# 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:

| *unit* | *gas per acre (thousand cubic ft)* |
|---|---|
| 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 $cm^3$). 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 $cm^3$). 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 $cm^3$). 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 $cm^3$). 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:

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

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 (°R = 460 + °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:

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

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:

| *unit* | *depth* | *moisture* | *ash* | *moisture-free ash* |
|---|---|---|---|---|
| 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% |

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:

| *unit* | *depth* | *moisture* | *ash* | *moisture-free ash* |
|---|---|---|---|---|
| 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:

| *unit* | *depth* | *moisture-free ash* | $G_c$ | $G_{pc}$ |
|---|---|---|---|---|
| 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 |

[1]KGS 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:

| *unit* | *depth* | *density and uncertainty* |
|---|---|---|
| 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')** |
|---|---|---|---|---|---|
| $\delta^{13}CO_2$ | -14.18 | -17.11 | -14.62 | -13.53 | -2.03 |
| $\delta^{13}C_{methane}$ | -61.94 | -60.67 | -61.14 | -61.90 | -59.42 |
| $\delta DC_{methane}$ | -226.3 | -227.9 | -227.7 | -224.3 | -242.0 |
| $\delta^{13}C_{ethane}$ | -36.03 | -37.01 | -36.33 | -33.80 | -27.76 |
| $\delta DC_{ethane}$ | -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 |

[1]atmospheric 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:

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

where $V_{coal}$ is the volume of the sample; $W_{coal}$ is the dry weight of the sample; $\rho_{coal}$ 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)

$Vtest_0 = 0$
$Vtest_1$ = volume of gas tested at first test
$Vtest_2$ = volume of gas tested at second test, etc.

Frac $atm_0$ = fraction of $V_0$ that is atmosphere (= 1 when sample is canistered)

Frac $atm_1$ = fraction of $V_0$ that is atmosphere after $Vtest_1$
Frac $atm_1 = Vtest_1/(V_0 + Vtest_0)$

Vol $atm_1$ = volume of atmosphere in canister after first test
Vol $atm_1$ = Frac $atm_1 * V_0$

Frac $atm_2$ = Vol $atm_1/(V_0 + Vtest_2)$
Vol $atm_2$ = Frac $atm_2 * V_0$

Frac $atm_n$ = Vol $atm_{(n-1)}/(V_0 + Vtest_n)$
Vol $atm_n$ = 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'):

$V_{can} = 1738.00$ cm$^3$ = volume of canister Brady 28
$W_{coal} = 774.42$ gr = weight of coal
$\rho_{coal} = 1.34$ gr/cm$^3$ = density of coal

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

| 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 $cm^3$ 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 $cm^3$). 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 |

[1]atmospheric 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 $cm^3$) that should be in the canister at the time of gas sampling. Again, according to the chemical analysis of the gas, only 0.07 $cm^3$ 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 |

[1]atmospheric 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 $cm^3$ of oxygen, but only 12.9 $cm^3$ were present. Bevier (743.1') should have had 44.2 $cm^3$ of oxygen, but only 13.0 $cm^3$ 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 |

[1]atmospheric 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 $cm^3$ of oxygen, but only 18.7 $cm^3$ were present. The Tebo (815.3') sample should have had 67.8 $cm^3$ of oxygen, but only 18.2 $cm^3$ were present. The Dry Wood(?) (951.2') sample should have had 149.4 $cm^3$ of oxygen, but only 0.1 $cm^3$ 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 |

[1]atmospheric 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:

| *Sample* | *scf/ton* | *missing volume* | *revised scf/ton* | *increase* |
|---|---|---|---|---|
| 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:

| *unit* | *thickness*[1] *(ft)* | *coal/shale per acre* *($ft^3$)*[2] | *(ton)*[3] | *gas per acre (thousand cubic ft)*[4] |
|---|---|---|---|---|
| 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 |

[1]thicknesses (ft) from Johnson (2004)
[2]thickness (ft) X 43,560 $ft^2$/acre
[3]$ft^3$ coal or shale per acre X density ($g/cm^3$) X (1/ 907,168 g/ton) X 28,317 $cm^3/ft^3$
[4]tons coal or shale per acre X gas content ($ft^3$/ton)
[5]averaged density (1.34 $g/cm^3$) and gas content (57.1 $ft^3$/ton) used
[6]averaged density (1.42 $g/cm^3$) and gas content (77.7 $ft^3$/ton) used

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

| *unit* | *depth* | *sorption time (days)* |
|---|---|---|
| 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.

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FIGURES, TABLES, and APPENDICES

# Correlation of Field Barometer to KGS Petrophysics Lab Barometer

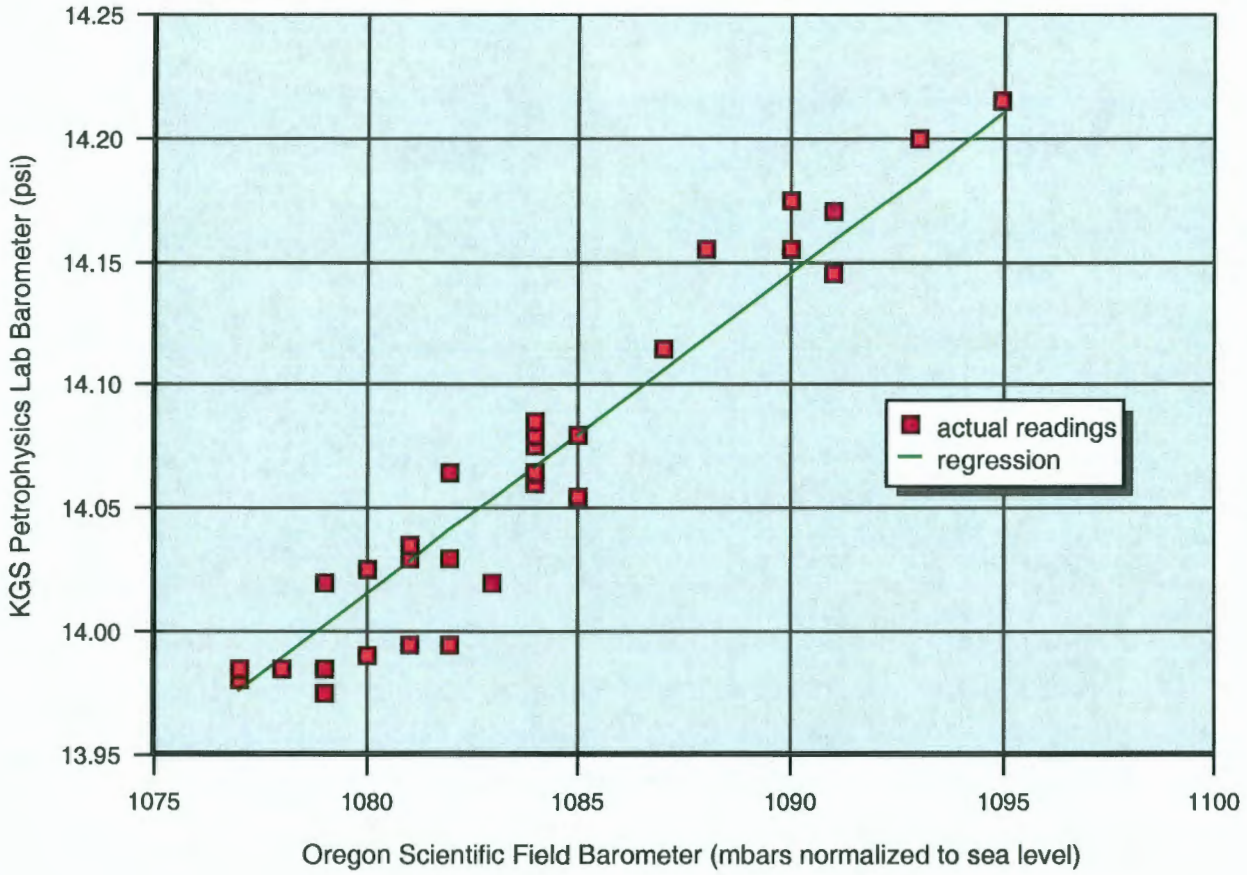



FIGURE 1.

TABLE 1 -- Desorption measurements for Colt #2-8 Spencer, SE NW NE 8-18S-21E, Franklin Co., KS

SAMPLE: 340.0' to 342.0' (Stark Shale) in canister LJ

| | lbs. | grams | | lbs. | grams | moisture % | | est. lost gas (cc) = |
|---|---|---|---|---|---|---|---|---|
| dry sample weight: | 5.798 | 2628.98 | wet sample weight: | 5.958 | 2702.72 | 2.73% | | 5 |

| TIME OF: | | elapsed time (off bottom to canistering) | |
|---|---|---|---|
| off bottom | at surface | in canister | 9.3 minutes |
| 10/18/03 13:39 | 10/18/03 13:40 | 10/18/03 13:48 | 0.154 hours |
| | | | 0.392840633 SQRT (hrs) |

| RIG/LAB MEASUREMENTS | | | CONVERSION OF RIG/LAB 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 | cubic ft | absolute T (F) | psia | cubic ft (@STP) | cc (@STP) | cubic ft | cc | without lost gas | with lost gas | TIME OF MEASURE | off bottom | at surface | in canister | SQRT hrs. (since off bottom) |
| 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 | 0.591607978 |
| 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 | 0.858280589 |
| 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 | 0.716795289 |
| 4 | 70 | 1081 | 0.0001 | 530 | 14.031 | 0.000132286 | 3.75 | 0.000198429 | 5.62 | 0.07 | 0.13 | 10/18/03 14:23 | 0:44:00 | 0:42:45 | 0:34:45 | 0.656348839 |
| 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 | 0.921954448 |
| 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 | 0.991631652 |
| 1 | 71 | 1080 | 4E-05 | 531 | 14.018 | 3.29786E-05 | 0.93 | 0.000297488 | 8.42 | 0.10 | 0.18 | 10/18/03 14:45 | 1:06:00 | 1:04:45 | 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 | 1.140175425 |
| 2.5 | 71 | 1080 | 9E-05 | 531 | 14.018 | 8.24465E-05 | 2.33 | 0.000445892 | 12.63 | 0.15 | 0.21 | 10/18/03 15:12 | 1:33:00 | 1:31:45 | 1:23:45 | 1.24498998 |
| 2.5 | 72 | 1080 | 9E-05 | 532 | 14.018 | 8.22916E-05 | 2.33 | 0.000526163 | 14.96 | 0.16 | 0.24 | 10/18/03 15:22 | 1:43:00 | 1:41:45 | 1:33:45 | 1.310218267 |
| 2 | 72 | 1080 | 7E-05 | 532 | 14.018 | 6.58333E-05 | 1.86 | 0.000594018 | 16.82 | 0.20 | 0.27 | 10/18/03 15:38 | 1:59:00 | 1:57:45 | 1:49:45 | 1.408308678 |
| 0 | 72 | 1080 | 0 | 532 | 14.018 | 0 | 0.00 | 0.000594018 | 16.82 | 0.20 | 0.27 | 10/18/03 16:30 | 2:51:00 | 2:49:45 | 2:41:45 | 1.688194302 |
| -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 | 1.879716291 |
| 2 | 71 | 1083 | 7E-05 | 531 | 14.057 | 6.61404E-05 | 1.87 | 0.00062724 | 17.76 | 0.22 | 0.26 | 10/16/03 18:44 | 5:05:00 | 5:03:45 | 4:55:45 | 2.254624878 |
| 22 | 81 | 1085 | 0.0008 | 541 | 14.063 | 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 | 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 | 4.155317678 |
| 0 | 78 | 1086 | 0 | 536 | 14.096 | 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 | 4.573474245 |
| 6 | 78 | 1084 | 0.0002 | 536 | 14.070 | 0.00019602 | 5.55 | 0.001571348 | 44.50 | 0.54 | 0.80 | 10/19/03 19:14 | 29:35:00 | 29:33:45 | 29:25:45 | 5.439056291 |
| 8 | 78 | 1083 | 0.0003 | 536 | 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 | 6.434263177 |
| 5 | 76 | 1081 | 0.0002 | 536 | 14.031 | 0.000163506 | 4.63 | 0.001995972 | 56.52 | 0.89 | 0.75 | 10/20/03 15:54 | 50:15:00 | 50:13:45 | 50:05:45 | 7.088723439 |
| 0 | 78 | 1085 | 0 | 536 | 14.063 | 0 | 0.00 | 0.001995972 | 56.52 | 0.89 | 0.75 | 10/21/03 11:42 | 70:03:00 | 70:01:45 | 69:53:45 | 8.369587803 |
| 10 | 75 | 1082 | 0.0004 | 535 | 14.044 | 0.000327927 | 9.29 | 0.002323898 | 65.81 | 0.60 | 0.88 | 10/22/03 14:14 | 96:35:00 | 96:33:45 | 96:25:45 | 9.827881992 |
| -8 | 72 | 1081 | -0.0002 | 532 | 14.031 | -0.000197663 | -5.60 | 0.002126216 | 60.21 | 0.73 | 0.79 | 10/23/03 11:56 | 116:19:00 | 116:17:45 | 116:09:45 | 10.87734649 |
| 25 | 82 | 1076 | 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 | 11.65467559 |
| -25 | 68 | 1093 | -0.0009 | 528 | 14.187 | -0.00083913 | -23.76 | 0.002091828 | 59.23 | 0.72 | 0.78 | 10/25/03 13:30 | 167:51:00 | 167:49:45 | 167:41:45 | 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 10:19 | 188:40:00 | 188:38:45 | 188:30:45 | 13.73559652 |
| 1 | 69 | 1075 | 4E-05 | 529 | 13.953 | 3.295E-05 | 0.93 | 0.002778134 | 78.67 | 0.98 | 1.02 | 10/27/03 14:58 | 217:19:00 | 217:17:45 | 217:09:45 | 14.74186431 |
| 19 | 73 | 1080 | 0.0007 | 533 | 14.018 | 0.000624243 | 17.68 | 0.003402376 | 96.34 | 1.17 | 1.23 | 11/3/03 10:03 | 360:24:00 | 360:22:45 | 360:14:45 | 19.50384577 |
| 25 | 75 | 1085 | 0.0009 | 535 | 14.063 | 0.00082209 | 23.28 | 0.004224686 | 119.62 | 1.48 | 1.52 | 11/10/03 11:44 | 550:05:00 | 550:03:45 | 549:55:45 | 23.4538554 |
| 38 | 75 | 1089 | 0.0013 | 535 | 13.875 | 0.001186352 | 33.03 | 0.005390818 | 152.65 | 1.86 | 1.92 | 11/17/03 18:19 | 722:40:00 | 722:38:45 | 722:30:45 | 26.8824602 |
| 5 | 73 | 1086 | 0.0002 | 533 | 14.096 | 0.000165187 | 4.66 | 0.005556005 | 157.33 | 1.92 | 1.96 | 11/24/03 14:19 | 868:40:00 | 868:38:45 | 868:30:45 | 29.61051289 |
| 24 | 72 | 1090 | 0.0008 | 532 | 14.148 | 0.000797314 | 22.58 | 0.006353319 | 179.91 | 2.19 | 2.25 | 12/4/03 19:46 | 1134:07:00 | 1134:05:45 | 1133:57:45 | 33.67864869 |
| 15 | 70 | 1083 | 0.0006 | 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 | 35.67982623 |
| 18 | 76 | 1087 | 0.0006 | 536 | 14.109 | 0.000591889 | 16.76 | 0.00747533 | 211.68 | 2.58 | 2.64 | 12/18/03 14:09 | 1416:30:00 | 1416:28:45 | 1416:20:45 | 37.63641853 |
| 18 | 75 | 1081 | 0.0006 | 535 | 14.031 | 0.000524196 | 14.84 | 0.007999527 | 226.52 | 2.76 | 2.82 | 12/22/03 15:48 | 1562:09:00 | 1562:07:45 | 1561:59:45 | 39.52404332 |
| 15 | 73 | 1082 | 0.0005 | 533 | 14.044 | 0.000493736 | 13.96 | 0.008493263 | 240.50 | 2.93 | 2.99 | 12/29/03 14:21 | 1728:42:00 | 1728:40:45 | 1728:32:45 | 41.57763822 |
| -5 | 73 | 1103 | -0.0002 | 533 | 14.316 | -0.000187773 | -4.75 | 0.00832549 | 235.75 | 2.87 | 2.93 | 1/8/04 15:02 | 1921:23:00 | 1921:21:45 | 1921:13:45 | 43.83358662 |
| 19 | 75 | 1093 | 0.0007 | 535 | 14.187 | 0.000829395 | 17.82 | 0.008954685 | 253.57 | 3.09 | 3.15 | 1/12/04 11:37 | 2081:58:00 | 2081:56:45 | 2081:48:45 | 45.40868313 |
| 19 | 73 | 1089 | 0.0007 | 533 | 14.135 | 0.000829445 | 17.82 | 0.00958433 | 271.40 | 3.31 | 3.37 | 1/21/04 10:24 | 2278:45:00 | 2278:43:45 | 2278:35:45 | 47.71530153 |
| 4 | 70 | 1091 | 0.0001 | 530 | 14.161 | 0.000133509 | 3.78 | 0.009717639 | 275.18 | 3.35 | 3.41 | 1/27/04 10:01 | 2420:22:00 | 2420:20:45 | 2420:12:45 | 49.19722214 |
| 23 | 73 | 1085 | 0.0008 | 533 | 14.083 | 0.00075916 | 21.50 | 0.010477 | 296.67 | 3.62 | 3.68 | 2/2/04 15:33 | 2589:54:00 | 2589:52:45 | 2589:44:45 | 50.69416113 |
| 7 | 74 | 1091 | 0.0002 | 534 | 14.161 | 0.000231691 | 6.57 | 0.010708691 | 303.24 | 3.70 | 3.76 | 2/9/04 10:23 | 2732:44:00 | 2732:42:45 | 2732:34:45 | 52.27555197 |
| 11 | 75 | 1091 | 0.0004 | 535 | 14.161 | 0.00036372 | 10.30 | 0.011072611 | 313.54 | 3.82 | 3.88 | 2/18/04 14:11 | 2904:32:00 | 2904:30:45 | 2904:22:45 | 53.69372256 |
| 16 | 75 | 1088 | 0.0006 | 535 | 14.096 | 0.000526822 | 14.91 | 0.011599233 | 328.45 | 4.00 | 4.06 | 2/23/04 14:21 | 3072:42:00 | 3072:40:45 | 3072:32:45 | 55.43194025 |
| 8 | 75 | 1091 | 0.0003 | 535 | 14.161 | 0.000264523 | 7.49 | 0.011863757 | 335.94 | 4.09 | 4.15 | 3/2/04 10:38 | 3260:59:00 | 3260:57:45 | 3260:49:45 | 57.10502021 |
| -25 | 75 | 1088 | -0.0009 | 535 | 14.122 | -0.000824363 | -23.34 | 0.011039394 | 312.60 | 3.81 | 3.87 | 3/8/04 9:54 | 3404:15:00 | 3404:13:45 | 3404:05:45 | 58.34595102 |
| -7 | 74 | 1082 | -0.0002 | 534 | 14.044 | -0.000229979 | -6.51 | 0.010809415 | 306.09 | 3.73 | 3.79 | 3/15/04 11:27 | 3573:48:00 | 3573:46:45 | 3573:38:45 | 59.78126797 |

DECANISTERED 3/17/2004; sample dried for 15 days in air

SAMPLE: 371.5' to 372.5' (Hushpuckney Shale) in canister Brady 23

| | lbs. | grams | | lbs. | grams | moisture % | | est. lost gas (cc) = |
|---|---|---|---|---|---|---|---|---|
| dry sample weight: | 3.082 | 1397.95 | wet sample weight: | 3.123 | 1416.43 | 1.30% | | 1 |

| TIME OF: | | elapsed time (off bottom to canistering) | |
|---|---|---|---|
| off bottom | at surface | in canister | 7.0 minutes |
| 10/18/03 15:36 | 10/18/03 15:37 | 10/18/03 15:43 | 0.117 hours |
| | | | 0.341585026 SQRT (hrs) |

| RIG/LAB MEASUREMENTS | | | CONVERSION OF RIG/LAB 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 | cubic ft | absolute T (F) | psia | cubic ft (@STP) | cc (@STP) | cubic ft | cc | without lost gas | with lost gas | TIME OF MEASURE | off bottom | at surface | in canister | SQRT hrs. (since off bottom) |
| -2 | 72 | 1080 | -7E-05 | 532 | 14.018 | -6.58333E-05 | -1.86 | -6.5833E-05 | -1.86 | -0.04 | -0.02 | 10/18/03 15:50 | 0:14:00 | 0:13:00 | 0:07:00 | 0.483045691 |
| 0 | 72 | 1080 | 0 | 532 | 14.018 | 0 | 0.00 | -6.5833E-05 | -1.86 | -0.04 | -0.02 | 10/18/03 16:00 | 0:24:00 | 0:23:00 | 0:17:00 | 0.632455532 |
| 0.5 | 72 | 1080 | 2E-05 | 532 | 14.018 | 1.64583E-05 | 0.47 | -4.9375E-05 | -1.40 | -0.03 | -0.01 | 10/18/03 16:26 | 0:52:00 | 0:51:00 | 0:45:00 | 0.930949336 |
| 5 | 72 | 1080 | 0.0002 | 532 | 14.018 | 0.000164583 | 4.66 | 0.000115208 | 3.26 | 0.07 | 0.10 | 10/18/03 17:12 | 1:38:00 | 1:35:00 | 1:29:00 | 1.264911064 |
| -1 | 71 | 1083 | -4E-05 | 531 | 14.057 | -3.30702E-05 | -0.94 | 8.2138E-05 | 2.33 | 0.05 | 0.08 | 10/18/03 18:42 | 3:08:00 | 3:05:00 | 2:59:00 | 1.760661686 |
| 33 | 73 | 1085 | 0.0012 | 533 | 14.083 | 0.00108923 | 30.84 | 0.001171388 | 33.17 | 0.76 | 0.78 | 10/19/03 2:22 | 10:48:00 | 10:45:00 | 10:39:00 | 3.281259921 |
| 7 | 75 | 1086 | 0.0002 | 535 | 14.096 | 0.000230397 | 6.52 | 0.001401785 | 39.69 | 0.91 | 0.93 | 10/19/03 8:58 | 15:20:00 | 15:19:00 | 15:13:00 | 3.915760041 |
| 7 | 75 | 1086 | 0.0002 | 535 | 14.096 | 0.000230397 | 6.52 | 0.001632183 | 46.22 | 1.06 | 1.06 | 10/19/03 10:25 | 18:49:00 | 18:48:00 | 18:42:00 | 4.337816192 |
| 18 | 75 | 1084 | 0.0006 | 535 | 14.070 | 0.000591359 | 16.75 | 0.002223522 | 62.98 | 1.44 | 1.47 | 10/19/03 19:15 | 27:39:00 | 27:38:00 | 27:32:00 | 5.25632673 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 79 | 1083 | 0.0004 | 539 | 14.057 | 0.000325794 | 9.23 | 0.002549316 | 72.19 | 1.85 | 1.88 | 10/20/03 | 7:02 | 39:26:00 | 39:25:00 | 39:19:00 | 6.27959859 |
| 12 | 77 | 1081 | 0.0004 | 537 | 14.031 | 0.000391864 | 11.09 | 0.002941 | 83.26 | 1.91 | 1.93 | 10/20/03 | 15:55 | 48:19:00 | 48:18:00 | 48:12:00 | 6.95101911 |
| 14 | 78 | 1085 | 0.0005 | 536 | 14.063 | 0.000459511 | 13.01 | 0.003400511 | 96.29 | 2.21 | 2.23 | 10/21/03 | 11:44 | 66:08:00 | 66:07:00 | 66:01:00 | 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 | 9.728623158 |
| -6 | 72 | 1081 | -0.0002 | 532 | 14.031 | -0.000197683 | -5.60 | 0.003924287 | 111.12 | 2.55 | 2.57 | 10/23/03 | 11:56 | 116:22:00 | 116:21:00 | 116:15:00 | 10.78733826 |
| 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 | 136:35:00 | 136:34:00 | 136:28:00 | 11.77214226 |
| -14 | 73 | 1093 | -0.0005 | 533 | 14.187 | -0.000485505 | -13.18 | 0.003962493 | 112.77 | 2.58 | 2.61 | 10/25/03 | 13:30 | 185:54:00 | 185:53:00 | 185:47:00 | 12.88021739 |
| 11 | 73 | 1094 | 0.0004 | 533 | 14.200 | 0.000366086 | 10.37 | 0.004348581 | 123.14 | 2.82 | 2.84 | 10/26/03 | 10:20 | 166:44:00 | 166:43:00 | 166:37:00 | 13.86504055 |
| 17 | 71 | 1075 | 0.0006 | 531 | 13.953 | 0.000558041 | 15.80 | 0.004906622 | 136.94 | 3.16 | 3.21 | 10/27/03 | 14:59 | 215:23:00 | 215:22:00 | 215:16:00 | 14.87594404 |
| 30 | 72 | 1080 | 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 | 19.45464812 |
| 41 | 75 | 1085 | 0.0014 | 535 | 14.063 | 0.001346227 | 38.18 | 0.007242346 | 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 | 0.008626921 | 249.95 | 5.73 | 5.75 | 11/17/03 | 16:20 | 720:44:00 | 720:43:00 | 720:37:00 | 26.84847711 |
| -1 | 73 | 1086 | -4E-05 | 533 | 14.096 | -3.30374E-05 | -0.94 | 0.008793684 | 249.01 | 5.71 | 5.73 | 11/24/03 | 14:20 | 888:44:00 | 888:43:00 | 888:37:00 | 29.77808799 |
| 16 | 72 | 1090 | 0.0006 | 532 | 14.148 | 0.000531543 | 15.05 | 0.009325426 | 264.07 | 6.05 | 6.07 | 12/4/03 | 19:48 | 1132:12:00 | 1132:11:00 | 1132:05:00 | 33.64817974 |
| 18 | 70 | 1083 | 0.0006 | 530 | 14.057 | 0.000596367 | 16.89 | 0.009921613 | 280.95 | 6.44 | 6.46 | 12/10/03 | 14:44 | 1271:06:00 | 1271:07:00 | 1271:01:00 | 35.65295687 |
| 34 | 76 | 1087 | 0.0012 | 536 | 14.109 | 0.001118013 | 31.66 | 0.011039826 | 312.81 | 7.18 | 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 | 0.011656885 | 335.80 | 7.70 | 7.72 | 12/22/03 | 15:56 | 1580:22:00 | 1580:21:00 | 1580:15:00 | 39.50147677 |
| 18 | 73 | 1082 | 0.0006 | 533 | 14.044 | 0.000592483 | 16.78 | 0.012451386 | 352.58 | 8.08 | 8.10 | 12/29/03 | 14:22 | 1726:46:00 | 1726:45:00 | 1726:39:00 | 41.55436204 |
| -6 | 73 | 1103 | -0.0002 | 533 | 14.316 | -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 | 43.61133795 |
| 26 | 75 | 1093 | 0.0009 | 535 | 14.187 | 0.000861277 | 24.39 | 0.013111316 | 371.27 | 8.51 | 8.53 | 1/12/04 | 11:37 | 2080:01:00 | 2080:00:00 | 2059:54:00 | 45.36740648 |
| 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 | 14.181 | -6.87547E-05 | -1.89 | 0.013077892 | 370.32 | 8.49 | 8.51 | 1/27/04 | 10:02 | 2416:26:00 | 2416:25:00 | 2416:19:00 | 49.17758941 |
| 29 | 73 | 1085 | 0.001 | 533 | 14.063 | 0.000957202 | 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 | 14.181 | 0.000331274 | 9.38 | 0.014368188 | 406.80 | 9.32 | 9.35 | 2/9/04 | 10:24 | 2730:46:00 | 2730:47:00 | 2730:41:00 | 52.25705694 |
| 16 | 75 | 1091 | 0.0006 | 535 | 14.181 | 0.000529047 | 14.98 | 0.014895215 | 421.78 | 9.67 | 9.69 | 2/16/04 | 14:12 | 2902:36:00 | 2902:35:00 | 2902:29:00 | 53.87578306 |
| 22 | 75 | 1088 | 0.0008 | 535 | 14.098 | 0.000724108 | 20.50 | 0.01561932 | 442.29 | 10.14 | 10.16 | 2/23/04 | 14:22 | 3070:48:00 | 3070:45:00 | 3070:39:00 | 55.4144987 |
| 8 | 75 | 1091 | 0.0003 | 535 | 14.181 | 0.000264523 | 7.49 | 0.015883844 | 449.78 | 10.31 | 10.33 | 3/2/04 | 10:39 | 3259:03:00 | 3259:02:00 | 3258:56:00 | 57.06808963 |
| 15 | 75 | 1088 | 0.0005 | 535 | 14.122 | 0.000494816 | 14.01 | 0.016376481 | 463.78 | 10.63 | 10.65 | 3/8/04 | 9:55 | 3402:19:00 | 3402:18:00 | 3402:12:00 | 58.32938082 |
| 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 | 1097 | -0.0002 | 537 | 14.239 | -0.000165617 | -4.89 | 0.016935834 | 479.56 | 10.99 | 11.01 | 3/22/04 | 9:53 | 3738:17:00 | 3738:16:00 | 3738:10:00 | 61.14150254 |
| 12 | 74 | 1088 | 0.0004 | 534 | 14.122 | 0.000396435 | 11.23 | 0.017332089 | 490.79 | 11.25 | 11.27 | 3/30/04 | 20:26 | 3940:50:00 | 3940:49:00 | 3940:43:00 | 62.77805701 |
| 28 | 75 | 1080 | 0.001 | 535 | 14.018 | 0.000916497 | 25.95 | 0.018246566 | 516.74 | 11.84 | 11.87 | 4/8/04 | 14:38 | 4103:00:00 | 4102:59:00 | 4102:53:00 | 64.05468415 |
| -2 | 74 | 1086 | -7E-05 | 534 | 14.098 | -6.59511E-05 | -1.87 | 0.018182615 | 514.87 | 11.80 | 11.82 | 4/12/04 | 14:58 | 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 | 66.44345967 |
| 7 | 78 | 1090 | 0.0002 | 536 | 14.146 | 0.000230814 | 8.54 | 0.019070483 | 540.01 | 12.36 | 12.40 | 4/26/04 | 11:26 | 4579:52:00 | 4579:51:00 | 4579:45:00 | 67.87471217 |
| 17 | 74 | 1084 | 0.0008 | 534 | 14.070 | 0.000559552 | 15.84 | 0.019630015 | 555.86 | 12.74 | 12.76 | 5/3/04 | 18:58 | 4755:20:00 | 4755:19:00 | 4755:13:00 | 66.95892497 |
| 20 | 76 | 1081 | 0.0007 | 536 | 14.031 | 0.000854025 | 18.52 | 0.02026404 | 574.38 | 13.18 | 13.19 | 5/10/04 | 13:58 | 4916:20:00 | 4916:19:00 | 4916:13:00 | 70.13083012 |
| -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 | 71.26873216 |
| 29 | 78 | 1075 | 0.001 | 538 | 13.953 | 0.000939586 | 26.61 | 0.021190613 | 600.05 | 13.75 | 13.77 | 5/24/04 | 10:26 | 5250:50:00 | 5250:49:00 | 5250:43:00 | 72.46263405 |
| 4 | 75 | 1077 | 0.0001 | 535 | 13.979 | 0.000130585 | 3.70 | 0.021321378 | 603.75 | 13.84 | 13.88 | 6/1/04 | 10:50 | 5443:14:00 | 5443:13:00 | 5443:07:00 | 73.77827142 |
| 13 | 78 | 1078 | 0.0005 | 536 | 13.986 | 0.00042315 | 11.98 | 0.021744527 | 615.73 | 14.11 | 14.13 | 6/7/04 | 10:32 | 5566:56:00 | 5566:55:00 | 5566:49:00 | 74.74579141 |
| 17 | 79 | 1078 | 0.0006 | 539 | 13.992 | 0.000551293 | 15.61 | 0.02229582 | 631.34 | 14.47 | 14.49 | 6/14/04 | 10:44 | 5755:06:00 | 5755:07:00 | 5755:01:00 | 75.86259509 |
| -2 | 78 | 1082 | -7E-05 | 536 | 14.044 | -6.5463E-05 | -1.85 | 0.022230357 | 629.49 | 14.43 | 14.45 | 8/23/04 | 16:20 | 5978:44:00 | 5978:43:00 | 5978:37:00 | 77.30933536 |
| 8 | 77 | 1083 | 0.0003 | 537 | 14.057 | 0.000261606 | 7.41 | 0.022491963 | 636.90 | 14.60 | 14.62 | 7/1/04 | 11:46 | 6184:10:00 | 6184:09:00 | 6184:03:00 | 78.51220712 |
| 10 | 78 | 1081 | 0.0004 | 536 | 14.031 | 0.000325797 | 9.23 | 0.022817759 | 646.12 | 14.81 | 14.83 | 7/7/04 | 10:26 | 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 | 657.18 | 15.06 | 15.08 | 7/13/04 | 14:15 | 6454:39:00 | 6454:38:00 | 6454:32:00 | 80.34063644 |
| 2 | 75 | 1080 | 7E-05 | 535 | 14.018 | 6.54641E-05 | 1.85 | 0.023273815 | 659.04 | 15.10 | 15.13 | 7/19/04 | 11:18 | 6595:42:00 | 6595:41:00 | 6595:35:00 | 81.21391506 |
| -12 | 78 | 1091 | -0.0004 | 536 | 14.181 | -0.000396045 | -11.21 | 0.02267777 | 647.82 | 14.85 | 14.87 | 7/26/04 | 10:20 | 6782:44:00 | 6782:43:00 | 6782:37:00 | 82.23563971 |
| 19 | 77 | 1079 | 0.0007 | 537 | 14.005 | 0.000819019 | 17.53 | 0.023496789 | 665.35 | 15.25 | 15.27 | 8/2/04 | 14:40 | 6935:04:00 | 6935:03:00 | 6934:57:00 | 83.27704788 |
| -1 | 78 | 1086 | -4E-05 | 536 | 14.098 | -3.27304E-05 | -0.93 | 0.023464059 | 664.43 | 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 | 536 | 14.122 | -3.2913E-05 | -0.93 | 0.023431148 | 663.49 | 15.21 | 15.23 | 8/16/04 | 11:01 | 7267:25:00 | 7267:24:00 | 7267:18:00 | 85.24914487 |

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

SAMPLE: 595.4' to 596.4' (Mulberry coal) in canister Brady 28

| | lbs. | grams | | lbs. | grams | moisture % | | est. lost gas (cc) = | |
|---|---|---|---|---|---|---|---|---|---|
| dry sample weight: | 1.707 | 774.42 | wet sample weight: | 1.789 | 811.59 | 4.58% | | 46 | |

