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Electromagnetic Borehole Flowmeter (EBF) Testing at the Southwest Plume Test Pad (U)

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EXECUTIVE SUMMARY

Multiple-well aquifer tests were recently conducted at the Southwest Plume Test Pad near the Burial Ground Complex (BGC) in accordance with the BGC Field Investigation Plan (WSRC, 1999). The pumping tests were performed in the Upper Three Runs and Gordon aquifers in February and March of 1999. The tests provide reliable estimates of horizontal conductivity averaged over aquifer thickness, and a relatively large horizontal zone of influence. Table 1 summarizes the results of WSRC (1999). To complement these results, Electromagnetic Borehole Flowmeter (EBF) testing using the 1" ID EBF was performed to determine the vertical variation of horizontal conductivity for SWP-300A, SWP-200C and SWP-100D.

EBF testing indicates significant heterogeneity over the tested screen zones (Figures 8, 10 and 12). At SWP-300A in the Gordon aquifer, two high conductivity zones separated by a low conductivity interval are observed in the lower half of the screen. Conductivity is relatively low in the upper half of the screen. At SWP-200C in the lower Upper Three Runs Aquifer (UTRA), two high conductivity zones separated by a low conductivity interval are observed in the middle of the screen zone. At SWP-100D in the upper UTRA, conductivity generally increases from top to bottom of the screen.

Regarding future deployments of the technology, experience at the Southwest Plume Test Pad (SPTP) confirms that the 1" ID EBF is preferred over the 1/2" ID EBF for dynamic testing. The 1" EBF has more than adequate sensitivity and practically eliminates bypass flow through the filter pack. Testing at the SPTP also revealed that the EBF packer cannot achieve a good seal against a wire wrap screen, which leads to flow bypassing the flowmeter between the casing and packer bellows. The raw EBF flow data were corrected for internal bypass flow by comparing the flow measured at screen joints, where a good seal was achieved, to adjacent flows. Other considerations being equal, slotted screen is preferred over wire wrap screen because a good seal can be achieved and bypass flow corrections avoided. Equipment failures and design deficiencies with the current EBF system continue to be a problem. A more reliable EBF system is needed for future deployments to be efficient.

Single-well aquifer testing performed concurrently with EBF testing was investigated as an possible alternative to reliance on prior multiple-well estimates of average horizontal conductivity or well efficiency. Single-well testing refers to conventional estimates of screen-average conductivity and estimates of subinterval conductivity using Cooper-Jacob analysis. As with all single-well testing, either approach depends on an uncertain estimate of well efficiency in the absence of prior multiple-well testing. Concurrent single-well aquifer testing was determined to be feasible in the field. Based on EBF testing in R-area and at the Southwest Plume Test Pad, conductivity estimates based on single-well testing alone have an uncertainty of roughly plus or minus a factor of 2. A prior multiple-well estimate of average conductivity is technically preferred, but concurrent single-well testing may be preferred overall considering the cost of multiple-well aquifer testing.

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Contents

Executive summary iii
Tables vi
Figures vii
Appendices viii
Introduction 1
Borehole flowmeter instrument 1
Borehole flowmeter testing 1
Borehole flowmeter analysis 2
Pre-test design 5
Time to reach quasi-steady flow 5
Bypass flow estimates 6
Field experience at the Southwest Plume Test Pad 7
Conductivity distribution results 7
SWP-300A 7
SWP-200C 9
SWP-100D 9
Average conductivity estimates 10
Prior multiple-well testing 10
Single-well testing concurrent with EBF testing 10
Alternative conductivity estimates using Cooper-Jacob analysis 11
Considerations and recommendations for future EBF deployment 12
1" versus 1/2" EBF for dynamic testing 12
Slotted versus wire wrap screen 12
Equipment issues 13
Feasibility of concurrent single-well aquifer testing 13
References 14

Tables

Table 1 SPTP well information 16
Table 2 Calibration data for the ½" ID EBF 17
Table 3 Calibration data for the 1" ID EBF 18
Table 4 Pre-test design calculations for SWP-300A 19
Table 5 Pre-test design calculations for SWP-200C 20
Table 6 Pre-test design calculations for SWP-100D 21
Table 7 Field data for SWP-300A 22
Table 8 Hydraulic conductivity calculations for SWP-300A at 1 ft increments 23
Table 9 Hydraulic conductivity calculations for SWP-300A at 2 ft increments 24
Table 10 Hydraulic conductivity calculations for SWP-300A at 5 ft increments 25
Table 11 Hydraulic conductivity calculations for SWP-300A at 10 ft increments 26
Table 12 Field data for SWP-200C 27
Table 13 Hydraulic conductivity calculations for SWP-200C at 2 ft increments 28
Table 14 Hydraulic conductivity calculations for SWP-200C at 6 ft increments 29
Table 15 Field data for SWP-100D 30
Table 16 Hydraulic conductivity calculations for SWP-100D at 1 ft increments 31
Table 17 Hydraulic conductivity calculations for SWP-100D at 3 ft increments 32
Table 18 Hydraulic conductivity calculations for SWP-100D at 7 ft increments 33
Table 19 Comparison of average conductivity estimates 34

Figures

Figure 1 Schematic diagram of the Electromagnetic Borehole Flowmeter; reproduced from Molz and Young (1993) 35

Figure 2 Electromagnetic Borehole Flowmeter (EBF) application of Faraday's Law of Induction; reproduced from Molz and Young (1993) 36

Figure 3 Calibration data and curve for the ½" ID EBF 37

Figure 4 Calibration data and curve for the 1" ID EBF 37

Figure 5 Schematic illustration of borehole flowmeter testing; reproduced from Molz and Young (1993) 38

Figure 6 Basic geometry and analysis of borehole flowmeter data; reproduced from Molz and Young (1993) 39

Figure 7 Ambient flow measurements for SWP-300A 40

Figure 8 Estimated relative hydraulic conductivity profile for SWP-300A at 1, 2, 5 and 10 ft resolutions 40

Figure 9 Ambient flow measurements for SWP-200C 41

Figure 10 Estimated relative hydraulic conductivity profile for SWP-200C at 2 and 6 ft resolutions 41

Figure 11 Ambient flow measurements for SWP-100D 42

Figure 12 Estimated relative hydraulic conductivity profile for SWP-100D at 1, 3 and 7 ft resolutions 42

Figure 13 Comparison of EBF relative conductivity profiles to natural gamma log 43

Figure 14 Time-drawdown data and single-well conductivity estimates for SWP-300A 44

Figure 15 Time-drawdown data and single-well conductivity estimates for SWP-200C 45

Figure 16 Time-drawdown data and single-well conductivity estimates for SWP-100D 46

Figure 17 Unaltered and smoothed water level transducer data for SWP-300A 47

Figure 18 Unaltered and smoothed water level transducer data for SWP-200C 47

Figure 19 Unaltered and smoothed water level transducer data for SWP-100D 48

Appendices

Appendix A Time-drawdown data for SWP-300A A-1
Appendix B Time-drawdown data for SWP-200C..... B-1
Appendix C Time-drawdown data for SWP-100D C-1

Introduction

Multiple-well aquifer tests were recently conducted at the Southwest Plume Test Pad (SPTP) near the Burial Ground Complex (BGC) in accordance with the BGC Field Investigation Plan (WSRC, 1999). The pumping tests were performed in the Upper Three Runs and Gordon aquifers in February and March of 1999. The tests provide reliable estimates of horizontal conductivity averaged over aquifer thickness, and a relatively large horizontal zone of influence. Table 1 summarizes the results of WSRC (1999). To complement these results, Electromagnetic Borehole Flowmeter (EBF) testing was performed to determine the vertical variation of horizontal conductivity about the average determined from the conventional aquifer testing. This report introduces the borehole flowmeter concept and EBF instrument, summarizes field and calculation procedures, presents EBF test results for 3 SPTP wells, and provides recommendations for future application of the technology.

Borehole flowmeter instrument

The term "borehole flowmeter" in this report refers to any instrument that measures the *vertical* flow inside a well casing. Various types of borehole flowmeters have been used in field applications, including heat pulse, tracer release and impeller (spinner) designs. Researchers at the Tennessee Valley Authority (TVA) developed, patented and commercialized a robust, highly-sensitive, borehole flowmeter based on electromagnetic principles. The Electromagnetic Borehole Flowmeter operates according to Faraday's Law of Induction, which states that the voltage induced by a conductor moving at right angles through a magnetic field is directly proportional to the velocity of the moving conductor (Waldrop, 1995). Schematic diagrams of the EBF are shown in Figures 1 and 2 (Molz and Young, 1993). Groundwater acts as the moving conductor, an electromagnet generates the magnetic field, and electrodes measure the induced voltage. The ½" ID EBF has a threshold flowrate of about 5 mL/min, which is 1000 times more sensitive than the typical impeller flowmeter. Flowrates up about 10 L/min can be measured, giving the ½" ID EBF outstanding range. The 1" ID EBF can measure flows from about 40 mL/min to 40 L/min (Waldrop, 1995). Both the ½" and 1" EBF instruments were used for aquifer testing at the SPTP site. Calibration data for both EBF instruments are provided in Tables 2 and 3 and Figures 3 and 4. The calibration curves are developed in Flach and others (2000).

Borehole flowmeter testing

The idea behind borehole flowmeter testing is to relate horizontal conductivity as a function of elevation, K(z), to borehole discharge as a function of elevation Q(z). The field procedure is schematically illustrated in Figure 5 (Molz and Young, 1993). Under quasi-steady pumping conditions, borehole discharge (Q) from the bottom of the screen up to the current flowmeter position is measured as a function of elevation (z). As shown in Figure 6, the difference (ΔQ) in borehole discharge Q(z) between at any two locations is the flowrate of groundwater entering the well casing over that interval. This differential flowrate, minus any ambient flow effects, is proportional to the horizontal

conductivity of the aquifer over that interval. Ambient flow refers to horizontal flow through the well screen and vertical flow in the casing under natural, undisturbed conditions. In order to rigorously account for potential ambient flow effects, the standard borehole flowmeter test procedure actually involves two series of measurements:

1) under ambient conditions, measure the vertical flowrate inside the well screen at 1 to 2 ft intervals,

2) pump (or inject) at a constant rate above the screen zone and borehole flowmeter,

3) pause until the drawdown becomes quasi-steady-state,

4) under these quasi-steady-state pumping conditions, again measure the vertical flowrate inside the well screen at 1 to 2 ft intervals.

The quasi-steady conditions referred to in step 3) typically occur within 15 to 30 minutes in confined aquifers, and a couple of hours in unconfined aquifers (Flach and others, 2000). The ambient flow data is also useful by itself for determining the direction(s) of vertical head gradients in the surrounding aquifer, which has contaminant monitoring implications discussed by Flach and others (2000).

Borehole flowmeter analysis

Molz and others (1989) and Molz and Young (1993) present two methods for estimating the vertical variation of horizontal conductivity from field measurements of borehole discharge as a function of depth, such as those provided by the EBF (see also Rehfeldt and others (1989)). Both methods assume a fully-penetrating well in a confined aquifer. The first method applies the Cooper-Jacob (1946) method to individual sub-intervals of the well screen to estimate conductivity as a function of vertical position. Alternatively, the relative variation of horizontal conductivity about vertically-averaged K can be directly related to the EBF measurements of borehole discharge as a function of depth. If the vertical average is known or can be estimated by other means (e.g. pumping test), then the conductivity profile can be determined. The first method produces conductivity estimates from EBF test data alone, but involves a number of uncertain parameters. The second method is simpler and more precise, but requires an independent estimate of average conductivity. At the Southwest Plume Test Pad, a conventional pumping test result is available for each EBF tested well. Therefore, the second approach presented by Molz and Young (1993) is preferred for the present application. Nevertheless, both methods are presented in order to later compare methods.

As discussed previously, the field procedure involves measuring the vertical flowrate within the well casing at regular intervals, typically every 1 to 2 ft, first under ambient conditions and then under pumping conditions. The difference between any two readings is the flow entering the well between the two corresponding elevations. A negative value implies that flow is leaving the well. To develop the first method, the Cooper-Jacob equation is applied to each layer as

$$\Delta h_i(r_w, t) = \frac{(\Delta Q_i - \Delta q_i)}{2\pi K_i \Delta z_i} \ln\left(\frac{1.5}{r_w}\sqrt{\frac{K_i \Delta z_i t}{S_{si}\Delta z_i}}\right) \quad (1)$$

where

$\Delta h_i \equiv$ drawdown

$\Delta Q_i - \Delta q_i \equiv$ net differential flow

$\Delta Q_i \equiv$ difference in EBF flow at the top and bottom of the i^{th} interval under *pumping* conditions

$\Delta q_i \equiv$ difference in EBF flow at the top and bottom of the i^{th} interval under *ambient* conditions

$K_i \equiv$ horizontal conductivity of i^{th} layer

$\Delta z_i \equiv$ thickness of i^{th} layer

$r_w \equiv$ well bore radius

$t \equiv$ elapsed time

$S_{si} \equiv$ specific storage of i^{th} layer

Assuming negligible borehole flowmeter losses under low flow conditions, each layer experiences the same measured drawdown, Δh. The numerical simulations of Javendel and Witherspoon (1969) indicate that the transient drawdown responses of layers in a heterogeneous aquifer quickly merge into a common response described by the Theis solution using averaged aquifer properties. This observation suggests that each layer effectively behaves as if it has the hydraulic diffusivity of the entire aquifer:

$$\frac{K_i \Delta z_i}{S_{si}\Delta z_i} = \frac{T}{S} = \nu \quad (2)$$

In this expression

$\nu \equiv$ hydraulic diffusivity of the entire aquifer

$T \equiv$ transmissivity of the entire aquifer

$S \equiv$ storage coefficient (storativity) of the entire aquifer

With this assumption, one of two proposed by Molz and others (1989), equation (1) becomes after solving for K_i

$$K_i = \frac{(\Delta Q_i - \Delta q_i)}{2\pi \Delta z_i \Delta h} \ln\left(\frac{1.5}{r_w}\sqrt{\frac{Tt}{S}}\right) \tag{3}$$

With a prior estimate of aquifer diffusivity (T/S), equation (3) provides a direct estimate of horizontal conductivity for the i^{th} layer. Fortunately, the Cooper-Jacob estimate is not highly sensitive to the assumed value of T/S for large times, because diffusivity appears within a square-root and logarithm. However, well inefficiencies introduce significant uncertainty in the drawdown experienced by the formation, Δh.

The data analysis procedure for the second method presented by Molz and Young (1993) is summarized by

$$\frac{K_i}{\overline{K}} = \frac{(\Delta Q_i - \Delta q_i)/\Delta z_i}{\sum_i (\Delta Q_i - \Delta q_i) \Big/ \sum_i \Delta z_i} \tag{4}$$

where

$K_i \equiv$ horizontal conductivity of the i^{th} interval

$\overline{K} \equiv$ vertically-averaged conductivity

$\Delta Q_i \equiv$ difference in EBF flow at the top and bottom of the i^{th} interval under *pumping* conditions

$\Delta q_i \equiv$ difference in EBF flow at the top and bottom of the i^{th} interval under *ambient* conditions

$\Delta z_i \equiv$ height of the i^{th} interval.

In equation (4), $(\Delta Q_i - \Delta q_i)$ is the net flowrate induced by pumping and accounts for ambient flow effects. Note that the relative conductivity distribution is equal to the relative distribution of net flow entering the well, which is assumed to occur after the initial transient passes and quasi-steady conditions develop. The basis for this assumption is considered in detail by Flach and others (2000).

Both methods, summarized by equations (3) and (4), assume that flow approaching the well is horizontal and driven by a vertically-uniform radial head gradient. Any deviations from this assumption in the flow field will introduce systematic biases in the relative conductivity profile computed from either equation. Therefore, pre-testing consideration should be given to identifying, and minimizing if possible, any conditions that will violate the above assumption. For example, non-horizontal flow will occur in an unconfined aquifer if the drawdown is significant, but can be minimized by pumping at a small rate. A partially-penetrating well screen would also create vertical flows. More subtle sources of vertical flow leading to systematic errors are 1) transient effects in the

presence of aquifer heterogeneity, 2) a high conductivity filter pack, and 3) head losses across the EBF. Flach and others (2000) further discuss each type of systematic error.

Pre-test design

Pre-test design calculations were performed to ensure quasi-steady flow conditions would be achieved before EBF testing started, and to minimize systematic errors related to head losses across the EBF, such as bypass flow.

Time to reach quasi-steady flow: Conductivity profiles estimated from equations (3) or (4) depend on the flow having reached quasi-steady conditions. Four possible criteria for defining the elapsed time required after pumping to achieve quasi-steady conditions have been identified by Flach and others (2000, eqns. (10), (13), (14) and (15)). They are summarized by

$$t_D = \frac{4Tt}{Sr_w^2} = \frac{4\nu t}{r_w^2} > 4\times10^2 \text{ to } 4\times10^3 \tag{5}$$

$$t_D > 1000\,\frac{1+\nu_2/\nu_1}{2} \tag{6}$$

$$t_D > 10^2\left(\frac{r_i}{r_w}\right)^2 \tag{7}$$

$$t_D > 10^6 \tag{8}$$

where

$t \equiv$ elapsed time

$T \equiv$ transmissivity of the entire aquifer

$S \equiv$ storage coefficient (storativity) of the entire aquifer

$\nu \equiv$ hydraulic diffusivity (T/S)

$r_w \equiv$ well bore radius

$r_i \equiv$ influence radius

and the subscripts 1 and 2 refer to the least and most hydraulically diffusive intervals ($\nu_2/\nu_1>1$). The latter three estimates tend to be more conservative. The safest strategy to minimize systematic errors due to transient effects is to wait as long as practical after pumping starts before taking borehole flow measurements. Dr. Fred Molz recommends waiting at least 30 minutes after pumping before starting borehole flowmeter testing (Molz, 2000).

Tables 4 through 6 evaluate the four criteria for SWP-300A, SWP-200C and SWP-100D. In these tables, the "Ruud and Kabala (1996)" criterion refers to equation (6), "Molz and others (1989)" to equation (7), "Rehfeldt and others (1989)" to equation (5), and "Flach" refers to equation (8). Among these, criterion (6) based on Ruud and Kabala (1996) is preferred because it has a more rigorous basis than equations (5) and (7) and avoids the probable over-conservatism of equation (8). A reasonable assumption for diffusivity contrast is 100:1, considering that flows associated with intervals with conductivity lower than 1/100 of the most permeable layer cannot be accurately measured. In evaluating hydraulic diffusivity (T/S), the transmissivity (T) and storage coefficient (S) estimates are based on the pumping tests of WSRC (1999, Table 5-1). Storage coefficients from pumping tests are more uncertain than transmissivity estimates for a heterogeneous aquifer (Meier and others, 1998; Sanchez-Vila and others, 1999). Therefore, the diffusivity estimates have similar uncertainty as the storage coefficient estimates.

The pre-test analysis indicates that quasi-steady flow conditions will conservatively occur within a minute or two for SWP-300A (Table 4), and within 30 minutes for SWP-200C (Table 5). These wells are in confined aquifer zones that have a high hydraulic diffusivity compared to unconfined aquifers (Table 1). SWP-100D is in the unconfined upper UTRA, which has low hydraulic diffusivity. Therefore, significantly longer times are required to reach quasi-steady conditions, as shown in Table 6. Assuming less conservative values for diffusivity contrast (e.g. 10:1), influence radius (e.g. 2 ft) and/or non-dimensional time (t_D = 4000) than for SWP-300A and SWP-200C produces an elapsed time under 2 hours for SWP-100D. This elapsed time is feasible for a single day test.

Bypass flow estimates: Head losses across the EBF during pumping can introduce significant errors in the hydraulic conductivity profile calculated from equations (3) or (4). Head loss causes some flow to bypass the EBF by through the formation and filter pack, and reduces the drawdown experienced by the formation below the EBF.

Bypass flow is undesirable because the EBF measures only a fraction of the flow leaving the aquifer below the instrument position, generally leading to an under-estimate of the actual conductivity. The exception occurs at the uppermost screen interval, when the EBF passes the top of the screen. Lacking screen above the EBF, bypass flow suddenly ceases and all flow must now pass through the meter. The sudden increase in differential flow for the top interval produces an anomalous high K estimate.

Reduced drawdown below the EBF are undesirable because equations (3) and (4) assume that the aquifer is exposed to the same drawdown over the entire well screen length. When the head loss caused by flow through the EBF is significant compared to the imposed drawdown, significant biases are introduced in the calculated relative conductivity profile. Dinwiddie and others (1999) demonstrated for a well without a filter pack that the lower three-quarters of the computed K profile is biased low while the upper quarter is biased high by a greater amount. They termed the phenomenon "head-loss-induced flow redistribution" and showed that the bias increases with increasing aquifer conductivity for the same pumping rate.

Bypass flow calculations for the 1/2" and 1" EBF and various flowrates are included in the pre-test calculations shown in Tables 4 through 6. The basis for the calculations is discussed in Flach and others (2000). Head losses can be practically eliminated by using the 1" ID EBF, or the 1/2" ID EBF at much lower flowrates. The estimated bypass flowrate using the 1" EBF is 1% of total flow at the top of the screen for pumping rates of 20, 15 and 15 L/min for SWP-300A, SWP-200C and SWP-100D respectively. Head losses for the 1/2" EBF can be made small at practical pumping rates, but remain significant. For example, bypass flow is 5% of total flow using the 1/2" EBF and a pumping rate of 4 L/min for SWP-200C. These pre-test calculations suggest that EBF testing be conducted using the 1" EBF and at pumping rates below 15-20 L/min (4-5 gpm).

Field experience at the Southwest Plume Test Pad

In addition to deploying the EBF, a conventional single-well pumping test was concurrently performed by using a pressure transducer and data logger to monitor drawdown before and during EBF testing. The time-drawdown data from pumping wells can be used to estimate average hydraulic conductivity independent of the prior multiple-well testing (WSRC, 1999). The purpose was to explore the feasibility of concurrent EBF and single-well pumping tests as a way to avoid the need for a prior estimate of average conductivity.

Prior EBF testing in D-area and R-area involved slotted well screens. The SWP wells have wire wrap screens with longitudinal ribs inside the screen. These internal ribs prevented a tight seal with the EBF packer and resulted in unanticipated and significant bypass flow inside the well casing. This bypass flow is in addition to flow bypassing the EBF outside the screen as discussed previously. Modifications to the normal calculation procedure were necessary to compensate, as discussed later in the report. Differential pressure between the packer and groundwater was held constant to ensure that bypass flow would be proportionally the same at all elevations.

Ambient flow testing was performed using the 1/2" EBF for greater sensitivity, and the 1" EBF was generally used for dynamic testing to minimize head loss. An electrical failure occurred with the 1" EBF during dynamic testing at SWP-200C. Testing with the 1" EBF was abandoned and restarted the next day with the 1/2" EBF at a lower flowrate. Unfortunately, head losses across the 1/2" EBF were significantly larger than for the 1" EBF, even at the lower pumping rate. The increased head loss caused large bypass flow between the packer bellows and the wire wrap screen.

Conductivity distribution results

Relative hydraulic conductivity profiles can be estimated from EBF ambient and dynamic flow data using equation (4). These results and interpretation of the ambient flow data are presented for each SWP well below.

SWP-300A: SWP-300A is a 4 inch well with a fully-penetrating 40 ft screen in the Gordon aquifer. The EBF field data for SWP-300A are presented in Table 7. Ambient

and dynamic testing were performed at 1 ft intervals. Dynamic testing began 32 minutes after pumping, which easily exceeds the pre-test criteria for quasi-steady flow of 2 minutes (Table 4). The occurrence of bypass flow between the packer bellows and wire wrap screen is evident in both the ambient and dynamic testing results from measurements taken near joints between screen sections. At the joint between two screen sections, a good seal was apparently achieved with the EBF packer. Significantly higher flows were recorded during dynamic testing at 10 ft intervals corresponding to screen section joints. Comparing measured flow at a joint to the average of flows just above and below the joint indicate that the EBF measured approximately 70% of total discharge and 30% bypassed the EBF.

The field data are analyzed at 1, 2, 5 and 10 ft resolutions in Tables 8 through 11. Analysis of the data at intervals greater than 1 ft reduces noise/uncertainty in the relative conductivity profile, at the expense of resolution. The calculations at a 10 ft interval have the added benefit of eliminating the need to correct for internal bypass flow, because only measurements at screen joints are involved.

Column (4) in Tables 8 through 11 lists flow inside the well casing under ambient conditions, measured as a function position with the EBF. A positive value indicates upward flow, and a negative value corresponds to downward flow. The ambient flow data have not been adjusted to account for internal bypass flow because conductivity characterization is the main objective of this study and the ambient flows are insignificant compared to dynamic flows. Fortunately, the data at 10 ft intervals require no correction and can be interpreted at face value. Overall the ambient data at 10 ft increments indicate downward flow through the casing due to a downward head gradient in the aquifer (column (4) of Table 11). Column (5) lists differential ambient flow, computed as the difference between adjacent EBF measurements. In this column, a positive value means groundwater is entering the casing (leaving the aquifer) while a negative value means water is flowing out the screen (entering the aquifer). These data are plotted in Figure 7. For SWP-300A, groundwater is observed to enter the casing over the upper three-quarters of the screen and leave over the bottom quarter.

The non-dimensional or relative hydraulic conductivity distribution, K_i/K, based on EBF data alone is shown in column (15) (column (13) in Table 11). The negative values observed at 1 and 2 ft analysis resolution are not physically possible of course. Negative values of K_i/K, are generally the result of measurement errors and non-ideal test conditions. Expanding on the latter, any artificial reduction in EBF flow when the instrument is passing by a low permeability interval can cause a negative differential net flow in column (11) (column (9) in Table 11). Examples include a reduction in pump flowrate, which is assumed to be constant in the analysis, and increased flow bypassing the EBF internally or through the filter pack, which also reduces EBF measured flow. These reductions in EBF measured flow are typically small, but can overwhelm the true differential net flow from the aquifer over an interval if the permeability is low. Therefore, negative values should simply be interpreted as a low permeability zone, and/or an artifact of varying internal bypass flow. At the coarser 5 and 10 ft resolutions,

conductivities are all positive. The amount of flow bypassing the EBF through the filter pack is estimated to be negligible.

The relative conductivity profile for SWP-300A is plotted in Figure 8 for 1, 2, 5 and 10 ft intervals. Values greater than 1 correspond to greater than average conductivity, and vice versa. Two high conductivity zones separated by a low conductivity interval are observed in the lower half of the screen. Conductivity is relatively low in the upper half of the screen.

SWP-200C: SWP-200C is a 6 inch well with a fully-penetrating 60 ft screen in the lower UTRA. The EBF field data for SWP-200C are presented in Table 12. Ambient testing was performed at 1 ft intervals using the 1/2" EBF. Subsequent dynamic testing was performed at 2 ft intervals to save time, also using the 1/2" EBF due to equipment failure with the 1" EBF. Dynamic testing began 37 minutes after pumping, which exceeds the pre-test criteria for quasi-steady flow of 30 minutes (Table 5). Apparently none of the test elevations aligned with a joint between screens, as intermediate high flows were not observed as with SWP-300A. However, measured flow increased abruptly as the EBF passed the top of screen in going from a depth of 92.5 to 90.5 ft. At this point the measured EBF flow was only 11% of the total, compared to about 70% for SWP-300A. The increased internal bypass flow is a result of greater head loss associated with the 1/2" EBF.

The field data are analyzed at 2 and 6 ft resolutions in Tables 13 and 14. Analysis of the data at 6 ft intervals reduces noise/uncertainty in the relative conductivity profile, at the expense of resolution. The ambient flow data have not been adjusted to account for internal bypass flow because conductivity characterization is the main objective of this study and the ambient flows are insignificant compared to dynamic flows. Nevertheless, differential ambient flow at a 6 ft resolution is plotted in Figure 9. Roughly speaking, flow enters the upper portion of the screen and exits the lower portion, consistent with a downward head gradient. The non-dimensional or relative hydraulic conductivity distribution, K_i/K, based on EBF data alone is shown in column (15) of both tables. The presence of significant negative conductivities in the upper portion of the screen suggests significant measurement errors along that portion of the screen. The relative conductivity profile for SWP-200C is plotted in Figure 10 for 2 and 6 ft intervals. Values greater than 1 correspond to greater than average conductivity, and vice versa. Two high conductivity zones separated by a low conductivity interval are observed in the middle of the screen zone. Bypass flow through the filter pack is non-negligible, as shown by column (20) in the tables.

SWP-100D: SWP-100D is a 6 inch well with a fully-penetrating 30 ft screen in the upper UTRA. The EBF field data for SWP-100D are presented in Table 15. Ambient testing was performed at 1 ft intervals using the 1/2" EBF. Dynamic testing was performed at 1 ft intervals using the 1" EBF. Dynamic testing was performed between 76 and 145 minutes after pumping, which is generally shorter than the pre-test objective 2 hours (Table 6). Therefore some bias due to transient effects is probable. At a TOC depth of 67.8 ft, the EBF apparently aligned with a joint between screens, as measured flow

increased abruptly compared to the test stations immediately above and below. At this point the measured EBF flow was estimated to be 48% of the total.

The field data are analyzed at 1, 3 and 7 ft resolutions in Tables 16 through 18. As before the ambient flow data have not been adjusted to account for internal bypass flow. Nevertheless, differential ambient flow at a 7 ft resolution is plotted in Figure 11. The result appears to be non-physical in that flow is only shown entering the screen. Under steady conditions, this is impossible. Measurement error, or possibly a rising water table, are probably the cause. The non-dimensional or relative hydraulic conductivity distribution, K_i/K, based on EBF data alone is shown in column (15) of the tables. Some negative values of conductivity are observed at a 1 ft resolution, but not the coarser resolutions. The relative conductivity profile for SWP-100D is plotted in Figure 12 for 1, 3 and 7 ft intervals. Values greater than 1 correspond to greater than average conductivity, and vice versa. Conductivity generally increases from top to bottom of the screen. Bypass flow through the filter pack is negligible, as shown by column (20) in the tables.

Comparison to natural gamma log: Figure 13 compares the relative hydraulic conductivity profiles derived from EBF testing to a natural gamma log from nearby borehole SWP01SB. Intervals of low gamma response tend to correlate with intervals of high hydraulic conductivity, consistent with the presence of sandy sediment. However, reproducing in detail the conductivity variation inferred from EBF testing is not feasible. The comparison illustrates the value of EBF testing when accurate knowledge of conductivity variations is needed.

Average conductivity estimates

Dimensional conductivity profiles can be obtained by multiplying the relative conductivity profile from EBF testing (e.g. Figures 8, 10 and 12) by an independent estimate of average conductivity over the screen zone. The SWP wells are fully-penetrating, so the screen-average conductivity is synonymous with formation-average conductivity. Conductivity averaged over formation thickness can be estimated from multiple- or single-well aquifer testing.

Prior multiple-well testing: The results of prior multiple-well aquifer testing at the Southwest Plume Test Pad are presented by WSRC (1999) and summarized in Tables 1 and 19. These conductivity estimates are more reliable than single-well aquifer test results because well losses in the pumping well do not affect drawdowns in the observation wells. Tables 8-11, 13-14 and 16-18 incorporate these average conductivity estimates in the dimensional conductivity profiles.

Single-well testing concurrent with EBF testing: Single-well aquifer testing was performed concurrently with EBF testing to assess the feasibility of estimating average conductivity in this manner at sites where prior estimates are not available. Appendices A, B and C contain the water level transducer and barometric pressure data and plots for SWP-300A, 200C and 100D, respectively. Although well efficiencies are known from prior multiple-well testing (Table 1), these estimates are ignored in the present analysis so

that estimates independent of prior testing can be developed. Instead, the efficiency of each well is assumed to be 50%, a value judged to be representative of average conditions. Figures 14 through 16 illustrate time-drawdown data for each well, after applying the assumed well efficiency of 50%. The average transmissivity values listed in these figures were estimated using AQTESOLV using the type curve denoted in each figures. Only the early time data before EBF testing began are analyzed in these figures. Hence these single-well pumping tests were of short duration. Emphasis was placed on accurately fitting the longer times in each set of drawdown data to reduce the effects of well bore storage. The corresponding conductivity estimates, based on saturated formation thickness from Table 1, are compared to the prior multiple-well results in Table 19. Significant differences are observed between the multiple- and single-well test results, largely because the assumed well efficiency of 50% is inaccurate. This exercise illustrates the well-known difficulty in predicting conductivity from single-well aquifer tests.

Alternative conductivity estimates using Cooper-Jacob analysis

Horizontal conductivity can be estimated directly for individual screen intervals, provided the pumping rate is held constant (or is the superposition of constant pumping rates) and time-drawdown data are recorded in addition to EBF flowrates. Under these conditions, a Cooper-Jacob analysis can be applied to each screen interval as summarized by equation (3). Well losses can be introduced by modifying equation (3) as

$$K_i = \frac{(\Delta Q_i - \Delta q_i)}{2\pi \Delta z_i \Delta h E} \ln\left(\frac{1.5}{r_w}\sqrt{\frac{Tt}{S}}\right) \qquad (9)$$

where E is well efficiency, defined to be the theoretical drawdown divided by actual drawdown (Δh). If barometric pressure variations are significant, further adjustments to measured drawdown are needed. This approach replaces the need for a prior screen-average conductivity estimate, ideally from a separate multiple-well pumping test, with single-well pump testing conducted concurrently with EBF flow measurements. Being a form of single-well aquifer testing, the Cooper-Jacob analysis requires prior estimates for hydraulic diffusivity (T/S) and well efficiency (E). Transmissivity (T) can be determined iteratively from the layer estimates of conductivity (K_i). Therefore, storage coefficient (S) and well efficiency (E) are fundamentally required. Both are difficult to estimate with accuracy. However, the Cooper-Jacob estimate is not highly sensitive to the assumed value of storage coefficient for large times, because S appears within a square-root and logarithm in equation (9). Unfortunately, the same cannot be said for well efficiency because conductivity is inversely proportional to E. Therefore, EBF conductivity estimates from equation (9) have a level of uncertainty similar to conventional single-well pumping test estimates.

The conditions required for Cooper-Jacob analysis were satisfied during EBF testing at all 3 SWP wells. Barometric pressure was monitored, but did not vary substantially over the course of a 2 hour EBF test. Therefore, no barometric corrections to the time-drawdown data were made. Prior to EBF testing, water level changed smoothly with time. During

EBF testing, packer inflation and deflation, and movement of the EBF, caused artificial fluctuations in water level. Unlike the conventional single-well analysis discussed above, the Cooper-Jacob analysis is applied during EBF testing. Therefore the water level transducer data must be smoothed to remove these artifacts from the time-drawdown data. Figures 17 through 19 plot the water level transducer response in the unaltered and smoothed forms. At SWP-200C the flowrate was increased from about 4 L/min to about 7 L/min after 2 hours of pumping, creating an abrupt change in transducer pressure at that time. Borehole flowrates near the bottom of SWP-200C at a pumping rate of 4 L/min were too small to be resolved by the 1" EBF, so the pumping rate was increased. At SWP-100D the transducer was raised 2 ft near the end of EBF testing so that the pump and EBF could be raised as close as possible to the water level. The offset is accounted for by raising the smoothed tail of the unaltered transducer response by 2 ft. Tables 8-11, 13-14 and 16-18 use the smoothed drawdown data to compute dimensional conductivity profiles using the Cooper-Jacob analysis. For these calculations, well efficiency was assumed to be 50% as with conventional single-well testing. Specific storage coefficient were assumed to be 10^{-5} ft^{-1} for confined aquifers and 10^{-2} ft^{-1} for unconfined aquifers.

The Cooper-Jacob conductivity estimates are shown in the second half of the calculation tables. The ratio of the Cooper-Jacob estimate to the estimate based on prior multiple-well aquifer testing is shown in each table. The ratio varies little, which means that the relative conductivity variation is the practically the same between the two calculation methods. Similarly, the Cooper-Jacob estimates are averaged over the screen zone and compared to the prior multiple-well test result. The average Cooper-Jacob estimates are included in Table 19 for comparison to the prior multiple-well and conventional single-well aquifer test results. Significant differences are observed between the multiple-well and average Cooper-Jacob results, largely because the assumed well efficiency of 50% is inaccurate. When well efficiency and specific storage are based on the prior multiple-well aquifer tests (WSRC, 1999), the agreement is much improved.

Considerations and recommendations for future EBF deployment

Based on the experience gained at the Southwest Plume Test Pad, the following recommendations and considerations for future EBF deployments are stated.

1" versus 1/2" EBF for dynamic testing: As suggested by Flach and others (2000), the 1" EBF is clearly preferred over the 1/2" EBF for dynamic testing. The 1" EBF has more than adequate sensitivity and practically eliminates bypass flow through the filter pack.

Slotted versus wire wrap screen: The EBF packer cannot achieve a good seal against a wire wrap screen, which leads to undesirable internal bypass flow, even with the 1" EBF. The measured EBF flow can be corrected if measurements are taken at screen section joints and above the top of screen. At these locations a good seal is achieved and the measured flow provides a good reference for corrections to the surrounding data. Because of variations in the packer seal against a wire wrap screen, the corrections are imperfect and introduce noticeable noise in the relative conductivity profiles. The noise can be reduced by analyzing the data at a coarser resolution, but at the expense of also

smoothing out real conductivity variations. Other considerations being equal, slotted screen is preferred over wire wrap screen for the purpose of measuring flowrates with the EBF. If single-well aquifer testing is to be performed concurrently with EBF testing, a wire wrap screen might be more desirable from the standpoint of increased well efficiency however.

Equipment issues: The present EBF system has a number of shortcomings that should ideally be remedied before extensive, routine application of the technology at the SRS. Several deficiencies have been identified in Flach and others (2000) in reference to R-area EBF testing. At the Southwest Plume Test Pad, the 1" EBF failed electrically causing lost time and poorer quality results as a result of subsequently having to use the 1/2" EBF. A more reliable EBF system is needed.

Feasibility of concurrent single-well aquifer testing: Single-well aquifer testing performed concurrently with EBF testing was investigated as an possible alternative to reliance on prior multiple-well estimates of average horizontal conductivity or well efficiency. Single-well testing refers to conventional estimates of screen-average conductivity and estimates of subinterval conductivity using Cooper-Jacob analysis. As with all single-well testing, either approach depends on an uncertain estimate of well efficiency in the absence of prior multiple-well testing. Concurrent single-well aquifer testing was determined to be feasible in the field. Based on EBF testing in R-area and at the Southwest Plume Test Pad, conductivity estimates based on single-well testing alone have an uncertainty of roughly plus or minus a factor of 2. A prior multiple-well estimate of average conductivity is technically preferred, but concurrent single-well testing may be preferred overall considering the cost of multiple-well aquifer testing.

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Table 1 SPTP well information.

Well	*SRS N* (ft)	*SRS E* (ft)	*Pad Elevation* (ft msl)	*TOC Elev* (ft msl)	*Top of Screen* (ft msl)	*Bottom of Screen* (ft msl)	*Screen Length* (ft)	*Borehole Diameter* (in)	*Casing Diameter* (in)	*Filter Pack*	*Hydro-stratigraphic unit*	*Unit Thickness* (ft)	*Average Trans-missivity* (ft^2/d)	*Average Storativity* (unitless)	*Average Diffusivity (T/S)* (ft^2/d)	*Average Conductivity* (ft/d)	*Well efficiency* (%)
SWP-300A	75,133	52,936	268.69	271.19	105.69	65.68	40.01	8	4	FX-50	Gordon	43	2260	9.30E-04	2.4E+06	52.6	27
SWP-200C	75,129	52,947	268.87	270.82	179.42	119.43	59.99	10	6	FX-50	lower UTRA	65	96	6.82E-04	1.4E+05	1.48	76
SWP-100D	75,125	52,955	268.41	270.77	222.02	192.02	30.00	10	6	FX-50	upper UTRA	28.5	835	2.50E-01	3.3E+03	29.3	10

Sources: WSRC-RP-99-4069 and WSRC-RP-99-4073

Table 2 Calibration data for the 1/2" ID EBF.

	Calibration Data				Calculated Data					y = 0.0024x2 + 0.7838x		
Instrument Response	Water Temp (C)	Water Weight (lbs)	Time Duration (min)	Mass Flow (lbs/min)	Water Density (lb/ft^3)	Volume Flow (ft^3/min)	Volume Flow (Actual) (LPM)	Act-Inst Resp	% Error	Calibrated Meter Flow Rate	Act-Cal Mtr Flow	% Error
0.00							0	0.000		0.000	0.000	
0.029	21.5	0.685	10.00533	0.0685	62.2877	0.0011	0.0311	0.002	6.89	0.023	0.008	27.01
0.036	21.9	0.670	10.0065	0.0670	62.2826	0.0011	0.0304	-0.006	18.25	0.028	0.002	7.30
0.073	22.0	0.667	5.004333	0.1332	62.2813	0.0021	0.0606	-0.012	20.51	0.057	0.003	5.52
0.089	21.8	0.814	5.0035	0.1627	62.2839	0.0026	0.0740	-0.015	20.32	0.070	0.004	5.67
0.506	19.4	4.510	5.009167	0.9003	62.3135	0.0144	0.4091	-0.097	23.68	0.397	0.012	2.91
0.506	19.5	4.500	5.008333	0.8985	62.3123	0.0144	0.4083	-0.098	23.93	0.397	0.011	2.71
0.552	22.2	2.935	3.006833	0.9761	62.2787	0.0157	0.4438	-0.108	24.38	0.433	0.010	2.35
1.007	19.0	17.830	10.01183	1.7809	62.3181	0.0286	0.8092	-0.198	24.44	0.792	0.017	2.16
1.019	20.5	18.020	10.00867	1.8004	62.3003	0.0289	0.8183	-0.201	24.52	0.801	0.017	2.09
4.010	20.8	35.100	5.0065	7.0109	62.2966	0.1125	3.1867	-0.823	25.84	3.182	0.005	0.16
4.030	19.6	35.260	5.0085	7.0400	62.3111	0.1130	3.1992	-0.831	25.97	3.198	0.002	0.05
6.955	21.2	60.990	5.008333	12.1777	62.2916	0.1955	5.5357	-1.419	25.64	5.567	-0.032	0.57
9.860	21.2	52.470	3.0105	17.4290	62.2916	0.2798	7.9227	-1.937	24.45	7.962	-0.039	0.49
9.875	20.5	53.070	3.004667	17.6625	62.3003	0.2835	8.0278	-1.847	23.01	7.974	0.054	0.67
10.015	21.4	53.480	3.005833	17.7921	62.2890	0.2856	8.0881	-1.927	23.82	8.090	-0.002	0.03

Table 3 Calibration data for the 1" ID EBF.

	Calibration Data				Calculated Data					Calibrated Meter Flow y = 0.9797x + 0.1097		
Instrument Response	Water Temp (C)	Water Weight (lbs)	Time Duration (min)	Mass Flow (lbs/min)	Water Density (lb/ft^3)	Volume Flow (ft^3/min)	Volume Flow (Actual) (LPM)	Act-Inst Resp	% Error	Calibrated Meter Flow Rate (L/min)	Act-Cal Mtr Flow (L/min)	% Error
0.00							0	0.00		0.110	-0.110	
0.10	19.0	2.070	5.0065	0.4135	62.3181	0.0066	0.1879	0.09	46.77	0.208	-0.020	10.5
0.10	18.8	2.070	5.006	0.4135	62.3204	0.0066	0.1879	0.09	46.77	0.208	-0.020	10.5
0.10	19.0	2.075	5.0075	0.4144	62.3181	0.0066	0.1883	0.09	46.89	0.208	-0.019	10.3
1.00	22.2	7.255	3.0075	2.4123	62.2787	0.0387	1.0968	0.10	8.83	1.089	0.007	0.7
1.00	22.2	7.280	3.011	2.4178	62.2787	0.0388	1.0993	0.10	9.03	1.089	0.010	0.9
1.00	22.40	7.260	3.006667	2.4146	62.2760	0.0388	1.0979	0.10	8.92	1.089	0.009	0.8
10.02	19.2	66.290	3.0035	22.0709	62.3158	0.3542	10.0289	0.01	0.09	9.926	0.103	1.0
10.23	19.6	68.090	3.0035	22.6702	62.3111	0.3638	10.3020	0.07	0.70	10.132	0.170	1.7
10.40	19.8	68.800	3.005	22.8952	62.3087	0.3674	10.4047	0.00	0.04	10.299	0.106	1.0
20.12	19.2	130.060	3.004667	43.2860	62.3158	0.6946	19.6690	-0.45	2.29	19.821	-0.152	0.8
20.15	19.6	131.500	3.008333	43.7119	62.3111	0.7015	19.8640	-0.29	1.44	19.851	0.013	0.1
20.51	19.8	134.010	3.0075	44.5586	62.3087	0.7151	20.2495	-0.26	1.29	20.203	0.046	0.2
30.00	19.6	161.780	2.509	64.4799	62.3111	1.0348	29.3016	-0.70	2.38	29.501	-0.199	0.7
30.15	19.8	162.290	2.505667	64.7692	62.3087	1.0395	29.4342	-0.72	2.43	29.648	-0.213	0.7
30.30	20.0	163.240	2.5075	65.1007	62.3063	1.0448	29.5860	-0.71	2.41	29.795	-0.209	0.7
35.00	20.0	150.470	2.004167	75.0786	62.3063	1.2050	34.1206	-0.88	2.58	34.399	-0.279	0.8
35.00	19.8	150.510	2.005167	75.0611	62.3087	1.2047	34.1113	-0.89	2.61	34.399	-0.288	0.8
35.00	20.0	156.560	2.007833	77.9746	62.3063	1.2515	35.4367	0.44	1.23	34.399	1.038	2.9

Table 4 Pre-test design calculations for SWP-300A.

Pretest criteria for valid EBF application (pseudo-steady state & minimal bypass flow)

Site SWP-300A

Formation properties

estimated K (ft/d)	52.6
estimated S_s (1/ft)	2.2E-05
thickness b (ft)	43
estimated T (ft^2/d)	2261.8
estimated S	9.3E-04
diffusivity ν = T/S (ft^2/d)	2.4E+06

Well properties

borehole diameter (in)	8
Casing diameter (in)	4
Borehole radius (in)	4
Casing radius (in)	2
Borehole radius (m)	0.1016
Casing radius (m)	0.0508
Annulus area (m^2)	0.024
Annulus thickness (cm)	5.08
Filter pack conductivity (m/d)	100

EBF properties

L_{EBF} (m)	0.178

Bypass properties

ΔL (m)	0.079
L (m)	0.257

Ruud and Kabala (1996) pseudo-steady criterion

1.0E+03 Non-dimensional time, t_D

Diffusivity contrast	Time, t (d)	Time, t (hr)	Time, t (min)	Time, t (s)
1:1	0.0	0.0	0.0	1.0
10:1	0.0	0.0	0.1	5.4
100:1	0.0	0.0	0.8	50.0
1000:1	0.0	0.1	8.3	495.6

Molz and others (1989) pseudo-steady criterion

(but using assumed influence radius per personal comm.)

1.0E+02 Non-dimensional time, t_D

Influence radius, r (ft)	Time, t (d)	Time, t (hr)	Time, t (min)	Time, t (s)
1	0.0	0.0	0.0	0.9
2	0.0	0.0	0.1	3.6
5	0.0	0.0	0.4	22.3
10	0.0	0.0	1.5	89.1
20	0.0	0.1	5.9	356.4

Rehfeldt and others (1989) and Flach criteria

Non-dimensional time, t_D	Time, t (d)	Time, t (hr)	Time, t (min)	Time, t (s)	
4.0E+02	0.0	0.0	0.0	0.4	10:1
4.0E+03	0.0	0.0	0.1	4.0	100:1
4.0E+04	0.0	0.0	0.7	39.6	r/b<0.125
1.0E+06	0.0	0.3	16.5	990.1	long time

Bypass flow estimate

		1/2" EBF		***1" EBF***	
Pumping rate, QP (L/min)	Pumping rate, QP (gal/min)	Bypass (L/min)	Ratio	Bypass (L/min)	Ratio
0.2	0.05	0.00	0.8%	0.00	0.1%
0.5	0.13	0.01	1.1%	0.00	0.1%
1	0.26	0.01	1.4%	0.00	0.1%
2	0.53	0.04	2.2%	0.00	0.1%
5	1.32	0.23	4.6%	0.01	0.3%
10	2.64	0.86	8.6%	0.05	0.5%
20	5.28	3.29	16.4%	0.21	1.0%
20	5.28	3.29	16.4%	0.21	1.0%

Table 5 Pre-test design calculations for SWP-200C.

