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RESULTS OF FLOW TESTS OF WELL 88-11, FISH LAKE VALLEY, NEVADA

for

STEAM RESERVES CORPORATION

GOLDEN, COLORADO

by

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SUMMARY

Well 88-11 was flow tested using the James method within several hours of its first flow on June 2, 1984, and again at the end of a 7-day period of flow on June 21. On both dates water, steam and gas samples were also collected. Between the two tests a slotted liner was installed and perforated.

The well history, stratigraphy, temperature and pressure profiles are consistent with flow into the wellbore from one dominant production zone at the total depth (8,150 feet) and at an inflow temperature of 364°F. The well has very low thermal gradients, which may reflect either a convective gradient in a nearby fault zone, or downward conductive heating from a high temperature aquifer at 400 feet.

Flow tests indicated that before the liner was set, the well could flow a maximum of about 540,000 pounds per hour with a total enthalpy of about 300 BTU/lb at a wellhead pressure range of 52 to 58 pounds per square inch absolute. With the liner in place, the well can flow a maximum of about 400,000 pounds per hour with a total enthalpy on the order of 290 BTU/lb and a wellhead pressure range of 44 to 47 psia.

The geothermometers indicate that the final (equilibrium) temperature of the well may exceed the measured maximum of 364° F, but a temperature exceeding 400°F in the vicinity of the well is unlikely.

The well can produce at most 2 megawatt (gross) with a flash-cycle electrical power plant. If the well is pumped and a binary power plant is used, as much as 4 megawatt (gross) may be possible to produce from it. Even higher power capacity may be possible if pumping is particularly effective.

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CONCLUSIONS

1. It is highly probable that fluid is being produced only from one zone at the bottom of the well (8,149 and 8,150 feet). Permeability in this zone probably is due to fracturing, possibly due to a fault, in the limestone formation.

2. Some convective flow around the annulus of the liner is probably occurring, causing sharp changes in the temperature profile at 6,500 and 7,900 feet.

3. Temperature profiles are consistent with flow from one dominant zone at 8,149 feet (364°F maximum temperature) and unusually low thermal gradients at most depths may indicate a convective gradient near a fault zone or downward conductive heating from a high temperature aquifer at 400 feet.

4. Unstable, pulsating flow from the well made interpretation of pressure data gathered during both flow test periods difficult; scattering of data seems to be caused by well performance rather than due to any equipment problem.

5. Flow tests before and after running the 7-inch liner indicated a decrease in production due to the presence of the liner.

6. Before the liner was installed the production rate from the well ranged between 120,000 to 540,000 pounds per hour, as estimated from a flow test on June 2. After the liner was installed the flow rates ranged between 180,000 and 400,000 pounds per hour as tested on June 21 after a seven-day flow period.

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7. The total enthalpy of the produced fluid averaged about 300 BTU/lb during the June 2 test, and about 290 BTU/lb during the June 21 test. The apparent lower enthalpy during the second test may be due to the effect of injection of cold water before the flow test and/or higher heat loss in the borehole due to the lower flow rates on June 21. The enthalpy of the water correpsonding to the main fluid entry zone at the bottom of the well is about 337 BUT/lb. If the well is pumped it is probable that not only higher flow rates can be achieved but also higher enthalpy (due to less wellbore heat loss at a higher rate).

8. No significant difference was observed between the chemistry of the liquid samples from both test periods (June 2 and June 21); even though the June 2 samples were found to be contaminated by cement, drilling mud and other substances during the first 6 hours of flow.

9. Some differences between the chemistry of the fluids from wells 88-11 and 88-14 seem to be due to contamination in the fluid samples from well 88-14, since it was still undergoing clean-out when it was tested.

10. The geothermometers indicate that the final (equilibrium) temperature of the well may exceed the measured maximum of 364°F, but a temperature exceeding 400°F in the vicinity of the well is unlikely.

11. The well can produce at most 2 megawatt (gross) with a flash-cycle electrical power plant. If the well is pumped and a binary plant is used, as much as 4 megawatt (gross) may be possible to produce from it. The capacity may be higher if pumping is particularly attractive.

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1. INTRODUCTION

This report presents the results of flow test of the well 88-11 drilled by Steam Reserves Corporation (SRC) in Fish Lake Valley, Nevada. The well location is Section 11 T1S R 36 E MD. These test were conducted on June 2 and June 21, 1984, by GeothermEx, Inc. Drilling of the well was completed on May 21, 1984. The June 2 test was conducted within hours of the first flow of the well, which was unloaded using nitrogen. The well was then cleaned-out and a liner was installed from 6,800 to 8,150 feet. The well was then flowed for several days, the liner perforated, and the well unloaded with air on June 15. The well flowed continuously between June 15 and June 21. At the end of the June 21 test the well was again shut-in. A discussion of the history, geology, pressure and temperature of the well follows as Section 2 of this report.

The well was flow tested using the James method which allows determination of the enthalpy and mass flow rate at the wellhead from the pressure drop across an orifice plate and the pressure at the "lip" of the pipe as it discharges fluid at the critical velocity to the atmosphere. Pruett Industries of Bakersfield, California provided the equipment and field services for pressure and temperature measurements. Test results are presented and discussed in Section 3.

On both dates water and gas samples were collected by GeothermEx from the well flow stream, results of which are presented in Section 4.

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2. WELL HISTORY, STRATIGRAPHY, TEMPERATURE AND LOCATION OF PERMEABILITY

Figure 1 shows the casing design, stratigraphy, circulation loss zones, and temperature profiles measured in the well 88-11.

The stratigraphic section encountered in the well can be divided into two major units. The upper unit consists of a Tertiary sequence of tuff, siltstone, sandstone, and thin lava beds extending to a depth of 3,920 feet. The second major unit consists of Paleozoic rocks. From 3,920 feet to 7,420 feet, the Paleozoic strata consists of interbedded sandstone and siltstone. From 7,420 feet to the total depth (8,150 feet), the Paleozoic consists mainly of phyllite with thin interbeds of limestone.

As shown in figure 1, a total loss of circulation was encountered at 928 and 8,149 feet and partial losses occurred at 2,876 feet, 5,420 feet, and from 5,820 to 5,950 feet. Circulation was not recovered at 8,149 feet, and it is highly probable that this is the only depth from which fluid has been produced. It is uncertain if the permeability encountered at 8,149 feet is "stratigraphic" permeability due to fractured limestone, or "structural" permeability due to a fault.

Well 88-11 was drilled with a diameter of 10-1/4-inch to 8,150 feet. A 9-5/8-inch casing was cemented from 802 to 6,803 feet (figure 1). Because flow was severely diminished at the end of the first flow test (June 1 to 3), formation caving was suspected below the 9-5/8-inch casing. This caving was confirmed when the nitrogen tube, being used to unload the well, encountered a blockage at 7,435 feet. Subsequently, the hole was cleared and a 7-inch slotted liner was run from 6,555 to 8,140 feet on June 6. The slots are located between 7,997 and 8,139 feet. After running the liner, attempts to induce the well into self-sustained flow were unsuccessful. On June 14, the liner was perforated from 7,692 to 8,129 feet, and subsequently, the well flowed unassisted from June 16 to June 21, when it was shut-in.

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The temperature profiles run in the well are shown in figure 1, and the times at which they were run relative to the sequence of testing are shown in figure 2.

The low temperatures shown in the profile of June 3 are probably due to the large drawdown caused by unloading the well with nitrogen after the blockage occurred below the 9-5/8-inch casing. A large drawdown would allow boiling, and consequent cooling, to occur deep in the fluid column. The occurrence of a large drawdown during unloading is confirmed by the pressure profile of June 3.

The second temperature profile (on June 11) was run after injecting 1,000 barrels of water which resulted in"smearing" and elongating the sharp temperature high which occurs, under equilibrium conditions, at 400 feet (see profile of 13 July).

The temperature profile of June 21, started one hour after shut-in, is probably close to the flowing temperature profile.

The temperature profile of July 13 was run 21 days after shut-in, and represents the most stable temperature condition surveyed in the well, except for the sharp increases in temperature at 6,500 and 7,900 feet. These increases are probably due to convective flow down the 7-inch liner and up the annulus outside the liner. In-hole convection, due to the presence of concentric open-ended pipes has been reported to occur in geothermal wells.

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In summary, the temperature profiles of Well 88-11 are consistent with flow from one dominant zone at the total depth and at an inflow temperature of 364° F. The very low thermal gradients measured in Well 88-11 (2.3°F/ 100 feet in the Tertiary basin fill and 0.75°F/100 feet in the Paleozoic basement) are unusual and may reflect either a convective gradient in a nearby fault zone, or downward conductive heating from the high temperature aquifer at 400 feet. The former possibility has major implications for future development of this resource. Additional drilling in the area will resolve which of these interpretations is correct.

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3. FLOW TESTS

3.1 Test Design

The well was flow-tested by using the James method. This method is based on an empirical correlation of the flow rate and stagnation enthalpy during the discharge of a steam-water mixture from a pipe to the atmosphere under critical flow conditions (mixture flowing at sonic velocity). This method is widely used for "rig tests" of wells while the more direct method using a steam-flash separator is used for flow measurement during long-term tests. This method is less expensive and operationally more convenient than the separator method. It yields flow rate and enthalpy values within ±10% of those measured by the separator method.

The equipment set up used for both testing periods is shown in figure 3. Four Paroscientific quartz crystal pressure transducers were connected to four points in the flow line (wellhead, upstream and downstream of the orifice, "lip" of the discharge pipe) by stainless steel capillary tubing and pipe taps. The transducer signals were processed in a multichannel processor and the pressure data were recorded continuously on a chart recorder. The orifice plate is used to relate total flow to the total enthalpy from the pressure drop across the orifice and the pressure upstream of the orifice, using a modified two-phase orifice metering approach. Measuring the "lip pressure" (pressure at the "lip" of the discharge pipe) and knowing the inside diameter of the discharge pipe allows one to arrive at a second relation between the total flow rate and the total enthalpy. Simultaneous solution of these two relations allows the determination of the total flow rate and total enthalpy using an iterative calculation.

A computer program developed by GeothermEx calculates the total mass flow rate and total enthalpy, as well as such parameters as water and steam flow rates at wellhead conditions and at atmospheric conditions. The test conducted on 6/2/84 and 6/21/84 were continuously monitored for flow rate, wellhead temperature, wellhead pressure, pressures upstream and downstream of the orifice, and the "lip" pressure. On both testing periods (6/2/84 and 6/21/84), a series of eight 30-90 minute tests was planned. During each one of these tests, a different combination of discharge pipe (James tube) and orifice plate diameters was used. The first three attempts made on 6/2/84 produced unreliable pressure measurements because of operational problems, such as plugging of capillary tubing by drill cuttings.

3.2 Test Program

Table 1 summarizes the test program and the combination of discharge and orifice diameters used.

On June 2, the well was unloaded with nitrogen through a pipe at about 600-800 feet below surface. The well first flowed at about 0100 hours. Injection of nitrogen was stopped after about 2 hours and self-sustained flow continued. The first complete flow test started at 1330 hours (table 1). Between the separate tests the well was completely shut-in, to allow changing the orifice plate and James tube. The flow resumed sponaneously each time the well was re-opened. For each combination of orifice plate and James tube the well was flowed for about 30-90 minutes, although the flow appeared to stabilize at each new combination within a few minutes. As discussed below, complete stability of flow was very difficult to determine because the wellhead pressure and flow rate pulsated constantly.

On June 21 the well-flow was diverted from the main 10-inch flowline into a 2-1/2 inch diameter by-pass each time the main line was

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shut-in for changing the orifice plate or James tube. Although the flow through the by-pass usually died during the changeover interval, it resumed immediately when the main valve was reopened. The well flow periods were essentially the same as for the June 2 test and the flow rate and pressure pulsated similarly.

3.3 Test Results

Table 2 summarizes the results of each test on 6/2/84 and 6/21/84. It was always very difficult to maintain a stable flow condition from the well; the flow pulsated with alternating slugs of relatively high and low steam fraction. This pulsating behavior made it equally difficult to interpret the data. Appendices A and B present for each test the plots of lip pressure, orifice upstream and downstream pressures, and wellhead pressure versus time; total flow rate versus time; wellhead steam quality versus time; and wellhead steam quality versus total flow rate for the June 2 and June 21 tests, respectively. All of these plots are shown for five of the eight tests done on 6/2/84 (Appendix A) and for the seven of the eight tests done on 6/21/84 (Appendix B). For the first three tests of 6/2/84 we have shown only the orifice pressure and the wellhead pressure versus time, because the lip pressure data were unreliable. For the test 7 on June 21, only the measured data (wellhead, orifice and lip pressures) are plotted, the data being unreliable for any calculation.

The total flow rate and total enthalpy corresponding to each data point were calculated and plotted in figures 4 and 5, respectively, for the June 2 test and in figures 6 and 7, respectively, for the June 21 test. In these plots, the time scale shows the time from the beginning of pressure measurement on the respective dates.

Appendices C and D present the tabulated results for each test on June 2 and June 21, respectively. The plots of wellhead steam quality versus total flow rate for various tests (Appendices A and B) show a decreasing trend of steam quality with total flow rate. This trend is a reflection of the pulsating flow, with high flow rate and low steam quality slugs alternating with low flow rate and high steam quality slugs.

As can be seen from figures 4 through 7, the data plotted for each specific test tends to show more scatter at the beginning of the test than at the end. There does not seem to be any relationship between the scattering of the data and the diameter of the orifice and/or discharge pipe. This indicates that the data scatter is not due to the equipment used, but due to well performance.

The total flow rates in figure 4 (June 2) range between 120,000 and 540,000 pounds per hour, while those in figure 6 (June 21) range between 180,000 and 400,000 pounds per hour. This apparent decline in flow rate is most probably due to the extra frictional pressure drop in the installed liner. Enthalpy values shown in figure 5 (June 2) average about 300 BTU/lb, while those on figure 7 (June 21) average about 290 BTU/lb. Higher heat loss in the wellbore due to lower flow rate and/or cooling due to injection of cold water prior to flow test probably had caused the lower enthalpy. Since we have neither a reliable estimate of the static wellhead pressure in the heated wellbore nor measurements of downhole pressure as a function of time (such as pressure builduip or drawdown data) no evaluation of the well or reservoir flow characteristics is possible. However, we approximately estimate a 40% reduction in productivity index and 17% increase in heat loss due to the setting of the liner. Therefore, the productivity may be increased by reworking this well and recompleting.

4. GEOCHEMICAL EVALUATION

4.1 Methods and Data Tabulation

Water and gas samples from well 88-11 were collected on June 2 and June 21. Sample descriptions, times of sampling, collection points, field measurements and comments are in tables E1 through E4 of Appendix E. Gaps in the numbering sequence correspond to samples initially collected but not retained. During both tests some water samples were collected after boiling from tap in the flow line, whereas others were collected through a condensing coil attached to a portable steam-water cyclone separator. The separator was also used to collect all gas samples.

The separator performed well and efficiently during both tests. It was quickly adjusted to obtain steam samples uncontaminated by water, and vice versa. Pressure in the separator was close to wellhead pressure, pulsating rapidly over several psi due to the constant surging of the well flow which is discussed in Section 3. However, the separation chamber effectively buffered the sample stream flows, which were steady. The flow rates for water and steam condensate from the separator did not correspond to proportions of the two phases expected from total enthalpy and pressure measurements. Steam flow rates in the separator were much too high relative to water flow rates, indicating that steam tended to channel through the separator from the main flow line, although the separator was attached to the main flow line at a point where complete turbulence of the two-phase flow was expected.

Original laboratory reports for all analytical work are presented in table E5 of Appendix E. Note that a few of the samples collected (tables E1-E4) were not analyzed; these include a set from June 2 which was previously submitted to SRC. Sample 18 in the June 2 set is the fresh water used for drilling fluid, collected from a hose at the mud tanks. The sample descriptors such as Ru, Fa, etc., which designate different treatment of different sample portions, are defined in notes to table E1.

Table E6, E7 and E8 of Appendix E present the computer-processed analyses, including four samples from well 81-14, made available by SRC. The tables list determinations of pH at the time of sample collection, but omit field determinations of conductivity (tables E1-E4) and Cl (not reproduced), which were used to monitor well flow and separator performance. Sample numbers in table E6 through E8, columns NUM, indicate test number to the left of the decimal and sample number in the first two digits to the right. Thus, 1.0300 is sample three of the June 2 test, and 2.0100 is sample 1 of the June 21 test. The make-up water is tabulated as number 1.1800 and samples from well 81-14 are listed as 9.0100 through 9.0400.

The June 2 samples were collected starting shortly after the well was first flowed using nitrogen lift. Conductivity of the fluid during initial flow was about 2,750 micromhos in fluid flashed to atmospheric pressure, and conductivity was still the same an hour later in sample 3, which was the first sample retained for analysis. This fluid contained high levels of Ca, K and SO_4 along with a high pH, all due to contamination by drilling fluid and cement. Sometime between 2 and 3 hours of flow the fluid conductivity increased and stabilitized at about 4,300 micromhos although the fluid composition was still changing in sample 4 (3 hours). Conductivity thereafter remained stable. The next sample analyzed was number 7 (6 hours), and this and all subsequent samples showed the same composition. There is no evidence of any change in fluid composition following a change of orifice plate and James tube during the test.

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All of the well flow on June 2 carried suspended solids visually identified as drill cutting of rock and cement plus drilling mud. As a result, the samples could not be easily filtered in the field and most filtration was postponed for the laboratory. The suspended material was abundant at first and decreased markedly during the 15 hour period over which samples were collected. In the first few samples some fines remained suspended even after 24 hours of storage (see Comments in table E1). In samples where all fines did settle, the water above was brownish. Steam condensate sampled on both dates was clear and colorless.

On June 21 the samples were collected during a period of several hours which was preceeded by several days of continuous well flow; the fluid was colorless and carried only traces of fine suspended solids which resembled drill cuttings and settled quickly.

On both dates the water sampled had no odor of H_2S, except after acidification.

4.2 Results - Liquid Phase

The compositions of reservoir brine flashed to atmospheric pressure and then corrected for steam loss are summarized from Appendix E into tables 3, 4 and 5. For each test the tables of corrected concentrations show sets of high, average and low values corresponding to three estimates of the steam fraction. The three steam fraction estimates were calculated in turn from separation pressure and three estimates of total flow enthalpy. As discussed in Section 3, it has not been possible to obtain a highly reliable estimate of fluid enthalpy from the test data. It was thus deemed best to calculate steam fraction using an approximate average enthalpy value along with high and low estimates representing the probable maximum uncertainty in the average value. The three values used were 270 BTU/lb, 290 BTU/lb (ave) and 310 BTU/lb. Appendix E, table E6 shows the steam fractions calculated at these enthalpy values, for the separation pressure of each sample.

We interpret the data to indicate that there was no change in fluid chemistry between the June 2 and June 21 tests. Small differences in composition appear to exist, as shown by an anion diagram (figure 8), and the "Overall Averages" of tables 4 and 5, which suggest that water of the June 21 test was slightly enriched in HCO_3 + CO_3 relative to Cl and CO_4, compared to the water of June 2. However, this difference is explained as the result of analytical bias. A study of equivalent concentrations and conductivity in Appendix E, table E7 indicates that the most probable explanation for the difference is an overestimation of Cl and SO_4 contents on June 2, and a slight underestimation on June 21. This also explains the difference in the B/Cl ratio between the two tests (figure 9 and tables 4 and 5).

Data in Appendix E include SiO_2 determined by both the colorimetric (Color) and Atomic Absorbtion (AA) techniques. The average of the color and AA values is somewhat lower on June 2 than on June 21. On both dates the AA values are the highest, and the difference between the AA and color values is the greatest on June 2. There are a variety of phenomena which can explain the differences between averages and methods. We suspect that analytical errors, cooling of the reservoir near the wellbore prior to the June 2 test, and mixing of colloid-sized clay particulates from drilling fluid into the well flow, mostly on June 2, are all involved. For geothermometry, the color measurements provide the most conservative estimates and should be favored. AA measurements on June 21 should be more reliable than those on June 2, and suggest that the color estimates of that date are too low.

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Samples collected during a 24 hour test of well 81-14 are distinct from those of well 88-11 (table 3, figures 8 and 9). The most recent of the three complete samples is more similar to 88-11 waters than the first two, and roughly fits a mixing relationship between the earlier samples and those from well 88-11. We believe that well 81-14 was probably contaminated by drilling fluid and make-up water and was still undergoing clean-out at the end of the test. We have a report that the well was drilled with air and air/foam, but have no data on fluid lost or injected into the well. This information should be checked, along with data on the make-up water, foam, and mud compositions, if used. The well was tested immediately after drilling and produced only about 100,000 gallons (400 cubic meters) of water. Even if the shallow aquifer at well 81-14 is connected to the deeper system produced by well 81-14, the deep and shallow waters are probably not identical. There should exist differences between them caused by cooling, reactions with rocks and mixing with shallow recharge.

4.3 Results - Geothermometers

Table 6 summarizes the major chemical geothermometers from Appendix E table E8. At the temperature of this well chalcedony might be controlloing SiO_2 content but the quartz temperatures are somewhat more likely to be accurate and agree better with the other data. The quartz and cation temperatures on June 21 range from 374°F to 403°F, higher than the range of 352°F to 379°F observed on June 2. The June 2 temperatures agree better with the 364°F maximum measured downhole, but may have been depressed by residual effects of drilling and injection.

It is tempting to regard the 399°F quartz (AA) and 403°F Na-K-Ca temperatures of June 21 as evidence for higher temperatures in the reservoir. However, we view them with some caution. The well inlet temperature and maximum temperature actually measured downhole is 364°F (Section 1, above). The discrepancy between colorimetric and AA silica determinations has been mentioned. The Na-K-Ca temperature could have been shifted upwards by formation of $CaCO_3$ scale. Although we have received no direct evidence that this is occuring and rough calculations suggest that the fluid composition sampled was more or less at equilibrium with calcite in the reservoir (no loss due to scaling). However, the difference between Na-K-Ca and Na-K temperatures is large, and the two geothermometers would be in closer agreement if at least several mg/l Ca has been lost to scale. Considering these uncertainties, we feel that the combined data indicate that the final equilibrium temperature of the well may exceed 364°F, but a temperature exceeding 400°F in the vicinity of the well is unlikely. The geothermometers of well 81-14 are probably inaccurate due to mixing, presence of contaminant and disequilibrium.

4.4 Results - Non-condensible Gases

The non-condensible gas in the wellflow was essentially the same in composition and concentration on June 2 and June 21 (Appendix E and tables 4 and 5). THe gas is about 95% CO_2 and 3.5% N_2 by volume, with less than 1% of each of H_2S, NH_3 and CH_4 and less than 0.1% each of Ar, He and H_2. Estimates of species concentrations in the total flow depend on the steam fraction as for the dissolved species discussed above. Thus, on June 2, the combined non-condensibles totaled between 0.028%-wt and 0.105%-wt of the total flow, averaging 0.067%-wt, and on June 21 the range was slightly tighter with an average of 0.068%-wt. H_2S averages less than 2 ppm-wt of the total flow, and CO_2 about 645 ppm-wt. The gas composition from well 81-14 was similar, but its concentration in the total flow was undetermined.

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5. ELECTRIC POWER POTENTIAL OF THE WELL

The well 88-11 produces at a wellhead temperature (274°F to 287°F) much lower than the temperature of the main fluid entry zone at the bottom. This is most likely due to: (1) the low flow rate and consequent high heat loss rate from the wellbore; and (2) flashing and consequent temperature decrease due to pressure decrease. If the well can be pumped the water can be prevented from flashing and the flow rate can be increased. On both accounts, the temperature of the wellhead fluid will be higher. It may be possible to raise the wellhead fluid temperature to close to the maximum downhole temperature if (1) all fluid entry zones of lower temperature are cemented off and/or (2) higher temperature fluids are drawn in from deeper or hotter parts of the reservoir. An absolute maximum wellhead fluid temperature in this well is calculated to be about 362°F for a ± 500,000 pounds per hour flow rate.

We do not know the flash depth in this well for any flow rate. However, the well must have flashed upstream of the wellhead because the heat loss required to reduce the fluid temperature from 364°F to 274°F is impossible for the flow rates encoutered. This assertion is also verified by the temperature profile on June 21 taken just after the flow test. This figure shows that even at 600 feet depth the flowing temperature was higher than 344°F; and it is impossible for this fluid to cool from 344° to 274°F in 600 feet without flashing. The wellhead temperatures appear to be lower than the boiling temperatures (corresponding to the wellhead pressures) by about ± 2°C probably due to the partial pressure of noncondensible gases. If the flash depth is not too deep it is realistic to consider raising the production rate of a well by pumping. Geothermal pumps have been operated to as high as 381°F temperature (at East Mesa, California) with pump setting depth as deep as 2,000 feet (at Raft River, Idaho). The maximum available production rate by pumping will depend on the difference between the static water level and the pump-setting depth, and the productivity index of the well (pounds per hour per foot drawdown). The available data from the well were not adequate to estimate the productivity index of this well with any certainty. Therefore, for the purposes of estimating the electrical power potential of this well, we have arbitrarily taken the maximum observed flow rate of 540,000 lbs per hour (before the liner was set) as being a typical achievable rate by pumping.

We have taken 362°F to be the maximum available wellhead fluid temperature. To maximize the available electrical power capacity by flash cycle, we have considered the lowest practical turbine inlet pressure of 35 psia. Figure 10 presents the typical brine requirement per kilowatt-hour (kwh) for a single-flash electric power plant as a function of resource temperature and turbine inlet pressure (Falcon et al, 1981, GRC Transactions). From this figure we estimate a brine requirement of 212 pounds/kwh for a 362°F resource, at a turbine inlet pressure of 35 psia. For a 540,000 pounds per hour rate well, we can have a 2.55 MW (gross) capacity. But pumping at this rate will consume about 0.5 MW power. Therefore a maximum possible power capacity of this well using a flash plant is at most about 2 MW. Higher pumping rate may be possible; in which case this value may be higher.

Using a binary power plant will increase the recovery of electrical power from this resource. We can estimate this well's power capacity using a binary system as follows. From the Second Law of thermodynamics the maximum available work per pound of fluid is related to the temperature drop of the fluid in the plant by the relation:

$$dW_{max} = C_p \, dT \, (1 - \frac{T_o}{T}) \qquad (1)$$

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TABLES

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Table 1. Flow test program, well 88-11 June 2 and June 21, 1984

Test Number	Test Time	Internal Diameters (inches) Flowline	Orifice	James Tube	Comment
June 2, 1984					
1-3	--	--	--	--	aborted because of bad lip pressures
4	1330 to 1426	10	6.5	5.0	
5	1438 to 1546	10	5.5	5.0	
6	1604 to 1658	10	5.5	4.0	
7	1732 to 1816	10	6.5	6.13	
8	1837 to 1914	10	6.5	7.0	
June 21, 1984					
1	1539 to 1610	10	6.5	6.13	
2	1613 to 1654	10	5.5	6.13	
3	1703 to 1734	10	7.5	6.13	
4	1747 to 1822	10	7.5	7.0	
5	1830 to 1903	10	5.5	7.0	
6	1910 1935	10	6.5	7.0	
7	1951 2045	10	6.5	5.0	
8	2107	10	5.5	5.0	

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Table 2. Flow test results, well 88-11, June 2 and June 21, 1984

Test Number	Internal Diameter (inches)	James Tube (inches)	Flowing Wellhead Pressure (psia)	Total Mass Flow Rate (lb/hr)	Wellhead Steam Quality (%)	Flowing Wellhead Temperature (°F)	Total Fluid Enthalpy (BTU/lb)
June 2, 1984							
4	6.5	5.0	54	200,000	6.0	284	337
5	5.5	5.0	55	240,000	4.4	284	299
6	5.5	4.0	52	160,000	5.5	280	301
7	6.5	6.13	58	350,000	5.0	287	309
8	6.5	7.0	58	450,000	3.5	287	293
June 21, 1984							
1	6.5	6.13	46	230,000	8.8	--	329
2	5.5	6.13	47	240,000	4.8	274	290
3	7.5	6.13	47	250,000	6.2	274	296
4	7.5	7.0	45	290,000	6.0	271	301
5	5.5	7.0	46	270,000	5.0	274	292
6	6.5	7.0	45	320,000	2.5	273	--
7	6.5	5.0	45	--	--	274	--
8	5.5	5.0	44	200,000	2.0	274	269

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Table 3. Summary of wellhead sample compositions well 88-11 and well 81-14: After steam loss at atmospheric pressure

Concentrations in mg/l				
	Well 88-11 (1)		Well 81-14 (2)	
Specie	6/2/84	6/21/84	7/25/82	7/26/82
Ca	1.2	1.2	1.8	2.3
Mg	0.07	0.05	0.00	0.00
Na	800	850	587	660
K	45.7	50.0	61.7	68.0
Li	1.97	2.10	2.27	2.50
HCO_3	770	740	174	201
CO_3	167	180	0	135
T. Alk (as HCO_3)	1,100	1,106	174	475
SO_4	260	210	125	140
Cl	557	460	760	830
B	15.0	16.0	11.0	13.0
F	11.0	17.0	4.6	5.4
SiO_2 (color)	167	260	117	130
TDS (sum)	2,404	2,,411	1,830	2,189
S (as H_2S)	--	--	--	--
pH	9.0 (lab)	8.84 (field)	6.3	9.0
Na/K (meq)	29.6	28.9	16.2	16.5
B*100/Cl (mmoles/meq)	8.87	11.4	4.77	5.14

Notes:

1. Data represent an average of samples 7, 9 and 10, collected 6/2/84, and sample 1, collected 6/21/84.

2. Average of 3 samples collected 7/25/82; single sample collected 7/26/82.

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Table 4. (continued)

3. Concentrations in brine corrected to pre-flash conditions. High, Ave. and Low values represent uncertainty in percent steam at separation conditions, due to uncertain total fluid enthalpy. Values are based on enthalpies of 270, 290 and 310 BTU/lb, respecively.

4. pH is value in brine after steam separation and cooling to ambient temperature, measured in the laboratory.

5. Average Ca and Mg data from filtered samples only (see note 1).

6. H_2S represents combined H_2S in brine and steam; CO_2 represents CO_2 in steam only (concentration in brine is negligible except as HCO_3 and CO_3).

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Table 5. Summary of well 88-11 Brine Composition - Test of 6-21-84: Steam-Loss Corrected

Specie	Concentration, mg/l						
	Pressurized Sep.			Atmospheric Sep.[2,3]			Overall Average
	High	Ave	Low	High	Ave	Low	with Range
Ca	1.0	0.9	0.9	1.1	1.1	1.0	1.0 ± 0.1
Mg	0.03	0.03	0.03	0.04	0.04	0.04	0.035 ± 0.05
Na	697	681	666	764	747	729	714 ± 50
K	40.6	39.7	38.8	44.9	43.9	42.9	42 ± 3
HCO_3	677	662	647	665	650	635	656 ± 21
CO_3	135	132	129	162	158	154	145 ± 17
Tot. Alk (as HCO_3)	951	931	909	994	971	948	951 ± 43
SO_4	174	170	166	189	184	180	175 ± 14
Cl	377	369	361	414	404	395	387 ± 28
B	14.5	14.2	13.9	14.4	14.1	13.7	14.1 ± 0.4
F	13.5	13.2	12.9	15.3	14.9	14.6	14.1 ± 1.2
SiO_2	232	227	222	234	228	223	228 ± 6
TDS	2020	1975	1931	2167	2117	2068	2046 ± 121
$S^=$(as H_2S)[4]	0.27	0.27	0.28	-	-	-	0.27 ± 0.1
pH [5]	-	8.81	-	-	8.84	-	8.82 ± 0.1
Na/K (meq)	-	29.1	-	-	28.9	-	
B*100/Cl (mmoles/meq)		12.6			11.4		
Non-Condensible Gases[6]							
Total	0.095	0.068	0.041	-% by wt in total flow			
H_2S	2.54	1.89	1.25	-ppmwt in total flow			
CO_2	914	655	396	-ppmwt in total flow			

Notes

1. Sample 2, collected 1245 hours.

2. Sample 1, collected 1115 hours.

3. Concentrations in brine corrected to pre-flash conditions. High, Ave and Low values represent uncertainty in percent steam at separation conditions, due to uncertain total fluid enthalpy. Values are based on enthalpies of 270, 290 and 310 BTU/lb, respectively.

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Table 5. (continued)

4. $S^=$ does not include H_2S in NCGs.

5. pH is field measurement of brine after steam separation and cooling to ambient temperature.

6. Gas plus condensate samples collected 1355 hours to 1415 hours. H_2S represents combined H_2S in brine and steam; CO_2 represents CO_2 in steam only (concentration in brine is negligible except as HCO_3 and CO_3).

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Table 6. Summary of Chemical Geothermometers, wells 88-11 and 81-14

Specie	Temperature, °F		
	Well 88-11		Well 81-14
	6/2/84[1]	6/21/84	7/25/84 - 7/26/84
Na-K-Ca	379	403	450
Na-K-Ca-Mg	370	403	450
Na-K	338	347	430
Quartz [2]	352 (424)	374 (399)	286
Chalcedony [2]	313 (374)	338 (370)	243
Max. measured downhole	364	--	315

1. Average of samples 12, 15 and 16.

2. Values for well 88-11 are based on colorimetric determination of SiO_2 with value based on atomic absorbtion determination of SiO_2 in parentheses. Method used for SiO_2 determination in samples from well 81-14 is unknown.

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FIGURES

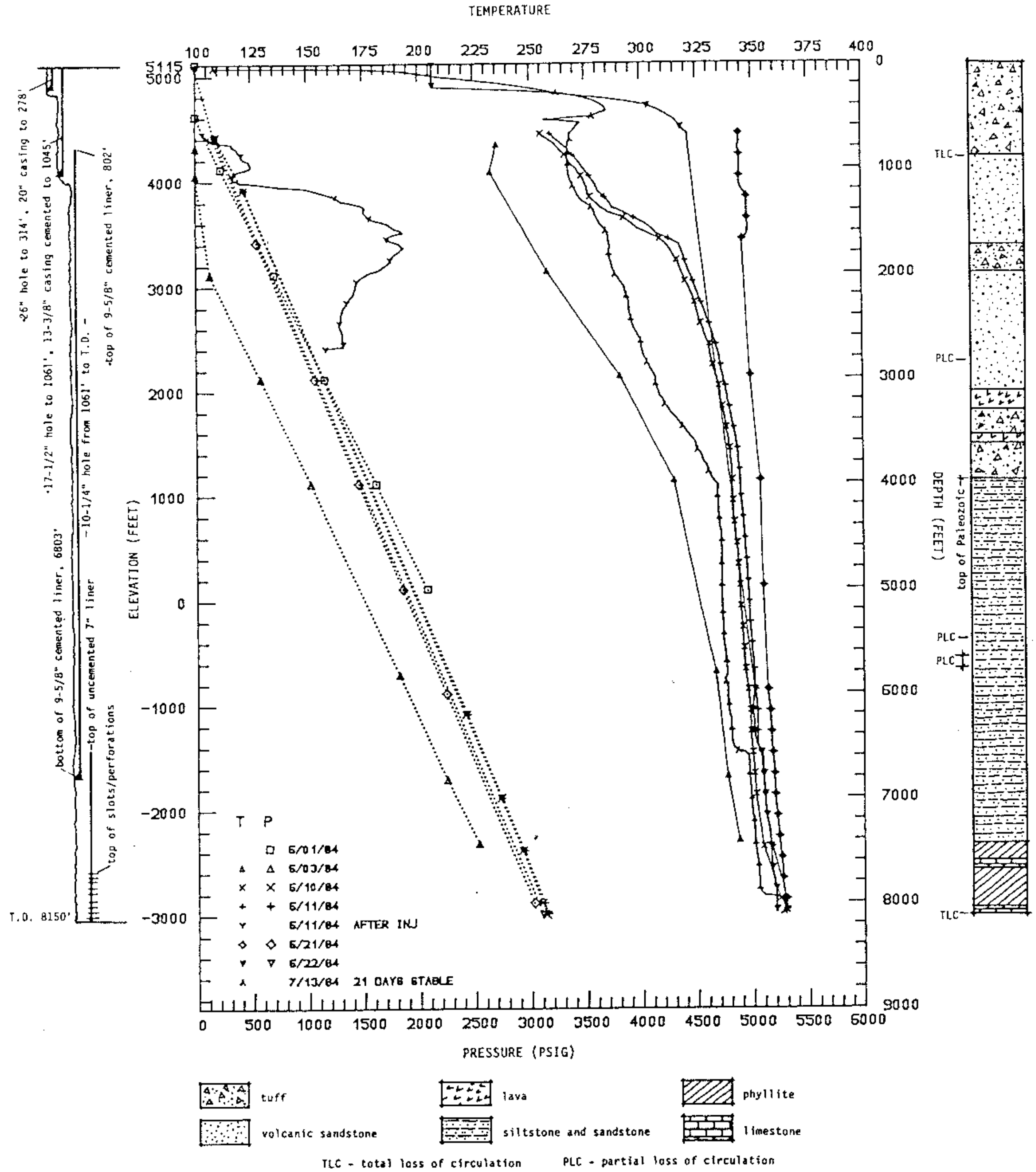

Figure 1. Completion profile, stratigraphy, and temperature profile of well 88-11

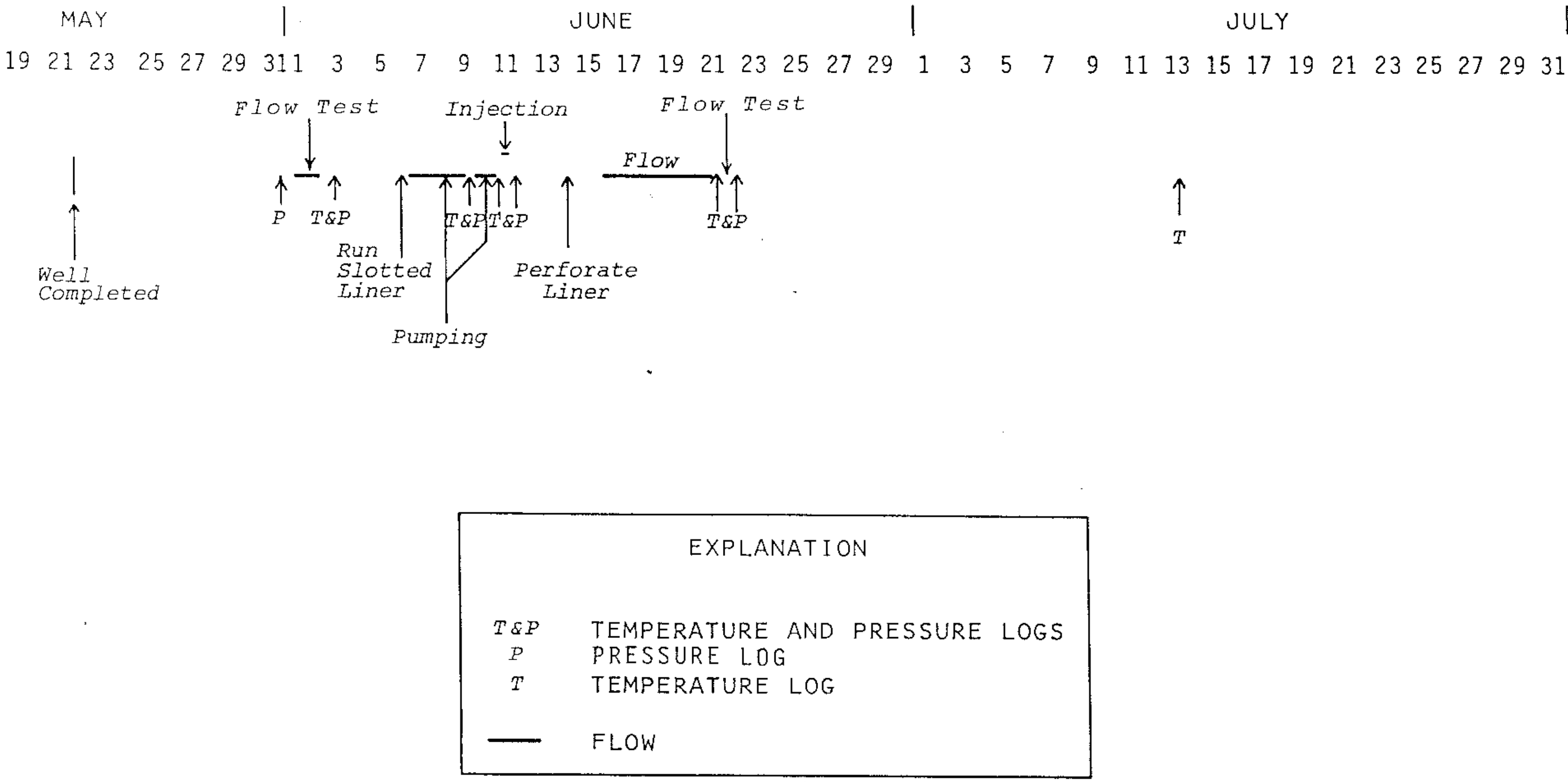

FIGURE 2: HISTORY OF WELLFLOW, LOGGING AND TESTING , WELL 88-11

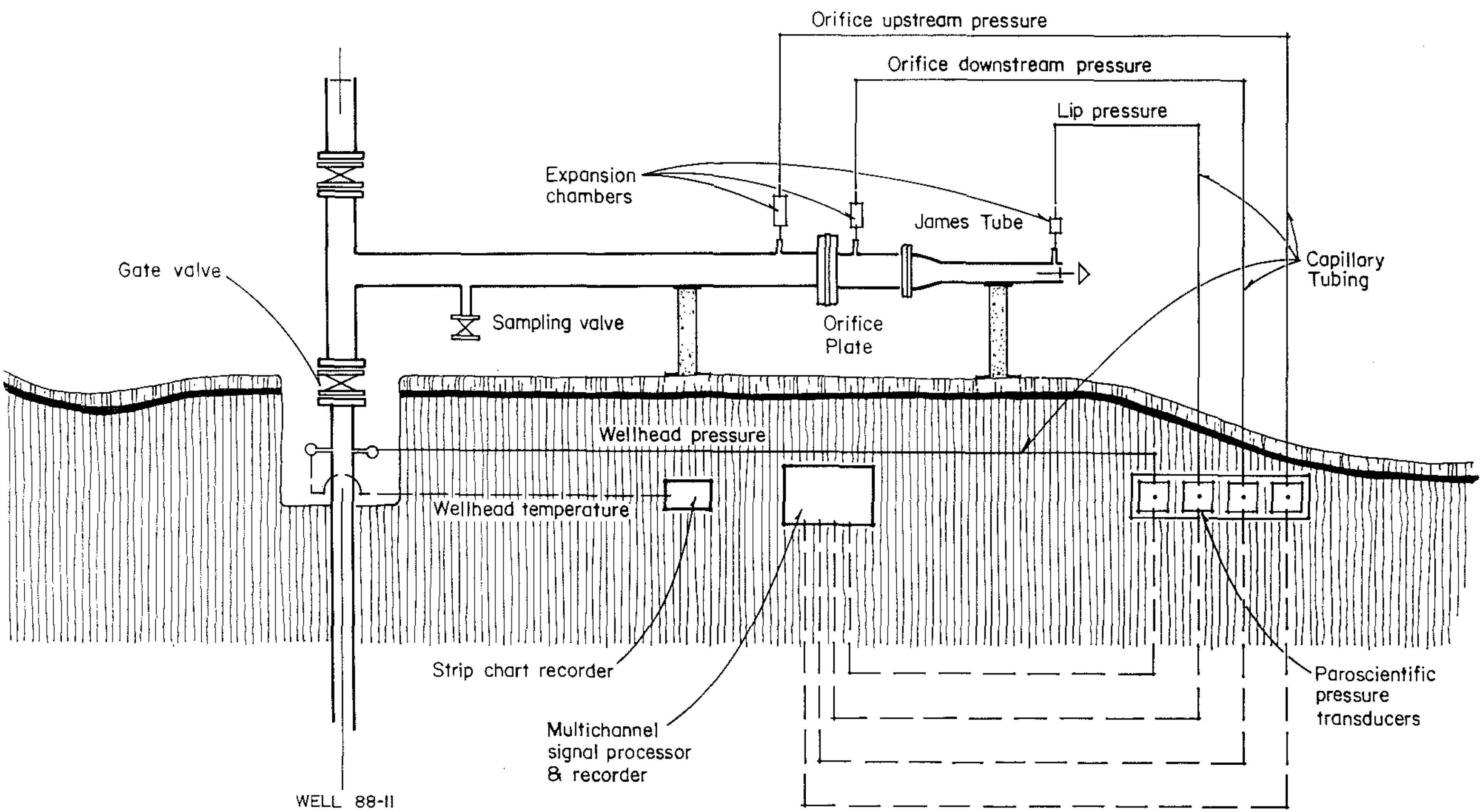

Figure 3: Instrument set-up for tests carried out on 6/2/84 and 6/21/84 on well 88-11.

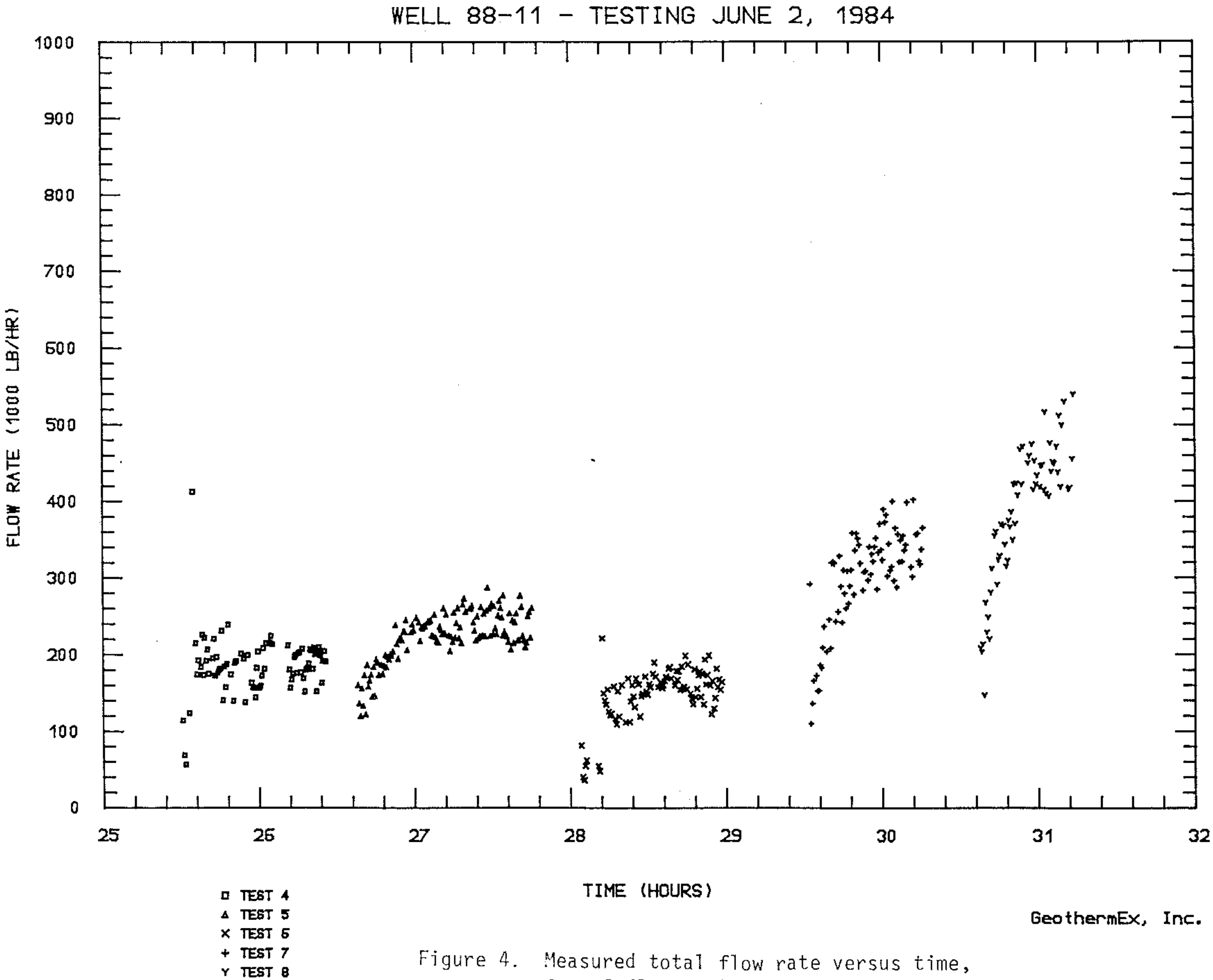

Figure 4. Measured total flow rate versus time, June 2 flow test

09-23-1984A:TEST4TH.PLT

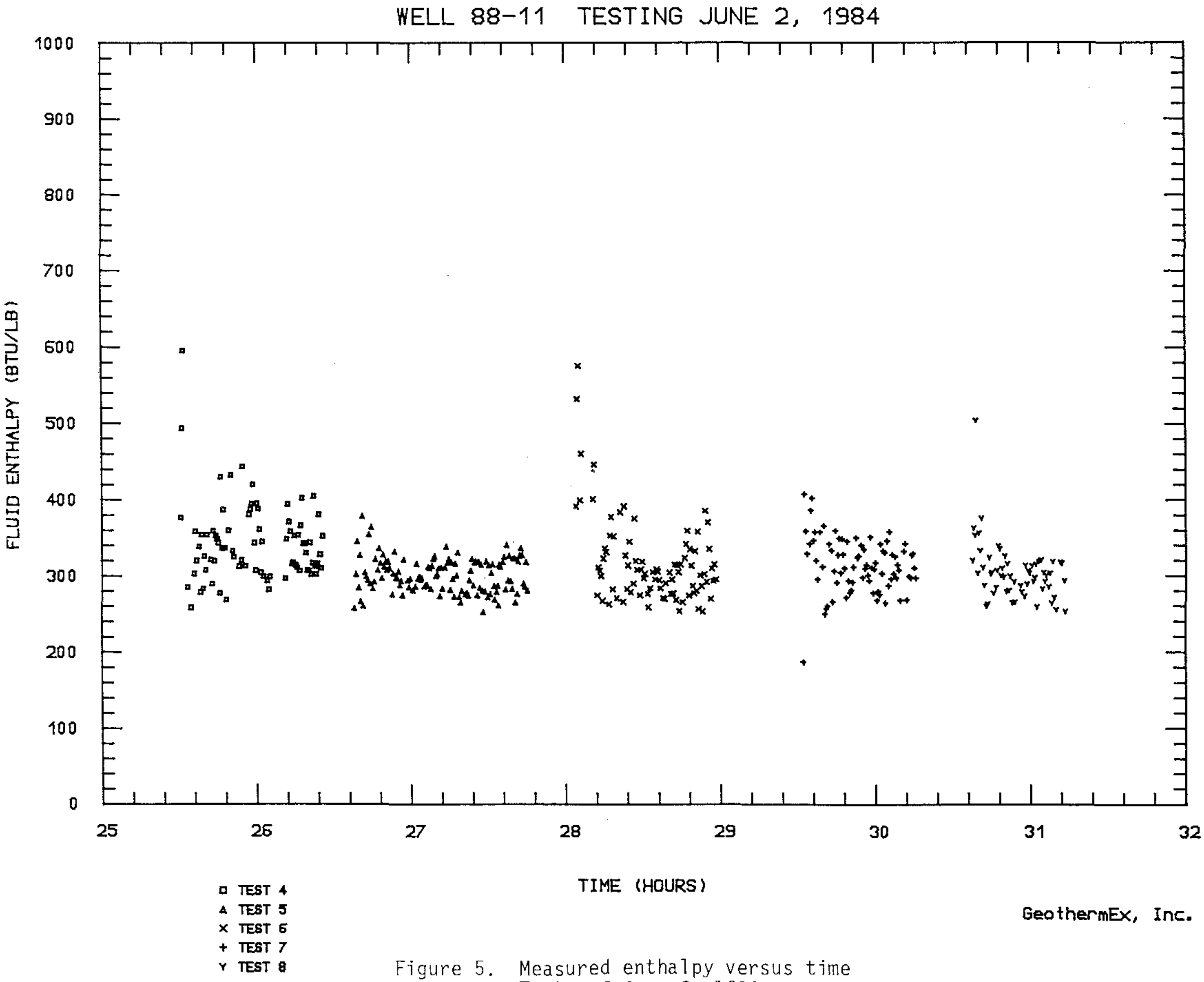

Figure 5. Measured enthalpy versus time
Tests of June 2, 1984

09-23-1984A:TEST1RTE.PLT

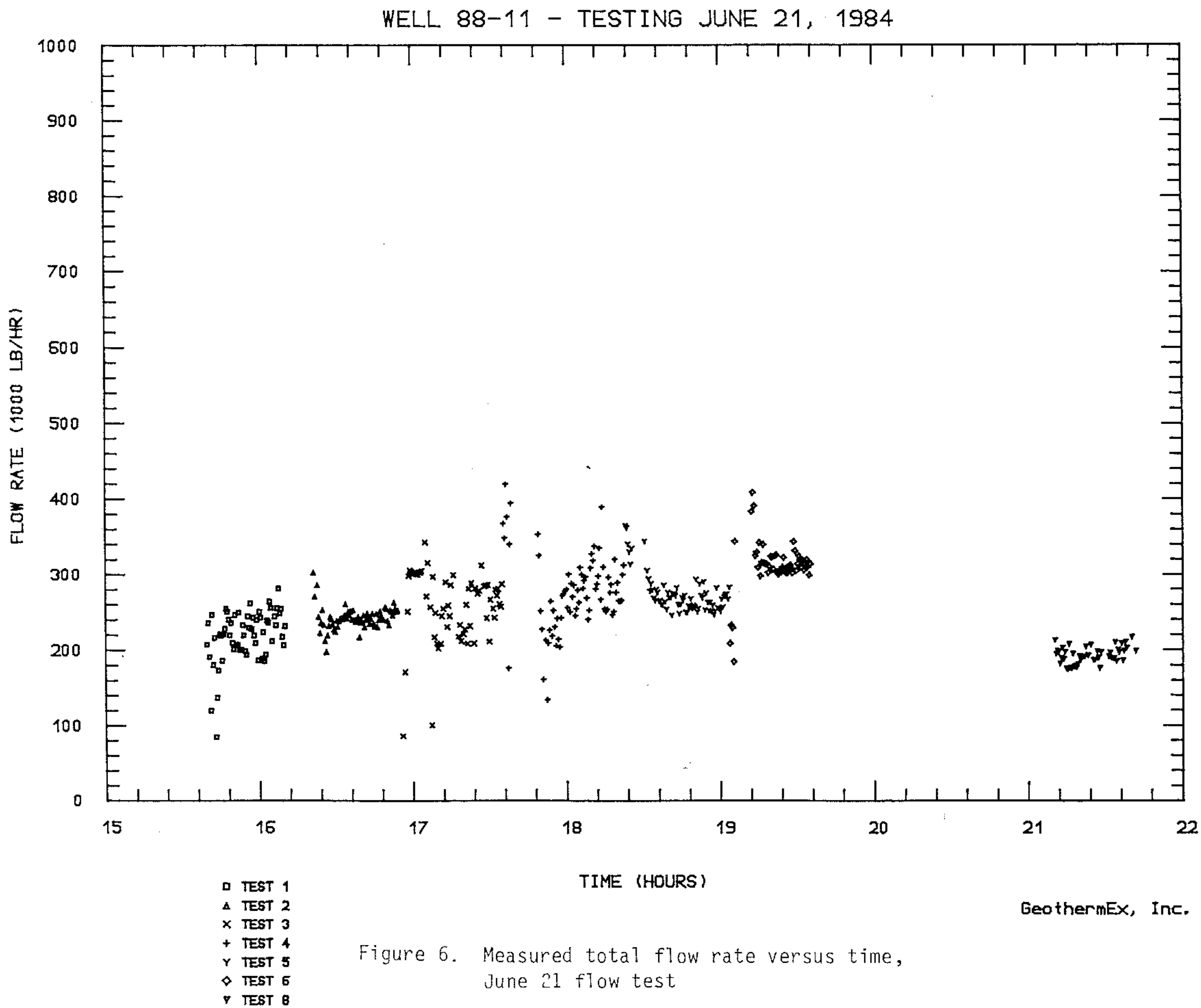

Figure 6. Measured total flow rate versus time, June 21 flow test

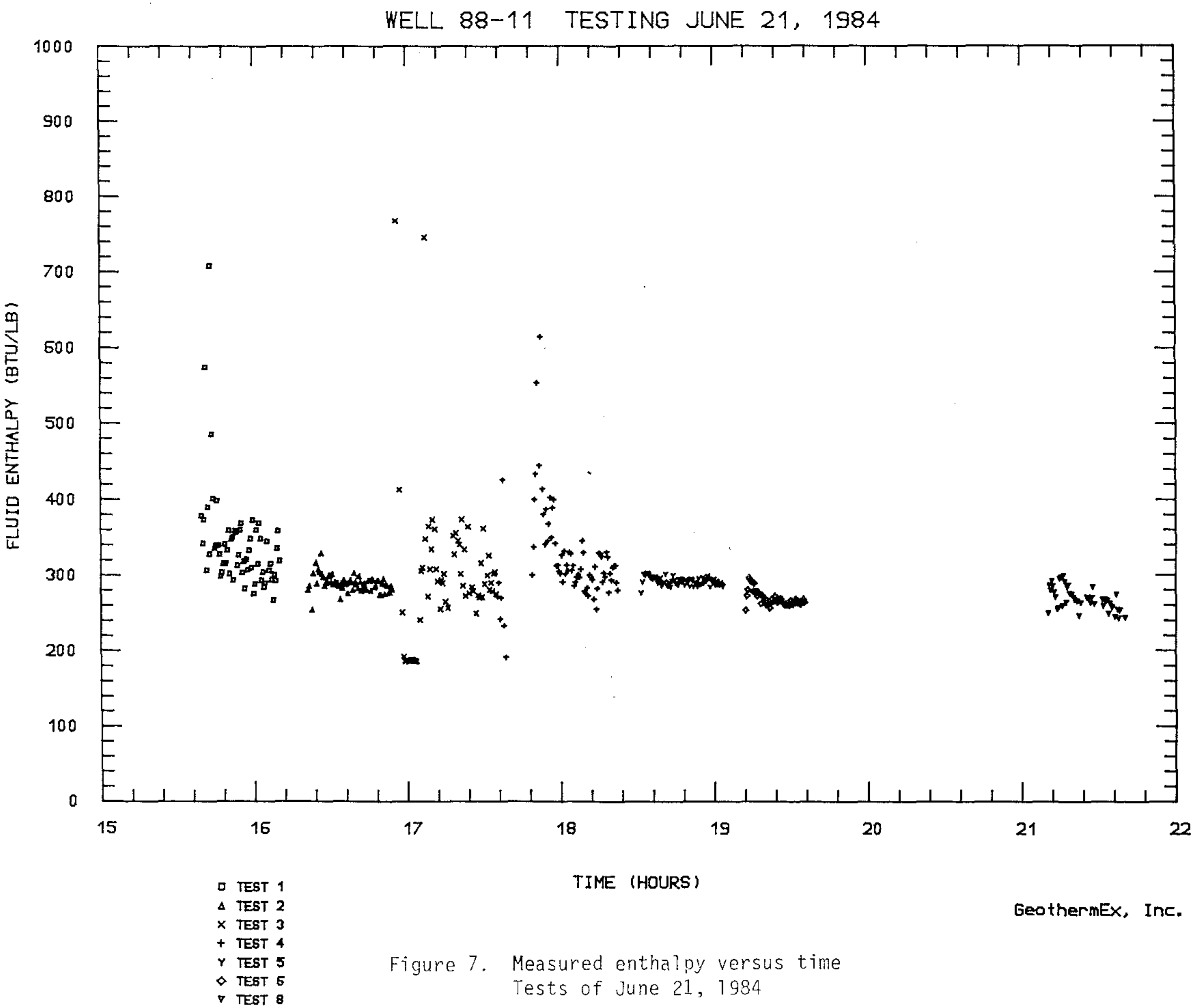

Figure 7. Measured enthalpy versus time
Tests of June 21, 1984

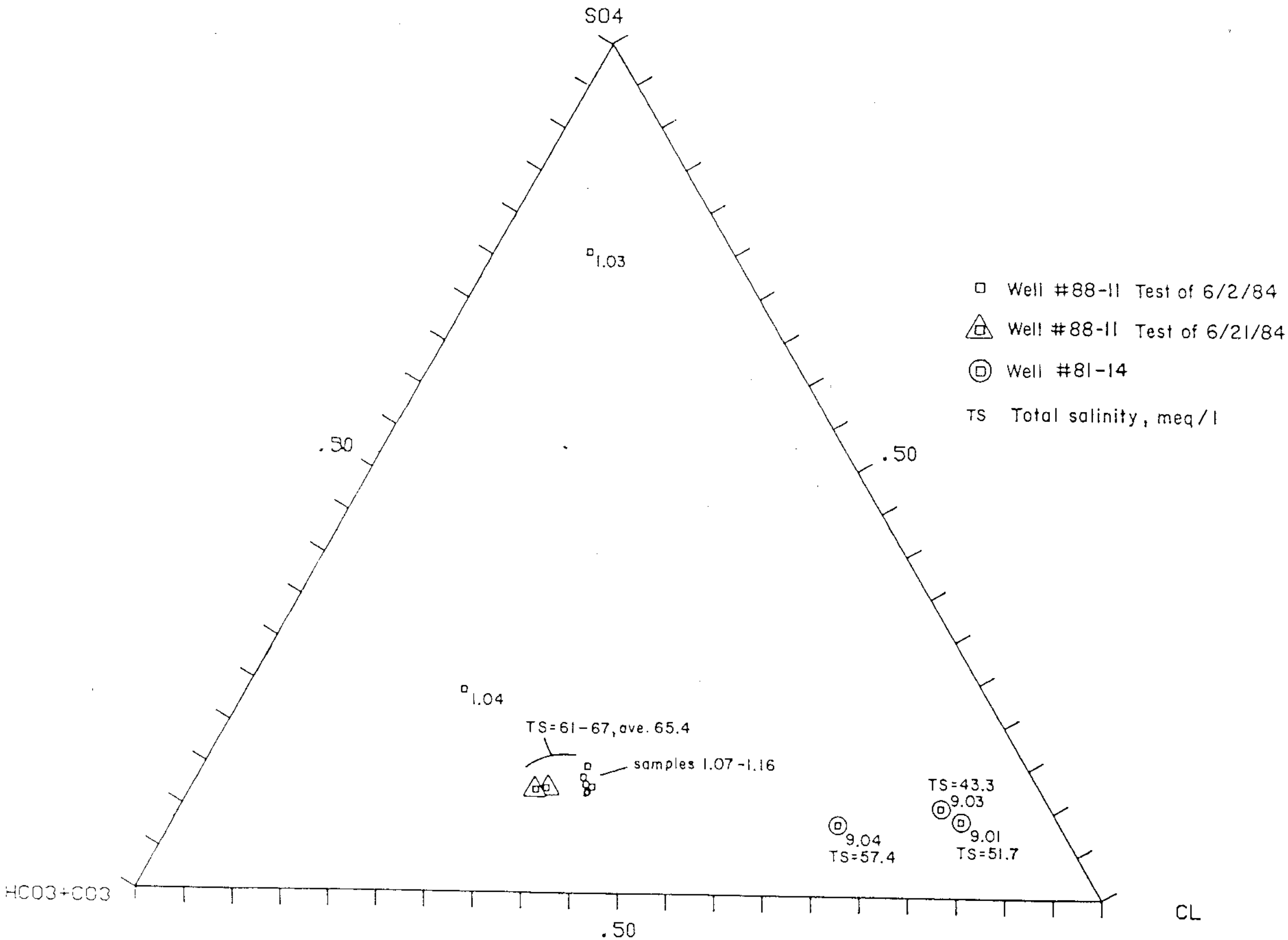

FIGURE 8. TRILINEAR DIAGRAM SHOWING HCO3+CO3, SO4 AND CL, WELLS 88-11 & 81-14

GeothermEx, Inc.

