REPORT

RESULTS OF 24-HOUR TEST
AMAX 81-14
FISH LAKE, NEVADA

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1.0 SUMMARY

Low flow rates of two-phase fluid were produced over 24 hours of flow of AMAX well 81-14 near Fish Lake, Nevada. Wellhead pressure averaged 24 psig. Flow rates ranged from 33,600 lbm/hr to 34,800 lbm/hr from James' Method and were around 49,000 lbm/hr using orifice calculations. Enthalpy and steam quality were high, 660 BTU/lb and 30-37% respectively. This suggested the presence of a shallow steam cap. Extreme temperature reversal in the well suggests that this well penetrated a zone of upwelling hot water and steam, and that a more productive, higher temperature zone may be encountered at deeper depths.

2.0 TEST PROCEDURE

AMAX well 81-14 was drilled in an area of high heat flow and thermal manifestations near Dyer, Nevada, in the vicinity of Fish Lake. The well was originally drilled to a depth of 460 feet where a hard-pan layer, possibly a silica cap, was encountered with a steam producing zone below. The well was intended as a heat flow hole and the small rig drilling the well was not set up to deal with the steam/water mixture produced. The rig was moved off and a second phase of drilling began on July 11, 1982. (Appendix B shows drilling history of Phase II). The well was completed to a total depth of 2046 feet. No other high temperature zones were encountered. Geothermometry done on water samples indicated high reservoir temperatures, between 390 and 475oF.

It was decided by AMAX that a short term production test to determine the well characteristics and reservoir properties, if possible, would be performed. Since flow from the well was two-phase, measurement of flow rate and estimation of enthalpy was of primary importance.

2.1 TEST FACILITY

An initial well test facility design was done based on the characteristics of the hole prior to completion of Phase II drilling. This is shown in Figure 6. A flow T connected to the master valve and provided with a lubricator for temperature logging during flow testing was originally planned. However, as the hole was drilled deeper and temperatures never reached the maximum observed at 460 feet, there was concern that the well would not flow without air lifting of the cold water column. This contingency was provided for by machining a reducing flange to come off the Grant rotating head used during drilling so that the drill pipe could be left in the hole and used to air lift the well. In this case temperature surveys could be run inside the drill pipe, allowing protection of the wireline tool from the two-phase flow regime in the borehole.

2.1.1 PRESSURE AND TEMPERATURE INSTRUMENTATION

Pressure and temperature were measured at several points in the system through taps in the 4" line. Pressure was measured using liquid filled pressure gauges just downstream of the wellhead after the flowline shutoff valve, and at the lip of the pipe outlet. Temperature was measured using a bimetal thermometer, just downstream of the wellhead, set in a 2½" thermalwell.

2.1.2 FLOW RATE MEASUREMENT

Flow rate was measured using three methods. James' Method for measuring two-phase flow from lip pressure was used. A ¼" tap was gauged with a 0-15 psig gauge ¼" from the top of the pipe outlet. Water flow was channeled into a measured area and water flows estimated by timing the channel velocity. This estimate was hampered by the fact that the pit used for water disposal is quite narrow at this point with a rock wall on the far side. Water splashed against this rock wall and could not be easily channeled into one area. The pit could not be accurately gauged since water losses out of the bottom through old mining excavations were quite large.

In addition, flow rate was measured using a 3" orifice held by metering flanges with pressure drop across the orifice measured and recorded using a Barton meter. A square edge orifice was used. Flow rate was than calculated using single phase orifice flow equations assuming average density for the fluid calculated from the observed steam quality.

Flow rate was also estimated using the temperature gradient measured during the flowing temperature survey. A method developed by James for the cased portion of the hole was used. James assumes that in two-phase flow the temperature gradient in the casing is largely dependent on flow rate.

2.1.3 WATER SAMPLING

Water samples were taken through a ½" tap in the flow line upstream of the metering flanges. It had been hoped that the flow would remain single phase until after the orifice; however, this was not the case. The sample was thus taken of the two-phase mixture. Since steam tends to separate and flow along the pipe wall in non-equilibrium flow situations, it is not likely that a representative sample was obtained. Larger amounts of steam would be sampled through the pipe tap than water.

Water samples were analyzed by AMAX. Samples of condensate preserved for measurement of non-condensible gases were taken by using specially prepared gas bombs with NaOH as a preservative. These samples were analyzed by Anatec Laboratories, Inc., Santa Rosa, California.

2.2 TEST PLAN

A 24 hour flow test at constant wellhead pressure was planned. It was hoped that production from deeper, hotter zones would allow production at high enough pressures to keep the fluid single phase above the orifice by throttling the flow with a gate valve in the flow line. Since no high temperature zones were encountered below the 460 foot depth, the flow was two-phase in the borehole and pressures at the wellhead were low. Thus, the well could not be throttled.

A flowing temperature survey was planned for eight hours after the start of flow and just prior to shut-in. This was run through the drill pipe.

In a constant pressure test, the decline of flow rate is used to estimate well productivity and reservoir properties such as transmissity and storage. In a two-phase flow situation, a constant rate is usually very difficult to maintain due to irregular water production. The temperature reversal in this well may have resulted in mixing of colder water with the hot waters from the steam zone. This may have reduced the wellhead pressures. As a result, wellhead pressure was very difficult to control until the borehole was heated. In addition, the well was choked by flowing it with the drill pipe in the hole.

3.0 WELL BEHAVIOR DURING TESTING

The test facility was rigged up by 3:00 A.M., July 25, 1982. The well was flowed by opening the pipe rams to the open flow line to avoid water hammer effects. Steam continually leaked through the drill pipe due to a bad seal in the check valve in the float-sub at the bottom of the pipe. The pipe was run to total depth and remained in the hole until 4:00 A.M., July 26, 1982 when it was removed to determine the amount of choking occurring due to the pipe.

Two temperature surveys were run. The first began at 0930, 7/25/82. The tool stuck at 1050 and was removed by 1350. The tool was again run in starting at 1500, 7/25/82 and removed at 2335, 7/25/82. This survey is shown in Figure 4.

Water samples were taken at 1330, 1630, and 2055 on 7/25/82. Another sample was taken at 0530 on 7/26/82. Non-condensible gases were sampled at 0010, 7/26/82. Results of chemical analyses are shown in Tables 2 and 3.

