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ORNL/TM-5816

Argon Permeability of Graphite Fuel Elements for the High-Temperature Gas-Cooled Reactor

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MASTER

OAK RIDGE NATIONAL LABORATORY

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Printed in the United States of America. Available from
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road, Springfield, Virginia 22161
Price Printed Copy \$4.50; Microfiche \$3.00

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ORNL/TM-5816
Distribution
Category UC-77

Contract No. W-7405-eng-26

METALS AND CERAMICS DIVISION
THORIUM UTILIZATION PROGRAM (189a OH045)
Fabrication Development — Task 300

**ARGON PERMEABILITY OF GRAPHITE FUEL ELEMENTS
FOR THE HIGH-TEMPERATURE GAS-COOLED REACTOR**

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Date Published: May 1977

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ARGON PERMEABILITY OF GRAPHITE FUEL ELEMENTS FOR THE HIGH-TEMPERATURE GAS-COOLED REACTOR

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ABSTRACT

The flow rate of pressurized argon escaping from individual fuel holes in High-Temperature Gas-Cooled Reactor (HTGR) fuel-element blocks by diffusion through graphite webs surrounding the holes was measured for ten fuel-element blocks. The argon permeability varied significantly from block to block. Also, within the blocks, the permeability varied as a function of radial distance from the axis of the prismatic shape. The argon permeability was highest in the center of the fuel blocks. Argon permeability contours were not entirely symmetric, nor were they necessarily centered at the geometric center of the block. The argon permeabilities of fuel holes near the center and exterior of the blocks, where the web thickness is different from that of regular holes, differed from those of the regular fuel holes; however, the difference was too small to be of practical importance.

INTRODUCTION

The fuel element for the High-Temperature Gas-Cooled Reactor (HTGR) is comprised of a machined graphite block which contains the fuel rods. The graphite block is the fuel moderator and is also a structural member in the reactor core. The fuel is in the form of thorium and uranium oxide-uranium carbide microspheres that have been coated with multiple layers of pyrolytic carbon and, in the case of the fissile microspheres, silicon carbide. The fuel particles are bonded together into cylindrical rods. The prismatic graphite block has a hexagonal cross section, 14 in. across the flats and 31 in. long. The fuel rods are contained in blind holes drilled parallel to the vertical axis of the element. Coolant holes are drilled parallel to the fuel holes. Figure 1 illustrates the geometry of the fuel element; the hexagonal symmetry of the fuel and coolant hole positions is apparent. Each fuel hole is surrounded by three coolant holes, and each coolant hole is surrounded by six fuel holes. The graphite web separating the fuel from the coolant is nominally 0.178 in. thick.

The fabrication process for the fuel rods involves bonding the fuel particles together with petroleum pitch and graphite powder by warm (180°C) molding. The molded rods are loaded into the fuel-element holes, and the holes are capped with graphite plugs. The elements are then heated in an inert atmosphere to 1000°C in order to decompose the pitch and drive off the volatile decomposition products. The element is subsequently heated to 1800°C in order to stabilize the fuel rods.

During the decomposition of the pitch binder, volatile decomposition products are released. Approximately 70% of the total weight of the pitch is lost as volatile reaction products. The gaseous reaction products must escape from the graphite fuel block by diffusing through the 0.178-in.-thick webs separating the fuel from the inert sweep gas. The microstructure and physical and mechanical properties of the bonded fuel rods are strongly dependent on the heating rate during the carbonization process. The gas permeability of the graphite webs probably influences the process. Because the pores in graphite fuel blocks are presumably much larger than the hydrocarbon gas molecules, it was tacitly assumed that the permeability of the graphite to hydrocarbons is linearly related to the argon permeability.

The purpose of this investigation was to characterize the relative argon permeability of ten HTGR fuel-element blocks. The permeability variation within each block and among the blocks was measured.

Fig. 1. HTGR graphite fuel-element block.

EXPERIMENTAL PROCEDURE

Ten HTGR fuel-element blocks were acquired from the General Atomic Company, San Diego, California. The blocks were the type manufactured for the Ft. St. Vrain HTGR located near Denver, Colorado. The graphite was type H-327.*

The specific argon permeability of the graphite was not determined, because the geometry of the fuel blocks was too complex. Rather, argon was introduced into the fuel holes and maintained at a fixed pressure of 4 psig at the bottom of the holes while the tops of the holes were sealed, and the resulting argon flow was measured. Four psig was chosen as a convenient value within the sensitivity range of the pressure gauges. Measurements were also made at higher and lower pressures to determine the pressure effect on the argon flow. The relative argon permeabilities are expressed as flows in liters per minute standard temperature and pressure.

Figures 2 and 3 illustrate the device constructed for relative argon permeability measurements. The probe seals the top of the fuel hole while introducing argon at a regulated pressure. Provisions were made for measuring the resulting argon pressure at the top and bottom of the fuel hole; however, no appreciable differences were seen between the pressures at the top and bottom. The argon flows were measured with rotameters. Parallel rotameters and exchangeable rotameter floats allowed the

*H-327 graphite is manufactured by Great Lakes Carbon Company.

ORNL-DWG 76-18400R

Fig. 2. Schematic drawing of argon-permeability measuring device.

PHOTO 2314-76

Fig. 3. Argon-permeability measuring device.

measurement of flows ranging from 0.2 to 40.0 liters/min. All measurements were corrected to standard conditions, 14.7 psia and 70°F, by using procedures and data provided by the rotameter manufacturer.¹

Because the fuel-element blocks are not entirely symmetric (the dowel holes are not symmetric), it was possible to uniquely identify each hole relative to a Cartesian coordinate system with the (0, 0) position at the center of the block. The fuel holes in three of the six triangular block segments were examined for argon permeability. The three segments examined were equally spaced 120° apart. The holes on the borders between segments were also measured.

Some of the holes have atypical geometry. They were identified as follows:

I—Holes on the inner circle (radius = 1.48 in.) about the origin. These holes not only are close to the center hole but also are adjacent to the innermost circle of coolant holes, which have a smaller hole diameter than the other coolant holes in the block. This results in two of the three graphite webs between each fuel hole and coolant hole being thicker, 0.240 in. compared to 0.178 in. for normal webs, for these inner circle holes.

S—The second circle (radius = 1.96 in.) of fuel holes about the origin. These are also near the small coolant holes but have only one thick graphite web between fuel hole and coolant hole.

C—The holes on the corners of the hexagonal block. These are adjacent to only one coolant hole but have access to the block surface through two 0.427-in. webs.

F—The holes along the flat sides of the block. These are adjacent to two coolant holes but have access to the block surface through a 0.427-in. web.

As all the atypical geometries were represented by an alphabetical letter, it was convenient to represent the typical (or regular) fuel holes by "R."

All of the holes with atypical geometry were measured in each block. In all, a total of 146 holes were measured in each block.

The results were analyzed by multiple-linear-regression analysis. The following variables were considered as possible sources of variation in the permeability results: different fuel blocks, hole position within the blocks, and the holes with special geometries.

EXPERIMENTAL RESULTS

A statistical analysis of the data by multiple linear regression is attached as Appendix A. The complete experimental data are attached as Appendix B.

DISCUSSION OF RESULTS

Pressure Effect

The effect of pressure on the permeability of porous materials, including graphite, has been reported elsewhere.²⁻⁴ For the complex geometry involved in this investigation, the overall pressure

1. *Handbook Tri-Flat Variable-Area Flowmeters*, Fischer and Porter Company (10 A 9010), Warminster, Pennsylvania, 1962.
2. H. P. G. Darcy, *Les Fontaines publiques de la ville de Dijon*, Victor Dalmont, Paris, 1856.
3. P. C. Carman, *Flow of Gases Through Porous Media*, Academic Press, Inc., London, 1956.
4. W. P. Eatherly, et al., "Physical Properties of Graphite Materials for Special Nuclear Applications," pp. 389-401 in *Peaceful Uses At. Energy Proc. Int. Conf., 2nd, 1958*, Vol. 8, United Nations, Geneva, 1958.

effect was determined by taking argon-flow measurements at pressures ranging from 0.25 to 10 psig. The measurements were made in holes that represented the lowest, average, and highest relative permeability values found in this investigation. This pressure effect is shown in Fig. 4. Thus, the results of this investigation can be extended to other pressures by estimating according to the data displayed in Fig. 4.

Permeability Among Blocks

The fuel-element blocks showed an appreciable variation in relative argon permeability among blocks. The average permeability of each block is listed in Table 1. The overall average argon flow for all holes measured in the ten blocks was 14.9 liters/min. The average for an individual block ranged from a low of 6.2 to a high of 25.4 liters/min. This variation in the average permeabilities among blocks is no doubt primarily due to differences in the porosity of the graphite logs from which the fuel blocks were made. The surface condition of the fuel holes, which is determined by drilling speed, tool sharpness, etc., may also be a factor.

Permeability Within Blocks

Significant differences in argon permeability occurred within the individual blocks. The major source of the within-block variation was a systematic radial gradient in argon permeability. The permeability was highest along the central axis of the block and decreased radially toward the outside

Fig. 4. Pressure effect on the argon flow from HTGR graphite fuel-element holes at various permeability levels.

Table 1. Permeability of HTGR
fuel-element blocks

Block number	Relative argon flow (standard liters/min)	
	Block mean	Range of individual holes
1-0372	6.2	1.5-12.9
1-0637	14.1	4.0-23.4
1-1046	6.7	0.8-16.4
1-1343	11.5	5.5-15.9
1-1622	11.4	2.3-25.6
1-2926	23.0	4.7-38.6
1-4748	21.4	20-37.1
1-4749	20.2	1.7-36.7
1-5285	9.1	1.5-22.3
1-5864	25.4	6.4-41.3
Overall mean	14.9	
Overall range	6.2-25.4	0.8-41.3

surface. Figure 5 illustrates the radial variation for block 1-0637. Presumably the radial gradient in gas permeability results from the impregnation step in the graphite fabrication. Since the pitch is intruded into the shape from the outside, one might expect the porosity of the graphite to be highest in the center and lowest on the outer surfaces. The gas permeability would be expected to be higher in the porous center of the graphite log.

Contours of equal argon permeability were calculated from the multiple-regression equations determined for the blocks. The contour plots are included in Appendix A. The argon permeability contour plots are analogous to contour land maps and can be considered as maps of the argon permeability for each block. The outstanding feature of the contour plots is the radial permeability gradient. However, in most cases the contours are elliptical; that is, the permeability gradient is not entirely symmetrical. Also, the centers of the contour maps deviate from the geometrical centers of the blocks in most cases. A nonsymmetrical porosity gradient could result during fabrication of the graphite if, for example, the part were graphitized in a temperature gradient. This might occur if one edge of the part were near a furnace wall during processing.

Permeability of Atypical Fuel Holes

The fuel holes near the center or the outside edges of the element have a different geometry for out-diffusion of gases. The argon permeabilities of the different geometry types were shown to be statistically different. The experimental data are summarized by hole type in Table 2. The large apparent difference in hole types is mostly due to the radial effect. In Table 2 the columns, from left to right, are in order of increasing radial position. However, in the statistical analysis of the data, the permeabilities of the different hole types were calculated as though the holes were all at the same radial position. That calculation is described in Appendix A. The results are tabulated in Table A-7 of Appendix A. The effect of the hole geometry is relatively small, when adjusted for the radius effect, even though it is statistically significant. Relative to the variation in argon permeability among blocks and along the radius within blocks, the effect of hole geometry appears to be of little practical importance.

Fig. 5. Permeability of an HTGR fuel element (1-0637) at 4 psig versus radial hole position.

Table 2. Relative argon permeability of different fuel hole types in HTGR fuel element

Block No.	Average argon flow (standard liters/min)					
	Inner circle (I)	Second circle (s)	Regular (R)	Flat (F)	Corner (C)	All holes
1-0372	9.1	10.7	6.9	3.0	2.2	6.2
1-0637	21.1	22.1	16.0	7.4	5.0	14.1
1-1046	11.7	12.2	7.7	2.6	1.3	6.7
1-1343	12.9	13.7	12.7	8.8	6.3	11.5
1-1622	17.1	18.4	12.9	5.7	3.5	11.4
1-2926	31.4	34.3	27.0	11.0	7.0	23.0
1-4748	31.5	33.6	24.6	10.5	5.0	21.4
1-4749	28.3	30.7	23.8	9.7	3.4	20.2
1-5285	18.8	20.3	10.2	2.4	1.6	9.1
1-5864	29.5	33.3	29.2	15.9	8.0	25.4
Average	21.1	22.9	17.1	7.7	4.3	14.9

CONCLUSIONS

The mean relative argon permeabilities of ten graphite HTGR fuel-element blocks were shown to differ by approximately a factor of 4. Within the blocks the argon permeability systematically varies along the radius of the elements. The permeability along the central axis of the elements is an order of magnitude higher than at the surface.

RECOMMENDATIONS FOR FUTURE WORK

The effects of permeability on the resultant properties and irradiation behavior of carbonized fuel rods are uncertain. Property variations will be monitored during future development phases of in-block carbonization, and any related effects in Fort St. Vrain test elements will be noted.

ACKNOWLEDGMENTS

The authors wish to express their appreciation to J. C. McLaughlin for taking all the measurements, to Janice Trent for transferring the measurements to keypunch cards, to Rhonda Castleberry for typing the draft report, and to S. Bomar, J. J. Beauchamp, and E. Long for their assistance in reviewing the draft report. The manuscript was prepared for publication by the Technical Publications Department.

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APPENDIX A

Statistical Analysis of The Data

The statistical analysis of the data from the ten graphite blocks considered the following variables as possible sources of systematic variation: (1) hole position in the block, (2) atypical geometry types, (3) different blocks, and (4) the interaction of geometry and blocks. The interaction effect is a manifestation of geometry types responding differently from block to block.

The different effects were studied using linear models of the form:

$$\text{FLOW} = \text{INDEPENDENT VARIABLES} + \text{ERROR}.$$

The INDEPENDENT VARIABLES consist of parameters which represent the effect on the FLOW measurements of different blocks, different geometry types, and different hole positions. Parameters for the INDEPENDENT VARIABLES terms were estimated by minimizing the sum of the squared errors (SSE). The errors were assumed to be independently normally distributed random variables with zero mean and constant variance, σ^2 . More specifically, the following notation was used to describe the permeability results with multiple-regression models:

$\mu \equiv$ an overall average,

$\beta_i \equiv$ effect of the i th block, $i = 1, 2, \dots, 10$,

$\tau_j \equiv$ effect of j th geometry type; $\tau_1 = I$, $\tau_2 = S$, $\tau_3 = R$, $\tau_4 = F$, and $\tau_5 = C$; $j = 1, 2, \dots, 5$,

$(\beta\chi\tau)_{ij} \equiv$ effect of the j th geometry type with the i th block,

$R_k \equiv$ radius of the k th hole, $k = 1, 2, \dots, n_j$, where n_j depends on geometry type: $n_1 = 6$, $n_2 = 12$, $n_3 = 86$, $n_4 = 36$, and $n_5 = 6$, and

$$N = \sum_{j=1}^5 n_j = 146,$$

$X_k \equiv$ ordinate of k th point,

$Y_k \equiv$ abscissa of the k th point.

Nine models, which are listed in Table A-1, were investigated to represent the response of FLOW. The nine models represent different combinations of the BLOCK, TYPE, and POSITION effects. For example, the coefficients of the POSITION effect in models 1 through 5 and 7 do not depend on either

Table A-1. Nine multiple-regression models used to represent the response FLOW

1. $\text{FLOW} = \mu + \rho R_k + \tau_j + \epsilon_{ij}$
2. $\text{FLOW} = \mu + \alpha_{11} X_k^2 + \alpha_{22} Y_k^2 + \tau_j + \epsilon_{ij}$
3. $\text{FLOW} = \mu + \rho R_k + \beta_i + \tau_j + \epsilon_{ijk}$
4. $\text{FLOW} = \mu + \alpha_{11} X_k^2 + \alpha_{22} Y_k^2 + \beta_i + \tau_j + \epsilon_{ijk}$
5. $\text{FLOW} = \mu + \rho R_k^2 + \beta_i + \tau_j + (\beta\chi\tau)_{ij} + \epsilon_{ijk}$
6. $\text{FLOW} = \mu + \rho_j R_k^2 + \beta_i + \tau_j + (\beta\chi\tau)_{ij} + \epsilon_{ijk}$
7. $\text{FLOW} = \mu + \alpha_{11} X_k^2 + \alpha_{22} Y_k^2 + \alpha_{11} X_k + \alpha_{22} Y_k + \alpha_{12} X_k Y_k + \beta_i + \tau_j + (\beta\chi\tau)_{ij} + \epsilon_{ijk}$
8. $\text{FLOW} = \mu + \rho_i R_k^2 + \beta_i + \tau_j + (\beta\chi\tau)_{ij} + \epsilon_{ijk}$
9. $\text{FLOW} = \mu + \alpha_{11i} X_k^2 + \alpha_{22i} Y_k^2 + \alpha_{1i} X_k + \alpha_{2i} Y_k + \alpha_{12i} X_k Y_k + \beta_i + \tau_j + (\beta\chi\tau)_{ij} + \epsilon_{ijk}$

the TYPE or BLOCK effects; while the coefficients in model 6 depend on the TYPE effect, the coefficients in models 8 and 9 depend on the BLOCK effect. The pertinent statistics for the analyses of the response models are shown in Table A-2. The best model was selected by comparing the different SSEs, and their degrees of freedom (DF = number of data points minus number of parameters in the model).¹ An estimate of the error variance is the error mean square (MSE = SSE/DF), and the coefficient of determination, R^2 , is the percentage attributable to the response model of the total sum of squares adjusted for the mean. As more independent variables were added to the response model, the sum of squares due to error decreased. Whether the decrease was statistically significant for models I and II can be tested by comparing the F statistic,

$$F = [(SSE_I - SSE_{II}) / (DF_I - DF_{II})] / MSE_{II} ,$$

with the α -percentile values of an F distribution with $DF_I - DF_{II}$ and DF_{II} degrees of freedom. For example, model 9 has 40 more parameters than model 8, and the value of the F statistic is $F = 34.61$, which is significant even at the 0.5% significance level.