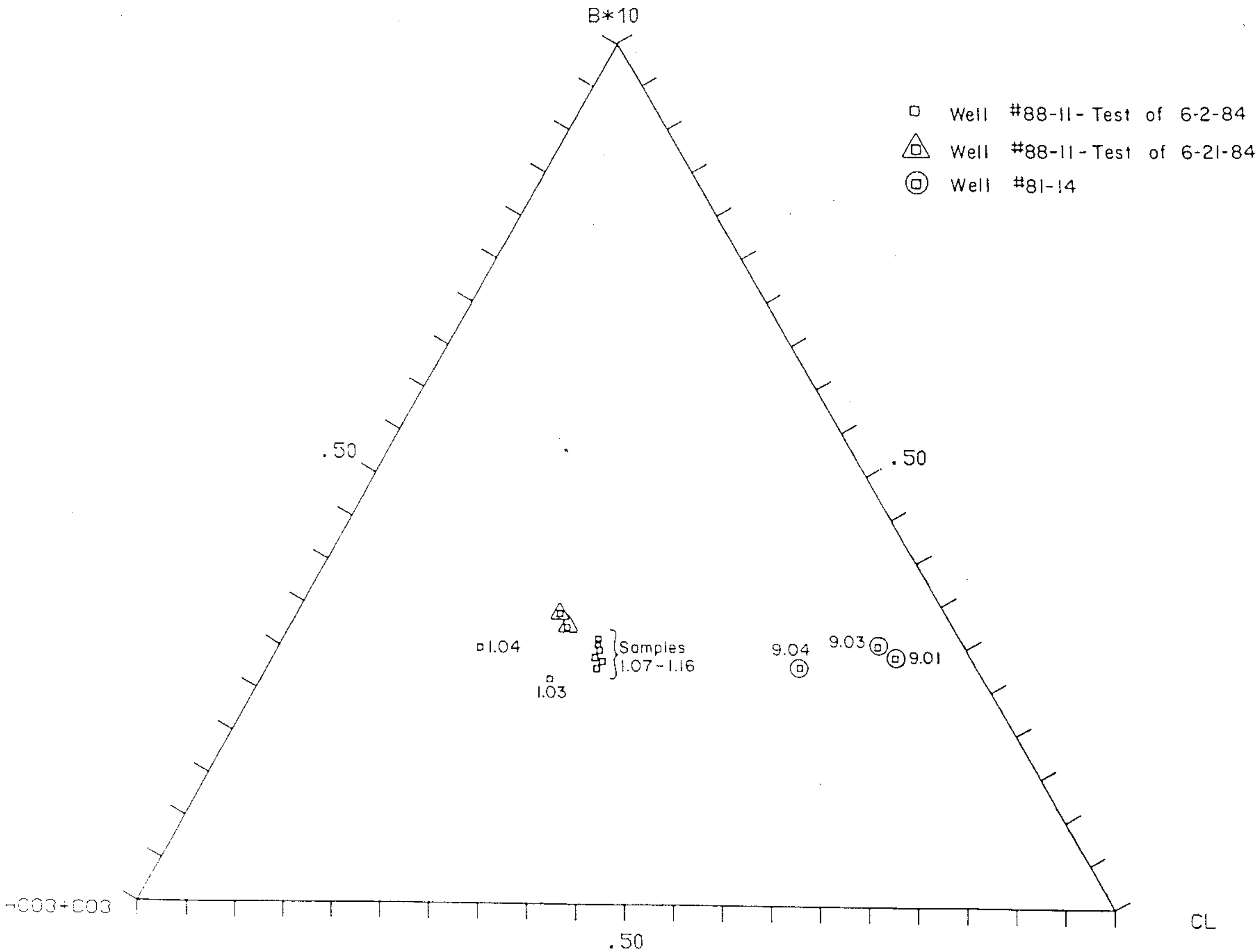

FIGURE 9. TRILINEAR DIAGRAM SHOWING HCO3+CO3, B AND CL, WELLS 88-11 & 81-14

GeothermEx, Inc.

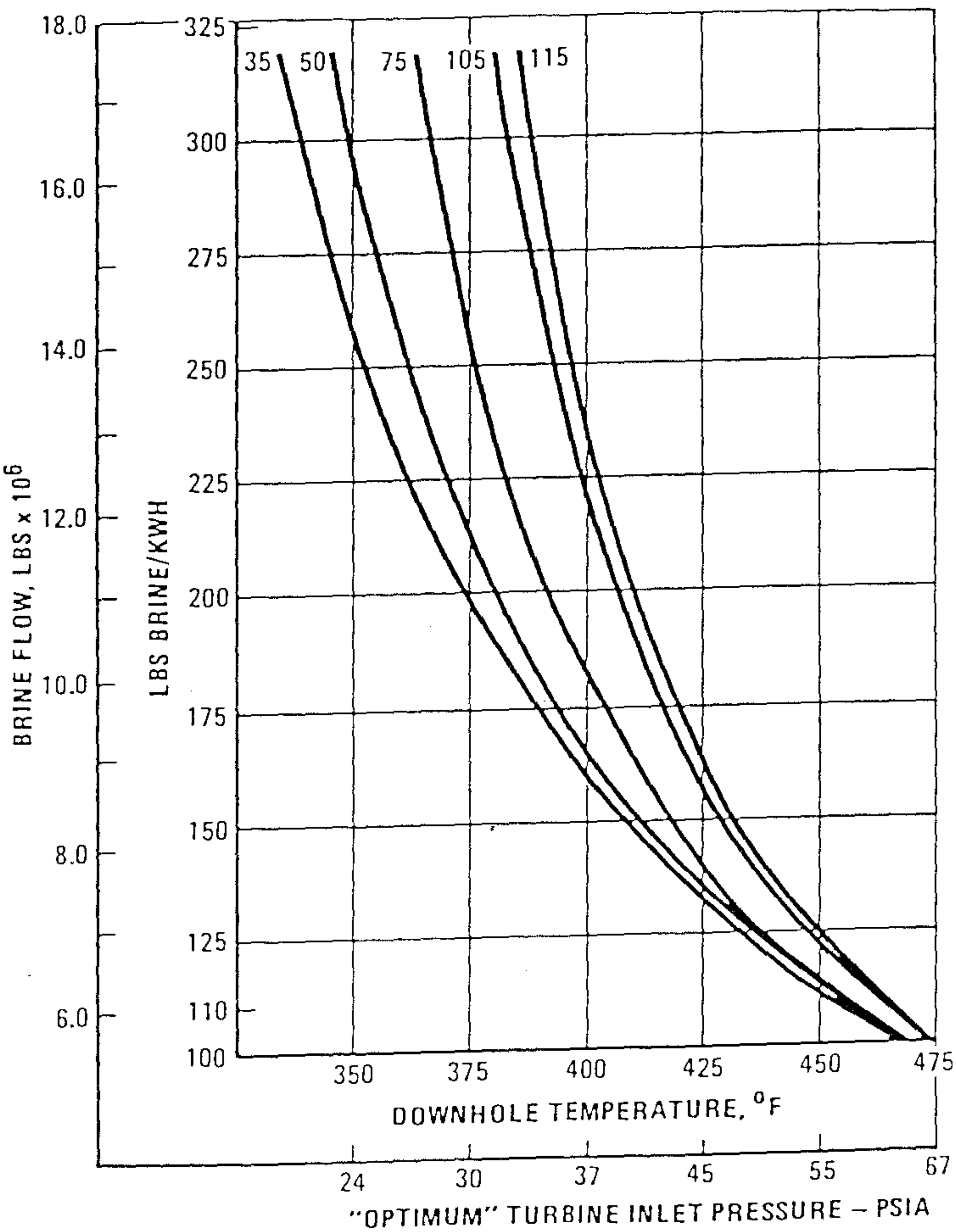

Figure 10: Typical Brine Requirement Curves for Single-flash Electrical Power Plants for various turbine inlet pressures (From Falcon, et. al., 1981).

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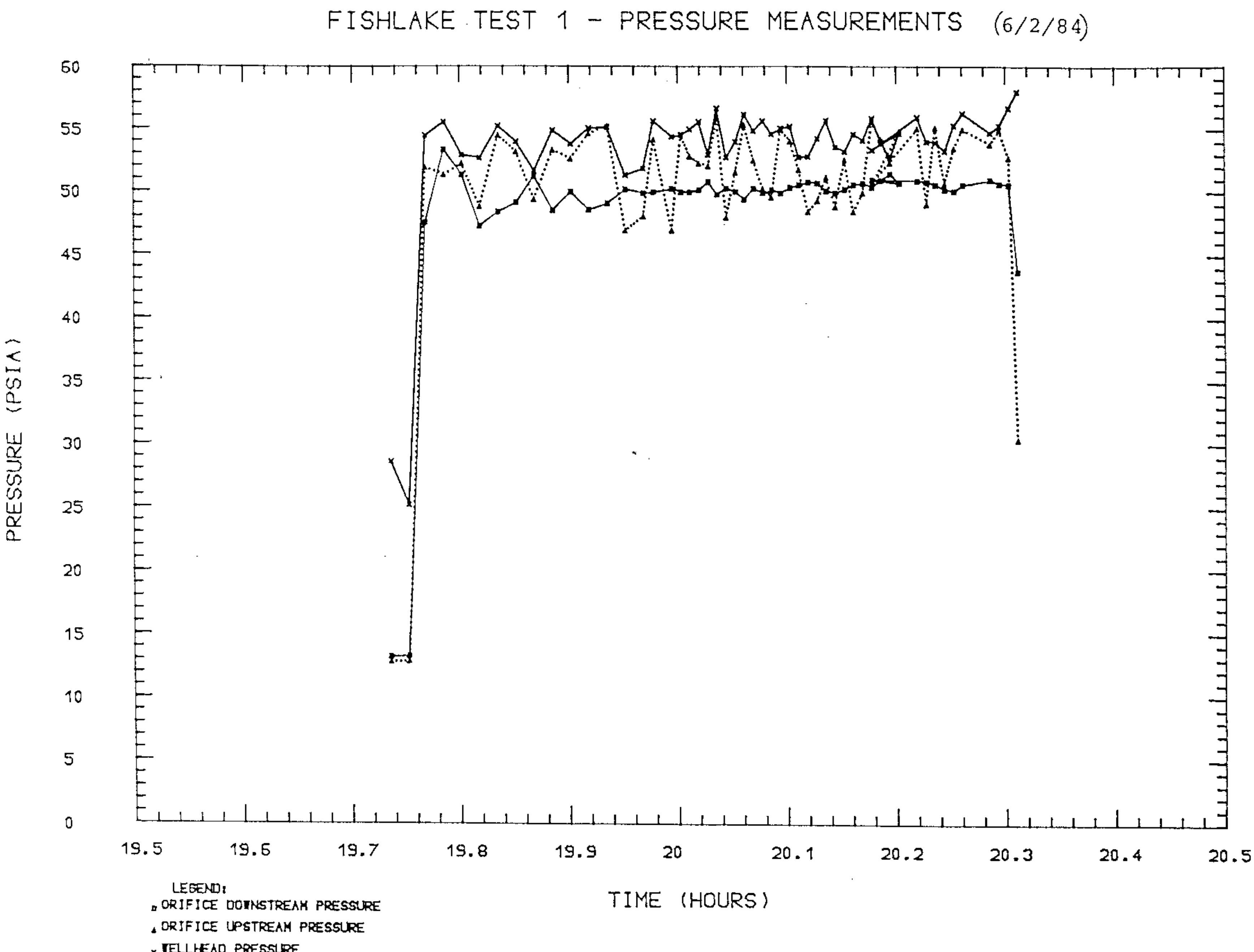
APPENDIX A

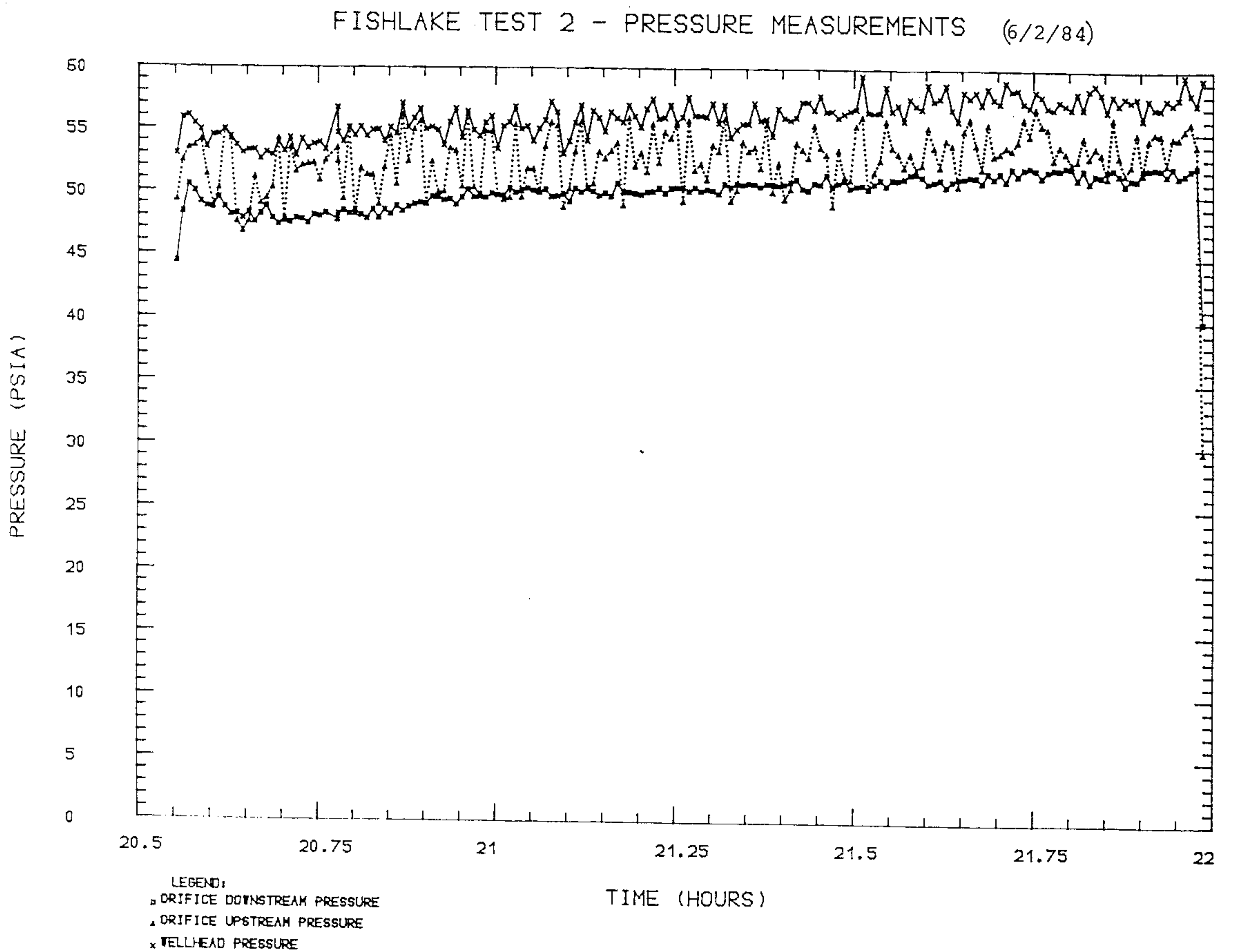
Graphical Presentation of June 2 Flow Test Results

A:TEST1P2.PLT



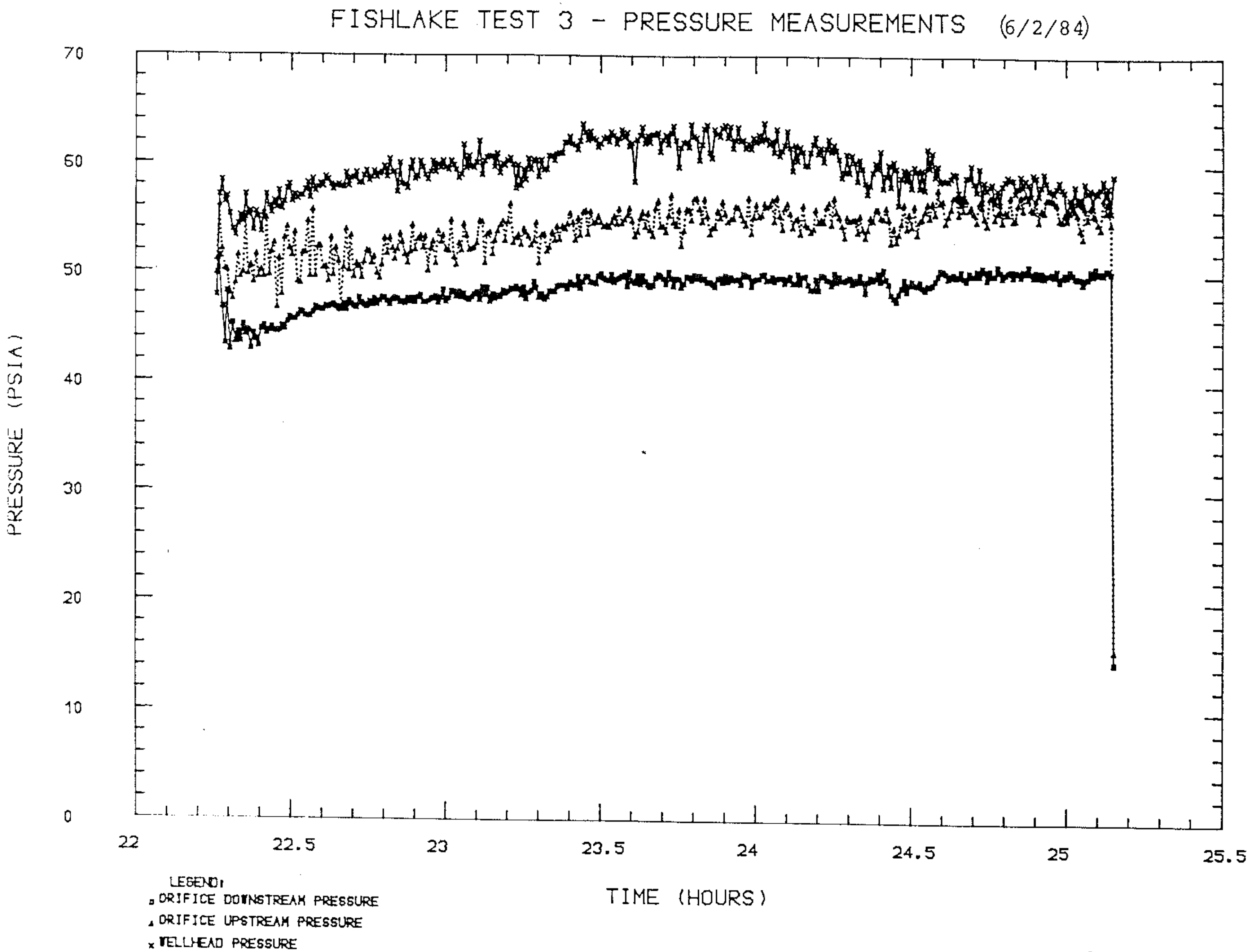
GeothermEx, Inc.
05-13-1984

A:TEST2P2.PLT



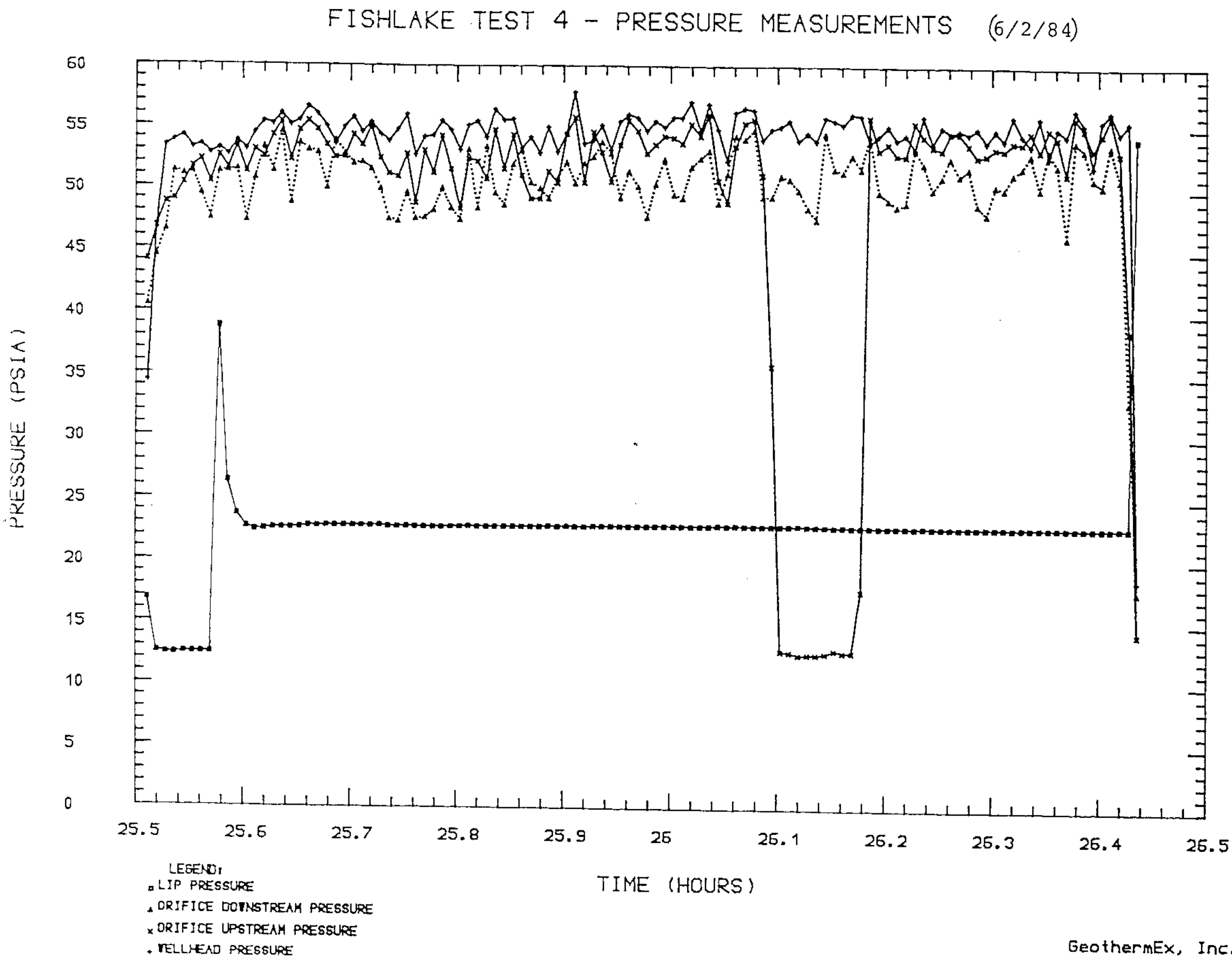
GeothermEx, Inc.
06-14-1984

A:TEST3P2.PLT



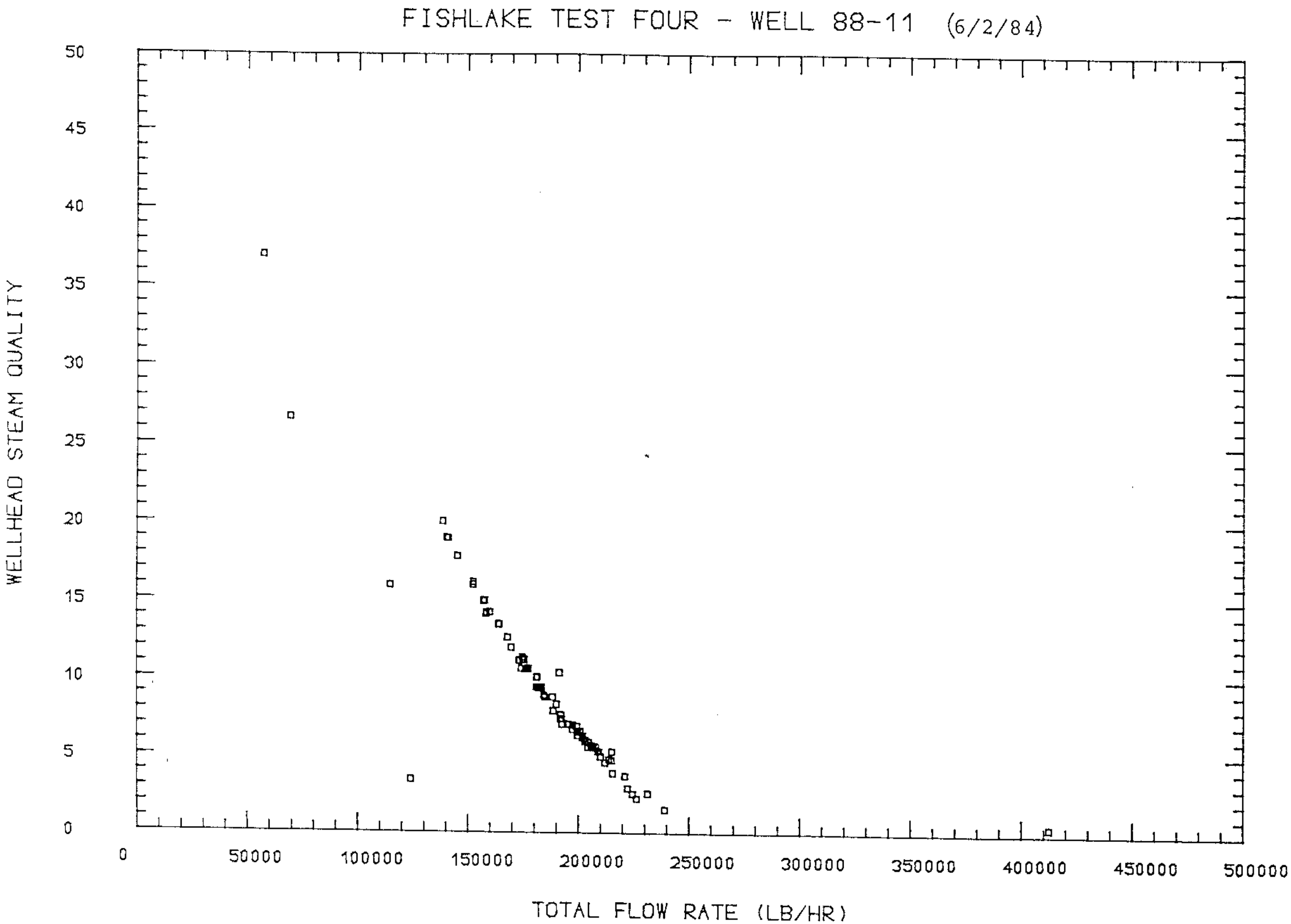
GeothermEx, Inc.
05-14-1984

A:TEST P1.PLT



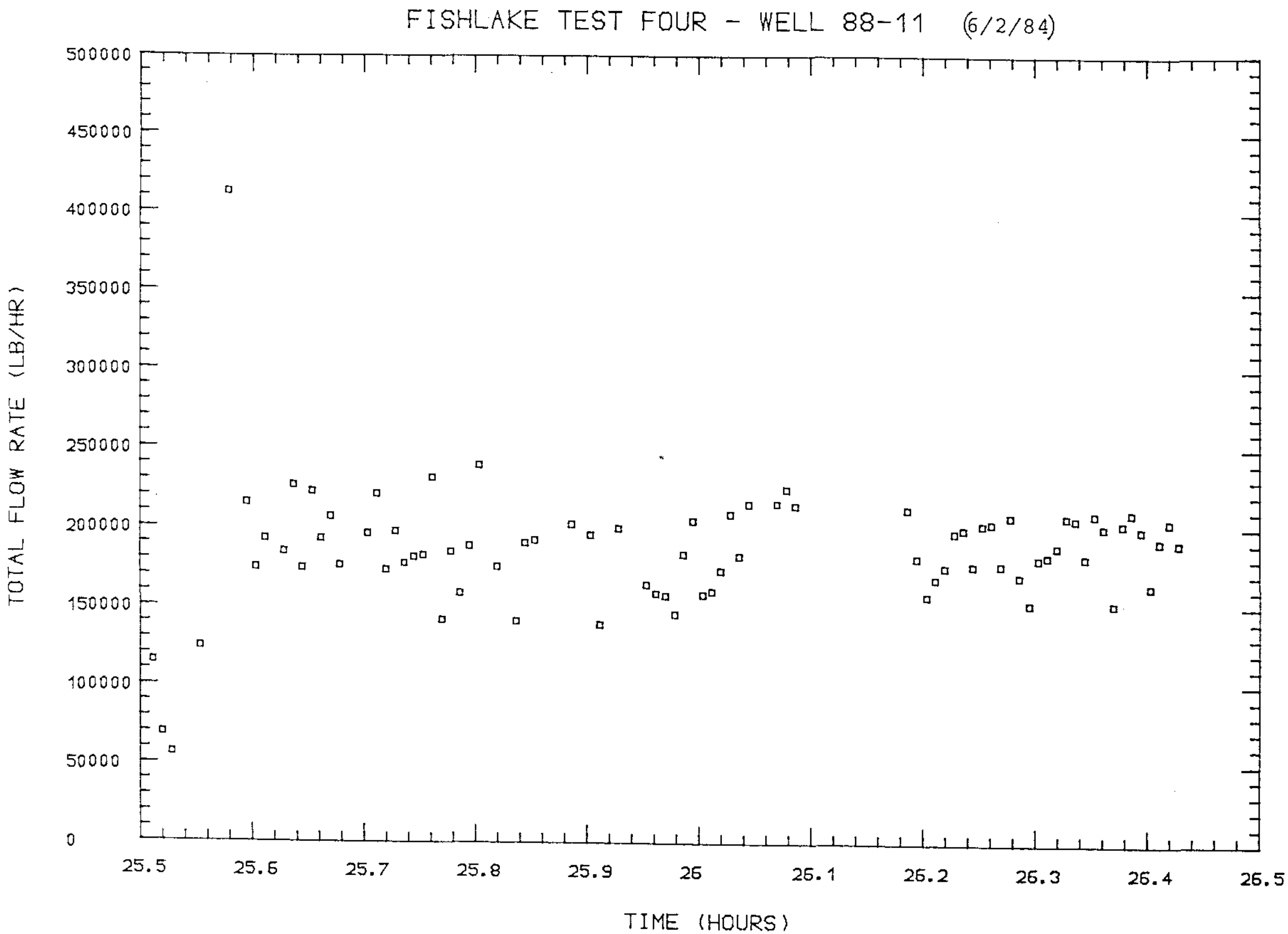
GeothermEx, Inc.
06-13-1984

A:TEST4QF.PLT 06-13-1984

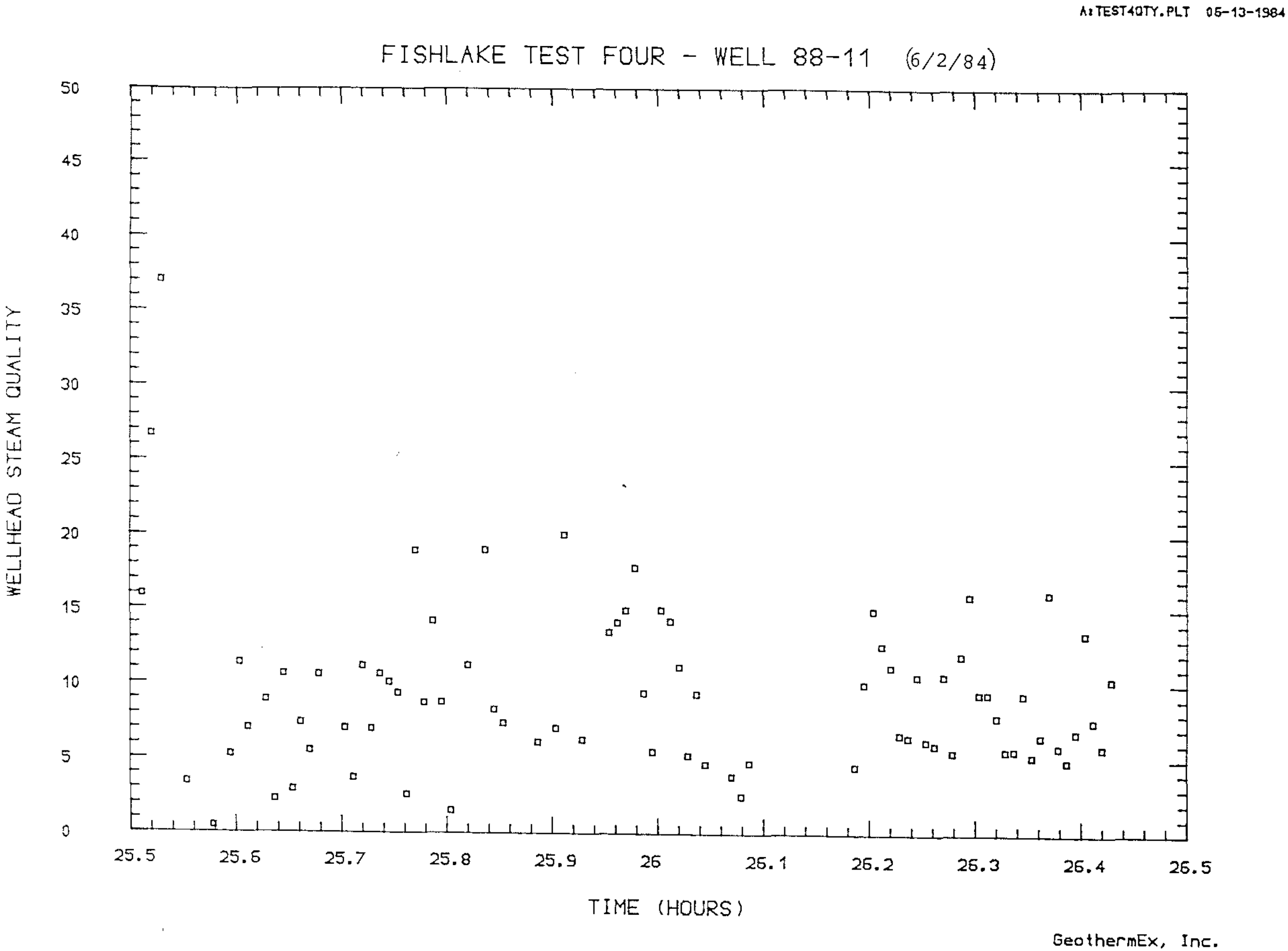


GeothermEx, Inc.

A:TEST4RTE.PLT 05-13-1984

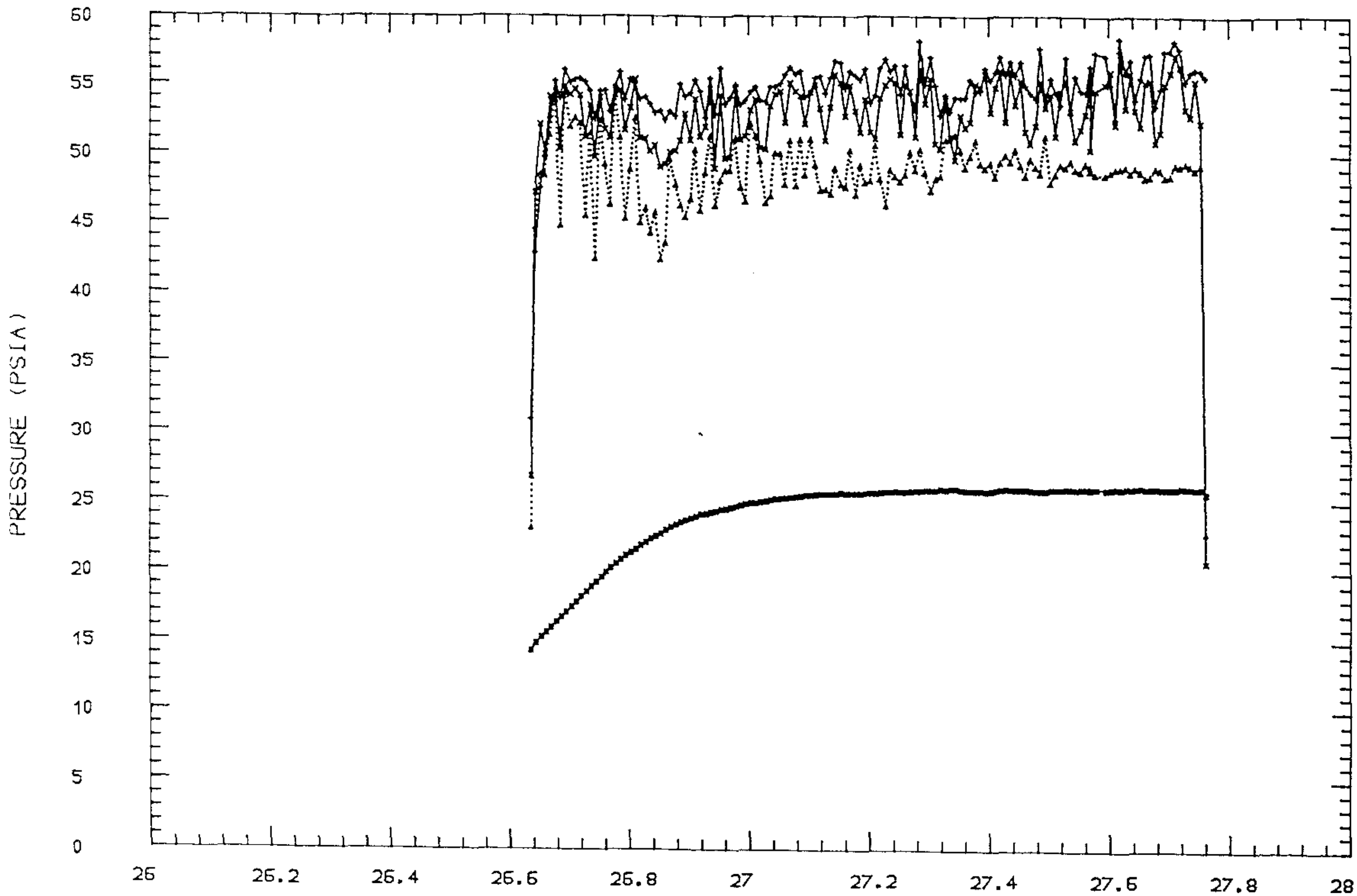


GeothermEx, Inc.


A:TEST4QTY.PLT 05-13-1984
FISHLAKE TEST FOUR - WELL 88-11 (6/2/84)
WELLHEAD STEAM QUALITY
0
5
10
15
20
25
30
35
40
45
50
25.5
25.6
25.7
25.8
25.9
26
26.1
26.2
26.3
26.4
26.5
TIME (HOURS)
GeothermEx, Inc.

A: TEST5P1.PLT

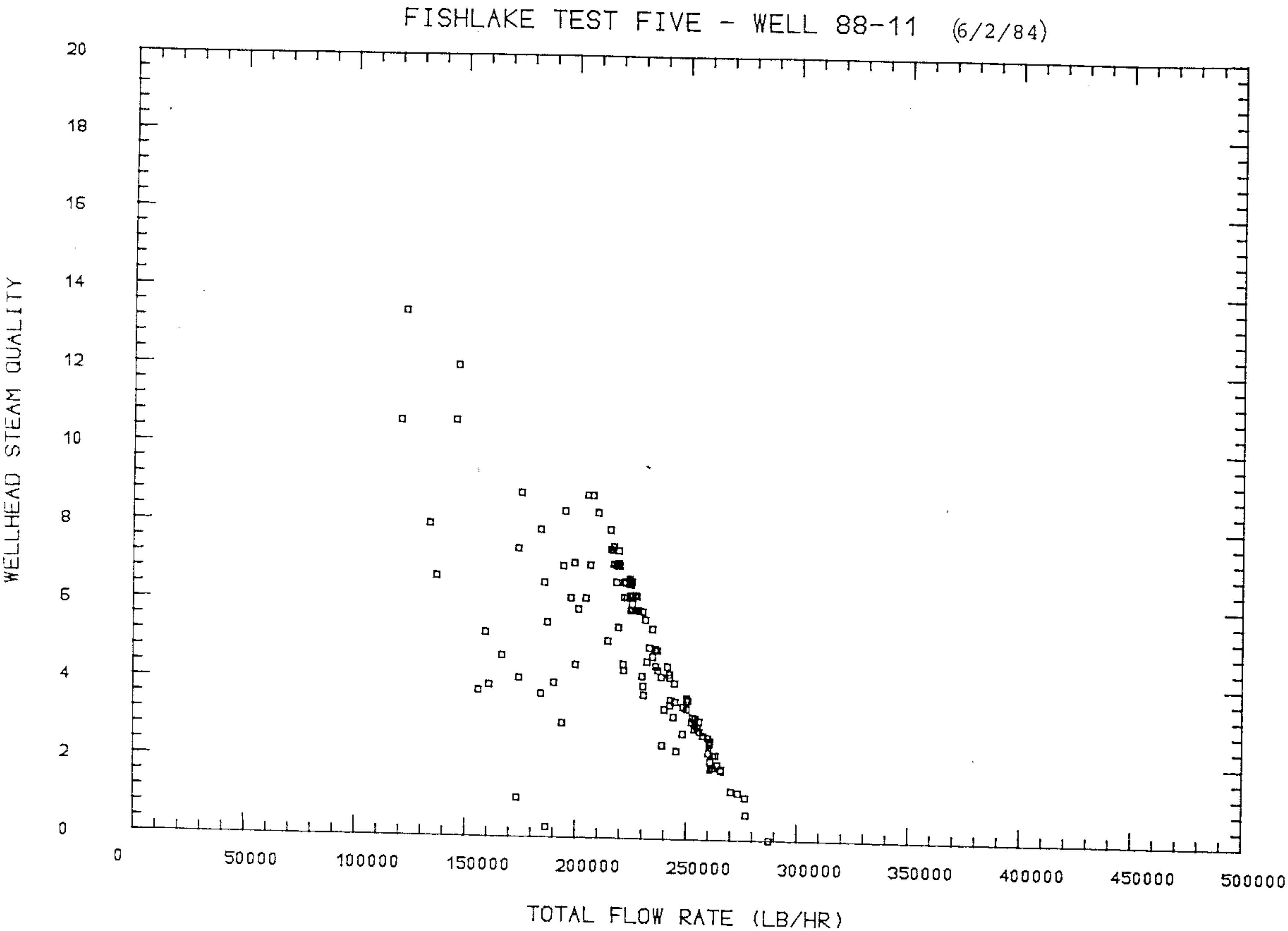
FISHLAKE TEST 5 - PRESSURE MEASUREMENTS (6/2/84)



LEGEND:
- LIP PRESSURE
- ORIFICE DOWNSTREAM PRESSURE
- ORIFICE UPSTREAM PRESSURE
- WELLHEAD PRESSURE

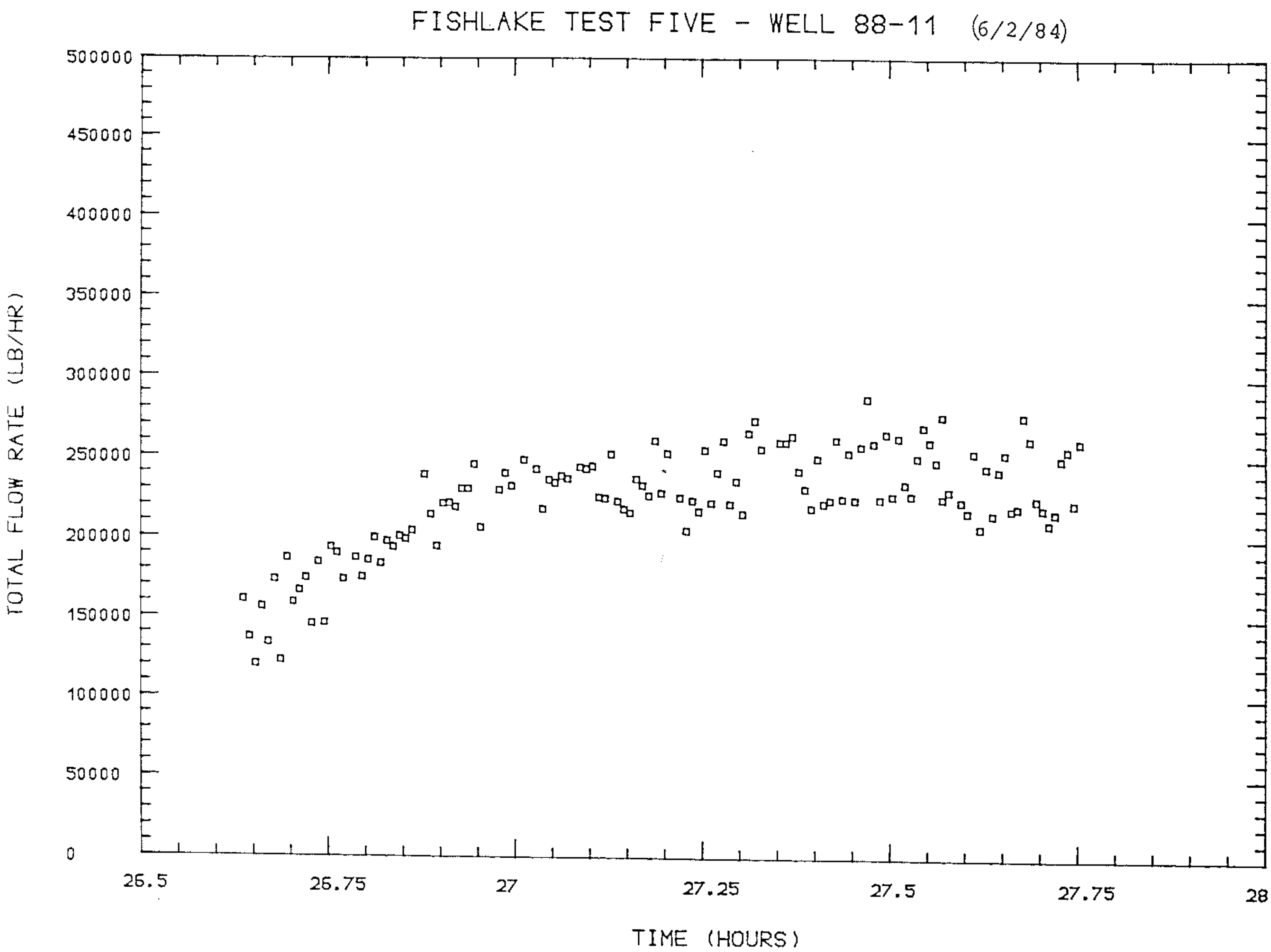
GeothermEx, Inc.
06-14-1984

A:TEST5DF.PLT 06-14-1984

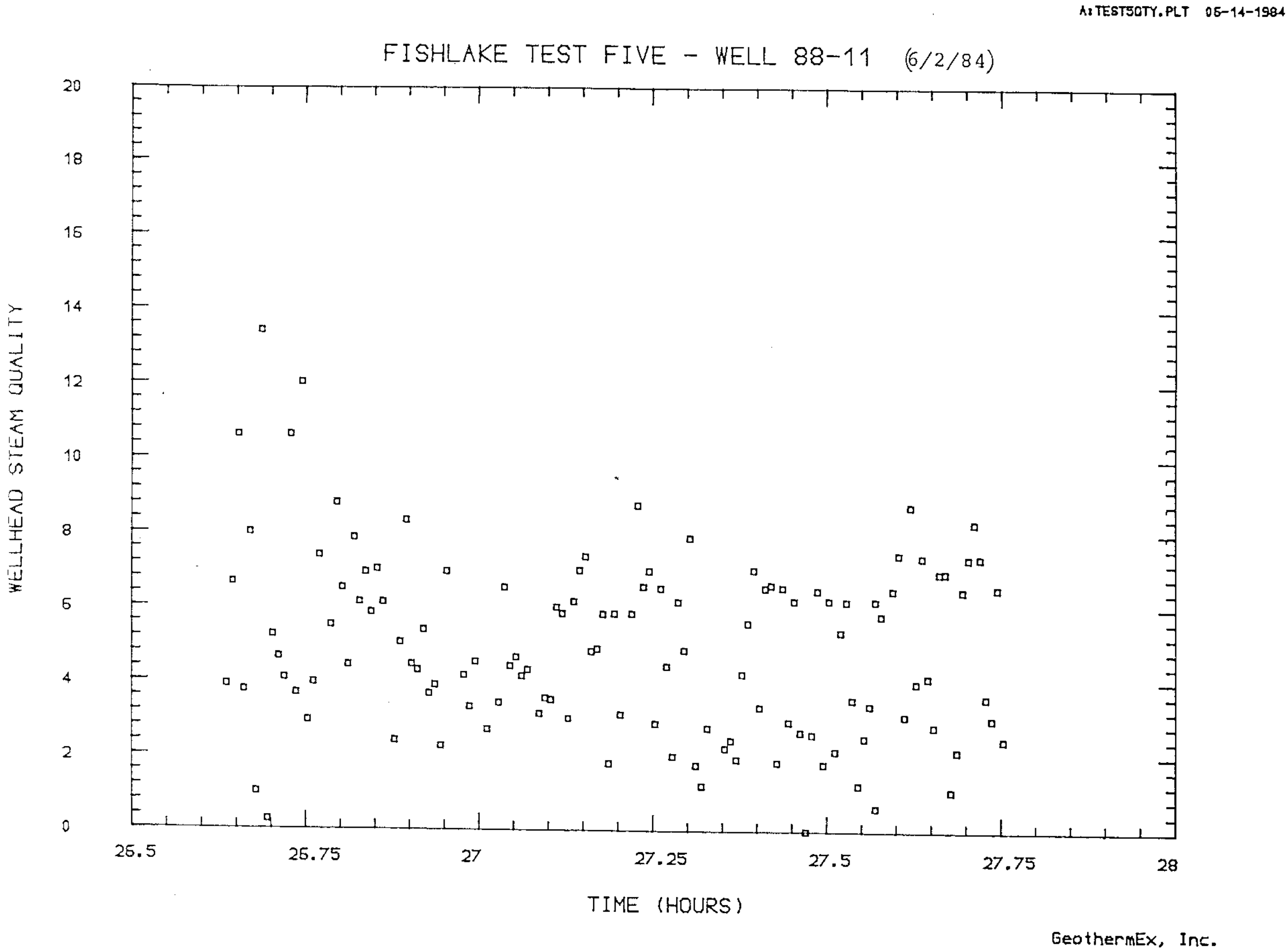


GeothermEx, Inc.