3.1 WELLHEAD PRESSURE

A plot of wellhead pressure is shown in Figure 2. Surging occurred periodically throughout the test as indicated by the range of the pressure drop measured by the Barton meter and by the fluctuations in wellhead and lip pressure. An attempt was made to choke the flow and observe the decrease in flow rate with higher wellhead pressures, but the increased column density decreased the wellhead pressure and the throttle was opened again. Wellhead pressure increased several psi as the pipe was withdrawn as shown in Figure 2. This indicated the amount of pressure drop due to frictional losses around the drill pipe. However, the flow rate did not increase substantially at the same time, suggesting that the flow was not severally choked.

3.2 FLOW RATE

Flow rate was calculated using James' Method, orifice measurements and the temperature gradient during the flowing survey. James' Method requires the calculation of an enthalpy from weir flow rates. Initial estimates of enthalpy using James' Method were quite high. This resulted in low flow rates. Estimates using enthalpy calculated from the Fauske model of two-phase flow at a pipe exit were made and found to be in the same order of magnitude as the estimate from the flowing temperature survey.

Enthalpy was then converged on by using the weir flow of 50 gpm and trial enthalpies until steam quality and flow rate agreed.

Flow rates from James' Method are shown in Table 1 with a plot of rates in Figure 3. Rates ranged from 33,600 lbm/hr total mass flow with 37% steam to 35,800 lbs/hr. The calculation method is shown in Appendix A along with the weir flow calculation. Calculated flows from the orifice measurement were around 49,400 lbm/hr total mass with 34,600 lbm/hr liquid or about 30% steam. This is in the same general range as the 31,000 lbm/hr found from the temperature gradient.

3.3 WELL PRODUCTIVITY

Flow rate versus pressure at the wellhead was plotted and a productivity index calculated. Figure 5 shows two (2) curves for productivity, with and without the drill pipe in the hole. These are both rough estimates since the low wellhead pressures did not permit choking of the flow. The productivity index of 466 lbm/hr/psi is not suggestive of the high productivities normally found in open fractures.

4.0 CONCLUSION

4.1 RESERVOIR MODEL

The high steam quality is suggestive of a steam cap on the reservoir. However, the low productivity does not suggest fractures. The extreme temperature reversal indicates upwelling of hot fluids along a vertical high conductivity zone such as a fracture, with a steam cap built up beneath a silica or carbonate seal. The well probably intersected this steam zone in a cinder layer in hydrologic connection with the fracture. This is shown in Figure 6.

4.2 ECONOMICS

Economic steam rates can not be produced from this well. Wellhead pressures are too low to turn a steam turbine, flow rates are also low despite the high steam quality. Our calculations show a maximum of 14,600 lbm/hr of steam at 25 psig. This is probably less than .5 MW_e, even if a low enough pressure turbine existed. Present turbines used at The Geysers require 100 psig inlet pressure. Turbines now replacing existing equipment operate at pressures as low as 80 psig inlet pressure.

However, the high temperatures at such shallow depths are indicative of a deeper, hotter reservoir in this area. The geology suggests possible open fractures which could produce at high rates. Further exploration to locate fracture direction at depth could yield commercial hot water or two-phase production.

4.3 RESERVOIR PROPERTIES

Due to the low wellhead pressures which prevented a constant pressure test, reservoir parameters were not calculated. The low well productivity is an indication of either partially sealed fractures or low to moderate permeability matrix production.

4.4 RECOMMENDATIONS

Further drilling in an area where fracture zones can be intersected at deeper depths should yield higher pressures and temperatures. Since the area has warm wells and hot springs, open fractures may be encountered with high productivity. At depths below 5000 feet the reservoir should be single phase. Production of a single phase fluid avoids the problems of scale in the borehole and formation with resulting loss of production. Further exploration should be done to determine if fractures exist at this depth.

TABLE I

AMAX WELL 81-14

24 HOUR PRODUCTION TEST 7/25 - 7/26/82

FLOW RATE FROM JAMES' METHOD

TIME	P_{lip}	P_{atm}	FLUX $\frac{lbm}{ft^2 \ sec}$	FLOW RATE $\frac{lbm}{hr}$
3:56	0-2	12.7-14.7	102.2-117.6	32,500-37,300
6:42	1	13.7	109.9	34,800
7:15	.9	13.6	109.1	34,600
7:56	.8	13.5	108.4	34,300
8:13	.8	13.5	108.4	34,300
8:30	.8	13.5	108.4	34,300
9:00	1.0	13.7	109.9	34,800
9:30	1.0	13.7	109.9	34,800
9:35	.8-1.0	13.5-13.7	108.4-109.9	34,300-34,800
10:00	.9	13.6	109.1	34,600
10:30	.8	13.5	108.4	34,300
11:00	.8	13.5	108.4	34,300
11:30	.8	13.5	108.4	34,300
12:00	.8	13.5	108.4	34,300
12:30	.8	13.5	108.4	34,300
13:00	.8	13.5	108.4	34,300
13:30	.5	13.2	106.1	33,600
14:00	.5	13.6	106.1	33,600
14:30	.6	13.3	106.8	33,800
15:00	.6	13.3	106.8	33,800
15:30	.6	13.3	106.8	33,800
16:00	.7	13.4	107.6	34,000
16:30	.7	13.4	107.6	34,000
17:00	.7	13.4	107.6	34,000
17:30	.7	13.4	107.6	34,000
18:00	.7	13.4	107.6	34,000
18:30	.7	13.4	107.6	34,000

TABLE 1 (CONT.)

TIME	P_{lip}	P_{atm}	FLUX $\frac{lbm}{ft^2 \, sec}$	FLOW RATE $\frac{lbm}{hr}$
19:00	.7	13.4	107.6	34,000
19:30	.7	13.4	107.6	34,000
20:00	.7	13.4	107.6	34,000
20:30	.7	13.4	107.6	34,000
21:00	.7	13.4	107.6	34,000
21:30	.7	13.4	107.6	34,000
22:00	.7	13.4	107.6	34,000
22:30	.7	13.4	107.6	34,000
23:00	.7	13.4	107.6	34,000
24:00	.7	13.4	107.6	34,000
24:30	.7	13.4	107.6	34,000
01:00	.7	13.4	107.6	34,000
01:30	.7	13.4	107.6	34,000
02:00	.7	13.4	107.6	34,000
02:30	.7	13.4	107.6	34,000
03:00	.7	13.4	107.6	34,000
03:30	.7	13.4	107.6	34,000
04:00	.7	13.4	107.6	34,000
04:30	.8	13.5	108.4	34,300
04:45	.8/1.0	13.5-13.7	108.4-109.9	34,300-34,800
05:00	.8/1.0	13.5-13.7	108.4-109.9	34,300-34,800
05:15	.8/1.0	13.5-13.7	108.4-109.9	34,300-34,800
05:30	.8/1.0	13.5-13.7	108.4-109.9	34,300-34,800
06:00	.8/1.0	13.5-13.7	108.4-109.9	34,300-34,800