Because model 9 had the lowest SSE and was significantly different from any other model, it was chosen as the best model. The total sum of squares can be partitioned among the independent variables of model 9 as shown in the analysis of variance table, Table A-3 (see ref. 2). The order in which a source of variation appears in the analysis of variance table means that its sum of squares has been adjusted for those sources listed above its position. For example, the TYPE source has had its sum of squares adjusted for both BLOCK and POSITION (terms in the model involving the x and y coordinates) effects. The analysis of variance table (Table A-3) shows that after the fixed effect variables BLOCK, TYPE, and BLOCK $\times$ TYPE have been adjusted for the covariate effect of POSITION, the fixed effect variables have F values, where $F = (MS \text{ for a source}) / (MS \text{ for error})$, which are significant even at very low significance levels. If the order of the variables in the regression model is changed so that POSITION is adjusted for the fixed effects, the sum of squares can be partitioned as in Table A-4. The POSITION effect is significant at small significance levels even when adjusted for all the fixed

1. N. R. Draper and H. Smith, *Applied Regression Analysis*, John Wiley and Sons, Inc., New York, N.Y., 1966.
2. G. W. Snedecor and W. G. Cochran, *Statistical Methods*, Iowa State University Press, Ames, Iowa, 1967.

Table A-2. Statistics for the nine multiple-regression models

Model	SSE	DF	MSE	R^2
1	86063.53	1454	59.19	38%
2	85727.93	1453	59.00	38%
3	20728.86	1445	14.35	85%
4	20389.51	1444	14.12	85%
5	12224.48	1409	8.68	91%
6	12214.56	1405	8.69	91%
7	12127.36	1405	8.63	91%
8	9929.18	1400	7.09	93%
9	4917.29	1360	3.62	96%

Table A-3. Analysis of variance for model 9

Source	D.F.	S.S.	M.S.	F value
Position	50	90121.10	1802.42	497.91
Block	9	41019.31	4557.70	1260.55
Geometry type	4	934.94	233.74	64.57
Block $\times$ type	36	1534.76	42.63	11.78
Error	1360	4917.29	3.62	
Total	1459	138527.40		

Table A-4. Alternative analysis of variance for model 9

Source	D.F.	S.S.	M.S.	F value
Block	9	65327.48	7258.61	2005.14
Type	4	39618.87	9904.72	2736.11
Block $\times$ type	36	8163.91	226.78	62.65
Position	50	20499.85	410.00	113.26
Error	1360	4917.29	3.62	
Total	1459	138527.40		

effects. Considering both analysis of variance tables (Tables A-3 and A-4), we can conclude that the four sources, POSITION, BLOCK, TYPE, and BLOCK $\times$ TYPE, are significant sources of variation for the permeability measurements.

In order to study the POSITION and TYPE effects in more detail, the permeability data were analyzed separately for each block. The following model 10 was used:

$$\text{FLOW} = \mu + \alpha_{11}X_k^2 + \alpha_{22}Y_k^2 + \alpha_1X_k + \alpha_2Y_k + \alpha_{12}X_kY_k + \tau_j + \epsilon_{kj},$$

where

$$j = 1, 2, \dots, 5 \text{ } (\tau_1 = I, \tau_2 = S, \tau_3 = R, \tau_4 = F, \text{ and } \tau_5 = C),$$

$$k = 1, 2, \dots, n_j \text{ } (n_1 = 6, n_2 = 12, n_3 = 86, n_4 = 36, \text{ and } n_5 = 6).$$

Those POSITION parameters which were not significant at the 10% significance level under the normality assumption for the error random variables were eliminated from the model. The estimated parameter values were then recalculated. The estimated α coefficients for model 10 are denoted by a 's, and these estimated coefficients are listed in Table A-5. A summary of some statistics for model 10 are given in Table A-6.

Model 10 can be used for calculating contours of equal air permeability for each of the ten blocks, by using the coefficients in Table A-5. Permeability contours are shown in Figs. A-1–A-10. The contours give a picture of the permeability as a function of hole location. The holes in the center of the blocks have

Table A-5. Multiple-regression coefficients for model 10

Block	Intercept	Coefficient of —				
		X ²	Y ²	X	Y	XY
1-0372	12.67	−0.25	−0.23	0.00	0.00	0.03
1-0637	22.93	−0.32	−0.34	0.17	−0.09	−0.04
1-1046	12.78	−0.21	−0.25	0.40	−0.21	−0.06
1-1343	14.40	−0.10	−0.11	−0.06	0.17	0.00
1-1622	18.21	−0.28	−0.22	−0.29	0.17	0.06
1-2926	37.66	−0.56	−0.53	−0.21	0.15	0.00
1-4748	35.41	−0.52	−0.52	−0.94	−0.26	0.05
1-4749	36.21	−0.60	−0.58	0.64	−0.21	−0.04
1-5285	22.01	−0.47	−0.47	−0.39	0.12	0.00
1-5864	36.05	−0.38	−0.41	0.14	−0.16	0.07

Table A-6. Summary statistics for model 10 in each block

Block	SSE	DF	MSE	R ²
1-0372	146.48	138	1.06	90%
1-0637	158.41	136	1.16	97%
1-1046	251.32	136	1.85	91%
1-1343	138.12	137	1.01	85%
1-1622	324.33	136	2.38	92%
1-2926	715.07	137	5.22	95%
1-4748	401.13	136	2.95	97%
1-4749	749.05	136	5.51	95%
1-5285	669.81	137	4.89	91%
1-5864	1378.39	136	10.14	87%

Symbol	Contour Values (liter/min)
--------	----------------------------------

1	1.0
2	4.0
3	6.0
4	9.0
5	12.0

Fig. A-1. Contour plot of argon permeability for block 1-0372.

Fig. A-2. Contour plot of argon permeability for block 1-0637.

Fig. A-3. Contour plot of argon permeability for block 1-1046.

Fig. A-4. Contour plot of argon permeability for block 1-1343.

Fig. A-5. Contour plot of argon permeability for block 1-1622.

Fig. A-6. Contour plot of argon permeability for block 1-2926.

Fig. A-7. Contour plot of argon permeability for block 1-4748.

Fig. A-8. Contour plot of argon permeability for block 1-4749.

Fig. A-9. Contour plot of argon permeability for block 1-5285.

Fig. A-10. Contour plot of argon permeability for block 1-5864.

a higher permeability than those located near the outside. In general, the contours are slightly elliptical in shape and are not centered on the middle of the block.

The fixed effects τ_{1j} cannot be estimated with a linear combination of the responses. However, the effect $\mu + \tau_j$ can be estimated by:

$$\mu + \tau_j = \overline{Z}_{j.} - a_{11}\overline{X}_{j.}^2 - a_{22}\overline{Y}_{j.}^2 - a_{12}\overline{XY}_{j.},$$

where $\overline{Z}_{j.}$ is the average of the permeability measurements over the j th geometry type, the “.” notation means summed, and the “-” notation means average; for example,

$$\overline{X}_{j.}^2 = \frac{1}{n_j} \sum_{k=1}^{n_j} X_{jk}^2.$$

The estimate $\mu + \tau_j$ represents the sum of the overall mean and the effect of the j th geometry type adjusted for the POSITION effect. These adjusted means are tabulated in Table A-7. Differences among the geometry types within a block are significant at the 5% level in nine blocks but not in block 1-1046. A significant difference among the geometry types means that there are two or more geometry types in a block which have a significantly different effect on the permeability response. These adjusted means represent the permeability values which would occur due to the geometry type if there were no position effect.

Table A-7. Estimates of the adjusted geometry type means;
 $\mu + \tau_j$ for geometry types I, S, R, F, and C

Block	I	S	R	F	C
1-0372	9.67	11.64	12.34	13.84	15.37
1-0637	21.77	23.31	23.33	22.04	22.89
1-1046	12.17	13.11	12.73	12.73	13.65
1-1343	13.16	14.13	15.07	13.49	12.10
1-1622	17.65	19.32	18.64	17.03	17.29
1-2926	32.57	36.40	39.22	35.37	36.72
1-4748	32.65	35.60	36.34	33.91	33.51
1-4749	29.63	32.94	37.12	36.29	35.89
1-5285	19.83	22.13	20.99	23.80	27.71
1-5864	30.40	34.77	38.09	33.62	29.67
Average	21.95	24.34	25.39	24.21	24.48

APPENDIX B

A complete listing of all the argon flows and rate data is given in Appendix B. Table B-1 gives the rotameter calibration data used to determine the argon flow versus metering pressure and rotameter float material type.

The argon flow rate data are listed by block number in Table B-2. The description of the column headings is as follows:

OBS = observation number,

HOLE = hole number (see Fig. B-1),

TYPE = hole type,

X axis = coordinates of hole position in inches (the block center is 0, 0) ,

Y axis

METER = metering pressure (psig), i.e., pressure at rotameter,

Meas 1 = rotameter scale readings,

Meas 2

FLOW = argon flow rate, corrected to standard temperature and pressure, standard liters/min.

GAGE = rotameter float material.

Table B-1. Rotameter calibration data for glass, stainless steel, and tantalum floats

Rotameter scale reading	Metering pressure (psia)	Argon flow (standard liter/min)		
		Glass	Stainless steel	Tantalum
2	14.7	0.22	0.75	1.39
3	14.7	0.49	1.33	2.27
4	14.7	0.83	2.05	3.30
5	14.7	1.22	2.78	4.38
6	14.7	1.58	3.53	5.42
8	14.7	2.36	5.07	7.72
10	14.7	3.24	6.76	10.19
12	14.7	4.06	8.45	12.67
14	14.7	4.92	10.20	15.22
16	14.7	5.87	11.98	17.78
18	14.7	6.72	13.64	20.39
20	14.7	7.83	15.69	23.42
25	14.7	10.03	20.16	29.84
2	18.7	0.28	0.95	1.66
3	18.7	0.59	1.60	2.68
4	18.7	0.99	2.40	3.82
5	18.7	1.41	3.27	5.04
6	18.7	1.84	4.08	6.21
8	18.7	2.72	5.82	8.85
10	18.7	3.70	7.76	11.64
12	18.7	4.68	9.70	14.48
14	18.7	5.62	11.64	17.37
16	18.7	6.47	13.68	20.35
18	18.7	7.67	15.59	23.23
20	18.7	8.94	18.04	26.66
25	18.7	11.55	22.97	33.85
2	24.7	0.36	1.19	1.99
3	24.7	0.74	1.97	3.21
4	24.7	1.21	2.85	4.50
5	24.7	1.71	3.87	6.02
6	24.7	2.21	4.81	7.31
8	24.7	3.23	6.84	10.41
10	24.7	4.42	9.07	13.62
12	24.7	5.50	11.34	16.94
14	24.7	6.65	13.68	20.26
16	24.7	7.92	15.95	23.69
18	24.7	9.02	18.10	27.01
20	24.7	10.52	21.11	30.95
25	24.7	13.44	26.62	39.39

Table B-2. Argon permeability data

BLOCK 1-0372 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
1	1	C	-3.70	6.41	4.1	7.3		2.4625	GL
2	11	C	3.70	6.41	4.1	6.5		2.1047	GL
3	154	C	-7.40	0.00	4.1	6.4		2.0603	GL
4	171	C	7.40	0.00	4.1	5.6		1.7079	GL
5	314	C	-3.70	-6.41	4.1	8.4		2.9622	GL
6	324	C	3.70	-6.41	4.1	6.0		1.8835	GL
7	2	F	-2.96	6.41	4.1	9.8		3.6111	GL
8	4	F	-1.48	6.41	4.1	8.9		3.1923	GL
9	5	F	-0.74	6.41	4.1	10.8		4.0835	GL
10	7	F	0.74	6.41	4.1	10.2		3.7991	GL
11	8	F	1.48	6.41	4.1	10.0		3.7050	GL
12	10	F	2.96	6.41	4.1	8.5		3.0080	GL
13	12	F	-4.07	5.77	4.1	7.0		2.3278	GL
14	23	F	4.07	5.77	4.1	7.6		2.5979	GL
15	37	F	-4.81	4.49	4.1	7.9		2.7339	GL
16	50	F	4.81	4.49	4.1	10.6		3.9884	GL
17	51	F	-5.18	3.85	4.1	8.0		2.7794	GL
18	65	F	5.18	3.85	4.1	11.3		4.3224	GL
19	82	F	-5.92	2.56	4.1	8.9		3.1923	GL
20	98	F	5.92	2.56	4.1	11.8		4.5632	GL
21	99	F	-6.29	1.92	4.1	9.1		3.2848	GL
22	116	F	6.29	1.92	4.1	8.8		3.1461	GL
23	136	F	-7.03	0.64	4.1	6.4		2.0603	GL
24	153	F	7.03	0.64	4.1	6.6		2.1492	GL
25	172	F	-7.03	-0.64	4.1	9.2		3.3312	GL
26	189	F	7.03	-0.64	4.1	5.7		1.7517	GL
27	209	F	-6.29	-1.92	4.1	9.8		3.6111	GL
28	226	F	6.29	-1.92	4.1	5.6		1.7079	GL
29	227	F	-5.92	-2.56	4.1	9.2		3.3312	GL
30	243	F	5.92	-2.56	4.1	5.6		1.7079	GL
31	260	F	-5.18	-3.85	4.1	8.8		3.1461	GL
32	274	F	5.18	-3.85	4.1	6.0		1.8835	GL
33	275	F	-4.81	-4.49	4.1	9.2		3.3312	GL
34	288	F	4.81	-4.49	4.1	5.5		1.6642	GL
35	302	F	-4.07	-5.77	4.1	8.6		3.0540	GL
36	313	F	4.07	-5.77	4.1	5.2		1.5334	GL
37	315	F	-2.96	-6.41	4.1	9.9		3.6580	GL
38	317	F	-1.48	-6.41	4.1	10.2		3.7991	GL
39	318	F	-0.74	-6.41	4.2	11.6		4.4810	GL
40	320	F	0.74	-6.41	4.1	9.5		3.4708	GL
41	321	F	1.48	-6.41	4.1	8.0		2.7794	GL
42	323	F	2.96	-6.41	4.1	6.9		2.2830	GL
43	14	R	-2.59	5.77	4.1	10.1		3.7520	GL
44	15	R	-1.85	5.77	4.1	10.1		3.7520	GL
45	17	R	-0.37	5.77	4.2	12.6		4.9681	GL
46	18	R	0.37	5.77	4.2	12.7		5.0173	GL
47	20	R	1.85	5.77	4.2	12.4		4.8701	GL
48	21	R	2.59	5.77	4.1	11.1		4.2266	GL
49	28	R	-1.48	5.13	4.2	12.0		4.6750	GL
50	29	R	-0.74	5.13	4.2	12.8		5.0665	GL
51	31	R	0.74	5.13	4.2	13.7		5.5125	GL
52	32	R	1.48	5.13	4.2	13.6		5.4627	GL
53	41	R	-1.85	4.49	4.2	13.7		5.5125	GL
54	43	R	-0.37	4.49	4.2	16.4		6.8867	GL
55	44	R	0.37	4.49	4.2	16.1		6.7313	GL

Table E-2. (continued)

BLOCK 1-0372 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
56	46	R	1.85	4.49	4.2	16.6		6.9906	GL
57	56	R	-1.48	3.85	4.2	15.8		6.5767	GL
58	57	R	-0.74	3.85	4.2	17.2		7.3042	GL
59	59	R	0.74	3.85	4.2	19.4		8.4768	GL
60	60	R	1.48	3.85	4.2	19.0		8.2609	GL
61	71	R	-1.85	3.20	4.2	17.1		7.2518	GL
62	73	R	-0.37	3.20	4.2	20.9		9.2968	GL
63	74	R	0.37	3.20	4.2	21.1		9.4074	GL
64	76	R	1.85	3.20	4.3	23.3		10.6745	GL
65	88	R	-1.48	2.56	4.2	20.6		9.1315	GL
66	89	R	-0.74	2.56	4.2	20.7		9.1865	GL
67	91	R	0.74	2.56	4.3	23.6		10.8463	GL
68	92	R	1.48	2.56	4.3	22.2		10.0504	GL
69	156	R	-5.92	0.00	4.1	9.0		3.2385	GL
70	157	R	-5.18	0.00	4.1	9.5		3.4708	GL
71	159	R	-3.70	0.00	4.2	17.1		7.2518	GL
72	160	R	-2.96	0.00	4.2	17.8		7.6205	GL
73	165	R	2.96	0.00	4.3	14.8		12.4603	SS
74	166	R	3.70	0.00	4.2	21.7		9.7410	GL
75	168	R	5.18	0.00	4.2	14.8		6.0659	GL
76	169	R	5.92	0.00	4.2	11.0		4.1923	GL
77	173	R	-6.29	-0.64	4.1	10.6		3.9884	GL
78	175	R	-4.81	-0.64	4.1	12.7		5.0014	GL
79	176	R	-4.07	-0.64	4.2	17.8		7.6205	GL
80	178	R	-2.59	-0.64	4.3	23.3		10.6745	GL
81	183	R	2.59	-0.64	4.3	14.4		12.0646	SS
82	185	R	4.07	-0.64	4.2	20.6		9.1315	GL
83	186	R	4.81	-0.64	4.2	15.5		6.4226	GL
84	188	R	6.29	-0.64	4.1	8.4		2.9622	GL
85	191	R	-5.92	-1.28	4.1	10.7		4.0359	GL
86	192	R	-5.18	-1.28	4.1	11.4		4.3704	GL
87	194	R	-3.70	-1.28	4.3	21.2		9.4908	GL
88	195	R	-2.96	-1.28	4.2	22.3		10.0772	GL
89	203	R	2.96	-1.28	4.3	24.1		11.1340	GL
90	204	R	3.70	-1.28	4.2	19.6		8.5852	GL
91	206	R	5.18	-1.28	4.2	11.4		4.3845	GL
92	207	R	5.92	-1.28	4.1	8.2		2.8707	GL
93	211	R	-4.81	-1.92	4.1	13.0		5.1487	GL
94	212	R	-4.07	-1.92	4.2	17.6		7.5147	GL
95	214	R	-2.59	-1.92	4.2	22.7		10.3029	GL
96	215	R	-1.85	-1.92	4.3	23.7		10.9037	GL
97	220	R	1.85	-1.92	4.3	15.2		12.8580	SS
98	221	R	2.59	-1.92	4.3	23.0		10.5034	GL
99	223	R	4.07	-1.92	4.2	16.8		7.0949	GL
100	224	R	4.81	-1.92	4.2	11.6		4.4810	GL
101	228	R	-5.18	-2.56	4.1	10.9		4.1311	GL
102	230	R	-3.70	-2.56	4.2	18.9		8.2072	GL
103	231	R	-2.96	-2.56	4.2	21.4		9.5739	GL
104	233	R	-1.48	-2.56	4.3	24.1		11.1340	GL
105	237	R	1.48	-2.56	4.3	14.0		11.6708	SS
106	239	R	2.96	-2.56	4.2	21.4		9.5739	GL
107	240	R	3.70	-2.56	4.2	16.5		6.9386	GL
108	242	R	5.18	-2.56	4.1	8.0		2.7794	GL
109	245	R	-4.81	-3.20	4.1	11.3		4.3224	GL
110	246	R	-4.07	-3.20	4.2	13.4		5.3632	GL