Pretest criteria for valid EBF application (pseudo-steady state & minimal bypass flow)

Site SWP-200C

Formation properties

estimated K (ft/d)	1.48
estimated S_s (1/ft)	1.0E-05
thickness b (ft)	65
estimated T (ft^2/d)	96.2
estimated S	6.8E-04
diffusivity ν = T/S (ft^2/d)	1.4E+05

Well properties

borehole diameter (in)	10
Casing diameter (in)	6
Borehole radius (in)	5
Casing radius (in)	3
Borehole radius (m)	0.1270
Casing radius (m)	0.0762
Annulus area (m^2)	0.032
Annulus thickness (cm)	5.08
Filter pack conductivity (m/d)	100

EBF properties

L_{EBF} (m)	0.178

Bypass properties

ΔL (m)	0.079
L (m)	0.257

Ruud and Kabala (1996) pseudo-steady criterion

1.0E+03	Non-dimensional time, t_D			
Diffusivity contrast	Time, t (d)	Time, t (hr)	Time, t (min)	Time, t (s)
1:1	0.0	0.0	0.4	26.4
10:1	0.0	0.0	2.4	144.9
100:1	0.0	0.4	22.2	1330.7
1000:1	0.2	3.7	219.8	13188.9

Molz and others (1989) pseudo-steady criterion

(but using assumed influence radius per personal comm.)

1.0E+02	Non-dimensional time, t_D			
Influence radius, r (ft)	Time, t (d)	Time, t (hr)	Time, t (min)	Time, t (s)
1	0.0	0.0	0.3	15.2
2	0.0	0.0	1.0	60.7
5	0.0	0.1	6.3	379.5
10	0.0	0.4	25.3	1517.8
20	0.1	1.7	101.2	6071.4

Rehfeldt and others (1989) and Flach criteria

Non-dimensional time, t_D	Time, t (d)	Time, t (hr)	Time, t (min)	Time, t (s)	
4.0E+02	0.0	0.0	0.2	10.5	10:1
4.0E+03	0.0	0.0	1.8	105.4	100:1
4.0E+04	0.0	0.3	17.6	1054.1	r/b<0.125
1.0E+06	0.3	7.3	439.2	26351.4	long time

Bypass flow estimate

		1/2" EBF		***1" EBF***	
Pumping rate, QP (L/min)	Pumping rate, QP (gal/min)	Bypass (L/min)	Ratio	Bypass (L/min)	Ratio
0.2	0.05	0.00	1.1%	0.00	0.1%
0.5	0.13	0.01	1.4%	0.00	0.1%
1	0.26	0.02	1.9%	0.00	0.1%
2	0.53	0.06	3.0%	0.00	0.2%
5	1.32	0.31	6.1%	0.02	0.4%
10	2.64	1.14	11.4%	0.07	0.7%
20	5.28	4.38	21.9%	0.27	1.4%
15	3.96	2.50	16.7%	0.16	1.0%
4	1.06	0.20	5.1%	0.01	0.3%

Table 6 Pre-test design calculations for SWP-100D.

Pretest criteria for valid EBF application (pseudo-steady state & minimal bypass flow)

Site SWP-100D

Formation properties

estimated K (ft/d)	29.3
estimated S_s (1/ft)	8.8E-03
thickness b (ft)	28.5
estimated T (ft^2/d)	835
estimated S	2.5E-01
diffusivity ν = T/S (ft^2/d)	3.3E+03

Well properties

borehole diameter (in)	10
Casing diameter (in)	6
Borehole radius (in)	5
Casing radius (in)	3
Borehole radius (m)	0.1270
Casing radius (m)	0.0762
Annulus area (m^2)	0.032
Annulus thickness (cm)	5.08
Filter pack conductivity (m/d)	100

EBF properties

L_{EBF} (m)	0.178

Bypass properties

ΔL (m)	0.079
L (m)	0.257

Ruud and Kabala (1996) pseudo-steady criterion

1.0E+03 Non-dimensional time, t_D

Diffusivity contrast	Time, t (d)	Time, t (hr)	Time, t (min)	Time, t (s)
1:1	0.0	0.3	18.7	1119.9
10:1	0.1	1.7	102.7	6159.3
100:1	0.7	15.7	942.6	56554.0
1000:1	6.5	155.7	9341.7	#######

Molz and others (1989) pseudo-steady criterion

(but using assumed influence radius per personal comm.)

1.0E+02 Non-dimensional time, t_D

Influence radius, r (ft)	Time, t (d)	Time, t (hr)	Time, t (min)	Time, t (s)
1	0.0	0.2	10.8	645.1
2	0.0	0.7	43.0	2580.2
5	0.2	4.5	268.8	16126.3
10	0.7	17.9	1075.1	64505.1
20	3.0	71.7	4300.3	#######

Rehfeldt and others (1989) and Flach criteria

Non-dimensional time, t_D	Time, t (d)	Time, t (hr)	Time, t (min)	Time, t (s)	
4.0E+02	0.0	0.1	7.5	448.0	10:1
4.0E+03	0.1	1.2	74.7	4479.5	100:1
4.0E+04	0.5	12.4	746.6	44795.2	r/b<0.125
1.0E+06	13.0	311.1	18664.7	#######	long time

Bypass flow estimate

		1/2" EBF		***1" EBF***	
Pumping rate, QP (L/min)	Pumping rate, QP (gal/min)	Bypass (L/min)	Ratio	Bypass (L/min)	Ratio
0.2	0.05	0.00	1.1%	0.00	0.1%
0.5	0.13	0.01	1.4%	0.00	0.1%
1	0.26	0.02	1.9%	0.00	0.1%
2	0.53	0.06	3.0%	0.00	0.2%
5	1.32	0.31	6.1%	0.02	0.4%
10	2.64	1.14	11.4%	0.07	0.7%
20	5.28	4.38	21.9%	0.27	1.4%
15	3.96	2.50	16.7%	0.16	1.0%

Table 7 Field data for SWP-300A.

Well ID	Top of Screen From Grade (ft)	Bottom of Screen From Grade (ft)	Screen Length (ft)	Casing Diameter (inch)	Approx. Water Level From TOC (ft)	Survey Elev. TOC (ft-msl)	Survey Elev. Conc Pad (ft-msl)	TOC to Conc Pad (ft)	Pad Thickness (ft)	Top of Screen From TOC (ft)	Bottom of Screen From TOC (ft)	Top of Screen Elevation (ft-msl)	Bottom of Screen Elevation (ft-msl)
SWP-300A	162.19	202.2	40.01	4	114.75	271.19	268.69	2.5	0.33	165.02	205.03	106.17	66.16

									Dynamic Corrected for "0"				
	Probe	.5"		1.0"		1.0"			.5"	1.0"			
	Date	7/24/00		7/25/00		7/25/00			3/29/00	3/31/00			
Station	Depth Below TOC (ft)	Time	Ambient Instrument Response (L/min)	Time	Dynamic Flow Instrument Response (L/min)	Delta Time min	Delta (ml)	Dynamic Instrument Response Corrected for "0"	y = 0.0024x2 + 0.7838x Ambient Calibrated Flow (L/min)	y = 0.9797x + 0.1097 Dynamic Calibrated Flow (L/min)			
48	157.0	14:10	-0.002						-0.0016				
42	163.0	14:06	-0.004	11:52	13.57	105	0.0200	13.59	-0.0031	13.42			
41	164.0	14:02	-0.004	11:49	13.57	102	0.0194	13.59	-0.0031	13.42	bypass ratio		
40	165.0	14:00	-0.004	11:46	13.48	99	0.0189	13.50	-0.0031	13.33	0.681		
39	166.0	13:58	0.025	11:42	9.14	95	0.0181	9.16	0.0196	9.08			
38	167.0	13:55	0.021	11:39	9.21	92	0.0175	9.23	0.0165	9.15			
37	168.0	13:53	0.021	11:36	9.24	89	0.0170	9.26	0.0165	9.18			
36	169.0	13:50	0.022	11:33	9.20	86	0.0164	9.22	0.0172	9.14			
35	170.0	13:48	0.023	11:31	9.22	84	0.0160	9.24	0.0180	9.16			
34	171.0	13:46	0.016	11:28	9.22	81	0.0154	9.24	0.0125	9.16			
33	172.0	13:44	0.016	11:24	9.11	77	0.0147	9.12	0.0125	9.05			
32	173.0	13:42	0.015	11:22	9.12	75	0.0143	9.13	0.0118	9.06			
31	174.0	13:38	0.009	11:19	9.20	72	0.0137	9.21	0.0071	9.14	bypass ratio		
30	175.0	13:35	-0.093	11:17	13.10	70	0.0133	13.11	-0.0729	12.96	0.698		
29	176.0	13:33	0.011	11:13	9.02	66	0.0126	9.03	0.0086	8.96			
28	177.0	13:29	0.006	11:11	8.87	64	0.0122	8.88	0.0047	8.81			
27	178.0	13:22	0.000	11:08	8.84	61	0.0116	8.85	0.0000	8.78			
26	179.0	13:15	-0.100	11:06	8.74	59	0.0112	8.75	-0.0784	8.68			
25	180.0	13:13	-0.115	11:04	8.78	57	0.0109	8.79	-0.0901	8.72			
24	181.0	13:11	-0.125	11:02	8.71	55	0.0105	8.72	-0.0979	8.65			
23	182.0	13:09	-0.130	10:59	8.72	52	0.0099	8.73	-0.1019	8.66			
22	183.0	13:07	-0.136	10:57	8.75	50	0.0095	8.76	-0.1066	8.69			
21	184.0	13:05	-0.142	10:55	8.66	48	0.0091	8.67	-0.1113	8.60	bypass ratio		
20	185.0	13:03	-0.262	10:53	12.08	46	0.0088	12.09	-0.2052	11.95	0.719		
19	186.0	13:00	-0.178	10:50	8.64	43	0.0082	8.65	-0.1394	8.58			
18	187.0	12:58	-0.179	10:48	8.52	41	0.0078	8.53	-0.1402	8.46			
17	188.0	12:55	-0.195	10:46	8.43	39	0.0074	8.44	-0.1527	8.38			
16	189.0	12:50	-0.195	10:44	8.32	37	0.0070	8.33	-0.1527	8.27			
15	190.0	12:48	-0.210	10:42	8.34	35	0.0067	8.35	-0.1645	8.29			
14	191.0	12:47	-0.210	10:40	8.11	33	0.0063	8.12	-0.1645	8.06			
13	192.0	12:45	-0.243	10:38	7.09	31	0.0059	7.10	-0.1903	7.06			
12	193.0	12:44	-0.265	10:33	6.01	26	0.0050	6.01	-0.2075	6.00			
11	194.0	12:42	-0.262	10:31	5.85	24	0.0046	5.85	-0.2052	5.85	bypass ratio		
10	195.0	12:40	-0.444	10:28	7.78	21	0.0040	7.78	-0.3475	7.74	0.756		
9	196.0	12:39	-0.280	10:26	5.85	19	0.0036	5.85	-0.2193	5.84			
8	197.0	12:37	-0.287	10:24	5.74	17	0.0032	5.74	-0.2248	5.74			
7	198.0	12:35	-0.266	10:22	5.44	15	0.0029	5.44	-0.2083	5.44			
6	199.0	12:33	-0.255	10:20	5.15	13	0.0025	5.15	-0.1997	5.16			
5	200.0	12:32	-0.237	10:16	5.00	9	0.0017	5.00	-0.1856	5.01			
4	201.0	12:30	-0.176	10:11	3.73	4	0.0008	3.73	-0.1379	3.76			
3	202.3	12:28	0.000	10:07	1.02	0	0.0000	1.02	0.0000	1.11			
2													
1													
0													

7/24/00

Time	Water Level (ft)	Time to Fill Bucket 16.8L (sec)	Field Measured Flow (L/min)	Panametric Flow Reading Ref Only (L/min)
14:15	53.2	N/A	N/A	N/A

7/25/00

Time	Water Level (ft)	Time to Fill Bucket 16.8L (sec)	Field Measured Flow (L/min)	Panametric Flow Reading Ref Only (L/min)
9:37	See Data Logger	76	13.26	
9:42		76	13.26	
9:59		76	13.26	
10:02				13.21
10:17				13.29
10:18		76	13.26	
10:23				13.10
10:25				13.21
10:27				13.25
10:29				13.28
10:32		76	13.26	13.22
10:39				13.29
10:44				13.34
10:54				13.28
10:56				13.34
11:01		75	13.44	13.36
11:07				13.30
11:10				13.42
11:19		75	13.44	
11:28				13.34
11:32				13.51
11:35				13.51
11:37		75	13.44	
11:40				13.44
11:47				13.43
11:50				13.46
11:53		73	13.81	

Note: Meter at bottom of well at 202.3'

7/24/00 Ambient
Probe moved from testing of 200C to 300A Warm up in 300A from 11:38 to 12:15
Initial reading at -.014. Set to 0.00 and stable for full duration of warm up.
Last reading at 14:10 - .002
Reading check 195 @ 12:53 -0.447
Reading check 179 @ 13:24 -0.095

7/25/00 Dynamic
Warm up 7:45 to 8:45
Reading at 12:10 after pumping stopped and well had fully recovered -.02
Correction per min = -0.00019
Reading check 195 @ 10:35 +7.78
Reading check 175 @ 11:33 +12.98
Reading check 163 @ 11:54 +13.52
Reading @ 201 varied from +4.5-5.5

Table 8 Hydraulic conductivity calculations for SWP-300A at 1 ft increments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
Depth Below TOC (ft)	Elevation (ft-msl)	Ambient Flow (L/min)	Ambient Flow, q (ft^3/min)	Differential Ambient Flow, Δq_i (ft^3/min)	Recorded Pump Induced Flow (L/min)	Bypass flow factor	Corrected Pump Induced Flow (L/min)	Pump Induced Flow, Q (ft^3/min)	Net Pumping Flow, Q - q (ft^3/min)	Differential Net Flow, $\Delta(Q_i - q_i)$ (ft^3/min)	*Adjusted?* Differential Net Flow $\Delta(Q_i - q_i)$ (ft^3/min)	Layer Thickness Δz_i (ft)	Mid-point Elevation (ft)	$K_i/K_{bar} * b(\Delta Q_i - \Delta q_i)/(Q_p \Delta z_i)$	K_i (ft/d)	K_i (cm/s/s)	Check $\Delta z * K_i/K_{bar}$	Estimated bypass flow (L/min)	Estimated bypass flow ratio (Q_{bp}/Q_{EBF})	Clock Time	Elapsed Time (min)	Water Level (ft)	dh (ft)	Cooper-Jacob K_i (ft/d)	Ratio	$K\Delta z$
165.02	106.17	-0.00314	-0.00011	-0.00080	13.33	0.681	13.33	0.47084	0.47095	0.00196	0.00196	0.98	105.68	0.17	9.0	3.17E-03	1.669E-01	0.09	0.007	11:46	131	8.671	1.55	4.6	0.51	4.48
166	105.19	0.01960	0.00069	0.00011	9.08	0.683	13.30	0.46968	0.46899	-0.00244	-0.00244	1.00	104.69	-0.21	-10.9	-3.84E-03	-2.069E-01	0.09	0.007	11:42	127	8.678	1.54	-5.6	0.51	-5.56
167	104.19	0.01646	0.00058	0.00000	9.15	0.684	13.37	0.47201	0.47142	-0.00030	-0.00030	1.00	103.69	-0.03	-1.3	-4.68E-04	-2.523E-02	0.09	0.007	11:39	124	8.683	1.53	-0.7	0.51	-0.68
168	103.19	0.01646	0.00058	-0.00003	9.18	0.686	13.38	0.47230	0.47172	0.00325	0.00325	1.00	102.69	0.28	14.5	5.12E-03	2.763E-01	0.09	0.007	11:36	121	8.687	1.53	7.4	0.51	7.45
169	102.19	0.01724	0.00061	-0.00003	9.14	0.688	13.28	0.46908	0.46847	0.00022	0.00022	1.00	101.69	0.02	1.0	3.42E-04	1.843E-02	0.09	0.007	11:33	118	8.689	1.53	0.5	0.51	0.50
170	101.19	0.01803	0.00064	0.00019	9.16	0.690	13.28	0.46889	0.46825	0.00100	0.00100	1.00	100.69	0.09	4.5	1.58E-03	8.536E-02	0.09	0.007	11:31	116	8.691	1.53	2.3	0.51	2.30
171	100.19	0.01254	0.00044	0.00000	9.16	0.691	13.25	0.46769	0.46725	0.00669	0.00669	1.00	99.69	0.57	29.9	1.05E-02	5.685E-01	0.09	0.007	11:28	113	8.693	1.53	15.3	0.51	15.32
172	99.19	0.01254	0.00044	0.00003	9.05	0.693	13.06	0.46100	0.46056	0.00064	0.00064	1.00	98.69	0.05	2.8	1.00E-03	5.420E-02	0.09	0.007	11:24	109	8.691	1.53	1.5	0.51	1.46
173	98.19	0.01176	0.00042	0.00017	9.06	0.695	13.04	0.46033	0.45992	-0.00297	-0.00297	1.00	97.69	-0.25	-13.3	-4.68E-03	-2.524E-01	0.09	0.007	11:22	107	8.689	1.53	-6.8	0.51	-6.76
174	97.19	0.00705	0.00025	0.00282	9.14	0.697	13.12	0.46314	0.46289	0.00281	0.00281	1.00	96.69	0.24	12.5	4.42E-03	2.386E-01	0.09	0.007	11:19	104	8.686	1.53	6.4	0.51	6.37
175	96.19	-0.07287	-0.00257	-0.00288	12.96	0.698	12.96	0.45751	0.46008	0.00870	0.00870	1.00	95.69	0.74	38.8	1.37E-02	7.387E-01	0.09	0.007	11:17	102	8.684	1.53	19.7	0.51	19.66
176	95.19	0.00862	0.00030	0.00014	8.96	0.700	12.79	0.45169	0.45138	0.00859	0.00859	1.00	94.69	0.73	38.4	1.35E-02	7.298E-01	0.09	0.007	11:13	98	8.684	1.53	19.4	0.51	19.38
177	94.19	0.00470	0.00017	0.00017	8.81	0.702	12.54	0.44296	0.44279	0.00263	0.00263	1.00	93.69	0.22	11.7	4.14E-03	2.233E-01	0.08	0.007	11:11	96	8.687	1.53	5.9	0.51	5.93
178	93.19	0.00000	0.00000	0.00277	8.78	0.704	12.47	0.44016	0.44016	0.00343	0.00343	1.00	92.69	0.29	15.3	5.40E-03	2.914E-01	0.08	0.007	11:08	93	8.692	1.53	7.7	0.51	7.75
179	92.19	-0.07836	-0.00277	0.00041	8.68	0.707	12.29	0.43397	0.43673	-0.00109	-0.00109	1.00	91.69	-0.09	-4.9	-1.72E-03	-9.254E-02	0.08	0.006	11:06	91	8.694	1.52	-2.5	0.51	-2.46
180	91.19	-0.09011	-0.00318	0.00028	8.72	0.709	12.31	0.43464	0.43782	0.00441	0.00441	1.00	90.69	0.37	19.7	6.94E-03	3.745E-01	0.08	0.006	11:04	89	8.696	1.52	10.0	0.51	9.96
181	90.19	-0.09794	-0.00346	0.00014	8.65	0.711	12.18	0.42996	0.43342	0.00065	0.00065	1.00	89.69	0.05	2.9	1.02E-03	5.480E-02	0.08	0.006	11:02	87	8.698	1.52	1.5	0.51	1.46
182	89.19	-0.10185	-0.00360	0.00017	8.66	0.713	12.15	0.42917	0.43277	-0.00036	-0.00036	1.00	88.69	-0.03	-1.6	-5.74E-04	-3.095E-02	0.08	0.006	10:59	84	8.702	1.52	-0.8	0.51	-0.82
183	88.19	-0.10655	-0.00376	0.00017	8.69	0.715	12.16	0.42937	0.43314	0.00543	0.00543	1.00	87.69	0.46	24.2	8.55E-03	4.611E-01	0.08	0.006	10:57	82	8.704	1.51	12.3	0.51	12.25
184	87.19	-0.11125	-0.00393	0.00332	8.60	0.717	12.00	0.42378	0.42771	-0.00160	-0.00160	1.00	86.69	-0.14	-7.1	-2.52E-03	-1.359E-01	0.08	0.006	10:55	80	8.705	1.51	-3.6	0.51	-3.61
185	86.19	-0.20519	-0.00725	-0.00232	11.95	0.719	11.95	0.42206	0.42931	0.00497	0.00497	1.00	85.69	0.42	22.2	7.83E-03	4.221E-01	0.08	0.006	10:53	78	8.705	1.51	11.2	0.50	11.19
186	85.19	-0.13944	-0.00492	0.00003	8.58	0.723	11.88	0.41942	0.42434	0.00783	0.00783	1.00	84.69	0.66	35.0	1.23E-02	6.650E-01	0.07	0.006	10:50	75	8.706	1.51	17.6	0.50	17.59
187	84.19	-0.14022	-0.00495	0.00044	8.46	0.726	11.66	0.41156	0.41651	0.00591	0.00591	1.00	83.69	0.50	26.4	9.31E-03	5.023E-01	0.07	0.006	10:48	73	8.708	1.51	13.3	0.50	13.28
188	83.19	-0.15275	-0.00539	0.00000	8.38	0.730	11.48	0.40521	0.41060	0.00723	0.00723	1.00	82.69	0.61	32.3	1.14E-02	6.146E-01	0.07	0.006	10:46	71	8.710	1.51	16.2	0.50	16.24
189	82.19	-0.15275	-0.00539	0.00041	8.27	0.734	11.27	0.39797	0.40337	0.00065	0.00065	1.00	81.69	0.05	2.9	1.02E-03	5.498E-02	0.07	0.006	10:44	69	8.712	1.51	1.5	0.50	1.45
190	81.19	-0.16449	-0.00581	0.00000	8.29	0.737	11.24	0.39691	0.40272	0.01272	0.01272	1.00	80.69	1.08	56.8	2.00E-02	1.081E+00	0.07	0.006	10:42	67	8.715	1.50	28.5	0.50	28.54
191	80.19	-0.16449	-0.00581	0.00091	8.06	0.741	10.88	0.38419	0.38999	0.04839	0.04839	1.00	79.69	4.11	216.1	7.62E-02	4.111E+00	0.06	0.006	10:40	65	8.718	1.50	108.5	0.50	108.52
192	79.19	-0.19032	-0.00672	0.00061	7.06	0.745	9.48	0.33488	0.34160	0.05101	0.05101	1.00	78.69	4.33	227.8	8.04E-02	4.334E+00	0.05	0.005	10:38	63	8.721	1.50	114.4	0.50	114.41
193	78.19	-0.20754	-0.00733	-0.00008	6.00	0.748	8.02	0.28327	0.29059	0.00884	0.00884	1.00	77.69	0.75	39.5	1.39E-02	7.514E-01	0.04	0.004	10:33	58	8.728	1.49	19.8	0.50	19.82
194	77.19	-0.20519	-0.00725	0.00503	5.85	0.752	7.77	0.27450	0.28175	-0.00367	-0.00367	1.00	76.69	-0.31	-16.4	-5.78E-03	-3.118E-01	0.03	0.004	10:31	56	8.730	1.49	-8.2	0.50	-8.21
195	76.19	-0.34753	-0.01227	-0.00453	7.74	0.756	7.74	0.27315	0.28542	0.00587	0.00587	1.00	75.69	0.50	26.2	9.25E-03	4.988E-01	0.03	0.004	10:28	53	8.731	1.49	13.1	0.50	13.10
196	75.19	-0.21928	-0.00774	0.00019	5.84	0.759	7.70	0.27180	0.27955	0.00612	0.00612	1.00	74.69	0.52	27.3	9.64E-03	5.199E-01	0.03	0.004	10:26	51	8.733	1.49	13.6	0.50	13.64
197	74.19	-0.22475	-0.00794	-0.00058	5.74	0.763	7.52	0.26549	0.27343	0.01541	0.01541	1.00	73.69	1.31	68.8	2.43E-02	1.309E+00	0.03	0.004	10:24	49	8.735	1.48	34.3	0.50	34.28
198	73.19	-0.20832	-0.00736	-0.00030	5.44	0.767	7.10	0.25066	0.25802	0.01454	0.01454	1.00	72.69	1.24	64.9	2.29E-02	1.235E+00	0.03	0.004	10:22	47	8.737	1.48	32.3	0.50	32.30
199	72.19	-0.19971	-0.00705	-0.00050	5.16	0.770	6.70	0.23643	0.24348	0.00836	0.00836	1.00	71.69	0.71	37.3	1.32E-02	7.100E-01	0.02	0.004	10:20	45	8.739	1.48	18.5	0.50	18.53
200	71.19	-0.18563	-0.00655	-0.00169	5.01	0.774	6.47	0.22857	0.23512	0.05931	0.05931	1.00	70.69	5.04	264.8	9.34E-02	5.038E+00	0.02	0.004	10:16	41	8.742	1.48	130.9	0.49	130.94
201	70.19	-0.13787	-0.00487	-0.00487	3.76	0.778	4.84	0.17095	0.17582	0.12577	0.12577	1.30	69.54	8.22	432.0	1.52E-01	1.068E+01	0.01	0.003	10:11	36	8.749	1.47	212.6	0.49	276.41
202.3	68.89	0.00000	0.00000	0.00000	1.11	0.782	1.42	0.05005	0.05005	0.05005	0.05005	2.73	67.52	1.56	81.8	2.88E-02	4.252E+00	0.00	0.001	10:07	32	8.756	1.46	40.1	0.49	109.63
205.03	66.16	0.00000	0.00000		0.00		0.00	0.00000	0.00000																	

165.02	Top of Screen Depth from TOC (ft)		*Filter pack:*	QP (ft^3/min)	0.47095	40.01	b (ft)	Avg K_i/K_{bar}	1.000000	r_w (in)	4	Avg Cooper-Jacob K	26.14
205.03	Bottom of Screen Depth from TOC (ft)	0.203	Do (m)	QP (L/min)	13.34				(Should be exactly 1)	b (ft)	43	Ratio	0.50
40.01	Screen Length (ft)	0.102	Di (m)	uncorr QP	13.34					K (ft/d)	26	26	48
271.19	TOC Elevation (ft)	0.024	Area (m^2)							S_s (1/ft)	1.0E-05	1.0E-05	2.1E-05
2260	T pump (ft^2/d)	5.08	Thickness (cm)							T (ft^2/d)	1118		
43	Formation thickness (ft)	100	Conductivity, K_{gp} (m/d) FX-50							S (unitless)	4.3E-04		
52.6	K pump (ft/d)		*EBF:*							T/S (ft^2/d)	2.60E+06		
1.85E-02	K pump (cm/s)	0.178	L_{EBF} (m)							Start of pumping	9:35		
			Bypass flow:							Initial transducer level (ft)	10.218		
		0.079	ΔL (m)							Well efficiency	50%	50%	27%
		0.257	L (m)										

Table 9 Hydraulic conductivity calculations for SWP-300A at 2 ft increments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
Depth Below TOC (ft)	Elevation (ft-msl)	Ambient Flow (L/min)	Ambient Flow, q (ft^3/min)	Differential Ambient Flow, Δq_i (ft^3/min)	Recorded Pump Induced Flow (L/min)	Bypass flow factor	Corrected Pump Induced Flow (L/min)	Pump Induced Flow, Q (ft^3/min)	Net Pumping Flow, Q - q (ft^3/min)	Differential Net Flow, $\Delta(Q_i - q_i)$ (ft^3/min)	*Adjusted?* Differential Net Flow $\Delta(Q_i - q_i)$ (ft^3/min)	Layer Thickness Δz_i (ft)	Mid-point Elevation (ft)	K_i/K_{bar}= $b(\Delta Q_i-\Delta q_i)/(Q_p\Delta z_i)$	K_i (ft/d)	K_i (cms/s)	Check $\Delta z*K_i/K_{bar}$	Estimated bypass flow (L/min)	Estimated bypass flow ratio (Q_{bp}/Q_{EBF})	Clock Time	Elapsed Time (min)	Water Level (ft)	dh (ft)	Cooper-Jacob K_i (ft/d)	Ratio	KΔz
165.02	106.17	-0.00314	-0.00011	-0.00069	13.33	0.681	13.33	0.47084	0.47095	-0.00047	-0.00047	1.98	105.18	-0.02	-1.1	-3.76E-04	-4.004E-02	0.09	0.007	11:46	131	8.671	1.55	-0.5	0.51	-1.07
167	104.19	0.01646	0.00058	-0.00003	9.15	0.684	13.37	0.47201	0.47142	0.00296	0.00296	2.00	103.19	0.13	6.6	2.33E-03	2.511E-01	0.09	0.007	11:39	124	8.683	1.53	3.4	0.51	6.76
169	102.19	0.01724	0.00061	0.00017	9.14	0.688	13.28	0.46908	0.46847	0.00122	0.00122	2.00	101.19	0.05	2.7	9.62E-04	1.038E-01	0.09	0.007	11:33	118	8.689	1.53	1.4	0.51	2.80
171	100.19	0.01254	0.00044	0.00003	9.16	0.691	13.25	0.46769	0.46725	0.00733	0.00733	2.00	99.19	0.31	16.4	5.77E-03	6.227E-01	0.09	0.007	11:28	113	8.693	1.53	8.4	0.51	16.78
173	98.19	0.01176	0.00042	0.00299	9.06	0.695	13.04	0.46033	0.45992	-0.00016	-0.00016	2.00	97.19	-0.01	-0.4	-1.27E-04	-1.374E-02	0.09	0.007	11:22	107	8.689	1.53	-0.2	0.51	-0.37
175	96.19	-0.07287	-0.00257	-0.00274	12.96	0.698	12.96	0.45751	0.46008	0.01729	0.01729	2.00	95.19	0.73	38.6	1.36E-02	1.469E+00	0.09	0.007	11:17	102	8.684	1.53	19.5	0.51	39.08
177	94.19	0.00470	0.00017	0.00293	8.81	0.702	12.54	0.44296	0.44279	0.00606	0.00606	2.00	93.19	0.26	13.5	4.77E-03	5.147E-01	0.08	0.007	11:11	96	8.687	1.53	6.8	0.51	13.67
179	92.19	-0.07836	-0.00277	0.00069	8.68	0.707	12.29	0.43397	0.43673	0.00332	0.00332	2.00	91.19	0.14	7.4	2.61E-03	2.819E-01	0.08	0.006	11:06	91	8.694	1.52	3.7	0.51	7.50
181	90.19	-0.09794	-0.00346	0.00030	8.65	0.711	12.18	0.42996	0.43342	0.00028	0.00028	2.00	89.19	0.01	0.6	2.21E-04	2.385E-02	0.08	0.006	11:02	87	8.698	1.52	0.3	0.51	0.63
183	88.19	-0.10655	-0.00376	0.00348	8.69	0.715	12.16	0.42937	0.43314	0.00383	0.00383	2.00	87.19	0.16	8.5	3.01E-03	3.252E-01	0.08	0.006	10:57	82	8.704	1.51	4.3	0.51	8.64
185	86.19	-0.20519	-0.00725	-0.00229	11.95	0.719	11.95	0.42206	0.42931	0.01280	0.01280	2.00	85.19	0.54	28.6	1.01E-02	1.087E+00	0.08	0.006	10:53	78	8.705	1.51	14.4	0.50	28.82
187	84.19	-0.14022	-0.00495	0.00044	8.46	0.726	11.66	0.41156	0.41651	0.01315	0.01315	2.00	83.19	0.56	29.3	1.04E-02	1.117E+00	0.07	0.006	10:48	73	8.708	1.51	14.8	0.50	29.52
189	82.19	-0.15275	-0.00539	0.00041	8.27	0.734	11.27	0.39797	0.40337	0.01337	0.01337	2.00	81.19	0.57	29.9	1.05E-02	1.136E+00	0.07	0.006	10:44	69	8.712	1.51	15.0	0.50	30.00
191	80.19	-0.16449	-0.00581	0.00152	8.06	0.741	10.88	0.38419	0.38999	0.09940	0.09940	2.00	79.19	4.22	221.9	7.83E-02	8.445E+00	0.06	0.006	10:40	65	8.718	1.50	111.5	0.50	222.91
193	78.19	-0.20754	-0.00733	0.00494	6.00	0.748	8.02	0.28327	0.29059	0.00517	0.00517	2.00	77.19	0.22	11.6	4.08E-03	4.396E-01	0.04	0.004	10:33	58	8.728	1.49	5.8	0.50	11.60
195	76.19	-0.34753	-0.01227	-0.00434	7.74	0.756	7.74	0.27315	0.28542	0.01199	0.01199	2.00	75.19	0.51	26.8	9.44E-03	1.019E+00	0.03	0.004	10:28	53	8.731	1.49	13.4	0.50	26.76
197	74.19	-0.22475	-0.00794	-0.00088	5.74	0.763	7.52	0.26549	0.27343	0.02995	0.02995	2.00	73.19	1.27	66.9	2.36E-02	2.544E+00	0.03	0.004	10:24	49	8.735	1.48	33.3	0.50	66.63
199	72.19	-0.19971	-0.00705	-0.00705	5.16	0.770	6.70	0.23643	0.24348	0.19343	0.19343	3.30	70.54	4.98	261.7	9.23E-02	1.643E+01	0.02	0.004	10:20	45	8.739	1.48	130.0	0.50	428.91
202.3	68.89	0.00000	0.00000	0.00000	1.11	0.782	1.42	0.05005	0.05005	0.05005	0.05005	2.73	67.52	1.56	81.8	2.88E-02	4.252E+00	0.00	0.001	10:07	32	8.756	1.46	40.1	0.49	109.63
205.03	66.16	0.00000	0.00000		0.00		0.00	0.00000	0.00000																	

165.02	Top of Screen Depth from TOC (ft)			*Filter pack:*		QP (ft^3/min)	0.47095	40.01	b (ft)			Avg K_i/K_{bar}	1.000000					r_w (in)	4						Avg Cooper-Jacob K	26.22
205.03	Bottom of Screen Depth from TOC (ft)		0.203	Do (m)		QP (L/min)	13.34					(Should be exactly 1)						b (ft)	43						Ratio	0.50
40.01	Screen Length (ft)		0.102	Di (m)		uncorr QP	13.34											K (ft/d)	26	26	48					
271.19	TOC Elevation (ft)		0.024	Area (m^2)														S_s (1/ft)	1.0E-05	1.0E-05	2.1E-05					
2260	T pump (ft^2/d)		5.08	Thickness (cm)														T (ft^2/d)	1118							
43	Formation thickness (ft)		100	Conductivity, K_{gp} (m/d)	FX-50													S (unitless)	4.3E-04							
52.6	K pump (ft/d)			*EBF:*														T/S (ft^2/d)	2.60E+06							
1.85E-02	K pump (cm/s)		0.178	L_{EBF} (m)														Start of pumping	9:35							
				Bypass flow:														Initial transducer level (ft)	10.218							
			0.079	ΔL (m)														Well efficiency	50%	50%	27%					
			0.257	L (m)																						

Table 10 Hydraulic conductivity calculations for SWP-300A at 5 ft increments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
Depth Below TOC (ft)	Elevation (ft-msl)	Ambient Flow (L/min)	Ambient Flow, q (ft^3/min)	Differential Ambient Flow, Δq_i (ft^3/min)	Recorded Pump Induced Flow (L/min)	Bypass flow factor	Corrected Pump Induced Flow (L/min)	Pump Induced Flow, Q (ft^3/min)	Net Pumping Flow, Q - q (ft^3/min)	Differential Net Flow, $\Delta(Q_i - q_i)$ (ft^3/min)	*Adjusted?* Differential Net Flow $\Delta(Q_i - q_i)$ (ft^3/min)	Layer Thickness Δz_i (ft)	Mid-point Elevation (ft)	$K_i/K_{bar} = b(\Delta Q_i - \Delta q_i)/(Q_p \Delta z_i)$	K_i (ft/d)	K_i (cms/s)	Check $\Delta z * K_i/K_{bar}$	Estimated bypass flow (L/min)	Estimated bypass flow ratio (Q_{bp}/Q_{EBF})	Clock Time	Elapsed Time (min)	Water Level (ft)	dh (ft)	Cooper-Jacob K_i (ft/d)	Ratio	$K\Delta z$
165.02	106.17	-0.00314	-0.00011	-0.00075	13.33	0.681	13.33	0.47084	0.47095	0.00270	0.00270	4.98	103.68	0.05	2.4	8.55E-04	2.295E-01	0.09	0.007	11:46	131	8.671	1.55	1.2	0.51	6.15
170	101.19	0.01803	0.00064	0.00321	9.16	0.690	13.28	0.46889	0.46825	0.00817	0.00817	5.00	98.69	0.14	7.3	2.57E-03	6.944E-01	0.09	0.007	11:31	116	8.691	1.53	3.7	0.51	18.72
175	96.19	-0.07287	-0.00257	0.00061	12.96	0.698	12.96	0.45751	0.46008	0.02225	0.02225	5.00	93.69	0.38	19.9	7.01E-03	1.891E+00	0.09	0.007	11:17	102	8.684	1.53	10.1	0.51	50.32
180	91.19	-0.09011	-0.00318	0.00406	8.72	0.709	12.31	0.43464	0.43782	0.00852	0.00852	5.00	88.69	0.14	7.6	2.68E-03	7.235E-01	0.08	0.006	11:04	89	8.696	1.52	3.8	0.51	19.24
185	86.19	-0.20519	-0.00725	-0.00144	11.95	0.719	11.95	0.42206	0.42931	0.02659	0.02659	5.00	83.69	0.45	23.7	8.38E-03	2.259E+00	0.08	0.006	10:53	78	8.705	1.51	12.0	0.50	59.88
190	81.19	-0.16449	-0.00581	0.00646	8.29	0.737	11.24	0.39691	0.40272	0.11730	0.11730	5.00	78.69	1.99	104.8	3.70E-02	9.965E+00	0.07	0.006	10:42	67	8.715	1.50	52.6	0.50	263.07
195	76.19	-0.34753	-0.01227	-0.00572	7.74	0.756	7.74	0.27315	0.28542	0.05030	0.05030	5.00	73.69	0.85	44.9	1.58E-02	4.273E+00	0.03	0.004	10:28	53	8.731	1.49	22.5	0.50	112.25
200	71.19	-0.18563	-0.00655	-0.00655	5.01	0.774	6.47	0.22857	0.23512	0.23512	0.23512	5.03	68.67	3.97	208.6	7.36E-02	1.997E+01	0.02	0.004	10:16	41	8.742	1.48	103.1	0.49	519.12
205.03	66.16	0.00000	0.00000		0.00		0.00	0.00000	0.00000																	

165.02	Top of Screen Depth from TOC (ft)			*Filter pack:*		QP (ft^3/min)	0.47095	40.01	b (ft)			Avg K_i/K_{bar}	1.000000					r_w (in)	4					Avg Cooper-Jacob K	26.21
205.03	Bottom of Screen Depth from TOC (ft)			Do (m)	0.203	QP (L/min)	13.34					(Should be exactly 1)						b (ft)	43					Ratio	0.50
40.01	Screen Length (ft)			Di (m)	0.102	uncorr QP	13.34											K (ft/d)	26	26	48				
271.19	TOC Elevation (ft)			Area (m^2)	0.024													S_s (1/ft)	1.0E-05	1.0E-05	2.1E-05				
2260	T pump (ft^2/d)			Thickness (cm)	5.08													T (ft^2/d)	1118						
43	Formation thickness (ft)			Conductivity, K_{gp} (m/d)	100	FX-50												S (unitless)	4.3E-04						
52.6	K pump (ft/d)			*EBF:*														T/S (ft^2/d)	2.60E+06						
1.85E-02	K pump (cm/s)			L_{EBF} (m)	0.178													Start of pumping	9:35						
				Bypass flow:														Initial transducer level (ft)	10.218						
				ΔL (m)	0.079													Well efficiency	50%	50%	27%				
				L (m)	0.257																				

Table 11 Hydraulic conductivity calculations for SWP-300A at 10 ft increments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
Depth Below TOC (ft)	Elevation (ft-msl)	Ambient Flow (L/min)	Ambient Flow, q (ft^3/min)	Differential Ambient Flow, Δq_i (ft^3/min)	Pump Induced Flow (L/min)	Pump Induced Flow, Q (ft^3/min)	Net Pumping Flow, Q - q (ft^3/min)	Differential Net Flow, $\Delta(Q_i - q_i)$ (ft^3/min)	*Adjusted* Differential Net Flow $\Delta(Q_i - q_i)$ (ft^3/min)	Layer Thickness Δz_i (ft)	Mid-point Elevation (ft)	$K_i/K_{bar} = b(\Delta Q_i - \Delta q_i)/(Q_p \Delta z_i)$	K_i (ft/d)	K_i (cms/s)	Check $\Delta z * K_i/K_{bar}$	Estimated bypass flow (L/min)	Estimated bypass flow ratio (Q_{bp}/Q_{EBF})	Clock Time	Elapsed Time (min)	Water Level (ft)	dh (ft)	Cooper-Jacob K_i (ft/d)	Ratio	$K\Delta z$
165.02	106.17	-0.00314	-0.00011	0.00246	13.33	0.47084	0.47095	0.01087	0.01087	9.98	101.18	0.09	4.9	1.72E-03	9.238E-01	0.09	0.007	11:46	131	8.671	1.55	2.5	0.51	24.78
175	96.19	-0.07287	-0.00257	0.00467	12.96	0.45751	0.46008	0.03077	0.03077	10.00	91.19	0.26	13.7	4.85E-03	2.614E+00	0.09	0.007	11:17	102	8.68	1.53	7.0	0.51	69.56
185	86.19	-0.20519	-0.00725	0.00503	11.95	0.42206	0.42931	0.14389	0.14389	10.00	81.19	1.22	64.2	2.27E-02	1.222E+01	0.08	0.006	10:53	78	8.71	1.51	32.4	0.50	323.96
195	76.19	-0.34753	-0.01227	-0.01227	7.74	0.27315	0.28542	0.28542	0.28542	10.03	71.17	2.42	127.0	4.48E-02	2.425E+01	0.03	0.004	10:28	53	8.73	1.49	63.5	0.50	636.85
205.03	66.16	0.00000	0.00000		0.00	0.00000	0.00000																	

165.02	Top of Screen Depth from TOC (ft)			*Filter pack:*		QP (ft^3/min)	0.47095		40.01	b (ft)			Avg K_i/K_{bar}	1.000000				r_w (in)	4			Avg Cooper-Jacob K	26.37	
205.03	Bottom of Screen Depth from TOC (ft)			0.203	Do (m)	QP (L/min)	13.34							(Should be exactly 1)				b (ft)	43				Ratio	0.50
40.01	Screen Length (ft)			0.102	Di (m)	uncorr QP	13.34											K (ft/d)	26	26	48			
271.19	TOC Elevation (ft)			0.024	Area (m^2)													S_s (1/ft)	1.0E-05	1.0E-05	2.1E-05			
2260	T pump (ft^2/d)			5.08	Thickness (cm)													T (ft^2/d)	1118					
43	Formation thickness (ft)			100	Conductivity, K_{gp} (m/d) FX-50													S (unitless)	4.3E-04					
52.6	K pump (ft/d)				*EBF:*													T/S (ft^2/d)	2.60E+06					
1.85E-02	K pump (cm/s)			0.178	L_{EBF} (m)													Start of pumping	9:35					
					Bypass flow:													Initial transducer level (ft)	10.218					
				0.079	ΔL (m)													Well efficiency	50%	50%	27%			
				0.257	L (m)															0.50	0.92			

Table 12 Field data for SWP-200C.

Well ID	Top of Screen From Grade (ft)	Bottom of Screen From Grade (ft)	Screen Length (ft)	Casing Diameter (inch)	Approx. Water Level From TOC (ft)	Survey Elev. TOC (ft-msl)	Survey Elev. Conc Pad (ft-msl)	TOC to Conc Pad (ft)	Pad Thickness (ft)	Top of Screen From TOC (ft)	Bottom of Screen From TOC (ft)	Top of Screen Elevation (ft-msl)	Bottom of Screen Elevation (ft-msl)
SWP-200C	88.27	148.26	59.99	6	59.48	270.82	268.87	1.95	0.33	90.6	150.5	180.27	120.28

Ambient Corrected for "0"

Station	Depth Below TOC (ft)	Probe Date	.5" 7/24/00 Time	.5" 7/24/00 Ambient Instrument Response (L/min)	.5" 7/24/00 Delta Time min	.5" 7/24/00 Delta (ml)	.5" 7/24/00 Ambient Instrument Response Corrected for "0" (L/min)	.5" 7/27/00 Time	.5" 7/27/00 Dynamic Flow Instrument Response (L/min)	.5" 7/24/00 y = 0.0024x2 + 0.7838x Ambient Calibrated Flow (L/min)	.5" 7/27/00 y = 0.0024x2 + 0.7838x Dynamic Calibrated Flow (L/min)
52	78.5		11:32	-0.024	156	0.0140	-0.010			-0.008	
62	88.5		11:25	-0.024	149	0.0134	-0.011	12:18	8.620	-0.008	6.935
61	89.5		11:20	-0.026	144	0.0129	-0.013			-0.010	
60	90.5		11:14	-0.023	138	0.0124	-0.011	12:12	8.530	-0.008	6.860
59	91.5		11:09	0.016	133	0.0119	0.028			0.022	
58	92.5		11:07	0.037	131	0.0118	0.049	12:05	1.008	0.038	0.793
57	93.5		11:05	0.034	129	0.0116	0.046			0.036	
56	94.5		11:03	0.039	127	0.0114	0.050	12:03	0.920	0.040	0.723
55	95.5		11:01	0.032	125	0.0112	0.043			0.034	
54	96.5		10:59	0.031	123	0.0110	0.042	11:58	1.008	0.033	0.793
53	97.5		10:57	0.036	121	0.0109	0.047			0.037	
52	98.5		10:55	0.034	119	0.0107	0.045	11:54	0.980	0.035	0.770
51	99.5		10:54	0.033	118	0.0106	0.044			0.034	
50	100.5		10:52	0.031	116	0.0104	0.041	11:49	1.030	0.032	0.810
49	101.5		10:50	0.018	114	0.0102	0.028			0.022	
48	102.5		10:38	0.04	102	0.0092	0.049	11:46	1.046	0.039	0.822
47	103.5		10:37	0.04	101	0.0091	0.049			0.038	
46	104.5		10:35	0.041	99	0.0089	0.050	11:43	1.030	0.039	0.810
45	105.5		10:34	0.036	98	0.0088	0.045			0.035	
44	106.5		10:32	0.041	96	0.0086	0.050	11:38	0.967	0.039	0.760
43	107.5		10:30	0.038	94	0.0084	0.046			0.036	
42	108.5		10:28	0.036	92	0.0083	0.044	11:33	0.888	0.035	0.698
41	109.5		10:25	0.022	89	0.0080	0.030			0.024	
40	110.5		10:24	0.014	88	0.0079	0.022	11:31	0.606	0.017	0.476
39	111.5		10:21	-0.388	85	0.0076	-0.380			-0.298	
38	112.5		10:19	-0.003	83	0.0074	0.004	11:29	0.487	0.003	0.382
37	113.5		10:15	-0.003	79	0.0071	0.004			0.003	
36	114.5		10:13	-0.01	77	0.0069	-0.003	11:26	0.477	-0.002	0.374
35	115.5		10:08	-0.017	72	0.0065	-0.011			-0.008	
34	116.5		10:06	0.004	70	0.0063	0.010	11:23	0.447	0.008	0.351
33	117.5		10:03	-0.022	67	0.0060	-0.016			-0.013	
32	118.5		10:00	-0.123	64	0.0057	-0.117	11:20	0.441	-0.092	0.346
31	119.5		9:58	-0.174	62	0.0056	-0.168			-0.132	
30	120.5		9:56	-0.152	60	0.0054	-0.147	11:17	0.420	-0.115	0.330
29	121.5		9:54	-0.481	58	0.0052	-0.476			-0.372	
28	122.5		9:52	-0.136	56	0.0050	-0.131	11:14	0.311	-0.103	0.244
27	123.5		9:50	-0.163	54	0.0048	-0.158			-0.124	
26	124.5		9:49	-0.191	53	0.0048	-0.186	11:11	0.044	-0.146	0.034
25	125.5		9:48	-0.191	52	0.0047	-0.186			-0.146	
24	126.5		9:46	-0.188	50	0.0045	-0.184	11:08	0.033	-0.144	0.026
23	127.5		9:45	-0.201	49	0.0044	-0.197			-0.154	
22	128.5		9:44	-0.218	48	0.0043	-0.214	11:05	0.031	-0.167	0.024
21	129.5		9:42	-0.177	46	0.0041	-0.173			-0.135	
20	130.5		9:40	-0.155	44	0.0039	-0.151	11:01	0.018	-0.118	0.014
19	131.5		9:38	-1.022	42	0.0038	-1.018			-0.796	
18	132.5		9:37	-0.151	41	0.0037	-0.147	10:57	0.015	-0.115	0.012
17	133.5		9:35	-0.168	39	0.0035	-0.164			-0.129	
16	134.5		9:34	-0.159	38	0.0034	-0.156	10:54	0.013	-0.122	0.010
15	135.5		9:33	-0.136	37	0.0033	-0.133			-0.104	
14	136.5		9:32	-0.137	36	0.0032	-0.134	10:49	0.022	-0.105	0.017
13	137.5		9:30	-0.162	34	0.0031	-0.159			-0.125	
12	138.5		9:29	-0.171	33	0.0030	-0.168	10:45	0.024	-0.132	0.019
11	139.5		9:27	-0.171	31	0.0028	-0.168			-0.132	
10	140.5		9:24	-0.153	28	0.0025	-0.150	10:42	0.018	-0.118	0.014
9	141.5		9:22	-0.843	26	0.0023	-0.841			-0.657	
8	142.5		9:20	-0.148	24	0.0022	-0.146	10:35	0.013	-0.114	0.010
7	143.5		9:19	-0.135	23	0.0021	-0.133			-0.104	
6	144.5		9:17	-0.089	21	0.0019	-0.087	10:32	0.013	-0.068	0.010
5	145.5		9:15	-0.093	19	0.0017	-0.091			-0.072	
4	146.5		9:14	-0.104	18	0.0016	-0.102	10:29	0.013	-0.080	0.010
3	147.5		9:12	0.005	16	0.0014	0.006			0.005	
2	148.5		9:05	0.010	9	0.0008	0.011	10:27	0.022	0.008	0.017
1	149.5		9:01	0.061	5	0.0004	0.061			0.048	
0	150.2		8:56	-0.010	0	0.0000	-0.010	10:23	0.000	-0.008	0.000

7/24/00

Time	Water Level (ft)	Time to Fill Graduated Cylinder (sec)	ml	Field Measured Flow (L/min)	Panametric Flow Reading Ref Only (L/min)

bypass ratio 0.114 (approx)

7/27/00

Time	Water Level (ft)	Time to Fill Graduated Cylinder (sec)	ml	Field Measured Flow (L/min)	Panametric Flow Reading Ref Only (L/min)
9:53	See Data Logger	16.4	1960	7.17	
10:08		16.8	1960	7.00	
10:19					7.14
10:21		16.8	1960	7.00	
10:31		15.8	1870	7.10	
10:50					6.96
10:52		17	1950	6.88	
10:59		17	2000	7.06	7.24
11:18		17	2000	7.06	
11:20					7.20
11:24		17	1990	7.02	
11:41		17	1970	6.95	
11:58		17	1980	6.99	
12:10		17.2	1995	6.96	
12:21		17	1960	6.92	

7/24/00 Ambient
Warm up 7:47 to 8:45
Final reading at -.014 @ 11:35 with packer plugged.
Correction per min= 0.000089744
Reading check 149.5 @ 9:07 +0.062
Reading check 141.5 @ 9:26 -0.817
Reading check 111.5 @ 10:44 -0.708

7/26/00 Dynamic
1.0" Probe failed to operate correctly test stopped.