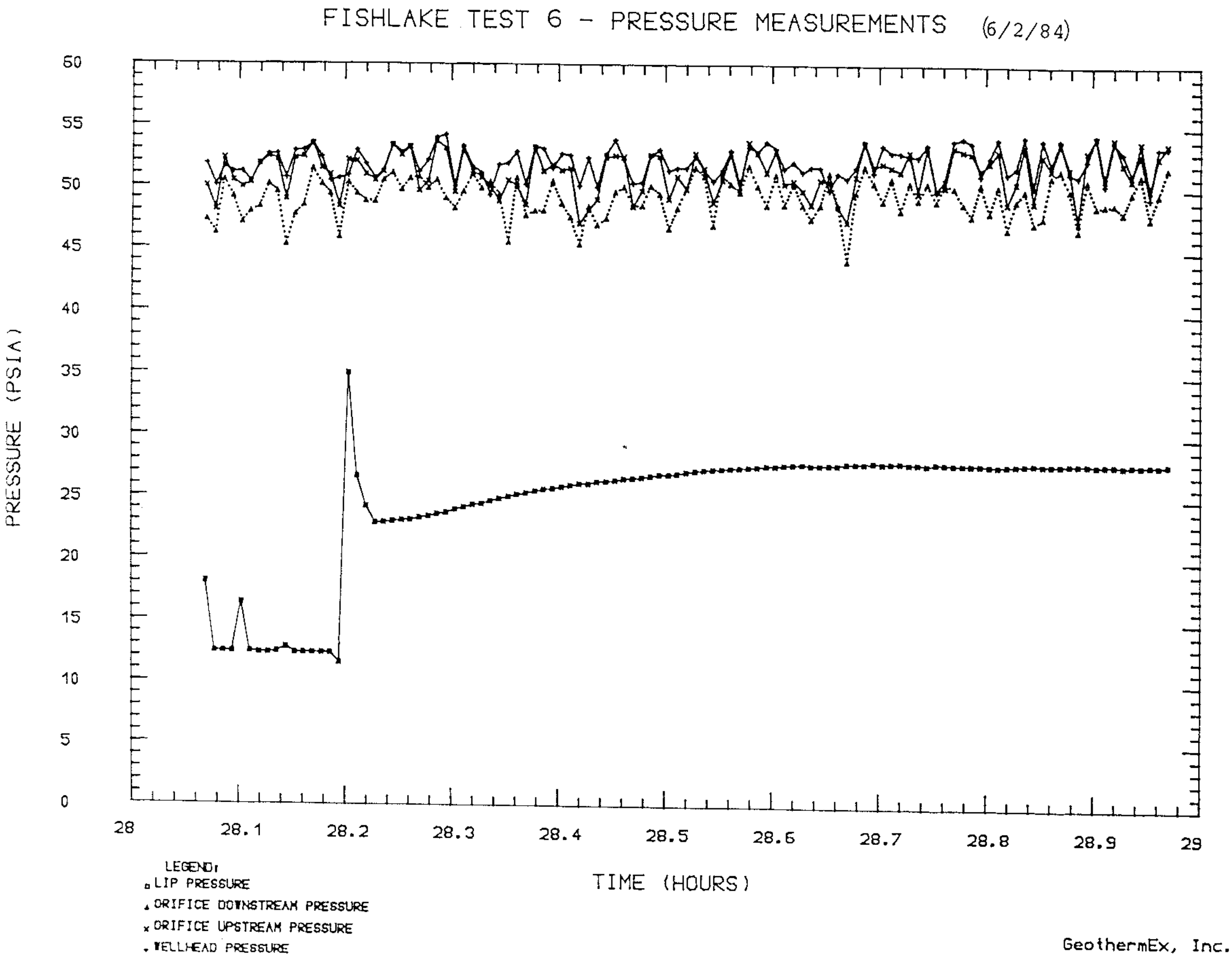
A:TEST5RTE.PLT 06-14-1984



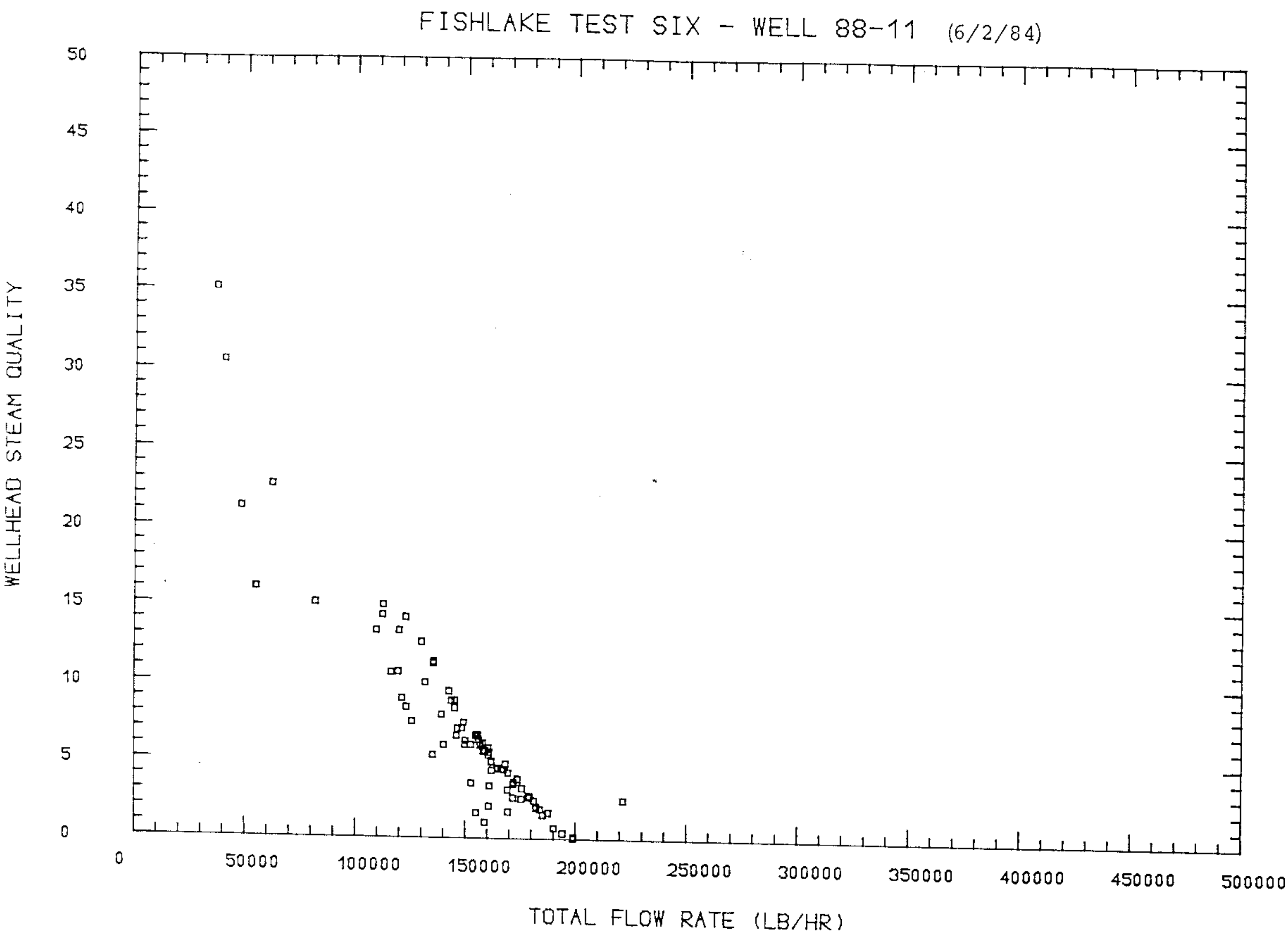
GeothermEx, Inc.


A:TESTSQTY.PLT 05-14-1984
FISHLAKE TEST FIVE - WELL 88-11 (6/2/84)
WELLHEAD STEAM QUALITY
0
2
4
6
8
10
12
14
16
18
20
25.5
25.75
27
27.25
27.5
27.75
28
TIME (HOURS)
GeothermEx, Inc.

A:TEST P1.PLT

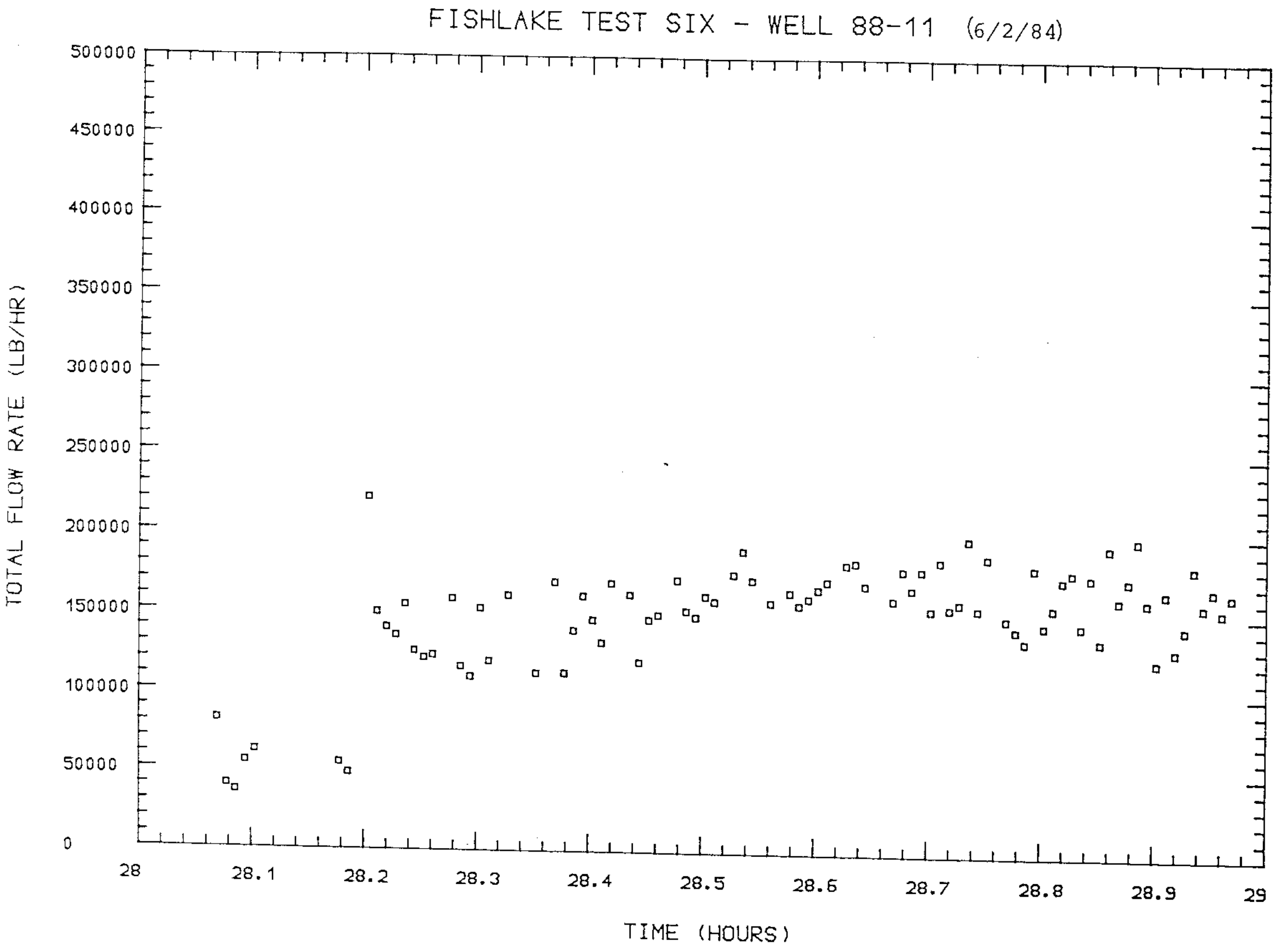


GeothermEx, Inc.
06-12-1984



GeothermEx, Inc.

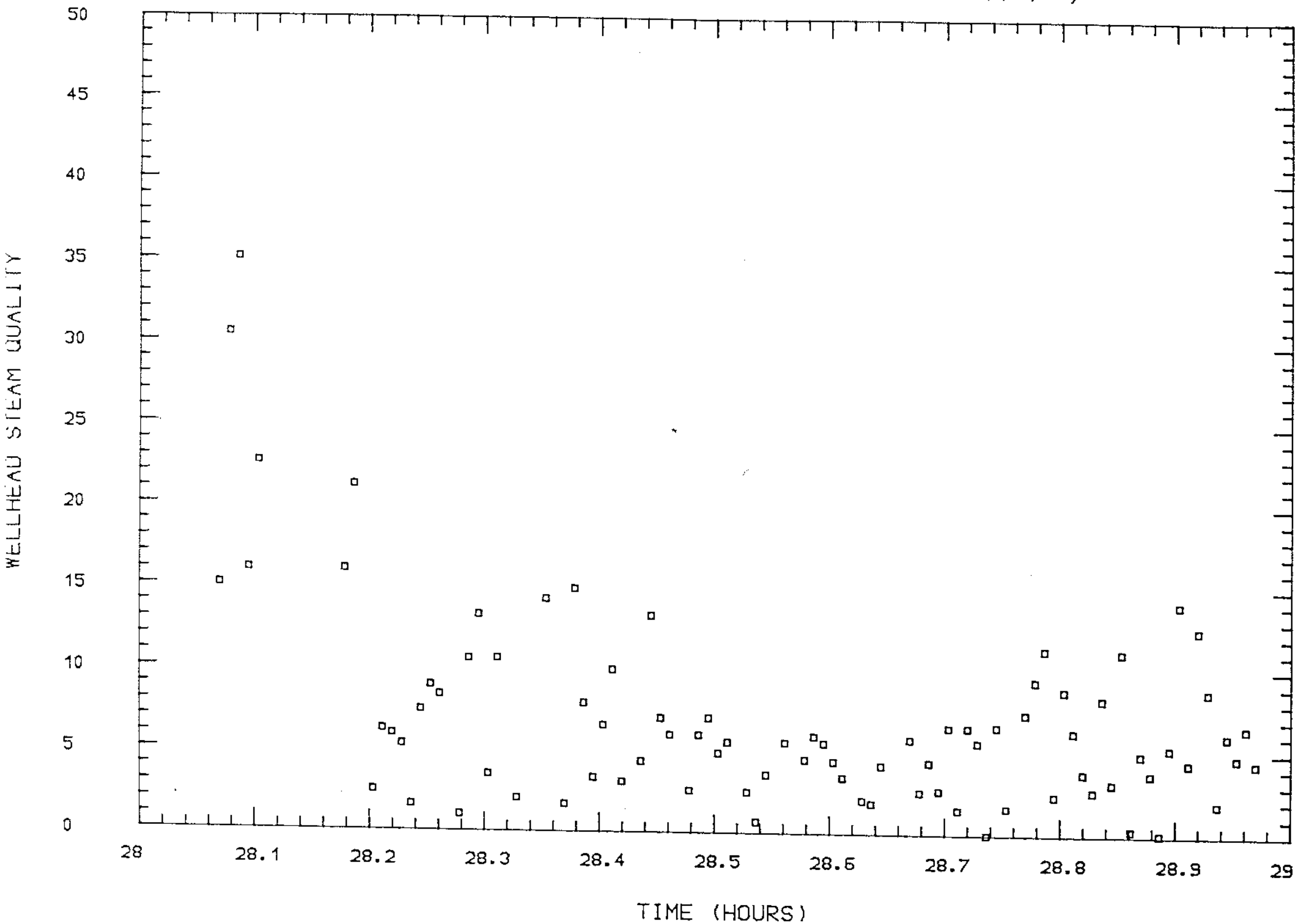
A:TESTGRTE.PLT 06-13-1984



GeothermEx, Inc.

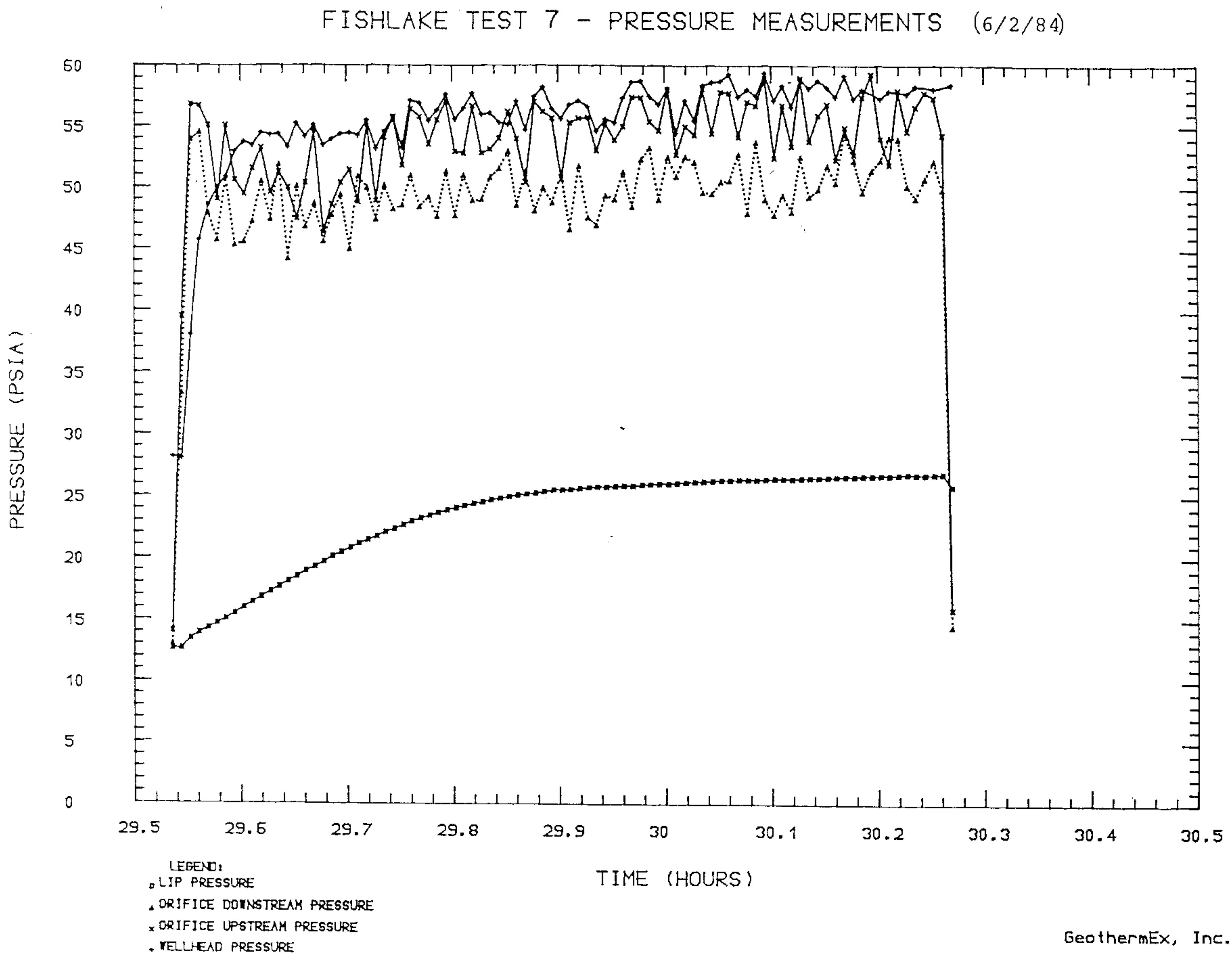
A:TEST6QTY.PLT 05-13-1984

FISHLAKE TEST SIX - WELL 88-11 (6/2/84)



GeothermEx, Inc.

A:TEST P1.PLT



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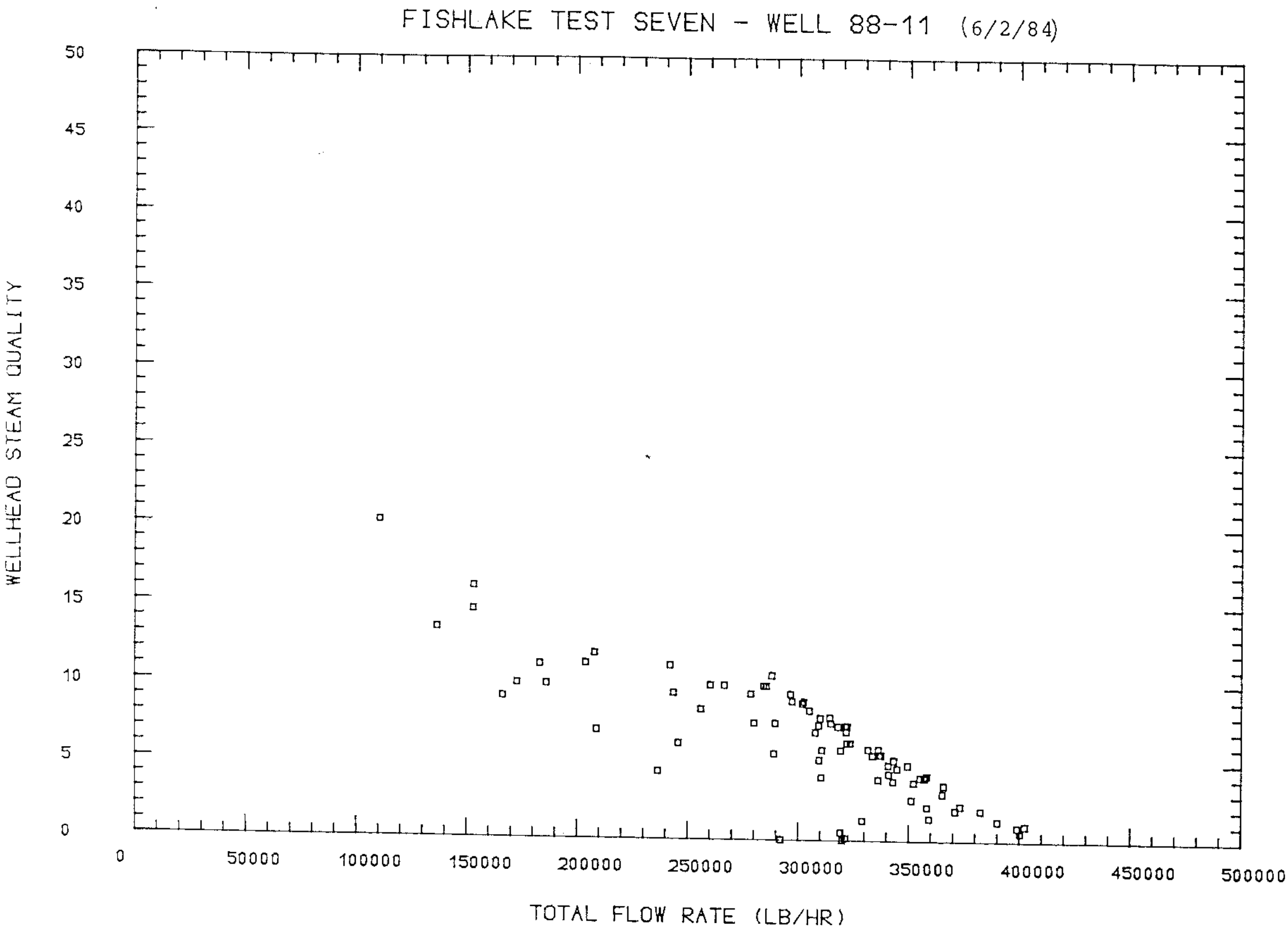
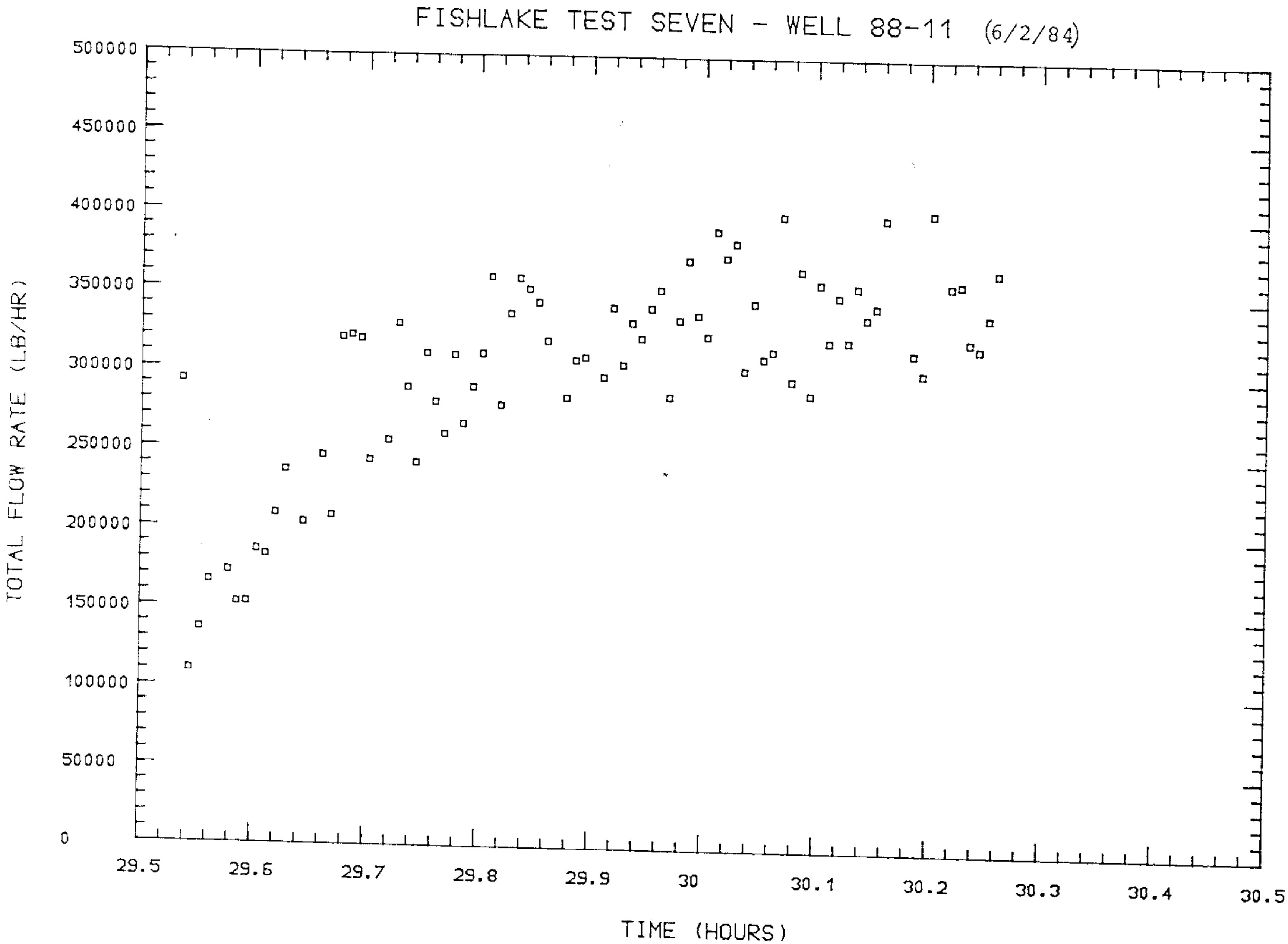
05-11-1984



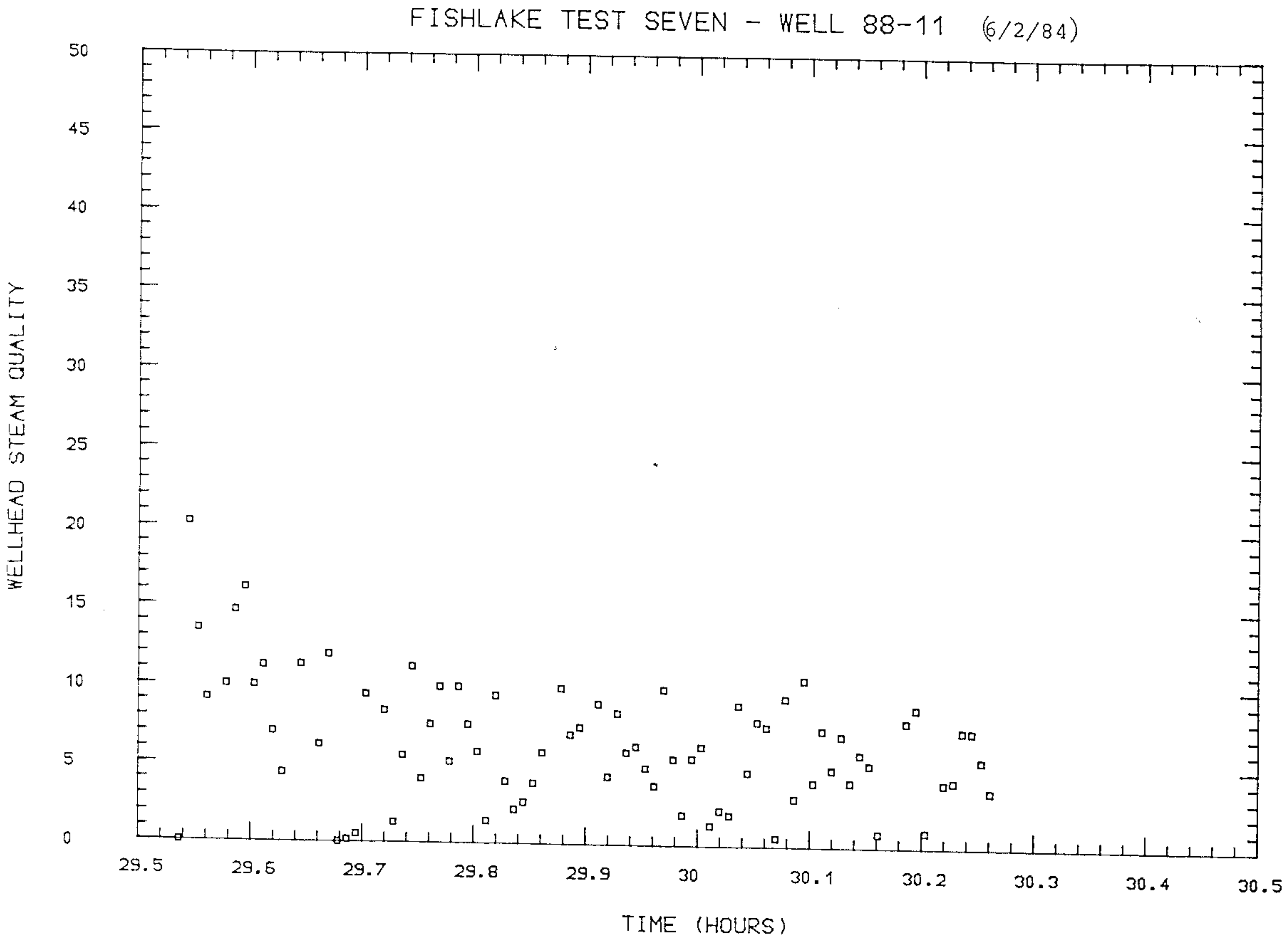
GeothermEx, Inc.

A:TEST7RTE.PLT 06-13-1984



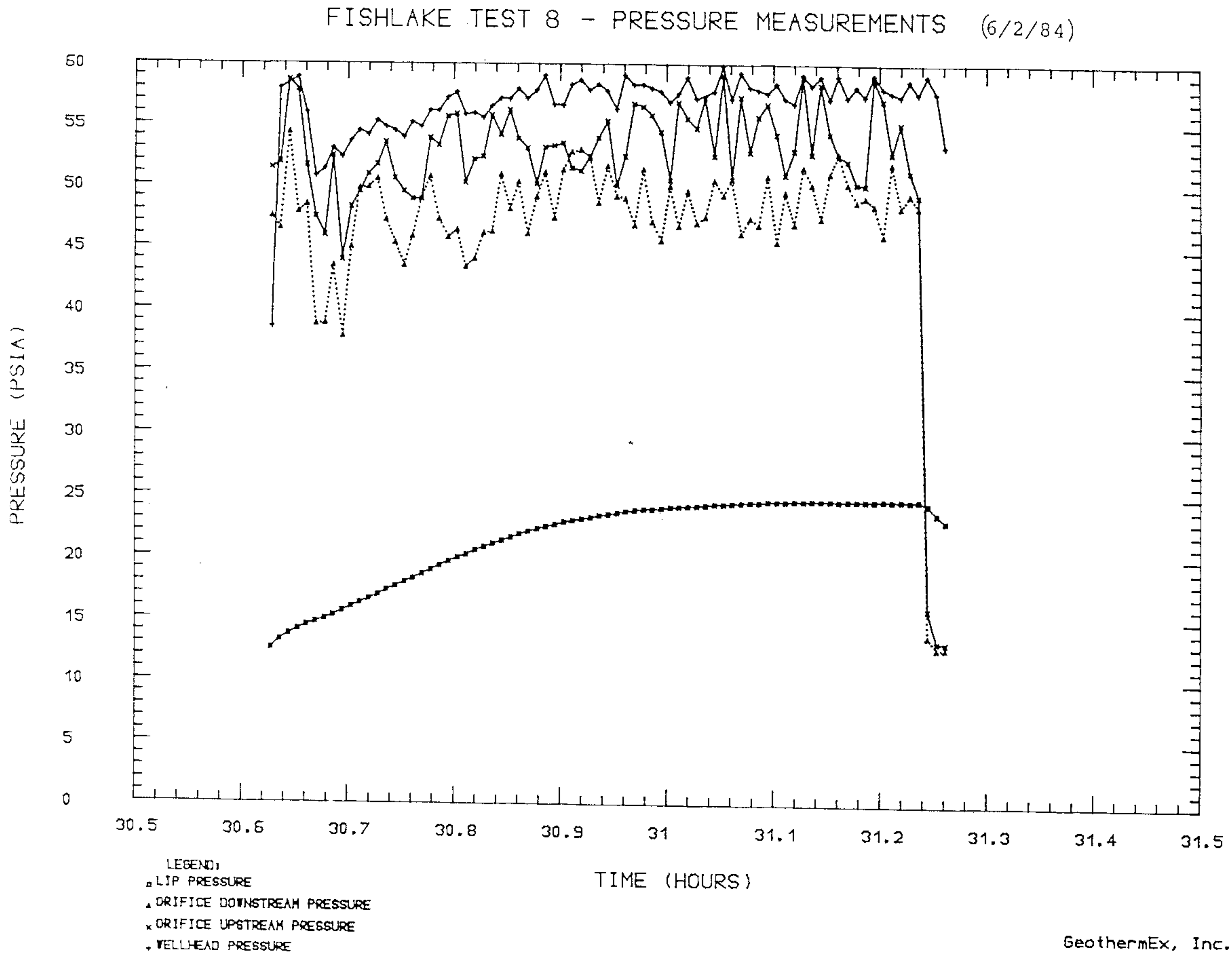
GeothermEx, Inc.

A:TEST7QTY.PLT 06-13-1984

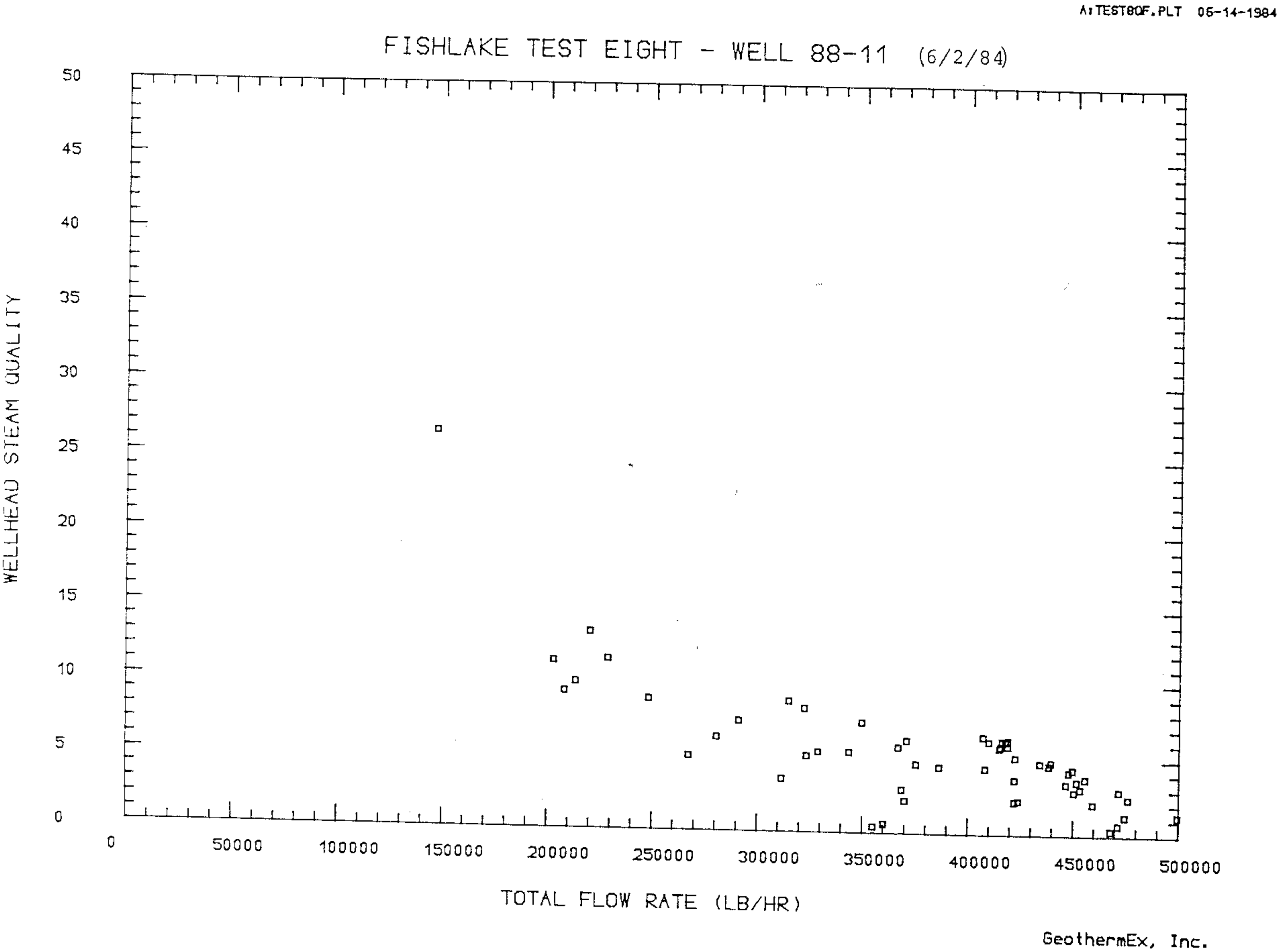


GeothermEx, Inc.

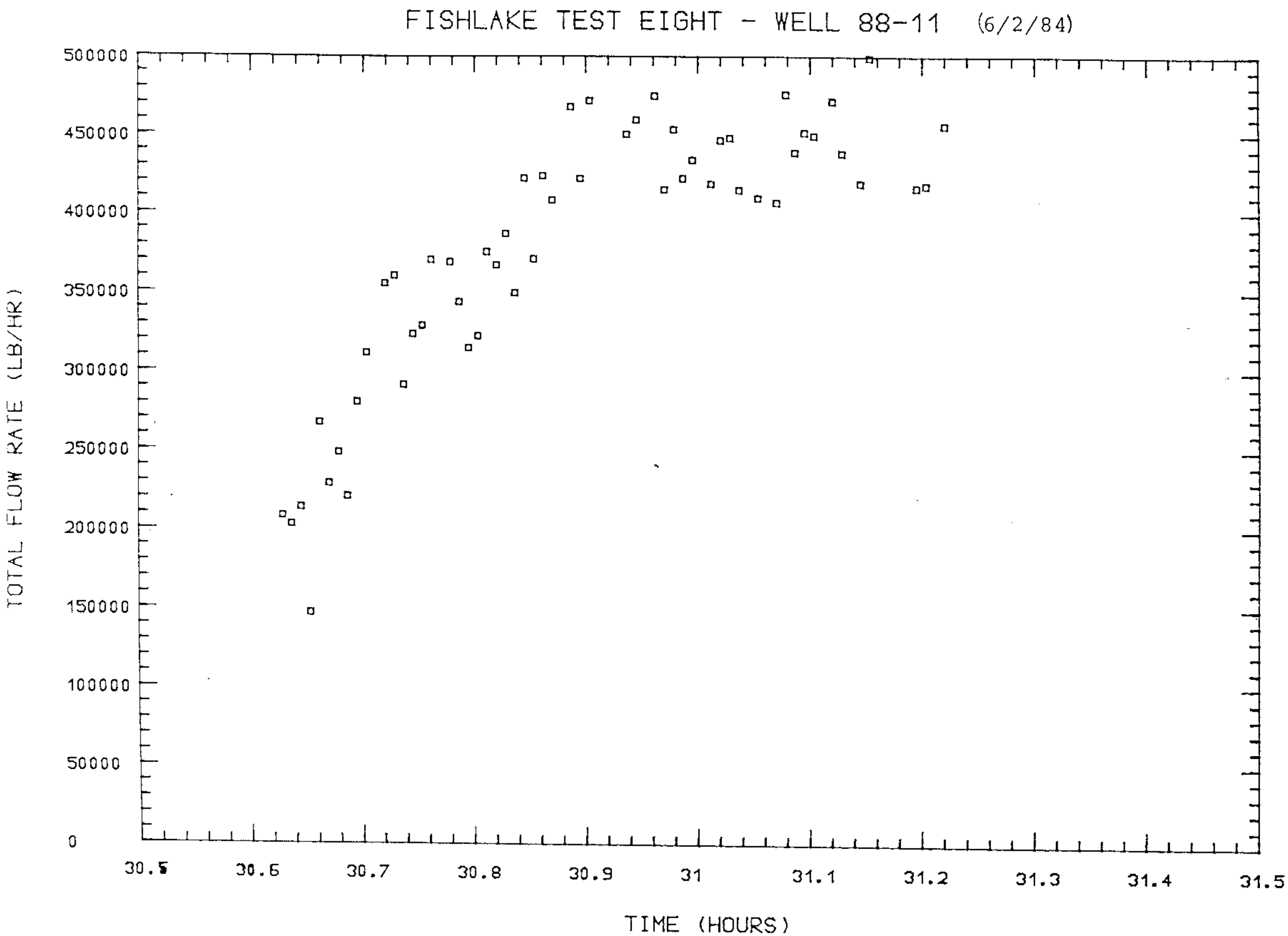
A:TEST P1.PLT



GeothermEx, Inc.
06-13-1984

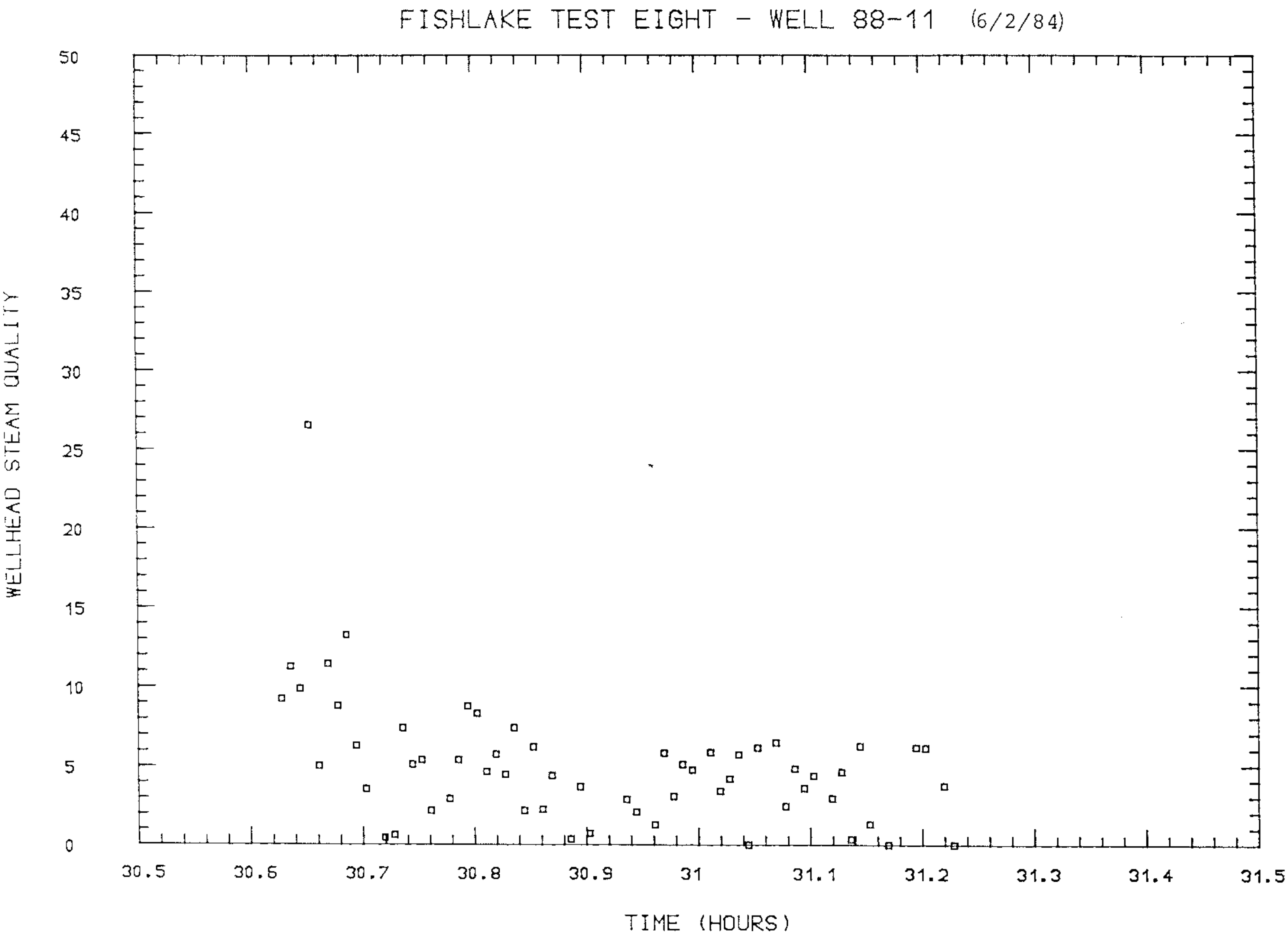

A:TEST8QF.PLT 06-14-1984
FISHLAKE TEST EIGHT - WELL 88-11 (6/2/84)
WELLHEAD STEAM QUALITY
0
5
10
15
20
25
30
35
40
45
50
0
50000
100000
150000
200000
250000
300000
350000
400000
450000
500000
TOTAL FLOW RATE (LB/HR)
GeothermEx, Inc.

A:TESTØRTE.PLT 06-14-1984



GeothermEx, Inc.

A:TESTBQTY.PLT 06-14-1984



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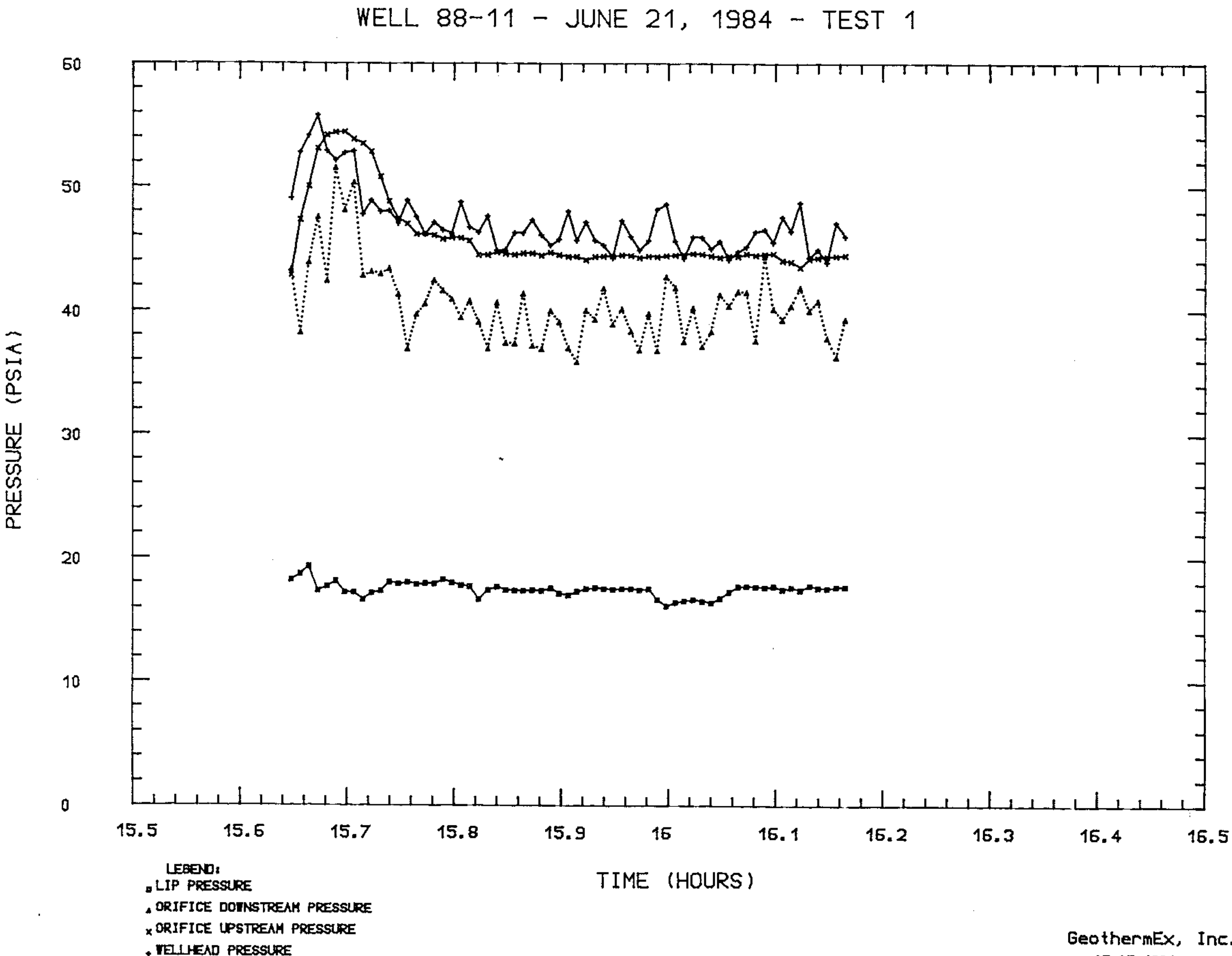
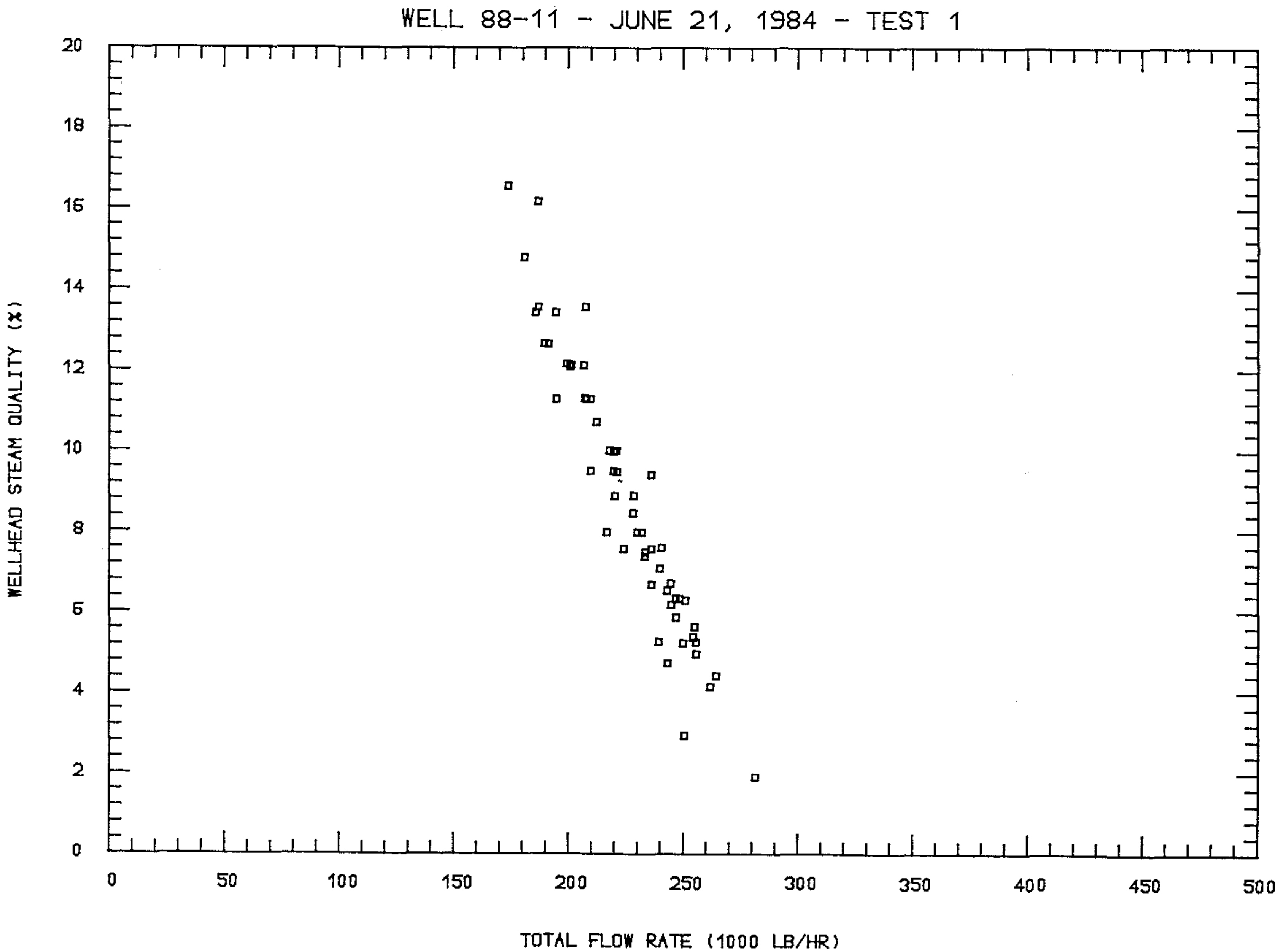
APPENDIX B

Graphical Presentation of June 21 Flow Test Results

A:TEST1P1.PLT

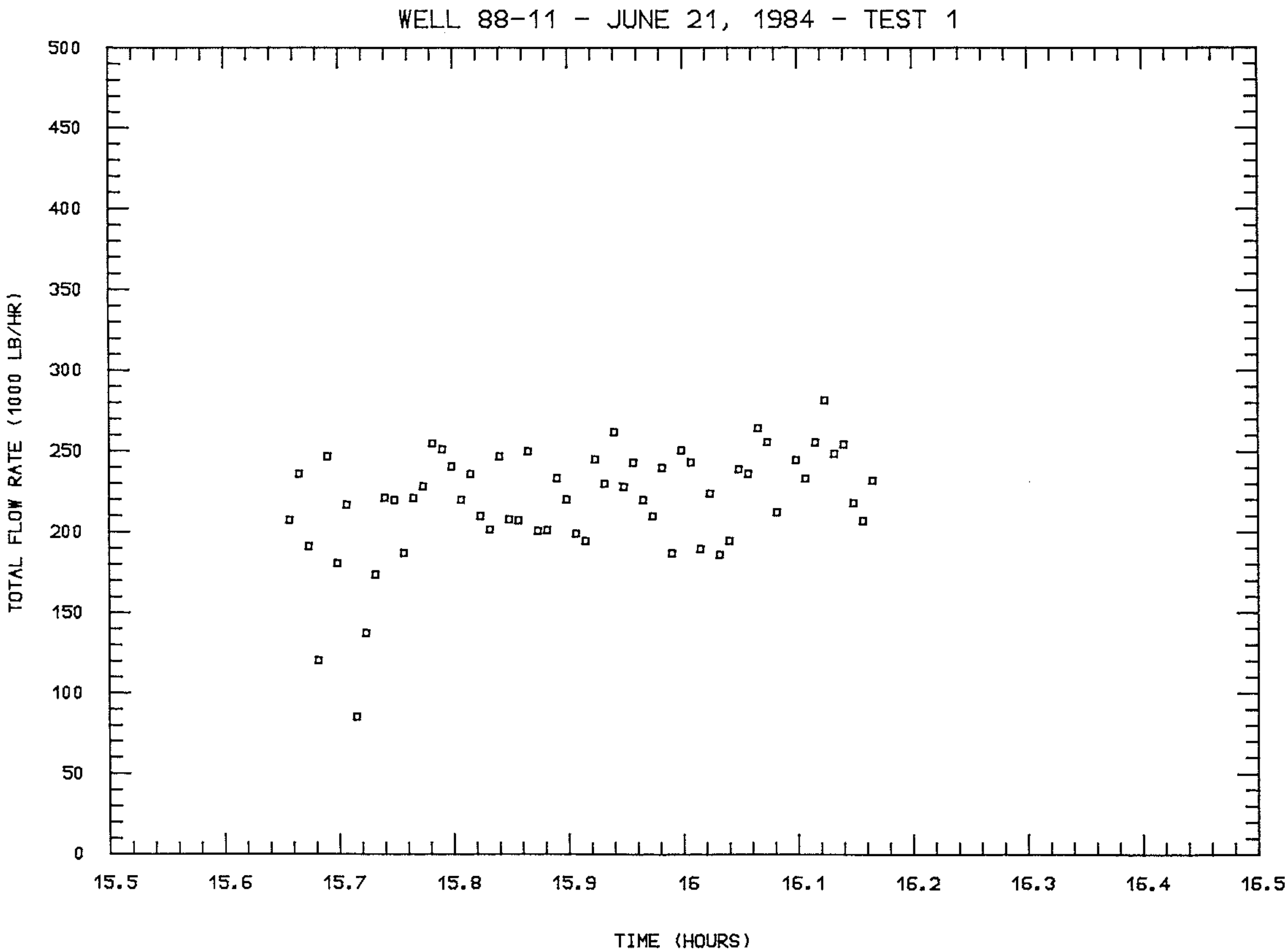


GeothermEx, Inc.
07-05-1984



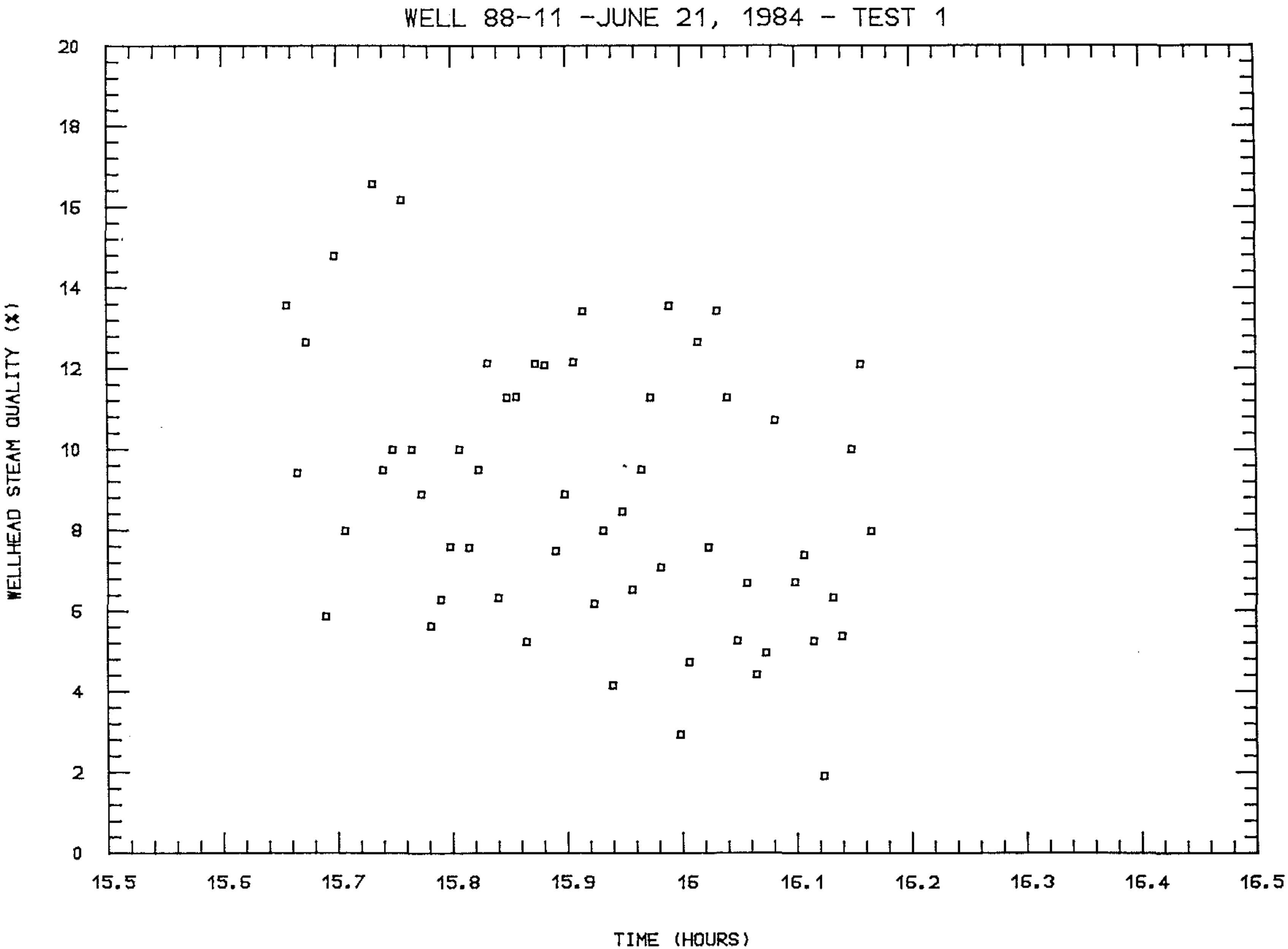
GeothermEx, Inc.