Table B-2. (continued)

BLOCK 1-0372 (4 PSIG)

DBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
111	248	R	-2.59	-3.20	4.3	23.0		10.5034	GL
112	249	R	-1.85	-3.20	4.3	23.9		11.0187	GL
113	254	R	1.85	-3.20	4.3	23.9		11.0187	GL
114	255	R	2.59	-3.20	4.2	19.9		8.7483	GL
115	257	R	4.07	-3.20	4.2	12.0		4.6750	GL
116	258	R	4.81	-3.20	4.1	8.0		2.7794	GL
117	262	R	-3.70	-3.85	4.2	13.5		5.4129	GL
118	263	R	-2.96	-3.85	4.2	17.3		7.3567	GL
119	271	R	2.96	-3.85	4.2	15.6		6.4739	GL
120	272	R	3.70	-3.85	4.2	11.0		4.1923	GL
121	276	R	-4.07	-4.49	4.1	10.5		3.9410	GL
122	278	R	-2.59	-4.49	4.2	15.5		6.4226	GL
123	285	R	2.59	-4.49	4.2	13.7		5.5125	GL
124	287	R	4.07	-4.86	4.1	7.8		2.6885	GL
125	290	R	-3.70	-5.13	4.1	10.5		3.9410	GL
126	291	R	-2.96	-5.13	4.1	11.5		4.4185	GL
127	299	R	2.96	-5.13	4.2	9.5		3.4822	GL
128	300	R	3.70	-5.13	4.1	7.2		2.4175	GL
129	107	S	-0.37	1.92	4.3	13.6		11.2789	SS
130	108	S	0.37	1.92	4.2	10.6		8.3753	SS
131	124	S	-1.48	1.28	4.2	11.7		9.4150	SS
132	128	S	1.48	1.28	4.2	11.1		8.8461	SS
133	143	S	-1.85	0.64	4.2	11.5		9.2249	SS
134	146	S	1.85	0.64	4.3	13.0		10.6947	SS
135	179	S	-1.85	-0.64	4.3	13.1		10.7918	SS
136	182	S	1.85	-0.64	4.3	15.2		12.8580	SS
137	197	S	-1.48	-1.28	4.3	13.2		10.8890	SS
138	201	S	1.48	-1.28	4.3	14.8		12.4603	SS
139	217	S	-0.37	-1.92	4.3	14.5		12.1633	SS
140	218	S	0.37	-1.92	4.3	13.9		11.5726	SS
141	125	I	-0.74	1.28	4.2	9.5		7.3500	SS
142	127	I	0.74	1.28	4.2	10.6		8.3753	SS
143	162	I	-1.48	0.00	4.2	10.4		8.1878	SS
144	163	I	1.48	0.00	4.2	11.2		8.9406	SS
145	198	I	-0.74	-1.28	4.3	12.4		10.1148	SS
146	200	I	0.74	-1.28	4.3	14.2		11.8675	SS

Table B-2. (continued)

BLOCK 1-0637 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
1	1	C	-3.70	6.41	4.2	11.0		4.1923	GL
2	11	C	3.70	6.41	4.1	10.7		4.0359	GL
3	154	C	-7.40	0.00	4.2	11.6		4.4810	GL
4	171	C	7.40	0.00	4.2	15.6		6.4739	GL
5	314	C	-3.70	-6.41	4.1	10.7		4.0359	GL
6	324	C	3.70	-6.41	4.2	16.4		6.8867	GL
7	2	F	-2.96	6.41	4.2	14.0		5.6625	GL
8	4	F	-1.48	6.41	4.2	16.7		7.0427	GL
9	5	F	-0.74	6.41	4.2	16.6		6.9906	GL
10	7	F	0.74	6.41	4.2	16.5		6.9386	GL
11	8	F	1.48	6.41	4.2	15.6		6.4739	GL
12	10	F	2.96	6.41	4.2	12.9		5.1157	GL
13	12	F	-4.07	5.77	4.2	12.5		4.9191	GL
14	23	F	4.07	5.77	4.2	12.7		5.0173	GL
15	37	F	-4.81	4.49	4.2	16.3		6.8348	GL
16	50	F	4.81	4.49	4.2	17.6		7.5147	GL
17	51	F	-5.18	3.85	4.2	15.6		6.4739	GL
18	65	F	5.18	3.85	4.2	18.7		8.0998	GL
19	82	F	-5.92	2.56	4.2	15.4		6.3715	GL
20	98	F	5.92	2.56	4.2	12.0		9.7011	SS
21	99	F	-6.29	1.92	4.2	13.9		5.6125	GL
22	116	F	6.29	1.92	4.2	11.7		9.4150	SS
23	136	F	-7.03	0.64	4.2	12.3		4.8212	GL
24	153	F	7.03	0.64	4.2	11.0		8.7517	SS
25	172	F	-7.03	-0.64	4.2	13.2		5.2640	GL
26	189	F	7.03	-0.64	4.2	11.0		8.7517	SS
27	209	F	-6.29	-1.92	4.2	17.2		7.3042	GL
28	226	F	6.29	-1.92	4.2	12.6		10.2765	SS
29	227	F	-5.92	-2.56	4.2	18.3		7.8860	GL
30	243	F	5.92	-2.56	4.2	12.9		10.5658	SS
31	260	F	-5.18	-3.85	4.2	17.0		7.1994	GL
32	274	F	5.18	-3.85	4.2	12.8		10.4693	SS
33	275	F	-4.81	-4.49	4.2	14.8		6.0659	GL
34	288	F	4.81	-4.49	4.2	13.0		10.6625	SS
35	302	F	-4.07	-5.77	4.2	12.7		5.0173	GL
36	313	F	4.07	-5.77	4.2	10.4		8.1878	SS
37	315	F	-2.96	-6.41	4.2	12.7		5.0173	GL
38	317	F	-1.48	-6.41	4.2	16.4		6.8867	GL
39	318	F	-0.74	-6.41	4.2	10.4		8.1878	SS
40	320	F	0.74	-6.41	4.2	11.5		9.2249	SS
41	321	F	1.48	-6.41	4.2	10.9		8.6574	SS
42	323	F	2.96	-6.41	4.2	10.6		8.3753	SS
43	14	R	-2.59	5.77	4.2	11.0		8.7517	SS
44	15	R	-1.85	5.77	4.2	13.0		10.6625	SS
45	17	R	-0.37	5.77	4.2	12.5		10.1803	SS
46	18	R	0.37	5.77	4.2	12.9		10.5658	SS
47	20	R	1.85	5.77	4.2	11.8		9.5102	SS
48	21	R	2.59	5.77	4.2	10.6		8.3753	SS
49	28	R	-1.48	5.13	4.3	16.1		13.7597	SS
50	29	R	-0.74	5.13	4.3	16.1		13.7597	SS
51	31	R	0.74	5.13	4.3	15.9		13.5584	SS
52	32	R	1.48	5.13	4.3	14.8		12.4603	SS
53	41	R	-1.85	4.49	4.3	18.9		16.6271	SS
54	43	R	-0.37	4.49	4.3	18.6		16.3154	SS
55	44	R	0.37	4.49	4.4	19.1		16.8841	SS

Table B-2. (continued)

BLOCK 1-0637 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
56	46	R	1.85	4.49	4.3	17.0		14.6711	SS
57	56	R	-1.48	3.85	4.4	21.2		19.1071	SS
58	57	R	-0.74	3.85	4.4	20.6		18.4666	SS
59	59	R	0.74	3.85	4.4	21.0		18.8931	SS
60	60	R	1.48	3.85	4.4	19.0		16.7796	SS
61	71	R	-1.85	3.20	4.5	22.8		20.8948	SS
62	73	R	-0.37	3.20	4.5	22.1		20.1326	SS
63	74	R	0.37	3.20	4.5	23.7		21.8835	SS
64	76	R	1.85	3.20	4.5	20.6		18.5192	SS
65	88	R	-1.48	2.56	4.6	24.6		22.9451	SS
66	89	R	-0.74	2.56	4.5	23.4		21.5528	SS
67	91	R	0.74	2.56	4.5	23.4		21.5528	SS
68	92	R	1.48	2.56	4.5	21.5		19.4840	SS
69	156	R	-5.92	0.00	4.3	13.4		11.0837	SS
70	157	R	-5.18	0.00	4.3	15.8		13.4580	SS
71	159	R	-3.70	0.00	4.5	21.7		19.6997	SS
72	160	R	-2.96	0.00	4.5	21.7		19.6997	SS
73	165	R	2.96	0.00	4.5	22.1		20.1326	SS
74	166	R	3.70	0.00	4.4	20.4		18.2540	SS
75	168	R	5.18	0.00	4.4	18.6		16.3626	SS
76	169	R	5.92	0.00	4.3	16.1		13.7597	SS
77	173	R	-6.29	-0.64	4.2	11.1		8.8461	SS
78	175	R	-4.81	-0.64	4.4	17.2		14.9184	SS
79	176	R	-4.07	-0.64	4.5	21.4		19.3763	SS
80	178	R	-2.59	-0.64	4.5	20.8		18.7327	SS
81	183	R	2.59	-0.64	4.5	22.1		20.1326	SS
82	185	R	4.07	-0.64	4.4	19.3		17.0936	SS
83	186	R	4.81	-0.64	4.4	19.7		17.5139	SS
84	188	R	6.29	-0.64	4.3	14.8		12.4603	SS
85	191	R	-5.92	-1.28	4.3	13.1		10.7918	SS
86	192	R	-5.18	-1.28	4.3	16.6		14.2648	SS
87	194	R	-3.70	-1.28	4.5	21.3		19.2688	SS
88	195	R	-2.96	-1.28	4.4	19.3		17.0936	SS
89	203	R	2.96	-1.28	4.5	22.1		20.1326	SS
90	204	R	3.70	-1.28	4.4	20.3		18.1479	SS
91	206	R	5.18	-1.28	4.4	17.8		15.5345	SS
92	207	R	5.92	-1.28	4.3	15.0		12.6589	SS
93	211	R	-4.81	-1.92	4.4	17.6		15.3286	SS
94	212	R	-4.07	-1.92	4.4	20.6		18.4666	SS
95	214	R	-2.59	-1.92	4.4	19.2		16.9888	SS
96	215	R	-1.85	-1.92	4.6	22.7		20.8438	SS
97	220	R	1.85	-1.92	4.5	22.3		20.3498	SS
98	221	R	2.59	-1.92	4.5	22.1		20.1326	SS
99	223	R	4.07	-1.92	4.4	18.6		16.3626	SS
100	224	R	4.81	-1.92	4.4	17.8		15.5345	SS
101	228	R	-5.18	-2.56	4.3	13.4		11.0837	SS
102	230	R	-3.70	-2.56	4.4	19.8		17.6192	SS
103	231	R	-2.96	-2.56	4.5	21.6		19.5918	SS
104	233	R	-1.48	-2.56	4.5	21.5		19.4840	SS
105	237	R	1.48	-2.56	4.5	21.2		19.1613	SS
106	239	R	2.96	-2.56	4.5	21.7		19.6997	SS
107	240	R	3.70	-2.56	4.4	19.1		16.8841	SS
108	242	R	5.18	-2.56	4.3	16.2		13.8605	SS
109	245	R	-4.81	-3.20	4.2	12.6		10.2765	SS
110	246	R	-4.07	-3.20	4.3	16.5		14.1635	SS

Table B-2. (continued)

BLOCK 1-0637 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
111	248	R	-2.59	-3.20	4.4	19.0		16.7796	SS
112	249	R	-1.85	-3.20	4.5	21.3		19.2688	SS
113	254	R	1.85	-3.20	4.4	20.5		18.3602	SS
114	255	R	2.59	-3.20	4.5	21.6		19.5918	SS
115	257	R	4.07	-3.20	4.4	17.2		14.9184	SS
116	258	R	4.81	-3.20	4.4	17.0		14.7140	SS
117	262	R	-3.70	-3.85	4.3	15.8		13.4580	SS
118	263	R	-2.96	-3.85	4.5	20.3		18.1997	SS
119	271	R	2.96	-3.85	4.4	19.8		17.6192	SS
120	272	R	3.70	-3.85	4.4	17.7		15.4315	SS
121	276	R	-4.07	-4.49	4.2	12.3		9.9882	SS
122	278	R	-2.59	-4.49	4.3	15.2		12.8580	SS
123	285	R	2.59	-4.49	4.4	18.7		16.4667	SS
124	287	R	4.07	-4.86	4.3	15.7		13.3577	SS
125	290	R	-3.70	-5.13	4.2	10.5		8.2814	SS
126	291	R	-2.96	-5.13	4.2	11.7		9.4150	SS
127	299	R	2.96	-5.13	4.3	15.6		13.2575	SS
128	300	R	3.70	-5.13	4.3	14.8		12.4603	SS
129	107	S	-0.37	1.92	4.6	23.2		21.3926	SS
130	108	S	0.37	1.92	4.6	24.5		22.8334	SS
131	124	S	-1.48	1.28	4.6	25.0		23.3930	SS
132	128	S	1.48	1.28	4.6	23.9		22.1659	SS
133	143	S	-1.85	0.64	4.6	24.3		22.6104	SS
134	146	S	1.85	0.64	4.6	24.1		22.3879	SS
135	179	S	-1.85	-0.64	4.6	23.4		21.6129	SS
136	182	S	1.85	-0.64	4.5	22.1		20.1326	SS
137	197	S	-1.48	-1.28	4.6	23.8		22.0551	SS
138	201	S	1.48	-1.28	4.6	22.9		21.0629	SS
139	217	S	-0.37	-1.92	4.6	23.9		22.1659	SS
140	218	S	0.37	-1.92	4.6	24.6		22.9451	SS
141	125	I	-0.74	1.28	4.6	23.2		21.3926	SS
142	127	I	0.74	1.28	4.6	22.9		21.0629	SS
143	162	I	-1.48	0.00	4.5	22.1		20.1326	SS
144	163	I	1.48	0.00	4.6	22.4		20.5160	SS
145	198	I	-0.74	-1.28	4.6	23.3		21.5027	SS
146	200	I	0.74	-1.28	4.6	23.5		21.7233	SS

Table B-2. (continued)

BLOCK 1-1046 (4 PSIG)