7/27/00 Dynamic
Warm up 6:40 to 7:40
Actual measurements started at 10:23. Pumping was changed from approximently 4 to 7.2 l/minat 9:50. Resolution could not be seen at the lower flow rate
Reading check 148.5 @ 10:38 +0.027

Table 13 Hydraulic conductivity calculations for SWP-200C at 2 ft increments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)
											Adjusted?																type cntrl-k with cell in "dh discrepancy" column to iterate k						
Depth Below TOC (ft)	Elevation (ft-msl)	Ambient Flow (L/min)	Ambient Flow, q (ft^3/min)	Differential Ambient Flow, Δq_i (ft^3/min)	Recorded Pump Induced Flow (L/min)	Bypass flow factor	Corrected Pump Induced Flow (L/min)	Pump Induced Flow, Q (ft^3/min)	Net Pumping Flow, Q - q (ft^3/min)	Differential Net Flow, $\Delta(Q_i - q_i)$ (ft^3/min)	Differential Net Flow $\Delta(Q_i - q_i)$ (ft^3/min)	Layer Thickness Δz_i (ft)	Mid-point Elevation (ft)	$K_i/K_{bar}=$ $b(\Delta Q_i-\Delta q_i)/$ $(Q_i\Delta z_i)$	K_i (ft/d)	K_i (cms/s)	Check $\Delta z^*K_i/K_{bar}$	Estimated bypass flow (L/min)	Estimated bypass flow ratio (Q_{BP}/Q_{EBF})	Clock Time	4 L/min Elapsed Time (min)	"+3 L/min Elapsed Time (min)"	Water Level (ft)	dh (ft)	Cooper-Jacob K_i (ft/d)	4 L/min Cooper-Jacob dh (ft)	"+3 L/min Cooper-Jacob dh (ft)	Cooper-Jacob dh (ft)	dh discrepancy	Ratio	KΔz
90.55	180.27	-0.00832	-0.00029	-0.00164	6.93	1.000	6.93	0.24486	0.24516	0.00317	0.00317	1.95	179.29	0.40	0.59	2.08E-04	7.763E-01	0.57	0.082	12:12	265	142	8.798	3.60	1.39	2.10	1.50	3.60	0.00	2.36	2.71
92.50	178.32	0.03822	0.00135	-0.00005	0.79	0.115	6.89	0.24333	0.24199	0.02135	0.02135	2.00	177.32	2.61	3.86	1.36E-03	5.224E+00	0.56	0.081	12:05	258	135	8.892	3.50	9.33	2.04	1.46	3.50	0.00	2.42	18.66
94.50	176.32	0.03951	0.00140	0.00023	0.72	0.115	6.29	0.22203	0.22064	-0.02153	-0.02153	2.00	175.32	-2.63	-3.89	-1.37E-03	-5.270E+00	0.47	0.075	12:03	256	133	8.920	3.48	-9.48	2.03	1.45	3.48	0.00	2.44	-18.96
96.50	174.32	0.03295	0.00116	-0.00007	0.79	0.115	6.89	0.24333	0.24217	0.00685	0.00685	2.00	173.32	0.84	1.24	4.37E-04	1.677E+00	0.56	0.081	11:58	251	128	8.950	3.44	3.04	2.01	1.43	3.45	0.00	2.45	6.07
98.50	172.32	0.03502	0.00124	0.00009	0.77	0.115	6.70	0.23656	0.23532	-0.01220	-0.01220	2.00	171.32	-1.49	-2.20	-7.78E-04	-2.985E+00	0.53	0.079	11:54	247	124	8.954	3.44	-5.40	2.01	1.43	3.44	0.00	2.45	-10.80
100.50	170.32	0.03246	0.00115	-0.00021	0.81	0.115	7.04	0.24866	0.24752	-0.00366	-0.00366	2.00	169.32	-0.45	-0.66	-2.33E-04	-8.958E-01	0.58	0.083	11:49	242	119	8.963	3.43	-1.62	2.01	1.43	3.43	0.00	2.45	-3.24
102.50	168.32	0.03853	0.00136	-0.00002	0.82	0.115	7.15	0.25254	0.25118	0.00390	0.00390	2.00	167.32	0.48	0.70	2.48E-04	9.532E-01	0.60	0.084	11:46	239	116	8.968	3.43	1.73	2.00	1.42	3.43	0.00	2.45	3.45
104.50	166.32	0.03911	0.00138	0.00001	0.81	0.115	7.04	0.24866	0.24728	0.01525	0.01525	2.00	165.32	1.87	2.76	9.72E-04	3.731E+00	0.58	0.083	11:43	236	113	8.970	3.42	6.75	2.00	1.42	3.42	0.00	2.45	13.50
106.50	164.32	0.03889	0.00137	0.00015	0.76	0.115	6.61	0.23341	0.23203	0.01887	0.01887	2.00	163.32	2.32	3.43	1.21E-03	4.642E+00	0.52	0.078	11:38	231	108	8.974	3.42	8.38	2.00	1.42	3.42	0.00	2.45	16.78
108.50	162.32	0.03469	0.00123	0.00062	0.70	0.115	6.07	0.21429	0.21306	0.06756	0.06756	2.00	161.32	8.27	12.21	4.31E-03	1.653E+01	0.44	0.073	11:33	226	103	8.974	3.42	29.80	2.00	1.42	3.42	0.00	2.44	59.60
110.50	160.32	0.01716	0.00061	0.00048	0.48	0.115	4.14	0.14611	0.14550	0.02825	0.02825	2.00	159.32	3.46	5.11	1.80E-03	6.913E+00	0.22	0.052	11:31	224	101	8.976	3.42	12.46	2.00	1.41	3.42	0.00	2.44	24.91
112.50	158.32	0.00349	0.00012	0.00021	0.38	0.115	3.32	0.11738	0.11725	0.00221	0.00221	2.00	157.32	0.27	0.40	1.41E-04	5.396E-01	0.15	0.044	11:29	222	99	8.980	3.42	0.97	2.00	1.41	3.42	0.00	2.44	1.94
114.50	156.32	-0.00242	-0.00009	-0.00037	0.37	0.115	3.26	0.11496	0.11505	0.00761	0.00761	2.00	155.32	0.93	1.38	4.85E-04	1.862E+00	0.14	0.043	11:26	219	96	8.987	3.41	3.36	2.00	1.41	3.41	0.00	2.44	6.71
116.50	154.32	0.00806	0.00028	0.00353	0.35	0.115	3.05	0.10772	0.10744	-0.00208	-0.00208	2.00	153.32	-0.25	-0.38	-1.33E-04	-5.091E-01	0.12	0.041	11:23	216	93	8.994	3.40	-0.92	2.00	1.40	3.40	0.00	2.44	-1.84
118.50	152.32	-0.09187	-0.00324	0.00081	0.35	0.115	3.01	0.10627	0.10952	0.00426	0.00426	2.00	151.32	0.52	0.77	2.71E-04	1.041E+00	0.12	0.040	11:20	213	90	9.000	3.39	1.88	1.99	1.40	3.39	0.00	2.44	3.76
120.50	150.32	-0.11487	-0.00406	-0.00043	0.33	0.115	2.87	0.10121	0.10526	0.02672	0.02672	2.00	149.32	3.27	4.83	1.70E-03	6.539E+00	0.11	0.039	11:17	210	87	9.007	3.39	11.80	1.99	1.40	3.39	0.00	2.44	23.59
122.50	148.32	-0.10262	-0.00362	0.00153	0.24	0.115	2.12	0.07492	0.07854	0.06280	0.06280	2.00	147.32	7.68	11.35	4.00E-03	1.537E+01	0.07	0.031	11:14	207	84	9.011	3.38	27.71	1.99	1.39	3.38	0.00	2.44	55.42
124.50	146.32	-0.14589	-0.00515	-0.00008	0.03	0.115	0.30	0.01059	0.01574	0.00272	0.00272	2.00	145.32	0.33	0.49	1.74E-04	6.664E-01	0.00	0.012	11:11	204	81	9.014	3.38	1.20	1.99	1.39	3.38	0.00	2.44	2.40
126.50	144.32	-0.14376	-0.00508	0.00083	0.03	0.115	0.22	0.00794	0.01302	-0.00035	-0.00035	2.00	143.32	-0.04	-0.06	-2.25E-05	-8.633E-02	0.00	0.011	11:08	201	78	9.018	3.38	-0.16	1.99	1.39	3.38	0.00	2.44	-0.31
128.50	142.32	-0.16738	-0.00591	-0.00173	0.02	0.115	0.21	0.00746	0.01337	0.00486	0.00486	2.00	141.32	0.59	0.88	3.10E-04	1.189E+00	0.00	0.011	11:05	198	75	9.025	3.37	2.14	1.99	1.38	3.37	0.00	2.44	4.28
130.50	140.32	-0.11834	-0.00418	-0.00010	0.01	0.115	0.12	0.00433	0.00851	0.00083	0.00083	2.00	139.32	0.10	0.15	5.26E-05	2.019E-01	0.00	0.010	11:01	194	71	9.036	3.36	0.36	1.98	1.38	3.36	0.00	2.44	0.73
132.50	138.32	-0.11542	-0.00408	0.00023	0.01	0.115	0.10	0.00361	0.00769	0.00025	0.00025	2.00	137.32	0.03	0.05	1.61E-05	6.184E-02	0.00	0.010	10:57	190	67	9.045	3.35	0.11	1.98	1.37	3.35	0.00	2.44	0.22
134.50	136.32	-0.12189	-0.00430	-0.00060	0.01	0.115	0.09	0.00313	0.00743	-0.00156	-0.00156	2.00	135.32	-0.19	-0.28	-9.96E-05	-3.824E-01	0.00	0.010	10:54	187	64	9.052	3.34	-0.69	1.98	1.36	3.34	0.00	2.44	-1.38
136.50	134.32	-0.10481	-0.00370	0.00095	0.02	0.115	0.15	0.00529	0.00900	-0.00143	-0.00143	2.00	133.32	-0.17	-0.26	-9.11E-05	-3.497E-01	0.00	0.010	10:49	182	59	9.059	3.33	-0.63	1.97	1.35	3.33	0.00	2.44	-1.26
138.50	132.32	-0.13154	-0.00465	-0.00049	0.02	0.115	0.16	0.00578	0.01042	0.00193	0.00193	2.00	131.32	0.24	0.35	1.23E-04	4.721E-01	0.00	0.010	10:45	178	55	9.079	3.32	0.85	1.97	1.35	3.32	0.00	2.44	1.70
140.50	130.32	-0.11790	-0.00416	-0.00013	0.01	0.115	0.12	0.00433	0.00850	0.00133	0.00133	2.00	129.32	0.16	0.24	8.49E-05	3.259E-01	0.00	0.010	10:42	175	52	9.082	3.31	0.59	1.97	1.34	3.31	0.00	2.44	1.17
142.50	128.32	-0.11426	-0.00403	-0.00162	0.01	0.115	0.09	0.00313	0.00716	0.00162	0.00162	2.00	127.32	0.20	0.29	1.04E-04	3.975E-01	0.00	0.010	10:35	168	45	9.114	3.28	0.72	1.96	1.32	3.28	0.00	2.44	1.43
144.50	126.32	-0.05826	-0.00241	0.00042	0.01	0.115	0.09	0.00313	0.00554	-0.00042	-0.00042	2.00	125.32	-0.05	-0.08	-2.69E-05	-1.033E-01	0.00	0.010	10:32	165	42	9.143	3.25	-0.19	1.94	1.31	3.25	0.00	2.46	-0.38
146.50	124.32	-0.08022	-0.00283	-0.00313	0.01	0.115	0.09	0.00313	0.00596	0.00097	0.00097	2.00	123.32	0.12	0.17	6.16E-05	2.363E-01	0.00	0.010	10:29	162	39	9.178	3.22	0.43	1.93	1.29	3.22	0.00	2.48	0.86
148.50	122.32	0.00847	0.00030	0.00030	0.02	0.115	0.15	0.00529	0.00500	0.00500	0.00500	2.04	121.30	0.60	0.88	3.12E-04	1.222E+00	0.00	0.010	10:27	160	37	9.202	3.19	2.20	1.92	1.28	3.19	0.00	2.49	4.49
150.54	120.28	0.00000	0.00000		0.00	0.115	0.00	0.00000	0.00000																						

90.55	Top of Screen Depth from TOC (ft)		*Filter pack*:	QP (ft^3/min)	0.24516	59.99	b (ft)	Avg K_i/K_{bar}	1.000000		r_w (in)	5			
150.54	Bottom of Screen Depth from TOC (ft)	0.254	Do (m)	QP (L/min)	6.94				(Should be exactly 1)		b (ft)	65		Avg Cooper-Jacob K	3.60
59.99	Screen Length (ft)	0.152	Di (m)	uncorr QP	6.94						K (ft/d)	3.6		Ratio	2.44
270.82	TOC Elevation (ft)	0.032	Area (m^2)								S_s (1/ft)	1.0E-05			
95	T pump (ft^2/d)	5.08	Thickness (cm)								T (ft^2/d)	234			
65	Formation thickness (ft)	100	Conductivity, K_{gp} (m/d)	FX-50							S (unitless)	6.5E-04			
1.48	K pump (ft/d)		*EBF*:								T/S (ft^2/d)	3.60E+05			
5.21E-04	K pump (cm/s)	0.178	L_{EBF} (m)								Start of pumping	7:47	9:50		
			Bypass flow:								Initial transducer level (ft)	12.395			
		0.079	ΔL (m)								Well efficiency	100%			
		0.257	L (m)												

Table 14 Hydraulic conductivity calculations for SWP-200C at 6 ft increments

type ctrl-x with cell in "dh discrepancy" column to iterate x

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)
Depth Below TOC (ft)	Elevation (ft-msl)	Ambient Flow (L/min)	Ambient Flow, q (ft^3/min)	Differential Ambient Flow, Δq_i (ft^3/min)	Recorded Pump Induced Flow (L/min)	Bypass flow factor	Corrected Pump Induced Flow (L/min)	Pump Induced Flow, Q (ft^3/min)	Net Pumping Flow, Q - q (ft^3/min)	Differential Net Flow, $\Delta(Q_i - q_i)$ (ft^3/min)	*Adjusted?* Differential Net Flow $\Delta(Q_i - q_i)$ (ft^3/min)	Layer Thickness Δz_i (ft)	Mid-point Elevation (ft)	K_i/K_{bar}= $b(\Delta Q_i-\Delta q_i)/(Q_t\Delta z_i)$	K_i (ft/d)	K_i (cms/s)	Check $\Delta z^*K_i/K_{bar}$	Estimated bypass flow (L/min)	Estimated bypass flow ratio (Q_{bp}/Q_{EBF})	Clock Time	4 L/min Elapsed Time (min)	"+3 L/min Elapsed Time (min)"	Water Level (ft)	dh (ft)	Cooper-Jacob K_i (ft/d)	4 L/min Cooper-Jacob dh (ft)	"+3 L/min Cooper-Jacob dh (ft)	Cooper-Jacob dh (ft)	dh discrepancy	Ratio	$K\Delta z$
90.55	180.27	-0.00832	-0.00029	-0.00146	6.93	1.000	6.93	0.24486	0.24516	0.00299	0.00299	5.95	177.29	0.12	0.18	6.40E-05	7.308E-01	0.57	0.082	12:12	265	142	8.798	3.60	0.43	2.10	1.50	3.60	0.00	2.36	2.55
96.50	174.32	0.03295	0.00116	-0.00020	0.79	0.115	6.89	0.24333	0.24217	-0.00901	-0.00901	6.00	171.32	-0.37	-0.54	-1.91E-04	-2.204E+00	0.56	0.081	11:58	251	128	8.950	3.44	-1.33	2.01	1.43	3.44	0.00	2.45	-7.98
102.50	168.32	0.03853	0.00136	0.00014	0.82	0.115	7.15	0.25254	0.25118	0.03811	0.03811	6.00	165.32	1.55	2.30	8.10E-04	9.326E+00	0.60	0.084	11:46	239	116	8.968	3.43	5.63	2.00	1.42	3.43	0.00	2.45	33.77
108.50	162.32	0.03469	0.00123	0.00131	0.70	0.115	6.07	0.21429	0.21306	0.09801	0.09801	6.00	159.32	4.00	5.90	2.08E-03	2.398E+01	0.44	0.073	11:33	226	103	8.974	3.42	14.41	2.00	1.42	3.42	0.00	2.44	86.47
114.50	156.32	-0.00245	-0.00009	0.00397	0.37	0.115	3.26	0.11496	0.11505	0.09978	0.09978	6.00	153.32	0.40	0.59	2.08E-04	2.394E+00	0.14	0.043	11:26	219	96	8.987	3.41	1.44	2.00	1.41	3.41	0.00	2.44	8.63
120.50	150.32	-0.11487	-0.00406	0.00102	0.33	0.115	2.87	0.10121	0.10526	0.09224	0.09224	6.00	147.32	3.76	5.56	1.95E-03	2.257E+01	0.11	0.039	11:17	210	87	9.007	3.39	13.57	1.99	1.40	3.39	0.00	2.44	81.44
126.50	144.32	-0.14376	-0.00508	-0.00100	0.03	0.115	0.22	0.00794	0.01302	0.00533	0.00533	6.00	141.32	0.22	0.32	1.13E-04	1.305E+00	0.00	0.011	11:08	201	78	9.018	3.38	0.78	1.99	1.39	3.38	0.00	2.44	4.70
132.50	138.32	-0.11542	-0.00408	0.00057	0.01	0.115	0.10	0.00361	0.00769	-0.00274	-0.00274	6.00	135.32	-0.11	-0.16	-5.82E-05	-6.702E-01	0.00	0.010	10:57	190	67	9.045	3.35	-0.40	1.98	1.37	3.35	0.00	2.44	-2.41
138.50	132.32	-0.13164	-0.00465	-0.00224	0.02	0.115	0.16	0.00578	0.01042	0.00489	0.00489	6.00	129.32	0.20	0.29	1.04E-04	1.195E+00	0.00	0.010	10:45	178	55	9.079	3.32	0.72	1.97	1.35	3.32	0.00	2.44	4.31
144.50	126.32	-0.05826	-0.00241	-0.00241	0.01	0.115	0.09	0.00313	0.00554	0.00554	0.00554	6.04	123.30	0.22	0.33	1.17E-04	1.355E+00	0.00	0.010	10:32	165	42	9.143	3.25	0.81	1.94	1.31	3.25	0.00	2.46	4.92
150.54	120.28	0.00000	0.00000		0.00	0.115	0.00	0.00000	0.00000																						

90.55	Top of Screen Depth from TOC (ft)					*Filter pack*:		QP (ft^3/min)	0.24516	59.99	b (ft)			Avg K_i/K_{bar}	1.000000			r_w (in)	5												Avg Cooper-Jacob K	3.61
150.54	Bottom of Screen Depth from TOC (ft)				0.254	Do (m)		QP (L/min)	6.94						(Should be exactly 1)			b (ft)	65												Ratio	2.44
59.99	Screen Length (ft)				0.152	Di (m)		uncorr QP	6.94									K (ft/d)	3.6		3.6	2.3										
270.82	TOC Elevation (ft)				0.032	Area (m^2)												S_s (1/ft)	1.0E-06		1.0E-06	1E-06										
96	T pump (ft^2/d)				5.08	Thickness (cm)												T (ft^2/d)	234													
65	Formation thickness (ft)				100	Conductivity, K_{bp} (m/d)		FX-50										S (unitless)	6.5E-04													
1.48	K pump (ft/d)					*EBF*:												T/S (ft^2/d)	3.60E+05													
5.21E-04	K pump (cm/s)				0.178	L_{EBF} (m)												Start of pumping	7:47	9:50												
						Bypass flow:												Initial transducer level (ft)	12.395													
					0.079	ΔL (m)												Well efficiency	100%		50%	70%										
					0.257	L (m)															2.44	1.54										

Table 15 Field data for SWP-100D.

Well ID	Top of Screen From Grade (ft)	Bottom of Screen From Grade (ft)	Screen Length (ft)	Casing Diameter (inch)	Approx. Water Level From TOC (ft)	Survey Elev. TOC (ft-msl)	Survey Elev. Conc Pad (ft-msl)	TOC to Conc Pad (ft)	Pad Thickness (ft)	Top of Screen From TOC (ft)	Bottom of Screen From TOC (ft)	Top of Screen Elevation (ft)	Bottom of Screen Elevation (ft)
SWP-100D	45.18	75.14	29.96	6	53.45	270.77	268.41	2.36	0.33	47.87	77.8	222.90	192.94

	Probe	.5"		1.0"		.5"	1.0"
	Date	7/24/00		7/25/00		7/24/00	7/25/00
Station	Depth Below TOC (ft)	Time	Ambient Instrument Response (L/min)	Time	Dynamic Instrument Response (L/min)	y = 0.0024x2 + 0.7838x Ambient Calibrated Flow (L/min)	y = 0.9797x + 0.1097 Dynamic Calibrated Flow (L/min)
31	46.8						
30	47.8						
29	48.8						
28	49.8						
27	50.8						
26	51.8						
25	52.8						
24	53.8	15:54	0.056			0.044	
23	54.8	15:52	0.056			0.044	
22	55.8	15:50	0.052			0.041	
21	56.8	15:48	0.056			0.044	
20	57.8	15:46	-0.005			-0.004	
19	58.8	15:40	0.052			0.041	
18	59.8	15:38	0.053	16:27	3.20	0.042	3.24
17	60.8	15:36	0.050	16:15	3.42	0.039	3.46
16	61.8	15:35	0.054	16:06	3.14	0.042	3.19
15	62.8	15:33	0.054	16:04	2.97	0.042	3.02
14	63.8	15:31	0.052	16:01	3.10	0.041	3.15
13	64.8	15:24	0.047	15:58	3.12	0.037	3.17
12	65.8	15:21	0.052	15:52	2.94	0.041	2.99
11	66.8	15:19	0.047	15:49	2.66	0.037	2.72
10	67.8	15:16	-0.018	15:47	5.42	-0.014	5.42
9	68.8	15:12	0.050	15:40	2.46	0.039	2.52
8	69.8	15:10	0.046	15:36	2.24	0.036	2.30
7	70.8	15:09	0.044	15:33	2.13	0.034	2.20
6	71.8	15:07	0.044	15:31	2.09	0.034	2.16
5	72.8	15:06	0.043	15:29	1.90	0.034	1.97
4	73.8	15:05	0.047	15:26	1.56	0.037	1.64
3	74.8	15:04	0.045	15:24	1.39	0.035	1.47
2	75.8	15:02	0.042	15:21	0.95	0.033	1.04
1	76.8	15:00	0.017	15:18	0.66	0.013	0.76
0	77.8	14:57	0.000	15:09	0.00	0.000	0.11

7/24/00

Time	Water Level (ft)	Time to Fill Bucket 16.8L (sec)	Field Measured Flow (L/min)	Panametric Flow Reading Ref Only (L/min)
14:15	53.2	N/A	N/A	N/A

7/25/00

Time				
14:05	See Data	134	7.52	
14:06	Logger			7.57
14:20				7.54
14:25		136	7.41	7.57
14:45		136	7.41	7.49
15:07				7.53
15:11		140	7.20	
15:28				7.47
15:42				7.5
15:45		137	7.36	
15:57				7.45
16:04				7.43
16:07		137	7.36	
16:30				7.45

bypass ratio 0.483

average 7.50

Correction for "0"

Start Time - Stop Time = 180 min
Total Delta "0"= -.032
Delta/min =.032/180= 0.000178

7/24/00 Ambient
Probe moved from testing of 300A to 100D Warm up in 100D from 14:17 to 14:47.
Initial reading at -.005. Set to 0.00 and stable for full duration of warm up.
Reading check 67.8 @ 15:29 -0.010
Reading check 77.8 @ 15:57 0.000

7/25/00 Dynamic
Warm up 14:00 to 14:58
16:17 Tranducer raised up 2'
Reading check 67.8 @ 15:55 +5.36
Reading check 62.8 @ 16:11 +3.20

Table 16 Hydraulic conductivity calculations for SWP-100D at 1 ft increments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
Depth Below TOC (ft)	Elevation (ft-msl)	Ambient Flow (L/min)	Ambient Flow, q (ft^3/min)	Differential Ambient Flow, Δq_i (ft^3/min)	Recorded Pump Induced Flow (L/min)	Bypass flow factor	Corrected Pump Induced Flow (L/min)	Pump Induced Flow, Q (ft^3/min)	Net Pumping Flow, Q - q (ft^3/min)	Differential Net Flow, $\Delta(Q_i - q_i)$ (ft^3/min)	*Adjusted?* Differential Net Flow $\Delta(Q_i - q_i)$ (ft^3/min)	Layer Thickness Δz_i (ft)	Mid-point Elevation (ft)	K_i/K_{bar}= $b(\Delta Q_i-\Delta q_i)/(Q_p\Delta z_i)$	K_i (ft/d)	K_i (cms/s)	Check $\Delta z*K_i/K_{bar}$	Estimated bypass flow (L/min)	Estimated bypass flow ratio (Q_{bp}/Q_{EBF})	Clock Time	Elapsed Time (min)	Water Level (ft)	dh (ft)	Cooper-Jacob K_i (ft/d)	Ratio	KΔz
53.20	217.57	0.00000	0.00000	-0.00155																						
53.80	216.97	0.04390	0.00155	0.00000																						
54.80	215.97	0.04390	0.00155	0.00011																						
55.80	214.97	0.04076	0.00144	-0.00011																						
56.80	213.97	0.04390	0.00155	0.00169	7.45	0.483	7.45	0.26306	0.26151	0.02577	0.02577	3.00	212.47	0.71	20.9	7.37E-03	2.138E+00	0.04	0.005	16:30	148	2.930	3.53	3.6	0.17	10.81
57.80	212.97	-0.00392	-0.00014	-0.00158																						
58.80	211.97	0.04076	0.00144	-0.00003																						
59.80	210.97	0.04155	0.00147	0.00008	3.24	0.483	6.72	0.23721	0.23574	-0.01584	-0.01584	1.00	210.47	-1.31	-38.5	-1.36E-02	-1.314E+00	0.03	0.005	16:27	145	2.903	3.56	-6.6	0.17	-6.57
60.80	209.97	0.03920	0.00138	-0.00011	3.46	0.483	7.16	0.25296	0.25158	0.02016	0.02016	1.00	209.47	1.67	49.0	1.73E-02	1.673E+00	0.04	0.005	16:15	133	2.934	3.53	8.3	0.17	8.33
61.80	208.97	0.04233	0.00149	0.00000	3.19	0.483	6.60	0.23291	0.23141	0.01218	0.01218	1.00	208.47	1.01	29.6	1.04E-02	1.010E+00	0.03	0.005	16:06	124	2.926	3.53	5.0	0.17	4.96
62.80	207.97	0.04233	0.00149	0.00006	3.02	0.483	6.25	0.22073	0.21924	-0.00937	-0.00937	1.00	207.47	-0.78	-22.8	-8.03E-03	-7.772E-01	0.03	0.005	16:04	122	2.931	3.53	-3.8	0.17	-3.81
63.80	206.97	0.04076	0.00144	0.00014	3.15	0.483	6.51	0.23004	0.22860	-0.00157	-0.00157	1.00	206.47	-0.13	-3.8	-1.35E-03	-1.303E-01	0.03	0.005	16:01	119	2.938	3.52	-0.6	0.17	-0.64
64.80	205.97	0.03684	0.00130	-0.00014	3.17	0.483	6.56	0.23148	0.23018	0.01303	0.01303	1.00	205.47	1.08	31.7	1.12E-02	1.081E+00	0.03	0.005	15:58	116	2.944	3.52	5.3	0.17	5.28
65.80	204.97	0.04076	0.00144	0.00014	2.99	0.483	6.19	0.21858	0.21715	0.01992	0.01992	1.00	204.47	1.65	48.4	1.71E-02	1.652E+00	0.03	0.005	15:52	110	2.935	3.52	8.0	0.16	7.98
66.80	203.97	0.03684	0.00130	0.00180	2.72	0.483	5.62	0.19853	0.19723	0.00536	0.00536	1.00	203.47	0.44	13.0	4.60E-03	4.450E-01	0.02	0.004	15:49	107	2.932	3.53	2.1	0.16	2.14
67.80	202.97	-0.01411	-0.00050	-0.00188	5.42	0.483	5.42	0.19137	0.19187	0.00904	0.00904	1.00	202.47	0.75	22.0	7.76E-03	7.504E-01	0.02	0.004	15:47	105	2.931	3.53	3.6	0.16	3.59
68.80	201.97	0.03920	0.00138	0.00011	2.52	0.483	5.22	0.18421	0.18282	0.01565	0.01565	1.00	201.47	1.30	38.0	1.34E-02	1.298E+00	0.02	0.004	15:40	98	2.947	3.51	6.2	0.16	6.17
69.80	200.97	0.03606	0.00127	0.00006	2.30	0.483	4.77	0.16845	0.16718	0.00782	0.00782	1.00	200.47	0.65	19.0	6.71E-03	6.491E-01	0.02	0.004	15:36	94	2.969	3.49	3.1	0.16	3.08
70.80	199.97	0.03449	0.00122	0.00000	2.20	0.483	4.55	0.16057	0.15935	0.00286	0.00286	1.00	199.47	0.24	7.0	2.46E-03	2.377E-01	0.02	0.004	15:33	91	2.974	3.49	1.1	0.16	1.13
71.80	198.97	0.03449	0.00122	0.00003	2.16	0.483	4.47	0.15771	0.15649	0.01358	0.01358	1.00	198.47	1.13	33.0	1.16E-02	1.127E+00	0.02	0.003	15:31	89	2.959	3.50	5.3	0.16	5.29
72.80	197.97	0.03371	0.00119	-0.00011	1.97	0.483	4.08	0.14410	0.14291	0.02446	0.02446	1.00	197.47	2.03	59.5	2.10E-02	2.030E+00	0.01	0.003	15:29	87	2.953	3.51	9.5	0.16	9.48
73.80	196.97	0.03684	0.00130	0.00006	1.64	0.483	3.39	0.11975	0.11845	0.01212	0.01212	1.00	196.47	1.01	29.5	1.04E-02	1.006E+00	0.01	0.003	15:26	84	2.962	3.50	4.7	0.16	4.68
74.80	195.97	0.03528	0.00125	0.00008	1.47	0.483	3.05	0.10757	0.10633	0.03143	0.03143	1.00	195.47	2.61	76.4	2.70E-02	2.608E+00	0.01	0.003	15:24	82	2.965	3.50	12.1	0.16	12.10
75.80	194.97	0.03292	0.00116	0.00069	1.04	0.483	2.15	0.07606	0.07490	0.02008	0.02008	1.00	194.47	1.67	48.8	1.72E-02	1.666E+00	0.00	0.002	15:21	79	2.956	3.50	7.7	0.16	7.66
76.80	193.97	0.01333	0.00047	0.00047	0.76	0.483	1.57	0.05529	0.05482	0.04680	0.04680	1.03	193.45	3.76	110.1	3.88E-02	3.883E+00	0.00	0.002	15:18	76	2.961	3.50	17.2	0.16	17.76
77.83	192.94	0.00000	0.00000		0.11	0.483	0.23	0.00802	0.00802																	

47.87	Top of Screen Depth from TOC (ft)		*Filter pack:*	QP (ft^3/min)	0.25349	21.03 b (ft)		Avg K_i/K_{bar}	1.000000		r_w (in)	5			Avg Cooper-Jacob K	4.73
77.83	Bottom of Screen Depth from TOC (ft)	0.254	Do (m)	QP (L/min)	7.18			(Should be exactly 1)			b (ft)	21.03			Ratio	0.16
24.63	Saturated Screen Length (ft)	0.152	Di (m)	uncorr QP	7.18						K (ft/d)	4.8	4.8	31		
270.77	TOC Elevation (ft)	0.032	Area (m^2)								S_s (1/ft)	1.0E-02	1.0E-02	1.2E-02		
835	T pump (ft^2/d)	5.08	Thickness (cm)								T (ft^2/d)	100.96				
28.5	Formation thickness (ft)	100	Conductivity, K_{gp} (m/d) FX-50								S (unitless)	2.1E-01				
29.3	K pump (ft/d)		*EBF:*								T/S (ft^2/d)	4.80E+02				
1.03E-02	K pump (cm/s)	0.178	L_{EBF} (m)								Start of pumping	14:02				
53.2	Water Level Depth from TOC (ft) - 7/24/00		*Bypass flow:*								Initial transducer level (ft)	6.460				
56.75	Water Level Depth from TOC (ft) -	0.079	ΔL (m)								Well efficiency	50%	50%	10%		
	EBF dynamic testing	0.257	L (m)													

Table 17 Hydraulic conductivity calculations for SWP-100D at 3 ft increments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
Depth Below TOC (ft)	Elevation (ft-msl)	Ambient Flow (L/min)	Ambient Flow, q (ft^3/min)	Differential Ambient Flow, Δq_i (ft^3/min)	Recorded Pump Induced Flow (L/min)	Bypass flow factor	Corrected Pump Induced Flow (L/min)	Pump Induced Flow, Q (ft^3/min)	Net Pumping Flow, Q - q (ft^3/min)	Differential Net Flow, $\Delta(Q_i - q_i)$ (ft^3/min)	*Adjusted?* Differential Net Flow $\Delta(Q_i - q_i)$ (ft^3/min)	Layer Thickness Δz_i (ft)	Mid-point Elevation (ft)	$K_i/K_{bar} = b(\Delta Q_i \cdot \Delta q_i)/(Q_p \Delta z_i)$	K_i (ft/d)	K_i (cms/s)	Check $\Delta z * K_i/K_{bar}$	Estimated bypass flow (L/min)	Estimated bypass flow ratio (Q_{bp}/Q_{EBF})	Clock Time	Elapsed Time (min)	Water Level (ft)	dh (ft)	Cooper-Jacob K_i (ft/d)	Ratio	$K\Delta z$
53.20	217.57	0.00000	0.00000	-0.00155																						
56.80	213.97	0.04390	0.00155	0.00008	7.45	0.483	7.45	0.26306	0.26151	0.02577	0.02577	3.00	212.47	0.71	20.9	7.37E-03	2.138E+00	0.04	0.005	16:30	148	2.930	3.53	3.6	0.17	10.81
59.80	210.97	0.04155	0.00147	-0.00003	3.24	0.483	6.72	0.23721	0.23574	0.01650	0.01650	3.00	209.47	0.46	13.4	4.72E-03	1.369E+00	0.03	0.005	16:27	145	2.903	3.56	2.3	0.17	6.85
62.80	207.97	0.04233	0.00149	0.00006	3.02	0.483	6.25	0.22073	0.21924	0.00209	0.00209	3.00	206.47	0.06	1.7	5.98E-04	1.737E-01	0.03	0.005	16:04	122	2.931	3.53	0.3	0.17	0.85
65.80	204.97	0.04076	0.00144	0.00006	2.99	0.483	6.19	0.21858	0.21715	0.03432	0.03432	3.00	203.47	0.95	27.8	9.81E-03	2.848E+00	0.03	0.005	15:52	110	2.935	3.52	4.6	0.16	13.76
68.80	201.97	0.03920	0.00138	0.00017	2.52	0.483	5.22	0.18421	0.18282	0.02633	0.02633	3.00	200.47	0.73	21.3	7.53E-03	2.185E+00	0.02	0.004	15:40	98	2.947	3.51	3.5	0.16	10.39
71.80	198.97	0.03449	0.00122	-0.00003	2.16	0.483	4.47	0.15771	0.15649	0.05016	0.05016	3.00	197.47	1.39	40.6	1.43E-02	4.162E+00	0.02	0.003	15:31	89	2.959	3.50	6.5	0.16	19.54
74.80	195.97	0.03528	0.00125	0.00125	1.47	0.483	3.05	0.10757	0.10633	0.09831	0.09831	3.03	194.45	2.69	78.8	2.78E-02	8.157E+00	0.01	0.003	15:24	82	2.965	3.50	12.5	0.16	37.84
77.83	192.94	0.00000	0.00000		0.11	0.483	0.23	0.00802	0.00802																	

47.87	Top of Screen Depth from TOC (ft)				*Filter pack:*		QP (ft^3/min)	0.25349		21.03	b (ft)			Avg K_i/K_{bar}	1.000000			r_w (in)	5						Avg Cooper-Jacob K	4.76
77.83	Bottom of Screen Depth from TOC (ft)			0.254	Do (m)		QP (L/min)	7.18						(Should be exactly 1)				b (ft)	21.03						Ratio	0.16
24.63	Saturated Screen Length (ft)			0.152	Di (m)		uncorr QP	7.18										K (ft/d)	4.8	4.8	31					
270.77	TOC Elevation (ft)			0.032	Area (m^2)													S_s (1/ft)	1.0E-02	1.0E-02	1.2E-02					
835	T pump (ft^2/d)			5.08	Thickness (cm)													T (ft^2/d)	100.96							
28.5	Formation thickness (ft)			100	Conductivity, K_{gp} (m/d)	FX-50												S (unitless)	2.1E-01							
29.3	K pump (ft/d)				*EBF:*													T/S (ft^2/d)	4.80E+02							
1.03E-02	K pump (cm/s)			0.178	L_{EBF} (m)													Start of pumping	14:02							
53.2	Water Level Depth from TOC (ft) - 7/24/00				*Bypass flow:*													Initial transducer level (ft)	6.460							
56.75	Water Level Depth from TOC (ft) -			0.079	ΔL (m)													Well efficiency	50%	50%	10%					
	EBF dynamic testing			0.257	L (m)																					

Table 18 Hydraulic conductivity calculations for SWP-100D at 7 ft increments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
Depth Below TOC (ft)	Elevation (ft-msl)	Ambient Flow (L/min)	Ambient Flow, q (ft^3/min)	Differential Ambient Flow, Δq_i (ft^3/min)	Recorded Pump Induced Flow (L/min)	Bypass flow factor	Corrected Pump Induced Flow (L/min)	Pump Induced Flow, Q (ft^3/min)	Net Pumping Flow, Q - q (ft^3/min)	Differential Net Flow, $\Delta(Q_i - q_i)$ (ft^3/min)	*Adjusted?* Differential Net Flow $\Delta(Q_i - q_i)$ (ft^3/min)	Layer Thickness Δz_i (ft)	Mid-point Elevation (ft)	$K_i/K_{bar} = b(\Delta Q_i/\Delta q_i)/(Q_p\Delta z_i)$	K_i (ft/d)	K_i (cms/s)	Check $\Delta z * K_i/K_{bar}$	Estimated bypass flow (L/min)	Estimated bypass flow ratio (Q_{pp}/Q_{EBF})	Clock Time	Elapsed Time (min)	Water Level (ft)	dh (ft)	Cooper-Jacob K_i (ft/d)	Ratio	$K\Delta z$
56.80	213.97	0.04390	0.00155	0.00011	7.45	0.483	7.45	0.26306	0.26151	0.03290	0.03290	7.00	210.47	0.39	11.4	4.03E-03	2.730E+00	0.04	0.005	16:30	148	2.930	3.53	2.0	0.17	13.80
63.80	206.97	0.04076	0.00144	0.00022	3.15	0.483	6.51	0.23004	0.22860	0.06925	0.06925	7.00	203.47	0.82	24.0	8.48E-03	5.746E+00	0.03	0.005	16:01	119	2.938	3.52	4.0	0.17	28.13
70.80	199.97	0.03449	0.00122	0.00122	2.20	0.483	4.55	0.16057	0.15935	0.15133	0.15133	7.03	196.45	1.79	52.3	1.85E-02	1.256E+01	0.02	0.004	15:33	91	2.974	3.49	8.5	0.16	59.43
77.83	192.94	0.00000	0.00000		0.11	0.483	0.23	0.00802	0.00802																	

47.87	Top of Screen Depth from TOC (ft)					*Filter pack:*		QP (ft^3/min)	0.25349	21.03	b (ft)			Avg K_i/K_{bar}	1.000000			r_w (in)	5					Avg Cooper-Jacob K	4.82
77.83	Bottom of Screen Depth from TOC (ft)				0.254	Do (m)		QP (L/min)	7.18					(Should be exactly 1)				b (ft)	21.03					Ratio	0.16
24.63	Saturated Screen Length (ft)				0.152	Di (m)		uncorr QP	7.18									K (ft/d)	4.8	4.8	31				
270.77	TOC Elevation (ft)				0.032	Area (m^2)												S_s (1/ft)	1.0E-02	1.0E-02	1.2E-02				
835	T pump (ft^2/d)				5.08	Thickness (cm)												T (ft^2/d)	100.96						
28.5	Formation thickness (ft)				100	Conductivity, K_{gp} (m/d)	FX-50											S (unitless)	2.1E-01						
29.3	K pump (ft/d)					*EBF:*												T/S (ft^2/d)	4.80E+02						
1.03E-02	K pump (cm/s)				0.178	L_{EBF} (m)												Start of pumping	14:02						
53.2	Water Level Depth from TOC (ft) - 7/24/00					*Bypass flow:*												Initial transducer level (ft)	6.460						
56.75	Water Level Depth from TOC (ft) -				0.079	ΔL (m)												Well efficiency	50%	50%	10%				
	EBF dynamic testing				0.257	L (m)														0.16	1.05					

Table 19 Comparison of average conductivity estimates.

Aquifer test	**Horizontal conductivity** (ft/d)		
	Gordon SWP-300A	*lower UTRA SWP-200C*	*upper UTRA SWP-100D*
Multiple-well (WSRC, 1999)	52.6	1.48	29.3
Single-well concurrent with EBF testing	23	2.3	12
Cooper-Jacob analysis applied to individual screen intervals - assumed well efficiency and specific storage	26	3.6	4.8
Cooper-Jacob analysis applied to individual screen intervals - well efficiency and specific storage from WSRC (1999)	48	2.3	31

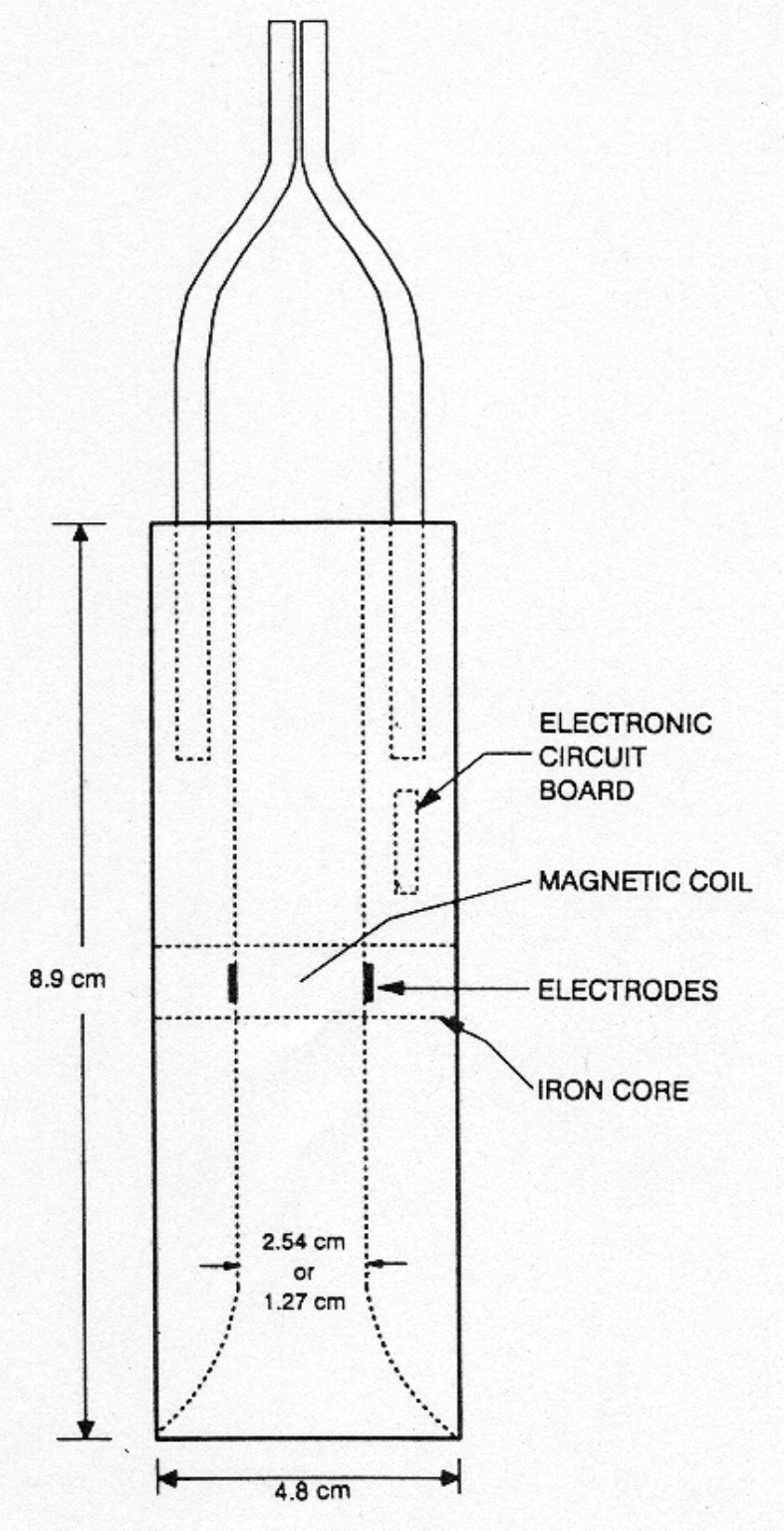


Figure 1 Schematic diagram of the Electromagnetic Borehole Flowmeter; reproduced from Molz and Young (1993).

