

ANALYSIS OF LANSING-KANSAS CITY, MARMATON AND CHEROKEE GROUP
CORE SAMPLES FOR GAS CONTENT
-- COLT ENERGY #B2-6 SPENCER;
SE NW NE 6-T.18S.-R.21E., FRANKLIN COUNTY, KANSAS

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SUMMARY

Fourteen two-inch diameter core samples from the Pennsylvanian Lansing-Kansas City, Marmaton, and Cherokee Groups were collected from the Colt Energy #2-6 Spencer well, SE NW NE sec. 6-T.18S.-R.21E., in Franklin Co., KS from October 18 to November 8th, 2003. The following as-received gas contents were measured, based on the dry weight of the sample:

- 340.0' to 342.0' (Stark Shale) (4.2 scf/ton)
- 371.5' to 372.5' (Hushpuckney Shale) (15.3 scf/ton)
- 595.4' to 596.4' (Mulberry coal) (53.8 scf/ton)
- 596.4' to 597.4' (Mulberry coal) (60.4 scf/ton)
- 622.9' to 623.7' (Anna Shale) (24.5 scf/ton)
- 742.1' to 743.1' (Bevier coal) (87.2 scf/ton)
- 743.1' to 744.2' (Bevier coal) (69.1 scf/ton)
- 752.0' to 753.0' ("V shale") (22.5 scf/ton)
- 755.5' to 756.5' (Croweburg coal) (93.2 scf/ton)
- 779.5' to 781.0' (Mineral coal) (85.9 scf/ton)
- 794.0' to 795.0' (Scammon coal) (58.1 scf/ton)
- 815.3' to 816.9' (Tebo coal) (90.1 scf/ton)
- 891.7' to 893.9' (Dbj(?) coal) (111.3 scf/ton)
- 951.2' to 952.5' (Dry Wood(?) coal) (93.1 scf/ton)

Gas analyses of five desorbed coal gas indicate that these gases are dry gases, ranging from 930 to 1050 BTU/scf. Nitrogen is the major non-combustible component gas. Carbon dioxide contents range from 1% to 3%. Isotopic analysis indicate the gas is mixed thermogenic and biogenic in origin.

Based on gas content, density, and thickness measurements, the gas-in-place estimates for the respective units are:

<i>unit</i>	<i>gas per acre (thousand cubic ft)</i>
Stark Shale	24
Hushpuckney Shale	42
Mulberry	218
Anna Shale	71
Bevier	600
"V shale"	63
Croweburg	180
Mineral	242
Scammon	179
Tebo	356
Dbj(?)	321
Dry Wood(?)	467

BACKGROUND

The Colt Energy #2-6 Spencer well, SE NW NE sec. 6-T.18S-R.21E., in Franklin County, KS was selected for desorption tests in association with an on-going coalbed-gas research project at the Kansas Geological Survey, and with a grant from Colt Energy, Inc. The samples (2-inch-diameter cores) were gathered from October 18th, 2003 to November 8, 2003 by Troy A. Johnson and K. David Newell of the Kansas Geological Survey, with assistance by Jim Stegeman of Colt Energy. Samples were obtained by wireline coring. The well was drilled by a rig owned by Kansas Geological Survey.

Bottom-hole times (i.e., the time the core sample was lifted from the bottom of the hole) and canistering times (i.e., the time the sample was placed in the desorption canister) were noted in order to determine lost gas and start of desorption. Approximate wet weight of the sample was determined by subtraction of the weight of the empty canister from the weight of the canister with the sample in it. After the sample was removed from the canister, it was weighed again before air-drying, then weighed after drying. The weight loss is noted in the desorption table (Table 1).

Temperature baths for the desorption canisters were on site, with temperatures at 70 °F for the Anna Shale and shallower samples. Samples deeper than the Anna Shale were desorbed at 75 °F. The canistered samples were transported to the laboratory at the Kansas Geological Survey in Lawrence, KS each evening after their collection at the wellsite and desorption measurements were continued at these temperatures. Desorption measurements were periodically made until the canisters produced no more gas upon testing for at least two successive measurements.

DESORPTION MEASUREMENTS

The equipment and method for measuring desorption gas is that prescribed by McLennan and others (1995). The volumetric displacement apparatus is a set of connected dispensing burettes, one of which measures the gas evolved from the desorption canister. The other burette compensates for the compression that occurs when the desorbed gas displaces the water in the measuring burette. This compensation is performed by adjusting the cylinders so that their water levels are identical, then figuring the amount of gas that evolved by simply reading the difference in water level using the volumetric scale on the side of the burette.

Some of the canisters utilized for this study were made in-house at the Kansas Geological Survey. Canister LJ was 24 inches (61 cm) long and 3 inches (7.6 cm) in diameter, and enclosed a volume of 170 cubic inches (2786 cm³). The "Brady" canisters, also constructed in-house at the Kansas Geological Survey, were approximately 15 inches high (38 cm), 3 inches (7.5 cm) in diameter, and enclosed a volume of approximately 106 cubic inches (1738 cm³). The "M" canisters were approximately 13 inches high (33 cm), 3 inches (7.5 cm) in diameter, and enclosed a volume of approximately 92 cubic inches (1505 cm³). The remaining canisters were commercially obtained from SSD, Inc. in Grand Junction, CO. On average, these canisters were approximately 12.5 inches high (32 cm), 3 1/2 inches (9 cm) in diameter, and enclosed a volume of approximately 150 cubic inches (2450 cm³). The desorbed gas that collected in the desorption canisters was periodically released into the volumetric displacement apparatus and measured as a function of time, temperature and atmospheric pressure.

The time and atmospheric pressure were measured in the field using a portable weather station (model BA928) marketed by Oregon Scientific (Tualatin, OR). The atmospheric pressure was displayed in millibars on this instrument, however, this measurement was not the actual barometric pressure, but rather an altitude-compensated barometric pressure automatically converted to a sea-level-equivalent pressure. In order to translate this measurement to actual atmospheric pressure, a regression correlation was determined over several weeks by comparing readings from the Oregon Scientific instrument to that from a pressure transducer in the Petrophysics Laboratory in the Kansas Geological Survey in Lawrence, Kansas (Figure 1). The regression equation shown graphically in Figure 1 was entered into a spreadsheet and was used to automatically convert the millibar measurement to barometric pressure in psi.

A spreadsheet program written by K.D. Newell (Kansas Geological Survey) was used to convert all gas volumes at standard temperature and pressure. Conversion of gas volumes to standard temperature and pressure was by application of the perfect-gas equation, obtainable from basic college chemistry texts:

$$n = PV/RT$$

where n is moles of gas, T is degrees Kelvin (i.e., absolute temperature), V is in liters, and R is the universal gas constant, which has a numerical value depending on the units in which it is measured (for example, in the metric system $R = 0.0820$ liter atmosphere per degree mole). The number of moles of gas (i.e., the value n) is constant in a volumetric conversion, therefore the conversion equation, derived from the ideal gas equation, is:

$$(P_{\text{stp}} V_{\text{stp}})/(RT_{\text{stp}}) = (P_{\text{rig}} V_{\text{rig}})/(RT_{\text{rig}})$$

Customarily, standard temperature and pressure for gas volumetric measurements in the oil industry are 60 °F and 14.7 psi (see Dake, 1978, p. 13), therefore P_{stp} , V_{stp} , and T_{stp} , respectively, are pressure, volume and temperature at standard temperature and pressure, where standard temperature is degrees Rankine ($^{\circ}\text{R} = 460 + ^{\circ}\text{F}$). P_{rig} , V_{rig} , and T_{rig} , respectively, are ambient pressure, volume and temperature measurements taken at the rig site or in the desorption laboratory.

The universal gas constant R drops out as this equation is simplified and the determination of V_{stp} becomes:

$$V_{\text{stp}} = (T_{\text{stp}}/T_{\text{rig}}) (P_{\text{rig}}/P_{\text{stp}}) V_{\text{rig}}$$

The conversion calculations in the spreadsheet were carried out in the English metric system, as this is the customary measure system used in American coal and oil industry. V is therefore converted to cubic feet; P is psia; T is °R.

The desorbed gas was summed over the time period for which the coal samples evolved all of their gas.

Lost gas (i.e., the gas lost from the sample from the time it was drilled, brought to the surface, to the time it was canistered) was determined using the direct method (Kissel and others, 1975; also see McLennan and others, 1995, p. 6.1-6.14) in which the cumulative gas evolved is plotted against the square root of elapsed time. Time zero is assumed to be instant the core sample is lifted from the bottom of the hole. Characteristically, the cumulative gas evolved from the sample, when plotted against the square root of time, is linear for a short time period after the sample reaches ambient pressure conditions, therefore lost gas is determined by a line projected back to time zero. The period of linearity generally is about two hours for core samples.

LITHOLOGIC ANALYSIS

Upon removal from the canisters, the cores were washed of drilling mud, and air-dried for several days. After drying, the cores were weighed again to obtain a dry-weight based gas content.

DATA PRESENTATION

Data and analyses accompanying this report are presented in the following order: 1) data tables for the desorption analyses, 2) lost-gas graphs, 3) desorption graphs for individual samples, and 4) desorption graph for all samples at a common scale, 5) gas chemistry diagrams, and 6) reserve diagrams.

Data Tables of the Desorption Analyses (Table 1)

These are the basic data used for lost-gas analysis and determination of total gas desorbed from the core samples. Basic temperature, volume, and barometric measurements are listed at left. Farther to the right, these are converted to standard temperature, pressure and volumes. The volumes are cumulatively summed, and converted to scf/ton based on the total weight of coal and dark shale in the sample. At the right of the table, the time of the measurements are listed and converted to hours (and square root of hours) since the sample was drilled.

Lost-Gas Graphs (Figures 2-15)

Gas lost prior to the canistering of the sample was estimated by extrapolation of the first few data points after the sample was canistered. The linear characteristic of the initial desorption measurements was usually lost within the first two hours after canistering, thus data are presented in the lost-gas graphs for only up to 9 hours after canistering. Lost-gas volumes derived from this analysis are incorporated in the data tables described above.

Desorption Graphs (Figures 16-17)

The first graph (Figure 16) has all the desorption curves on it at a common scale. The second (Figure 17) expresses the desorption in terms of percentage of the total gas desorbed with time. Sorption times are derived from this latter figure.

Gas Chemistry (Figure 18)

Gas isotopic chemistry is crossplotted and compared to other nearby gases (Figure 18).

Reserve Estimate (Figure 19)

Gas reserves are calculated based on desorption data, and crossplotted with sorption time, which is a semi-quantitative indicator of production rates.

Appendix 1

These are photocopies of the results of the Luman's Laboratories proximate analyses.

Appendix 2

These are photocopies of the results of the Isotech Laboratories compositional and isotopic analysis.

RESULTS and DISCUSSION

The following gas contents are calculated, based on dry weight of the sample:

- 340.0' to 342.0' (Stark Shale) (4.2 scf/ton)
- 371.5' to 372.5' (Hushpuckney Shale) (15.3 scf/ton)
- 595.4' to 596.4' (Mulberry coal) (53.8 scf/ton)
- 596.4' to 597.4' (Mulberry coal) (60.4 scf/ton)
- 622.9' to 623.7' (Anna Shale) (24.5 scf/ton)
- 742.1' to 743.1' (Bevier coal) (87.2 scf/ton)
- 743.1' to 744.2' (Bevier coal) (69.1 scf/ton)
- 752.0' to 753.0' ("V shale") (22.5 scf/ton)
- 755.5' to 756.5' (Croweburg coal) (93.2 scf/ton)
- 779.5' to 781.0' (Mineral coal) (85.9 scf/ton)
- 794.0' to 795.0' (Scammon coal) (58.1 scf/ton)
- 815.3' to 816.9' (Tebo coal) (90.1 scf/ton)
- 891.7' to 893.9' (Dbj(?) coal) (111.3 scf/ton)
- 951.2' to 952.5' (Dry Wood(?) coal) (93.1 scf/ton)

Proximate analyses were made for ten selected coals in early 2005. The core was cut down its vertical axis and half was preserved for future analyses. The proximate analyses were performed on the following samples by Luman's Laboratory (see Appendix 1):

Luman's Lab proximate analysis:

<i>unit</i>	<i>depth</i>	<i>moisture</i>	<i>ash</i>	<i>moisture-free ash</i>
Mulberry	596.4'	4.41%	18.72%	19.58%
Anna Shale	622.9'	1.36%	76.34%	77.40%
Bevier	742.1'	2.06%	11.75%	12.00%
Bevier	743.1'	3.04%	26.64%	27.47%
Croweburg	755.5'	2.00%	18.81%	19.20%
Mineral	779.5'	1.98%	19.84%	20.25%
Scammon	794.0'	3.14%	35.17%	36.31%
Tebo	815.3'	2.45%	27.64%	28.34%
Dbj(?)	891.7'	2.70%	29.72%	30.55%

Dry Wood(?)	951.2'	1.64%	17.22%	17.51%
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According to the BTU/lb. (dry, ash-free) determinations, all the samples can be classified as high-volatile B bituminous to high-volatile A bituminous coal.

Simple ashing of the remaining samples were carried out at the Kansas Geological Survey were carried out in a muffle furnace in which the samples were first weighed and then subjected to 110 °C until their weight stabilized. This first firing approximates moisture content. A second firing at 750 °C for three to four days essentially ashed the sample. Two crucibles of sample were utilized for both the 110 °C and 750 °C firings. Each crucible was filled with approximately 1.5 grams of pulverized material (i.e., < 0.0460" sieve size). Results were accepted if the difference in weight loss for each sample was less than 2%. The analyses are as follows:

<i>unit</i>	<i>depth</i>	<i>moisture</i>	<i>ash</i>	<i>moisture-free ash</i>
Stark Shale	340.0'	2.32%	79.48%	81.37%
Hushpuckney Shale	371.5'	1.20%	74.15%	75.05%
Mulberry	595.4'	2.98%	14.08%	14.51%
"V shale"	752.0'	1.98%	77.28%	78.78%

Using the equation from McLennan and others (1995):

$$G_c = G_{pc} (1 - a_d)$$

where:

G_c = gas content, scf/ton

G_{pc} = "pure coal", gas content, scf/ton

a_d = dry ash content, weight fraction

the gas content of the samples converts to:

<i>unit</i>	<i>depth</i>	<i>moisture-free ash</i>	G_c	G_{pc}
Stark Shale	340.0'	81.37% ¹	4.2 scf/ton	22.3 scf/ton
Hushpuckney Shale	371.5'	75.05% ¹	15.3 scf/ton	61.3 scf/ton
Mulberry	595.4'	14.51% ¹	53.8 scf/ton	62.9 scf/ton
Mulberry	596.4'	19.58%	60.4 scf/ton	75.1 scf/ton
Anna Shale	622.9'	77.40%	24.5 scf/ton	108.4 scf/ton
Bevier	742.1'	12.00%	87.2 scf/ton	99.1 scf/ton
Bevier	743.1'	27.47%	69.1 scf/ton	99.3 scf/ton
"V shale"	752.0'	78.78% ¹	22.5 scf/ton	106.0 scf/ton
Croweburg	755.5'	19.20%	93.2 scf/ton	115.3 scf/ton
Mineral	779.5'	20.25%	85.9 scf/ton	107.7 scf/ton
Scammon	794.0'	36.31%	58.1 scf/ton	91.2 scf/ton
Tebo	815.3'	28.34%	90.1 scf/ton	125.7 scf/ton
Dbj(?)	891.7'	30.55%	111.3 scf/ton	160.3 scf/ton
Dry Wood(?)	951.2'	17.51%	93.1 scf/ton	112.9 scf/ton

¹KGS simplified ashing

Samples were also tested for their density. Dried samples were weighed and immersed in water in a beaker filled to its brim. With placing the sample in the beaker, the displaced water was spilled from the beaker and subsequently weighed. The volume of the sample is thus easily converted to volume using 1 gram/cc for the density of the water. The following density measurements were calculated:

<i>unit</i>	<i>depth</i>	<i>density and uncertainty</i>
Stark Shale	340.0'	2.02 g/cc ± 0.04
Hushpuckney Shale	371.5'	2.00 g/cc ± 0.01
Mulberry	595.4'	1.34 g/cc ± 0.03
Mulberry	596.4'	1.33 g/cc ± 0.05
Anna Shale	622.9'	2.14 g/cc ± 0.03
Bevier	742.1'	1.34 g/cc ± 0.03
Bevier	743.1'	1.50 g/cc ± 0.04
"V shale"	752.0'	2.07 g/cc ± 0.02
Croweburg	755.5'	1.42 g/cc ± 0.04
Mineral	779.5'	1.38 g/cc ± 0.01
Scammon	794.0'	1.74 g/cc ± 0.06
Tebo	815.3'	1.53 g/cc ± 0.01
Dbj(?)	891.7'	1.63 g/cc ± 0.04
Dry Wood(?)	951.2'	1.42 g/cc ± 0.04

Compositional and isotopic chemistry were performed on five gas samples. These analyses are in Appendix II and were performed by Isotech Laboratories in Champaign, IL.

Isotopic Analyses

Analysis	Mulberry (595.4')	Bevier (742.1')	Mineral (779.5')	Tebo (815.3')	Dry Wood(?) (951.2')
$\delta^{13}\text{CO}_2$	-14.18	-17.11	-14.62	-13.53	-2.03
$\delta^{13}\text{C}_{\text{methane}}$	-61.94	-60.67	-61.14	-61.90	-59.42
$\delta\text{DC}_{\text{methane}}$	-226.3	-227.9	-227.7	-224.3	-242.0
$\delta^{13}\text{C}_{\text{ethane}}$	-36.03	-37.01	-36.33	-33.80	-27.76
$\delta\text{DC}_{\text{ethane}}$	-174.5	-191.6	-188.3	-161.6	

Chemical Analyses (as reported; red = hydrocarbons; blue = non hydrocarbons, green = oxygen)

Component (%)	Mulberry	Bevier	Mineral	Tebo	Dry Wood(?)
Methane	63.89	64.52	63.93	75.49	60.48
Ethane	0.427	0.810	0.646	0.701	0.140
Propane	0.212	1.18	0.739	0.233	0.131
n-Butane	0.0122	0.264	0.167	0.0193	0.0059
iso-Butane	0.0727	0.102	0.0469	0.0454	0

n-Pentane	0	0.0071	0.0147	0.0032	0
iso-Pentane	0.002	0.0302	0.0148	0.0098	0
Hexane+	0.0092	0.0091	0.0121	0.0065	0.0025
Nitrogen	34.03	30.33	31.73	22.17	36.60
Oxygen	0.0063	1.47	1.19	0.0518	0.0051
Argon	0.396	0.347	0.355	0.239	0.405
Hydrogen	0	0	0	0	0.0248
Carbon Dioxide	0.94	0.92	1.14	1.02	2.18
Helium	0	0.0084	0.0169	0.0093	0.0263

Chemical Analyses (recalculated after removing atmospheric contamination; red = hydrocarbons; blue = non hydrocarbons)

Component (%)¹	Mulberry	Bevier	Mineral	Tebo	Dry Wood(?)
Methane	63.91	69.39	67.77	75.68	60.49
Ethane	0.427	0.871	0.685	0.703	0.140
Propane	0.212	1.27	0.783	0.234	0.131
n-Butane	0.0122	0.284	0.177	0.0193	0.0059
iso-Butane	0.0727	0.110	0.0497	0.0455	0
n-Pentane	0	0.0076	0.0156	0.0032	0
iso-Pentane	0.002	0.0325	0.0157	0.0098	0
Hexane+	0.0092	0.0098	0.0128	0.0065	0.0025
Nitrogen	34.02	26.73	28.94	22.03	36.59
Argon	0.396	0.303	0.320	0.237	0.405
Hydrogen	0	0	0	0	0.0248
Carbon Dioxide	0.94	0.99	1.21	1.02	2.18
Helium	0	0.0090	0.0179	0.0093	0.0263

¹atmospheric component (based on oxygen content) subtracted from the analysis, with components recalculated to 100%

Summary

	Mulberry	Bevier	Mineral	Tebo	Dry Wood(?)
Calculated BTU	692	799	759	822	646
Total % non-HCs	35.35	28.03	30.49	23.30	39.23
HC Wetness (%)	1.14	3.59	2.50	1.33	0.46

Plotting of the isotopes and gas wetness (Figure 18) indicates that the gas is of mixed biogenic and thermogenic origin.

The low-BTU value of the gas is suspicious, considering that low-BTU gases are not common in the Cherokee Group in the vicinity of the well. The coals and shales were placed in the desorption canisters without cover of water, and consequently the oxygen in the canister could have been taken up by oxidation reactions with the rock sample. A low amount of oxygen in the canister could therefore be the basis for an inadequate atmospheric correction to the composition of the gas, since the correction for atmospheric contents in the canister is based on the atmospheric ratios of other gases to oxygen.

The gas compositions can be independently checked and corrected by calculating the theoretical amount of oxygen that should be in the canisters at the time the gas was collected for compositional analysis. The basis for this is calculation of the free-air volume in the canister, which is determined by subtracting the sample volume from the canister volume. The canister volume is a measured value. The sample volume is determined by:

$$V_{\text{coal}} = W_{\text{coal}} / \rho_{\text{coal}}$$

where V_{coal} is the volume of the sample; W_{coal} is the dry weight of the sample; ρ_{coal} is the density of the sample.

The theoretical amount of oxygen in the desorption canister at the time of gas sampling is determined by a series of calculations that yield the fraction (and volume) of atmosphere in the canister after each desorption test. Implicit in this is the assumption that there is perfect mixing of the desorbed gas with the atmosphere in the canister, and that after each test when gas is yielded from the canister a new composition of gas in the canister can then be calculated. The variables and calculation sequence are:

V_0 = free volume in canister (i.e., total canister volume - sample volume)

$$V_{\text{test}_0} = 0$$

V_{test_1} = volume of gas tested at first test

V_{test_2} = volume of gas tested at second test, etc.

Frac atm₀ = fraction of V_0 that is atmosphere (= 1 when sample is canistered)

Frac atm₁ = fraction of V_0 that is atmosphere after V_{test_1}

$$\text{Frac atm}_1 = V_{\text{test}_1} / (V_0 + V_{\text{test}_0})$$

Vol atm₁ = volume of atmosphere in canister after first test

$$\text{Vol atm}_1 = \text{Frac atm}_1 * V_0$$

Frac atm₂ = Vol atm₁ / ($V_0 + V_{\text{test}_2}$)

$$\text{Vol atm}_2 = \text{Frac atm}_2 * V_0$$

Frac atm_n = Vol atm_(n-1) / ($V_0 + V_{\text{test}_n}$)

$$\text{Vol atm}_n = \text{Frac atm}_n * V_0$$

The following is an example of the calculations for the theoretical amount of oxygen that should have been in the canister Brady 28 for when the gas sample was gathered from the Mulberry coal (595.4'):

$V_{\text{can}} = 1738.00 \text{ cm}^3$ = volume of canister Brady 28

$W_{\text{coal}} = 774.42 \text{ gr}$ = weight of coal

$\rho_{\text{coal}} = 1.34 \text{ gr/cm}^3$ = density of coal

$$V_{\text{coal}} = W_{\text{coal}} / \rho_{\text{coal}} = 577.93 \text{ cm}^3$$

$$V_0 = 1160.07 \text{ cm}^3 = \text{free volume in canister} = V_{\text{can}} - V_{\text{coal}} = 1738.00 \text{ cm}^3 - 577.93 \text{ cm}^3$$

Vtest (cm ³)	Frac atm	Vol atm (cm ³)
0	1	1160.07
18	0.9847	1142.35
9	0.9771	1133.56
5	0.9729	1128.69
5	0.9688	1123.85
5	0.9646	1119.02
1	0.9638	1118.06
1	0.9630	1117.10
7	0.9572	1110.40
4	0.9539	1106.58
10	0.9457	1097.12
10	0.9377	1087.75
11	0.9288	1077.53
66	0.8788	1019.53
111	0.8021	930.49
49	0.7696	892.78
62	0.7305	847.49
50	0.7004	812.47
36	0.6793	788.02
23	0.6661	772.70
30	0.6493	753.22
35	0.6303	731.16
11	0.6243	724.29
15	0.6164	715.05
24	0.6039	700.55
14	0.5967	692.20
8	0.5926	687.46
29	0.5781	670.69
77	0.5422	628.95
40	0.5241	607.98
50	0.5024	582.86
23	0.4927	571.53
28	0.4811	558.06
71	0.4533	525.87
63	0.4300	498.79
60	0.4088	474.26
27	0.3995	463.47 (gas collected for analysis)
7	0.3971	460.69 (gas collected for analysis)
61	0.3773	437.68 (gas collected for analysis)
15	0.3725	432.09 (gas collected for analysis)
31	0.3628	420.84 (gas collected for analysis)
45	0.3492	405.13 (gas collected for analysis)

Oxygen composes 0.2095 of the atmosphere. The theoretical fraction of oxygen in the canister when the final amount of canister gas was drawn for analysis is therefore 0.0732 (i.e., $0.2095 * 0.3492$). Multiplying $0.0732 * 1160.07 \text{ cm}^3$ indicates that 84.9 cm^3 of oxygen should have been remaining in the canister, but according to the as-reported chemical analysis of the gas, only 0.07 cm^3 of oxygen were present (i.e., $0.0063\% * 1160.07 \text{ cm}^3$). The discrepancy is likely due to the removal of the oxygen by chemical reactions with the sample.

If 84.9 cm^3 of oxygen were present, the composition of gas should have been reported as follows:

Component (%)	Mulberry (595.4')
Methane	58.21
Ethane	0.396
Propane	0.197
n-Butane	0.0113
iso-Butane	0.0674
n-Pentane	0
iso-Pentane	0.002
Hexane+	0.0085
Nitrogen	31.54
Oxygen	7.32
Argon	0.367
Hydrogen	0
Carbon Dioxide	0.87
Helium	0

Removing the theoretical amount of oxygen, and other atmospheric gases in their ratio to oxygen, yields the following corrected analysis:

Chemical Analyses (recalculated after removing atmospheric contamination; red = hydrocarbons; blue = non hydrocarbons)

Component (%) ¹	Mulberry (595.4')
Methane	90.98
Ethane	0.608
Propane	0.302
n-Butane	0.0174
iso-Butane	0.1035
n-Pentane	0
iso-Pentane	0.003
Hexane+	0.0131
Nitrogen	6.59
Argon	0.065
Hydrogen	0
Carbon Dioxide	1.32
Helium	0

¹atmospheric component (based on oxygen content) subtracted from the analysis, with components recalculated to 100%

Summary

	Mulberry (595.4')
Calculated BTU	986
Total % non-HCs	7.98

A second test is the other Mulberry coal canister (Brady 24), which also contributed to the Mulberry gas analysis. Running through the above calculations (not shown) for this canister indicates that 0.0640 is the theoretical fraction of oxygen (73.9 cm³) that should be in the canister at the time of gas sampling. Again, according to the chemical analysis of the gas, only 0.07 cm³ of oxygen were present.

If the theoretical amount of oxygen were actually present, then the composition of gas should have been reported as follows:

Component (%)	Mulberry (596.4')
Methane	59.80
Ethane	0.340
Propane	0.198
n-Butane	0.0114
iso-Butane	0.0681
n-Pentane	0
iso-Pentane	0.002
Hexane+	0.0086
Nitrogen	31.85
Oxygen	6.40
Argon	0.371
Hydrogen	0
Carbon Dioxide	0.88
Helium	0

Removing the theoretical amount of oxygen, and other atmospheric gases in their ratio to oxygen, yields the following corrected analysis:

Chemical Analyses (recalculated after removing atmospheric contamination; red = hydrocarbons; blue = non hydrocarbons)

Component (%)¹	Mulberry (596.4')
Methane	86.08
Ethane	0.575
Propane	0.286
n-Butane	0.0164
iso-Butane	0.0979
n-Pentane	0
iso-Pentane	0.003

Hexane+	0.0124
Nitrogen	11.55
Argon	0.125
Hydrogen	0
Carbon Dioxide	1.25
Helium	0

¹atmospheric component (based on oxygen content) subtracted from the analysis, with components recalculated to 100%

Summary

	Mulberry (596.4')
Calculated BTU	933
Total % non-HCs	12.93

The following are the calculations for the two Bevier coal canisters, which also contributed to the Bevier gas analysis. Bevier (742.1') should have had 53.9 cm³ of oxygen, but only 12.9 cm³ were present. Bevier (743.1') should have had 44.2 cm³ of oxygen, but only 13.0 cm³ were present.

Chemical Analyses (recalculated after removing atmospheric contamination; red = hydrocarbons; blue = non hydrocarbons)

Component (%)¹	Bevier (742.1')	Bevier (743.1')
Methane	86.81	81.65
Ethane	1.090	1.025
Propane	1.588	1.493
n-Butane	0.3552	0.3341
iso-Butane	0.1372	0.1291
n-Pentane	0.0096	0.0090
iso-Pentane	0.0406	0.0382
Hexane+	0.0122	0.0115
Nitrogen	8.63	14.00
Argon	0.083	0.148
Hydrogen	0	0
Carbon Dioxide	1.23	1.15
Helium	0.0111	0.0105

¹atmospheric component (based on oxygen content) subtracted from the analysis, with components recalculated to 100%

Summary

	Bevier (742.1')	Bevier (743.1')
Calculated BTU	999	940
Total % non-HCs	9.95	15.31

The following are the calculations for the Mineral (779.5'), Tebo (815.3'), and Dry Wood(?) (951.2') samples. The Mineral (779.5') sample should have had 125.7 cm³ of oxygen, but only 18.7 cm³ were present. The Tebo (815.3') sample should have had 67.8 cm³ of oxygen, but only 18.2 cm³ were present. The Dry Wood(?) (951.2') sample should have had 149.4 cm³ of oxygen, but only 0.1 cm³ were present.

Chemical Analyses (recalculated after removing atmospheric contamination; red = hydrocarbons; blue = non hydrocarbons)

Component (%)¹	Mineral (779.5')	Tebo (815.3')	Dry Wood(?) (951.2')
Methane	96.37	91.57	93.92
Ethane	0.974	0.850	0.217
Propane	1.111	0.283	0.203
n-Butane	0.252	0.0234	0.0092
iso-Butane	0.0707	0.0551	0
n-Pentane	0.0222	0.0039	0
iso-Pentane	0.0223	0.0119	0
Hexane+	0.0182	0.0079	0.0039
Nitrogen	-0.53	5.92	2.23
Argon	-0.041	0.040	-0.022
Hydrogen	0	0	0.0385
Carbon Dioxide	1.70	1.23	3.36
Helium	0.0252	0.0111	0.0405

¹atmospheric component (based on oxygen content) subtracted from the analysis, with components recalculated to 100%

Summary

	Mineral (779.5')	Tebo (815.3')	Dry Wood(?) (951.2')
Calculated BTU	1080	995	1003
Total % non-HCs	1.16	7.20	5.65

Negative percentages for nitrogen and argon suggest that there are slight overcorrections to these calculations. Remaining gas percentages are thus slightly inflated.

In summary, due to the placing of cores in the canisters without a water cover, some of the oxygen in the canister was likely removed due to oxidation reactions with the coal. The atmospheric nitrogen remains though and calculating it out based on oxygen content of the analyzed gas sample causes an undercorrection in the gas composition, resulting in an artificially low calculated BTU. The recalculated BTUs, based on what oxygen should have been in the canisters, indicates the heating values of the coalbed gases should be in the normal range for natural gases (i.e., approximately 950 BTU, or greater).

As a corollary, and due to the volume of oxygen that was consumed by the samples, the gas content of all the samples is slightly under estimated. Adding the missing volume of oxygen to the samples increases their gas content as follows:

<i>Sample</i>	<i>scf/ton</i>	<i>missing volume</i>	<i>revised scf/ton</i>	<i>increase</i>
Mulberry (595.4')	53.8	84.8 cm ³	57.1	6.1 %
Mulberry (596.4')	60.4	73.8 cm ³	63.3	4.8 %
Bevier (742.1')	87.2	41.0 cm ³	88.8	1.8 %
Bevier (743.1)	69.1	31.2 cm ³	70.1	1.4 %
Mineral (779.5')	85.9	107.0 cm ³	88.4	2.9 %
Tebo (815.3')	90.1	49.6 cm ³	91.0	1.0 %
Dry Wood (951.2')	93.1	149.3 cm ³	97.1	4.3 %

Average upward correction to the gas content is 3.2%

An estimate of gas reserves per acre for the coals and shales tested can be made using thickness, density, and gas content data:

<i>unit</i>	<i>thickness</i> ¹ <i>(ft)</i>	<i>coal/shale per acre</i>		<i>gas per acre</i> <i>(thousand cubic ft)</i> ⁴
		<i>(ft³)</i> ²	<i>(ton)</i> ³	
Stark Shale	2.0	87,120	5493	23.5
Hushpuckney Shale	1.0	43,560	2719	41.6
Mulberry	2.1	91,476	3812	217.7 ⁵
Anna Shale	1.0	43,560	2910	71.3
Bevier	4.0	174,240	7723	600.1 ⁶
"V shale"	1.0	43,560	2815	63.3
Croweburg	1.0	43,560	1931	179.9
Mineral	1.5	65,340	2815	241.8
Scammon	1.3	56,628	3076	178.7
Tebo	1.9	82,764	3953	355.7
Dbj(?)	1.3	56,628	2881	320.7
Dry Wood(?)	2.6	113,256	5020	467.4

¹thicknesses (ft) from Johnson (2004)

²thickness (ft) X 43,560 ft²/acre

³ft³ coal or shale per acre X density (g/cm³) X (1/ 907,168 g/ton) X 28,317 cm³/ft³

⁴tons coal or shale per acre X gas content (ft³/ton)

⁵averaged density (1.34 g/cm³) and gas content (57.1 ft³/ton) used

⁶averaged density (1.42 g/cm³) and gas content (77.7 ft³/ton) used

Sorption times (time required to desorb 62.3% of the total gas content) for the samples are as follows:

<i>unit</i>	<i>depth</i>	<i>sorption time (days)</i>
Stark Shale	340.0'	58.5
Hushpuckney Shale	371.5'	120.1
Mulberry	595.4'	7.1
Mulberry	596.4'	8.0
Anna Shale	622.9'	64.1
Bevier	742.1'	38.4

Bevier	743.1'	16.8
"V shale"	752.0'	30.7
Croweburg	755.5'	33.4
Mineral	779.5'	60.3
Scammon	794.0'	9.6
Tebo	815.3'	21.4
Dbj(?)	891.7'	16.8
Dry Wood(?)	951.2'	48.8

A reserves versus sorption time diagram is shown in Figure 19.

REFERENCES

- Dake, L.P., 1978, Fundamentals of Reservoir Engineering, Elsevier Scientific Publishing, New York, NY, 443 p.
- Johnson, T.A., 2004, Stratigraphy, depositional environments, and coalbed gas potential of Middle Pennsylvanian (Desmoinesian Stage) coals -- Bourbon Arch region, eastern Kansas: unpublished M.S. thesis, University of Kansas, Lawrence, KS, 309 p.
- Kissel, F.N., McCulloch, C.M., and Elder, C.H., 1975, The direct method of determining methane content of coals for ventilation design: U.S. Bureau of Mines, Report of Investigations, RI7767.
- McLennan, J.D., Schafer, P.S., and Pratt, T.J., 1995, A guide to determining coalbed gas content: Gas Research Institute, Chicago, IL, Reference No. GRI-94/0396, 180 p.

FIGURES, TABLES, and APPENDICES

FIGURE 1. Correlation of field barometer to Petrophysics Lab pressure transducer.

TABLE 1. Desorption measurements for samples.

FIGURE 2. Lost-gas graph for 340.0' to 342.0' (Stark Shale).

FIGURE 3. Lost-gas graph for 371.5' to 372.5' (Hushpuckney Shale).

FIGURE 4. Lost-gas graph for 595.4' to 596.4' (Mulberry coal).

FIGURE 5. Lost-gas graph for 596.4' to 597.4' (Mulberry coal).

FIGURE 6. Lost-gas graph for 622.9' to 623.7' (Anna Shale).

FIGURE 7. Lost-gas graph for 742.1' to 743.1' (Bevier coal).

FIGURE 8. Lost-gas graph for 743.1' to 744.2' (Bevier coal).

FIGURE 9. Lost-gas graph for 752.0' to 753.0' ("V shale").

FIGURE 10. Lost-gas graph for 755.5' to 756.5' (Croweburg coal).

FIGURE 11. Lost-gas graph for 779.5' to 781.0' (Mineral coal).

FIGURE 12. Lost-gas graph for 794.0' to 795.0' (Scammon coal).

FIGURE 13. Lost-gas graph for 815.3' to 816.9' (Tebo coal).

FIGURE 14. Lost-gas graph for 891.7' to 893.9' (Dbj(?) coal).

FIGURE 15. Lost-gas graph for 951.2' to 952.5' (Dry Wood(?) coal)

FIGURE 16. Desorption graph for all samples.

FIGURE 17. Sorption Times for all samples.

FIGURE 18. Gas chemistry of samples compared to other nearby samples.

FIGURE 19. Reserves and sorption times for all units.

APPENDIX I. Proximate analyses of 10 coal samples by Luman's Laboratories, Chetopa, KS.

APPENDIX II. Chemical and isotopic analyses of 5 gas samples by Isotech Laboratories, Champaign, IL.