TIME OF: off bottom 11/4/03 16:08 at surface 11/4/03 16:08 in canister 11/4/03 16:18

elapsed time (off bottom to canistering): 11.2 minutes; 0.186 hours; 0.431405970 SQRT (hrs)

| RIG/LAB MEASUREMENTS | | | CONVERSION OF RIG/LAB 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 | cubic ft | absolute T (F) | psia | cubic ft (@STP) | cc (@STP) | cubic ft | cc | without lost gas | with lost gas | TIME OF MEASURE | off bottom | at surface | in canister | SQRT hrs. (since off bottom) |
| 18 | 71 | 1078 | 0.0006 | 531 | 13.992 | 0.000592516 | 16.78 | 0.000592516 | 16.78 | 0.69 | 2.66 | 11/4/03 16:22 | 0:15:45 | 0:15:42 | 0:04:35 | 0.512347538 |
| 9 | 71 | 1078 | 0.0003 | 531 | 13.992 | 0.000296258 | 8.39 | 0.000888774 | 25.17 | 1.04 | 3.03 | 11/4/03 16:27 | 0:20:10 | 0:20:07 | 0:09:00 | 0.579750904 |
| 5 | 71 | 1078 | 0.0002 | 531 | 13.992 | 0.000164588 | 4.66 | 0.001053381 | 29.83 | 1.23 | 3.22 | 11/4/03 16:29 | 0:22:55 | 0:22:52 | 0:11:45 | 0.616016541 |
| 5 | 71 | 1078 | 0.0002 | 531 | 13.992 | 0.000164588 | 4.66 | 0.001217949 | 34.49 | 1.43 | 3.41 | 11/4/03 16:34 | 0:27:40 | 0:27:37 | 0:16:30 | 0.679051826 |
| 5 | 71 | 1078 | 0.0002 | 531 | 13.992 | 0.000164588 | 4.66 | 0.001382537 | 39.15 | 1.62 | 3.61 | 11/4/03 16:42 | 0:35:55 | 0:35:52 | 0:24:45 | 0.773899626 |
| 1 | 71 | 1078 | 4E-05 | 531 | 13.992 | 3.29175E-05 | 0.93 | 0.001415454 | 40.08 | 1.66 | 3.64 | 11/4/03 16:44 | 0:37:40 | 0:37:37 | 0:26:30 | 0.792324288 |
| 1 | 71 | 1078 | 4E-05 | 531 | 13.992 | 3.29175E-05 | 0.93 | 0.001446372 | 41.01 | 1.70 | 3.66 | 11/4/03 16:46 | 0:39:55 | 0:39:52 | 0:28:45 | 0.81584562 |
| 7 | 71 | 1078 | 0.0002 | 531 | 13.992 | 0.000230423 | 6.52 | 0.001676795 | 47.54 | 1.97 | 3.95 | 11/4/03 16:57 | 0:50:25 | 0:50:22 | 0:39:15 | 0.916866867 |
| 4 | 71 | 1078 | 0.0001 | 531 | 13.992 | 0.00013167 | 3.73 | 0.001810485 | 51.27 | 2.12 | 4.11 | 11/4/03 17:02 | 0:55:55 | 0:55:52 | 0:44:45 | 0.985372897 |
| 10 | 71 | 1078 | 0.0004 | 531 | 13.992 | 0.000329175 | 9.32 | 0.00213984 | 60.59 | 2.51 | 4.49 | 11/4/03 17:23 | 1:16:10 | 1:16:07 | 1:05:00 | 1.126898252 |
| 10 | 71 | 1079 | 0.0004 | 531 | 14.005 | 0.000329461 | 9.33 | 0.002469121 | 89.92 | 2.89 | 4.86 | 11/4/03 17:43 | 1:36:10 | 1:36:07 | 1:25:00 | 1.268008601 |
| 11 | 71 | 1079 | 0.0004 | 531 | 14.005 | 0.000362429 | 10.26 | 0.00283155 | 80.18 | 3.32 | 5.30 | 11/4/03 17:54 | 1:47:10 | 1:47:07 | 1:36:00 | 1.33845466 |
| 65 | 70 | 1084 | 0.0023 | 530 | 14.070 | 0.002188772 | 61.98 | 0.005020322 | 142.18 | 5.88 | 7.87 | 11/4/03 19:24 | 3:17:10 | 3:17:07 | 3:06:00 | 1.812783391 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 111 | 73 | 1087 | 0.0039 | 533 | 14.109 | 0.003670528 | 103.94 | 0.00869085 | 248.10 | 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 | 0.001632493 | 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 | 526 | 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 | 0.001858388 | 46.90 | 0.014055042 | 397.99 | 16.46 | 16.45 | 11/5/03 | 17:59 | 25:52:10 | 25:52:07 | 25:41:00 | 5.088201377 | |
| 36 | 70 | 1095 | 0.0013 | 530 | 14.213 | 0.001205991 | 34.15 | 0.015261033 | 432.14 | 17.88 | 19.88 | 11/8/03 | 8:01 | 37:54:10 | 37:54:07 | 37:43:00 | 6.156523189 | |
| 23 | 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 | 6.471948015 | |
| 30 | 67 | 1096 | 0.0011 | 527 | 14.228 | 0.001011838 | 28.65 | 0.017046062 | 482.69 | 19.97 | 21.95 | 11/8/03 | 19:33 | 51:26:10 | 51:26:07 | 51:15:00 | 7.171897316 | |
| 35 | 73 | 1096 | 0.0012 | 533 | 14.228 | 0.001186956 | 33.04 | 0.018213038 | 515.73 | 21.34 | 23.32 | 11/7/03 | 0:24 | 56:17:10 | 56:17:07 | 56:06:00 | 7.502407021 | |
| 11 | 72 | 1097 | 0.0004 | 532 | 14.239 | 0.000387782 | 10.41 | 0.01858082 | 526.15 | 21.77 | 23.75 | 11/7/03 | 5:59 | 61:52:10 | 61:52:07 | 61:41:00 | 7.685713219 | |
| 15 | 70 | 1097 | 0.0005 | 530 | 14.239 | 0.000503414 | 14.28 | 0.019084234 | 540.40 | 22.36 | 24.34 | 11/7/03 | 10:50 | 66:43:10 | 66:43:07 | 66:32:00 | 8.188197136 | |
| 24 | 71 | 1097 | 0.0008 | 531 | 14.239 | 0.000803945 | 22.77 | 0.01966816 | 563.17 | 23.30 | 25.28 | 11/7/03 | 16:39 | 74:32:10 | 74:32:07 | 74:21:00 | 8.633429858 | estimate |
| 14 | 71 | 1098 | 0.0005 | 531 | 14.252 | 0.000469398 | 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 | 0.020825785 | 584.05 | 24.16 | 26.15 | 11/8/03 | 6:16 | 86:11:10 | 86:11:07 | 86:00:00 | 9.283647511 | |
| 29 | 69 | 1101 | 0.001 | 529 | 14.291 | 0.000978682 | 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 | 0.024162361 | 684.20 | 28.30 | 30.29 | 11/9/03 | 22:20 | 126:13:10 | 126:13:07 | 126:02:00 | 11.23474274 | |
| 40 | 75 | 1085 | 0.0014 | 535 | 14.063 | 0.001315343 | 37.25 | 0.025477725 | 721.45 | 29.85 | 31.83 | 11/10/03 | 11:46 | 139:39:10 | 139:39:07 | 139:28:00 | 11.81747784 | |
| 50 | 77 | 1080 | 0.0018 | 537 | 14.018 | 0.001830507 | 46.17 | 0.027106232 | 767.62 | 31.76 | 33.74 | 11/11/03 | 9:28 | 161:19:10 | 161:19:07 | 161:08:00 | 12.70115916 | |
| 23 | 75 | 1091 | 0.0008 | 535 | 14.161 | 0.000780505 | 21.54 | 0.027888737 | 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 | 26.34 | 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 | 0.031118332 | 881.11 | 36.45 | 36.44 | 11/15/03 | 13:16 | 261:09:10 | 261:09:07 | 260:58:00 | 16.16022208 | |
| 83 | 78 | 1069 | 0.0022 | 536 | 13.875 | 0.002037306 | 57.69 | 0.03315364 | 936.80 | 38.84 | 40.82 | 11/17/03 | 16:07 | 312:00:10 | 312:00:07 | 311:49:00 | 17.66360036 | |
| 60 | 72 | 1078 | 0.0021 | 532 | 13.992 | 0.00197134 | 55.82 | 0.03512496 | 994.62 | 41.15 | 43.13 | 11/21/03 | 11:32 | 403:25:10 | 403:25:07 | 403:14:00 | 20.06530419 | |
| 27 | 75 | 1073 | 0.001 | 535 | 13.927 | 0.000878037 | 24.86 | 0.038003017 | 1019.49 | 42.18 | 44.16 | 11/26/03 | 15:02 | 526:55:10 | 526:55:07 | 526:44:00 | 22.95472597 | |
| 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 | 27.20544267 | |
| 61 | 75 | 1083 | 0.0022 | 535 | 14.057 | 0.002002201 | 56.70 | 0.03823798 | 1082.77 | 44.79 | 46.78 | 12/10/03 | 14:44 | 862:37:10 | 862:37:07 | 862:26:00 | 29.3703838 | |
| 15 | 71 | 1081 | 0.0005 | 531 | 14.031 | 0.000495137 | 14.02 | 0.038733097 | 1096.80 | 45.37 | 47.36 | 12/22/03 | 16:25 | 1152:16:10 | 1152:16:07 | 1152:07:00 | 33.94558554 | |
| 31 | 70 | 1103 | 0.0011 | 530 | 14.318 | 0.001046079 | 29.62 | 0.039779176 | 1126.42 | 46.60 | 48.58 | 1/6/04 | 14:50 | 1510:43:10 | 1510:43:07 | 1510:32:00 | 38.88797453 | |
| 45 | 70 | 1089 | 0.0016 | 530 | 14.135 | 0.001499226 | 42.45 | 0.041278404 | 1168.87 | 48.36 | 50.34 | 1/21/04 | 10:55 | 1888:46:10 | 1888:46:07 | 1888:37:00 | 43.20651314 | |
| 16 | 68 | 1091 | 0.0006 | 528 | 14.161 | 0.000536081 | 15.18 | 0.041814485 | 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 | 0.041814485 | 1184.05 | 48.98 | 50.97 | 2/2/04 | 15:34 | 2159:27:10 | 2159:27:07 | 2159:16:00 | 46.46991261 | |
| -0.5 | 71 | 1091 | -2E-05 | 531 | 14.161 | -1.86573E-05 | -0.47 | 0.041797808 | 1183.58 | 48.98 | 50.95 | 2/9/04 | 10:25 | 2322:16:10 | 2322:16:07 | 2322:07:00 | 48.1902766 | |
| 8 | 71 | 1091 | 0.0003 | 531 | 14.161 | 0.000266516 | 7.55 | 0.042064324 | 1191.12 | 49.26 | 51.26 | 2/16/04 | 14:13 | 2494:06:10 | 2494:06:07 | 2493:55:00 | 49.94099298 | |
| 1 | 70 | 1086 | 4E-05 | 530 | 14.098 | 3.32244E-05 | 0.94 | 0.042097548 | 1192.07 | 49.31 | 51.30 | 2/23/04 | 14:23 | 2662:16:10 | 2662:16:07 | 2662:05:00 | 51.59716448 | |
| 8 | 72 | 1091 | 0.0003 | 532 | 14.161 | 0.000266015 | 7.53 | 0.042363563 | 1199.60 | 49.63 | 51.61 | 3/2/04 | 10:39 | 2850:32:10 | 2850:32:07 | 2850:21:00 | 53.39041216 | |
| 17 | 71 | 1088 | 0.0006 | 531 | 14.122 | 0.000564789 | 15.99 | 0.042928353 | 1215.59 | 50.29 | 52.27 | 3/8/04 | 9:56 | 2993:49:10 | 2993:49:07 | 2993:36:00 | 54.71580817 | |
| 28 | 70 | 1082 | 0.0009 | 530 | 14.044 | 0.000860853 | 24.37 | 0.043789008 | 1239.96 | 51.30 | 53.28 | 3/15/04 | 11:28 | 3163:21:10 | 3163:21:07 | 3163:10:00 | 56.243691 | |
| -2 | 72 | 1097 | -7E-05 | 532 | 14.239 | -6.68695E-05 | -1.89 | 0.043722138 | 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 | 20:28 | 3532:19:10 | 3532:19:07 | 3532:08:00 | 59.43331931 | |
| 14 | 70 | 1060 | 0.0005 | 530 | 14.018 | 0.000482572 | 13.10 | 0.044251279 | 1253.05 | 51.84 | 53.82 | 4/6/04 | 14:37 | 3694:30:10 | 3694:30:07 | 3694:19:00 | 60.78242162 | |
| -15 | 68 | 1088 | -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 | -5.67 | 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 | 11:26 | 4171:21:10 | 4171:21:07 | 4171:10:00 | 64.5860107 | |

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

SAMPLE: 596.4' to 597.4' (Mulberry coal) in canister Brady 24

| | lbs. | grams | | lbs. | grams | moisture % | | est. lost gas (cc) = | 48 |
|---|---|---|---|---|---|---|---|---|---|
| dry sample weight: | 1.712 | 776.52 | wet sample weight: | 1.818 | 823.86 | 5.75% | | | |

TIME OF:

| | off bottom | at surface | in canister |
|---|---|---|---|
| | 11/4/03 16:08 | 11/4/03 16:09 | 11/4/03 16:17 |

elapsed time (off bottom to canistering)
10.2 minutes
0.189 hours
0.411636301 SQRT (hrs)

| RIG/LAB MEASUREMENTS | | | CONVERSION OF RIG/LAB 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 | cubic ft | absolute T (F) | psia | cubic ft (@STP) | cc (@STP) | cubic ft | cc | without lost gas | with lost gas | TIME OF MEASURE | off bottom | at surface | in canister | SQRT hrs. (since off bottom) |
| 18 | 71 | 1078 | 0.0006 | 531 | 13.992 | 0.000592516 | | 18.78 | 0.000592516 | 18.78 | 0.89 | 2.87 | 11/4/03 16:20 | 0:13:55 | 0:10:52 | 0:03:45 | 0.481606109 |
| 10 | 71 | 1078 | 0.0004 | 531 | 13.992 | 0.000329175 | | 9.32 | 0.000921691 | 28.10 | 1.08 | 3.08 | 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 | 0.593950989 |
| 8 | 71 | 1078 | 0.0003 | 531 | 13.992 | 0.00026334 | | 7.48 | 0.001415454 | 40.08 | 1.65 | 3.83 | 11/4/03 16:38 | 0:29:25 | 0:26:22 | 0:19:15 | 0.700198385 |
| 5 | 71 | 1078 | 0.0002 | 531 | 13.992 | 0.000164588 | | 4.66 | 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 | 5.58351E-05 | | 1.66 | 0.001645877 | 46.61 | 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 | | 4.66 | 0.00200797 | 56.86 | 2.35 | 4.33 | 11/4/03 16:58 | 0:49:10 | 0:46:07 | 0:39:00 | 0.905231706 |
| 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 | 0.000460848 | | 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 |
| 6 | 71 | 1078 | 0.0002 | 531 | 13.992 | 0.000197505 | | 5.59 | 0.003258637 | 92.28 | 3.81 | 5.79 | 11/4/03 17:53 | 1:46:10 | 1:43:07 | 1:36:00 | 1.330204663 |
| 68 | 70 | 1084 | 0.0024 | 530 | 14.070 | 0.002255099 | | 63.86 | 0.005513936 | 156.14 | 6.44 | 8.42 | 11/4/03 19:23 | 3:16:10 | 3:13:07 | 3:06:00 | 1.808160514 |
| 113 | 73 | 1067 | 0.004 | 533 | 14.109 | 0.003736863 | | 105.81 | 0.009250599 | 261.95 | 10.81 | 12.79 | 11/5/03 0:08 | 8:01:10 | 7:58:07 | 7:51:00 | 2.831862363 |
| 58 | 70 | 1089 | 0.002 | 530 | 14.135 | 0.001932339 | | 54.72 | 0.011182938 | 316.68 | 13.08 | 15.05 | 11/5/03 5:57 | 13:50:10 | 13:47:07 | 13:40:00 | 3.719692341 |
| 87 | 68 | 1090 | 0.0024 | 526 | 14.148 | 0.002242897 | | 63.51 | 0.013425834 | 380.17 | 15.68 | 17.67 | 11/5/03 12:54 | 20:47:10 | 20:44:07 | 20:37:00 | 4.559178776 |
| 63 | 74 | 1091 | 0.0022 | 534 | 14.161 | 0.002087023 | | 59.10 | 0.015512858 | 439.27 | 18.12 | 20.10 | 11/5/03 18:00 | 25:53:10 | 25:50:07 | 25:43:00 | 5.087839533 |
| 35 | 70 | 1095 | 0.0012 | 530 | 14.213 | 0.001172491 | | 33.20 | 0.016865149 | 472.47 | 19.49 | 21.47 | 11/6/03 6:02 | 37:55:10 | 37:52:07 | 37:45:00 | 6.157876618 |
| 24 | 68 | 1095 | 0.0006 | 526 | 14.213 | 0.000607039 | | 22.85 | 0.017492188 | 495.32 | 20.44 | 22.42 | 11/6/03 10:05 | 41:58:10 | 41:55:07 | 41:46:00 | 6.476382657 |
| 31 | 67 | 1096 | 0.0011 | 527 | 14.226 | 0.001045358 | | 29.60 | 0.018537545 | 524.92 | 21.66 | 23.84 | 11/6/03 19:31 | 51:24:10 | 51:21:07 | 51:14:00 | 7.189573054 |
| 35 | 73 | 1096 | 0.0012 | 533 | 14.228 | 0.001186956 | | 33.04 | 0.019704502 | 557.97 | 23.02 | 25.00 | 11/7/03 0:21 | 56:14:10 | 56:11:07 | 56:04:00 | 7.499074017 |
| 14 | 72 | 1097 | 0.0005 | 532 | 14.239 | 0.000466087 | | 13.25 | 0.020172566 | 571.22 | 23.57 | 25.55 | 11/7/03 6:01 | 61:54:10 | 61:51:07 | 61:44:00 | 7.867631835 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | 70 | 1097 | 0.0007 | 530 | 14.239 | 0.000637656 | 18.06 | 0.020610246 | 589.28 | 24.31 | 26.29 | 11/7/03 | 10:51 | 66:44:10 | 66:41:07 | 66:34:00 | 8.169217289 |
| 26 | 71 | 1098 | 0.0009 | 531 | 14.252 | 0.000671735 | 24.68 | 0.021661981 | 613.98 | 25.33 | 27.31 | 11/7/03 | 16:41 | 74:34:10 | 74:31:07 | 74:24:00 | 8.635360122 |
| 18 | 72 | 1100 | 0.0006 | 532 | 14.276 | 0.000603472 | 17.09 | 0.022265452 | 631.05 | 26.04 | 28.02 | 11/7/03 | 22:39 | 78:32:10 | 78:29:07 | 78:22:00 | 8.862060207 |
| 14 | 72 | 1100 | 0.0005 | 532 | 14.276 | 0.000469367 | 13.29 | 0.022754819 | 644.34 | 26.58 | 28.56 | 11/8/03 | 6:20 | 88:13:10 | 88:10:07 | 88:03:00 | 9.285442609 |
| 29 | 69 | 1101 | 0.001 | 529 | 14.291 | 0.000978862 | 27.71 | 0.023733461 | 672.05 | 27.73 | 29.71 | 11/8/03 | 19:03 | 96:56:10 | 96:53:07 | 96:46:00 | 9.946663315 |
| 85 | 73 | 1092 | 0.003 | 533 | 14.174 | 0.002823894 | 79.96 | 0.026557175 | 752.01 | 31.03 | 33.01 | 11/9/03 | 22:22 | 126:15:10 | 126:12:07 | 126:05:00 | 11.23622814 |
| 45 | 75 | 1085 | 0.0016 | 535 | 14.083 | 0.001479761 | 41.90 | 0.028036936 | 793.91 | 32.75 | 34.74 | 11/10/03 | 11:47 | 139:40:10 | 139:37:07 | 139:30:00 | 11.81618279 |
| 57 | 77 | 1080 | 0.002 | 537 | 14.016 | 0.001856778 | 52.63 | 0.029695714 | 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 | 0.000991983 | 28.09 | 0.030887877 | 874.64 | 36.09 | 38.07 | 11/12/03 | 14:20 | 190:13:10 | 190:10:07 | 190:03:00 | 13.79200654 |
| 33 | 75 | 1095 | 0.0012 | 535 | 14.213 | 0.00109516 | 31.01 | 0.031982637 | 905.65 | 37.36 | 39.34 | 11/13/03 | 19:26 | 219:19:10 | 219:16:07 | 219:09:00 | 14.80943788 |
| 78 | 75 | 1077 | 0.0028 | 535 | 13.979 | 0.002546006 | 72.09 | 0.034528845 | 977.74 | 40.34 | 42.32 | 11/15/03 | 13:17 | 261:10:10 | 261:07:07 | 261:00:00 | 16.16073774 |
| 70 | 76 | 1069 | 0.0025 | 536 | 13.875 | 0.002263875 | 64.10 | 0.03679252 | 1041.64 | 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 | 62.33 | 0.03699365 | 1104.18 | 45.58 | 47.54 | 11/21/03 | 11:35 | 403:28:10 | 403:25:07 | 403:18:00 | 20.08854884 |
| 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 | 22.95726707 |
| 35 | 74 | 1095 | 0.0012 | 534 | 14.213 | 0.001163708 | 32.95 | 0.043702227 | 1237.50 | 51.06 | 53.04 | 12/5/03 | 12:15 | 740:06:10 | 740:05:07 | 739:58:00 | 27.20544287 |
| 57 | 75 | 1083 | 0.002 | 535 | 14.057 | 0.001870909 | 52.98 | 0.045573136 | 1290.48 | 53.24 | 55.22 | 12/10/03 | 14:45 | 862:36:10 | 862:35:07 | 862:28:00 | 29.37066753 |
| 12 | 71 | 1061 | 0.0004 | 531 | 14.031 | 0.00039611 | 11.22 | 0.045969246 | 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 | 0.04637416 | 1313.17 | 54.18 | 56.16 | 1/6/04 | 15:00 | 1510:53:10 | 1510:50:07 | 1510:43:00 | 36.87011849 |
| 54 | 70 | 1089 | 0.0019 | 530 | 14.135 | 0.001799074 | 50.94 | 0.046173254 | 1364.11 | 56.28 | 58.26 | 1/21/04 | 10:55 | 1866:48:10 | 1866:45:07 | 1866:38:00 | 43.20851314 |
| 10 | 70 | 1091 | 0.0004 | 530 | 14.161 | 0.000333774 | 9.45 | 0.046507027 | 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 | 0.000783458 | 21.62 | 0.049270485 | 1395.18 | 57.56 | 59.54 | 2/2/04 | 15:34 | 2159:27:10 | 2159:24:07 | 2159:17:00 | 46.48991261 |
| 8 | 71 | 1091 | 0.0002 | 531 | 14.161 | 0.000199687 | 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 | 14.098 | 0.00029902 | 8.47 | 0.049898335 | 1412.14 | 58.28 | 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 |
| 3 | 71 | 1088 | 0.0001 | 531 | 14.122 | 9.96667E-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 | 0.000198812 | 5.62 | 0.050001356 | 1415.88 | 58.42 | 60.40 | 3/15/04 | 11:29 | 3163:22:10 | 3163:19:07 | 3163:12:00 | 56.24363917 |
| -13 | 72 | 1097 | -0.0005 | 532 | 14.239 | -0.000434652 | -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

| | lbs. | grams | | lbs. | grams | moisture % | | est. lost gas (cc) = |
|---|---|---|---|---|---|---|---|---|
| dry sample weight: | 3.231 | 1465.74 | wet sample weight: | 3.266 | 1490.40 | 1.65% | | 65 |

TIME OF:

| | off bottom | at surface | in canister |
|---|---|---|---|
| | 11/5/03 9:24 | 11/5/03 9:27 | 11/5/03 9:38 |

elapsed time (off bottom to canistering)
11.9 minutes
0.199 hours
0.445858065 SQRT (hrs)

| RIG/LAB MEASUREMENTS | | | CONVERSION OF RIG/LAB 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 | cubic ft | absolute T (F) | psia | cubic ft (@STP) | cc (@STP) | cubic ft | cc | without lost gas | with lost gas | TIME OF MEASURE | off bottom | at surface | in canister | SQRT hrs. (since 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 | 0:16:35 | 0:15:40 | 0:08:40 | 0.556526929 |
| 2 | 71 | 1088 | 7E-05 | 531 | 14.122 | 6.64456E-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 | 0.578551632 |
| 3 | 72 | 1088 | 0.0001 | 532 | 14.122 | 9.94614E-05 | 2.82 | 0.000531379 | 15.05 | 0.33 | 1.75 | 11/5/03 9:47 | 0:23:35 | 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 | 0:16:15 | 0.68518016 |
| 2 | 72 | 1088 | 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 | 0.000265264 | 7.51 | 0.001028766 | 29.13 | 0.64 | 2.06 | 11/5/03 10:06 | 0:44:10 | 0:41:15 | 0:32:15 | 0.857969178 |
| 4 | 72 | 1088 | 0.0001 | 532 | 14.122 | 0.000132842 | 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 | 0.000132842 | 3.76 | 0.00129407 | 36.64 | 0.80 | 2.22 | 11/5/03 10:23 | 0:56:55 | 0:56:00 | 0:47:00 | 0.9909311 |
| 8 | 73 | 1088 | 0.0003 | 533 | 14.122 | 0.000264786 | 7.50 | 0.001558655 | 44.14 | 0.96 | 2.39 | 11/5/03 10:44 | 1:19:55 | 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 | 1.383935812 |
| 10 | 72 | 1088 | 0.0004 | 532 | 14.122 | 0.000331605 | 9.39 | 0.002254208 | 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 | 0.00046557 | 13.18 | 0.002719778 | 77.02 | 1.68 | 3.10 | 11/5/03 13:59 | 4:34:55 | 4:32:00 | 4:23:00 | 2.140547697 |
| 10 | 72 | 1088 | 0.0004 | 532 | 14.098 | 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 | 0.000185339 | 4.66 | 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 | 0.003346879 | 94.83 | 2.07 | 3.49 | 11/5/03 16:34 | 7:09:55 | 7:07:00 | 6:58:00 | 2.678803649 |
| 7 | 68 | 1091 | 0.0002 | 528 | 14.161 | 0.000234527 | 6.64 | 0.003583406 | 101.47 | 2.22 | 3.64 | 11/5/03 17:59 | 8:34:55 | 8:32:00 | 8:23:00 | 2.929495598 |
| 22 | 70 | 1095 | 0.0008 | 530 | 14.213 | 0.000736994 | 20.87 | 0.0043204 | 122.34 | 2.67 | 4.09 | 11/6/03 6:03 | 20:36:55 | 20:36:00 | 20:27:00 | 4.544074285 |
| 15 | 66 | 1095 | 0.0005 | 528 | 14.213 | 0.0005044 | 14.26 | 0.0048246 | 136.62 | 2.99 | 4.41 | 11/6/03 9:59 | 24:34:55 | 24:32:00 | 24:23:00 | 4.958018197 |
| 18 | 67 | 1098 | 0.0006 | 527 | 14.226 | 0.000539539 | 15.28 | 0.005384339 | 151.90 | 3.32 | 4.74 | 11/6/03 19:32 | 34:07:55 | 34:05:00 | 33:58:00 | 5.842255062 |
| 25 | 73 | 1096 | 0.0009 | 533 | 14.226 | 0.00083354 | 23.60 | 0.006197679 | 175.50 | 3.64 | 5.26 | 11/7/03 0:22 | 38:57:55 | 38:55:00 | 38:48:00 | 6.242217377 |
| 4 | 72 | 1097 | 0.0001 | 532 | 14.239 | 0.000133739 | 3.79 | 0.006331818 | 179.29 | 3.92 | 5.34 | 11/7/03 8:02 | 44:37:55 | 44:35:00 | 44:26:00 | 6.660714386 |
| 1 | 70 | 1097 | 4E-05 | 530 | 14.239 | 3.35609E-05 | 0.95 | 0.006365179 | 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 | 0.000502486 | 14.23 | 0.006867645 | 194.47 | 4.25 | 5.67 | 11/7/03 18:41 | 57:16:55 | 57:14:00 | 57:05:00 | 7.588483629 |
| 7 | 71 | 1098 | 0.0002 | 531 | 14.252 | 0.000234698 | 6.65 | 0.007102343 | 201.12 | 4.40 | 5.82 | 11/7/03 22:23 | 60:58:55 | 60:56:00 | 60:47:00 | 7.609093702 |
| 7 | 72 | 1100 | 0.0002 | 532 | 14.276 | 0.000234683 | 6.65 | 0.007337026 | 207.78 | 4.54 | 5.98 | 11/8/03 6:20 | 68:55:55 | 68:53:00 | 68:44:00 | 8.302526389 |
| 13 | 69 | 1101 | 0.0005 | 529 | 14.291 | 0.000436711 | 12.42 | 0.007775737 | 220.16 | 4.81 | 6.23 | 11/9/03 19:04 | 105:39:55 | 105:37:00 | 105:28:00 | 10.27938174 |
| 48 | 73 | 1092 | 0.0017 | 533 | 14.174 | 0.001594556 | 45.15 | 0.009370294 | 265.34 | 5.60 | 7.22 | 11/9/03 22:23 | 108:58:55 | 108:56:00 | 108:47:00 | 10.43944177 |
| 28 | 75 | 1085 | 0.0009 | 535 | 14.083 | 0.000854973 | 24.21 | 0.010225267 | 289.55 | 6.33 | 7.75 | 11/10/03 11:47 | 122:22:55 | 122:20:00 | 122:11:00 | 11.06263732 |
| 31 | 77 | 1080 | 0.0011 | 537 | 14.016 | 0.001010914 | 28.63 | 0.011236181 | 318.17 | 6.95 | 8.36 | 11/11/03 9:29 | 144:04:55 | 144:02:00 | 143:53:00 | 12.00341387 |
| 6 | 75 | 1091 | 0.0002 | 535 | 14.161 | 0.000198393 | 5.62 | 0.011434574 | 323.79 | 7.08 | 8.50 | 11/12/03 14:21 | 172:58:55 | 172:54:00 | 172:45:00 | 13.15099278 |
| 101 | 78 | 1069 | 0.0038 | 536 | 13.875 | 0.00326816 | 92.49 | 0.014700734 | 416.28 | 9.10 | 10.52 | 11/17/03 16:21 | 294:56:55 | 294:54:00 | 294:45:00 | 17.17406796 |
| 55 | 72 | 1088 | 0.0019 | 532 | 14.098 | 0.001620472 | 51.55 | 0.016521208 | 467.83 | 10.23 | 11.65 | 11/24/03 14:21 | 460:56:55 | 460:54:00 | 460:45:00 | 21.46971361 |
| 53 | 73 | 1090 | 0.0022 | 533 | 14.146 | 0.002089022 | 59.15 | 0.018610229 | 526.98 | 11.52 | 12.94 | 12/4/03 19:50 | 708:25:55 | 708:23:00 | 708:14:00 | 26.57878749 |
| 35 | 75 | 1083 | 0.0012 | 535 | 14.057 | 0.001148804 | 32.53 | 0.019759032 | 559.51 | 12.23 | 13.65 | 12/10/03 14:46 | 845:21:55 | 845:19:00 | 845:10:00 | 29.075186 |
| 27 | 73 | 1087 | 0.001 | 533 | 14.109 | 0.000892631 | 25.26 | 0.020651884 | 584.79 | 12.78 | 14.20 | 12/18/03 14:21 | 988:58:55 | 988:54:00 | 988:45:00 | 31.44755334 |
| 29 | 71 | 1081 | 0.001 | 531 | 14.031 | 0.000957265 | 27.11 | 0.021609129 | 611.90 | 13.37 | 14.60 | 12/22/03 15:59 | 1134:34:55 | 1134:32:00 | 1134:23:00 | 33.68355599 |
| 27 | 72 | 1082 | 0.001 | 532 | 14.044 | 0.000890395 | 25.21 | 0.022499524 | 637.11 | 13.93 | 15.35 | 12/29/03 14:23 | 1300:58:55 | 1300:56:00 | 1300:47:00 | 36.0691273 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -5 | 70 | 1103 | -0.0002 | 530 | 14.316 | -0.000166722 | -4.78 | 0.022330801 | 832.34 | 13.82 | 15.24 | 1/8/04 | 15:04 | 1493:39:55 | 1493:37:00 | 1493:28:00 | 36.64796602 |
| 32 | 75 | 1093 | 0.0011 | 535 | 14.167 | 0.001060033 | 30.02 | 0.023390835 | 862.35 | 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 | 0.000986189 | 27.36 | 0.024357004 | 889.71 | 15.08 | 16.50 | 1/21/04 | 10:26 | 1849:01:55 | 1848:59:00 | 1848:50:00 | 43.00037145 |
| 9 | 88 | 1091 | 0.0003 | 526 | 14.161 | 0.000301534 | 8.54 | 0.024658536 | 898.25 | 15.28 | 16.88 | 1/27/04 | 10:04 | 1992:39:55 | 1992:37:00 | 1992:28:00 | 44.63927954 |
| 26 | 70 | 1085 | 0.001 | 530 | 14.083 | 0.000929427 | 26.32 | 0.025587985 | 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 | 48.01074622 |
| 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 | 49.78794783 |
| 25 | 70 | 1086 | 0.0009 | 530 | 14.096 | 0.00063061 | 23.52 | 0.027316087 | 773.58 | 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 | 0.000365771 | 10.36 | 0.027663837 | 783.92 | 17.13 | 18.55 | 3/2/04 | 10:41 | 2833:18:55 | 2833:14:00 | 2833:05:00 | 53.22858203 |
| 17 | 71 | 1086 | 0.0006 | 531 | 14.122 | 0.000584789 | 15.99 | 0.028246827 | 799.91 | 17.48 | 18.90 | 3/8/04 | 9:57 | 2978:32:55 | 2978:30:00 | 2978:21:00 | 54.55775482 |
| 26 | 70 | 1082 | 0.0009 | 530 | 14.044 | 0.000860853 | 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 | 1086 | 0.0005 | 530 | 14.122 | 0.000432713 | 12.25 | 0.029541992 | 836.53 | 18.28 | 19.71 | 3/30/04 | 20:26 | 3515:03:55 | 3515:01:00 | 3514:52:00 | 59.28798595 |
| 26 | 70 | 1080 | 0.0009 | 530 | 14.016 | 0.000859082 | 24.33 | 0.030401054 | 860.86 | 18.82 | 20.24 | 4/6/04 | 14:37 | 3677:12:55 | 3677:10:00 | 3677:01:00 | 60.64004682 |
| -4 | 68 | 1086 | -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 | 61.61667526 |
| 13 | 69 | 1088 | 0.0005 | 529 | 14.122 | 0.000433531 | 12.26 | 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 | 64.45216788 |
| 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 | 0.001046395 | 29.69 | 0.032513881 | 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 | 0.000131663 | 3.73 | 0.032645324 | 924.41 | 20.21 | 21.83 | 5/17/04 | 9:42 | 4658:17:55 | 4658:15:00 | 4658:06:00 | 68.23707651 |
| 24 | 73 | 1075 | 0.0008 | 533 | 13.953 | 0.000764866 | 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 | 0.000184745 | 4.67 | 0.033594936 | 951.30 | 20.79 | 22.21 | 6/1/04 | 10:51 | 5017:28:55 | 5017:24:00 | 5017:15:00 | 70.83395098 |
| 15 | 72 | 1078 | 0.0005 | 532 | 13.968 | 0.000491921 | 13.93 | 0.034086858 | 965.23 | 21.10 | 22.52 | 8/7/04 | 10:33 | 5161:08:55 | 5161:06:00 | 5160:57:00 | 71.84113453 |
| 21 | 78 | 1078 | 0.0007 | 536 | 13.992 | 0.00088482 | 19.39 | 0.034771877 | 984.62 | 21.52 | 22.94 | 8/14/04 | 10:45 | 5329:20:55 | 5329:18:00 | 5329:09:00 | 73.00238771 |
| 2 | 73 | 1082 | 7E-05 | 533 | 14.044 | 6.58314E-05 | 1.66 | 0.034837508 | 986.46 | 21.58 | 22.96 | 8/23/04 | 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 | 996.75 | 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 | 10:26 | 5861:03:55 | 5861:01:00 | 5860:52:00 | 76.88810389 |
| 12 | 75 | 1082 | 0.0004 | 535 | 14.044 | 0.000393512 | 11.14 | 0.035921664 | 1017.18 | 22.23 | 23.65 | 7/13/04 | 14:15 | 6026:50:55 | 6026:48:00 | 6026:39:00 | 77.64566081 |
| 8 | 73 | 1080 | 0.0003 | 533 | 14.016 | 0.000262639 | 7.44 | 0.036184503 | 1024.63 | 22.40 | 23.82 | 7/19/04 | 11:19 | 6189:54:55 | 6189:52:00 | 6189:43:00 | 78.54880825 |
| -7 | 72 | 1091 | -0.0002 | 532 | 14.161 | -0.000232763 | -6.59 | 0.03595174 | 1018.04 | 22.25 | 23.87 | 7/26/04 | 10:21 | 6338:58:55 | 6338:54:00 | 6338:45:00 | 79.60495343 |
| 20 | 73 | 1079 | 0.0007 | 533 | 14.005 | 0.000656489 | 18.59 | 0.036808229 | 1036.63 | 22.68 | 24.08 | 8/2/04 | 14:40 | 6509:15:55 | 6509:13:00 | 6509:04:00 | 80.68001763 |
| 1 | 72 | 1086 | 4E-05 | 532 | 14.096 | 3.30995E-05 | 0.94 | 0.036841329 | 1037.58 | 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 | -3.30982E-05 | -0.94 | 0.03860823 | 1036.63 | 22.66 | 24.08 | 8/16/04 | 11:02 | 6841:37:55 | 6841:35:00 | 6841:28:00 | 82.71415807 |
| 7 | 72 | 1076 | 0.0002 | 532 | 13.966 | 0.000229583 | 8.50 | 0.038837793 | 1043.13 | 22.80 | 24.22 | 8/23/04 | 14:03 | 7012:36:55 | 7012:36:00 | 7012:27:00 | 83.74155845 |
| 0 | 73 | 1087 | 0 | 533 | 14.109 | 0 | 0.00 | 0.038837793 | 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 | -8.84458E-05 | -1.66 | 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 | 86.86261469 |
| -8 | 73 | 1083 | -0.0003 | 533 | 14.057 | -0.000263569 | -7.46 | 0.036964335 | 1046.71 | 22.88 | 24.30 | 9/21/04 | 16:40 | 7711:15:55 | 7711:13:00 | 7711:04:00 | 87.81361029 |
| -8 | 70 | 1089 | -0.0002 | 530 | 14.135 | -0.000199897 | -5.66 | 0.036764436 | 1041.05 | 22.75 | 24.18 | 9/28/04 | 20:57 | 7883:32:55 | 7883:30:00 | 7883:21:00 | 88.78934985 |
| 6 | 71 | 1085 | 0.0002 | 531 | 14.063 | 0.000198766 | 5.63 | 0.036963225 | 1046.68 | 22.88 | 24.30 | 10/8/04 | 10:00 | 8112:35:55 | 8112:33:00 | 8112:24:00 | 90.08996509 |

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

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

| | lbs. | grams | | lbs. | grams | moisture % | | est. lost gas (cc) = |
|---|---|---|---|---|---|---|---|---|
| dry sample weight: | 1.659 | 752.59 | wet sample weight: | 1.695 | 769.05 | 2.14% | | 90 |

