

OIL CONSERVATION DIVISION

MR. STAMETS

BENSON-MONTIN-GREER DRILLING CORP.
EXHIBITS IN CASE NOS. 8946 & 8950
BEFORE THE OIL CONSERVATION DIVISION OF THE
NEW MEXICO DEPARTMENT OF ENERGY AND MINERALS

AUGUST 7, 1986

NMOCC/NMOCD Case No.	<u>8950</u>
Hearing Date	<u>8/21/86</u>
<u>Benson-Montin-Greer</u>	
Exhibit No.	<u>4</u>

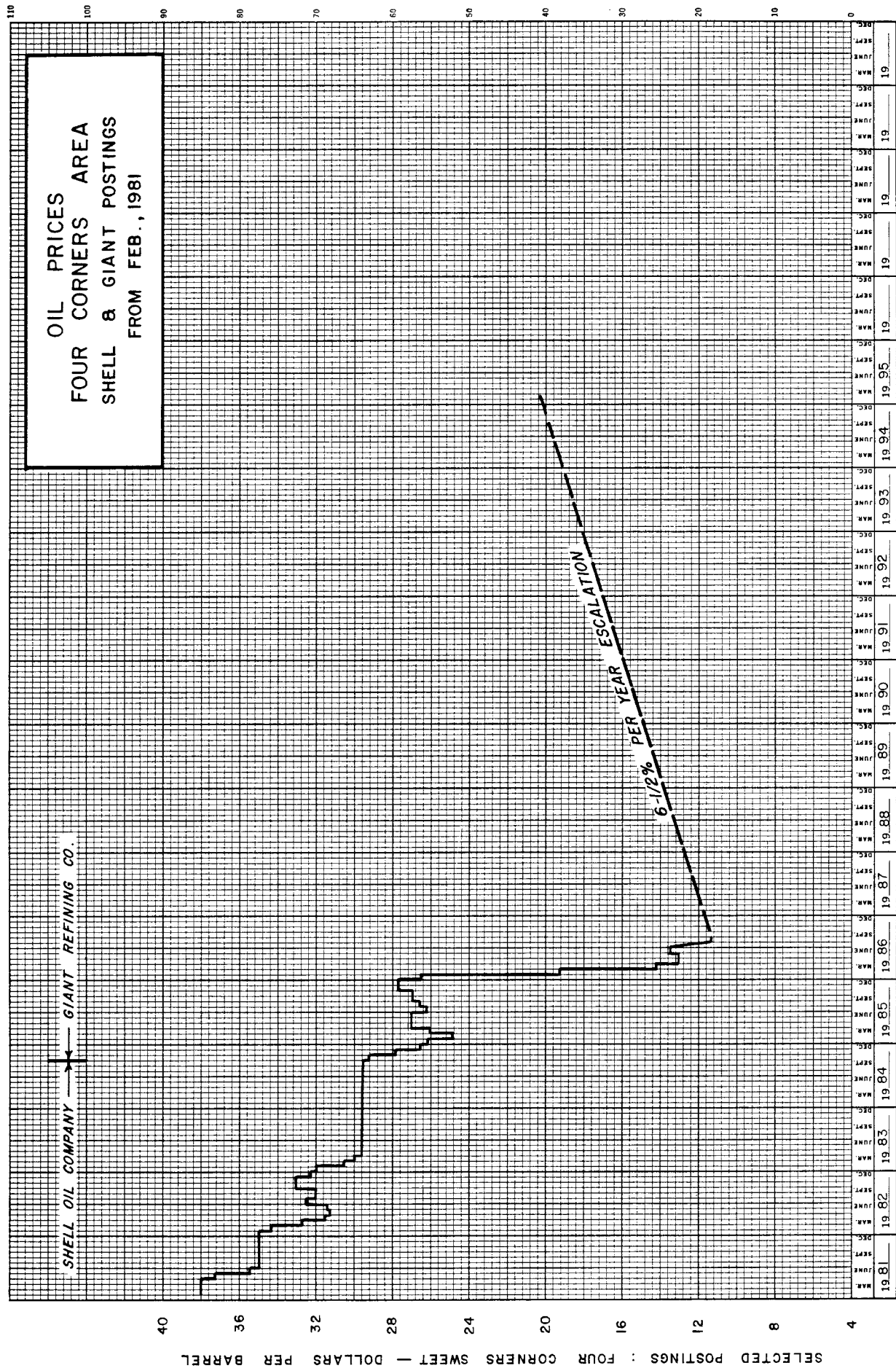
IMPACT ON STATE REVENUE
FROM TAXES
BY REDUCING ALLOWABLES
ON GAVILAN PRODUCTION

The Chairman has asked for information describing the impact of reduced allowables on state revenue.

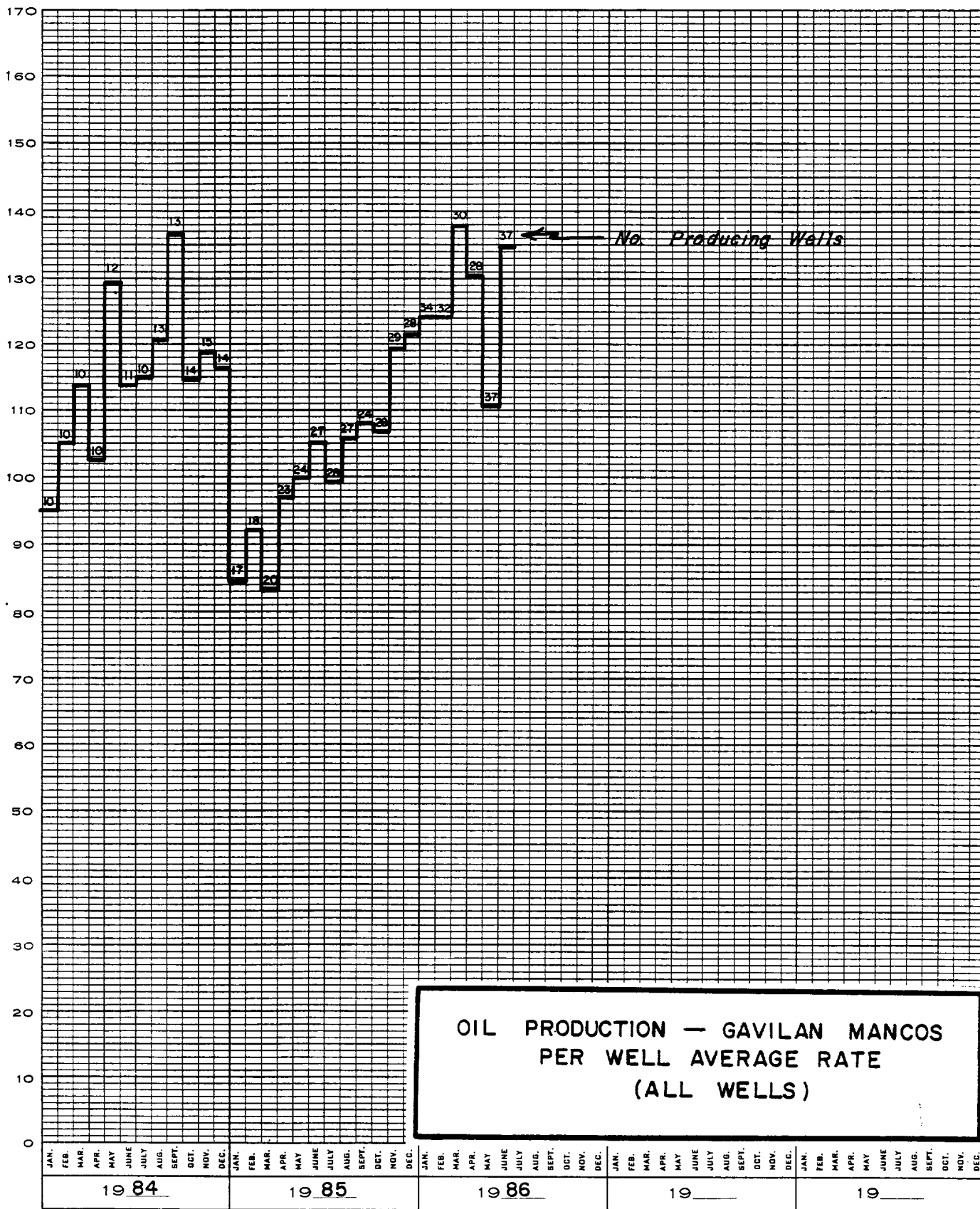
In this respect, the following pertinent statistics respecting discount rates were obtained from the State Treasurer's Office during the week ending August 15, 1986.