Correlation of Field Barometer to KGS Petrophysics Lab Barometer

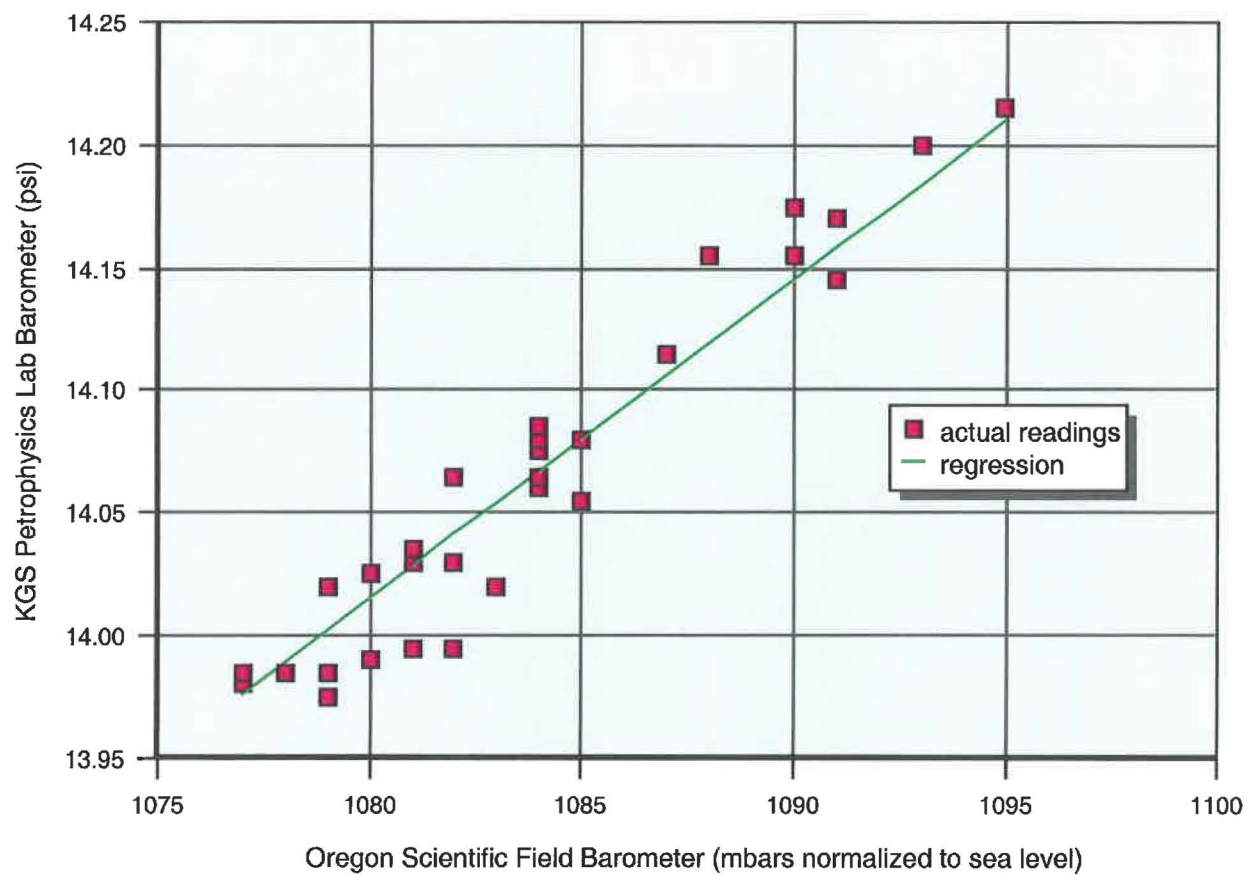


FIGURE 1.

TABLE 1 -- Desorption measurements for Coll: #2-6 Spencer, SE NW NE 6-18S-21E, Franklin Co., KS

SAMPLE: 340.0' to 342.0' (Stark Shale) in canister LJ		lbs.	grams	moisture %	est. lost gas (cc) =	TIME OF:		elapsed time (off bottom to canistering)														
dry sample weight:		5.796	2628.98		5	off bottom	at surface	in canister														
wet sample weight:				2.73%		10/18/03 13:39	10/18/03 13:40	10/18/03 13:48	0.154 hours													
RIG/LAB MEASUREMENTS		CONVERSION OF RIG/LAB MEASUREMENTS TO STP (@60 deg F, 14.7 psi)			CUMULATIVE VOLUMES (@STP)		SCF/TON	SCF/TON	TIME OF MEASURE	TIME SINCE	TIME SINCE	TIME SINCE	TIME SINCE	TIME SINCE	TIME SINCE	TIME SINCE	TIME SINCE	TIME SINCE	TIME SINCE			
measured cc	measured T (F)	measured P	cubic ft	absolute T (F) psia	cubic ft (@STP)	cc (@STP)	cubic ft	cc	without lost gas	with lost gas	off bottom	at surface	in canister	in canister	in canister	in canister	in canister	in canister	in canister			
0.5	70	1081	2E-05	530 14.031	1.65357E-05	0.47	1.65357E-05	0.47	0.01	0.07	10/18/03 14:00	0:21:00	0:19:45	0:11:45	0:11:45	0:11:45	0:11:45	0:11:45	0:11:45	0.591607978		
0.5	70	1081	2E-05	530 14.031	1.65357E-05	0.47	3.30714E-05	0.94	0.01	0.07	10/18/03 14:05	0:26:00	0:24:45	0:16:45	0:16:45	0:16:45	0:16:45	0:16:45	0:16:45	0:16:45	0.656280589	
1	70	1081	4E-05	530 14.031	3.30714E-05	0.94	6.61429E-05	1.87	0.02	0.08	10/18/03 14:10	0:31:00	0:29:45	0:21:45	0:21:45	0:21:45	0:21:45	0:21:45	0:21:45	0:21:45	0.718795289	
4	70	1081	0.0001	530 14.031	0.000132288	3.75	0.000198429	5.82	0.07	0.13	10/18/03 14:23	0:44:00	0:42:45	0:34:45	0:34:45	0:34:45	0:34:45	0:34:45	0:34:45	0:34:45	0.856348839	
1	70	1081	4E-05	530 14.031	3.30714E-05	0.94	0.0002315	6.56	0.08	0.14	10/18/03 14:30	0:51:00	0:49:45	0:41:45	0:41:45	0:41:45	0:41:45	0:41:45	0:41:45	0:41:45	0.921954446	
1	71	1081	4E-05	531 14.031	3.30092E-05	0.93	0.000264509	7.49	0.09	0.15	10/18/03 14:38	0:59:00	0:57:45	0:49:45	0:49:45	0:49:45	0:49:45	0:49:45	0:49:45	0:49:45	0.991631652	
1	71	1080	4E-05	531 14.018	3.29788E-05	0.93	0.000297488	8.42	0.10	0.16	10/18/03 14:45	1:06:00	1:04:45	0:56:45	0:56:45	0:56:45	0:56:45	0:56:45	0:56:45	0:56:45	1.048808848	
2	71	1080	7E-05	531 14.018	6.59572E-05	1.87	0.000363445	10.29	0.13	0.19	10/18/03 14:57	1:18:00	1:16:45	1:08:45	1:08:45	1:08:45	1:08:45	1:08:45	1:08:45	1:08:45	1.140175425	
2.5	71	1080	9E-05	531 14.018	8.24485E-05	2.33	0.000445892	12.83	0.15	0.21	10/18/03 15:12	1:33:00	1:31:45	1:23:45	1:23:45	1:23:45	1:23:45	1:23:45	1:23:45	1:23:45	1.244989896	
2	72	1080	7E-05	532 14.018	6.58933E-05	1.86	0.000584016	16.82	0.20	0.24	10/18/03 15:22	1:43:00	1:41:45	1:33:45	1:33:45	1:33:45	1:33:45	1:33:45	1:33:45	1:33:45	1.310216267	
0	72	1080	0	532 14.018	0	0.00	0.000594016	16.82	0.20	0.27	10/18/03 15:38	1:59:00	1:57:45	1:49:45	1:49:45	1:49:45	1:49:45	1:49:45	1:49:45	1:49:45	1.408308678	
-1	72	1080	-4E-05	532 14.018	-3.29166E-05	-0.93	0.0005611	15.89	0.19	0.25	10/18/03 17:11	3:32:00	3:30:45	3:22:45	3:22:45	3:22:45	3:22:45	3:22:45	3:22:45	3:22:45	1.878716291	
2	71	1083	7E-05	531 14.057	6.61404E-05	1.87	0.00062724	17.76	0.22	0.28	10/18/03 18:44	5:05:00	5:03:45	4:55:45	4:55:45	4:55:45	4:55:45	4:55:45	4:55:45	4:55:45	2.254624876	
22	81	1085	0.0008	541 14.083	0.000715416	20.26	0.001342656	38.02	0.46	0.52	10/19/03 2:22	12:43:00	12:41:45	12:33:45	12:33:45	12:33:45	12:33:45	12:33:45	12:33:45	12:33:45	3.566043559	
1	79	1086	4E-05	539 14.096	3.26696E-05	0.93	0.001375325	38.94	0.47	0.54	10/19/03 6:55	17:16:00	17:14:45	17:06:45	17:06:45	17:06:45	17:06:45	17:06:45	17:06:45	17:06:45	4.155317878	
0	76	1085	0	538 14.098	0	0.00	0.001375325	38.94	0.47	0.54	10/19/03 10:34	20:55:00	20:53:45	20:45:45	20:45:45	20:45:45	20:45:45	20:45:45	20:45:45	20:45:45	4.573474245	
6	78	1084	0.0002	538 14.070	0.00019602	5.55	0.001571346	44.50	0.54	0.60	10/19/03 19:14	29:35:00	29:33:45	29:25:45	29:25:45	29:25:45	29:25:45	29:25:45	29:25:45	29:25:45	5.439056291	
8	78	1083	0.0003	538 14.057	0.00026112	7.39	0.001832465	51.89	0.63	0.69	10/20/03 7:03	41:24:00	41:22:45	41:14:45	41:14:45	41:14:45	41:14:45	41:14:45	41:14:45	41:14:45	6.434283177	
5	76	1081	0.0002	538 14.031	0.000163506	4.63	0.001995972	56.52	0.69	0.75	10/20/03 15:54	50:15:00	50:13:45	50:05:45	50:05:45	50:05:45	50:05:45	50:05:45	50:05:45	50:05:45	7.088723439	
0	76	1085	0	538 14.083	0	0.00	0.001995972	56.52	0.69	0.75	10/21/03 11:42	70:03:00	70:01:45	69:53:45	69:53:45	69:53:45	69:53:45	69:53:45	69:53:45	69:53:45	69:53:45	8.369587803
10	75	1082	0.0004	535 14.044	0.000327927	9.29	0.002328898	65.81	0.80	0.86	10/22/03 14:14	98:35:00	98:33:45	98:25:45	98:25:45	98:25:45	98:25:45	98:25:45	98:25:45	98:25:45	98:25:45	9.827681992
-6	72	1081	-0.0002	532 14.031	-0.000197883	-5.80	0.002126216	60.21	0.73	0.79	10/23/03 11:58	118:19:00	118:17:45	118:09:45	118:09:45	118:09:45	118:09:45	118:09:45	118:09:45	118:09:45	118:09:45	10.87734649
25	62	1078	0.0009	542 13.986	0.000804741	22.79	0.002930957	83.00	1.01	1.07	10/24/03 10:11	140:32:00	140:30:45	140:22:45	140:22:45	140:22:45	140:22:45	140:22:45	140:22:45	140:22:45	140:22:45	11.85467559
68	68	1093	-0.0009	528 14.187	-0.00083913	-23.76	0.002091826	59.23	0.72	0.78	10/25/03 13:30	187:51:00	187:49:45	187:41:45	187:41:45	187:41:45	187:41:45	187:41:45	187:41:45	187:41:45	187:41:45	12.95569373
20	83	1094	0.0007	543 14.200	0.000653357	18.50	0.002745184	77.73	0.95	1.01	10/26/03 10:18	188:40:00	188:38:45	188:30:45	188:30:45	188:30:45	188:30:45	188:30:45	188:30:45	188:30:45	188:30:45	13.73559852
1	69	1075	4E-05	528 13.953	3.295E-05	0.93	0.002778134	78.67	0.96	1.02	10/27/03 14:58	217:19:00	217:17:45	217:09:45	217:09:45	217:09:45	217:09:45	217:09:45	217:09:45	217:09:45	217:09:45	14.74168431
19	73	1090	0.0007	533 14.018	0.000824243	17.88	0.003402376	96.34	1.17	1.23	11/3/03 10:03	380:24:00	380:22:45	380:14:45	380:14:45	380:14:45	380:14:45	380:14:45	380:14:45	380:14:45	380:14:45	19.50384577
2.5	75	1085	0.0009	535 14.083	0.00082209	23.26	0.004224486	119.62	1.48	1.52	11/10/03 11:44	550:05:00	550:03:45	549:55:45	549:55:45	549:55:45	549:55:45	549:55:45	549:55:45	549:55:45	549:55:45	23.4538554
36	75	1089	0.0013	535 13.875	0.001166352	33.03	0.005390818	152.85	1.86	1.92	11/17/03 16:19	722:40:00	722:38:45	722:30:45	722:30:45	722:30:45	722:30:45	722:30:45	722:30:45	722:30:45	722:30:45	26.8824602
5	73	1085	0.0002	533 14.096	0.000185187	4.88	0.005560005	157.33	1.92	1.98	11/24/03 14:19	888:40:00	888:38:45	888:30:45	888:30:45	888:30:45	888:30:45	888:30:45	888:30:45	888:30:45	888:30:45	29.81051269
24	72	1080	0.0008	532 14.148	0.000797314	22.58	0.006353319	179.91	2.19	2.25	12/1/03 19:46	1134:07:00	1134:05:45	1133:57:45	1133:57:45	1133:57:45	1133:57:45	1133:57:45	1133:57:45	1133:57:45	1133:57:45	33.67664869
16	70	1083	0.0008	530 14.057	0.000530122	15.01	0.00888344	194.92	2.38	2.44	12/10/03 14:42	1273:03:00	1273:01:45	1272:53:45	1272:53:45	1272:53:45	1272:53:45	1272:53:45	1272:53:45	1272:53:45	1272:53:45	35.87982623
18	76	1087	0.0008	536 14.109	0.000591889	16.76	0.00747533	211.68	2.58	2.64	12/16/03 14:09	1416:30:00	1416:28:45	1416:20:45	1416:20:45	1416:20:45	1416:20:45	1416:20:45	1416:20:45	1416:20:45	1416:20:45	37.83641853
16	75	1081	0.0006	535 14.031	0.000524188	14.84	0.007999527	228.52	2.76	2.82	12/22/03 15:48	1582:09:00	1582:07:45	1581:59:45	1581:59:45	1581:59:45	1581:59:45	1581:59:45	1581:59:45	1581:59:45	1581:59:45	39.52404332
15	73	1082	0.0005	533 14.044	0.000493736	13.98	0.008493283	240.50	2.93	2.99	12/29/03 14:21	1728:42:00	1728:40:45	1728:32:45	1728:32:45	1728:32:45	1728:32:45	1728:32:45	1728:32:45	1728:32:45	1728:32:45	41.57763822
-5	73	1103	-0.0002	533 14.316	-0.000167773	-4.75	0.00832549	235.75	2.87	2.93	1/8/04 15:02	1921:23:00	1921:21:45	1921:13:45	1921:13:45	1921:13:45	1921:13:45	1921:13:45	1921:13:45	1921:13:45	1921:13:45	43.83358882
19	75	1092	0.0007	535 14.187	0.000629385	17.82	0.008954885	253.57	3.09	3.15	1/12/04 11:37	2061:58:00	2061:56:45	2061:48:45	2061:48:45	2061:48:45	2061:48:45	2061:48:45	2061:48:45	2061:48:45	2061:48:45	45.40888313
18	73	1083	0.0007	533 14.135	0.000629445	17.82	0.00958433	271.40	3.31	3.37	1/21/04 10:24	2276:45:00	2276:43:45	2276:35:45	2276:35:45	2276:35:45	2276:35:45	2276:35:45	2276:35:45	2276:35:45	2276:35:45	47.71530153
4	70	1091	0.0001	530 14.161	0.000133509	3.78	0.009717839	275.18	3.35	3.41	1/27/04 10:01	2420:22:00	2420:20:45	2420:12:45	2420:12:45	2420:12:45	2420:12:45	2420:12:45	2420:12:45	2420:12:45	2420:12:45	49.19722214
23	73	1085	0.0008	533 14.083	0.000759116	21.50	0.010477	298.67	3.62	3.68	2/2/04 15:33	2569:54:00	2569:52:45	2569:44:45	2569:44:45	2569:44:45	2569:44:45	2569:44:45	2569:44:45	2569:44:45	2569:44:45	50.69418113
7	74	1091	0.0002	534 14.161	0.000231891	6.57	0.010708891	303.24	3.70	3.76	2/9/04 10:23	2732:44:00	2732:42:45	2732:34:45	2732:34:45	2732:34:45	2732:3					

10	79	1023	0.0004	539	14.057	0.000325794	9.23	0.002549316	72.19	1.65	1.68	10/20/03	7.02	39:26:00	39:25:00	39:19:00	6.27959659
12	77	1081	0.0004	537	14.031	0.000391864	11.09	0.002941	83.28	1.91	1.93	10/20/03	15.55	48:19:00	48:18:00	48:12:00	5.95101911
14	76	1085	0.0005	536	14.093	0.000459511	13.01	0.003400511	96.29	2.21	2.23	10/21/03	11.44	68:08:00	68:07:00	68:01:00	8.254291813
22	75	1082	0.0008	535	14.044	0.000721439	20.43	0.004121949	116.72	2.67	2.70	10/22/03	14.15	94:39:00	94:38:00	94:32:00	9.728823156
-6	72	1061	-0.0002	532	14.031	-0.000197883	-5.80	0.003924287	111.12	2.55	2.57	10/23/03	11.58	116:22:00	116:21:00	116:15:00	10.78738826
16	73	1076	0.0006	533	13.986	0.000523731	14.83	0.004447998	125.95	2.89	2.91	10/24/03	10.11	138:35:00	138:34:00	138:28:00	11.77214228
-14	73	1093	-0.0005	533	14.187	-0.000466505	-13.18	0.003982493	112.77	2.58	2.61	10/25/03	13.30	165:54:00	165:53:00	165:47:00	12.88021739
11	73	1094	0.0004	533	14.200	0.000386088	10.37	0.004348581	123.14	2.82	2.84	10/26/03	10.20	166:44:00	166:43:00	166:37:00	13.68504055
17	71	1075	0.0006	531	13.953	0.000558041	15.80	0.004908622	138.84	3.18	3.21	10/27/03	14.59	215:23:00	215:22:00	215:18:00	14.67594404
30	72	1030	0.0011	532	14.018	0.000987499	27.96	0.005894121	166.90	3.82	3.85	11/3/03	10.05	378:29:00	378:28:00	378:22:00	19.48464812
41	75	1065	0.0014	535	14.083	0.001348227	38.18	0.007242348	205.08	4.70	4.72	11/10/03	11.44	548:08:00	548:07:00	548:01:00	23.41224751
49	76	1069	0.0017	536	13.875	0.001584573	44.87	0.008826921	249.95	5.73	5.75	11/17/03	16.20	720:44:00	720:43:00	720:37:00	26.84647711
-1	73	1066	-4E-05	533	14.098	-3.30374E-05	-0.94	0.008793884	249.01	5.71	5.73	11/24/03	14.20	886:44:00	886:43:00	886:37:00	29.77806799
16	72	1090	0.0008	532	14.148	0.000531543	15.05	0.009325426	284.07	6.05	6.07	12/4/03	19.48	1132:12:00	1132:11:00	1132:06:00	33.64817974
16	70	1043	0.0006	530	14.057	0.000596387	18.89	0.009921813	280.95	6.44	6.48	12/10/03	14.44	1271:08:00	1271:07:00	1271:01:00	35.65295687
04	76	1087	0.0012	538	14.109	0.001118013	31.68	0.011039826	312.61	7.16	7.19	12/16/03	14.10	1414:34:00	1414:33:00	1414:27:00	37.61072542
25	75	1081	0.0009	535	14.031	0.000819059	23.19	0.011858885	335.80	7.70	7.72	12/22/03	15.58	1560:22:00	1560:21:00	1560:15:00	39.50147677
18	73	1082	0.0006	533	14.044	0.000592483	18.78	0.012451368	352.58	8.08	8.10	12/29/03	14.22	1726:46:00	1726:45:00	1726:39:00	41.55438204
-6	73	1103	-0.0002	533	14.318	-0.000201327	-5.70	0.012250041	346.88	7.95	7.97	1/6/04	15.02	1919:26:00	1919:25:00	1919:19:00	43.81133795
26	75	1083	0.0009	535	14.187	0.000861277	24.39	0.013111318	371.27	8.51	8.53	1/12/04	11.37	2060:01:00	2060:00:00	2059:54:00	45.38740648
1	73	1089	4E-05	533	14.135	3.31287E-05	0.94	0.013144447	372.21	8.53	8.55	1/21/04	10.25	2274:49:00	2274:48:00	2274:42:00	47.69503818
-2	70	1091	-7E-05	530	14.161	-8.87547E-05	-1.89	0.013077892	370.32	8.49	8.51	1/27/04	10.02	2418:26:00	2418:25:00	2418:19:00	47.6756941
28	73	1085	0.0001	533	14.083	0.000857202	27.10	0.014034894	397.42	9.11	9.13	2/2/04	15.34	2567:58:00	2567:57:00	2567:51:00	50.67510895
10	74	1091	0.0004	534	14.161	0.000331274	9.38	0.014366168	406.80	9.32	9.35	2/9/04	10.24	2730:48:00	2730:47:00	2730:41:00	52.25705694
16	75	1091	0.0006	535	14.161	0.000529047	14.98	0.014895215	421.78	9.87	9.89	2/16/04	14.12	2902:36:00	2902:35:00	2902:29:00	53.87578306
22	75	1086	0.0008	535	14.096	0.000724106	20.50	0.01561932	442.29	10.14	10.18	2/23/04	14.22	3070:46:00	3070:45:00	3070:39:00	55.4144887
8	75	1091	0.0003	535	14.161	0.000264523	7.49	0.015883844	449.78	10.31	10.33	3/2/04	10.39	3259:03:00	3259:02:00	3259:56:00	57.08808983
15	75	1088	0.0005	535	14.122	0.000494818	14.01	0.016378461	463.78	10.65	10.65	3/8/04	9.55	3402:19:00	3402:18:00	3402:12:00	58.32938032
22	74	1082	0.0008	534	14.044	0.00072279	20.47	0.017101251	484.25	11.10	11.12	3/15/04	11.27	3571:51:00	3571:50:00	3571:44:00	59.76495629
-5	77	1087	-0.0002	537	14.239	-0.000165617	-4.89	0.016935634	479.56	10.99	11.01	3/22/04	8.53	3738:17:00	3738:16:00	3738:10:00	61.14150254
12	74	1088	0.0004	534	14.122	0.000398435	11.23	0.017392059	490.79	11.25	11.27	3/30/04	20.28	3940:50:00	3940:49:00	3940:43:00	62.77605701
28	75	1080	0.0001	535	14.018	0.000918497	25.95	0.018248566	516.74	11.84	11.87	4/8/04	14.38	4103:00:00	4102:59:00	4102:53:00	64.05468415
-2	74	1085	-7E-05	534	14.096	-6.59511E-05	-1.87	0.018182815	514.87	11.80	11.82	4/12/04	14.56	4247:20:00	4247:19:00	4247:13:00	65.17158844
20	77	1088	0.0007	537	14.122	0.000657034	18.61	0.018839649	533.48	12.23	12.25	4/19/04	14.20	4414:44:00	4414:43:00	4414:37:00	68.44345867
7	76	1090	0.0002	536	14.148	0.000230814	6.54	0.019070463	540.01	12.38	12.40	4/26/04	11.28	4579:52:00	4579:51:00	4579:45:00	67.67471217
17	74	1084	0.0008	534	14.070	0.000559552	15.84	0.019630015	555.88	12.74	12.76	5/3/04	18.56	4755:20:00	4755:19:00	4755:13:00	68.95892497
20	76	1081	0.0007	536	14.031	0.000654025	18.52	0.02028404	574.38	13.16	13.19	5/10/04	13.56	4918:20:00	4918:19:00	4918:13:00	70.13063012
-1	75	1082	-4E-05	535	14.044	-3.27927E-05	-0.93	0.020251247	573.45	13.14	13.16	5/17/04	9.41	5082:05:00	5082:04:00	5081:58:00	71.28873218
29	78	1075	0.0001	538	13.953	0.000939566	26.61	0.021190813	800.05	13.75	13.77	5/24/04	10.26	5250:50:00	5250:49:00	5250:43:00	72.48263405
4	75	1077	0.0001	535	13.979	0.000130585	3.70	0.021321378	803.75	13.84	13.86	6/1/04	10.50	5443:14:00	5443:13:00	5443:07:00	73.77827142
13	78	1075	0.0005	538	13.986	0.00042315	11.98	0.021744527	815.73	14.11	14.13	6/7/04	10.32	5586:56:00	5586:55:00	5586:49:00	74.74579147
17	79	1076	0.0006	539	13.992	0.000551293	15.61	0.02228582	831.34	14.47	14.49	6/14/04	10.44	5755:08:00	5755:07:00	5755:01:00	75.88259509
-2	76	1082	-7E-05	536	14.044	-6.5483E-05	-1.85	0.022230357	829.49	14.43	14.45	6/23/04	16.20	5976:44:00	5976:43:00	5976:37:00	77.30933538
8	77	1083	0.0003	537	14.057	0.000281606	7.41	0.022491963	836.90	14.60	14.62	7/1/04	11.45	6164:10:00	6164:09:00	6164:03:00	78.51220712
10	78	1081	0.0004	538	14.031	0.000325797	9.23	0.022817759	846.12	14.81	14.83	7/7/04	10.28	6306:52:00	6306:51:00	6306:45:00	79.41578349
12	79	1082	0.0004	539	14.044	0.000390592	11.06	0.023208351	857.18	15.05	15.08	7/13/04	14.15	6454:39:00	6454:38:00	6454:32:00	80.34083644
2	75	1080	7E-05	535	14.018	8.54641E-05	1.85	0.023273815	859.04	15.10	15.13	7/19/04	11.18	6595:42:00	6595:41:00	6595:35:00	81.21391506
-12	75	1091	-0.0004	538	14.161	-0.000396045	-11.21	0.022877777	847.82	14.85	14.87	7/26/04	10.20	6782:44:00	6782:43:00	6782:37:00	82.23583971
19	77	1079	0.0007	537	14.005	0.000619019	17.53	0.023496789	885.35	15.25	15.27	8/2/04	14.40	6935:04:00	6935:03:00	6934:57:00	83.27704766
-1	76	1085	-4E-05	538	14.096	-3.27304E-05	-0.93	0.023464059	864.43	15.23	15.25	8/9/04	13.56	7102:20:00	7102:19:00	7102:13:00	84.27534238
-1	78	1088	-4E-05	538	14.122	-3.2913E-05	-0.93	0.023431146	863.49	15.21	15.23	8/16/04	11.01	7267:25:00	7267:24:00	7267:18:00	85.24914467

DECANISTERED 8/16/2004; sample dried for 14 days in air

SAMPLE: 595.4' to 598.4' (mulberry coal) in canister Brady 28

dry sample weight:		lbs.	grams	wet sample weight:		lbs.	grams	moisture %	est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)	
		1.707	774.42			1.789	811.59	4.58%	48		off bottom	at surface	in canister	11.2 minutes	
											11/4/03	18:06	11/4/03	16:06	0.186 hours
RIGLAB MEASUREMENTS															
measured cc	measured T (F)	measured P (psi)	absolute T (F)	psi	cubic ft (@STP)	cc (@STP)	CUMULATIVE VOLUMES (@STP)	SCF/TON	without lost gas	with lost gas	TIME-OF-MEASURE	off bottom	at surface	in canister	SCRT hrs. (since off bottom)
18	71	1078	0.0006	531	13.992	0.000592516	16.78	0.000592516	0.89	2.88	11/4/03	18:22	0:15:45	0:15:42	0:04:35
9	71	1076	0.0003	531	13.992	0.000296258	8.39	0.000888774	1.04	3.03	11/4/03	16:27	0:20:10	0:20:07	0:09:00
5	71	1079	0.0002	531	13.992	0.000164588	4.88	0.001053361	1.23	3.22	11/4/03	16:29	0:22:55	0:22:52	0:11:45
5	71	1078	0.0002	531	13.992	0.000164588	4.68	0.001217949	1.43	3.41	11/4/03	16:34	0:27:40	0:27:37	0:16:30
5	71	1078	0.0002	531	13.992	0.000164588	4.68	0							

111	73	1027	0.0039	533	14.109	0.003670528	103.94	0.00869085	246.10	10.18	12.17	11/5/03	0:09	8:02:10	8:02:07	7:51:00	2.83480354
49	70	1089	0.0017	530	14.135	0.001832493	46.23	0.010323343	292.32	12.09	14.08	11/5/03	5:58	13:49:10	13:49:07	13:38:00	3.717451337
62	68	1090	0.0022	528	14.148	0.002075331	58.77	0.012398675	351.09	14.52	16.51	11/5/03	12:56	20:49:10	20:49:07	20:38:00	4.562832941
50	74	1091	0.0018	534	14.161	0.001656368	46.90	0.014055042	397.99	16.48	18.45	11/5/03	17:59	25:52:10	25:52:07	25:41:00	5.086201377
36	70	1095	0.0013	530	14.213	0.001205991	34.15	0.015261033	432.14	17.88	19.86	11/8/03	8:01	37:54:10	37:54:07	37:43:00	6.156523189
29	68	1095	0.0008	528	14.213	0.000773413	21.90	0.016034445	454.04	18.78	20.77	11/8/03	10:00	41:53:10	41:53:07	41:42:00	6.471848015
30	67	1096	0.0011	527	14.226	0.001011636	28.85	0.017046092	482.89	19.97	21.95	11/8/03	19:33	51:26:10	51:26:07	51:15:00	7.171897318
35	73	1098	0.0012	533	14.226	0.001166956	33.04	0.018213036	515.73	21.34	23.32	11/7/03	0:24	56:17:10	56:17:07	56:08:00	7.502407021
11	72	1097	0.0004	532	14.239	0.000367782	10.41	0.01858082	528.15	21.77	23.75	11/7/03	5:59	61:52:10	61:52:07	61:41:00	7.865713219
15	70	1087	0.0005	530	14.239	0.000503414	14.26	0.019084234	540.40	22.38	24.34	11/7/03	10:50	66:43:10	66:43:07	66:32:00	8.168197136
24	71	1097	0.0008	531	14.239	0.000803945	22.77	0.01988818	563.17	23.30	25.28	11/7/03	18:39	74:32:10	74:32:07	74:21:00	8.633429858 estimate
14	71	1099	0.0005	531	14.252	0.000489396	13.29	0.020357575	576.46	23.85	25.83	11/7/03	22:37	78:30:10	78:30:07	78:19:00	8.860179331
8	72	1100	0.0003	532	14.278	0.00026821	7.59	0.020625785	584.05	24.16	26.15	11/8/03	6:18	86:11:10	86:11:07	86:00:00	9.283647511
29	69	1101	0.001	529	14.291	0.000978662	27.71	0.021604447	611.77	25.31	27.29	11/8/03	19:00	98:53:10	98:53:07	98:42:00	9.944149592
77	73	1092	0.0027	533	14.174	0.002557934	72.43	0.024182381	684.20	28.30	30.29	11/8/03	22:20	126:13:10	126:13:07	126:02:00	11.23474274
40	75	1085	0.0014	535	14.083	0.001315343	37.25	0.025477725	721.45	29.85	31.83	11/10/03	11:48	139:39:10	139:39:07	139:28:00	11.81747764
50	77	1080	0.0018	537	14.018	0.001630507	48.17	0.027108232	767.62	31.76	33.74	11/11/03	9:28	161:19:10	161:19:07	161:08:00	12.70115918
23	75	1091	0.0008	535	14.181	0.000780505	21.54	0.027868737	789.15	32.65	34.63	11/12/03	14:19	190:12:10	190:12:07	190:01:00	13.79140231
28	75	1096	0.001	535	14.228	0.000930075	28.34	0.028798812	815.49	33.74	35.72	11/13/03	19:25	219:18:10	219:18:07	219:07:00	14.80887497
71	75	1077	0.0025	535	13.979	0.00231752	65.62	0.031116332	881.11	36.45	38.44	11/15/03	13:16	261:09:10	261:09:07	260:58:00	16.16022208
63	76	1069	0.0022	536	13.875	0.002037308	57.69	0.03315364	938.80	38.84	40.82	11/17/03	16:07	312:00:10	312:00:07	311:49:00	17.66360036
59	72	1078	0.0021	532	13.992	0.00197134	55.82	0.03512498	994.82	41.15	43.13	11/21/03	11:32	403:25:10	403:25:07	403:14:00	20.08530419
27	75	1073	0.001	535	13.927	0.000878037	24.88	0.038003017	1019.48	42.18	44.16	11/26/03	15:02	526:55:10	526:55:07	526:44:00	22.96472597
7	74	1095	0.0002	534	14.213	0.000232742	6.59	0.038235759	1026.08	42.45	44.43	12/5/03	12:15	740:08:10	740:08:07	739:57:00	25.20544267
61	75	1033	0.0022	535	14.057	0.002002201	58.70	0.038237969	1092.77	44.79	46.78	12/10/03	14:44	862:37:10	862:37:07	862:26:00	29.3708388
15	71	1081	0.0005	531	14.031	0.000495137	14.02	0.038733097	1098.80	45.37	47.36	12/22/03	16:25	1152:18:10	1152:18:07	1152:07:00	33.94558554
31	70	1103	0.0011	530	14.318	0.001048079	29.62	0.039779176	1126.42	46.60	48.58	11/6/04	14:50	1510:43:10	1510:43:07	1510:32:00	38.86797453
45	70	1089	0.0018	530	14.135	0.001489228	42.45	0.041278404	1168.87	48.36	50.34	1/21/04	10:55	1868:48:10	1868:48:07	1868:37:00	43.20651314
16	68	1091	0.0006	528	14.161	0.000538061	15.18	0.041814465	1184.05	48.98	50.97	1/27/04	10:03	2009:58:10	2009:58:07	2009:45:00	44.83231102
0	70	1085	0	530	14.083	0	0.00	0.041814465	1184.05	48.98	50.97	2/2/04	15:34	2159:27:10	2159:27:07	2159:16:00	46.46991281
-0.5	71	1091	-2E-05	531	14.181	-1.86673E-05	-0.47	0.041797808	1183.58	48.98	50.95	2/9/04	10:25	2322:18:10	2322:18:07	2322:07:00	48.1902768
8	71	1091	0.0003	531	14.181	0.000266516	7.55	0.042064324	1191.12	49.28	51.26	2/16/04	14:13	2494:08:10	2494:08:07	2493:55:00	49.94099295
1	70	1066	4E-05	530	14.096	3.32244E-05	0.94	0.042097548	1192.07	49.31	51.30	2/23/04	14:23	2682:16:10	2682:16:07	2682:05:00	51.59718446
8	72	1091	0.0003	532	14.181	0.000286015	7.53	0.042363563	1199.60	49.63	51.61	3/2/04	10:39	2850:32:10	2850:32:07	2850:21:00	53.39041215
17	71	1068	0.0006	531	14.122	0.000564789	15.99	0.042928353	1215.59	50.29	52.27	3/8/04	9:58	2993:49:10	2993:49:07	2993:38:00	54.71680617
26	70	1082	0.0009	530	14.044	0.000860653	24.37	0.043789006	1239.96	51.30	53.28	3/15/04	11:28	3163:21:10	3163:21:07	3163:10:00	56.243891
-2	72	1087	-7E-05	532	14.239	-6.88695E-05	-1.89	0.043722136	1238.07	51.22	53.20	3/22/04	9:54	3329:47:10	3329:47:07	3329:36:00	57.7042989
2	70	1088	7E-05	530	14.122	6.65712E-05	1.89	0.043788707	1239.95	51.30	53.28	3/30/04	20:26	3532:19:10	3532:19:07	3532:08:00	59.43331931
14	70	1080	0.0005	530	14.018	0.000482572	13.10	0.044251279	1253.05	51.84	53.82	4/8/04	14:37	3694:30:10	3694:30:07	3694:19:00	60.78242162
-15	68	1036	-0.0005	528	14.098	-0.000500254	-14.17	0.043751025	1238.89	51.25	53.24	4/12/04	14:57	3838:50:10	3838:50:07	3838:39:00	61.95834174
-6	69	1088	-0.0002	529	14.122	-0.000200091	-5.87	0.043550934	1233.22	51.02	53.00	4/19/04	14:21	4006:14:10	4006:14:07	4006:03:00	63.29483479
0	71	1090	0	531	14.148	0	0.00	0.043550934	1233.22	51.02	53.00	4/26/04	11:28	4171:21:10	4171:21:07	4171:10:00	64.5860107