ORS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
1	1	C	-3.70	6.41	4.1	3.6		0.8475	GL
2	11	C	3.70	6.41	4.1	3.9		0.9747	GL
3	154	C	-7.40	0.00	4.1	4.5		1.2310	GL
4	171	C	7.40	0.00	4.1	5.6		1.7079	GL
5	314	C	-3.70	-6.41	4.1	4.4		1.1881	GL
6	324	C	3.70	-6.41	4.1	5.4		1.6205	GL
7	2	F	-2.96	6.41	4.1	4.5		1.2310	GL
8	4	F	-1.48	6.41	4.1	5.1		1.4900	GL
9	5	F	-0.74	6.41	4.1	5.5		1.6642	GL
10	7	F	0.74	6.41	4.1	5.9		1.8395	GL
11	8	F	1.48	6.41	4.1	5.5		1.6642	GL
12	10	F	2.96	6.41	4.1	4.5		1.2310	GL
13	12	F	-4.07	5.77	4.1	4.5		1.2310	GL
14	23	F	4.07	5.77	4.1	4.8		1.3602	GL
15	37	F	-4.81	4.49	4.1	5.5		1.6642	GL
16	50	F	4.81	4.49	4.1	6.2		1.9718	GL
17	51	F	-5.18	3.85	4.1	5.9		1.8395	GL
18	65	F	5.18	3.85	4.1	7.0		2.3278	GL
19	82	F	-5.92	2.56	4.1	5.9		1.8395	GL
20	98	F	5.92	2.56	4.1	8.0		2.7794	GL
21	99	F	-6.29	1.92	4.1	6.0		1.8835	GL
22	116	F	6.29	1.92	4.2	8.6		3.0641	GL
23	136	F	-7.03	0.64	4.1	5.0		1.4467	GL
24	153	F	7.03	0.64	4.1	7.3		2.4625	GL
25	172	F	-7.03	-0.64	4.1	5.4		1.6205	GL
26	189	F	7.03	-0.64	4.2	9.4		3.4354	GL
27	209	F	-6.29	-1.92	4.1	6.0		1.8835	GL
28	226	F	6.29	-1.92	4.2	16.6		6.9906	GL
29	227	F	-5.92	-2.56	4.1	6.2		1.9718	GL
30	243	F	5.92	-2.56	4.2	18.1		7.7796	GL
31	260	F	-5.18	-3.85	4.1	6.0		1.8835	GL
32	274	F	5.18	-3.85	4.2	14.9		6.1166	GL
33	275	F	-4.81	-4.49	4.1	5.5		1.6642	GL
34	288	F	4.81	-4.49	4.2	13.6		5.4627	GL
35	302	F	-4.07	-5.77	4.1	4.7		1.3170	GL
36	313	F	4.07	-5.77	4.1	7.9		2.7339	GL
37	315	F	-2.96	-6.41	4.1	4.5		1.2310	GL
38	317	F	-1.48	-6.41	4.1	6.4		2.0603	GL
39	318	F	-0.74	-6.41	4.1	8.1		2.8250	GL
40	320	F	0.74	-6.41	4.2	9.9		3.6699	GL
41	321	F	1.48	-6.41	4.2	10.1		3.7642	GL
42	323	F	2.96	-6.41	4.1	8.5		3.0080	GL
43	14	R	-2.59	5.77	4.1	6.4		2.0603	GL
44	15	R	-1.85	5.77	4.1	7.0		2.3278	GL
45	17	R	-0.37	5.77	4.1	8.0		2.7794	GL
46	18	R	0.37	5.77	4.1	7.9		2.7339	GL
47	20	R	1.85	5.77	4.1	7.2		2.4175	GL
48	21	R	2.59	5.77	4.1	6.7		2.1937	GL
49	28	R	-1.48	5.13	4.1	9.6		3.5175	GL
50	29	R	-0.74	5.13	4.2	10.8		4.0967	GL
51	31	R	0.74	5.13	4.2	10.7		4.0489	GL
52	32	R	1.48	5.13	4.2	10.3		3.8588	GL
53	41	R	-1.85	4.49	4.2	11.9		4.6264	GL
54	43	R	-0.37	4.49	4.2	14.2		5.7629	GL
55	44	R	0.37	4.49	4.2	15.0		6.1674	GL

Table B-2. (continued)

BLOCK 1-1046 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
56	46	R	1.85	4.49	4.2	13.7		5.5125	GL
57	56	R	-1.48	3.85	4.2	15.6		6.4739	GL
58	57	R	-0.74	3.85	4.2	16.2		6.7831	GL
59	59	R	0.74	3.85	4.2	17.8		7.6205	GL
60	60	R	1.48	3.85	4.3	18.6		8.0706	GL
61	71	R	-1.85	3.20	4.2	16.8		7.0949	GL
62	73	R	-0.37	3.20	4.2	19.6		8.5852	GL
63	74	R	0.37	3.20	4.3	21.4		9.6022	GL
64	76	R	1.85	3.20	4.3	21.2		9.4908	GL
65	88	R	-1.48	2.56	4.2	20.6		9.1315	GL
66	89	R	-0.74	2.56	4.3	22.4		10.1632	GL
67	91	R	0.74	2.56	4.3	23.6		10.8463	GL
68	92	R	1.48	2.56	4.3	23.2		10.6174	GL
69	156	R	-5.92	0.00	4.1	7.9		2.7339	GL
70	157	R	-5.18	0.00	4.1	9.6		3.5175	GL
71	159	R	-3.70	0.00	4.2	18.0		7.7265	GL
72	160	R	-2.96	0.00	4.2	20.1		8.8574	GL
73	165	R	2.96	0.00	4.4	18.6		16.3626	SS
74	166	R	3.70	0.00	4.4	17.2		14.9184	SS
75	168	R	5.18	0.00	4.3	13.7		11.3767	SS
76	169	R	5.92	0.00	4.2	18.2		7.8328	GL
77	173	R	-6.29	-0.64	4.1	7.0		2.3278	GL
78	175	R	-4.81	-0.64	4.2	10.9		4.1444	GL
79	176	R	-4.07	-0.64	4.2	15.0		6.1674	GL
80	178	R	-2.59	-0.64	4.2	19.6		8.5852	GL
81	183	R	2.59	-0.64	4.3	15.3		12.9577	SS
82	185	R	4.07	-0.64	4.3	14.5		12.1633	SS
83	186	R	4.81	-0.64	4.3	14.6		12.2622	SS
84	188	R	6.29	-0.64	4.2	17.7		7.5676	GL
85	191	R	-5.92	-1.28	4.1	7.6		2.5979	GL
86	192	R	-5.18	-1.28	4.1	8.5		3.0080	GL
87	194	R	-3.70	-1.28	4.2	15.5		6.4226	GL
88	195	R	-2.96	-1.28	4.2	19.4		8.4768	GL
89	203	R	2.96	-1.28	4.3	16.0		13.6590	SS
90	204	R	3.70	-1.28	4.3	15.2		12.8580	SS
91	206	R	5.18	-1.28	4.3	24.1		11.1340	GL
92	207	R	5.92	-1.28	4.2	20.6		9.1315	GL
93	211	R	-4.81	-1.92	4.1	9.5		3.4708	GL
94	212	R	-4.07	-1.92	4.2	13.5		5.4129	GL
95	214	R	-2.59	-1.92	4.2	20.2		8.9121	GL
96	215	R	-1.85	-1.92	4.3	24.5		11.3655	GL
97	220	R	1.85	-1.92	4.3	13.8		11.4746	SS
98	221	R	2.59	-1.92	4.3	15.6		13.2575	SS
99	223	R	4.07	-1.92	4.3	15.5		13.1574	SS
100	224	R	4.81	-1.92	4.3	14.8		12.4603	SS
101	228	R	-5.18	-2.56	4.1	8.0		2.7794	GL
102	230	R	-3.70	-2.56	4.2	14.5		5.9141	GL
103	231	R	-2.96	-2.56	4.2	16.6		6.9906	GL
104	233	R	-1.48	-2.56	4.3	25.0		11.6566	GL
105	237	R	1.48	-2.56	4.3	13.4		11.0837	SS
106	239	R	2.96	-2.56	4.3	15.4		13.0575	SS
107	240	R	3.70	-2.56	4.3	14.0		11.6708	SS
108	242	R	5.18	-2.56	4.3	22.7		10.3330	GL
109	245	R	-4.81	-3.20	4.1	7.9		2.7339	GL
110	246	R	-4.07	-3.20	4.1	10.0		3.7050	GL

Table B-2. (continued)

BLUCK 1-1046 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
111	248	R	-2.59	-3.20	4.2	17.0		7.1994	GL
112	249	R	-1.85	-3.20	4.2	20.5		9.0765	GL
113	254	R	1.85	-3.20	4.3	15.5		13.1574	SS
114	255	R	2.59	-3.20	4.3	15.0		12.6589	SS
115	257	R	4.07	-3.20	4.3	13.2		10.8890	SS
116	258	R	4.81	-3.20	4.3	21.3		9.5465	GL
117	262	R	-3.70	-3.85	4.1	10.2		3.7991	GL
118	263	R	-2.96	-3.85	4.2	12.9		5.1157	GL
119	271	P	2.96	-3.85	4.3	14.0		11.6708	SS
120	272	P	3.70	-3.85	4.3	13.0		10.6947	SS
121	276	R	-4.07	-4.49	4.1	7.6		2.5979	GL
122	278	R	-2.59	-4.49	4.2	12.4		4.8701	GL
123	285	R	2.59	-4.49	4.3	12.5		10.2111	SS
124	287	R	4.07	-4.86	4.2	17.3		7.3567	GL
125	290	R	-3.70	-5.13	4.1	6.6		2.1492	GL
126	291	R	-2.96	-5.13	4.1	8.1		2.8250	GL
127	299	R	2.96	-5.13	4.2	10.1		7.9074	SS
128	300	R	3.70	-5.13	4.2	16.3		6.8348	GL
129	107	S	-0.37	1.92	4.2	23.1		10.5297	GL
130	108	S	0.37	1.92	4.3	14.2		11.8675	SS
131	124	S	-1.48	1.28	4.3	14.1		11.7691	SS
132	128	S	1.48	1.28	4.4	16.5		14.2051	SS
133	143	S	-1.85	0.64	4.3	13.8		11.4746	SS
134	146	S	1.85	0.64	4.4	16.5		14.2051	SS
135	179	S	-1.85	-0.64	4.3	13.8		11.4746	SS
136	182	S	1.85	-0.64	4.3	14.0		11.6708	SS
137	197	S	-1.48	-1.28	4.3	14.7		12.3612	SS
138	201	S	1.48	-1.28	4.3	13.1		10.7918	SS
139	217	S	-0.37	-1.92	4.3	15.3		12.9577	SS
140	218	S	0.37	-1.92	4.3	16.0		13.6590	SS
141	125	I	-0.74	1.28	4.2	21.8		9.7969	GL
142	127	I	0.74	1.28	4.3	24.5		11.3655	GL
143	162	I	-1.48	0.00	4.3	9.7		11.3611	TA
144	163	I	1.48	0.00	4.3	11.4		13.7028	TA
145	198	I	-0.74	-1.28	4.3	10.0		11.7707	TA
146	200	I	0.74	-1.28	4.3	10.2		12.0446	TA

Table B-2. (continued)

BLOCK 1-1343 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
1	1	C	-3.70	6.41	4.2	18.0		7.7265	GL
2	11	C	3.70	6.41	4.2	15.5		6.4226	GL
3	154	C	-7.40	0.00	4.2	13.7		5.5125	GL
4	171	C	7.40	0.00	4.2	16.4		6.8867	GL
5	314	C	-3.70	-6.41	4.2	13.8		5.5625	GL
6	324	C	3.70	-6.41	4.2	14.5		5.9141	GL
7	2	F	-2.96	6.41	4.2	12.0		9.7011	SS
8	4	F	-1.48	6.41	4.2	12.7		10.3728	SS
9	5	F	-0.74	6.41	4.2	12.4		10.0842	SS
10	7	F	0.74	6.41	4.2	13.5		11.1477	SS
11	8	F	1.48	6.41	4.2	13.2		10.8562	SS
12	10	F	2.96	6.41	4.2	11.4		9.1300	SS
13	12	F	-4.07	5.77	4.2	11.3		9.0352	SS
14	23	F	4.07	5.77	4.2	10.8		8.5632	SS
15	37	F	-4.81	4.49	4.2	13.9		11.5380	SS
16	50	F	4.81	4.49	4.2	12.5		10.1803	SS
17	51	F	-5.18	3.85	4.2	13.6		11.2451	SS
18	65	F	5.18	3.85	4.2	11.6		9.3199	SS
19	82	F	-5.92	2.56	4.2	14.6		12.2257	SS
20	98	F	5.92	2.56	4.2	10.7		8.4692	SS
21	99	F	-6.29	1.92	4.2	13.6		11.2451	SS
22	116	F	6.29	1.92	4.2	11.4		9.1300	SS
23	136	F	-7.03	0.64	4.2	18.7		8.0998	GL
24	153	F	7.03	0.64	4.2	10.6		8.3753	SS
25	172	F	-7.03	-0.64	4.2	15.3		6.3203	GL
26	189	F	7.03	-0.64	4.2	10.3		8.0942	SS
27	209	F	-6.29	-1.92	4.2	10.6		8.3753	SS
28	226	F	6.29	-1.92	4.2	10.6		8.3753	SS
29	227	F	-5.92	-2.56	4.2	11.0		8.7517	SS
30	243	F	5.92	-2.56	4.2	16.4		6.8867	GL
31	260	F	-5.18	-3.85	4.2	11.2		8.9406	SS
32	274	F	5.18	-3.85	4.2	17.9		7.6734	GL
33	275	F	-4.81	-4.49	4.2	16.6		6.9906	GL
34	288	F	4.81	-4.49	4.2	18.1		7.7796	GL
35	302	F	-4.07	-5.77	4.2	15.0		6.1674	GL
36	313	F	4.07	-5.77	4.2	16.4		6.8867	GL
37	315	F	-2.96	-6.41	4.2	15.0		6.1674	GL
38	317	F	-1.48	-6.41	4.2	18.4		7.9394	GL
39	318	F	-0.74	-6.41	4.2	18.3		7.8860	GL
40	320	F	0.74	-6.41	4.2	19.3		8.4227	GL
41	321	F	1.48	-6.41	4.2	17.9		7.6734	GL
42	323	F	2.96	-6.41	4.2	17.3		7.3567	GL
43	14	R	-2.59	5.77	4.2	14.2		11.8320	SS
44	15	R	-1.85	5.77	4.3	15.0		12.6589	SS
45	17	R	-0.37	5.77	4.3	14.6		12.2622	SS
46	18	R	0.37	5.77	4.3	16.2		13.8605	SS
47	20	R	1.85	5.77	4.2	14.2		11.8320	SS
48	21	R	2.59	5.77	4.3	15.5		13.1574	SS
49	28	R	-1.48	5.13	4.3	16.0		13.6590	SS
50	29	R	-0.74	5.13	4.3	15.6		13.2575	SS
51	31	R	0.74	5.13	4.3	15.6		13.2575	SS
52	32	R	1.48	5.13	4.3	15.1		12.7584	SS
53	41	R	-1.85	4.49	4.3	15.5		13.1574	SS
54	43	R	-0.37	4.49	4.3	15.0		12.6589	SS
55	44	R	0.37	4.49	4.3	15.5		13.1574	SS

Table B-2. (continued)

BLOCK 1-1343 (4 PSIG)

DBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
56	46	R	1.85	4.49	4.3	15.3		12.9577	SS
57	56	R	-1.48	3.85	4.3	14.7		12.3612	SS
58	57	R	-0.74	3.85	4.3	14.7		12.3612	SS
59	59	R	0.74	3.85	4.3	15.2		12.8580	SS
60	60	R	1.48	3.85	4.3	15.0		12.6589	SS
61	71	R	-1.85	3.20	4.3	15.2		12.8580	SS
62	73	R	-0.37	3.20	4.3	15.4		13.0575	SS
63	74	R	0.37	3.20	4.3	15.9		13.5584	SS
64	76	R	1.85	3.20	4.3	15.8		13.4580	SS
65	88	R	-1.48	2.56	4.3	15.1		12.7584	SS
66	89	R	-0.74	2.56	4.3	14.9		12.5595	SS
67	91	R	0.74	2.56	4.3	15.6		13.2575	SS
68	92	R	1.48	2.56	4.3	15.6		13.2575	SS
69	156	R	-5.92	0.00	4.3	15.4		13.0575	SS
70	157	R	-5.18	0.00	4.4	17.0		14.7140	SS
71	159	R	-3.70	0.00	4.4	17.7		15.4315	SS
72	160	R	-2.96	0.00	4.3	15.8		13.4580	SS
73	165	R	2.96	0.00	4.4	16.9		14.6120	SS
74	166	R	3.70	0.00	4.4	18.2		15.9476	SS
75	168	R	5.18	0.00	4.3	15.0		12.6589	SS
76	169	R	5.92	0.00	4.3	14.1		11.7691	SS
77	173	R	-6.29	-0.64	4.2	13.8		11.4403	SS
78	175	R	-4.81	-0.64	4.3	16.4		14.0624	SS
79	176	R	-4.07	-0.64	4.4	17.2		14.9184	SS
80	178	R	-2.59	-0.64	4.3	16.1		13.7597	SS
81	183	R	2.59	-0.64	4.4	17.0		14.7140	SS
82	185	R	4.07	-0.64	4.3	15.8		13.4580	SS
83	186	R	4.81	-0.64	4.3	15.5		13.1574	SS
84	188	R	6.29	-0.64	4.2	12.5		10.1803	SS
85	191	R	-5.92	-1.28	4.2	13.6		11.2451	SS
86	192	R	-5.18	-1.28	4.3	15.2		12.8580	SS
87	194	R	-3.70	-1.28	4.4	17.8		15.5345	SS
88	195	R	-2.96	-1.28	4.3	16.8		14.4677	SS
89	203	R	2.96	-1.28	4.3	16.5		14.1635	SS
90	204	R	3.70	-1.28	4.3	15.2		12.8580	SS
91	206	R	5.18	-1.28	4.2	13.9		11.5380	SS
92	207	R	5.92	-1.28	4.2	11.1		8.8461	SS
93	211	R	-4.81	-1.92	4.3	15.2		12.8580	SS
94	212	R	-4.07	-1.92	4.3	16.1		13.7597	SS
95	214	R	-2.59	-1.92	4.3	15.8		13.4580	SS
96	215	R	-1.85	-1.92	4.3	16.6		14.2648	SS
97	220	R	1.85	-1.92	4.3	15.6		13.2575	SS
98	221	R	2.59	-1.92	4.4	17.2		14.9184	SS
99	223	R	4.07	-1.92	4.3	15.5		13.1574	SS
100	224	R	4.81	-1.92	4.3	14.1		11.7691	SS
101	228	R	-5.18	-2.56	4.2	13.1		10.7593	SS
102	230	R	-3.70	-2.56	4.3	15.8		13.4580	SS
103	231	R	-2.96	-2.56	4.3	15.6		13.2575	SS
104	233	R	-1.48	-2.56	4.3	16.0		13.6590	SS
105	237	R	1.48	-2.56	4.3	15.7		13.3577	SS
106	239	R	2.96	-2.56	4.3	16.7		14.3662	SS
107	240	R	3.70	-2.56	4.3	15.0		12.6589	SS
108	242	R	5.18	-2.56	4.2	11.5		9.2249	SS
109	245	R	-4.81	-3.20	4.2	13.4		11.0504	SS
110	246	R	-4.07	-3.20	4.3	15.0		12.6589	SS

Table B-2. (continued)

