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Revision 2

TNX Area

Phase II Soil Vapor Extraction Test

Treatability Study Report

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Westinghouse Savannah River Company
Savannah River Site
Aiken, SC 29808

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LIST OF ACRONYMS

B&K	Brüel & Kjær
CVOC	Chlorinated volatile organic compound
ECD	Electron capture detector
EPA	Environmental Protection Agency
ERD	Environmental Restoration Department
FID	Flame ionization detector
GC	Gas chromatograph
HP	Hewlett Packard
IVS	In-well vapor stripping
PCE	Perchloroethylene
ppmv	part per million by volume
scfm	standard cubic feet per minute
STP	standard temperature and pressure
SRS	Savannah River Site
SRTC	Savannah River Technology Center
SVE	Soil vapor extraction
SVEU	Soil vapor extraction unit
TCE	Trichloroethylene
VOC	Volatile organic compound
VRW	Vertical recirculation well
WSRC	Westinghouse Savannah River Company

1.0 Executive Summary

Shallow groundwater and sediments beneath the TNX Area are contaminated with both *dissolved* and *residual* chlorinated volatile organic compounds (CVOCs) such as trichloroethylene (TCE), carbon tetrachloride, and perchloroethylene (PCE). In 1997, a single well soil vapor extraction test was conducted at TNX using well TVR1A to collect preliminary information for the design of a SVE system to remediate the residual CVOCs in the sediments (Nichols, 1997). This test was conducted using a regenerative blower capable of producing moderate vacuum and flow rate. Soil permeabilities were found to range from 3.85 to 12.67 darcies. For soil permeabilities in this range, EPA recommends additional testing prior to selecting SVE as a remedial alternative (EPA, 1993). Consequently, additional (Phase II) soil vapor extraction testing was conducted during February and March, 1999 at TNX to further evaluate the feasibility of soil vapor extraction as a remediation strategy at TNX. The Phase II SVE test was designated a Task Activity and was conducted in accordance with WSRC Manual E7. Therefore, the results from the test meet the requirements for design input for the final SVE design for TNX. The objectives of the testing were to estimate the permeability of the sediments at TNX, to determine the potential radius of influence for the SVE system, and to estimate potential mass removal rates for the CVOCs.

The shallow sediments underlying the TNX Area are comprised of densely packed stratified sands which exhibit low permeabilities, as indicated by the single well SVE test. These densely packed sediments require significantly greater vacuum to induce nominal air flow for SVE. As a result, a rotary lobe blower was used as the vacuum source for the multi-well SVE test rather than the regenerative blower used for the single well test.

The Phase II test was conducted using wells TVM-1V, TVM-2V, TVM-3V, TVM-4V, TVM-1U, TVM-2U, TVM-3U, TVM-4U, and TBG4. A combination of tests was performed including pumping individual wells and up to three wells simultaneously. For each test, vacuum drawdown was logged in nearby wells. Additionally, flow rates from each extraction well were logged. CVOC concentrations were monitored during each test with a Bruel & Kjaer (B&K) Model 1302 infrared photoacoustic multigas monitor.

The results of the Phase II SVE test, which corroborate the results of the single well test performed in 1997 (Nichols, 1997), suggest that SVE is a suitable remediation alternative for clean-up of the CVOC contamination present in the unsaturated sediments at TNX. The estimated permeability of the contaminated sediments was found to range from 5.40 to 18.16 darcies. Based upon these permeabilities and the measured vacuum drawdown, the estimated radius of influence was found to be 40 to 110 feet for pumping rates between 5 and 15 scfm.

All of the Phase II soil vapor extraction tests produced soil vapor contaminated with CVOCs. The primary CVOCs were trichloroethylene and carbon tetrachloride. A cumulative of 5.48 lbs. of trichloroethylene and 3.68 lbs. of carbon tetrachloride was removed by the tests during about 810 hours of operation.

Results from the Phase II soil vapor extraction test at TNX meet the EPA requirements for selecting soil vapor extraction as a presumptive remedy for the site (EPA, 1993). The results from the Phase II test provide sufficient data for the determination of the radius of influence of the final SVE system. These data will also be useful in establishing clean-up goals for the site. Additionally, further long term multiple well testing is recommended to better determine asymptotic contaminant concentrations resulting from long term

operation. Mathematical modeling is also recommended to characterize the mass transport mechanisms and to assist with establishing cleanup goals and remediation times for the site.

The results of the Phase II testing show that SVE is a desirable remedial alternative for the TNX area. SVE can reduce future groundwater contamination by removing contaminant mass before it reaches the water table. Additionally, SVE is a proven technology which is cost effective, relatively simple to implement, and can remediate areas difficult to access with other technologies.

2.0 Introduction

The Savannah River Technology Center (SRTC), at the Savannah River Site (SRS), operates a pilot scale testing facility in the TNX Area. Research conducted in the TNX Area generated wastewater that was disposed of in earthen basins until 1988. As a result of these operations, shallow groundwater and sediments beneath the TNX Area are contaminated with both *dissolved* and *residual* chlorinated volatile organic compounds (CVOCs) such as trichloroethylene (TCE), carbon tetrachloride, and perchloroethylene (PCE). In 1996, the SRS initiated an Interim Remedial Action to capture and contain the dissolved contamination that was greater that 500 µg/L TCE (WSRC, 1999). The Interim Remedial Action included the installation of a recovery well network and air stripper, and a vertical recirculation well. The objective of the recovery well network and air stripper is to provide hydraulic containment of the contaminated groundwater and provide a mechanism for the treatment of purge water generated during monitoring of the Interim Remedial Action. A vertical recirculation well, TVR1A, was installed to test the in-well vapor stripping (IVS) technology. Results from the test indicated that the IVS technology was not effective in the TNX Area.

A single well soil vapor extraction test was conducted during June of 1997 using well TVR1A and the existing vacuum extraction unit that was installed for the in-well vapor stripping test. The objective of the SVE test at TNX was to collect preliminary information for the design of a SVE system to remediate residual CVOCs in the sediments.

During the SVE test, soil vapor was extracted from well TVR1A at a rate of 4 scfm with 4 inches of Hg vacuum using a 1 hp regenerative blower. After 6 days of operation the SVE produced about 2 millibars of vacuum in well TVM2U at a radius of 19 feet. Shortly after starting the SVE unit the CVOC concentration increased sharply from 45 ppmv to approximately 120 ppmv total CVOC. After the 5^{th} day of operation the CVOC concentrations began to gradually decline. The average mass removal rate for the SVE unit during the test was 0.1 lbs/day for both TCE and carbon tetrachloride giving a total CVOC removal rate of 0.2 lbs/day.

Results of the single well SVE test, which are summarized above, indicate that SVE could successfully remediate CVOCs in the vadose zone at TNX. The single well test was operated at moderate vacuum and flow rate, and removed soil vapor within a radius of about 30 – 40 ft of the well. Soil permeabilities were found to range from 3.85 to 12.67 darcies. For soil permeabilities in this range, EPA recommends additional testing prior to selecting SVE as a remedial alternative. Phase II testing was undertaken to meet these recommendations.

3.0 Test Objectives

The objective of the Phase II SVE testing at TNX was to collect information for the design of a permanent SVE system to remediate residual CVOC contamination in the local sediments. Previous site characterization has identified the primary CVOC contaminants as trichloroethylene, carbon tetrachloride, perchloroethylene, and cis-dichloroethylene (Nichols, 1997). Phase II testing was conducted on single and multiple well combinations.

The specific objectives of the test were:

- To determine the permeability of the shallow sediments
- To determine the radius of influence of the SVE system
- To determine the potential mass removal rates for the CVOCs in the unsaturated sediments

4.0 Test Methods

4.1 SVE Testing

The SVE Phase II testing was conducted using the wells identified in Table 1 and shown in developmental drawing SKS-RLN-98-020 (Appendix A). Figure 1 gives the layout of the test wells in relation to the TNX Area facilities and selected TCE contours. The pump used in the testing was a Roots-Dresser™ universal rotary lobe blower (Frame 22). A manifold constructed of 1 inch diameter Schedule 40 PVC pipe was used to interface the blower to the extraction wells. Each extraction well was connected to the manifold using 1 inch diameter heavy duty Newflex® spiral reinforced PVC flexible tubing manufactured by NewAge Industries, Inc. The Newflex® tubing was connected to each well using a well head assembly constructed of Schedule 40 PVC pipe. All connections were made using standard hose clamps. Teflon tape and standard silicone sealant (e.g., RTV) were used as necessary to seal connections on the well assembly and manifold. Air flow rate for each extraction well was measured individually using Kurz™ Model 510FT insertion flow transmitters. A Campbell™ CR21 data logger was used to record data from the flow meters. A schematic of the hardware for the SVE multiple well test is given in developmental drawing SKS-RLN-98-018 (Appendix A).

Seven short term single well extraction tests were conducted on wells TVM 1 - 4 V, TVM-2U, TVM-3U and TBG-4. The purpose of these tests was to verify the permeabilities estimated by Nichols (1997), and to examine the radius of influence of the individual wells operating under greater vacuum and higher air flow rates than implemented by Nichols (1997). In order to determine the relationship between vacuum and air flow rate, step tests were performed on wells TVM-1V, TVM-4V, and TBG-4. For these tests, vacuum was increased in a stepwise fashion and the resulting flow rate was recorded in the field notebook. In addition to the single well extraction tests, two multiple well tests were performed. The multiple well tests were performed on TVM-2V, 3V, and 4V, and TVM-2U, 3U, and 4U.

4.2 Soil Gas Sampling and Analysis

Prior to the start of the Phase II testing, soil gas samples were collected from each well using a small vacuum pump and Tedlar™ bags. The samples were analyzed within 24 hours of collection using a Hewlett Packard 5890 gas chromatograph equipped with a flame ionization detector (FID), electron capture detector (ECD), and a mass spectrophotometer. The samples were analyzed for trichloroethylene, carbon tetrachloride, perchloroethylene, cis-dichloroethylene, trans-dichloroethylene, and chloroform. Results of the background sampling are presented in Table 2.

During each test, a portable Bruel & Kjaer (B&K) Model 1302 infrared photoacoustic multigas monitor was used to monitor and record CVOC concentrations from each extraction well. The B&K uses a photoacoustic infra-red detection method to analyze for CVOCs in the gas stream. The B&K was configured to analyze for trichloroethylene, perchloroethylene, carbon tetrachloride, and carbon dioxide. Carbon dioxide was used to indicate the origin of the gas stream and to verify the seal between the blower and the extraction well. Soil gas and atmospheric air exhibit different concentrations of carbon dioxide gas. The concentration of carbon dioxide in atmospheric air is on the order of 500 ppmv whereas soil gas carbon dioxide concentrations at the TNX site have been observed to be on the order of 50000 ppmv.

Confirmation grab samples were routinely collected from the gas stream using a small vacuum pump and Tedlar™ bags. These samples were analyzed in the same method as described above for the background samples. The results of these samples were used to verify the operation of the B&K multigas monitor.

4.3 Pressure Monitoring

For each test, nearby vadose zone piezometers and water table wells were used to monitor the air pressure in the vadose zone. These wells were fitted with press on PVC caps modified with tubing connections. One eighth inch polyethylene tubing was used to transmit air pressure from each well to a data logger. Air pressure in the vadose zone was monitored using a data logger equipped with a differential pressure transducer, a barometer, and a computer operated manifold.

5.0 Results

A total of nine vadose zone pumping tests were performed on wells in the TNX area to characterize the hydraulic properties of the shallow sediments and to examine mass removal rates of CVOC from the contaminated vadose zone. Testing consisted of seven short term single well pump tests and two multiple well pump tests of longer duration.

5.1 Vadose Zone Pumping Tests

5.1.1 Model Description

Each of the seven short term pumping tests were conducted during times in which barometric pressure was relatively stable; however, barometric pressure can change almost continually even during periods of high pressure (Appendix B). Barometric pressure fluctuations are transmitted through the unsaturated subsurface. These pressure waves are typically damped and delayed to degrees dependent on the effective permeability of the unsaturated media (Buckingham, 1904; Weeks, 1978). As a result of the attenuation and delay of the transmitted pressure wave, at a given time, the atmospheric pressure at the surface and the soil gas pressure in the subsurface will be different (Rossabi, 1999). The dampened pressure wave associated with barometric pressure fluctuations is manifested in any data collected from a pumping test. Thus, it is necessary prior to interpreting data from vadose zone pumping tests, to separate out the barometric component. This is particularly important when the measured drawdown is expected to be on the same scale as the barometric fluctuations. A common method for separating out barometric effects is to determine the lag time of the pressure wave and the efficiency of the transmission through the vadose zone. The lag time of the pressure wave is defined as the amount of time for a change in pressure at the surface to be observed in the subsurface. The barometric efficiency is a measure of the attenuation of the pressure wave as it travels through the subsurface. To account for barometric pressure changes in the drawdown data, the subsurface pressure wave is shifted in time an amount equal to the lag time and then decreased an amount equal to the barometric efficiency. This method of dealing with barometric effects can be problematic because lag time and barometric efficiency depend directly upon the effective permeability of the unsaturated media. Changes in moisture content (wetting/drying) can have a dramatic effect on the air permeability of unsaturated sediments (Jury et al., 1991). Therefore, most vadose zone pumping tests are conducted over short periods of time to minimize these problems.

An alternate method for separating out barometric effects is to make use of a reference well (Massmann, 1989). The reference well is located out of the area of influence of the pumping test, but screened within the zone of interest. Subsurface gas pressure is monitored in the reference well in addition to the observation wells used in the pumping test. Because the reference well is located outside the area of influence, there will be no drawdown observed at that location. Therefore, fluctuations in gas pressure in the reference well can be directly attributed to fluctuations in barometric pressure. The pressure wave from the reference well is then used to correct the pressure waves measured in the observation wells for barometric pressure fluctuations. This method was chosen for the Phase II SVE testing at TNX because of the simplicity of the method and the availability of a reference well for each test.

For each test, differential pressure was measured in each of the observation wells along with barometric pressure. The absolute gas pressure in each well was determined by adding the differential pressure to the barometric pressure. The absolute pressure in each observation well was then subtracted from the absolute

pressure in the reference well. This removed any barometric fluctuations from the observation data. Table 3 lists the extraction wells, observation wells, and reference wells used in each test. All pressure measurements were logged in units of millibars, which were converted into units of feet of water. The units of feet of water were then converted to feet of air by multiplying by the ratio of the density of water to the density of air.

The data from each pumping test was analyzed using the program AQTESOLV, which is a program designed for pump test analysis (Geraghty and Miller Inc., 1996). A type curve matching procedure was employed using a model for leaky aquifers with partially penetrating wells. The model used was developed by Hantush and Jacob (1955) and Hantush (1961a and b) to analyze data from pumping tests in leaky aquifers. It has been shown that under certain conditions, standard techniques used to model groundwater pumping tests may also be used in the interpretation of data from vadose zone pumping tests (Massmann, 1989; Massmann and Madden, 1994). In the case of a vadose zone pumping test, the fluid is air rather than water. Massmann (1989) gives the assumptions and limitations associated with modeling gas transport with conventional groundwater transport equations. One of the more significant assumptions is that gas transport can be modeled using the equation for incompressible fluid flow. Massmann (1989) found that for pressure variations on the order of one half atmosphere or less this assumption is valid. For the Phase II SVE testing at TNX, pressure variations were less than one tenth of an atmosphere.

Parameters used in the Hantush-Jacob model for leaky aquifers includes the saturated thickness of the aquifer, the thickness of the overlying confining layer, and the zone of penetration of the pumping and observation well (or wells). For the case of a vadose zone pumping test, the fluid is air and the "saturated thickness" is equal to the thickness of the unsaturated zone minus the confining layer. For the TNX area, the confining layer was taken to be ten feet in thickness based upon characterization performed by Nichols (1997). Nichols (1997) reported that the test site is underlain by a layer of backfill roughly ten feet in thickness. The water table was taken as the underlying no flow boundary condition in the Hantush-Jacob leaky aquifer model. The average water table depth was determined from historical records from the "U" series of TVM wells. This depth was found to be about 43 feet. Subtracting the thickness of the confining layer from the depth to the water table yielded a "saturated thickness" of 33 feet. The zone of penetration of the pumping and observation wells was determined from the well construction logs for each well. For wells screened completely within the vadose zone, the zone of penetration was defined as the length of the well screen. For wells screened across the water table, the dry portion of the well screen was used as the zone of penetration.

5.1.2 Model Results

AQTESOLV simulations were performed for each test and the resulting type curves are presented in Appendix B. Looney et al. (1991) recommended implementing calculated limits for the storage coefficient in the Hantush-Jacob leaky aquifer model. The use of calculated limits prevents AQTESOLV from predicting storage coefficients greater than physically possible based upon the expected moisture content of the unsaturated zone.

The specific storage, S_s, may be calculated using the following equation:

$$S_s = \frac{g \phi_a MW}{RT} \qquad (1)$$

where:
g = gravitational constant = 980 cm/sec^2
ϕ_a = available porosity
MW = molecular weight of gas (air) = 28 g/mol
RT = gas constant * absolute temperature = 2.5 x 10^{10} cm^2 g/mol sec^2

The available porosity, ϕ_a may be calculated using the following equation:

$$\phi_a = \phi_t (1 - \theta_s) \quad (2)$$

where:
ϕ_t = total porosity, 0.4 (Eddy et al., 1991)
θ_s = saturation

The storage coefficient, S, may then be determined with the following equation:

$$S = S_s b$$

where:
b = thickness of the unsaturated zone

An upper and lower bound for the storage coefficient was established based upon expected ranges of moisture content in the vadose zone. These bounds were calculated using saturation values of 0.3 for most of the unsaturated zone, and 0.9 near the capillary fringe. This produced storage coefficients of 0.0003 and 0.000045. For each simulation, the storage coefficient was set equal to either 0.0003 or 0.000045 depending on which value produced the best fit with the data. Figure 4 clearly shows the effect of the storage coefficient on the predicted type curves. In one case, the storage coefficient was fixed at 0.0003 while for the other case, AQTESOLV iterated the storage coefficient to produce the best fit. The type curve produced from the iterated fit matches the early time data better than the fixed value; however, for later data, both values of the storage coefficient produce similar fits. For a long term soil vapor extraction project, the later time data is most important. In most cases, AQTESOLV iterated the storage coefficient to a value greater than would be expected for the unsaturated zone. Therefore, it was deemed appropriate to fix the storage coefficient at a reasonable value and iterate transmissivity and leakage to produce the best fit of the data.

In some cases, it was found that a storage coefficient much smaller than 0.0003 was necessary to yield a good fit to the data (Figure 5). This was particularly true for cases where the extraction well was within the capillary fringe (i.e. the "U" series wells). This was expected since the available porosity in the capillary fringe is less than that of the remainder of the vadose zone due to an increase in saturation. In these cases, the storage coefficient was taken as 0.000045 (θ_s = 0.9).

For one data set, both the Hantush-Jacob leaky aquifer model and the Theis (1935) confined aquifer model with no leakage were used to match the data. Figure 6 shows the results of the simulations. Although both models match the early time data well, the Hantush-Jacob solution with leakage clearly matches the later time data better than the Theis model. Therefore, the assumption of leakage through the overlying

confining layer is accurate, and the Hantush-Jacob leaky aquifer model is the most appropriate model for the simulations.

The results from the AQTESOLV simulations are presented in Table 4. The transmissivity of the unsaturated sediments was estimated to range from 0.023 to 0.076 ft^2/min, with a median value of 0.035 ft^2/min. The radial permeability of the sediments (k_r) was estimated to range from 5.40 to 18.16 darcies, with a median value of 8.42 darcies. The vertical permeability (k_z)of the sediments was estimated to range from 1.08 – 3.63 darcies, with a median value of 1.68. For the overlying semi-confining layer, the permeability (k') was estimated to range from 0.07 – 3.6 darcies, with a median value of 0.62. Table 5 gives a comparison of the Phase II results to those estimated by Nichols (1997). The results from the two tests were found to be very comparable.

Figures 7 through 9 show typical drawdown data and the results from fitting the analytical Hantush-Jacob type curve model to the data. From these figures, it can be clearly seen that the Hantush-Jacob model matches the drawdown data well. Figures 8 and 9 show the effects of anisotropy where the predicted type curves are shifted somewhat from the actual data; however, the type curve match is still reasonable. Appendix B gives the type curve matches for each of the tests performed as part of the Phase II SVE testing. Appendix C gives the AQTESOLV result logs for each test.

5.1.3 Radius of Influence

The radius of influence is defined as the distance at which a sufficient level of vacuum will be present to cause air to flow (Suthersan, 1997). Typically, to determine radius of influence, steady state vacuum levels are measured at monitoring wells located at varying radial distances from the extraction well. Vacuum is plotted against distance and a best fit line is drawn through the points. An arbitrary cutoff value is then chosen for the minimum vacuum level which will induce air flow. Several different minimum values have been proposed ranging from 0.1 to 1.0 in. H_2O to 10 percent of the applied vacuum (Suthersan, 1997; Peargin and Mohr, 1998; Looney et al., 1991). Once the cutoff value has been selected, the radius of influence is read directly from the graph.

Because the existing wells at the Phase II test site were not adequately spaced, the radius of influence of the vacuum extraction system was estimated using AQTESOLV. AQTESOLV was used to estimate the steady state vacuum drawdown at several different radial distances from a hypothetical pumping well. A two inch diameter pumping well was modeled with a screened length of ten feet. The bottom of the screen on the pumping well was located five feet above the water table. The median values for transmissivity and leakage factor determined from the model simulations were used to describe the unsaturated zone. Observation wells were established at varying distances from the pumping well. Using the Hantush-Jacob leaky aquifer type curve matching feature in AQTESOLV, the drawdown was simulated in each observation well. Step tests were performed on wells TVM-1V, TVM-4V, and TBG-4 to investigate the relationship between applied vacuum and pumping rate. Results from these tests are given in Figure 10. From Figure 10, it can be seen that flow rates in the range of 5 to 15 scfm can be expected for vacuums within the range of those tested. Therefore, the radius of influence simulations were performed for pumping rates of 5, 10, and 15 scfm. Figure 11 shows the vacuum drawdown as a function of elapsed time at different radii for a pumping rate of 10 scfm. Graphs for the other pumping rates were similar. Steady state vacuum drawdown was then plotted for each radius for each pumping rate.

Figure 12 shows vacuum drawdown as a function of distance from the pumping well for the three different pumping rates. A cutoff value of 0.5 in. of H_2O was chosen to estimate the radius of influence. This value

represents the midpoint of the range given by Suthersan (1997). Based on the cutoff value of 0.5 in. H_2O, the radius of influence is estimated to be within the range of 40 to 110 feet for pumping rates in the range of 5 to 15 scfm.

5.2 Contaminant Removal

All of the Phase II soil vapor extraction tests produced soil vapor contaminated with CVOCs. The primary CVOCs were trichloroethylene and carbon tetrachloride (Table 6). A cumulative of 5.48 lbs. of trichloroethylene and 3.68 lbs. of carbon tetrachloride was removed by the tests. Figure 13 shows the concentration history of trichloroethylene and carbon tetrachloride in off-gas from the 24 day test and Figure 14 shows the cumulative mass removed for the test. During the 24 day test, an instrument error and the failure of a sampling pump resulted in the loss of a small amount of data; however, the trend of decreasing contaminant concentrations remains clear in Figure 13.

Shortly after starting the 24 day test, the vapor concentration of trichloroethylene and carbon tetrachloride peaked at 28.2 and 13.1 ppmv, respectively. Subsequently, concentrations decreased slowly to 6.6 and 3.8 ppmv. Prior to starting operation of an SVE test the concentration of contaminants in the soil vapor are in equilibrium with residual contaminants that are present in the following forms:

- Sorbed film on sediments
- Residual liquid in pore spaces
- Dissolved in mobile and immobile water
- Diffused into fine grain sediments

When the SVE test is started, contaminated soil vapor is removed from the unsaturated zone by advection. As long as the residual sources release contaminants (by volatilization) into the soil vapor at the rate it is being removed the concentration will remain constant. Once the contaminated soil vapor is removed from the sediments and volatilization can no longer keep up with the soil vapor extraction, the transport process shifts away from equilibrium and mass transfer between the remaining sources of residual contaminant and soil vapor controls removal of contaminants from the soil. Mass transfer from the remaining sources is much slower than soil vapor extraction, and as a result, contaminant concentrations in the off-gas begin to decline (Figure 13). If soil vapor extraction is terminated before all of the residual contaminants are removed, the concentration of contaminants in the soil vapor will rebound until they are in equilibrium with the remaining residual. Operation of SVE systems is often optimized by temporarily stopping the system when the off-gas concentration reaches an asymptote and resuming operation after the soil vapor concentration has rebounded.

Active SVE eventually becomes no longer cost effective and passive SVE is deployed as a polishing technique to remove the final residual contaminant. Passive SVE uses a flow control valve such as the BaroBall™ to control the flow of soil vapor that occurs as a result of natural fluctuations in barometric pressure. When the barometric pressure is greater than the subsurface pressure atmospheric air flows into a well and when the atmospheric pressure is less than the subsurface pressure soil vapor flows out of the well. The BaroBall controls the flow of air so that soil vapor flows out of a well and does not allow atmospheric air to blow into the well which would dilute soil vapor concentrations and slow down the passive SVE.

5.3 Strategy for SVE Operations

A strategy for operating the SVEU at TNX has been developed using the results contained in this report on Phase II Soil Vapor Extraction Testing at TNX. This is consistent with the EPA Presumptive Remedy guidance for SVE in soils with moderate permeability. Figure 15 contains a flowchart that shows the strategy for operating the SVEU. The first two items in the strategy, Identify Source Term and Conduct Treatability Study have been completed. The remaining items will be completed in the Feasibility Study, Remedial Design Report/Remedial Action Workplan, and operations and monitoring. This strategy can be used to prepare a plan for disciplined construction and operation of the SVEU that minimizes clean-up time and maximizes cost effectiveness.

5.3.1 Design & Installation

In the event that SVE is selected as the final action to remediate the vadose zone, the design of the SVE system at TNX will include determining the location of SVE wells, selection and sizing of equipment, and piping and instrumentation design. The SVE wells should be installed using drilling techniques that minimize the loss of permeability adjacent to the borehole such as using a hollow stem auger or cone penetrometer. Depth discrete samples should be collected on a 1-2 ft interval and analyzed for CVOCs at each proposed location. An SVE well will be installed if the CVOCs exceed predetermined concentration criteria in the sediments. If the criteria are not met then the boring will be abandoned.

5.3.2 Set Clean-up Criteria

Site specific clean-up criteria for SVE should be established based on the Remedial Action Objectives (RAO) in the Feasibility Study and the contaminant removal performance of SVE as determined in this report. The proposed RAO for the TNX Vadose Zone is to "Reduce secondary source of CVOCs in the vadose zone to reduce time to achieve groundwater RAOs." (WSRC, 1999). The groundwater RAO for CVOCs are the Maximum Contaminant Levels (MCLs) promulgated in 40CFR (1989). After the RAOs for SVE have been finalized, the clean-up criteria should be established by performing mathematical modeling based on permeability and contaminant recovery data presented in this report and on CVOC concentrations in soils reported in the TNX Area Soil Vapor Extraction Test Treatability Study Report, Nichols (1997). The criteria will have a tiered approach to allow both active and passive SVE and should be based on either CVOC concentration in soil vapor or a contaminant recovery rate. Additionally, the criteria should include a provision that ensures that the concentration or removal rate does not rebound above the criteria, such as periodic monitoring (less frequent than during operation) for a specified time after completing active and passive SVE.

5.3.3 Operate and Monitor

During operation of the SVE system, CVOC concentrations should be periodically monitored to check progress toward achieving clean-up criteria. The SVEU should be sampled on a more frequent basis than the individual wells. Additionally, vacuum and flowrate at the SVEU and wells should be monitored to ensure that the wells are operating properly. In addition to tracking system performance, this information can be used to optimize operation as site clean-up progresses. The constituents monitored should include trichloroethylene, carbon tetrachloride, tetrachloroethylene, chloroform, and cis-1,2-dichloroethylene.

5.3.4 Evaluate Effectiveness

The SVEU performance should be evaluated using monitoring data collected during operation of the SVEU. Soil vapor extraction should be changed from active to passive when it is no longer economically feasible to operate active SVE. The effectiveness of the SVEU may be evaluated by the following methods:

- Comparing the actual contaminant recovery with anticipated recovery.
- Reviewing mass removal trends from the SVEU and individual wells for premature asymptotes that may indicate reduced removal efficiency.
- Comparing CVOC concentrations with clean-up criteria to determine if a well or the SVEU should be changed from active to passive operation or terminated all together.
- Comparing SVE removal rates to contaminant removal rates for the pump and treat system.

6.0 Summary and Recommendations

Phase II soil vapor extraction testing was conducted during February and March, 1999 at TNX to evaluate the feasibility of soil vapor extraction as a remediation strategy at TNX. The Phase II SVE test was designated a Task Activity and was conducted in accordance with WSRC Manual E7 to meet the requirements for design input for the final SVE design for TNX. The objectives of the testing were to estimate the permeability of the sediments at TNX, to determine the potential radius of influence for the SVE system, and to estimate potential mass removal rates for the CVOCs.

The Phase II test was conducted using wells TVM-1V, TVM-2V, TVM-3V, TVM-4V, TVM-1U, TVM-2U, TVM-3U, TVM-4U, and TBG4. A combination of tests were performed including pumping individual wells and up to three wells simultaneously. For each test, vacuum drawdown was logged in nearby wells. Additionally, flow rates from each extraction well were logged. CVOC concentrations were monitored during each test with a Bruel & Kjaer (B&K) Model 1302 infrared photoacoustic multigas monitor.

The results of the Phase II SVE test, which corroborate the results of the single well test performed in 1997 (Nichols, 1997), suggest that SVE is a suitable remediation alternative for clean-up of the CVOC contamination present in the unsaturated sediments at TNX. The estimated permeability of the contaminated sediments was found to range from 5.40 to 18.16 darcies. Based upon these permeabilities and the measured vacuum drawdown, the estimated radius of influence was found to be 40 to 110 feet for pumping rates between 5 and 15 scfm.

All of the Phase II soil vapor extraction tests produced soil vapor contaminated with CVOCs. The primary CVOCs were trichloroethylene and carbon tetrachloride. A cumulative of 5.48 lbs. of trichloroethylene and 3.68 lbs. of carbon tetrachloride was removed by the tests during about 810 hours of operation.

Results from the Phase II soil vapor extraction test at TNX meet the EPA requirements for selecting soil vapor extraction as a presumptive remedy for the site (EPA, 1993). The results from the Phase II test provide sufficient data for the determination of the radius of influence of the final SVE system. These data will also be useful in establishing clean-up goals for the site. Additionally, further long term multiple well testing is recommended to better determine asymptotic contaminant concentrations resulting from long term operation. Mathematical modeling is also recommended to characterize the mass transport mechanisms and to assist with establishing cleanup goals and remediation times for the site.

The results of the Phase II testing show that SVE is a desirable remedial alternative for the TNX area. SVE can reduce future groundwater contamination by removing contaminant mass before it reaches the water table. Additionally, SVE is a proven technology which is cost effective, relatively simple to implement, and can remediate areas difficult to access with other technologies.

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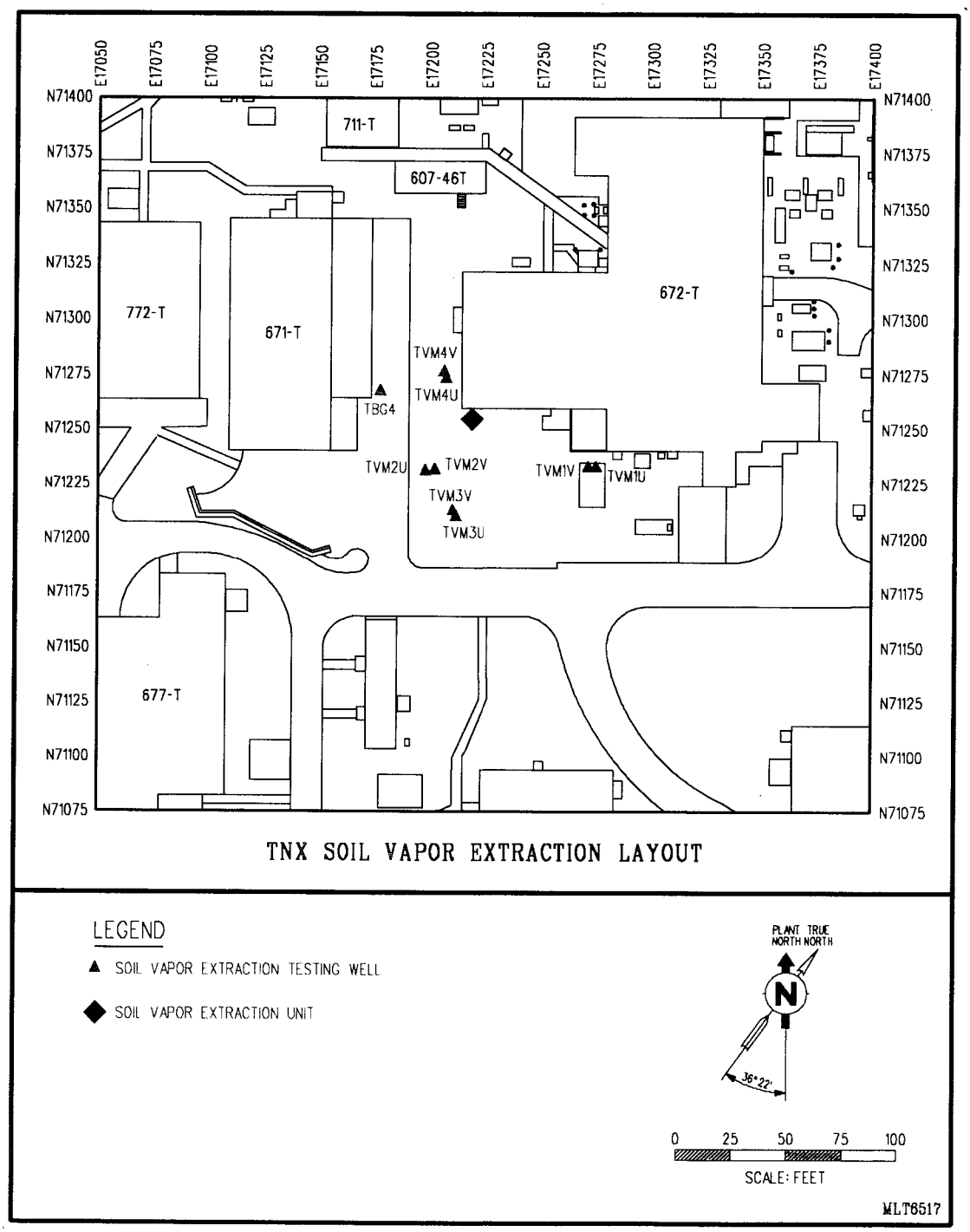


Figure 1. Layout of the Phase II SVE test wells.

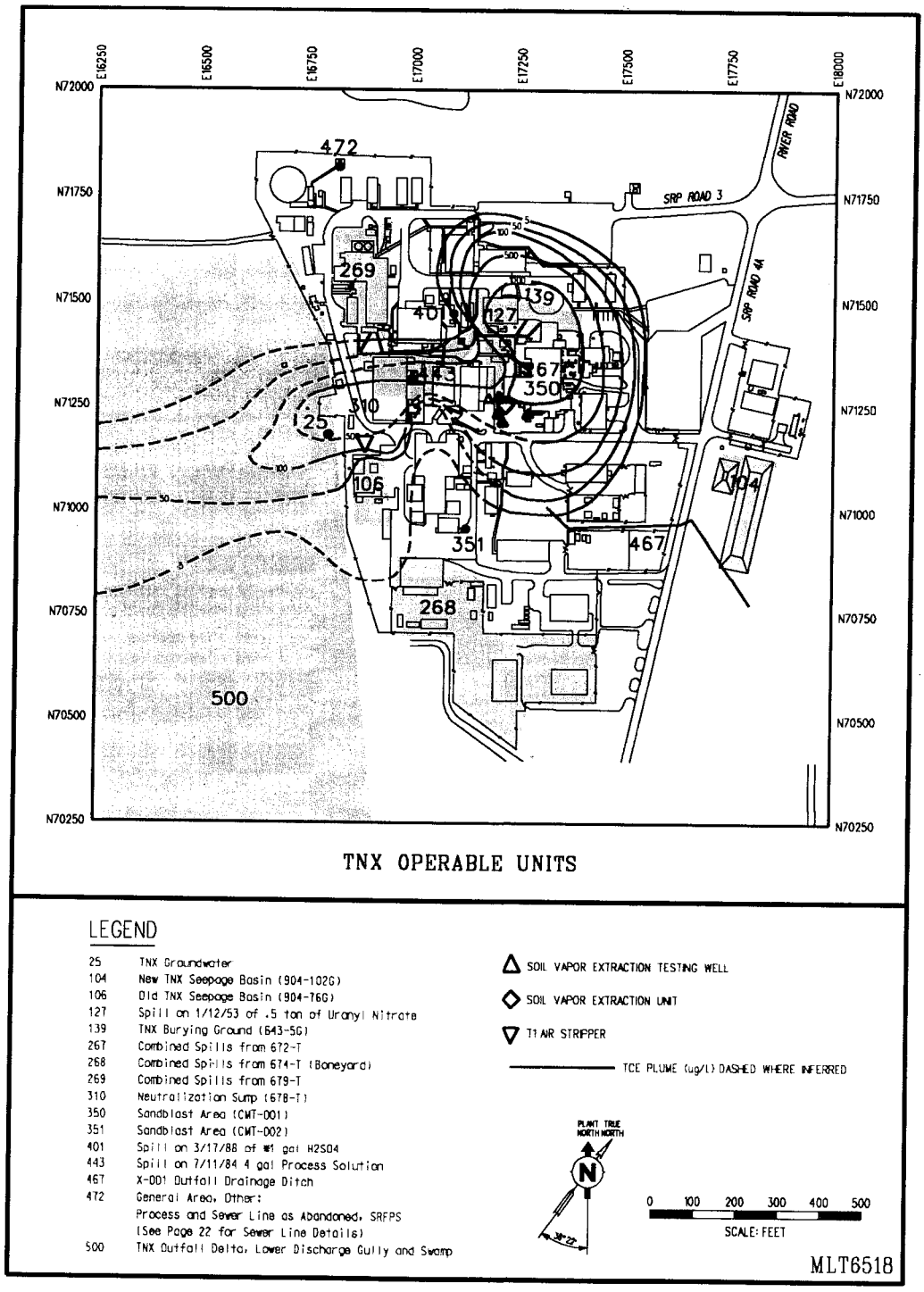


Figure 2. Layout of the Phase II SVE test wells in relation to the TNX Operable Units.

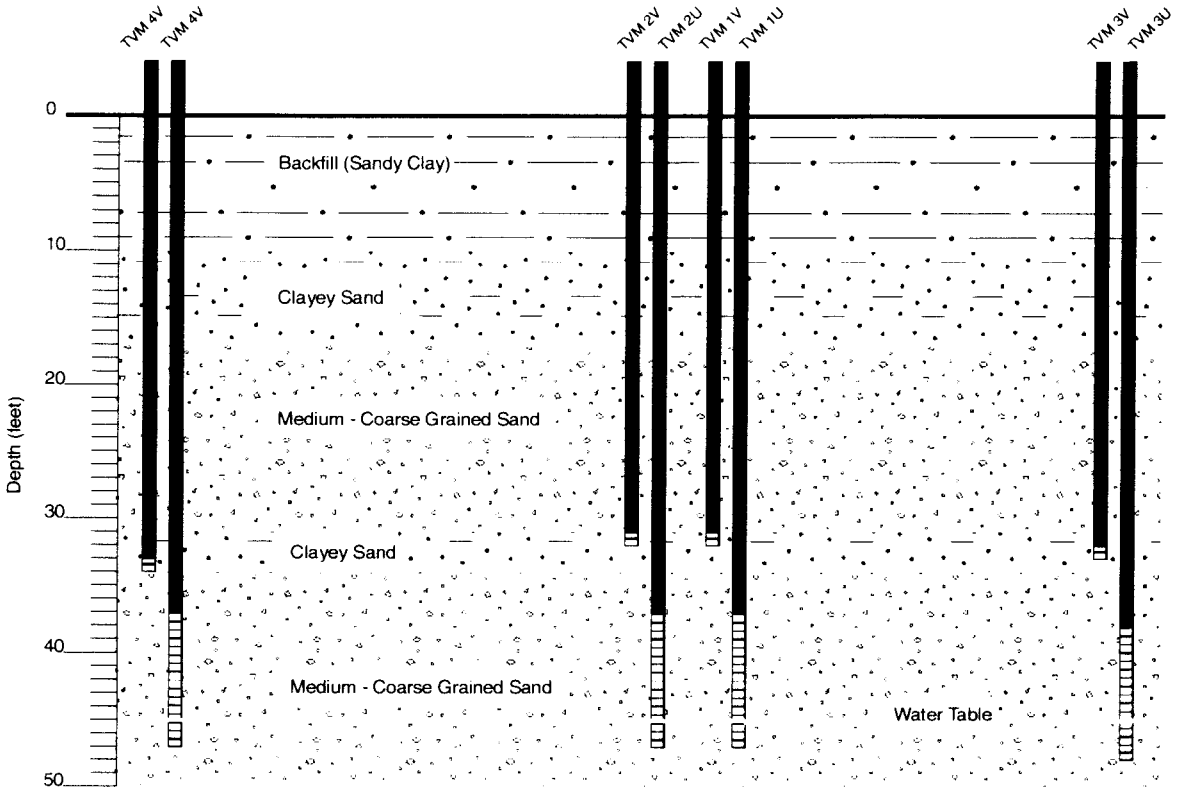


Figure 3. Geologic cross-section of the TNX SVE test site.

