ANALYSIS OF MARMATON AND CHEROKEE GROUP COAL AND SHALE SAMPLES FOR GAS CONTENT IN FOUR PETRON RESOURCES CORE HOLES IN BATES AND CASS COUNTIES, MISSOURI:

#1-24 JACOBS, S2 NW sec. 24-T.42N.-R.33W.
#1-26 LACY, S2 NE sec. 26-T.43N.-R.33W.
#1-21 COCKRELL, SW SW SW sec. 21-T.44N.-R.32W.
#1-30 ZIMMERMAN, SE NW NW sec. 30-T.45N.-R.32W.

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September 1, 2008

Open-File Report 2014-12

SUMMARY

Core samples from the Pennsylvanian Marmaton Group and Cherokee Group were collected from four wells cored by the Kansas Geological Survey for Petron Resources LP. The four wells were drilled in the late summer and fall of 2007 in Bates and Cass Counties, Missouri. Core samples of dark shale and coal from these wells were analyzed for gas content. By well, the samples calculate as having the following gas contents:

#1-24 Jacobs, S2 NW 24-42N-33W, Bates Co., MO

unit, depth	*(desorbed gas, desorbed + residual gas)*
• Mulberry coal, 268’ 3.5” to 269’ 1”	(26 scf/ton, 39 scf/ton)
• Anna Shale, 308’ 4.5” to 310’ 0”	(6 scf/ton, 9 scf/ton)
• Excello Shale, 369’ 9.5” to 371’ 2”	(1 scf/ton, 10 scf/ton)
• Mulky coal , 371’ 2” to 372’ 1.5”	(29 scf/ton, 46 scf/ton)
• Croweburg coal, 472’ 6” to 473’ 2”	(67 scf/ton, 82 scf/ton)
• shale above Fleming coal, 490’ 3.5” to 491’ 3.5”	(1 scf/ton, 5 scf/ton)
• Fleming coal, 495’ 3” to 496’ 9”	(45 scf/ton, 68 scf/ton)
• Mineral coal , 503’ 4” to 504’ 5.5”	(46 scf/ton, 64 scf/ton)
• shale above Weir-Pittsburg coal, 524’ 7” to 526’ 0.5”	(1 scf/ton, 4 scf/ton)
• shale over Weir-Pittsburg coal, 529’ 5” to 530’ 8”	(13 scf/ton, 18 scf/ton)
• Weir-Pittsburg coal, 530’ 8” to 532’ 5”	(86 scf/ton, 137 scf/ton)
• shale below Weir-Pittsburg coal, 535’ 1” to 536’ 0”	(3 scf/ton, 16 scf/ton)
• shale below Weir-Pittsburg coal, 541’ 4” to 542’ 9”	(3 scf/ton, 5 scf/ton)
• Dry Wood coal, 610’ 8” to 611’ 3.5”	(50 scf/ton, 100 scf/ton)
• shale near Riverton coal, 692’ 9.5” to 694’ 3”	(3 scf/ton, 6 scf/ton)

#1-26 Lacy, S2 NE 26-43N-33W, Cass Co., MO

unit, depth	*(desorbed gas, desorbed + residual gas)*
• Lexington coal (canistered wet), 330’ 7.5” to 331’ 7.5”	(28 scf/ton, 81 scf/ton)
• Lexington coal (canistered dry), 330’ 7.5” to 331’ 7.5”	(24 scf/ton, 53 scf/ton)
• Little Osage Shale, 371’ 0” to 372’ 9”	(3 scf/ton, 18 scf/ton)
• Excello Shale, 388’ 1” to 389’ 0”	(3 scf/ton, 38 scf/ton)
• Mulky coal , 389’ 0” to 389’ 11.5”	(30 scf/ton, 71 scf/ton)
• shale over Bevier coal, 473’ 10” to 474’ 6”	(5 scf/ton, 12 scf/ton)
• Bevier coal, 474’ 6” to 475’ 5.5”	(50 scf/ton, 91 scf/ton)
• “V shale”, 486’ 8.5” to 487’ 10”	(3 scf/ton, 5 scf/ton)
• Croweburg coal , 495’ 6” to 496’ 0.5”	(43 scf/ton, 59 scf/ton)
• Weir-Pittsburg coal, 556’ 1” to 557’ 7”	(92 scf/ton, 140 scf/ton)
• shale below Weir-Pittsburg coal, 561’ 9.5” to 563’ 6”	(30 scf/ton, 35 scf/ton)

#1-21 Cockrell, SW SW SW 21-44N-32W, Cass Co., MO

unit, depth	*(desorbed gas, desorbed + residual gas)*
• Croweburg coal, 344’ 7” to 345’ 2”	(76 scf/ton, 105 scf/ton)
• Fleming coal, 379’ 4” to 380’ 5”	(75 scf/ton, 153 scf/ton)
• Mineral coal, 386’ 6” to 387’ 0”	(59 scf/ton, 78 scf/ton)
• Mineral coal, 387’ 2.5” to 388’ 5”	(110 scf/ton, 136 scf/ton)

- Mineral coal, 388’ 5” to 390’ 3” (120 scf/ton, 129 scf/ton)
- Weir-Pittsburg coal, 405’ 6” to 407’ 4” (100 scf/ton, 130 scf/ton)
- coal in Bluejacket Fm., 450’ 3” to 450’ 8.5” (65 scf/ton, 116 scf/ton)
- Riverton coal, 596’ 1” to 597’ 5” (78 scf/ton, 99 scf/ton)

#1-30 Zimmerman, SE NW NW 30-45N-32W, Cass Co., MO

unit, depth *(desorbed gas, desorbed + residual gas)*

- Wheeler coal, 443’ 3” to 444’ 1” (56 scf/ton, 90 scf/ton)
- “shale” above Fleming coal, 487’ 8” to 488’ 6” (41 scf/ton, 56 scf/ton)
- Fleming coal, 490’ 3.5” to 491’ 6.5” (66 scf/ton, 95 scf/ton)
- shale over Weir-Pittsburg coal, 524’ 8” to 525’ 9.5” (15 scf/ton, 30 scf/ton)
- Weir-Pittsburg coal , 525’ 9.5” to 527’ 5” (78 scf/ton, 116 scf/ton)
- coal in Bluejacket Fm., 567’ 7” to 567’ 11” (69 scf/ton, 87 scf/ton)
- shale in Bluejacket Fm., 586’ 11” to 587’ 11” (9 scf/ton, 15 scf/ton)
- shale over Riverton coal, 704’ 9” to 705’ 8” (7 scf/ton, 12 scf/ton)
- Riverton coal , 705’ 8” to 706’ 7” (93 scf/ton, 120 scf/ton)

BACKGROUND

A grant from Petron Resources LP (Frisco, Texas) facilitated the coring of four wells in western Missouri (fig. 1) and testing of their samples for adsorbed gas. The #1-24 Jacobs well was cored from September 26 through October 1, 2008; the #1-26 Lacy well was cored from October 9 through October 12; the #1-21 Cockrell well was cored from October 25 through October 28, and the #1-30 Zimmerman well was cored from November 30 through December 5, 2008.

PROCEDURE

Samples were described and collected for desorption analysis by K. David Newell and Kenneth R. Stalder of the Kansas Geological Survey. The wells were cored by Joe Anderson and a helper using the Kansas Geological Survey Acker drilling rig, using water as a drilling fluid. Borehole diameter was 3”, and the cores, which were taken from approximately 20’ below ground surface to total depth, were NQ (2” diameter) gauge. After reaching T.D., the wells were logged behind pipe with a slim-hole natural gamma ray tool and cemented from T.D. to surface.

Cores were described at the wellsite (Appendix 1) and photographs were taken of each core box (Appendix 2).

Coal and dark shales selected for desorption testing were collected in canisters that were supplied by the Kansas Geological Survey. Lag times for samples to reach the surface (important for assessing lost gas) were determined by noting the time, to the nearest 15 seconds, when the samples were taken off-bottom, when they reached the surface, and when they were canistered.

With the exception of the samples from the #1-26 Lacy well, the cores taken for desorption were immersed in water. Zephyrn chloride or isopropyl alcohol was added as a biocide, with a headspace of 1 to 2 inches being preserved at the top of the canister. Temperature baths were available on site.

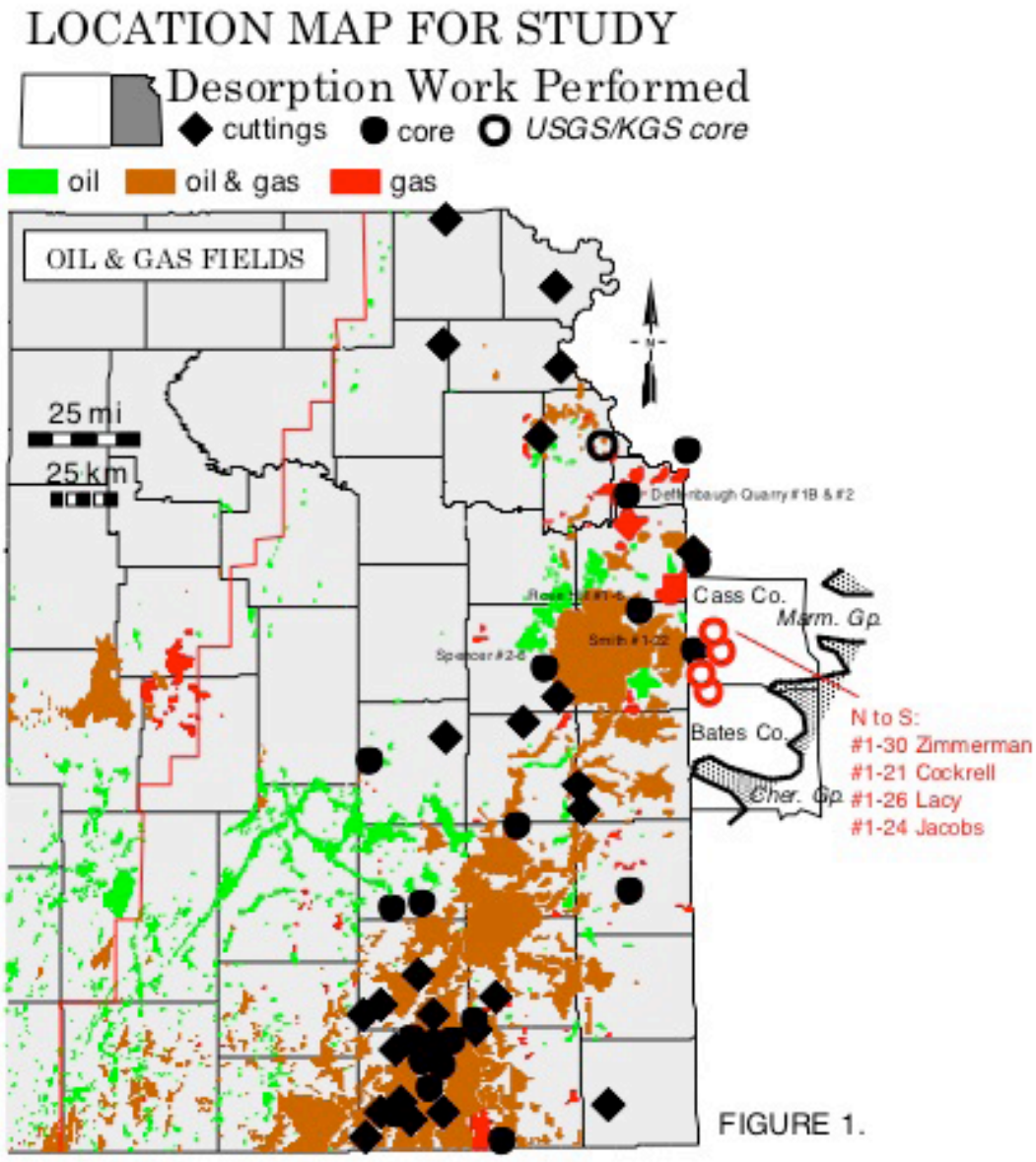


FIGURE 1. Location map for the Petron cores, in relation to other wells in eastern Kansas and western Missouri from which samples were studied for adsorbed gas content.

All samples were transported to the laboratory at the Kansas Geological Survey in Lawrence, Kansas, on a daily basis, and desorption measurements were continued at approximately 70 ˚F. Desorption measurements were periodically made until the canisters produced negligible gas with daily testing for at least two successive days, or if the canisters were not completely desorbed, then a desorption curve was fitted to the available data to determine likely amount of gas ultimately desorbed.

Selected samples of desorption gas were collected in 120-cc vaccination bottles sent to Isotech Laboratories in Champaign, Illinois, for analysis. Gas samples were collected in these glass containers by a capillary tube connected to the desorption canister, utilizing the internal pressure of the canister to force the gas out of the canister. The sampling container was filled with water and inverted and immersed in a water-filled bucket. Gas bubbled from the capillary tube then displaced this water out of the sampling container. The container was sealed under water.

Upon decanistering, the samples were weighed in the laboratory for a wet weight. The sample was halved and both halves were weighed again. One half of the sample was dried in air for several weeks and weighed for a dry weight, and then archived. The other half was dried for one day and part of this sample (100 to 400 grams) was crushed in a ball mill for a residual gas measurement. If the sample that was crushed for residual gas was only one day or less out of the canister, the residual gas from it was proportioned to the wet weight of the entire sample. If the sample that was crushed for residual gas was a dry sample, the residual gas was proportioned to the dry weight of the entire sample.

The ball mill used for the residual gas determination was on loan to the Kansas Geological Survey by Gary Murrie from Petron Resources. Its capacity was approximately 2,500 ccs. The sample selected for residual gas was weighed before being placed in the ball-mill canister. Immediately before the sample was sealed in the ball-mill canister, the canister was flooded with helium so that any atmospheric oxygen that may oxidize the sample was thus removed. Each sample was crushed approximately 24 hours, and after removal from the ball mill, the canister was allowed to equilibrate to laboratory temperature. The temperature and atmospheric pressure was noted at the time the canister was sealed and when the residual gas was finally measured. Corrections (5 ccs for every degree F change in temperature; 2.7 ccs for every mb change in atmospheric pressure) were applied to the gas measured from the canister. Results for the residual gas analyses are reported in the desorption tables for each well (Tables 1, 2, 3, 4).

Proximate analyses were performed on selected samples (usually the powder from the ball mills) by Luman's laboratories in Chetopa, Kansas. A less elaborate and less expensive ashing experiment was carried out for all the desorption samples. This simple ashing or ignition loss utilized a Lindberg muffle furnace at the Kansas Geological Survey. Samples were first weighed and then subjected to 105 ˚C to 110 ˚C until a constant weight was obtained. The heating for about 24 hours approximates moisture content. A second firing ashes the sample and consists of placing the sample into the furnace at 350 ˚C and increasing the temperature up to 750 ˚C where the samples are heated for 20 to 24 hours. Two samples of each sample are utilized for both the 110 ˚C and 750 ˚C firings. Each crucible is filled with approximately 1.5 grams of coal. All weights were obtained to the nearest 0.001 gram. Samples during drying and firing were contained in zero-absorption mullite (aluminum silicate) crucibles. The constant weight of the crucibles throughout the study indicated that no reaction occurred with the samples. Results for the simple ashing and the proximate analyses are reported in the desorption tables for each well (Tables 1, 2, 3, 4).

Density measurements for each sample were also made after each sample was dried. Core samples were weighed and then immersed in water in a beaker filled to its brim. Placing the sample in the beaker caused the displaced water to spill from the beaker into another container. This displaced water was subsequently weighed. The weight of the water displaced by the sample is thus easily converted to volume by using 1 gram/cc for the density of the water. Measurements were repeated three times for each sample and then averaged. Results for the density measurements are reported in the desorption tables for each well (Tables 1, 2, 3, 4).

Correlation of the four cores and a nearby well core hole by Osborn Energy is facilitated by a stratigraphic cross section shown in Appendix 3. Gamma-ray logging for each of the core holes is also presented on this diagram, as well as desorption results and unit identification of stratigraphic units.

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 reading the difference in water level using the volumetric scale on the side of the burette.

The desorption canisters were obtained from SSD, Inc., in Grand Junction, Colorado. These canisters are 12.5 inches high (32 cm), 3.5 inches (9 cm) in diameter, and enclose a volume of approximately 150 cubic inches (2,450 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, Oregon). The atmospheric pressure was displayed in millibars on this instrument.

A spreadsheet program written by K.D. Newell (KGS) 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 Vstp 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, the customary measuring 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 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 the 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.

DATA PRESENTATION

Desorption Analyses

These tables showing the record of desorptions (Tables 1, 2, 3, 4) are the basic data used for lost-gas analysis and determination of total gas desorbed from the core samples. Wellsite descriptions and results from ashing and proximate analysis are presented in the headings for each sample. 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. Results for residual gas and drying are presented below the desorption data for each sample.

Lost-Gas Determinations

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 volume determined for each sample (see Figures 2, 3, 4, 5) are incorporated in the data tables described above (Tables 1, 2, 3, 4).

TABLE 1 -- Desorption measurements for Petron Resources #1-24 Jacobs, S2 NW 24-42N-33W, Bates Co., MO

SAMPLE: 268' 3.5" to 269' 1" (Mulberry coal) core in SSD canister J1
NOTES: smutty coal with minor clay-rich intervals, core broken in three places, no cleat evident
density = 1.43 gr/cc; KGS simple moisture = 1.88% (as received); KGS simple ash content = 42.99% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	7512	7761	13396
Sulfur	4.59%	4.74%	
Moisture	3.21%		
Ash	40.72%	42.06%	
Volatile Matter	23.91%	24.71%	
Fixed Carbon	32.16%	33.23%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	1.459	661.69	wet sample weight:	1.568	711.28	6.97%		16		off bottom	at surface	in canister	14.0 minutes
										9/27/07 13:30	9/27/07 13:31	9/27/07 13:44	0.233 hours
													0.483045892 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	temp (R)	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)	
8	67	982	0.00028	526.67	14.243	0.000270263	7.65	0.000270263	7.65	0.37	1.15	9/27/07 13:48	0:17:15	0:16:15	0:03:15	0.536190265	
2	67	982	7.1E-05	526.67	14.243	6.75658E-05	1.91	0.000337829	9.57	0.46	1.24	9/27/07 13:53	0:23:00	0:22:00	0:09:00	0.619139187	
2	67	982	7.1E-05	526.67	14.243	6.75658E-05	1.91	0.000405395	11.48	0.56	1.33	9/27/07 13:58	0:27:30	0:26:30	0:13:30	0.6770032	
1	67	982	3.5E-05	526.67	14.243	3.37829E-05	0.96	0.000439177	12.44	0.60	1.38	9/27/07 14:05	0:34:30	0:33:30	0:20:30	0.758287544	
2	67	982	7.1E-05	526.67	14.243	6.75658E-05	1.91	0.000506743	14.35	0.69	1.47	9/27/07 14:11	0:40:45	0:39:45	0:26:45	0.824115688	
4	67	982	0.00014	526.67	14.243	0.000135132	3.83	0.000641875	18.18	0.88	1.65	9/27/07 14:19	0:49:00	0:48:00	0:35:00	0.903696114	
4	67	982	0.00014	526.67	14.243	0.000135132	3.83	0.000777006	22.00	1.07	1.84	9/27/07 14:30	0:59:30	0:58:30	0:45:30	0.995824616	
4	67	982	0.00014	526.67	14.243	0.000135132	3.83	0.000912138	25.83	1.25	2.03	9/27/07 14:39	1:08:30	1:07:30	0:54:30	1.068488028	
1	67	982	3.5E-05	526.67	14.243	3.37829E-05	0.96	0.000945921	26.79	1.30	2.07	9/27/07 14:50	1:19:30	1:18:30	1:05:30	1.151086443	
4	67	982	0.00014	526.67	14.243	0.000135132	3.83	0.001081052	30.61	1.48	2.26	9/27/07 15:00	1:30:00	1:29:00	1:16:00	1.224744871	
4	67	982	0.00014	526.67	14.243	0.000135132	3.83	0.001216184	34.44	1.67	2.44	9/27/07 15:20	1:49:30	1:48:30	1:35:30	1.350925609	
12	67	982	0.00042	526.67	14.243	0.000405395	11.48	0.001621578	45.92	2.22	3.00	9/27/07 15:45	2:15:00	2:14:00	2:01:00	1.5	
12	71	981	0.00042	530.67	14.228	0.000401929	11.38	0.002023508	57.30	2.77	3.55	9/27/07 16:10	2:39:15	2:38:15	2:25:15	1.629161338	
52	71	989	0.00184	530.67	14.344	0.001755896	49.72	0.003779404	107.02	5.18	5.96	9/28/07 7:20	17:49:15	17:48:15	17:35:15	4.221472887	back at lab
38	71	984	0.00134	530.67	14.272	0.001276668	36.15	0.005056072	143.17	6.93	7.71	9/28/07 20:33	31:02:15	31:01:15	30:48:15	5.571130944	
55	71	984	0.00194	530.67	14.272	0.001847809	52.32	0.006903881	195.50	9.47	10.24	9/30/07 18:57	77:26:15	77:25:15	77:12:15	8.799857953	
53	72	975	0.00187	531.67	14.141	0.001761011	49.87	0.008664892	245.36	11.88	12.65	10/2/07 14:41	121:10:15	121:09:15	120:56:15	11.00776241	
43	72	978	0.00152	531.67	14.185	0.001433141	40.58	0.010098033	285.94	13.84	14.62	10/4/07 16:15	170:44:15	170:43:15	170:30:15	13.06665604	
45	73	980	0.00159	532.67	14.214	0.001500045	42.48	0.011598078	328.42	15.90	16.68	10/7/07 17:35	244:04:15	244:03:15	243:50:15	15.62276651	
39	68	968	0.00138	527.67	14.040	0.001296288	36.71	0.012894365	365.13	17.68	18.45	10/17/07 11:00	477:29:15	477:28:15	477:15:15	21.85148736	gas sampled
20	67	993	0.00071	526.67	14.402	0.000683226	19.35	0.013577591	384.47	18.62	19.39	10/29/07 15:55	770:24:15	770:23:15	770:10:15	27.75615547	gas sampled
22	68	988	0.00078	527.67	14.330	0.000746347	21.13	0.014323939	405.61	19.64	20.41	10/31/07 11:10	813:39:15	813:38:15	813:25:15	28.52462387	gas sampled
11	70	993	0.00039	529.67	14.402	0.000373646	10.58	0.014697585	416.19	20.15	20.93	11/7/07 10:15	980:44:15	980:43:15	980:30:15	31.31672876	gas sampled
31	67	988	0.00109	526.67	14.330	0.001053668	29.84	0.015751253	446.02	21.60	22.37	11/26/07 11:08	1437:37:15	1437:36:15	1437:23:15	37.91597069	gas sampled
12	67	982	0.00042	526.67	14.243	0.000405395	11.48	0.016156647	457.50	22.15	22.93	11/28/07 10:22	1484:51:15	1484:50:15	1484:37:15	38.5338055	
10	67	986	0.00035	526.67	14.301	0.000339205	9.61	0.016495852	467.11	22.62	23.39	12/7/07 11:35	1702:04:15	1702:03:15	1701:50:15	41.25616116	
2	67	991	7.1E-05	526.67	14.373	6.8185E-05	1.93	0.016564037	469.04	22.71	23.48	12/12/07 13:02	1823:31:15	1823:30:15	1823:17:15	42.70270288	
16	69	977	0.00057	528.67	14.170	0.00053574	15.17	0.017099777	484.21	23.44	24.22	12/20/07 9:24	2011:53:15	2011:52:15	2011:39:15	44.85406893	
2	67	986	7.1E-05	526.67	14.301	6.7841E-05	1.92	0.017167618	486.13	23.54	24.31	12/27/07 10:06	2180:35:15	2180:34:15	2180:21:15	46.69676113	
-7	67	1012	-0.0002	526.67	14.678	-0.000243705	-6.90	0.016923913	479.23	23.20	23.98	1/2/08 10:16	2324:45:15	2324:44:15	2324:31:15	48.21570456	
23	67	974	0.00081	526.67	14.127	0.000770676	21.82	0.01769459	501.05	24.26	25.03	1/7/08 10:35	2445:04:15	2445:03:15	2444:50:15	49.44765751	
3	67	981	0.00011	526.67	14.228	0.000101245	2.87	0.017795835	503.92	24.40	25.17	1/15/08 13:18	2639:47:15	2639:46:15	2639:33:15	51.37886239	
0	67	986	0	526.67	14.301	0	0.00	0.017795835	503.92	24.40	25.17	1/23/08 11:00	2829:29:15	2829:28:15	2829:15:15	53.19292716	
11	67	967	0.00039	526.67	14.025	0.000365935	10.36	0.01816177	514.28	24.90	25.67	1/28/08 8:55	2947:24:15	2947:23:15	2947:10:15	54.29000061	
3	67	969	0.00011	526.67	14.054	0.000100007	2.83	0.018261777	517.11	25.04	25.81	2/4/08 10:11	3116:40:15	3116:39:15	3116:26:15	55.8271514	
-1	67	983	-4E-05	526.67	14.257	-3.38173E-05	-0.96	0.01822796	516.16	24.99	25.77	2/11/08 14:30	3288:59:15	3288:58:15	3288:45:15	57.34969486	

3	67	981	0.00011	526.67	14.228	0.000101245	2.87	0.018329205	519.02	25.13	25.90	2/18/08 8:39	3451:08:15	3451:07:15	3450:54:15	58.74638287	
11	67	970	0.00039	526.67	14.069	0.000367071	10.39	0.018696276	529.42	25.63	26.41	2/25/08 9:08	3619:37:15	3619:36:15	3619:23:15	60.16328476	
-4	67	986	-0.0001	526.67	14.301	-0.000135682	-3.84	0.018560594	525.58	25.45	26.22	3/3/08 10:18	3788:47:15	3788:46:15	3788:33:15	61.55312746	
277.74	69	975	0.00981	528.67	14.141	0.009280731	262.80	0.027841325	788.38	38.17	38.95	3/3/08 10:18	3788:47:15	3788:46:15	3788:33:15	61.55312746	residual gas calc.

DECANISTERED 3/03/2008; sample dried for 22 days in air; 363.65 grams placed in ball mill (134.36 cc @ STP desorbed), proportional to 262.80 cc @ STP for 711.28 grams (wet wt.) for entire sample

SAMPLE: 308' 4.5" to 310' 0" (Anna Shale) core in SSD canister J2
NOTES: black shale, with small phosphate nodules, no fracturing
density = 2.21 gr/cc; KGS simple moisture = 2.04% (as received); KGS simple ash content = 80.16% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	1163	1175	10492
Sulfur	3.82%	3.86%	
Moisture	0.95%		
Ash	87.96%	88.80%	
Volatile Matter	7.99%	8.06%	
Fixed Carbon	3.10%	3.14%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)	
dry sample weight:	4.364	1979.36	wet sample weight:	4.647	2107.88	6.10%		10		off bottom	at surface	in canister	23.1	minutes
										9/27/07 16:19	9/27/07 16:20	9/27/07 16:42	0.385	hours
													0.620259802	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	temp (R)	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)	
12	69	981	0.00042	528.67	14.228	0.00040345	11.42	0.00040345	11.42	0.18	0.35	9/27/07 17:16	0:56:50	0:55:50	0:33:45	0.973253421	
3	66	981	0.00011	525.67	14.228	0.000101438	2.87	0.000504888	14.30	0.23	0.39	9/27/07 17:37	1:17:50	1:16:50	0:54:45	1.138956638	
2	66	981	7.1E-05	525.67	14.228	6.76254E-05	1.91	0.000572513	16.21	0.26	0.42	9/27/07 17:57	1:38:05	1:37:05	1:15:00	1.278562561	
2	66	981	7.1E-05	525.67	14.228	6.76254E-05	1.91	0.000640138	18.13	0.29	0.46	9/27/07 18:36	2:16:50	2:15:50	1:53:45	1.510150839	
39	71	989	0.00138	530.67	14.344	0.001316922	37.29	0.001957061	55.42	0.90	1.06	9/28/07 7:19	14:59:50	14:58:50	14:36:45	3.87262472	back at lab
28	71	984	0.00099	530.67	14.272	0.000940703	26.64	0.002897763	82.06	1.33	1.49	9/28/07 20:34	28:14:50	28:13:50	27:51:45	5.314811589	
39	71	984	0.00138	530.67	14.272	0.001310264	37.10	0.004208028	119.16	1.93	2.09	9/30/07 6:58	62:38:50	62:37:50	62:15:45	7.914999825	
40	72	975	0.00141	531.67	14.141	0.001329065	37.63	0.005537093	156.79	2.54	2.70	10/2/07 14:41	118:21:50	118:20:50	117:58:45	10.87951694	
22	72	978	0.00078	531.67	14.185	0.000733235	20.76	0.006270328	177.56	2.87	3.04	10/4/07 16:17	167:57:50	167:56:50	167:34:45	12.96008831	
23	73	980	0.00081	532.67	14.214	0.000766689	21.71	0.007037017	199.27	3.23	3.39	10/7/07 17:36	241:16:50	241:15:50	240:53:45	15.53320815	
24	70	976	0.00085	529.67	14.156	0.000801271	22.69	0.007838289	221.95	3.59	3.75	10/13/07 18:01	385:41:50	385:40:50	385:18:45	19.6391757	
17	68	968	0.0006	527.67	14.040	0.000565048	16.00	0.008403337	237.96	3.85	4.01	10/17/07 12:15	475:55:50	475:54:50	475:32:45	21.81583268	
9	69	984	0.00032	528.67	14.272	0.000303513	8.59	0.00870685	246.55	3.99	4.15	10/23/07 21:57	629:37:50	629:36:50	629:14:45	25.09244021	
4	67	993	0.00014	526.67	14.402	0.000136645	3.87	0.008843495	250.42	4.05	4.22	10/29/07 15:56	767:36:50	767:35:50	767:13:45	27.70584575	
4	68	988	0.00014	527.67	14.330	0.0001357	3.84	0.008979194	254.26	4.12	4.28	10/31/07 11:28	811:08:50	811:07:50	810:45:45	28.48064645	
11	68	987	0.00039	527.67	14.315	0.000372796	10.56	0.00935199	264.82	4.29	4.45	11/5/07 11:23	931:03:50	931:02:50	930:40:45	30.51333952	
3	70	993	0.00011	529.67	14.402	0.000101903	2.89	0.009453894	267.70	4.33	4.49	11/7/07 10:37	978:17:50	978:16:50	977:54:45	31.27774324	
11	68	993	0.00039	527.67	14.402	0.000375062	10.62	0.009828956	278.32	4.50	4.67	11/15/07 9:46	1169:26:50	1169:25:50	1169:03:45	34.1971815	
14	67	990	0.00049	526.67	14.359	0.000476813	13.50	0.010305769	291.83	4.72	4.89	11/24/07 20:02	1395:42:50	1395:41:50	1395:19:45	37.35925439	
9	67	982	0.00032	526.67	14.243	0.000304046	8.61	0.010609815	300.44	4.86	5.02	11/28/07 10:22	1482:02:50	1482:01:50	1481:39:45	38.49736643	
9	67	986	0.00032	526.67	14.301	0.000305284	8.64	0.0109151	309.08	5.00	5.16	12/7/07 11:35	1699:15:50	1699:14:50	1698:52:45	41.22212863	
2	67	991	7.1E-05	526.67	14.373	6.8185E-05	1.93	0.010983285	311.01	5.03	5.20	12/12/07 13:03	1820:43:50	1820:42:50	1820:20:45	42.6700194	
14	69	977	0.00049	528.67	14.170	0.000468772	13.27	0.011452057	324.28	5.25	5.41	12/20/07 9:26	2009:06:50	2009:05:50	2008:43:45	44.82314011	
5	67	986	0.00018	526.67	14.301	0.000169602	4.80	0.011621659	329.09	5.33	5.49	12/27/07 10:07	2177:47:50	2177:46:50	2177:24:45	46.666875	
-6	67	1012	-0.0002	526.67	14.678	-0.00020889	-5.92	0.01141277	323.17	5.23	5.39	1/2/08 10:19	2321:59:50	2321:58:50	2321:36:45	48.18710639	
19	67	974	0.00067	526.67	14.127	0.000636646	18.03	0.012049415	341.20	5.52	5.68	1/7/08 10:37	2442:17:50	2442:16:50	2441:54:45	49.41960362	
4	67	981	0.00014	526.67	14.228	0.000134994	3.82	0.012184409	345.02	5.58	5.75	1/15/08 13:19	2636:59:50	2636:58:50	2636:36:45	51.35170126	
2	67	986	7.1E-05	526.67	14.301	6.7841E-05	1.92	0.01225225	346.94	5.62	5.78	1/23/08 11:02	2826:42:50	2826:41:50	2826:19:45	53.16684953	
11	67	967	0.00039	526.67	14.025	0.000365935	10.36	0.012618185	357.31	5.78	5.95	1/28/08 8:56	2944:36:50	2944:35:50	2944:13:45	54.26429663	
3	67	969	0.00011	526.67	14.054	0.000100007	2.83	0.012718192	360.14	5.83	5.99	2/4/08 10:12	3113:52:50	3113:51:50	3113:29:45	55.80215547	
0	67	983	0	526.67	14.257	0	0.00	0.012718192	360.14	5.83	5.99	2/11/08 14:33	3286:13:50	3286:12:50	3285:50:45	57.32565356	
4	67	981	0.00014	526.67	14.228	0.000134994	3.82	0.012853186	363.96	5.89	6.05	2/18/08 8:39	3448:19:50	3448:18:50	3447:56:45	58.72248765	

182.41	67	981	0.00644	526.67	14.228	0.00615606	174.32	0.019009247	538.28	8.71	8.87	2/18/08 8:39	3448:19:50	3448:18:50	3447:56:45	58.72248765	residual gas calc.

DECANISTERED 2/18/2008; sample dried for 36 days in air; 810.90 grams placed in ball mill (67.06 cc @ STP desorbed), proportional to 174.32 cc @ STP for 2107.88 grams (wet wt.) for entire sample

SAMPLE: 310' 0" to 310' 10" (Lexington coal) core in SSD canister J3
NOTES: easily disaggregated, relatively pure coal, with poorly developed cleat, possible 2 cm spacing; density = 1.36 gr/cc
density = 1.36 gr/cc; KGS simple moisture = 0.00% (as received); KGS simple ash content = 18.84% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	11594	11853	14401
Sulfur	4.42%	4.52%	
Moisture	2.18%		
Ash	17.31%	17.69%	
Volatile Matter	36.57%	37.38%	
Fixed Carbon	43.94%	44.93%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)	
dry sample weight:	1.360	616.94	wet sample weight:	1.462	663.08	6.96%		5		off bottom	at surface	in canister	27.8	minutes
										9/27/07 16:19	9/27/07 16:20	9/27/07 16:47	0.464	hours
													0.681093891	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	temp (R)	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)	
5	69	981	0.00018	528.67	14.228	0.000168104		4.76	0.000168104	4.76	0.25	0.51	9/27/07 16:56	0:37:35	0:36:35	0:09:45	0.791447338	
4	66	981	0.00014	525.67	14.228	0.000135251		3.83	0.000303355	8.59	0.45	0.71	9/27/07 17:37	1:18:35	1:17:35	0:50:45	1.14443096	
0	66	981	0	525.67	14.228	0		0.00	0.000303355	8.59	0.45	0.71	9/27/07 18:37	2:17:50	2:16:50	1:50:00	1.515659006	
45	71	989	0.00159	530.67	14.344	0.001519526		43.03	0.001822881	51.62	2.68	2.94	9/28/07 7:18	14:58:50	14:57:50	14:31:00	3.870472265	back at lab
37	71	984	0.00131	530.67	14.272	0.001243071		35.20	0.003065952	86.82	4.51	4.77	9/28/07 20:35	28:15:50	28:14:50	27:48:00	5.316379303	
56	71	984	0.00198	530.67	14.272	0.001881405		53.28	0.004947357	140.09	7.27	7.53	9/30/07 6:59	62:39:50	62:38:50	62:12:00	7.916052608	
62	72	975	0.00219	531.67	14.141	0.002060051		58.33	0.007007408	198.43	10.30	10.56	10/2/07 14:42	118:22:50	118:21:50	117:55:00	10.88028288	
39	72	978	0.00138	531.67	14.185	0.001299826		36.81	0.008307234	235.23	12.22	12.48	10/4/07 16:18	167:58:50	167:57:50	167:31:00	12.96073129	
44	73	980	0.00155	532.67	14.214	0.00146671		41.53	0.009773944	276.77	14.37	14.63	10/7/07 17:37	241:17:50	241:16:50	240:50:00	15.53374463	
49	70	976	0.00173	529.67	14.156	0.001635928		46.32	0.011409873	323.09	16.78	17.04	10/13/07 18:01	385:41:50	385:40:50	385:14:00	19.6391757	
32	68	968	0.00113	527.67	14.040	0.001063621		30.12	0.012473493	353.21	18.34	18.60	10/17/07 12:17	475:57:50	475:56:50	475:30:00	21.81659664	
19	68	984	0.00067	527.67	14.272	0.000641963		18.18	0.013115456	371.39	19.29	19.55	10/23/07 21:58	629:38:50	629:37:50	629:11:00	25.09277231	
17	67	993	0.0006	526.67	14.402	0.000580742		16.44	0.013696198	387.83	20.14	20.40	10/29/07 15:58	767:38:50	767:37:50	767:11:00	27.7064473	
12	68	988	0.00042	527.67	14.330	0.000407099		11.53	0.014103297	399.36	20.74	21.00	10/31/07 11:28	811:08:50	811:07:50	810:41:00	28.48064645	
19	68	987	0.00067	527.67	14.315	0.00064392		18.23	0.014747217	417.59	21.69	21.94	11/5/07 11:23	931:03:50	931:02:50	930:36:00	30.51333952	
7	70	993	0.00025	529.67	14.402	0.000237775		6.73	0.014984992	424.33	22.03	22.29	11/7/07 10:38	978:18:50	978:17:50	977:51:00	31.27800967	
19	68	993	0.00067	527.67	14.402	0.000647835		18.34	0.015632827	442.67	22.99	23.25	11/15/07 9:46	1169:26:50	1169:25:50	1168:59:00	34.1971815	
24	67	990	0.00085	526.67	14.359	0.000817394		23.15	0.016450221	465.82	24.19	24.45	11/24/07 20:02	1395:42:50	1395:41:50	1395:15:00	37.35925439	
15	67	982	0.00053	526.67	14.243	0.000506743		14.35	0.016956964	480.17	24.93	25.19	11/28/07 10:24	1482:04:50	1482:03:50	1481:37:00	38.49779936	
15	67	986	0.00053	526.67	14.301	0.000508807		14.41	0.017465772	494.57	25.68	25.94	12/7/07 11:36	1699:16:50	1699:15:50	1698:49:00	41.22233079	
4	67	991	0.00014	526.67	14.373	0.00013637		3.86	0.017602142	498.44	25.88	26.14	12/12/07 13:03	1820:43:50	1820:42:50	1820:16:00	42.6700194	
21	69	977	0.00074	528.67	14.170	0.000703158		19.91	0.0183053	518.35	26.92	27.18	12/20/07 9:26	2009:06:50	2009:05:50	2008:39:00	44.82314011	
8	67	986	0.00028	526.67	14.301	0.000271364		7.68	0.018576664	526.03	27.32	27.58	12/27/07 10:08	2177:48:50	2177:47:50	2177:21:00	46.66705357	
-7	67	1012	-0.0002	526.67	14.678	-0.000243705		-6.90	0.018332959	519.13	26.96	27.22	1/2/08 10:20	2322:00:50	2321:59:50	2321:33:00	48.18727933	
30	67	974	0.00106	526.67	14.127	0.00100523		28.46	0.019338189	547.59	28.44	28.70	1/7/08 10:38	2442:18:50	2442:17:50	2441:51:00	49.41977225	
6	67	981	0.00021	526.67	14.228	0.000202491		5.73	0.01954068	553.33	28.73	28.99	1/15/08 13:20	2637:00:50	2636:59:50	2636:33:00	51.35186354	
4	67	986	0.00014	526.67	14.301	0.000135682		3.84	0.019676362	557.17	28.93	29.19	1/23/08 11:03	2826:43:50	2826:42:50	2826:16:00	53.16700627	
17	67	967	0.0006	526.67	14.025	0.000565536		16.01	0.020241899	573.18	29.76	30.02	1/28/08 8:57	2944:37:50	2944:36:50	2944:10:00	54.2644502	
5	67	969	0.00018	526.67	14.054	0.000166678		4.72	0.020408577	577.90	30.01	30.27	2/4/08 10:13	3113:53:50	3113:52:50	3113:26:00	55.80230481	
0	67	983	0	526.67	14.257	0		0.00	0.020408577	577.90	30.01	30.27	2/11/08 14:33	3286:13:50	3286:12:50	3285:46:00	57.32565356	
6	67	981	0.00021	526.67	14.228	0.000202491		5.73	0.020611068	583.64	30.31	30.57	2/18/08 8:40	3448:20:50	3448:19:50	3447:53:00	58.72262956	
14	67	970	0.00049	526.67	14.069	0.000467181		13.23	0.021078248	596.87	30.99	31.25	2/25/08 9:09	3616:49:50	3616:48:50	3616:22:00	60.14009108	
-2	67	986	-7E-05	526.67	14.301	-6.7841E-05		-1.92	0.021010408	594.95	30.89	31.15	3/3/08 10:20	3786:00:50	3785:59:50	3785:33:00	61.53059311	
3	67	982	0.00011	526.67	14.243	0.000101349		2.87	0.021111756	597.82	31.04	31.30	3/4/08 8:26	3808:06:50	3808:05:50	3807:39:00	61.70991727	
1675.10	67	982	0.05916	526.67	14.243	0.056589706		1602.44	0.077701463	2200.25	114.26	114.52	3/4/08 8:26	3808:06:50	3808:05:50	3807:39:00	61.70991727	residual gas calc.

DECANISTERED 3/04/2008; sample dried for 22 days in air; 21.36 grams placed in ball mill (51.62 cc @ STP desorbed), proportional to 1602.44 cc @ STP for 663.08 grams (wet wt.) for entire sample

SAMPLE: 369' 9.5" to 371' 2" (Excello Shale) core in SSD canister J4
NOTES: black shale, with small phosphate nodules, no fracturing
density = 2.20 gr/cc; KGS simple moisture = 2.87% (as received); KGS simple ash content = 93.10% (moisture-free)

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	4.420	2004.91	wet sample weight:	4.713	2137.60	6.21%		2		off bottom	at surface	in canister	27.4 minutes
										9/28/07 12:38	9/28/07 12:39	9/28/07 13:06	0.457 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			0.675976660 SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)
10	67	987	0.00035	526.67	14.315	0.000339549	9.61	0.000339549	9.61	0.15	0.19	9/28/07 13:43	1:04:40	1:03:40	0:37:15	1.038160767
-2	67	986	-7E-05	526.67	14.301	-6.7841E-05	-1.92	0.000271708	7.69	0.12	0.15	9/28/07 14:01	1:22:10	1:21:10	0:54:45	1.170232645
-5	67	985	-0.0002	526.67	14.286	-0.00016943	-4.80	0.000102278	2.90	0.05	0.08	9/28/07 15:03	2:24:55	2:23:55	1:57:30	1.554116398
6	67	984	0.00021	526.67	14.272	0.00020311	5.75	0.000305388	8.65	0.14	0.17	9/28/07 15:52	3:13:10	3:12:10	2:45:45	1.794281038
0	68	984	0	527.67	14.272	0	0.00	0.000305388	8.65	0.14	0.17	9/28/07 17:03	4:24:10	4:23:10	3:56:45	2.098279719
33	72	975	0.00117	531.67	14.141	0.001096479	31.05	0.001401866	39.70	0.63	0.67	10/2/07 14:45	98:06:10	98:05:10	97:38:45	9.904684638 back at lab
13	72	978	0.00046	531.67	14.185	0.000433275	12.27	0.001835142	51.97	0.83	0.86	10/4/07 16:18	147:39:10	147:38:10	147:11:45	12.15124594
13	73	980	0.00046	532.67	14.214	0.000433346	12.27	0.002268488	64.24	1.03	1.06	10/7/07 17:39	221:00:10	220:59:10	220:32:45	14.86616217
14	70	976	0.00049	529.67	14.156	0.000467408	13.24	0.002735896	77.47	1.24	1.27	10/13/07 18:03	365:24:10	365:23:10	364:56:45	19.11551144
12	68	968	0.00042	527.67	14.040	0.000398858	11.29	0.003134754	88.77	1.42	1.45	10/17/07 12:18	455:39:10	455:38:10	455:11:45	21.34602487
-2	68	984	-7E-05	527.67	14.272	-6.75751E-05	-1.91	0.003067179	86.85	1.39	1.42	10/23/07 21:59	609:20:10	609:19:10	608:52:45	24.68473437
0	67	993	0	526.67	14.402	0	0.00	0.003067179	86.85	1.39	1.42	10/29/07 15:58	747:19:10	747:18:10	746:51:45	27.33714404
575.78	75	980	0.02033	534.67	14.214	0.019121442	541.46	0.02218862	628.31	10.04	10.07	10/29/07 15:58	747:19:10	747:18:10	746:51:45	27.33714404 residual gas calc.

DECANISTERED 10/29/2007; sample dried for 100 days in air; 249.68 grams placed in ball mill (67.43 cc @ STP desorbed), proportional to 541.46 cc @ STP for 2004.91 grams (dry wt.) for entire sample

SAMPLE: 371' 2" to 372' 1.5" (Mulky coal) core in SSD canister J5
NOTES: relatively clean coal, with 1-2 cm dull layers, cross-cut by near-vertical mineral-filled fractures, bottom 1" rubbly
density = 1.27 gr/cc; KGS simple moisture = 1.81% (as received); KGS simple ash content = 8.21% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	13199	13598	14738
Sulfur	3.73%	3.84%	
Moisture	2.94%		
Ash	7.51%	7.73%	
Volatile Matter	43.87%	45.20%	
Fixed Carbon	45.68%	47.07%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	1.573	713.40	wet sample weight:	1.629	738.88	3.45%		24		off bottom	at surface	in canister	22.2 minutes
										9/28/07 12:38	9/28/07 12:39	9/28/07 13:01	0.369 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			0.607819418 SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)
6	67	987	0.00021	526.67	14.315	0.000203729	5.77	0.000203729	5.77	0.26	1.34	9/28/07 13:07	0:28:40	0:27:40	0:06:30	0.691214712
3	67	987	0.00011	526.67	14.315	0.000101865	2.88	0.000305594	8.65	0.39	1.47	9/28/07 13:16	0:37:25	0:36:25	0:15:15	0.789690516
1	67	987	3.5E-05	526.67	14.315	3.39549E-05	0.96	0.000339549	9.61	0.43	1.51	9/28/07 13:21	0:42:55	0:41:55	0:20:45	0.845740964
10	67	987	0.00035	526.67	14.315	0.000339549	9.61	0.000679098	19.23	0.86	1.94	9/28/07 13:42	1:03:40	1:02:40	0:41:30	1.030102476
5	67	986	0.00018	526.67	14.301	0.000169602	4.80	0.0008487	24.03	1.08	2.16	9/28/07 13:59	1:20:10	1:19:10	0:58:00	1.155902726
5	67	985	0.00018	526.67	14.286	0.00016943	4.80	0.001018131	28.83	1.29	2.37	9/28/07 15:02	2:23:40	2:22:40	2:01:30	1.547399252
10	67	984	0.00035	526.67	14.272	0.000338517	9.59	0.001356648	38.42	1.73	2.80	9/28/07 15:51	3:12:10	3:11:10	2:50:00	1.789630626
5	68	984	0.00018	527.67	14.272	0.000168938	4.78	0.001525585	43.20	1.94	3.02	9/28/07 17:04	4:25:10	4:24:10	4:03:00	2.102247475
88	71	984	0.00311	530.67	14.272	0.002956494	83.72	0.004482079	126.92	5.70	6.78	9/30/07 6:59	42:20:10	42:19:10	41:58:00	6.50662056 back at lab
72	72	975	0.00254	531.67	14.141	0.002392317	67.74	0.006874397	194.66	8.74	9.82	10/2/07 14:45	98:06:10	98:05:10	97:44:00	9.904684638
41	72	978	0.00145	531.67	14.185	0.001366483	38.69	0.00824088	233.35	10.48	11.56	10/4/07 16:20	147:41:10	147:40:10	147:19:00	12.15261746
41	73	980	0.00145	532.67	14.214	0.001366707	38.70	0.009607587	272.06	12.22	13.30	10/7/07 17:40	221:01:10	221:00:10	220:39:00	14.86672272
72	68	968	0.00254	527.67	14.040	0.002393146	67.77	0.012000734	339.82	15.26	16.34	10/17/07 12:20	455:41:10	455:40:10	455:19:00	21.34680564
25	68	984	0.00088	527.67	14.272	0.000844688	23.92	0.012845422	363.74	16.33	17.41	10/23/07 22:00	609:21:10	609:20:10	608:59:00	24.68507196

21	67	993	0.00074	526.67	14.402	0.000717387	20.31	0.013562809	384.05	17.25	18.32	10/29/07 16:03	747:24:10	747:23:10	747:02:00	27.33866818	
12	68	988	0.00042	527.67	14.330	0.000407099	11.53	0.013969908	395.58	17.76	18.84	10/31/07 11:27	790:48:10	790:47:10	790:26:00	28.12121579	
20	68	987	0.00071	527.67	14.315	0.000677811	19.19	0.014647719	414.78	18.63	19.70	11/5/07 11:24	910:45:10	910:44:10	910:23:00	30.17868085	
8	70	993	0.00028	529.67	14.402	0.000271743	7.69	0.014919461	422.47	18.97	20.05	11/7/07 10:39	958:00:10	957:59:10	957:38:00	30.95161995	
21	68	993	0.00074	527.67	14.402	0.000716028	20.28	0.015635489	442.75	19.88	20.96	11/15/07 9:47	1149:08:10	1149:07:10	1148:46:00	33.89891018	
25	67	990	0.00088	526.67	14.359	0.000851452	24.11	0.016486942	466.86	20.97	22.04	11/24/07 20:03	1375:24:10	1375:23:10	1375:02:00	37.08642309	
15	67	982	0.00053	526.67	14.243	0.000506743	14.35	0.016993685	481.21	21.61	22.69	11/28/07 10:26	1461:47:10	1461:46:10	1461:25:00	38.23331154	
17	67	986	0.0006	526.67	14.301	0.000576648	16.33	0.017570333	497.53	22.34	23.42	12/7/07 11:36	1678:57:10	1678:56:10	1678:35:00	40.97502627	
8	67	991	0.00028	526.67	14.373	0.00027274	7.72	0.017843073	505.26	22.69	23.77	12/12/07 13:04	1800:25:10	1800:24:10	1800:03:00	42.43134978	
22	69	977	0.00078	528.67	14.170	0.000736642	20.86	0.018579715	526.12	23.63	24.70	12/20/07 9:27	1988:48:10	1988:47:10	1988:26:00	44.59599509	
11	67	986	0.00039	526.67	14.301	0.000373125	10.57	0.01895284	536.68	24.10	25.18	12/27/07 10:09	2157:30:10	2157:29:10	2157:08:00	46.44892655	
-4	67	1012	-0.0001	526.67	14.678	-0.00013926	-3.94	0.018813581	532.74	23.92	25.00	1/2/08 10:21	2301:42:10	2301:41:10	2301:20:00	47.97606463	
32	67	974	0.00113	526.67	14.127	0.001072245	30.36	0.019885826	563.10	25.29	26.37	1/7/08 10:39	2422:00:10	2421:59:10	2421:38:00	49.21384742	
11	67	981	0.00039	526.67	14.228	0.000371233	10.51	0.020257059	573.61	25.76	26.84	1/15/08 13:20	2616:41:10	2616:40:10	2616:19:00	51.15355424	
6	67	986	0.00021	526.67	14.301	0.000203523	5.76	0.020460582	579.38	26.02	27.10	1/23/08 11:04	2806:25:10	2806:24:10	2806:03:00	52.97564954	
16	67	967	0.00057	526.67	14.025	0.00053227	15.07	0.020992852	594.45	26.70	27.77	1/28/08 9:58	2925:19:10	2925:18:10	2924:57:00	54.08622232	
7	67	969	0.00025	526.67	14.054	0.00023335	6.61	0.021226201	601.06	26.99	28.07	2/4/08 10:15	3093:36:10	3093:35:10	3093:14:00	55.62016521	
-2	67	983	-7E-05	526.67	14.257	-6.76346E-05	-1.92	0.021158567	599.14	26.91	27.98	2/11/08 14:34	3265:55:10	3265:54:10	3265:33:00	57.14822346	
7	67	981	0.00025	526.67	14.228	0.000236239	6.69	0.021394806	605.83	27.21	28.28	2/18/08 8:41	3428:02:10	3428:01:10	3427:40:00	58.54943306	
14	67	969	0.00049	526.67	14.054	0.000466699	13.22	0.021861505	619.05	27.80	28.88	2/25/08 9:11	3596:32:10	3596:31:10	3596:10:00	59.97112731	
0	67	986	0	526.67	14.301	0	0.00	0.021861505	619.05	27.80	28.88	3/3/08 10:21	3765:42:10	3765:41:10	3765:20:00	61.36532227	
-1	67	998	-4E-05	526.67	14.475	-3.43333E-05	-0.97	0.021827172	618.07	27.76	28.83	3/10/08 8:50	3932:11:10	3932:10:10	3931:49:00	62.70714561	
10	68	975	0.00035	527.67	14.141	0.000334785	9.48	0.022161957	627.55	28.18	29.26	3/12/08 10:00	3981:21:10	3981:20:10	3980:59:00	63.09796176	
392.40	68	975	0.01386	527.67	14.141	0.013136964	372.00	0.035298921	999.55	44.89	45.97	3/12/08 10:00	3981:21:10	3981:20:10	3980:59:00	63.09796176	residual gas calc.

DECANISTERED 3/12/2008; sample dried for 26 days in air; 304.45 grams placed in ball mill (153.28 cc @ STP desorbed), proportional to 372.00 cc @ STP for 738.88 grams (wet wt.) for entire sample

SAMPLE: 472' 6" to 473' 2" (Croweburg coal) core in SSD canister J6
NOTES: not disaggregated, minor mineralization in sparse fractures, no cleat evident
density = 1.40 gr/cc; KGS simple moisture = 0.95% (as received); KGS simple ash content = 30.60% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	10218	10503	13715
Sulfur	3.07%	3.16%	
Moisture	2.71%		
Ash	22.79%	23.42%	
Volatile Matter	38.44%	39.51%	
Fixed Carbon	36.06%	37.07%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	1.138	515.99	wet sample weight:	1.227	556.72	7.32%		25		off bottom	at surface	in canister	22.9 minutes
										9/29/07 9:32	9/29/07 9:43	9/29/07 9:55	0.382 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			0.618016540 SQRT (hrs)	
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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	66	986	0.00049	525.67	14.301	0.00047579	13.47	0.00047579	13.47	0.84	2.39	9/29/07 9:56	0:23:55	0:12:30	0:01:00	0.631356564	
17	66	986	0.0006	525.67	14.301	0.000577745	16.36	0.001053536	29.83	1.85	3.40	9/29/07 10:00	0:27:40	0:16:15	0:04:45	0.679051626	
11	67	987	0.00039	526.67	14.315	0.000373504	10.58	0.001427039	40.41	2.51	4.06	9/29/07 10:25	0:52:40	0:41:15	0:29:45	0.936897955	
7	67	987	0.00025	526.67	14.315	0.000237684	6.73	0.001664724	47.14	2.93	4.48	9/29/07 10:40	1:07:40	0:56:15	0:44:45	1.061968821	
11	68	986	0.00039	527.67	14.301	0.000372418	10.55	0.002037142	57.69	3.58	5.13	9/29/07 10:55	1:22:40	1:11:15	0:59:45	1.173787791	
10	68	986	0.00035	527.67	14.301	0.000338562	9.59	0.002375704	67.27	4.18	5.73	9/29/07 11:35	2:02:40	1:51:15	1:39:45	1.429840706	
15	68	986	0.00053	527.67	14.301	0.000507843	14.38	0.002883547	81.65	5.07	6.62	9/29/07 12:02	2:29:40	2:18:15	2:06:45	1.579381032	
9	68	986	0.00032	527.67	14.301	0.000304706	8.63	0.003188253	90.28	5.61	7.16	9/29/07 12:23	2:50:40	2:39:15	2:27:45	1.686548085	
7	68	986	0.00025	527.67	14.301	0.000236993	6.71	0.003425246	96.99	6.02	7.57	9/29/07 12:47	3:14:40	3:03:15	2:51:45	1.801234145	
14	68	986	0.00049	527.67	14.301	0.000473987	13.42	0.003899233	110.41	6.86	8.41	9/29/07 13:22	3:49:40	3:38:15	3:26:45	1.956470745	
135	71	984	0.00477	530.67	14.272	0.004535531	128.43	0.008434764	238.85	14.83	16.38	9/30/07 7:02	21:29:40	21:18:15	21:06:45	4.636210138	back at lab
176	72	975	0.00622	531.67	14.141	0.005847886	165.59	0.014282651	404.44	25.11	26.66	10/2/07 14:46	77:13:40	77:02:15	76:50:45	8.787933647	
98	72	978	0.00346	531.67	14.185	0.003266229	92.49	0.017548879	496.93	30.85	32.41	10/4/07 16:22	126:49:40	126:38:15	126:26:45	11.26178395	
211	68	968	0.00745	527.67	14.040	0.007013248	198.59	0.024562127	695.52	43.18	44.74	10/17/07 11:10	433:37:40	433:26:15	433:14:45	20.82373112	gas sampled
70	68	984	0.00247	527.67	14.272	0.002365127	66.97	0.026927255	762.49	47.34	48.89	10/23/07 22:02	588:29:40	588:18:15	588:06:45	24.25890444	

38	67	993	0.00134	526.67	14.402	0.00129813	36.76	0.028225384	799.25	49.62	51.18	10/29/07 16:04	726:31:40	726:20:15	726:08:45	26.95417923	
11	68	988	0.00039	527.67	14.330	0.000373174	10.57	0.028598558	809.82	50.28	51.83	10/31/07 11:25	769:52:40	769:41:15	769:29:45	27.74667147	estimated
32	68	987	0.00113	527.67	14.315	0.001084497	30.71	0.029683055	840.53	52.19	53.74	11/5/07 11:25	889:52:40	889:41:15	889:29:45	29.83081926	
12	70	993	0.00042	529.67	14.402	0.000407614	11.54	0.030090669	852.07	52.90	54.46	11/7/07 10:39	937:06:40	936:55:15	936:43:45	30.6122706	
30	68	993	0.00106	527.67	14.402	0.001022897	28.97	0.031113566	881.03	54.70	56.25	11/15/07 9:47	1128:14:40	1128:03:15	1127:51:45	33.58935016	
34	67	990	0.0012	526.67	14.359	0.001157975	32.79	0.032271542	913.82	56.74	58.29	11/24/07 20:04	1354:31:40	1354:20:15	1354:08:45	36.80390982	
19	67	982	0.00067	526.67	14.243	0.000641875	18.18	0.032913416	932.00	57.87	59.42	11/28/07 10:26	1440:53:40	1440:42:15	1440:30:45	37.95911543	
20	67	986	0.00071	526.67	14.301	0.00067841	19.21	0.033591826	951.21	59.06	60.61	12/7/07 11:37	1658:04:40	1657:53:15	1657:41:45	40.7195012	
8	67	991	0.00028	526.67	14.373	0.00027274	7.72	0.033864566	958.93	59.54	61.09	12/12/07 13:04	1779:31:40	1779:20:15	1779:08:45	42.18444948	
24	69	977	0.00085	528.67	14.170	0.000803609	22.76	0.034668175	981.69	60.95	62.50	12/20/07 9:28	1967:55:40	1967:44:15	1967:32:45	44.36133201	
10	67	986	0.00035	526.67	14.301	0.000339205	9.61	0.03500738	991.29	61.55	63.10	12/27/07 10:11	2136:38:40	2136:27:15	2136:15:45	46.22385147	
-7	67	1012	-0.0002	526.67	14.678	-0.000243705	-6.90	0.034763676	984.39	61.12	62.67	1/2/08 10:22	2280:49:40	2280:38:15	2280:26:45	47.75801271	
32	67	974	0.00113	526.67	14.127	0.001072245	30.36	0.035835921	1014.76	63.00	64.56	1/7/08 10:40	2401:07:40	2400:56:15	2400:44:45	49.00130384	
6	67	981	0.00021	526.67	14.228	0.000202491	5.73	0.036038412	1020.49	63.36	64.91	1/15/08 13:21	2595:48:40	2595:37:15	2595:25:45	50.94910314	
3	67	986	0.00011	526.67	14.301	0.000101761	2.88	0.036140173	1023.37	63.54	65.09	1/23/08 11:05	2785:32:40	2785:21:15	2785:09:45	52.77825731	
18	67	967	0.00064	526.67	14.025	0.000598803	16.96	0.036738977	1040.33	64.59	66.14	1/28/08 9:00	2903:27:40	2903:16:15	2903:04:45	53.8837741	
5	67	969	0.00018	526.67	14.054	0.000166678	4.72	0.036905655	1045.05	64.89	66.44	2/4/08 10:16	3072:43:40	3072:32:15	3072:20:45	55.43219081	
-6	67	983	-0.0002	526.67	14.257	-0.000202904	-5.75	0.036702751	1039.30	64.53	66.08	2/11/08 14:35	3245:02:40	3244:51:15	3244:39:45	56.96529158	
4	67	981	0.00014	526.67	14.228	0.000134994	3.82	0.036837745	1043.12	64.77	66.32	2/18/08 8:42	3407:09:40	3406:58:15	3406:46:45	58.37089267	
13	67	969	0.00046	526.67	14.054	0.000433364	12.27	0.037271109	1055.40	65.53	67.08	2/25/08 9:12	3575:39:40	3575:28:15	3575:16:45	59.79683195	
-5	67	986	-0.0002	526.67	14.301	-0.000169602	-4.80	0.037101506	1050.59	65.23	66.78	3/3/08 10:22	3744:49:40	3744:38:15	3744:26:45	61.19499798	
-4	67	998	-0.0001	526.67	14.475	-0.000137333	-3.89	0.036964173	1046.70	64.99	66.54	3/10/08 8:52	3911:19:40	3911:08:15	3910:56:45	62.54060903	
14	67	982	0.00049	526.67	14.243	0.00047296	13.39	0.037437133	1060.10	65.82	67.37	3/17/08 10:08	4080:35:40	4080:24:15	4080:12:45	63.87953072	
241.65	67	982	0.00853	526.67	14.243	0.008163634	231.17	0.045600767	1291.27	80.17	81.72	3/17/08 10:08	4080:35:40	4080:24:15	4080:12:45	63.87953072	residual gas calc.

DECANISTERED 3/17/2008; sample dried for 49 days in air; 294.73 grams placed in ball mill (122.38 cc @ STP desorbed), proportional to 231.17 cc @ STP for 556.72 grams (wet wt.) for entire sample

SAMPLE: 490' 3.5" to 491' 3.5" (shale 4' above Fleming coal) core in SSD canister J9
NOTES: black shale, with small phosphate nodules, minor pyrite nodules parallel to bedding, no fracturing
density = 2.49 gr/cc; ; KGS simple moisture = 3.16% (as received); KGS simple ash content = 93.83% (moisture-free)

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)	
dry sample weight:	3.019	1369.39	wet sample weight:	3.155	1430.87	4.30%		36		off bottom	at surface	in canister	33.8	minutes
										9/29/07 10:59	9/29/07 11:00	9/29/07 11:33	0.563	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			0.750000000	SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)
10	68	986	0.00035	527.67	14.301	0.000338562	9.59	0.000338562	9.59	0.22	1.07	9/29/07 12:02	1:02:30	1:01:15	0:28:45	1.020620726	
4	68	986	0.00014	527.67	14.301	0.000135425	3.83	0.000473987	13.42	0.31	1.16	9/29/07 12:08	1:09:15	1:08:00	0:35:30	1.074321491	
7	68	986	0.00025	527.67	14.301	0.000236993	6.71	0.00071098	20.13	0.47	1.31	9/29/07 12:16	1:17:00	1:15:45	0:43:15	1.132843031	
3	68	986	0.00011	527.67	14.301	0.000101569	2.88	0.000812549	23.01	0.54	1.38	9/29/07 12:42	1:43:15	1:42:00	1:09:30	1.311805372	
8	68	986	0.00028	527.67	14.301	0.00027085	7.67	0.001083399	30.68	0.72	1.56	9/29/07 14:42	3:42:30	3:41:15	3:08:45	1.925703335	
-16	71	984	-0.0006	530.67	14.272	-0.000537544	-15.22	0.000545854	15.46	0.36	1.20	9/30/07 7:06	20:06:30	20:05:15	19:32:45	4.484231632	
6	72	975	0.00021	531.67	14.141	0.00019936	5.65	0.000745214	21.10	0.49	1.34	10/2/07 14:54	75:54:30	75:53:15	75:20:45	8.712538857	back at lab
-1	72	978	-4E-05	531.67	14.185	-3.33289E-05	-0.94	0.000711885	20.16	0.47	1.31	10/4/07 16:35	125:35:30	125:34:15	125:01:45	11.20676879	
0	73	980	0	532.67	14.214	0	0.00	0.000711885	20.16	0.47	1.31	10/7/07 17:43	198:43:30	198:42:15	198:09:45	14.09698549	
-5	70	976	-0.0002	529.67	14.156	-0.000166931	-4.73	0.000544954	15.43	0.36	1.20	10/13/07 18:05	343:05:30	343:04:15	342:31:45	18.52273378	
2	68	968	7.1E-05	527.67	14.040	6.64763E-05	1.88	0.00061143	17.31	0.41	1.25	10/17/07 12:54	433:54:30	433:53:15	433:20:45	20.83046647	
156.94	74	980	0.00554	533.67	14.214	0.005221686	147.86	0.005833116	165.17	3.86	4.71	10/17/07 12:54	433:54:30	433:53:15	433:20:45	20.83046647	residual gas calc.

DECANISTERED 10/17/2007; sample dried for 103 days in air; 364.81 grams placed in ball mill (39.38 cc @ STP desorbed), proportional to 147.86 cc @ STP for 1369.39 grams (dry wt.) for entire sample

SAMPLE: 495' 3" to 496' 9" (Fleming coal) core in SSD canister J7
NOTES: not disaggregated, no cleat evident
density = 1.32 gr/cc; KGS simple moisture = 0.70% (as received); KGS simple ash content = 24.76% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	10526	10737	14163

Sulfur	7.75%	7.90%
Moisture	1.96%	
Ash	23.72%	24.19%
Volatile Matter	34.47%	35.16%
Fixed Carbon	39.85%	40.65%

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)	
dry sample weight:	2.680	1215.57	wet sample weight:	2.844	1290.09	5.78%		64		off bottom	at surface	in canister	16.5	minutes
										9/29/07 10:59	9/29/07 11:00	9/29/07 11:16	0.275	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			0.524404424	SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)	
50	68	986	0.00177	527.67	14.301	0.00169281	47.93	0.00169281	47.93	1.26	2.95	9/29/07 11:38	0:39:00	0:37:45	0:22:30	0.806225775	
20	68	986	0.00071	527.67	14.301	0.000677124	19.17	0.002369935	67.11	1.77	3.46	9/29/07 11:48	0:48:30	0:47:15	0:32:00	0.899073597	
7	68	986	0.00025	527.67	14.301	0.000236993	6.71	0.002606928	73.82	1.95	3.63	9/29/07 11:52	0:53:15	0:52:00	0:36:45	0.942072184	
4	68	986	0.00014	527.67	14.301	0.000135425	3.83	0.002742353	77.65	2.05	3.73	9/29/07 12:00	1:00:30	0:59:15	0:44:00	1.004158022	
23	68	986	0.00081	527.67	14.301	0.000778693	22.05	0.003521046	99.70	2.63	4.31	9/29/07 12:21	1:22:15	1:21:00	1:05:45	1.170825919	
23	68	986	0.00081	527.67	14.301	0.000778693	22.05	0.004299738	121.75	3.21	4.90	9/29/07 12:46	1:46:30	1:45:15	1:30:00	1.332291259	
31	68	986	0.00109	527.67	14.301	0.001049542	29.72	0.005349281	151.47	3.99	5.68	9/29/07 13:28	2:28:30	2:27:15	2:12:00	1.573213272	estimate
23	68	986	0.00081	527.67	14.301	0.000778693	22.05	0.006127974	173.52	4.57	6.26	9/29/07 14:07	3:07:30	3:06:15	2:51:00	1.767766953	
216	71	984	0.00763	530.67	14.272	0.007256849	205.49	0.013384823	379.01	9.99	11.68	9/30/07 7:03	20:03:30	20:02:15	19:47:00	4.478653071	back at lab
225	72	975	0.00795	531.67	14.141	0.007475991	211.70	0.020860814	590.71	15.57	17.26	10/2/07 14:49	75:49:30	75:48:15	75:33:00	8.707755164	
128	72	978	0.00452	531.67	14.185	0.004266094	120.80	0.025126908	711.51	18.75	20.44	10/4/07 16:23	125:23:30	125:22:15	125:07:00	11.19784205	
292	68	968	0.01031	527.67	14.040	0.009705538	274.83	0.034832446	986.34	26.00	27.68	10/17/07 11:46	432:46:30	432:45:15	432:30:00	20.80324494	gas sampled
104	68	984	0.00367	527.67	14.272	0.003513903	99.50	0.03834635	1085.84	28.62	30.30	10/23/07 22:03	587:03:30	587:02:15	586:47:00	24.22928669	
68	67	993	0.0024	526.67	14.402	0.002322969	65.78	0.040669318	1151.62	30.35	32.04	10/29/07 16:06	725:06:30	725:05:15	724:50:00	26.92783566	
29	68	988	0.00102	527.67	14.330	0.000983822	27.86	0.04165314	1179.48	31.09	32.77	10/31/07 11:27	768:27:30	768:26:15	768:11:00	27.72108103	
49	68	987	0.00173	527.67	14.315	0.001660637	47.02	0.043313777	1226.50	32.33	34.01	11/5/07 11:25	888:25:30	888:24:15	888:09:00	29.80645903	
22	70	993	0.00078	529.67	14.402	0.000747292	21.16	0.044061069	1247.67	32.88	34.57	11/7/07 10:40	935:40:30	935:39:15	935:24:00	30.58880514	
54	68	993	0.00191	527.67	14.402	0.001841215	52.14	0.045902283	1299.80	34.26	35.94	11/15/07 9:48	1126:48:30	1126:47:15	1126:32:00	33.56796588	
51	67	990	0.0018	526.67	14.359	0.001736963	49.19	0.047639246	1348.99	35.55	37.24	11/24/07 20:05	1353:05:30	1353:04:15	1352:49:00	36.78439434	
26	67	982	0.00092	526.67	14.243	0.000878355	24.87	0.048517601	1373.86	36.21	37.90	11/28/07 10:27	1439:27:30	1439:26:15	1439:11:00	37.94019417	
36	67	986	0.00127	526.67	14.301	0.001221138	34.58	0.049738739	1408.44	37.12	38.81	12/7/07 11:37	1656:37:30	1656:36:15	1656:21:00	40.70165844	
17	67	991	0.0006	526.67	14.373	0.000579573	16.41	0.050318311	1424.85	37.55	39.24	12/12/07 13:05	1778:05:30	1778:04:15	1777:49:00	42.16742424	
32	69	977	0.00113	528.67	14.170	0.001071479	30.34	0.05138979	1455.19	38.35	40.04	12/20/07 9:29	1966:29:30	1966:28:15	1966:13:00	44.34514254	
20	67	986	0.00071	526.67	14.301	0.00067841	19.21	0.0520682	1474.40	38.86	40.55	12/27/07 10:11	2135:11:30	2135:10:15	2134:55:00	46.2081342	
4	67	1012	0.00014	526.67	14.678	0.00013926	3.94	0.05220746	1478.35	38.96	40.65	1/2/08 10:23	2279:23:30	2279:22:15	2279:07:00	47.74297505	
34	67	974	0.0012	526.67	14.127	0.001139261	32.26	0.053346721	1510.61	39.81	41.50	1/7/08 10:41	2399:41:30	2399:40:15	2399:25:00	48.98664784	
22	67	981	0.00078	526.67	14.228	0.000742467	21.02	0.054089187	1531.63	40.37	42.05	1/15/08 13:22	2594:22:30	2594:21:15	2594:06:00	50.93500761	
18	67	986	0.00064	526.67	14.301	0.000610569	17.29	0.054699756	1548.92	40.82	42.51	1/23/08 11:05	2784:05:30	2784:04:15	2783:49:00	52.76449248	
22	67	967	0.00078	526.67	14.025	0.000731871	20.72	0.055431627	1569.64	41.37	43.06	1/28/08 9:01	2902:01:30	2902:00:15	2901:45:00	53.87044644	
18	67	969	0.00064	526.67	14.054	0.000600042	16.99	0.056031669	1586.63	41.82	43.50	2/4/08 10:17	3071:17:30	3071:16:15	3071:01:00	55.41923553	
3	67	983	0.00011	526.67	14.257	0.000101452	2.87	0.05613312	1589.51	41.89	43.58	2/11/08 14:36	3243:36:30	3243:35:15	3243:20:00	56.95268504	
7	67	981	0.00025	526.67	14.228	0.000236239	6.69	0.05636936	1596.20	42.07	43.76	2/18/08 8:43	3405:43:30	3405:42:15	3405:27:00	58.35858977	
19	67	969	0.00067	526.67	14.054	0.000633377	17.94	0.057002737	1614.13	42.54	44.23	2/25/08 9:13	3574:13:30	3574:12:15	3573:57:00	59.78482249	
6	67	986	0.00021	526.67	14.301	0.000203523	5.76	0.05720626	1619.89	42.69	44.38	3/3/08 10:24	3743:24:30	3743:23:15	3743:08:00	61.18339916	
4	67	998	0.00014	526.67	14.475	0.000137333	3.89	0.057343593	1623.78	42.80	44.48	3/10/08 8:53	3909:53:30	3909:52:15	3909:37:00	62.52912655	
14	67	982	0.00049	526.67	14.243	0.00047296	13.39	0.057816554	1637.18	43.15	44.84	3/17/08 10:09	4079:09:30	4079:08:15	4078:53:00	63.86828895	
937.48	69	985	0.03311	528.67	14.286	0.031647352	896.15	0.089463905	2533.33	66.77	68.45	3/17/08 10:09	4079:09:30	4079:08:15	4078:53:00	63.86828895	residual gas calc.