BLOCK 1-1343 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
111	248	R	-2.59	-3.20	4.3	14.5		12.1633	SS
112	249	R	-1.85	-3.20	4.3	16.2		13.8605	SS
113	254	R	1.85	-3.20	4.3	16.5		14.1635	SS
114	255	R	2.59	-3.20	4.3	16.8		14.4677	SS
115	257	R	4.07	-3.20	4.2	13.4		11.0504	SS
116	258	R	4.81	-3.20	4.2	11.5		9.2249	SS
117	262	R	-3.70	-3.85	4.2	14.1		11.7339	SS
118	263	R	-2.96	-3.85	4.2	14.4		12.0286	SS
119	271	R	2.96	-3.85	4.3	14.9		12.5595	SS
120	272	R	3.70	-3.85	4.2	13.5		11.1477	SS
121	276	R	-4.07	-4.49	4.2	12.4		10.0842	SS
122	278	R	-2.59	-4.49	4.2	13.1		10.7593	SS
123	285	R	2.59	-4.49	4.3	14.2		11.8675	SS
124	287	R	4.07	-4.86	4.2	11.7		9.4150	SS
125	290	R	-3.70	-5.13	4.2	11.8		9.5102	SS
126	291	R	-2.96	-5.13	4.2	12.1		9.7967	SS
127	299	R	2.96	-5.13	4.2	13.1		10.7593	SS
128	300	R	3.70	-5.13	4.2	10.6		8.3753	SS
129	107	S	-0.37	1.92	4.3	15.1		12.7584	SS
130	108	S	0.37	1.92	4.3	15.7		13.3577	SS
131	124	S	-1.48	1.28	4.3	15.5		13.1574	SS
132	128	S	1.48	1.28	4.3	15.4		13.0575	SS
133	143	S	-1.85	0.64	4.3	16.0		13.6590	SS
134	146	S	1.85	0.64	4.3	15.6		13.2575	SS
135	179	S	-1.85	-0.64	4.3	16.4		14.0624	SS
136	182	S	1.85	-0.64	4.3	16.7		14.3662	SS
137	197	S	-1.48	-1.28	4.3	16.7		14.3662	SS
138	201	S	1.48	-1.28	4.3	16.8		14.4677	SS
139	217	S	-0.37	-1.92	4.3	15.8		13.4580	SS
140	218	S	0.37	-1.92	4.3	17.1		14.7730	SS
141	125	I	-0.74	1.28	4.3	13.8		11.4746	SS
142	127	I	0.74	1.28	4.3	14.9		12.5595	SS
143	162	I	-1.48	0.00	4.3	14.6		12.2622	SS
144	163	I	1.48	0.00	4.3	15.8		13.4580	SS
145	198	I	-0.74	-1.28	4.3	16.2		13.8605	SS
146	200	I	0.74	-1.28	4.3	16.3		13.9614	SS

Table B-2. (continued)

BLOCK 1-1622 (4 PSIG)

ORIS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
1	1	C	-3.70	6.409	4.1	7.7		2.6432	GL
2	11	C	3.70	6.409	4.1	10.4		3.8936	GL
3	154	C	-7.40	0.000	4.1	10.0		3.7050	GL
4	171	C	7.40	0.000	4.1	7.0		2.3278	GL
5	314	C	-3.70	-6.409	4.1	12.0		4.6601	GL
6	324	C	3.70	-6.409	4.1	9.6		3.5175	GL
7	2	F	-2.96	6.409	4.2	11.6		4.4810	GL
8	4	F	-1.48	6.409	4.2	17.0		7.1994	GL
9	5	F	-0.74	6.409	4.2	17.9		7.6734	GL
10	7	F	0.74	6.409	4.2	17.3		7.3567	GL
11	8	F	1.48	6.409	4.2	15.7		6.5252	GL
12	10	F	2.96	6.409	4.2	12.3		4.8212	GL
13	12	F	-4.07	5.768	4.2	10.6		4.0013	GL
14	23	F	4.07	5.768	4.2	13.9		5.6125	GL
15	37	F	-4.81	4.486	4.2	12.8		5.0665	GL
16	50	F	4.81	4.486	4.2	16.9		7.1471	GL
17	51	F	-5.18	3.845	4.2	13.0		5.1651	GL
18	65	F	5.18	3.845	4.2	17.2		7.3042	GL
19	82	F	-5.92	2.563	4.2	14.0		5.6625	GL
20	98	F	5.92	2.563	4.2	14.0		5.6625	GL
21	99	F	-6.29	1.923	4.2	13.3		5.3135	GL
22	116	F	6.29	1.923	4.2	12.1		4.7237	GL
23	136	F	-7.03	0.641	4.2	11.4		4.3845	GL
24	153	F	7.03	0.641	4.2	8.7		3.1102	GL
25	172	F	-7.03	-0.641	4.2	12.9		5.1157	GL
26	189	F	7.03	-0.641	4.2	8.1		2.8344	GL
27	209	F	-6.29	-1.923	4.2	16.1		6.7313	GL
28	226	F	6.29	-1.923	4.2	8.9		3.2028	GL
29	227	F	-5.92	-2.563	4.2	18.1		7.7796	GL
30	243	F	5.92	-2.563	4.2	9.0		3.2491	GL
31	260	F	-5.18	-3.845	4.2	18.8		8.1535	GL
32	274	F	5.18	-3.845	4.2	10.5		3.9537	GL
33	275	F	-4.81	-4.486	4.2	17.6		7.5147	GL
34	288	F	4.81	-4.486	4.2	10.7		4.0489	GL
35	302	F	-4.07	-5.768	4.2	16.0		6.6797	GL
36	313	F	4.07	-5.768	4.2	11.0		4.1923	GL
37	315	F	-2.96	-6.409	4.2	14.3		5.8132	GL
38	317	F	-1.48	-6.409	4.2	16.3		6.8348	GL
39	318	F	-0.74	-6.409	4.2	17.4		7.4093	GL
40	320	F	0.74	-6.409	4.2	18.4		7.9394	GL
41	321	F	1.48	-6.409	4.2	16.2		6.7831	GL
42	323	F	2.96	-6.409	4.2	12.9		5.1157	GL
43	14	R	-2.59	5.768	4.2	12.8		10.4693	SS
44	15	R	-1.85	5.768	4.2	14.6		12.2257	SS
45	17	R	-0.37	5.768	4.2	15.1		12.7205	SS
46	18	R	0.37	5.768	4.2	15.2		12.8199	SS
47	20	R	1.85	5.768	4.2	14.2		11.8320	SS
48	21	R	2.59	5.768	4.2	12.2		9.8924	SS
49	28	R	-1.48	5.127	4.4	16.4		14.1037	SS
50	29	R	-0.74	5.127	4.4	17.2		14.9184	SS
51	31	R	0.74	5.127	4.3	16.9		14.5693	SS
52	32	R	1.48	5.127	4.4	17.0		14.7140	SS
53	41	R	-1.85	4.486	4.4	17.5		15.2259	SS
54	43	R	-0.37	4.486	4.4	18.3		16.0512	SS
55	44	R	0.37	4.486	4.4	19.2		16.9888	SS

Table B-2. (continued)

BLOCK 1-1622 (4 PSIG)

ORS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
56	46	R	1.85	4.486	4.4	18.8		16.5709	SS
57	56	R	-1.48	3.845	4.4	18.3		16.0512	SS
58	57	R	-0.74	3.845	4.4	18.4		16.1549	SS
59	59	R	0.74	3.845	4.4	19.6		17.4086	SS
60	60	R	1.48	3.845	4.4	10.6	12.5	18.6688	SS
61	71	R	-1.85	3.204	4.4	19.4		17.1985	SS
62	73	R	-0.37	3.204	4.4	17.5		15.2259	SS
63	74	R	0.37	3.204	4.4	18.0		15.7408	SS
64	76	R	1.85	3.204	4.4	19.2		16.9888	SS
65	88	R	-1.48	2.563	4.4	19.5		17.3035	SS
66	89	R	-0.74	2.563	4.4	10.3	12.2	18.0966	SS
67	91	R	0.74	2.563	4.4	18.3		16.0512	SS
68	92	R	1.48	2.563	4.4	19.2		16.9888	SS
69	156	R	-5.92	0.000	4.2	13.2		10.8562	SS
70	157	R	-5.18	0.000	4.4	17.0		14.7140	SS
71	159	R	-3.70	0.000	4.4	10.9	12.8	19.2431	SS
72	160	R	-2.96	0.000	4.4	11.2	13.3	20.0146	SS
73	165	R	2.96	0.000	4.4	19.1		16.8841	SS
74	166	R	3.70	0.000	4.4	17.1		14.8162	SS
75	168	R	5.18	0.000	4.2	10.6		8.3753	SS
76	169	R	5.92	0.000	4.2	8.3		6.2482	SS
77	173	R	-6.29	-0.641	4.2	11.2		8.9406	SS
78	175	R	-4.81	-0.641	4.4	18.6		16.3626	SS
79	176	R	-4.07	-0.641	4.4	17.2		14.9184	SS
80	178	R	-2.59	-0.641	4.4	11.0	13.0	19.5322	SS
81	183	R	2.59	-0.641	4.2	17.0		14.6282	SS
82	185	R	4.07	-0.641	4.2	13.0		10.6625	SS
83	186	R	4.81	-0.641	4.2	11.0		8.7517	SS
84	188	R	6.29	-0.641	4.2	6.9		4.9845	SS
85	191	R	-5.92	-1.282	4.2	11.8		9.5102	SS
86	192	R	-5.18	-1.282	4.4	14.2		11.9029	SS
87	194	R	-3.70	-1.282	4.4	18.2		15.9476	SS
88	195	R	-2.96	-1.282	4.4	18.8		16.5709	SS
89	203	R	2.96	-1.282	4.4	16.0		13.6992	SS
90	204	R	3.70	-1.282	4.4	13.7		11.4108	SS
91	206	R	5.18	-1.282	4.2	8.3		5.2482	SS
92	207	R	5.92	-1.282	4.2	7.2		5.2533	SS
93	211	R	-4.81	-1.923	4.4	15.4		13.0961	SS
94	212	R	-4.07	-1.923	4.4	16.7		13.4083	SS
95	214	R	-2.59	-1.923	4.4	18.6		15.3626	SS
96	215	R	-1.85	-1.923	4.4	18.0		15.7408	SS
97	220	R	1.85	-1.923	4.4	16.0		13.6992	SS
98	221	R	2.59	-1.923	4.4	15.9		13.5984	SS
99	223	R	4.07	-1.923	4.2	11.7		9.4150	SS
100	224	R	4.81	-1.923	4.2	8.6		5.5220	SS
101	228	R	-5.18	-2.563	4.4	16.0		13.6992	SS
102	230	R	-3.70	-2.563	4.4	18.2		15.9476	SS
103	231	R	-2.96	-2.563	4.4	17.8		15.5345	SS
104	233	R	-1.48	-2.563	4.4	18.8		16.5709	SS
105	237	R	1.48	-2.563	4.4	16.2		13.9012	SS
106	239	R	2.96	-2.563	4.4	14.2		11.9029	SS
107	240	R	3.70	-2.563	4.2	11.7		9.4150	SS
108	242	R	5.18	-2.563	4.2	8.0		5.9754	SS
109	245	R	-4.81	-3.204	4.4	14.1		11.8042	SS
110	246	R	-4.07	-3.204	4.4	16.0		13.6992	SS

Table B-2. (continued)

BLOCK 1-1622 (4 PSIG)

DHS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
111	248	R	-2.59	-3.204	4.4	17.1		14.8162	SS
112	249	R	-1.85	-3.204	4.4	17.1		14.8162	SS
113	254	R	1.85	-3.204	4.4	15.5		13.1963	SS
114	255	R	2.59	-3.204	4.2	13.3		10.9533	SS
115	257	R	4.07	-3.204	4.2	9.8		7.6282	SS
116	258	R	4.81	-3.204	4.2	7.6		5.6134	SS
117	262	R	-3.70	-3.845	4.4	15.2		12.8961	SS
118	263	R	-2.96	-3.845	4.4	15.1		12.7962	SS
119	271	R	2.96	-3.845	4.2	12.5		10.1803	SS
120	272	R	3.70	-3.845	4.2	9.9		7.7212	SS
121	276	R	-4.07	-4.486	4.2	12.1		9.7967	SS
122	278	R	-2.59	-4.486	4.4	14.0		11.7057	SS
123	285	R	2.59	-4.486	4.2	11.8		9.5102	SS
124	287	R	4.07	-4.486	4.2	8.0		5.9754	SS
125	290	R	-3.70	-5.127	4.2	12.2		9.8924	SS
126	291	R	-2.96	-5.127	4.2	12.6		10.2765	SS
127	299	R	2.96	-5.127	4.2	10.5		8.2814	SS
128	300	R	3.70	-5.127	4.2	8.2		6.1571	SS
129	107	S	-0.37	1.923	4.4	10.7	19.3	25.6148	SS
130	108	S	0.37	1.923	4.2	19.7		17.4136	SS
131	124	S	-1.48	1.282	4.4	11.4	13.4	20.3028	SS
132	128	S	1.48	1.282	4.4	19.6		17.4086	SS
133	143	S	-1.85	0.641	4.4	11.5	13.6	20.5940	SS
134	146	S	1.85	0.641	4.4	10.4	12.3	18.2871	SS
135	179	S	-1.85	-0.641	4.4	20.0		17.8304	SS
136	182	S	1.85	-0.641	4.4	18.4		16.1549	SS
137	197	S	-1.48	-1.282	4.4	10.5	12.4	18.4778	SS
138	201	S	1.48	-1.282	4.4	16.9		14.6120	SS
139	217	S	-0.37	-1.923	4.4	19.5		17.3035	SS
140	218	S	0.37	-1.923	4.4	18.5		16.2587	SS
141	125	I	-0.74	1.282	4.4	19.1		16.8841	SS
142	127	I	0.74	1.282	4.4	18.1		15.8441	SS
143	162	I	-1.48	0.000	4.4	11.0	13.0	19.5322	SS
144	163	I	1.48	0.000	4.4	20.0		17.8304	SS
145	198	I	-0.74	-1.282	4.4	18.6		16.3626	SS
146	200	I	0.74	-1.282	4.4	18.4		16.1549	SS

Table B-2. (continued)

BLOCK 1-2926 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
1	1	C	-3.70	6.41	4.2	12.8		10.4693	SS
2	11	C	3.70	6.41	4.2	9.0		6.8888	SS
3	154	C	-7.40	0.00	4.2	10.2		8.0008	SS
4	171	C	7.40	0.00	4.2	12.0		4.6750	GL
5	314	C	-3.70	-6.41	4.2	13.6		5.4627	GL
6	324	C	3.70	-6.41	4.2	16.2		6.7831	GL
7	2	F	-2.96	6.41	4.3	15.0		12.6589	SS
8	4	F	-1.48	6.41	4.3	16.7		14.3662	SS
9	5	F	-0.74	6.41	4.3	16.6		14.2648	SS
10	7	F	0.74	6.41	4.4	18.6		16.3626	SS
11	8	F	1.48	6.41	4.3	16.7		14.3662	SS
12	10	F	2.96	6.41	4.2	13.0		10.6625	SS
13	12	F	-4.07	5.77	4.2	13.1		10.7593	SS
14	23	F	4.07	5.77	4.2	11.1		8.8461	SS
15	37	F	-4.81	4.49	4.4	17.0		14.7140	SS
16	50	F	4.81	4.49	4.2	12.6		10.2765	SS
17	51	F	-5.18	3.85	4.4	16.5		14.2051	SS
18	65	F	5.18	3.85	4.2	12.2		9.8924	SS
19	82	F	-5.92	2.56	4.4	19.7		17.5139	SS
20	98	F	5.92	2.56	4.2	10.7		8.4692	SS
21	99	F	-6.29	1.92	4.4	17.3		15.0208	SS
22	116	F	6.29	1.92	4.2	10.0		7.8142	SS
23	136	F	-7.03	0.64	4.2	13.0		10.6625	SS
24	153	F	7.03	0.64	4.2	12.3		4.8212	GL
25	172	F	-7.03	-0.64	4.2	12.2		9.8924	SS
26	189	F	7.03	-0.64	4.2	15.4		6.3715	GL
27	209	F	-6.29	-1.92	4.3	15.0		12.6589	SS
28	226	F	6.29	-1.92	4.2	20.5		9.0765	GL
29	227	F	-5.92	-2.56	4.3	16.0		13.6590	SS
30	243	F	5.92	-2.56	4.2	22.0		9.9088	GL
31	260	F	5.18	-3.85	4.3	24.8		11.5399	GL
32	274	F	5.18	-3.85	4.2	22.9		10.4161	GL
33	275	F	-4.81	-4.49	4.2	21.5		9.6295	GL
34	288	F	4.81	-4.49	4.2	21.4		9.5739	GL
35	302	F	-4.07	-5.77	4.2	16.5		6.9386	GL
36	313	F	4.07	-5.77	4.2	16.4		6.8867	GL
37	315	F	-2.96	-6.41	4.2	16.0		6.6797	GL
38	317	F	-1.48	-6.41	4.3	14.0		11.6708	SS
39	318	F	-0.74	-6.41	4.4	17.3		15.0208	SS
40	320	F	0.74	-6.41	4.4	17.6		15.3286	SS
41	321	F	1.48	-6.41	4.2	21.0		9.3521	GL
42	323	F	2.96	-6.41	4.2	16.8		7.0949	GL
43	14	R	-2.59	5.77	4.4	18.4		16.1549	SS
44	15	R	-1.85	5.77	4.6	22.2		20.2980	SS
45	17	R	-0.37	5.77	4.6	22.3		20.4069	SS
46	18	R	0.37	5.77	4.6	24.4		22.7219	SS
47	20	R	1.85	5.77	4.5	21.4		19.3763	SS
48	21	R	2.59	5.77	4.4	20.4		18.2540	SS
49	28	R	-1.48	5.13	4.8	20.0		26.6911	TA
50	29	R	-0.74	5.13	4.8	19.6		26.0680	TA
51	31	R	0.74	5.13	4.9	21.1		28.4977	TA
52	32	R	1.48	5.13	4.8	19.3		25.6025	TA
53	41	R	-1.85	4.49	5.0	21.9		29.8525	TA
54	43	R	-0.37	4.49	4.8	21.2		28.5773	TA
55	44	R	0.37	4.49	5.0	22.5		30.8169	TA

