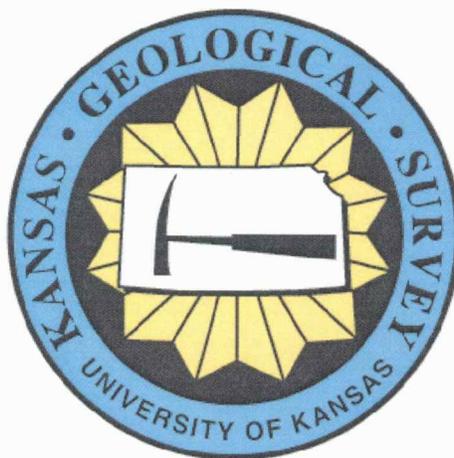


ANALYSIS OF KANSAS CITY, MARMATON, AND CHEROKEE GROUP CORE
SAMPLES FOR GAS CONTENT -- OSBORN ENERGY ROSE HILL #1-6 (sec. 6-
T.16S.-R.24E.) MIAMI COUNTY, KANSAS



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APRIL 25, 2003
(to be held proprietary to April 22, 2004)

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SUMMARY

Seventeen three-inch diameter core samples from the Pennsylvanian Kansas City, Marmaton, and Cherokee Groups were collected from the Osborn Energy #1-6 Rose Hill well in Sec. 6-T.16S.-R.24E. in Miami County, KS over April 22nd to 25th, 2002. The following gas contents were measured, based on dry weight of the samples:

- 291' 0" to 292' 5" (Stark Shale) (no data obtained)
- 316' 0" to 318' 5" (Hushpuckney Shale) (no data obtained)
- 506' 0" to 509' 0" (South Mound Shale) (1.4 scf/ton)
- 510' 2" to 512' 9" (South Mound Shale) (6.5 scf/ton)
- 525' 4" to 526' 0" (Upper Mulberry coal) (49.9 scf/ton)
- 566' 3" to 570' 0" (black shale) (no data obtained)
- 576' 8.5" to 577' 7.5" (Lexington coal & sh. above) (19.5 scf/ton)
- 577' 7.5" to 578' 8" (Lexington coal) (88.4 scf/ton)
- 617' 2" to 618' 1" (Summit coal) (no gas evolved)
- 635' 4" to 636' 4" (Mulky coal) (no gas evolved)
- 721' 0" to 722' 0" (Bevier coal) (54.8 scf/ton)
- 737' 0" to 738' 0" (Croweburg coal) (33.0 scf/ton)
- 767' 5" to 768' 5" (Mineral coal) (58.2 scf/ton)
- 809' 0" to 810' 0" (Tebo coal) (42.5 scf/ton)
- 915' 8" to 916' 1.5" (Rowe coal) (34.8 scf/ton)
- 931' 2" to 931' 11" (upper Neutral coal) (22.2 scf/ton)
- 951' 0" to 956' 0" (shaley lower Neutral) (no data obtained)

BACKGROUND

The Osborn Energy #1-6 Rose Hill well in S2 NE NW Sec. 6-T.16S.-R.24E. (Miami County, KS) was selected for desorption tests in association with an on-going coalbed gas research project at the Kansas Geological Survey. The samples (3-inch-diameter core) were gathered April 22th through 25th, 2002 by K. David Newell, L. Michael Magnuson, and Glen Gagnon of the Kansas Geological Survey, with well site collection aided by Rex Ashlock (geologist for Osborn Energy) and Bill Stout (consultant for Osborn Energy). Samples were obtained during wireline coring. The well was drilled a rig owned by Layne Christensen, Canada.

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- or oven-drying, then weighed after drying. The weight loss due to drying is noted in the desorption table (Table 1).

Temperature baths for the desorption canisters were on site, with temperatures at 65 degrees F for all samples. The canistered samples were later transported to the laboratory at the Kansas Geological Survey in Lawrence, KS 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.

The desorption canisters were both home-made and commercially obtained. The former were made by Osborn Energy using 5"-diameter PVC pipe and plumbing materials available at hardware stores. These canisters ranged in length from 2- 5 feet. The latter were obtained from SSD, Inc. in Grand Junction, CO. On average, the commercial canisters were approximately 12.5 inches high (32 cm), 3 1/2 inches (9 cm) in diameter, and enclosed a volume of approximately 150 cubic inches (2450 cm³).

The desorbed gas that collected in the desorption canisters was periodically released into the volumetric displacement apparatus and measured as a function of time, temperature and atmospheric pressure.

The time and atmospheric pressure were measured in the field using a portable weather station. The atmospheric pressure was displayed in millibars on this instrument, and later correlated to atmospheric pressure (in psi) read from a pressure transducer in the Petrophysics Laboratory in the Kansas Geological Survey in Lawrence, Kansas.

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

$$n = PV/RT$$

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

volumetric conversion, therefore the conversion equation, derived from the ideal gas equation, is:

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

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

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

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

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

The desorbed gas was summed over the time period for which the coal samples evolved all of their gas. In the case of core samples from the Osborn Energy #1-6 well, the longest the samples evolved gas was approximately 6 months after canistering.

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 either dried in an oven at 150 °F for 1 to 6 days, or air-dried for 2 to 3 weeks. After drying, the cores were weighed again to obtain a dry-weight based gas content. Selected samples were sent for proximate analysis at Luman's Laboratories in Chetopa, KS, and also subjected to ashing at the Kansas Geological Survey.

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 graph for all samples at a common scale.

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 (or) 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 1-11)

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 Graph (Figure 12)

This is the desorption graph (gas content per weight vs. square root of time) for all the samples.

RESULTS and DISCUSSION

Four samples (see data table) were placed in containers that were subsequently proved to be leaky, therefore no data were obtained for these samples. Of the thirteen samples saved for long-term desorption measurements, the following gas contents were calculated:

- 506' 0" to 509' 0" (South Mound Shale) (1.4 scf/ton)
- 510' 2" to 512' 9" (South Mound Shale) (6.5 scf/ton)
- 525' 4" to 526' 0" (Upper Mulberry coal) (49.9 scf/ton)
- 576' 8.5" to 577' 7.5" (Lexington coal & sh. above) (19.5 scf/ton)
- 577' 7.5" to 578' 8" (Lexington coal) (88.4 scf/ton)
- 617' 2" to 618' 1" (Summit coal) (no gas evolved)
- 635' 4" to 636' 4" (Mulky coal) (no gas evolved)
- 721' 0" to 722' 0" (Bevier coal) (54.8 scf/ton)
- 737' 0" to 738' 0" (Croweburg coal) (33.0 scf/ton)
- 767' 5" to 768' 5" (Mineral coal) (58.2 scf/ton)
- 809' 0" to 810' 0" (Tebo coal) (42.5 scf/ton)
- 915' 8" to 916' 1.5" (Rowe coal) (34.8 scf/ton)
- 931' 2" to 931' 11" (upper Neutral coal) (22.2 scf/ ton)

Proximate analyses were made for selected coals in early 2003. The core was cut down its vertical axis and half was preserved for future analyses. The proximate analyses were performed on the following samples by Luman's Laboratory (see Appendix 1):

Luman's Lab proximate analysis:

<i>unit</i>	<i>depth</i>	<i>moisture</i>	<i>ash</i>	<i>moisture-free ash</i>
Lexington	576' 9"	1.91%	14.84%	15.12%
Croweburg	737' 0"	4.85%	6.25%	6.57%
Mineral	767' 5"	7.04%	11.37%	12.23%

According to the BTU/lb. (dry, ash-free) determinations, all the samples can be classified as high-volatile A bituminous coal.

Simple ashing of the samples at the Kansas Geological Survey was carried out in a muffle furnace in which the samples, each weighing approximately 1.5 grams, were first subjected to 110 °C heating 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%.

KGS ashing experiments:

<i>unit</i>	<i>depth</i>	<i>moisture</i>	<i>ash</i>	<i>moisture-free ash</i>
South Mound Sh.	507' 0"	1.45%	79.77%	80.94%
Upper Mulberry	525' 4"	1.35%	5.61%	5.69%
Lexington	576' 9"	0.98%	9.45%	9.57%
Lexington	578' 0"	1.28%	16.67%	16.89%
Bevier	721' 0"	1.03%	31.64%	31.97%
Croweburg	737' 0"	1.24%	14.88%	15.07%
Mineral	767' 6"	0.96%	40.77%	41.16%
Tebo	809' 0"	1.13%	19.83%	20.05%
Rowe	915' 8"	0.90%	15.80%	15.94%
Upper Neutral	931' 2"	0.78%	15.30%	15.42%

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:

KGS ashing experiments:

<i>unit</i>	<i>depth</i>	<i>moisture-free ash</i>	G_c	G_{pc}
South Mound Sh.	507' 0"	80.94%	1.4 scf/tn	7.3 scf/tn
Upper Mulberry	525' 4"	5.69%	49.9 scf/tn	52.9 scf/tn
Lexington	576' 9"	9.57%	19.5 scf/tn	21.6 scf/tn
Lexington	578' 0"	16.89%	88.4 scf/tn	106.4 scf/tn
Bevier	721' 0"	31.97%	54.8 scf/tn	80.5 scf/tn
Croweburg	737' 0"	15.07%	33.0 scf/tn	38.9 scf/tn
Mineral	767' 6"	41.16%	58.2 scf/tn	98.9 scf/tn
Tebo	809' 0"	20.05%	42.5 scf/tn	53.2 scf/tn
Rowe	915' 8"	15.94%	34.8 scf/tn	41.4 scf/tn
Upper Neutral	931' 2"	15.42%	22.2 scf/tn	26.2 scf/tn

Luman's Lab proximate analysis:

<i>unit</i>	<i>depth</i>	<i>moisture-free ash</i>	G_c	G_{pc}
Lexington	576'	15.12%	19.5 scf/ton	23.0 scf/ton
Croweburg	737'	6.57%	33.0 scf/ton	35.3 scf/ton
Mineral	767'	12.23%	58.2 scf/ton	66.3 scf/ton

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- McLennan, J.D., Schafer, P.S., and Pratt, T.J., 1995, A guide to determining coalbed gas content: Gas Research Institute, Chicago, IL, Reference No. GRI-94/0396, 180 p.

FIGURES and TABLES

TABLE 1. Desorption measurements for samples.

- FIGURE 1. Lost-gas graph for 506' 0" to 509' 0" (South Mound Shale)
- FIGURE 2. Lost-gas graph for 510' 2" to 512' 9" (South Mound Shale)
- FIGURE 3. Lost-gas graph for 525' 4" to 526' 0" (Upper Mulberry coal)
- FIGURE 4. Lost-gas graph for 576' 8.5" to 577' 7.5" (Lexington coal & sh. above)
- FIGURE 5. Lost-gas graph for 577' 7.5" to 578' 8" (Lexington coal)
- FIGURE 6. Lost-gas graph for 721' 0" to 722' 0" (Bevier coal)
- FIGURE 7. Lost-gas graph for 737' 0" to 738' 0" (Croweburg coal)
- FIGURE 8. Lost-gas graph for 767' 5" to 768' 5" (Mineral coal)
- FIGURE 9. Lost-gas graph for 809' 0" to 810' 0" (Tebo coal)
- FIGURE 10. Lost-gas graph for 915' 8" to 916' 1.5" (Rowe coal)

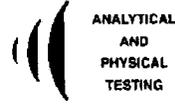
FIGURE 11. Lost-gas graph for 931' 2" to 931' 11" (upper Neutral coal)

FIGURE 12. Desorption graph for all samples.

APPENDIX 1. Proximate analyses performed to date.

LUMAN'S LABORATORIES

P.O. Box 326 • Chetopa, KS 67336
(620) 236-7874



June 20, 2003

Kansas Geological Survey
1930 Constant Ave.
Lawrence Ks 66047-3724

Attn: Jonathan Lange

Please find listed below analysis on the following sample.

Lab ID. 61801 Sample ID. Kansas Geological Survey Sample 3G-202.88g.

	As Received	Moisture Free	MAF
Moisture	5.08%		
Ash	15.11%	15.92%	
Volatile Matter	34.10%	35.93%	
Fixed Carbon	45.71%	48.15%	
BTU/lb	11,378	11,986	14,256
Sulfur	2.23%	2.35%	

Rose Hill Mulberry
525'

Respectfully,


Carrol Luman

CGL:pdl

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TESTING

February 14, 2003

Kansas Geological Survey
1930 Constant Ave.
Lawrence Ks 66047-3724

ROBEHILL
LEXINGTON
5771

Attn: Jonathan Lange

Please find listed below analysis on the following sample.

Lab ID. 21209 Sample ID. Kansas Geological Survey Sample I.

	As Received	Moisture Free	MAF
Moisture	1.91%		
Ash	14.84%	15.12%	
Volatile Matter	35.62%	36.32%	
Fixed Carbon	47.63%	48.56%	
BTU/lb	12,070	12,305	14,498
Sulfur	3.36%	3.43%	

Respectfully,

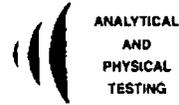
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APPENDIX 1

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Kansas Geological Survey
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Attn: Jonathan Lange

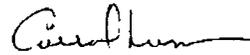
Please find listed below analysis on the following sample.

Lab ID. 61802 Sample ID. Kansas Geological Survey Sample 3H-752.72g.

Russ Hill Basin
721'

	As Received	Moisture Free	MAF
Moisture	5.03%		
Ash	24.61%	25.92%	
Volatile Matter	30.85%	32.48%	
Fixed Carbon	39.51%	41.60%	
BTU/lb	9,751	10,267	13,859
Sulfur	5.36%	5.64%	

Respectfully,

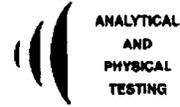


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Lawrence Ks 66047-3724

Attn: Jonathan Lange

ROSE HILL
CROWLEYBURG
737'

Please find listed below analysis on the following sample.

Lab ID. 21210 Sample ID. Kansas Geological Survey Sample J.

	As Received	Moisture Free	MAF
Moisture	4.85%		
Ash	6.25%	6.57%	
Volatile Matter	38.94%	40.93%	
Fixed Carbon	49.96%	52.50%	
BTU/lb	13,025	13,689	14,652
Sulfur	2.78%	2.92%	

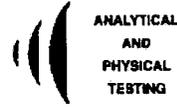
Respectfully,

Carrol Luman

CGL:pdl

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1930 Constant Ave.
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Attn: Jonathan Lange

Please find listed below analysis on the following sample.

Lab ID. 21211 Sample ID. Kansas Geological Survey Sample K.

ROSE HILL
MINERAL
767'

	As Received	Moisture Free	MAF
Moisture	7.04%		
Ash	11.37%	12.23%	
Volatile Matter	33.71%	36.26%	
Fixed Carbon	47.88%	51.51%	
BTU/lb	11,886	12,786	14,568
Sulfur	4.47%	4.81%	

Respectfully,

Carrol Luman

CGL:pd1

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June 20, 2003

Kansas Geological Survey
1930 Constant Ave.
Lawrence Ks 66047-3724

Attn: Jonathan Lange

Rose Hill Tebo
809'

Please find listed below analysis on the following sample.

Lab ID. 61610 Sample ID. Kansas Geological Survey Sample 3F-1096.18g.

	As Received	Moisture Free	MAF
Moisture	4.34%		
Ash	22.05%	23.05%	
Volatile Matter	30.84%	32.24%	
Fixed Carbon	42.77%	44.71%	
BTU/lb	9,591	10,026	13,030
Sulfur	3.06%	3.20%	

Respectfully,

Carrol Luman

CGL:pdl

TABLE 1 -- Desorption Data, Osborn Energy Rose Hill #1-6, sec. 6-T.16S-R.24E.; Miami Co., KS

SAMPLE: 291' 0" to 292' 5" (Stark Shale) in large Osborn container

WEIGHT CALCULATION lbs.

weight of container (full):

weight of container (empty):

sample weight:

CONVERSION OF RIG MEASUREMENTS TO STP

CONVERSION OF RIG MEASUREMENTS TO STP				CONVERSION OF RIG MEASUREMENTS TO STP (cubic ft. @60 degrees; CUMULATIVE VOLUMES)						
measured cc	measured T (F)	measured F	adjusted P	cubic ft. (@riq)	ABSOLUTE T (F)	(@riq psia (@riq) cubic ft. (@STP cc (@STP cubic ft. (@STP cc (@STP cubic ft. (@STP cc (@STP				
41	73	980	974	0.001447907	533	14.12668	0.001357499	38.43995	0.001357499	38.4399
14	75	980.5	974.5	0.000494407	535	14.13393	0.00046204	13.08348	0.001819539	51.5234
17	63	981	975	0.000600352	523	14.14118	0.000574217	16.25994	0.002393756	67.7834
6	61	980	974	0.000211889	521	14.12668	0.000203234	5.754925	0.00259699	73.5383
13	64.5	982	976	0.000459092	524.5	14.15569	0.0004383	12.41123	0.00303529	85.9495
34	62	980	974	0.001200703	522	14.12668	0.001149453	32.54877	0.004184743	118.498
0	63	980	974	0.00081224	523.5	14.1992	-0.000779323	-22.0679	0.00340542	96.4304

DESORPTION TERMINATED DUE TO LEAKY CONTAINER!

