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# SAN JUAN 29-5 UNIT #91

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## WELL HISTORY

Well first delivered. 0=2776 MCF/D 07-30-80 Completed 12 day liquid production test - 19 BWPD. 11-25-80 Installed stopcock set for 6 hours off & 2 hours on. 05-01-81 12-29-81 Changed stopcock time to 2 hours off & 4 hours on. QI=1011 MCF/D, QA=252 MCF/D. 04-12-82 Changed stopcock time to 2 hours off & 10 hours on. QI=607 MCF/D, QA=400 MCF/D. 09 - 19 - 84Well shut in for overproduction. QI=313 MCF/D, QA=261 MCF/D. 12 - 20 - 84Well scheduled to produce. Logged. Csg pressure=1620#, tubing pressure=880#. 12-26-84 Equalized tubing and casing. Well still logged. 10-18-85 Swab well. to 10-29-85 10-30-85 Acidized well. 10-31-85 Swab well. to 11-02-85 11-17-85 Well on line; stopcock set for 5 hours off & 1 hour on. QI=575 MCF/D, QA=96 MCF/D. 11-12-85 Well logged. 11-20-85 Swab well. 12-03-85 Well on line; stopcock set for 7 hours off & 1 hour on. • QI=622 MCF/D, QA=78 MCF/D. Well produced steady and did not log at this setting. 12-16-85 Changed stopcock time to 5 hours off & 1 hour on. QI=601 MCF/D, QA=100 MCF/D. Well produced steady and did not log at this setting. First day of log-off test. 12-18-85 Changed stopcock time to  $6\frac{1}{2}$  hours off and  $1\frac{1}{2}$  hours on. QI=571 MCF/D, QA=107 MCF/D. Well produced steady throughout this time setting. Third day of log-off test. hadaag ah 🗤

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- 12-20-85 Changed stopcock time to ll hours off & l hour on. QI=612 MCF/D, QA=51 MCF/D. Well produced steady throughout time setting. Fifth day of log-off test.
- 12-24-85 Changed stopcock time to 5½ hours off & ½ hour on. QI=618 MCF/D, QA=57 MCF/D. Well produced steady throughout time setting. Ninth day of log-off test.
- 12-26-85 Log-off test concluded. Stopcock time changed back to 11 hours off & 1 hour on.
- 101-07-86 Log-off test inconclusive. Changed stopcock time to 111 hours off and 3/4 hours on. QI=721 MCF/D, QA=45 MCF/D. Start log-off test.
- 01-08-86 Changed stopcock time to ll½ hours off & ½ hour on. QI=650 MCF/D, QA=27 MCF/D. Well produced steady throughout time setting. Second day of log-off test.
- 01-15-86 Changed stopcock time setting to 11-3/4 hours off and hour on. QI=739 MCF/D, QA=15 MCF/D. Ninth day of log-off test.
- 01-17-86 Found well logging with stopcock set at 11-3/4 hours off and  $\frac{1}{4}$  hour on. Unloaded well through unit and changed time to 11 hours off and 1 hour on. Log-off test concluded.
- 01-22-86 Log-off test conclusive. Changed stopcock time back to 11-3/4 hours off and  $\frac{1}{4}$  hour on. QI=748 MCF/D, QA=16 MCF/D. Start log-off test.
- 01-25-86 Well logging with stopcock set at 11-3/4 hours off and  $\frac{1}{4}$  hour on. Unloaded well through unit and changed stopcock time to 5 hours off and 1 hour on. Log-off test concluded.

Well Name: San Juan 29-5 Unit #91 DK

Rig: Silver Star Swabbing

Invoice Date	Cost	Days		
10/26/85 11/11/85 11/20/85	\$4,287.64 3,580.65 514.66	5 5 1		
Total	\$8,381.95	11		

<u>NWP Representative</u>: Production technician at \$22.11 hr

Average 10 hrs/day = \$221.10/day Total = \$2,432.10

NWP Vehicle: 1 ton pickup at \$.77/mile

Distance to San Juan 29-5 Unit #91 = 65 miles one way 130 miles/day at \$77/mile = \$100.10/day Total = \$1,101.10

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NWP Engineering overhead & miscellaneous charges: \$165/day

Total = \$1,815.00

Totals:	Rig Man	\$ 8,381.95
	Vehicle	1,101.10
	OH	 1,815.00
		\$ 13,730.15

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SAN JUAN 29-5 UNIT #91 PRODUCTION ECONOMICS

#### Gas Price

Market	Out	Gas	Price	8-1-86	=	1.35	\$/MMBTU
		Roya	alties		-	.17	
		Taxe	es		-	.15	
BTU	Adjı	ıstme	ent Fac	etor	x	1.03	\$/MMBTU MMBTU/MCF
						1.08	\$/MCF

#### 1. Normal Production Costs

Fixed annual overhead costs \$243/month x 12 mo.= \$2914 Routine annual production costs \$125/month x 12 mo.= \$1493

Breakeven Production Costs

(2914 + 1493)/1.08 MCF = 4081 MCF/yr x 365 day/yr = 11 MCF/D.

