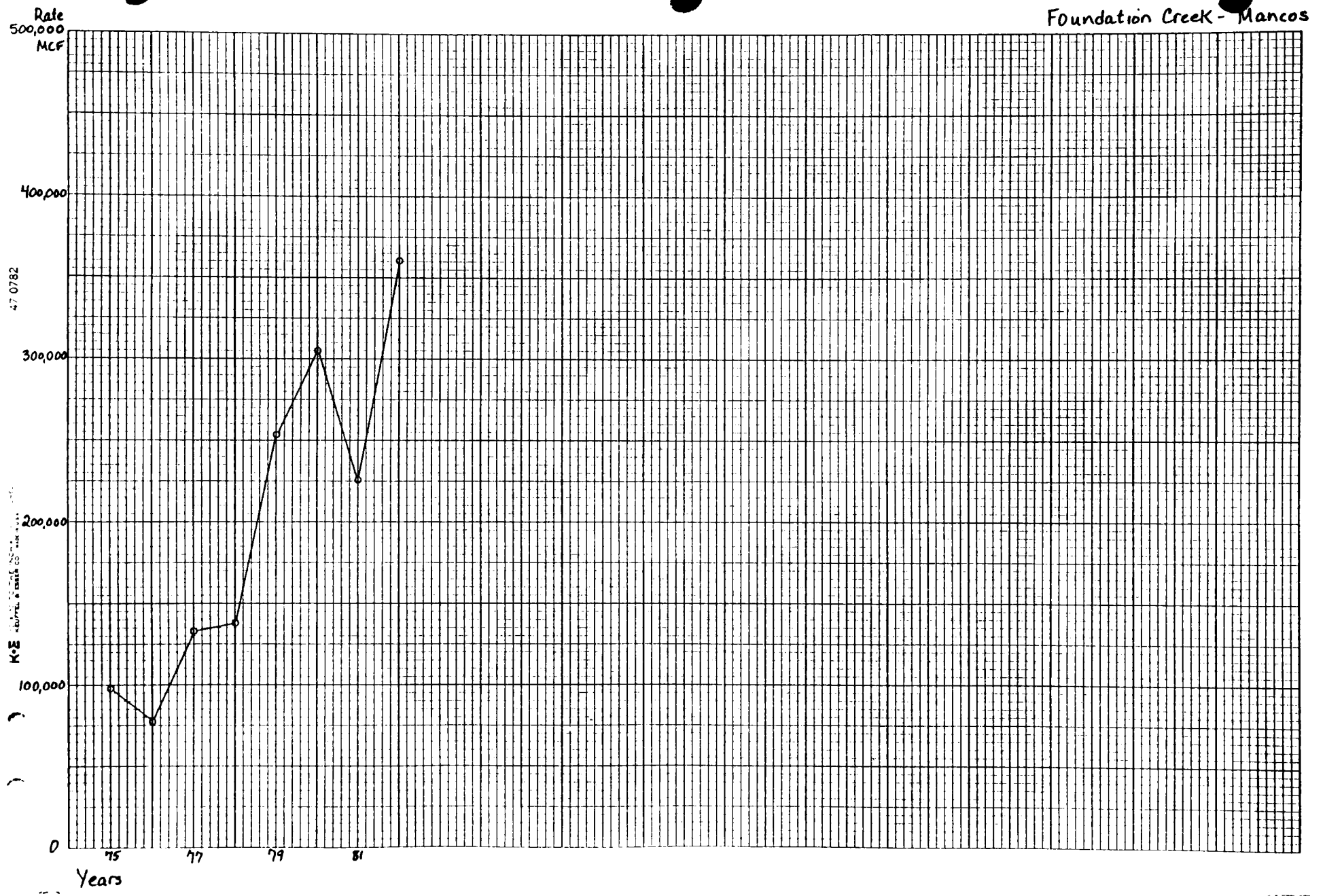


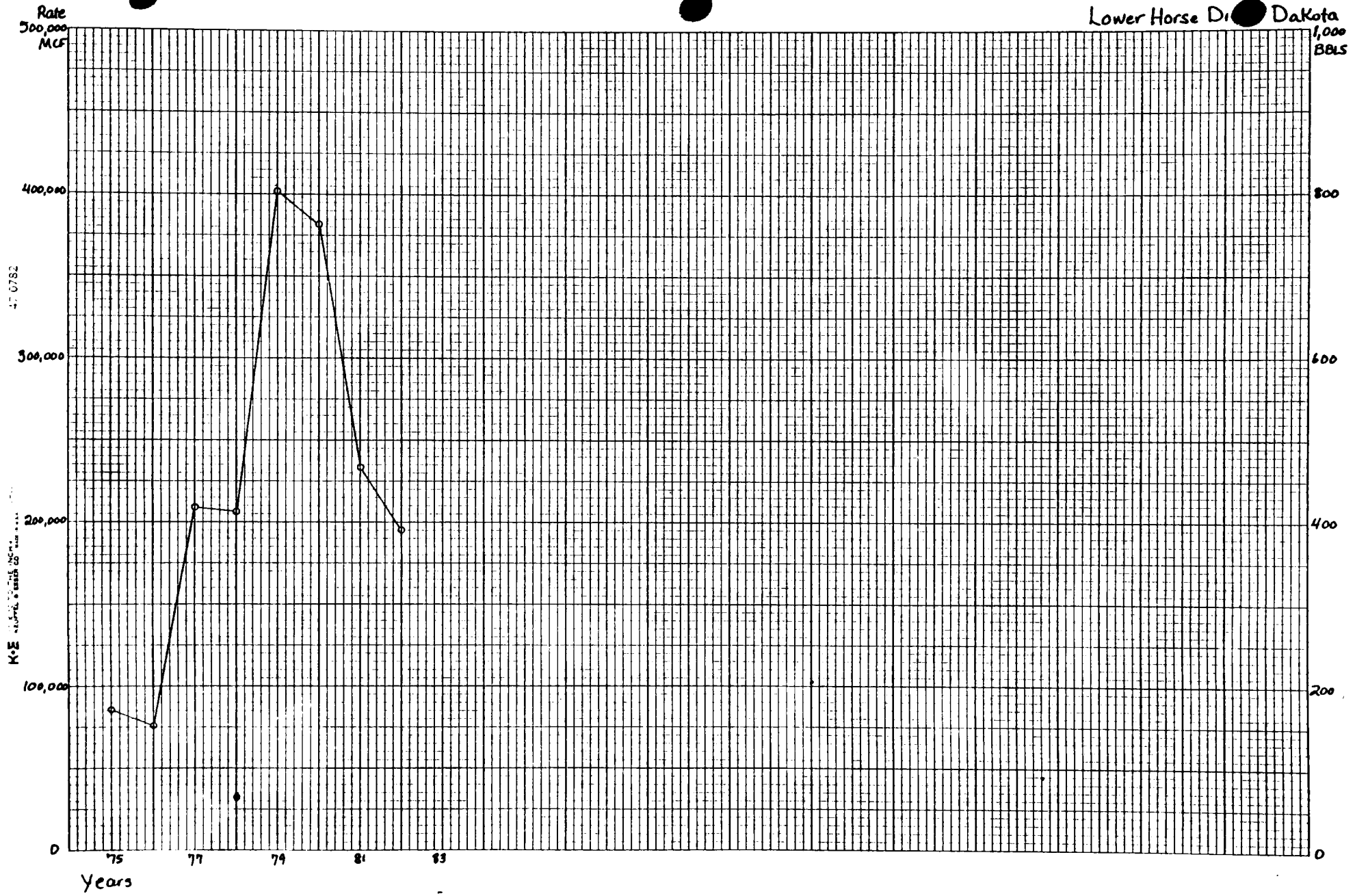

Foundation Creek - Buckhorn
Rate
250,000 MCF
200,000
150,000
100,000
50,000
0
77
79
81
Years


Rate
150,000 MCF
120,000
90,000
60,000
30,000
0
5,000 BBLS
4,000
3,000
2,000
1,000
0
Foundation Creek- Cedar Mtn.
47 0702
K&E
73
75
77
79
81
Years
NF JAN'S
SI 4 mos

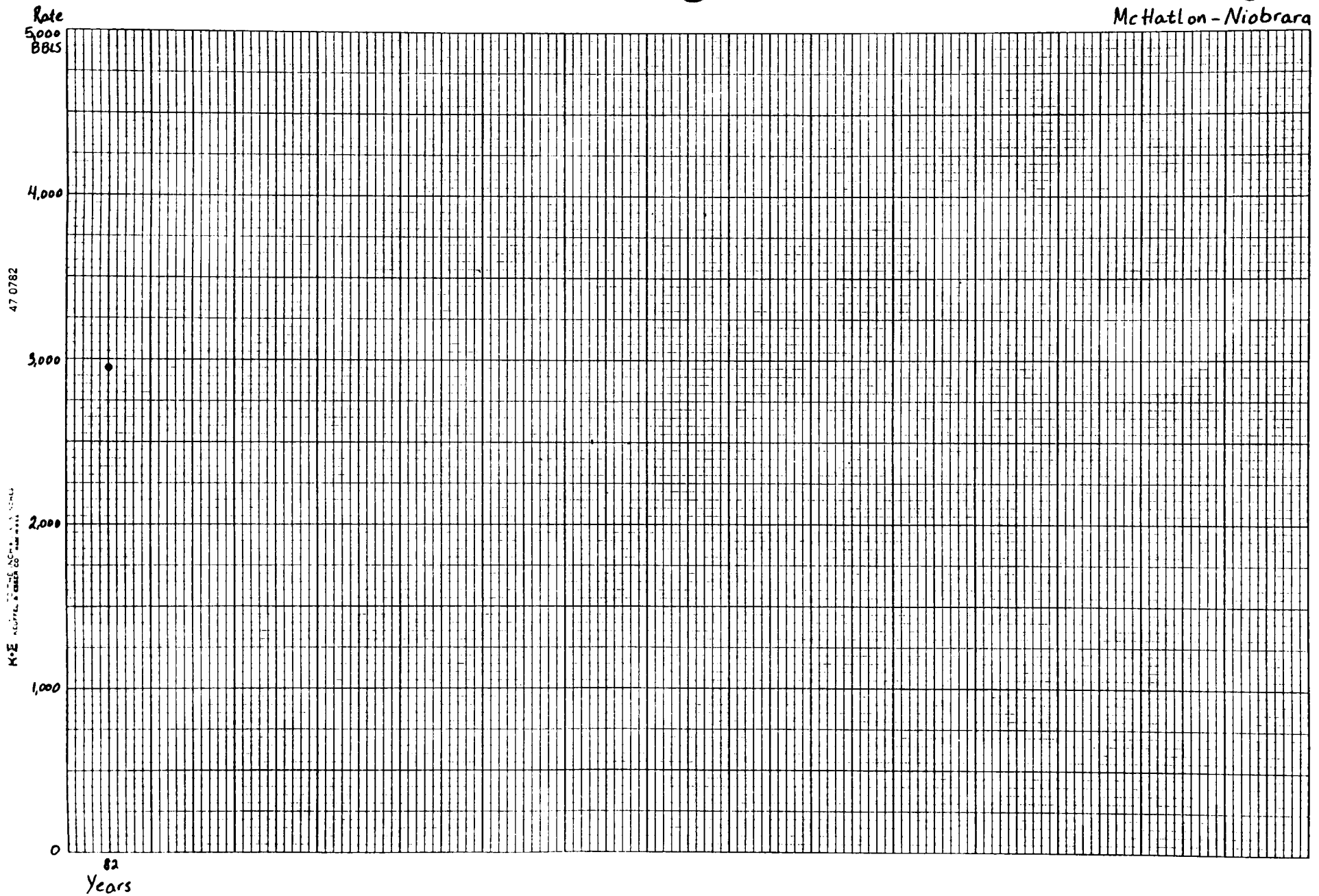
Foundation Creek - Dakota

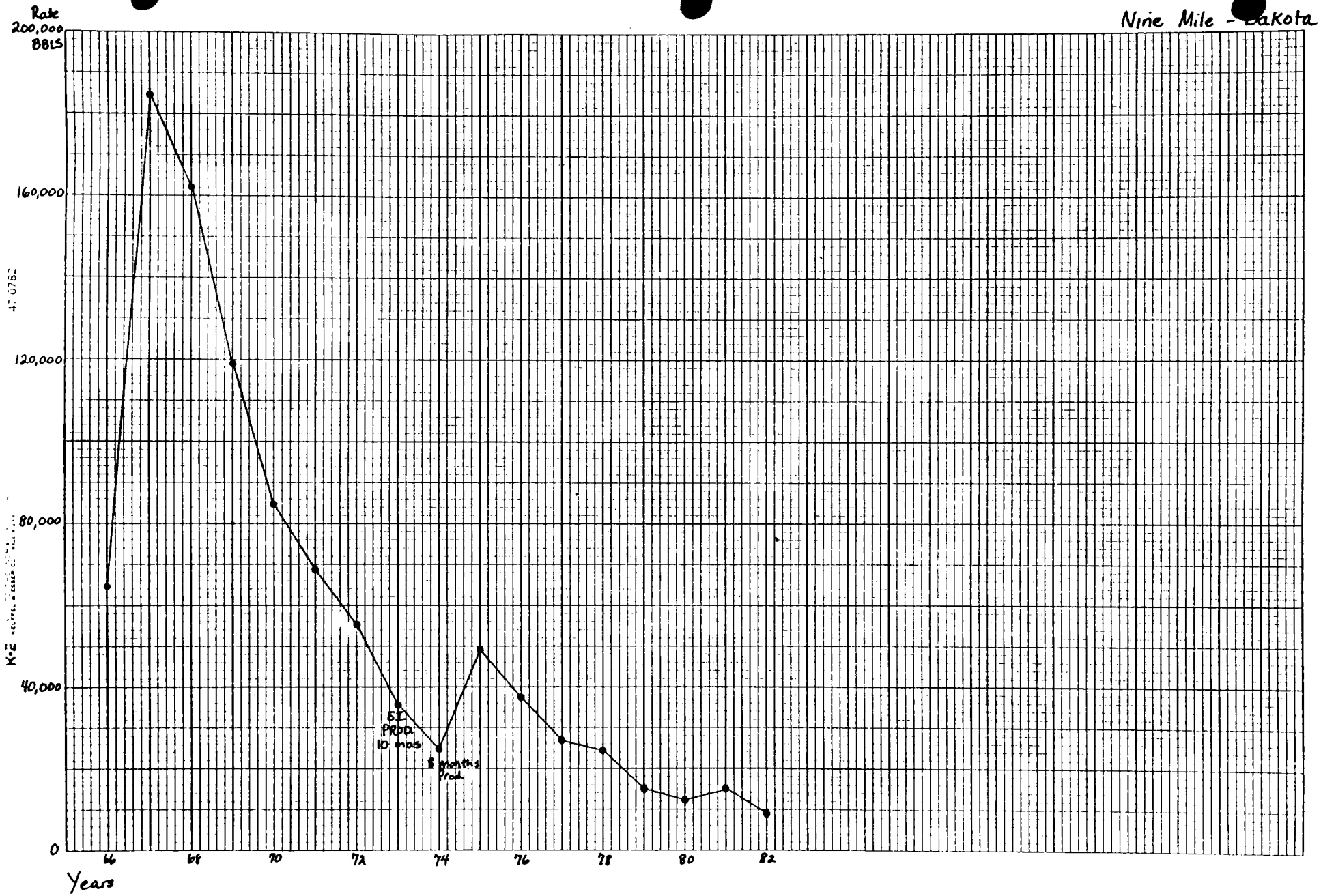



Foundation Creek - Mancos
Rate
500,000
MCF
400,000
300,000
200,000
100,000
0
'75
'77
'79
'81
Years
47 0782
K·E

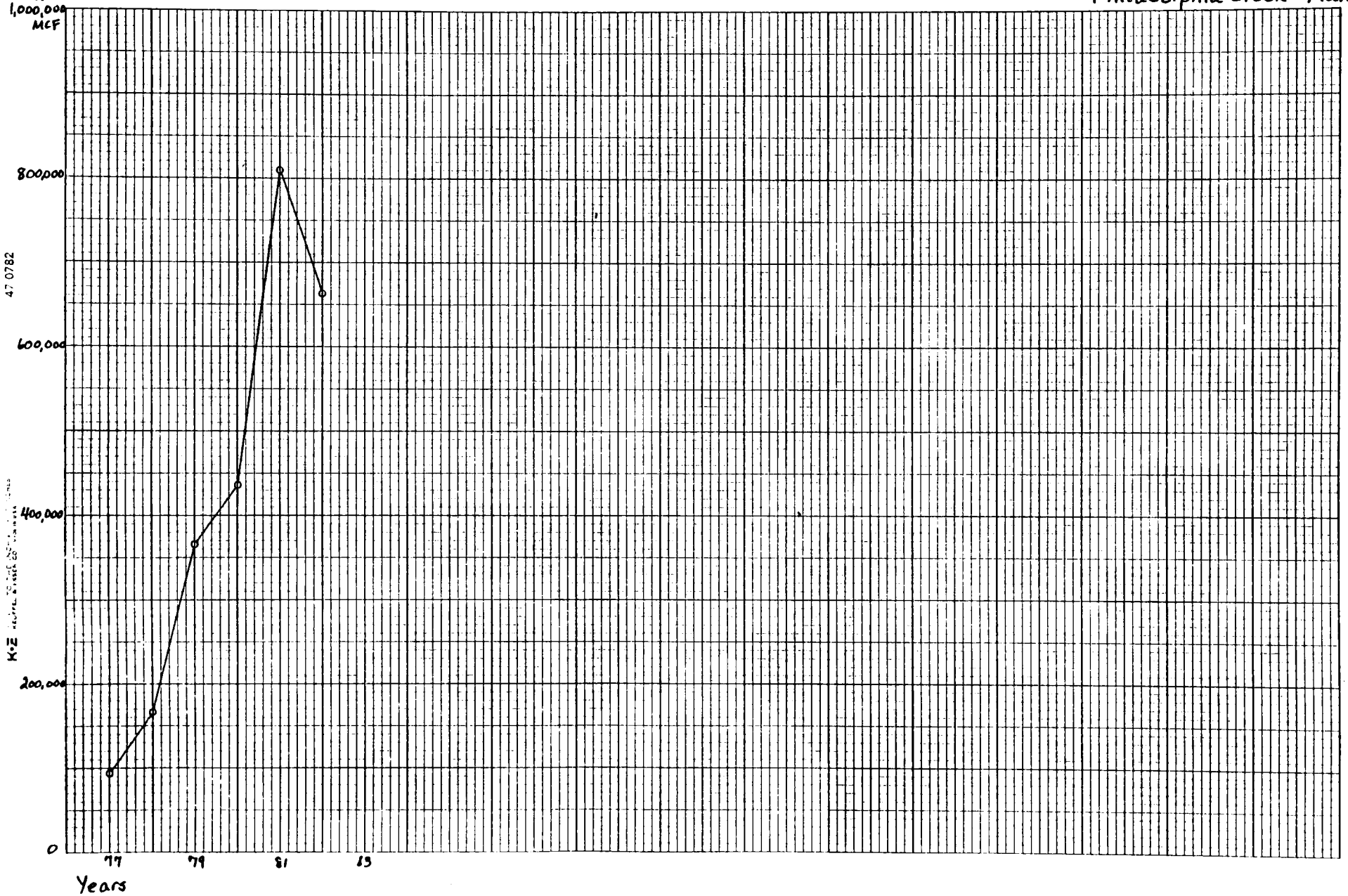

Rate
300,000 MCF
400,000
300,000
200,000
100,000
0
1,000 BBLS
800
600
400
200
0
75
77
79
81
83
Years
Lower Horse D
DaKota