DECANISTERED 4/23/2004; sample dried for 23 days in air

SAMPLE: 598.4' to 597.4' (Mulberry coal) in canister Brady 24

dry sample weight:		lbs.	grams	wet sample weight:		lbs.	grams	moisture %	est. lost gas (cc) =		TIME OF: elapsed time (off bottom to canistering)					
		1.712	776.52			1.816	823.88	5.75%	48		off bottom	at surface	in canister	10.2 minutes		
											11/4/03 16:06	11/4/03 16:09	11/4/03 16:17	0.169 hours		
														0.411636301		
														SCRT (hrs)		
measured cc	measured T (F)	measured P	cubic ft	absolute T (F)	psia	cubic ft (@STP)	cc (@STP)	CUMULATIVE VOLUMES (@STP)	SCF/TON	SCF/TON	TIME OF MEASURE	off bottom	at surface	in canister	SCRT hrs. (since off bottom)	
18	71	1078	531	13.992	0.000592518	16.78	0.000592516	16.78	0.69	2.67	11/4/03 16:20	0:13:55	0:10:52	0:03:45	0.481806109	
10	71	1076	0.0004	531	13.992	0.000329175	9.32	0.000921691	26.10	1.08	3.05	11/4/03 16:24	0:18:00	0:14:57	0:07:50	0.547722557
7	71	1078	0.0002	531	13.992	0.000230423	6.52	0.001152114	32.62	1.35	3.33	11/4/03 16:28	0:21:10	0:18:07	0:11:00	0.583950989
6	71	1078	0.0003	531	13.992	0.00028334	7.48	0.001415454	40.08	1.55	3.63	11/4/03 16:36	0:29:25	0:28:22	0:19:15	0.700198385
5	71	1078	0.0002	531	13.992	0.000164588	4.86	0.001580042	44.74	1.85	3.83	11/4/03 16:39	0:32:55	0:29:52	0:22:45	0.740882868
2	71	1078	7E-05	531	13.992	6.58351E-05	1.86	0.001645877	48.61	1.92	3.90	11/4/03 16:41	0:34:40	0:31:37	0:24:30	0.76011695
6	71	1078	0.0002	531	13.992	0.000197505	5.59	0.001843383	52.20	2.15	4.13	11/4/03 16:48	0:41:40	0:38:37	0:31:30	0.833333333
5	71	1078	0.0002	531	13.992	0.000164588	4.86	0.00200797	56.86	2.35	4.33	11/4/03 16:56	0:49:10	0:46:07	0:39:00	0.905231708
7	71	1078	0.0002	531	13.992	0.000230423	6.52	0.002238393	63.38	2.62	4.60	11/4/03 17:04	0:57:55	0:54:52	0:47:45	0.98248551
11	71	1078	0.0004	531	13.992	0.000362093	10.25	0.002600486	73.64	3.04	5.02	11/4/03 17:21	1:14:10	1:11:07	1:04:00	1.111805339
14	71	1078	0.0005	531	13.992	0.000480846	13.05	0.003061332	86.69	3.58	5.56	11/4/03 17:45	1:38:10	1:35:07	1:28:00	1.27910559
8	71	1076	0.0002	531	13.992	0.000197505	5.59	0.003258837	92.28	3.81	5.79	11/4/03 17:53	1:46:10	1:43:07	1:36:00	1.330204663
88	70	1084	0.0024	530	14.070	0.002255099										

19	70	1097	0.0007	530	14.239	0.000637658	18.06	0.020810246	589.28	24.31	26.29	11/7/03	10:51	66.44:10	66.41:07	66:34:00	8.169217289
26	71	1096	0.0009	531	14.252	0.000871735	24.68	0.021681981	613.96	25.33	27.31	11/7/03	18:41	74:34:10	74:31:07	74:24:00	8.635601222
18	72	1100	0.0006	532	14.278	0.000603472	17.09	0.022286452	631.05	26.04	28.02	11/7/03	22:39	78:32:10	78:29:07	78:22:00	8.662060207
14	72	1100	0.0005	532	14.278	0.000469367	13.29	0.022754819	644.34	26.58	28.56	11/8/03	8:20	86:13:10	86:10:07	86:03:00	9.285442609
29	69	1101	0.001	529	14.291	0.000878662	27.71	0.023733481	672.05	27.73	29.71	11/8/03	19:03	98:58:10	98:53:07	98:46:00	9.946683315
85	73	1092	0.003	533	14.174	0.002623694	79.96	0.028557175	752.01	31.03	33.01	11/9/03	22:22	128:15:10	128:12:07	126:05:00	11.23622614
45	75	1085	0.0016	535	14.083	0.001479761	41.90	0.028036996	793.91	32.75	34.74	11/10/03	11:47	139:40:10	139:37:07	139:30:00	11.81816279
57	77	1080	0.002	537	14.018	0.001858778	52.63	0.029895714	846.55	34.93	36.91	11/11/03	9:27	161:20:10	161:17:07	161:10:00	12.70181527
30	75	1091	0.0011	535	14.161	0.000991963	26.09	0.030887677	874.64	36.09	38.07	11/12/03	14:20	180:13:10	180:10:07	180:03:00	13.79200654
33	75	1095	0.0012	535	14.213	0.00109516	31.01	0.031982837	905.65	37.36	39.34	11/13/03	19:26	219:19:10	219:16:07	219:09:00	14.80943768
78	75	1077	0.0028	535	13.979	0.002546008	72.09	0.034528845	977.74	40.34	42.32	11/15/03	13:17	261:10:10	261:07:07	261:00:00	18.16073774
70	76	1069	0.0025	536	13.875	0.002263675	84.10	0.03679252	1041.84	42.98	44.96	11/17/03	16:08	312:01:10	311:58:07	311:51:00	17.66407214
67	72	1078	0.0024	532	13.992	0.00220133	82.33	0.03899385	1104.18	45.56	47.54	11/21/03	11:35	403:28:10	403:25:07	403:18:00	20.08654884
109	75	1073	0.0038	535	13.927	0.003544689	100.37	0.042538519	1204.55	49.70	51.68	11/26/03	15:09	527:02:10	526:59:07	526:52:00	22.95728707
85	74	1095	0.0012	534	14.213	0.001163708	32.95	0.043702227	1237.50	51.06	53.04	12/5/03	12:15	740:08:10	740:05:07	739:58:00	27.20544267
57	75	1083	0.002	535	14.057	0.001870909	52.98	0.045573138	1290.48	53.24	55.22	12/10/03	14:45	862:39:10	862:35:07	862:28:00	29.37066753
12	71	1081	0.0004	531	14.031	0.00039611	11.22	0.045989246	1301.70	53.70	55.68	12/22/03	16:30	1152:23:10	1152:20:07	1152:13:00	33.94681297
12	70	1103	0.0004	530	14.316	0.000404934	11.47	0.04637418	1313.17	54.18	56.16	1/8/04	15:00	1510:53:10	1510:50:07	1510:43:00	38.87011849
54	70	1089	0.0019	530	14.135	0.001798074	50.94	0.048173254	1364.11	56.28	58.26	1/21/04	10:55	1866:48:10	1866:45:07	1866:38:00	43.20651314
10	70	1081	0.0004	530	14.161	0.000333774	8.45	0.048507027	1373.56	56.67	58.65	1/27/04	10:04	2009:57:10	2009:54:07	2009:47:00	44.83249889
23	70	1085	0.0008	530	14.083	0.000763458	21.82	0.049270485	1395.18	57.56	59.54	2/2/04	15:34	2159:27:10	2159:24:07	2159:17:00	46.46991261
8	71	1091	0.0002	531	14.161	0.000199887	5.66	0.049470372	1400.84	57.79	59.78	2/9/04	10:26	2322:19:10	2322:16:07	2322:09:00	48.19044972
3	71	1091	0.0001	531	14.161	9.99435E-05	2.83	0.049570315	1403.67	57.91	59.89	2/16/04	14:14	2494:07:10	2494:04:07	2493:57:00	49.94115982
9	70	1086	0.0003	530	14.096	0.00029902	6.47	0.049889335	1412.14	58.26	60.24	2/23/04	14:23	2662:16:10	2662:13:07	2662:06:00	51.59718446
-5	72	1091	-0.0002	532	14.161	-0.000166259	-4.71	0.049703076	1407.43	58.07	60.05	3/2/04	10:41	2850:34:10	2850:31:07	2850:24:00	53.39072433
5	71	1088	0.0001	531	14.122	9.96687E-05	2.82	0.049802744	1410.25	58.18	60.16	3/8/04	9:57	2993:50:10	2993:47:07	2993:40:00	54.71595847
6	70	1082	0.0002	530	14.044	0.000198612	5.62	0.050001356	1415.88	58.42	60.40	3/15/04	11:29	3163:22:10	3163:19:07	3163:12:00	56.24383917
-13	72	1097	-0.0005	532	14.239	-0.000494852	-12.31	0.049566705	1403.57	57.91	59.89	3/22/04	9:54	3329:47:10	3329:44:07	3329:37:00	57.7042989
-12	70	1088	-0.0004	530	14.122	-0.000399427	-11.31	0.049167278	1392.26	57.44	59.42	3/30/04	20:27	3532:20:10	3532:17:07	3532:10:00	59.43345953

DECANISTERED 3/31/2004; sample dried for 27 days in air

SAMPLE: 622.9' to 623.9' (Anna Shale) in canister Brady 31

dry sample weight:	lbs.	grams	wet sample weight:	lbs.	grams	moisture %	est. lost gas (cc) =	TIME OF:	elapsed time (off bottom to canistering)							
	3.231	1465.74		3.288	1490.40	1.85%	85	off bottom	11.9 minutes							
								at surface	0.199 hours							
								in canister	0.445658065 SQRT (hrs)							
								11/5/03 9:24	11/5/03 9:27							
									11/5/03 9:36							
RIGLAB MEASUREMENTS	CONVERSION OF RIGLAB MEASUREMENTS TO STP (@60 deg F; 14.7 psi)						CUMULATIVE VOLUMES (@STP)		SCF/TON	SCF/TON	TIME OF MEASURE	TIME SINCE	at surface	in canister	SQRT hrs. (since off bottom)	
measured co	measured T (F)	measured P	cubic ft	absolute T (F)	psia	cubic ft (@STP)	cc (@STP)	cubic ft	cc	without lost gas	with lost gas	off bottom				
11	71	1088	0.0004	531	14.122	0.000365452	10.35	0.000365452	10.35	0.23	1.65	11/5/03 9:42	0:18:35	0:15:40	0:06:40	0.556526929
2	71	1088	7E-05	531	14.122	6.64450E-05	1.88	0.000431898	12.23	0.27	1.69	11/5/03 9:44	0:20:05	0:17:10	0:08:10	0.578551832
3	72	1088	0.0001	532	14.122	9.94814E-05	2.82	0.000531379	15.05	0.33	1.75	11/5/03 9:47	0:23:36	0:20:40	0:11:40	0.626941429
5	72	1088	0.0002	532	14.122	0.000165802	4.69	0.000697181	19.74	0.43	1.85	11/5/03 9:52	0:28:10	0:25:15	0:18:15	0.66516016
2	72	1086	7E-05	532	14.122	6.63209E-05	1.88	0.000763502	21.62	0.47	1.89	11/5/03 9:56	0:31:55	0:29:00	0:20:00	0.729345216
8	72	1088	0.0003	532	14.122	0.000265284	7.51	0.001028786	29.13	0.84	2.06	11/5/03 10:08	0:44:10	0:41:15	0:32:15	0.857969178
4	72	1088	0.0001	532	14.122	0.000132642	3.76	0.001161428	32.89	0.72	2.14	11/5/03 10:15	0:50:55	0:48:00	0:39:00	0.921200907
4	72	1088	0.0001	532	14.122	0.000132642	3.76	0.00129407	36.64	0.80	2.22	11/5/03 10:23	0:58:35	0:56:00	0:47:00	0.9909311
8	73	1086	0.0003	533	14.122	0.000264768	7.50	0.001558855	44.14	0.96	2.39	11/5/03 10:44	1:10:55	1:17:00	1:08:00	1.154098975
11	73	1087	0.0004	533	14.109	0.000363746	10.30	0.001922601	54.44	1.19	2.61	11/5/03 11:19	1:54:55	1:52:00	1:43:00	1.389395612
10	72	1088	0.0004	532	14.122	0.000331605	9.39	0.002254206	63.83	1.40	2.82	11/5/03 11:58	2:34:15	2:31:20	2:22:20	1.603381843
14	70	1087	0.0005	530	14.109	0.00048557	13.18	0.002719776	77.02	1.68	3.10	11/5/03 13:59	4:34:55	4:32:00	4:23:00	2.140547697
10	72	1086	0.0004	532	14.096	0.000330995	9.37	0.003050771	86.39	1.89	3.31	11/5/03 15:02	5:37:55	5:35:00	5:26:00	2.373171811
5	73	1087	0.0002	533	14.109	0.000165339	4.68	0.00321611	91.07	1.99	3.41	11/5/03 16:05	6:40:55	6:38:00	6:29:00	2.584945733
4	71	1087	0.0001	531	14.109	0.000132769	3.76	0.003348879	94.83	2.07	3.49	11/5/03 16:34	7:09:55	7:07:00	6:58:00	2.676803649
7	68	1081	0.0002	528	14.181	0.000234527	6.84	0.003583406	101.47	2.22	3.64	11/5/03 17:59	8:34:55	8:32:00	8:23:00	2.929495956
22	70	1095	0.0008	530	14.213	0.000736994	20.87	0.0043204	122.34	2.67	4.09	11/8/03 6:03	20:38:55	20:36:00	20:27:00	4.544074285
15	88	1095	0.0005	528	14.213	0.0005044	14.28	0.0048248	136.62	2.99	4.41	11/8/03 9:59	24:34:55	24:32:00	24:23:00	4.958018197
16	67	1096	0.0006	527	14.226	0.000539539	15.90	0.005364339	151.90	3.32	4.74	11/6/03 19:32	34:07:55	34:05:00	33:56:00	5.842255082
25	73	1096	0.0009	533	14.226	0.00083354	23.60	0.006197879	175.50	3.84	5.26	11/7/03 0:22	38:57:55	38:55:00	38:46:00	6.242217377
4	72	1097	0.0001	532	14.239	0.000133739	3.79	0.006331618	179.29	3.92	5.34	11/7/03 6:02	44:37:55	44:35:00	44:26:00	6.680714366
1	70	1097	4E-05	530	14.239	3.35609E-05	0.95	0.006385179	180.24	3.94	5.36	11/7/03 10:54	49:29:55	49:27:00	49:18:00	7.035524935
15	71	1097	0.0005	531	14.239	0.000502466	14.23	0.006867645	194.47	4.25	5.67	11/7/03 18:41	57:16:55	57:14:00	57:05:00	7.568483629
7	71	1088	0.0002	531	14.252	0.000234698	6.65	0.007102349	201.12	4.40	5.82	11/7/03 22:23	60:58:55	60:56:00	60:47:00	7.809093702
7																

-5	70	1103	-0.0002	530	14.316	-0.000168722	-4.78	0.022330801	632.34	13.82	15.24	1/6/04	15.04	1493:39:55	1493:37:00	1493:28:00	38.64796602
32	75	1083	0.0011	535	14.187	0.001080033	30.02	0.023390835	662.35	14.48	15.90	1/12/04	11:38	1634:13:55	1634:11:00	1634:02:00	40.42563474
29	70	1089	0.001	530	14.135	0.000966169	27.38	0.024357004	689.71	15.08	16.50	1/21/04	10.26	1849:01:55	1848:59:00	1848:50:00	43.00037145
9	68	1091	0.00003	528	14.161	0.000301534	8.54	0.024658538	698.25	15.26	16.98	1/27/04	10.04	1992:39:55	1992:37:00	1992:28:00	44.63927954
28	70	1085	0.001	530	14.083	0.000929427	26.32	0.025587965	724.57	15.84	17.28	2/2/04	15.35	2142:10:55	2142:08:00	2141:59:00	46.28371144
12	71	1091	0.0004	531	14.161	0.000399774	11.32	0.025987739	735.89	16.08	17.51	2/9/04	10.26	2305:01:55	2304:59:00	2304:50:00	48.01074822
15	71	1091	0.0005	531	14.161	0.000499718	14.15	0.026487457	750.04	16.39	17.81	2/16/04	14.15	2476:50:55	2476:48:00	2476:39:00	49.76794783
25	70	1086	0.0009	530	14.096	0.00083061	23.52	0.027318067	773.56	16.91	18.33	2/23/04	14.24	2644:59:55	2644:57:00	2644:48:00	51.42954998
11	72	1091	0.0004	532	14.161	0.000385771	10.36	0.027883837	783.92	17.13	18.55	3/2/04	10.41	2833:16:55	2833:14:00	2833:05:00	53.22858203
17	71	1088	0.0006	531	14.122	0.000564789	15.99	0.028248527	799.91	17.48	18.90	3/8/04	9.57	2976:32:55	2976:30:00	2976:21:00	54.55775482
25	70	1082	0.0009	530	14.044	0.000880653	24.37	0.029109279	824.28	18.02	19.44	3/15/04	11.30	3146:05:55	3146:03:00	3145:54:00	56.0900937
0	72	1097	0	532	14.239	0	0.00	0.029109279	824.28	18.02	19.44	3/22/04	9.55	3312:30:55	3312:28:00	3312:19:00	57.55445489
13	70	1088	0.0005	530	14.122	0.000432713	12.25	0.029541992	838.53	18.28	19.71	3/30/04	20.28	3515:03:55	3515:01:00	3514:52:00	59.28798595
26	70	1080	0.0009	530	14.018	0.000859062	24.33	0.030401054	860.86	18.82	20.24	4/6/04	14.37	3677:12:55	3677:10:00	3677:01:00	60.84004682
-4	68	1085	-0.0001	528	14.096	-0.000133401	-3.78	0.030267653	857.08	18.73	20.15	4/12/04	14.57	3821:32:55	3821:30:00	3821:21:00	61.81867526
13	69	1088	0.0005	529	14.122	0.000433531	12.28	0.030701184	869.36	19.00	20.42	4/19/04	14.22	3988:57:55	3988:55:00	3988:46:00	63.15825582
11	71	1090	0.0004	531	14.148	0.000366124	10.37	0.031067307	879.72	19.23	20.65	4/26/04	11.29	4154:04:55	4154:02:00	4153:53:00	64.545216788
12	70	1084	0.0004	530	14.070	0.000397959	11.27	0.031465266	890.99	19.47	20.90	5/3/04	18.57	4329:32:55	4329:30:00	4329:21:00	65.79930555
32	75	1081	0.0011	535	14.031	0.001048395	29.69	0.032513681	920.68	20.12	21.54	5/10/04	13.57	4492:32:55	4492:30:00	4492:21:00	67.02647694
4	73	1082	0.0001	533	14.044	0.000131863	3.73	0.032645324	924.41	20.21	21.63	5/17/04	9.42	4656:17:55	4656:15:00	4656:06:00	68.23707651
24	73	1075	0.0008	533	13.953	0.000784868	22.22	0.03343019	946.63	20.69	22.11	5/24/04	10.26	4825:01:55	4824:59:00	4824:50:00	69.46244989
5	70	1077	0.0002	530	13.979	0.000164745	4.67	0.033594936	951.30	20.79	22.21	6/1/04	10.51	5017:26:55	5017:24:00	5017:15:00	70.83395098
15	72	1076	0.0005	532	13.966	0.000491921	13.93	0.034086856	965.23	21.10	22.52	6/7/04	10.33	5161:08:55	5161:06:00	5160:57:00	71.84113453
21	76	1078	0.0007	536	13.992	0.00068482	19.39	0.034771677	984.62	21.52	22.94	6/14/04	10.45	5329:20:55	5329:18:00	5329:09:00	73.00238771
2	73	1082	7E-05	533	14.044	6.58314E-05	1.86	0.034837508	986.48	21.56	22.98	6/23/04	16.21	5550:56:55	5550:54:00	5550:45:00	74.50488852
11	73	1083	0.0004	533	14.057	0.000362407	10.26	0.035199915	998.75	21.79	23.21	7/1/04	11.46	5738:21:55	5738:19:00	5738:10:00	75.75199851
10	74	1081	0.0004	534	14.031	0.000328237	9.29	0.035528153	1006.04	21.99	23.41	7/7/04	10.28	5881:03:55	5881:01:00	5880:52:00	76.88810389
12	75	1082	0.0004	535	14.044	0.000393512	11.14	0.035921684	1017.18	22.23	23.65	7/13/04	11.45	6028:50:55	6028:48:00	6028:39:00	77.84566061
8	73	1080	0.0003	533	14.018	0.000262839	7.44	0.036184503	1024.63	22.40	23.82	7/19/04	11.19	6169:54:55	6169:52:00	6169:43:00	78.54808245
-7	72	1091	-0.0002	532	14.161	-0.000232763	-6.58	0.03595174	1018.04	22.25	23.67	7/26/04	10.21	6336:56:55	6336:54:00	6336:45:00	79.60495343
20	73	1079	0.0007	533	14.005	0.000656489	18.59	0.036608229	1036.63	22.66	24.08	8/2/04	14.40	6509:15:55	6509:13:00	6509:04:00	80.68001783
1	72	1088	4E-05	532	14.096	3.30995E-05	0.94	0.036641329	1037.56	22.68	24.10	8/9/04	13.57	6676:32:55	6676:30:00	6676:21:00	81.71014999
-1	73	1088	-4E-05	533	14.122	-3.30992E-05	-0.94	0.03668023	1036.63	22.66	24.08	8/16/04	11.02	6841:37:55	6841:35:00	6841:26:00	82.71415807
7	72	1078	0.0002	532	13.986	0.000229563	6.50	0.036837793	1043.13	22.80	24.22	8/23/04	14.03	7012:38:55	7012:36:00	7012:27:00	83.74155845
0	73	1087	0	533	14.109	0	0.00	0.036837793	1043.13	22.80	24.22	8/30/04	16.37	7183:12:55	7183:10:00	7183:01:00	84.75385111
-2	71	1088	-7E-05	531	14.122	-6.84458E-05	-1.88	0.036771348	1041.24	22.76	24.18	9/7/04	15.50	7374:25:55	7374:23:00	7374:14:00	85.87451278
14	74	1074	0.0005	534	13.940	0.000456556	12.93	0.037227904	1054.17	23.04	24.46	9/14/04	18.33	7545:08:55	7545:06:00	7544:57:00	86.86281489
-8	73	1083	-0.0003	533	14.057	-0.000263589	-7.48	0.036964335	1046.71	22.88	24.30	9/21/04	16.40	7711:15:55	7711:13:00	7711:04:00	87.81381029
-6	70	1089	-0.0002	530	14.135	-0.000189897	-5.66	0.036764438	1041.05	22.75	24.18	9/28/04	20.57	7883:32:55	7883:30:00	7883:21:00	88.78934965
6	71	1085	0.0002	531	14.083	0.000198788	5.63	0.036963225	1046.68	22.88	24.30	10/8/04	10:00	8112:35:55	8112:33:00	8112:24:00	90.06996509

DECANISTERED 10/08/2004; sample dried for 30 days in air

SAMPLE: 742.1' to 743.1' (Bevier coal) in canister M1

dry sample weight:	lbs.	grams	wet sample weight:	lbs.	grams	moisture %	est. lost gas (cc) =	TIME OF:	elapsed time (off bottom to canistering)
	1.659	752.59		1.695	769.05	2.14%	90	off bottom 11/8/03 11:54	12.5 minutes
								at surface 11/6/03 11:56	0.208 hours
								in canister 11/6/03 12:06	0.456435465 SQRT (hrs)

RIGLAB MEASUREMENTS			CONVERSION OF RIGLAB MEASUREMENTS TO STP (@60 deg F; 14.7 psi)				CUMULATIVE VOLUMES (@STP)		SCF/TON	SCF/TON	TIME OF MEASURE	TIME SINCE			SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	absolute T (F)	psia	cubic ft (@STP)	cc (@STP)	without lost gas	with lost gas	off bottom	at surface	in canister	in canister	(hrs)	
2.6	73	1091	0.0009	533	14.161	0.000862927	24.44	0.000862927	24.44	4.87	11/6/03	12:12	0:18:00	0.547722557	
1.1	73	1091	0.0004	533	14.161	0.000365095	10.34	0.001228012	34.77	1.48	11/6/03	12:15	0:21:00	0.591607978	
8	73	1091	0.0003	533	14.161	0.000265516	7.52	0.001493528	42.29	1.80	11/6/03	12:18	0:24:00	0.632455532	
10	73	1091	0.0004	533	14.161	0.000331895	9.40	0.001825423	51.69	2.20	11/6/03	12:23	0:29:00	0.695221787	
9	73	1091	0.0003	533	14.161	0.000298709	8.46	0.002124128	60.15	2.56	11/6/03	12:28	0:34:00	0.752772653	
7	73	1091	0.0002	533	14.161	0.000232327	6.58	0.002356455	66.73	2.84	11/6/03	12:33	0:39:00	0.806225775	
10	73	1091	0.0004	533	14.161	0.000331895	9.40	0.00268835	76.13	3.24	11/6/03	12:41	0:47:00	0.86561203	
12	73	1091	0.0004	533	14.161	0.000398274	11.28	0.003086624	87.40	3.72	11/6/03	12:51	0:57:00	0.924679434	
10	73	1091	0.0004	533	14.161	0.000331895	9.40	0.003418519	96.80	4.12	11/6/03	13:00	1:06:00	0.983608848	
20	73	1091	0.0007	533	14.161	0.00066379	18.80	0.004082309	115.60	4.92	11/6/03	13:17	1:23:15	1.107921899	
9	74	1093	0.0003	534	14.161	0.000298146	8.44	0.004380455	124.04	5.28	11/9/03	13:27	1:33:30	1.248332221	
17	74	1093	0.0008	534	14.161	0.000563165	15.95	0.00494382	139.99	5.96	11/9/03	13:55	2:01:30	1.423024947	
16	73	1091	0.0006	533	14.161	0.000531032	15.04	0.005474652	155.02	6.60	11/6/03	14:28	2:34:00	1.602081879	
10	72	1090	0.0004	532	14.148	0.000332214	9.41	0.005806886	164.43	7.00	11/6/03	14:56	3:02:00	1.74164673	
12	71	1091	0.0004	531	14.161	0.000399774	11.32	0.00620664	175.75	7.48	11/31	15:31	3:37:00	1.901753577	
15	71	1091	0.0005	531	14.161	0.000499718	14.15	0.006706358	189.90	8.08	11/9/03	16:27	4:33:00	2.133072901	
6	71	1091	0.0002	531	14.161	0.000199887	5.68	0.006906245	195.56	8.32	12/16	18:03	6:09:00	2.479919354	
12	86	1096	0.0004	526	14.226	0.000405424	11.48	0.007311569	207.04	8.81	12/6/03	19:34</			

32	75	1027	0.0011	535	14.109	0.001054214	29.85	0.02114339	598.71	25.49	29.32	11/10/03	8:08	92:14:00	92:11:20	92:01:30	9.603818665
15	75	1048	0.0005	535	14.096	0.000493708	13.98	0.021637099	612.69	28.08	29.91	11/10/03	10:52	94:58:00	94:56:20	94:45:30	9.745084231
65	77	1080	0.0023	537	14.018	0.002118659	60.02	0.023756750	672.71	28.64	32.47	11/11/03	9:29	117:35:00	117:32:20	117:22:30	10.84368489
40	75	1091	0.0014	535	14.161	0.001322617	37.45	0.025079375	710.17	30.23	34.06	11/12/03	14:23	146:29:00	146:26:20	146:16:30	12.10302992
42	75	1095	0.0015	535	14.213	0.00139384	39.47	0.026473215	749.64	31.91	35.74	11/13/03	19:27	175:33:00	175:30:20	175:20:30	13.24962829
75	75	1077	0.0028	535	13.979	0.002578649	73.02	0.029051854	822.65	35.02	38.85	11/15/03	13:18	217:24:00	217:21:20	217:11:30	14.7444905
71	76	1062	0.0025	535	13.875	0.002296014	85.02	0.031347877	887.67	37.79	41.62	11/17/03	16:09	268:15:00	268:12:20	268:02:30	16.37833935
71	72	1074	0.0025	532	13.992	0.002332753	66.06	0.033680603	953.73	40.60	44.43	11/21/03	11:20	359:26:00	359:23:20	359:13:30	18.9587271
97	75	1073	0.0034	535	13.927	0.00315443	89.32	0.03683506	1043.05	44.40	48.23	11/26/03	15:22	483:28:00	483:25:20	483:15:30	21.98787545
73	73	1090	0.0026	533	14.148	0.002420613	88.54	0.039255673	1111.59	47.32	51.15	12/4/03	19:33	679:39:00	679:36:20	679:26:30	26.07009781
59	75	1083	0.0021	535	14.057	0.001936555	54.84	0.041192228	1186.43	49.65	53.49	12/10/03	14:46	818:52:00	818:49:20	818:39:30	28.61584643
56	73	1087	0.002	533	14.109	0.001851798	52.44	0.043044026	1218.87	51.89	55.72	12/16/03	14:12	982:18:00	982:15:20	982:05:30	31.02096066
49	71	1081	0.0017	531	14.031	0.001617448	45.80	0.044661475	1284.87	53.94	57.67	12/22/03	16:00	1108:06:00	1108:03:20	1107:53:30	33.28813602
52	72	1092	0.0018	532	14.044	0.001714834	48.58	0.046376309	1313.23	55.90	59.73	12/29/03	14:25	1274:31:00	1274:28:20	1274:18:30	35.70037348
20	70	1105	0.0007	530	14.318	0.00067489	19.11	0.047051199	1332.34	56.72	60.55	1/6/04	15:04	1467:10:00	1467:07:20	1466:57:30	38.30381167
51	71	1098	0.0018	531	14.187	0.001702155	48.20	0.048753353	1380.54	58.77	62.60	1/12/04	11:58	1607:44:00	1607:41:20	1607:31:30	40.09655014
50	70	1089	0.0018	530	14.135	0.001665809	47.17	0.050419162	1427.71	60.78	64.61	1/21/04	10:27	1822:30:00	1822:27:20	1822:17:30	42.68193402
24	68	1091	0.0008	528	14.161	0.000804091	22.77	0.051223254	1450.48	61.75	65.58	1/27/04	10:05	1988:11:00	1988:08:20	1985:58:30	44.34166588
38	70	1085	0.0014	530	14.083	0.001294559	36.66	0.052517812	1487.13	63.31	67.14	2/2/04	15:36	2115:42:00	2115:39:20	2115:29:30	45.99673901
25	71	1081	0.0009	531	14.161	0.000832863	23.58	0.053350675	1510.72	64.31	68.14	2/9/04	10:27	2278:33:00	2278:30:20	2278:20:30	47.79415968
27	71	1091	0.001	531	14.161	0.000899492	25.47	0.054250167	1536.19	65.39	69.23	2/16/04	14:16	2450:22:00	2450:19:20	2450:09:30	49.50117844
36	70	1085	0.0013	530	14.096	0.001196078	33.87	0.055446245	1570.06	66.84	70.67	2/23/04	14:24	2618:30:00	2618:27:20	2618:17:30	51.17128101
20	72	1091	0.0007	532	14.161	0.000665038	18.83	0.056111283	1588.89	67.84	71.47	3/2/04	10:42	2806:48:00	2806:45:20	2806:35:30	52.97924122
23	71	1086	0.0008	531	14.122	0.000764127	21.64	0.05687541	1610.53	68.56	72.39	3/8/04	9:58	2950:04:00	2950:01:20	2949:51:30	54.31451617
31	70	1082	0.0011	530	14.044	0.001026163	29.06	0.057901572	1639.58	69.80	73.63	3/15/04	11:30	3119:36:00	3119:33:20	3119:23:30	55.85937949
9	72	1097	0.0003	532	14.239	0.000300913	8.52	0.058202485	1648.10	70.18	73.99	3/22/04	9:58	3288:02:00	3285:59:20	3285:49:30	57.32393334
27	70	1086	0.0007	530	14.122	0.000665712	18.85	0.058888197	1668.95	70.98	74.79	3/30/04	20:29	3488:35:00	3488:32:20	3488:22:30	59.08423057
20	70	1080	0.001	530	14.018	0.000892103	25.28	0.0597803	1692.22	72.04	75.87	4/8/04	14:38	3850:44:00	3850:41:20	3850:31:30	60.42129867
-1	69	1085	-4E-05	529	14.096	-3.33503E-05	-0.94	0.05972695	1691.27	72.00	75.83	4/12/04	14:57	3795:03:00	3795:00:20	3794:50:30	61.60397714
16	69	1036	0.0006	529	14.122	0.000533576	15.11	0.060280526	1708.38	72.64	76.47	4/19/04	14:22	3982:28:00	3982:25:20	3982:15:30	62.94812679
16	71	1090	0.0006	531	14.148	0.000532544	15.08	0.060793069	1721.46	73.28	77.11	4/26/04	11:29	4127:35:00	4127:32:20	4127:22:30	64.24627097
16	70	1084	0.0006	530	14.070	0.000530611	15.03	0.061323681	1736.49	73.92	77.75	5/3/04	18:59	4303:05:00	4303:02:20	4302:52:30	65.59789123
30	75	1081	0.0013	535	14.031	0.001179445	33.40	0.062503125	1769.88	75.34	79.17	5/10/04	13:58	4466:04:00	4466:01:20	4465:51:30	66.82863658
11	73	1082	0.0004	533	14.044	0.000362073	10.25	0.062865198	1780.14	75.78	79.61	5/17/04	9:42	4629:48:00	4629:45:20	4629:35:30	68.04263369
26	73	1075	0.0009	533	13.953	0.000850272	24.08	0.06371547	1804.21	76.80	80.63	5/24/04	10:26	4798:32:00	4798:29:20	4798:19:30	69.27144874
9	70	1077	0.0003	530	13.979	0.000296542	8.40	0.064012012	1812.61	77.16	80.99	6/1/04	10:51	4990:57:00	4990:54:20	4990:44:30	70.64865697
16	72	1076	0.0006	532	13.968	0.000524715	14.88	0.064536727	1827.47	77.79	81.62	6/7/04	10:33	5134:39:00	5134:36:20	5134:26:30	71.65647214
22	76	1078	0.0008	538	13.992	0.000717431	20.32	0.065254158	1847.78	78.68	82.49	6/14/04	10:46	5302:52:00	5302:49:20	5302:39:30	72.82078458
4	73	1082	0.0001	533	14.044	0.000131683	3.73	0.065395821	1851.51	78.82	82.65	6/23/04	16:21	5524:27:00	5524:24:20	5524:14:30	74.32864384
10	73	1083	0.0004	533	14.057	0.000329481	9.33	0.065715282	1860.84	79.21	83.05	7/1/04	11:47	5711:53:00	5711:50:20	5711:40:30	75.6700267
14	74	1081	0.0005	534	14.031	0.000459532	13.01	0.066174814	1873.85	79.77	83.60	7/7/04	10:29	5854:35:00	5854:32:20	5854:22:30	76.51524902
14	75	1082	0.0005	535	14.044	0.000459097	13.00	0.066633911	1886.86	80.32	84.15	7/13/04	14:16	6002:22:00	6002:19:20	6002:09:30	77.47494219
10	73	1080	0.0004	533	14.018	0.000328549	9.30	0.06698246	1896.16	80.72	84.55	7/19/04	11:20	6143:26:00	6143:23:20	6143:13:30	78.36005699
-4	72	1091	-0.0001	532	14.161	-0.000133008	-3.77	0.068829452	1892.39	80.56	84.39	7/26/04	10:21	6310:27:00	6310:24:20	6310:14:30	79.43834087
22	73	1079	0.0008	533	14.005	0.000722138	20.45	0.067551559	1912.84	81.43	85.26	8/2/04	14:41	6482:47:00	6482:44:20	6482:34:30	80.51573345
4	73	1085	0.0001	533	14.096	0.00013215	3.74	0.06768374	1916.58	81.59	85.42	8/9/04	13:59	6650:04:00	6650:01:20	6649:51:30	81.54794091
0	73	1085	0	533	14.122	0	0.00	0.06768374	1916.58	81.59	85.42	8/16/04	11:03	6815:09:00	6815:06:20	6814:56:30	82.55392177
18	72	1076	0.0006	532	13.968	0.000590305	16.72	0.068274045	1933.30	82.30	86.13	8/23/04	14:06	6986:12:00	6986:09:20	6985:59:30	83.58349119
4	73	1087	0.0001	533	14.109	0.000132271	3.75	0.068409316	1937.04	82.46	86.29	8/30/04	16:39	7156:45:00	7156:42:20	7156:32:30	84.5975768
1	71	1088	4E-05	531	14.122	3.32229E-05	0.94	0.068439539	1937.98	82.50	86.33	9/7/04	15:51	7347:57:00	7347:54:20	7347:44:30	85.72018432
22	73	1074	0.0008	533	13.940	0.000718792	20.35	0.06915833	1958.34	83.36	87.20	9/14/04	18:34	7518:40:00	7518:37:20	7518:27:30	86.71024545
-4	73	1083	-0.0001	533	14.057	-0.000131765	-3.73	0.069026546	1954.81	83.21	87.04	9/21/04	18:41	7684:47:00	7684:44:20	7684:34:30	87.86289599
-3	70	1080	-0.0001	530	14.135	-9.99485E-05	-2.83	0.068926597	1951.78	83.09	86.92	9/28/04	20:58	7857:04:00	7857:01:20	7855:51:30	88.64009827
6	71	1085	0.0002	531	14.083	0.000198788	5.83	0.069125385	1957.41	83.32	87.16	10/8/04	10:01	8088:07:00	8088:04:20	8085:54:30	89.92283729

DECANISTERED 10/08/2004; sample dried for 30 days in air

SAMPLE: 743.1' to 744.2' (Bowler coal) in canister M2

dry sample weight:		lbs.	grams	wet sample weight:		lbs.	grams	moisture %	est. lost gas (cc) =	TIME OF:	elapsed time (off bottom to canistering)				
		2.002	908.11			2.041	925.77	1.91%	79	off bottom	at surface	in canister	15.0 minutes		
										11/6/03	11/6/03	11/6/03	0.250 hours		
										TIME SINCE			0.500000000		
										off bottom	at surface	in canister	SQRT (hrs. (since off bottom))		
RIGLAB MEASUREMENTS:	measured T (F)	measured P	absolute T (F)	psia	cubic ft (@STP)	cc (@STP)	cubic ft	cc	without lost gas	with lost gas	TIME OF MEASURE				
16	73	1093	0.0006												