1. Current short term earnings:
Excess funds on deposit in banks and overnight deposits were averaging 6.1% to 6.25%. Approximately \$184 million of these kinds of funds were on deposit during this time.
2. Longer term interest earnings:
CD's for one year were 6.01%; for 182 days, 5.75%. \$256 million were earning interest at these rates.
3. Cost of money for funds borrowed:
The following percentages were given for about \$80 million of severance tax bonds sold in July:
6%, 7.2%, 7.5%, 6.7%, 6.9% and 5.75%, for an overall arithmetic average of about 6.5%.

Accordingly, for the following analyses, a discount rate of 6.5% per annum has been used.



BARRELS OF OIL PER DAY PER WELL



COMPARISON
OF
PRESENT WORTH
OF
NEW MEXICO'S FUTURE REVENUE
FROM PRODUCTION TAXES
FOR
CONDITIONS OF HIGH PRODUCTION RATE
VERSUS
CONDITIONS OF LOW PRODUCTION RATE
FOR
CONSTANT PRICE OF OIL

ASSUMPTIONS FOR HIGH PRODUCTION RATE:

1. Pool instantly and completely developed on 320-acre spacing.
2. Pool-wide average per-well initial production rate will be the same as now (+ 130 BOPD for all wells)
and
With all spacing units drilled, producing mechanism will be solution gas drive with recoveries of + 200 BOPA, or average of 64,000 barrels for 320-acre spaced wells.
3. Economic limit, 3 BOPD/well.
4. Production decline rate 72.43%/year.
5. Discounted present worth of future income is 59,000 barrels/well average.

ASSUMPTIONS FOR LOW PRODUCTION RATE:

1. Additional wells drilled will be only those necessary for efficient drainage.
2. Pool-wide per well average initial production rate will be 37-1/2 BOPD.
3. Economic limit same as for first example, 3 BOPD. Production decline rate is 5%/year.
4. Ultimate recovery increased by about 10% (to 71,000 barrels/well).
5. Discounted present worth of future income is 59,000 barrels/well average (same as first example).

ASSUMPTIONS FOR BOTH EXAMPLES:

1. Oil price is constant throughout.
2. Discount rate is 6.5% per annum, compounded monthly, 30.4 day month.

COMPARISON
OF
PRESENT WORTH
OF
NEW MEXICO'S FUTURE REVENUE
FROM PRODUCTION TAXES
FOR
CONDITIONS OF HIGH PRODUCTION RATE
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CONDITIONS OF LOW PRODUCTION RATE
FOR
CONSTANT PRICE OF OIL

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	<u>EXAMPLE I</u>	<u>EXAMPLE II</u>
Initial Production Rate (BOPD)	130	37.5
Production Decline Rate, Percent/Year	72.43	5.00
Producing Life (Years)	5.2	6.0
Ultimate Recovery (Barrels)	64,000	71,000
Discounted Ultimate Recovery (@ 6.5%/Year), Barrels	59,000	59,000

STATISTICS FOR WELL WITH INITIAL PRODUCTION RATE OF 130 BOPD

<u>Year</u>	<u>Month</u>	<u>Undiscounted</u>		<u>Factor</u>	<u>Discounted</u>	
		<u>Production for Month</u> (Bbls)	<u>Cumulative Production</u> (Bbls)		<u>Production for Month</u> (Bbls)	<u>Cumulative Production</u> (Bbls)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
0	1	3837	3837	.9946	3816	3816
	2	3612	7449	.9893	3573	7390
	3	3401	10850	.9834	3346	10736
	4	3201	14051	.9786	3133	13868
	5	3014	17065	.9734	2934	16802
	6	2837	19903	.9681	2747	19549
	7	2671	22574	.9629	2572	22122
	8	2515	25089	.9577	2408	24530
	9	2367	27456	.9525	2255	26785
	10	2229	29685	.9474	2112	28897
	11	2098	31783	.9423	1977	30874
	12	1975	33759	.9372	1851	32725
1	1	1860	35618	.9322	1734	24459
	2	1751	37369	.9272	1623	36082
	3	1648	39017	.9222	1520	37602
	4	1552	40569	.9172	1423	39025
	5	1461	42030	.9123	1333	40358
	6	1375	43405	.9073	1248	41605
	7	1295	44700	.9025	1168	42774
	8	1219	45918	.8976	1094	43868
	9	1147	47066	.8928	1024	44892
	10	1080	48146	.8879	959	45851
	11	1017	49163	.8832	898	46750
	12	957	50120	.8784	841	47591
2	1	901	51022	.8737	787	48378
	2	849	51870	.8690	737	49115
	3	799	52669	.8643	690	49806
	4	752	53421	.8596	646	50452
	5	708	54129	.8550	605	51057
	6	666	54796	.8504	567	51624
	7	627	55423	.8458	531	52155
	8	591	56014	.8413	497	52652
	9	556	56570	.8367	465	53117
	10	524	57094	.8322	436	53553
	11	493	57586	.8277	408	53961
	12	464	58050	.8233	382	54343
3	1	437	58487	.8188	358	54701
	2	411	58898	.8144	335	55036
	3	387	59286	.8100	314	55349
	4	364	59650	.8057	294	55643
	5	343	59993	.8013	275	55918
	6	323	60316	.7970	258	56175
	7	304	60620	.7927	241	56416
	8	286	60907	.7884	226	56642
	9	270	61176	.7842	211	56853
	10	254	61430	.7800	198	57051
	11	239	61669	.7758	185	57237
	12	225	61894	.7716	174	57410
4	1	212	62105	.7674	163	57573
	2	199	62305	.7633	152	57725
	3	188	62492	.7592	143	57867
	4	177	62669	.7551	133	58001
	5	166	62835	.7510	125	58126
	6	156	62992	.7470	117	58243
	7	147	63139	.7430	110	58352
	8	139	63278	.7390	103	58455
	9	131	63409	.7350	96	58551
	10	123	63532	.7310	90	58640
	11	116	63648	.7271	84	58725
	12	109	63757	.7232	79	58804
5	1	103	63859	.7193	74	58877
	2	97	63956	.7154	69	58946
	3	91	64047	.7115	65	59011

STATISTICS FOR WELL WITH INITIAL PRODUCTION RATE OF 130 BOPD

PAGE 2

From figures on previous page weighted average discount rate:
 $59011/64000 = .9220$.