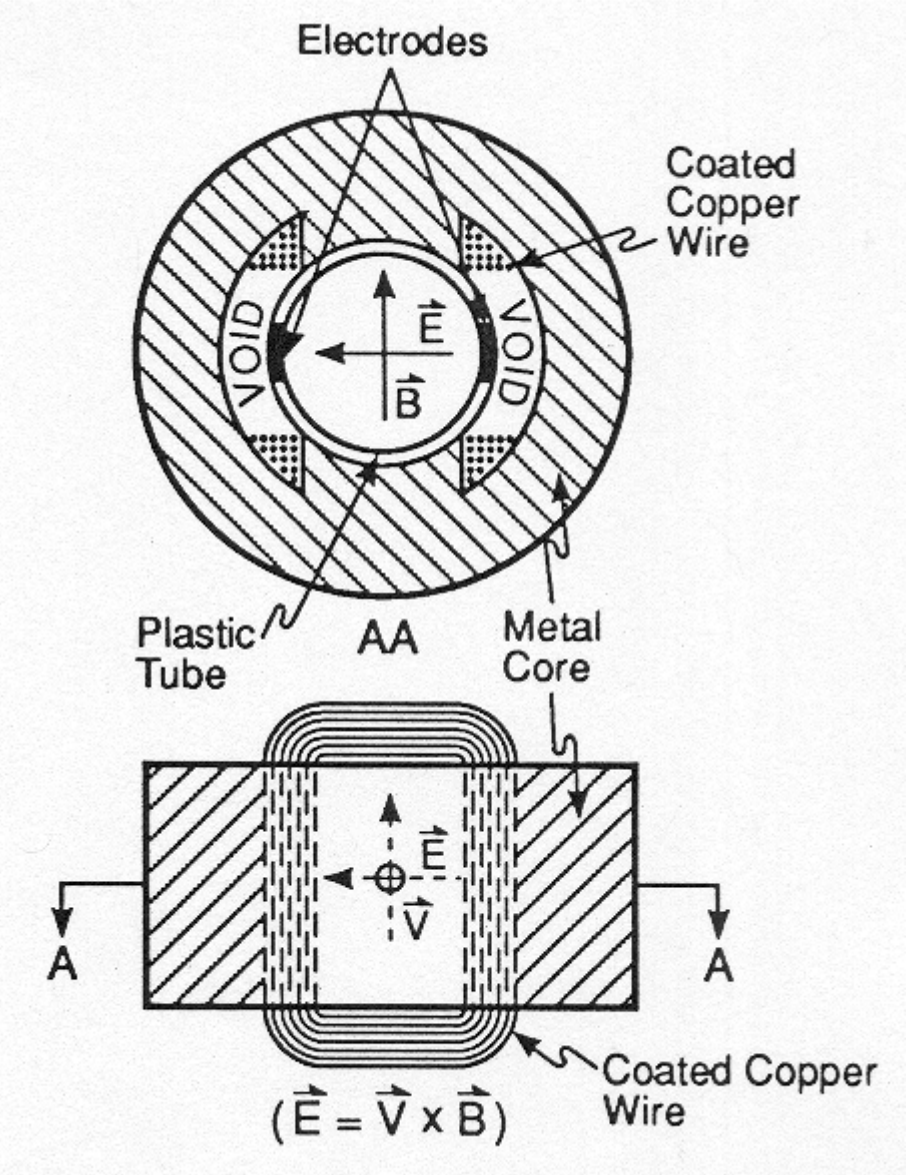


Figure 2 Electromagnetic Borehole Flowmeter (EBF) application of Faraday's Law of Induction; reproduced from Molz and Young (1993).

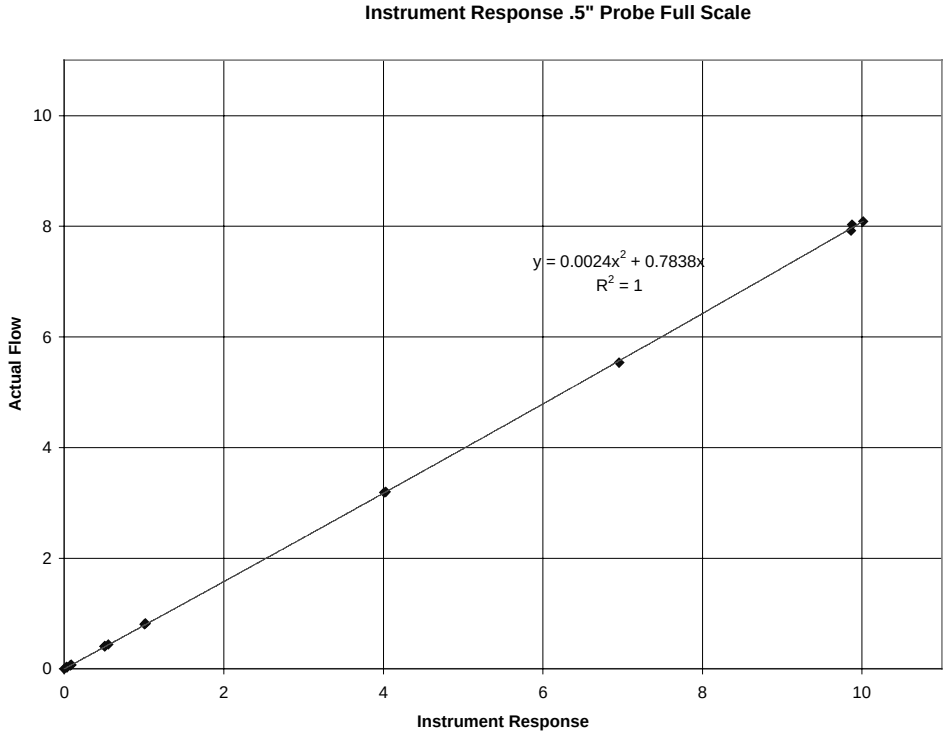


Figure 3 Calibration data and curve for the ½" ID EBF.

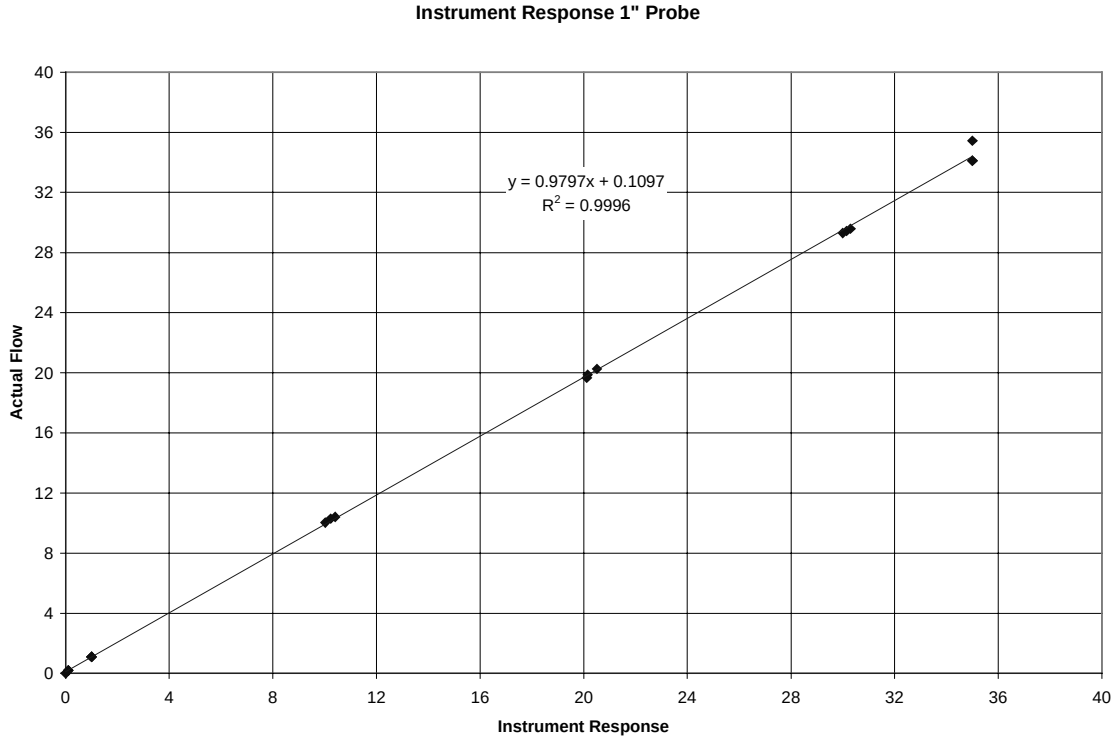


Figure 4 Calibration data and curve for the 1" ID EBF.

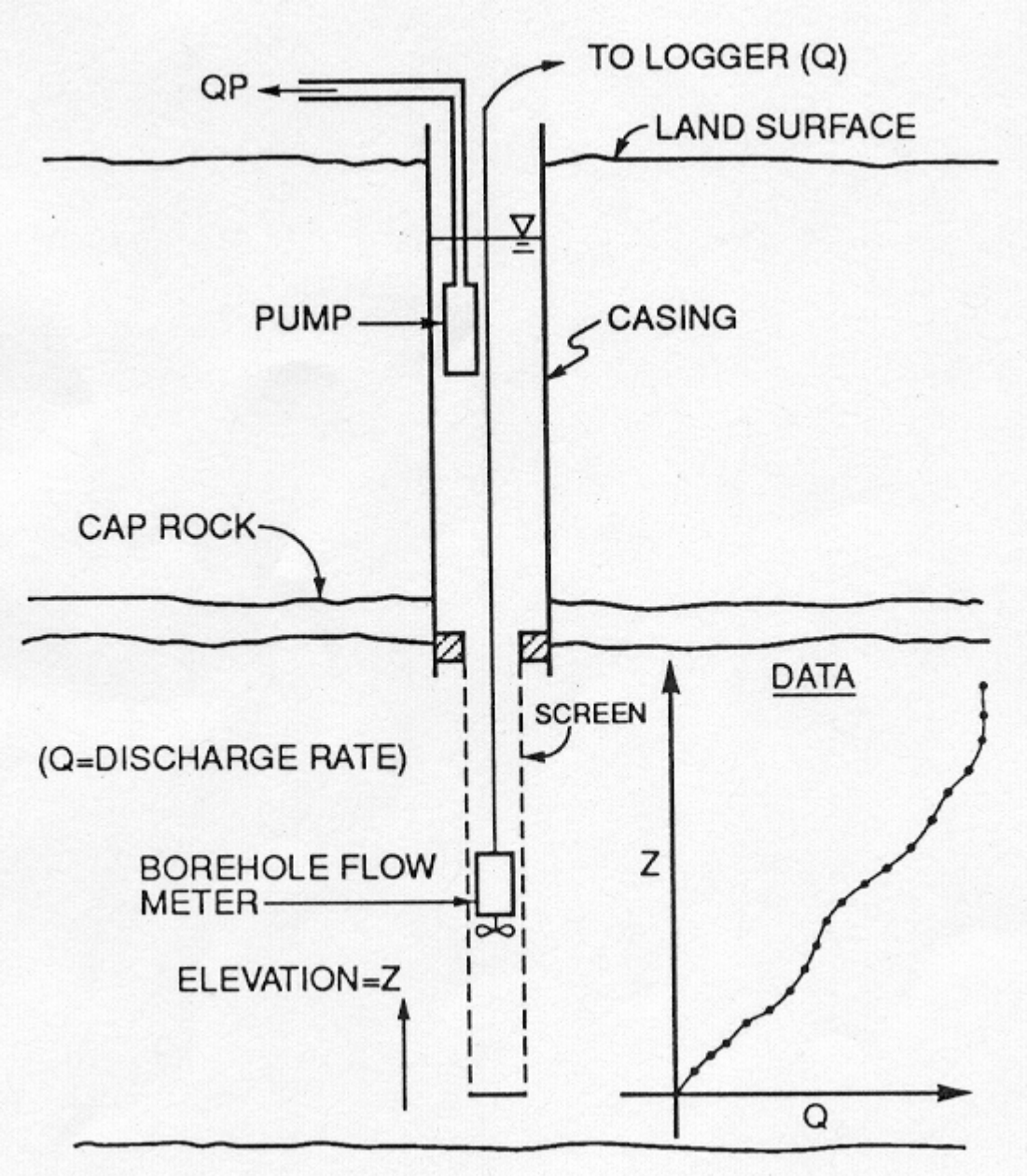


Figure 5 Schematic illustration of borehole flowmeter testing; reproduced from Molz and Young (1993).

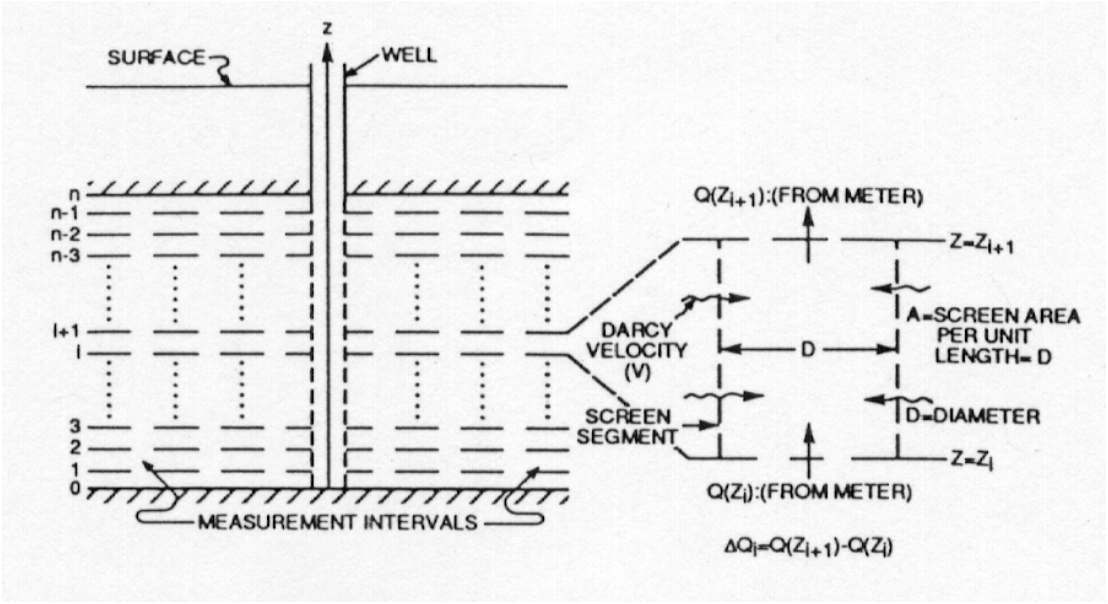


Figure 6 Basic geometry and analysis of borehole flowmeter data; reproduced from Molz and Young (1993).

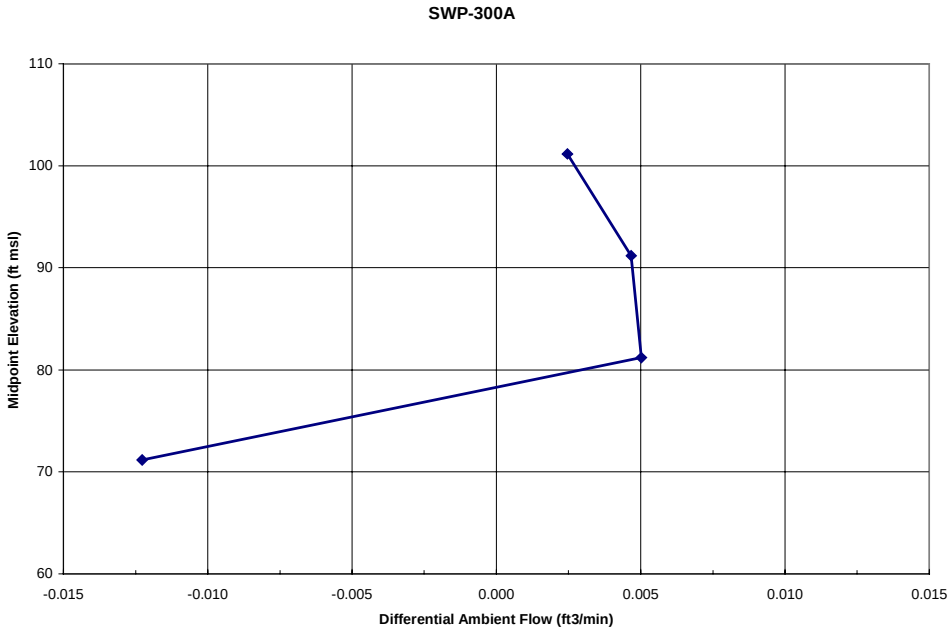


Figure 7 Ambient flow measurements for SWP-300A.

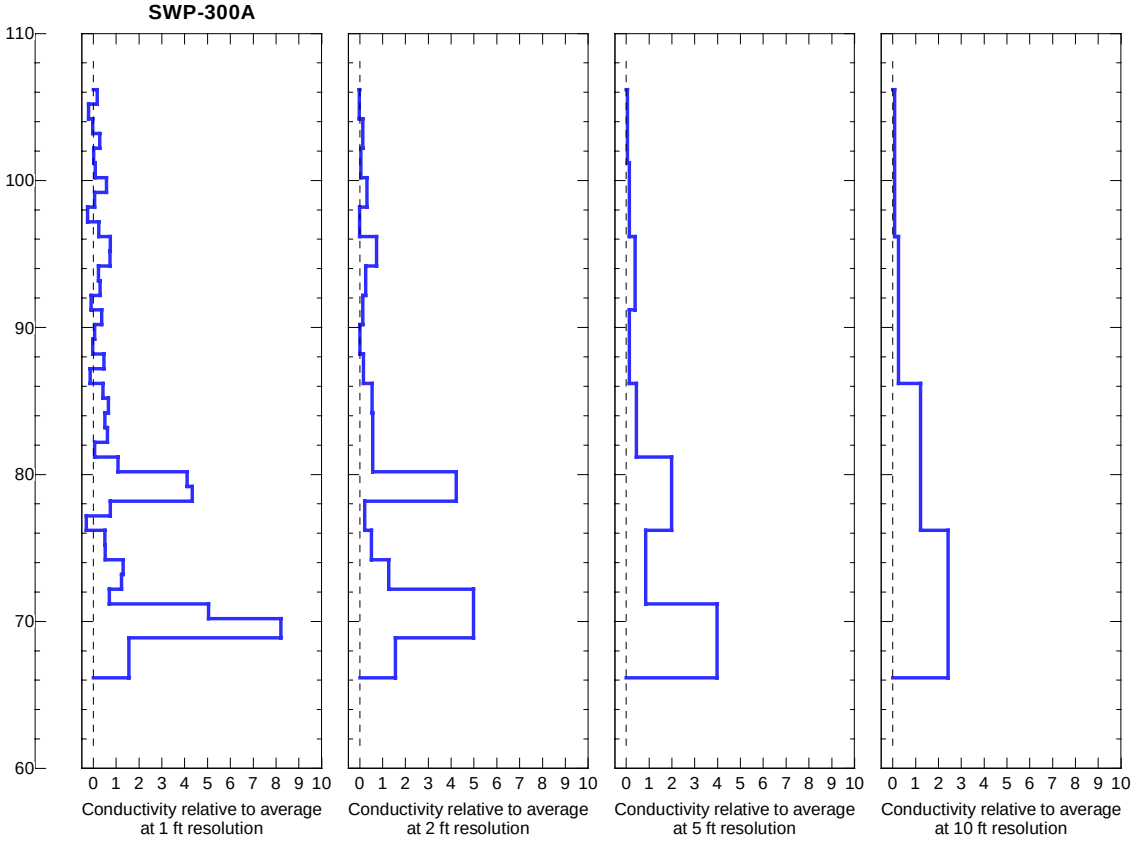


Figure 8 Estimated relative hydraulic conductivity profile for SWP-300A at 1, 2, 5 and 10 ft resolutions.

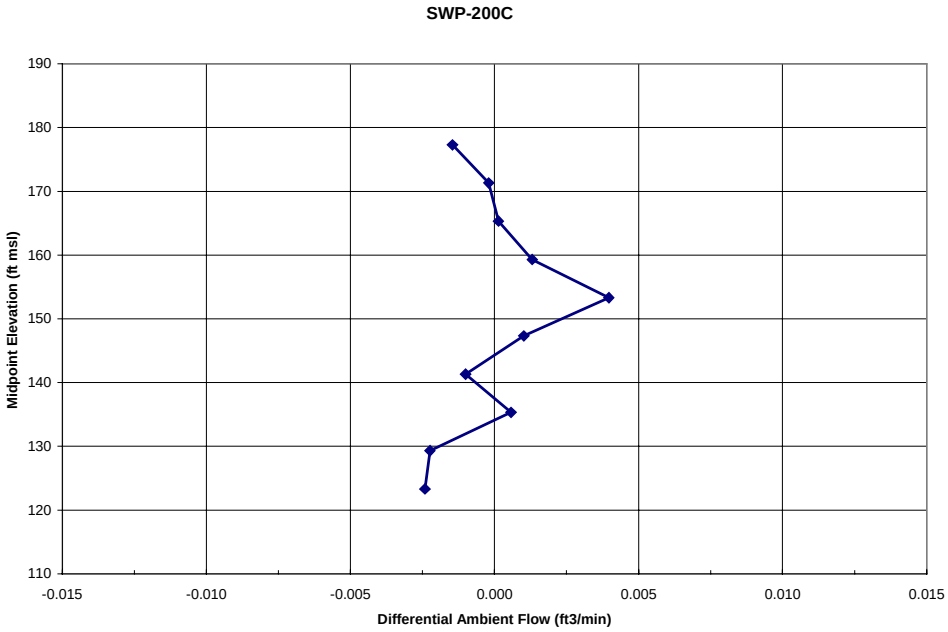


Figure 9 Ambient flow measurements for SWP-200C.

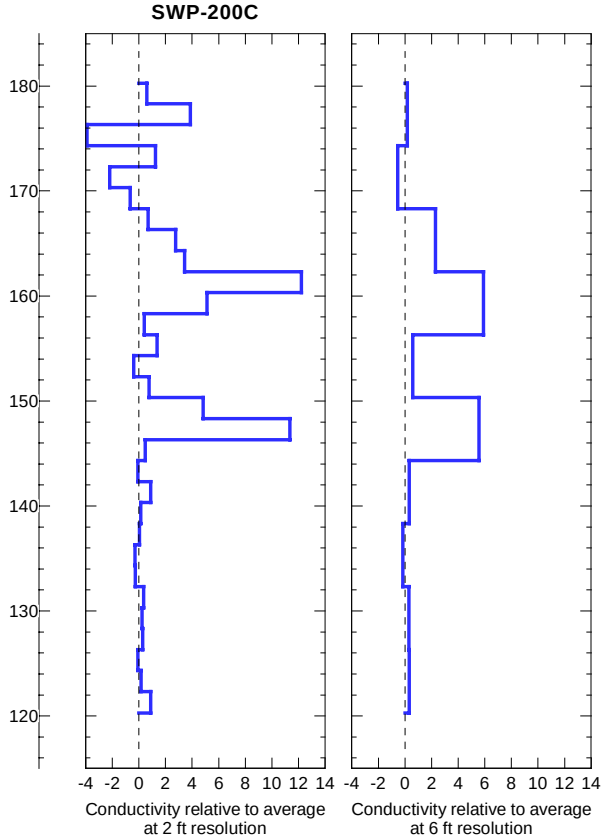


Figure 10 Estimated relative hydraulic conductivity profile for SWP-200C at 2 and 6 ft resolutions.

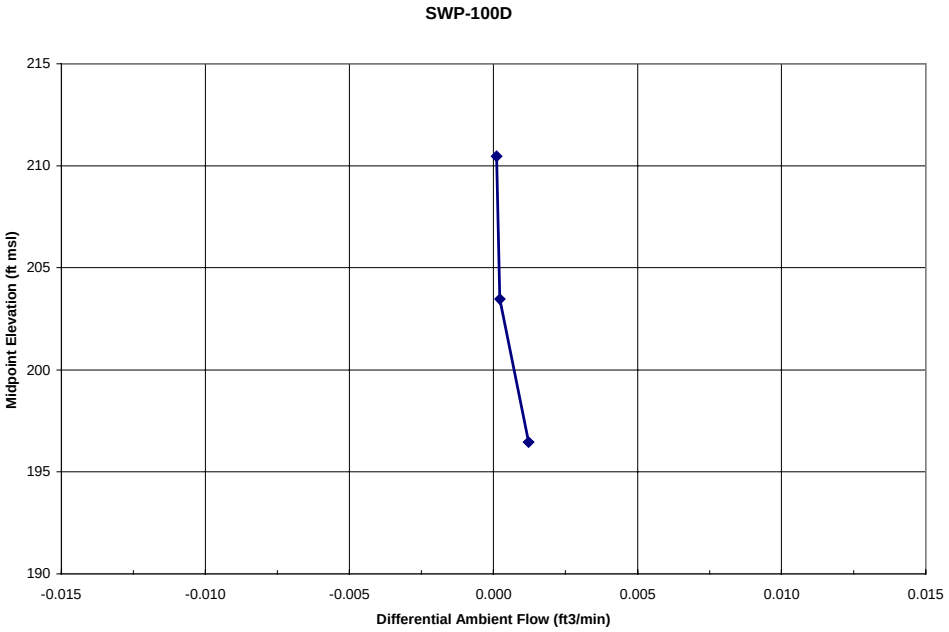


Figure 11 Ambient flow measurements for SWP-100D.

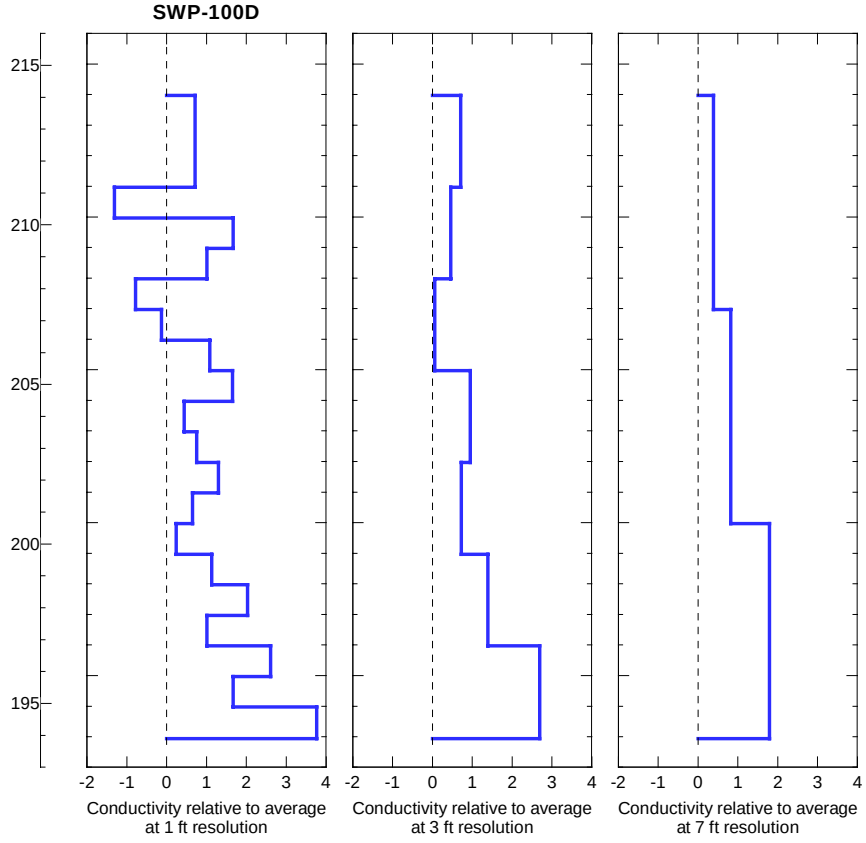


Figure 12 Estimated relative hydraulic conductivity profile for SWP-100D at 1, 3 and 7 ft resolutions.

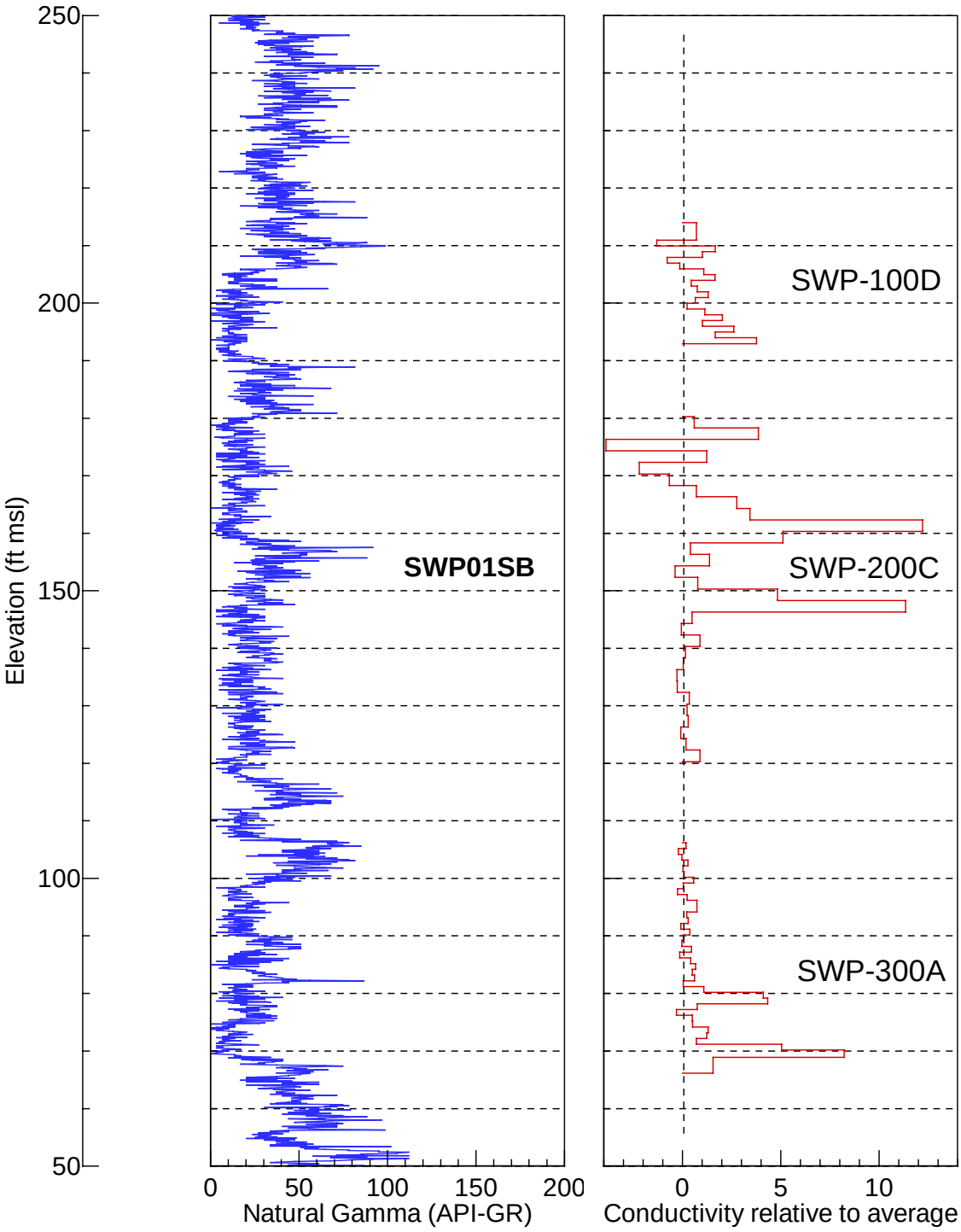
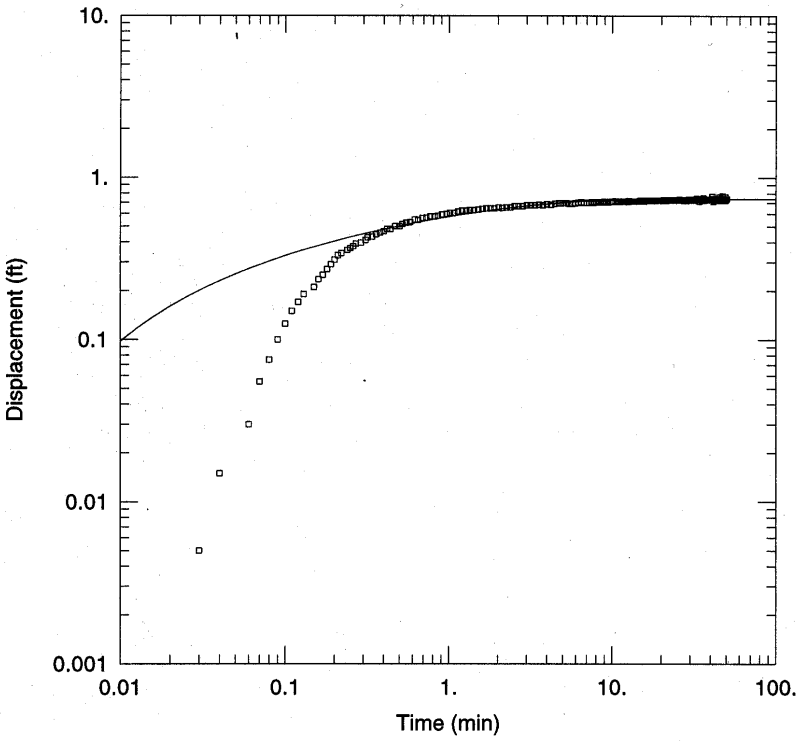


Figure 13 Comparison of EBF relative conductivity profiles to natural gamma log.



WELL TEST ANALYSIS

Data Set: C:\1BobworkC\BoreholeFlow\Logged Data\SWP300_compensated.aqt
Date: 10/26/00 Time: 14:54:30

AQUIFER DATA

Saturated Thickness: 43. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells			Observation Wells		
Well Name	X (ft)	Y (ft)	Well Name	X (ft)	Y (ft)
SWP-300A	0	0	▫ OW 1	0	0.67

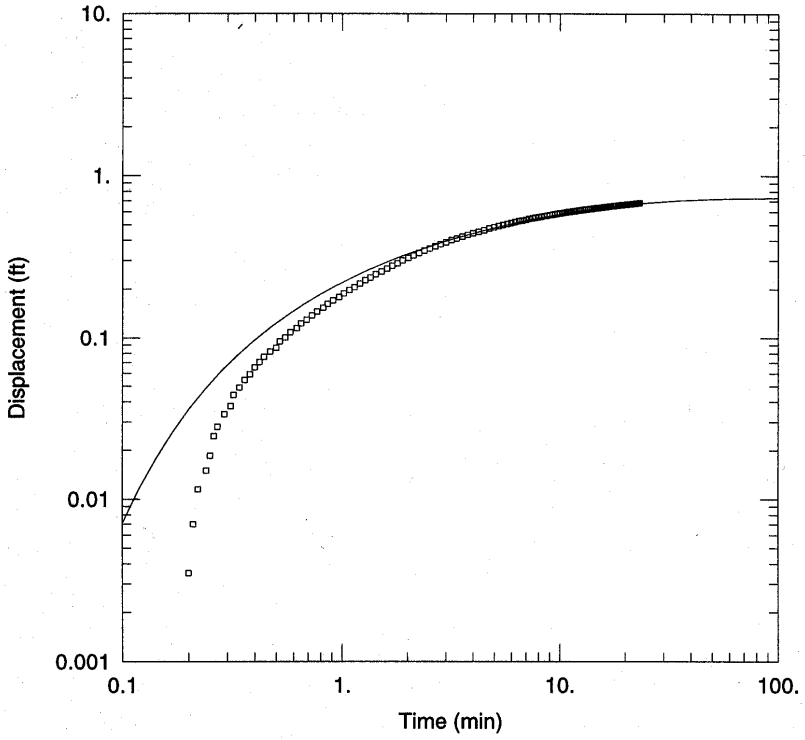
SOLUTION

Aquifer Model: Leaky Solution Method: Hantush-Jacob

T = 0.6989 ft^2/min S = 0.02

r/B = 0.04387

Figure 14 Time-drawdown data and single-well conductivity estimates for SWP-300A.



SWP-200C

Data Set: C:\1BobworkC\BoreholeFlow\Logged Data\SWP200C_compensated.aqt
Date: 10/26/00 Time: 15:12:34

AQUIFER DATA

Saturated Thickness: 65. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
SWP-200C	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OW 1	0	0.833

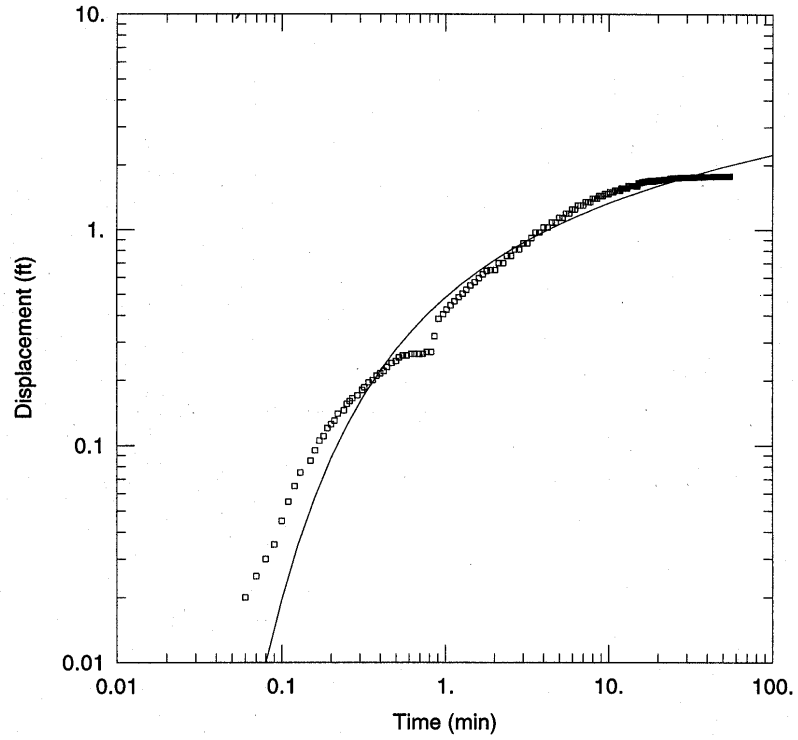
SOLUTION

Aquifer Model: Leaky Solution Method: Hantush-Jacob

T = 0.1018 ft^2/min S = 0.13

r/B = 0.1761

Figure 15 Time-drawdown data and single-well conductivity estimates for SWP-200C.



SWP-100D

Data Set: C:\1BobworkC\BoreholeFlow\Logged Data\SWP100D_compensated.aqt
Date: 10/26/00 Time: 15:29:04

AQUIFER DATA

Saturated Thickness: 24.3 ft

WELL DATA

Pumping Wells			Observation Wells		
Well Name	X (ft)	Y (ft)	Well Name	X (ft)	Y (ft)
SWP-100D	0	0	▫ OW 1	0	0.833

SOLUTION

Aquifer Model: Unconfined Solution Method: Quick Neuman

T = 0.2014 ft^2/min S = 0.2311
Sy = 0.001 ß = 0.001

Figure 16 Time-drawdown data and single-well conductivity estimates for SWP-100D.

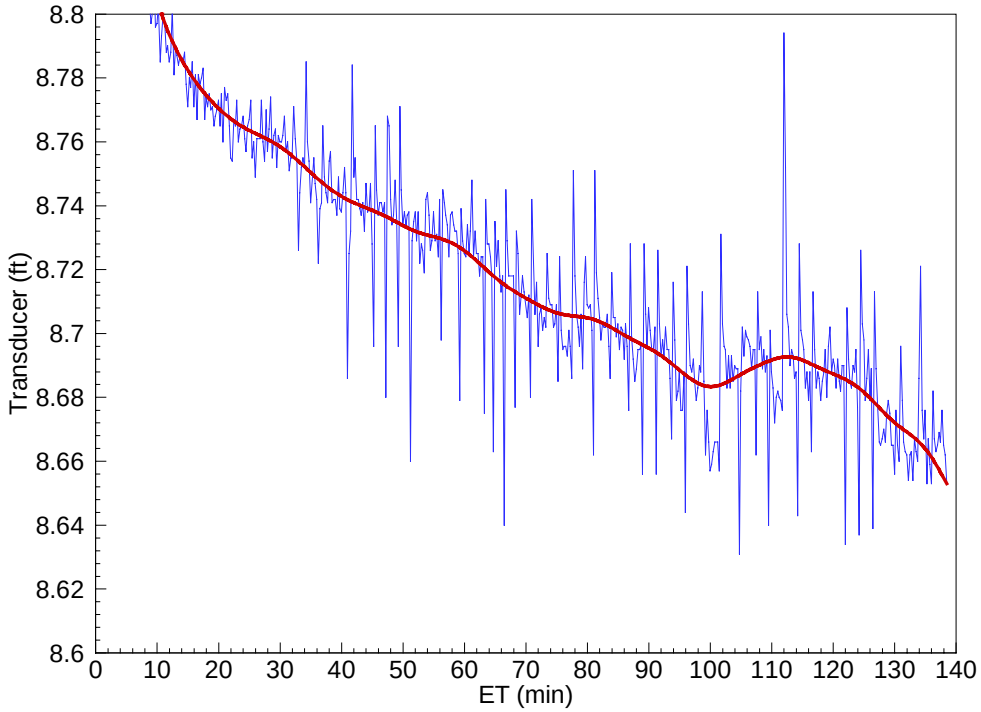


Figure 17 Unaltered and smoothed water level transducer data for SWP-300A.

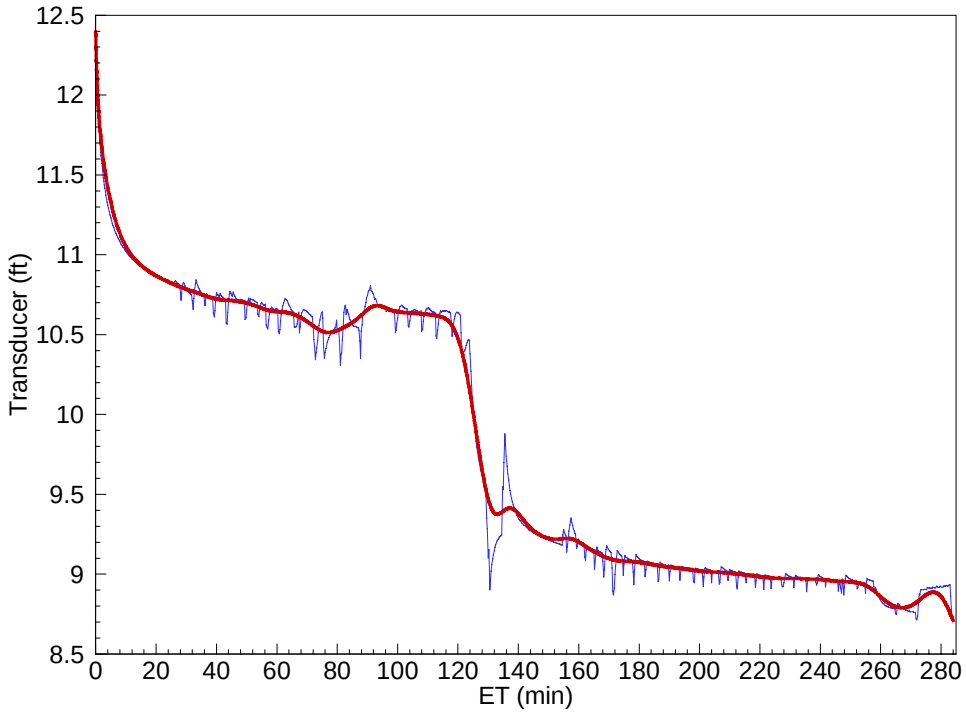


Figure 18 Unaltered and smoothed water level transducer data for SWP-200C.

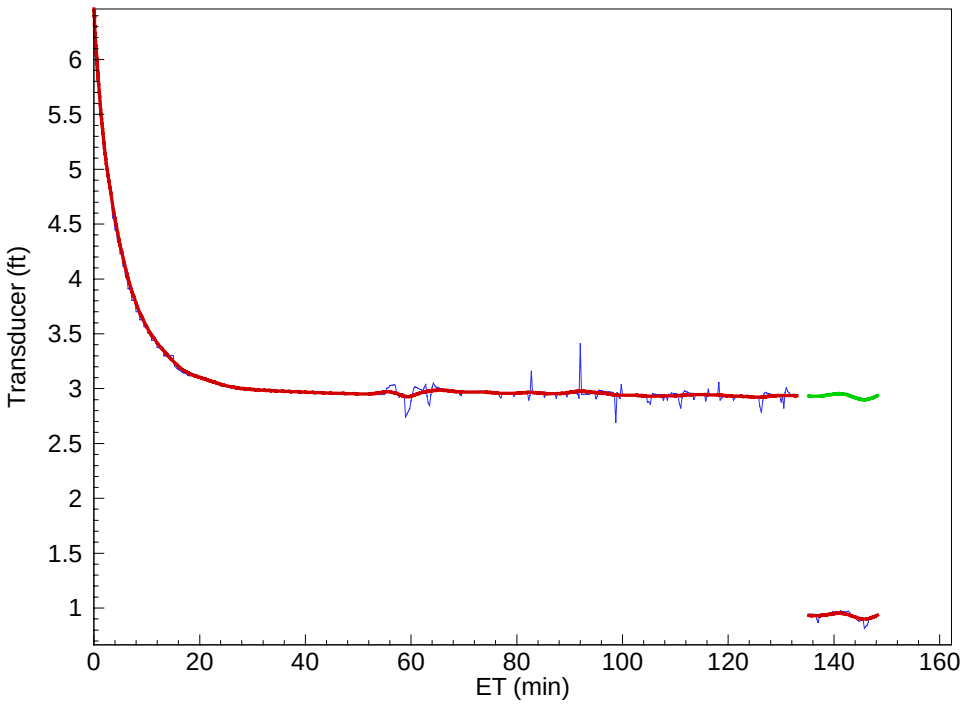
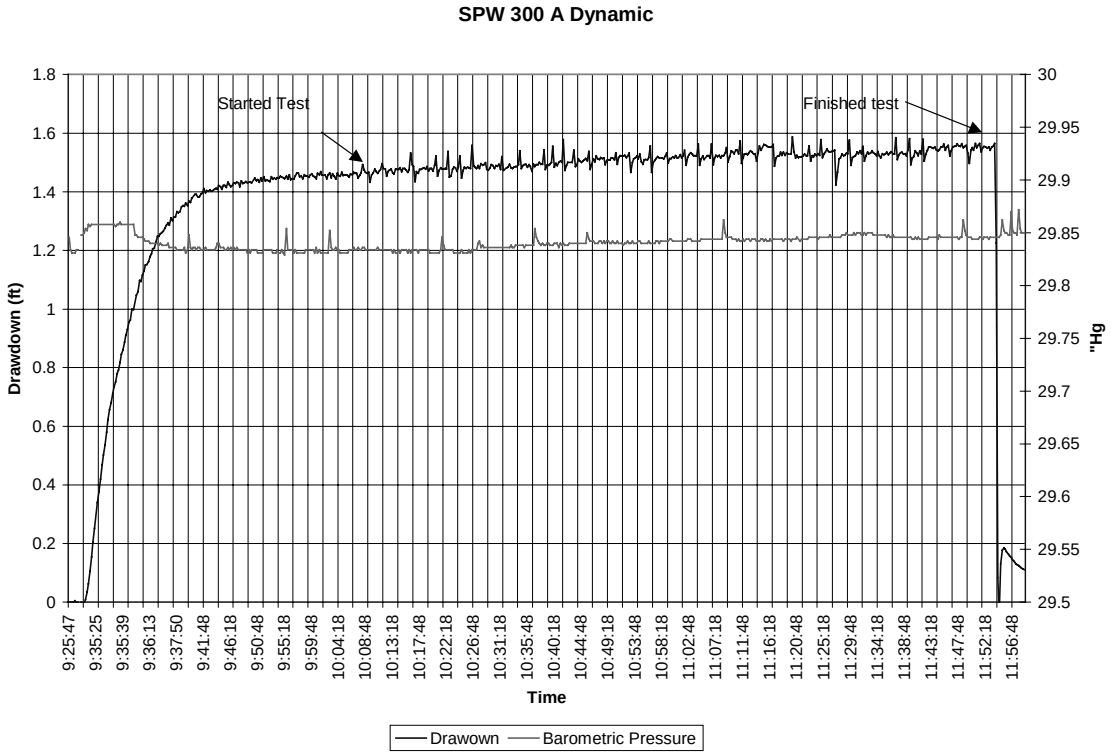


Figure 19 Unaltered and smoothed water level transducer data for SWP-100D.