Table B-2. (continued)

BLOCK 1-2926 (4 PSIG)

OBS	HOLE	TYPE	X AXIS	Y AXIS	METER	MEAS1	MEAS2	FLOW	GAGE
56	46	R	1.85	4.49	5.0	22.4		30.6558	TA
57	56	R	-1.48	3.85	5.1	23.5		32.5262	TA
58	57	R	-0.74	3.85	5.0	22.1		30.1733	TA
59	59	R	0.74	3.85	5.1	23.9		33.1811	TA
60	60	R	1.48	3.85	5.0	22.6		30.9783	TA
61	71	R	-1.85	3.20	5.0	22.7		31.1398	TA
62	73	R	-0.37	3.20	5.0	21.9		29.8525	TA
63	74	R	0.37	3.20	5.2	24.6		34.4262	TA
64	76	R	1.85	3.20	5.0	21.9		29.8525	TA
65	88	R	-1.48	2.56	5.0	22.5		30.8169	TA
66	89	R	-0.74	2.56	5.0	22.6		30.9783	TA
67	91	R	0.74	2.56	5.0	13.0	15.0	35.4937	TA
68	92	R	1.48	2.56	5.1	23.4		32.3629	TA
69	156	R	-5.92	0.00	4.6	16.2		20.7646	TA
70	157	R	-5.18	0.00	4.8	19.0		25.1385	TA
71	159	R	-3.70	0.00	5.0	22.2		30.3339	TA
72	160	R	-2.96	0.00	5.0	21.6		29.3726	TA
73	165	R	2.96	0.00	5.3	24.8		34.8509	TA
74	166	R	3.70	0.00	5.1	23.5		32.5262	TA
75	168	R	5.18	0.00	4.8	19.5		25.9126	TA
76	169	R	5.92	0.00	4.5	13.6		16.9067	TA
77	173	R	-6.29	-0.64	4.4	13.8		17.1445	TA
78	175	R	-4.81	-0.64	4.8	20.3		27.1603	TA
79	176	R	-4.07	-0.64	5.2	23.6		32.7779	TA
80	178	R	-2.59	-0.64	5.1	23.5		32.5262	TA
81	183	R	2.59	-0.64	5.0	13.4	15.4	36.6683	TA
82	185	R	4.07	-0.64	5.1	23.0		31.7114	TA
83	186	R	4.81	-0.64	4.9	21.1		28.4977	TA
84	188	R	6.29	-0.64	4.4	11.0		13.1866	TA
85	191	R	-5.92	-1.28	4.6	16.2		20.7646	TA
86	192	R	-5.18	-1.28	4.9	20.7		27.8654	TA
87	194	R	-3.70	-1.28	5.1	23.1		31.8740	TA
88	195	R	-2.96	-1.28	5.1	22.9		31.5489	TA
89	203	R	2.96	-1.28	5.3	24.9		35.0174	TA
90	204	R	3.70	-1.28	5.0	22.3		30.4948	TA
91	206	R	5.18	-1.28	4.7	17.7		23.0807	TA
92	207	R	5.92	-1.28	4.4	11.7		14.1633	TA
93	211	R	-4.81	-1.92	4.8	19.8		26.3792	TA
94	212	R	-4.07	-1.92	5.1	23.0		31.7114	TA
95	214	R	-2.59	-1.92	5.0	21.5		29.2130	TA
96	215	R	-1.85	-1.92	5.2	24.5		34.2606	TA
97	220	R	1.85	-1.92	5.3	24.7		34.6845	TA
98	221	R	2.59	-1.92	4.9	12.7	14.7	34.5169	TA
99	223	R	4.07	-1.92	4.9	20.6		27.7077	TA
100	224	R	4.81	-1.92	4.8	19.2		25.4476	TA
101	228	R	-5.18	-2.56	4.7	18.0		23.5367	TA
102	230	R	-3.70	-2.56	5.0	22.5		30.8169	TA
103	231	R	-2.96	-2.56	5.1	23.5		32.5262	TA
104	233	R	-1.48	-2.56	5.2	24.1		33.5999	TA
105	237	R	1.48	-2.56	5.2	23.9		33.2706	TA
106	239	R	2.96	-2.56	5.1	23.2		32.0368	TA
107	240	R	3.70	-2.56	4.9	20.1		26.9221	TA
108	242	R	5.18	-2.56	4.5	14.5		18.2082	TA
109	245	R	-4.81	-3.20	4.5	14.8		18.6452	TA
110	246	R	-4.07	-3.20	4.9	21.2		28.6563	TA

Table B-2. (continued)

BLOCK 1-2926 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
111	248	R	-2.59	-3.20	4.9	20.7		27.8654	TA
112	249	R	-1.85	-3.20	5.1	23.0		31.7114	TA
113	254	R	1.85	-3.20	5.1	23.0		31.7114	TA
114	255	R	2.59	-3.20	5.1	23.4		32.3629	TA
115	257	R	4.07	-3.20	4.7	18.5		24.3002	TA
116	258	R	4.81	-3.20	4.5	15.3		19.3770	TA
117	262	R	-3.70	-3.85	4.9	21.0		28.3394	TA
118	263	R	-2.96	-3.85	4.8	21.0		28.2612	TA
119	271	R	2.96	-3.85	5.0	21.4		29.0536	TA
120	272	R	3.70	-3.85	4.6	17.3		22.4114	TA
121	276	R	-4.37	-4.49	4.5	14.1		17.6280	TA
122	278	R	-2.59	-4.49	4.7	18.2		23.8416	TA
123	285	R	2.59	-4.49	4.8	19.9		26.5351	TA
124	287	R	4.37	-4.86	4.4	12.0		14.5845	TA
125	290	R	-3.70	-5.13	4.4	12.3		15.0072	TA
126	291	R	-2.96	-5.13	4.5	14.3		17.9178	TA
127	299	R	2.96	-5.13	4.4	13.6		16.8573	TA
128	300	R	3.70	-5.13	4.4	10.1		11.9434	TA
129	107	S	-0.37	1.92	5.0	22.7		31.1398	TA
130	108	S	0.37	1.92	4.9	12.9	14.8	34.9522	TA
131	124	S	-1.48	1.28	5.0	22.6		30.9783	TA
132	128	S	1.48	1.28	5.2	24.5		34.2606	TA
133	143	S	-1.85	0.64	5.0	22.9		31.4634	TA
134	146	S	1.85	0.64	5.2	24.1		33.5999	TA
135	179	S	-1.85	-0.64	5.0	13.0	15.0	35.4937	TA
136	182	S	1.85	-0.64	5.0	13.0	15.0	35.4937	TA
137	197	S	-1.48	-1.28	5.2	24.6		34.4262	TA
138	201	S	1.48	-1.28	5.0	13.0	15.0	35.4937	TA
139	217	S	-0.37	-1.92	5.0	13.2	15.2	36.0803	TA
140	218	S	0.37	-1.92	5.1	13.8	16.2	38.5579	TA
141	125	I	-0.74	1.28	4.8	20.0		26.6911	TA
142	127	I	0.74	1.28	5.2	24.0		33.4351	TA
143	162	I	-1.48	0.00	4.8	20.1		26.8474	TA
144	163	I	1.48	0.00	5.1	22.9		31.5489	TA
145	198	I	-0.74	-1.28	5.1	23.7		32.8533	TA
146	200	I	0.74	-1.28	5.0	13.5	15.5	36.9628	TA

Table B-2. (continued)

BLOCK 1-4748 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
1	1	C	-3.70	6.41	4.2	13.0		5.1651	GL
2	11	C	3.70	6.41	4.1	6.3		2.0160	GL
3	154	C	-7.40	0.00	4.2	17.2		7.3042	GL
4	171	C	7.40	0.00	4.1	7.1		2.3726	GL
5	314	C	-3.70	-6.41	4.2	19.2		8.3687	GL
6	324	C	3.70	-6.41	4.2	11.6		4.4810	GL
7	2	F	-2.96	6.41	4.3	13.4		11.0837	SS
8	4	F	-1.48	6.41	4.3	16.4		14.0624	SS
9	5	F	-0.74	6.41	4.3	15.8		13.4580	SS
10	7	F	0.74	6.41	4.3	13.9		11.5726	SS
11	8	F	1.48	6.41	4.2	11.1		8.8461	SS
12	10	F	2.96	6.41	4.1	9.1		3.2848	GL
13	12	F	-4.07	5.77	4.2	10.5		8.2814	SS
14	23	F	4.07	5.77	4.1	8.0		2.7794	GL
15	37	F	-4.81	4.49	4.3	15.5		13.1574	SS
16	50	F	4.81	4.49	4.1	12.6		4.9524	GL
17	51	F	-5.18	3.85	4.3	15.5		13.1574	SS
18	65	F	5.18	3.85	4.1	15.6		6.4539	GL
19	82	F	-5.92	2.56	4.4	17.5		15.2259	SS
20	98	F	5.92	2.56	4.2	18.7		8.0998	GL
21	99	F	-6.29	1.92	4.3	16.3		13.9614	SS
22	116	F	6.29	1.92	4.2	17.3		7.3567	GL
23	136	F	-7.03	0.64	4.3	13.8		11.4746	SS
24	153	F	7.03	0.64	4.1	10.2		3.7991	GL
25	172	F	-7.03	-0.64	4.3	15.6		13.2575	SS
26	189	F	7.03	-0.64	4.1	10.5		3.9410	GL
27	209	F	-6.29	-1.92	4.4	20.0		17.8304	SS
28	226	F	6.29	-1.92	4.2	15.5		6.4226	GL
29	227	F	-5.92	-2.56	4.5	21.0		18.9468	SS
30	243	F	5.92	-2.56	4.2	17.6		7.5147	GL
31	260	F	-5.18	-3.85	4.5	21.3		19.2688	SS
32	274	F	5.18	-3.85	4.2	17.4		7.4093	GL
33	275	F	-4.81	-4.49	4.4	19.1		16.8841	SS
34	288	F	4.81	-4.49	4.2	17.1		7.2518	GL
35	302	F	-4.07	-5.77	4.3	15.8		13.4580	SS
36	313	F	4.07	-5.77	4.2	15.3		6.3203	GL
37	315	F	-2.96	-6.41	4.3	13.8		11.4746	SS
38	317	F	-1.48	-6.41	4.3	14.8		12.4603	SS
39	318	F	-0.74	-6.41	4.3	16.0		13.6590	SS
40	320	F	0.74	-6.41	4.3	15.3		12.9577	SS
41	321	F	1.48	-6.41	4.3	23.1		10.5604	GL
42	323	F	2.96	-6.41	4.2	17.0		7.1994	GL
43	14	R	-2.59	5.77	4.4	18.9		16.6752	SS
44	15	R	-1.85	5.77	4.4	20.8		18.6796	SS
45	17	R	-0.37	5.77	4.4	19.0		16.7796	SS
46	18	R	0.37	5.77	4.4	19.1		16.8841	SS
47	20	R	1.85	5.77	4.3	14.5		12.1633	SS
48	21	R	2.59	5.77	4.3	11.5		9.2530	SS
49	28	R	-1.48	5.13	4.6	23.6		21.8337	SS
50	29	R	-0.74	5.13	4.6	23.0		21.1727	SS
51	31	R	0.74	5.13	4.5	22.6		20.6765	SS
52	32	R	1.48	5.13	4.4	20.1		17.9361	SS
53	41	R	-1.85	4.49	4.9	19.0		25.2089	TA
54	43	R	-0.37	4.49	4.9	18.7		24.7453	TA
55	44	R	0.37	4.49	4.9	19.5		25.9850	TA

Table B-2. (continued)

BLOCK 1-4748 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
56	46	R	1.85	4.49	4.6	15.7		20.0231	TA
57	56	R	-1.48	3.85	5.0	21.0		28.4176	TA
58	57	R	-0.74	3.85	4.9	20.0		26.7654	TA
59	59	R	0.74	3.85	5.0	20.4		27.4688	TA
60	60	R	1.48	3.85	4.8	17.8		23.2983	TA
61	71	R	-1.85	3.20	5.1	21.9		29.9342	TA
62	73	R	-0.37	3.20	5.1	21.8		29.7736	TA
63	74	R	0.37	3.20	5.2	22.9		31.6345	TA
64	76	R	1.85	3.20	4.8	18.8		24.8301	TA
65	88	R	-1.48	2.56	5.3	23.2		32.2102	TA
66	89	R	-0.74	2.56	5.3	23.3		32.3740	TA
67	91	R	0.74	2.56	5.3	23.0		31.8833	TA
68	92	R	1.48	2.56	5.0	20.8		23.1006	TA
69	156	R	-5.92	0.00	4.7	17.5		22.7776	TA
70	157	R	-5.18	0.00	4.8	19.3		25.6025	TA
71	159	R	-3.70	0.00	4.9	12.5	14.5	33.9353	TA
72	160	R	-2.96	0.00	5.0	13.0	15.0	35.4937	TA
73	165	R	2.96	0.00	5.0	20.3		27.3113	TA
74	166	R	3.70	0.00	4.8	17.6		22.9940	TA
75	168	R	5.18	0.00	4.4	19.7		17.5139	SS
76	169	R	5.92	0.00	4.3	15.4		13.0575	SS
77	173	R	-6.29	-0.64	4.7	16.1		20.6751	TA
78	175	R	-4.81	-0.64	4.8	11.5	13.2	30.5245	TA
79	176	R	-4.07	-0.64	4.9	12.5	14.5	33.9353	TA
80	178	R	-2.59	-0.64	4.9	12.7	14.7	34.5169	TA
81	183	R	2.59	-0.64	5.2	22.5		30.9850	TA
82	185	R	4.07	-0.64	4.6	23.7		21.9443	SS
83	186	R	4.81	-0.64	4.5	21.1		19.0540	SS
84	188	R	6.29	-0.64	4.2	12.0		9.7011	SS
85	191	R	-5.92	-1.28	4.8	18.1		23.7560	TA
86	192	R	-5.18	-1.28	5.0	20.7		27.9424	TA
87	194	R	-3.70	-1.28	5.0	13.5	15.6	37.1119	TA
88	195	R	-2.96	-1.28	4.9	12.9	14.9	35.0998	TA
89	203	R	2.96	-1.28	5.0	20.4		27.4688	TA
90	204	R	3.70	-1.28	4.6	24.4		22.7219	SS
91	206	R	5.18	-1.28	4.4	18.6		16.3626	SS
92	207	R	5.92	-1.28	4.3	13.6		11.2789	SS
93	211	R	-4.81	-1.92	5.1	21.8		29.7736	TA
94	212	R	-4.07	-1.92	4.9	12.7	14.7	34.5169	TA
95	214	R	-2.59	-1.92	4.9	12.5	14.5	33.9353	TA
96	215	R	-1.85	-1.92	4.9	12.4	14.4	33.6451	TA
97	220	R	1.85	-1.92	5.2	22.6		31.1471	TA
98	221	R	2.59	-1.92	5.1	21.8		29.7736	TA
99	223	R	4.07	-1.92	4.6	22.4		20.5160	SS
100	224	R	4.81	-1.92	4.4	19.5		17.3035	SS
101	228	R	-5.18	-2.56	4.8	18.7		24.6761	TA
102	230	R	-3.70	-2.56	5.4	24.7		34.7771	TA
103	231	R	-2.96	-2.56	4.9	12.8	14.8	34.8082	TA
104	233	R	-1.48	-2.56	4.8	12.0	13.7	31.9571	TA
105	237	R	1.48	-2.56	5.2	22.3		30.6612	TA
106	239	R	2.96	-2.56	4.8	18.5		24.3687	TA
107	240	R	3.70	-2.56	4.5	21.9		19.9160	SS
108	242	R	5.18	-2.56	4.4	16.1		13.8002	SS
109	245	R	-4.81	-3.20	4.9	19.7		26.2967	TA
110	246	R	-4.07	-3.20	5.1	22.0		30.0949	TA

Table B-2. (continued)

BLOCK 1-4748 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
111	248	R	-2.59	-3.20	5.4	24.5		34.4442	TA
112	249	R	-1.85	-3.20	4.9	12.2	14.0	32.7731	TA
113	254	R	1.85	-3.20	4.9	20.0		26.7654	TA
114	255	R	2.59	-3.20	4.8	17.7		23.1461	TA
115	257	R	4.07	-3.20	4.4	19.7		17.5139	SS
116	258	R	4.81	-3.20	4.4	16.5		14.2051	SS
117	262	R	-3.70	-3.85	5.0	21.1		28.5763	TA
118	263	R	-2.96	-3.85	5.2	22.6		31.1471	TA
119	271	R	2.96	-3.85	4.5	22.0		20.0242	SS
120	272	R	3.70	-3.85	4.4	18.8		16.5709	SS
121	276	R	-4.07	-4.49	4.8	17.9		23.4507	TA
122	278	R	-2.59	-4.49	5.0	21.1		28.5763	TA
123	285	R	2.59	-4.49	4.5	21.2		19.1613	SS
124	287	R	4.07	-4.86	4.3	14.2		11.8675	SS
125	290	R	-3.70	-5.13	4.7	17.2		22.3242	TA
126	291	R	-2.96	-5.13	4.8	18.0		23.6032	TA
127	299	R	2.96	-5.13	4.4	17.0		14.7140	SS
128	300	R	3.70	-5.13	4.3	13.6		11.2789	SS
129	107	S	-0.37	1.92	5.2	23.8		33.1062	TA
130	108	S	0.37	1.92	5.2	23.9		33.2706	TA
131	124	S	-1.48	1.28	5.3	24.2		33.8554	TA
132	128	S	1.48	1.28	5.1	22.7		31.2246	TA
133	143	S	-1.85	0.64	5.0	13.1	15.1	35.7868	TA
134	146	S	1.85	0.64	5.1	22.6		31.0627	TA
135	179	S	-1.85	-0.64	5.0	12.9	14.9	35.2009	TA
136	182	S	1.85	-0.64	5.3	24.6		34.5184	TA
137	197	S	-1.48	-1.28	5.2	24.2		33.7648	TA
138	201	S	1.48	-1.28	5.3	24.6		34.5184	TA
139	217	S	-0.37	-1.92	5.1	23.6		32.6896	TA
140	218	S	0.37	-1.92	4.9	12.6	14.6	34.2259	TA
141	125	I	-0.74	1.28	5.0	22.1		30.1733	TA
142	127	I	0.74	1.28	5.0	22.3		30.4948	TA
143	162	I	-1.48	0.00	5.2	23.7		32.9420	TA
144	163	I	-1.48	0.00	5.0	22.3		30.4948	TA
145	198	I	-0.74	-1.28	5.2	23.6		32.7779	TA
146	200	I	0.74	-1.28	5.1	23.3		32.1997	TA