14	74	1091	0.0005	534 14.161	0.000463783	13.13	0.00401506	113.69	4.01	6.80	11/6/03 13:30	1:36:30	1:33:50	1:21:30	1.268200825
20	74	1091	0.0007	534 14.161	0.000682547	18.76	0.004677607	132.45	4.67	7.46	11/6/03 13:54	2:00:15	1:57:35	1:45:15	1.415685995
18	73	1091	0.0006	533 14.161	0.000597411	18.92	0.005275018	149.37	5.27	8.06	11/6/03 14:27	2:33:00	2:30:20	2:18:00	1.599871942
17	72	1090	0.0006	532 14.148	0.000584784	15.99	0.005839782	165.36	5.83	8.82	11/6/03 14:57	3:03:00	3:00:20	2:48:00	1.74642492
24	71	1091	0.0008	531 14.161	0.000799548	22.64	0.006839333	188.00	6.63	9.42	11/6/03 15:30	3:36:00	3:33:20	3:21:00	1.897386596
26	71	1091	0.0009	531 14.161	0.000888177	24.53	0.007505507	212.53	7.50	10.28	11/6/03 16:28	4:32:00	4:29:20	4:17:00	2.12916259
39	71	1091	0.0014	531 14.161	0.001299288	37.80	0.008804773	249.32	8.80	11.58	11/6/03 18:02	6:08:00	6:05:20	5:53:00	2.476556749
34	86	1096	0.0012	526 14.228	0.001148701	32.53	0.009953474	281.85	9.94	12.73	11/6/03 19:35	7:41:00	7:38:20	7:28:00	2.771892933
93	73	1096	0.0033	533 14.228	0.00310077	53.34	0.013054244	369.85	13.04	15.83	11/7/03 0:27	12:33:00	12:30:20	12:18:00	3.542597917
55	72	1097	0.0019	532 14.239	0.001838912	52.07	0.014893155	421.73	14.88	17.67	11/7/03 6:04	18:10:00	18:07:20	17:55:00	4.282237284
53	71	1097	0.0019	531 14.239	0.001775379	50.27	0.016668535	472.00	16.85	19.44	11/7/03 18:43	30:49:00	30:46:20	30:34:00	5.55127613
32	71	1096	0.0011	531 14.252	0.001072904	30.38	0.017741439	502.38	17.72	20.51	11/7/03 22:44	34:50:00	34:47:20	34:35:00	5.90197707
31	72	1100	0.0011	532 14.278	0.001039312	29.43	0.018780751	531.81	18.76	21.55	11/8/03 6:22	42:28:00	42:25:20	42:13:00	6.516645354
51	69	1101	0.0018	529 14.291	0.001721096	48.74	0.020501847	580.55	20.48	23.27	11/8/03 19:05	55:11:00	55:08:20	54:56:00	7.428548535
50	73	1100	0.0018	533 14.278	0.001673165	47.38	0.022175012	627.92	22.15	24.94	11/9/03 5:45	65:51:00	65:48:20	65:36:00	8.114801291
71	75	1092	0.0025	535 14.174	0.002349787	66.54	0.024524809	694.46	24.50	27.29	11/9/03 22:26	82:32:00	82:29:20	82:17:00	9.084785817
34	75	1087	0.0012	535 14.109	0.001120103	31.72	0.025644912	726.18	25.82	29.41	11/10/03 8:08	92:14:00	92:11:20	91:59:00	9.609818685
86	77	1090	0.003	537 14.018	0.002804472	79.41	0.028449384	805.59	28.42	31.21	11/11/03 9:31	117:37:00	117:34:20	117:22:00	10.84512179
48	75	1091	0.0017	535 14.161	0.001587141	44.94	0.030036625	850.54	30.01	32.79	11/12/03 14:24	148:30:00	148:27:20	148:15:00	12.10371844
53	75	1095	0.0019	535 14.213	0.001758893	49.81	0.031795418	900.34	31.76	34.55	11/13/03 19:28	175:34:00	175:31:20	175:19:00	13.25015723
91	75	1077	0.0032	535 13.979	0.002970342	84.11	0.03476576	984.45	34.73	37.52	11/15/03 13:20	217:28:00	217:23:20	217:11:00	14.74562082
34	76	1069	0.003	536 13.875	0.002716411	76.92	0.037482171	1061.37	37.44	40.23	11/17/03 16:08	268:15:00	268:12:20	268:00:00	16.87833935
61	72	1078	0.0022	532 13.992	0.002004198	56.75	0.039488936	1118.13	39.45	42.23	11/21/03 11:15	359:21:00	359:18:20	359:06:00	18.95652922
119	75	1073	0.0042	535 13.927	0.003899888	109.58	0.043356234	1227.71	43.31	46.10	11/26/03 15:27	483:33:00	483:30:20	483:18:00	21.98977035
65	73	1090	0.0023	533 14.148	0.00215534	61.03	0.045511574	1288.74	45.47	48.25	12/4/03 19:38	679:44:00	679:41:20	679:29:00	26.67169602
56	75	1063	0.002	535 14.057	0.001838086	52.05	0.047349661	1340.79	47.30	50.09	12/10/03 14:47	818:53:00	818:50:20	818:38:00	28.81613764
54	73	1087	0.0019	533 14.109	0.001785682	50.56	0.049135323	1391.35	49.09	51.87	12/13/03 14:13	890:19:00	890:16:20	890:04:00	29.83817465
47	71	1091	0.0017	531 14.031	0.001551143	43.93	0.050688753	1435.28	50.64	53.42	12/22/03 16:00	1108:06:00	1108:03:20	1107:51:00	33.28813602
47	72	1082	0.0017	532 14.044	0.001549948	43.89	0.0522367	1479.17	52.18	54.97	12/29/03 14:28	1274:32:00	1274:29:20	1274:17:00	35.7006069
13	70	1103	0.0005	530 14.318	0.000438678	12.42	0.052675378	1491.59	52.62	55.41	1/8/04 15:03	1487:09:00	1487:06:20	1486:54:00	38.30339411
44	71	1083	0.0018	531 14.187	0.001468526	41.58	0.054143903	1533.18	54.09	56.88	1/12/04 11:39	1607:45:00	1607:42:20	1607:30:00	40.09875797
42	70	1089	0.0015	530 14.135	0.001389228	39.82	0.055543183	1572.80	55.49	58.27	1/21/04 10:27	1822:33:00	1822:30:20	1822:18:00	42.69133402
19	68	1091	0.0007	528 14.161	0.000636572	18.03	0.056179755	1590.83	56.12	58.91	1/27/04 10:06	1986:12:00	1986:09:20	1985:57:00	44.34185382
33	70	1065	0.0012	530 14.083	0.001095396	31.02	0.057275151	1621.85	57.22	60.00	2/2/04 15:36	2115:42:00	2115:39:20	2115:27:00	45.89673901
20	71	1091	0.0007	531 14.161	0.00066629	18.87	0.057941441	1640.71	57.88	60.67	2/9/04 10:27	2278:30:00	2278:27:20	2278:15:00	47.73419968
35	70	1091	0.0007	531 14.161	0.00066629	18.87	0.058607731	1659.58	58.55	61.34	2/16/04 14:16	2450:22:00	2450:19:20	2450:07:00	49.50117844
14	72	1091	0.0005	532 14.161	0.000485526	32.93	0.059770585	1692.51	59.71	62.50	2/23/04 14:25	2618:31:00	2618:28:20	2618:16:00	51.17144386
16	71	1098	0.0006	531 14.122	0.000531566	13.18	0.060236112	1705.69	60.17	62.96	3/2/04 10:42	2806:48:00	2806:45:20	2806:33:00	52.97924122
25	70	1092	0.0009	530 14.044	0.000827551	15.05	0.060767678	1720.74	60.71	63.49	3/8/04 9:59	2950:05:00	2950:02:20	2949:50:00	54.3146696
2	72	1097	7E-05	532 14.239	6.88895E-05	23.43	0.061585229	1744.18	61.53	64.32	3/15/04 11:32	3119:38:00	3119:35:20	3119:23:00	55.85367789
16	70	1086	0.0006	530 14.122	0.000532509	1.89	0.061862098	1746.07	61.60	64.39	3/22/04 9:57	3286:09:00	3286:06:20	3285:48:00	57.32407871
23	70	1060	0.0008	530 14.018	0.000759939	15.08	0.062194688	1761.15	62.13	64.92	3/30/04 20:29	3488:35:00	3488:32:20	3488:20:00	59.06423057
-3	68	1036	-0.0001	528 14.096	-0.000100051	21.52	0.062954607	1782.67	62.89	65.68	4/6/04 14:38	3650:44:00	3650:41:20	3650:29:00	60.42129887
6	69	1036	0.0002	529 14.122	0.000200091	-2.83	0.062854556	1779.84	62.79	65.58	4/12/04 14:58	3795:04:00	3795:01:20	3794:49:00	61.80411242
9	71	1090	0.0009	531 14.148	0.000299556	5.67	0.063054648	1785.50	62.99	65.78	4/19/04 14:23	3962:29:00	3962:26:20	3962:14:00	62.94825818
6	70	1084	0.0002	530 14.070	0.000165816	8.48	0.063354203	1793.98	63.29	66.08	4/26/04 11:30	4127:38:00	4127:35:20	4127:21:00	64.24640068
30	75	1081	0.0011	535 14.031	0.000982871	4.70	0.063520019	1798.68	63.46	66.24	5/3/04 19:00	4303:08:00	4303:03:20	4302:51:00	65.59801826
10	73	1082	0.0004	533 14.044	0.000329157	27.83	0.064502889	1826.51	64.44	67.22	5/10/04 13:59	4468:05:00	4468:02:20	4465:50:00	66.82876127
19	73	1075	0.0007	533 13.953	0.000821353	9.32	0.064832047	1835.83	64.77	67.55	5/17/04 9:42	4629:48:00	4629:45:20	4629:33:00	68.04263369
2	70	1077	7E-05	530 13.979	8.58981E-05	17.59	0.0654534	1853.43	65.39	68.17	5/24/04 10:28	4798:34:00	4798:31:20	4798:19:00	69.27168734
10	72	1078	0.0004	532 13.968	0.000327947	1.87	0.065519298	1855.29	65.45	68.24	6/1/04 10:52	4980:58:00	4980:55:20	4980:43:00	70.64677393
16	76	1078	0.0008	536 13.992	0.000521768	9.29	0.065847245	1864.58	65.78	68.57	6/7/04 10:34	5134:40:00	5134:37:20	5134:25:00	71.85665844
-4	73	1082	-0.0001	533 14.044	-0.000131863	14.77	0.066389013	1879.35	66.30	69.09	6/14/04 10:47	5302:53:00	5302:50:20	5302:38:00	72.82089901
4	73	1083	0.0001	533 14.057	0.000131785	-3.73	0.06623735	1875.63	66.17	68.96	6/23/04 16:22	5524:28:00	5524:25:20	5524:13:00	74.32675608
				533 14.057	0.000131785	3.73	0.066369134	1879.36	66.30	69.09	7/1/04 11:47	5711:53:00	5711:50:20	5711:38:00	75.57700267

DECANISTERED 7/01/2004; sample dried 10 days in air

SAMPLE: 752.0° to 753.0° ("V shale") in canister C

dry sample weight:	lbs.	grams	wet sample weight:	lbs.	grams	moisture %	est. lost gas (cc) =	TIME OF:	elapsed time (off bottom to canistering)						
	2.978	1350.97		3.019	1369.23	1.33%	59	off bottom	at surface	in canister	12.7 minutes				
								11/6/03 12:37	11/6/03 12:40	11/6/03 12:50	0.211 hours				
RICAP MEASUREMENTS:	CONVERSION OF RIGLAB MEASUREMENTS TO STP (@60 deg F; 14.7 psi)						CUMULATIVE VOLUMES (@STP):		SCF/TON	SCF/TON	TIME SINCE				
measured cc	measured T (F)	measured P (F)	cubic ft absolute	cubic ft (F) psia	cubic ft (F) psia	cc (@STP)	without lost gas	with lost gas	TIME OF MEASURE	off bottom	at surface	in canister	SCF/TON (since off bottom)		
17	73	1091	0.0008	533 14.161	0.000564222	15.98	0.000564222	15.98	1.78	11/6/03 12:54	0:18:55	0:13:45	0:04:15	0.530884411	
8	73	1091	0.0003	533 14.161	0.000285516	7.52	0.000829738	23.50	0.58	1.96	11/6/03 12:56	0:18:55	0:15:45	0:08:15	0.501496018
5	73	1091	0.0002												

6	72	1090	0.0002	532 14.148	0.000199328	5.64	0.003185079	90.19	2.14	3.54	11/6/03 15:00	2:22:25	2:18:15	2:09:45	1.54065282
-2	71	1091	-7E-05	531 14.181	-8.6629E-05	-1.89	0.00311845	88.30	2.09	3.49	11/6/03 15:27	2:49:25	2:46:15	2:36:45	1.680360411
5	71	1010	0.0002	531 13.226	0.00015558	4.41	0.003274029	92.71	2.20	3.60	11/6/03 16:24	3:46:25	3:43:15	3:33:45	1.84257847
-4	71	1091	0.0001	531 14.161	0.000133258	3.77	0.003407287	96.48	2.29	3.69	11/6/03 17:59	5:21:25	5:18:15	5:08:45	2.314507387
0	56	1096	0	526 14.228	0	0.00	0.003407287	96.48	2.29	3.69	11/6/03 19:36	6:58:25	6:55:15	6:45:45	2.840759571
65	73	1095	0.0023	533 14.226	0.002187205	61.37	0.00574492	157.85	3.74	5.14	11/7/03 0:29	11:51:25	11:48:15	11:38:45	3.443391416
11	72	1037	0.0004	532 14.239	0.000367792	10.41	0.005942274	168.27	3.99	5.39	11/7/03 6:06	17:28:25	17:25:15	17:15:45	4.180144867
11	70	1037	0.0004	530 14.239	0.00036917	10.45	0.008311444	178.72	4.24	5.64	11/7/03 11:07	22:29:25	22:28:15	22:16:45	4.742391567
24	71	1037	0.0008	531 14.239	0.000803945	22.77	0.00711539	201.48	4.78	6.18	11/7/03 18:44	30:06:25	30:03:15	29:53:45	5.486979537
14	71	1056	0.0005	531 14.252	0.000469396	13.29	0.007584785	214.78	5.09	6.49	11/7/03 22:45	34:07:25	34:04:15	33:54:45	5.841541844
5	72	1100	0.0002	532 14.278	0.000167631	4.75	0.007752418	219.52	5.21	6.60	11/8/03 6:22	41:44:25	41:41:15	41:31:45	6.46067162
16	59	1101	0.0006	529 14.291	0.000539952	15.29	0.008292368	234.81	5.57	6.97	11/8/03 19:06	54:28:25	54:25:15	54:15:45	7.380624033
70	73	1092	0.0025	533 14.174	0.002325995	65.85	0.010617763	300.66	7.13	8.53	11/9/03 22:28	81:50:25	81:47:15	81:37:45	9.046581855
42	75	1057	0.0015	535 14.109	0.001383658	39.18	0.012001419	339.84	8.06	9.46	11/10/03 8:09	91:31:25	91:28:15	91:18:45	9.586797328
50	77	1050	0.0018	537 14.018	0.001630507	46.17	0.013831926	386.01	9.15	10.55	11/11/03 9:32	116:54:25	116:51:15	116:41:45	10.812351148
-8	76	1091	-0.0003	535 14.161	-0.000264523	-7.49	0.013367403	378.52	8.98	10.38	11/12/03 14:24	145:46:25	145:43:15	145:33:45	12.0736743
110	76	1068	0.0039	536 13.875	0.003557204	100.73	0.018924607	479.25	11.36	12.76	11/17/03 16:22	267:44:25	267:41:15	267:31:45	16.362771109
26	72	1083	0.0009	532 14.096	0.000860587	24.37	0.017785194	503.62	11.94	13.34	11/24/03 14:22	433:44:25	433:41:15	433:31:45	20.82643219
24	73	1090	0.0008	533 14.148	0.000795818	22.53	0.018581012	528.15	12.48	13.88	11/24/03 19:51	679:13:25	679:10:15	679:00:45	26.06191879
36	75	1033	0.0013	535 14.057	0.001247273	35.32	0.019828285	561.47	13.31	14.71	12/10/03 14:44	818:08:25	818:03:15	817:53:45	28.50256884
17	73	1067	0.0006	533 14.109	0.000562163	15.92	0.020390438	577.39	13.69	15.09	12/16/03 14:13	961:35:25	961:32:15	961:22:45	31.00951815
14	71	1081	0.0005	531 14.031	0.000462128	13.09	0.020852566	590.48	14.00	15.40	12/22/03 16:01	1107:23:25	1107:20:15	1107:10:45	33.27747403
13	72	1082	0.0005	532 14.044	0.000428709	12.14	0.021281274	602.82	14.29	15.69	12/29/03 14:26	1273:48:25	1273:45:15	1273:35:45	35.68043211
-18	70	1103	-0.0006	530 14.316	-0.000607401	-17.20	0.020973874	585.42	14.88	16.28	1/2/04 15:06	1466:28:25	1466:25:15	1466:15:45	38.29456373
50	71	1093	0.0011	531 14.187	0.001001267	28.35	0.021675141	613.77	14.55	15.95	1/12/04 11:40	1607:02:25	1606:59:15	1606:49:45	40.08790688
23	70	1059	0.0008	530 14.135	0.000766272	21.70	0.022441413	635.47	15.07	16.47	1/21/04 10:28	1821:50:25	1821:47:15	1821:37:45	42.68902095
-1	68	1091	-4E-05	528 14.181	-3.35038E-05	-0.95	0.022407909	634.52	15.05	16.45	1/27/04 10:06	1965:28:25	1965:25:15	1965:15:45	44.33366228
32	70	1095	0.0011	530 14.083	0.001062202	30.08	0.023470111	664.60	15.78	17.16	2/2/04 15:37	2114:59:25	2114:56:15	2114:46:45	45.99802345
7	71	1091	0.0002	531 14.161	0.000233202	6.80	0.023703313	671.20	15.92	17.32	2/9/04 10:28	2277:50:25	2277:47:15	2277:37:45	47.2627498
9	71	1091	0.0003	531 14.161	0.000299831	8.49	0.024003143	679.69	18.12	17.52	2/16/04 14:17	2449:39:25	2449:36:15	2449:26:45	49.40400918
28	70	1095	0.001	530 14.096	0.000930283	28.34	0.024933427	706.03	18.74	18.14	2/23/04 14:28	2617:48:25	2617:45:15	2617:35:45	51.16450864
6	72	1091	0.0002	532 14.161	0.000199511	5.85	0.025132938	711.68	18.88	18.28	3/2/04 10:42	2806:04:25	2806:01:15	2805:51:45	52.97238536
14	71	1058	0.0005	531 14.122	0.000465121	13.17	0.025698059	724.85	17.19	18.59	3/8/04 9:59	2949:21:25	2949:18:15	2949:08:45	54.30798233
31	70	1052	0.0011	530 14.044	0.001026183	29.08	0.026624222	753.91	17.88	19.28	3/15/04 11:33	3118:55:25	3118:52:15	3118:42:45	55.84732412
-9	72	1097	-0.0003	532 14.239	-0.000300913	-8.52	0.026323309	745.39	17.68	19.08	3/22/04 9:57	3285:19:25	3285:16:15	3285:06:45	57.31774255
8	70	1089	0.0003	530 14.122	0.000268285	7.54	0.026589593	752.93	17.86	19.25	3/30/04 20:30	3487:52:25	3487:49:15	3487:39:45	59.05822221
36	70	1085	0.0013	530 14.018	0.00118947	33.68	0.027779064	786.61	18.65	20.05	4/6/04 14:39	3650:01:25	3649:58:15	3649:48:45	60.41542527
-12	68	1056	-0.0004	528 14.098	-0.000400203	-11.33	0.027378861	775.28	18.39	19.78	4/12/04 14:58	3794:20:25	3794:17:15	3794:07:45	61.59821651
8	69	1088	0.0003	529 14.122	0.000300137	8.50	0.027678997	783.78	18.59	19.99	4/19/04 14:24	3961:46:25	3961:43:15	3961:33:45	62.94262158
10	71	1090	0.0004	531 14.148	0.00033284	9.42	0.028011837	793.20	18.81	20.21	4/26/04 11:30	4126:52:25	4126:49:15	4126:39:45	64.24074728
11	70	1084	0.0004	530 14.070	0.000384795	10.33	0.028376632	803.53	19.06	20.45	5/3/04 19:01	4302:23:25	4302:20:15	4302:10:45	65.59260841
49	75	1081	0.0017	535 14.031	0.001605365	45.48	0.029891988	848.99	20.13	21.53	5/10/04 13:59	4485:21:25	4485:18:15	4485:08:45	66.82332535
-1	73	1082	-4E-06	533 14.044	-3.29157E-05	-0.93	0.029949072	848.06	20.11	21.51	5/17/04 9:42	4629:04:25	4629:01:15	4628:51:45	68.03729574
28	73	1075	0.001	533 13.953	0.000919677	25.93	0.030864749	873.99	20.73	22.13	5/24/04 10:28	4797:50:25	4797:47:15	4797:37:45	69.2654441
-6	70	1077	-0.0002	530 13.979	-0.000197694	-5.60	0.030867055	868.39	20.59	21.99	6/1/04 10:52	4990:14:25	4990:11:15	4990:01:45	70.64163275
9	72	1076	0.0003	532 13.968	0.000295152	8.38	0.030962208	876.75	20.79	22.19	6/7/04 10:34	5133:58:25	5133:53:15	5133:43:45	71.65151972
15	76	1078	0.0005	536 13.992	0.000489157	13.85	0.031451365	890.60	21.12	22.52	6/14/04 10:47	5302:09:25	5302:08:15	5301:58:45	72.81591134
-14	73	1082	-0.0005	533 14.044	-0.00046082	-13.05	0.030990545	877.55	20.81	22.21	6/23/04 18:23	5523:45:25	5523:42:15	5523:32:45	74.32198157
-4	73	1083	-0.0001	533 14.057	-0.000131785	-3.73	0.03085876	873.82	20.72	22.12	7/1/04 11:48	5711:10:25	5711:07:15	5710:57:45	75.57230717

DECANISTERED 7/01/2004; sample dried for 10 days in air

SAMPLE: 755.5' to 758.5' (Crowburg coal) in canister M3

dry sample weight:		lbs.	grams	wet sample weight:		lbs.	grams	moisture %	est. lost gas (cc) =	TIME OF:			elapsed time (off bottom to canistering)		
		1.599	725.49			1.633	740.80	2.07%	70	off bottom	at surface	in canister	0.431405970 SQRT (hrs)		
										11/6/03 12:37	11/6/03 12:40	11/6/03 12:48	0.188 hours		
										TIME SINCE			SQRT hrs. (since off bottom)		
										off bottom	at surface	in canister			
14	73	1091	0.0005	533 14.181	0.000464853	13.16	0.000464853	13.16	0.58	3.67	11/6/03 12:53	0:15:55	0:12:45	0:04:45	0.515051288
7	73	1081	0.0002	533 14.161	0.000232327	6.58	0.00069698	19.74	0.87	3.96	11/6/03 12:55	0:17:55	0:14:45	0:06:45	0.54645321
5	73	1081	0.0002	533 14.161	0.000185948	4.70	0.000862927	24.44	1.08	4.17	11/6/03 12:57	0:19:55	0:16:45	0:08:45	0.576148201
8	73	1081	0.0003	533 14.181	0.000285516	7.52	0.001128443	31.95	1.41	4.50	11/6/03 13:02	0:24:25	0:21:15	0:13:15	0.637921974
19	73	1091	0.0007	533 14.161	0.000630601	17.86	0.001759044	49.81	2.20	5.29	11/6/03 13:09	0:31:55	0:28:45	0:20:45	0.729345216
2	73	1091	7E-05	533 14.161	6.8379E-05	1.88	0.001825423	51.69	2.28	5.37	11/6/03 13:10	0:33:10	0:30:00	0:22:00	0.743490267
-4	73	1091	0.0001	533 14.161	0.000132758	3.76	0.001958181	55.45	2.45	5.54	11/6/03 13:14	0:36:55	0:33:45	0:25:45	0.784396442
13	74	1081	0.0005	534 14.161	0.00049691	14.07	0.002455091	69.52	3.07	6.18	11/6/03 13:24	0:48:55	0:43:45	0:35:45	0.884276226
9	74	1091	0.0003	534 14.161	0.000298148	8.44	0.002753237	77.96	3.44	6.53	11/6/03 13:32	0:54:25	0:51:15	0:43:15	0.952336308
24	74	1091	0.0008												

27	66	1096	0.001	526	14.228	0.000912204	25.83	0.008219363	232.75	10.28	13.37	11/6/03	19.35	6:57:25	6:54:15	6:46:15	2.637602025
86	73	1096	0.003	533	14.228	0.002867378	81.19	0.011086742	313.94	13.86	16.95	11/7/03	0:30	11:52:25	11:49:15	11:41:15	3.445810661
46	72	1097	0.0016	532	14.239	0.001537999	43.55	0.012624741	357.49	15.79	18.88	11/7/03	8:10	17:27:25	17:24:15	17:18:15	4.17815084
45	70	1097	0.0018	530	14.239	0.001510242	42.77	0.014134982	400.26	17.68	20.77	11/7/03	11:05	22:32:25	22:29:15	22:21:15	4.747680242
47	71	1087	0.0017	531	14.239	0.001574393	44.58	0.015709375	444.84	19.84	22.73	11/7/03	18:44	30:08:25	30:03:15	29:55:15	5.486979537
28	71	1096	0.001	531	14.252	0.000938791	28.58	0.018648187	471.42	20.82	23.91	11/7/03	22:46	34:08:25	34:05:15	33:57:15	5.842969234
30	72	1100	0.0011	532	14.278	0.001005786	28.48	0.017653953	499.90	22.08	25.17	11/8/03	6:23	41:45:25	41:42:15	41:34:15	6.481981347
49	69	1101	0.0017	529	14.291	0.001853802	46.82	0.019307554	546.73	24.14	27.23	11/8/03	19:07	54:29:25	54:26:15	54:18:15	7.381753029
47	73	1100	0.0017	533	14.278	0.001572775	44.54	0.020880329	591.28	26.11	29.20	11/9/03	5:46	65:08:25	65:05:15	64:57:15	8.070952718
69	73	1092	0.0024	533	14.174	0.002292175	84.91	0.023172504	656.17	28.98	32.07	11/9/03	22:29	81:51:25	81:48:15	81:40:15	9.047482768
34	75	1087	0.0012	535	14.109	0.001120103	31.72	0.024292607	687.89	30.38	33.47	11/10/03	8:10	91:32:25	91:29:15	91:21:15	9.567668366
82	77	1090	0.0029	537	14.018	0.002874032	75.72	0.026986638	763.61	33.72	36.81	11/11/03	9:32	116:54:25	116:51:15	116:43:15	10.81235148
41	75	1091	0.0014	535	14.161	0.001355689	38.39	0.028322321	802.00	35.42	38.51	11/12/03	14:25	145:47:25	145:44:15	145:36:15	12.07436449
40	76	1095	0.0014	535	14.213	0.001327466	37.59	0.029649787	839.69	37.08	40.17	11/13/03	19:31	174:53:25	174:50:15	174:42:15	13.22460879
61	75	1077	0.0029	535	13.979	0.002843931	74.87	0.032293719	914.45	40.38	43.47	11/15/03	13:21	216:43:25	216:40:15	216:32:15	14.72153562
73	76	1059	0.0026	536	13.875	0.002360689	66.85	0.034654409	981.30	43.33	46.42	11/17/03	16:10	267:32:25	267:29:15	267:21:15	16.35665852
64	72	1078	0.0023	532	13.992	0.002102783	59.54	0.036757172	1040.84	45.96	49.05	11/21/03	11:36	358:58:25	358:55:15	358:47:15	18.94859989
43	72	1088	0.0017	532	14.096	0.001588776	44.99	0.038345647	1085.83	47.85	51.04	11/24/03	14:14	433:36:25	433:33:15	433:25:15	20.82320388
58	75	1073	0.002	535	13.927	0.001866154	53.41	0.040232101	1139.24	50.31	53.40	11/26/03	15:33	482:55:25	482:52:15	482:44:15	21.975523
80	73	1090	0.0028	533	14.148	0.002852727	75.12	0.042884828	1214.36	53.63	56.72	12/4/03	19:37	678:59:25	678:56:15	678:48:15	26.05744189
50	75	1083	0.0021	535	14.057	0.001969378	55.77	0.044854205	1270.12	56.09	59.18	12/10/03	14:50	818:12:25	818:09:15	818:01:15	28.60431688
56	73	1087	0.002	533	14.109	0.001917933	54.31	0.04677214	1324.43	58.49	61.58	12/16/03	14:14	961:36:25	961:33:15	961:25:15	31.00978788
50	71	1081	0.0018	531	14.031	0.001650458	46.74	0.048422597	1371.17	60.55	63.64	12/22/03	16:01	1107:23:25	1107:20:15	1107:12:15	33.27747403
52	72	1082	0.0018	532	14.044	0.001714834	48.56	0.050137432	1419.73	62.69	65.79	12/29/03	14:27	1273:49:25	1273:46:15	1273:38:15	35.8906856
14	70	1103	0.0005	530	14.316	0.000472423	13.38	0.050609855	1433.11	63.28	66.38	1/6/04	15:07	1466:29:25	1466:26:15	1466:18:15	38.29478134
47	71	1093	0.0017	531	14.187	0.001568652	44.42	0.052178507	1477.53	65.25	68.34	1/12/04	11:40	1607:02:25	1606:59:15	1606:51:15	40.08790688
46	70	1089	0.0016	530	14.135	0.001532544	43.40	0.053711051	1520.92	67.16	70.25	1/21/04	10:28	1821:50:25	1821:47:15	1821:39:15	42.68302095
20	88	1051	0.0007	528	14.161	0.000670076	18.97	0.054381127	1539.90	68.00	71.09	1/27/04	10:07	1965:29:25	1965:26:15	1965:18:15	44.33385025
36	70	1095	0.0013	530	14.083	0.001194977	33.84	0.055578104	1573.73	69.49	72.59	2/2/04	15:37	2114:59:25	2114:56:15	2114:48:15	45.98902345
22	71	1091	0.0008	531	14.161	0.000732919	20.75	0.056309023	1594.49	70.41	73.50	2/9/04	10:29	2277:51:25	2277:48:15	2277:40:15	47.2689959
38	71	1091	0.0013	531	14.161	0.001285951	35.85	0.057574975	1630.34	71.99	75.09	2/18/04	14:17	2449:39:25	2449:36:15	2449:28:15	49.48400918
57	70	1096	0.002	530	14.098	0.001893791	53.63	0.059468766	1683.96	74.36	77.45	2/23/04	14:28	2617:48:25	2617:45:15	2617:37:15	51.16450884
21	72	1091	0.0007	532	14.122	0.000698229	19.77	0.060167055	1703.73	75.24	78.33	3/2/04	10:43	2808:05:25	2808:02:15	2808:04:15	52.97254268
24	71	1088	0.0006	531	14.122	0.00079735	22.58	0.060964405	1726.31	76.23	79.32	3/8/04	10:00	2949:22:25	2949:19:15	2949:11:15	54.30813577
84	70	1082	0.0012	530	14.044	0.001125469	31.87	0.062089874	1758.18	77.84	80.73	3/15/04	11:33	3118:55:25	3118:52:15	3118:44:15	55.84732412
9	72	1097	0.0003	532	14.239	0.000300913	8.52	0.062390787	1766.70	78.02	81.11	3/22/04	9:58	3285:20:25	3285:17:15	3285:09:15	57.31788794
20	70	1088	0.0007	530	14.122	0.000865712	18.85	0.063056499	1785.55	78.85	81.94	3/30/04	20:30	3487:52:25	3487:49:15	3487:41:15	59.05822221
32	70	1080	0.0011	530	14.018	0.001057307	29.94	0.064113806	1815.49	80.17	83.28	4/6/04	14:39	3650:01:25	3649:58:15	3649:50:15	60.41542527
4	88	1066	0.0001	528	14.098	0.000133401	3.78	0.064247207	1819.27	80.34	83.43	4/12/04	14:59	3794:21:25	3794:18:15	3794:10:15	61.5983518
15	89	1038	0.0008	529	14.122	0.000533578	15.11	0.064780763	1834.38	81.00	84.10	4/19/04	14:24	3981:48:25	3981:43:15	3981:35:15	62.94262158
17	71	1090	0.0008	531	14.148	0.000565828	16.02	0.065346551	1850.40	81.71	84.80	4/26/04	11:30	4128:52:25	4128:49:15	4128:41:15	64.24074728
16	70	1084	0.0006	530	14.070	0.000530611	15.03	0.065877222	1865.43	82.38	85.47	5/3/04	19:02	4302:24:25	4302:21:15	4302:13:15	65.59273545
38	75	1051	0.0013	535	14.031	0.00124497	35.25	0.067122191	1900.68	83.93	87.02	5/10/04	13:59	4485:21:25	4485:18:15	4485:10:15	66.82332635
16	73	1082	0.0008	533	14.044	0.000528651	14.91	0.067848843	1915.59	84.59	87.68	5/17/04	9:43	4629:05:25	4629:02:15	4628:54:15	68.03741822
25	73	1075	0.0009	533	13.953	0.000817569	23.15	0.068466412	1938.75	85.61	88.70	5/24/04	10:29	4797:51:25	4797:48:15	4797:40:15	69.2665644
3	70	1077	0.0001	530	13.979	9.88472E-05	2.80	0.068585259	1941.64	85.74	88.83	6/1/04	10:53	4990:15:25	4990:12:15	4990:04:15	70.84175072
12	72	1075	0.0004	532	13.986	0.000393537	11.14	0.068958795	1952.69	86.23	89.32	6/7/04	10:34	5133:58:25	5133:53:15	5133:45:15	71.65151972
17	76	1078	0.0006	536	13.992	0.000554378	15.70	0.069513174	1968.39	86.92	90.01	6/14/04	10:48	5302:10:25	5302:07:15	5301:59:15	72.81602578
-2	73	1052	-7E-05	533	14.044	-6.58314E-05	-1.86	0.069447342	1968.52	86.84	89.93	6/23/04	16:23	5523:45:25	5523:42:15	5523:34:15	74.32198157
8	73	1033	0.0003	533	14.057	0.000263569	7.46	0.069710911	1973.99	87.17	90.26	7/1/04	11:49	5711:11:25	5711:08:15	5711:00:15	75.57241744
9	74	1041	0.0003	534	14.031	0.000295413	8.37	0.070006325	1982.35	87.54	90.63	7/7/04	10:30	5853:52:25	5853:49:15	5853:41:15	76.5106111
11	75	1082	0.0004	535	14.044	0.000360719	10.21	0.070387044	1992.57	87.89	91.08	7/13/04	14:17	6001:39:25	6001:36:15	6001:28:15	77.47036172
9	73	1080	0.0003	533	14.018	0.000295894	8.37	0.070862738	2000.94	88.36	91.45	7/19/04	11:21	6142:43:25	6142:40:15	6142:32:15	78.37552942
-8	72	1091	-0.0003	532	14.161	-0.000286015	-7.53	0.070398723	1993.41	88.03	91.12	7/26/04	10:22	6309:44:25	6309:41:15	6309:33:15	79.43387362
16	73	1079	0.0006	533	14.005	0.00059084	16.73	0.070987583	2010.14	88.77	91.86	8/2/04	14:41	6482:03:25	6482:00:15	6481:52:15	80.51122248
0	73	1086	0	533	14.098	0	0.00	0.070987583	2010.14	88.77	91.86	8/9/04	13:58	6649:20:25	6649:17:15	6649:09:15	81.54348703
-1	73	1083	-4E-05	533	14.122	-3.30982E-05	-0.94	0.070954464	2009.20	88.72	91.82	8/16/04	11:03	6814:25:25	6814:22:15	6814:14:15	82.54952217
14	72	1075	0.0005	532	13.966	0.000459126	13.00	0.07141359	2022.20	89.30	92.39	8/23/04	14:04	6985:26:25	6985:23:15	6985:15:15	83.57894638
1	73	1087	4E-05	533	14.109	3.306											