Appendix A – Time-drawdown data for SWP-300A



	Date	Time	ET (min)	Feet H2O	Inches Hg	Drawdown ft
Background	07/25/00	9:25:47	0	10.218	29.846	0
	07/25/00	9:26:47	1	10.218	29.834	0
	07/25/00	9:27:47	2	10.218	29.831	0
	07/25/00	9:28:47	3	10.218	29.831	0
	07/25/00	9:29:47	4	10.213	29.831	0.005
	07/25/00	9:30:47	5	10.22	29.834	-0.002
	07/25/00	9:31:47	6	10.218	29.834	0
Pumping	07/25/00	9:35:19	0	10.218	29.848	0
	07/25/00	9:35:19	0.0112	10.22	29.848	-0.002
	07/25/00	9:35:20	0.0223	10.22	29.85	-0.002
	07/25/00	9:35:21	0.0335	10.208	29.854	0.01
	07/25/00	9:35:21	0.0447	10.184	29.852	0.034
	07/25/00	9:35:22	0.0558	10.155	29.858	0.063
	07/25/00	9:35:23	0.067	10.113	29.856	0.105
	07/25/00	9:35:23	0.0782	10.064	29.858	0.154
	07/25/00	9:35:24	0.0893	10.014	29.858	0.204
	07/25/00	9:35:25	0.1005	9.966	29.858	0.252
	07/25/00	9:35:25	0.1117	9.917	29.858	0.301
	07/25/00	9:35:26	0.1228	9.878	29.858	0.34
	07/25/00	9:35:27	0.134	9.841	29.858	0.377

Appendix A (continued)

07/25/00	9:35:27	0.1452	9.798	29.858	0.42
07/25/00	9:35:28	0.1563	9.749	29.858	0.469
07/25/00	9:35:29	0.1675	9.716	29.858	0.502
07/25/00	9:35:29	0.1787	9.681	29.858	0.537
07/25/00	9:35:30	0.1898	9.638	29.858	0.58
07/25/00	9:35:31	0.201	9.595	29.858	0.623
07/25/00	9:35:31	0.2122	9.562	29.858	0.656
07/25/00	9:35:32	0.2233	9.537	29.858	0.681
07/25/00	9:35:33	0.235	9.507	29.858	0.711
07/25/00	9:35:33	0.2475	9.484	29.858	0.734
07/25/00	9:35:34	0.2607	9.467	29.856	0.751
07/25/00	9:35:35	0.2747	9.438	29.858	0.78
07/25/00	9:35:36	0.2895	9.426	29.858	0.792
07/25/00	9:35:37	0.3052	9.4	29.86	0.818
07/25/00	9:35:38	0.3218	9.372	29.858	0.846
07/25/00	9:35:39	0.3395	9.357	29.858	0.861
07/25/00	9:35:40	0.3582	9.331	29.858	0.887
07/25/00	9:35:41	0.378	9.307	29.858	0.911
07/25/00	9:35:42	0.399	9.287	29.858	0.931
07/25/00	9:35:44	0.4212	9.262	29.858	0.956
07/25/00	9:35:45	0.4447	9.256	29.858	0.962
07/25/00	9:35:47	0.4695	9.219	29.858	0.999
07/25/00	9:35:48	0.4958	9.22	29.858	0.998
07/25/00	9:35:50	0.5238	9.192	29.848	1.026
07/25/00	9:35:52	0.5535	9.171	29.848	1.047
07/25/00	9:35:54	0.5848	9.158	29.846	1.06
07/25/00	9:35:56	0.618	9.121	29.846	1.097
07/25/00	9:35:58	0.6532	9.124	29.846	1.094
07/25/00	9:36:00	0.6905	9.102	29.846	1.116
07/25/00	9:36:02	0.73	9.088	29.844	1.13
07/25/00	9:36:05	0.7718	9.068	29.842	1.15
07/25/00	9:36:07	0.8162	9.066	29.842	1.152
07/25/00	9:36:10	0.8632	9.056	29.842	1.162
07/25/00	9:36:13	0.913	9.039	29.84	1.179
07/25/00	9:36:16	0.9657	9.03	29.84	1.188
07/25/00	9:36:20	1.0215	9.013	29.84	1.205
07/25/00	9:36:23	1.0807	9.01	29.84	1.208
07/25/00	9:36:27	1.1433	8.989	29.84	1.229
07/25/00	9:36:31	1.2097	8.97	29.84	1.248
07/25/00	9:36:35	1.28	8.97	29.838	1.248
07/25/00	9:36:40	1.3545	8.961	29.84	1.257
07/25/00	9:36:45	1.4335	8.957	29.838	1.261
07/25/00	9:36:50	1.5172	8.953	29.838	1.265
07/25/00	9:36:55	1.6057	8.942	29.838	1.276
07/25/00	9:37:00	1.6995	8.931	29.838	1.287
07/25/00	9:37:06	1.7988	8.924	29.84	1.294
07/25/00	9:37:13	1.9042	8.931	29.836	1.287
07/25/00	9:37:19	2.0157	8.908	29.836	1.31
07/25/00	9:37:27	2.1338	8.917	29.836	1.301
07/25/00	9:37:34	2.259	8.904	29.836	1.314
07/25/00	9:37:42	2.3915	8.904	29.836	1.314

Appendix A (continued)

07/25/00	9:37:50	2.532	8.886	29.834	1.332
07/25/00	9:37:59	2.6808	8.889	29.834	1.329
07/25/00	9:38:09	2.8383	8.886	29.834	1.332
07/25/00	9:38:19	3.0052	8.87	29.834	1.348
07/25/00	9:38:29	3.182	8.865	29.834	1.353
07/25/00	9:38:41	3.3693	8.868	29.836	1.35
07/25/00	9:38:53	3.5677	8.856	29.831	1.362
07/25/00	9:39:05	3.7778	8.865	29.834	1.353
07/25/00	9:39:19	4.0005	8.85	29.848	1.368
07/25/00	9:39:33	4.2363	8.855	29.836	1.363
07/25/00	9:39:48	4.4862	8.84	29.834	1.378
07/25/00	9:40:03	4.7362	8.833	29.836	1.385
07/25/00	9:40:18	4.9862	8.827	29.836	1.391
07/25/00	9:40:33	5.2362	8.827	29.834	1.391
07/25/00	9:40:48	5.4862	8.836	29.836	1.382
07/25/00	9:41:03	5.7362	8.834	29.836	1.384
07/25/00	9:41:18	5.9862	8.826	29.834	1.392
07/25/00	9:41:33	6.2362	8.823	29.834	1.395
07/25/00	9:41:48	6.4862	8.807	29.834	1.411
07/25/00	9:42:03	6.7362	8.821	29.836	1.397
07/25/00	9:42:18	6.9862	8.814	29.834	1.404
07/25/00	9:42:33	7.2362	8.816	29.834	1.402
07/25/00	9:42:48	7.4862	8.811	29.834	1.407
07/25/00	9:43:03	7.7362	8.816	29.834	1.402
07/25/00	9:43:18	7.9862	8.813	29.834	1.405
07/25/00	9:43:33	8.2362	8.809	29.834	1.409
07/25/00	9:43:48	8.4862	8.806	29.836	1.412
07/25/00	9:44:03	8.7362	8.81	29.84	1.408
07/25/00	9:44:18	8.9862	8.797	29.84	1.421
07/25/00	9:44:33	9.2362	8.8	29.836	1.418
07/25/00	9:44:48	9.4862	8.81	29.836	1.408
07/25/00	9:45:03	9.7362	8.796	29.836	1.422
07/25/00	9:45:18	9.9862	8.797	29.834	1.421
07/25/00	9:45:33	10.2362	8.803	29.834	1.415
07/25/00	9:45:48	10.4862	8.785	29.836	1.433
07/25/00	9:46:03	10.7362	8.793	29.834	1.425
07/25/00	9:46:18	10.9862	8.8	29.836	1.418
07/25/00	9:46:33	11.2362	8.797	29.834	1.421
07/25/00	9:46:48	11.4862	8.788	29.836	1.43
07/25/00	9:47:03	11.7362	8.79	29.834	1.428
07/25/00	9:47:18	11.9862	8.785	29.836	1.433
07/25/00	9:47:33	12.2362	8.788	29.834	1.43
07/25/00	9:47:48	12.4862	8.801	29.834	1.417
07/25/00	9:48:03	12.7362	8.781	29.834	1.437
07/25/00	9:48:18	12.9862	8.79	29.834	1.428
07/25/00	9:48:33	13.2362	8.787	29.834	1.431
07/25/00	9:48:48	13.4862	8.784	29.834	1.434
07/25/00	9:49:03	13.7362	8.787	29.831	1.431
07/25/00	9:49:18	13.9862	8.785	29.834	1.433
07/25/00	9:49:33	14.2362	8.785	29.831	1.433
07/25/00	9:49:48	14.4862	8.788	29.834	1.43

Appendix A (continued)

07/25/00	9:50:03	14.7362	8.778	29.834	1.44
07/25/00	9:50:18	14.9862	8.771	29.834	1.447
07/25/00	9:50:33	15.2362	8.78	29.834	1.438
07/25/00	9:50:48	15.4862	8.777	29.831	1.441
07/25/00	9:51:03	15.7362	8.785	29.831	1.433
07/25/00	9:51:18	15.9862	8.771	29.831	1.447
07/25/00	9:51:33	16.2362	8.781	29.831	1.437
07/25/00	9:51:48	16.4862	8.767	29.834	1.451
07/25/00	9:52:03	16.7362	8.781	29.834	1.437
07/25/00	9:52:18	16.9862	8.778	29.834	1.44
07/25/00	9:52:33	17.2362	8.78	29.834	1.438
07/25/00	9:52:48	17.4862	8.783	29.834	1.435
07/25/00	9:53:03	17.7362	8.767	29.834	1.451
07/25/00	9:53:18	17.9862	8.774	29.831	1.444
07/25/00	9:53:33	18.2362	8.771	29.831	1.447
07/25/00	9:53:48	18.4862	8.775	29.831	1.443
07/25/00	9:54:03	18.7362	8.77	29.834	1.448
07/25/00	9:54:18	18.9862	8.771	29.831	1.447
07/25/00	9:54:33	19.2362	8.765	29.831	1.453
07/25/00	9:54:48	19.4862	8.768	29.834	1.45
07/25/00	9:55:03	19.7362	8.77	29.831	1.448
07/25/00	9:55:18	19.9862	8.773	29.829	1.445
07/25/00	9:55:33	20.2362	8.765	29.854	1.453
07/25/00	9:55:48	20.4862	8.775	29.834	1.443
07/25/00	9:56:03	20.7362	8.76	29.834	1.458
07/25/00	9:56:18	20.9862	8.777	29.834	1.441
07/25/00	9:56:33	21.2362	8.773	29.834	1.445
07/25/00	9:56:48	21.4862	8.775	29.831	1.443
07/25/00	9:57:03	21.7362	8.765	29.834	1.453
07/25/00	9:57:18	21.9862	8.755	29.831	1.463
07/25/00	9:57:33	22.2362	8.754	29.831	1.464
07/25/00	9:57:48	22.4862	8.767	29.831	1.451
07/25/00	9:58:03	22.7362	8.765	29.831	1.453
07/25/00	9:58:18	22.9862	8.773	29.831	1.445
07/25/00	9:58:33	23.2362	8.76	29.831	1.458
07/25/00	9:58:48	23.4862	8.764	29.834	1.454
07/25/00	9:59:03	23.7362	8.765	29.834	1.453
07/25/00	9:59:18	23.9862	8.768	29.834	1.45
07/25/00	9:59:33	24.2362	8.761	29.834	1.457
07/25/00	9:59:48	24.4862	8.757	29.834	1.461
07/25/00	10:00:03	24.7362	8.765	29.834	1.453
07/25/00	10:00:18	24.9862	8.767	29.831	1.451
07/25/00	10:00:33	25.2362	8.773	29.836	1.445
07/25/00	10:00:48	25.4862	8.755	29.831	1.463
07/25/00	10:01:03	25.7362	8.76	29.834	1.458
07/25/00	10:01:18	25.9862	8.749	29.831	1.469
07/25/00	10:01:33	26.2362	8.761	29.831	1.457
07/25/00	10:01:48	26.4862	8.761	29.831	1.457
07/25/00	10:02:03	26.7362	8.761	29.831	1.457
07/25/00	10:02:18	26.9862	8.773	29.831	1.445
07/25/00	10:02:33	27.2362	8.76	29.831	1.458

Appendix A (continued)

07/25/00	10:02:48	27.4862	8.754	29.852	1.464
07/25/00	10:03:03	27.7362	8.77	29.836	1.448
07/25/00	10:03:18	27.9862	8.757	29.834	1.461
07/25/00	10:03:33	28.2362	8.764	29.834	1.454
07/25/00	10:03:48	28.4862	8.774	29.836	1.444
07/25/00	10:04:03	28.7362	8.755	29.834	1.463
07/25/00	10:04:18	28.9862	8.762	29.834	1.456
07/25/00	10:04:33	29.2362	8.764	29.831	1.454
07/25/00	10:04:48	29.4862	8.752	29.831	1.466
07/25/00	10:05:03	29.7362	8.762	29.831	1.456
07/25/00	10:05:18	29.9862	8.76	29.831	1.458
07/25/00	10:05:33	30.2362	8.76	29.831	1.458
07/25/00	10:05:48	30.4862	8.762	29.831	1.456
07/25/00	10:06:03	30.7362	8.768	29.834	1.45
07/25/00	10:06:18	30.9862	8.757	29.834	1.461
07/25/00	10:06:33	31.2362	8.76	29.834	1.458
07/25/00	10:06:48	31.4862	8.751	29.836	1.467
07/25/00	10:07:03	31.7362	8.755	29.834	1.463
07/25/00	10:07:18	31.9862	8.755	29.834	1.463
07/25/00	10:07:33	32.2362	8.771	29.836	1.447
07/25/00	10:07:48	32.4862	8.761	29.834	1.457
07/25/00	10:08:03	32.7362	8.754	29.834	1.464
07/25/00	10:08:18	32.9862	8.726	29.836	1.492
07/25/00	10:08:33	33.2362	8.744	29.836	1.474
07/25/00	10:08:48	33.4862	8.752	29.834	1.466
07/25/00	10:09:03	33.7362	8.755	29.834	1.463
07/25/00	10:09:18	33.9862	8.752	29.834	1.466
07/25/00	10:09:33	34.2362	8.785	29.834	1.433
07/25/00	10:09:48	34.4862	8.76	29.834	1.458
07/25/00	10:10:03	34.7362	8.754	29.834	1.464
07/25/00	10:10:18	34.9862	8.741	29.834	1.477
07/25/00	10:10:33	35.2362	8.748	29.834	1.47
07/25/00	10:10:48	35.4862	8.755	29.836	1.463
07/25/00	10:11:03	35.7362	8.747	29.834	1.471
07/25/00	10:11:18	35.9862	8.742	29.834	1.476
07/25/00	10:11:33	36.2362	8.722	29.834	1.496
07/25/00	10:11:48	36.4862	8.739	29.834	1.479
07/25/00	10:12:03	36.7362	8.741	29.834	1.477
07/25/00	10:12:18	36.9862	8.765	29.834	1.453
07/25/00	10:12:33	37.2362	8.749	29.834	1.469
07/25/00	10:12:48	37.4862	8.744	29.834	1.474
07/25/00	10:13:03	37.7362	8.741	29.834	1.477
07/25/00	10:13:18	37.9862	8.754	29.831	1.464
07/25/00	10:13:33	38.2362	8.757	29.834	1.461
07/25/00	10:13:48	38.4862	8.741	29.831	1.477
07/25/00	10:14:03	38.7362	8.742	29.831	1.476
07/25/00	10:14:18	38.9862	8.742	29.834	1.476
07/25/00	10:14:33	39.2362	8.737	29.831	1.481
07/25/00	10:14:48	39.4862	8.749	29.834	1.469
07/25/00	10:15:03	39.7362	8.739	29.834	1.479
07/25/00	10:15:18	39.9862	8.738	29.834	1.48

Appendix A (continued)

07/25/00	10:15:33	40.2362	8.744	29.834	1.474
07/25/00	10:15:48	40.4862	8.752	29.831	1.466
07/25/00	10:16:03	40.7362	8.744	29.834	1.474
07/25/00	10:16:18	40.9862	8.686	29.831	1.532
07/25/00	10:16:33	41.2362	8.725	29.834	1.493
07/25/00	10:16:48	41.4862	8.732	29.834	1.486
07/25/00	10:17:03	41.7362	8.784	29.834	1.434
07/25/00	10:17:18	41.9862	8.749	29.834	1.469
07/25/00	10:17:33	42.2362	8.755	29.831	1.463
07/25/00	10:17:48	42.4862	8.742	29.834	1.476
07/25/00	10:18:03	42.7362	8.742	29.834	1.476
07/25/00	10:18:18	42.9862	8.739	29.834	1.479
07/25/00	10:18:33	43.2362	8.737	29.834	1.481
07/25/00	10:18:48	43.4862	8.741	29.834	1.477
07/25/00	10:19:03	43.7362	8.732	29.834	1.486
07/25/00	10:19:18	43.9862	8.747	29.834	1.471
07/25/00	10:19:33	44.2362	8.738	29.831	1.48
07/25/00	10:19:48	44.4862	8.739	29.831	1.479
07/25/00	10:20:03	44.7362	8.747	29.831	1.471
07/25/00	10:20:18	44.9862	8.728	29.831	1.49
07/25/00	10:20:33	45.2362	8.696	29.831	1.522
07/25/00	10:20:48	45.4862	8.765	29.831	1.453
07/25/00	10:21:03	45.7362	8.745	29.831	1.473
07/25/00	10:21:18	45.9862	8.737	29.834	1.481
07/25/00	10:21:33	46.2362	8.741	29.846	1.477
07/25/00	10:21:48	46.4862	8.741	29.838	1.477
07/25/00	10:22:03	46.7362	8.738	29.834	1.48
07/25/00	10:22:18	46.9862	8.741	29.834	1.477
07/25/00	10:22:33	47.2362	8.68	29.834	1.538
07/25/00	10:22:48	47.4862	8.768	29.834	1.45
07/25/00	10:23:03	47.7362	8.765	29.834	1.453
07/25/00	10:23:18	47.9862	8.742	29.834	1.476
07/25/00	10:23:33	48.2362	8.734	29.831	1.484
07/25/00	10:23:48	48.4862	8.737	29.831	1.481
07/25/00	10:24:03	48.7362	8.748	29.831	1.47
07/25/00	10:24:18	48.9862	8.735	29.831	1.483
07/25/00	10:24:33	49.2362	8.696	29.831	1.522
07/25/00	10:24:48	49.4862	8.771	29.834	1.447
07/25/00	10:25:03	49.7362	8.745	29.831	1.473
07/25/00	10:25:18	49.9862	8.734	29.831	1.484
07/25/00	10:25:33	50.2362	8.738	29.831	1.48
07/25/00	10:25:48	50.4862	8.734	29.831	1.484
07/25/00	10:26:03	50.7362	8.737	29.834	1.481
07/25/00	10:26:18	50.9862	8.738	29.831	1.48
07/25/00	10:26:33	51.2362	8.66	29.834	1.558
07/25/00	10:26:48	51.4862	8.729	29.834	1.489
07/25/00	10:27:03	51.7362	8.735	29.834	1.483
07/25/00	10:27:18	51.9862	8.738	29.834	1.48
07/25/00	10:27:33	52.2362	8.729	29.84	1.489
07/25/00	10:27:48	52.4862	8.738	29.842	1.48
07/25/00	10:28:03	52.7362	8.722	29.836	1.496

Appendix A (continued)

07/25/00	10:28:18	52.9862	8.728	29.838	1.49
07/25/00	10:28:33	53.2362	8.726	29.836	1.492
07/25/00	10:28:48	53.4862	8.719	29.836	1.499
07/25/00	10:29:03	53.7362	8.742	29.836	1.476
07/25/00	10:29:18	53.9862	8.744	29.836	1.474
07/25/00	10:29:33	54.2362	8.737	29.836	1.481
07/25/00	10:29:48	54.4862	8.726	29.836	1.492
07/25/00	10:30:03	54.7362	8.729	29.836	1.489
07/25/00	10:30:18	54.9862	8.738	29.836	1.48
07/25/00	10:30:33	55.2362	8.729	29.836	1.489
07/25/00	10:30:48	55.4862	8.731	29.836	1.487
07/25/00	10:31:03	55.7362	8.724	29.836	1.494
07/25/00	10:31:18	55.9862	8.742	29.836	1.476
07/25/00	10:31:33	56.2362	8.698	29.836	1.52
07/25/00	10:31:48	56.4862	8.745	29.836	1.473
07/25/00	10:32:03	56.7362	8.741	29.836	1.477
07/25/00	10:32:18	56.9862	8.737	29.836	1.481
07/25/00	10:32:33	57.2362	8.734	29.836	1.484
07/25/00	10:32:48	57.4862	8.724	29.836	1.494
07/25/00	10:33:03	57.7362	8.737	29.838	1.481
07/25/00	10:33:18	57.9862	8.738	29.836	1.48
07/25/00	10:33:33	58.2362	8.734	29.836	1.484
07/25/00	10:33:48	58.4862	8.732	29.838	1.486
07/25/00	10:34:03	58.7362	8.732	29.838	1.486
07/25/00	10:34:18	58.9862	8.725	29.838	1.493
07/25/00	10:34:33	59.2362	8.679	29.838	1.539
07/25/00	10:34:48	59.4862	8.739	29.838	1.479
07/25/00	10:35:03	59.7362	8.729	29.838	1.489
07/25/00	10:35:18	59.9862	8.725	29.836	1.493
07/25/00	10:35:33	60.2362	8.724	29.838	1.494
07/25/00	10:35:48	60.4862	8.734	29.838	1.484
07/25/00	10:36:03	60.7362	8.725	29.838	1.493
07/25/00	10:36:18	60.9862	8.732	29.838	1.486
07/25/00	10:36:33	61.2362	8.748	29.838	1.47
07/25/00	10:36:48	61.4862	8.724	29.838	1.494
07/25/00	10:37:03	61.7362	8.732	29.854	1.486
07/25/00	10:37:18	61.9862	8.725	29.846	1.493
07/25/00	10:37:33	62.2362	8.725	29.842	1.493
07/25/00	10:37:48	62.4862	8.718	29.84	1.5
07/25/00	10:38:03	62.7362	8.724	29.838	1.494
07/25/00	10:38:18	62.9862	8.724	29.84	1.494
07/25/00	10:38:33	63.2362	8.675	29.838	1.543
07/25/00	10:38:48	63.4862	8.742	29.838	1.476
07/25/00	10:39:03	63.7362	8.728	29.84	1.49
07/25/00	10:39:18	63.9862	8.728	29.84	1.49
07/25/00	10:39:33	64.2362	8.724	29.838	1.494
07/25/00	10:39:48	64.4862	8.718	29.838	1.5
07/25/00	10:40:03	64.7362	8.663	29.838	1.555
07/25/00	10:40:18	64.9862	8.735	29.84	1.483
07/25/00	10:40:33	65.2362	8.721	29.84	1.497
07/25/00	10:40:48	65.4862	8.729	29.84	1.489

Appendix A (continued)

07/25/00	10:41:03	65.7362	8.718	29.836	1.5
07/25/00	10:41:18	65.9862	8.713	29.84	1.505
07/25/00	10:41:33	66.2362	8.718	29.838	1.5
07/25/00	10:41:48	66.4862	8.64	29.84	1.578
07/25/00	10:42:03	66.7362	8.745	29.838	1.473
07/25/00	10:42:18	66.9862	8.729	29.838	1.489
07/25/00	10:42:33	67.2362	8.718	29.838	1.5
07/25/00	10:42:48	67.4862	8.718	29.84	1.5
07/25/00	10:43:03	67.7362	8.718	29.84	1.5
07/25/00	10:43:18	67.9862	8.718	29.84	1.5
07/25/00	10:43:33	68.2362	8.677	29.84	1.541
07/25/00	10:43:48	68.4862	8.732	29.84	1.486
07/25/00	10:44:03	68.7362	8.725	29.84	1.493
07/25/00	10:44:18	68.9862	8.706	29.84	1.512
07/25/00	10:44:33	69.2362	8.712	29.84	1.506
07/25/00	10:44:48	69.4862	8.718	29.84	1.5
07/25/00	10:45:03	69.7362	8.713	29.84	1.505
07/25/00	10:45:18	69.9862	8.709	29.84	1.509
07/25/00	10:45:33	70.2362	8.705	29.84	1.513
07/25/00	10:45:48	70.4862	8.712	29.85	1.506
07/25/00	10:46:03	70.7362	8.68	29.844	1.538
07/25/00	10:46:18	70.9862	8.742	29.842	1.476
07/25/00	10:46:33	71.2362	8.724	29.842	1.494
07/25/00	10:46:48	71.4862	8.706	29.842	1.512
07/25/00	10:47:03	71.7362	8.716	29.84	1.502
07/25/00	10:47:18	71.9862	8.696	29.84	1.522
07/25/00	10:47:33	72.2362	8.706	29.84	1.512
07/25/00	10:47:48	72.4862	8.708	29.842	1.51
07/25/00	10:48:03	72.7362	8.701	29.842	1.517
07/25/00	10:48:18	72.9862	8.705	29.84	1.513
07/25/00	10:48:33	73.2362	8.702	29.842	1.516
07/25/00	10:48:48	73.4862	8.725	29.84	1.493
07/25/00	10:49:03	73.7362	8.711	29.842	1.507
07/25/00	10:49:18	73.9862	8.709	29.842	1.509
07/25/00	10:49:33	74.2362	8.709	29.84	1.509
07/25/00	10:49:48	74.4862	8.702	29.84	1.516
07/25/00	10:50:03	74.7362	8.703	29.842	1.515
07/25/00	10:50:18	74.9862	8.709	29.84	1.509
07/25/00	10:50:33	75.2362	8.685	29.84	1.533
07/25/00	10:50:48	75.4862	8.724	29.842	1.494
07/25/00	10:51:03	75.7362	8.701	29.84	1.517
07/25/00	10:51:18	75.9862	8.695	29.84	1.523
07/25/00	10:51:33	76.2362	8.696	29.84	1.522
07/25/00	10:51:48	76.4862	8.696	29.838	1.522
07/25/00	10:52:03	76.7362	8.693	29.84	1.525
07/25/00	10:52:18	76.9862	8.701	29.84	1.517
07/25/00	10:52:33	77.2362	8.696	29.842	1.522
07/25/00	10:52:48	77.4862	8.686	29.84	1.532
07/25/00	10:53:03	77.7362	8.751	29.84	1.467
07/25/00	10:53:18	77.9862	8.718	29.842	1.5
07/25/00	10:53:33	78.2362	8.706	29.84	1.512

Appendix A (continued)

07/25/00	10:53:48	78.4862	8.702	29.84	1.516
07/25/00	10:54:03	78.7362	8.696	29.84	1.522
07/25/00	10:54:18	78.9862	8.706	29.842	1.512
07/25/00	10:54:33	79.2362	8.689	29.842	1.529
07/25/00	10:54:48	79.4862	8.716	29.84	1.502
07/25/00	10:55:03	79.7362	8.724	29.84	1.494
07/25/00	10:55:18	79.9862	8.709	29.84	1.509
07/25/00	10:55:33	80.2362	8.708	29.84	1.51
07/25/00	10:55:48	80.4862	8.709	29.84	1.509
07/25/00	10:56:03	80.7362	8.701	29.842	1.517
07/25/00	10:56:18	80.9862	8.662	29.84	1.556
07/25/00	10:56:33	81.2362	8.751	29.84	1.467
07/25/00	10:56:48	81.4862	8.719	29.84	1.499
07/25/00	10:57:03	81.7362	8.711	29.84	1.507
07/25/00	10:57:18	81.9862	8.705	29.842	1.513
07/25/00	10:57:33	82.2362	8.698	29.842	1.52
07/25/00	10:57:48	82.4862	8.703	29.84	1.515
07/25/00	10:58:03	82.7362	8.702	29.842	1.516
07/25/00	10:58:18	82.9862	8.702	29.842	1.516
07/25/00	10:58:33	83.2362	8.706	29.842	1.512
07/25/00	10:58:48	83.4862	8.696	29.842	1.522
07/25/00	10:59:03	83.7362	8.686	29.842	1.532
07/25/00	10:59:18	83.9862	8.719	29.842	1.499
07/25/00	10:59:33	84.2362	8.705	29.844	1.513
07/25/00	10:59:48	84.4862	8.705	29.844	1.513
07/25/00	11:00:03	84.7362	8.699	29.842	1.519
07/25/00	11:00:18	84.9862	8.703	29.842	1.515
07/25/00	11:00:33	85.2362	8.695	29.842	1.523
07/25/00	11:00:48	85.4862	8.702	29.842	1.516
07/25/00	11:01:03	85.7362	8.701	29.842	1.517
07/25/00	11:01:18	85.9862	8.692	29.842	1.526
07/25/00	11:01:33	86.2362	8.703	29.842	1.515
07/25/00	11:01:48	86.4862	8.696	29.842	1.522
07/25/00	11:02:03	86.7362	8.676	29.842	1.542
07/25/00	11:02:18	86.9862	8.728	29.842	1.49
07/25/00	11:02:33	87.2362	8.699	29.844	1.519
07/25/00	11:02:48	87.4862	8.692	29.844	1.526
07/25/00	11:03:03	87.7362	8.685	29.844	1.533
07/25/00	11:03:18	87.9862	8.689	29.842	1.529
07/25/00	11:03:33	88.2362	8.695	29.842	1.523
07/25/00	11:03:48	88.4862	8.695	29.842	1.523
07/25/00	11:04:03	88.7362	8.696	29.842	1.522
07/25/00	11:04:18	88.9862	8.656	29.842	1.562
07/25/00	11:04:33	89.2362	8.728	29.842	1.49
07/25/00	11:04:48	89.4862	8.706	29.844	1.512
07/25/00	11:05:03	89.7362	8.696	29.844	1.522
07/25/00	11:05:18	89.9862	8.708	29.844	1.51
07/25/00	11:05:33	90.2362	8.701	29.844	1.517
07/25/00	11:05:48	90.4862	8.695	29.844	1.523
07/25/00	11:06:03	90.7362	8.695	29.844	1.523
07/25/00	11:06:18	90.9862	8.702	29.844	1.516

Appendix A (continued)

07/25/00	11:06:33	91.2362	8.656	29.844	1.562
07/25/00	11:06:48	91.4862	8.726	29.844	1.492
07/25/00	11:07:03	91.7362	8.703	29.844	1.515
07/25/00	11:07:18	91.9862	8.693	29.844	1.525
07/25/00	11:07:33	92.2362	8.698	29.844	1.52
07/25/00	11:07:48	92.4862	8.693	29.844	1.525
07/25/00	11:08:03	92.7362	8.702	29.844	1.516
07/25/00	11:08:18	92.9862	8.695	29.844	1.523
07/25/00	11:08:33	93.2362	8.695	29.862	1.523
07/25/00	11:08:48	93.4862	8.686	29.85	1.532
07/25/00	11:09:03	93.7362	8.667	29.846	1.551
07/25/00	11:09:18	93.9862	8.716	29.846	1.502
07/25/00	11:09:33	94.2362	8.698	29.846	1.52
07/25/00	11:09:48	94.4862	8.679	29.846	1.539
07/25/00	11:10:03	94.7362	8.682	29.844	1.536
07/25/00	11:10:18	94.9862	8.688	29.844	1.53
07/25/00	11:10:33	95.2362	8.676	29.844	1.542
07/25/00	11:10:48	95.4862	8.676	29.842	1.542
07/25/00	11:11:03	95.7362	8.688	29.844	1.53
07/25/00	11:11:18	95.9862	8.644	29.842	1.574
07/25/00	11:11:33	96.2362	8.721	29.842	1.497
07/25/00	11:11:48	96.4862	8.703	29.844	1.515
07/25/00	11:12:03	96.7362	8.69	29.842	1.528
07/25/00	11:12:18	96.9862	8.688	29.844	1.53
07/25/00	11:12:33	97.2362	8.692	29.844	1.526
07/25/00	11:12:48	97.4862	8.685	29.844	1.533
07/25/00	11:13:03	97.7362	8.679	29.842	1.539
07/25/00	11:13:18	97.9862	8.683	29.844	1.535
07/25/00	11:13:33	98.2362	8.69	29.844	1.528
07/25/00	11:13:48	98.4862	8.688	29.844	1.53
07/25/00	11:14:03	98.7362	8.713	29.842	1.505
07/25/00	11:14:18	98.9862	8.685	29.842	1.533
07/25/00	11:14:33	99.2362	8.662	29.842	1.556
07/25/00	11:14:48	99.4862	8.676	29.844	1.542
07/25/00	11:15:03	99.7362	8.666	29.844	1.552
07/25/00	11:15:18	99.9862	8.657	29.842	1.561
07/25/00	11:15:33	100.2362	8.659	29.844	1.559
07/25/00	11:15:48	100.4862	8.663	29.842	1.555
07/25/00	11:16:03	100.7362	8.666	29.842	1.552
07/25/00	11:16:18	100.9862	8.666	29.844	1.552
07/25/00	11:16:33	101.2362	8.666	29.842	1.552
07/25/00	11:16:48	101.4862	8.657	29.844	1.561
07/25/00	11:17:03	101.7362	8.731	29.844	1.487
07/25/00	11:17:18	101.9862	8.703	29.844	1.515
07/25/00	11:17:33	102.2362	8.696	29.844	1.522
07/25/00	11:17:48	102.4862	8.695	29.844	1.523
07/25/00	11:18:03	102.7362	8.683	29.844	1.535
07/25/00	11:18:18	102.9862	8.693	29.844	1.525
07/25/00	11:18:33	103.2362	8.683	29.842	1.535
07/25/00	11:18:48	103.4862	8.693	29.844	1.525
07/25/00	11:19:03	103.7362	8.685	29.844	1.533

Appendix A (continued)

07/25/00	11:19:18	103.9862	8.69	29.844	1.528
07/25/00	11:19:33	104.2362	8.689	29.844	1.529
07/25/00	11:19:48	104.4862	8.689	29.842	1.529
07/25/00	11:20:03	104.7362	8.631	29.844	1.587
07/25/00	11:20:18	104.9862	8.682	29.844	1.536
07/25/00	11:20:33	105.2362	8.702	29.844	1.516
07/25/00	11:20:48	105.4862	8.693	29.846	1.525
07/25/00	11:21:03	105.7362	8.701	29.844	1.517
07/25/00	11:21:18	105.9862	8.699	29.842	1.519
07/25/00	11:21:33	106.2362	8.698	29.844	1.52
07/25/00	11:21:48	106.4862	8.696	29.844	1.522
07/25/00	11:22:03	106.7362	8.689	29.844	1.529
07/25/00	11:22:18	106.9862	8.695	29.844	1.523
07/25/00	11:22:33	107.2362	8.695	29.844	1.523
07/25/00	11:22:48	107.4862	8.662	29.846	1.556
07/25/00	11:23:03	107.7362	8.713	29.846	1.505
07/25/00	11:23:18	107.9862	8.695	29.846	1.523
07/25/00	11:23:33	108.2362	8.699	29.846	1.519
07/25/00	11:23:48	108.4862	8.689	29.846	1.529
07/25/00	11:24:03	108.7362	8.695	29.846	1.523
07/25/00	11:24:18	108.9862	8.688	29.844	1.53
07/25/00	11:24:33	109.2362	8.693	29.846	1.525
07/25/00	11:24:48	109.4862	8.64	29.846	1.578
07/25/00	11:25:03	109.7362	8.701	29.846	1.517
07/25/00	11:25:18	109.9862	8.688	29.846	1.53
07/25/00	11:25:33	110.2362	8.683	29.846	1.535
07/25/00	11:25:48	110.4862	8.672	29.846	1.546
07/25/00	11:26:03	110.7362	8.68	29.846	1.538
07/25/00	11:26:18	110.9862	8.682	29.848	1.536
07/25/00	11:26:33	111.2362	8.68	29.846	1.538
07/25/00	11:26:48	111.4862	8.679	29.846	1.539
07/25/00	11:27:03	111.7362	8.676	29.846	1.542
07/25/00	11:27:18	111.9862	8.794	29.846	1.424
07/25/00	11:27:33	112.2362	8.752	29.846	1.466
07/25/00	11:27:48	112.4862	8.706	29.846	1.512
07/25/00	11:28:03	112.7362	8.702	29.846	1.516
07/25/00	11:28:18	112.9862	8.69	29.848	1.528
07/25/00	11:28:33	113.2362	8.695	29.848	1.523
07/25/00	11:28:48	113.4862	8.693	29.848	1.525
07/25/00	11:29:03	113.7362	8.686	29.85	1.532
07/25/00	11:29:18	113.9862	8.688	29.848	1.53
07/25/00	11:29:33	114.2362	8.643	29.848	1.575
07/25/00	11:29:48	114.4862	8.728	29.848	1.49
07/25/00	11:30:03	114.7362	8.701	29.848	1.517
07/25/00	11:30:18	114.9862	8.698	29.85	1.52
07/25/00	11:30:33	115.2362	8.695	29.848	1.523
07/25/00	11:30:48	115.4862	8.683	29.85	1.535
07/25/00	11:31:03	115.7362	8.688	29.85	1.53
07/25/00	11:31:18	115.9862	8.679	29.85	1.539
07/25/00	11:31:33	116.2362	8.688	29.848	1.53
07/25/00	11:31:48	116.4862	8.663	29.848	1.555

Appendix A (continued)

07/25/00	11:32:03	116.7362	8.713	29.85	1.505
07/25/00	11:32:18	116.9862	8.695	29.848	1.523
07/25/00	11:32:33	117.2362	8.683	29.85	1.535
07/25/00	11:32:48	117.4862	8.688	29.85	1.53
07/25/00	11:33:03	117.7362	8.686	29.85	1.532
07/25/00	11:33:18	117.9862	8.679	29.85	1.539
07/25/00	11:33:33	118.2362	8.685	29.848	1.533
07/25/00	11:33:48	118.4862	8.688	29.848	1.53
07/25/00	11:34:03	118.7362	8.695	29.848	1.523
07/25/00	11:34:18	118.9862	8.68	29.848	1.538
07/25/00	11:34:33	119.2362	8.696	29.848	1.522
07/25/00	11:34:48	119.4862	8.702	29.848	1.516
07/25/00	11:35:03	119.7362	8.688	29.848	1.53
07/25/00	11:35:18	119.9862	8.692	29.848	1.526
07/25/00	11:35:33	120.2362	8.69	29.848	1.528
07/25/00	11:35:48	120.4862	8.683	29.846	1.535
07/25/00	11:36:03	120.7362	8.692	29.848	1.526
07/25/00	11:36:18	120.9862	8.685	29.846	1.533
07/25/00	11:36:33	121.2362	8.682	29.846	1.536
07/25/00	11:36:48	121.4862	8.69	29.848	1.528
07/25/00	11:37:03	121.7362	8.69	29.846	1.528
07/25/00	11:37:18	121.9862	8.634	29.846	1.584
07/25/00	11:37:33	122.2362	8.708	29.846	1.51
07/25/00	11:37:48	122.4862	8.692	29.846	1.526
07/25/00	11:38:03	122.7362	8.685	29.846	1.533
07/25/00	11:38:18	122.9862	8.683	29.846	1.535
07/25/00	11:38:33	123.2362	8.69	29.846	1.528
07/25/00	11:38:48	123.4862	8.688	29.846	1.53
07/25/00	11:39:03	123.7362	8.695	29.846	1.523
07/25/00	11:39:18	123.9862	8.677	29.846	1.541
07/25/00	11:39:33	124.2362	8.637	29.846	1.581
07/25/00	11:39:48	124.4862	8.726	29.846	1.492
07/25/00	11:40:03	124.7362	8.703	29.844	1.515
07/25/00	11:40:18	124.9862	8.698	29.844	1.52
07/25/00	11:40:33	125.2362	8.679	29.846	1.539
07/25/00	11:40:48	125.4862	8.686	29.844	1.532
07/25/00	11:41:03	125.7362	8.695	29.846	1.523
07/25/00	11:41:18	125.9862	8.679	29.844	1.539
07/25/00	11:41:33	126.2362	8.689	29.844	1.529
07/25/00	11:41:48	126.4862	8.639	29.844	1.579
07/25/00	11:42:03	126.7362	8.713	29.844	1.505
07/25/00	11:42:18	126.9862	8.689	29.844	1.529
07/25/00	11:42:33	127.2362	8.677	29.844	1.541
07/25/00	11:42:48	127.4862	8.666	29.846	1.552
07/25/00	11:43:03	127.7362	8.665	29.846	1.553
07/25/00	11:43:18	127.9862	8.667	29.846	1.551
07/25/00	11:43:33	128.2362	8.67	29.846	1.548
07/25/00	11:43:48	128.4862	8.666	29.846	1.552
07/25/00	11:44:03	128.7362	8.675	29.846	1.543
07/25/00	11:44:18	128.9862	8.679	29.844	1.539
07/25/00	11:44:33	129.2362	8.675	29.848	1.543

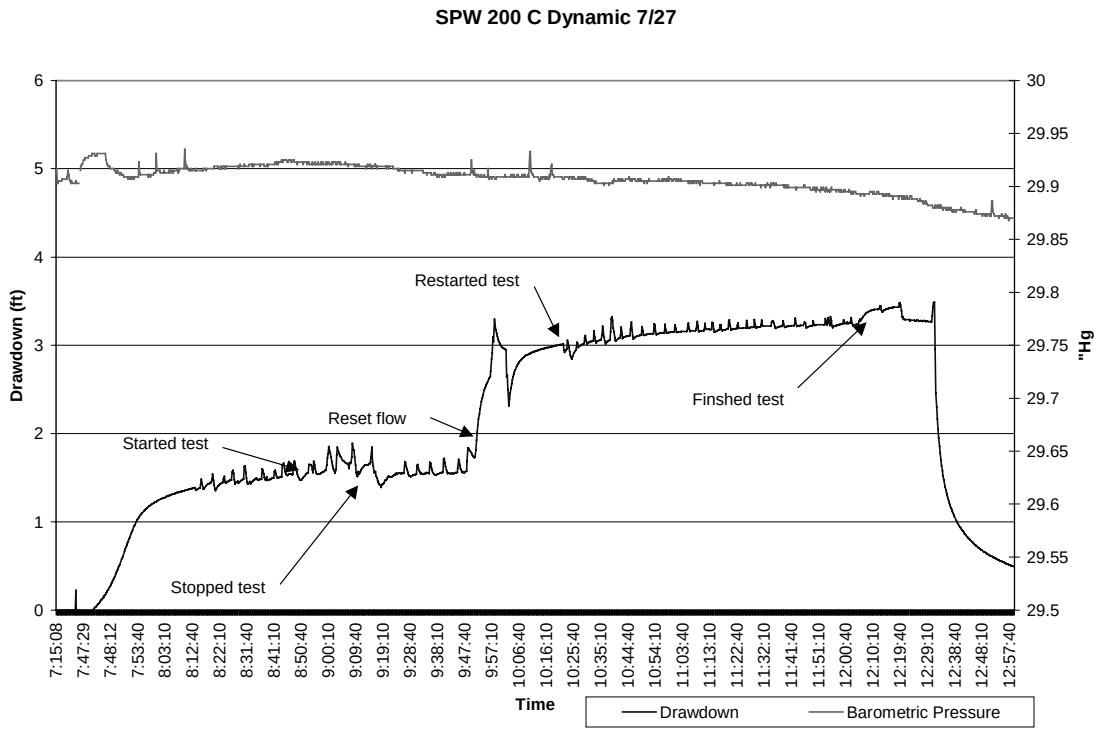
Appendix A (continued)

07/25/00	11:44:48	129.4862	8.665	29.846	1.553
07/25/00	11:45:03	129.7362	8.665	29.846	1.553
07/25/00	11:45:18	129.9862	8.656	29.846	1.562
07/25/00	11:45:33	130.2362	8.676	29.846	1.542
07/25/00	11:45:48	130.4862	8.665	29.846	1.553
07/25/00	11:46:03	130.7362	8.66	29.846	1.558
07/25/00	11:46:18	130.9862	8.696	29.846	1.522
07/25/00	11:46:33	131.2362	8.679	29.846	1.539
07/25/00	11:46:48	131.4862	8.666	29.846	1.552
07/25/00	11:47:03	131.7362	8.663	29.846	1.555
07/25/00	11:47:18	131.9862	8.662	29.846	1.556
07/25/00	11:47:33	132.2362	8.654	29.846	1.564
07/25/00	11:47:48	132.4862	8.662	29.844	1.556
07/25/00	11:48:03	132.7362	8.663	29.846	1.555
07/25/00	11:48:18	132.9862	8.654	29.846	1.564
07/25/00	11:48:33	133.2362	8.667	29.862	1.551
07/25/00	11:48:48	133.4862	8.663	29.852	1.555
07/25/00	11:49:03	133.7362	8.66	29.848	1.558
07/25/00	11:49:18	133.9862	8.686	29.846	1.532
07/25/00	11:49:33	134.2362	8.721	29.846	1.497
07/25/00	11:49:48	134.4862	8.676	29.846	1.542
07/25/00	11:50:03	134.7362	8.667	29.844	1.551
07/25/00	11:50:18	134.9862	8.676	29.844	1.542
07/25/00	11:50:33	135.2362	8.653	29.844	1.565
07/25/00	11:50:48	135.4862	8.667	29.844	1.551
07/25/00	11:51:03	135.7362	8.659	29.844	1.559
07/25/00	11:51:18	135.9862	8.653	29.846	1.565
07/25/00	11:51:33	136.2362	8.682	29.846	1.536
07/25/00	11:51:48	136.4862	8.667	29.844	1.551
07/25/00	11:52:03	136.7362	8.663	29.846	1.555
07/25/00	11:52:18	136.9862	8.665	29.846	1.553
07/25/00	11:52:33	137.2362	8.669	29.846	1.549
07/25/00	11:52:48	137.4862	8.666	29.844	1.552
07/25/00	11:53:03	137.7362	8.676	29.846	1.542
07/25/00	11:53:18	137.9862	8.665	29.846	1.553
07/25/00	11:53:33	138.2362	8.662	29.846	1.556
07/25/00	11:53:48	138.4862	8.653	29.846	1.565
07/25/00	11:54:03	138.7362	8.991	29.846	1.227
07/25/00	11:54:18	138.9862	10.133	29.846	0.085
07/25/00	11:54:33	139.2362	10.267	29.846	-0.049
07/25/00	11:54:48	139.4862	10.086	29.848	0.132
07/25/00	11:55:03	139.7362	10.041	29.862	0.177
07/25/00	11:55:18	139.9862	10.033	29.852	0.185
07/25/00	11:55:33	140.2362	10.037	29.85	0.181
07/25/00	11:55:48	140.4862	10.046	29.85	0.172
07/25/00	11:56:03	140.7362	10.054	29.848	0.164
07/25/00	11:56:18	140.9862	10.06	29.848	0.158
07/25/00	11:56:33	141.2362	10.066	29.87	0.152
07/25/00	11:56:48	141.4862	10.073	29.852	0.145
07/25/00	11:57:03	141.7362	10.079	29.85	0.139
07/25/00	11:57:18	141.9862	10.086	29.85	0.132

Appendix A (continued)

07/25/00	11:57:33	142.2362	10.09	29.848	0.128
07/25/00	11:57:48	142.4862	10.093	29.872	0.125
07/25/00	11:58:03	142.7362	10.097	29.854	0.121
07/25/00	11:58:18	142.9862	10.102	29.85	0.116
07/25/00	11:58:33	143.2362	10.105	29.85	0.113
07/25/00	11:58:48	143.4862	10.107	29.85	0.111

Appendix B – Time-drawdown data for SWP-200C



SPW 200 C 7/27

	Date	Time	ET (min)	Feet H2O	Inches Hg	Drawdown ft
Background	07/27/00	7:15:08	0	12.196	29.917	0
	07/27/00	7:16:08	1	12.199	29.903	-0.003
	07/27/00	7:17:08	2	12.199	29.903	-0.003
	07/27/00	7:18:08	3	12.199	29.905	-0.003
	07/27/00	7:19:08	4	12.199	29.905	-0.003
	07/27/00	7:20:08	5	12.199	29.905	-0.003
	07/27/00	7:21:08	6	12.199	29.905	-0.003
	07/27/00	7:22:08	7	12.199	29.905	-0.003
	07/27/00	7:23:08	8	12.199	29.907	-0.003
	07/27/00	7:24:08	9	12.199	29.907	-0.003
	07/27/00	7:25:08	10	12.198	29.907	-0.002
	07/27/00	7:26:08	11	12.198	29.907	-0.002
	07/27/00	7:27:08	12	12.196	29.907	0
	07/27/00	7:28:08	13	12.196	29.907	0
	07/27/00	7:29:08	14	12.196	29.907	0
	07/27/00	7:30:08	15	12.196	29.909	0
	07/27/00	7:31:08	16	12.195	29.915	0.001
	07/27/00	7:32:08	17	12.195	29.911	0.001
	07/27/00	7:33:08	18	12.195	29.907	0.001
	07/27/00	7:34:08	19	12.196	29.905	0