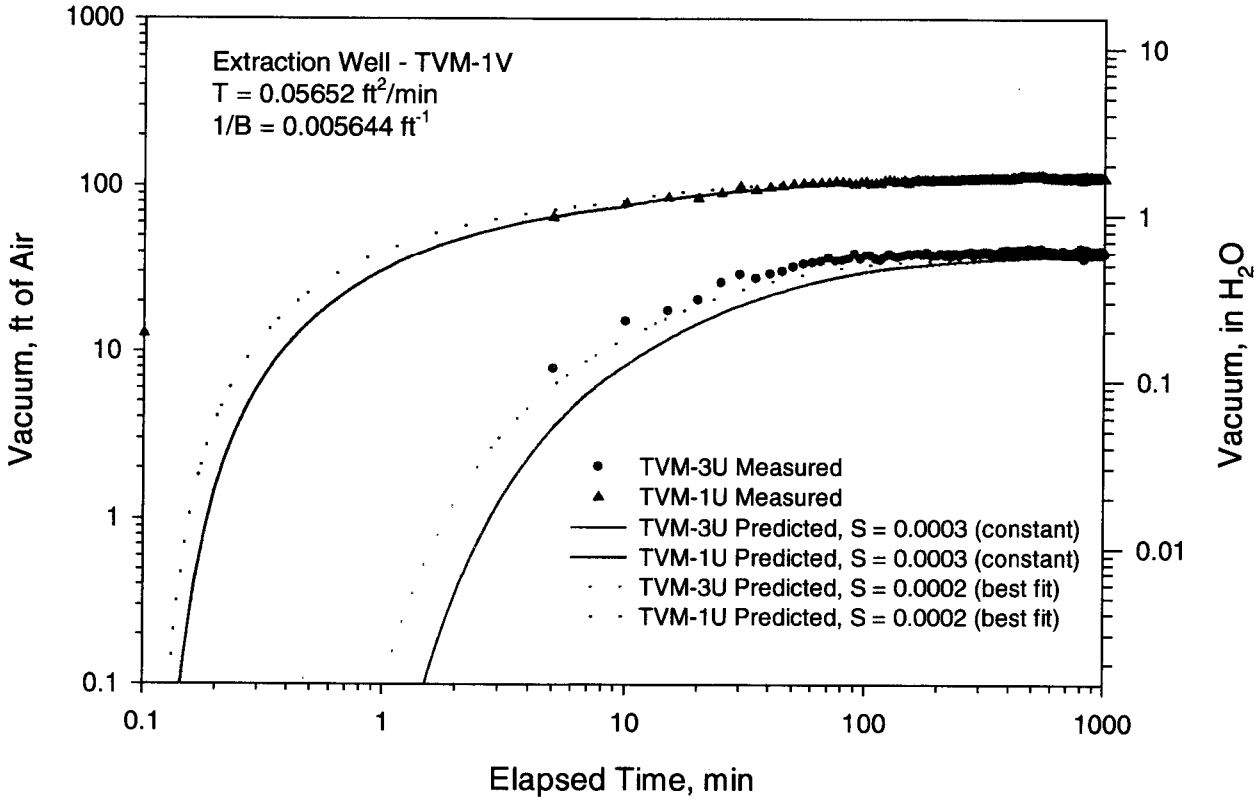


Figure 4. Storage coefficient effects on type curve matches for extraction well TVM-1V.

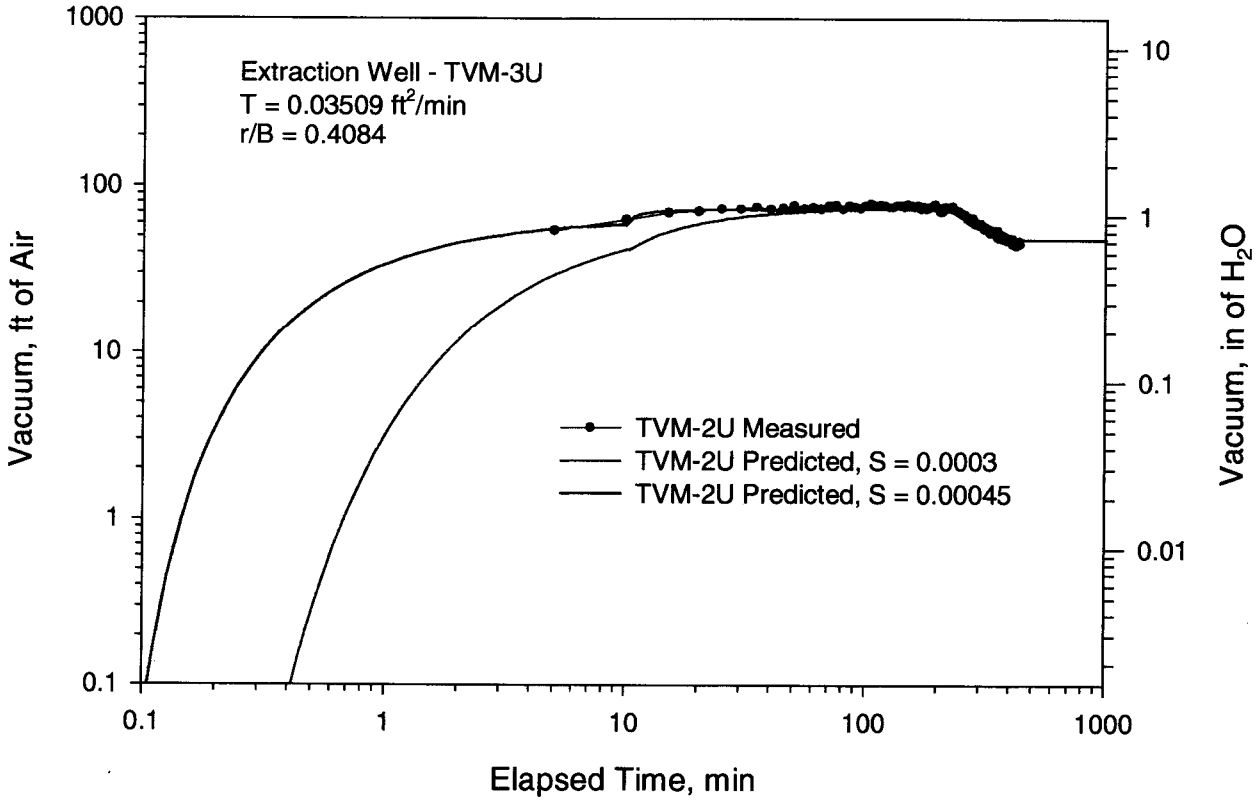


Figure 5. Storage coefficient effects on type curve matches for extraction well TVM-3U.

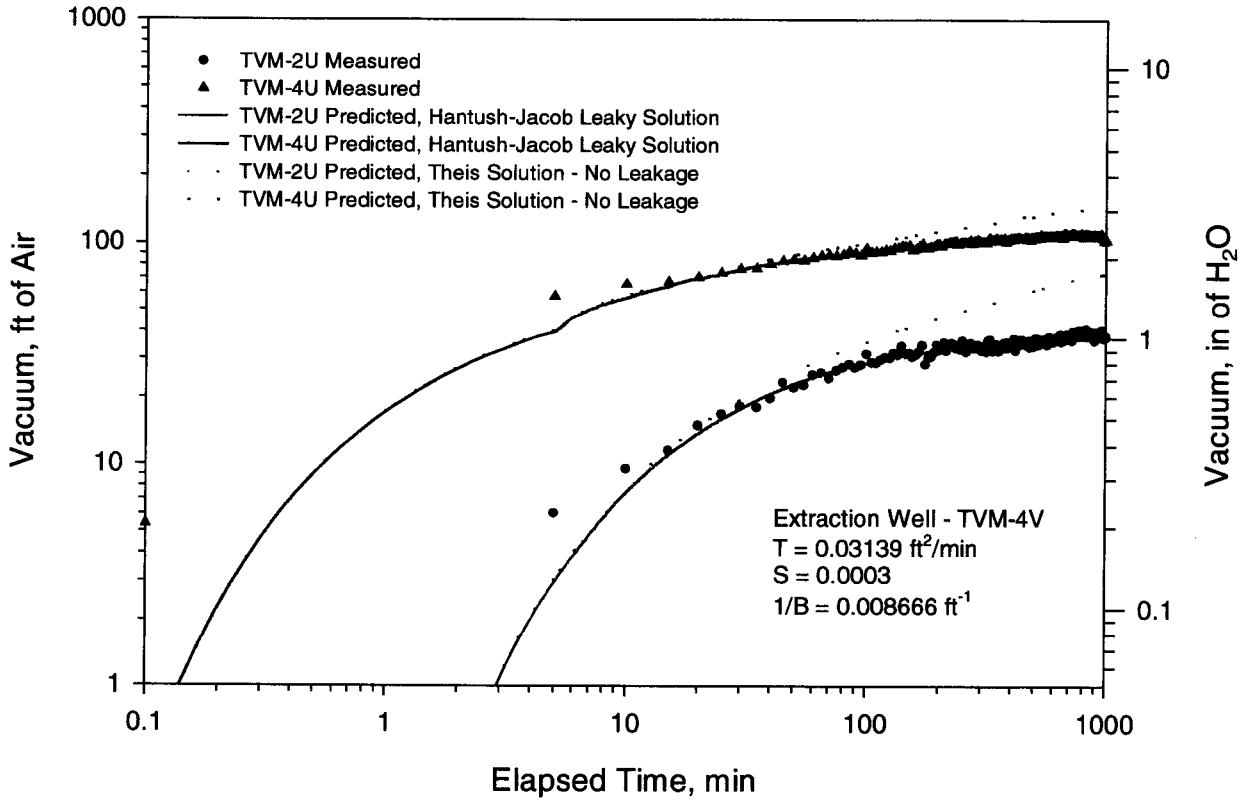


Figure 6. Comparison of the Hantush-Jacob leaky aquifer model to the Theis confined aquifer model for extraction well TVM-4V.

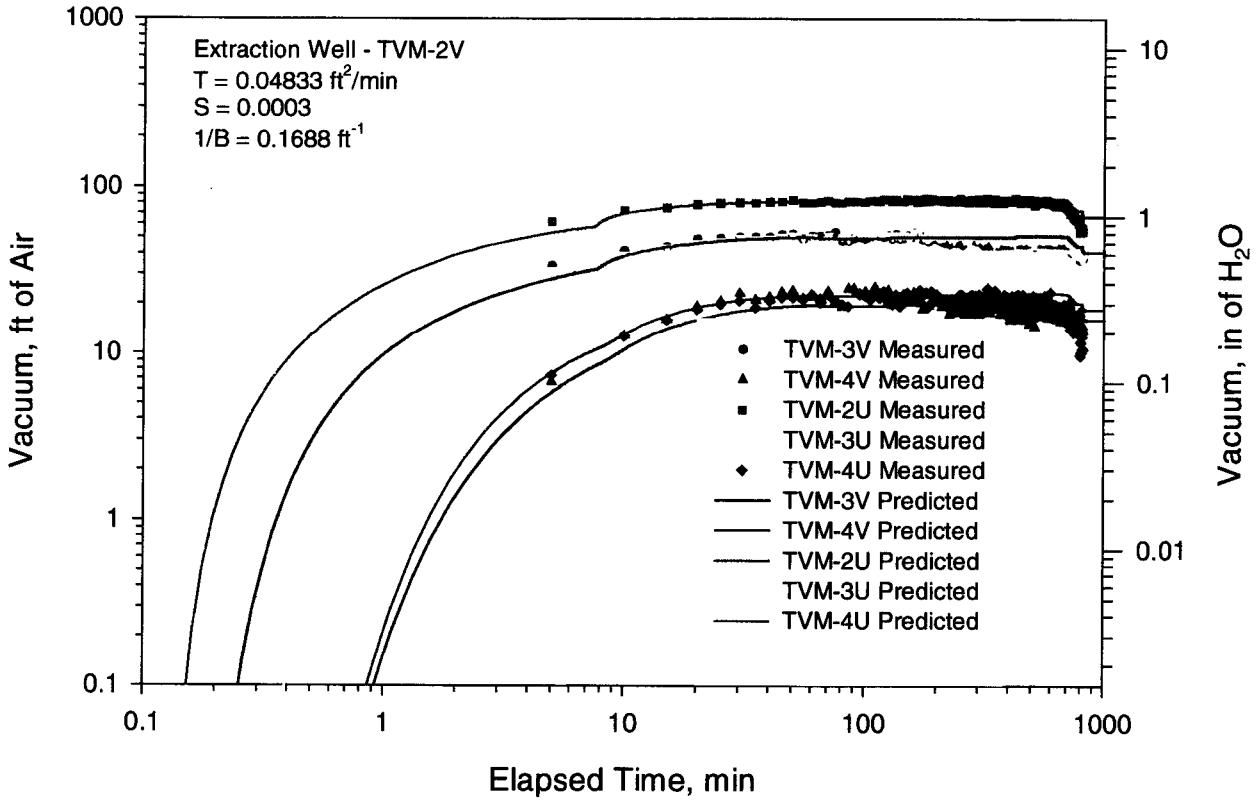


Figure 7. Vacuum drawdown as a function of elapsed time for extraction well TVM-2V.

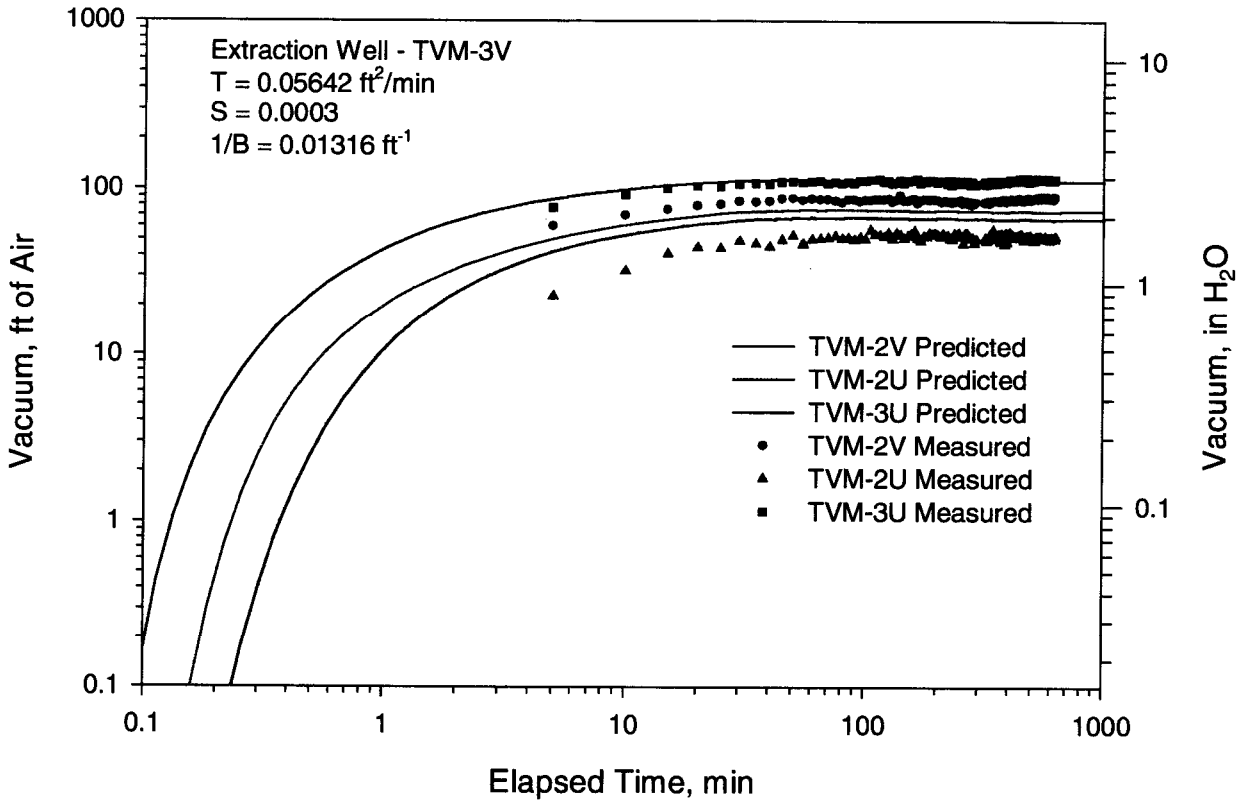


Figure 8. Vacuum drawdown as a function of elapsed time for extraction well TVM-3V.

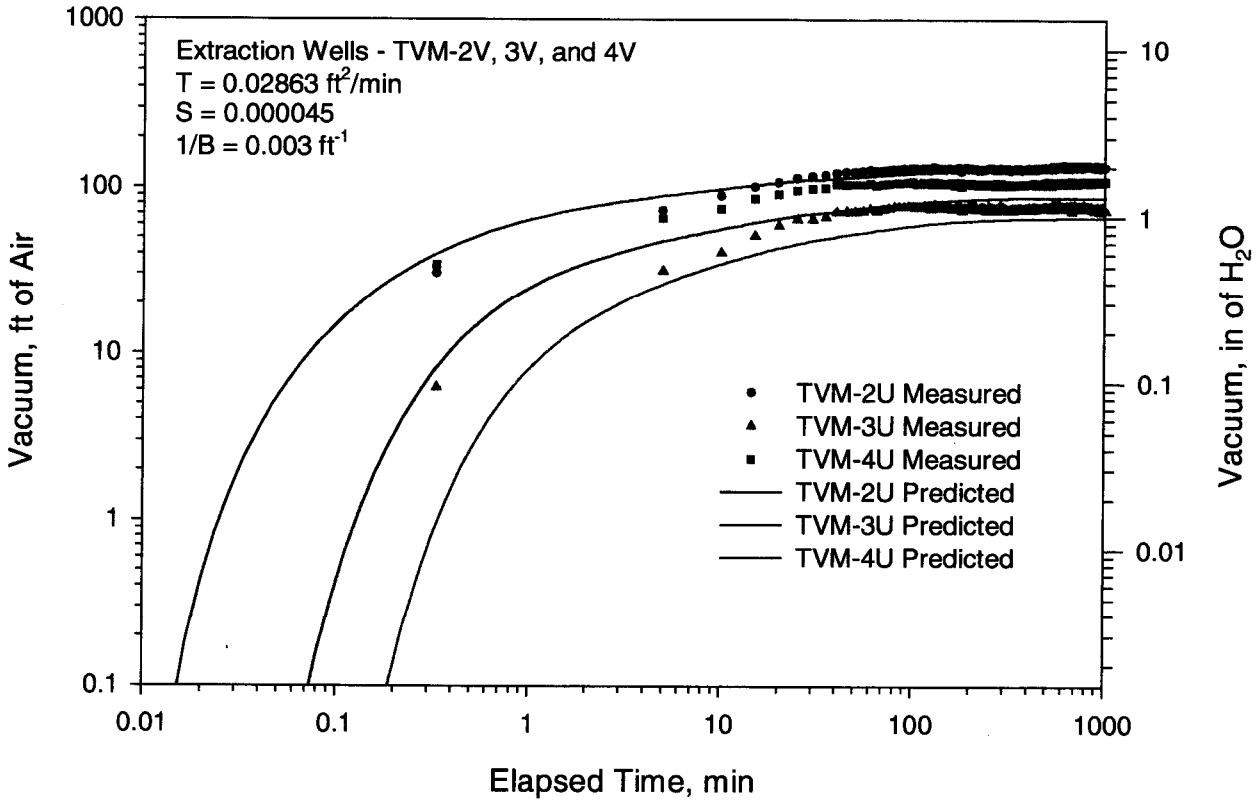


Figure 9. Vacuum drawdown as a function of elapsed time for the multiple well test performed on wells TVM-2V, 3V, and 4V.

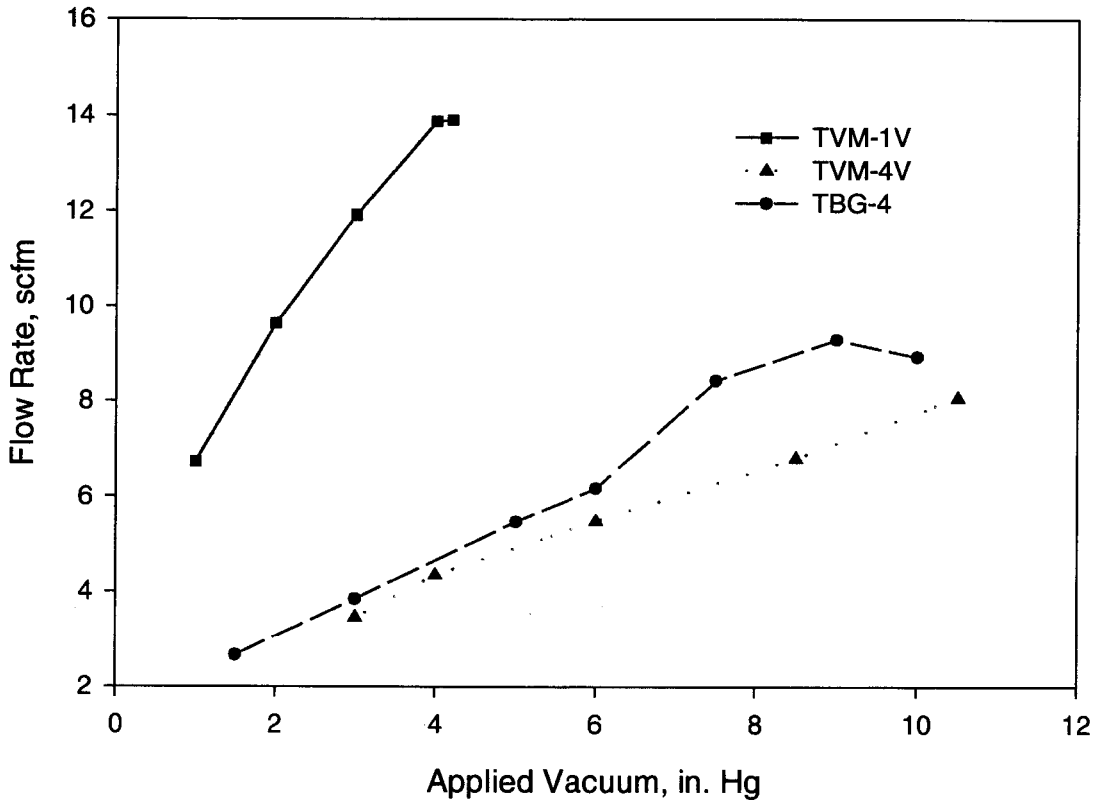


Figure 10. Step test results for wells TVM-1V, TVM-4V, and TBG4.

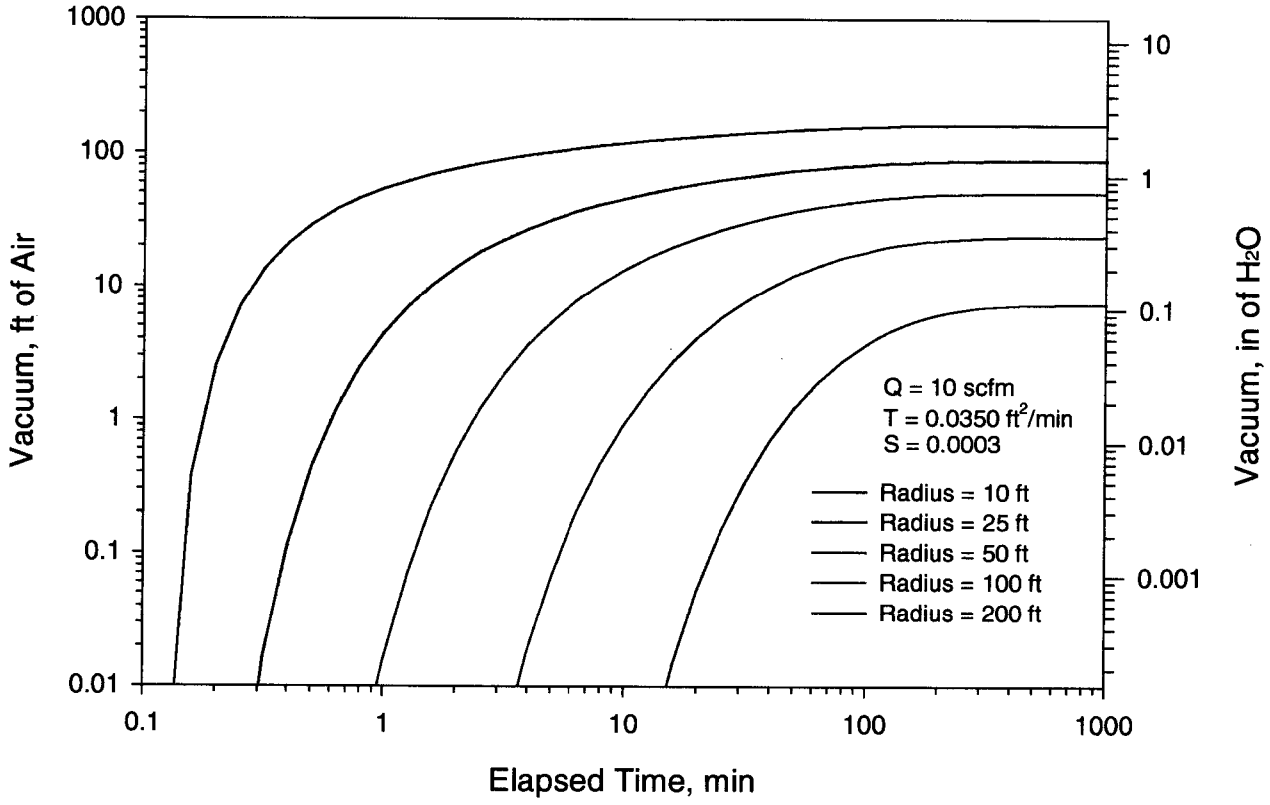


Figure 11. Predicted vacuum drawdown as a function of elapsed time for a flow rate of 10 scfm.

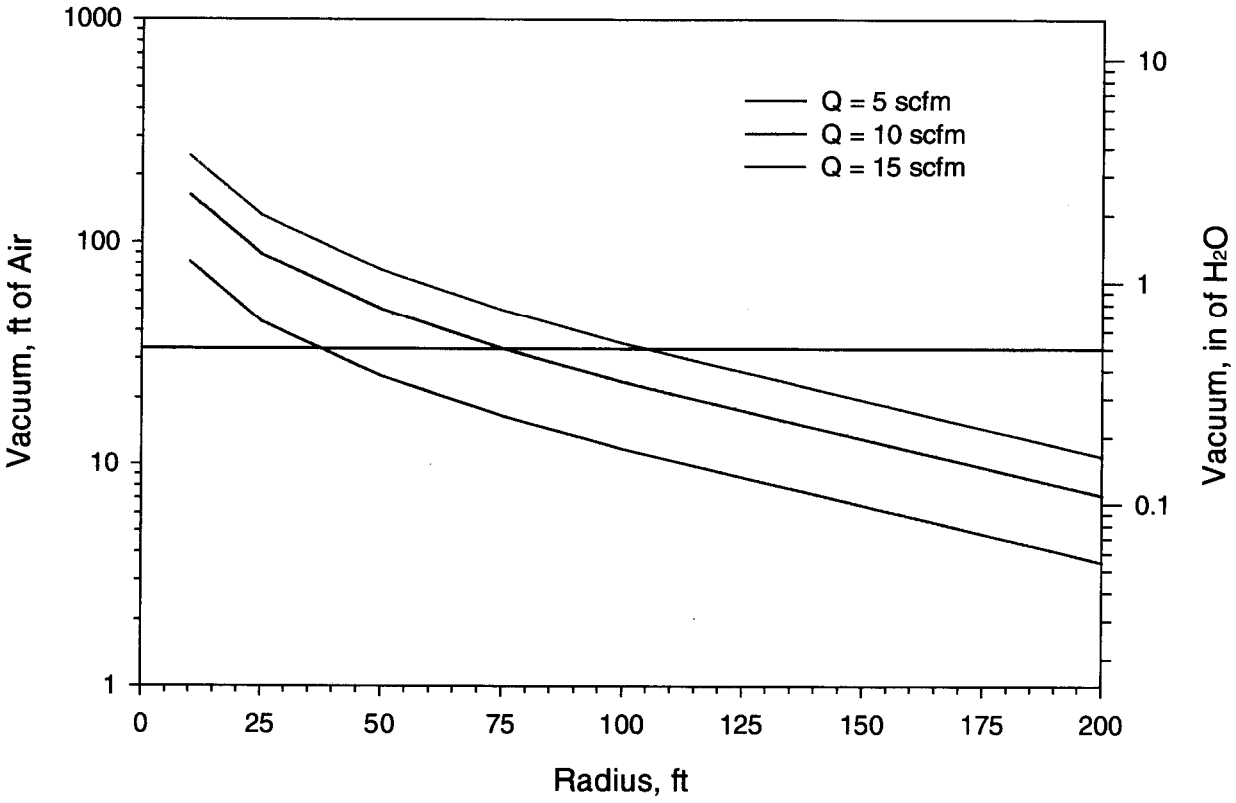


Figure 12. Predicted vacuum drawdown as a function of radial distance for different flow rates.

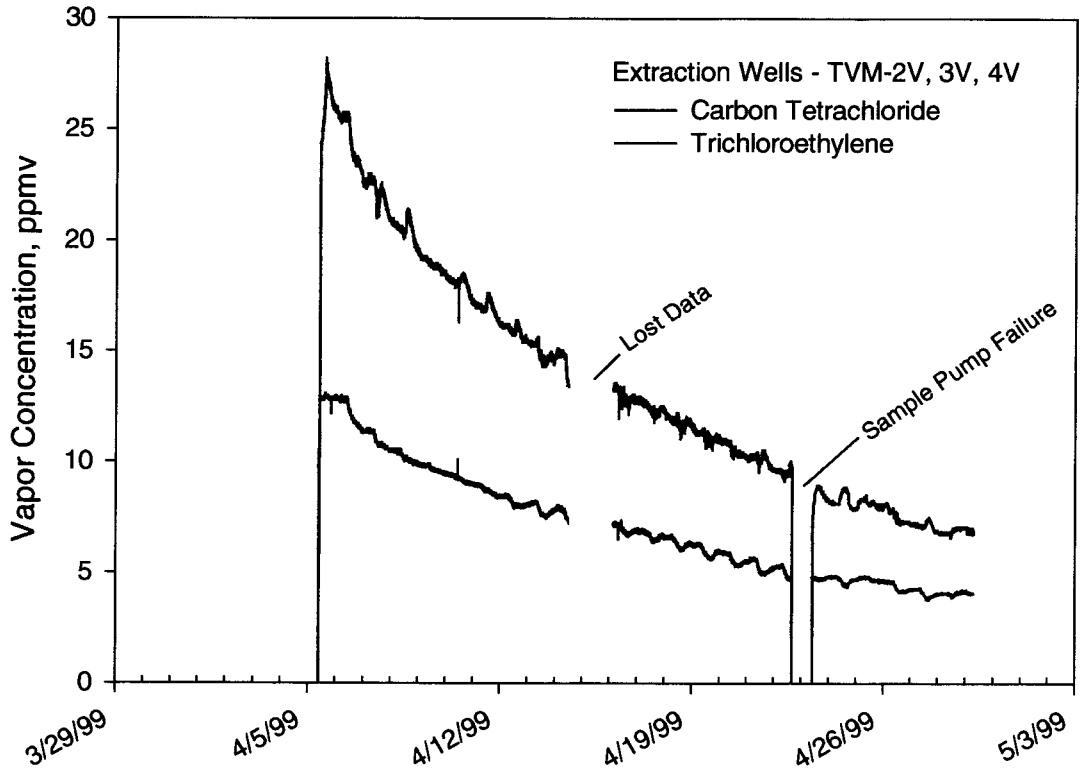


Figure 13. CVOC concentrations as a function of time for the multiple well test performed on TVM-2V, 3V, and 4V.

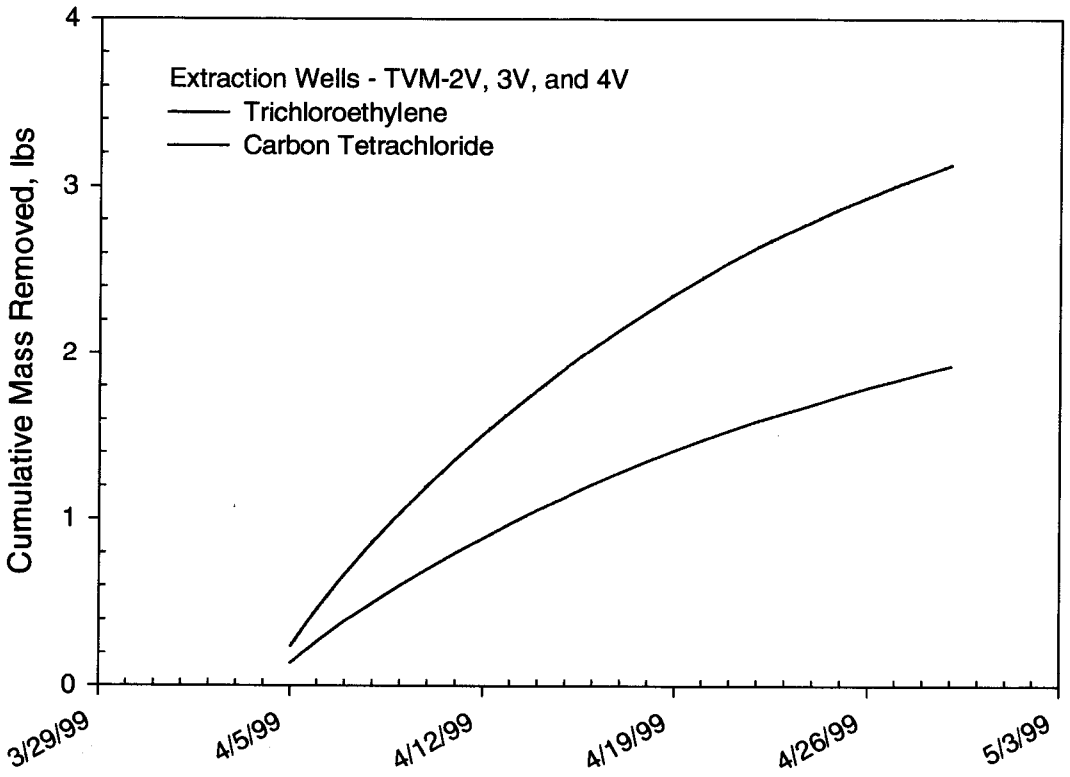


Figure 14. Total CVOC removed during the multiple well test performed on wells TVM-2V, 3V, and 4V.

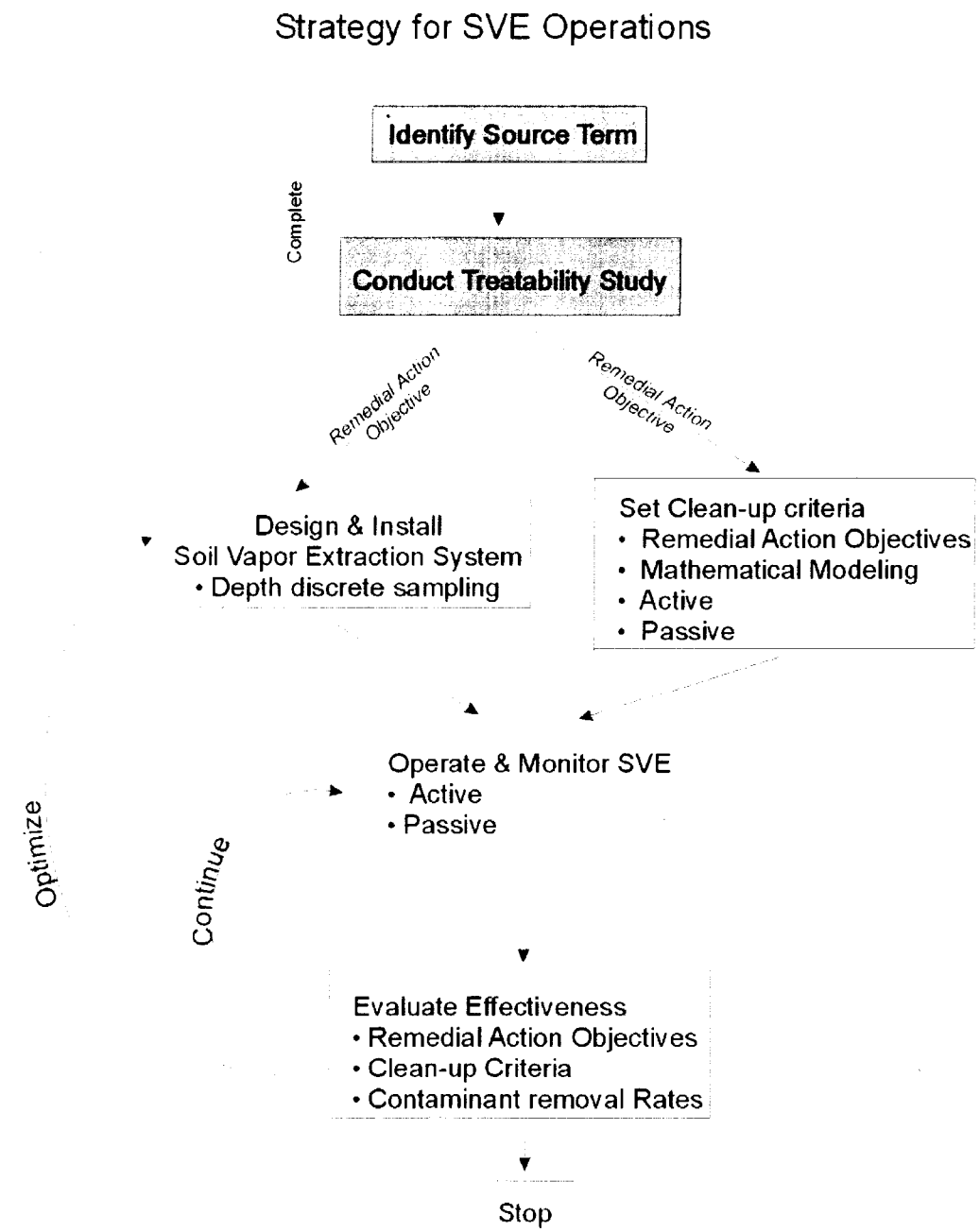


Figure 15. Flowchart detailing strategy for SVE operations.

Table 1. Wells utilized in the Phase II SVE test.

Well ID	SRS North	SRS East	Screen Zone Elevation Top/Bottom (ft, msl)
TVM 1U	71232.2	17274.9	109.7/99.7
TVM 1V	71232.2	17271.3	115.2/113.2
TVM 2U	71230.6	17198.1	112.0/102.0
TVM 2V	71231.0	17202.2	116.6/114.6
TVM 3U	71209.6	17211.8	111.3/101.3
TVM 3V	71212.4	17210.4	117.0/115.0
TVM 4U	71272.7	17207.3	111.0/100.9
TVM 4V	71275.9	17206.4	115.1/114.1
TBG 4	71267.1	17177.7	109.3/89.3

Table 2. Analytical results from background samples collected from the SVE wells.