25	71	1091	0.0009	531 14.161	0.000832863	23.58	0.000832863	23.58	0.58	1.88	11/6/03	15 34	0:18:30	0:15:30	0:09:30	0.555277708
3	71	1091	0.0001	531 14.161	9.99435E-05	2.83	0.000932806	28.41	0.65	1.95	11/6/03	15 35	0:20:00	0:17:00	0:11:00	0.577350269
5	71	1091	0.0002	531 14.161	0.000166573	4.72	0.001099379	31.13	0.77	2.07	11/6/03	15 37	0:21:45	0:18:45	0:12:45	0.602079729
6	71	1091	0.0002	531 14.161	0.000199887	5.66	0.001299286	38.79	0.91	2.21	11/6/03	15 40	0:25:00	0:22:00	0:16:00	0.645467224
6	70	1091	0.0002	530 14.161	0.000200284	5.87	0.00149953	42.46	1.04	2.35	11/6/03	15 43	0:28:15	0:25:15	0:19:15	0.686172962
9	70	1091	0.0003	530 14.161	0.000300396	8.51	0.001799928	50.97	1.25	2.56	11/6/03	15 49	0:34:00	0:31:00	0:25:00	0.752772853
9	71	1091	0.0003	531 14.161	0.000299831	8.49	0.002099757	59.46	1.46	2.77	11/6/03	15 55	0:39:45	0:36:45	0:30:45	0.813841103
6	71	1091	0.0002	531 14.161	0.000199887	5.88	0.002299644	65.12	1.60	2.91	11/6/03	15 59	0:44:15	0:41:15	0:35:15	0.858778202
5	71	1091	0.0002	531 14.161	0.000186573	4.72	0.002488217	69.84	1.72	3.02	11/6/03	16 03	0:48:15	0:45:15	0:39:15	0.896753404
6	71	1091	0.0002	531 14.161	0.000199887	5.88	0.002668104	75.50	1.86	3.16	11/6/03	16 08	0:53:00	0:50:00	0:44:00	0.939858145
8	71	1091	0.0003	531 14.161	0.000286518	7.55	0.00293262	83.04	2.04	3.35	11/6/03	16 16	1:00:30	0:57:30	0:51:30	1.004158022
7	71	1091	0.0002	531 14.161	0.000239202	6.60	0.003165821	89.65	2.21	3.51	11/6/03	16 22	1:06:45	1:03:45	0:57:45	1.054751156
15	71	1091	0.0005	531 14.161	0.000499718	14.15	0.003665539	103.80	2.55	3.86	11/6/03	16 38	1:22:30	1:19:30	1:13:30	1.17260384
16	71	1092	0.0008	531 14.174	0.000533521	15.11	0.00419906	118.90	2.93	4.23	11/6/03	16 57	1:41:30	1:38:30	1:32:30	1.300640868
38	71	1092	0.0013	531 14.174	0.001267112	35.88	0.005466172	154.78	3.81	5.11	11/6/03	17 58	2:42:30	2:39:30	2:33:30	1.845701472
31	66	1096	0.0011	526 14.228	0.001047345	29.68	0.006513516	184.44	4.54	5.84	11/6/03	18 36	4:20:30	4:17:30	4:11:30	2.08366664
142	73	1096	0.005	533 14.228	0.004734508	134.07	0.011248025	318.51	7.84	9.14	11/7/03	0 32	8:16:30	8:13:30	8:07:30	3.045488467
62	72	1097	0.0022	532 14.239	0.002072955	58.70	0.01332098	377.21	9.28	10.59	11/7/03	8 06	14:50:30	14:47:30	14:41:30	3.852488373
71	70	1097	0.0025	530 14.239	0.002382826	67.47	0.015703806	444.88	10.94	12.25	11/7/03	11 10	19:54:30	19:51:30	19:45:30	4.46187554
69	71	1097	0.0024	531 14.239	0.002311343	65.45	0.018015149	510.13	12.55	13.88	11/7/03	18 45	27:29:30	27:26:30	27:20:30	5.243249628
43	71	1098	0.0015	531 14.252	0.001441715	40.82	0.019456864	550.95	13.56	14.88	11/7/03	22 47	31:31:30	31:28:30	31:22:30	5.814712815
42	72	1100	0.0015	532 14.278	0.0014081	39.87	0.020864964	590.83	14.54	15.84	11/8/03	6 23	39:07:30	39:04:30	38:58:30	6.254988002
71	69	1101	0.0025	529 14.291	0.002396035	67.85	0.023260999	658.58	16.21	17.51	11/8/03	19 08	51:52:30	51:49:30	51:43:30	7.202430145
88	73	1100	0.0031	534 14.278	0.00294477	83.39	0.026205769	742.06	18.26	19.58	11/9/03	5 47	62:31:30	62:28:30	62:22:30	7.907275131
89	73	1092	0.0031	533 14.174	0.002956573	83.72	0.029162343	825.78	20.32	21.62	11/9/03	22 31	79:15:30	79:12:30	79:06:30	8.902714942
49	76	1057	0.0017	535 14.109	0.001614266	45.71	0.030776508	871.49	21.44	22.75	11/10/03	8 10	88:54:30	88:51:30	88:45:30	9.428121557
21	75	1066	0.0007	535 14.098	0.000891192	19.57	0.0314678	891.07	21.93	23.23	11/10/03	9 53	91:37:30	91:34:30	91:28:30	9.57209486
101	77	1080	0.0038	537 14.018	0.003293824	93.26	0.034761424	984.33	24.22	25.52	11/11/03	10 38	114:17:30	114:14:30	114:08:30	10.69072807
61	75	1091	0.0022	535 14.161	0.002018991	57.11	0.036778416	1041.44	25.63	26.83	11/12/03	14 26	143:10:30	143:07:30	143:01:30	11.96557562
62	75	1095	0.0022	535 14.213	0.002057573	58.26	0.038835988	1099.71	27.06	28.36	11/13/03	19 34	172:18:30	172:15:30	172:09:30	13.12682888
124	75	1077	0.0044	535 13.979	0.0040475	114.81	0.042883488	1214.32	29.88	31.18	11/15/03	1 24	202:08:30	202:05:30	201:59:30	14.21785335
113	76	1069	0.004	536 13.875	0.003854219	103.48	0.046537707	1317.80	32.43	33.73	11/17/03	16 11	264:55:30	264:52:30	264:46:30	18.27651683
72	72	1078	0.0051	532 13.992	0.004731217	133.97	0.051288924	1451.77	35.72	37.03	11/21/03	10 58	355:42:30	355:39:30	355:33:30	18.86023153
49	72	1088	0.0017	532 14.098	0.001821875	45.93	0.052890799	1497.69	36.85	38.16	11/24/03	14 12	430:56:30	430:53:30	430:47:30	20.75913454
202	74	1095	0.0071	534 14.213	0.008716259	190.18	0.059807058	1687.88	41.53	42.84	12/5/03	12 04	692:48:30	692:45:30	692:39:30	26.3212525
115	74	1082	0.0041	534 14.057	0.00378171	107.09	0.063388768	1794.96	44.17	45.47	12/10/03	14 52	815:36:30	815:33:30	815:27:30	28.55885735
96	76	1087	0.0034	536 14.109	0.003156743	89.39	0.066545511	1884.35	46.37	47.67	12/16/03	14 15	958:59:30	958:56:30	958:50:30	30.96759059
145	73	1081	0.0051	533 14.031	0.004768367	135.02	0.071313878	2019.38	49.69	50.99	12/22/03	18 02	1104:46:30	1104:43:30	1104:37:30	33.23815579
90	75	1082	0.0032	535 14.044	0.00295134	83.57	0.074265218	2102.95	51.75	53.05	12/29/03	14 28	1271:12:30	1271:09:30	1271:03:30	35.65400866
57	74	1103	0.002	534 14.318	0.001909028	54.06	0.076174248	2157.01	53.08	54.38	1/6/04	15 07	1463:51:30	1463:48:30	1463:42:30	38.28040164
100	75	1093	0.0035	535 14.187	0.003312804	93.80	0.07948685	2250.81	55.38	56.69	1/12/04	11 41	1604:25:30	1604:22:30	1604:16:30	40.05527431
175	75	1089	0.0062	535 14.135	0.005775843	183.55	0.085262693	2414.36	59.41	60.71	1/21/04	10 29	1819:13:30	1819:10:30	1819:04:30	42.65237391
69	71	1091	0.0024	531 14.161	0.002298701	85.09	0.087551394	2479.45	61.01	62.31	1/27/04	10 17	1962:51:30	1962:48:30	1962:42:30	44.30415707
94	75	1085	0.0033	535 14.083	0.003091057	87.53	0.090652451	2566.98	63.16	64.47	2/2/04	15 38	2112:22:30	2112:19:30	2112:13:30	45.98058094
62	75	1091	0.0022	535 14.161	0.002050057	58.05	0.092702508	2625.03	64.59	65.90	2/9/04	10 29	2275:13:30	2275:10:30	2275:04:30	47.69931865
86	75	1091	0.0023	535 14.161	0.002182318	61.80	0.094884826	2686.83	66.11	67.42	2/16/04	14 19	2447:03:30	2447:00:30	2446:54:30	49.46775044
53	74	1086	0.0019	534 14.096	0.001747703	49.49	0.096632529	2736.32	67.33	68.63	2/23/04	14 27	2615:11:30	2615:08:30	2615:02:30	51.13894472
36	75	1091	0.0013	535 14.161	0.001190355	33.71	0.097822885	2770.03	68.16	69.46	3/2/04	10 44	2803:28:30	2803:25:30	2803:19:30	52.9478517
46	75	1088	0.0018	535 14.122	0.001516827	42.95	0.099339712	2812.98	69.22	70.52	3/8/04	10 31	2946:45:30	2946:42:30	2946:36:30	54.28405229
52	74	1082	0.0018	534 14.044	0.001708412	48.38	0.101048124	2861.35	70.41	71.71	3/15/04	11 04	3118:18:30	3118:15:30	3118:09:30	55.82380468
18	75	1087	0.0006	535 14.239	0.000598451	16.95	0.101646575	2878.30	70.82	72.13	3/22/04	9 59	3282:43:30	3282:40:30	3282:34:30	57.2950896
65	75	1085	0.0023	535 14.122	0.002143343	60.69	0.103789918	2938.99	72.32	73.62	3/30/04	20 31	3485:15:30	3485:12:30	3485:06:30	59.03807854
80	75	1080	0.0021	535 14.018	0.001963923	55.61	0.105753841	2994.60	73.69	74.99	4/6/04	14 40	3647:24:30	3647:21:30	3647:15:30	60.38977727
19	75	1086	0.0007	535 14.099	0.000625364	17.71	0.106379205	3012.31	74.12	75.43	4/12/04	14 59	3791:43:30	3791:40:30	3791:34:30	61.57698434
0	66	1086	0	528 14.122	0	0.00	0.106379205	3012.31	74.12	75.43	4/19/04	14 25	3959:09:30	3959:06:30	3959:00:30	62.92184305
50	76	1090	0.0018	536 14.148	0.001848674	46.89	0.108027879	3059.00	75.27	76.57	4/29/04	11 31	4124:15:30	4124:12:30	4124:06:30	64.22038677
10	70	1084	0.0007	530 14.070	0.000630101	17.84	0.108665798	3076.84	75.71	77.01	5/3/04	19 03	4299:47:30	4299:44:30	4299:38:30	65.5727987
56	75	1081	0.0002	535 14.031	0.001834692	51.95	0.110492672	3128.79	78.99	78.29	5/10/04	14 00	4462:44:30	4462:41:30	4462:35:30	68.80375488
19	73	1082	0.0007	533 14.044	0.000625399	17.71	0.111118071	3146.50	77.42	78.73	5/17/04	9 43	4626:27:30	4626:24:30	4626:18:30	68.01807358
3	73	1075	0.0012	533 13.953	0.001111894	31.49	0.112229965	3177.99	78.20	79.50	5/24/04	10 30	4795:14:30	4795:11:30	4795:05:30	69.24768348
34	70	1077	0.0001	530 13.979	9											

33	72	1070	0.0012	532	13.966	0.001082226	30.65	0.118257667	3348.67	82.40	83.70	8/23/04	14:06	6882:50:30	6882:47:30	6882:41:30	83.56339909
9	73	1067	0.0003	533	14.109	0.00029761	8.43	0.118555277	3357.10	82.81	83.91	8/30/04	18:40	7153:24:30	7153:21:30	7153:15:30	84.57782412
4	71	1088	0.0001	531	14.122	0.000132892	3.76	0.118688169	3360.86	82.70	84.00	9/7/04	15:54	7344:38:30	7344:35:30	7344:29:30	85.70088487
39	73	1073	0.0014	533	13.927	0.001273035	36.05	0.119961204	3396.91	83.58	84.89	9/14/04	18:36	7515:20:30	7515:17:30	7515:11:30	86.69107028
-7	73	1083	-0.0002	533	14.057	-0.000230623	-8.63	0.119730581	3390.38	83.42	84.73	9/21/04	16:42	7681:26:30	7681:23:30	7681:17:30	87.64383416
-6	70	1089	-0.0002	530	14.135	-0.000199897	-5.66	0.119530684	3384.72	83.28	84.59	9/28/04	20:59	7853:43:30	7853:40:30	7853:34:30	88.62124463
12	71	1085	0.0004	531	14.083	0.000397578	11.28	0.11992828	3395.98	83.56	84.87	10/8/04	10:11	8082:55:30	8082:52:30	8082:48:30	89.90508884
5	85	1079	0.0002	525	14.005	0.000166623	4.72	0.120094883	3400.70	83.68	84.98	10/19/04	14:14	8350:58:30	8350:55:30	8350:49:30	91.38368922
7	59	1056	0.0002	528	14.096	0.000233452	6.81	0.120328334	3407.31	83.84	85.14	10/27/04	14:03	8542:47:30	8542:44:30	8542:38:30	92.42722362
16	72	1090	0.0006	532	14.148	0.000597985	16.93	0.12092632	3424.24	84.26	85.56	11/5/04	11:05	8755:49:30	8755:46:30	8755:40:30	93.57258542
-14	66	1095	-0.0005	526	14.213	-0.000472563	-13.38	0.120453757	3410.86	83.93	85.23	11/12/04	16:27	8929:11:30	8929:08:30	8929:02:30	94.49440019
26	67	1080	0.001	527	14.018	0.00083041	26.36	0.121384187	3437.20	84.58	85.88	11/24/04	10:47	9211:31:30	9211:28:30	9211:22:30	95.97688988
-2	65	1083	-7E-05	525	14.135	-6.7267E-05	-1.90	0.1213169	3435.30	84.53	85.83	12/2/04	10:29	9403:13:30	9403:10:30	9403:04:30	96.97022739

DECANISTERED 12/02/2004; sample dried for 21 days in air

SAMPLE 794.0' to 795.0' (Seam coal) in canister M4

dry sample weight: 2.216 lbs. 1005.08 grams wet sample weight: 2.291 lbs. 1039.37 grams moisture % 3.90% est. lost gas (cc) = 90

RIG/LAB MEASUREMENTS		CONVERSION OF RIG/LAB MEASUREMENTS TO STP (@60 deg F; 14.7 psi)				CUMULATIVE VOLUMES (@STP)		SCF/TON	SCF/TON	TIME OF MEASURE	TIME SINCE			elapsed time (off bottom to canistering)			
measured cc	measured T (°F)	measured P	cubic ft	absolute T (°F)	psia	cubic ft (@STP)	cc (@STP)	without lost gas	with lost gas	off bottom	at surface	in canister	12.6 minutes				
11	71	1082	0.0004	531	14.174	0.000366796	10.39	0.000366796	10.39	11/6/03	16:54	11/6/03	16:57	11/6/03	17:08	0.210 hours	
7	71	1092	0.0002	531	14.174	0.000233415	6.81	0.000602211	17.00	0.54	3.41	11/6/03	17:10	0:16:20	0:13:20	0:08:45	0.497214463
14	71	1092	0.0005	531	14.174	0.000466831	13.22	0.001067041	30.22	0.96	3.83	11/6/03	17:15	0:20:50	0:17:50	0:08:15	0.521749195
16	71	1091	0.0008	531	14.181	0.000539302	15.09	0.001600074	45.31	1.44	4.31	11/6/03	17:19	0:25:05	0:22:05	0:12:30	0.589255851
5	71	1091	0.0002	531	14.181	0.000166573	4.72	0.001768646	50.03	1.59	4.46	11/6/03	17:24	0:29:50	0:26:50	0:17:15	0.648572158
14	71	1091	0.0005	531	14.181	0.000468403	13.21	0.002239049	63.23	2.02	4.88	11/6/03	17:30	0:36:05	0:33:05	0:23:30	0.70513986
11	71	1093	0.0004	531	14.181	0.00038646	10.38	0.002599509	73.61	2.35	5.22	11/6/03	17:36	0:41:50	0:38:50	0:29:15	0.775492675
12	71	1093	0.0004	531	14.181	0.000398774	11.32	0.002999283	84.93	2.71	5.58	11/6/03	17:44	0:50:05	0:47:05	0:37:30	0.834988337
16	71	1091	0.0008	531	14.181	0.000533032	15.09	0.003532315	100.02	3.19	6.08	11/6/03	17:53	1:01:50	0:58:50	0:49:15	0.775492675
92	68	1036	0.0032	526	14.228	0.003108249	88.02	0.00640585	188.04	5.99	8.88	11/6/03	19:37	2:42:50	2:39:50	2:30:15	0.834988337
163	73	1098	0.0058	533	14.228	0.005434682	153.89	0.012075247	341.93	10.90	13.77	11/7/03	6:33	7:38:50	7:35:50	7:28:15	0.913631338
75	72	1077	0.0026	532	14.239	0.002507607	71.01	0.014582854	412.94	13.16	18.03	11/7/03	6:07	13:12:50	13:09:50	13:00:15	1.015182822
58	70	1087	0.002	530	14.239	0.001879412	53.22	0.016462268	486.16	14.86	17.73	11/7/03	11:11	18:16:50	18:13:50	18:04:15	1.647388506
64	71	1087	0.0023	531	14.239	0.002143854	60.71	0.01860612	526.86	16.79	19.66	11/7/03	18:46	25:51:50	25:48:50	25:40:15	2.765361138
37	71	1088	0.0013	531	14.252	0.001240546	35.13	0.019846666	561.99	17.91	20.78	11/7/03	22:48	29:53:50	29:50:50	29:41:15	3.535091318
39	72	1100	0.0014	532	14.278	0.001307522	37.02	0.021154187	599.02	19.09	21.96	11/8/03	6:24	37:29:50	37:26:50	37:17:15	4.275576634
58	69	1101	0.002	529	14.291	0.001957325	55.43	0.023111512	654.44	20.86	23.73	11/8/03	19:07	50:12:50	50:09:50	50:00:15	5.08555207
55	73	1100	0.0019	533	14.278	0.001840481	52.12	0.024951993	706.56	22.52	25.39	11/9/03	5:47	60:52:50	60:49:50	60:40:15	6.123487548
78	75	1092	0.0026	533	14.174	0.002425054	68.67	0.027377048	775.23	24.71	27.58	11/9/03	22:32	77:37:50	77:34:50	77:25:15	7.0861759
35	75	1087	0.0012	535	14.109	0.001153047	32.65	0.028530095	807.88	25.75	28.62	11/10/03	8:11	87:16:50	87:13:50	87:04:15	7.80259282
83	77	1090	0.0029	537	14.018	0.002708642	78.64	0.031236736	894.52	28.19	31.08	11/11/03	9:34	112:39:50	112:36:50	112:27:15	8.810820368
41	75	1091	0.0014	535	14.161	0.001355683	38.39	0.032592419	922.91	29.42	32.29	11/12/03	14:26	141:31:50	141:28:50	141:19:15	9.342406304
39	75	1095	0.0014	535	14.213	0.00129428	36.85	0.033886899	959.56	30.59	33.45	11/13/03	19:36	170:40:50	170:37:50	170:28:15	10.86143247
86	75	1077	0.003	536	13.979	0.002807137	79.49	0.036893835	1039.05	33.12	35.99	11/15/03	13:26	212:31:50	212:28:50	212:19:15	11.96968153
70	76	1069	0.0025	536	13.875	0.002263875	64.10	0.038957511	1103.15	35.16	38.03	11/17/03	16:26	263:31:50	263:28:50	263:19:15	14.57842775
99	72	1075	0.0035	532	13.992	0.003252711	92.11	0.042210222	1195.26	38.10	40.97	11/21/03	10:52	353:57:50	353:54:50	353:45:15	16.23362423
30	72	1088	0.0011	532	14.096	0.000992985	28.12	0.043203207	1223.37	39.00	41.86	11/24/03	14:10	429:15:50	429:12:50	429:03:15	18.18392806
141	72	1096	0.005	532	14.213	0.004705706	133.25	0.047908913	1356.62	43.24	46.11	12/5/03	11:56	691:01:50	690:58:50	690:49:15	20.71688454
39	75	1034	0.0014	535	14.057	0.001280098	36.25	0.049189009	1392.87	44.40	47.27	12/10/03	14:53	813:58:50	813:55:50	813:46:15	22.50748004
92	71	1087	0.0011	533	14.109	0.00105817	29.96	0.050247179	1422.84	45.35	48.22	12/16/03	14:16	957:21:50	957:18:50	957:09:15	25.2634447
31	71	1081	0.0011	531	14.031	0.001023284	28.98	0.051270463	1451.81	46.28	49.15	12/22/03	16:03	1103:08:50	1103:05:50	1102:56:15	28.5034447
30	72	1082	0.0011	532	14.044	0.000989328	28.01	0.052258791	1479.83	47.17	50.04	12/29/03	14:29	1269:34:50	1269:31:50	1269:22:15	30.94129747
-3	70	1103	-0.0001	530	14.316	-0.000101293	-2.87	0.052158557	1476.96	47.08	49.95	1/8/04	15:07	1482:12:50	1482:09:50	1482:00:15	33.21368018
32	71	1083	0.0011	531	14.187	0.001068019	30.24	0.053226576	1507.20	48.04	50.91	1/12/04	11:42	1602:47:50	1602:44:50	1602:35:15	35.63117393
27	70	1089	0.001	530	14.135	0.000899537	25.47	0.054128113	1532.88	48.85	51.72	1/21/04	10:32	1817:37:50	1817:34:50	1817:25:15	38.23890544
9	69	1093	0.0003	528	14.161	0.000301534	8.54	0.054427647	1541.21	49.13	52.00	1/27/04	10:08	1981:19:50	1981:16:50	1981:07:15	40.03485001
23	70	1085	0.0008	530	14.083	0.000763458	21.82	0.055191104	1562.83	49.82	52.68	2/2/04	15:39	2110:44:50	2110:41:50	2110:32:15	42.63367865
10	71	1031	0.0004	531	14.161	0.000333145	9.43	0.05552425	1572.27	50.12	52.98	2/9/04	10:30	2273:35:50	2273:32:50	2273:23:15	44.28578277
9.5	71	1091	0.0003	531	14.161	0.000318488	8.96	0.055840737	1581.23	50.40	53.27	2/16/04	14:20	2445:25:50	2445:22:50	2445:13:15	45.94286911
21	70	1085	0.0007	530	14.098	0.000697712	19.76	0.05653845	1600.98	51.03	53.90	2/23/04	14:28	2613:39:50	2613:36:50	2613:27:15	47.6822527
8	72	1091	0.0003	532	14.161	0.000268015	7.53	0.056804465	1608.52	51.27	54.14	3/2/04	10:44	2801:49:50	2801:46:50	2801:37:15	49.45128478
12	71	1083	0.0004	531	14.122	0.000398875	11.29	0.05720314	1619.81	51.83	54.60	3/8/04	10:02	2945:07:50	2945:04:50	2944:55:15	51.12302699
20	70	1082	0.0007	530	14.044	0.00082041	18.75	0.05788518	1638.55	52.23	55.10	3/15/04	11:35	3114:40:50	3114:37:50	3114:28:15	52.93230252
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3	73	1082	0.0001	533	14.044	9.87471E-05	2.80	0.060007096	1699.21	54.16	57.03	5/17/04	8:44	4624:49:50	4624:46:50	4624:37:15	68.00610675
14	73	1075	0.0005	533	13.953	0.000457839	12.96	0.060464935	1712.17	54.58	57.44	5/24/04	10:31	4793:38:50	4793:33:50	4793:24:15	68.23592918
-1	70	1077	-4E-05	530	13.979	-3.29491E-05	-0.93	0.060431986	1711.24	54.55	57.41	8/1/04	10:54	4985:59:50	4985:56:50	4985:47:15	70.61159411
9	72	1078	0.0003	532	13.968	0.000295152	8.36	0.060727138	1719.59	54.81	57.68	8/7/04	10:35	5129:40:50	5129:37:50	5129:28:15	71.82178827
14	78	1078	0.0005	538	13.992	0.000456547	12.93	0.061183885	1732.52	55.22	58.09	6/14/04	10:49	5297:54:50	5297:51:50	5297:42:15	72.78677001
-5	73	1082	-0.0002	533	14.044	-0.000164579	-4.66	0.061019106	1727.85	55.08	57.84	6/23/04	16:24	5519:29:50	5519:26:50	5519:17:15	74.29331883
0	73	1082	0	533	14.044	0	0.00	0.061019106	1727.85	55.08	57.94	7/1/04	13:51	5708:58:50	5708:53:50	5708:44:15	75.55757554

DECANISTERED 7/01/2004; sample dried for 28 days in air

SAMPLE: 815.3' to 816.9' (Tebo coal) in canister 3

dry sample weight:	lbs.	grams	lbs.	grams	moisture weight	est. lost gas (cc) =	TIME OF:	elapsed time (off bottom to canistering)
	3.320	1505.80	wet sample weight:	3.391	1538.31	2.1%	off bottom	10.0 minutes
							11/7/03	0.167 hours
							at surface	11/7/03
							in canister	11/7/03
							11:29	11:32
							11:32	11:39

RIGLAB MEASUREMENTS			CONVERSION OF RIGLAB MEASUREMENTS TO STP (@60 deg F; 14.7 psi)				CUMULATIVE VOLUMES (@STP)		SCF/TON	SCF/TON	TIME OF MEASURE				TIME SINCE	SCRT (hrs)	
measured cc	measured T (F)	measured P	cubic ft	absolute T (F)	psia	cubic ft (@STP)	cc (@STP)	cubic ft	without lost gas	with lost gas	off bottom	at surface	in canister	off bottom	at surface	in canister	SCRT (hrs)
30	75	1092	0.0011	535	14.174	0.000992872	28.11	0.000992872	28.11	0.60	3.41	11/7/03	11:43	0:14:10	0:10:55	0:04:10	0.485912858
4	75	1092	0.0001	535	14.174	0.000132383	3.75	0.001125255	31.86	0.68	3.49	11/7/03	11:44	0:14:40	0:11:25	0:04:40	0.494413233
3	75	1092	0.0001	535	14.174	9.92872E-05	2.81	0.001224542	34.68	0.74	3.55	11/7/03	11:44	0:15:10	0:11:55	0:05:10	0.502770104
4	75	1092	0.0001	535	14.174	0.000132383	3.75	0.001356925	38.42	0.82	3.63	11/7/03	11:45	0:15:40	0:12:25	0:05:40	0.510990324
3	75	1092	0.0001	535	14.174	9.92872E-05	2.81	0.001456212	41.24	0.88	3.69	11/7/03	11:45	0:16:10	0:12:55	0:06:10	0.519080384
4	75	1092	0.0001	535	14.174	0.000132383	3.75	0.001588559	44.98	0.96	3.77	11/7/03	11:46	0:16:40	0:13:25	0:06:40	0.527046277
4	76	1092	0.0001	536	14.174	0.000132136	3.74	0.001720731	48.73	1.04	3.85	11/7/03	11:47	0:17:40	0:14:25	0:07:40	0.542627353
3	76	1092	0.0001	536	14.174	9.9102E-05	2.81	0.001819833	51.53	1.10	3.90	11/7/03	11:48	0:18:40	0:15:25	0:08:40	0.557773351
9	76	1092	0.0003	536	14.174	0.000297306	8.42	0.002117139	59.95	1.28	4.08	11/7/03	11:50	0:20:40	0:17:25	0:10:40	0.586893895
10	76	1092	0.0004	536	14.174	0.00033034	9.35	0.002447479	69.30	1.47	4.28	11/7/03	11:52	0:22:40	0:19:25	0:12:40	0.614636297
14	76	1092	0.0005	536	14.174	0.000462478	13.10	0.002909955	82.40	1.75	4.56	11/7/03	11:55	0:25:40	0:22:25	0:15:40	0.654047229
15	75	1093	0.0005	535	14.187	0.000498891	14.07	0.003406848	98.47	2.05	4.86	11/7/03	12:00	0:30:40	0:27:25	0:20:40	0.714920353
27	75	1093	0.001	535	14.187	0.000894403	25.33	0.004301249	121.80	2.59	5.40	11/7/03	12:10	0:40:40	0:37:25	0:30:40	0.823272802
28	75	1093	0.001	535	14.187	0.000927529	28.26	0.005228778	148.08	3.15	5.96	11/7/03	12:20	0:50:40	0:47:25	0:40:40	0.918936584
25	74	1092	0.0009	534	14.174	0.000828943	23.47	0.006057721	171.53	3.85	6.46	11/7/03	12:30	1:00:40	0:57:25	0:50:40	1.006540209
54	74	1092	0.0019	534	14.174	0.001790517	50.70	0.007848238	222.24	4.73	7.54	11/7/03	13:00	1:30:40	1:27:25	1:20:40	1.229272594
49	73	1092	0.0017	533	14.174	0.001827778	46.09	0.009476014	288.33	5.71	8.52	11/7/03	13:30	2:00:40	1:57:25	1:50:40	1.418138492
45	73	1091	0.0018	533	14.181	0.001493528	42.29	0.010969542	310.62	6.61	9.42	11/7/03	14:06	2:36:40	2:33:25	2:28:40	1.615893286
38	73	1091	0.0013	533	14.181	0.001261201	35.71	0.012230743	346.33	7.37	10.18	11/7/03	14:39	3:09:40	3:06:25	2:59:40	1.77795138
24	73	1091	0.0008	533	14.181	0.000798548	22.56	0.013027291	368.89	7.85	10.66	11/7/03	15:00	3:30:40	3:27:25	3:20:40	1.87379591
58	73	1092	0.002	533	14.174	0.001926756	54.56	0.014954046	423.45	9.01	11.82	11/7/03	16:01	4:31:40	4:28:25	4:21:40	2.127857556
39	73	1092	0.0014	533	14.174	0.001285577	36.68	0.016249623	460.14	9.79	12.60	11/7/03	17:00	5:30:40	5:27:25	5:20:40	2.347575562
56	74	1097	0.002	534	14.239	0.001865334	52.82	0.018114957	512.96	10.91	13.72	11/7/03	18:48	7:18:40	7:15:25	7:08:40	2.703906639
128	72	1090	0.0045	532	14.252	0.00428355	121.30	0.022398508	634.25	13.49	16.30	11/7/03	22:50	11:20:40	11:17:25	11:10:40	3.368151488
135	72	1100	0.0048	532	14.278	0.004526036	128.18	0.026924544	762.42	18.22	19.03	11/8/03	8:25	18:55:40	18:52:25	18:45:40	4.350606599
169	69	1101	0.006	529	14.291	0.005703239	181.50	0.032627783	923.91	19.68	22.47	11/8/03	19:09	31:39:40	31:38:25	31:29:40	5.628820693
107	74	1100	0.0038	534	14.278	0.003573867	101.20	0.03820185	1025.11	21.81	24.82	11/9/03	2:29	38:59:40	38:56:25	38:49:40	6.244553182
42	73	1100	0.0015	533	14.278	0.001405458	39.80	0.037607108	1064.91	22.66	25.47	11/9/03	5:48	42:19:40	42:16:25	42:09:40	6.505980155
182	73	1100	0.0064	533	14.278	0.0043697428	172.48	0.043697428	1237.37	28.33	29.13	11/9/03	22:34	59:04:40	59:01:25	58:54:40	7.686206983
83	75	1092	0.0029	535	14.174	0.002746946	77.78	0.046444374	1315.15	27.98	30.79	11/10/03	8:12	68:42:40	68:38:25	68:30:40	8.289218558
27	75	1097	0.001	535	14.109	0.000889493	25.19	0.047333867	1340.34	28.52	31.33	11/10/03	10:51	71:21:40	71:18:25	71:11:40	8.447550598
141	77	1090	0.005	537	14.018	0.00459803	130.20	0.051931897	1470.54	31.29	34.10	11/11/03	9:35	94:05:40	94:02:25	93:55:40	9.700229092
133	75	1091	0.0047	535	14.161	0.004397702	124.53	0.0563296	1595.07	33.94	36.74	11/12/03	14:28	122:58:40	122:55:25	122:48:40	11.08953461
145	75	1095	0.0051	535	14.213	0.004812088	138.25	0.061141665	1731.33	36.84	39.64	11/13/03	19:38	152:06:40	152:03:25	151:56:40	12.33333333
173	75	1077	0.0062	535	13.979	0.005744838	182.88	0.068886503	1894.01	40.30	43.10	11/15/03	13:27	193:57:40	193:54:25	193:47:40	13.92699218
192	78	1089	0.0068	538	13.875	0.006208938	175.82	0.073095442	2068.82	44.04	46.85	11/17/03	16:13	244:43:40	244:40:25	244:38:40	15.64377761
269	72	1076	0.0095	532	13.992	0.008838175	250.27	0.081933817	2320.09	49.36	52.17	11/21/03	10:33	335:03:40	335:00:25	334:59:40	18.30467457
84	72	1086	0.003	532	14.098	0.002780358	78.73	0.084713975	2398.82	51.04	53.85	11/24/03	14:03	410:33:40	410:30:25	410:23:40	20.26230785
109	75	1073	0.0038	535	13.927	0.003544669	100.37	0.088258644	2499.20	53.17	55.98	11/28/03	15:37	460:07:40	460:04:25	459:57:40	21.45058922
158	78	1090	0.0056	533	14.148	0.005239135	148.38	0.093497778	2647.55	56.33	59.14	12/4/03	19:41	658:11:40	658:08:25	658:01:40	25.61629256
161	75	1088	0.0057	535	14.057	0.005284498	149.84	0.098782277	2797.19	59.51	62.32	12/10/03	14:55	795:25:40	795:22:25	795:15:40	28.2033292
205	73	1087	0.0072	533	14.109	0.006778903	191.96	0.105561179	2989.15	63.60	66.40	12/16/03	14:17	938:47:40	938:44:25	938:37:40	30.63975268
117	71	1081	0.0041	531	14.031	0.003862071	109.38	0.10942325	3098.51	65.92	68.73	12/22/03	16:04	1084:34:40	1084:31:25	1084:24:40	32.93292847
75	72	1082	0.0026	532	14.044	0.002473319	70.04	0.111896589	3168.55	67.41	70.22	12/29/03	14:29	1250:59:40	1250:56:25	1250:49:40	35.36939983
21	70	1103	0.0007	530	14.318	0.000708634	20.07	0.12605203	3188.61	67.84	70.65	1/8/04	15:07	1443:37:40	1443:34:25	1443:27:40	37.99510202
77	71	1095	0.0027	531	14.017	0.00258992	72.77	0.115175123	3261.38	69.39	72.20	1/12/04	11:42	1584:12:40	1584:09:25	1584:02:40	39.80214958
84	70	1089	0.003	530	14.135	0.002798559	79.25	0.11973682	3340.63	71.07	73.88	1/21/04	10:32	1799:02:40	1798:59:25	1798:52:40	42.41514405
38	68	1091	0.0013	528	14.161	0.001273144	38.05	0.119248927	3375.68	71.84	74.65	1/24/04	10:08				

6.4	70	1080	0.0023	530	14.018	0.002114614	59.88	0.132598969	3754.77	79.89	82.69	4/8/04	14:41	3627:11:40	3627:08:25	3627:01:40	60.22619401
11	88	1083	0.0004	528	14.096	0.000366853	10.39	0.132985822	3765.16	80.11	82.92	4/12/04	15:00	3771:30:40	3771:27:25	3771:20:40	61.4126299
36	69	1086	0.0013	529	14.122	0.001200546	34.00	0.134166366	3799.15	80.83	83.64	4/19/04	14:26	3938:56:40	3938:53:25	3938:46:40	62.76101054
36	71	1090	0.0013	531	14.148	0.001264791	35.81	0.135431159	3834.97	81.59	84.40	4/26/04	11:33	4104:03:40	4104:00:25	4103:53:40	64.06294648
32	70	1084	0.0011	530	14.070	0.001061223	30.05	0.136492382	3865.02	82.23	85.04	5/3/04	19:06	4279:36:40	4279:33:25	4279:26:40	65.4187367
77	75	1081	0.0027	535	14.031	0.002522701	71.43	0.139015083	3936.45	83.75	86.56	5/10/04	14:02	4442:32:40	4442:29:25	4442:22:40	68.85241514
22	75	1082	0.0008	533	14.044	0.000724146	20.51	0.139739229	3956.98	84.19	87.00	5/17/04	9:45	4606:15:40	4606:12:25	4606:05:40	67.86944168
44	73	1075	0.0018	533	13.953	0.001438922	40.75	0.141178151	3997.70	85.05	87.86	5/24/04	10:31	4775:01:40	4774:58:25	4774:51:40	69.1015758
5	70	1077	0.0002	530	13.979	0.000164745	4.67	0.141342896	4002.37	85.15	87.96	6/1/04	10:54	4967:24:40	4967:21:25	4967:14:40	70.47986318
25	72	1075	0.0009	532	13.966	0.000819868	23.22	0.142162764	4025.59	85.65	88.46	6/7/04	10:36	5111:06:40	5111:03:25	5110:56:40	71.4920353
37	76	1078	0.0013	536	13.992	0.001206588	34.17	0.143369352	4059.75	86.37	89.18	6/14/04	10:49	5279:19:40	5279:16:25	5279:09:40	72.65898277
-4	75	1082	-0.0001	533	14.044	-0.000131663	-3.73	0.143237689	4056.02	86.30	89.10	6/23/04	16:24	5500:54:40	5500:51:25	5500:44:40	74.16812733
6	73	1082	0.0002	533	14.044	0.000197494	5.59	0.143435183	4061.62	86.41	89.22	7/1/04	11:50	5688:20:40	5688:17:25	5688:10:40	75.42111405
8	74	1081	0.0003	534	14.031	0.000262559	7.44	0.143697773	4069.05	86.57	89.38	7/7/04	10:31	5831:01:40	5830:58:25	5830:51:40	78.38116869
11	75	1082	0.0004	535	14.044	0.000360719	10.21	0.144058492	4079.27	86.79	89.60	7/13/04	14:19	5978:49:40	5978:46:25	5978:39:40	77.32288004
9	73	1080	0.0003	533	14.018	0.000295694	8.37	0.144554186	4087.64	86.97	89.78	7/19/04	11:22	6119:52:40	6119:49:25	6119:42:40	78.22964769
-13	72	1091	-0.0005	532	14.161	-0.000432275	-12.24	0.143921911	4075.40	88.71	89.52	7/26/04	10:23	6286:53:40	6286:50:25	6286:43:40	79.28993911
27	73	1079	0.001	533	14.005	0.00088626	25.10	0.144808171	4100.50	87.24	90.05	8/2/04	14:42	6459:12:40	6459:09:25	6459:02:40	80.36921743
-2	73	1085	-7E-05	533	14.098	-6.80748E-05	-1.87	0.144742097	4098.62	87.20	90.01	8/9/04	13:59	6626:29:40	6626:26:25	6626:19:40	81.40328276
-3	73	1088	-0.0001	533	14.122	-9.92947E-05	-2.81	0.144642802	4095.81	87.14	89.95	8/16/04	11:05	6791:35:40	6791:32:25	6791:25:40	82.41113059