09-22-1984A:TEST1RTE.PLT



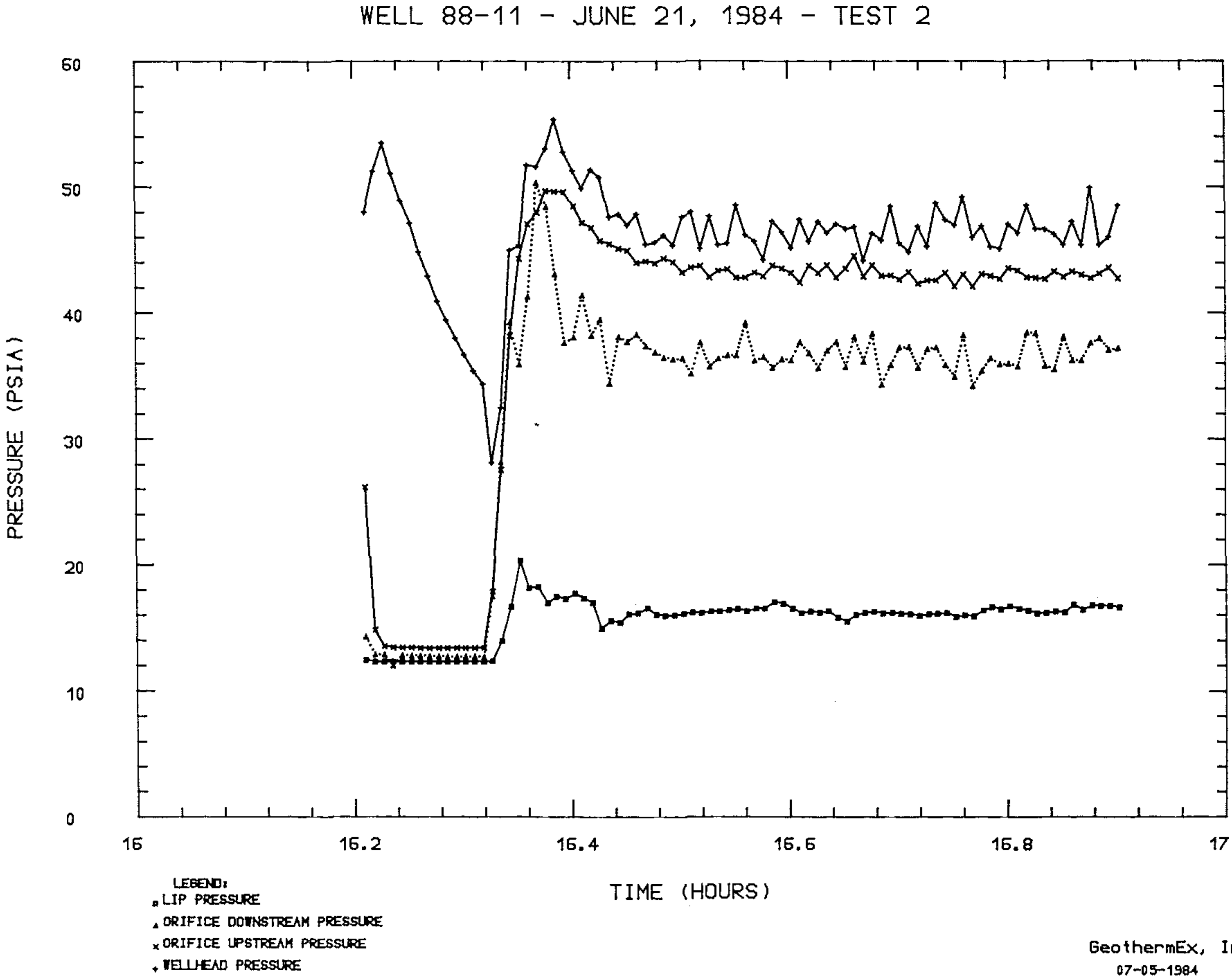
GeothermEx, Inc.

09-22-1984A:TEST1QTY.PLT

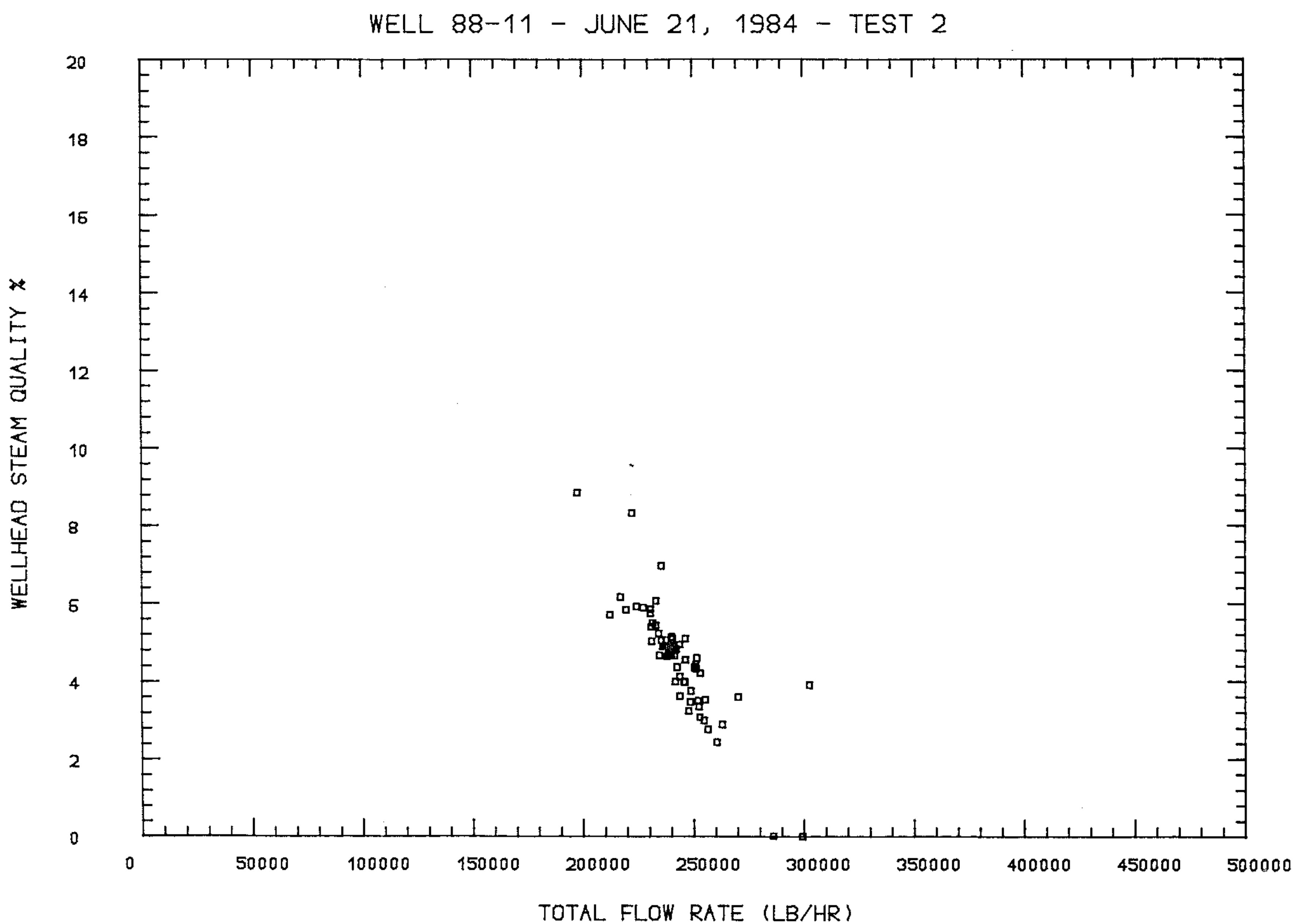


GeothermEx, Inc.

A:TEST2P1.PLT

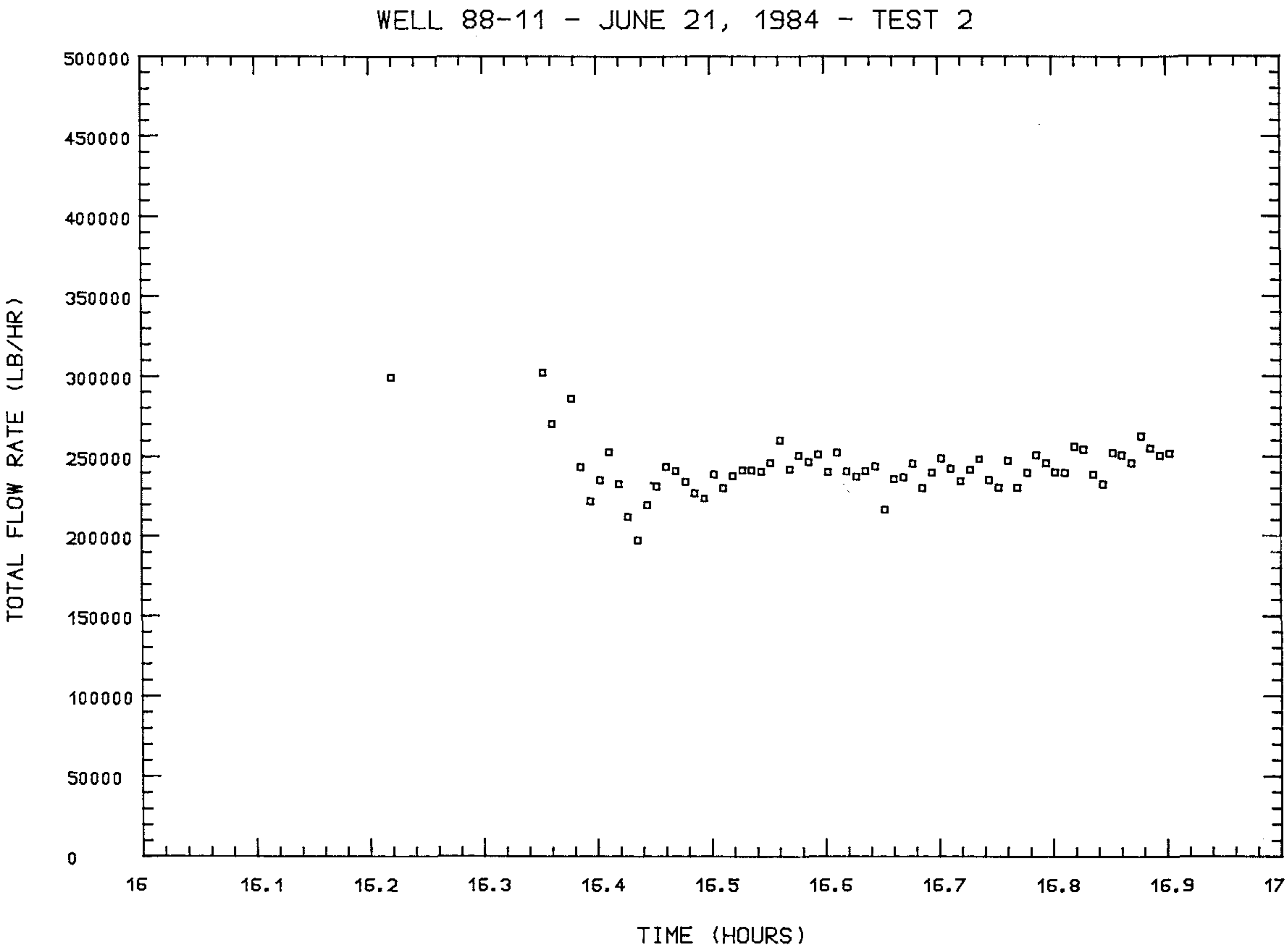


GeothermEx, Inc.
07-05-1984

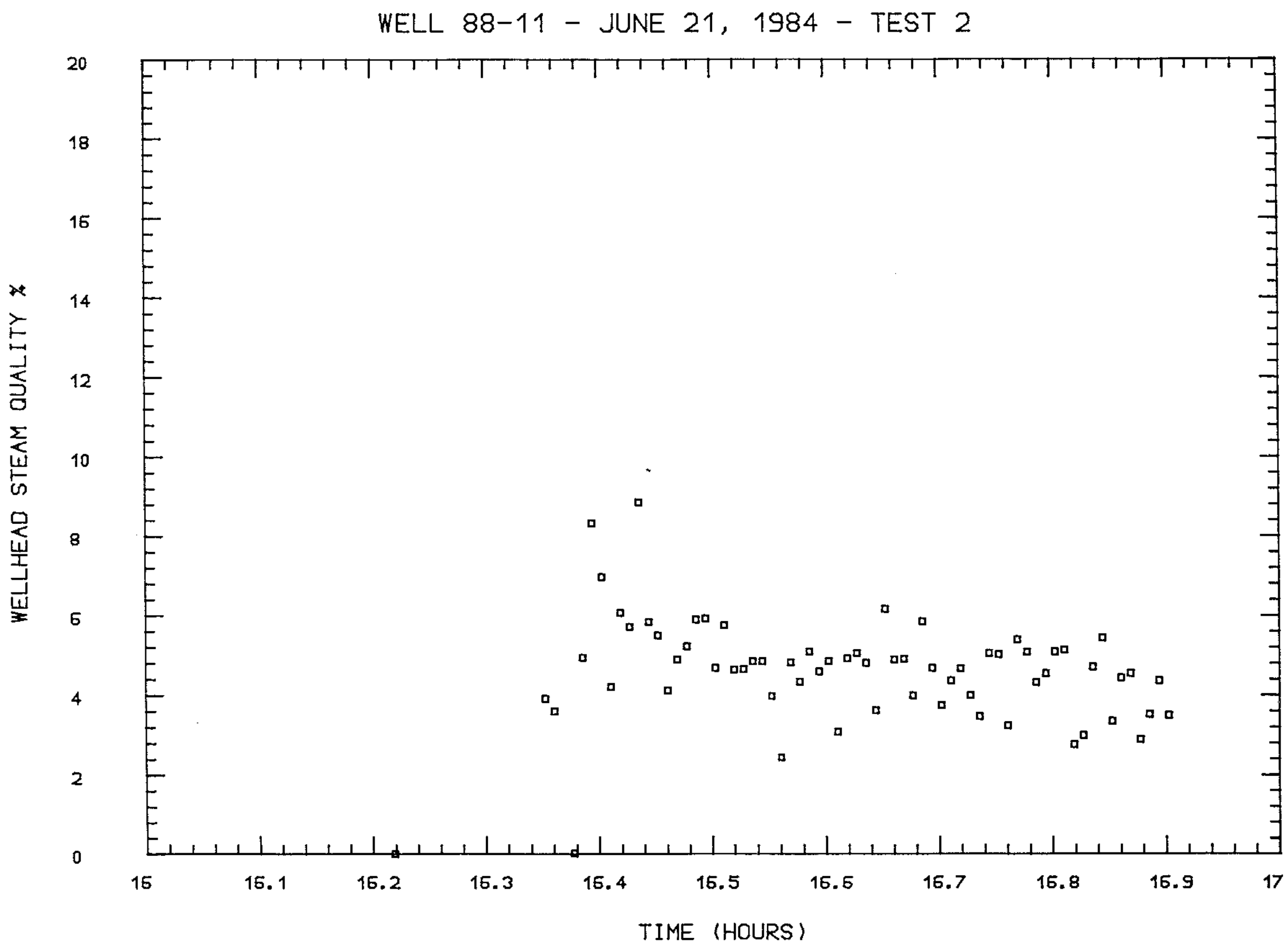


GeothermEx, Inc.

A:TEST2RTE.PLT 07-06-1984

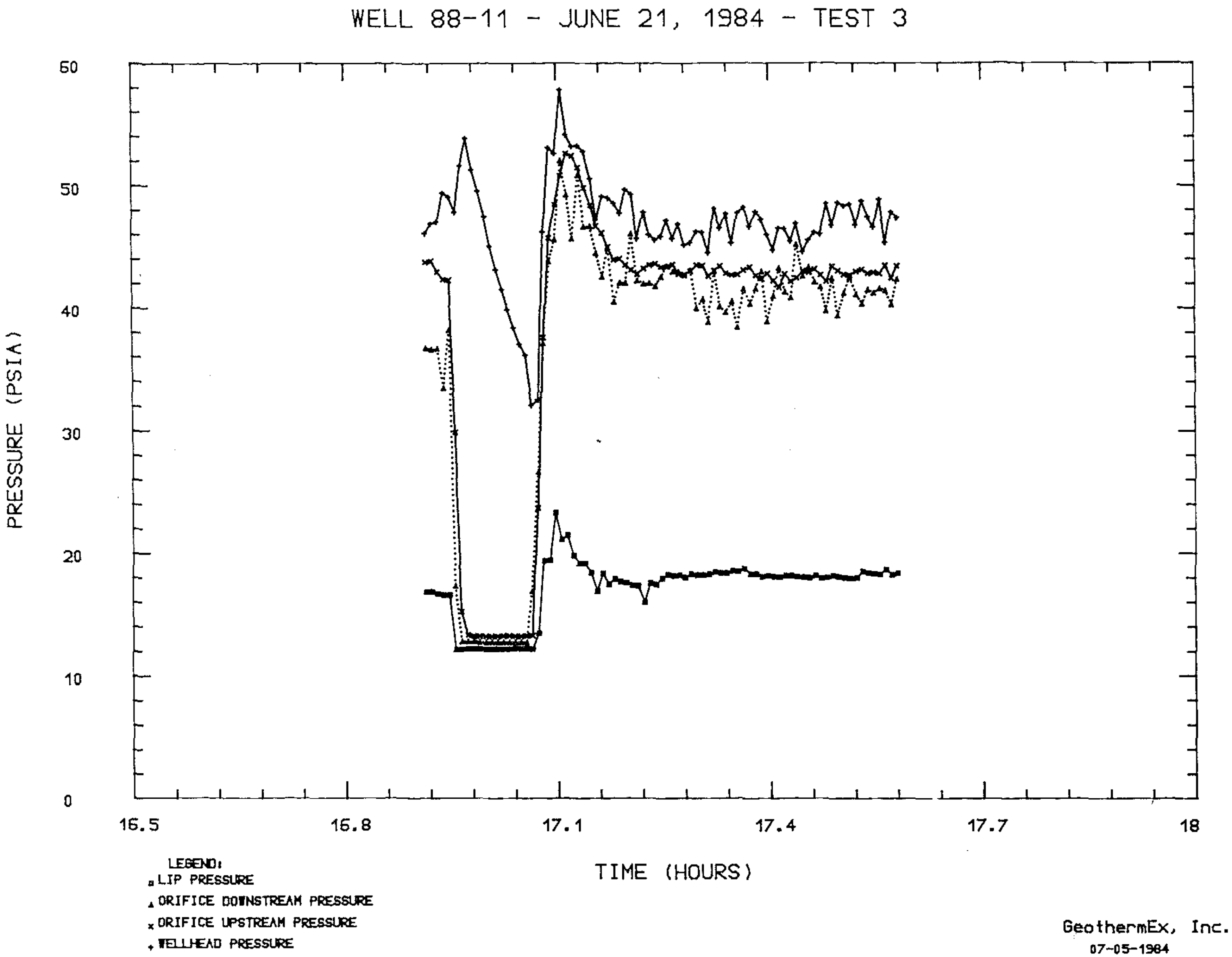


GeothermEx, Inc.



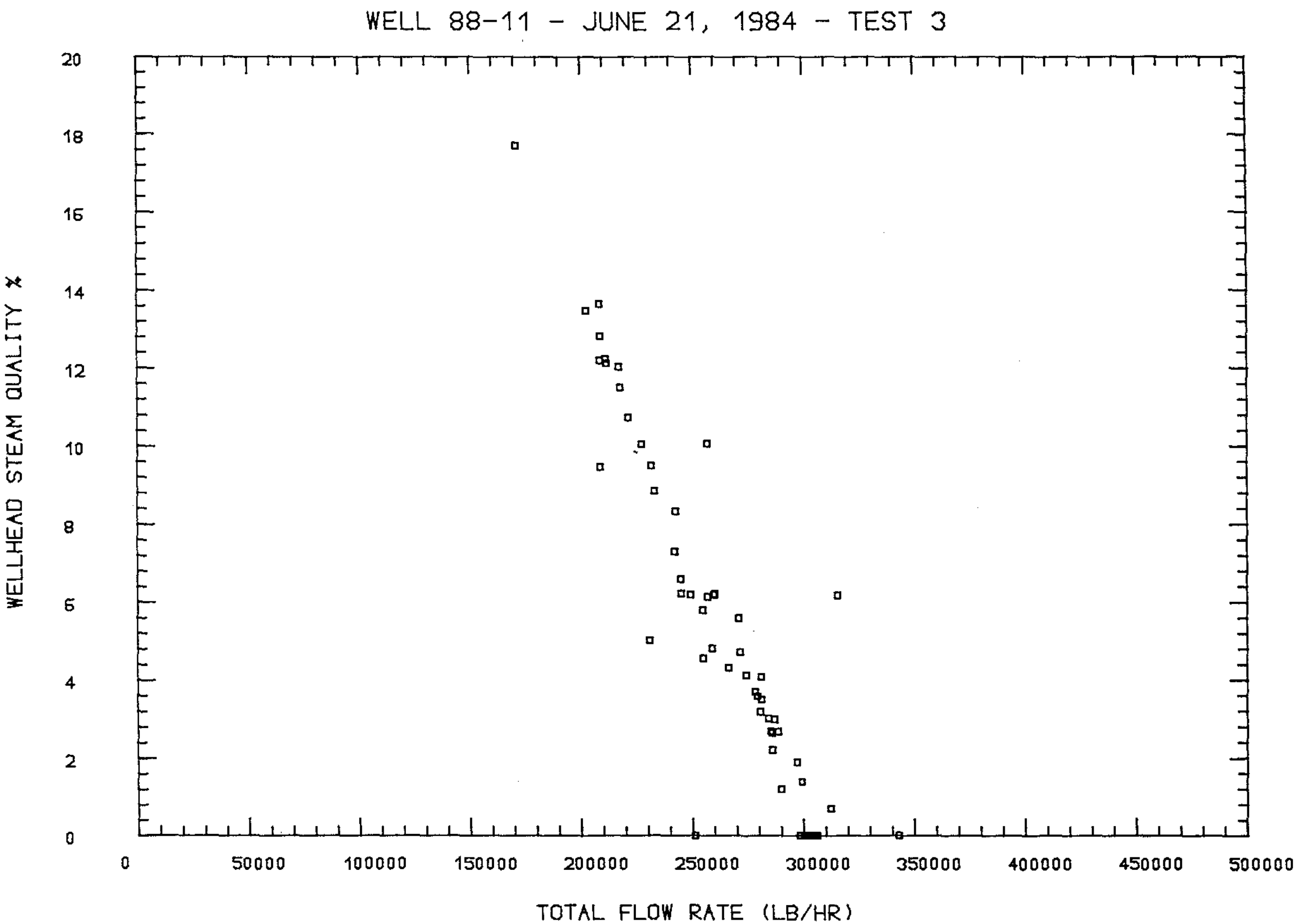
GeothermEx, Inc.

A:TEST3P1.PLT



GeothermEx, Inc.
07-05-1984

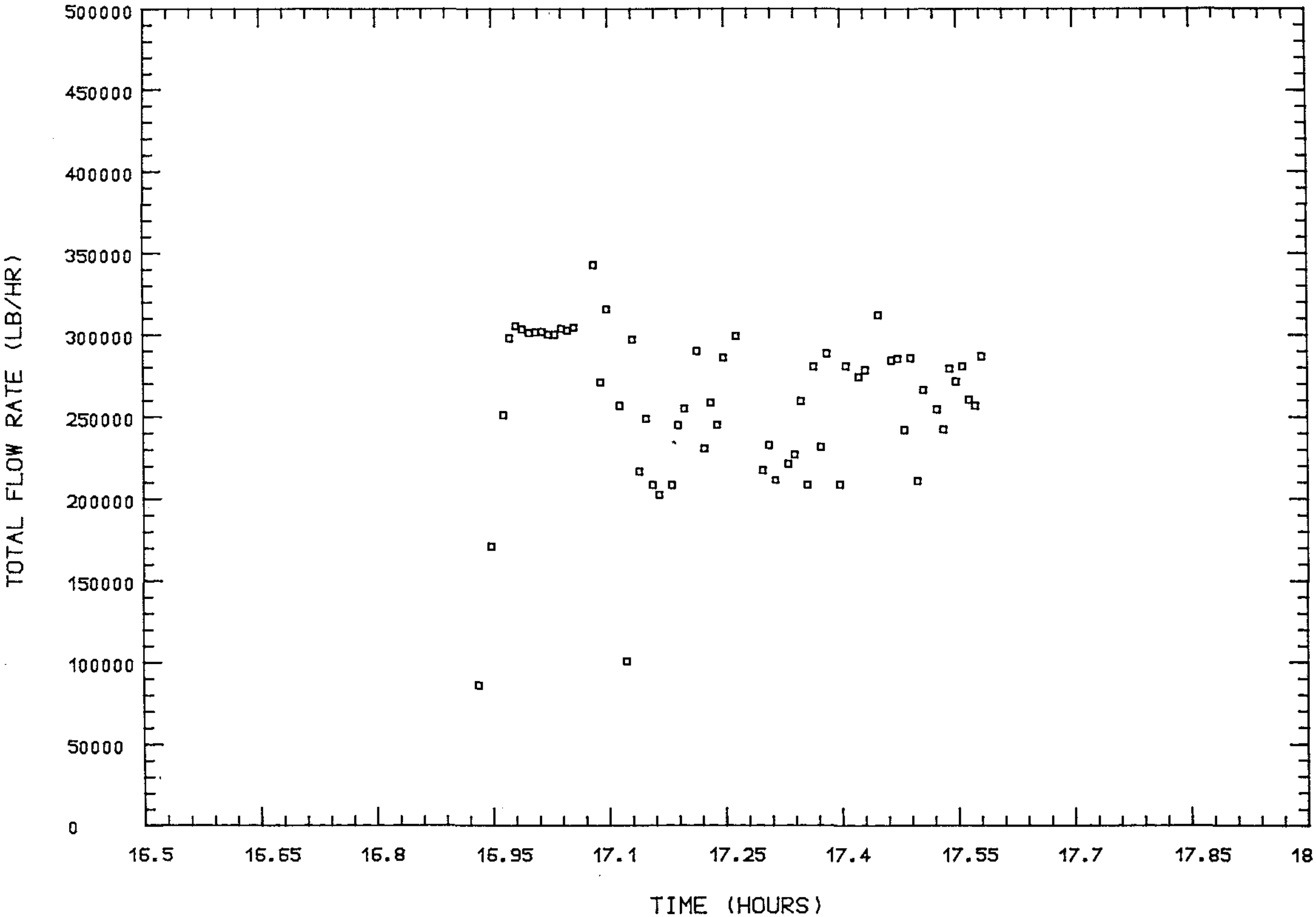
A:TEST3OF.PLT 07-06-1984



GeothermEx, Inc.

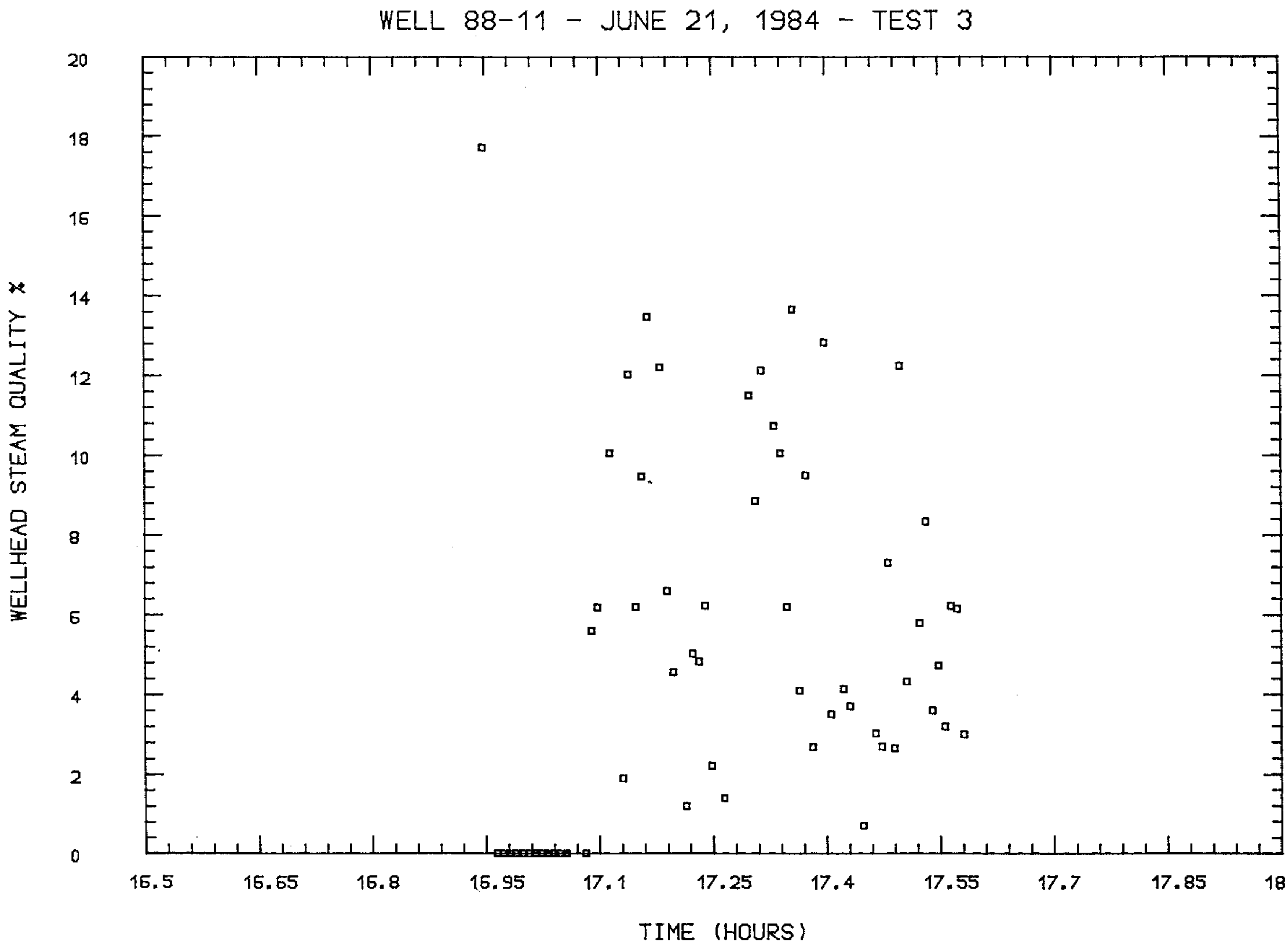
A:TEST3RTE.PLT 07-06-1984

WELL 88-11 - JUNE 21, 1984 - TEST 3



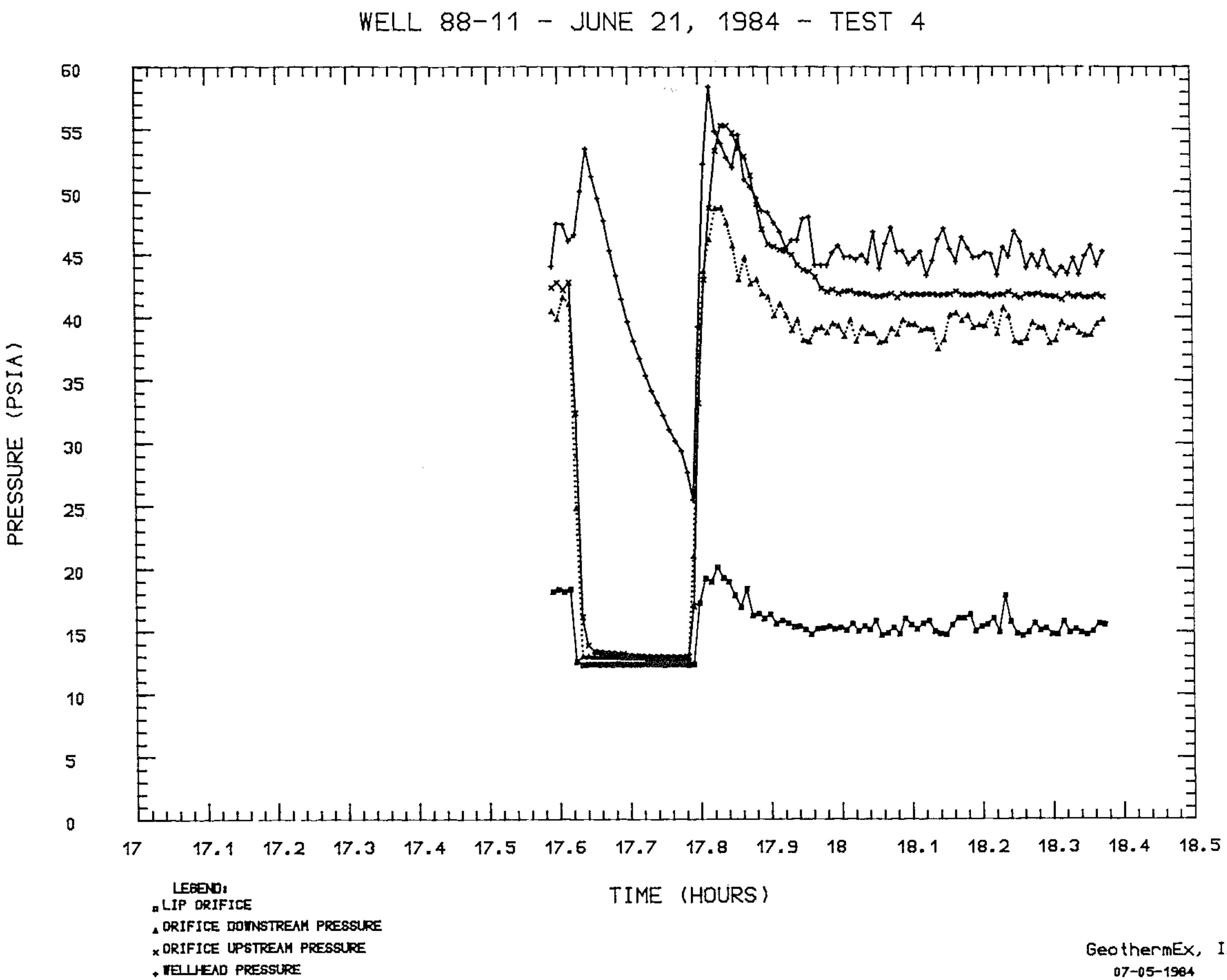
GeothermEx, Inc.

A:TEST3QTY.PLT 07-06-1984



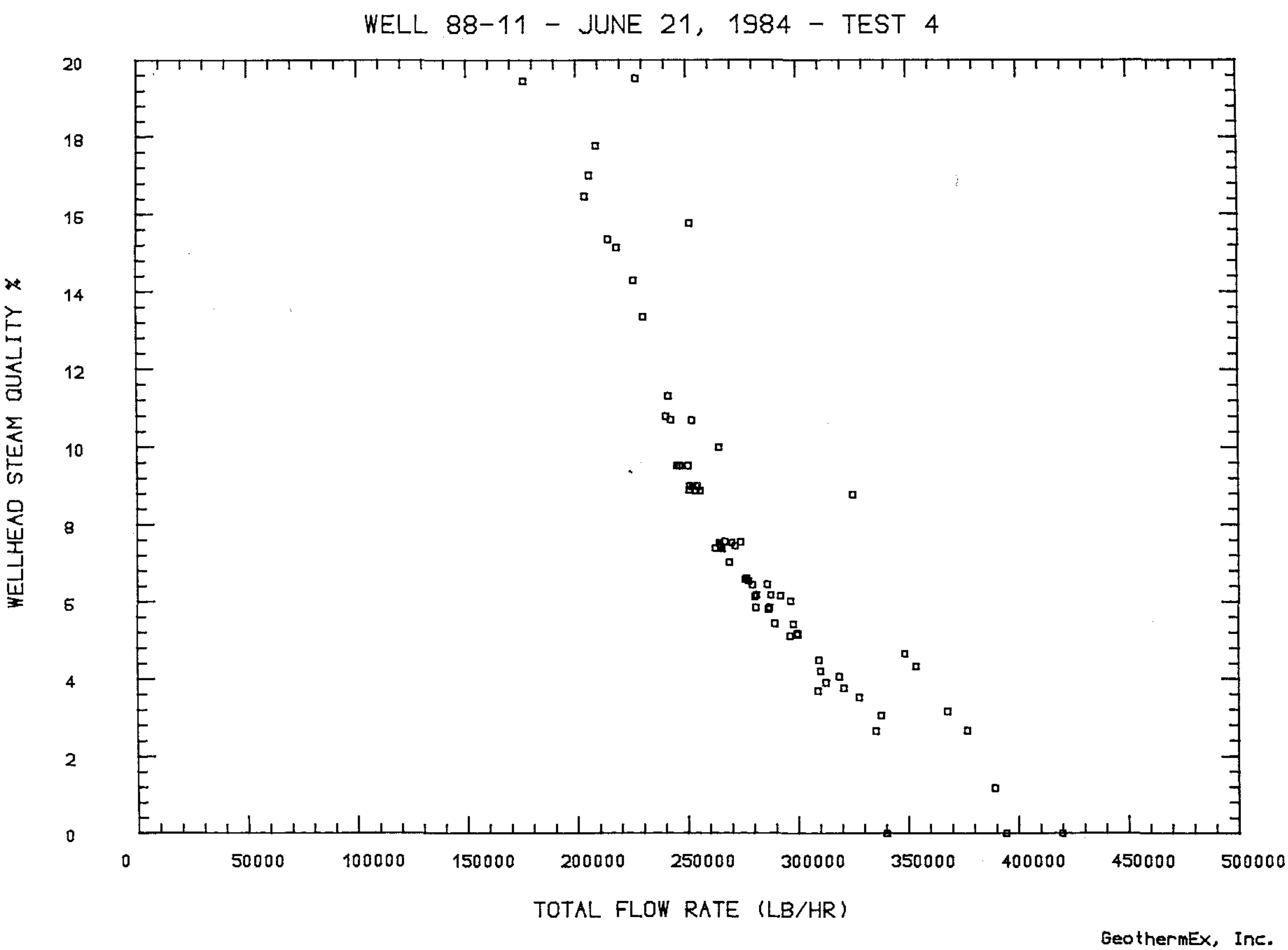
GeothermEx, Inc.

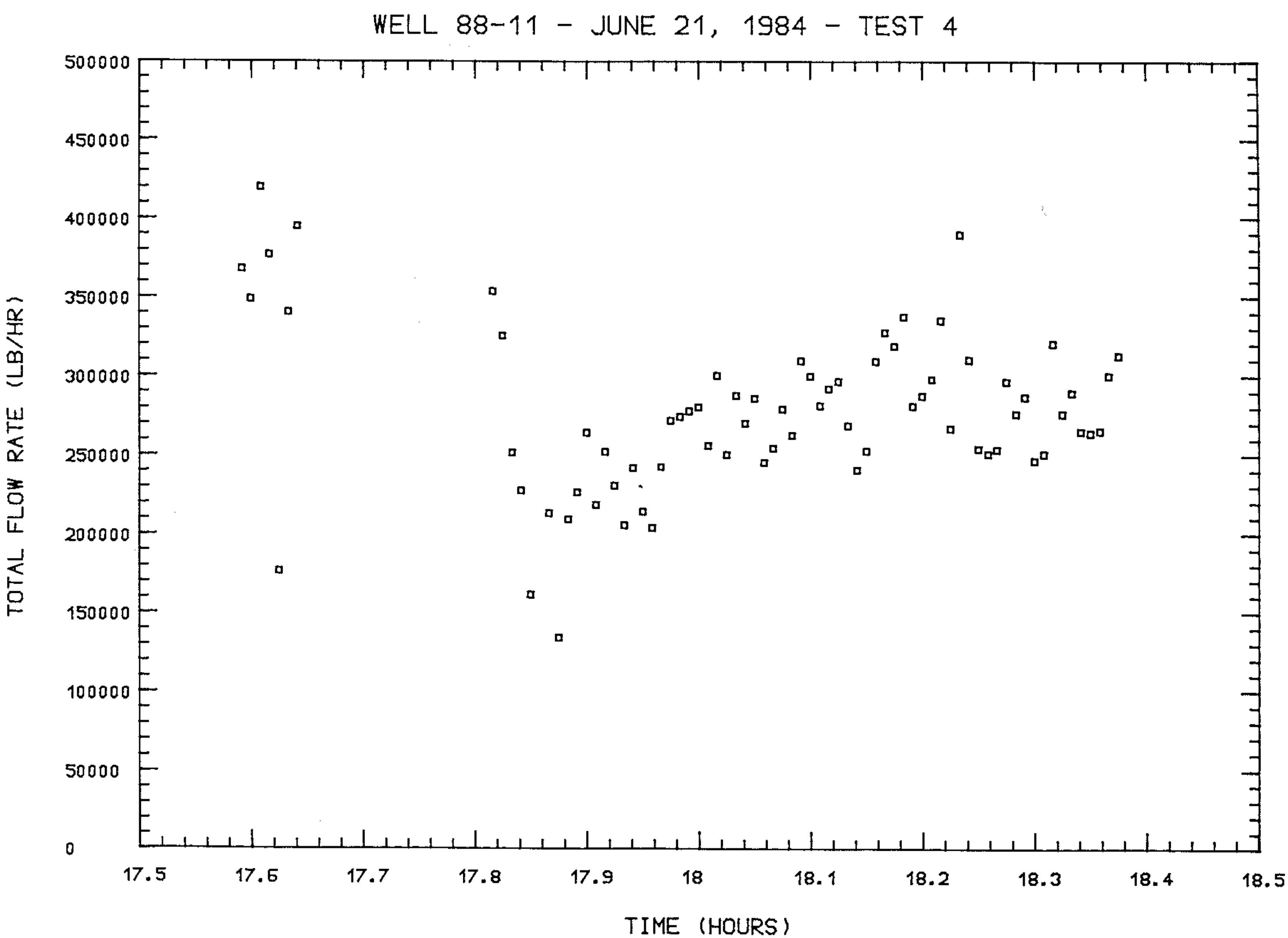
A:TEST4P1.PLT



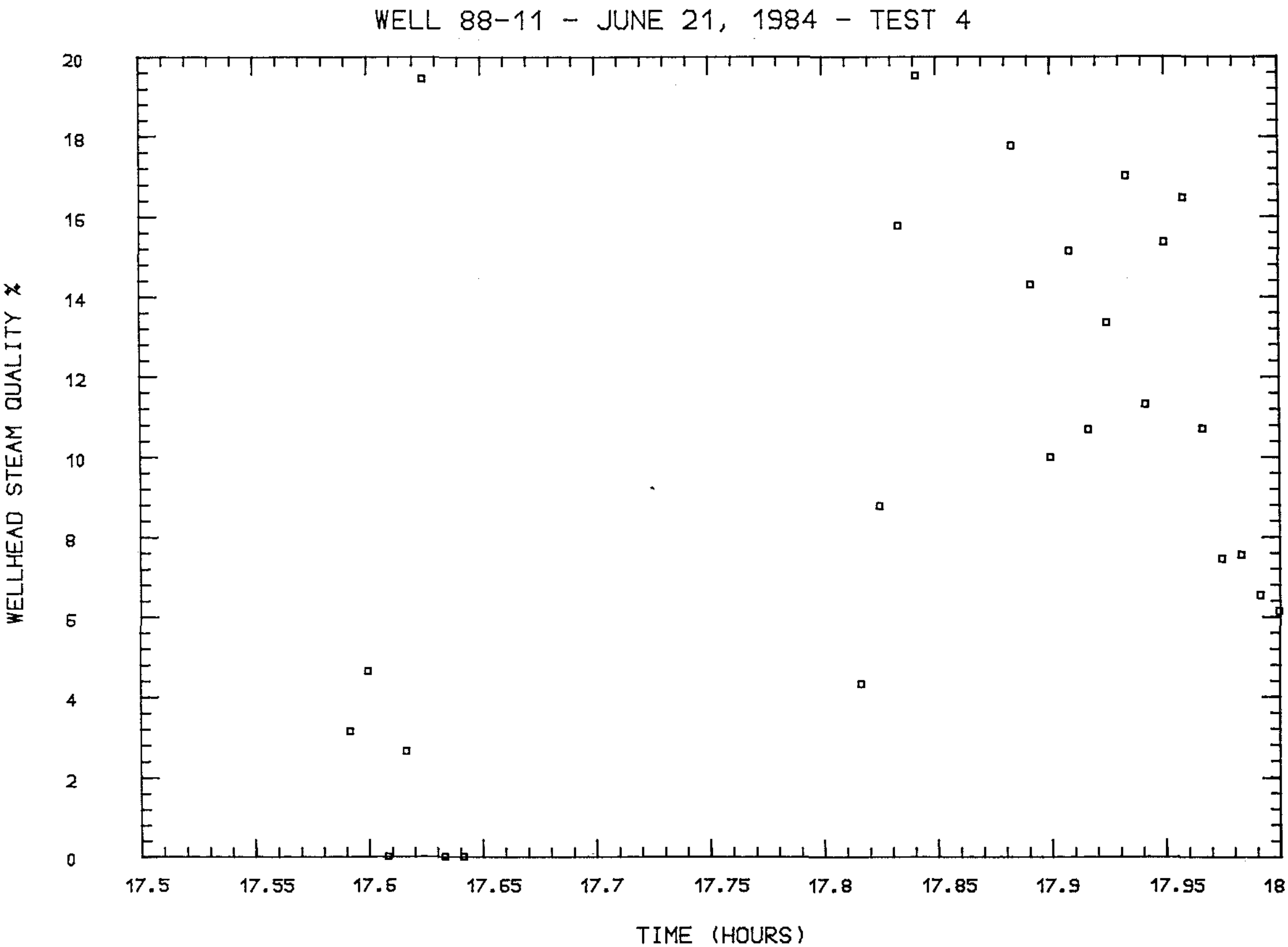
GeothermEx, Inc.
07-05-1984

A:TEST4QF.PLT 07-06-1984



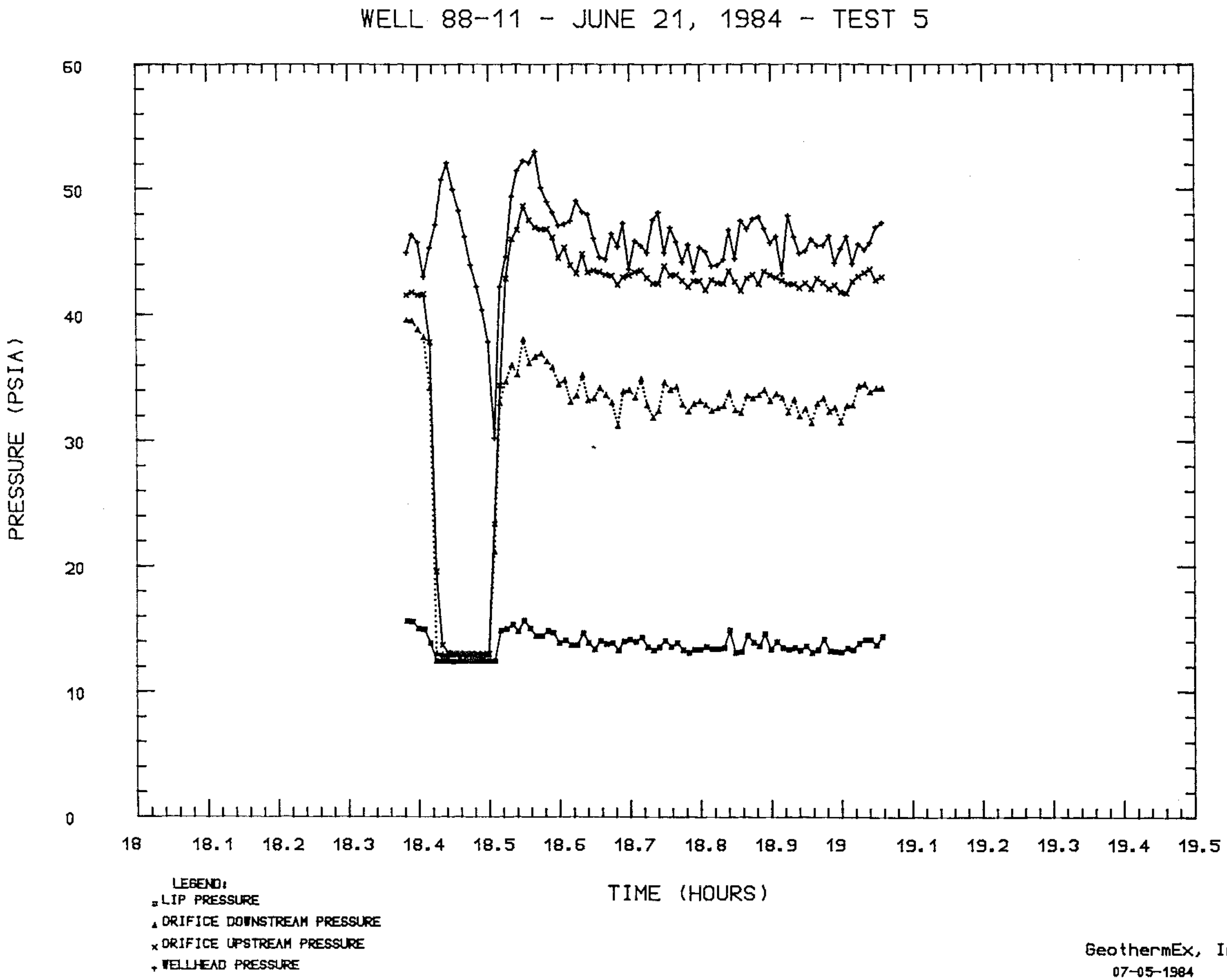


GeothermEx, Inc.



GeothermEx, Inc.

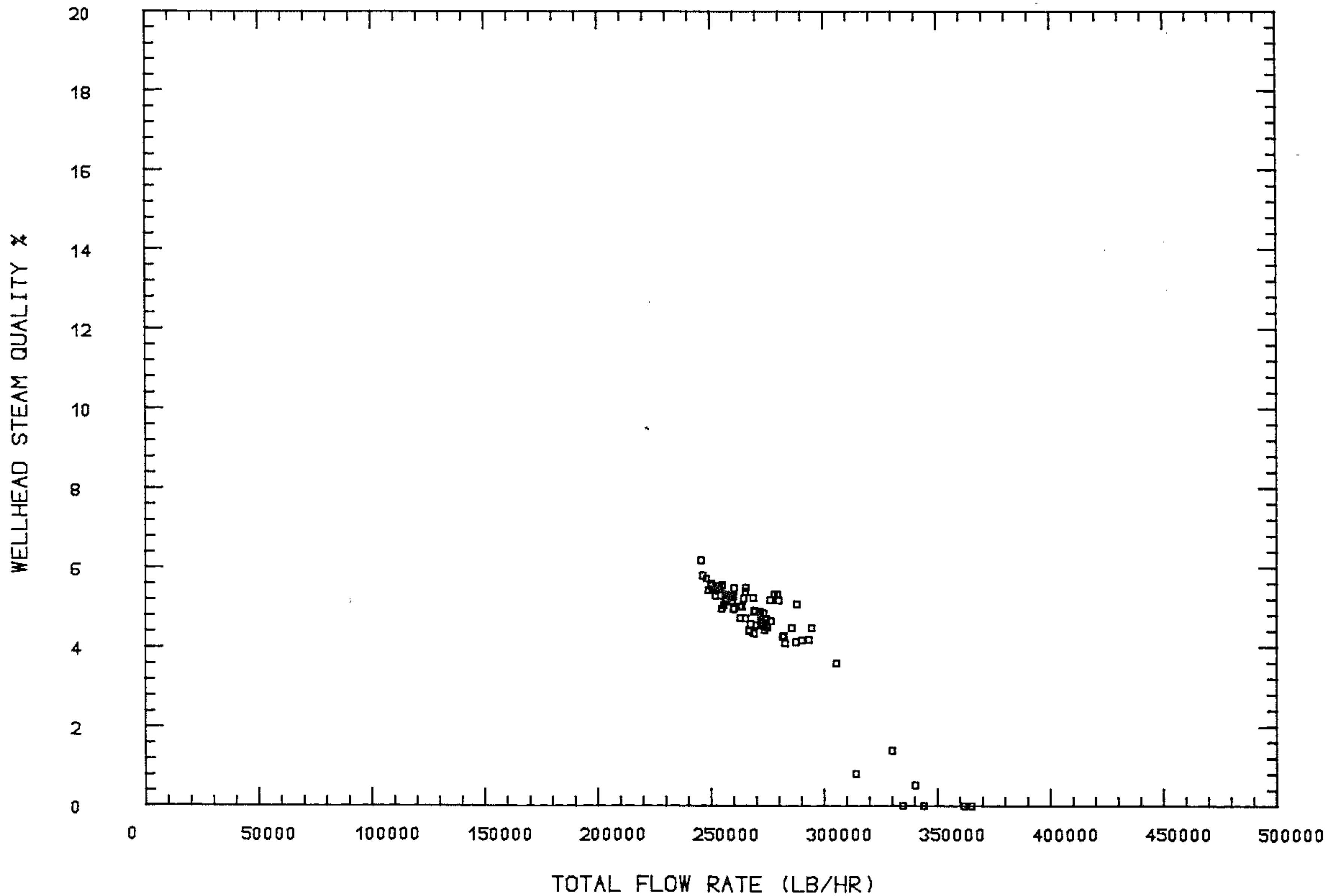
A:TEST5P1.PLT



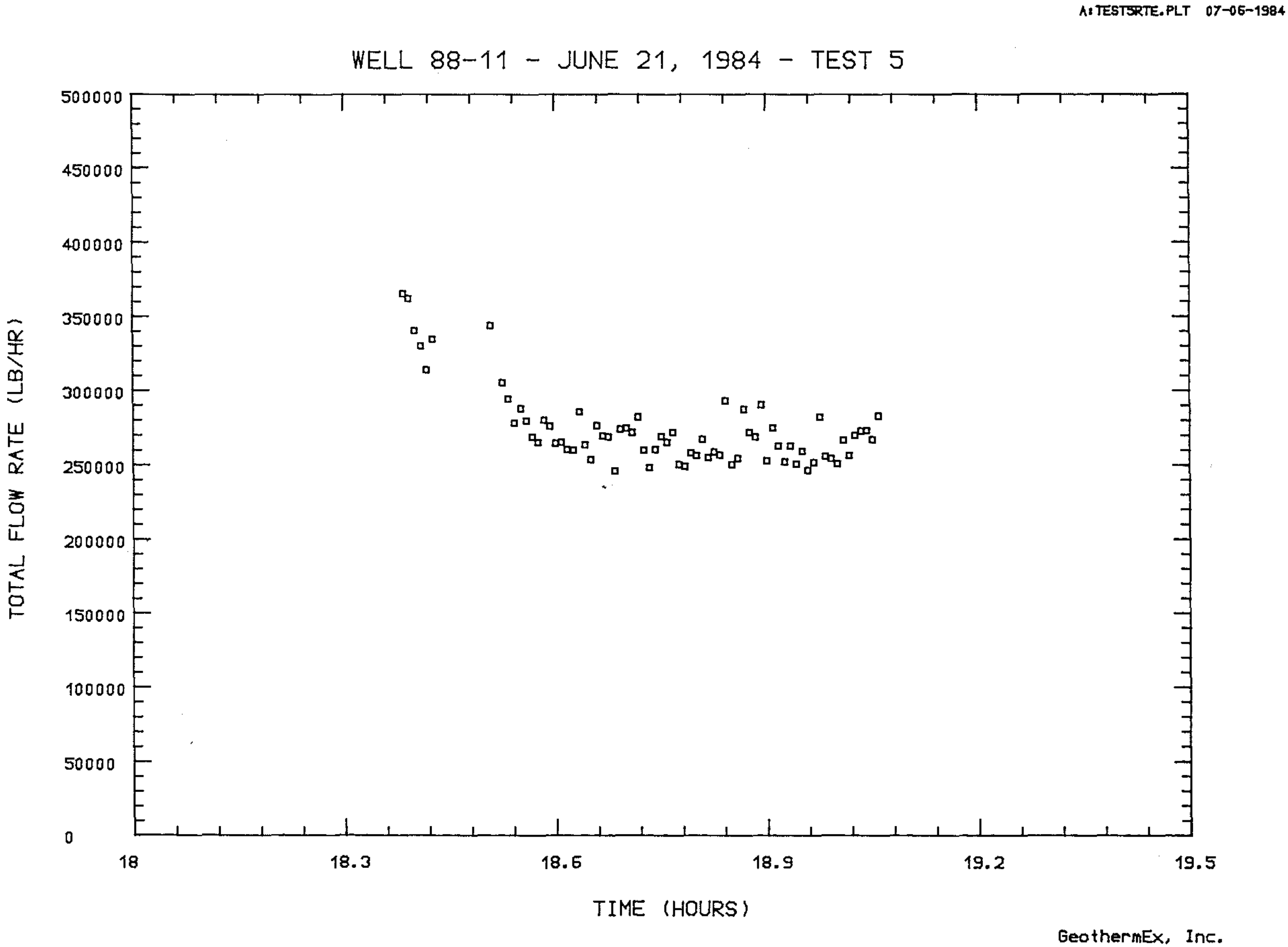
GeothermEx, Inc.
07-05-1984

A:TEST5QF.PLT 07-06-1984

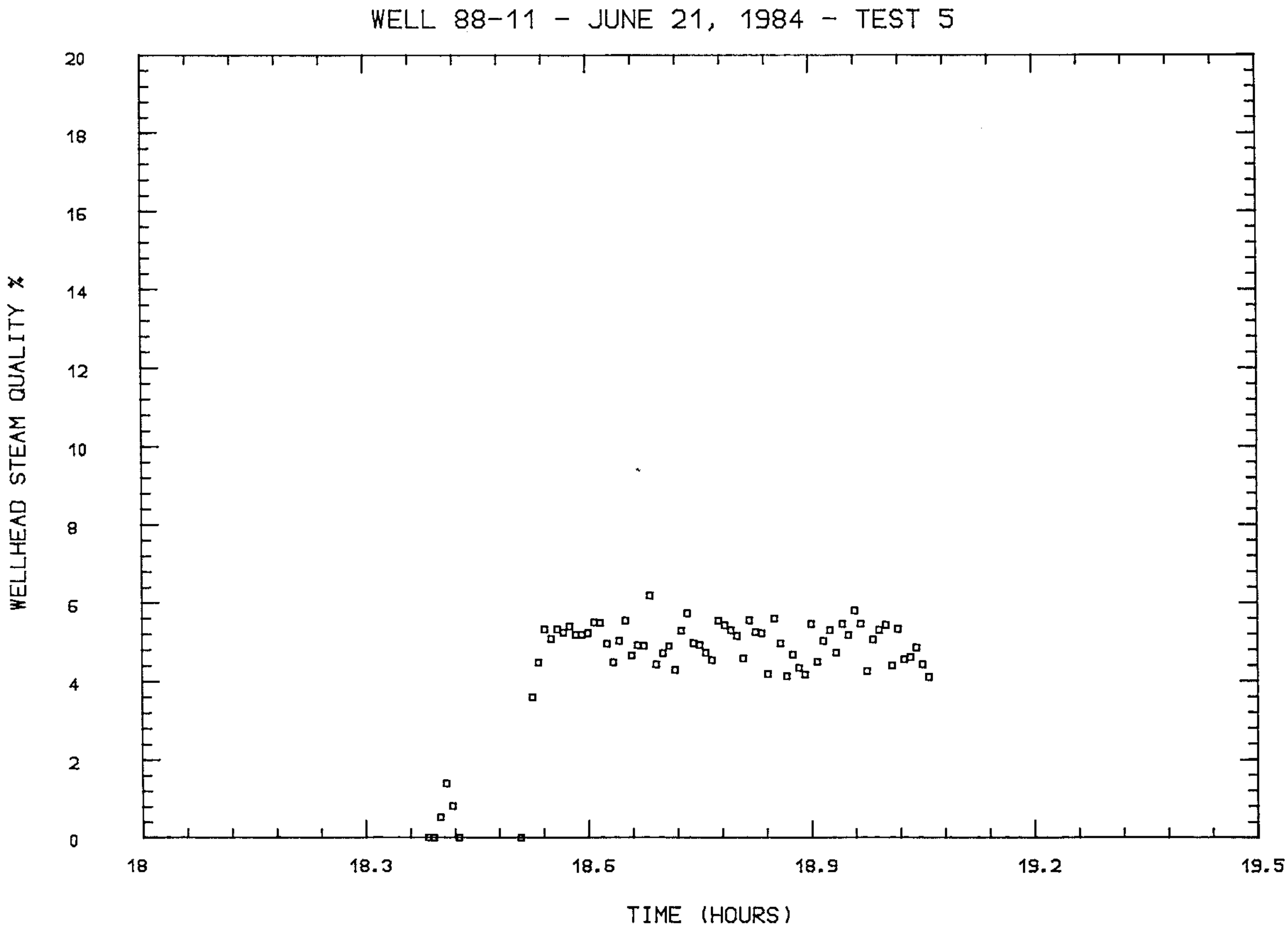
WELL 88-11 - JUNE 21, 1984 - TEST 5



GeothermEx, Inc.