TIME OF:				elapsed time (off bottom to canistering)			
off bottom	at surface	in canister		off bottom	at surface	in canister	
4/23/2002 0:45				17 minutes			
4/23/2002 0:52				0.283 hours			
				0.53229047			
				SQRT hrs. (since cutting)			
4/23/2002 10:50	10:05:00	9:58:00	9:48:00	3.175426481			
4/24/2002 15:11	38:28:00	38:19:00	38:09:00	6.199462342			
4/28/2002 22:45	142:00:00	141:53:00	141:43:00	11.91637529			
4/30/2002 16:55	184:10:00	184:03:00	183:53:00	13.57080199			
5/3/2002 11:35	250:50:00	250:43:00	250:33:00	15.83771869			
5/7/2002 16:16	351:31:00	351:24:00	351:14:00	18.74877774			
5/10/2002 13:51	421:06:00	420:59:00	420:49:00	20.52072123			

SAMPLE: 316' 0" to 318' 5" (Hushpuckney Shale) in large Osborn container

WEIGHT CALCULATION lbs.

weight of container (full):

weight of container (empty):

sample weight:

CONVERSION OF RIG MEASUREMENTS TO STP

CONVERSION OF RIG MEASUREMENTS TO STP				CONVERSION OF RIG MEASUREMENTS TO STP (cubic ft. @60 degrees; CUMULATIVE VOLUMES)						
measured cc	measured T (F)	measured F	adjusted P	cubic ft. (@riq)	ABSOLUTE T (F)	(@riq psia (@riq) cubic ft. (@STP cc (@STP cubic ft. (@STP cc (@STP				
-1.5	69	980.5	974.5	-5.2972E-05	529	14.13393	-5.00658E-05	-1.4177	-5.00658E-05	-1.4177
0	76.5	979.5	973.5	0	536.5	14.11943	0	0	-5.00658E-05	-1.4177
0	63	981	975	0	523	14.14118	0	0	-5.00658E-05	-1.4177
0	61	980	974	0	521	14.12668	0	0	-5.00658E-05	-1.4177

DESORPTION TERMINATED DUE TO LEAKY CONTAINER!

TIME OF:				elapsed time (off bottom to canistering)			
off bottom	at surface	in canister		off bottom	at surface	in canister	
4/23/2002 1:59				25 minutes			
4/23/2002 2:16				0.417 hours			
				0.645497224			
				SQRT hrs. (since cutting)			
4/23/2002 10:07	8:08:00	7:51:00	7:43:00	2.851899951			
4/24/2002 16:32	38:33:00	38:18:00	38:33:00	6.208864831			
4/28/2002 22:43	140:44:00	140:27:00	140:44:00	11.86318088			
4/30/2002 16:59	183:00:00	182:43:00	183:00:00	13.52774926			

SAMPLE: 506' 0" to 509' 0" (South Mound Shale) in large Osborn container

sample dried 10 days in air

DRY WEIGHT lbs. grams

sample weight: 21.3921 9703.28

CONVERSION OF VOLUMES TO STP

CONVERSION OF RIG MEASUREMENTS TO STP				CONVERSION OF RIG MEASUREMENTS TO STP (cubic ft. @60 degrees; CUMULATIVE VOLUMES SCF/TON (approx) SCF/TON (approx))						
measured cc	measured T (F)	measured F	adjusted P	cubic ft. (@riq)	ABSOLUTE T (F)	(@riq psia (@riq) cubic ft. (@STP cc (@STP cubic ft. (@STP cc (@STP without lost gas with lost gas				
198	71	981	975	0.00999233	531	14.14118	0.006587175	69.52732	0.006587175	69.5273
10	71	981	975	0.000353148	531	14.14118	0.00032886	9.420572	0.006919861	78.9479
14	73	981	975	0.000494407	533	14.14118	0.000464012	13.13931	0.007383873	92.0872
42	74.5	980	974	0.001483222	534.5	14.12668	0.001386706	39.267	0.008770579	131.354
-3	65.5	980.5	974.5	-0.00010594	525.5	14.13393	-0.000100799	-2.85429	0.008669878	128.5
17	67	986	980	0.000603352	527	14.2137	0.000572781	16.21928	0.009242561	144.719
23	63.5	981	975	0.00091224	523.5	14.14118	0.000776139	21.97773	0.0100187	166.697
10	61.5	980	974	0.000353148	521.5	14.12668	0.000338399	9.582345	0.010357099	178.279
8	64.5	982	976	0.000282518	524.5	14.15569	0.000289723	7.63788	0.010626822	183.917
11	62	980	974	0.000388463	522	14.12668	0.000371882	10.53048	0.01098704	194.447
-30	63.5	984	978	-0.00105944	523.5	14.1847	-0.001015471	-28.7548	0.009883233	185.693
-5	64.5	985	979	-0.00017657	524.5	14.1992	-0.000169095	-4.78822	0.009814138	160.904

DESORPTION TERMINATED at 6/06/02

TIME OF:				elapsed time (off bottom to canistering)			
off bottom	at surface	in canister		off bottom	at surface	in canister	
4/23/2002 12:38	0:52:00	0:17:00	0:13:00	0.930949336			
4/23/2002 12:56	1:10:00	0:35:00	0:31:00	1.08012345			
4/23/2002 13:32	1:46:00	1:11:00	1:07:00	1.329160136			
4/23/2002 14:45	2:09:00	2:24:00	2:20:00	1.727232854			
4/24/2002 3:42	15:56:00	15:21:00	15:17:00	3.991657968			
4/28/2002 11:20	71:34:00	70:59:00	70:55:00	8.459708427			
4/28/2002 22:47	131:01:00	130:28:00	130:22:00	11.44625121			
4/30/2002 17:02	173:16:00	172:41:00	172:37:00	13.16307968			
5/3/2002 11:43	239:57:00	239:22:00	239:18:00	15.49031956			
5/7/2002 16:25	340:39:00	340:04:00	340:00:00	18.4567061			
5/10/2002 13:55	410:09:00	409:34:00	409:30:00	20.25216038			
5/13/2002 10:44	478:58:00	478:23:00	478:19:00	21.8853071			

SAMPLE: 510' 2" to 512' 9" (South Mound Shale) in large Osborn container

sample dried 10 days in air

DRY WEIGHT lbs. grams

sample weight: 16.3482 7415.4

CONVERSION OF VOLUMES TO STP

CONVERSION OF RIG MEASUREMENTS TO STP				CONVERSION OF RIG MEASUREMENTS TO STP (cubic ft. @60 degrees; CUMULATIVE VOLUMES SCF/TON (approx) SCF/TON (approx))						
measured cc	measured T (F)	measured F	adjusted P	cubic ft. (@riq)	ABSOLUTE T (F)	(@riq psia (@riq) cubic ft. (@STP cc (@STP cubic ft. (@STP cc (@STP without lost gas with lost gas				
215	71	981	975	0.00752682	531	14.14118	0.007152741	367.5423	0.007152741	367.542
20	71	981	975	0.000706296	531	14.14118	0.000665371	18.84114	0.007818112	386.383
38	73	981	975	0.001341962	533	14.14118	0.001259462	35.66385	0.009077573	422.047
129	74.5	980	974	0.004908757	534.5	14.12668	0.004589337	129.9551	0.01366691	552.002
171	74	980	974	0.006038831	534	14.12668	0.005951162	160.0225	0.019318072	712.025
0	65.5	980.5	974.5	0	525.5	14.13393	0	0	0.019318072	712.025
192	67	986	980	0.006780442	527	14.2137	0.006469051	183.1824	0.025787123	865.207
223	63.5	981	975	0.0078752	523.5	14.14118	0.007525177	213.0885	0.0333123	1108.3
214	62	980	974	0.007557367	522	14.12668	0.007234794	204.8658	0.040547094	1313.16
68	64.5	982	976	0.002401406	524.5	14.15569	0.002292647	64.92028	0.042839741	1378.08
30	62	980	974	0.001059444	522	14.12668	0.001014223	28.7195	0.043853964	1406.8
-4	63.5	984	978	-0.00014126	523.5	14.1847	-0.000135396	-3.83398	0.043718568	1402.97
20	64.5	985	979	0.000706296	524.5	14.1992	0.000676381	19.15289	0.044394948	1422.12
130	63	980	974	0.004590924	523	14.12668	0.004386655	124.2132	0.048781513	1546.33
-5	63.5	982	976	-0.00017657	523.5	14.15569	-0.000168899	-4.78267	0.048612614	1541.55

DESORPTION TERMINATED 6/20/02

TIME OF:				elapsed time (off bottom to canistering)			
off bottom	at surface	in canister		off bottom	at surface	in canister	
4/23/2002 13:07	0:39:00	0:20:00	0:14:00	0.806225775			
4/23/2002 13:11	0:43:00	0:24:00	0:18:00	0.846561623			
4/23/2002 13:18	0:50:00	0:31:00	0:25:00	0.912870629			
4/23/2002 14:37	2:09:00	1:50:00	1:44:00	1.46628783			
4/23/2002 19:06	6:39:00	6:19:00	6:13:00	2.575525636			
4/24/2002 3:49	15:21:00	15:02:00	14:58:00	3.917907905			
4/28/2002 11:59	71:12:00	70:59:00	71:06:00	8.456752726			
4/28/2002 22:53	130:25:00	130:06:00	130:00:00	11.42001168			
4/30/2002 17:05	172:37:00	172:18:00	172:12:00	13.16307968			
5/3/2002 11:48	239:22:00	239:01:00	238:55:00	15.47040185			
5/7/2002 16:27	339:59:00	339:40:00	339:34:00	18.43863997			
5/10/2002 14:04	409:38:00	409:17:00	409:11:00	20.23857703			
5/13/2002 10:48	478:20:00	478:01:00	477:55:00	21.87083294			
6/13/2002 17:35	1229:07:00	1228:48:00	1228:42:00	35.0567602			
6/20/2002 15:45	1395:17:00	1394:58:00	1394:52:00	37.35349158			

SAMPLE: 525' 4" to 528' 0" (Upper Mulberry coal) in canister 10

sample dried 10 days in air		lbs.	grams	wet sample weight:		lbs.	grams	moisture weight	est. lost gas (cc) =	TIME OF:			elapsed time (off bottom to canistering)				
DRY WEIGHT		1.2907	585.44			1.3195	598.51	2.2%	120	off bottom	at surface	in canister	21 minutes				
sample weight:		1.2907	585.44			1.3195	598.51	2.2%	120	#####	#####	4/23/2002 13:22	0.350 hours				
CONVERSION OF VOLUMES TO STP		CONVERSION OF RIG MEASUREMENTS TO STP (cubic ft; @60 degrees; CUMULATIVE VOLUMES SCF/TON (approx) SCF/TON (approx)										TIME SINCE		0.591607978 SQRT (hrs)			
measured cc	measured T (F)	measured F	adjusted P	cubic ft (@rig)	ABSOLUTE T (F)	(@r psia (@rig))	cubic ft (@STP)	cc (@STP)	cubic ft (@STP)	without lost gas	with lost gas	TIME OF MEASU	off bottom	at surface	in canister	SQRT hrs. (since cutting)	
73	73.5	981	975	0.00257798	53.5	14.14118	0.002417224	68.44791	88.4479	3.745877094	10.31244044	4/23/2002 13:49	0.48	0.31	0.27	0.604427191	
26	74.5	981	975	0.000918185	53.5	14.14118	0.000859319	24.3331	0.003276543	92.781	5.077257934	11.64402128	4/23/2002 14:23	1.22	1.05	1.01	1.159645194
15	75	981	975	0.000556037	53.5	14.14118	0.000528317	14.96022	0.00380486	107.741	5.89592847	12.46268981	4/23/2002 15:00	1.59	1.42	1.38	1.408308678
25	77	980	974	0.00088287	53.7	14.12668	0.000821578	23.2644	0.004826438	131.006	7.169024842	13.73578818	4/23/2002 15:35	2.34	2.17	2.13	1.602081979
19	77	980	974	0.00070981	53.7	14.12668	0.000624399	17.68094	0.005250837	148.687	8.136579605	14.70334295	4/23/2002 16:06	3.05	2.48	2.44	1.755942292
140	67.5	985.5	979.5	0.004944072	527.5	14.20645	0.004710141	133.3758	0.009960978	282.062	15.43530955	22.0020729	4/26/2002 12:11	71.10	70.53	70.49	8.436033823
56	61	981	975	0.001977629	52.1	14.14118	0.001898798	53.76778	0.011859776	335.83	18.37764513	24.94400847	4/28/2002 21:57	128.56	128.39	128.35	11.35488418
60	62.5	980	974	0.002118888	522.5	14.12668	0.002026506	57.38403	0.013886282	393.214	21.51787323	28.06463657	4/30/2002 17:17	172.16	171.59	171.55	13.12503968
35	64.5	982	976	0.001236018	524.5	14.15569	0.001180039	33.41485	0.015066321	426.629	23.34643507	29.91319841	5/3/2002 11:54	238.53	238.36	238.32	15.4558511
35	62	980	974	0.001236018	522	14.12668	0.001183261	33.50608	0.016249581	460.135	25.17968939	31.74675274	5/7/2002 16:30	339.29	339.12	339.08	18.4250735
20	64.5	985	979	0.000706296	524.5	14.1992	0.000676381	19.15289	0.016925962	479.288	26.22809363	32.79485698	5/13/2002 10:54	477.53	477.36	477.32	21.86054284
25	61.5	981	975	0.00088287	521.5	14.14118	0.000846865	23.98046	0.017772827	503.269	27.54037691	34.10714025	5/16/2002 16:18	555.17	555.00	555.00	23.6445063
20	62	982	976	0.000706296	522	14.15569	0.000677537	19.18565	0.018450364	522.454	28.59027367	35.15703705	5/23/2002 19:57	726.56	726.39	726.35	26.96170123
56	63	980	974	0.001977629	523	14.12668	0.001898597	53.50723	0.020339961	575.961	31.51835124	38.08511458	6/6/2002 18:09	1061.08	1060.51	1060.47	32.57504157
15	63.5	982	976	0.000529722	523.5	14.15569	0.000506697	14.34801	0.020846658	590.309	32.30351758	38.87028092	6/20/2002 15:25	1394.24	1394.07	1394.03	37.34166574
39	64.5	981	975	0.001377277	524.5	14.14118	0.001313563	37.19554	0.022160211	627.505	34.33897027	40.90573362	7/2/2002 16:24	1683.23	1683.06	1683.02	41.02905475
6	62.5	981	975	0.000211889	522.5	14.14118	0.000202859	5.744295	0.02236307	633.249	34.85331549	41.22007883	7/7/2002 21:29	1808.28	1808.11	1808.07	42.52607044
24	63	981	975	0.000847555	523	14.14118	0.000810659	22.95521	0.023173729	856.204	35.90949427	42.47625761	7/11/2002 17:53	1900.52	1900.35	1900.31	43.59892965
5	63	975	969	0.000178574	523	14.05416	0.000167948	4.752906	0.023341577	860.957	36.16958769	42.73635103	7/19/2002 17:15	2020.14	2019.57	2019.53	44.94700583
17	65	975	969	0.000603052	525	14.05416	0.000598509	18.99832	0.023910086	877.056	37.05053951	43.61729985	7/22/2002 15:40	2162.39	2162.22	2162.18	46.50430086
25	66	973	967	0.00088287	526	14.02515	0.000832731	23.58022	0.024742917	700.636	38.3409177	44.90768104	7/29/2002 15:08	2330.07	2329.50	2329.46	48.27128021
25	66	972	966	0.003498185	540	14.01065	0.003208799	90.98272	0.027951615	791.499	43.31320076	46.8799641	8/12/2002 13:25	2664.24	2664.07	2664.03	51.61782538
-8	64	974	968	-0.000706296	524	14.03966	-0.000669419	-18.9558	0.027282196	772.543	42.27588411	48.24626475	8/20/2002 14:51	2857.50	2857.33	2857.29	53.45570681
-2	64	978	972	-0.00028252	524	14.09767	-0.000258874	-7.61384	0.027013322	764.929	41.85624288	48.42600622	8/26/2002 10:34	2997.33	2997.16	2997.12	54.74988584

DESORPTION TERMINATED 08/30/02 DUE TO NO GAS BEING EVOLVED

SAMPLE: 566' 3" to 570' 0" (black shale) in large Osborn container

WEIGHT CALCULATION		lbs.	wet sample weight:		lbs.	grams	moisture weight	est. lost gas (cc) =	TIME OF:			elapsed time (off bottom to canistering)				
weight of container (full):		5.1078	2316.8811			5.3573	2430.01	4.7%	80	off bottom	at surface	in canister	106 minutes			
weight of container (empty):		5.1078	2316.8811			5.3573	2430.01	4.7%	80	#####	#####	4/23/2002 16:09	1.767 hours			
sample weight:		0	74.5			0	0	0	0	TIME OF MEASU	off bottom	at surface	in canister	1.329160136 SQRT (hrs)		
CONVERSION OF VOLUMES TO STP		CONVERSION OF RIG MEASUREMENTS TO STP (cubic ft; @60 degrees; CUMULATIVE VOLUMES SCF/TON (approx) SCF/TON (approx)										TIME SINCE		0.718795288 SQRT (hrs)		
measured cc	measured T (F)	measured F	adjusted P	cubic ft (@rig)	ABSOLUTE T (F)	(@r psia (@rig))	cubic ft (@STP)	cc (@STP)	cubic ft (@STP)	without lost gas	with lost gas	TIME OF MEASU	off bottom	at surface	in canister	SQRT hrs. (since cutting)
0	74.5	980	974	0	534.5	14.12668	0	0	0	0	0	4/23/2002 18:58	4.35	0	2.49	2.140872096
0	63	981	975	0	523	14.14118	0	0	0	0	0	4/28/2002 22:31	128.08	0	126.22	11.31969599
1	62	980	974	3.53148E-05	522	14.12668	3.38074E-05	0.957317	3.38074E-05	0.95732	0	4/30/2002 17:12	170.49	0	169.03	13.06968503
0	64.5	982	978	0	524.5	14.15569	0	0	0	0	0	5/3/2002 11:52	237.29	0	235.43	15.41049426