DECANISTERED 3/17/2008; sample dried for 62 days in air; 535.31 grams placed in ball mill (371.85 cc @ STP desorbed), proportional to 896.15 cc @ STP for 1290.09 grams (wet wt.) for entire sample

SAMPLE: 503' 4" to 504' 5.5" (Mineral coal) core in SSD canister J8
NOTES: very crumbly coal, with minor mineralization in fractures, cleat spacing at 1/2 cm
density = 1.45 gr/cc; KGS simple moisture = 2.35% (as received); KGS simple ash content = 34.20% (moisture-free)
PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF

BTU/lb	8765	9013	13575
Sulfur	7.54%	7.75%	
Moisture	2.75%		
Ash	32.68%	33.61%	
Volatile Matter	28.53%	29.33%	
Fixed Carbon	36.04%	37.06%	

	lbs.	grams		lbs.	grams	moisture %		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	2.080	943.44	wet sample weight:	2.232	1012.22	6.79%	est. lost gas (cc) = 71	off bottom	at surface	in canister	27.2 minutes
								9/29/07 11:39	9/29/07 11:40	9/29/07 12:06	0.454 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			0.673918887 SQRT (hrs)	
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)	
24	68	986	0.00085	527.67	14.301	0.000812549	23.01	0.000812549	23.01	0.78	3.19	9/29/07 12:19	0:39:45	0:38:30	0:12:30	0.81394103	
24	68	986	0.00085	527.67	14.301	0.000812549	23.01	0.001625098	46.02	1.56	3.97	9/29/07 12:44	1:05:00	1:03:45	0:37:45	1.040833	
39	68	986	0.00138	527.67	14.301	0.001320392	37.39	0.00294549	83.41	2.83	5.24	9/29/07 13:30	1:51:15	1:50:00	1:24:00	1.361677887	
193	71	984	0.00682	530.67	14.272	0.006484129	183.61	0.009429619	267.02	9.07	11.48	9/30/07 7:04	19:24:30	19:23:15	18:57:15	4.405489	back at lab
225	72	975	0.00795	531.67	14.141	0.007475991	211.70	0.01690561	478.71	16.26	18.67	10/2/07 14:51	75:11:30	75:10:15	74:44:15	8.671312857	
118	72	978	0.00417	531.67	14.185	0.003932806	111.36	0.020838416	590.08	20.04	22.45	10/4/07 16:34	124:54:30	124:53:15	124:27:15	11.17623968	
105	73	980	0.00371	532.67	14.214	0.003500104	99.11	0.02433852	689.19	23.40	25.81	10/7/07 17:42	198:02:30	198:01:15	197:35:15	14.07272776	
148	68	968	0.00523	527.67	14.040	0.004919245	139.30	0.029257765	828.48	28.13	30.54	10/17/07 11:20	431:40:30	431:39:15	431:13:15	20.77678993	gas sampled
95	67	993	0.00335	526.67	14.402	0.003245324	91.90	0.032503089	920.38	31.25	33.67	10/29/07 15:46	724:06:30	724:05:15	723:39:15	26.90926111	gas sampled
32	68	988	0.00113	527.67	14.330	0.001085596	30.74	0.033588685	951.12	32.30	34.71	10/31/07 11:26	767:46:30	767:45:15	767:19:15	27.70875313	
36	68	987	0.00127	527.67	14.315	0.00122006	34.55	0.034808745	985.67	33.47	35.88	11/5/07 11:26	887:46:30	887:45:15	887:19:15	29.79555336	
14	70	993	0.00049	529.67	14.402	0.000475549	13.47	0.035284295	999.14	33.93	36.34	11/7/07 10:40	935:00:30	934:59:15	934:33:15	30.57790597	
37	68	993	0.00131	527.67	14.402	0.001261573	35.72	0.036545867	1034.86	35.14	37.55	11/15/07 9:48	1126:08:30	1126:07:15	1125:41:15	33.55803431	
39	67	990	0.00138	526.67	14.359	0.001328266	37.61	0.037874133	1072.47	36.42	38.83	11/24/07 20:06	1352:26:30	1352:25:15	1351:59:15	36.77555801	
20	67	982	0.00071	526.67	14.243	0.000675658	19.13	0.038549791	1091.60	37.07	39.48	11/28/07 10:27	1438:47:30	1438:46:15	1438:20:15	37.93140739	
24	67	986	0.00085	526.67	14.301	0.000814092	23.05	0.039363883	1114.66	37.85	40.26	12/7/07 11:38	1655:58:30	1655:57:15	1655:31:15	40.69367273	
10	67	991	0.00035	526.67	14.373	0.000340925	9.65	0.039704808	1124.31	38.18	40.59	12/12/07 13:06	1777:26:30	1777:25:15	1776:59:15	42.15971616	
26	69	977	0.00092	528.67	14.170	0.000870577	24.65	0.040575385	1148.96	39.02	41.43	12/20/07 9:30	1965:50:30	1965:49:15	1965:23:15	44.33781306	
12	67	986	0.00042	526.67	14.301	0.000407046	11.53	0.04098243	1160.49	39.41	41.82	12/27/07 10:12	2134:32:30	2134:31:15	2134:05:15	46.20110028	
-6	67	1012	-0.0002	526.67	14.678	-0.00020889	-5.92	0.040773541	1154.57	39.21	41.62	1/2/08 10:24	2278:44:30	2278:43:15	2278:17:15	47.73616728	
35	67	974	0.00124	526.67	14.127	0.001172768	33.21	0.041946309	1187.78	40.33	42.75	1/7/08 10:42	2399:02:30	2399:01:15	2398:35:15	48.98001293	
12	67	981	0.00042	526.67	14.228	0.000404982	11.47	0.042351291	1199.25	40.72	43.13	1/15/08 13:23	2593:43:30	2593:42:15	2593:16:15	50.92862653	
6	67	986	0.00021	526.67	14.301	0.000203523	5.76	0.042554814	1205.01	40.92	43.33	1/23/08 11:06	2783:26:30	2783:25:15	2782:59:15	52.75833268	
20	67	967	0.00071	526.67	14.025	0.000665337	18.84	0.043220151	1223.85	41.56	43.97	1/28/08 9:02	2901:22:30	2901:21:15	2900:55:15	53.86441311	
9	67	969	0.00032	526.67	14.054	0.000300021	8.50	0.043520172	1232.35	41.85	44.26	2/4/08 10:18	3070:38:30	3070:37:15	3070:11:15	55.41337083	
-5	67	983	-0.0002	526.67	14.257	-0.000169086	-4.79	0.043351085	1227.56	41.69	44.10	2/11/08 14:37	3242:57:30	3242:56:15	3242:30:15	56.94697826	
8	67	981	0.00028	526.67	14.228	0.000269988	7.65	0.043621073	1235.21	41.94	44.36	2/18/08 8:44	3405:04:30	3405:03:15	3404:37:15	58.35302049	
17	67	969	0.0006	526.67	14.054	0.000566706	16.05	0.044187779	1251.25	42.49	44.90	2/25/08 9:14	3573:34:30	3573:33:15	3573:07:15	59.77938608	
-2	67	986	-7E-05	526.67	14.301	-6.7841E-05	-1.92	0.044119938	1249.33	42.42	44.84	3/3/08 10:25	3742:45:30	3742:44:15	3742:18:15	61.17808704	
-2	67	998	-7E-05	526.67	14.475	-6.86666E-05	-1.94	0.044051272	1247.39	42.36	44.77	3/10/08 8:54	3909:14:30	3909:13:15	3908:47:15	62.52392875	
18	67	982	0.00064	526.67	14.243	0.000608092	17.22	0.044659363	1264.61	42.94	45.35	3/17/08 10:10	4078:30:30	4078:29:15	4078:03:15	63.86320015	
0	67	993	0	526.67	14.402	0	0.00	0.044659363	1264.61	42.94	45.35	3/24/08 8:36	4244:56:30	4244:55:15	4244:29:15	65.15321686	
7	66	982	0.00025	525.67	14.243	0.00023693	6.71	0.044896294	1271.32	43.17	45.58	3/25/08 14:52	4275:12:30	4275:11:15	4274:45:15	65.3850773	
571.71	66	982	0.02019	525.67	14.243	0.019350753	547.95	0.064247047	1819.27	61.78	64.19	3/25/08 14:52	4275:12:30	4275:11:15	4274:45:15	65.3850773	residual gas calc.

DECANISTERED 3/25/2008; sample dried for 43 days in air; 436.59 grams placed in ball mill (236.34 cc @ STP desorbed), proportional to 547.95 cc @ STP for 1012.22 grams (wet wt.) for entire sample

SAMPLE: 524' 7" to 526' 0.5" (shale 4' above Weir-Pittsburg coal) core in SSD canister J10
NOTES: dark shale with minor 1 to 2 cm lighter-colored zones, easily broken along bedding planes
density = 2.49 gr/cc; KGS simple moisture = 0.98% (as received); KGS simple ash content = 90.67% (moisture-free)

	lbs.	grams		lbs.	grams	moisture %		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	4.679	2122.27	wet sample weight:	4.943	2242.27	5.35%	est. lost gas (cc) = 8	off bottom	at surface	in canister	25.2 minutes
								9/29/07 13:00	9/29/07 13:02	9/29/07 13:26	0.421 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	0.648716682 SQRT (hrs)

measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)	
5	68	986	0.00018	527.67	14.301	0.000169281	4.79		0.000169281	4.79	0.07	0.19	9/29/07 14:10	1:09:15	1:07:45	0:44:00	1.074321491	
13	68	986	0.00046	527.67	14.301	0.000440131	12.46		0.000609412	17.26	0.26	0.38	9/29/07 14:59	1:58:15	1:56:45	1:33:00	1.403863716	
11	71	986	0.00039	530.67	14.301	0.000370313	10.49		0.000979725	27.74	0.42	0.54	9/30/07 7:07	18:06:15	18:04:45	17:41:00	4.254899137	back at lab
16	72	975	0.00057	531.67	14.141	0.000531626	15.05		0.001511351	42.80	0.65	0.77	10/2/07 14:54	73:53:15	73:51:45	73:28:00	8.59578385	
3	72	978	0.00011	531.67	14.185	9.99866E-05	2.83		0.001611337	45.63	0.69	0.81	10/4/07 16:24	123:23:15	123:21:45	122:58:00	11.10799262	
3	73	980	0.00011	532.67	14.214	0.000100003	2.83		0.00171134	48.46	0.73	0.85	10/7/07 17:43	196:42:15	196:40:45	196:17:00	14.02512626	
-1	70	976	-4E-05	529.67	14.156	-3.33863E-05	-0.95		0.001677954	47.51	0.72	0.84	10/13/07 18:06	341:05:15	341:03:45	340:40:00	18.46855436	
5	68	968	0.00018	527.67	14.040	0.000166191	4.71		0.001844145	52.22	0.79	0.91	10/17/07 12:55	431:54:15	431:52:45	431:29:00	20.78230417	
-15	68	984	-0.0005	527.67	14.272	-0.000506813	-14.35		0.001337332	37.87	0.57	0.69	10/23/07 22:04	585:03:15	585:01:45	584:38:00	24.18789298	
-11	67	993	-0.0004	526.67	14.402	-0.000375774	-10.64		0.000961557	27.23	0.41	0.53	10/29/07 16:08	723:07:15	723:05:45	722:42:00	26.89090615	
230.46	72	985	0.00814	531.67	14.286	0.007735946	219.06		0.008697503	246.28	3.72	3.84	10/29/07 16:08	723:07:15	723:05:45	722:42:00	26.89090615	residual gas calc.

DECANISTERED 10/29/2007; sample dried for 91 days in air; 356.42 grams placed in ball mill (36.79 cc @ STP desorbed), proportional to 219.06 cc @ STP for 2122.27 grams (dry wt.) for entire sample

SAMPLE: 529' 5" to 530' 8" (shale overlying Weir-Pittsburg coal) core in SSD canister J12

NOTES: dark shale, easily broken along bedding planes

density = 2.09 gr/cc; KGS simple moisture = 2.47% (as received); KGS simple ash content = 77.41% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	2618	2677	11513
Sulfur	1.89%	1.93%	
Moisture	2.20%		
Ash	75.06%	76.75%	
Volatile Matter	12.98%	13.28%	
Fixed Carbon	9.76%	9.97%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	3.276	1485.98	wet sample weight:	3.426	1554.21	4.39%		10		off bottom	at surface	in canister	34.0 minutes
										9/29/07 13:41	9/29/07 13:42	9/29/07 14:15	0.567 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			0.752772653 SQRT (hrs)	
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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	67	984	0.00057	526.67	14.272	0.000541627	15.34	0.000541627	15.34	0.33	0.55	9/29/07 14:45	1:04:45	1:03:15	0:30:45	1.038829469	
-1	67	984	-4E-05	526.67	14.272	-3.38517E-05	-0.96	0.000507775	14.38	0.31	0.53	9/29/07 15:24	1:43:45	1:42:15	1:09:45	1.31497782	
1	67	984	3.5E-05	526.67	14.272	3.38517E-05	0.96	0.000541627	15.34	0.33	0.55	9/29/07 15:45	2:04:00	2:02:30	1:30:00	1.437590577	
5	68	984	0.00018	527.67	14.272	0.000168938	4.78	0.000710565	20.12	0.43	0.65	9/29/07 16:43	3:02:00	3:00:30	2:28:00	1.74164673	
24	71	984	0.00085	530.67	14.272	0.000806317	22.83	0.001516881	42.95	0.93	1.14	9/30/07 7:12	17:31:00	17:29:30	16:57:00	4.185291706	back at lab
72	72	975	0.00254	531.67	14.141	0.002392317	67.74	0.003909198	110.70	2.39	2.60	10/2/07 15:03	73:22:00	73:20:30	72:48:00	8.565434412	
46	72	978	0.00162	531.67	14.185	0.001533128	43.41	0.005442326	154.11	3.32	3.54	10/4/07 16:29	122:48:00	122:46:30	122:14:00	11.08151614	
48	73	980	0.0017	532.67	14.214	0.001600047	45.31	0.007042374	199.42	4.30	4.51	10/7/07 17:44	196:03:00	196:01:30	195:29:00	14.0017856	
57	70	976	0.00201	529.67	14.156	0.001903019	53.89	0.008945392	253.30	5.46	5.68	10/13/07 18:09	340:28:00	340:26:30	339:54:00	18.45173885	
36	68	968	0.00127	527.67	14.040	0.001196573	33.88	0.010141966	287.19	6.19	6.41	10/17/07 12:58	431:17:00	431:15:30	430:43:00	20.76736221	
26	68	984	0.00092	527.67	14.272	0.000878476	24.88	0.011020441	312.06	6.73	6.94	10/23/07 22:07	584:26:00	584:24:30	583:52:00	24.17505602	
22	67	993	0.00078	526.67	14.402	0.000751549	21.28	0.01177199	333.34	7.19	7.40	10/29/07 16:11	722:30:00	722:28:30	721:56:00	26.87936011	
13	68	988	0.00046	527.67	14.330	0.000441023	12.49	0.012213014	345.83	7.46	7.67	10/31/07 11:24	765:43:00	765:41:30	765:09:00	27.67158591	
20	68	987	0.00071	527.67	14.315	0.000677811	19.19	0.012890825	365.03	7.87	8.09	11/5/07 11:28	885:47:00	885:45:30	885:13:00	29.76211238	
7	70	993	0.00025	529.67	14.402	0.000237775	6.73	0.013128599	371.76	8.01	8.23	11/7/07 10:41	933:00:00	932:58:30	932:26:00	30.5450487	
21	68	993	0.00074	527.67	14.402	0.000716028	20.28	0.013844627	392.03	8.45	8.67	11/15/07 9:50	1124:09:00	1124:07:30	1123:35:00	33.52834622	
26	67	990	0.00092	526.67	14.359	0.000885511	25.07	0.014730138	417.11	8.99	9.21	11/24/07 20:08	1350:27:00	1350:25:30	1349:53:00	36.74846936	
14	67	982	0.00049	526.67	14.243	0.00047296	13.39	0.015203098	430.50	9.28	9.50	11/28/07 10:28	1436:47:00	1436:45:30	1436:13:00	37.90492492	
17	67	986	0.0006	526.67	14.301	0.000576648	16.33	0.015779746	446.83	9.63	9.85	12/7/07 11:39	1653:58:00	1653:56:30	1653:24:00	40.668989	
7	67	991	0.00025	526.67	14.373	0.000238648	6.76	0.016018394	453.59	9.78	9.99	12/12/07 13:06	1775:25:00	1775:23:30	1774:51:00	42.1356935	
22	69	977	0.00078	528.67	14.170	0.000736642	20.86	0.016755036	474.45	10.23	10.44	12/20/07 9:31	1963:50:00	1963:48:30	1963:16:00	44.31515918	
11	67	986	0.00039	526.67	14.301	0.000373125	10.57	0.017128161	485.01	10.46	10.67	12/27/07 10:13	2132:32:00	2132:30:30	2131:58:00	46.17936047	
-5	67	1012	-0.0002	526.67	14.678	-0.000174075	-4.93	0.016954086	480.08	10.35	10.57	1/2/08 10:26	2276:45:00	2276:43:30	2276:11:00	47.71530153	
28	67	974	0.00099	526.67	14.127	0.000938215	26.57	0.017892301	506.65	10.92	11.14	1/7/08 10:44	2397:03:00	2397:01:30	2396:29:00	48.95967729	

8	67	981	0.00028	526.67	14.228	0.000269988	7.65	0.018162289	514.30	11.09	11.30	1/15/08 13:26	2591:45:00	2591:43:30	2591:11:00	50.90923295	
6	67	986	0.00021	526.67	14.301	0.000203523	5.76	0.018365812	520.06	11.21	11.43	1/23/08 11:08	2781:27:00	2781:25:30	2780:53:00	52.73945392	
17	67	967	0.0006	526.67	14.025	0.000565536	16.01	0.018931348	536.07	11.56	11.77	1/28/08 9:04	2899:23:00	2899:21:30	2898:49:00	53.84592216	
6	67	969	0.00021	526.67	14.054	0.000200014	5.66	0.019131362	541.74	11.68	11.90	2/4/08 10:20	3068:39:00	3068:37:30	3068:05:00	55.39539692	
-2	67	983	-7E-05	526.67	14.257	-6.76346E-05	-1.92	0.019063728	539.82	11.64	11.85	2/11/08 14:40	3240:59:00	3240:57:30	3240:25:00	56.92963493	
7	67	981	0.00025	526.67	14.228	0.000236239	6.69	0.019299967	546.51	11.78	12.00	2/18/08 8:45	3403:04:00	3403:02:30	3402:30:00	58.33580947	
14	67	969	0.00049	526.67	14.054	0.000466699	13.22	0.019766666	559.73	12.07	12.28	2/25/08 9:15	3571:34:00	3571:32:30	3571:00:00	59.76258584	
0	67	986	0	526.67	14.301	0	0.00	0.019766666	559.73	12.07	12.28	3/3/08 10:25	3740:44:00	3740:42:30	3740:10:00	61.16153475	
0	67	998	0	526.67	14.475	0	0.00	0.019766666	559.73	12.07	12.28	3/10/08 8:55	3907:14:00	3907:12:30	3906:40:00	62.50786617	
15	67	982	0.00053	526.67	14.243	0.000506743	14.35	0.020273409	574.08	12.38	12.59	3/17/08 10:12	4076:31:00	4076:29:30	4075:57:00	63.84760502	
1	67	993	3.5E-05	526.67	14.402	3.41613E-05	0.97	0.020307571	575.04	12.40	12.61	3/24/08 8:37	4242:56:00	4242:54:30	4242:22:00	65.13780264	
7	67	986	0.00025	526.67	14.301	0.000237443	6.72	0.020545014	581.77	12.54	12.76	3/26/08 8:56	4291:15:00	4291:13:30	4290:41:00	65.50763314	
256.50	70	982	0.00906	529.67	14.243	0.00861623	243.98	0.029161244	825.75	17.80	18.02	3/26/08 8:56	4291:15:00	4291:13:30	4290:41:00	65.50763314	residual gas calc.

DECANISTERED 3/26/2008; sample dried for 40 days in air; 278.10 grams placed in ball mill (45.66 cc @ STP desorbed), proportional to 243.98 cc @ STP for 1485.98 grams (dry wt.) for entire sample

SAMPLE: 530' 8" to 532' 5" (Weir-Pittsburg coal) core in SSD canister J11
NOTES: tends to break along fusinite-rich layers along bedding, 3/4- to 1-cm spaced poorly developed cleat
density = 1.37 gr/cc; KGS simple moisture = 1.01% (as received); KGS simple ash content = 10.11% (moisture-free)
TerraTek moisture = 4.83%; ash content = 14.27%

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	13069	13476	14847
Sulfur	3.12%	3.22%	
Moisture	3.02%		
Ash	8.96%	9.24%	
Volatile Matter	41.79%	43.10%	
Fixed Carbon	46.23%	47.66%	

	lbs.	grams		lbs.	grams	moisture weight		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)	
dry sample weight:	2.959	1342.13	wet sample weight:	3.054	1385.23	3.11%		136		off bottom	at surface	in canister	24.0	minutes
										9/29/07 13:41	9/29/07 13:42	9/29/07 14:05	0.400	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			0.632455532	SQRT (hrs)	
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)		
36	68	985	0.00127	527.67	14.286	0.001217587	34.48	0.001217587	34.48	0.82	4.07	9/29/07 14:17	0:36:00	0:34:30	0:12:00	0.774596669		
17	68	984	0.0006	527.67	14.272	0.000574388	16.26	0.001791975	50.74	1.21	4.46	9/29/07 14:22	0:41:30	0:40:00	0:17:30	0.831664997		
9	68	984	0.00032	527.67	14.272	0.000304088	8.61	0.002096063	59.35	1.42	4.66	9/29/07 14:25	0:44:30	0:43:00	0:20:30	0.861200712		
18	68	984	0.00064	527.67	14.272	0.000608176	17.22	0.002704239	76.58	1.83	5.07	9/29/07 14:35	0:54:45	0:53:15	0:30:45	0.955248659		
15	67	984	0.00053	526.67	14.272	0.000507775	14.38	0.003212014	90.95	2.17	5.42	9/29/07 14:44	1:03:00	1:01:30	0:39:00	1.024695077		
16	67	984	0.00057	526.67	14.272	0.000541627	15.34	0.003753641	106.29	2.54	5.78	9/29/07 14:54	1:13:00	1:11:30	0:49:00	1.10302614		
5	67	984	0.00018	526.67	14.272	0.000169258	4.79	0.0039229	111.08	2.65	5.90	9/29/07 14:58	1:17:00	1:15:30	0:53:00	1.132843031		
27	67	984	0.00095	526.67	14.272	0.000913996	25.88	0.004836895	136.97	3.27	6.52	9/29/07 15:20	1:39:00	1:37:30	1:15:00	1.284523258		
10	67	984	0.00035	526.67	14.272	0.000338517	9.59	0.005175412	146.55	3.50	6.74	9/29/07 15:27	1:46:00	1:44:30	1:22:00	1.329160136		
35	67	984	0.00124	526.67	14.272	0.001184809	33.55	0.006360221	180.10	4.30	7.55	9/29/07 15:44	2:03:00	2:01:30	1:39:00	1.431782106		
61	68	984	0.00215	527.67	14.272	0.00206104	58.36	0.008421261	238.46	5.69	8.94	9/29/07 16:43	3:02:00	3:00:30	2:38:00	1.74164673		
347	71	984	0.01225	530.67	14.272	0.011657994	330.12	0.020079255	568.58	13.57	16.82	9/30/07 7:08	17:27:00	17:25:30	17:03:00	4.177319715	back at lab	
429	72	975	0.01515	531.67	14.141	0.014254223	403.63	0.034333478	972.21	23.21	26.45	10/2/07 14:55	73:14:00	73:12:30	72:50:00	8.557647652		
261	72	978	0.00922	531.67	14.185	0.008698833	246.32	0.043032311	1218.53	29.09	32.33	10/4/07 16:25	122:44:00	122:42:30	122:20:00	11.07850772		
374	71	984	0.01321	530.67	14.272	0.0125651	355.80	0.055597411	1574.34	37.58	40.83	10/10/07 20:51	271:10:00	271:08:30	270:46:00	16.46713899	gas sampled	
177	70	976	0.00625	529.67	14.156	0.005909374	167.33	0.061506785	1741.67	41.57	44.82	10/13/07 18:08	340:27:00	340:25:30	340:03:00	18.45128722		
152	68	968	0.00537	527.67	14.040	0.005052198	143.06	0.066558983	1884.73	44.99	48.24	10/17/07 12:56	431:15:00	431:13:30	430:51:00	20.76655966		
150	68	984	0.0053	527.67	14.272	0.00506813	143.51	0.071627113	2028.25	48.41	51.66	10/23/07 22:05	584:24:00	584:22:30	584:00:00	24.17436659		
122	67	993	0.00431	526.67	14.402	0.004167679	118.02	0.075794793	2146.26	51.23	54.48	10/29/07 16:10	722:29:00	722:27:30	722:05:00	26.87905008		
53	68	988	0.00187	527.67	14.330	0.001798019	50.91	0.077592811	2197.18	52.45	55.69	10/31/07 11:24	765:43:00	765:41:30	765:19:00	27.67158591		
92	68	987	0.00325	527.67	14.315	0.00311793	88.29	0.080710741	2285.47	54.55	57.80	11/5/07 11:27	885:46:00	885:44:30	885:22:00	29.76183238		
51	70	993	0.0018	529.67	14.402	0.001732359	49.05	0.0824431	2334.52	55.73	58.97	11/7/07 10:41	933:00:00	932:58:30	932:36:00	30.5450487		

90	68	980	0.00318	527.67	14.214	0.003028517	85.76	0.085471617	2420.28	57.77	61.02	11/13/07 11:53	1078:12:00	1078:10:30	1077:48:00	32.8359559	
38	68	993	0.00134	527.67	14.402	0.00129567	36.69	0.086767286	2456.97	58.65	61.89	11/15/07 9:49	1124:08:00	1124:06:30	1123:44:00	33.52809767	
93	67	990	0.00328	526.67	14.359	0.003167403	89.69	0.08993469	2546.66	60.79	64.04	11/24/07 20:07	1350:26:00	1350:24:30	1350:02:00	36.74824259	
57	67	982	0.00201	526.67	14.243	0.001925624	54.53	0.091860314	2601.18	62.09	65.34	11/28/07 10:28	1436:47:00	1436:45:30	1436:23:00	37.90492492	
78	67	987	0.00275	526.67	14.315	0.002648482	75.00	0.094508796	2676.18	63.88	67.13	12/7/07 11:39	1653:58:00	1653:56:30	1653:34:00	40.668989	
49	67	991	0.00173	526.67	14.373	0.001670533	47.30	0.096179328	2723.49	65.01	68.26	12/12/07 13:06	1775:25:00	1775:23:30	1775:01:00	42.1356935	
62	69	977	0.00219	528.67	14.170	0.002075991	58.79	0.098255319	2782.27	66.41	69.66	12/20/07 9:30	1963:49:00	1963:47:30	1963:25:00	44.31497113	
48	67	986	0.0017	526.67	14.301	0.001628184	46.10	0.099883502	2828.38	67.51	70.76	12/27/07 10:13	2132:32:00	2132:30:30	2132:08:00	46.17936047	
26	67	1012	0.00092	526.67	14.678	0.000905189	25.63	0.100788691	2854.01	68.13	71.37	1/2/08 10:25	2276:44:00	2276:42:30	2276:20:00	47.71512688	
49	67	974	0.00173	526.67	14.127	0.001641876	46.49	0.102430567	2900.50	69.24	72.48	1/7/08 10:43	2397:02:00	2397:00:30	2396:38:00	48.95950708	
44	67	981	0.00155	526.67	14.228	0.001484933	42.05	0.1039155	2942.55	70.24	73.49	1/15/08 13:25	2591:44:00	2591:42:30	2591:20:00	50.90906926	
38	67	986	0.00134	526.67	14.301	0.001288979	36.50	0.105204478	2979.05	71.11	74.36	1/23/08 11:07	2781:26:00	2781:24:30	2781:02:00	52.73929591	
37	67	967	0.00131	526.67	14.025	0.001230873	34.85	0.106435352	3013.90	71.94	75.19	1/28/08 9:03	2899:22:00	2899:20:30	2898:58:00	53.8457674	
35	67	969	0.00124	526.67	14.054	0.001166748	33.04	0.1076021	3046.94	72.73	75.98	2/4/08 10:19	3068:38:00	3068:36:30	3068:14:00	55.39524649	
18	67	983	0.00064	526.67	14.257	0.000608711	17.24	0.108210811	3064.18	73.14	76.39	2/11/08 14:38	3240:57:00	3240:55:30	3240:33:00	56.92934217	
28	67	981	0.00099	526.67	14.228	0.000944957	26.76	0.109155768	3090.94	73.78	77.03	2/18/08 8:45	3403:04:00	3403:02:30	3402:40:00	58.33580947	
34	67	969	0.0012	526.67	14.054	0.001133412	32.09	0.110289181	3123.03	74.55	77.79	2/25/08 9:16	3571:35:00	3571:33:30	3571:11:00	59.76272528	
22	67	986	0.00078	526.67	14.301	0.000746251	21.13	0.111035431	3144.16	75.05	78.30	3/3/08 10:26	3740:45:00	3740:43:30	3740:21:00	61.161671	
18	67	998	0.00064	526.67	14.475	0.000618	17.50	0.111653431	3161.66	75.47	78.72	3/10/08 8:56	3907:15:00	3907:13:30	3906:51:00	62.50799949	
32	67	982	0.00113	526.67	14.243	0.001081052	30.61	0.112734483	3192.27	76.20	79.45	3/17/08 10:13	4076:32:00	4076:30:30	4076:08:00	63.84773554	
21	67	993	0.00074	526.67	14.402	0.000717387	20.31	0.113451871	3212.59	76.69	79.93	3/24/08 8:39	4242:58:00	4242:56:30	4242:34:00	65.13805851	
46	66	970	0.00162	525.67	14.069	0.001537943	43.55	0.114989813	3256.14	77.72	80.97	3/31/08 10:50	4413:09:00	4413:07:30	4412:45:00	66.43154371	
21	67	986	0.00074	526.67	14.301	0.00071233	20.17	0.115702144	3276.31	78.21	81.45	4/7/08 8:22	4578:41:00	4578:39:30	4578:17:00	67.6659688	
17	67	994	0.0006	526.67	14.417	0.000581327	16.46	0.116283471	3292.77	78.60	81.85	4/14/08 8:18	4746:37:00	4746:35:30	4746:13:00	68.89569411	
37	61	987	0.00131	520.67	14.315	0.001270809	35.99	0.117554279	3328.75	79.46	82.70	4/28/08 9:34	5083:53:00	5083:51:30	5083:29:00	71.30135576	
13	61	986	0.00046	520.67	14.301	0.000446048	12.63	0.118000327	3341.38	79.76	83.01	5/5/08 8:22	5250:41:00	5250:39:30	5250:17:00	72.46159903	
21	62	980	0.00074	521.67	14.214	0.000714782	20.24	0.118715109	3361.62	80.24	83.49	5/12/08 9:01	5419:20:00	5419:18:30	5418:56:00	73.61612142	
24	63	965	0.00085	522.67	13.996	0.000802851	22.73	0.119517959	3384.36	80.79	84.03	5/19/08 9:15	5587:34:00	5587:32:30	5587:10:00	74.75002787	
16	65	982	0.00057	524.67	14.243	0.000542587	15.36	0.120060546	3399.72	81.15	84.40	5/27/08 11:06	5781:25:00	5781:23:30	5781:01:00	76.03562761	
16	66	981	0.00057	525.67	14.228	0.000541003	15.32	0.120601549	3415.04	81.52	84.76	5/31/08 17:25	5883:44:00	5883:42:30	5883:20:00	76.70549741	
28	69	981	0.00099	528.67	14.228	0.000941383	26.66	0.121542932	3441.70	82.15	85.40	6/9/08 11:38	6093:57:00	6093:55:30	6093:33:00	78.06375599	
19	68	984	0.00067	527.67	14.272	0.000641963	18.18	0.122184895	3459.88	82.59	85.83	6/16/08 8:17	6258:36:00	6258:34:30	6258:12:00	79.11131398	
12	68	984	0.00042	527.67	14.272	0.00040545	11.48	0.122590345	3471.36	82.86	86.11	6/23/08 10:35	6428:54:00	6428:52:30	6428:30:00	80.18042155	
8	71	983	0.00028	530.67	14.257	0.000268499	7.60	0.122858844	3478.96	83.04	86.29	6/24/08 15:41	6458:00:00	6457:58:30	6457:36:00	80.36168241	
2230.58	71	977	0.07877	530.67	14.170	0.074406629	2106.95	0.197265473	5585.92	133.34	136.58	6/24/08 15:41	6458:00:00	6457:58:30	6457:36:00	80.36168241	residual gas calc.

DECANISTERED 6/24/2008; sample dried for 24 days in air; 251.51 grams placed in ball mill (382.55 cc @ STP desorbed), proportional to 2106.95 cc @ STP for 1385.23 grams (wet wt.) for entire sample

SAMPLE: 535' 1" to 536' 0" (shale 3' below Weir-Pittsburg coal) core in SSD canister J13
NOTES: very dark gray, easily broken along bedding planes, minor slickensides
density = 2.20 gr/cc; KGS simple moisture = 1.15% (as received); KGS simple ash content = 87.98% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	2141	2192	9750
Sulfur	2.68%	2.74%	
Moisture	2.31%		
Ash	75.73%	77.52%	
Volatile Matter	10.34%	10.58%	
Fixed Carbon	11.62%	11.90%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	2.695	1222.27	wet sample weight:	2.856	1295.30	5.64%		21		off bottom	at surface	in canister	62.8 minutes
										9/29/07 13:41	9/29/07 13:42	9/29/07 14:43	1.046 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			1.022659930 SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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	67	984	0.00039	526.67	14.272	0.000372369	10.54	0.000372369	10.54	0.28	0.83	9/29/07 14:46	1:05:30	1:04:00	0:02:45	1.044828535

1	67	984	3.5E-05	526.67	14.272	3.38517E-05	0.96	0.00040622	11.50	0.30	0.85	9/29/07 15:25	1:44:30	1:43:00	0:41:45	1.319722193	
2	67	984	7.1E-05	526.67	14.272	6.77034E-05	1.92	0.000473924	13.42	0.35	0.90	9/29/07 15:45	2:04:00	2:02:30	1:01:15	1.437590577	
7	68	984	0.00025	527.67	14.272	0.000236513	6.70	0.000710436	20.12	0.53	1.08	9/29/07 16:44	3:03:00	3:01:30	2:00:15	1.74642492	
26	71	984	0.00092	530.67	14.272	0.00087351	24.73	0.001583946	44.85	1.18	1.73	9/30/07 7:13	17:32:00	17:30:30	16:29:15	4.187282333	back at lab
47	72	975	0.00166	531.67	14.141	0.001561651	44.22	0.003145597	89.07	2.33	2.89	10/2/07 15:03	73:22:00	73:20:30	72:19:15	8.565434412	
16	72	978	0.00057	531.67	14.185	0.000533262	15.10	0.003678859	104.17	2.73	3.28	10/4/07 16:30	122:49:00	122:47:30	121:46:15	11.08226812	
13	73	980	0.00046	532.67	14.214	0.000433346	12.27	0.004112205	116.44	3.05	3.60	10/7/07 17:46	196:05:00	196:03:30	195:02:15	14.00297587	
6	70	976	0.00021	529.67	14.156	0.000200318	5.67	0.004312523	122.12	3.20	3.75	10/13/07 18:11	340:30:00	340:28:30	339:27:15	18.45264209	
10	68	968	0.00035	527.67	14.040	0.000332381	9.41	0.004644905	131.53	3.45	4.00	10/17/07 12:59	431:18:00	431:16:30	430:15:15	20.76776348	
-16	68	984	-0.0006	527.67	14.272	-0.000540601	-15.31	0.004104304	116.22	3.05	3.60	10/23/07 22:07	584:26:00	584:24:30	583:23:15	24.17505602	
-9	67	993	-0.0003	526.67	14.402	-0.000307452	-8.71	0.003796852	107.51	2.82	3.37	10/29/07 16:12	722:31:00	722:29:30	721:28:15	26.87967014	
488.97	72	984	0.01727	531.67	14.272	0.016396794	464.30	0.020193647	571.82	14.99	15.54	10/29/07 16:12	722:31:00	722:29:30	721:28:15	26.87967014	residual gas calc.

DECANISTERED 10/29/2007; sample dried for 90 days in air; 352.25 grams placed in ball mill (133.70 cc @ STP desorbed), proportional to 463.92 cc @ STP for 1222.27 grams (dry wt.) for entire sample

SAMPLE: 541' 4" to 542' 9" (shale 9' below Weir-Pittsburg coal) core in SSD canister J14
NOTES: very dark gray, with finely disseminated pyrite, minor caliche-like nodules, easily broken along bedding planes
density = 2.44 gr/cc; KGS simple moisture = 1.74% (as received); KGS simple ash content = 88.82% (moisture-free)

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)	
dry sample weight:	4.547	2062.37	wet sample weight:	4.808	2180.70	5.43%		12		off bottom	at surface	in canister	33.8	minutes
										9/29/07 14:20	9/29/07 14:21	9/29/07 14:53	0.563	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			0.750000000	SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)
8	67	984	0.00028	526.67	14.272	0.000270813	7.67	0.000270813	7.67	0.12	0.31	9/29/07 15:26	1:06:00	1:04:30	0:32:15	1.048808848	
3	67	984	0.00011	526.67	14.272	0.000101555	2.88	0.000372369	10.54	0.16	0.35	9/29/07 15:45	1:25:00	1:23:30	0:51:15	1.190238071	
5	68	984	0.00018	527.67	14.272	0.000168938	4.78	0.000541306	15.33	0.24	0.42	9/29/07 16:44	2:24:00	2:22:30	1:50:15	1.549193339	
52	71	984	0.00184	530.67	14.272	0.001747019	49.47	0.002288326	64.80	1.01	1.19	9/30/07 7:13	16:53:00	16:51:30	16:19:15	4.108933357	back at lab
64	72	975	0.00226	531.67	14.141	0.002126504	60.22	0.00441483	125.01	1.94	2.13	10/2/07 15:04	72:44:00	72:42:30	72:10:15	8.528383981	
21	72	978	0.00074	531.67	14.185	0.000699906	19.82	0.005114736	144.83	2.25	2.44	10/4/07 16:30	122:10:00	122:08:30	121:36:15	11.05290309	
17	73	980	0.0006	532.67	14.214	0.000566683	16.05	0.005681419	160.88	2.50	2.69	10/7/07 17:47	195:27:00	195:25:30	194:53:15	13.98034334	
15	70	976	0.00053	529.67	14.156	0.000500794	14.18	0.006182214	175.06	2.72	2.91	10/13/07 18:12	339:52:00	339:50:30	339:18:15	18.43547305	
11	68	968	0.00039	527.67	14.040	0.00036562	10.35	0.006547833	185.41	2.88	3.07	10/17/07 13:00	430:40:00	430:38:30	430:06:15	20.75250989	
-12	68	984	-0.0004	527.67	14.272	-0.00040545	-11.48	0.006142383	173.93	2.70	2.89	10/23/07 22:09	583:49:00	583:47:30	583:15:15	24.16229846	
-7	67	993	-0.0002	526.67	14.402	-0.000239129	-6.77	0.005903254	167.16	2.60	2.78	10/29/07 16:13	721:53:00	721:51:30	721:19:15	26.86788666	
122.15	71	977	0.00431	530.67	14.170	0.004074622	115.38	0.009977875	282.54	4.39	4.58	10/29/07 16:13	721:53:00	721:51:30	721:19:15	26.86788666	residual gas calc.

DECANISTERED 10/20/2007; sample dried for 100 days in air; 339.45 grams placed in ball mill (18.99 cc @ STP desorbed), proportional to 115.38 cc @ STP for 2062.37 grams (dry wt.) for entire sample

SAMPLE: 610' 8" to 611' 3.5" (Drywood coal) core in SSD canister J15
NOTES: easily disaggregated, crumbly, good cleat development, 1/2 to 1 cm spacing
density = 1.38 gr/cc; KGS simple moisture = 1.49% (as received); KGS simple ash content = 10.14% (moisture-free)
PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	12810	13213	14688
Sulfur	4.93%	5.08%	
Moisture	3.05%		
Ash	9.74%	10.05%	
Volatile Matter	39.68%	40.93%	
Fixed Carbon	47.53%	49.02%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)	
dry sample weight:	0.989	448.52	wet sample weight:	1.038	470.95	4.76%		26		off bottom	at surface	in canister	25.6	minutes
										9/30/07 12:36	9/30/07 12:37	9/30/07 13:01	0.426	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			0.652984601	SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)
8	68	981	0.00028	527.67	14.228	0.000269476	7.63	0.000269476	7.63	0.55	2.40	9/30/07 13:05	0:29:05	0:27:30	0:03:30	0.696219952	
2	68	984	7.1E-05	527.67	14.272	6.75751E-05	1.91	0.000337051	9.54	0.68	2.54	9/30/07 13:09	0:32:50	0:31:15	0:07:15	0.739744701	

3	68	984	0.00011	527.67	14.272	0.000101363	2.87	0.000438414	12.41	0.89	2.74	9/30/07 13:14	0:37:50	0:36:15	0:12:15	0.794075283	
2	68	984	7.1E-05	527.67	14.272	6.75751E-05	1.91	0.000505989	14.33	1.02	2.88	9/30/07 13:24	0:47:50	0:46:15	0:22:15	0.892873016	
5	68	975	0.00018	527.67	14.141	0.000167393	4.74	0.000673381	19.07	1.36	3.22	9/30/07 13:35	0:59:05	0:57:30	0:33:30	0.99233171	
6	68	981	0.00021	527.67	14.228	0.000202107	5.72	0.000875489	24.79	1.77	3.63	9/30/07 13:47	1:11:05	1:09:30	0:45:30	1.088449458	
2	68	980	7.1E-05	527.67	14.214	6.73004E-05	1.91	0.000942789	26.70	1.91	3.76	9/30/07 13:58	1:22:05	1:20:30	0:56:30	1.169639071	
18	68	979	0.00064	527.67	14.199	0.000605085	17.13	0.001547874	43.83	3.13	4.99	9/30/07 15:55	3:18:50	3:17:15	2:53:15	1.820408989	
2	68	979	7.1E-05	527.67	14.199	6.72317E-05	1.90	0.001615106	45.73	3.27	5.12	9/30/07 16:50	4:13:50	4:12:15	3:48:15	2.056831436	
111	72	975	0.00392	531.67	14.141	0.003688156	104.44	0.005303262	150.17	10.73	12.58	10/2/07 15:06	50:29:50	50:28:15	50:04:15	7.106139755	back at lab
60	72	978	0.00212	531.67	14.185	0.001999732	56.63	0.007302993	206.80	14.77	16.63	10/4/07 16:31	99:54:50	99:53:15	99:29:15	9.995693517	
121	68	968	0.00427	527.67	14.040	0.004021815	113.88	0.011324809	320.68	22.91	24.76	10/17/07 11:45	407:08:50	407:07:15	406:43:15	20.17788944	gas sampled
143	68	988	0.00505	527.67	14.330	0.004851258	137.37	0.016176067	458.05	32.72	34.58	10/31/07 10:27	741:50:50	741:49:15	741:25:15	27.23687248	gas sampled
25	68	987	0.00088	527.67	14.315	0.000847264	23.99	0.01702333	482.05	34.43	36.29	11/5/07 11:29	862:52:50	862:51:15	862:27:15	29.3748286	
2	70	993	7.1E-05	529.67	14.402	6.79356E-05	1.92	0.017091266	483.97	34.57	36.43	11/7/07 10:42	910:05:50	910:04:15	909:40:15	30.16781766	
19	68	993	0.00067	527.67	14.402	0.000647835	18.34	0.017739101	502.31	35.88	37.74	11/15/07 9:50	1101:13:50	1101:12:15	1100:48:15	33.18479404	
24	67	990	0.00085	526.67	14.359	0.000817394	23.15	0.018556495	525.46	37.53	39.39	11/24/07 20:09	1327:32:50	1327:31:15	1327:07:15	36.43552143	
14	67	982	0.00049	526.67	14.243	0.00047296	13.39	0.019029455	538.85	38.49	40.35	11/28/07 10:29	1413:52:50	1413:51:15	1413:27:15	37.6016031	
15	67	986	0.00053	526.67	14.301	0.000508807	14.41	0.019538263	553.26	39.52	41.38	12/7/07 11:40	1631:03:50	1631:02:15	1630:38:15	40.38643199	
6	67	991	0.00021	526.67	14.373	0.000204555	5.79	0.019742818	559.05	39.93	41.79	12/12/07 13:07	1752:30:50	1752:29:15	1752:05:15	41.86303726	
21	69	977	0.00074	528.67	14.170	0.000703158	19.91	0.020445976	578.96	41.35	43.21	12/20/07 9:32	1940:55:50	1940:54:15	1940:30:15	44.05599341	
8	67	986	0.00028	526.67	14.301	0.000271364	7.68	0.02071734	586.65	41.90	43.76	12/27/07 10:14	2109:37:50	2109:36:15	2109:12:15	45.93071473	
-7	67	1012	-0.0002	526.67	14.678	-0.000243705	-6.90	0.020473635	579.75	41.41	43.27	1/2/08 10:28	2253:51:50	2253:50:15	2253:26:15	47.4748764	
31	67	974	0.00109	526.67	14.127	0.001038738	29.41	0.021512373	609.16	43.51	45.37	1/7/08 10:48	2374:11:50	2374:10:15	2373:46:15	48.7257347	
6	67	981	0.00021	526.67	14.228	0.000202491	5.73	0.021714864	614.89	43.92	45.78	1/15/08 13:27	2568:50:50	2568:49:15	2568:25:15	50.68379645	
4	67	986	0.00014	526.67	14.301	0.000135682	3.84	0.021850546	618.74	44.20	46.05	1/23/08 11:09	2758:32:50	2758:31:15	2758:07:15	52.52187375	
17	67	967	0.0006	526.67	14.025	0.000565536	16.01	0.022416082	634.75	45.34	47.20	1/28/08 9:05	2876:28:50	2876:27:15	2876:03:15	53.63283095	
5	67	969	0.00018	526.67	14.054	0.000166678	4.72	0.02258276	639.47	45.68	47.53	2/4/08 10:22	3045:45:50	3045:44:15	3045:20:15	55.18843981	
0	67	983	0	526.67	14.257	0	0.00	0.02258276	639.47	45.68	47.53	2/11/08 14:40	3218:03:50	3218:02:15	3217:38:15	56.72798153	
6	67	981	0.00021	526.67	14.228	0.000202491	5.73	0.022785251	645.20	46.09	47.94	2/18/08 8:46	3380:09:50	3380:08:15	3379:44:15	58.13917689	
14	67	969	0.00049	526.67	14.054	0.000466699	13.22	0.02325195	658.42	47.03	48.89	2/25/08 9:17	3548:40:50	3548:39:15	3548:15:15	59.57080288	
-2	67	987	-7E-05	526.67	14.315	-6.79098E-05	-1.92	0.023184041	656.50	46.89	48.75	3/3/08 10:28	3717:51:50	3717:50:15	3717:26:15	60.97428875	
-2	67	998	-7E-05	526.67	14.475	-6.86666E-05	-1.94	0.023115374	654.55	46.75	48.61	3/10/08 8:57	3884:20:50	3884:19:15	3883:55:15	62.32453146	
16	67	982	0.00057	526.67	14.243	0.000540526	15.31	0.0236559	669.86	47.85	49.70	3/17/08 10:14	4053:37:50	4053:36:15	4053:12:15	63.66812826	
-1	67	993	-4E-05	526.67	14.402	-3.41613E-05	-0.97	0.023621739	668.89	47.78	49.63	3/24/08 8:40	4220:03:50	4220:02:15	4219:38:15	64.96201882	
7	67	986	0.00025	526.67	14.301	0.000237443	6.72	0.023859182	675.61	48.26	50.12	3/26/08 8:55	4268:18:50	4268:17:15	4267:53:15	65.33233418	
653.78	67	986	0.02309	526.67	14.301	0.022176539	627.97	0.046035721	1303.58	93.11	94.97	3/26/08 8:55	4268:18:50	4268:17:15	4267:53:15	65.33233418	residual gas calc.

DECANISTERED 3/26/2008; sample dried for 42 days in air; 175.34 grams placed in ball mill (223.80 cc @ STP desorbed), proportional to 627.97 cc @ STP for 470.95 grams (wet wt.) for entire sample

SAMPLE: 692' 9.5" to 694' 3" (shale at Riverton level) core in SSD canister J16
NOTES: very dark gray, with carbonaceous-rich layers that tend to break along bedding
density = 2.24 gr/cc; KGS simple moisture = 1.96% (as received); KGS simple ash content = 86.73% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	904	922	6981
Sulfur	1.35%	1.38%	
Moisture	1.99%		
Ash	85.07%	86.79%	
Volatile Matter	9.12%	9.30%	
Fixed Carbon	3.82%	3.91%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	4.047	1835.50	wet sample weight:	4.418	2004.18	8.42%		15		off bottom	at surface	in canister	29.3 minutes
										10/1/07 12:41	10/1/07 12:44	10/1/07 13:10	0.488 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			0.698212002 SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)
4	67	988	0.00014	526.67	14.330	0.000135957	3.85	0.000135957		3.85	0.07	0.33	10/1/07 13:12	0:31:00	0:27:45	0:01:45	0.718795289

1	67	988	3.5E-05	526.67	14.330	3.39893E-05	0.96	0.000169946	4.81	0.08	0.35	10/1/07 13:27	0:46:45	0:43:30	0:17:30	0.882704178	
4	67	988	0.00014	526.67	14.330	0.000135957	3.85	0.000305904	8.66	0.15	0.41	10/1/07 13:40	0:59:00	0:55:45	0:29:45	0.991631652	
3	67	988	0.00011	526.67	14.330	0.000101968	2.89	0.000407872	11.55	0.20	0.46	10/1/07 13:54	1:13:15	1:10:00	0:44:00	1.10491327	
85	72	975	0.003	531.67	14.141	0.002824263	79.97	0.003232135	91.52	1.60	1.86	10/2/07 15:08	26:27:00	26:23:45	25:57:45	5.142956348	back at lab
32	72	978	0.00113	531.67	14.185	0.001066524	30.20	0.004298658	121.72	2.12	2.39	10/4/07 16:32	75:51:00	75:47:45	75:21:45	8.709190548	
16	73	980	0.00057	532.67	14.214	0.000533349	15.10	0.004832008	136.83	2.39	2.65	10/7/07 17:48	149:07:00	149:03:45	148:37:45	12.21133353	
5	70	976	0.00018	529.67	14.156	0.000166931	4.73	0.004998939	141.55	2.47	2.73	10/13/07 18:13	293:32:00	293:28:45	293:02:45	17.13281452	
8	68	968	0.00028	527.67	14.040	0.000265905	7.53	0.005264844	149.08	2.60	2.86	10/17/07 13:03	384:22:00	384:18:45	383:52:45	19.6052714	
-13	68	984	-0.0005	527.67	14.272	-0.000439238	-12.44	0.004825606	136.65	2.39	2.65	10/23/07 22:22	537:41:00	537:37:45	537:11:45	23.18799977	
-8	67	993	-0.0003	526.67	14.402	-0.00027329	-7.74	0.004552316	128.91	2.25	2.51	10/29/07 16:15	675:34:00	675:30:45	675:04:45	25.99166533	
190.21	71	987	0.00672	530.67	14.315	0.006409878	181.51	0.010962194	310.41	5.42	5.68	10/29/07 16:15	675:34:00	675:30:45	675:04:45	25.99166533	residual gas calc.

DECANISTERED 10/29/2007; sample dried for 90 days in air; 368.59 grams placed in ball mill (36.45 cc @ STP desorbed), proportional to 181.51 cc @ STP for 1835.50 grams (dry wt.) for entire sample

TABLE 2 -- Desorption measurements for Petron Resources #1-26 Lacy, S2 NE 26-43N-33W, Cass Co., MO

SAMPLE: 330' 7.5" to 331' 7.5" (Lexington coal) core in SSD canister L1 (portion canistered wet)
NOTES: cohesive smutty coal with minor clay-rich intervals, approx. 1 cm thick, no cleat evident, with mineral-filled near vertical fractures
density = 1.29 gr/cc; KGS simple moisture = 1.71% (as received); KGS simple ash content = 16.73% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	11892	12267	14432
Sulfur	3.13%	3.23%	
Moisture	3.06%		
Ash	14.55%	15.01%	
Volatile Matter	38.03%	39.23%	
Fixed Carbon	44.36%	45.76%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =	15
dry sample weight:	0.848	384.67	wet sample weight:	0.879	398.93	3.57%			

TIME OF: off bottom 10/10/07 15:01 | at surface 10/10/07 15:02 | in canister 10/10/07 15:29

elapsed time (off bottom to canistering): 28.5 minutes = 0.475 hours = 0.689202438 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	temp (R)	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)
12	68	984	0.00042	527.67	14.272	0.00040545	11.48	0.00040545	11.48	0.96	2.21	10/10/07 15:48	0:47:30	0:46:30	0:19:00	0.889756521
1	68	984	3.5E-05	527.67	14.272	3.37875E-05	0.96	0.000439238	12.44	1.04	2.29	10/10/07 15:53	0:52:45	0:51:45	0:24:15	0.937638879
2	68	984	7.1E-05	527.67	14.272	6.75751E-05	1.91	0.000506813	14.35	1.20	2.44	10/10/07 16:02	1:01:15	1:00:15	0:32:45	1.010362971
1	68	984	3.5E-05	527.67	14.272	3.37875E-05	0.96	0.000540601	15.31	1.27	2.52	10/10/07 16:12	1:11:00	1:10:00	0:42:30	1.087811258
0	68	984	0	527.67	14.272	0	0.00	0.000540601	15.31	1.27	2.52	10/10/07 16:34	1:33:30	1:32:30	1:05:00	1.248332221
0	68	984	0	527.67	14.272	0	0.00	0.000540601	15.31	1.27	2.52	10/10/07 16:49	1:48:00	1:47:00	1:19:30	1.341640786
-1	68	984	-4E-05	527.67	14.272	-3.37875E-05	-0.96	0.000506813	14.35	1.20	2.44	10/10/07 16:55	1:54:30	1:53:30	1:26:00	1.381424386
-2	68	984	-7E-05	527.67	14.272	-6.75751E-05	-1.91	0.000439238	12.44	1.04	2.29	10/10/07 18:21	3:20:00	3:19:00	2:51:30	1.825741858
1	68	984	3.5E-05	527.67	14.272	3.37875E-05	0.96	0.000473025	13.39	1.12	2.36	10/10/07 21:03	6:02:00	6:01:00	5:33:30	2.456284457 back at lab
77	70	976	0.00272	529.67	14.156	0.002570745	72.80	0.00304377	86.19	7.18	8.43	10/13/07 17:40	74:39:00	74:38:00	74:10:30	8.640023148
32	69	978	0.00113	528.67	14.185	0.001072576	30.37	0.004116346	116.56	9.71	10.96	10/15/07 20:52	125:51:00	125:50:00	125:22:30	11.21828864
24	68	868	0.00085	527.67	12.589	0.000715307	20.26	0.004831653	136.82	11.39	12.64	10/17/07 13:08	166:07:00	166:06:00	165:38:30	12.88862548
26	68	984	0.00092	527.67	14.272	0.000878476	24.88	0.005710129	161.69	13.47	14.72	10/23/07 22:11	319:10:00	319:09:00	318:41:30	17.86523626
20	67	993	0.00071	526.67	14.402	0.000683226	19.35	0.006393355	181.04	15.08	16.33	10/29/07 16:16	457:15:00	457:14:00	456:46:30	21.38340478
13	68	988	0.00046	527.67	14.330	0.000441023	12.49	0.006834378	193.53	16.12	17.37	10/31/07 11:23	500:22:00	500:21:00	499:53:30	22.36887719
17	68	987	0.0006	527.67	14.315	0.000576139	16.31	0.007410517	209.84	17.48	18.73	11/5/07 11:29	620:28:00	620:27:00	619:59:30	24.90916833
6	70	993	0.00021	529.67	14.402	0.000203807	5.77	0.007614324	215.61	17.96	19.21	11/7/07 10:42	667:41:00	667:40:00	667:12:30	25.83956914
15	68	993	0.00053	527.67	14.402	0.000511448	14.48	0.008125773	230.10	19.16	20.41	11/15/07 9:51	858:50:00	858:49:00	858:21:30	29.30585834
20	67	990	0.00071	526.67	14.359	0.000681162	19.29	0.008806935	249.38	20.77	22.02	11/24/07 20:10	1085:09:00	1085:08:00	1084:40:30	32.94161502
12	67	982	0.00042	526.67	14.243	0.000405395	11.48	0.009212329	260.86	21.73	22.98	11/28/07 10:29	1171:28:00	1171:27:00	1170:59:30	34.22669523
10	67	986	0.00035	526.67	14.301	0.000339205	9.61	0.009551534	270.47	22.53	23.78	12/7/07 11:40	1388:39:00	1388:38:00	1388:10:30	37.26459446
1	67	991	3.5E-05	526.67	14.373	3.40925E-05	0.97	0.009585627	271.43	22.61	23.86	12/12/07 13:14	1510:13:00	1510:12:00	1509:44:30	38.86150623
16	69	977	0.00057	528.67	14.170	0.00053574	15.17	0.010121366	286.60	23.87	25.12	12/20/07 9:33	1698:32:00	1698:31:00	1698:03:30	41.21326647
2	67	986	7.1E-05	526.67	14.301	6.7841E-05	1.92	0.010189207	288.53	24.03	25.28	12/27/07 10:15	1867:14:00	1867:13:00	1866:45:30	43.21149538
-8	67	1012	-0.0003	526.67	14.678	-0.00027852	-7.89	0.009910688	280.64	23.37	24.62	1/2/08 10:29	2011:28:00	2011:27:00	2010:59:30	44.84937755
27	67	974	0.00095	526.67	14.127	0.000904707	25.62	0.010815395	306.26	25.51	26.76	1/7/08 10:47	2131:46:00	2131:45:00	2131:17:30	46.17105876
3	67	981	0.00011	526.67	14.228	0.000101245	2.87	0.01091664	309.12	25.75	26.99	1/15/08 13:28	2326:27:00	2326:26:00	2325:58:30	48.23328726
0	67	986	0	526.67	14.301	0	0.00	0.01091664	309.12	25.75	26.99	1/23/08 11:10	2516:09:00	2516:08:00	2515:40:30	50.16124002
12	67	967	0.00042	526.67	14.025	0.000399202	11.30	0.011315842	320.43	26.69	27.94	1/28/08 9:06	2634:05:00	2634:04:00	2633:36:30	51.32332153
2	67	969	7.1E-05	526.67	14.054	6.66713E-05	1.89	0.011382514	322.32	26.84	28.09	2/4/08 10:23	2803:22:00	2803:21:00	2802:53:30	52.94682867
-7	67	983	-0.0002	526.67	14.257	-0.000236721	-6.70	0.011145793	315.61	26.29	27.53	2/11/08 14:41	2975:40:00	2975:39:00	2975:11:30	54.54967155
2	67	981	7.1E-05	526.67	14.228	6.7497E-05	1.91	0.01121329	317.52	26.44	27.69	2/18/08 8:47	3137:46:00	3137:45:00	3137:17:30	56.01577159
9	67	969	0.00032	526.67	14.054	0.000300021	8.50	0.011513311	326.02	27.15	28.40	2/25/08 9:18	3306:17:00	3306:16:00	3305:48:30	57.50028985
-5	67	987	-0.0002	526.67	14.315	-0.000169774	-4.81	0.011343536	321.21	26.75	28.00	3/3/08 10:28	3475:27:00	3475:26:00	3474:58:30	58.95294734
-5	67	998	-0.0002	526.67	14.475	-0.000171667	-4.86	0.01117187	316.35	26.35	27.60	3/10/08 8:58	3641:57:00	3641:56:00	3641:28:30	60.34857082
10	67	982	0.00035	526.67	14.243	0.000337829	9.57	0.011509698	325.92	27.14	28.39	3/17/08 10:15	3811:14:00	3811:13:00	3810:45:30	61.73518716
-4	67	993	-0.0001	526.67	14.402	-0.000136645	-3.87	0.011373053	322.05	26.82	28.07	3/24/08 8:41	3977:40:00	3977:39:00	3977:11:30	63.06874556
14	67	970	0.00049	526.67	14.069	0.000467181	13.23	0.011840234	335.28	27.92	29.17	3/31/08 10:51	4147:50:00	4147:49:00	4147:21:30	64.40367484
-4	67	986	-0.0001	526.67	14.301	-0.000135682	-3.84	0.011704552	331.43	27.60	28.85	4/7/08 8:23	4313:22:00	4313:21:00	4312:53:30	65.67622604
-4	67	994	-0.0001	526.67	14.417	-0.000136783	-3.87	0.011567769	327.56	27.28	28.53	4/14/08 8:18	4481:17:00	4481:16:00	4480:48:30	66.94238817
-2	61	987	-7E-05	520.67	14.315	-6.86924E-05	-1.95	0.011499077	325.62	27.12	28.37	4/28/08 9:34	4818:33:00	4818:32:00	4818:04:30	69.4157763
-2	61	986	-7E-05	520.67	14.301	-6.86228E-05	-1.94	0.011430454	323.67	26.96	28.21	5/5/08 8:23	4985:22:00	4985:21:00	4984:53:30	70.60712901

669.97	66	968	0.02366	525.67	14.040	0.022353283	632.97	0.033783737	956.65	79.67	80.92	5/5/08 8:23	4985:22:00	4985:21:00	4984:53:30	70.60712901	residual gas calc.

DECANISTERED 5/05/2008; sample dried for 34 days in air; 167.32 grams placed in ball mill (265.48 cc @ STP desorbed), proportional to 632.97 cc @ STP for 398.93 grams (wet wt.) for entire sample

SAMPLE: 330' 7.5" to 331' 7.5" (Lexington coal) core in SSD canister L1 (portion canistered dry)
NOTES: cohesive smutty coal with minor clay-rich intervals, approx. 1 cm thick, no cleat evident, with mineral-filled near vertical fractures
density = 1.44 gr/cc; KGS simple moisture = 1.99% (as received); KGS simple ash content = 32.12% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	9557	9902	14476
Sulfur	3.23%	3.35%	
Moisture	3.48%		
Ash	30.50%	31.60%	
Volatile Matter	29.45%	30.52%	
Fixed Carbon	36.57%	37.88%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)	
dry sample weight:	0.897	406.67	wet sample weight:	0.919	417.00	2.48%		16		off bottom	at surface	in canister	29.2	minutes
										10/10/07 15:01	10/10/07 15:02	10/10/07 15:30	0.487	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			0.698212002	SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)	
-7	68	984	-0.0002	527.67	14.272	-0.000236513	-6.70	-0.00023651	-6.70	-0.53	0.73	10/10/07 15:35	0:34:45	0:33:45	0:05:30	0.761030004	
-3	68	984	-0.0001	527.67	14.272	-0.000101363	-2.87	-0.00033788	-9.57	-0.75	0.51	10/10/07 15:38	0:37:45	0:36:45	0:08:30	0.793200269	
-3	68	984	-0.0001	527.67	14.272	-0.000101363	-2.87	-0.00043924	-12.44	-0.98	0.28	10/10/07 15:46	0:45:15	0:44:15	0:16:00	0.868427698	
0	68	984	0	527.67	14.272	0	0.00	-0.00043924	-12.44	-0.98	0.28	10/10/07 16:37	1:36:45	1:35:45	1:07:30	1.26984251	
2	68	984	7.1E-05	527.67	14.272	6.75751E-05	1.91	-0.00037166	-10.52	-0.83	0.43	10/10/07 16:55	1:54:00	1:53:00	1:24:45	1.378404875	
1	68	984	3.5E-05	527.67	14.272	3.37875E-05	0.96	-0.00033788	-9.57	-0.75	0.51	10/10/07 18:20	3:19:00	3:18:00	2:49:45	1.821171784	
32	69	984	0.00113	528.67	14.272	0.001079156	30.56	0.000741281	20.99	1.65	2.91	10/10/07 21:01	6:00:00	5:59:00	5:30:45	2.449489743	back at lab
130	70	976	0.00459	529.67	14.156	0.004340218	122.90	0.005081499	143.89	11.34	12.60	10/13/07 17:41	74:40:00	74:39:00	74:10:45	8.640987598	
29	69	978	0.00102	528.67	14.185	0.000972022	27.52	0.006053521	171.42	13.50	14.76	10/15/07 20:53	125:52:00	125:51:00	125:22:45	11.21903145	
47	68	968	0.00166	527.67	14.040	0.001562193	44.24	0.007615714	215.65	16.99	18.25	10/17/07 13:09	166:08:00	166:07:00	165:38:45	12.88927202	
-15	68	984	-0.0005	527.67	14.272	-0.000506813	-14.35	0.007108901	201.30	15.86	17.12	10/23/07 22:13	319:12:00	319:11:00	318:42:45	17.86616915	
-12	67	993	-0.0004	526.67	14.402	-0.000409936	-11.61	0.006698965	189.69	14.94	16.20	10/29/07 16:17	457:16:00	457:15:00	456:46:45	21.38379449	
19	68	988	0.00067	527.67	14.330	0.000644573	18.25	0.007343538	207.95	16.38	17.64	10/31/07 11:22	500:21:00	500:20:00	499:51:45	22.36850464	
9	68	987	0.00032	527.67	14.315	0.000305015	8.64	0.007648552	216.58	17.06	18.32	11/5/07 11:30	620:29:00	620:28:00	619:59:45	24.90950287	
-4	70	993	-0.0001	529.67	14.402	-0.000135871	-3.85	0.007512681	212.73	16.76	18.02	11/7/07 10:43	667:42:00	667:41:00	667:12:45	25.83989164	
-7	68	993	-0.0002	527.67	14.402	-0.000238676	-6.76	0.007274005	205.98	16.23	17.49	11/15/07 9:51	858:50:00	858:49:00	858:20:45	29.30585834	
7	67	990	0.00025	526.67	14.359	0.000238407	6.75	0.007512412	212.73	16.76	18.02	11/24/07 20:10	1085:09:00	1085:08:00	1084:39:45	32.94161502	
17	67	982	0.0006	526.67	14.243	0.000574309	16.26	0.008086721	228.99	18.04	19.30	11/28/07 10:30	1171:29:00	1171:28:00	1170:59:45	34.22693871	
-7	67	986	-0.0002	526.67	14.301	-0.000237443	-6.72	0.007849278	222.27	17.51	18.77	12/7/07 11:41	1388:40:00	1388:39:00	1388:10:45	37.26481808	
-9	67	991	-0.0003	526.67	14.373	-0.000306833	-8.69	0.007542445	213.58	16.83	18.09	12/12/07 13:14	1510:13:00	1510:12:00	1509:43:45	38.86150623	
29	69	977	0.00102	528.67	14.170	0.000971028	27.50	0.008513473	241.07	18.99	20.25	12/20/07 9:33	1698:32:00	1698:31:00	1698:02:45	41.21326647	
-10	67	986	-0.0004	526.67	14.301	-0.000339205	-9.61	0.008174268	231.47	18.23	19.50	12/27/07 10:15	1867:14:00	1867:13:00	1866:44:45	43.21149538	
-37	67	1012	-0.0013	526.67	14.678	-0.001288153	-36.48	0.006886115	194.99	15.36	16.62	1/2/08 10:30	2011:29:00	2011:28:00	2010:59:45	44.84956336	
86	67	974	0.00304	526.67	14.127	0.002881659	81.60	0.009767774	276.59	21.79	23.05	1/7/08 10:47	2131:46:00	2131:45:00	2131:16:45	46.17105876	
-9	67	981	-0.0003	526.67	14.228	-0.000303736	-8.60	0.009464038	267.99	21.11	22.37	1/15/08 13:29	2326:28:00	2326:27:00	2325:58:45	48.23346003	
-7	67	986	-0.0002	526.67	14.301	-0.000237443	-6.72	0.009226594	261.27	20.58	21.84	1/23/08 11:11	2516:10:00	2516:09:00	2515:40:45	50.16140615	
43	67	967	0.00152	526.67	14.025	0.001430475	40.51	0.010657069	301.77	23.77	25.03	1/28/08 9:07	2634:06:00	2634:05:00	2633:36:45	51.3234839	
-3	67	969	-0.0001	526.67	14.054	-0.000100007	-2.83	0.010557062	298.94	23.55	24.81	2/4/08 10:24	2803:23:00	2803:22:00	2802:53:45	52.94698606	
-25	67	983	-0.0009	526.67	14.257	-0.000845432	-23.94	0.00971163	275.00	21.66	22.92	2/11/08 14:42	2975:41:00	2975:40:00	2975:11:45	54.54982432	
4	67	981	0.00014	526.67	14.228	0.000134994	3.82	0.009846624	278.82	21.97	23.23	2/18/08 8:48	3137:47:00	3137:46:00	3137:17:45	56.01592036	
21	67	969	0.00074	526.67	14.054	0.000700049	19.82	0.010546673	298.65	23.53	24.79	2/25/08 9:19	3306:18:00	3306:17:00	3305:48:45	57.50043478	
-22	67	987	-0.0008	526.67	14.315	-0.000747008	-21.15	0.009799665	277.49	21.86	23.12	3/3/08 10:29	3475:28:00	3475:27:00	3474:58:45	58.95308869	
-19	67	998	-0.0007	526.67	14.475	-0.000652333	-18.47	0.009147332	259.02	20.41	21.67	3/10/08 8:59	3641:58:00	3641:57:00	3641:28:45	60.34870891	
36	67	982	0.00127	526.67	14.243	0.001216184	34.44	0.010363516	293.46	23.12	24.38	3/17/08 10:16	3811:15:00	3811:14:00	3810:45:45	61.73532214	
-13	67	993	-0.0005	526.67	14.402	-0.000444097	-12.58	0.009919419	280.89	22.13	23.39	3/24/08 8:42	3977:41:00	3977:40:00	3977:11:45	63.06887769	
54	67	970	0.00191	526.67	14.069	0.001801983	51.03	0.011721402	331.91	26.15	27.41	3/31/08 10:52	4147:51:00	4147:50:00	4147:21:45	64.40380424	
-20	67	986	-0.0007	526.67	14.301	-0.00067841	-19.21	0.011042992	312.70	24.63	25.89	4/7/08 8:23	4313:22:00	4313:21:00	4312:52:45	65.67622604	
-19	67	994	-0.0007	526.67	14.417	-0.000649718	-18.40	0.010393274	294.30	23.18	24.45	4/14/08 8:20	4481:19:00	4481:18:00	4480:49:45	66.94263714	
-8	61	987	-0.0003	520.67	14.315	-0.000274769	-7.78	0.010118504	286.52	22.57	23.83	4/28/08 9:35	4818:34:00	4818:33:00	4818:04:45	69.41589635	
-3	61	986	-0.0001	520.67	14.301	-0.000102934	-2.91	0.01001557	283.61	22.34	23.60	5/5/08 8:23	4985:22:00	4985:21:00	4984:52:45	70.60712901	
385.75	65	984	0.01362	524.67	14.272	0.013108065	371.18	0.023123635	654.79	51.58	52.84	5/5/08 8:23	4985:22:00	4985:21:00	4984:52:45	70.60712901	residual gas calc.

DECANISTERED 5/05/2008; sample dried for 34 days in air; 204.31 grams placed in ball mill (181.86 cc @ STP desorbed), proportional to 371.18 cc @ STP for 417.00 grams (wet wt.) for entire sample

SAMPLE: 371' 0" to 372' 9" (Little Osage Shale) core in SSD canister L2
NOTES: black shale, fissile, with minor fossil debris, finely diseeminated pyrite, and pyrite concentrated in thin lenses
density = 2.19 gr/cc; KGS simple moisture = 1.04% (as received); KGS simple ash content = 88.52% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	982	992	6625
Sulfur	0.78%	0.79%	
Moisture	1.05%		
Ash	84.13%	85.02%	
Volatile Matter	12.82%	12.96%	
Fixed Carbon	2.00%	2.02%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	4.941	2241.09	wet sample weight:	5.279	2394.65	6.41%		13		off bottom	at surface	in canister	56.0 minutes
										10/10/07 16:50	10/10/07 16:51	10/10/07 17:46	0.933 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			0.966091783 SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)
3	68	984	0.00011	527.67	14.272	0.000101363	2.87		0.000101363	2.87	0.04	0.23	10/10/07 17:57	1:06:30	1:05:30	0:10:30	1.052774113	
1	68	984	3.5E-05	527.67	14.272	3.37875E-05	0.96		0.00013515	3.83	0.05	0.24	10/10/07 18:21	1:30:30	1:29:30	0:34:30	1.228142228	
12	69	984	0.00042	528.67	14.272	0.000404683	11.46		0.000539834	15.29	0.22	0.40	10/10/07 21:03	4:12:30	4:11:30	3:16:30	2.051422271	back at lab
19	70	976	0.00067	529.67	14.156	0.00063434	17.96		0.001174173	33.25	0.48	0.66	10/13/07 17:44	72:53:30	72:52:30	71:57:30	8.537661663	
13	69	978	0.00046	528.67	14.185	0.000435734	12.34		0.001609907	45.59	0.65	0.84	10/15/07 20:54	124:03:30	124:02:30	123:07:30	11.13814766	
11	68	968	0.00039	527.67	14.040	0.00036562	10.35		0.001975527	55.94	0.80	0.99	10/17/07 13:10	164:19:30	164:18:30	163:23:30	12.81893131	
14	68	984	0.00049	527.67	14.272	0.000473025	13.39		0.002448552	69.34	0.99	1.18	10/23/07 22:14	317:23:30	317:22:30	316:27:30	17.81548952	
14	67	993	0.00049	526.67	14.402	0.000478258	13.54		0.00292681	82.88	1.18	1.37	10/29/07 16:17	455:26:30	455:25:30	454:30:30	21.34107932	
10	68	988	0.00035	527.67	14.330	0.000339249	9.61		0.003266059	92.48	1.32	1.51	10/31/07 11:21	498:30:30	498:29:30	497:34:30	22.32730018	
13	68	987	0.00046	527.67	14.315	0.000440577	12.48		0.003706636	104.96	1.50	1.69	11/5/07 11:30	618:39:30	618:38:30	617:43:30	24.87284329	
4	70	993	0.00014	529.67	14.402	0.000135871	3.85		0.003842508	108.81	1.56	1.74	11/7/07 10:44	665:53:30	665:52:30	664:57:30	25.8048768	
10	68	993	0.00035	527.67	14.402	0.000340966	9.66		0.004183473	118.46	1.69	1.88	11/15/07 9:52	857:01:30	857:00:30	856:05:30	29.27498933	
15	67	990	0.00053	526.67	14.359	0.000510871	14.47		0.004694345	132.93	1.90	2.09	11/24/07 20:11	1083:20:30	1083:19:30	1082:24:30	32.91415602	
11	67	982	0.00039	526.67	14.243	0.000371612	10.52		0.005065956	143.45	2.05	2.24	11/28/07 10:30	1169:39:30	1169:38:30	1168:43:30	34.20026803	
12	67	986	0.00042	526.67	14.301	0.000407046	11.53		0.005473002	154.98	2.22	2.40	12/7/07 11:42	1386:51:30	1386:50:30	1385:55:30	37.2405469	
4	67	991	0.00014	526.67	14.373	0.00013637	3.86		0.005609372	158.84	2.27	2.46	12/12/07 13:15	1508:24:30	1508:23:30	1507:28:30	38.83823288	
12	69	977	0.00042	528.67	14.170	0.000401805	11.38		0.006011177	170.22	2.43	2.62	12/20/07 9:34	1696:43:30	1696:42:30	1695:47:30	41.1913219	
3	67	986	0.00011	526.67	14.301	0.000101761	2.88		0.006112938	173.10	2.47	2.66	12/27/07 10:16	1865:25:30	1865:24:30	1864:29:30	43.1905661	
-4	67	1012	-0.0001	526.67	14.678	-0.00013926	-3.94		0.005973679	169.16	2.42	2.60	1/2/08 10:31	2009:40:30	2009:39:30	2008:44:30	44.82939884	
19	67	974	0.00067	526.67	14.127	0.000636646	18.03		0.006610324	187.18	2.68	2.86	1/7/08 10:50	2129:59:30	2129:58:30	2129:03:30	46.15183276	
3	67	981	0.00011	526.67	14.228	0.000101245	2.87		0.00671157	190.05	2.72	2.90	1/15/08 13:30	2324:39:30	2324:38:30	2323:43:30	48.21471076	
3	67	986	0.00011	526.67	14.301	0.000101761	2.88		0.006813331	192.93	2.76	2.94	1/23/08 11:12	2514:21:30	2514:20:30	2513:25:30	50.14337776	
7	67	967	0.00025	526.67	14.025	0.000232868	6.59		0.007046199	199.53	2.85	3.04	1/28/08 9:08	2632:17:30	2632:16:30	2631:21:30	51.30586386	
2	67	969	7.1E-05	526.67	14.054	6.66713E-05	1.89		0.007112871	201.41	2.88	3.07	2/4/08 10:25	2801:34:30	2801:33:30	2800:38:30	52.92990648	
-3	67	983	-0.0001	526.67	14.257	-0.000101452	-2.87		0.007011419	198.54	2.84	3.02	2/11/08 14:43	2973:52:30	2973:51:30	2972:56:30	54.53324674	
0	67	983	0	526.67	14.257	0	0.00		0.007011419	198.54	2.84	3.02	2/13/08 10:24	3017:33:30	3017:32:30	3016:37:30	54.93230683	
1064.28	68	985	0.03758	527.67	14.286	0.03599594	1019.29		0.043007359	1217.83	17.41	17.60	2/13/08 10:24	3017:33:30	3017:32:30	3016:37:30	54.93230683	residual gas calc.