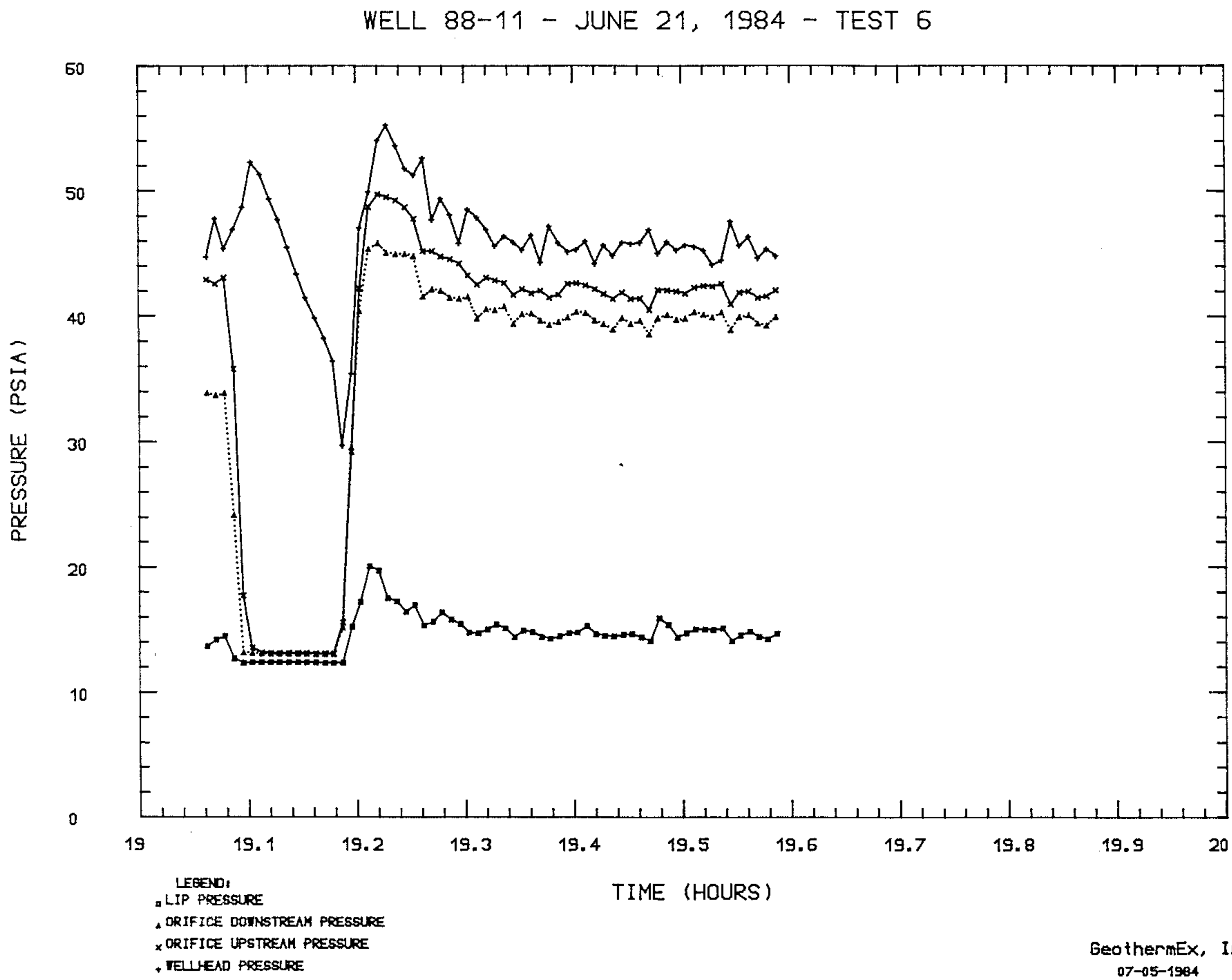

A:TESTSRTE.PLT 07-06-1984
WELL 88-11 - JUNE 21, 1984 - TEST 5
TOTAL FLOW RATE (LB/HR)
500000
450000
400000
350000
300000
250000
200000
150000
100000
50000
0
18
18.3
18.6
18.9
19.2
19.5
TIME (HOURS)
GeothermEx, Inc.

A:TEST5QTY.PLT 07-06-1984

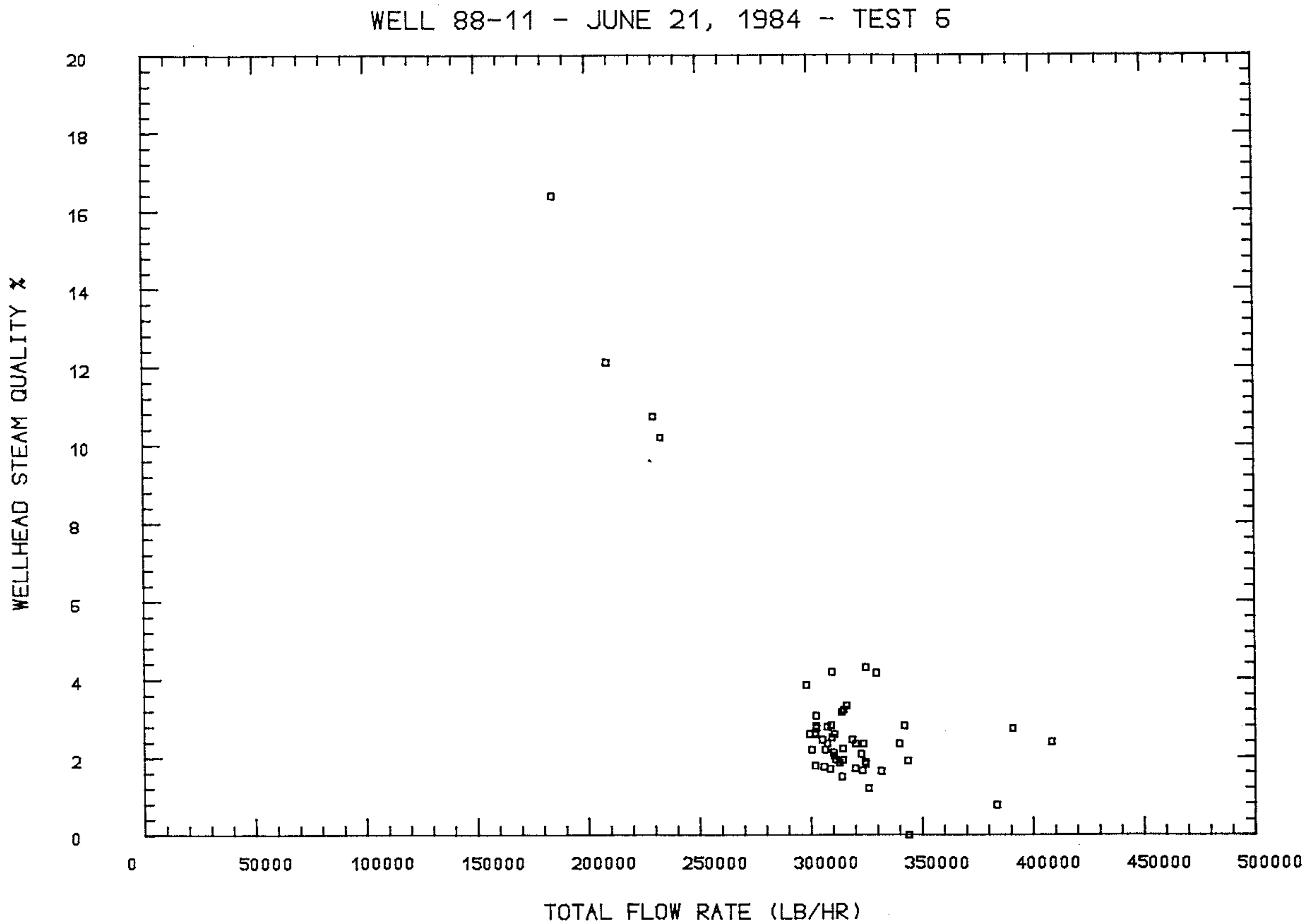


GeothermEx, Inc.

A:TESTGP1.PLT

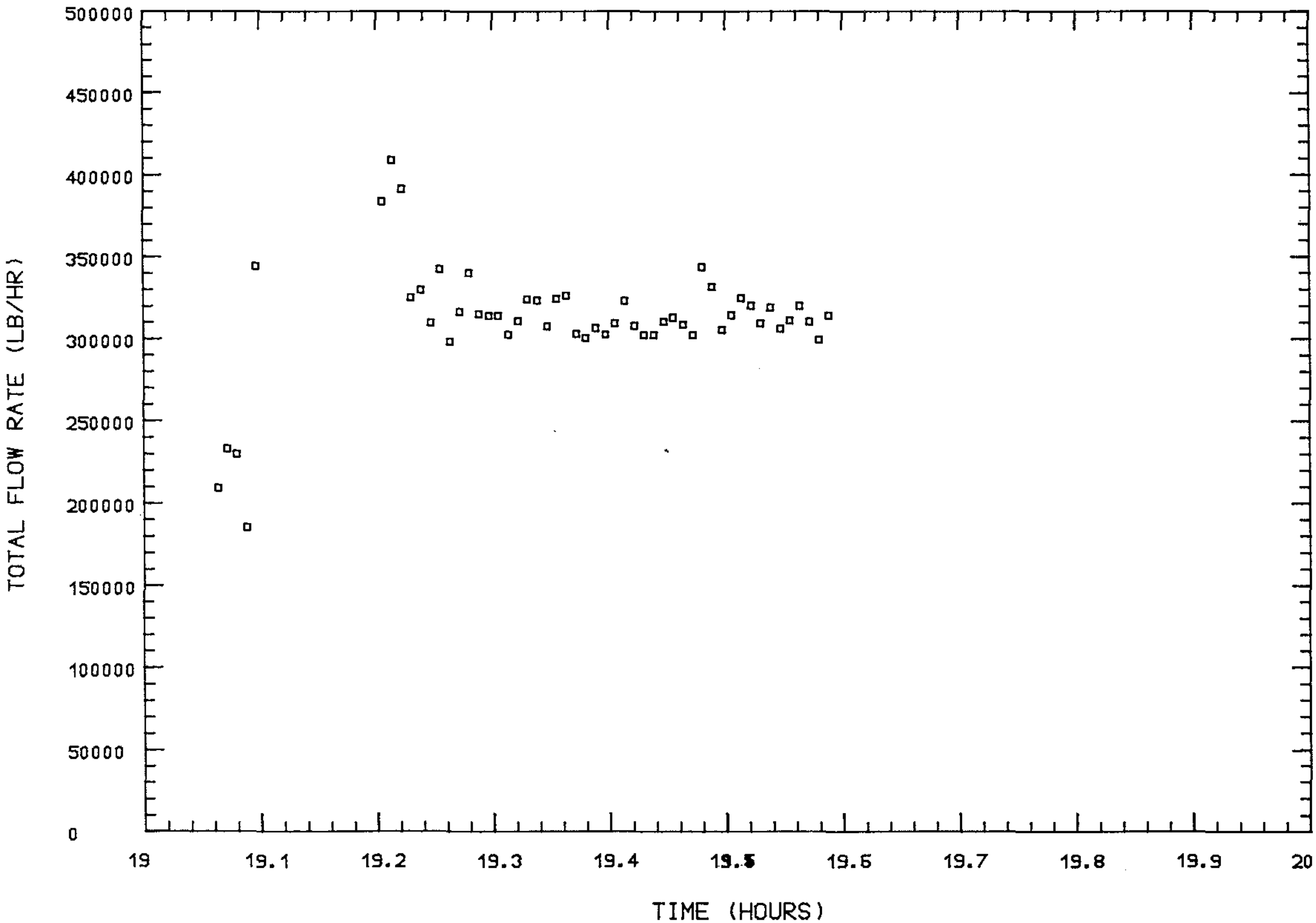


GeothermEx, Inc.
07-05-1984



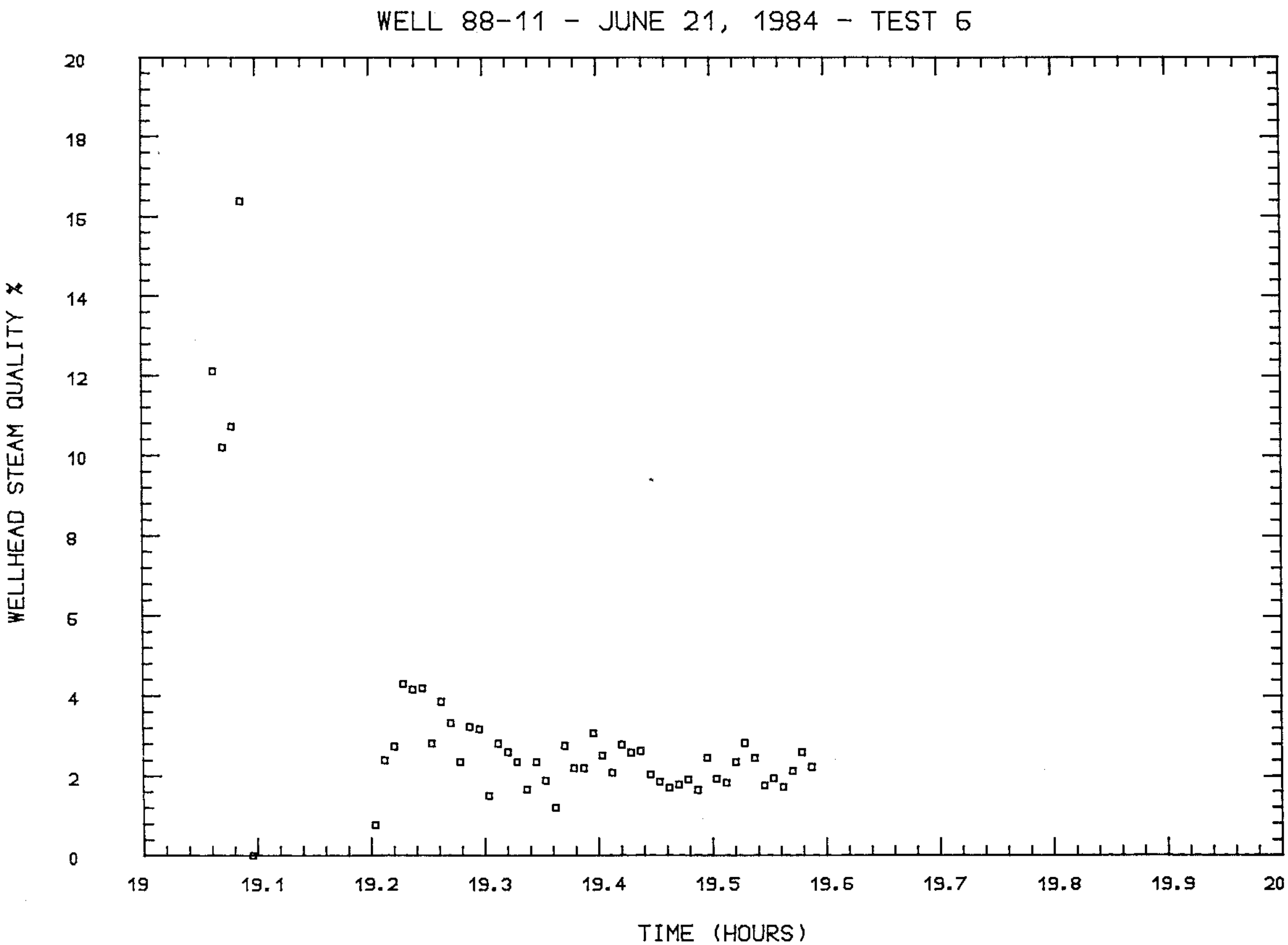
GeothermEx, Inc.

WELL 88-11 - JUNE 21, 1984 - TEST 6



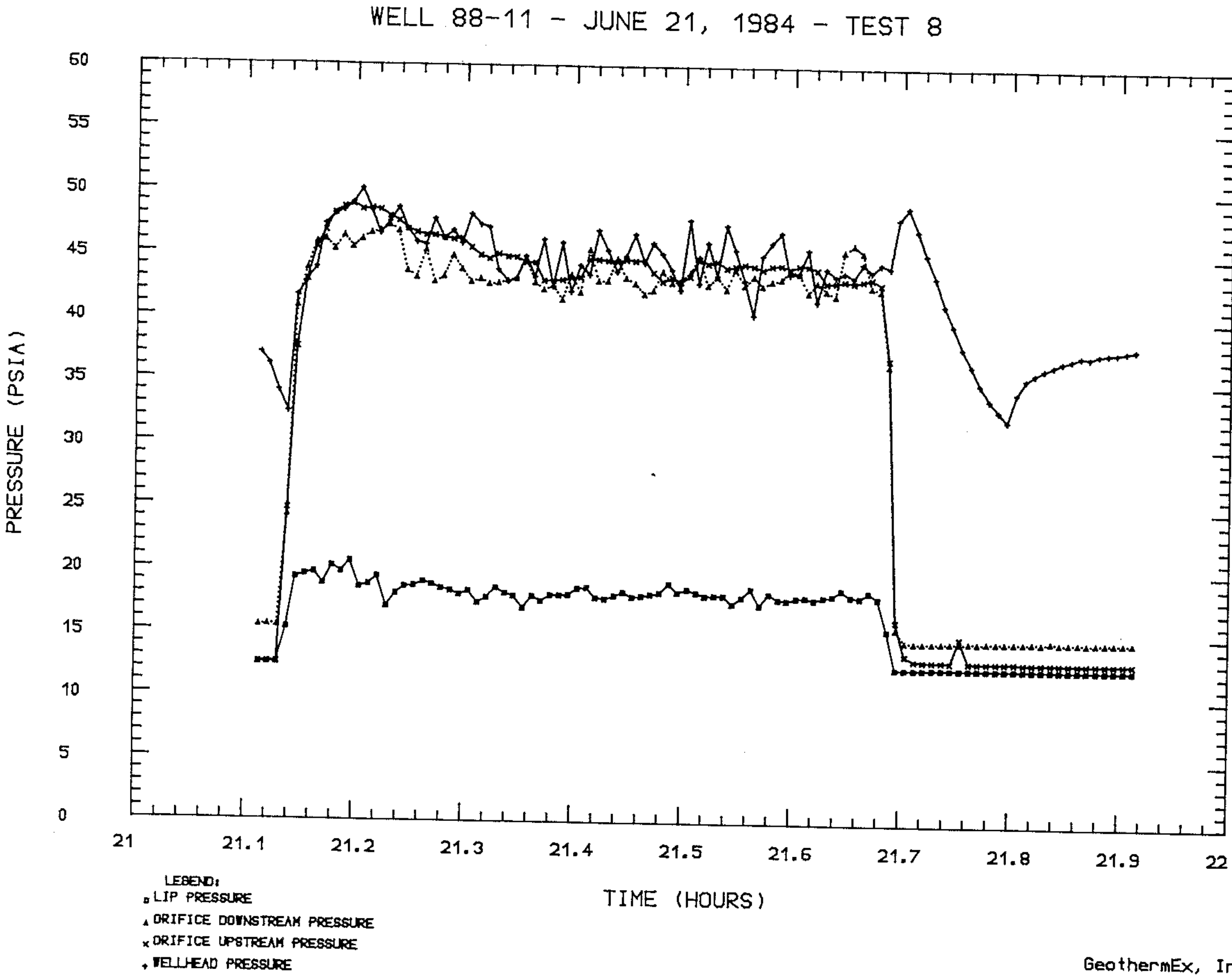
GeothermEx, Inc.

A:TEST6QTY.PLT 07-06-1984



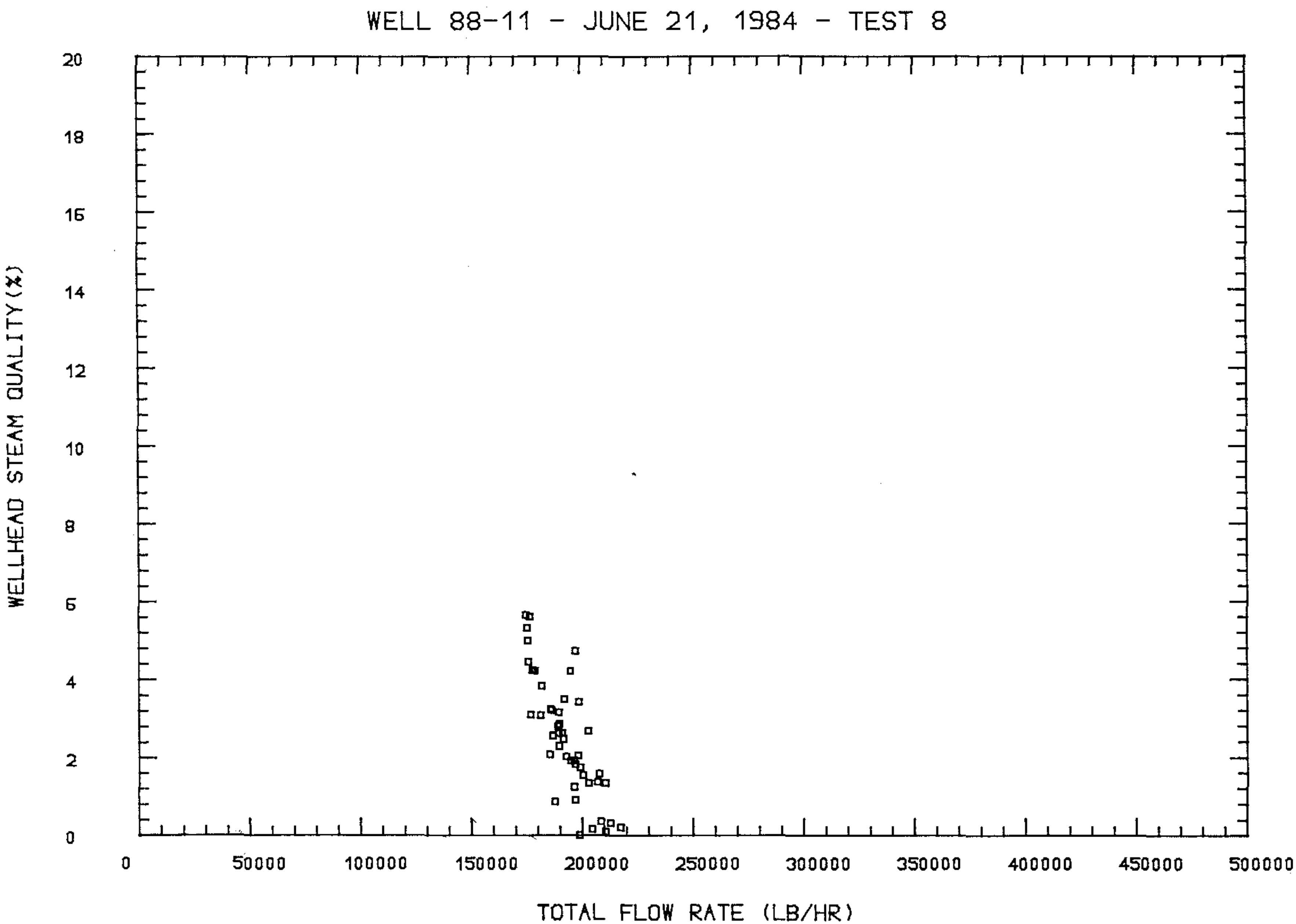
GeothermEx, Inc.

A:TEST8P1.PLT

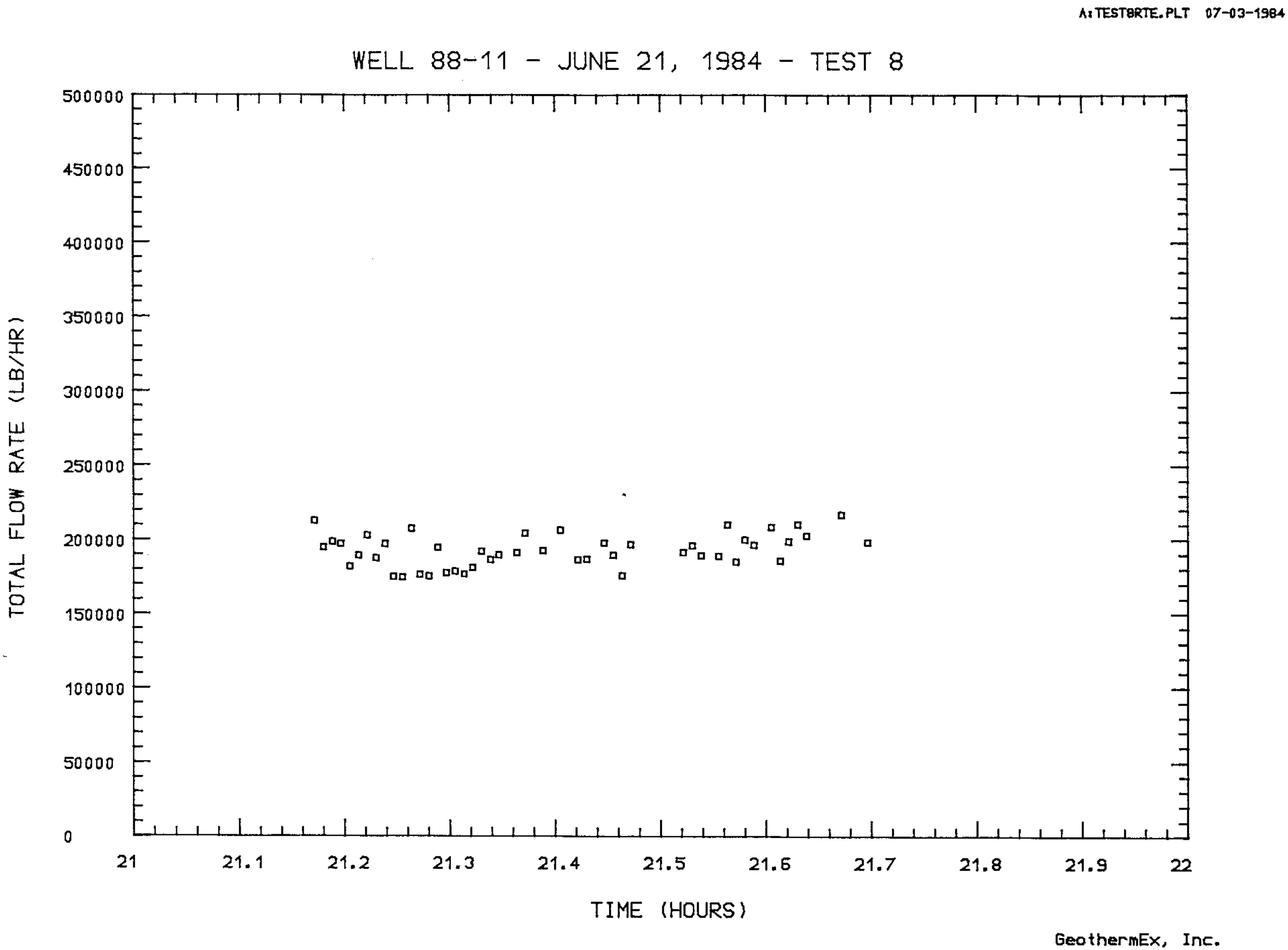


GeothermEx, Inc.
07-03-1984

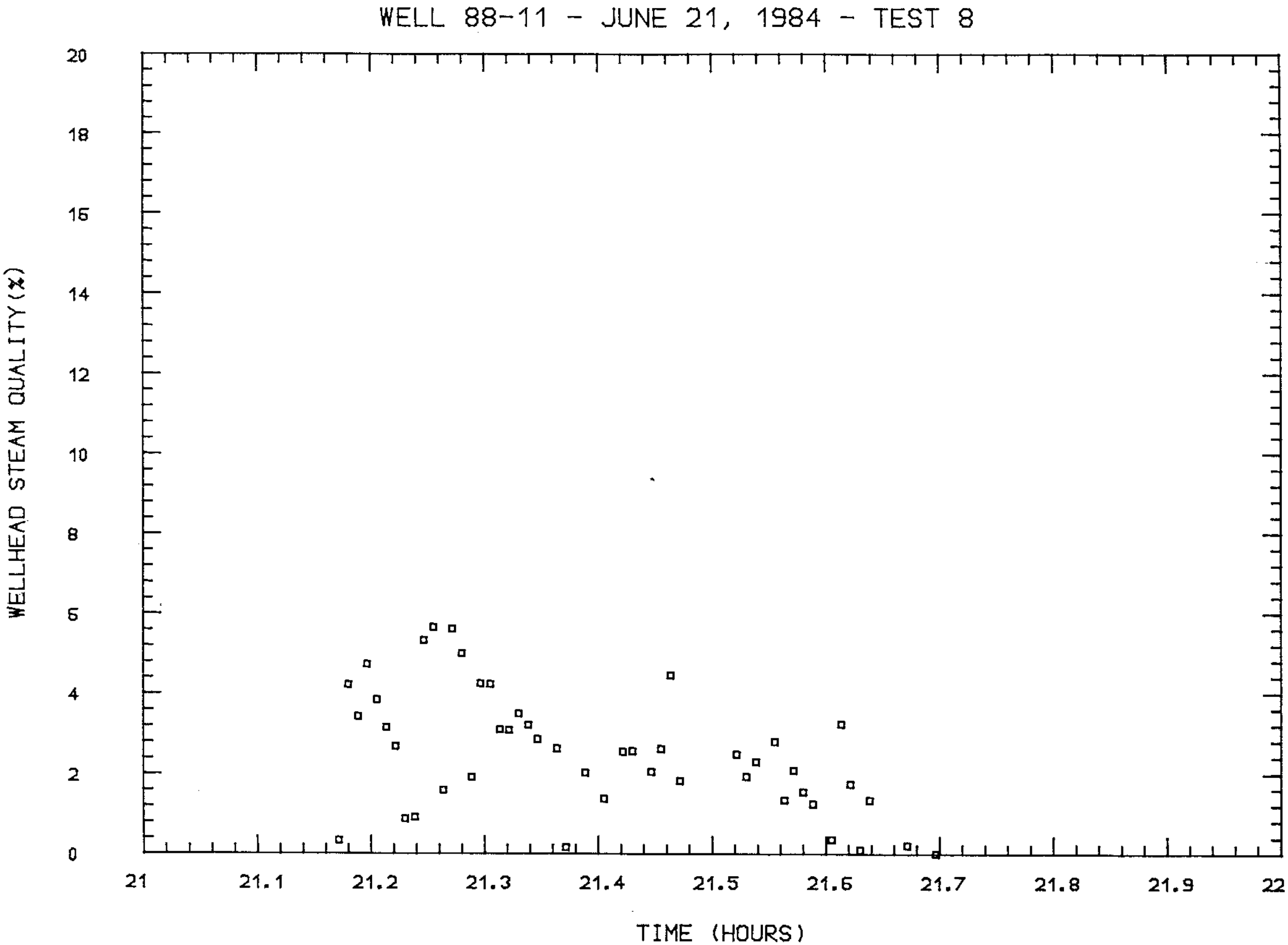
A:TEST8QF.PLT 07-03-1984



GeothermEx, Inc.


A:TEST8RTE.PLT 07-03-1984
WELL 88-11 - JUNE 21, 1984 - TEST 8
TOTAL FLOW RATE (LB/HR)
500000
450000
400000
350000
300000
250000
200000
150000
100000
50000
0
21
21.1
21.2
21.3
21.4
21.5
21.6
21.7
21.8
21.9
22
TIME (HOURS)
GeothermEx, Inc.

A:TEST8QTY.PLT 07-03-1984



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APPENDIX C

TABULAR PRESENTATION OF JUNE 2 FLOW TEST RESULTS

FISHLAKE PROJECT - TEST FOUR 6/2/84 GEOTHERMEX INC. - PROGRAM JAMESORI

TEST TIME 1:30 PM TO 2:26 PM

MAIN FLOW LINE DIAMETER (IN) = 10.000

ORIFICE DIAMETER (IN) = 6.500

CRITICAL FLOW PIPE DIAMETER (IN) = 5.000

ATMOSPHERIC PRESSURE (PSIA) = 13.200

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO. OF ITERA-TIONS
25:30:41	16.86	44.07	40.56	34.42	258.3	114743.	96448.	18295.	15.94	376.76	20.75	10
25:31:11	12.57	46.71	44.48	46.90	277.0	69025.	50596.	18430.	26.70	493.44	32.74	3
25:31:41	12.48	48.74	46.53	53.38	285.1	56762.	35718.	21044.	37.07	595.78	43.25	1
25:32:11	12.47	48.97	51.33	53.82	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
25:32:41	12.56	50.31	51.08	54.21	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
25:33:11	12.54	51.66	51.27	53.20	284.9	124229.	120004.	4224.	3.40	285.43	11.38	17
25:33:41	12.54	52.23	49.52	53.45	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
25:34:11	12.56	50.40	47.47	52.75	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
25:34:41	38.87	52.58	51.32	53.20	284.9	412727.	410798.	1928.	.47	258.42	8.60	7
25:35:11	26.41	51.57	51.37	52.69	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
25:35:41	23.75	53.46	51.52	53.82	285.7	215204.	203849.	11356.	5.28	303.45	13.23	18
25:36:11	22.76	51.29	47.34	53.11	284.8	174548.	154703.	19845.	11.37	358.74	18.90	28
25:36:41	22.50	53.12	50.81	54.52	286.5	192740.	179230.	13510.	7.01	320.21	14.95	16
25:37:11	22.59	52.50	53.39	55.41	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
25:37:41	22.66	54.30	51.40	55.19	287.3	184434.	167983.	16452.	8.92	338.54	16.83	22
25:38:11	22.65	55.40	54.58	56.08	288.3	226407.	221244.	5162.	2.28	278.54	10.67	16
25:38:41	22.66	52.27	48.80	55.16	287.3	174131.	155633.	18498.	10.62	354.17	18.43	17
25:39:11	22.74	54.70	53.69	55.54	287.7	222265.	215826.	6439.	2.90	283.58	11.19	22
25:39:41	22.83	55.47	53.09	56.64	289.0	192604.	178376.	14228.	7.39	326.07	15.55	8

FISHLAKE PROJECT - TEST FOUR 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
25:40:11	22.82	54.77	52.91	56.01	288.2	206745.	195372.	11373.	5.50	308.05	13.70	10
25:40:41	22.85	53.48	50.04	55.02	287.1	175750.	157113.	18637.	10.60	353.84	18.40	17
25:41:11	22.84	52.51	53.92	53.60	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
25:41:41	22.86	52.56	52.84	54.97	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
25:42:11	22.86	54.37	52.04	55.79	288.0	195764.	182060.	13704.	7.00	321.58	15.09	16
25:42:41	22.86	53.49	52.16	54.61	286.6	221003.	212877.	8127.	3.68	289.65	11.81	28
25:43:11	22.86	55.08	51.58	55.37	287.5	173150.	153836.	19315.	11.15	359.29	18.96	9
25:43:41	22.88	52.45	49.99	54.42	286.4	197272.	183482.	13789.	6.99	319.91	14.92	16
25:44:11	22.79	51.19	47.49	53.85	285.7	177250.	158397.	18854.	10.64	352.83	18.30	17
25:44:41	22.81	50.92	47.32	54.81	286.8	181285.	163012.	18272.	10.08	348.78	17.88	25
25:45:11	22.83	52.81	49.66	56.01	288.2	182169.	165061.	17108.	9.39	343.79	17.37	14
25:45:41	22.82	48.76	47.56	52.73	284.4	231346.	225320.	6026.	2.60	277.54	10.57	22
25:46:11	22.82	53.05	47.63	54.21	286.1	141081.	114301.	26780.	18.98	430.04	26.23	13
25:46:41	22.80	51.25	48.20	54.34	286.3	184995.	168744.	16252.	8.78	336.35	16.60	3
25:47:11	22.80	54.27	50.03	55.50	287.6	158304.	135855.	22449.	14.18	387.25	21.83	15
25:47:41	22.84	51.53	48.37	54.75	286.8	188407.	171866.	16541.	8.78	336.76	16.65	3
25:48:11	22.84	48.30	47.40	53.11	284.8	239223.	235463.	3760.	1.57	268.48	9.64	13
25:48:41	22.89	52.41	53.15	55.16	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
25:49:11	22.84	52.18	48.35	55.50	287.6	175209.	155552.	19657.	11.22	360.02	19.04	9

FISHLAKE PROJECT - TEST FOUR 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO. OF ITERA-TIONS
25:49:41	22.86	50.77	53.42	54.15	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
25:50:11	22.84	54.78	49.64	56.47	288.8	140473.	113784.	26689.	19.00	432.52	26.48	13
25:50:41	22.83	51.60	48.63	55.60	287.8	190101.	174335.	15766.	8.29	333.25	16.29	11
25:51:11	22.84	54.38	51.98	55.68	287.9	191978.	177791.	14187.	7.39	325.02	15.44	8
25:51:41	22.85	51.05	53.15	53.26	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
25:52:11	22.83	49.16	50.51	54.20	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
25:52:41	22.86	49.14	50.01	52.91	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
25:53:11	22.87	51.41	49.18	55.03	287.1	201830.	189507.	12323.	6.11	312.48	14.15	13
25:53:41	22.86	50.47	50.93	52.98	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
25:54:11	22.88	54.46	52.15	54.52	286.5	195111.	181339.	13771.	7.06	320.66	14.99	16
25:54:41	22.87	55.79	50.48	57.86	290.3	138519.	110749.	27769.	20.05	443.54	27.61	5
25:55:11	22.85	50.49	52.08	53.69	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
25:55:41	22.87	54.64	52.60	53.98	285.9	199535.	186942.	12593.	6.31	313.16	14.22	13
25:56:11	22.89	52.99	53.79	55.18	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
25:56:41	22.87	50.60	52.90	53.16	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
25:57:11	22.88	53.58	49.28	55.50	287.6	164140.	141999.	22141.	13.49	380.89	21.18	23
25:57:41	22.87	55.58	51.46	56.08	288.3	158235.	135875.	22360.	14.13	387.41	21.85	15
25:58:11	22.89	54.72	50.22	55.82	288.0	157136.	133666.	23470.	14.94	394.54	22.58	7
25:58:41	22.90	52.91	47.71	54.78	286.8	145159.	119274.	25885.	17.83	420.06	25.20	2

FISHLAKE PROJECT - TEST FOUR 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
26:11:41	22.89	53.25	49.83	54.46	286.4	181147.	162924.	18223.	10.06	348.21	17.82	25
26:12:11	22.91	53.77	49.18	55.21	287.3	157054.	133547.	23507.	14.97	394.17	22.54	7
26:12:41	22.88	52.83	48.69	54.11	286.0	167913.	146741.	21172.	12.61	371.28	20.19	12
26:13:11	22.90	52.76	48.96	54.50	286.5	175664.	156001.	19663.	11.19	358.69	18.90	9
26:13:41	22.90	55.49	53.38	53.36	285.1	197352.	184104.	13248.	6.71	316.14	14.53	5
26:14:11	22.91	54.36	52.15	56.01	288.2	199635.	186594.	13041.	6.53	317.53	14.67	5
26:14:41	22.89	53.52	50.05	53.80	285.7	176474.	157764.	18710.	10.60	352.46	18.26	17
26:15:11	22.89	53.29	51.10	55.15	287.2	202181.	189499.	12682.	6.27	314.15	14.32	32
26:15:41	22.89	54.64	52.63	54.74	286.8	203239.	190980.	12259.	6.03	311.47	14.05	40
26:16:11	22.89	54.64	51.23	54.90	286.9	177025.	158277.	18748.	10.59	353.58	18.37	17
26:16:41	22.90	53.73	51.81	54.62	286.6	207831.	196344.	11487.	5.53	306.69	13.56	10
26:17:11	22.89	52.75	48.85	55.05	287.1	169714.	149383.	20332.	11.98	366.52	19.70	20
26:17:41	22.89	52.95	48.08	53.95	285.8	152328.	127983.	24345.	15.98	402.15	23.36	18
26:18:11	22.90	53.46	50.40	54.94	287.0	180853.	163845.	17008.	9.40	342.72	17.26	14
26:18:41	22.89	53.31	50.17	54.12	286.0	182816.	165603.	17212.	9.42	341.90	17.17	14
26:19:11	22.87	53.93	51.36	56.01	288.2	188620.	173753.	14867.	7.88	329.92	15.94	19
26:19:41	22.87	53.83	51.89	54.50	286.5	207244.	195604.	11640.	5.62	307.38	13.63	29
26:20:11	22.88	54.77	52.92	53.69	285.5	205850.	194229.	11621.	5.65	306.69	13.56	10
26:20:41	22.87	53.25	50.14	55.92	288.1	181805.	164728.	17077.	9.39	343.71	17.36	14

FISHLAKE PROJECT - TEST FOUR 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
26:21:11	22.87	55.03	53.34	52.72	284.4	209277.	198285.	10992.	5.25	301.93	13.07	45
26:21:41	22.90	54.32	52.08	55.08	287.2	200884.	187675.	13209.	6.58	316.85	14.60	5
26:22:11	22.89	51.38	46.30	54.49	286.5	152470.	127824.	24646.	16.16	404.41	23.59	18
26:22:41	22.88	55.97	54.04	56.58	288.9	203093.	191082.	12012.	5.91	312.48	14.15	21
26:23:11	22.89	55.02	53.38	55.46	287.6	210067.	199720.	10347.	4.93	302.12	13.09	7
26:23:41	22.90	53.35	51.02	52.03	283.5	199306.	185625.	13681.	6.86	315.97	14.51	43
26:24:11	22.91	54.65	50.48	55.72	287.9	163858.	141832.	22027.	13.44	380.70	21.16	23
26:24:41	22.91	56.09	53.67	56.47	288.8	192173.	177533.	14640.	7.62	328.00	15.75	46
26:25:11	22.92	53.06	50.99	54.75	286.8	204572.	192567.	12005.	5.87	309.98	13.90	21
26:25:41	22.91	38.82	33.05	55.63	287.8	191418.	171587.	19832.	10.36	352.28	18.24	6
26:26:11	54.26	14.32	17.76	18.62 ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.								

FISHLAKE PROJECT - TEST FIVE 6/2/84 GEOTHERMEX INC. - PROGRAM JAMESORI

TEST TIME 2:38 PM TO 3:46 PM

MAIN FLOW LINE DIAMETER (IN) = 10.000

ORIFICE DIAMETER (IN) = 5.500

CRITICAL FLOW PIPE DIAMETER (IN) = 5.000

ATMOSPHERIC PRESSURE (PSIA) = 13.200

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO. OF ITERA-TIONS
26:38:11	14.34	26.79	23.17	30.90	252.0	160815.	154566.	6249.	3.89	257.23	8.48	12
26:38:41	14.83	47.19	44.74	42.88	271.5	136871.	127758.	9113.	6.66	302.30	13.11	32
26:39:11	15.27	52.10	48.53	47.51	277.8	120324.	107548.	12776.	10.62	345.16	17.51	17
26:39:41	15.63	49.92	48.43	49.72	280.7	156082.	150225.	5857.	3.75	284.41	11.27	9
26:40:11	15.97	54.14	51.36	52.56	284.2	133593.	122907.	10686.	8.00	327.05	15.65	19
26:40:41	16.37	54.50	53.90	55.29	287.4	173518.	171775.	1744.	1.00	265.89	9.37	6
26:41:11	16.72	50.43	44.86	54.04	285.9	122500.	106056.	16444.	13.42	378.69	20.95	4
26:41:41	17.07	54.95	54.44	56.11	288.4	186932.	186445.	486.	.26	260.02	8.77	9
26:42:11	17.44	54.27	52.00	55.18	287.3	159005.	150679.	8326.	5.24	304.66	13.35	18
26:42:41	17.82	54.71	52.59	55.41	287.5	166694.	158935.	7759.	4.65	299.58	12.83	15
26:43:11	18.20	54.23	52.20	55.50	287.6	174376.	167256.	7120.	4.08	294.43	12.30	12
26:43:41	18.56	51.22	45.59	55.25	287.4	145422.	129944.	15478.	10.64	354.46	18.46	17
26:44:11	18.92	53.54	51.52	54.61	286.6	184386.	177597.	6789.	3.68	289.69	11.81	28
26:44:41	19.25	49.82	42.50	52.53	284.1	146391.	128774.	17617.	12.03	364.22	19.47	20
26:45:11	19.60	54.11	52.42	54.61	286.6	193826.	188144.	5682.	2.93	282.79	11.10	22
26:45:41	19.94	51.77	49.23	54.58	286.6	190186.	182636.	7550.	3.97	292.31	12.08	12
26:46:11	20.26	51.17	46.36	53.04	284.7	173819.	160972.	12847.	7.39	322.01	15.13	8
26:46:41	20.55	54.60	54.27	54.94 MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.								
26:47:11	20.85	54.61	51.18	55.95	288.2	187143.	176859.	10284.	5.50	307.93	13.69	10

FISHLAKE PROJECT - TEST FIVE 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
26:47:41	21.15	51.74	45.35	53.90	285.8	175195.	159783.	15412.	8.80	335.96	16.56	3
26:48:11	21.35	53.34	48.89	55.41	287.5	185732.	173625.	12107.	6.52	316.72	14.59	5
26:48:41	21.60	55.42	52.58	55.12	287.2	199870.	191023.	8847.	4.43	297.14	12.58	4
26:49:11	21.88	51.16	45.05	53.99	285.9	183852.	169360.	14492.	7.88	327.64	15.71	19
26:49:41	22.11	51.11	46.12	54.11	286.0	197714.	185577.	12137.	6.14	311.73	14.08	13
26:50:11	22.35	50.22	44.33	53.60	285.4	194043.	180560.	13482.	6.95	318.58	14.78	16
26:50:41	22.55	50.64	45.80	52.97	284.7	201062.	189309.	11753.	5.85	307.68	13.66	21
26:51:11	22.74	49.07	42.46	53.13	284.9	199060.	185062.	13998.	7.03	318.80	14.80	35
26:51:41	22.96	49.30	43.65	52.47	284.1	204481.	191924.	12557.	6.14	309.82	13.88	13
26:52:11	23.18	50.15	49.67	53.07 MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.								
26:52:41	23.38	50.25	47.79	52.73	284.4	239013.	233269.	5745.	2.40	275.69	10.37	19
26:53:11	23.54	50.97	46.31	55.06	287.1	214316.	203499.	10817.	5.05	302.78	13.16	18
26:53:41	23.68	52.88	45.50	54.14	286.1	194899.	178628.	16271.	8.35	332.10	16.17	11
26:54:11	23.82	51.04	46.81	54.43	286.4	221352.	211449.	9904.	4.47	296.78	12.54	15
26:54:41	23.94	53.98	50.33	55.38	287.5	221735.	212196.	9539.	4.30	296.31	12.49	4
26:55:11	24.09	51.27	45.99	54.56	286.6	219175.	207355.	11820.	5.39	305.39	13.42	10
26:55:41	24.16	51.99	48.68	52.57	284.2	230564.	222089.	8474.	3.68	287.22	11.56	9
26:56:11	24.23	54.75	51.33	55.48	287.6	230391.	221384.	9007.	3.91	292.82	12.13	20
26:56:41	24.34	48.98	46.31	52.84	284.5	245509.	239947.	5562.	2.27	274.54	10.26	19

FISHLAKE PROJECT - TEST FIVE 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
26:57:11	24.45	54.30	48.13	56.23	288.5	206474.	192064.	14411.	6.98	321.87	15.12	16
26:57:41	24.51	49.73	48.79	53.61	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
26:58:11	24.60	49.80	48.86	54.11	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
26:58:41	24.69	54.77	51.14	55.02	287.1	229758.	220194.	9564.	4.16	294.60	12.32	12
26:59:11	24.78	51.07	47.63	53.60	285.4	240000.	232043.	7957.	3.32	285.13	11.34	17
26:59:41	24.85	51.31	46.62	53.89	285.8	232204.	221683.	10521.	4.53	296.67	12.53	15
27: 0:11	24.92	53.19	52.25	54.56	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
27: 0:41	24.93	53.98	51.31	54.89	286.9	248318.	241611.	6707.	2.70	281.00	10.92	11
27: 1:11	25.04	50.49	49.56	53.92	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
27: 1:41	25.09	50.37	46.55	53.80	285.7	242555.	234222.	8333.	3.44	286.48	11.48	9
27: 2:11	25.17	53.49	47.03	54.90	286.9	218071.	203789.	14282.	6.55	316.41	14.56	5
27: 2:41	25.23	54.37	50.11	54.94	287.0	236225.	225774.	10451.	4.42	296.92	12.55	23
27: 3:11	25.24	54.57	50.08	55.16	287.3	234500.	223567.	10933.	4.66	299.36	12.81	15
27: 3:41	25.27	52.31	47.86	55.81	288.0	238599.	228698.	9902.	4.15	295.40	12.40	4
27: 4:11	25.33	55.18	51.02	56.33	288.6	237142.	226905.	10237.	4.32	297.53	12.62	4
27: 4:41	25.38	24.58	47.74	55.87	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
27: 5:11	25.40	54.24	51.13	56.08	288.3	244141.	236475.	7666.	3.14	286.44	11.48	6
27: 5:41	25.48	52.24	48.54	54.21	286.1	242942.	234302.	8639.	3.56	288.08	11.65	9
27: 6:11	25.49	54.54	51.16	54.61	286.6	244838.	236212.	8625.	3.52	288.23	11.66	17

FISHLAKE PROJECT - TEST FIVE 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERATURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERATIONS
27: 6:41	25.56	55.12	49.29	55.57	287.7	225380.	211836.	13545.	6.01	312.22	14.13	40
27: 7:11	25.58	53.36	47.46	55.72	287.9	224721.	211619.	13102.	5.83	310.74	13.97	21
27: 7:41	25.59	51.05	47.50	54.45	286.4	252432.	244849.	7584.	3.00	283.27	11.15	6
27: 8:11	25.58	53.46	47.19	55.60	287.8	222900.	209149.	13751.	6.17	313.72	14.28	13
27: 8:41	25.59	55.86	49.07	56.80	289.1	218054.	202766.	15288.	7.01	322.80	15.21	16
27: 9:11	25.66	55.25	47.91	56.66	289.0	216007.	200066.	15941.	7.38	326.02	15.54	8
27: 9:41	25.63	52.80	47.66	54.83	286.9	236990.	225556.	11434.	4.82	300.46	12.92	7
27:10:11	25.62	55.07	50.36	56.08	288.3	233046.	221661.	11385.	4.89	302.48	13.13	7
27:10:41	25.64	53.21	47.16	55.76	288.0	226711.	213516.	13195.	5.82	310.70	13.97	21
27:11:11	25.63	51.68	49.27	55.48	287.6	260940.	256225.	4716.	1.81	273.49	10.15	5
27:11:41	25.66	54.03	47.98	56.23	288.5	228451.	215121.	13331.	5.84	311.37	14.04	21
27:12:11	25.65	51.69	48.17	53.77	285.6	252997.	245099.	7898.	3.12	283.55	11.18	6
27:12:41	25.69	51.18	50.71	54.34 MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.								
27:13:11	25.72	54.12	48.28	56.29	288.6	225408.	212252.	13156.	5.84	311.44	14.05	21
27:13:41	25.75	55.07	46.38	56.92	289.3	205104.	187109.	17994.	8.77	339.11	16.89	3
27:14:11	25.76	55.51	48.95	56.08	288.3	223812.	209091.	14721.	6.58	318.02	14.72	5
27:14:41	25.79	55.24	48.44	56.44	288.7	216942.	201746.	15196.	7.00	322.33	15.17	16
27:15:11	25.77	51.50	48.12	54.36	286.3	255138.	247797.	7341.	2.88	282.00	11.02	14
27:15:41	25.77	55.11	48.60	56.45	288.7	222341.	207793.	14548.	6.54	318.11	14.73	5

FISHLAKE PROJECT - TEST FIVE 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
27:16:11	25.81	54.62	50.26	54.42	286.4	241382.	230707.	10675.	4.42	296.29	12.49	4
27:16:41	25.84	51.35	48.93	53.29	285.0	260929.	255709.	5220.	2.00	272.65	10.06	5
27:17:11	25.86	56.24	50.43	58.24	290.8	221661.	207999.	13661.	6.16	316.60	14.58	13
27:17:41	25.91	53.72	48.74	55.12	287.2	235791.	224323.	11469.	4.86	301.17	12.99	7
27:18:11	25.89	55.54	47.44	57.08	289.5	215481.	198486.	16995.	7.89	331.15	16.07	19
27:18:41	25.91	50.86	48.33	55.00	287.1	265877.	261169.	4708.	1.77	272.59	10.06	5
27:19:11	25.98	50.45	48.52	52.87	284.5	273642.	270336.	3306.	1.21	264.83	9.26	23
27:19:41	25.92	53.97	51.12	54.31	286.3	256029.	248974.	7055.	2.76	280.83	10.90	11
27:20:11	26.02	51.32	51.16	53.11	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
27:20:41	26.01	49.68	51.46	54.14	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
27:21:11	25.94	52.86	50.36	54.12	286.0	260021.	254238.	5784.	2.22	275.72	10.38	16
27:21:41	25.91	51.97	49.09	54.14	286.1	260261.	253924.	6337.	2.43	277.67	10.58	19
27:22:11	25.88	52.41	49.94	55.47	287.6	264060.	258997.	5063.	1.92	274.49	10.25	24
27:22:41	25.90	55.14	51.07	54.61	286.6	242277.	232046.	10230.	4.22	294.67	12.32	12
27:23:11	25.89	54.93	49.42	54.65	286.7	231349.	218408.	12941.	5.59	307.34	13.62	10
27:23:41	25.87	55.91	49.05	56.29	288.6	219068.	203657.	15411.	7.03	322.45	15.18	16
27:24:11	25.89	53.09	49.46	55.46	287.6	250184.	241860.	8323.	3.33	287.43	11.58	17
27:24:41	25.96	54.90	48.39	56.04	288.3	221814.	207277.	14538.	6.55	317.76	14.69	5
27:25:11	25.96	56.12	49.49	57.12	289.5	224076.	209186.	14889.	6.64	319.79	14.90	24

FISHLAKE PROJECT - TEST FIVE 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
27:25:41	26.02	52.42	50.02	55.81	288.0	262062.	257209.	4853.	1.85	274.28	10.23	5
27:26:11	25.99	56.10	49.55	56.76	289.1	225078.	210290.	14789.	6.57	318.70	14.79	5
27:26:41	25.99	53.65	50.43	55.76	288.0	253750.	246280.	7470.	2.94	284.27	11.26	14
27:27:11	25.99	55.39	49.29	56.73	289.1	224459.	210541.	13918.	6.20	315.28	14.44	13
27:27:41	25.99	51.73	48.50	55.02	287.1	257689.	250804.	6885.	2.67	280.89	10.91	22
27:28:11	25.96	50.83	49.70	54.52	286.5	287678.	288752.	0.	.00	252.28	7.97	9
27:28:41	25.90	52.17	49.13	54.05	286.0	259988.	253206.	6782.	2.61	279.17	10.73	11
27:29:11	25.88	55.33	48.68	57.74	290.2	224706.	210117.	14589.	6.49	319.08	14.83	5
27:29:41	25.90	53.44	51.35	53.99	285.9	265939.	261157.	4782.	1.80	271.64	9.96	10
27:30:11	25.96	54.43	48.04	55.56	287.7	226952.	212844.	14109.	6.22	314.11	14.32	13
27:30:41	25.96	51.41	48.63	54.53	286.5	263259.	257561.	5699.	2.16	275.65	10.37	8
27:31:11	25.99	54.65	49.34	53.64	285.5	234539.	221966.	12574.	5.36	304.02	13.28	18
27:31:41	26.00	55.43	49.16	57.07	289.4	227300.	213241.	14060.	6.19	315.51	14.46	13
27:32:11	26.01	53.25	49.61	53.04	284.7	250873.	241963.	8911.	3.55	286.64	11.50	17
27:32:41	25.99	51.10	48.96	55.72	287.9	270348.	266956.	3392.	1.25	268.69	9.66	18
27:33:11	26.01	51.92	48.85	54.71	286.7	260830.	254255.	6575.	2.52	279.14	10.73	11
27:33:41	26.02	53.01	49.42	54.61	286.6	248518.	240085.	8433.	3.39	287.04	11.54	17
27:34:11	26.01	55.35	49.18	56.47	288.8	225560.	211547.	14013.	6.21	315.09	14.42	13
27:34:11	26.00	50.45	48.87	53.69	285.5	277038.	275241.	1797.	.65	260.68	8.83	14

FISHLAKE PROJECT - TEST FIVE 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
27:34:41	26.01	54.70	48.64	57.43	289.9	230199.	216837.	13362.	5.80	312.42	14.15	21
27:35:41	25.98	55.16	48.54	57.18	289.6	223892.	209314.	14578.	6.51	318.63	14.79	5
27:36:11	26.04	56.05	48.78	55.13	287.2	216889.	200701.	16188.	7.46	325.09	15.45	8
27:36:41	26.06	52.28	48.97	52.62	284.2	254243.	246334.	7909.	3.11	282.07	11.03	14
27:37:11	26.03	57.41	49.03	58.47	291.0	207253.	189077.	18175.	8.77	340.75	17.06	3
27:37:41	26.08	53.45	49.16	55.98	288.2	244646.	234890.	9756.	3.99	294.11	12.27	12
27:38:11	26.02	55.92	48.74	56.89	289.2	215557.	199624.	15933.	7.39	326.39	15.58	8
27:38:41	26.06	53.31	49.09	54.01	285.9	242692.	232663.	10028.	4.13	293.14	12.17	12
27:39:11	26.10	52.16	48.87	55.62	287.8	253519.	246362.	7157.	2.82	282.99	11.12	14
27:39:41	26.04	55.32	48.42	57.24	289.6	218510.	203270.	15240.	6.97	322.95	15.23	16
27:40:11	26.07	55.47	48.50	57.33	289.7	219659.	204335.	15324.	6.98	323.06	15.24	16
27:40:41	26.05	50.96	49.09	53.57	285.4	276929.	273911.	3018.	1.09	264.60	9.24	12
27:41:11	26.04	51.71	48.97	54.84	286.9	262189.	256513.	5676.	2.16	276.02	10.41	8
27:41:41	26.04	55.15	48.47	57.53	290.0	224767.	210169.	14598.	6.49	318.87	14.81	5
27:42:11	26.02	56.00	48.55	57.59	290.0	219080.	202936.	16143.	7.37	326.96	15.64	8
27:42:41	26.00	57.28	49.34	58.29	290.8	209998.	192527.	17471.	8.32	336.43	16.61	11
27:43:11	26.09	56.41	49.23	57.74	290.2	216592.	200617.	15975.	7.38	327.18	15.66	8
27:43:41	26.06	53.39	49.46	55.35	287.5	250209.	241184.	9024.	3.61	289.88	11.83	28
27:44:11	26.07	52.83	49.30	56.04	288.3	255790.	248063.	7727.	3.02	285.30	11.36	6

FISHLAKE PROJECT - TEST FIVE 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA- TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA- TIONS
27:44:41	26.04	55.42	48.96	56.26	288.5	222234.	207643.	14590.	6.57	318.10	14.73	5
27:45:11	26.08	52.40	49.31	56.14	288.4	260851.	254404.	6446.	2.47	280.36	10.85	30
27:45:41	25.70	20.77	22.94	55.73 ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.								