DESORPTION TERMINATED DUE TO LEAKY CONTAINER

SAMPLE: 576' 8.5" to 577' 7.5" (Lexington coal & shale above coal) in canister 1

sample dried 7 days @ 150 deg F		lbs.	grams	wet sample weight:		lbs.	grams	moisture weight	est. lost gas (cc) =	TIME OF:			elapsed time (off bottom to canistering)				
DRY WEIGHT		5.1078	2316.8811			5.3573	2430.01	4.7%	80	off bottom	at surface	in canister	31 minutes				
sample weight:		5.1078	2316.8811			5.3573	2430.01	4.7%	80	#####	#####	4/23/2002 17:04	0.517 hours				
CONVERSION OF VOLUMES TO STP		CONVERSION OF RIG MEASUREMENTS TO STP (cubic ft; @60 degrees; CUMULATIVE VOLUMES SCF/TON (approx) SCF/TON (approx)										TIME SINCE		0.718795288 SQRT (hrs)			
measured cc	measured T (F)	measured F	adjusted P	cubic ft (@rig)	ABSOLUTE T (F)	(@r psia (@rig))	cubic ft (@STP)	cc (@STP)	cubic ft (@STP)	without lost gas	with lost gas	TIME OF MEASU	off bottom	at surface	in canister	SQRT hrs. (since cutting)	
55	76.5	980	974	0.001942314	536.5	14.12668	0.001809155	51.22938	0.001809155	51.2294	0.70838254	1.814659524	4/23/2002 18:00	1.27	1:10	0.56	1.204159458
81	65	980.5	974.5	0.002860499	525	14.13393	0.002724153	77.13913	0.004533308	128.369	1.775036347	2.88124933	4/24/2002 3:31	10.58	10.41	10.27	3.311595789
75	68	985	979	0.004273091	528	14.1992	0.004064977	115.1069	0.008598285	243.475	3.366695488	4.472908472	4/26/2002 12:17	67.44	67.27	67.13	8.230026326
121	61	981	975	0.00264861	521	14.14118	0.002543033	72.01042	0.01141318	315.486	4.362431203	5.468644186	4/28/2002 22:02	125.29	125.12	124.58	11.20193436
111	64.5	982	976	0.003919943	524.5	14.15569	0.003742409	105.9728	0.014883727	421.459	5.827787491	6.934000474	5/3/2002 11:52	235.19	235.02	234.48	15.34003477
59	62	980	974	0.002083573	522.5	14.12668	0.001994639	56.48168	0.016878366	477.94	6.60879713	7.715010114	5/7/2002 16:33	336.00	335.43	335.29	18.33030278
61	64.5	985	979	0.002154203	524.5	14.1992	0.002062961	58.41632	0.018941327	536.357	7.416558282	8.522771266	5/13/2002 10:57	474.24	474.07	473.53	21.78072542
40	61.5	981	975	0.001412592	521.5	14.14118	0.001354984	38.36873	0.020296311	574.725	7.947108165	9.053321148	5/16/2002 16:28	551.55	551.38	551.24	23.49290673
62	62	981	975	0.002189518	522	14.14118	0.002098214	59.41457	0.022394525	634.14	8.768672789	9.874885773	5/23/2002 19:58	723.25	723.08	722.54	26.8964062
112	63	980	974	0.003919943	523	14.12668	0.003745451	108.059	0.026139978	740.199	10.23522043	11.34143341	6/6/2002 18:35	1058.02	1057.45	1057.31	32.52742433
91	63.5	982	978	0.003213847	523.5	14.15569	0.003073962	87.04457	0.029213938	827.243	11.43884336	12.54506534	6/20/2002 15:27	1390.54	1390.37	1390.23	37.29477175
70	64	981	975	0.002472036	524	14.14118	0.002359909	65.82493	0.031573847	894.068	12.36287597	13.46808895	6/27/2002 19:30	1562.57	1562.40	1562.26	39.53416244
22	64.5	981	975	0.000776926	524.5	14.14118	0.000740979	20.9821	0.032314828	915.051	12.65300637	13.75922235	7/2/2002 16:26	1679.53	1679.36	1679.22	40.98637985
23	62.5	981	975	0.000811224	522.5	14.14118	0.000778825	22.0198	0.03309245	937.07	12.95749169	14.06370468	7/7/2002 21:30	1804.40	1804.23	1804.09	42.48470313
63	63	981	975	0.000706296	523	14.14118	0.000675549	19.12934	0.033787999	956.2	13.22200581	14.32821879	7/11/2002 17:54	1897.21	1897.04	1896.50	43.55658124
21	63	975	969	0.000741611	523	14.05416	0.000704961	19.96221	0.034472961	978.182	13.48903646	1					

-3 66 975 969 -0.00010594 526 14.05416 -0.000100134 -2.83548 0.046918425 1328.58 18.37111168 19.47732466 10/4/2002 18.45 3938.12.00 3937.55.00 3937.41.00 62.75507948

SAMPLE: 577' 7.5" to 578' 8" (Lexington coal) in canister 3

sample dried 7 days @ 150 deg F
 DRY WEIGHT lbs. grams
 sample weight: 3.2883 1491.5652
 wet sample weight: lbs. grams moisture weight 3.7588 1704.96 12.5%

est. lost gas (cc) = 230
 TIME OF: off bottom (est.) at surface in canister elapsed time (off bottom to canistering) 30 minutes
 4/23/2002 14:33 4/23/2002 17:02 4/23/2002 17:02 0.500 hours

CONVERSION OF RIG MEASUREMENTS TO STP (cubic ft. @60 degrees; CUMULATIVE VOLUMES SCF/TON (approx) SCF/TON (approx) TIME OF MEASUREMENT TIME SINCE

measured cc	measured T (F)	measured F	adjusted F	cubic ft. (@STP)	ABSOLUTE T (F)	psia (@STP)	cubic ft. (@STP)	cc (@STP)	cubic ft. (@STP)	cc (@STP)	without lost gas	with lost gas	TIME OF MEASUREMENT	TIME SINCE	off bottom	at surface	in canister	elapsed time (off bottom to canistering)
104	76.5	980	974	0.003672739	536.5	14.12668	0.003420948	96.8701	0.003420948	96.8701	2.980554726	7.020781789	4/23/2002 17:10	0.38.00	0.38.00	0.20.00	0.08.00	0.795822426
71	76	980	974	0.002507351	536	14.12668	0.002337834	66.19416	0.002337834	66.19416	3.502426746	6.442553868	4/23/2002 17:24	0.52.00	0.34.00	0.34.00	0.22.00	0.93049336
100	75.5	980	974	0.00353148	536.5	14.12668	0.002395516	93.31826	0.002395516	93.31826	5.506792293	10.44691936	4/23/2002 17:50	1.18.00	1.00.00	1.00.00	0.48.00	1.140175425
65	76.5	980	974	0.002295462	536.5	14.12668	0.002138093	60.54381	0.002138093	60.54381	6.807201497	11.74732856	4/23/2002 18:10	1.38.00	1.20.00	1.20.00	1.08.00	1.278019301
58	76.5	980	974	0.002048258	536.5	14.12668	0.001907836	54.02371	0.001907836	54.02371	7.967566633	12.9076937	4/23/2002 18:34	2.02.00	1.44.00	1.44.00	1.32.00	1.425949976
164	68	980.5	974.5	0.005791627	528	14.13393	0.00548423	155.2955	0.00548423	155.2955	11.30313016	16.24325722	4/23/2002 20:31	3.59.00	3.41.00	3.41.00	3.29.00	1.995828984
154	65	981	975	0.005438479	525	14.14118	0.005181911	146.7348	0.005181911	146.7348	16.45482006	19.39494713	4/23/2002 23:03	6.31.00	6.13.00	6.13.00	6.01.00	2.552776266
159	65.5	980.5	974.5	0.005615053	525.5	14.13393	0.005342323	151.2772	0.005342323	151.2772	17.70407431	22.64420137	4/24/2002 3:55	11.23.00	11.05.00	11.05.00	10.53.00	3.37391958
531	66	986.5	980.5	0.018752159	526	14.22095	0.017934129	507.8361	0.017934129	507.8361	28.61179032	33.55191738	4/26/2002 10:45	66.13.00	65.55.00	65.55.00	65.43.00	8.13736239
340	61	981	975	0.012007032	521	14.14118	0.011528418	326.4472	0.011528418	326.4472	35.6234892	46.56361626	4/28/2002 21:47	125.15.00	124.57.00	124.57.00	124.45.00	11.19151464
194	61	980	974	0.006851071	521	14.12668	0.006571233	186.0759	0.006571233	186.0759	39.62017871	44.56030577	4/30/2002 11:38	163.08.00	162.48.00	162.48.00	162.36.00	12.77106104
32	62.5	980	974	0.001130074	522.5	14.12668	0.001080903	30.60482	0.001080903	30.60482	40.27753389	45.21766095	4/30/2002 17:21	168.49.00	168.31.00	168.31.00	168.19.00	12.9629468
96	64.5	982	976	0.006921701	524.5	14.15569	0.006680821	187.1232	0.006680821	187.1232	44.29671747	49.23684453	5/3/2002 11:52	235.20.00	235.02.00	235.02.00	234.50.00	15.340578
215	62	980	974	0.007592882	522	14.12668	0.007289601	205.8231	0.007289601	205.8231	48.71755303	53.9576801	5/7/2002 16:35	338.03.00	335.45.00	335.45.00	335.33.00	18.33166959
133	63.5	984	978	0.004898888	523.5	14.1847	0.004501919	127.4797	0.004501919	127.4797	51.45566534	58.3957924	5/10/2002 13:58	405.28.00	405.08.00	405.08.00	404.56.00	20.13537517
114	64.5	985	979	0.004025887	524.5	14.1992	0.003855369	109.1715	0.003855369	109.1715	53.80053927	58.74066633	5/13/2002 10:59	474.27.00	474.09.00	474.09.00	473.57.00	21.7818732
103	61.5	981	975	0.003637424	521.5	14.14118	0.003489084	98.79949	0.003489084	98.79949	55.92263501	60.8827206	5/16/2002 16:27	551.55.00	551.37.00	551.37.00	551.25.00	23.48290873
171	62	982	976	0.006038831	522	14.15569	0.005792944	164.0373	0.005792944	164.0373	59.44596137	64.38608843	5/23/2002 20:01	723.29.00	723.11.00	723.11.00	722.59.00	28.8976455
251	63	980	974	0.008864015	523	14.12668	0.008469444	239.827	0.008469444	239.827	64.59716166	69.53728873	6/8/2002 19:20	1058.48.00	1058.30.00	1058.30.00	1058.18.00	32.53820712
124	63.5	982	976	0.004379035	523.5	14.15569	0.004189965	118.8102	0.004189965	118.8102	67.14476767	72.08484833	6/20/2002 15:28	1390.56.00	1390.38.00	1390.38.00	1390.26.00	37.29521864
121	64	981	975	0.004273091	524	14.14118	0.004079272	115.5117	0.004079272	115.5117	69.62582172	74.56594833	6/27/2002 19:25	1562.53.00	1562.35.00	1562.35.00	1562.23.00	39.53331928
57	64.5	981	975	0.002012944	524.5	14.14118	0.001919808	64.36272	0.001919808	64.36272	70.79346789	75.73359495	7/2/2002 16:28	1879.56.00	1879.38.00	1879.38.00	1879.26.00	40.98598081
39	62.5	981	975	0.001372727	522.5	14.14118	0.001318581	37.33792	0.001318581	37.33792	71.59544205	76.53556911	7/7/2002 21:31	1804.59.00	1804.41.00	1804.41.00	1804.29.00	42.48509543
43	63	981	975	0.001518536	523	14.14118	0.00145243	41.12809	0.00145243	41.12809	72.47882462	77.41895169	7/11/2002 17:55	1897.23.00	1897.05.00	1897.05.00	1896.53.00	43.55896387
35	63	975	969	0.001236018	523	14.05416	0.001174936	33.27034	0.001174936	33.27034	73.19343214	78.13356062	7/16/2002 17:18	2016.46.00	2016.28.00	2016.28.00	2016.16.00	44.90842534
37	65	975	969	0.001306848	525	14.05416	0.001237343	35.03752	0.001237343	35.03752	73.94599665	78.88612356	7/22/2002 15:43	2159.11.00	2158.53.00	2158.53.00	2158.41.00	46.46701339
55	66	973	967	0.001942314	526	14.02515	0.001832008	51.87649	0.001832008	51.87649	75.06024194	80.000369	7/29/2002 15:10	2326.38.00	2326.20.00	2326.20.00	2326.08.00	48.23518771
185	60	972	966	0.005833238	540	14.01065	0.00599624	169.794	0.00599624	169.794	78.70721489	83.64734196	8/12/2002 13:27	2660.55.00	2660.37.00	2660.37.00	2660.25.00	51.58407377
205	64	974	968	0.00088287	524	14.03966	0.000836774	23.6947	0.000836774	23.6947	79.21614896	84.15627036	8/20/2002 14:53	2854.21.00	2854.03.00	2854.03.00	2853.51.00	53.42611721
20	64	978	972	0.000706296	524	14.09767	0.000672185	19.03409	0.000672185	19.03409	79.62497865	84.56510571	8/26/2002 10:35	2994.03.00	2993.45.00	2993.45.00	2993.33.00	54.71791297
38	64	971	965	0.001341962	524	13.99615	0.001267954	35.90433	0.001267954	35.90433	80.39616098	85.33828804	9/2/2002 14:12	3165.40.00	3165.22.00	3165.22.00	3165.10.00	56.26425745
8	65	972	966	0.000282518	525	14.01065	0.00026705	7.522226	0.00026705	7.522226	80.58837383	85.49850089	9/5/2002 17:30	3240.58.00	3240.40.00	3240.40.00	3240.28.00	56.92948855
3	64	974	968	0.000105944	524	14.03966	0.000100413	2.843364	0.000100413	2.843364	80.61944592	85.59657298	9/7/2002 12:47	3284.15.00	3283.57.00	3283.57.00	3283.45.00	57.30837635
26	63	972	966	0.000918185	523	14.01065	0.000870107	24.6386	0.000870107	24.6386	81.14865371	86.06878078	9/13/2002 18:30	3433.58.00	3433.40.00	3433.40.00	3433.28.00	58.60005688
43	68	967	961	0.001518536	528	13.93813	0.001480118	40.15398	0.001480118	40.15398	86.95123364	9/20/2002 10:28	3593.56.00	3593.38.00	3593.38.00	3593.26.00	59.94942313	
9	65	972	966	0.000317833	525	14.01065	0.000300044	8.496254	0.000300044	8.496254	87.1337321	9/27/2002 13:59	3765.27.00	3765.09.00	3765.09.00	3764.57.00	61.36326263	
63	75	971	965	0.002224832	535	13.99615	0.002058913	58.3017	0.002058913	58.3017	83.44584744	89.3865745	10/1/2002 13:54	3861.22.00	3861.04.00	3861.04.00	3860.52.00	62.13869593
-2	66	975	969	-0.063E-05	526	14.05416	-6.7563E-05	-1.89032	0.000000000	0.000000000	83.40524562	86.34537299	10/4/2002 18:48	3938.14.00	3937.56.00	3937.56.00	3937.44.00	62.75534506

SAMPLE: 617' 2" to 618' 1" (Summit coal) in canister 4

WEIGHT CALCULATION lbs.
 weight of container (full): 10.025
 weight of container (empty): 6.225
 sample weight: 3.8

CONVERSION OF RIG MEASUREMENTS TO STP (cubic ft. @60 degrees; CUMULATIVE VOLUMES SCF/TON (approx) SCF/TON (approx) TIME OF MEASUREMENT TIME SINCE

measured cc	measured T (F)	measured F	adjusted F	cubic ft. (@STP)	ABSOLUTE T (F)	psia (@STP)	cubic ft. (@STP)	cc (@STP)	cubic ft. (@STP)	cc (@STP)	without lost gas	with lost gas	TIME OF MEASUREMENT	TIME SINCE	off bottom	at surface	in canister	elapsed time (off bottom to canistering)
0	66	980	974	0	526	14.12668	0	0	0	0	0	0	4/23/2002 8:59	2:09.00	1:29.00	1:21.00	1:21.00	0.894427191
DESORPTION TERMINATED AT 4/23/02 9:25 AM DUE TO NO GAS BUILD UP IN CANISTER																		