TIME OF:

| | off bottom | at surface | in canister | elapsed time (off bottom to canistering) |
|---|---|---|---|---|
| | 11/6/03 11:54 | 11/6/03 11:58 | 11/6/03 12:08 | 12.5 minutes |
| | | | | 0.208 hours |
| | | | | 0.456435465 SQRT (hrs) |

| RIG/LAB MEASUREMENTS | | | CONVERSION OF RIG/LAB 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 | cubic ft | absolute T (F) | psia | cubic ft (@STP) | cc (@STP) | cubic ft | cc | without lost gas | with lost gas | TIME OF MEASURE | off bottom | at surface | in canister | SQRT hrs. (since off bottom) |
| 26 | 73 | 1091 | 0.0009 | 533 | 14.161 | 0.000862927 | | 24.44 | 0.000862927 | 24.44 | 1.04 | 4.87 | 11/6/03 12:12 | 0:16:00 | 0:15:20 | 0:05:30 | 0.547722557 |
| 11 | 73 | 1091 | 0.0004 | 533 | 14.161 | 0.000365085 | | 10.34 | 0.001226012 | 34.77 | 1.46 | 5.31 | 11/6/03 12:15 | 0:21:00 | 0:18:20 | 0:08:30 | 0.591607978 |
| 8 | 73 | 1091 | 0.0003 | 533 | 14.161 | 0.000265516 | | 7.52 | 0.001493528 | 42.29 | 1.80 | 5.63 | 11/6/03 12:18 | 0:24:00 | 0:21:20 | 0:11:30 | 0.632455532 |
| 10 | 73 | 1091 | 0.0004 | 533 | 14.161 | 0.000331895 | | 9.40 | 0.001825423 | 51.69 | 2.20 | 6.03 | 11/6/03 12:23 | 0:29:00 | 0:26:20 | 0:16:30 | 0.695221767 |
| 9 | 73 | 1091 | 0.0003 | 533 | 14.161 | 0.000298706 | | 8.46 | 0.002124128 | 60.15 | 2.56 | 6.39 | 11/6/03 12:28 | 0:34:00 | 0:31:20 | 0:21:30 | 0.752772653 |
| 7 | 73 | 1091 | 0.0002 | 533 | 14.161 | 0.000232327 | | 6.58 | 0.002356455 | 66.73 | 2.84 | 6.87 | 11/6/03 12:33 | 0:39:00 | 0:36:20 | 0:26:30 | 0.808225775 |
| 10 | 73 | 1091 | 0.0004 | 533 | 14.161 | 0.000331895 | | 9.40 | 0.00268835 | 76.13 | 3.24 | 7.07 | 11/8/03 12:41 | 0:47:00 | 0:44:20 | 0:34:30 | 0.885061203 |
| 12 | 73 | 1091 | 0.0004 | 533 | 14.161 | 0.000398274 | | 11.28 | 0.003086624 | 87.40 | 3.72 | 7.55 | 11/8/03 12:51 | 0:57:00 | 0:54:20 | 0:44:30 | 0.974679434 |
| 10 | 73 | 1091 | 0.0004 | 533 | 14.161 | 0.000331895 | | 9.40 | 0.003418519 | 96.80 | 4.12 | 7.95 | 11/6/03 13:00 | 1:06:00 | 1:03:20 | 0:53:30 | 1.048606648 |
| 20 | 73 | 1091 | 0.0007 | 533 | 14.161 | 0.00066379 | | 18.80 | 0.004082309 | 115.60 | 4.92 | 8.75 | 11/6/03 13:17 | 1:23:15 | 1:20:35 | 1:10:45 | 1.177921899 |
| 9 | 74 | 1091 | 0.0003 | 534 | 14.161 | 0.000298146 | | 8.44 | 0.004380455 | 124.04 | 5.28 | 9.11 | 11/6/03 13:27 | 1:33:30 | 1:30:50 | 1:21:00 | 1.248332221 |
| 17 | 74 | 1091 | 0.0006 | 534 | 14.161 | 0.000563165 | | 15.95 | 0.00494362 | 139.99 | 5.96 | 9.79 | 11/8/03 13:55 | 2:01:30 | 1:58:50 | 1:49:00 | 1.423024947 |
| 16 | 73 | 1091 | 0.0008 | 533 | 14.161 | 0.000531032 | | 15.04 | 0.005474652 | 155.02 | 6.60 | 10.43 | 11/8/03 14:26 | 2:34:00 | 2:31:20 | 2:21:30 | 1.602061979 |
| 10 | 72 | 1090 | 0.0004 | 532 | 14.148 | 0.000332214 | | 9.41 | 0.005808888 | 164.43 | 7.00 | 10.63 | 11/6/03 14:56 | 3:02:00 | 2:59:20 | 2:49:30 | 1.74164673 |
| 12 | 71 | 1091 | 0.0004 | 531 | 14.161 | 0.000399774 | | 11.32 | 0.00820884 | 175.75 | 7.48 | 11.31 | 11/8/03 15:31 | 3:37:00 | 3:34:20 | 3:24:30 | 1.901753577 |
| 15 | 71 | 1091 | 0.0005 | 531 | 14.161 | 0.000499718 | | 14.15 | 0.006708356 | 189.90 | 8.08 | 11.92 | 11/6/03 16:27 | 4:33:00 | 4:30:20 | 4:20:30 | 2.133072901 |
| 6 | 71 | 1091 | 0.0002 | 531 | 14.161 | 0.000199887 | | 5.66 | 0.006908245 | 195.56 | 8.32 | 12.16 | 11/8/03 16:03 | 6:09:00 | 6:06:20 | 5:56:30 | 2.479919354 |
| 12 | 66 | 1096 | 0.0004 | 526 | 14.226 | 0.000405424 | | 11.46 | 0.007311689 | 207.04 | 8.81 | 12.64 | 11/8/03 19:34 | 7:40:00 | 7:37:20 | 7:27:30 | 2.768874621 |
| 73 | 73 | 1096 | 0.0028 | 533 | 14.226 | 0.002433937 | | 68.92 | 0.009745606 | 275.96 | 11.75 | 15.56 | 11/7/03 0:26 | 12:32:00 | 12:29:20 | 12:19:30 | 3.540244813 |
| 36 | 72 | 1097 | 0.0013 | 532 | 14.239 | 0.001203651 | | 34.06 | 0.010949258 | 310.05 | 13.20 | 17.03 | 11/7/03 8:03 | 18:09:00 | 18:06:20 | 17:56:30 | 4.260281681 |
| 26 | 70 | 1097 | 0.001 | 530 | 14.239 | 0.000939706 | | 26.61 | 0.011888964 | 336.66 | 14.33 | 18.16 | 11/7/03 11:03 | 23:09:00 | 23:06:20 | 22:56:30 | 4.811444689 |
| 41 | 71 | 1097 | 0.0014 | 531 | 14.239 | 0.001373407 | | 38.89 | 0.01326237 | 375.55 | 15.99 | 19.82 | 11/7/03 18:42 | 30:48:00 | 30:45:20 | 30:35:30 | 5.54977477 |
| 26 | 71 | 1098 | 0.0009 | 531 | 14.252 | 0.000871735 | | 24.66 | 0.014134105 | 400.23 | 17.04 | 20.87 | 11/7/03 22:41 | 34:47:00 | 34:44:20 | 34:34:30 | 5.89773966 |
| 27 | 72 | 1100 | 0.001 | 532 | 14.278 | 0.000905207 | | 25.63 | 0.015039312 | 425.86 | 18.13 | 21.96 | 11/8/03 8:21 | 42:27:00 | 42:24:20 | 42:14:30 | 6.515366452 |
| 44 | 89 | 1101 | 0.0016 | 529 | 14.291 | 0.001464667 | | 42.05 | 0.016524179 | 467.91 | 19.92 | 23.75 | 11/8/03 19:04 | 55:10:00 | 55:07:20 | 54:57:30 | 7.427426652 |
| 43 | 73 | 1100 | 0.0015 | 533 | 14.276 | 0.001436922 | | 40.75 | 0.017963101 | 508.66 | 21.65 | 25.48 | 11/9/03 5:45 | 65:51:00 | 65:48:20 | 65:38:30 | 8.114801291 |
| 64 | 73 | 1092 | 0.0023 | 533 | 14.174 | 0.002126075 | | 60.20 | 0.020069176 | 568.86 | 24.22 | 28.05 | 11/9/03 22:25 | 82:31:00 | 82:28:20 | 82:18:30 | 9.083868466 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | 75 | 1087 | 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 | 9.603818885 |
| 15 | 75 | 1086 | 0.0005 | 535 | 14.096 | 0.000493706 | 13.96 | 0.021637099 | 612.89 | 26.08 | 29.91 | 11/10/03 | 10:52 | 94:56:00 | 94:55:20 | 94:45:30 | 9.745084231 |
| 85 | 77 | 1080 | 0.0023 | 537 | 14.018 | 0.002119659 | 80.02 | 0.023756756 | 672.71 | 28.84 | 32.47 | 11/11/03 | 9:29 | 117:35:00 | 117:32:20 | 117:22:30 | 10.84356489 |
| 40 | 75 | 1091 | 0.0014 | 535 | 14.161 | 0.001322617 | 37.45 | 0.025079375 | 710.17 | 30.23 | 34.08 | 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 | 749.84 | 31.91 | 35.74 | 11/13/03 | 19:27 | 175:33:00 | 175:30:20 | 175:20:30 | 13.24952629 |
| 79 | 75 | 1077 | 0.0028 | 535 | 13.979 | 0.002578649 | 73.02 | 0.029051864 | 822.65 | 35.02 | 38.85 | 11/15/03 | 13:16 | 217:24:00 | 217:21:20 | 217:11:30 | 14.7444905 |
| 71 | 76 | 1069 | 0.0025 | 536 | 13.875 | 0.002298014 | 65.02 | 0.031347877 | 887.67 | 37.79 | 41.82 | 11/17/03 | 16:09 | 266:15:00 | 266:12:20 | 266:02:30 | 16.37833935 |
| 71 | 72 | 1078 | 0.0025 | 532 | 13.992 | 0.002332753 | 66.08 | 0.03388083 | 953.73 | 40.60 | 44.43 | 11/21/03 | 11:20 | 359:26:00 | 359:23:20 | 359:13:30 | 16.9587271 |
| 97 | 75 | 1073 | 0.0034 | 535 | 13.927 | 0.00315443 | 89.32 | 0.03883506 | 1043.05 | 44.40 | 48.23 | 11/26/03 | 15:22 | 483:28:00 | 483:25:20 | 483:15:30 | 21.96787545 |
| 73 | 73 | 1090 | 0.0026 | 533 | 14.148 | 0.002420813 | 86.54 | 0.039255673 | 1111.59 | 47.32 | 51.15 | 12/4/03 | 19:33 | 679:39:00 | 679:36:20 | 679:26:30 | 28.07009781 |
| 59 | 75 | 1083 | 0.0021 | 535 | 14.057 | 0.001936555 | 54.84 | 0.041192228 | 1166.43 | 49.65 | 53.49 | 12/10/03 | 14:46 | 818:52:00 | 818:49:20 | 818:39:30 | 28.61584643 |
| 58 | 73 | 1087 | 0.002 | 533 | 14.109 | 0.001651798 | 52.44 | 0.043044028 | 1218.87 | 51.89 | 55.72 | 12/16/03 | 14:12 | 982:16:00 | 982:15:20 | 982:05:30 | 31.02098086 |
| 49 | 71 | 1081 | 0.0017 | 531 | 14.031 | 0.001817448 | 45.80 | 0.044661475 | 1264.67 | 53.84 | 57.67 | 12/22/03 | 16:00 | 1108:06:00 | 1108:03:20 | 1107:53:30 | 33.26813602 |
| 52 | 72 | 1082 | 0.0018 | 532 | 14.044 | 0.001714834 | 48.56 | 0.048378309 | 1313.23 | 55.90 | 59.73 | 12/29/03 | 14:25 | 1274:31:00 | 1274:28:20 | 1274:16:30 | 35.70037348 |
| 20 | 70 | 1103 | 0.0007 | 530 | 14.318 | 0.00087489 | 19.11 | 0.047051199 | 1332.34 | 56.72 | 60.55 | 1/6/04 | 15:04 | 1467:10:00 | 1467:07:20 | 1466:57:30 | 38.30361167 |
| 51 | 71 | 1093 | 0.0018 | 531 | 14.167 | 0.001702155 | 48.20 | 0.048753353 | 1380.54 | 58.77 | 62.60 | 1/12/04 | 11:36 | 1607:44:00 | 1607:41:20 | 1607:31:30 | 40.09655014 |
| 50 | 70 | 1089 | 0.0018 | 530 | 14.135 | 0.001665809 | 47.17 | 0.050419182 | 1427.71 | 60.78 | 64.61 | 1/21/04 | 10:27 | 1822:33:00 | 1822:30:20 | 1822:20:30 | 42.69133402 |
| 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 | 1966:11:00 | 1966:08:20 | 1965:58:30 | 44.34186588 |
| 39 | 70 | 1085 | 0.0014 | 530 | 14.083 | 0.001294559 | 36.86 | 0.052517812 | 1487.13 | 63.31 | 67.14 | 2/2/04 | 15:38 | 2115:42:00 | 2115:39:20 | 2115:29:30 | 45.99873901 |
| 25 | 71 | 1091 | 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 | 47.73415968 |
| 27 | 71 | 1091 | 0.001 | 531 | 14.161 | 0.000899492 | 25.47 | 0.054250187 | 1536.19 | 65.39 | 69.23 | 2/16/04 | 14:16 | 2450:22:00 | 2450:19:20 | 2450:09:30 | 49.50117844 |
| 36 | 70 | 1086 | 0.0013 | 530 | 14.096 | 0.001198078 | 33.67 | 0.055448245 | 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 | 0.000685036 | 18.83 | 0.056111283 | 1588.89 | 67.64 | 71.47 | 3/2/04 | 10:42 | 2808:48:00 | 2808:45:20 | 2808:35:30 | 52.97924122 |
| 23 | 71 | 1088 | 0.0008 | 531 | 14.122 | 0.000764127 | 21.64 | 0.05867541 | 1610.53 | 68.58 | 72.39 | 3/8/04 | 9:58 | 2950:04:00 | 2950:01:20 | 2949:51:30 | 54.31451817 |
| 31 | 70 | 1082 | 0.0011 | 530 | 14.044 | 0.001026163 | 29.06 | 0.057901572 | 1639.58 | 69.80 | 73.83 | 3/15/04 | 11:30 | 3119:36:00 | 3119:33:20 | 3119:23:30 | 55.65337949 |
| 9 | 72 | 1097 | 0.0003 | 532 | 14.239 | 0.000300913 | 8.52 | 0.058202485 | 1648.10 | 70.16 | 73.99 | 3/22/04 | 9:56 | 3266:02:00 | 3265:59:20 | 3265:49:30 | 57.32393334 |
| 20 | 70 | 1088 | 0.0007 | 530 | 14.122 | 0.000665712 | 18.85 | 0.058868197 | 1666.96 | 70.96 | 74.79 | 3/30/04 | 20:29 | 3488:35:00 | 3488:32:20 | 3488:22:30 | 59.06423057 |
| 27 | 70 | 1080 | 0.001 | 530 | 14.016 | 0.000892103 | 25.26 | 0.0597603 | 1692.22 | 72.04 | 75.87 | 4/8/04 | 14:38 | 3650:44:00 | 3650:41:20 | 3650:31:30 | 60.42129867 |
| -1 | 68 | 1086 | -4E-05 | 528 | 14.098 | -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 | 1088 | 0.0006 | 529 | 14.122 | 0.000533576 | 15.11 | 0.060280526 | 1706.38 | 72.64 | 76.47 | 4/19/04 | 14:22 | 3962:28:00 | 3962:25:20 | 3962:15:30 | 62.94812679 |
| 16 | 71 | 1090 | 0.0006 | 531 | 14.148 | 0.000532544 | 15.08 | 0.060793069 | 1721.46 | 73.26 | 77.11 | 4/26/04 | 11:29 | 4127:35:00 | 4127:32:20 | 4127:22:30 | 64.24827097 |
| 16 | 70 | 1084 | 0.0006 | 530 | 14.070 | 0.000530611 | 15.03 | 0.061323681 | 1736.49 | 73.92 | 77.75 | 5/3/04 | 16:59 | 4303:05:00 | 4303:02:20 | 4302:52:30 | 65.59789123 |
| 38 | 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 | 66.82863858 |
| 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 | 68.04283389 |
| 26 | 73 | 1075 | 0.0009 | 533 | 13.953 | 0.000850272 | 24.06 | 0.08371547 | 1804.21 | 76.80 | 80.83 | 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 | 0.084012012 | 1812.61 | 77.16 | 80.99 | 8/1/04 | 10:51 | 4990:57:00 | 4990:54:20 | 4990:44:30 | 70.64885597 |
| 18 | 72 | 1076 | 0.0006 | 532 | 13.986 | 0.000524715 | 14.86 | 0.084536727 | 1827.47 | 77.79 | 81.62 | 8/7/04 | 10:33 | 5134:39:00 | 5134:36:20 | 5134:26:30 | 71.65647214 |
| 22 | 76 | 1078 | 0.0008 | 536 | 13.992 | 0.000717431 | 20.32 | 0.085254158 | 1847.76 | 78.66 | 82.49 | 8/14/04 | 10:46 | 5302:52:00 | 5302:49:20 | 5302:39:30 | 72.82078458 |
| 4 | 73 | 1082 | 0.0001 | 533 | 14.044 | 0.000131663 | 3.73 | 0.085385821 | 1851.51 | 78.82 | 82.65 | 6/23/04 | 16:21 | 5524:27:00 | 5524:24:20 | 5524:14:30 | 74.32664394 |
| 10 | 73 | 1083 | 0.0004 | 533 | 14.057 | 0.000329461 | 9.33 | 0.085715282 | 1860.84 | 79.21 | 83.05 | 7/1/04 | 11:47 | 5711:53:00 | 5711:50:20 | 5711:40:30 | 75.57700267 |
| 14 | 74 | 1081 | 0.0005 | 534 | 14.031 | 0.000459532 | 13.01 | 0.086174814 | 1873.85 | 79.77 | 83.80 | 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 | 0.086633911 | 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 | 0.000326549 | 9.30 | 0.08698246 | 1896.16 | 80.72 | 84.55 | 7/19/04 | 11:20 | 6143:28:00 | 6143:23:20 | 6143:13:30 | 78.36005899 |
| -4 | 72 | 1091 | -0.0001 | 532 | 14.161 | -0.000133008 | -3.77 | 0.088829452 | 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 | 0.000722136 | 20.45 | 0.08755159 | 1912.84 | 81.43 | 85.26 | 8/2/04 | 14:41 | 6482:47:00 | 6482:44:20 | 6482:34:30 | 80.51573345 |
| 4 | 73 | 1088 | 0.0001 | 533 | 14.096 | 0.00013215 | 3.74 | 0.08788374 | 1916.58 | 81.59 | 85.42 | 8/9/04 | 13:58 | 6650:04:00 | 6650:01:20 | 6649:51:30 | 81.54794091 |
| 0 | 73 | 1088 | 0 | 533 | 14.122 | 0 | 0.00 | 0.08788374 | 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 | 13.966 | 0.000590305 | 16.72 | 0.088274045 | 1933.30 | 82.30 | 86.13 | 8/23/04 | 14:06 | 6988:12:00 | 6988:09:20 | 6985:59:30 | 83.56349119 |
| 4 | 73 | 1087 | 0.0001 | 533 | 14.109 | 0.000132271 | 3.75 | 0.088408316 | 1937.04 | 82.46 | 86.29 | 8/30/04 | 18:39 | 7156:45:00 | 7156:42:20 | 7156:32:30 | 84.5975788 |
| 1 | 71 | 1088 | 4E-05 | 531 | 14.122 | 3.32229E-05 | 0.94 | 0.088439539 | 1937.98 | 82.50 | 86.33 | 9/7/04 | 15:51 | 7347:57:00 | 7347:54:20 | 7347:44:30 | 85.72016432 |
| 22 | 73 | 1074 | 0.0008 | 533 | 13.940 | 0.000718792 | 20.35 | 0.08915833 | 1958.34 | 83.36 | 87.20 | 9/14/04 | 18:34 | 7518:40:00 | 7518:37:20 | 7516:27:30 | 86.71024545 |
| -4 | 73 | 1083 | -0.0001 | 533 | 14.057 | -0.000131785 | -3.73 | 0.089026546 | 1954.61 | 83.21 | 87.04 | 9/21/04 | 18:41 | 7684:47:00 | 7684:44:20 | 7664:34:30 | 87.68269599 |
| -3 | 70 | 1089 | -0.0001 | 530 | 14.135 | -9.99485E-05 | -2.83 | 0.089026597 | 1951.78 | 83.09 | 86.92 | 9/26/04 | 20:58 | 7857:04:00 | 7857:01:20 | 7856:51:30 | 88.64009827 |
| 6 | 71 | 1085 | 0.0002 | 531 | 14.083 | 0.000196788 | 5.63 | 0.089125365 | 1957.41 | 83.32 | 87.16 | 10/6/04 | 10:01 | 8066:07:00 | 8066:04:20 | 8065:54:30 | 89.92283729 |

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

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

| | lbs. | grams | | lbs. | grams | moisture % | | est. lost gas (cc) = |
|---|---|---|---|---|---|---|---|---|
| dry sample weight: | 2.002 | 908.11 | wet sample weight: | 2.041 | 925.77 | 1.91% | | 79 |

TIME OF:

| | off bottom | at surface | in canister |
|---|---|---|---|
| | 11/8/03 11:54 | 11/8/03 11:56 | 11/8/03 12:09 |

elapsed time (off bottom to canistering)
15.0 minutes
0.250 hours
0.500000000 SQRT (hrs)

| RIG/LAB MEASUREMENTS | | | CONVERSION OF RIG/LAB 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 | cubic ft | abeolute T (F) | psia | cubic ft (@STP) | cc (@STP) | cubic ft | cc | without lost gas | with lost gas | TIME OF MEASURE | off bottom | at surface | in canister | SQRT hrs. (since off bottom) |
| 16 | 73 | 1091 | 0.0006 | 533 | 14.161 | 0.000531032 | 15.04 | 0.000531032 | 15.04 | 0.53 | 3.32 | 11/8/03 12:13 | 0:19:45 | 0:17:05 | 0:04:45 | 0.573730483 |
| 8 | 73 | 1091 | 0.0003 | 533 | 14.161 | 0.000265516 | 7.52 | 0.000796548 | 22.56 | 0.80 | 3.58 | 11/8/03 12:16 | 0:22:00 | 0:19:20 | 0:07:00 | 0.605530071 |
| 7 | 73 | 1091 | 0.0002 | 533 | 14.161 | 0.000232327 | 6.58 | 0.001028875 | 29.13 | 1.03 | 3.81 | 11/8/03 12:19 | 0:25:00 | 0:22:20 | 0:10:00 | 0.645497224 |
| 10 | 73 | 1091 | 0.0004 | 533 | 14.161 | 0.000331895 | 9.40 | 0.00136077 | 38.53 | 1.36 | 4.15 | 11/8/03 12:24 | 0:30:00 | 0:27:20 | 0:15:00 | 0.707106781 |
| 9 | 73 | 1091 | 0.0003 | 533 | 14.161 | 0.000298706 | 8.46 | 0.001659475 | 46.99 | 1.66 | 4.44 | 11/8/03 12:29 | 0:35:00 | 0:32:20 | 0:20:00 | 0.763762616 |
| 6 | 73 | 1091 | 0.0003 | 533 | 14.161 | 0.000265516 | 7.52 | 0.001924991 | 54.51 | 1.92 | 4.71 | 11/8/03 12:34 | 0:40:00 | 0:37:20 | 0:25:00 | 0.816496581 |
| 10 | 73 | 1091 | 0.0004 | 533 | 14.161 | 0.000331895 | 9.40 | 0.002256886 | 63.91 | 2.25 | 5.04 | 11/8/03 12:42 | 0:48:00 | 0:45:20 | 0:33:00 | 0.894427191 |
| 14 | 73 | 1091 | 0.0005 | 533 | 14.161 | 0.000464853 | 13.16 | 0.002721539 | 77.07 | 2.72 | 5.51 | 11/8/03 12:52 | 0:58:00 | 0:55:20 | 0:43:00 | 0.98319208 |
| 10 | 73 | 1091 | 0.0004 | 533 | 14.161 | 0.000331895 | 9.40 | 0.003053434 | 86.46 | 3.05 | 5.84 | 11/8/03 13:01 | 1:07:00 | 1:04:20 | 0:52:00 | 1.056724499 |
| 15 | 73 | 1091 | 0.0005 | 533 | 14.161 | 0.000497843 | 14.10 | 0.003551277 | 100.56 | 3.55 | 6.33 | 11/8/03 13:16 | 1:22:30 | 1:19:50 | 1:07:30 | 1.17280394 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 0.000662547 | 18.76 | 0.004677607 | 132.45 | 4.87 | 7.48 | 11/6/03 | 13:54 | 2:00:15 | 1:57:35 | 1:45:15 | 1.415685985 |
| 18 | 73 | 1091 | 0.0006 | 533 | 14.161 | 0.000597411 | 18.92 | 0.005275018 | 149.37 | 5.27 | 8.08 | 11/6/03 | 14:27 | 2:33:00 | 2:30:20 | 2:18:00 | 1.598671942 |
| 17 | 72 | 1090 | 0.0006 | 532 | 14.148 | 0.000584784 | 15.99 | 0.005639782 | 165.38 | 5.83 | 8.62 | 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 | 22.84 | 0.00863933 | 188.00 | 6.63 | 9.42 | 11/6/03 | 15:30 | 3:36:00 | 3:33:20 | 3:21:00 | 1.897388596 |
| 26 | 71 | 1091 | 0.0009 | 531 | 14.161 | 0.000866177 | 24.53 | 0.007505507 | 212.53 | 7.50 | 10.28 | 11/6/03 | 16:26 | 4:32:00 | 4:29:20 | 4:17:00 | 2.12918259 |
| 39 | 71 | 1091 | 0.0014 | 531 | 14.161 | 0.001299268 | 36.79 | 0.008804773 | 249.32 | 8.80 | 11.58 | 11/6/03 | 18:02 | 6:08:00 | 6:05:20 | 5:53:00 | 2.478558749 |
| 34 | 68 | 1098 | 0.0012 | 528 | 14.228 | 0.001146701 | 32.53 | 0.009953474 | 281.85 | 9.94 | 12.73 | 11/6/03 | 19:35 | 7:41:00 | 7:38:20 | 7:26:00 | 2.771682833 |
| 93 | 73 | 1096 | 0.0033 | 533 | 14.228 | 0.00310077 | 87.80 | 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 | 14.86 | 17.67 | 11/7/03 | 8:04 | 18:10:00 | 18:07:20 | 17:55:00 | 4.282237284 |
| 53 | 71 | 1097 | 0.0019 | 531 | 14.239 | 0.001775379 | 50.27 | 0.018868535 | 472.00 | 16.85 | 19.44 | 11/7/03 | 18:43 | 30:49:00 | 30:46:20 | 30:34:00 | 5.55127813 |
| 32 | 71 | 1098 | 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 | 6.518845354 |
| 51 | 69 | 1101 | 0.0018 | 529 | 14.291 | 0.001721098 | 48.74 | 0.020501847 | 580.55 | 20.46 | 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 | 0.001873165 | 47.38 | 0.022175012 | 827.92 | 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 | 0.002349797 | 66.54 | 0.024524809 | 894.46 | 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 | 25.62 | 28.41 | 11/10/03 | 8:08 | 92:14:00 | 92:11:20 | 91:59:00 | 9.603818685 |
| 88 | 77 | 1080 | 0.003 | 537 | 14.016 | 0.002804472 | 79.41 | 0.028449384 | 805.59 | 26.42 | 31.21 | 11/11/03 | 9:31 | 117:37:00 | 117:34:20 | 117:22:00 | 10.64512179 |
| 48 | 75 | 1091 | 0.0017 | 535 | 14.161 | 0.001587141 | 44.94 | 0.030036525 | 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 | 0.001758693 | 49.81 | 0.031795416 | 900.34 | 31.78 | 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 | 0.03476578 | 984.45 | 34.73 | 37.52 | 11/15/03 | 13:20 | 217:26:00 | 217:23:20 | 217:11:00 | 14.74582082 |
| 84 | 76 | 1069 | 0.003 | 536 | 13.875 | 0.002718411 | 78.92 | 0.037482171 | 1081.37 | 37.44 | 40.23 | 11/17/03 | 16:09 | 268:15:00 | 268:12:20 | 268:00:00 | 18.37833935 |
| 81 | 72 | 1078 | 0.0022 | 532 | 13.992 | 0.002004196 | 58.75 | 0.039486366 | 1116.13 | 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 | 0.003869866 | 109.56 | 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 | 1286.74 | 45.47 | 48.25 | 12/4/03 | 19:38 | 679:44:00 | 679:41:20 | 679:29:00 | 28.07189802 |
| 58 | 75 | 1083 | 0.002 | 535 | 14.057 | 0.001838066 | 52.05 | 0.047349861 | 1340.79 | 47.30 | 50.09 | 12/10/03 | 14:47 | 818:53:00 | 818:50:20 | 818:38:00 | 28.61613764 |
| 54 | 73 | 1087 | 0.0019 | 533 | 14.109 | 0.001785882 | 50.56 | 0.049135323 | 1391.35 | 49.09 | 51.87 | 12/13/03 | 14:13 | 890:19:00 | 890:16:20 | 890:04:00 | 29.63617485 |
| 47 | 71 | 1081 | 0.0017 | 531 | 14.031 | 0.00155143 | 43.93 | 0.050688753 | 1435.28 | 50.64 | 53.42 | 12/22/03 | 16:00 | 1108:06:00 | 1108:03:20 | 1107:51:00 | 33.28813802 |
| 47 | 72 | 1082 | 0.0017 | 532 | 14.044 | 0.001549946 | 43.89 | 0.0522387 | 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 | 0.000438878 | 12.42 | 0.052875378 | 1491.59 | 52.62 | 55.41 | 1/6/04 | 15:03 | 1487:09:00 | 1487:06:20 | 1488:54:00 | 38.30339411 |
| 44 | 71 | 1093 | 0.0016 | 531 | 14.187 | 0.001466526 | 41.56 | 0.054143903 | 1533.18 | 54.09 | 56.88 | 1/12/04 | 11:39 | 1607:45:00 | 1807:42:20 | 1807:30:00 | 40.09875797 |
| 42 | 70 | 1089 | 0.0015 | 530 | 14.135 | 0.00139926 | 39.62 | 0.055543183 | 1572.80 | 55.49 | 58.27 | 1/21/04 | 10:27 | 1822:33:00 | 1822:30:20 | 1822:18:00 | 42.89133402 |
| 19 | 68 | 1091 | 0.0007 | 528 | 14.161 | 0.000636572 | 18.03 | 0.056179755 | 1590.83 | 56.12 | 58.91 | 1/27/04 | 10:08 | 1988:12:00 | 1988:09:20 | 1985:57:00 | 44.34185382 |
| 33 | 70 | 1085 | 0.0012 | 530 | 14.083 | 0.001095396 | 31.02 | 0.057275151 | 1621.85 | 57.22 | 60.00 | 2/2/04 | 15:38 | 2115:42:00 | 2115:39:20 | 2115:27:00 | 45.99673901 |
| 20 | 71 | 1091 | 0.0007 | 531 | 14.161 | 0.00066629 | 18.87 | 0.057941441 | 1640.71 | 57.88 | 60.87 | 2/9/04 | 10:27 | 2278:33:00 | 2278:30:20 | 2278:18:00 | 47.73415988 |
| 20 | 71 | 1091 | 0.0007 | 531 | 14.161 | 0.00066629 | 18.87 | 0.058607731 | 1659.58 | 58.55 | 61.34 | 2/18/04 | 14:18 | 2450:22:00 | 2450:19:20 | 2450:07:00 | 49.50117644 |
| 35 | 70 | 1086 | 0.0012 | 530 | 14.096 | 0.001182654 | 32.93 | 0.059770585 | 1692.51 | 59.71 | 62.50 | 2/23/04 | 14:25 | 2818:31:00 | 2818:28:20 | 2818:16:00 | 51.17144386 |
| 14 | 72 | 1091 | 0.0005 | 532 | 14.161 | 0.000465528 | 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 |
| 16 | 71 | 1086 | 0.0006 | 531 | 14.122 | 0.000531586 | 15.05 | 0.060787678 | 1720.74 | 60.71 | 63.49 | 3/8/04 | 9:59 | 2950:05:00 | 2950:02:20 | 2949:50:00 | 54.3148696 |
| 25 | 70 | 1082 | 0.0009 | 530 | 14.044 | 0.000827551 | 23.43 | 0.081595229 | 1744.16 | 61.53 | 64.32 | 3/15/04 | 11:32 | 3119:36:00 | 3119:35:20 | 3119:23:00 | 55.85367789 |
| 2 | 72 | 1097 | 7E-05 | 532 | 14.239 | 6.68895E-05 | 1.89 | 0.081862098 | 1746.07 | 61.60 | 64.39 | 3/22/04 | 9:57 | 3288:03:00 | 3288:00:20 | 3285:48:00 | 57.32407871 |
| 16 | 70 | 1088 | 0.0006 | 530 | 14.122 | 0.000532589 | 15.08 | 0.082194686 | 1761.15 | 62.13 | 64.92 | 3/30/04 | 20:29 | 3488:35:00 | 3488:32:20 | 3488:20:00 | 59.06423057 |
| 23 | 70 | 1080 | 0.0008 | 530 | 14.018 | 0.000759939 | 21.52 | 0.082954807 | 1782.67 | 62.89 | 65.66 | 4/6/04 | 14:38 | 3650:44:00 | 3650:41:20 | 3650:29:00 | 60.42129887 |
| -3 | 68 | 1086 | -0.0001 | 528 | 14.098 | -0.000100051 | -2.83 | 0.082854558 | 1779.84 | 62.79 | 65.56 | 4/12/04 | 14:58 | 3795:04:00 | 3795:01:20 | 3794:49:00 | 61.80411242 |
| 6 | 69 | 1088 | 0.0002 | 529 | 14.122 | 0.000200091 | 5.67 | 0.083054848 | 1785.50 | 62.99 | 65.78 | 4/19/04 | 14:23 | 3982:29:00 | 3982:26:20 | 3982:14:00 | 62.94625918 |
| 9 | 71 | 1090 | 0.0003 | 531 | 14.148 | 0.000299556 | 8.48 | 0.083354203 | 1793.98 | 63.29 | 66.08 | 4/26/04 | 11:30 | 4127:36:00 | 4127:33:20 | 4127:21:00 | 64.24640086 |
| 5 | 70 | 1084 | 0.0002 | 530 | 14.070 | 0.000165618 | 4.70 | 0.083520019 | 1798.68 | 63.46 | 66.24 | 5/3/04 | 19:00 | 4303:06:00 | 4303:03:20 | 4302:51:00 | 65.59801826 |
| 30 | 75 | 1081 | 0.0011 | 535 | 14.031 | 0.000962671 | 27.83 | 0.08450289 | 1826.51 | 64.44 | 67.22 | 5/10/04 | 13:59 | 4468:05:00 | 4468:02:20 | 4465:50:00 | 66.82678127 |
| 10 | 73 | 1082 | 0.0004 | 533 | 14.044 | 0.000329157 | 9.32 | 0.084832047 | 1835.83 | 64.77 | 67.55 | 5/17/04 | 9:42 | 4629:46:00 | 4629:45:20 | 4629:33:00 | 68.04263389 |
| 19 | 73 | 1075 | 0.0007 | 533 | 13.953 | 0.000821353 | 17.59 | 0.0854534 | 1853.43 | 65.39 | 68.17 | 5/24/04 | 10:28 | 4798:34:00 | 4798:31:20 | 4798:19:00 | 69.27168734 |
| 2 | 70 | 1077 | 7E-05 | 530 | 13.979 | 8.58981E-05 | 1.87 | 0.085519298 | 1855.29 | 65.45 | 68.24 | 6/1/04 | 10:52 | 4990:58:00 | 4990:55:20 | 4990:43:00 | 70.64677393 |
| 10 | 72 | 1078 | 0.0004 | 532 | 13.988 | 0.000327947 | 9.29 | 0.085847245 | 1864.58 | 65.78 | 68.57 | 6/7/04 | 10:34 | 5134:40:00 | 5134:37:20 | 5134:25:00 | 71.85858844 |
| 16 | 76 | 1078 | 0.0008 | 536 | 13.992 | 0.000521788 | 14.77 | 0.086369013 | 1879.35 | 66.30 | 69.09 | 6/14/04 | 10:47 | 5302:53:00 | 5302:50:20 | 5302:38:00 | 72.82089901 |
| -4 | 73 | 1082 | -0.0001 | 533 | 14.044 | -0.000131663 | -3.73 | 0.08823735 | 1875.63 | 66.17 | 68.96 | 6/23/04 | 18:22 | 5524:28:00 | 5524:25:20 | 5524:13:00 | 74.32675608 |
| 4 | 73 | 1083 | 0.0001 | 533 | 14.057 | 0.000131785 | 3.73 | 0.086369134 | 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

| | lbs. | grams | | lbs. | grams | moisture % | est. lost gas (cc) = |
|---|---|---|---|---|---|---|---|
| dry sample weight: | 2.978 | 1350.97 | wet sample weight: | 3.019 | 1369.23 | 1.33% | 59 |