FISHLAKE PROJECT - TEST SIX 6/2/84 GEOTHERMEX INC. - PROGRAM JAMESORI

TEST TIME 4:04 PM TO 4:58 PM

MAIN FLOW LINE DIAMETER (IN) = 10.000

ORIFICE DIAMETER (IN) = 5.500

CRITICAL FLOW PIPE DIAMETER (IN) = 4.000

ATMOSPHERIC PRESSURE (PSIA) = 13.200

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO. OF ITERA-TIONS
28: 4:11	18.12	50.06	47.33	51.86	283.3	81557.	69278.	12279.	15.06	391.31	22.25	7
28: 4:41	12.45	48.12	46.26	50.13	281.2	40177.	27923.	12253.	30.50	532.03	36.70	6
28: 5:11	12.44	52.33	50.54	51.65	283.1	36396.	23615.	12782.	35.12	576.16	41.23	1
28: 5:41	12.44	50.50	49.21	51.20	282.5	54836.	46061.	8775.	16.00	399.30	23.07	18
28: 6:11	16.41	49.98	47.12	51.24	282.6	61942.	47928.	14013.	22.62	460.46	29.35	8
28: 6:41	12.44	50.33	47.98	50.39	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
28: 7:11	12.36	51.89	48.36	51.86	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
28: 7:41	12.37	52.48	50.26	52.65	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
28: 8:11	12.48	52.19	49.57	52.68	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
28: 8:41	12.80	48.99	45.34	50.73	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
28: 9:11	12.36	52.32	47.78	52.92	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
28: 9:41	12.36	52.44	48.52	53.00	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
28:10:11	12.37	53.56	51.47	53.60	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
28:10:41	12.38	51.49	50.24	52.41	284.0	54629.	45886.	8742.	16.00	400.67	23.21	18
28:11:11	12.36	50.97	49.47	50.48	281.6	47975.	37811.	10164.	21.19	446.37	27.90	16
28:11:41	11.59	48.42	45.91	50.73	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
28:12:11	35.07	52.19	50.39	50.94	282.2	221472.	215958.	5514.	2.49	274.27	10.23	16
28:12:41	26.76	52.10	49.47	52.98	284.7	149800.	140449.	9351.	6.24	311.36	14.04	13
28:13:11	24.29	51.02	48.85	51.83	283.3	140004.	131703.	8302.	5.93	307.10	13.60	21

FISHLAKE PROJECT - TEST SIX 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
28:13:41	22.93	50.54	48.82	50.73	281.9	135012.	127853.	7159.	5.30	299.98	12.87	18
28:14:11	22.97	51.22	50.59	51.36	282.7	154899.	152360.	2540.	1.64	266.95	9.48	7
28:14:41	23.08	53.40	51.16	53.45	285.2	125691.	116334.	9357.	7.44	322.98	15.23	8
28:15:11	23.14	52.58	49.81	52.82	284.5	121210.	110364.	10846.	8.95	336.10	16.58	22
28:15:41	23.19	53.30	50.74	53.30	285.1	123081.	112770.	10311.	8.38	331.40	16.10	11
28:16:11	23.37	49.71	50.86	51.18	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
28:16:41	23.52	50.50	49.94	52.21	283.7	158925.	157282.	1643.	1.03	262.42	9.01	9
28:17:11	23.69	53.78	50.60	54.07	286.0	116030.	103731.	12299.	10.60	352.74	18.29	17
28:17:41	23.83	53.14	49.12	54.29	286.2	109375.	94846.	14529.	13.28	377.68	20.85	4
28:18:11	24.08	49.65	48.30	50.07	281.1	152650.	147297.	5352.	3.51	282.57	11.08	17
28:18:41	24.23	53.12	49.69	53.35	285.1	119397.	106733.	12663.	10.61	351.98	18.21	17
28:19:11	24.47	51.34	51.08	51.71	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
28:19:41	24.57	50.80	49.95	51.17	282.5	160723.	157418.	3305.	2.06	270.55	9.85	13
28:20:11	24.78	50.10	50.46	49.38	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
28:20:41	24.93	48.89	49.44	51.86	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
28:21:11	25.10	50.59	45.57	51.96	283.4	112010.	96053.	15956.	14.25	383.95	21.49	15
28:21:41	25.26	50.11	50.82	52.88	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
28:22:11	25.43	48.57	47.70	50.22	281.3	169362.	166522.	2840.	1.68	265.86	9.37	10
28:22:41	25.57	53.29	48.12	53.38	285.1	112441.	95687.	16754.	14.90	391.56	22.27	7

FISHLAKE PROJECT - TEST SIX 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
28:23:11	25.72	51.33	48.11	53.14	284.9	139217.	128204.	11013.	7.91	326.92	15.64	19
28:23:41	25.80	51.90	50.56	51.59	283.0	160775.	155403.	5372.	3.34	282.94	11.12	6
28:24:11	25.92	51.41	48.70	52.76	284.4	145781.	136210.	9571.	6.57	314.07	14.32	5
28:24:41	26.07	51.57	47.58	52.62	284.2	131710.	118617.	13093.	9.94	345.02	17.49	6
28:25:11	26.21	47.11	45.47	50.16	281.2	169110.	163896.	5213.	3.08	278.77	10.69	25
28:25:41	26.18	48.20	48.51	52.46	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
28:26:11	26.37	49.05	47.02	50.06	281.1	161817.	154779.	7038.	4.35	290.35	11.88	4
28:26:41	26.43	52.51	47.53	52.76	284.4	119521.	103675.	15847.	13.26	375.76	20.65	4
28:27:11	26.49	52.63	49.69	53.95	285.8	146289.	136025.	10264.	7.02	319.61	14.89	16
28:27:41	26.61	52.53	50.11	52.34	283.9	149608.	140663.	8945.	5.98	308.17	13.71	21
28:28:11	26.68	48.49	48.57	50.39	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
28:28:41	26.76	49.82	48.59	50.48	281.6	171714.	167267.	4447.	2.59	274.62	10.27	19
28:29:11	26.86	52.72	50.21	52.66	284.3	152385.	143287.	9098.	5.97	308.47	13.74	21
28:29:41	26.96	52.57	49.54	53.17	284.9	148410.	137952.	10458.	7.05	318.99	14.82	16
28:30:11	26.99	49.17	46.76	51.48	282.8	161678.	153773.	7905.	4.89	297.08	12.57	26
28:30:41	27.07	50.99	48.42	51.67	283.1	158314.	149521.	8793.	5.55	303.44	13.22	10
28:31:11	27.19	49.97	49.97	51.70	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
28:31:41	27.28	52.85	51.70	52.68	284.3	175402.	171018.	4384.	2.50	276.50	10.46	8
28:32:11	27.36	51.62	51.02	51.56	283.0	190130.	188795.	1335.	.70	258.55	8.61	13

FISHLAKE PROJECT - TEST SIX 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA- TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA- TIONS
28:32:41	27.42	48.88	47.02	50.61	281.8	171876.	165715.	6160.	3.58	283.97	11.23	9
28:33:11	27.47	50.71	51.09	51.53	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
28:33:41	27.51	52.88	50.42	53.11	284.8	157976.	149174.	8802.	5.57	305.34	13.42	10
28:34:11	27.54	49.90	49.73	50.42	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
28:34:41	27.58	53.81	51.85	53.39	285.2	164598.	157187.	7410.	4.50	295.81	12.44	23
28:35:11	27.62	52.89	50.24	53.01	284.7	156685.	147348.	9337.	5.96	308.78	13.77	21
28:35:41	27.70	51.35	48.66	53.86	285.7	160945.	152064.	8881.	5.52	305.72	13.46	29
28:36:11	27.72	53.15	51.15	53.28	285.0	166448.	159120.	7328.	4.40	294.75	12.33	4
28:36:41	27.81	50.39	48.70	51.68	283.1	171638.	165757.	5881.	3.43	283.83	11.21	17
28:37:11	27.83	50.65	50.46	52.18	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
28:37:41	27.89	49.89	48.73	51.43	282.8	182207.	178484.	3723.	2.04	270.76	9.87	5
28:38:11	27.82	48.77	47.57	51.78	283.2	183870.	180404.	3466.	1.89	269.74	9.76	5
28:38:41	27.81	50.77	48.71	51.75	283.2	169372.	162300.	7072.	4.18	290.83	11.93	31
28:39:11	27.86	50.67	51.32	49.94	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
28:39:41	27.86	48.57	48.77	51.27	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
28:40:11	27.97	47.36	44.23	50.88	282.1	160448.	151147.	9301.	5.80	304.73	13.36	21
28:40:41	27.96	51.08	49.76	51.80	283.2	179097.	174474.	4623.	2.58	276.18	10.43	19
28:41:11	27.99	53.84	51.84	53.89	285.8	167353.	159980.	7373.	4.41	295.52	12.41	4
28:41:41	28.05	51.85	50.54	51.39	282.7	179052.	174217.	4834.	2.70	276.77	10.49	19

FISHLAKE PROJECT - TEST SIX 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
28:42:11	27.99	52.12	49.09	53.60	285.4	154474.	144350.	10125.	6.55	314.95	14.41	5
28:42:41	28.01	51.79	50.88	53.04	284.7	185039.	182241.	2797.	1.51	267.84	9.57	7
28:43:11	28.09	51.47	48.35	53.00	284.7	155633.	145430.	10203.	6.56	314.27	14.34	5
28:43:41	27.96	53.08	50.59	52.71	284.3	158839.	149929.	8910.	5.61	305.20	13.41	10
28:44:11	27.97	49.76	49.18	52.69	284.3	198785.	198747.	38.	.02	253.66	8.11	9
28:44:41	27.90	53.51	50.53	53.66	285.5	155297.	145031.	10266.	6.61	315.54	14.47	5
28:45:11	28.01	50.01	49.06	49.94	280.9	187725.	184598.	3128.	1.67	265.40	9.32	7
28:45:41	27.97	50.23	50.48	50.92	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
28:46:11	27.94	53.44	50.19	54.04	285.9	149062.	137997.	11065.	7.42	323.46	15.28	8
28:46:41	27.91	53.13	48.90	54.26	286.2	142430.	129024.	13406.	9.41	342.02	17.19	14
28:47:11	27.92	52.98	47.90	53.83	285.7	135261.	119927.	15335.	11.34	359.26	18.96	28
28:47:41	27.93	51.67	50.48	51.21	282.5	181222.	176861.	4361.	2.41	273.84	10.19	16
28:48:11	27.87	52.24	48.18	52.68	284.3	145046.	132244.	12802.	8.83	334.81	16.45	3
28:48:41	27.85	53.18	50.31	54.18	286.1	156173.	146307.	9866.	6.32	313.46	14.25	32
28:49:11	27.88	48.95	46.89	51.37	282.7	173622.	167048.	6574.	3.79	286.77	11.51	20
28:49:41	27.92	50.61	49.21	51.83	283.3	178532.	173755.	4777.	2.68	277.09	10.52	11
28:50:11	27.98	53.64	50.01	54.40	286.4	145029.	132912.	12117.	8.35	332.45	16.20	11
28:50:41	28.02	49.06	47.38	50.38	281.5	175538.	169927.	5612.	3.20	280.10	10.83	6
28:51:11	27.97	52.85	47.85	54.14	286.1	135464.	120308.	15157.	11.19	358.24	18.85	9

FISHLAKE PROJECT - TEST SIX 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
28:51:41	27.96	51.71	51.16	52.11	283.6	194039.	193348.	691.	.36	256.04	8.36	9
28:52:11	27.99	53.86	51.70	54.15	286.1	161779.	153786.	7993.	4.94	300.75	12.95	7
28:52:41	28.02	51.85	50.05	51.48	282.8	173697.	167165.	6532.	3.76	286.66	11.50	9
28:53:11	28.03	47.51	46.86	51.21	282.5	199162.	198915.	247.	.12	252.78	8.02	10
28:53:41	28.01	53.19	50.83	52.52	284.1	160467.	151887.	8580.	5.35	302.55	13.13	18
28:54:11	27.93	54.40	48.75	54.52	286.5	122656.	105325.	17330.	14.13	385.71	21.67	15
28:54:41	27.97	50.98	48.90	50.56	281.7	166418.	159003.	7414.	4.46	291.94	12.04	4
28:55:11	27.97	54.30	48.98	54.01	285.9	129976.	113665.	16311.	12.55	370.61	20.12	12
28:55:41	27.90	52.22	48.24	53.11	284.8	143707.	131037.	12670.	8.82	335.23	16.49	3
28:56:11	27.97	50.91	49.88	51.43	282.8	182137.	178617.	3520.	1.93	269.74	9.76	21
28:56:41	27.93	53.98	51.29	52.98	284.7	157998.	148363.	9635.	6.10	310.03	13.90	40
28:57:11	27.97	50.17	47.82	49.47	280.3	168121.	160087.	8034.	4.78	293.59	12.21	15
28:57:41	27.93	52.78	49.78	53.49	285.3	154808.	144611.	10197.	6.59	315.13	14.43	5

FISHLAKE PROJECT - TEST SEVEN 6/2/84 GEOTHERMEX INC. - PROGRAM JAMESON

TEST TIME 5:32 PM TO 6:16 PM

MAIN FLOW LINE DIAMETER (IN) = 10.000

ORIFICE DIAMETER (IN) = 6.500

CRITICAL FLOW PIPE DIAMETER (IN) = 6.130

ATMOSPHERIC PRESSURE (PSIA) = 13.200

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO. OF ITERA-TIONS
29:32:11	12.62	14.08	13.08	28.18	247.5	308120.	317976.	0.	.00	185.67	1.13	23
29:32:41	12.68	39.54	33.32	28.08	247.1	125039.	103269.	21770.	17.41	380.54	21.14	13
29:33:11	13.47	56.84	53.95	38.08	264.3	148401.	130166.	18235.	12.29	348.00	17.80	12
29:33:41	13.96	56.72	54.54	45.77	275.5	172490.	157440.	15050.	8.72	325.40	15.48	11
29:34:11	14.32	55.12	47.93	48.58	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
29:34:41	14.72	49.08	45.77	50.03	281.0	187726.	171123.	16603.	8.84	331.84	16.14	8
29:35:11	15.13	55.13	50.94	50.91	282.1	166366.	144589.	21777.	13.09	372.09	20.27	4
29:35:41	15.54	50.62	45.39	52.97	284.7	166744.	142907.	23837.	14.30	385.54	21.66	15
29:36:11	16.02	49.52	45.65	53.76	285.6	202218.	184454.	17765.	8.78	335.68	16.54	3
29:36:41	16.44	51.58	47.30	53.44	285.2	199048.	179270.	19778.	9.94	345.91	17.59	6
29:37:11	16.87	53.28	50.54	54.49	286.5	226044.	211987.	14057.	6.22	312.90	14.20	13
29:37:41	17.31	49.65	47.47	54.34	286.3	254500.	244760.	9740.	3.83	290.72	11.92	12
29:38:11	17.72	51.30	51.87	54.43	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
29:38:41	18.16	50.01	44.26	53.33	285.1	221563.	199517.	22046.	9.95	345.92	17.59	6
29:39:11	18.54	47.51	50.15	55.28	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
29:39:41	18.97	50.42	46.85	54.18	286.1	256782.	241923.	14809.	5.77	308.40	13.73	21
29:40:11	19.34	54.75	48.78	55.13	287.2	226033.	202097.	23936.	10.59	353.83	18.40	17
29:40:41	19.73	46.40	45.69	53.51	285.3	337528.	340487.	0.	.00	246.42	7.37	9
29:41:11	20.15	48.67	47.80	53.96	285.9	338477.	338714.	0.	.00	254.40	8.19	10

FISHLAKE PROJECT - TEST SEVEN 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO. OF ITERA-TIONS
29:41:41	20.51	50.40	49.47	54.40	286.4	332833.	331755.	1079.	.32	258.56	8.62	8
29:42:11	20.86	51.44	45.07	54.49	286.5	254943.	232549.	22394.	8.78	336.50	16.62	3
29:42:41	21.20	48.86	50.91	54.27	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
29:43:11	21.49	55.38	50.03	55.54	287.7	272394.	251608.	20786.	7.63	327.09	15.65	46
29:43:41	21.83	48.94	47.46	53.19	284.9	351198.	347711.	3487.	.99	263.24	9.10	23
29:44:11	22.15	54.10	50.19	54.65	286.7	306280.	290786.	15494.	5.06	302.41	13.12	45
29:44:41	22.43	55.81	48.28	55.79	288.0	262966.	236914.	26051.	9.91	348.29	17.83	6
29:45:11	22.73	51.81	48.59	53.29	285.0	333058.	321072.	11986.	3.60	287.37	11.57	9
29:45:41	23.01	56.44	50.98	57.15	289.5	292720.	272177.	20543.	7.02	323.25	15.26	16
29:46:11	23.28	55.80	48.46	56.95	289.3	282468.	257665.	24804.	8.78	339.21	16.90	3
29:46:41	23.51	53.54	49.26	55.48	287.6	322803.	307219.	15584.	4.83	301.26	13.00	7
29:47:11	23.73	55.53	47.66	56.35	288.6	289401.	263962.	25439.	8.79	338.64	16.84	3
29:47:41	23.92	57.13	51.31	57.67	290.1	302718.	281465.	21254.	7.02	323.85	15.32	16
29:48:11	24.12	52.93	47.70	55.60	287.8	324411.	306820.	17591.	5.42	306.86	13.58	10
29:48:41	24.27	52.82	51.04	56.54	288.8	376217.	371551.	4666.	1.24	269.51	9.74	7
29:49:11	24.44	56.73	48.96	57.75	290.2	291591.	265998.	25592.	8.78	340.05	16.98	3
29:49:41	24.59	52.85	49.08	56.01	288.2	357735.	345184.	12551.	3.51	289.74	11.82	28
29:50:11	24.77	53.14	50.83	56.17	288.4	378796.	371638.	7158.	1.89	275.05	10.31	5
29:50:41	24.90	54.06	51.59	55.35	287.5	372523.	363872.	8751.	2.35	278.31	10.64	8

FISHLAKE PROJECT - TEST SEVEN 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERATURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO. OF ITERATIONS
29:51:11	25.02	56.22	52.99	55.18	287.3	356212.	343338.	12874.	3.61	289.74	11.82	17
29:51:41	25.13	54.04	48.60	57.09	289.5	344645.	327064.	17581.	5.10	305.59	13.45	18
29:52:11	25.26	50.46	51.35	54.78 ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.								
29:52:41	25.32	57.06	48.14	57.50	289.9	305623.	278400.	27222.	8.91	340.98	17.08	22
29:53:11	25.47	56.23	50.04	58.28	290.8	332806.	312304.	20502.	6.16	316.62	14.58	13
29:53:41	25.59	55.70	48.79	56.49	288.8	331803.	309715.	22088.	6.66	319.21	14.84	24
29:54:11	25.60	50.71	51.26	55.66 ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.								
29:54:41	25.65	55.38	46.67	56.83	289.2	311258.	285351.	25906.	8.32	334.88	16.45	11
29:55:11	25.71	55.74	51.79	57.15	289.5	362780.	348803.	13977.	3.85	294.20	12.28	20
29:55:41	25.78	55.79	47.63	56.67	289.0	316083.	291095.	24988.	7.91	330.87	16.04	19
29:56:11	25.83	53.08	47.00	54.67	286.7	345952.	326967.	18984.	5.49	306.38	13.53	10
29:56:41	25.85	55.27	49.42	55.66	287.8	347678.	328381.	19297.	5.55	308.10	13.70	10
29:57:11	25.89	53.93	49.12	55.35	287.5	363493.	347638.	15856.	4.36	296.82	12.55	23
29:57:41	25.94	55.07	51.33	57.39	289.8	366131.	353232.	12900.	3.52	291.44	11.99	9
29:58:11	25.95	57.44	48.50	58.73	291.3	309927.	282764.	27163.	8.76	340.98	17.08	3
29:58:41	26.00	57.42	52.35	58.81	291.4	344791.	326856.	17906.	5.19	308.33	13.73	18
29:59:11	26.05	55.47	53.33	57.56	290.0	398771.	392255.	6516.	1.63	274.31	10.23	10
29:59:41	26.10	54.70	49.10	56.89	289.2	351324.	333219.	18105.	5.15	305.84	13.47	18
30: 0:11	26.11	58.09	52.53	58.19	290.7	346215.	326724.	19491.	5.63	311.66	14.07	29

FISHLAKE PROJECT - TEST SEVEN 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
30: 0:41	26.14	52.76	50.99	54.49	286.5	413597.	409321.	4277.	1.03	265.20	9.30	9
30: 1:11	26.19	55.05	52.59	57.21	289.6	394198.	386395.	7803.	1.98	277.07	10.52	5
30: 1:41	26.23	54.38	52.17	55.56	287.7	401928.	394977.	6951.	1.73	272.86	10.08	10
30: 2:11	26.28	58.14	49.69	58.44	291.0	316539.	290164.	26375.	8.33	336.71	16.64	11
30: 2:41	26.33	54.49	49.59	58.72	291.3	370936.	355748.	15188.	4.09	298.16	12.68	4
30: 3:11	26.38	57.89	50.53	58.79	291.4	335608.	312114.	23494.	7.00	324.88	15.43	16
30: 3:41	26.35	57.79	50.62	59.33	292.0	331980.	308825.	23155.	6.97	325.29	15.46	16
30: 4:11	26.40	54.19	52.79	57.49	289.9	422328.	421093.	1235.	.29	261.92	8.96	13
30: 4:41	26.42	57.06	47.97	58.09	290.6	321856.	295073.	26782.	8.32	336.23	16.59	11
30: 5:11	26.41	56.74	53.79	57.56	290.0	388356.	377854.	10502.	2.70	284.13	11.24	11
30: 5:41	26.48	59.02	49.11	59.45	292.1	312773.	283466.	29307.	9.37	347.29	17.79	14
30: 6:11	26.52	52.50	47.83	57.21	289.6	380388.	366701.	13687.	3.60	291.93	12.04	20
30: 6:41	26.50	56.83	49.44	58.43	291.0	332734.	309516.	23219.	6.98	324.28	15.36	16
30: 7:11	26.51	53.48	48.11	56.66	289.0	367317.	350850.	16467.	4.48	299.42	12.81	15
30: 7:41	26.55	59.03	52.57	59.00	291.6	336031.	313899.	22131.	6.59	321.30	15.06	5
30: 8:11	26.60	53.83	49.34	58.21	290.7	378266.	364556.	13709.	3.62	293.28	12.18	20
30: 8:41	26.61	55.96	49.95	58.84	291.4	354076.	334956.	19120.	5.40	310.26	13.92	10
30: 9:11	26.64	56.90	51.83	58.28	290.8	357850.	340479.	17371.	4.85	304.64	13.35	7
30: 9:41	26.65	52.33	50.46	57.50	289.9	423320.	420613.	2708.	.64	265.12	9.29	9

FISHLAKE PROJECT - TEST SEVEN 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
30:10:11	26.70	54.96	54.49	59.26	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
30:10:41	26.71	52.78	52.29	57.34	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
30:11:11	26.78	57.44	49.73	58.10	290.6	340435.	316560.	23875.	7.01	324.25	15.36	16
30:11:41	26.77	59.39	51.45	60.23	292.9	324080.	298541.	25538.	7.88	334.46	16.41	19
30:12:11	26.81	54.12	52.34	57.37	289.8	417368.	413760.	3608.	.86	267.03	9.49	9
30:12:41	26.82	51.93	54.17	57.97	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
30:13:11	26.85	58.04	54.06	60.09	292.8	371063.	356972.	14091.	3.80	296.95	12.56	20
30:13:41	26.88	54.69	50.19	57.75	290.2	381374.	367167.	14207.	3.73	293.71	12.23	20
30:14:11	26.86	56.70	49.21	58.37	290.9	348868.	326125.	22743.	6.52	320.00	14.93	5
30:14:41	26.85	57.84	50.82	60.15	292.9	343959.	321662.	22297.	6.48	321.59	15.09	5
30:15:11	26.88	57.43	52.23	58.15	290.7	363568.	345765.	17803.	4.90	304.89	13.37	7
30:15:41	26.92	54.37	49.94	62.41	295.3	377446.	364800.	12645.	3.35	295.34	12.39	20
30:16:11	25.89	15.95	14.56	58.51	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							

FISHLAKE PROJECT - TEST EIGHT 6/2/84 GEOTHERMEX INC. - PROGRAM JAMESORI

TEST TIME 6:37 PM TO 7:14 PM

MAIN FLOW LINE DIAMETER (IN) = 10.000

ORIFICE DIAMETER (IN) = 6.500

CRITICAL FLOW PIPE DIAMETER (IN) = 7.000

ATMOSPHERIC PRESSURE (PSIA) = 13.200

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERATURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERATIONS
30:37:41	12.58	51.55	47.60	38.68	265.2	208415.	189190.	19225.	9.22	320.23	14.95	3
30:38:11	13.29	52.00	46.59	58.00	290.5	203209.	180328.	22880.	11.26	363.08	19.35	9
30:38:41	13.75	58.72	54.42	61.38	294.2	213593.	192539.	21053.	9.86	353.75	18.39	6
30:39:11	14.13	57.90	47.95	58.92	291.5	147072.	108012.	39059.	26.56	504.24	33.85	3
30:39:41	14.48	51.74	48.54	56.01	288.2	267335.	253879.	13456.	5.03	303.75	13.26	18
30:40:11	14.77	47.53	38.89	50.85	282.1	228833.	202633.	26199.	11.45	356.88	18.71	28
30:40:41	15.04	46.02	38.98	51.45	282.8	248435.	226551.	21884.	8.81	333.21	16.28	3
30:41:11	15.33	52.52	43.59	53.13	284.9	220411.	191161.	29250.	13.27	376.28	20.70	4
30:41:41	15.69	44.06	37.92	52.40	284.0	280507.	262818.	17689.	6.31	311.26	14.03	5
30:42:11	16.00	48.36	45.12	53.73	285.6	311676.	300623.	11053.	3.55	287.41	11.58	20
30:42:41	16.33	49.59	49.88	54.55	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
30:43:11	16.65	51.01	49.95	54.18	286.1	355076.	353555.	1521.	.43	259.26	8.69	8
30:43:41	17.00	51.82	50.61	55.38	287.5	360125.	357906.	2219.	.62	262.42	9.01	14
30:44:11	17.38	53.59	47.31	54.86	286.9	291182.	269646.	21536.	7.40	324.15	15.35	8
30:44:41	17.69	50.64	45.48	54.56	286.6	323423.	306815.	16608.	5.14	303.01	13.18	37
30:45:11	18.01	49.60	43.61	53.96	285.9	328786.	310972.	17814.	5.42	304.92	13.38	29
30:45:41	18.35	49.00	45.99	55.22	287.3	370155.	362051.	8104.	2.19	276.69	10.48	11
30:46:11	18.68	48.96	49.03	54.84	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
30:46:41	19.04	53.95	50.80	56.19	288.4	368685.	357874.	10812.	2.93	284.65	11.30	14

FISHLAKE PROJECT - TEST EIGHT 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA- TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO. OF ITERA- TIONS
30:47:11	19.38	53.31	47.37	56.22	288.5	343595.	325015.	18579.	5.41	307.42	13.63	10
30:47:41	19.70	55.70	45.88	57.27	289.7	314897.	287269.	27628.	8.77	339.49	16.93	3
30:48:11	20.01	55.95	46.52	57.74	290.2	322456.	295659.	26797.	8.31	335.75	16.54	11
30:48:41	20.30	50.32	43.56	55.89	288.1	375280.	357760.	17520.	4.67	300.27	12.90	26
30:49:11	20.63	52.22	44.19	56.04	288.3	366852.	345735.	21117.	5.76	310.43	13.94	21
30:49:41	20.90	52.46	46.25	55.65	287.8	386429.	369099.	17331.	4.48	298.29	12.70	15
30:50:11	21.16	55.84	46.37	56.58	288.9	349512.	323646.	25866.	7.40	326.13	15.56	8
30:50:41	21.42	54.25	51.01	57.23	289.6	422041.	412828.	9213.	2.18	278.96	10.71	8
30:51:11	21.67	56.28	48.18	57.21	289.6	370963.	347899.	23064.	6.22	315.97	14.51	13
30:51:41	21.92	53.94	50.42	58.02	290.5	423821.	414268.	9553.	2.25	280.51	10.87	19
30:52:11	22.16	53.17	46.18	57.26	289.7	408047.	390005.	18042.	4.42	299.54	12.82	15
30:52:41	22.36	50.23	49.21	57.87	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
30:53:11	22.54	53.25	51.18	59.13	291.7	467759.	466077.	1682.	.36	264.40	9.22	14
30:53:41	22.73	53.37	47.50	56.71	289.0	422092.	406458.	15634.	3.70	292.34	12.08	20
30:54:11	22.92	53.59	51.43	56.68	289.0	471444.	467974.	3470.	.74	265.05	9.28	6
30:54:41	23.07	51.54	52.91	58.38	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
30:55:11	23.20	51.34	53.06	58.75	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
30:55:41	23.34	52.55	52.41	57.94	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
30:56:11	23.50	54.01	48.74	58.41	291.0	450352.	437204.	13148.	2.92	287.05	11.54	6

FISHLAKE PROJECT - TEST EIGHT 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
30:56:41	23.60	55.41	51.78	57.86	290.3	459456.	449778.	9678.	2.11	278.97	10.71	16
30:57:11	23.73	50.15	49.29	56.36	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
30:57:41	23.84	52.54	49.10	59.17	291.8	474720.	468583.	6137.	1.29	273.00	10.10	21
30:58:11	23.93	56.86	46.99	58.35	290.9	415324.	390980.	24344.	5.86	313.96	14.30	21
30:58:41	24.00	56.60	51.50	58.40	290.9	453255.	439017.	14237.	3.14	289.07	11.75	6
30:59:11	24.04	55.88	47.24	58.09	290.6	422481.	400730.	21751.	5.15	307.13	13.60	18
30:59:41	24.10	54.55	45.73	57.86	290.3	434049.	413193.	20856.	4.80	303.72	13.25	26
31: 0:11	24.17	50.64	50.15	56.98	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
31: 0:41	24.22	56.98	46.90	57.68	290.1	418856.	394125.	24731.	5.90	313.62	14.27	21
31: 1:11	24.27	55.61	49.76	59.04	291.6	446589.	431257.	15333.	3.43	292.46	12.10	9
31: 1:41	24.34	54.85	47.17	57.27	289.7	447969.	429044.	18925.	4.22	297.75	12.64	4
31: 2:11	24.36	57.38	47.69	60.45	293.2	414771.	390822.	23949.	5.77	315.42	14.46	21
31: 2:41	24.44	52.64	50.63	57.87	290.3	516378.	516918.	0.	.00	258.71	8.63	7
31: 3:11	24.46	59.21	49.41	59.98	292.7	409920.	384468.	25451.	6.21	318.90	14.81	13
31: 3:41	24.49	50.71	50.70	57.26	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
31: 4:11	24.53	57.41	46.27	59.38	292.0	407022.	380560.	26462.	6.50	320.94	15.02	5
31: 4:41	24.57	52.92	47.55	58.21	290.7	476021.	464157.	11864.	2.49	282.91	11.12	22
31: 5:11	24.60	55.80	46.99	57.99	290.5	439262.	417853.	21409.	4.87	304.50	13.33	26
31: 5:41	24.66	56.83	50.97	57.74	290.2	451551.	435137.	16414.	3.64	292.86	12.14	9

FISHLAKE PROJECT - TEST EIGHT 6/2/84 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO. OF ITERA-TIONS
31: 6:11	24.66	54.36	45.63	58.48	291.0	449550.	429694.	19856.	4.42	300.86	12.96	15
31: 6:41	24.69	51.07	49.66	57.27	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
31: 7:11	24.73	53.05	47.05	56.89	289.2	471629.	457642.	13987.	2.97	285.76	11.41	6
31: 7:41	24.72	59.05	51.73	59.25	291.9	438432.	417945.	20487.	4.67	304.04	13.29	15
31: 8:11	24.75	52.79	50.26	58.37	290.9	511691.	509698.	1992.	.39	263.80	9.15	14
31: 8:41	24.77	58.44	47.52	59.10	291.7	418982.	392563.	26419.	6.31	318.84	14.81	32
31: 9:11	24.75	54.41	51.21	57.27	289.7	499504.	492824.	6680.	1.34	271.25	9.92	7
31: 9:41	24.71	52.66	52.86	59.14	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
31:10:11	24.75	52.23	50.34	57.43	289.9	530040.	532173.	0.	.00	255.46	8.30	8
31:10:41	24.74	50.32	48.88	58.29	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
31:11:11	24.76	50.22	49.24	57.52	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
31:11:41	24.75	58.90	48.59	59.23	291.9	416159.	390217.	25942.	6.23	318.33	14.75	13
31:12:11	24.78	57.14	46.17	58.15	290.7	417739.	391804.	25936.	6.21	316.92	14.61	13
31:12:41	24.78	52.79	51.97	57.80	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
31:13:11	24.78	55.24	48.44	57.52	290.0	455734.	438481.	17253.	3.79	294.00	12.26	20
31:13:41	24.77	51.34	49.46	58.75	291.3	539722.	544300.	0.	.00	252.89	8.03	9
31:14:11	24.80	49.38	48.46	57.71	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
31:14:41	24.50	15.98	13.79	59.14	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
31:15:11	23.73	13.34	12.81	57.75	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							

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APPENDIX D

TABULAR PRESENTATION OF JUNE 21 FLOW TEST RESULTS

FISHLAKE PROJECT - JUNE 21, 1984 - TEST 1

TEST TIME 15:38:54 TO 16:09:54

MAIN FLOW LINE DIAMETER (IN) = 10.000

ORIFICE DIAMETER (IN) = 6.500

CRITICAL FLOW PIPE DIAMETER (IN) = 6.130

ATMOSPHERIC PRESSURE (PSIA) = 12.300

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
15:38:54	18.26	42.85	43.37	49.07	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
15:39:24	18.71	47.32	38.25	52.75	284.4	207387.	179239.	28148.	13.57	378.64	21.26	4
15:39:54	19.34	50.05	43.91	54.17	286.1	236179.	213942.	22237.	9.42	341.95	17.50	14
15:40:24	17.39	53.10	47.52	55.81	288.0	191417.	167211.	24205.	12.65	373.47	20.73	12
15:40:54	17.72	54.20	42.42	52.90	284.6	120443.	78440.	42003.	34.87	575.08	41.39	1
15:41:24	18.13	54.40	51.55	52.15	283.7	246857.	232365.	14493.	5.87	306.95	13.91	48
15:41:54	17.25	54.44	48.13	52.78	284.4	180866.	154112.	26753.	14.79	389.91	22.41	7
15:42:24	17.23	53.86	50.37	52.91	284.6	216639.	199353.	17287.	7.98	327.28	16.00	19
15:42:54	16.65	53.49	42.84	47.75	278.1	85427.	42849.	42578.	49.84	708.67	55.08	2
15:43:24	17.21	52.85	43.16	48.89	279.6	137342.	102074.	35267.	25.68	486.18	32.28	3
15:43:54	17.36	50.83	42.96	48.00	278.4	173835.	145052.	28783.	16.56	400.75	23.53	10
15:44:24	18.06	48.82	43.41	48.07	278.5	221246.	200280.	20966.	9.48	335.28	16.82	14
15:44:54	17.95	47.40	41.32	47.02	277.2	219765.	197812.	21953.	9.99	338.71	17.17	6
15:45:24	18.06	46.98	36.92	48.89	279.6	186998.	156766.	30232.	16.17	398.19	23.26	18
15:45:54	17.89	46.15	39.73	47.53	277.8	221066.	198962.	22104.	10.00	339.45	17.24	6
15:46:24	18.00	46.21	40.57	46.17	276.0	228349.	208049.	20300.	8.89	327.44	16.01	3
15:46:54	17.95	46.06	42.46	47.10	277.3	254966.	240599.	14367.	5.63	298.46	13.04	29
15:47:24	18.28	45.75	41.64	46.49	276.5	251187.	235388.	15799.	6.29	303.74	13.59	13
15:47:54	18.00	45.88	40.92	46.21	276.1	240545.	222280.	18265.	7.59	315.47	14.79	27

FISHLAKE PROJECT - TEST 1 JUNE 21, 1984 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
16: 7:24	17.47	43.53	41.92	48.76	279.4	281444.	276030.	5414.	1.92	266.27	9.74	8
16: 7:54	17.79	44.24	40.06	44.33	273.5	248590.	232839.	15751.	6.34	301.30	13.33	13
16: 8:24	17.61	44.33	40.87	44.97	274.4	254336.	240660.	13677.	5.38	293.26	12.51	37
16: 8:54	17.60	44.42	37.85	43.93	273.0	217994.	196151.	21843.	10.02	335.01	16.79	6
16: 9:24	17.74	44.45	36.31	47.12	277.3	206982.	181896.	25086.	12.12	358.58	19.20	20
16: 9:54	17.72	44.52	39.36	46.02	275.8	231984.	213474.	18509.	7.98	318.80	15.13	19

PROJECT - JUNE 21, 1984 - TEST 2
TEST TIME 16:12:39 TO 16:54:09
MAIN FLOW LINE DIAMETER (IN) = 10.000
ORIFICE DIAMETER (IN) = 5.500
CRITICAL FLOW PIPE DIAMETER (IN) = 6.130
ATMOSPHERIC PRESSURE (PSIA) = 12.300

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO. OF ITERA-TIONS
16:14:39	12.33	13.45	12.84	48.95	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
16:15: 9	12.32	13.45	12.81	47.13	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
16:15:39	12.31	13.43	12.79	44.87	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
16:16: 9	12.34	13.43	12.76	42.94	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
16:16:39	12.33	13.42	12.75	40.92	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
16:17: 9	12.33	13.42	12.73	39.44	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
16:17:39	12.34	13.42	12.73	38.04	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
16:18: 9	12.35	13.42	12.74	36.71	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
16:18:39	12.34	13.41	12.71	35.43	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
16:19: 9	12.35	13.42	12.68	34.39	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
16:19:39	12.35	17.89	17.52	28.14	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
16:20: 9	13.97	27.58	28.17	32.50	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
16:20:39	16.66	38.19	39.28	45.01	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
16:21: 9	20.36	44.37	35.92	45.39	275.0	302665.	290805.	11860.	3.92	280.29	11.18	20
16:21:39	18.20	47.12	41.32	51.74	283.2	270399.	260649.	9749.	3.61	285.56	11.72	20
16:22: 9	18.30	48.03	50.38	51.61	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
16:22:39	16.98	49.71	48.44	53.04	284.7	286238.	286181.	57.	.02	254.10	8.50	12
16:23: 9	17.50	49.66	43.11	55.40	287.5	243840.	231768.	12072.	4.95	302.29	13.44	18
16:23:39	17.33	49.64	37.70	52.82	284.5	222493.	203957.	18536.	8.33	330.42	16.32	11
16:24: 9	17.74	48.49	38.09	51.33	282.7	235665.	219210.	16455.	6.98	316.22	14.86	16
16:24:39	17.35	47.21	41.46	49.94	280.9	253128.	242448.	10680.	4.22	289.00	12.07	4
16:25: 9	17.01	46.79	38.25	51.42	282.8	233203.	219021.	14181.	6.08	308.01	14.02	13
16:25:39	14.97	45.78	39.50	50.82	282.0	212256.	200111.	12145.	5.72	303.97	13.61	21
16:26: 9	15.60	45.51	34.47	47.69	278.0	197679.	180165.	17514.	8.86	329.10	16.18	3
16:26:39	15.46	45.13	38.13	47.91	278.3	219726.	206873.	12853.	5.85	301.50	13.36	21
16:27: 9	16.11	44.97	37.75	47.00	277.1	231672.	218932.	12740.	5.50	297.08	12.90	10
16:27:39	16.19	44.04	38.31	47.91	278.3	243794.	233710.	10084.	4.14	285.64	11.73	4
16:28: 9	16.57	44.15	37.42	45.50	275.1	241087.	229254.	11833.	4.91	289.61	12.14	7
16:28:39	16.06	43.96	36.93	45.67	275.3	234497.	222230.	12268.	5.23	292.85	12.47	18
16:29: 9	15.96	44.39	36.52	46.23	276.1	227339.	213908.	13431.	5.91	299.86	13.19	21
16:29:39	16.00	44.05	36.38	45.41	275.0	224254.	210937.	13316.	5.94	299.05	13.10	21
16:30: 9	16.14	43.22	36.45	47.66	278.0	238972.	227770.	11203.	4.69	290.43	12.22	7
16:30:39	16.24	43.62	35.19	48.06	278.5	230639.	217342.	13297.	5.77	300.91	13.29	21
16:31: 9	16.20	43.74	37.68	45.15	274.6	238179.	227115.	11065.	4.65	286.70	11.84	15
16:31:39	16.31	42.84	35.78	47.72	278.1	241564.	230310.	11254.	4.66	290.23	12.20	7
16:32: 9	16.34	43.36	36.41	45.45	275.1	241742.	230002.	11739.	4.86	289.07	12.08	7
16:32:39	16.40	43.52	36.66	45.57	275.2	240981.	229272.	11708.	4.86	289.25	12.10	7
16:33: 9	16.51	42.79	36.68	48.60	279.2	246165.	236352.	9813.	3.99	285.14	11.68	4

FISHLAKE PROJECT - TEST 2 JUNE 21, 1984 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
16:33:39	16.31	42.87	39.22	46.23	276.1	260698.	254299.	6400.	2.45	267.83	9.91	11
16:34: 9	16.54	43.26	36.24	45.72	275.4	242285.	230583.	11702.	4.83	289.17	12.09	7
16:34:39	16.56	42.93	36.56	44.22	273.4	250923.	240010.	10913.	4.35	282.69	11.43	4
16:35: 9	17.08	43.78	35.68	47.31	277.5	246453.	233860.	12593.	5.11	293.88	12.57	18
16:35:39	16.95	43.54	36.35	46.45	276.4	251560.	239993.	11567.	4.60	288.00	11.97	34
16:36: 9	16.52	43.19	36.30	45.20	274.7	240519.	228823.	11696.	4.86	288.80	12.05	7
16:36:39	16.20	42.44	37.74	47.46	277.7	252787.	244977.	7810.	3.09	275.36	10.68	17
16:37: 9	16.32	43.79	36.86	45.70	275.4	240774.	228883.	11891.	4.94	290.17	12.19	26
16:37:39	16.25	43.18	35.69	47.30	277.5	237706.	225647.	12060.	5.07	293.52	12.54	18
16:38: 9	16.38	43.85	37.05	46.42	276.4	241267.	229638.	11629.	4.82	290.02	12.18	7
16:38:39	15.86	42.85	37.78	47.09	277.2	243984.	235108.	8876.	3.64	279.95	11.15	20
16:39: 9	15.53	43.60	35.75	46.71	276.7	217060.	203653.	13408.	6.18	302.98	13.51	13
16:39:39	16.06	44.59	38.16	46.90	277.0	236122.	224537.	11584.	4.91	291.45	12.33	26
16:40: 9	16.25	42.94	36.22	44.20	273.3	237478.	225792.	11686.	4.92	287.96	11.97	7
16:40:39	16.33	43.84	38.41	46.39	276.3	245972.	236114.	9858.	4.01	282.45	11.40	12
16:41: 9	16.18	42.99	34.35	45.82	275.5	230521.	217015.	13506.	5.86	298.86	13.09	21
16:41:39	16.23	43.02	35.95	48.49	279.1	240082.	228821.	11262.	4.69	291.53	12.33	26
16:42: 9	16.16	42.68	37.33	45.57	275.2	248946.	239596.	9350.	3.76	279.01	11.05	20
16:42:39	16.09	43.28	37.36	44.88	274.3	242659.	232020.	10639.	4.38	283.92	11.55	23
16:43: 9	16.00	42.38	35.74	46.94	277.1	234670.	223683.	10987.	4.68	289.43	12.12	7
16:43:39	16.09	42.62	37.21	45.32	274.9	241839.	232173.	9665.	4.00	280.91	11.25	12
16:44: 9	16.14	42.64	37.31	48.76	279.4	248610.	239960.	8650.	3.48	280.66	11.22	20
16:44:39	16.18	43.25	35.95	47.47	277.8	235617.	223680.	11936.	5.07	293.68	12.55	18
16:45: 9	15.88	42.17	34.97	47.00	277.1	231057.	219434.	11624.	5.03	292.74	12.46	18
16:45:39	16.00	43.10	38.26	49.24	280.0	247827.	239761.	8065.	3.25	279.20	11.07	28
16:46: 9	15.92	42.16	34.26	46.07	275.9	230808.	218354.	12455.	5.40	294.90	12.68	10
16:46:39	16.40	43.17	35.45	46.99	277.1	240154.	227924.	12230.	5.09	293.29	12.51	18
16:47: 9	16.68	42.99	36.45	45.32	274.9	251373.	240501.	10872.	4.33	283.96	11.56	23
16:47:39	16.49	42.77	35.96	45.13	274.6	246257.	234992.	11265.	4.57	286.02	11.77	15
16:48: 9	16.77	43.64	36.00	47.09	277.2	240713.	228401.	12312.	5.11	293.64	12.55	18
16:48:39	16.56	43.43	35.81	46.42	276.4	240008.	227654.	12354.	5.15	293.05	12.49	18
16:49: 9	16.42	42.89	38.50	48.58	279.2	256687.	249546.	7140.	2.78	273.98	10.53	6
16:49:39	16.21	42.85	38.44	46.77	276.8	254993.	247344.	7649.	3.00	273.61	10.50	25
16:50: 9	16.18	42.74	35.85	46.68	276.7	238950.	227660.	11290.	4.72	289.48	12.12	7
16:50:39	16.32	43.32	35.55	46.29	276.2	233018.	220322.	12696.	5.45	295.68	12.76	10
16:51: 9	16.22	42.90	38.17	45.44	275.0	252747.	244223.	8524.	3.37	275.28	10.67	36
16:51:39	16.85	43.34	36.30	47.27	277.5	251175.	239989.	11187.	4.45	287.74	11.95	15
16:52: 9	16.48	43.05	36.30	45.41	275.0	246274.	235010.	11264.	4.57	286.39	11.81	15
16:52:39	16.81	42.81	37.69	49.96	281.0	263034.	255408.	7626.	2.90	276.82	10.83	17
16:53: 9	16.76	43.13	38.03	45.47	275.1	255417.	246377.	9040.	3.54	276.86	10.83	9
16:53:39	16.78	43.63	37.12	46.08	275.9	250743.	239765.	10978.	4.38	285.48	11.71	42
16:54: 9	16.63	42.77	37.25	48.54	279.1	252232.	243383.	8848.	3.51	280.64	11.22	20

FISHLAKE PROJECT - JUNE 21, 1984 - TEST 3
TEST TIME 16:54:54 TO 17:34:53
MAIN FLOW LINE DIAMETER (IN) = 10.000
ORIFICE DIAMETER (IN) = 7.500
CRITICAL FLOW PIPE DIAMETER (IN) = 6.130
ATMOSPHERIC PRESSURE (PSIA) = 12.300

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
16:54:54	16.87	43.78	36.78	46.14	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
16:55:23	16.87	43.90	36.65	46.93	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
16:55:53	16.70	42.96	36.73	47.06	277.2	86356.	37741.	48615.	56.30	767.87	61.14	2
16:56:23	16.64	42.37	33.50	49.45	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
16:56:53	16.64	42.31	38.24	49.12	279.9	171133.	140809.	30324.	17.72	412.82	24.76	10
16:57:23	12.18	29.88	17.39	47.87	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
16:57:53	12.21	15.29	12.86	51.68	283.1	251180.	251587.	0.	.00	250.73	8.15	14
16:58:23	12.22	13.38	12.89	53.91	285.8	298388.	318756.	0.	.00	192.14	2.15	13
16:58:53	12.23	13.26	12.83	51.33	282.7	306064.	328009.	0.	.00	185.62	1.48	12
16:59:23	12.23	13.28	12.82	49.58	280.5	303909.	324512.	0.	.00	186.87	1.61	15
16:59:53	12.22	13.27	12.80	47.44	277.7	301780.	321176.	0.	.00	187.18	1.64	7
17: 0:23	12.23	13.27	12.80	45.07	274.5	301879.	320300.	0.	.00	186.80	1.60	7
17: 0:53	12.23	13.28	12.78	43.14	271.8	302197.	319532.	0.	.00	187.35	1.66	18
17: 1:23	12.24	13.31	12.80	41.54	269.5	300377.	316657.	0.	.00	187.83	1.71	10
17: 1:53	12.24	13.31	12.80	39.88	267.1	300490.	316042.	0.	.00	187.51	1.68	10
17: 2:23	12.26	13.30	12.80	38.42	264.8	303967.	319234.	0.	.00	186.57	1.58	18
17: 2:53	12.25	13.30	12.80	37.08	262.7	302905.	317476.	0.	.00	186.32	1.55	18
17: 3:23	12.27	13.31	12.80	36.14	261.2	304962.	319157.	0.	.00	186.18	1.54	18
17: 3:53	12.25	13.31	16.93	32.12	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
17: 4:23	13.50	23.71	26.69	32.56	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
17: 4:53	19.42	37.65	37.15	46.24	276.1	342869.	344316.	0.	.00	241.17	7.17	8
17: 5:23	19.47	45.78	43.79	53.12	284.8	271167.	255974.	15193.	5.60	305.62	13.78	21
17: 5:53	23.33	48.50	45.61	52.63	284.3	315716.	296180.	19536.	6.19	310.45	14.27	32
17: 6:23	21.17	50.84	52.05	57.86	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
17: 6:53	21.49	52.61	49.27	54.14	286.1	256812.	230963.	25849.	10.07	347.90	18.11	25
17: 7:23	19.85	52.40	45.68	53.18	284.9	100917.	46998.	53919.	53.43	746.26	58.93	2
17: 7:53	19.19	51.50	50.87	53.29	285.0	297201.	291551.	5650.	1.90	271.73	10.31	13
17: 8:23	19.20	49.87	46.67	52.80	284.5	217043.	190914.	26129.	12.04	364.55	19.82	20
17: 8:53	18.47	48.40	46.71	50.60	281.8	249276.	233832.	15444.	6.20	308.07	14.03	13
17: 9:23	16.94	46.71	44.52	47.24	277.4	208816.	189014.	19801.	9.48	334.30	16.72	14
17: 9:53	18.37	46.16	42.58	49.15	279.9	202555.	175258.	27297.	13.48	373.62	20.75	4
17:10:23	17.49	45.02	44.91	49.02	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:10:53	17.93	43.97	40.54	48.60	279.2	208582.	183145.	25438.	12.20	361.10	19.46	20
17:11:23	17.72	44.07	42.09	47.76	278.1	245167.	228988.	16179.	6.60	308.26	14.05	24
17:11:53	17.63	43.53	42.11	49.74	280.7	255068.	243423.	11646.	4.57	291.95	12.38	7
17:12:23	17.40	43.13	46.10	49.33	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
17:12:53	17.37	42.80	42.28	45.73	275.4	290028.	286527.	3501.	1.21	255.58	8.65	15
17:13:23	16.03	43.26	42.00	47.87	278.3	230758.	219126.	11632.	5.04	293.96	12.58	18
17:13:53	17.58	43.53	42.07	46.04	275.8	258899.	246405.	12494.	4.83	289.57	12.13	7
17:14:23	17.46	43.63	41.82	45.57	275.2	245056.	229768.	15288.	6.24	302.05	13.41	13

FISHLAKE PROJECT - TEST 3   JUNE 21, 1984   (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
17:14:53	17.97	43.35	42.58	45.88	275.6	286106.	279760.	6346.	2.22	265.16	9.63	8
17:15:23	18.28	43.43	43.51	47.18	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
17:15:53	18.18	43.60	43.03	45.72	275.4	299453.	295259.	4193.	1.40	257.35	8.83	7
17:16:23	18.26	42.80	43.00	46.90	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
17:16:53	18.08	42.81	42.74	45.19	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:17:23	18.33	43.07	43.17	45.37	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
17:17:53	18.25	43.53	40.01	46.27	276.2	217770.	192723.	25047.	11.50	351.80	18.51	28
17:18:23	18.25	43.49	40.75	46.21	276.1	233140.	212450.	20690.	8.87	327.35	16.00	3
17:18:53	18.31	42.62	38.91	44.55	273.8	211748.	186068.	25680.	12.13	355.41	18.88	20
17:19:23	18.49	43.11	43.03	48.14	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:19:53	18.42	43.44	40.14	46.54	276.5	221615.	197791.	23824.	10.75	345.16	17.83	17
17:20:23	18.42	42.85	39.66	47.71	278.1	227392.	204523.	22869.	10.06	340.21	17.32	6
17:20:53	18.57	42.71	40.60	45.32	274.9	259895.	243759.	16136.	6.21	301.45	13.35	13
17:21:23	18.54	42.76	38.46	47.81	278.2	208669.	180147.	28522.	13.67	373.78	20.76	4
17:21:53	18.75	43.10	41.57	48.26	278.8	281000.	269474.	11526.	4.10	285.77	11.74	23
17:22:23	18.31	43.37	40.35	46.67	276.7	231964.	209920.	22045.	9.50	333.76	16.66	14
17:22:53	18.30	42.68	41.63	47.91	278.3	288640.	280883.	7757.	2.69	272.23	10.36	33
17:23:23	18.10	42.40	43.00	47.25	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
17:23:53	18.21	42.86	38.95	46.04	275.8	209068.	182214.	26854.	12.84	363.96	19.76	12
17:24:23	18.12	42.23	41.01	44.77	274.1	281311.	271404.	9907.	3.52	275.75	10.72	9
17:24:53	18.05	41.72	43.28	46.56	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
17:25:23	18.22	42.81	41.38	46.49	276.5	274430.	263032.	11398.	4.15	283.93	11.56	4
17:25:53	18.19	42.21	40.91	45.50	275.1	278658.	268288.	10370.	3.72	278.59	11.01	20
17:26:23	18.12	42.50	45.24	46.94	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
17:26:53	18.05	43.06	42.64	44.62	273.9	312283.	310041.	2242.	.72	249.50	8.03	11
17:27:23	18.01	42.95	43.39	45.60	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
17:27:53	18.17	43.21	42.15	46.18	276.0	284357.	275704.	8652.	3.04	273.23	10.46	6
17:28:23	17.99	42.73	41.76	46.05	275.9	285490.	277773.	7717.	2.70	269.90	10.12	41
17:28:53	18.01	42.18	39.80	48.54	279.1	242299.	224564.	17735.	7.32	315.91	14.83	8
17:29:23	18.17	43.42	42.48	46.74	276.8	285919.	278310.	7608.	2.66	270.43	10.17	22
17:29:53	18.12	43.07	39.43	48.61	279.2	211382.	185490.	25891.	12.25	361.61	19.51	20
17:30:23	18.01	42.74	41.27	48.35	278.9	266598.	255050.	11547.	4.33	288.01	11.97	15
17:30:53	17.99	42.73	42.49	48.48	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:31:23	18.02	43.02	41.17	46.80	276.9	254846.	240052.	14794.	5.81	299.65	13.17	21
17:31:53	18.52	43.14	40.35	48.74	279.4	242755.	222478.	20277.	8.35	325.73	15.84	11
17:32:23	18.40	42.85	41.55	47.44	277.7	279526.	269441.	10085.	3.61	280.14	11.17	20
17:32:53	18.38	42.93	41.29	46.64	276.6	271705.	258823.	12882.	4.74	289.58	12.13	7
17:33:23	18.33	42.85	41.65	48.89	279.6	280861.	271855.	9006.	3.21	278.31	10.98	9
17:33:53	18.72	43.52	41.44	45.38	275.0	260499.	244236.	16263.	6.24	301.85	13.39	13
17:34:23	18.30	42.44	40.33	47.87	278.3	257062.	241219.	15842.	6.16	304.35	13.65	32
17:34:53	18.42	43.46	42.37	47.35	277.6	287042.	278424.	8617.	3.00	274.41	10.58	25

FISHLAKE PROJECT - JUNE 21, 1984 - TEST 4
TEST TIME 17:35:30 TO 18:22:29
MAIN FLOW LINE DIAMETER (IN) = 10.000
ORIFICE DIAMETER (IN) = 7.500
CRITICAL FLOW PIPE DIAMETER (IN) = 7.000
ATMOSPHERIC PRESSURE (PSIA) = 12.300