TABLE 2

CHEMICAL ANALYSES OF CONDENSED SAMPLE DURING FLOW TEST OF 81-14

	W14187 1330 hrs 25/7/82	W14186 1630 hrs 25/7/82	W14185 2055 hrs 25/7/82	W14188 0530 hrs 26/7/82
T^oC	123	---*	123	127+
Flow	50 gpm	---*	50 gpm	60 gpm+
pH	5.9	---*	6.65	9.0
Cl	860.0	---*	660.0	830.0
F	5.0	---*	4.2	5.4
SO_4	130.0	---*	120.0	140.0
HCO_3	182.0	---*	165.0	201.0
CO_3	0.0		0.0	135.0
$S:O_2$	120.0	120.0	110.0	130.0
Na	610.0	610.0	540.0	660.0
K	64.0	64.0	57.0	680
Ca	2.1	< 0.5*	1.5	2.3
Mg	< 1.0	< 1.0	< 1.0	< 1.0
Li	2.3	2.4	2.1	2.5
B	12.0	---*	10.0	13.0
TDS	1988.4	---	1670.8	2189.2
Ec (K)	3200.0	---	2800.0	3400.0

* Sample acidified with H_2SO_4 which made analysis impossible

\+ Temperature increase and rate of flow increase after

TABLE 3

ANALYSIS OF NON-CONDENSIBLE GASES
AMAX WELL 81-14
1210 HOURS

Water Vapor Present

9.91×10^{1}

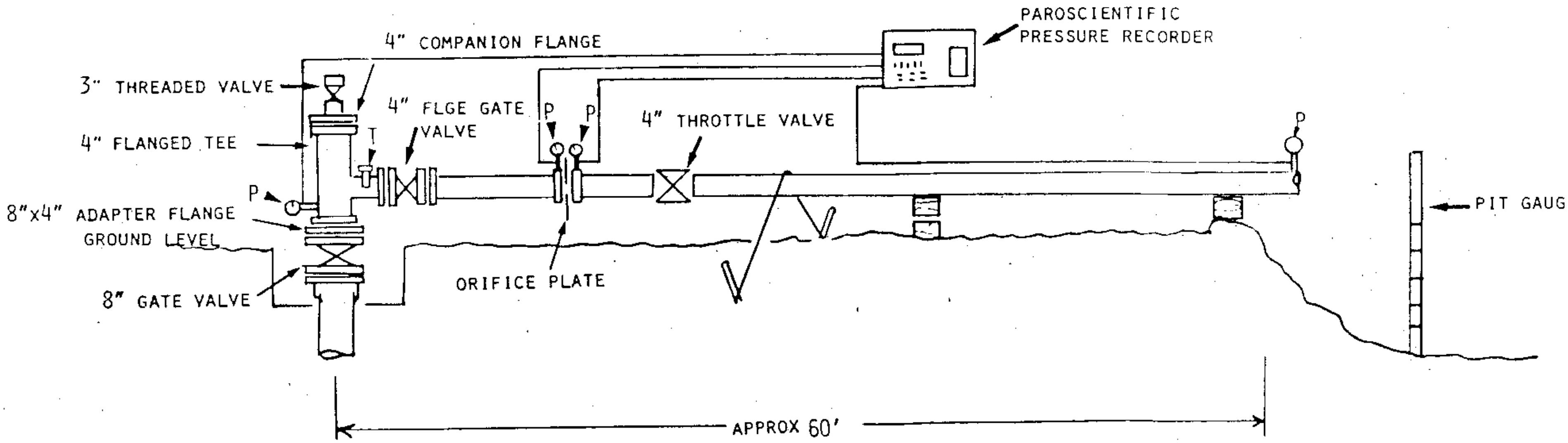
	MOLE PERCENT WITHOUT WATER	MOLES PER 1,000 MOLE WATER	WEIGHT PERCENT WITH WATER
CO_2	9.80×10^{1}	3.49×10^{0}	8.45×10^{-1}
H_2S	3.85×10^{-1}	1.37×10^{-2}	2.57×10^{-3}
H_3	2.77×10^{-1}	9.86×10^{-3}	9.24×10^{-4}
Ar	2.31×10^{-2}	8.22×10^{-4}	1.81×10^{-4}
N_2	1.11×10^{0}	3.94×10^{-2}	6.08×10^{-3}
CH_4	1.56×10^{-1}	5.54×10^{-3}	4.89×10^{-4}
He	6.59×10^{-3}	2.35×10^{-4}	5.16×10^{-6}
H_2	4.27×10^{-2}	1.52×10^{-3}	8.44×10^{-6}

Moles/1,000 mole condensate	3.563
Ratio of cubic feet/lb	7.10×10^{-2}
Percent non-condensibles by weight	0.863
Percent air	0.00

These are the results of 1 sample
other sample was voided because of broken stem.