SAMPLE: 635' 4" to 636' 4" (Mulky coal) in canister 2

WEIGHT CALCULATION lbs.
 weight of container (full): 12.9
 weight of container (empty): 6.225
 sample weight: 6.675

CONVERSION OF RIG MEASUREMENTS TO STP (cubic ft. @60 degrees; CUMULATIVE VOLUMES SCF/TON (approx) SCF/TON (approx) TIME OF MEASUREMENT TIME SINCE

measured cc	measured T (F)	measured F	adjusted F	cubic ft. (@STP)	ABSOLUTE T (F)	psia (@STP)	cubic ft. (@STP)	cc (@STP)	cubic ft. (@STP)	cc (@STP)	without lost gas	with lost gas	TIME OF MEASUREMENT	TIME SINCE	off bottom	at surface	in canister	elapsed time (off bottom to canistering)
10	69	980	974	0.000353148	529	14.12668	0.000333601	9.44649	0.000333601	9.44649	0.099955323	0.099955323	4/23/2002 20:15	0.35.00	0.22.00	0.20.00	0.20.00	0.763782616
3.5	68	980.5	974.5	0.000123602	528	14.13393	0.000117042	3.14234	0.000117042	3.14234	0.004509642	12.7907	4/23/2002 20:48	1.06.00	0.53.00	0.53.00	0.51.00	1.048808848
3	65.5	980.5	974.5	0.000105944	525.5	14.13393	0.000100709	2.854286	0.000100709	2.854286	0.000551441	15.615	4/24/2002 3:26	7.46.00	7.33.00	7.33.00	7.31.00	2.786873995
2	68	985	979	7.06298E-05	528	14.1992	8.71897E-05	1.902593	0.000818831	17.5176	0.185357495							

DRY WEIGHT		lbs.	grams	wet sample weight:		lbs.	grams	moisture weight	est. lost gas (cc) =	TIME OF:			elapsed time (off bottom to canistering)			
sample weight:		3.3543	1521.47			3.4075	1545.6	1.6%	200	off bottom	at surface	in canister	27 minutes			
CONVERSION OF VOLUMES TO STP		CONVERSION OF RIG MEASUREMENTS TO STP (cubic ft. @60 degrees; ABSOLUTE T (F) (@r psia (@riq) cubic ft. (@STP cc (@STF cubic ft. (@STP cc (@STF without lost gas with lost gas		CUMULATIVE VOLUMES SCF/TON (approx) SCF/TON (approx)		TIME OF MEASUREMENT		TIME SINCE		0.450 hours		0.670820393 SQRT (hrs)				
measured cc	measured T (F)	measured F	adjusted P	cubic ft. (@riq)	ABSOLUTE T (F) (@r psia (@riq)	cubic ft. (@STP cc (@STF	cubic ft. (@STP cc (@STF	cubic ft. (@STP cc (@STF	without lost gas	with lost gas	TIME OF MEASUREMENT	off bottom	at surface	in canister	SQRT hrs. (since cutting)	
134	65	981	975	0.004732183	525	14.14118	0.004508938	127.6784	2.688477415	6.899805857	4/24/2002 2:16	1:10.00	0:52.00	0:43.00	1.08012345	
82	65.5	980.5	974.5	0.002896814	525.5	14.13393	0.002755118	78.01718	0.007284096	205.896	4.331258849	4/24/2002 3:11	2:05.00	1:47.00	1.443375673	
86	65.5	980.5	974.5	0.003037073	525.5	14.13393	0.002896558	81.92288	0.010153654	287.518	6.054171865	10.26550031	4/24/2002 4:39	3:33.00	3:15.00	1.884144368
89	65	980	974	0.003143017	525	14.12668	0.002991869	84.71432	0.013145324	372.233	7.837970971	12.04929941	4/24/2002 7:12	8:08.00	5:48.00	2.468917807
526	67.5	985	979	0.018575585	527.5	14.1992	0.01788784	500.8593	0.030832964	873.089	18.38432276	22.5956512	4/26/2002 11:38	58:32.00	58:14.00	7.650780228
257	62	981	975	0.009075904	522	14.14118	0.008697434	246.283	0.039530398	1119.37	23.57021536	27.7815438	4/28/2002 22:18	117:12.00	116:45.00	10.82589488
120	61	981	975	0.004237776	521	14.14118	0.004068854	115.2167	0.043599251	1234.59	25.99629146	30.2076199	4/30/2002 11:45	154:39.00	154:21.00	12.43858352
20	62.5	980	974	0.000706296	522.5	14.12668	0.006755502	19.12801	0.044274753	1253.72	26.39906315	30.61039159	4/30/2002 17:27	160:21.00	160:03.00	12.66293805
127	64.5	982	976	0.00448498	524.5	14.15569	0.004281852	121.2482	0.048559608	1374.96	28.95214259	33.16347103	5/3/2002 12:08	227:02.00	226:44.00	15.06762534
151	62	980	974	0.005332535	522	14.12668	0.005104924	144.5548	0.053661533	1519.52	31.99598163	36.20731007	5/7/2002 16:38	327:32.00	327:05.00	18.09788201
135	64.5	985	979	0.00478498	524.5	14.1992	0.004565569	129.282	0.058227101	1648.8	34.71822689	38.92955533	5/13/2002 11:04	465:58.00	465:31.00	21.58626106
78	61.5	981	975	0.002754554	521.5	14.14118	0.002642219	74.81903	0.06086932	1723.62	36.29366442	40.50492986	5/16/2002 16:30	543:24.00	543:06.00	23.31094164
125	62	982	976	0.00441435	522	14.15569	0.004234608	119.0103	0.065103929	1843.53	38.81857271	43.02990116	5/23/2002 20:04	714:58.00	714:40.00	26.73886061
170	63	980	974	0.006003516	523	14.12668	0.005736277	162.4327	0.070840205	2005.96	42.23885917	46.45018754	6/6/2002 19:04	1049:58.00	1049:31.00	32.40318914
94	63.5	982	976	0.003319591	523.5	14.15569	0.003175301	89.91417	0.074015506	2095.88	44.13214965	48.34347809	6/20/2002 15:32	1382:26.00	1382:08.00	37.18108838
84	64.5	981	975	0.002966443	524.5	14.14118	0.002829191	80.11348	0.076844698	2175.99	45.81907044	50.03039888	7/2/2002 16:29	1671:23.00	1671:05.00	40.88255537
20	62.5	981	975	0.000706296	522	14.14118	0.006876195	19.14785	0.077520893	2195.14	46.22225565	50.4335841	7/7/2002 21:32	1796:26.00	1796:08.00	42.38435246
27	63	981	975	0.0009535	523	14.14118	0.00911991	25.82461	0.078432884	2220.96	46.76603533	50.97736377	7/11/2002 17:36	1888:30.00	1888:12.00	43.45687518
19	63	975	969	0.000670981	523	14.05416	0.006837822	18.06104	0.079070707	2239.02	47.14634027	51.35766872	7/16/2002 17:20	2008:14.00	2007:56.00	44.81331647
19	65	975	969	0.000670981	525	14.05416	0.00635392	17.99224	0.079706099	2257.02	47.52519644	51.73652488	7/22/2002 15:50	2150:44.00	2150:26.00	46.37599954
31	66	973	967	0.001094759	526	14.02515	0.001032586	29.23948	0.080738685	2286.26	48.14088162	52.35221007	7/29/2002 15:11	2318:05.00	2317:47.00	48.14647789
126	80	972	966	0.004449665	540	14.01665	0.004083926	115.6435	0.084822611	2401.9	50.57594458	54.78727302	8/12/2002 13:29	2652:23.00	2652:05.00	51.50129448
-4	64	974	968	-0.00014126	524	14.03966	-0.001133884	-3.79115	0.084888727	2398.11	50.49611564	54.70744408	8/20/2002 14:54	2845:48.00	2845:30.00	53.34604015
0	64	978	972	0	524	14.09767	0	0	0.084888727	2398.11	50.49611564	54.70744408	8/26/2002 10:36	2985:30.00	2985:12.00	54.63972914

DESORPTION TERMINATED 08/30/02 DUE TO NO GAS BEING EVOLVED

SAMPLE: 737° 0' to 738° 0' (Croweburg coal) in canister 7

MEASURED DENSITY: 1.21 grams/cc

sample dried 10 days in air

DRY WEIGHT		lbs.	grams	wet sample weight:		lbs.	grams	moisture weight	est. lost gas (cc) =	TIME OF:			elapsed time (off bottom to canistering)			
sample weight:		3.6024	1634.0202			3.8423	1742.83	6.2%	160	off bottom	at surface	in canister	27 minutes			
CONVERSION OF VOLUMES TO STP		CONVERSION OF RIG MEASUREMENTS TO STP (cubic ft. @60 degrees; ABSOLUTE T (F) (@r psia (@riq) cubic ft. (@STP cc (@STF cubic ft. (@STP cc (@STF without lost gas with lost gas		CUMULATIVE VOLUMES SCF/TON (approx) SCF/TON (approx)		TIME OF MEASUREMENT		TIME SINCE		0.450 hours		0.670820393 SQRT (hrs)				
measured cc	measured T (F)	measured F	adjusted P	cubic ft. (@riq)	ABSOLUTE T (F) (@r psia (@riq)	cubic ft. (@STP cc (@STF	cubic ft. (@STP cc (@STF	cubic ft. (@STP cc (@STF	without lost gas	with lost gas	TIME OF MEASUREMENT	off bottom	at surface	in canister	SQRT hrs. (since cutting)	
97	65.5	980.5	974.5	0.003425536	525.5	14.13393	0.003259153	92.28859	0.003259153	92.2886	4.946435469	4/24/2002 3:19	1:06.00	0:43.00	0.39.00	1.048890884
81	65	980	974	0.002860499	525	14.12668	0.002722755	77.09955	0.005981908	169.388	3.321070384	6.458074298	4/24/2002 5:12	2:59.00	2:36.00	1.727232854
101	66	980	974	0.003569795	526	14.12668	0.003398589	95.85371	0.003398589	265.342	5.202396508	6.339369862	4/24/2002 8:54	6:41.00	6:14.00	2.585214369
299	67.5	985	979	0.01059125	527.5	14.1992	0.010054381	284.7973	0.019424875	550.049	10.78441424	13.82141819	4/26/2002 11:58	57:45.00	57:22.00	7.584342077
152	62	981	975	0.00536785	522	14.14118	0.005144008	145.8615	0.024568889	895.711	13.84029416	16.77728908	4/28/2002 22:07	115:54.00	115:27.00	10.76566623
85	63	980	974	0.003001758	523	14.12668	0.002868138	81.21633	0.027437021	778.927	15.23264381	18.36964772	4/30/2002 17:28	159:15.00	158:52.00	12.61942046
72	64.5	982	976	0.002542686	524.5	14.15569	0.002427508	68.73912	0.02986453	845.686	16.58036192	19.71738653	5/3/2002 12:10	225:57.00	225:34.00	15.03163331
78	62	980	974	0.002754554	522	14.12668	0.002836981	74.6707	0.03260151	920.337	18.04437615	21.18138006	5/7/2002 16:39	328:26.00	326:03.00	18.06746616
76	64.5	985	979	0.002683925	524.5	14.1992	0.002570246	72.78099	0.035071757	993.118	19.4713402	22.60834412	5/13/2002 11:07	464:54.00	464:31.00	21.56153983
61	61.5	981	975	0.001801055	521.5	14.14118	0.001727605	48.92013	0.036799361	1042.04	20.43048179	23.5674857	5/16/2002 16:25	542:12.00	541:49.00	23.28518843
51	62	982	976	0.002154203	522	14.15569	0.002066489	58.51623	0.03886585	1100.55	21.57776699	24.7147709	5/23/2002 20:05	713:52.00	713:29.00	26.71828338
96	63	980	974	0.003390221	523	14.12668	0.003239309	91.72668	0.042105159	1192.28	23.37818541	26.51318933	6/6/2002 19:08	1048:55.00	1048:32.00	32.36698298
71	63.5	982	976	0.002507351	523.5	14.15569	0.002398366	67.9139	0.044503525	1260.19	24.70772389	27.84472781	6/20/2002 15:33	1381:20.00	1380:53.00	37.16629297
68	64.5	981	975	0.002401406	524.5	14.14118	0.002290298	64.85377	0.046793823	1325.05	25.97926463	29.11626854	7/2/2002 16:31	1670:18.00	1669:55.00	40.86930398
15	62.5	981	975	0.000529722	522.5	14.14118	0.000507147	14.36074	0.047300969	1339.41	26.26082519	29.3978291	7/7/2002 21:33	1795:20.00	1794:53.00	42.37137388
20	63	981	975	0.000706296	523	14.14118	0.00675549	19.12934	0.047976518	1358.54	26.63588037	27.77284228	7/11/2002 17:58	1887:45.00	1887:22.00	43.44824507
13	65	975	969	0.000459092	523	14.05416	0.000436405	12.35756	0.048412923	1370.9	26.87816601	30.01516993	7/16/2002 17:21	2007:08.00	2006:45.00	44.80104165
17	65	975	969	0.000459092	525	14.05416	0.000434742	12.31048	0.048847665	1383.21	27.11952866	30.25653258	7/22/2002 15:46	2149:33.00	2149:10.00	46.36323975
13	66	973	967	0.000600352	526	14.02515	0.000566257	16.03455	0.049413922	1399.24	27.43390648	30.57091039	7/29/2002 15:12	2316:59.00	2316:36.00	48.13505306
-110	80	972	966	0.003884828	540	14.01665	0.003965332	100.9586	0.052979254	1500.2	29.41332803	32.55033194	8/12/2002 13:30	2651:17.00	2650:54.00	51.49061403
1	64	974	968	-3.5315E-05	524	14.03966	-3.34709E-05	-0.94779	0.052945783	1499.25	29.39474543	32.53174935	8/20/2002 14:54	2844:41.00	2844:18.00	53.33557287
3	64	978	972	0.000105944	524	14.09767	0.000100828	2.855114	0.053048611	1502.11	29.50723358	32.58772749	8/26/2002 10:36	2984:23.00	2984:00.00	54.62950973
5	65	979	973	0.000176574	525	14.1218	0.000187899	4.754345	0.05321451	1506.86	29.54393857	32.68094249	8/30/2002 14:00	3083:47.00	3083:24.00	55.53182271
15	64	971	965	0.000529722	524	13.99615	0.000500508	14.17276	0.053715018	1521.03	29.8218136	32.95881752	9/2/2002 14:14	3156:01.00	3155:38.00	56.17843596
0	64	974	968	0												