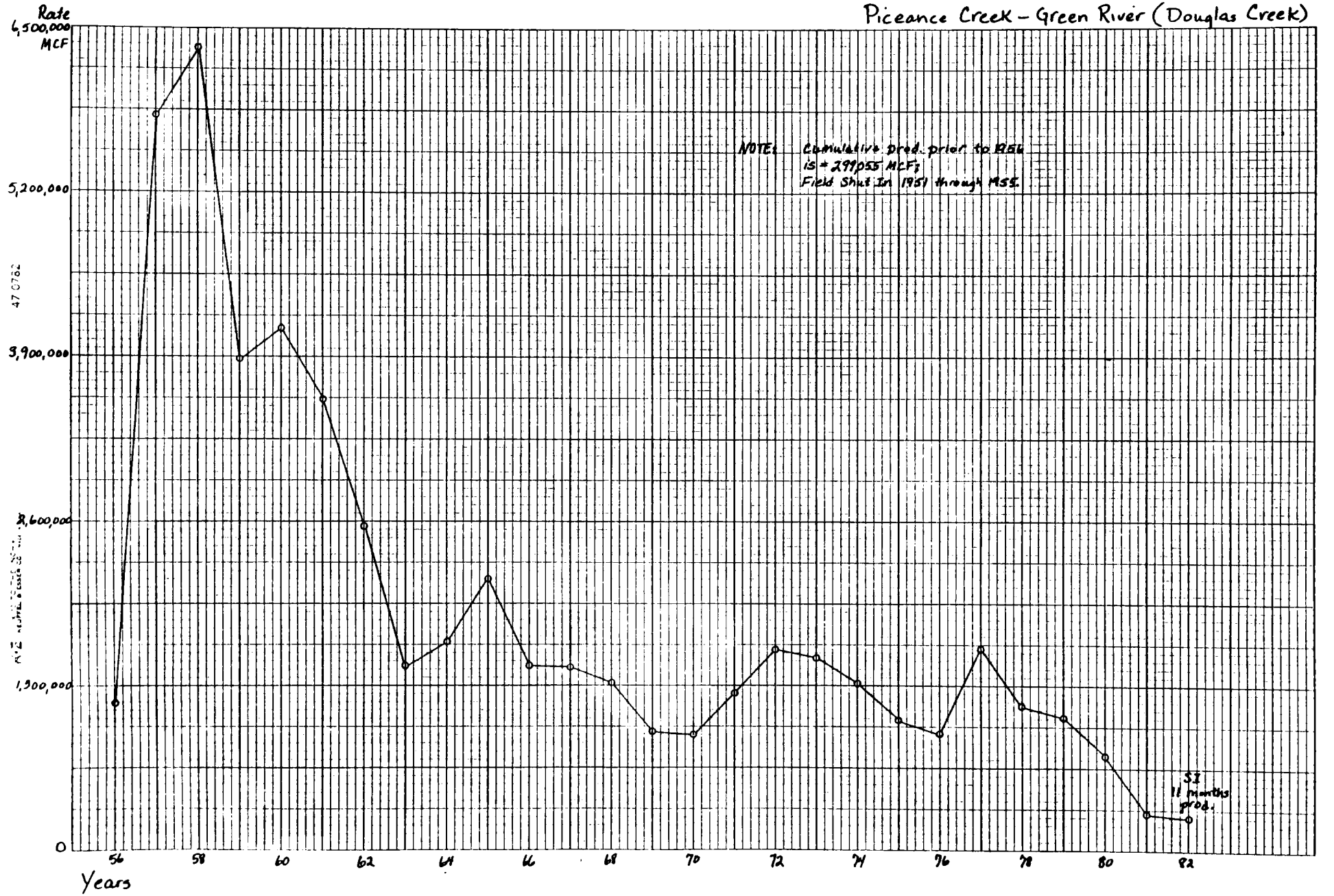

Rate
5,000,000 MCF
4,000,000
3,000,000
2,000,000
1,000,000
0
2,500 BBLS
2,000
1,500
1,000
500
0
61
63
65
67
69
71
73
75
77
79
81
83
Years
Lower Horse Draw- Manc (Emery)
SHUT IN — WAITING FOR PIPELINE
SHUT IN — WAITING FOR PIPELINE
47 0782

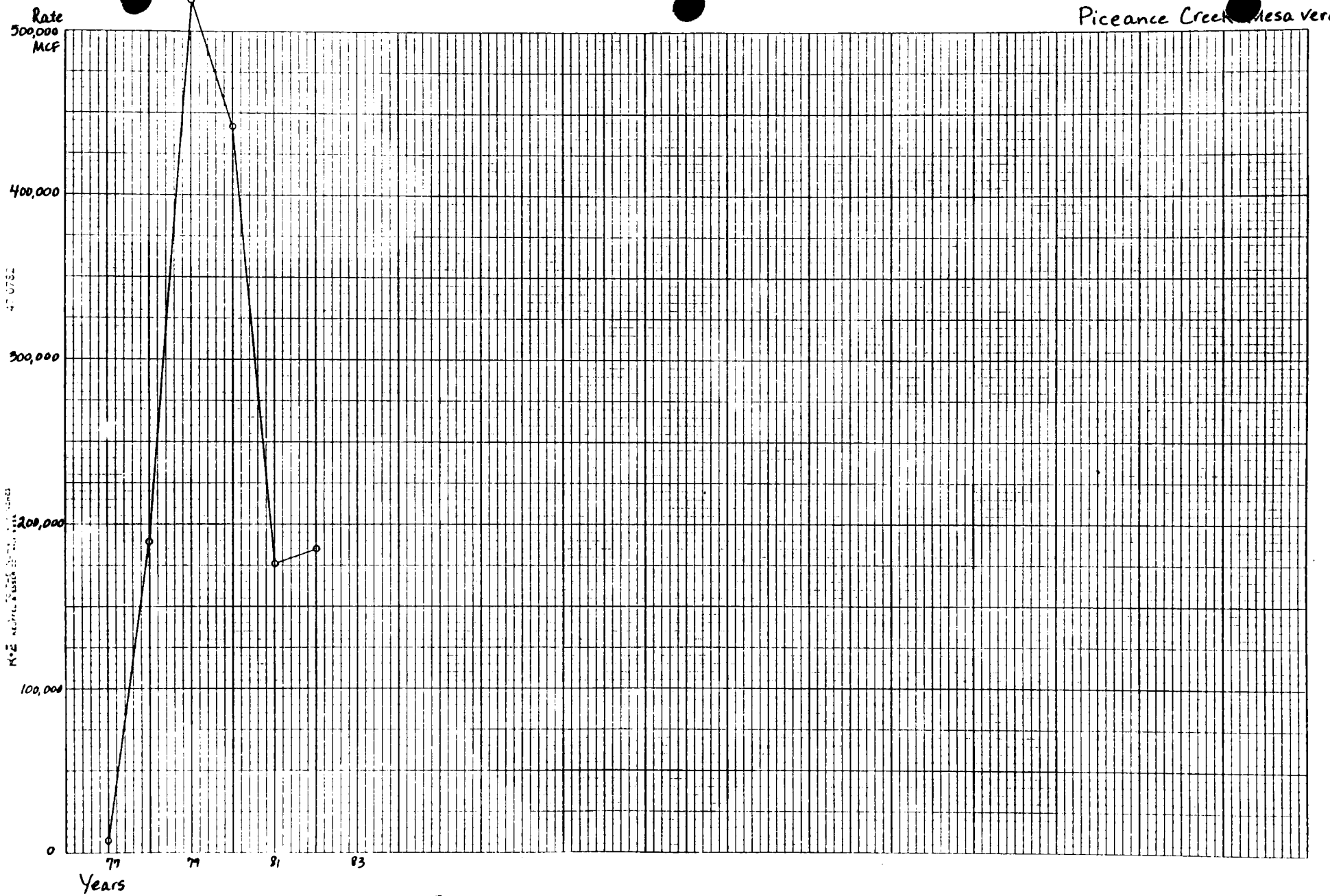

Rate
5,000 BBLS
4,000
3,000
2,000
1,000
0
82
Years
McHatlon - Niobrara
47 0782
K·E

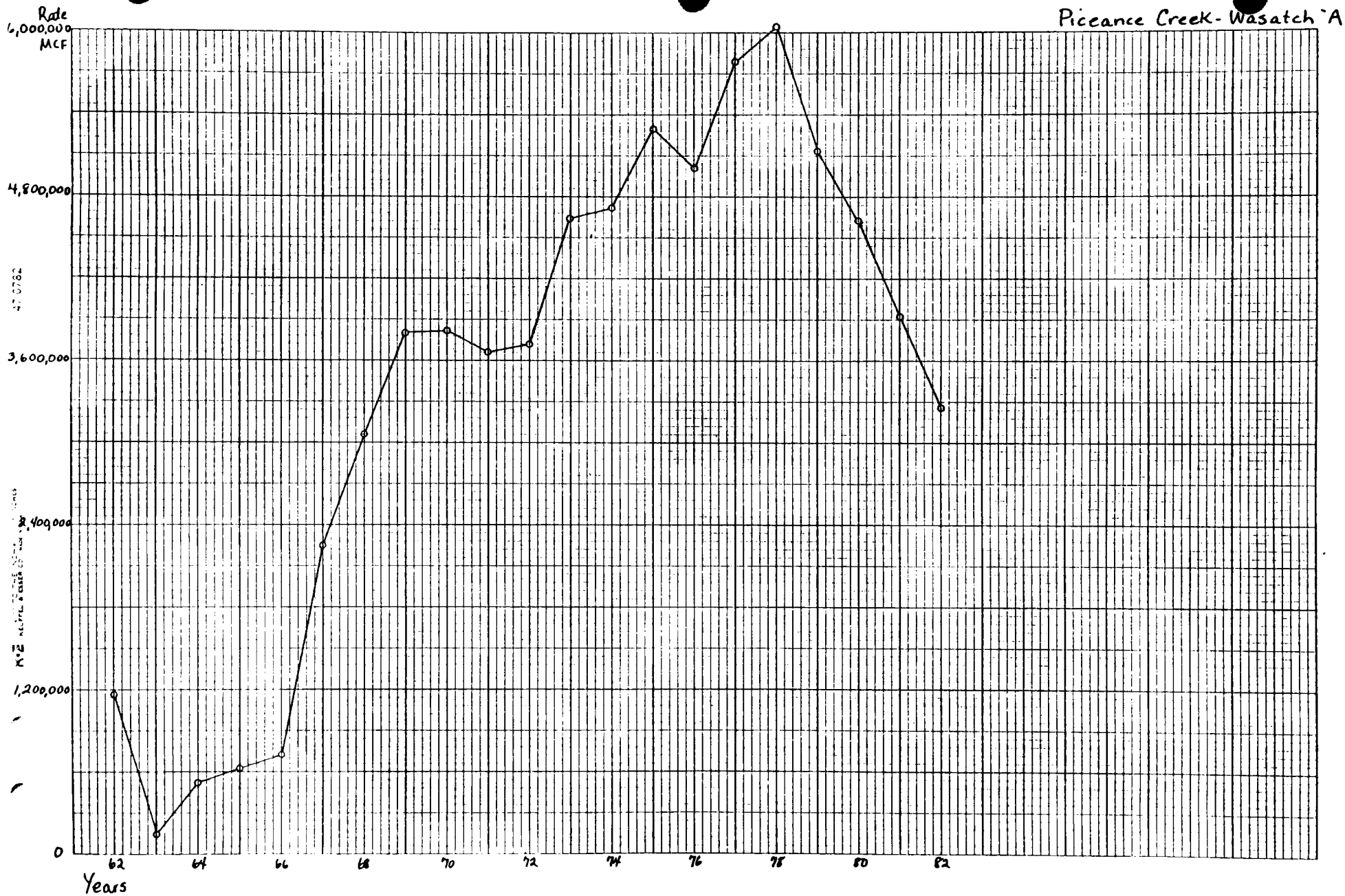

Nine Mile - Dakota
Rate
200,000 BBLS
160,000
120,000
80,000
40,000
0
SI PROD. 10 mos
8 months Prod.
66
68
70
72
74
76
78
80
82
Years