Table B-2. (continued)

BLOCK 1-4749 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
1	1	C	-3.70	6.41	4.1	5.6		1.7079	GL
2	11	C	3.70	6.41	4.1	10.6		3.9884	GL
3	154	C	-7.40	0.00	4.1	6.5		2.1047	GL
4	171	C	7.40	0.00	4.2	13.0		5.1651	GL
5	314	C	-3.70	-6.41	4.2	13.0		5.1651	GL
6	324	C	3.70	-6.41	4.1	7.5		2.5527	GL
7	2	F	-2.96	6.41	4.1	8.5		3.0080	GL
8	4	F	-1.48	6.41	4.2	15.6		6.4739	GL
9	5	F	-0.74	6.41	4.2	18.5		7.9928	GL
10	7	F	0.74	6.41	4.2	21.8		9.7969	GL
11	8	F	1.48	6.41	4.2	21.4		9.5739	GL
12	10	F	2.96	6.41	4.2	16.2		6.7831	GL
13	12	F	-4.07	5.77	4.1	7.5		5.5057	SS
14	23	F	4.07	5.77	4.2	16.4		6.8867	GL
15	37	F	-4.81	4.49	4.2	12.5		10.1803	SS
16	50	F	4.81	4.49	4.3	24.5		11.3655	GL
17	51	F	-5.18	3.85	4.2	14.2		11.8320	SS
18	65	F	5.18	3.85	4.3	24.9		11.5982	GL
19	82	F	-5.92	2.56	4.2	13.6		11.2451	SS
20	98	F	5.92	2.56	4.3	23.7		10.9037	GL
21	99	F	-6.29	1.92	4.2	11.5		9.2249	SS
22	116	F	6.29	1.92	4.2	22.0		9.9088	GL
23	136	F	-7.03	0.64	4.1	8.3		6.2286	SS
24	153	F	7.03	0.64	4.2	18.1		7.7796	GL
25	172	F	-7.03	-0.64	4.1	8.4		6.3195	SS
26	189	F	7.03	-0.64	4.2	20.4		9.0217	GL
27	209	F	-6.29	-1.92	4.2	7.8		5.7942	SS
28	226	F	6.29	-1.92	4.4	16.5		14.2051	SS
29	227	F	-5.92	-2.56	4.2	10.3		8.0942	SS
30	243	F	5.92	-2.56	4.4	17.6		15.3286	SS
31	260	F	-5.18	-3.85	4.2	13.0		10.6625	SS
32	274	F	5.18	-3.85	4.4	19.8		17.6192	SS
33	275	F	-4.81	-4.49	4.2	11.5		9.2249	SS
34	288	F	4.81	-4.49	4.4	18.2		15.9476	SS
35	302	F	-4.07	-5.77	4.2	10.0		7.8142	SS
36	313	F	4.07	-5.77	4.2	9.0		6.8888	SS
37	315	F	-2.96	-6.41	4.2	11.4		9.1300	SS
38	317	F	-1.48	-6.41	4.4	17.0		14.7140	SS
39	318	F	-0.74	-6.41	4.4	18.2		15.9476	SS
40	320	F	0.74	-6.41	4.3	14.6		12.2622	SS
41	321	F	1.48	-6.41	4.2	21.0		9.3521	GL
42	323	F	2.96	-6.41	4.2	11.0		4.1923	GL
43	14	R	-2.59	5.77	4.2	18.2		7.8328	GL
44	15	R	-1.85	5.77	4.3	25.0		11.6566	GL
45	17	R	-0.37	5.77	4.4	19.4		17.1985	SS
46	18	R	0.37	5.77	4.5	20.7		18.6259	SS
47	20	R	1.85	5.77	4.4	18.3		16.0512	SS
48	21	R	2.59	5.77	4.4	17.0		14.7140	SS
49	28	R	-1.48	5.13	4.5	20.8		18.7327	SS
50	29	R	-0.74	5.13	4.6	22.6		20.7344	SS
51	31	R	0.74	5.13	4.7	25.0		23.4573	SS
52	32	R	1.48	5.13	4.6	23.1		21.2826	SS
53	41	R	-1.85	4.49	4.5	22.5		20.5675	SS
54	43	R	-0.37	4.49	4.8	18.3		24.0620	TA
55	44	R	0.37	4.49	5.0	20.3		27.3113	TA

Table B-2. (continued)

BLOCK 1-4749 (4 PSIG)

ORS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
56	46	R	1.85	4.49	4.9	17.6		22.9940	TA
57	56	R	-1.48	3.85	4.9	18.9		25.0542	TA
58	57	R	-0.74	3.85	5.0	20.0		26.8397	TA
59	59	R	0.74	3.85	5.0	20.8		28.1006	TA
60	60	R	1.48	3.85	5.0	21.1		28.5763	TA
61	71	R	-1.85	3.20	4.9	19.8		26.4527	TA
62	73	R	-0.37	3.20	5.2	22.1		30.3382	TA
63	74	R	0.37	3.20	5.3	23.4		32.5379	TA
64	76	R	1.85	3.20	5.1	21.9		29.9342	TA
65	88	R	-1.48	2.56	5.3	23.0		31.8833	TA
66	89	R	-0.74	2.56	5.2	22.4		30.8230	TA
67	91	R	0.74	2.56	5.3	23.6		32.8662	TA
68	92	R	1.48	2.56	5.2	23.0		31.7973	TA
69	156	R	-5.92	0.00	4.2	7.5		8.3797	TA
70	157	R	-5.18	0.00	4.4	11.3		13.6041	TA
71	159	R	-3.70	0.00	4.8	18.9		24.9842	TA
72	160	R	-2.96	0.00	4.9	19.8		26.4527	TA
73	165	R	2.96	0.00	5.4	13.1	15.1	36.1975	TA
74	166	R	3.70	0.00	5.3	23.4		32.5379	TA
75	168	R	5.18	0.00	4.9	19.1		25.3638	TA
76	169	R	5.92	0.00	4.6	15.6		19.8753	TA
77	173	R	-6.29	-0.64	4.2	6.3		6.8076	TA
78	175	R	-4.81	-0.64	4.4	12.9		15.8574	TA
79	176	R	-4.07	-0.64	4.7	16.9		21.8723	TA
80	178	R	-2.59	-0.64	5.1	21.4		29.1333	TA
81	183	R	2.59	-0.64	5.0	12.8	14.8	34.9085	TA
82	185	R	4.07	-0.64	5.1	22.0		30.0949	TA
83	186	R	4.81	-0.64	5.0	20.4		27.4688	TA
84	188	R	6.29	-0.64	4.5	14.0		17.4834	TA
85	191	R	-5.92	-1.28	4.2	8.0		9.0421	TA
86	192	R	-5.18	-1.28	4.4	11.8		14.3035	TA
87	194	R	-3.70	-1.28	4.8	17.7		23.1461	TA
88	195	R	-2.96	-1.28	4.9	19.7		26.2967	TA
89	203	R	2.96	-1.28	5.0	12.6	14.6	34.3247	TA
90	204	R	3.70	-1.28	5.2	22.8		31.4719	TA
91	206	R	5.18	-1.28	4.9	19.1		25.3638	TA
92	207	R	5.92	-1.28	4.6	15.4		19.5802	TA
93	211	R	-4.81	-1.92	4.4	12.0		14.5845	TA
94	212	R	-4.07	-1.92	4.7	16.0		20.5262	TA
95	214	R	-2.59	-1.92	4.9	19.5		25.9850	TA
96	215	R	-1.85	-1.92	5.2	22.0		30.1769	TA
97	220	R	1.85	-1.92	5.0	12.6	14.6	34.3247	TA
98	221	R	2.59	-1.92	5.0	13.4	15.4	36.6683	TA
99	223	R	4.07	-1.92	5.1	22.2		30.4168	TA
100	224	R	4.81	-1.92	5.0	20.0		26.8397	TA
101	228	R	-5.18	-2.56	4.4	10.6		12.6323	TA
102	230	R	-3.70	-2.56	4.7	16.5		21.2723	TA
103	231	R	-2.96	-2.56	4.8	17.5		22.8421	TA
104	233	R	-1.48	-2.56	5.1	21.7		29.6133	TA
105	237	R	1.48	-2.56	5.0	12.6	14.6	34.3247	TA
106	239	R	2.96	-2.56	5.0	12.7	14.7	34.6164	TA
107	240	R	3.70	-2.56	5.1	22.2		30.4168	TA
108	242	R	5.18	-2.56	4.8	17.6		22.9940	TA
109	245	R	-4.81	-3.20	4.4	11.4		13.7436	TA
110	246	R	-4.07	-3.20	4.5	13.5		16.7629	TA

Table B-2. (continued)

BLOCK 1-4749 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
111	248	R	-2.59	-3.20	4.8	18.4	14.5	24.2153	TA
112	249	R	-1.85	-3.20	5.0	20.3		27.3113	TA
113	254	R	1.85	-3.20	5.4	24.9		35.1108	TA
114	255	R	2.59	-3.20	5.0	12.6		34.1773	TA
115	257	R	4.07	-3.20	5.0	20.6		27.7843	TA
116	258	R	4.81	-3.20	4.8	18.1		23.7560	TA
117	262	R	-3.70	-3.85	4.6	14.9		18.8456	TA
118	263	R	-2.96	-3.85	4.6	15.4		19.5802	TA
119	271	R	2.96	-3.85	5.2	22.5		30.9850	TA
120	272	R	3.70	-3.85	4.9	19.6		26.1407	TA
121	276	R	-4.07	-4.49	4.4	11.5		13.8833	TA
122	278	R	-2.59	-4.49	4.6	15.4		19.5802	TA
123	285	R	2.59	-4.49	5.0	20.4		27.4688	TA
124	287	R	4.07	-4.86	4.6	15.6		19.8753	TA
125	290	R	-3.70	-5.13	4.4	10.8		12.9091	TA
126	291	R	-2.96	-5.13	4.5	13.4		16.6194	TA
127	299	R	2.96	-5.13	4.6	15.1		19.1390	TA
128	300	R	3.70	-5.13	4.4	12.6		15.4316	TA
129	107	S	-0.37	1.92	5.0	21.6		29.3726	TA
130	108	S	0.37	1.92	5.2	23.5		32.6141	TA
131	124	S	-1.48	1.28	5.0	21.6		29.3726	TA
132	128	S	1.48	1.28	5.2	23.0		31.7973	TA
133	143	S	-1.85	0.64	5.2	22.6		31.1471	TA
134	146	S	1.85	0.64	5.2	23.0		31.7973	TA
135	179	S	-1.85	-0.64	5.1	21.9		29.9342	TA
136	182	S	1.85	-0.64	5.2	23.1		31.9603	TA
137	197	S	-1.48	-1.28	5.0	21.6		29.3726	TA
138	201	S	1.48	-1.28	5.2	22.5		30.9850	TA
139	217	S	-0.37	-1.92	5.0	21.4		29.0536	TA
140	218	S	0.37	-1.92	5.2	22.3		30.6612	TA
141	125	I	-0.74	1.28	4.9	20.3		27.2358	TA
142	127	I	0.74	1.28	5.0	20.9		28.2590	TA
143	162	I	-1.48	0.00	5.0	20.9		28.2590	TA
144	163	I	1.48	0.00	5.0	21.4		29.0536	TA
145	198	I	-0.74	-1.28	5.0	21.6		29.3726	TA
146	200	I	0.74	-1.28	5.0	20.6		27.7843	TA

Table B-2. (continued)

BLOCK 1-5285 (4 PSIG)

OPS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
1	1	C	-3.70	6.41	4.1	5.0		1.4467	GL
2	11	C	3.70	6.41	4.1	5.2		1.5334	GL
3	154	C	-7.40	0.00	4.1	5.8		1.7956	GL
4	171	C	7.40	0.00	4.1	5.4		1.6205	GL
5	314	C	-3.70	-6.41	4.1	5.6		1.7079	GL
6	324	C	3.70	-6.41	4.1	5.6		1.7079	GL
7	2	F	-2.96	6.41	4.1	6.8		2.2383	GL
8	4	F	-1.48	6.41	4.1	7.7		2.6432	GL
9	5	F	-0.74	6.41	4.1	7.6		2.5979	GL
10	7	F	0.74	6.41	4.1	6.3		2.0160	GL
11	8	F	1.48	6.41	4.1	6.3		2.0160	GL
12	10	F	2.96	6.41	4.1	5.5		1.6642	GL
13	12	F	-4.07	5.77	4.1	5.7		1.7517	GL
14	23	F	4.07	5.77	4.1	5.6		1.7079	GL
15	37	F	-4.81	4.49	4.1	9.0		3.2385	GL
16	50	F	4.81	4.49	4.1	8.0		2.7794	GL
17	51	F	-5.18	3.85	4.1	10.6		3.9884	GL
18	65	F	5.18	3.85	4.1	6.7		2.1937	GL
19	82	F	-5.92	2.56	4.1	10.6		3.9884	GL
20	98	F	5.92	2.56	4.1	6.6		2.1492	GL
21	99	F	-6.29	1.92	4.1	9.4		3.4242	GL
22	116	F	6.29	1.92	4.1	6.4		2.0603	GL
23	136	F	-7.03	0.64	4.1	6.7		2.1937	GL
24	153	F	7.03	0.64	4.1	5.7		1.7517	GL
25	172	F	-7.03	-0.64	4.1	7.4		2.5076	GL
26	189	F	7.03	-0.64	4.1	6.0		1.8835	GL
27	209	F	-6.29	-1.92	4.1	10.0		3.7050	GL
28	226	F	6.29	-1.92	4.1	5.6		1.7079	GL
29	227	F	-5.92	-2.56	4.2	11.2		4.2883	GL
30	243	F	5.92	-2.56	4.1	5.6		1.7079	GL
31	260	F	-5.18	-3.85	4.1	9.6		3.5175	GL
32	274	F	5.18	-3.85	4.1	6.2		1.9718	GL
33	275	F	-4.81	-4.49	4.1	9.0		3.2385	GL
34	288	F	4.81	-4.49	4.1	6.3		2.0160	GL
35	302	F	-4.07	-5.77	4.1	6.3		2.0160	GL
36	313	F	4.07	-5.77	4.1	5.6		1.7079	GL
37	315	F	-2.96	-6.41	4.1	5.7		1.7517	GL
38	317	F	-1.48	-6.41	4.1	6.6		2.1492	GL
39	318	F	-0.74	-6.41	4.1	6.8		2.2383	GL
40	320	F	0.74	-6.41	4.1	6.4		2.0603	GL
41	321	F	1.48	-6.41	4.1	6.6		2.1492	GL
42	323	F	2.96	-6.41	4.1	6.2		1.9718	GL
43	14	R	-2.59	5.77	4.1	11.0		4.1788	GL
44	15	R	-1.85	5.77	4.1	12.2		4.7572	GL
45	17	R	-0.37	5.77	4.1	11.6		4.4667	GL
46	18	R	0.37	5.77	4.1	10.8		4.0835	GL
47	20	R	1.85	5.77	4.1	7.6		2.5979	GL
48	21	R	2.59	5.77	4.1	7.1		2.3726	GL
49	28	R	-1.48	5.13	4.2	12.1		9.7967	SS
50	29	R	-0.74	5.13	4.2	12.0		9.7011	SS
51	31	R	0.74	5.13	4.2	14.6		5.9646	GL
52	32	R	1.48	5.13	4.1	10.7		4.0359	GL
53	41	R	-1.85	4.49	4.4	16.6		14.3067	SS
54	43	R	-0.37	4.49	4.3	15.8		13.4580	SS
55	44	R	0.37	4.49	4.3	15.5		13.1574	SS

Table B-2. (continued)