DECANISTERED 2/13/2008; sample dried for 38 days in air; 149.51 grams placed in ball mill (68.00 cc @ STP desorbed), proportional to 1019.29 cc @ STP for 2241.09 grams (dry wt.) for entire sample

SAMPLE: 388' 1" to 389' 0" (Excello Shale) core in canister W1
NOTES: black shale, with small phosphate nodules, no fracturing
density = 2.25 gr/cc; KGS simple moisture = 6.16% (as received); KGS simple ash content = 90.94% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	852	895	7955
Sulfur	0.88%	0.92%	
Moisture	4.76%		
Ash	84.52%	88.75%	
Volatile Matter	6.78%	7.12%	
Fixed Carbon	3.94%	4.13%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	2.460	1116.03	wet sample weight:	2.623	1189.82	6.20%		5		off bottom	at surface	in canister	17.3 minutes

													10/11/07 8:48	10/11/07 8:50	10/11/07 9:06	0.289	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			0.537483850	SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)	
1	65	988	3.5E-05	524.67	14.330	3.41189E-05	0.97	3.41189E-05	0.97	0.03	0.17	10/11/07 9:11	0:23:05	0:21:45	0:05:45	0.620259802	
2	65	988	7.1E-05	524.67	14.330	6.82377E-05	1.93	0.000102357	2.90	0.08	0.23	10/11/07 9:38	0:49:20	0:48:00	0:32:00	0.906764701	
3	65	987	0.00011	524.67	14.315	0.000102253	2.90	0.00020461	5.79	0.17	0.31	10/11/07 10:17	1:28:20	1:27:00	1:11:00	1.213351648	
4	67	986	0.00014	526.67	14.301	0.000135682	3.84	0.000340292	9.64	0.28	0.42	10/11/07 11:32	2:44:05	2:42:45	2:26:45	1.653699556	
2	67	986	7.1E-05	526.67	14.301	6.7841E-05	1.92	0.000408133	11.56	0.33	0.48	10/11/07 12:23	3:34:20	3:33:00	3:17:00	1.890032334	
1	68	984	3.5E-05	527.67	14.272	3.37875E-05	0.96	0.00044192	12.51	0.36	0.50	10/11/07 14:25	5:36:20	5:35:00	5:19:00	2.367605448	
0	68	983	0	527.67	14.257	0	0.00	0.00044192	12.51	0.36	0.50	10/11/07 15:13	6:24:20	6:23:00	6:07:00	2.530919903	
0	68	983	0	527.67	14.257	0	0.00	0.00044192	12.51	0.36	0.50	10/11/07 16:55	8:06:20	8:05:00	7:49:00	2.847025738	
3	70	976	0.00011	529.67	14.156	0.000100159	2.84	0.000542079	15.35	0.44	0.58	10/13/07 17:44	56:55:20	56:54:00	56:38:00	7.544681718	back at lab
7	69	978	0.00025	528.67	14.185	0.000234626	6.64	0.000776705	21.99	0.63	0.77	10/15/07 20:56	108:07:20	108:06:00	107:50:00	10.3981836	
10	68	968	0.00035	527.67	14.040	0.000332381	9.41	0.001109086	31.41	0.90	1.05	10/17/07 13:12	148:23:20	148:22:00	148:06:00	12.18149781	
14	68	984	0.00049	527.67	14.272	0.000473025	13.39	0.001582112	44.80	1.29	1.43	10/23/07 22:15	301:26:20	301:25:00	301:09:00	17.36199553	
9	67	993	0.00032	526.67	14.402	0.000307452	8.71	0.001889564	53.51	1.54	1.68	10/29/07 16:19	439:30:20	439:29:00	439:13:00	20.96438779	
5	68	988	0.00018	527.67	14.330	0.000169624	4.80	0.002059188	58.31	1.67	1.82	10/31/07 11:21	482:32:20	482:31:00	482:15:00	21.96676783	
7	68	987	0.00025	527.67	14.315	0.000237234	6.72	0.002296422	65.03	1.87	2.01	11/5/07 11:31	602:42:20	602:41:00	602:25:00	24.55006223	
1	70	993	3.5E-05	529.67	14.402	3.39678E-05	0.96	0.00233039	65.99	1.89	2.04	11/7/07 10:44	649:55:20	649:54:00	649:38:00	25.49357217	
6	68	993	0.00021	527.67	14.402	0.000204579	5.79	0.002534969	71.78	2.06	2.20	11/15/07 9:52	841:03:20	841:02:00	840:46:00	29.00095784	
6	67	990	0.00021	526.67	14.359	0.000204349	5.79	0.002739318	77.57	2.23	2.37	11/24/07 20:13	1067:24:20	1067:23:00	1067:07:00	32.67117316	
3	67	982	0.00011	526.67	14.243	0.000101349	2.87	0.002840666	80.44	2.31	2.45	11/28/07 10:31	1153:42:20	1153:41:00	1153:25:00	33.96624141	
2	67	986	7.1E-05	526.67	14.301	6.7841E-05	1.92	0.002908507	82.36	2.36	2.51	12/7/07 11:42	1370:53:20	1370:52:00	1370:36:00	37.02551673	
0	67	991	0	526.67	14.373	0	0.00	0.002908507	82.36	2.36	2.51	12/12/07 13:16	1492:27:20	1492:26:00	1492:10:00	38.63231232	
5	69	977	0.00018	528.67	14.170	0.000167419	4.74	0.003075926	87.10	2.50	2.64	12/20/07 9:35	1680:46:20	1680:45:00	1680:29:00	40.99722213	
0	67	986	0	526.67	14.301	0	0.00	0.003075926	87.10	2.50	2.64	12/27/07 10:17	1849:28:20	1849:27:00	1849:11:00	43.00549061	
-5	67	1012	-0.0002	526.67	14.678	-0.000174075	-4.93	0.002901851	82.17	2.36	2.50	1/2/08 10:33	1993:44:20	1993:43:00	1993:27:00	44.65130333	
10	67	974	0.00035	526.67	14.127	0.000335077	9.49	0.003236928	91.66	2.63	2.77	1/7/08 10:52	2114:03:20	2114:02:00	2113:46:00	45.97885988	
0	67	981	0	526.67	14.228	0	0.00	0.003236928	91.66	2.63	2.77	1/15/08 13:31	2308:42:20	2308:41:00	2308:25:00	48.0489912	
0	67	986	0	526.67	14.301	0	0.00	0.003236928	91.66	2.63	2.77	1/23/08 11:13	2498:24:20	2498:23:00	2498:07:00	49.98405301	
4	67	967	0.00014	526.67	14.025	0.000133067	3.77	0.003369995	95.43	2.74	2.88	1/28/08 9:09	2616:20:20	2616:19:00	2616:03:00	51.1501602	
-2	67	985	-7E-05	526.67	14.286	-6.77722E-05	-1.92	0.003302223	93.51	2.68	2.83	1/31/08 9:50	2689:01:20	2689:00:00	2688:44:00	51.85578292	
1290.83	64	975	0.04559	523.67	14.141	0.043545148	1233.06	0.046847371	1326.56	38.08	38.22	1/31/08 9:50	2689:01:20	2689:00:00	2688:44:00	51.85578292	residual gas calc.

DECANISTERED 1/31/2008; sample dried for 60 days in air; 103.75 grams placed in ball mill (114.63 cc @ STP desorbed), proportional to 1233.06 cc @ STP for 1116.03 grams (dry wt.) for entire sample

SAMPLE: 389' 0" to 389' 11.5" (Mulky coal) core in SSD canister L3

NOTES: cohesive, non-fractured coal, poorly developed cleat, minor thin (0.5 cm) fusinite layers, thin (0.5 cm) shale bed
density = 1.27 gr/cc; KGS simple moisture = 2.09% (as received); KGS simple ash content = 9.40% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	13050	13451	14860
Sulfur	3.52%	3.63%	
Moisture	2.99%		
Ash	9.20%	9.48%	
Volatile Matter	39.15%	40.35%	
Fixed Carbon	48.66%	50.17%	

	lbs.	grams		lbs.	grams	moisture %	est. lost gas (cc) =
dry sample weight:	1.521	690.02	wet sample weight:	1.554	704.72	2.09%	100

TIME OF:			elapsed time (off bottom to canistering)	
off bottom	at surface	in canister	35.3	minutes
10/11/07 9:15	10/11/07 9:16	10/11/07 9:50	0.588	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			0.766485486 SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)
5	65	987	0.00018	524.67	14.315	0.000170422	4.83	0.000170422	4.83	0.22	4.87	10/11/07 9:52	0:36:45	0:35:35	0:01:30	0.782623792
10	65	987	0.00035	524.67	14.315	0.000340843	9.65	0.000511265	14.48	0.67	5.32	10/11/07 9:57	0:41:30	0:40:20	0:06:15	0.831664997
10	65	987	0.00035	524.67	14.315	0.000340843	9.65	0.000852108	24.13	1.12	5.76	10/11/07 10:06	0:51:00	0:49:50	0:15:45	0.921954446
9	65	987	0.00032	524.67	14.315	0.000306759	8.69	0.001158867	32.82	1.52	6.17	10/11/07 10:15	1:00:15	0:59:05	0:25:00	1.002081168
3	66	987	0.00011	525.67	14.315	0.000102058	2.89	0.001260926	35.71	1.66	6.30	10/11/07 10:27	1:12:15	1:11:05	0:37:00	1.097345281
9	66	987	0.00032	525.67	14.315	0.000306175	8.67	0.001567101	44.38	2.06	6.70	10/11/07 10:52	1:36:45	1:35:35	1:01:30	1.26984251
8	67	986	0.00028	526.67	14.301	0.000271364	7.68	0.001838465	52.06	2.42	7.06	10/11/07 11:31	2:15:45	2:14:35	1:40:30	1.504160896
16	67	986	0.00057	526.67	14.301	0.000542728	15.37	0.002381193	67.43	3.13	7.77	10/11/07 12:20	3:05:00	3:03:50	2:29:45	1.755942292
-7	67	986	-0.0002	526.67	14.301	-0.000237443	-6.72	0.002143749	60.70	2.82	7.46	10/11/07 12:30	3:14:30	3:13:20	2:39:15	1.800462903

41	68	983	0.00145	527.67	14.257	0.001383881	39.19	0.00352763	99.89	4.64	9.28	10/11/07 15:13	5:57:30	5:56:20	5:22:15	2.440969753		
-1	68	983	-4E-05	527.67	14.257	-3.37532E-05	-0.96	0.003493877	98.94	4.59	9.24	10/11/07 16:54	7:38:30	7:37:20	7:03:15	2.764356465		
82	70	976	0.0029	529.67	14.156	0.002737676	77.52	0.006231553	176.46	8.19	12.84	10/13/07 17:46	56:30:30	56:29:20	55:55:15	7.517202494	back at lab	
38	69	978	0.00134	528.67	14.185	0.001273684	36.07	0.007505237	212.52	9.87	14.51	10/15/07 20:57	107:41:30	107:40:20	107:06:15	10.37745955		
45	68	968	0.00159	527.67	14.040	0.001495716	42.35	0.009000954	254.88	11.83	16.48	10/17/07 13:13	147:57:30	147:56:20	147:22:15	12.16381245		
8	68	984	0.00028	527.67	14.272	0.0002703	7.65	0.009271254	262.53	12.19	16.83	10/23/07 22:16	301:00:30	300:59:20	300:25:15	17.34959173		
17	67	993	0.0006	526.67	14.402	0.000580742	16.44	0.009851996	278.98	12.95	17.60	10/29/07 16:20	439:04:30	439:03:20	438:29:15	20.95411654		
21	68	988	0.00074	527.67	14.330	0.000712423	20.17	0.010564418	299.15	13.89	18.53	10/31/07 11:20	482:04:30	482:03:20	481:29:15	21.95620641		
26	68	987	0.00092	527.67	14.315	0.000881154	24.95	0.011445573	324.10	15.05	19.69	11/5/07 11:31	602:15:30	602:14:20	601:40:15	24.54095217		
1	70	993	3.5E-05	529.67	14.402	3.39678E-05	0.96	0.01147954	325.06	15.09	19.74	11/7/07 10:45	649:29:30	649:28:20	648:54:15	25.48512638		
16	68	993	0.00057	527.67	14.402	0.000545545	15.45	0.012025086	340.51	15.81	20.45	11/15/07 9:53	840:37:30	840:36:20	840:02:15	28.99353376		
30	67	990	0.00106	526.67	14.359	0.001021743	28.93	0.013046828	369.44	17.15	21.80	11/24/07 20:13	1066:57:30	1066:56:20	1066:22:15	32.66432815		
12	67	982	0.00042	526.67	14.243	0.000405395	11.48	0.013452223	380.92	17.69	22.33	11/28/07 10:31	1153:15:30	1153:14:20	1152:40:15	33.95965744		
9	67	986	0.00032	526.67	14.301	0.000305284	8.64	0.013757508	389.57	18.09	22.73	12/7/07 11:42	1370:26:30	1370:25:20	1369:51:15	37.01947686		
-5	67	991	-0.0002	526.67	14.373	-0.000170463	-4.83	0.013587045	384.74	17.86	22.51	12/12/07 13:16	1492:00:30	1491:59:20	1491:25:15	38.6265237		
35	69	977	0.00124	528.67	14.170	0.00117193	33.19	0.014758975	417.93	19.40	24.05	12/20/07 9:36	1680:20:30	1680:19:20	1679:45:15	40.99197076		
-7	67	986	-0.0002	526.67	14.301	-0.000237443	-6.72	0.014521532	411.20	19.09	23.73	12/27/07 10:16	1849:00:30	1848:59:20	1848:25:15	43.0000969		
-31	67	1012	-0.0011	526.67	14.678	-0.001079263	-30.56	0.013442268	380.64	17.67	22.32	1/2/08 10:32	1993:16:30	1993:15:20	1992:41:15	44.64610845		
89	67	974	0.00314	526.67	14.127	0.002982182	84.45	0.016424451	465.09	21.59	26.24	1/7/08 10:50	2113:34:30	2113:33:20	2112:59:15	45.97363375		
-6	67	981	-0.0002	526.67	14.228	-0.000202491	-5.73	0.01622196	459.35	21.33	25.97	1/15/08 13:32	2308:16:30	2308:15:20	2307:41:15	48.04451061		
-4	67	986	-0.0001	526.67	14.301	-0.000135682	-3.84	0.016086278	455.51	21.15	25.79	1/23/08 11:14	2497:58:30	2497:57:20	2497:23:15	49.9797459		
42	67	967	0.00148	526.67	14.025	0.001397208	39.56	0.017483486	495.08	22.99	27.63	1/28/08 9:10	2615:54:30	2615:53:20	2615:19:15	51.14595129		
0	67	969	0	526.67	14.054	0	0.00	0.017483486	495.08	22.99	27.63	2/4/08 10:26	2785:10:30	2785:09:20	2784:35:15	52.77475722	estimate	
-22	67	983	-0.0008	526.67	14.257	-0.00074398	-21.07	0.016739505	474.01	22.01	26.65	2/11/08 14:43	2957:27:30	2957:26:20	2956:52:15	54.38251864		
7	67	981	0.00025	526.67	14.228	0.000236239	6.69	0.016975745	480.70	22.32	26.96	2/18/08 8:49	3119:33:30	3119:32:20	3118:58:15	55.85300648		
30	67	969	0.00106	526.67	14.054	0.00100007	28.32	0.017975814	509.02	23.63	28.28	2/25/08 9:20	3288:04:30	3288:03:20	3287:29:15	57.34173872		
-19	67	987	-0.0007	526.67	14.315	-0.000645143	-18.27	0.017330671	490.75	22.79	27.43	3/3/08 10:30	3457:14:30	3457:13:20	3456:39:15	58.79831347		
-11	67	998	-0.0004	526.67	14.475	-0.000377666	-10.69	0.016953005	480.05	22.29	26.93	3/10/08 9:00	3623:44:30	3623:43:20	3623:09:15	60.1975221		
38	67	982	0.00134	526.67	14.243	0.00128375	36.35	0.018236754	516.41	23.98	28.62	3/17/08 10:18	3793:02:30	3793:01:20	3792:27:15	61.58767463		
-14	67	993	-0.0005	526.67	14.402	-0.000478258	-13.54	0.017758496	502.86	23.35	27.99	3/24/08 8:43	3959:27:30	3959:26:20	3958:52:15	62.92422692		
47	67	972	0.00166	526.67	14.098	0.001571626	44.50	0.019330123	547.37	25.41	30.06	3/27/08 7:34	4030:18:30	4030:17:20	4029:43:15	63.48470945		
923.00	67	972	0.0326	526.67	14.098	0.030864069	873.97	0.050194192	1421.34	65.99	70.63	3/27/08 7:34	4030:18:30	4030:17:20	4029:43:15	63.48470945	residual gas calc.	

DECANISTERED 3/27/2008; sample dried for 41 days in air; 167.34 grams placed in ball mill (207.53 cc @ STP desorbed), proportional to 873.97 cc @ STP for 704.72 grams (wet wt.) for entire sample

SAMPLE: 473' 10" to 474' 6" (shale above Bevier coal) core in canister L4
NOTES: black shale, fissile, non-fractured, with minor disseminated pyrite
density = 2.49 gr/cc; KGS simple moisture = 1.33% (as received); KGS simple ash content = 87.08% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	1041	1053	7382
Sulfur	7.13%	7.21%	
Moisture	1.09%		
Ash	84.81%	85.74%	
Volatile Matter	10.48%	10.59%	
Fixed Carbon	3.62%	3.67%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)	
dry sample weight:	2.020	916.45	wet sample weight:	2.289	1038.19	11.73%		4		off bottom	at surface	in canister	14.8	minutes
										10/11/07 12:41	10/11/07 12:42	10/11/07 12:55	0.246	hours
													0.495815826	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	temp (R)	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	67	985	7.1E-05	526.67	14.286	6.77722E-05	1.92	6.77722E-05	1.92	0.07	0.21	10/11/07 13:40	0:59:45	0:58:15	0:45:00	0.997914492
3	67	984	0.00011	526.67	14.272	0.000101555	2.88	0.000169327	4.79	0.17	0.31	10/11/07 14:23	1:42:00	1:40:30	1:27:15	1.303840481
10	68	983	0.00035	527.67	14.257	0.000337532	9.56	0.000506859	14.35	0.50	0.64	10/11/07 15:11	2:30:00	2:28:30	2:15:15	1.58113883
1	68	983	3.5E-05	527.67	14.257	3.37532E-05	0.96	0.000540612	15.31	0.54	0.67	10/11/07 16:54	4:13:00	4:11:30	3:58:15	2.053452378
52	70	976	0.00184	529.67	14.156	0.001736087	49.16	0.0022767	64.47	2.25	2.39	10/13/07 17:47	53:06:00	53:04:30	52:51:15	7.286974681
24	69	978	0.00085	528.67	14.185	0.000804432	22.78	0.003081132	87.25	3.05	3.19	10/15/07 20:58	104:17:00	104:15:30	104:02:15	10.21192114
17	68	968	0.0006	527.67	14.040	0.000565048	16.00	0.00364618	103.25	3.61	3.75	10/17/07 13:15	144:34:00	144:32:30	144:19:15	12.02358793
11	68	984	0.00039	527.67	14.272	0.000371663	10.52	0.004017843	113.77	3.98	4.12	10/23/07 22:17	297:36:00	297:34:30	297:21:15	17.25108692
5	67	993	0.00018	526.67	14.402	0.000170807	4.84	0.004188649	118.61	4.15	4.29	10/29/07 16:22	435:41:00	435:39:30	435:26:15	20.87302885
7	68	988	0.00025	527.67	14.330	0.000237474	6.72	0.004426124	125.33	4.38	4.52	10/31/07 11:20	478:39:00	478:37:30	478:24:15	21.87807121
6	68	987	0.00021	527.67	14.315	0.000203343	5.76	0.004629467	131.09	4.58	4.72	11/5/07 11:32	598:51:00	598:49:30	598:36:15	24.47141189
-2	68	993	-7E-05	527.67	14.402	-6.81931E-05	-1.93	0.004561274	129.16	4.52	4.65	11/15/07 9:53	837:12:00	837:10:30	836:57:15	28.93440858
0	67	990	0	526.67	14.359	0	0.00	0.004561274	129.16	4.52	4.65	11/24/07 20:15	1063:34:00	1063:32:30	1063:19:15	32.61236984
2	67	982	7.1E-05	526.67	14.243	6.75658E-05	1.91	0.004628839	131.07	4.58	4.72	11/28/07 10:31	1149:50:00	1149:48:30	1149:35:15	33.90919246

-3	67	986	-0.0001	526.67	14.301	-0.000101761	-2.88	0.004527078	128.19	4.48	4.62	12/7/07 11:43	1367:02:00	1367:00:30	1366:47:15	36.97341387	
-3	67	991	-0.0001	526.67	14.373	-0.000102278	-2.90	0.0044248	125.30	4.38	4.52	12/12/07 13:16	1488:35:00	1488:33:30	1488:20:15	38.58216341	
17	69	977	0.0006	528.67	14.170	0.000569223	16.12	0.004994024	141.41	4.94	5.08	12/20/07 9:38	1676:57:00	1676:55:30	1676:42:15	40.95057997	
-5	67	986	-0.0002	526.67	14.301	-0.000169602	-4.80	0.004824421	136.61	4.78	4.92	12/27/07 10:18	1845:37:00	1845:35:30	1845:22:15	42.9606409	
-11	67	1012	-0.0004	526.67	14.678	-0.000382964	-10.84	0.004441457	125.77	4.40	4.54	1/2/08 10:34	1989:53:00	1989:51:30	1989:38:15	44.60810838	
17	67	974	0.0006	526.67	14.127	0.00056963	16.13	0.005011087	141.90	4.96	5.10	1/7/08 10:52	2110:11:00	2110:09:30	2109:56:15	45.93673185	
-4	67	981	-0.0001	526.67	14.228	-0.000134994	-3.82	0.004876093	138.08	4.83	4.97	1/15/08 13:33	2304:52:00	2304:50:30	2304:37:15	48.00902693	
-4	67	986	-0.0001	526.67	14.301	-0.000135682	-3.84	0.004740411	134.23	4.69	4.83	1/23/08 11:14	2494:33:00	2494:31:30	2494:18:15	49.94547027	
6	67	967	0.00021	526.67	14.025	0.000199601	5.65	0.004940012	139.89	4.89	5.03	1/28/08 9:11	2612:30:00	2612:28:30	2612:15:15	51.11262075	
-3	67	969	-0.0001	526.67	14.054	-0.000100007	-2.83	0.004840005	137.05	4.79	4.93	2/4/08 10:27	2781:46:00	2781:44:30	2781:31:15	52.74245602	
226.33	75	980	0.00799	534.67	14.214	0.007516336	212.84	0.012356341	349.89	12.23	12.37	2/4/08 10:27	2781:46:00	2781:44:30	2781:31:15	52.74245602	residual gas calc.

DECANISTERED 2/04/2008; sample dried for 54 days in air; 304.90 grams placed in ball mill (70.81 cc @ STP desorbed), proportional to 212.84 cc @ STP for 916.45 grams (dry wt.) for entire sample

SAMPLE: 474' 6" to 475' 5.5" (Bevier coal) core in SSD canister L5
NOTES: coal, very crumbly, with mineral-filled fractures, 1' to 2" thick cohesive chunks
density = 1.58 gr/cc; KGS simple moisture = 1.47% (as received); KGS simple ash content = 20.71% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	11382	11674	14574
Sulfur	5.88%	6.03%	
Moisture	2.50%		
Ash	19.40%	19.90%	
Volatile Matter	35.83%	36.74%	
Fixed Carbon	42.27%	43.36%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	1.695	768.71	wet sample weight:	1.762	799.26	3.82%		77		off bottom	at surface	in canister	27.5 minutes
										10/11/07 12:41	10/11/07 12:42	10/11/07 13:08	0.458 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			0.677003200 SQRT (hrs)	
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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	67	985	7.1E-05	526.67	14.286	6.77722E-05	1.92	6.77722E-05	1.92	0.08	3.29	10/11/07 13:10	0:29:30	0:28:00	0:02:00	0.701189466	
12	67	985	0.00042	526.67	14.286	0.000406633	11.51	0.000474405	13.43	0.56	3.77	10/11/07 13:23	0:42:00	0:40:30	0:14:30	0.836660027	
13	67	985	0.00046	526.67	14.286	0.000440519	12.47	0.000914924	25.91	1.08	4.29	10/11/07 13:28	0:47:45	0:46:15	0:20:15	0.892094913	
11	67	985	0.00039	526.67	14.286	0.000372747	10.55	0.001287671	36.46	1.52	4.73	10/11/07 13:39	0:58:15	0:56:45	0:30:45	0.98530875	
2	67	985	7.1E-05	526.67	14.286	6.77722E-05	1.92	0.001355444	38.38	1.60	4.81	10/11/07 13:46	1:05:30	1:04:00	0:38:00	1.044828535	
8	67	985	0.00028	526.67	14.286	0.000271089	7.68	0.001626532	46.06	1.92	5.13	10/11/07 13:56	1:15:30	1:14:00	0:48:00	1.121754578	
16	67	984	0.00057	526.67	14.272	0.000541627	15.34	0.002168159	61.40	2.56	5.77	10/11/07 14:19	1:38:30	1:37:00	1:11:00	1.281275406	
28	68	983	0.00099	527.67	14.257	0.00094509	26.76	0.003113249	88.16	3.67	6.88	10/11/07 15:10	2:29:00	2:27:30	2:01:30	1.575859554	
28	68	983	0.00099	527.67	14.257	0.00094509	26.76	0.004058338	114.92	4.79	8.00	10/11/07 16:52	4:11:00	4:09:30	3:43:30	2.045319861	
266	70	976	0.00939	529.67	14.156	0.008880755	251.47	0.012939093	366.39	15.27	18.48	10/13/07 17:48	53:07:00	53:05:30	52:39:30	7.288118184	back at lab
108	69	978	0.00381	528.67	14.185	0.003619943	102.50	0.016559036	468.90	19.54	22.75	10/15/07 20:58	104:17:00	104:15:30	103:49:30	10.21192114	
79	68	968	0.00279	527.67	14.040	0.002625813	74.35	0.019184849	543.25	22.64	25.85	10/17/07 13:16	144:35:00	144:33:30	144:07:30	12.02428099	
85	68	984	0.003	527.67	14.272	0.00287194	81.32	0.02205679	624.58	26.03	29.24	10/23/07 22:18	297:37:00	297:35:30	297:09:30	17.25156998	
131	70	993	0.00463	529.67	14.402	0.004449784	126.00	0.026506574	750.58	31.28	34.49	11/7/07 10:45	646:04:00	646:02:30	645:36:30	25.4178415	gas sampled
79	68	993	0.00279	527.67	14.402	0.002693629	76.27	0.029200203	826.85	34.46	37.67	11/15/07 9:45	837:04:00	837:02:30	836:36:30	28.93210443	gas sampled
41	67	988	0.00145	526.67	14.330	0.001393561	39.46	0.030593764	866.32	36.10	39.31	11/26/07 11:05	1102:24:00	1102:22:30	1101:56:30	33.20240955	gas sampled
23	67	982	0.00081	526.67	14.243	0.000777006	22.00	0.03137077	888.32	37.02	40.23	11/28/07 10:33	1149:52:00	1149:50:30	1149:24:30	33.90968397	
25	67	986	0.00088	526.67	14.301	0.000848012	24.01	0.032218782	912.33	38.02	41.23	12/7/07 11:43	1367:02:00	1367:00:30	1366:34:30	36.97341387	
0	67	991	0	526.67	14.373	0	0.00	0.032218782	912.33	38.02	41.23	12/12/07 13:17	1488:36:00	1488:34:30	1488:08:30	38.5823794	
43	69	977	0.00152	528.67	14.170	0.0014398	40.77	0.033658582	953.10	39.72	42.93	12/20/07 9:37	1676:56:00	1676:54:30	1676:28:30	40.95037647	
-2	67	986	-7E-05	526.67	14.301	-6.7841E-05	-1.92	0.033590741	951.18	39.64	42.85	12/27/07 10:18	1845:37:00	1845:35:30	1845:09:30	42.9606409	
-21	67	1012	-0.0007	526.67	14.678	-0.000731114	-20.70	0.032859627	930.48	38.78	41.99	1/2/08 10:36	1989:55:00	1989:53:30	1989:27:30	44.608482	
83	67	974	0.00293	526.67	14.127	0.002781136	78.75	0.035640764	1009.23	42.06	45.27	1/7/08 10:54	2110:13:00	2110:11:30	2109:45:30	45.93709467	
3	67	981	0.00011	526.67	14.228	0.000101245	2.87	0.035742009	1012.10	42.18	45.39	1/15/08 13:34	2304:53:00	2304:51:30	2304:25:30	48.00920051	
1	67	986	3.5E-05	526.67	14.301	3.39205E-05	0.96	0.03577593	1013.06	42.22	45.43	1/23/08 11:15	2494:34:00	2494:32:30	2494:06:30	49.94563711	
47	67	967	0.00166	526.67	14.025	0.001563542	44.27	0.037339472	1057.33	44.07	47.27	1/28/08 9:12	2612:31:00	2612:29:30	2612:03:30	51.11278379	
10	67	969	0.00035	526.67	14.054	0.000333357	9.44	0.037672828	1066.77	44.46	47.67	2/4/08 10:28	2781:47:00	2781:45:30	2781:19:30	52.74261402	
-15	67	983	-0.0005	526.67	14.257	-0.000507259	-14.36	0.037165569	1052.41	43.86	47.07	2/11/08 14:44	2954:03:00	2954:01:30	2953:35:30	54.35117294	
14	67	981	0.00049	526.67	14.228	0.000472479	13.38	0.037638048	1065.79	44.42	47.63	2/18/08 8:50	3116:09:00	3116:07:30	3115:41:30	55.82248651	
39	67	969	0.00138	526.67	14.054	0.001300091	36.81	0.038938138	1102.60	45.95	49.16	2/25/08 9:21	3284:40:00	3284:38:30	3284:12:30	57.31201154	
-11	67	987	-0.0004	526.67	14.315	-0.000373504	-10.58	0.038564634	1092.02	45.51	48.72	3/3/08 10:31	3453:50:00	3453:48:30	3453:22:30	58.76932306	

-10	67	998	-0.0004	526.67	14.475	-0.000343333	-9.72	0.038221301	1082.30	45.11	48.32	3/10/08 9:00	3620:19:00	3620:17:30	3619:51:30	60.16906736	
43	67	982	0.00152	526.67	14.243	0.001452664	41.13	0.039673965	1123.44	46.82	50.03	3/17/08 10:19	3789:38:00	3789:36:30	3789:10:30	61.55999783	
-7	67	993	-0.0002	526.67	14.402	-0.000239129	-6.77	0.039434836	1116.67	46.54	49.75	3/24/08 8:44	3956:03:00	3956:01:30	3955:35:30	62.89713825	
14	67	990	0.00049	526.67	14.359	0.000476813	13.50	0.039911649	1130.17	47.10	50.31	3/27/08 13:37	4032:56:00	4032:54:30	4032:28:30	63.50538035	
1030.95	67	970	0.03641	526.67	14.069	0.03440286	974.18	0.07431451	2104.34	87.70	90.91	3/27/08 13:37	4032:56:00	4032:54:30	4032:28:30	63.50538035	residual gas calc.

DECANISTERED 3/27/2008; sample dried for 41 days in air; 331.04 grams placed in ball mill (403.49 cc @ STP desorbed), proportional to 974.18 cc @ STP for 799.26 grams (wet wt.) for entire sample

SAMPLE: 486' 8.5" to 487' 10" ("V shale") core in SSD canister L6
NOTES: black shale, with lenses of disseminated pyrite, crumbly in two or three very thin (2 cm) zones, otherwise not fractured
density = 2.18 gr/cc; KGS simple moisture = 0.71% (as received); KGS simple ash content = 85.26% (moisture-free)

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)	
dry sample weight:	3.071	1393.12	wet sample weight:	3.451	1565.20	10.99%		17		off bottom	at surface	in canister	21.9	minutes
										10/11/07 13:15	10/11/07 13:17	10/11/07 13:37	0.365	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			0.604382145 SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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	67	984	0.00049	526.67	14.272	0.000473924	13.42	0.000473924	13.42	0.31	0.70	10/11/07 14:20	1:04:40	1:03:15	0:42:45	1.038160767	
8	68	983	0.00028	527.67	14.257	0.000270026	7.65	0.000743949	21.07	0.48	0.88	10/11/07 15:09	1:53:25	1:52:00	1:31:30	1.374873732	
-1	68	983	-4E-05	527.67	14.257	-3.37532E-05	-0.96	0.000710196	20.11	0.46	0.85	10/11/07 16:44	3:28:10	3:26:45	3:06:15	1.862644476	
43	70	976	0.00152	529.67	14.156	0.001435611	40.65	0.002145807	60.76	1.40	1.79	10/13/07 17:52	52:36:10	52:34:45	52:14:15	7.252777246	back at lab
21	69	978	0.00074	528.67	14.185	0.000703878	19.93	0.002849685	80.69	1.86	2.25	10/15/07 21:01	103:45:10	103:43:45	103:23:15	10.18591075	
16	68	968	0.00057	527.67	14.040	0.00053181	15.06	0.003381495	95.75	2.20	2.59	10/17/07 13:16	144:00:10	143:58:45	143:38:15	12.00011574	
4	68	984	0.00014	527.67	14.272	0.00013515	3.83	0.003516645	99.58	2.29	2.68	10/23/07 22:19	297:03:10	297:01:45	296:41:15	17.23521911	
-2	67	993	-7E-05	526.67	14.402	-6.83226E-05	-1.93	0.003448322	97.65	2.25	2.64	10/29/07 16:24	435:08:10	435:06:45	434:46:15	20.85991637	
2	68	988	7.1E-05	527.67	14.330	6.78498E-05	1.92	0.003516172	99.57	2.29	2.68	10/31/07 11:19	478:03:10	478:01:45	477:41:15	21.86441808	
0	68	987	0	527.67	14.315	0	0.00	0.003516172	99.57	2.29	2.68	11/5/07 11:33	598:17:10	598:15:45	597:55:15	24.4598878	
0	70	993	0	529.67	14.402	0	0.00	0.003516172	99.57	2.29	2.68	11/7/07 10:46	645:30:10	645:28:45	645:08:15	25.4067467	
89.60	73	984	0.00316	532.67	14.272	0.002998946	84.92	0.006515118	184.49	4.24	4.63	11/7/07 10:46	645:30:10	645:28:45	645:08:15	25.4067467	residual gas calc.

DECANISTERED 11/07/2007; sample dried for 90 days in air; 393.06 grams placed in ball mill (23.96 cc @ STP desorbed), proportional to 84.92 cc @ STP for 1393.12 grams (dry wt.) for entire sample

SAMPLE: 495' 6" to 496' 0.5" (Croweburg coal) core in SSD canister L7
NOTES: very crumbly coal, with minor mineralization in fractures, cleat spacing at 1/2 cm
density = 1.48 gr/cc; KGS simple moisture = 2.54% (as received); KGS simple ash content = 17.74% (moisture-free)
PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	11112	11568	13986
Sulfur	9.39%	9.77%	
Moisture	3.95%		
Ash	16.60%	17.29%	
Volatile Matter	31.61%	32.91%	
Fixed Carbon	47.84%	49.80%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)	
dry sample weight:	1.039	471.32	wet sample weight:	1.094	496.38	5.05%		40		off bottom	at surface	in canister	25.2	minutes
										10/11/07 14:04	10/11/07 14:06	10/11/07 14:30	0.421	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			0.648716682 SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)	
8	68	984	0.00028	527.67	14.272	0.0002703	7.65	0.0002703	7.65	0.52	3.24	10/11/07 14:35	0:31:00	0:29:30	0:05:45	0.718795288	
10	68	984	0.00035	527.67	14.272	0.000337875	9.57	0.000608176	17.22	1.17	3.89	10/11/07 14:49	0:44:15	0:42:45	0:19:00	0.858778202	
2	68	984	7.1E-05	527.67	14.272	6.75751E-05	1.91	0.000675751	19.14	1.30	4.02	10/11/07 14:53	0:48:15	0:46:45	0:23:00	0.896753403	
5	68	984	0.00018	527.67	14.272	0.000168938	4.78	0.000844688	23.92	1.63	4.34	10/11/07 15:01	0:56:30	0:55:00	0:31:15	0.970395108	
3	68	983	0.00011	527.67	14.257	0.00010126	2.87	0.000945948	26.79	1.82	4.54	10/11/07 15:08	1:03:15	1:01:45	0:38:00	1.026726189	
8	68	983	0.00028	527.67	14.257	0.000270026	7.65	0.001215974	34.43	2.34	5.06	10/11/07 15:26	1:21:45	1:20:15	0:56:30	1.167261753	
5	68	983	0.00018	527.67	14.257	0.000168766	4.78	0.001384739	39.21	2.67	5.38	10/11/07 16:44	2:39:15	2:37:45	2:14:00	1.629161338	
134	70	976	0.00473	529.67	14.156	0.004473764	126.68	0.005858503	165.89	11.28	14.00	10/13/07 17:52	51:47:15	51:45:45	51:22:00	7.196353243	back at lab
67	69	978	0.00237	528.67	14.185	0.002245705	63.59	0.008104209	229.48	15.60	18.32	10/15/07 21:02	102:57:15	102:55:45	102:32:00	10.14663327	
41	68	968	0.00145	527.67	14.040	0.001362764	38.59	0.009466972	268.07	18.22	20.94	10/17/07 13:18	143:13:15	143:11:45	142:48:00	11.96749069	
50	68	984	0.00177	527.67	14.272	0.001689377	47.84	0.011156349	315.91	21.47	24.19	10/23/07 22:20	296:15:15	296:13:45	295:50:00	17.21203552	
32	67	993	0.00113	526.67	14.402	0.001093162	30.95	0.012249511	346.87	23.58	26.30	10/29/07 16:26	434:21:15	434:19:45	433:56:00	20.84116519	
16	68	988	0.00057	527.67	14.330	0.000542798	15.37	0.012792309	362.24	24.62	27.34	10/31/07 11:18	477:13:15	477:11:45	476:48:00	21.84538471	
26	68	987	0.00092	527.67	14.315	0.000881154	24.95	0.013673463	387.19	26.32	29.04	11/5/07 11:34	597:29:15	597:27:45	597:04:00	24.44355743	
9	70	993	0.00032	529.67	14.402	0.00030571	8.66	0.013979174	395.84	26.91	29.63	11/7/07 10:47	644:42:15	644:40:45	644:17:00	25.39102532	

24	68	993	0.00085	527.67	14.402	0.000818318	23.17	0.014797491	419.02	28.48	31.20	11/15/07 9:54	835:49:15	835:47:45	835:24:00	28.91056612	
29	67	990	0.00102	526.67	14.359	0.000987685	27.97	0.015785176	446.98	30.38	33.10	11/24/07 20:17	1062:12:15	1062:10:45	1061:47:00	32.59147383	
15	67	982	0.00053	526.67	14.243	0.000506743	14.35	0.016291919	461.33	31.36	34.08	11/28/07 10:33	1148:28:15	1148:26:45	1148:03:00	33.88909608	
16	67	986	0.00057	526.67	14.301	0.000542728	15.37	0.016834647	476.70	32.40	35.12	12/7/07 11:44	1365:39:15	1365:37:45	1365:14:00	36.95475838	
5	67	991	0.00018	526.67	14.373	0.000170463	4.83	0.01700511	481.53	32.73	35.45	12/12/07 13:17	1487:12:15	1487:10:45	1486:47:00	38.56428616	
21	69	977	0.00074	528.67	14.170	0.000703158	19.91	0.017708268	501.44	34.08	36.80	12/20/07 9:38	1675:33:15	1675:31:45	1675:08:00	40.93353352	
7	67	986	0.00025	526.67	14.301	0.000237443	6.72	0.017945711	508.16	34.54	37.26	12/27/07 10:19	1844:14:15	1844:12:45	1843:49:00	42.94458639	
-7	67	1012	-0.0002	526.67	14.678	-0.000243705	-6.90	0.017702006	501.26	34.07	36.79	1/2/08 10:37	1988:32:15	1988:30:45	1988:07:00	44.59302075	
33	67	974	0.00117	526.67	14.127	0.001105753	31.31	0.018807759	532.57	36.20	38.92	1/7/08 10:56	2108:51:15	2108:49:45	2108:26:00	45.92226221	
6	67	981	0.00021	526.67	14.228	0.000202491	5.73	0.01901025	538.31	36.59	39.31	1/15/08 13:35	2303:30:15	2303:28:45	2303:05:00	47.99483479	
4	67	986	0.00014	526.67	14.301	0.000135682	3.84	0.019145932	542.15	36.85	39.57	1/23/08 11:16	2493:11:15	2493:09:45	2492:46:00	49.93182853	
18	67	967	0.00064	526.67	14.025	0.000598803	16.96	0.019744736	559.11	38.00	40.72	1/28/08 9:13	2611:08:15	2611:06:45	2610:43:00	51.0992906	
6	67	969	0.00021	526.67	14.054	0.000200014	5.66	0.01994475	564.77	38.39	41.11	2/4/08 10:29	2780:24:15	2780:22:45	2779:59:00	52.7295379	
-6	67	983	-0.0002	526.67	14.257	-0.000202904	-5.75	0.019741846	559.02	38.00	40.72	2/11/08 14:45	2952:40:15	2952:38:45	2952:15:00	54.33848391	
6	67	981	0.00021	526.67	14.228	0.000202491	5.73	0.019944337	564.76	38.39	41.11	2/18/08 8:51	3114:46:15	3114:44:45	3114:21:00	55.810132	
14	67	969	0.00049	526.67	14.054	0.000466699	13.22	0.020411036	577.97	39.29	42.01	2/25/08 9:22	3283:17:15	3283:15:45	3282:52:00	57.29997818	
-3	67	987	-0.0001	526.67	14.315	-0.000101865	-2.88	0.020309171	575.09	39.09	41.81	3/3/08 10:32	3452:27:15	3452:25:45	3452:02:00	58.75758816	
-4	67	998	-0.0001	526.67	14.475	-0.000137333	-3.89	0.020171838	571.20	38.83	41.55	3/10/08 9:02	3618:57:15	3618:55:45	3618:32:00	60.15774403	
15	67	982	0.00053	526.67	14.243	0.000506743	14.35	0.020678581	585.55	39.80	42.52	3/17/08 10:20	3788:15:15	3788:13:45	3787:50:00	61.54879501	
-2	67	993	-7E-05	526.67	14.402	-6.83226E-05	-1.93	0.020610259	583.62	39.67	42.39	3/24/08 8:45	3954:40:15	3954:38:45	3954:15:00	62.88617363	
5	67	990	0.00018	526.67	14.359	0.00017029	4.82	0.020780549	588.44	40.00	42.72	3/28/08 13:38	4055:33:15	4055:31:45	4055:08:00	63.68323301	
247.26	67	994	0.00873	526.67	14.417	0.008455231	239.42	0.02923578	827.86	56.27	58.99	3/28/08 13:38	4055:33:15	4055:31:45	4055:08:00	63.68323301	residual gas calc.

DECANISTERED 3/28/2008; sample dried for 40 days in air; 230.88 grams placed in ball mill (111.36 cc @ STP desorbed), proportional to 239.42 cc @ STP for 496.38 grams (wet wt.) for entire sample

SAMPLE: 556' 1" to 557' 7" (Weir-Pittsburg coal) core in SSD canister L8
NOTES: very crumbly coal, only a 1" coherent segment
density = 1.32 gr/cc; KGS simple moisture = 0.96% (as received); KGS simple ash content = 13.30% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	12525	12883	14815
Sulfur	4.28%	4.40%	
Moisture	2.77%		
Ash	12.68%	13.04%	
Volatile Matter	38.12%	39.21%	
Fixed Carbon	46.43%	47.75%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =	192
dry sample weight:	2.396	1086.75	wet sample weight:	2.467	1118.99	2.88%			

TIME OF: | off bottom | at surface | in canister
10/12/07 9:08 | 10/12/07 9:10 | 10/12/07 10:05

elapsed time (off bottom to canistering) 56.8 minutes; 0.946 hours; 0.972539631 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	temp (R)	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)
8	66	984	0.00028	525.67	14.272	0.000271329	7.68	0.000271329	7.68	0.23	5.89	10/12/07 10:10	1:02:00	1:00:30	0:05:15	1.016530045
3	66	984	0.00011	525.67	14.272	0.000101748	2.88	0.000373077	10.56	0.31	5.97	10/12/07 10:12	1:03:45	1:02:15	0:07:00	1.030776406
4	66	984	0.00014	525.67	14.272	0.000135664	3.84	0.000508741	14.41	0.42	6.08	10/12/07 10:15	1:06:30	1:05:00	0:09:45	1.052774113
11	66	984	0.00039	525.67	14.272	0.000373077	10.56	0.000881818	24.97	0.74	6.40	10/12/07 10:23	1:14:45	1:13:15	0:18:00	1.116169043
5	66	984	0.00018	525.67	14.272	0.00016958	4.80	0.001051399	29.77	0.88	6.54	10/12/07 10:27	1:18:45	1:17:15	0:22:00	1.145643924
4	66	984	0.00014	525.67	14.272	0.000135664	3.84	0.001187063	33.61	0.99	6.65	10/12/07 10:30	1:22:00	1:20:30	0:25:15	1.169045194
13	66	984	0.00046	525.67	14.272	0.000440909	12.49	0.001627972	46.10	1.36	7.02	10/12/07 10:41	1:33:00	1:31:30	0:36:15	1.24498996
37	66	984	0.00131	525.67	14.272	0.001254895	35.53	0.002882867	81.63	2.41	8.07	10/12/07 11:12	2:04:15	2:02:45	1:07:30	1.439039031
5	65	984	0.00018	524.67	14.272	0.000169904	4.81	0.003052771	86.44	2.55	8.21	10/12/07 11:18	2:09:30	2:08:00	1:12:45	1.469126725
21	65	984	0.00074	524.67	14.272	0.000713595	20.21	0.003766366	106.65	3.14	8.80	10/12/07 11:42	2:33:30	2:32:00	1:36:45	1.599479082
30	65	984	0.00106	524.67	14.272	0.001019422	28.87	0.004785788	135.52	4.00	9.66	10/12/07 12:12	3:03:30	3:02:00	2:06:45	1.748809119
75	66	983	0.00265	525.67	14.257	0.002541121	71.96	0.007326909	207.47	6.12	11.78	10/12/07 13:15	4:06:30	4:05:00	3:09:45	2.026902399
48	66	983	0.0017	525.67	14.257	0.001626318	46.05	0.008953227	253.53	7.47	13.13	10/12/07 14:15	5:06:30	5:05:00	4:09:45	2.260162236
39	66	983	0.00138	525.67	14.257	0.001321383	37.42	0.01027461	290.94	8.58	14.24	10/12/07 15:23	6:15:15	6:13:45	5:18:30	2.500833194
27	66	983	0.00095	525.67	14.257	0.000914804	25.90	0.011189413	316.85	9.34	15.00	10/12/07 16:17	7:09:15	7:07:45	6:12:30	2.6747274
19	66	983	0.00067	525.67	14.257	0.000643751	18.23	0.011833164	335.08	9.88	15.54	10/12/07 17:15	8:06:45	8:05:15	7:10:00	2.848245074
269	70	976	0.0095	529.67	14.156	0.008980914	254.31	0.020814078	589.39	17.37	23.04	10/13/07 17:55	32:46:30	32:45:00	31:49:45	5.724945415	back at lab
339	69	978	0.01197	528.67	14.185	0.011362599	321.75	0.032176677	911.14	26.86	32.52	10/15/07 21:03	83:54:30	83:53:00	82:57:45	9.160149198	
200	68	968	0.00706	527.67	14.040	0.006647629	188.24	0.038824305	1099.38	32.41	38.07	10/17/07 13:20	124:11:30	124:10:00	123:14:45	11.14413149	
296	68	984	0.01045	527.67	14.272	0.01000111	283.20	0.048825415	1382.58	40.76	46.42	10/23/07 22:21	277:12:30	277:11:00	276:15:45	16.64957457	

163	68	988	0.00576	527.67	14.330	0.005529756	156.58	0.054355171	1539.16	45.37	51.03	10/31/07 11:00	457:51:30	457:50:00	456:54:45	21.39762448	gas sampled
198	70	993	0.00699	529.67	14.402	0.006725628	190.45	0.061080799	1729.61	50.99	56.65	11/7/07 10:24	625:15:30	625:14:00	624:18:45	25.00516613	gas sampled
146	68	980	0.00516	527.67	14.214	0.004912927	139.12	0.065993726	1868.73	55.09	60.75	11/13/07 11:56	770:47:30	770:46:00	769:50:45	27.76313503	
21	68	993	0.00074	527.67	14.402	0.000716028	20.28	0.066709754	1889.00	55.69	61.35	11/15/07 9:54	816:45:30	816:44:00	815:48:45	28.57898412	
147	67	990	0.00519	526.67	14.359	0.005006541	141.77	0.071716295	2030.77	59.87	65.53	11/24/07 20:17	1043:08:30	1043:07:00	1042:11:45	32.29770374	
68	67	982	0.0024	526.67	14.243	0.002297236	65.05	0.074013531	2095.82	61.78	67.44	11/28/07 10:33	1129:24:30	1129:23:00	1128:27:45	33.60667096	
102	67	986	0.0036	526.67	14.301	0.00345989	97.97	0.077473421	2193.79	64.67	70.33	12/7/07 11:45	1346:36:30	1346:35:00	1345:39:45	36.69616238	
46	67	991	0.00162	526.67	14.373	0.001568255	44.41	0.079041676	2238.20	65.98	71.64	12/12/07 13:18	1468:09:30	1468:08:00	1467:12:45	38.3165543	
87	69	977	0.00307	528.67	14.170	0.002913084	82.49	0.081954759	2320.69	68.41	74.07	12/20/07 9:39	1656:30:30	1656:29:00	1655:33:45	40.70022522	
43	67	986	0.00152	526.67	14.301	0.001458581	41.30	0.083413341	2361.99	69.63	75.29	12/27/07 10:21	1825:12:30	1825:11:00	1824:15:45	42.72245701	
-1	67	1012	-4E-05	526.67	14.678	-3.48149E-05	-0.99	0.083378526	2361.01	69.60	75.26	1/2/08 10:38	1969:29:30	1969:28:00	1968:32:45	44.37895522	
98	67	974	0.00346	526.67	14.127	0.003283751	92.99	0.086662277	2453.99	72.34	78.00	1/7/08 10:57	2089:48:30	2089:47:00	2088:51:45	45.7144215	
44	67	981	0.00155	526.67	14.228	0.001484933	42.05	0.08814721	2496.04	73.58	79.24	1/15/08 13:36	2284:27:30	2284:26:00	2283:30:45	47.7960075	
36	67	986	0.00127	526.67	14.301	0.001221138	34.58	0.089368348	2530.62	74.60	80.26	1/23/08 11:17	2474:08:30	2474:07:00	2473:11:45	49.74074453	
58	67	967	0.00205	526.67	14.025	0.001929477	54.64	0.091297825	2585.26	76.21	81.87	1/28/08 9:14	2592:05:30	2592:04:00	2591:08:45	50.91258849	
37	67	969	0.00131	526.67	14.054	0.001233419	34.93	0.092531244	2620.18	77.24	82.90	2/4/08 10:30	2761:21:30	2761:20:00	2760:24:45	52.54862827	
0	67	983	0	526.67	14.257	0	0.00	0.092531244	2620.18	77.24	82.90	2/11/08 14:46	2933:37:30	2933:36:00	2932:40:45	54.16294859	
34	67	981	0.0012	526.67	14.228	0.001147448	32.49	0.093678693	2652.68	78.20	83.86	2/18/08 8:51	3095:42:30	3095:41:00	3094:45:45	55.63908998	
52	67	969	0.00184	526.67	14.054	0.001733454	49.09	0.095412147	2701.76	79.65	85.31	2/25/08 0:23	3255:14:30	3255:13:00	3254:17:45	57.05472519	
2	67	987	7.1E-05	526.67	14.315	6.79098E-05	1.92	0.095480056	2703.68	79.70	85.36	3/3/08 10:32	3433:23:30	3433:22:00	3432:26:45	58.59515054	
2	67	998	7.1E-05	526.67	14.475	6.86666E-05	1.94	0.095548723	2705.63	79.76	85.42	3/10/08 9:02	3599:53:30	3599:52:00	3598:56:45	59.99909722	
51	67	982	0.0018	526.67	14.243	0.001722927	48.79	0.09727165	2754.42	81.20	86.86	3/17/08 10:21	3769:12:30	3769:11:00	3768:15:45	61.39387863	
7	67	993	0.00025	526.67	14.402	0.000239129	6.77	0.097510779	2761.19	81.40	87.06	3/24/08 8:46	3935:37:30	3935:36:00	3934:40:45	62.73455985	
65	66	970	0.0023	525.67	14.069	0.00217318	61.54	0.099683959	2822.72	83.21	88.87	3/31/08 9:49	4104:40:30	4104:39:00	4103:43:45	64.06773759	
4	67	986	0.00014	526.67	14.301	0.000135682	3.84	0.099819641	2826.57	83.33	88.99	4/7/08 8:24	4271:15:30	4271:14:00	4270:18:45	65.35486465	
5	67	994	0.00018	526.67	14.417	0.000170979	4.84	0.09999062	2831.41	83.47	89.13	4/14/08 8:20	4439:11:30	4439:10:00	4438:14:45	66.62725919	
30	61	987	0.00106	520.67	14.315	0.001030385	29.18	0.101021005	2860.59	84.33	89.99	4/28/08 9:36	4776:27:30	4776:26:00	4775:30:45	69.11192613	
11	61	986	0.00039	520.67	14.301	0.000377425	10.69	0.10139843	2871.27	84.64	90.30	5/5/08 8:24	4943:15:30	4943:14:00	4942:18:45	70.30830913	
33	62	980	0.00117	521.67	14.214	0.001123228	31.81	0.102521658	2903.08	85.58	91.24	5/12/08 9:03	5111:54:30	5111:53:00	5110:57:45	71.49761068	
44	63	965	0.00155	522.67	13.996	0.001471893	41.68	0.103993551	2944.76	86.81	92.47	5/19/08 9:16	5280:07:30	5280:06:00	5279:10:45	72.66446862	
1712.56	66	971	0.06048	525.67	14.083	0.057315968	1623.00	0.161309519	4567.76	134.66	140.32	5/19/08 9:16	5280:07:30	5280:06:00	5279:10:45	72.66446862	residual gas calc.

DECANISTERED 5/19/2008; sample dried for 20 days in air; 457.38 grams placed in ball mill (663.39 cc @ STP desorbed), proportional to 1623.00 cc @ STP for 1118.99 grams (wet wt.) for entire sample

SAMPLE: 561' 9.5" to 563' 6" (shale in Weir Fm.) core in SSD canister L9
NOTES: dark shale, easily broken along bedding planes, with 3"-thick smutty coaly layer (coherent) in middle
density = 2.11 gr/cc; KGS simple moisture = 0.92% (as received); KGS simple ash content = 50.66% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	5360	5445	10934
Sulfur	13.60%	13.81%	
Moisture	1.56%		
Ash	49.42%	50.20%	
Volatile Matter	23.99%	24.37%	
Fixed Carbon	25.03%	25.43%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	4.106	1862.47	wet sample weight:	4.311	1955.23	4.74%		103		off bottom	at surface	in canister	22.5 minutes
										10/12/07 9:33	10/12/07 9:34	10/12/07 9:55	0.375 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			0.612372436 SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)
6	66	984	0.00021	525.67	14.272	0.000203497	5.76	0.000203497	5.76	0.10	1.87	10/12/07 9:58	0:25:00	0:23:15	0:02:30	0.645497224
4	66	984	0.00014	525.67	14.272	0.000135664	3.84	0.000339161	9.60	0.17	1.94	10/12/07 10:00	0:27:30	0:25:45	0:05:00	0.6770032
18	66	984	0.00064	525.67	14.272	0.00061049	17.29	0.00094965	26.89	0.46	2.23	10/12/07 10:07	0:34:45	0:33:00	0:12:15	0.761030004
2	66	984	7.1E-05	525.67	14.272	6.78322E-05	1.92	0.001017483	28.81	0.50	2.27	10/12/07 10:09	0:36:15	0:34:30	0:13:45	0.777281588
31	66	984	0.00109	525.67	14.272	0.001051399	29.77	0.002068881	58.58	1.01	2.78	10/12/07 10:29	0:56:00	0:54:15	0:33:30	0.966091783
65	65	983	0.0023	524.67	14.257	0.002206503	62.48	0.004275384	121.06	2.08	3.85	10/12/07 11:20	1:47:15	1:45:30	1:24:45	1.336974196
20	65	983	0.00071	524.67	14.257	0.000678924	19.22	0.004954308	140.29	2.41	4.18	10/12/07 11:40	2:07:45	2:06:00	1:45:15	1.459166429
35	65	983	0.00124	524.67	14.257	0.001188117	33.64	0.006142424	173.93	2.99	4.76	10/12/07 12:17	2:44:00	2:42:15	2:21:30	1.653279569
47	66	983	0.00166	525.67	14.257	0.001592436	45.09	0.00773486	219.03	3.77	5.54	10/12/07 13:19	3:46:00	3:44:15	3:23:30	1.940790217
47	66	983	0.00166	525.67	14.257	0.001592436	45.09	0.009327296	264.12	4.54	6.31	10/12/07 14:17	4:44:00	4:42:15	4:21:30	2.175622516
42	66	983	0.00148	525.67	14.257	0.001423028	40.30	0.010750324	304.41	5.24	7.01	10/12/07 15:26	5:53:00	5:51:15	5:30:30	2.425558355

27	66	983	0.00095	525.67	14.257	0.000914804	25.90	0.011665128	330.32	5.68	7.45	10/12/07 16:19	6:46:00	6:44:15	6:23:30	2.601281735	
20	66	983	0.00071	525.67	14.257	0.000677632	19.19	0.01234276	349.51	6.01	7.78	10/12/07 17:17	7:44:00	7:42:15	7:21:30	2.780887149	
265	70	976	0.00936	529.67	14.156	0.008847368	250.53	0.021190129	600.04	10.32	12.09	10/13/07 17:59	32:26:00	32:24:15	32:03:30	5.69502707	back at lab
252	69	978	0.0089	528.67	14.185	0.008446534	239.18	0.029636662	839.21	14.44	16.21	10/15/07 21:06	83:33:00	83:31:15	83:10:30	9.14056891	
128	68	968	0.00452	527.67	14.040	0.004254482	120.47	0.033891145	959.69	16.51	18.28	10/17/07 13:23	123:50:00	123:48:15	123:27:30	11.12804266	
164	68	984	0.00579	527.67	14.272	0.005541156	156.91	0.0394323	1116.59	19.21	20.98	10/23/07 22:24	276:51:00	276:49:15	276:28:30	16.63881005	
130	68	988	0.00459	527.67	14.330	0.004410235	124.88	0.043842535	1241.48	21.36	23.13	10/31/07 10:55	457:22:00	457:20:15	456:59:30	21.38613258	gas sampled
80	70	993	0.00283	529.67	14.402	0.002717426	76.95	0.04655996	1318.43	22.68	24.45	11/7/07 10:30	624:57:00	624:55:15	624:34:30	24.99899998	gas sampled
149	68	993	0.00526	527.67	14.402	0.005080388	143.86	0.051640349	1462.29	25.15	26.93	11/15/07 9:38	816:05:00	816:03:15	815:42:30	28.5671723	gas sampled
87	67	990	0.00307	526.67	14.359	0.002963055	83.90	0.054603403	1546.19	26.60	28.37	11/24/07 20:18	1042:45:00	1042:43:15	1042:22:30	32.29163978	
36	67	982	0.00127	526.67	14.243	0.001216184	34.44	0.055819587	1580.63	27.19	28.96	11/28/07 10:34	1129:01:00	1128:59:15	1128:38:30	33.60084324	
43	67	986	0.00152	526.67	14.301	0.001458581	41.30	0.057278168	1621.93	27.90	29.67	12/7/07 11:46	1346:13:00	1346:11:15	1345:50:30	36.69082537	
12	67	991	0.00042	526.67	14.373	0.00040911	11.58	0.057687278	1633.52	28.10	29.87	12/12/07 13:19	1467:46:00	1467:44:15	1467:23:30	38.31144303	
52	69	977	0.00184	528.67	14.170	0.001741153	49.30	0.059428432	1682.82	28.95	30.72	12/20/07 9:40	1656:07:00	1656:05:15	1655:44:30	40.69541334	
12	67	986	0.00042	526.67	14.301	0.000407046	11.53	0.059835477	1694.35	29.15	30.92	12/27/07 10:22	1824:49:00	1824:47:15	1824:26:30	42.71787292	
0	67	1012	0	526.67	14.678	0	0.00	0.059835477	1694.35	29.15	30.92	1/2/08 10:39	1969:06:00	1969:04:15	1968:43:30	44.37454225	
24	67	974	0.00085	526.67	14.127	0.000804184	22.77	0.060639661	1717.12	29.54	31.31	1/7/08 10:58	2089:25:00	2089:23:15	2089:02:30	45.71013746	
-43	67	981	-0.0015	526.67	14.228	-0.001451185	-41.09	0.059188477	1676.02	28.83	30.60	1/15/08 13:37	2284:04:00	2284:02:15	2283:41:30	47.79191005	
-28	67	986	-0.001	526.67	14.301	-0.000949774	-26.89	0.058238703	1649.13	28.37	30.14	1/23/08 11:18	2473:45:00	2473:43:15	2473:22:30	49.7368073	
24	67	967	0.00085	526.67	14.025	0.000798404	22.61	0.059037107	1671.74	28.76	30.53	1/28/08 9:16	2591:43:00	2591:41:15	2591:20:30	50.90890557	
-3	67	969	-0.0001	526.67	14.054	-0.000100007	-2.83	0.0589371	1668.91	28.71	30.48	2/4/08 10:31	2760:58:00	2760:56:15	2760:35:30	52.54490143	
-2	67	979	-7E-05	526.67	14.199	-6.73594E-05	-1.91	0.058869741	1667.00	28.67	30.45	2/7/08 13:30	2835:57:00	2835:55:15	2835:34:30	53.25363837	
301.75	67	979	0.01066	526.67	14.199	0.010162842	287.78	0.069032583	1954.78	33.62	35.40	2/7/08 13:30	2835:57:00	2835:55:15	2835:34:30	53.25363837	residual gas calc.

DECANISTERED 2/07/2008; sample dried for 37 days in air; 529.14 grams placed in ball mill (77.88 cc @ STP desorbed), proportional to 287.78 cc @ STP for 1955.23 grams (wet wt.) for entire sample

TABLE 3 -- Desorption measurements for Petron Resources #1-21 Cockrell, SW SW SW 21-44N-32W, Cass Co., MO

SAMPLE: 344' 7" to 345' 2" (Croweburg coal) core in SSD canister C1
NOTES: coal breaks into 1" to 2" fragments, no cleat evident
density = 1.27 gr/cc; KGS simple moisture = 4.01% (as received); KGS simple ash content = 23.74% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	10320	10882	13926
Sulfur	4.81%	5.07%	
Moisture	5.17%		
Ash	20.73%	21.86%	
Volatile Matter	33.84%	35.68%	
Fixed Carbon	40.26%	42.46%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =
dry sample weight:	0.723	327.99	wet sample weight:	0.825	374.38	12.39%		24

TIME OF: off bottom 10/26/07 14:16 | at surface 10/26/07 14:17 | in canister 10/26/07 14:38
elapsed time (off bottom to canistering): 22.3 minutes = 0.371 hours = 0.608960864 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	temp (R)	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	67	989	7.1E-05	526.67	14.344	6.80474E-05	1.93		6.80474E-05	1.93	0.19	2.53	10/26/07 14:41	0:24:45	0:23:40	0:02:30	0.642261629	
3	67	988	0.00011	526.67	14.330	0.000101968	2.89		0.000170015	4.81	0.47	2.81	10/26/07 14:44	0:28:00	0:26:55	0:05:45	0.683130051	
3	67	988	0.00011	526.67	14.330	0.000101968	2.89		0.000271983	7.70	0.75	3.10	10/26/07 14:48	0:32:30	0:31:25	0:10:15	0.735980072	
1	67	988	3.5E-05	526.67	14.330	3.39893E-05	0.96		0.000305972	8.66	0.85	3.19	10/26/07 14:51	0:35:30	0:34:25	0:13:15	0.769198717	
3	67	988	0.00011	526.67	14.330	0.000101968	2.89		0.00040794	11.55	1.13	3.47	10/26/07 15:01	0:45:30	0:44:25	0:23:15	0.870823365	
3	68	988	0.00011	527.67	14.330	0.000101775	2.88		0.000509715	14.43	1.41	3.75	10/26/07 15:07	0:51:15	0:50:10	0:29:00	0.924211376	
4	69	989	0.00014	528.67	14.344	0.00013558	3.84		0.000645295	18.27	1.78	4.13	10/26/07 15:16	1:00:30	0:59:25	0:38:15	1.004158022	
4	69	989	0.00014	528.67	14.344	0.00013558	3.84		0.000780875	22.11	2.16	4.50	10/26/07 15:23	1:07:15	1:06:10	0:45:00	1.058694164	
2	69	989	7.1E-05	528.67	14.344	6.779E-05	1.92		0.000848665	24.03	2.35	4.69	10/26/07 15:32	1:16:30	1:15:25	0:54:15	1.129158979	
3	70	989	0.00011	529.67	14.344	0.000101493	2.87		0.000950158	26.91	2.63	4.97	10/26/07 15:42	1:26:15	1:25:10	1:04:00	1.198957881	
2	70	989	7.1E-05	529.67	14.344	6.7662E-05	1.92		0.00101782	28.82	2.82	5.16	10/26/07 15:55	1:39:30	1:38:25	1:17:15	1.287762918	
2	70	989	7.1E-05	529.67	14.344	6.7662E-05	1.92		0.001085482	30.74	3.00	5.35	10/26/07 16:03	1:47:30	1:46:25	1:25:15	1.338531534	
3	70	989	0.00011	529.67	14.344	0.000101493	2.87		0.001186975	33.61	3.28	5.63	10/26/07 16:13	1:57:00	1:55:55	1:34:45	1.396424004	
5	70	989	0.00018	529.67	14.344	0.000169155	4.79		0.00135613	38.40	3.75	6.10	10/26/07 16:45	2:28:45	2:27:40	2:06:30	1.574536969	
65	70	992	0.0023	529.67	14.388	0.002205685	62.46		0.003561814	100.86	9.85	12.20	10/27/07 6:58	16:41:45	16:40:40	16:19:30	4.086053516	back at lab
39	67	999	0.00138	526.67	14.489	0.001340341	37.95		0.004902155	138.81	13.56	15.90	10/27/07 19:07	28:50:45	28:49:40	28:28:30	5.370831717	
83	67	993	0.00293	526.67	14.402	0.002835388	80.29		0.007737544	219.10	21.40	23.75	10/29/07 16:27	74:10:45	74:09:40	73:48:30	8.612732822	
142	68	987	0.00501	527.67	14.315	0.004812457	136.27		0.012550001	355.38	34.71	37.06	11/5/07 11:11	236:54:45	236:53:40	236:32:30	15.39196219	gas sampled
95	68	993	0.00335	527.67	14.402	0.003239174	91.72		0.015789175	447.10	43.67	46.02	11/15/07 9:38	475:21:45	475:20:40	474:59:30	21.80280945	gas sampled
87	67	988	0.00307	526.67	14.330	0.002957069	83.73		0.018746244	530.83	51.85	54.19	11/26/07 11:01	740:44:45	740:43:40	740:22:30	27.21664625	gas sampled
16	67	982	0.00057	526.67	14.243	0.000540526	15.31		0.01928677	546.14	53.35	55.69	11/28/07 10:34	788:17:45	788:16:40	787:55:30	28.07660651	
29	67	986	0.00102	526.67	14.301	0.000983694	27.86		0.020270464	573.99	56.07	58.41	12/7/07 11:46	1005:29:45	1005:28:40	1005:07:30	31.70955429	
4	67	993	0.00014	526.67	14.402	0.000136645	3.87		0.020407109	577.86	56.44	58.79	12/10/07 10:13	1075:56:45	1075:55:40	1075:34:30	32.80161327	
10	67	991	0.00035	526.67	14.373	0.000340925	9.65		0.020748034	587.52	57.39	59.73	12/12/07 13:20	1127:03:45	1127:02:40	1126:41:30	33.57175152	
4	67	993	0.00014	526.67	14.402	0.000136645	3.87		0.020884679	591.39	57.76	60.11	12/14/07 9:57	1171:40:45	1171:39:40	1171:18:30	34.2297994	
25	69	977	0.00088	528.67	14.170	0.000837093	23.70		0.021721772	615.09	60.08	62.42	12/20/07 9:43	1315:26:45	1315:25:40	1315:04:30	36.26907544	
12	67	986	0.00042	526.67	14.301	0.000407046	11.53		0.022128818	626.62	61.21	63.55	12/27/07 10:22	1484:05:45	1484:04:40	1483:43:30	38.5239644	
-5	67	1012	-0.0002	526.67	14.678	-0.000174075	-4.93		0.021954744	621.69	60.72	63.07	1/2/08 10:41	1628:24:45	1628:23:40	1628:02:30	40.3535934	
34	67	974	0.0012	526.67	14.127	0.001139261	32.26		0.023094004	653.95	63.88	66.22	1/7/08 11:00	1748:43:45	1748:42:40	1748:21:30	41.8178092	
12	67	981	0.00042	526.67	14.228	0.000404982	11.47		0.023498986	665.41	65.00	67.34	1/15/08 13:38	1943:21:45	1943:20:40	1942:59:30	44.08358538	
6	67	986	0.00021	526.67	14.301	0.000203523	5.76		0.023702509	671.18	65.56	67.90	1/23/08 11:20	2133:03:45	2133:02:40	2132:41:30	46.18508959	
20	67	967	0.00071	526.67	14.025	0.000665337	18.84		0.024367846	690.02	67.40	69.74	1/28/08 9:17	2251:00:45	2250:59:40	2250:38:30	47.44483639	
8	67	969	0.00028	526.67	14.054	0.000266685	7.55		0.024634531	697.57	68.14	70.48	2/4/08 10:32	2420:15:45	2420:14:40	2419:53:30	49.19616347	
-2	67	983	-7E-05	526.67	14.257	-6.76346E-05	-1.92		0.024566897	695.65	67.95	70.29	2/11/08 14:47	2592:30:45	2592:29:40	2592:08:30	50.91672122	
10	67	981	0.00035	526.67	14.228	0.000337485	9.56		0.024904381	705.21	68.88	71.23	2/18/08 8:53	2754:36:45	2754:35:40	2754:14:30	52.48440244	
18	67	969	0.00064	526.67	14.054	0.000600042	16.99		0.025504423	722.20	70.54	72.89	2/25/08 9:24	2923:07:45	2923:06:40	2922:45:30	54.06597051	
0	67	987	0	526.67	14.315	0	0.00		0.025504423	722.20	70.54	72.89	3/3/08 10:35	3092:18:45	3092:17:40	3091:56:30	55.60856499	
-1	67	998	-4E-05	526.67	14.475	-3.43333E-05	-0.97		0.02547009	721.23	70.45	72.79	3/10/08 9:03	3258:46:45	3258:45:40	3258:24:30	57.08571771	
18	67	982	0.00064	526.67	14.243	0.000608092	17.22		0.026078182	738.45	72.13	74.47	3/17/08 10:22	3428:05:45	3428:04:40	3427:43:30	58.54994307	
-1	67	993	-4E-05	526.67	14.402	-3.41613E-05	-0.97		0.02604402	737.48	72.03	74.38	3/24/08 8:47	3594:30:45	3594:29:40	3594:08:30	59.95425339	
22	66	970	0.00078	525.67	14.069	0.000735538	20.83		0.026779558	758.31	74.07	76.41	3/31/08 10:53	3764:36:45	3764:35:40	3764:14:30	61.35643813	
308.04	75	981	0.01088	534.67	14.228	0.010240334	289.97		0.037019892	1048.28	102.39	104.74	3/31/08 10:53	3764:36:45	3764:35:40	3764:14:30	61.35643813	residual gas calc.