Appendix B (continued)

	07/27/00	7:35:08	20	12.195	29.903	0.001
	07/27/00	7:36:08	21	12.195	29.905	0.001
	07/27/00	7:37:08	22	12.195	29.903	0.001
	07/27/00	7:38:08	23	12.196	29.903	0
	07/27/00	7:39:08	24	12.196	29.903	0
	07/27/00	7:40:08	25	12.195	29.903	0.001
	07/27/00	7:41:08	26	12.196	29.903	0
	07/27/00	7:42:08	27	11.973	29.905	0.223
	07/27/00	7:43:08	28	12.391	29.903	-0.195
	07/27/00	7:44:08	29	12.623	29.903	-0.427
	07/27/00	7:45:08	30	12.427	29.903	-0.231
	07/27/00	7:46:08	31	12.453	29.903	-0.257
Pumping	07/27/00	7:47:26	0	12.395	29.915	-0.199
	07/27/00	7:47:26	0.0112	12.395	29.919	-0.199
	07/27/00	7:47:27	0.0223	12.394	29.921	-0.198
	07/27/00	7:47:28	0.0335	12.394	29.921	-0.198
	07/27/00	7:47:28	0.0447	12.386	29.923	-0.19
	07/27/00	7:47:29	0.0558	12.382	29.925	-0.186
	07/27/00	7:47:30	0.067	12.371	29.925	-0.175
	07/27/00	7:47:30	0.0782	12.35	29.927	-0.154
	07/27/00	7:47:31	0.0893	12.329	29.927	-0.133
	07/27/00	7:47:32	0.1005	12.304	29.927	-0.108
	07/27/00	7:47:32	0.1117	12.287	29.927	-0.091
	07/27/00	7:47:33	0.1228	12.267	29.927	-0.071
	07/27/00	7:47:34	0.134	12.254	29.929	-0.058
	07/27/00	7:47:34	0.1452	12.244	29.929	-0.048
	07/27/00	7:47:35	0.1563	12.235	29.929	-0.039
	07/27/00	7:47:36	0.1675	12.219	29.929	-0.023
	07/27/00	7:47:36	0.1787	12.209	29.929	-0.013
	07/27/00	7:47:37	0.1898	12.201	29.931	-0.005
	07/27/00	7:47:38	0.201	12.189	29.931	0.007
	07/27/00	7:47:38	0.2122	12.182	29.931	0.014
	07/27/00	7:47:39	0.2233	12.173	29.931	0.023
	07/27/00	7:47:40	0.235	12.166	29.929	0.03
	07/27/00	7:47:40	0.2475	12.159	29.929	0.037
	07/27/00	7:47:41	0.2607	12.147	29.929	0.049
	07/27/00	7:47:42	0.2747	12.14	29.931	0.056
	07/27/00	7:47:43	0.2895	12.129	29.931	0.067
	07/27/00	7:47:44	0.3052	12.121	29.931	0.075
	07/27/00	7:47:45	0.3218	12.108	29.931	0.088
	07/27/00	7:47:46	0.3395	12.098	29.931	0.098
	07/27/00	7:47:47	0.3582	12.087	29.931	0.109
	07/27/00	7:47:48	0.378	12.078	29.931	0.118
	07/27/00	7:47:49	0.399	12.065	29.931	0.131
	07/27/00	7:47:51	0.4212	12.055	29.931	0.141
	07/27/00	7:47:52	0.4447	12.044	29.931	0.152
	07/27/00	7:47:54	0.4695	12.032	29.931	0.164
	07/27/00	7:47:55	0.4958	12.023	29.931	0.173
	07/27/00	7:47:57	0.5238	12.006	29.925	0.19
	07/27/00	7:47:59	0.5535	11.995	29.923	0.201

Appendix B (continued)

07/27/00	7:48:01	0.5848	11.979	29.921	0.217
07/27/00	7:48:03	0.618	11.966	29.919	0.23
07/27/00	7:48:05	0.6532	11.95	29.919	0.246
07/27/00	7:48:07	0.6905	11.937	29.919	0.259
07/27/00	7:48:09	0.73	11.921	29.917	0.275
07/27/00	7:48:12	0.7718	11.905	29.917	0.291
07/27/00	7:48:14	0.8162	11.889	29.917	0.307
07/27/00	7:48:17	0.8632	11.872	29.917	0.324
07/27/00	7:48:20	0.913	11.855	29.917	0.341
07/27/00	7:48:23	0.9657	11.838	29.917	0.358
07/27/00	7:48:27	1.0215	11.819	29.915	0.377
07/27/00	7:48:30	1.0807	11.801	29.915	0.395
07/27/00	7:48:34	1.1433	11.784	29.913	0.412
07/27/00	7:48:38	1.2097	11.763	29.913	0.433
07/27/00	7:48:42	1.28	11.742	29.915	0.454
07/27/00	7:48:47	1.3545	11.724	29.913	0.472
07/27/00	7:48:52	1.4335	11.702	29.913	0.494
07/27/00	7:48:57	1.5172	11.682	29.911	0.514
07/27/00	7:49:02	1.6057	11.66	29.913	0.536
07/27/00	7:49:07	1.6995	11.639	29.913	0.557
07/27/00	7:49:13	1.7988	11.619	29.911	0.577
07/27/00	7:49:20	1.9042	11.595	29.911	0.601
07/27/00	7:49:26	2.0157	11.572	29.911	0.624
07/27/00	7:49:34	2.1338	11.551	29.909	0.645
07/27/00	7:49:41	2.259	11.528	29.909	0.668
07/27/00	7:49:49	2.3915	11.506	29.909	0.69
07/27/00	7:49:57	2.532	11.483	29.909	0.713
07/27/00	7:50:06	2.6808	11.461	29.909	0.735
07/27/00	7:50:16	2.8383	11.438	29.909	0.758
07/27/00	7:50:26	3.0052	11.417	29.907	0.779
07/27/00	7:50:36	3.182	11.394	29.909	0.802
07/27/00	7:50:48	3.3693	11.374	29.907	0.822
07/27/00	7:51:00	3.5677	11.352	29.909	0.844
07/27/00	7:51:12	3.7778	11.33	29.909	0.866
07/27/00	7:51:26	4.0005	11.31	29.907	0.886
07/27/00	7:51:40	4.2363	11.29	29.907	0.906
07/27/00	7:51:55	4.4862	11.268	29.909	0.928
07/27/00	7:52:10	4.7362	11.248	29.907	0.948
07/27/00	7:52:25	4.9862	11.231	29.909	0.965
07/27/00	7:52:40	5.2362	11.214	29.909	0.982
07/27/00	7:52:55	5.4862	11.196	29.909	1
07/27/00	7:53:10	5.7362	11.183	29.909	1.013
07/27/00	7:53:25	5.9862	11.17	29.909	1.026
07/27/00	7:53:40	6.2362	11.155	29.909	1.041
07/27/00	7:53:55	6.4862	11.142	29.923	1.054
07/27/00	7:54:10	6.7362	11.133	29.913	1.063
07/27/00	7:54:25	6.9862	11.122	29.911	1.074
07/27/00	7:54:40	7.2362	11.109	29.911	1.087
07/27/00	7:54:55	7.4862	11.1	29.911	1.096
07/27/00	7:55:10	7.7362	11.091	29.911	1.105
07/27/00	7:55:25	7.9862	11.083	29.911	1.113

Appendix B (continued)

07/27/00	7:55:40	8.2362	11.073	29.911	1.123
07/27/00	7:55:55	8.4862	11.064	29.911	1.132
07/27/00	7:56:10	8.7362	11.057	29.911	1.139
07/27/00	7:56:25	8.9862	11.049	29.911	1.147
07/27/00	7:56:40	9.2362	11.044	29.911	1.152
07/27/00	7:56:55	9.4862	11.034	29.911	1.162
07/27/00	7:57:10	9.7362	11.028	29.909	1.168
07/27/00	7:57:25	9.9862	11.021	29.911	1.175
07/27/00	7:57:40	10.2362	11.015	29.911	1.181
07/27/00	7:57:55	10.4862	11.008	29.909	1.188
07/27/00	7:58:10	10.7362	11.003	29.911	1.193
07/27/00	7:58:25	10.9862	10.995	29.911	1.201
07/27/00	7:58:40	11.2362	10.99	29.911	1.206
07/27/00	7:58:55	11.4862	10.986	29.911	1.21
07/27/00	7:59:10	11.7362	10.982	29.913	1.214
07/27/00	7:59:25	11.9862	10.975	29.913	1.221
07/27/00	7:59:40	12.2362	10.972	29.913	1.224
07/27/00	7:59:55	12.4862	10.967	29.931	1.229
07/27/00	8:00:10	12.7362	10.962	29.915	1.234
07/27/00	8:00:25	12.9862	10.959	29.915	1.237
07/27/00	8:00:40	13.2362	10.952	29.915	1.244
07/27/00	8:00:55	13.4862	10.947	29.915	1.249
07/27/00	8:01:10	13.7362	10.944	29.915	1.252
07/27/00	8:01:25	13.9862	10.94	29.913	1.256
07/27/00	8:01:40	14.2362	10.936	29.913	1.26
07/27/00	8:01:55	14.4862	10.933	29.913	1.263
07/27/00	8:02:10	14.7362	10.928	29.913	1.268
07/27/00	8:02:25	14.9862	10.926	29.913	1.27
07/27/00	8:02:40	15.2362	10.923	29.915	1.273
07/27/00	8:02:55	15.4862	10.92	29.913	1.276
07/27/00	8:03:10	15.7362	10.917	29.913	1.279
07/27/00	8:03:25	15.9862	10.91	29.913	1.286
07/27/00	8:03:40	16.2362	10.908	29.913	1.288
07/27/00	8:03:55	16.4862	10.904	29.913	1.292
07/27/00	8:04:10	16.7362	10.901	29.913	1.295
07/27/00	8:04:25	16.9862	10.898	29.915	1.298
07/27/00	8:04:40	17.2362	10.894	29.915	1.302
07/27/00	8:04:55	17.4862	10.891	29.913	1.305
07/27/00	8:05:10	17.7362	10.888	29.915	1.308
07/27/00	8:05:25	17.9862	10.885	29.915	1.311
07/27/00	8:05:40	18.2362	10.882	29.913	1.314
07/27/00	8:05:55	18.4862	10.88	29.913	1.316
07/27/00	8:06:10	18.7362	10.878	29.915	1.318
07/27/00	8:06:25	18.9862	10.875	29.915	1.321
07/27/00	8:06:40	19.2362	10.871	29.915	1.325
07/27/00	8:06:55	19.4862	10.869	29.915	1.327
07/27/00	8:07:10	19.7362	10.865	29.915	1.331
07/27/00	8:07:25	19.9862	10.864	29.917	1.332
07/27/00	8:07:40	20.2362	10.862	29.913	1.334
07/27/00	8:07:55	20.4862	10.859	29.915	1.337
07/27/00	8:08:10	20.7362	10.856	29.917	1.34

Appendix B (continued)

07/27/00	8:08:25	20.9862	10.855	29.917	1.341
07/27/00	8:08:40	21.2362	10.852	29.917	1.344
07/27/00	8:08:55	21.4862	10.851	29.917	1.345
07/27/00	8:09:10	21.7362	10.848	29.917	1.348
07/27/00	8:09:25	21.9862	10.845	29.917	1.351
07/27/00	8:09:40	22.2362	10.844	29.917	1.352
07/27/00	8:09:55	22.4862	10.842	29.935	1.354
07/27/00	8:10:10	22.7362	10.838	29.921	1.358
07/27/00	8:10:25	22.9862	10.836	29.917	1.36
07/27/00	8:10:40	23.2362	10.833	29.919	1.363
07/27/00	8:10:55	23.4862	10.832	29.917	1.364
07/27/00	8:11:10	23.7362	10.828	29.917	1.368
07/27/00	8:11:25	23.9862	10.826	29.915	1.37
07/27/00	8:11:40	24.2362	10.825	29.915	1.371
07/27/00	8:11:55	24.4862	10.823	29.915	1.373
07/27/00	8:12:10	24.7362	10.82	29.917	1.376
07/27/00	8:12:25	24.9862	10.818	29.915	1.378
07/27/00	8:12:40	25.2362	10.816	29.915	1.38
07/27/00	8:12:55	25.4862	10.815	29.915	1.381
07/27/00	8:13:10	25.7362	10.813	29.915	1.383
07/27/00	8:13:25	25.9862	10.81	29.915	1.386
07/27/00	8:13:40	26.2362	10.833	29.917	1.363
07/27/00	8:13:55	26.4862	10.836	29.915	1.36
07/27/00	8:14:10	26.7362	10.829	29.915	1.367
07/27/00	8:14:25	26.9862	10.823	29.915	1.373
07/27/00	8:14:40	27.2362	10.82	29.915	1.376
07/27/00	8:14:55	27.4862	10.816	29.915	1.38
07/27/00	8:15:10	27.7362	10.813	29.915	1.383
07/27/00	8:15:25	27.9862	10.764	29.915	1.432
07/27/00	8:15:40	28.2362	10.715	29.915	1.481
07/27/00	8:15:55	28.4862	10.761	29.915	1.435
07/27/00	8:16:10	28.7362	10.806	29.917	1.39
07/27/00	8:16:25	28.9862	10.823	29.915	1.373
07/27/00	8:16:40	29.2362	10.822	29.917	1.374
07/27/00	8:16:55	29.4862	10.807	29.917	1.389
07/27/00	8:17:10	29.7362	10.797	29.917	1.399
07/27/00	8:17:25	29.9862	10.786	29.915	1.41
07/27/00	8:17:40	30.2362	10.777	29.917	1.419
07/27/00	8:17:55	30.4862	10.77	29.917	1.426
07/27/00	8:18:10	30.7362	10.767	29.917	1.429
07/27/00	8:18:25	30.9862	10.761	29.917	1.435
07/27/00	8:18:40	31.2362	10.757	29.917	1.439
07/27/00	8:18:55	31.4862	10.753	29.917	1.443
07/27/00	8:19:10	31.7362	10.75	29.917	1.446
07/27/00	8:19:25	31.9862	10.712	29.917	1.484
07/27/00	8:19:40	32.2362	10.658	29.917	1.538
07/27/00	8:19:55	32.4862	10.725	29.917	1.471
07/27/00	8:20:10	32.7362	10.777	29.919	1.419
07/27/00	8:20:25	32.9862	10.819	29.919	1.377
07/27/00	8:20:40	33.2362	10.842	29.919	1.354
07/27/00	8:20:55	33.4862	10.823	29.919	1.373

Appendix B (continued)

07/27/00	8:21:10	33.7362	10.809	29.919	1.387
07/27/00	8:21:25	33.9862	10.796	29.919	1.4
07/27/00	8:21:40	34.2362	10.786	29.917	1.41
07/27/00	8:21:55	34.4862	10.777	29.917	1.419
07/27/00	8:22:10	34.7362	10.77	29.917	1.426
07/27/00	8:22:25	34.9862	10.763	29.919	1.433
07/27/00	8:22:40	35.2362	10.757	29.917	1.439
07/27/00	8:22:55	35.4862	10.753	29.917	1.443
07/27/00	8:23:10	35.7362	10.75	29.919	1.446
07/27/00	8:23:25	35.9862	10.712	29.919	1.484
07/27/00	8:23:40	36.2362	10.681	29.919	1.515
07/27/00	8:23:55	36.4862	10.738	29.917	1.458
07/27/00	8:24:10	36.7362	10.756	29.917	1.44
07/27/00	8:24:25	36.9862	10.75	29.919	1.446
07/27/00	8:24:40	37.2362	10.743	29.919	1.453
07/27/00	8:24:55	37.4862	10.738	29.919	1.458
07/27/00	8:25:10	37.7362	10.734	29.919	1.462
07/27/00	8:25:25	37.9862	10.731	29.919	1.465
07/27/00	8:25:40	38.2362	10.727	29.919	1.469
07/27/00	8:25:55	38.4862	10.724	29.919	1.472
07/27/00	8:26:10	38.7362	10.723	29.919	1.473
07/27/00	8:26:25	38.9862	10.633	29.919	1.563
07/27/00	8:26:40	39.2362	10.612	29.919	1.584
07/27/00	8:26:55	39.4862	10.65	29.919	1.546
07/27/00	8:27:10	39.7362	10.718	29.919	1.478
07/27/00	8:27:25	39.9862	10.764	29.919	1.432
07/27/00	8:27:40	40.2362	10.747	29.919	1.449
07/27/00	8:27:55	40.4862	10.751	29.919	1.445
07/27/00	8:28:10	40.7362	10.743	29.919	1.453
07/27/00	8:28:25	40.9862	10.737	29.919	1.459
07/27/00	8:28:40	41.2362	10.756	29.917	1.44
07/27/00	8:28:55	41.4862	10.746	29.919	1.45
07/27/00	8:29:10	41.7362	10.741	29.921	1.455
07/27/00	8:29:25	41.9862	10.734	29.919	1.462
07/27/00	8:29:40	42.2362	10.728	29.919	1.468
07/27/00	8:29:55	42.4862	10.721	29.919	1.475
07/27/00	8:30:10	42.7362	10.715	29.919	1.481
07/27/00	8:30:25	42.9862	10.711	29.919	1.485
07/27/00	8:30:40	43.2362	10.571	29.921	1.625
07/27/00	8:30:55	43.4862	10.566	29.919	1.63
07/27/00	8:31:10	43.7362	10.638	29.919	1.558
07/27/00	8:31:25	43.9862	10.701	29.919	1.495
07/27/00	8:31:40	44.2362	10.753	29.919	1.443
07/27/00	8:31:55	44.4862	10.769	29.919	1.427
07/27/00	8:32:10	44.7362	10.757	29.919	1.439
07/27/00	8:32:25	44.9862	10.746	29.921	1.45
07/27/00	8:32:40	45.2362	10.74	29.921	1.456
07/27/00	8:32:55	45.4862	10.766	29.921	1.43
07/27/00	8:33:10	45.7362	10.753	29.921	1.443
07/27/00	8:33:25	45.9862	10.743	29.919	1.453
07/27/00	8:33:40	46.2362	10.734	29.921	1.462

Appendix B (continued)

07/27/00	8:33:55	46.4862	10.724	29.919	1.472
07/27/00	8:34:10	46.7362	10.72	29.921	1.476
07/27/00	8:34:25	46.9862	10.712	29.921	1.484
07/27/00	8:34:40	47.2362	10.708	29.921	1.488
07/27/00	8:34:55	47.4862	10.699	29.921	1.497
07/27/00	8:35:10	47.7362	10.717	29.921	1.479
07/27/00	8:35:25	47.9862	10.72	29.921	1.476
07/27/00	8:35:40	48.2362	10.717	29.921	1.479
07/27/00	8:35:55	48.4862	10.717	29.921	1.479
07/27/00	8:36:10	48.7362	10.715	29.919	1.481
07/27/00	8:36:25	48.9862	10.714	29.921	1.482
07/27/00	8:36:40	49.2362	10.714	29.921	1.482
07/27/00	8:36:55	49.4862	10.597	29.921	1.599
07/27/00	8:37:10	49.7362	10.607	29.921	1.589
07/27/00	8:37:25	49.9862	10.653	29.921	1.543
07/27/00	8:37:40	50.2362	10.695	29.919	1.501
07/27/00	8:37:55	50.4862	10.717	29.919	1.479
07/27/00	8:38:10	50.7362	10.728	29.919	1.468
07/27/00	8:38:25	50.9862	10.686	29.919	1.51
07/27/00	8:38:40	51.2362	10.725	29.921	1.471
07/27/00	8:38:55	51.4862	10.721	29.919	1.475
07/27/00	8:39:10	51.7362	10.72	29.921	1.476
07/27/00	8:39:25	51.9862	10.718	29.921	1.478
07/27/00	8:39:40	52.2362	10.715	29.921	1.481
07/27/00	8:39:55	52.4862	10.714	29.921	1.482
07/27/00	8:40:10	52.7362	10.708	29.921	1.488
07/27/00	8:40:25	52.9862	10.705	29.921	1.491
07/27/00	8:40:40	53.2362	10.702	29.921	1.494
07/27/00	8:40:55	53.4862	10.702	29.921	1.494
07/27/00	8:41:10	53.7362	10.629	29.921	1.567
07/27/00	8:41:25	53.9862	10.613	29.923	1.583
07/27/00	8:41:40	54.2362	10.649	29.923	1.547
07/27/00	8:41:55	54.4862	10.678	29.921	1.518
07/27/00	8:42:10	54.7362	10.694	29.923	1.502
07/27/00	8:42:25	54.9862	10.701	29.921	1.495
07/27/00	8:42:40	55.2362	10.695	29.923	1.501
07/27/00	8:42:55	55.4862	10.688	29.923	1.508
07/27/00	8:43:10	55.7362	10.685	29.923	1.511
07/27/00	8:43:25	55.9862	10.686	29.923	1.51
07/27/00	8:43:40	56.2362	10.689	29.925	1.507
07/27/00	8:43:55	56.4862	10.56	29.925	1.636
07/27/00	8:44:10	56.7362	10.545	29.923	1.651
07/27/00	8:44:25	56.9862	10.535	29.925	1.661
07/27/00	8:44:40	57.2362	10.591	29.925	1.605
07/27/00	8:44:55	57.4862	10.629	29.925	1.567
07/27/00	8:45:10	57.7362	10.649	29.925	1.547
07/27/00	8:45:25	57.9862	10.663	29.925	1.533
07/27/00	8:45:40	58.2362	10.672	29.923	1.524
07/27/00	8:45:55	58.4862	10.666	29.923	1.53
07/27/00	8:46:10	58.7362	10.659	29.925	1.537
07/27/00	8:46:25	58.9862	10.653	29.925	1.543

Appendix B (continued)

07/27/00	8:46:40	59.2362	10.653	29.925	1.543
07/27/00	8:46:55	59.4862	10.659	29.923	1.537
07/27/00	8:47:10	59.7362	10.658	29.923	1.538
07/27/00	8:47:25	59.9862	10.663	29.925	1.533
07/27/00	8:47:40	60.2362	10.658	29.925	1.538
07/27/00	8:47:55	60.4862	10.521	29.925	1.675
07/27/00	8:48:10	60.7362	10.506	29.923	1.69
07/27/00	8:48:25	60.9862	10.532	29.923	1.664
07/27/00	8:48:40	61.2362	10.587	29.923	1.609
07/27/00	8:48:55	61.4862	10.626	29.923	1.57
07/27/00	8:49:10	61.7362	10.655	29.921	1.541
07/27/00	8:49:25	61.9862	10.682	29.923	1.514
07/27/00	8:49:40	62.2362	10.699	29.923	1.497
07/27/00	8:49:55	62.4862	10.714	29.923	1.482
07/27/00	8:50:10	62.7362	10.723	29.923	1.473
07/27/00	8:50:25	62.9862	10.72	29.923	1.476
07/27/00	8:50:40	63.2362	10.718	29.923	1.478
07/27/00	8:50:55	63.4862	10.712	29.923	1.484
07/27/00	8:51:10	63.7362	10.697	29.921	1.499
07/27/00	8:51:25	63.9862	10.686	29.923	1.51
07/27/00	8:51:40	64.2362	10.679	29.923	1.517
07/27/00	8:51:55	64.4862	10.669	29.923	1.527
07/27/00	8:52:10	64.7362	10.656	29.923	1.54
07/27/00	8:52:25	64.9862	10.649	29.923	1.547
07/27/00	8:52:40	65.2362	10.645	29.921	1.551
07/27/00	8:52:55	65.4862	10.64	29.923	1.556
07/27/00	8:53:10	65.7362	10.548	29.923	1.648
07/27/00	8:53:25	65.9862	10.547	29.921	1.649
07/27/00	8:53:40	66.2362	10.545	29.921	1.651
07/27/00	8:53:55	66.4862	10.553	29.921	1.643
07/27/00	8:54:10	66.7362	10.568	29.921	1.628
07/27/00	8:54:25	66.9862	10.61	29.923	1.586
07/27/00	8:54:40	67.2362	10.64	29.921	1.556
07/27/00	8:54:55	67.4862	10.511	29.921	1.685
07/27/00	8:55:10	67.7362	10.548	29.921	1.648
07/27/00	8:55:25	67.9862	10.597	29.923	1.599
07/27/00	8:55:40	68.2362	10.635	29.921	1.561
07/27/00	8:55:55	68.4862	10.648	29.921	1.548
07/27/00	8:56:10	68.7362	10.656	29.921	1.54
07/27/00	8:56:25	68.9862	10.655	29.923	1.541
07/27/00	8:56:40	69.2362	10.653	29.921	1.543
07/27/00	8:56:55	69.4862	10.652	29.921	1.544
07/27/00	8:57:10	69.7362	10.649	29.921	1.547
07/27/00	8:57:25	69.9862	10.643	29.923	1.553
07/27/00	8:57:40	70.2362	10.639	29.921	1.557
07/27/00	8:57:55	70.4862	10.633	29.923	1.563
07/27/00	8:58:10	70.7362	10.629	29.921	1.567
07/27/00	8:58:25	70.9862	10.625	29.921	1.571
07/27/00	8:58:40	71.2362	10.619	29.921	1.577
07/27/00	8:58:55	71.4862	10.613	29.921	1.583
07/27/00	8:59:10	71.7362	10.612	29.923	1.584

Appendix B (continued)

07/27/00	8:59:25	71.9862	10.553	29.921	1.643
07/27/00	8:59:40	72.2362	10.47	29.921	1.726
07/27/00	8:59:55	72.4862	10.429	29.923	1.767
07/27/00	9:00:10	72.7362	10.344	29.923	1.852
07/27/00	9:00:25	72.9862	10.387	29.921	1.809
07/27/00	9:00:40	73.2362	10.417	29.921	1.779
07/27/00	9:00:55	73.4862	10.463	29.921	1.733
07/27/00	9:01:10	73.7362	10.517	29.923	1.679
07/27/00	9:01:25	73.9862	10.557	29.921	1.639
07/27/00	9:01:40	74.2362	10.591	29.923	1.605
07/27/00	9:01:55	74.4862	10.614	29.923	1.582
07/27/00	9:02:10	74.7362	10.635	29.923	1.561
07/27/00	9:02:25	74.9862	10.642	29.923	1.554
07/27/00	9:02:40	75.2362	10.603	29.921	1.593
07/27/00	9:02:55	75.4862	10.439	29.921	1.757
07/27/00	9:03:10	75.7362	10.352	29.923	1.844
07/27/00	9:03:25	75.9862	10.387	29.923	1.809
07/27/00	9:03:40	76.2362	10.413	29.923	1.783
07/27/00	9:03:55	76.4862	10.434	29.921	1.762
07/27/00	9:04:10	76.7362	10.453	29.923	1.743
07/27/00	9:04:25	76.9862	10.469	29.921	1.727
07/27/00	9:04:40	77.2362	10.482	29.921	1.714
07/27/00	9:04:55	77.4862	10.495	29.921	1.701
07/27/00	9:05:10	77.7362	10.505	29.921	1.691
07/27/00	9:05:25	77.9862	10.512	29.921	1.684
07/27/00	9:05:40	78.2362	10.519	29.921	1.677
07/27/00	9:05:55	78.4862	10.525	29.923	1.671
07/27/00	9:06:10	78.7362	10.529	29.921	1.667
07/27/00	9:06:25	78.9862	10.535	29.921	1.661
07/27/00	9:06:40	79.2362	10.541	29.921	1.655
07/27/00	9:06:55	79.4862	10.544	29.919	1.652
07/27/00	9:07:10	79.7362	10.59	29.921	1.606
07/27/00	9:07:25	79.9862	10.528	29.921	1.668
07/27/00	9:07:40	80.2362	10.531	29.921	1.665
07/27/00	9:07:55	80.4862	10.521	29.921	1.675
07/27/00	9:08:10	80.7362	10.462	29.921	1.734
07/27/00	9:08:25	80.9862	10.309	29.921	1.887
07/27/00	9:08:40	81.2362	10.377	29.921	1.819
07/27/00	9:08:55	81.4862	10.385	29.921	1.811
07/27/00	9:09:10	81.7362	10.466	29.919	1.73
07/27/00	9:09:25	81.9862	10.555	29.921	1.641
07/27/00	9:09:40	82.2362	10.64	29.919	1.556
07/27/00	9:09:55	82.4862	10.678	29.919	1.518
07/27/00	9:10:10	82.7362	10.684	29.919	1.512
07/27/00	9:10:25	82.9862	10.625	29.921	1.571
07/27/00	9:10:40	83.2362	10.656	29.921	1.54
07/27/00	9:10:55	83.4862	10.642	29.919	1.554
07/27/00	9:11:10	83.7362	10.625	29.919	1.571
07/27/00	9:11:25	83.9862	10.607	29.919	1.589
07/27/00	9:11:40	84.2362	10.594	29.919	1.602
07/27/00	9:11:55	84.4862	10.583	29.919	1.613

Appendix B (continued)

07/27/00	9:12:10	84.7362	10.573	29.919	1.623
07/27/00	9:12:25	84.9862	10.563	29.919	1.633
07/27/00	9:12:40	85.2362	10.555	29.919	1.641
07/27/00	9:12:55	85.4862	10.551	29.919	1.645
07/27/00	9:13:10	85.7362	10.551	29.917	1.645
07/27/00	9:13:25	85.9862	10.551	29.919	1.645
07/27/00	9:13:40	86.2362	10.55	29.921	1.646
07/27/00	9:13:55	86.4862	10.545	29.919	1.651
07/27/00	9:14:10	86.7362	10.544	29.919	1.652
07/27/00	9:14:25	86.9862	10.541	29.919	1.655
07/27/00	9:14:40	87.2362	10.528	29.921	1.668
07/27/00	9:14:55	87.4862	10.46	29.919	1.736
07/27/00	9:15:10	87.7362	10.352	29.917	1.844
07/27/00	9:15:25	87.9862	10.522	29.919	1.674
07/27/00	9:15:40	88.2362	10.561	29.919	1.635
07/27/00	9:15:55	88.4862	10.64	29.919	1.556
07/27/00	9:16:10	88.7362	10.629	29.921	1.567
07/27/00	9:16:25	88.9862	10.627	29.921	1.569
07/27/00	9:16:40	89.2362	10.676	29.919	1.52
07/27/00	9:16:55	89.4862	10.701	29.917	1.495
07/27/00	9:17:10	89.7362	10.73	29.919	1.466
07/27/00	9:17:25	89.9862	10.751	29.919	1.445
07/27/00	9:17:40	90.2362	10.767	29.919	1.429
07/27/00	9:17:55	90.4862	10.776	29.919	1.42
07/27/00	9:18:10	90.7362	10.783	29.919	1.413
07/27/00	9:18:25	90.9862	10.806	29.919	1.39
07/27/00	9:18:40	91.2362	10.777	29.919	1.419
07/27/00	9:18:55	91.4862	10.769	29.919	1.427
07/27/00	9:19:10	91.7362	10.761	29.919	1.435
07/27/00	9:19:25	91.9862	10.756	29.919	1.44
07/27/00	9:19:40	92.2362	10.733	29.919	1.463
07/27/00	9:19:55	92.4862	10.72	29.919	1.476
07/27/00	9:20:10	92.7362	10.727	29.917	1.469
07/27/00	9:20:25	92.9862	10.708	29.919	1.488
07/27/00	9:20:40	93.2362	10.695	29.919	1.501
07/27/00	9:20:55	93.4862	10.679	29.917	1.517
07/27/00	9:21:10	93.7362	10.685	29.919	1.511
07/27/00	9:21:25	93.9862	10.686	29.919	1.51
07/27/00	9:21:40	94.2362	10.689	29.919	1.507
07/27/00	9:21:55	94.4862	10.686	29.919	1.51
07/27/00	9:22:10	94.7362	10.686	29.919	1.51
07/27/00	9:22:25	94.9862	10.678	29.919	1.518
07/27/00	9:22:40	95.2362	10.671	29.917	1.525
07/27/00	9:22:55	95.4862	10.665	29.917	1.531
07/27/00	9:23:10	95.7362	10.661	29.917	1.535
07/27/00	9:23:25	95.9862	10.663	29.917	1.533
07/27/00	9:23:40	96.2362	10.645	29.917	1.551
07/27/00	9:23:55	96.4862	10.652	29.917	1.544
07/27/00	9:24:10	96.7362	10.649	29.915	1.547
07/27/00	9:24:25	96.9862	10.646	29.915	1.55
07/27/00	9:24:40	97.2362	10.646	29.917	1.55

Appendix B (continued)

07/27/00	9:24:55	97.4862	10.646	29.915	1.55
07/27/00	9:25:10	97.7362	10.65	29.915	1.546
07/27/00	9:25:25	97.9862	10.646	29.915	1.55
07/27/00	9:25:40	98.2362	10.649	29.915	1.547
07/27/00	9:25:55	98.4862	10.643	29.915	1.553
07/27/00	9:26:10	98.7362	10.645	29.915	1.551
07/27/00	9:26:25	98.9862	10.645	29.915	1.551
07/27/00	9:26:40	99.2362	10.515	29.913	1.681
07/27/00	9:26:55	99.4862	10.528	29.915	1.668
07/27/00	9:27:10	99.7362	10.567	29.915	1.629
07/27/00	9:27:25	99.9862	10.604	29.915	1.592
07/27/00	9:27:40	100.2362	10.636	29.915	1.56
07/27/00	9:27:55	100.4862	10.656	29.915	1.54
07/27/00	9:28:10	100.7362	10.675	29.915	1.521
07/27/00	9:28:25	100.9862	10.678	29.915	1.518
07/27/00	9:28:40	101.2362	10.685	29.915	1.511
07/27/00	9:28:55	101.4862	10.679	29.915	1.517
07/27/00	9:29:10	101.7362	10.674	29.913	1.522
07/27/00	9:29:25	101.9862	10.672	29.915	1.524
07/27/00	9:29:40	102.2362	10.665	29.915	1.531
07/27/00	9:29:55	102.4862	10.666	29.915	1.53
07/27/00	9:30:10	102.7362	10.661	29.915	1.535
07/27/00	9:30:25	102.9862	10.662	29.915	1.534
07/27/00	9:30:40	103.2362	10.659	29.915	1.537
07/27/00	9:30:55	103.4862	10.558	29.915	1.638
07/27/00	9:31:10	103.7362	10.547	29.915	1.649
07/27/00	9:31:25	103.9862	10.587	29.915	1.609
07/27/00	9:31:40	104.2362	10.617	29.915	1.579
07/27/00	9:31:55	104.4862	10.636	29.915	1.56
07/27/00	9:32:10	104.7362	10.648	29.915	1.548
07/27/00	9:32:25	104.9862	10.646	29.915	1.55
07/27/00	9:32:40	105.2362	10.652	29.915	1.544
07/27/00	9:32:55	105.4862	10.655	29.915	1.541
07/27/00	9:33:10	105.7362	10.655	29.913	1.541
07/27/00	9:33:25	105.9862	10.65	29.913	1.546
07/27/00	9:33:40	106.2362	10.65	29.913	1.546
07/27/00	9:33:55	106.4862	10.649	29.913	1.547
07/27/00	9:34:10	106.7362	10.638	29.913	1.558
07/27/00	9:34:25	106.9862	10.642	29.911	1.554
07/27/00	9:34:40	107.2362	10.643	29.913	1.553
07/27/00	9:34:55	107.4862	10.643	29.913	1.553
07/27/00	9:35:10	107.7362	10.648	29.913	1.548
07/27/00	9:35:25	107.9862	10.522	29.913	1.674
07/27/00	9:35:40	108.2362	10.534	29.913	1.662
07/27/00	9:35:55	108.4862	10.584	29.911	1.612
07/27/00	9:36:10	108.7362	10.613	29.911	1.583
07/27/00	9:36:25	108.9862	10.636	29.911	1.56
07/27/00	9:36:40	109.2362	10.648	29.911	1.548
07/27/00	9:36:55	109.4862	10.655	29.913	1.541
07/27/00	9:37:10	109.7362	10.666	29.913	1.53
07/27/00	9:37:25	109.9862	10.663	29.911	1.533

Appendix B (continued)

07/27/00	9:37:40	110.2362	10.668	29.911	1.528
07/27/00	9:37:55	110.4862	10.658	29.909	1.538
07/27/00	9:38:10	110.7362	10.659	29.911	1.537
07/27/00	9:38:25	110.9862	10.653	29.911	1.543
07/27/00	9:38:40	111.2362	10.648	29.909	1.548
07/27/00	9:38:55	111.4862	10.643	29.911	1.553
07/27/00	9:39:10	111.7362	10.642	29.911	1.554
07/27/00	9:39:25	111.9862	10.639	29.911	1.557
07/27/00	9:39:40	112.2362	10.639	29.909	1.557
07/27/00	9:39:55	112.4862	10.633	29.909	1.563
07/27/00	9:40:10	112.7362	10.492	29.911	1.704
07/27/00	9:40:25	112.9862	10.478	29.911	1.718
07/27/00	9:40:40	113.2362	10.529	29.909	1.667
07/27/00	9:40:55	113.4862	10.568	29.911	1.628
07/27/00	9:41:10	113.7362	10.609	29.911	1.587
07/27/00	9:41:25	113.9862	10.633	29.911	1.563
07/27/00	9:41:40	114.2362	10.65	29.913	1.546
07/27/00	9:41:55	114.4862	10.642	29.911	1.554
07/27/00	9:42:10	114.7362	10.645	29.911	1.551
07/27/00	9:42:25	114.9862	10.648	29.911	1.548
07/27/00	9:42:40	115.2362	10.648	29.913	1.548
07/27/00	9:42:55	115.4862	10.649	29.911	1.547
07/27/00	9:43:10	115.7362	10.646	29.911	1.55
07/27/00	9:43:25	115.9862	10.649	29.911	1.547
07/27/00	9:43:40	116.2362	10.649	29.913	1.547
07/27/00	9:43:55	116.4862	10.645	29.911	1.551
07/27/00	9:44:10	116.7362	10.643	29.911	1.553
07/27/00	9:44:25	116.9862	10.64	29.911	1.556
07/27/00	9:44:40	117.2362	10.642	29.913	1.554
07/27/00	9:44:55	117.4862	10.635	29.911	1.561
07/27/00	9:45:10	117.7362	10.587	29.911	1.609
07/27/00	9:45:25	117.9862	10.489	29.913	1.707
07/27/00	9:45:40	118.2362	10.519	29.911	1.677
07/27/00	9:45:55	118.4862	10.56	29.913	1.636
07/27/00	9:46:10	118.7362	10.596	29.911	1.6
07/27/00	9:46:25	118.9862	10.616	29.911	1.58
07/27/00	9:46:40	119.2362	10.632	29.911	1.564
07/27/00	9:46:55	119.4862	10.639	29.911	1.557
07/27/00	9:47:10	119.7362	10.636	29.911	1.56
07/27/00	9:47:25	119.9862	10.64	29.913	1.556
07/27/00	9:47:40	120.2362	10.635	29.911	1.561
07/27/00	9:47:55	120.4862	10.625	29.911	1.571
07/27/00	9:48:10	120.7362	10.622	29.911	1.574
07/27/00	9:48:25	120.9862	10.512	29.911	1.684
07/27/00	9:48:40	121.2362	10.36	29.911	1.836
07/27/00	9:48:55	121.4862	10.362	29.911	1.834
07/27/00	9:49:10	121.7362	10.383	29.911	1.813
07/27/00	9:49:25	121.9862	10.393	29.911	1.803
07/27/00	9:49:40	122.2362	10.403	29.913	1.793
07/27/00	9:49:55	122.4862	10.416	29.925	1.78
07/27/00	9:50:10	122.7362	10.434	29.915	1.762

Appendix B (continued)

07/27/00	9:50:25	122.9862	10.449	29.913	1.747
07/27/00	9:50:40	123.2362	10.463	29.911	1.733
07/27/00	9:50:55	123.4862	10.468	29.915	1.728
07/27/00	9:51:10	123.7362	10.466	29.911	1.73
07/27/00	9:51:25	123.9862	10.38	29.911	1.816
07/27/00	9:51:40	124.2362	10.272	29.909	1.924
07/27/00	9:51:55	124.4862	10.182	29.911	2.014
07/27/00	9:52:10	124.7362	10.102	29.911	2.094
07/27/00	9:52:25	124.9862	10.031	29.911	2.165
07/27/00	9:52:40	125.2362	9.974	29.909	2.222
07/27/00	9:52:55	125.4862	9.92	29.909	2.276
07/27/00	9:53:10	125.7362	9.876	29.909	2.32
07/27/00	9:53:25	125.9862	9.832	29.911	2.364
07/27/00	9:53:40	126.2362	9.795	29.909	2.401
07/27/00	9:53:55	126.4862	9.762	29.909	2.434
07/27/00	9:54:10	126.7362	9.732	29.909	2.464
07/27/00	9:54:25	126.9862	9.703	29.911	2.493
07/27/00	9:54:40	127.2362	9.678	29.909	2.518
07/27/00	9:54:55	127.4862	9.655	29.909	2.541
07/27/00	9:55:10	127.7362	9.635	29.909	2.561
07/27/00	9:55:25	127.9862	9.615	29.909	2.581
07/27/00	9:55:40	128.2362	9.599	29.917	2.597
07/27/00	9:55:55	128.4862	9.582	29.907	2.614
07/27/00	9:56:10	128.7362	9.566	29.909	2.63
07/27/00	9:56:25	128.9862	9.552	29.909	2.644
07/27/00	9:56:40	129.2362	9.49	29.909	2.706
07/27/00	9:56:55	129.4862	9.349	29.907	2.847
07/27/00	9:57:10	129.7362	9.285	29.909	2.911
07/27/00	9:57:25	129.9862	9.104	29.909	3.092
07/27/00	9:57:40	130.2362	9.154	29.909	3.042
07/27/00	9:57:55	130.4862	8.902	29.909	3.294
07/27/00	9:58:10	130.7362	8.968	29.907	3.228
07/27/00	9:58:25	130.9862	9.019	29.907	3.177
07/27/00	9:58:40	131.2362	9.061	29.909	3.135
07/27/00	9:58:55	131.4862	9.095	29.909	3.101
07/27/00	9:59:10	131.7362	9.122	29.909	3.074
07/27/00	9:59:25	131.9862	9.148	29.909	3.048
07/27/00	9:59:40	132.2362	9.169	29.909	3.027
07/27/00	9:59:55	132.4862	9.184	29.909	3.012
07/27/00	10:00:10	132.7362	9.199	29.909	2.997
07/27/00	10:00:25	132.9862	9.21	29.909	2.986
07/27/00	10:00:40	133.2362	9.219	29.909	2.977
07/27/00	10:00:55	133.4862	9.226	29.909	2.97
07/27/00	10:01:10	133.7362	9.233	29.909	2.963
07/27/00	10:01:25	133.9862	9.236	29.909	2.96
07/27/00	10:01:40	134.2362	9.241	29.911	2.955
07/27/00	10:01:55	134.4862	9.243	29.909	2.953
07/27/00	10:02:10	134.7362	9.549	29.909	2.647
07/27/00	10:02:25	134.9862	9.531	29.909	2.665
07/27/00	10:02:40	135.2362	9.698	29.909	2.498
07/27/00	10:02:55	135.4862	9.878	29.909	2.318

Appendix B (continued)

07/27/00	10:03:10	135.7362	9.806	29.909	2.39
07/27/00	10:03:25	135.9862	9.739	29.909	2.457
07/27/00	10:03:40	136.2362	9.677	29.911	2.519
07/27/00	10:03:55	136.4862	9.629	29.911	2.567
07/27/00	10:04:10	136.7362	9.589	29.909	2.607
07/27/00	10:04:25	136.9862	9.554	29.909	2.642
07/27/00	10:04:40	137.2362	9.524	29.911	2.672
07/27/00	10:04:55	137.4862	9.5	29.909	2.696
07/27/00	10:05:10	137.7362	9.475	29.909	2.721
07/27/00	10:05:25	137.9862	9.454	29.909	2.742
07/27/00	10:05:40	138.2362	9.436	29.909	2.76
07/27/00	10:05:55	138.4862	9.422	29.911	2.774
07/27/00	10:06:10	138.7362	9.405	29.911	2.791
07/27/00	10:06:25	138.9862	9.393	29.909	2.803
07/27/00	10:06:40	139.2362	9.382	29.909	2.814
07/27/00	10:06:55	139.4862	9.369	29.909	2.827
07/27/00	10:07:10	139.7362	9.36	29.909	2.836
07/27/00	10:07:25	139.9862	9.351	29.909	2.845
07/27/00	10:07:40	140.2362	9.344	29.911	2.852
07/27/00	10:07:55	140.4862	9.337	29.911	2.859
07/27/00	10:08:10	140.7362	9.331	29.909	2.865
07/27/00	10:08:25	140.9862	9.323	29.911	2.873
07/27/00	10:08:40	141.2362	9.318	29.911	2.878
07/27/00	10:08:55	141.4862	9.314	29.909	2.882
07/27/00	10:09:10	141.7362	9.308	29.909	2.888
07/27/00	10:09:25	141.9862	9.305	29.909	2.891
07/27/00	10:09:40	142.2362	9.301	29.911	2.895
07/27/00	10:09:55	142.4862	9.295	29.909	2.901
07/27/00	10:10:10	142.7362	9.291	29.929	2.905
07/27/00	10:10:25	142.9862	9.287	29.933	2.909
07/27/00	10:10:40	143.2362	9.282	29.915	2.914
07/27/00	10:10:55	143.4862	9.278	29.913	2.918
07/27/00	10:11:10	143.7362	9.275	29.911	2.921
07/27/00	10:11:25	143.9862	9.274	29.911	2.922
07/27/00	10:11:40	144.2362	9.269	29.909	2.927
07/27/00	10:11:55	144.4862	9.266	29.909	2.93
07/27/00	10:12:10	144.7362	9.262	29.909	2.934
07/27/00	10:12:25	144.9862	9.261	29.909	2.935
07/27/00	10:12:40	145.2362	9.256	29.909	2.94
07/27/00	10:12:55	145.4862	9.255	29.909	2.941
07/27/00	10:13:10	145.7362	9.253	29.909	2.943
07/27/00	10:13:25	145.9862	9.251	29.907	2.945
07/27/00	10:13:40	146.2362	9.245	29.905	2.951
07/27/00	10:13:55	146.4862	9.242	29.907	2.954
07/27/00	10:14:10	146.7362	9.241	29.909	2.955
07/27/00	10:14:25	146.9862	9.239	29.907	2.957
07/27/00	10:14:40	147.2362	9.236	29.907	2.96
07/27/00	10:14:55	147.4862	9.235	29.909	2.961
07/27/00	10:15:10	147.7362	9.23	29.909	2.966
07/27/00	10:15:25	147.9862	9.23	29.909	2.966
07/27/00	10:15:40	148.2362	9.228	29.907	2.968

Appendix B (continued)