FIGURE 1

AMAX EXPLORATION, INC.
SCHEMATIC OF PIT TEST RIG UP
FOR N-31417 WELL 24-33
JULY, 1982



NOTE: ALL EQUIPMENT 150 LB ANSI OR GREATER

FIGURE 2

AMAX WELL 81-14
24 HOUR PRODUCTION TEST
PLOT OF FLOWING WELLHEAD PRESSURE -vs- TIME
7/25 - 7/26/82

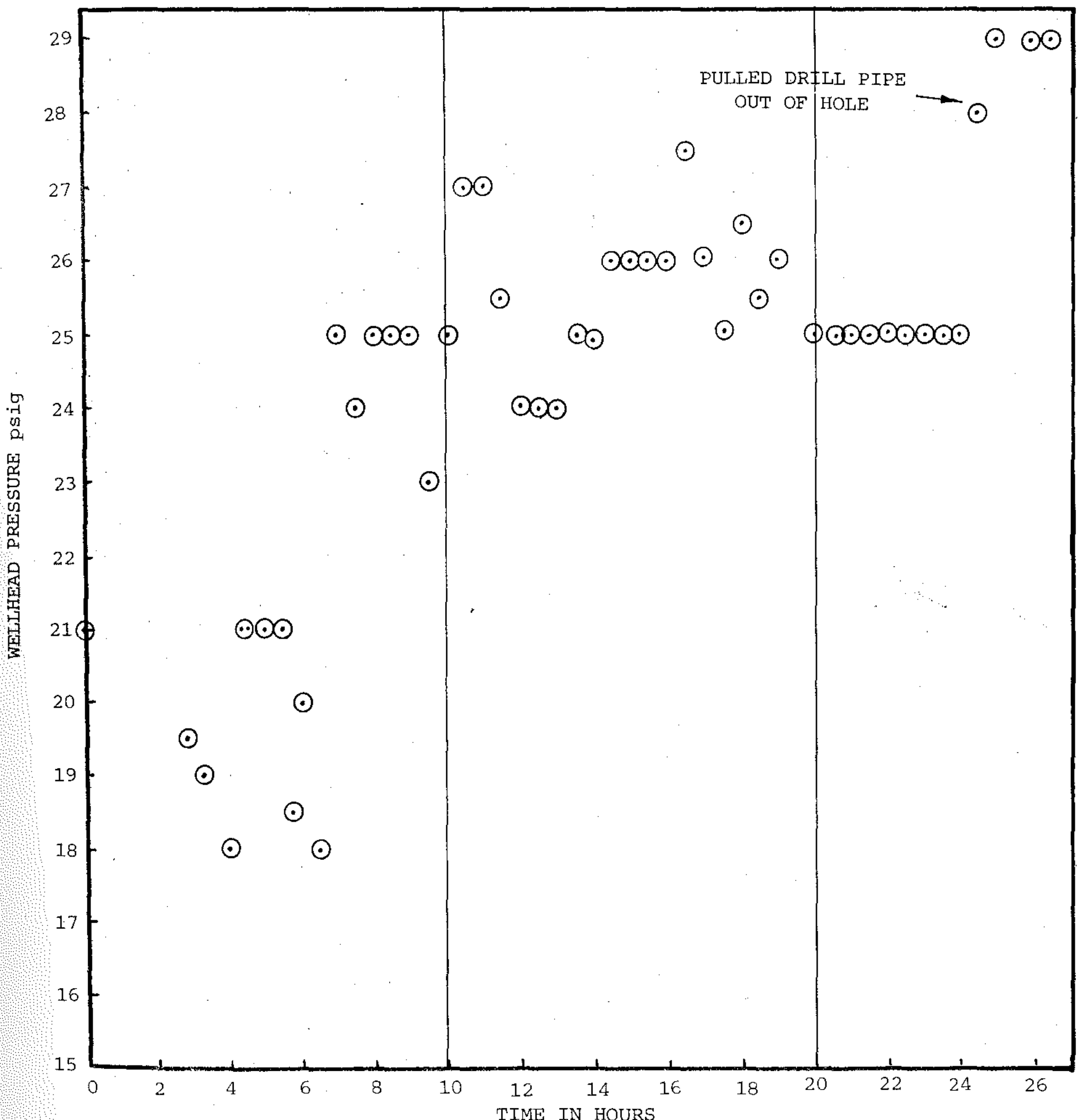


FIGURE 3

AMAX WELL 81-14
PRODUCTION TEST
PLOT OF FLOW RATE -vs- TIME
7/25 - 7/26/82