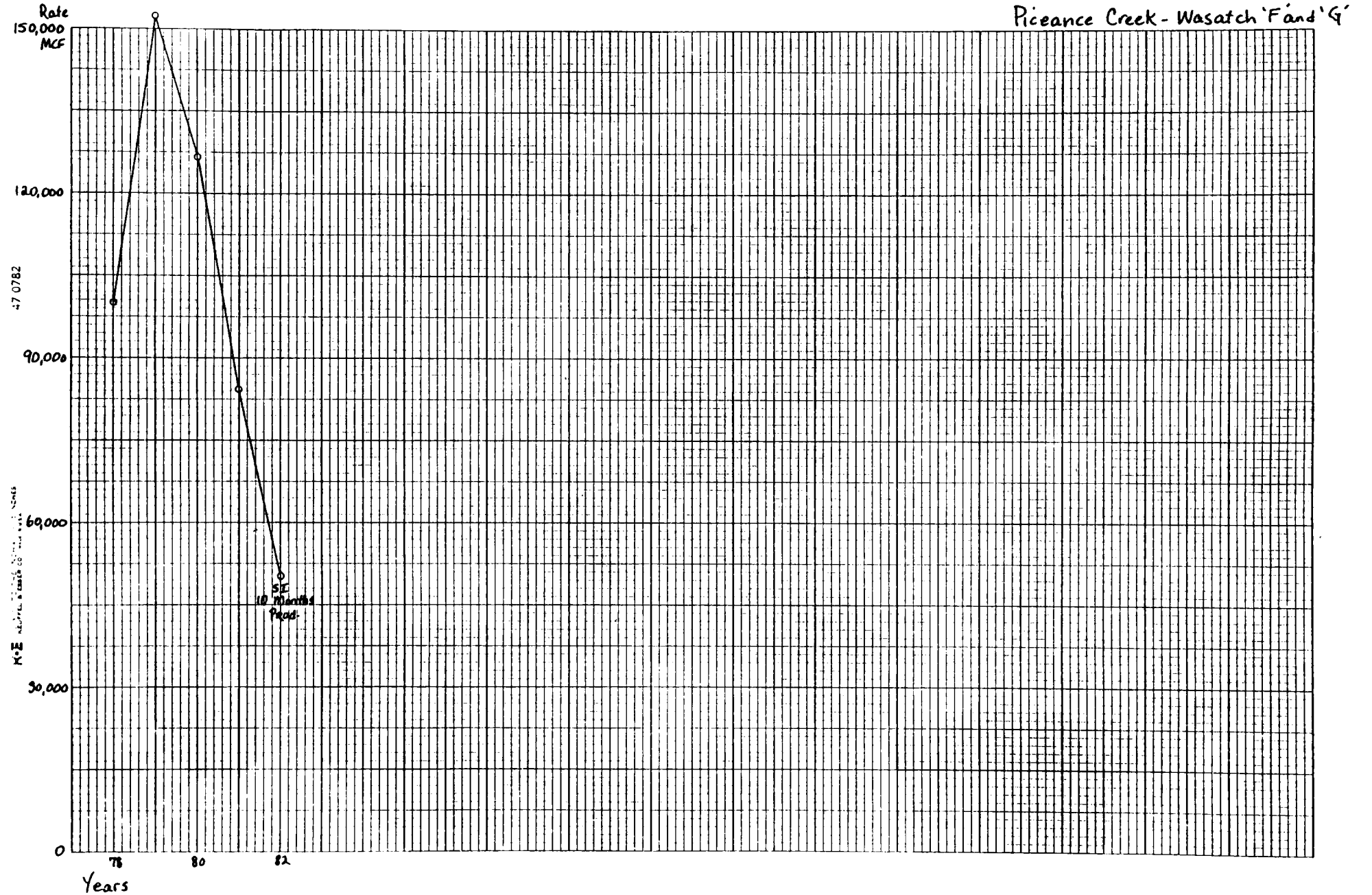
Philadelphia Creek - Mancos

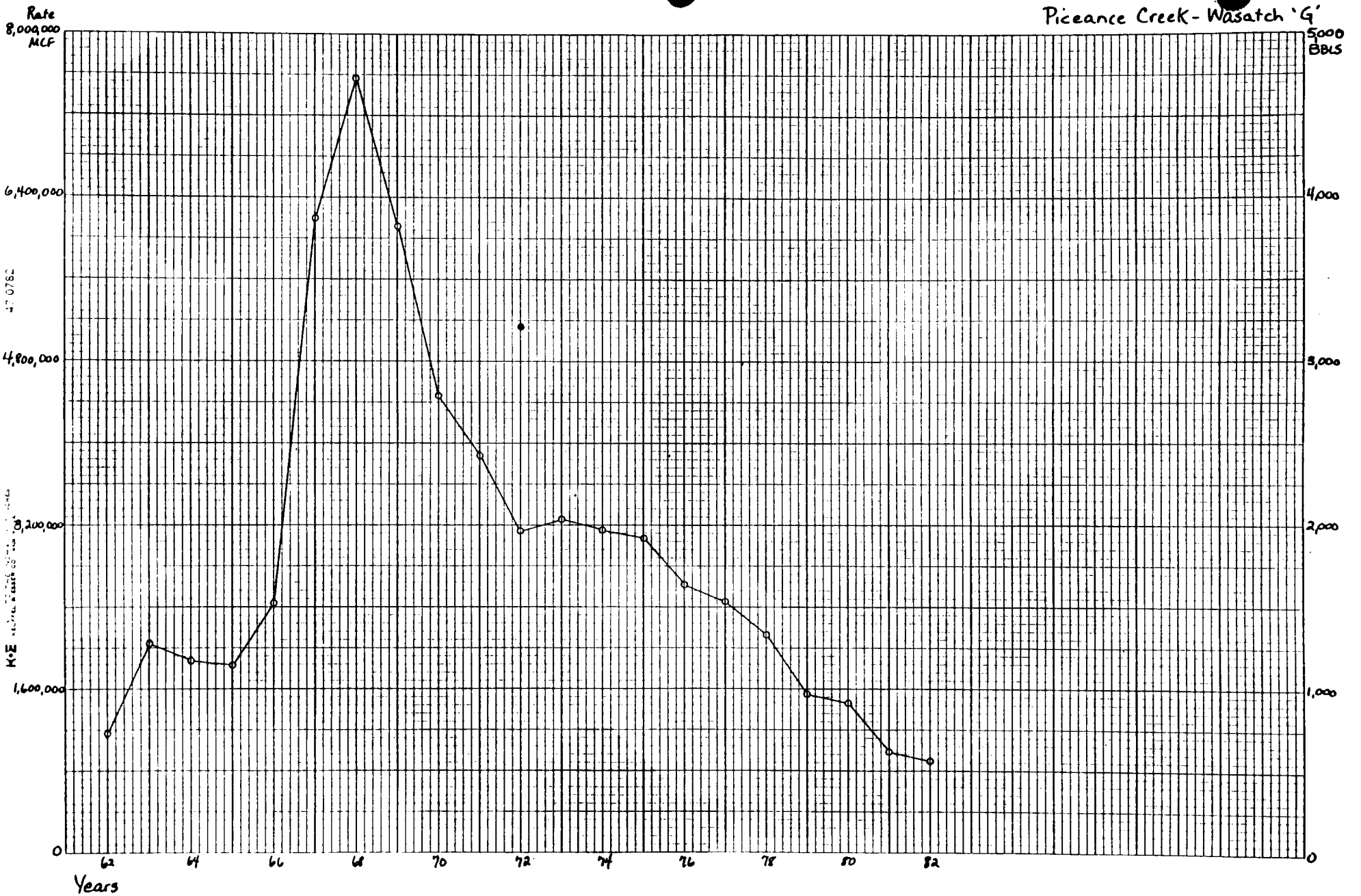



Rate
Piceance Creek – Green River (Douglas Creek)
4,500,000 MCF
5,200,000
3,900,000
2,600,000
1,900,000
0
NOTE: Cumulative Prod. prior to 1956 is = 299,055 MCF; Field Shut In 1951 through 1955.
SI 11 months prod.
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

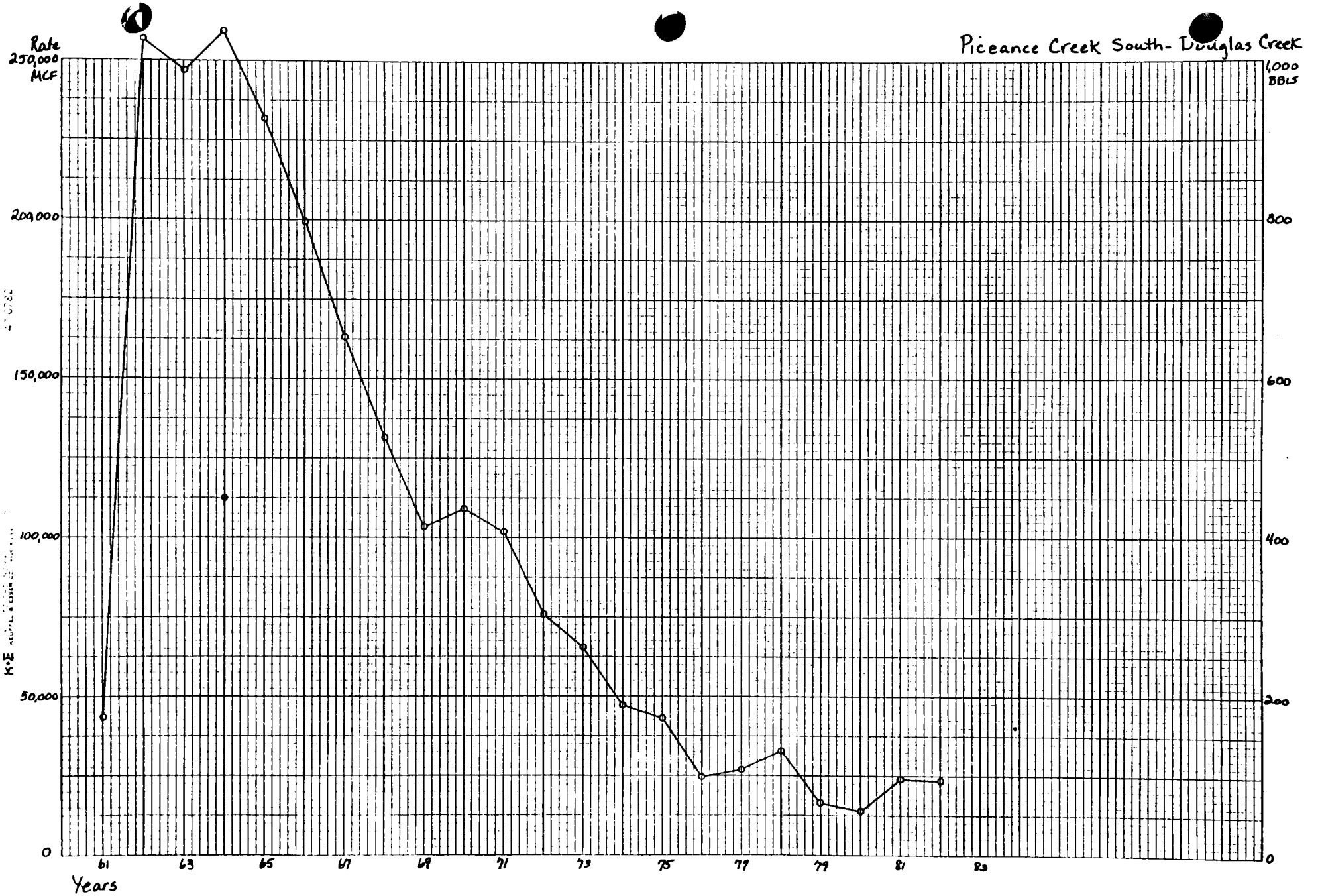

Rate
500,000 MCF
400,000
300,000
200,000
100,000
0
77
79
81
83
Years
Piceance Creek Mesa Verde

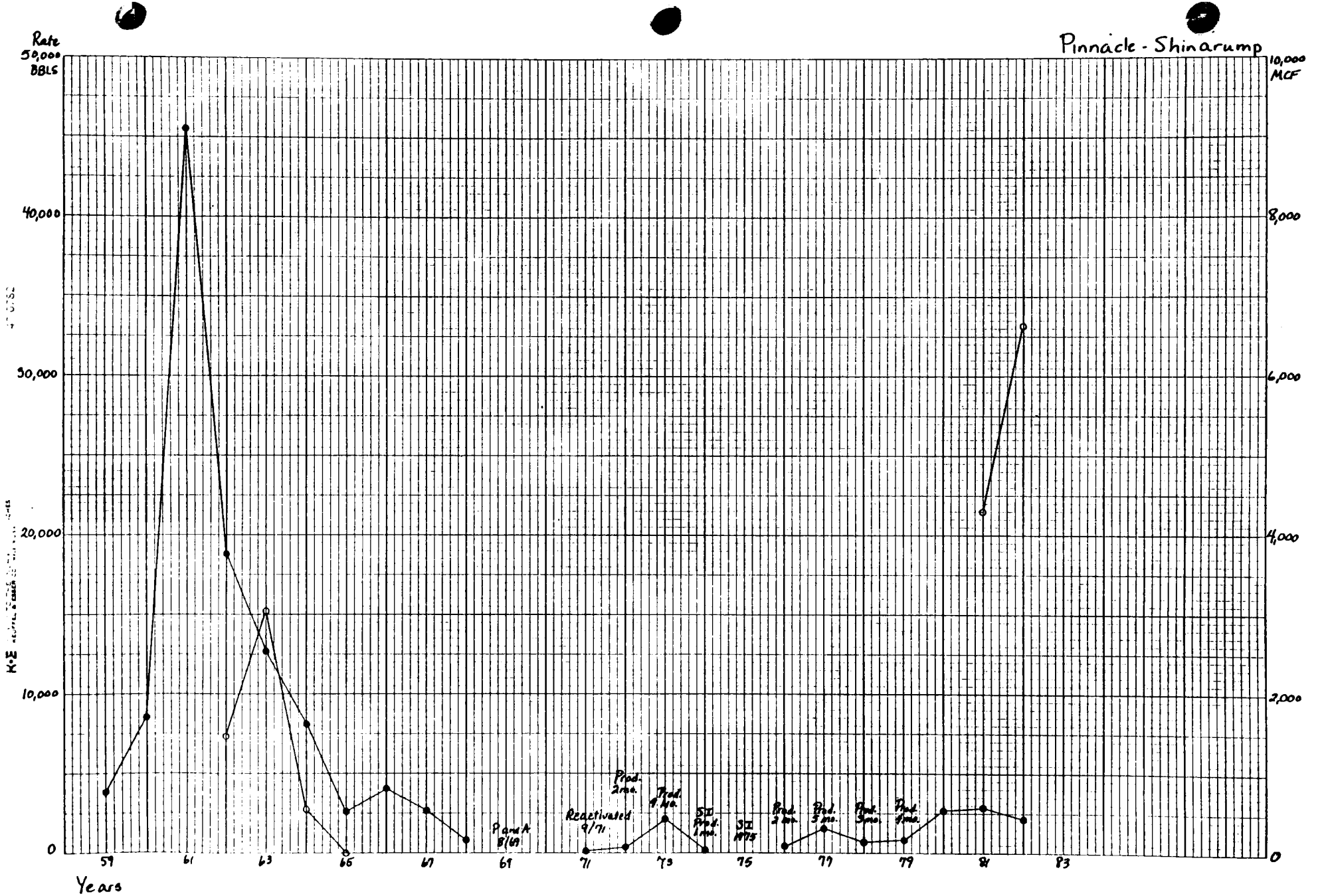

Rate
6,000,000
MCF
4,800,000
3,600,000
2,400,000
1,200,000
0
62
64
66
68
70
72
74
76
78
80
82
Years
Piceance Creek - Wasatch "A"


Piceance Creek - Wasatch 'F' and 'G'
Rate
150,000 MCF
120,000
90,000
60,000
30,000
0
78
80
82
Years
SI
10 Months
Prod.
47 0782
K&E

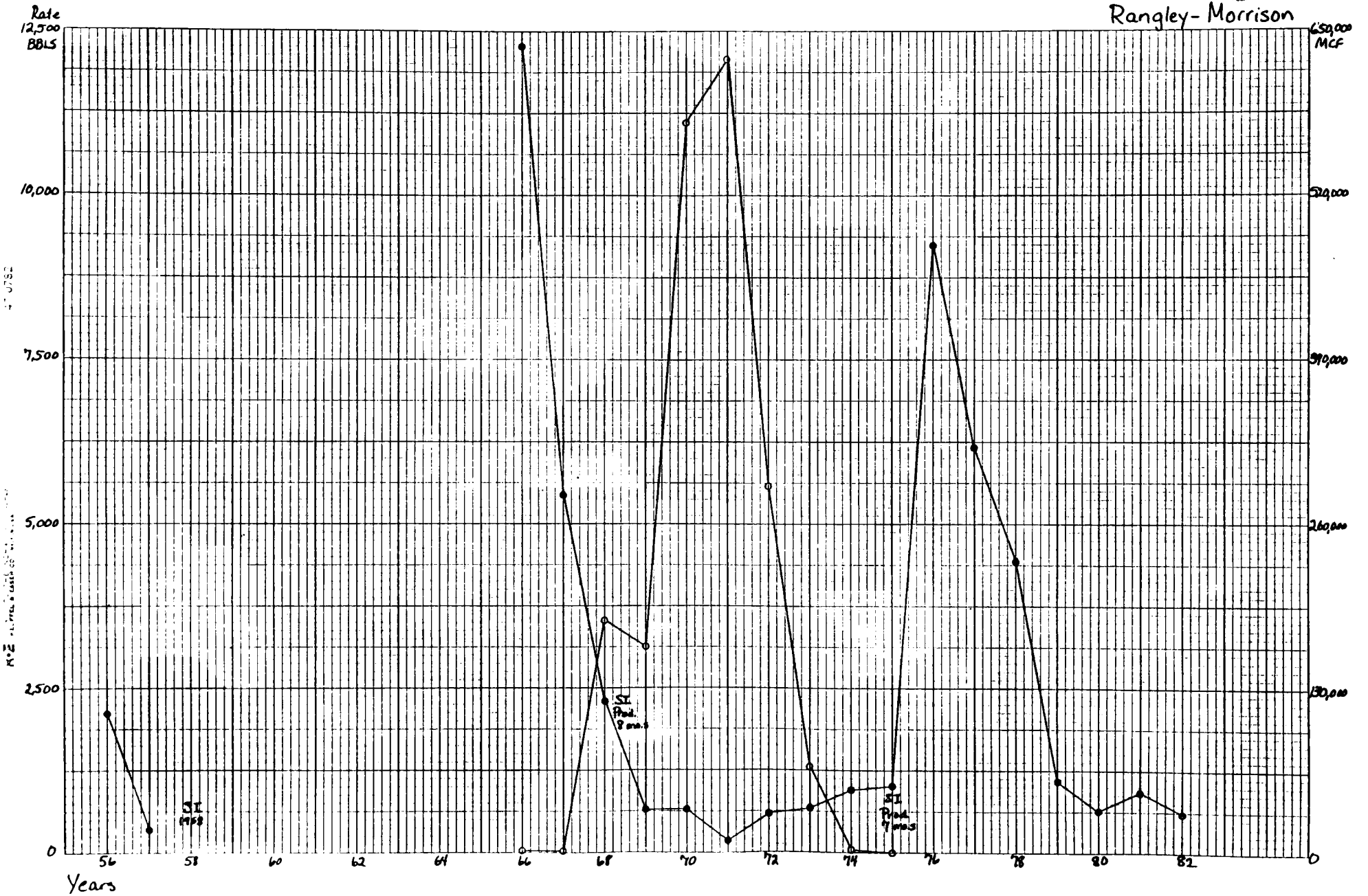


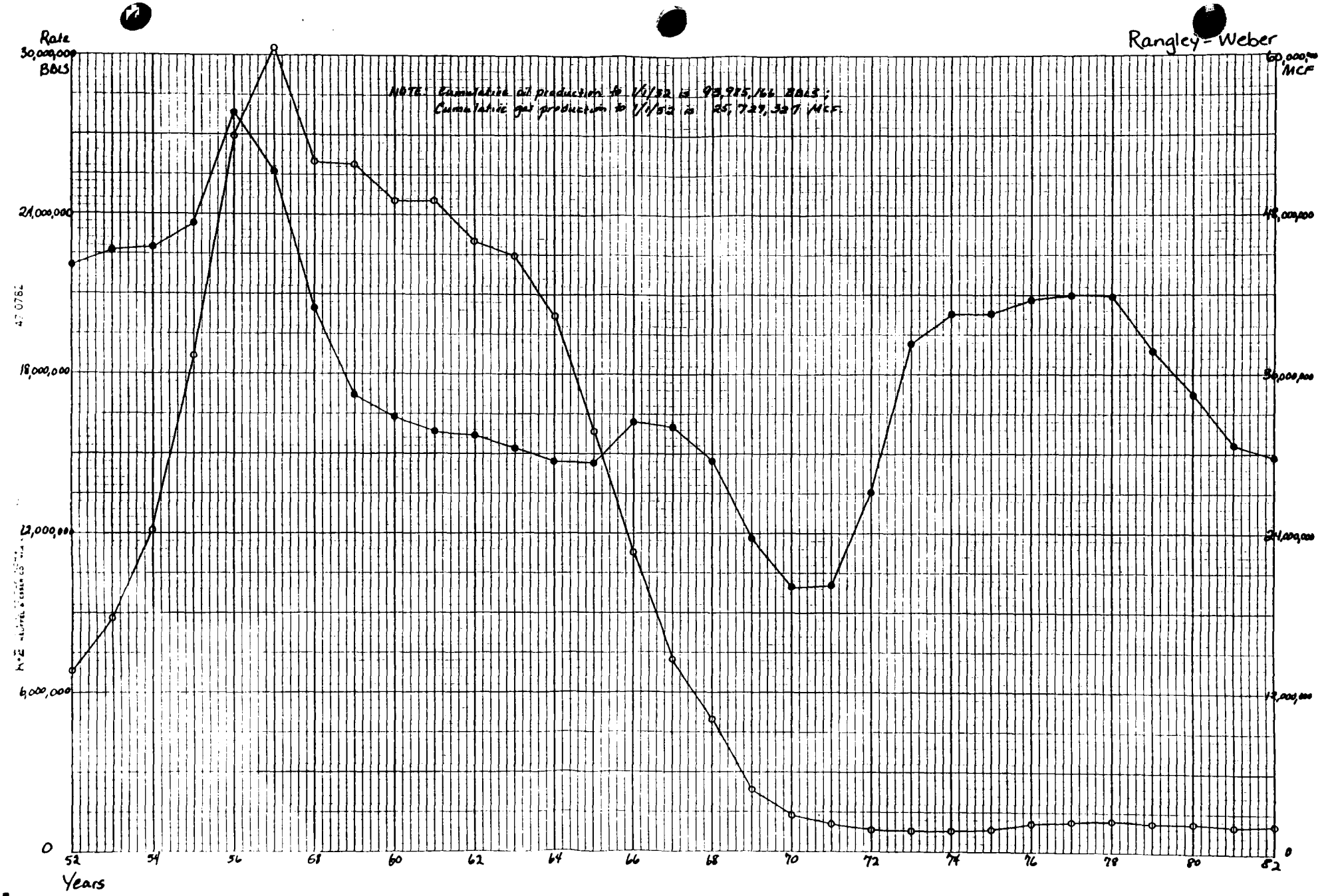
Piceance Creek - Wasatch 'G'