DECANISTERED 8/16/2004; sample dried for 14 days in air

SAMPLE: 891.7' to 893.0' (Dbj(?) coal) in canister E

dry sample weight:	lbs.	grams	wet sample weight:	lbs.	grams	moisture %	est. lost gas (cc) =	TIME OF:	elapsed time (off bottom to canistering)							
	2.601	1179.59		2.676	1213.65	2.8%	165	off bottom 11/8/03 10:48	13.1 minutes 0.218 hours							
								at surface 11/8/03 10:52								
								in canister 11/8/03 11:02								
FIGLAB MEASUREMENTS	CONVERSION OF FIGLAB MEASUREMENTS TO STP (@60 deg F; 14.7 psi)		CUMULATIVE VOLUMES (@STP)		SCF/TON	SCF/TON	TIME OF MEASURE	TIME SINCE	0.465964191 SCF/T (hrs)							
measured cc	measured T (F)	measured P	cubic ft	absolute T (F)	psi	cubic ft (@STP)	cc (@STP)	without lost gas	with lost gas	off bottom	at surface	in canister	SCF/T hrs. (since off bottom)			
39	65	1087	529	14.239	0.001008731	28.56	0.001008731	28.56	5.28	11/8/03 11:07	0:18:25	0:14:30	0:05:20	0.554025671		
5	69	1087	0.0002	529	14.239	0.000168122	4.78	0.001178853	33.32	0.91	5.39	11/8/03 11:08	0:18:05	0:15:10	0:08:00	0.563984144
4	69	1097	0.0001	529	14.239	0.000134497	3.81	0.001311135	37.13	1.01	5.49	11/8/03 11:08	0:19:35	0:15:40	0:08:30	0.57130455
2	69	1097	7E-05	529	14.239	6.72487E-05	1.80	0.001378599	39.04	1.06	5.64	11/8/03 11:09	0:20:05	0:18:10	0:07:00	0.578551932
5	69	1097	0.0002	529	14.239	0.000168122	4.80	0.001546721	43.80	1.19	5.67	11/8/03 11:10	0:21:05	0:17:10	0:08:00	0.592780842
4	69	1097	0.0001	529	14.239	0.000134497	3.81	0.001681219	47.61	1.29	5.77	11/8/03 11:11	0:22:05	0:18:10	0:09:00	0.606675824
5	69	1097	0.0002	529	14.239	0.000168122	4.76	0.00184934	52.37	1.42	5.90	11/8/03 11:12	0:23:05	0:19:10	0:10:00	0.620259802
12	68	1097	0.0004	529	14.239	0.000403492	11.43	0.002252833	63.79	1.73	6.21	11/8/03 11:15	0:26:05	0:22:10	0:13:00	0.659334681
54	69	1090	0.0019	529	14.252	0.001817371	51.46	0.004070204	115.25	3.13	7.61	11/8/03 11:30	0:41:05	0:37:10	0:28:00	0.827479439
53	70	1097	0.0019	530	14.239	0.001778729	50.37	0.005848933	165.62	4.50	8.98	11/8/03 11:45	0:58:05	0:52:10	0:43:00	0.966810334
40	70	1097	0.0014	530	14.239	0.001342437	38.01	0.00719137	203.64	5.53	10.01	11/8/03 12:00	1:11:05	1:07:10	0:58:00	1.088449458
32	70	1097	0.0011	530	14.239	0.00107395	30.41	0.00826532	234.05	6.36	10.84	11/8/03 12:10	1:21:05	1:17:10	1:08:00	1.162492533
96	71	1097	0.0034	531	14.239	0.003215782	91.06	0.011481102	325.11	8.83	13.31	11/8/03 12:50	2:01:05	1:57:10	1:48:00	1.420582822
80	72	1096	0.0028	532	14.226	0.002872342	75.67	0.01453444	400.78	10.88	15.37	11/8/03 13:20	2:31:05	2:27:10	2:18:00	1.586839228
76	73	1095	0.0027	533	14.213	0.00253185	71.89	0.016885094	472.47	12.83	17.31	11/8/03 14:05	3:16:05	3:12:10	3:03:00	1.807776412
76	73	1095	0.0027	533	14.213	0.00253185	71.89	0.019218745	544.16	14.78	19.26	11/8/03 15:08	4:19:05	4:15:10	4:06:00	2.077993158
66	75	1095	0.0023	535	14.213	0.00219032	62.02	0.021407064	606.18	16.46	20.94	11/8/03 16:10	5:21:05	5:17:10	5:08:00	2.313036918
69	74	1095	0.0024	534	14.226	0.002298263	65.02	0.023703327	671.20	18.23	22.71	11/8/03 17:40	6:51:05	6:47:10	6:38:00	2.617515786
48	75	1101	0.0017	535	14.291	0.001801888	45.35	0.025305015	716.56	19.46	23.94	11/8/03 19:10	8:21:05	8:17:10	8:08:00	2.898876988
229	74	1100	0.0079	534	14.278	0.00744834	210.91	0.032753355	927.47	25.19	29.67	11/9/03 2:28	15:39:05	15:35:10	15:26:00	3.956183627
77	73	1100	0.0027	533	14.278	0.002578874	72.96	0.035330029	1000.43	27.17	31.65	11/9/03 5:49	19:00:05	18:56:10	18:47:00	4.359058257
204	75	1092	0.0107	535	14.174	0.010061104	284.90	0.045391133	1285.33	34.91	39.39	11/9/03 22:39	35:50:05	35:46:10	35:37:00	5.998211007
119	75	1087	0.0042	535	14.109	0.00392036	111.01	0.049311493	1396.34	37.92	42.41	11/10/03 8:13	45:24:05	45:20:10	45:11:00	6.738055275
37	75	1096	0.0013	535	14.098	0.001217814	34.48	0.050529307	1430.83	38.88	43.34	11/10/03 10:54	48:05:05	48:01:10	47:52:00	6.934314834
183	77	1090	0.0065	537	14.018	0.005967656	188.98	0.056496963	1599.81	43.45	47.93	11/11/03 9:38	70:49:05	70:45:10	70:38:00	8.415348431
130	75	1091	0.0048	535	14.181	0.004298506	121.72	0.080795469	1721.53	48.78	51.24	11/12/03 14:30	99:41:05	99:37:10	99:28:00	9.984223668
116	75	1095	0.0041	535	14.213	0.003849653	0.064645121	1930.54	49.72	54.20	11/13/03 19:39	128:50:05	128:46:10	128:37:00	11.35053841	
165	75	1077	0.0058	535	13.978	0.005385786	152.51	0.070030907	1983.05	53.86	58.34	11/15/03 13:29	170:40:05	170:36:10	170:27:00	13.083999845
155	75	1069	0.0055	535	13.875	0.005021793	142.20	0.0750527	2125.25	57.72	62.20	11/17/03 16:18	221:27:05	221:23:10	221:14:00	14.88124285
166	74	1078	0.0059	534	13.992	0.005433614	153.86	0.080486314	2279.11	61.90	66.38	11/21/03 11:21	312:32:05	312:28:10	312:19:00	17.6786516
119	76	1086	0.0042	536	14.096	0.003909446	110.70	0.084395378	2389.81	64.91	68.39	11/24/03 14:02	387:13:05	387:09:10	387:00:00	19.67785699
134	74	1073	0.0042	534	13.927	0.003844534	108.86	0.088240294	2498.58	67.86	72.34	11/26/03 15:38	436:49:05	436:45:10	436:36:00	20.90019272
118	75	1090	0.0047	535	14.148	0.004426706	125.35	0.092667	2624.03	71.27	75.75	12/4/03 19:44	632:55:05	632:51:10		

55	74	1088	0.0019	534 14.096	0.001813654	51.36	0.120242704	3404.88	92.47	96.96	2/23/04 14:29	2571:40:05	2571:36:10	2571:27:00	50.71161657
43	75	1091	0.0015	535 14.161	0.001421813	40.26	0.121684517	3445.14	93.57	98.05	3/2/04 10:46	2759:57:05	2759:53:10	2759:44:00	52.5352395
44	75	1088	0.0016	535 14.122	0.001450878	41.08	0.123115396	3486.23	94.68	99.17	3/8/04 10:03	2903:14:05	2903:10:10	2903:01:00	53.88167334
55	74	1082	0.002	534 14.044	0.001839828	52.10	0.124955224	3538.32	96.10	100.58	3/15/04 11:37	3072:48:05	3072:44:10	3072:35:00	55.43285478
11	75	1097	0.0004	535 14.239	0.00036572	10.38	0.125320944	3548.68	96.38	100.88	3/22/04 10:02	3239:13:05	3239:09:10	3239:00:00	56.81412879
32	75	1098	0.0011	535 14.122	0.001055184	29.88	0.126376128	3578.56	97.19	101.87	3/30/04 20:33	3441:44:05	3441:40:10	3441:31:00	58.65629971
53	75	1080	0.0019	535 14.018	0.001734799	49.12	0.128110927	3627.88	98.53	103.01	4/6/04 14:42	3603:53:05	3603:49:10	3603:40:00	60.03236396
7	75	1088	0.0002	535 14.098	0.000230397	6.52	0.128341324	3634.21	98.70	103.18	4/12/04 15:00	3748:11:05	3748:07:10	3747:58:00	61.22242009
-10	68	1088	-0.0004	528 14.122	-0.000334117	-9.46	0.128072707	3624.75	98.45	102.93	4/19/04 14:26	3915:37:05	3915:33:10	3915:24:00	62.57489956
35	76	1090	0.0012	536 14.148	0.001154072	32.68	0.129161279	3657.43	99.38	103.82	4/26/04 11:33	4080:44:05	4080:40:10	4080:31:00	63.88062889
32	76	1084	0.0011	536 14.070	0.001049344	29.71	0.130210623	3687.14	100.14	104.62	5/3/04 19:07	4256:18:05	4256:14:10	4256:05:00	65.2403356
38	77	1081	0.0013	537 14.031	0.001240333	35.12	0.131450956	3722.26	101.09	105.58	5/10/04 14:02	4419:13:05	4419:09:10	4419:00:00	66.47719952
13	78	1082	0.0005	538 14.044	0.000423927	12.00	0.131874883	3734.27	101.42	105.90	5/17/04 9:45	4582:56:05	4582:52:10	4582:43:00	67.69737604
11	74	1075	0.0004	534 13.953	0.000359057	10.17	0.13223394	3744.43	101.70	106.18	5/24/04 10:32	4751:43:05	4751:39:10	4751:30:00	68.93270672
21	77	1077	0.0007	537 13.979	0.000682911	19.34	0.13291885	3763.77	102.22	106.70	6/1/04 10:55	4944:06:05	4944:02:10	4943:53:00	70.3143043
36	78	1076	0.0013	538 13.966	0.001167443	33.08	0.134084293	3795.83	103.12	107.60	6/7/04 10:36	5087:47:05	5087:43:10	5087:34:00	71.32870996
-2	75	1078	-7E-05	535 13.992	-6.53429E-05	-1.85	0.134018951	3794.98	103.07	107.55	6/14/04 10:50	5258:01:05	5258:57:10	5258:48:00	72.49840037
9	77	1082	0.0003	537 14.044	0.000294035	8.33	0.134312985	3803.31	103.30	107.78	6/23/04 18:25	5477:38:05	5477:32:10	5477:23:00	74.0108194
17	77	1082	0.0006	537 14.044	0.000555399	15.73	0.134888384	3819.03	103.72	108.20	7/1/04 11:53	5665:04:05	5665:00:10	5664:51:00	75.26864637
22	79	1081	0.0008	539 14.031	0.000715423	20.26	0.135583807	3839.29	104.27	108.75	7/7/04 10:33	5807:44:05	5807:40:10	5807:31:00	76.20848508
20	79	1082	0.0007	539 14.044	0.000850986	18.43	0.136234793	3857.73	104.77	109.26	7/13/04 14:20	5955:31:05	5955:27:10	5955:18:00	77.17200306
-24	73	1080	-0.0008	533 14.018	-0.000788517	-22.33	0.135446276	3835.40	104.17	108.65	7/19/04 11:22	6096:33:05	6096:29:10	6096:20:00	78.08041617
5	79	1091	0.0002	539 14.161	0.0001641	4.65	0.135610377	3840.04	104.29	108.77	7/26/04 10:23	6263:34:05	6263:30:10	6263:21:00	79.1427089
39	80	1079	0.0014	540 14.005	0.001263559	35.78	0.136873936	3875.82	105.27	109.75	8/2/04 14:43	6435:54:05	6435:50:10	6435:41:00	80.22408988
0	78	1086	0	538 14.096	0	0.00	0.136873936	3875.82	105.27	109.75	8/9/04 14:00	6603:11:05	6603:07:10	6602:58:00	81.25898229
-5	78	1086	-0.0002	538 14.122	-0.000163953	-4.64	0.136709892	3871.18	105.14	109.62	8/16/04 11:06	6768:17:05	6768:13:10	6768:04:00	82.28558565
18	75	1075	0.0008	535 13.966	0.000586995	16.62	0.137296977	3887.80	105.59	110.07	8/23/04 14:07	6939:18:05	6939:14:10	6939:05:00	83.30246928
-25	73	1087	-0.0009	533 14.109	-0.000826695	-23.41	0.138470282	3864.39	104.95	110.95	8/30/04 16:42	7109:53:05	7109:49:10	7109:40:00	84.32013237
31	75	1088	0.0011	535 14.122	0.00102221	28.95	0.137492491	3893.34	105.74	110.22	9/7/04 15:54	7301:05:05	7301:01:10	7300:52:00	85.44638507
42	77	1073	0.0015	537 13.927	0.001360749	38.53	0.13885324	3931.87	106.79	111.27	9/14/04 18:37	7471:48:05	7471:44:10	7471:35:00	86.4395823
-28	77	1083	-0.001	537 14.057	-0.00091562	-25.93	0.13793762	3905.94	106.08	110.56	9/21/04 18:44	7637:55:05	7637:51:10	7637:42:00	87.39518325
-8	75	1089	-0.0003	535 14.135	-0.000297043	-8.41	0.137640577	3897.53	105.85	110.34	9/28/04 21:01	7810:12:05	7810:08:10	7809:59:00	88.37534378

DECANISTERED 09/29/2004; sample dried for 20 days in air

SAMPLE: 951.2' to 952.5' (Dry Wood(?) coal) in canister F

dry sample weight:		lbs.	grams	wet sample weight:		lbs.	grams	moisture %	est. lost gas (cc) =	TIME OF:			elapsed time (off bottom to canistering)		
		2.448	1110.20			2.549	1158.25	4.0%	79	off bottom	at surface	in canister	7.5 minutes		
										11/8/03 18:28	11/8/03 18:29	11/8/03 18:33	0.125 hours		
										TIME SINCE			0.353553391 SCFT (hrs)		
										off bottom	at surface	in canister	SQRT hrs. (since off bottom)		
35	75	1095	0.0012	535 14.228	0.001182594	32.92	0.001162594	32.92	0.95	3.23	11/8/03 18:41	0:15:00	0:11:10	0:07:30	0.5
6	75	1095	0.0002	535 14.228	0.000199302	5.64	0.001381896	36.56	1.11	3.39	11/8/03 18:42	0:16:15	0:12:25	0:08:45	0.5204165
7	75	1098	0.0002	535 14.228	0.000232519	6.58	0.001594414	45.15	1.30	3.58	11/8/03 18:44	0:18:45	0:14:55	0:11:15	0.559016994
11	75	1095	0.0004	535 14.228	0.000385387	10.35	0.001959801	55.50	1.60	3.88	11/8/03 18:47	0:21:45	0:17:55	0:14:15	0.602079729
6	75	1096	0.0002	535 14.228	0.000199302	5.64	0.002159103	61.14	1.76	4.04	11/8/03 18:49	0:23:45	0:19:55	0:16:15	0.62915287
7	75	1095	0.0002	535 14.228	0.000232519	6.58	0.002391622	67.72	1.95	4.23	11/8/03 18:51	0:25:45	0:21:55	0:18:15	0.655108134
7	75	1098	0.0002	535 14.228	0.000232519	6.58	0.00262414	74.31	2.14	4.42	11/8/03 18:54	0:28:15	0:24:25	0:20:45	0.686172982
10	75	1095	0.0004	535 14.228	0.00033217	9.41	0.00295631	83.71	2.42	4.70	11/8/03 18:58	0:32:00	0:28:10	0:24:30	0.730296743
9	75	1096	0.0003	535 14.228	0.000298983	8.47	0.003255263	92.18	2.66	4.94	11/8/03 17:01	0:35:00	0:31:10	0:27:30	0.763762616
9	75	1096	0.0003	535 14.228	0.000298983	8.47	0.003554216	100.64	2.90	5.18	11/8/03 17:05	0:39:15	0:35:25	0:31:45	0.808805704
18	74	1096	0.0006	534 14.228	0.000599025	16.86	0.004153241	117.61	3.39	5.67	11/8/03 17:13	0:47:00	0:43:10	0:39:30	0.885061203
11	74	1095	0.0004	534 14.228	0.000366071	10.37	0.004519311	127.97	3.69	5.97	11/8/03 17:19	0:53:30	0:49:40	0:46:00	0.944281032
14	74	1096	0.0005	534 14.228	0.000465908	13.19	0.00489522	141.17	4.07	6.35	11/8/03 17:26	1:00:30	0:56:40	0:53:00	1.004158022
14	74	1096	0.0005	534 14.228	0.000465908	13.19	0.005451128	154.36	4.45	6.73	11/8/03 17:39	1:13:00	1:09:10	1:05:30	1.103028141
30	75	1101	0.0032	535 14.291	0.003003165	85.04	0.008454294	239.40	6.91	9.19	11/8/03 19:11	2:45:00	2:41:10	2:37:30	1.658312395
215	74	1106	0.0076	534 14.278	0.007181135	203.35	0.015635429	442.74	12.78	15.06	11/8/03 2:22	9:56:00	9:52:10	9:48:30	3.151719108
61	73	1100	0.0022	533 14.278	0.002041261	57.80	0.01767689	500.55	14.44	16.72	11/9/03 5:50	13:24:00	13:20:10	13:18:30	3.660601044
218	75	1092	0.0077	535 14.174	0.007247967	205.24	0.024924656	705.79	20.37	22.85	11/9/03 22:44	30:18:00	30:14:10	30:10:30	5.504543578
80	75	1067	0.0028	535 14.109	0.002635536	74.63	0.027560192	780.41	22.62	24.80	11/10/03 8:14	39:48:00	39:44:10	39:40:30	6.308724118
39	75	1066	0.0014	535 14.096	0.001283642	36.35	0.028843834	816.76	23.57	25.85	11/10/03 10:55	42:29:00	42:25:10	42:21:30	6.517924005
139	77	1080	0.0049	537 14.018	0.004500199	127.43	0.033344033	944.19	27.25	29.53	11/11/03 9:40	65:14:00	65:10:10	65:06:30	8.076715504
82	75	1091	0.0029	535 14.161	0.002711385	76.78	0.038605399	1020.97	29.46	31.74	11/12/03 14:31	94:05:00	94:01:10	93:57:30	9.698956351
89	75	1095	0.0031	535 14.213	0.002920428	82.70	0.038975825	1103.67	31.85	34.13	11/13/03 18:39	123:13:00	123:09:10	123:05:30	11.1003003
126	75	1077	0.0044	535 13.979	0.004112782	116.46	0.043088607	1220.13	35.21	37.49	11/15/03 13:31	165:05:00	165:01:10	164:57:30	12.484847591
109	75	1069	0.0038	535 13.875	0.003531455	100.00	0.048620061	1320.13	38.09	40.37	11/17/03 16:17	215:51:00	215:47:10	215:43:30	14.69183447
68	74	1078	0.0024	534 13.992	0.002225818	63.03	0.048845879	13							

77	75	1081	0.0027	535	14.031	0.002522701	71.43	0.06731237	1906.07	55.00	57.28	12/22/03	16:06	1055:40:00	1055:38:10	1055:32:30	32.4910244
82	73	1082	0.0029	533	14.044	0.002899088	76.43	0.070011459	1982.50	57.21	59.49	12/29/03	14:31	1222:05:00	1222:01:10	1221:57:30	34.9583085
30	73	1103	0.0011	533	14.318	0.001006637	28.50	0.071018095	2011.00	58.03	60.31	1/8/04	15:10	1414:44:00	1414:40:10	1414:36:30	37.61284104
77	75	1093	0.0027	535	14.187	0.002550705	72.23	0.073688801	2083.23	60.12	62.40	1/12/04	11:44	1555:18:00	1555:14:10	1555:10:30	39.437292
81	73	1083	0.0029	533	14.135	0.002883422	75.99	0.076252222	2159.21	62.31	64.58	1/21/04	10:33	1770:07:00	1770:03:10	1769:59:30	42.07275445
26	70	1091	0.0013	530	14.181	0.00128834	35.92	0.077520562	2195.13	63.34	65.82	1/27/04	10:09	1913:43:00	1913:38:10	1913:35:30	43.74804744
87	73	1085	0.0031	533	14.083	0.002871607	81.31	0.080392189	2276.44	65.69	67.97	2/2/04	15:41	2083:15:00	2083:11:10	2083:07:30	45.42301179
57	74	1091	0.002	534	14.181	0.001888259	53.47	0.082280428	2329.91	67.23	69.51	2/9/04	10:32	2226:06:00	2226:02:10	2225:58:30	47.1815842
52	75	1091	0.0018	535	14.181	0.001719402	48.89	0.083999983	2378.80	68.84	70.92	2/16/04	14:23	2397:57:00	2397:53:10	2397:49:30	48.98886768
51	75	1036	0.0018	535	14.098	0.001678809	47.53	0.085678439	2426.13	70.01	72.29	2/23/04	14:30	2586:04:00	2586:00:10	2585:56:30	50.8563588
33	75	1091	0.0012	535	14.181	0.001091159	30.90	0.088769598	2457.03	70.90	73.18	3/2/04	10:46	2754:20:00	2754:16:10	2754:12:30	52.48174286
44	75	1086	0.0018	535	14.122	0.001450878	41.08	0.088220478	2498.12	72.09	74.37	3/8/04	10:04	2897:38:00	2897:34:10	2897:30:30	53.82966964
51	74	1082	0.0018	534	14.044	0.001675558	47.45	0.089898034	2545.56	73.46	75.74	3/15/04	11:38	3067:12:00	3067:08:10	3067:04:30	55.38230784
5	77	1097	0.0002	537	14.239	0.000185617	4.69	0.090061851	2550.25	73.59	75.87	3/22/04	10:03	3233:37:00	3233:33:10	3233:29:30	56.88489837
36	74	1038	0.0013	534	14.122	0.001189305	33.68	0.091250957	2583.93	74.56	76.84	3/30/04	20:33	3438:07:00	3438:03:10	3435:59:30	58.6183987
56	75	1090	0.002	535	14.018	0.001832995	51.90	0.093083991	2635.83	76.06	78.34	4/6/04	14:43	3598:17:00	3598:13:10	3598:09:30	59.98589274
5	74	1085	0.0002	534	14.098	0.000164878	4.67	0.093248829	2640.50	76.20	78.48	4/12/04	15:01	3742:35:00	3742:31:10	3742:27:30	61.17685877
43	77	1098	0.0015	537	14.122	0.001412623	40.00	0.094861452	2680.50	77.35	79.63	4/18/04	14:28	3910:02:00	3909:58:10	3909:54:30	62.53025934
18	78	1090	0.0007	536	14.148	0.000826498	17.74	0.095287948	2698.24	77.86	80.14	4/26/04	11:34	4075:08:00	4075:04:10	4075:00:30	63.83877101
32	74	1034	0.0011	534	14.070	0.001053274	29.83	0.096341222	2728.07	78.72	81.00	5/3/04	19:09	4250:43:00	4250:39:10	4250:35:30	65.1976204
44	76	1081	0.0016	536	14.031	0.001438854	40.74	0.097780076	2768.81	79.90	82.18	5/10/04	14:02	4413:36:00	4413:32:10	4413:28:30	68.43493057
4	75	1082	0.0001	535	14.044	0.000131171	3.71	0.097911247	2772.53	80.01	82.29	5/17/04	9:45	4577:19:00	4577:15:10	4577:11:30	67.65886942
55	78	1075	0.0019	538	13.953	0.001781836	50.46	0.099693183	2822.99	81.46	83.74	5/24/04	10:32	4746:06:00	4746:02:10	4745:58:30	68.88184438
12	75	1077	0.0004	535	13.979	0.000391894	11.09	0.100084876	2834.08	81.78	84.06	6/1/04	10:55	4938:29:00	4938:25:10	4938:21:30	70.27434335
24	76	1076	0.0008	536	13.966	0.000781199	22.12	0.100866078	2856.20	82.42	84.70	6/7/04	10:37	5082:11:00	5082:07:10	5082:03:30	71.28943353
34	79	1076	0.0012	539	13.992	0.001102585	31.22	0.101968861	2887.42	83.32	85.60	6/14/04	10:50	5250:24:00	5250:20:10	5250:16:30	72.45964394
-2	76	1082	-7E-05	536	14.044	-6.5489E-05	-1.85	0.101903198	2885.57	83.27	85.55	6/23/04	18:26	5472:00:00	5471:56:10	5471:52:30	73.97296804
17	77	1082	0.0006	537	14.044	0.000855399	16.73	0.102458597	2901.29	83.72	86.00	7/1/04	11:55	5659:29:00	5659:25:10	5659:21:30	75.22853784
20	78	1081	0.0007	538	14.031	0.000851593	18.45	0.103110119	2919.74	84.28	86.53	7/7/04	10:33	5802:07:00	5802:03:10	5801:59:30	76.17182639
22	79	1082	0.0008	539	14.044	0.000716085	20.28	0.103826275	2940.02	84.84	87.12	7/13/04	14:21	5949:55:00	5949:51:10	5949:47:30	77.13570293
16	75	1080	0.0008	535	14.018	0.000523713	14.83	0.104349988	2954.85	85.27	87.55	7/19/04	11:23	6090:57:00	6090:53:10	6090:49:30	78.04453857
-8	76	1091	-0.0003	536	14.161	-0.000297034	-8.41	0.104052954	2948.44	85.03	87.31	7/28/04	10:24	6257:58:00	6257:54:10	6257:50:30	79.10731108
26	77	1073	0.0013	537	14.005	0.001172878	33.21	0.105225832	2979.85	85.98	88.26	8/2/04	14:43	6430:17:00	6430:13:10	6430:09:30	80.18904746
2	78	1086	7E-05	538	14.098	6.54607E-05	1.86	0.105291293	2981.51	86.04	88.32	8/9/04	14:00	6597:34:00	6597:30:10	6597:26:30	81.22540653
2	76	1068	7E-05	536	14.122	6.5828E-05	1.86	0.105357119	2983.37	86.09	88.37	8/18/04	11:06	6782:40:00	6782:36:10	6782:32:30	82.23643437
32	75	1076	0.0011	535	13.986	0.001043546	29.55	0.106400665	3012.92	86.94	89.22	8/23/04	14:08	6933:42:00	6933:38:10	6933:34:30	83.28884171
9	76	1087	0.0003	536	14.109	0.000295945	8.38	0.10669661	3021.30	87.19	89.47	8/30/04	16:44	7104:18:00	7104:14:10	7104:10:30	84.28700868
0	76	1088	0	535	14.122	0	0.00	0.10669881	3021.30	87.19	89.47	9/7/04	15:56	7295:30:00	7295:26:10	7295:22:30	85.41369914
42	76	1073	0.0015	538	13.927	0.001383287	38.80	0.108059897	3059.90	88.30	90.58	9/14/04	18:39	7466:13:00	7466:09:10	7466:05:30	86.40727207
-9	78	1083	-0.0003	538	14.057	-0.000294856	-8.35	0.107785041	3051.55	88.08	90.34	9/21/04	16:45	7632:19:00	7632:15:10	7632:11:30	87.38313105
-10	75	1089	-0.0004	535	14.135	-0.000330048	-9.35	0.107434993	3042.21	87.79	90.07	9/28/04	21:02	7804:36:00	7804:32:10	7804:28:30	88.3436472
19	75	1085	0.0007	538	14.083	0.000823822	17.88	0.108058618	3059.87	88.30	90.58	10/8/04	10:11	8033:48:00	8033:44:10	8033:40:30	89.63118877
20	75	1079	0.0007	535	14.005	0.000854035	18.52	0.10871285	3078.39	88.83	91.11	10/19/04	14:14	8301:48:00	8301:44:10	8301:40:30	91.11421404
12	77	1088	0.0004	537	14.098	0.000393498	11.14	0.109108148	3089.53	89.15	91.43	10/27/04	14:04	8493:38:00	8493:34:10	8493:30:30	92.16081001
12	79	1090	0.0004	538	14.148	0.000394211	11.18	0.109500357	3100.89	89.48	91.76	11/5/04	11:10	8706:44:00	8706:40:10	8706:36:30	93.30987801
-9	76	1085	-0.0003	538	14.213	-0.000298123	-8.44	0.109202234	3092.25	89.23	91.51	11/12/04	16:28	8880:02:00	8879:58:10	8879:54:30	94.23392878
38	75	1080	0.0014	535	14.018	0.00127655	38.15	0.110478784	3128.40	90.28	92.56	11/24/04	10:49	9182:23:00	9182:19:10	9182:15:30	95.72033918
20	78	1081	0.0007	538	14.031	0.000851593	18.45	0.111130378	3146.85	90.81	93.09	12/3/04	15:58	9383:32:00	9383:28:10	9383:24:30	96.88863958
-47	72	1106	-0.0017	532	14.355	-0.001584328	-44.86	0.109548052	3101.99	89.51	91.79	12/14/04	11:45	9643:19:00	9643:15:10	9643:11:30	98.20039036
19	72	1100	0.0007	532	14.278	0.000636998	18.04	0.110183049	3120.02	90.03	92.31	12/23/04	12:02	9859:36:00	9859:32:10	9859:28:30	99.29551853

DECANISTERED 12/23/2004; sample dried for 15 days in air

340.0'-342.0' (Stark Shale) in canister LJ

Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS

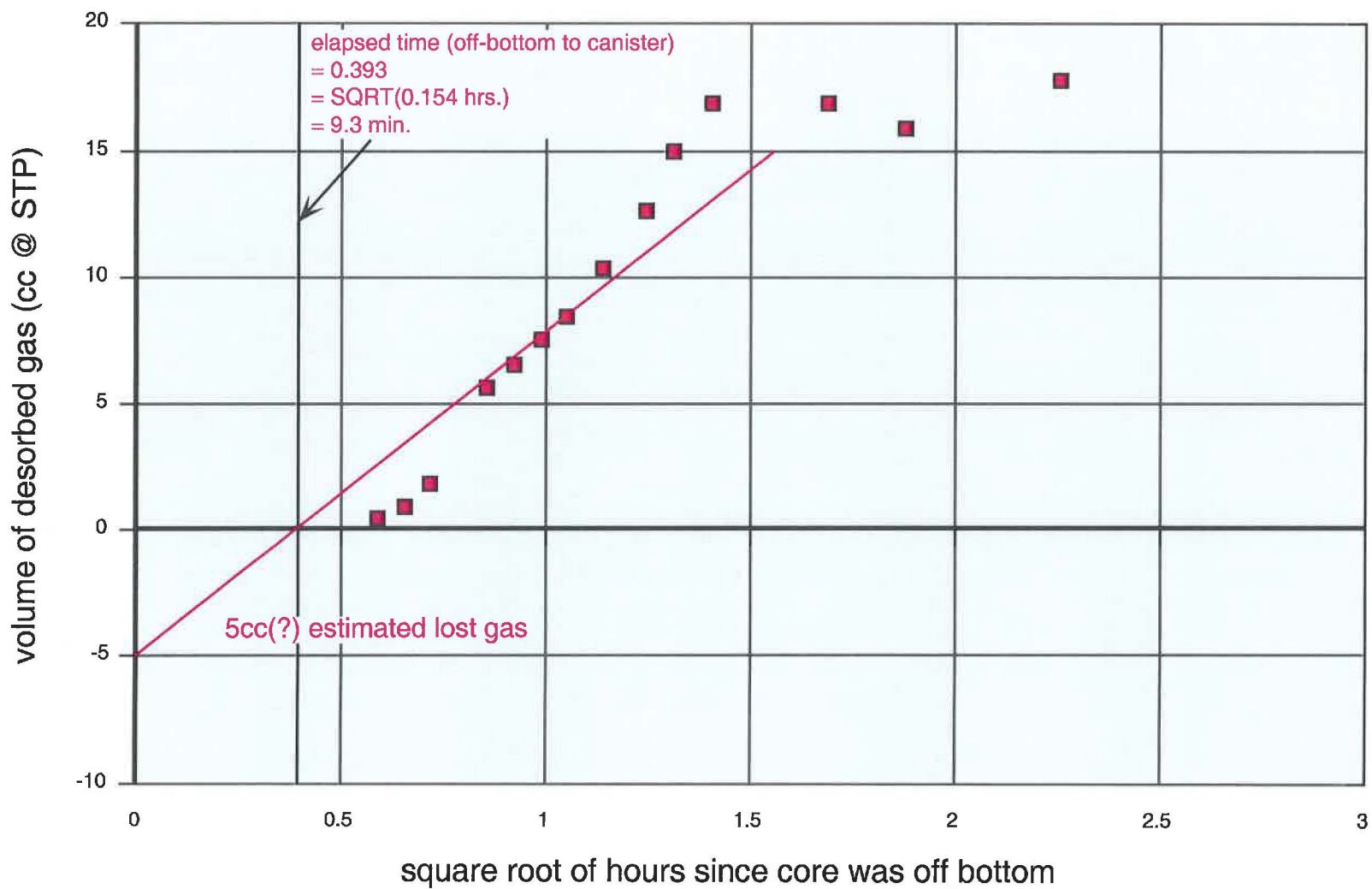


FIGURE 2.

371.5' to 372.5' (Hushpuckney Shale) in canister Brady 23
Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS

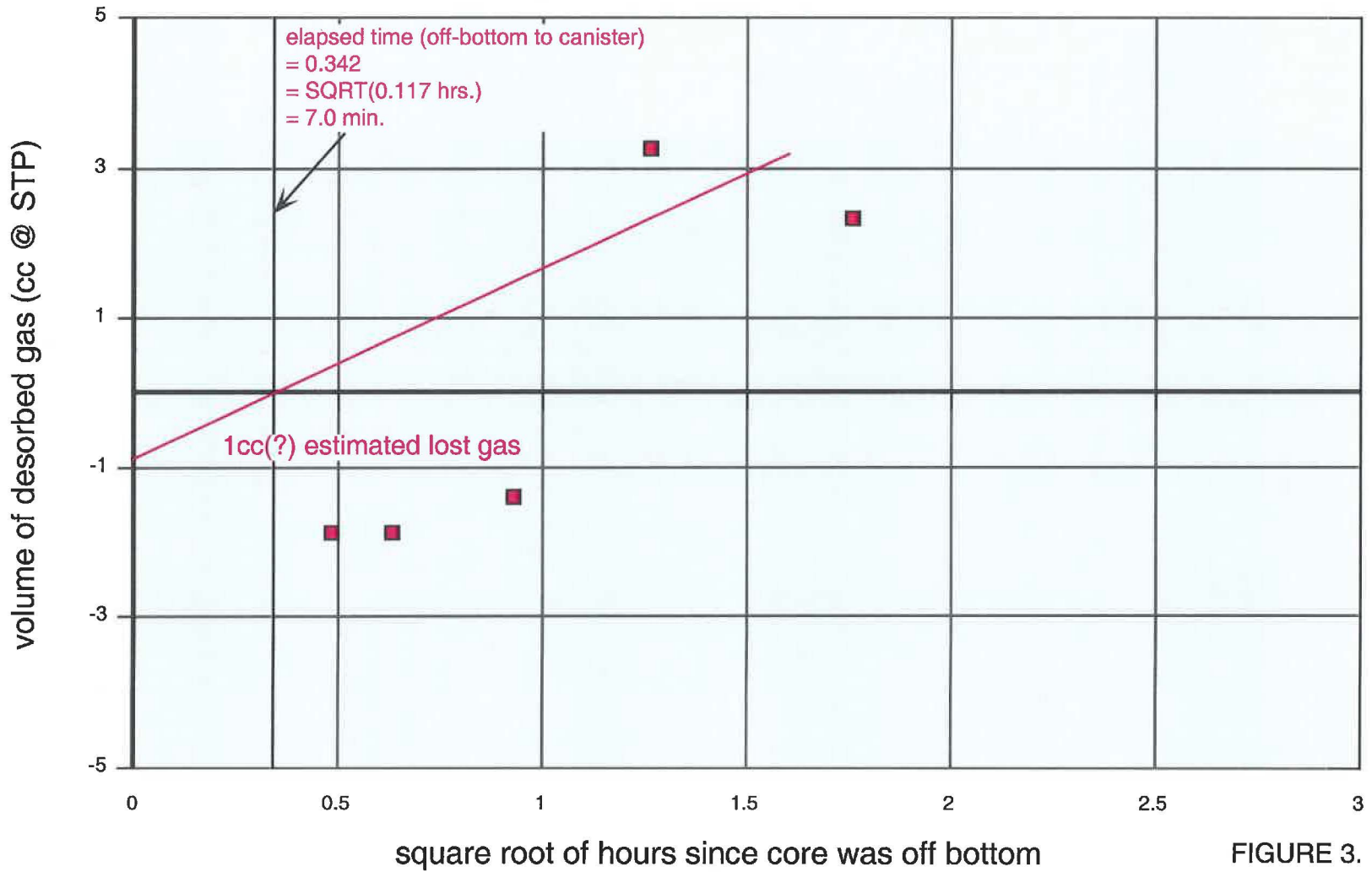


FIGURE 3.