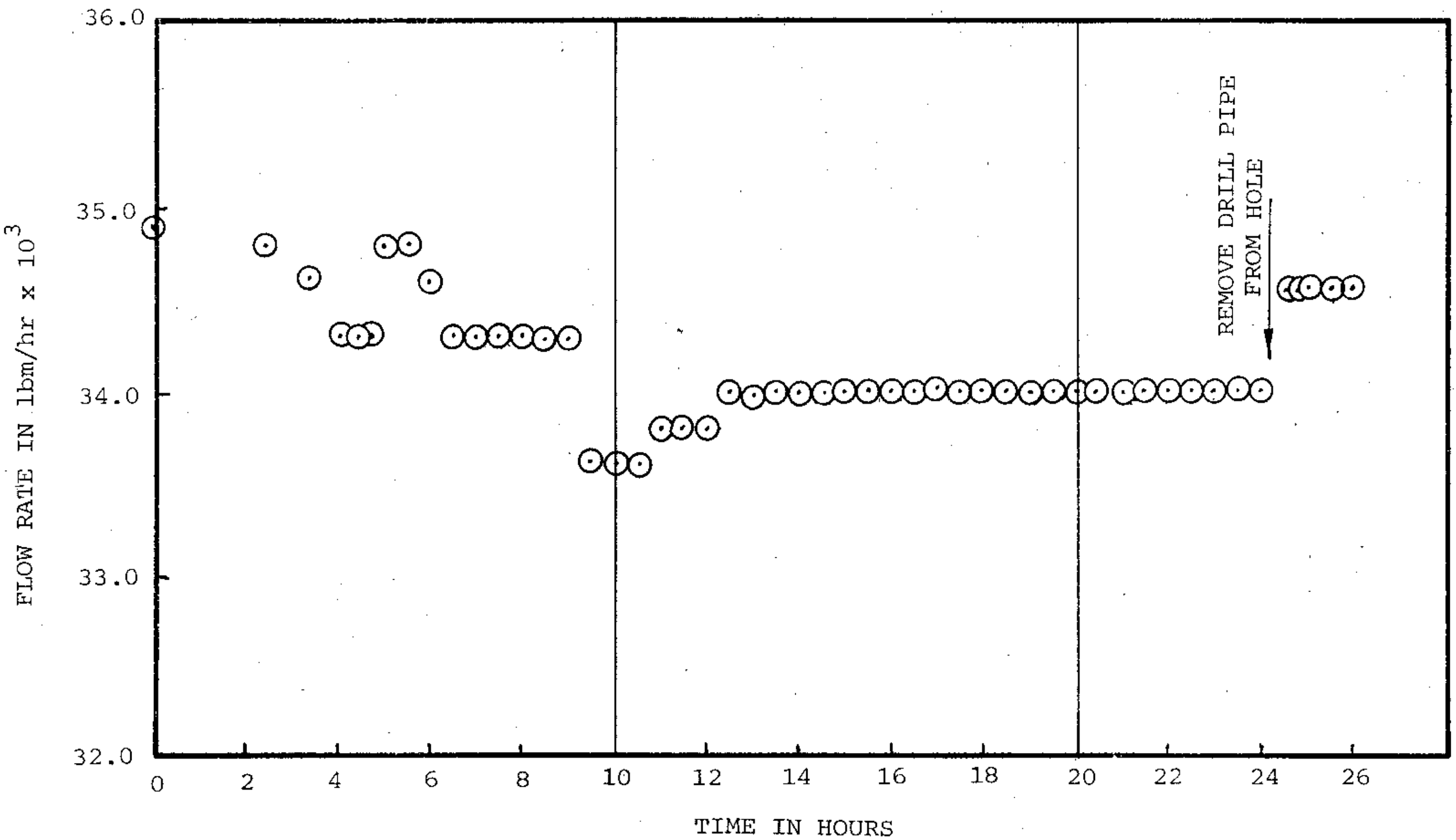


FIGURE 4

AMAX WELL 81-14

FLOWING TEMPERATURE SURVEY

15:00 7/25/82

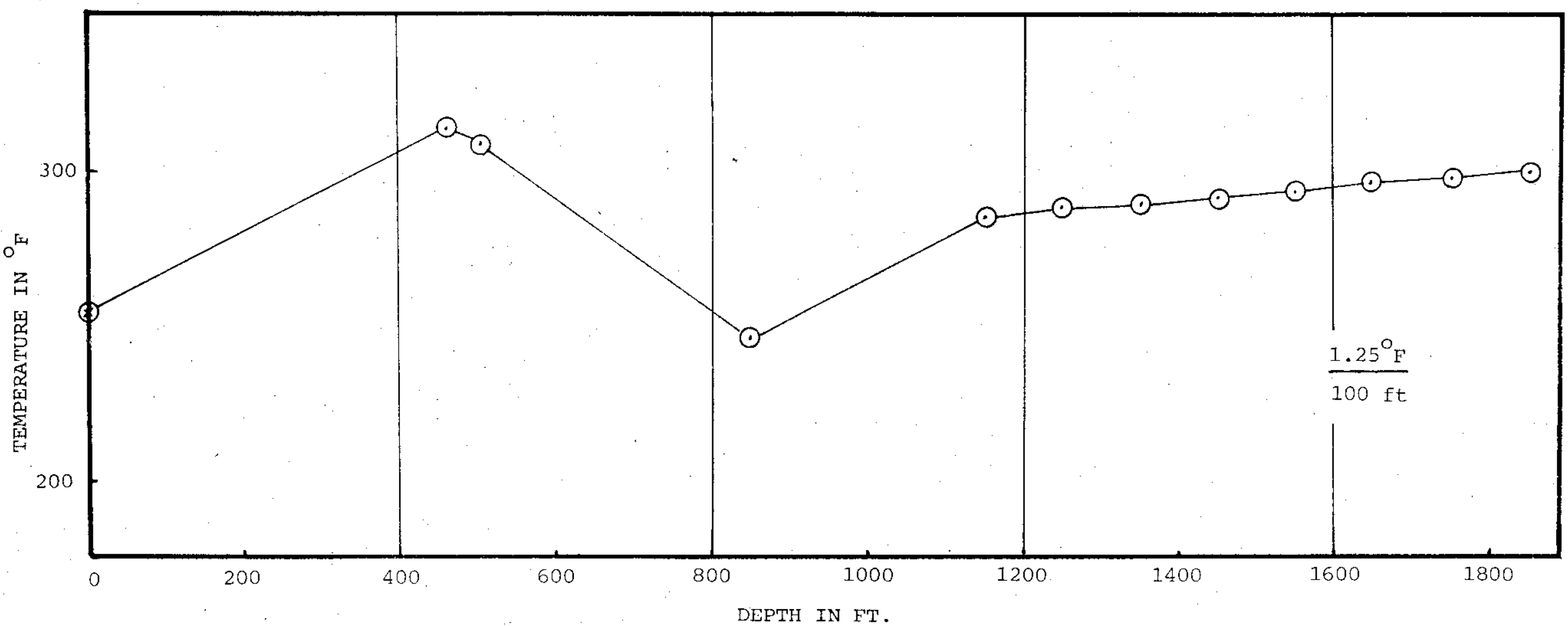


FIGURE 5

AMAX WELL 81-14

24 HOUR PRODUCTION TEST

WELL PRODUCTIVITY

7/25 - 7/26/82

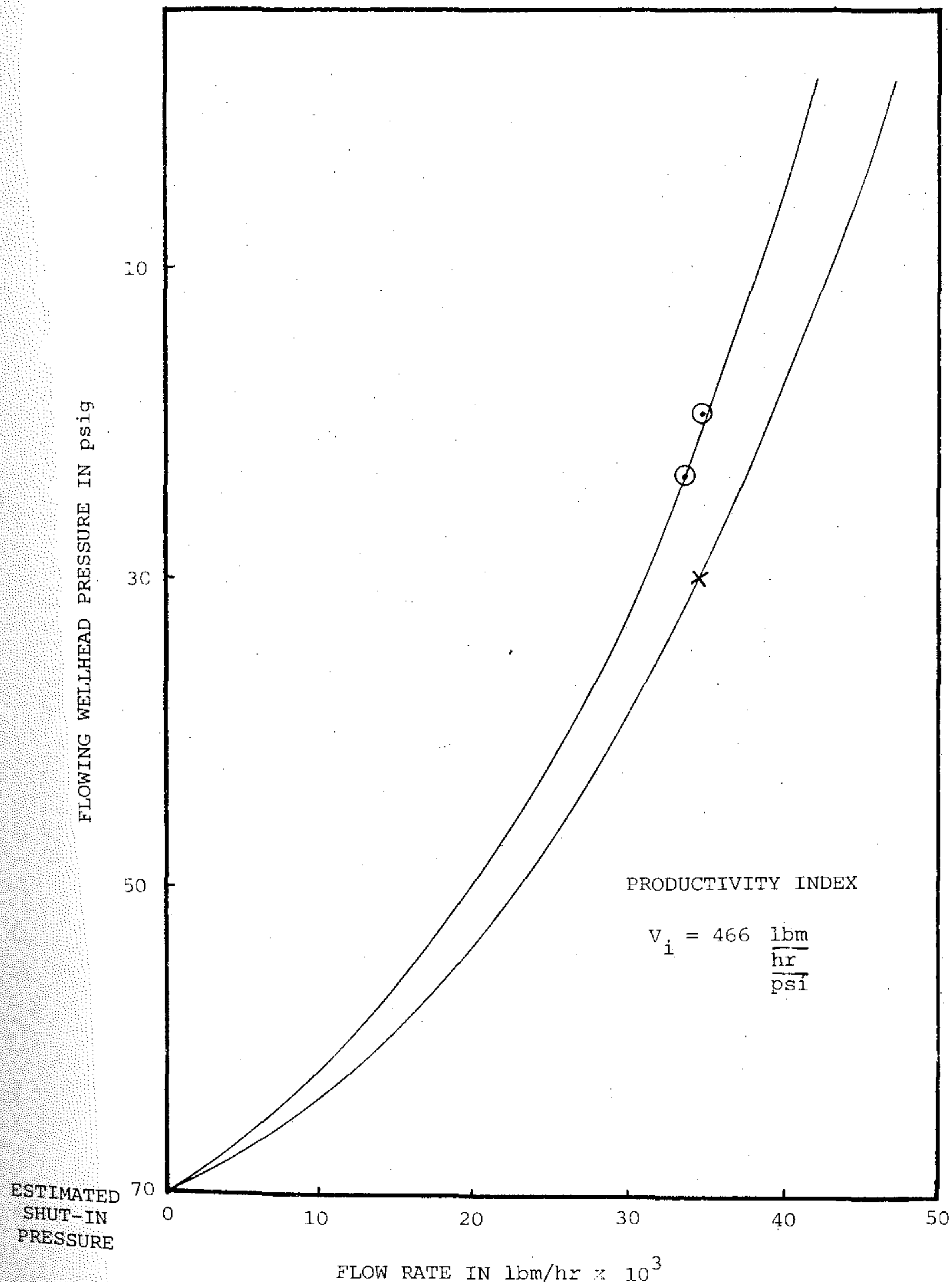
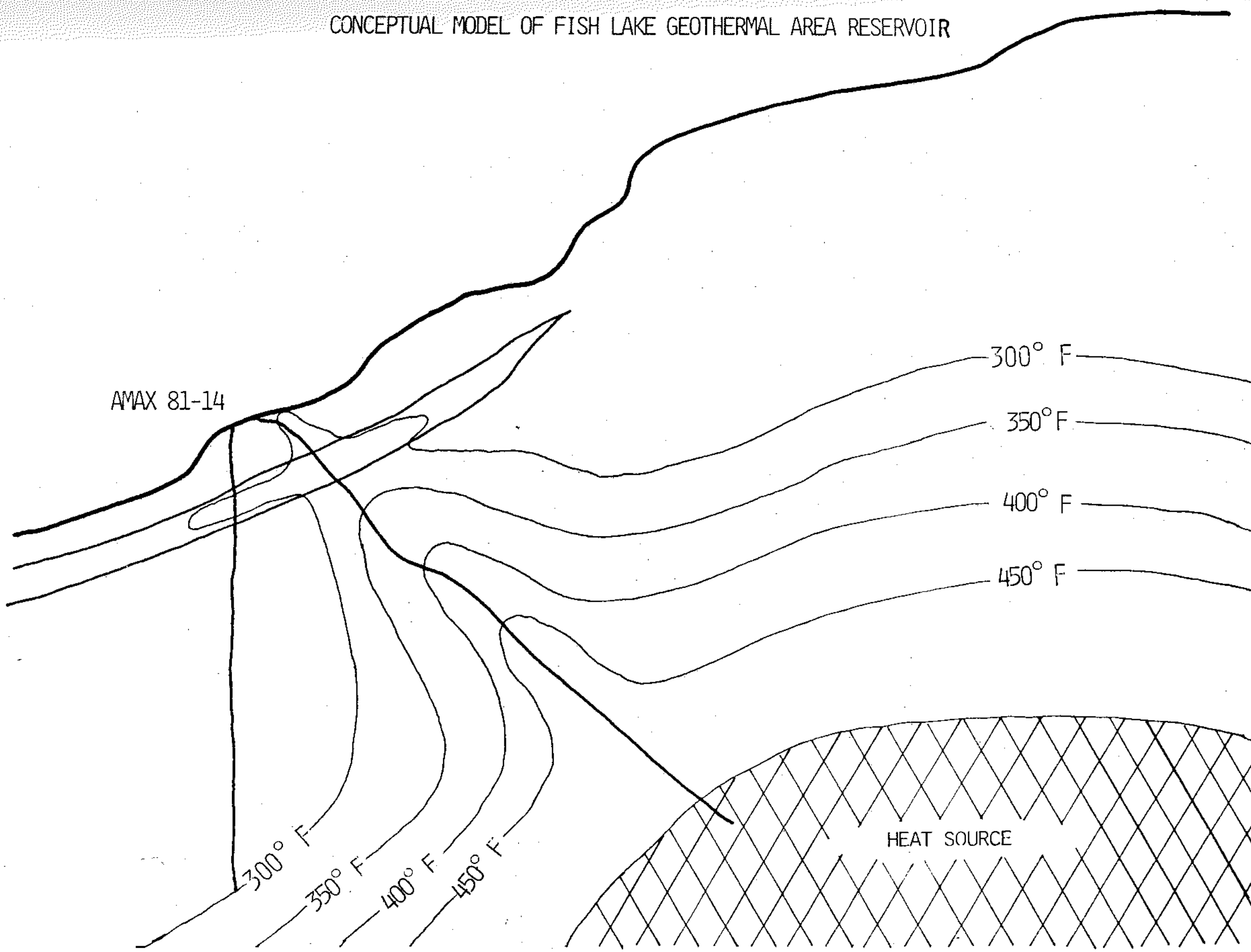


FIGURE 6

CONCEPTUAL MODEL OF FISH LAKE GEOTHERMAL AREA RESERVOIR



APPENDIX A

FLOW RATE CALCULATIONS

8-28-82

AMAX WELL ORIFICE FLOW

A. GIVEN

$T = 255^{o}$

$P = 22 \text{ psig} + 12.7 = \underline{34.7 \text{ psia}}$

I.D. pipe = 4.025 in $\quad A_{ID} = 12.72 \text{ in}^2$

Orifice = 3.0 in $\quad A_o = 7.07 \text{ in}^2$

$\Delta p = 7.2 \text{ DIV} \times \frac{200 \text{ in}}{10 \text{ DIV}} = 144 \text{ in } H_2O = 12\ H_2O\ .62.4 \text{ lb} \times \frac{1}{144} \text{ in}^2$