DECANISTERED 3/31/2008; sample dried for 39 days in air; 119.25 grams placed in ball mill (105,43 cc @ STP desorbed), proportional to 289.98 cc @ STP for 327.99 grams (dry wt.) for entire sample

SAMPLE: 379' 4" to 380' 5" (Fleming coal) core in SSD canister C2
NOTES: very crumbly coal, well developed cleat 1/2 to 1 cm
density = 1.38 gr/cc; KGS simple moisture = 2.52% (as received); KGS simple ash content = 7.69% (moisture-free)
TerraTek moisture = 8.89%; ash content = 20.40%

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	12980	13564	14702
Sulfur	5.00%	5.22%	
Moisture	4.30%		
Ash	7.41%	7.74%	
Volatile Matter	40.52%	42.34%	
Fixed Carbon	47.77%	49.92%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =
dry sample weight:	1.772	803.80	wet sample weight:	1.842	835.56	3.80%		40

TIME 0F:
off bottom 10/26/07 16:03
at surface 10/26/07 16:05
in canister 10/26/07 16:25

elapsed time (off bottom to canistering)
22.3 minutes
0.371 hours
0.608960864 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	temp (R)	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)	
13	68	989	0.00046	527.67	14.344	0.00044147	12.50	0.00044147	12.50	0.50	2.09	10/26/07 16:33	0:29:30	0:28:00	0:07:15	0.701189466	
7	68	989	0.00025	527.67	14.344	0.000237715	6.73	0.000679184	19.23	0.77	2.36	10/26/07 16:37	0:33:45	0:32:15	0:11:30	0.75	
14	68	989	0.00049	527.67	14.344	0.000475429	13.46	0.001154613	32.69	1.30	2.90	10/26/07 16:46	0:43:00	0:41:30	0:20:45	0.846561673	
13	68	989	0.00046	527.67	14.344	0.00044147	12.50	0.001596083	45.20	1.80	3.40	10/26/07 17:09	1:05:45	1:04:15	0:43:30	1.046820583	
13	67	990	0.00046	526.67	14.359	0.000442755	12.54	0.002038839	57.73	2.30	3.90	10/26/07 17:57	1:53:45	1:52:15	1:31:30	1.376892637	
13	67	990	0.00046	526.67	14.359	0.000442755	12.54	0.002481594	70.27	2.80	4.40	10/26/07 18:10	2:06:30	2:05:00	1:44:15	1.452010101	
8	67	991	0.00028	526.67	14.373	0.00027274	7.72	0.002754334	77.99	3.11	4.70	10/26/07 18:28	2:25:00	2:23:30	2:02:45	1.554563176	
138	70	994	0.00487	529.67	14.417	0.00469228	132.87	0.007446614	210.86	8.40	10.00	10/27/07 6:40	14:36:30	14:35:00	14:14:15	3.822084946	back at lab
81	67	999	0.00286	526.67	14.489	0.002783785	78.83	0.010230399	289.69	11.55	13.14	10/27/07 19:09	27:05:30	27:04:00	26:43:15	5.204965578	
160	67	993	0.00565	526.67	14.402	0.005465809	154.77	0.015696208	444.47	17.72	19.31	10/29/07 16:29	72:25:30	72:24:00	72:03:15	8.510287892	
269	68	987	0.0095	527.67	14.315	0.009116556	258.15	0.024812764	702.62	28.00	29.60	11/5/07 11:15	235:11:30	235:10:00	234:49:15	15.33595992	gas sampled
73	70	993	0.00258	529.67	14.402	0.002479651	70.22	0.027292415	772.83	30.80	32.40	11/7/07 10:48	282:44:30	282:43:00	282:22:15	16.81492393	
61	67	986	0.00215	526.67	14.301	0.00206915	58.59	0.029361565	831.42	33.14	34.73	11/9/07 9:40	329:36:30	329:35:00	329:14:15	18.15511865	
86	68	980	0.00304	527.67	14.214	0.002893916	81.95	0.032255481	913.37	36.40	38.00	11/13/07 11:33	427:29:30	427:28:00	427:07:15	20.67587161	
27	68	993	0.00095	527.67	14.402	0.000920607	26.07	0.033176088	939.44	37.44	39.04	11/15/07 9:55	473:51:30	473:50:00	473:29:15	21.76828733	
114	67	990	0.00403	526.67	14.359	0.003882623	109.94	0.037058711	1049.38	41.83	43.42	11/24/07 20:20	700:16:30	700:15:00	699:54:15	26.46270961	
56	67	982	0.00198	526.67	14.243	0.001891841	53.57	0.038950553	1102.95	43.96	45.55	11/28/07 10:35	786:31:30	786:30:00	786:09:15	28.04505304	
46	68	988	0.00162	527.67	14.330	0.001560545	44.19	0.040511097	1147.14	45.72	47.32	12/3/07 20:06	916:02:30	916:01:00	915:40:15	30.26618025	
36	67	986	0.00127	526.67	14.301	0.001221138	34.58	0.041732235	1181.72	47.10	48.69	12/7/07 11:47	1003:43:30	1003:42:00	1003:21:15	31.68161928	
18	67	993	0.00064	526.67	14.402	0.000614904	17.41	0.042347139	1199.13	47.79	49.39	12/10/07 10:14	1074:10:30	1074:09:00	1073:48:15	32.77460907	
19	67	991	0.00067	526.67	14.373	0.000647758	18.34	0.042994896	1217.48	48.52	50.12	12/12/07 13:20	1125:16:30	1125:15:00	1124:54:15	33.54511887	
12	67	993	0.00042	526.67	14.402	0.000409936	11.61	0.043404832	1229.08	48.99	50.58	12/14/07 9:57	1169:53:30	1169:52:00	1169:31:15	34.20367914	
50	69	977	0.00177	528.67	14.170	0.001674186	47.41	0.045079018	1276.49	50.88	52.47	12/20/07 9:43	1313:39:30	1313:38:00	1313:17:15	36.24442486	
36	67	986	0.00127	526.67	14.301	0.001221138	34.58	0.046300155	1311.07	52.26	53.85	12/27/07 10:23	1482:19:30	1482:18:00	1481:57:15	38.50097401	
12	67	1012	0.00042	526.67	14.678	0.000417779	11.83	0.046717935	1322.90	52.73	54.32	1/2/08 10:43	1626:39:30	1626:38:00	1626:17:15	40.33185259	
57	67	974	0.00201	526.67	14.127	0.001909937	54.08	0.048627872	1376.98	54.88	56.48	1/7/08 11:01	1746:57:30	1746:56:00	1746:35:15	41.79663065	
34	67	981	0.0012	526.67	14.228	0.001147448	32.49	0.04977532	1409.47	56.18	57.77	1/15/08 13:39	1941:35:30	1941:34:00	1941:13:15	44.06349585	
27	67	986	0.00095	526.67	14.301	0.000915853	25.93	0.050691173	1435.41	57.21	58.81	1/23/08 11:21	2131:17:30	2131:16:00	2130:55:15	46.16591455	
36	67	967	0.00127	526.67	14.025	0.001197607	33.91	0.05188878	1469.32	58.56	60.16	1/28/08 9:18	2249:14:30	2249:13:00	2248:52:15	47.42617069	
25	67	969	0.00088	526.67	14.054	0.000833391	23.60	0.052722171	1492.92	59.50	61.10	2/4/08 10:33	2418:29:30	2418:28:00	2418:07:15	49.1781625	
10	67	983	0.00035	526.67	14.257	0.000338173	9.58	0.053060344	1502.50	59.88	61.48	2/11/08 14:47	2590:43:30	2590:42:00	2590:21:15	50.89916502	
26	67	981	0.00092	526.67	14.228	0.00087746	24.85	0.053937805	1527.34	60.88	62.47	2/18/08 8:54	2752:50:30	2752:49:00	2752:28:15	52.46752964	
33	67	969	0.00117	526.67	14.054	0.001100077	31.15	0.055037881	1558.49	62.12	63.71	2/25/08 9:25	2921:21:30	2921:20:00	2920:59:15	54.04959143	
9	67	987	0.00032	526.67	14.315	0.000305594	8.65	0.055343475	1567.15	62.46	64.06	3/3/08 10:36	3090:32:30	3090:31:00	3090:10:15	55.5926404	
11	67	998	0.00039	526.67	14.475	0.000377666	10.69	0.055721142	1577.84	62.89	64.48	3/10/08 9:05	3257:01:30	3257:00:00	3256:39:15	57.07035132	
38	67	982	0.00134	526.67	14.243	0.00128375	36.35	0.057004891	1614.19	64.34	65.93	3/17/08 10:23	3426:19:30	3426:18:00	3425:57:15	58.5348187	
24	67	993	0.00085	526.67	14.402	0.000819871	23.22	0.057824763	1637.41	65.26	66.86	3/24/08 8:48	3592:44:30	3592:43:00	3592:22:15	59.93948337	
57	66	970	0.00201	525.67	14.069	0.001905712	53.96	0.059730474	1691.37	67.41	69.01	3/31/08 10:54	3762:50:30	3762:49:00	3762:28:15	61.34200573	
21	67	986	0.00074	526.67	14.301	0.00071233	20.17	0.060442805	1711.54	68.22	69.81	4/7/08 8:25	3928:21:30	3928:20:00	3927:59:15	62.67661712	
17	67	994	0.0006	526.67	14.417	0.000581327	16.46	0.061024132	1728.00	68.87	70.47	4/14/08 8:21	4096:17:30	4096:16:00	4095:55:15	64.00227861	
32	61	987	0.00113	520.67	14.315	0.001099078	31.12	0.062123209	1759.13	70.11	71.71	4/28/08 9:37	4433:33:30	4433:32:00	4433:11:15	66.58497078	

13	61	987	0.00046	520.67	14.315	0.0004465	12.64	0.06256971	1771.77	70.62	72.21	5/5/08 8:26	4600:22:30	4600:21:00	4600:00:15	67.82606431	
23	62	980	0.00081	521.67	14.214	0.000782856	22.17	0.063352566	1793.94	71.50	73.10	5/12/08 9:04	4769:00:30	4768:59:00	4768:38:15	69.05800702	
22	63	965	0.00078	522.67	13.996	0.000735946	20.84	0.064088512	1814.78	72.33	73.93	5/19/08 9:17	4937:13:30	4937:12:00	4936:51:15	70.26538977	
0	65	982	0	524.67	14.243	0	0.00	0.064088512	1814.78	72.33	73.93	5/27/08 11:07	5131:03:30	5131:02:00	5130:41:15	71.63140605	
7	66	981	0.00025	525.67	14.228	0.000236689	6.70	0.064325201	1821.48	72.60	74.19	5/31/08 17:25	5233:21:30	5233:20:00	5232:59:15	72.34195417	
16	69	981	0.00057	528.67	14.228	0.000537933	15.23	0.064863134	1836.71	73.21	74.80	6/9/08 11:37	5443:33:30	5443:32:00	5443:11:15	73.78047393	
5	68	984	0.00018	527.67	14.272	0.000168938	4.78	0.065032071	1841.50	73.40	74.99	6/16/08 8:18	5608:14:30	5608:13:00	5607:52:15	74.88819444	
7	68	984	0.00025	527.67	14.272	0.000236513	6.70	0.065268584	1848.19	73.66	75.26	6/23/08 10:38	5778:34:30	5778:33:00	5778:12:15	76.0169389	
2058.74	71	983	0.0727	530.67	14.257	0.069096218	1956.58	0.134364803	3804.77	151.65	153.24	6/23/08 10:38	5778:34:30	5778:33:00	5778:12:15	76.0169389	residual gas calc.

DECANISTERED 6/23/2008; sample dried for 25 days in air; 139.21 grams placed in ball mill (325.98 cc @ STP desorbed), proportional to 1956.58 cc @ STP for 835.56 grams (wet wt.) for entire sample

SAMPLE: 386' 6" to 387' 0" (Mineral coal) core in SSD canister C3
NOTES: shaly coal, broken along bedding into 3 pieces; minor fracturing, no cleat evident
density = 1.74 gr/cc; KGS simple moisture = 2.69% (as received); KGS simple ash content = 36.67% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	8152	8404	13340
Sulfur	8.70%	8.97%	
Moisture	2.99%		
Ash	35.90%	37.01%	
Volatile Matter	28.96%	29.85%	
Fixed Carbon	32.15%	33.14%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	1.039	471.32	wet sample weight:	1.065	483.15	2.45%		55		off bottom	at surface	in canister	30.0 minutes
										10/26/07 16:03	10/26/07 16:05	10/26/07 16:33	0.500 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			0.707106781 SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)
15	68	989	0.00053	527.67	14.344	0.000509388	14.42	0.000509388	14.42	0.98	4.72	10/26/07 16:39	0:35:45	0:34:15	0:05:45	0.771902412
10	68	989	0.00035	527.67	14.344	0.000339592	9.62	0.00084898	24.04	1.63	5.37	10/26/07 16:44	0:41:15	0:39:45	0:11:15	0.829156198
3	68	989	0.00011	527.67	14.344	0.000101878	2.88	0.000950858	26.93	1.83	5.57	10/26/07 16:48	0:44:45	0:43:15	0:14:45	0.863616427
15	67	989	0.00053	526.67	14.344	0.000510355	14.45	0.001461214	41.38	2.81	6.55	10/26/07 17:10	1:07:00	1:05:30	0:37:00	1.056724499
25	67	989	0.00088	526.67	14.344	0.000850592	24.09	0.002311806	65.46	4.45	8.19	10/26/07 17:59	1:56:00	1:54:30	1:26:00	1.390443574
7	67	990	0.00025	526.67	14.359	0.000238407	6.75	0.002550213	72.21	4.91	8.65	10/26/07 18:11	2:07:45	2:06:15	1:37:45	1.459166429
9	67	991	0.00032	526.67	14.373	0.000306833	8.69	0.002857045	80.90	5.50	9.24	10/26/07 18:29	2:25:45	2:24:15	1:55:45	1.558578412
135	70	994	0.00477	529.67	14.417	0.004590274	129.98	0.007447319	210.88	14.33	18.07	10/27/07 6:42	14:38:30	14:37:00	14:08:30	3.826443083
65	67	999	0.0023	526.67	14.489	0.002233902	63.26	0.009681221	274.14	18.63	22.37	10/27/07 19:10	27:06:30	27:05:00	26:36:30	5.206566367 back at lab
111	67	993	0.00392	526.67	14.402	0.003791905	107.37	0.013473125	381.51	25.93	29.67	10/29/07 16:32	72:28:30	72:27:00	71:58:30	8.513225006
65	68	988	0.0023	527.67	14.330	0.002205117	62.44	0.015678243	443.96	30.18	33.92	10/31/07 11:16	115:12:30	115:11:00	114:42:30	10.73351449
83	68	987	0.00293	527.67	14.315	0.002812915	79.65	0.018491158	523.61	35.59	39.33	11/5/07 11:35	235:31:30	235:30:00	235:01:30	15.34682378
22	70	993	0.00078	529.67	14.402	0.000747292	21.16	0.01923845	544.77	37.03	40.77	11/7/07 10:48	282:44:30	282:43:00	282:14:30	16.81492393
51	68	980	0.0018	527.67	14.214	0.001716159	48.60	0.020954609	593.37	40.33	44.07	11/13/07 11:34	427:30:30	427:29:00	427:00:30	20.67627465
-1	68	993	-4E-05	527.67	14.402	-3.40966E-05	-0.97	0.020920513	592.40	40.27	44.01	11/15/07 9:56	473:52:30	473:51:00	473:22:30	21.76867015
21	67	979	0.00074	526.67	14.199	0.000707273	20.03	0.021627786	612.43	41.63	45.37	11/16/07 9:39	497:35:30	497:34:00	497:05:30	22.3067628
20	67	990	0.00071	526.67	14.359	0.000681162	19.29	0.022308948	631.72	42.94	46.68	11/24/07 20:21	700:17:30	700:16:00	699:47:30	26.46302452
18	67	982	0.00064	526.67	14.243	0.000608092	17.22	0.02291704	648.94	44.11	47.85	11/28/07 10:36	786:32:30	786:31:00	786:02:30	28.04535018
15	67	986	0.00053	526.67	14.301	0.000508807	14.41	0.023425847	663.34	45.09	48.83	12/7/07 11:48	1003:44:30	1003:43:00	1003:14:30	31.68188231
2	67	991	7.1E-05	526.67	14.373	6.8185E-05	1.93	0.023494032	665.27	45.22	48.96	12/12/07 13:20	1125:16:30	1125:15:00	1124:46:30	33.54511887
24	69	977	0.00085	528.67	14.170	0.000803609	22.76	0.024297642	688.03	46.77	50.51	12/20/07 9:44	1313:40:30	1313:39:00	1313:10:30	36.24465478
0	67	986	0	526.67	14.301	0	0.00	0.024297642	688.03	46.77	50.51	12/27/07 10:24	1482:20:30	1482:19:00	1481:50:30	38.50119046
-19	67	1012	-0.0007	526.67	14.678	-0.000661484	-18.73	0.023636158	669.30	45.49	49.23	1/2/08 10:44	1626:40:30	1626:39:00	1626:10:30	40.33205921
45	67	974	0.00159	526.67	14.127	0.001507845	42.70	0.025144003	712.00	48.40	52.14	1/7/08 11:02	1746:58:30	1746:57:00	1746:28:30	41.79683002
3	67	981	0.00011	526.67	14.228	0.000101245	2.87	0.025245248	714.86	48.59	52.33	1/15/08 13:40	1941:36:30	1941:35:00	1941:06:30	44.06368497
1	67	986	3.5E-05	526.67	14.301	3.39205E-05	0.96	0.025279168	715.82	48.66	52.40	1/23/08 11:22	2131:18:30	2131:17:00	2130:48:30	46.16609506
23	67	967	0.00081	526.67	14.025	0.000765138	21.67	0.026044306	737.49	50.13	53.87	1/28/08 9:19	2249:15:30	2249:14:00	2248:45:30	47.42634641
4	67	969	0.00014	526.67	14.054	0.000133343	3.78	0.026177649	741.27	50.39	54.12	2/4/08 10:35	2418:31:30	2418:30:00	2418:01:30	49.1785014
-5	67	983	-0.0002	526.67	14.257	-0.000169086	-4.79	0.026008562	736.48	50.06	53.80	2/11/08 14:48	2590:44:30	2590:43:00	2590:14:30	50.89932874
7	67	981	0.00025	526.67	14.228	0.000236239	6.69	0.026244802	743.17	50.52	54.25	2/18/08 8:55	2752:51:30	2752:50:00	2752:21:30	52.46768847
18	67	969	0.00064	526.67	14.054	0.000600042	16.99	0.026844843	760.16	51.67	55.41	2/25/08 9:26	2921:22:30	2921:21:00	2920:52:30	54.04974561
0	67	987	0	526.67	14.315	0	0.00	0.026844843	760.16	51.67	55.41	3/3/08 10:38	3090:34:30	3090:33:00	3090:04:30	55.5929402
-5	67	998	-0.0002	526.67	14.475	-0.000171667	-4.86	0.026673177	755.30	51.34	55.08	3/10/08 9:06	3257:02:30	3257:01:00	3256:32:30	57.07049734

21	67	982	0.00074	526.67	14.243	0.000709441	20.09	0.027382617	775.39	52.71	56.44	3/17/08 10:24	3426:20:30	3426:19:00	3425:50:30	58.53496106	
-2	67	993	-7E-05	526.67	14.402	-6.83226E-05	-1.93	0.027314295	773.45	52.57	56.31	3/24/08 8:49	3592:45:30	3592:44:00	3592:15:30	59.9396224	
31	66	970	0.00109	525.67	14.069	0.00103644	29.35	0.028350734	802.80	54.57	58.31	3/31/08 10:55	3762:51:30	3762:50:00	3762:21:30	61.34214158	
0	67	986	0	526.67	14.301	0	0.00	0.028350734	802.80	54.57	58.31	4/7/08 8:26	3928:22:30	3928:21:00	3927:52:30	62.67675008	
7	67	978	0.00025	526.67	14.185	0.000235517	6.67	0.028586251	809.47	55.02	58.76	4/8/08 9:12	3953:08:30	3953:07:00	3952:38:30	62.87401424	
292.23	69	984	0.01032	528.67	14.272	0.009855054	279.06	0.038441306	1088.53	73.99	77.73	4/8/08 9:12	3953:08:30	3953:07:00	3952:38:30	62.87401424	residual gas calc.

DECANISTERED 4/08/2008; sample dried for 30 days in air; 166.99 grams placed in ball mill (96.45 cc @ STP desorbed), proportional to 279.06 cc @ STP for 483.15 grams (wet wt.) for entire sample

SAMPLE: 387' 2.5" to 388' 5" (Mineral coal) core in SSD canister C4
NOTES: lower half of core very crumbly with well-developed cleat, approx 1 cm spacing, upper half shaly, breaking along bedding
density = 1.58 gr/cc; KGS simple moisture = 4.27% (as received); KGS simple ash content = 14.40% (moisture-free)
TerraTek moisture = 8.66%; ash content = 7.91%

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	11610	12238	14324
Sulfur	9.11%	9.60%	
Moisture	5.13%		
Ash	13.82%	14.56%	
Volatile Matter	35.34%	37.25%	
Fixed Carbon	45.71%	48.19%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	1.935	877.80	wet sample weight:	2.052	930.98	5.71%		165		off bottom	at surface	in canister	41.0 minutes
										10/26/07 16:03	10/26/07 16:05	10/26/07 16:44	0.683 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			0.826639784 SQRT (hrs)	
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)	
24	68	989	0.00085	527.67	14.344	0.000815021	23.08	0.000815021	23.08	0.84	6.86	10/26/07 16:51	0:48:00	0:46:30	0:07:00	0.894427191	
6	68	989	0.00021	527.67	14.344	0.000203755	5.77	0.001018777	28.85	1.05	7.07	10/26/07 16:53	0:49:30	0:48:00	0:08:30	0.908295106	
11	68	989	0.00039	527.67	14.344	0.000373551	10.58	0.001392328	39.43	1.44	7.46	10/26/07 16:57	0:54:00	0:52:30	0:13:00	0.948683298	
14	68	989	0.00049	527.67	14.344	0.000475429	13.46	0.001867757	52.89	1.93	7.95	10/26/07 17:03	1:00:15	0:58:45	0:19:15	1.002081168	
15	68	989	0.00053	527.67	14.344	0.000509388	14.42	0.002377145	67.31	2.46	8.48	10/26/07 17:08	1:05:00	1:03:30	0:24:00	1.040833	
67	67	989	0.00237	526.67	14.344	0.002279588	64.55	0.004656733	131.86	4.81	10.83	10/26/07 18:01	1:57:30	1:56:00	1:16:30	1.399404635	
15	67	990	0.00053	526.67	14.359	0.000510871	14.47	0.005167604	146.33	5.34	11.36	10/26/07 18:12	2:08:30	2:07:00	1:27:30	1.463443428	
23	67	991	0.00081	526.67	14.373	0.000784128	22.20	0.005951732	168.53	6.15	12.17	10/26/07 18:30	2:27:15	2:25:45	1:46:15	1.566578012	
323	70	994	0.01141	529.67	14.417	0.010982655	310.99	0.016934387	479.53	17.50	23.52	10/27/07 6:43	14:39:30	14:38:00	13:58:30	3.828620291	back at lab
179	67	999	0.00632	526.67	14.489	0.006151822	174.20	0.023086208	653.73	23.86	29.88	10/27/07 19:12	27:08:30	27:07:00	26:27:30	5.20976647	
277	67	993	0.00978	526.67	14.402	0.009462682	267.95	0.03254889	921.68	33.64	39.66	10/29/07 16:33	72:29:30	72:28:00	71:48:30	8.514203819	
195	68	988	0.00689	527.67	14.330	0.006615352	187.33	0.039164242	1109.00	40.48	46.50	10/31/07 11:05	115:01:30	115:00:00	114:20:30	10.72497086	gas sampled
299	68	987	0.01056	527.67	14.315	0.010133273	286.94	0.049297515	1395.94	50.95	56.97	11/5/07 11:05	235:01:30	235:00:00	234:20:30	15.33052511	gas sampled
129	70	993	0.00456	529.67	14.402	0.004381849	124.08	0.053679363	1520.02	55.48	61.50	11/7/07 10:49	282:45:30	282:44:00	282:04:30	16.81541951	
93	67	986	0.00328	526.67	14.301	0.003154606	89.33	0.056833969	1609.35	58.74	64.76	11/9/07 9:39	329:35:30	329:34:00	328:54:30	18.15465964	
121	68	980	0.00427	527.67	14.214	0.004071672	115.30	0.060905641	1724.65	62.94	68.97	11/13/07 11:35	427:31:30	427:30:00	426:50:30	20.67667768	
57	68	993	0.00201	527.67	14.402	0.001943504	55.03	0.062849146	1779.68	64.95	70.98	11/15/07 9:57	473:53:30	473:52:00	473:12:30	21.76905296	
159	67	990	0.00562	526.67	14.359	0.005415238	153.34	0.068264384	1933.02	70.55	76.57	11/24/07 20:22	700:18:30	700:17:00	699:37:30	26.46333942	
84	67	982	0.00297	526.67	14.243	0.002837762	80.36	0.071102146	2013.38	73.48	79.50	11/28/07 10:37	786:33:30	786:32:00	785:52:30	28.04564732	
71	68	988	0.00251	527.67	14.330	0.002408667	68.21	0.073510812	2081.59	75.97	81.99	12/3/07 20:05	916:01:30	916:00:00	915:20:30	30.26590491	
53	67	986	0.00187	526.67	14.301	0.001797786	50.91	0.075308598	2132.49	77.83	83.85	12/7/07 11:48	1003:44:30	1003:43:00	1003:03:30	31.68188231	
30	67	993	0.00106	526.67	14.402	0.001024839	29.02	0.076333437	2161.51	78.89	84.91	12/10/07 10:13	1074:09:30	1074:08:00	1073:28:30	32.77435481	
26	67	991	0.00092	526.67	14.373	0.000886405	25.10	0.077219842	2186.61	79.80	85.83	12/12/07 13:21	1125:17:30	1125:16:00	1124:36:30	33.54536729	
19	67	993	0.00067	526.67	14.402	0.000649065	18.38	0.077868907	2204.99	80.48	86.50	12/14/07 9:58	1169:54:30	1169:53:00	1169:13:30	34.20392278	
52	69	977	0.00184	528.67	14.170	0.001741153	49.30	0.079610061	2254.30	82.28	88.30	12/20/07 9:45	1313:41:30	1313:40:00	1313:00:30	36.2448847	
45	67	986	0.00159	526.67	14.301	0.001526422	43.22	0.081136483	2297.52	83.85	89.87	12/27/07 10:25	1482:21:30	1482:20:00	1481:40:30	38.5014069	
22	67	1012	0.00078	526.67	14.678	0.000765929	21.69	0.081902412	2319.21	84.64	90.67	1/2/08 10:45	1626:41:30	1626:40:00	1626:00:30	40.33226583	
57	67	974	0.00201	526.67	14.127	0.001909937	54.08	0.083812349	2373.29	86.62	92.64	1/7/08 11:04	1747:00:30	1746:59:00	1746:19:30	41.79722878	
42	67	981	0.00148	526.67	14.228	0.001417436	40.14	0.085229785	2413.43	88.08	94.10	1/15/08 13:41	1941:37:30	1941:36:00	1940:56:30	44.06387409	
34	67	986	0.0012	526.67	14.301	0.001153297	32.66	0.086383081	2446.09	89.27	95.30	1/23/08 11:23	2131:19:30	2131:18:00	2130:38:30	46.16627557	
38	67	967	0.00134	526.67	14.025	0.00126414	35.80	0.087647222	2481.88	90.58	96.60	1/28/08 9:21	2249:17:30	2249:16:00	2248:36:30	47.42669783	
31	67	969	0.00109	526.67	14.054	0.001033405	29.26	0.088680627	2511.15	91.65	97.67	2/4/08 10:36	2418:32:30	2418:31:00	2417:51:30	49.17867085	
18	67	983	0.00064	526.67	14.257	0.000608711	17.24	0.089289338	2528.38	92.28	98.30	2/11/08 14:49	2590:45:30	2590:44:00	2590:04:30	50.89949247	
28	67	981	0.00099	526.67	14.228	0.000944957	26.76	0.090234296	2555.14	93.25	99.28	2/18/08 8:56	2752:52:30	2752:51:00	2752:11:30	52.4678473	
18	67	969	0.00064	526.67	14.054	0.000600042	16.99	0.090834337	2572.13	93.88	99.90	2/25/08 9:26	2921:22:30	2921:21:00	2920:41:30	54.04974561	

12	67	987	0.00042	526.67	14.315	0.000407459	11.54	0.091241796	2583.67	94.30	100.32	3/3/08 10:40	3090:36:30	3090:35:00	3089:55:30	55.59324	
13	67	998	0.00046	526.67	14.475	0.000446333	12.64	0.091688129	2596.31	94.76	100.78	3/10/08 9:07	3257:03:30	3257:02:00	3256:22:30	57.07064336	
32	67	982	0.00113	526.67	14.243	0.001081052	30.61	0.092769181	2626.92	95.87	101.90	3/17/08 10:25	3426:21:30	3426:20:00	3425:40:30	58.53510343	
14	67	993	0.00049	526.67	14.402	0.000478258	13.54	0.09324744	2640.46	96.37	102.39	3/24/08 8:50	3592:46:30	3592:45:00	3592:05:30	59.93976143	
35	66	970	0.00124	525.67	14.069	0.001170174	33.14	0.094417614	2673.60	97.58	103.60	3/31/08 10:56	3762:52:30	3762:51:00	3762:11:30	61.34227743	
13	67	986	0.00046	526.67	14.301	0.000440966	12.49	0.09485858	2686.09	98.03	104.06	4/7/08 8:26	3928:22:30	3928:21:00	3927:41:30	62.67675008	
9	67	994	0.00032	526.67	14.417	0.000307761	8.71	0.095166341	2694.80	98.35	104.37	4/14/08 8:23	4096:19:30	4096:18:00	4095:38:30	64.00253901	
19	61	987	0.00067	520.67	14.315	0.000652577	18.48	0.095818919	2713.28	99.03	105.05	4/28/08 9:38	4433:34:30	4433:33:00	4432:53:30	66.58509593	
7	61	986	0.00025	520.67	14.301	0.00024018	6.80	0.096059098	2720.08	99.27	105.30	5/5/08 8:26	4600:22:30	4600:21:00	4599:41:30	67.82606431	
19	62	980	0.00067	521.67	14.214	0.000646707	18.31	0.096705805	2738.39	99.94	105.97	5/12/08 9:05	4769:01:30	4769:00:00	4768:20:30	69.05812769	
24	63	965	0.00085	522.67	13.996	0.000802851	22.73	0.097508656	2761.13	100.77	106.79	5/19/08 9:18	4937:14:30	4937:13:00	4936:33:30	70.26550837	
6	65	982	0.00021	524.67	14.243	0.00020347	5.76	0.097712126	2766.89	100.98	107.01	5/27/08 11:07	5131:03:30	5131:02:00	5130:22:30	71.63140605	
13	66	981	0.00046	525.67	14.228	0.000439565	12.45	0.098151691	2779.34	101.44	107.46	5/31/08 17:28	5233:24:30	5233:23:00	5232:43:30	72.34229975	
23	69	981	0.00081	528.67	14.228	0.000773279	21.90	0.098924969	2801.23	102.24	108.26	6/9/08 11:38	5443:34:30	5443:33:00	5442:53:30	73.78058688	
13	68	984	0.00046	527.67	14.272	0.000439238	12.44	0.099364207	2813.67	102.69	108.71	6/17/08 8:19	5632:15:30	5632:14:00	5631:34:30	75.04837329	
14	68	984	0.00049	527.67	14.272	0.000473025	13.39	0.099837233	2827.06	103.18	109.20	6/23/08 10:38	5778:34:30	5778:33:00	5777:53:30	76.0169389	
16	69	987	0.00057	528.67	14.315	0.000541223	15.33	0.100378456	2842.39	103.74	109.76	6/29/08 12:45	5924:41:30	5924:40:00	5924:00:30	76.97201873	
760.85	71	983	0.02687	530.67	14.257	0.025535938	723.09	0.125914394	3565.49	130.13	136.15	6/29/08 12:45	5924:41:30	5924:40:00	5924:00:30	76.97201873	residual gas calc.

DECANISTERED 6/29/2008; sample dried for 19 days in air; 316.92 grams placed in ball mill (246.15 cc @ STP desorbed), proportional to 723.09 cc @ STP for 930.98 grams (wet wt.) for entire sample

SAMPLE: 388' 5" to 390' 3" (Mineral coal) core in SSD canister C5
NOTES: upper half very crumbly coal; lower half more shaly and pyrite-rich in 4" to 5" pieces breaking along bedding, minor calcite-filled fractures
density = 1.47 gr/cc; KGS simple moisture = 3.61% (as received); KGS simple ash content = 12.84% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	11682	12417	14272
Sulfur	5.74%	6.10%	
Moisture	5.92%		
Ash	12.23%	13.00%	
Volatile Matter	36.58%	38.88%	
Fixed Carbon	45.27%	48.12%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =	128
dry sample weight:	2.183	990.35	wet sample weight:	2.314	1049.60	5.65%			

TIME OF:

off bottom	at surface	in canister
10/26/07 16:32	10/26/07 16:34	10/26/07 17:00

elapsed time (off bottom to canistering) 27.9 minutes 0.465 hours 0.682112731 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	temp (R)	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)	
37	67	990	0.00131	526.67	14.359	0.00126015	35.68	0.00126015	35.68	1.15	5.30	10/26/07 17:11	0:38:40	0:37:15	0:10:45	0.802772972	
5	67	990	0.00018	526.67	14.359	0.00017029	4.82	0.00143044	40.51	1.31	5.45	10/26/07 17:14	0:41:10	0:39:45	0:13:15	0.828318243	
6	67	990	0.00021	526.67	14.359	0.000204349	5.79	0.001634789	46.29	1.50	5.64	10/26/07 17:18	0:45:25	0:44:00	0:17:30	0.870025542	
13	67	990	0.00046	526.67	14.359	0.000442755	12.54	0.002077544	58.83	1.90	6.04	10/26/07 17:24	0:51:10	0:49:45	0:23:15	0.923459678	
56	67	990	0.00198	526.67	14.359	0.001907254	54.01	0.003984798	112.84	3.65	7.79	10/26/07 18:02	1:29:25	1:28:00	1:01:30	1.220769338	
15	67	990	0.00053	526.67	14.359	0.000510871	14.47	0.004495669	127.30	4.12	8.26	10/26/07 18:13	1:40:40	1:39:15	1:12:45	1.295290615	
21	67	991	0.00074	526.67	14.373	0.000715943	20.27	0.005211612	147.58	4.77	8.91	10/26/07 18:32	1:59:10	1:57:45	1:31:15	1.409294544	
429	70	994	0.01515	529.67	14.417	0.014586869	413.05	0.019798481	560.63	18.14	22.28	10/27/07 6:48	14:15:10	14:13:45	13:47:15	3.775285125	back at lab
204	67	999	0.0072	526.67	14.489	0.007011015	198.53	0.026809496	759.16	24.56	28.70	10/27/07 19:15	26:42:10	26:40:45	26:14:15	5.167473055	
423	67	993	0.01494	526.67	14.402	0.014450232	409.18	0.041259728	1168.34	37.79	41.94	10/29/07 16:36	72:03:10	72:01:45	71:35:15	8.488390765	
257	68	988	0.00908	527.67	14.330	0.008718694	246.89	0.049978423	1415.23	45.78	49.92	10/31/07 11:14	114:41:10	114:39:45	114:13:15	10.70916015	
400	68	987	0.01413	527.67	14.315	0.013556218	383.87	0.06353464	1799.09	58.20	62.34	11/5/07 11:05	234:32:10	234:30:45	234:04:15	15.31457186	
122	70	993	0.00431	529.67	14.402	0.004144074	117.35	0.067678714	1916.44	62.00	66.14	11/7/07 10:50	282:17:10	282:15:45	281:49:15	16.8013723	
103	67	986	0.00364	526.67	14.301	0.003493811	98.93	0.071172525	2015.37	65.20	69.34	11/9/07 9:38	329:05:10	329:03:45	328:37:15	18.14073072	
155	68	980	0.00547	527.67	14.214	0.005215779	147.69	0.076388304	2163.07	69.97	74.11	11/13/07 11:37	427:04:10	427:02:45	426:36:15	20.66565858	
36	68	993	0.00127	527.67	14.402	0.001227476	34.76	0.07761578	2197.83	71.10	75.24	11/15/07 9:57	473:24:10	473:22:45	472:56:15	21.75782107	
202	67	990	0.00713	526.67	14.359	0.006879736	194.81	0.084495516	2392.64	77.40	81.54	11/24/07 20:24	699:51:10	699:49:45	699:23:15	26.45473073	
83	67	982	0.00293	526.67	14.243	0.002803979	79.40	0.087299495	2472.04	79.97	84.11	11/28/07 10:37	786:04:10	786:02:45	785:36:15	28.03693001	
63	68	988	0.00222	527.67	14.330	0.002137268	60.52	0.089436763	2532.56	81.93	86.07	12/3/07 20:03	915:30:10	915:28:45	915:02:15	30.25727644	
51	67	986	0.0018	526.67	14.301	0.001729945	48.99	0.091166708	2581.54	83.51	87.65	12/7/07 11:49	1003:16:10	1003:14:45	1002:48:15	31.67442887	
17	67	993	0.0006	526.67	14.402	0.000580742	16.44	0.09174745	2597.99	84.04	88.18	12/10/07 10:12	1073:39:10	1073:37:45	1073:11:15	32.76664123	
27	67	991	0.00095	526.67	14.373	0.000920498	26.07	0.092667948	2624.05	84.89	89.03	12/12/07 13:22	1124:49:10	1124:47:45	1124:21:15	33.53832799	
15	67	993	0.00053	526.67	14.402	0.00051242	14.51	0.093180367	2638.56	85.36	89.50	12/14/07 10:00	1169:27:10	1169:25:45	1168:59:15	34.19726272	
72	69	977	0.00254	528.67	14.170	0.002410828	68.27	0.095591195	2706.83	87.56	91.70	12/20/07 9:46	1313:13:10	1313:11:45	1312:45:15	36.23836978	
35	67	987	0.00124	526.67	14.315	0.001188421	33.65	0.096779616	2740.48	88.65	92.79	12/27/07 10:28	1481:55:10	1481:53:45	1481:27:15	38.49570683	

-8	67	1012	-0.0003	526.67	14.678	-0.00027852	-7.89	0.096501097	2732.60	88.40	92.54	1/2/08 10:46	1626:13:10	1626:11:45	1625:45:15	40.32641125	
98	67	974	0.00346	526.67	14.127	0.003283751	92.99	0.099784848	2825.58	91.41	95.55	1/7/08 11:05	1746:32:10	1746:30:45	1746:04:15	41.79157943	
35	67	981	0.00124	526.67	14.228	0.001181197	33.45	0.100966045	2859.03	92.49	96.63	1/15/08 13:42	1941:09:10	1941:07:45	1940:41:15	44.05851538	
23	67	986	0.00081	526.67	14.301	0.000780171	22.09	0.101746216	2881.12	93.20	97.34	1/23/08 11:24	2130:51:10	2130:49:45	2130:23:15	46.16116092	
56	67	967	0.00198	526.67	14.025	0.001862944	52.75	0.10360916	2933.87	94.91	99.05	1/28/08 9:22	2248:49:10	2248:47:45	2248:21:15	47.42171912	
27	67	969	0.00095	526.67	14.054	0.000900063	25.49	0.104509222	2959.36	95.73	99.87	2/4/08 10:38	2418:05:10	2418:03:45	2417:37:15	49.174039	
1	67	983	3.5E-05	526.67	14.257	3.38173E-05	0.96	0.10454304	2960.32	95.76	99.90	2/11/08 14:50	2590:17:10	2590:15:45	2589:49:15	50.89485348	
21	67	981	0.00074	526.67	14.228	0.000708718	20.07	0.105251758	2980.39	96.41	100.55	2/18/08 8:57	2752:24:10	2752:22:45	2751:56:15	52.46334699	
36	67	969	0.00127	526.67	14.054	0.001200084	33.98	0.106451841	3014.37	97.51	101.65	2/25/08 9:27	2920:54:10	2920:52:45	2920:26:15	54.04537703	
24	67	987	0.00085	526.67	14.315	0.000814917	23.08	0.107266759	3037.44	98.26	102.40	3/3/08 10:40	3090:07:10	3090:05:45	3089:39:15	55.58884281	estimate
-35	67	998	-0.0012	526.67	14.475	-0.001201666	-34.03	0.106065093	3003.42	97.16	101.30	3/10/08 9:08	3256:35:10	3256:33:45	3256:07:15	57.06650604	
4	67	982	0.00014	526.67	14.243	0.000135132	3.83	0.106200224	3007.24	97.28	101.42	3/17/08 10:26	3425:53:10	3425:51:45	3425:25:15	58.53106962	
-29	67	993	-0.001	526.67	14.402	-0.000990678	-28.05	0.105209546	2979.19	96.37	100.52	3/24/08 8:51	3592:18:10	3592:16:45	3591:50:15	59.93582216	
23	67	980	0.00081	526.67	14.214	0.000775424	21.96	0.10598497	3001.15	97.08	101.23	3/25/08 9:56	3617:23:10	3617:21:45	3616:55:15	60.14470975	
902.97	69	985	0.03189	528.67	14.286	0.030482367	863.16	0.136467337	3864.31	125.01	129.15	3/25/08 9:56	3617:23:10	3617:21:45	3616:55:15	60.14470975	residual gas calc.

DECANISTERED 3/25/2008; sample dried for 41 days in air; 395.79 grams placed in ball mill (273.39 cc @ STP desorbed), proportional to 863.16 cc @ STP for 1249.60 grams (wet wt.) for entire sample

SAMPLE: 390' 3" to 391' 2" (Mineral coal) core in SSD canister C6

NOTES: shaly coal, tends to not crumble, but breaks along bedding, mnor breakage along poorly developed cleat in lower half
density = 1.43 gr/cc; KGS simple moisture = 4.03% (as received); KGS simple ash content = 16.34% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	11367	11889	14226
Sulfur	5.57%	5.82%	
Moisture	4.39%		
Ash	15.70%	16.42%	
Volatile Matter	33.74%	35.29%	
Fixed Carbon	46.17%	48.29%	

	lbs.	grams		lbs.	grams	moisture %	est. lost gas (cc) =
dry sample weight:	1.663	754.13	wet sample weight:	1.839	834.15	9.59%	169

TIME OF: | off bottom | at surface | in canister | elapsed time (off bottom to canistering)
10/26/07 16:32 | 10/26/07 16:34 | 10/26/07 17:05 | 32.9 minutes | 0.549 hours | 0.740682868 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	temp (R)	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)	
83	67	990	0.00293	526.67	14.359	0.002826822		80.05	0.002826822	80.05	3.40	10.58	10/26/07 17:25	0:52:40	0:51:15	0:19:45	0.936897955	
9	67	990	0.00032	526.67	14.359	0.000306523		8.68	0.003133345	88.73	3.77	10.95	10/26/07 17:29	0:56:10	0:54:45	0:23:15	0.967528352	
9	67	990	0.00032	526.67	14.359	0.000306523		8.68	0.003439868	97.41	4.14	11.32	10/26/07 17:34	1:01:55	1:00:30	0:29:00	1.015846664	
7	67	990	0.00025	526.67	14.359	0.000238407		6.75	0.003678275	104.16	4.42	11.60	10/26/07 17:38	1:05:40	1:04:15	0:32:45	1.046156988	
46	67	990	0.00162	526.67	14.359	0.001566673		44.36	0.005244947	148.52	6.31	13.49	10/26/07 18:03	1:30:25	1:29:00	0:57:30	1.227576655	
18	67	990	0.00064	526.67	14.359	0.000613046		17.36	0.005857993	165.88	7.05	14.23	10/26/07 18:14	1:41:55	1:40:30	1:09:00	1.303307758	
25	67	991	0.00088	526.67	14.373	0.000852313		24.13	0.006710306	190.01	8.07	15.25	10/26/07 18:33	2:00:25	1:59:00	1:27:30	1.416666667	
462	70	994	0.01632	529.67	14.417	0.015708936		444.83	0.022419242	634.84	26.97	34.15	10/27/07 6:55	14:22:10	14:20:45	13:49:15	3.790705006	back at lab
149	67	999	0.00526	526.67	14.489	0.00512079		145.00	0.027540032	779.84	33.13	40.31	10/27/07 19:18	26:45:10	26:43:45	26:12:15	5.172308747	
419	67	993	0.0148	526.67	14.402	0.014313587		405.31	0.041853619	1185.16	50.35	57.53	10/29/07 16:40	72:07:10	72:05:45	71:34:15	8.492316789	
233	68	988	0.00823	527.67	14.330	0.007904497		223.83	0.049758117	1408.99	59.86	67.04	10/31/07 11:12	114:39:10	114:37:45	114:06:15	10.70760374	
358	68	987	0.01264	527.67	14.315	0.012132815		343.56	0.061890931	1752.55	74.45	81.63	11/5/07 11:39	235:06:10	235:04:45	234:33:15	15.33306159	
106	70	993	0.00374	529.67	14.402	0.003600589		101.96	0.06549152	1854.51	78.78	85.96	11/7/07 10:51	282:18:10	282:16:45	281:45:15	16.80186828	
98	67	986	0.00346	526.67	14.301	0.003324208		94.13	0.068815728	1948.64	82.78	89.96	11/9/07 9:37	329:04:10	329:02:45	328:31:15	18.14027134	
132	68	980	0.00466	527.67	14.214	0.004441825		125.78	0.073257553	2074.42	88.13	95.31	11/13/07 11:38	427:05:10	427:03:45	426:32:15	20.66606182	
18	68	993	0.00064	527.67	14.402	0.000613738		17.38	0.073871291	2091.79	88.86	96.04	11/15/07 9:58	473:25:10	473:23:45	472:52:15	21.75820407	
146	67	990	0.00516	526.67	14.359	0.004972483		140.80	0.078843774	2232.60	94.85	102.03	11/24/07 20:26	699:53:10	699:51:45	699:20:15	26.45536073	
67	67	982	0.00237	526.67	14.243	0.002263453		64.09	0.081107227	2296.69	97.57	104.75	11/28/07 10:38	786:05:10	786:03:45	785:32:15	28.03722724	
32	68	988	0.00113	527.67	14.330	0.001085596		30.74	0.082192823	2327.43	98.87	106.05	12/3/07 20:02	915:29:10	915:27:45	914:56:15	30.25700103	
30	67	986	0.00106	526.67	14.301	0.001017615		28.82	0.083210438	2356.25	100.10	107.28	12/7/07 11:50	1003:17:10	1003:15:45	1002:44:15	31.67469197	
-2	67	993	-7E-05	526.67	14.402	-6.83226E-05		-1.93	0.083142115	2354.31	100.02	107.20	12/10/07 10:11	1073:38:10	1073:36:45	1073:05:15	32.76638691	
18	67	991	0.00064	526.67	14.373	0.000613665		17.38	0.08375578	2371.69	100.75	107.93	12/12/07 13:22	1124:49:10	1124:47:45	1124:16:15	33.53832799	
62	69	977	0.00219	528.67	14.170	0.002075991		58.79	0.085831771	2430.48	103.25	110.43	12/20/07 9:49	1313:16:10	1313:14:45	1312:43:15	36.23905965	
9	67	987	0.00032	526.67	14.315	0.000305594		8.65	0.086137365	2439.13	103.62	110.80	12/27/07 10:28	1481:55:10	1481:53:45	1481:22:15	38.49570683	
-19	67	1012	-0.0007	526.67	14.678	-0.000661484		-18.73	0.085475881	2420.40	102.82	110.00	1/2/08 10:48	1626:15:10	1626:13:45	1625:42:15	40.32682454	
93	67	974	0.00328	526.67	14.127	0.003116213		88.24	0.088592094	2508.64	106.57	113.75	1/7/08 11:06	1746:33:10	1746:31:45	1746:00:15	41.79177883	
6	67	981	0.00021	526.67	14.228	0.000202491		5.73	0.088794585	2514.37	106.82	114.00	1/15/08 13:43	1941:10:10	1941:08:45	1940:37:15	44.05870453	
2	67	986	7.1E-05	526.67	14.301	6.7841E-05		1.92	0.088862426	2516.29	106.90	114.08	1/23/08 11:25	2130:52:10	2130:50:45	2130:19:15	46.16134145	

56	67	967	0.00198	526.67	14.025	0.001862944	52.75	0.090725369	2569.05	109.14	116.32	1/28/08 9:23	2248:50:10	2248:48:45	2248:17:15	47.42189485	
0	67	969	0	526.67	14.054	0	0.00	0.090725369	2569.05	109.14	116.32	2/4/08 10:41	2418:08:10	2418:06:45	2417:35:15	49.17454739	
-16	67	983	-0.0006	526.67	14.257	-0.000541077	-15.32	0.090184293	2553.73	108.49	115.67	2/11/08 14:51	2590:18:10	2590:16:45	2589:45:15	50.89501722	
7	67	981	0.00025	526.67	14.228	0.000236239	6.69	0.090420532	2560.41	108.77	115.95	2/18/08 8:58	2752:25:10	2752:23:45	2751:52:15	52.46350583	
22	67	969	0.00078	526.67	14.054	0.000733384	20.77	0.091153916	2581.18	109.65	116.83	2/25/08 9:29	2920:56:10	2920:54:45	2920:23:15	54.04568541	
-9	67	986	-0.0003	526.67	14.301	-0.000305284	-8.64	0.090848632	2572.54	109.29	116.47	3/3/08 10:42	3090:09:10	3090:07:45	3089:36:15	55.58914262	
-10	67	998	-0.0004	526.67	14.475	-0.000343333	-9.72	0.090505299	2562.81	108.87	116.05	3/10/08 9:09	3256:36:10	3256:34:45	3256:03:15	57.06665206	
39	67	982	0.00138	526.67	14.243	0.001317532	37.31	0.091822831	2600.12	110.46	117.64	3/17/08 10:27	3425:54:10	3425:52:45	3425:21:15	58.531212	
-11	67	993	-0.0004	526.67	14.402	-0.000375774	-10.64	0.091447057	2589.48	110.01	117.19	3/24/08 8:52	3592:19:10	3592:17:45	3591:46:15	59.9359612	
53	67	970	0.00187	526.67	14.069	0.001768613	50.08	0.09321567	2639.56	112.13	119.31	3/31/08 10:57	3762:24:10	3762:22:45	3761:51:15	61.33842823	
-10	67	986	-0.0004	526.67	14.301	-0.000339205	-9.61	0.092876465	2629.96	111.73	118.91	4/7/08 8:27	3927:54:10	3927:52:45	3927:21:15	62.67298284	
14	67	978	0.00049	526.67	14.185	0.000471034	13.34	0.093347499	2643.30	112.29	119.47	4/8/08 9:12	3952:39:10	3952:37:45	3952:06:15	62.87012627	
240.46	75	977	0.00849	534.67	14.170	0.007961142	225.43	0.101308641	2868.73	121.87	129.05	4/8/08 9:12	3952:39:10	3952:37:45	3952:06:15	62.87012627	residual gas calc.

DECANISTERED 4/08/2008; sample dried for 30 days in air; 171.55 grams placed in ball mill (51.28 cc @ STP desorbed), proportional to 225.43 cc @ STP for 754.13 grams (dry wt.) for entire sample

SAMPLE: 405' 6" to 407' 4" (Weir-Pittsburg coal) core in SSD canister C7
NOTES: very crumbly coal that breaks into 1 to 3 cm pieces and along bedding, slightly shaly
density = 1.46 gr/cc; KGS simple moisture = 3.09% (as received); KGS simple ash content = 13.54% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	12271	12856	14648
Sulfur	4.61%	4.83%	
Moisture	4.55%		
Ash	11.68%	12.23%	
Volatile Matter	39.93%	41.84%	
Fixed Carbon	43.84%	45.93%	

	lbs.	grams		lbs.	grams	moisture %	est. lost gas (cc) =
dry sample weight:	3.206	1454.35	wet sample weight:	3.333	1511.68	3.79%	196

TIME OF:

	off bottom	at surface	in canister	elapsed time (off bottom to canistering)	
	10/26/07 17:06	10/26/07 17:07	10/26/07 17:27	20.7	minutes
				0.346	hours
TIME SINCE				0.588075959	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						
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)	
64	67	990	0.00226	526.67	14.359	0.002179718		61.72	0.002179718	61.72	1.36	5.68	10/26/07 17:40	0:34:00	0:32:45	0:13:15	0.752772653	
18	67	990	0.00064	526.67	14.359	0.000613046		17.36	0.002792764	79.08	1.74	6.06	10/26/07 17:45	0:39:30	0:38:15	0:18:45	0.81137743	
23	67	990	0.00081	526.67	14.359	0.000783336		22.18	0.0035761	101.26	2.23	6.55	10/26/07 17:52	0:46:30	0:45:15	0:25:45	0.880340843	
9	67	990	0.00032	526.67	14.359	0.000306523		8.68	0.003882623	109.94	2.42	6.74	10/26/07 17:55	0:49:00	0:47:45	0:28:15	0.903696114	
28	67	990	0.00099	526.67	14.359	0.000953627		27.00	0.00483625	136.95	3.02	7.33	10/26/07 18:05	0:58:45	0:57:30	0:38:00	0.989528507	
27	67	990	0.00095	526.67	14.359	0.000919569		26.04	0.005755819	162.99	3.59	7.91	10/26/07 18:15	1:09:30	1:08:15	0:48:45	1.076258953	
42	67	991	0.00148	526.67	14.373	0.001431885		40.55	0.007187704	203.53	4.48	8.80	10/26/07 18:34	1:28:00	1:26:45	1:07:15	1.211060142	
630	70	994	0.02225	529.67	14.417	0.021421277		606.58	0.028608981	810.11	17.85	22.16	10/27/07 7:00	13:53:45	13:52:30	13:33:00	3.727711541	back at lab
279	67	999	0.00985	526.67	14.489	0.009588593		271.52	0.038197574	1081.63	23.83	28.14	10/27/07 19:20	26:13:45	26:12:30	25:53:00	5.121441854	
512	67	993	0.01808	526.67	14.402	0.017490589		495.28	0.055688163	1576.91	34.74	39.05	10/29/07 16:45	71:38:45	71:37:30	71:18:00	8.464386176	
312	68	988	0.01102	527.67	14.330	0.010584563		299.72	0.066272726	1876.63	41.34	45.66	10/31/07 10:45	113:38:45	113:37:30	113:18:00	10.66047998	gas sampled
509	68	987	0.01798	527.67	14.315	0.017250287		488.47	0.083523013	2365.10	52.10	56.42	11/5/07 11:41	234:34:45	234:33:30	234:14:00	15.3159775	
179	70	993	0.00632	529.67	14.402	0.00608024		172.17	0.089603253	2537.27	55.89	60.21	11/7/07 10:52	281:45:45	281:44:30	281:25:00	16.78578267	
144	67	986	0.00509	526.67	14.301	0.004884551		138.31	0.094487803	2675.59	58.94	63.26	11/9/07 9:37	328:30:45	328:29:30	328:10:00	18.12491379	
218	68	980	0.0077	527.67	14.214	0.007335741		207.72	0.101823544	2883.31	63.51	67.83	11/13/07 11:40	426:33:45	426:32:30	426:13:00	20.65338955	
74	68	993	0.00261	527.67	14.402	0.002523146		71.45	0.10434669	2954.76	65.09	69.41	11/15/07 9:59	472:52:45	472:51:30	472:32:00	21.74578503	
283	67	990	0.00999	526.67	14.359	0.009638442		272.93	0.113985132	3227.69	71.10	75.42	11/24/07 20:27	699:20:45	699:19:30	699:00:00	26.44514763	
122	67	982	0.00431	526.67	14.243	0.004121512		116.71	0.118106643	3344.40	73.67	77.99	11/28/07 10:39	785:32:45	785:31:30	785:12:00	28.02759057	
101	68	988	0.00357	527.67	14.330	0.003426413		97.02	0.121533056	3441.42	75.81	80.13	12/3/07 20:00	914:53:45	914:52:30	914:33:00	30.24724505	
55	67	986	0.00194	526.67	14.301	0.001865627		52.83	0.123398683	3494.25	76.97	81.29	12/7/07 11:50	1002:43:45	1002:42:30	1002:23:00	31.66589911	estimate
36	67	993	0.00127	526.67	14.402	0.001229807		34.82	0.12462849	3529.07	77.74	82.06	12/10/07 10:11	1073:04:45	1073:03:30	1072:44:00	32.75788709	
39	67	991	0.00138	526.67	14.373	0.001329608		37.65	0.125958098	3566.72	78.57	82.89	12/12/07 13:22	1124:15:45	1124:14:30	1123:55:00	33.53002386	
25	67	993	0.00088	526.67	14.402	0.000854033		24.18	0.126812131	3590.91	79.10	83.42	12/14/07 10:02	1168:55:45	1168:54:30	1168:35:00	34.18960612	
90	69	977	0.00318	528.67	14.170	0.003013535		85.33	0.129825665	3676.24	80.98	85.30	12/20/07 9:50	1312:43:45	1312:42:30	1312:23:00	36.23160453	
65	67	987	0.0023	526.67	14.315	0.002207068		62.50	0.132032733	3738.74	82.36	86.68	12/27/07 10:29	1481:22:45	1481:21:30	1481:02:00	38.48868881	
18	67	1012	0.00064	526.67	14.678	0.000626669		17.75	0.132659402	3756.48	82.75	87.07	1/2/08 10:49	1625:42:45	1625:41:30	1625:22:00	40.32012525	
93	67	974	0.00328	526.67	14.127	0.003116213		88.24	0.135775615	3844.72	84.69	89.01	1/7/08 11:07	1746:00:45	1745:59:30	1745:40:00	41.78531441	
61	67	981	0.00215	526.67	14.228	0.002058657		58.29	0.137834273	3903.02	85.98	90.29	1/15/08 13:45	1940:38:45	1940:37:30	1940:18:00	44.05276193	
47	67	986	0.00166	526.67	14.301	0.001594263		45.14	0.139428536	3948.16	86.97	91.29	1/23/08 11:26	2130:19:45	2130:18:30	2129:59:00	46.15548902	

66	67	967	0.00233	526.67	14.025	0.002195612	62.17	0.141624148	4010.33	88.34	92.66	1/28/08 9:24	2248:17:45	2248:16:30	2247:57:00	47.41619801	
44	67	969	0.00155	526.67	14.054	0.001466769	41.53	0.143090917	4051.87	89.26	93.57	2/4/08 10:43	2417:36:45	2417:35:30	2417:16:00	49.1692231	
16	67	983	0.00057	526.67	14.257	0.000541077	15.32	0.143631993	4067.19	89.59	93.91	2/11/08 14:53	2589:46:45	2589:45:30	2589:26:00	50.88987293	
43	67	981	0.00152	526.67	14.228	0.001451185	41.09	0.145083178	4108.28	90.50	94.82	2/18/08 9:00	2751:53:45	2751:52:30	2751:33:00	52.45851536	
56	67	969	0.00198	526.67	14.054	0.001866797	52.86	0.146949975	4161.14	91.66	95.98	2/25/08 9:30	2920:23:45	2920:22:30	2920:03:00	54.04068683	
13	67	986	0.00046	526.67	14.301	0.000440966	12.49	0.147390941	4173.63	91.94	96.26	3/3/08 10:43	3089:36:45	3089:35:30	3089:16:00	55.58428285	
10	67	998	0.00035	526.67	14.475	0.000343333	9.72	0.147734274	4183.35	92.15	96.47	3/10/08 9:11	3256:04:45	3256:03:30	3255:44:00	57.06206416	
56	67	982	0.00198	526.67	14.243	0.001891841	53.57	0.149626116	4236.92	93.33	97.65	3/17/08 10:28	3425:21:45	3425:20:30	3425:01:00	58.52659652	
27	67	993	0.00095	526.67	14.402	0.000922355	26.12	0.150548471	4263.04	93.91	98.23	3/24/08 8:53	3591:46:45	3591:45:30	3591:26:00	59.9314539	estimate
28	66	970	0.00099	525.67	14.069	0.000936139	26.51	0.15148461	4289.55	94.49	98.81	3/31/08 10:58	3761:51:45	3761:50:30	3761:31:00	61.334024	
-13	67	986	-0.0005	526.67	14.301	-0.000440966	-12.49	0.151043644	4277.06	94.22	98.53	4/7/08 8:29	3927:22:45	3927:21:30	3927:02:00	62.66880537	
14	67	978	0.00049	526.67	14.185	0.000471034	13.34	0.151514677	4290.40	94.51	98.83	4/8/08 9:13	3952:06:45	3952:05:30	3951:46:00	62.86582935	
-11	67	994	-0.0004	526.67	14.417	-0.000376153	-10.65	0.151138525	4279.75	94.28	98.59	4/14/08 8:24	4095:17:45	4095:16:30	4094:57:00	63.99449846	
27	61	987	0.00095	520.67	14.315	0.000927347	26.26	0.152065871	4306.01	94.85	99.17	4/28/08 9:39	4432:32:45	4432:31:30	4432:12:00	66.57736728	
16	61	986	0.00057	520.67	14.301	0.000548982	15.55	0.152614853	4321.56	95.20	99.51	5/5/08 8:27	4599:20:45	4599:19:30	4599:00:00	67.81847708	
37	62	980	0.00131	521.67	14.214	0.001259377	35.66	0.15387423	4357.22	95.98	100.30	5/12/08 9:06	4767:59:45	4767:58:30	4767:39:00	69.05067584	
3	63	965	0.00011	522.67	13.996	0.000100356	2.84	0.153974587	4360.06	96.05	100.36	5/19/08 9:19	4936:12:45	4936:11:30	4935:52:00	70.25818458	
1414.06	66	980	0.04994	525.67	14.214	0.047764421	1352.53	0.201739007	5712.59	125.84	130.16	5/19/08 9:19	4936:12:45	4936:11:30	4935:52:00	70.25818458	residual gas calc.

DECANISTERED 5/19/2008; sample dried for 20 days in air; 406.24 grams placed in ball mill (363.47 cc @ STP desorbed), proportional to 1352.53 cc @ STP for 1511.68 grams (wet wt.) for entire sample

SAMPLE: 450' 3" to 450' 8.5" (unnamed coal at top of Bluejacket Fm.) core in canister DN6
NOTES: very crumbly to granular coal; 5.5" recovered, but driller suspects it was 8" total coal; density = 1.35 gr/cc
density = 1.35 gr/cc; KGS simple moisture = 3.97% (as received); KGS simple ash content = 26.89% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	10125	10469	14190
Sulfur	6.50%	6.72%	
Moisture	3.28%		
Ash	25.36%	26.22%	
Volatile Matter	32.30%	33.40%	
Fixed Carbon	39.06%	40.38%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =	35
dry sample weight:	0.561	254.27	wet sample weight:	0.605	274.39	7.33%			

TIME 0F:

off bottom	at surface	in canister	elapsed time (off bottom to canistering)
10/27/07 11:29	10/27/07 11:31	10/27/07 11:50	21.3 minutes
			0.354 hours
			0.595119036 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	temp (R)	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	65	1000	7.1E-05	524.67	14.504	6.90665E-05	1.96	6.90665E-05	1.96	0.25	4.66	10/27/07 11:54	0:25:00	0:23:30	0:03:45	0.645497224	
3	65	1000	0.00011	524.67	14.504	0.0001036	2.93	0.000172666	4.89	0.62	5.03	10/27/07 11:59	0:29:45	0:28:15	0:08:30	0.704154339	
7	65	1000	0.00025	524.67	14.504	0.000241733	6.85	0.000414399	11.73	1.48	5.89	10/27/07 12:10	0:40:45	0:39:15	0:19:30	0.824115688	
4	65	1000	0.00014	524.67	14.504	0.000138133	3.91	0.000552532	15.65	1.97	6.38	10/27/07 12:17	0:48:15	0:46:45	0:27:00	0.896753404	
7	66	1000	0.00025	525.67	14.504	0.000241273	6.83	0.000793805	22.48	2.83	7.24	10/27/07 12:29	0:59:45	0:58:15	0:38:30	0.997914492	
7	66	1000	0.00025	525.67	14.504	0.000241273	6.83	0.001035078	29.31	3.69	8.10	10/27/07 12:42	1:13:00	1:11:30	0:51:45	1.103026141	
7	66	1000	0.00025	525.67	14.504	0.000241273	6.83	0.001276351	36.14	4.55	8.96	10/27/07 12:55	1:26:00	1:24:30	1:04:45	1.197219	
5	67	1000	0.00018	526.67	14.504	0.000172011	4.87	0.001448362	41.01	5.17	9.58	10/27/07 13:06	1:37:15	1:35:45	1:16:00	1.273119528	
7	67	1000	0.00025	526.67	14.504	0.000240815	6.82	0.001689176	47.83	6.03	10.44	10/27/07 13:25	1:56:00	1:54:30	1:34:45	1.390443574	
3	68	1000	0.00011	527.67	14.504	0.000103011	2.92	0.001792187	50.75	6.39	10.80	10/27/07 13:32	2:03:15	2:01:45	1:42:00	1.433236431	
13	68	1000	0.00046	527.67	14.504	0.00044638	12.64	0.002238567	63.39	7.99	12.40	10/27/07 14:26	2:56:30	2:55:00	2:35:15	1.715128761	
9	67	1000	0.00032	526.67	14.504	0.000309619	8.77	0.002548186	72.16	9.09	13.50	10/27/07 15:23	3:53:30	3:52:00	3:32:15	1.972730764	
9	67	1000	0.00032	526.67	14.504	0.000309619	8.77	0.002857805	80.92	10.20	14.61	10/27/07 15:56	4:26:30	4:25:00	4:05:15	2.107526196	
4	68	1000	0.00014	527.67	14.504	0.000137348	3.89	0.002995153	84.81	10.69	15.10	10/27/07 16:37	5:07:30	5:06:00	4:46:15	2.263846285	
163	67	993	0.00576	526.67	14.402	0.005568293	157.68	0.008563446	242.49	30.55	34.96	10/29/07 16:49	53:19:30	53:18:00	52:58:15	7.302396867	back at lab
87	68	988	0.00307	527.67	14.330	0.002951465	83.58	0.011514911	326.06	41.08	45.49	10/31/07 11:12	95:42:30	95:41:00	95:21:15	9.783063597	
103	68	987	0.00364	527.67	14.315	0.003490726	98.85	0.015005637	424.91	53.54	57.95	11/5/07 11:45	216:15:30	216:14:00	215:54:15	14.70572451	
17	70	993	0.0006	529.67	14.402	0.000577453	16.35	0.01558309	441.26	55.60	60.01	11/7/07 10:53	263:23:30	263:22:00	263:02:15	16.22934585	
19	68	980	0.00067	527.67	14.214	0.000639354	18.10	0.016222443	459.37	57.88	62.29	11/13/07 11:42	408:12:30	408:11:00	407:51:15	20.20416624	
4	68	993	0.00014	527.67	14.402	0.000136386	3.86	0.016358829	463.23	58.37	62.77	11/15/07 9:59	454:29:30	454:28:00	454:08:15	21.31881016	
3	67	990	0.00011	526.67	14.359	0.000102174	2.89	0.016461004	466.12	58.73	63.14	11/24/07 20:29	680:59:30	680:58:00	680:38:15	26.09581703	
1	67	982	3.5E-05	526.67	14.243	3.37829E-05	0.96	0.016494787	467.08	58.85	63.26	11/28/07 10:40	767:10:30	767:09:00	766:49:15	27.69792411	
1	67	986	3.5E-05	526.67	14.301	3.39205E-05	0.96	0.016528707	468.04	58.97	63.38	12/7/07 11:51	984:21:30	984:20:00	984:00:15	31.37448539	
1	67	991	3.5E-05	526.67	14.373	3.40925E-05	0.97	0.0165628	469.00	59.09	63.50	12/12/07 13:23	1105:53:30	1105:52:00	1105:32:15	33.25494951	

2	69	977	7.1E-05	528.67	14.170	6.69674E-05	1.90	0.016629767	470.90	59.33	63.74	12/20/07 9:51	1294:21:30	1294:20:00	1294:00:15	35.97719185	
0	67	986	0	526.67	14.301	0	0.00	0.016629767	470.90	59.33	63.74	12/27/07 10:32	1463:02:30	1463:01:00	1462:41:15	38.24972767	
0	67	1012	0	526.67	14.678	0	0.00	0.016629767	470.90	59.33	63.74	1/2/08 10:49	1607:19:30	1607:18:00	1606:58:15	40.09145794	
1	67	974	3.5E-05	526.67	14.127	3.35077E-05	0.95	0.016663275	471.85	59.45	63.86	1/7/08 11:09	1727:39:30	1727:38:00	1727:18:15	41.56510957	
3	67	981	0.00011	526.67	14.228	0.000101245	2.87	0.01676452	474.72	59.81	64.22	1/15/08 13:46	1922:16:30	1922:15:00	1921:55:15	43.84375668	
2	67	986	7.1E-05	526.67	14.301	6.7841E-05	1.92	0.016832361	476.64	60.05	64.46	1/23/08 11:27	2111:57:30	2111:56:00	2111:36:15	45.95604784	
3	67	967	0.00011	526.67	14.025	9.98006E-05	2.83	0.016932162	479.46	60.41	64.82	1/28/08 9:26	2229:56:30	2229:55:00	2229:35:15	47.22225817	
0	67	969	0	526.67	14.054	0	0.00	0.016932162	479.46	60.41	64.82	2/4/08 10:44	2399:14:30	2399:13:00	2398:53:15	48.98205454	
430.11	69	973	0.01519	528.67	14.112	0.01434272	406.14	0.031274881	885.60	111.58	115.99	2/4/08 10:44	2399:14:30	2399:13:00	2398:53:15	48.98205454	residual gas calc.

DECANISTERED 2/04/2008; sample dried for 54 days in air; 15.37 grams placed in ball mill (24.55 cc @ STP desorbed), proportional to 406.14 cc @ STP for 254.27 grams (dry wt.) for entire sample

SAMPLE: 596' 1" to 597' 5" (Riverton coal) core in SSD canister C9
NOTES: very crumbly coal, with minor mineralization in fractures, cleat spacing at 1/2 cm
density = 1.55 gr/cc; KGS simple moisture = 2.48% (as received); KGS simple ash content = 14.21% (moisture-free)
TerraTek moisture = 7.39%; ash content = 11.04%
PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	11850	12414	14467
Sulfur	6.08%	6.37%	
Moisture	4.55%		
Ash	13.54%	14.19%	
Volatile Matter	34.21%	35.84%	
Fixed Carbon	47.70%	49.97%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	2.364	1072.26	wet sample weight:	2.510	1138.43	5.81%		117		off bottom	at surface	in canister	22.8 minutes
										10/28/07 14:38	10/28/07 14:39	10/28/07 15:01	0.379 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			0.615765107 SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)	
6	65	1004	0.00021	524.67	14.562	0.000208028	5.89	0.000208028	5.89	0.18	3.67	10/28/07 15:03	0:25:30	0:24:00	0:02:45	0.651920241	
7	65	1004	0.00025	524.67	14.562	0.0002427	6.87	0.000450728	12.76	0.38	3.88	10/28/07 15:07	0:28:45	0:27:15	0:06:00	0.692218655	
8	65	1004	0.00028	524.67	14.562	0.000277371	7.85	0.000728099	20.62	0.62	4.11	10/28/07 15:10	0:32:00	0:30:30	0:09:15	0.730296743	
19	66	1003	0.00067	525.67	14.547	0.000656848	18.60	0.001384948	39.22	1.17	4.67	10/28/07 15:18	0:40:00	0:38:30	0:17:15	0.816496581	
12	66	1003	0.00042	525.67	14.547	0.000414852	11.75	0.001799799	50.96	1.52	5.02	10/28/07 15:24	0:46:15	0:44:45	0:23:30	0.877971146	
24	66	1003	0.00085	525.67	14.547	0.000829703	23.49	0.002629502	74.46	2.22	5.72	10/28/07 15:41	1:03:15	1:01:45	0:40:30	1.026726189	
32	67	1003	0.00113	526.67	14.547	0.00110417	31.27	0.003733673	105.73	3.16	6.65	10/28/07 16:09	1:31:15	1:29:45	1:08:30	1.233220716	
21	67	1003	0.00074	526.67	14.547	0.000724612	20.52	0.004458285	126.24	3.77	7.27	10/28/07 16:30	1:51:45	1:50:15	1:29:00	1.364734406	
24	66	1003	0.00085	525.67	14.547	0.000829703	23.49	0.005287988	149.74	4.47	7.97	10/28/07 17:01	2:22:45	2:21:15	2:00:00	1.542454754	
121	64	999	0.00427	523.67	14.489	0.004182317	118.43	0.009470305	268.17	8.01	11.51	10/28/07 21:12	6:33:45	6:32:15	6:11:00	2.561737691	back at lab
243	67	993	0.00858	526.67	14.402	0.008301197	235.06	0.017771502	503.23	15.04	18.53	10/29/07 16:52	26:13:45	26:12:15	25:51:00	5.121441854	
274	68	988	0.00968	527.67	14.330	0.009295417	263.22	0.02706692	766.45	22.90	26.40	10/31/07 11:10	68:31:45	68:30:15	68:09:00	8.278234514	gas sampled
298	68	987	0.01052	527.67	14.315	0.010099382	285.98	0.037166302	1052.43	31.44	34.94	11/5/07 11:46	189:07:45	189:06:15	188:45:00	13.75242403	.
141	70	993	0.00498	529.67	14.402	0.004789463	135.62	0.041955765	1188.05	35.50	38.99	11/7/07 10:54	236:15:45	236:14:15	235:53:00	15.37083277	
96	67	986	0.00339	526.67	14.301	0.003256367	92.21	0.045212132	1280.26	38.25	41.75	11/9/07 9:36	282:57:45	282:56:15	282:35:00	16.82148923	
163	68	993	0.00576	527.67	14.402	0.00555774	157.38	0.050769872	1437.64	42.95	46.45	11/15/07 9:34	426:55:45	426:54:15	426:33:00	20.66226432	
174	67	990	0.00614	526.67	14.359	0.005926109	167.81	0.056695981	1605.45	47.97	51.46	11/24/07 20:30	653:51:45	653:50:15	653:29:00	25.57073523	
83	67	982	0.00293	526.67	14.243	0.002803979	79.40	0.059499961	1684.84	50.34	53.84	11/28/07 10:41	740:02:45	740:01:15	739:40:00	27.20378344	
70	68	988	0.00247	527.67	14.330	0.002374742	67.24	0.061874702	1752.09	52.35	55.84	12/3/07 20:01	869:22:45	869:21:15	869:00:00	29.48523642	
50	67	986	0.00177	526.67	14.301	0.001696025	48.03	0.063570727	1800.12	53.78	57.28	12/7/07 11:51	957:12:45	957:11:15	956:50:00	30.93885098	
28	67	993	0.00099	526.67	14.402	0.000956517	27.09	0.064527243	1827.20	54.59	58.09	12/10/07 10:10	1027:31:45	1027:30:15	1027:09:00	32.0550958	
25	67	991	0.00088	526.67	14.373	0.000852313	24.13	0.065379556	1851.34	55.31	58.81	12/12/07 13:23	1078:44:45	1078:43:15	1078:22:00	32.84426637	
17	67	993	0.0006	526.67	14.402	0.000580742	16.44	0.065960298	1867.78	55.81	59.30	12/14/07 10:03	1123:24:45	1123:23:15	1123:02:00	33.51734626	
97	69	977	0.00343	528.67	14.170	0.003247921	91.97	0.069208219	1959.75	58.55	62.05	12/20/07 9:52	1267:13:45	1267:12:15	1266:51:00	35.59816241	
41	67	987	0.00145	526.67	14.315	0.001392151	39.42	0.07060037	1999.17	59.73	63.23	12/27/07 10:33	1435:54:45	1435:53:15	1435:32:00	37.89343611	
22	67	1012	0.00078	526.67	14.678	0.000765929	21.69	0.071366298	2020.86	60.38	63.88	1/2/08 10:51	1580:12:45	1580:11:15	1579:50:00	39.75188675	
98	67	974	0.00346	526.67	14.127	0.003283751	92.99	0.07465005	2113.85	63.16	66.65	1/7/08 11:10	1700:31:45	1700:30:15	1700:09:00	41.23747285	
38	67	981	0.00134	526.67	14.228	0.001282442	36.31	0.075932492	2150.16	64.24	67.74	1/15/08 13:47	1895:08:45	1895:07:15	1894:46:00	43.53327272	
32	67	986	0.00113	526.67	14.301	0.001085456	30.74	0.077017948	2180.90	65.16	68.66	1/23/08 11:28	2084:49:45	2084:48:15	2084:27:00	45.65992955	
34	67	967	0.0012	526.67	14.025	0.001131073	32.03	0.07814902	2212.93	66.12	69.61	1/28/08 9:27	2202:48:45	2202:47:15	2202:26:00	46.93412937	
27	67	969	0.00095	526.67	14.054	0.000900063	25.49	0.079049083	2238.41	66.88	70.38	2/4/08 10:45	2372:06:45	2372:05:15	2371:44:00	48.70433759	
19	67	983	0.00067	526.67	14.257	0.000642528	18.19	0.079691612	2256.61	67.42	70.92	2/14/08 14:54	2616:15:45	2616:14:15	2615:53:00	51.14941349	

22	67	981	0.00078	526.67	14.228	0.000742467	21.02	0.080434078	2277.63	68.05	71.55	2/18/08 9:01	2706:22:45	2706:21:15	2706:00:00	52.02287157	
29	67	969	0.00102	526.67	14.054	0.000966734	27.37	0.081400812	2305.01	68.87	72.36	2/25/08 9:31	2874:52:45	2874:51:15	2874:30:00	53.61789969	
15	67	986	0.00053	526.67	14.301	0.000508807	14.41	0.081909619	2319.41	69.30	72.80	3/3/08 10:44	3044:05:45	3044:04:15	3043:43:00	55.17332538	
12	67	998	0.00042	526.67	14.475	0.000412	11.67	0.082321619	2331.08	69.65	73.14	3/10/08 9:12	3210:33:45	3210:32:15	3210:11:00	56.66182577	
27	67	982	0.00095	526.67	14.243	0.000912138	25.83	0.083233757	2356.91	70.42	73.92	3/17/08 10:29	3379:50:45	3379:49:15	3379:28:00	58.13644153	
13	67	993	0.00046	526.67	14.402	0.000444097	12.58	0.083677854	2369.48	70.80	74.29	3/24/08 8:54	3546:15:45	3546:14:15	3545:53:00	59.55050378	
29	66	970	0.00102	525.67	14.069	0.000969573	27.46	0.084647427	2396.94	71.62	75.11	3/31/08 10:59	3716:20:45	3716:19:15	3715:58:00	60.96183916	
11	67	986	0.00039	526.67	14.301	0.000373125	10.57	0.085020552	2407.50	71.93	75.43	4/7/08 8:29	3881:50:45	3881:49:15	3881:28:00	62.30446078	
9	67	994	0.00032	526.67	14.417	0.000307761	8.71	0.085328313	2416.22	72.19	75.69	4/14/08 8:24	4049:45:45	4049:44:15	4049:23:00	63.6377443	
18	61	987	0.00064	520.67	14.315	0.000618231	17.51	0.085946545	2433.73	72.72	76.21	4/28/08 9:40	4387:01:45	4387:00:15	4386:39:00	66.23465231	
7	61	986	0.00025	520.67	14.301	0.00024018	6.80	0.086186724	2440.53	72.92	76.41	5/5/08 8:28	4553:49:45	4553:48:15	4553:27:00	67.48206552	
16	62	980	0.00057	521.67	14.214	0.000544595	15.42	0.08673132	2455.95	73.38	76.87	5/12/08 9:08	4722:29:45	4722:28:15	4722:07:00	68.72041788	
19	63	965	0.00067	522.67	13.996	0.00063559	18.00	0.08736691	2473.95	73.92	77.41	5/19/08 9:20	4890:41:45	4890:40:15	4890:19:00	69.93351009	
0	65	982	0	524.67	14.243	0	0.00	0.08736691	2473.95	73.92	77.41	5/27/08 11:09	5084:30:45	5084:29:15	5084:08:00	71.30576765	
4	66	981	0.00014	525.67	14.228	0.000135251	3.83	0.087502161	2477.78	74.03	77.53	5/31/08 17:29	5186:50:45	5186:49:15	5186:28:00	72.01976002	
12	69	981	0.00042	528.67	14.228	0.00040345	11.42	0.08790561	2489.20	74.37	77.87	6/9/08 11:39	5397:00:45	5396:59:15	5396:38:00	73.46436211	
4	68	984	0.00014	527.67	14.272	0.00013515	3.83	0.08804076	2493.03	74.49	77.98	6/16/08 20:20	5573:41:45	5573:40:15	5573:19:00	74.65718876	
2	68	985	7.1E-05	527.67	14.286	6.76437E-05	1.92	0.088108404	2494.94	74.54	78.04	6/21/08 11:11	5684:32:45	5684:31:15	5684:10:00	75.39592717	
735.28	70	984	0.02597	529.67	14.272	0.024749491	700.82	0.112857895	3195.77	95.48	98.98	6/21/08 11:11	5684:32:45	5684:31:15	5684:10:00	75.39592717	residual gas calc.