Compare with weighted average continuous discount rate of 6.5%

$$\bar{D}_{cp} = \frac{(dt) (e^{dt} - e^{-tj})}{(dt + tj) (e^{dt} - 1)}$$

$d = 72.43\%$ per year

$t = 5.2$ years

$j = 6.5\%$

$$\bar{D}_{cp} = .9239$$

STATISTICS FOR WELL WITH INITIAL PRODUCTION RATE OF 37-1/2 BOPD

<u>Year</u>	<u>Month</u>	<u>Undiscounted</u>		<u>Factor</u>	<u>Discounted</u>	
		<u>Production for Month (Bbls)</u>	<u>Cumulative Production (Bbls)</u>		<u>Production for Month (Bbls)</u>	<u>Cumulative Production (Bbls)</u>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
0	1	1138	1138	.9946	1132	1132
	2	1134	2272	.9893	1121	2253
	3	1129	3401	.9839	1111	3364
	4	1124	4525	.9786	1100	4464
	5	1119	5644	.9734	1090	5554
	6	1115	6759	.9681	1079	6633
	7	1110	7869	.9629	1069	7702
	8	1106	8975	.9577	1059	8761
	9	1101	10076	.9525	1049	9809
	10	1096	11172	.9474	1039	10848
	11	1092	12264	.9423	1029	11877
	12	1087	13351	.9372	1019	12896
1	1	1083	14434	.9322	1009	13905
	2	1078	15512	.9272	1000	14905
	3	1074	16586	.9222	990	15895
	4	1069	17655	.9172	981	16876
	5	1065	18720	.9123	971	17847
	6	1060	19780	.9073	962	18809
	7	1056	20836	.9025	953	19762
	8	1052	21888	.8976	944	20706
	9	1047	22935	.8928	935	21641
	10	1043	23978	.8880	926	22567
	11	1039	25017	.8832	917	23485
	12	1034	26051	.8784	908	24393
2	1	1030	27081	.8737	900	25293
	2	1026	28106	.8690	891	26184
	3	1021	29128	.8643	883	27067
	4	1017	30145	.8596	874	27941
	5	1013	31158	.8550	866	28807
	6	1009	32166	.8504	858	29665
	7	1005	33171	.8458	850	30515
	8	1000	34171	.8413	842	31356
	9	996	35167	.8367	834	32190
	10	992	36159	.8322	826	33015
	11	988	37147	.8277	818	33833
	12	984	38131	.8233	810	34643
3	1	980	39111	.8188	802	35445
	2	976	40087	.8144	795	36240
	3	972	41058	.8100	787	37027
	4	968	42026	.8057	780	37806
	5	964	42989	.8013	772	38578
	6	960	43949	.7970	765	39343
	7	956	44904	.7927	757	40101
	8	952	45856	.7885	750	40851
	9	948	46803	.7842	743	41594
	10	944	47747	.7800	736	42330
	11	940	48687	.7758	729	43059
	12	936	49622	.7714	722	43781
4	1	932	50555	.7674	715	44496
	2	928	51482	.7633	708	45205
	3	924	52407	.7592	702	45907
	4	920	53327	.7551	695	46601
	5	917	54243	.7510	688	47289
	6	913	55156	.7470	682	47971
	7	909	56065	.7430	675	48646
	8	905	56970	.7390	669	49315
	9	901	57872	.7350	662	49978
	10	898	58769	.7310	656	50634
	11	894	59663	.7271	650	51284
	12	890	60553	.7232	644	51928
5	1	886	61440	.7193	638	52565
	2	883	62323	.7154	632	53197
	3	879	63202	.7115	626	53822

STATISTICS FOR WELL WITH INITIAL PRODUCTION RATE OF 37-1/2 BOPD

PAGE 2

<u>Year</u>	<u>Month</u>	<u>Undiscounted</u>		<u>Factor</u>	<u>Discounted</u>	
		<u>Production for Month</u> (Bbls)	<u>Cumulative Production</u> (Bbls)		<u>Production for Month</u> (Bbls)	<u>Cumulative Production</u> (Bbls)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
5	4	875	64077	.7077	620	54442
	5	872	64949	.7039	614	55056
	6	868	65817	.7001	608	55663
	7	865	66682	.6963	602	56265
	8	861	67543	.6926	596	56862
	9	857	68400	.6888	591	57452
	10	854	69254	.6851	585	58037
	11	850	70104	.6814	579	58617
	12	847	70951	.6778	574	59191

STATISTICS FOR WELL WITH INITIAL PRODUCTION RATE OF 37-1/2 BOPD

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From figures on previous page weighted average discount rate:
 $59191/70951 = .8343$.