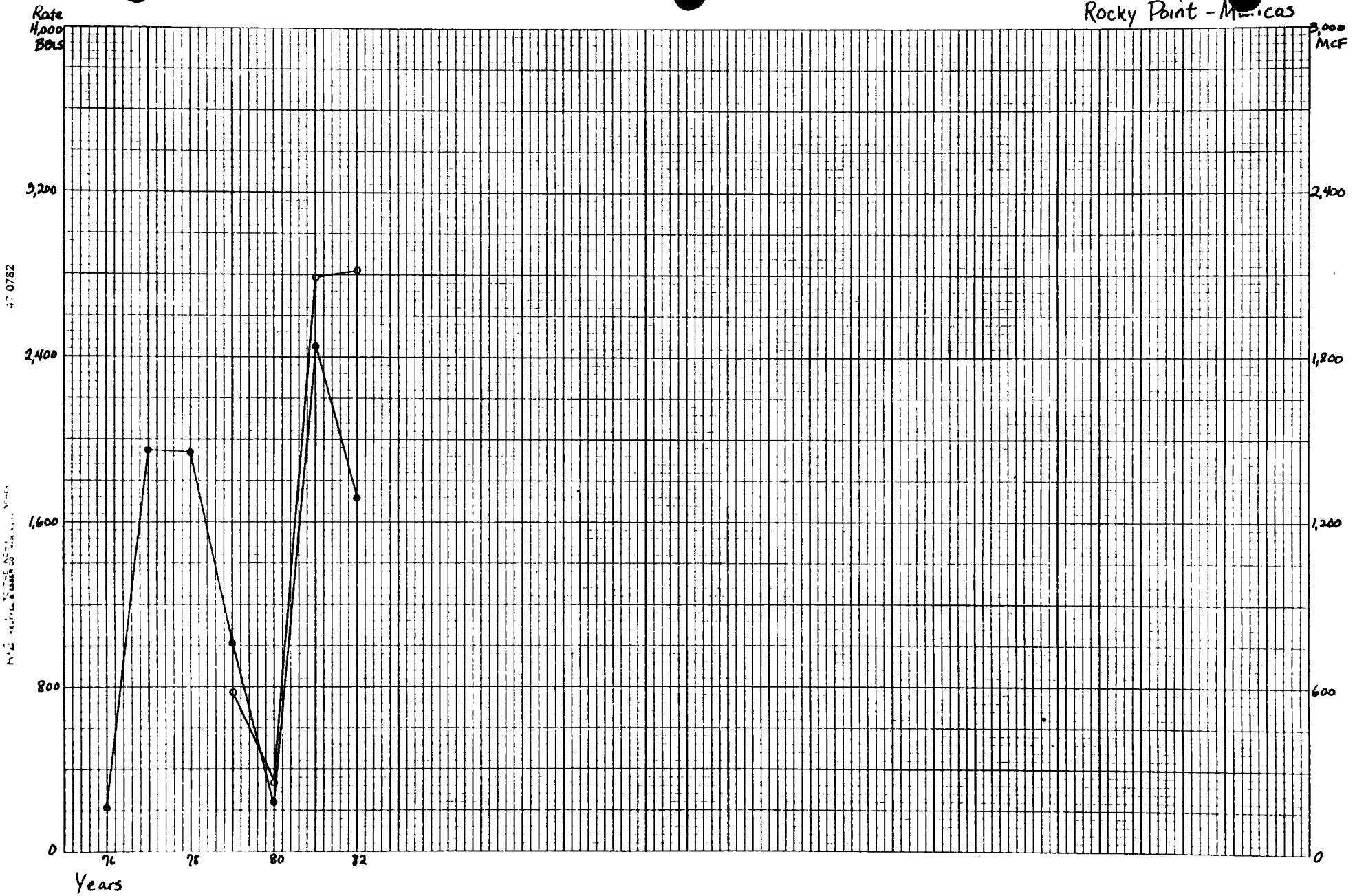

Rate
250,000 MCF
200,000
150,000
100,000
50,000
0
1,000 BBLS
800
600
400
200
0
61
63
65
67
69
71
73
75
77
79
81
83
Years
Piceance Creek South- Douglas Creek

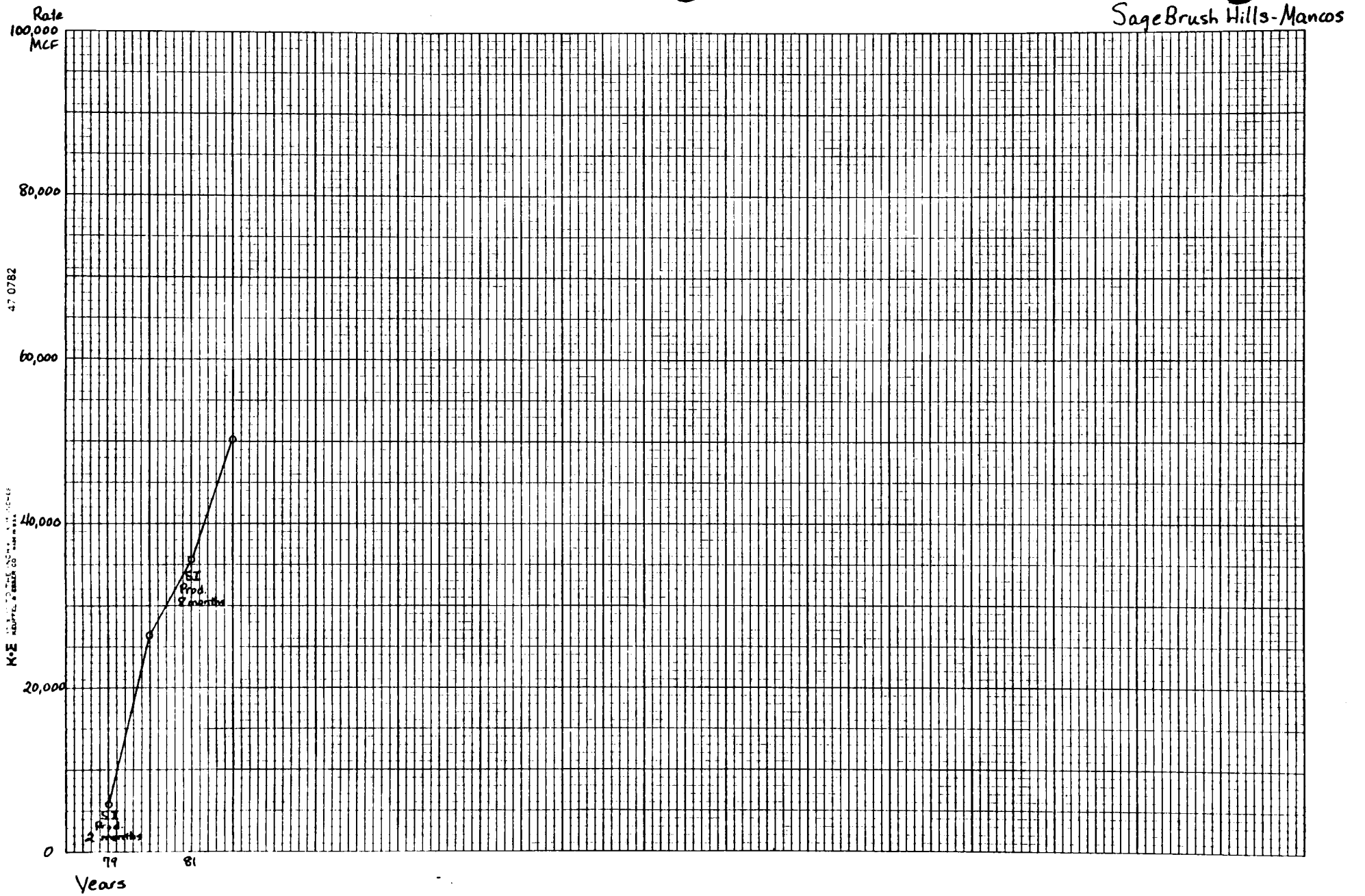

Pinnacle - Shinarump
Rate
50,000 BBLS
40,000
30,000
20,000
10,000
0
10,000 MCF
8,000
6,000
4,000
2,000
0
59
61
63
65
67
69
71
73
75
77
79
81
83
Years
P and A 8/69
Reactivated 9/71
Prod. 2 mo.
Prod. 9 mo.
SI Prod. 1 mo.
SI 1975
Prod. 2 mo.
Prod. 5 mo.
Prod. 5 mo.
Prod. 4 mo.


Rangley - Mancos
Rate
650,000 BBLS
520,000
390,000
260,000
130,000
0
NOTE: Cumulative production to 1/1/52 is 4,184,411
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

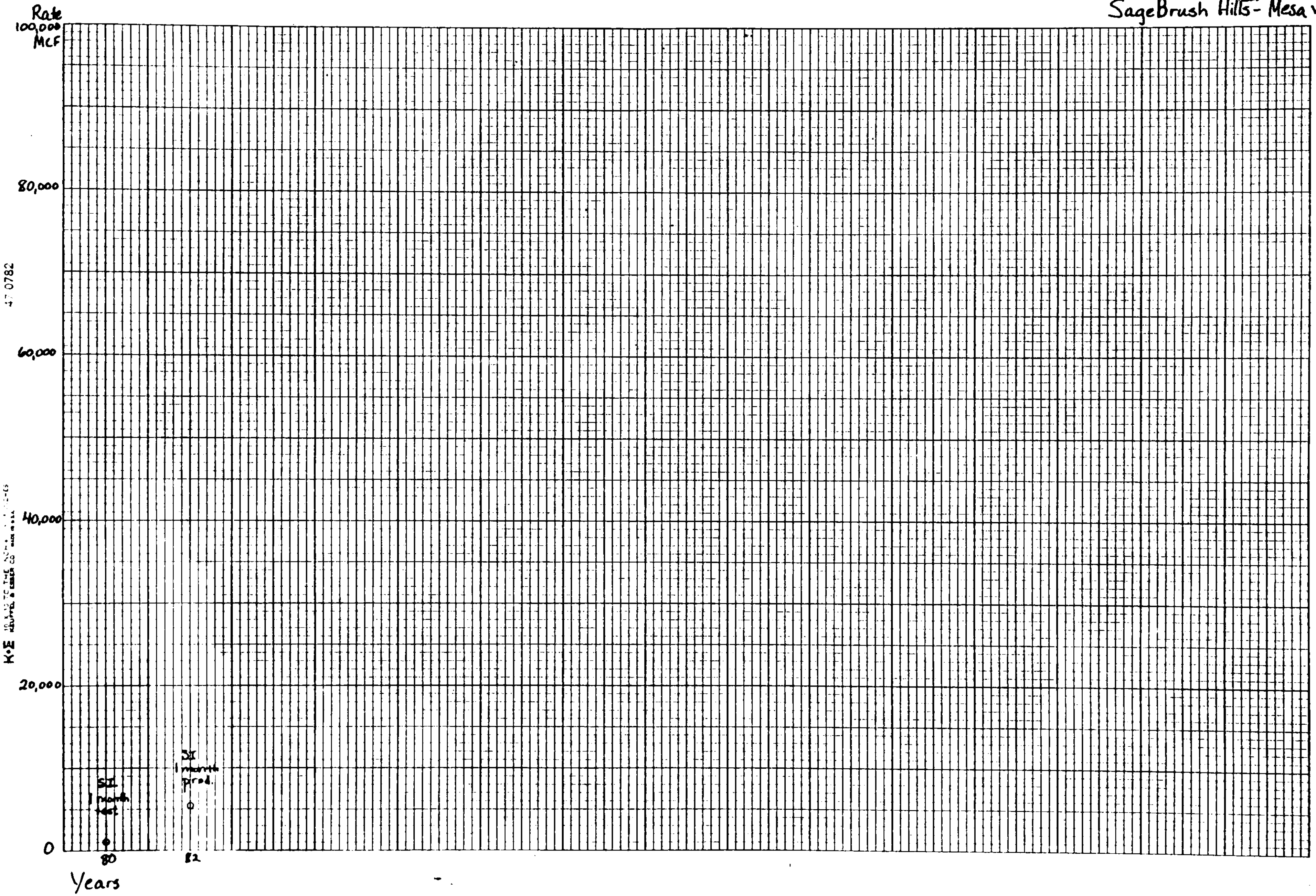

Rangley - Morrison
Rate
12,500 BBLS
10,000
7,500
5,000
2,500
0
650,000 MCF
520,000
390,000
260,000
130,000
0
SI 1958
SI Prod. 8 mos.
SI Prod. 7 mos.
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

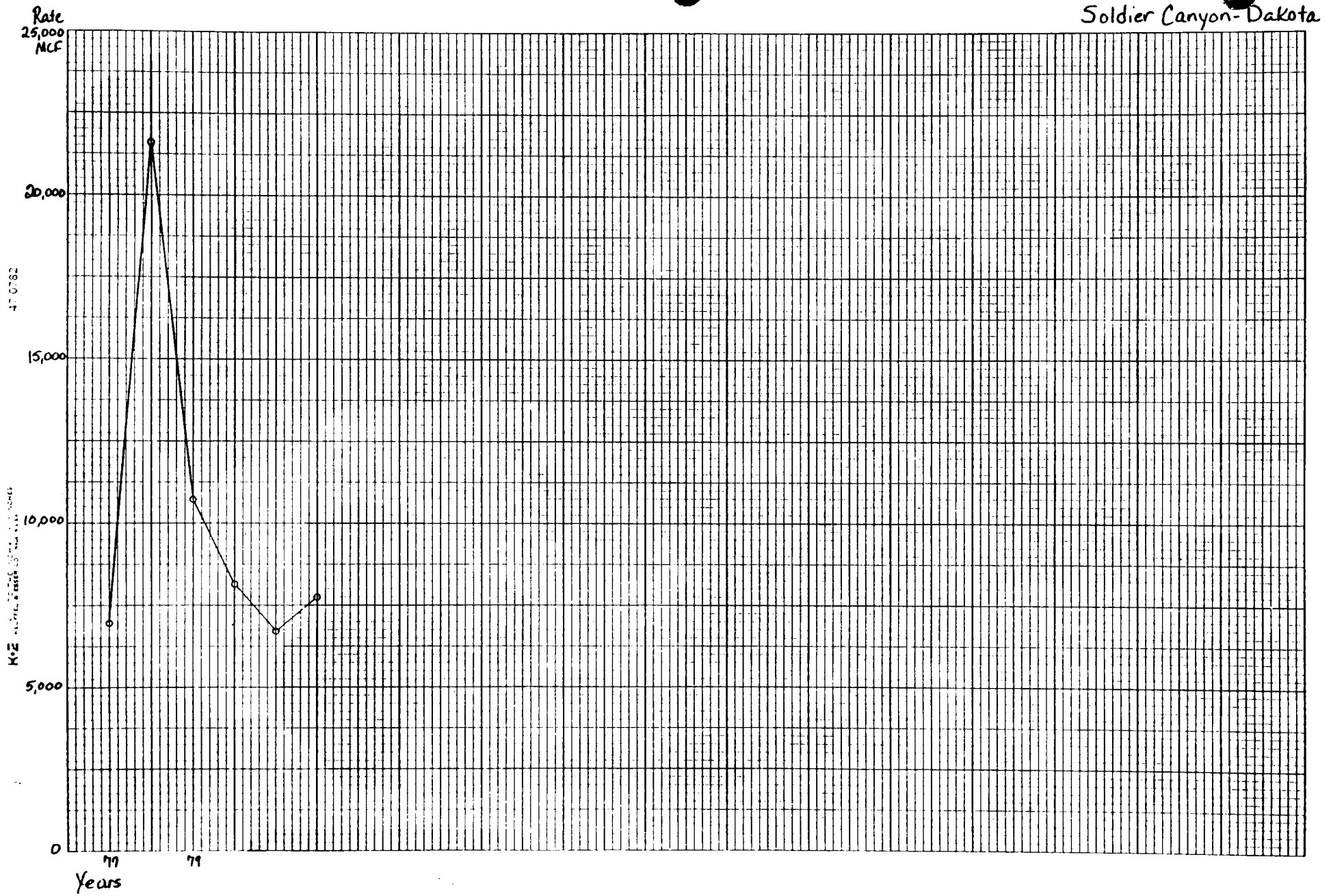

Rangley - Weber
Rate
30,000,000
BBLS
21,000,000
18,000,000
12,000,000
6,000,000
0
MCF
60,000,000
48,000,000
36,000,000
24,000,000
12,000,000
0
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
NOTE: Cumulative oil production to 1/1/82 is 93,985,166 BBLS;
Cumulative gas production to 1/1/82 is 25,729,327 MCF.