$= 5.2 \text{ psid}$

B. R_e

Assume $35{,}000 \frac{\text{lbm}}{\text{hr}} = 9.72 \frac{\text{lbm}}{\text{sec}}$

$R_e = \frac{PVD}{\mu} \qquad w = PVA \quad V = \frac{\dot{W}}{PA}$

$R_e = \frac{PDW}{PA\mu} = \frac{\dot{W}}{DX.758\ \mu} = \frac{1.274\dot{W}}{d\mu}$

at T = 255 P = 34.7

$\mu g = 2.7 + (1.3) \times \frac{55}{200} = 2.78 \times 10^{-7} \quad \frac{\text{lb sec}}{\text{Ft}^2}$

$\mu f = 64 - 35 \times \frac{55}{200} = 54 \times 10^{-7} \quad \frac{\text{lb sec}}{\text{Ft}^2}$

$R_{eg} = \frac{1{,}274 \cdot 9.72}{(.33)\ 2.78} \times 10^{-7} \quad \frac{\frac{\text{Lbm}}{\text{sec}}}{\frac{\text{sec lb} \cdot \text{ft}}{\text{ft}^2}} = \frac{\text{lbm} \cdot \text{ft}}{\text{sec}^2 \cdot \text{Lbf}} \cdot \frac{1}{32.2 \frac{\text{ft} \cdot \text{Lbm}}{\text{sec} \cdot \text{Lbf}}}$

$= 4.2 \times 10^6 \times .2 = \underline{.8 \times 10^6}$

$R_e = \frac{1.274 \times 9.72 \times .8}{(133)\ 54 \times 10^{-7} \times 32.2} = 172{,}106.00 = \underline{1.72 \times 10^5}$

C. PROPERTIES FROM KEENAN & KEYS

$P = 35$ psia $\qquad T = 259.28$

$v_f = .01701 \frac{ft^2}{lbm} \qquad v_g = 13.746 \frac{ft^2}{lbm} \qquad h_f = 218.82 \frac{bm}{lbm}$

$h_{fg} = 945.3 \frac{btu}{lbm} \qquad h_g = 1164.1 \frac{btu}{lbm}$

D. ORIFICE CALCULATION

From "Fluid Meters" at $B = .745$, $R_e = .8x10^6$ & R_e 1.72×10^5

R_e $.8 \times 10^6 \qquad C = .6010$

R_e $1.72 \times 10^5 \qquad C = .6111$

Find Y: $\frac{\Delta P}{P} = \frac{5.2}{34.7} = .15 \qquad \gamma = 1.4$

$x/\gamma = \frac{.15}{1.4} = .107$

$\therefore Y = .952$

Assume $X = 30\%$

$\rho = \frac{.7}{.01701} + \frac{.3}{13.746} = 41.17 \frac{lbm}{ft^3}$

$W = 1891 \; do^2 \; c \sqrt{\Delta P \rho}$

Where $d_o = 3$ in

$C = .61$

$P = 5.2$ psid

$\rho = 41.17$ lbm/ft^3

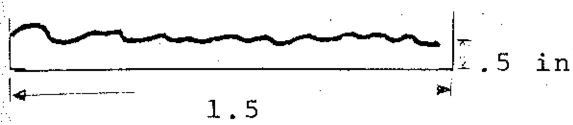
ASSUME COMPRESSIBLE

$W = (1891) \cdot (9) \cdot (.61) (.952) \cdot \sqrt{(5)\ (41.17)}$

$= 49,416.4 \frac{lbm}{hr}$

Liquid $= 34,591 \frac{lbm}{hr}$

FLOW THROUGH CHANNEL



$$1.5\,\text{ft} \times \frac{.5}{12}\,\text{ft} \times \frac{1.8\ \text{ft}}{\text{sec}}$$

$$\frac{3\,\text{ft}}{1.65\ \text{sec}} = 1.8\ \frac{\text{ft}}{\text{sec}}$$

$$= .1136\ \frac{\text{ft}^3}{\text{sec}}$$

$$= 51\ \frac{\text{gal}}{\text{min}}$$

FLOW RATE USING JAMES' METHOD

Weir flow = $50 \frac{gal}{min} = 23{,}000$ lb/hr

$h_o = 660$ BTU/Lbm

$P_{lip} = 14.5$

$$C_m = \frac{11{,}400\ P^{.96}}{h_o\ 1.102}$$

$$= 116 \frac{lb}{sec\ ft^2}$$

$$= 36700 \frac{lb}{hr}$$

Steam quality = 37.5%

FLOW RATE FROM TEMPERATURE SURVEY

$$\frac{T}{km} = 10.69 \frac{wt}{d}$$

$$\frac{T}{km} = \frac{^{o}C}{km} = \text{temp. gradient}$$

W_t = flow in tonnes/hr

d = diameter of casing in inches

$$\frac{T}{km} = .1265\ ^{o}F/ft = 21.42 \frac{^{o}C}{km}$$

$$21.42 \frac{^{o}C}{km} = \frac{10.69\ W_t}{7''}$$

$$= 14.0 \frac{\text{tonnes}}{\text{hr}} \times 2204.6 \frac{\text{lb}}{\text{tonne}}$$

$$= 31{,}000 \frac{\text{lbm}}{\text{hr}}$$

APPENDIX B

DRILLING HISTORY - PHASE II

DRILL HISTORY FISH LAKE 81-14
PHASE II

7/11 Minerals Management drilling shot holes for cellar
B & L Mining running D-6 and Terex 8240 cats building reservoir and leveling site.

7/13 Superior Drilling crew on standby most of day waiting for cellar to be shot, Minerals Management completed drilling and shot cellar area, Williams backhoe dug out cellar and set 6x6x8 foot deep wooden cellar over wellhead. Cut off casing and welded on wellhead.
No night shift.

7/14 Crew set 8 inch valve, two cross over flanges, 6 inch LWP BOP, and rotating head. Crossover flanges required extensive machining to fit 8 inch valve.
RIH

7/15 Begin drilling about midnight 14/15, and drill with air 465-786 feet with 6-1/8" bit.
Run two bottom hole temperature surveys inside drill pipe.
POH, change bit, RIH
Tony Barker, Wim Lodder & Ray Sadowski visited location.