Compare with weighted average continuous discount rate of 6.5%

$$\bar{D}_{cp} = \frac{(dt) (e^{dt} - e^{-tj})}{(dt + tj) (e^{dt} - 1)}$$

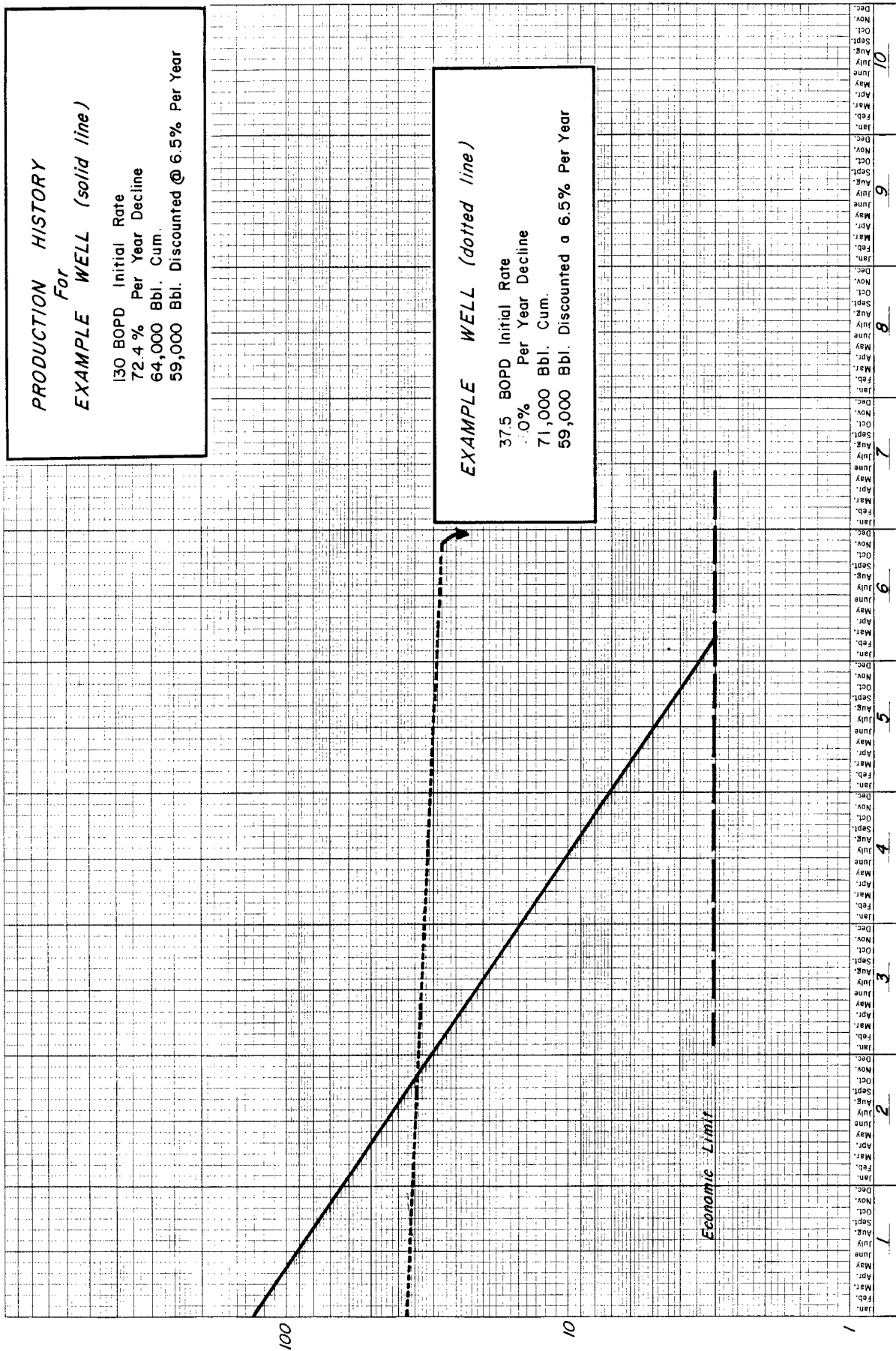
$d = 5.00\%$ per year

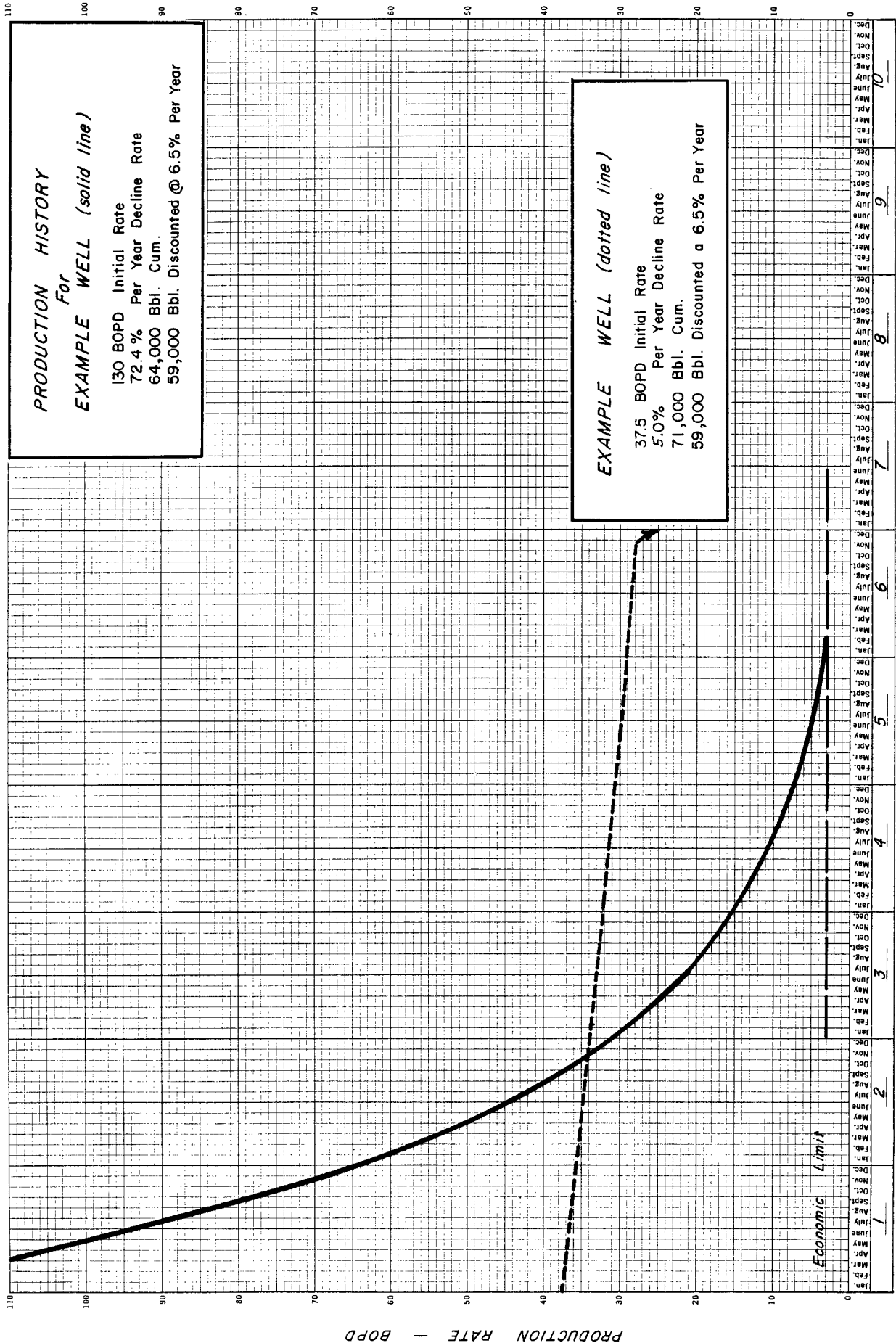
$t = 6.0$ years

$j = 6.5\%$

$$\bar{D}_{cp} = .8361$$

PRODUCTION RATE - BOPD





GAVILAN MANCOS PRODUCTION STATISTICS
FOR ALL WELLS

Date	Total Monthly Pool Oil Production	No. Wells	Production Per Well Per Month	BOPD Per Well
<u>1984</u>				
Jan 1-31	29,443	10	2,944	95.0
Feb 1-28	29,380	10	2,938	104.9
March 1-31	35,279	10	3,528	113.8
April 1-30	30,826	10	3,083	102.8
May 1-31	48,106	12	4,009	129.3
June 1-30	37,533	11	3,412	113.7
July 1-31	35,510	10	3,551	114.5
Aug 1-31	48,575	13	3,737	120.5
Sept 1-30	53,177	13	4,091	136.4
Oct 1-31	49,721	14	3,552	114.6
Nov 1-30	53,276	15	3,552	118.4
Dec 1-31	50,573	14	3,612	116.5
<u>1985</u>				
Jan 1-31	44,587	17	2,623	84.6
Feb 1-28	46,407	18	2,578	92.1
March 1-31	51,713	20	2,586	83.4
April 1-30	66,736	23	2,902	96.7
May 1-31	73,684	24	3,071	99.0
June 1-30	85,109	27	3,152	105.1
July 1-31	86,256	28	3,081	99.4
Aug 1-31	88,588	27	3,281	105.8
Sept 1-30	77,586	24	3,233	107.8
Oct 1-31	92,791	28	3,314	106.9
Nov 1-30	103,754	29	3,578	119.3
Dec 1-31	105,578	28	3,771	121.6
<u>1986</u>				
Jan 1-31	131,058	34	3,855	124.3
Feb 1-28	111,329	32	3,479	124.3
March 1-31	127,946	30	4,265	137.6
April 1-30	109,478	28	3,910	130.3
May 1-31	126,731	37	3,425	110.5
June 1-30	149,517	37	4,041	134.7

GAVILAN MANOOS PRODUCTION STATISTICS
(ALL WELLS AND ALL WELLS LESS THOSE WITH GREATER THAN 300 BOPD)