TIME OF:

| off bottom | | at surface | | in canister | | elapsed time (off bottom to canistering) |
|---|---|---|---|---|---|---|
| 11/6/03 | 12:37 | 11/6/03 | 12:40 | 11/6/03 | 12:50 | 12.7 minutes |
| | | | | | | 0.211 hours |
| | | | | | | 0.459488292 SQRT (hrs) |

| RIG/LAB MEASUREMENTS | | | CONVERSION OF RIG/LAB 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 | cubic ft | absolute T (F) | psia | cubic ft (@STP) | cc (@STP) | cubic ft | cc | without lost gas | with lost gas | TIME OF MEASURE | off bottom | at surface | in canister | SQRT hrs. (since off bottom) |
| 17 | 73 | 1091 | 0.0006 | 533 | 14.161 | 0.000564222 | 15.98 | 0.000564222 | 15.98 | 0.38 | 1.78 | 11/6/03 12:54 | 0:16:55 | 0:13:45 | 0:04:15 | 0.530984411 |
| 8 | 73 | 1091 | 0.0003 | 533 | 14.161 | 0.000265516 | 7.52 | 0.000829738 | 23.50 | 0.56 | 1.98 | 11/6/03 12:56 | 0:18:55 | 0:15:45 | 0:06:15 | 0.561498016 |
| 5 | 73 | 1091 | 0.0002 | 533 | 14.161 | 0.000165948 | 4.70 | 0.000995685 | 28.19 | 0.67 | 2.07 | 11/6/03 12:58 | 0:20:55 | 0:17:45 | 0:08:15 | 0.590432986 |
| 10 | 73 | 1091 | 0.0004 | 533 | 14.161 | 0.000331895 | 9.40 | 0.00132758 | 37.59 | 0.89 | 2.29 | 11/6/03 13:04 | 0:26:25 | 0:23:15 | 0:13:45 | 0.683534308 |
| 7 | 73 | 1091 | 0.0002 | 533 | 14.161 | 0.000232327 | 6.58 | 0.001559907 | 44.17 | 1.05 | 2.45 | 11/6/03 13:15 | 0:37:55 | 0:34:45 | 0:25:15 | 0.794949335 |
| 6 | 73 | 1091 | 0.0002 | 533 | 14.161 | 0.000199137 | 5.64 | 0.001759044 | 49.81 | 1.18 | 2.58 | 11/6/03 13:25 | 0:47:55 | 0:44:45 | 0:35:15 | 0.893650441 |
| 10 | 74 | 1091 | 0.0004 | 534 | 14.161 | 0.000331274 | 9.36 | 0.002090317 | 59.19 | 1.40 | 2.80 | 11/6/03 13:33 | 0:55:25 | 0:52:15 | 0:42:45 | 0.981046883 |
| 11 | 74 | 1091 | 0.0004 | 534 | 14.161 | 0.000364401 | 10.32 | 0.002454718 | 69.51 | 1.65 | 3.05 | 11/6/03 13:52 | 1:14:25 | 1:11:15 | 1:01:45 | 1.113677592 |
| 16 | 73 | 1091 | 0.0006 | 533 | 14.161 | 0.000531032 | 15.04 | 0.00298575 | 84.55 | 2.00 | 3.40 | 11/6/03 14:27 | 1:49:25 | 1:46:15 | 1:36:45 | 1.35041146 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 72 | 1090 | 0.0002 | 532 | 14.146 | 0.000199328 | 5.64 | 0.003185079 | 90.19 | 2.14 | 3.54 | 11/8/03 | 15:00 | 2:22:25 | 2:19:15 | 2:09:45 | 1.54085282 |
| -2 | 71 | 1091 | -7E-05 | 531 | 14.161 | -6.6629E-05 | -1.89 | 0.00311845 | 88.30 | 2.09 | 3.49 | 11/8/03 | 15:27 | 2:49:25 | 2:46:15 | 2:36:45 | 1.660360411 |
| 5 | 71 | 1019 | 0.0002 | 531 | 13.226 | 0.00015556 | 4.41 | 0.003274029 | 92.71 | 2.20 | 3.60 | 11/8/03 | 16:24 | 3:46:25 | 3:43:15 | 3:33:45 | 1.94257847 |
| 4 | 71 | 1091 | 0.0001 | 531 | 14.161 | 0.000133256 | 3.77 | 0.003407287 | 96.46 | 2.29 | 3.69 | 11/8/03 | 17:59 | 5:21:25 | 5:18:15 | 5:08:45 | 2.314507387 |
| 0 | 68 | 1096 | 0 | 526 | 14.228 | 0 | 0.00 | 0.003407287 | 96.48 | 2.29 | 3.69 | 11/8/03 | 19:36 | 6:58:25 | 6:55:15 | 6:45:45 | 2.640759571 |
| 65 | 73 | 1096 | 0.0023 | 533 | 14.226 | 0.002167205 | 61.37 | 0.005574492 | 157.85 | 3.74 | 5.14 | 11/7/03 | 0:29 | 11:51:25 | 11:48:15 | 11:38:45 | 3.443391416 |
| 11 | 72 | 1097 | 0.0004 | 532 | 14.239 | 0.000367782 | 10.41 | 0.005942274 | 168.27 | 3.99 | 5.39 | 11/7/03 | 6:08 | 17:28:25 | 17:25:15 | 17:15:45 | 4.180144687 |
| 11 | 70 | 1097 | 0.0004 | 530 | 14.239 | 0.00036917 | 10.45 | 0.006311444 | 178.72 | 4.24 | 5.64 | 11/7/03 | 11:07 | 22:29:25 | 22:26:15 | 22:16:45 | 4.742391587 |
| 24 | 71 | 1097 | 0.0008 | 531 | 14.239 | 0.000803945 | 22.77 | 0.00711539 | 201.46 | 4.76 | 6.18 | 11/7/03 | 18:44 | 30:06:25 | 30:03:15 | 29:53:45 | 5.486979537 |
| 14 | 71 | 1098 | 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 | 14.276 | 0.000187831 | 4.75 | 0.007752418 | 219.52 | 5.21 | 6.60 | 11/8/03 | 6:22 | 41:44:25 | 41:41:15 | 41:31:45 | 6.48087162 |
| 16 | 69 | 1101 | 0.0006 | 529 | 14.291 | 0.000539852 | 15.29 | 0.008292388 | 234.81 | 5.57 | 6.97 | 11/8/03 | 19:08 | 54:26:25 | 54:25:15 | 54:15:45 | 7.380624033 |
| 70 | 73 | 1092 | 0.0025 | 533 | 14.174 | 0.002325395 | 65.85 | 0.010617783 | 300.66 | 7.13 | 8.53 | 11/9/03 | 22:26 | 81:50:25 | 81:47:15 | 81:37:45 | 9.046581855 |
| 42 | 75 | 1087 | 0.0015 | 535 | 14.109 | 0.001363656 | 39.16 | 0.012001419 | 339.84 | 8.06 | 9.48 | 11/10/03 | 8:09 | 91:31:25 | 91:28:15 | 91:18:45 | 9.586797328 |
| 50 | 77 | 1080 | 0.0018 | 537 | 14.018 | 0.001630507 | 46.17 | 0.013631926 | 386.01 | 9.15 | 10.55 | 11/11/03 | 9:32 | 116:54:25 | 116:51:15 | 116:41:45 | 10.81235146 |
| -8 | 75 | 1091 | -0.0003 | 535 | 14.161 | -0.000264523 | -7.49 | 0.013387403 | 378.52 | 8.98 | 10.36 | 11/12/03 | 14:24 | 145:46:25 | 145:43:15 | 145:33:45 | 12.0738743 |
| 110 | 76 | 1069 | 0.0039 | 536 | 13.675 | 0.003557204 | 100.73 | 0.018924807 | 479.25 | 11.36 | 12.76 | 11/17/03 | 18:22 | 287:44:25 | 287:41:15 | 287:31:45 | 16.36277109 |
| 26 | 72 | 1088 | 0.0009 | 532 | 14.096 | 0.000860567 | 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 | 0.0006 | 533 | 14.146 | 0.000795618 | 22.53 | 0.018581012 | 526.15 | 12.46 | 13.88 | 12/4/03 | 19:51 | 879:13:25 | 879:10:15 | 879:00:45 | 28.06191879 |
| 36 | 75 | 1083 | 0.0013 | 535 | 14.057 | 0.001247273 | 35.32 | 0.019828265 | 561.47 | 13.31 | 14.71 | 12/10/03 | 14:44 | 816:06:25 | 816:03:15 | 815:53:45 | 28.60256864 |
| 17 | 73 | 1087 | 0.0006 | 533 | 14.109 | 0.000562153 | 15.92 | 0.020390436 | 577.39 | 13.69 | 15.09 | 12/16/03 | 14:13 | 961:35:25 | 961:32:15 | 961:22:45 | 31.00951915 |
| 14 | 71 | 1081 | 0.0005 | 531 | 14.031 | 0.000462128 | 13.09 | 0.020852588 | 590.46 | 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 | 602.62 | 14.29 | 15.69 | 12/29/03 | 14:26 | 1273:46:25 | 1273:45:15 | 1273:35:45 | 35.69043211 |
| -18 | 70 | 1103 | -0.0006 | 530 | 14.318 | -0.000607401 | -17.20 | 0.020673874 | 585.42 | 13.86 | 15.26 | 1/6/04 | 15:08 | 1466:26:25 | 1466:25:15 | 1466:15:45 | 38.29456373 |
| 30 | 71 | 1093 | 0.0011 | 531 | 14.167 | 0.001001267 | 28.35 | 0.021675141 | 613.77 | 14.55 | 15.95 | 1/12/04 | 11:40 | 1807:02:25 | 1806:59:15 | 1806:49:45 | 40.08790888 |
| 23 | 70 | 1089 | 0.0008 | 530 | 14.135 | 0.000768272 | 21.70 | 0.022441413 | 635.47 | 15.07 | 16.47 | 1/21/04 | 10:28 | 1821:50:25 | 1821:47:15 | 1821:37:45 | 42.86302095 |
| -1 | 68 | 1091 | -4E-05 | 526 | 14.161 | -3.35038E-05 | -0.95 | 0.022407909 | 634.52 | 15.05 | 16.45 | 1/27/04 | 10:06 | 1965:26:25 | 1965:25:15 | 1965:15:45 | 44.33386228 |
| 32 | 70 | 1085 | 0.0011 | 530 | 14.083 | 0.001082202 | 30.08 | 0.023470111 | 664.60 | 15.76 | 17.16 | 2/2/04 | 15:37 | 2114:59:25 | 2114:58:15 | 2114:48:45 | 45.98902345 |
| 7 | 71 | 1091 | 0.0002 | 531 | 14.161 | 0.000233202 | 6.60 | 0.023703313 | 671.20 | 15.92 | 17.32 | 2/9/04 | 10:28 | 2277:50:25 | 2277:47:15 | 2277:37:45 | 47.72872498 |
| 9 | 71 | 1091 | 0.0003 | 531 | 14.161 | 0.000299831 | 8.49 | 0.024003143 | 679.69 | 16.12 | 17.52 | 2/16/04 | 14:17 | 2449:39:25 | 2449:36:15 | 2449:26:45 | 49.49400918 |
| 28 | 70 | 1086 | 0.001 | 530 | 14.096 | 0.000930263 | 26.34 | 0.024933427 | 706.03 | 16.74 | 18.14 | 2/23/04 | 14:26 | 2617:46:25 | 2617:45:15 | 2617:35:45 | 51.16450864 |
| 6 | 72 | 1091 | 0.0002 | 532 | 14.161 | 0.000199511 | 5.65 | 0.025132938 | 711.68 | 16.88 | 18.28 | 3/2/04 | 10:42 | 2808:04:25 | 2808:01:15 | 2805:51:45 | 52.97238536 |
| 14 | 71 | 1088 | 0.0005 | 531 | 14.122 | 0.000465121 | 13.17 | 0.025598059 | 724.85 | 17.19 | 18.59 | 3/8/04 | 9:59 | 2949:21:25 | 2949:18:15 | 2949:08:45 | 54.30798233 |
| 31 | 70 | 1082 | 0.0011 | 530 | 14.044 | 0.001026183 | 29.06 | 0.026624222 | 753.91 | 17.88 | 19.26 | 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 | 3285:18:15 | 3285:08:45 | 57.31774255 |
| 6 | 70 | 1088 | 0.0003 | 530 | 14.122 | 0.000266285 | 7.54 | 0.026589593 | 752.93 | 17.86 | 19.25 | 3/30/04 | 20:30 | 3467:52:25 | 3467:49:15 | 3467:39:45 | 59.05822221 |
| 36 | 70 | 1080 | 0.0013 | 530 | 14.018 | 0.00116947 | 33.66 | 0.027779084 | 786.61 | 18.65 | 20.05 | 4/6/04 | 14:39 | 3650:01:25 | 3649:58:15 | 3649:48:45 | 60.41542527 |
| -12 | 68 | 1086 | -0.0004 | 528 | 14.096 | -0.000400203 | -11.33 | 0.027378881 | 775.28 | 18.39 | 19.78 | 4/12/04 | 14:56 | 3794:20:25 | 3794:17:15 | 3794:07:45 | 61.59621651 |
| 9 | 69 | 1088 | 0.0003 | 529 | 14.122 | 0.000300137 | 8.50 | 0.027678997 | 783.78 | 18.59 | 19.99 | 4/19/04 | 14:24 | 3981:46:25 | 3981:43:15 | 3981:33:45 | 62.94262158 |
| 10 | 71 | 1090 | 0.0004 | 531 | 14.148 | 0.00033264 | 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 | 65.59280641 |
| 49 | 75 | 1081 | 0.0017 | 535 | 14.031 | 0.001605355 | 45.46 | 0.029981988 | 848.99 | 20.13 | 21.53 | 5/10/04 | 13:59 | 4465:21:25 | 4465:18:15 | 4465:08:45 | 66.62332635 |
| -1 | 73 | 1082 | -4E-05 | 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 | 66.63729574 |
| 28 | 73 | 1075 | 0.001 | 533 | 13.953 | 0.000915877 | 25.93 | 0.030864749 | 873.99 | 20.73 | 22.13 | 5/24/04 | 10:28 | 4797:50:25 | 4797:47:15 | 4797:37:45 | 69.2684441 |
| -6 | 70 | 1077 | -0.0002 | 530 | 13.979 | -0.000197694 | -5.60 | 0.030667055 | 868.39 | 20.59 | 21.99 | 6/1/04 | 10:52 | 4990:14:25 | 4990:11:15 | 4990:01:45 | 70.84183275 |
| 9 | 72 | 1076 | 0.0003 | 532 | 13.986 | 0.000295152 | 8.36 | 0.030962208 | 878.75 | 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 | 0.031451385 | 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 | -0.00046062 | -13.05 | 0.030990545 | 877.55 | 20.81 | 22.21 | 6/23/04 | 16:23 | 5523:45:25 | 5523:42:15 | 5523:32:45 | 74.32198157 |
| -4 | 73 | 1083 | -0.0001 | 533 | 14.057 | -0.000131765 | -3.73 | 0.03085878 | 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 756.5' (Croweburg coal) in canister M3

| | lbs. | grams | | lbs. | grams | moisture % | | est. lost gas (cc) = |
|---|---|---|---|---|---|---|---|---|
| dry sample weight: | 1.599 | 725.49 | wet sample weight: | 1.833 | 740.80 | 2.07% | | 70 |

TIME OF:

| | off bottom | at surface | in canister |
|---|---|---|---|
| | 11/8/03 12:37 | 11/8/03 12:40 | 11/8/03 12:48 |

elapsed time (off bottom to canistering)

11.2 minutes

0.186 hours

0.431405970 SQRT (hrs)

| RIG/LAB MEASUREMENTS | | | CONVERSION OF RIG/LAB 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 | cubic ft | absolute T (F) | psia | cubic ft (@STP) | cc (@STP) | cubic ft | cc | without lost gas | with lost gas | TIME OF MEASURE | off bottom | at surface | in canister | SQRT hrs. (since off bottom) |
| 14 | 73 | 1091 | 0.0005 | 533 | 14.161 | 0.000464653 | | 13.16 | 0.000484653 | 0.56 | 3.67 | 11/8/03 12:53 | 0:15:55 | 0:12:45 | 0:04:45 | 0.515051238 |
| 7 | 73 | 1091 | 0.0002 | 533 | 14.161 | 0.000232327 | | 6.58 | 0.00069898 | 0.87 | 3.98 | 11/8/03 12:55 | 0:17:55 | 0:14:45 | 0:06:45 | 0.54645321 |
| 5 | 73 | 1091 | 0.0002 | 533 | 14.161 | 0.000165948 | | 4.70 | 0.000662927 | 1.08 | 4.17 | 11/8/03 12:57 | 0:19:55 | 0:16:45 | 0:08:45 | 0.578148201 |
| 8 | 73 | 1091 | 0.0003 | 533 | 14.161 | 0.000265518 | | 7.52 | 0.001128443 | 1.41 | 4.50 | 11/8/03 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 | 2.20 | 5.29 | 11/8/03 13:09 | 0:31:55 | 0:28:45 | 0:20:45 | 0.729345218 |
| 2 | 73 | 1091 | 7E-05 | 533 | 14.161 | 6.6379E-05 | | 1.88 | 0.001825423 | 2.28 | 5.37 | 11/8/03 13:10 | 0:33:10 | 0:30:00 | 0:22:00 | 0.743490287 |
| 4 | 73 | 1091 | 0.0001 | 533 | 14.161 | 0.000132758 | | 3.76 | 0.001958181 | 2.45 | 5.54 | 11/8/03 13:14 | 0:36:55 | 0:33:45 | 0:25:45 | 0.784398442 |
| 15 | 74 | 1091 | 0.0005 | 534 | 14.161 | 0.00049891 | | 14.07 | 0.002455091 | 3.07 | 6.18 | 11/8/03 13:24 | 0:46:55 | 0:43:45 | 0:35:45 | 0.884276228 |
| 9 | 74 | 1091 | 0.0003 | 534 | 14.161 | 0.000298146 | | 8.44 | 0.002753237 | 3.44 | 6.53 | 11/8/03 13:32 | 0:54:25 | 0:51:15 | 0:43:15 | 0.952336308 |
| 24 | 74 | 1091 | 0.0008 | 534 | 14.161 | 0.000795056 | | 22.51 | 0.003548293 | 4.44 | 7.53 | 11/8/03 13:53 | 1:15:25 | 1:12:15 | 1:04:15 | 1.121135337 |
| 29 | 73 | 1091 | 0.001 | 533 | 14.161 | 0.000962496 | | 27.25 | 0.004510789 | 5.64 | 8.73 | 11/8/03 14:23 | 1:45:25 | 1:42:15 | 1:34:15 | 1.32549781 |
| 22 | 72 | 1090 | 0.0006 | 532 | 14.146 | 0.000730671 | | 20.70 | 0.00524166 | 6.55 | 9.85 | 11/8/03 14:59 | 2:21:25 | 2:18:15 | 2:10:15 | 1.535234329 |
| 14 | 71 | 1091 | 0.0005 | 531 | 14.161 | 0.000468403 | | 13.21 | 0.005708083 | 7.14 | 10.23 | 11/8/03 15:29 | 2:51:25 | 2:48:15 | 2:40:15 | 1.690249817 |
| 19 | 71 | 1091 | 0.0007 | 531 | 14.161 | 0.000632976 | | 17.92 | 0.006341039 | 7.93 | 11.02 | 11/8/03 16:25 | 3:47:25 | 3:44:15 | 3:36:15 | 1.946863575 |
| 29 | 71 | 1091 | 0.001 | 531 | 14.161 | 0.000956121 | | 27.36 | 0.00730716 | 8.91 | 12.23 | 11/8/03 16:00 | 5:22:25 | 5:19:15 | 5:11:15 | 2.318105069 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 27 | 88 | 1096 | 0.001 | 528 | 14.228 | 0.000912204 | 25.63 | 0.008219363 | 232.75 | 10.28 | 13.37 | 11/6/03 | 19:35 | 8:57:25 | 8:54:15 | 8:46:15 | 2.637802025 |
| 86 | 73 | 1096 | 0.003 | 533 | 14.226 | 0.002887378 | 81.19 | 0.011066742 | 313.94 | 13.88 | 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 | 16.88 | 11/7/03 | 8:05 | 17:27:25 | 17:24:15 | 17:16:15 | 4.17815084 |
| 45 | 70 | 1097 | 0.0016 | 530 | 14.239 | 0.001510242 | 42.77 | 0.014134982 | 400.26 | 17.68 | 20.77 | 11/7/03 | 11:10 | 22:32:25 | 22:29:15 | 22:21:15 | 4.747660242 |
| 47 | 71 | 1097 | 0.0017 | 531 | 14.239 | 0.001574393 | 44.56 | 0.015709375 | 444.84 | 19.64 | 22.73 | 11/7/03 | 18:44 | 30:08:25 | 30:03:15 | 29:55:15 | 5.488979537 |
| 28 | 71 | 1098 | 0.001 | 531 | 14.252 | 0.000938791 | 26.58 | 0.016848167 | 471.42 | 20.82 | 23.91 | 11/7/03 | 22:48 | 34:08:25 | 34:05:15 | 33:57:15 | 5.842988234 |
| 30 | 72 | 1100 | 0.0011 | 532 | 14.276 | 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 | 8.481961347 |
| 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 | 591.26 | 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 | 64.91 | 0.023172504 | 656.17 | 28.98 | 32.07 | 11/9/03 | 22:29 | 81:51:25 | 81:48:15 | 81:40:15 | 9.047482766 |
| 34 | 75 | 1087 | 0.0012 | 535 | 14.109 | 0.001120103 | 31.72 | 0.024292607 | 687.89 | 30.36 | 33.47 | 11/10/03 | 8:10 | 91:32:25 | 91:29:15 | 91:21:15 | 9.567868356 |
| 82 | 77 | 1080 | 0.0029 | 537 | 14.016 | 0.002874032 | 75.72 | 0.028986638 | 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 | 0.001355883 | 36.39 | 0.028322321 | 802.00 | 35.42 | 38.51 | 11/12/03 | 14:25 | 145:47:25 | 145:44:15 | 145:36:15 | 12.07438449 |
| 40 | 75 | 1095 | 0.0014 | 535 | 14.213 | 0.001327466 | 37.59 | 0.029849787 | 839.59 | 37.08 | 40.17 | 11/13/03 | 19:31 | 174:53:25 | 174:50:15 | 174:42:15 | 13.22460879 |
| 81 | 75 | 1077 | 0.0029 | 535 | 13.979 | 0.002843931 | 74.87 | 0.032293719 | 914.45 | 40.38 | 43.47 | 11/15/03 | 13:21 | 218:43:25 | 218:40:15 | 218:32:15 | 14.72153562 |
| 73 | 78 | 1089 | 0.0026 | 538 | 13.875 | 0.00236089 | 66.65 | 0.034654409 | 981.30 | 43.33 | 46.42 | 11/17/03 | 16:10 | 267:32:25 | 267:29:15 | 267:21:15 | 18.35685852 |
| 64 | 72 | 1078 | 0.0023 | 532 | 13.992 | 0.002102783 | 59.54 | 0.038757172 | 1040.84 | 45.96 | 49.05 | 11/21/03 | 11:38 | 358:56:25 | 358:55:15 | 358:47:15 | 18.94859893 |
| 48 | 72 | 1088 | 0.0017 | 532 | 14.098 | 0.001568776 | 44.99 | 0.038345947 | 1085.83 | 47.95 | 51.04 | 11/24/03 | 14:14 | 433:36:25 | 433:33:15 | 433:25:15 | 20.82323088 |
| 58 | 75 | 1073 | 0.002 | 535 | 13.927 | 0.001886154 | 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 | 676:59:25 | 676:56:15 | 676:48:15 | 26.05744189 |
| 80 | 75 | 1083 | 0.0021 | 535 | 14.057 | 0.001969378 | 55.77 | 0.044854206 | 1270.12 | 58.09 | 59.18 | 12/10/03 | 14:50 | 818:12:25 | 818:09:15 | 818:01:15 | 28.80431688 |
| 58 | 73 | 1087 | 0.002 | 533 | 14.109 | 0.001917933 | 54.31 | 0.04877214 | 1324.43 | 58.49 | 61.58 | 12/16/03 | 14:14 | 981:36:25 | 981:33:15 | 981:25:15 | 31.00978788 |
| 50 | 71 | 1081 | 0.0018 | 531 | 14.031 | 0.001850458 | 48.74 | 0.048422597 | 1371.17 | 60.55 | 63.84 | 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 | 48.58 | 0.050137432 | 1419.73 | 62.89 | 65.79 | 12/29/03 | 14:27 | 1273:49:25 | 1273:46:15 | 1273:38:15 | 35.6908656 |
| 14 | 70 | 1103 | 0.0005 | 530 | 14.316 | 0.000472423 | 13.38 | 0.050809855 | 1433.11 | 63.28 | 66.38 | 1/6/04 | 15:07 | 1468:29:25 | 1468:26:15 | 1468:18:15 | 38.29478134 |
| 47 | 71 | 1093 | 0.0017 | 531 | 14.187 | 0.001568852 | 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 |
| 48 | 70 | 1089 | 0.0016 | 530 | 14.135 | 0.001532544 | 43.40 | 0.053711051 | 1520.92 | 67.18 | 70.25 | 1/21/04 | 10:28 | 1821:50:25 | 1821:47:15 | 1821:39:15 | 42.68302095 |
| 20 | 68 | 1091 | 0.0007 | 528 | 14.181 | 0.000870076 | 18.97 | 0.054361127 | 1539.90 | 68.00 | 71.09 | 1/27/04 | 10:07 | 1965:29:25 | 1965:26:15 | 1965:18:15 | 44.33385025 |
| 36 | 70 | 1085 | 0.0013 | 530 | 14.063 | 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 | 0.058309023 | 1594.49 | 70.41 | 73.50 | 2/9/04 | 10:29 | 2277:51:25 | 2277:48:15 | 2277:40:15 | 47.72689959 |
| 38 | 71 | 1091 | 0.0013 | 531 | 14.161 | 0.001265951 | 35.85 | 0.057574975 | 1630.34 | 71.99 | 75.09 | 2/16/04 | 14:17 | 2449:39:25 | 2449:36:15 | 2449:28:15 | 49.49400918 |
| 57 | 70 | 1088 | 0.002 | 530 | 14.098 | 0.001893791 | 53.63 | 0.059468786 | 1683.96 | 74.36 | 77.45 | 2/23/04 | 14:28 | 2617:48:25 | 2617:45:15 | 2617:37:15 | 51.18450884 |
| 21 | 72 | 1091 | 0.0007 | 532 | 14.181 | 0.00069829 | 19.77 | 0.060167055 | 1703.73 | 75.24 | 78.33 | 3/2/04 | 10:43 | 2606:05:25 | 2606:02:15 | 2605:54:15 | 52.97254268 |
| 24 | 71 | 1088 | 0.0008 | 531 | 14.122 | 0.00079735 | 22.58 | 0.060964405 | 1728.31 | 78.23 | 79.32 | 3/8/04 | 10:00 | 2949:22:25 | 2949:19:15 | 2949:11:15 | 54.30813577 |
| 34 | 70 | 1082 | 0.0012 | 530 | 14.044 | 0.001125469 | 31.87 | 0.062089874 | 1758.18 | 77.64 | 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 | 1788.70 | 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 | 0.000885712 | 18.85 | 0.063058499 | 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 | 83.26 | 4/6/04 | 14:39 | 3850:01:25 | 3849:58:15 | 3849:50:15 | 60.41542527 |
| 4 | 68 | 1086 | 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 |
| 16 | 89 | 1086 | 0.0006 | 529 | 14.122 | 0.000533578 | 15.11 | 0.064780783 | 1834.38 | 81.00 | 84.10 | 4/19/04 | 14:24 | 3961:48:25 | 3961:43:15 | 3961:35:15 | 62.94282158 |
| 17 | 71 | 1090 | 0.0006 | 531 | 14.148 | 0.000585828 | 16.02 | 0.06534661 | 1850.40 | 81.71 | 84.80 | 4/26/04 | 11:30 | 4126:52:25 | 4126:49:15 | 4126:41:15 | 64.24074726 |
| 16 | 70 | 1084 | 0.0006 | 530 | 14.070 | 0.000530611 | 15.03 | 0.065877222 | 1885.43 | 82.38 | 85.47 | 5/3/04 | 19:02 | 4302:24:25 | 4302:21:15 | 4302:13:15 | 65.59273545 |
| 38 | 75 | 1081 | 0.0013 | 535 | 14.031 | 0.00124497 | 35.25 | 0.067122191 | 1900.88 | 83.93 | 87.02 | 5/10/04 | 13:59 | 4465:21:25 | 4465:18:15 | 4465:10:15 | 66.82332635 |
| 16 | 73 | 1082 | 0.0006 | 533 | 14.044 | 0.000526851 | 14.91 | 0.067848843 | 1915.59 | 84.59 | 87.86 | 5/17/04 | 9:43 | 4829:05:25 | 4829:02:15 | 4828:54:15 | 68.03741822 |
| 25 | 73 | 1075 | 0.0009 | 533 | 13.953 | 0.000817589 | 23.15 | 0.068488412 | 1938.75 | 85.61 | 88.70 | 5/24/04 | 10:29 | 4797:51:25 | 4797:48:15 | 4797:40:15 | 69.2885844 |
| 3 | 70 | 1077 | 0.0001 | 530 | 13.979 | 9.86472E-05 | 2.80 | 0.068585259 | 1941.54 | 85.74 | 88.83 | 6/1/04 | 10:53 | 4990:15:25 | 4990:12:15 | 4990:04:15 | 70.84175072 |
| 12 | 72 | 1078 | 0.0004 | 532 | 13.988 | 0.000393537 | 11.14 | 0.068958795 | 1952.69 | 86.22 | 89.32 | 6/7/04 | 10:34 | 5133:56:25 | 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 | 1082 | -7E-05 | 533 | 14.044 | -6.58314E-05 | -1.86 | 0.069447342 | 1966.52 | 86.84 | 89.93 | 6/23/04 | 16:23 | 5523:45:25 | 5523:42:15 | 5523:34:15 | 74.32198157 |
| 8 | 73 | 1083 | 0.0003 | 533 | 14.057 | 0.000283569 | 7.46 | 0.069710911 | 1973.99 | 87.17 | 90.28 | 7/1/04 | 11:49 | 5711:11:25 | 5711:08:15 | 5711:00:15 | 75.57241744 |
| 9 | 74 | 1081 | 0.0003 | 534 | 14.031 | 0.000295413 | 8.37 | 0.070008325 | 1982.35 | 87.54 | 90.83 | 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 | 0.070367044 | 1992.57 | 87.99 | 91.08 | 7/13/04 | 14:17 | 6001:39:25 | 6001:36:15 | 6001:28:15 | 77.47036172 |
| 9 | 73 | 1080 | 0.0003 | 533 | 14.016 | 0.000295894 | 8.37 | 0.070662738 | 2000.94 | 88.38 | 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 | -0.000266015 | -7.53 | 0.070396723 | 1993.41 | 88.03 | 91.12 | 7/26/04 | 10:22 | 6309:44:25 | 6309:41:15 | 6309:33:15 | 79.43387382 |
| 18 | 73 | 1079 | 0.0006 | 533 | 14.005 | 0.00059084 | 16.73 | 0.070987563 | 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 | 0.070987563 | 2010.14 | 88.77 | 91.86 | 8/9/04 | 13:58 | 6649:20:25 | 6649:17:15 | 6649:09:15 | 81.54348703 |
| -1 | 73 | 1088 | -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 | 1078 | 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 | 83.57894838 |
| 1 | 73 | 1087 | 4E-05 | 533 | 14.109 | 3.30678E-05 | 0.94 | 0.071446858 | 2023.14 | 89.34 | 92.43 | 8/30/04 | 16:39 | 7156:01:25 | 7155:58:15 | 7155:50:15 | 84.59328349 |
| -1 | 71 | 1088 | -4E-05 | 531 | 14.122 | -3.32229E-05 | -0.94 | 0.071413435 | 2022.20 | 89.30 | 92.39 | 9/7/04 | 15:52 | 7347:14:25 | 7347:11:15 | 7347:03:15 | 85.71804446 |
| 20 | 73 | 1073 | 0.0007 | 533 | 13.927 | 0.000852638 | 18.49 | 0.072066274 | 2040.88 | 90.11 | 93.21 | 9/14/04 | 18:35 | 7517:57:25 | 7517:54:15 | 7517:46:15 | 86.70815288 |
| -4 | 73 | 1083 | -0.0001 | 533 | 14.057 | -0.000131785 | -3.73 | 0.071934489 | 2036.95 | 89.95 | 93.04 | 9/21/04 | 18:42 | 7684:04:25 | 7684:01:15 | 7683:53:15 | 87.65864788 |
| -4 | 70 | 1089 | -0.0001 | 530 | 14.135 | -0.000133285 | -3.77 | 0.071801225 | 2033.18 | 89.78 | 92.87 | 9/28/04 | 20:58 | 7858:20:25 | 7858:17:15 | 7858:09:15 | 88.63599677 |
| 8 | 71 | 1085 | 0.0003 | 531 | 14.083 | 0.00026505 | 7.51 | 0.072088275 | 2040.88 | 90.11 | 93.21 | 10/8/04 | 10:08 | 8085:30:25 | 8085:27:15 | 8085:19:15 | 89.91944898 |

DECANISTERED 10/8/2004; sample dried for 30 days in air

SAMPLE: 779.5' to 761.0' (Mineral coal) in canister 1

| | lbs. | grams | | lbs. | grams | moisture % | | est. lost gas (cc) = |
|---|---|---|---|---|---|---|---|---|
| dry sample weight: | 2.870 | 1302.00 | wet sample weight: | 2.914 | 1321.68 | 1.49% | | 53 |

| | | | TIME OF: | off bottom | at surface | in canister | elapsed time (off bottom to canistering) |
|---|---|---|---|---|---|---|---|
| | | | | 11/6/03 15:15 | 11/6/03 15:16 | 11/6/03 15:24 | 9.0 minutes |
| | | | | | | | 0.150 hours |
| RIG/LAB MEASUREMENTS | | | CONVERSION OF RIG/LAB MEASUREMENTS TO STP (@60 deg F; 14.7 psi) | | | | 0.387298335 SQRT (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 SINCE | | | |
|---|---|---|---|---|---|---|---|---|
| cubic ft | cc | without lost gas | with lost gas | TIME OF MEASURE | off bottom | at surface | in canister | SQRT hrs. (since off bottom) |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 0:16:30 | 0:15:30 | 0:09:30 | 0.555277708 |
| 3 | 71 | 1091 | 0.0001 | 531 | 14.161 | 9.99435E-05 | 2.83 | 0.000932808 | 26.41 | 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 | 0.001299288 | 36.79 | 0.91 | 2.21 | 11/6/03 | 15:40 | 0:25:00 | 0:22:00 | 0:16:00 | 0.645497224 |
| 6 | 70 | 1091 | 0.0002 | 530 | 14.161 | 0.000200264 | 5.67 | 0.00149953 | 42.46 | 1.04 | 2.35 | 11/6/03 | 15:43 | 0:26:15 | 0:25:15 | 0:19:15 | 0.688172962 |
| 9 | 70 | 1091 | 0.0003 | 530 | 14.161 | 0.000300396 | 8.51 | 0.001799926 | 50.97 | 1.25 | 2.56 | 11/6/03 | 15:49 | 0:34:00 | 0:31:00 | 0:25:00 | 0.752772653 |
| 9 | 71 | 1091 | 0.0003 | 531 | 14.161 | 0.000299631 | 8.49 | 0.002099757 | 59.48 | 1.46 | 2.77 | 11/6/03 | 15:55 | 0:39:45 | 0:38:45 | 0:30:45 | 0.81394103 |
| 6 | 71 | 1091 | 0.0002 | 531 | 14.161 | 0.000199887 | 5.66 | 0.002299844 | 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 | 0.000166573 | 4.72 | 0.002466217 | 69.84 | 1.72 | 3.02 | 11/6/03 | 16:03 | 0:48:15 | 0:45:15 | 0:39:15 | 0.898753404 |
| 6 | 71 | 1091 | 0.0002 | 531 | 14.161 | 0.000199887 | 5.66 | 0.002666104 | 75.50 | 1.86 | 3.16 | 11/6/03 | 16:08 | 0:53:00 | 0:50:00 | 0:44:00 | 0.939658145 |
| 8 | 71 | 1091 | 0.0003 | 531 | 14.161 | 0.000266516 | 7.55 | 0.00293262 | 83.04 | 2.04 | 3.35 | 11/6/03 | 16:16 | 1:00:30 | 0:57:30 | 0:51:30 | 1.004156022 |
| 7 | 71 | 1091 | 0.0002 | 531 | 14.161 | 0.000233202 | 6.60 | 0.003185821 | 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 | 16:36 | 1:22:30 | 1:19:30 | 1:13:30 | 1.17260394 |
| 18 | 71 | 1092 | 0.0006 | 531 | 14.174 | 0.000533521 | 15.11 | 0.00419908 | 118.90 | 2.93 | 4.23 | 11/6/03 | 16:57 | 1:41:30 | 1:36:30 | 1:32:30 | 1.300840868 |
| 38 | 71 | 1092 | 0.0013 | 531 | 14.174 | 0.001267112 | 35.88 | 0.005466172 | 154.78 | 3.81 | 5.11 | 11/6/03 | 17:56 | 2:42:30 | 2:39:30 | 2:33:30 | 1.645701472 |
| 31 | 68 | 1096 | 0.0011 | 526 | 14.226 | 0.001047345 | 29.86 | 0.006513518 | 184.44 | 4.54 | 5.84 | 11/6/03 | 19:36 | 4:20:30 | 4:17:30 | 4:11:30 | 2.08368864 |
| 142 | 73 | 1096 | 0.005 | 533 | 14.226 | 0.004734506 | 134.07 | 0.011246025 | 318.51 | 7.84 | 9.14 | 11/7/03 | 0:32 | 9:16:30 | 9:13:30 | 9:07:30 | 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 | 8:08 | 14:50:30 | 14:47:30 | 14:41:30 | 3.852488373 |
| 71 | 70 | 1097 | 0.0025 | 530 | 14.239 | 0.002382626 | 67.47 | 0.015703808 | 444.68 | 10.94 | 12.25 | 11/7/03 | 11:10 | 19:54:30 | 19:51:30 | 19:45:30 | 4.48167554 |
| 69 | 71 | 1097 | 0.0024 | 531 | 14.239 | 0.002311343 | 65.45 | 0.018015149 | 510.13 | 12.55 | 13.86 | 11/7/03 | 18:45 | 27:29:30 | 27:26:30 | 27:20:30 | 5.243249828 |
| 43 | 71 | 1098 | 0.0015 | 531 | 14.252 | 0.001441715 | 40.82 | 0.019458884 | 550.95 | 13.56 | 14.88 | 11/7/03 | 22:47 | 31:31:30 | 31:28:30 | 31:22:30 | 5.614712615 |
| 42 | 72 | 1100 | 0.0015 | 532 | 14.278 | 0.0014081 | 39.67 | 0.020884984 | 590.83 | 14.54 | 15.84 | 11/8/03 | 6:23 | 39:07:30 | 39:04:30 | 38:58:30 | 6.254996002 |
| 71 | 69 | 1101 | 0.0025 | 529 | 14.291 | 0.002396035 | 67.65 | 0.023260999 | 658.68 | 18.21 | 17.51 | 11/8/03 | 19:08 | 51:52:30 | 51:49:30 | 51:43:30 | 7.202430145 |
| 88 | 73 | 1100 | 0.0031 | 533 | 14.278 | 0.00294477 | 83.39 | 0.026205789 | 742.08 | 18.26 | 19.56 | 11/9/03 | 5:47 | 62:31:30 | 62:28:30 | 62:22:30 | 7.907275131 |
| 89 | 73 | 1092 | 0.0031 | 533 | 14.174 | 0.002958573 | 83.72 | 0.029162343 | 825.78 | 20.32 | 21.62 | 11/9/03 | 22:31 | 79:15:30 | 79:12:30 | 79:06:30 | 6.902714942 |
| 49 | 75 | 1087 | 0.0017 | 535 | 14.109 | 0.001614288 | 45.71 | 0.030776808 | 871.49 | 21.44 | 22.75 | 11/10/03 | 8:10 | 88:54:30 | 88:51:30 | 88:45:30 | 9.429121557 |
| 21 | 75 | 1088 | 0.0007 | 535 | 14.096 | 0.000691192 | 19.57 | 0.0314878 | 891.07 | 21.93 | 23.23 | 11/10/03 | 10:53 | 91:37:30 | 91:34:30 | 91:28:30 | 9.57209486 |
| 101 | 77 | 1080 | 0.0036 | 537 | 14.018 | 0.003293624 | 93.28 | 0.034781424 | 984.33 | 24.22 | 25.52 | 11/11/03 | 9:33 | 114:17:30 | 114:14:30 | 114:08:30 | 10.89072607 |
| 61 | 75 | 1091 | 0.0022 | 535 | 14.161 | 0.002018991 | 57.11 | 0.036778418 | 1041.44 | 25.83 | 26.93 | 11/12/03 | 14:28 | 143:10:30 | 143:07:30 | 143:01:30 | 11.98557562 |
| 62 | 75 | 1095 | 0.0022 | 535 | 14.213 | 0.002057573 | 58.28 | 0.038835988 | 1099.71 | 27.06 | 28.38 | 11/13/03 | 19:34 | 172:16:30 | 172:15:30 | 172:09:30 | 13.12682888 |
| 124 | 75 | 1077 | 0.0044 | 535 | 13.979 | 0.0040475 | 114.61 | 0.042883488 | 1214.32 | 29.88 | 31.18 | 11/15/03 | 1:24 | 202:06:30 | 202:05:30 | 201:59:30 | 14.21765335 |
| 113 | 76 | 1069 | 0.004 | 536 | 13.875 | 0.003654219 | 103.48 | 0.046537707 | 1317.80 | 32.43 | 33.73 | 11/17/03 | 16:11 | 264:55:30 | 264:52:30 | 264:46:30 | 16.27651883 |
| 144 | 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 | 14.096 | 0.001621875 | 45.93 | 0.052890799 | 1497.69 | 36.85 | 36.16 | 11/24/03 | 14:12 | 430:56:30 | 430:53:30 | 430:47:30 | 20.75913454 |
| 202 | 74 | 1095 | 0.0071 | 534 | 14.213 | 0.006716259 | 190.18 | 0.059607058 | 1687.88 | 41.53 | 42.84 | 12/5/03 | 12:04 | 892:46:30 | 892:45:30 | 892:39:30 | 26.3212525 |
| 115 | 74 | 1083 | 0.0041 | 534 | 14.057 | 0.00378171 | 107.09 | 0.063388768 | 1794.98 | 44.17 | 45.47 | 12/10/03 | 14:52 | 815:36:30 | 815:33:30 | 815:27:30 | 28.55865735 |
| 96 | 76 | 1087 | 0.0034 | 536 | 14.109 | 0.003158743 | 89.39 | 0.066545511 | 1884.35 | 46.37 | 47.67 | 12/18/03 | 14:15 | 958:59:30 | 958:56:30 | 958:50:30 | 30.98759059 |
| 145 | 73 | 1081 | 0.0051 | 533 | 14.031 | 0.004788367 | 135.02 | 0.071313878 | 2019.38 | 49.69 | 50.99 | 12/22/03 | 16:02 | 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 | 14:26 | 1271:12:30 | 1271:09:30 | 1271:03:30 | 35.65400666 |
| 57 | 74 | 1103 | 0.002 | 534 | 14.316 | 0.001909028 | 54.08 | 0.076174246 | 2157.01 | 53.08 | 54.38 | 1/8/04 | 15:07 | 1463:51:30 | 1463:48:30 | 1463:42:30 | 38.26040184 |
| 100 | 75 | 1093 | 0.0035 | 535 | 14.187 | 0.003312604 | 93.60 | 0.07946885 | 2250.61 | 55.36 | 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 | 163.55 | 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 | 0.087581394 | 2479.45 | 61.01 | 62.31 | 1/27/04 | 10:07 | 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 | 15:36 | 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 | 47.89931885 |
| 68 | 75 | 1091 | 0.0023 | 535 | 14.161 | 0.002182318 | 61.80 | 0.094884828 | 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 | 0.096832529 | 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 | 69.48 | 3/2/04 | 10:44 | 2803:28:30 | 2803:25:30 | 2803:19:30 | 52.9478517 |
| 46 | 75 | 1088 | 0.0016 | 535 | 14.122 | 0.001516827 | 42.95 | 0.099339712 | 2812.98 | 69.22 | 70.52 | 3/8/04 | 10:01 | 2946:45:30 | 2946:42:30 | 2946:36:30 | 54.28405229 |
| 52 | 74 | 1082 | 0.0018 | 534 | 14.044 | 0.001708412 | 46.38 | 0.101048124 | 2881.35 | 70.41 | 71.71 | 3/15/04 | 11:34 | 3116:16:30 | 3116:15:30 | 3116:09:30 | 55.82390468 |
| 18 | 75 | 1097 | 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 | 57.2950696 |
| 65 | 75 | 1088 | 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 | 59.03607854 |
| 60 | 75 | 1080 | 0.0021 | 535 | 14.018 | 0.001963923 | 55.61 | 0.105753841 | 2994.60 | 73.69 | 74.99 | 4/6/04 | 14:40 | 3847:24:30 | 3847:21:30 | 3847:15:30 | 60.39377727 |
| 19 | 75 | 1086 | 0.0007 | 535 | 14.096 | 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 | 61.57898434 |
| 0 | 68 | 1088 | 0 | 526 | 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 | 62.92164305 |
| 50 | 76 | 1090 | 0.0016 | 536 | 14.148 | 0.001648674 | 48.89 | 0.108027879 | 3059.00 | 75.27 | 76.57 | 4/26/04 | 11:31 | 4124:15:30 | 4124:12:30 | 4124:06:30 | 64.22036877 |
| 19 | 70 | 1084 | 0.0007 | 530 | 14.070 | 0.000630101 | 17.64 | 0.10865798 | 3076.64 | 75.71 | 77.01 | 5/3/04 | 19:03 | 4299:47:30 | 4299:44:30 | 4299:38:30 | 65.5727987 |
| 58 | 75 | 1081 | 0.002 | 535 | 14.031 | 0.001834692 | 51.95 | 0.110492672 | 3128.79 | 76.99 | 76.29 | 5/10/04 | 14:00 | 4462:44:30 | 4462:41:30 | 4462:35:30 | 66.80375488 |
| 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 |
| 34 | 73 | 1075 | 0.0012 | 533 | 13.953 | 0.001111894 | 31.49 | 0.112229985 | 3177.99 | 78.20 | 79.50 | 5/24/04 | 10:30 | 4795:14:30 | 4795:11:30 | 4795:05:30 | 89.24766348 |
| 3 | 70 | 1077 | 0.0001 | 530 | 13.979 | 9.88472E-05 | 2.80 | 0.112328812 | 3180.79 | 78.27 | 79.57 | 6/1/04 | 10:53 | 4967:37:30 | 4967:34:30 | 4967:28:30 | 70.82311944 |
| 25 | 72 | 1076 | 0.0009 | 532 | 13.966 | 0.000819866 | 23.22 | 0.11314866 | 3204.00 | 78.84 | 80.14 | 6/7/04 | 10:35 | 5131:19:30 | 5131:16:30 | 5131:10:30 | 71.63326741 |
| 38 | 76 | 1078 | 0.0013 | 536 | 13.992 | 0.001239198 | 35.09 | 0.114387878 | 3239.09 | 79.70 | 81.01 | 6/14/04 | 10:48 | 5299:32:30 | 5299:29:30 | 5299:23:30 | 72.79795098 |
| 4 | 73 | 1082 | 0.0001 | 533 | 14.044 | 0.000131663 | 3.73 | 0.114519541 | 3242.82 | 79.79 | 81.10 | 6/23/04 | 16:24 | 5521:08:30 | 5521:05:30 | 5520:59:30 | 74.30436525 |
| 13 | 73 | 1082 | 0.0005 | 533 | 14.044 | 0.000427904 | 12.12 | 0.114947445 | 3254.94 | 80.09 | 81.40 | 7/1/04 | 11:50 | 5708:34:30 | 5708:31:30 | 5708:25:30 | 75.55511234 |
| 14 | 74 | 1081 | 0.0005 | 534 | 14.031 | 0.000459532 | 13.01 | 0.115408977 | 3267.95 | 80.41 | 81.72 | 7/7/04 | 10:31 | 5851:15:30 | 5851:12:30 | 5851:06:30 | 78.49351824 |
| 17 | 75 | 1082 | 0.0008 | 535 | 14.044 | 0.000557475 | 15.79 | 0.115984452 | 3283.74 | 80.80 | 82.10 | 7/13/04 | 14:17 | 5999:01:30 | 5998:58:30 | 5998:52:30 | 77.45337307 |
| 14 | 73 | 1080 | 0.0005 | 533 | 14.018 | 0.000459968 | 13.02 | 0.116424421 | 3296.76 | 81.12 | 82.42 | 7/19/04 | 11:21 | 6140:05:30 | 6140:02:30 | 6139:56:30 | 78.35873702 |
| -11 | 72 | 1091 | -0.0004 | 532 | 14.161 | -0.000365771 | -10.38 | 0.11805885 | 3286.40 | 80.87 | 82.17 | 7/26/04 | 10:22 | 6307:08:30 | 6307:03:30 | 6306:57:30 | 79.417305 |
| 31 | 73 | 1079 | 0.0011 | 533 | 14.005 | 0.001017558 | 28.81 | 0.117076208 | 3315.22 | 81.57 | 82.66 | 8/2/04 | 14:42 | 6479:28:30 | 6479:23:30 | 6479:17:30 | 80.49497914 |
| 1 | 73 | 1086 | 4E-05 | 533 | 14.096 | 3.30374E-05 | 0.94 | 0.117109245 | 3318.15 | 81.60 | 82.90 | 8/9/04 | 13:59 | 6646:43:30 | 6646:40:30 | 6646:34:30 | 81.52744937 |
| 2 | 73 | 1088 | 7E-05 | 533 | 14.122 | 6.61965E-05 | 1.67 | 0.117175442 | 3318.03 | 81.64 | 82.95 | 8/18/04 | 11:05 | 6811:49:30 | 6811:46:30 | 6811:40:30 | 82.53376098 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33 | 72 | 1076 | 0.0012 | 532 | 13.986 | 0.001082226 | 30.65 | 0.118257667 | 3348.67 | 82.40 | 83.70 | 8/23/04 | 14:06 | 6982:50:30 | 6982:47:30 | 6982:41:30 | 83.56339909 |
| 9 | 73 | 1067 | 0.0003 | 533 | 14.109 | 0.00029761 | 8.43 | 0.118555277 | 3357.10 | 82.61 | 83.91 | 8/30/04 | 16:40 | 7153:24:30 | 7153:21:30 | 7153:15:30 | 84.57782412 |
| 4 | 71 | 1088 | 0.0001 | 531 | 14.122 | 0.000132692 | 3.76 | 0.118688189 | 3360.86 | 82.70 | 84.00 | 9/7/04 | 15:54 | 7344:36:30 | 7344:35:30 | 7344:29:30 | 85.70086487 |
| 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 | -6.53 | 0.119730561 | 3390.38 | 83.42 | 84.73 | 9/21/04 | 16:42 | 7681:26:30 | 7681:23:30 | 7681:17:30 | 87.84383416 |
| -6 | 70 | 1089 | -0.0002 | 530 | 14.135 | -0.000199897 | -5.66 | 0.119530884 | 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 | 0.000397576 | 11.26 | 0.11992826 | 3395.98 | 83.56 | 84.87 | 10/6/04 | 10:11 | 8082:55:30 | 8082:52:30 | 8082:46:30 | 89.90508684 |
| 5 | 65 | 1079 | 0.0002 | 525 | 14.005 | 0.000166823 | 4.72 | 0.120094883 | 3400.70 | 83.68 | 84.98 | 10/19/04 | 14:14 | 8350:58:30 | 8350:55:30 | 8350:49:30 | 91.36366922 |
| 7 | 66 | 1086 | 0.0002 | 528 | 14.098 | 0.000233452 | 6.61 | 0.120328334 | 3407.31 | 83.84 | 85.14 | 10/27/04 | 14:03 | 8542:47:30 | 8542:44:30 | 8542:38:30 | 92.42722362 |
| 18 | 72 | 1090 | 0.0006 | 532 | 14.146 | 0.000597965 | 16.93 | 0.12092832 | 3424.24 | 84.26 | 85.58 | 11/5/04 | 11:05 | 8755:49:30 | 8755:46:30 | 8755:40:30 | 93.57256542 |
| -14 | 66 | 1095 | -0.0005 | 528 | 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 | 0.00093041 | 26.35 | 0.121384167 | 3437.20 | 84.58 | 85.86 | 11/24/04 | 10:47 | 9211:31:30 | 9211:28:30 | 9211:22:30 | 95.97668988 |
| -2 | 65 | 1089 | -7E-05 | 525 | 14.135 | -8.7267E-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' (Scammon coal) in canister M4