07/27/00	10:15:55	148.4862	9.225	29.909	2.971
07/27/00	10:16:10	148.7362	9.223	29.907	2.973
07/27/00	10:16:25	148.9862	9.222	29.909	2.974
07/27/00	10:16:40	149.2362	9.219	29.907	2.977
07/27/00	10:16:55	149.4862	9.219	29.907	2.977
07/27/00	10:17:10	149.7362	9.217	29.911	2.979
07/27/00	10:17:25	149.9862	9.213	29.909	2.983
07/27/00	10:17:40	150.2362	9.212	29.919	2.984
07/27/00	10:17:55	150.4862	9.21	29.921	2.986
07/27/00	10:18:10	150.7362	9.209	29.911	2.987
07/27/00	10:18:25	150.9862	9.207	29.911	2.989
07/27/00	10:18:40	151.2362	9.206	29.909	2.99
07/27/00	10:18:55	151.4862	9.205	29.909	2.991
07/27/00	10:19:10	151.7362	9.2	29.909	2.996
07/27/00	10:19:25	151.9862	9.2	29.909	2.996
07/27/00	10:19:40	152.2362	9.199	29.909	2.997
07/27/00	10:19:55	152.4862	9.196	29.909	3
07/27/00	10:20:10	152.7362	9.194	29.909	3.002
07/27/00	10:20:25	152.9862	9.193	29.909	3.003
07/27/00	10:20:40	153.2362	9.192	29.909	3.004
07/27/00	10:20:55	153.4862	9.19	29.909	3.006
07/27/00	10:21:10	153.7362	9.189	29.909	3.007
07/27/00	10:21:25	153.9862	9.186	29.909	3.01
07/27/00	10:21:40	154.2362	9.184	29.907	3.012
07/27/00	10:21:55	154.4862	9.183	29.907	3.013
07/27/00	10:22:10	154.7362	9.246	29.907	2.95
07/27/00	10:22:25	154.9862	9.277	29.909	2.919
07/27/00	10:22:40	155.2362	9.261	29.909	2.935
07/27/00	10:22:55	155.4862	9.251	29.909	2.945
07/27/00	10:23:10	155.7362	9.239	29.909	2.957
07/27/00	10:23:25	155.9862	9.14	29.909	3.056
07/27/00	10:23:40	156.2362	9.169	29.909	3.027
07/27/00	10:23:55	156.4862	9.222	29.907	2.974
07/27/00	10:24:10	156.7362	9.269	29.909	2.927
07/27/00	10:24:25	156.9862	9.307	29.909	2.889
07/27/00	10:24:40	157.2362	9.334	29.909	2.862
07/27/00	10:24:55	157.4862	9.351	29.907	2.845
07/27/00	10:25:10	157.7362	9.324	29.907	2.872
07/27/00	10:25:25	157.9862	9.304	29.909	2.892
07/27/00	10:25:40	158.2362	9.284	29.909	2.912
07/27/00	10:25:55	158.4862	9.269	29.907	2.927
07/27/00	10:26:10	158.7362	9.256	29.907	2.94
07/27/00	10:26:25	158.9862	9.245	29.907	2.951
07/27/00	10:26:40	159.2362	9.163	29.907	3.033
07/27/00	10:26:55	159.4862	9.173	29.907	3.023
07/27/00	10:27:10	159.7362	9.22	29.909	2.976
07/27/00	10:27:25	159.9862	9.215	29.909	2.981
07/27/00	10:27:40	160.2362	9.207	29.907	2.989
07/27/00	10:27:55	160.4862	9.199	29.907	2.997
07/27/00	10:28:10	160.7362	9.194	29.909	3.002
07/27/00	10:28:25	160.9862	9.19	29.907	3.006

Appendix B (continued)

07/27/00	10:28:40	161.2362	9.186	29.909	3.01
07/27/00	10:28:55	161.4862	9.18	29.909	3.016
07/27/00	10:29:10	161.7362	9.177	29.907	3.019
07/27/00	10:29:25	161.9862	9.107	29.909	3.089
07/27/00	10:29:40	162.2362	9.085	29.909	3.111
07/27/00	10:29:55	162.4862	9.151	29.907	3.045
07/27/00	10:30:10	162.7362	9.18	29.907	3.016
07/27/00	10:30:25	162.9862	9.171	29.905	3.025
07/27/00	10:30:40	163.2362	9.167	29.905	3.029
07/27/00	10:30:55	163.4862	9.163	29.907	3.033
07/27/00	10:31:10	163.7362	9.158	29.907	3.038
07/27/00	10:31:25	163.9862	9.156	29.905	3.04
07/27/00	10:31:40	164.2362	9.153	29.905	3.043
07/27/00	10:31:55	164.4862	9.15	29.907	3.046
07/27/00	10:32:10	164.7362	9.147	29.905	3.049
07/27/00	10:32:25	164.9862	9.145	29.905	3.051
07/27/00	10:32:40	165.2362	9.032	29.905	3.164
07/27/00	10:32:55	165.4862	9.099	29.903	3.097
07/27/00	10:33:10	165.7362	9.151	29.905	3.045
07/27/00	10:33:25	165.9862	9.17	29.903	3.026
07/27/00	10:33:40	166.2362	9.151	29.903	3.045
07/27/00	10:33:55	166.4862	9.148	29.903	3.048
07/27/00	10:34:10	166.7362	9.144	29.903	3.052
07/27/00	10:34:25	166.9862	9.141	29.903	3.055
07/27/00	10:34:40	167.2362	9.137	29.903	3.059
07/27/00	10:34:55	167.4862	9.135	29.903	3.061
07/27/00	10:35:10	167.7362	9.133	29.903	3.063
07/27/00	10:35:25	167.9862	9.082	29.903	3.114
07/27/00	10:35:40	168.2362	8.983	29.903	3.213
07/27/00	10:35:55	168.4862	9.032	29.903	3.164
07/27/00	10:36:10	168.7362	9.099	29.901	3.097
07/27/00	10:36:25	168.9862	9.153	29.903	3.043
07/27/00	10:36:40	169.2362	9.179	29.903	3.017
07/27/00	10:36:55	169.4862	9.17	29.903	3.026
07/27/00	10:37:10	169.7362	9.157	29.903	3.039
07/27/00	10:37:25	169.9862	9.151	29.903	3.045
07/27/00	10:37:40	170.2362	9.145	29.903	3.051
07/27/00	10:37:55	170.4862	9.141	29.901	3.055
07/27/00	10:38:10	170.7362	9.135	29.903	3.061
07/27/00	10:38:25	170.9862	9.039	29.903	3.157
07/27/00	10:38:40	171.2362	8.896	29.903	3.3
07/27/00	10:38:55	171.4862	8.872	29.903	3.324
07/27/00	10:39:10	171.7362	8.912	29.905	3.284
07/27/00	10:39:25	171.9862	8.999	29.903	3.197
07/27/00	10:39:40	172.2362	9.05	29.907	3.146
07/27/00	10:39:55	172.4862	9.108	29.905	3.088
07/27/00	10:40:10	172.7362	9.148	29.905	3.048
07/27/00	10:40:25	172.9862	9.144	29.905	3.052
07/27/00	10:40:40	173.2362	9.134	29.905	3.062
07/27/00	10:40:55	173.4862	9.127	29.905	3.069
07/27/00	10:41:10	173.7362	9.121	29.907	3.075

Appendix B (continued)

07/27/00	10:41:25	173.9862	9.115	29.907	3.081
07/27/00	10:41:40	174.2362	9.111	29.905	3.085
07/27/00	10:41:55	174.4862	9.081	29.907	3.115
07/27/00	10:42:10	174.7362	8.993	29.907	3.203
07/27/00	10:42:25	174.9862	9.063	29.905	3.133
07/27/00	10:42:40	175.2362	9.118	29.907	3.078
07/27/00	10:42:55	175.4862	9.109	29.905	3.087
07/27/00	10:43:10	175.7362	9.105	29.905	3.091
07/27/00	10:43:25	175.9862	9.102	29.905	3.094
07/27/00	10:43:40	176.2362	9.098	29.907	3.098
07/27/00	10:43:55	176.4862	9.095	29.907	3.101
07/27/00	10:44:10	176.7362	9.094	29.907	3.102
07/27/00	10:44:25	176.9862	9.092	29.907	3.104
07/27/00	10:44:40	177.2362	9.091	29.907	3.105
07/27/00	10:44:55	177.4862	9.088	29.909	3.108
07/27/00	10:45:10	177.7362	9.086	29.907	3.11
07/27/00	10:45:25	177.9862	9.012	29.905	3.184
07/27/00	10:45:40	178.2362	8.935	29.907	3.261
07/27/00	10:45:55	178.4862	9.026	29.905	3.17
07/27/00	10:46:10	178.7362	9.092	29.907	3.104
07/27/00	10:46:25	178.9862	9.124	29.907	3.072
07/27/00	10:46:40	179.2362	9.114	29.907	3.082
07/27/00	10:46:55	179.4862	9.108	29.907	3.088
07/27/00	10:47:10	179.7362	9.102	29.905	3.094
07/27/00	10:47:25	179.9862	9.097	29.905	3.099
07/27/00	10:47:40	180.2362	9.094	29.905	3.102
07/27/00	10:47:55	180.4862	9.091	29.907	3.105
07/27/00	10:48:10	180.7362	9.088	29.905	3.108
07/27/00	10:48:25	180.9862	9.086	29.907	3.11
07/27/00	10:48:40	181.2362	9.084	29.905	3.112
07/27/00	10:48:55	181.4862	9.081	29.907	3.115
07/27/00	10:49:10	181.7362	9.079	29.905	3.117
07/27/00	10:49:25	181.9862	8.986	29.905	3.21
07/27/00	10:49:40	182.2362	9.03	29.905	3.166
07/27/00	10:49:55	182.4862	9.078	29.905	3.118
07/27/00	10:50:10	182.7362	9.081	29.903	3.115
07/27/00	10:50:25	182.9862	9.079	29.905	3.117
07/27/00	10:50:40	183.2362	9.076	29.905	3.12
07/27/00	10:50:55	183.4862	9.075	29.905	3.121
07/27/00	10:51:10	183.7362	9.072	29.903	3.124
07/27/00	10:51:25	183.9862	9.069	29.905	3.127
07/27/00	10:51:40	184.2362	9.069	29.905	3.127
07/27/00	10:51:55	184.4862	9.069	29.907	3.127
07/27/00	10:52:10	184.7362	9.069	29.905	3.127
07/27/00	10:52:25	184.9862	9.065	29.905	3.131
07/27/00	10:52:40	185.2362	9.063	29.905	3.133
07/27/00	10:52:55	185.4862	9.062	29.905	3.134
07/27/00	10:53:10	185.7362	9.063	29.905	3.133
07/27/00	10:53:25	185.9862	9.061	29.905	3.135
07/27/00	10:53:40	186.2362	8.955	29.905	3.241
07/27/00	10:53:55	186.4862	8.965	29.905	3.231

Appendix B (continued)

07/27/00	10:54:10	186.7362	9.035	29.905	3.161
07/27/00	10:54:25	186.9862	9.076	29.905	3.12
07/27/00	10:54:40	187.2362	9.069	29.905	3.127
07/27/00	10:54:55	187.4862	9.065	29.905	3.131
07/27/00	10:55:10	187.7362	9.063	29.907	3.133
07/27/00	10:55:25	187.9862	9.061	29.905	3.135
07/27/00	10:55:40	188.2362	9.058	29.905	3.138
07/27/00	10:55:55	188.4862	9.058	29.905	3.138
07/27/00	10:56:10	188.7362	9.056	29.905	3.14
07/27/00	10:56:25	188.9862	9.055	29.907	3.141
07/27/00	10:56:40	189.2362	9.055	29.907	3.141
07/27/00	10:56:55	189.4862	9.055	29.905	3.141
07/27/00	10:57:10	189.7362	9.056	29.907	3.14
07/27/00	10:57:25	189.9862	8.96	29.907	3.236
07/27/00	10:57:40	190.2362	9.017	29.905	3.179
07/27/00	10:57:55	190.4862	9.056	29.907	3.14
07/27/00	10:58:10	190.7362	9.055	29.905	3.141
07/27/00	10:58:25	190.9862	9.053	29.905	3.143
07/27/00	10:58:40	191.2362	9.052	29.909	3.144
07/27/00	10:58:55	191.4862	9.05	29.905	3.146
07/27/00	10:59:10	191.7362	9.05	29.907	3.146
07/27/00	10:59:25	191.9862	9.048	29.907	3.148
07/27/00	10:59:40	192.2362	9.046	29.907	3.15
07/27/00	10:59:55	192.4862	9.046	29.905	3.15
07/27/00	11:00:10	192.7362	9.045	29.905	3.151
07/27/00	11:00:25	192.9862	9.043	29.907	3.153
07/27/00	11:00:40	193.2362	9.043	29.907	3.153
07/27/00	11:00:55	193.4862	8.963	29.907	3.233
07/27/00	11:01:10	193.7362	9.006	29.905	3.19
07/27/00	11:01:25	193.9862	9.045	29.907	3.151
07/27/00	11:01:40	194.2362	9.049	29.905	3.147
07/27/00	11:01:55	194.4862	9.046	29.905	3.15
07/27/00	11:02:10	194.7362	9.043	29.907	3.153
07/27/00	11:02:25	194.9862	9.043	29.905	3.153
07/27/00	11:02:40	195.2362	9.042	29.905	3.154
07/27/00	11:02:55	195.4862	9.042	29.907	3.154
07/27/00	11:03:10	195.7362	9.04	29.905	3.156
07/27/00	11:03:25	195.9862	9.039	29.905	3.157
07/27/00	11:03:40	196.2362	9.039	29.905	3.157
07/27/00	11:03:55	196.4862	9.039	29.905	3.157
07/27/00	11:04:10	196.7362	9.037	29.905	3.159
07/27/00	11:04:25	196.9862	9.037	29.905	3.159
07/27/00	11:04:40	197.2362	9.037	29.905	3.159
07/27/00	11:04:55	197.4862	9.037	29.905	3.159
07/27/00	11:05:10	197.7362	9.036	29.905	3.16
07/27/00	11:05:25	197.9862	8.955	29.905	3.241
07/27/00	11:05:40	198.2362	8.947	29.903	3.249
07/27/00	11:05:55	198.4862	9.013	29.903	3.183
07/27/00	11:06:10	198.7362	9.037	29.905	3.159
07/27/00	11:06:25	198.9862	9.033	29.905	3.163
07/27/00	11:06:40	199.2362	9.033	29.903	3.163

Appendix B (continued)

07/27/00	11:06:55	199.4862	9.032	29.905	3.164
07/27/00	11:07:10	199.7362	9.032	29.905	3.164
07/27/00	11:07:25	199.9862	9.03	29.903	3.166
07/27/00	11:07:40	200.2362	9.03	29.905	3.166
07/27/00	11:07:55	200.4862	9.03	29.905	3.166
07/27/00	11:08:10	200.7362	9.027	29.905	3.169
07/27/00	11:08:25	200.9862	9.003	29.903	3.193
07/27/00	11:08:40	201.2362	8.925	29.905	3.271
07/27/00	11:08:55	201.4862	8.983	29.905	3.213
07/27/00	11:09:10	201.7362	9.037	29.903	3.159
07/27/00	11:09:25	201.9862	9.039	29.905	3.157
07/27/00	11:09:40	202.2362	9.035	29.901	3.161
07/27/00	11:09:55	202.4862	9.032	29.905	3.164
07/27/00	11:10:10	202.7362	9.032	29.905	3.164
07/27/00	11:10:25	202.9862	9.03	29.905	3.166
07/27/00	11:10:40	203.2362	9.03	29.903	3.166
07/27/00	11:10:55	203.4862	9.03	29.903	3.166
07/27/00	11:11:10	203.7362	9.016	29.903	3.18
07/27/00	11:11:25	203.9862	8.948	29.903	3.248
07/27/00	11:11:40	204.2362	9.009	29.903	3.187
07/27/00	11:11:55	204.4862	9.016	29.903	3.18
07/27/00	11:12:10	204.7362	9.016	29.903	3.18
07/27/00	11:12:25	204.9862	9.016	29.903	3.18
07/27/00	11:12:40	205.2362	9.016	29.903	3.18
07/27/00	11:12:55	205.4862	9.017	29.903	3.179
07/27/00	11:13:10	205.7362	9.017	29.903	3.179
07/27/00	11:13:25	205.9862	9.017	29.903	3.179
07/27/00	11:13:40	206.2362	9.017	29.903	3.179
07/27/00	11:13:55	206.4862	8.94	29.903	3.256
07/27/00	11:14:10	206.7362	8.947	29.903	3.249
07/27/00	11:14:25	206.9862	9.012	29.903	3.184
07/27/00	11:14:40	207.2362	9.046	29.901	3.15
07/27/00	11:14:55	207.4862	9.043	29.903	3.153
07/27/00	11:15:10	207.7362	9.039	29.903	3.157
07/27/00	11:15:25	207.9862	9.035	29.903	3.161
07/27/00	11:15:40	208.2362	9.03	29.903	3.166
07/27/00	11:15:55	208.4862	9.026	29.903	3.17
07/27/00	11:16:10	208.7362	9.025	29.903	3.171
07/27/00	11:16:25	208.9862	9.023	29.905	3.173
07/27/00	11:16:40	209.2362	8.965	29.903	3.231
07/27/00	11:16:55	209.4862	8.963	29.903	3.233
07/27/00	11:17:10	209.7362	9.014	29.903	3.182
07/27/00	11:17:25	209.9862	9.03	29.903	3.166
07/27/00	11:17:40	210.2362	9.025	29.903	3.171
07/27/00	11:17:55	210.4862	9.022	29.903	3.174
07/27/00	11:18:10	210.7362	9.019	29.903	3.177
07/27/00	11:18:25	210.9862	9.019	29.903	3.177
07/27/00	11:18:40	211.2362	9.017	29.903	3.179
07/27/00	11:18:55	211.4862	9.016	29.901	3.18
07/27/00	11:19:10	211.7362	9.014	29.903	3.182
07/27/00	11:19:25	211.9862	9.013	29.901	3.183

Appendix B (continued)

07/27/00	11:19:40	212.2362	8.925	29.903	3.271
07/27/00	11:19:55	212.4862	8.909	29.903	3.287
07/27/00	11:20:10	212.7362	8.983	29.901	3.213
07/27/00	11:20:25	212.9862	9.02	29.903	3.176
07/27/00	11:20:40	213.2362	9.017	29.901	3.179
07/27/00	11:20:55	213.4862	9.014	29.901	3.182
07/27/00	11:21:10	213.7362	9.013	29.901	3.183
07/27/00	11:21:25	213.9862	9.012	29.901	3.184
07/27/00	11:21:40	214.2362	9.01	29.901	3.186
07/27/00	11:21:55	214.4862	9.01	29.901	3.186
07/27/00	11:22:10	214.7362	9.009	29.901	3.187
07/27/00	11:22:25	214.9862	9.006	29.903	3.19
07/27/00	11:22:40	215.2362	8.968	29.901	3.228
07/27/00	11:22:55	215.4862	8.947	29.901	3.249
07/27/00	11:23:10	215.7362	9	29.901	3.196
07/27/00	11:23:25	215.9862	9.003	29.901	3.193
07/27/00	11:23:40	216.2362	9.003	29.903	3.193
07/27/00	11:23:55	216.4862	9.001	29.901	3.195
07/27/00	11:24:10	216.7362	9.001	29.901	3.195
07/27/00	11:24:25	216.9862	9.001	29.901	3.195
07/27/00	11:24:40	217.2362	9	29.901	3.196
07/27/00	11:24:55	217.4862	9	29.901	3.196
07/27/00	11:25:10	217.7362	9	29.901	3.196
07/27/00	11:25:25	217.9862	8.999	29.901	3.197
07/27/00	11:25:40	218.2362	8.999	29.901	3.197
07/27/00	11:25:55	218.4862	8.917	29.903	3.279
07/27/00	11:26:10	218.7362	8.961	29.903	3.235
07/27/00	11:26:25	218.9862	9.001	29.903	3.195
07/27/00	11:26:40	219.2362	8.999	29.901	3.197
07/27/00	11:26:55	219.4862	8.996	29.901	3.2
07/27/00	11:27:10	219.7362	8.994	29.903	3.202
07/27/00	11:27:25	219.9862	8.993	29.903	3.203
07/27/00	11:27:40	220.2362	8.993	29.903	3.203
07/27/00	11:27:55	220.4862	8.991	29.901	3.205
07/27/00	11:28:10	220.7362	8.991	29.901	3.205
07/27/00	11:28:25	220.9862	8.99	29.901	3.206
07/27/00	11:28:40	221.2362	8.906	29.901	3.29
07/27/00	11:28:55	221.4862	8.961	29.903	3.235
07/27/00	11:29:10	221.7362	8.996	29.901	3.2
07/27/00	11:29:25	221.9862	8.994	29.901	3.202
07/27/00	11:29:40	222.2362	8.991	29.901	3.205
07/27/00	11:29:55	222.4862	8.99	29.901	3.206
07/27/00	11:30:10	222.7362	8.989	29.901	3.207
07/27/00	11:30:25	222.9862	8.989	29.901	3.207
07/27/00	11:30:40	223.2362	8.987	29.901	3.209
07/27/00	11:30:55	223.4862	8.971	29.899	3.225
07/27/00	11:31:10	223.7362	8.911	29.901	3.285
07/27/00	11:31:25	223.9862	8.968	29.901	3.228
07/27/00	11:31:40	224.2362	8.978	29.901	3.218
07/27/00	11:31:55	224.4862	8.978	29.901	3.218
07/27/00	11:32:10	224.7362	8.978	29.901	3.218

Appendix B (continued)

07/27/00	11:32:25	224.9862	8.978	29.899	3.218
07/27/00	11:32:40	225.2362	8.978	29.901	3.218
07/27/00	11:32:55	225.4862	8.978	29.901	3.218
07/27/00	11:33:10	225.7362	8.977	29.903	3.219
07/27/00	11:33:25	225.9862	8.978	29.901	3.218
07/27/00	11:33:40	226.2362	8.977	29.901	3.219
07/27/00	11:33:55	226.4862	8.977	29.901	3.219
07/27/00	11:34:10	226.7362	8.977	29.899	3.219
07/27/00	11:34:25	226.9862	8.977	29.903	3.219
07/27/00	11:34:40	227.2362	8.934	29.901	3.262
07/27/00	11:34:55	227.4862	8.921	29.901	3.275
07/27/00	11:35:10	227.7362	8.925	29.903	3.271
07/27/00	11:35:25	227.9862	8.947	29.903	3.249
07/27/00	11:35:40	228.2362	8.98	29.901	3.216
07/27/00	11:35:55	228.4862	9.004	29.901	3.192
07/27/00	11:36:10	228.7362	9	29.903	3.196
07/27/00	11:36:25	228.9862	8.996	29.901	3.2
07/27/00	11:36:40	229.2362	8.993	29.901	3.203
07/27/00	11:36:55	229.4862	8.989	29.901	3.207
07/27/00	11:37:10	229.7362	8.987	29.901	3.209
07/27/00	11:37:25	229.9862	8.986	29.901	3.21
07/27/00	11:37:40	230.2362	8.984	29.901	3.212
07/27/00	11:37:55	230.4862	8.981	29.901	3.215
07/27/00	11:38:10	230.7362	8.98	29.901	3.216
07/27/00	11:38:25	230.9862	8.974	29.901	3.222
07/27/00	11:38:40	231.2362	8.918	29.901	3.278
07/27/00	11:38:55	231.4862	8.964	29.899	3.232
07/27/00	11:39:10	231.7362	8.993	29.901	3.203
07/27/00	11:39:25	231.9862	8.989	29.899	3.207
07/27/00	11:39:40	232.2362	8.987	29.901	3.209
07/27/00	11:39:55	232.4862	8.981	29.899	3.215
07/27/00	11:40:10	232.7362	8.981	29.899	3.215
07/27/00	11:40:25	232.9862	8.98	29.901	3.216
07/27/00	11:40:40	233.2362	8.978	29.899	3.218
07/27/00	11:40:55	233.4862	8.976	29.899	3.22
07/27/00	11:41:10	233.7362	8.976	29.899	3.22
07/27/00	11:41:25	233.9862	8.974	29.899	3.222
07/27/00	11:41:40	234.2362	8.973	29.899	3.223
07/27/00	11:41:55	234.4862	8.973	29.899	3.223
07/27/00	11:42:10	234.7362	8.974	29.899	3.222
07/27/00	11:42:25	234.9862	8.973	29.899	3.223
07/27/00	11:42:40	235.2362	8.957	29.899	3.239
07/27/00	11:42:55	235.4862	8.891	29.899	3.305
07/27/00	11:43:10	235.7362	8.958	29.897	3.238
07/27/00	11:43:25	235.9862	8.98	29.899	3.216
07/27/00	11:43:40	236.2362	8.977	29.899	3.219
07/27/00	11:43:55	236.4862	8.976	29.899	3.22
07/27/00	11:44:10	236.7362	8.974	29.899	3.222
07/27/00	11:44:25	236.9862	8.973	29.899	3.223
07/27/00	11:44:40	237.2362	8.971	29.899	3.225
07/27/00	11:44:55	237.4862	8.971	29.899	3.225

Appendix B (continued)

07/27/00	11:45:10	237.7362	8.971	29.899	3.225
07/27/00	11:45:25	237.9862	8.971	29.899	3.225
07/27/00	11:45:40	238.2362	8.971	29.899	3.225
07/27/00	11:45:55	238.4862	8.954	29.901	3.242
07/27/00	11:46:10	238.7362	8.932	29.901	3.264
07/27/00	11:46:25	238.9862	8.944	29.899	3.252
07/27/00	11:46:40	239.2362	8.994	29.899	3.202
07/27/00	11:46:55	239.4862	8.997	29.899	3.199
07/27/00	11:47:10	239.7362	8.99	29.899	3.206
07/27/00	11:47:25	239.9862	8.986	29.899	3.21
07/27/00	11:47:40	240.2362	8.983	29.899	3.213
07/27/00	11:47:55	240.4862	8.978	29.899	3.218
07/27/00	11:48:10	240.7362	8.977	29.897	3.219
07/27/00	11:48:25	240.9862	8.976	29.897	3.22
07/27/00	11:48:40	241.2362	8.974	29.897	3.222
07/27/00	11:48:55	241.4862	8.97	29.897	3.226
07/27/00	11:49:10	241.7362	8.921	29.899	3.275
07/27/00	11:49:25	241.9862	8.967	29.897	3.229
07/27/00	11:49:40	242.2362	8.968	29.899	3.228
07/27/00	11:49:55	242.4862	8.967	29.897	3.229
07/27/00	11:50:10	242.7362	8.965	29.895	3.231
07/27/00	11:50:25	242.9862	8.964	29.899	3.232
07/27/00	11:50:40	243.2362	8.964	29.897	3.232
07/27/00	11:50:55	243.4862	8.963	29.897	3.233
07/27/00	11:51:10	243.7362	8.963	29.897	3.233
07/27/00	11:51:25	243.9862	8.963	29.897	3.233
07/27/00	11:51:40	244.2362	8.963	29.895	3.233
07/27/00	11:51:55	244.4862	8.963	29.899	3.233
07/27/00	11:52:10	244.7362	8.964	29.897	3.232
07/27/00	11:52:25	244.9862	8.963	29.897	3.233
07/27/00	11:52:40	245.2362	8.963	29.899	3.233
07/27/00	11:52:55	245.4862	8.963	29.897	3.233
07/27/00	11:53:10	245.7362	8.961	29.897	3.235
07/27/00	11:53:25	245.9862	8.895	29.895	3.301
07/27/00	11:53:40	246.2362	8.934	29.899	3.262
07/27/00	11:53:55	246.4862	8.964	29.897	3.232
07/27/00	11:54:10	246.7362	8.914	29.895	3.282
07/27/00	11:54:25	246.9862	8.883	29.897	3.313
07/27/00	11:54:40	247.2362	8.945	29.897	3.251
07/27/00	11:54:55	247.4862	8.97	29.895	3.226
07/27/00	11:55:10	247.7362	8.872	29.895	3.324
07/27/00	11:55:25	247.9862	8.917	29.899	3.279
07/27/00	11:55:40	248.2362	8.971	29.897	3.225
07/27/00	11:55:55	248.4862	8.994	29.897	3.202
07/27/00	11:56:10	248.7362	8.99	29.897	3.206
07/27/00	11:56:25	248.9862	8.984	29.897	3.212
07/27/00	11:56:40	249.2362	8.978	29.897	3.218
07/27/00	11:56:55	249.4862	8.976	29.897	3.22
07/27/00	11:57:10	249.7362	8.971	29.895	3.225
07/27/00	11:57:25	249.9862	8.968	29.897	3.228
07/27/00	11:57:40	250.2362	8.967	29.897	3.229

Appendix B (continued)

07/27/00	11:57:55	250.4862	8.965	29.897	3.231
07/27/00	11:58:10	250.7362	8.963	29.895	3.233
07/27/00	11:58:25	250.9862	8.961	29.897	3.235
07/27/00	11:58:40	251.2362	8.96	29.895	3.236
07/27/00	11:58:55	251.4862	8.958	29.897	3.238
07/27/00	11:59:10	251.7362	8.958	29.895	3.238
07/27/00	11:59:25	251.9862	8.958	29.895	3.238
07/27/00	11:59:40	252.2362	8.909	29.895	3.287
07/27/00	11:59:55	252.4862	8.918	29.897	3.278
07/27/00	12:00:10	252.7362	8.948	29.897	3.248
07/27/00	12:00:25	252.9862	8.948	29.895	3.248
07/27/00	12:00:40	253.2362	8.948	29.895	3.248
07/27/00	12:00:55	253.4862	8.935	29.895	3.261
07/27/00	12:01:10	253.7362	8.948	29.895	3.248
07/27/00	12:01:25	253.9862	8.948	29.895	3.248
07/27/00	12:01:40	254.2362	8.947	29.897	3.249
07/27/00	12:01:55	254.4862	8.947	29.895	3.249
07/27/00	12:02:10	254.7362	8.922	29.895	3.274
07/27/00	12:02:25	254.9862	8.882	29.893	3.314
07/27/00	12:02:40	255.2362	8.945	29.895	3.251
07/27/00	12:02:55	255.4862	8.973	29.895	3.223
07/27/00	12:03:10	255.7362	8.965	29.893	3.231
07/27/00	12:03:25	255.9862	8.967	29.895	3.229
07/27/00	12:03:40	256.2362	8.964	29.895	3.232
07/27/00	12:03:55	256.4862	8.963	29.895	3.233
07/27/00	12:04:10	256.7362	8.961	29.893	3.235
07/27/00	12:04:25	256.9862	8.96	29.893	3.236
07/27/00	12:04:40	257.2362	8.958	29.893	3.238
07/27/00	12:04:55	257.4862	8.957	29.893	3.239
07/27/00	12:05:10	257.7362	8.922	29.893	3.274
07/27/00	12:05:25	257.9862	8.901	29.893	3.295
07/27/00	12:05:40	258.2362	8.917	29.891	3.279
07/27/00	12:05:55	258.4862	8.906	29.893	3.29
07/27/00	12:06:10	258.7362	8.888	29.893	3.308
07/27/00	12:06:25	258.9862	8.876	29.893	3.32
07/27/00	12:06:40	259.2362	8.865	29.893	3.331
07/27/00	12:06:55	259.4862	8.855	29.891	3.341
07/27/00	12:07:10	259.7362	8.845	29.893	3.351
07/27/00	12:07:25	259.9862	8.837	29.893	3.359
07/27/00	12:07:40	260.2362	8.829	29.893	3.367
07/27/00	12:07:55	260.4862	8.824	29.893	3.372
07/27/00	12:08:10	260.7362	8.819	29.893	3.377
07/27/00	12:08:25	260.9862	8.814	29.893	3.382
07/27/00	12:08:40	261.2362	8.81	29.893	3.386
07/27/00	12:08:55	261.4862	8.806	29.895	3.39
07/27/00	12:09:10	261.7362	8.801	29.895	3.395
07/27/00	12:09:25	261.9862	8.8	29.895	3.396
07/27/00	12:09:40	262.2362	8.797	29.895	3.399
07/27/00	12:09:55	262.4862	8.796	29.893	3.4
07/27/00	12:10:10	262.7362	8.794	29.895	3.402
07/27/00	12:10:25	262.9862	8.791	29.893	3.405

Appendix B (continued)

07/27/00	12:10:40	263.2362	8.79	29.893	3.406
07/27/00	12:10:55	263.4862	8.788	29.893	3.408
07/27/00	12:11:10	263.7362	8.788	29.893	3.408
07/27/00	12:11:25	263.9862	8.787	29.895	3.409
07/27/00	12:11:40	264.2362	8.787	29.895	3.409
07/27/00	12:11:55	264.4862	8.785	29.895	3.411
07/27/00	12:12:10	264.7362	8.783	29.893	3.413
07/27/00	12:12:25	264.9862	8.752	29.893	3.444
07/27/00	12:12:40	265.2362	8.751	29.893	3.445
07/27/00	12:12:55	265.4862	8.796	29.893	3.4
07/27/00	12:13:10	265.7362	8.814	29.893	3.382
07/27/00	12:13:25	265.9862	8.813	29.891	3.383
07/27/00	12:13:40	266.2362	8.804	29.893	3.392
07/27/00	12:13:55	266.4862	8.798	29.891	3.398
07/27/00	12:14:10	266.7362	8.794	29.891	3.402
07/27/00	12:14:25	266.9862	8.79	29.891	3.406
07/27/00	12:14:40	267.2362	8.785	29.893	3.411
07/27/00	12:14:55	267.4862	8.784	29.893	3.412
07/27/00	12:15:10	267.7362	8.781	29.893	3.415
07/27/00	12:15:25	267.9862	8.778	29.891	3.418
07/27/00	12:15:40	268.2362	8.775	29.893	3.421
07/27/00	12:15:55	268.4862	8.775	29.891	3.421
07/27/00	12:16:10	268.7362	8.773	29.891	3.423
07/27/00	12:16:25	268.9862	8.771	29.891	3.425
07/27/00	12:16:40	269.2362	8.767	29.891	3.429
07/27/00	12:16:55	269.4862	8.77	29.888	3.426
07/27/00	12:17:10	269.7362	8.765	29.891	3.431
07/27/00	12:17:25	269.9862	8.765	29.891	3.431
07/27/00	12:17:40	270.2362	8.764	29.891	3.432
07/27/00	12:17:55	270.4862	8.764	29.891	3.432
07/27/00	12:18:10	270.7362	8.764	29.891	3.432
07/27/00	12:18:25	270.9862	8.762	29.891	3.434
07/27/00	12:18:40	271.2362	8.762	29.891	3.434
07/27/00	12:18:55	271.4862	8.762	29.888	3.434
07/27/00	12:19:10	271.7362	8.721	29.891	3.475
07/27/00	12:19:25	271.9862	8.715	29.891	3.481
07/27/00	12:19:40	272.2362	8.737	29.891	3.459
07/27/00	12:19:55	272.4862	8.809	29.891	3.387
07/27/00	12:20:10	272.7362	8.875	29.888	3.321
07/27/00	12:20:25	272.9862	8.872	29.891	3.324
07/27/00	12:20:40	273.2362	8.901	29.888	3.295
07/27/00	12:20:55	273.4862	8.902	29.891	3.294
07/27/00	12:21:10	273.7362	8.904	29.888	3.292
07/27/00	12:21:25	273.9862	8.904	29.888	3.292
07/27/00	12:21:40	274.2362	8.904	29.891	3.292
07/27/00	12:21:55	274.4862	8.905	29.891	3.291
07/27/00	12:22:10	274.7362	8.905	29.888	3.291
07/27/00	12:22:25	274.9862	8.905	29.888	3.291
07/27/00	12:22:40	275.2362	8.904	29.888	3.292
07/27/00	12:22:55	275.4862	8.918	29.891	3.278
07/27/00	12:23:10	275.7362	8.915	29.891	3.281

Appendix B (continued)

07/27/00	12:23:25	275.9862	8.914	29.891	3.282
07/27/00	12:23:40	276.2362	8.912	29.888	3.284
07/27/00	12:23:55	276.4862	8.912	29.888	3.284
07/27/00	12:24:10	276.7362	8.912	29.888	3.284
07/27/00	12:24:25	276.9862	8.911	29.888	3.285
07/27/00	12:24:40	277.2362	8.919	29.888	3.277
07/27/00	12:24:55	277.4862	8.918	29.888	3.278
07/27/00	12:25:10	277.7362	8.915	29.888	3.281
07/27/00	12:25:25	277.9862	8.915	29.888	3.281
07/27/00	12:25:40	278.2362	8.914	29.886	3.282
07/27/00	12:25:55	278.4862	8.924	29.886	3.272
07/27/00	12:26:10	278.7362	8.921	29.886	3.275
07/27/00	12:26:25	278.9862	8.918	29.888	3.278
07/27/00	12:26:40	279.2362	8.917	29.886	3.279
07/27/00	12:26:55	279.4862	8.921	29.886	3.275
07/27/00	12:27:10	279.7362	8.924	29.886	3.272
07/27/00	12:27:25	279.9862	8.921	29.884	3.275
07/27/00	12:27:40	280.2362	8.918	29.886	3.278
07/27/00	12:27:55	280.4862	8.917	29.884	3.279
07/27/00	12:28:10	280.7362	8.922	29.884	3.274
07/27/00	12:28:25	280.9862	8.927	29.886	3.269
07/27/00	12:28:40	281.2362	8.924	29.884	3.272
07/27/00	12:28:55	281.4862	8.922	29.884	3.274
07/27/00	12:29:10	281.7362	8.929	29.882	3.267
07/27/00	12:29:25	281.9862	8.928	29.882	3.268
07/27/00	12:29:40	282.2362	8.925	29.882	3.271
07/27/00	12:29:55	282.4862	8.929	29.882	3.267
07/27/00	12:30:10	282.7362	8.934	29.882	3.262
07/27/00	12:30:25	282.9862	8.932	29.882	3.264
07/27/00	12:30:40	283.2362	8.863	29.882	3.333
07/27/00	12:30:55	283.4862	8.765	29.88	3.431
07/27/00	12:31:10	283.7362	8.715	29.88	3.481
07/27/00	12:31:25	283.9862	8.711	29.88	3.485
07/27/00	12:31:40	284.2362	9.235	29.882	2.961
07/27/00	12:31:55	284.4862	9.734	29.88	2.462
07/27/00	12:32:10	284.7362	9.896	29.88	2.3
07/27/00	12:32:25	284.9862	10.03	29.882	2.166
07/27/00	12:32:40	285.2362	10.145	29.882	2.051
07/27/00	12:32:55	285.4862	10.249	29.88	1.947
07/27/00	12:33:10	285.7362	10.341	29.882	1.855
07/27/00	12:33:25	285.9862	10.42	29.88	1.776
07/27/00	12:33:40	286.2362	10.493	29.882	1.703
07/27/00	12:33:55	286.4862	10.557	29.88	1.639
07/27/00	12:34:10	286.7362	10.616	29.88	1.58
07/27/00	12:34:25	286.9862	10.669	29.878	1.527
07/27/00	12:34:40	287.2362	10.717	29.88	1.479
07/27/00	12:34:55	287.4862	10.76	29.88	1.436
07/27/00	12:35:10	287.7362	10.799	29.88	1.397
07/27/00	12:35:25	287.9862	10.836	29.878	1.36
07/27/00	12:35:40	288.2362	10.871	29.88	1.325
07/27/00	12:35:55	288.4862	10.901	29.878	1.295

Appendix B (continued)

07/27/00	12:36:10	288.7362	10.931	29.878	1.265
07/27/00	12:36:25	288.9862	10.962	29.88	1.234
07/27/00	12:36:40	289.2362	10.988	29.88	1.208
07/27/00	12:36:55	289.4862	11.012	29.878	1.184
07/27/00	12:37:10	289.7362	11.037	29.88	1.159
07/27/00	12:37:25	289.9862	11.058	29.878	1.138
07/27/00	12:37:40	290.2362	11.08	29.876	1.116
07/27/00	12:37:55	290.4862	11.098	29.876	1.098
07/27/00	12:38:10	290.7362	11.119	29.878	1.077
07/27/00	12:38:25	290.9862	11.136	29.878	1.06
07/27/00	12:38:40	291.2362	11.155	29.876	1.041
07/27/00	12:38:55	291.4862	11.172	29.876	1.024
07/27/00	12:39:10	291.7362	11.186	29.878	1.01
07/27/00	12:39:25	291.9862	11.204	29.878	0.992
07/27/00	12:39:40	292.2362	11.217	29.878	0.979
07/27/00	12:39:55	292.4862	11.231	29.878	0.965
07/27/00	12:40:10	292.7362	11.247	29.878	0.949
07/27/00	12:40:25	292.9862	11.258	29.878	0.938
07/27/00	12:40:40	293.2362	11.27	29.88	0.926
07/27/00	12:40:55	293.4862	11.284	29.878	0.912
07/27/00	12:41:10	293.7362	11.294	29.878	0.902
07/27/00	12:41:25	293.9862	11.306	29.876	0.89
07/27/00	12:41:40	294.2362	11.317	29.878	0.879
07/27/00	12:41:55	294.4862	11.329	29.878	0.867
07/27/00	12:42:10	294.7362	11.339	29.876	0.857
07/27/00	12:42:25	294.9862	11.349	29.876	0.847
07/27/00	12:42:40	295.2362	11.358	29.876	0.838
07/27/00	12:42:55	295.4862	11.369	29.876	0.827
07/27/00	12:43:10	295.7362	11.378	29.876	0.818
07/27/00	12:43:25	295.9862	11.387	29.876	0.809
07/27/00	12:43:40	296.2362	11.394	29.876	0.802
07/27/00	12:43:55	296.4862	11.404	29.876	0.792
07/27/00	12:44:10	296.7362	11.413	29.876	0.783
07/27/00	12:44:25	296.9862	11.42	29.876	0.776
07/27/00	12:44:40	297.2362	11.427	29.876	0.769
07/27/00	12:44:55	297.4862	11.434	29.876	0.762
07/27/00	12:45:10	297.7362	11.441	29.876	0.755
07/27/00	12:45:25	297.9862	11.45	29.874	0.746
07/27/00	12:45:40	298.2362	11.457	29.876	0.739
07/27/00	12:45:55	298.4862	11.464	29.878	0.732
07/27/00	12:46:10	298.7362	11.472	29.874	0.724
07/27/00	12:46:25	298.9862	11.479	29.874	0.717
07/27/00	12:46:40	299.2362	11.485	29.874	0.711
07/27/00	12:46:55	299.4862	11.493	29.874	0.703
07/27/00	12:47:10	299.7362	11.499	29.874	0.697
07/27/00	12:47:25	299.9862	11.505	29.874	0.691
07/27/00	12:47:40	300.2362	11.51	29.874	0.686
07/27/00	12:47:55	300.4862	11.516	29.874	0.68
07/27/00	12:48:10	300.7362	11.522	29.872	0.674
07/27/00	12:48:25	300.9862	11.528	29.874	0.668
07/27/00	12:48:40	301.2362	11.535	29.874	0.661

Appendix B (continued)

07/27/00	12:48:55	301.4862	11.539	29.874	0.657
07/27/00	12:49:10	301.7362	11.545	29.872	0.651
07/27/00	12:49:25	301.9862	11.551	29.874	0.645
07/27/00	12:49:40	302.2362	11.555	29.874	0.641
07/27/00	12:49:55	302.4862	11.559	29.872	0.637
07/27/00	12:50:10	302.7362	11.565	29.874	0.631
07/27/00	12:50:25	302.9862	11.57	29.874	0.626
07/27/00	12:50:40	303.2362	11.575	29.874	0.621
07/27/00	12:50:55	303.4862	11.58	29.872	0.616
07/27/00	12:51:10	303.7362	11.584	29.872	0.612
07/27/00	12:51:25	303.9862	11.585	29.886	0.611
07/27/00	12:51:40	304.2362	11.59	29.886	0.606
07/27/00	12:51:55	304.4862	11.597	29.876	0.599
07/27/00	12:52:10	304.7362	11.601	29.874	0.595
07/27/00	12:52:25	304.9862	11.606	29.872	0.59
07/27/00	12:52:40	305.2362	11.61	29.872	0.586
07/27/00	12:52:55	305.4862	11.613	29.872	0.583
07/27/00	12:53:10	305.7362	11.619	29.872	0.577
07/27/00	12:53:25	305.9862	11.624	29.872	0.572
07/27/00	12:53:40	306.2362	11.627	29.872	0.569
07/27/00	12:53:55	306.4862	11.631	29.87	0.565
07/27/00	12:54:10	306.7362	11.634	29.872	0.562
07/27/00	12:54:25	306.9862	11.639	29.872	0.557
07/27/00	12:54:40	307.2362	11.643	29.872	0.553
07/27/00	12:54:55	307.4862	11.644	29.874	0.552
07/27/00	12:55:10	307.7362	11.649	29.872	0.547
07/27/00	12:55:25	307.9862	11.653	29.872	0.543
07/27/00	12:55:40	308.2362	11.656	29.872	0.54
07/27/00	12:55:55	308.4862	11.662	29.87	0.534
07/27/00	12:56:10	308.7362	11.666	29.874	0.53
07/27/00	12:56:25	308.9862	11.668	29.872	0.528
07/27/00	12:56:40	309.2362	11.672	29.87	0.524
07/27/00	12:56:55	309.4862	11.675	29.872	0.521
07/27/00	12:57:10	309.7362	11.678	29.87	0.518
07/27/00	12:57:25	309.9862	11.682	29.868	0.514
07/27/00	12:57:40	310.2362	11.685	29.87	0.511
07/27/00	12:57:55	310.4862	11.688	29.87	0.508
07/27/00	12:58:10	310.7362	11.691	29.87	0.505
07/27/00	12:58:25	310.9862	11.693	29.87	0.503
07/27/00	12:58:40	311.2362	11.696	29.87	0.5
07/27/00	12:58:55	311.4862	11.701	29.87	0.495
07/27/00	12:59:10	311.7362	11.704	29.87	0.492

Appendix B (continued)

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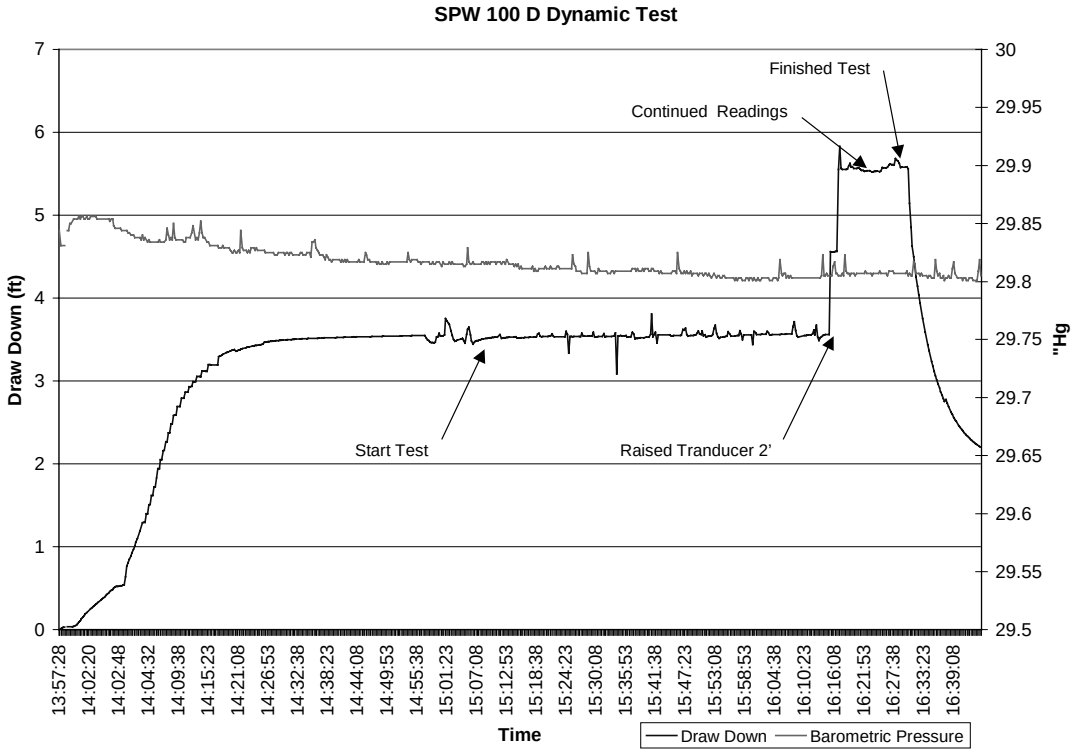
Appendix C – Time-drawdown data for SWP-100D



Back Ground

	Date	Time	ET (min)	Feet H2O	Inches Hg	FT Drawdown
	07/25/00	13:57:28	0	6.496	29.844	0
	07/25/00	13:58:28	1	6.485	29.831	0.011
	07/25/00	13:59:28	2	6.476	29.831	0.02
	07/25/00	14:00:28	3	6.469	29.831	0.027
	07/25/00	14:01:28	4	6.463	29.831	0.033
Pumping	07/25/00	14:02:09	0	6.46	29.844	0.036
	07/25/00	14:02:09	0.0112	6.46	29.844	0.036
	07/25/00	14:02:10	0.0223	6.46	29.85	0.036
	07/25/00	14:02:11	0.0335	6.459	29.85	0.037
	07/25/00	14:02:11	0.0447	6.459	29.852	0.037
	07/25/00	14:02:12	0.0558	6.456	29.854	0.04
	07/25/00	14:02:13	0.067	6.449	29.854	0.047
	07/25/00	14:02:13	0.0782	6.439	29.854	0.057
	07/25/00	14:02:14	0.0893	6.425	29.854	0.071
	07/25/00	14:02:15	0.1005	6.406	29.856	0.09
	07/25/00	14:02:15	0.1117	6.387	29.854	0.109
	07/25/00	14:02:16	0.1228	6.364	29.856	0.132
	07/25/00	14:02:17	0.134	6.344	29.856	0.152
	07/25/00	14:02:17	0.1452	6.324	29.854	0.172

Appendix C (continued)