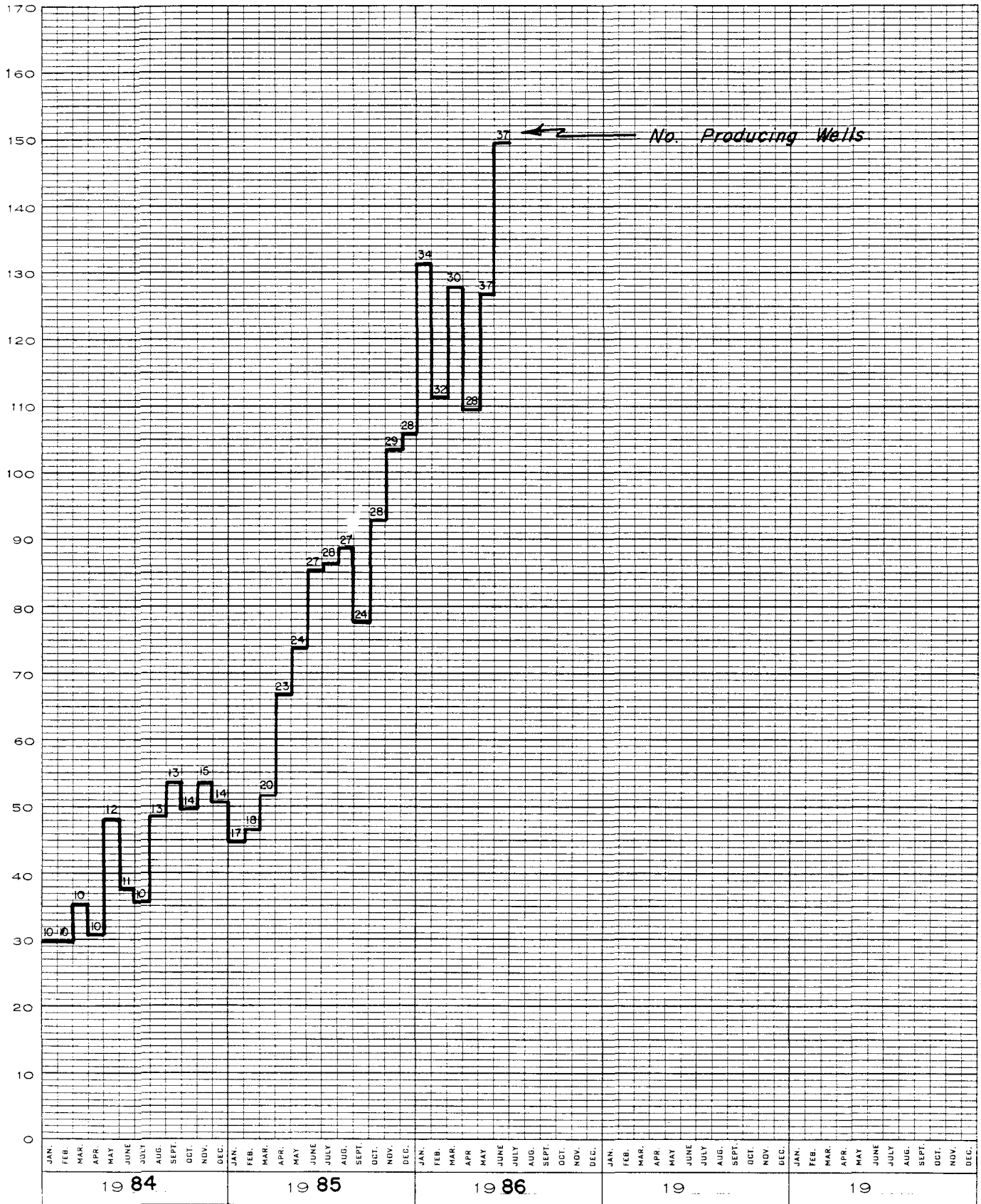
Total Production All Wells					Production Less Than 300 BOPD				
Date	Total Monthly		No. Wells	Production		Production of Wells (No. of Wells)	Total Monthly		BOPD Per Well
	Pool Oil Production	Per Well Per Month		Pool Oil Production	Per Well Per Month				
1984									
Jan 1-31	29,443	2,944	10	-0-					95.0
Feb 1-28	29,380	2,938	10	-0-					104.9
March 1-31	35,279	3,528	10	9,701 (1)	25,578		2,842		91.7
April 1-30	30,826	3,083	10	-0-					102.8
May 1-31	48,106	4,009	12	12,159 (1)	35,947		3,268		105.4
June 1-30	37,533	3,412	11	9,967 (1)	27,566		2,757		91.9
July 1-31	35,510	3,551	10	-0-					114.5
Aug 1-31	48,575	3,737	13	-0-					120.5
Sept 1-30	53,177	4,091	13	23,317 (2)	29,860		2,715		90.5
Oct 1-31	49,721	3,552	14	-0-					114.6
Nov 1-30	53,276	3,552	15	35,180 (3)	18,096		1,508		50.3
Dec 1-31	50,573	3,612	14	11,024 (1)	39,549		3,042		98.1
1985									
Jan 1-31	44,587	2,623	17	12,072 (1)	32,515		2,168		69.9
Feb 1-28	46,407	2,578	18	22,979 (2)	23,428		1,464		52.3
March 1-31	51,713	2,586	20	13,098 (1)	38,615		2,032		65.6
April 1-30	66,736	2,902	23	14,349 (1)	52,387		2,381		79.4
May 1-31	73,684	3,071	24	15,652 (1)	58,032		2,523		81.4
June 1-30	85,109	3,152	27	28,077 (2)	57,032		2,281		76.0
July 1-31	86,256	3,081	28	25,623 (2)	60,633		2,332		75.2
Aug 1-31	88,588	3,281	27	25,821 (2)	62,767		2,511		81.0
Sept 1-30	77,586	3,233	24	23,454 (2)	54,132		2,461		82.0
Oct 1-31	92,791	3,314	28	26,544 (2)	66,247		2,548		82.2
Nov 1-30	103,754	3,578	29	41,853 (3)	61,901		2,293		76.4
Dec 1-31	105,578	3,771	28	39,107 (3)	66,471		2,659		85.8
1986									
Jan 1-31	131,058	3,855	34	64,142 (5)	66,916		2,307		74.4
Feb 1-28	111,329	3,479	32	45,463 (4)	65,866		2,352		84.0
March 1-31	127,946	4,265	30	46,769 (4)	1,177		3,122		100.7
April 1-30	109,478	3,910	28	25,496 (2)	83,982		3,230		107.7
May 1-31	126,731	3,425	37	64,043 (5)	62,688		1,959		63.2
June 1-30	149,517	4,041	37	73,161 (5)	76,356		2,386		79.5

GAVILAN MANCOS PRODUCTION STATISTICS
(ALL WELLS AND ALL WELLS LESS THOSE WITH LESS THAN 25 BOPD)