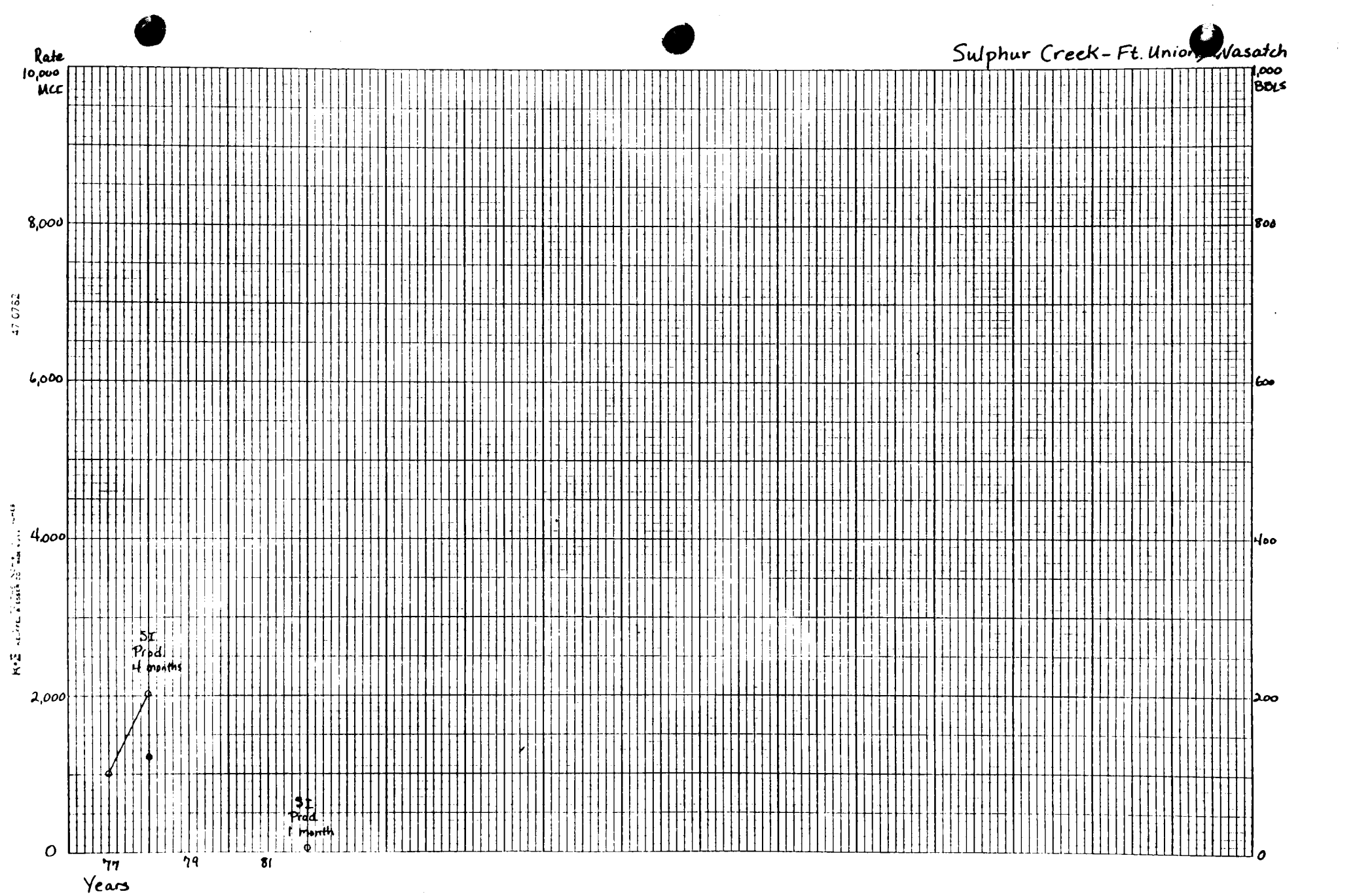

Rocky Point - Mancos
Rate
4,000
BBLS
3,200
2,400
1,600
800
0
8,000
MCF
2,400
1,800
1,200
600
0
76
78
80
82
Years

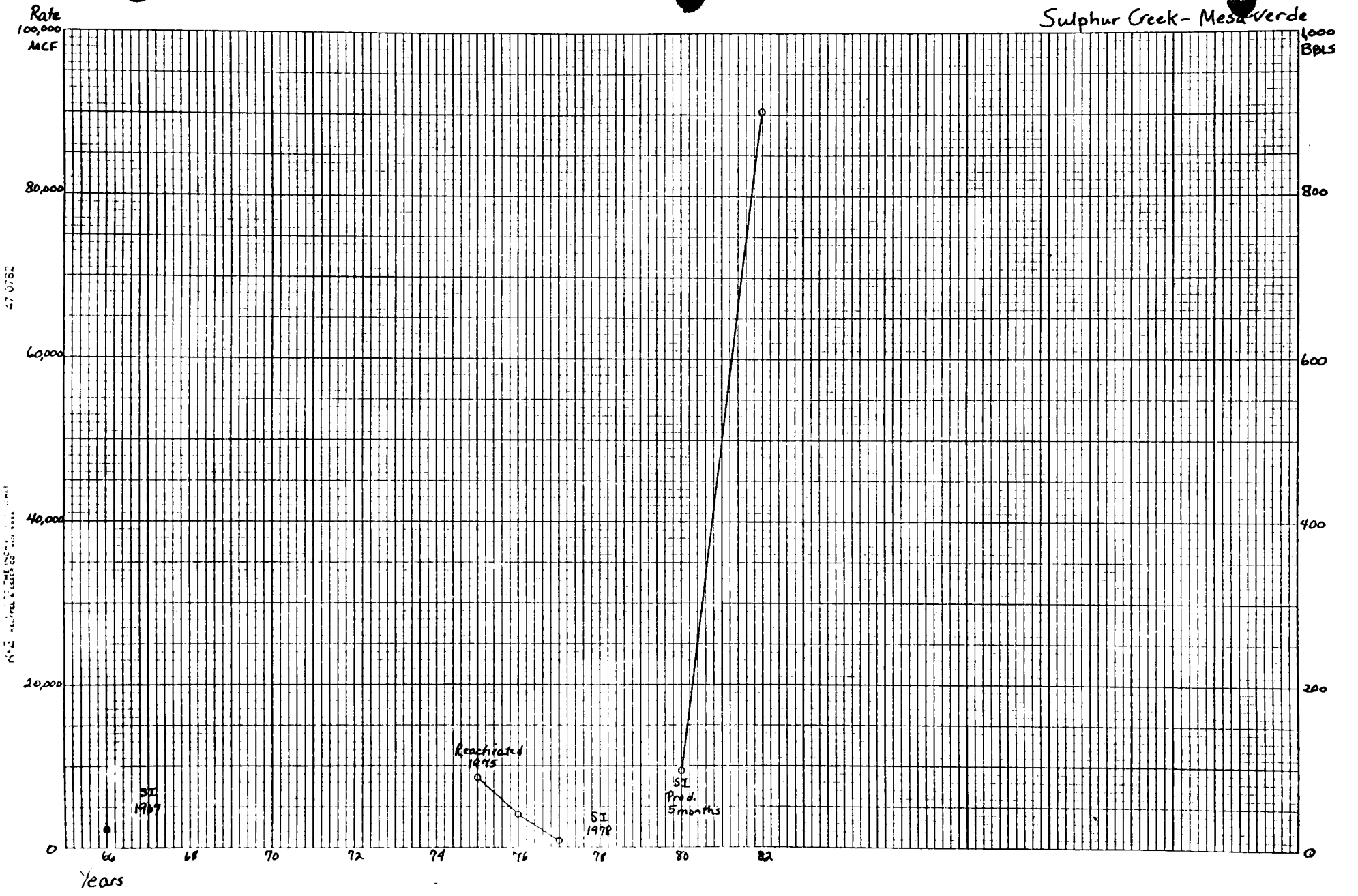

Rate
100,000 MCF
80,000
60,000
40,000
20,000
0
79
81
Years
SI Prod. 2 months
SI Prod. 8 months
SageBrush Hills-Mancos
47 0782
K&E