| | lbs. | grams | | lbs. | grams | moisture % | | est. lost gas (cc) = | | TIME OF: | | | elapsed time (off bottom to canistering) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| dry sample weight: | 2.216 | 1005.08 | wet sample weight: | 2.291 | 1039.37 | 3.30% | | 90 | | off bottom | at surface | in canister | 12.6 | minutes |
| | | | | | | | | | | 11/6/03 16:54 | 11/6/03 18:57 | 11/6/03 17:08 | 0.210 | 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 SINCE | | 0.457954369 SQRT (hrs) |
| 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 | TIME OF MEASURE | off bottom | at surface | in canister | SQRT hrs. (since off bottom) |
| 11 | 71 | 1092 | 0.0004 | 531 | 14.174 | 0.000388796 | 10.39 | 0.000388796 | 10.39 | 0.33 | 3.20 | 11/6/03 17:09 | 0:14:50 | 0:11:50 | 0:02:15 | 0.497214483 |
| 7 | 71 | 1092 | 0.0002 | 531 | 14.174 | 0.000233415 | 6.61 | 0.000800211 | 17.00 | 0.54 | 3.41 | 11/6/03 17:10 | 0:16:20 | 0:13:20 | 0:03:45 | 0.521749195 |
| 14 | 71 | 1092 | 0.0005 | 531 | 14.174 | 0.000466831 | 13.22 | 0.001087041 | 30.22 | 0.96 | 3.83 | 11/6/03 17:15 | 0:20:50 | 0:17:50 | 0:08:15 | 0.589255851 |
| 16 | 71 | 1091 | 0.0006 | 531 | 14.161 | 0.000533032 | 15.09 | 0.001600074 | 45.31 | 1.44 | 4.31 | 11/6/03 17:19 | 0:25:05 | 0:22:05 | 0:12:30 | 0.646572158 |
| 5 | 71 | 1091 | 0.0002 | 531 | 14.161 | 0.000166573 | 4.72 | 0.001766648 | 50.03 | 1.59 | 4.46 | 11/6/03 17:24 | 0:29:50 | 0:26:50 | 0:17:15 | 0.70513986 |
| 14 | 71 | 1091 | 0.0005 | 531 | 14.161 | 0.000466403 | 13.21 | 0.002233049 | 63.23 | 2.02 | 4.88 | 11/6/03 17:30 | 0:36:05 | 0:33:05 | 0:23:30 | 0.775492675 |
| 11 | 71 | 1091 | 0.0004 | 531 | 14.161 | 0.00036648 | 10.38 | 0.002599509 | 73.61 | 2.35 | 5.22 | 11/6/03 17:36 | 0:41:50 | 0:38:50 | 0:29:15 | 0.834998337 |
| 12 | 71 | 1091 | 0.0004 | 531 | 14.161 | 0.000399774 | 11.32 | 0.002999283 | 84.93 | 2.71 | 5.58 | 11/6/03 17:44 | 0:50:05 | 0:47:05 | 0:37:30 | 0.913831338 |
| 16 | 71 | 1091 | 0.0006 | 531 | 14.161 | 0.000533032 | 15.09 | 0.003532315 | 100.02 | 3.19 | 6.08 | 11/6/03 17:56 | 1:01:50 | 0:58:50 | 0:49:15 | 1.015182822 |
| 92 | 68 | 1096 | 0.0032 | 528 | 14.226 | 0.003108249 | 88.02 | 0.006640565 | 188.04 | 5.99 | 8.86 | 11/6/03 19:37 | 2:42:50 | 2:39:50 | 2:30:15 | 1.647368506 |
| 163 | 73 | 1098 | 0.0058 | 533 | 14.226 | 0.005434662 | 153.89 | 0.012075247 | 341.93 | 10.90 | 13.77 | 11/7/03 0:33 | 7:38:50 | 7:35:50 | 7:28:15 | 2.785361136 |
| 75 | 72 | 1097 | 0.0026 | 532 | 14.239 | 0.002507807 | 71.01 | 0.014582854 | 412.94 | 13.16 | 16.03 | 11/7/03 8:07 | 13:12:50 | 13:09:50 | 13:00:15 | 3.635091316 |
| 56 | 70 | 1097 | 0.002 | 530 | 14.239 | 0.001879412 | 53.22 | 0.016462266 | 466.16 | 14.88 | 17.73 | 11/7/03 11:11 | 18:16:50 | 18:13:50 | 18:04:15 | 4.275576634 estimate |
| 64 | 71 | 1097 | 0.0023 | 531 | 14.239 | 0.002143854 | 60.71 | 0.01860812 | 526.86 | 16.79 | 19.68 | 11/7/03 18:46 | 25:51:50 | 25:48:50 | 25:39:15 | 5.085655207 |
| 37 | 71 | 1098 | 0.0013 | 531 | 14.252 | 0.001240546 | 35.13 | 0.019846866 | 561.99 | 17.91 | 20.78 | 11/7/03 22:48 | 29:53:50 | 29:50:50 | 29:41:15 | 5.467835241 |
| 39 | 72 | 1100 | 0.0014 | 532 | 14.278 | 0.001307522 | 37.02 | 0.021154187 | 599.02 | 19.09 | 21.96 | 11/8/03 8:24 | 37:29:50 | 37:26:50 | 37:17:15 | 6.123497548 |
| 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 | 7.0861759 |
| 55 | 73 | 1100 | 0.0019 | 533 | 14.278 | 0.001840461 | 52.12 | 0.024951993 | 706.56 | 22.52 | 25.39 | 11/9/03 5:47 | 60:52:50 | 60:49:50 | 60:40:15 | 7.602599282 |
| 73 | 73 | 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 | 8.810820368 |
| 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 | 9.342406304 |
| 63 | 77 | 1080 | 0.0029 | 537 | 14.018 | 0.002706842 | 76.64 | 0.031236738 | 884.52 | 28.19 | 31.08 | 11/11/03 9:34 | 112:39:50 | 112:36:50 | 112:27:15 | 10.6143247 |
| 41 | 75 | 1091 | 0.0014 | 535 | 14.161 | 0.001355663 | 38.39 | 0.032592419 | 922.91 | 29.42 | 32.29 | 11/12/03 14:26 | 141:31:50 | 141:28:50 | 141:19:15 | 11.89666153 |
| 39 | 75 | 1095 | 0.0014 | 535 | 14.213 | 0.00129428 | 36.65 | 0.033886699 | 959.56 | 30.59 | 33.45 | 11/13/03 19:35 | 170:40:50 | 170:37:50 | 170:28:15 | 13.06447666 |
| 66 | 75 | 1077 | 0.003 | 535 | 13.979 | 0.002807137 | 79.49 | 0.036693835 | 1039.05 | 33.12 | 35.99 | 11/15/03 13:26 | 212:31:50 | 212:28:50 | 212:19:15 | 14.57842775 |
| 70 | 76 | 1069 | 0.0025 | 538 | 13.675 | 0.002263875 | 64.10 | 0.038957511 | 1103.15 | 35.18 | 38.03 | 11/17/03 16:26 | 263:31:50 | 263:28:50 | 263:19:15 | 16.23362423 |
| 99 | 72 | 1078 | 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 | 16.81392606 |
| 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 | 20.71868454 |
| 141 | 72 | 1095 | 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 | 26.28746004 |
| 39 | 75 | 1083 | 0.0014 | 535 | 14.057 | 0.001260096 | 36.25 | 0.049189009 | 1392.87 | 44.40 | 47.27 | 12/10/03 14:53 | 813:58:50 | 813:55:50 | 813:46:15 | 28.53034447 |
| 32 | 73 | 1087 | 0.0011 | 533 | 14.109 | 0.00105617 | 29.96 | 0.050247179 | 1422.84 | 45.35 | 48.22 | 12/16/03 14:16 | 957:21:50 | 957:18:50 | 957:09:15 | 30.94129747 |
| 31 | 71 | 1081 | 0.0011 | 531 | 14.031 | 0.001023264 | 28.98 | 0.051270443 | 1451.81 | 46.28 | 49.15 | 12/22/03 18:03 | 1103:08:50 | 1103:05:50 | 1102:56:15 | 33.21366018 |
| 30 | 72 | 1082 | 0.0011 | 532 | 14.044 | 0.000989328 | 28.01 | 0.052259791 | 1479.83 | 47.17 | 50.04 | 12/29/03 14:29 | 1269:34:50 | 1269:31:50 | 1269:22:15 | 35.63117393 |
| -3 | 70 | 1103 | -0.0001 | 530 | 14.318 | -0.000101233 | -2.87 | 0.052158557 | 1476.96 | 47.08 | 49.95 | 1/6/04 15:07 | 1462:12:50 | 1462:09:50 | 1462:00:15 | 38.23890544 |
| 32 | 71 | 1093 | 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 | 40.03495001 |
| 27 | 70 | 1089 | 0.001 | 530 | 14.135 | 0.000899537 | 25.47 | 0.054126113 | 1532.68 | 48.85 | 51.72 | 1/21/04 10:32 | 1817:37:50 | 1817:34:50 | 1817:25:15 | 42.63367885 |
| 9 | 68 | 1091 | 0.0003 | 528 | 14.161 | 0.000301534 | 8.54 | 0.054427647 | 1541.21 | 49.13 | 52.00 | 1/27/04 10:08 | 1961:13:50 | 1961:10:50 | 1961:01:15 | 44.28576277 |
| 23 | 70 | 1085 | 0.0008 | 530 | 14.083 | 0.000783458 | 21.82 | 0.055191104 | 1562.83 | 49.82 | 52.68 | 2/2/04 15:39 | 2110:44:50 | 2110:41:50 | 2110:32:15 | 45.94286911 |
| 10 | 71 | 1091 | 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 | 47.6822527 |
| 95 | 71 | 1091 | 0.0003 | 531 | 14.161 | 0.000316488 | 8.96 | 0.055840737 | 1581.23 | 50.40 | 53.27 | 2/16/04 14:20 | 2445:25:50 | 2445:22:50 | 2445:13:15 | 49.45129478 |
| 21 | 70 | 1086 | 0.0007 | 530 | 14.096 | 0.000697712 | 19.76 | 0.05653845 | 1600.98 | 51.03 | 53.90 | 2/23/04 14:28 | 2613:33:50 | 2613:30:50 | 2613:21:15 | 51.12302699 |
| 8 | 72 | 1091 | 0.0003 | 532 | 14.161 | 0.000266015 | 7.53 | 0.056804485 | 1608.52 | 51.27 | 54.14 | 3/2/04 10:44 | 2801:49:50 | 2801:46:50 | 2801:37:15 | 52.93232052 |
| 12 | 71 | 1088 | 0.0004 | 531 | 14.122 | 0.000398675 | 11.29 | 0.05720314 | 1619.81 | 51.63 | 54.50 | 3/8/04 10:02 | 2945:07:50 | 2945:04:50 | 2944:55:15 | 54.26905707 |
| 20 | 70 | 1082 | 0.0007 | 530 | 14.044 | 0.000662041 | 18.75 | 0.05786518 | 1638.55 | 52.23 | 55.10 | 3/15/04 11:35 | 3114:40:50 | 3114:37:50 | 3114:28:15 | 55.8093232 |
| -4 | 72 | 1097 | -0.0001 | 532 | 14.239 | -0.000133739 | -3.79 | 0.057731441 | 1634.77 | 52.11 | 54.98 | 3/22/04 9:59 | 3281:04:50 | 3281:01:50 | 3280:52:15 | 57.28071714 |
| 7 | 70 | 1088 | 0.0002 | 530 | 14.122 | 0.000232999 | 6.60 | 0.05798444 | 1641.36 | 52.32 | 55.19 | 3/30/04 20:31 | 3483:36:50 | 3483:33:50 | 3483:24:15 | 59.02214744 |
| 18 | 70 | 1080 | 0.0006 | 530 | 14.018 | 0.000594735 | 16.84 | 0.058559176 | 1658.20 | 52.88 | 55.72 | 4/6/04 14:41 | 3645:46:50 | 3645:43:50 | 3645:34:15 | 60.3802994 |
| -8 | 68 | 1086 | -0.0002 | 528 | 14.096 | -0.000200102 | -5.67 | 0.058359074 | 1652.54 | 52.67 | 55.54 | 4/12/04 15:00 | 3790:05:50 | 3790:02:50 | 3789:53:15 | 61.5837855 |
| 4 | 69 | 1088 | 0.0001 | 529 | 14.122 | 0.000133394 | 3.78 | 0.058492468 | 1656.32 | 52.80 | 55.86 | 4/19/04 14:26 | 3957:31:50 | 3957:28:50 | 3957:19:15 | 62.90690681 |
| 9 | 71 | 1090 | 0.0003 | 531 | 14.148 | 0.000299556 | 8.48 | 0.058792024 | 1664.80 | 53.07 | 55.93 | 4/26/04 11:32 | 4122:37:50 | 4122:34:50 | 4122:25:15 | 64.20771414 |
| 6 | 70 | 1084 | 0.0002 | 530 | 14.070 | 0.000198979 | 5.63 | 0.058991003 | 1670.43 | 53.25 | 56.11 | 5/3/04 19:05 | 4298:10:50 | 4298:07:50 | 4297:58:15 | 65.58051084 |
| 28 | 75 | 1081 | 0.001 | 535 | 14.031 | 0.000917346 | 25.98 | 0.059908349 | 1696.41 | 54.07 | 56.94 | 5/10/04 14:00 | 4461:05:50 | 4461:02:50 | 4460:53:15 | 66.79144573 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 73 | 1082 | 0.0001 | 533 | 14.044 | 9.87471E-05 | 2.80 | 0.060007096 | 1899.21 | 54.16 | 57.03 | 5/17/04 | 9:44 | 4824:49:50 | 4824:46:50 | 4824:37:15 | 88.00610675 |
| 14 | 73 | 1075 | 0.0005 | 533 | 13.953 | 0.000457839 | 12.96 | 0.060484935 | 1712.17 | 54.58 | 57.44 | 5/24/04 | 10:31 | 4793:36:50 | 4793:33:50 | 4793:24:15 | 89.23592918 |
| -1 | 70 | 1077 | -4E-05 | 530 | 13.979 | -3.29491E-05 | -0.93 | 0.060431988 | 1711.24 | 54.55 | 57.41 | 6/1/04 | 10:54 | 4985:59:50 | 4985:56:50 | 4985:47:15 | 70.81159411 |
| 9 | 72 | 1076 | 0.0003 | 532 | 13.966 | 0.000295152 | 8.38 | 0.060727138 | 1719.59 | 54.81 | 57.88 | 6/7/04 | 10:35 | 5129:40:50 | 5129:37:50 | 5129:28:15 | 71.62176627 |
| 14 | 78 | 1078 | 0.0005 | 536 | 13.992 | 0.000456547 | 12.93 | 0.061163885 | 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 | -0.000184579 | -4.66 | 0.061019108 | 1727.86 | 55.08 | 57.94 | 6/23/04 | 18:24 | 5519:29:50 | 5519:26:50 | 5519:17:15 | 74.29331883 |
| 0 | 73 | 1082 | 0 | 533 | 14.044 | 0 | 0.00 | 0.061019108 | 1727.86 | 55.08 | 57.94 | 7/1/04 | 13:51 | 5708:56:50 | 5708:53:50 | 5708:44:15 | 75.55757554 |

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

SAMPLE: 815.3' to 818.9' (Tebo coal) in canister 3

| | lbs. | grams | | lbs. | grams | moisture weight | est. lost gas (cc) = |
|---|---|---|---|---|---|---|---|
| dry sample weight: | 3.320 | 1505.80 | wet sample weight: | 3.391 | 1538.31 | 2.1% | 132 |

TIME OF:

| | | | | | |
|---|---|---|---|---|---|
| | off bottom | | at surface | | in canister |
| | 11/7/03 | 11:29 | 11/7/03 | 11:32 | 11/7/03 | 11:39 |

elapsed time (off bottom to canistering)
10.0 minutes
0.167 hours
0.408246290 SQRT (hrs)

| RIG/LAB MEASUREMENTS | | | CONVERSION OF RIG/LAB 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 | cubic ft | absolute T (F) | psia | cubic ft (@STP) | cc (@STP) | cubic ft | cc | without lost gas | with lost gas | TIME OF MEASURE | off bottom | at surface | in canister | SQRT hrs. (since off bottom) |
| 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 | 0.485912658 |
| 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 | 9.92672E-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 | 0.001358925 | 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 | 9.92672E-05 | 2.81 | 0.001458212 | 41.24 | 0.88 | 3.69 | 11/7/03 11:45 | 0:16:10 | 0:12:55 | 0:06:10 | 0.519060384 |
| 4 | 75 | 1092 | 0.0001 | 535 | 14.174 | 0.000132383 | 3.75 | 0.001588595 | 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 | 0.000132138 | 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 | 0.000297308 | 8.42 | 0.002117139 | 59.95 | 1.28 | 4.08 | 11/7/03 11:50 | 0:20:40 | 0:17:25 | 0:10:40 | 0.586893695 |
| 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 | 4.58 | 11/7/03 11:55 | 0:25:40 | 0:22:25 | 0:15:40 | 0.654047229 |
| 15 | 75 | 1093 | 0.0005 | 535 | 14.187 | 0.000496891 | 14.07 | 0.003406848 | 96.47 | 2.05 | 4.88 | 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 | 26.26 | 0.005228778 | 148.08 | 3.15 | 5.98 | 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 | 3.65 | 6.48 | 11/7/03 12:30 | 1:00:40 | 0:57:25 | 0:50:40 | 1.005540209 |
| 54 | 74 | 1092 | 0.0019 | 534 | 14.174 | 0.001790517 | 50.70 | 0.007848236 | 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 | 0.001627778 | 46.09 | 0.009476014 | 268.33 | 5.71 | 8.52 | 11/7/03 13:30 | 2:00:40 | 1:57:25 | 1:50:40 | 1.418136492 |
| 45 | 73 | 1091 | 0.0016 | 533 | 14.161 | 0.001493526 | 42.29 | 0.010969542 | 310.62 | 6.61 | 9.42 | 11/7/03 14:08 | 2:36:40 | 2:33:25 | 2:26:40 | 1.615893286 |
| 38 | 73 | 1091 | 0.0013 | 533 | 14.161 | 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 | 14.161 | 0.000796548 | 22.56 | 0.013027291 | 368.89 | 7.85 | 10.68 | 11/7/03 15:00 | 3:30:40 | 3:27:25 | 3:20:40 | 1.87379591 |
| 58 | 73 | 1092 | 0.002 | 533 | 14.174 | 0.001926758 | 54.58 | 0.014954048 | 423.45 | 9.01 | 11.82 | 11/7/03 16:01 | 4:31:40 | 4:28:25 | 4:21:40 | 2.127857558 |
| 39 | 73 | 1092 | 0.0014 | 533 | 14.174 | 0.001295577 | 36.69 | 0.016249823 | 460.14 | 9.79 | 12.60 | 11/7/03 17:00 | 5:30:40 | 5:27:25 | 5:20:40 | 2.347575582 |
| 58 | 74 | 1097 | 0.002 | 534 | 14.239 | 0.001885334 | 52.62 | 0.018114957 | 512.98 | 10.91 | 13.72 | 11/7/03 18:48 | 7:18:40 | 7:15:25 | 7:08:40 | 2.703908639 |
| 128 | 72 | 1098 | 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 | 3.386151486 |
| 135 | 72 | 1100 | 0.0048 | 532 | 14.278 | 0.004526036 | 128.18 | 0.028924544 | 782.42 | 16.22 | 19.03 | 11/8/03 6:25 | 18:55:40 | 18:52:25 | 18:45:40 | 4.350806599 |
| 169 | 69 | 1101 | 0.006 | 529 | 14.291 | 0.005703239 | 161.50 | 0.032827783 | 923.91 | 19.66 | 22.47 | 11/8/03 19:09 | 31:39:40 | 31:36:25 | 31:29:40 | 5.626820893 |
| 107 | 74 | 1100 | 0.0038 | 534 | 14.278 | 0.003573867 | 101.20 | 0.03620185 | 1025.11 | 21.81 | 24.62 | 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 | 0.037607106 | 1064.91 | 22.66 | 25.47 | 11/9/03 5:49 | 42:19:40 | 42:16:25 | 42:09:40 | 6.505980155 |
| 182 | 73 | 1100 | 0.0064 | 533 | 14.278 | 0.006090319 | 172.48 | 0.043897428 | 1237.37 | 26.33 | 29.13 | 11/9/03 22:34 | 59:04:40 | 59:01:25 | 58:54:40 | 7.886206983 |
| 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 | 68:39:25 | 68:32:40 | 8.289216556 |
| 27 | 75 | 1087 | 0.001 | 535 | 14.109 | 0.000889493 | 25.19 | 0.047333887 | 1340.34 | 28.52 | 31.33 | 11/10/03 10:51 | 71:21:40 | 71:18:25 | 71:11:40 | 8.447550598 |
| 141 | 77 | 1080 | 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 | 0.0583296 | 1595.07 | 33.94 | 38.74 | 11/12/03 14:28 | 122:58:40 | 122:55:25 | 122:48:40 | 11.08953461 |
| 145 | 75 | 1095 | 0.0051 | 535 | 14.213 | 0.004612066 | 138.28 | 0.061141665 | 1731.33 | 36.84 | 39.64 | 11/13/03 19:38 | 152:08:40 | 152:03:25 | 151:56:40 | 12.33333333 |
| 178 | 75 | 1077 | 0.0062 | 535 | 13.979 | 0.005744838 | 162.66 | 0.066666503 | 1894.01 | 40.30 | 43.10 | 11/15/03 13:27 | 193:57:40 | 193:54:25 | 193:47:40 | 13.92699218 |
| 192 | 76 | 1089 | 0.0068 | 536 | 13.875 | 0.006208938 | 175.82 | 0.073095442 | 2089.82 | 44.04 | 46.85 | 11/17/03 18:13 | 244:43:40 | 244:40:25 | 244:33:40 | 15.64377761 |
| 269 | 72 | 1078 | 0.0095 | 532 | 13.992 | 0.008636175 | 250.27 | 0.081933617 | 2320.09 | 49.36 | 52.17 | 11/21/03 10:33 | 335:03:40 | 335:00:25 | 334:53:40 | 18.30487457 |
| 84 | 72 | 1086 | 0.003 | 532 | 14.096 | 0.002760358 | 78.73 | 0.084713975 | 2398.82 | 51.04 | 53.85 | 11/24/03 14:03 | 410:33:40 | 410:30:25 | 410:23:40 | 20.28230785 |
| 109 | 75 | 1073 | 0.0038 | 535 | 13.927 | 0.003544669 | 100.37 | 0.088258644 | 2499.20 | 53.17 | 55.98 | 11/26/03 15:37 | 460:07:40 | 460:04:25 | 459:57:40 | 21.45058922 |
| 158 | 73 | 1090 | 0.0056 | 533 | 14.148 | 0.005239135 | 148.36 | 0.093497778 | 2647.55 | 56.33 | 59.14 | 12/4/03 19:41 | 658:11:40 | 658:08:25 | 658:01:40 | 25.81629258 |
| 161 | 75 | 1083 | 0.0057 | 535 | 14.057 | 0.005264498 | 149.64 | 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 | 0.105581179 | 2989.15 | 63.60 | 66.40 | 12/18/03 14:17 | 936:47:40 | 936:44:25 | 936:37:40 | 30.63975266 |
| 117 | 71 | 1081 | 0.0041 | 531 | 14.031 | 0.003862071 | 109.36 | 0.10942325 | 3098.51 | 65.92 | 68.73 | 12/22/03 18:04 | 1084:34:40 | 1084:31:25 | 1084:24:40 | 32.93292847 |
| 75 | 72 | 1082 | 0.0026 | 532 | 14.044 | 0.002473319 | 70.04 | 0.111898589 | 3168.55 | 67.41 | 70.22 | 12/29/03 14:29 | 1250:59:40 | 1250:56:25 | 1250:49:40 | 35.38939983 |
| 21 | 70 | 1103 | 0.0007 | 530 | 14.318 | 0.000706834 | 20.07 | 0.112605203 | 3188.61 | 67.84 | 70.85 | 1/6/04 15:07 | 1443:37:40 | 1443:34:25 | 1443:27:40 | 37.99510202 |
| 77 | 71 | 1093 | 0.0027 | 531 | 14.187 | 0.00256992 | 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 | 0.117973882 | 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 | 36.05 | 0.119246827 | 3376.68 | 71.84 | 74.85 | 1/27/04 10:08 | 1942:38:40 | 1942:35:25 | 1942:28:40 | 44.07544038 |
| 59 | 70 | 1085 | 0.0021 | 530 | 14.083 | 0.001956435 | 55.48 | 0.121205281 | 3432.14 | 73.02 | 75.83 | 2/2/04 15:39 | 2092:09:40 | 2092:08:25 | 2091:59:40 | 45.74014789 |
| 34 | 71 | 1091 | 0.0012 | 531 | 14.161 | 0.001132893 | 32.07 | 0.122337955 | 3464.21 | 73.70 | 78.51 | 2/9/04 10:31 | 2255:01:40 | 2254:58:25 | 2254:51:40 | 47.48713276 |
| 2 | 71 | 1091 | 7E-05 | 531 | 14.161 | 6.6829E-05 | 1.89 | 0.122404584 | 3466.10 | 73.74 | 78.55 | 2/18/04 14:21 | 2426:51:40 | 2426:48:25 | 2426:41:40 | 49.26318211 |
| 48 | 70 | 1086 | 0.0017 | 530 | 14.096 | 0.001594771 | 45.18 | 0.123999355 | 3511.28 | 74.70 | 77.51 | 2/23/04 14:28 | 2594:58:40 | 2594:55:25 | 2594:48:40 | 50.94092439 |
| 34 | 71 | 1091 | 0.0012 | 531 | 14.161 | 0.001132893 | 32.07 | 0.125132048 | 3543.33 | 75.39 | 78.20 | 3/2/04 10:44 | 2783:14:40 | 2783:11:25 | 2783:04:40 | 52.75848353 |
| 36 | 71 | 1088 | 0.0013 | 531 | 14.122 | 0.001196025 | 33.87 | 0.126328073 | 3577.20 | 76.11 | 78.92 | 3/8/04 10:02 | 2926:32:40 | 2926:29:25 | 2926:22:40 | 54.09754584 |
| 48 | 70 | 1082 | 0.0016 | 530 | 14.044 | 0.001522893 | 43.12 | 0.127850788 | 3620.32 | 77.03 | 79.83 | 3/15/04 11:38 | 3098:08:40 | 3098:03:25 | 3095:58:40 | 55.84270942 |
| 27 | 72 | 1097 | 0.001 | 532 | 14.239 | 0.000902739 | 25.56 | 0.128753505 | 3645.88 | 77.57 | 80.38 | 3/22/04 10:00 | 3282:30:40 | 3282:27:25 | 3282:20:40 | 57.11839556 |
| 52 | 70 | 1088 | 0.0018 | 530 | 14.122 | 0.001730851 | 49.01 | 0.130484355 | 3694.89 | 78.61 | 81.42 | 3/30/04 20:32 | 3485:02:40 | 3464:59:25 | 3464:52:40 | 58.86462813 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64 | 70 | 1080 | 0.0023 | 530 | 14.016 | 0.002114614 | 59.66 | 0.132598969 | 3754.77 | 79.89 | 82.69 | 4/6/04 | 14:41 | 3827:11:40 | 3827:08:25 | 3827:01:40 | 80.22619401 |
| 11 | 68 | 1086 | 0.0004 | 528 | 14.098 | 0.000388653 | 10.39 | 0.132965822 | 3765.18 | 80.11 | 82.92 | 4/12/04 | 15:00 | 3771:30:40 | 3771:27:25 | 3771:20:40 | 61.4126299 |
| 36 | 69 | 1088 | 0.0013 | 529 | 14.122 | 0.001200546 | 34.00 | 0.134188388 | 3799.15 | 80.83 | 83.84 | 4/19/04 | 14:28 | 3938:58:40 | 3938:53:25 | 3938:48:40 | 62.76101054 |
| 38 | 71 | 1090 | 0.0013 | 531 | 14.146 | 0.001264791 | 35.61 | 0.135431159 | 3834.97 | 81.59 | 84.40 | 4/26/04 | 11:33 | 4104:03:40 | 4104:00:25 | 4103:53:40 | 64.08294648 |
| 32 | 70 | 1084 | 0.0011 | 530 | 14.070 | 0.001061223 | 30.05 | 0.136492382 | 3865.02 | 82.23 | 85.04 | 5/3/04 | 19:08 | 4279:38:40 | 4279:33:25 | 4279:28:40 | 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 | 66.65241514 |
| 22 | 73 | 1082 | 0.0008 | 533 | 14.044 | 0.000724148 | 20.51 | 0.139739229 | 3956.96 | 84.19 | 87.00 | 5/17/04 | 9:45 | 4606:15:40 | 4606:12:25 | 4606:05:40 | 67.88944168 |
| 44 | 73 | 1075 | 0.0016 | 533 | 13.953 | 0.001438922 | 40.75 | 0.141178151 | 3997.70 | 85.05 | 87.88 | 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 | 0.141342898 | 4002.37 | 85.15 | 87.96 | 6/1/04 | 10:54 | 4987:24:40 | 4987:21:25 | 4987:14:40 | 70.47986318 |
| 25 | 72 | 1078 | 0.0009 | 532 | 13.966 | 0.000619886 | 23.22 | 0.142162784 | 4025.59 | 85.65 | 88.48 | 6/7/04 | 10:36 | 5111:06:40 | 5111:03:25 | 5110:56:40 | 71.4920353 |
| 37 | 76 | 1078 | 0.0013 | 536 | 13.992 | 0.001208586 | 34.17 | 0.143369352 | 4059.75 | 86.37 | 89.18 | 6/14/04 | 10:49 | 5279:19:40 | 5279:18:25 | 5279:09:40 | 72.65898277 |
| -4 | 73 | 1082 | -0.0001 | 533 | 14.044 | -0.000131683 | -3.73 | 0.143237669 | 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 | 5888:20:40 | 5888:17:25 | 5888:10:40 | 75.42111405 |
| 8 | 74 | 1081 | 0.0003 | 534 | 14.031 | 0.00026259 | 7.44 | 0.143897773 | 4089.05 | 86.57 | 89.38 | 7/7/04 | 10:31 | 5831:01:40 | 5830:58:25 | 5830:51:40 | 76.38116869 |
| 11 | 75 | 1082 | 0.0004 | 535 | 14.044 | 0.000380719 | 10.21 | 0.144058492 | 4079.27 | 86.79 | 89.60 | 7/13/04 | 14:19 | 5978:49:40 | 5978:46:25 | 5978:39:40 | 77.32286004 |
| 9 | 73 | 1080 | 0.0003 | 533 | 14.016 | 0.000295894 | 8.37 | 0.144354188 | 4087.64 | 86.97 | 89.78 | 7/19/04 | 11:22 | 6119:52:40 | 6119:49:25 | 6119:42:40 | 78.22964789 |
| -13 | 72 | 1091 | -0.0005 | 532 | 14.161 | -0.000432275 | -12.24 | 0.143921911 | 4075.40 | 86.71 | 89.52 | 7/28/04 | 10:23 | 6286:53:40 | 6286:50:25 | 6286:43:40 | 79.28993911 |
| 27 | 73 | 1079 | 0.001 | 533 | 14.005 | 0.00088628 | 25.10 | 0.144808171 | 4100.50 | 87.24 | 90.05 | 8/2/04 | 14:42 | 6459:12:40 | 6459:09:25 | 6459:02:40 | 80.38921743 |
| -2 | 73 | 1086 | -7E-05 | 533 | 14.098 | -6.60748E-05 | -1.87 | 0.144742097 | 4098.62 | 87.20 | 90.01 | 8/9/04 | 13:59 | 6628:29:40 | 6628:26:25 | 6628:19:40 | 81.40328276 |
| -3 | 73 | 1088 | -0.0001 | 533 | 14.122 | -9.92947E-05 | -2.81 | 0.144642802 | 4095.81 | 87.14 | 89.95 | 8/18/04 | 11:05 | 6791:35:40 | 6791:32:25 | 6791:25:40 | 82.41113059 |