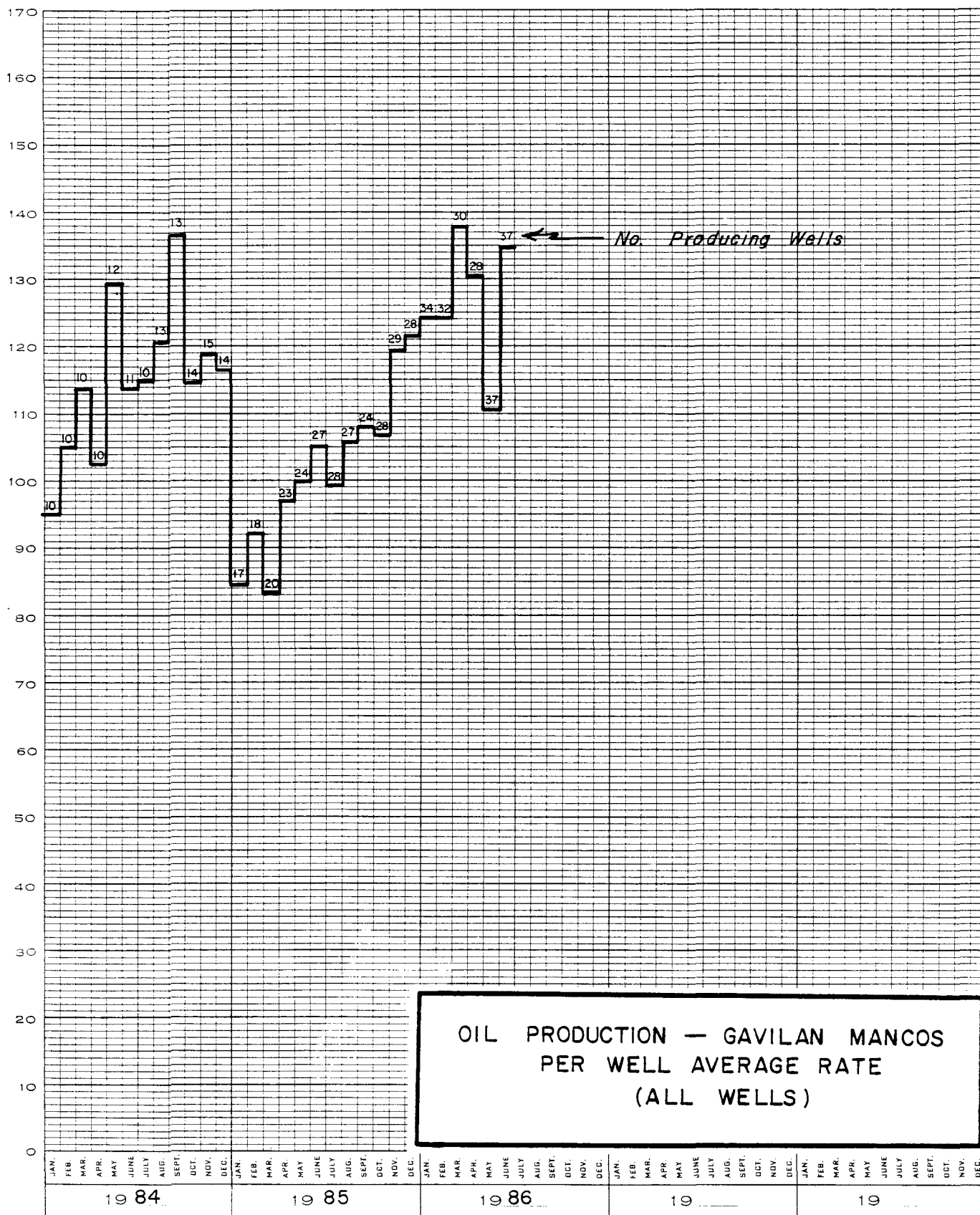
Total Production All Wells					Production Less Than 25 BOPD							
Date	Total Monthly		No. Wells	Production Per Well Per Month	BOPD Per Well	Production of Wells (No. of Wells)		Total Monthly Pool Oil Production		Production Per Well Per Month		BOPD Per Well
	Pool Oil Production											
1984												
Jan 1-31	29,443		10	2,944	95.0	-0-				10		95.0
Feb 1-28	29,380		10	2,938	104.9	-0-				10		104.9
March 1-31	35,279		10	3,528	113.8	764 (1)		34,515		9	3,835	123.7
April 1-30	30,826		10	3,083	102.8	-0-				10		102.8
May 1-31	48,106		12	4,009	129.3	-0-				12		129.3
June 1-30	37,533		11	3,412	113.7	991 (2)		36,542		9	4,060	135.3
July 1-31	35,510		10	3,551	114.5	507 (1)		35,003		9	3,889	125.5
Aug 1-31	48,575		13	3,737	120.5	537 (1)		48,038		12	4,003	129.1
Sept 1-30	53,177		13	4,091	136.4	648 (1)		52,529		12	4,377	145.9
Oct 1-31	49,721		14	3,552	114.6	680 (2)		49,041		12	4,087	131.8
Nov 1-30	53,276		15	3,552	118.4	1,441 (3)		51,835		12	4,320	144.0
Dec 1-31	50,573		14	3,612	116.5	851 (3)		49,722		11	4,520	145.8
1985												
Jan 1-31	44,587		17	2,623	84.6	2,290 (6)		42,297		11	3,845	124.0
Feb 1-28	46,407		18	2,578	92.1	1,053 (5)		45,354		13	3,489	124.6
March 1-31	51,713		20	2,586	83.4	2,181 (8)		49,532		12	4,128	133.2
April 1-30	66,736		23	2,902	96.7	1,889 (5)		64,847		18	3,603	120.1
May 1-31	73,684		24	3,071	99.0	2,506 (8)		71,178		16	4,449	143.5
June 1-30	85,109		27	3,152	105.1	2,436 (8)		82,673		19	4,351	145.0
July 1-31	86,256		28	3,081	99.4	2,167 (7)		84,089		21	4,004	129.2
Aug 1-31	88,588		27	3,281	105.8	2,024 (7)		86,564		20	4,328	139.6
Sept 1-30	77,586		24	3,233	107.8	1,656 (6)		75,930		18	4,218	140.6
Oct 1-31	92,791		28	3,314	106.9	2,566 (7)		90,225		21	4,296	138.6
Nov 1-30	103,754		29	3,578	119.3	1,746 (6)		102,008		23	4,435	147.8
Dec 1-31	105,578		28	3,771	121.6	2,521 (6)		103,057		22	4,684	151.1
1986												
Jan 1-31	131,058		34	3,855	124.3	3,887 (12)		127,171		22	5,781	186.5
Feb 1-28	111,329		32	3,479	124.3	1,966 (10)		109,363		22	4,971	177.5
March 1-31	127,946		30	4,265	137.6	2,320 (9)		125,626		21	5,982	193.0
April 1-30	109,478		28	3,910	130.3	1,635 (8)		107,843		20	5,392	179.7
May 1-31	126,731		37	3,425	110.5	4,041 (12)		122,690		25	4,908	158.3
June 1-30	149,517		37	4,041	134.7	1,992 (9)		147,525		28	5,269	175.6