DECANISTERED 6/21/2008; sample dried for 27 days in air; 230.70 grams placed in ball mill (142.02 cc @ STP desorbed), proportional to 700.82 cc @ STP for 1138.43 grams (wet wt.) for entire sample

TABLE 4 -- Desorption measurements for Petron Resources #1-30 Zimmerman, SE NW NW 30-45N-32W, Cass Co., MO

SAMPLE: 443' 3" to 444' 1" (Wheeler coal) core in SSD canister Z1
NOTES: single piece of coal, cleat filled with light-colored mineral
density = 1.48 gr/cc; KGS simple moisture = 5.40% (as received); KGS simple ash content = 9.06% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	12159	12938	14314
Sulfur	4.63%	4.93%	
Moisture	6.02%		
Ash	9.04%	9.62%	
Volatile Matter	37.08%	39.46%	
Fixed Carbon	47.86%	50.92%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	1.552	703.76	wet sample weight:	1.648	747.31	5.83%		48		off bottom	at surface	in canister	23.5 minutes
										12/3/07 12:44	12/3/07 12:45	12/3/07 13:07	0.392 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			0.625832779 SQRT (hrs)	
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)	
4	69	996	0.00014	528.67	14.446	0.00013654	3.87	0.00013654	3.87	0.18	2.36	12/3/07 13:12	0:28:00	0:26:40	0:04:30	0.683130051	
3	69	996	0.00011	528.67	14.446	0.000102405	2.90	0.000238944	6.77	0.31	2.49	12/3/07 13:15	0:31:15	0:29:55	0:07:45	0.721687837	
1	69	996	3.5E-05	528.67	14.446	3.41349E-05	0.97	0.000273079	7.73	0.35	2.54	12/3/07 13:16	0:32:45	0:31:25	0:09:15	0.738805342	
4	69	995	0.00014	528.67	14.431	0.000136402	3.86	0.000409482	11.60	0.53	2.71	12/3/07 13:21	0:37:30	0:36:10	0:14:00	0.790569415	
3	69	996	0.00011	528.67	14.446	0.000102405	2.90	0.000511886	14.49	0.66	2.84	12/3/07 13:25	0:41:00	0:39:40	0:17:30	0.826639785	
5	69	996	0.00018	528.67	14.446	0.000170674	4.83	0.000682561	19.33	0.88	3.06	12/3/07 13:33	0:49:00	0:47:40	0:25:30	0.903696114	
3	69	996	0.00011	528.67	14.446	0.000102405	2.90	0.000784965	22.23	1.01	3.20	12/3/07 13:37	0:53:30	0:52:10	0:30:00	0.944281032	
5	69	995	0.00018	528.67	14.431	0.000170503	4.83	0.000955468	27.06	1.23	3.42	12/3/07 13:44	1:00:15	0:58:55	0:36:45	1.002081168	
4	69	995	0.00014	528.67	14.431	0.000136402	3.86	0.001091871	30.92	1.41	3.59	12/3/07 13:50	1:06:00	1:04:40	0:42:30	1.048808848	
7	69	995	0.00025	528.67	14.431	0.000238704	6.76	0.001330575	37.68	1.72	3.90	12/3/07 14:00	1:16:45	1:15:25	0:53:15	1.131002505	
5	68	994	0.00018	527.67	14.417	0.000170655	4.83	0.00150123	42.51	1.94	4.12	12/3/07 14:10	1:26:00	1:24:40	1:02:30	1.197219	
12	68	994	0.00042	527.67	14.417	0.000409571	11.60	0.0019108	54.11	2.46	4.65	12/3/07 14:33	1:49:00	1:47:40	1:25:30	1.347837775	
7	68	994	0.00025	527.67	14.417	0.000238916	6.77	0.002149717	60.87	2.77	4.96	12/3/07 14:48	2:04:45	2:03:25	1:41:15	1.441931575	
4	68	994	0.00014	527.67	14.417	0.000136524	3.87	0.00228624	64.74	2.95	5.13	12/3/07 15:00	2:16:15	2:14:55	1:52:45	1.506928443	
8	67	993	0.00028	526.67	14.402	0.00027329	7.74	0.002559531	72.48	3.30	5.48	12/3/07 15:20	2:36:30	2:35:10	2:13:00	1.615033539	
6	67	993	0.00021	526.67	14.402	0.000204968	5.80	0.002764499	78.28	3.56	5.75	12/3/07 15:38	2:54:45	2:53:25	2:31:15	1.706604817	
30	67	993	0.00106	526.67	14.402	0.001024839	29.02	0.003789338	107.30	4.88	7.07	12/3/07 17:08	4:24:00	4:22:40	4:00:30	2.097617696	
69	67	988	0.00244	526.67	14.330	0.002345261	66.41	0.006134599	173.71	7.91	10.09	12/3/07 21:19	8:35:00	8:33:40	8:11:30	2.929732639	back at lab
96	68	983	0.00339	527.67	14.257	0.003240307	91.75	0.009374906	265.47	12.08	14.27	12/4/07 7:41	18:57:00	18:55:40	18:33:30	4.353159772	
86	67	973	0.00304	526.67	14.112	0.002878701	81.52	0.012253607	346.98	15.80	17.98	12/4/07 20:23	31:39:00	31:37:40	31:15:30	5.625833272	
49	67	983	0.00173	526.67	14.257	0.001657047	46.92	0.013910654	393.90	17.93	20.12	12/5/07 7:49	43:05:00	43:03:40	42:41:30	6.563789556	
43	67	990	0.00152	526.67	14.359	0.001464498	41.47	0.015375152	435.37	19.82	22.00	12/5/07 20:21	55:37:00	55:35:40	55:13:30	7.457658256	
95	67	986	0.00335	526.67	14.301	0.003222447	91.25	0.018597599	526.62	23.97	26.16	12/7/07 11:00	94:16:00	94:14:40	93:52:30	9.709102259	gas sampled
103	67	993	0.00364	526.67	14.402	0.003518615	99.64	0.022116213	626.26	28.51	30.69	12/10/07 9:50	165:06:00	165:04:40	164:42:30	12.84912448	gas sampled
72	67	991	0.00254	526.67	14.373	0.00245466	69.51	0.024570873	695.77	31.67	33.86	12/12/07 13:01	216:17:00	216:15:40	215:53:30	14.70657449	gas sampled
44	67	993	0.00155	526.67	14.402	0.001503097	42.56	0.026073971	738.33	33.61	35.80	12/14/07 10:04	261:20:00	261:18:40	260:56:30	16.16580754	
84	69	977	0.00297	528.67	14.170	0.002812632	79.64	0.028886603	817.97	37.24	39.42	12/20/07 9:52	405:08:00	405:06:40	404:44:30	20.12792422	
64	67	987	0.00226	526.67	14.315	0.002173113	61.54	0.031059716	879.51	40.04	42.22	12/27/07 10:34	573:50:00	573:48:40	573:26:30	23.95481858	
22	67	1012	0.00078	526.67	14.678	0.000765929	21.69	0.031825645	901.20	41.02	43.21	1/2/08 10:52	718:08:00	718:06:40	717:44:30	26.79800988	
55	67	974	0.00194	526.67	14.127	0.001842922	52.19	0.033668567	953.38	43.40	45.59	1/7/08 11:12	838:28:00	838:26:40	838:04:30	28.9562889	
44	67	981	0.00155	526.67	14.228	0.001484933	42.05	0.0351535	995.43	45.31	47.50	1/15/08 13:50	1033:06:00	1033:04:40	1032:42:30	32.141873	
33	67	986	0.00117	526.67	14.301	0.001119376	31.70	0.036272876	1027.13	46.76	48.94	1/23/08 11:29	1222:45:00	1222:43:40	1222:21:30	34.96784237	
31	67	967	0.00109	526.67	14.025	0.001031272	29.20	0.037304148	1056.33	48.09	50.27	1/28/08 9:29	1340:45:00	1340:43:40	1340:21:30	36.61625322	
24	67	969	0.00085	526.67	14.054	0.000800056	22.65	0.038104204	1078.99	49.12	51.30	2/4/08 10:48	1510:04:00	1510:02:40	1509:40:30	38.85957625	
7	67	983	0.00025	526.67	14.257	0.000236721	6.70	0.038340925	1085.69	49.42	51.61	2/11/08 14:55	1682:11:00	1682:09:40	1681:47:30	41.01442836	
18	67	981	0.00064	526.67	14.228	0.000607473	17.20	0.038948398	1102.89	50.21	52.39	2/18/08 9:02	1844:18:00	1844:16:40	1843:54:30	42.94531406	
23	67	969	0.00081	526.67	14.054	0.00076672	21.71	0.039715118	1124.60	51.19	53.38	2/25/08 9:33	2012:49:00	2012:47:40	2012:25:30	44.8644254	
6	67	986	0.00021	526.67	14.301	0.000203523	5.76	0.039918641	1130.37	51.46	53.64	3/3/08 10:45	2182:01:00	2181:59:40	2181:37:30	46.71206125	
5	67	998	0.00018	526.67	14.475	0.000171667	4.86	0.040090307	1135.23	51.68	53.86	3/10/08 9:13	2348:29:00	2348:27:40	2348:05:30	48.46115283	
21	67	982	0.00074	526.67	14.243	0.000709441	20.09	0.040799748	1155.32	52.59	54.78	3/17/08 10:30	2517:46:00	2517:44:40	2517:22:30	50.17735213	
6	67	993	0.00021	526.67	14.402	0.000204968	5.80	0.041004716	1161.12	52.86	55.04	3/24/08 8:57	2684:13:00	2684:11:40	2683:49:30	51.80942643	
22	66	970	0.00078	525.67	14.069	0.000735538	20.83	0.041740254	1181.95	53.81	55.99	3/31/08 11:00	2854:16:00	2854:14:40	2853:52:30	53.42533731	

781.75	74	984	0.02761	533.67	14.272	0.026116441	739.53	0.067856695	1921.48	87.47	89.66	3/31/08 11:00	2854:16:00	2854:14:40	2853:52:30	53.42533731	residual gas calc.

DECANISTERED 3/31/2008; sample dried for 38 days in air; 171.95 grams placed in ball mill (180.69 cc @ STP desorbed), proportional to 739.53 cc @ STP for 703.76 grams (dry wt.) for entire sample

SAMPLE: 487' 8" to 488' 6" (shale above Fleming coal) core in SSD canister Z2
NOTES: coaly shale, no cleat evident, breaks along bedding planes into 3 large pieces
density = 1.89 gr/cc; KGS simple moisture = 1.33% (as received); KGS simple ash content = 48.00% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	5841	5929	11543
Sulfur	15.77%	16.01%	
Moisture	1.50%		
Ash	47.90%	48.63%	
Volatile Matter	25.54%	25.92%	
Fixed Carbon	25.06%	25.45%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	1.708	774.86	wet sample weight:	1.847	837.90	7.52%		59		off bottom	at surface	in canister	20.7 minutes
										12/3/07 15:26	12/3/07 15:28	12/3/07 15:47	0.346 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			0.588075959 SQRT (hrs)	
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)	
5	67	993	0.00018	526.67	14.402	0.000170807	4.84	0.000170807	4.84	0.20	2.64	12/3/07 15:52	0:25:30	0:23:45	0:04:45	0.651920241	
2	67	993	7.1E-05	526.67	14.402	6.83226E-05	1.93	0.000239129	6.77	0.28	2.72	12/3/07 15:54	0:27:30	0:25:45	0:06:45	0.6770032	
13	67	993	0.00046	526.67	14.402	0.000444097	12.58	0.000683226	19.35	0.80	3.24	12/3/07 16:04	0:37:30	0:35:45	0:16:45	0.790569415	
6	67	993	0.00021	526.67	14.402	0.000204968	5.80	0.000888194	25.15	1.04	3.48	12/3/07 16:10	0:43:45	0:42:00	0:23:00	0.853912564	
4	67	993	0.00014	526.67	14.402	0.000136645	3.87	0.001024839	29.02	1.20	3.64	12/3/07 16:14	0:47:45	0:46:00	0:27:00	0.892094913	
5	67	993	0.00018	526.67	14.402	0.000170807	4.84	0.001195646	33.86	1.40	3.84	12/3/07 16:19	0:52:45	0:51:00	0:32:00	0.937638879	
4	67	993	0.00014	526.67	14.402	0.000136645	3.87	0.001332291	37.73	1.56	4.00	12/3/07 16:23	0:56:45	0:55:00	0:36:00	0.972539631	
24	67	992	0.00085	526.67	14.388	0.000819046	23.19	0.002151337	60.92	2.52	4.96	12/3/07 17:05	1:38:15	1:36:30	1:17:30	1.279648389	
106	67	988	0.00374	526.67	14.330	0.003602865	102.02	0.005754202	162.94	6.74	9.18	12/3/07 21:21	5:54:15	5:52:30	5:33:30	2.429849104	back at lab
119	68	983	0.0042	527.67	14.257	0.00401663	113.74	0.009770832	276.68	11.44	13.88	12/4/07 7:42	16:15:15	16:13:30	15:54:30	4.031645652	
94	67	973	0.00332	526.67	14.112	0.003146487	89.10	0.012917319	365.78	15.12	17.56	12/4/07 20:24	28:57:15	28:55:30	28:36:30	5.380907606	
45	67	983	0.00159	526.67	14.257	0.001521778	43.09	0.014439097	408.87	16.90	19.34	12/5/07 7:50	40:23:15	40:21:30	40:02:30	6.355116049	
36	67	990	0.00127	526.67	14.359	0.001226092	34.72	0.015665188	443.59	18.34	20.78	12/5/07 20:22	52:55:15	52:53:30	52:34:30	7.274670668	
79	67	986	0.00279	526.67	14.301	0.002679719	75.88	0.018344907	519.47	21.48	23.92	12/7/07 11:30	92:03:15	92:01:30	91:42:30	9.594486264	
71	67	993	0.00251	526.67	14.402	0.002425453	68.68	0.02077036	588.15	24.32	26.76	12/10/07 10:00	162:33:15	162:31:30	162:12:30	12.7496732	
44	67	991	0.00155	526.67	14.373	0.00150007	42.48	0.02227043	630.63	26.07	28.51	12/12/07 13:24	213:57:15	213:55:30	213:36:30	14.6271722	
27	67	993	0.00095	526.67	14.402	0.000922355	26.12	0.023192785	656.74	27.15	29.59	12/14/07 10:06	258:39:15	258:37:30	258:18:30	16.08272883	
60	69	977	0.00212	528.67	14.170	0.002009023	56.89	0.025201808	713.63	29.51	31.94	12/20/07 9:55	402:28:15	402:26:30	402:07:30	20.06167574	
39	67	987	0.00138	526.67	14.315	0.001324241	37.50	0.026526049	751.13	31.06	33.50	12/27/07 10:35	571:08:15	571:06:30	570:47:30	23.89848322	
12	67	1012	0.00042	526.67	14.678	0.000417779	11.83	0.026943829	762.96	31.55	33.98	1/2/08 10:54	715:27:15	715:25:30	715:06:30	26.747975	
40	67	974	0.00141	526.67	14.127	0.001340307	37.95	0.028284135	800.91	33.11	35.55	1/7/08 11:13	835:46:15	835:44:30	835:25:30	28.90970137	
22	67	981	0.00078	526.67	14.228	0.000742467	21.02	0.029026602	821.94	33.98	36.42	1/15/08 13:51	1030:24:15	1030:22:30	1030:03:30	32.09990914	
14	67	986	0.00049	526.67	14.301	0.000474887	13.45	0.029501489	835.39	34.54	36.98	1/23/08 11:30	1220:03:15	1220:01:30	1219:42:30	34.92927378	
21	67	967	0.00074	526.67	14.025	0.000698604	19.78	0.030200093	855.17	35.36	37.80	1/28/08 9:30	1338:03:15	1338:01:30	1337:42:30	36.57942272	
12	67	969	0.00042	526.67	14.054	0.000400028	11.33	0.03060012	866.50	35.83	38.27	2/4/08 10:48	1507:21:15	1507:19:30	1507:00:30	38.82465926	
-3	67	983	-0.0001	526.67	14.257	-0.000101452	-2.87	0.030498669	863.62	35.71	38.15	2/11/08 14:56	1679:29:15	1679:27:30	1679:08:30	40.98155073	
8	67	981	0.00028	526.67	14.228	0.000269988	7.65	0.030768656	871.27	36.02	38.46	2/18/08 9:03	1841:36:15	1841:34:30	1841:15:30	42.91391577	
22	67	969	0.00078	526.67	14.054	0.000733384	20.77	0.031502041	892.04	36.88	39.32	2/25/08 9:34	2010:07:15	2010:05:30	2009:46:30	44.83437112	
-1	67	986	-4E-05	526.67	14.301	-3.39205E-05	-0.96	0.03146812	891.07	36.84	39.28	3/3/08 10:46	2179:19:15	2179:17:30	2178:58:30	46.68319648	
-1	67	998	-4E-05	526.67	14.475	-3.43333E-05	-0.97	0.031433787	890.10	36.80	39.24	3/10/08 9:14	2345:47:15	2345:45:30	2345:26:30	48.43333047	
17	67	982	0.0006	526.67	14.243	0.000574309	16.26	0.032008096	906.36	37.47	39.91	3/17/08 10:31	2515:04:15	2515:02:30	2514:43:30	50.15048189	
0	67	993	0	526.67	14.402	0	0.00	0.032008096	906.36	37.47	39.91	3/24/08 8:59	2681:32:15	2681:30:30	2681:11:30	51.78356399	
19	66	970	0.00067	525.67	14.069	0.000635237	17.99	0.032643333	924.35	38.22	40.66	3/31/08 11:01	2851:34:15	2851:32:30	2851:13:30	53.40010144	
405.57	75	984	0.01432	534.67	14.272	0.013523805	382.95	0.046167138	1307.30	54.05	56.49	3/31/08 11:01	2851:34:15	2851:32:30	2851:13:30	53.40010144	residual gas calc.

DECANISTERED 3/31/2008; sample dried for 39 days in air; 220.29 grams placed in ball mill (108.87 cc @ STP desorbed), proportional to 382.95 cc @ STP for 774.86 grams (dry wt.) for entire sample

SAMPLE: 490' 3.5" to 491' 6.5" (Fleming coal) core in SSD canister Z3
NOTES: coherent piece of coal, with top 3" crumbly, cleat filled with white mineral
density = 1.39 gr/cc; KGS simple moisture = 2.00% (as received); KGS simple ash content = 17.28% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF

BTU/lb	11278	11718	14162
Sulfur	8.40%	8.73%	
Moisture	3.75%		
Ash	16.61%	17.26%	
Volatile Matter	36.88%	38.32%	
Fixed Carbon	42.76%	44.42%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	1.970	893.50	wet sample weight:	2.100	952.36	6.18%		104		off bottom	at surface	in canister	33.0 minutes
										12/3/07 15:57	12/3/07 15:59	12/3/07 16:30	0.550 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			0.741619849 SQRT (hrs)	
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)	
3	67	992	0.00011	526.67	14.388	0.000102381	2.90	0.000102381	2.90	0.10	3.83	12/3/07 16:35	0:37:45	0:36:15	0:04:45	0.793200269	
2	67	992	7.1E-05	526.67	14.388	6.82538E-05	1.93	0.000170635	4.83	0.17	3.90	12/3/07 16:36	0:39:15	0:37:45	0:06:15	0.808805704	
6	67	992	0.00021	526.67	14.388	0.000204761	5.80	0.000375396	10.63	0.38	4.11	12/3/07 16:39	0:42:15	0:40:45	0:09:15	0.839146392	
2	67	992	7.1E-05	526.67	14.388	6.82538E-05	1.93	0.00044365	12.56	0.45	4.18	12/3/07 16:41	0:44:15	0:42:45	0:11:15	0.858778202	
5	67	992	0.00018	526.67	14.388	0.000170635	4.83	0.000614284	17.39	0.62	4.35	12/3/07 16:45	0:48:00	0:46:30	0:15:00	0.894427191	
12	67	992	0.00042	526.67	14.388	0.000409523	11.60	0.001023807	28.99	1.04	4.77	12/3/07 16:54	0:56:45	0:55:15	0:23:45	0.972539631	
9	67	992	0.00032	526.67	14.388	0.000307142	8.70	0.001330949	37.69	1.35	5.08	12/3/07 17:01	1:04:00	1:02:30	0:31:00	1.032795559	
9	67	992	0.00032	526.67	14.388	0.000307142	8.70	0.001638091	46.39	1.66	5.39	12/3/07 17:09	1:11:45	1:10:15	0:38:45	1.093541647	
155	67	988	0.00547	526.67	14.330	0.005268341	149.18	0.006906432	195.57	7.01	10.74	12/3/07 21:22	5:24:30	5:23:00	4:51:30	2.325582364	
172	68	983	0.00607	527.67	14.257	0.00580555	164.39	0.012711982	359.96	12.91	16.64	12/4/07 7:43	15:45:30	15:44:00	15:12:30	3.969676729	
126	67	973	0.00445	526.67	14.112	0.004217631	119.43	0.016929613	479.39	17.19	20.92	12/4/07 20:26	28:28:30	28:27:00	27:55:30	5.336197148	
69	67	983	0.00244	526.67	14.257	0.002333393	66.07	0.019263006	545.47	19.56	23.29	12/5/07 7:52	39:54:30	39:53:00	39:21:30	6.317304277	
56	67	990	0.00198	526.67	14.359	0.001907254	54.01	0.021170259	599.47	21.49	25.22	12/5/07 20:23	52:25:30	52:24:00	51:52:30	7.240511032	
119	67	986	0.0042	526.67	14.301	0.004036538	114.30	0.025206798	713.77	25.59	29.32	12/7/07 11:30	91:32:30	91:31:00	90:59:30	9.567740939	
124	67	993	0.00438	526.67	14.402	0.004236002	119.95	0.0294428	833.72	29.89	33.62	12/10/07 10:02	162:04:30	162:03:00	161:31:30	12.730868	
84	67	991	0.00297	526.67	14.373	0.00286377	81.09	0.03230657	914.82	32.80	36.53	12/12/07 13:25	213:27:30	213:26:00	212:54:30	14.61021332	
54	67	993	0.00191	526.67	14.402	0.001844711	52.24	0.03415128	967.05	34.67	38.40	12/14/07 10:07	258:09:30	258:08:00	257:36:30	16.06730635	
113	69	977	0.00399	528.67	14.170	0.00378366	107.14	0.037934941	1074.19	38.52	42.24	12/20/07 9:56	401:58:30	401:57:00	401:25:30	20.0493142	
87	67	987	0.00307	526.67	14.315	0.002954076	83.65	0.040889016	1157.84	41.52	45.24	12/27/07 10:37	570:39:30	570:38:00	570:06:30	23.88845607	
51	67	1012	0.0018	526.67	14.678	0.001775562	50.28	0.042664579	1208.12	43.32	47.05	1/2/08 10:55	714:57:30	714:56:00	714:24:30	26.73870478	
69	67	974	0.00244	526.67	14.127	0.002312029	65.47	0.044976608	1273.59	45.67	49.39	1/7/08 11:15	835:17:30	835:16:00	834:44:30	28.90141288	
61	67	981	0.00215	526.67	14.228	0.002058657	58.29	0.047035265	1331.89	47.76	51.48	1/15/08 13:52	1029:54:30	1029:53:00	1029:21:30	32.09218493	
49	67	986	0.00173	526.67	14.301	0.001662104	47.07	0.048697369	1378.95	49.44	53.17	1/23/08 11:31	1219:33:30	1219:32:00	1219:00:30	34.92217538	
45	67	967	0.00159	526.67	14.025	0.001497008	42.39	0.050194377	1421.34	50.96	54.69	1/28/08 9:31	1337:33:30	1337:32:00	1337:00:30	36.5726446	
33	67	969	0.00117	526.67	14.054	0.001100077	31.15	0.051294454	1452.49	52.08	55.81	2/4/08 10:51	1506:53:30	1506:52:00	1506:20:30	38.81870254	estimate
17	67	983	0.0006	526.67	14.257	0.000574894	16.28	0.051869348	1468.77	52.66	56.39	2/11/08 14:57	1678:59:30	1678:58:00	1678:26:30	40.97550081	
31	67	981	0.00109	526.67	14.228	0.001046203	29.63	0.052915551	1498.40	53.73	57.45	2/18/08 9:04	1841:06:30	1841:05:00	1840:33:30	42.90813831	
37	67	969	0.00131	526.67	14.054	0.001233419	34.93	0.05414897	1533.32	54.98	58.71	2/25/08 9:36	2009:38:30	2009:37:00	2009:05:30	44.82902705	
18	67	986	0.00064	526.67	14.301	0.000610569	17.29	0.054759539	1550.61	55.60	59.33	3/3/08 10:47	2178:49:30	2178:48:00	2178:16:30	46.67788556	
16	67	998	0.00057	526.67	14.475	0.000549333	15.56	0.055308872	1566.17	56.16	59.88	3/10/08 9:14	2345:16:30	2345:15:00	2344:43:30	48.4280394	
32	67	981	0.00113	526.67	14.228	0.001079951	30.58	0.056388823	1596.75	57.25	60.98	3/17/08 10:32	2514:34:30	2514:33:00	2514:01:30	50.14553819	
17	67	993	0.0006	526.67	14.402	0.000580742	16.44	0.056969565	1613.19	57.84	61.57	3/24/08 9:00	2681:02:30	2681:01:00	2680:29:30	51.77877622	
34	66	970	0.0012	525.67	14.069	0.00113674	32.19	0.058106306	1645.38	59.00	62.73	3/31/08 11:02	2851:04:30	2851:03:00	2850:31:30	53.39545861	
14	68	986	0.00049	527.67	14.301	0.000473987	13.42	0.058580292	1658.80	59.48	63.21	4/7/08 8:30	3016:32:30	3016:31:00	3015:59:30	54.92305223	
10	67	994	0.00035	526.67	14.417	0.000341957	9.68	0.058922249	1668.49	59.82	63.55	4/14/08 8:25	3184:27:30	3184:26:00	3183:54:30	56.43100507	
21	61	987	0.00074	520.67	14.315	0.00072127	20.42	0.059643519	1688.91	60.56	64.29	4/28/08 9:41	3521:43:30	3521:42:00	3521:10:30	59.34412355	
9	61	986	0.00032	520.67	14.301	0.000308802	8.74	0.059952322	1697.65	60.87	64.60	5/5/08 8:29	3688:31:30	3688:30:00	3687:58:30	60.73322814	
19	62	980	0.00067	521.67	14.214	0.000646707	18.31	0.060599029	1715.97	61.53	65.26	5/12/08 9:08	3857:10:30	3857:09:00	3856:37:30	62.10615911	
22	63	965	0.00078	522.67	13.996	0.000735946	20.84	0.061334975	1736.81	62.27	66.00	5/19/08 9:21	4025:23:30	4025:22:00	4024:50:30	63.44597439	
845.66	66	980	0.02986	525.67	14.214	0.028564884	808.86	0.089899859	2545.67	91.28	95.01	5/19/08 9:21	4025:23:30	4025:22:00	4024:50:30	63.44597439	residual gas calc.

DECANISTERED 5/19/2008; sample dried for 20 days in air; 443.72 grams placed in ball mill (376.86 cc @ STP desorbed), proportional to 808.86 cc @ STP for 952.36 grams (wet wt.) for entire sample

SAMPLE: 524' 8" to 525' 9.5" (shale overlying Weir-Pittsburg coal) core in SSD canister Z4
NOTES: black shale, breaks along bedding planes, contains 1" of floating shelly debris
density = 2.10 gr/cc; KGS simple moisture = 1.49% (as received); KGS simple ash content = 79.34% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	1842	1877	10407
Sulfur	2.52%	2.57%	

Moisture	1.84%
Ash	80.45%
Volatile Matter	11.29%
Fixed Carbon	6.42%

	lbs.	grams		lbs.	grams	moisture %		
dry sample weight:	3.184	1444.24	wet sample weight:	3.324	1507.81	4.22%	est. lost gas (cc) =	42

TIME OF:	off bottom	at surface	in canister
	12/4/07 10:21	12/4/07 10:23	12/4/07 10:54

elapsed time (off bottom to canistering)	
32.5	minutes
0.542	hours
0.735980072	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	temp (R)	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	69	982	0.00049	528.67	14.243	0.000471171	13.34	0.000471171	13.34	0.30	1.23	12/4/07 11:15	0:54:00	0:52:30	0:21:30	0.948683298
2	69	982	7.1E-05	528.67	14.243	6.73102E-05	1.91	0.000538481	15.25	0.34	1.27	12/4/07 11:19	0:58:00	0:56:30	0:25:30	0.98319208
2	69	982	7.1E-05	528.67	14.243	6.73102E-05	1.91	0.000605791	17.15	0.38	1.31	12/4/07 11:25	1:04:00	1:02:30	0:31:30	1.032795559
9	69	981	0.00032	528.67	14.228	0.000302587	8.57	0.000908379	25.72	0.57	1.50	12/4/07 11:45	1:23:15	1:21:45	0:50:45	1.177921899
3	69	981	0.00011	528.67	14.228	0.000100862	2.86	0.001009241	28.58	0.63	1.57	12/4/07 11:53	1:31:45	1:30:15	0:59:15	1.236594787
7	69	979	0.00025	528.67	14.199	0.000234866	6.65	0.001244107	35.23	0.78	1.71	12/4/07 12:21	1:59:30	1:58:00	1:27:00	1.411264209
3	69	978	0.00011	528.67	14.185	0.000100554	2.85	0.001344661	38.08	0.84	1.78	12/4/07 12:51	2:29:15	2:27:45	1:56:45	1.57718103
9	69	977	0.00032	528.67	14.170	0.000301353	8.53	0.001646014	46.61	1.03	1.97	12/4/07 14:50	4:28:15	4:26:45	3:55:45	2.114434519
11	69	976	0.00039	528.67	14.156	0.000367944	10.42	0.002013958	57.03	1.27	2.20	12/4/07 16:44	6:22:15	6:20:45	5:49:45	2.524050977
30	69	973	0.00106	528.67	14.112	0.001000399	28.33	0.003014357	85.36	1.89	2.83	12/4/07 20:27	10:05:15	10:03:45	9:32:45	3.176082493 back at lab
39	69	983	0.00138	528.67	14.257	0.001313885	37.20	0.004328242	122.56	2.72	3.65	12/5/07 7:52	21:30:15	21:28:45	20:57:45	4.637258529
33	69	990	0.00117	528.67	14.359	0.001119665	31.71	0.005447907	154.27	3.42	4.35	12/5/07 20:24	34:02:15	34:00:45	33:29:45	5.834166607
75	67	986	0.00265	526.67	14.301	0.002544037	72.04	0.007991944	226.31	5.02	5.95	12/7/07 11:31	73:09:15	73:07:45	72:36:45	8.553020909
67	67	993	0.00237	526.67	14.402	0.002288807	64.81	0.010280752	291.12	6.46	7.39	12/10/07 10:03	143:41:15	143:39:45	143:08:45	11.98697209
40	67	991	0.00141	526.67	14.373	0.0013637	38.62	0.011644452	329.73	7.31	8.25	12/12/07 13:25	195:03:15	195:01:45	194:30:45	13.96617939
26	67	993	0.00092	526.67	14.402	0.000888194	25.15	0.012532646	354.88	7.87	8.80	12/14/07 10:07	239:45:15	239:43:45	239:12:45	15.48399712
57	69	977	0.00201	528.67	14.170	0.001908572	54.04	0.014441218	408.93	9.07	10.00	12/20/07 9:59	383:37:15	383:35:45	383:04:45	19.58624092
36	67	987	0.00127	526.67	14.315	0.001222376	34.61	0.015663594	443.54	9.84	10.77	12/27/07 10:38	552:16:15	552:14:45	551:43:45	23.50044326
10	67	1012	0.00035	526.67	14.678	0.000348149	9.86	0.016011743	453.40	10.06	10.99	1/2/08 10:56	696:34:15	696:32:45	696:01:45	26.39262839
42	68	974	0.00148	527.67	14.127	0.001404655	39.78	0.017416398	493.18	10.94	11.87	1/7/08 11:16	816:54:15	816:52:45	816:21:45	28.58153541
21	67	981	0.00074	526.67	14.228	0.000708718	20.07	0.018125116	513.24	11.39	12.32	1/15/08 13:54	1011:32:15	1011:30:45	1010:59:45	31.80467733
14	67	986	0.00049	526.67	14.301	0.000474887	13.45	0.018600003	526.69	11.68	12.62	1/23/08 11:32	1201:10:15	1201:08:45	1200:37:45	34.65791155
22	67	967	0.00078	526.67	14.025	0.000731871	20.72	0.019331874	547.42	12.14	13.07	1/28/08 9:31	1319:09:15	1319:07:45	1318:36:45	36.32016199
9	67	969	0.00032	526.67	14.054	0.000300021	8.50	0.019631895	555.91	12.33	13.26	2/4/08 10:52	1488:30:15	1488:28:45	1487:57:45	38.58113745
-3	67	983	-0.0001	526.67	14.257	-0.000101452	-2.87	0.019530443	553.04	12.27	13.20	2/11/08 14:58	1660:36:15	1660:34:45	1660:03:45	40.75051124
10	67	981	0.00035	526.67	14.228	0.000337485	9.56	0.019867928	562.59	12.48	13.41	2/18/08 9:05	1822:43:15	1822:41:45	1822:10:45	42.69333476
21	67	969	0.00074	526.67	14.054	0.000700049	19.82	0.020567977	582.42	12.92	13.85	2/25/08 9:37	1991:15:15	1991:13:45	1990:42:45	44.62347103
-2	67	986	-7E-05	526.67	14.301	-6.7841E-05	-1.92	0.020500136	580.50	12.88	13.81	3/3/08 10:48	2160:26:15	2160:24:45	2159:53:45	46.48050667
-1	67	998	-4E-05	526.67	14.475	-3.43333E-05	-0.97	0.020465802	579.52	12.86	13.79	3/10/08 9:15	2326:53:15	2326:51:45	2326:20:45	48.2378223
17	67	981	0.0006	526.67	14.228	0.000573724	16.25	0.021039526	595.77	13.22	14.15	3/17/08 10:33	2496:11:15	2496:09:45	2495:38:45	49.96186045
1	67	993	3.5E-05	526.67	14.402	3.41613E-05	0.97	0.021073688	596.74	13.24	14.17	3/24/08 9:01	2662:39:15	2662:37:45	2662:06:45	51.60091246
20	66	970	0.00071	525.67	14.069	0.000668671	18.93	0.021742358	615.67	13.66	14.59	3/31/08 11:03	2832:41:15	2832:39:45	2832:08:45	53.22299785
-3	68	986	-0.0001	527.67	14.301	-0.000101569	-2.88	0.02164079	612.80	13.59	14.53	4/7/08 8:31	2998:09:15	2998:07:45	2997:36:45	54.75540308
14	67	968	0.00049	526.67	14.040	0.000466218	13.20	0.022107007	626.00	13.89	14.82	4/11/08 8:12	3093:50:15	3093:48:45	3093:17:45	55.62227521
703.45	68	980	0.02484	527.67	14.214	0.023671223	670.29	0.045778231	1296.29	28.76	29.69	4/11/08 8:12	3093:50:15	3093:48:45	3093:17:45	55.62227521 residual gas calc.

DECANISTERED 4/11/2008; sample dried for 69 days in air; 113.60 grams placed in ball mill (50.50 cc @ STP desorbed), proportional to 670.29 cc @ STP for 1507.81 grams (wet wt.) for entire sample

SAMPLE: 525' 9.5" to 527' 5" (Weir-Pittsburg coal) core in SSD canister Z5

NOTES: upper half very crumbly, lower half in tact, cross-cut by near-vertical mineral-filled fractures, no cleat evident
density = 1.27 gr/cc; KGS simple moisture = 2.97% (as received); KGS simple ash content = 15.07% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	11822	12400	14522
Sulfur	5.04%	5.28%	
Moisture	4.65%		
Ash	13.93%	14.61%	
Volatile Matter	38.14%	40.00%	
Fixed Carbon	43.28%	45.39%	

	lbs.	grams		lbs.	grams	moisture %		
dry sample weight:	2.627	1191.80	wet sample weight:	2.711	1229.65	3.08%	est. lost gas (cc) =	130

TIME OF:	off bottom	at surface	in canister
	12/4/07 10:21	12/4/07 10:23	12/4/07 10:40

elapsed time (off bottom to canistering)	
18.3	minutes
0.304	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			0.551513070 SQRT (hrs)	
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)	
9	69	983	0.00032	528.67	14.257	0.000303204	8.59	0.000303204	8.59	0.23	3.73	12/4/07 10:43	0:22:00	0:20:30	0:03:45	0.605530071	
6	69	983	0.00021	528.67	14.257	0.000202136	5.72	0.00050534	14.31	0.38	3.88	12/4/07 10:45	0:24:00	0:22:30	0:05:45	0.632455532	
12	69	983	0.00042	528.67	14.257	0.000404272	11.45	0.000909612	25.76	0.69	4.19	12/4/07 10:49	0:28:00	0:26:30	0:09:45	0.683130051	
8	69	983	0.00028	528.67	14.257	0.000269515	7.63	0.001179127	33.39	0.90	4.39	12/4/07 10:52	0:30:30	0:29:00	0:12:15	0.712974988	
9	69	983	0.00032	528.67	14.257	0.000303204	8.59	0.001482331	41.97	1.13	4.62	12/4/07 10:55	0:33:45	0:32:15	0:15:30	0.75	
25	69	982	0.00088	528.67	14.243	0.000841377	23.83	0.002323708	65.80	1.77	5.26	12/4/07 11:05	0:43:30	0:42:00	0:25:15	0.851469318	
13	69	982	0.00046	528.67	14.243	0.000437516	12.39	0.002761224	78.19	2.10	5.60	12/4/07 11:11	0:49:15	0:47:45	0:31:00	0.905998528	
6	69	982	0.00021	528.67	14.243	0.00020193	5.72	0.002963155	83.91	2.26	5.75	12/4/07 11:14	0:52:15	0:50:45	0:34:00	0.933184512	
57	69	981	0.00201	528.67	14.228	0.001916386	54.27	0.004879541	138.17	3.71	7.21	12/4/07 11:55	1:33:15	1:31:45	1:15:00	1.24666221	
20	69	979	0.00071	528.67	14.199	0.000671045	19.00	0.005550586	157.17	4.23	7.72	12/4/07 12:09	1:47:30	1:46:00	1:29:15	1.338531534	
12	69	979	0.00042	528.67	14.199	0.000402627	11.40	0.005953213	168.58	4.53	8.03	12/4/07 12:20	1:59:00	1:57:30	1:40:45	1.408308678	
25	69	978	0.00088	528.67	14.185	0.00083795	23.73	0.006791163	192.30	5.17	8.66	12/4/07 12:52	2:30:30	2:29:00	2:12:15	1.583771869	
55	67	977	0.00194	526.67	14.170	0.001848598	52.35	0.008639761	244.65	6.58	10.07	12/4/07 14:49	4:27:15	4:25:45	4:09:00	2.110489675	
61	68	976	0.00215	527.67	14.156	0.002044283	57.89	0.010684044	302.54	8.13	11.63	12/4/07 16:44	6:22:15	6:20:45	6:04:00	2.524050977	
86	67	973	0.00304	526.67	14.112	0.002878701	81.52	0.013562745	384.05	10.32	13.82	12/4/07 20:29	10:07:15	10:05:45	9:49:00	3.181325719	back at lab
143	67	983	0.00505	526.67	14.257	0.004835872	136.94	0.018398617	520.99	14.00	17.50	12/5/07 7:53	21:31:15	21:29:45	21:13:00	4.63905522	
128	67	990	0.00452	526.67	14.359	0.004359437	123.45	0.022758053	644.43	17.32	20.82	12/5/07 20:25	34:03:15	34:01:45	33:45:00	5.8355948	
242	67	986	0.00855	526.67	14.301	0.008208759	232.45	0.030966812	876.88	23.57	27.07	12/7/07 11:15	72:53:15	72:51:45	72:35:00	8.537417642	gas sampled
235	67	993	0.0083	526.67	14.402	0.008027907	227.32	0.038994719	1104.20	29.68	33.18	12/10/07 10:04	143:42:15	143:40:45	143:24:00	11.98766727	
150	67	991	0.0053	526.67	14.373	0.005113875	144.81	0.044108594	1249.01	33.57	37.07	12/12/07 13:26	195:04:15	195:02:45	194:46:00	13.96677605	
102	67	994	0.0036	526.67	14.417	0.003487962	98.77	0.047596556	1347.78	36.23	39.72	12/14/07 10:10	239:48:15	239:46:45	239:30:00	15.4856116	
82	69	977	0.0029	528.67	14.170	0.002745665	77.75	0.050342221	1425.53	38.32	41.81	12/20/07 10:00	383:38:15	383:36:45	383:20:00	19.58666638	
165	67	987	0.00583	526.67	14.315	0.005602557	158.65	0.055944779	1584.17	42.58	46.08	12/27/07 10:40	552:18:15	552:16:45	552:00:00	23.50115245	
104	67	1012	0.00367	526.67	14.678	0.003620754	102.53	0.059565533	1686.70	45.34	48.84	1/2/08 10:58	696:36:15	696:34:45	696:18:00	26.39325987	
125	68	974	0.00441	527.67	14.127	0.004180521	118.38	0.063746054	1805.08	48.52	52.02	1/7/08 11:17	816:55:15	816:53:45	816:37:00	28.58182698	
104	67	981	0.00367	526.67	14.228	0.003509842	99.39	0.067255896	1904.47	51.19	54.69	1/15/08 13:55	1011:33:15	1011:31:45	1011:15:00	31.80493934	
102	67	986	0.0036	526.67	14.301	0.00345989	97.97	0.070715786	2002.44	53.83	57.32	1/23/08 11:33	1201:11:15	1201:09:45	1200:53:00	34.658152	
82	67	967	0.0029	526.67	14.025	0.002727882	77.24	0.073443668	2079.69	55.90	59.40	1/28/08 9:32	1319:10:15	1319:08:45	1318:52:00	36.32039143	
75	67	969	0.00265	526.67	14.054	0.002500174	70.80	0.075943842	2150.48	57.81	61.30	2/4/08 10:54	1488:32:15	1488:30:45	1488:14:00	38.58156943	
54	67	983	0.00191	526.67	14.257	0.001826133	51.71	0.077769975	2202.19	59.20	62.69	2/11/08 14:59	1660:37:15	1660:35:45	1660:19:00	40.75071574	
64	67	981	0.00226	526.67	14.228	0.002159903	61.16	0.079929878	2263.35	60.84	64.34	2/18/08 9:06	1822:44:15	1822:42:45	1822:26:00	42.69352995	
67	68	969	0.00237	527.67	14.054	0.002229256	63.13	0.082159134	2326.48	62.54	66.03	2/25/08 9:39	1991:17:15	1991:15:45	1990:59:00	44.62384452	
49	67	986	0.00173	526.67	14.301	0.001662104	47.07	0.083821238	2373.54	63.80	67.30	3/3/08 10:49	2160:27:15	2160:25:45	2160:09:00	46.48068595	
44	67	998	0.00155	526.67	14.475	0.001510666	42.78	0.085331904	2416.32	64.95	68.45	3/10/08 9:17	2326:55:15	2326:53:45	2326:37:00	48.23816781	
58	67	981	0.00205	526.67	14.228	0.001957412	55.43	0.087289316	2471.75	66.44	69.94	3/17/08 10:34	2496:12:15	2496:10:45	2495:54:00	49.96202725	
42	67	993	0.00148	526.67	14.402	0.001434775	40.63	0.088724091	2512.38	67.54	71.03	3/24/08 9:02	2662:40:15	2662:38:45	2662:22:00	51.60107396	
57	66	970	0.00201	525.67	14.069	0.001905712	53.96	0.090629802	2566.34	68.99	72.48	3/31/08 11:04	2832:42:15	2832:40:45	2832:24:00	53.22315442	
37	68	986	0.00131	527.67	14.301	0.00125268	35.47	0.091882482	2601.81	69.94	73.43	4/7/08 8:32	2998:10:15	2998:08:45	2997:52:00	54.75555527	
31	67	994	0.00109	526.67	14.417	0.001060067	30.02	0.092942549	2631.83	70.75	74.24	4/14/08 8:26	3166:04:15	3166:02:45	3165:46:00	56.26784902	
41	61	987	0.00145	520.67	14.315	0.001408193	39.88	0.094350742	2671.71	71.82	75.31	4/28/08 9:42	3503:20:15	3503:18:45	3503:02:00	59.18899813	
24	61	986	0.00085	520.67	14.301	0.000823473	23.32	0.095174215	2695.02	72.45	75.94	5/5/08 8:30	3670:08:15	3670:06:45	3669:50:00	60.58165977	
33	62	980	0.00117	521.67	14.214	0.001123228	31.81	0.096297443	2726.83	73.30	76.80	5/12/08 9:09	3838:47:15	3838:45:45	3838:29:00	61.95794945	
37	64	965	0.00131	523.67	13.996	0.001235365	34.98	0.097532808	2761.81	74.24	77.74	5/19/08 9:22	4007:00:15	4006:58:45	4006:42:00	63.30090178	
1508.71	66	978	0.05328	525.67	14.185	0.050857526	1440.12	0.148390333	4201.93	112.95	116.45	5/19/08 9:22	4007:00:15	4006:58:45	4006:42:00	63.30090178	residual gas calc.

DECANISTERED 5/19/2008; sample dried for 20 days in air; 412.41 grams placed in ball mill (483.00 cc @ STP desorbed), proportional to 1440.12 cc @ STP for 1229.65 grams (wet wt.) for entire sample

SAMPLE: 567' 7" to 567' 11" (unnamed coal at top of Bluejacket Fm.) core in SSD canister Z6

NOTES: 4" coal, top 1" crumbly, bottom 3" coherent, minor mineralization in sparse vertical fractures, no cleat evident

density = 1.48 gr/cc; KGS simple moisture = 2.13% (as received); KGS simple ash content = 21.77% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	10614	10953	13991
Sulfur	9.60%	9.90%	
Moisture	3.10%		
Ash	21.04%	21.71%	
Volatile Matter	33.71%	34.79%	
Fixed Carbon	42.15%	43.50%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =
dry sample weight:	0.582	263.92	wet sample weight:	0.652	295.82	10.78%		32

TIME OF:			elapsed time (off bottom to canistering)
off bottom	at surface	in canister	19.0 minutes
12/4/07 12:30	12/4/07 12:32	12/4/07 12:49	0.317 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 0.562731434 SQRT (hrs)

measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)	
4	69	978	0.00014	528.67	14.185	0.000134072		3.80	0.000134072	3.80	0.46	4.35	12/4/07 12:53	0:22:45	0:21:00	0:03:45	0.615765107	
6	69	978	0.00021	528.67	14.185	0.000201108		5.69	0.00033518	9.49	1.15	5.04	12/4/07 13:00	0:30:30	0:28:45	0:11:30	0.712974988	
5	69	978	0.00018	528.67	14.185	0.00016759		4.75	0.00050277	14.24	1.73	5.61	12/4/07 13:09	0:39:30	0:37:45	0:20:30	0.81137743	
8	68	978	0.00028	527.67	14.185	0.000268652		7.61	0.000771422	21.84	2.65	6.54	12/4/07 13:31	1:01:15	0:59:30	0:42:15	1.010362971	
5	68	978	0.00018	527.67	14.185	0.000167908		4.75	0.00093933	26.60	3.23	7.11	12/4/07 13:52	1:21:45	1:20:00	1:02:45	1.167261753	
17	67	977	0.0006	526.67	14.170	0.000571385		16.18	0.001510714	42.78	5.19	9.08	12/4/07 14:47	2:16:45	2:15:00	1:57:45	1.509690918	
8	68	976	0.00028	527.67	14.156	0.000268103		7.59	0.001778817	50.37	6.11	10.00	12/4/07 15:21	2:51:00	2:49:15	2:32:00	1.688194302	
13	68	976	0.00046	527.67	14.156	0.000435667		12.34	0.002214484	62.71	7.61	11.50	12/4/07 16:46	4:15:45	4:14:00	3:56:45	2.064582282	
24	67	973	0.00085	526.67	14.112	0.000803358		22.75	0.003017842	85.46	10.37	14.26	12/4/07 20:30	7:59:45	7:58:00	7:40:45	2.827690459	back at lab
41	67	983	0.00145	526.67	14.257	0.001386509		39.26	0.004404351	124.72	15.14	19.02	12/5/07 7:53	19:22:45	19:21:00	19:03:45	4.402177492	
32	67	990	0.00113	526.67	14.359	0.001089859		30.86	0.00549421	155.58	18.89	22.77	12/5/07 20:26	31:55:45	31:54:00	31:36:45	5.65058994	
64	67	986	0.00226	526.67	14.301	0.002170911		61.47	0.007665122	217.05	26.35	30.23	12/7/07 11:33	71:02:45	71:01:00	70:43:45	8.428869042	
57	67	993	0.00201	526.67	14.402	0.001947194		55.14	0.009612316	272.19	33.04	36.93	12/10/07 10:05	141:34:45	141:33:00	141:15:45	11.89870441	
36	67	991	0.00127	526.67	14.373	0.00122733		34.75	0.010839646	306.94	37.26	41.14	12/12/07 13:27	192:56:45	192:55:00	192:37:45	13.89049435	
20	67	994	0.00071	526.67	14.417	0.000683914		19.37	0.01152356	326.31	39.61	43.49	12/14/07 10:12	237:41:45	237:40:00	237:22:45	15.41738737	
53	69	977	0.00187	528.67	14.170	0.001774637		50.25	0.013298197	376.56	45.71	49.59	12/20/07 10:02	381:31:45	381:30:00	381:12:45	19.53277161	
32	67	987	0.00113	526.67	14.315	0.001086557		30.77	0.014384754	407.33	49.45	53.33	12/27/07 10:42	550:11:45	550:10:00	549:52:45	23.45625361	
2	67	1012	7.1E-05	526.67	14.678	6.96299E-05		1.97	0.014454384	409.30	49.68	53.57	1/2/08 11:00	694:29:45	694:28:00	694:10:45	26.35328885	
41	68	974	0.00145	527.67	14.127	0.001371211		38.83	0.015825595	448.13	54.40	58.28	1/7/08 11:18	814:47:45	814:46:00	814:28:45	28.5446288	
13	67	981	0.00046	526.67	14.228	0.00043873		12.42	0.016264325	460.55	55.91	59.79	1/15/08 13:57	1009:26:45	1009:25:00	1009:07:45	31.77177731	
7	67	986	0.00025	526.67	14.301	0.000237443		6.72	0.016501768	467.28	56.72	60.61	1/23/08 11:35	1199:04:45	1199:03:00	1198:45:45	34.62772252	
22	67	967	0.00078	526.67	14.025	0.000731871		20.72	0.017233639	488.00	59.24	63.12	1/28/08 9:32	1317:01:45	1317:00:00	1316:42:45	36.29089647	
6	67	969	0.00021	526.67	14.054	0.000200014		5.66	0.017433653	493.66	59.93	63.81	2/4/08 10:55	1486:24:45	1486:23:00	1486:05:45	38.55402054	
-7	67	983	-0.0002	526.67	14.257	-0.000236721		-6.70	0.017196932	486.96	59.11	63.00	2/11/08 15:00	1658:29:45	1658:28:00	1658:10:45	40.72463423	
3	67	981	0.00011	526.67	14.228	0.000101245		2.87	0.017298177	489.83	59.46	63.34	2/18/08 9:07	1820:36:45	1820:35:00	1820:17:45	42.66863602	
11	68	969	0.00039	527.67	14.054	0.000365997		10.36	0.017664175	500.19	60.72	64.60	2/25/08 9:40	1989:09:45	1989:08:00	1988:50:45	44.60002803	
-2	67	987	-7E-05	526.67	14.315	-6.79098E-05		-1.92	0.017596265	498.27	60.48	64.37	3/3/08 10:50	2158:19:45	2158:18:00	2158:00:45	46.45782137	
-1	67	998	-4E-05	526.67	14.475	-3.43333E-05		-0.97	0.017561931	497.30	60.37	64.25	3/10/08 9:18	2324:47:45	2324:46:00	2324:28:45	48.21613665	
19	67	981	0.00067	526.67	14.228	0.000641221		18.16	0.018203153	515.45	62.57	66.46	3/17/08 10:36	2494:05:45	2494:04:00	2493:46:45	49.94092343	
0	67	993	0	526.67	14.402	0		0.00	0.018203153	515.45	62.57	66.46	3/24/08 9:03	2660:32:45	2660:31:00	2660:13:45	51.58047919	
23	66	970	0.00081	525.67	14.069	0.000768971		21.77	0.018972124	537.23	65.21	69.10	3/31/08 11:05	2830:34:45	2830:33:00	2830:15:45	53.20318756	
156.47	69	983	0.00553	528.67	14.257	0.005271373		149.27	0.024243497	686.50	83.33	87.22	3/31/08 11:05	2830:34:45	2830:33:00	2830:15:45	53.20318756	residual gas calc.

DECANISTERED 3/31/2008; sample dried for 41 days in air; 117.22 grams placed in ball mill (59.15 cc @ STP desorbed), proportional to 149.27 cc @ STP for 295.82 grams (wet wt.) for entire sample

SAMPLE: 586' 11" to 587' 11" (shale in Bluejacket Fm.) core in SSD canister Z7

NOTES: black shale, silty, bioturbated, breaks along fractures (not bedding), upper 2" crumbly, otherwise nearly coherent
density = 2.46 gr/cc; KGS simple moisture = 0.97% (as received); KGS simple ash content = 88.68% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	953	960	8238
Sulfur	2.77%	2.79%	
Moisture	0.78%		
Ash	87.66%	88.34%	
Volatile Matter	7.76%	7.82%	
Fixed Carbon	3.80%	3.84%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =	
dry sample weight:	2.593	1176.10	wet sample weight:	2.753	1248.56	5.80%		32	

TIME OF:	off bottom	at surface	in canister	elapsed time (off bottom to canistering)
	12/4/07 13:30	12/4/07 13:32	12/4/07 13:50	20.0 minutes
				0.333 hours
				0.577350269 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	temp (R)	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	68	978	7.1E-05	527.67	14.185	6.7163E-05	1.90	6.7163E-05	1.90	0.05	0.92	12/4/07 13:53	0:23:00	0:21:15	0:03:00	0.619139187	
5	68	978	0.00018	527.67	14.185	0.000167908	4.75	0.000235071	6.66	0.18	1.05	12/4/07 13:58	0:28:00	0:26:15	0:08:00	0.683130051	
9	68	978	0.00032	527.67	14.185	0.000302234	8.56	0.000537304	15.21	0.41	1.29	12/4/07 14:14	0:43:45	0:42:00	0:23:45	0.853912564	
4	67	977	0.00014	526.67	14.170	0.000134443	3.81	0.000671748	19.02	0.52	1.39	12/4/07 14:27	0:56:15	0:54:30	0:36:15	0.968245837	
7	67	977	0.00025	526.67	14.170	0.000235276	6.66	0.000907024	25.68	0.70	1.57	12/4/07 14:45	1:14:45	1:13:00	0:54:45	1.116169043	
10	68	976	0.00035	527.67	14.156	0.000335128	9.49	0.001242152	35.17	0.96	1.83	12/4/07 15:20	1:49:15	1:47:30	1:29:15	1.349382575	
13	68	976	0.00046	527.67	14.156	0.000435667	12.34	0.001677819	47.51	1.29	2.17	12/4/07 16:47	3:16:15	3:14:30	2:56:15	1.808544535	
37	67	973	0.00131	526.67	14.112	0.001238511	35.07	0.00291633	82.58	2.25	3.12	12/4/07 20:32	7:01:15	6:59:30	6:41:15	2.649685516	back at lab
36	67	983	0.00127	526.67	14.257	0.001217422	34.47	0.004133752	117.05	3.19	4.06	12/5/07 7:54	18:23:15	18:21:30	18:03:15	4.288064832	

26	67	990	0.00092	526.67	14.359	0.000885511	25.07	0.005019263	142.13	3.87	4.74	12/5/07 20:27	30:56:15	30:54:30	30:36:15	5.562148865	
47	67	986	0.00166	526.67	14.301	0.001594263	45.14	0.006613526	187.27	5.10	5.97	12/7/07 11:33	70:02:15	70:00:30	69:42:15	8.368841019	
31	67	993	0.00109	526.67	14.402	0.001059	29.99	0.007672526	217.26	5.92	6.79	12/10/07 10:06	140:35:15	140:33:30	140:15:15	11.85695998	
17	67	991	0.0006	526.67	14.373	0.000579573	16.41	0.008252099	233.67	6.37	7.24	12/12/07 13:27	191:56:15	191:54:30	191:36:15	13.854151	
11	67	994	0.00039	526.67	14.417	0.000376153	10.65	0.008628252	244.32	6.66	7.53	12/14/07 10:14	236:43:15	236:41:30	236:23:15	15.38573473	
21	69	977	0.00074	528.67	14.170	0.000703158	19.91	0.00933141	264.24	7.20	8.07	12/20/07 10:03	380:32:15	380:30:30	380:12:15	19.5073704	
4	68	987	0.00014	527.67	14.315	0.000135562	3.84	0.009466972	268.07	7.30	8.17	12/27/07 10:45	549:14:15	549:12:30	548:54:15	23.43581661	
-12	67	1012	-0.0004	526.67	14.678	-0.000417779	-11.83	0.009049192	256.24	6.98	7.85	1/2/08 11:01	693:30:15	693:28:30	693:10:15	26.33446728	
27	68	974	0.00095	527.67	14.127	0.000902992	25.57	0.009952185	281.81	7.68	8.55	1/7/08 11:19	813:48:15	813:46:30	813:28:15	28.52725305	
0	67	981	0	526.67	14.228	0	0.00	0.009952185	281.81	7.68	8.55	1/15/08 13:58	1008:27:15	1008:25:30	1008:07:15	31.75616738	
-1	67	986	-4E-05	526.67	14.301	-3.39205E-05	-0.96	0.009918264	280.85	7.65	8.52	1/23/08 11:33	1198:02:15	1198:00:30	1197:42:15	34.61267831	
13	67	967	0.00046	526.67	14.025	0.000432469	12.25	0.010350733	293.10	7.98	8.86	1/28/08 9:33	1316:02:15	1316:00:30	1315:42:15	36.27723115	
0	67	969	0	526.67	14.054	0	0.00	0.010350733	293.10	7.98	8.86	2/4/08 10:56	1485:25:15	1485:23:30	1485:05:15	38.54115765	
-8	67	983	-0.0003	526.67	14.257	-0.000270538	-7.66	0.010080195	285.44	7.78	8.65	2/11/08 15:01	1657:30:15	1657:28:30	1657:10:15	40.71245714	
4	67	981	0.00014	526.67	14.228	0.000134994	3.82	0.010215189	289.26	7.88	8.75	2/18/08 9:08	1819:37:15	1819:35:30	1819:17:15	42.65701388	
8	68	969	0.00028	527.67	14.054	0.00026618	7.54	0.010481369	296.80	8.08	8.96	2/25/08 9:41	1988:10:15	1988:08:30	1987:50:15	44.58890931	
-7	67	986	-0.0002	526.67	14.301	-0.000237443	-6.72	0.010243925	290.07	7.90	8.77	3/3/08 10:51	2157:20:15	2157:18:30	2157:00:15	46.44714738	
-7	67	998	-0.0002	526.67	14.475	-0.000240333	-6.81	0.010003592	283.27	7.72	8.59	3/10/08 9:19	2323:48:15	2323:46:30	2323:28:15	48.205852	
8	67	981	0.00028	526.67	14.228	0.000269988	7.65	0.01027358	290.91	7.92	8.80	3/17/08 10:37	2493:06:15	2493:04:30	2492:46:15	49.93099405	
254.59	67	981	0.00899	526.67	14.228	0.008592026	243.30	0.018865606	534.21	14.55	15.42	3/17/08 10:37	2493:06:15	2493:04:30	2492:46:15	49.93099405	residual gas recalc

DECANISTERED 3/17/2008 due to no gas being evolved; sample dried for 62 days in air; 559.21 grams placed in ball mill (108.97 cc @ STP desorbed), proportional to 243.30 cc @ STP for 1248.59 grams (wet wt.) for entire sample

SAMPLE: 704' 9" to 705' 8" (shale overlying Riverton coal) core in SSD canister Z9
NOTES: not disaggregated, no cleat evident
density = 2.38 gr/cc; KGS simple moisture = 0.85% (as received); KGS simple ash content = 84.49% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	1091	1101	6971
Sulfur	6.84%	6.90%	
Moisture	0.83%		
Ash	83.51%	84.21%	
Volatile Matter	10.61%	10.70%	
Fixed Carbon	5.05%	5.09%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)	
dry sample weight:	2.782	1261.99	wet sample weight:	2.955	1340.30	5.84%		35		off bottom	at surface	in canister	33.5	minutes
										12/5/07 13:04	12/5/07 13:06	12/5/07 13:37	0.558	hours
													0.747217059	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	temp (R)	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)	
23	69	990	0.00081	528.67	14.359	0.000780373	22.10	0.000780373	22.10	0.56	1.45	12/5/07 14:22	1:18:00	1:16:00	0:44:30	1.140175425	
3	69	990	0.00011	528.67	14.359	0.000101788	2.88	0.000882161	24.98	0.63	1.52	12/5/07 14:37	1:33:15	1:31:15	0:59:45	1.24666221	
8	69	990	0.00028	528.67	14.359	0.000271434	7.69	0.001153595	32.67	0.83	1.72	12/5/07 15:04	2:00:45	1:58:45	1:27:15	1.418626096	
4	68	990	0.00014	527.67	14.359	0.000135974	3.85	0.001289569	36.52	0.93	1.82	12/5/07 15:17	2:13:00	2:11:00	1:39:30	1.488847429	
4	68	990	0.00014	527.67	14.359	0.000135974	3.85	0.001425543	40.37	1.02	1.91	12/5/07 15:30	2:26:45	2:24:45	1:53:15	1.563916025	
5	68	990	0.00018	527.67	14.359	0.000169968	4.81	0.001595511	45.18	1.15	2.04	12/5/07 15:51	2:47:30	2:45:30	2:14:00	1.670828138	
3	68	990	0.00011	527.67	14.359	0.000101981	2.89	0.001697492	48.07	1.22	2.11	12/5/07 16:05	3:01:45	2:59:45	2:28:15	1.740450133	
15	67	989	0.00053	526.67	14.344	0.000510355	14.45	0.002207847	62.52	1.59	2.48	12/5/07 20:30	7:26:00	7:24:00	6:52:30	2.726414006	back at lab
105	67	986	0.00371	526.67	14.301	0.003561652	100.85	0.005769499	163.37	4.15	5.04	12/7/07 11:34	46:30:00	46:28:00	45:56:30	6.819090848	
50	67	993	0.00177	526.67	14.402	0.001708065	48.37	0.007477564	211.74	5.38	6.26	12/10/07 10:09	117:05:00	117:03:00	116:31:30	10.82050523	
20	67	991	0.00071	526.67	14.373	0.00068185	19.31	0.008159414	231.05	5.87	6.75	12/12/07 13:28	168:24:00	168:22:00	167:50:30	12.97690256	
18	67	994	0.00064	526.67	14.417	0.000615523	17.43	0.008774937	248.48	6.31	7.20	12/14/07 10:18	213:14:00	213:12:00	212:40:30	14.6025112	
17	67	977	0.0006	526.67	14.170	0.000571385	16.18	0.009346321	264.66	6.72	7.61	12/20/07 10:04	357:00:00	356:58:00	356:26:30	18.89444363	
-4	68	987	-0.0001	527.67	14.315	-0.000135562	-3.84	0.009210759	260.82	6.62	7.51	12/27/07 10:46	525:42:00	525:40:00	525:08:30	22.92814864	
-8	67	1012	-0.0003	526.67	14.678	-0.00027852	-7.89	0.00893224	252.93	6.42	7.31	1/2/08 11:02	669:58:00	669:56:00	669:24:30	25.88371431	
18	68	974	0.00064	527.67	14.127	0.000601995	17.05	0.009534235	269.98	6.85	7.74	1/7/08 11:20	790:16:00	790:14:00	789:42:30	28.11168203	
-7	67	981	-0.0002	526.67	14.228	-0.000236239	-6.69	0.009297995	263.29	6.68	7.57	1/15/08 14:00	984:56:00	984:54:00	984:22:30	31.38364755	
-5	67	986	-0.0002	526.67	14.301	-0.000169602	-4.80	0.009128393	258.49	6.56	7.45	1/23/08 11:36	1174:32:00	1174:30:00	1173:58:30	34.27146529	
9	67	967	0.00032	526.67	14.025	0.000299402	8.48	0.009427795	266.96	6.78	7.67	1/28/08 9:33	1292:29:00	1292:27:00	1291:55:30	35.95112423	
-4	67	969	-0.0001	526.67	14.054	-0.000133343	-3.78	0.009294452	263.19	6.68	7.57	2/4/08 10:57	1461:53:00	1461:51:00	1461:19:30	38.23458295	
-9	67	983	-0.0003	526.67	14.257	-0.000304356	-8.62	0.008990096	254.57	6.46	7.35	2/11/08 15:02	1633:58:00	1633:56:00	1633:24:30	40.42235355	
191.18	73	982	0.00675	532.67	14.243	0.006385862	180.83	0.015375958	435.40	11.05	11.94	2/11/08 15:02	1633:58:00	1633:56:00	1633:24:30	40.42235355	residual gas calc.

DECANISTERED 2/12/2008; sample dried for 45 days in air; 192.76 grams placed in ball mill (27.62 cc @ STP desorbed), proportional to 180.83 cc @ STP for 1261.99 grams (dry wt.) for entire sample

SAMPLE: 705' 8" to 706' 7" (Riverton coal) core in SSD canister KGS2
NOTES: crumbly coal, broken into 3" to 4 " clasts, cleat evident, mineral filled
density = 1.33 gr/cc; KGS simple moisture = 2.17% (as received); KGS simple ash content = 22.81% (moisture-free)

PROXIMATE ANALYSIS by Luman's Laboratories, Chetopa, KS

	As Received	Moisture Free	MAF
BTU/lb	10553	10801	13970
Sulfur	8.13%	8.32%	
Moisture	2.30%		
Ash	22.16%	22.68%	
Volatile Matter	33.41%	34.20%	
Fixed Carbon	42.13%	43.12%	

	lbs.	grams		lbs.	grams	moisture %		est. lost gas (cc) =		TIME OF:			elapsed time (off bottom to canistering)
dry sample weight:	1.421	644.34	wet sample weight:	1.573	713.31	9.67%			108	off bottom	at surface	in canister	25.3 minutes
										12/5/07 13:04	12/5/07 13:06	12/5/07 13:29	0.421 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			0.648716682 SQRT (hrs)
measured cc	measured T (F)	measured P	cubic ft	temp (R)	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)	
25	69	990	0.00088	528.67	14.359	0.000848231	24.02	0.000848231	24.02	1.19	6.56	12/5/07 13:41	0:37:30	0:35:30	0:12:15	0.790569415	
3	69	990	0.00011	528.67	14.359	0.000101788	2.88	0.000950019	26.90	1.34	6.71	12/5/07 13:44	0:40:00	0:38:00	0:14:45	0.816496581	
4	69	990	0.00014	528.67	14.359	0.000135717	3.84	0.001085736	30.74	1.53	6.90	12/5/07 13:46	0:42:15	0:40:15	0:17:00	0.839146392	
3	69	990	0.00011	528.67	14.359	0.000101788	2.88	0.001187524	33.63	1.67	7.04	12/5/07 13:48	0:44:15	0:42:15	0:19:00	0.858778202	
10	69	990	0.00035	528.67	14.359	0.000339293	9.61	0.001526816	43.23	2.15	7.52	12/5/07 13:54	0:50:45	0:48:45	0:25:30	0.919691977	
6	69	990	0.00021	528.67	14.359	0.000203576	5.76	0.001730392	49.00	2.44	7.81	12/5/07 13:59	0:55:00	0:53:00	0:29:45	0.957427108	
9	69	990	0.00032	528.67	14.359	0.000305363	8.65	0.002035755	57.65	2.87	8.24	12/5/07 14:04	1:00:45	0:58:45	0:35:30	1.00623059	
17	69	990	0.0006	528.67	14.359	0.000576797	16.33	0.002612553	73.98	3.68	9.05	12/5/07 14:20	1:16:30	1:14:30	0:51:15	1.129158979	
22	69	990	0.00078	528.67	14.359	0.000746444	21.14	0.003358996	95.12	4.73	10.10	12/5/07 14:39	1:35:45	1:33:45	1:10:30	1.263262971	
17	69	990	0.0006	528.67	14.359	0.000576797	16.33	0.003935794	111.45	5.54	10.91	12/5/07 14:58	1:54:00	1:52:00	1:28:45	1.378404875	
8	68	990	0.00028	527.67	14.359	0.000271948	7.70	0.004207742	119.15	5.92	11.29	12/5/07 15:03	1:59:45	1:57:45	1:34:30	1.412739655	
44	68	990	0.00155	527.67	14.359	0.001495716	42.35	0.005703458	161.50	8.03	13.40	12/5/07 15:53	2:49:45	2:47:45	2:24:30	1.682012683	
6	68	990	0.00021	527.67	14.359	0.000203961	5.78	0.00590742	167.28	8.32	13.69	12/5/07 16:04	3:00:45	2:58:45	2:35:30	1.735655496	
129	67	989	0.00456	526.67	14.344	0.004389057	124.28	0.010296477	291.56	14.50	19.87	12/5/07 20:28	7:24:00	7:22:00	6:58:45	2.720294102	back at lab
412	67	986	0.01455	526.67	14.301	0.013975242	395.73	0.024271719	687.30	34.17	39.54	12/7/07 11:28	46:24:00	46:22:00	45:58:45	6.811754546	gas sampled
256	67	993	0.00904	526.67	14.402	0.008745294	247.64	0.033017013	934.93	46.49	51.86	12/10/07 10:07	117:03:00	117:01:00	116:37:45	10.81896483	
144	67	991	0.00509	526.67	14.373	0.00490932	139.02	0.037926334	1073.95	53.40	58.77	12/12/07 13:28	168:24:00	168:22:00	167:58:45	12.97690256	
95	67	994	0.00335	526.67	14.417	0.003248592	91.99	0.041174926	1165.94	57.97	63.34	12/14/07 10:15	213:11:00	213:09:00	212:45:45	14.60079906	estimate
77	69	977	0.00272	528.67	14.170	0.002578246	73.01	0.043753172	1238.95	61.60	66.97	12/20/07 10:05	357:01:00	356:59:00	356:35:45	18.89488467	
153	68	987	0.0054	527.67	14.315	0.005185253	146.83	0.048938425	1385.78	68.90	74.27	12/27/07 10:47	525:43:00	525:41:00	525:17:45	22.92851209	
59	67	1012	0.00208	526.67	14.678	0.002054082	58.16	0.050992507	1443.94	71.79	77.16	1/2/08 11:03	669:59:00	669:57:00	669:33:45	25.88403626	
78	68	974	0.00275	527.67	14.127	0.002608645	73.87	0.053601152	1517.81	75.47	80.84	1/7/08 11:22	790:18:00	790:16:00	789:52:45	28.1122749	
54	67	981	0.00191	526.67	14.228	0.001822418	51.60	0.05542357	1569.41	78.03	83.40	1/15/08 13:59	984:55:00	984:53:00	984:29:45	31.38338201	
38	67	986	0.00134	526.67	14.301	0.001288979	36.50	0.056712549	1605.91	79.85	85.22	1/23/08 11:37	1174:33:00	1174:31:00	1174:07:45	34.27170845	
37	67	967	0.00131	526.67	14.025	0.001230873	34.85	0.057943422	1640.77	81.58	86.95	1/28/08 9:34	1292:30:00	1292:28:00	1292:04:45	35.95135602	
26	67	969	0.00092	526.67	14.054	0.000866727	24.54	0.058810149	1665.31	82.80	88.17	2/4/08 10:58	1461:54:00	1461:52:00	1461:28:45	38.2348009	
4	67	983	0.00014	526.67	14.257	0.000135269	3.83	0.058945418	1669.14	82.99	88.36	2/11/08 15:03	1633:59:00	1633:57:00	1633:33:45	40.42255971	
19	67	981	0.00067	526.67	14.228	0.000641221	18.16	0.059586639	1687.30	83.89	89.26	2/18/08 9:09	1796:05:00	1796:03:00	1795:39:45	42.38022338	
25	67	969	0.00088	526.67	14.054	0.000833391	23.60	0.060420031	1710.90	85.07	90.44	2/25/08 9:42	1964:38:00	1964:36:00	1964:12:45	44.32418452	
3	67	986	0.00011	526.67	14.301	0.000101761	2.88	0.060521792	1713.78	85.21	90.58	3/3/08 10:52	2133:48:00	2133:46:00	2133:22:45	46.19307307	
1	67	998	3.5E-05	526.67	14.475	3.43333E-05	0.97	0.060556126	1714.75	85.26	90.63	3/10/08 9:20	2300:16:00	2300:14:00	2299:50:45	47.96109534	
21	68	981	0.00074	527.67	14.228	0.000707375	20.03	0.061263501	1734.78	86.25	91.62	3/17/08 10:38	2469:34:00	2469:32:00	2469:08:45	49.6947348	
2	68	993	7.1E-05	527.67	14.402	6.81931E-05	1.93	0.061331694	1736.71	86.35	91.72	3/24/08 9:04	2636:00:00	2635:58:00	2635:34:45	51.34199061	
23	66	970	0.00081	525.67	14.069	0.000768971	21.77	0.062100665	1758.49	87.43	92.80	3/31/08 11:07	2806:03:00	2806:01:00	2805:37:45	52.9721625	
588.61	76	981	0.02079	535.67	14.228	0.019530939	553.05	0.081631604	2311.54	114.93	120.30	3/31/08 11:07	2806:03:00	2806:01:00	2805:37:45	52.9721625	residual gas calc.