	Analytes[1] (ppmv)					
	CCL4	TCE	PCE	CF	c-dce	t-dce
TVM-1U	9.83	38.90	0.23	0.30	8.37	ND[2]
TVM-1V	8.80	22.87	0.10	0.35	8.37	ND
TVM-2U	2.40	3.30	ND	ND	ND	ND
TVM-2V	18.55	25.00	0.45	0.30	5.10	ND
TVM-3U	4.85	6.80	0.10	0.20	ND	ND
TVM-3V	0.20	0.90	ND	ND	ND	2.10
TVM-4U	85.15	119.70	1.95	29.75	21.10	ND
TVM-4V	82.00	91.85	2.00	2.20	16.50	ND
TBG4	66.90	54.20	1.20	0.70	ND	ND

[1]CCL4 - Carbon tetrachloride, TCE – Trichloroethylene, PCE – Perchloroethylene
CF – Chloroform, c-dce – cis-Dichloroethylene, t-dce - trans-Dichloroethylene
[2]Not detected

Table 3. Extraction, observation, and reference wells for the Phase II SVE testing at TNX.

Extraction Wells	Observation Wells	Reference Well
TVM-3V	TVM-2V, 2U, 3U	TVM-1V
TVM-3U	TVM-2U	TVM-1V
TVM-2V	TVM-3V, 4V, 2U, 3U, 4U	TVM-1V
TVM-2U	TVM-3U	TVM-1V
TVM-4V	TVM-2U, 4U	TVM-1V
TVM-1V	TVM-1U, 3U	TVM-4V
TBG-4	TVM-4V, 4U, 2U	TVM-1V
TVM-2U, 3U, 4U	TVM-2V, 3V, 4V, TBG-4	TVM-1V
TVM-2V, 3V, 4V	TVM-2U, 3U, 4U	TVM-1V

Table 4. Results of the Phase II soil vapor extraction testing at TNX

Extraction Well	Observation Wells	b ft	T ft^2/min	S	1/B ft^{-1}	k_r darcy	k_z darcy	b' ft	k' darcy
TVM-3V	TVM-2V, 2U, 3U	33	0.056420	0.000300	0.013160	13.540	2.708	10	2.554
TVM-3U	TVM-2U	33	0.035090	0.000045	0.016271	8.421	1.684	10	2.428
TVM-2V	TVM-3V, 4V, 2U, 3U, 4U	33	0.048330	0.000300	0.016880	11.598	2.320	10	3.599
TVM-2U	TVM-3U	33	0.075690	0.000045	0.003410	18.164	3.633	10	0.230
TVM-4V	TVM-2U, 4U	33	0.031390	0.000300	0.008666	7.533	1.507	10	0.616
TVM-1V	TVM-1U, 3U	33	0.056520	0.000300	0.005644	13.564	2.713	10	0.471
TBG-4	TVM-4V, 4U, 2U	33	0.022520	0.000300	0.023400	5.404	1.081	10	3.223
TVM-2U, 3U, 4U	TVM-2V, 3V, 4V, TBG-4	33	0.030000	0.000045	0.003500	7.200	1.440	10	0.096
TVM-2V, 3V, 4V	TVM-2U, 3U, 4U	33	0.028630	0.000045	0.003000	6.871	1.374	10	0.067

Table 5. Comparison of Phase II results to results from Nichols (1997).

Parameter	Phase II Testing		Nichols (1997)	
	Range	Median	Range	Median
T, ft^2/min	0.023 – 0.076	0.035	0.018 – 0.059	0.034
k_r, darcies	5.40 – 18.16	8.42	3.85 – 12.67	7.28
k_z, darcies	1.08 – 3.63	1.68	0.77 – 2.53	1.46
k' darcies	0.07 – 3.60	0.62	0.01 – 0.53	0.13

Table 6. Contaminant data for Phase II SVE testing.

Test Well(s)	Flow Rate (scfm)	Vacuum @ Wellhead (Inches Hg)	Duration (hours)	TCE[a] (ppmv)	CCL4[b] (ppmv)
TVM-3V	13.25	2.5	24.75	17.50	15.97
TVM-3U	8.50	7.25 –10.5	24.08	23.99	21.17
TVM-2V	8.00	7.5 - 8.5	24.25	55.81	43.22
TVM-2U	11.00	5.5	23.80	63.45	46.69
TVM-4V	6.00	8.0 – 9.25	26.42	53.16	47.46
TVM-1V	10.50	4.5 – 5.5	22.83	36.90	9.56
TBG4	5.50	8.5 – 10.5	19.25	29.63	42.92
TVM-2U, TVM-3U, TVM-4U	20.47	-	71.00	40.32	20.97
TVM-2V, TVM-3V, TVM-4V	19.25	-	574.20	9.1-28.2[c]	4.7-13.1[c]
Total			810.58		

[a]Trichloroethylene
[b]Carbon Tetrachloride
[c]Concentration range

Appendix A

Developmental Drawings

Appendix B

Barometric Pressure Data

Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)
2/1/99 1:00	1018.91	2/3/99 17:00	1006.22	2/6/99 9:00	1012.37	2/9/99 1:00	1008.49	2/11/99 17:00	1011.38
2/1/99 2:00	1018.82	2/3/99 18:00	1006.80	2/6/99 10:00	1012.51	2/9/99 2:00	1008.52	2/11/99 18:00	1011.19
2/1/99 3:00	1017.50	2/3/99 19:00	1007.01	2/6/99 11:00	1012.26	2/9/99 3:00	1008.57	2/11/99 19:00	1011.47
2/1/99 4:00	1017.11	2/3/99 20:00	1007.40	2/6/99 12:00	1011.88	2/9/99 4:00	1008.58	2/11/99 20:00	1011.64
2/1/99 5:00	1016.48	2/3/99 21:00	1007.46	2/6/99 13:00	1010.85	2/9/99 5:00	1008.83	2/11/99 21:00	1011.97
2/1/99 6:00	1016.12	2/3/99 22:00	1007.91	2/6/99 14:00	1009.51	2/9/99 6:00	1009.14	2/11/99 22:00	1012.35
2/1/99 7:00	1015.82	2/3/99 23:00	1007.26	2/6/99 15:00	1008.52	2/9/99 7:00	1009.68	2/11/99 23:00	1012.40
2/1/99 8:00	1015.90	2/4/99 0:00	1007.41	2/6/99 16:00	1007.62	2/9/99 8:00	1010.24	2/12/99 0:00	1012.24
2/1/99 9:00	1015.85	2/4/99 1:00	1007.22	2/6/99 17:00	1007.55	2/9/99 9:00	1010.83	2/12/99 1:00	1011.79
2/1/99 10:00	1015.33	2/4/99 2:00	1006.36	2/6/99 18:00	1007.56	2/9/99 10:00	1011.32	2/12/99 2:00	1010.97
2/1/99 11:00	1015.12	2/4/99 3:00	1006.15	2/6/99 19:00	1007.83	2/9/99 11:00	1011.51	2/12/99 3:00	1010.44
2/1/99 12:00	1014.18	2/4/99 4:00	1006.12	2/6/99 20:00	1007.93	2/9/99 12:00	1011.31	2/12/99 4:00	1010.12
2/1/99 13:00	1013.65	2/4/99 5:00	1005.40	2/6/99 21:00	1007.74	2/9/99 13:00	1010.59	2/12/99 5:00	1009.81
2/1/99 14:00	1012.73	2/4/99 6:00	1005.47	2/6/99 22:00	1007.75	2/9/99 14:00	1009.72	2/12/99 6:00	1009.72
2/1/99 15:00	1011.40	2/4/99 7:00	1005.32	2/6/99 23:00	1007.72	2/9/99 15:00	1009.15	2/12/99 7:00	1009.63
2/1/99 16:00	1010.51	2/4/99 8:00	1005.49	2/7/99 0:00	1007.46	2/9/99 16:00	1009.09	2/12/99 8:00	1009.73
2/1/99 17:00	1010.12	2/4/99 9:00	1005.75	2/7/99 1:00	1007.01	2/9/99 17:00	1008.73	2/12/99 9:00	1009.87
2/1/99 18:00	1009.30	2/4/99 10:00	1006.61	2/7/99 2:00	1006.62	2/9/99 18:00	1008.68	2/12/99 10:00	1009.86
2/1/99 19:00	1008.99	2/4/99 11:00	1007.57	2/7/99 3:00	1006.19	2/9/99 19:00	1008.60	2/12/99 11:00	1009.49
2/1/99 20:00	1009.12	2/4/99 12:00	1007.35	2/7/99 4:00	1005.65	2/9/99 20:00	1008.55	2/12/99 12:00	1008.92
2/1/99 21:00	1008.97	2/4/99 13:00	1007.04	2/7/99 5:00	1005.46	2/9/99 21:00	1008.71	2/12/99 13:00	1007.52
2/1/99 22:00	1009.00	2/4/99 14:00	1006.73	2/7/99 6:00	1005.74	2/9/99 22:00	1009.24	2/12/99 14:00	1006.06
2/1/99 23:00	1008.83	2/4/99 15:00	1006.16	2/7/99 7:00	1005.55	2/9/99 23:00	1009.54	2/12/99 15:00	1006.07
2/2/99 0:00	1008.16	2/4/99 16:00	1006.38	2/7/99 8:00	1005.66	2/10/99 0:00	1009.44	2/12/99 16:00	1007.02
2/2/99 1:00	1007.68	2/4/99 17:00	1007.14	2/7/99 9:00	1005.91	2/10/99 1:00	1009.31	2/12/99 17:00	1007.50
2/2/99 2:00	1007.29	2/4/99 18:00	1007.94	2/7/99 10:00	1005.92	2/10/99 2:00	1009.52	2/12/99 18:00	1009.05
2/2/99 3:00	1006.93	2/4/99 19:00	1008.73	2/7/99 11:00	1005.48	2/10/99 3:00	1009.27	2/12/99 19:00	1009.80
2/2/99 4:00	1006.29	2/4/99 20:00	1009.62	2/7/99 12:00	1004.55	2/10/99 4:00	1008.94	2/12/99 20:00	1010.41
2/2/99 5:00	1006.04	2/4/99 21:00	1010.13	2/7/99 13:00	1003.65	2/10/99 5:00	1008.71	2/12/99 21:00	1010.50
2/2/99 6:00	1005.73	2/4/99 22:00	1010.85	2/7/99 14:00	1002.17	2/10/99 6:00	1008.78	2/12/99 22:00	1011.29
2/2/99 7:00	1006.50	2/4/99 23:00	1011.74	2/7/99 15:00	1000.89	2/10/99 7:00	1009.25	2/12/99 23:00	1012.56
2/2/99 8:00	1006.58	2/5/99 0:00	1012.24	2/7/99 16:00	1000.35	2/10/99 8:00	1010.02	2/13/99 0:00	1013.30
2/2/99 9:00	1006.29	2/5/99 1:00	1012.86	2/7/99 17:00	999.82	2/10/99 9:00	1010.07	2/13/99 1:00	1013.33
2/2/99 10:00	1006.84	2/5/99 2:00	1013.47	2/7/99 18:00	1000.03	2/10/99 10:00	1011.29	2/13/99 2:00	1012.78
2/2/99 11:00	1007.17	2/5/99 3:00	1013.76	2/7/99 19:00	999.98	2/10/99 11:00	1011.41	2/13/99 3:00	1012.64
2/2/99 12:00	1007.05	2/5/99 4:00	1014.14	2/7/99 20:00	1000.32	2/10/99 12:00	1011.89	2/13/99 4:00	1012.44
2/2/99 13:00	1006.92	2/5/99 5:00	1014.28	2/7/99 21:00	1000.64	2/10/99 13:00	1011.58	2/13/99 5:00	1012.32
2/2/99 14:00	1005.79	2/5/99 6:00	1015.01	2/7/99 22:00	1000.76	2/10/99 14:00	1010.83	2/13/99 6:00	1012.61
2/2/99 15:00	1004.79	2/5/99 7:00	1015.80	2/7/99 23:00	1000.88	2/10/99 15:00	1010.25	2/13/99 7:00	1012.79
2/2/99 16:00	1003.96	2/5/99 8:00	1016.48	2/8/99 0:00	1000.94	2/10/99 16:00	1009.90	2/13/99 8:00	1013.01
2/2/99 17:00	1004.36	2/5/99 9:00	1017.70	2/8/99 1:00	1001.03	2/10/99 17:00	1009.88	2/13/99 9:00	1013.18
2/2/99 18:00	1004.12	2/5/99 10:00	1017.54	2/8/99 2:00	1001.18	2/10/99 18:00	1010.14	2/13/99 10:00	1013.26
2/2/99 19:00	1004.29	2/5/99 11:00	1018.12	2/8/99 3:00	1001.52	2/10/99 19:00	1010.61	2/13/99 11:00	1013.27
2/2/99 20:00	1004.73	2/5/99 12:00	1018.06	2/8/99 4:00	1001.41	2/10/99 20:00	1011.46	2/13/99 12:00	1012.70
2/2/99 21:00	1004.91	2/5/99 13:00	1017.55	2/8/99 5:00	1001.56	2/10/99 21:00	1011.80	2/13/99 13:00	1012.35
2/2/99 22:00	1005.08	2/5/99 14:00	1016.30	2/8/99 6:00	1001.91	2/10/99 22:00	1012.28	2/13/99 14:00	1011.98
2/2/99 23:00	1005.94	2/5/99 15:00	1014.95	2/8/99 7:00	1002.81	2/10/99 23:00	1012.85	2/13/99 15:00	1011.86
2/3/99 0:00	1005.81	2/5/99 16:00	1014.40	2/8/99 8:00	1003.87	2/11/99 0:00	1012.97	2/13/99 16:00	1012.06
2/3/99 1:00	1005.89	2/5/99 17:00	1014.46	2/8/99 9:00	1004.81	2/11/99 1:00	1012.83	2/13/99 17:00	1012.63
2/3/99 2:00	1005.86	2/5/99 18:00	1014.68	2/8/99 10:00	1005.55	2/11/99 2:00	1012.51	2/13/99 18:00	1013.28
2/3/99 3:00	1005.64	2/5/99 19:00	1014.73	2/8/99 11:00	1005.93	2/11/99 3:00	1012.39	2/13/99 19:00	1014.45
2/3/99 4:00	1005.64	2/5/99 20:00	1015.01	2/8/99 12:00	1006.18	2/11/99 4:00	1012.34	2/13/99 20:00	1015.72
2/3/99 5:00	1005.43	2/5/99 21:00	1014.71	2/8/99 13:00	1006.20	2/11/99 5:00	1012.67	2/13/99 21:00	1016.01
2/3/99 6:00	1005.89	2/5/99 22:00	1014.52	2/8/99 14:00	1005.63	2/11/99 6:00	1013.32	2/13/99 22:00	1016.32
2/3/99 7:00	1006.46	2/5/99 23:00	1013.97	2/8/99 15:00	1005.11	2/11/99 7:00	1013.60	2/13/99 23:00	1016.83
2/3/99 8:00	1006.88	2/6/99 0:00	1013.82	2/8/99 16:00	1005.03	2/11/99 8:00	1013.84	2/14/99 0:00	1017.34
2/3/99 9:00	1007.43	2/6/99 1:00	1013.16	2/8/99 17:00	1005.05	2/11/99 9:00	1014.22	2/14/99 1:00	1017.24
2/3/99 10:00	1007.80	2/6/99 2:00	1013.41	2/8/99 18:00	1005.45	2/11/99 10:00	1015.02	2/14/99 2:00	1017.61
2/3/99 11:00	1004.54	2/6/99 3:00	1013.53	2/8/99 19:00	1005.96	2/11/99 11:00	1015.40	2/14/99 3:00	1017.50
2/3/99 12:00	1008.60	2/6/99 4:00	1012.88	2/8/99 20:00	1006.84	2/11/99 12:00	1015.11	2/14/99 4:00	1017.93
2/3/99 13:00	1007.91	2/6/99 5:00	1012.30	2/8/99 21:00	1007.67	2/11/99 13:00	1014.51	2/14/99 5:00	1018.42
2/3/99 14:00	1006.92	2/6/99 6:00	1012.28	2/8/99 22:00	1008.33	2/11/99 14:00	1013.33	2/14/99 6:00	1018.78
2/3/99 15:00	1006.34	2/6/99 7:00	1011.98	2/8/99 23:00	1008.61	2/11/99 15:00	1012.38	2/14/99 7:00	1019.47
2/3/99 16:00	1005.84	2/6/99 8:00	1012.33	2/9/99 0:00	1008.56	2/11/99 16:00	1011.88	2/14/99 8:00	1019.96

Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)
2/14/99 9:00	1020.66	2/17/99 1:00	1008.58	2/19/99 17:00	995.54	2/22/99 9:00	1015.25	2/25/99 1:00	1015.17
2/14/99 10:00	1021.02	2/17/99 2:00	1008.28	2/19/99 18:00	996.76	2/22/99 10:00	1015.70	2/25/99 2:00	1014.59
2/14/99 11:00	1021.34	2/17/99 3:00	1008.08	2/19/99 19:00	998.18	2/22/99 11:00	1016.03	2/25/99 3:00	1014.53
2/14/99 12:00	1021.24	2/17/99 4:00	1007.74	2/19/99 20:00	999.06	2/22/99 12:00	1015.97	2/25/99 4:00	1014.21
2/14/99 13:00	1020.47	2/17/99 5:00	1007.55	2/19/99 21:00	1000.11	2/22/99 13:00	1015.55	2/25/99 5:00	1014.02
2/14/99 14:00	1019.29	2/17/99 6:00	1007.44	2/19/99 22:00	1000.87	2/22/99 14:00	1014.62	2/25/99 6:00	1013.81
2/14/99 15:00	1018.28	2/17/99 7:00	1007.38	2/19/99 23:00	1001.88	2/22/99 15:00	1014.07	2/25/99 7:00	1014.10
2/14/99 16:00	1017.99	2/17/99 8:00	1006.99	2/20/99 0:00	1002.18	2/22/99 16:00	1013.32	2/25/99 8:00	1014.99
2/14/99 17:00	1017.68	2/17/99 9:00	1007.10	2/20/99 1:00	1002.11	2/22/99 17:00	1013.36	2/25/99 9:00	1015.16
2/14/99 18:00	1017.62	2/17/99 10:00	1006.97	2/20/99 2:00	1002.65	2/22/99 18:00	1013.56	2/25/99 10:00	1014.84
2/14/99 19:00	1017.73	2/17/99 11:00	1006.37	2/20/99 3:00	1002.92	2/22/99 19:00	1014.14	2/25/99 11:00	1014.10
2/14/99 20:00	1018.39	2/17/99 12:00	1006.11	2/20/99 4:00	1003.04	2/22/99 20:00	1015.12	2/25/99 12:00	1013.73
2/14/99 21:00	1018.60	2/17/99 13:00	1005.17	2/20/99 5:00	1003.46	2/22/99 21:00	1015.53	2/25/99 13:00	1012.32
2/14/99 22:00	1018.77	2/17/99 14:00	1003.63	2/20/99 6:00	1003.89	2/22/99 22:00	1016.02	2/25/99 14:00	1009.88
2/14/99 23:00	1018.82	2/17/99 15:00	1002.46	2/20/99 7:00	1004.97	2/22/99 23:00	1016.14	2/25/99 15:00	1008.91
2/15/99 0:00	1018.67	2/17/99 16:00	1001.57	2/20/99 8:00	1006.04	2/23/99 0:00	1015.67	2/25/99 16:00	1007.59
2/15/99 1:00	1018.72	2/17/99 17:00	1001.14	2/20/99 9:00	1006.63	2/23/99 1:00	1015.98	2/25/99 17:00	1006.58
2/15/99 2:00	1018.28	2/17/99 18:00	1001.08	2/20/99 10:00	1007.22	2/23/99 2:00	1016.12	2/25/99 18:00	1006.38
2/15/99 3:00	1018.19	2/17/99 19:00	1001.00	2/20/99 11:00	1007.42	2/23/99 3:00	1015.95	2/25/99 19:00	1005.94
2/15/99 4:00	1018.34	2/17/99 20:00	1001.87	2/20/99 12:00	1007.23	2/23/99 4:00	1015.88	2/25/99 20:00	1006.22
2/15/99 5:00	1018.10	2/17/99 21:00	1001.30	2/20/99 13:00	1006.69	2/23/99 5:00	1016.26	2/25/99 21:00	1006.31
2/15/99 6:00	1018.81	2/17/99 22:00	1000.88	2/20/99 14:00	1005.76	2/23/99 6:00	1016.86	2/25/99 22:00	1006.51
2/15/99 7:00	1019.12	2/17/99 23:00	999.88	2/20/99 15:00	1005.29	2/23/99 7:00	1017.21	2/25/99 23:00	1007.05
2/15/99 8:00	1019.28	2/18/99 0:00	999.30	2/20/99 16:00	1004.77	2/23/99 8:00	1017.34	2/26/99 0:00	1006.97
2/15/99 9:00	1019.76	2/18/99 1:00	998.82	2/20/99 17:00	1004.91	2/23/99 9:00	1018.02	2/26/99 1:00	1007.56
2/15/99 10:00	1020.13	2/18/99 2:00	998.26	2/20/99 18:00	1004.97	2/23/99 10:00	1017.97	2/26/99 2:00	1007.90
2/15/99 11:00	1020.10	2/18/99 3:00	997.74	2/20/99 19:00	1005.35	2/23/99 11:00	1018.15	2/26/99 3:00	1007.88
2/15/99 12:00	1019.67	2/18/99 4:00	997.80	2/20/99 20:00	1005.71	2/23/99 12:00	1017.09	2/26/99 4:00	1007.82
2/15/99 13:00	1018.84	2/18/99 5:00	997.62	2/20/99 21:00	1005.90	2/23/99 13:00	1014.52	2/26/99 5:00	1008.30
2/15/99 14:00	1017.41	2/18/99 6:00	997.79	2/20/99 22:00	1005.83	2/23/99 14:00	1015.41	2/26/99 6:00	1009.29
2/15/99 15:00	1016.09	2/18/99 7:00	998.30	2/20/99 23:00	1005.67	2/23/99 15:00	1015.12	2/26/99 7:00	1010.17
2/15/99 16:00	1015.50	2/18/99 8:00	998.91	2/21/99 0:00	1005.35	2/23/99 16:00	1015.05	2/26/99 8:00	1010.97
2/15/99 17:00	1015.34	2/18/99 9:00	999.47	2/21/99 1:00	1004.90	2/23/99 17:00	1013.73	2/26/99 9:00	1012.00
2/15/99 18:00	1015.03	2/18/99 10:00	999.65	2/21/99 2:00	1005.47	2/23/99 18:00	1013.36	2/26/99 10:00	1012.52
2/15/99 19:00	1014.96	2/18/99 11:00	999.67	2/21/99 3:00	1005.04	2/23/99 19:00	1012.89	2/26/99 11:00	1012.76
2/15/99 20:00	1015.18	2/18/99 12:00	999.31	2/21/99 4:00	1004.67	2/23/99 20:00	1013.38	2/26/99 12:00	1012.86
2/15/99 21:00	1015.31	2/18/99 13:00	999.02	2/21/99 5:00	1004.23	2/23/99 21:00	1013.83	2/26/99 13:00	1012.61
2/15/99 22:00	1015.45	2/18/99 14:00	998.33	2/21/99 6:00	1004.55	2/23/99 22:00	1014.64	2/26/99 14:00	1011.52
2/15/99 23:00	1015.44	2/18/99 15:00	997.90	2/21/99 7:00	1005.23	2/23/99 23:00	1014.48	2/26/99 15:00	1010.55
2/16/99 0:00	1014.96	2/18/99 16:00	997.96	2/21/99 8:00	1005.76	2/24/99 0:00	1013.98	2/26/99 16:00	1010.26
2/16/99 1:00	1014.89	2/18/99 17:00	997.85	2/21/99 9:00	1006.11	2/24/99 1:00	1013.80	2/26/99 17:00	1009.62
2/16/99 2:00	1014.70	2/18/99 18:00	998.13	2/21/99 10:00	1006.47	2/24/99 2:00	1013.88	2/26/99 18:00	1009.20
2/16/99 3:00	1014.26	2/18/99 19:00	998.92	2/21/99 11:00	1006.72	2/24/99 3:00	1013.20	2/26/99 19:00	1009.81
2/16/99 4:00	1014.15	2/18/99 20:00	999.04	2/21/99 12:00	1006.99	2/24/99 4:00	1012.24	2/26/99 20:00	1009.93
2/16/99 5:00	1013.82	2/18/99 21:00	999.53	2/21/99 13:00	1006.37	2/24/99 5:00	1012.06	2/26/99 21:00	1010.21
2/16/99 6:00	1013.50	2/18/99 22:00	999.45	2/21/99 14:00	1005.72	2/24/99 6:00	1013.03	2/26/99 22:00	1010.34
2/16/99 7:00	1013.64	2/18/99 23:00	999.32	2/21/99 15:00	1005.27	2/24/99 7:00	1013.65	2/26/99 23:00	1010.87
2/16/99 8:00	1013.75	2/19/99 0:00	999.13	2/21/99 16:00	1005.07	2/24/99 8:00	1014.22	2/27/99 0:00	1010.91
2/16/99 9:00	1014.37	2/19/99 1:00	998.67	2/21/99 17:00	1005.00	2/24/99 9:00	1014.85	2/27/99 1:00	1011.19
2/16/99 10:00	1014.48	2/19/99 2:00	998.29	2/21/99 18:00	1005.04	2/24/99 10:00	1015.67	2/27/99 2:00	1010.78
2/16/99 11:00	1014.30	2/19/99 3:00	997.86	2/21/99 19:00	1005.40	2/24/99 11:00	1015.99	2/27/99 3:00	1010.80
2/16/99 12:00	1013.87	2/19/99 4:00	997.93	2/21/99 20:00	1005.91	2/24/99 12:00	1016.20	2/27/99 4:00	1010.17
2/16/99 13:00	1012.85	2/19/99 5:00	997.76	2/21/99 21:00	1006.90	2/24/99 13:00	1016.08	2/27/99 5:00	1009.34
2/16/99 14:00	1011.51	2/19/99 6:00	997.66	2/21/99 22:00	1008.53	2/24/99 14:00	1015.23	2/27/99 6:00	1009.45
2/16/99 15:00	1010.13	2/19/99 7:00	997.71	2/21/99 23:00	1008.99	2/24/99 15:00	1014.53	2/27/99 7:00	1009.72
2/16/99 16:00	1009.33	2/19/99 8:00	997.69	2/22/99 0:00	1009.47	2/24/99 16:00	1013.96	2/27/99 8:00	1009.29
2/16/99 17:00	1008.91	2/19/99 9:00	996.98	2/22/99 1:00	1010.08	2/24/99 17:00	1013.91	2/27/99 9:00	1009.93
2/16/99 18:00	1008.42	2/19/99 10:00	996.71	2/22/99 2:00	1010.82	2/24/99 18:00	1014.05	2/27/99 10:00	1009.52
2/16/99 19:00	1008.42	2/19/99 11:00	996.19	2/22/99 3:00	1011.37	2/24/99 19:00	1014.18	2/27/99 11:00	1009.39
2/16/99 20:00	1009.14	2/19/99 12:00	995.72	2/22/99 4:00	1011.66	2/24/99 20:00	1014.60	2/27/99 12:00	1008.65
2/16/99 21:00	1009.31	2/19/99 13:00	995.09	2/22/99 5:00	1012.37	2/24/99 21:00	1015.11	2/27/99 13:00	1008.15
2/16/99 22:00	1009.19	2/19/99 14:00	994.18	2/22/99 6:00	1012.94	2/24/99 22:00	1015.64	2/27/99 14:00	1006.96
2/16/99 23:00	1008.99	2/19/99 15:00	994.20	2/22/99 7:00	1013.89	2/24/99 23:00	1015.73	2/27/99 15:00	1005.90
2/17/99 0:00	1008.60	2/19/99 16:00	994.38	2/22/99 8:00	1014.30	2/25/99 0:00	1015.49	2/27/99 16:00	1005.59

Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)
2/27/99 17:00	1005.57	3/2/99 9:00	1004.34	3/5/99 1:00	1012.68	3/7/99 17:00	1015.72	3/10/99 9:00	1004.01
2/27/99 18:00	1005.12	3/2/99 10:00	1005.17	3/5/99 2:00	1012.86	3/7/99 18:00	1016.22	3/10/99 10:00	1004.00
2/27/99 19:00	1004.43	3/2/99 11:00	1005.20	3/5/99 3:00	1013.23	3/7/99 19:00	1017.20	3/10/99 11:00	1004.31
2/27/99 20:00	1003.62	3/2/99 12:00	1005.04	3/5/99 4:00	1013.40	3/7/99 20:00	1017.94	3/10/99 12:00	1003.84
2/27/99 21:00	1002.84	3/2/99 13:00	1004.31	3/5/99 5:00	1013.65	3/7/99 21:00	1018.70	3/10/99 13:00	1003.32
2/27/99 22:00	1003.52	3/2/99 14:00	1003.38	3/5/99 6:00	1014.55	3/7/99 22:00	1019.55	3/10/99 14:00	1002.78
2/27/99 23:00	1002.61	3/2/99 15:00	1002.65	3/5/99 7:00	1015.19	3/7/99 23:00	1020.42	3/10/99 15:00	1002.31
2/28/99 0:00	1001.64	3/2/99 16:00	1002.32	3/5/99 8:00	1016.06	3/8/99 0:00	1020.50	3/10/99 16:00	1002.01
2/28/99 1:00	1001.67	3/2/99 17:00	1002.02	3/5/99 9:00	1016.78	3/8/99 1:00	1020.61	3/10/99 17:00	1001.61
2/28/99 2:00	1000.39	3/2/99 18:00	1002.07	3/5/99 10:00	1017.49	3/8/99 2:00	1020.89	3/10/99 18:00	1001.63
2/28/99 3:00	999.30	3/2/99 19:00	1002.10	3/5/99 11:00	1017.77	3/8/99 3:00	1020.53	3/10/99 19:00	1002.34
2/28/99 4:00	998.66	3/2/99 20:00	1002.37	3/5/99 12:00	1017.33	3/8/99 4:00	1020.54	3/10/99 20:00	1002.78
2/28/99 5:00	998.51	3/2/99 21:00	1002.19	3/5/99 13:00	1016.51	3/8/99 5:00	1020.56	3/10/99 21:00	1003.38
2/28/99 6:00	997.14	3/2/99 22:00	1002.01	3/5/99 14:00	1015.35	3/8/99 6:00	1021.17	3/10/99 22:00	1004.12
2/28/99 7:00	996.52	3/2/99 23:00	1001.96	3/5/99 15:00	1014.59	3/8/99 7:00	1021.89	3/10/99 23:00	1004.56
2/28/99 8:00	996.83	3/3/99 0:00	1001.77	3/5/99 16:00	1014.51	3/8/99 8:00	1022.35	3/11/99 0:00	1004.91
2/28/99 9:00	996.21	3/3/99 1:00	1001.79	3/5/99 17:00	1014.15	3/8/99 9:00	1023.59	3/11/99 1:00	1005.31
2/28/99 10:00	995.74	3/3/99 2:00	1001.08	3/5/99 18:00	1013.85	3/8/99 10:00	1023.43	3/11/99 2:00	1005.52
2/28/99 11:00	995.07	3/3/99 3:00	1000.60	3/5/99 19:00	1013.69	3/8/99 11:00	1023.53	3/11/99 3:00	1005.63
2/28/99 12:00	994.40	3/3/99 4:00	999.43	3/5/99 20:00	1013.58	3/8/99 12:00	1022.70	3/11/99 4:00	1005.89
2/28/99 13:00	994.16	3/3/99 5:00	997.73	3/5/99 21:00	1013.93	3/8/99 13:00	1022.50	3/11/99 5:00	1006.03
2/28/99 14:00	993.20	3/3/99 6:00	996.41	3/5/99 22:00	1014.21	3/8/99 14:00	1021.99	3/11/99 6:00	1006.56
2/28/99 15:00	992.96	3/3/99 7:00	995.63	3/5/99 23:00	1013.70	3/8/99 15:00	1020.92	3/11/99 7:00	1007.23
2/28/99 16:00	992.59	3/3/99 8:00	994.54	3/6/99 0:00	1013.37	3/8/99 16:00	1020.07	3/11/99 8:00	1007.66
2/28/99 17:00	993.07	3/3/99 9:00	996.22	3/6/99 1:00	1012.80	3/8/99 17:00	1019.51	3/11/99 9:00	1008.41
2/28/99 18:00	993.78	3/3/99 10:00	994.99	3/6/99 2:00	1012.49	3/8/99 18:00	1019.57	3/11/99 10:00	1009.06
2/28/99 19:00	994.56	3/3/99 11:00	992.60	3/6/99 3:00	1012.28	3/8/99 19:00	1019.39	3/11/99 11:00	1008.75
2/28/99 20:00	995.42	3/3/99 12:00	992.44	3/6/99 4:00	1010.97	3/8/99 20:00	1019.15	3/11/99 12:00	1008.15
2/28/99 21:00	995.96	3/3/99 13:00	992.98	3/6/99 5:00	1010.22	3/8/99 21:00	1018.93	3/11/99 13:00	1007.40
2/28/99 22:00	996.42	3/3/99 14:00	994.73	3/6/99 6:00	1010.47	3/8/99 22:00	1018.00	3/11/99 14:00	1006.25
2/28/99 23:00	996.89	3/3/99 15:00	994.78	3/6/99 7:00	1010.29	3/8/99 23:00	1017.84	3/11/99 15:00	1005.33
3/1/99 0:00	997.12	3/3/99 16:00	995.39	3/6/99 8:00	1011.08	3/9/99 0:00	1017.20	3/11/99 16:00	1004.80
3/1/99 1:00	997.39	3/3/99 17:00	996.80	3/6/99 9:00	1013.49	3/9/99 1:00	1016.16	3/11/99 17:00	1004.03
3/1/99 2:00	997.56	3/3/99 18:00	998.33	3/6/99 10:00	1013.69	3/9/99 2:00	1015.06	3/11/99 18:00	1003.98
3/1/99 3:00	997.08	3/3/99 19:00	999.68	3/6/99 11:00	1012.53	3/9/99 3:00	1012.94	3/11/99 19:00	1004.09
3/1/99 4:00	996.81	3/3/99 20:00	1000.68	3/6/99 12:00	1011.23	3/9/99 4:00	1011.84	3/11/99 20:00	1004.38
3/1/99 5:00	997.08	3/3/99 21:00	1001.68	3/6/99 13:00	1010.44	3/9/99 5:00	1011.82	3/11/99 21:00	1004.94
3/1/99 6:00	997.65	3/3/99 22:00	1002.40	3/6/99 14:00	1009.36	3/9/99 6:00	1011.85	3/11/99 22:00	1005.00
3/1/99 7:00	998.17	3/3/99 23:00	1002.83	3/6/99 15:00	1007.74	3/9/99 7:00	1009.75	3/11/99 23:00	1005.18
3/1/99 8:00	998.55	3/4/99 0:00	1003.21	3/6/99 16:00	1006.80	3/9/99 8:00	1009.66	3/12/99 0:00	1005.60
3/1/99 9:00	999.28	3/4/99 1:00	1003.25	3/6/99 17:00	1006.69	3/9/99 9:00	1010.51	3/12/99 1:00	1005.81
3/1/99 10:00	999.08	3/4/99 2:00	1003.94	3/6/99 18:00	1006.47	3/9/99 10:00	1008.95	3/12/99 2:00	1006.06
3/1/99 11:00	998.89	3/4/99 3:00	1004.03	3/6/99 19:00	1007.15	3/9/99 11:00	1009.02	3/12/99 3:00	1006.53
3/1/99 12:00	998.65	3/4/99 4:00	1004.05	3/6/99 20:00	1007.07	3/9/99 12:00	1007.99	3/12/99 4:00	1006.59
3/1/99 13:00	998.26	3/4/99 5:00	1004.24	3/6/99 21:00	1007.26	3/9/99 13:00	1006.45	3/12/99 5:00	1007.02
3/1/99 14:00	997.45	3/4/99 6:00	1005.08	3/6/99 22:00	1007.51	3/9/99 14:00	1004.26	3/12/99 6:00	1007.61
3/1/99 15:00	996.87	3/4/99 7:00	1005.91	3/6/99 23:00	1007.83	3/9/99 15:00	1002.35	3/12/99 7:00	1008.17
3/1/99 16:00	996.38	3/4/99 8:00	1006.72	3/7/99 0:00	1007.82	3/9/99 16:00	1002.32	3/12/99 8:00	1008.53
3/1/99 17:00	996.22	3/4/99 9:00	1007.77	3/7/99 1:00	1008.09	3/9/99 17:00	1002.27	3/12/99 9:00	1009.49
3/1/99 18:00	996.91	3/4/99 10:00	1008.53	3/7/99 2:00	1008.71	3/9/99 18:00	1002.76	3/12/99 10:00	1010.29
3/1/99 19:00	997.62	3/4/99 11:00	1009.10	3/7/99 3:00	1009.03	3/9/99 19:00	1002.86	3/12/99 11:00	1010.43
3/1/99 20:00	998.43	3/4/99 12:00	1009.40	3/7/99 4:00	1009.29	3/9/99 20:00	1002.95	3/12/99 12:00	1010.19
3/1/99 21:00	999.27	3/4/99 13:00	1009.68	3/7/99 5:00	1009.82	3/9/99 21:00	1003.21	3/12/99 13:00	1009.67
3/1/99 22:00	999.60	3/4/99 14:00	1008.98	3/7/99 6:00	1011.11	3/9/99 22:00	1003.67	3/12/99 14:00	1008.55
3/1/99 23:00	1000.01	3/4/99 15:00	1008.75	3/7/99 7:00	1012.58	3/9/99 23:00	1003.71	3/12/99 15:00	1007.90
3/2/99 0:00	1000.25	3/4/99 16:00	1008.68	3/7/99 8:00	1013.71	3/10/99 0:00	1003.49	3/12/99 16:00	1006.83
3/2/99 1:00	1000.56	3/4/99 17:00	1008.96	3/7/99 9:00	1014.79	3/10/99 1:00	1003.20	3/12/99 17:00	1006.52
3/2/99 2:00	1001.05	3/4/99 18:00	1009.31	3/7/99 10:00	1015.77	3/10/99 2:00	1003.05	3/12/99 18:00	1006.66
3/2/99 3:00	1001.38	3/4/99 19:00	1010.09	3/7/99 11:00	1016.51	3/10/99 3:00	1002.56	3/12/99 19:00	1006.70
3/2/99 4:00	1001.20	3/4/99 20:00	1010.51	3/7/99 12:00	1016.60	3/10/99 4:00	1002.04	3/12/99 20:00	1007.45
3/2/99 5:00	1001.58	3/4/99 21:00	1010.98	3/7/99 13:00	1016.56	3/10/99 5:00	1002.10	3/12/99 21:00	1008.11
3/2/99 6:00	1002.02	3/4/99 22:00	1011.47	3/7/99 14:00	1016.11	3/10/99 6:00	1002.77	3/12/99 22:00	1008.48
3/2/99 7:00	1002.78	3/4/99 23:00	1011.97	3/7/99 15:00	1015.65	3/10/99 7:00	1003.16	3/12/99 23:00	1008.65
3/2/99 8:00	1003.71	3/5/99 0:00	1012.51	3/7/99 16:00	1015.47	3/10/99 8:00	1003.52	3/13/99 0:00	1008.86

Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)
3/13/99 1:00	1009.00	3/15/99 17:00	1000.92	3/18/99 9:00	1008.84	3/21/99 1:00	1004.69	3/23/99 17:00	1007.19
3/13/99 2:00	1009.26	3/15/99 18:00	1001.72	3/18/99 10:00	1008.78	3/21/99 2:00	1003.90	3/23/99 18:00	1007.18
3/13/99 3:00	1009.47	3/15/99 19:00	1002.78	3/18/99 11:00	1008.70	3/21/99 3:00	1002.72	3/23/99 19:00	1007.11
3/13/99 4:00	1008.96	3/15/99 20:00	1003.68	3/18/99 12:00	1008.46	3/21/99 4:00	1001.36	3/23/99 20:00	1007.23
3/13/99 5:00	1009.10	3/15/99 21:00	1004.79	3/18/99 13:00	1007.68	3/21/99 5:00	1000.12	3/23/99 21:00	1007.24
3/13/99 6:00	1009.67	3/15/99 22:00	1005.83	3/18/99 14:00	1006.78	3/21/99 6:00	999.47	3/23/99 22:00	1008.08
3/13/99 7:00	1009.84	3/15/99 23:00	1006.68	3/18/99 15:00	1005.89	3/21/99 7:00	999.73	3/23/99 23:00	1008.33
3/13/99 8:00	1009.83	3/16/99 0:00	1007.19	3/18/99 16:00	1005.30	3/21/99 8:00	999.90	3/24/99 0:00	1008.29
3/13/99 9:00	1010.32	3/16/99 1:00	1007.47	3/18/99 17:00	1005.01	3/21/99 9:00	1000.13	3/24/99 1:00	1008.15
3/13/99 10:00	1011.06	3/16/99 2:00	1007.96	3/18/99 18:00	1004.93	3/21/99 10:00	1000.14	3/24/99 2:00	1007.83
3/13/99 11:00	1011.08	3/16/99 3:00	1008.45	3/18/99 19:00	1004.99	3/21/99 11:00	1000.31	3/24/99 3:00	1007.42
3/13/99 12:00	1010.57	3/16/99 4:00	1008.62	3/18/99 20:00	1005.46	3/21/99 12:00	999.54	3/24/99 4:00	1007.25
3/13/99 13:00	1010.11	3/16/99 5:00	1009.17	3/18/99 21:00	1005.72	3/21/99 13:00	998.86	3/24/99 5:00	1007.23
3/13/99 14:00	1009.63	3/16/99 6:00	1009.79	3/18/99 22:00	1006.19	3/21/99 14:00	998.30	3/24/99 6:00	1007.44
3/13/99 15:00	1008.59	3/16/99 7:00	1010.12	3/18/99 23:00	1006.64	3/21/99 15:00	998.04	3/24/99 7:00	1007.70
3/13/99 16:00	1007.64	3/16/99 8:00	1010.88	3/19/99 0:00	1006.96	3/21/99 16:00	998.29	3/24/99 8:00	1007.88
3/13/99 17:00	1006.33	3/16/99 9:00	1011.53	3/19/99 1:00	1007.08	3/21/99 17:00	998.26	3/24/99 9:00	1007.89
3/13/99 18:00	1006.11	3/16/99 10:00	1012.34	3/19/99 2:00	1007.51	3/21/99 18:00	998.66	3/24/99 10:00	1007.98
3/13/99 19:00	1005.22	3/16/99 11:00	1012.43	3/19/99 3:00	1008.01	3/21/99 19:00	999.11	3/24/99 11:00	1008.20
3/13/99 20:00	1005.72	3/16/99 12:00	1012.43	3/19/99 4:00	1008.29	3/21/99 20:00	999.57	3/24/99 12:00	1007.72
3/13/99 21:00	1006.13	3/16/99 13:00	1012.14	3/19/99 5:00	1008.60	3/21/99 21:00	1000.35	3/24/99 13:00	1006.98
3/13/99 22:00	1006.42	3/16/99 14:00	1011.03	3/19/99 6:00	1009.44	3/21/99 22:00	1001.40	3/24/99 14:00	1005.91
3/13/99 23:00	1005.69	3/16/99 15:00	1010.17	3/19/99 7:00	1010.02	3/21/99 23:00	1001.87	3/24/99 15:00	1005.20
3/14/99 0:00	1005.09	3/16/99 16:00	1009.62	3/19/99 8:00	1010.59	3/22/99 0:00	1002.17	3/24/99 16:00	1004.71
3/14/99 1:00	1005.04	3/16/99 17:00	1009.22	3/19/99 9:00	1011.54	3/22/99 1:00	1002.26	3/24/99 17:00	1004.48
3/14/99 2:00	1003.07	3/16/99 18:00	1008.98	3/19/99 10:00	1012.19	3/22/99 2:00	1002.54	3/24/99 18:00	1004.12
3/14/99 3:00	1002.11	3/16/99 19:00	1009.18	3/19/99 11:00	1012.61	3/22/99 3:00	1002.73	3/24/99 19:00	1004.15
3/14/99 4:00	1000.58	3/16/99 20:00	1009.28	3/19/99 12:00	1012.40	3/22/99 4:00	1002.78	3/24/99 20:00	1004.35
3/14/99 5:00	1001.96	3/16/99 21:00	1009.53	3/19/99 13:00	1012.23	3/22/99 5:00	1003.86	3/24/99 21:00	1004.83
3/14/99 6:00	1000.78	3/16/99 22:00	1010.00	3/19/99 14:00	1011.52	3/22/99 6:00	1005.01	3/24/99 22:00	1005.76
3/14/99 7:00	999.47	3/16/99 23:00	1010.11	3/19/99 15:00	1010.88	3/22/99 7:00	1006.45	3/24/99 23:00	1005.48
3/14/99 8:00	998.25	3/17/99 0:00	1010.01	3/19/99 16:00	1009.95	3/22/99 8:00	1007.20	3/25/99 0:00	1005.23
3/14/99 9:00	997.55	3/17/99 1:00	1009.90	3/19/99 17:00	1009.72	3/22/99 9:00	1007.96	3/25/99 1:00	1004.84
3/14/99 10:00	996.29	3/17/99 2:00	1009.79	3/19/99 18:00	1009.57	3/22/99 10:00	1008.55	3/25/99 2:00	1005.14
3/14/99 11:00	995.25	3/17/99 3:00	1009.55	3/19/99 19:00	1010.02	3/22/99 11:00	1008.49	3/25/99 3:00	1004.70
3/14/99 12:00	994.42	3/17/99 4:00	1009.13	3/19/99 20:00	1010.40	3/22/99 12:00	1008.46	3/25/99 4:00	1004.46
3/14/99 13:00	993.10	3/17/99 5:00	1009.08	3/19/99 21:00	1010.33	3/22/99 13:00	1008.08	3/25/99 5:00	1004.23
3/14/99 14:00	991.52	3/17/99 6:00	1009.55	3/19/99 22:00	1010.63	3/22/99 14:00	1007.85	3/25/99 6:00	1004.13
3/14/99 15:00	990.16	3/17/99 7:00	1010.17	3/19/99 23:00	1010.61	3/22/99 15:00	1006.98	3/25/99 7:00	1004.30
3/14/99 16:00	989.21	3/17/99 8:00	1010.81	3/20/99 0:00	1010.91	3/22/99 16:00	1006.43	3/25/99 8:00	1004.74
3/14/99 17:00	988.27	3/17/99 9:00	1011.39	3/20/99 1:00	1010.79	3/22/99 17:00	1006.35	3/25/99 9:00	1005.03
3/14/99 18:00	988.84	3/17/99 10:00	1011.59	3/20/99 2:00	1010.66	3/22/99 18:00	1006.26	3/25/99 10:00	1005.11
3/14/99 19:00	990.14	3/17/99 11:00	1011.68	3/20/99 3:00	1010.58	3/22/99 19:00	1006.68	3/25/99 11:00	1005.30
3/14/99 20:00	991.38	3/17/99 12:00	1011.26	3/20/99 4:00	1010.30	3/22/99 20:00	1007.21	3/25/99 12:00	1005.01
3/14/99 21:00	992.83	3/17/99 13:00	1010.55	3/20/99 5:00	1010.38	3/22/99 21:00	1007.76	3/25/99 13:00	1003.97
3/14/99 22:00	993.40	3/17/99 14:00	1009.66	3/20/99 6:00	1010.77	3/22/99 22:00	1008.49	3/25/99 14:00	1002.75
3/14/99 23:00	993.74	3/17/99 15:00	1008.60	3/20/99 7:00	1011.59	3/22/99 23:00	1008.97	3/25/99 15:00	1002.96
3/15/99 0:00	993.80	3/17/99 16:00	1008.07	3/20/99 8:00	1012.18	3/23/99 0:00	1009.18	3/25/99 16:00	1003.55
3/15/99 1:00	993.84	3/17/99 17:00	1007.69	3/20/99 9:00	1012.58	3/23/99 1:00	1009.00	3/25/99 17:00	1003.39
3/15/99 2:00	993.59	3/17/99 18:00	1007.52	3/20/99 10:00	1012.64	3/23/99 2:00	1008.94	3/25/99 18:00	1003.24
3/15/99 3:00	993.64	3/17/99 19:00	1007.64	3/20/99 11:00	1012.39	3/23/99 3:00	1009.03	3/25/99 19:00	1003.46
3/15/99 4:00	993.67	3/17/99 20:00	1007.75	3/20/99 12:00	1012.22	3/23/99 4:00	1009.07	3/25/99 20:00	1003.95
3/15/99 5:00	993.95	3/17/99 21:00	1008.16	3/20/99 13:00	1011.64	3/23/99 5:00	1009.41	3/25/99 21:00	1004.04
3/15/99 6:00	994.47	3/17/99 22:00	1008.45	3/20/99 14:00	1010.37	3/23/99 6:00	1009.98	3/25/99 22:00	1004.48
3/15/99 7:00	994.89	3/17/99 23:00	1008.62	3/20/99 15:00	1009.00	3/23/99 7:00	1010.45	3/25/99 23:00	1004.53
3/15/99 8:00	995.10	3/18/99 0:00	1008.75	3/20/99 16:00	1008.31	3/23/99 8:00	1011.02	3/26/99 0:00	1004.34
3/15/99 9:00	996.18	3/18/99 1:00	1008.29	3/20/99 17:00	1007.94	3/23/99 9:00	1011.01	3/26/99 1:00	1004.29
3/15/99 10:00	997.15	3/18/99 2:00	1008.15	3/20/99 18:00	1007.76	3/23/99 10:00	1011.35	3/26/99 2:00	1003.96
3/15/99 11:00	997.97	3/18/99 3:00	1007.92	3/20/99 19:00	1007.53	3/23/99 11:00	1011.59	3/26/99 3:00	1003.84
3/15/99 12:00	998.87	3/18/99 4:00	1007.60	3/20/99 20:00	1007.02	3/23/99 12:00	1011.30	3/26/99 4:00	1003.46
3/15/99 13:00	999.48	3/18/99 5:00	1007.79	3/20/99 21:00	1007.08	3/23/99 13:00	1010.78	3/26/99 5:00	1003.48
3/15/99 14:00	1000.08	3/18/99 6:00	1008.17	3/20/99 22:00	1007.15	3/23/99 14:00	1009.94	3/26/99 6:00	1003.74
3/15/99 15:00	999.83	3/18/99 7:00	1008.41	3/20/99 23:00	1006.60	3/23/99 15:00	1008.69	3/26/99 7:00	1004.14
3/15/99 16:00	1000.46	3/18/99 8:00	1008.58	3/21/99 0:00	1005.64	3/23/99 16:00	1007.68	3/26/99 8:00	1004.87

Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)
3/26/99 9:00	1005.47	3/29/99 1:00	1009.77	3/31/99 17:00	1009.79	4/3/99 9:00	1007.91	4/6/99 1:00	1011.89
3/26/99 10:00	1006.42	3/29/99 2:00	1009.64	3/31/99 18:00	1009.42	4/3/99 10:00	1007.77	4/6/99 2:00	1011.49
3/26/99 11:00	1006.88	3/29/99 3:00	1009.25	3/31/99 19:00	1009.04	4/3/99 11:00	1008.45	4/6/99 3:00	1011.35
3/26/99 12:00	1007.16	3/29/99 4:00	1009.20	3/31/99 20:00	1009.21	4/3/99 12:00	1007.97	4/6/99 4:00	1011.57
3/26/99 13:00	1007.39	3/29/99 5:00	1009.47	3/31/99 21:00	1009.21	4/3/99 13:00	1007.41	4/6/99 5:00	1012.56
3/26/99 14:00	1007.03	3/29/99 6:00	1009.93	3/31/99 22:00	1009.05	4/3/99 14:00	1007.03	4/6/99 6:00	1012.55
3/26/99 15:00	1006.68	3/29/99 7:00	1010.71	3/31/99 23:00	1008.68	4/3/99 15:00	1006.61	4/6/99 7:00	1013.22
3/26/99 16:00	1006.40	3/29/99 8:00	1011.10	4/1/99 0:00	1008.37	4/3/99 16:00	1006.40	4/6/99 8:00	1014.02
3/26/99 17:00	1006.61	3/29/99 9:00	1010.34	4/1/99 1:00	1007.98	4/3/99 17:00	1005.96	4/6/99 9:00	1014.44
3/26/99 18:00	1007.03	3/29/99 10:00	1011.41	4/1/99 2:00	1007.35	4/3/99 18:00	1006.00	4/6/99 10:00	1014.78
3/26/99 19:00	1007.49	3/29/99 11:00	1012.48	4/1/99 3:00	1006.67	4/3/99 19:00	1006.30	4/6/99 11:00	1014.57
3/26/99 20:00	1007.97	3/29/99 12:00	1012.99	4/1/99 4:00	1006.19	4/3/99 20:00	1006.65	4/6/99 12:00	1014.35
3/26/99 21:00	1008.55	3/29/99 13:00	1012.77	4/1/99 5:00	1006.00	4/3/99 21:00	1007.37	4/6/99 13:00	1014.10
3/26/99 22:00	1009.17	3/29/99 14:00	1011.72	4/1/99 6:00	1006.28	4/3/99 22:00	1007.88	4/6/99 14:00	1013.14
3/26/99 23:00	1009.51	3/29/99 15:00	1011.01	4/1/99 7:00	1006.71	4/3/99 23:00	1007.78	4/6/99 15:00	1012.61
3/27/99 0:00	1009.83	3/29/99 16:00	1010.78	4/1/99 8:00	1007.23	4/4/99 0:00	1007.65	4/6/99 16:00	1011.92
3/27/99 1:00	1009.93	3/29/99 17:00	1010.36	4/1/99 9:00	1007.44	4/4/99 1:00	1008.01	4/6/99 17:00	1011.73
3/27/99 2:00	1009.70	3/29/99 18:00	1010.25	4/1/99 10:00	1007.55	4/4/99 2:00	1008.20	4/6/99 18:00	1011.67
3/27/99 3:00	1009.55	3/29/99 19:00	1010.64	4/1/99 11:00	1007.64	4/4/99 3:00	1007.31	4/6/99 19:00	1011.34
3/27/99 4:00	1009.31	3/29/99 20:00	1011.07	4/1/99 12:00	1007.80	4/4/99 4:00	1007.10	4/6/99 20:00	1011.15
3/27/99 5:00	1009.42	3/29/99 21:00	1011.58	4/1/99 13:00	1007.27	4/4/99 5:00	1007.47	4/6/99 21:00	1011.39
3/27/99 6:00	1009.46	3/29/99 22:00	1012.37	4/1/99 14:00	1006.57	4/4/99 6:00	1008.17	4/6/99 22:00	1011.70
3/27/99 7:00	1009.94	3/29/99 23:00	1012.91	4/1/99 15:00	1005.31	4/4/99 7:00	1008.67	4/6/99 23:00	1011.87
3/27/99 8:00	1011.17	3/30/99 0:00	1012.73	4/1/99 16:00	1004.99	4/4/99 8:00	1009.41	4/7/99 0:00	1012.11
3/27/99 9:00	1011.69	3/30/99 1:00	1012.86	4/1/99 17:00	1004.52	4/4/99 9:00	1009.26	4/7/99 1:00	1012.21
3/27/99 10:00	1011.81	3/30/99 2:00	1012.64	4/1/99 18:00	1004.56	4/4/99 10:00	1009.21	4/7/99 2:00	1011.97
3/27/99 11:00	1012.14	3/30/99 3:00	1012.57	4/1/99 19:00	1004.86	4/4/99 11:00	1008.79	4/7/99 3:00	1011.60
3/27/99 12:00	1012.02	3/30/99 4:00	1012.51	4/1/99 20:00	1004.99	4/4/99 12:00	1008.18	4/7/99 4:00	1011.40
3/27/99 13:00	1011.59	3/30/99 5:00	1013.06	4/1/99 21:00	1005.17	4/4/99 13:00	1007.52	4/7/99 5:00	1011.65
3/27/99 14:00	1010.57	3/30/99 6:00	1013.91	4/1/99 22:00	1005.55	4/4/99 14:00	1006.35	4/7/99 6:00	1011.96
3/27/99 15:00	1009.58	3/30/99 7:00	1014.88	4/1/99 23:00	1005.72	4/4/99 15:00	1005.47	4/7/99 7:00	1012.22
3/27/99 16:00	1008.89	3/30/99 8:00	1015.65	4/2/99 0:00	1005.90	4/4/99 16:00	1004.88	4/7/99 8:00	1012.86
3/27/99 17:00	1007.99	3/30/99 9:00	1016.67	4/2/99 1:00	1006.26	4/4/99 17:00	1004.05	4/7/99 9:00	1013.25
3/27/99 18:00	1007.92	3/30/99 10:00	1016.71	4/2/99 2:00	1006.01	4/4/99 18:00	1003.64	4/7/99 10:00	1013.24
3/27/99 19:00	1008.44	3/30/99 11:00	1016.98	4/2/99 3:00	1005.79	4/4/99 19:00	1003.76	4/7/99 11:00	1013.34
3/27/99 20:00	1009.07	3/30/99 12:00	1016.98	4/2/99 4:00	1005.42	4/4/99 20:00	1004.22	4/7/99 12:00	1013.11
3/27/99 21:00	1009.41	3/30/99 13:00	1016.32	4/2/99 5:00	1005.12	4/4/99 21:00	1004.57	4/7/99 13:00	1012.25
3/27/99 22:00	1010.11	3/30/99 14:00	1016.07	4/2/99 6:00	1005.43	4/4/99 22:00	1004.90	4/7/99 14:00	1011.31
3/27/99 23:00	1010.24	3/30/99 15:00	1015.16	4/2/99 7:00	1006.05	4/4/99 23:00	1005.21	4/7/99 15:00	1010.36
3/28/99 0:00	1010.31	3/30/99 16:00	1014.54	4/2/99 8:00	1006.59	4/5/99 0:00	1004.96	4/7/99 16:00	1009.53
3/28/99 1:00	1010.16	3/30/99 17:00	1014.27	4/2/99 9:00	1007.05	4/5/99 1:00	1004.98	4/7/99 17:00	1008.64
3/28/99 2:00	1010.00	3/30/99 18:00	1014.46	4/2/99 10:00	1007.40	4/5/99 2:00	1004.86	4/7/99 18:00	1008.33
3/28/99 3:00	1010.16	3/30/99 19:00	1014.84	4/2/99 11:00	1007.87	4/5/99 3:00	1004.63	4/7/99 19:00	1008.68
3/28/99 4:00	1010.30	3/30/99 20:00	1015.47	4/2/99 12:00	1007.43	4/5/99 4:00	1004.72	4/7/99 20:00	1008.42
3/28/99 5:00	1009.88	3/30/99 21:00	1016.12	4/2/99 13:00	1007.02	4/5/99 5:00	1004.89	4/7/99 21:00	1008.95
3/28/99 6:00	1010.41	3/30/99 22:00	1016.25	4/2/99 14:00	1006.87	4/5/99 6:00	1005.33	4/7/99 22:00	1009.33
3/28/99 7:00	1011.15	3/30/99 23:00	1016.10	4/2/99 15:00	1005.87	4/5/99 7:00	1005.52	4/7/99 23:00	1009.31
3/28/99 8:00	1011.50	3/31/99 0:00	1015.42	4/2/99 16:00	1005.40	4/5/99 8:00	1006.45	4/8/99 0:00	1008.95
3/28/99 9:00	1011.54	3/31/99 1:00	1015.77	4/2/99 17:00	1004.96	4/5/99 9:00	1007.06	4/8/99 1:00	1008.45
3/28/99 10:00	1011.72	3/31/99 2:00	1015.64	4/2/99 18:00	1004.85	4/5/99 10:00	1007.51	4/8/99 2:00	1007.92
3/28/99 11:00	1011.50	3/31/99 3:00	1014.97	4/2/99 19:00	1004.87	4/5/99 11:00	1007.76	4/8/99 3:00	1007.46
3/28/99 12:00	1011.13	3/31/99 4:00	1013.97	4/2/99 20:00	1005.15	4/5/99 12:00	1007.68	4/8/99 4:00	1007.24
3/28/99 13:00	1011.10	3/31/99 5:00	1013.63	4/2/99 21:00	1005.71	4/5/99 13:00	1007.27	4/8/99 5:00	1007.35
3/28/99 14:00	1009.58	3/31/99 6:00	1012.71	4/2/99 22:00	1006.32	4/5/99 14:00	1006.75	4/8/99 6:00	1007.22
3/28/99 15:00	1008.27	3/31/99 7:00	1013.62	4/2/99 23:00	1006.32	4/5/99 15:00	1006.43	4/8/99 7:00	1007.72
3/28/99 16:00	1007.93	3/31/99 8:00	1014.30	4/3/99 0:00	1006.24	4/5/99 16:00	1006.08	4/8/99 8:00	1007.99
3/28/99 17:00	1007.76	3/31/99 9:00	1014.06	4/3/99 1:00	1006.12	4/5/99 17:00	1005.85	4/8/99 9:00	1007.87
3/28/99 18:00	1007.71	3/31/99 10:00	1014.24	4/3/99 2:00	1005.90	4/5/99 18:00	1006.01	4/8/99 10:00	1008.23
3/28/99 19:00	1007.92	3/31/99 11:00	1014.12	4/3/99 3:00	1005.79	4/5/99 19:00	1006.97	4/8/99 11:00	1008.47
3/28/99 20:00	1008.40	3/31/99 12:00	1013.78	4/3/99 4:00	1005.79	4/5/99 20:00	1008.17	4/8/99 12:00	1007.97
3/28/99 21:00	1008.97	3/31/99 13:00	1013.12	4/3/99 5:00	1005.57	4/5/99 21:00	1009.40	4/8/99 13:00	1006.19
3/28/99 22:00	1008.89	3/31/99 14:00	1012.16	4/3/99 6:00	1005.91	4/5/99 22:00	1010.95	4/8/99 14:00	1005.66
3/28/99 23:00	1009.11	3/31/99 15:00	1011.16	4/3/99 7:00	1006.83	4/5/99 23:00	1011.68	4/8/99 15:00	1004.26
3/29/99 0:00	1009.54	3/31/99 16:00	1010.47	4/3/99 8:00	1007.66	4/6/99 0:00	1011.89	4/8/99 16:00	1003.42

Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)
4/8/99 17:00	1003.27	4/11/99 9:00	1003.92	4/14/99 1:00	1004.63	4/16/99 17:00	999.91	4/19/99 9:00	1012.57
4/8/99 18:00	1003.00	4/11/99 10:00	1003.52	4/14/99 2:00	1004.46	4/16/99 18:00	1000.24	4/19/99 10:00	1012.56
4/8/99 19:00	1004.67	4/11/99 11:00	1003.85	4/14/99 3:00	1004.07	4/16/99 19:00	1000.27	4/19/99 11:00	1012.63
4/8/99 20:00	1005.59	4/11/99 12:00	1003.27	4/14/99 4:00	1004.14	4/16/99 20:00	1001.33	4/19/99 12:00	1012.41
4/8/99 21:00	1005.41	4/11/99 13:00	1002.40	4/14/99 5:00	1004.45	4/16/99 21:00	1002.36	4/19/99 13:00	1011.66
4/8/99 22:00	1005.15	4/11/99 14:00	1001.78	4/14/99 6:00	1004.55	4/16/99 22:00	1003.28	4/19/99 14:00	1010.92
4/8/99 23:00	1005.16	4/11/99 15:00	1001.34	4/14/99 7:00	1005.47	4/16/99 23:00	1003.95	4/19/99 15:00	1010.27
4/9/99 0:00	1004.15	4/11/99 16:00	1000.78	4/14/99 8:00	1005.92	4/17/99 0:00	1003.85	4/19/99 16:00	1009.35
4/9/99 1:00	1002.93	4/11/99 17:00	1000.41	4/14/99 9:00	1006.37	4/17/99 1:00	1003.81	4/19/99 17:00	1008.83
4/9/99 2:00	1001.36	4/11/99 18:00	1000.24	4/14/99 10:00	1006.49	4/17/99 2:00	1003.88	4/19/99 18:00	1008.74
4/9/99 3:00	999.96	4/11/99 19:00	1000.45	4/14/99 11:00	1006.85	4/17/99 3:00	1003.86	4/19/99 19:00	1008.54
4/9/99 4:00	1000.32	4/11/99 20:00	1000.72	4/14/99 12:00	1006.71	4/17/99 4:00	1003.82	4/19/99 20:00	1008.32
4/9/99 5:00	1000.77	4/11/99 21:00	1001.81	4/14/99 13:00	1006.01	4/17/99 5:00	1004.33	4/19/99 21:00	1008.51
4/9/99 6:00	1000.56	4/11/99 22:00	1002.75	4/14/99 14:00	1005.96	4/17/99 6:00	1005.10	4/19/99 22:00	1008.70
4/9/99 7:00	1000.29	4/11/99 23:00	1003.13	4/14/99 15:00	1005.31	4/17/99 7:00	1005.46	4/19/99 23:00	1008.62
4/9/99 8:00	1000.43	4/12/99 0:00	1003.18	4/14/99 16:00	1004.08	4/17/99 8:00	1006.45	4/20/99 0:00	1009.05
4/9/99 9:00	1001.04	4/12/99 1:00	1002.95	4/14/99 17:00	1003.53	4/17/99 9:00	1006.13	4/20/99 1:00	1008.26
4/9/99 10:00	1000.98	4/12/99 2:00	1002.73	4/14/99 18:00	1003.07	4/17/99 10:00	1006.28	4/20/99 2:00	1007.98
4/9/99 11:00	1000.32	4/12/99 3:00	1002.61	4/14/99 19:00	1002.79	4/17/99 11:00	1006.72	4/20/99 3:00	1007.18
4/9/99 12:00	999.78	4/12/99 4:00	1002.65	4/14/99 20:00	1002.53	4/17/99 12:00	1006.82	4/20/99 4:00	1006.89
4/9/99 13:00	998.89	4/12/99 5:00	1003.43	4/14/99 21:00	1003.05	4/17/99 13:00	1005.89	4/20/99 5:00	1006.80
4/9/99 14:00	998.17	4/12/99 6:00	1003.75	4/14/99 22:00	1003.22	4/17/99 14:00	1005.09	4/20/99 6:00	1006.79
4/9/99 15:00	997.28	4/12/99 7:00	1004.70	4/14/99 23:00	1003.25	4/17/99 15:00	1004.63	4/20/99 7:00	1007.03
4/9/99 16:00	996.40	4/12/99 8:00	1005.00	4/15/99 0:00	1003.21	4/17/99 16:00	1003.76	4/20/99 8:00	1007.98
4/9/99 17:00	995.62	4/12/99 9:00	1005.45	4/15/99 1:00	1002.39	4/17/99 17:00	1003.73	4/20/99 9:00	1007.31
4/9/99 18:00	995.23	4/12/99 10:00	1005.35	4/15/99 2:00	1001.47	4/17/99 18:00	1004.10	4/20/99 10:00	1006.63
4/9/99 19:00	995.47	4/12/99 11:00	1005.41	4/15/99 3:00	1000.11	4/17/99 19:00	1004.56	4/20/99 11:00	1006.51
4/9/99 20:00	995.83	4/12/99 12:00	1005.03	4/15/99 4:00	999.33	4/17/99 20:00	1005.46	4/20/99 12:00	1006.02
4/9/99 21:00	996.10	4/12/99 13:00	1004.51	4/15/99 5:00	998.40	4/17/99 21:00	1006.56	4/20/99 13:00	1005.11
4/9/99 22:00	996.55	4/12/99 14:00	1003.96	4/15/99 6:00	997.93	4/17/99 22:00	1008.00	4/20/99 14:00	1004.39
4/9/99 23:00	996.87	4/12/99 15:00	1003.35	4/15/99 7:00	998.24	4/17/99 23:00	1008.82	4/20/99 15:00	1003.61
4/10/99 0:00	996.63	4/12/99 16:00	1002.64	4/15/99 8:00	999.17	4/18/99 0:00	1009.25	4/20/99 16:00	1003.00
4/10/99 1:00	996.73	4/12/99 17:00	1002.70	4/15/99 9:00	998.91	4/18/99 1:00	1009.21	4/20/99 17:00	1002.88
4/10/99 2:00	996.76	4/12/99 18:00	1002.93	4/15/99 10:00	997.75	4/18/99 2:00	1009.23	4/20/99 18:00	1003.42
4/10/99 3:00	997.06	4/12/99 19:00	1003.66	4/15/99 11:00	996.45	4/18/99 3:00	1009.06	4/20/99 19:00	1003.59
4/10/99 4:00	997.22	4/12/99 20:00	1004.42	4/15/99 12:00	995.73	4/18/99 4:00	1009.05	4/20/99 20:00	1004.05
4/10/99 5:00	997.98	4/12/99 21:00	1005.72	4/15/99 13:00	995.21	4/18/99 5:00	1009.00	4/20/99 21:00	1004.70
4/10/99 6:00	998.48	4/12/99 22:00	1006.82	4/15/99 14:00	993.53	4/18/99 6:00	1009.82	4/20/99 22:00	1005.18
4/10/99 7:00	999.21	4/12/99 23:00	1007.29	4/15/99 15:00	992.63	4/18/99 7:00	1010.52	4/20/99 23:00	1005.52
4/10/99 8:00	1000.64	4/13/99 0:00	1007.84	4/15/99 16:00	990.84	4/18/99 8:00	1011.36	4/21/99 0:00	1005.73
4/10/99 9:00	1001.70	4/13/99 1:00	1008.28	4/15/99 17:00	989.32	4/18/99 9:00	1011.71	4/21/99 1:00	1005.78
4/10/99 10:00	1002.04	4/13/99 2:00	1008.46	4/15/99 18:00	990.15	4/18/99 10:00	1011.94	4/21/99 2:00	1005.47
4/10/99 11:00	1002.66	4/13/99 3:00	1008.20	4/15/99 19:00	990.98	4/18/99 11:00	1012.17	4/21/99 3:00	1004.97
4/10/99 12:00	1002.65	4/13/99 4:00	1008.29	4/15/99 20:00	991.16	4/18/99 12:00	1011.80	4/21/99 4:00	1004.97
4/10/99 13:00	1002.58	4/13/99 5:00	1008.76	4/15/99 21:00	992.28	4/18/99 13:00	1010.94	4/21/99 5:00	1005.21
4/10/99 14:00	1002.51	4/13/99 6:00	1009.13	4/15/99 22:00	993.51	4/18/99 14:00	1010.39	4/21/99 6:00	1005.18
4/10/99 15:00	1002.74	4/13/99 7:00	1009.98	4/15/99 23:00	994.41	4/18/99 15:00	1009.75	4/21/99 7:00	1006.04
4/10/99 16:00	1001.87	4/13/99 8:00	1010.84	4/16/99 0:00	995.02	4/18/99 16:00	1009.05	4/21/99 8:00	1006.73
4/10/99 17:00	1001.92	4/13/99 9:00	1010.98	4/16/99 1:00	995.61	4/18/99 17:00	1008.85	4/21/99 9:00	1007.19
4/10/99 18:00	1002.05	4/13/99 10:00	1010.61	4/16/99 2:00	996.33	4/18/99 18:00	1009.13	4/21/99 10:00	1007.46
4/10/99 19:00	1002.43	4/13/99 11:00	1010.19	4/16/99 3:00	996.79	4/18/99 19:00	1009.67	4/21/99 11:00	1007.78
4/10/99 20:00	1002.65	4/13/99 12:00	1009.30	4/16/99 4:00	997.17	4/18/99 20:00	1010.14	4/21/99 12:00	1007.59
4/10/99 21:00	1003.46	4/13/99 13:00	1008.23	4/16/99 5:00	997.81	4/18/99 21:00	1010.99	4/21/99 13:00	1007.20
4/10/99 22:00	1004.49	4/13/99 14:00	1007.39	4/16/99 6:00	998.24	4/18/99 22:00	1011.51	4/21/99 14:00	1006.63
4/10/99 23:00	1004.16	4/13/99 15:00	1006.50	4/16/99 7:00	999.68	4/18/99 23:00	1011.56	4/21/99 15:00	1005.91
4/11/99 0:00	1004.05	4/13/99 16:00	1005.31	4/16/99 8:00	1000.17	4/19/99 0:00	1011.73	4/21/99 16:00	1005.45
4/11/99 1:00	1004.14	4/13/99 17:00	1004.68	4/16/99 9:00	1000.96	4/19/99 1:00	1011.91	4/21/99 17:00	1004.89
4/11/99 2:00	1003.75	4/13/99 18:00	1004.68	4/16/99 10:00	1001.54	4/19/99 2:00	1011.55	4/21/99 18:00	1004.71
4/11/99 3:00	1003.22	4/13/99 19:00	1004.73	4/16/99 11:00	1002.42	4/19/99 3:00	1011.03	4/21/99 19:00	1004.71
4/11/99 4:00	1002.42	4/13/99 20:00	1004.82	4/16/99 12:00	1001.98	4/19/99 4:00	1010.97	4/21/99 20:00	1004.80
4/11/99 5:00	1002.40	4/13/99 21:00	1004.84	4/16/99 13:00	1001.50	4/19/99 5:00	1011.05	4/21/99 21:00	1005.33
4/11/99 6:00	1002.84	4/13/99 22:00	1004.93	4/16/99 14:00	1001.18	4/19/99 6:00	1010.90	4/21/99 22:00	1005.94
4/11/99 7:00	1003.22	4/13/99 23:00	1004.66	4/16/99 15:00	1000.60	4/19/99 7:00	1011.49	4/21/99 23:00	1006.23
4/11/99 8:00	1003.73	4/14/99 0:00	1004.67	4/16/99 16:00	999.80	4/19/99 8:00	1012.34	4/22/99 0:00	1006.47

Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)
4/22/99 1:00	1006.68	4/24/99 17:00	1004.84	4/27/99 9:00	1003.63	4/30/99 1:00	1003.57	5/2/99 17:00	1003.55
4/22/99 2:00	1006.33	4/24/99 18:00	1005.76	4/27/99 10:00	1003.99	4/30/99 2:00	1002.95	5/2/99 18:00	1003.98
4/22/99 3:00	1005.95	4/24/99 19:00	1006.71	4/27/99 11:00	1003.93	4/30/99 3:00	1002.48	5/2/99 19:00	1003.97
4/22/99 4:00	1005.94	4/24/99 20:00	1007.82	4/27/99 12:00	1003.38	4/30/99 4:00	1001.98	5/2/99 20:00	1004.61
4/22/99 5:00	1006.27	4/24/99 21:00	1008.61	4/27/99 13:00	1002.59	4/30/99 5:00	1001.82	5/2/99 21:00	1005.28
4/22/99 6:00	1006.80	4/24/99 22:00	1009.66	4/27/99 14:00	1002.26	4/30/99 6:00	1001.52	5/2/99 22:00	1005.60
4/22/99 7:00	1007.41	4/24/99 23:00	1010.13	4/27/99 15:00	1001.66	4/30/99 7:00	1001.59	5/2/99 23:00	1005.73
4/22/99 8:00	1007.96	4/25/99 0:00	1009.64	4/27/99 16:00	1000.61	4/30/99 8:00	1001.90	5/3/99 0:00	1005.75
4/22/99 9:00	1008.55	4/25/99 1:00	1009.41	4/27/99 17:00	1000.39	4/30/99 9:00	1001.72	5/3/99 1:00	1005.66
4/22/99 10:00	1009.05	4/25/99 2:00	1009.35	4/27/99 18:00	1000.08	4/30/99 10:00	1001.59	5/3/99 2:00	1005.49
4/22/99 11:00	1009.62	4/25/99 3:00	1008.81	4/27/99 19:00	1000.05	4/30/99 11:00	1001.44	5/3/99 3:00	1005.65
4/22/99 12:00	1009.71	4/25/99 4:00	1008.91	4/27/99 20:00	1000.44	4/30/99 12:00	1001.89	5/3/99 4:00	1006.02
4/22/99 13:00	1009.30	4/25/99 5:00	1008.26	4/27/99 21:00	1001.46	4/30/99 13:00	1002.03	5/3/99 5:00	1006.27
4/22/99 14:00	1008.68	4/25/99 6:00	1008.84	4/27/99 22:00	1002.08	4/30/99 14:00	1001.69	5/3/99 6:00	1006.91
4/22/99 15:00	1008.09	4/25/99 7:00	1009.38	4/27/99 23:00	1002.30	4/30/99 15:00	1001.52	5/3/99 7:00	1007.30
4/22/99 16:00	1007.51	4/25/99 8:00	1010.22	4/28/99 0:00	1002.48	4/30/99 16:00	1001.44	5/3/99 8:00	1007.65
4/22/99 17:00	1007.14	4/25/99 9:00	1010.72	4/28/99 1:00	1002.47	4/30/99 17:00	1001.83	5/3/99 9:00	1008.17
4/22/99 18:00	1006.85	4/25/99 10:00	1010.86	4/28/99 2:00	1001.53	4/30/99 18:00	1002.34	5/3/99 10:00	1008.20
4/22/99 19:00	1006.87	4/25/99 11:00	1010.91	4/28/99 3:00	1001.44	4/30/99 19:00	1002.49	5/3/99 11:00	1008.18
4/22/99 20:00	1006.94	4/25/99 12:00	1011.24	4/28/99 4:00	1001.03	4/30/99 20:00	1003.06	5/3/99 12:00	1007.60
4/22/99 21:00	1007.67	4/25/99 13:00	1010.84	4/28/99 5:00	1000.93	4/30/99 21:00	1003.63	5/3/99 13:00	1006.70
4/22/99 22:00	1008.00	4/25/99 14:00	1010.23	4/28/99 6:00	1001.53	4/30/99 22:00	1004.31	5/3/99 14:00	1006.05
4/22/99 23:00	1008.35	4/25/99 15:00	1010.08	4/28/99 7:00	1002.07	4/30/99 23:00	1004.37	5/3/99 15:00	1005.41
4/23/99 0:00	1008.22	4/25/99 16:00	1009.77	4/28/99 8:00	1002.50	5/1/99 0:00	1004.13	5/3/99 16:00	1004.59
4/23/99 1:00	1008.35	4/25/99 17:00	1009.43	4/28/99 9:00	1002.50	5/1/99 1:00	1003.82	5/3/99 17:00	1004.23
4/23/99 2:00	1008.26	4/25/99 18:00	1009.57	4/28/99 10:00	1002.92	5/1/99 2:00	1002.86	5/3/99 18:00	1004.11
4/23/99 3:00	1008.08	4/25/99 19:00	1009.28	4/28/99 11:00	1003.27	5/1/99 3:00	1002.46	5/3/99 19:00	1003.80
4/23/99 4:00	1008.08	4/25/99 20:00	1009.45	4/28/99 12:00	1003.12	5/1/99 4:00	1002.10	5/3/99 20:00	1003.93
4/23/99 5:00	1008.49	4/25/99 21:00	1009.67	4/28/99 13:00	1003.45	5/1/99 5:00	1002.02	5/3/99 21:00	1004.12
4/23/99 6:00	1008.80	4/25/99 22:00	1010.34	4/28/99 14:00	1004.29	5/1/99 6:00	1002.07	5/3/99 22:00	1004.33
4/23/99 7:00	1009.42	4/25/99 23:00	1009.74	4/28/99 15:00	1004.79	5/1/99 7:00	1002.53	5/3/99 23:00	1004.55
4/23/99 8:00	1009.90	4/26/99 0:00	1009.21	4/28/99 16:00	1004.43	5/1/99 8:00	1002.83	5/4/99 0:00	1004.63
4/23/99 9:00	1010.30	4/26/99 1:00	1008.71	4/28/99 17:00	1004.61	5/1/99 9:00	1003.17	5/4/99 1:00	1004.57
4/23/99 10:00	1010.34	4/26/99 2:00	1007.99	4/28/99 18:00	1004.59	5/1/99 10:00	1003.42	5/4/99 2:00	1004.42
4/23/99 11:00	1010.07	4/26/99 3:00	1007.05	4/28/99 19:00	1003.96	5/1/99 11:00	1004.01	5/4/99 3:00	1004.42
4/23/99 12:00	1009.55	4/26/99 4:00	1006.73	4/28/99 20:00	1004.89	5/1/99 12:00	1003.84	5/4/99 4:00	1004.30
4/23/99 13:00	1008.49	4/26/99 5:00	1006.60	4/28/99 21:00	1005.14	5/1/99 13:00	1003.70	5/4/99 5:00	1003.97
4/23/99 14:00	1007.80	4/26/99 6:00	1006.89	4/28/99 22:00	1004.87	5/1/99 14:00	1003.91	5/4/99 6:00	1004.35
4/23/99 15:00	1007.24	4/26/99 7:00	1007.60	4/28/99 23:00	1005.01	5/1/99 15:00	1004.16	5/4/99 7:00	1005.16
4/23/99 16:00	1006.42	4/26/99 8:00	1007.64	4/29/99 0:00	1004.67	5/1/99 16:00	1003.81	5/4/99 8:00	1005.68
4/23/99 17:00	1005.73	4/26/99 9:00	1007.49	4/29/99 1:00	1004.78	5/1/99 17:00	1003.55	5/4/99 9:00	1005.70
4/23/99 18:00	1005.49	4/26/99 10:00	1007.41	4/29/99 2:00	1003.97	5/1/99 18:00	1003.17	5/4/99 10:00	1005.87
4/23/99 19:00	1005.35	4/26/99 11:00	1007.05	4/29/99 3:00	1003.72	5/1/99 19:00	1003.25	5/4/99 11:00	1006.09
4/23/99 20:00	1005.39	4/26/99 12:00	1006.57	4/29/99 4:00	1003.24	5/1/99 20:00	1003.05	5/4/99 12:00	1006.13
4/23/99 21:00	1005.63	4/26/99 13:00	1005.70	4/29/99 5:00	1003.06	5/1/99 21:00	1003.15	5/4/99 13:00	1005.57
4/23/99 22:00	1006.01	4/26/99 14:00	1005.11	4/29/99 6:00	1003.41	5/1/99 22:00	1003.18	5/4/99 14:00	1005.18
4/23/99 23:00	1005.97	4/26/99 15:00	1004.20	4/29/99 7:00	1003.65	5/1/99 23:00	1003.28	5/4/99 15:00	1004.38
4/24/99 0:00	1006.35	4/26/99 16:00	1003.36	4/29/99 8:00	1004.25	5/2/99 0:00	1003.17	5/4/99 16:00	1003.19
4/24/99 1:00	1006.17	4/26/99 17:00	1003.09	4/29/99 9:00	1004.84	5/2/99 1:00	1003.17	5/4/99 17:00	1002.98
4/24/99 2:00	1005.83	4/26/99 18:00	1002.63	4/29/99 10:00	1005.03	5/2/99 2:00	1002.89	5/4/99 18:00	1003.16
4/24/99 3:00	1005.45	4/26/99 19:00	1002.28	4/29/99 11:00	1004.71	5/2/99 3:00	1002.32	5/4/99 19:00	1003.20
4/24/99 4:00	1005.60	4/26/99 20:00	1002.43	4/29/99 12:00	1004.48	5/2/99 4:00	1002.48	5/4/99 20:00	1002.81
4/24/99 5:00	1005.94	4/26/99 21:00	1002.47	4/29/99 13:00	1004.56	5/2/99 5:00	1002.42	5/4/99 21:00	1003.55
4/24/99 6:00	1006.27	4/26/99 22:00	1002.82	4/29/99 14:00	1004.42	5/2/99 6:00	1002.69	5/4/99 22:00	1003.71
4/24/99 7:00	1006.87	4/26/99 23:00	1002.65	4/29/99 15:00	1004.37	5/2/99 7:00	1003.35	5/4/99 23:00	1004.65
4/24/99 8:00	1007.56	4/27/99 0:00	1002.95	4/29/99 16:00	1004.07	5/2/99 8:00	1003.77	5/5/99 0:00	1004.99
4/24/99 9:00	1008.04	4/27/99 1:00	1003.20	4/29/99 17:00	1003.72	5/2/99 9:00	1003.83	5/5/99 1:00	1005.06
4/24/99 10:00	1008.06	4/27/99 2:00	1002.73	4/29/99 18:00	1003.84	5/2/99 10:00	1004.22	5/5/99 2:00	1003.98
4/24/99 11:00	1008.30	4/27/99 3:00	1002.36	4/29/99 19:00	1004.01	5/2/99 11:00	1004.57	5/5/99 3:00	1003.52
4/24/99 12:00	1008.04	4/27/99 4:00	1002.64	4/29/99 20:00	1003.75	5/2/99 12:00	1004.49	5/5/99 4:00	1004.22
4/24/99 13:00	1006.94	4/27/99 5:00	1002.96	4/29/99 21:00	1004.59	5/2/99 13:00	1004.50	5/5/99 5:00	1003.64
4/24/99 14:00	1006.26	4/27/99 6:00	1003.04	4/29/99 22:00	1004.94	5/2/99 14:00	1004.11	5/5/99 6:00	1002.57
4/24/99 15:00	1005.75	4/27/99 7:00	1003.48	4/29/99 23:00	1004.84	5/2/99 15:00	1004.09	5/5/99 7:00	1002.39
4/24/99 16:00	1005.03	4/27/99 8:00	1003.39	4/30/99 0:00	1004.36	5/2/99 16:00	1003.75	5/5/99 8:00	1003.89

Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)
5/5/99 9:00	1005.12	5/8/99 1:00	1003.22	5/10/99 17:00	1004.63	5/13/99 9:00	1001.00	5/16/99 1:00	1010.53
5/5/99 10:00	1004.96	5/8/99 2:00	1003.21	5/10/99 18:00	1004.76	5/13/99 10:00	1001.32	5/16/99 2:00	1010.04
5/5/99 11:00	1004.45	5/8/99 3:00	1003.36	5/10/99 19:00	1005.12	5/13/99 11:00	1000.96	5/16/99 3:00	1009.63
5/5/99 12:00	1004.83	5/8/99 4:00	1003.35	5/10/99 20:00	1006.25	5/13/99 12:00	1000.67	5/16/99 4:00	1009.45
5/5/99 13:00	1004.96	5/8/99 5:00	1003.73	5/10/99 21:00	1006.89	5/13/99 13:00	1000.08	5/16/99 5:00	1009.45
5/5/99 14:00	1004.74	5/8/99 6:00	1004.27	5/10/99 22:00	1007.35	5/13/99 14:00	999.45	5/16/99 6:00	1009.23
5/5/99 15:00	1004.24	5/8/99 7:00	1004.87	5/10/99 23:00	1007.92	5/13/99 15:00	998.85	5/16/99 7:00	1010.36
5/5/99 16:00	1005.35	5/8/99 8:00	1005.42	5/11/99 0:00	1008.04	5/13/99 16:00	998.23	5/16/99 8:00	1011.22
5/5/99 17:00	1004.67	5/8/99 9:00	1006.14	5/11/99 1:00	1008.15	5/13/99 17:00	998.00	5/16/99 9:00	1011.52
5/5/99 18:00	1005.86	5/8/99 10:00	1006.44	5/11/99 2:00	1007.34	5/13/99 18:00	997.86	5/16/99 10:00	1012.10
5/5/99 19:00	1005.26	5/8/99 11:00	1006.86	5/11/99 3:00	1007.12	5/13/99 19:00	998.14	5/16/99 11:00	1011.94
5/5/99 20:00	1004.69	5/8/99 12:00	1007.03	5/11/99 4:00	1006.86	5/13/99 20:00	998.69	5/16/99 12:00	1012.03
5/5/99 21:00	1004.58	5/8/99 13:00	1006.50	5/11/99 5:00	1006.89	5/13/99 21:00	1000.67	5/16/99 13:00	1011.29
5/5/99 22:00	1004.81	5/8/99 14:00	1006.07	5/11/99 6:00	1006.92	5/13/99 22:00	999.85	5/16/99 14:00	1010.55
5/5/99 23:00	1004.73	5/8/99 15:00	1005.52	5/11/99 7:00	1007.45	5/13/99 23:00	999.60	5/16/99 15:00	1010.09
5/6/99 0:00	1004.39	5/8/99 16:00	1004.83	5/11/99 8:00	1008.12	5/14/99 0:00	1000.00	5/16/99 16:00	1009.10
5/6/99 1:00	1004.07	5/8/99 17:00	1004.49	5/11/99 9:00	1008.66	5/14/99 1:00	999.87	5/16/99 17:00	1008.54
5/6/99 2:00	1003.21	5/8/99 18:00	1004.78	5/11/99 10:00	1009.01	5/14/99 2:00	999.27	5/16/99 18:00	1008.41
5/6/99 3:00	1002.20	5/8/99 19:00	1005.00	5/11/99 11:00	1009.38	5/14/99 3:00	998.85	5/16/99 19:00	1008.73
5/6/99 4:00	1001.99	5/8/99 20:00	1005.19	5/11/99 12:00	1009.40	5/14/99 4:00	998.51	5/16/99 20:00	1009.27
5/6/99 5:00	1001.94	5/8/99 21:00	1005.68	5/11/99 13:00	1008.81	5/14/99 5:00	998.60	5/16/99 21:00	1009.35
5/6/99 6:00	1002.95	5/8/99 22:00	1006.32	5/11/99 14:00	1008.35	5/14/99 6:00	998.98	5/16/99 22:00	1009.80
5/6/99 7:00	1004.14	5/8/99 23:00	1006.54	5/11/99 15:00	1007.52	5/14/99 7:00	1000.10	5/16/99 23:00	1010.21
5/6/99 8:00	1005.08	5/9/99 0:00	1006.48	5/11/99 16:00	1006.95	5/14/99 8:00	1000.54	5/17/99 0:00	1010.62
5/6/99 9:00	1005.32	5/9/99 1:00	1006.33	5/11/99 17:00	1006.42	5/14/99 9:00	1001.30	5/17/99 1:00	1010.42
5/6/99 10:00	1004.77	5/9/99 2:00	1006.06	5/11/99 18:00	1006.42	5/14/99 10:00	1001.43	5/17/99 2:00	1009.66
5/6/99 11:00	1005.04	5/9/99 3:00	1005.83	5/11/99 19:00	1006.52	5/14/99 11:00	1001.49	5/17/99 3:00	1009.34
5/6/99 12:00	1004.88	5/9/99 4:00	1005.81	5/11/99 20:00	1007.10	5/14/99 12:00	1001.62	5/17/99 4:00	1009.15
5/6/99 13:00	1004.87	5/9/99 5:00	1005.85	5/11/99 21:00	1007.76	5/14/99 13:00	1001.35	5/17/99 5:00	1009.39
5/6/99 14:00	1003.79	5/9/99 6:00	1006.23	5/11/99 22:00	1008.14	5/14/99 14:00	1001.01	5/17/99 6:00	1010.13
5/6/99 15:00	1005.99	5/9/99 7:00	1006.96	5/11/99 23:00	1008.12	5/14/99 15:00	1001.04	5/17/99 7:00	1010.77
5/6/99 16:00	1004.63	5/9/99 8:00	1007.51	5/12/99 0:00	1007.73	5/14/99 16:00	1001.08	5/17/99 8:00	1011.20
5/6/99 17:00	1004.21	5/9/99 9:00	1007.96	5/12/99 1:00	1007.67	5/14/99 17:00	1001.62	5/17/99 9:00	1011.68
5/6/99 18:00	1002.77	5/9/99 10:00	1008.04	5/12/99 2:00	1007.17	5/14/99 18:00	1002.22	5/17/99 10:00	1011.60
5/6/99 19:00	1003.19	5/9/99 11:00	1007.99	5/12/99 3:00	1006.24	5/14/99 19:00	1003.57	5/17/99 11:00	1011.56
5/6/99 20:00	1002.36	5/9/99 12:00	1007.78	5/12/99 4:00	1005.54	5/14/99 20:00	1004.33	5/17/99 12:00	1011.26
5/6/99 21:00	1002.63	5/9/99 13:00	1007.04	5/12/99 5:00	1005.35	5/14/99 21:00	1005.33	5/17/99 13:00	1010.30
5/6/99 22:00	1004.58	5/9/99 14:00	1006.44	5/12/99 6:00	1005.04	5/14/99 22:00	1006.38	5/17/99 14:00	1009.78
5/6/99 23:00	1003.48	5/9/99 15:00	1006.04	5/12/99 7:00	1005.39	5/14/99 23:00	1007.06	5/17/99 15:00	1009.29
5/7/99 0:00	1004.13	5/9/99 16:00	1005.31	5/12/99 8:00	1006.06	5/15/99 0:00	1007.55	5/17/99 16:00	1008.69
5/7/99 1:00	1003.95	5/9/99 17:00	1004.89	5/12/99 9:00	1006.17	5/15/99 1:00	1007.64	5/17/99 17:00	1008.42
5/7/99 2:00	1004.03	5/9/99 18:00	1004.54	5/12/99 10:00	1006.37	5/15/99 2:00	1007.70	5/17/99 18:00	1008.34
5/7/99 3:00	1003.38	5/9/99 19:00	1004.23	5/12/99 11:00	1006.48	5/15/99 3:00	1007.55	5/17/99 19:00	1008.13
5/7/99 4:00	1003.06	5/9/99 20:00	1004.50	5/12/99 12:00	1006.08	5/15/99 4:00	1007.49	5/17/99 20:00	1008.26
5/7/99 5:00	1004.19	5/9/99 21:00	1004.71	5/12/99 13:00	1005.38	5/15/99 5:00	1007.81	5/17/99 21:00	1008.58
5/7/99 6:00	1003.99	5/9/99 22:00	1005.49	5/12/99 14:00	1004.75	5/15/99 6:00	1008.52	5/17/99 22:00	1008.90
5/7/99 7:00	1004.24	5/9/99 23:00	1005.96	5/12/99 15:00	1004.39	5/15/99 7:00	1009.14	5/17/99 23:00	1008.92
5/7/99 8:00	1004.70	5/10/99 0:00	1006.04	5/12/99 16:00	1003.57	5/15/99 8:00	1009.70	5/18/99 0:00	1009.00
5/7/99 9:00	1004.42	5/10/99 1:00	1005.45	5/12/99 17:00	1002.75	5/15/99 9:00	1010.29	5/18/99 1:00	1009.41
5/7/99 10:00	1004.79	5/10/99 2:00	1005.09	5/12/99 18:00	1002.29	5/15/99 10:00	1010.66	5/18/99 2:00	1009.02
5/7/99 11:00	1004.26	5/10/99 3:00	1004.45	5/12/99 19:00	1002.27	5/15/99 11:00	1011.30	5/18/99 3:00	1008.49
5/7/99 12:00	1004.31	5/10/99 4:00	1004.59	5/12/99 20:00	1002.41	5/15/99 12:00	1011.23	5/18/99 4:00	1008.19
5/7/99 13:00	1003.58	5/10/99 5:00	1004.79	5/12/99 21:00	1002.21	5/15/99 13:00	1010.65	5/18/99 5:00	1007.72
5/7/99 14:00	1003.64	5/10/99 6:00	1005.12	5/12/99 22:00	1002.60	5/15/99 14:00	1010.01	5/18/99 6:00	1007.80
5/7/99 15:00	1003.34	5/10/99 7:00	1005.46	5/12/99 23:00	1002.60	5/15/99 15:00	1009.38	5/18/99 7:00	1008.59
5/7/99 16:00	1002.89	5/10/99 8:00	1005.82	5/13/99 0:00	1002.19	5/15/99 16:00	1008.61	5/18/99 8:00	1009.02
5/7/99 17:00	1002.24	5/10/99 9:00	1006.11	5/13/99 1:00	1002.18	5/15/99 17:00	1008.12	5/18/99 9:00	1009.43
5/7/99 18:00	1001.58	5/10/99 10:00	1006.33	5/13/99 2:00	1001.58	5/15/99 18:00	1008.01	5/18/99 10:00	1009.21
5/7/99 19:00	1001.61	5/10/99 11:00	1006.57	5/13/99 3:00	1001.06	5/15/99 19:00	1008.21	5/18/99 11:00	1008.81
5/7/99 20:00	1002.04	5/10/99 12:00	1006.49	5/13/99 4:00	1000.84	5/15/99 20:00	1009.08	5/18/99 12:00	1008.66
5/7/99 21:00	1002.29	5/10/99 13:00	1006.14	5/13/99 5:00	1000.60	5/15/99 21:00	1009.55	5/18/99 13:00	1007.63
5/7/99 22:00	1002.87	5/10/99 14:00	1005.72	5/13/99 6:00	1000.75	5/15/99 22:00	1009.99	5/18/99 14:00	1007.34
5/7/99 23:00	1003.23	5/10/99 15:00	1005.33	5/13/99 7:00	1001.13	5/15/99 23:00	1010.41	5/18/99 15:00	1006.43
5/8/99 0:00	1003.61	5/10/99 16:00	1004.72	5/13/99 8:00	1001.31	5/16/99 0:00	1010.67	5/18/99 16:00	995.13

Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)	Date	Barometric Pressure (mb)
5/18/99 17:00	1005.00	5/21/99 9:00	1010.94	5/24/99 1:00	1000.51	5/26/99 17:00	1001.89	5/29/99 9:00	1012.79
5/18/99 18:00	1004.79	5/21/99 10:00	1012.20	5/24/99 2:00	999.94	5/26/99 18:00	1001.74	5/29/99 10:00	1012.86
5/18/99 19:00	1004.73	5/21/99 11:00	1012.14	5/24/99 3:00	999.51	5/26/99 19:00	1002.09	5/29/99 11:00	1012.70
5/18/99 20:00	1004.95	5/21/99 12:00	1012.00	5/24/99 4:00	999.32	5/26/99 20:00	1002.91	5/29/99 12:00	1012.53
5/18/99 21:00	1005.30	5/21/99 13:00	1011.40	5/24/99 5:00	999.07	5/26/99 21:00	1003.21	5/29/99 13:00	1012.14
5/18/99 22:00	1005.53	5/21/99 14:00	1010.60	5/24/99 6:00	999.47	5/26/99 22:00	1003.90	5/29/99 14:00	1011.81
5/18/99 23:00	1005.62	5/21/99 15:00	1010.09	5/24/99 7:00	999.75	5/26/99 23:00	1005.33	5/29/99 15:00	1011.35
5/19/99 0:00	1005.70	5/21/99 16:00	1009.50	5/24/99 8:00	999.91	5/27/99 0:00	1004.13	5/29/99 16:00	1010.65
5/19/99 1:00	1005.68	5/21/99 17:00	1008.88	5/24/99 9:00	1000.29	5/27/99 1:00	1003.38	5/29/99 17:00	1010.32
5/19/99 2:00	1004.91	5/21/99 18:00	1008.55	5/24/99 10:00	1000.39	5/27/99 2:00	1003.49	5/29/99 18:00	1010.20
5/19/99 3:00	1004.65	5/21/99 19:00	1008.49	5/24/99 11:00	1000.23	5/27/99 3:00	1003.61	5/29/99 19:00	1010.57
5/19/99 4:00	1005.09	5/21/99 20:00	1008.60	5/24/99 12:00	1000.05	5/27/99 4:00	1004.01	5/29/99 20:00	1010.97
5/19/99 5:00	1004.87	5/21/99 21:00	1009.05	5/24/99 13:00	999.65	5/27/99 5:00	1004.33	5/29/99 21:00	1011.61
5/19/99 6:00	1004.95	5/21/99 22:00	1009.89	5/24/99 14:00	998.95	5/27/99 6:00	1005.05	5/29/99 22:00	1012.34
5/19/99 7:00	1005.45	5/21/99 23:00	1010.00	5/24/99 15:00	998.73	5/27/99 7:00	1005.90	5/29/99 23:00	1012.93
5/19/99 8:00	1006.02	5/22/99 0:00	1009.82	5/24/99 16:00	998.44	5/27/99 8:00	1006.56	5/30/99 0:00	1012.98
5/19/99 9:00	1006.09	5/22/99 1:00	1009.39	5/24/99 17:00	998.52	5/27/99 9:00	1006.82	5/30/99 1:00	1012.90
5/19/99 10:00	1006.51	5/22/99 2:00	1008.90	5/24/99 18:00	998.71	5/27/99 10:00	1007.01	5/30/99 2:00	1012.76
5/19/99 11:00	1006.62	5/22/99 3:00	1008.66	5/24/99 19:00	999.17	5/27/99 11:00	1007.46	5/30/99 3:00	1012.65
5/19/99 12:00	1006.73	5/22/99 4:00	1008.69	5/24/99 20:00	1000.01	5/27/99 12:00	1007.21	5/30/99 4:00	1012.74
5/19/99 13:00	1006.16	5/22/99 5:00	1008.66	5/24/99 21:00	1000.73	5/27/99 13:00	1006.93	5/30/99 5:00	1012.76
5/19/99 14:00	1005.75	5/22/99 6:00	1008.84	5/24/99 22:00	1001.59	5/27/99 14:00	1006.45	5/30/99 6:00	1013.24
5/19/99 15:00	1005.53	5/22/99 7:00	1009.15	5/24/99 23:00	1002.18	5/27/99 15:00	1005.97	5/30/99 7:00	1013.78
5/19/99 16:00	1005.04	5/22/99 8:00	1009.62	5/25/99 0:00	1002.59	5/27/99 16:00	1005.29	5/30/99 8:00	1014.19
5/19/99 17:00	1004.85	5/22/99 9:00	1009.99	5/25/99 1:00	1002.52	5/27/99 17:00	1005.04	5/30/99 9:00	1014.78
5/19/99 18:00	1004.80	5/22/99 10:00	1009.98	5/25/99 2:00	1002.64	5/27/99 18:00	1005.08	5/30/99 10:00	1014.94
5/19/99 19:00	1004.84	5/22/99 11:00	1009.74	5/25/99 3:00	1002.80	5/27/99 19:00	1005.10	5/30/99 11:00	1014.82
5/19/99 20:00	1005.48	5/22/99 12:00	1009.46	5/25/99 4:00	1003.07	5/27/99 20:00	1005.53	5/30/99 12:00	1014.68
5/19/99 21:00	1006.04	5/22/99 13:00	1008.69	5/25/99 5:00	1003.54	5/27/99 21:00	1006.19	5/30/99 13:00	1014.14
5/19/99 22:00	1006.67	5/22/99 14:00	1007.52	5/25/99 6:00	1003.94	5/27/99 22:00	1006.81	5/30/99 14:00	1013.51
5/19/99 23:00	1007.14	5/22/99 15:00	1006.69	5/25/99 7:00	1004.39	5/27/99 23:00	1007.76	5/30/99 15:00	1012.74
5/20/99 0:00	1007.09	5/22/99 16:00	1005.62	5/25/99 8:00	1004.95	5/28/99 0:00	1007.66	5/30/99 16:00	1011.88
5/20/99 1:00	1006.96	5/22/99 17:00	1005.46	5/25/99 9:00	1005.52	5/28/99 1:00	1007.50	5/30/99 17:00	1011.33
5/20/99 2:00	1006.85	5/22/99 18:00	1005.70	5/25/99 10:00	1005.69	5/28/99 2:00	1007.46	5/30/99 18:00	1010.88
5/20/99 3:00	1007.26	5/22/99 19:00	1006.33	5/25/99 11:00	1005.49	5/28/99 3:00	1007.52	5/30/99 19:00	1010.45
5/20/99 4:00	1007.29	5/22/99 20:00	1006.30	5/25/99 12:00	1004.92	5/28/99 4:00	1008.09	5/30/99 20:00	1010.73
5/20/99 5:00	1007.51	5/22/99 21:00	1006.27	5/25/99 13:00	1004.34	5/28/99 5:00	1008.52	5/30/99 21:00	1011.14
5/20/99 6:00	1008.29	5/22/99 22:00	1006.19	5/25/99 14:00	1003.85	5/28/99 6:00	1009.11	5/30/99 22:00	1011.99
5/20/99 7:00	1009.31	5/22/99 23:00	1006.46	5/25/99 15:00	1003.37	5/28/99 7:00	1009.82	5/30/99 23:00	1012.69
5/20/99 8:00	1009.83	5/23/99 0:00	1006.06	5/25/99 16:00	1002.62	5/28/99 8:00	1010.24	5/31/99 0:00	1012.78
5/20/99 9:00	1010.18	5/23/99 1:00	1005.70	5/25/99 17:00	1002.39	5/28/99 9:00	1010.78		
5/20/99 10:00	1010.55	5/23/99 2:00	1005.31	5/25/99 18:00	1002.08	5/28/99 10:00	1010.85		
5/20/99 11:00	1010.56	5/23/99 3:00	1005.09	5/25/99 19:00	1002.34	5/28/99 11:00	1010.77		
5/20/99 12:00	1010.49	5/23/99 4:00	1004.91	5/25/99 20:00	1003.04	5/28/99 12:00	1011.05		
5/20/99 13:00	1009.82	5/23/99 5:00	1004.85	5/25/99 21:00	1003.88	5/28/99 13:00	1010.85		
5/20/99 14:00	1009.19	5/23/99 6:00	1005.01	5/25/99 22:00	1004.40	5/28/99 14:00	1010.28		
5/20/99 15:00	1008.88	5/23/99 7:00	1005.57	5/25/99 23:00	1004.76	5/28/99 15:00	1009.59		
5/20/99 16:00	1008.13	5/23/99 8:00	1005.83	5/26/99 0:00	1004.56	5/28/99 16:00	1008.83		
5/20/99 17:00	1007.68	5/23/99 9:00	1005.70	5/26/99 1:00	1004.55	5/28/99 17:00	1008.28		
5/20/99 18:00	1007.61	5/23/99 10:00	1005.54	5/26/99 2:00	1004.30	5/28/99 18:00	1008.11		
5/20/99 19:00	1007.67	5/23/99 11:00	1005.40	5/26/99 3:00	1004.05	5/28/99 19:00	1008.05		
5/20/99 20:00	1008.07	5/23/99 12:00	1005.00	5/26/99 4:00	1003.96	5/28/99 20:00	1008.49		
5/20/99 21:00	1008.74	5/23/99 13:00	1004.07	5/26/99 5:00	1003.99	5/28/99 21:00	1008.88		
5/20/99 22:00	1009.29	5/23/99 14:00	1003.29	5/26/99 6:00	1004.27	5/28/99 22:00	1009.47		
5/20/99 23:00	1009.76	5/23/99 15:00	1002.44	5/26/99 7:00	1004.90	5/28/99 23:00	1010.17		
5/21/99 0:00	1010.08	5/23/99 16:00	1002.18	5/26/99 8:00	1005.19	5/29/99 0:00	1010.44		
5/21/99 1:00	1010.29	5/23/99 17:00	1001.09	5/26/99 9:00	1005.22	5/29/99 1:00	1010.42		
5/21/99 2:00	1010.38	5/23/99 18:00	1000.59	5/26/99 10:00	1003.29	5/29/99 2:00	1010.32		
5/21/99 3:00	1010.28	5/23/99 19:00	1001.74	5/26/99 11:00	1004.70	5/29/99 3:00	1010.32		
5/21/99 4:00	1010.33	5/23/99 20:00	1001.33	5/26/99 12:00	1004.34	5/29/99 4:00	1010.35		
5/21/99 5:00	1010.49	5/23/99 21:00	1001.09	5/26/99 13:00	1003.45	5/29/99 5:00	1010.52		
5/21/99 6:00	1010.56	5/23/99 22:00	1001.86	5/26/99 14:00	1002.90	5/29/99 6:00	1010.82		
5/21/99 7:00	1011.39	5/23/99 23:00	1001.75	5/26/99 15:00	1002.52	5/29/99 7:00	1011.66		
5/21/99 8:00	1011.96	5/24/99 0:00	1001.17	5/26/99 16:00	1001.86	5/29/99 8:00	1012.27		

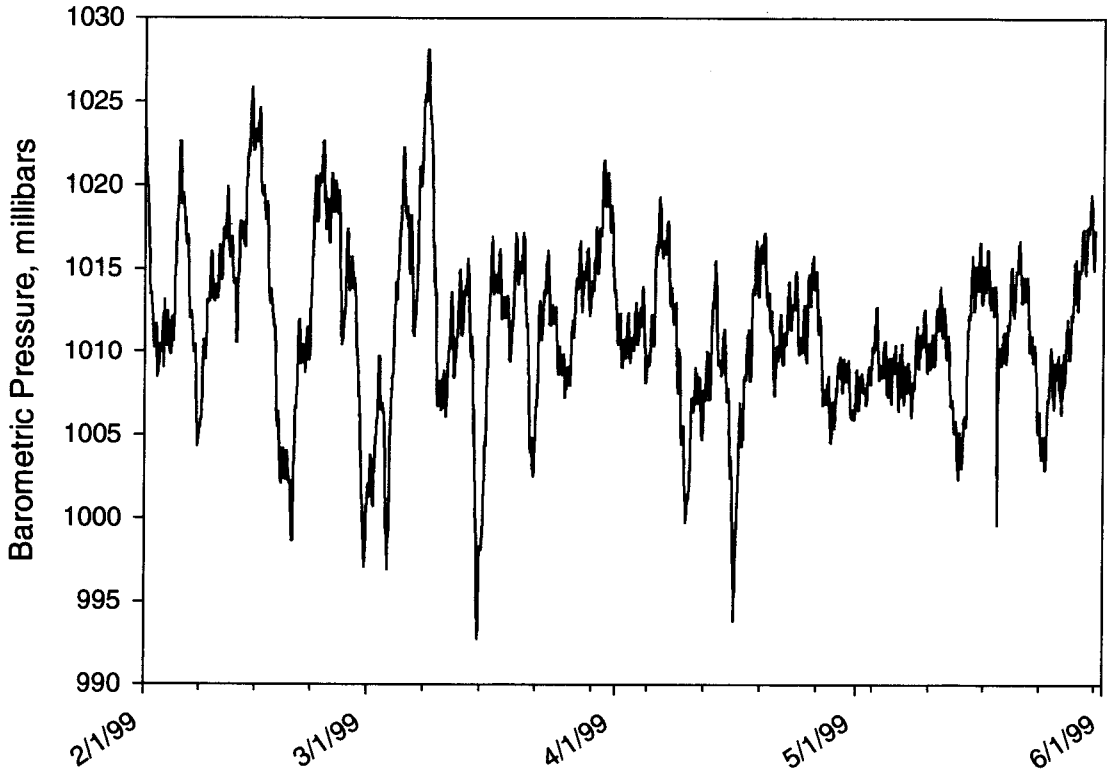
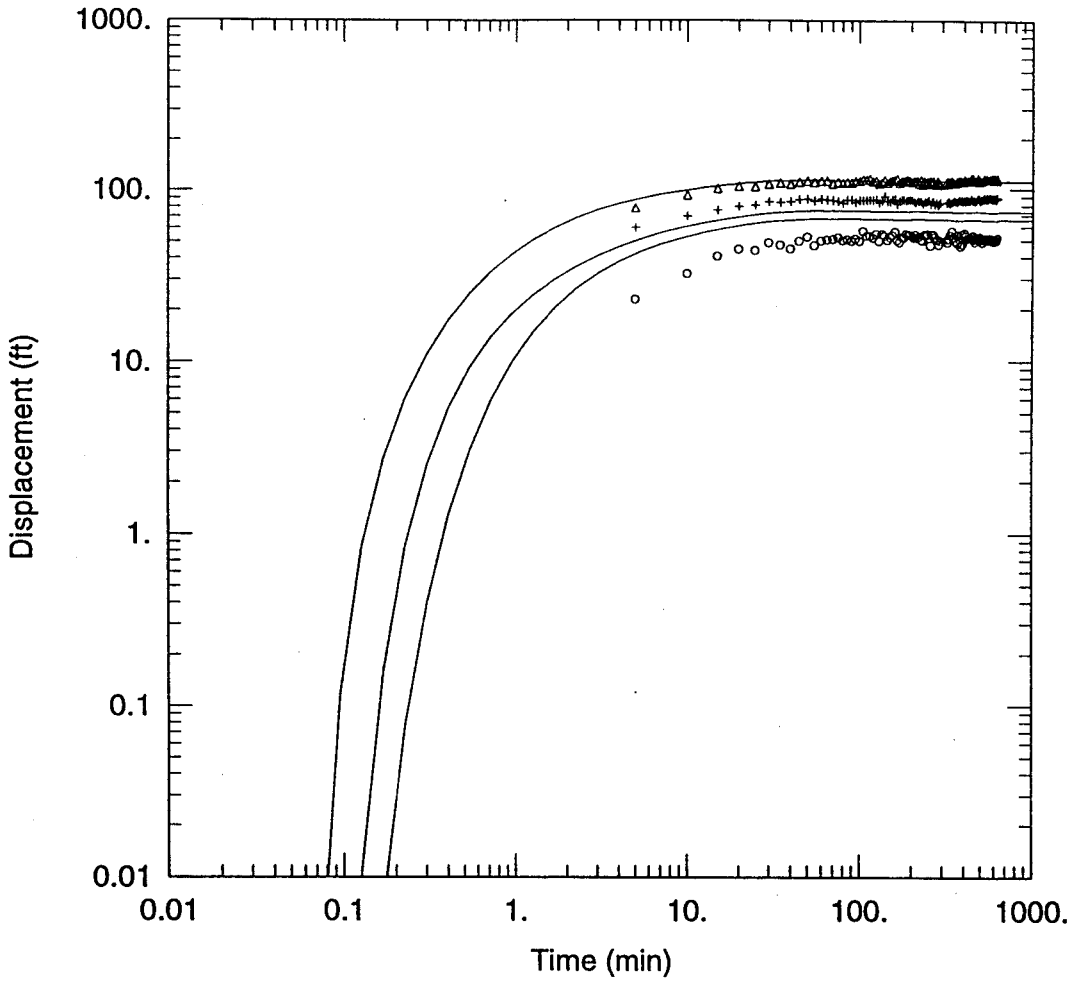


Figure A-1. Barometric pressure as a function of time during Phase II SVE testing at TNX.

Appendix C

Type Curve Matches



TVM-3V

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST1-3V\TVM3VC-F.AQT
Date: 12/16/99 Time: 15:38:45

PROJECT INFORMATION

Test Well: TVM-2V

AQUIFER DATA

Saturated Thickness: 33. ft Anisotropy Ratio (Kz/Kr): 0.2

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TVM-3V	1.721E+004	7.121E+004

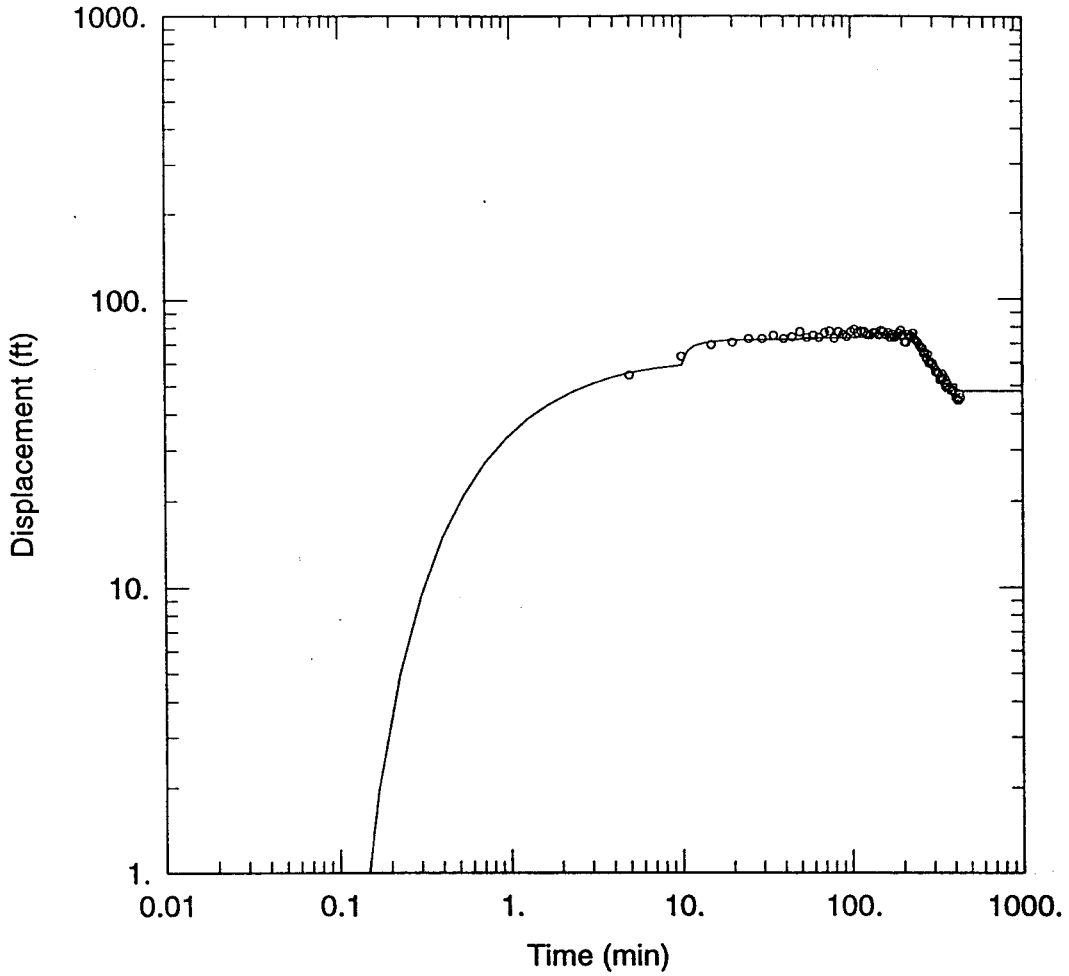
Observation Wells

Well Name	X (ft)	Y (ft)
+ TVM-2V	1.72E+004	7.123E+004
○ TVM-2U	1.72E+004	7.123E+004
△ TVM-3U	1.721E+004	7.121E+004

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 0.05642 ft^2/min
S = 0.0003
1/B = 0.01316 ft^{-1}



TVM-3U

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST2-3U\TVM-3U-S.AQT
Date: 12/16/99 Time: 15:49:29

PROJECT INFORMATION

Test Well: TVM-3U

AQUIFER DATA

Saturated Thickness: 33. ft Anisotropy Ratio (Kz/Kr): 0.2

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TVM-3U	1.721E+004	7.121E+004

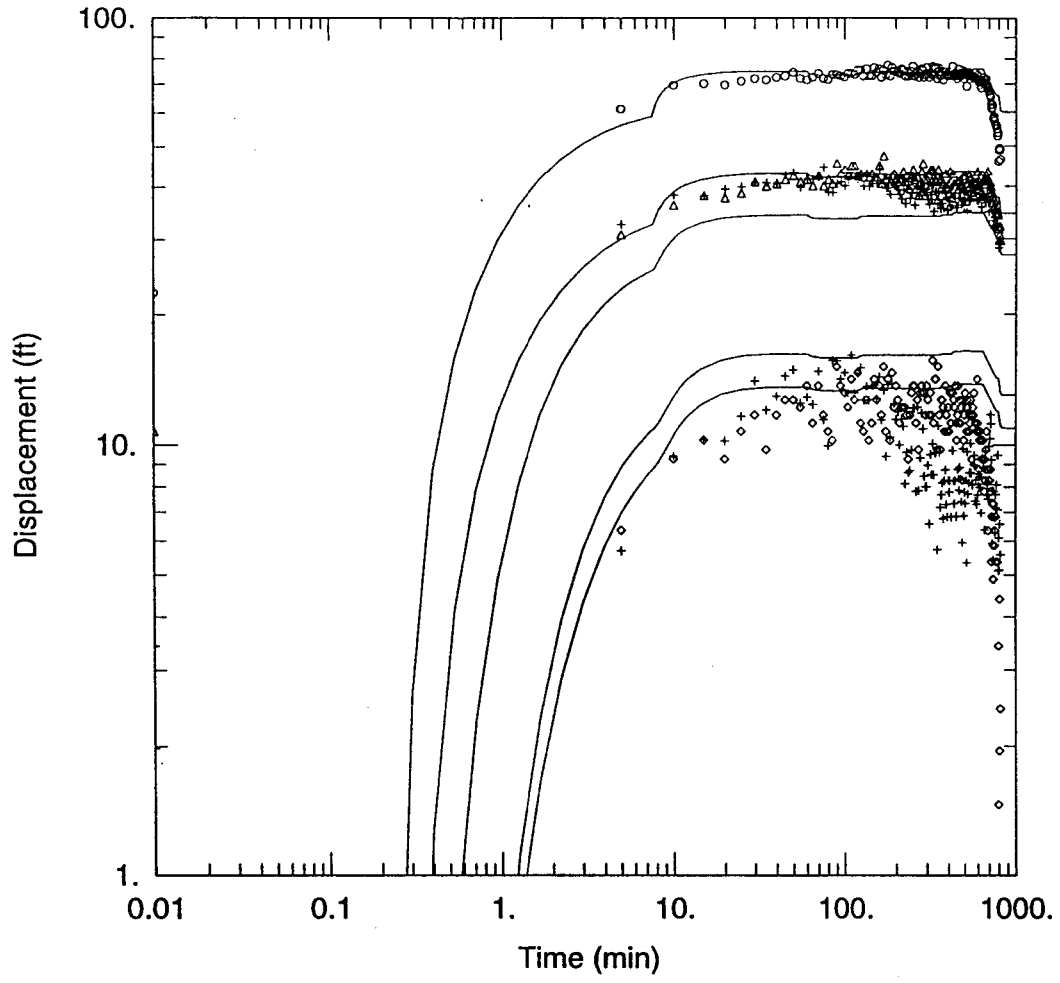
Observation Wells

Well Name	X (ft)	Y (ft)
◦ TVM-2U	1.72E+004	7.123E+004

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 0.03509 ft^2/min
S = 4.5E-05
r/B = 0.4084



TVM-2V

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST4-2V\TVM-2VC.AQT
Date: 12/16/99 Time: 15:40:11