308	63	981	975	0.010876958	523	14.14118	0.010403454	294.5919	0.046028957	1303.39	24.8156487	30.52744226	4/28/2002 22:22	114.34.00	114.15.00	114.10.00	10.70358195
127	61	981	975	0.004484988	521	14.14118	0.004306203	121.9376	0.05033516	1425.33	27.13725741	32.84905098	4/30/2002 11:42	151.54.00	151.35.00	151.30.00	12.3247718
21	63	980	974	0.000741611	523	14.12668	0.000708599	20.06521	0.051043759	1445.39	27.51926522	33.23107879	4/30/2002 17.31	157.43.00	157.24.00	157.19.00	12.55652964
141	64.5	982	976	0.004979387	524.5	14.15569	0.004753871	134.6141	0.05579763	1580.01	30.08224535	35.79403891	5/3/2002 12.12	224.24.00	224.05.00	224.00.00	14.97996665
149	62	980	974	0.005261905	522	14.12668	0.00503731	142.6402	0.060834939	1722.85	32.79801627	38.50980984	5/7/2002 16.40	324.52.00	324.33.00	324.28.00	18.024058
88	63.5	984	978	0.003107702	523.5	14.1847	0.002978714	84.34746	0.063813653	1806.99	34.40393386	40.11572742	5/10/2002 14.00	394.12.00	393.53.00	393.48.00	19.85447053
73	64.5	985	979	0.002931128	524.5	14.1992	0.002806979	79.4845	0.06620632	1896.48	35.91726407	41.62905764	5/13/2002 11.09	463.21.00	463.02.00	462.57.00	21.52565919
83	61.5	981	975	0.002794554	521.5	14.14118	0.002642219	74.81903	0.062922851	1981.3	37.34176991	43.0540047	5/19/2002 16.02	540.44.00	540.25.00	540.20.00	23.25367054
120	62	982	976	0.004237776	522	14.15569	0.004065224	115.1139	0.073328075	2078.41	39.53345613	45.24549497	5/23/2002 20.06	712.18.00	711.59.00	711.54.00	26.88694902
179	63	980	974	0.006321349	523	14.12668	0.006399662	171.032	0.079386037	2247.44	42.78678839	48.50158196	6/8/2002 20.15	1048.27.00	1048.08.00	1048.03.00	32.37677764
114	63.5	982	976	0.004025887	523.5	14.15569	0.003850897	109.0448	0.083218934	2356.49	44.86592724	50.57722006	6/20/2002 15.36	1379.48.00	1379.29.00	1379.24.00	37.14565823
82	64	981	975	0.002895814	524	14.14118	0.002764465	78.28064	0.085983399	2434.77	46.35633668	52.06813025	6/27/2002 19.27	1551.39.00	1551.20.00	1551.15.00	39.39098802
30	64.5	981	975	0.001059444	524.5	14.14118	0.001010425	28.61196	0.089993825	2463.38	46.90108863	52.61288219	7/2/2002 16.34	1668.46.00	1668.27.00	1668.22.00	40.85054059
21	62.5	981	975	0.000741611	522.5	14.14118	0.000710005	20.10503	0.08770383	2483.49	47.28387461	52.99568818	7/7/2002 21.34	1793.46.00	1793.27.00	1793.22.00	42.35286263
28	63	981	975	0.000988814	523	14.14118	0.000945769	26.78108	0.088649599	2510.27	47.79376799	53.50566155	7/11/2002 17.59	1886.11.00	1885.52.00	1885.47.00	43.43021222
21	63	975	969	0.000741611	523	14.05416	0.000704961	19.96221	0.08935456	2530.23	48.17383467	53.88562823	7/16/2002 17.23	2005.35.00	2005.16.00	2005.11.00	44.78373961
25	65	975	969	0.00088287	525	14.05416	0.000836043	23.674	0.090190603	2553.9	48.62457134	54.3363649	7/22/2002 15.47	2147.59.00	2147.35.00	2147.30.00	46.3463411
-3	66	973	967	0.001518536	526	14.02515	0.001432297	40.55798	0.0916229	2594.46	49.39676743	55.10856099	7/29/2002 15.13	2315.25.00	2315.06.00	2315.01.00	48.11877665
-5	80	972	966	-0.00017657	540	14.01065	-0.000162061	-4.58903	0.091460839	2589.87	49.30939553	55.02118909	8/12/2002 13.30	2649.42.00	2649.23.00	2649.18.00	51.47523676
-2	64	974	968	-7.063E-05	524	14.03966	-6.89419E-05	-1.89558	0.091393997	2587.98	49.27330506	54.98509863	8/20/2002 14.55	2843.07.00	2842.48.00	2842.43.00	53.2088396
18	64	971	965	0.000356966	524	13.99615	0.00080061	17.00731	0.091994507	2604.98	49.59711259	55.30890616	8/23/2002 19.58	2920.10.00	2919.51.00	2919.46.00	54.03869647
0	64	978	973	0	524	14.11218	0	0	0.091994507	2604.98	49.59711259	55.30890616	8/25/2002 10.37	2982.49.00	2982.30.00	2982.25.00	54.81516883
10	65	978	973	0.000335148	525	14.11218	0.000335797	9.50869	0.092330305	2614.49	49.77815151	55.48994508	8/30/2002 14.00	3082.12.00	3081.53.00	3081.48.00	55.51756479
24	64	978	965	0.000847555	524	13.99615	0.000800813	22.67642	0.093131118	2637.17	50.20989488	55.92168485	9/2/2002 14.15	3154.27.00	3154.08.00	3154.03.00	56.16449056
1	64	978	968	3.53148E-05	524	14.03966	3.34709E-05	0.947788	0.093164589	2638.12	50.22794012	56.93973368	9/5/2002 17.17	3229.29.00	3229.10.00	3229.05.00	56.8285433
19	63	972	968	0.000670981	523	14.03966	0.000637164	18.04241	0.093801753	2656.16	50.5714551	56.28324866	9/15/2002 19.07	3471.19.00	3471.00.00	3470.55.00	58.9178807
48	68	967	968	0.00189511	524	14.03966	0.001594434	45.14918	0.095396187	2701.31	51.43106436	57.14285792	9/20/2002 10.30	3582.42.00	3582.23.00	3582.18.00	59.85565972
3	65	972	968	0.000105944	525	14.03966	0.000100222	2.837948	0.095496408	2704.15	51.48509694	57.1969895	9/27/2002 13.59	3754.11.00	3753.52.00	3753.47.00	61.27139082
55	76	971	968	0.001942314	536	14.03966	0.001796688	50.96129	0.097296096	2755.11	52.45536485	58.16715842	10/1/2002 13.56	3850.08.00	3849.49.00	3849.44.00	62.04944265

DESORPTION TERMINATED 10/07/02 DUE TO NO GAS BEING EVOLVED

SAMPLE: 809° 0' to 810° 0' (Tebco coal) in canister 9

sample dried 10 days in air																	
DRY WEIGHT:																	
	lbs.	grams		lbs.	grams	moisture weight		est. lost gas (cc) =		TIME OF:							elapsed time (off bottom to canistering)
sample weight:	4.2008	1905.47	wet sample weight:	4.5133	2047.2	6.9%		220		cutting	at surface	in canister					20 minutes
CONVERSION OF VOLUMES TO STP																	
RIG MEASUREMENTS																	
measured cc measured T (F) measured F adjusted P cubic ft (@riq); ABSOLUTE T (F) (@r psia (@riq) cubic ft (@STP cc (@STF cubic ft (@STP cc (@STF without lost gas with lost gas TIME OF MEASU off bottom at surface in canister																	
CONVERSION OF RIG MEASUREMENTS TO STP (cubic ft. @80 degrees; CUMULATIVE VOLUMES SCF/TON (approx SCF/TON (approx)																	
94	65	980	974	0.003319591	525	14.12668	0.003159741	89.47355	0.003159741	89.4736	1.504336756	5.203240897	4/24/2002 6.35	0.44.00	0.26.00	0.24.00	0.656348839
78	65	980	974	0.002754554	525	14.12668	0.002621912	74.24401	0.005781853	163.718	2.752616191	6.451520332	4/24/2002 6.59	1.08.00	0.50.00	0.48.00	1.064581295
148	66	980	974	0.00522659	526	14.12668	0.004965453	140.6054	0.010747106	304.323	5.116643493	8.815564734	4/24/2002 8.39	2.48.00	2.30.00	2.28.00	1.673320053
455	67.5	986	980	0.01608234	527.5	14.2137	0.015315773	433.6928	0.028062879	798.016	12.40840689	16.10731103	4/28/2002 11.50	53.59.00	53.41.00	53.39.00	7.347335118
277	62	981	975	0.0097822	522	14.14118	0.009374277	265.449	0.035437156	1003.46	16.87145369	20.57035783	4/28/2002 22.14	112.23.00	112.05.00	112.03.00	10.60110057
134	61	981	975	0.004732183	521	14.14118	0.004543553	128.8586	0.039980709	1132.12	19.03461672	22.7352086	4/30/2002 11.40	149.49.00	149.31.00	149.29.00	12.23996187
26	63	980	974	0.000918195	523	14.12668	0.000877313	24.84264	0.040858022	1158.97	19.45230104	23.15120518	4/30/2002 17.33	155.42.00	155.24.00	155.22.00	12.47798061
140	64.5	982	976	0.00494072	524.5	14.15569	0.004720155	133.8594	0.045578177	1290.63	21.89954344	25.39644758	5/3/2002 12.14	222.23.00	222.05.00	222.03.00	14.9125227
136	62	980	974	0.004802813	522	14.12668	0.004567813	130.1981	0.050175599	1420.82	23.8883921	27.58744335	5/7/2002 16.43	322.52.00	322.34.00	322.32.00	17.96849094
82	63.5	984	978	0.002895814	523.5	14.1847	0.00277562	78.5965	0.052951809	1499.42	25.20999787	28.90890201	5/10/2002 14.01	392.10.00	391.52.00	391.50.00	19.80319839
93	64.5	985	979	0.00264861	524.5	14.1992	0.002536427	71.82334	0.055488036	1571.24	26.41758781	30.11648232	5/13/2002 11.12	461.21.00	461.03.00	461.01.00	21.47905957
63	61.5	981	975	0.002224832	521.5	14.14118	0.0021341	60.43075	0.057622136	1631.67	27.43361257	31.13251672	5/16/2002 16.34	538.43.00	538.25.00	538.23.00	23.21027072
106	62	982	976	0.003743369	522	14.15569	0.003590948	101.8839	0.061213084	1733.35	29.14324497	32.84214911	5/23/2002 20.08	710.17.00	709.59.00	709.57.00	26.65114311
157	63	980	974	0.005544424	523	14.12668	0.00529782	150.0113	0.066510705	1883.37	31.6654157	35.36431984	6/6/2002 19.40	1045.49.00	1045.31.00	1045.29.00	32.33908883
100	63.5	982	976	0.00353148	523.5	14.15569	0.00337798	95.65337	0.069888884	1979.02	33.27385507	36.97255921	6/20/2002 15.37	1377.46.00	1377.28.00	1377.26.00	37.11827941
74	64	981	975	0.002613295	524	14.14118	0.002494761	70.6435	0.072383446	2049.66	34.46139842	38.16030257	6/27/2002 19.32	1549.41.00	1549.23.00	1549.21.00	39.36601749
29	64.5	981	975	0.001024129	524.5	14.14118	0.000976745	27.65822	0.07336019	2077.32	34.92642169	38.62532583	7/2/2002 16.36	1666.45.00	1666.27.00	1666.25.00	40.82584965
15	63.5	981	975	0.000565037	522.5	14.14118	0.000540956	15.31812	0.073901147	2092.64	35.18396831	38.88287246	7/7/2002 21.35	1791.44.00	1791.26.00	1791.24.00	42.3288714
25	63	981	975	0.00088287	523	14.14118	0.000844436	23.91168	0.074745583	2116.55	35.5860002	39.28490434	7/11/2002 18.00	1884.09.00	1883.51.00	1883.49.00	43.4067967
17	63	975	969	0.00060352	523	14.05416	0.000570683	16.15988	0.075316266	2132.71	35.85769953	39.55660367	7/16/2002 17.24	2003.33.00	2003.15.00	2003.13.00	

55	63	980	974	0.001942314	523	14.12668	0.001855854	52.55174	0.011607132	328.676	21.34695657	29.14075294	4/30/2002 17:34	137.02.00	136.43.00	136.09.00	11.70612375
24	64.5	982	976	0.000847555	524.5	14.15569	0.000809169	22.91304	0.012416301	351.589	22.8351197	30.62891606	5/3/2002 12:04	203.32.00	203.13.00	202.39.00	14.2665109
23	62	980	974	0.00081224	522	14.12668	0.000777571	22.01828	0.013193872	373.807	24.26516963	32.05969619	5/7/2002 16:45	304.13.00	303.54.00	303.20.00	17.44180801
8	64.5	985	979	0.000282518	524.5	14.1992	0.000270552	7.661157	0.013484425	381.269	24.76274896	32.56654532	5/13/2002 11:01	442.29.00	442.10.00	441.36.00	21.03528781
16	61.5	981	975	0.000568037	521.5	14.14118	0.000541994	15.34749	0.014006418	396.616	25.7595246	33.55333896	5/16/2002 16:21	519.49.00	519.30.00	518.56.00	22.7994883
9	62	982	976	0.000317833	522	14.15569	0.000304892	8.633542	0.01431131	405.25	26.32027648	34.11407284	5/23/2002 20:10	691.38.00	691.19.00	690.45.00	26.29892266
11	63	980	974	0.000389463	523	14.12668	0.000371171	10.51035	0.014682481	415.76	27.00290578	34.79670214	6/6/2002 19:05	1026.33.00	1026.14.00	1025.40.00	32.03981898
-5	63.5	982	976	-0.00017657	523.5	14.15569	-0.000168999	-4.78267	0.014513582	410.977	26.69227966	34.46907592	6/20/2002 15:38	1359.06.00	1359.47.00	1358.13.00	36.86597347

DESORPTION TERMINATED 6/20/02

SAMPLE: 931' 2" to 931' 11" (upper Neutral coal) in canister Brady 28

sample dried 5 days @ 150 deg. F (65 deg C)

DRY WEIGHT	lbs.	grams	moisture weight	est. lost gas (cc) =	TIME OF:	elapsed time (off bottom to canistering)											
sample weight:	2.9537	1294.42	wet sample weight: 3.0745 1394.56 7.2%	200	off bottom at surface in canister	42 minutes											
CONVERSION OF VOLUMES TO STP	CONVERSION OF RIG MEASUREMENTS TO STP (cubic ft. @60 degrees; CUMULATIVE VOLUMES SCF/TON (approx) SCF/TON (approx))			TIME OF MEASU	4/25/2002 1:28	4/25/2002 2:05	4/25/2002 2:10	0.700 hours									
RIG MEASUREMENTS	measured cc measured T (F measured F adjusted P cubic ft. (@riq; ABSOLUTE T (F) (@r psia (@riq; cubic ft. (@STP cc (@STF cubic ft. (@STP cc (@STF without lost gas with lost gas			TIME OF MEASU	off bottom at surface in canister	0.83660027	SQRT (hrs)										
18	66	985	979	0.000635666	526	14.1992	0.00067007	17.18845	0.00067007	17.1884	0.425416092	5.375439952	4/25/2002 2:16	0.48.00	0.11.00	0.06.00	0.894427191
21	67	985	979	0.000741611	527	14.1992	0.000706831	20.01514	0.001313837	37.2036	9.020793084	5.870816944	4/25/2002 2:30	1.02.00	0.25.00	0.20.00	1.016530445
5	67	985	979	0.000176574	527	14.1992	0.000168293	4.785508	0.00148213	41.9691	1.038739987	5.988763847	4/25/2002 2:35	1.07.00	0.30.00	0.25.00	1.056724499
12	68.5	985	979	0.000423778	528.5	14.1992	0.000402757	11.40476	0.001884887	53.3738	1.321009131	6.271032992	4/25/2002 2:44	1.16.00	0.39.00	0.34.00	1.125462868
5	69	985	979	0.000176574	529	14.1992	0.000167657	4.747491	0.002052544	58.1213	1.43851011	6.388533971	4/25/2002 2:56	1.28.00	0.51.00	0.46.00	1.211060142
6	69	984	978	0.000211889	529	14.1847	0.000200983	5.691171	0.002253526	63.8125	1.579367259	6.52939112	4/25/2002 3:04	1.36.00	0.59.00	0.54.00	1.264911064
15	69	985	979	0.000529722	529	14.1992	0.00050297	14.24247	0.002756496	78.055	1.931870196	6.881894056	4/25/2002 3:24	1.56.00	1.19.00	1.14.00	1.380443574
12	68	985	979	0.000423778	528	14.1992	0.000403138	11.41556	0.003159634	89.4705	2.214440641	7.164430501	4/25/2002 3:44	2.16.00	1.39.00	1.34.00	1.505545305
8	66	985	979	0.000282518	526	14.1992	0.000269781	7.639309	0.003429415	97.1099	2.403480459	7.35350432	4/25/2002 4:10	2.42.00	2.05.00	2.00.00	1.643167672
18	68	985	979	0.000635666	528	14.1992	0.000604707	17.12334	0.004034122	114.233	2.627285127	7.777309867	4/25/2002 5:15	3.47.00	3.10.00	3.05.00	1.945078261
14	69.5	985	979	0.000494407	529.5	14.1992	0.000468998	13.28042	0.004503118	127.514	3.155977194	8.106001055	4/25/2002 5:53	4.25.00	3.48.00	3.43.00	2.101586702
16	68	985	979	0.000585037	528	14.1992	0.000537518	15.22075	0.005040635	142.734	3.532662454	8.482716315	4/25/2002 7:12	5.44.00	5.07.00	5.02.00	2.394437999
4	69	984	978	0.000141259	529	14.1847	0.000133988	3.794114	0.005174624	146.528	3.62659722	8.576621081	4/25/2002 9:45	8.17.00	7.40.00	7.35.00	2.878078062
47	66	986.5	980.5	0.003072388	526	14.22095	0.00293838	83.20478	0.008112984	229.733	5.685925422	10.63594928	4/26/2002 10:34	33.06.00	32.29.00	32.24.00	5.753259945
35	68	982	976	0.001271333	528	14.15569	0.001205708	34.14173	0.009318692	263.875	6.530637384	11.48096124	4/26/2002 17:50	40.22.00	39.45.00	39.40.00	6.353476738
64	62	980	974	0.002280147	522	14.12668	0.002163677	61.26827	0.011482369	325.143	8.047334286	12.997350815	4/27/2002 19:37	68.09.00	65.32.00	65.27.00	8.133265027
14	61	981	975	0.000494407	521	14.14118	0.0004747	13.44194	0.011957069	338.585	8.380024012	13.33004787	4/28/2002 21:39	92.11.00	91.34.00	91.29.00	9.601215201
32	61	981	975	0.001130074	521	14.14118	0.001085028	30.72444	0.013042096	369.31	9.14045767	14.09048153	4/29/2002 17:01	111.33.00	110.56.00	110.51.00	10.56172334
19	61	981	975	0.000670981	521	14.14118	0.000644235	18.24264	0.013896331	387.552	9.591965155	14.54198902	4/30/2002 11:47	130.19.00	129.42.00	129.37.00	11.41563256
9	63	980	974	0.000317833	523	14.12668	0.000303685	8.599376	0.013990016	396.152	9.804800738	14.7548246	4/30/2002 17:36	136.08.00	135.31.00	135.26.00	11.66761901
46	64.5	982	976	0.001824481	524.5	14.15569	0.001550908	43.91866	0.015540925	440.068	10.89174336	15.84176722	5/3/2002 12:17	202.49.00	202.12.00	202.07.00	14.24137166
43	62	980	974	0.001518536	522	14.12668	0.00145372	41.16462	0.016994645	481.233	11.91057253	16.86059639	5/7/2002 16:47	303.19.00	302.42.00	302.37.00	17.41598882
33	63.5	984	978	0.001165388	523.5	14.1847	0.001117018	31.6303	0.018111662	512.863	12.69342615	17.64345001	5/10/2002 14:03	372.35.00	371.58.00	371.53.00	19.30241781
28	64.5	985	979	0.000988814	524.5	14.1992	0.000946933	26.81405	0.019058595	539.677	13.35707706	18.30710092	5/13/2002 11:13	441.45.00	441.08.00	441.03.00	21.01784956
40	61.5	981	975	0.001412592	521.5	14.14118	0.001354984	38.36873	0.020413579	578.046	14.30670778	19.25673164	5/16/2002 16:36	519.08.00	518.31.00	518.26.00	22.78449765
47	62	982	976	0.001659796	522	14.15569	0.001592213	45.08627	0.022005792	623.132	15.42259842	20.37262228	5/23/2002 20:12	690.44.00	690.07.00	690.02.00	26.28180613
24	63	980	974	0.000847555	523	14.12668	0.000809827	22.93167	0.022815619	646.064	15.99015997	20.94018383	6/6/2002 18:25	1024.57.00	1024.20.00	1024.15.00	32.01484031
38	63.5	982	976	0.001341962	523.5	14.15569	0.001283632	36.34828	0.024099252	682.412	16.88978429	21.83980815	6/20/2002 15:40	1358.12.00	1357.35.00	1357.30.00	36.85376507
14	64	981	975	0.000494407	524	14.14118	0.000471982	13.36499	0.024871234	695.777	17.22056931	22.17096317	6/27/2002 19:33	1530.05.00	1529.28.00	1529.23.00	39.11627965