DECANISTERED 3/31/2008; sample dried for 39 days in air; 122.60 grams placed in ball mill (105.23 cc @ STP desorbed), proportional to 553.05 cc @ STP for 644.34 grams (dry wt.) for entire sample

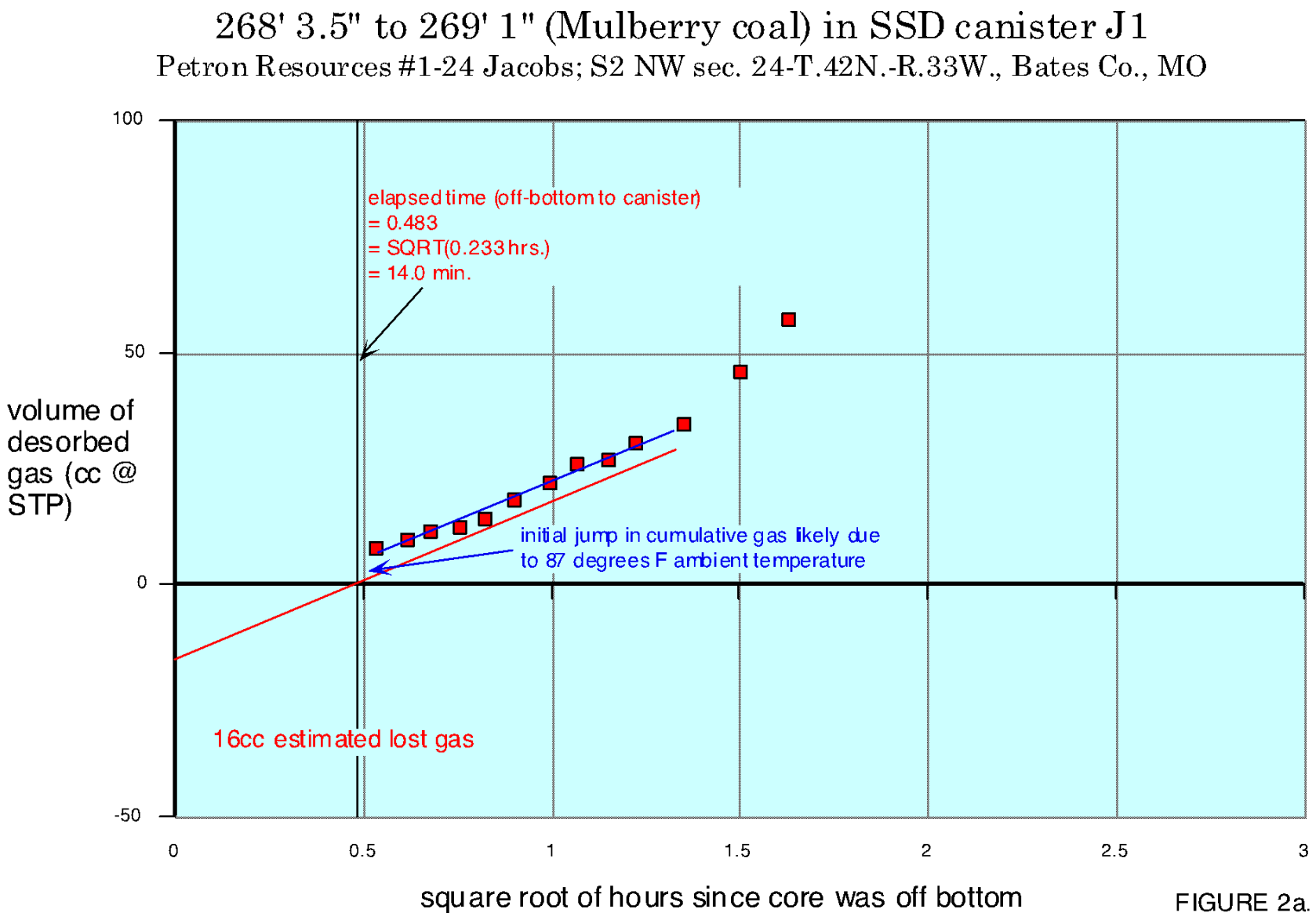


FIGURE 2a. Lost-gas determination for 268'3.5" to 269'1" (Mulberry coal), #1-24 Jacobs well.

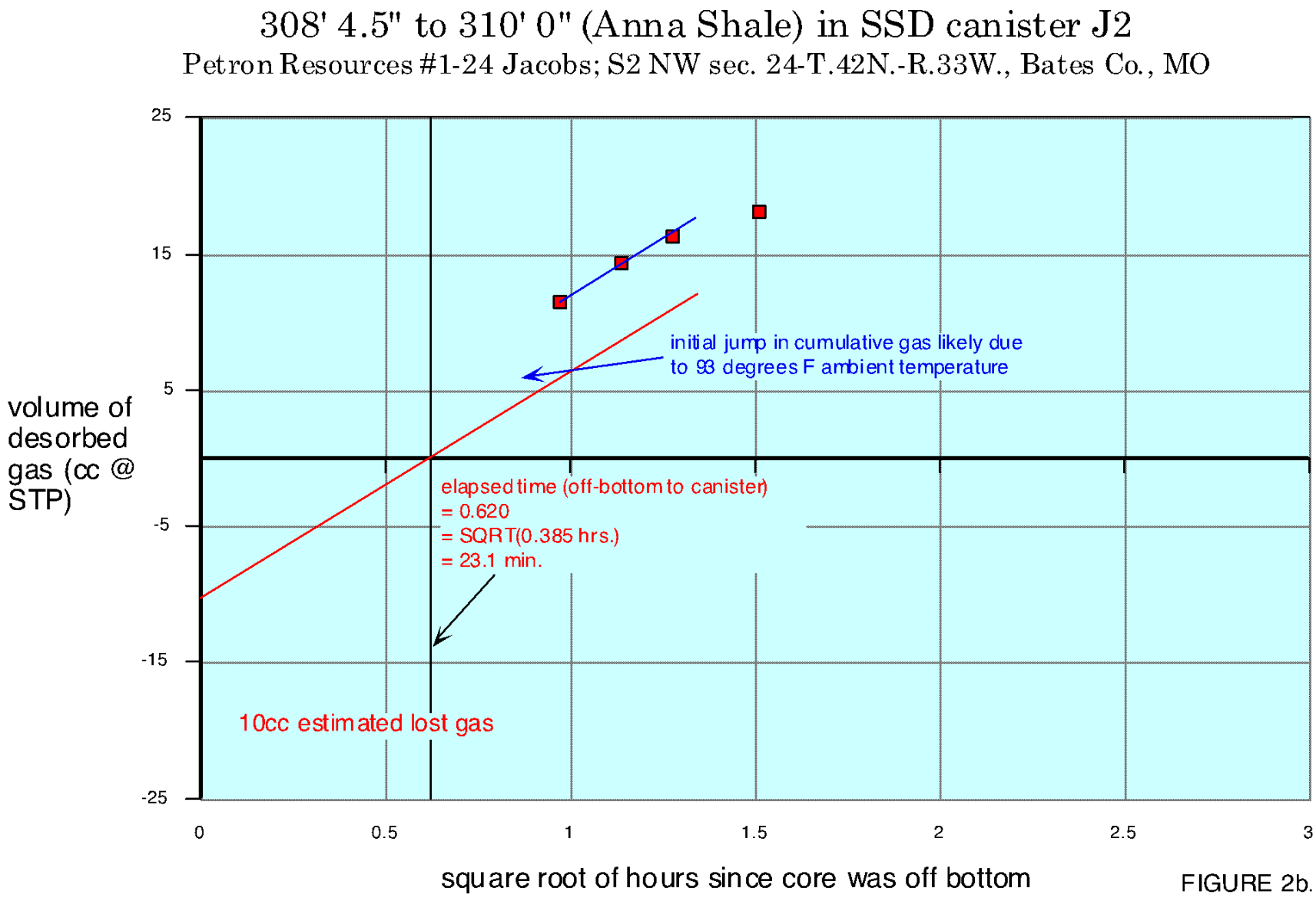


FIGURE 2b. Lost-gas determination for 308'4.5" to 310'0" (Anna Shale), #1-24 Jacobs well.

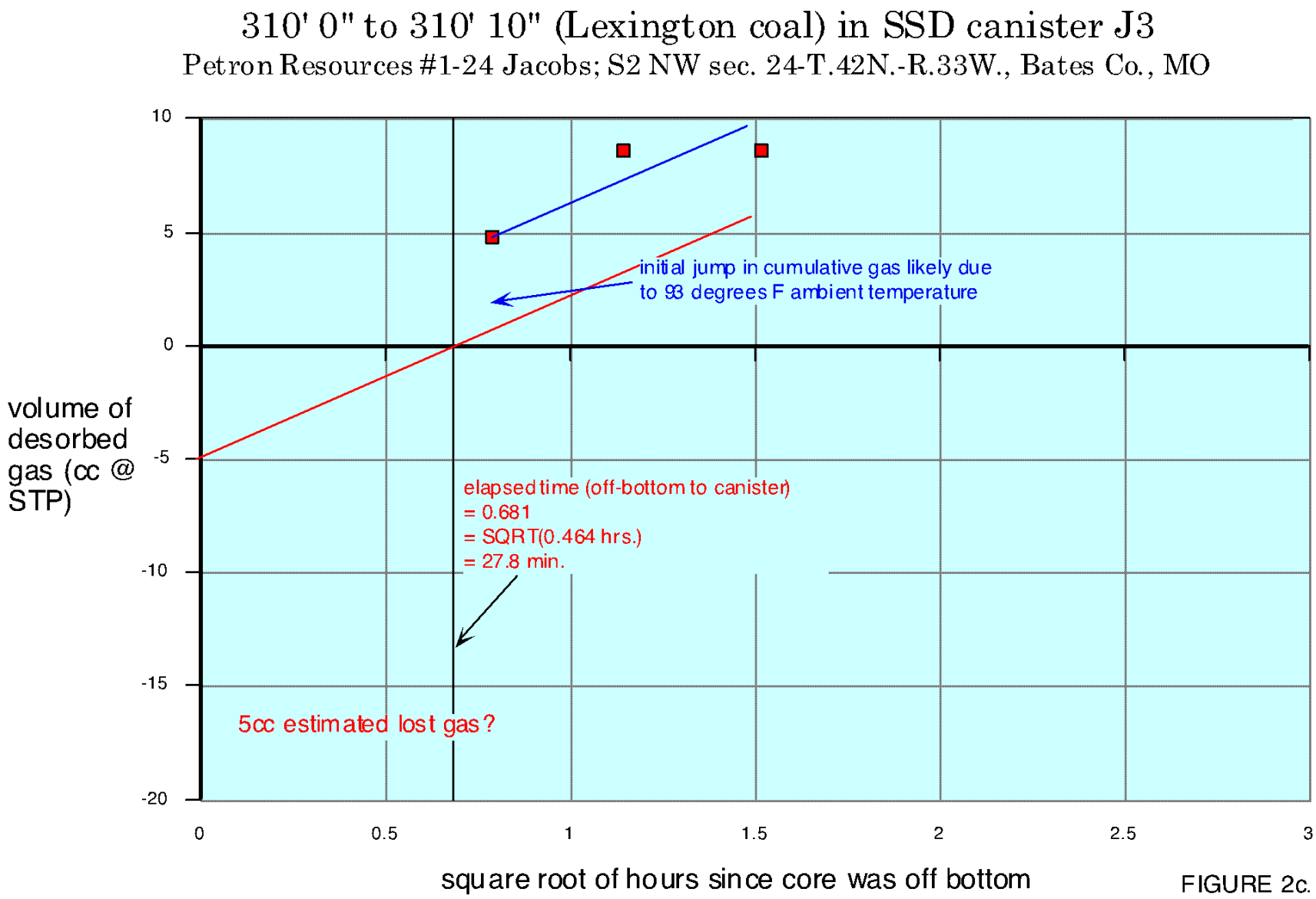


FIGURE 2c.

FIGURE 2c. Lost-gas determination for 310'0" to 310'10" (Lexington coal), #1-24 Jacobs well.

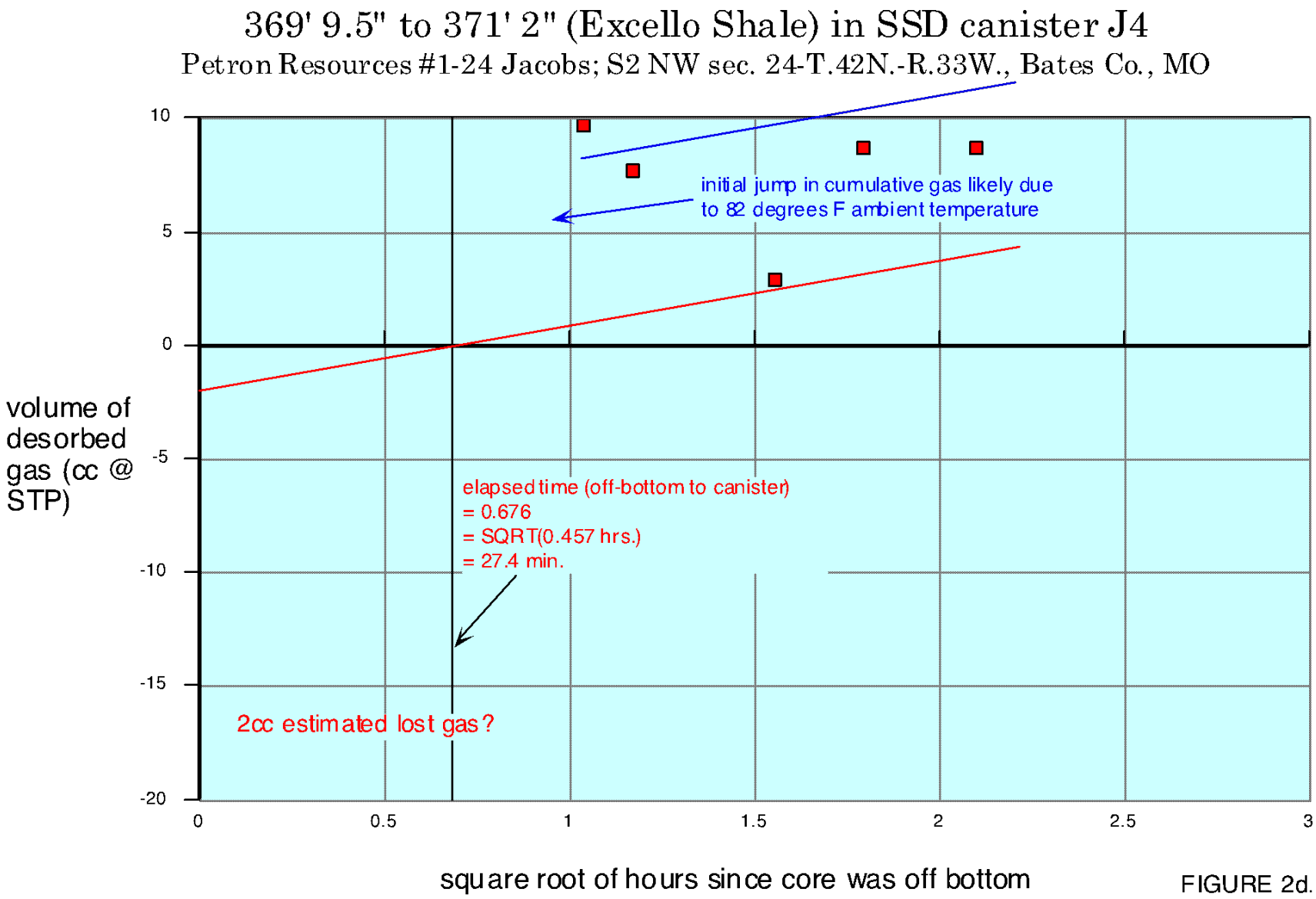


FIGURE 2d.

FIGURE 2d. Lost-gas determination for 369'9.5" to 371'2" (Excello Shale), #1-24 Jacobs well.

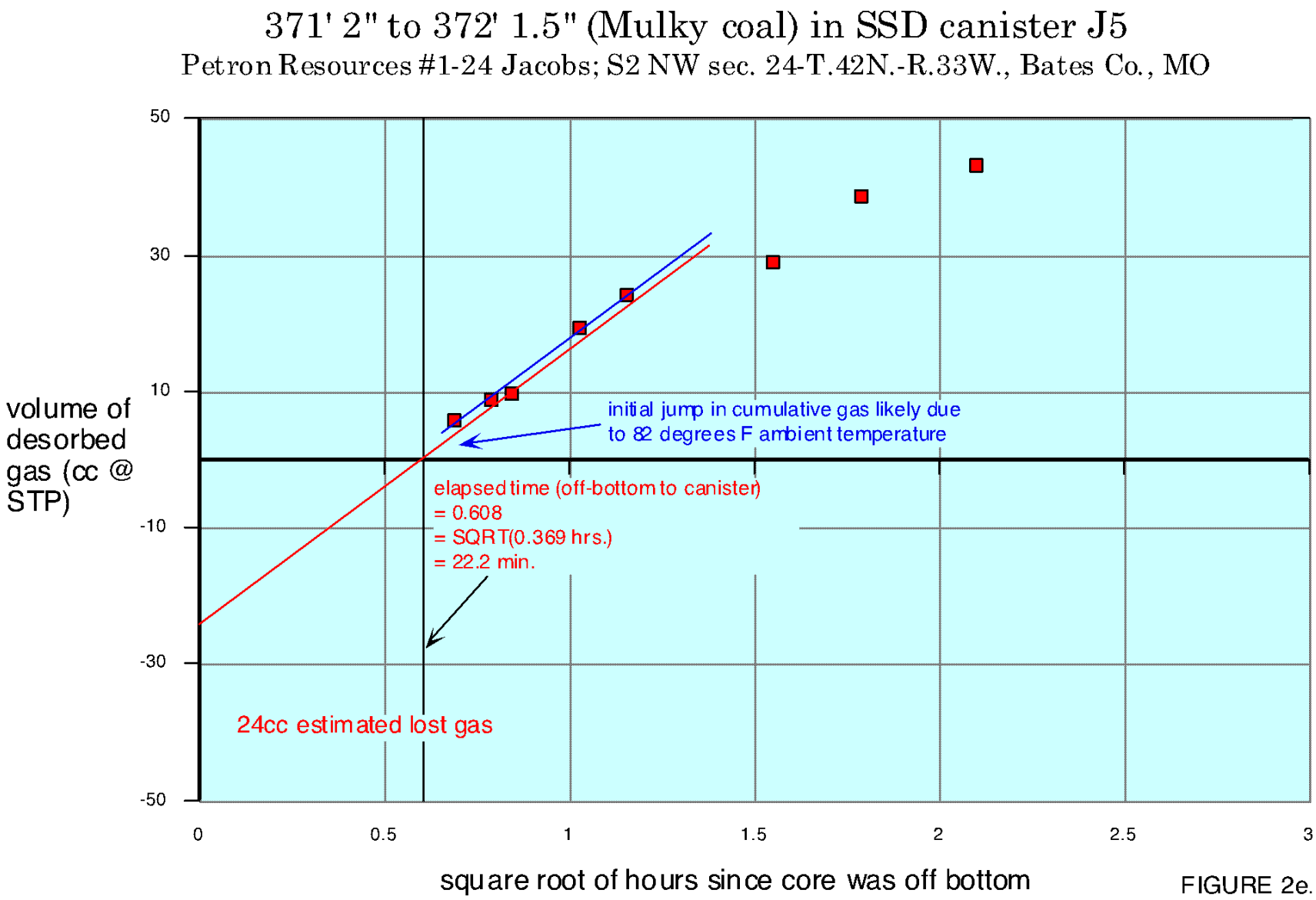


FIGURE 2e.

FIGURE 2e. Lost-gas determination for 371'2" to 372'1.5" (Mulky coal), #1-24 Jacobs well.

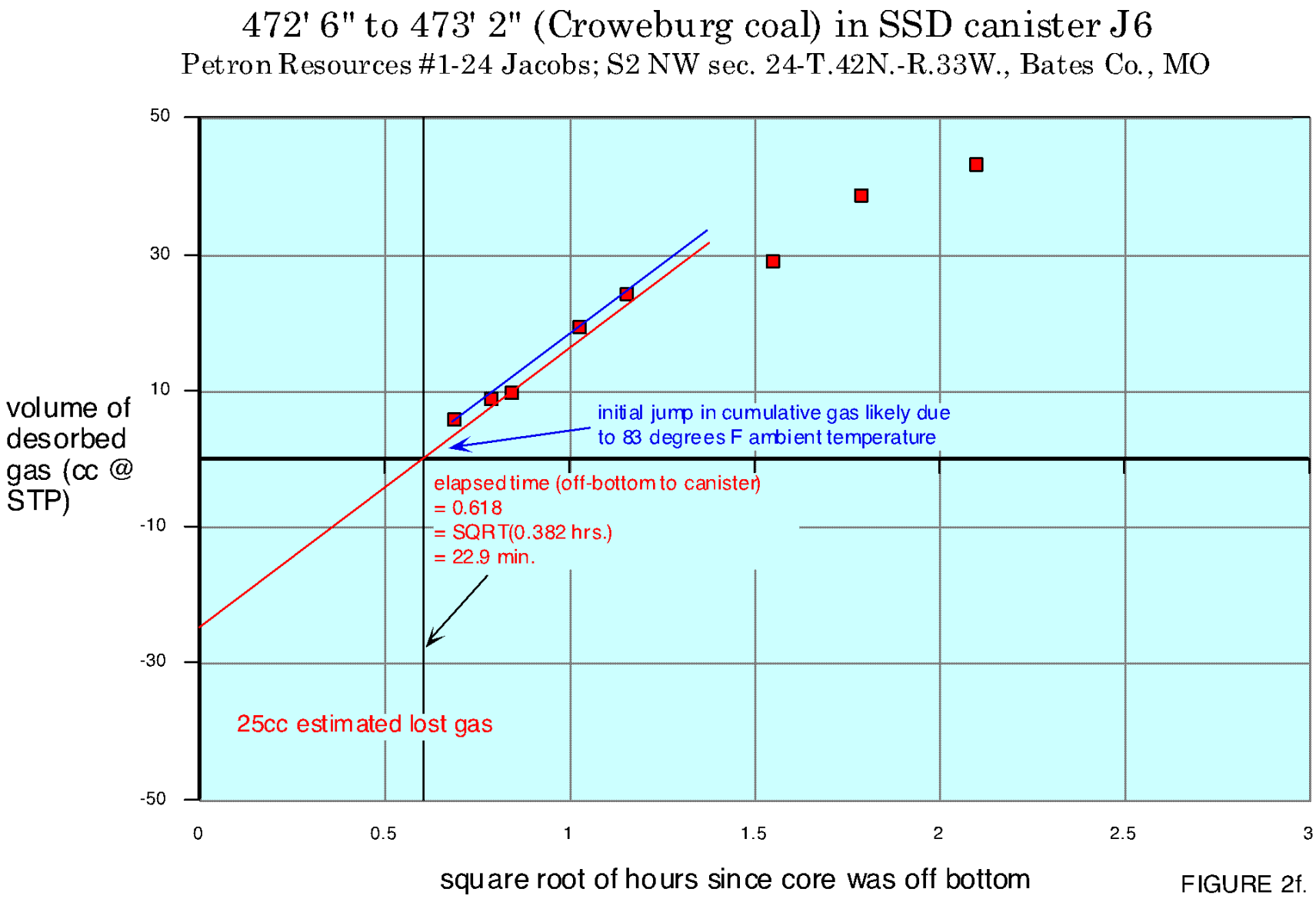


FIGURE 2f.

FIGURE 2f. Lost-gas determination for 472'6" to 473'2" (Croweburg coal), #1-24 Jacobs well.

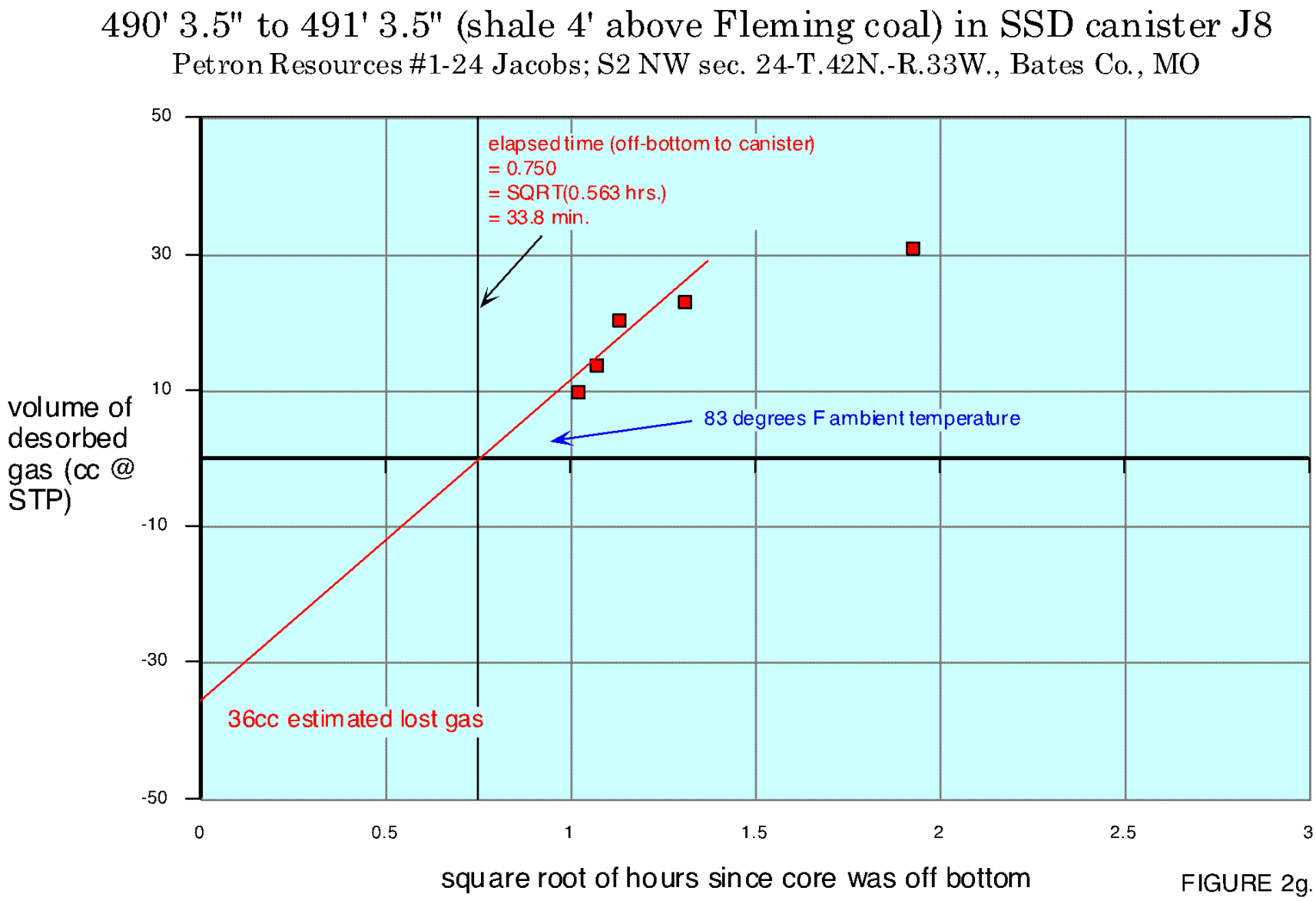


FIGURE 2g.

FIGURE 2g. Lost-gas determination for 490'3.5" to 491'3.5" (shale 4' above Fleming coal), #1-24 Jacobs well.

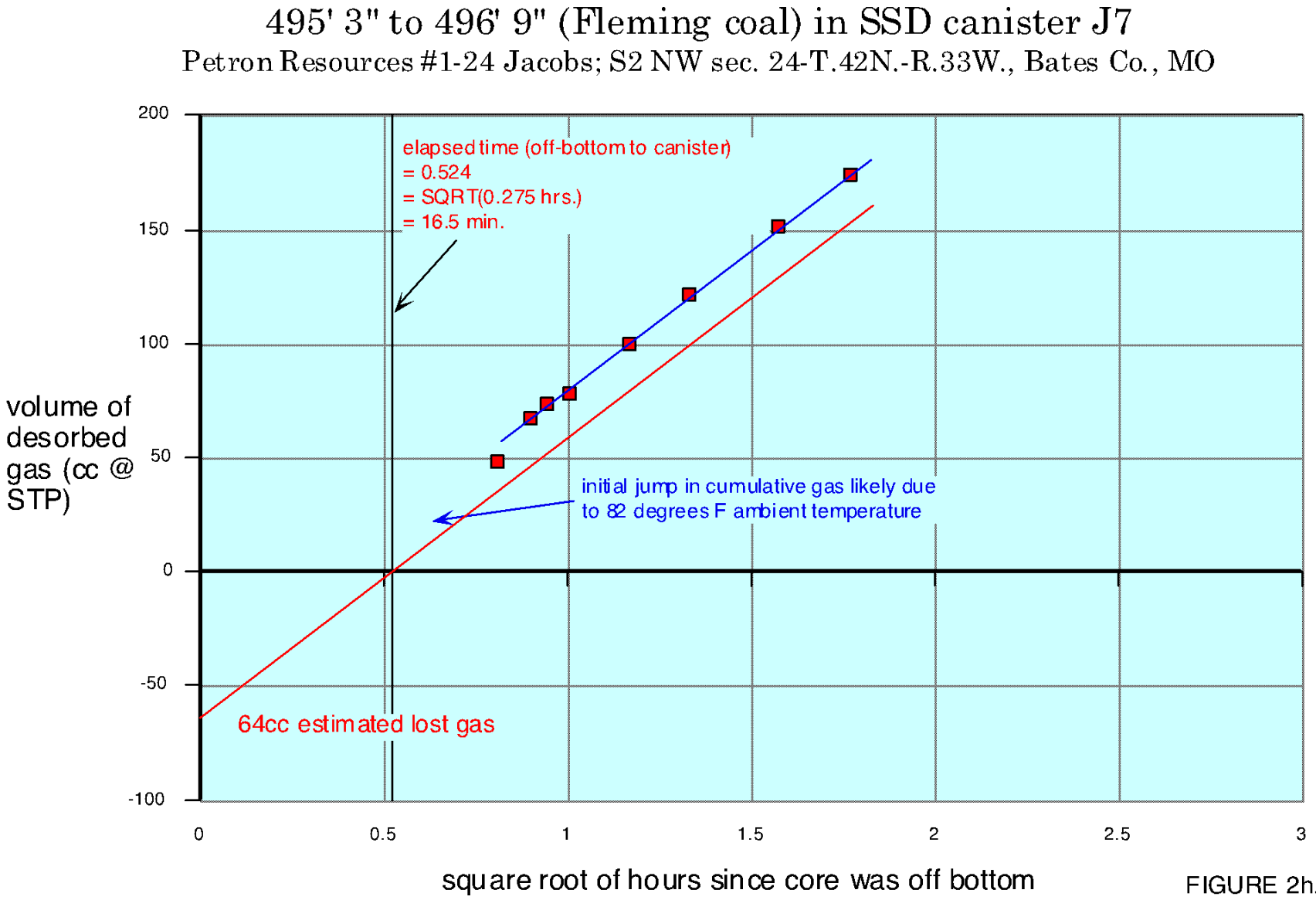


FIGURE 2h.

FIGURE 2h. Lost-gas determination for 495'3" to 496'9" (Fleming coal), #1-24 Jacobs well.

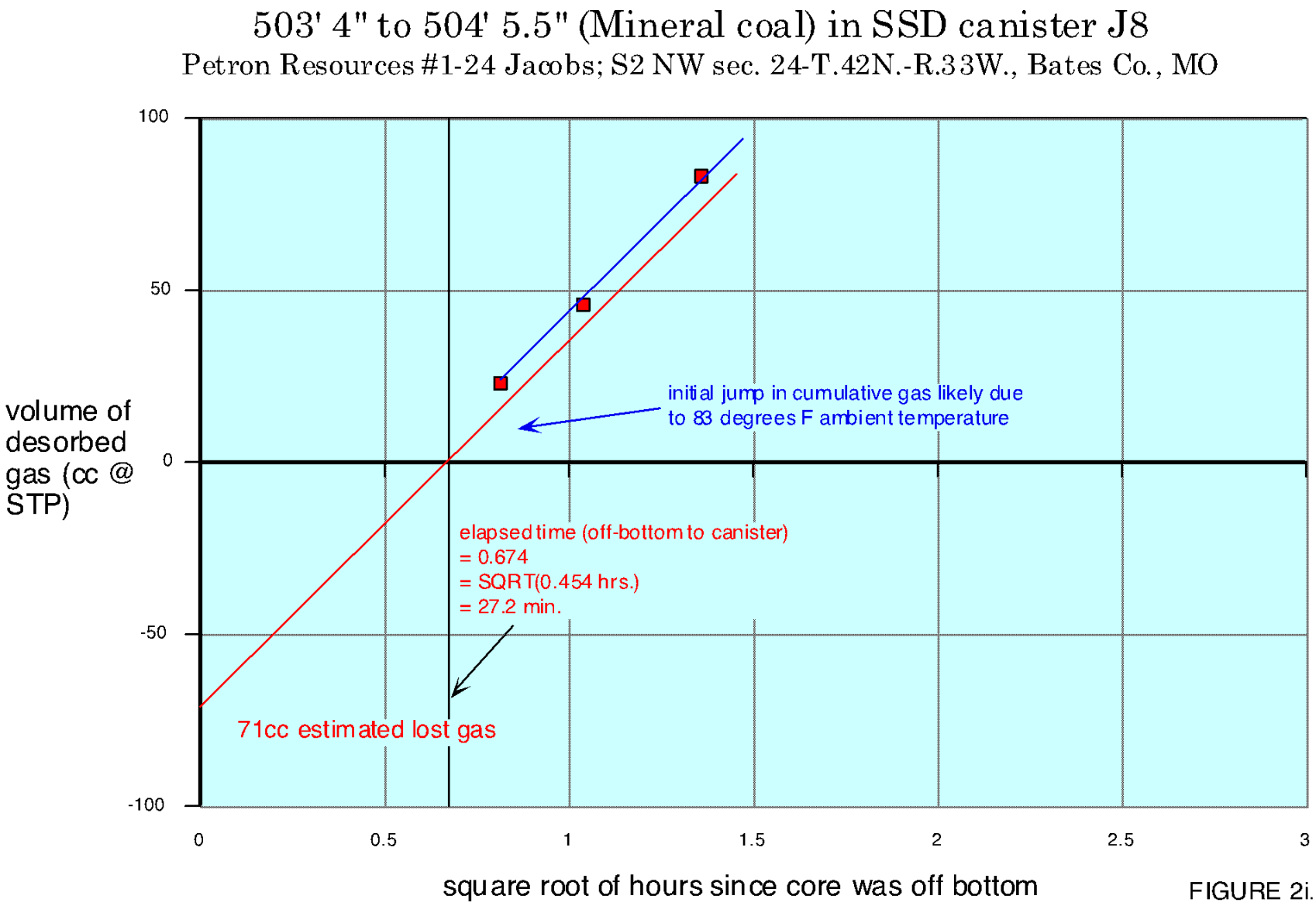


FIGURE 2i.

FIGURE 2i. Lost-gas determination for 503'4" to 504'5.5" (Mineral coal), #1-24 Jacobs well.

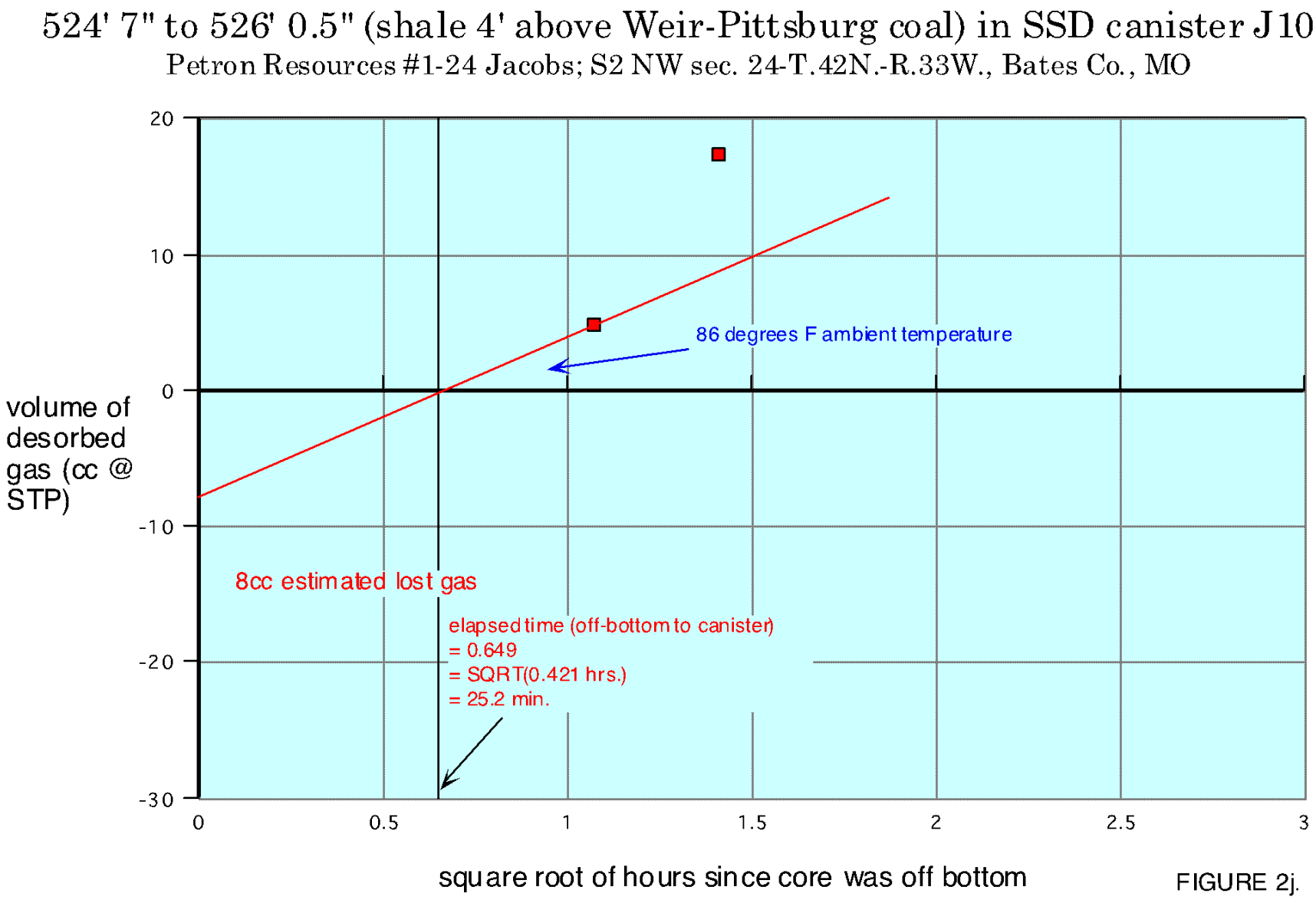


FIGURE 2j.

FIGURE 2j. Lost-gas determination for 524' 7" to 526' 0.5" (shale 4' above Weir-Pittsburg coal), #1-24 Jacobs well.

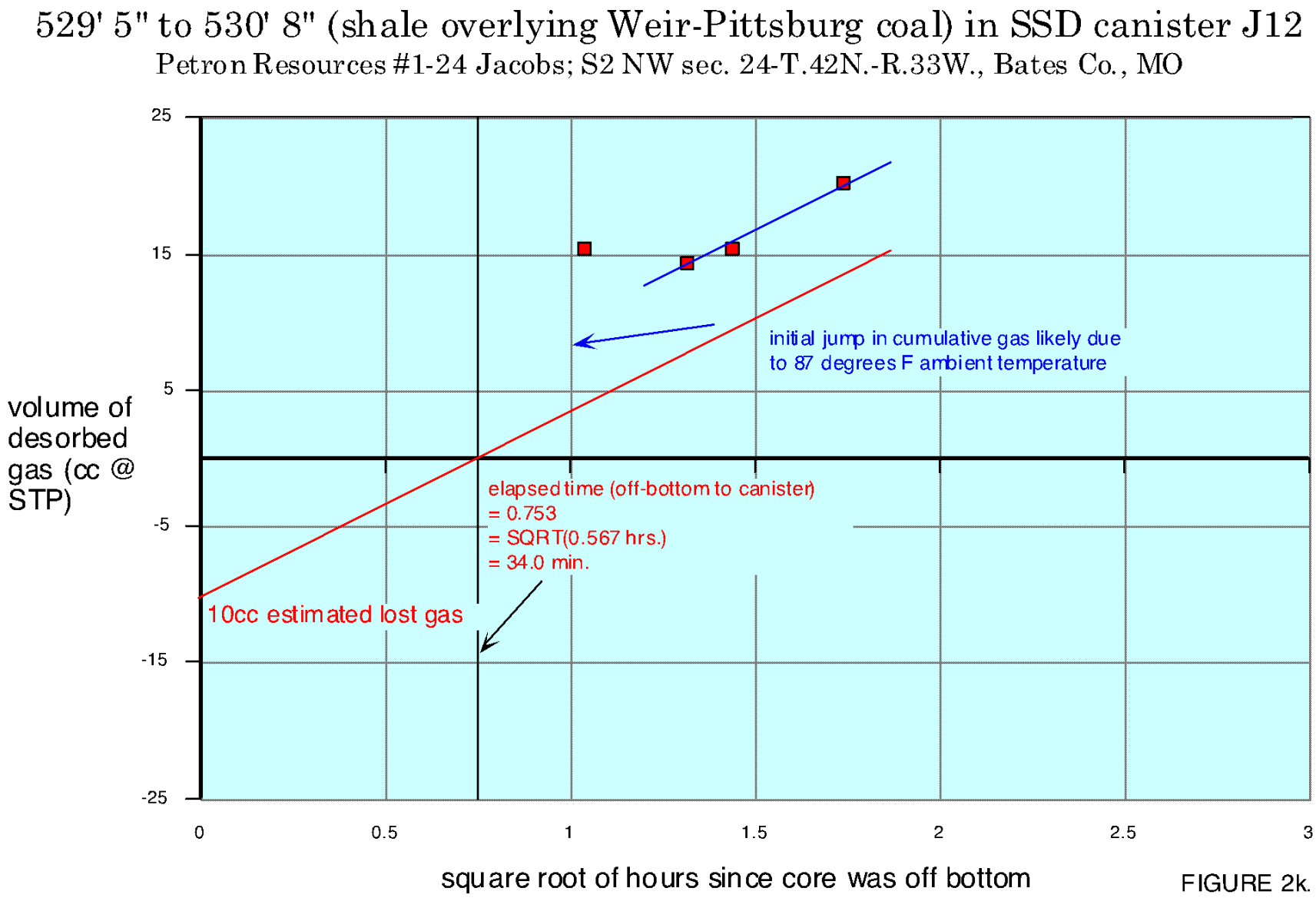


FIGURE 2k. Lost-gas determination for 529'5" to 530'8" (shale overlying Weir-Pittsburg coal), #1-24 Jacobs well.

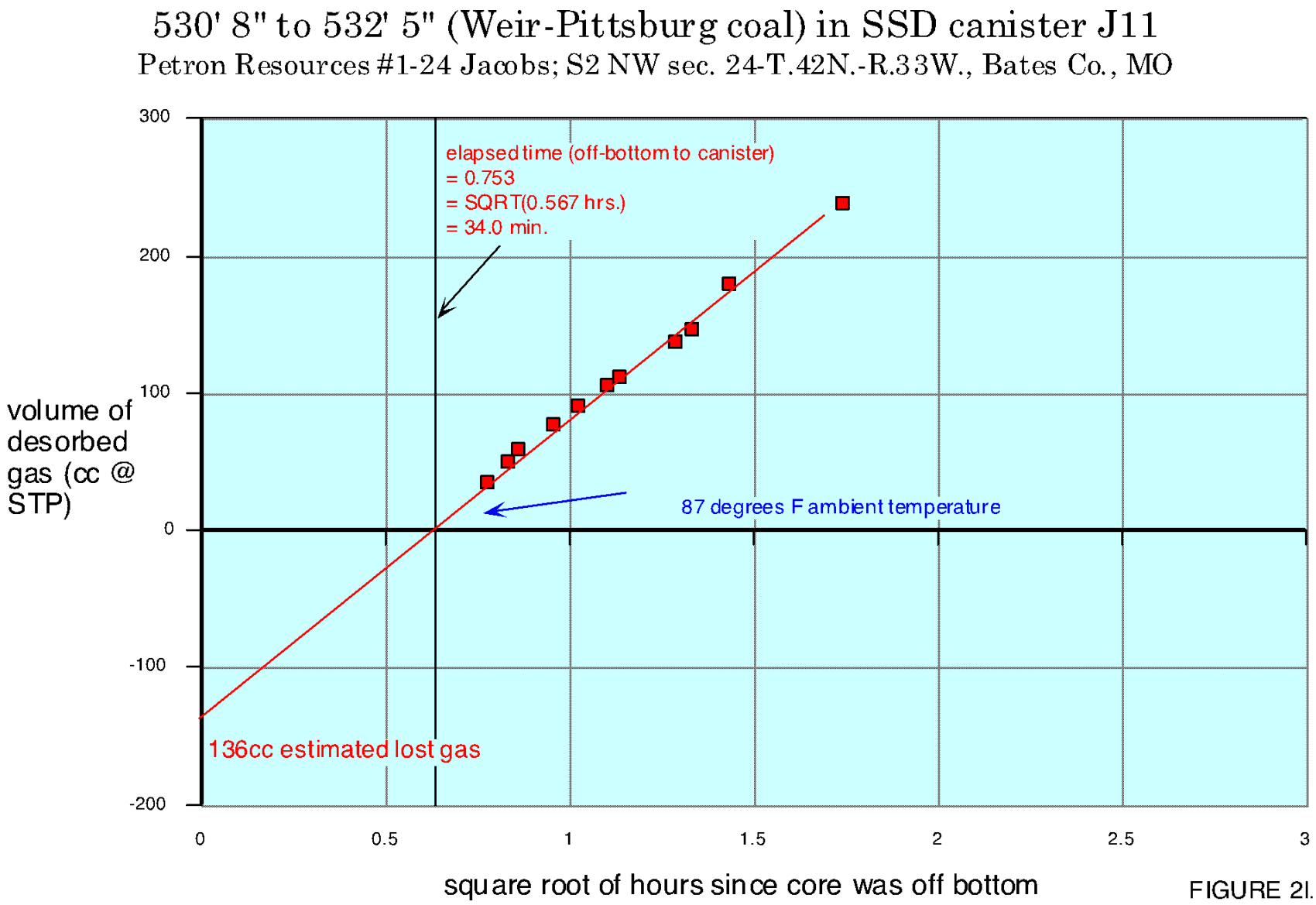


FIGURE 2l. Lost-gas determination for 530'8" to 532'5" (Weir-Pittsburg coal), #1-24 Jacobs well.

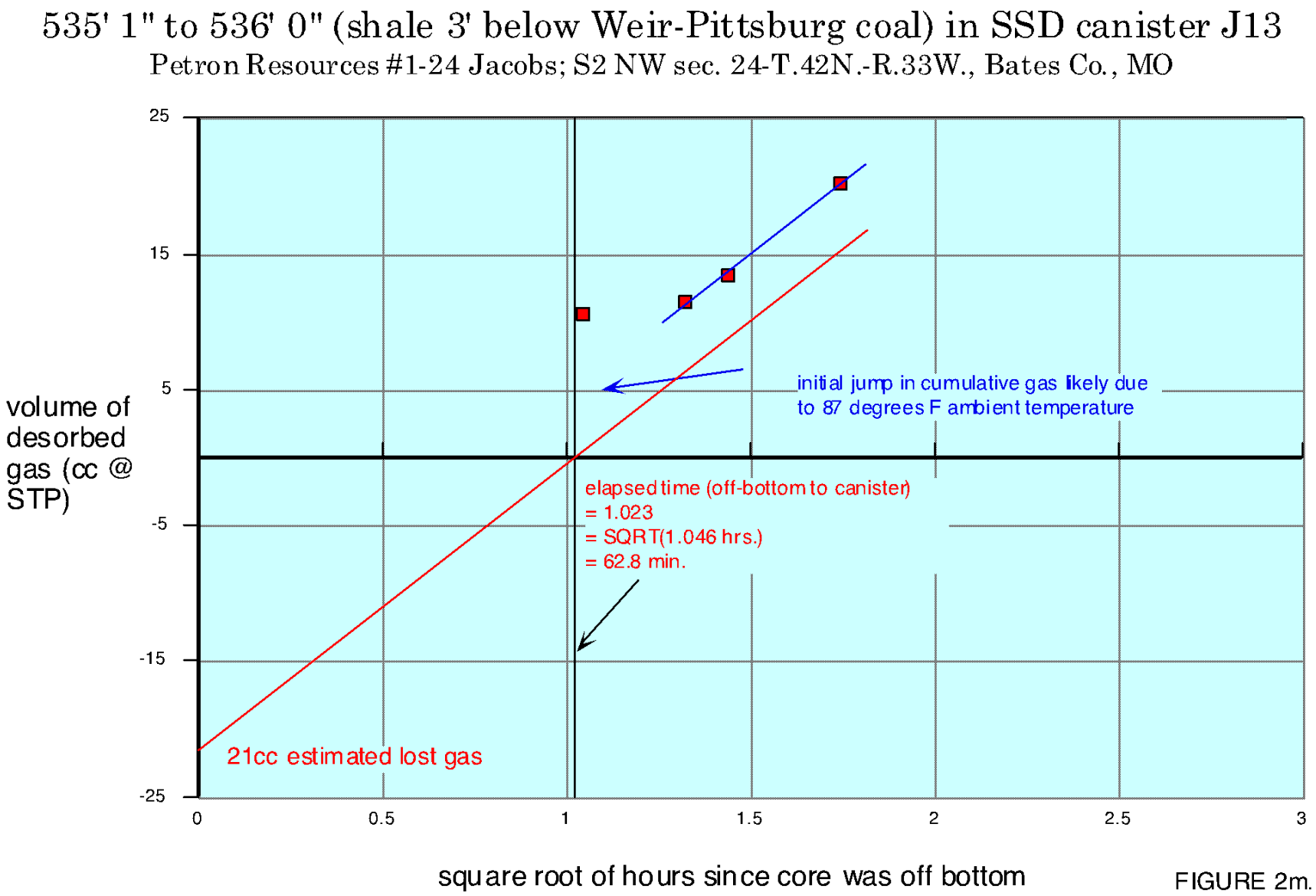


FIGURE 2m.

FIGURE 2m. Lost-gas determination for 535'1" to 536'0" (shale 3' below Weir-Pittsburg coal), #1-24 Jacobs well.

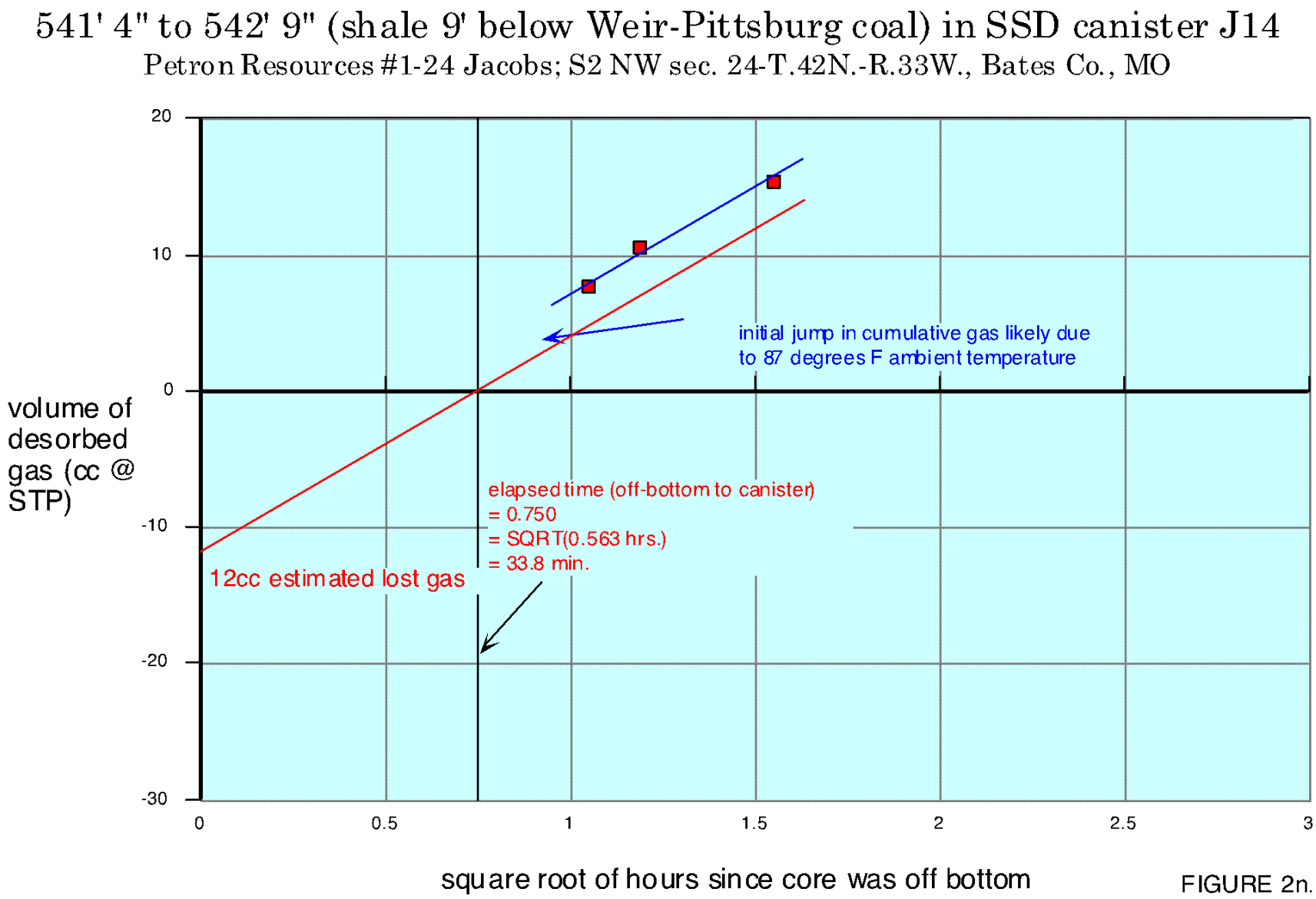


FIGURE 2n. Lost-gas determination for 541'4" to 542'9" (shale 9' below Weir-Pittsburg coal), #1-24 Jacobs well.

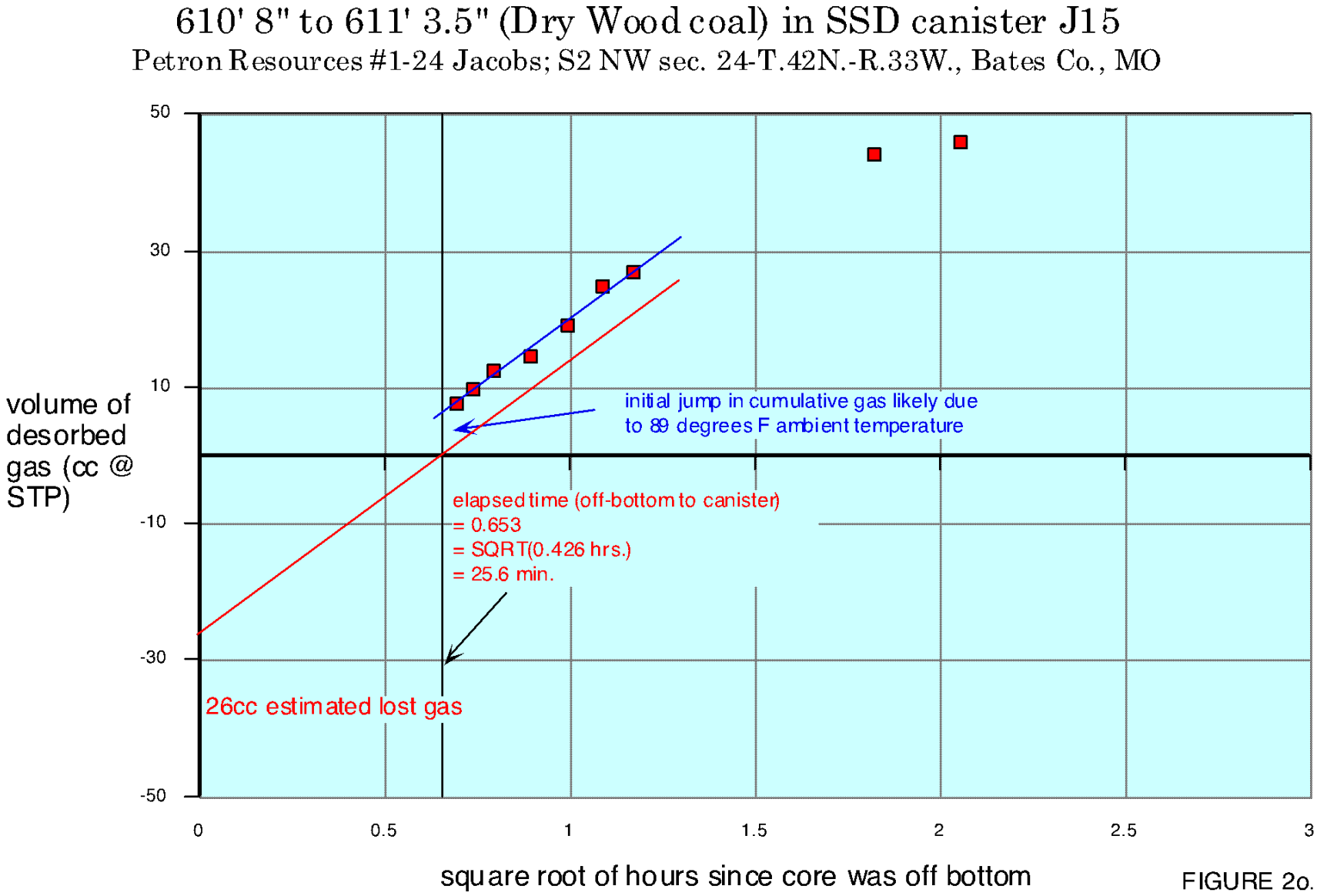


FIGURE 2o.

FIGURE 2o. Lost-gas determination for 610'8" to 611'3.5" (Dry Wood coal), #1-24 Jacobs well.

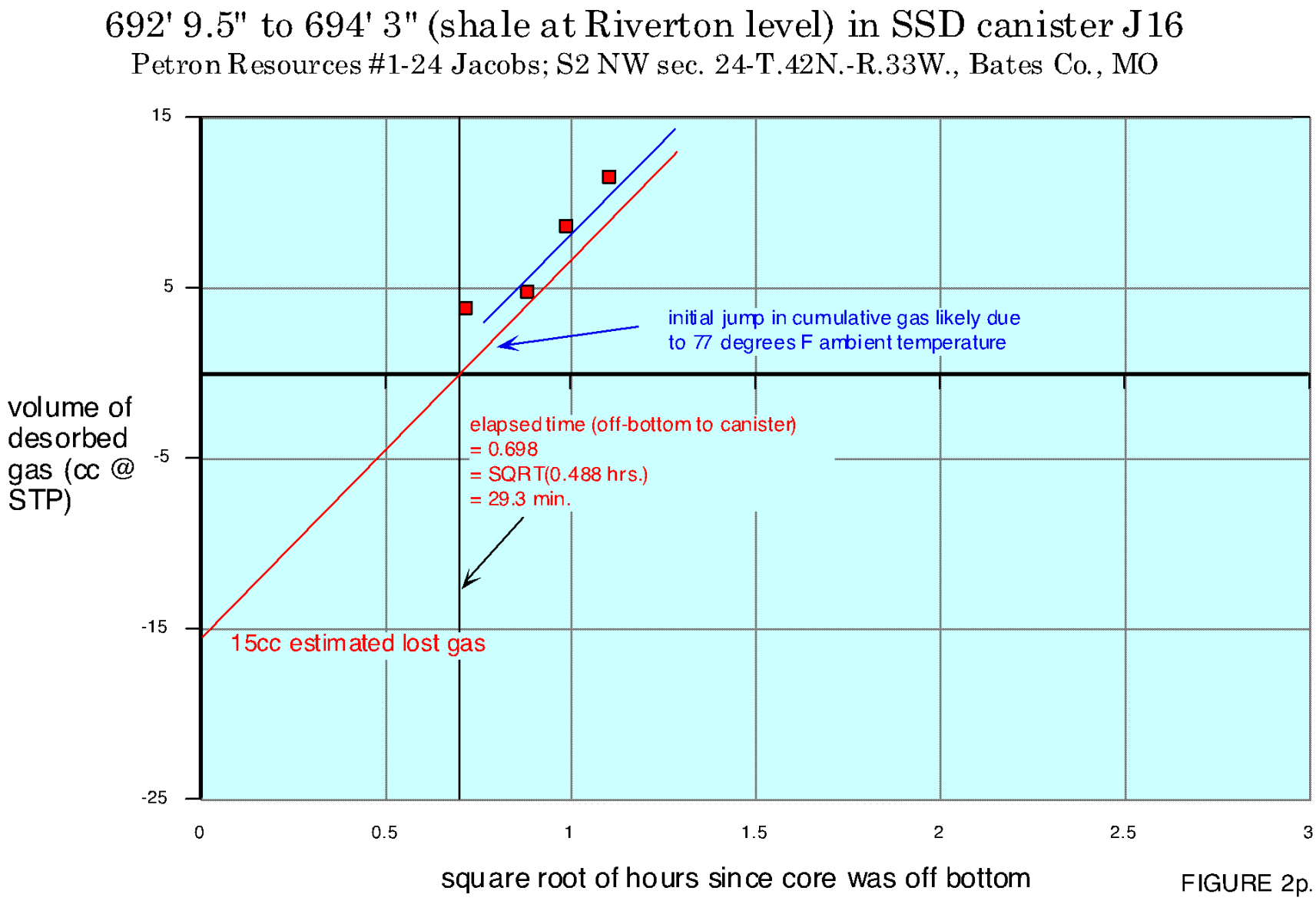


FIGURE 2p. Lost-gas determination for 692'9.5" to 694'3" (shale at Riverton level), #1-24 Jacobs well.

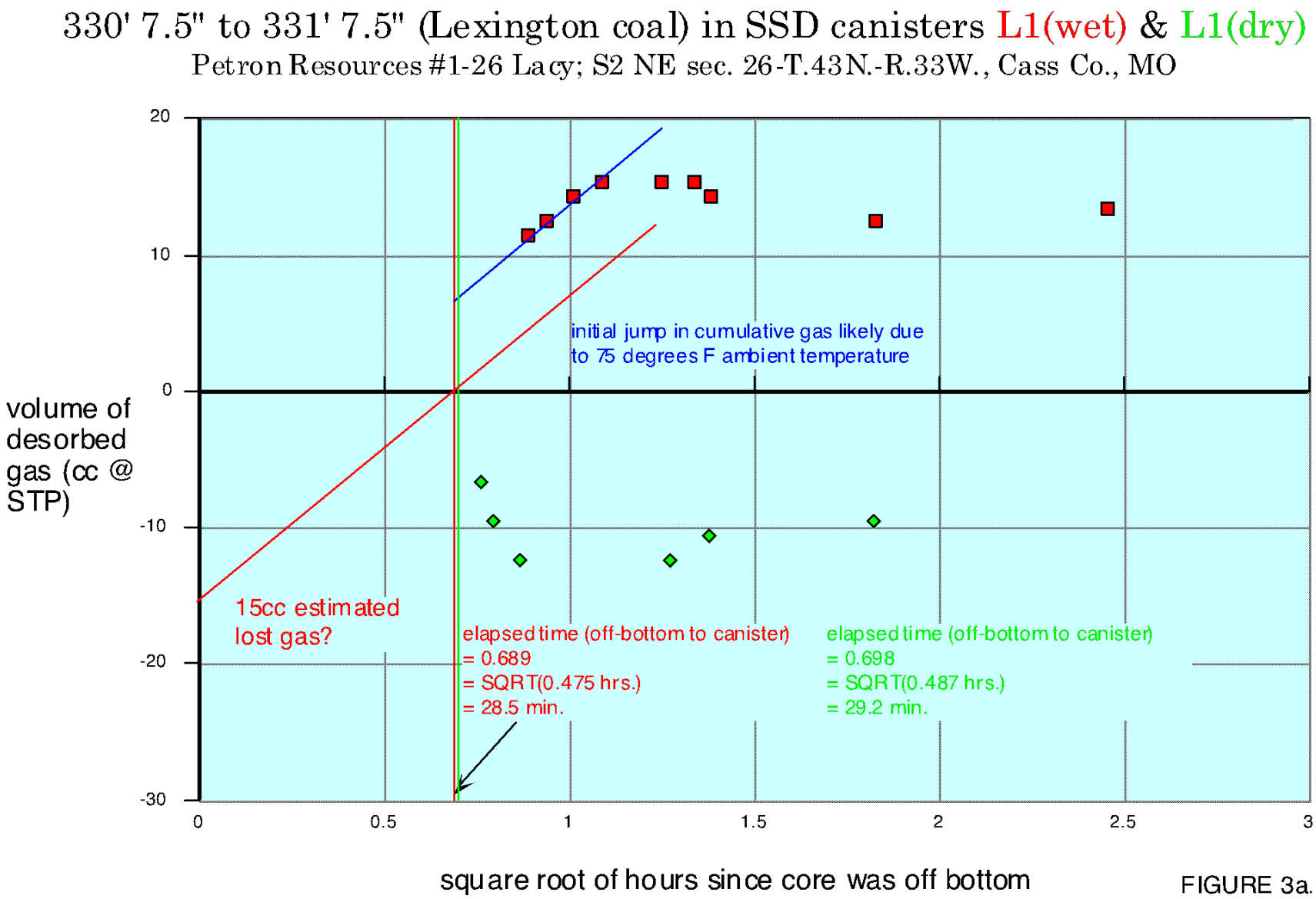


FIGURE 3a.

FIGURE 3a. Lost-gas determination for 330'7.5" to 331'7.5" (Lexington coal) in SSD canisters L1(sample canistered wet) & L1(sample canistered dry), #1-26 Lacy well.

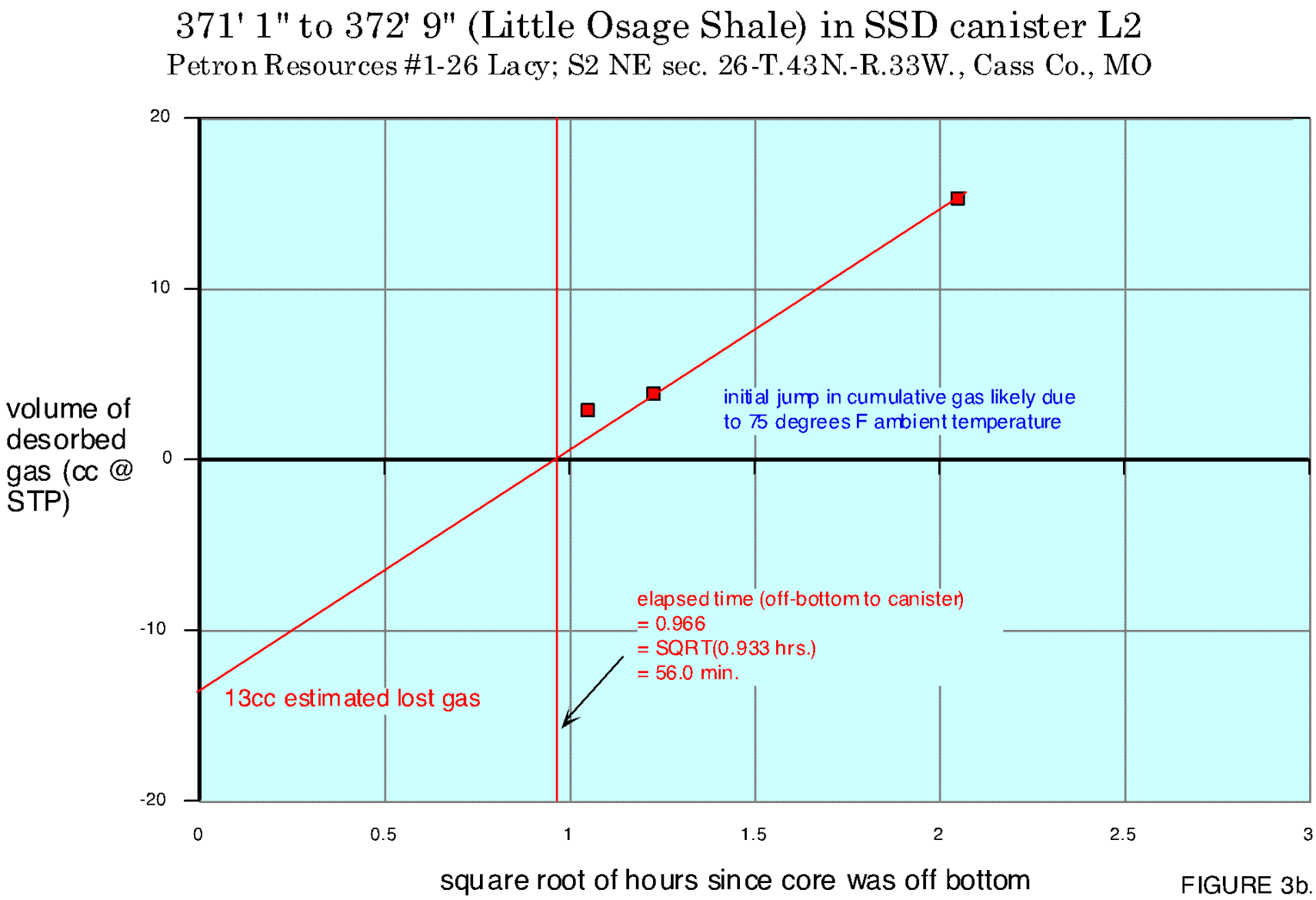


FIGURE 3b.

FIGURE 3b. Lost-gas determination for 371'1" to 372'9" (Little Osage Shale), #1-24 Lacy well.

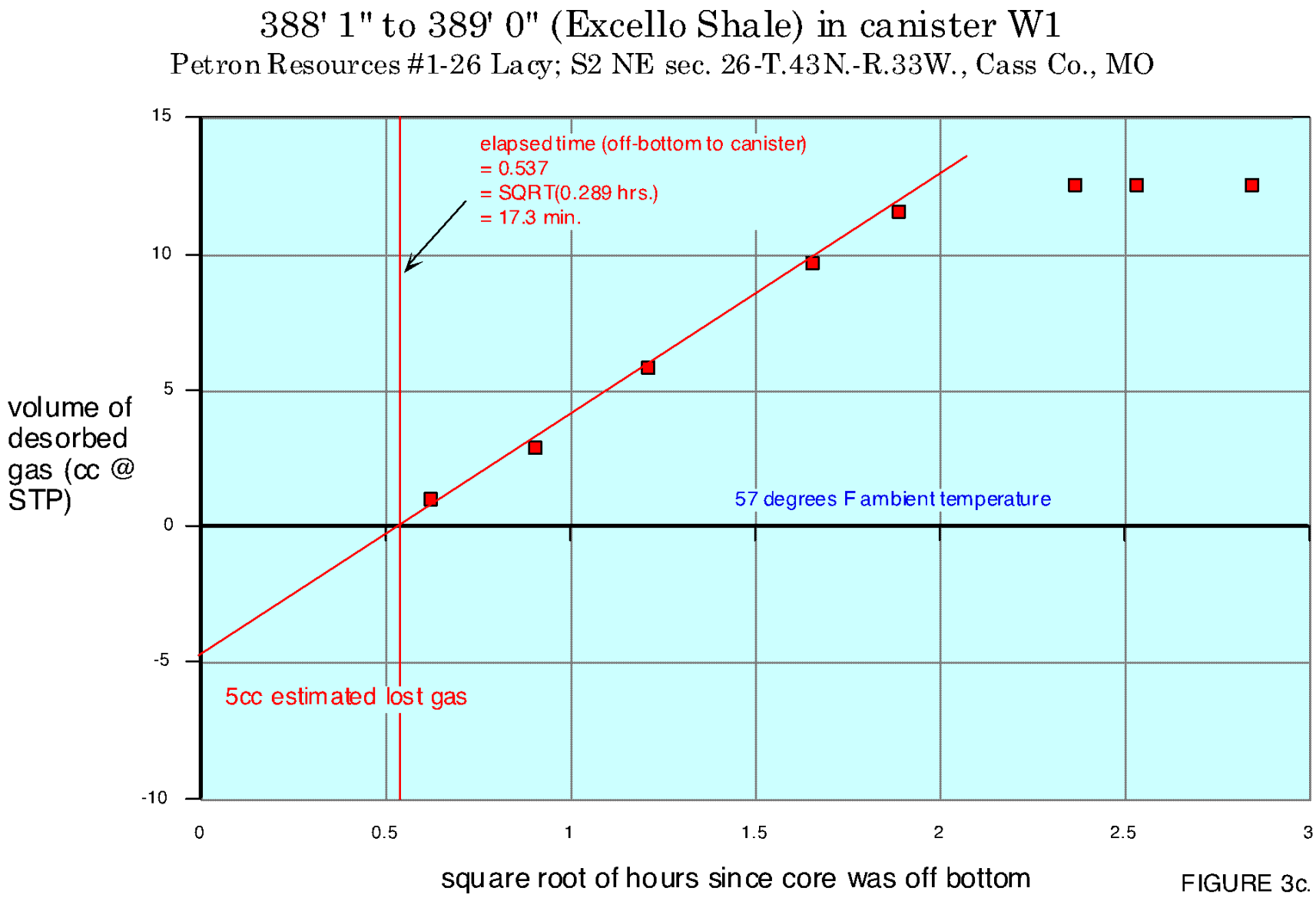


FIGURE 3c. Lost-gas determination for 388'1" to 389'0" (Excello Shale), #1-24 Lacy well.