DECANISTERED 8/18/2004; sample dried for 14 days in air

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

| | lbs. | grams | | lbs. | grams | moisture % | | est. lost gas (cc) = |
|---|---|---|---|---|---|---|---|---|
| dry sample weight: | 2.801 | 1179.59 | wet sample weight: | 2.676 | 1213.65 | 2.8% | | 165 |

TIME OF:

| | off bottom | at surface | in canister |
|---|---|---|---|
| | 11/8/03 10:48 | 11/8/03 10:52 | 11/8/03 11:02 |

elapsed time (off bottom to canistering)

13.1 minutes
0.218 hours
0.466984191 SQRT (hrs)

| RIG/LAB MEASUREMENTS | | | CONVERSION OF RIG/LAB 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 | cubic ft | absolute T (F) | psia | cubic ft (@STP) | cc (@STP) | cubic ft | cc | without lost gas | with lost gas | TIME OF MEASURE | off bottom | at surface | in canister | SQRT hrs. (since off bottom) |
| 30 | 69 | 1097 | 0.0011 | 529 | 14.239 | 0.001008731 | | 28.58 | 0.001008731 | 28.58 | 0.78 | 5.26 | 11/8/03 11:07 | 0:18:25 | 0:14:30 | 0:05:20 | 0.554025871 |
| 5 | 69 | 1097 | 0.0002 | 529 | 14.239 | 0.000168122 | | 4.76 | 0.001178853 | 33.32 | 0.91 | 5.39 | 11/8/03 11:08 | 0:19:05 | 0:15:10 | 0:08:00 | 0.563984144 |
| 4 | 69 | 1097 | 0.0001 | 529 | 14.239 | 0.000134497 | | 3.81 | 0.00131135 | 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 | | 1.90 | 0.001378599 | 39.04 | 1.06 | 5.54 | 11/8/03 11:09 | 0:20:05 | 0:16:10 | 0:07:00 | 0.578551832 |
| 5 | 69 | 1097 | 0.0002 | 529 | 14.239 | 0.000168122 | | 4.76 | 0.001546721 | 43.80 | 1.19 | 5.87 | 11/8/03 11:10 | 0:21:05 | 0:17:10 | 0:08:00 | 0.592780642 |
| 4 | 69 | 1097 | 0.0001 | 529 | 14.239 | 0.000134497 | | 3.81 | 0.001681219 | 47.81 | 1.29 | 5.77 | 11/8/03 11:11 | 0:22:05 | 0:18:10 | 0:09:00 | 0.606675624 |
| 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 | 69 | 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 | 0.659334881 |
| 54 | 69 | 1098 | 0.0019 | 529 | 14.252 | 0.001817371 | | 51.46 | 0.004070204 | 115.25 | 3.13 | 7.81 | 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 | 0:56:05 | 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 | | 91.08 | 0.011481102 | 325.11 | 8.83 | 13.31 | 11/8/03 12:50 | 2:01:05 | 1:57:10 | 1:48:00 | 1.420562622 |
| 80 | 72 | 1096 | 0.0028 | 532 | 14.226 | 0.002672342 | | 75.67 | 0.014153444 | 400.76 | 10.88 | 15.37 | 11/8/03 13:20 | 2:31:05 | 2:27:10 | 2:18:00 | 1.586836226 |
| 78 | 73 | 1095 | 0.0027 | 533 | 14.213 | 0.00253185 | | 71.89 | 0.016685094 | 472.47 | 12.83 | 17.31 | 11/8/03 14:05 | 3:16:05 | 3:12:10 | 3:03:00 | 1.807778412 |
| 78 | 73 | 1095 | 0.0027 | 533 | 14.213 | 0.00253185 | | 71.89 | 0.019216745 | 544.18 | 14.78 | 19.28 | 11/8/03 15:08 | 4:19:05 | 4:15:10 | 4:06:00 | 2.077993156 |
| 68 | 75 | 1095 | 0.0023 | 535 | 14.213 | 0.00219032 | | 62.02 | 0.021407084 | 606.18 | 16.48 | 20.94 | 11/8/03 16:10 | 5:21:05 | 5:17:10 | 5:08:00 | 2.313308916 |
| 69 | 74 | 1096 | 0.0024 | 534 | 14.226 | 0.002298263 | | 65.02 | 0.023703327 | 671.20 | 18.23 | 22.71 | 11/8/03 17:40 | 8:51:05 | 8:47:10 | 8:38:00 | 2.617515786 |
| 48 | 75 | 1101 | 0.0017 | 535 | 14.291 | 0.001801888 | | 45.35 | 0.025305015 | 718.58 | 19.46 | 23.94 | 11/8/03 19:10 | 8:21:05 | 8:17:10 | 8:08:00 | 2.889878966 |
| 223 | 74 | 1100 | 0.0079 | 534 | 14.276 | 0.00744834 | | 210.91 | 0.032753355 | 927.47 | 25.19 | 29.67 | 11/9/03 2:26 | 15:39:05 | 15:35:10 | 15:26:00 | 3.958183827 |
| 77 | 73 | 1100 | 0.0027 | 533 | 14.276 | 0.002578874 | | 72.98 | 0.035330029 | 1000.43 | 27.17 | 31.65 | 11/9/03 5:49 | 19:00:05 | 18:56:10 | 18:47:00 | 4.359058257 |
| 304 | 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 | 5.986211007 |
| 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 | 1088 | 0.0013 | 535 | 14.098 | 0.001217614 | | 34.48 | 0.050529307 | 1430.83 | 38.86 | 43.34 | 11/10/03 10:54 | 48:05:05 | 48:01:10 | 47:52:00 | 6.934314834 |
| 183 | 77 | 1080 | 0.0065 | 537 | 14.016 | 0.005967658 | | 168.98 | 0.056496963 | 1599.81 | 43.45 | 47.93 | 11/11/03 9:36 | 70:49:05 | 70:45:10 | 70:36:00 | 8.415348431 |
| 130 | 75 | 1091 | 0.0046 | 535 | 14.161 | 0.004296506 | | 121.72 | 0.060795469 | 1721.53 | 46.76 | 51.24 | 11/12/03 14:30 | 99:41:05 | 99:37:10 | 99:28:00 | 9.984223868 |
| 116 | 75 | 1095 | 0.0041 | 535 | 14.213 | 0.003849853 | | 109.01 | 0.064645121 | 1830.54 | 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 | 13.979 | 0.005365788 | | 152.51 | 0.070030907 | 1983.05 | 53.86 | 58.34 | 11/15/03 13:29 | 170:40:05 | 170:36:10 | 170:27:00 | 13.06399845 |
| 155 | 75 | 1069 | 0.0055 | 535 | 13.875 | 0.005021793 | | 142.20 | 0.0750527 | 2125.25 | 57.72 | 62.20 | 11/17/03 18:18 | 221:27:05 | 221:23:10 | 221:14:00 | 14.88124285 |
| 166 | 74 | 1078 | 0.0059 | 534 | 13.992 | 0.005433814 | | 153.86 | 0.080488314 | 2279.11 | 61.90 | 66.36 | 11/21/03 11:21 | 312:32:05 | 312:28:10 | 312:19:00 | 17.8786516 |
| 119 | 76 | 1088 | 0.0042 | 536 | 14.098 | 0.003909446 | | 110.70 | 0.08439578 | 2389.81 | 64.91 | 69.39 | 11/24/03 14:02 | 387:13:05 | 387:09:10 | 387:00:00 | 19.67785699 |
| 116 | 74 | 1073 | 0.0042 | 534 | 13.927 | 0.003844534 | | 106.86 | 0.088240294 | 2498.68 | 67.86 | 72.34 | 11/28/03 15:38 | 436:49:05 | 436:45:10 | 436:36:00 | 20.90019272 |
| 134 | 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 | 632:42:00 | 25.1578627 |
| 132 | 74 | 1083 | 0.0047 | 534 | 14.057 | 0.004340746 | | 122.92 | 0.097007746 | 2746.94 | 74.61 | 79.09 | 12/10/03 14:55 | 772:06:05 | 772:02:10 | 771:53:00 | 27.78671245 |
| 89 | 76 | 1087 | 0.0031 | 536 | 14.109 | 0.002926584 | | 82.87 | 0.09993431 | 2829.81 | 76.86 | 81.34 | 12/18/03 14:19 | 915:30:05 | 915:26:10 | 915:17:00 | 30.25725349 |
| 94 | 73 | 1081 | 0.0033 | 533 | 14.031 | 0.003091217 | | 87.53 | 0.103025527 | 2917.35 | 79.23 | 83.71 | 12/22/03 18:06 | 1061:17:05 | 1061:13:10 | 1061:04:00 | 32.57736518 |
| 78 | 75 | 1082 | 0.0028 | 535 | 14.044 | 0.002557626 | | 72.43 | 0.105583355 | 2989.78 | 81.20 | 85.68 | 12/29/03 14:30 | 1227:41:05 | 1227:37:10 | 1227:28:00 | 35.03833216 |
| 35 | 74 | 1103 | 0.0012 | 534 | 14.316 | 0.00117221 | | 33.19 | 0.106755585 | 3022.97 | 82.10 | 86.58 | 1/6/04 15:09 | 1420:20:05 | 1420:16:10 | 1420:07:00 | 37.6873284 |
| 80 | 75 | 1093 | 0.0028 | 535 | 14.187 | 0.002650084 | | 75.04 | 0.109405849 | 3098.01 | 84.14 | 88.62 | 1/12/04 11:43 | 1580:54:05 | 1580:50:10 | 1580:41:00 | 39.50824457 |
| 90 | 75 | 1089 | 0.0032 | 535 | 14.135 | 0.002970433 | | 84.11 | 0.112378082 | 3182.12 | 86.42 | 90.91 | 1/21/04 10:33 | 1775:44:05 | 1775:40:10 | 1775:31:00 | 42.13946751 |
| 54 | 71 | 1091 | 0.0019 | 531 | 14.161 | 0.001796984 | | 50.94 | 0.114175066 | 3233.07 | 87.81 | 92.29 | 1/27/04 10:09 | 1919:20:05 | 1919:16:10 | 1919:07:00 | 43.81021253 |
| 63 | 75 | 1085 | 0.0022 | 535 | 14.083 | 0.002071868 | | 58.68 | 0.116248731 | 3291.73 | 89.40 | 93.88 | 2/2/04 15:40 | 2066:51:05 | 2066:47:10 | 2066:38:00 | 45.48462605 |
| 30 | 75 | 1091 | 0.0011 | 535 | 14.161 | 0.000991983 | | 28.09 | 0.117238694 | 3319.82 | 90.16 | 94.85 | 2/9/04 10:32 | 2231:43:05 | 2231:39:10 | 2231:30:00 | 47.24106323 |
| 36 | 75 | 1091 | 0.0013 | 535 | 14.161 | 0.001190355 | | 33.71 | 0.11842905 | 3353.52 | 91.08 | 95.56 | 2/16/04 14:21 | 2403:32:05 | 2403:28:10 | 2403:19:00 | 49.02585769 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55 | 74 | 1088 | 0.0019 | 534 | 14.098 | 0.001813854 | 51.36 | 0.120242704 | 3404.88 | 92.47 | 98.98 | 2/23/04 | 14:29 | 2571:40:05 | 2571:36:10 | 2571:27:00 | 50.71181657 |
| 43 | 75 | 1091 | 0.0015 | 535 | 14.161 | 0.001421813 | 40.28 | 0.121884517 | 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 | 0.0018 | 535 | 14.122 | 0.001450878 | 41.08 | 0.123115398 | 3488.23 | 94.88 | 99.17 | 3/8/04 | 10:03 | 2903:14:05 | 2903:10:10 | 2903:01:00 | 53.86187334 |
| 58 | 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 | 10.36 | 0.125320944 | 3548.68 | 96.36 | 100.88 | 3/22/04 | 10:02 | 3239:13:05 | 3239:09:10 | 3239:00:00 | 56.91412879 |
| 32 | 75 | 1088 | 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 | 58.88629971 |
| 53 | 75 | 1080 | 0.0019 | 535 | 14.018 | 0.001734799 | 49.12 | 0.128110927 | 3627.68 | 98.53 | 103.01 | 4/8/04 | 14:42 | 3603:53:05 | 3603:49:10 | 3603:40:00 | 60.03236398 |
| 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 | 88 | 1088 | -0.0004 | 528 | 14.122 | -0.000334117 | -9.46 | 0.128007207 | 3624.75 | 98.45 | 102.93 | 4/19/04 | 14:28 | 3915:37:05 | 3915:33:10 | 3915:24:00 | 62.57489958 |
| 35 | 78 | 1090 | 0.0012 | 536 | 14.148 | 0.001154072 | 32.88 | 0.129161279 | 3857.43 | 99.33 | 103.82 | 4/26/04 | 11:33 | 4080:44:05 | 4080:40:10 | 4080:31:00 | 63.88082689 |
| 32 | 78 | 1084 | 0.0011 | 536 | 14.070 | 0.001049344 | 29.71 | 0.130210823 | 3887.14 | 100.14 | 104.82 | 5/3/04 | 19:07 | 4256:18:05 | 4256:14:10 | 4256:05:00 | 65.2403356 |
| 36 | 77 | 1081 | 0.0013 | 537 | 14.031 | 0.001240333 | 35.12 | 0.131450958 | 3722.28 | 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 | 536 | 14.044 | 0.000423927 | 12.00 | 0.131874883 | 3734.27 | 101.42 | 105.90 | 5/17/04 | 9:45 | 4582:58:05 | 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 | 4944:08:05 | 4944:02:10 | 4943:53:00 | 70.3143043 |
| 36 | 78 | 1078 | 0.0013 | 536 | 13.988 | 0.001167443 | 33.08 | 0.134084293 | 3796.83 | 103.12 | 107.80 | 6/7/04 | 10:38 | 5087:47:05 | 5087:43:10 | 5087:34:00 | 71.32870898 |
| -2 | 75 | 1078 | -7E-05 | 535 | 13.992 | -8.53429E-05 | -1.85 | 0.134018951 | 3794.98 | 103.07 | 107.55 | 6/14/04 | 10:50 | 5258:01:05 | 5255:57:10 | 5255:48:00 | 72.49840037 |
| 9 | 77 | 1082 | 0.0003 | 537 | 14.044 | 0.000294035 | 8.33 | 0.134312985 | 3803.31 | 103.30 | 107.78 | 8/23/04 | 18:25 | 5477:36:05 | 5477:32:10 | 5477:23:00 | 74.0106194 |
| 17 | 77 | 1082 | 0.0006 | 537 | 14.044 | 0.000555399 | 15.73 | 0.134868384 | 3819.03 | 103.72 | 108.20 | 7/1/04 | 11:53 | 5885:04:05 | 5885:00:10 | 5884:51:00 | 75.26884837 |
| 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 | 76.20649508 |
| 20 | 79 | 1082 | 0.0007 | 539 | 14.044 | 0.000650988 | 18.43 | 0.136234793 | 3857.73 | 104.77 | 109.28 | 7/13/04 | 14:20 | 5955:31:05 | 5955:27:10 | 5955:18:00 | 77.17200308 |
| -24 | 73 | 1080 | -0.0008 | 533 | 14.018 | -0.000788517 | -22.33 | 0.135446276 | 3835.40 | 104.17 | 108.85 | 7/19/04 | 11:22 | 6098:33:05 | 6098:29:10 | 6098:20:00 | 78.06041617 |
| 5 | 79 | 1091 | 0.0002 | 539 | 14.181 | 0.0001841 | 4.85 | 0.135810377 | 3840.04 | 104.29 | 108.77 | 7/28/04 | 10:23 | 6283:34:05 | 6283:30:10 | 6283:21:00 | 79.1427089 |
| 39 | 80 | 1079 | 0.0014 | 540 | 14.005 | 0.001263559 | 35.78 | 0.136873938 | 3875.82 | 105.27 | 109.75 | 8/2/04 | 14:43 | 6435:54:05 | 6435:50:10 | 6435:41:00 | 80.22406988 |
| 0 | 78 | 1086 | 0 | 538 | 14.098 | 0 | 0.00 | 0.136873938 | 3875.82 | 105.27 | 109.75 | 8/9/04 | 14:00 | 6603:11:05 | 6603:07:10 | 6602:58:00 | 81.25996229 |
| -5 | 78 | 1088 | -0.0002 | 538 | 14.122 | -0.000183953 | -4.84 | 0.136709982 | 3871.16 | 105.14 | 109.62 | 8/16/04 | 11:08 | 6788:17:05 | 6788:13:10 | 6788:04:00 | 82.28958585 |
| 18 | 75 | 1076 | 0.0006 | 535 | 13.966 | 0.000568995 | 16.62 | 0.137298977 | 3887.80 | 105.59 | 110.07 | 8/23/04 | 14:07 | 6939:18:05 | 6939:14:10 | 6939:05:00 | 83.30248928 |
| -25 | 73 | 1087 | -0.0009 | 533 | 14.109 | -0.000828695 | -23.41 | 0.136470282 | 3864.39 | 104.95 | 109.44 | 8/30/04 | 18:42 | 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 | 85.44836507 |
| 42 | 77 | 1073 | 0.0015 | 537 | 13.927 | 0.001380749 | 38.53 | 0.13885324 | 3931.87 | 106.79 | 111.27 | 9/14/04 | 18:37 | 7471:48:05 | 7471:44:10 | 7471:35:00 | 88.4395823 |
| -28 | 77 | 1083 | -0.001 | 537 | 14.057 | -0.00091582 | -25.93 | 0.13793782 | 3905.94 | 106.08 | 110.58 | 9/21/04 | 18:44 | 7837:55:05 | 7837:51:10 | 7837:42:00 | 87.39516325 |
| -9 | 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

| | lbs. | grams | | lbs. | grams | moisture % | | est. lost gas (cc) = |
|---|---|---|---|---|---|---|---|---|
| dry sample weight: | 2.448 | 1110.20 | wet sample weight: | 2.549 | 1156.25 | 4.0% | | 79 |

TIME OF:

| | | | |
|---|---|---|---|
| | off bottom | at surface | in canister |
| | 11/8/03 16:28 | 11/8/03 16:29 | 11/8/03 16:33 |

elapsed time (off bottom to canistering)
7.5 minutes
0.125 hours
0.353553391 SQRT (hrs)

| RIG/LAB MEASUREMENTS | | | CONVERSION OF RIG/LAB 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 | cubic ft | absolute T (F) | psia | cubic ft (@STP) | cc (@STP) | cubic ft | cc | without lost gas | with lost gas | TIME OF MEASURE | off bottom | at surface | in canister | SQRT hrs. (since off bottom) |
| 35 | 75 | 1096 | 0.0012 | 535 | 14.228 | 0.001162594 | | 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 | 1098 | 0.0002 | 535 | 14.228 | 0.000199302 | | 5.64 | 0.001361898 | 38.58 | 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 | 1096 | 0.0004 | 535 | 14.228 | 0.000365387 | | 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 | 1098 | 0.0002 | 535 | 14.228 | 0.000199302 | | 5.64 | 0.002159103 | 61.14 | 1.78 | 4.04 | 11/8/03 18:49 | 0:23:45 | 0:19:55 | 0:16:15 | 0.62915287 |
| 7 | 75 | 1096 | 0.0002 | 535 | 14.228 | 0.000232519 | | 6.58 | 0.002391822 | 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 | 0.688172982 |
| 10 | 75 | 1096 | 0.0004 | 535 | 14.228 | 0.00033217 | | 9.41 | 0.00295831 | 83.71 | 2.42 | 4.70 | 11/8/03 18:58 | 0:32:00 | 0:28:10 | 0:24:30 | 0.730298743 |
| 9 | 75 | 1098 | 0.0003 | 535 | 14.228 | 0.000298953 | | 8.47 | 0.003255283 | 92.18 | 2.66 | 4.94 | 11/8/03 17:01 | 0:35:00 | 0:31:10 | 0:27:30 | 0.763782818 |
| 9 | 75 | 1096 | 0.0003 | 535 | 14.228 | 0.000298953 | | 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 | 1098 | 0.0006 | 534 | 14.228 | 0.000599025 | | 16.96 | 0.004153241 | 117.61 | 3.39 | 5.67 | 11/8/03 17:13 | 0:47:00 | 0:43:10 | 0:39:30 | 0.865081203 |
| 11 | 74 | 1096 | 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 | 0.944261032 |
| 14 | 74 | 1098 | 0.0005 | 534 | 14.228 | 0.000465908 | | 13.19 | 0.00496522 | 141.17 | 4.07 | 6.35 | 11/8/03 17:28 | 1:00:30 | 0:56:40 | 0:53:00 | 1.004156022 |
| 14 | 74 | 1096 | 0.0005 | 534 | 14.228 | 0.000465908 | | 13.19 | 0.005451126 | 154.36 | 4.45 | 6.73 | 11/8/03 17:39 | 1:13:00 | 1:09:10 | 1:05:30 | 1.103026141 |
| 90 | 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 | 1100 | 0.0076 | 534 | 14.278 | 0.007161135 | | 203.35 | 0.015635429 | 442.74 | 12.78 | 15.08 | 11/9/03 2:22 | 9:58:00 | 9:52:10 | 9:48:30 | 3.151719108 |
| 81 | 73 | 1100 | 0.0022 | 533 | 14.278 | 0.002041261 | | 57.80 | 0.01787689 | 500.55 | 14.44 | 18.72 | 11/9/03 5:50 | 13:24:00 | 13:20:10 | 13:16:30 | 3.660601044 |
| 219 | 75 | 1092 | 0.0077 | 535 | 14.174 | 0.007247987 | | 205.24 | 0.024924858 | 705.79 | 20.37 | 22.85 | 11/9/03 22:44 | 30:18:00 | 30:14:10 | 30:10:30 | 5.504543578 |
| 80 | 75 | 1087 | 0.0028 | 535 | 14.109 | 0.002635536 | | 74.63 | 0.027580192 | 780.41 | 22.52 | 24.80 | 11/10/03 8:14 | 39:48:00 | 39:44:10 | 39:40:30 | 6.308724118 |
| 39 | 75 | 1086 | 0.0014 | 535 | 14.098 | 0.001263842 | | 36.35 | 0.028843834 | 816.78 | 23.57 | 25.85 | 11/10/03 10:55 | 42:29:00 | 42:25:10 | 42:21:30 | 6.517924005 |
| 138 | 77 | 1080 | 0.0049 | 537 | 14.018 | 0.004500199 | | 127.43 | 0.033344033 | 944.19 | 27.25 | 29.53 | 11/11/03 9:40 | 85:14:00 | 85:10:10 | 85:06:30 | 8.078715504 |
| 82 | 75 | 1091 | 0.0029 | 535 | 14.181 | 0.002711385 | | 76.78 | 0.036055399 | 1020.97 | 29.46 | 31.74 | 11/12/03 14:31 | 94:05:00 | 94:01:10 | 93:57:30 | 9.699858351 |
| 88 | 75 | 1095 | 0.0031 | 535 | 14.213 | 0.002920426 | | 82.70 | 0.038975825 | 1103.67 | 31.85 | 34.13 | 11/13/03 19:39 | 123:13:00 | 123:09:10 | 123:05:30 | 11.1003003 |
| 126 | 75 | 1077 | 0.0044 | 535 | 13.979 | 0.004112782 | | 116.48 | 0.043088807 | 1220.13 | 35.21 | 37.49 | 11/15/03 13:31 | 165:05:00 | 165:01:10 | 164:57:30 | 12.84847591 |
| 109 | 75 | 1069 | 0.0038 | 535 | 13.875 | 0.003531455 | | 100.00 | 0.046820081 | 1320.13 | 38.09 | 40.37 | 11/17/03 18:17 | 215:51:00 | 215:47:10 | 215:43:30 | 14.69183447 |
| 88 | 74 | 1078 | 0.0024 | 534 | 13.992 | 0.002225818 | | 83.03 | 0.048845879 | 1383.18 | 39.91 | 42.19 | 11/21/03 10:17 | 305:51:00 | 305:47:10 | 305:43:30 | 17.48858769 |
| 92 | 76 | 1086 | 0.0032 | 536 | 14.098 | 0.003022429 | | 85.59 | 0.051868308 | 1468.74 | 42.36 | 44.86 | 11/24/03 14:01 | 381:35:00 | 381:31:10 | 381:27:30 | 19.53415812 |
| 15 | 74 | 1073 | 0.0005 | 534 | 13.927 | 0.000466712 | | 13.84 | 0.05235702 | 1482.58 | 42.76 | 45.08 | 11/28/03 15:43 | 431:17:00 | 431:13:10 | 431:09:30 | 20.78738221 |
| 153 | 75 | 1095 | 0.0054 | 535 | 14.213 | 0.005077559 | | 143.78 | 0.057434579 | 1626.36 | 46.93 | 49.21 | 12/5/03 11:47 | 843:21:00 | 843:17:10 | 843:13:30 | 25.38434505 |
| 89 | 70 | 1083 | 0.0031 | 530 | 14.057 | 0.002948803 | | 83.50 | 0.060383382 | 1709.86 | 49.34 | 51.62 | 12/10/03 14:57 | 788:31:00 | 788:27:10 | 788:23:30 | 27.8880374 |
| 134 | 76 | 1087 | 0.0047 | 536 | 14.109 | 0.004406287 | | 124.77 | 0.084789869 | 1834.63 | 52.94 | 55.22 | 12/18/03 14:20 | 909:54:00 | 909:50:10 | 909:46:30 | 30.18454873 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 77 | 75 | 1081 | 0.0027 | 535 | 14.031 | 0.002522701 | 71.43 | 0.08731237 | 1906.07 | 55.00 | 57.26 | 12/22/03 | 16:06 | 1055:40:00 | 1055:36:10 | 1055:32:30 | 32.4910244 |
| 82 | 73 | 1082 | 0.0029 | 533 | 14.044 | 0.002899066 | 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 | 14.316 | 0.001006637 | 28.50 | 0.071016095 | 2011.00 | 58.03 | 60.31 | 1/6/04 | 15:10 | 1414:44:00 | 1414:40:10 | 1414:36:30 | 37.61294104 |
| 77 | 75 | 1093 | 0.0027 | 535 | 14.167 | 0.002550705 | 72.23 | 0.073568601 | 2063.23 | 60.12 | 62.40 | 1/12/04 | 11:44 | 1555:16:00 | 1555:14:10 | 1555:10:30 | 39.437292 |
| 81 | 73 | 1089 | 0.0029 | 533 | 14.135 | 0.002683422 | 75.99 | 0.076252222 | 2159.21 | 62.31 | 64.59 | 1/21/04 | 10:33 | 1770:07:00 | 1770:03:10 | 1769:59:30 | 42.07275445 |
| 38 | 70 | 1091 | 0.0013 | 530 | 14.161 | 0.00126834 | 35.92 | 0.077520562 | 2195.13 | 63.34 | 65.62 | 1/27/04 | 10:09 | 1913:43:00 | 1913:39:10 | 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 | 2063:15:00 | 2063:11:10 | 2063:07:30 | 45.42301179 |
| 57 | 74 | 1091 | 0.002 | 534 | 14.161 | 0.001888259 | 53.47 | 0.082280428 | 2329.91 | 67.23 | 69.51 | 2/9/04 | 10:32 | 2226:08:00 | 2226:02:10 | 2225:56:30 | 47.1815642 |
| 52 | 75 | 1091 | 0.0018 | 535 | 14.161 | 0.001719402 | 48.89 | 0.08399983 | 2376.60 | 66.84 | 70.92 | 2/16/04 | 14:23 | 2397:57:00 | 2397:53:10 | 2397:49:30 | 48.98888786 |
| 51 | 75 | 1086 | 0.0018 | 535 | 14.096 | 0.001678609 | 47.53 | 0.085878439 | 2426.13 | 70.01 | 72.29 | 2/23/04 | 14:30 | 2566:04:00 | 2566:00:10 | 2565:56:30 | 50.6563586 |
| 33 | 75 | 1091 | 0.0012 | 535 | 14.161 | 0.001091159 | 30.90 | 0.086769598 | 2457.03 | 70.90 | 73.18 | 3/2/04 | 10:46 | 2754:20:00 | 2754:16:10 | 2754:12:30 | 52.48174286 |
| 44 | 75 | 1088 | 0.0016 | 535 | 14.122 | 0.001450878 | 41.06 | 0.088220476 | 2498.12 | 72.09 | 74.37 | 3/8/04 | 10:04 | 2897:36:00 | 2897:34:10 | 2897:30:30 | 53.82966964 |
| 51 | 74 | 1082 | 0.0018 | 534 | 14.044 | 0.001675556 | 47.45 | 0.089896034 | 2545.58 | 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 | 0.000165817 | 4.69 | 0.090061651 | 2550.25 | 73.59 | 75.87 | 3/22/04 | 10:03 | 3233:37:00 | 3233:33:10 | 3233:29:30 | 58.86469837 |
| 36 | 74 | 1088 | 0.0013 | 534 | 14.122 | 0.001169305 | 33.66 | 0.091250957 | 2583.93 | 74.56 | 76.84 | 3/30/04 | 20:33 | 3436:07:00 | 3436:03:10 | 3435:59:30 | 56.6183987 |
| 58 | 75 | 1080 | 0.002 | 535 | 14.018 | 0.001832995 | 51.90 | 0.093083951 | 2635.83 | 76.08 | 78.34 | 4/8/04 | 14:43 | 3598:17:00 | 3598:13:10 | 3598:09:30 | 59.98569274 |
| 5 | 74 | 1086 | 0.0002 | 534 | 14.096 | 0.000164676 | 4.67 | 0.093248629 | 2640.50 | 76.20 | 78.46 | 4/12/04 | 15:01 | 3742:35:00 | 3742:31:10 | 3742:27:30 | 61.17665877 |
| 43 | 77 | 1086 | 0.0015 | 537 | 14.122 | 0.001412623 | 40.00 | 0.094661452 | 2680.50 | 77.35 | 79.83 | 4/19/04 | 14:26 | 3910:02:00 | 3909:58:10 | 3909:54:30 | 62.53025934 |
| 19 | 76 | 1090 | 0.0007 | 536 | 14.148 | 0.000626496 | 17.74 | 0.095287948 | 2698.24 | 77.86 | 80.14 | 4/26/04 | 11:34 | 4075:08:00 | 4075:04:10 | 4075:00:30 | 63.63677101 |
| 32 | 74 | 1084 | 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 | 65.1975204 |
| 44 | 78 | 1081 | 0.0016 | 536 | 14.031 | 0.001438854 | 40.74 | 0.097780078 | 2768.81 | 79.90 | 82.18 | 5/10/04 | 14:02 | 4413:36:00 | 4413:32:10 | 4413:28:30 | 66.43493057 |
| 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 | 67.65588942 |
| 55 | 76 | 1075 | 0.0019 | 538 | 13.953 | 0.001781936 | 50.46 | 0.099693163 | 2822.99 | 81.46 | 83.74 | 5/24/04 | 10:32 | 4748:06:00 | 4746:02:10 | 4745:58:30 | 68.89194438 |
| 12 | 75 | 1077 | 0.0004 | 535 | 13.979 | 0.000391694 | 11.09 | 0.100084676 | 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 | 13.986 | 0.000781199 | 22.12 | 0.100866076 | 2856.20 | 82.42 | 84.70 | 6/7/04 | 10:37 | 5082:11:00 | 5082:07:10 | 5082:03:30 | 71.28943353 |
| 34 | 79 | 1078 | 0.0012 | 539 | 13.992 | 0.001102565 | 31.22 | 0.101968661 | 2887.42 | 83.32 | 85.60 | 8/14/04 | 10:50 | 5250:24:00 | 5250:20:10 | 5250:16:30 | 72.45984394 |
| -2 | 76 | 1082 | -7E-05 | 536 | 14.044 | -6.5463E-05 | -1.85 | 0.101903196 | 2885.57 | 83.27 | 85.55 | 6/23/04 | 16:28 | 5472:00:00 | 5471:56:10 | 5471:52:30 | 73.97298804 |
| 17 | 77 | 1082 | 0.0006 | 537 | 14.044 | 0.000555399 | 15.73 | 0.102458597 | 2901.29 | 83.72 | 86.00 | 7/1/04 | 11:55 | 5659:29:00 | 5659:25:10 | 5659:21:30 | 75.22953784 |
| 20 | 78 | 1081 | 0.0007 | 536 | 14.031 | 0.000651593 | 18.45 | 0.10311019 | 2919.74 | 84.26 | 88.53 | 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 |
| 18 | 75 | 1080 | 0.0006 | 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 | 78.04453657 |
| -9 | 76 | 1091 | -0.0003 | 536 | 14.161 | -0.000297034 | -8.41 | 0.104052954 | 2946.44 | 85.03 | 87.31 | 7/26/04 | 10:24 | 6257:58:00 | 6257:54:10 | 6257:50:30 | 79.10731108 |
| 38 | 77 | 1079 | 0.0013 | 537 | 14.005 | 0.001172676 | 33.21 | 0.105225632 | 2979.65 | 85.98 | 88.26 | 8/2/04 | 14:43 | 6430:17:00 | 6430:13:10 | 6430:09:30 | 80.16904748 |
| 2 | 78 | 1086 | 7E-05 | 536 | 14.096 | 6.54607E-05 | 1.65 | 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 | 78 | 1088 | 7E-05 | 536 | 14.122 | 6.5626E-05 | 1.86 | 0.105357119 | 2983.37 | 86.09 | 88.37 | 8/18/04 | 11:06 | 6762:40:00 | 6762:36:10 | 6762:32:30 | 82.23543437 |
| 32 | 75 | 1078 | 0.0011 | 535 | 13.986 | 0.001043546 | 29.55 | 0.106400885 | 3012.92 | 86.94 | 89.22 | 8/23/04 | 14:06 | 6933:42:00 | 6933:38:10 | 6933:34:30 | 83.26884171 |
| 9 | 76 | 1087 | 0.0003 | 538 | 14.109 | 0.000295945 | 8.38 | 0.10689661 | 3021.30 | 87.19 | 89.47 | 8/30/04 | 16:44 | 7104:18:00 | 7104:14:10 | 7104:10:30 | 84.28700988 |
| 0 | 75 | 1086 | 0 | 535 | 14.122 | 0 | 0.00 | 0.10689661 | 3021.30 | 87.19 | 89.47 | 9/7/04 | 15:56 | 7295:30:00 | 7295:26:10 | 7295:22:30 | 85.41369914 |
| 42 | 78 | 1073 | 0.0015 | 536 | 13.927 | 0.001383287 | 38.60 | 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 | 536 | 14.057 | -0.000294856 | -8.35 | 0.107765041 | 3051.55 | 88.06 | 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 | -0.000330046 | -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 | 76 | 1085 | 0.0007 | 536 | 14.083 | 0.000623622 | 17.66 | 0.108058618 | 3059.67 | 88.30 | 90.56 | 10/6/04 | 10:11 | 8033:45:00 | 8033:41:10 | 8033:37:30 | 89.63118877 |
| 20 | 75 | 1079 | 0.0007 | 535 | 14.005 | 0.000654035 | 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 | 1086 | 0.0004 | 537 | 14.096 | 0.000393498 | 11.14 | 0.109108146 | 3089.53 | 89.15 | 91.43 | 10/27/04 | 14:04 | 8493:38:00 | 8493:34:10 | 8493:30:30 | 92.18091001 |
| 12 | 78 | 1090 | 0.0004 | 536 | 14.148 | 0.000394211 | 11.16 | 0.109500357 | 3100.69 | 89.46 | 91.78 | 11/5/04 | 11:10 | 8706:44:00 | 8706:40:10 | 8706:36:30 | 93.30987801 |
| -9 | 78 | 1095 | -0.0003 | 536 | 14.213 | -0.000298123 | -8.44 | 0.109202234 | 3092.25 | 89.23 | 91.51 | 11/12/04 | 16:26 | 8880:02:00 | 8879:58:10 | 8879:54:30 | 94.23392878 |
| 39 | 75 | 1080 | 0.0014 | 535 | 14.018 | 0.00127855 | 36.15 | 0.110478784 | 3128.40 | 90.26 | 92.58 | 11/24/04 | 10:49 | 9162:23:00 | 9162:19:10 | 9162:15:30 | 95.72033918 |
| 20 | 78 | 1081 | 0.0007 | 536 | 14.031 | 0.000651593 | 18.45 | 0.111130378 | 3146.85 | 90.81 | 93.09 | 12/3/04 | 15:56 | 9383:32:00 | 9383:28:10 | 9383:24:30 | 96.88863958 |
| -47 | 72 | 1106 | -0.0017 | 532 | 14.355 | -0.001584326 | -44.86 | 0.109548052 | 3101.99 | 89.51 | 91.79 | 12/14/04 | 11:45 | 9843:19:00 | 9843:15:10 | 9843:11:30 | 98.20039036 |
| 19 | 72 | 1100 | 0.0007 | 532 | 14.276 | 0.000636996 | 18.04 | 0.110183049 | 3120.02 | 90.03 | 92.31 | 12/23/04 | 12:02 | 9859:38:00 | 9859:32:10 | 9859:28:30 | 99.29551853 |