Using exponential decline analysis, remaining reserves at abandonment are <u>14.6 MMCF</u>.

2. Swabbing Costs

Assume 3 swabbing jobs/yr requiring 5 days each time at 1000 \$/day = \$15,000/yr.

Breakeven Production Requirements

(2914 + 1493 + 15000)/1.08 MCF = 17,970 MCF/yr x 365 day/yr = 49 MCF/D. Assuming 50% curtailment due to low demand breakeven production required is 98 MCF/D.

Using exponential decline analysis, remaining reserves at abandonment are <u>127.8 MMCF</u>.

3. Pumping Unit Costs

Used pumping unit, rods, motor, pump, downhole separator, and installation cost \$90,000.

Operation costs are negligible.

Assume well life of 7.5 years (28% decline to breakeven volume of 11 MCF/D).

Annual pumping costs 90,000/7.5 yr = 12,000

### Breakeven Production Requirements

\$(2914 + 1493 + 12,000)/1.08 \$/MCF = 15192 MCF/yr x 365 day/yr = 42
MCF/D. Assuming 50% curtailment due to low demand, breakeven
production required is 84 MCF/D.

Using exponential decline anallsis, remaining reserves at abandonment are  $\underline{109.5}$  MMCF.

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Volume of water in tubing required to log well off:

- In 2-3/8", 4.7 lb/Ft, EUE tbg. (8731-3000)Ft X .00387 BBL/Ft = 22.2 BBLS
- In 1-1/2", 2.90 lb/Ft, EUE tbg. (8731-3000)Ft X .00252 BBL/Ft = 14.4 BBLS
- In 1-1/4", 2.33 lb/Ft, IJ tbg. (8731-3000)Ft X .00185 BBL/Ft = <u>10.6 BBLS</u>





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 $\left\{ Q_{i}^{(1)},\ldots,Q_{i}^{(n)}\right\} = \left\{ e_{i}^{(1)},e_{i}^{(1)},\ldots,e_{i}^{(n)}\right\} = \left\{ e_{i}^{(1)},\ldots,e_{i}^{(n)}\right\} = \left\{ e_{i}^{(1)},\ldots,e_$ 

EXHIBIT



EXHIBIT #11





<sup>252</sup> 

CALENDER DAYS\*\*.5



SAN JUAN 29-5 UNIT #91 DK

-DI(1) Qt = Qi + E WHERE: Dt = PRODUCING RATE AT TIME = T (MCF/D) Qi = INITIAL PRODUCING RATE (MCF/D) -D = 1/T + Ln(Qt/Qi)E = EXPONENTIAL FUNCTION -D = Z DECLINE (decisal) ~ 1980 Qi = T = TIME PERIOD (years) 754 MCF/D 1984 Qt = 245 MCF/D I = 4 Ln(Qt/Qi) = -1.12 -]) = -0.29 ESTIMATED RESERVES LOST FROM THE #91 LOGGING \$ 0i - 0t (1) Np = ---- ¥ 365 WHERE: Np = RESERVES REMAINING (MMCF) D Qi = INITIAL PRODUCING RATE (NCF/D) Qt = PRODUCING RATE AT ABANDONMENT (MCF/D) **RESERVES BEFORE LOGGING:** D = X DECLINE (decimal) @i = 245.00 MCF/D Qt = 0.00 MCF/DNp = 319.37 MMCF D = 0.28**RESERVES AFTER LOGGING:** Qi = 146 MCF/D- ! 0.00 190.32 ₽t = Np = 0.28 D = LOST RESERVES = 129.05ESTIMATED RESERVES LOST FROM PREMATURE ABANDONMENT Qi = 49.00No = 64.0 KMCF ₽t = · 0.00 D = 0.28 (T) ARPS, J.J.: ESTIMATION OF PRIMARY OIL AND GAS RESERVES, PETROLEUM PRODUCTION HANDBOOK, VOL. II; RESERVIOR ENGINEERING, SPE OF AIHE, 1962, P. 37-43 EXHIBIT

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