TOTAL MONTHLY GAVILAN MANCOS POOL OIL PRODUCTION

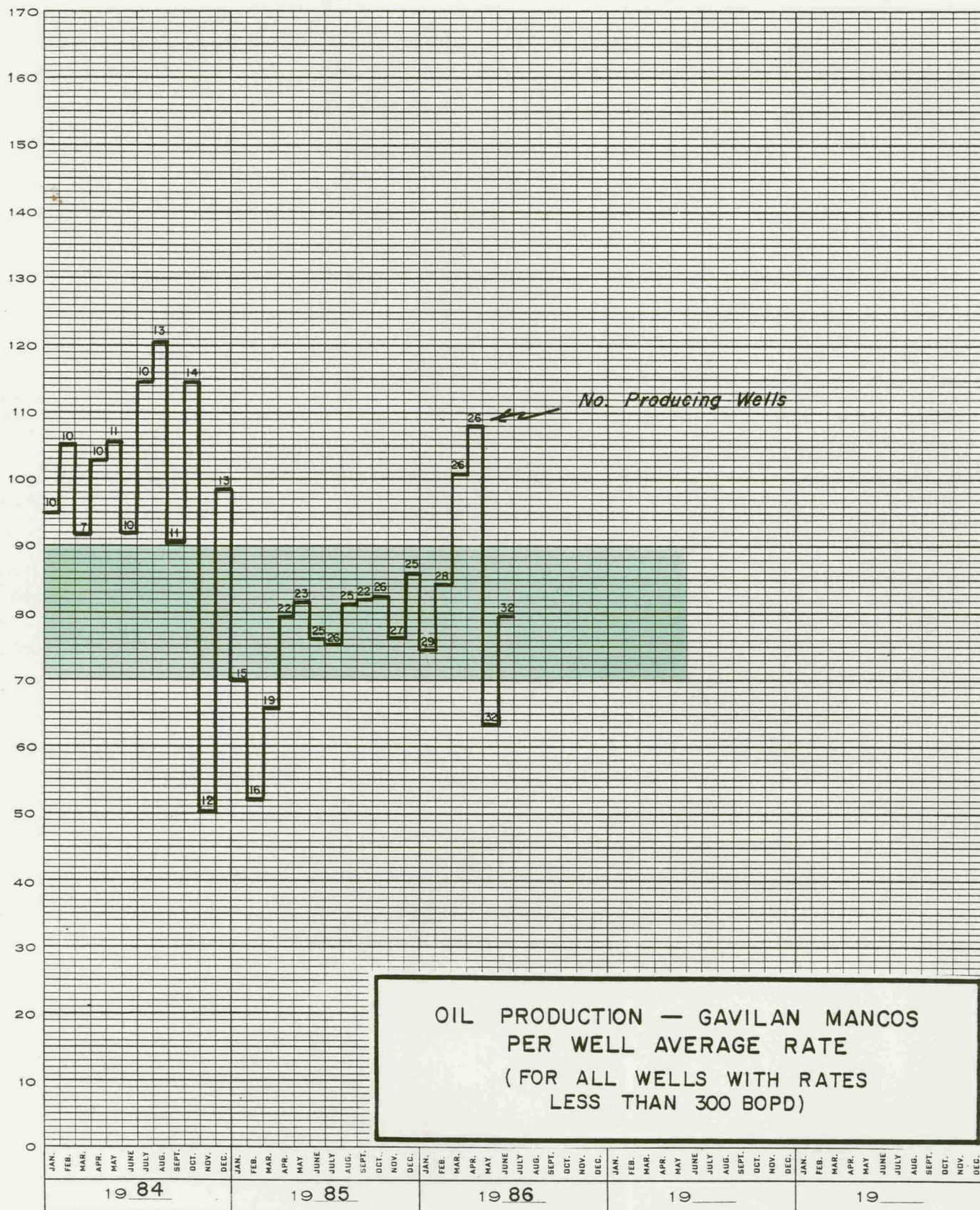
PRODUCTION RATE — THOUSANDS OF BARRELS PER MONTH



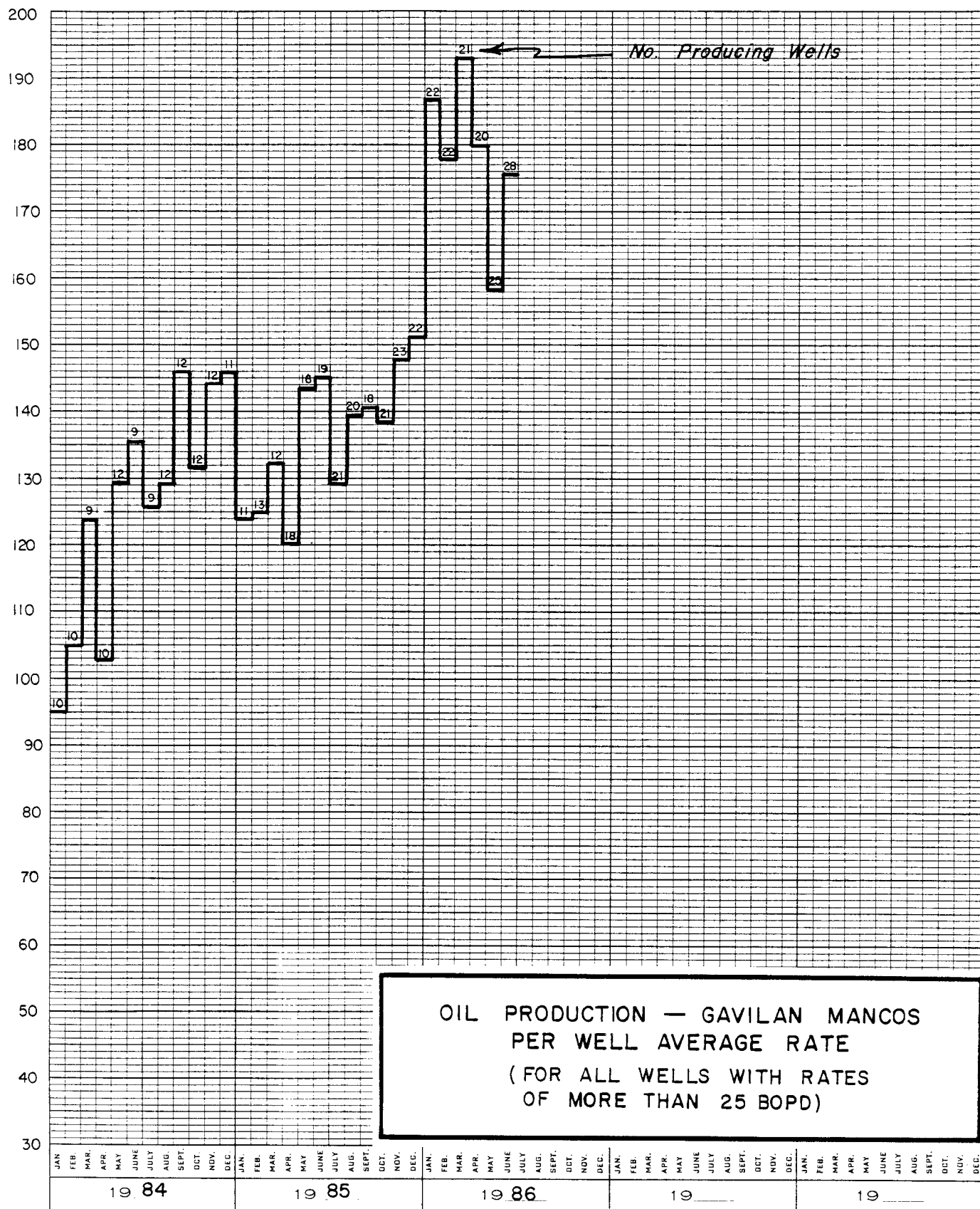
BARRELS OF OIL PER DAY PER WELL



BARRELS OF OIL PER DAY PER WELL



BARRELS OF OIL PER DAY PER WELL



OIL PRODUCTION — GAVILAN MANCOS
PER WELL AVERAGE RATE
(FOR ALL WELLS WITH RATES
OF MORE THAN 25 BOPD)