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

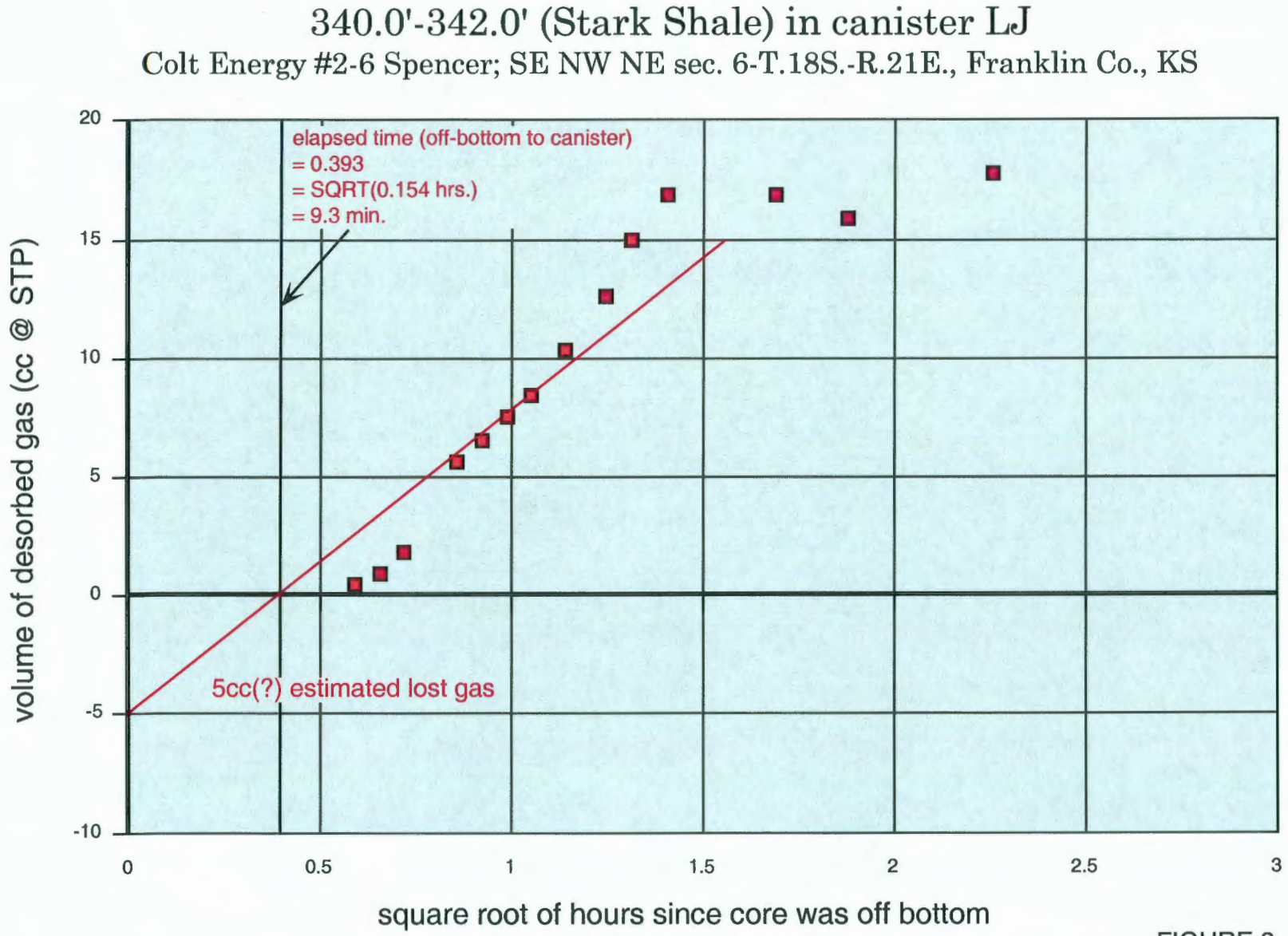

340.0'-342.0' (Stark Shale) in canister LJ
Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS
elapsed time (off-bottom to canister)
= 0.393
= SQRT(0.154 hrs.)
= 9.3 min.
5cc(?) estimated lost gas
volume of desorbed gas (cc @ STP)
square root of hours since core was off bottom
20
15
10
5
0
-5
-10
0
0.5
1
1.5
2
2.5
3

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

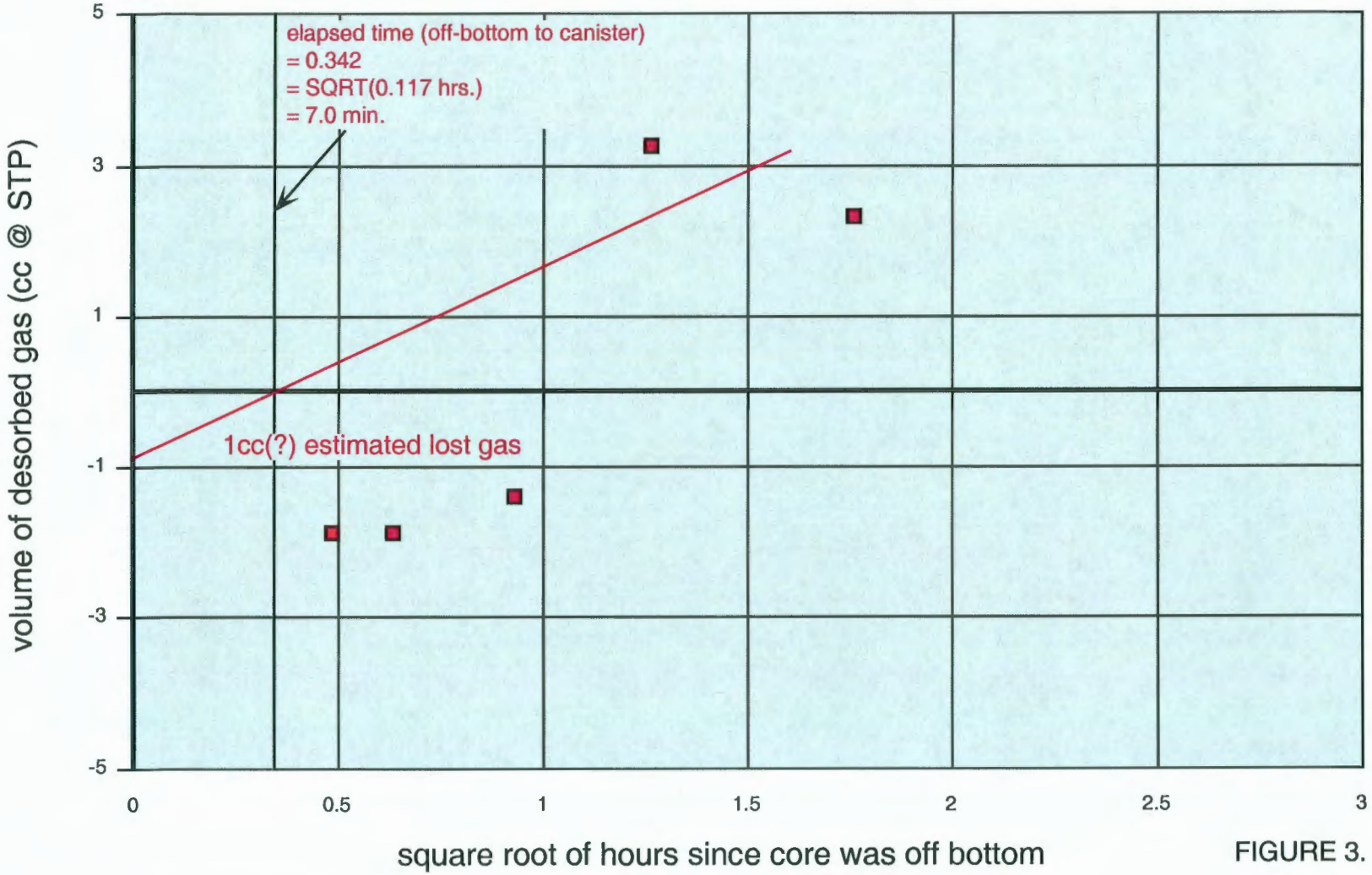



FIGURE 3.

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

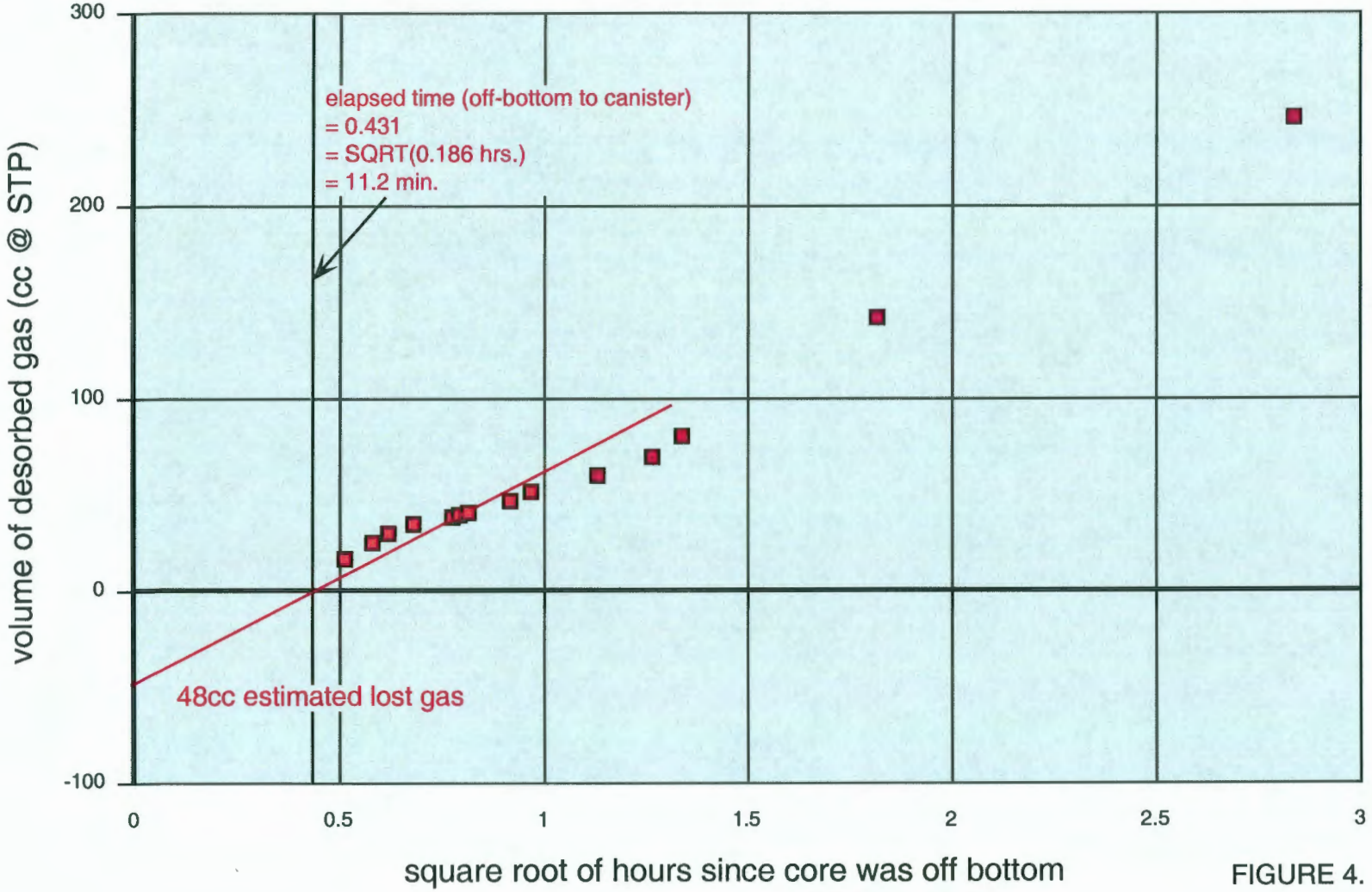



FIGURE 4.

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

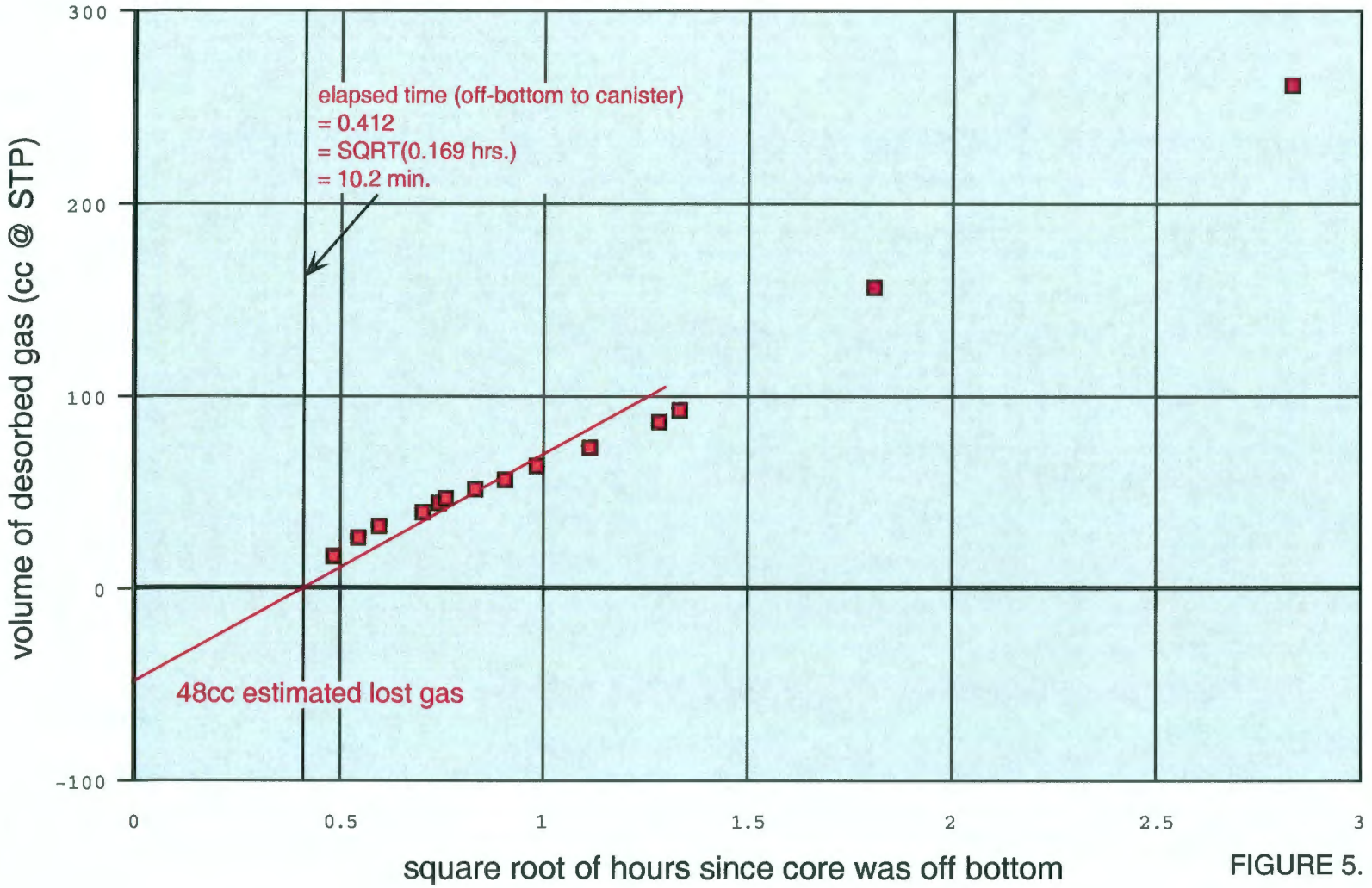



FIGURE 5.

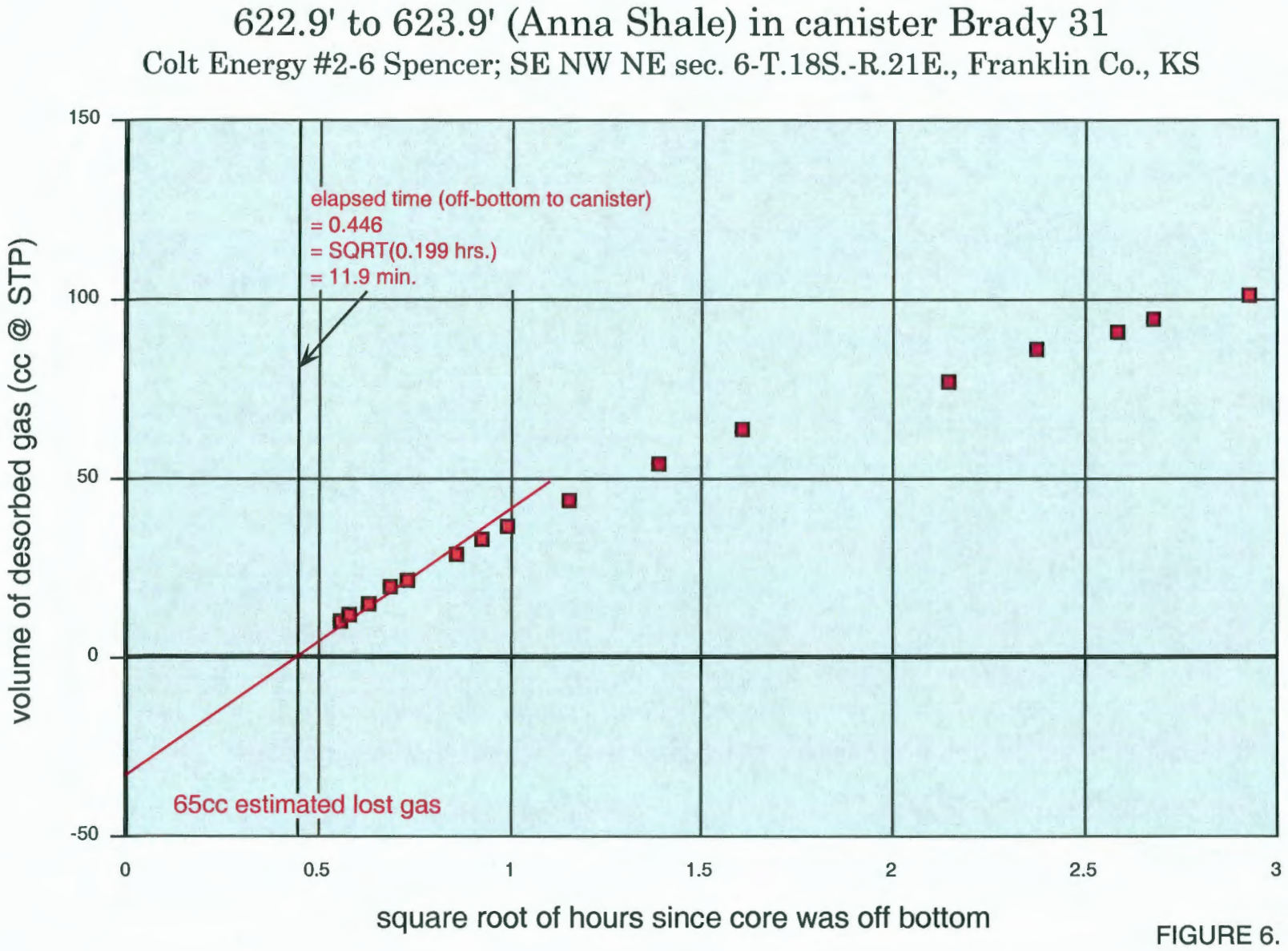

622.9' to 623.9' (Anna Shale) in canister Brady 31
Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS
elapsed time (off-bottom to canister)
= 0.446
= SQRT(0.199 hrs.)
= 11.9 min.
65cc estimated lost gas
volume of desorbed gas (cc @ STP)
150
100
50
0
-50
0
0.5
1
1.5
2
2.5
3
square root of hours since core was off bottom

FIGURE 6.

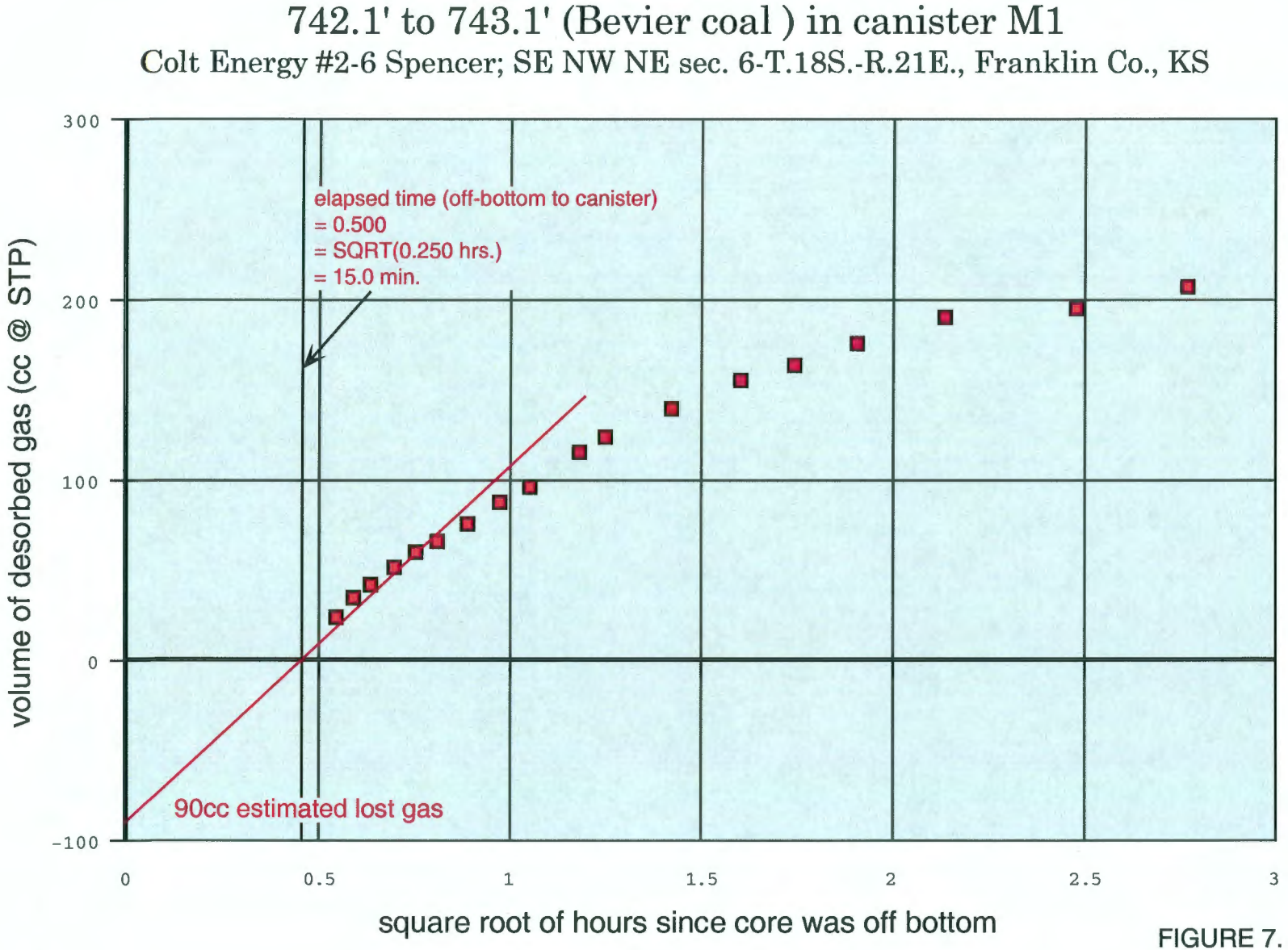

742.1' to 743.1' (Bevier coal ) in canister M1
Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS
elapsed time (off-bottom to canister)
= 0.500
= SQRT(0.250 hrs.)
= 15.0 min.
90cc estimated lost gas
volume of desorbed gas (cc @ STP)
300
200
100
0
-100
0
0.5
1
1.5
2
2.5
3
square root of hours since core was off bottom

FIGURE 7.

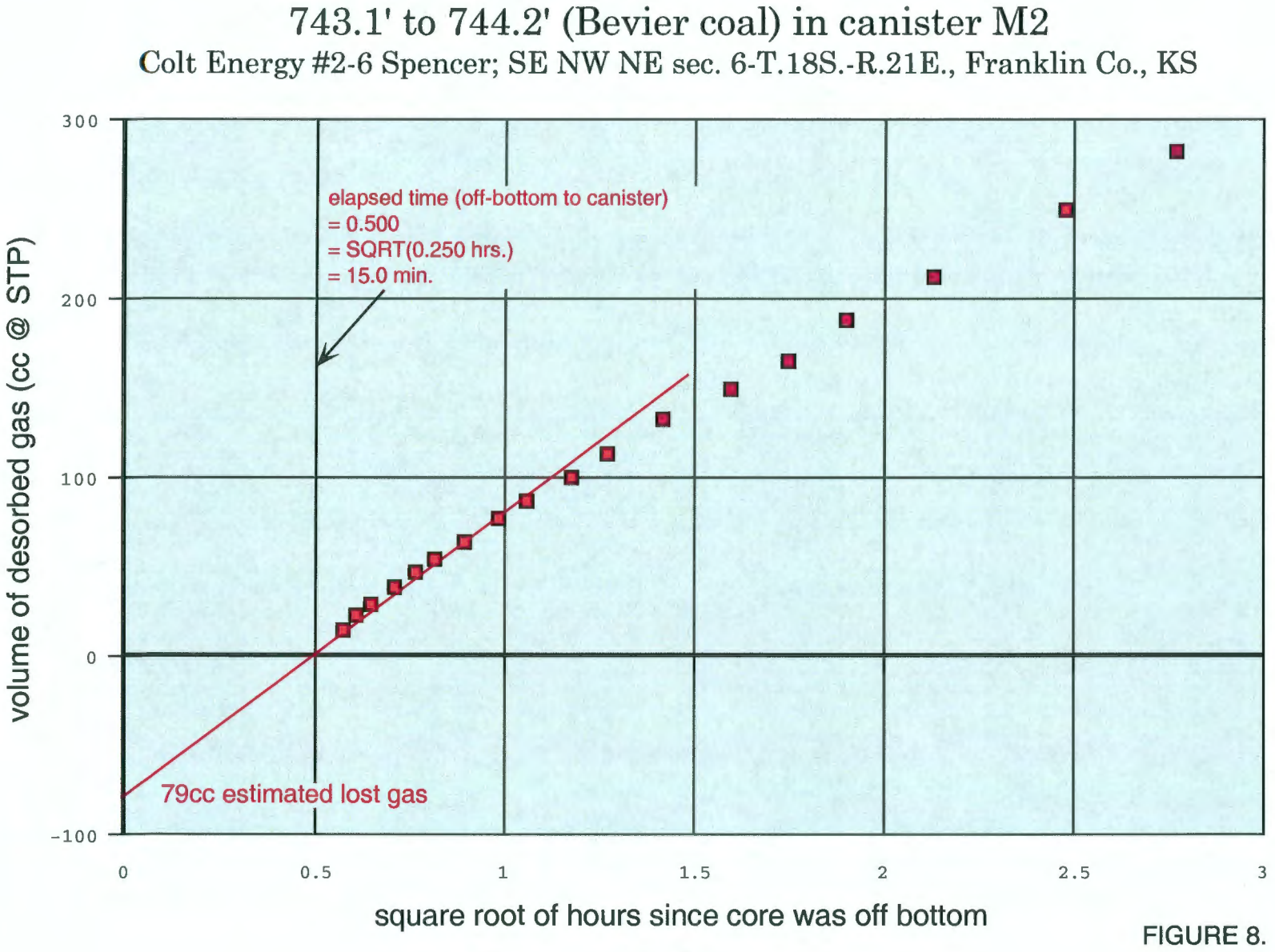

743.1' to 744.2' (Bevier coal) in canister M2
Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS
elapsed time (off-bottom to canister)
= 0.500
= SQRT(0.250 hrs.)
= 15.0 min.
79cc estimated lost gas
volume of desorbed gas (cc @ STP)
300
200
100
0
-100
0
0.5
1
1.5
2
2.5
3
square root of hours since core was off bottom

FIGURE 8.

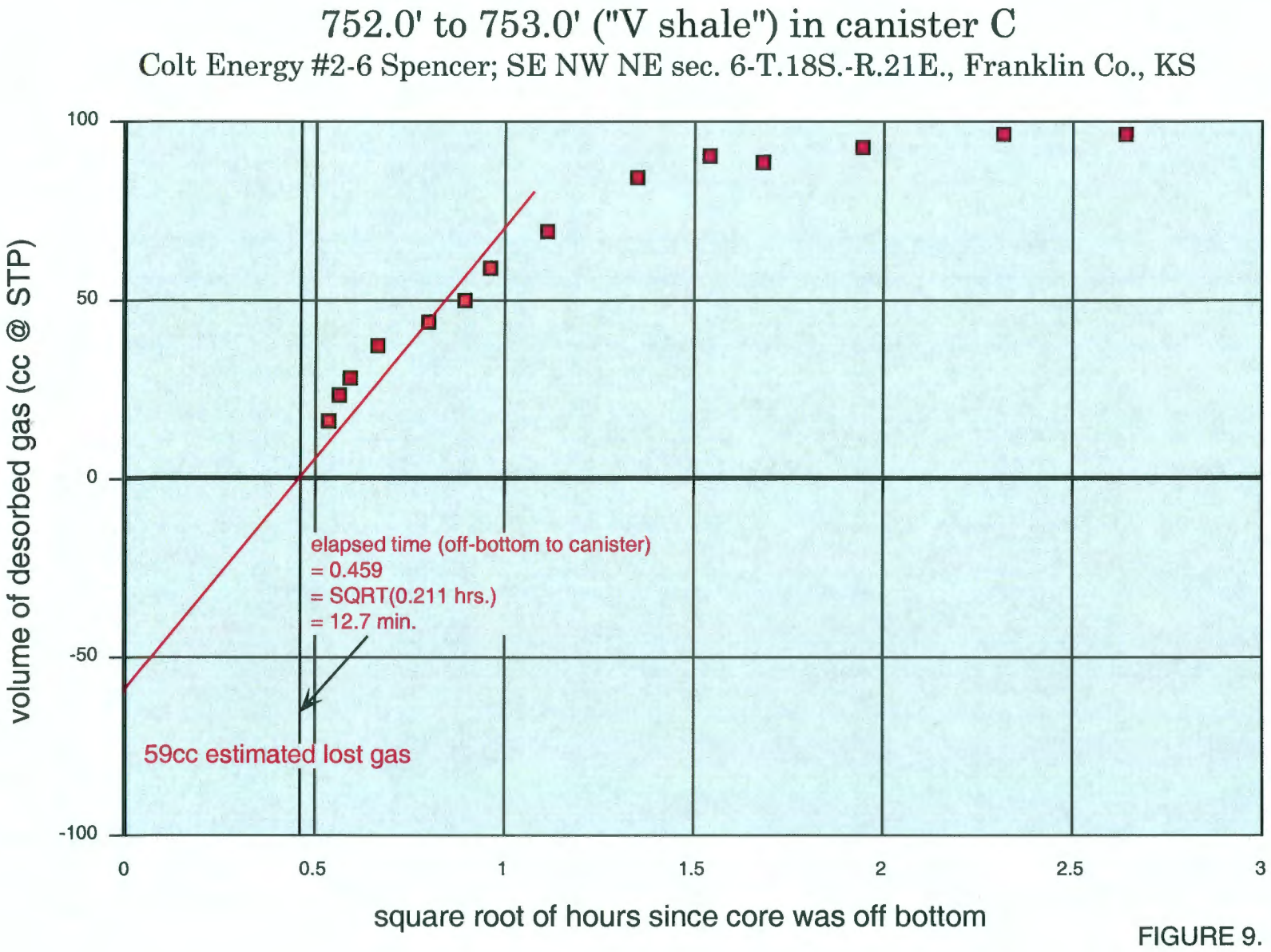

752.0' to 753.0' ("V shale") in canister C
Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS
volume of desorbed gas (cc @ STP)
100
50
0
-50
-100
0
0.5
1
1.5
2
2.5
3
square root of hours since core was off bottom
elapsed time (off-bottom to canister)
= 0.459
= SQRT(0.211 hrs.)
= 12.7 min.
59cc estimated lost gas

FIGURE 9.

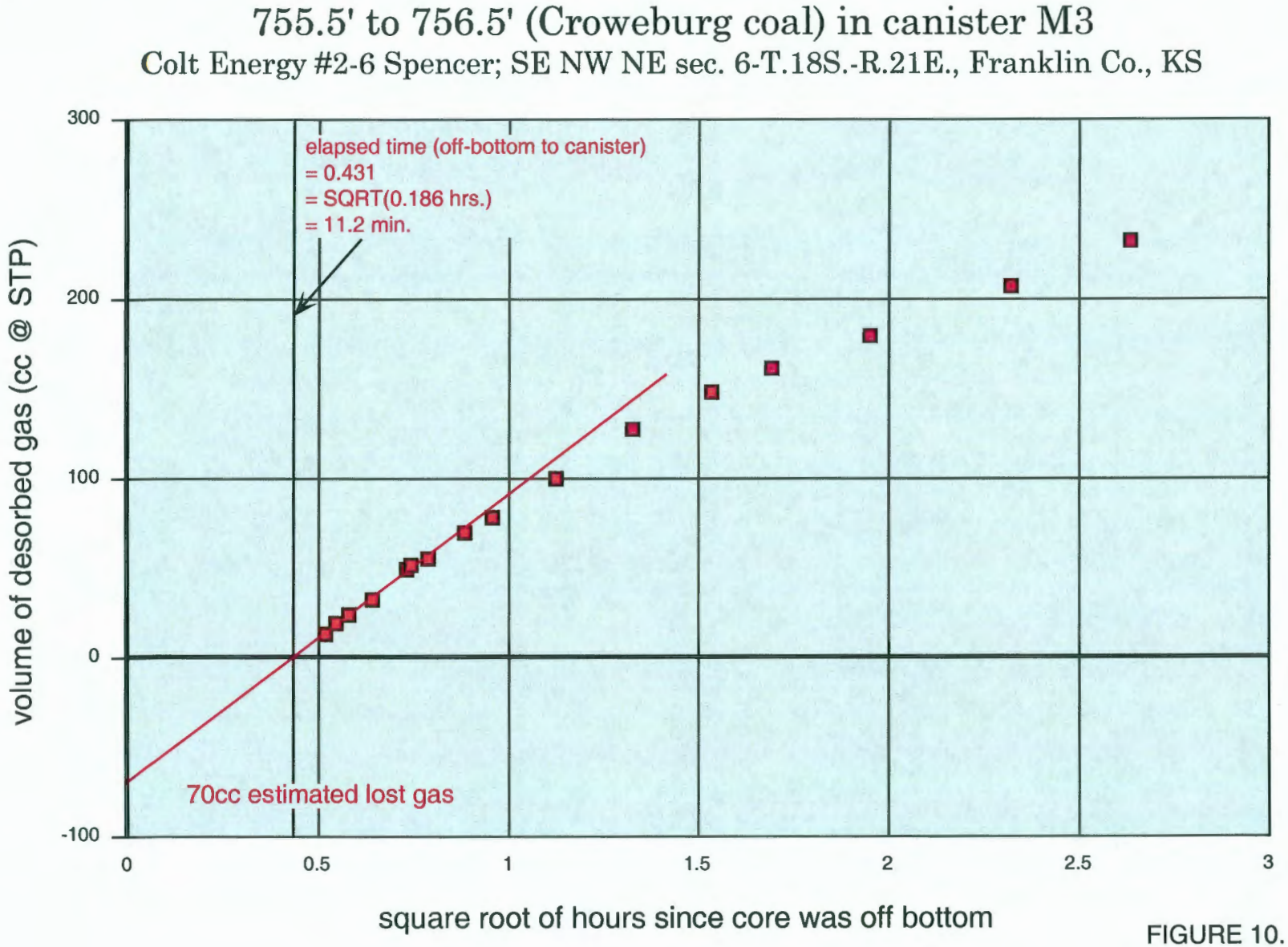

755.5' to 756.5' (Croweburg coal) in canister M3
Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS
elapsed time (off-bottom to canister)
= 0.431
= SQRT(0.186 hrs.)
= 11.2 min.
70cc estimated lost gas
volume of desorbed gas (cc @ STP)
300
200
100
0
-100
0
0.5
1
1.5
2
2.5
3
square root of hours since core was off bottom

FIGURE 10.