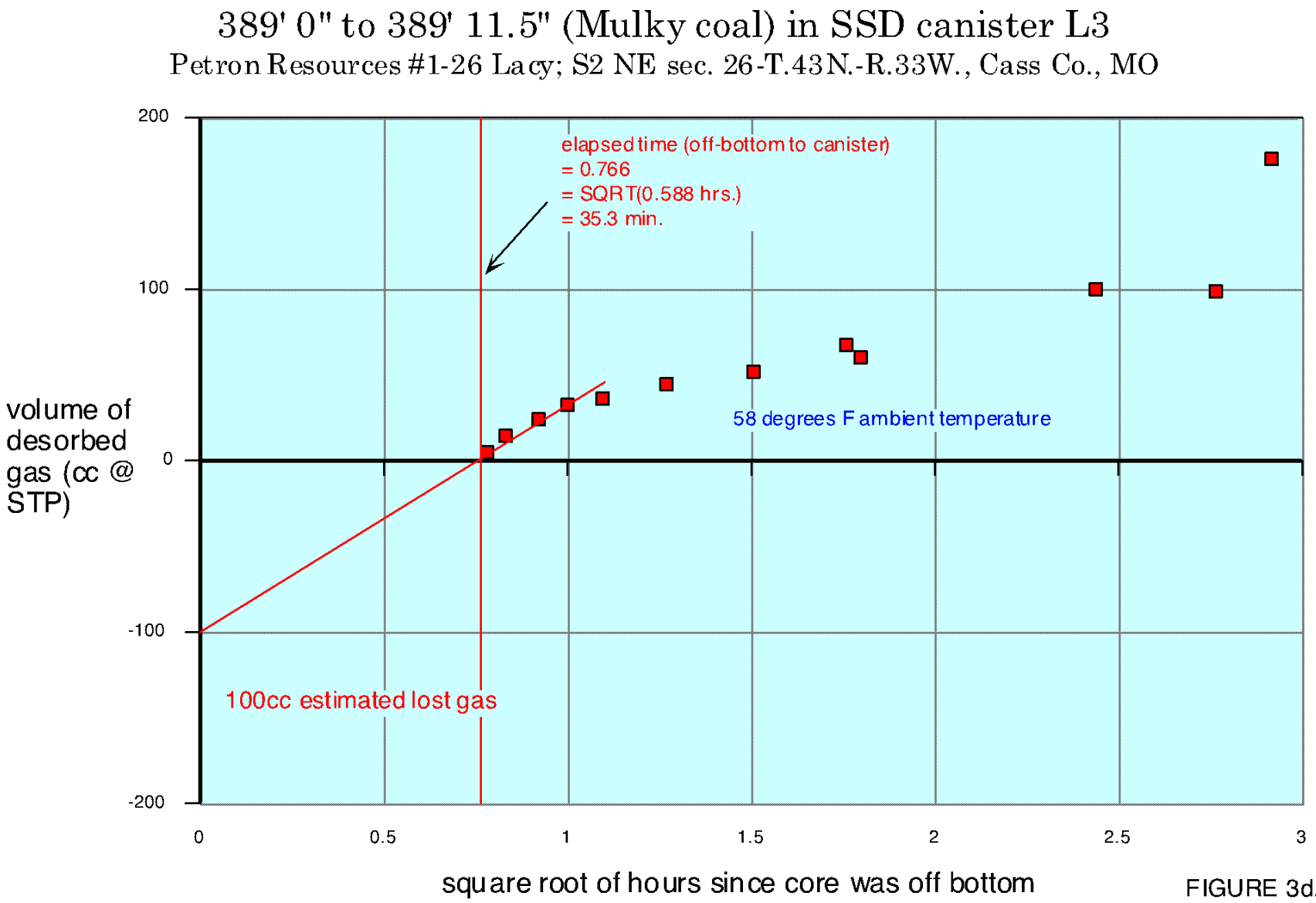


FIGURE 3d.

FIGURE 3d. Lost-gas determination for 389'0" to 389'11.5" (Mulky coal), #1-24 Lacy well.

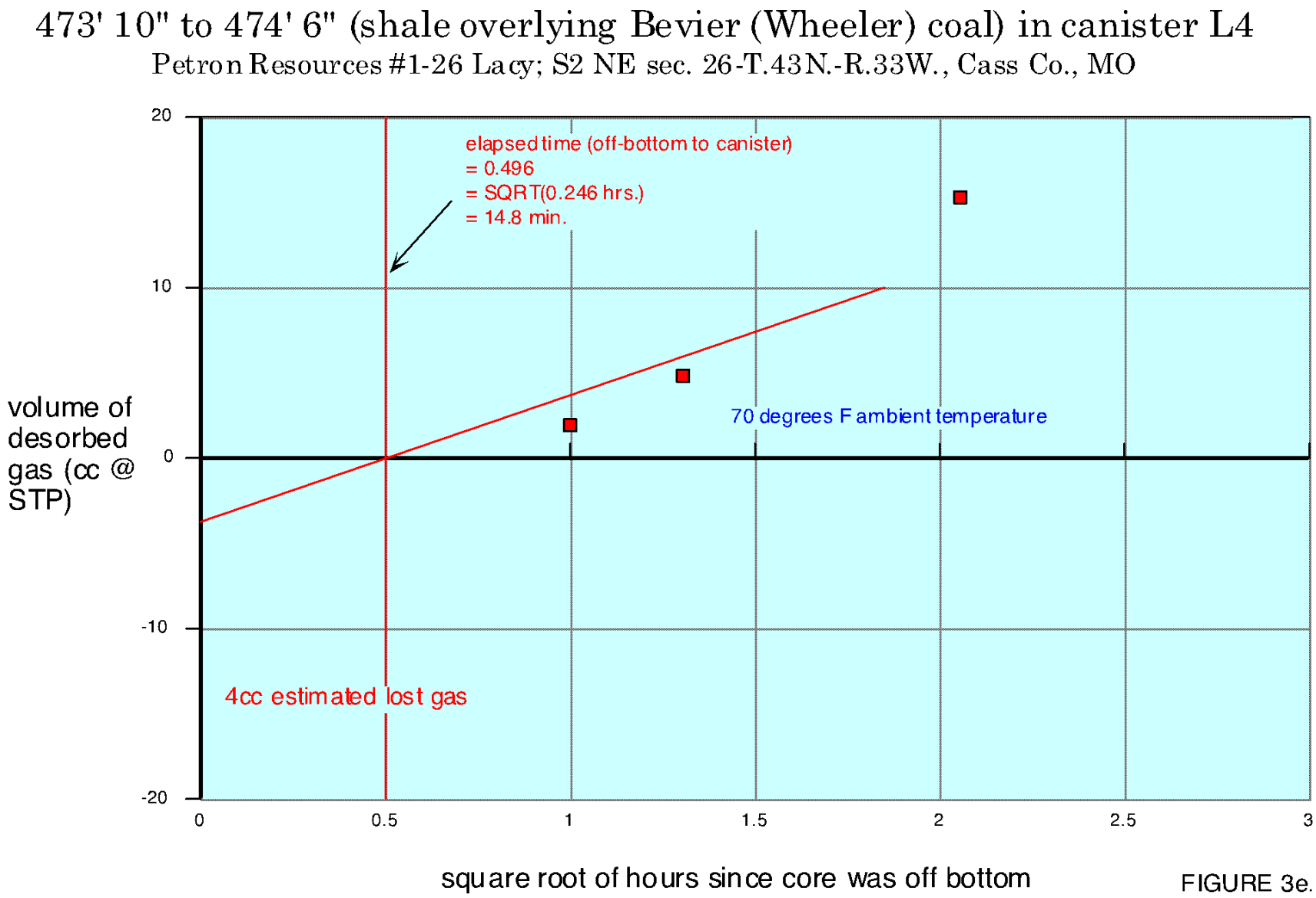


FIGURE 3e. Lost-gas determination for 473'10" to 474'6" (shale overlying Bevier (Wheeler) coal), #1-24 Lacy well.

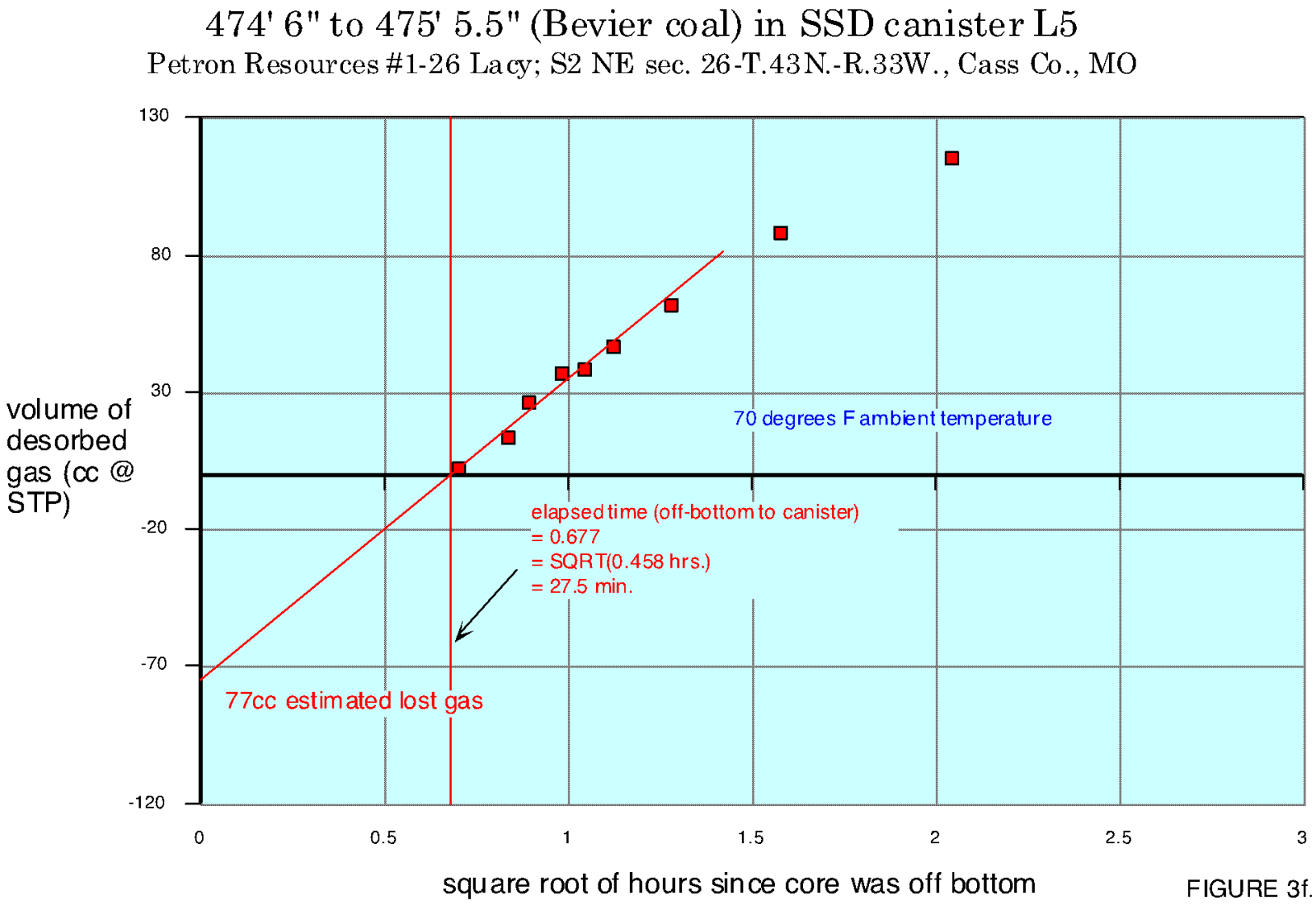


FIGURE 3f.

FIGURE 3f. Lost-gas determination for 474'6" to 475'5.5" (Bevier coal), #1-24 Lacy well.

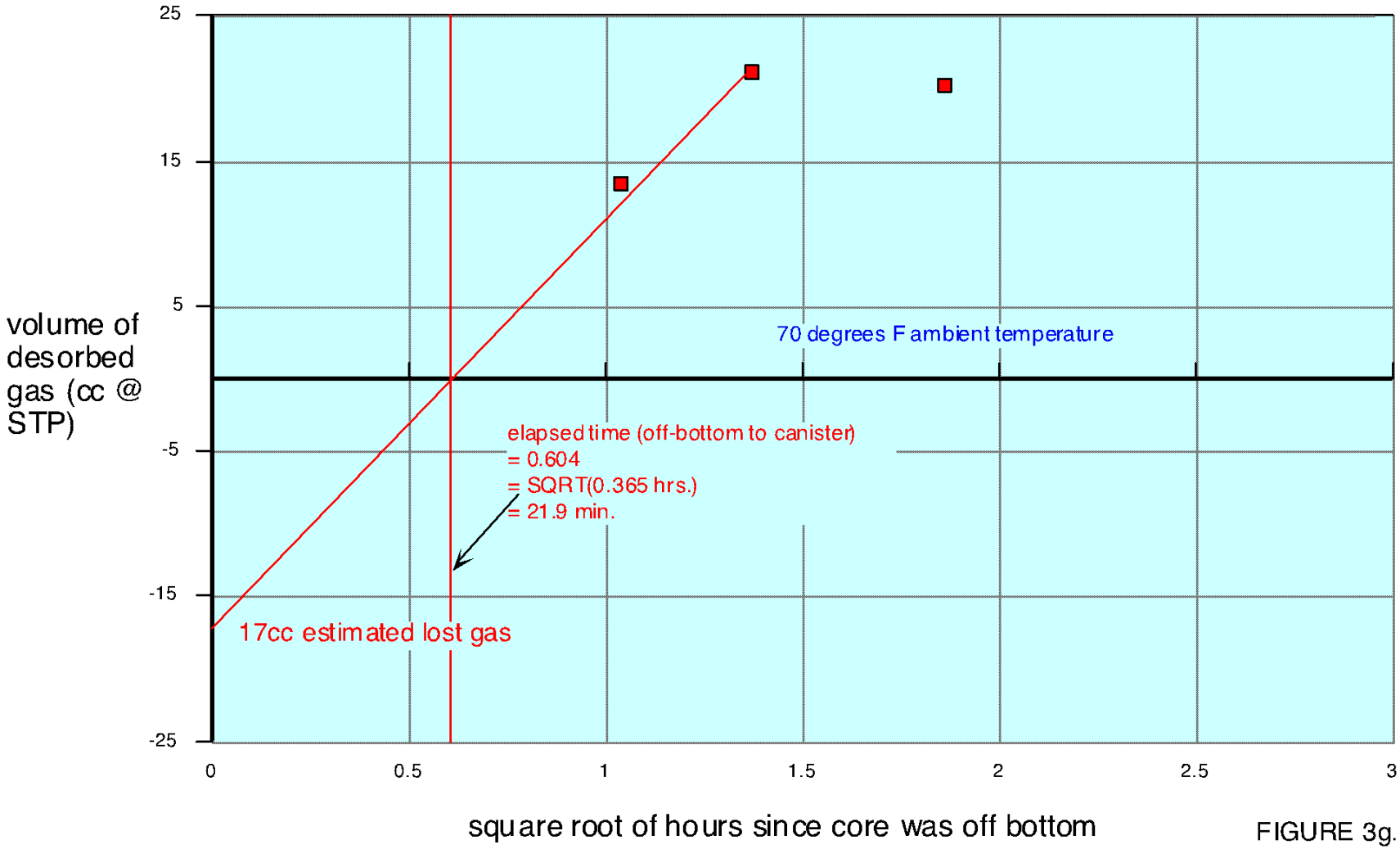


FIGURE 3g.

FIGURE 3g. Lost-gas determination for 486'8.5" to 487'10" ("V shale"), #1-24 Lacy well.

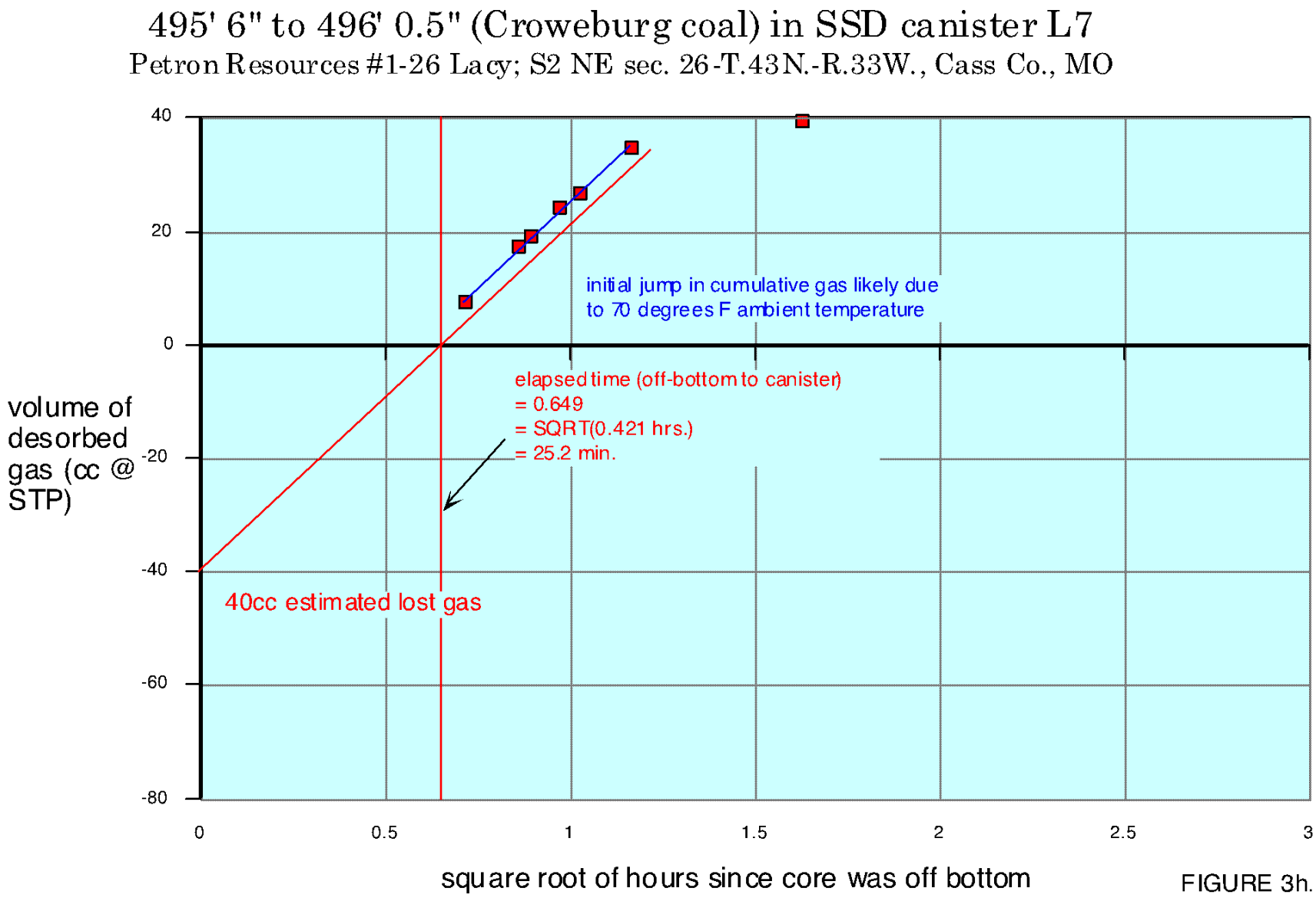


FIGURE 3h.

FIGURE 3h. Lost-gas determination for 495'6" to 496'0.5" (Croweburg coal), #1-24 Lacy well.

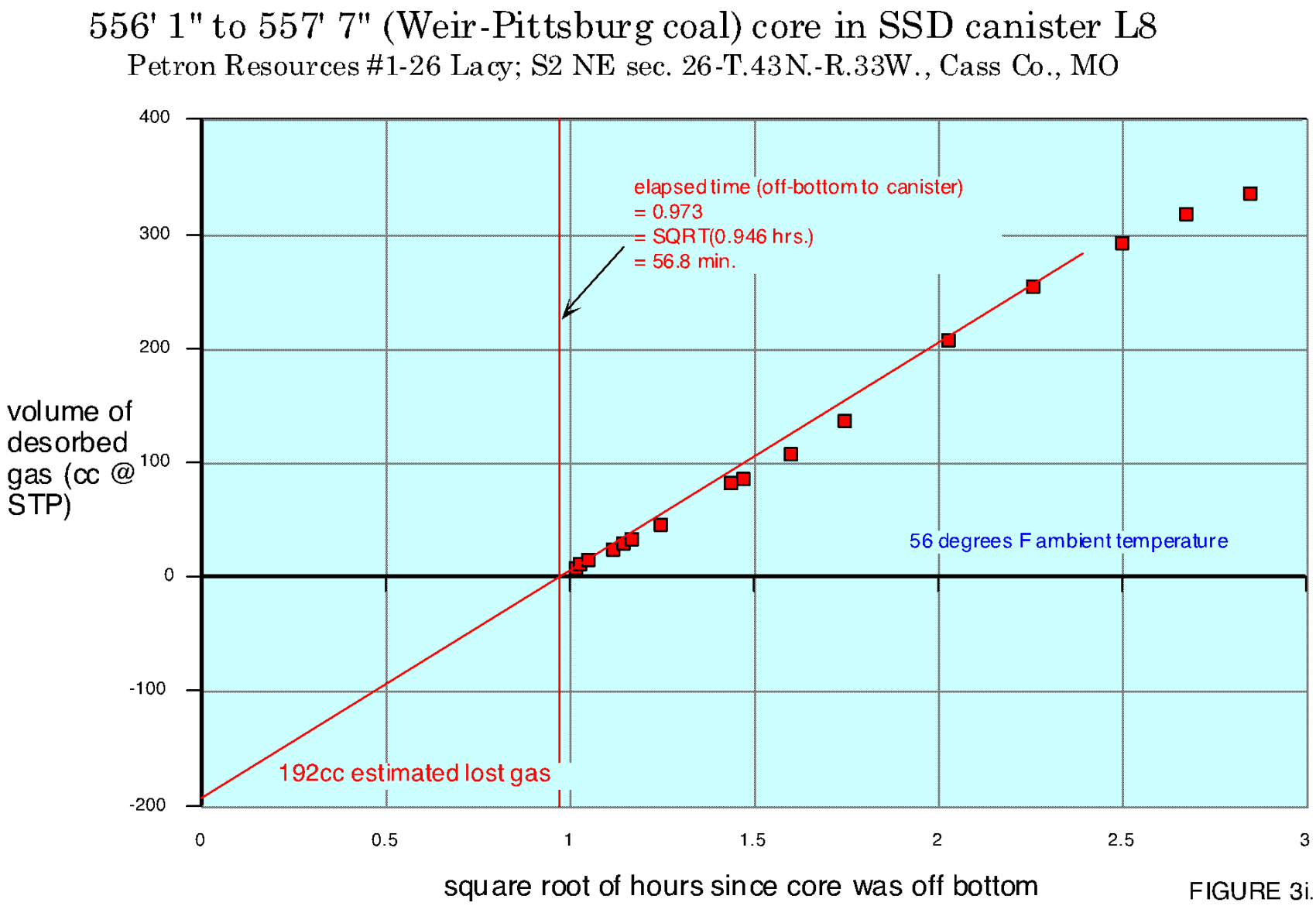


FIGURE 3i.

FIGURE 3i. Lost-gas determination for 556' 1" to 557' 7" (Weir-Pittsburg coal), #1-24 Lacy well.

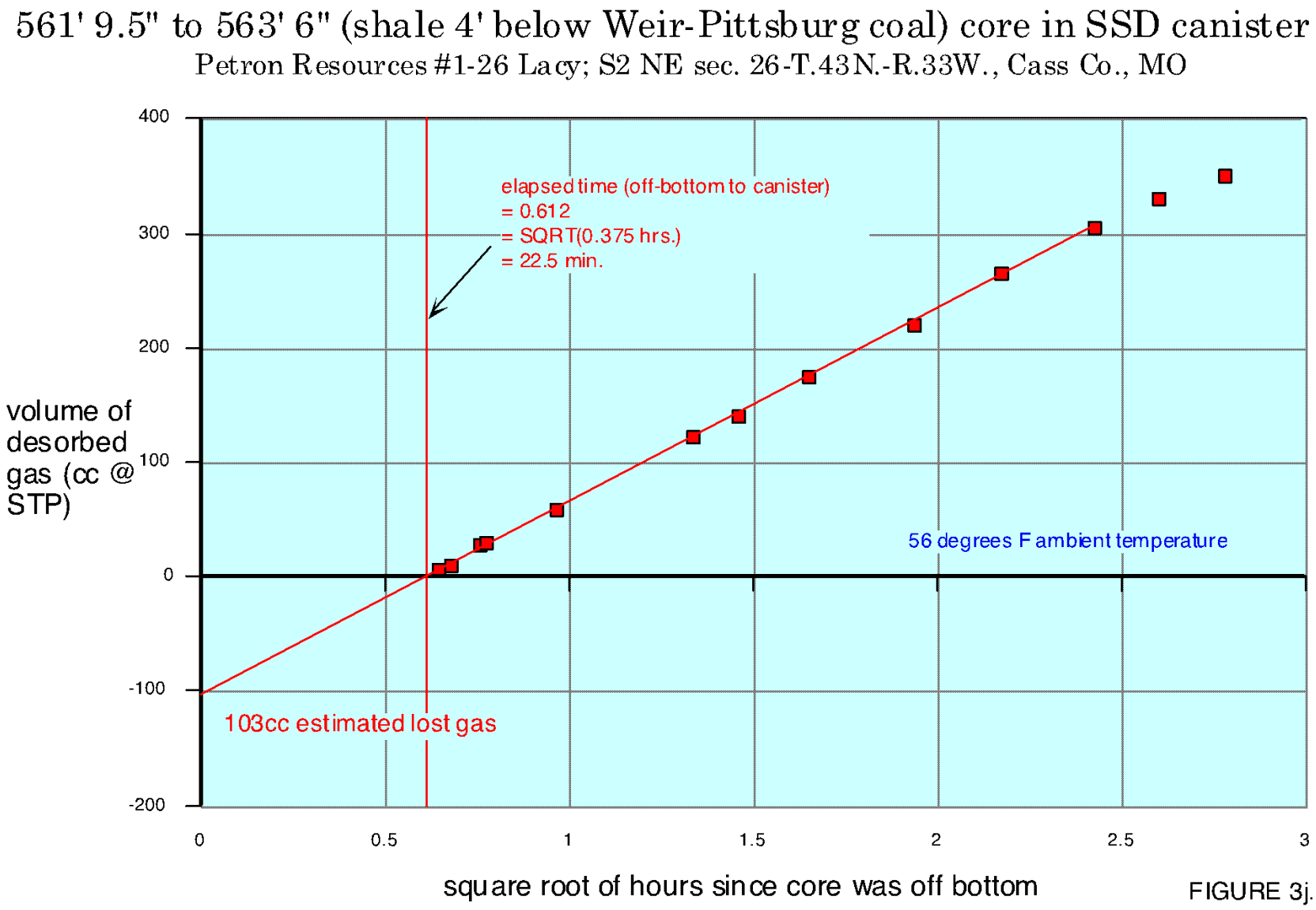


FIGURE 3j.

FIGURE 3j. Lost-gas determination for 561'9.5" to 563'6" (shale 4' below Weir-Pittsburg coal), #1-24 Lacy well.

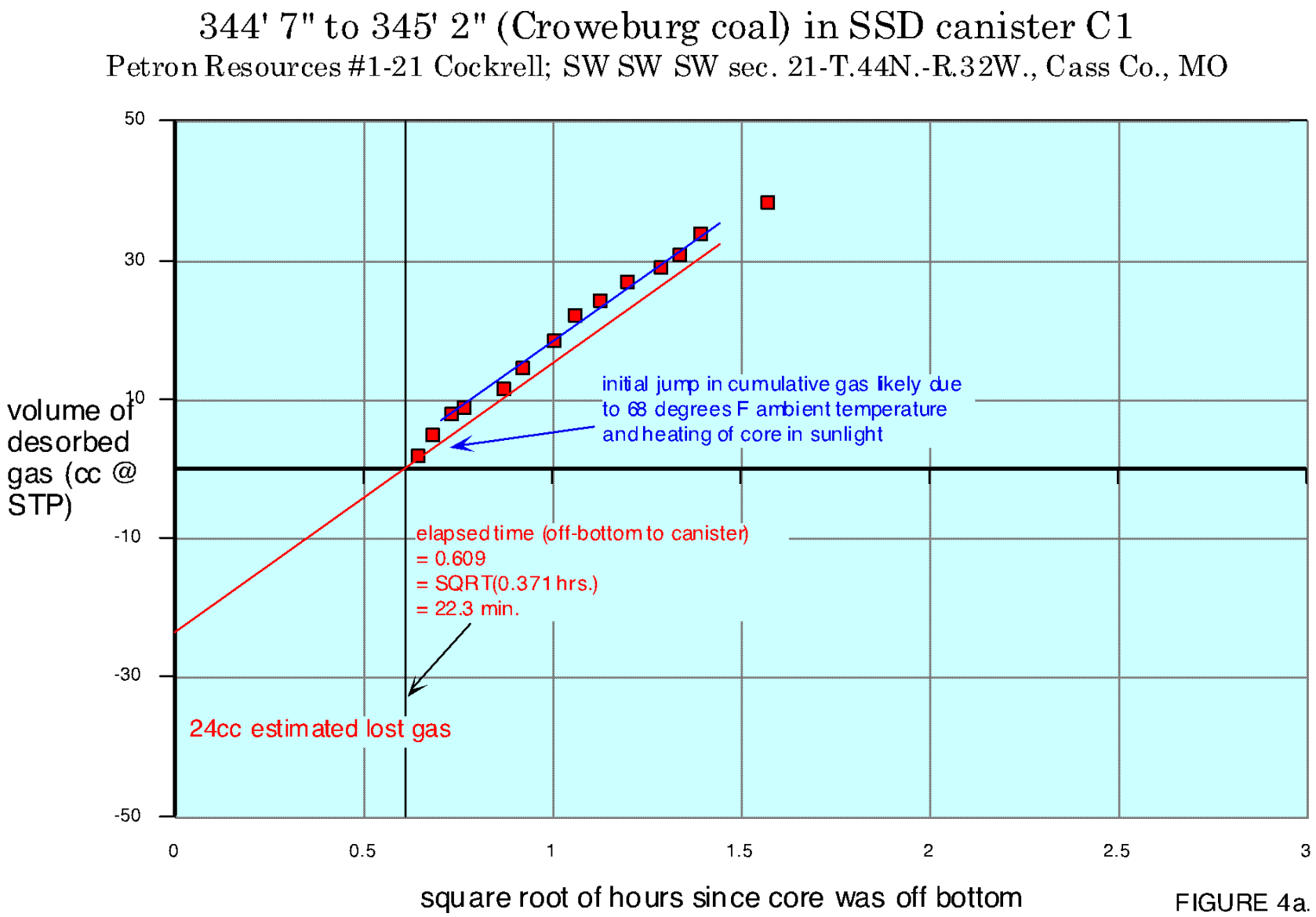


FIGURE 4a. Lost-gas determination for 344'7" to 345'2" (Croweburg coal), #1-21 Cockrell well.

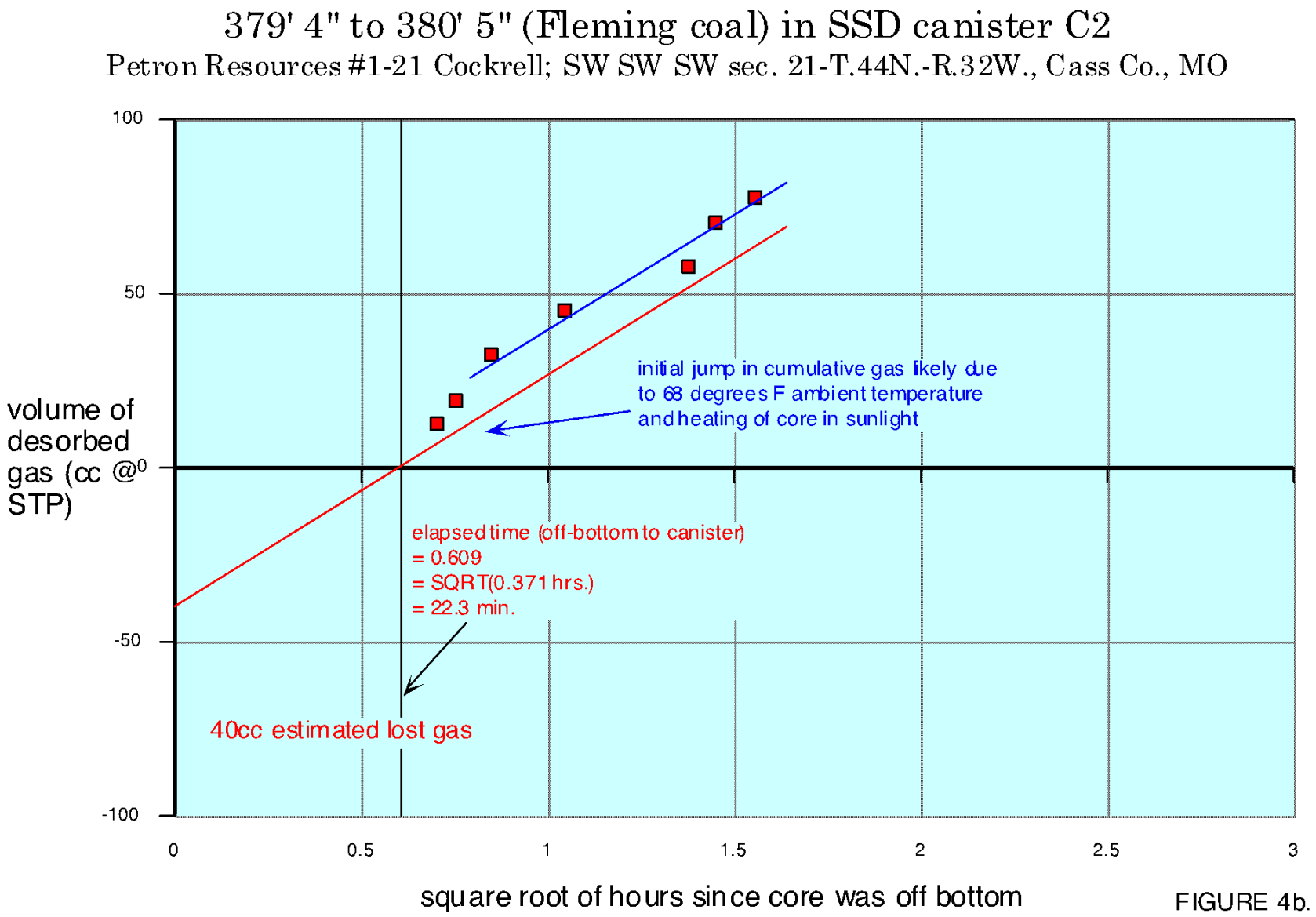


FIGURE 4b. Lost-gas determination for 379'4" to 380'5" (Fleming coal), #1-21 Cockrell well.

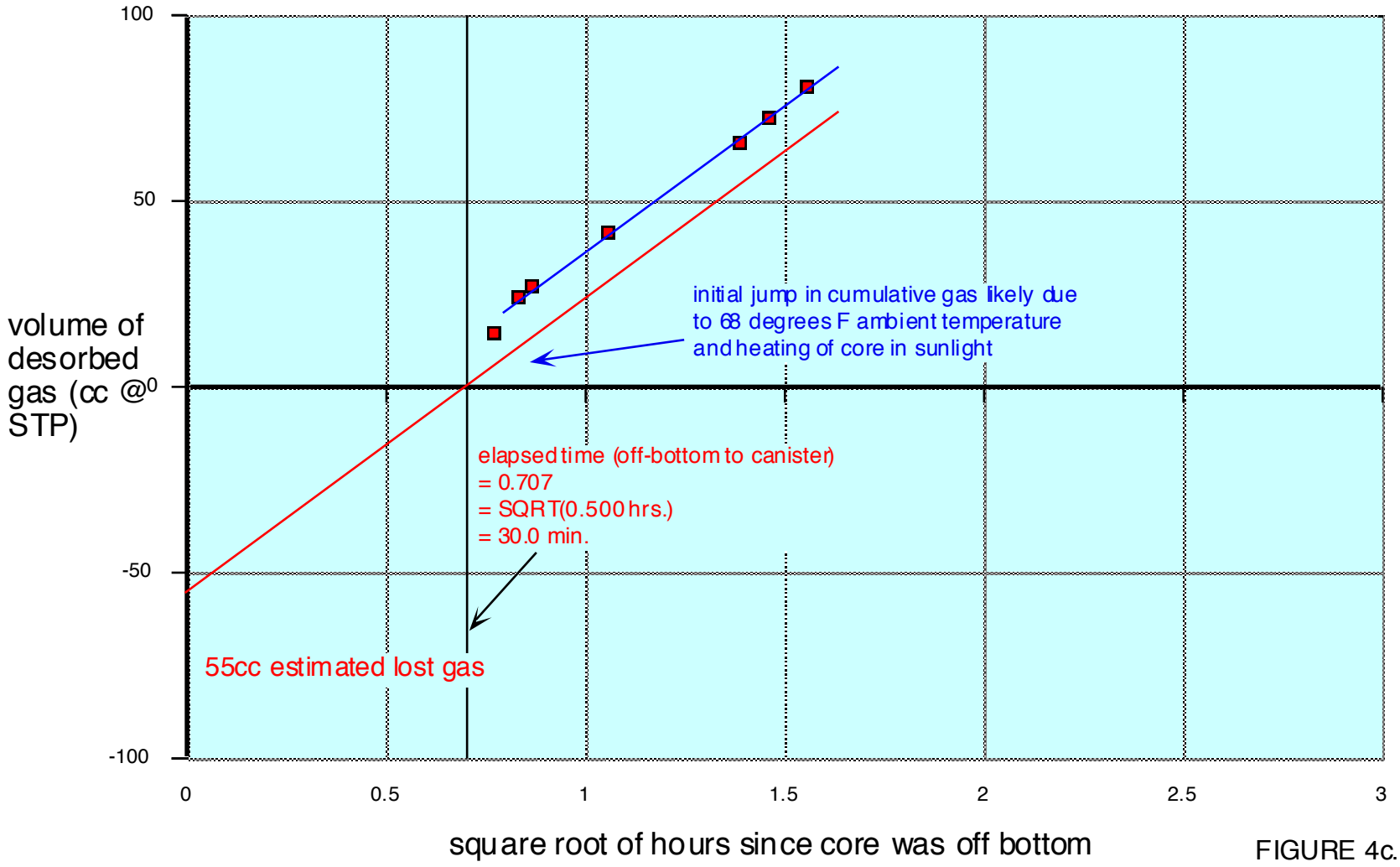


FIGURE 4c.

FIGURE 4c. Lost-gas determination for 386'6" to 387'0" (Mineral coal), #1-21 Cockrell well.

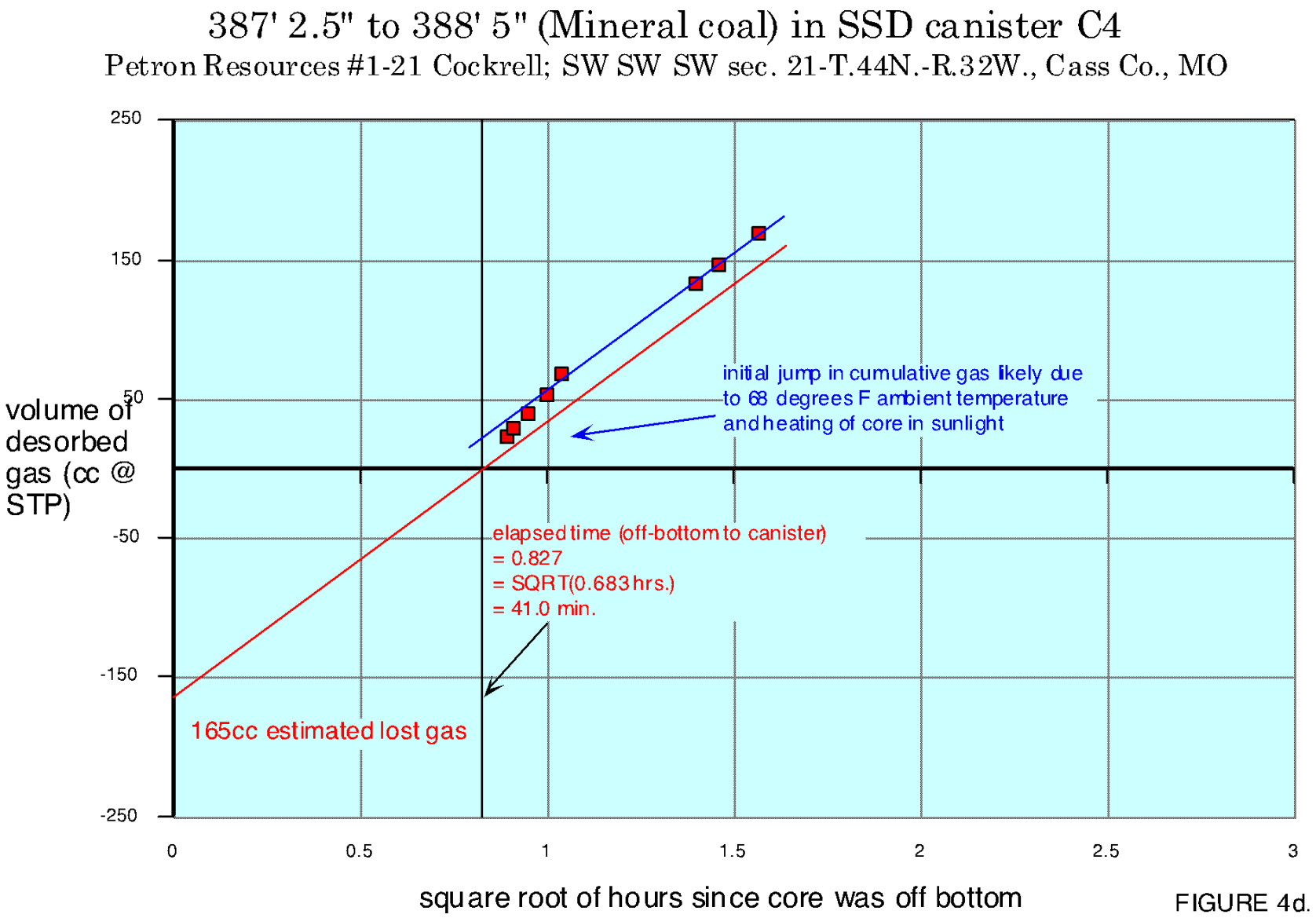


FIGURE 4d.

FIGURE 4d. Lost-gas determination for 387'2.5" to 388'5" (Mineral coal), #1-21 Cockrell well.

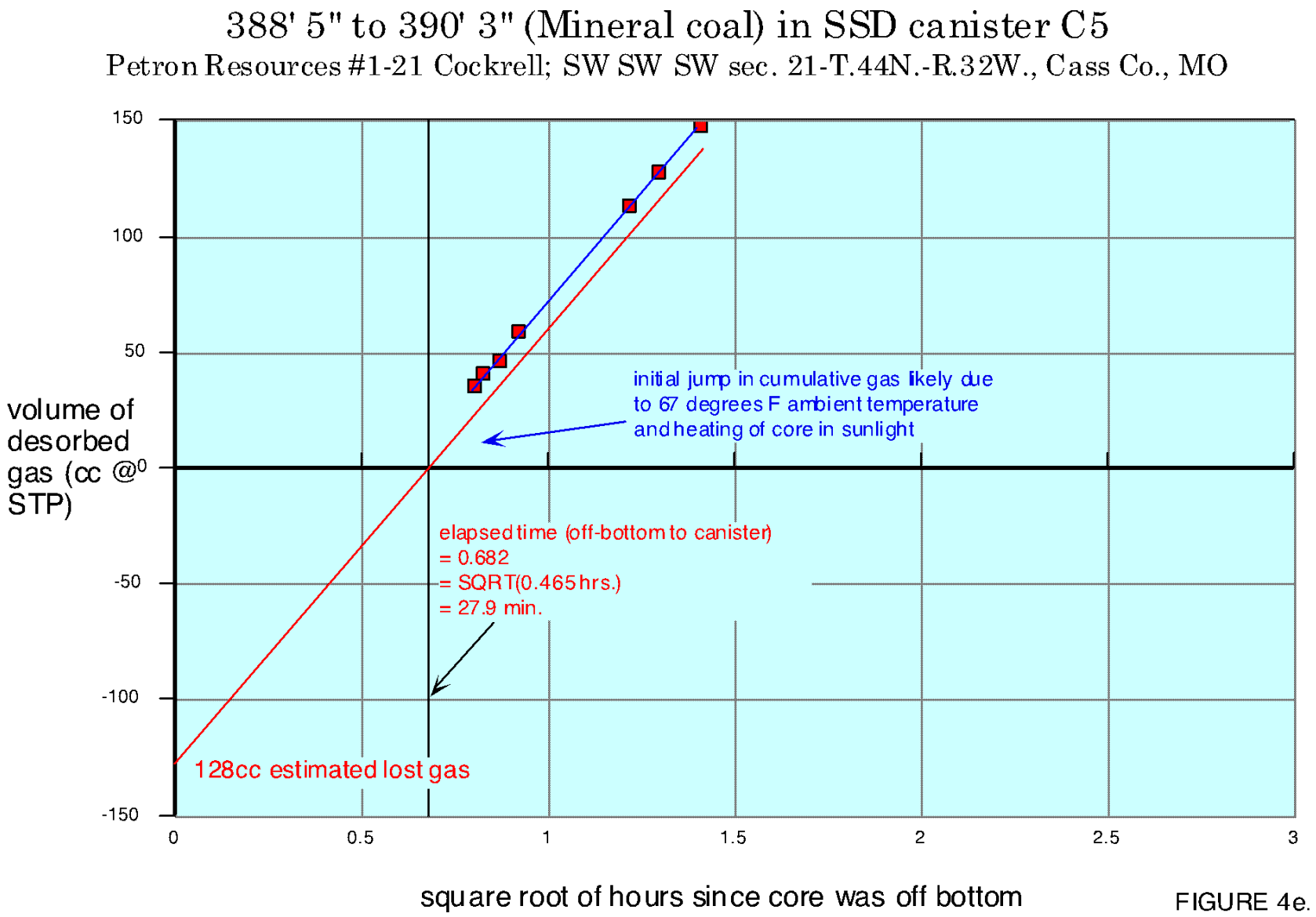


FIGURE 4e.

FIGURE 4e. Lost-gas determination for 388'5" to 390'3" (Mineral coal), #1-21 Cockrell well.

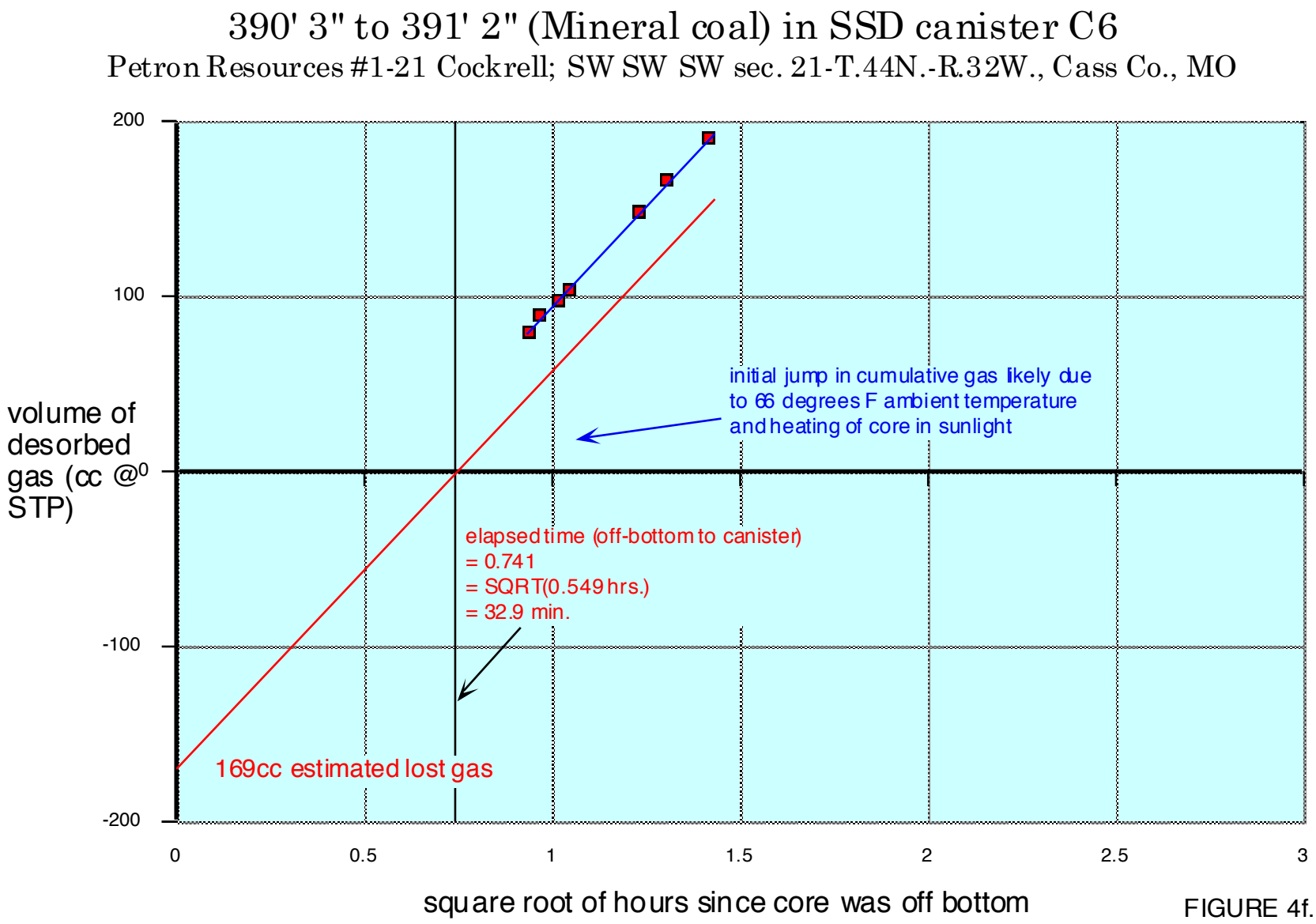


FIGURE 4f.

FIGURE 4f. Lost-gas determination for 390'3" to 391'2" (Mineral coal), #1-21 Cockrell well.

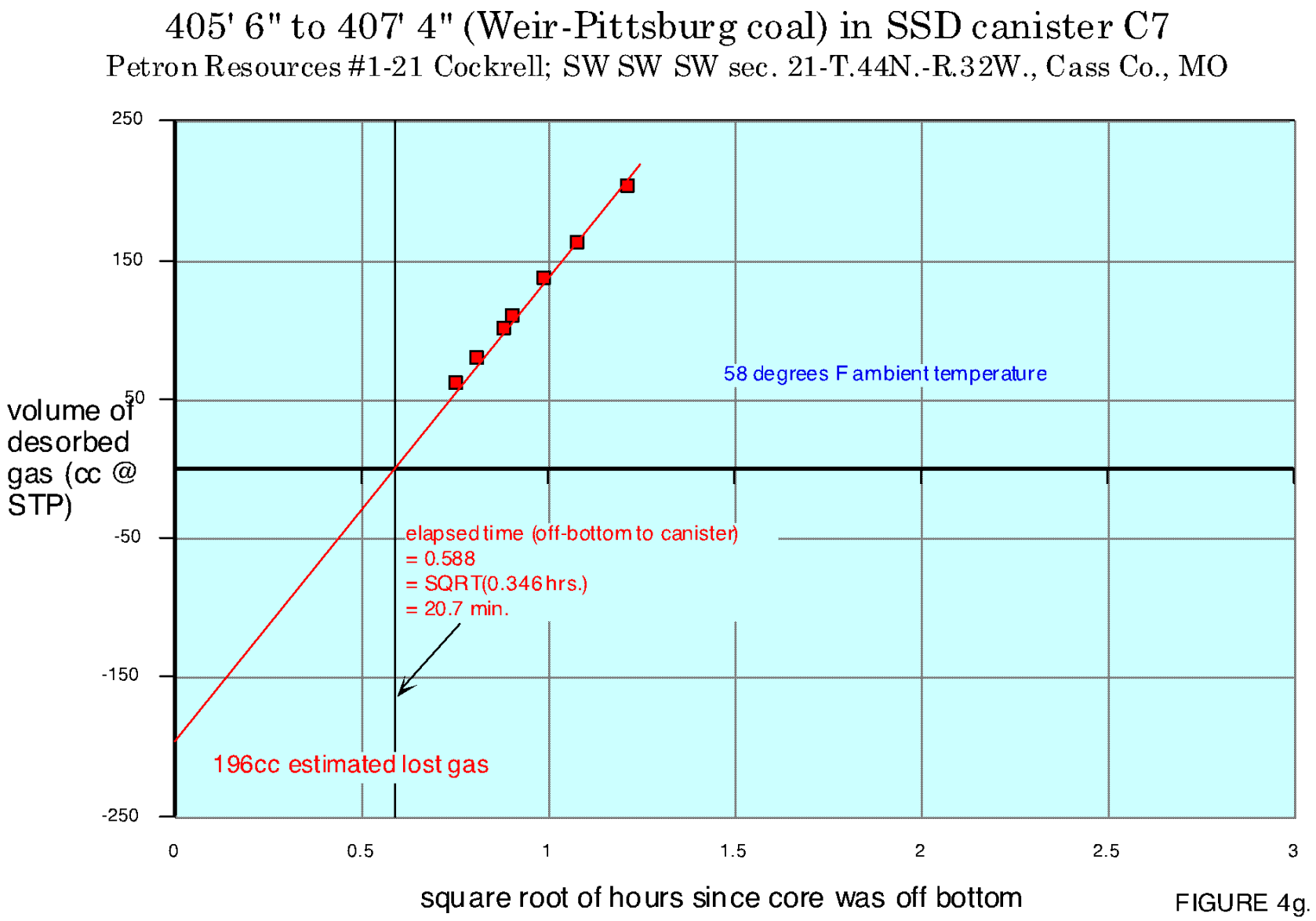


FIGURE 4g.

FIGURE 4g. Lost-gas determination for 405'6" to 407'4" (Weir-Pittsburg coal), #1-21 Cockrell well.

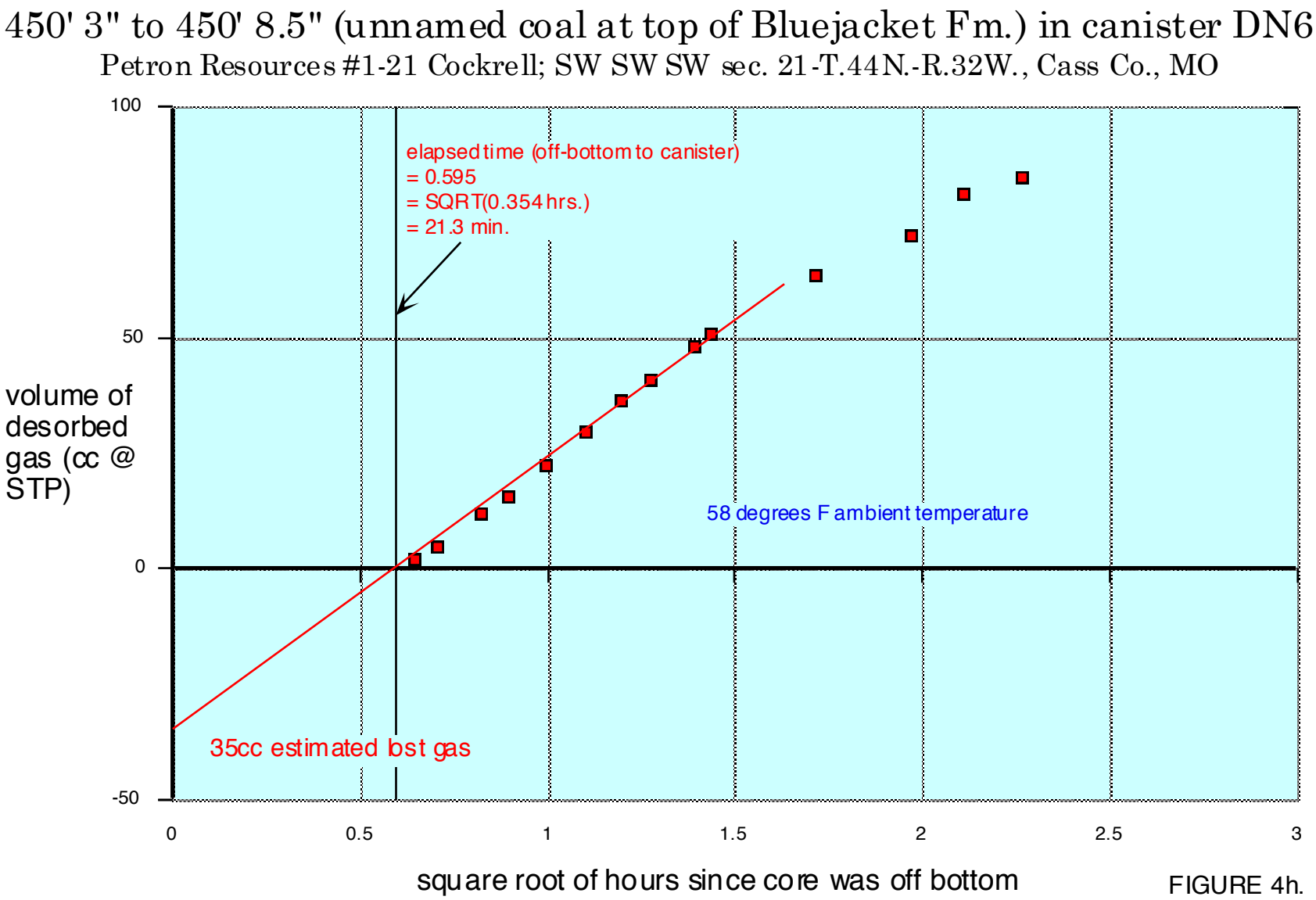


FIGURE 4h.

FIGURE 4h. Lost-gas determination for 450'3" to 450'8.5" (unnamed coal at top of Bluejacket Fm.), #1-21 Cockrell well.

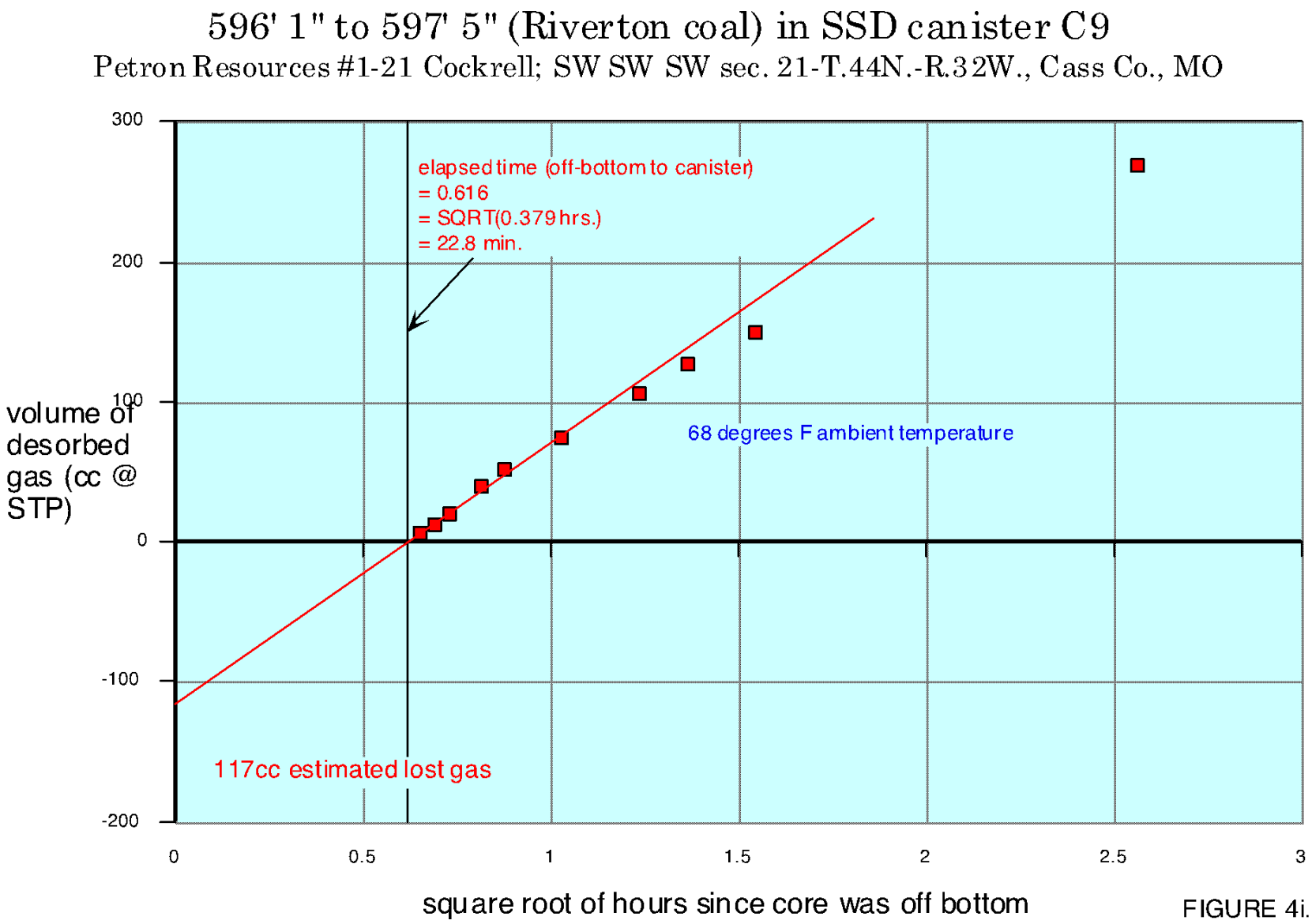


FIGURE 4i. Lost-gas determination for 596' 1" to 597' 5" (Riverton coal), #1-21 Cockrell well.

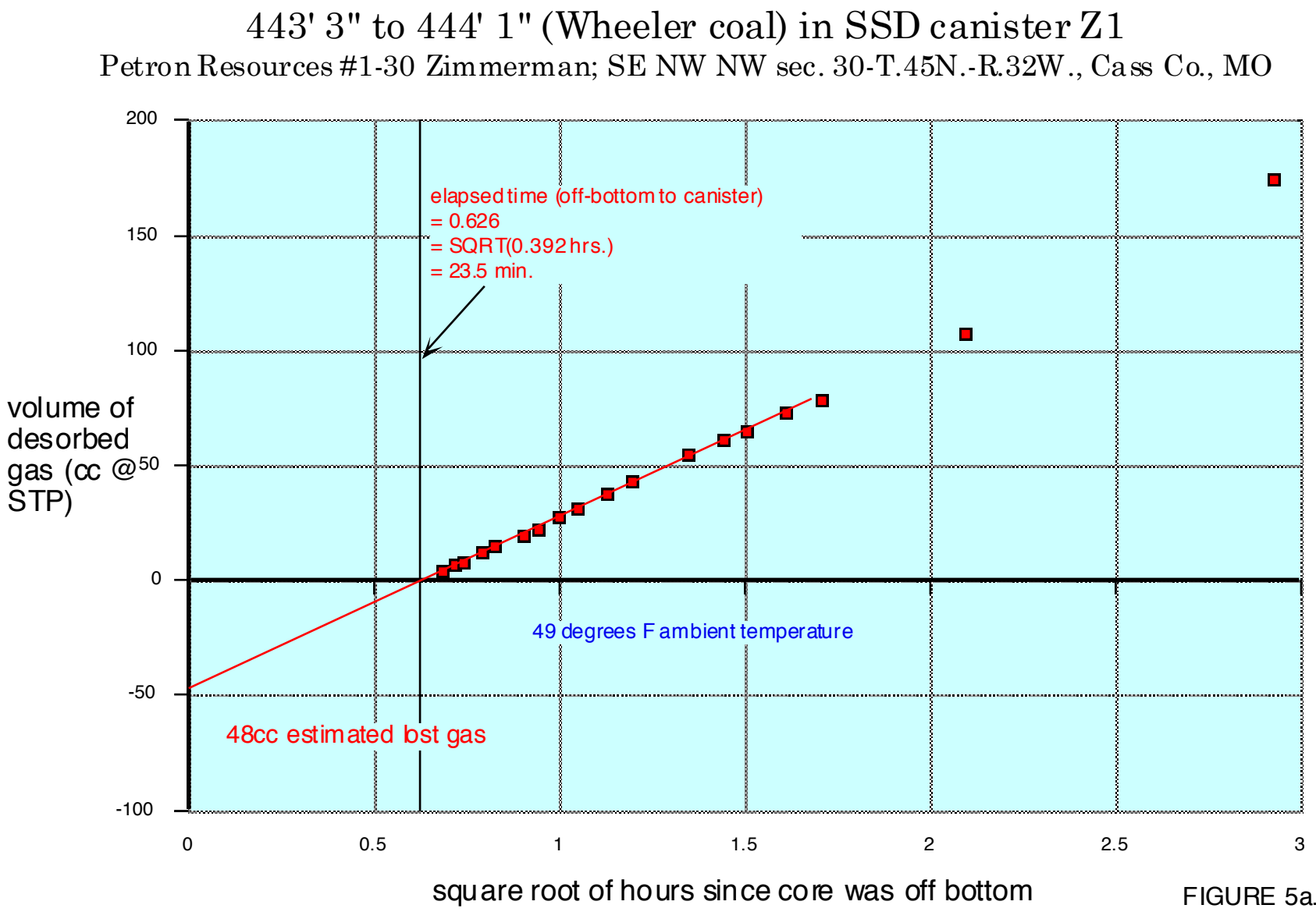


FIGURE 5a.

FIGURE 5a. Lost-gas determination for 443'3" to 444'1" (Wheeler coal), #1-30 Zimmerman well.

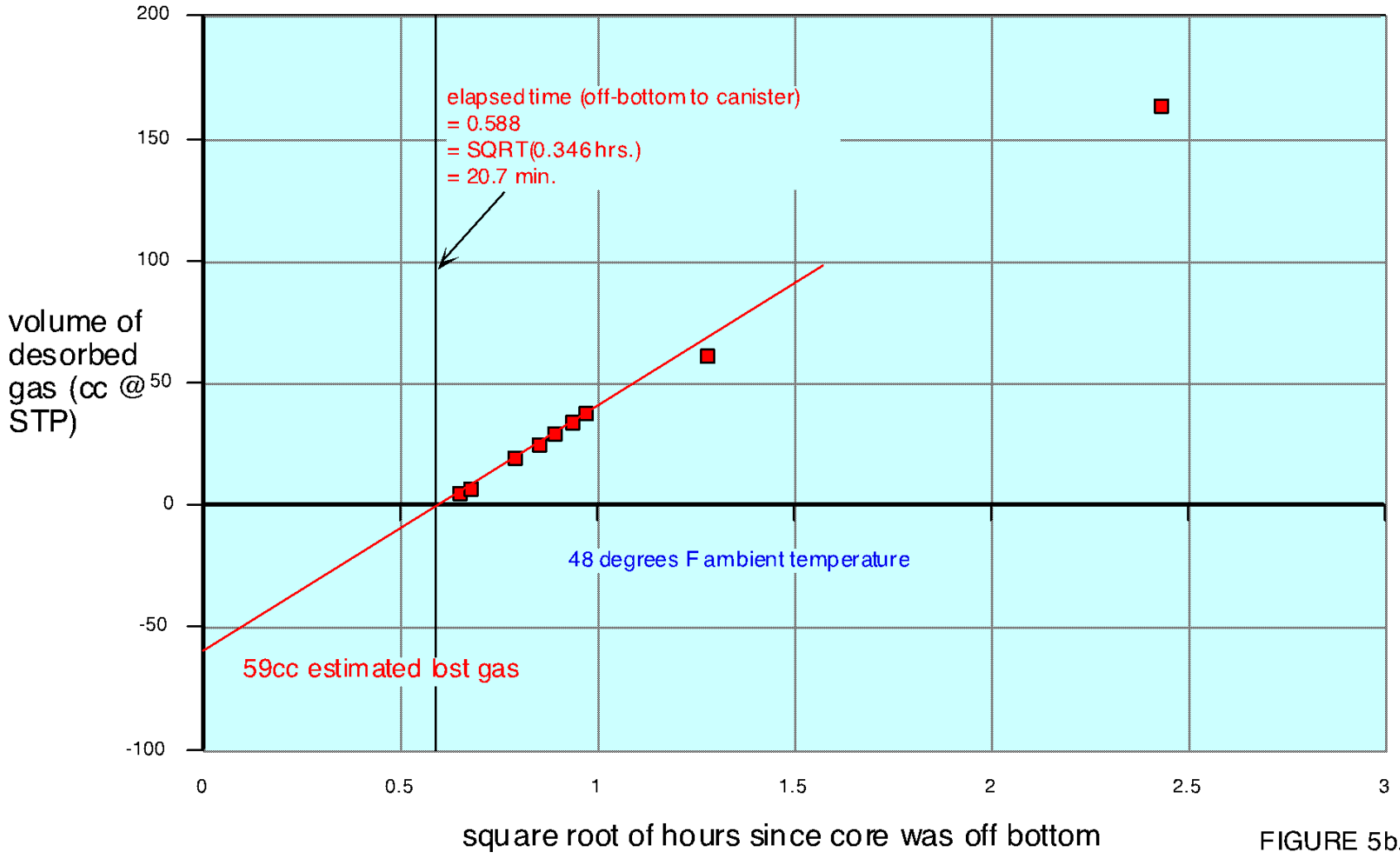


FIGURE 5b.

FIGURE 5b. Lost-gas determination for 487'8" to 488'6" (shale above Fleming coal), #1-30 Zimmerman well.

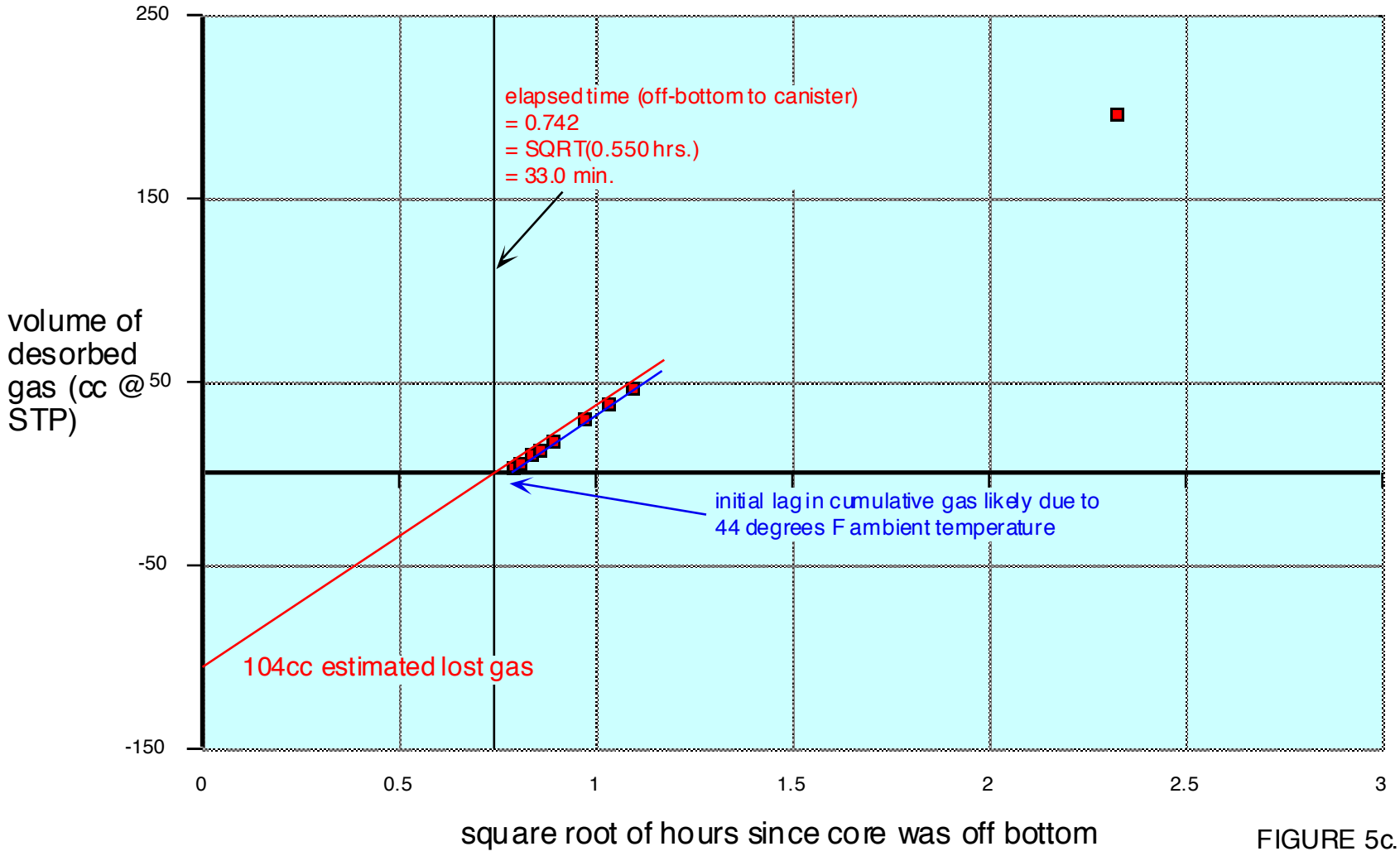


FIGURE 5c.

FIGURE 5c. Lost-gas determination for 490'3.5" to 491'6.5" (Fleming coal), #1-30 Zimmerman well.

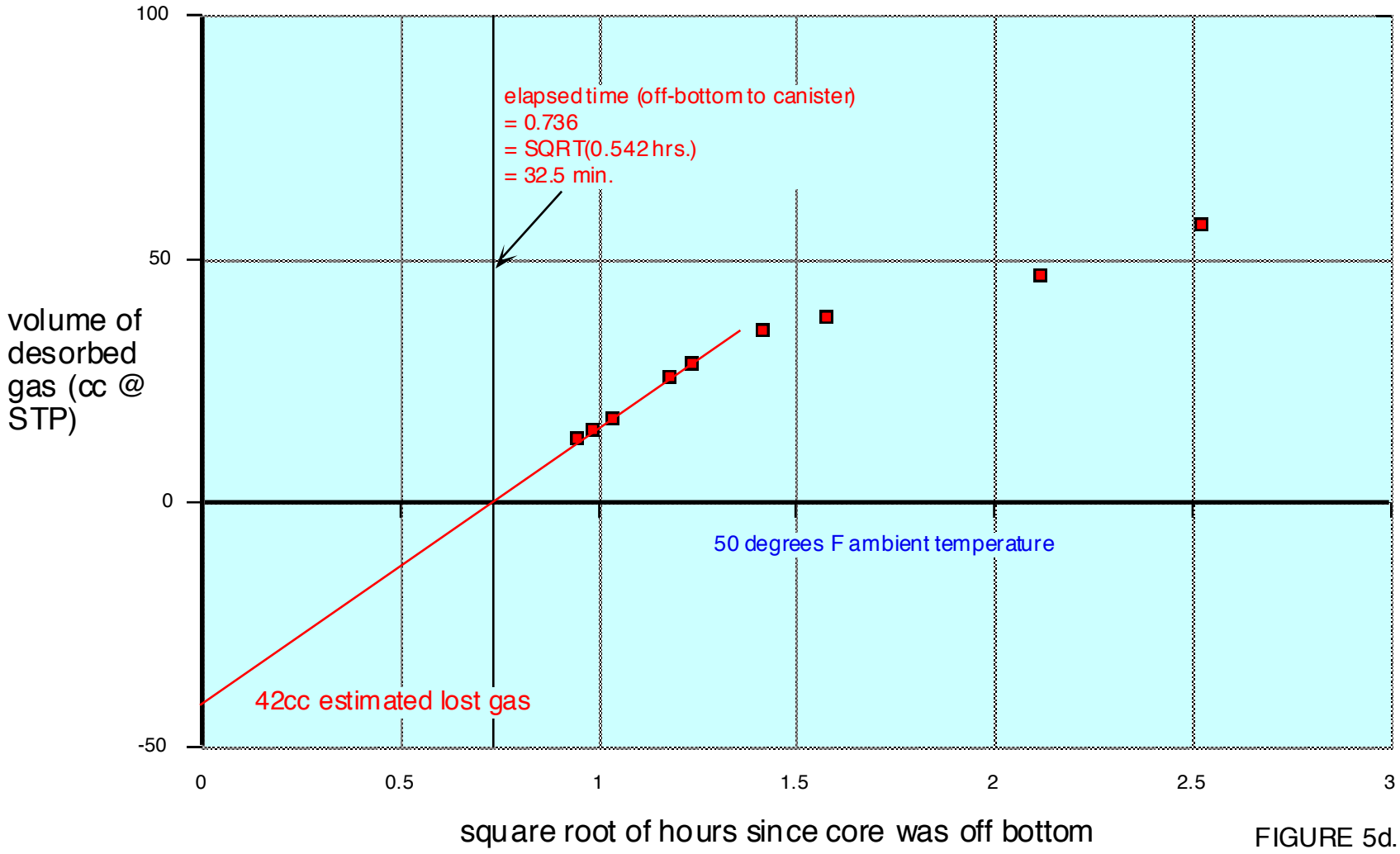


FIGURE 5d. Lost-gas determination for 524'8" to 525'9.5" (shale above Weir-Pittsburg coal), #1-30 Zimmerman well.