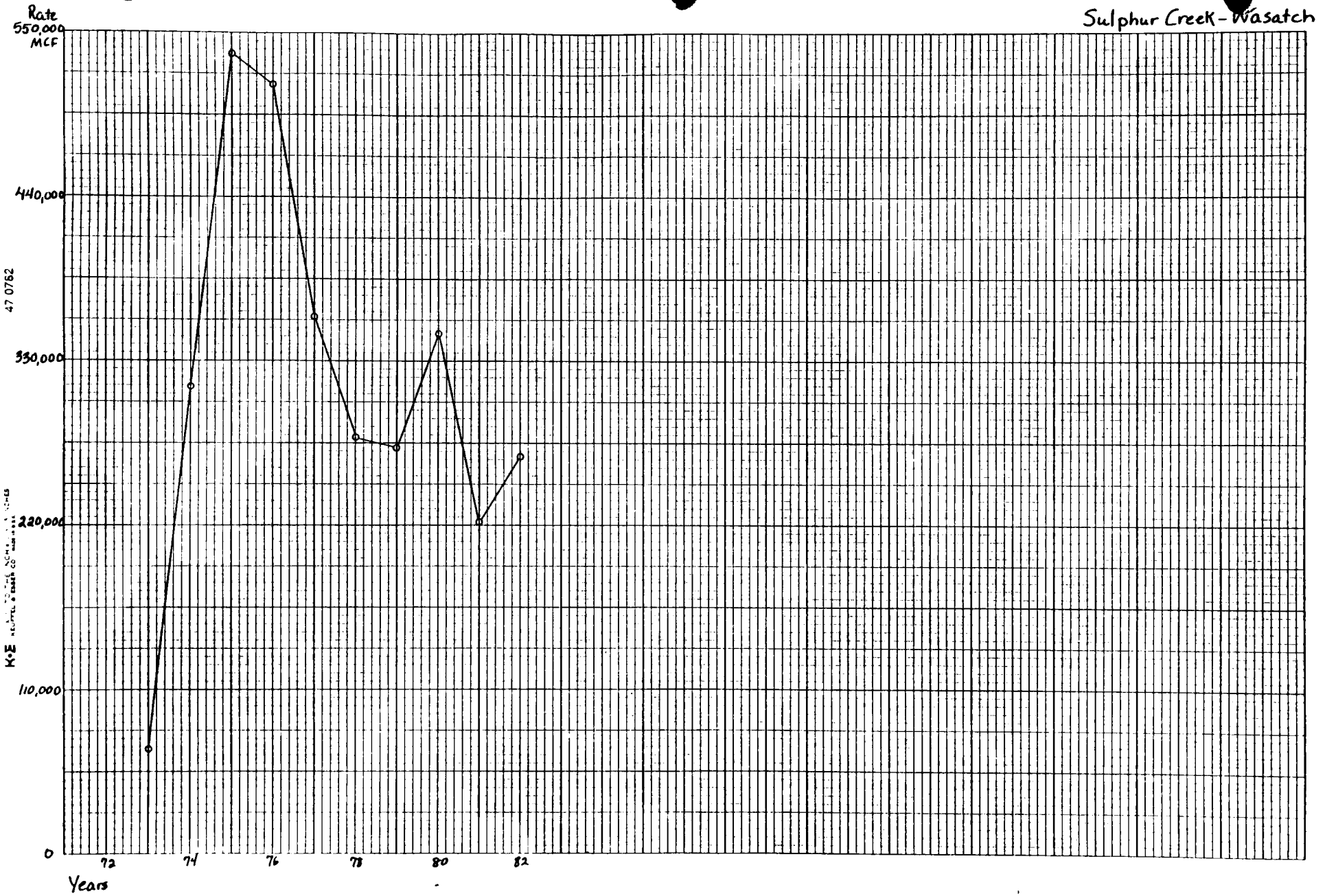
SageBrush Hills - Mesa verde

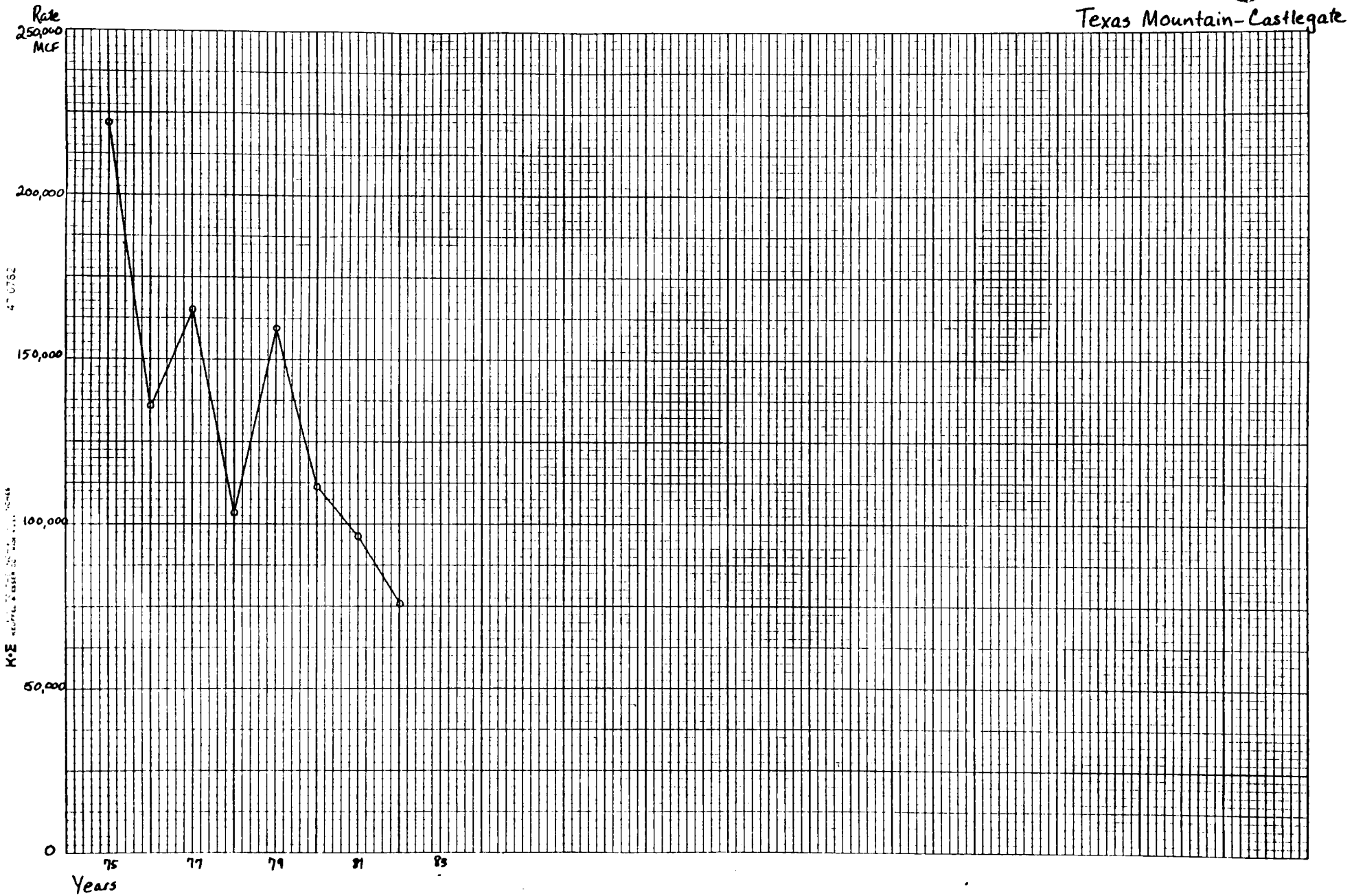


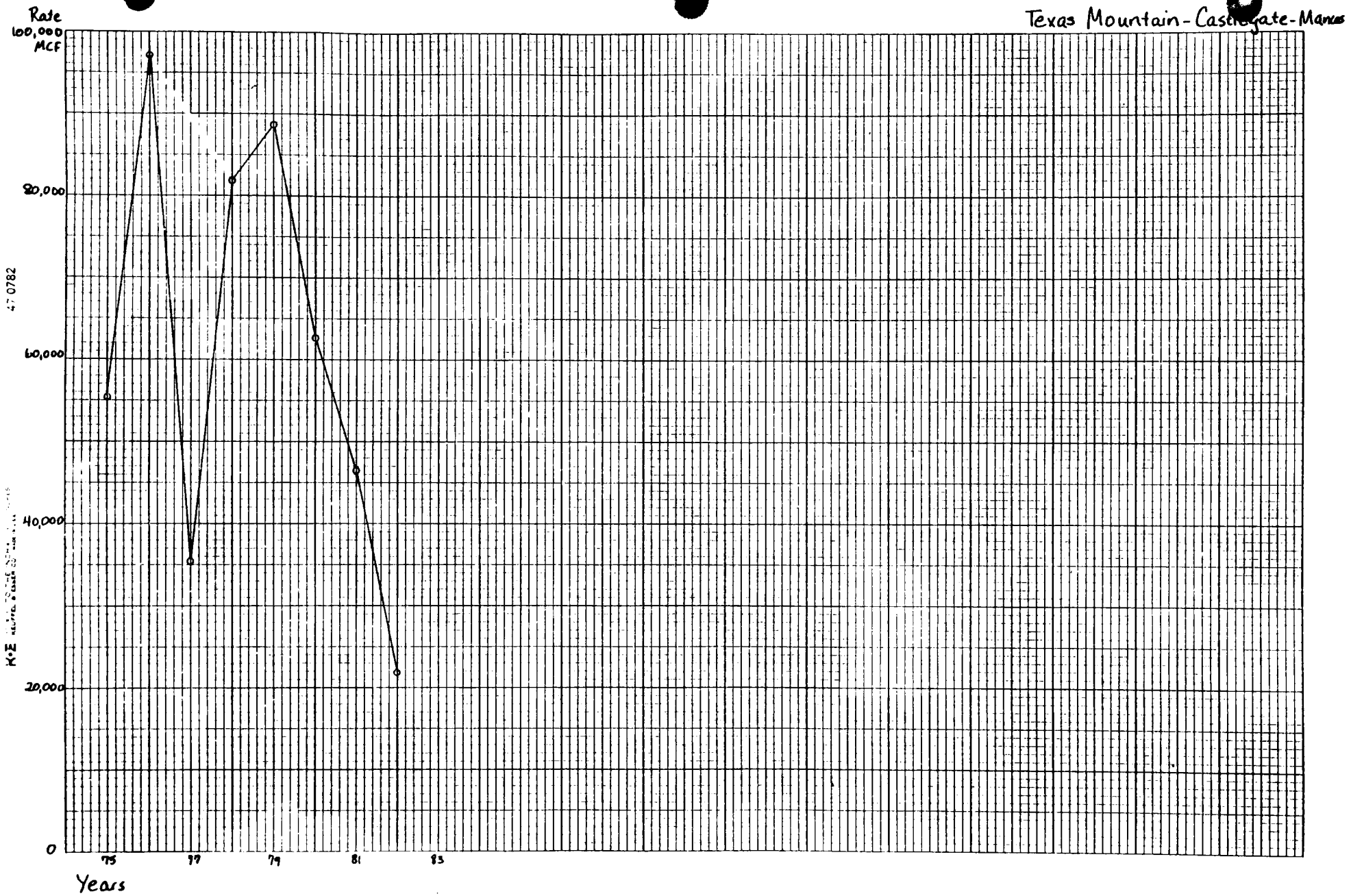

Rate
25,000 MCF
20,000
15,000
10,000
5,000
0
77
79
Years
Soldier Canyon-Dakota

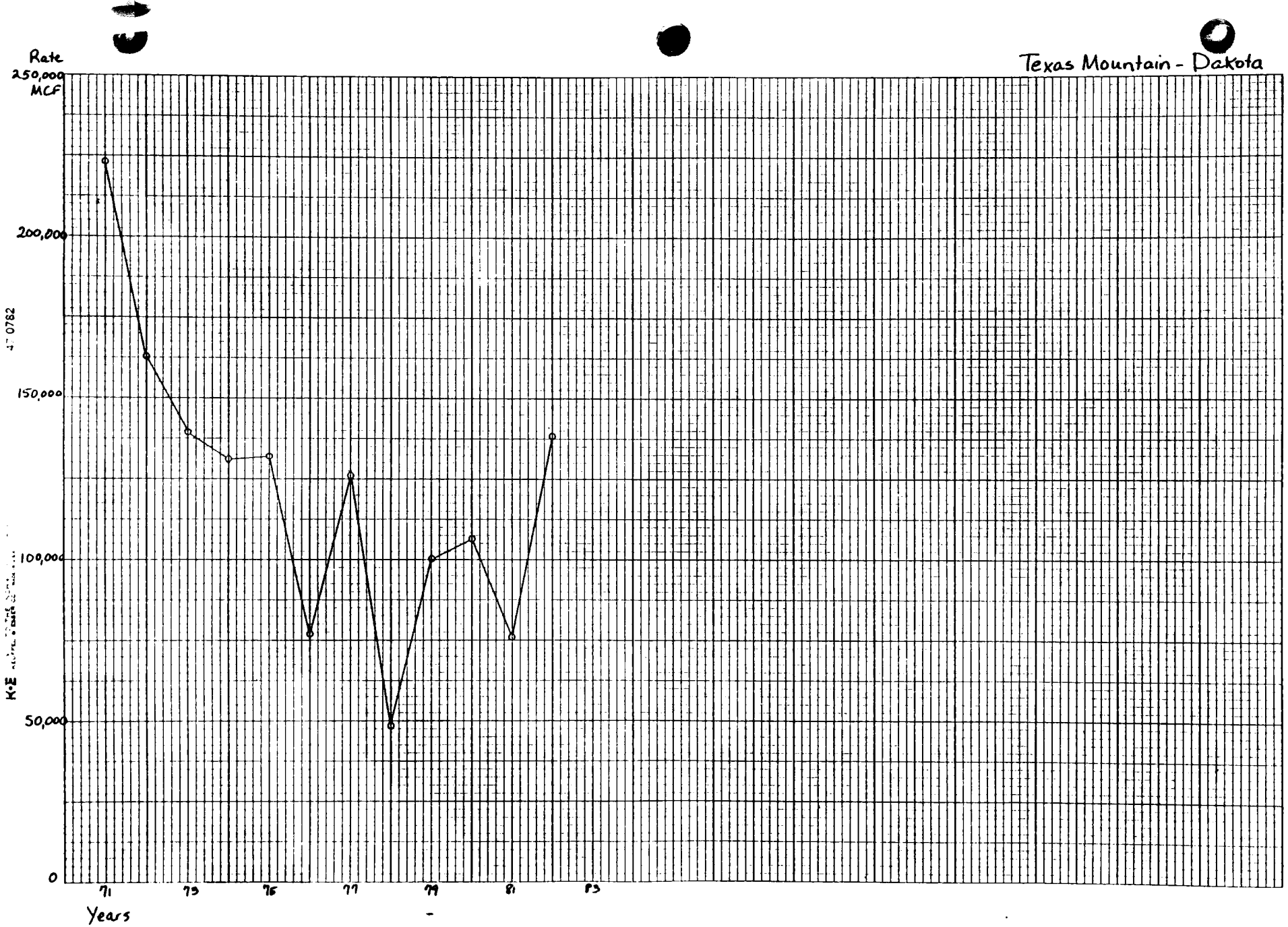

Sulphur Creek - Ft. Union / Wasatch
Rate
10,000 MCF
8,000
6,000
4,000
2,000
0
1,000 BBLS
800
600
400
200
0
SI Prod. 4 months
SI Prod 1 Month
77
79
81
Years
47 0782

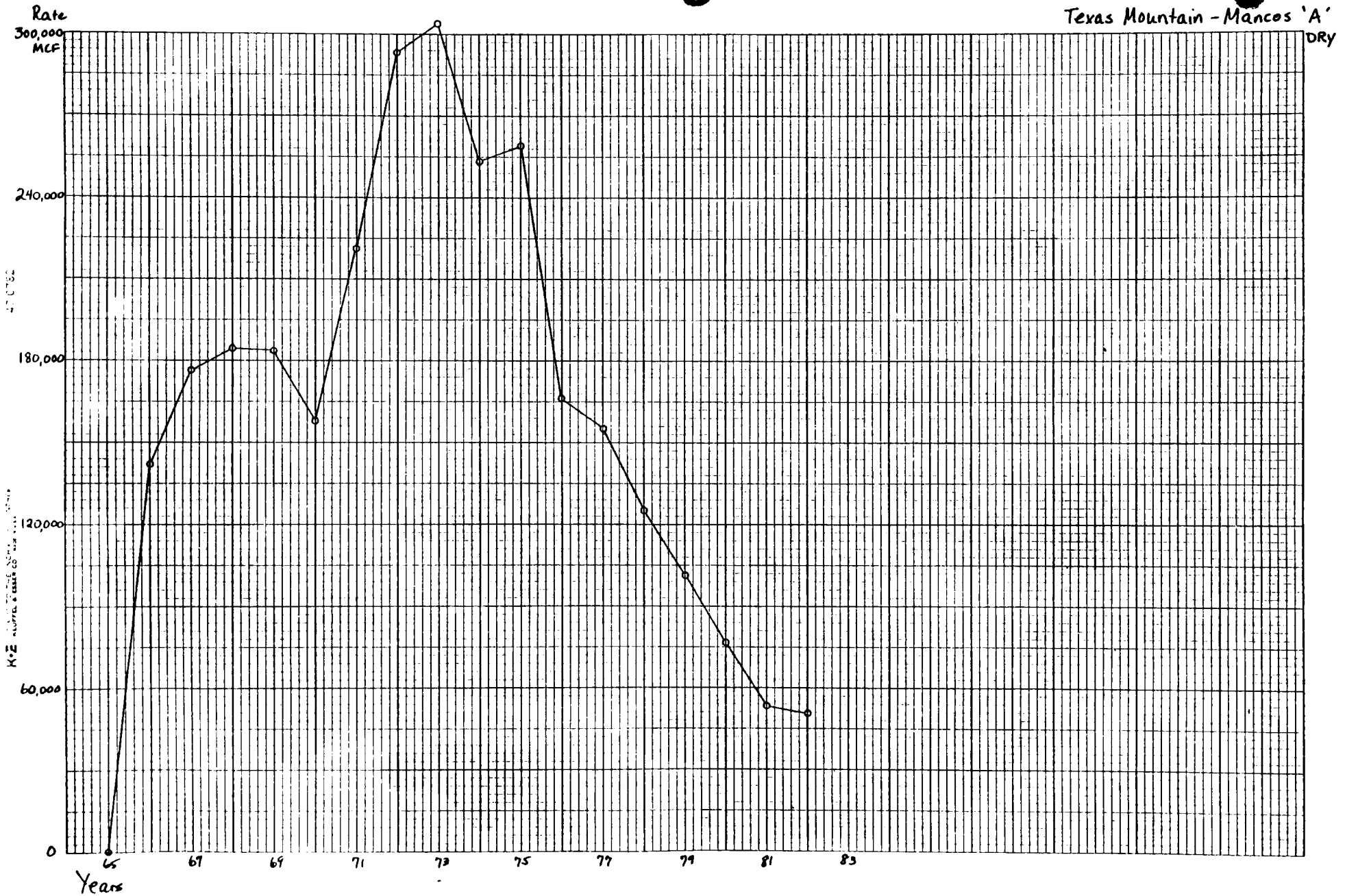

Rate
100,000 MCF
80,000
60,000
40,000
20,000
0
Sulphur Creek - Mesa Verde
1000 BBLS
800
600
400
200
0
66
68
70
72
74
76
78
80
82
Years
SI 1967
Reactivated 1975
SI 1978
SI Prod. 5 months

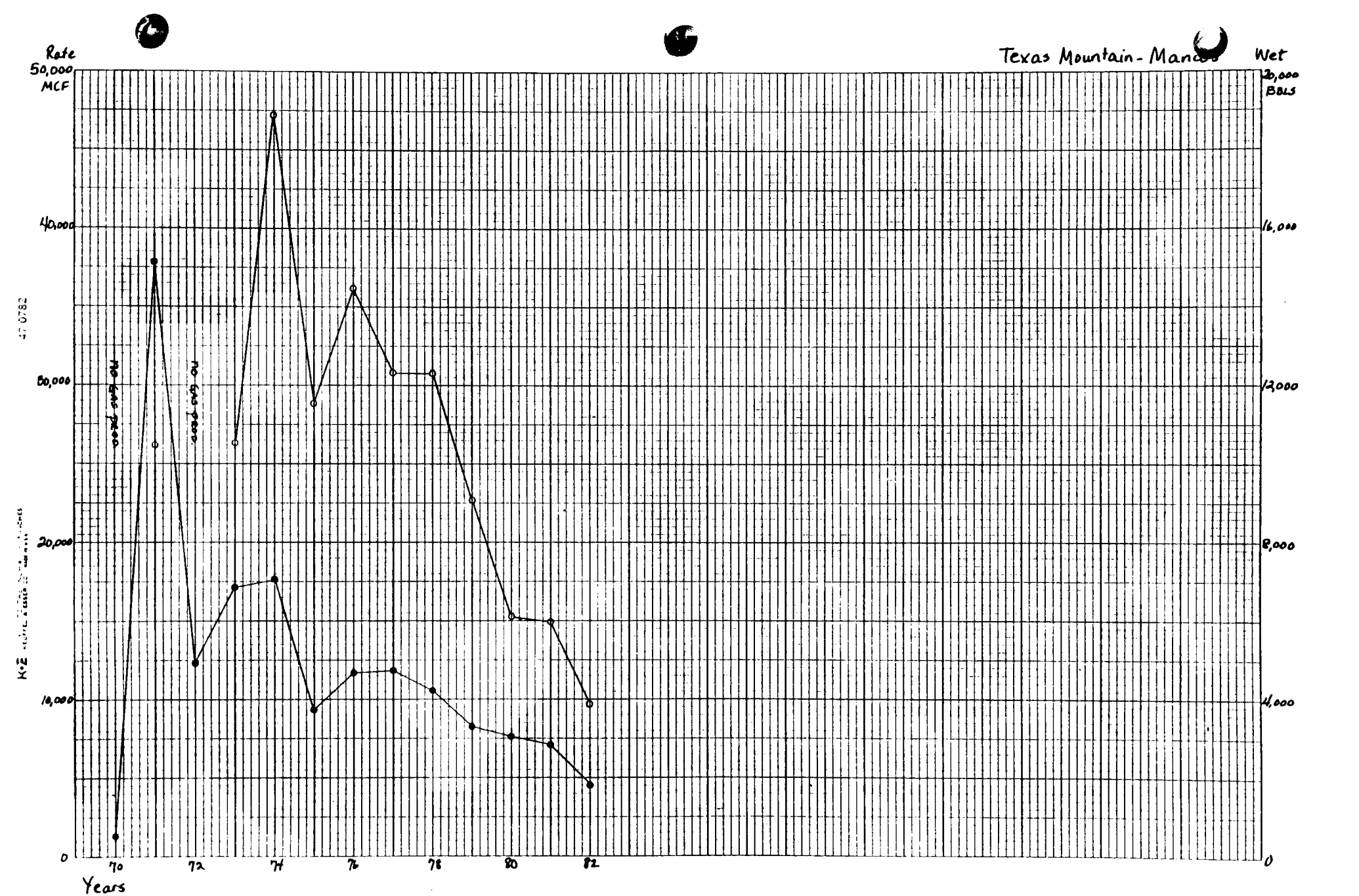

Rate
550,000
MCF
440,000
330,000
220,000
110,000
0
72
74
76
78
80
82
Years
Sulphur Creek - Wasatch
47 0762
K+E


Texas Mountain-Castlegate
Rate
250,000 MCF
200,000
150,000
100,000
50,000
0
75
77
79
81
83
Years
K·E

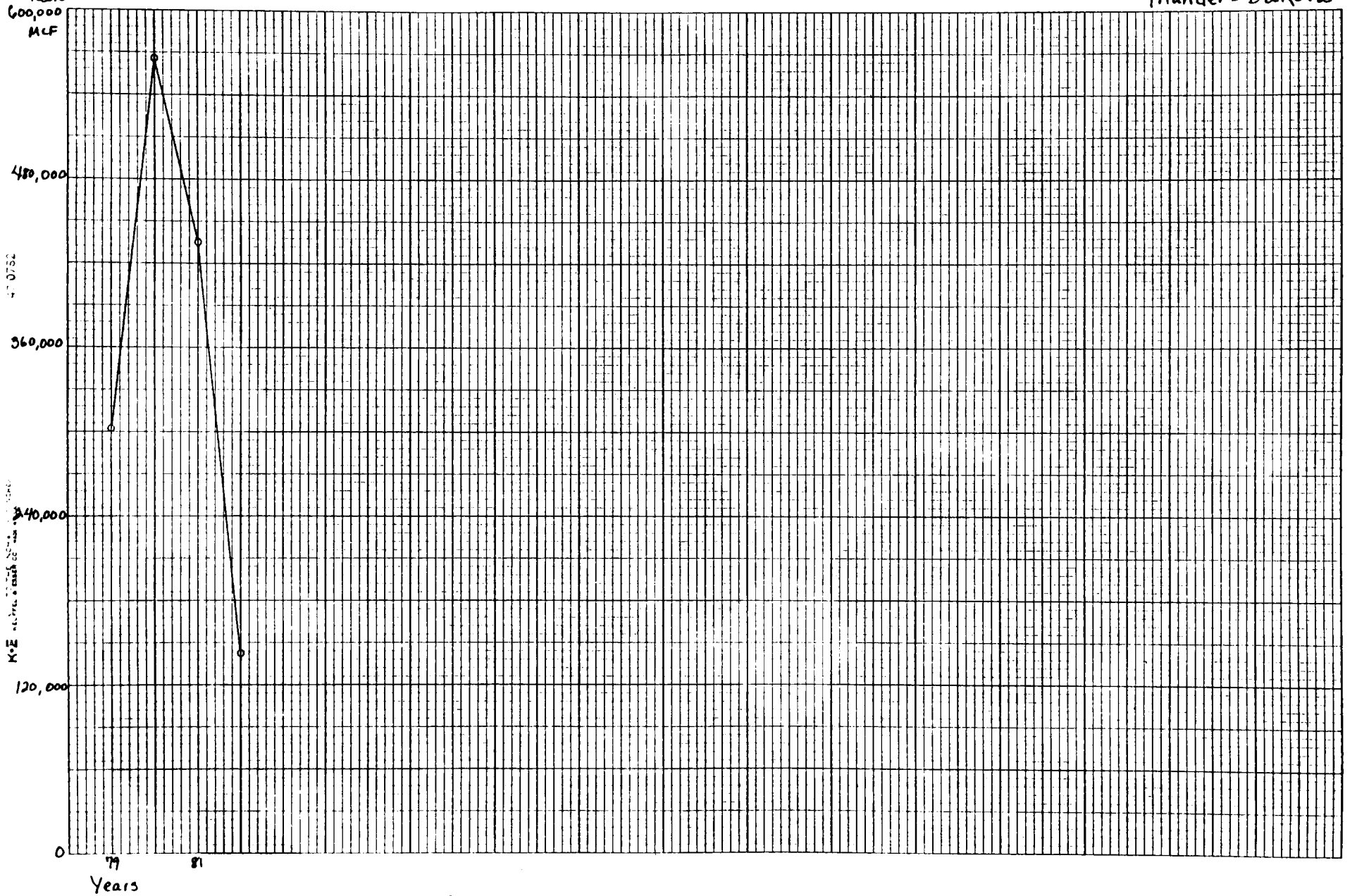

Rate
100,000 MCF
80,000
60,000
40,000
20,000
0
75
77
79
81
83
Years
Texas Mountain-Castlegate-Manus
47 0782
K+E


Texas Mountain - Dakota
Rate
250,000 MCF
200,000
150,000
100,000
50,000
0
71
73
75
77
79
81
83
Years
K&E