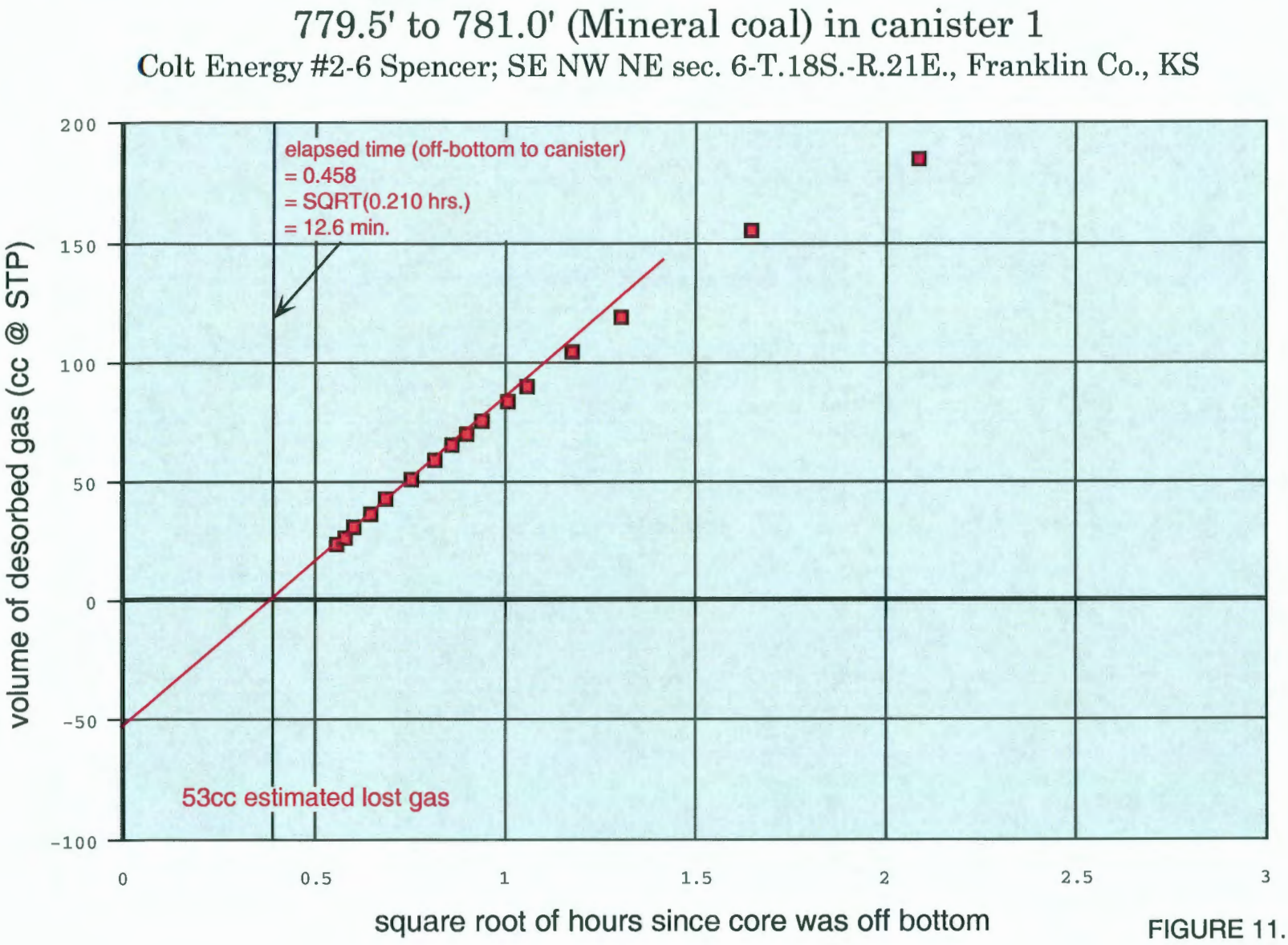

779.5' to 781.0' (Mineral coal) in canister 1
Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS
elapsed time (off-bottom to canister)
= 0.458
= SQRT(0.210 hrs.)
= 12.6 min.
53cc estimated lost gas
volume of desorbed gas (cc @ STP)
square root of hours since core was off bottom
200
150
100
50
0
-50
-100
0
0.5
1
1.5
2
2.5
3

FIGURE 11.

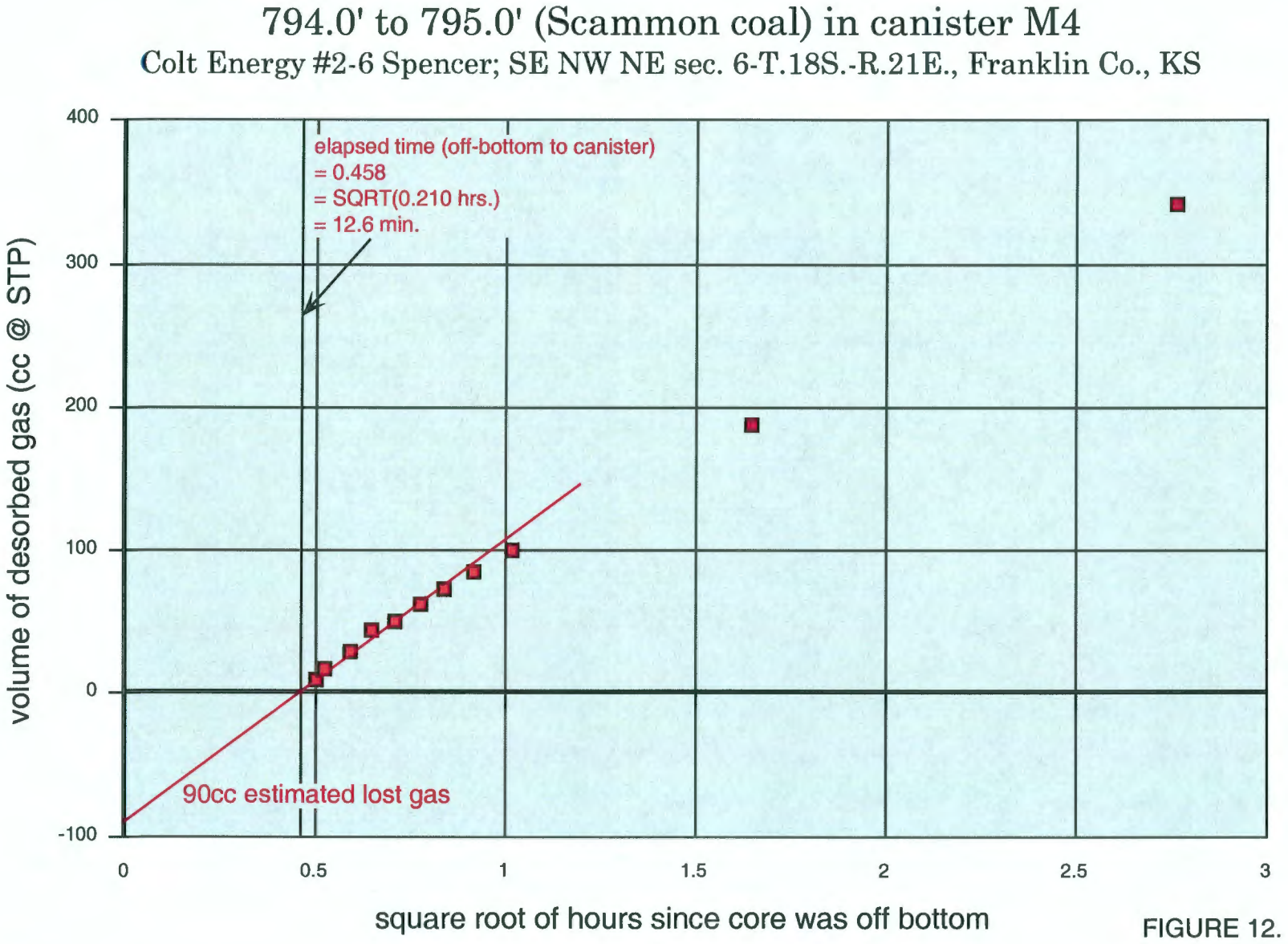

794.0' to 795.0' (Scammon coal) in canister M4
Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS
elapsed time (off-bottom to canister)
= 0.458
= SQRT(0.210 hrs.)
= 12.6 min.
90cc estimated lost gas
volume of desorbed gas (cc @ STP)
400
300
200
100
0
-100
0
0.5
1
1.5
2
2.5
3
square root of hours since core was off bottom

FIGURE 12.

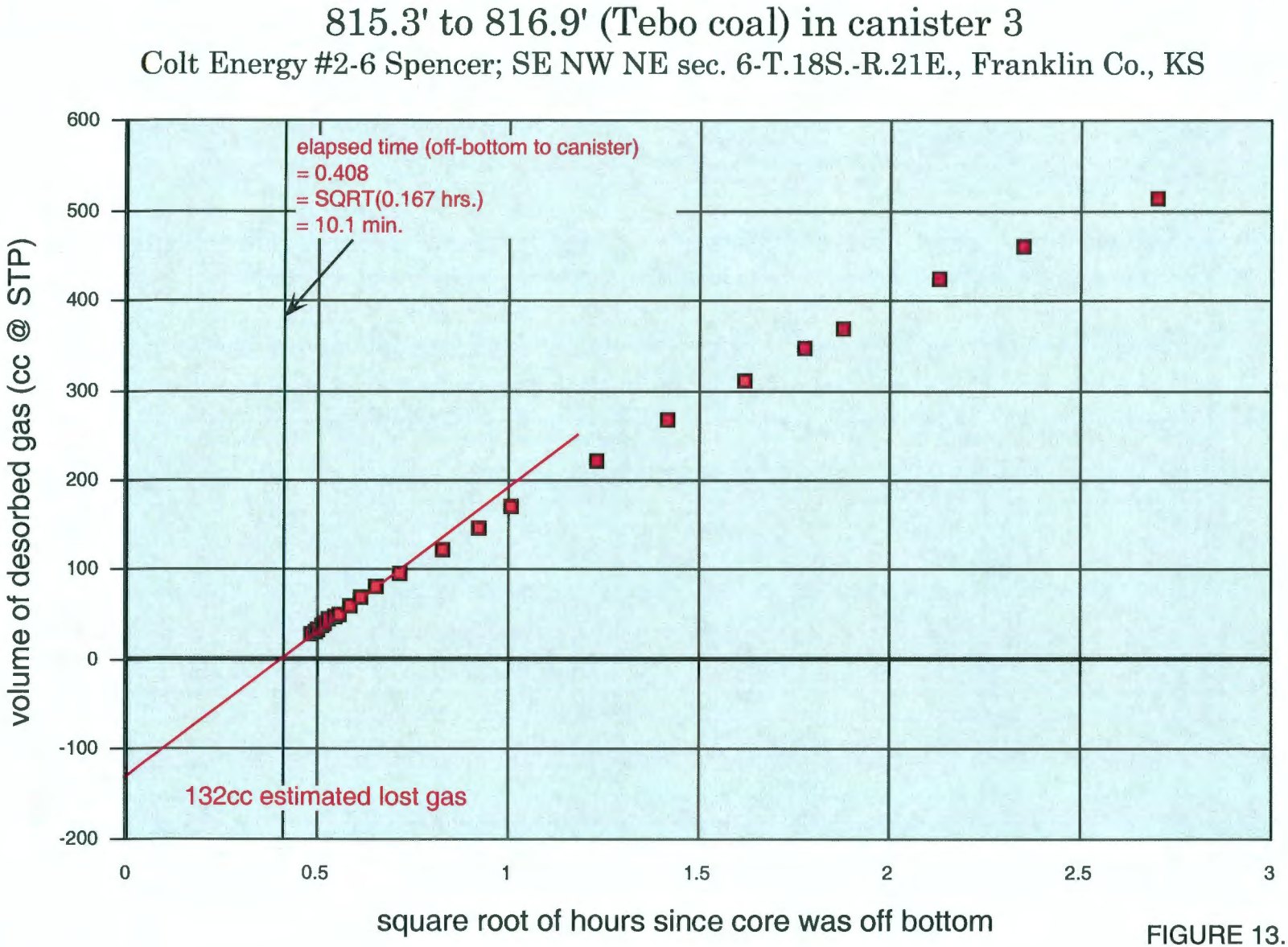

815.3' to 816.9' (Tebo coal) in canister 3
Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS
elapsed time (off-bottom to canister)
= 0.408
= SQRT(0.167 hrs.)
= 10.1 min.
132cc estimated lost gas
volume of desorbed gas (cc @ STP)
600
500
400
300
200
100
0
-100
-200
0
0.5
1
1.5
2
2.5
3
square root of hours since core was off bottom

FIGURE 13.

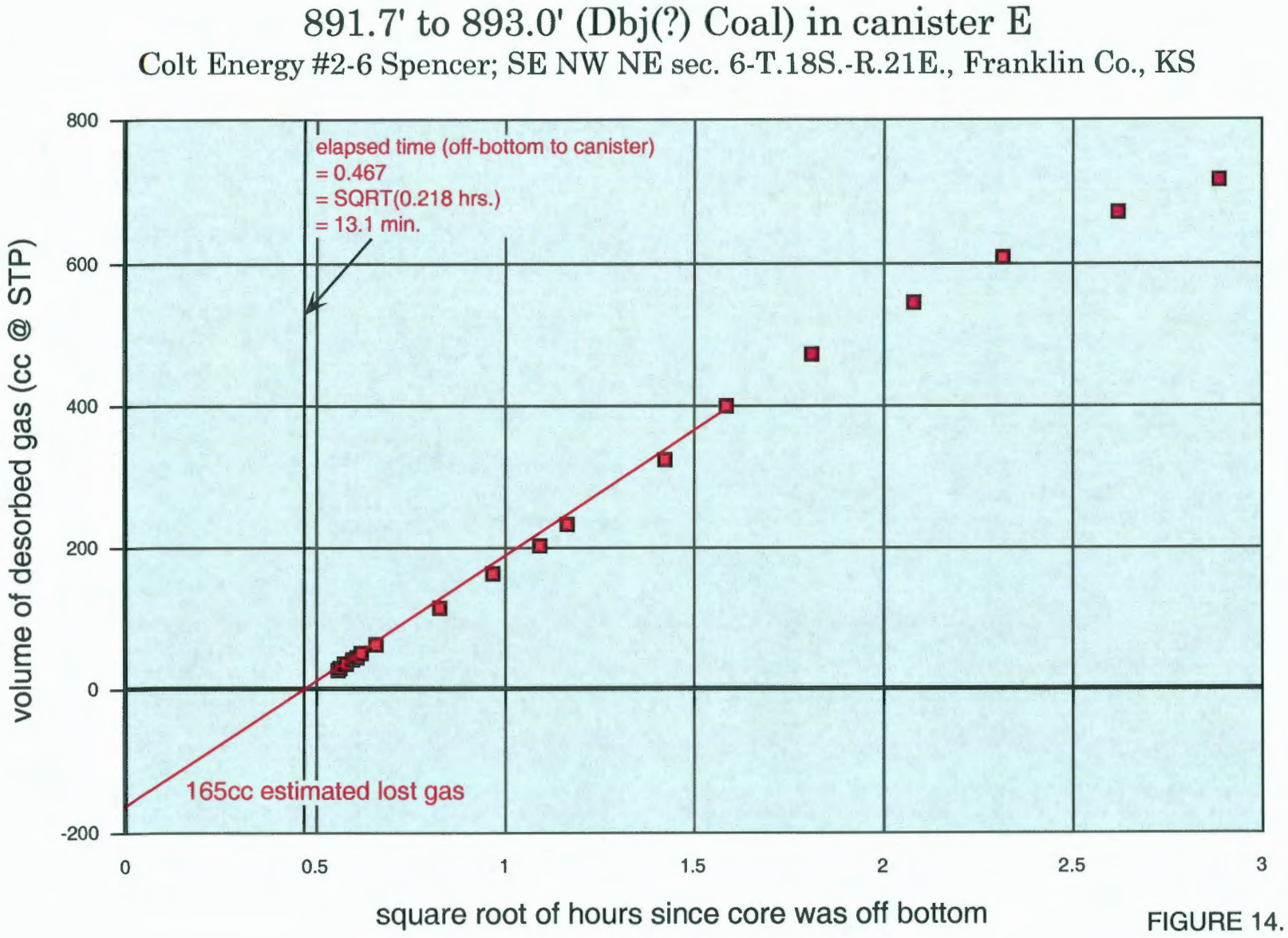

891.7' to 893.0' (Dbj(?) Coal) in canister E
Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS
elapsed time (off-bottom to canister)
= 0.467
= SQRT(0.218 hrs.)
= 13.1 min.
165cc estimated lost gas
volume of desorbed gas (cc @ STP)
800
600
400
200
0
-200
0
0.5
1
1.5
2
2.5
3
square root of hours since core was off bottom

FIGURE 14.

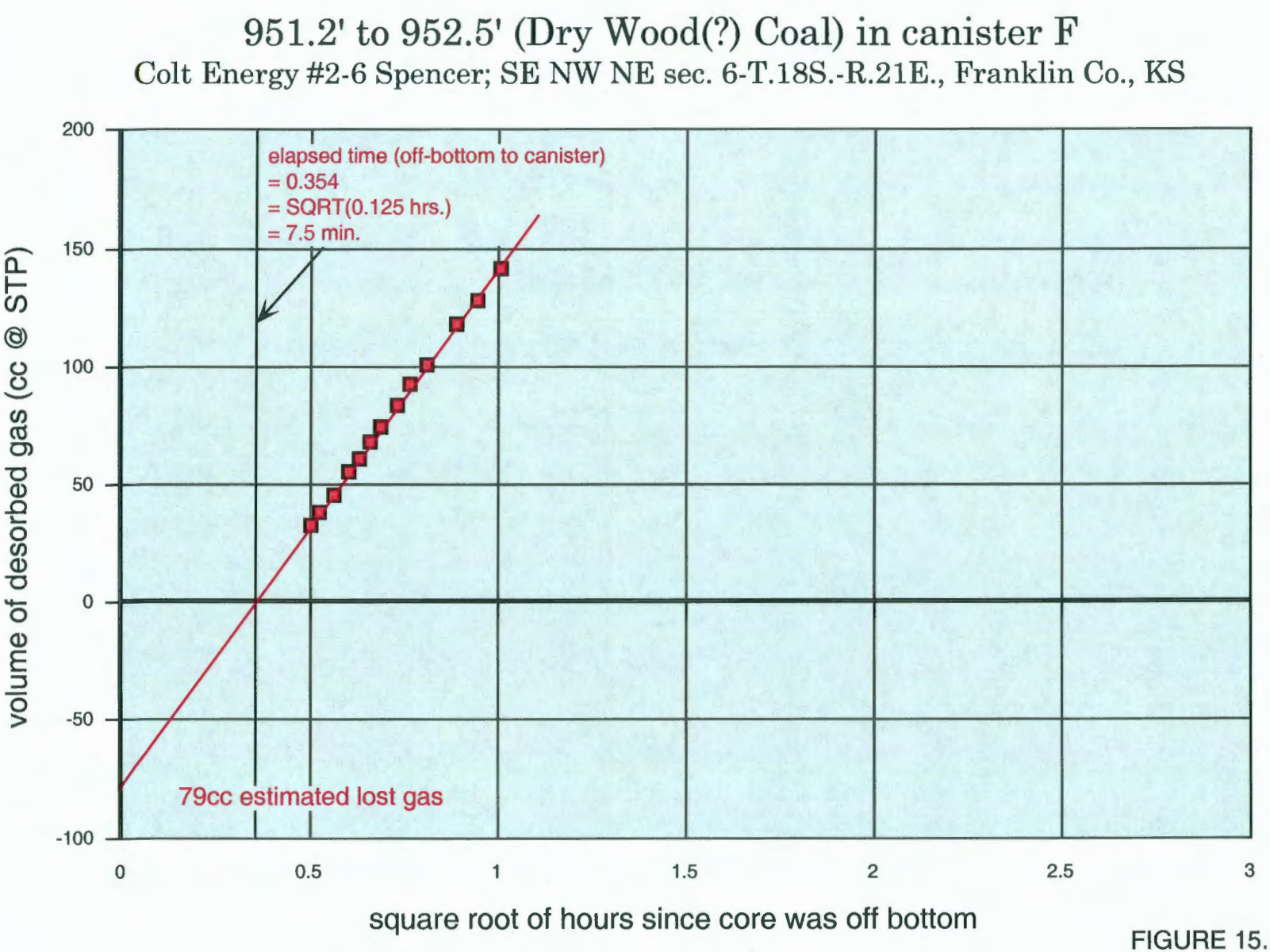
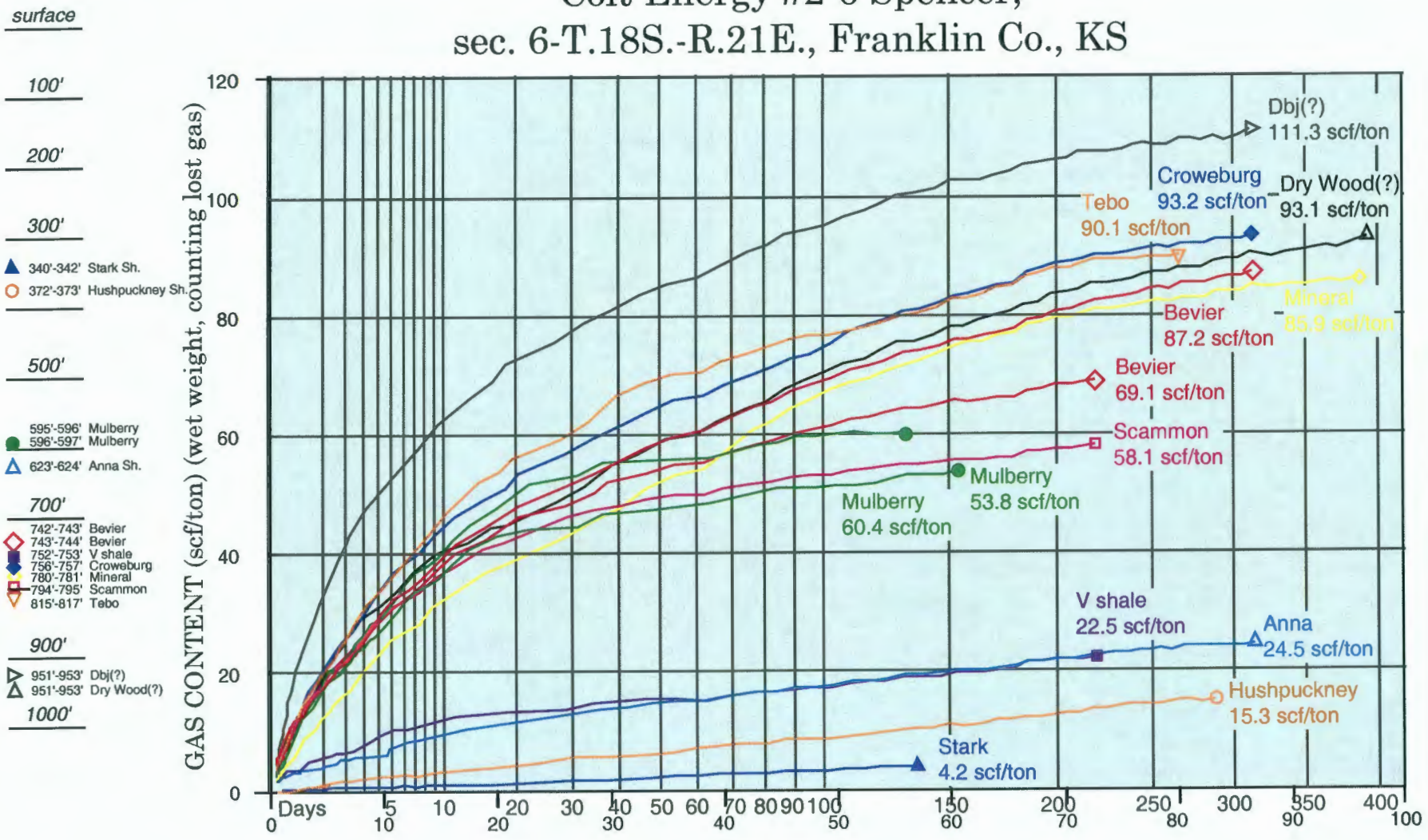

951.2' to 952.5' (Dry Wood(?) Coal) in canister F
Colt Energy #2-6 Spencer; SE NW NE sec. 6-T.18S.-R.21E., Franklin Co., KS
elapsed time (off-bottom to canister)
= 0.354
= SQRT(0.125 hrs.)
= 7.5 min.
79cc estimated lost gas
volume of desorbed gas (cc @ STP)
200
150
100
50
0
-50
-100
0
0.5
1
1.5
2
2.5
3
square root of hours since core was off bottom

FIGURE 15.

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




TIME (square root of hours since bottom hole time of core)

FIGURE 16.

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

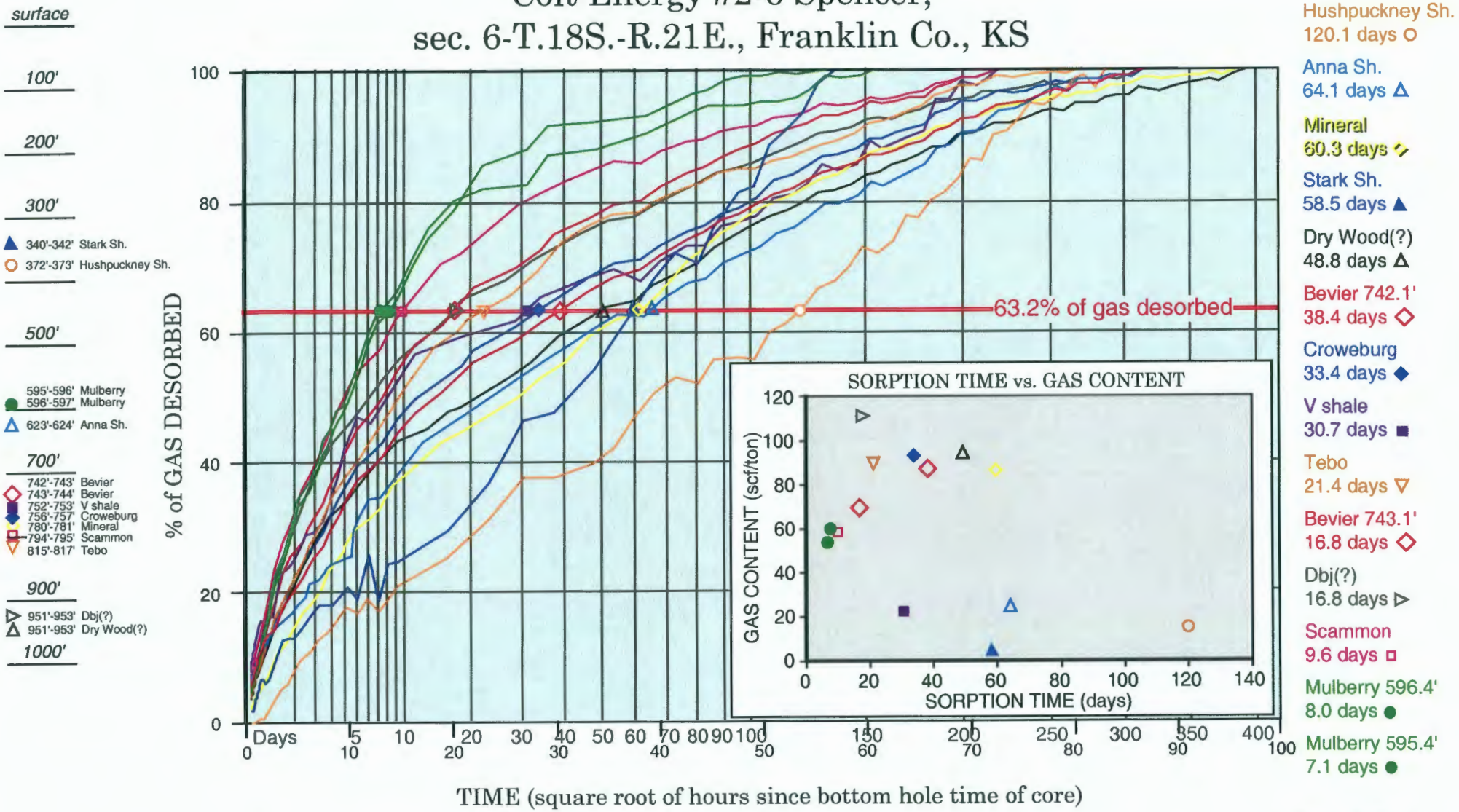
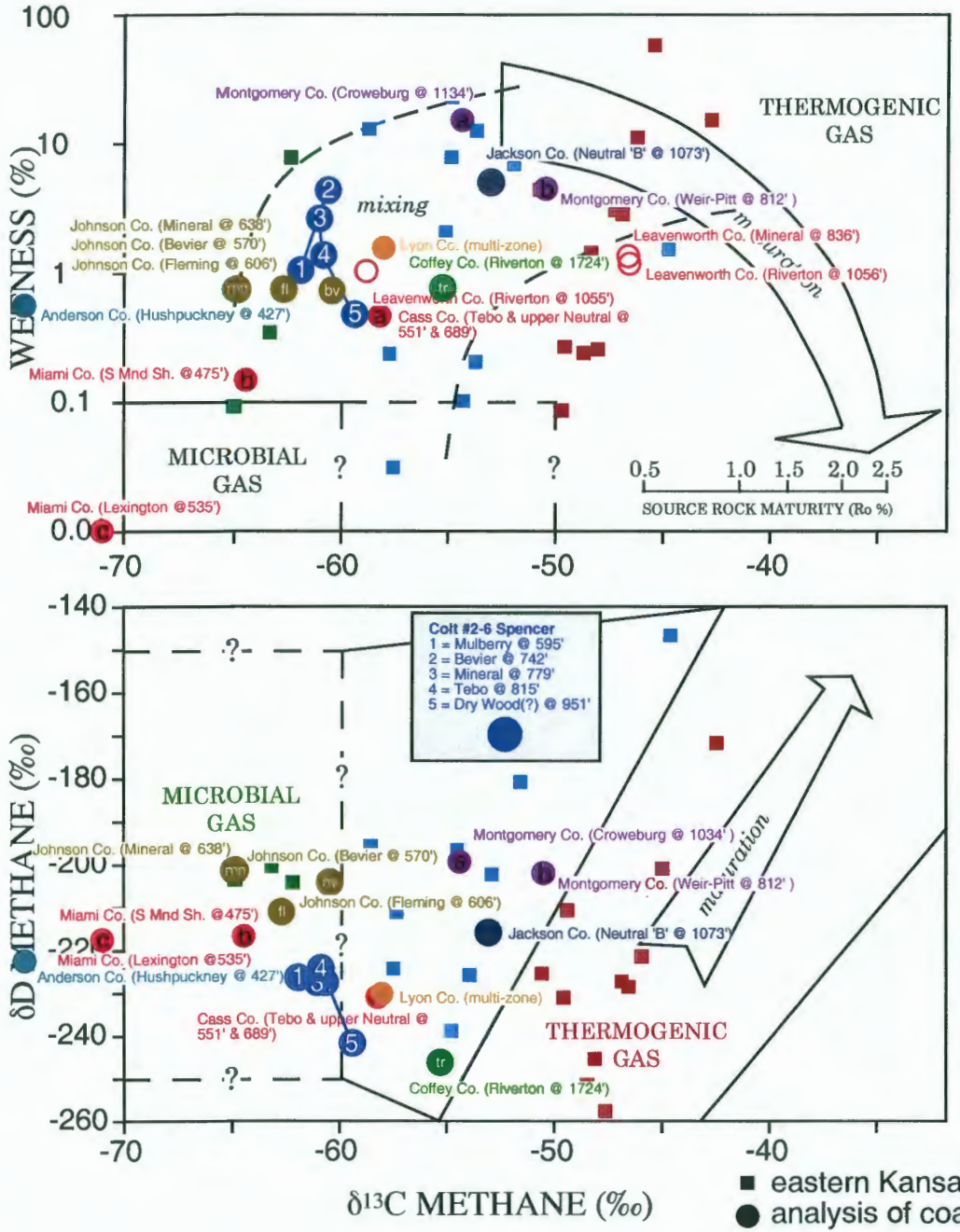
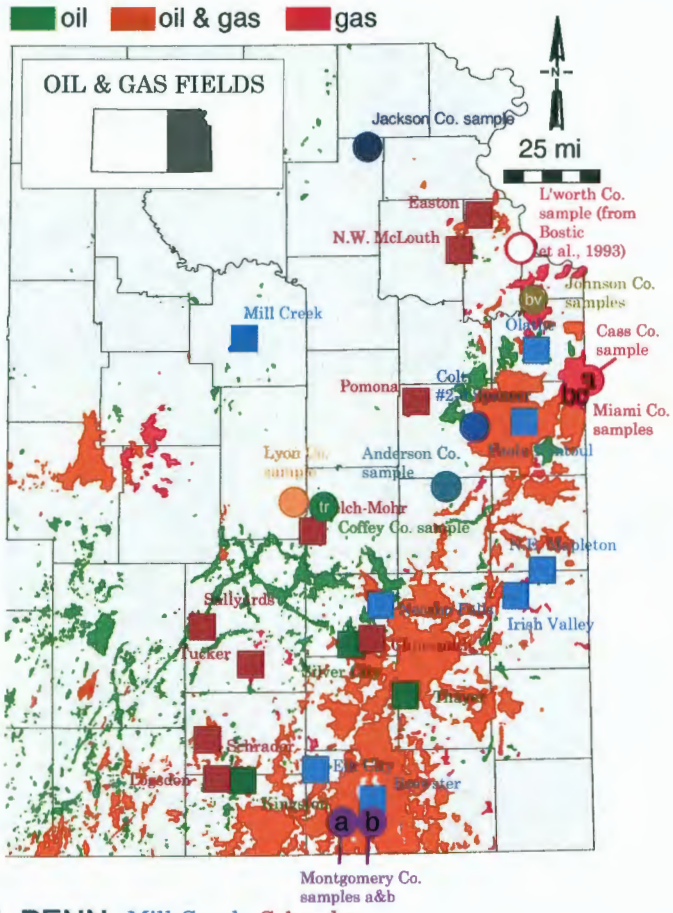



FIGURE 17.




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 Logsden

■ eastern Kansas conventional gas (from Jenden et al., 1988)

● analysis of coalbed desorption gas

FIGURE 18.

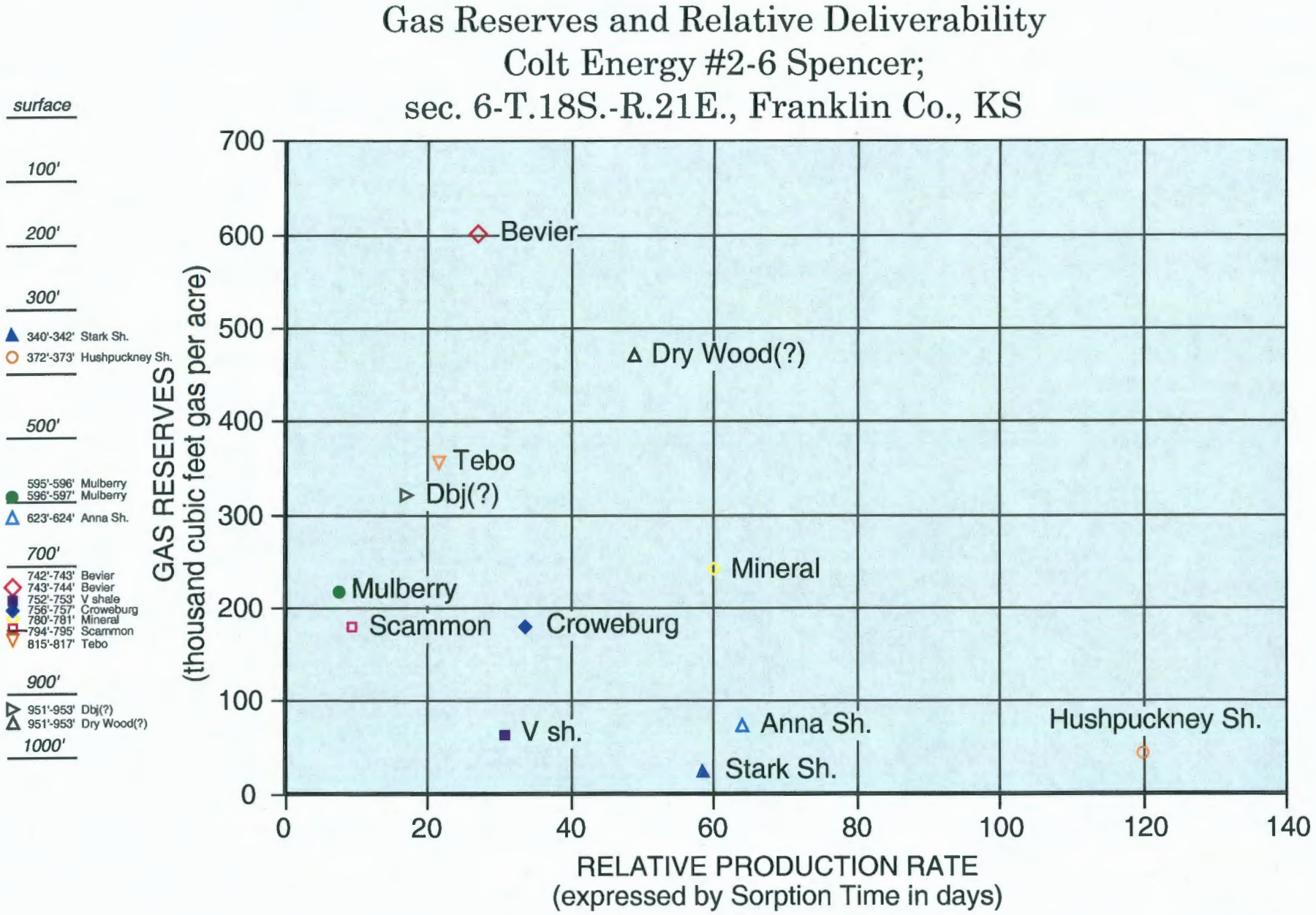

Gas Reserves and Relative Deliverability
Colt Energy #2-6 Spencer;
sec. 6-T.18S.-R.21E., Franklin Co., KS
surface
100'
200'
300'
340'-342' Stark Sh.
372'-373' Hushpuckney Sh.
500'
595'-596' Mulberry
596'-597' Mulberry
623'-624' Anna Sh.
700'
742'-743' Bevier
743'-744' Bevier
752'-753' V shale
756'-757' Croweburg
780'-781' Mineral
794'-795' Scammon
815'-817' Tebo
900'
951'-953' Dbj(?)
951'-953' Dry Wood(?)
1000'
GAS RESERVES
(thousand cubic feet gas per acre)
700
600
500
400
300
200
100
0
Bevier
Dry Wood(?)
Tebo
Dbj(?)
Mineral
Mulberry
Scammon
Croweburg
V sh.
Anna Sh.
Stark Sh.
Hushpuckney Sh.
0
20
40
60
80
100
120
140
RELATIVE PRODUCTION RATE
(expressed by Sorption Time in days)

FIGURE 19.

# LUMAN'S LABORATORIES

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(620) 236-7874

ANALYTICAL AND PHYSICAL TESTING


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:pdl

APPENDIX 1

# LUMAN'S LABORATORIES

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(620) 236-7874

ANALYTICAL AND PHYSICAL TESTING


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. 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

Appendix I

# LUMAN'S LABORATORIES

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(620) 236-7874

ANALYTICAL AND PHYSICAL TESTING


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1930 Constant Ave.
Lawrence KS 66047-3726

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

APPENDIX 1

# LUMAN'S LABORATORIES

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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. 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

APPENDIX I

# LUMAN'S LABORATORIES

ANALYTICAL AND PHYSICAL TESTING

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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. 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

# LUMAN'S LABORATORIES

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ANALYTICAL AND PHYSICAL TESTING


February 7, 2005

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1930 Constant Ave.
Lawrence KS 66047-3726

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:pdl

APPENDIX 1

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ANALYTICAL AND PHYSICAL TESTING


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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. 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

APPENDIX 1

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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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ANALYTICAL AND PHYSICAL TESTING


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

APPENDIX 1

# LUMAN'S LABORATORIES

ANALYTICAL AND PHYSICAL TESTING

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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. 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

APPENDIX 1

# 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: | 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 | 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%

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# 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: | 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 | 0.0084 | | | |
| 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%

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# 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%

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# 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%

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# 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%

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