PROJECT INFORMATION

Test Well: TVM-2V

AQUIFER DATA

Saturated Thickness: 33. ft Anisotropy Ratio (Kz/Kr): 0.2

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TVM-2V	1.72E+004	7.123E+004

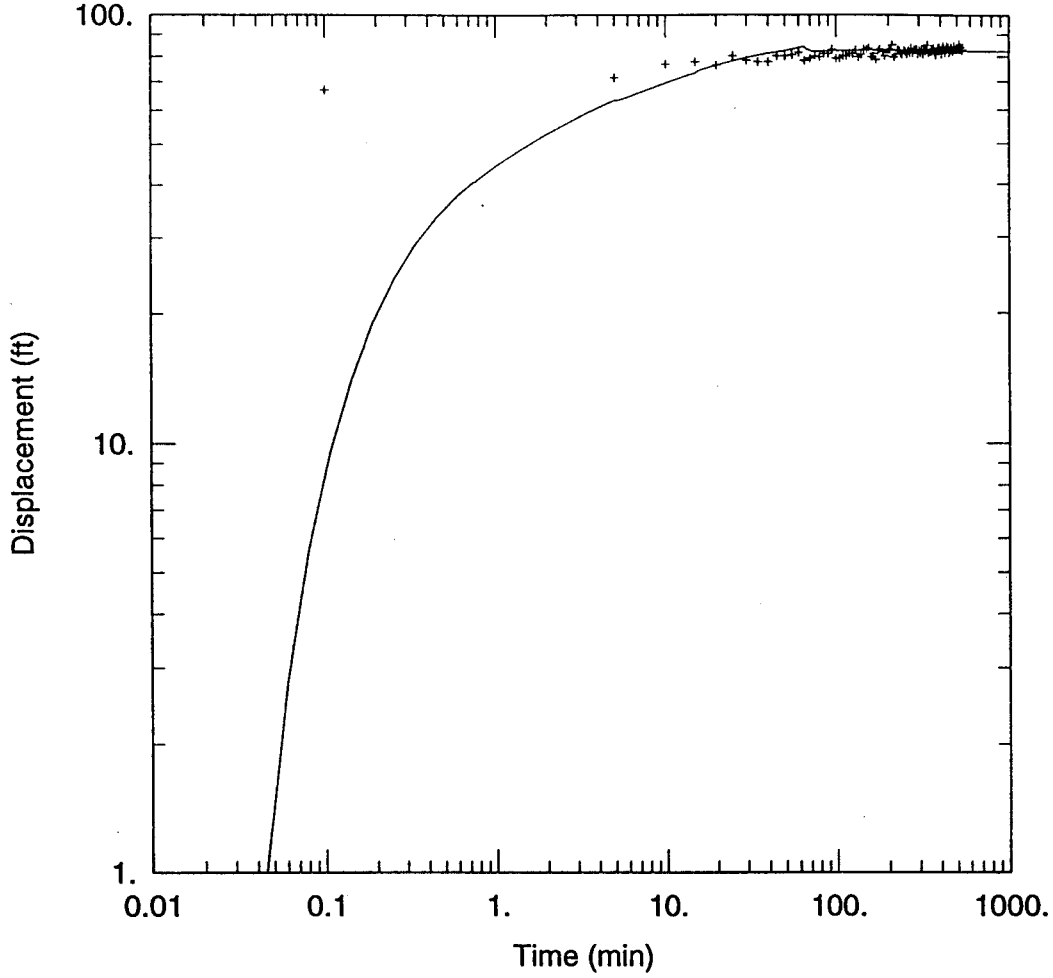
Observation Wells

Well Name	X (ft)	Y (ft)
+ TVM-3V	1.721E+004	7.121E+004
+ TVM-4V	1.721E+004	7.128E+004
○ TVM-2U	1.72E+004	7.123E+004
△ TVM-3U	1.721E+004	7.121E+004
◇ TVM-4U	1.721E+004	7.127E+004

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 0.04551 ft^2/min
S = 0.0002
1/B = 0.024 ft^{-1}



TVM-2U

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST5-2U\TVM-2U-2.AQT
Date: 12/16/99 Time: 15:43:26

PROJECT INFORMATION

Test Well: TVM-2V

AQUIFER DATA

Saturated Thickness: 33. ft Anisotropy Ratio (Kz/Kr): 0.2

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TVM-2U	1.72E+004	7.123E+004

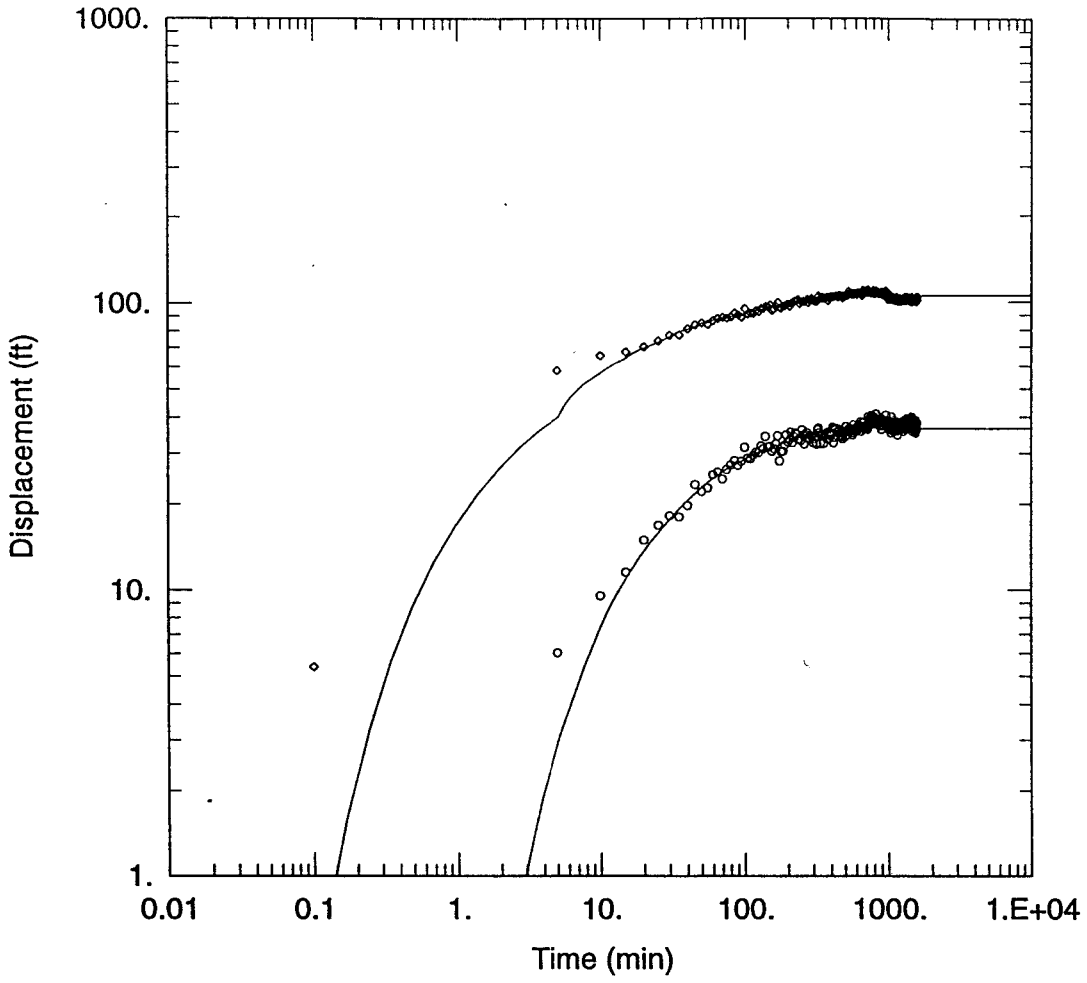
Observation Wells

Well Name	X (ft)	Y (ft)
+ TVM-3U	1.721E+004	7.121E+004

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 0.07569 ft^2/min
S = 4.5E-05
r/B = 0.08558



TVM-4V

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST6-4V\TVM-4V-1.AQT
Date: 12/16/99 Time: 15:44:02

PROJECT INFORMATION

Test Well: TVM-4V

AQUIFER DATA

Saturated Thickness: 33. ft Anisotropy Ratio (Kz/Kr): 0.2

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TVM-4V	1.721E+004	7.128E+004

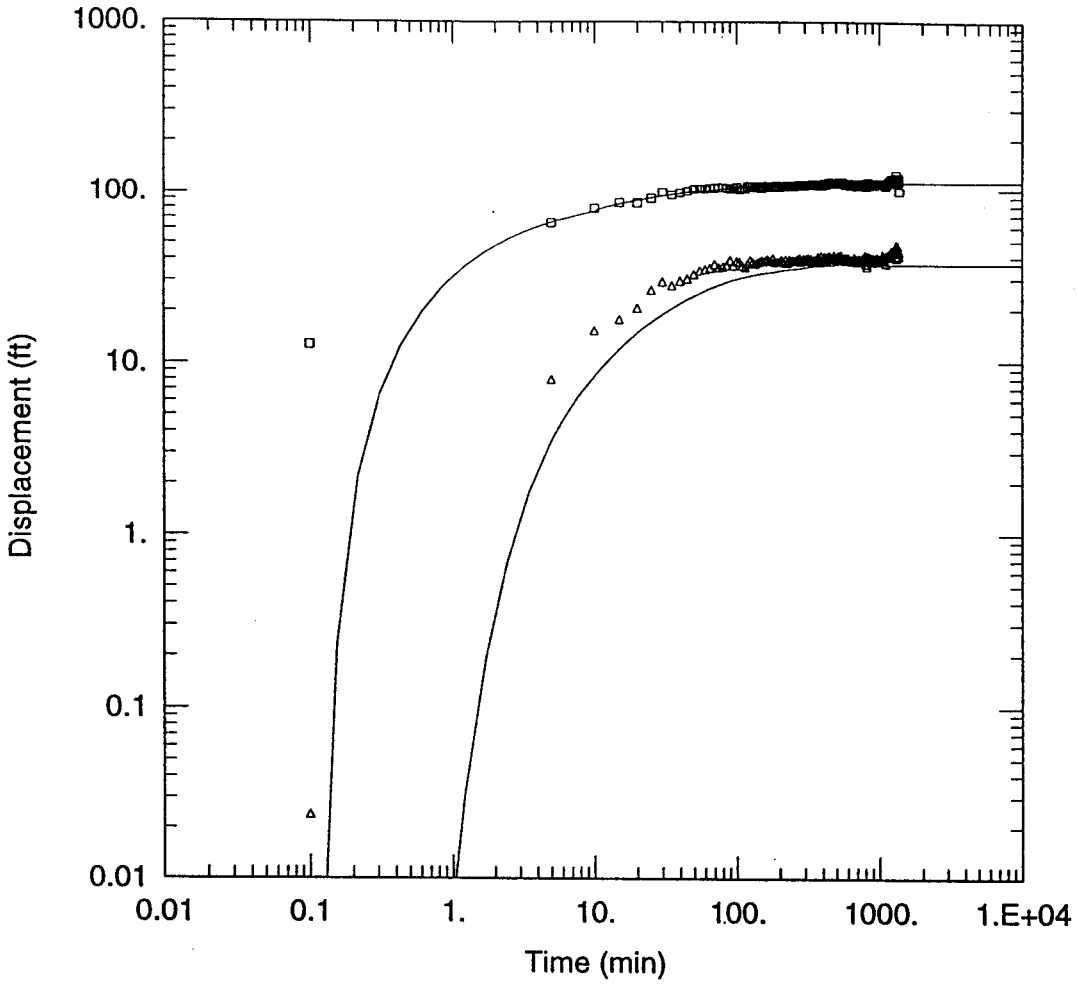
Observation Wells

Well Name	X (ft)	Y (ft)
○ TVM-2U	1.72E+004	7.123E+004
◇ TVM-4U	1.721E+004	7.127E+004

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 0.03139 ft^2/min
S = 0.0003
1/B = 0.008666 ft^{-1}



TVM-1V

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST7-1V\TVM-1V-1.AQT
Date: 12/16/99 Time: 15:44:25

PROJECT INFORMATION

Test Well: TVM-1V

AQUIFER DATA

Saturated Thickness: 33. ft Anisotropy Ratio (Kz/Kr): 0.2

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TVM-1V	1.727E+004	7.123E+004

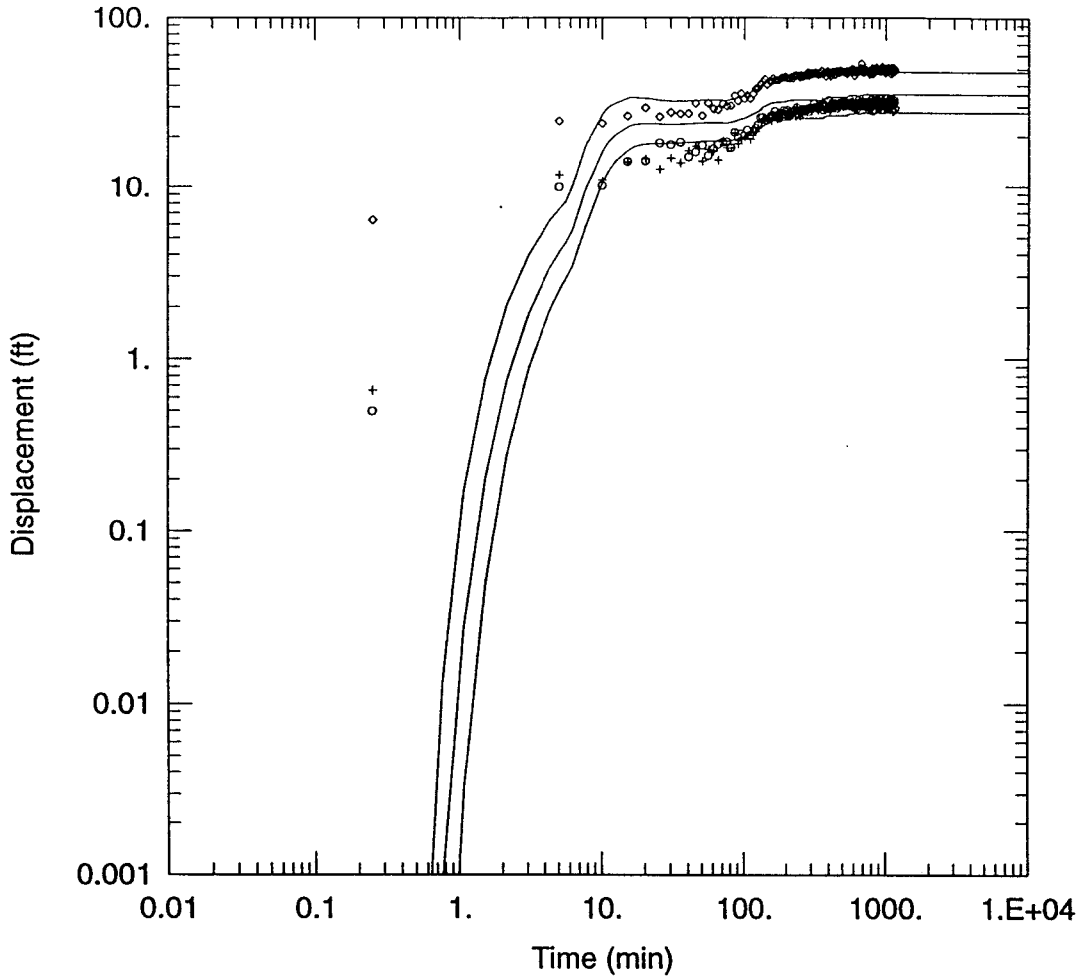
Observation Wells

Well Name	X (ft)	Y (ft)
△ TVM-3U	1.721E+004	7.121E+004
□ TVM-1U	1.727E+004	7.123E+004

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 0.05652 ft^2/min
S = 0.0003
1/B = 0.005644 ft^{-1}



TBG4

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST8~~1\TBG-4-C.AQT
Date: 12/16/99 Time: 15:45:24

PROJECT INFORMATION

Test Well: TBG4

AQUIFER DATA

Saturated Thickness: 33. ft Anisotropy Ratio (Kz/Kr): 0.2

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TBG4	1.718E+004	7.127E+004

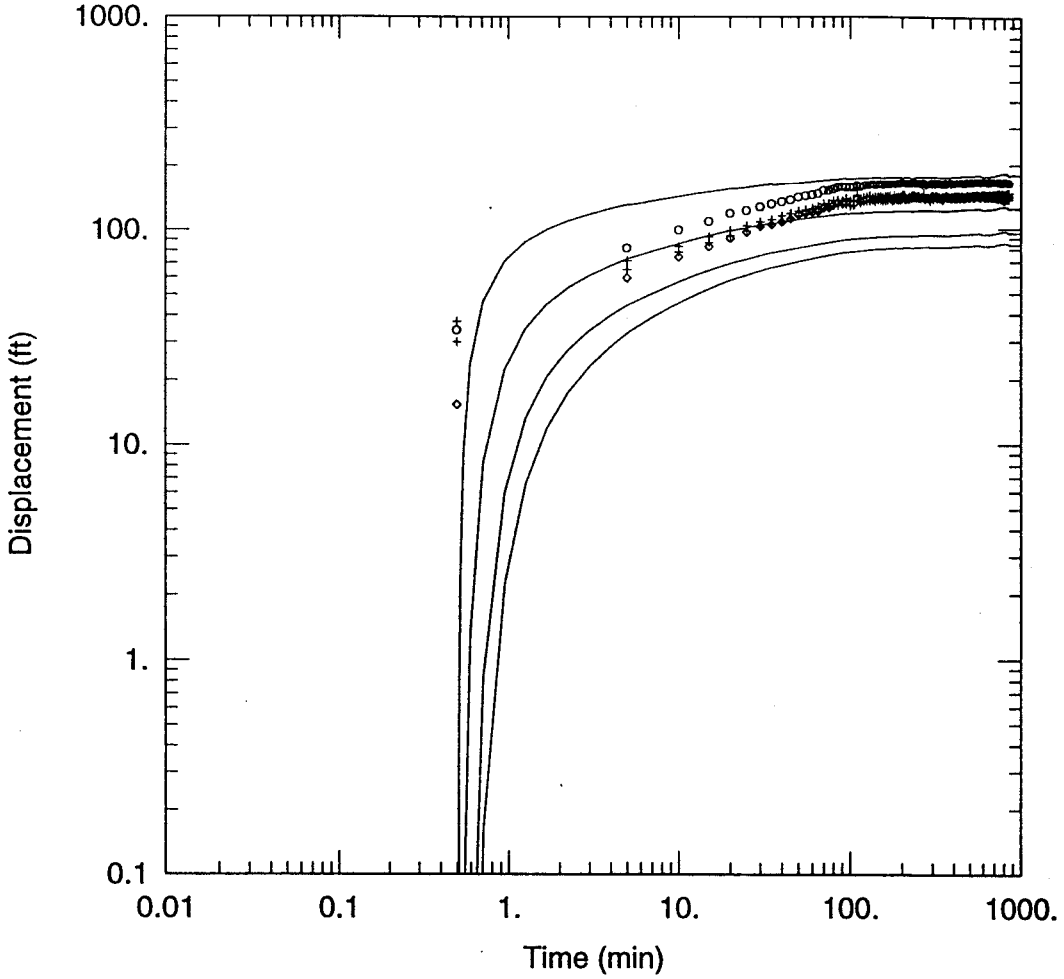
Observation Wells

Well Name	X (ft)	Y (ft)
+ TVM-4V	1.721E+004	7.128E+004
○ TVM-2U	1.72E+004	7.123E+004
◇ TVM-4U	1.721E+004	7.127E+004

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 0.02252 ft^2/min
S = 0.0003
1/B = 0.0234 ft^{-1}



TVM-2U, 3U, 4U

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST10~1\TEST-1~1.AQT
Date: 12/16/99 Time: 15:46:08

PROJECT INFORMATION

Test Well: TVM-2U, 3U, 4U

AQUIFER DATA

Saturated Thickness: 33. ft Anisotropy Ratio (Kz/Kr): 0.2

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TVM-2U	1.72E+004	7.123E+004
TVM-3U	1.721E+004	7.121E+004
TVM-4U	1.721E+004	7.127E+004

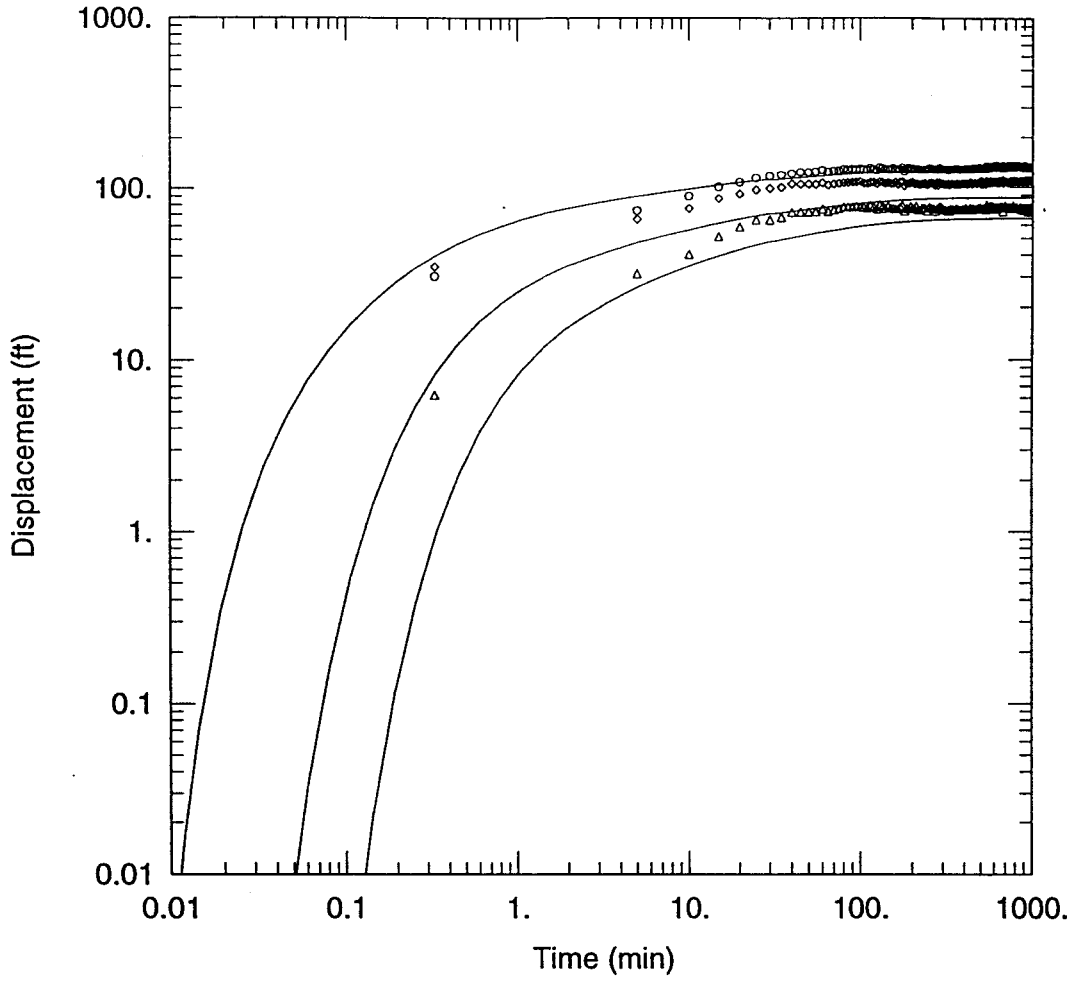
Observation Wells

Well Name	X (ft)	Y (ft)
+ TVM-3V	1.721E+004	7.121E+004
+ TVM-4V	1.721E+004	7.128E+004
◦ TVM-2V	1.72E+004	7.123E+004
◇ TBG4	1.718E+004	7.127E+004

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 0.03 ft^2/min
S = 4.5E-05
1/B = 0.0035 ft^{-1}



TVM-2V, 3V, 4V

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST11~1\TEST-1~1.AQT
Date: 12/16/99 Time: 15:46:52

PROJECT INFORMATION

Test Well: TVM-2V

AQUIFER DATA

Saturated Thickness: 33. ft Anisotropy Ratio (Kz/Kr): 0.2

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TVM-2V	1.72E+004	7.123E+004
TVM-3V	1.721E+004	7.121E+004
TVM-4V	1.721E+004	7.128E+004

Observation Wells

Well Name	X (ft)	Y (ft)
○ TVM-2U	1.72E+004	7.123E+004
△ TVM-3U	1.721E+004	7.121E+004
◇ TVM-4U	1.721E+004	7.127E+004

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 0.02863 ft^2/min
S = 4.5E-05
1/B = 0.003 ft^{-1}

Appendix D

AQTESOLV Result Logs

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST1-3V\TVM3VC-F.AQT
Title: TVM-3V
Date: 05/11/99
Time: 13:29:48

PROJECT INFORMATION

Test Well: TVM-2V

AQUIFER DATA

Saturated Thickness: 33 ft
Anisotropy Ratio (Kz/Kr): 0.2

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: TVM-3V

X Location: 17210.4 ft
Y Location: 71212.4 ft

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.04	0.
0.05	13.84
35.	13.67
60.	13.53
100.	13.39
150.	13.31
195.	13.45
235.	13.31
285.	13.3
335.	13.19
385.	13.25
435.	13.29
485.	13.23
535.	13.21
585.	13.11
620.	13.24

OBSERVATION WELL DATA

Number of observation wells: 3

Observation Well No. 1: TVM-2V

X Location: 17202.2 ft
Y Location: 71231 ft

Observation Data

Time (min)	Displacement (ft)
5.	59.6
10.	69.34
15.	75.24
20.	79.11
25.	80.78
30.	84.46
35.	83.83
40.	84.41
45.	87.16
50.	87.51
55.	85.29
60.	87.4
65.	86.55
70.	86.11
75.	84.77
80.	82.88
85.	86.27
90.	86.74
95.	83.87
100.	85.82
105.	85.83
110.	86.37
115.	86.35
120.	86.38
125.	86.89
130.	83.52
135.	85.46
140.	90.78
145.	85.01
150.	84.53
155.	86.61
160.	87.49
165.	81.74
170.	85.09
175.	86.63
180.	86.15
185.	85.73
190.	86.28
195.	86.33
200.	85.77
205.	84.34
210.	83.36
215.	85.29
220.	84.32
225.	84.38
230.	82.47
235.	84.44
240.	83.99
245.	84.95
250.	85.88
255.	82.06

260.	84.45
265.	84.46
270.	80.93
275.	83.41
280.	80.57
285.	81.49
290.	82.98
315.	82.94
320.	83.82
325.	84.36
330.	81.89
335.	83.84
340.	83.84
345.	84.75
350.	85.19
355.	84.66
360.	84.71
365.	84.13
370.	86.04
375.	86.42
380.	84.91
385.	86.36
390.	84.35
395.	85.77
400.	85.27
405.	85.23
410.	87.11
415.	85.64
420.	86.09
425.	85.54
430.	85.47
435.	86.85
440.	87.8
445.	85.34
450.	85.83
455.	86.23
460.	84.75
465.	86.11
470.	86.06
475.	87.45
480.	88.36
485.	87.83
490.	86.38
495.	85.37
500.	87.27
505.	87.21
510.	87.17
515.	88.14
520.	87.63
525.	89.04
530.	87.05
535.	87.48

540.	89.37
545.	87.37
550.	87.81
555.	88.72
560.	89.17
565.	88.66
570.	87.68
575.	87.67
580.	89.1
585.	87.63
590.	87.12
595.	88.54
600.	88.54
605.	87.58
610.	88.05
615.	86.58
620.	89.46
625.	88.52

Observation Well No. 2: TVM-2U

X Location: 17198.1 ft
Y Location: 71230.6 ft

Observation Data

Time (min)	Displacement (ft)
5.	22.72
10.	32.14
15.	40.58
20.	44.57
25.	43.91
30.	48.59
35.	47.04
40.	44.75
45.	49.59
50.	52.34
55.	46.71
60.	49.8
65.	50.4
70.	50.97
75.	52.
80.	50.09
85.	50.6
90.	49.65
95.	51.13
100.	49.67
105.	56.51
110.	53.1
115.	53.1
120.	51.64
125.	54.57
130.	49.69

135.	54.58
140.	53.11
145.	50.18
150.	52.14
155.	53.6
160.	56.04
165.	50.18
170.	48.72
175.	52.14
180.	51.65
185.	54.58
190.	53.6
195.	54.09
200.	53.11
205.	51.65
210.	54.09
215.	51.65
220.	52.62
225.	50.18
230.	49.7
235.	54.09
240.	53.11
245.	54.58
250.	51.65
255.	46.77
260.	54.09
265.	54.09
270.	52.14
275.	50.18
280.	50.67
285.	47.25
290.	49.7
315.	50.67
320.	48.72
325.	51.16
330.	53.6
335.	53.6
340.	56.53
345.	52.14
350.	52.14
355.	49.7
360.	53.6
365.	48.23
370.	54.09
375.	51.16
380.	46.28
385.	54.58
390.	47.74
395.	50.67
400.	55.07
405.	51.16
410.	53.11

415.	51.16
420.	51.65
425.	51.65
430.	52.14
435.	52.14
440.	53.11
445.	50.67
450.	53.6
455.	50.67
460.	49.21
465.	50.67
470.	51.65
475.	51.65
480.	51.65
485.	51.65
490.	52.62
495.	50.18
500.	50.67
505.	48.72
510.	48.72
515.	51.16
520.	51.16
525.	51.16
530.	51.65
535.	50.18
540.	51.65
545.	50.18
550.	50.18
555.	50.18
560.	50.18
565.	51.65
570.	49.7
575.	50.18
580.	50.67
585.	50.18
590.	49.21
595.	49.7
600.	50.67
605.	49.7
610.	49.7
615.	50.67
620.	49.7
625.	51.65

Observation Well No. 3: TVM-3U

X Location: 17211.8 ft
Y Location: 71209.6 ft

Observation Data	
Time (min)	Displacement (ft)
5.	77.4

10.	92.19
15.	100.6
20.	103.6
25.	103.5
30.	106.7
35.	108.1
40.	106.7
45.	109.6
50.	110.9
55.	109.2
60.	110.8
65.	111.4
70.	107.1
75.	109.6
80.	108.2
85.	109.7
90.	108.7
95.	111.2
100.	111.2
105.	113.1
110.	113.1
115.	114.1
120.	110.7
125.	111.7
130.	107.3
135.	109.2
140.	112.7
145.	108.8
150.	111.7
155.	112.2
160.	113.2
165.	114.1
170.	108.3
175.	111.2
180.	110.7
185.	112.7
190.	112.7
195.	111.7
200.	109.7
205.	111.2
210.	111.2
215.	111.7
220.	107.8
225.	112.7
230.	105.8
235.	111.2
240.	107.8
245.	110.2
250.	107.3
255.	111.7
260.	109.3
265.	111.2

270.	107.3
275.	105.8
280.	110.7
285.	105.8
290.	106.8
315.	110.2
320.	106.8
325.	110.2
330.	109.3
335.	111.2
340.	111.2
345.	108.8
350.	107.8
355.	108.3
360.	110.7
365.	109.3
370.	111.2
375.	112.2
380.	111.2
385.	111.2
390.	109.7
395.	110.7
400.	113.6
405.	111.2
410.	111.2
415.	111.2
420.	112.2
425.	111.2
430.	112.7
435.	111.2
440.	116.1
445.	112.2
450.	115.6
455.	112.2
460.	111.7
465.	111.7
470.	112.2
475.	112.7
480.	115.6
485.	110.2
490.	113.6
495.	111.2
500.	111.7
505.	111.7
510.	112.7
515.	113.2
520.	113.6
525.	115.6
530.	113.6
535.	113.2
540.	114.6
545.	113.2

550.	113.2
555.	113.6
560.	113.6
565.	114.1
570.	113.2
575.	113.6
580.	116.1
585.	113.2
590.	112.7
595.	115.1
600.	114.6
605.	114.1
610.	114.1
615.	113.6
620.	112.2
625.	114.6

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.05642	ft^2/min
S	0.0003	
1/B	0.01316	ft^{-1}

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
T	0.05642	0.001173	ft^2/min
S	0.0003	not estimated	
1/B	0.01316	0.0005954	ft^{-1}

Parameter Correlations

	T	1/B
T	1.00	-0.95
1/B	-0.95	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 4.873E+04 ft^2

Variance..... 101.1 ft^2
Std. Deviation..... 10.05 ft
Mean ..... 0.1579 ft
No. of Residuals ... 484
No. of Estimates ... 2

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST2-3U\TVM-3U-S.AQT
Title: TVM-3U
Date: 05/11/99
Time: 13:25:44

PROJECT INFORMATION

Test Well: TVM-3U

AQUIFER DATA

Saturated Thickness: 33 ft
Anisotropy Ratio (Kz/Kr): 0.2

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: TVM-3U

X Location: 17211.8 ft
Y Location: 71209.6 ft

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.01	0.
0.05	9.438
10.	11.43
50.	11.56
100.	11.6
125.	11.72
140.	11.57
190.	11.41
235.	11.24
240.	11.04
245.	10.76
250.	10.62
255.	10.38
265.	10.12
275.	9.843
305.	9.255
320.	8.952
360.	8.243
380.	8.
415.	7.577

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: TVM-2U

X Location: 17198.1 ft
Y Location: 71230.6 ft

Observation Data

Time (min)	Displacement (ft)
0.01	0.
5.	54.19
10.	62.97
15.	69.32
20.	70.78
25.	72.74
30.	72.74
35.	74.69
40.	72.74
45.	73.71
50.	76.64
55.	73.22
60.	74.69
65.	73.22
70.	76.15
75.	77.13
80.	72.74
85.	76.64
90.	75.18
95.	73.71
100.	76.64
105.	78.11
110.	76.15
115.	77.13
120.	76.64
125.	74.69
130.	74.69
135.	76.15
140.	76.15
145.	74.69
150.	77.62
155.	76.64
160.	74.69
165.	76.15
170.	73.22
175.	75.18
180.	73.22
185.	74.2
190.	75.67
195.	77.62
200.	74.69
205.	70.78
210.	70.3
215.	75.18
220.	73.71
225.	74.2
230.	75.67

235.	72.25
240.	71.27
245.	70.3
250.	68.83
255.	67.37
260.	67.37
265.	64.44
270.	64.93
275.	62.
280.	63.95
285.	59.56
290.	60.04
295.	59.07
300.	59.56
305.	58.09
310.	55.65
315.	56.63
320.	55.65
325.	54.67
330.	52.23
335.	53.7
340.	52.72
345.	52.72
350.	50.77
355.	49.3
360.	50.77
365.	49.3
370.	48.33
375.	49.3
380.	48.82
385.	47.84
390.	47.84
395.	48.33
400.	47.84
405.	46.86
410.	45.4
415.	47.35
420.	44.42
425.	44.91
430.	44.42
435.	46.86
440.	45.4

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.03509	ft^2/min
S	4.5E-05	
r/B	0.4084	

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST4-2V\TVM-2V-C.AQT
Title: TVM-2V
Date: 05/11/99
Time: 13:39:50

PROJECT INFORMATION

Test Well: TVM-2V

AQUIFER DATA

Saturated Thickness: 33 ft
Anisotropy Ratio (Kz/Kr): 0.2

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: TVM-2V

X Location: 17202.2 ft
Y Location: 71231 ft

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.1	0.
0.11	7.31
5.	7.31
7.5	8.85
10.	8.864
60.	8.678
120.	8.807
360.	8.864
420.	8.983
480.	9.01
540.	8.983
660.	8.907
685.	8.884
700.	8.695
710.	8.542
715.	8.458
720.	8.374
725.	8.259
730.	8.198
735.	8.117
740.	8.05
745.	8.008
750.	7.887
760.	7.785
805.	7.225
810.	7.131
815.	7.128

OBSERVATION WELL DATA

Number of observation wells: 5

Observation Well No. 1: TVM-3V

X Location: 17210.4 ft
Y Location: 71212.4 ft

Observation Data	
Time (min)	Displacement (ft)
5.	33.52
10.	41.47
15.	43.68
20.	48.43
25.	48.89
30.	49.82
35.	49.78
40.	49.73
45.	51.65
50.	52.14
55.	48.77
60.	50.63
65.	50.61
70.	51.07
75.	53.49
80.	47.7
85.	47.64
90.	49.51
95.	49.96
100.	49.02
105.	50.44
110.	51.92
115.	50.9
120.	50.41
125.	51.35
130.	48.96
135.	51.85
140.	48.97
145.	49.51
150.	50.98
155.	49.56
160.	53.01
165.	49.63
170.	50.61
175.	48.59
180.	48.64
185.	47.22
190.	49.67
195.	49.22
200.	48.72

205.	48.22
210.	47.27
215.	46.33
220.	48.29
225.	45.41
230.	48.32
235.	49.26
240.	46.47
245.	47.47
250.	50.86
255.	45.09
260.	48.43
265.	49.01
270.	47.03
275.	48.98
280.	48.6
285.	48.61
290.	47.67
295.	47.67
300.	47.2
305.	46.24
310.	45.28
315.	47.25
320.	46.3
325.	49.24
330.	43.89
335.	47.79
340.	47.82
345.	45.39
350.	47.85
355.	45.44
360.	44.45
365.	45.43
370.	45.44
375.	44.5
380.	47.93
385.	47.46
390.	46.47
395.	44.08
400.	46.03
405.	46.48
410.	45.06
415.	47.43
420.	45.04
425.	46.97
430.	46.97
435.	46.99
440.	46.5
445.	44.58
450.	44.59
455.	45.58
460.	46.58

465.	47.52
470.	46.62
475.	45.62
480.	45.16
485.	45.61
490.	46.1
495.	45.08
500.	46.49
505.	46.05
510.	47.96
515.	44.05
520.	47.4
525.	46.43
530.	45.93
535.	45.89
540.	47.84
545.	46.39
550.	46.83
555.	48.26
560.	46.33
565.	47.72
570.	47.68
575.	47.64
580.	47.57
585.	46.06
590.	46.01
595.	48.86
600.	45.91
605.	46.35
610.	47.28
615.	46.23
620.	46.68
625.	47.15
630.	44.71
635.	46.64
640.	47.1
645.	46.59
650.	46.6
655.	47.04
660.	45.55
665.	45.54
670.	46.93
675.	47.38
680.	46.86
685.	45.87
690.	46.79
695.	43.82
700.	45.29
705.	48.6
710.	45.66
715.	47.51
720.	46.94

725.	43.54
730.	40.69
735.	45.48
740.	41.59
745.	40.12
750.	42.03
755.	41.94
760.	40.44
765.	40.4
770.	40.33
775.	40.77
780.	40.24
785.	40.67
790.	40.17
795.	36.74
800.	37.71
805.	37.68
810.	38.13
815.	37.13

Observation Well No. 2: TVM-4V

X Location: 17206.4 ft
Y Location: 71275.9 ft

Observation Data

Time (min)	Displacement (ft)
5.	6.694
10.	12.73
15.	15.89
20.	19.21
25.	20.63
30.	23.
35.	21.04
40.	21.95
45.	23.38
50.	23.87
55.	21.47
60.	21.88
65.	21.39
70.	23.76
75.	20.44
80.	18.95
85.	24.65
90.	24.6
95.	23.14
100.	23.64
105.	22.18
110.	25.09
115.	22.16
120.	23.58
125.	24.04

130.	21.66
135.	22.63
140.	21.66
145.	22.69
150.	22.71
155.	21.77
160.	23.31
165.	20.41
170.	22.34
175.	18.41
180.	22.77
185.	19.43
190.	22.84
195.	21.43
200.	20.46
205.	20.92
210.	19.01
215.	20.46
220.	20.03
225.	17.15
230.	18.62
235.	17.65
240.	17.73
245.	18.73
250.	21.16
255.	21.14
260.	16.82
265.	21.23
270.	16.85
275.	18.33
280.	20.82
285.	19.87
290.	17.49
295.	17.02
300.	17.02
305.	17.97
310.	15.58
315.	18.51
320.	17.56
325.	19.06
330.	17.54
335.	18.57
340.	18.6
345.	14.73
350.	20.06
355.	18.62
360.	16.19
365.	16.68
370.	17.18
375.	15.76
380.	17.27
385.	17.76

390.	16.3
395.	15.82
400.	17.29
405.	16.78
410.	17.27
415.	15.82
420.	15.82
425.	18.71
430.	17.27
435.	16.33
440.	17.28
445.	15.83
450.	15.85
455.	17.8
460.	17.36
465.	16.87
470.	17.88
475.	17.35
480.	16.41
485.	14.95
490.	18.8
495.	15.86
500.	16.79
505.	16.35
510.	17.3
515.	14.35
520.	18.65
525.	16.73
530.	17.19
535.	17.63
540.	17.66
545.	19.09
550.	17.61
555.	17.13
560.	17.11
565.	18.02
570.	18.46
575.	17.94
580.	16.44
585.	17.32
590.	16.31
595.	20.11
600.	16.69
605.	17.13
610.	17.58
615.	17.01
620.	17.46
625.	16.97
630.	15.97
635.	17.42
640.	18.36
645.	17.85