DESORPTION TERMINATED AT 7/02/02

SAMPLE: 951' 0" to 956' 0" (dark shale w/ 1/16" to 1/8" laminae [lower Neutral]) in large Osborn container

WEIGHT CALCULATION	lbs.	weight of container (full):	weight of container (empty)	sample weight:	TIME OF:	elapsed time (off bottom to canistering)									
CONVERSION OF VOLUMES TO STP	CONVERSION OF RIG MEASUREMENTS TO STP (cubic ft. @60 degrees; CUMULATIVE VOLUMES			TIME OF MEASU	4/25/2002 2:55	4/25/2002 3:23	4/25/2002 3:36	0.683							
RIG MEASUREMENTS	measured cc measured T (F measured F adjusted P cubic ft. (@riq; ABSOLUTE T (F) (@r psia (@riq; cubic ft. (@STP cc (@STF cubic ft. (@STP cc (@STF			TIME OF MEASU	off bottom at surface in canister	0.826639784	SQRT (hrs)								
1	65	985	979	3.53148E-05	525	14.1992	3.37868E-05	0.956733	3.37868E-05	0.95673	4/25/2002 3:49	0.54.00	0.26.00	0.13.00	0.948683298
1	66.5	985	979	3.53148E-05	526.5	14.1992	3.38906E-05	0.954007	6.74774E-05	1.91074	4/25/2002 4:14	1.19.00	0.51.00	0.38.00	1.147460965
1	67.5	985	979	3.53148E-05	527.5	14.1992	3.36287E-05	0.952198	0.000101104	2.86294	4/25/2002 4:33	1.38.00	1.10.00	0.57.00	1.278019301
1	69.5	985	979	3.53148E-05	529.5	14.1992	3.34997E-05	0.948602	0.000134604	3.81154	4/25/2002 6:13	3.18.00	2.50.00	2.37.00	1.816590212
0	61	986	980	0	521	14.2137	0	0	0.000134604	3.81154	4/25/2002 10:40	7.45.00	7.17.00	7.04.00	2.783882181
0	63	981	975	0	523	14.14118	0	0	0.000134604	3.81154	4/28/2002 22:25	91.30.00	91.02.00	90.49.00	9.565563235
0	62.5	980	974	0	522.5	14.12668	0	0	0.000134604	3.81154	4/30/2002 17:16	134.21.00	133.53.00	133.40.00	11.59094474

DESORPTION TERMINATED AT 4/30/02 6:15 PM DUE TO NO GAS BUILD UP IN OSBORN CONTAINER; LEAK SUBSEQUENTLY FOUND IN CANISTER

506' 0" to 509' 0" (South Mound Shale) in large Osborn container

Osborn Energy Rose Hill #1-6; sec. 6-T.16S.-R.24E.

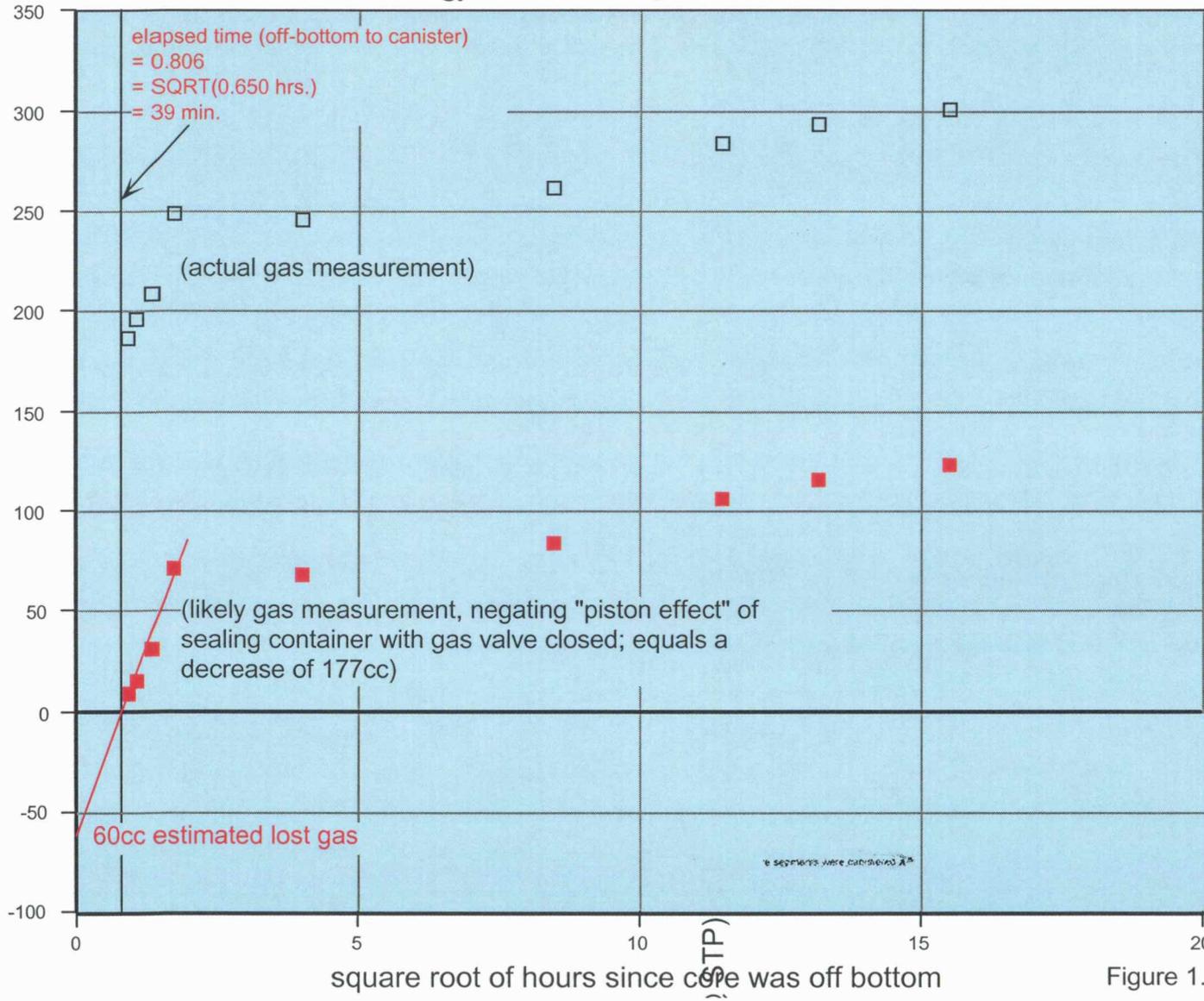


Figure 1.

as off bottom at 12:51 AM EDT

510' 2" to 512' 9" (South Mound Shale) in large Osborn container

Osborn Energy Rose Hill #1-6; sec. 6-T.16S.-R.24E.

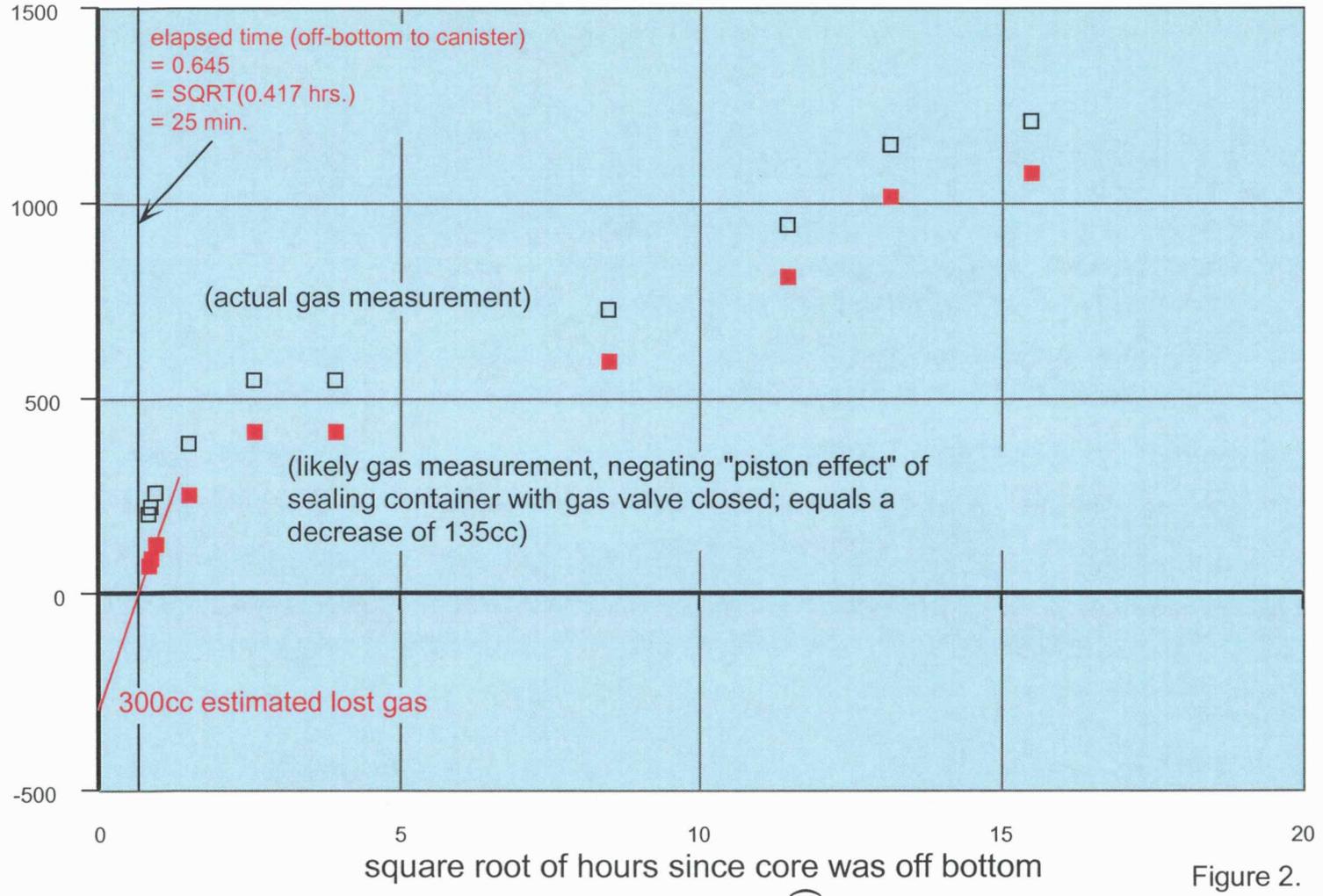


Figure 2.

525' 4" to 526' 0" (Upper Mulberry Coal) in canister 10

Osborn Energy Rose Hill #1-6; sec. 6-T.16S.-R.24E.

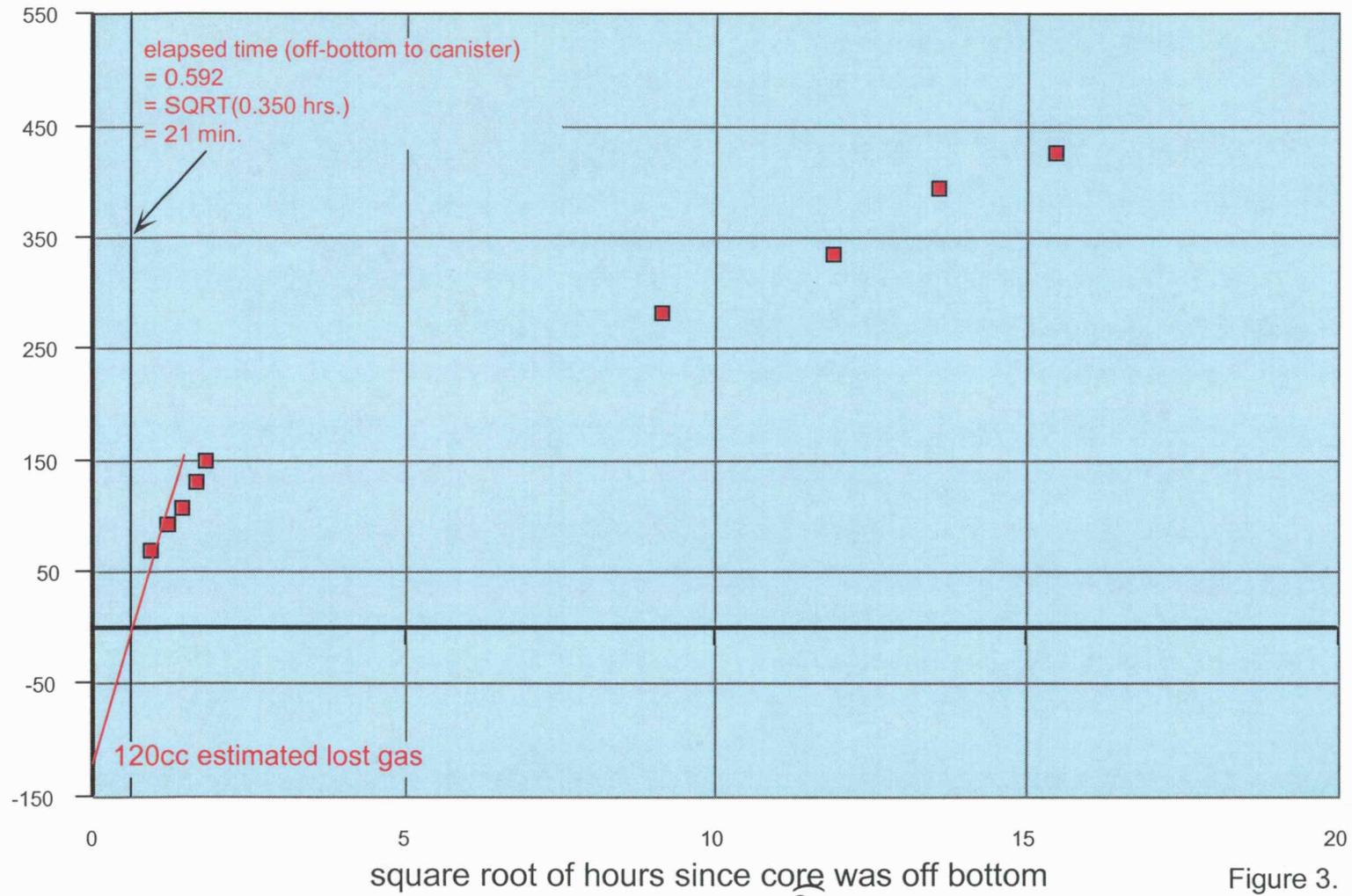


Figure 3.

576' 8.5" to 577' 7.5" (Lexington Coal & shale above coal) in canister 1
Osborn Energy Rose Hill #1-6; sec. 6-T.16S.-R.24E.