595.4' to 596.4' (Mulberry coal) in canister Brady 28
 Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS

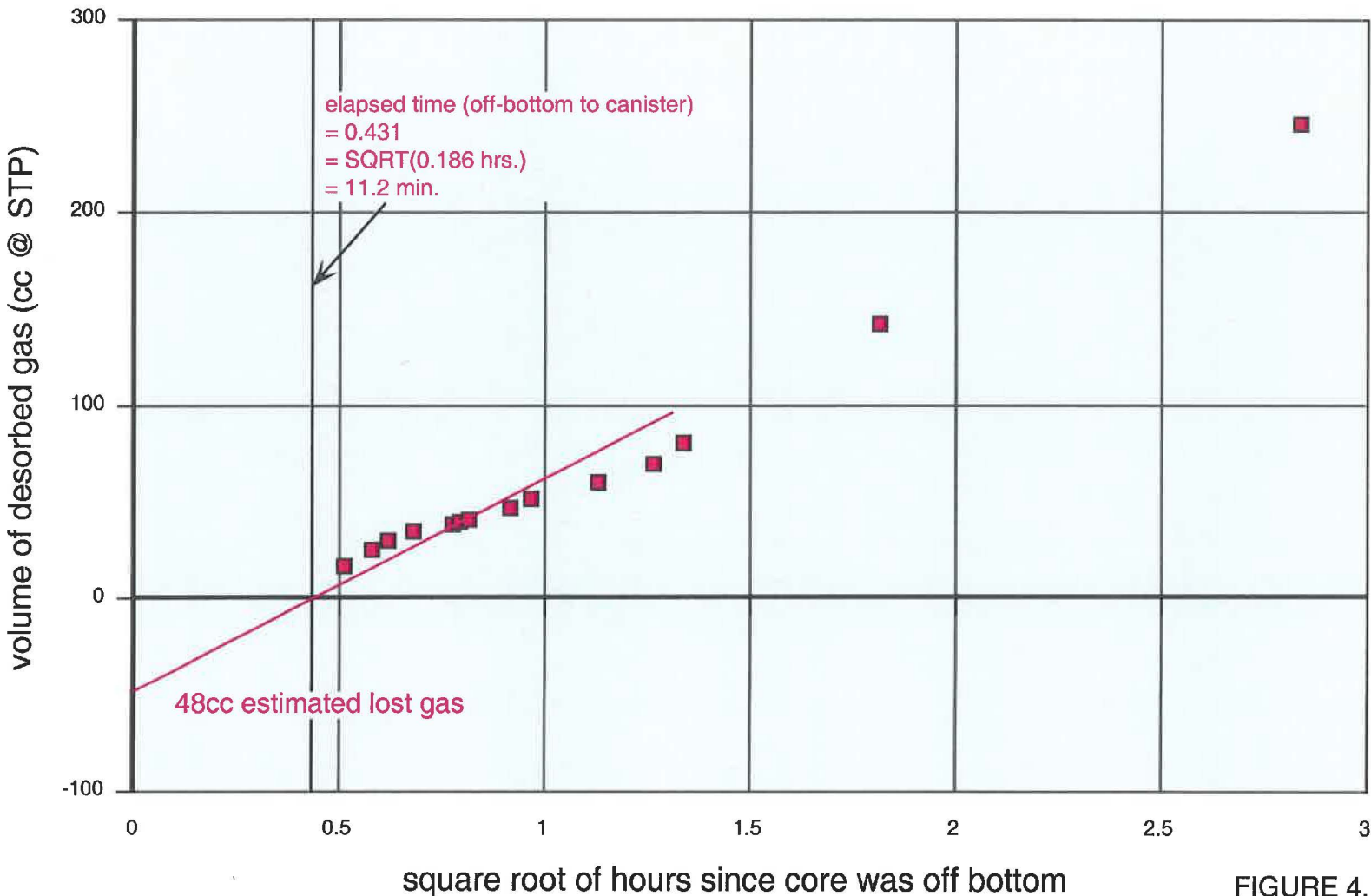


FIGURE 4.

596.4' to 597.4' (Mulberry coal) in canister Brady 24
Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS

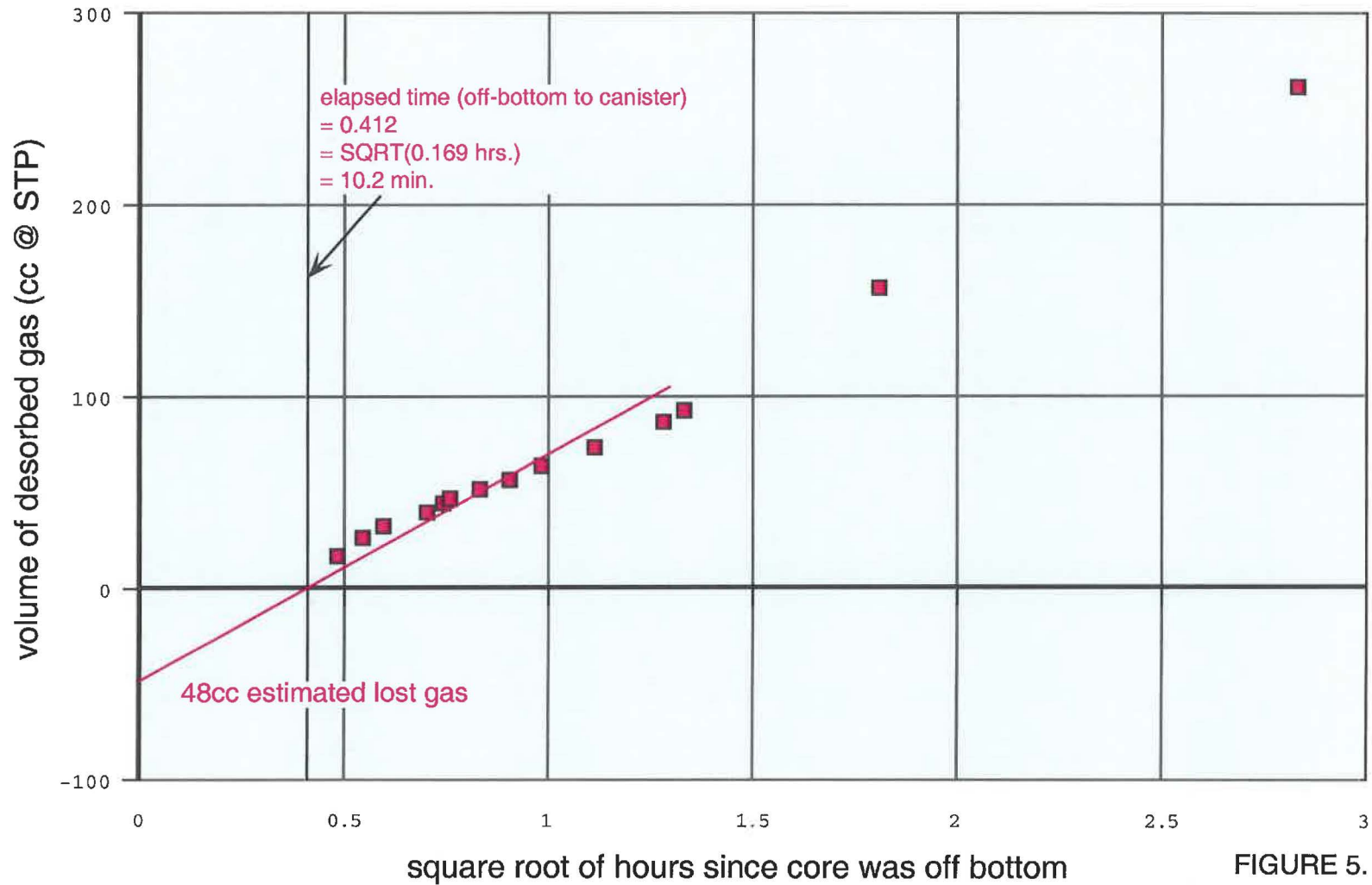


FIGURE 5.

622.9' to 623.9' (Anna Shale) in canister Brady 31
Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS

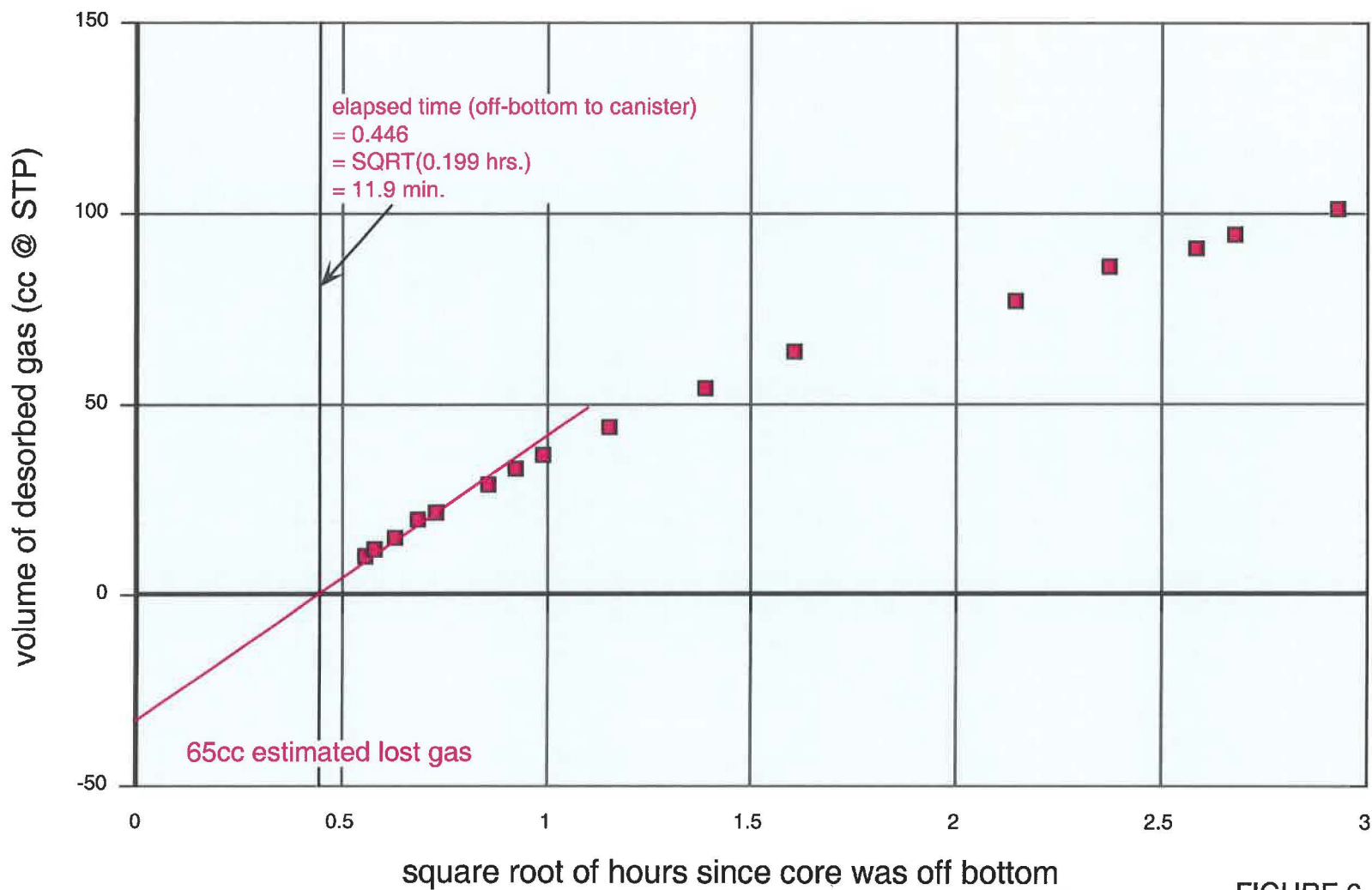


FIGURE 6.

742.1' to 743.1' (Bevier coal) in canister M1

Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS

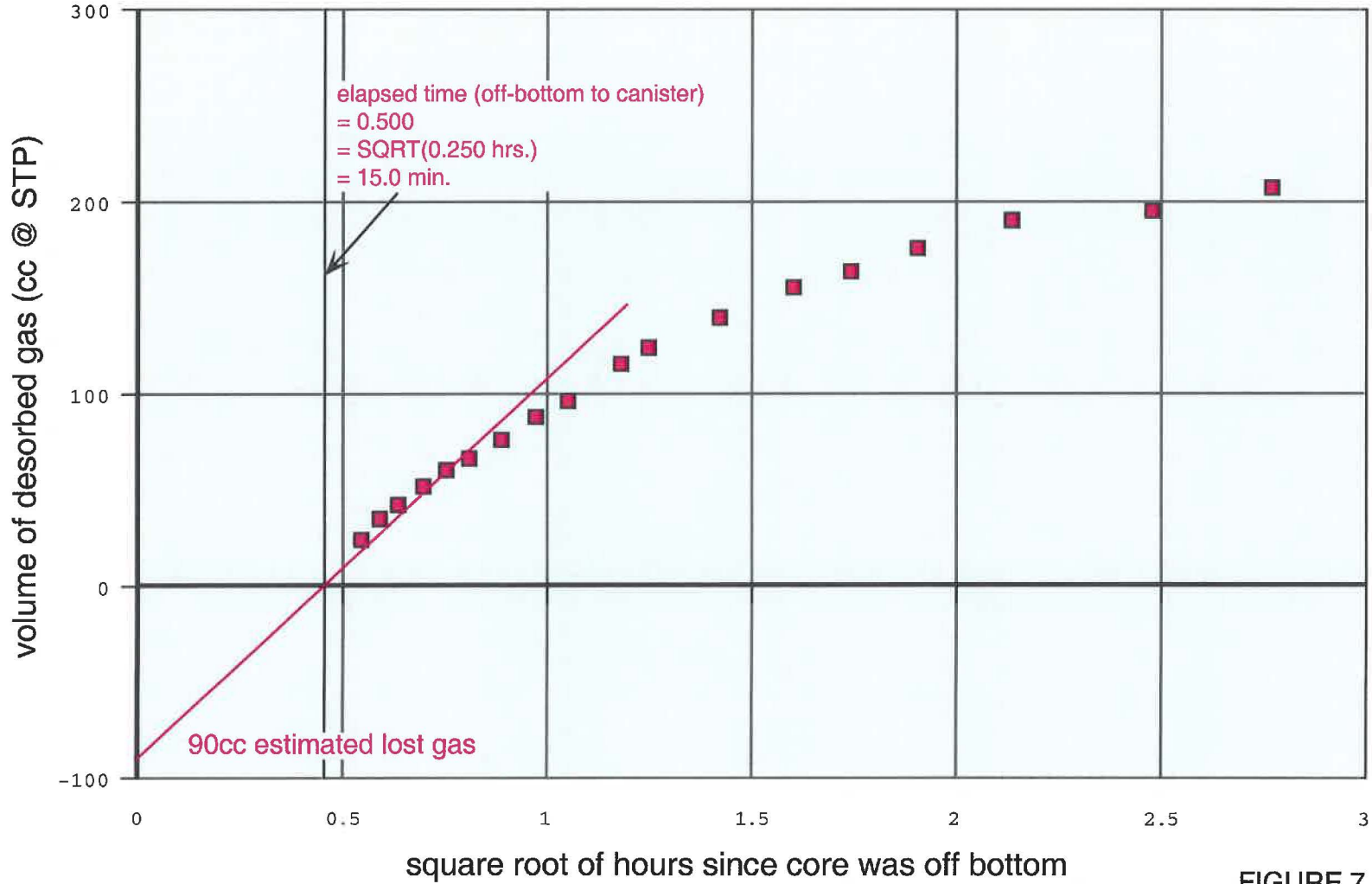


FIGURE 7.

743.1' to 744.2' (Bevier coal) in canister M2

Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS

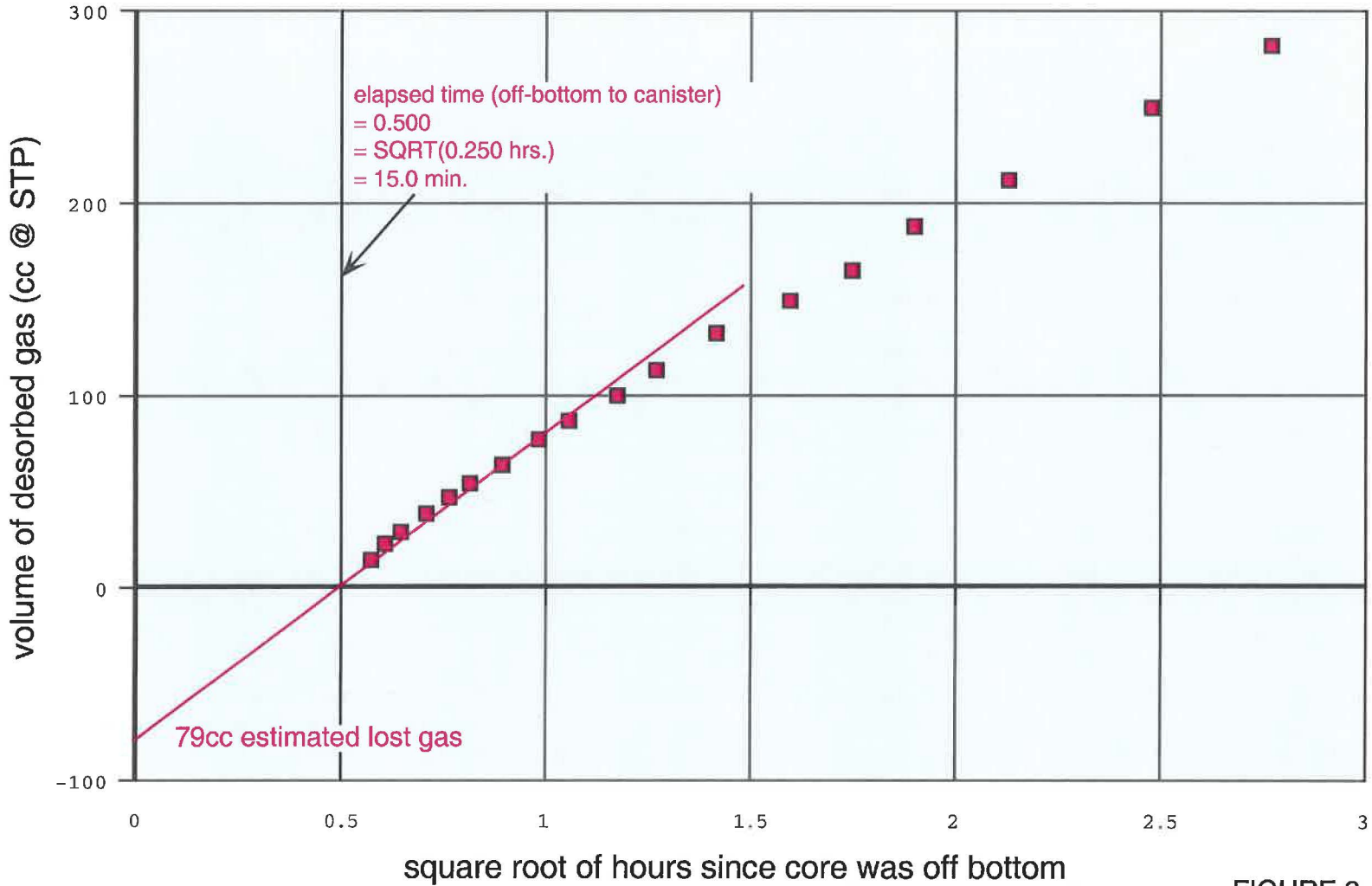


FIGURE 8.

752.0' to 753.0' ("V shale") in canister C

Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS

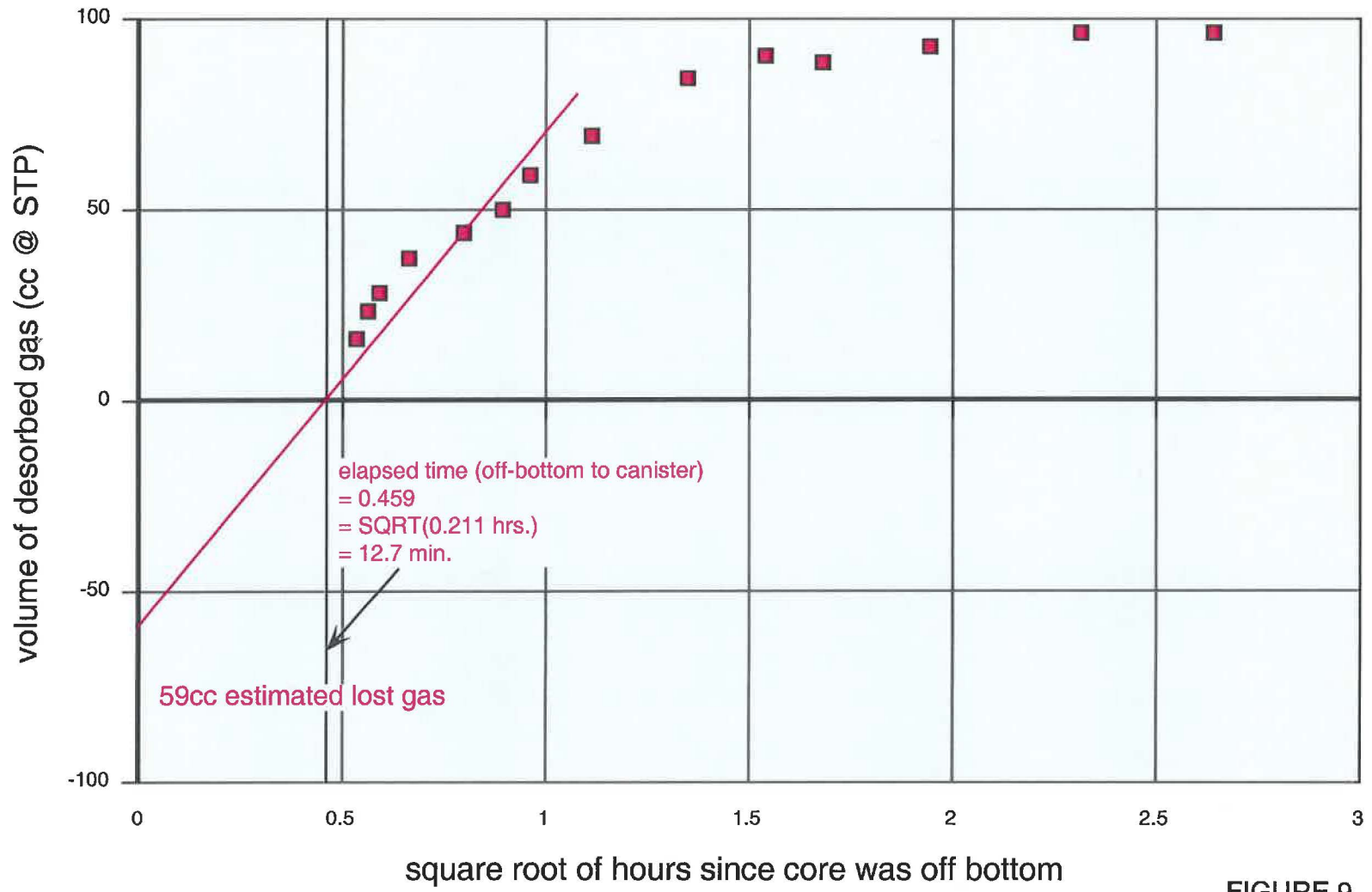


FIGURE 9.

755.5' to 756.5' (Croweburg coal) in canister M3

Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS

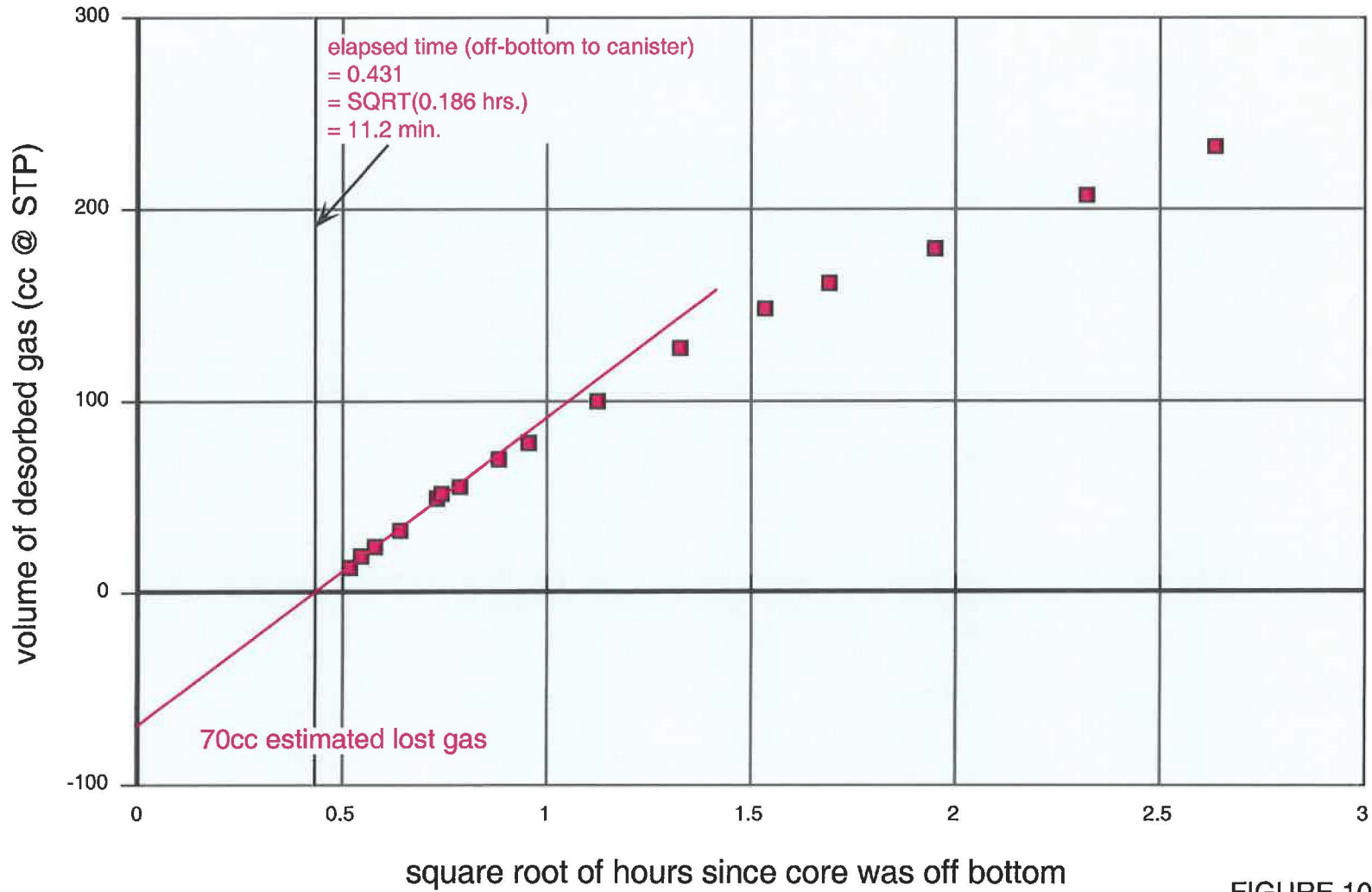


FIGURE 10.

779.5' to 781.0' (Mineral coal) in canister 1

Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS

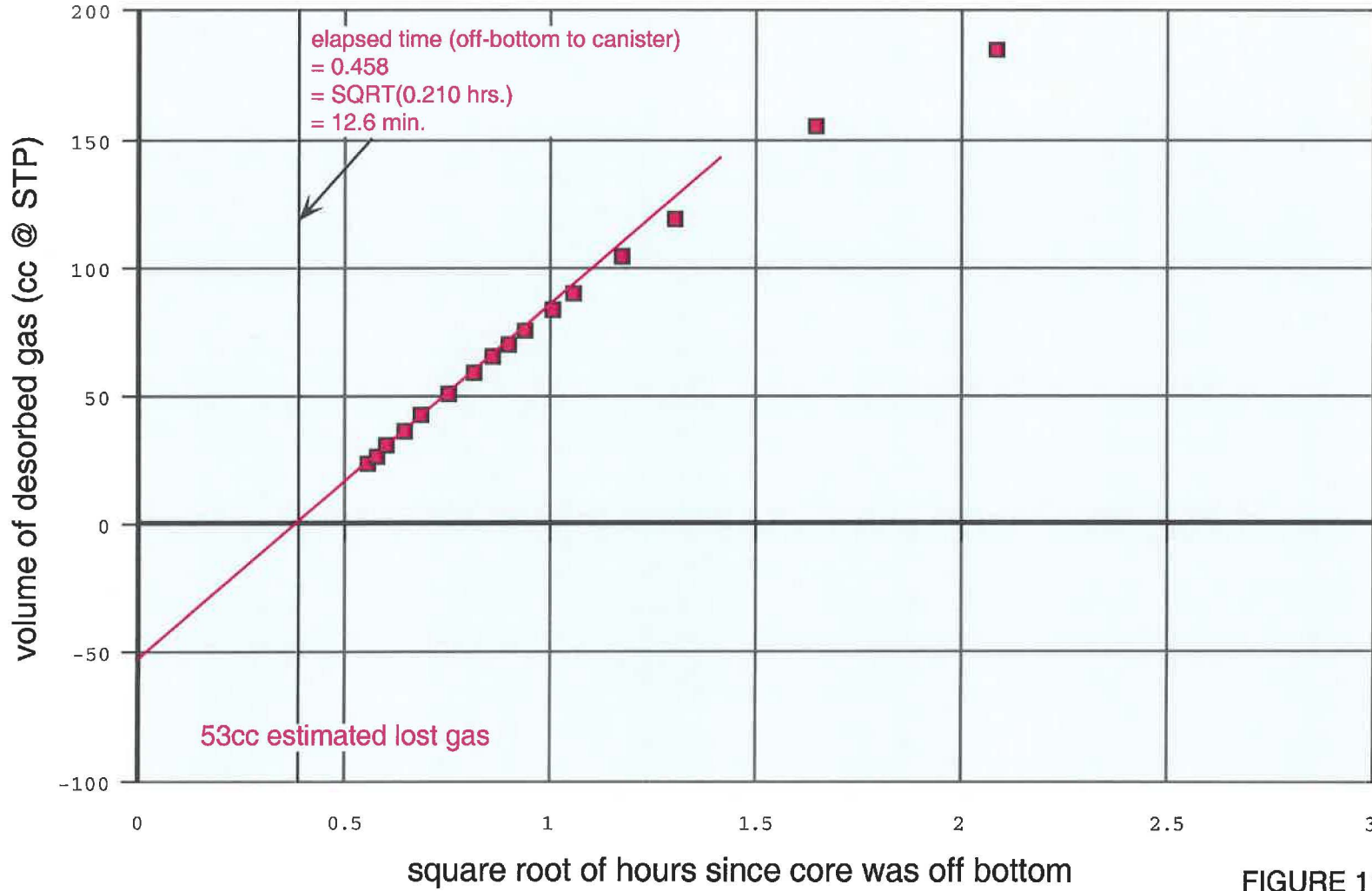


FIGURE 11.

794.0' to 795.0' (Scammon coal) in canister M4
Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS

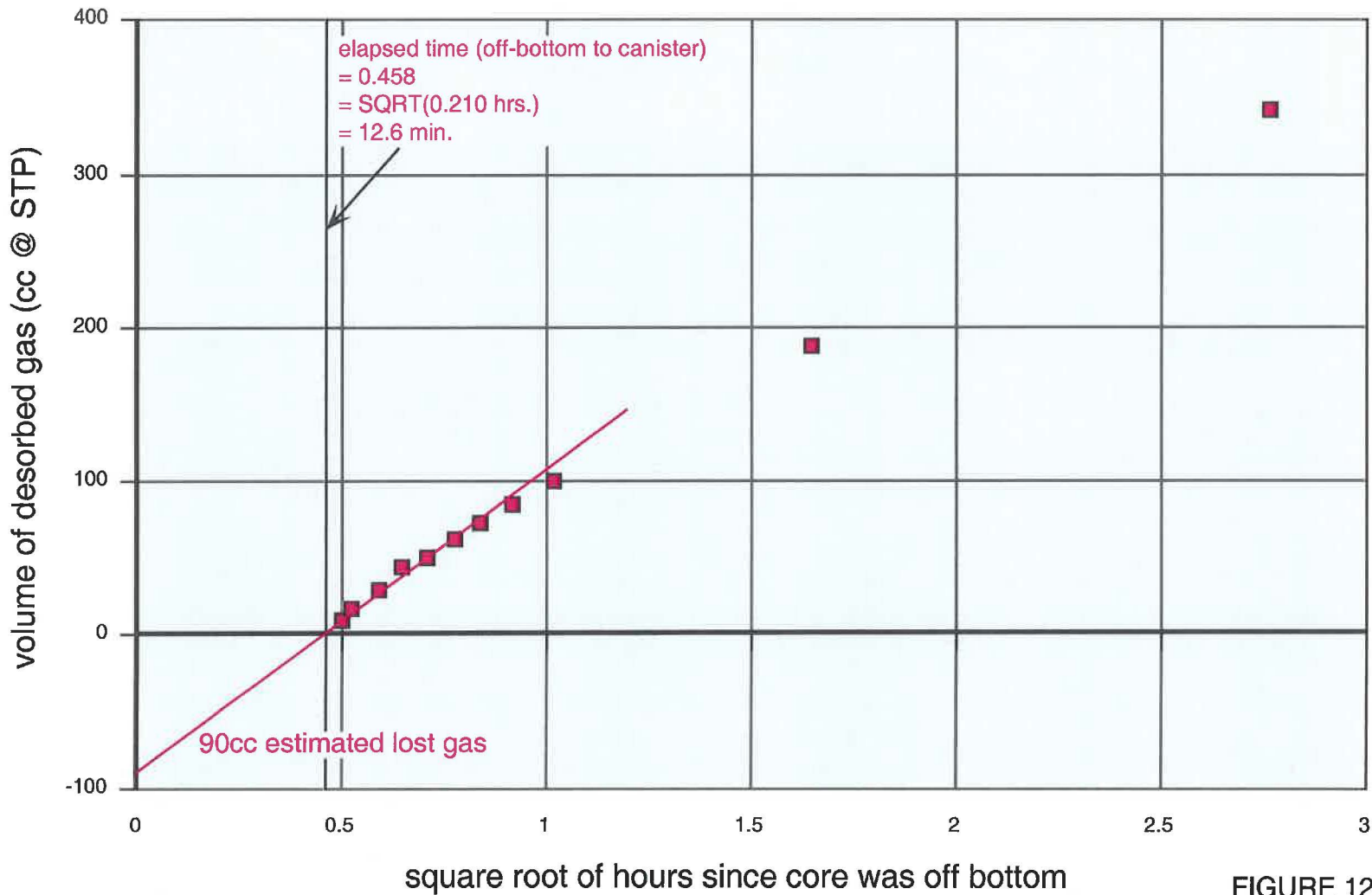


FIGURE 12.

815.3' to 816.9' (Tebo coal) in canister 3

Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS

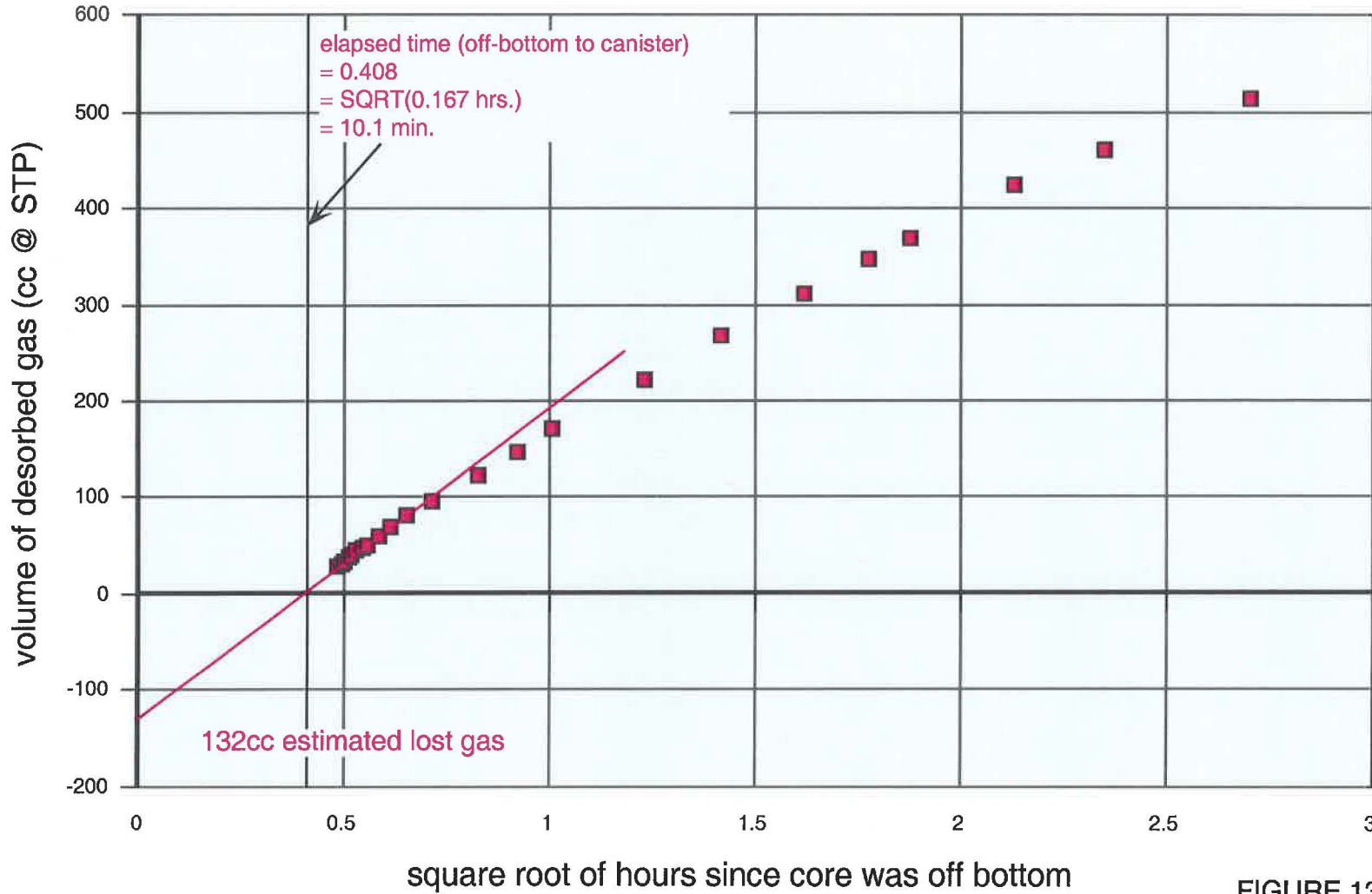


FIGURE 13.