650.	17.86
655.	17.82
660.	15.37
665.	17.76
670.	18.67
675.	17.2
680.	16.68
685.	17.13
690.	17.09
695.	16.52
700.	18.47
705.	16.02
710.	18.83
715.	20.2
720.	19.64
725.	17.68
730.	14.34
735.	16.25
740.	13.8
745.	13.77
750.	16.17
755.	15.12
760.	14.57
765.	15.97
770.	15.42
775.	16.34
780.	15.33
785.	15.28
790.	17.66
795.	13.26
800.	14.24
805.	13.25
810.	14.66
815.	13.65

Observation Well No. 3: TVM-2U

X Location: 17198.1 ft
Y Location: 71230.6 ft

Observation Data

Time (min)	Displacement (ft)
5.	62.02
10.	72.62
15.	75.41
20.	78.32
25.	79.78
30.	80.76
35.	80.27
40.	81.25
45.	81.74
50.	83.2

55.	80.76
60.	80.27
65.	81.25
70.	82.71
75.	80.76
80.	80.27
85.	82.22
90.	82.22
95.	81.74
100.	81.25
105.	82.71
110.	82.71
115.	82.22
120.	84.18
125.	84.18
130.	81.74
135.	84.67
140.	81.74
145.	81.74
150.	85.15
155.	83.2
160.	84.67
165.	81.25
170.	84.18
175.	82.22
180.	86.13
185.	81.74
190.	85.15
195.	83.69
200.	83.69
205.	83.2
210.	82.71
215.	84.67
220.	84.18
225.	81.74
230.	83.69
235.	81.74
240.	82.71
245.	83.69
250.	85.64
255.	81.74
260.	82.71
265.	83.69
270.	81.25
275.	82.71
280.	84.67
285.	84.18
290.	81.25
295.	82.22
300.	85.15
305.	82.71
310.	81.25

315.	83.2
320.	82.22
325.	85.64
330.	82.22
335.	85.15
340.	85.15
345.	80.76
350.	85.15
355.	83.69
360.	81.74
365.	82.22
370.	83.2
375.	80.27
380.	83.69
385.	83.69
390.	82.22
395.	81.74
400.	82.22
405.	81.74
410.	83.69
415.	82.22
420.	81.74
425.	85.64
430.	81.74
435.	82.71
440.	82.71
445.	81.74
450.	80.76
455.	83.2
460.	84.67
465.	82.71
470.	84.67
475.	81.74
480.	82.22
485.	82.71
490.	84.18
495.	80.76
500.	82.71
505.	83.2
510.	83.2
515.	77.83
520.	82.22
525.	81.74
530.	82.22
535.	80.76
540.	82.71
545.	81.74
550.	82.22
555.	81.74
560.	81.25
565.	81.25
570.	81.74

575.	83.2
580.	80.27
585.	81.25
590.	79.78
595.	82.22
600.	80.27
605.	79.78
610.	80.27
615.	78.32
620.	79.3
625.	80.27
630.	77.34
635.	80.27
640.	79.3
645.	79.3
650.	78.81
655.	81.25
660.	79.3
665.	78.32
670.	80.27
675.	80.76
680.	77.34
685.	78.32
690.	77.83
695.	75.88
700.	75.9
705.	74.42
710.	73.91
715.	73.4
720.	70.94
725.	69.45
730.	69.92
735.	70.88
740.	66.46
745.	65.96
750.	66.91
755.	65.43
760.	64.43
765.	64.41
770.	63.9
775.	63.88
780.	62.89
785.	60.91
790.	61.87
795.	54.04
800.	56.95
805.	57.42
810.	56.91
815.	54.45

Observation Well No. 4: TVM-3U

X Location: 17211.8 ft
Y Location: 71209.6 ft

Observation Data

Time (min)	Displacement (ft)
5.	31.75
10.	39.42
15.	43.68
20.	46.59
25.	47.56
30.	50.01
35.	49.03
40.	49.52
45.	50.49
50.	51.47
55.	50.01
60.	50.49
65.	49.03
70.	51.47
75.	49.03
80.	50.49
85.	49.52
90.	54.4
95.	51.96
100.	52.93
105.	51.47
110.	53.91
115.	53.91
120.	51.47
125.	51.96
130.	50.98
135.	51.96
140.	50.98
145.	51.96
150.	50.98
155.	50.98
160.	53.91
165.	49.52
170.	56.35
175.	50.49
180.	50.01
185.	50.01
190.	51.47
195.	51.96
200.	50.49
205.	50.01
210.	50.49
215.	50.49
220.	52.45
225.	50.01
230.	51.47
235.	48.54

240.	50.98
245.	51.47
250.	52.93
255.	50.49
260.	48.54
265.	50.98
270.	47.08
275.	50.01
280.	52.45
285.	54.4
290.	50.49
295.	49.03
300.	50.49
305.	51.96
310.	48.54
315.	52.93
320.	50.01
325.	52.93
330.	52.45
335.	50.49
340.	50.01
345.	46.1
350.	52.93
355.	50.49
360.	47.08
365.	50.49
370.	50.01
375.	49.52
380.	48.54
385.	51.96
390.	48.54
395.	48.54
400.	49.52
405.	47.56
410.	52.45
415.	50.01
420.	46.59
425.	51.96
430.	49.52
435.	49.52
440.	49.03
445.	49.03
450.	50.01
455.	50.01
460.	48.54
465.	49.03
470.	50.49
475.	49.52
480.	49.03
485.	48.05
490.	51.47
495.	48.54

500.	47.08
505.	51.47
510.	49.52
515.	47.08
520.	49.52
525.	48.54
530.	51.47
535.	50.49
540.	49.52
545.	50.98
550.	49.52
555.	48.54
560.	49.03
565.	50.01
570.	49.52
575.	49.52
580.	49.52
585.	50.01
590.	49.03
595.	52.45
600.	49.52
605.	49.03
610.	50.01
615.	48.05
620.	51.47
625.	50.98
630.	48.05
635.	50.01
640.	50.01
645.	50.49
650.	50.01
655.	50.01
660.	49.52
665.	49.52
670.	50.49
675.	51.47
680.	50.49
685.	52.45
690.	50.01
695.	47.56
700.	49.54
705.	49.52
710.	48.52
715.	48.5
720.	47.02
725.	45.05
730.	45.03
735.	45.98
740.	44.01
745.	43.99
750.	45.43
755.	43.46

760.	42.95
765.	43.42
770.	43.89
775.	42.89
780.	42.87
785.	42.36
790.	42.83
795.	37.93
800.	39.86
805.	38.87
810.	40.31
815.	37.85

Observation Well No. 5: TVM-4U

X Location: 17207.3 ft
Y Location: 71272.7 ft

Observation Data

Time (min)	Displacement (ft)
5.	7.346
10.	12.58
15.	15.85
20.	18.28
25.	19.74
30.	20.72
35.	18.76
40.	20.72
45.	21.69
50.	21.69
55.	21.2
60.	22.67
65.	20.23
70.	22.67
75.	20.72
80.	19.74
85.	19.25
90.	24.13
95.	22.67
100.	22.18
105.	21.2
110.	23.16
115.	21.69
120.	23.64
125.	20.23
130.	19.74
135.	21.69
140.	19.25
145.	20.23
150.	23.16
155.	21.69
160.	22.67

165.	20.72
170.	24.13
175.	19.74
180.	23.16
185.	19.25
190.	23.64
195.	21.2
200.	22.67
205.	21.69
210.	20.23
215.	21.2
220.	21.2
225.	21.2
230.	20.72
235.	18.28
240.	20.72
245.	22.18
250.	22.67
255.	22.67
260.	20.23
265.	21.69
270.	18.76
275.	22.18
280.	22.67
285.	22.18
290.	22.18
295.	20.72
300.	22.67
305.	21.69
310.	20.72
315.	22.18
320.	20.72
325.	24.62
330.	20.23
335.	23.16
340.	23.16
345.	18.76
350.	24.13
355.	20.72
360.	18.76
365.	21.69
370.	21.69
375.	21.2
380.	19.74
385.	22.67
390.	20.72
395.	19.74
400.	21.2
405.	19.74
410.	22.18
415.	20.23
420.	20.23

425.	22.18
430.	21.69
435.	21.2
440.	22.67
445.	20.23
450.	19.25
455.	20.72
460.	22.67
465.	20.23
470.	21.69
475.	20.23
480.	21.2
485.	17.3
490.	21.69
495.	19.25
500.	20.72
505.	22.18
510.	21.2
515.	19.74
520.	21.69
525.	21.2
530.	20.72
535.	19.74
540.	20.23
545.	21.69
550.	20.72
555.	18.28
560.	21.2
565.	20.72
570.	22.18
575.	20.23
580.	20.23
585.	20.23
590.	19.74
595.	23.16
600.	20.23
605.	19.74
610.	19.25
615.	17.79
620.	19.25
625.	19.74
630.	18.28
635.	19.25
640.	19.25
645.	18.28
650.	19.25
655.	18.28
660.	16.81
665.	18.28
670.	17.3
675.	18.76
680.	19.74

685.	17.79
690.	17.79
695.	15.35
700.	16.83
705.	16.81
710.	16.79
715.	17.26
720.	16.26
725.	13.8
730.	15.25
735.	15.72
740.	14.23
745.	13.24
750.	15.66
755.	14.17
760.	14.64
765.	15.11
770.	13.62
775.	13.6
780.	13.58
785.	13.56
790.	13.54
795.	9.618
800.	11.55
805.	10.07
810.	12.49
815.	10.51

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.04833	ft^2/min
S	0.0003	
1/B	0.01688	ft^{-1}

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
T	0.04833	0.0004494	ft^2/min
S	0.0003	not estimated	
1/B	0.01688	0.0002799	ft^{-1}

Parameter Correlations

	T	1/B
T	1.00	-0.93
1/B	-0.93	1.00

Residual Statistics

for weighted residuals

Sum of Squares ...	2.092E+04 ft^2
Variance.....	21.3 ft^2
Std. Deviation.....	4.615 ft
Mean	-0.07941 ft
No. of Residuals ...	984
No. of Estimates ...	2

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST5-2U\TVM-2U-2.AQT
Title: TVM-2U
Date: 05/11/99
Time: 13:48:08

PROJECT INFORMATION

Test Well: TVM-2V

AQUIFER DATA

Saturated Thickness: 33 ft
Anisotropy Ratio (Kz/Kr): 0.2

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: TVM-2U

X Location: 17198.1 ft
Y Location: 71230.6 ft

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.
0.01	12.
5.	11.73
15.	11.86
60.	12.01
65.	11.67
70.	11.52
320.	11.33
520.	11.46

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: TVM-3U

X Location: 17211.8 ft
Y Location: 71209.6 ft

Observation Data

Time (min)	Displacement (ft)
0.1	66.88
5.	71.27
10.	76.64
15.	77.62
20.	76.15
25.	80.06

30.	78.11
35.	77.62
40.	77.62
45.	80.06
50.	80.06
55.	80.55
60.	81.52
65.	78.11
70.	79.08
75.	80.06
80.	79.57
85.	81.03
90.	81.03
95.	82.99
100.	79.08
105.	79.08
110.	80.06
115.	80.06
120.	81.03
125.	81.03
130.	82.5
135.	79.57
140.	80.55
145.	82.99
150.	82.99
155.	83.48
160.	79.57
165.	81.03
170.	78.59
175.	82.5
180.	82.99
185.	82.01
190.	80.06
195.	81.52
200.	82.5
205.	82.99
210.	84.94
215.	79.57
220.	80.55
225.	82.5
230.	82.5
235.	81.03
240.	81.03
245.	82.5
250.	82.01
255.	81.03
260.	82.5
265.	81.52
270.	83.48
275.	81.52
280.	82.99
285.	82.5

290.	82.99
295.	81.03
300.	82.5
305.	81.52
310.	82.99
315.	81.03
320.	82.99
325.	82.01
330.	82.5
335.	84.94
340.	81.52
345.	82.01
350.	82.01
355.	82.99
360.	82.99
365.	83.48
370.	82.01
375.	80.55
380.	82.5
385.	83.48
390.	83.96
395.	83.48
400.	82.5
405.	81.03
410.	83.48
415.	84.45
420.	83.48
425.	81.52
430.	82.99
435.	84.45
440.	83.48
445.	83.96
450.	81.52
455.	82.5
460.	83.96
465.	83.48
470.	82.01
475.	82.5
480.	84.45
485.	82.99
490.	82.5
495.	82.99
500.	83.48
505.	83.48
510.	82.99
515.	85.43
520.	82.99
525.	83.96
530.	82.99
535.	82.5
540.	82.99

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.07569	ft^2/min
S	4.5E-05	
r/B	0.08558	

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
T	0.07569	0.003813	ft^2/min
S	4.5E-05	not estimated	
r/B	0.08558	0.01553	

Parameter Correlations

	T	r/B
T	1.00	-0.99
r/B	-0.99	1.00

Residual Statistics

for weighted residuals

Sum of Squares ...	3923.5 ft^2
Variance.....	36.67 ft^2
Std. Deviation.....	6.055 ft
Mean	0.6372 ft
No. of Residuals ...	109
No. of Estimates ...	2

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST6-4V\TVM-4V-C.AQT
Title: TVM-4V
Date: 05/11/99
Time: 13:49:17

PROJECT INFORMATION

Test Well: TVM-4V

AQUIFER DATA

Saturated Thickness: 33 ft
Anisotropy Ratio (Kz/Kr): 0.2

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: TVM-4V

X Location: 17206.4 ft
Y Location: 71275.9 ft

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.01	3.728
5.	4.587
10.	4.725
15.	4.921
25.	5.049
30.	5.172
45.	5.299
50.	5.193
55.	5.284
100.	5.393
135.	5.313
140.	5.402
150.	5.472
195.	5.539
325.	5.66
350.	5.736
380.	5.816
465.	5.733
515.	5.813
550.	5.874
750.	5.845

OBSERVATION WELL DATA

Number of observation wells: 2

Observation Well No. 1: TVM-2U

X Location: 17198.1 ft
Y Location: 71230.6 ft

Observation Data

Time (min)	Displacement (ft)
0.1	-0.953
5.	6.014
10.	9.524
15.	11.51
20.	14.9
25.	16.77
30.	18.11
35.	17.93
40.	19.66
45.	23.29
50.	22.01
55.	22.64
60.	25.19
65.	25.75
70.	24.33
75.	26.29
80.	27.25
85.	28.18
90.	27.14
95.	28.02
100.	31.32
105.	28.74
110.	28.59
115.	29.39
120.	30.17
125.	29.96
130.	31.69
135.	30.96
140.	34.12
145.	31.41
150.	31.62
155.	30.35
160.	31.03
165.	32.18
170.	34.29
175.	28.1
180.	30.2
185.	30.34
190.	31.93
195.	34.5
200.	32.66
205.	33.26
210.	35.31
215.	32.48
220.	34.04
225.	35.1

230.	34.69
235.	33.31
240.	33.38
245.	32.96
250.	35.95
255.	34.55
260.	32.16
265.	34.66
270.	35.2
275.	33.78
280.	33.34
285.	33.38
290.	34.4
295.	33.95
300.	32.52
305.	33.53
310.	34.05
315.	32.13
320.	36.06
325.	36.58
330.	35.14
335.	32.23
340.	34.7
345.	34.72
350.	34.25
355.	32.31
360.	34.29
365.	33.81
370.	34.81
375.	35.31
380.	33.37
385.	33.38
390.	35.35
395.	34.87
400.	34.4
405.	34.89
410.	36.86
415.	32.47
420.	36.39
425.	33.95
430.	36.4
435.	34.46
440.	35.44
445.	36.42
450.	35.45
455.	35.95
460.	34.49
465.	34.49
470.	34.01
475.	35.97
480.	33.53
485.	35.49

490.	35.49
495.	35.01
500.	34.04
505.	36.97
510.	36.97
515.	35.51
520.	34.54
525.	36.
530.	36.49
535.	36.01
540.	36.01
545.	36.5
550.	36.01
555.	35.53
560.	35.04
565.	34.55
570.	36.02
575.	37.49
580.	36.51
585.	36.51
590.	36.51
595.	36.51
600.	35.54
605.	35.54
610.	36.03
615.	37.01
620.	37.5
625.	36.52
630.	37.5
635.	36.52
640.	37.01
645.	38.48
650.	35.55
655.	36.04
660.	37.01
665.	37.99
670.	36.53
675.	37.01
680.	38.48
685.	37.01
690.	36.53
695.	37.02
700.	37.5
705.	37.5
710.	36.53
715.	37.51
720.	36.04
725.	39.95
730.	38.97
735.	38.97
740.	38.48
745.	39.46

750.	38.48
755.	38.48
760.	38.97
765.	38.
770.	40.44
775.	38.
780.	39.46
785.	39.95
790.	38.
795.	38.97
800.	38.97
805.	39.46
810.	38.48
815.	38.
820.	40.93
825.	38.48
830.	38.48
835.	39.46
840.	38.
845.	38.
850.	38.
855.	39.95
860.	38.97
865.	38.49
870.	38.97
875.	37.02
880.	38.49
885.	38.97
890.	39.46
895.	36.04
900.	39.46
905.	37.51
910.	37.02
915.	38.49
920.	38.97
925.	38.
930.	38.
935.	38.49
940.	38.49
945.	38.97
950.	37.51
955.	38.49
960.	40.44
965.	37.02
970.	38.97
975.	37.02
980.	37.51
985.	37.51
990.	38.
995.	37.02
1000.	37.51
1005.	36.05

490.	35.49
495.	35.01
500.	34.04
505.	36.97
510.	36.97
515.	35.51
520.	34.54
525.	36.
530.	36.49
535.	36.01
540.	36.01
545.	36.5
550.	36.01
555.	35.53
560.	35.04
565.	34.55
570.	36.02
575.	37.49
580.	36.51
585.	36.51
590.	36.51
595.	36.51
600.	35.54
605.	35.54
610.	36.03
615.	37.01
620.	37.5
625.	36.52
630.	37.5
635.	36.52
640.	37.01
645.	38.48
650.	35.55
655.	36.04
660.	37.01
665.	37.99
670.	36.53
675.	37.01
680.	38.48
685.	37.01
690.	36.53
695.	37.02
700.	37.5
705.	37.5
710.	36.53
715.	37.51
720.	36.04
725.	39.95
730.	38.97
735.	38.97
740.	38.48
745.	39.46

750.	38.48
755.	38.48
760.	38.97
765.	38.
770.	40.44
775.	38.
780.	39.46
785.	39.95
790.	38.
795.	38.97
800.	38.97
805.	39.46
810.	38.48
815.	38.
820.	40.93
825.	38.48
830.	38.48
835.	39.46
840.	38.
845.	38.
850.	38.
855.	39.95
860.	38.97
865.	38.49
870.	38.97
875.	37.02
880.	38.49
885.	38.97
890.	39.46
895.	36.04
900.	39.46
905.	37.51
910.	37.02
915.	38.49
920.	38.97
925.	38.
930.	38.
935.	38.49
940.	38.49
945.	38.97
950.	37.51
955.	38.49
960.	40.44
965.	37.02
970.	38.97
975.	37.02
980.	37.51
985.	37.51
990.	38.
995.	37.02
1000.	37.51
1005.	36.05

490.	35.49
495.	35.01
500.	34.04
505.	36.97
510.	36.97
515.	35.51
520.	34.54
525.	36.
530.	36.49
535.	36.01
540.	36.01
545.	36.5
550.	36.01
555.	35.53
560.	35.04
565.	34.55
570.	36.02
575.	37.49
580.	36.51
585.	36.51
590.	36.51
595.	36.51
600.	35.54
605.	35.54
610.	36.03
615.	37.01
620.	37.5
625.	36.52
630.	37.5
635.	36.52
640.	37.01
645.	38.48
650.	35.55
655.	36.04
660.	37.01
665.	37.99
670.	36.53
675.	37.01
680.	38.48
685.	37.01
690.	36.53
695.	37.02
700.	37.5
705.	37.5
710.	36.53
715.	37.51
720.	36.04
725.	39.95
730.	38.97
735.	38.97
740.	38.48
745.	39.46

750.	38.48
755.	38.48
760.	38.97
765.	38.
770.	40.44
775.	38.
780.	39.46
785.	39.95
790.	38.
795.	38.97
800.	38.97
805.	39.46
810.	38.48
815.	38.
820.	40.93
825.	38.48
830.	38.48
835.	39.46
840.	38.
845.	38.
850.	38.
855.	39.95
860.	38.97
865.	38.49
870.	38.97
875.	37.02
880.	38.49
885.	38.97
890.	39.46
895.	36.04
900.	39.46
905.	37.51
910.	37.02
915.	38.49
920.	38.97
925.	38.
930.	38.
935.	38.49
940.	38.49
945.	38.97
950.	37.51
955.	38.49
960.	40.44
965.	37.02
970.	38.97
975.	37.02
980.	37.51
985.	37.51
990.	38.
995.	37.02
1000.	37.51
1005.	36.05

1010.	36.05
1015.	37.02
1020.	37.02
1025.	38.
1030.	36.53
1035.	36.53
1040.	37.02
1045.	35.07
1050.	39.95
1055.	37.02
1060.	37.51
1065.	38.
1070.	38.49
1075.	35.56
1080.	38.97
1085.	35.56
1090.	37.51
1095.	37.51
1100.	37.02
1105.	35.56
1110.	38.49
1115.	36.05
1120.	35.56
1125.	36.05
1130.	36.53
1135.	37.51
1140.	37.02
1145.	38.49
1150.	38.
1155.	34.58
1160.	35.56
1165.	36.05
1170.	36.05
1175.	38.49
1180.	36.05
1185.	36.53
1190.	38.
1195.	37.51
1200.	36.53
1205.	37.51
1210.	38.
1215.	36.53
1220.	36.53
1225.	37.51
1230.	36.53
1235.	36.05
1240.	38.49
1245.	36.05
1250.	37.51
1255.	37.51
1260.	38.49
1265.	36.53

1270.	35.56
1275.	38.
1280.	37.02
1285.	38.97
1290.	37.51
1295.	38.97
1300.	36.05
1305.	38.49
1310.	38.
1315.	37.02
1320.	36.53
1325.	36.05
1330.	38.49
1335.	39.46
1340.	38.49
1345.	37.02
1350.	38.97
1355.	37.02
1360.	39.46
1365.	37.51
1370.	37.02
1375.	37.51
1380.	37.51
1385.	38.97
1390.	38.49
1395.	38.
1400.	38.97
1405.	36.53
1410.	36.53
1415.	38.
1420.	38.
1425.	38.97
1430.	37.02
1435.	39.46
1440.	39.95
1445.	38.97
1450.	38.49
1455.	35.56
1460.	38.49
1465.	36.05
1470.	37.51
1475.	37.02
1480.	37.51
1485.	38.49
1490.	37.02
1495.	37.51
1500.	38.
1505.	36.05
1510.	38.49
1515.	38.49
1520.	38.
1525.	35.56

1530.	37.02
1535.	38.97
1540.	35.07
1545.	38.
1550.	36.53
1555.	37.02
1560.	36.05
1565.	36.53
1570.	37.51
1575.	36.05
1580.	38.

Observation Well No. 2: TVM-4U

X Location: 17207.3 ft
Y Location: 71272.7 ft

Observation Data

Time (min)	Displacement (ft)
0.1	5.393
5.	57.76
10.	65.17
15.	67.16
20.	70.06
25.	73.4
30.	76.68
35.	76.99
40.	80.68
45.	83.34
50.	84.49
55.	83.66
60.	86.21
65.	87.75
70.	88.28
75.	87.8
80.	88.76
85.	91.64
90.	90.11
95.	88.55
100.	94.78
105.	90.74
110.	91.56
115.	91.39
120.	93.15
125.	92.45
130.	95.15
135.	94.91
140.	96.61
145.	96.34
150.	97.52
155.	93.33
160.	94.49

165.	96.61
170.	99.71
175.	95.47
180.	95.13
185.	96.24
190.	96.86
195.	98.45
200.	98.56
205.	96.72
210.	99.26
215.	99.36
220.	100.9
225.	101.
230.	101.6
235.	102.1
240.	98.79
245.	100.3
250.	100.4
255.	100.9
260.	100.
265.	101.5
270.	102.6
275.	99.68
280.	102.2
285.	101.2
290.	103.2
295.	101.8
300.	100.9
305.	100.9
310.	100.4
315.	100.5
320.	103.9
325.	105.4
330.	102.5
335.	103.5
340.	103.
345.	104.5
350.	104.1
355.	102.6
360.	104.1
365.	103.6
370.	104.1
375.	104.6
380.	101.2
385.	103.2
390.	103.7
395.	105.2
400.	105.2
405.	104.2
410.	105.2
415.	104.2
420.	105.2

425.	105.2
430.	105.7
435.	104.8
440.	104.3
445.	103.8
450.	104.8
455.	106.2
460.	105.3
465.	105.3
470.	103.8
475.	105.8
480.	103.3
485.	105.8
490.	105.3
495.	105.3
500.	104.8
505.	106.8
510.	106.3
515.	105.3
520.	106.8
525.	105.8
530.	109.2
535.	107.3
540.	106.8
545.	107.8
550.	106.3
555.	107.8
560.	106.8
565.	105.8
570.	106.3
575.	107.8
580.	106.3
585.	107.3
590.	107.3
595.	107.8
600.	106.8
605.	105.8
610.	107.3
615.	108.3
620.	107.8
625.	107.8
630.	107.3
635.	107.8
640.	108.3
645.	108.3
650.	107.3
655.	105.4
660.	108.3
665.	110.2
670.	108.8
675.	108.3
680.	109.8

685.	107.8
690.	107.8
695.	108.3
700.	109.3
705.	107.8
710.	108.3
715.	110.7
720.	107.8
725.	110.7
730.	109.8
735.	109.8
740.	108.3
745.	109.3
750.	107.3
755.	107.8
760.	108.3
765.	107.3
770.	108.8
775.	107.3
780.	109.3
785.	110.2
790.	108.8
795.	108.3
800.	106.3
805.	109.3
810.	107.3
815.	107.8
820.	109.8
825.	107.8
830.	108.3
835.	108.8
840.	107.8
845.	108.8
850.	106.3
855.	107.8
860.	108.3
865.	106.8
870.	107.3
875.	107.3
880.	108.3
885.	108.3
890.	108.8
895.	105.9
900.	108.3
905.	108.3
910.	106.3
915.	108.3
920.	106.3
925.	107.3
930.	108.3
935.	107.3
940.	107.3

945.	108.3
950.	108.8
955.	109.8
960.	107.8
965.	105.9
970.	105.4
975.	105.4
980.	101.9
985.	104.9
990.	104.9
995.	103.9
1000.	102.9
1005.	103.9
1010.	101.9
1015.	105.4
1020.	101.9
1025.	104.9
1030.	105.9
1035.	102.4
1040.	101.9
1045.	101.9
1050.	103.9
1055.	102.9
1060.	102.9
1065.	102.4
1070.	103.9
1075.	101.5
1080.	102.9
1085.	101.9
1090.	103.9
1095.	102.9
1100.	101.9
1105.	101.
1110.	103.4
1115.	101.5
1120.	102.4
1125.	101.
1130.	102.4
1135.	104.4
1140.	101.9
1145.	103.4
1150.	102.4
1155.	100.5
1160.	101.5
1165.	101.5
1170.	102.4
1175.	103.4
1180.	100.5
1185.	100.5
1190.	101.9
1195.	102.4
1200.	102.9

1205.	101.
1210.	102.4
1215.	101.9
1220.	101.5
1225.	100.5
1230.	102.9
1235.	102.4
1240.	102.9
1245.	101.5
1250.	101.9
1255.	103.4
1260.	102.4
1265.	101.5
1270.	101.5
1275.	102.9
1280.	101.
1285.	103.9
1290.	102.9
1295.	104.4
1300.	103.4
1305.	102.4
1310.	103.4
1315.	103.4
1320.	101.
1325.	102.4
1330.	103.4
1335.	104.4
1340.	103.4
1345.	101.5
1350.	103.4
1355.	102.4
1360.	102.9
1365.	103.9
1370.	103.9
1375.	102.9
1380.	101.
1385.	101.9
1390.	103.9
1395.	102.9
1400.	103.4
1405.	102.4
1410.	101.5
1415.	101.5
1420.	101.9
1425.	102.4
1430.	100.
1435.	103.9
1440.	104.4
1445.	103.9
1450.	101.9
1455.	101.5
1460.	101.5

1465.	100.5
1470.	101.9
1475.	101.9
1480.	101.5
1485.	101.
1490.	101.9
1495.	101.9
1500.	101.9
1505.	101.9
1510.	102.9
1515.	102.4
1520.	102.4
1525.	101.
1530.	102.4
1535.	103.4
1540.	100.
1545.	100.
1550.	104.4
1555.	102.4
1560.	101.5
1565.	101.5
1570.	101.5
1575.	101.9
1580.	104.4

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.03143	ft^2/min
S	0.0002675	
1/B	0.008659	ft^{-1}

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
T	0.03143	6.75E-05	ft^2/min
S	0.0002675	7.968E-06	
1/B	0.008659	4.683E-05	ft^{-1}

Parameter Correlations

	T	S	1/B
T	1.00	-0.16	-0.88

S	-0.16	1.00	0.03
1/B	-0.88	0.03	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 3473.1 ft^2
Variance..... 3.664 ft^2
Std. Deviation..... 1.914 ft
Mean ..... -0.02706 ft
No. of Residuals ... 951
No. of Estimates ... 3

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST7-1V\TVM-1V-C.AQT
Title: TVM-1V
Date: 05/11/99
Time: 13:49:59

PROJECT INFORMATION

Test Well: TVM-1V

AQUIFER DATA

Saturated Thickness: 33 ft
Anisotropy Ratio (Kz/Kr): 0.2

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: TVM-1V

X Location: 17271.3 ft
Y Location: 71232.2 ft

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.
0.1	9.92
5.	9.901
10.	10.33
60.	10.31
95.	10.2
135.	10.09
185.	10.15
280.	10.31
430.	10.47
530.	10.55
560.	10.34

OBSERVATION WELL DATA

Number of observation wells: 2

Observation Well No. 1: TVM-3U

X Location: 17211.8 ft
Y Location: 71209.6 ft

Observation Data

Time (min)	Displacement (ft)
0.1	0.02381
5.	7.926
10.	15.24

15.	17.66
20.	20.61
25.	26.11
30.	29.19
35.	27.75
40.	29.45
45.	30.42
50.	32.27
55.	33.95
60.	34.53
65.	35.06
70.	36.99
75.	35.34
80.	35.67
85.	36.43
90.	39.1
95.	36.36
100.	38.42
105.	38.12
110.	36.33
115.	35.48
120.	37.41
125.	39.
130.	38.05
135.	37.19
140.	37.78
145.	38.31
150.	38.82
155.	38.36
160.	38.95
165.	39.48
170.	38.54
175.	38.59
180.	40.04
185.	38.13
190.	38.19
195.	38.21
200.	38.24
205.	39.24
210.	38.76
215.	37.8
220.	39.29
225.	37.38
230.	37.91
235.	39.42
240.	38.48
245.	39.02
250.	38.6
255.	39.1
260.	39.1
265.	39.61
270.	39.17

275.	40.16
280.	38.24
285.	38.72
290.	39.72
295.	39.76
300.	38.82
305.	39.83
310.	39.34
315.	40.34
320.	39.37
325.	39.35
330.	39.83
335.	38.41
340.	38.91
345.	39.42
350.	39.44
355.	38.07
360.	39.47
365.	39.95
370.	41.07
375.	40.07
380.	38.2
385.	39.77
390.	41.37
395.	38.54
400.	38.61
405.	39.16
410.	41.17
415.	39.77
420.	40.81
425.	38.94
430.	40.92
435.	41.41
440.	40.02
445.	41.47
450.	41.45
455.	40.95
460.	40.02
465.	40.49
470.	40.52
475.	40.05
480.	42.01
485.	40.56
490.	39.59
495.	40.1
500.	41.07
505.	40.09
510.	41.06
515.	41.56
520.	41.08
525.	41.57
530.	39.63

535.	40.62
540.	42.09
545.	41.09
550.	40.14
555.	39.16
560.	40.63
565.	39.65
570.	40.16
575.	40.62
580.	38.67
585.	40.59
590.	40.09
595.	40.53
600.	40.05
605.	39.58
610.	40.51
615.	39.98
620.	39.49
625.	39.02
630.	39.
635.	39.48
640.	38.98
645.	38.46
650.	38.94
655.	39.39
660.	39.88
665.	38.89
670.	40.83
675.	39.39
680.	39.37
685.	38.35
690.	39.78
695.	38.8
700.	38.3
705.	39.26
710.	39.73
715.	38.77
720.	39.77
725.	39.76
730.	39.29
735.	39.27
740.	38.78
745.	38.76
750.	39.74
755.	39.25
760.	40.21
765.	38.27
770.	39.68
775.	38.69
780.	40.64
785.	41.09
790.	39.66

795.	42.07
800.	41.11
805.	37.3
810.	41.13
815.	41.16
820.	35.9
825.	36.87
830.	41.18
835.	41.17
840.	41.21
845.	40.7
850.	40.23
855.	39.27
860.	40.72
865.	39.79
870.	40.3
875.	40.33
880.	38.9
885.	37.94
890.	38.92
895.	39.94
900.	39.96
905.	40.48
910.	39.02
915.	39.04
920.	39.56
925.	38.62
930.	40.05
935.	40.06
940.	40.04
945.	40.02
950.	39.58
955.	39.11
960.	40.55
965.	40.1
970.	40.13
975.	38.18
980.	40.14
985.	39.16
990.	39.19
995.	39.18
1000.	38.71
1005.	39.68
1010.	39.67
1015.	39.72
1020.	39.23
1025.	38.72
1030.	39.23
1035.	40.18
1040.	39.25
1045.	38.75
1050.	39.22

1055.	42.09
1060.	39.65
1065.	41.14
1070.	39.68
1075.	39.68
1080.	40.62
1085.	40.14
1090.	40.16
1095.	40.16
1100.	41.15
1105.	41.56
1110.	37.24
1115.	37.77
1120.	41.63
1125.	41.57
1130.	41.1
1135.	41.1
1140.	41.1
1145.	41.59
1150.	42.55
1155.	42.11
1160.	40.68
1165.	42.11
1170.	41.18
1175.	41.69
1180.	41.7
1185.	42.68
1190.	43.65
1195.	42.71
1200.	42.66
1205.	44.59
1210.	41.66
1215.	44.09
1220.	44.11
1225.	44.54
1230.	44.47
1235.	43.92
1240.	43.91
1245.	43.37
1250.	43.86
1255.	43.9
1260.	45.26
1265.	43.77
1270.	44.28
1275.	46.61
1280.	43.14
1285.	43.12
1290.	43.59
1295.	45.47
1300.	44.43
1305.	48.21
1310.	46.79

1315.	40.11
1320.	43.41
1325.	44.19
1330.	43.31
1335.	46.14
1340.	40.81
1345.	44.67
1350.	47.5
1355.	43.49
1360.	43.54
1365.	44.92
1370.	41.45
1375.	43.37

Observation Well No. 2: TVM-1U

X Location: 17274.9 ft
Y Location: 71232.2 ft

Observation Data

Time (min)	Displacement (ft)
0.1	12.72
5.	64.55
10.	78.7
15.	85.03
20.	84.56
25.	90.06
30.	98.5
35.	94.63
40.	97.79
45.	99.74
50.	102.6
55.	103.3
60.	102.9
65.	104.4
70.	103.9
75.	105.6
80.	105.
85.	104.3
90.	102.6
95.	104.7
100.	105.8
105.	102.1
110.	102.7
115.	102.8
120.	106.7
125.	107.8
130.	106.9
135.	105.
140.	104.7
145.	107.6
150.	103.7

155.	106.2
160.	106.3
165.	108.3
170.	106.9
175.	107.4
180.	107.9
185.	105.5
190.	108.5
195.	106.6
200.	106.6
205.	107.6
210.	107.6
215.	108.1
220.	107.1
225.	108.7
230.	107.7
235.	107.3
240.	108.8
245.	107.9
250.	108.4
255.	108.4
260.	108.9
265.	108.9
270.	109.
275.	110.
280.	108.
285.	109.5
290.	108.6
295.	109.6
300.	109.1
305.	110.1
310.	109.6
315.	110.1
320.	109.2
325.	109.6
330.	109.1
335.	111.1
340.	109.7
345.	110.2
350.	110.7
355.	109.8
360.	109.8
365.	109.3
370.	108.9
375.	110.9
380.	109.
385.	111.
390.	109.2
395.	108.8
400.	110.9
405.	110.9
410.	112.4

415.	111.5
420.	111.1
425.	110.2
430.	111.2
435.	112.7
440.	113.2
445.	113.2
450.	113.7
455.	113.2
460.	112.3
465.	112.7
470.	112.8
475.	113.3
480.	112.8
485.	112.8
490.	111.8
495.	111.4
500.	113.3
505.	112.3
510.	112.8
515.	111.9
520.	114.3
525.	114.3
530.	112.4
535.	112.9
540.	114.3
545.	114.3
550.	112.9
555.	113.4
560.	111.4
565.	111.9
570.	111.4
575.	110.9
580.	109.5
585.	110.4
590.	110.4
595.	111.3
600.	110.8
605.	109.9
610.	110.8
615.	111.3
620.	111.7
625.	108.8
630.	110.3
635.	109.8
640.	109.8
645.	109.7
650.	108.7
655.	110.2
660.	110.2
665.	110.6
670.	110.6

675.	109.7
680.	109.7
685.	110.6
690.	111.1
695.	107.6
700.	108.6
705.	110.5
710.	111.5
715.	109.6
720.	109.6
725.	110.5
730.	111.1
735.	110.5
740.	110.
745.	109.1
750.	110.5
755.	110.5
760.	110.5
765.	109.1
770.	111.4
775.	109.5
780.	110.
785.	111.9
790.	110.4
795.	111.4
800.	111.4
805.	107.1
810.	111.9
815.	112.9
820.	109.1
825.	107.7
830.	111.
835.	113.4
840.	111.5
845.	112.
850.	111.5
855.	110.1
860.	110.5
865.	112.
870.	111.6
875.	111.1
880.	111.6
885.	109.2
890.	109.7
895.	110.7
900.	111.2
905.	110.8
910.	110.3
915.	108.8
920.	110.3
925.	110.4
930.	111.8

935.	110.4
940.	110.8
945.	111.8
950.	109.9
955.	109.9
960.	111.3
965.	110.9
970.	110.4
975.	109.9
980.	110.4
985.	110.9
990.	110.9
995.	111.9
1000.	110.
1005.	110.9
1010.	112.4
1015.	111.
1020.	111.
1025.	110.
1030.	111.
1035.	111.5
1040.	110.5
1045.	109.5
1050.	110.5
1055.	111.9
1060.	110.4
1065.	110.9
1070.	110.
1075.	109.5
1080.	111.4
1085.	111.9
1090.	109.5
1095.	111.4
1100.	111.4
1105.	112.3
1110.	107.5
1115.	108.6
1120.	110.
1125.	112.4
1130.	110.4
1135.	111.9
1140.	111.4
1145.	112.9
1150.	113.3
1155.	113.9
1160.	112.9
1165.	114.8
1170.	115.4
1175.	114.9
1180.	115.9
1185.	116.4
1190.	116.9

1195.	115.
1200.	116.4
1205.	116.8
1210.	117.8
1215.	116.8
1220.	118.8
1225.	115.8
1230.	114.8
1235.	115.7
1240.	117.6
1245.	119.5
1250.	114.6
1255.	119.1
1260.	118.
1265.	116.5
1270.	115.6
1275.	119.3
1280.	116.4
1285.	120.2
1290.	115.8
1295.	118.2
1300.	115.7
1305.	124.4
1310.	118.1
1315.	113.3
1320.	115.2
1325.	119.9
1330.	111.7
1335.	120.8
1340.	115.5
1345.	113.5
1350.	119.3
1355.	119.6
1360.	113.8
1365.	117.2
1370.	114.7
1375.	99.51

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.05652	ft^2/min
S	0.0001952	
1/B	0.005644	ft^{-1}

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
T	0.05652	0.0002923	ft^2/min
S	0.0001952	1.345E-05	
1/B	0.005644	7.804E-05	ft^{-1}