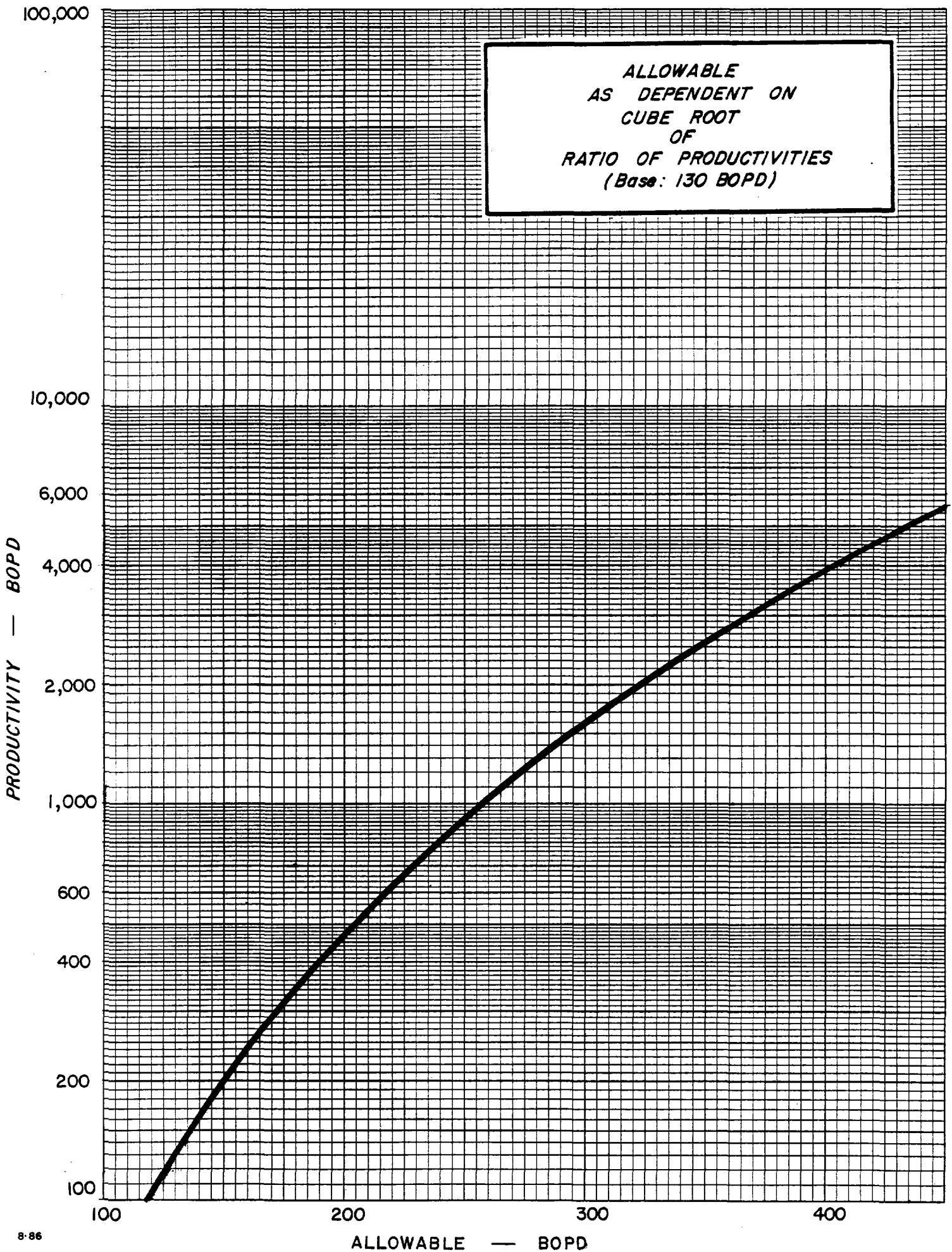
COMPARISON OF ALLOWABLES
OF 200 BOPD AND 700 BOPD
WITH ALLOWABLE BASED ON
RATIO OF CUBE ROOT OF PRODUCTIVITIES*

<u>Producti- vity (BOPD)</u> (1)	<u>Allowable if based on cube root of ratio of producti- vities*</u> (2)	<u>200 or Producti- vity Less Col 2 (BOPD) **</u> (3)	<u>Producti- vity Less Col 2</u> (4)
50	95	-	-
100	119	-	-
130	130	0	0
150	136	14	14
200	150	50	50
300	172	28	128
400	189	11	211
500	204	(4)	296
600	216	(16)	384
700	228	(28)	472

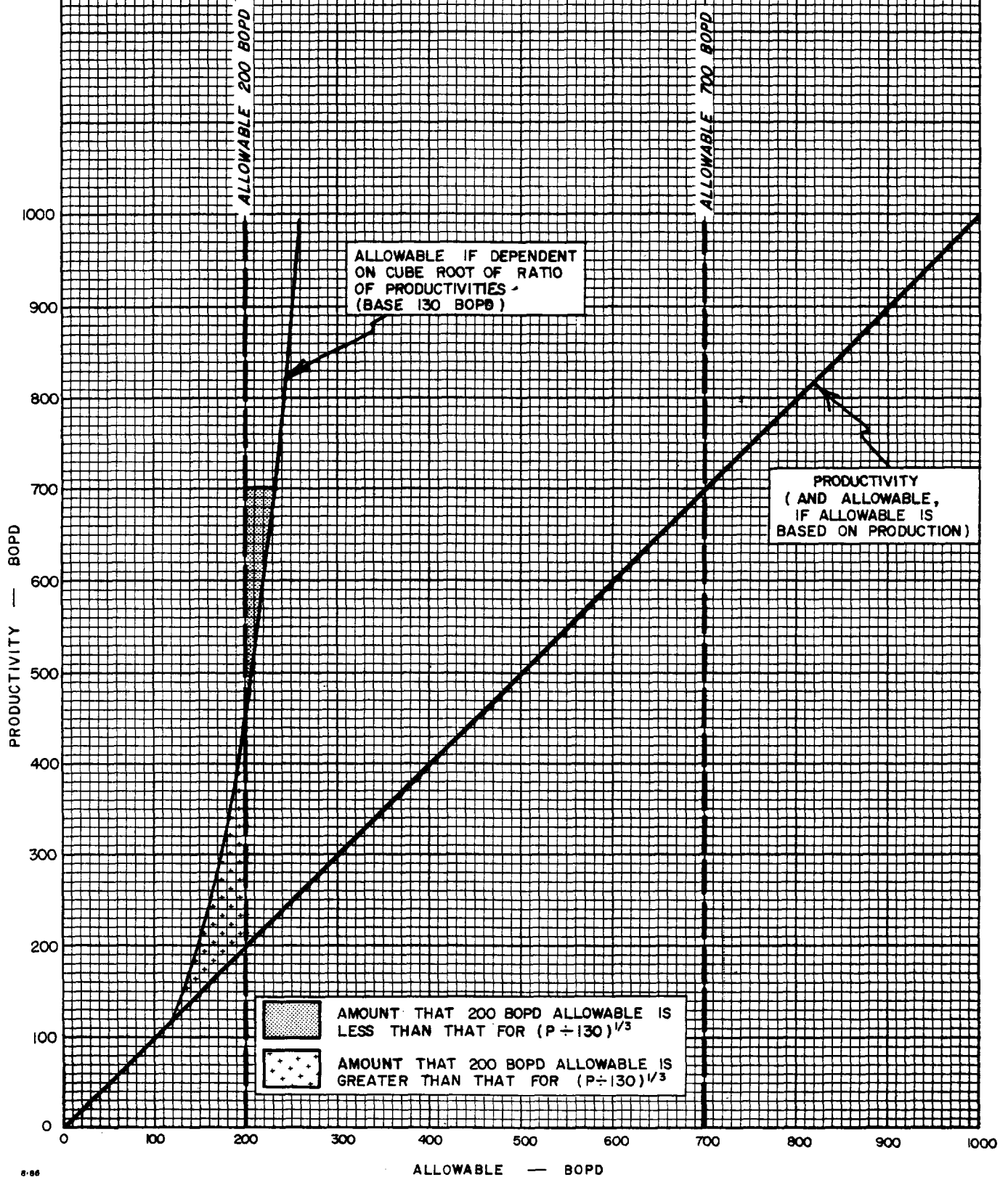
1000	257	(57)	743
10000	553	(353)	9447

* Base: 130 BOPD: allowable = (productivity, BOPD divided by 130)
raised to 1/3 power.

** Col. 3 is 200 BOPD or productivity (whichever is less) minus Col. 2.



COMPARISON OF ALLOWABLES
OF 200 BOPD & 700 BOPD
WITH
ALLOWABLE DEPENDENT
ON
CUBE ROOT OF RATIOS
OF PRODUCTIVITIES
(Base: 130 BOPD)



COMPARISON OF ALLOWABLES
OF 200 BOPD & 700 BOPD
WITH
ALLOWABLE DEPENDENT
ON
CUBE ROOT OF RATIOS
OF PRODUCTIVITIES
(Base: 130 BOPD)