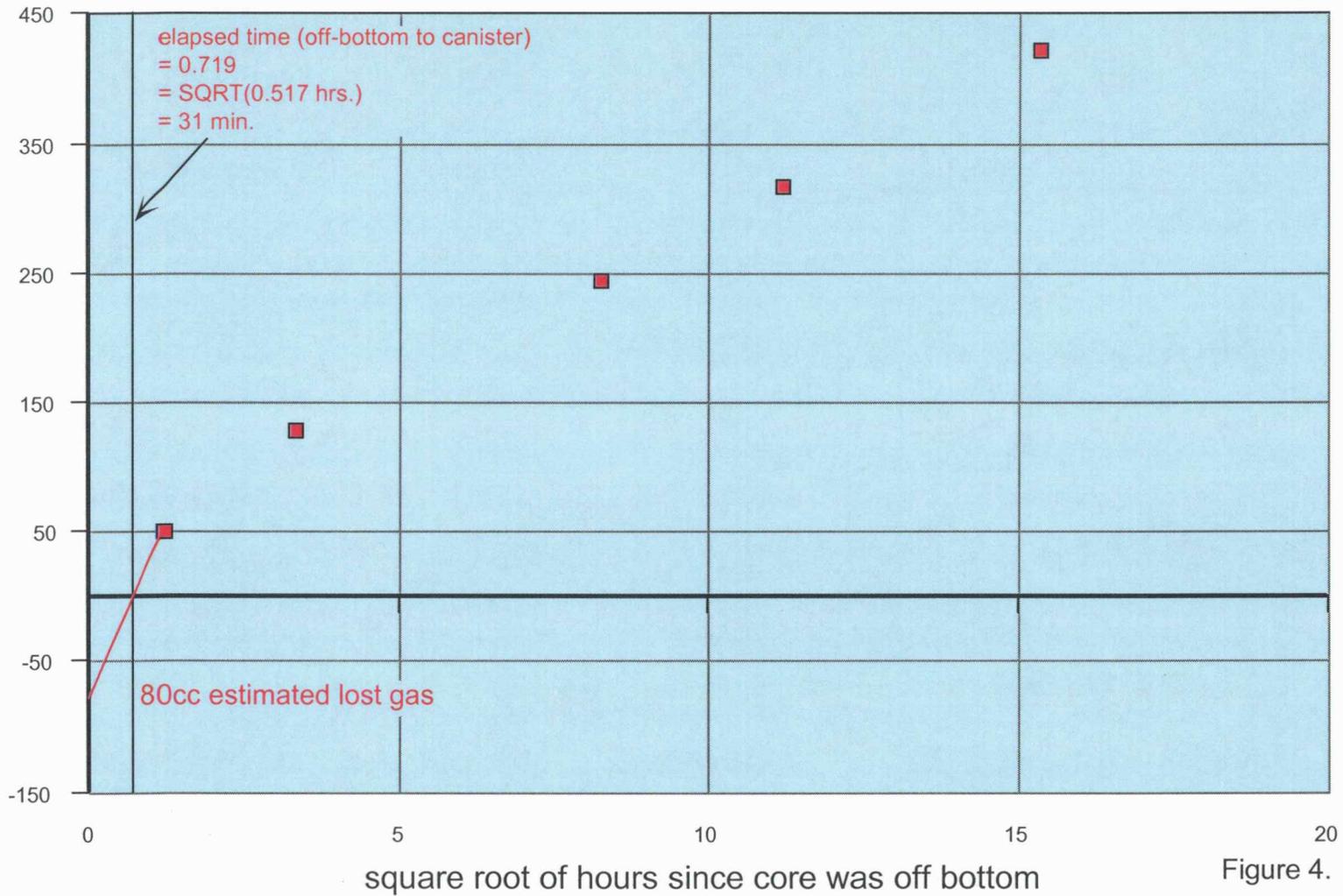


Figure 4.

577' 7.5" to 578' 8" (Lexington Coal) in canister 3

Osborn Energy Rose Hill #1-6; sec. 6-T.16S.-R.24E.

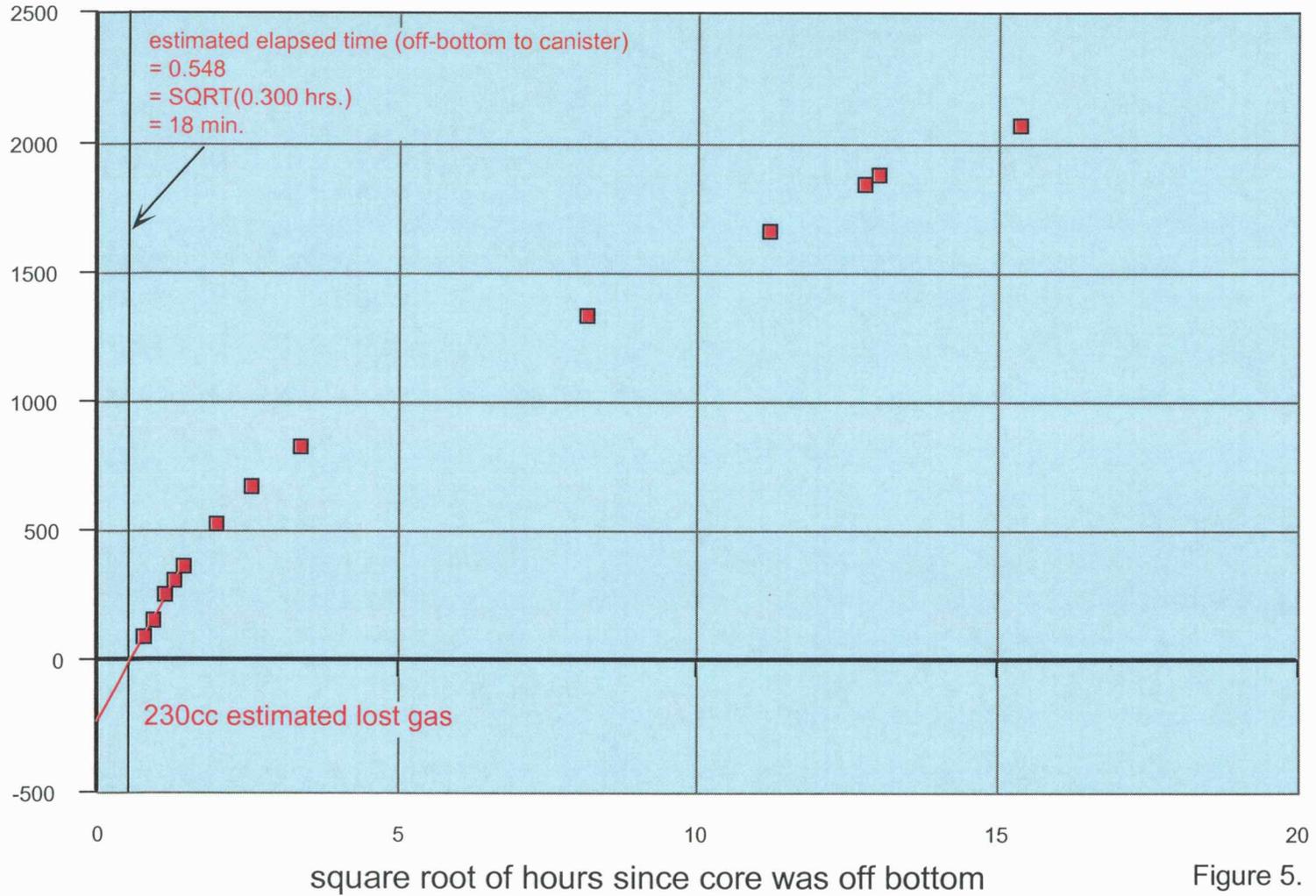


Figure 5.

721' 0" to 722' 0" (Bevier Coal) in container 5

Osborn Energy Rose Hill #1-6; sec. 6-T.16S.-R.24E.

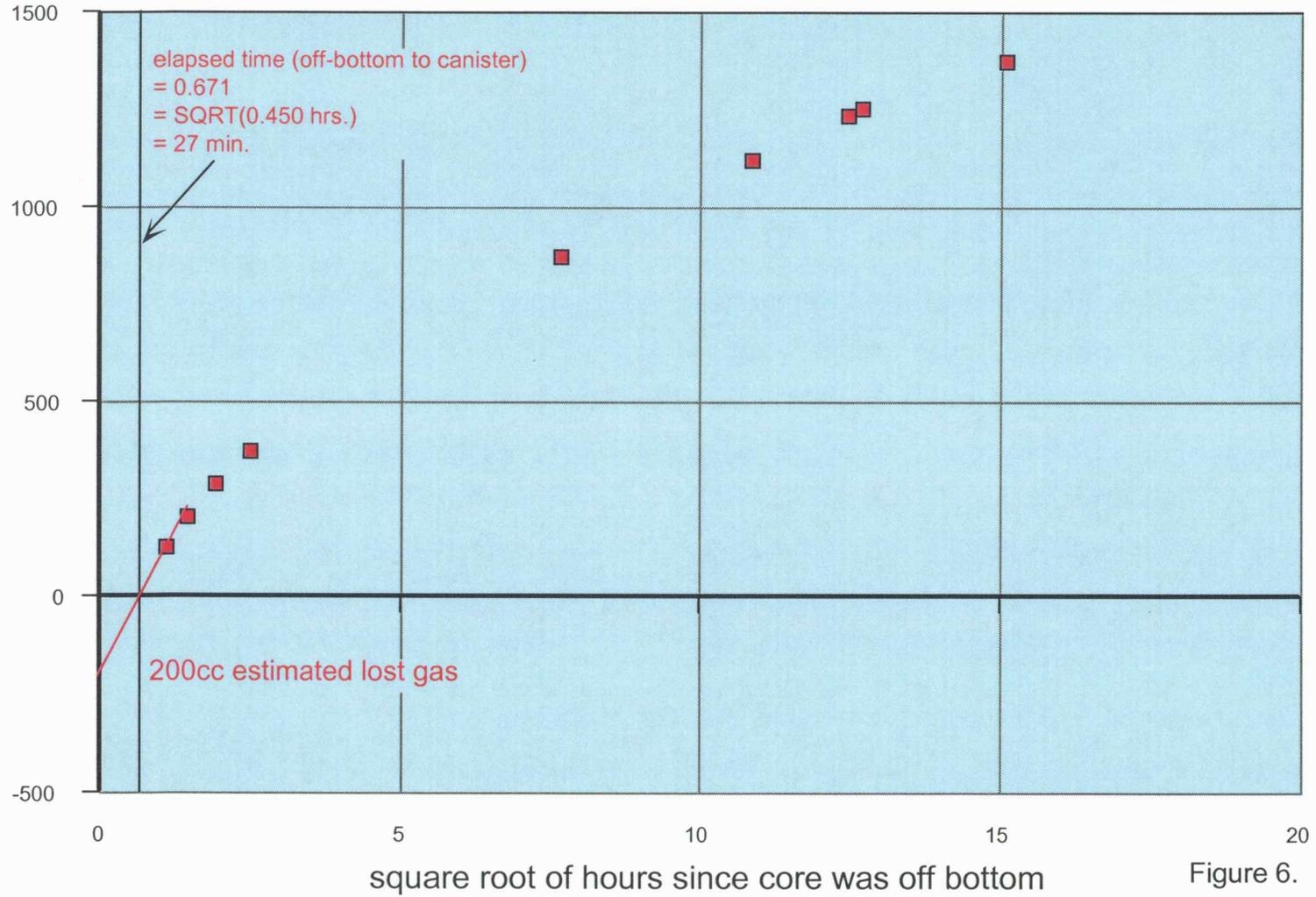


Figure 6.

737' 0" to 738' 0" (Croweburg Coal) in canister 7

Osborn Energy Rose Hill #1-6; sec. 6-T.16S.-R.24E.

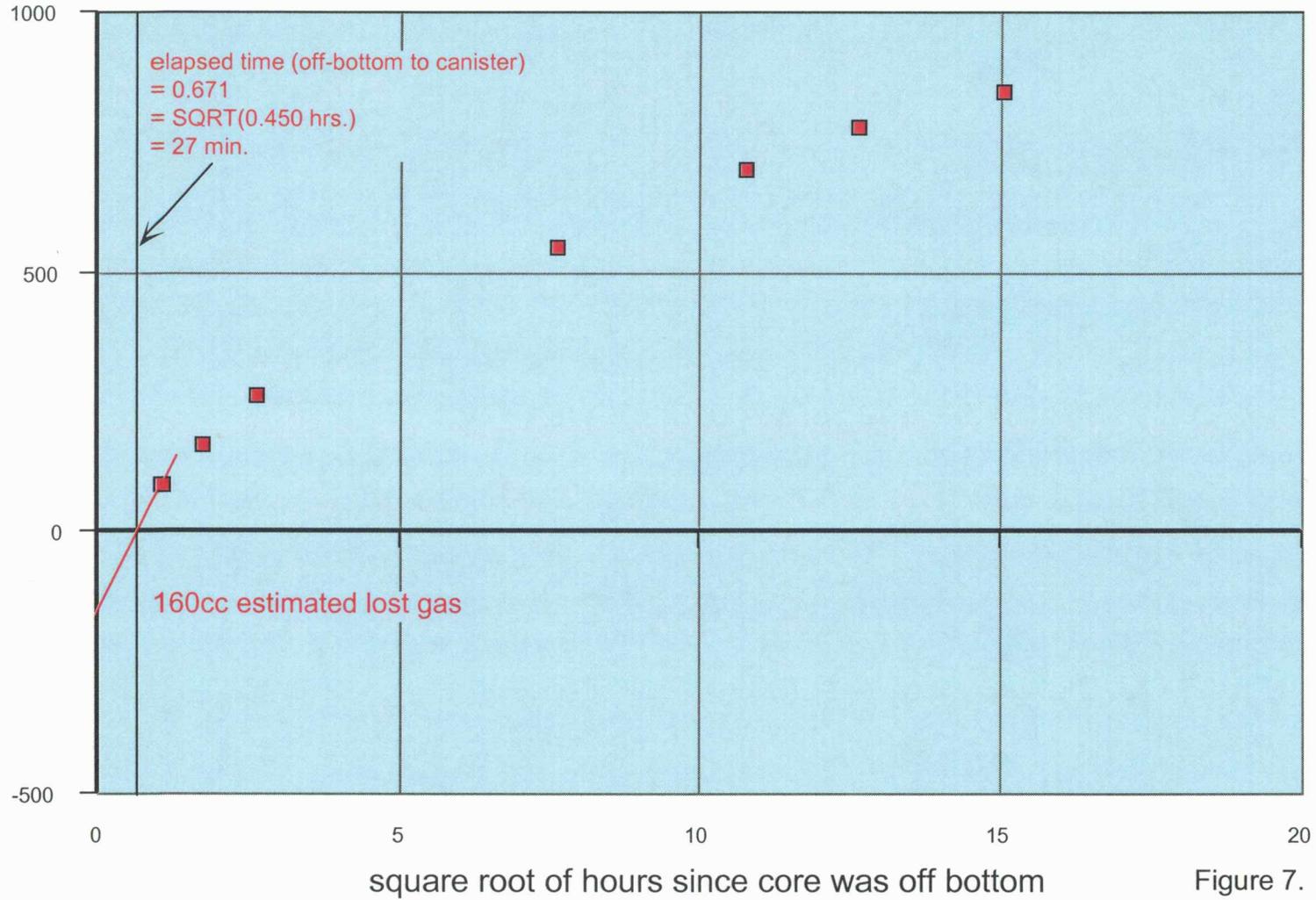


Figure 7.

767' 5" to 768' 5" (Mineral Coal) in canister 11

Osborn Energy Rose Hill #1-6; sec. 6-T.16S.-R.24E.

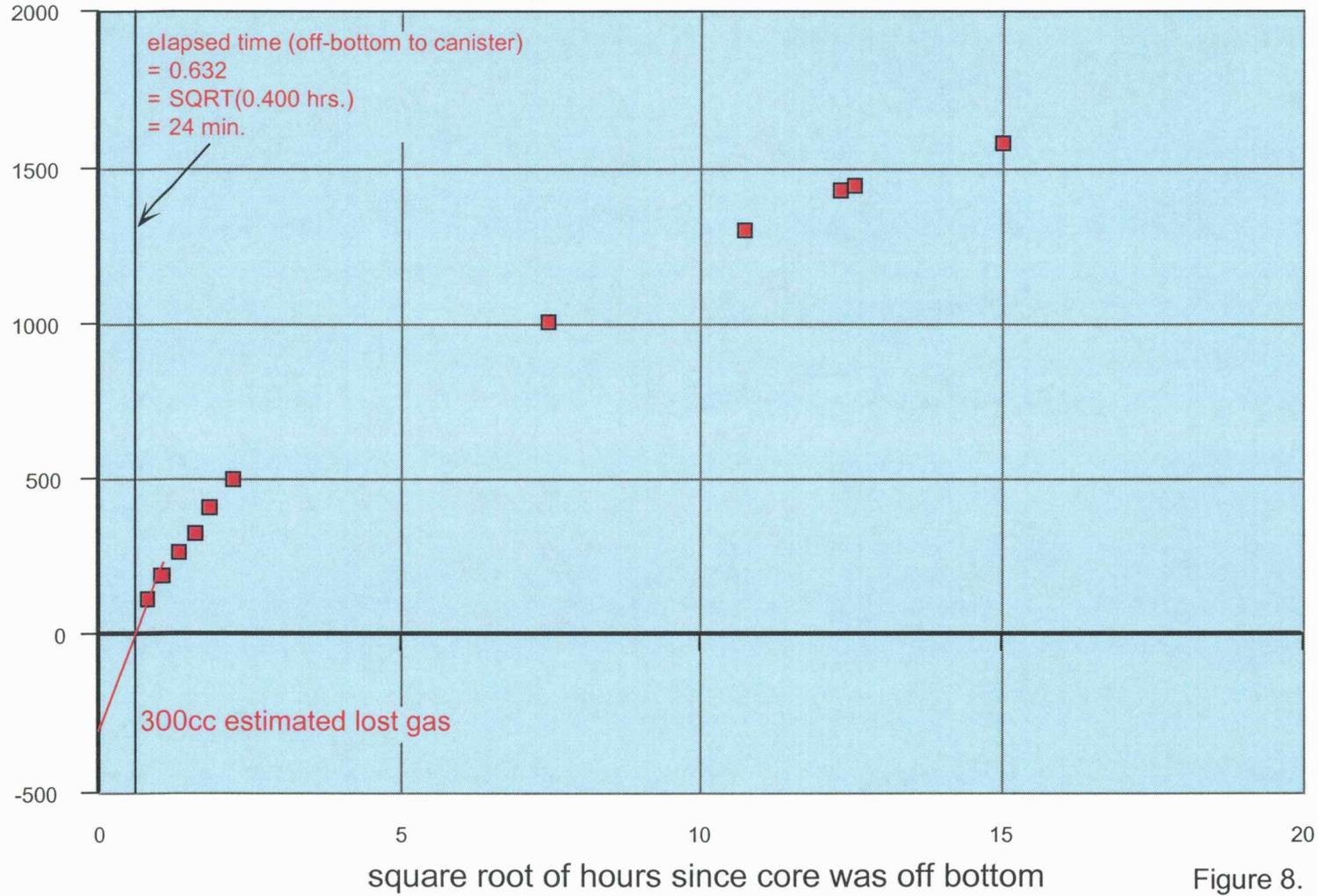


Figure 8.