Parameter Correlations

	T	S	1/B
T	1.00	-0.19	-0.87
S	-0.19	1.00	0.06
1/B	-0.87	0.06	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 1.896E+04 ft^2
Variance..... 22.98 ft^2
Std. Deviation..... 4.794 ft
Mean ..... -0.5533 ft
No. of Residuals ... 828
No. of Estimates ... 3

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST8~~1\TBG-4-C.AQT
Title: TBG4
Date: 05/11/99
Time: 13:51:47

PROJECT INFORMATION

Test Well: TBG4

AQUIFER DATA

Saturated Thickness: 33 ft
Anisotropy Ratio (Kz/Kr): 0.2

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: TBG4

X Location: 17177.7 ft
Y Location: 71267.1 ft

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.
0.25	2.088
5.	6.12
10.	5.151
15.	4.42
20.	4.15
25.	4.077
55.	4.021
75.	4.142
85.	4.334
100.	4.558
110.	4.714
125.	5.071
130.	5.229
145.	5.358
195.	5.483
360.	5.694
535.	5.835
720.	5.964
725.	5.896
745.	5.955
750.	5.894

OBSERVATION WELL DATA

Number of observation wells: 3

Observation Well No. 1: TVM-4V

X Location: 17206.4 ft
Y Location: 71275.9 ft

Observation Data

Time (min)	Displacement (ft)
0.25	0.6559
5.	11.82
10.	10.93
15.	14.04
20.	14.66
25.	12.81
30.	14.84
35.	13.95
40.	16.52
45.	17.58
50.	14.28
55.	16.79
60.	16.41
65.	14.52
70.	19.
75.	17.16
80.	17.15
85.	21.01
90.	18.16
95.	19.22
100.	19.7
105.	20.22
110.	19.21
115.	21.23
120.	21.29
125.	22.81
130.	24.37
135.	25.35
140.	24.85
145.	24.84
150.	25.79
155.	24.86
160.	26.85
165.	26.86
170.	25.42
175.	25.93
180.	27.4
185.	27.43
190.	28.41
195.	27.9
200.	26.89
205.	26.39
210.	27.81
215.	27.78
220.	27.76

225.	27.76
230.	26.31
235.	30.15
240.	27.75
245.	26.32
250.	29.17
255.	28.17
260.	28.59
265.	28.58
270.	29.51
275.	28.04
280.	29.96
285.	28.98
290.	29.95
295.	28.98
300.	28.43
305.	29.82
310.	29.81
315.	29.76
320.	29.25
325.	29.67
330.	28.65
335.	29.62
340.	29.6
345.	30.56
350.	31.02
355.	32.29
360.	28.81
365.	28.76
370.	30.62
375.	28.64
380.	31.06
385.	29.07
390.	29.97
395.	30.89
400.	27.96
405.	28.98
410.	29.02
415.	31.
420.	30.03
425.	29.57
430.	30.04
435.	29.57
440.	29.57
445.	30.54
450.	30.51
455.	29.54
460.	31.48
465.	29.56
470.	31.06
475.	30.56
480.	32.02

485.	30.55
490.	30.52
495.	30.56
500.	31.05
505.	30.57
510.	30.58
515.	30.61
520.	30.1
525.	32.07
530.	31.04
535.	31.58
540.	31.18
545.	31.63
550.	30.73
555.	30.27
560.	31.72
565.	31.27
570.	30.85
575.	30.85
580.	32.31
585.	31.66
590.	31.68
595.	31.22
600.	31.22
605.	29.83
610.	29.84
615.	32.22
620.	30.25
625.	31.16
630.	29.75
635.	30.27
640.	30.82
645.	32.21
650.	31.37
655.	31.85
660.	30.95
665.	31.8
670.	30.83
675.	30.81
680.	31.81
685.	32.9
690.	31.85
695.	29.48
700.	31.47
705.	31.48
710.	32.42
715.	31.01
720.	31.47
725.	30.52
730.	31.5
735.	31.95
740.	32.43

745.	31.9
750.	31.43
755.	31.46
760.	31.48
765.	30.04
770.	31.96
775.	31.96
780.	31.95
785.	31.92
790.	31.4
795.	30.44
800.	33.91
805.	31.47
810.	30.58
815.	32.55
820.	32.46
825.	31.98
830.	31.04
835.	31.96
840.	32.89
845.	31.48
850.	32.05
855.	32.53
860.	33.52
865.	32.01
870.	32.53
875.	32.52
880.	31.55
885.	31.55
890.	31.07
895.	33.
900.	31.49
905.	32.
910.	32.42
915.	32.39
920.	32.36
925.	32.36
930.	31.88
935.	31.43
940.	32.87
945.	32.82
950.	33.69
955.	32.21
960.	31.68
965.	33.18
970.	32.64
975.	31.65
980.	31.55
985.	32.07
990.	32.1
995.	31.59
1000.	32.57

1005.	31.12
1010.	32.11
1015.	31.08
1020.	31.62
1025.	33.03
1030.	30.6
1035.	32.52
1040.	33.95
1045.	31.5
1050.	32.47
1055.	32.88
1060.	33.33
1065.	31.38
1070.	33.28
1075.	30.35
1080.	30.37
1085.	30.89
1090.	31.35
1095.	33.3
1100.	32.3
1105.	32.33
1110.	27.98
1115.	31.93
1120.	31.49
1125.	31.97
1130.	31.96
1135.	32.94
1140.	32.39
1145.	31.43
1150.	29.96

Observation Well No. 2: TVM-2U

X Location: 17198.1 ft
Y Location: 71230.6 ft

Observation Data

Time (min)	Displacement (ft)
0.25	0.4959
5.	9.913
10.	10.05
15.	14.09
20.	14.21
25.	18.23
30.	17.85
35.	18.44
40.	15.12
45.	16.19
50.	17.73
55.	15.37
60.	16.91
65.	17.95

70.	18.5
75.	18.56
80.	17.16
85.	21.11
90.	19.7
95.	20.72
100.	20.28
105.	21.78
110.	20.35
115.	21.37
120.	22.38
125.	23.38
130.	25.85
135.	25.88
140.	24.93
145.	24.95
150.	25.46
155.	26.46
160.	26.48
165.	27.96
170.	26.52
175.	25.56
180.	27.52
185.	27.05
190.	28.53
195.	27.08
200.	28.55
205.	26.12
210.	27.11
215.	28.1
220.	27.62
225.	28.11
230.	28.61
235.	29.59
240.	27.16
245.	28.14
250.	28.15
255.	28.15
260.	29.13
265.	28.16
270.	29.14
275.	28.66
280.	29.15
285.	28.18
290.	29.65
295.	29.65
300.	29.17
305.	29.17
310.	31.12
315.	29.66
320.	30.15
325.	30.16

330.	29.18
335.	29.67
340.	29.67
345.	30.65
350.	30.65
355.	30.17
360.	28.7
365.	29.68
370.	30.66
375.	30.17
380.	31.64
385.	29.69
390.	30.18
395.	32.62
400.	29.2
405.	30.18
410.	30.18
415.	31.16
420.	31.64
425.	31.16
430.	31.16
435.	31.16
440.	30.18
445.	31.16
450.	29.21
455.	30.18
460.	31.65
465.	30.18
470.	30.67
475.	30.67
480.	31.16
485.	31.65
490.	29.7
495.	31.16
500.	31.65
505.	31.16
510.	32.14
515.	30.19
520.	30.67
525.	31.16
530.	30.68
535.	30.19
540.	31.16
545.	31.16
550.	31.16
555.	31.16
560.	31.65
565.	31.16
570.	29.7
575.	31.16
580.	32.14
585.	30.68

590.	30.68
595.	30.19
600.	30.68
605.	29.21
610.	30.19
615.	31.16
620.	30.68
625.	31.17
630.	29.21
635.	30.19
640.	31.65
645.	32.63
650.	30.19
655.	31.17
660.	30.68
665.	31.65
670.	30.68
675.	30.19
680.	30.68
685.	30.19
690.	32.14
695.	30.19
700.	32.14
705.	32.14
710.	31.17
715.	30.68
720.	30.68
725.	30.19
730.	31.65
735.	30.19
740.	30.19
745.	31.17
750.	29.7
755.	30.19
760.	28.72
765.	30.19
770.	31.17
775.	31.17
780.	30.68
785.	30.19
790.	31.17
795.	31.17
800.	33.12
805.	31.65
810.	28.24
815.	31.65
820.	31.17
825.	30.68
830.	28.72
835.	30.68
840.	31.17
845.	29.7

850.	30.68
855.	30.68
860.	32.63
865.	31.17
870.	31.17
875.	30.19
880.	30.68
885.	29.7
890.	29.7
895.	30.68
900.	30.19
905.	29.7
910.	30.68
915.	30.68
920.	31.17
925.	28.72
930.	30.68
935.	30.19
940.	31.17
945.	30.68
950.	33.61
955.	31.17
960.	28.72
965.	30.68
970.	30.68
975.	30.19
980.	31.65
985.	31.17
990.	31.65
995.	31.17
1000.	31.17
1005.	31.17
1010.	31.17
1015.	29.7
1020.	30.68
1025.	29.21
1030.	29.21
1035.	31.65
1040.	32.14
1045.	31.17
1050.	31.65
1055.	31.17
1060.	32.14
1065.	30.68
1070.	31.17
1075.	30.68
1080.	30.68
1085.	31.17
1090.	30.68
1095.	32.63
1100.	31.17
1105.	32.14

1110.	28.24
1115.	32.14
1120.	31.65
1125.	30.68
1130.	31.65
1135.	31.17
1140.	32.63
1145.	31.65
1150.	29.21

Observation Well No. 3: TVM-4U

X Location: 17207.3 ft
Y Location: 71272.7 ft

Observation Data

Time (min)	Displacement (ft)
0.25	6.354
5.	24.56
10.	23.72
15.	26.29
20.	29.35
25.	26.04
30.	27.62
35.	27.23
40.	27.32
45.	31.32
50.	26.52
55.	31.48
60.	29.11
65.	28.69
70.	31.2
75.	30.28
80.	30.34
85.	34.78
90.	32.39
95.	35.85
100.	33.46
105.	34.96
110.	33.54
115.	35.52
120.	38.
125.	38.52
130.	40.5
135.	41.99
140.	43.48
145.	40.58
150.	42.55
155.	42.08
160.	44.06
165.	43.1
170.	43.11

175.	43.13
180.	44.12
185.	44.62
190.	44.64
195.	45.14
200.	44.17
205.	44.18
210.	44.2
215.	45.18
220.	44.21
225.	45.69
230.	46.18
235.	45.7
240.	45.71
245.	44.74
250.	46.21
255.	45.24
260.	45.24
265.	45.74
270.	46.72
275.	45.75
280.	47.7
285.	45.75
290.	47.22
295.	46.25
300.	47.23
305.	47.23
310.	47.23
315.	47.73
320.	47.73
325.	46.75
330.	46.27
335.	47.25
340.	46.76
345.	47.25
350.	48.72
355.	48.72
360.	46.77
365.	47.26
370.	47.74
375.	45.31
380.	48.24
385.	47.26
390.	48.73
395.	47.75
400.	46.29
405.	45.31
410.	47.75
415.	47.75
420.	48.24
425.	48.24
430.	48.24

435.	46.29
440.	48.24
445.	48.24
450.	48.73
455.	47.76
460.	48.25
465.	47.27
470.	49.22
475.	48.25
480.	49.22
485.	48.25
490.	48.25
495.	48.25
500.	48.25
505.	48.25
510.	47.76
515.	47.76
520.	48.25
525.	48.74
530.	46.78
535.	48.25
540.	47.76
545.	48.74
550.	48.74
555.	48.25
560.	48.74
565.	49.23
570.	47.76
575.	49.23
580.	50.2
585.	49.23
590.	48.25
595.	49.71
600.	45.81
605.	47.76
610.	49.23
615.	49.23
620.	49.23
625.	47.76
630.	48.25
635.	47.76
640.	49.23
645.	48.74
650.	49.72
655.	48.74
660.	49.23
665.	50.69
670.	48.25
675.	53.62
680.	48.25
685.	50.2
690.	50.69

695.	47.27
700.	49.23
705.	48.25
710.	49.72
715.	48.25
720.	48.25
725.	49.23
730.	48.74
735.	48.74
740.	49.23
745.	48.74
750.	48.74
755.	47.76
760.	47.27
765.	46.3
770.	48.74
775.	49.23
780.	48.25
785.	48.74
790.	48.74
795.	46.79
800.	50.69
805.	48.74
810.	46.79
815.	50.2
820.	49.72
825.	49.72
830.	48.74
835.	48.74
840.	49.23
845.	48.25
850.	48.74
855.	48.74
860.	51.18
865.	48.74
870.	50.2
875.	49.72
880.	49.23
885.	48.74
890.	48.74
895.	49.72
900.	48.25
905.	48.74
910.	50.2
915.	49.72
920.	50.2
925.	48.25
930.	49.72
935.	49.72
940.	49.23
945.	51.67
950.	50.69

955.	51.18
960.	49.23
965.	49.23
970.	48.74
975.	49.23
980.	47.28
985.	50.2
990.	48.74
995.	49.23
1000.	49.23
1005.	47.76
1010.	49.72
1015.	48.25
1020.	49.23
1025.	50.69
1030.	48.74
1035.	50.2
1040.	50.69
1045.	48.74
1050.	48.74
1055.	49.72
1060.	50.69
1065.	50.2
1070.	50.2
1075.	46.79
1080.	48.25
1085.	50.2
1090.	48.74
1095.	50.2
1100.	49.72
1105.	51.18
1110.	47.28
1115.	50.69
1120.	49.72
1125.	50.2
1130.	49.72
1135.	50.69
1140.	50.2
1145.	49.23
1150.	48.25

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.02252	ft^2/min

S	0.0003	
1/B	0.0234	ft^{-1}

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
T	0.02252	0.000468	ft^2/min
S	0.0003	not estimated	
1/B	0.0234	0.0005228	ft^{-1}

Parameter Correlations

	T	1/B
T	1.00	-0.99
1/B	-0.99	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 8613.8 ft^2
Variance..... 9.343 ft^2
Std. Deviation..... 3.057 ft
Mean ..... -0.1262 ft
No. of Residuals ... 924
No. of Estimates ... 2

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST10~1\TEST-1~1.AQT
Title: TVM-2U, 3U, 4U
Date: 05/11/99
Time: 13:54:11

PROJECT INFORMATION

Test Well: TVM-2U, 3U, 4U

AQUIFER DATA

Saturated Thickness: 33 ft
Anisotropy Ratio (Kz/Kr): 0.2

PUMPING WELL DATA

Number of pumping wells: 3

Pumping Well No. 1: TVM-2U

X Location: 17198.1 ft
Y Location: 71230.6 ft

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.
0.5	7.97
5.	7.809
20.	7.716
35.	7.619
85.	7.658
95.	7.575
145.	7.535
195.	7.514
215.	7.433
230.	7.52
280.	7.49
330.	7.457
380.	7.518
430.	7.577
480.	7.59
530.	7.636
575.	7.508
625.	7.581
635.	7.497
650.	7.601
700.	7.609
710.	7.688
740.	7.766
790.	7.787
840.	7.776
845.	7.637

850.	7.469
855.	7.633

Pumping Well No. 2: TVM-3U

X Location: 17211.8 ft
Y Location: 71209.6 ft

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.
0.5	8.26
5.	8.1
20.	7.837
35.	7.685
85.	7.738
95.	7.661
145.	7.542
195.	7.55
215.	7.474
230.	7.575
280.	7.485
330.	7.551
380.	7.593
430.	7.639
480.	7.624
530.	7.635
575.	7.503
625.	7.479
635.	7.381
650.	7.376
700.	6.975
710.	6.932
740.	6.856
790.	6.662
840.	6.565
845.	6.605
850.	6.608
855.	6.601

Pumping Well No. 3: TVM-4U

X Location: 17207.3 ft
Y Location: 71272.7 ft

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.
0.5	4.99
5.	5.116
20.	5.223
35.	5.166

85.	5.21
95.	5.145
145.	5.179
195.	5.154
215.	5.025
230.	5.07
280.	5.013
330.	5.126
380.	5.057
430.	5.047
480.	5.036
530.	5.067
575.	5.068
625.	5.124
635.	5.053
650.	5.111
700.	5.073
710.	5.143
740.	5.084
790.	5.16
840.	5.151
845.	5.163
850.	5.25
855.	5.211

OBSERVATION WELL DATA

Number of observation wells: 4

Observation Well No. 1: TVM-3V

X Location: 17210.4 ft
Y Location: 71212.4 ft

Observation Data

Time (min)	Displacement (ft)
0.5	29.89
5.	64.41
10.	77.89
15.	86.11
20.	93.39
25.	97.83
30.	102.3
35.	105.1
40.	107.6
45.	112.3
50.	115.7
55.	118.
60.	119.9
65.	120.8
70.	124.8
75.	125.4

80.	128.2
85.	128.9
90.	130.1
95.	130.2
100.	128.7
105.	129.
110.	136.1
115.	131.9
120.	134.
125.	134.6
130.	134.6
135.	135.
140.	134.5
145.	136.3
150.	135.8
155.	134.6
160.	135.4
165.	136.2
170.	136.5
175.	134.3
180.	136.3
185.	136.
190.	136.2
195.	136.8
200.	137.4
205.	137.1
210.	136.1
215.	137.2
220.	137.3
225.	137.9
230.	138.9
235.	138.9
240.	138.
245.	138.1
250.	137.6
255.	137.2
260.	138.2
265.	137.8
270.	136.3
275.	136.4
280.	137.8
285.	136.9
290.	134.5
295.	138.9
300.	136.9
305.	137.
310.	139.9
315.	137.5
320.	137.5
325.	138.5
330.	138.
335.	138.

340.	135.6
345.	135.7
350.	138.
355.	139.
360.	138.
365.	139.4
370.	138.9
375.	137.8
380.	136.4
385.	138.3
390.	138.4
395.	138.3
400.	138.3
405.	137.8
410.	138.2
415.	138.2
420.	139.1
425.	138.1
430.	139.5
435.	138.5
440.	138.5
445.	140.5
450.	139.
455.	137.5
460.	138.4
465.	138.3
470.	138.8
475.	139.2
480.	141.1
485.	139.1
490.	139.6
495.	139.6
500.	139.5
505.	141.5
510.	141.4
515.	138.9
520.	139.9
525.	139.9
530.	139.4
535.	140.8
540.	140.7
545.	141.7
550.	141.6
555.	140.
560.	140.5
565.	141.
570.	140.
575.	138.9
580.	138.9
585.	141.3
590.	141.8
595.	141.7

600.	139.3
605.	140.2
610.	141.1
615.	140.1
620.	140.
625.	140.
630.	140.4
635.	139.9
640.	139.
645.	139.9
650.	140.
655.	140.9
660.	139.4
665.	138.5
670.	140.5
675.	139.5
680.	139.
685.	138.5
690.	140.
695.	139.9
700.	139.
705.	138.6
710.	138.6
715.	138.6
720.	138.1
725.	138.1
730.	137.6
735.	136.7
740.	139.1
745.	138.6
750.	138.6
755.	137.6
760.	137.1
765.	136.1
770.	136.2
775.	137.2
780.	137.7
785.	137.2
790.	134.8
795.	135.8
800.	137.8
805.	135.4
810.	136.4
815.	135.9
820.	137.4
825.	137.4
830.	135.9
835.	137.4
840.	136.9
845.	136.5
850.	136.9
855.	137.

Observation Well No. 2: TVM-4V

X Location: 17206.4 ft
Y Location: 71275.9 ft

Observation Data	
Time (min)	Displacement (ft)
0.5	37.07
5.	70.64
10.	82.68
15.	91.86
20.	98.18
25.	103.6
30.	108.
35.	110.4
40.	115.3
45.	118.5
50.	121.5
55.	123.2
60.	125.2
65.	127.5
70.	131.1
75.	131.7
80.	135.9
85.	135.6
90.	135.3
95.	138.3
100.	134.9
105.	135.7
110.	143.8
115.	138.2
120.	140.3
125.	140.8
130.	142.7
135.	139.8
140.	140.7
145.	141.6
150.	142.
155.	140.9
160.	142.1
165.	143.8
170.	143.7
175.	141.9
180.	144.
185.	143.2
190.	144.3
195.	144.4
200.	145.1
205.	144.7
210.	142.4
215.	143.5

220.	143.1
225.	144.1
230.	144.7
235.	144.7
240.	143.3
245.	144.3
250.	142.9
255.	142.4
260.	143.
265.	145.5
270.	141.1
275.	142.1
280.	141.7
285.	141.2
290.	142.2
295.	143.2
300.	143.6
305.	142.7
310.	144.2
315.	143.7
320.	142.3
325.	143.3
330.	141.4
335.	142.3
340.	142.8
345.	143.3
350.	142.4
355.	144.3
360.	143.8
365.	142.7
370.	142.7
375.	142.2
380.	143.6
385.	141.7
390.	144.1
395.	142.2
400.	143.6
405.	143.5
410.	142.5
415.	143.5
420.	143.4
425.	142.9
430.	142.4
435.	142.9
440.	142.3
445.	143.8
450.	142.8
455.	141.8
460.	142.2
465.	141.7
470.	143.1
475.	143.5

480.	144.5
485.	143.5
490.	143.4
495.	143.9
500.	142.9
505.	143.9
510.	144.8
515.	142.8
520.	144.3
525.	144.2
530.	143.7
535.	144.1
540.	144.1
545.	144.5
550.	145.9
555.	143.9
560.	143.9
565.	145.3
570.	143.8
575.	141.3
580.	144.2
585.	145.2
590.	145.6
595.	146.1
600.	143.6
605.	145.4
610.	146.4
615.	144.9
620.	144.4
625.	143.8
630.	144.7
635.	144.7
640.	143.3
645.	144.2
650.	144.7
655.	146.2
660.	144.7
665.	143.7
670.	145.7
675.	144.2
680.	144.7
685.	144.2
690.	145.7
695.	145.2
700.	145.2
705.	145.8
710.	145.8
715.	145.8
720.	145.8
725.	145.8
730.	147.2
735.	146.2

740.	146.7
745.	146.7
750.	147.7
755.	144.8
760.	145.7
765.	146.2
770.	145.7
775.	146.7
780.	146.3
785.	146.8
790.	144.9
795.	145.4
800.	146.4
805.	146.9
810.	144.5
815.	146.4
820.	147.4
825.	147.9
830.	146.
835.	146.5
840.	147.4
845.	146.5
850.	147.5
855.	147.

Observation Well No. 3: TVM-2V

X Location: 17202.2 ft
Y Location: 71231 ft

Observation Data

Time (min)	Displacement (ft)
0.5	33.72
5.	81.18
10.	98.49
15.	108.1
20.	117.8
25.	121.8
30.	126.7
35.	130.5
40.	134.
45.	136.7
50.	140.7
55.	142.9
60.	144.3
65.	146.2
70.	151.2
75.	151.3
80.	153.6
85.	156.2
90.	157.9
95.	156.5

100.	157.4
105.	156.8
110.	160.6
115.	158.3
120.	159.9
125.	161.4
130.	160.9
135.	162.8
140.	160.9
145.	162.2
150.	162.6
155.	161.5
160.	161.8
165.	162.
170.	162.4
175.	163.
180.	163.2
185.	162.8
190.	163.5
195.	163.6
200.	165.7
205.	164.4
210.	163.9
215.	163.6
220.	164.1
225.	163.8
230.	165.3
235.	165.3
240.	163.4
245.	163.9
250.	163.5
255.	162.5
260.	164.
265.	164.6
270.	159.8
275.	162.3
280.	161.8
285.	162.8
290.	163.3
295.	164.8
300.	161.8
305.	161.9
310.	164.8
315.	162.4
320.	163.4
325.	164.8
330.	162.4
335.	163.9
340.	162.5
345.	161.1
350.	162.5
355.	164.4

360.	163.4
365.	163.8
370.	163.8
375.	160.8
380.	164.7
385.	164.2
390.	163.7
395.	163.2
400.	164.2
405.	163.2
410.	164.5
415.	165.
420.	164.5
425.	163.5
430.	164.4
435.	164.4
440.	163.9
445.	165.4
450.	164.3
455.	162.4
460.	163.8
465.	162.8
470.	163.7
475.	164.6
480.	166.
485.	165.
490.	164.5
495.	165.4
500.	165.4
505.	165.9
510.	166.3
515.	164.3
520.	165.8
525.	164.8
530.	165.7
535.	165.7
540.	165.6
545.	167.1
550.	166.5
555.	165.9
560.	165.4
565.	166.4
570.	166.3
575.	164.3
580.	165.8
585.	164.8
590.	165.8
595.	166.6
600.	166.6
605.	167.
610.	166.
615.	165.5

620.	165.9
625.	164.9
630.	165.8
635.	164.8
640.	163.9
645.	165.3
650.	166.3
655.	167.2
660.	166.3
665.	164.8
670.	166.8
675.	165.8
680.	165.3
685.	164.8
690.	166.3
695.	165.8
700.	165.3
705.	165.4
710.	165.9
715.	165.5
720.	165.4
725.	164.9
730.	164.9
735.	164.9
740.	166.4
745.	166.8
750.	167.3
755.	164.4
760.	163.9
765.	164.4
770.	164.4
775.	165.4
780.	165.4
785.	165.9
790.	164.5
795.	163.6
800.	165.5
805.	167.
810.	164.2
815.	165.6
820.	166.1
825.	165.2
830.	164.6
835.	165.6
840.	165.6
845.	163.8
850.	164.2
855.	163.3

Observation Well No. 4: TBG4

X Location: 17177.7 ft

Y Location: 71267.1 ft

Observation Data

Time (min)	Displacement (ft)
0.5	15.29
5.	58.85
10.	73.66
15.	82.58
20.	90.53
25.	96.58
30.	102.7
35.	104.6
40.	107.6
45.	111.4
50.	116.3
55.	118.5
60.	120.1
65.	120.9
70.	126.
75.	125.6
80.	129.3
85.	132.
90.	131.2
95.	132.7
100.	131.6
105.	130.5
110.	138.6
115.	134.4
120.	135.5
125.	137.5
130.	138.
135.	136.5
140.	136.9
145.	137.7
150.	139.
155.	136.9
160.	139.1
165.	139.9
170.	139.1
175.	137.8
180.	140.
185.	140.6
190.	140.8
195.	140.9
200.	141.5
205.	140.7
210.	138.8
215.	138.9
220.	139.9
225.	140.5
230.	141.6
235.	141.1

240.	140.7
245.	140.7
250.	139.3
255.	140.3
260.	140.4
265.	141.9
270.	138.5
275.	140.
280.	139.5
285.	138.1
290.	138.6
295.	139.1
300.	139.1
305.	140.1
310.	140.6
315.	140.1
320.	140.1
325.	139.6
330.	138.7
335.	139.2
340.	139.2
345.	139.7
350.	139.7
355.	140.7
360.	140.2
365.	139.7
370.	140.2
375.	139.7
380.	140.2
385.	139.7
390.	140.7
395.	138.7
400.	140.2
405.	140.2
410.	140.2
415.	141.2
420.	140.2
425.	138.8
430.	140.7
435.	140.2
440.	139.7
445.	141.7
450.	140.2
455.	138.8
460.	140.2
465.	139.2
470.	141.2
475.	140.7
480.	140.7
485.	140.2
490.	140.2
495.	140.7

500.	140.7
505.	141.7
510.	142.2
515.	141.2
520.	141.7
525.	140.7
530.	140.7
535.	141.2
540.	141.7
545.	141.7
550.	141.7
555.	141.7
560.	142.2
565.	142.2
570.	141.2
575.	139.7
580.	142.2
585.	142.2
590.	143.2
595.	141.2
600.	142.7
605.	142.2
610.	143.2
615.	142.2
620.	142.2
625.	141.7
630.	143.2
635.	141.2
640.	140.2
645.	141.7
650.	142.7
655.	142.7
660.	141.7
665.	140.2
670.	142.2
675.	141.2
680.	142.7
685.	140.7
690.	143.6
695.	142.7
700.	142.7
705.	141.7
710.	141.7
715.	143.2
720.	142.7
725.	142.7
730.	142.2
735.	142.7
740.	143.2
745.	143.6
750.	144.6
755.	141.2

760.	142.2
765.	141.7
770.	141.7
775.	141.7
780.	141.7
785.	142.7
790.	140.7
795.	141.2
800.	141.7
805.	142.7
810.	141.2
815.	140.7
820.	142.7
825.	142.7
830.	141.7
835.	142.7
840.	141.7
845.	139.7
850.	140.7
855.	141.7

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.03	ft^2/min
S	4.5E-05	
1/B	0.0035	ft^{-1}

Data Set: D:\1KDWRKD2\SVE\NEWSVE~1\TEST11~1\TEST-1~1.AQT
Title: TVM-2V, 3V, 4V
Date: 05/11/99
Time: 13:56:00

PROJECT INFORMATION

Test Well: TVM-2V

AQUIFER DATA

Saturated Thickness: 33 ft
Anisotropy Ratio (Kz/Kr): 0.2

PUMPING WELL DATA

Number of pumping wells: 3

Pumping Well No. 1: TVM-2V

X Location: 17202.2 ft
Y Location: 71231 ft

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.
0.005	5.18
5.	5.126
30.	5.022
240.	5.03
400.	5.013

Pumping Well No. 2: TVM-3V

X Location: 17210.4 ft
Y Location: 71212.4 ft

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.
0.005	10.29
5.	10.37
30.	10.01
55.	9.927
240.	9.782
400.	9.774

Pumping Well No. 3: TVM-4V

X Location: 17206.4 ft
Y Location: 71275.9 ft

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.
0.005	5.03
5.	4.942
30.	4.883
240.	4.877
400.	4.941

OBSERVATION WELL DATA

Number of observation wells: 3

Observation Well No. 1: TVM-2U

X Location: 17198.1 ft
Y Location: 71230.6 ft

Observation Data

Time (min)	Displacement (ft)
0.33	30.14
5.	72.68
10.	88.7
15.	100.1
20.	107.
25.	113.6
30.	116.5
35.	118.8
40.	121.5
45.	123.4
50.	123.7
55.	124.7
60.	127.5
65.	124.8
70.	126.
75.	126.6
80.	128.7
85.	128.3
90.	129.3
95.	128.4
100.	129.9
105.	128.9
110.	128.
115.	130.9
120.	129.
125.	126.5
130.	132.4
135.	130.9
140.	129.
145.	129.5
150.	128.5
155.	130.9

160.	129.5
165.	129.
170.	129.
175.	131.9
180.	125.1
185.	129.
190.	131.4
195.	129.
200.	130.5
205.	129.
210.	129.
215.	129.5
220.	127.5
225.	128.
230.	127.5
235.	128.5
240.	128.
245.	129.
250.	130.9
255.	130.5
260.	130.
265.	128.5
270.	128.
275.	129.
280.	128.
285.	130.9
290.	128.5
295.	129.
300.	129.
305.	129.
310.	129.
315.	129.
320.	126.6
325.	126.6
330.	127.
335.	128.5
340.	129.
345.	128.5
350.	129.
355.	129.5
360.	129.5
365.	129.5
370.	127.5
375.	127.
380.	128.
385.	128.5
390.	128.5
395.	128.
400.	128.
405.	130.
410.	129.
415.	128.

420.	129.5
425.	129.5
430.	129.5
435.	130.
440.	128.
445.	129.5
450.	130.9
455.	129.5
460.	129.5
465.	130.5
470.	130.
475.	130.5
480.	130.
485.	131.4
490.	131.9
495.	130.5
500.	130.
505.	130.
510.	130.5
515.	130.9
520.	130.
525.	131.4
530.	129.5
535.	134.4
540.	132.4
545.	132.4
550.	130.9
555.	132.4
560.	130.9
565.	133.4
570.	131.4
575.	131.4
580.	132.4
585.	133.9
590.	134.4
595.	132.4
600.	132.4
605.	132.4
610.	131.4
615.	135.8
620.	133.4
625.	131.9
630.	133.9
635.	132.4
640.	131.9
645.	133.9
650.	132.9
655.	133.9
660.	132.9
665.	134.4
670.	130.5
675.	135.3

680.	132.9
685.	133.9
690.	133.9
695.	133.9
700.	133.9
705.	133.9
710.	133.4
715.	131.9
720.	133.4
725.	134.9
730.	133.9
735.	132.9
740.	133.4
745.	133.4
750.	133.9
755.	134.9
760.	131.9
765.	133.4
770.	134.4
775.	134.4
780.	134.4
785.	132.4
790.	134.4
795.	133.9
800.	134.9
805.	134.4
810.	133.4
815.	134.9
820.	133.9
825.	133.4
830.	135.3
835.	133.9
840.	133.4
845.	133.9
850.	133.4
855.	133.4
860.	133.9
865.	132.4
870.	132.4
875.	133.4
880.	132.4
885.	131.9
890.	132.9
895.	132.9
900.	134.9
905.	133.4
910.	133.4
915.	132.9
920.	131.4
925.	132.4
930.	132.9
935.	131.9

940.	132.4
945.	130.9
950.	131.4
955.	132.9
960.	132.9
965.	133.4
970.	131.4
975.	132.9
980.	131.4
985.	131.4
990.	131.4
995.	131.4
1000.	131.9

Observation Well No. 2: TVM-3U

X Location: 17211.8 ft
Y Location: 71209.6 ft

Observation Data

Time (min)	Displacement (ft)
0.33	6.218
5.	31.19
10.	40.38
15.	51.29
20.	58.65
25.	64.34
30.	64.29
35.	66.53
40.	71.24
45.	71.7
50.	71.42
55.	71.93
60.	74.75
65.	72.09
70.	73.76
75.	74.89
80.	76.46
85.	76.54
90.	76.6
95.	77.13
100.	76.67
105.	76.21
110.	75.74
115.	78.19
120.	76.74
125.	74.79
130.	79.19
135.	77.73
140.	75.29
145.	77.25
150.	75.29

155.	75.3
160.	74.81
165.	74.81
170.	76.76
175.	78.23
180.	72.37
185.	75.3
190.	74.81
195.	77.25
200.	75.79
205.	74.81
210.	77.74
215.	73.83
220.	73.83
225.	75.79
230.	75.79
235.	75.3
240.	72.86
245.	75.79
250.	76.76
255.	75.3
260.	75.3
265.	74.81
270.	72.37
275.	75.3
280.	74.32
285.	77.25
290.	76.76
295.	75.79
300.	74.32
305.	73.83
310.	73.35
315.	72.86
320.	73.83
325.	72.37
330.	74.81
335.	73.83
340.	74.32
345.	73.83
350.	73.35
355.	75.3
360.	73.83
365.	74.32
370.	73.83
375.	73.83
380.	73.83
385.	74.32
390.	74.32
395.	74.32
400.	73.35
405.	75.79
410.	73.83

415.	73.83
420.	73.35
425.	75.79
430.	75.3
435.	75.3
440.	73.83
445.	75.3
450.	74.81
455.	74.81
460.	74.81
465.	74.81
470.	74.32
475.	75.79
480.	75.3
485.	75.79
490.	76.27
495.	75.79
500.	74.81
505.	74.81
510.	75.3
515.	75.79
520.	75.3
525.	75.79
530.	73.83
535.	79.2
540.	78.72
545.	76.27
550.	76.27
555.	77.25
560.	74.81
565.	78.23
570.	76.27
575.	75.3
580.	77.74
585.	75.79
590.	76.76
595.	75.79
600.	76.27
605.	76.27
610.	75.3
615.	74.32
620.	76.76
625.	75.79
630.	76.76
635.	75.79
640.	76.76
645.	76.76
650.	77.25
655.	77.25
660.	75.3
665.	77.25
670.	71.88

675.	75.79
680.	76.27
685.	76.27
690.	78.23
695.	76.27
700.	76.76
705.	76.27
710.	76.76
715.	76.27
720.	76.27
725.	75.79
730.	76.27
735.	74.81
740.	76.27
745.	75.79
750.	75.79
755.	76.27
760.	76.27
765.	76.27
770.	78.23
775.	77.25
780.	76.76
785.	74.81
790.	76.27
795.	76.76
800.	74.81
805.	76.76
810.	76.27
815.	74.81
820.	74.81
825.	75.3
830.	74.32
835.	75.3
840.	74.32
845.	76.27
850.	75.3
855.	75.3
860.	73.83
865.	73.83
870.	74.32
875.	74.32
880.	73.35
885.	72.86
890.	74.81
895.	74.32
900.	74.32
905.	74.81
910.	75.79
915.	74.32
920.	73.83
925.	73.83
930.	73.83

935.	74.32
940.	71.39
945.	74.81
950.	72.37
955.	74.32
960.	73.83
965.	75.79
970.	73.83
975.	75.3
980.	72.86
985.	73.83
990.	73.83
995.	72.86
1000.	72.37

Observation Well No. 3: TVM-4U

X Location: 17207.3 ft
Y Location: 71272.7 ft

Observation Data

Time (min)	Displacement (ft)
0.33	34.25
5.	65.
10.	74.86
15.	86.
20.	91.26
25.	96.29
30.	98.53
35.	99.7
40.	104.8
45.	104.2
50.	104.4
55.	104.3
60.	106.2
65.	103.5
70.	104.6
75.	105.7
80.	106.3
85.	106.8
90.	107.3
95.	107.9
100.	108.4
105.	106.
110.	105.5
115.	107.4
120.	107.4
125.	105.5
130.	108.4
135.	107.4
140.	106.
145.	107.

150.	105.5
155.	105.6
160.	107.4
165.	104.1
170.	107.5
175.	108.1
180.	102.2
185.	105.6
190.	105.6
195.	106.7
200.	107.1
205.	105.2
210.	105.7
215.	104.7
220.	103.8
225.	105.2
230.	104.8
235.	105.7
240.	103.8
245.	104.3
250.	106.3
255.	106.3
260.	106.3
265.	103.9
270.	102.9
275.	106.8
280.	102.9
285.	106.8
290.	104.9
295.	105.4
300.	104.9
305.	103.9
310.	104.
315.	103.5
320.	104.9
325.	103.5
330.	104.4
335.	104.4
340.	104.4
345.	104.4
350.	103.9
355.	104.4
360.	104.9
365.	103.9
370.	104.4
375.	103.9
380.	104.4
385.	105.4
390.	104.9
395.	104.9
400.	105.3
405.	104.4

410.	104.8
415.	104.8
420.	104.8
425.	106.2
430.	106.7
435.	106.2
440.	104.2
445.	105.7
450.	106.1
455.	106.1
460.	106.
465.	105.5
470.	105.
475.	105.9
480.	106.3
485.	106.8
490.	107.7
495.	104.3
500.	108.6
505.	108.6
510.	104.2
515.	105.1
520.	105.1
525.	107.5
530.	103.9
535.	109.2
540.	108.1
545.	107.6
550.	106.1
555.	107.4
560.	105.9
565.	109.2
570.	107.7
575.	106.2
580.	107.6
585.	107.
590.	107.9
595.	106.9
600.	107.3
605.	107.7
610.	106.3
615.	106.7
620.	107.7
625.	105.7
630.	108.6
635.	106.5
640.	106.
645.	108.3
650.	106.7
655.	107.6
660.	109.
665.	108.

670.	105.5
675.	110.2
680.	106.8
685.	106.8
690.	107.2
695.	107.6
700.	108.1
705.	107.5
710.	107.
715.	105.5
720.	107.
725.	107.4
730.	108.4
735.	106.4
740.	107.4
745.	107.4
750.	109.3
755.	108.8
760.	107.8
765.	107.3
770.	108.8
775.	109.3
780.	109.8
785.	107.9
790.	108.4
795.	108.4
800.	108.4
805.	108.4
810.	108.9
815.	108.4
820.	108.4
825.	107.4
830.	108.
835.	107.
840.	108.4
845.	108.9
850.	108.5
855.	109.5
860.	108.1
865.	107.6
870.	107.1
875.	109.1
880.	107.2
885.	108.2
890.	109.2
895.	108.3
900.	108.8
905.	108.4
910.	109.8
915.	108.4
920.	107.4
925.	108.9

930.	109.9
935.	109.5
940.	109.
945.	109.1
950.	107.7
955.	110.1
960.	109.6
965.	109.7
970.	109.2
975.	110.2
980.	108.2
985.	109.2
990.	109.2
995.	109.7
1000.	108.8

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.02863	ft^2/min
S	4.5E-05	
1/B	0.003	ft^{-1}

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
T	0.02863	0.0006371	ft^2/min
S	4.5E-05	not estimated	
1/B	0.003	0.0002007	ft^{-1}

Parameter Correlations

	T	1/B
T	1.00	-0.92
1/B	-0.92	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 3.649E+05 ft^2
Variance..... 455. ft^2

Std. Deviation..... 21.33 ft
Mean ..... 1.559 ft
No. of Residuals ... 804
No. of Estimates ... 2