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
17:35:30	18.24	42.40	40.53	44.09	273.2	367989.	356321.	11668.	3.17	271.55	10.29	6
17:35:59	18.40	42.79	39.92	47.51	277.8	348661.	332381.	16281.	4.67	290.07	12.18	7
17:36:29	18.26	42.22	41.68	47.46	277.7	419761.	421897.	0.	.00	242.02	7.26	8
17:36:59	18.43	42.84	41.13	46.17	276.0	376873.	366851.	10023.	2.66	269.65	10.09	22
17:37:29	12.65	32.47	24.90	46.65	276.7	176479.	142119.	34360.	19.47	426.14	26.13	10
17:37:59	12.39	16.19	13.05	50.10	281.1	340406.	346575.	0.	.00	233.47	6.38	16
17:38:29	12.42	13.95	13.04	53.51	285.3	394684.	421555.	0.	.00	191.79	2.11	10
17:38:59	12.41	13.47	13.04	51.29	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:39:29	12.43	13.41	13.04	49.55	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:39:59	12.43	13.38	13.04	47.78	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:40:29	12.42	13.33	13.01	45.37	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:40:59	12.44	13.30	13.00	43.36	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:41:29	12.43	13.27	13.00	41.52	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:41:59	12.42	13.15	12.99	39.74	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:42:29	12.43	13.10	12.98	38.17	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:42:59	12.43	13.10	12.96	36.77	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:43:29	12.44	13.07	12.95	35.43	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:43:59	12.44	13.07	12.95	34.21	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:44:29	12.44	13.07	12.93	33.26	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:44:59	12.43	13.07	12.93	32.30	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:45:29	12.45	13.08	12.92	31.15	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:45:59	12.45	13.04	12.93	30.26	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:46:29	12.45	13.05	12.93	29.47	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:46:59	12.43	13.07	12.94	27.71	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:47:29	12.44	17.06	21.09	25.54	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
17:47:59	17.31	33.30	36.97	39.33	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
17:48:29	19.28	43.08	43.77	52.30	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
17:48:59	19.04	48.81	46.25	58.49	291.0	353840.	338479.	15361.	4.34	300.17	13.22	7
17:49:29	20.20	53.39	48.78	54.89	286.9	325407.	296789.	28617.	8.79	337.04	17.00	3
17:49:59	19.33	55.38	48.83	53.92	285.8	251585.	211877.	39708.	15.78	400.29	23.48	18
17:50:29	19.04	55.33	47.57	52.81	284.5	227529.	183069.	44460.	19.54	433.70	26.90	5
17:50:59	17.93	54.78	45.75	52.02	283.5	161754.	108883.	52871.	32.69	554.08	39.24	9
17:51:29	16.97	53.48	43.05	54.61	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
17:51:59	18.44	52.88	44.79	51.08	282.4	213550.	168767.	44783.	20.97	445.04	28.06	16
17:52:29	16.31	51.36	42.73	50.45	281.6	134513.	81456.	53057.	39.44	614.97	45.48	4
17:52:59	16.47	49.08	43.08	49.61	280.5	209337.	172117.	37220.	17.78	413.93	24.88	2
17:53:29	16.06	47.08	41.93	48.54	279.1	226497.	194083.	32414.	14.31	380.60	21.46	15
17:53:59	16.39	45.85	41.66	48.42	279.0	264610.	238144.	26467.	10.00	340.59	17.36	6
17:54:29	15.66	45.66	40.20	47.59	277.9	218801.	185649.	33153.	15.15	387.25	22.14	7
17:54:59	15.93	45.39	41.15	46.84	276.9	252298.	225297.	27002.	10.70	345.10	17.82	17
17:55:29	15.73	45.29	40.20	45.57	275.2	230747.	199916.	30830.	13.36	368.16	20.19	4
17:55:59	15.40	45.03	39.03	46.20	276.1	206047.	170980.	35067.	17.02	402.87	23.74	10
17:56:29	15.47	44.21	39.85	46.21	276.1	241967.	214588.	27380.	11.32	349.99	18.32	9
17:56:59	15.20	43.79	38.24	47.92	278.3	214505.	181544.	32961.	15.37	389.63	22.39	7
17:57:29	14.83	43.66	38.11	48.07	278.5	204057.	170427.	33630.	16.48	400.13	23.46	18

FISHLAKE PROJECT - TEST 4 JUNE 21, 1984 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO. OF ITERA-TIONS
17:57:59	15.26	43.25	39.11	44.18	273.3	242756.	216724.	26032.	10.72	341.87	17.49	17
17:58:29	15.34	42.33	39.25	44.21	273.3	271961.	251666.	20295.	7.46	311.60	14.39	8
17:58:59	15.46	42.07	38.84	44.21	273.3	274326.	253582.	20744.	7.56	312.53	14.49	27
17:59:29	15.24	42.23	39.54	45.18	274.7	277980.	259772.	18209.	6.55	304.42	13.66	5
17:59:59	15.38	41.93	39.37	45.77	275.5	280644.	263384.	17260.	6.15	301.50	13.36	13
18: 0:29	15.17	42.09	38.53	44.84	274.2	256149.	233376.	22773.	8.89	325.72	15.84	3
18: 0:59	15.65	42.14	39.84	44.91	274.3	300466.	284941.	15525.	5.17	291.23	12.30	18
18: 1:29	15.06	41.95	38.15	44.62	273.9	250601.	226730.	23870.	9.53	331.32	16.41	14
18: 1:59	15.47	41.95	39.24	45.03	274.5	287986.	270162.	17824.	6.19	300.88	13.29	13
18: 2:29	15.18	41.89	38.75	44.40	273.6	270445.	250024.	20421.	7.55	312.68	14.50	27
18: 2:59	15.88	41.70	38.78	46.84	276.9	286274.	267795.	18479.	6.46	305.73	13.79	5
18: 3:29	14.77	41.72	38.08	43.95	273.0	245567.	222166.	23400.	9.53	330.46	16.32	14
18: 3:59	14.94	41.81	38.18	45.89	275.6	254877.	231915.	22962.	9.01	328.18	16.09	22
18: 4:29	15.36	41.92	39.17	47.18	277.4	279557.	261530.	18026.	6.45	306.10	13.83	5
18: 4:59	14.87	41.64	38.73	45.29	274.8	262947.	243467.	19480.	7.41	312.54	14.49	8
18: 5:29	16.05	41.92	39.84	45.32	274.9	309835.	295900.	13934.	4.50	285.56	11.72	15
18: 5:59	15.59	41.80	39.49	44.31	273.5	300216.	284646.	15570.	5.19	290.59	12.24	18
18: 6:29	15.25	41.89	39.51	44.75	274.1	281475.	264970.	16504.	5.86	297.48	12.94	21
18: 6:59	15.69	41.83	39.02	45.26	274.8	292368.	274323.	18044.	6.17	301.03	13.31	13
18: 7:29	15.89	41.87	39.13	43.38	272.2	296815.	278924.	17891.	6.03	297.13	12.91	40
18: 7:59	15.07	41.89	39.10	44.55	273.8	269089.	250144.	18945.	7.04	308.14	14.04	16
18: 8:29	14.88	41.81	37.56	46.23	276.1	240744.	214742.	26002.	10.80	345.24	17.84	17
18: 8:59	14.82	41.85	38.29	47.11	277.3	252873.	230117.	22757.	9.00	329.65	16.24	22
18: 9:29	15.59	41.89	40.25	45.47	275.1	309356.	297921.	11435.	3.70	278.32	10.98	20
18: 9:59	16.12	42.11	40.40	44.46	273.7	328204.	316588.	11616.	3.54	275.49	10.69	9
18:10:29	16.12	41.85	39.82	46.42	276.4	319092.	306059.	13033.	4.08	283.20	11.48	4
18:10:59	16.43	41.80	40.18	45.54	275.2	338078.	327716.	10362.	3.06	272.56	10.39	44
18:11:29	15.09	41.82	39.24	44.82	274.2	281379.	263951.	17428.	6.19	300.65	13.27	13
18:11:59	15.46	41.94	39.44	44.85	274.2	287670.	270813.	16857.	5.86	297.59	12.95	21
18:12:29	15.63	41.83	39.37	45.19	274.7	298477.	282266.	16211.	5.43	294.05	12.59	10
18:12:59	16.09	41.72	40.36	45.07	274.5	335611.	326698.	8913.	2.66	268.12	9.94	22
18:13:29	15.02	41.84	38.78	43.42	272.2	267227.	246963.	20264.	7.58	311.66	14.40	27
18:13:59	17.95	41.83	40.83	45.61	275.3	389683.	385060.	4623.	1.19	255.22	8.61	7
18:14:29	15.84	42.05	40.15	44.88	274.3	310702.	297578.	13124.	4.22	282.43	11.40	4
18:14:59	14.91	41.78	38.16	46.89	277.0	254521.	231610.	22910.	9.00	329.39	16.21	22
18:15:29	14.70	41.57	38.03	46.08	275.9	251400.	228750.	22650.	9.01	328.44	16.12	22
18:15:59	15.04	41.87	38.36	43.99	273.0	254145.	231525.	22620.	8.90	324.68	15.73	3
18:16:29	15.72	41.87	39.61	45.01	274.5	296949.	281677.	15271.	5.14	291.14	12.29	18
18:16:59	15.14	41.93	39.25	44.05	273.1	276491.	258266.	18225.	6.59	303.29	13.54	5
18:17:29	15.35	41.75	39.25	45.32	274.9	287213.	270487.	16727.	5.82	297.87	12.98	21
18:17:59	14.84	41.71	38.03	43.95	273.0	246861.	223338.	23524.	9.53	330.46	16.32	14
18:18:29	14.82	41.69	38.25	43.38	272.2	251193.	228814.	22380.	8.91	323.93	15.65	3
18:18:59	15.84	41.45	39.65	44.08	273.2	321030.	308892.	12138.	3.78	277.21	10.87	20
18:19:29	15.00	41.89	39.20	43.49	272.3	276785.	258469.	18316.	6.62	302.77	13.49	5
18:19:59	15.24	41.68	39.36	44.78	274.1	289786.	273998.	15788.	5.45	293.66	12.55	10
18:20:29	14.96	41.79	38.83	43.46	272.9	265479.	245636.	19843.	7.47	310.71	14.30	8
18:20:59	14.79	41.62	38.61	44.94	274.4	264556.	244641.	19915.	7.53	313.19	14.55	27
18:21:29	15.04	41.65	38.68	45.75	275.4	265861.	246203.	19658.	7.39	313.01	14.54	8
18:21:59	15.66	41.86	39.54	44.21	273.3	300467.	284852.	15615.	5.20	290.55	12.23	18
18:22:29	15.57	41.69	39.87	45.26	274.8	313058.	300772.	12286.	3.92	280.16	11.17	12

FISHLAKE PROJECT - JUNE 21, 1984 - TEST 5
TEST TIME 18:23:03 TO 19:03:32
MAIN FLOW LINE DIAMETER (IN) = 10.000
ORIFICE DIAMETER (IN) = 5.500
CRITICAL FLOW PIPE DIAMETER (IN) = 7.000
ATMOSPHERIC PRESSURE (PSIA) = 12.300

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
18:23: 3	15.69	41.63	39.65	44.98	274.4	365166.	366044.	0.	.00	241.11	7.17	8
18:23:32	15.63	41.84	39.59	46.43	276.4	361998.	362417.	0.	.00	244.27	7.49	7
18:24: 2	15.04	41.64	38.88	45.82	275.5	340475.	338640.	1835.	.54	249.50	8.03	6
18:24:32	15.02	41.71	38.30	43.06	271.7	330167.	325517.	4651.	1.41	253.70	8.46	15
18:25: 2	13.94	37.91	34.23	45.38	275.0	314005.	311432.	2572.	.82	251.49	8.23	18
18:25:32	12.52	19.63	13.09	47.21	277.4	334793.	342255.	0.	.00	225.75	5.59	18
18:26: 2	12.49	13.75	13.03	50.81	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
18:26:32	12.50	13.15	13.03	52.17	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
18:27: 2	12.46	13.10	13.04	50.00	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
18:27:32	12.48	13.09	13.04	48.30	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
18:28: 2	12.51	13.08	13.01	46.23	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
18:28:32	12.51	13.09	13.00	43.99	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
18:29: 2	12.51	13.06	13.00	42.27	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
18:29:32	12.50	13.07	12.99	40.41	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
18:30: 2	12.50	13.07	13.01	37.91	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
18:30:32	12.49	23.39	21.20	30.24	250.8	344088.	347680.	0.	.00	209.41	3.92	9
18:31: 2	14.93	34.44	33.05	42.30	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
18:31:32	15.04	42.95	34.77	44.63	273.9	305650.	294646.	11004.	3.60	276.30	10.77	9
18:32: 2	15.41	46.08	36.08	49.46	280.3	294567.	281350.	13217.	4.49	290.87	12.27	15
18:32:32	14.89	46.81	35.33	51.52	282.9	278248.	263426.	14822.	5.33	301.17	13.32	10
18:33: 2	15.71	48.73	38.11	52.34	283.9	288074.	273421.	14653.	5.09	299.95	13.20	18
18:33:32	15.13	47.53	36.22	52.14	283.7	279748.	264836.	14913.	5.33	301.95	13.40	10
18:34: 2	14.49	46.96	36.72	53.06	284.8	268960.	254850.	14111.	5.25	302.27	13.43	10
18:34:32	14.48	46.85	36.98	50.16	281.2	265376.	251018.	14358.	5.41	300.28	13.23	10
18:35: 2	14.90	46.85	36.35	49.01	279.7	280136.	265606.	14530.	5.19	296.77	12.87	18
18:35:32	14.76	46.20	35.87	48.19	278.7	276276.	261907.	14369.	5.20	295.85	12.78	18
18:36: 2	13.93	44.53	34.55	47.15	277.3	264719.	250841.	13878.	5.24	294.89	12.68	37
18:36:32	14.15	45.41	34.91	47.30	277.5	265604.	250978.	14626.	5.51	297.53	12.95	10
18:37: 2	13.75	43.98	33.13	47.49	277.8	260475.	246167.	14308.	5.49	297.66	12.96	29
18:37:32	13.76	43.34	33.66	49.11	279.9	260176.	247255.	12921.	4.97	294.86	12.68	18
18:38: 2	14.70	44.87	35.28	48.26	278.8	285986.	273146.	12840.	4.49	289.37	12.11	15
18:38:32	13.94	43.40	33.30	48.04	278.5	263868.	250575.	13293.	5.04	294.16	12.60	18
18:39: 2	13.41	43.59	33.45	46.13	276.0	253772.	239675.	14097.	5.55	296.45	12.84	29
18:39:32	14.10	43.48	34.30	44.62	273.9	276501.	263596.	12905.	4.67	286.19	11.79	15
18:40: 2	13.86	43.23	33.71	44.44	273.7	269739.	256461.	13278.	4.92	288.32	12.00	7
18:40:32	13.95	43.14	33.09	46.51	276.5	269236.	256017.	13219.	4.91	290.97	12.28	45
18:41: 2	13.32	42.47	31.24	45.45	275.1	245991.	230762.	15229.	6.19	301.46	13.35	13
18:41:32	14.08	43.06	33.99	47.32	277.6	273932.	261798.	12134.	4.43	287.59	11.93	15

FISHLAKE PROJECT - TEST 5 JUNE 21, 1984 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
18:42: 2	14.21	43.19	34.09	43.67	272.6	274675.	261705.	12970.	4.72	285.39	11.70	15
18:42:32	14.01	43.46	33.51	45.95	275.7	271943.	258623.	13320.	4.90	290.12	12.19	26
18:43: 2	14.38	43.58	34.99	45.53	275.1	282361.	270240.	12121.	4.29	283.93	11.56	4
18:43:32	13.57	42.99	32.87	44.98	274.4	260155.	246388.	13767.	5.29	292.49	12.43	37
18:44: 2	13.32	42.56	31.88	47.57	277.9	248221.	233972.	14249.	5.74	300.06	13.21	21
18:44:32	13.59	42.55	32.47	48.22	278.7	260478.	247517.	12961.	4.98	293.81	12.57	18
18:45: 2	14.13	43.95	34.73	45.00	274.4	269465.	256177.	13288.	4.93	289.16	12.09	7
18:45:32	13.62	43.21	34.13	46.97	277.1	265432.	252861.	12570.	4.74	289.97	12.17	7
18:46: 2	13.92	43.23	34.37	45.85	275.6	272244.	259849.	12395.	4.55	286.78	11.85	15
18:46:32	13.35	42.76	32.96	44.25	273.4	250206.	236329.	13876.	5.55	293.85	12.57	10
18:47: 2	13.15	42.29	32.40	45.64	275.3	249167.	235639.	13528.	5.43	294.64	12.65	10
18:47:32	13.40	42.75	33.01	43.48	272.3	258435.	244721.	13714.	5.31	290.56	12.23	18
18:48: 2	13.40	42.77	33.24	45.41	275.0	256637.	243361.	13276.	5.17	291.95	12.38	18
18:48:32	13.62	42.02	32.93	45.06	274.5	267677.	255384.	12293.	4.59	286.09	11.78	34
18:49: 2	13.46	42.83	32.45	43.95	273.0	255026.	240820.	14206.	5.57	293.66	12.55	10
18:49:32	13.46	42.59	32.67	44.03	273.1	259268.	245640.	13628.	5.26	290.86	12.27	18
18:50: 2	13.56	42.54	32.86	44.40	273.6	257101.	243661.	13441.	5.23	291.10	12.29	18
18:50:32	14.98	43.54	33.88	46.80	276.9	293483.	281198.	12285.	4.19	284.64	11.63	4
18:51: 2	13.17	42.67	32.51	44.49	273.7	250427.	236391.	14036.	5.60	294.72	12.66	29
18:51:32	13.25	41.96	32.29	47.56	277.9	254846.	242149.	12697.	4.98	293.02	12.49	18
18:52: 2	14.52	42.97	33.67	46.90	277.0	287577.	275691.	11887.	4.13	284.29	11.59	4
18:52:32	13.97	43.24	33.47	47.68	278.0	272025.	259271.	12754.	4.69	290.45	12.22	7
18:53: 2	13.68	42.51	33.71	47.87	278.3	269013.	257310.	11702.	4.35	287.56	11.93	15
18:53:32	14.66	43.50	34.12	46.87	277.0	290459.	278327.	12132.	4.18	284.65	11.63	4
18:54: 2	13.43	43.18	33.24	45.77	275.5	252896.	239057.	13839.	5.47	295.22	12.71	10
18:54:32	14.04	43.02	33.79	46.29	276.2	275243.	262845.	12398.	4.50	286.92	11.86	15
18:55: 2	13.55	42.76	33.52	43.33	272.1	262876.	249619.	13256.	5.04	287.91	11.96	26
18:55:32	13.42	42.51	32.34	47.92	278.3	252156.	238784.	13372.	5.30	296.46	12.84	10
18:56: 2	13.56	42.50	33.38	46.23	276.1	263163.	250687.	12476.	4.74	289.04	12.08	7
18:56:32	13.34	42.19	32.04	44.94	274.4	250827.	237112.	13715.	5.47	294.06	12.59	10
18:57: 2	13.66	42.60	32.65	45.16	274.7	259611.	246165.	13446.	5.18	291.68	12.35	18
18:57:32	13.16	42.09	31.47	46.05	275.9	246662.	232354.	14308.	5.80	298.63	13.06	21
18:58: 2	13.37	42.94	33.03	45.56	275.2	251797.	238018.	13780.	5.47	294.93	12.68	10
18:58:32	14.18	42.58	33.44	45.60	275.2	281926.	269884.	12042.	4.27	283.84	11.55	23
18:59: 2	13.30	42.12	32.39	46.32	276.2	255959.	242976.	12983.	5.07	292.22	12.40	18
18:59:32	13.25	42.43	32.73	44.17	273.3	254615.	241088.	13526.	5.31	291.56	12.34	37
19: 0: 2	13.21	41.84	31.48	45.29	274.8	251005.	237388.	13618.	5.43	294.13	12.60	10
19: 0:32	13.49	41.76	32.87	46.27	276.2	267039.	255253.	11786.	4.41	286.06	11.77	15
19: 1: 2	13.38	42.71	32.88	44.12	273.2	256697.	243008.	13689.	5.33	291.69	12.35	37
19: 1:32	13.90	43.11	34.40	45.69	275.4	270325.	258007.	12318.	4.56	286.60	11.83	15
19: 2: 2	14.21	43.42	34.56	45.22	274.7	273032.	260430.	12603.	4.62	286.52	11.82	15
19: 2:32	14.18	43.69	33.96	45.76	275.5	273370.	260093.	13277.	4.86	289.49	12.12	7
19: 3: 2	13.75	42.79	34.25	47.03	277.2	267195.	255355.	11840.	4.43	287.22	11.89	15
19: 3:32	14.44	43.07	34.25	47.35	277.6	282891.	271278.	11612.	4.10	284.62	11.63	4

FISHLAKE PROJECT - JUNE 21, 1984 - TEST 6
TEST TIME 19:03:45 TO 19:35:14
MAIN FLOW LINE DIAMETER (IN) = 10.000
ORIFICE DIAMETER (IN) = 6.500
CRITICAL FLOW PIPE DIAMETER (IN) = 7.000
ATMOSPHERIC PRESSURE (PSIA) = 12.300

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO. OF ITERA-TIONS
19: 3:45	13.72	42.93	33.93	44.78	274.1	209217.	183861.	25356.	12.12	355.63	18.90	20
19: 4:14	14.23	42.57	33.78	47.81	278.2	233146.	209334.	23811.	10.21	341.78	17.48	25
19: 4:44	14.52	43.10	33.92	45.41	275.0	229757.	205072.	24684.	10.74	343.66	17.68	17
19: 5:14	12.70	35.86	24.19	46.94	277.1	185086.	154748.	30338.	16.39	397.95	23.24	7
19: 5:44	12.39	17.75	13.21	48.73	279.4	344103.	352620.	0.	.00	225.53	5.57	29
19: 6:14	12.40	13.59	13.14	52.34	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
19: 6:44	12.41	13.18	13.13	51.32	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
19: 7:14	12.42	13.14	13.13	49.37	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
19: 7:44	12.41	13.15	13.12	47.72	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
19: 8:14	12.41	13.15	13.11	45.51	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
19: 8:44	12.41	13.14	13.10	43.36	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
19: 9:14	12.40	13.14	13.10	41.46	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
19: 9:44	12.40	13.12	13.07	39.85	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
19:10:14	12.39	13.11	13.06	38.23	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
19:10:44	12.39	13.11	13.06	36.45	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
19:11:14	12.38	15.62	15.21	29.73	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
19:11:44	15.28	29.25	29.60	35.47	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
19:12:14	17.24	42.25	40.41	47.08	277.2	383900.	380914.	2987.	.78	253.43	8.43	12
19:12:44	20.10	48.77	45.43	49.91	280.9	408615.	398794.	9821.	2.40	272.18	10.35	27
19:13:14	19.77	49.77	45.90	54.07	286.0	391204.	380465.	10739.	2.75	280.44	11.20	14
19:13:44	17.52	49.52	45.11	55.28	287.4	325101.	311081.	14020.	4.31	296.29	12.82	15
19:14:14	17.29	49.27	45.02	53.64	285.5	329836.	316131.	13705.	4.16	292.91	12.48	23
19:14:44	16.45	48.70	45.04	51.79	283.2	309751.	296775.	12976.	4.19	291.00	12.28	4
19:15:14	16.97	47.82	44.84	51.30	282.6	342407.	332756.	9651.	2.82	277.76	10.92	14
19:15:44	15.36	45.22	41.58	52.63	284.3	298266.	286729.	11537.	3.87	289.06	12.08	4
19:16:14	15.68	45.25	42.18	47.72	278.1	316450.	305925.	10525.	3.33	277.89	10.94	17
19:16:44	16.41	44.81	42.07	49.43	280.3	340024.	331966.	8058.	2.37	271.26	10.26	30
19:17:14	15.83	44.58	41.49	48.11	278.6	315223.	305049.	10174.	3.23	277.49	10.90	17
19:17:44	15.52	44.25	41.42	45.85	275.6	314216.	304230.	9986.	3.18	274.03	10.54	6
19:18:14	14.81	43.30	41.60	48.55	279.2	314007.	309306.	4701.	1.50	262.05	9.31	13
19:18:44	14.77	42.56	39.86	47.88	278.3	302534.	294014.	8521.	2.82	273.38	10.47	6
19:19:14	15.06	43.09	40.61	46.92	277.0	310930.	302816.	8115.	2.61	270.19	10.15	22
19:19:44	15.45	42.87	40.50	45.63	275.3	323980.	316302.	7678.	2.37	266.23	9.74	19
19:20:14	15.15	42.65	40.82	46.40	276.3	323309.	317924.	5385.	1.67	260.75	9.18	13
19:20:44	14.46	41.71	39.39	45.94	275.7	307632.	300371.	7261.	2.36	266.56	9.78	11
19:21:14	15.00	42.20	40.20	45.31	274.9	324521.	318387.	6134.	1.89	261.34	9.24	24
19:21:44	14.84	41.85	40.25	46.49	276.5	326082.	322160.	3922.	1.20	256.58	8.75	18
19:22:14	14.47	42.06	39.66	44.31	273.5	302933.	294536.	8397.	2.77	268.15	9.94	22

FISHLAKE PROJECT - TEST 6 JUNE 21, 1984 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
19:22:44	14.32	41.52	39.31	47.21	277.4	300502.	293870.	6632.	2.21	266.85	9.80	11
19:23:14	14.48	41.75	39.59	45.91	275.7	306511.	299722.	6789.	2.21	265.17	9.63	19
19:23:44	14.78	42.62	39.92	45.19	274.7	302740.	293406.	9335.	3.08	272.25	10.36	6
19:24:14	14.80	42.66	40.36	45.38	275.0	309597.	301787.	7809.	2.52	267.31	9.85	11
19:24:44	15.34	42.48	40.27	46.04	275.8	322932.	316146.	6786.	2.10	264.30	9.54	8
19:25:14	14.66	42.18	39.69	44.22	273.4	307711.	299116.	8595.	2.79	268.23	9.95	22
19:25:44	14.55	41.82	39.41	45.73	275.4	302387.	294531.	7856.	2.60	268.49	9.97	22
19:26:14	14.48	41.39	38.97	44.91	274.3	302168.	294199.	7969.	2.64	267.73	9.90	22
19:26:44	14.64	41.94	39.89	45.95	275.7	310654.	304286.	6368.	2.05	263.70	9.48	8
19:27:14	14.67	41.40	39.42	45.83	275.6	313003.	307168.	5836.	1.86	261.82	9.29	16
19:27:44	14.43	41.46	39.67	45.95	275.7	308911.	303673.	5238.	1.70	260.41	9.15	5
19:28:14	14.12	40.56	38.57	46.92	277.0	302200.	296806.	5394.	1.79	262.55	9.36	8
19:28:44	15.94	42.17	39.90	45.04	274.5	343812.	337223.	6589.	1.92	261.22	9.23	24
19:29:14	15.43	42.12	40.16	45.99	275.8	331766.	326295.	5471.	1.65	260.04	9.11	13
19:29:44	14.41	42.01	39.75	45.34	274.9	305482.	297976.	7506.	2.46	266.64	9.78	11
19:30:14	14.75	41.86	39.87	45.73	275.4	314501.	308433.	6068.	1.93	262.28	9.34	16
19:30:44	15.05	42.32	40.36	45.57	275.2	324813.	318829.	5984.	1.84	261.25	9.23	5
19:31:14	15.07	42.47	40.13	45.26	274.8	320342.	312767.	7575.	2.36	265.68	9.68	19
19:31:44	15.01	42.43	39.93	44.17	273.3	309435.	300691.	8744.	2.83	268.45	9.97	22
19:32:14	15.16	42.62	40.32	44.50	273.7	318947.	311083.	7864.	2.47	265.57	9.67	19
19:32:44	14.13	40.96	38.94	47.59	277.9	306079.	300696.	5383.	1.76	263.20	9.43	8
19:33:14	14.60	41.93	39.99	45.66	275.3	311427.	305365.	6062.	1.95	262.34	9.34	16
19:33:44	14.91	42.04	40.12	46.37	276.3	320127.	314633.	5494.	1.72	261.18	9.22	5
19:34:14	14.47	41.52	39.45	44.68	274.0	310453.	303801.	6652.	2.14	262.82	9.39	8
19:34:44	14.29	41.65	39.28	45.42	275.0	299540.	291718.	7823.	2.61	268.19	9.94	22
19:35:14	14.70	42.11	39.98	44.85	274.2	314642.	307633.	7008.	2.23	263.85	9.50	27

FISHLAKE PROJECT - JUNE 21, 1984 - TEST EIGHT
TEST TIME 21:06:49 TO 21:54:49
MAIN FLOW LINE DIAMETER (IN) = 10.000
ORIFICE DIAMETER (IN) = 5.500
CRITICAL FLOW PIPE DIAMETER (IN) = 5.000
ATMOSPHERIC PRESSURE (PSIA) = 12.300

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO.OF ITERA-TIONS
21: 6:49	12.45	12.50	15.47	37.05	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21: 7:19	12.44	12.50	15.48	36.14	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21: 7:49	12.45	12.49	15.48	34.08	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21: 8:19	15.29	24.71	24.25	32.40	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
21: 8:49	19.27	37.56	40.80	41.67	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21: 9:19	19.53	42.87	43.79	42.85	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21: 9:49	19.73	45.49	45.88	43.86	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:10:19	18.81	46.79	46.11	47.34	277.6	212770.	212063.	707.	.33	249.66	8.04	9
21:10:49	20.18	48.20	45.33	48.11	278.6	194759.	186546.	8212.	4.22	286.65	11.83	12
21:11:19	19.77	48.69	46.42	48.42	279.0	198625.	191792.	6833.	3.44	279.86	11.14	44
21:11:49	20.58	48.90	45.49	48.99	279.7	197194.	187876.	9318.	4.73	292.48	12.43	15
21:12:19	18.58	48.47	46.17	50.09	281.1	181798.	174791.	7007.	3.85	285.81	11.75	20
21:12:49	18.81	48.53	46.65	48.36	278.9	189515.	183505.	6010.	3.17	277.30	10.88	14
21:13:19	19.40	48.48	46.81	46.65	276.7	202879.	197413.	5466.	2.69	270.62	10.19	8
21:13:49	17.01	47.93	47.29	47.53	277.8	187799.	186143.	1655.	.88	255.00	8.59	8
21:14:19	18.05	47.59	46.79	48.63	279.3	197184.	195379.	1805.	.92	256.76	8.77	14
21:14:49	18.61	46.93	43.69	46.99	277.1	175253.	165910.	9342.	5.33	295.50	12.74	18
21:15:19	18.74	46.66	43.16	45.92	275.7	174770.	164858.	9912.	5.67	297.26	12.92	10
21:15:49	19.02	46.47	45.33	45.73	275.4	207636.	204331.	3305.	1.59	259.15	9.02	23
21:16:19	18.80	46.47	42.80	47.78	278.2	176549.	166635.	9915.	5.62	299.17	13.12	29
21:16:49	18.52	46.27	43.26	46.24	276.1	175616.	166833.	8783.	5.00	291.47	12.33	7
21:17:19	18.32	46.17	44.90	46.84	276.9	194912.	191169.	3742.	1.92	263.70	9.48	21
21:17:49	18.00	46.23	43.78	45.83	275.6	177746.	170187.	7559.	4.25	283.98	11.56	12
21:18:19	18.30	45.50	42.79	48.14	278.6	178793.	171231.	7563.	4.23	286.81	11.85	4
21:18:49	17.35	44.91	43.07	47.32	277.6	176869.	171391.	5478.	3.10	275.25	10.67	6
21:19:19	17.79	44.62	42.67	47.12	277.3	181282.	175682.	5601.	3.09	274.91	10.63	6
21:19:49	18.61	45.02	42.78	43.74	272.7	192229.	185478.	6750.	3.51	274.23	10.56	25
21:20:19	18.15	44.81	42.98	42.87	271.4	186472.	180472.	6000.	3.22	270.26	10.15	22
21:20:49	17.93	44.78	43.13	43.16	271.9	189766.	184346.	5420.	2.86	267.32	9.85	19
21:21:19	16.99	44.36	44.69	44.87	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:21:49	17.93	44.38	42.81	43.25	272.0	191092.	186057.	5035.	2.63	265.38	9.65	8
21:22:19	17.54	42.94	42.23	46.18	276.0	204511.	204190.	321.	.16	246.46	7.72	10
21:22:49	18.03	42.96	42.59	42.51	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
21:23:19	18.03	43.03	41.48	45.99	275.8	192798.	188874.	3924.	2.04	263.62	9.47	16
21:23:49	18.08	43.19	43.47	42.11	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:24:19	18.57	43.25	42.08	44.21	273.3	206755.	203906.	2848.	1.38	255.05	8.60	23
21:24:49	18.68	44.66	45.44	43.45	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:25:19	17.85	44.66	42.96	46.96	277.1	186767.	181970.	4797.	2.57	269.86	10.11	11
21:25:49	17.76	44.57	42.96	45.42	275.0	186810.	181994.	4816.	2.58	267.88	9.91	19
21:26:19	18.01	44.56	44.76	43.70	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:26:49	18.30	44.67	43.25	44.97	274.4	198069.	193960.	4109.	2.07	262.59	9.37	13
21:27:19	17.95	44.58	42.79	46.71	276.7	189671.	184690.	4981.	2.63	270.07	10.13	30

FISHLAKE PROJECT - TEST EIGHT JUNE 21, 1984 (CONTINUED)

TIME (HR:MIN :SEC)	LIP PRESS. (PSIA)	ORIFICE UPSTREAM PRESSURE (PSIA)	ORIFICE DOWNSTREAM PRESSURE (PSIA)	WELLHEAD PRESSURE (PSIA)	WELLHEAD TEMPERA-TURE (DEG.F)	TOTAL MASS FLOW RATE (LBS/HR)	WATER RATE AT WELLHEAD (LBS/HR)	STEAM RATE AT WELLHEAD (LBS/HR)	WELLHEAD STEAM QUALITY (PERCENT)	TOTAL FLUID ENTHALPY (BTU/LB)	STEAM QUAL AT ATM PR. (PERCENT)	NO. OF ITERA-TIONS
21:27:49	18.00	44.66	42.00	44.46	273.7	175855.	167999.	7857.	4.47	284.12	11.57	4
21:28:19	18.15	43.69	42.27	46.02	275.8	196924.	193313.	3611.	1.83	261.79	9.29	13
21:28:49	18.28	42.98	43.74	45.16	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:29:19	19.04	43.32	42.91	43.89	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
21:29:49	18.31	42.99	43.00	42.31	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:30:19	18.58	43.42	43.71	47.85	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:30:49	18.31	44.75	44.95	42.87	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:31:19	18.05	44.42	42.73	46.07	275.9	191541.	186769.	4772.	2.49	267.96	9.92	19
21:31:49	18.11	44.60	43.41	43.45	272.3	196381.	192597.	3784.	1.93	259.08	9.01	18
21:32:19	18.09	44.08	42.40	47.44	277.7	189611.	185240.	4371.	2.31	268.07	9.93	19
21:32:49	17.46	44.22	43.98	45.51	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
21:33:19	17.97	44.37	42.72	43.13	271.8	189082.	183759.	5323.	2.81	266.89	9.81	19
21:33:49	18.65	44.22	43.41	40.38	267.8	210345.	207501.	2844.	1.35	249.23	8.00	16
21:34:19	17.38	43.99	42.68	45.04	274.5	185314.	181422.	3892.	2.10	262.93	9.40	5
21:34:49	18.26	44.29	43.05	46.11	275.9	200270.	197156.	3114.	1.55	259.33	9.03	18
21:35:19	17.84	44.32	43.24	46.93	277.0	196660.	194196.	2464.	1.25	257.63	8.86	15
21:35:49	17.75	44.07	43.88	43.64	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
21:36:19	18.00	44.35	43.73	43.74	272.7	208742.	207984.	758.	.36	244.96	7.56	8
21:36:49	18.00	44.29	42.18	45.58	275.2	185967.	179914.	6053.	3.25	274.38	10.58	25
21:37:19	17.85	44.03	43.01	41.51	269.5	199043.	195562.	3480.	1.75	254.61	8.55	12
21:37:49	18.06	42.99	42.36	44.11	273.2	210681.	210465.	216.	.10	243.05	7.37	8
21:38:19	18.18	43.03	41.96	43.49	272.3	202918.	200186.	2731.	1.35	253.74	8.46	12
21:38:49	18.67	43.16	45.51	43.82	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:39:19	18.16	43.04	46.04	43.41	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:39:49	18.09	43.18	45.43	44.53	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:40:19	18.52	43.34	42.66	43.90	272.9	217298.	216815.	483.	.22	243.87	7.45	11
21:40:49	18.02	42.89	42.40	44.49	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
21:41:19	15.45	36.92	36.46	44.20	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
21:41:49	12.43	16.18	15.59	48.06	278.5	198796.	211468.	0.	.00	188.53	1.78	10
21:42:19	12.43	13.50	14.60	48.99	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:42:49	12.43	13.12	14.55	47.15	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:43:19	12.43	13.07	14.56	45.23	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:43:49	12.45	13.08	14.56	43.46	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:44:19	12.44	13.06	14.58	41.30	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:44:49	12.45	13.03	14.60	39.69	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:45:19	12.46	14.94	14.60	37.91	MORE THAN 100 ITERATIONS WITH NO CONVERGENCE.							
21:45:49	12.46	13.04	14.61	36.48	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:46:19	12.46	13.03	14.61	35.03	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:46:49	12.45	13.01	14.63	33.85	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:47:19	12.45	13.01	14.62	32.99	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:47:49	12.46	13.02	14.64	32.20	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:48:19	12.46	13.01	14.64	34.37	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:48:49	12.45	13.00	14.65	35.51	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:49:19	12.46	13.00	14.66	35.95	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:49:49	12.46	13.00	14.65	36.33	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:50:19	12.46	12.98	14.76	36.61	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:50:49	12.46	12.98	14.65	36.92	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:51:19	12.46	12.99	14.67	37.15	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:51:49	12.46	12.99	14.67	37.41	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:52:19	12.46	13.00	14.65	37.34	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:52:49	12.46	12.96	14.66	37.57	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:53:19	12.47	12.97	14.66	37.68	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:53:49	12.46	12.98	14.66	37.71	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:54:19	12.46	12.96	14.68	37.85	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							
21:54:49	12.46	12.97	14.67	37.98	ORIFICE DOWNSTREAM PRESSURE GREATER THAN UPSTREAM.							

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APPENDIX E

Geochemical Sampling Schedule, Laboratory Reports, and Output from Data Processing

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APPENDIX E - TABLES

GeothermEx, Inc.
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Table E-1 : Fluids Samples Collected at Rig Test of well #88-11, Fish Lake Valley, Nevada, June 2, 1984 - Part I - Water Samples

Sample No.	Time (hrs)	Collection Point(1)	Sample Type(2)	Sample Volume (ml)	Comment
3	0206	T	Ru	500	Brownish water, gray sediment, EC = 2800 micromhos.
4	0253	T	Ru	500	Brownish water with suspended particulates and gray sediment.
			Fd(1:10)	100	
5	0354	T	Ru	500	Same appearance, EC = 3650 micromhos.
6	0430	T	Ru	500	Same appearance, EC = 3400 micromhos, pH = c.10.
7	0550	T	Ru	500	Brownish water, gray sediment, EC = 3500 micromhos.
8	0700	T	Ru	500	Same appearance.
9	0850	T	Ru	500	Same appearance, EC = 3600 micromhos.
			Fu	125	Filtrate slightly brown.
			Ra	125	20 drops 1:1 HCl caused flocculation of brown colorant, supernatant clear, colorless.
10	1156	BLA	Ru	500	Brownish water, gray sediment.
11	1200	SLC (41±2)	Ru	250	Clear, colorless, EC = 155 - 200 micromhos.

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Table E-1: (cont.)

Sample No.	Time (hrs)	Collection Point(1)	Sample Type(2)	Sample Volume (ml)	Comment
12	1237	BLC (41±2)	Ru	500	Brownish water, gray sediment, pH = 10, EC = 3200 micromhos.
			Fd(1:10)	100	
			Fa	125	10 drops 1:1 HCl, very pale brown, clear, no sediment.
13	1300	BLC	Ru	250	Brownish water, grey sediment.
none	1308	BLC	Ru	1000	Same appearance; sample given to SRC.
none	1500	BLC (40±2)	Ru	250	Same appearance; in glass bottles; given to SRC.
none	1500	SLC	Ru	250	Clear, colorless; in glass bottles; given to SRC.
15	1533	BLC (40±2)	Ru	500	Brownish water, gray sediment, lighter and cleaner than above; pH = 10.
			Rd(1:10)	100	
			Fd(1:10)	100	
			Fa	125	17 drops 1:1 HCl; clear, faint brown tint, no sediment.
16	1740	BLC (40±2)	Ru	750	Brownish color, gray sediment; EC = 3000 micromhos.
			Fa	125	20 drops 1:1 HCl.
			Fd(1:10)	100	
		SLC	Ru	250	Clear, colorless, EC = 200 micromhos.

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Notes

(1) Atmospheric Flash Sample:

T = 1½ inch tap located at 3:00 o'clock position on horizontal discharge line, 6½ ft downstream from center line of wellhead assembly. Sample collected directly from ½ inch discharge tube downstream from gate valve attached to tap. No cooling coil used, assume maximum steam separation at atmospheric pressure.

BLA = atmospheric flash sample collected from upper brine outlet of mini-separator connected at point T.

Samples Separated Under Pressure:

(mini-separator attached to point T; number in parentheses is separator pressure in psig)

BLC = sample from upper brine outlet of separator, cooled through stainless steel coil to 15°- 20° C.. Flow control valve is at separator outlet, coil not under pressure.

SLC = sample from steam outlet of separator, cooled through stainless steel coil to 15° - 20° C.. Flow control valve is at separator outlet, coil not under pressure.

(2) R = raw, unfiltered
F = filtered through 0.45 micron membrane at collection time.
u = untreated
a = acidified to pH 1 to 2.
d = diluted with silica-free deionized water.

General Comment

1. H_2S odor was found in acidified samples only.

2. The brownish coloration and fine gray sediment decreased regularly with time in Ru brine samples. Ru samples 3 through 13 were extremely difficult to impossible to filter due to complete clogging after less than 10 - 20 ml of filtrate was obtained. Sample 15 was cleaner. Sample 16 somewhat dirtier, but filtration of 125 ml was possible.

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Table E-2 : Fluids Samples Collected at Rig Test of well #88-11, Fish Lake Valley, Nevada, June 2, 1984 - Part II - Steam Line Samples.

Sample No.	Time(hrs)	Comment
GS#1	1152	Truesdell/Nehring gas flask with 250 ml 50% NaOH. Fine whitish precipitate formed during sample collection, recrystallized to fine, clear, colorless needles during 48 hrs storage.
GS#2	1217	Truesdell/Nehring gas flask with 100 ml 4N NaOH. Gray precipitate formed during storage.
GS#3	1230	Same as for GS#2.

General comment: All samples were collected from cooling coil connected to steam line of mini-separator. Sample GS#1 was collected at an average separator pressure of 41 psig, with rapid surging from 39 - 43 psig. GS#2 and GS#3 were collected at an average pressure of 42 psig, with rapid surging from 40 - 44 psig.

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Table E-3 : Fluids Samples Collected at Rig Test of well#88-11, Fish Lake Valley, Nevada, June 21, 1984 - Part I - Water Samples

Sample No.	Time (hrs)	Collection Point(1)	Sample Type(2)	Sample Volume (ml)	Comment
1	1115	T	Ru	250	pH = 8.84 at 36°C EC = 4000 micromhos
			Fu	250	
			Fa	125	20 drops 1:1 HCl
			Fd(1:10)	100	
2 and 2-duplicate set	1245	BLC (30)	Ru	250	pH = 8.81 at 20°C EC = 3350 micromhos
			Fu	250	
			Fa	125	20 drops 1:1 HCl
			Fd(1:10)	100	
3	1345	SLC (30)	Ru	250	pH 4.70 at 8°C EC = 185 micromhos
4	1417	SLC	Ru	250	pH = 4.48 at 27°C EC = 180 micromhos

Notes

(1) Atmospheric Flash Sample:

T = 1½ inch tap located at 1:30 o'clock position on horizontal discharge line, 6½ ft downstream from center line of wellhead assembly. Sample collected directly from ½ inch discharge tube downstream from gate valve attached to tap. No cooling coil used, assume maximum steam separation at atmospheric pressure.

Samples Separated Under Pressure:

(mini-separator attached to point T; number in parentheses is separator pressure in psig)

BLC = sample from upper brine outlet of separator, cooled through stainless steel coil to 10°- 20° C.. Flow control

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valve is at separator outlet, coil not under pressure.

SLC = sample from steam outlet of separator, cooled through stainless steel coil to 10° - 30° C.. Flow control valve is at separator outlet, coil not under pressure.

(2) R = raw, unfiltered
F = filtered through 0.45 micron membrane at collection time.
u = untreated
a = acidified to pH 1 to 2.
d = diluted with silica-free deionized water.

General Comment

The water produced by the well was clear, colorless and odorless, carrying scant traces of dark fine sand-sized particulates. Acidification of brine samples released a weak but distinct H_2S odor.

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Table E-4 : Fluids Samples Collected at Rig Test of well 88-11, Fish Lake Valley, Nevada, June 21, 1984 - Part II - Steam Line Samples.

Sample No.	Time(hrs)	Comment
GS#1	1355	Truesdell/Nehring gas flask with 100 ml 4N NaOH. A trace of dark gray fine precipitate (?) was visible in flask when sent to the laboratory.
GS#2	----	Same.
GS#3	----	Same.
GS#4	1415	Same.

General comment: All samples were collected from cooling coil connected to steam line of mini-separator operating at 30 psig.

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TABLE E-5

ANATEC Laboratories, Inc.

Laboratory Reports

Log No.: 5485,
5485A,
5557,
and 5557A

ANATEC
LABORATORIES
INC.

435 Tesconi Circle • Santa Rosa, California 95401 • 707-526-7200

Mr. Chris Klein
GeothermEx, Inc.
5221 Central Ave., Ste 201
Richmond, CA 94804

June 28, 1984
ANATEC Log No: 5485 (1-25)
Series No: 213/003
(Part 2 of 2 parts)

Subject: Analytical Results for GeothermEx Project SRC Samples Received June 4, 1984.

Dear Mr. Klein:

Chemical testing of the above-referenced samples is complete. All raw samples (designated by "R" on label) were filtered through 0.45-micron filters before analyses were performed. Various classical wet chemistry and atomic absorption measurements were made on the samples.

Summarized methodologies have been presented in our report for ANATEC Log No. 5557. Analytical results are summarized in Table 1 for the chloride measurements on the gas bomb residuals. The balance of analytical results are summarized in Tables 2 and 3.

Qualitative identification of the particulates in each gas bomb is pending.

If you have any questions, please call.

Submitted by:

Stephen F. Nackord
Project Manager

Approved by:

Greg Anderson, Director
Analytical Laboratories

/hs

Table 1. Chloride Content of Gas Bomb Residuals.

Descriptor	Lab No.	Chloride (mg/L)
GS#1	5485-1	<1
GS#2	5485-2	14
GS#3	5485-3	23

Table 2. Results for Samples Labeled "3,4,7,9,10,11 and 12".

	Descriptor, Lab No. (in parentheses), and Results (mg/L)[a]										
	3	4		7	9		10	11	12		
Parameter	Ru (-4*)	Ru (-5*)	Fd(1:10) (-6)	Ru (-7*)	Ru (-8*)	Ra (-9*)	Ru (-10*)	Ru (-11*)	Ru (-12*)	Fa (-13)	Fd(1:10) (-14)
pH (units at 25°C)	10.3	8.8	—	9.0	9.0	—	9.1	6.3	8.8	—	—
EC[b], umhos/cm	2,800	4,300	—	4,300	4,000	—	4,400	290	3,800	—	—
EC[c], dilute	3,100	4,400	—	4,300	4,200	—	4,400	290	3,900	—	—
Calcium	66	2.9	—	1.1	1.5	36	0.95	0.62	1.1	3.0	—
Magnesium	0.01	0.11	—	0.07	0.06	11	0.07	0.11	0.04	0.35	—
Sodium	310	810	—	800	800	830	800	24	730	710	—
Potassium	290	47	—	46	46	44	45	1.7	38	39	—
Lithium	1.1	1.7	—	1.9	2.0	2.0	2.0	0.06	1.8	1.8	—
Alkalinity:											
Total (as $CaCO_3$)	150	850	—	890	910	—	930	66	800	—	—
Bicarbonate (HCO_3^-)	110	890	—	760	770	—	780	81	700	—	—
Carbonate ($CO_3^=$)	40	70	—	160	170	—	170	0	140	—	—
Sulfate	770	360	—	280	240	—	260	6	210	—	—
Chloride	74	250	—	550	560	—	560	<10	510	—	—
Boron	2.0	11	—	16	14	—	15	2	13	—	—
Fluoride	1.0	12	—	11	11	—	11	0.6	10	—	—
Silica (AA[d])	110	190	33×10=330	300	290	320	300	10	280	270	31×10=310
Silica (color[d])	50	170	30×10=300	170	160	160	170	6	70	100	20×10=200
Iron (total)	0.03	0.04	—	0.04	0.05	12	0.05	0.22	≤0.03	0.28	—
Sulfide	—	—	—	—	—	—	<0.05	<0.05	<0.05	—	—

[a]Unless noted otherwise.
[b]EC - Specific Conductance at 25°C.
[c]Specific conductance (umhos/cm) obtained from sample diluted to give conductivity in 75-150 umhos/cm region.
[d]AA/color - refers to method of measurement; AA is atomic absorption and color is molybdate-reactive, colorimetric.
*Sample filtered (0.45 micron) in lab before analytical testing.

28 JUN 84

Table 3. Results for Samples Labeled "15,16,17 and 18".

Parameter	15: Ru (-15*)	15: Rd(1:10) (-16*)	15: Fd(1:10) (-17)	15: Fa (-18)	16: RuBL (-19*)	16: RuC (-20*)	16: FaBL (-21)	16: Fd(1:10) (-22)	16: Fd(1:10) (-23)	17: (-24*)	18: Makeup (-25*)
	Descriptor, Lab No. (in parentheses), and Results (mg/L)[a]										
pH (units at 25°C)	8.7	—	—	—	8.6	5.8	—	—	—	—	7.3
EC[b], umhos/cm	3,900	—	—	—	3,500	190	—	—	—	—	90
EC[c], dilute	3,800	—	—	—	3,500	190	—	—	—	—	100
Calcium	1.3	—	—	1.9	1.4	0.14	2.3	—	—	—	11
Magnesium	0.06	—	—	0.11	0.05	0.01	0.60	—	—	—	1.1
Sodium	730	—	—	710	730	4.1	730	—	—	—	6.8
Potassium	39	—	—	40	40	0.62	40	—	—	—	1.4
Lithium	1.8	—	—	1.9	1.8	0.01	1.8	—	—	—	0.01
Alkalinity:											
Total (as $CaCO_3$)	810	—	—	—	800	90	—	—	—	—	50
Bicarbonate (HCO_3^-)	780	—	—	—	830	110	—	—	—	—	61
Carbonate ($CO_3^=$)	110	—	—	—	70	0	—	—	—	—	0
Sulfate	200	—	—	—	190	<2	—	—	—	—	2
Chloride	510	—	—	—	490	<10	—	—	—	—	<10
Boron	14	—	—	—	14	0.2	—	—	—	—	0.2
Fluoride	10	—	—	—	10	<0.1	—	—	—	—	0.2
Silica (AA[d])	270	30	30 x10=300	270	270	1.8	260	30x10=300	29x10=290	1.8	26
Silica (color[d])	150	20	20 x10=200	230	140	<1	240	20x10=200	20 x10=200	1	20
Iron (total)	0.05	—	—	0.12	0.04	0.05	0.23	—	—	—	0.99
Sulfide	<0.05	—	—	—	<0.05	<0.05	—	—	—	—	—

[a]Unless noted otherwise.
[b]EC - Specific Conductance at 25°C.
[c]Specific conductance (umhos/cm) obtained from sample diluted to give conductivity in 75-150 umhos/cm region.
[d]AA/color - refers to method of measurement; AA is atomic absorption and color is molybdate-reactive, colorimetric.
*Sample filtered (0.45 micron) in lab before analytical testing.

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June 21, 1984

Mr. Chris W. Klein
GeothermEX, Inc.
5221 Central Ave., Ste 201
Richmond, CA 94804

ANATEC Log No: 5485A (1-25)
Series No: 213/003
Client Ref: Letter 6/4/84

Subject: Twenty-five Samples Labeled **GS-#**, Where "#" Is a Number From 1 to 25, Submitted June 4, 1984--Part 1.

Dear Mr. Klein:

Tabulated on the following pages are data for three samples received in gas bombs on a Routine basis. This report is the first of two reports. The general chemistry and metals determinations will follow next week in Part 2.

Please feel welcome to contact us should you have questions.

Submitted by:

Nina Jan Huston
Supervisor, Gas Analysis

Approved by:

Greg Anderson, Director
Analytical Laboratories

/hs

GAS ANALYSIS

Descriptor: GS-#1
Lab No.: 5485-1
Sample gas/steam ratio (ft^3/lb): 1.47×10^{-1}
Sample gas/steam ratio (moles/1000 moles steam): 7.39
Sample gas/steam ratio ($g/10^6$ grams steam): 17,700
Total weight of condensate (grams): 246.2
Initial headspace pressure (psi): 14.2

Gas	Mole % (w/o H_2O)	Moles per 1000 moles H_2O	ppm (with H_2O)
Water vapor	N/A	N/A	9.83×10^{5}
Carbon dioxide	9.51×10^{1}	7.02×10^{0}	1.69×10^{4}
Total Sulfur (as H_2S)	5.90×10^{-2}	4.36×10^{-3}	8.10×10^{0}
Ammonia	5.27×10^{-1}	3.89×10^{-2}	3.62×10^{1}
Argon	5.59×10^{-2}	4.13×10^{-3}	8.99×10^{0}
Oxygen	2.24×10^{-1}	1.65×10^{-2}	2.89×10^{1}
Nitrogen	3.42×10^{0}	2.53×10^{-1}	3.87×10^{2}
Methane	5.87×10^{-1}	4.34×10^{-2}	3.79×10^{1}
Helium	4.38×10^{-3}	3.24×10^{-4}	7.06×10^{-2}
Hydrogen	6.33×10^{-2}	4.68×10^{-3}	5.15×10^{-1}

Descriptor: GS-#2
Lab No.: 5485-2
Sample gas/steam ratio (ft^3/lb): 1.52×10^{-1}
Sample gas/steam ratio (moles/1000 moles steam): 7.64
Sample gas/steam ratio ($g/10^6$ grams steam): 18,200
Total weight of condensate (grams): 282.9
Initial headspace pressure (psi): 7.58

Gas	Mole % (w/o H_2O)	Moles per 1000 moles H_2O	ppm (with H_2O)
Water vapor	N/A	N/A	9.82×10^{5}
Carbon dioxide	9.41×10^{1}	7.19×10^{0}	1.73×10^{4}
Total Sulfur (as H_2S)	3.01×10^{-1}	2.30×10^{-2}	4.28×10^{1}
Ammonia	1.63×10^{-1}	1.24×10^{-2}	1.15×10^{1}
Argon	7.85×10^{-2}	6.00×10^{-3}	1.31×10^{1}
Oxygen	3.52×10^{-3}	2.69×10^{-4}	4.70×10^{-1}
Nitrogen	4.29×10^{0}	3.28×10^{-1}	5.01×10^{2}
Methane	9.65×10^{-1}	7.37×10^{-2}	6.44×10^{1}
Helium	5.05×10^{-3}	3.86×10^{-4}	8.41×10^{-2}
Hydrogen	7.09×10^{-2}	5.42×10^{-3}	5.97×10^{-1}

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Descriptor:	**GS-#3**
Lab No.:	5485-3
Sample gas/steam ratio (ft^3/lb):	1.41×10^{-1}
Sample gas/steam ratio (moles/1000 moles steam):	7.07
Sample gas/steam ratio ($g/10^6$ grams steam):	16,900
Total weight of condensate (grams):	325.1
Initial headspace pressure (psi):	11.6

Gas	Mole % (w/o H_2O)	Moles per 1000 moles H_2O	ppm (with H_2O)
Water vapor	N/A	N/A	9.83×10^5
Carbon dioxide	9.55×10^1	6.75×10^0	1.62×10^4
Total Sulfur (as H_2S)	2.88×10^{-1}	2.03×10^{-2}	3.78×10^1
Ammonia	1.86×10^{-1}	1.32×10^{-2}	1.22×10^1
Argon	5.62×10^{-2}	3.97×10^{-3}	8.66×10^0
Oxygen	1.64×10^{-2}	1.16×10^{-3}	2.02×10^0
Nitrogen	3.22×10^0	2.28×10^{-1}	3.48×10^2
Methane	6.68×10^{-1}	4.72×10^{-2}	4.13×10^1
Helium	5.04×10^{-3}	3.56×10^{-4}	7.77×10^{-2}
Hydrogen	7.31×10^{-2}	5.17×10^{-3}	5.70×10^{-1}

QUALITY CONTROL DATA

Analyte	Relative Standard Deviation	Matrix of Determination
Carbon Dioxide	1.0	Condensate/NaOH solution
Total Sulfur (as H_2S)	3.6	Condensate/NaOH solution
Ammonia	7.0	Condensate/NaOH solution
Argon	2.0	Residual Gas Phase
Oxygen	7.2	Residual Gas Phase
Nitrogen	4.4	Residual Gas Phase
Methane	5.5	Residual Gas Phase
Helium	3.3	Residual Gas Phase
Hydrogen	1.0	Residual Gas Phase

ANATEC LABORATORIES INC.

435 Tesconi Circle • Santa Rosa, California 95401 • 707-526-7200

GeothermEx, Inc.
5221 Central Ave, Suite 201
Richmond, CA 94804
Attn: Chris Klein

June 28, 1984
ANATEC Log No: 5557 (1-15)
Series No: 213/004
Part 2 of 2 Parts

Subject: Analytical Results for GeothermEx Project SRC-2 Samples Received June 22, 1984.

Dear Mr. Klein:

Chemical testing of the above referenced samples is complete. Various classical wet chemistry and atomic absorption measurements were made on the samples.

Details of the methods and references are available upon request. However, summarized methodologies are presented in Table 1. Analytical results are summarized in Table 2 for the chloride measurements on the gas bomb residuals. The balance of analytical results are summarized in Table 3.

Qualitative identification of the dark particulates in each gas bomb is pending.

If you have any questions, please call.