07/25/00	14:02:18	0.1563	6.306	29.854	0.19
07/25/00	14:02:19	0.1675	6.289	29.856	0.207
07/25/00	14:02:19	0.1787	6.275	29.854	0.221
07/25/00	14:02:20	0.1898	6.26	29.854	0.236
07/25/00	14:02:21	0.201	6.245	29.856	0.251
07/25/00	14:02:21	0.2122	6.232	29.856	0.264
07/25/00	14:02:22	0.2233	6.219	29.856	0.277
07/25/00	14:02:23	0.235	6.204	29.856	0.292
07/25/00	14:02:23	0.2475	6.191	29.856	0.305
07/25/00	14:02:24	0.2607	6.18	29.854	0.316
07/25/00	14:02:25	0.2747	6.164	29.854	0.332
07/25/00	14:02:26	0.2895	6.152	29.854	0.344
07/25/00	14:02:27	0.3052	6.14	29.854	0.356
07/25/00	14:02:28	0.3218	6.125	29.854	0.371
07/25/00	14:02:29	0.3395	6.111	29.854	0.385
07/25/00	14:02:30	0.3582	6.096	29.854	0.4
07/25/00	14:02:31	0.378	6.081	29.854	0.415
07/25/00	14:02:32	0.399	6.066	29.854	0.43
07/25/00	14:02:34	0.4212	6.052	29.854	0.444
07/25/00	14:02:35	0.4447	6.034	29.852	0.462
07/25/00	14:02:37	0.4695	6.019	29.854	0.477
07/25/00	14:02:38	0.4958	6.011	29.854	0.485
07/25/00	14:02:40	0.5238	5.99	29.848	0.506
07/25/00	14:02:42	0.5535	5.978	29.846	0.518
07/25/00	14:02:44	0.5848	5.974	29.846	0.522
07/25/00	14:02:46	0.618	5.971	29.846	0.525
07/25/00	14:02:48	0.6532	5.97	29.846	0.526
07/25/00	14:02:50	0.6905	5.964	29.846	0.532
07/25/00	14:02:52	0.73	5.963	29.844	0.533
07/25/00	14:02:55	0.7718	5.96	29.844	0.536
07/25/00	14:02:57	0.8162	5.955	29.844	0.541
07/25/00	14:03:00	0.8632	5.856	29.844	0.64
07/25/00	14:03:03	0.913	5.724	29.844	0.772
07/25/00	14:03:06	0.9657	5.685	29.842	0.811
07/25/00	14:03:10	1.0215	5.646	29.842	0.85
07/25/00	14:03:13	1.0807	5.608	29.84	0.888
07/25/00	14:03:17	1.1433	5.568	29.84	0.928
07/25/00	14:03:21	1.2097	5.528	29.84	0.968
07/25/00	14:03:25	1.28	5.486	29.838	1.01
07/25/00	14:03:30	1.3545	5.443	29.838	1.053
07/25/00	14:03:35	1.4335	5.398	29.838	1.098
07/25/00	14:03:40	1.5172	5.352	29.838	1.144
07/25/00	14:03:45	1.6057	5.306	29.838	1.19
07/25/00	14:03:50	1.6995	5.256	29.836	1.24
07/25/00	14:03:56	1.7988	5.206	29.84	1.29
07/25/00	14:04:03	1.9042	5.201	29.836	1.295
07/25/00	14:04:09	2.0157	5.2	29.838	1.296
07/25/00	14:04:17	2.1338	5.095	29.836	1.401
07/25/00	14:04:24	2.259	5.095	29.834	1.401
07/25/00	14:04:32	2.3915	4.987	29.836	1.509
07/25/00	14:04:40	2.532	4.985	29.834	1.511

Appendix C (continued)

07/25/00	14:04:49	2.6808	4.879	29.834	1.617
07/25/00	14:04:59	2.8383	4.877	29.834	1.619
07/25/00	14:05:09	3.0052	4.771	29.834	1.725
07/25/00	14:05:19	3.182	4.771	29.834	1.725
07/25/00	14:05:31	3.3693	4.663	29.834	1.833
07/25/00	14:05:43	3.5677	4.555	29.834	1.941
07/25/00	14:05:55	3.7778	4.554	29.836	1.942
07/25/00	14:06:09	4.0005	4.446	29.834	2.05
07/25/00	14:06:23	4.2363	4.444	29.834	2.052
07/25/00	14:06:38	4.4862	4.336	29.834	2.16
07/25/00	14:06:53	4.7362	4.335	29.834	2.161
07/25/00	14:07:08	4.9862	4.229	29.836	2.267
07/25/00	14:07:23	5.2362	4.227	29.846	2.269
07/25/00	14:07:38	5.4862	4.119	29.84	2.377
07/25/00	14:07:53	5.7362	4.119	29.836	2.377
07/25/00	14:08:08	5.9862	4.016	29.838	2.48
07/25/00	14:08:23	6.2362	4.014	29.836	2.482
07/25/00	14:08:38	6.4862	3.911	29.85	2.585
07/25/00	14:08:53	6.7362	3.909	29.838	2.587
07/25/00	14:09:08	6.9862	3.908	29.836	2.588
07/25/00	14:09:23	7.2362	3.806	29.836	2.69
07/25/00	14:09:38	7.4862	3.803	29.836	2.693
07/25/00	14:09:53	7.7362	3.803	29.836	2.693
07/25/00	14:10:08	7.9862	3.702	29.836	2.794
07/25/00	14:10:23	8.2362	3.702	29.836	2.794
07/25/00	14:10:38	8.4862	3.702	29.834	2.794
07/25/00	14:10:53	8.7362	3.629	29.834	2.867
07/25/00	14:11:08	8.9862	3.629	29.838	2.867
07/25/00	14:11:23	9.2362	3.629	29.838	2.867
07/25/00	14:11:38	9.4862	3.564	29.838	2.932
07/25/00	14:11:53	9.7362	3.564	29.838	2.932
07/25/00	14:12:08	9.9862	3.562	29.842	2.934
07/25/00	14:12:23	10.2362	3.505	29.848	2.991
07/25/00	14:12:38	10.4862	3.508	29.842	2.988
07/25/00	14:12:53	10.7362	3.505	29.836	2.991
07/25/00	14:13:08	10.9862	3.442	29.838	3.054
07/25/00	14:13:23	11.2362	3.442	29.836	3.054
07/25/00	14:13:38	11.4862	3.442	29.842	3.054
07/25/00	14:13:53	11.7362	3.446	29.852	3.05
07/25/00	14:14:08	11.9862	3.375	29.842	3.121
07/25/00	14:14:23	12.2362	3.375	29.838	3.121
07/25/00	14:14:38	12.4862	3.375	29.838	3.121
07/25/00	14:14:53	12.7362	3.377	29.836	3.119
07/25/00	14:15:08	12.9862	3.377	29.834	3.119
07/25/00	14:15:23	13.2362	3.299	29.834	3.197
07/25/00	14:15:38	13.4862	3.299	29.831	3.197
07/25/00	14:15:53	13.7362	3.301	29.831	3.195
07/25/00	14:16:08	13.9862	3.301	29.831	3.195
07/25/00	14:16:23	14.2362	3.301	29.831	3.195
07/25/00	14:16:38	14.4862	3.301	29.831	3.195
07/25/00	14:16:53	14.7362	3.302	29.831	3.194

Appendix C (continued)

07/25/00	14:17:08	14.9862	3.302	29.831	3.194
07/25/00	14:17:23	15.2362	3.201	29.829	3.295
07/25/00	14:17:38	15.4862	3.193	29.829	3.303
07/25/00	14:17:53	15.7362	3.184	29.829	3.312
07/25/00	14:18:08	15.9862	3.174	29.831	3.322
07/25/00	14:18:23	16.2362	3.167	29.829	3.329
07/25/00	14:18:38	16.4862	3.158	29.829	3.338
07/25/00	14:18:53	16.7362	3.151	29.829	3.345
07/25/00	14:19:08	16.9862	3.145	29.829	3.351
07/25/00	14:19:23	17.2362	3.14	29.829	3.356
07/25/00	14:19:38	17.4862	3.131	29.827	3.365
07/25/00	14:19:53	17.7362	3.125	29.825	3.371
07/25/00	14:20:08	17.9862	3.119	29.825	3.377
07/25/00	14:20:23	18.2362	3.117	29.827	3.379
07/25/00	14:20:38	18.4862	3.137	29.825	3.359
07/25/00	14:20:53	18.7362	3.132	29.825	3.364
07/25/00	14:21:08	18.9862	3.125	29.827	3.371
07/25/00	14:21:23	19.2362	3.118	29.825	3.378
07/25/00	14:21:38	19.4862	3.115	29.844	3.381
07/25/00	14:21:53	19.7362	3.106	29.829	3.39
07/25/00	14:22:08	19.9862	3.102	29.827	3.394
07/25/00	14:22:23	20.2362	3.098	29.827	3.398
07/25/00	14:22:38	20.4862	3.092	29.827	3.404
07/25/00	14:22:53	20.7362	3.088	29.825	3.408
07/25/00	14:23:08	20.9862	3.086	29.827	3.41
07/25/00	14:23:23	21.2362	3.082	29.825	3.414
07/25/00	14:23:38	21.4862	3.078	29.829	3.418
07/25/00	14:23:53	21.7362	3.075	29.829	3.421
07/25/00	14:24:08	21.9862	3.072	29.829	3.424
07/25/00	14:24:23	22.2362	3.069	29.827	3.427
07/25/00	14:24:38	22.4862	3.066	29.829	3.43
07/25/00	14:24:53	22.7362	3.063	29.827	3.433
07/25/00	14:25:08	22.9862	3.06	29.827	3.436
07/25/00	14:25:23	23.2362	3.058	29.827	3.438
07/25/00	14:25:38	23.4862	3.053	29.827	3.443
07/25/00	14:25:53	23.7362	3.05	29.827	3.446
07/25/00	14:26:08	23.9862	3.027	29.827	3.469
07/25/00	14:26:23	24.2362	3.026	29.825	3.47
07/25/00	14:26:38	24.4862	3.023	29.825	3.473
07/25/00	14:26:53	24.7362	3.02	29.825	3.476
07/25/00	14:27:08	24.9862	3.019	29.825	3.477
07/25/00	14:27:23	25.2362	3.017	29.825	3.479
07/25/00	14:27:38	25.4862	3.016	29.825	3.48
07/25/00	14:27:53	25.7362	3.014	29.825	3.482
07/25/00	14:28:08	25.9862	3.012	29.823	3.484
07/25/00	14:28:23	26.2362	3.01	29.823	3.486
07/25/00	14:28:38	26.4862	3.007	29.823	3.489
07/25/00	14:28:53	26.7362	3.006	29.825	3.49
07/25/00	14:29:08	26.9862	3.004	29.825	3.492
07/25/00	14:29:23	27.2362	3.004	29.825	3.492
07/25/00	14:29:38	27.4862	3.001	29.825	3.495

Appendix C (continued)

07/25/00	14:29:53	27.7362	3.001	29.825	3.495
07/25/00	14:30:08	27.9862	3	29.823	3.496
07/25/00	14:30:23	28.2362	2.999	29.825	3.497
07/25/00	14:30:38	28.4862	2.997	29.825	3.499
07/25/00	14:30:53	28.7362	2.996	29.823	3.5
07/25/00	14:31:08	28.9862	2.996	29.825	3.5
07/25/00	14:31:23	29.2362	2.996	29.825	3.5
07/25/00	14:31:38	29.4862	2.994	29.823	3.502
07/25/00	14:31:53	29.7362	2.993	29.823	3.503
07/25/00	14:32:08	29.9862	2.991	29.823	3.505
07/25/00	14:32:23	30.2362	2.991	29.823	3.505
07/25/00	14:32:38	30.4862	2.99	29.823	3.506
07/25/00	14:32:53	30.7362	2.99	29.823	3.506
07/25/00	14:33:08	30.9862	2.989	29.825	3.507
07/25/00	14:33:23	31.2362	2.987	29.825	3.509
07/25/00	14:33:38	31.4862	2.987	29.823	3.509
07/25/00	14:33:53	31.7362	2.986	29.823	3.51
07/25/00	14:34:08	31.9862	2.984	29.823	3.512
07/25/00	14:34:23	32.2362	2.984	29.825	3.512
07/25/00	14:34:38	32.4862	2.983	29.825	3.513
07/25/00	14:34:53	32.7362	2.981	29.825	3.515
07/25/00	14:35:08	32.9862	2.983	29.821	3.513
07/25/00	14:35:23	33.2362	2.981	29.834	3.515
07/25/00	14:35:38	33.4862	2.98	29.834	3.516
07/25/00	14:35:53	33.7362	2.98	29.836	3.516
07/25/00	14:36:08	33.9862	2.98	29.829	3.516
07/25/00	14:36:23	34.2362	2.98	29.827	3.516
07/25/00	14:36:38	34.4862	2.978	29.825	3.518
07/25/00	14:36:53	34.7362	2.978	29.823	3.518
07/25/00	14:37:08	34.9862	2.978	29.823	3.518
07/25/00	14:37:23	35.2362	2.977	29.823	3.519
07/25/00	14:37:38	35.4862	2.976	29.821	3.52
07/25/00	14:37:53	35.7362	2.976	29.819	3.52
07/25/00	14:38:08	35.9862	2.976	29.823	3.52
07/25/00	14:38:23	36.2362	2.976	29.821	3.52
07/25/00	14:38:38	36.4862	2.976	29.819	3.52
07/25/00	14:38:53	36.7362	2.974	29.819	3.522
07/25/00	14:39:08	36.9862	2.976	29.817	3.52
07/25/00	14:39:23	37.2362	2.974	29.819	3.522
07/25/00	14:39:38	37.4862	2.973	29.819	3.523
07/25/00	14:39:53	37.7362	2.973	29.819	3.523
07/25/00	14:40:08	37.9862	2.971	29.819	3.525
07/25/00	14:40:23	38.2362	2.971	29.819	3.525
07/25/00	14:40:38	38.4862	2.971	29.819	3.525
07/25/00	14:40:53	38.7362	2.971	29.817	3.525
07/25/00	14:41:08	38.9862	2.97	29.819	3.526
07/25/00	14:41:23	39.2362	2.97	29.817	3.526
07/25/00	14:41:38	39.4862	2.968	29.819	3.528
07/25/00	14:41:53	39.7362	2.968	29.817	3.528
07/25/00	14:42:08	39.9862	2.968	29.819	3.528
07/25/00	14:42:23	40.2362	2.968	29.817	3.528

Appendix C (continued)

07/25/00	14:42:38	40.4862	2.965	29.817	3.531
07/25/00	14:42:53	40.7362	2.965	29.817	3.531
07/25/00	14:43:08	40.9862	2.965	29.817	3.531
07/25/00	14:43:23	41.2362	2.964	29.817	3.532
07/25/00	14:43:38	41.4862	2.965	29.817	3.531
07/25/00	14:43:53	41.7362	2.964	29.817	3.532
07/25/00	14:44:08	41.9862	2.964	29.817	3.532
07/25/00	14:44:23	42.2362	2.964	29.819	3.532
07/25/00	14:44:38	42.4862	2.964	29.817	3.532
07/25/00	14:44:53	42.7362	2.963	29.817	3.533
07/25/00	14:45:08	42.9862	2.963	29.817	3.533
07/25/00	14:45:23	43.2362	2.963	29.817	3.533
07/25/00	14:45:38	43.4862	2.961	29.825	3.535
07/25/00	14:45:53	43.7362	2.961	29.823	3.535
07/25/00	14:46:08	43.9862	2.961	29.819	3.535
07/25/00	14:46:23	44.2362	2.96	29.819	3.536
07/25/00	14:46:38	44.4862	2.96	29.817	3.536
07/25/00	14:46:53	44.7362	2.958	29.817	3.538
07/25/00	14:47:08	44.9862	2.958	29.817	3.538
07/25/00	14:47:23	45.2362	2.958	29.817	3.538
07/25/00	14:47:38	45.4862	2.958	29.817	3.538
07/25/00	14:47:53	45.7362	2.958	29.815	3.538
07/25/00	14:48:08	45.9862	2.957	29.817	3.539
07/25/00	14:48:23	46.2362	2.957	29.815	3.539
07/25/00	14:48:38	46.4862	2.957	29.815	3.539
07/25/00	14:48:53	46.7362	2.957	29.817	3.539
07/25/00	14:49:08	46.9862	2.955	29.815	3.541
07/25/00	14:49:23	47.2362	2.955	29.815	3.541
07/25/00	14:49:38	47.4862	2.955	29.815	3.541
07/25/00	14:49:53	47.7362	2.955	29.817	3.541
07/25/00	14:50:08	47.9862	2.954	29.815	3.542
07/25/00	14:50:23	48.2362	2.955	29.817	3.541
07/25/00	14:50:38	48.4862	2.954	29.817	3.542
07/25/00	14:50:53	48.7362	2.954	29.817	3.542
07/25/00	14:51:08	48.9862	2.954	29.817	3.542
07/25/00	14:51:23	49.2362	2.953	29.817	3.543
07/25/00	14:51:38	49.4862	2.953	29.817	3.543
07/25/00	14:51:53	49.7362	2.953	29.817	3.543
07/25/00	14:52:08	49.9862	2.953	29.817	3.543
07/25/00	14:52:23	50.2362	2.953	29.817	3.543
07/25/00	14:52:38	50.4862	2.951	29.817	3.545
07/25/00	14:52:53	50.7362	2.951	29.817	3.545
07/25/00	14:53:08	50.9862	2.951	29.817	3.545
07/25/00	14:53:23	51.2362	2.95	29.817	3.546
07/25/00	14:53:38	51.4862	2.95	29.817	3.546
07/25/00	14:53:53	51.7362	2.95	29.825	3.546
07/25/00	14:54:08	51.9862	2.95	29.819	3.546
07/25/00	14:54:23	52.2362	2.95	29.817	3.546
07/25/00	14:54:38	52.4862	2.948	29.819	3.548
07/25/00	14:54:53	52.7362	2.948	29.819	3.548
07/25/00	14:55:08	52.9862	2.948	29.819	3.548

Appendix C (continued)

07/25/00	14:55:23	53.2362	2.948	29.819	3.548
07/25/00	14:55:38	53.4862	2.948	29.819	3.548
07/25/00	14:55:53	53.7362	2.947	29.817	3.549
07/25/00	14:56:08	53.9862	2.947	29.817	3.549
07/25/00	14:56:23	54.2362	2.945	29.815	3.551
07/25/00	14:56:38	54.4862	2.945	29.817	3.551
07/25/00	14:56:53	54.7362	2.945	29.817	3.551
07/25/00	14:57:08	54.9862	2.945	29.817	3.551
07/25/00	14:57:23	55.2362	2.977	29.817	3.519
07/25/00	14:57:38	55.4862	3.003	29.817	3.493
07/25/00	14:57:53	55.7362	3.009	29.817	3.487
07/25/00	14:58:08	55.9862	3.026	29.815	3.47
07/25/00	14:58:23	56.2362	3.032	29.815	3.464
07/25/00	14:58:38	56.4862	3.032	29.817	3.464
07/25/00	14:58:53	56.7362	3.036	29.815	3.46
07/25/00	14:59:08	56.9862	3.029	29.815	3.467
07/25/00	14:59:23	57.2362	2.961	29.817	3.535
07/25/00	14:59:38	57.4862	2.96	29.817	3.536
07/25/00	14:59:53	57.7362	2.921	29.817	3.575
07/25/00	15:00:08	57.9862	2.953	29.815	3.543
07/25/00	15:00:23	58.2362	2.951	29.813	3.545
07/25/00	15:00:38	58.4862	2.951	29.817	3.545
07/25/00	15:00:53	58.7362	2.938	29.815	3.558
07/25/00	15:01:08	58.9862	2.74	29.815	3.756
07/25/00	15:01:23	59.2362	2.77	29.815	3.726
07/25/00	15:01:38	59.4862	2.796	29.815	3.7
07/25/00	15:01:53	59.7362	2.814	29.817	3.682
07/25/00	15:02:08	59.9862	2.888	29.815	3.608
07/25/00	15:02:23	60.2362	2.945	29.817	3.551
07/25/00	15:02:38	60.4862	2.994	29.815	3.502
07/25/00	15:02:53	60.7362	3.016	29.815	3.48
07/25/00	15:03:08	60.9862	3.012	29.815	3.484
07/25/00	15:03:23	61.2362	3.003	29.815	3.493
07/25/00	15:03:38	61.4862	2.997	29.815	3.499
07/25/00	15:03:53	61.7362	2.993	29.815	3.503
07/25/00	15:04:08	61.9862	2.989	29.815	3.507
07/25/00	15:04:23	62.2362	2.981	29.815	3.515
07/25/00	15:04:38	62.4862	3.007	29.813	3.489
07/25/00	15:04:53	62.7362	3.04	29.813	3.456
07/25/00	15:05:08	62.9862	2.932	29.815	3.564
07/25/00	15:05:23	63.2362	2.868	29.829	3.628
07/25/00	15:05:38	63.4862	2.845	29.817	3.651
07/25/00	15:05:53	63.7362	2.942	29.815	3.554
07/25/00	15:06:08	63.9862	3.012	29.815	3.484
07/25/00	15:06:23	64.2362	3.05	29.817	3.446
07/25/00	15:06:38	64.4862	3.026	29.815	3.47
07/25/00	15:06:53	64.7362	3.017	29.815	3.479
07/25/00	15:07:08	64.9862	3.01	29.815	3.486
07/25/00	15:07:23	65.2362	3.006	29.815	3.49
07/25/00	15:07:38	65.4862	3	29.815	3.496
07/25/00	15:07:53	65.7362	2.996	29.815	3.5

Appendix C (continued)

07/25/00	15:08:08	65.9862	2.991	29.817	3.505
07/25/00	15:08:23	66.2362	2.989	29.817	3.507
07/25/00	15:08:38	66.4862	2.986	29.815	3.51
07/25/00	15:08:53	66.7362	2.983	29.817	3.513
07/25/00	15:09:08	66.9862	2.98	29.815	3.516
07/25/00	15:09:23	67.2362	2.977	29.817	3.519
07/25/00	15:09:38	67.4862	2.976	29.815	3.52
07/25/00	15:09:53	67.7362	2.973	29.817	3.523
07/25/00	15:10:08	67.9862	2.971	29.817	3.525
07/25/00	15:10:23	68.2362	2.97	29.817	3.526
07/25/00	15:10:38	68.4862	2.967	29.817	3.529
07/25/00	15:10:53	68.7362	2.965	29.815	3.531
07/25/00	15:11:08	68.9862	2.965	29.817	3.531
07/25/00	15:11:23	69.2362	2.948	29.817	3.548
07/25/00	15:11:38	69.4862	2.937	29.817	3.559
07/25/00	15:11:53	69.7362	2.98	29.815	3.516
07/25/00	15:12:08	69.9862	2.977	29.817	3.519
07/25/00	15:12:23	70.2362	2.976	29.817	3.52
07/25/00	15:12:38	70.4862	2.973	29.815	3.523
07/25/00	15:12:53	70.7362	2.971	29.819	3.525
07/25/00	15:13:08	70.9862	2.97	29.817	3.526
07/25/00	15:13:23	71.2362	2.968	29.815	3.528
07/25/00	15:13:38	71.4862	2.968	29.815	3.528
07/25/00	15:13:53	71.7362	2.967	29.815	3.529
07/25/00	15:14:08	71.9862	2.965	29.815	3.531
07/25/00	15:14:23	72.2362	2.965	29.813	3.531
07/25/00	15:14:38	72.4862	2.964	29.815	3.532
07/25/00	15:14:53	72.7362	2.976	29.813	3.52
07/25/00	15:15:08	72.9862	2.978	29.815	3.518
07/25/00	15:15:23	73.2362	2.977	29.811	3.519
07/25/00	15:15:38	73.4862	2.976	29.813	3.52
07/25/00	15:15:53	73.7362	2.974	29.811	3.522
07/25/00	15:16:08	73.9862	2.973	29.811	3.523
07/25/00	15:16:23	74.2362	2.971	29.811	3.525
07/25/00	15:16:38	74.4862	2.971	29.811	3.525
07/25/00	15:16:53	74.7362	2.971	29.811	3.525
07/25/00	15:17:08	74.9862	2.97	29.811	3.526
07/25/00	15:17:23	75.2362	2.968	29.811	3.528
07/25/00	15:17:38	75.4862	2.967	29.811	3.529
07/25/00	15:17:53	75.7362	2.967	29.813	3.529
07/25/00	15:18:08	75.9862	2.965	29.809	3.531
07/25/00	15:18:23	76.2362	2.964	29.811	3.532
07/25/00	15:18:38	76.4862	2.964	29.809	3.532
07/25/00	15:18:53	76.7362	2.927	29.809	3.569
07/25/00	15:19:08	76.9862	2.918	29.811	3.578
07/25/00	15:19:23	77.2362	2.955	29.811	3.541
07/25/00	15:19:38	77.4862	2.96	29.811	3.536
07/25/00	15:19:53	77.7362	2.958	29.811	3.538
07/25/00	15:20:08	77.9862	2.958	29.811	3.538
07/25/00	15:20:23	78.2362	2.958	29.813	3.538
07/25/00	15:20:38	78.4862	2.957	29.811	3.539

Appendix C (continued)

07/25/00	15:20:53	78.7362	2.957	29.811	3.539
07/25/00	15:21:08	78.9862	2.955	29.811	3.541
07/25/00	15:21:23	79.2362	2.955	29.813	3.541
07/25/00	15:21:38	79.4862	2.93	29.811	3.566
07/25/00	15:21:53	79.7362	2.955	29.811	3.541
07/25/00	15:22:08	79.9862	2.964	29.811	3.532
07/25/00	15:22:23	80.2362	2.964	29.811	3.532
07/25/00	15:22:38	80.4862	2.963	29.813	3.533
07/25/00	15:22:53	80.7362	2.963	29.813	3.533
07/25/00	15:23:08	80.9862	2.963	29.811	3.533
07/25/00	15:23:23	81.2362	2.963	29.811	3.533
07/25/00	15:23:38	81.4862	2.963	29.811	3.533
07/25/00	15:23:53	81.7362	2.963	29.811	3.533
07/25/00	15:24:08	81.9862	2.963	29.811	3.533
07/25/00	15:24:23	82.2362	2.896	29.811	3.6
07/25/00	15:24:38	82.4862	2.937	29.811	3.559
07/25/00	15:24:53	82.7362	3.158	29.811	3.338
07/25/00	15:25:08	82.9862	2.958	29.811	3.538
07/25/00	15:25:23	83.2362	2.958	29.811	3.538
07/25/00	15:25:38	83.4862	2.963	29.823	3.533
07/25/00	15:25:53	83.7362	2.958	29.815	3.538
07/25/00	15:26:08	83.9862	2.958	29.813	3.538
07/25/00	15:26:23	84.2362	2.958	29.809	3.538
07/25/00	15:26:38	84.4862	2.957	29.809	3.539
07/25/00	15:26:53	84.7362	2.958	29.809	3.538
07/25/00	15:27:08	84.9862	2.963	29.809	3.533
07/25/00	15:27:23	85.2362	2.919	29.807	3.577
07/25/00	15:27:38	85.4862	2.951	29.807	3.545
07/25/00	15:27:53	85.7362	2.953	29.807	3.543
07/25/00	15:28:08	85.9862	2.953	29.807	3.543
07/25/00	15:28:23	86.2362	2.953	29.807	3.543
07/25/00	15:28:38	86.4862	2.955	29.825	3.541
07/25/00	15:28:53	86.7362	2.951	29.813	3.545
07/25/00	15:29:08	86.9862	2.951	29.809	3.545
07/25/00	15:29:23	87.2362	2.954	29.809	3.542
07/25/00	15:29:38	87.4862	2.909	29.809	3.587
07/25/00	15:29:53	87.7362	2.965	29.809	3.531
07/25/00	15:30:08	87.9862	2.963	29.807	3.533
07/25/00	15:30:23	88.2362	2.963	29.807	3.533
07/25/00	15:30:38	88.4862	2.958	29.811	3.538
07/25/00	15:30:53	88.7362	2.957	29.809	3.539
07/25/00	15:31:08	88.9862	2.958	29.809	3.538
07/25/00	15:31:23	89.2362	2.958	29.809	3.538
07/25/00	15:31:38	89.4862	2.924	29.809	3.572
07/25/00	15:31:53	89.7362	2.961	29.809	3.535
07/25/00	15:32:08	89.9862	2.958	29.809	3.538
07/25/00	15:32:23	90.2362	2.958	29.807	3.538
07/25/00	15:32:38	90.4862	2.957	29.807	3.539
07/25/00	15:32:53	90.7362	2.957	29.807	3.539
07/25/00	15:33:08	90.9862	2.957	29.809	3.539
07/25/00	15:33:23	91.2362	2.955	29.809	3.541

Appendix C (continued)

07/25/00	15:33:38	91.4862	2.951	29.807	3.545
07/25/00	15:33:53	91.7362	2.915	29.809	3.581
07/25/00	15:34:08	91.9862	3.41	29.809	3.086
07/25/00	15:34:23	92.2362	2.951	29.809	3.545
07/25/00	15:34:38	92.4862	2.95	29.809	3.546
07/25/00	15:34:53	92.7362	2.948	29.809	3.548
07/25/00	15:35:08	92.9862	2.95	29.809	3.546
07/25/00	15:35:23	93.2362	2.951	29.809	3.545
07/25/00	15:35:38	93.4862	2.95	29.809	3.546
07/25/00	15:35:53	93.7362	2.948	29.809	3.548
07/25/00	15:36:08	93.9862	2.965	29.809	3.531
07/25/00	15:36:23	94.2362	2.963	29.809	3.533
07/25/00	15:36:38	94.4862	2.963	29.809	3.533
07/25/00	15:36:53	94.7362	2.963	29.809	3.533
07/25/00	15:37:08	94.9862	2.908	29.811	3.588
07/25/00	15:37:23	95.2362	2.927	29.811	3.569
07/25/00	15:37:38	95.4862	2.987	29.811	3.509
07/25/00	15:37:53	95.7362	2.981	29.809	3.515
07/25/00	15:38:08	95.9862	2.98	29.811	3.516
07/25/00	15:38:23	96.2362	2.977	29.809	3.519
07/25/00	15:38:38	96.4862	2.976	29.809	3.52
07/25/00	15:38:53	96.7362	2.974	29.809	3.522
07/25/00	15:39:08	96.9862	2.973	29.811	3.523
07/25/00	15:39:23	97.2362	2.973	29.809	3.523
07/25/00	15:39:38	97.4862	2.971	29.811	3.525
07/25/00	15:39:53	97.7362	2.968	29.811	3.528
07/25/00	15:40:08	97.9862	2.967	29.811	3.529
07/25/00	15:40:23	98.2362	2.967	29.809	3.529
07/25/00	15:40:38	98.4862	2.931	29.809	3.565
07/25/00	15:40:53	98.7362	2.691	29.811	3.805
07/25/00	15:41:08	98.9862	2.963	29.811	3.533
07/25/00	15:41:23	99.2362	2.932	29.809	3.564
07/25/00	15:41:38	99.4862	2.909	29.809	3.587
07/25/00	15:41:53	99.7362	3.037	29.809	3.459
07/25/00	15:42:08	99.9862	2.942	29.809	3.554
07/25/00	15:42:23	100.2362	2.941	29.807	3.555
07/25/00	15:42:38	100.4862	2.941	29.809	3.555
07/25/00	15:42:53	100.7362	2.941	29.807	3.555
07/25/00	15:43:08	100.9862	2.941	29.807	3.555
07/25/00	15:43:23	101.2362	2.94	29.807	3.556
07/25/00	15:43:38	101.4862	2.94	29.807	3.556
07/25/00	15:43:53	101.7362	2.94	29.807	3.556
07/25/00	15:44:08	101.9862	2.94	29.807	3.556
07/25/00	15:44:23	102.2362	2.94	29.807	3.556
07/25/00	15:44:38	102.4862	2.95	29.807	3.546
07/25/00	15:44:53	102.7362	2.95	29.809	3.546
07/25/00	15:45:08	102.9862	2.948	29.809	3.548
07/25/00	15:45:23	103.2362	2.947	29.809	3.549
07/25/00	15:45:38	103.4862	2.947	29.807	3.549
07/25/00	15:45:53	103.7362	2.948	29.825	3.548
07/25/00	15:46:08	103.9862	2.945	29.811	3.551

Appendix C (continued)

07/25/00	15:46:23	104.2362	2.945	29.809	3.551
07/25/00	15:46:38	104.4862	2.944	29.807	3.552
07/25/00	15:46:53	104.7362	2.876	29.807	3.62
07/25/00	15:47:08	104.9862	2.881	29.809	3.615
07/25/00	15:47:23	105.2362	2.859	29.807	3.637
07/25/00	15:47:38	105.4862	2.937	29.809	3.559
07/25/00	15:47:53	105.7362	2.953	29.807	3.543
07/25/00	15:48:08	105.9862	2.95	29.807	3.546
07/25/00	15:48:23	106.2362	2.948	29.809	3.548
07/25/00	15:48:38	106.4862	2.947	29.805	3.549
07/25/00	15:48:53	106.7362	2.945	29.807	3.551
07/25/00	15:49:08	106.9862	2.944	29.807	3.552
07/25/00	15:49:23	107.2362	2.942	29.807	3.554
07/25/00	15:49:38	107.4862	2.921	29.807	3.575
07/25/00	15:49:53	107.7362	2.894	29.805	3.602
07/25/00	15:50:08	107.9862	2.93	29.807	3.566
07/25/00	15:50:23	108.2362	2.935	29.807	3.561
07/25/00	15:50:38	108.4862	2.895	29.807	3.601
07/25/00	15:50:53	108.7362	2.95	29.805	3.546
07/25/00	15:51:08	108.9862	2.942	29.807	3.554
07/25/00	15:51:23	109.2362	2.961	29.807	3.535
07/25/00	15:51:38	109.4862	2.958	29.805	3.538
07/25/00	15:51:53	109.7362	2.955	29.807	3.541
07/25/00	15:52:08	109.9862	2.953	29.805	3.543
07/25/00	15:52:23	110.2362	2.951	29.803	3.545
07/25/00	15:52:38	110.4862	2.937	29.805	3.559
07/25/00	15:52:53	110.7362	2.86	29.807	3.636
07/25/00	15:53:08	110.9862	2.822	29.805	3.674
07/25/00	15:53:23	111.2362	2.918	29.803	3.578
07/25/00	15:53:38	111.4862	2.964	29.805	3.532
07/25/00	15:53:53	111.7362	2.98	29.805	3.516
07/25/00	15:54:08	111.9862	2.971	29.803	3.525
07/25/00	15:54:23	112.2362	2.968	29.803	3.528
07/25/00	15:54:38	112.4862	2.964	29.805	3.532
07/25/00	15:54:53	112.7362	2.961	29.805	3.535
07/25/00	15:55:08	112.9862	2.958	29.803	3.538
07/25/00	15:55:23	113.2362	2.955	29.803	3.541
07/25/00	15:55:38	113.4862	2.902	29.803	3.594
07/25/00	15:55:53	113.7362	2.927	29.803	3.569
07/25/00	15:56:08	113.9862	2.954	29.803	3.542
07/25/00	15:56:23	114.2362	2.955	29.803	3.541
07/25/00	15:56:38	114.4862	2.954	29.803	3.542
07/25/00	15:56:53	114.7362	2.953	29.801	3.543
07/25/00	15:57:08	114.9862	2.95	29.803	3.546
07/25/00	15:57:23	115.2362	2.948	29.801	3.548
07/25/00	15:57:38	115.4862	2.948	29.803	3.548
07/25/00	15:57:53	115.7362	2.888	29.803	3.608
07/25/00	15:58:08	115.9862	2.928	29.803	3.568
07/25/00	15:58:23	116.2362	2.996	29.801	3.5
07/25/00	15:58:38	116.4862	2.942	29.801	3.554
07/25/00	15:58:53	116.7362	2.942	29.801	3.554

Appendix C (continued)

07/25/00	15:59:08	116.9862	2.941	29.803	3.555
07/25/00	15:59:23	117.2362	2.941	29.803	3.555
07/25/00	15:59:38	117.4862	2.94	29.801	3.556
07/25/00	15:59:53	117.7362	2.94	29.803	3.556
07/25/00	16:00:08	117.9862	2.94	29.803	3.556
07/25/00	16:00:23	118.2362	3.055	29.801	3.441
07/25/00	16:00:38	118.4862	2.896	29.803	3.6
07/25/00	16:00:53	118.7362	2.912	29.801	3.584
07/25/00	16:01:08	118.9862	2.935	29.801	3.561
07/25/00	16:01:23	119.2362	2.935	29.803	3.561
07/25/00	16:01:38	119.4862	2.934	29.801	3.562
07/25/00	16:01:53	119.7362	2.934	29.801	3.562
07/25/00	16:02:08	119.9862	2.932	29.803	3.564
07/25/00	16:02:23	120.2362	2.932	29.803	3.564
07/25/00	16:02:38	120.4862	2.931	29.803	3.565
07/25/00	16:02:53	120.7362	2.931	29.803	3.565
07/25/00	16:03:08	120.9862	2.896	29.803	3.6
07/25/00	16:03:23	121.2362	2.912	29.803	3.584
07/25/00	16:03:38	121.4862	2.94	29.801	3.556
07/25/00	16:03:53	121.7362	2.938	29.801	3.558
07/25/00	16:04:08	121.9862	2.937	29.801	3.559
07/25/00	16:04:23	122.2362	2.937	29.803	3.559
07/25/00	16:04:38	122.4862	2.935	29.803	3.561
07/25/00	16:04:53	122.7362	2.935	29.803	3.561
07/25/00	16:05:08	122.9862	2.935	29.801	3.561
07/25/00	16:05:23	123.2362	2.934	29.803	3.562
07/25/00	16:05:38	123.4862	2.937	29.819	3.559
07/25/00	16:05:53	123.7362	2.932	29.807	3.564
07/25/00	16:06:08	123.9862	2.931	29.805	3.565
07/25/00	16:06:23	124.2362	2.931	29.807	3.565
07/25/00	16:06:38	124.4862	2.931	29.807	3.565
07/25/00	16:06:53	124.7362	2.93	29.803	3.566
07/25/00	16:07:08	124.9862	2.928	29.805	3.568
07/25/00	16:07:23	125.2362	2.927	29.803	3.569
07/25/00	16:07:38	125.4862	2.927	29.805	3.569
07/25/00	16:07:53	125.7362	2.928	29.803	3.568
07/25/00	16:08:08	125.9862	2.839	29.803	3.657
07/25/00	16:08:23	126.2362	2.783	29.803	3.713
07/25/00	16:08:38	126.4862	2.886	29.803	3.61
07/25/00	16:08:53	126.7362	2.951	29.803	3.545
07/25/00	16:09:08	126.9862	2.967	29.803	3.529
07/25/00	16:09:23	127.2362	2.961	29.803	3.535
07/25/00	16:09:38	127.4862	2.957	29.803	3.539
07/25/00	16:09:53	127.7362	2.953	29.803	3.543
07/25/00	16:10:08	127.9862	2.95	29.803	3.546
07/25/00	16:10:23	128.2362	2.948	29.803	3.548
07/25/00	16:10:38	128.4862	2.947	29.803	3.549
07/25/00	16:10:53	128.7362	2.944	29.803	3.552
07/25/00	16:11:08	128.9862	2.942	29.803	3.554
07/25/00	16:11:23	129.2362	2.94	29.803	3.556
07/25/00	16:11:38	129.4862	2.938	29.803	3.558

Appendix C (continued)

07/25/00	16:11:53	129.7362	2.93	29.803	3.566
07/25/00	16:12:08	129.9862	2.879	29.803	3.617
07/25/00	16:12:23	130.2362	2.938	29.803	3.558
07/25/00	16:12:38	130.4862	2.823	29.803	3.673
07/25/00	16:12:53	130.7362	2.965	29.803	3.531
07/25/00	16:13:08	130.9862	3.01	29.803	3.486
07/25/00	16:13:23	131.2362	2.976	29.803	3.52
07/25/00	16:13:38	131.4862	2.963	29.805	3.533
07/25/00	16:13:53	131.7362	2.948	29.823	3.548
07/25/00	16:14:08	131.9862	2.944	29.805	3.552
07/25/00	16:14:23	132.2362	2.937	29.805	3.559
07/25/00	16:14:38	132.4862	2.937	29.807	3.559
07/25/00	16:14:53	132.7362	2.934	29.805	3.562
07/25/00	16:15:08	132.9862	2.934	29.805	3.562
07/25/00	16:15:23	133.2362	1.936	29.805	4.56
07/25/00	16:15:38	133.4862	1.939	29.805	4.557
07/25/00	16:15:53	133.7362	1.939	29.813	4.557
07/25/00	16:16:08	133.9862	1.936	29.817	4.56
07/25/00	16:16:23	134.2362	1.934	29.807	4.562
07/25/00	16:16:38	134.4862	1.934	29.807	4.562
07/25/00	16:16:53	134.7362	0.943	29.805	5.553
07/25/00	16:17:08	134.9862	0.666	29.805	5.83
07/25/00	16:17:23	135.2362	0.933	29.805	5.563
07/25/00	16:17:38	135.4862	0.942	29.807	5.554
07/25/00	16:17:53	135.7362	0.943	29.805	5.553
07/25/00	16:18:08	135.9862	0.945	29.823	5.551
07/25/00	16:18:23	136.2362	0.942	29.809	5.554
07/25/00	16:18:38	136.4862	0.941	29.807	5.555
07/25/00	16:18:53	136.7362	0.902	29.807	5.594
07/25/00	16:19:08	136.9862	0.869	29.805	5.627
07/25/00	16:19:23	137.2362	0.915	29.807	5.581
07/25/00	16:19:38	137.4862	0.915	29.807	5.581
07/25/00	16:19:53	137.7362	0.931	29.807	5.565
07/25/00	16:20:08	137.9862	0.931	29.805	5.565
07/25/00	16:20:23	138.2362	0.931	29.807	5.565
07/25/00	16:20:38	138.4862	0.929	29.807	5.567
07/25/00	16:20:53	138.7362	0.929	29.807	5.567
07/25/00	16:21:08	138.9862	0.946	29.807	5.55
07/25/00	16:21:23	139.2362	0.956	29.807	5.54
07/25/00	16:21:38	139.4862	0.956	29.807	5.54
07/25/00	16:21:53	139.7362	0.966	29.807	5.53
07/25/00	16:22:08	139.9862	0.962	29.809	5.534
07/25/00	16:22:23	140.2362	0.961	29.807	5.535
07/25/00	16:22:38	140.4862	0.958	29.807	5.538
07/25/00	16:22:53	140.7362	0.959	29.807	5.537
07/25/00	16:23:08	140.9862	0.965	29.807	5.531
07/25/00	16:23:23	141.2362	0.975	29.805	5.521
07/25/00	16:23:38	141.4862	0.971	29.807	5.525
07/25/00	16:23:53	141.7362	0.968	29.807	5.528
07/25/00	16:24:08	141.9862	0.965	29.807	5.531
07/25/00	16:24:23	142.2362	0.962	29.807	5.534

Appendix C (continued)

07/25/00	16:24:38	142.4862	0.966	29.807	5.53
07/25/00	16:24:53	142.7362	0.971	29.809	5.525
07/25/00	16:25:08	142.9862	0.958	29.807	5.538
07/25/00	16:25:23	143.2362	0.922	29.807	5.574
07/25/00	16:25:38	143.4862	0.923	29.807	5.573
07/25/00	16:25:53	143.7362	0.925	29.807	5.571
07/25/00	16:26:08	143.9862	0.923	29.807	5.573
07/25/00	16:26:23	144.2362	0.919	29.805	5.577
07/25/00	16:26:38	144.4862	0.89	29.809	5.606
07/25/00	16:26:53	144.7362	0.88	29.809	5.616
07/25/00	16:27:08	144.9862	0.885	29.809	5.611
07/25/00	16:27:23	145.2362	0.886	29.809	5.61
07/25/00	16:27:38	145.4862	0.889	29.807	5.607
07/25/00	16:27:53	145.7362	0.814	29.807	5.682
07/25/00	16:28:08	145.9862	0.83	29.807	5.666
07/25/00	16:28:23	146.2362	0.843	29.807	5.653
07/25/00	16:28:38	146.4862	0.869	29.807	5.627
07/25/00	16:28:53	146.7362	0.922	29.807	5.574
07/25/00	16:29:08	146.9862	0.919	29.807	5.577
07/25/00	16:29:23	147.2362	0.916	29.807	5.58
07/25/00	16:29:38	147.4862	0.916	29.807	5.58
07/25/00	16:29:53	147.7362	0.916	29.807	5.58
07/25/00	16:30:08	147.9862	0.913	29.809	5.583
07/25/00	16:30:23	148.2362	0.936	29.805	5.56
07/25/00	16:30:38	148.4862	1.352	29.807	5.144
07/25/00	16:30:53	148.7362	1.644	29.805	4.852
07/25/00	16:31:08	148.9862	1.865	29.805	4.631
07/25/00	16:31:23	149.2362	1.999	29.817	4.497
07/25/00	16:31:38	149.4862	2.121	29.815	4.375
07/25/00	16:31:53	149.7362	2.238	29.807	4.258
07/25/00	16:32:08	149.9862	2.35	29.807	4.146
07/25/00	16:32:23	150.2362	2.456	29.807	4.04
07/25/00	16:32:38	150.4862	2.556	29.805	3.94
07/25/00	16:32:53	150.7362	2.649	29.807	3.847
07/25/00	16:33:08	150.9862	2.74	29.805	3.756
07/25/00	16:33:23	151.2362	2.825	29.805	3.671
07/25/00	16:33:38	151.4862	2.905	29.805	3.591
07/25/00	16:33:53	151.7362	2.983	29.805	3.513
07/25/00	16:34:08	151.9862	3.058	29.803	3.438
07/25/00	16:34:23	152.2362	3.128	29.805	3.368
07/25/00	16:34:38	152.4862	3.194	29.805	3.302
07/25/00	16:34:53	152.7362	3.259	29.803	3.237
07/25/00	16:35:08	152.9862	3.318	29.803	3.178
07/25/00	16:35:23	153.2362	3.378	29.803	3.118
07/25/00	16:35:38	153.4862	3.434	29.819	3.062
07/25/00	16:35:53	153.7362	3.485	29.809	3.011
07/25/00	16:36:08	153.9862	3.532	29.805	2.964
07/25/00	16:36:23	154.2362	3.581	29.807	2.915
07/25/00	16:36:38	154.4862	3.626	29.803	2.87
07/25/00	16:36:53	154.7362	3.669	29.803	2.827
07/25/00	16:37:08	154.9862	3.709	29.805	2.787

Appendix C (continued)

07/25/00	16:37:23	155.2362	3.745	29.801	2.751
07/25/00	16:37:38	155.4862	3.719	29.803	2.777
07/25/00	16:37:53	155.7362	3.765	29.803	2.731
07/25/00	16:38:08	155.9862	3.804	29.805	2.692
07/25/00	16:38:23	156.2362	3.839	29.803	2.657
07/25/00	16:38:38	156.4862	3.872	29.803	2.624
07/25/00	16:38:53	156.7362	3.901	29.811	2.595
07/25/00	16:39:08	156.9862	3.934	29.817	2.562
07/25/00	16:39:23	157.2362	3.96	29.807	2.536
07/25/00	16:39:38	157.4862	3.984	29.805	2.512
07/25/00	16:39:53	157.7362	4.01	29.803	2.486
07/25/00	16:40:08	157.9862	4.034	29.803	2.462
07/25/00	16:40:23	158.2362	4.056	29.803	2.44
07/25/00	16:40:38	158.4862	4.077	29.803	2.419
07/25/00	16:40:53	158.7362	4.096	29.801	2.4
07/25/00	16:41:08	158.9862	4.116	29.803	2.38
07/25/00	16:41:23	159.2362	4.135	29.803	2.361
07/25/00	16:41:38	159.4862	4.152	29.801	2.344
07/25/00	16:41:53	159.7362	4.168	29.801	2.328
07/25/00	16:42:08	159.9862	4.184	29.803	2.312
07/25/00	16:42:23	160.2362	4.2	29.803	2.296
07/25/00	16:42:38	160.4862	4.213	29.803	2.283
07/25/00	16:42:53	160.7362	4.227	29.801	2.269
07/25/00	16:43:08	160.9862	4.239	29.801	2.257
07/25/00	16:43:23	161.2362	4.254	29.801	2.242
07/25/00	16:43:38	161.4862	4.263	29.801	2.233
07/25/00	16:43:53	161.7362	4.273	29.809	2.223
07/25/00	16:44:08	161.9862	4.288	29.819	2.208
07/25/00	16:44:23	162.2362	4.295	29.805	2.201

Appendix C (continued)

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