809' 0" to 810' 0" (Tebo Coal) in canister 9
Osborn Energy Rose Hill #1-6; sec. 6-T.16S.-R.24E.

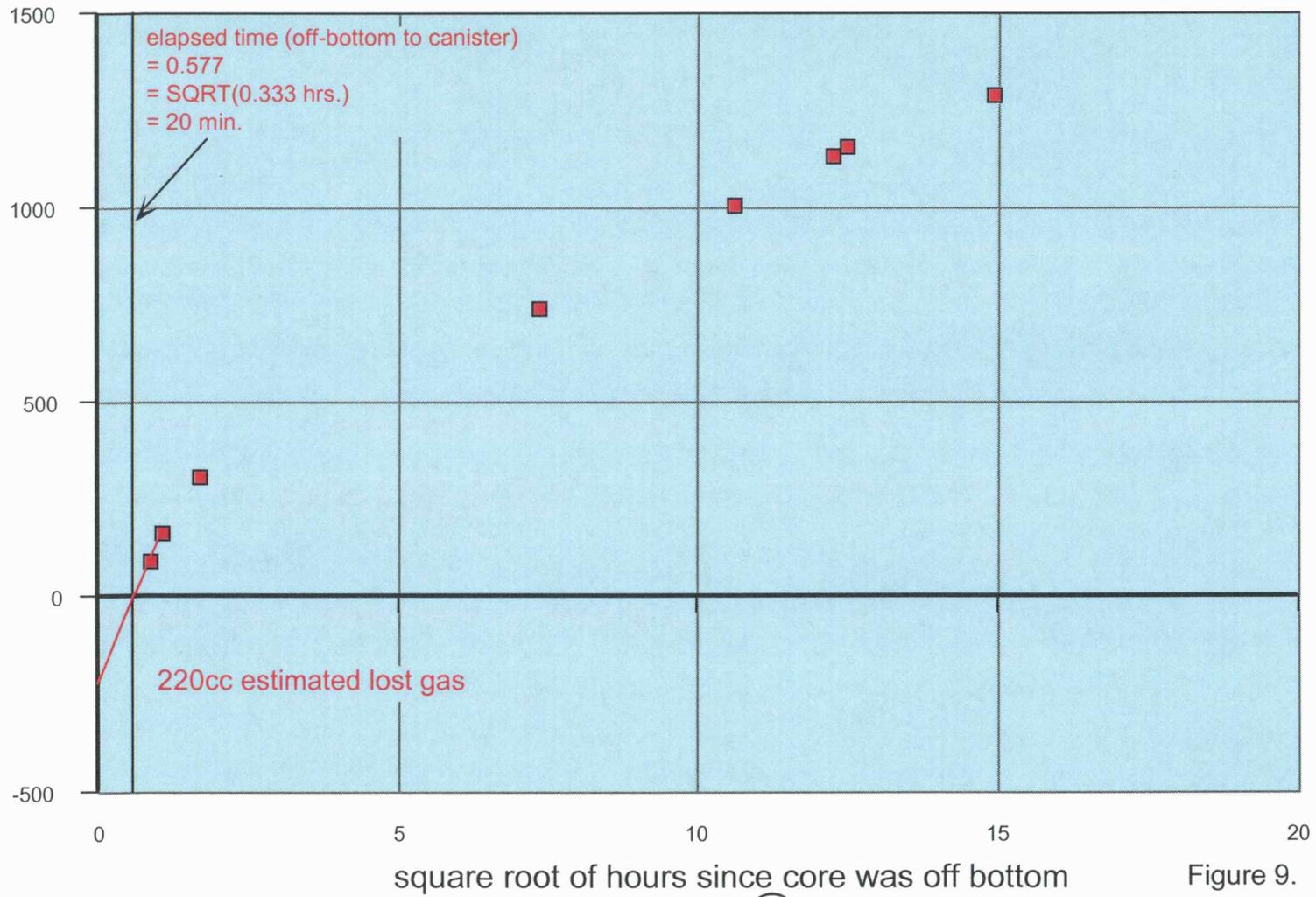


Figure 9.

915' 8" to 916' 1.5" (Rowe Coal) in canister 4

Osborn Energy Rose Hill #1-6; sec. 6-T.16S.-R.24E.

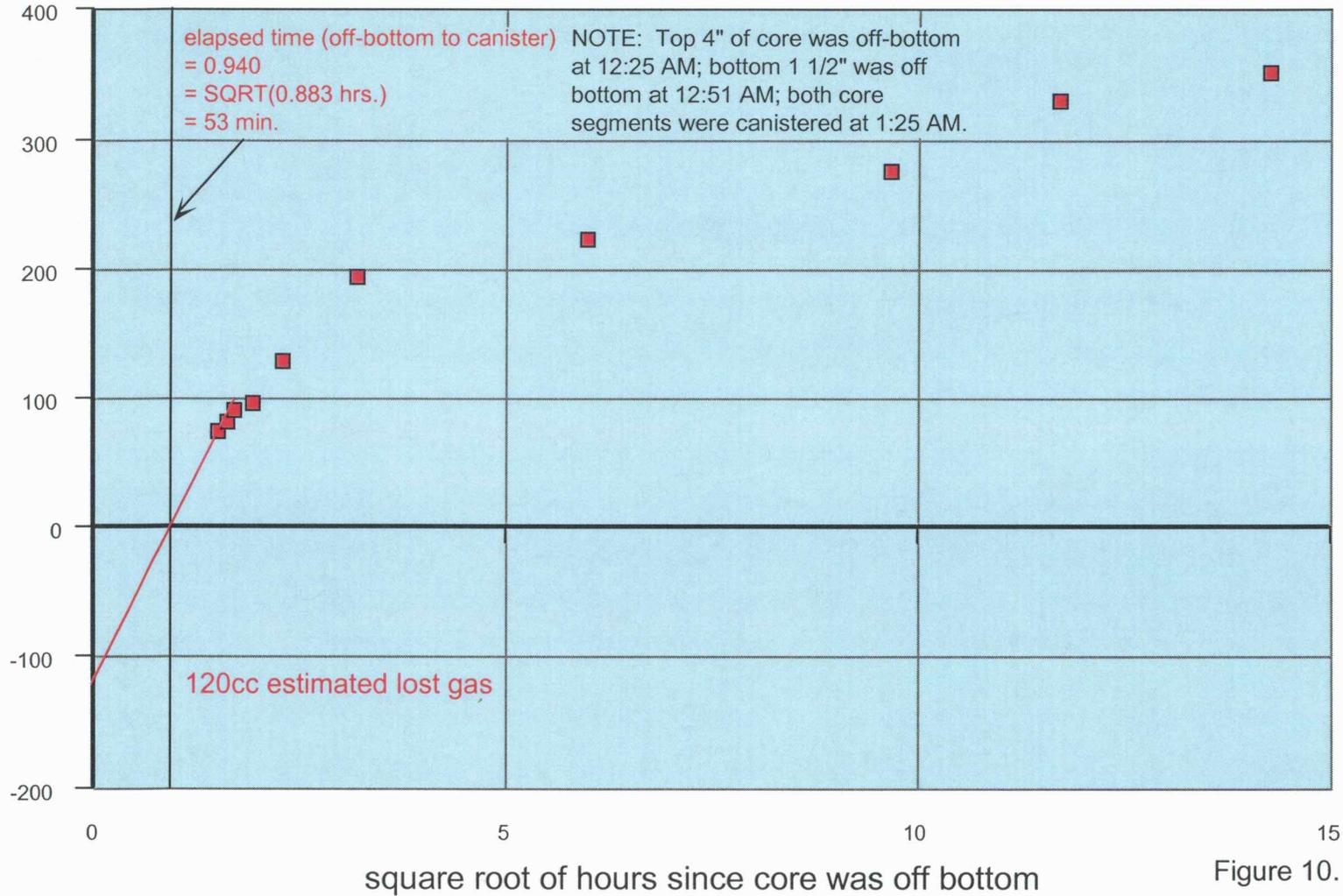


Figure 10.

931' 2" to 931' 11" (upper Neutral Coal) in canister Brady 28

Osborn Energy Rose Hill #1-6; sec. 6-T.16S.-R.24E.

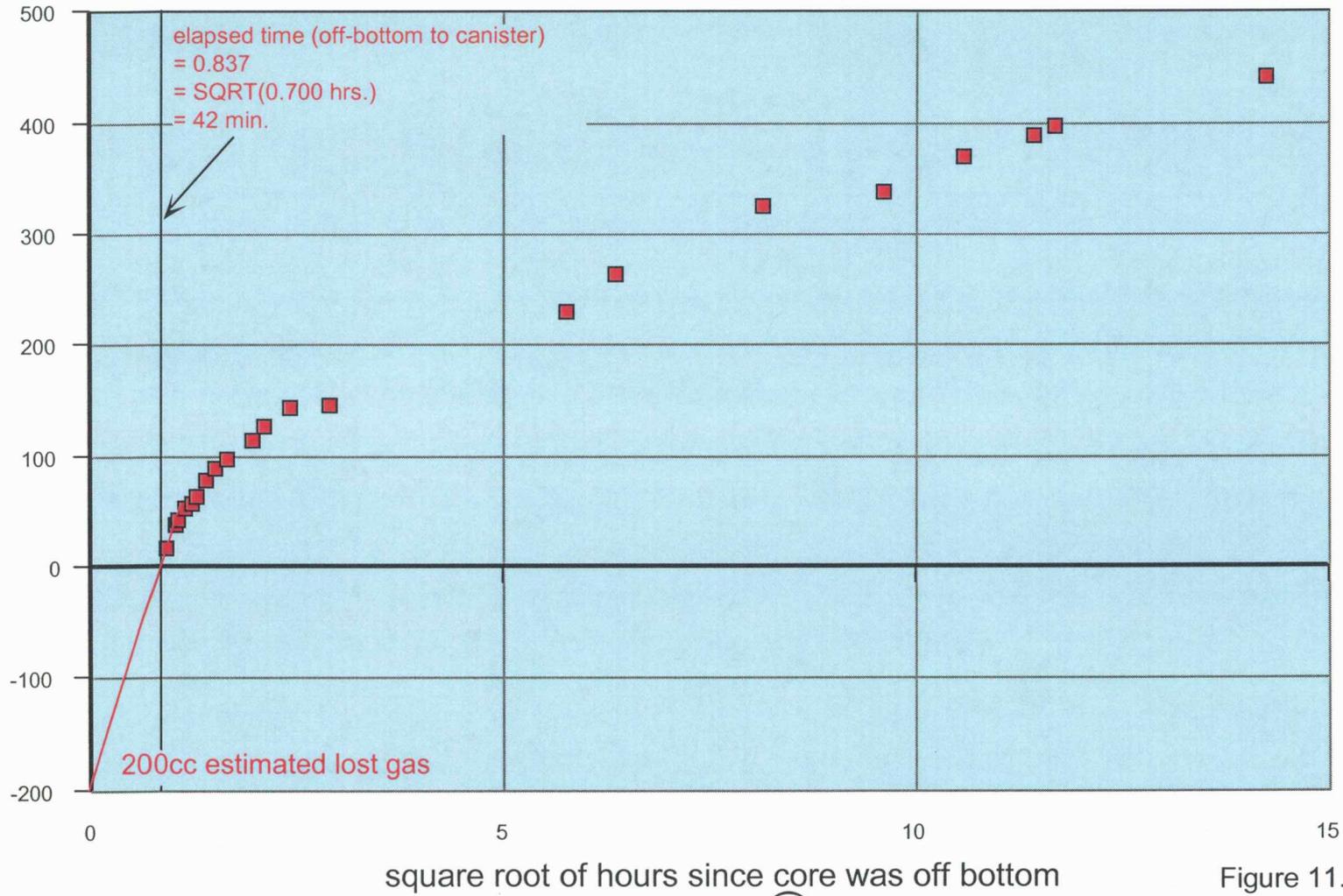


Figure 11.

Desorption Characteristics of Rose Hill #1-6 Samples

Osborn Energy Rose Hill #1-6; sec. 6-T.16S.-R.24E.; Miami Co., KS

(analyses by Kansas Geological Survey, April - October, 2002)

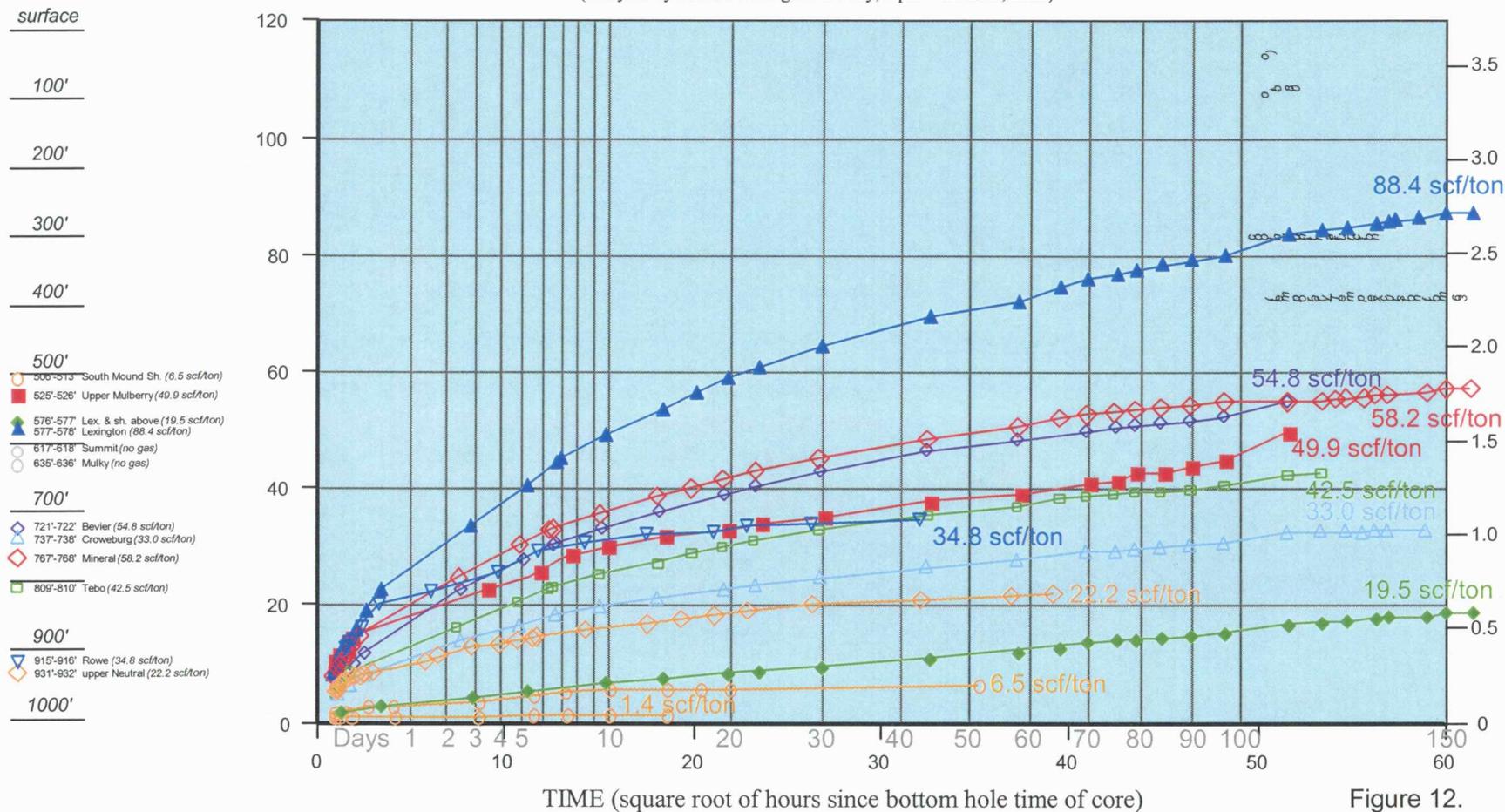


Figure 12.