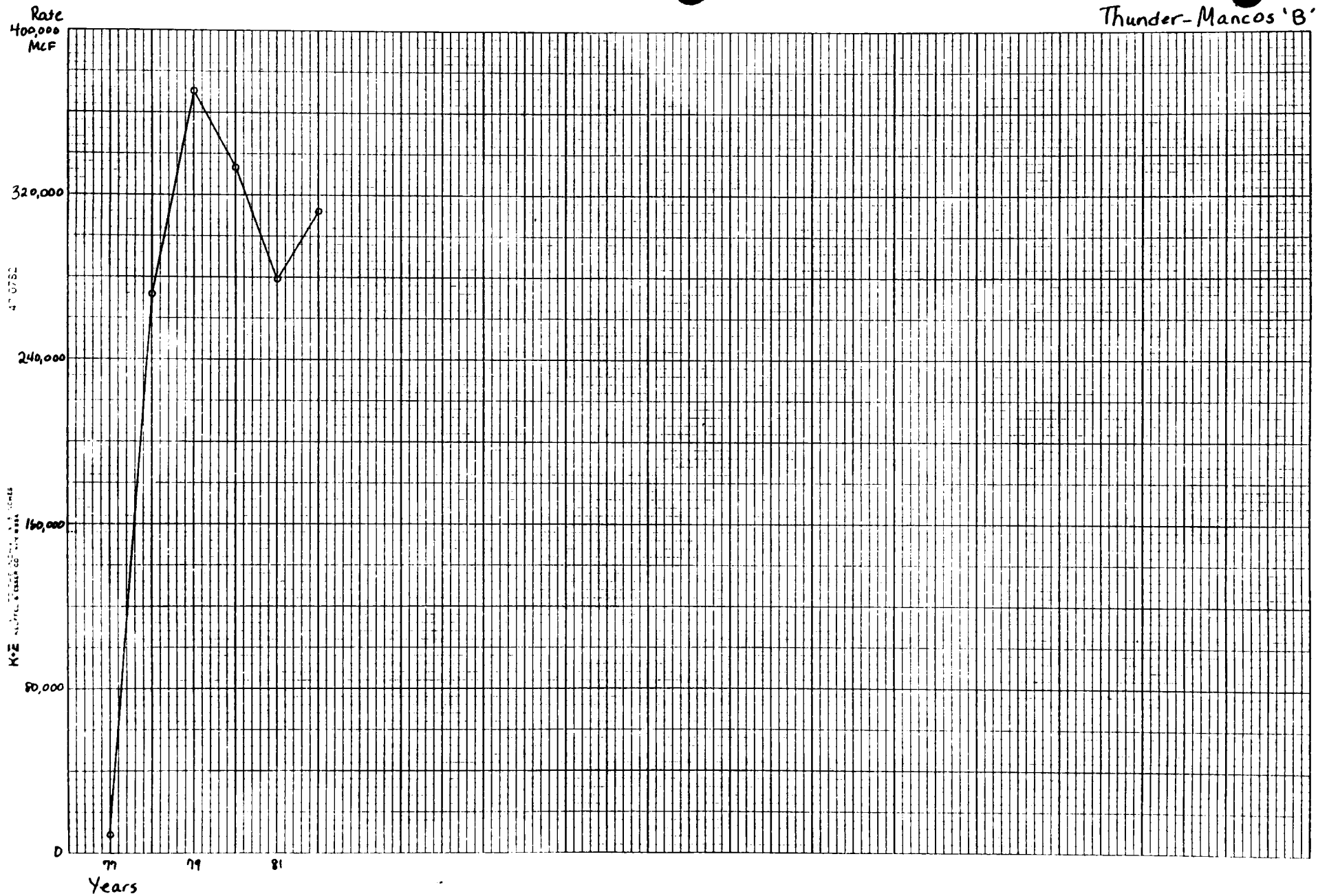

Rate
300,000 MCF
240,000
180,000
120,000
60,000
0
65
67
69
71
73
75
77
79
81
83
Years
Texas Mountain - Mancos 'A'
DRY


Rate
50,000 MCF
40,000
30,000
20,000
10,000
0
Texas Mountain - Mancos
Wet
20,000 BBLS
16,000
12,000
8,000
4,000
0
NO GAS PROD
NO GAS PROD
70
72
74
76
78
80
82
Years

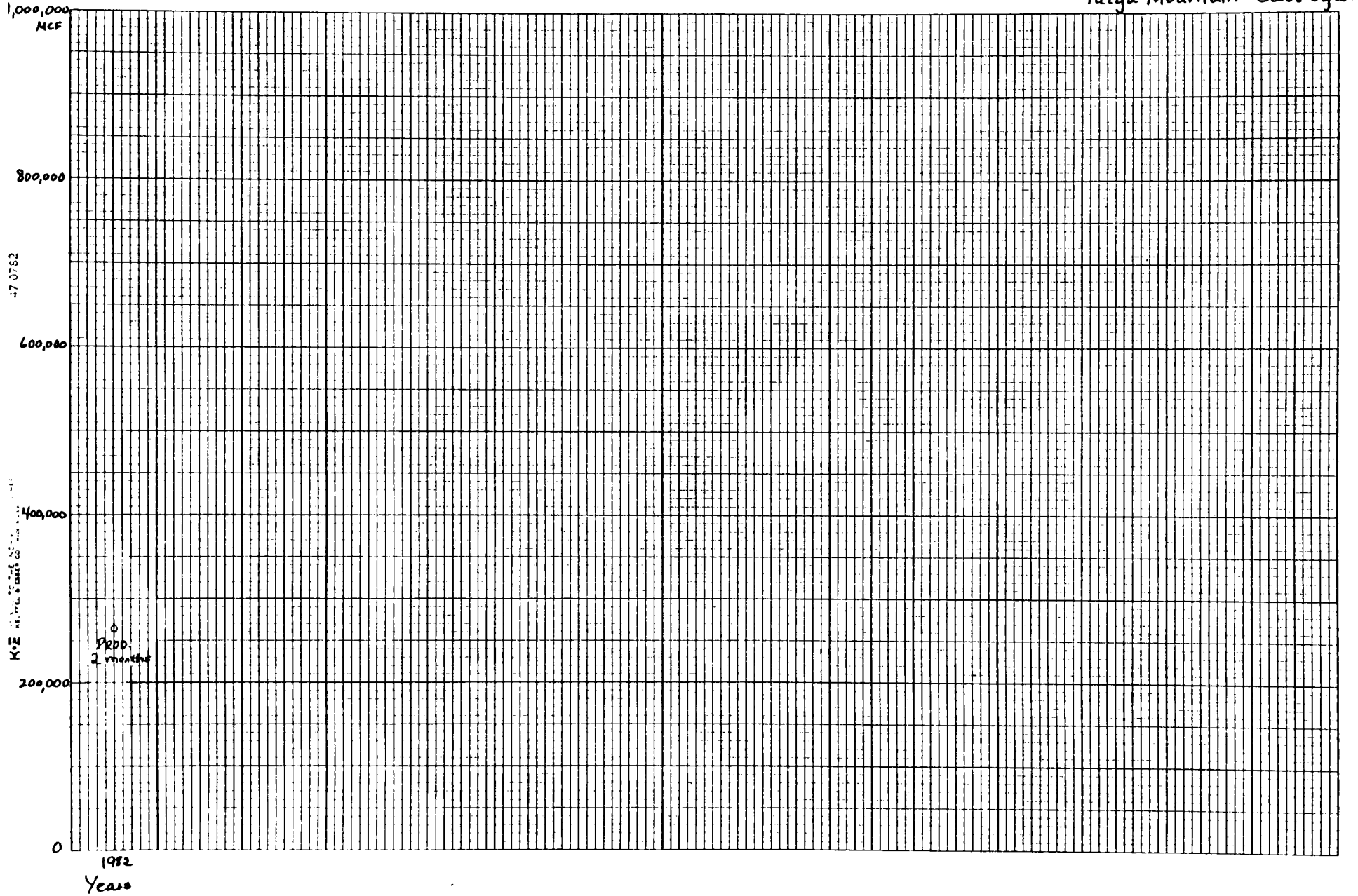
Thunder - Dakota

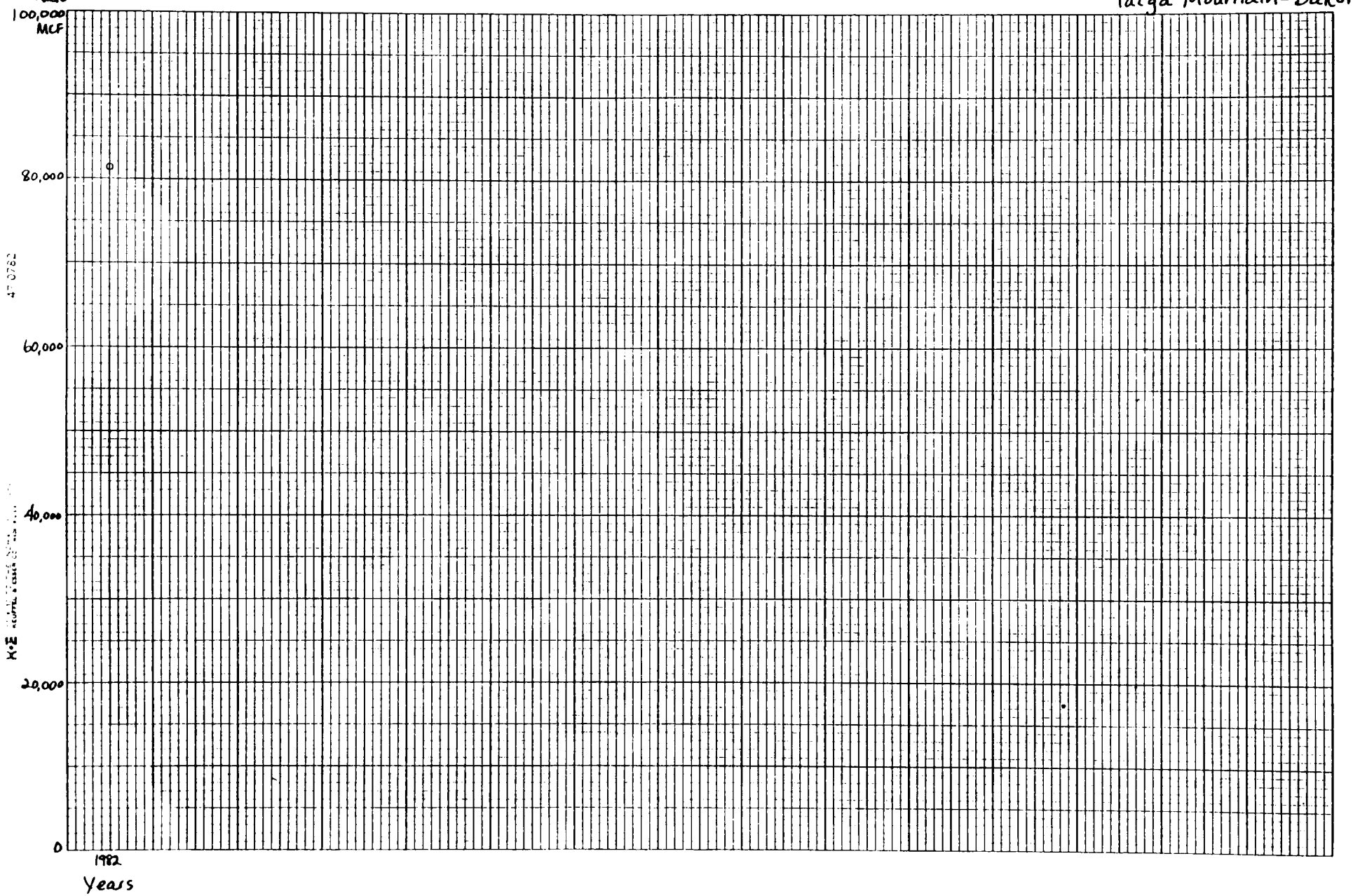


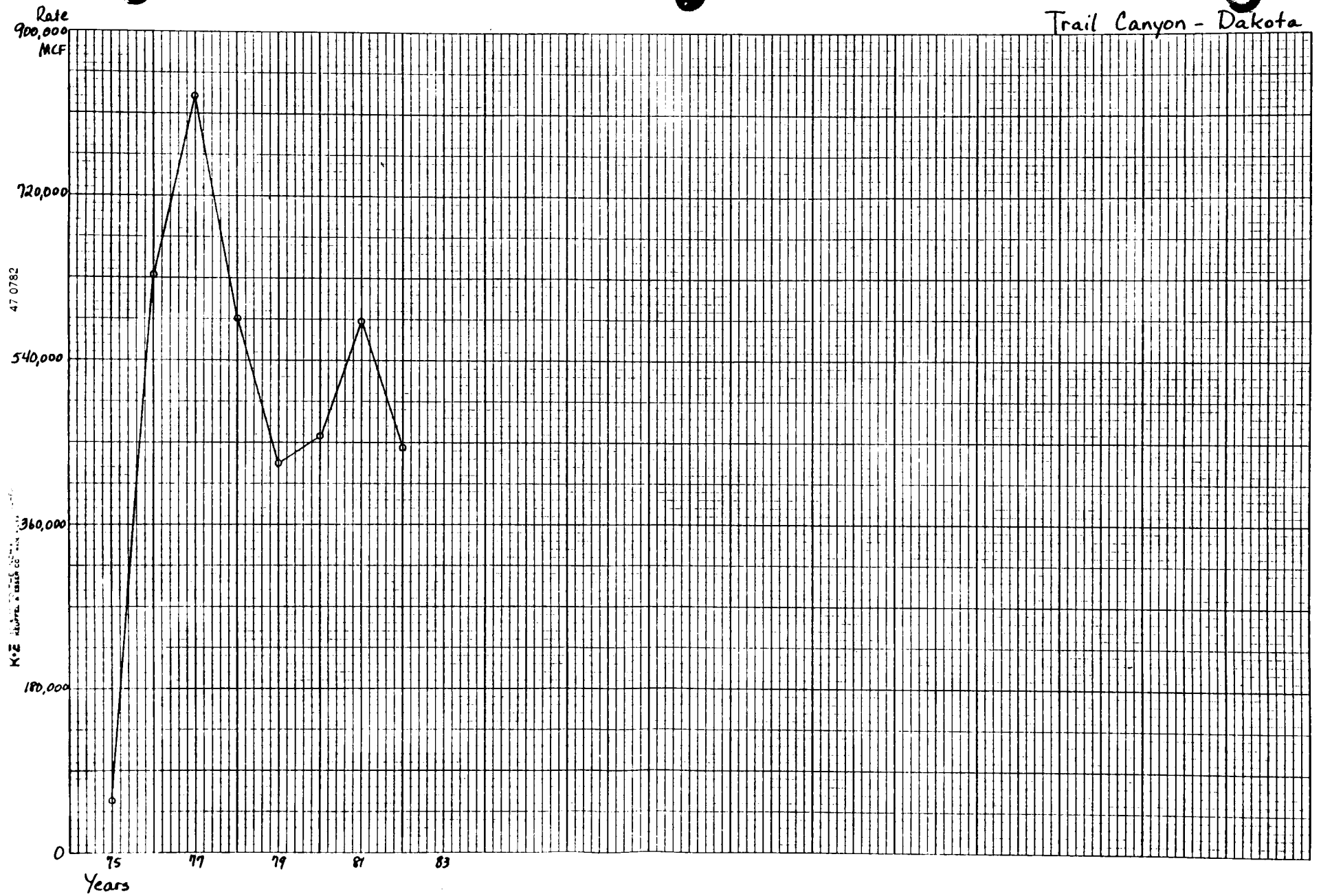
Thunder-Mancos 'B'