BLOCK 1-5285 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
56	46	R	1.85	4.49	4.2	13.9		5.6125	GL
57	56	R	-1.48	3.85	4.4	20.5		18.3602	SS
58	57	R	-0.74	3.85	4.4	19.6		17.4086	SS
59	59	R	0.74	3.85	4.4	18.0		15.7408	SS
60	60	R	1.48	3.85	4.3	14.1		11.7691	SS
61	71	R	-1.85	3.20	4.5	21.7		19.6997	SS
62	73	R	-0.37	3.20	4.4	20.2		18.0420	SS
63	74	R	0.37	3.20	4.4	21.3		19.2143	SS
64	76	R	1.85	3.20	4.3	16.1		13.7597	SS
65	88	R	-1.48	2.56	4.5	21.8		19.8078	SS
66	89	R	-0.74	2.56	4.5	21.5		19.4840	SS
67	91	R	0.74	2.56	4.5	22.3		20.3498	SS
68	92	R	1.48	2.56	4.5	20.8		18.7327	SS
69	156	R	-5.92	0.00	4.2	10.0		7.8142	SS
70	157	R	-5.18	0.00	4.2	14.0		11.6359	SS
71	159	R	-3.70	0.00	4.4	18.6		16.3626	SS
72	160	R	-2.96	0.00	4.4	19.7		17.5139	SS
73	165	R	2.96	0.00	4.4	18.7		16.4667	SS
74	166	R	3.70	0.00	4.2	20.0		8.8028	GL
75	168	R	5.18	0.00	4.2	9.3		3.3887	GL
76	169	R	5.92	0.00	4.1	7.3		2.4625	GL
77	173	R	-6.29	-0.64	4.2	14.3		5.8132	GL
78	175	R	-4.81	-0.64	4.3	16.0		13.6590	SS
79	176	R	-4.07	-0.64	4.4	19.2		16.9888	SS
80	178	R	-2.59	-0.64	4.6	23.3		21.5027	SS
81	183	R	2.59	-0.64	4.5	22.3		20.3498	SS
82	185	R	4.07	-0.64	4.2	14.6		5.9646	GL
83	186	R	4.81	-0.64	4.2	10.1		3.7642	GL
84	188	R	6.29	-0.64	4.1	7.1		2.3726	GL
85	191	R	-5.92	-1.28	4.2	16.5		6.9386	GL
86	192	R	-5.18	-1.28	4.2	13.5		11.1477	SS
87	194	R	-3.70	-1.28	4.4	19.0		16.7796	SS
88	195	R	-2.96	-1.28	4.4	20.9		18.7863	SS
89	203	R	2.96	-1.28	4.4	16.7		14.4083	SS
90	204	R	3.70	-1.28	4.2	17.2		7.3042	GL
91	206	R	5.18	-1.28	4.2	8.3		2.9260	GL
92	207	R	5.92	-1.28	4.1	6.9		2.2830	GL
93	211	R	-4.81	-1.92	4.2	13.1		10.7593	SS
94	212	R	-4.07	-1.92	4.3	16.5		14.1635	SS
95	214	R	-2.59	-1.92	4.4	20.5		18.3602	SS
96	215	R	-1.85	-1.92	4.4	21.4		19.3216	SS
97	220	R	1.85	-1.92	4.4	20.1		17.9361	SS
98	221	R	2.59	-1.92	4.4	16.6		14.3067	SS
99	223	R	4.07	-1.92	4.2	11.6		4.4810	GL
100	224	R	4.81	-1.92	4.2	8.9		3.2028	GL
101	228	R	-5.18	-2.56	4.2	17.3		7.3567	GL
102	230	R	-3.70	-2.56	4.2	14.6		12.2257	SS
103	231	R	-2.96	-2.56	4.4	17.5		15.2259	SS
104	233	R	-1.48	-2.56	4.4	20.2		18.0420	SS
105	237	R	1.48	-2.56	4.4	18.5		16.2587	SS
106	239	R	2.96	-2.56	4.2	17.9		7.6734	GL
107	240	R	3.70	-2.56	4.2	11.7		4.5294	GL
108	242	R	5.18	-2.56	4.1	7.5		2.5527	GL
109	245	R	-4.81	-3.20	4.2	16.2		6.7831	GL
110	246	R	-4.07	-3.20	4.2	12.0		9.7011	SS

Table B-2. (continued)

BLOCK 1-5285 (4 PSIG)

DES	HOLE	TYPE	XAXIS	YAXIS	METER	MFAS1	MEAS2	FLOW	GAGE
111	248	R	-2.59	-3.20	4.2	15.6		13.2184	SS
112	249	R	-1.85	-3.20	4.4	17.8		15.5345	SS
113	254	R	1.85	-3.20	4.3	13.5		11.1812	SS
114	255	R	2.59	-3.20	4.2	17.0		7.1994	GL
115	257	R	4.07	-3.20	4.2	9.1		3.2956	GL
116	258	R	4.81	-3.20	4.2	7.6		2.6065	GL
117	262	R	-3.70	-3.85	4.2	18.5		7.9928	GL
118	263	R	-2.96	-3.85	4.2	11.7		9.4150	SS
119	271	R	2.96	-3.85	4.2	10.5		3.9537	GL
120	272	R	3.70	-3.85	4.2	8.5		3.0180	GL
121	276	R	-4.07	-4.49	4.2	12.3		4.8212	GL
122	278	R	-2.59	-4.49	4.2	10.6		8.3753	SS
123	285	R	2.59	-4.49	4.2	9.6		3.5290	GL
124	287	R	4.07	-4.86	4.1	7.5		2.5527	GL
125	290	R	-3.70	-5.13	4.1	10.0		3.7050	GL
126	291	R	-2.96	-5.13	4.2	11.7		4.5294	GL
127	299	R	2.96	-5.13	4.2	8.2		2.8802	GL
128	300	R	3.70	-5.13	4.1	7.2		2.4175	GL
129	107	S	-0.37	1.92	4.4	21.7		19.6442	SS
130	108	S	0.37	1.92	4.4	22.4		20.4012	SS
131	124	S	-1.48	1.28	4.5	21.5		19.4840	SS
132	128	S	1.48	1.28	4.4	21.2		19.1071	SS
133	143	S	-1.85	0.64	4.5	21.6		19.5918	SS
134	146	S	1.85	0.64	4.4	21.4		19.3216	SS
135	179	S	-1.85	-0.64	4.5	23.7		21.8835	SS
136	182	S	1.85	-0.64	4.6	24.0		22.2768	SS
137	197	S	-1.48	-1.28	4.5	22.4		20.4586	SS
138	201	S	1.48	-1.28	4.5	22.7		20.7856	SS
139	217	S	-0.37	-1.92	4.5	22.2		20.2412	SS
140	218	S	0.37	-1.92	4.5	22.4		20.4586	SS
141	125	I	-0.74	1.28	4.4	19.8		17.6192	SS
142	127	I	0.74	1.28	4.4	21.1		19.0001	SS
143	162	I	-1.48	0.00	4.4	20.2		18.0420	SS
144	163	I	1.48	0.00	4.4	21.4		19.3216	SS
145	198	I	-0.74	-1.28	4.4	21.1		19.0001	SS
146	200	I	0.74	-1.28	4.4	21.8		19.7520	SS

Table B-2. (continued)

BLOCK 1-5864 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
1	1	C	-3.70	6.41	4.2	10.5		8.2814	SS
2	11	C	3.70	6.41	4.2	8.5		6.4306	SS
3	154	C	-7.40	0.00	4.2	8.5		6.4306	SS
4	171	C	7.40	0.00	4.2	13.6		11.2451	SS
5	314	C	-3.70	-6.41	4.2	9.5		7.3500	SS
6	324	C	3.70	-6.41	4.2	10.7		8.4692	SS
7	2	F	-2.96	6.41	4.2	15.2		12.8199	SS
8	4	F	-1.48	6.41	4.6	22.8		20.9533	SS
9	5	F	-0.74	6.41	4.6	23.0		21.1727	SS
10	7	F	0.74	6.41	4.6	18.0		23.4702	TA
11	8	F	1.48	6.41	4.4	15.4		19.4674	TA
12	10	F	2.96	6.41	4.2	13.3		10.9533	SS
13	12	F	-4.07	5.77	4.2	12.7		10.3728	SS
14	23	F	4.07	5.77	4.2	14.1		11.7339	SS
15	37	F	-4.81	4.49	4.4	17.0		14.7140	SS
16	50	F	4.81	4.49	4.6	23.9		22.1659	SS
17	51	F	-5.18	3.85	4.4	16.0		13.6992	SS
18	65	F	5.18	3.85	4.6	23.8		22.0551	SS
19	82	F	-5.92	2.56	4.4	16.2		13.9012	SS
20	98	F	5.92	2.56	4.6	23.2		21.3926	SS
21	99	F	-6.29	1.92	4.4	15.2		12.8961	SS
22	116	F	6.29	1.92	4.6	22.2		20.2980	SS
23	136	F	-7.03	0.64	4.2	11.0		8.7517	SS
24	153	F	7.03	0.64	4.2	16.9		14.5267	SS
25	172	F	-7.03	-0.64	4.2	12.0		9.7011	SS
26	189	F	7.03	-0.64	4.4	18.6		16.3626	SS
27	209	F	-6.29	-1.92	4.4	19.1		16.8841	SS
28	226	F	6.29	-1.92	4.4	21.0		18.8931	SS
29	227	F	-5.92	-2.56	4.6	21.4		19.4310	SS
30	243	F	5.92	-2.56	4.4	20.6		18.4666	SS
31	260	F	-5.18	-3.85	4.4	20.5		18.3602	SS
32	274	F	5.18	-3.85	4.4	18.0		15.7408	SS
33	275	F	-4.81	-4.49	4.4	20.2		18.0420	SS
34	288	F	4.81	-4.49	4.4	17.8		15.5345	SS
35	302	F	-4.07	-5.77	4.4	15.5		13.1963	SS
36	313	F	4.07	-5.77	4.2	14.0		11.6359	SS
37	315	F	-2.96	-6.41	4.2	13.0		10.6625	SS
38	317	F	-1.48	-6.41	4.4	18.1		15.8441	SS
39	318	F	-0.74	-6.41	4.4	19.1		16.8841	SS
40	320	F	0.74	-6.41	4.4	17.8		15.5345	SS
41	321	F	1.48	-6.41	4.4	15.9		13.5984	SS
42	323	F	2.96	-6.41	4.2	13.8		11.4403	SS
43	14	R	-2.59	5.77	4.6	22.1		20.1892	SS
44	15	R	-1.85	5.77	4.6	18.2		23.7743	TA
45	17	R	-0.37	5.77	4.6	17.5		22.7130	TA
46	18	R	0.37	5.77	4.8	20.0		26.6911	TA
47	20	R	1.85	5.77	4.6	17.8		23.1668	TA
48	21	R	2.59	5.77	4.6	16.5		21.2116	TA
49	28	R	-1.48	5.13	4.8	19.7		26.2235	TA
50	29	R	-0.74	5.13	4.8	19.6		26.0680	TA
51	31	R	0.74	5.13	5.0	21.4		29.0536	TA
52	32	R	1.48	5.13	4.8	19.6		26.0680	TA
53	41	R	-1.85	4.49	4.8	19.2		25.4476	TA
54	43	R	-0.37	4.49	4.8	18.7		24.6761	TA
55	44	R	0.37	4.49	5.0	21.4		29.0536	TA

Table B-2. (continued)

BLOCK 1-5864 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
56	46	R	1.85	4.49	4.8	19.4		25.7575	TA
57	56	R	-1.48	3.85	5.0	21.6		29.3726	TA
58	57	R	-0.74	3.85	5.0	21.1		28.5763	TA
59	59	R	0.74	3.85	5.0	21.5		29.2130	TA
60	60	R	1.48	3.85	4.8	19.7		26.2235	TA
61	71	R	-1.85	3.20	5.0	22.1		30.1733	TA
62	73	R	-0.37	3.20	5.0	22.8		31.3015	TA
63	74	R	0.37	3.20	5.0	22.9		31.4634	TA
64	76	R	1.85	3.20	5.0	21.1		28.5763	TA
65	88	R	-1.48	2.56	5.0	22.2		30.3339	TA
66	89	R	-0.74	2.56	4.8	20.7		27.7884	TA
67	91	R	0.74	2.56	5.0	22.0		30.0128	TA
68	92	R	1.48	2.56	4.8	20.5		27.4740	TA
69	156	R	-5.92	0.00	4.6	15.1		19.1390	TA
70	157	R	-5.18	0.00	4.6	17.5		22.7130	TA
71	159	R	-3.70	0.00	5.0	22.5		30.8169	TA
72	160	R	-2.96	0.00	5.0	21.7		29.5324	TA
73	165	R	2.96	0.00	5.0	22.6		30.9783	TA
74	166	R	3.70	0.00	5.0	21.9		29.8525	TA
75	168	R	5.18	0.00	4.8	19.2		25.4476	TA
76	169	R	5.92	0.00	4.8	17.3		22.5389	TA
77	173	R	-6.29	-0.64	4.6	15.6		19.8753	TA
78	175	R	-4.81	-0.64	5.0	22.0		30.0128	TA
79	176	R	-4.07	-0.64	5.2	24.0		33.4351	TA
80	178	R	-2.59	-0.64	5.1	14.2	16.6	39.7495	TA
81	183	R	2.59	-0.64	5.0	13.4	15.5	36.8173	TA
82	185	R	4.07	-0.64	5.2	24.6		34.4262	TA
83	186	R	4.81	-0.64	5.0	22.8		31.3015	TA
84	188	R	6.29	-0.64	4.8	18.5		24.3687	TA
85	191	R	-5.92	-1.28	4.8	19.2		25.4476	TA
86	192	R	-5.18	-1.28	5.0	22.0		30.0128	TA
87	194	R	-3.70	-1.28	5.0	13.7	16.0	38.0019	TA
88	195	R	-2.96	-1.28	5.1	14.3	16.6	39.8968	TA
89	203	R	2.96	-1.28	5.0	13.0	15.1	35.6420	TA
90	204	R	3.70	-1.28	5.0	12.8	14.7	34.7607	TA
91	206	R	5.18	-1.28	5.1	23.0		31.7114	TA
92	207	R	5.92	-1.28	5.0	20.2		27.1539	TA
93	211	R	-4.81	-1.92	5.0	21.4		29.0536	TA
94	212	R	-4.07	-1.92	5.0	13.0	15.0	35.4937	TA
95	214	R	-2.59	-1.92	5.0	13.8	16.1	38.2980	TA
96	215	R	-1.85	-1.92	5.1	14.1	16.5	39.4511	TA
97	220	R	1.85	-1.92	5.2	24.5		34.2606	TA
98	221	R	2.59	-1.92	5.2	24.6		34.4262	TA
99	223	R	4.07	-1.92	5.1	23.0		31.7114	TA
100	224	R	4.81	-1.92	5.1	23.0		31.7114	TA
101	228	R	-5.18	-2.56	4.6	17.6		22.8641	TA
102	230	R	-3.70	-2.56	5.2	24.9		34.9241	TA
103	231	R	-2.96	-2.56	5.0	12.8	14.8	34.9085	TA
104	233	R	-1.48	-2.56	5.0	13.1	15.2	35.9353	TA
105	237	R	1.48	-2.56	5.2	24.9		34.9241	TA
106	239	R	2.96	-2.56	5.2	24.5		34.2606	TA
107	240	R	3.70	-2.56	5.1	22.9		31.5489	TA
108	242	R	5.18	-2.56	5.0	20.4		27.4688	TA
109	245	R	-4.81	-3.20	4.8	19.6		26.0680	TA
110	246	R	-4.07	-3.20	5.2	23.3		32.2869	TA

Table B-2. (continued)

BLOCK 1-5864 (4 PSIG)

OBS	HOLE	TYPE	XAXIS	YAXIS	METER	MEAS1	MEAS2	FLOW	GAGE
111	248	R	-2.59	-3.20	5.0	12.7	14.6	34.4688	TA
112	249	R	-1.85	-3.20	5.2	24.4		34.0951	TA
113	254	R	1.85	-3.20	5.1	23.2		32.0368	TA
114	255	R	2.59	-3.20	5.2	23.9		33.2706	TA
115	257	R	4.07	-3.20	5.0	21.9		29.8525	TA
116	258	R	4.81	-3.20	4.8	19.2		25.4476	TA
117	262	R	-3.70	-3.85	5.0	21.5		29.2130	TA
118	263	R	-2.96	-3.85	5.0	22.7		31.1398	TA
119	271	R	2.96	-3.85	4.8	20.3		27.1603	TA
120	272	R	3.70	-3.85	4.8	19.9		26.5351	TA
121	276	R	-4.07	-4.49	5.0	20.4		27.4688	TA
122	278	R	-2.59	-4.49	5.0	22.5		30.8169	TA
123	285	R	2.59	-4.49	5.0	21.4		29.0536	TA
124	287	R	4.07	-4.86	4.6	16.3		20.9135	TA
125	290	R	-3.70	-5.13	4.6	17.5		22.7130	TA
126	291	R	-2.96	-5.13	4.8	18.7		24.6761	TA
127	299	R	2.96	-5.13	4.6	17.6		22.8641	TA
128	300	R	3.70	-5.13	4.4	14.0		17.4324	TA
129	107	S	-0.37	1.92	5.0	23.0		31.6254	TA
130	108	S	0.37	1.92	5.0	22.7		31.1398	TA
131	124	S	-1.48	1.28	4.8	21.6		29.2116	TA
132	128	S	1.48	1.28	5.0	21.3		28.8943	TA
133	143	S	-1.85	0.64	4.8	21.4		28.8941	TA
134	146	S	1.85	0.64	4.8	19.2		25.4476	TA
135	179	S	-1.85	-0.64	5.0	14.7	17.2	41.2821	TA
136	182	S	1.85	-0.64	5.0	13.1	15.2	35.9353	TA
137	197	S	-1.48	-1.28	5.0	14.3	16.6	39.7836	TA
138	201	S	1.48	-1.28	5.2	25.0		35.0904	TA
139	217	S	-0.37	-1.92	5.0	13.5	15.5	36.9628	TA
140	218	S	0.37	-1.92	4.8	12.9	14.8	34.8515	TA
141	125	I	-0.74	1.28	4.8	19.5		25.9126	TA
142	127	I	0.74	1.28	4.8	21.1		28.4192	TA
143	162	I	-1.48	0.00	4.8	21.9		29.6891	TA
144	163	I	1.48	0.00	4.8	19.1		25.2930	TA
145	198	I	-0.74	-1.28	4.8	13.0	15.0	35.2899	TA
146	200	I	0.74	-1.28	5.0	23.6		32.6013	TA

Fig. B-1. Top view of HTGR graphite Fuel-element block.

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