Submitted by:

Stephen F. Nackord
Project Manager

Approved by:

Greg Anderson, Director
Analytical Laboratories

Note to files: This copy of report supercedes one received previously, with same date, but lacking analytical value for H_2S. CWK 7/20/84

Table 1. Summarized Methodologies

Analyte	Methodologies
pH	Electrometric at 25°C (EPA[a])
Conductivity	Wheatstone bridge conductivity at 25°C (EPA)
Calcium	Flame atomic absorption (EPA)
Magnesium	Flame atomic absorption (EPA)
Sodium	Flame atomic absorption (EPA)
Potassium	Flame atomic absorption (EPA)
Lithium	Flame atomic absorption (EPA)
Alkalinity	Potentiometric titration to pH 8.3 and 3.7 (EPA)
Sulfate	Turbidimetric measurement of barium sulfate (EPA)
Chloride	Argentometric titration (EPA) and by specific ion electrode
Boron	Azomethine colorimetry
Fluoride	Specific ion electrode (EPA)
Silica (AA)	Flame and/or heated graphite atomic spectroscopy
Silica (color)	Ammonium molybdate spectrophotometric (molybdate reactive) (EPA)
Iron	Flame and/or heated graphite atomic spectroscopy (EPA)
Sulfide	Methylene blue colorimetric (EPA)

[a]EPA - Denotes methods accepted for use by the U.S. Environmental Protection Agency.

Table 2. Chloride Content of Gas Bomb Residuals

Descriptor	Lab No.	Chloride, mg/L
GS # 1	1	<1
GS # 2	2	2
GS # 3	3	2
GS # 4	4	1

Table 3. Summarized Analytical Results

Parameter	Results (mg/L)[a]										
Descriptor:	1115				1245 Brineline				1345 Steam-Line	1417 Steam-Line	DI Water
Subsample:	Ru	Fu	Fa	Fd (1:10)	Ru	Fu	Fa	Fd (1:10)	Ru	Ru	Used
ANATEC Lab No:	-5	-9	-11	-13	-6	-10	-12	-14	-7	-8	-15
pH (units at 25°C)	9.2	--	--	--	9.1	--	--	--	4.3	4.6	--
EC[b] (umhos/cm)	4,200	--	--	--	3,700	--	--	--	260	150	--
EC[c], dilute (umhos/cm)	4,500	--	--	--	3,900	--	--	--	--	--	--
Calcium	--	0.56	1.2	--	--	0.39	0.95	--	0.02	--	--
Magnesium	--	--	0.05	--	--	--	0.03	--	<0.01	--	--
Sodium	--	--	850	--	--	--	720	--	0.36	--	--
Potassium	--	--	50	--	--	--	42	--	<0.05	--	--
Lithium	--	--	2.1	--	--	--	1.8	--	<0.02	--	--
Alkalinity:											
Total (as $CaCO_3$)	910	--	--	--	810	--	--	--	52	--	--
Bicarbonate (HCO_3^-)	740	--	--	--	700	--	--	--	63	--	--
Carbonate (CO_3^{-2})	180	--	--	--	140	--	--	--	0	--	--
Sulfate	--	210	--	--	--	180	--	--	4.5	--	--
Chloride	--	460	--	--	--	390	--	--	4	--	--
Boron	--	16	--	--	--	15	--	--	0.12	--	--
Fluoride	--	17	--	--	--	14	--	--	<0.1	--	--
Silica (AA[d])	--	290	--	31 (310)	--	250	--	30 (300)	1.0	0.3	<0.1
Silica (color[d])	--	160	--	26 (260)	--	160	--	24 (240)	2.8	2.0	<0.6
Iron	--	<0.05	--	--	--	<0.05	--	--	--	--	--
Sulfide ($S^=$)	--	--	--	--	0.27	--	--	--	--	--	--

[a] Unless otherwise noted.
[b] EC - Specific Conductance at 25°C.
[c] Specific conductance obtained from sample diluted to give conductivity in 75-150 umhos/cm region.
[d] AA/color - refers to method of measurment; AA is atomic absorption and color is molybdate-reactive colorimetric.

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Mr. Chris Klein
GeoththermEX, Inc.
5221 Central Ave., Ste 201
Richmond, CA 94804

June 25, 1984
ANATEC Log No: 5557A (1-15)
Series No: 213/004
Client Ref: Letter 6/22/84

Subject: Samples Received June 22, 1984 on an ASAP Turnaround With Gas Bombs Labeled, "GS -1,-2,-3,-4" and Condensate Samples Labeled "840621. -1115,-1245,-1345, -1417". (Part 1 of 2 parts).

Dear Mr. Klein:

Tabulated on the following pages are data for the four gas samples referenced above. Analysis was begun shortly after the samples arrived at the laboratory June 22, 1984. Gas analysis was completed that night and your office was verbally notified on Saturday, June 23, 1984. The general chemistry and metals analyses will follow in part 2 of 2 parts.

Please feel welcome to contact us should you have questions.

Gas Analysis Submitted By:

Nina Jan Huston
Gas Analysis Supervisor

Report Approved by:

Greg Anderson, Director
Analytical Laboratories

/hs

GAS ANALYSIS

Descriptor: GS-#1
Lab No.: 5557-1

Sample gas/steam ratio (ft^3/lb): 1.09×10^{-1}
Sample gas/steam ratio (moles/1000 moles steam): 5.48
Sample gas/steam ratio ($g/10^6$ grams steam): 13,100
Total weight of condensate (grams): 148.9
Initial headspace pressure (psi): 2.18 absolute

Gas	Mole % (w/o H_2O)	Moles per 1000 moles H_2O	ppm wt (with H_2O)
Water vapor	N/A	N/A	9.87×10^5
Carbon dioxide	9.45×10^1	5.20×10^0	1.25×10^4
Total Sulfur (as H_2S)	3.39×10^{-1}	1.86×10^{-2}	3.47×10^1
Ammonia	3.16×10^{-1}	1.73×10^{-2}	1.62×10^1
Argon	5.36×10^{-2}	2.94×10^{-3}	6.43×10^0
Oxygen	1.43×10^{-1}	7.84×10^{-3}	1.37×10^1
Nitrogen	3.52×10^0	1.93×10^{-1}	2.96×10^2
Methane	6.09×10^{-1}	3.34×10^{-2}	2.94×10^1
Hydrogen	$<1.86 \times 10^{-1}$	$<1.02 \times 10^{-2}$	$<1.13 \times 10^0$

Descriptor: GS-#2
Lab No.: 5557-2

Sample gas/steam ratio (ft^3/lb): 1.03×10^{-1}
Sample gas/steam ratio (moles/1000 moles steam): 5.17
Sample gas/steam ratio ($g/10^6$ grams steam): 12,400
Total weight of condensate (grams): 355.8
Initial headspace pressure (psi): 9

Gas	Mole % (w/o H_2O)	Moles per 1000 moles H_2O	ppm (with H_2O)
Water vapor	N/A	N/A	9.88×10^5
Carbon dioxide	9.58×10^1	4.95×10^0	1.19×10^4
Total Sulfur (as H_2S)	3.08×10^{-1}	1.59×10^{-2}	2.98×10^1
Ammonia	3.87×10^{-1}	2.00×10^{-2}	1.87×10^1
Argon	4.90×10^{-2}	2.53×10^{-3}	5.54×10^0
Oxygen	$<1.97 \times 10^{-3}$	$<1.02 \times 10^{-4}$	$<1.78 \times 10^{-1}$
Nitrogen	2.89×10^0	1.50×10^{-1}	2.30×10^2
Methane	5.35×10^{-1}	2.77×10^{-2}	2.43×10^1
Hydrogen	$<3.73 \times 10^{-2}$	$<1.93 \times 10^{-3}$	$<2.14 \times 10^{-1}$

Descriptor: GS-#3
Lab No.: 5557-3

Sample gas/steam ratio (ft^3/lb): 1.04×10^{-1}
Sample gas/steam ratio (moles/1000 moles steam): 5.20
Sample gas/steam ratio ($g/10^6$ grams steam): 12,500
Total weight of condensate (grams): 358.5
Initial headspace pressure (psi): 11.0

Gas	Mole % (w/o H_2O)	Moles per 1000 moles H_2O	ppm (with H_2O)
Water vapor	N/A	N/A	9.88×10^{5}
Carbon dioxide	9.55×10^{1}	4.97×10^{0}	1.20×10^{4}
Total Sulfur (as H_2S)	3.03×10^{-1}	1.58×10^{-2}	2.94×10^{1}
Ammonia	3.90×10^{-1}	2.03×10^{-2}	1.89×10^{1}
Argon	5.21×10^{-2}	2.71×10^{-3}	5.94×10^{0}
Oxygen	$<8.73 \times 10^{-4}$	$<4.54 \times 10^{-5}$	$<7.96 \times 10^{-2}$
Nitrogen	3.11×10^{0}	1.62×10^{-1}	2.49×10^{2}
Methane	5.81×10^{-1}	3.02×10^{-2}	2.66×10^{1}
Hydrogen	$<3.31 \times 10^{-2}$	$<1.72 \times 10^{-3}$	$<1.91 \times 10^{-1}$

Descriptor: GS-#4
Lab No.: 5557-4

Sample gas/steam ratio (ft^3/lb): 1.03×10^{-1}
Sample gas/steam ratio (moles/1000 moles steam): 5.17
Sample gas/steam ratio ($g/10^6$ grams steam): 12,400
Total weight of condensate (grams): 373.7
Initial headspace pressure (psi): 11.78

Gas	Mole % (w/o H_2O)	Moles per 1000 moles H_2O	ppm (with H_2O)
Water vapor	N/A	N/A	9.88×10^{5}
Carbon dioxide	9.59×10^{1}	4.96×10^{0}	1.20×10^{4}
Total Sulfur (as H_2S)	2.82×10^{-1}	1.46×10^{-2}	2.72×10^{1}
Ammonia	3.92×10^{-1}	2.03×10^{-2}	1.89×10^{1}
Argon	4.70×10^{-2}	2.43×10^{-3}	5.32×10^{0}
Oxygen	1.54×10^{-3}	7.95×10^{-5}	1.39×10^{-1}
Nitrogen	2.80×10^{0}	1.45×10^{-1}	2.23×10^{2}
Methane	5.15×10^{-1}	2.66×10^{-2}	2.34×10^{1}
Hydrogen	$<2.94 \times 10^{-2}$	$<1.52 \times 10^{-3}$	$<1.68 \times 10^{-1}$

Note: Two gas bombs returned with no sample.

QUALITY CONTROL DATA

Analyte	Relative Standard Deviation	Matrix of Determination
Carbon Dioxide	1.0	Condensate/NaOH solution
Total Sulfur (as H_2S)	2.7	Condensate/NaOH solution
Ammonia	1.2	Condensate/NaOH solution
Argon	2.6	Residual Gas Phase
Oxygen	7.4	Residual Gas Phase
Nitrogen	1.0	Residual Gas Phase
Methane	1.0	Residual Gas Phase
Helium	N/A	Residual Gas Phase
Hydrogen	1.0	Residual Gas Phase

Table E-6: Chemical analyses in mg/l of samples from wells 88-11 and 81-14[1]

E#	NUM	DATEHRS	COMMENT1	SP	PUNITS	HT	HUNITS	XSTM	TC	COMMENT2	BASIS
1	1.0300	840602.0206	Atmosph.sep'n @ tap	12.30	psia	-1.00	BTU/LB	-1.00	-1		Sample
2	1.0301	840602.0206		12.30	psia	270.00	BTU/LB	10.12	95	TC calc'd frm SP	SEPCOR
3	1.0302	840602.0206		12.30	psia	290.00	BTU/LB	12.17	95	TC calc'd frm SP	SEPCOR
4	1.0303	840602.0206		12.30	psia	310.00	BTU/LB	14.22	95	TC calc'd frm SP	SEPCOR
5	1.0400	840602.0253	Atmosph.sep'n @ tap	12.30	psia	-1.00	BTU/LB	-1.00	-1		Sample
6	1.0401	840602.0253		12.30	psia	270.00	BTU/LB	10.12	95	TC calc'd frm SP	SEPCOR
7	1.0402	840602.0253		12.30	psia	290.00	BTU/LB	12.17	95	TC calc'd frm SP	SEPCOR
8	1.0403	840602.0253		12.30	psia	310.00	BTU/LB	14.22	95	TC calc'd frm SP	SEPCOR
9	1.0700	840602.0550	Atmosph.sep'n @ tap	12.30	psia	-1.00	BTU/LB	-1.00	-1		Sample
10	1.0701	840602.0550		12.30	psia	270.00	BTU/LB	10.12	95	TC calc'd frm SP	SEPCOR
11	1.0702	840602.0550		12.30	psia	290.00	BTU/LB	12.17	95	TC calc'd frm SP	SEPCOR
12	1.0703	840602.0550		12.30	psia	310.00	BTU/LB	14.22	95	TC calc'd frm SP	SEPCOR
13	1.0900	840602.0850	Atmosph.sep'n @ tap	12.30	psia	-1.00	BTU/LB	-1.00	-1		Sample
14	1.0901	840602.0850		12.30	psia	270.00	BTU/LB	10.12	95	TC calc'd frm SP	SEPCOR
15	1.0902	840602.0850		12.30	psia	290.00	BTU/LB	12.17	95	TC calc'd frm SP	SEPCOR
16	1.0903	840602.0850		12.30	psia	310.00	BTU/LB	14.22	95	TC calc'd frm SP	SEPCOR
17	1.1000	840602.1156	Brine out portab.sep	12.30	psia	-1.00	BTU/LB	-1.00	-1		Sample
18	1.1001	840602.1156		12.30	psia	270.00	BTU/LB	10.12	95	TC calc'd frm SP	SEPCOR
19	1.1002	840602.1156		12.30	psia	290.00	BTU/LB	12.17	95	TC calc'd frm SP	SEPCOR
20	1.1003	840602.1156		12.30	psia	310.00	BTU/LB	14.22	95	TC calc'd frm SP	SEPCOR
21	1.1100	840602.1200	Steam out portab.sep	53.30	psia	-1.00	BTU/LB	-1.00	-1		Sample
22	1.1200	840602.1237	Brine out portab.sep	53.30	psia	-1.00	BTU/LB	-1.00	-1		Sample
23	1.1201	840602.1237		53.30	psia	270.00	BTU/LB	1.70	141	TC calc'd frm SP	SEPCOR
24	1.1202	840602.1237		53.30	psia	290.00	BTU/LB	3.87	141	TC calc'd frm SP	SEPCOR
25	1.1203	840602.1237		53.30	psia	310.00	BTU/LB	6.04	141	TC calc'd frm SP	SEPCOR
26	1.1500	840602.1533	Brine out portab.sep	52.30	psia	-1.00	BTU/LB	-1.00	-1		Sample
27	1.1501	840602.1533		52.30	psia	270.00	BTU/LB	1.83	140	TC calc'd frm SP	SEPCOR
28	1.1502	840602.1533		52.30	psia	290.00	BTU/LB	4.00	140	TC calc'd frm SP	SEPCOR
29	1.1503	840602.1533		52.30	psia	310.00	BTU/LB	6.17	140	TC calc'd frm SP	SEPCOR
30	1.1600	840602.1740	Brine out portab.sep	52.30	psia	-1.00	BTU/LB	-1.00	-1		Sample
31	1.1601	840602.1740		52.30	psia	270.00	BTU/LB	1.83	140	TC calc'd frm SP	SEPCOR
32	1.1602	840602.1740		52.30	psia	290.00	BTU/LB	4.00	140	TC calc'd frm SP	SEPCOR
33	1.1603	840602.1740		52.30	psia	310.00	BTU/LB	6.17	140	TC calc'd frm SP	SEPCOR

1. Samples 1.0300 to 2.0400 are 88-11, samples 9.001-9.004 are 81-14.

Table E-6: Chemical analyses in mg/l of samples from wells 88-11 and 81-14

)724 D:SRCAM2;

!E#	NUM	DATEHRS	COMMENT1	SP	PUNITS	HT	HUNITS	XSTM	TC	COMMENT2	BASIS
34	1.1604	840602.1740	Steam out portab.sep	52.30	psia	-1.00	BTU/LB	-1.00	-1		Sample
35	1.1800	840602.0000	From supply tank	-1.00		-1.00		-1.00	-1		Sample
36	2.0100	840621.1115	Atmosph.sep'n @ tap	12.30	psia	-1.00	BTU/LB	-1.00	-1		Sample
37	2.0101	840621.1115		12.30	psia	270.00	BTU/LB	10.12	95	TC calc'd frm SP	SEPCOR
38	2.0102	840621.1115		12.30	psia	290.00	BTU/LB	12.17	95	TC calc'd frm SP	SEPCOR
39	2.0103	840621.1115		12.30	psia	310.00	BTU/LB	14.22	95	TC calc'd frm SP	SEPCOR
40	2.0200	840621.1245	Brine out portab.sep	42.30	psia	-1.00	BTU/LB	-1.00	-1		Sample
41	2.0201	840621.1245		42.30	psia	270.00	BTU/LB	3.27	133	TC calc'd frm SP	SEPCOR
42	2.0202	840621.1245		42.30	psia	290.00	BTU/LB	5.41	133	TC calc'd frm SP	SEPCOR
43	2.0203	840621.1245		42.30	psia	310.00	BTU/LB	7.56	133	TC calc'd frm SP	SEPCOR
44	2.0300	840621.1345	Steam out portab.sep	42.30	psia	-1.00	BTU/LB	-1.00	-1		Sample
45	2.0400	840621.1417	Steam out portab.sep	42.30	psia	-1.00	BTU/LB	-1.00	-1		Sample
46	9.0400	820726.0530	sidetap no separator	-1.00		-1.00		-1.00	127		Sample
47	9.0100	820725.1330	sidetap no separator	-1.00		-1.00		-1.00	123		Sample
48	9.0200	820725.1630	sidetap no separator	-1.00		-1.00		-1.00	-1		Sample
49	9.0300	820725.2055	sidetap no separator	-1.00		-1.00		-1.00	123		Sample

Table E-6: Chemical analyses in mg/l of samples from wells 88-11 and 81-14

24 D:SRCAM2;

#	NUM	EC	PHF	PHL	BASIS	CA	MG	NA	K	LI	HCO3	CO3	SO4	CL
1	1.0300	2800	-1.00	10.30	Sample	66.0	0.01	310.0	290.0	1.10	110.0	40.0	770.0	74.0
2	1.0301	-1	-1.00	-1.00	SEPCOR	59.3	0.01	278.6	260.7	0.99	98.9	36.0	692.1	66.5
3	1.0302	-1	-1.00	-1.00	SEPCOR	58.0	0.01	272.3	254.7	0.97	96.6	35.1	676.3	65.0
4	1.0303	-1	-1.00	-1.00	SEPCOR	56.6	0.01	265.9	248.8	0.94	94.4	34.3	660.5	63.5
5	1.0400	4300	-1.00	8.80	Sample	2.9	0.11	810.0	47.0	1.70	890.0	70.0	360.0	250.0
6	1.0401	-1	-1.00	-1.00	SEPCOR	2.6	0.10	728.0	42.2	1.53	799.9	62.9	323.6	224.7
7	1.0402	-1	-1.00	-1.00	SEPCOR	2.5	0.10	711.4	41.3	1.49	781.7	61.5	316.2	219.6
8	1.0403	-1	-1.00	-1.00	SEPCOR	2.5	0.09	694.8	40.3	1.46	763.5	60.0	308.8	214.5
9	1.0700	4300	-1.00	9.00	Sample	1.1	0.07	800.0	46.0	1.90	760.0	160.0	280.0	550.0
0	1.0701	-1	-1.00	-1.00	SEPCOR	1.0	0.06	719.0	41.3	1.71	683.1	143.8	251.7	494.3
11	1.0702	-1	-1.00	-1.00	SEPCOR	1.0	0.06	702.7	40.4	1.67	667.5	140.5	245.9	483.1
12	1.0703	-1	-1.00	-1.00	SEPCOR	0.9	0.06	686.3	39.5	1.63	651.9	137.3	240.2	471.8
13	1.0900	4000	-1.00	9.00	Sample	1.5	0.06	800.0	46.0	2.00	770.0	170.0	240.0	560.0
14	1.0901	-1	-1.00	-1.00	SEPCOR	1.3	0.05	719.0	41.3	1.80	692.1	152.8	215.7	503.3
15	1.0902	-1	-1.00	-1.00	SEPCOR	1.3	0.05	702.7	40.4	1.76	676.3	149.3	210.8	491.9
16	1.0903	-1	-1.00	-1.00	SEPCOR	1.3	0.05	686.3	39.5	1.72	660.5	145.8	205.9	480.4
17	1.1000	4400	-1.00	9.10	Sample	1.0	0.07	800.0	45.0	2.00	780.0	170.0	260.0	560.0
18	1.1001	-1	-1.00	-1.00	SEPCOR	0.9	0.06	719.0	40.4	1.80	701.1	152.8	233.7	503.3
19	1.1002	-1	-1.00	-1.00	SEPCOR	0.8	0.06	702.7	39.5	1.76	685.1	149.3	228.4	491.9
20	1.1003	-1	-1.00	-1.00	SEPCOR	0.8	0.06	686.3	38.6	1.72	669.1	145.8	223.0	480.4
21	1.1100	290	-1.00	6.30	Sample	0.6	0.11	24.0	1.7	0.06	81.0	0.0	6.0	0.0
22	1.1200	3800	10.00	8.80	Sample	3.0	0.35	720.0	38.5	1.80	700.0	140.0	210.0	510.0
23	1.1201	-1	-1.00	-1.00	SEPCOR	2.9	0.34	707.8	37.8	1.77	688.1	137.6	206.4	501.3
24	1.1202	-1	-1.00	-1.00	SEPCOR	2.9	0.34	692.1	37.0	1.73	672.9	134.6	201.9	490.3
25	1.1203	-1	-1.00	-1.00	SEPCOR	2.8	0.33	676.5	36.2	1.69	657.7	131.5	197.3	479.2
26	1.1500	3900	10.00	8.70	Sample	1.9	0.11	720.0	39.5	1.85	780.0	110.0	200.0	510.0
27	1.1501	-1	-1.00	-1.00	SEPCOR	1.9	0.11	706.8	38.8	1.82	765.7	108.0	196.3	500.7
28	1.1502	-1	-1.00	-1.00	SEPCOR	1.8	0.11	691.2	37.9	1.78	748.8	105.6	192.0	489.6
29	1.1503	-1	-1.00	-1.00	SEPCOR	1.8	0.10	675.6	37.1	1.74	731.9	103.2	187.7	478.5
30	1.1600	3500	-1.00	8.60	Sample	2.3	0.60	730.0	40.0	1.80	830.0	70.0	190.0	490.0
31	1.1601	-1	-1.00	-1.00	SEPCOR	2.3	0.59	716.7	39.3	1.77	814.8	68.7	186.5	481.0
32	1.1602	-1	-1.00	-1.00	SEPCOR	2.2	0.58	700.8	38.4	1.73	796.8	67.2	182.4	470.4
33	1.1603	-1	-1.00	-1.00	SEPCOR	2.2	0.56	685.0	37.5	1.69	778.8	65.7	178.3	459.8

Table E-6: Chemical analyses in mg/l of samples from wells 88-11 and 81-14

)724 D:SRCAM2;

:E#	NUM	EC	PHF	PHL	BASIS	CA	MG	NA	K	LI	HCO3	CO3	SO4	CL
34	1.1604	190	-1.00	5.80	Sample	0.1	0.01	4.1	0.6	0.01	110.0	0.0	0.0	0.0
35	1.1800	90	-1.00	7.30	Sample	11.0	1.10	6.8	1.4	0.01	61.0	0.0	2.0	0.0
36	2.0100	4200	8.84	9.20	Sample	1.2	0.05	850.0	50.0	2.10	740.0	180.0	210.0	460.0
37	2.0101	-1	-1.00	-1.00	SEPCOR	1.1	0.04	764.0	44.9	1.89	665.1	161.8	188.8	413.5
38	2.0102	-1	-1.00	-1.00	SEPCOR	1.1	0.04	746.6	43.9	1.84	650.0	158.1	184.4	404.0
39	2.0103	-1	-1.00	-1.00	SEPCOR	1.0	0.04	729.2	42.9	1.80	634.8	154.4	180.1	394.6
40	2.0200	3700	8.81	9.10	Sample	1.0	0.03	720.0	42.0	1.80	700.0	140.0	180.0	390.0
41	2.0201	-1	-1.00	-1.00	SEPCOR	1.0	0.03	696.5	40.6	1.74	677.1	135.4	174.1	377.3
42	2.0202	-1	-1.00	-1.00	SEPCOR	0.9	0.03	681.0	39.7	1.70	662.1	132.4	170.3	368.9
43	2.0203	-1	-1.00	-1.00	SEPCOR	0.9	0.03	665.6	38.8	1.66	647.1	129.4	166.4	360.5
44	2.0300	260	4.70	4.30	Sample	0.0	0.00	0.4	0.0	0.00	63.0	0.0	4.5	4.0
45	2.0400	150	4.48	4.60	Sample	-1.0	-1.00	-1.0	-1.0	-1.00	-1.0	-1.0	-1.0	-1.0
46	9.0400	3400	-1.00	9.00	Sample	2.3	0.00	660.0	68.0	2.50	201.0	135.0	140.0	830.0
47	9.0100	3200	-1.00	5.90	Sample	2.1	0.00	610.0	64.0	2.30	182.0	0.0	130.0	860.0
48	9.0200	-1	-1.00	-1.00	Sample	-1.0	0.00	610.0	64.0	2.40	-1.0	-1.0	-1.0	-1.0
49	9.0300	2800	-1.00	6.65	Sample	1.5	0.00	540.0	57.0	2.10	165.0	0.0	120.0	660.0

Table E-6: Chemical analyses in mg/l of samples from wells 88-11 and 81-14

724 D:SRCAM2;

E#	NUM	BASIS	B	F	SIO2	SIO2AA	H2S	FE	TDSS	COMMENT3
1	1.0300	Sample	2.0	1.00	50	110	-1.00	0.03	1657	
2	1.0301	SEPCOR	1.8	0.90	45	99	-1.00	0.03	1490	
3	1.0302	SEPCOR	1.8	0.88	44	97	-1.00	0.03	1456	
4	1.0303	SEPCOR	1.7	0.86	43	94	-1.00	0.03	1422	
5	1.0400	Sample	11.0	12.00	300	310	-1.00	0.04	2304	
6	1.0401	SEPCOR	9.9	10.79	270	279	-1.00	0.04	2070	
7	1.0402	SEPCOR	9.7	10.54	263	272	-1.00	0.04	2023	
8	1.0403	SEPCOR	9.4	10.29	257	266	-1.00	0.03	1976	
9	1.0700	Sample	16.0	11.00	170	300	-1.00	0.04	2410	
10	1.0701	SEPCOR	14.4	9.89	153	270	-1.00	0.04	2166	
11	1.0702	SEPCOR	14.1	9.66	149	263	-1.00	0.04	2117	
12	1.0703	SEPCOR	13.7	9.44	146	257	-1.00	0.03	2068	
13	1.0900	Sample	14.0	11.00	160	290	-1.00	0.05	2384	Ca,Mg in Ra not used-frm.particulates
14	1.0901	SEPCOR	12.6	9.89	144	261	-1.00	0.04	2143	Ca,Mg in Ra not used-frm.particulates
15	1.0902	SEPCOR	12.3	9.66	141	255	-1.00	0.04	2094	Ca,Mg in Ra not used-frm.particulates
16	1.0903	SEPCOR	12.0	9.44	137	249	-1.00	0.04	2045	Ca,Mg in Ra not used-frm.particulates
17	1.1000	Sample	15.0	11.00	170	300	0.00	-1.00	2418	
18	1.1001	SEPCOR	13.5	9.89	153	270	-1.00	-1.00	2173	
19	1.1002	SEPCOR	13.2	9.66	149	263	-1.00	-1.00	2124	
20	1.1003	SEPCOR	12.9	9.44	146	257	-1.00	-1.00	2074	
21	1.1100	Sample	2.0	0.60	6	10	0.00	0.22	81	
22	1.1200	Sample	13.0	10.00	200	310	0.00	0.00	2191	
23	1.1201	SEPCOR	12.8	9.83	197	305	-1.00	0.00	2154	
24	1.1202	SEPCOR	12.5	9.61	192	298	-1.00	0.00	2107	
25	1.1203	SEPCOR	12.2	9.40	188	291	-1.00	0.00	2059	
26	1.1500	Sample	14.0	10.00	200	300	0.00	0.12	2192	
27	1.1501	SEPCOR	13.7	9.82	196	295	-1.00	0.12	2152	
28	1.1502	SEPCOR	13.4	9.60	192	288	-1.00	0.12	2104	
29	1.1503	SEPCOR	13.1	9.38	188	281	-1.00	0.11	2056	
30	1.1600	Sample	14.0	10.00	200	295	0.00	0.23	2158	
31	1.1601	SEPCOR	13.7	9.82	196	290	-1.00	0.23	2118	
32	1.1602	SEPCOR	13.4	9.60	192	283	-1.00	0.22	2072	
33	1.1603	SEPCOR	13.1	9.38	188	277	-1.00	0.22	2025	

Table E-6: Chemical analyses in mg/l of samples from wells 88-11 and 81-14

E#	NUM	BASIS	B	F	SIO2	SIO2AA	H2S	FE	TDSS	COMMENT3
34	1.1604	Sample	0.2	0.00	-1	2	0.00	0.05	60	
35	1.1800	Sample	0.2	0.20	20	26	-1.00	0.99	73	
36	2.0100	Sample	16.0	17.00	260	310	-1.00	0.00	2411	
37	2.0101	SEPCOR	14.4	15.28	234	279	-1.00	0.00	2167	
38	2.0102	SEPCOR	14.1	14.93	228	272	-1.00	0.00	2117	
39	2.0103	SEPCOR	13.7	14.58	223	266	-1.00	0.00	2068	
40	2.0200	Sample	15.0	14.00	240	300	0.29	0.00	2089	
41	2.0201	SEPCOR	14.5	13.54	232	290	-1.00	0.00	2020	
42	2.0202	SEPCOR	14.2	13.24	227	284	-1.00	0.00	1975	
43	2.0203	SEPCOR	13.9	12.94	222	277	-1.00	0.00	1931	
44	2.0300	Sample	0.1	0.00	1	3	-1.00	-1.00	41	
45	2.0400	Sample	-1.0	-1.00	1	3	-1.00	-1.00	1	
46	9.0400	Sample	13.0	5.40	130	-1	-1.00	-1.00	2189	
47	9.0100	Sample	12.0	5.00	120	-1	-1.00	-1.00	1988	
48	9.0200	Sample	-1.0	-1.00	120	-1	-1.00	-1.00	-1	
49	9.0300	Sample	10.0	4.20	110	-1	-1.00	-1.00	1671	

Explanation of columheadings: All columns do not apply to all samples. A blank, -1 or all 9's indicates not applicable, c no data available.

NUM = sample number. AREA = geographic area. NAME = name of sample point. POINT = point of collection.
DATEHRS = date and time of collection (yr-month-day.hrs) WATERFLOW = water flow from spring, wellhead, or separator.
STEAMFLOW = steam or condensate flow from separator. TOTALFLOW = WATERFLOW + STEAMFLOW.
FLOWUNITS = units of flowrate values. WHP = wellhead pressure. SP = separator pressure.
PUNITS = pressure units. HT = reported total flow enthalpy. HUNITS = enthalpy units.
XSTM = percent steam in total flow. (reported value if BASIS='SAMPLE'; reported or calcualted from enthalpies, flowrates, separation conditions if BASIS='SEPCOR'; calculated from dissolved SIO2 and separation conditions if BASIS='SILCOR').
TC = temperature of sample point (spring temperature, separation temperature, well temperature at depth for downhole sample.)
DATASRC = laboratory reference number, file number of analysis, literature source, etc.
BASIS = corrections made to dissolved species concentrations ('SAMPLE' = original sample analysis; 'SEPCOR', 'SILCOR' = SAMPI concentrations corrected for loss of corresponding steam percentage XSTM.)
CA.......CD = dissolved species in mg/l.
TOTCO2 = total CO2. FE = total Fe. DELD = delta Deuterium, DEL18O = delta oxygen-18 (o/ooSMOW).

Table E-7: Chemical analyses in meq/l, ion balance,ion ratios of samples from wells 88-11 and 81-14[1]

840724 D:SRCEM2; PAGE 1

LINE#	NUM	BASIS	SCAT	SAN	SUM	DIF	PH	ECOBS	ECCAL	OBCA
1	1.0300	Sample	24.351	21.306	45.66	6.67	10.30	3100	2899	1.069
2	1.0301	SEPCOR	21.887	19.150	41.04	6.67	-1.00	-1	-1	-1.000
3	1.0302	SEPCOR	21.388	18.713	40.10	6.67	-1.00	-1	-1	-1.000
4	1.0303	SEPCOR	20.889	18.277	39.17	6.67	-1.00	-1	-1	-1.000
5	1.0400	Sample	36.824	32.096	68.92	6.86	8.80	4400	3739	1.177
6	1.0401	SEPCOR	33.098	28.848	61.95	6.86	-1.00	-1	-1	-1.000
7	1.0402	SEPCOR	32.343	28.190	60.53	6.86	-1.00	-1	-1	-1.000
8	1.0403	SEPCOR	31.589	27.533	59.12	6.86	-1.00	-1	-1	-1.000
9	1.0700	Sample	36.300	39.708	76.01	-4.48	9.00	4400	4391	1.002
10	1.0701	SEPCOR	32.626	35.690	68.32	-4.48	-1.00	-1	-1	-1.000
11	1.0702	SEPCOR	31.883	34.877	66.76	-4.48	-1.00	-1	-1	-1.000
12	1.0703	SEPCOR	31.139	34.063	65.20	-4.48	-1.00	-1	-1	-1.000
13	1.0900	Sample	36.334	39.655	75.99	-4.37	9.00	4200	4388	0.957
14	1.0901	SEPCOR	32.657	35.642	68.30	-4.37	-1.00	-1	-1	-1.000
15	1.0902	SEPCOR	31.912	34.830	66.74	-4.37	-1.00	-1	-1	-1.000
16	1.0903	SEPCOR	31.168	34.017	65.18	-4.37	-1.00	-1	-1	-1.000
17	1.1000	Sample	36.280	40.235	76.51	-5.17	9.10	4400	4422	0.995
18	1.1001	SEPCOR	32.608	36.164	68.77	-5.17	-1.00	-1	-1	-1.000
19	1.1002	SEPCOR	31.865	35.339	67.20	-5.17	-1.00	-1	-1	-1.000
20	1.1003	SEPCOR	31.121	34.515	65.64	-5.17	-1.00	-1	-1	-1.000
21	1.1100	Sample	1.144	1.484	2.63	-12.95	6.30	290	123	2.352
22	1.1200	Sample	32.731	35.420	68.15	-3.95	10.00	3900	3921	0.995
23	1.1201	SEPCOR	32.176	34.819	67.00	-3.95	-1.00	-1	-1	-1.000
24	1.1202	SEPCOR	31.465	34.050	65.52	-3.95	-1.00	-1	-1	-1.000
25	1.1203	SEPCOR	30.754	33.281	64.03	-3.95	-1.00	-1	-1	-1.000
26	1.1500	Sample	32.694	35.523	68.22	-4.15	10.00	3800	3876	0.980
27	1.1501	SEPCOR	32.096	34.874	66.97	-4.15	-1.00	-1	-1	-1.000
28	1.1502	SEPCOR	31.387	34.103	65.49	-4.15	-1.00	-1	-1	-1.000
29	1.1503	SEPCOR	30.677	33.333	64.01	-4.15	-1.00	-1	-1	-1.000
30	1.1600	Sample	33.198	34.237	67.44	-1.54	8.60	3500	3766	0.929
31	1.1601	SEPCOR	32.591	33.611	66.20	-1.54	-1.00	-1	-1	-1.000
32	1.1602	SEPCOR	31.871	32.868	64.74	-1.54	-1.00	-1	-1	-1.000
33	1.1603	SEPCOR	31.151	32.126	63.28	-1.54	-1.00	-1	-1	-1.000

[1] Samples 1.0300 to 2.0400 are 88-11, samples 9.001-9.004 are 81-14

Table E-7: Chemical analyses in meq/l, ion balance, ion ratios of samples from wells 88-11 and 81-14

LINE#	NUM	BASIS	SCAT	SAN	SUM	DIF	PH	ECOBS	ECCAL	OBCA
34	1.1604	Sample	0.205	1.803	2.01	-79.56	5.80	190	89	2.138
35	1.1800	Sample	1.008	1.052	2.06	-2.14	7.30	100	96	1.037
36	2.0100	Sample	38.607	36.368	74.97	2.99	8.84	4500	4247	1.060
37	2.0101	SEPCOR	34.700	32.687	67.39	2.99	-1.00	-1	-1	-1.000
38	2.0102	SEPCOR	33.909	31.942	65.85	2.99	-1.00	-1	-1	-1.000
39	2.0103	SEPCOR	33.118	31.197	64.31	2.99	-1.00	-1	-1	-1.000
40	2.0200	Sample	32.694	31.622	64.32	1.67	8.81	3900	3618	1.078
41	2.0201	SEPCOR	31.627	30.589	62.22	1.67	-1.00	-1	-1	-1.000
42	2.0202	SEPCOR	30.924	29.910	60.83	1.67	-1.00	-1	-1	-1.000
43	2.0203	SEPCOR	30.222	29.231	59.45	1.67	-1.00	-1	-1	-1.000
44	2.0300	Sample	0.017	1.239	1.26	-97.35	4.70	260	61	4.240
45	2.0400	Sample	-1.000	-1.000	-1.00	99.99	4.48	150	-1	******
46	9.0400	Sample	30.914	34.402	65.32	-5.34	9.00	3400	4051	0.839
47	9.0100	Sample	28.598	30.207	58.81	-2.74	5.90	3200	3591	0.891
48	9.0200	Sample	28.508	-1.000	-1.00	99.99	-1.00	-1	1415	-1.000
49	9.0300	Sample	25.317	24.037	49.35	2.59	6.65	2800	2972	0.942

Table E-7: Chemical analyses in meq/l, ion balance, ion ratios of samples from wells 88-11 and 81-14

840724 D:SRCEM2;

LINE#	NUM	BASIS	CA	MG	NA	K	LI	HCO3	CO3	SO4	CL	B	F	FE	PH	I
1	1.0300	Sample	3.29	0.00	13.48	7.42	0.16	1.80	1.33	16.03	2.09	0.19	0.05	0.00	10.30	0.033
2	1.0301	SEPCOR	2.96	0.00	12.12	6.67	0.14	1.62	1.20	14.41	1.88	0.17	0.05	0.00	-1.00	0.030
3	1.0302	SEPCOR	2.89	0.00	11.84	6.51	0.14	1.58	1.17	14.08	1.83	0.16	0.05	0.00	-1.00	0.029
4	1.0303	SEPCOR	2.83	0.00	11.56	6.36	0.14	1.55	1.14	13.75	1.79	0.16	0.05	0.00	-1.00	0.028
5	1.0400	Sample	0.14	0.01	35.22	1.20	0.24	14.59	2.33	7.49	7.05	1.02	0.63	0.00	8.80	0.039
6	1.0401	SEPCOR	0.13	0.01	31.66	1.08	0.22	13.11	2.10	6.74	6.34	0.91	0.57	0.00	-1.00	0.035
7	1.0402	SEPCOR	0.13	0.01	30.94	1.06	0.22	12.81	2.05	6.58	6.19	0.89	0.55	0.00	-1.00	0.035
8	1.0403	SEPCOR	0.12	0.01	30.21	1.03	0.21	12.51	2.00	6.43	6.05	0.87	0.54	0.00	-1.00	0.034
9	1.0700	Sample	0.05	0.01	34.79	1.18	0.27	12.45	5.33	5.83	15.51	1.48	0.58	0.00	9.00	0.043
10	1.0701	SEPCOR	0.05	0.01	31.27	1.06	0.25	11.19	4.79	5.24	13.94	1.33	0.52	0.00	-1.00	0.039
11	1.0702	SEPCOR	0.05	0.01	30.55	1.03	0.24	10.94	4.68	5.12	13.62	1.30	0.51	0.00	-1.00	0.038
12	1.0703	SEPCOR	0.05	0.00	29.84	1.01	0.23	10.68	4.58	5.00	13.31	1.27	0.50	0.00	-1.00	0.037
13	1.0900	Sample	0.07	0.00	34.79	1.18	0.29	12.62	5.67	5.00	15.79	1.30	0.58	0.00	9.00	0.043
14	1.0901	SEPCOR	0.07	0.00	31.27	1.06	0.26	11.34	5.09	4.49	14.20	1.16	0.52	0.00	-1.00	0.039
15	1.0902	SEPCOR	0.07	0.00	30.55	1.03	0.25	11.08	4.98	4.39	13.87	1.14	0.51	0.00	-1.00	0.038
16	1.0903	SEPCOR	0.06	0.00	29.84	1.01	0.25	10.82	4.86	4.29	13.55	1.11	0.50	0.00	-1.00	0.037
17	1.1000	Sample	0.05	0.01	34.79	1.15	0.29	12.78	5.67	5.41	15.79	1.39	0.58	-1.00	9.10	0.044
18	1.1001	SEPCOR	0.04	0.01	31.27	1.03	0.26	11.49	5.09	4.87	14.20	1.25	0.52	-1.00	-1.00	0.039
19	1.1002	SEPCOR	0.04	0.01	30.55	1.01	0.25	11.23	4.98	4.75	13.87	1.22	0.51	-1.00	-1.00	0.038
20	1.1003	SEPCOR	0.04	0.00	29.84	0.99	0.25	10.97	4.86	4.64	13.55	1.19	0.50	-1.00	-1.00	0.037
21	1.1100	Sample	0.03	0.01	1.04	0.04	0.01	1.33	0.00	0.12	0.00	0.19	0.03	0.01	6.30	0.001
22	1.1200	Sample	0.15	0.03	31.31	0.98	0.26	11.47	4.67	4.37	14.38	1.20	0.53	0.00	10.00	0.039
23	1.1201	SEPCOR	0.15	0.03	30.78	0.97	0.26	11.28	4.59	4.30	14.14	1.18	0.52	0.00	-1.00	0.038
24	1.1202	SEPCOR	0.14	0.03	30.10	0.95	0.25	11.03	4.49	4.20	13.83	1.16	0.51	0.00	-1.00	0.037
25	1.1203	SEPCOR	0.14	0.03	29.42	0.93	0.24	10.78	4.38	4.11	13.51	1.13	0.49	0.00	-1.00	0.036
26	1.1500	Sample	0.09	0.01	31.31	1.01	0.27	12.78	3.67	4.16	14.38	1.30	0.53	0.00	10.00	0.038
27	1.1501	SEPCOR	0.09	0.01	30.74	0.99	0.26	12.55	3.60	4.09	14.12	1.27	0.52	0.00	-1.00	0.037
28	1.1502	SEPCOR	0.09	0.01	30.06	0.97	0.26	12.27	3.52	4.00	13.81	1.24	0.51	0.00	-1.00	0.036
29	1.1503	SEPCOR	0.09	0.01	29.38	0.95	0.25	11.99	3.44	3.91	13.50	1.22	0.49	0.00	-1.00	0.036
30	1.1600	Sample	0.11	0.05	31.74	1.02	0.26	13.60	2.33	3.96	13.82	1.30	0.53	0.01	8.60	0.037
31	1.1601	SEPCOR	0.11	0.05	31.16	1.00	0.25	13.35	2.29	3.88	13.57	1.27	0.52	0.01	-1.00	0.036
32	1.1602	SEPCOR	0.11	0.05	30.47	0.98	0.25	13.06	2.24	3.80	13.27	1.24	0.51	0.01	-1.00	0.035
33	1.1603	SEPCOR	0.11	0.05	29.79	0.96	0.24	12.76	2.19	3.71	12.97	1.22	0.49	0.01	-1.00	0.035

Table E-7: Chemical analyses in meq/l, ion balance, ion ratios of samples from wells 88-11 and 81-14

LINE#	NUM	BASIS	CA	MG	NA	K	LI	HCO3	CO3	SO4	CL	B	F	FE	PH	I
34	1.1604	Sample	0.01	0.00	0.18	0.02	0.00	1.80	0.00	0.00	0.00	0.02	0.00	0.00	5.80	0.001
35	1.1800	Sample	0.55	0.09	0.30	0.04	0.00	1.00	0.00	0.04	0.00	0.02	0.01	0.04	7.30	0.001
36	2.0100	Sample	0.06	0.00	36.96	1.28	0.30	12.13	6.00	4.37	12.97	1.48	0.89	0.00	8.84	0.043
37	2.0101	SEPCOR	0.05	0.00	33.22	1.15	0.27	10.90	5.39	3.93	11.66	1.33	0.80	0.00	-1.00	0.038
38	2.0102	SEPCOR	0.05	0.00	32.46	1.12	0.27	10.65	5.27	3.84	11.39	1.30	0.79	0.00	-1.00	0.037
39	2.0103	SEPCOR	0.05	0.00	31.71	1.10	0.26	10.40	5.15	3.75	11.13	1.27	0.77	0.00	-1.00	0.037
40	2.0200	Sample	0.05	0.00	31.31	1.07	0.26	11.47	4.67	3.75	11.00	1.39	0.74	0.00	8.81	0.036
41	2.0201	SEPCOR	0.05	0.00	30.29	1.04	0.25	11.10	4.51	3.63	10.64	1.34	0.71	0.00	-1.00	0.035
42	2.0202	SEPCOR	0.05	0.00	29.61	1.02	0.25	10.85	4.41	3.54	10.40	1.31	0.70	0.00	-1.00	0.034
43	2.0203	SEPCOR	0.05	0.00	28.94	0.99	0.24	10.60	4.31	3.46	10.17	1.28	0.68	0.00	-1.00	0.034
44	2.0300	Sample	0.00	0.00	0.02	0.00	0.00	1.03	0.00	0.09	0.11	0.01	0.00	-1.00	4.70	0.001
45	2.0400	Sample	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	4.48	-1.000
46	9.0400	Sample	0.11	0.00	28.70	1.74	0.36	3.29	4.50	2.91	23.41	1.20	0.28	-1.00	9.00	0.036
47	9.0100	Sample	0.10	0.00	26.53	1.64	0.33	2.98	0.00	2.71	24.25	1.11	0.26	-1.00	5.90	0.031
48	9.0200	Sample	-1.00	0.00	26.53	1.64	0.35	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	0.014
49	9.0300	Sample	0.07	0.00	23.48	1.46	0.30	2.70	0.00	2.50	18.61	0.93	0.22	-1.00	6.65	0.026

Table E-7: Chemical analyses in meq/l, ion balance, ion ratios of samples from wells 88-11 and 81-14

840724 D:SRCEM2;

LINE#	NUM	BASIS	CAF	MGF	NKF	SOF	CLF	BCL	NAK	HCX	CLX	B10X
1	1.0300	Sample	0.136	0.000	0.864	0.754	0.098	8.865	1.82	0.443	0.295	0.262
5	1.0400	Sample	0.004	0.000	0.996	0.238	0.224	14.432	29.30	0.495	0.206	0.298
9	1.0700	Sample	0.002	0.000	0.998	0.149	0.396	9.542	29.57	0.370	0.322	0.308
13	1.0900	Sample	0.002	0.000	0.998	0.128	0.404	8.200	29.57	0.389	0.336	0.275
17	1.1000	Sample	0.001	0.000	0.999	0.136	0.398	8.786	30.22	0.383	0.328	0.288
21	1.1100	Sample	0.027	0.008	0.965	0.086	0.000	-1.000	24.00	0.418	0.000	0.582
22	1.1200	Sample	0.005	0.001	0.995	0.125	0.412	8.361	31.79	0.379	0.338	0.283
26	1.1500	Sample	0.003	0.000	0.997	0.119	0.411	9.004	30.99	0.376	0.329	0.296
30	1.1600	Sample	0.003	0.001	0.995	0.117	0.410	9.371	31.03	0.373	0.324	0.303
34	1.1604	Sample	0.035	0.004	0.961	0.000	0.000	-1.000	11.24	0.907	0.000	0.093
35	1.1800	Sample	0.565	0.093	0.341	0.040	0.000	-1.000	8.26	0.844	0.000	0.156
36	2.0100	Sample	0.002	0.000	0.998	0.123	0.366	11.409	28.90	0.395	0.283	0.322
40	2.0200	Sample	0.002	0.000	0.998	0.121	0.356	12.615	29.14	0.393	0.268	0.338
44	2.0300	Sample	0.060	0.000	0.940	0.076	0.091	9.840	*****	0.822	0.090	0.088
45	2.0400	Sample	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.00	-1.000	-1.000	-1.000
46	9.0400	Sample	0.004	0.000	0.996	0.085	0.686	5.137	16.50	0.180	0.542	0.278
47	9.0100	Sample	0.004	0.000	0.996	0.090	0.810	4.577	16.20	0.078	0.633	0.290
48	9.0200	Sample	-1.000	0.000	1.000	-1.000	-1.000	-1.000	16.20	-1.000	-1.000	-1.000
49	9.0300	Sample	0.003	0.000	0.997	0.105	0.782	4.970	16.11	0.088	0.609	0.303

Explanation of columheadings: All columns do not apply to all samples. A blank, -1 or all 9's indicates not applicable, no data available. ****** indicates field overflow.

NUM = sample number. AREA = geographic area. NAME = name of sample point.
TC = temperature of sample point (spring temperature, separation temperature, well temperature at depth for downhole sample.
BASIS = corrections made to dissolved species concentrations ('SAMPLE' = original sample analysis; 'SEPCOR'= SAMPLE concentr tions corrected for loss of measured or reported steam fraction; 'SILCOR' = SAMPLE concentrations corrected for steam fract calculated from dissolved SIO2 and separation conditions.)
SCAT = total cations, meq/l. SAN = total anions, meq/l. SUM = SCAT + SAN. DIF = ((SCAT-SAN)/DIF)*100.
PH = sample pH, field analysis preferred if available. CAF = CA/(CA+MG+NA+K) MGF = MG/(CA+MG+NA+K)
NKF = (NA+K)/(CA+MG+NA+K) HCF = (HCO3+CO3)/(HCO3+CO3+SO4+CL) SOF = SO4/(HCO3+CO3+SO4+CL)
CLF = CL/(HCO3+CO3+SO4+CL)
CA........FE = species concentrations in meq/1; B in mmoles/1. BCL = (B*100/CL) NAK = NA/K
DA........DF = D'amore-Scanidffio-Panichi parameters A through F.
HCX = (HCO3+CO3)/(HCO3+CO3+CL+B*10) CLX = CL/(HCO3+CO3+CL+B*10) B10X = B*10/(HCO3+CO3+CL+B*

Table E-8: Chemical geothermometers in degrees C of samples from wells 88-11 and 81-14[1]

340724 D:SRCGTM2;

LINE#	NUM	COMMENT1	BASIS	DIF	QTZC	QTZA	CHAL	SQ	B43	B13	NKC	R	DMG	CMG	NAK
1	1.0300	Atmosph.sep'n @ tap	Sample	6.67	102	103	72	3.01	252	346	-1	0.0	-1	-1	532
2	1.0301		SEPCOR	6.67	97	-1	67	3.18	247	344	-1	0.0	-1	-1	532
3	1.0302		SEPCOR	6.67	96	-1	66	3.21	246	344	-1	0.0	-1	-1	532
4	1.0303		SEPCOR	6.67	95	-1	64	3.25	244	344	-1	0.0	-1	-1	532
5	1.0400	Atmosph.sep'n @ tap	Sample	6.86	211	192	193	0.24	298	197	197	0.7	0	197	174
6	1.0401		SEPCOR	6.86	202	-1	184	0.25	292	196	196	0.7	0	196	174
7	1.0402		SEPCOR	6.86	201	-1	182	0.26	291	196	196	0.7	0	196	174
8	1.0403		SEPCOR	6.86	199	-1	180	0.26	289	196	196	0.7	0	196	174
9	1.0700	Atmosph.sep'n @ tap	Sample	-4.48	170	159	146	0.15	357	206	206	0.5	0	206	174
10	1.0701		SEPCOR	-4.48	163	-1	139	0.16	349	205	205	0.5	0	205	174
11	1.0702		SEPCOR	-4.48	161	-1	137	0.16	348	205	205	0.5	0	205	174
12	1.0703		SEPCOR	-4.48	160	-1	135	0.16	346	205	205	0.5	0	205	174
13	1.0900	Atmosph.sep'n @ tap	Sample	-4.37	166	156	142	0.18	336	203	203	0.4	0	203	174
14	1.0901		SEPCOR	-4.37	159	-1	134	0.19	329	202	202	0.4	0	202	174
15	1.0902		SEPCOR	-4.37	157	-1	133	0.19	328	202	202	0.4	0	202	174
16	1.0903		SEPCOR	-4.37	156	-1	131	0.19	326	201	201	0.4	0	201	174
17	1.1000	Brine out portab.sep	Sample	-5.17	170	159	146	0.14	365	206	206	0.5	0	206	172
18	1.1001		SEPCOR	-5.17	163	-1	139	0.15	357	205	205	0.5	0	205	172
19	1.1002		SEPCOR	-5.17	161	-1	137	0.15	356	205	205	0.5	0	205	172
20	1.1003		SEPCOR	-5.17	160	-1	135	0.15	354	205	205	0.5	0	205	172
21	1.1100	Steam out portab.sep	Sample	-12.95	-1	33	-1	3.77	102	159	159	10.8	35	124	189
22	1.1200	Brine out portab.sep	Sample	-3.95	181	168	159	0.28	276	190	190	2.5	2	188	169
23	1.1201		SEPCOR	-3.95	179	-1	157	0.28	275	190	190	2.5	2	188	169
24	1.1202		SEPCOR	-3.95	178	-1	156	0.28	274	190	190	2.5	2	188	169
25	1.1203		SEPCOR	-3.95	176	-1	154	0.29	273	189	189	2.5	2	187	169
26	1.1500	Brine out portab.sep	Sample	-4.15	181	168	159	0.22	304	196	196	0.8	0	196	170
27	1.1501		SEPCOR	-4.15	179	-1	157	0.22	303	196	196	0.8	0	196	170
28	1.1502		SEPCOR	-4.15	178	-1	156	0.22	302	195	195	0.8	0	195	170
29	1.1503		SEPCOR	-4.15	176	-1	154	0.23	300	195	195	0.8	0	195	170
30	1.1600	Brine out portab.sep	Sample	-1.54	181	168	159	0.24	294	194	194	4.2	14	180	170
31	1.1601		SEPCOR	-1.54	179	-1	157	0.24	293	194	194	4.2	14	180	170
32	1.1602		SEPCOR	-1.54	178	-1	156	0.24	292	194	194	4.2	14	180	170
33	1.1603		SEPCOR	-1.54	176	-1	154	0.25	291	194	194	4.2	14	180	170

[1]Samples 1.0300 to 2.0400 are well 88-11, samples 9.001 - 9.004 are well 81-14.

Table E-8: Chemical geothermometers in degrees C of samples from wells 88-11 and 81-14

840724 D:SRCGTM2;

LINE#	NUM	COMMENT1	BASIS	DIF	QTZC	QTZA	CHAL	SQ	B43	B13	NKC	R	DMG	CMG	NAK
34	1.1604	Steam out portab.sep	Sample	-79.56	-1	-1	-1	10.48	81	180	81	3.5	-29	81	255
35	1.1800	From supply tank	Sample	-2.14	64	69	31	56.03	27	167	27	13.4	-1	-1	288
36	2.0100	Atmosph.sep'n @ tap	Sample	2.99	200	183	180	0.15	362	208	208	0.3	0	208	175
37	2.0101		SEPCOR	2.99	192	-1	171	0.16	354	207	207	0.3	0	207	175
38	2.0102		SEPCOR	2.99	190	-1	170	0.16	353	206	206	0.3	0	206	175
39	2.0103		SEPCOR	2.99	188	-1	168	0.16	351	206	206	0.3	0	206	175
40	2.0200	Brine out portab.sep	Sample	1.67	194	179	174	0.16	350	206	206	0.2	0	206	175
41	2.0201		SEPCOR	1.67	191	-1	171	0.16	348	205	205	0.2	0	205	175
42	2.0202		SEPCOR	1.67	190	-1	169	0.16	347	205	205	0.2	0	205	175
43	2.0203		SEPCOR	1.67	188	-1	167	0.17	345	205	205	0.2	0	205	175
44	2.0300	Steam out portab.sep	Sample	-97.35	-1	-1	-1	45.13	1	0	-1	0.0	-1	-1	-1
45	2.0400	Steam out portab.sep	Sample	99.99	-1	-1	-1	-1.00	-1	-1	-1	-1.0	-1	-1	-1
46	9.0400	sidetap no separator	Sample	-5.34	153	145	127	0.26	340	231	231	0.0	0	231	220
47	9.0100	sidetap no separator	Sample	-2.74	148	141	122	0.27	337	232	232	0.0	0	232	221
48	9.0200	sidetap no separator	Sample	99.99	148	141	122	-1.00	-1	-1	-1	-1.0	-1	-1	221
49	9.0300	sidetap no separator	Sample	2.59	143	137	116	0.26	344	233	233	0.0	0	233	222

Explanation of columheadings: All columns do not apply to all samples. A blank, -1 or all 9's indicates not applicable no data available. ****** indicates field overflow. Some columns may not be present.

All temperatures in degrees, Celsius.

NUM = sample number. AREA = geographic area. NAME = name of sample source.
DATEHRS = date and time of collection (yr-mo-day.hrs) POINT = point of collection.
TC = temperature of sample point (spring temperature, separation temperature, well temperature at depth for downhole sampl
BASIS = corrections made to dissolved species concentrations ('SAMPLE' = original sample analysis; 'SEPCOR'= SAMPLE concentions corrected for loss of measured or reported steam fraction; 'SILCOR' = SAMPLE concentrations corrected for steam fra calculated from dissolved SIO2 and separation conditions.)
DIF = ((cations-anions)/(cations+anions))*100
PH = sample pH, field measurement preferred if available.
QTZC = quartz, conductive temperature. QTZA = quartz, adiabatic temperature, steam loss at 100 de
CHAL = chalcedony temperature (conductive). AMOR = amorphous silica temperature (conductive).
SQ = (square root CA)/NA
B43 = Na-K-Ca temperature for factor beta=4/3 B13 = Na-K-Ca temperature for factor beta=1/3
NKC = correct Na-K-Ca temperature according to selection rules.
R = factor R for Mg-corrected Na-K-Ca temperature. DMG = Mg correction in degrees. CMG = Na-K-Ca-Mg temperat
NAK = Na-K temperature. NALI = Na-Li temperature. CANA = Ca-Na temperature.
PCO2 = partial pressure of CO2 calculated from sample PH and HCO3, at temperature TC.
PCO2T25 = partial pressure of CO2 calculated from sample PH and HCO3, at 25 degrees C..
PCC = PCO2-corrected Na-K-Ca temperature.

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