891.7' to 893.0' (Dbj(?) Coal) in canister E

Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS

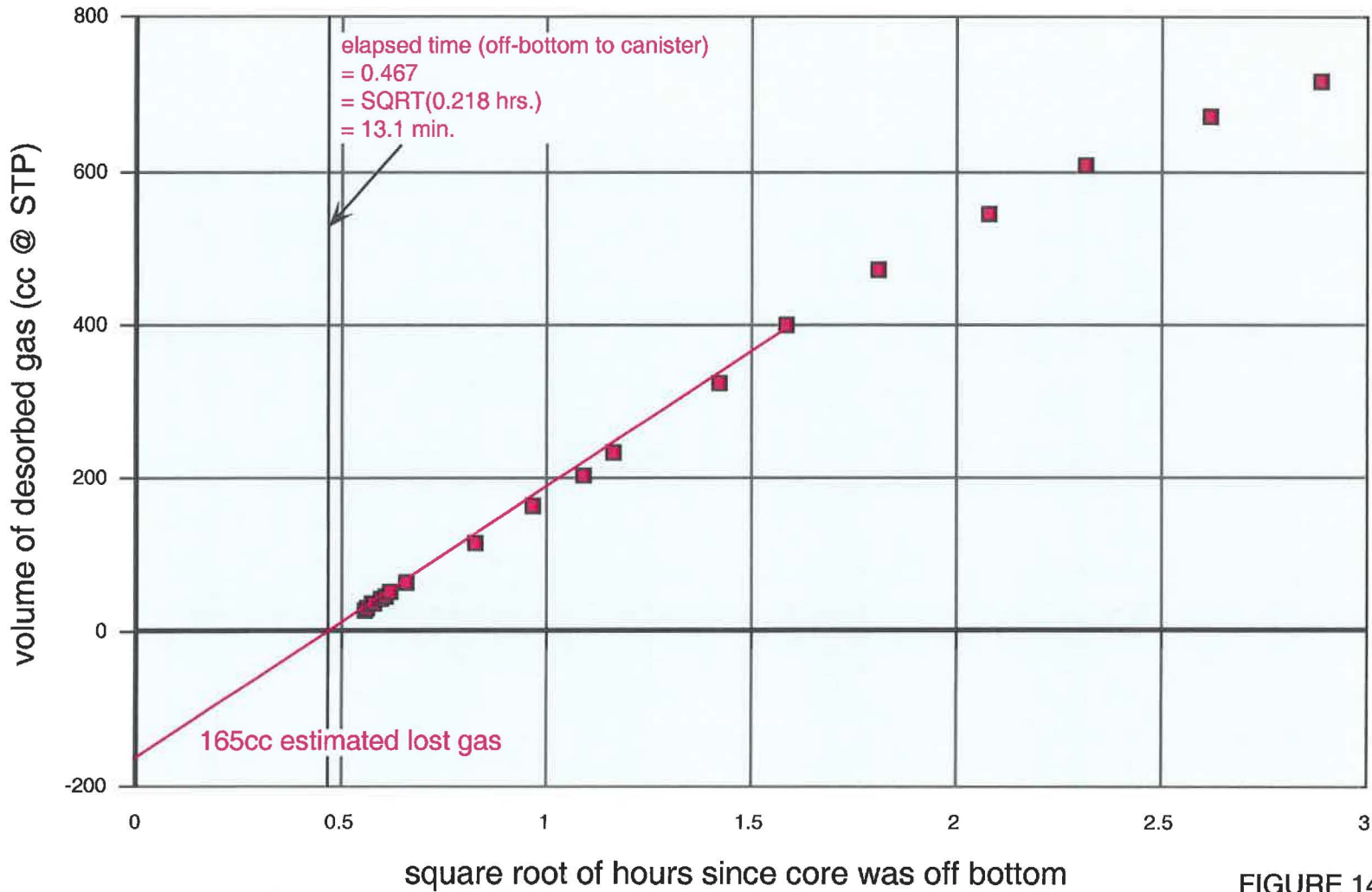


FIGURE 14.

951.2' to 952.5' (Dry Wood(?) Coal) in canister F
Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS

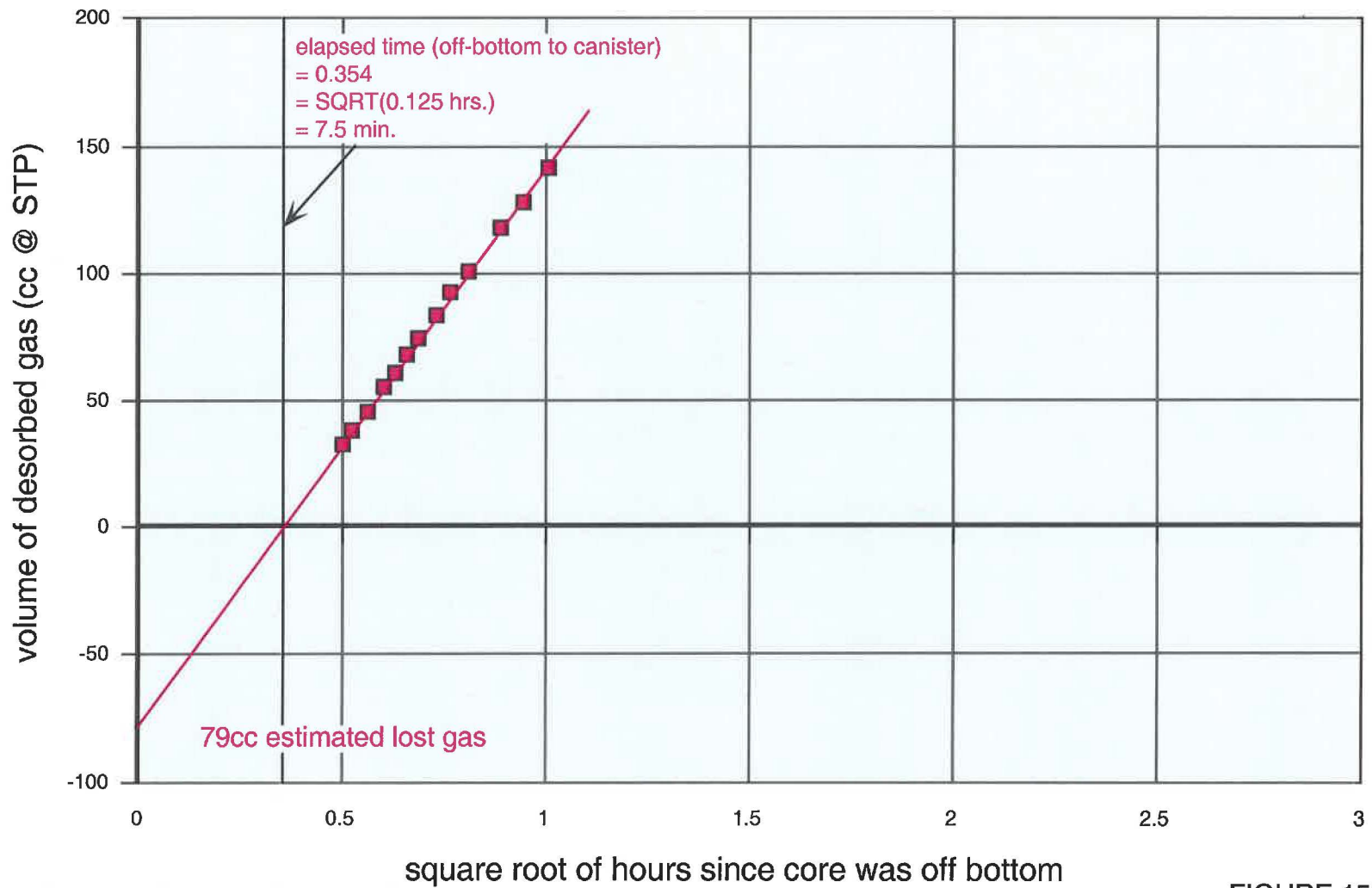


FIGURE 15.

Desorption of Coal Samples Colt Energy #2-6 Spencer; sec. 6-T.18S.-R.21E., Franklin Co., KS

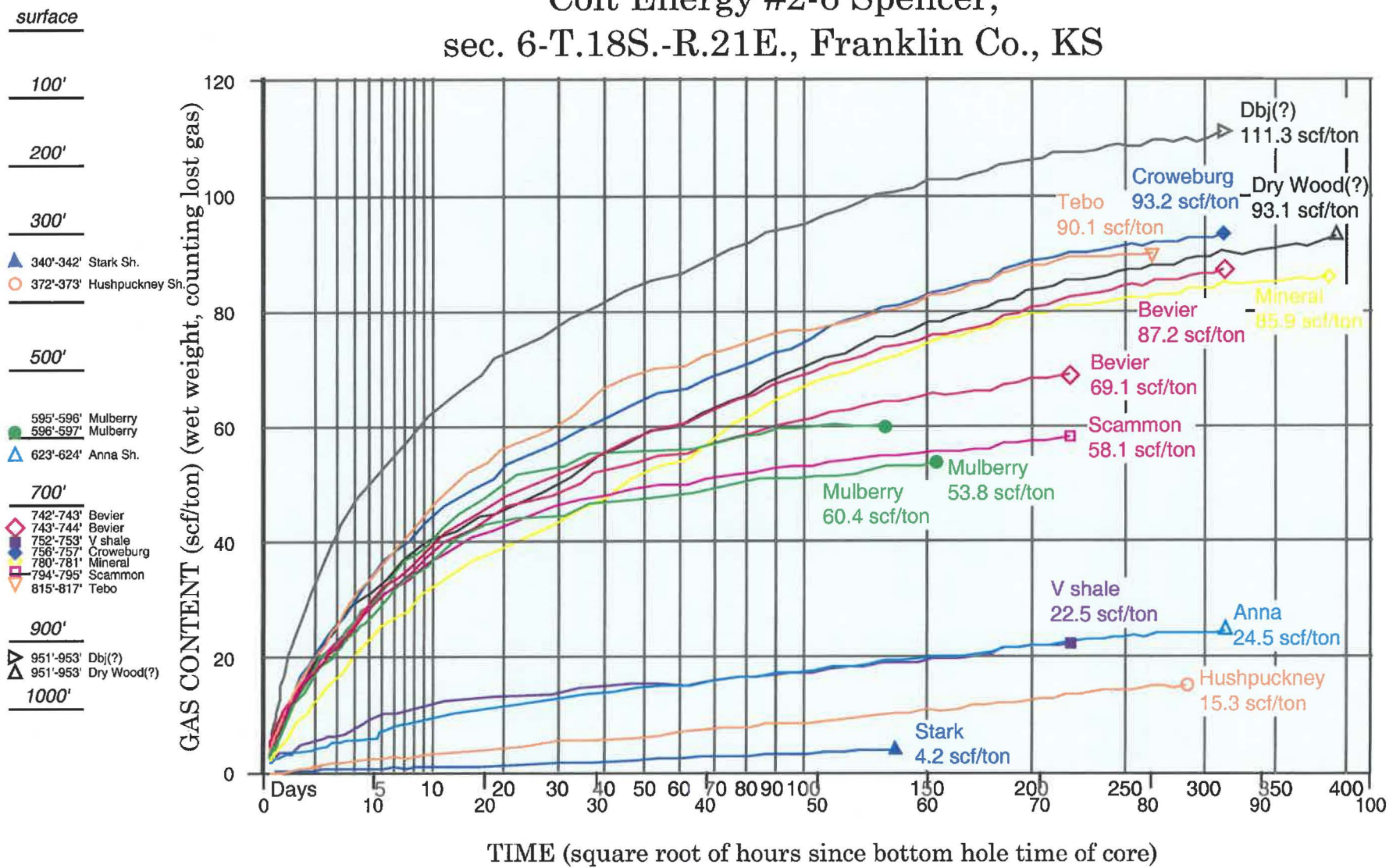


FIGURE 16.

Sorptions Time of Coal Samples

Colt Energy #2-6 Spencer; sec. 6-T.18S.-R.21E., Franklin Co., KS

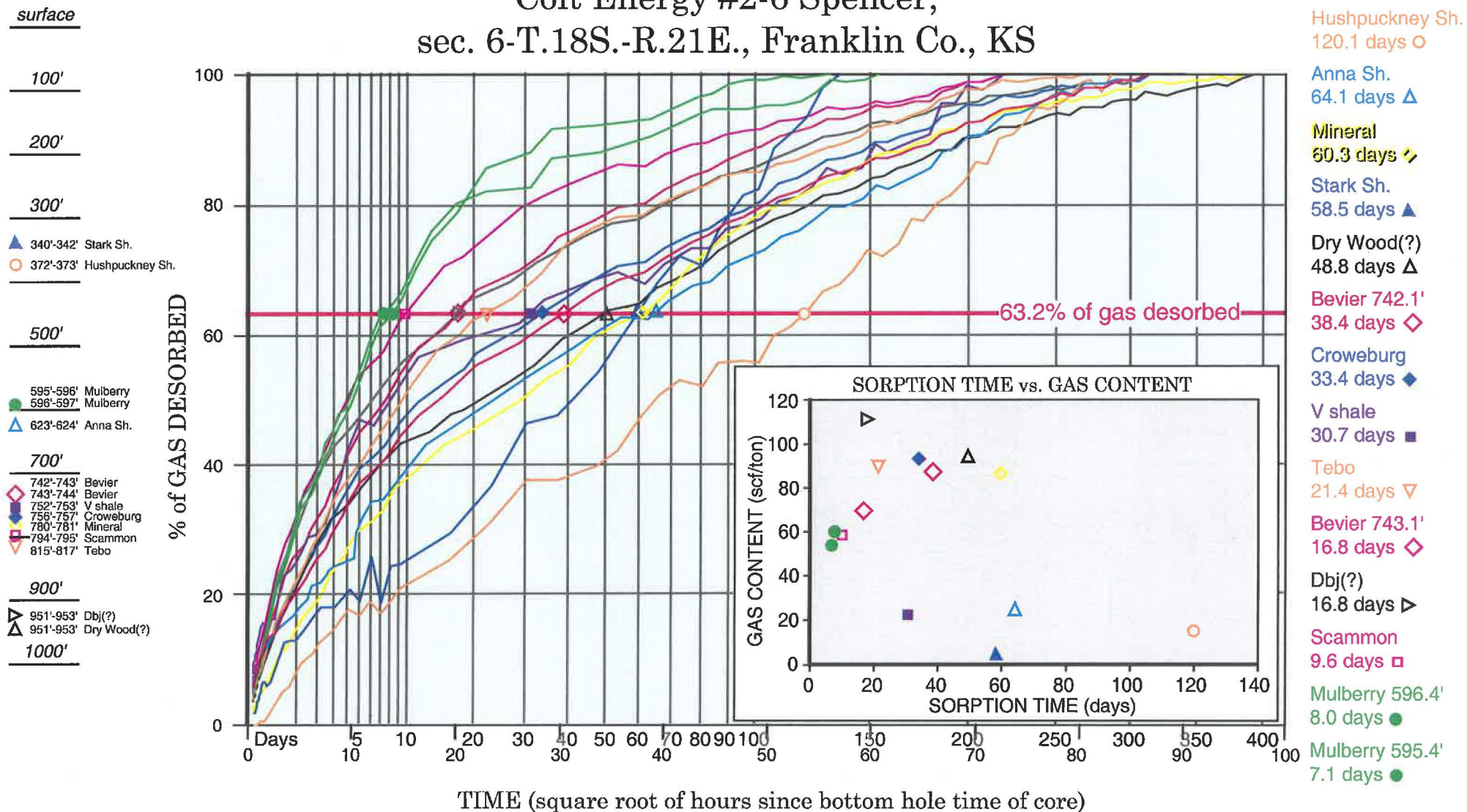
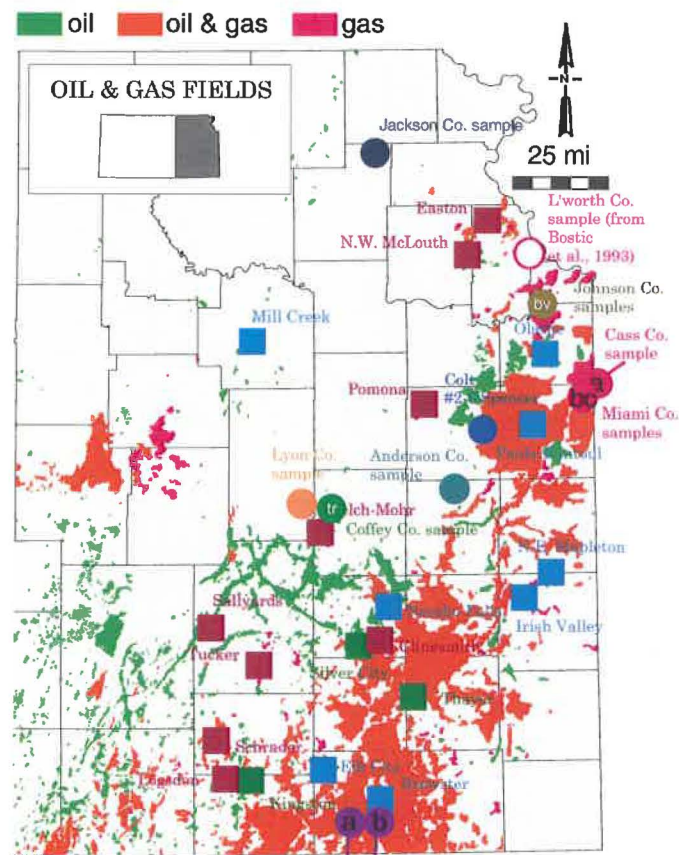
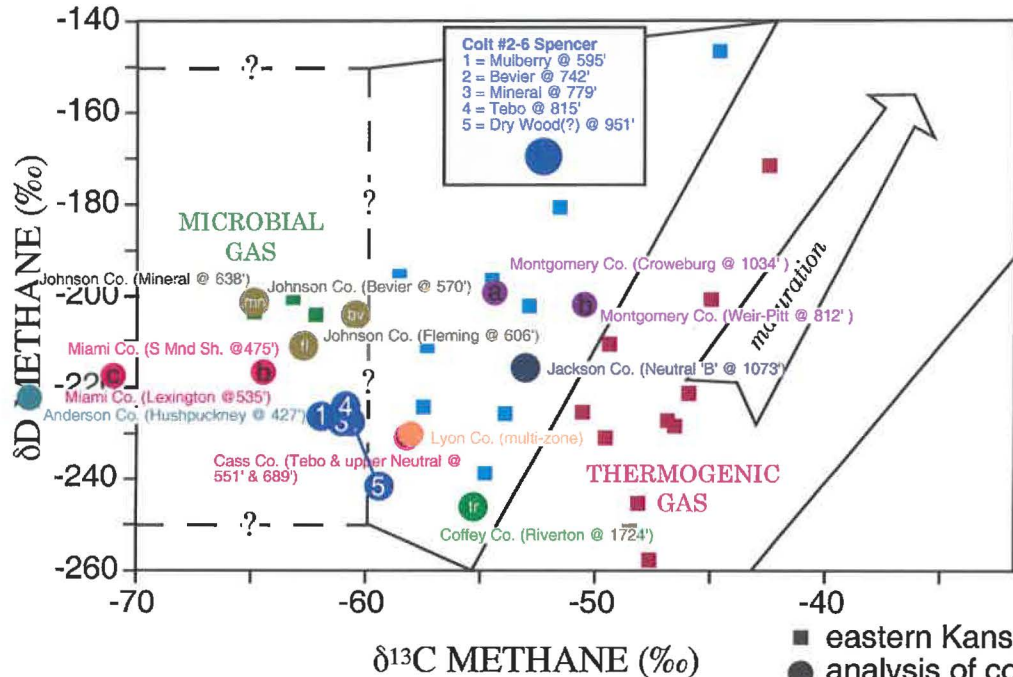
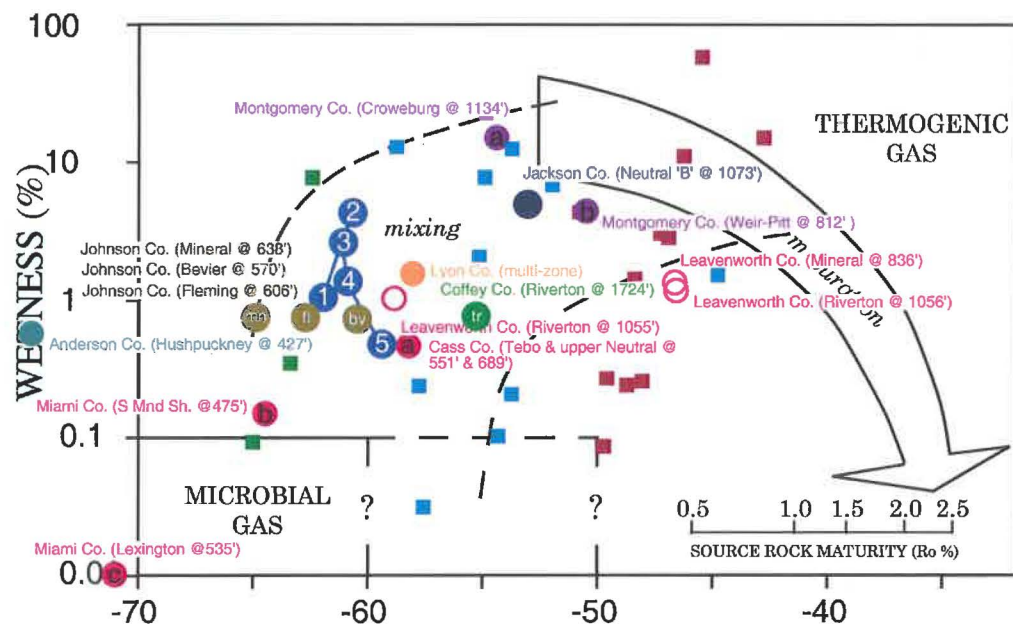


FIGURE 17.



- U. PENN** Mill Creek, Schrader
- M. PENN** Silver City, Thayer, Brewster, Elk City, Mapleton NE, Neosho Falls, Olathe, Clinesmith, Easton, McLouth NW, Pomona, Sallyards, Welch-Mohr
- MSSP** Kingston, Brewster, Irish Valley, Neosho Falls, Paola-Rantoul, Tucker
- L. ORD** Logsdan

■ eastern Kansas conventional gas (from Jenden et al., 1988)
 ● analysis of coalbed desorption gas

FIGURE 18.

Gas Reserves and Relative Deliverability

Colt Energy #2-6 Spencer; sec. 6-T.18S.-R.21E., Franklin Co., KS

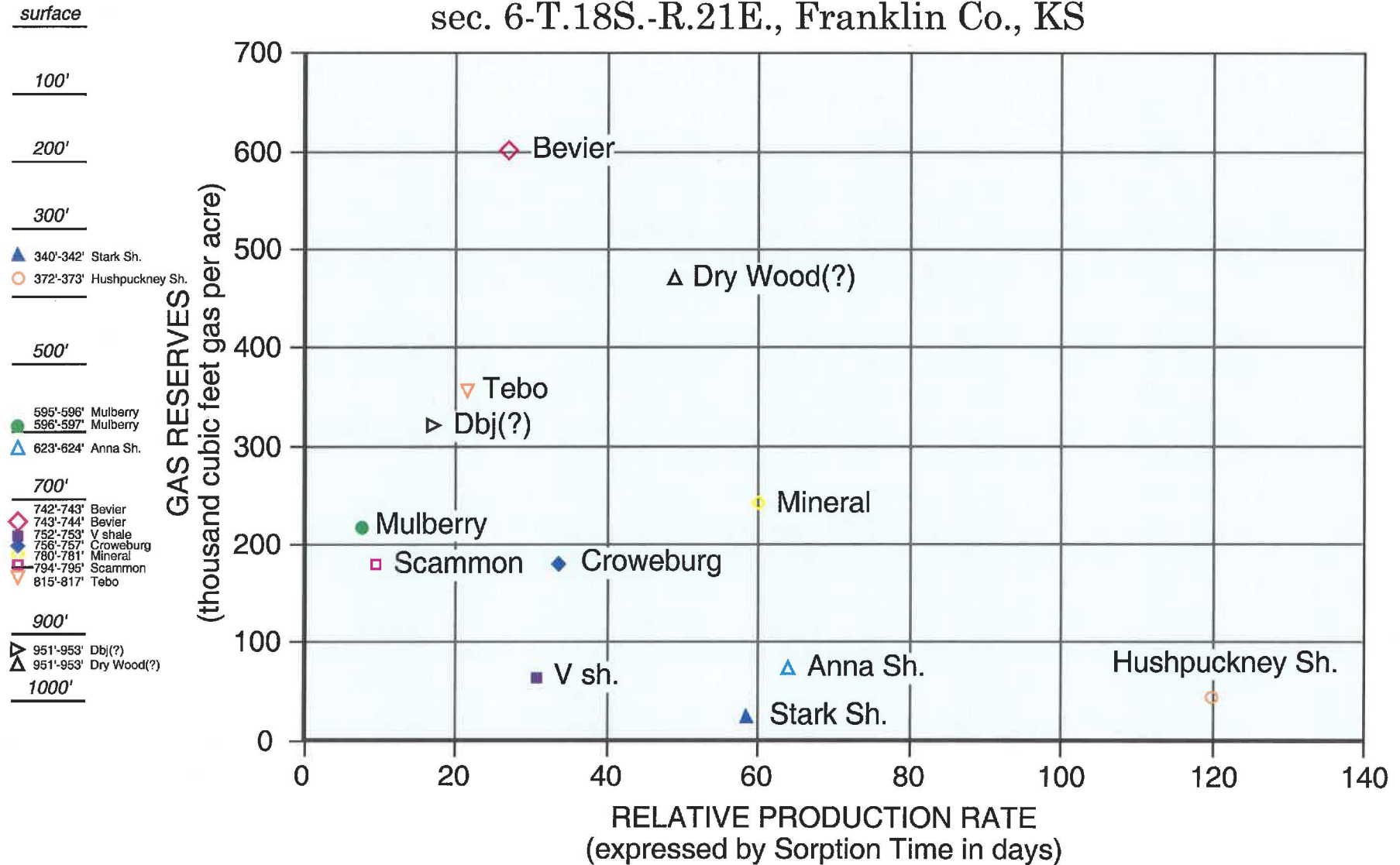


FIGURE 19.

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(620) 236-7874



February 7, 2005

Kansas Geological Survey
1930 Constant Ave.
Lawrence KS 66047-3726

Attn: K. David Newell

Please find listed below analysis on the following sample.

Lab ID. 20401 Sample ID. Kansas Geological Survey Spencer Mulberry Depth 596.4'

	As Received	Moisture Free	MAF
Moisture	4.41%		
Ash	18.72%	19.58%	
Volatile Matter	29.83%	31.20%	
Fixed Carbon	47.04%	49.22%	
BTU/lb	11,124	11,638	14,472
Sulfur	2.78%	2.90%	

Respectfully,

Carrol Luman

CGL:pd1

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February 7, 2005

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Lawrence KS 66047-3726

Attn: K. David Newell

Please find listed below analysis on the following sample.

Lab ID. 20404 Sample ID. Kansas Geological Survey Spencer Bevier Depth 743.1'

	As Received	Moisture Free	MAF
Moisture	3.04%		
Ash	26.64%	27.47%	
Volatile Matter	31.12%	32.10%	
Fixed Carbon	39.20%	40.43%	
BTU/lb	10,020	10,334	14,248
Sulfur	6.46%	6.66%	

Respectfully,



Carrol Luman

CGL:pdl

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Attn: K. David Newell

Please find listed below analysis on the following sample.

Lab ID. 20405 Sample ID. Kansas Geological Survey Spencer Croweburg Depth
755.5'.

	As Received	Moisture Free	MAF
Moisture	2.00%		
Ash	18.81%	19.20%	
Volatile Matter	37.92%	38.70%	
Fixed Carbon	41.27%	42.10%	
BTU/lb	11,832	12,073	14,941
Sulfur	4.30%	4.38%	

Respectfully,



Carrol Luman

CGL:pdl

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Lawrence KS 66047-3726

Attn: K. David Newell

Please find listed below analysis on the following sample.

Lab ID. 20406 Sample ID. Kansas Geological Survey Spencer Mineral Depth 779.5'.

	As Received	Moisture Free	MAF
Moisture	1.98%		
Ash	19.84%	20.25%	
Volatile Matter	37.54%	38.30%	
Fixed Carbon	40.64%	41.45%	
BTU/lb	11,680	11,916	14,942
Sulfur	4.69%	4.79%	

Respectfully,

Carrol Luman

CGL.pdl

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February 7, 2005

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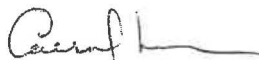
Attn: K. David Newell

Please find listed below analysis on the following sample.

Lab ID. 20407 Sample ID. Kansas Geological Survey Spencer Scammon Depth
794.0'.

	As Received	Moisture Free	MAF
Moisture	3.14%		
Ash	35.17%	36.31%	
Volatile Matter	28.15%	29.06%	
Fixed Carbon	33.54%	34.63%	
BTU/lb	7,814	8,067	12,666
Sulfur	16.25%	16.78%	

Respectfully,



Carrol Luman

CGL:pdl

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Attn: K. David Newell

Please find listed below analysis on the following sample.

Lab ID. 20408 Sample ID. Kansas Geological Survey Spencer Tebo Depth 813.3'

	As Received	Moisture Free	MAF
Moisture	2.45%		
Ash	27.64%	28.34%	
Volatile Matter	32.90%	33.72%	
Fixed Carbon	37.01%	37.94%	
BTU/lb	10,086	10,340	14,429
Sulfur	6.60%	6.77%	

Respectfully,



Carrol Luman

CGL:pd1

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Attn: K. David Newell

Please find listed below analysis on the following sample.

Lab ID. 20409 Sample ID. Kansas Geological Survey Spencer Dbj Depth 891.7'

	As Received	Moisture Free	MAF
Moisture	2.70%		
Ash	29.72%	30.55%	
Volatile Matter	30.06%	30.89%	
Fixed Carbon	37.52%	38.56%	
BTU/lb	9,449	9,711	13,982
Sulfur	11.12%	11.42%	

Respectfully,



Carrol Luman

CGL:pdl

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February 7, 2005

Kansas Geological Survey
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Lawrence KS 66047-3726

Attn: K. David Newell

Please find listed below analysis on the following sample.

Lab ID. 20410 Sample ID. Kansas Geological Survey Spencer Drywood Depth 951.5'

	As Received	Moisture Free	MAF
Moisture	1.64%		
Ash	17.22%	17.51%	
Volatile Matter	38.62%	39.27%	
Fixed Carbon	42.52%	43.22%	
BTU/lb	11,995	12,196	14,785
Sulfur	6.33%	6.44%	

Respectfully,



Carrol Luman

CGL:pdl

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February 7, 2005

Kansas Geological Survey
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Lawrence KS 66047-3726

Attn: K. David Newell

Please find listed below analysis on the following sample.

Lab ID. 20403 Sample ID. Kansas Geological Survey Spencer Bevier Depth 742.1'

	As Received	Moisture Free	MAF
Moisture	2.06%		
Ash	11.75%	12.00%	
Volatile Matter	40.26%	41.10%	
Fixed Carbon	45.93%	46.90%	
BTU/lb	12,808	13,078	14,860
Sulfur	2.54%	2.59%	

Respectfully,


Carrol Luman

CGL:pdl

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Lawrence KS 66047-3726


Attn: K. David Newell

Please find listed below analysis on the following sample.

Lab ID. 20402 Sample ID. Kansas Geological Survey Spencer Anna Shale Depth
622.9'.

	As Received	Moisture Free	MAF
Moisture	1.36%		
Ash	76.34%	77.40%	
Volatile Matter	15.22%	15.43%	
Fixed Carbon	7.08%	7.17%	
BTU/lb	2,425	2,458	10,876
Sulfur	0.86%	0.87%	

Respectfully,



Carrol Luman

CGL:pdl

ANALYSIS REPORT

Lab #: 63929 Job #: 4806
Sample Name/Number: 595.4 to 597.4 Mulberry coal
Company: Kansas Geological Survey
Date Sampled: / /
Container: Serum Bottles
Field/Site Name: Colt #2-6 Spencer Well
Location: Franklin County, KS
Formation/Depth: Middle Pennsylvanian Marmaton Group
Sampling Point: NWE Sec 6-T18S-R21E
Date Received: 2/19/2004 Date Reported: 3/15/2004

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.396			
Oxygen -----	0.0063			
Nitrogen -----	34.03			
Carbon Dioxide -----	0.94	-14.18		
Methane -----	63.89	-61.94	-226.3	
Ethane -----	0.427	-36.03	-174.5	
Ethylene -----	nd			
Propane -----	0.212			
Iso-butane -----	0.0727			
N-butane -----	0.0122			
Iso-pentane -----	0.0020			
N-pentane -----	nd			
Hexanes + -----	0.0092			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 664

Specific gravity, calculated: 0.713

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.
Chemical analysis based on standards accurate to within 2%

ANALYSIS REPORT

Lab #: 63930 Job #: 4806
 Sample Name/Number: 742.1 to 744.2 Bevier Coal
 Company: Kansas Geological Survey
 Date Sampled: / /
 Container: Serum Bottles
 Field/Site Name: Colt #2-6 Spencer Well
 Location: Franklin County, KS
 Formation/Depth: Middle Pennsylvanian Cherokee Group
 Sampling Point: NWE Sec 6-T18S-R21E
 Date Received: 2/19/2004 Date Reported: 3/15/2004

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	nd			
Helium -----	0.0084			
Hydrogen -----	nd			
Argon -----	0.347			
Oxygen -----	1.47			
Nitrogen -----	30.33			
Carbon Dioxide -----	0.92	-17.11		
Methane -----	64.52	-60.67	-227.9	
Ethane -----	0.810	-37.01	-191.6	
Ethylene -----	nd			
Propane -----	1.18			
Iso-butane -----	0.102			
N-butane -----	0.264			
Iso-pentane -----	0.0302			
N-pentane -----	0.0071			
Hexanes + -----	0.0091			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 712
 Specific gravity, calculated: 0.721

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

ANALYSIS REPORT

Lab #: 63931 Job #: 4806
 Sample Name/Number: 779.5 to 781.0 Mineral coal
 Company: Kansas Geological Survey
 Date Sampled: / /
 Container: Serum Bottles
 Field/Site Name: Colt #2-6 Spencer well
 Location: Franklin County, KS
 Formation/Depth: Middle Pennsylvanian Cherokee Group
 Sampling Point: NWNE Sec 6-T18S-R21E
 Date Received: 2/19/2004 Date Reported: 3/15/2004

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	nd			
Helium -----	0.0169			
Hydrogen -----	nd			
Argon -----	0.355			
Oxygen -----	1.19			
Nitrogen -----	31.73			
Carbon Dioxide -----	1.14	-14.62		
Methane -----	63.93	-61.14	-227.7	
Ethane -----	0.646	-36.33	-188.3	
Ethylene -----	nd			
Propane -----	0.739			
Iso-butane -----	0.0469			
N-butane -----	0.167			
Iso-pentane -----	0.0148			
N-pentane -----	0.0147			
Hexanes + -----	0.0121			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 687
 Specific gravity, calculated: 0.720

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

ANALYSIS REPORT

Lab #: 63932 Job #: 4806
 Sample Name/Number: 815.3 to 816.9 Tebo coal
 Company: Kansas Geological Survey
 Date Sampled: / /
 Container: Serum Bottles
 Field/Site Name: Colt #2-6 Spencer well
 Location: Franklin County, KS
 Formation/Depth: Middle Pennsylvanian Cherokee Group
 Sampling Point: NWNE Sec 6-T18S-R21E
 Date Received: 2/19/2004 Date Reported: 3/15/2004

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	nd			
Helium -----	0.0093			
Hydrogen -----	nd			
Argon -----	0.239			
Oxygen -----	0.0518			
Nitrogen -----	22.17			
Carbon Dioxide -----	1.02	-13.53		
Methane -----	75.49	-60.90	-224.3	
Ethane -----	0.701	-33.80	-161.6	
Ethylene -----	nd			
Propane -----	0.233			
Iso-butane -----	0.0454			
N-butane -----	0.0193			
Iso-pentane -----	0.0098			
N-pentane -----	0.0032			
Hexanes + -----	0.0065			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 786
 Specific gravity, calculated: 0.665

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

ANALYSIS REPORT

Lab #: 63933 Job #: 4806
Sample Name/Number: 951.2 to 952.3 ? coal
Company: Kansas Geological Survey
Date Sampled: / /
Container: Serum Bottles
Field/Site Name: Colt #2-6 Spencer well
Location: Franklin County, KS
Formation/Depth: Middle Pennsylvanian Cherokee Group
Sampling Point: NWNE Sec 6-T18S-R21E
Date Received: 2/19/2004 Date Reported: 3/15/2004

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	nd			
Helium -----	0.0263			
Hydrogen -----	0.0248			
Argon -----	0.405			
Oxygen -----	0.0051			
Nitrogen -----	36.60			
Carbon Dioxide -----	2.18	-2.03		
Methane -----	60.48	-59.42	-242.0	
Ethane -----	0.140	-27.76		
Ethylene -----	nd			
Propane -----	0.131			
Iso-butane -----	nd			
N-butane -----	0.0059			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	0.0025			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 619

Specific gravity, calculated: 0.732

Remarks:

Due to low ethane concentration, hydrogen isotope data is not available for that component, although carbon isotope data was generated.

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.
Chemical analysis based on standards accurate to within 2%