7/16 Run Kuster temperature survey in drill pipe and take measurements at 250, 350, 460, 500, 550, 600, 650, 700 and 750 feet after pumping water in hole to stop flow.
Drilling with air/foam 786-1026 with 6-1/8" bit. Rig compressors unable to unload hole, put on standby at 1600 hours waiting on Western Air booster compressors.
Tony Barker, Wim Lodder, Ray Sadowski and Bill Dolan visited location.
Ran second Kuster temp. survey in drillpipe at 750, 850, & 950 ft.

7/17 Crew on standby till 1300 waiting on Western Air.
Rig up for air drilling and drill 11026-1146 feet.
Hole flowing with air assist about 350 gpm.
Drill rods plugged with scale & blow apart air lines. Shut down for repairs at 2400 hours.

7/18 Repaired rig, resumed drilling at 1230 hours.
Compressors building up 300 psi to unload hole, drilling at 150 psi, flowing 400 gpm
Drilling 6-1/8 inch hole 1146-1407 ft.

7/19 Drilling 6-1/8 inch hole 1407-1826 feet.
Suspend drilling at 1830 hours, POH and standby for Halliburton to run packer.

7/20 Halliburton late, crew standing by till 1500 hours. Make two packer runs and take temperature surveys in drill pipe. Set packer at 1646 and 1056 ft.

7/21 Continue packer tests till 1700 hours.
RIH and drill 1826-1832 feet, with 5-7/8" bit.
Seal on rotating head failed, shut down to wait on replacement rotating heat at 2100 hours.

7/22 POH, shut in well, remove rotating head and standby for replacement.
Replacement head arrived 1400
Install new rotating head, and RIH

7/23 Drilling with 5-7/8" bit with air/foam 1832-2046 feet.
Unable to unload hole after connection at 2046, pressure will not increase past about 720 psi.
Pull up to 2006 and unload hole.

7/24 Blowing hole from 2006 and standing by for well test crew
Begin rigging up for flow test at 2100 hours.

7/25 Rig up for flow test and begin testing at 0600 with pipe in hole.
Flow test from 0600-2400

7/26 Continue flow test 2400-0600.
Shut in hole, rig down from flow test.
G.O. logging arrived at 1000, ran partial temperature, SP, gamma and dual induction. Finish at 2000 hours.
No night shift after logging.

7/27 Crew removed BOPE and rigged down.

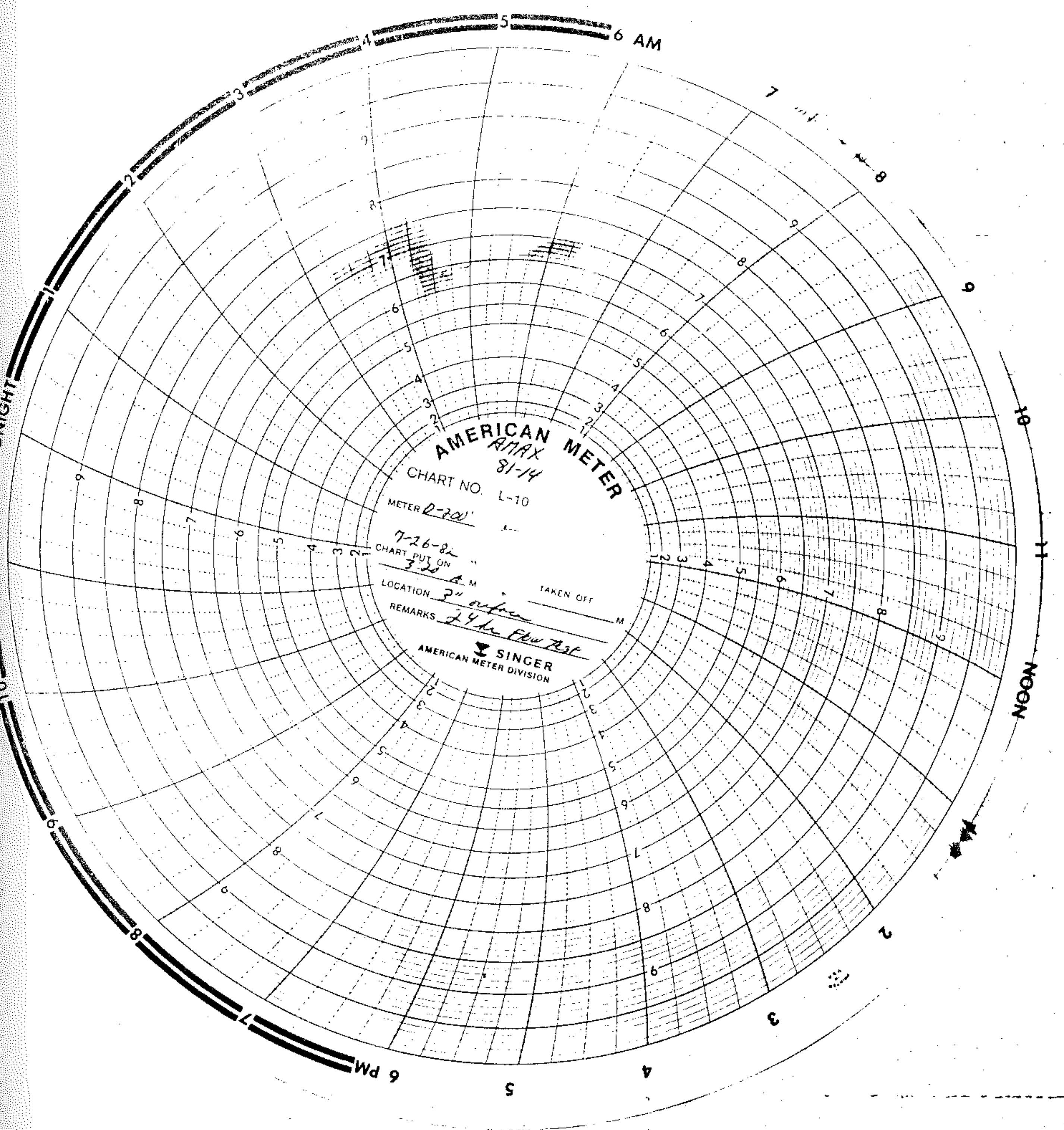
APPENDIX C

COPIES OF FLOW METER CHARTS

BARTON METER CHARTS

AMAX WELL 81-14

24 HOUR PRODUCTION TEST 7/25-7/26/82



BARTON METER CHARTS

AMAX WELL 81-14

24 HOUR PRODUCTION TEST 7/25-7/26/82