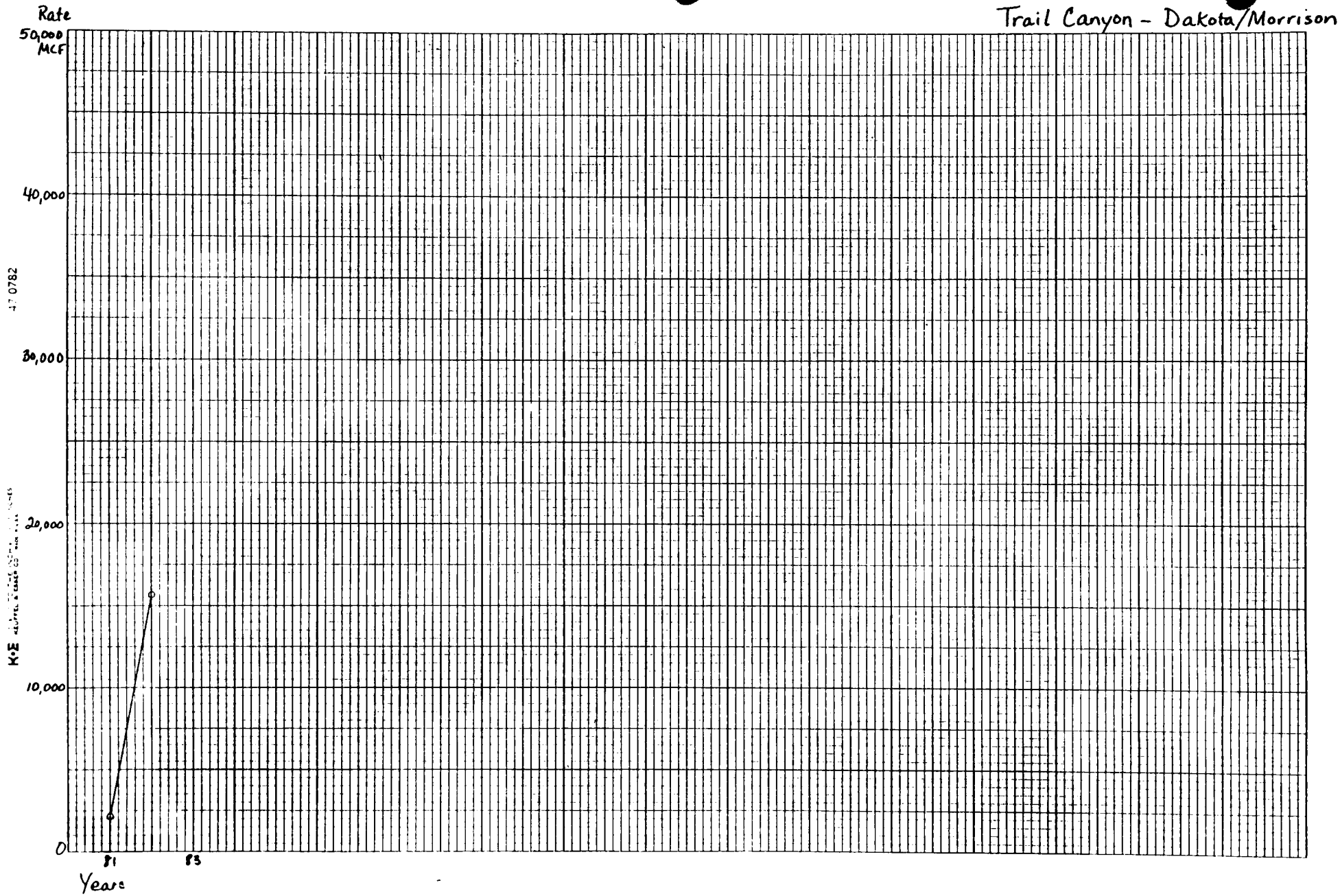
Taiga Mountain - Castlegate

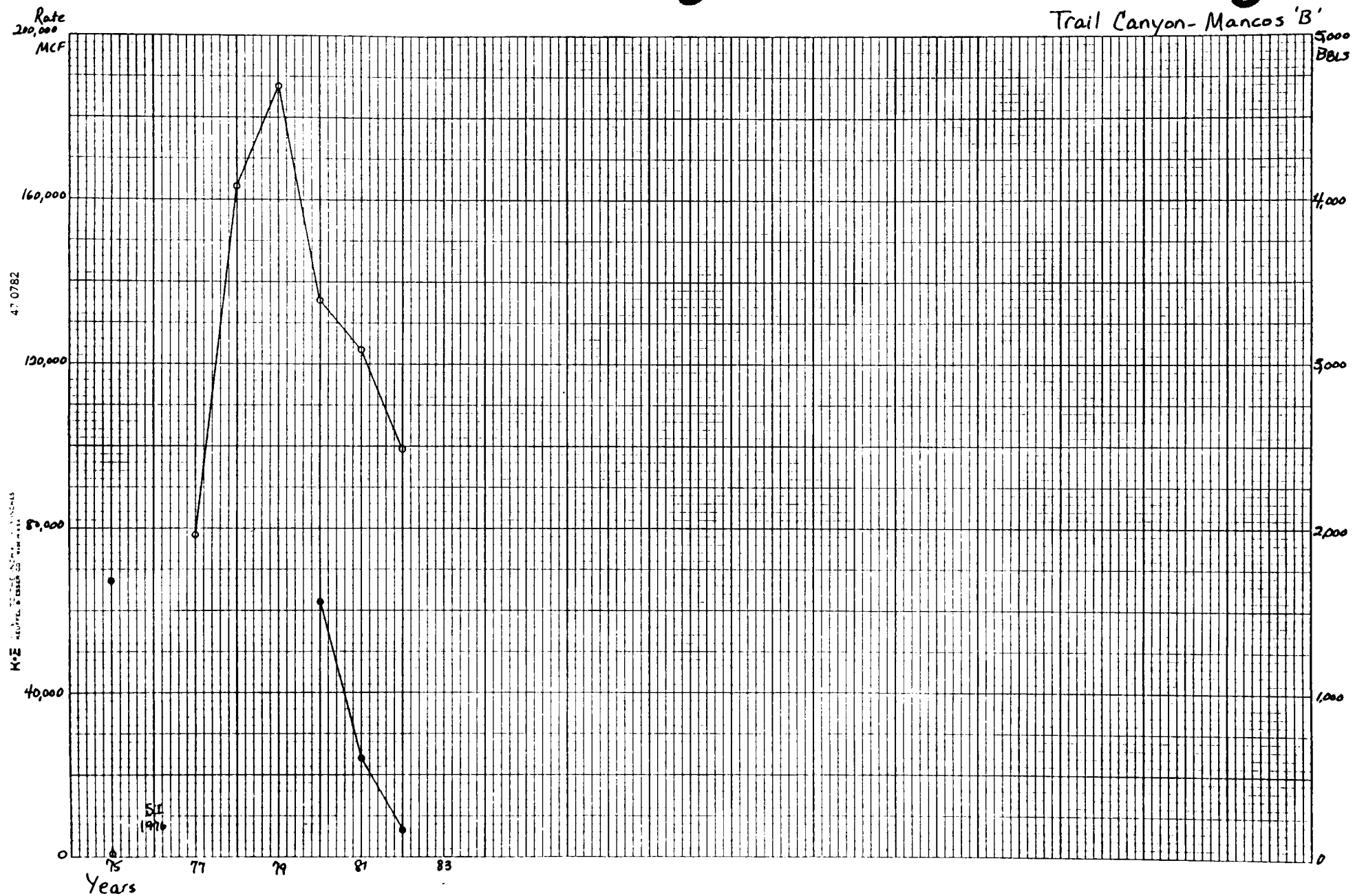


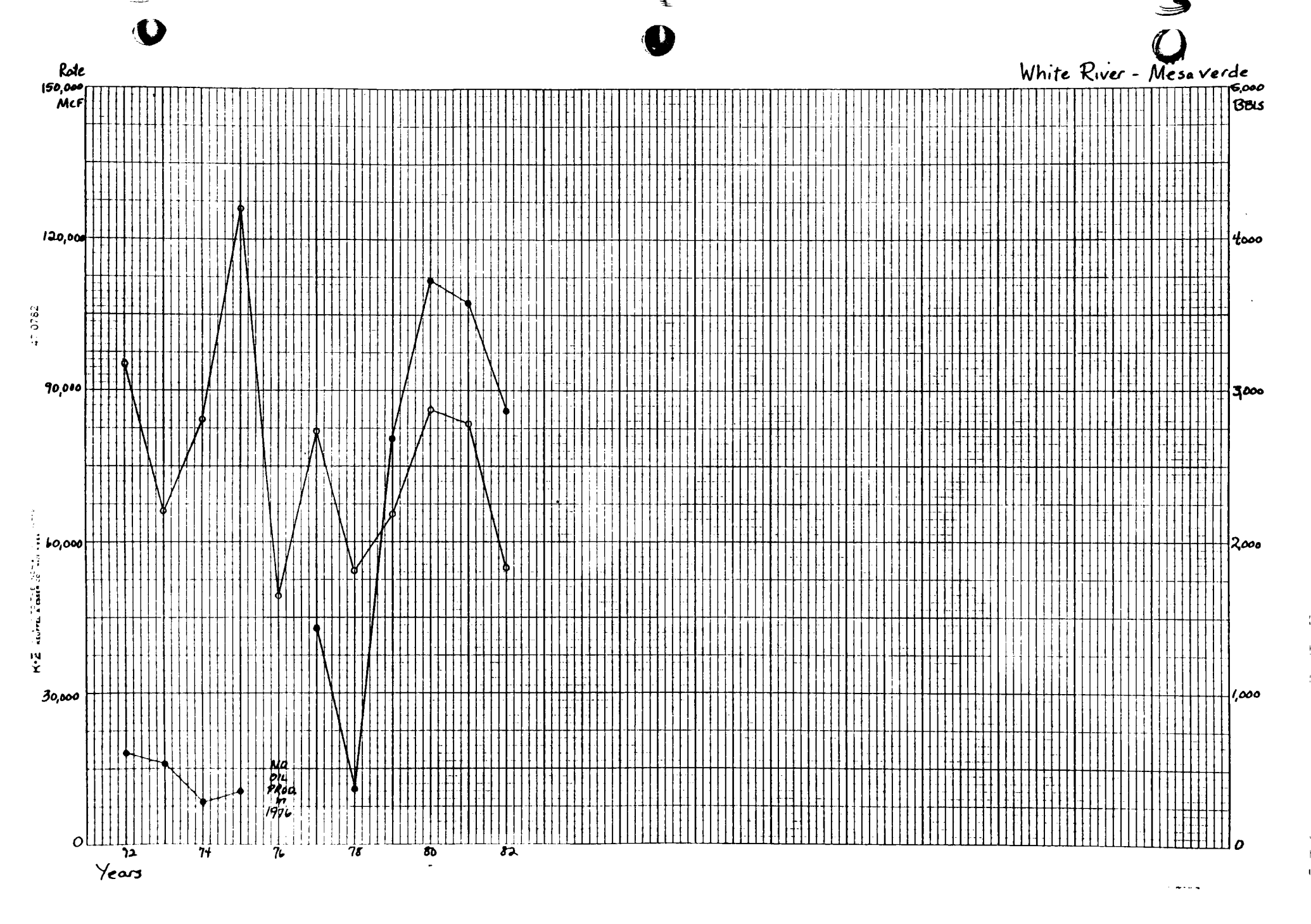

Taiga Mountain-Dakota
Rate
100,000 MCF
80,000
60,000
40,000
20,000
0
1982
Years


Rate
900,000
MCF
720,000
540,000
360,000
180,000
0
75
77
79
81
83
Years
Trail Canyon - Dakota
47 0782

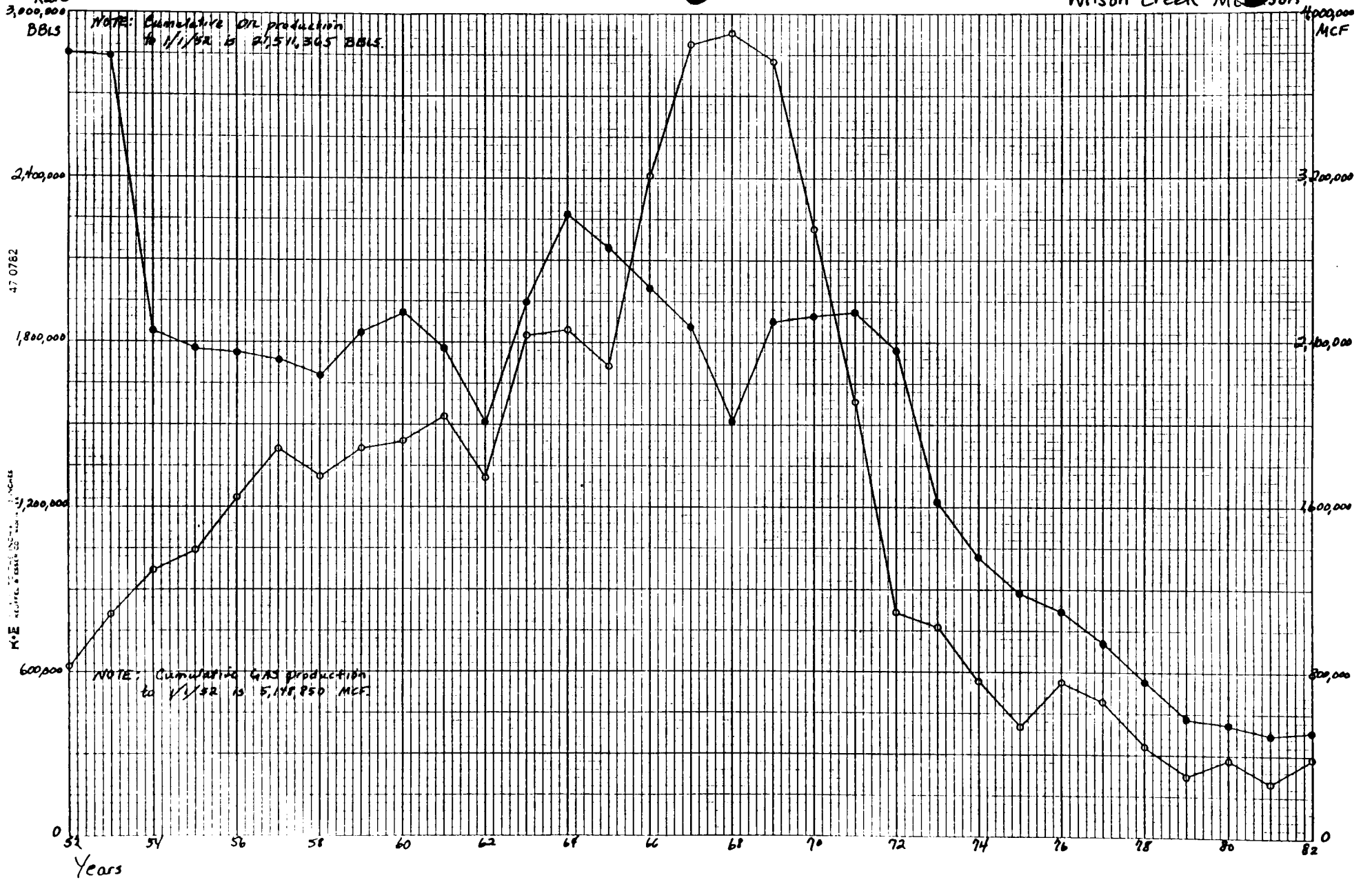
Trail Canyon - Dakota/Morrison

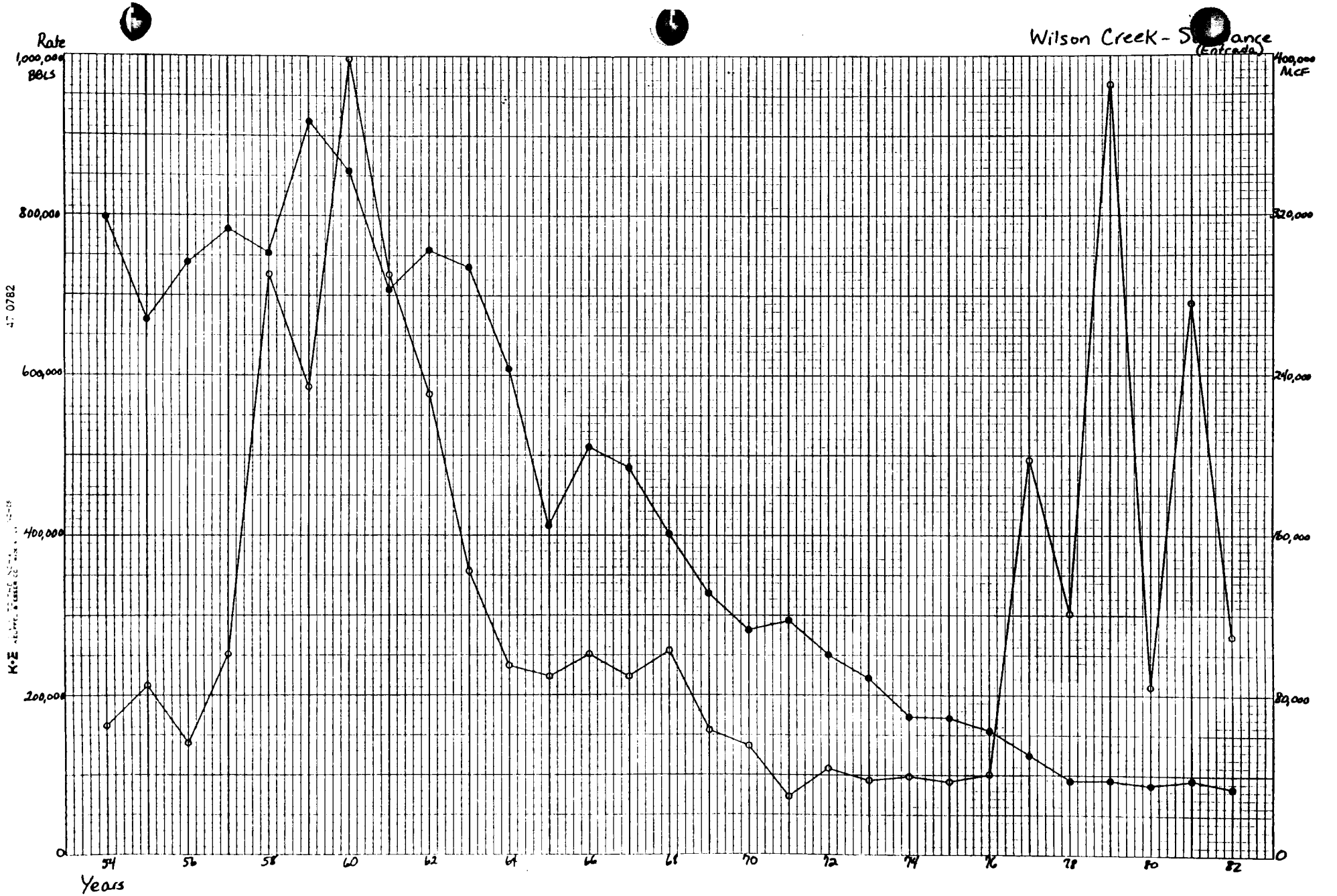



Trail Canyon- Mancos 'B'
Rate
200,000
MCF
160,000
120,000
80,000
40,000
0
5,000
BBLS
4,000
3,000
2,000
1,000
0
47 0782
SI
1976
75
77
79
81
83
Years


Rate
150,000
MCF
120,000
90,000
60,000
30,000
0
6,000
BBLS
4000
3000
2000
1,000
0
72
74
76
78
80
82
Years
White River - Mesaverde
NO OIL PROD. IN 1976


Rate
1,000,000
MCF
800,000
600,000
400,000
200,000
0
72
74
76
78
80
82
Years
White River - Wasatch


Rate
3,000,000
BBLS
2,400,000
1,800,000
1,200,000
600,000
0
4,000,000
MCF
3,200,000
2,400,000
1,600,000
800,000
0
NOTE: Cumulative OIL production to 1/1/82 is 27,541,345 BBLS.
NOTE: Cumulative GAS production to 1/1/82 is 5,145,850 MCF.
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
Wilson Creek-M
son


Rate
1,000,000 BBLS
800,000
600,000
400,000
200,000
0
Wilson Creek - S ange
(Entrada)
400,000 MCF
320,000
240,000
160,000
80,000
0
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

Other Publications

INFORMATION SERIES 18--Oil and Gas fields of Colorado: Statistical Data through 1981.
MAP SERIES 22--Oil and Gas fields map of Colorado, 1983, (1:500,000).
OPEN-FILE REPORT 84-3: Estimated Oil and Gas Reserves for Washington County, Colorado;
OPEN-FILE REPORT 84-4: Estimated Oil and Gas Reserves for Rio Blanco County, Colorado.
OPEN-FILE REPORT 84-5: Estimated Oil and Gas Reserves for Adams County, Colorado;
OPEN-FILE REPORT 84-6: Estimated Oil and Gas Reserves for Weld County, Colorado;
OPEN-FILE REPORT 84-7: Estimated Oil and Gas Reserves for Arapahoe County, Colorado;
OPEN-FILE REPORT 84-8: Estimated Oil and Gas Reserves for Baca County, Colorado.
OPEN-FILE REPORT 84-9: Estimated Oil and Gas Reserves for Cheyenne County, Colorado.
OPEN-FILE REPORT 84-10: Estimated Oil and Gas Reserves for Garfield County, Colorado;
OPEN-FILE REPORT 84-11: Estimated Oil and Gas Reserves for La Plata County, Colorado;
OPEN-FILE REPORT 84-12: Estimated Oil and Gas Reserves for Moffat County, Colorado;
OPEN-FILE REPORT 84-13: Estimated Oil and Gas Reserves for Elbert County, Colorado;
OPEN-FILE REPORT 84-14: Estimated Oil and Gas Reserves for Mesa County, Colorado;
OPEN-FILE REPORT 84-15: Estimated Oil and Gas Reserves for Routt County, Colorado;
OPEN-FILE REPORT 84-16: Estimated Oil and Gas Reserves for Yuma County, Colorado.

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