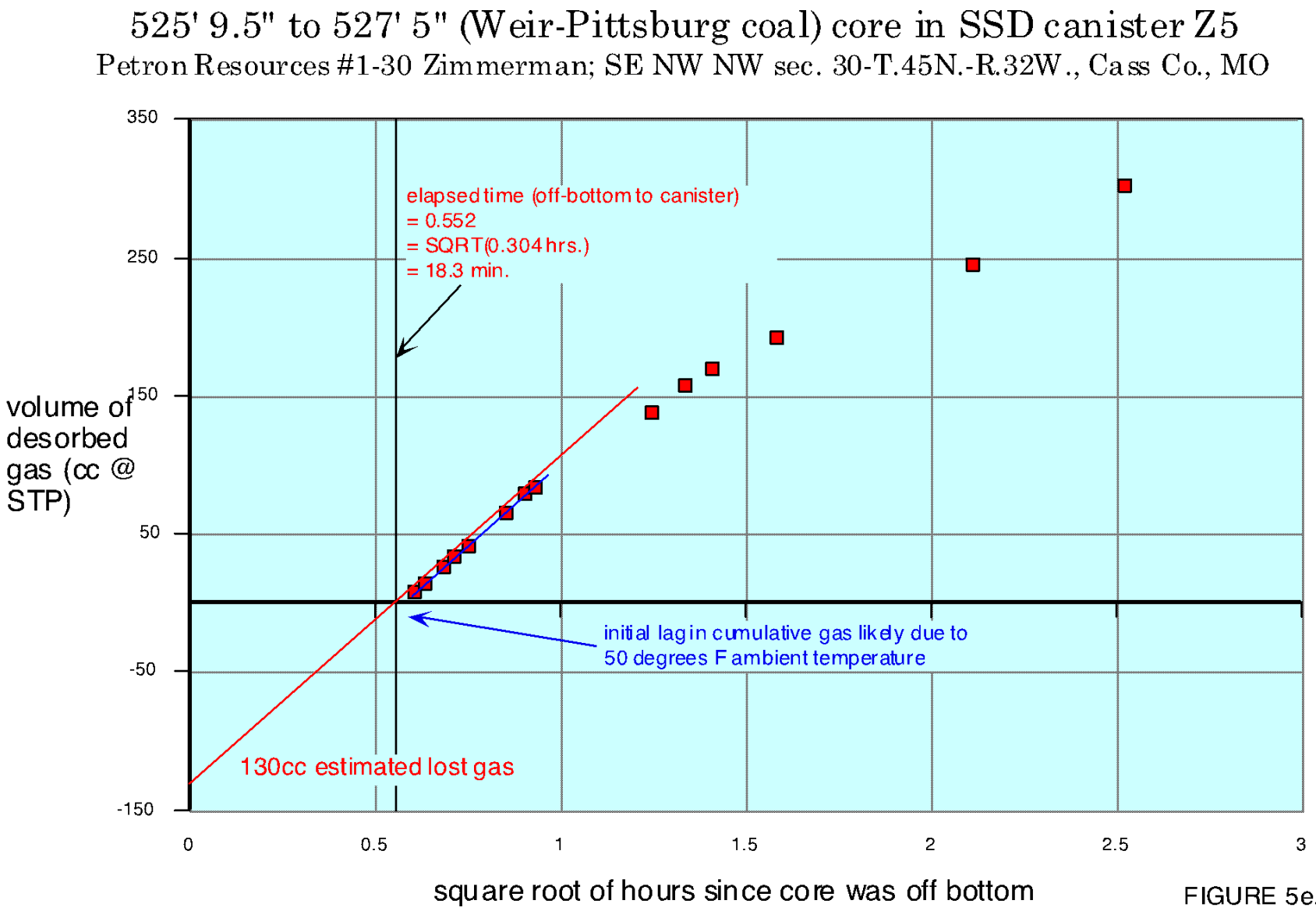


FIGURE 5e.

FIGURE 5e. Lost-gas determination for 525'9.5" to 527'5" (Weir-Pittsburg coal), #1-30 Zimmerman well.

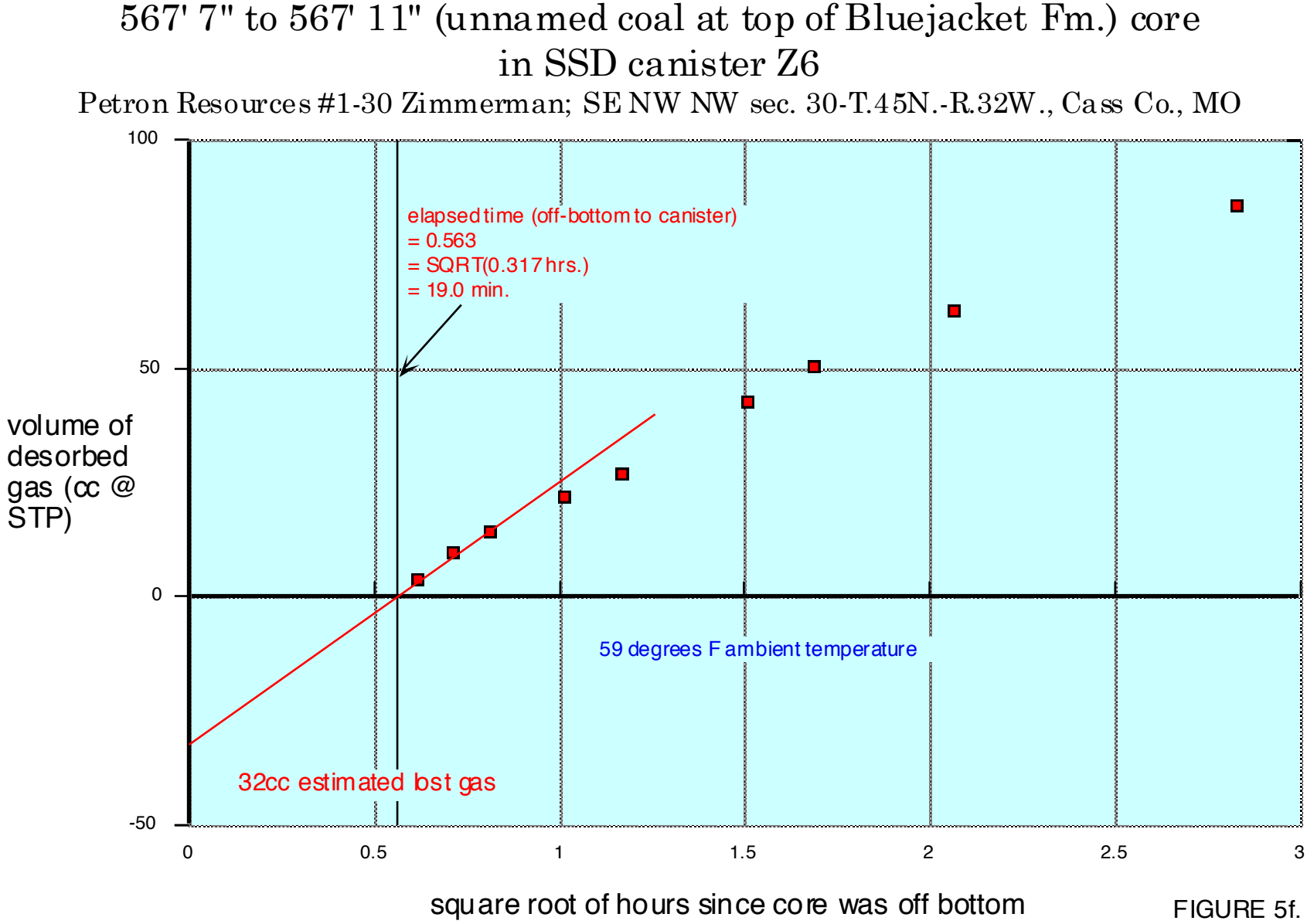


FIGURE 5f.

FIGURE 5f. Lost-gas determination for 567' 7" to 567' 11" (unnamed coal at top of Bluejacket Fm.), #1-30 Zimmerman well.

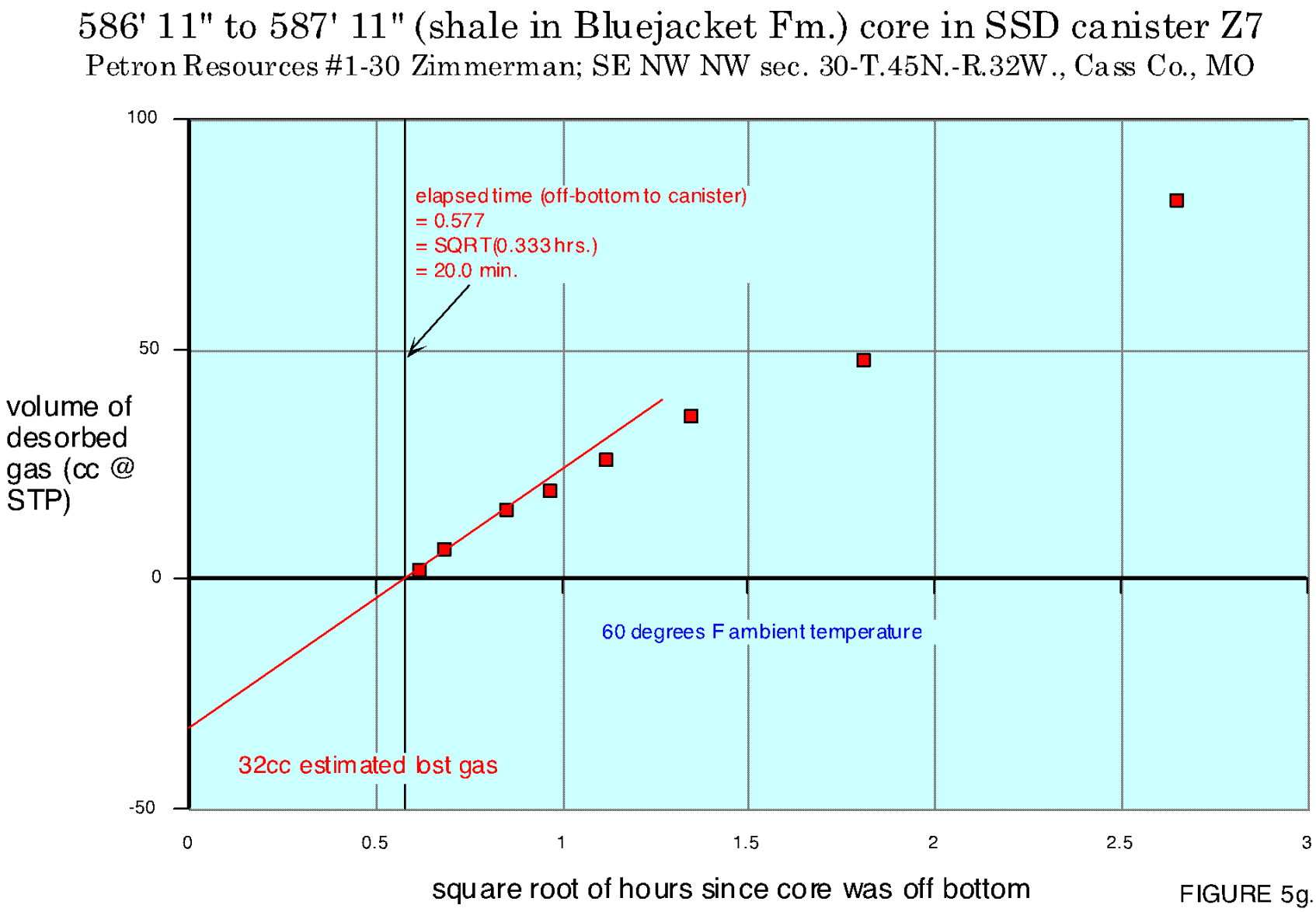


FIGURE 5g.

FIGURE 5g. Lost-gas determination for 586' 11" to 587' 11" (shale in Bluejacket Fm.), #1-30 Zimmerman well.

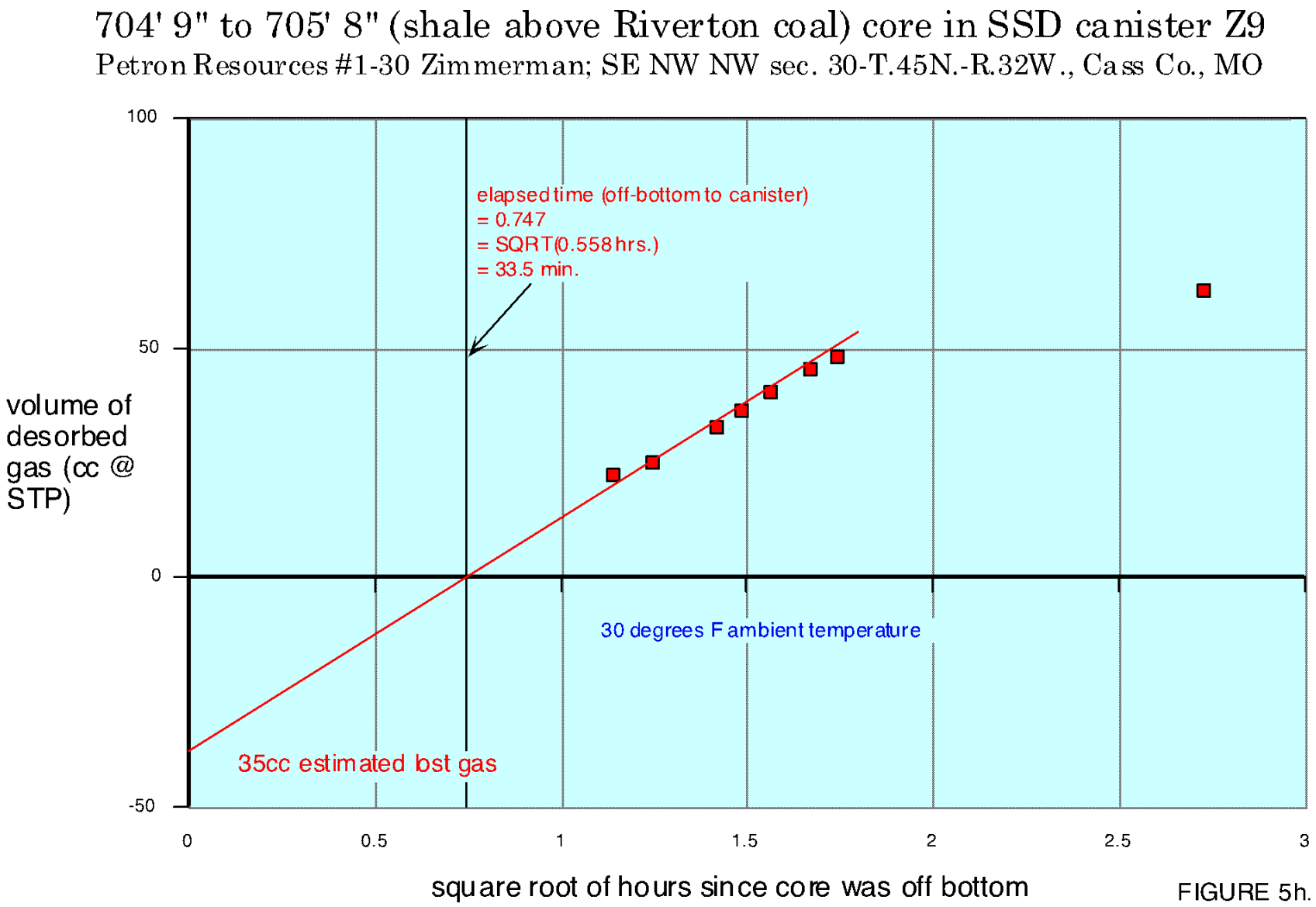


FIGURE 5h.

FIGURE 5h. Lost-gas determination for 704'9" to 705'8" (shale overlying Riverton coal), #1-30 Zimmerman well.

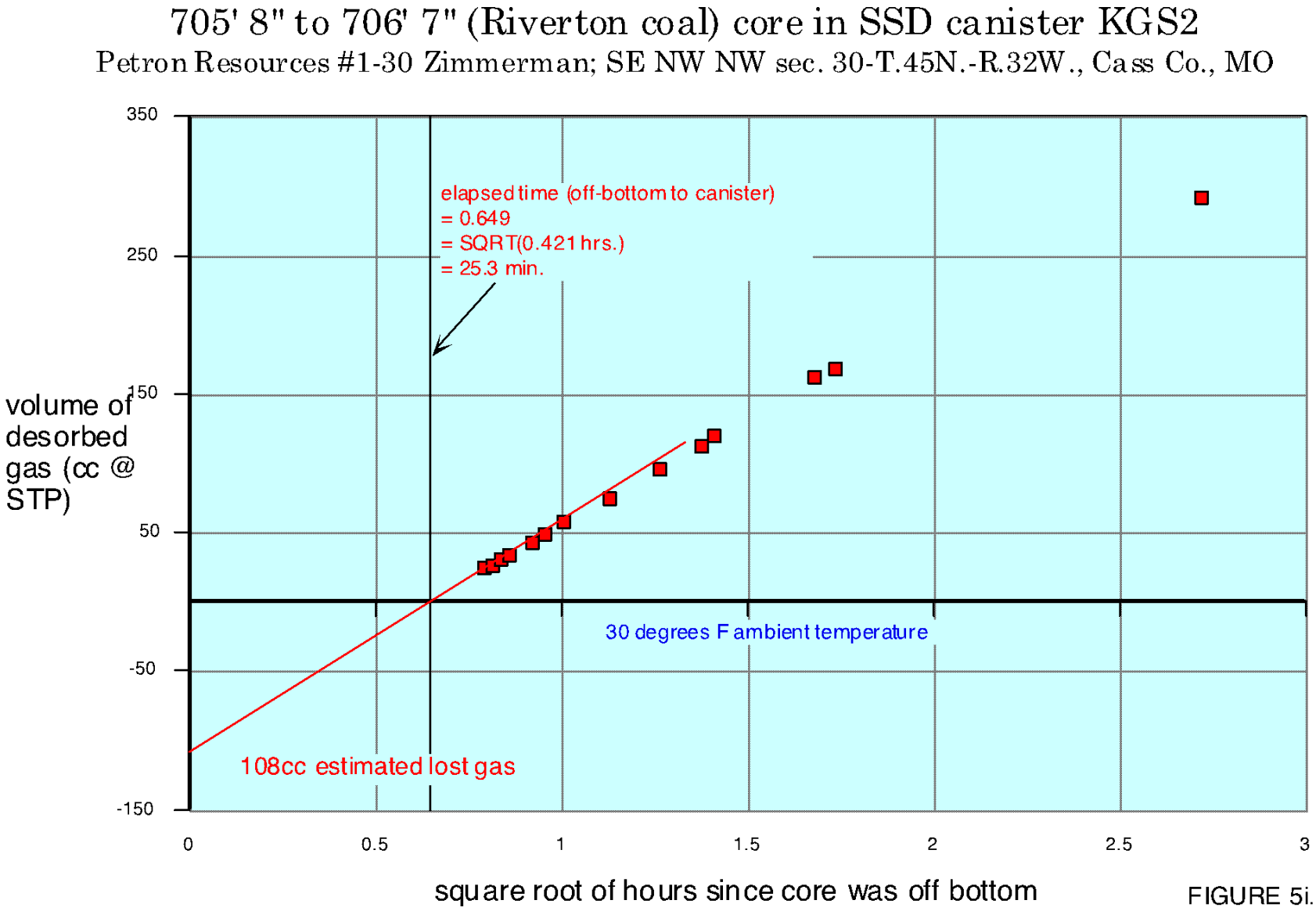


FIGURE 5i.

FIGURE 5i. Lost-gas determination for 705'8" to 706'7" (Riverton coal), #1-30 Zimmerman well.

Desorbed Gas

The coal desorption graphs (Figure 6) are all at a common scale and are presented by specific coals. Residual gas determinations are also presented for the coals. Some of the samples were decanistered before they expelled all their desorbed gas, so in these cases, a projected line infers the ultimate desorbed gas. This line is based on desorption curves in the region and is fitted visually to the existing data.

Shales desorbed are presented by well (Figure 7). Samples were not considered for graphing or gas-in-place calculations (see below) if the sample assayed at less that 10 scf/ton for the desorbed gas. Some of the dark shales analyzed did not desorb more than 10 scf/ton.

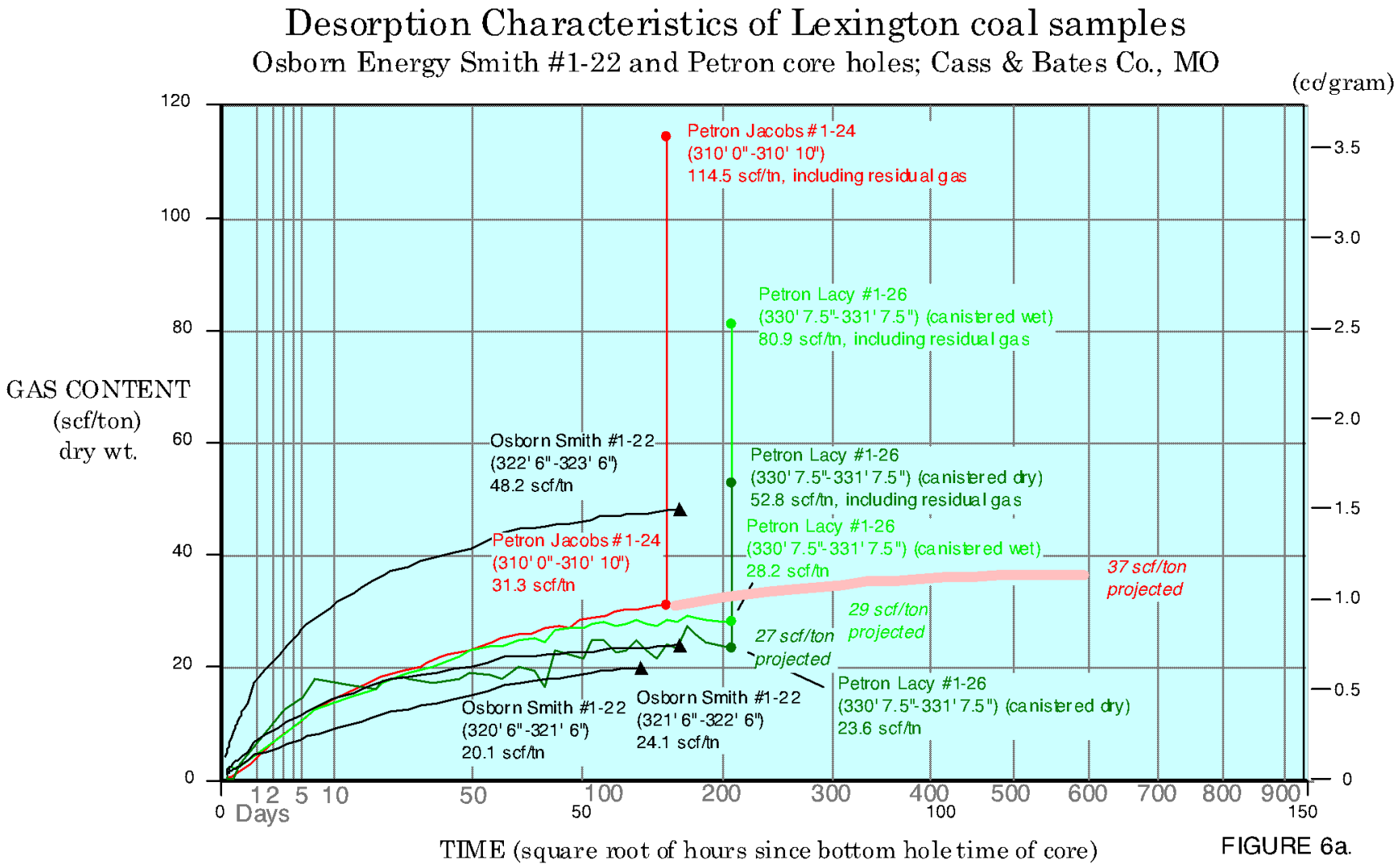


FIGURE 6a.

FIGURE 6a. Desorption characteristics of Lexington coals.

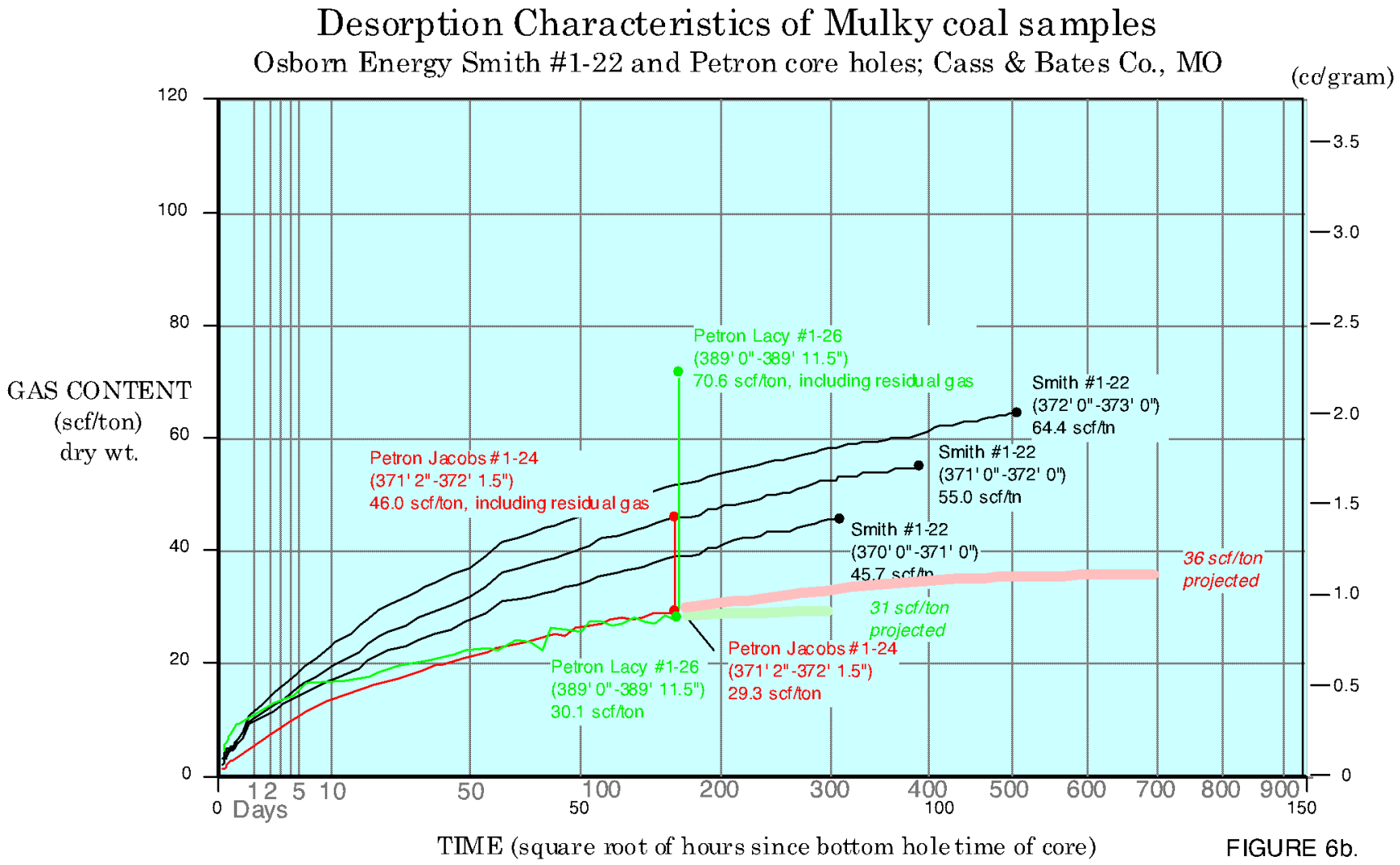


FIGURE 6b.

FIGURE 6b. Desorption characteristics of Mulky coals.

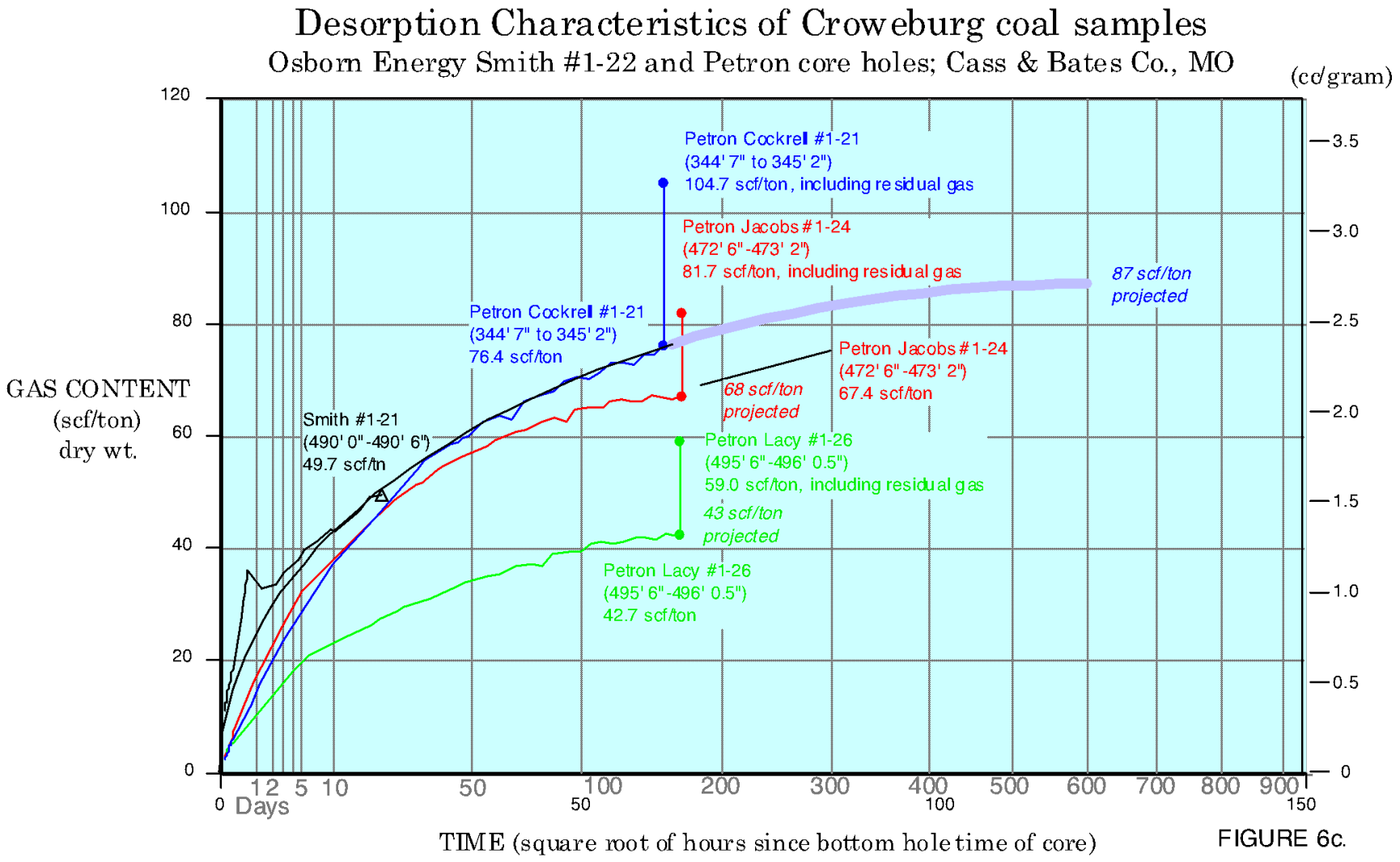


FIGURE 6c.

FIGURE 6c. Desorption characteristics of Croweburg coals.

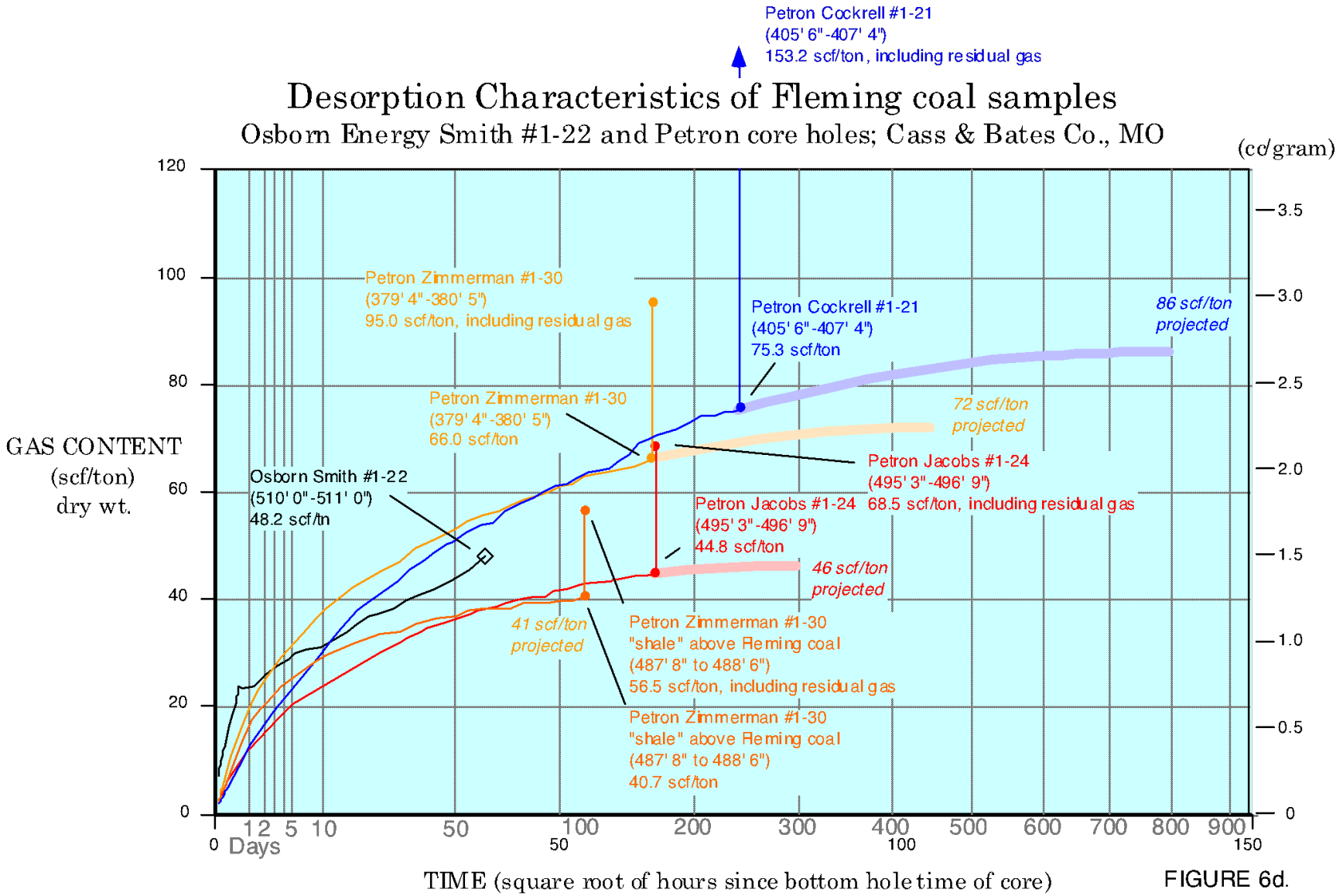


FIGURE 6d. Desorption characteristics of Fleming coals.

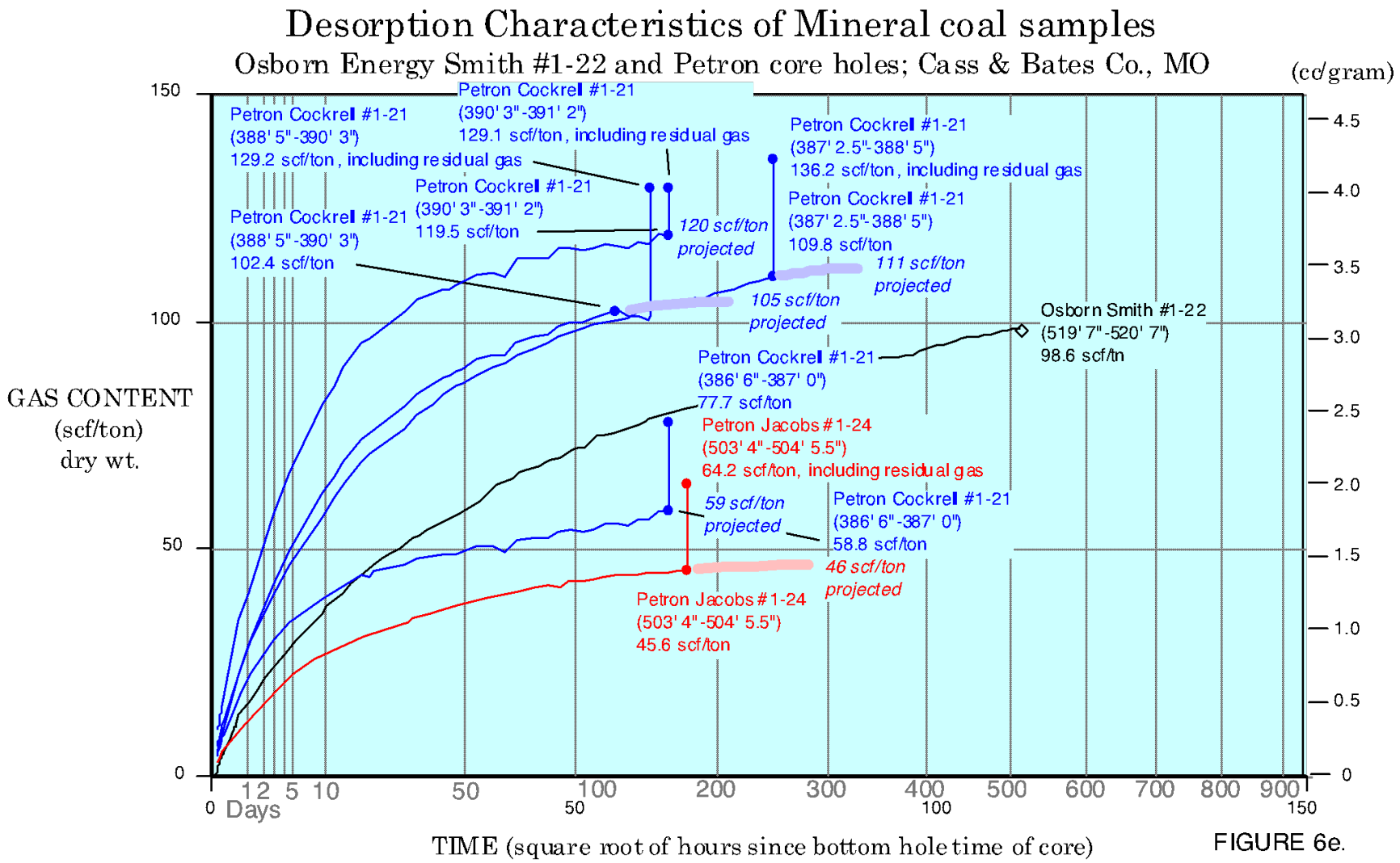


FIGURE 6e.

FIGURE 6e. Desorption characteristics of Mineral coals.

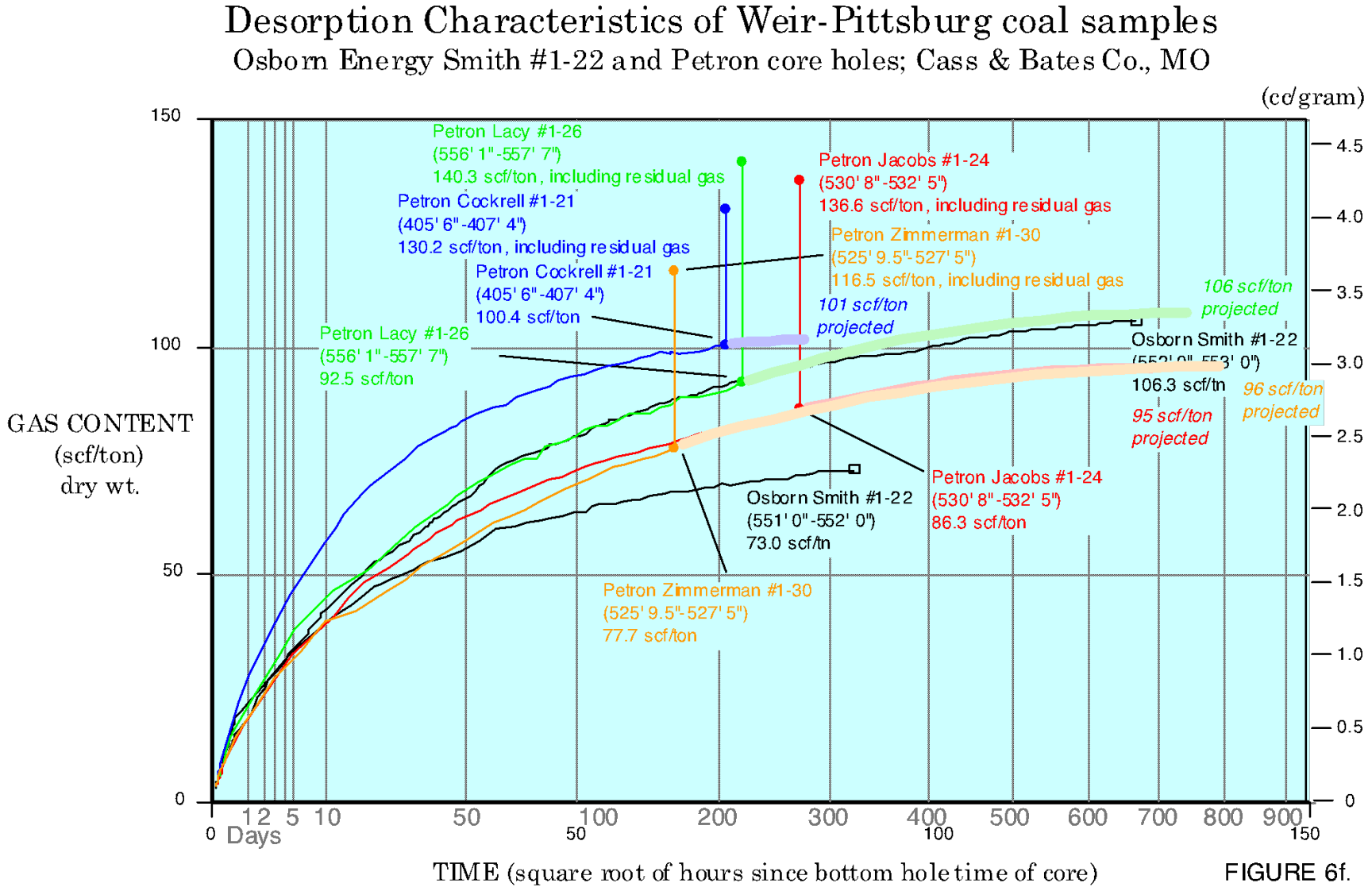


FIGURE 6f.

FIGURE 6f. Desorption characteristics of Weir-Pittsburg coals.

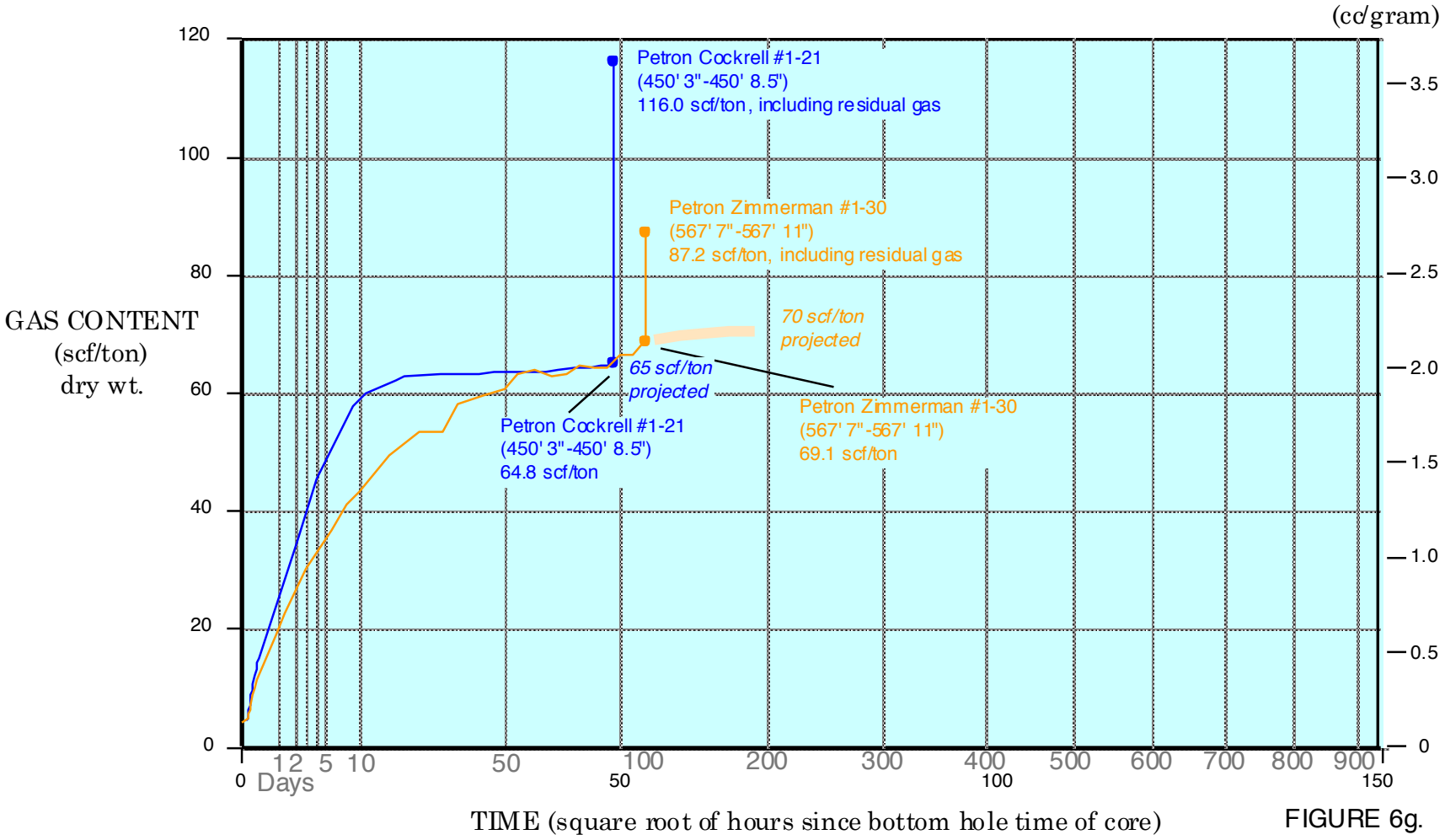


FIGURE 6g.

FIGURE 6g. Desorption characteristics of unnamed coals at top of Bluejacket Fm.

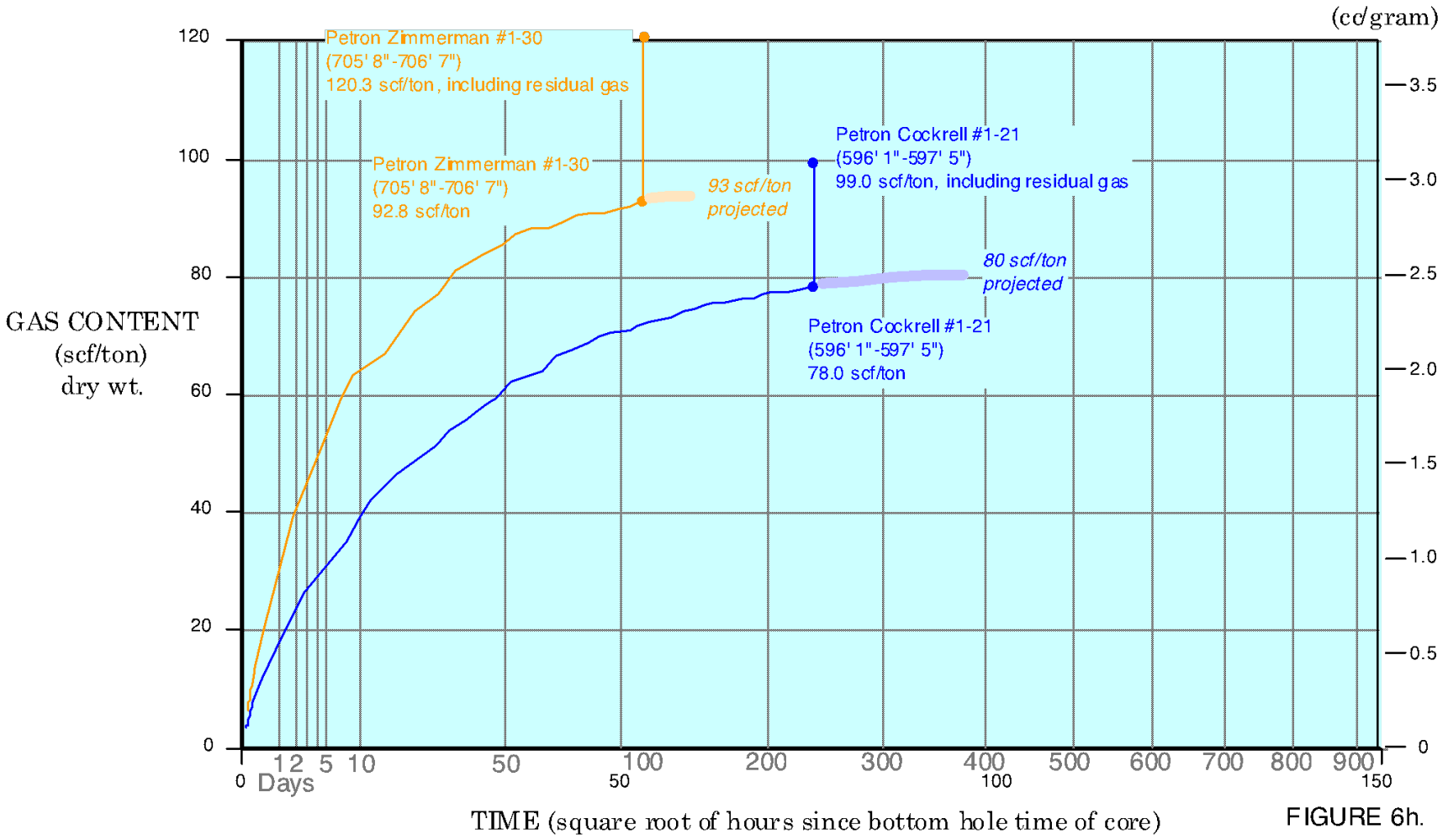


FIGURE 6h.

FIGURE 6h. Desorption characteristics of Riverton coals.

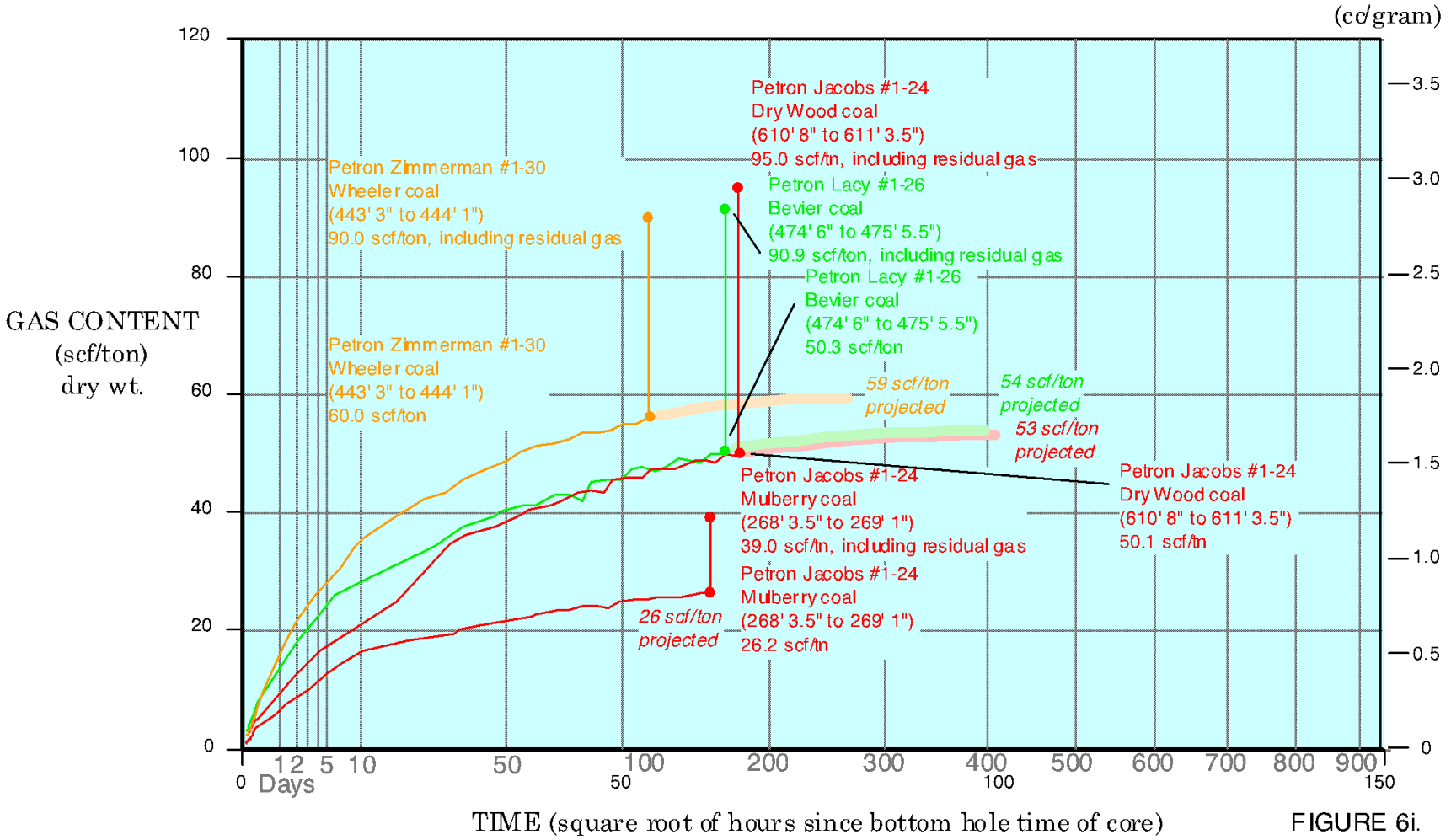


FIGURE 6i.

FIGURE 6i. Desorption characteristics of miscellaneous coals.

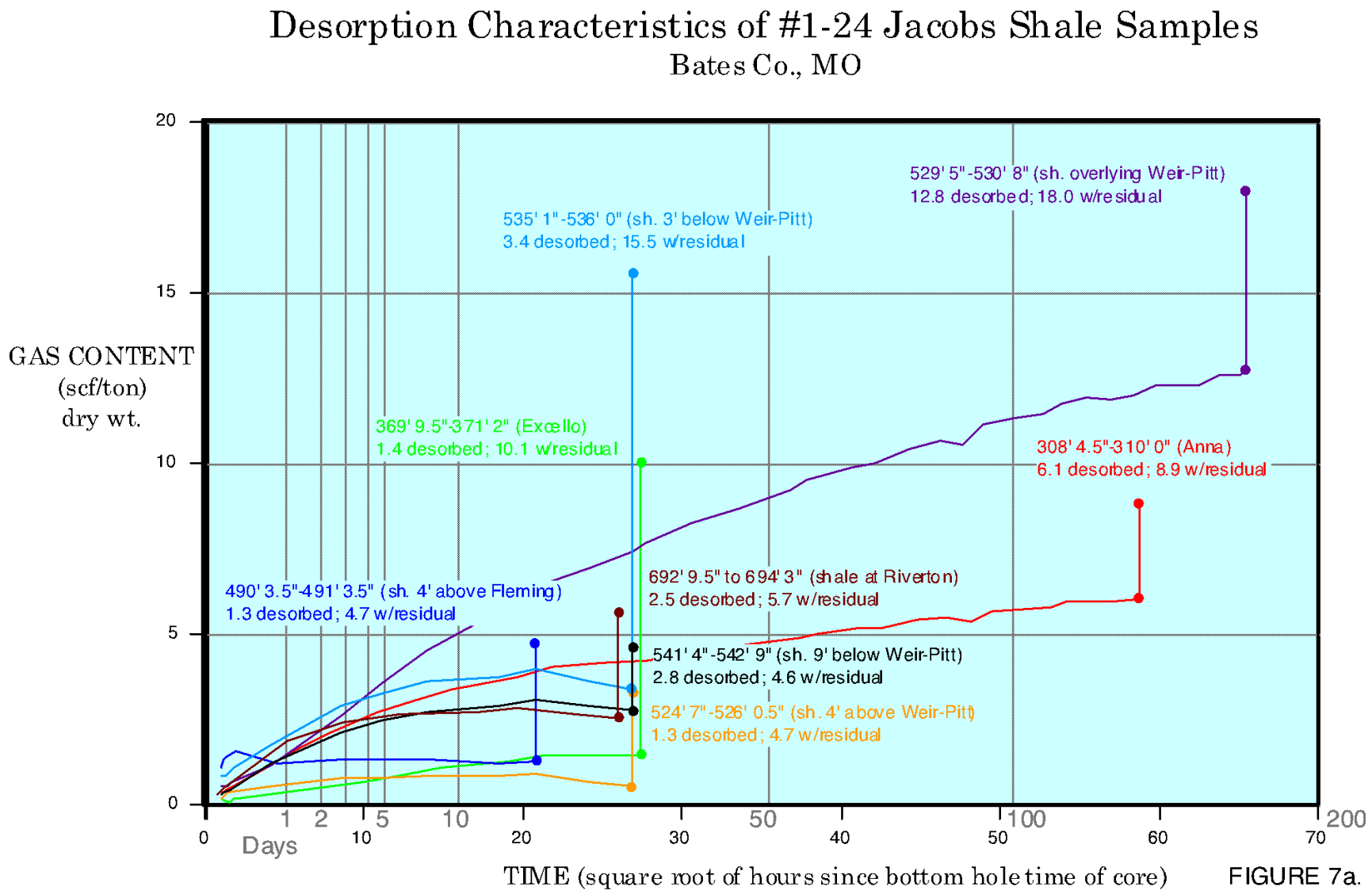


FIGURE 7a. Desorption characteristics of shale from the #1-24 Jacobs well.

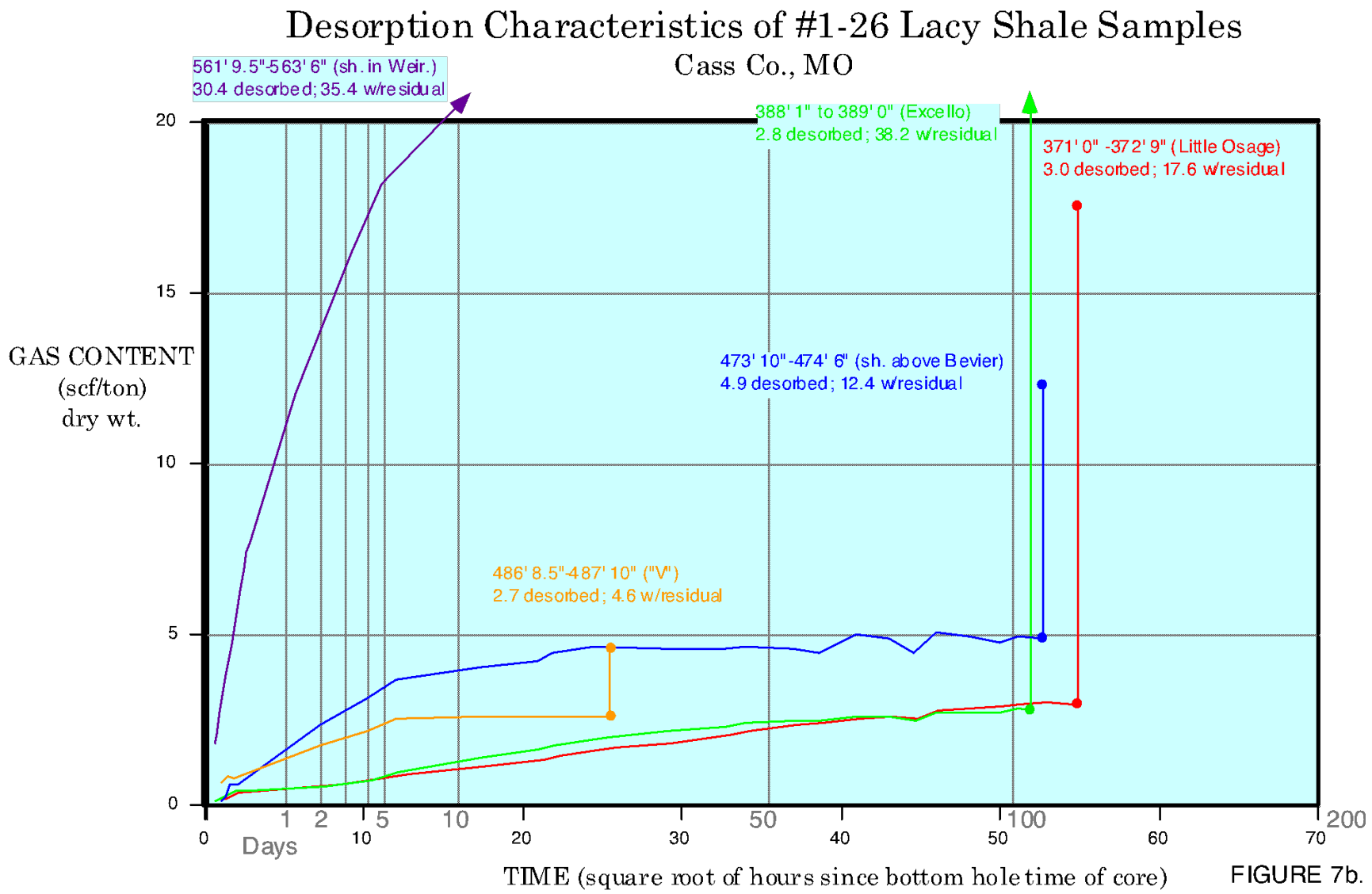


FIGURE 7b. Desorption characteristics of shale from the #1-26 Lacy well.

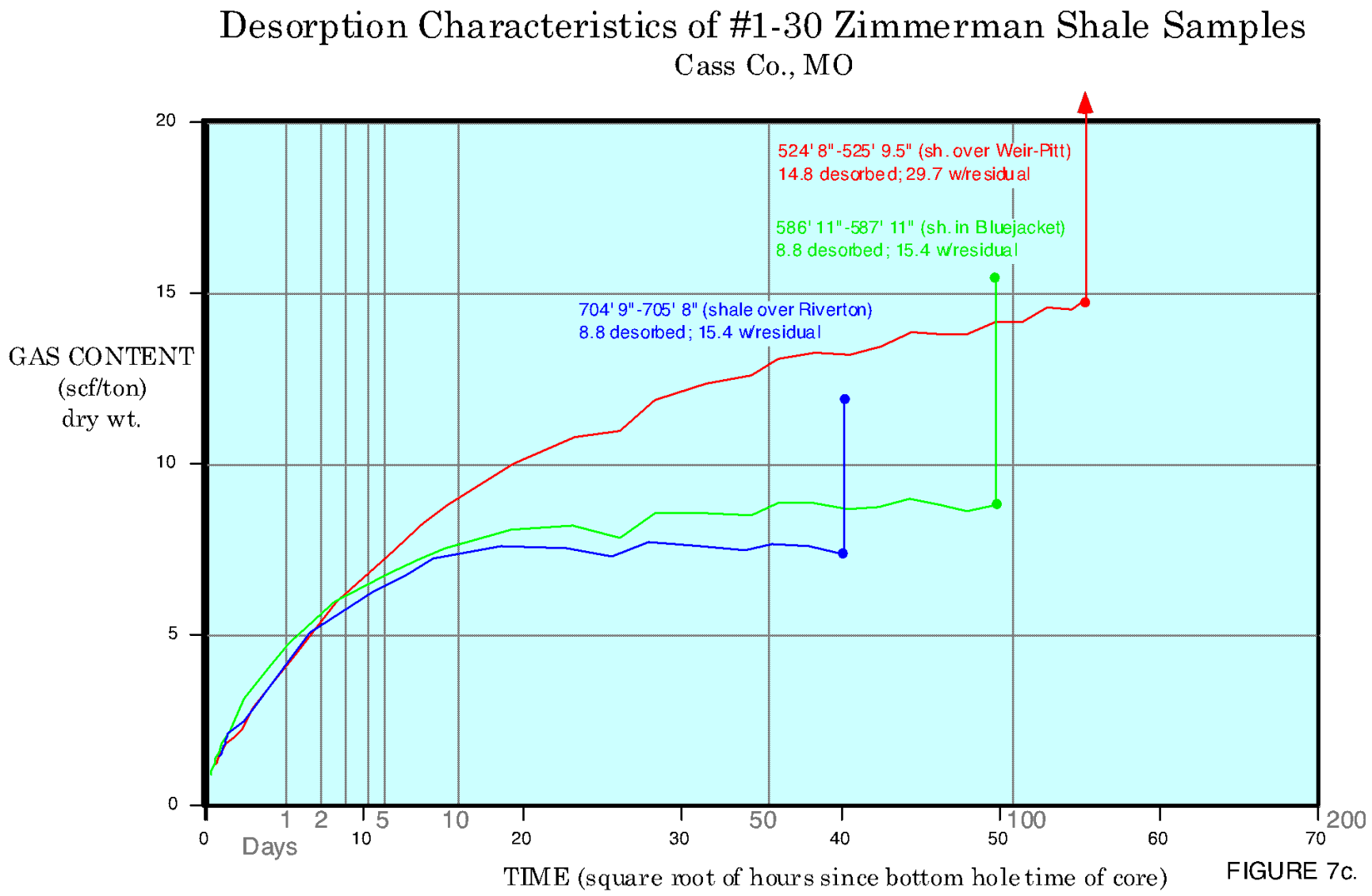


FIGURE 7c. Desorption characteristics of shale from the #1-30 Zimmerman well.

Ash content and proximate analysis allows for determination of ash-free gas content of samples, and rank of the coals by the Parr Formula (see ASTM, 1993, p. 202) (Table 5).

TABLE 5. Adsorbed gas content (lost gas plus desorbed plus residual) on an as-received and ash-free basis, with calculated coal rank.

SAMPLE	As-received gas content (desorbed plus residual) (scf/ton)	Ash-free gas content (desorbed plus residual) (scf/ton)	Ash Content (as-received) (%)	Moisture Content (as-received) (%)	Coal Rank
#1-24 Jacobs					
Mulberry, 268' 3.5"	39.0	73.0	40.72	4.59	hvCb
Anna Sh., 308' 4.5"	8.9	86.5	87.96	0.95	
Lexington, 310' 0.0"	114.5	142.9	17.31	2.18	hvBb
Excello Sh., 369' 9.5"	10.1	249.9	2.87	90.50	
Mulky, 371' 2.0"	46.0	51.5	2.94	7.51	hvBb
Croweburg, 472' 6.0"	81.7	110.6	2.71	22.79	hvBb
Sh., above Fleming, 490' 3.5"	4.7	156.5	3.16	91.21	
Fleming, 495' 3.0"	68.5	92.7	1.96	23.72	hvCb
Mineral, 503' 4.0"	64.2	100.9	2.75	32.68	hvCb
Sh., above Weir-Pitt, 524' 7.0"	3.8	46.0	0.98	88.14	
Sh., above Weir-Pitt, 529' 5.0"	18.0	85.6	2.20	75.06	
Weir-Pitt, 530' 8.0"	136.6	155.7	3.02	8.96	hvAb
Sh., below Weir-Pitt, 535' 1.0"	15.5	77.0	2.31	75.73	
Sh., below Weir-Pitt, 541' 4.0"	4.6	48.5	1.74	86.34	
Drywood, 610' 8.0"	95.0	109.3	3.05	9.74	hvBb
Sh., at Riverton, 692' 9.5"	5.7	50.6	1.99	85.07	
#1-26 Lacy					
Lexington, canistered wet, 330' 7.5"	80.9	98.8	3.06	14.55	hvBb
Lexington, canistered dry, 330' 7.5"	52.8	81.4	3.48	30.50	hvBb
Little Osage Sh., 371' 0.0"	17.6	126.3	1.05	84.13	
Excello Sh., 388' 1.0"	38.2	588.9	4.76	84.52	
Mulky, 389' 0.0"	70.6	80.7	2.99	9.20	hvBb
Sh., above Bevier, 473' 10.0"	12.4	93.9	1.09	84.81	
Bevier, 474' 6.0"	90.0	117.2	2.50	19.40	hvBb
"V shale," 486' 8.5"	4.6	33.0	0.71	82.88	
Croweburg, 495' 6.0"	59.0	74.9	3.95	16.60	hvCb
Weir-Pitt, 556' 1.0"	140.3	169.7	4.28	12.68	hvBb
Sh., in Weir-Pitt, 561' 9.5"	35.4	73.4	1.56	49.42	

SAMPLE	As-received gas content (desorbed plus residual) (scf/ton)	Ash-free gas content (desorbed plus residual) (scf/ton)	Ash Content (as-received) (%)	Moisture Content (as-received) (%)	Coal Rank
#1-21 Cockrell					
Croweburg, 344’ 7.0”	104.7	143.5	5.17	20.73	hvCb
Fleming, 379’ 4.0”	153.2	174.2	4.30	7.41	hvBb
Mineral, 386’ 6.0”	77.7	129.6	2.99	35.90	hvCb
Mineral, 387’ 2.5”	136.2	169.5	5.13	13.82	hvCb
Mineral, 388’ 5.0”	129.2	159.3	5.92	12.23	hvCb
Mineral, 390’ 3.0”	129.1	163.0	4.39	15.70	hvCb
Weir-Pitt, 405’ 6.0”	130.2	156.4	4.55	11.68	hvBb
Coal in Bj, 450’ 3.0”	116.0	164.5	3.28	25.36	hvCb
Riverton, 596’ 1.0”	99.0	121.8	4.55	13.54	hvBb
#1-30 Zimmerman					
Wheeler, 443’ 3.0”	89.7	106.3	6.02	9.04	hvCb
Sh., above Fleming, 487’ 8.0”	56.5	113.3	1.50	47.90	
Fleming, 490’ 3.5”	95.0	120.3	3.75	16.61	hvCb
Sh., over Weir-Pitt, 524’ 8.0”	29.7	183.4	1.84	80.45	
Weir-Pitt, 525’ 9.5”	116.5	144.2	4.65	13.93	hvBb
Coal in Bj, 567’ 7.0”	87.2	116.0	3.10	21.04	hvCb
Sh., below Bj, 586’ 11.0”	15.4	141.7	0.78	87.66	
Sh., over Riverton, 704’ 9.0”	11.9	79.8	0.83	83.51	
Riverton, 705’ 8.0”	120.3	160.4	2.30	22.16	hvCb

hvCb = high-volatile bituminous A

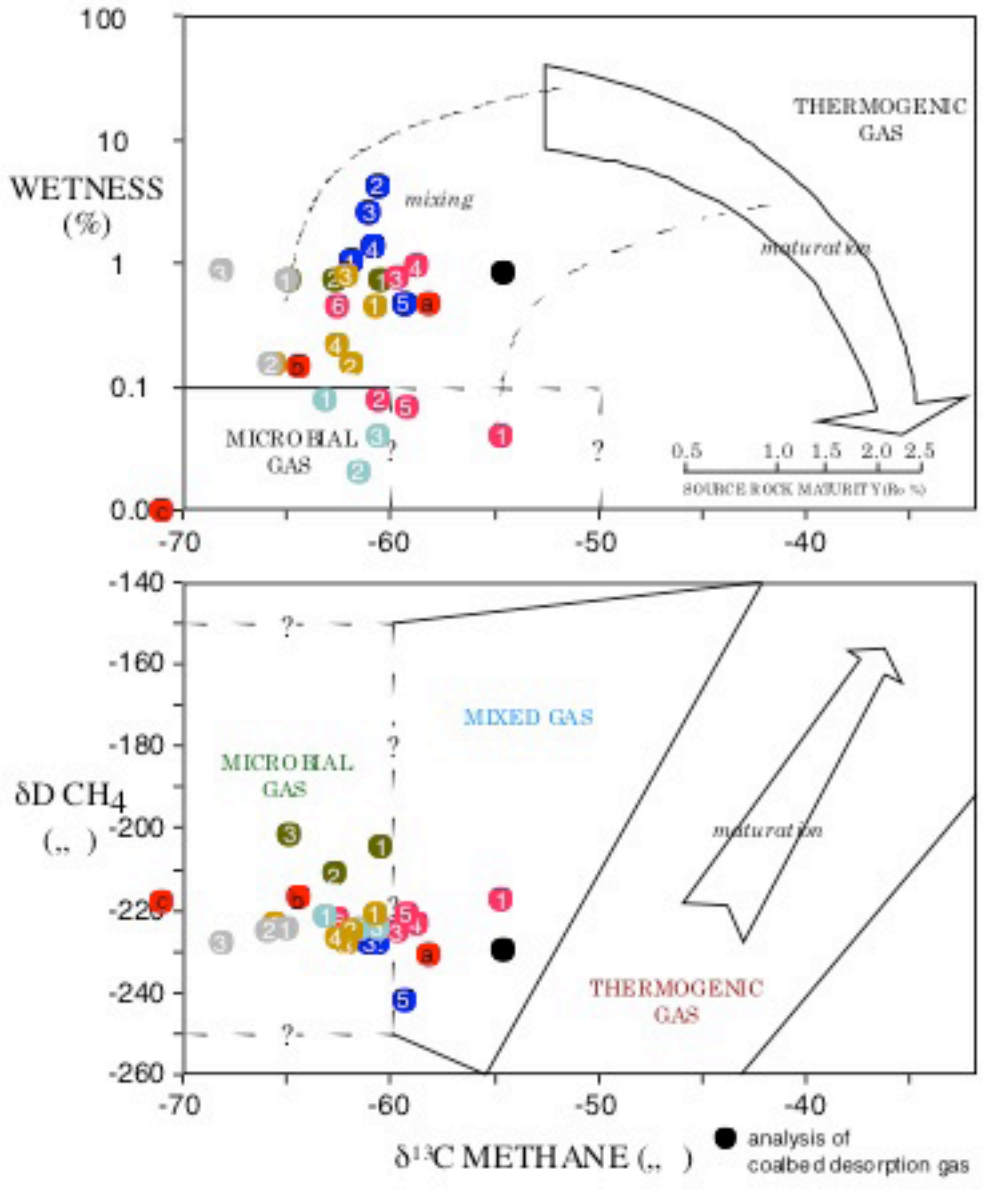
hvCb = high-volatile bituminous B

hvCb = high-volatile bituminous C

Based on these analyses, most coals in the four Petron wells assay along the boundary between high-volatile bituminous B and C ranks.

Gas Chemistry

Gas isotopic chemistry from the four Petron wells is crossplotted and compared to other nearby gases (Figure 8). Based on these data, the origin of the gas in the four Petron wells is mixed thermogenic-biogenic or biogenic in origin. By isotopes, the methane in the #1-24 Jacobs well is least depleted; thus it has a mixed thermogenic-biogenic origin. The #1-26 Lacy, #1-21 Cockrell, and #1-30 Zimmerman wells all have lighter carbon isotopic signatures indicative of a more biogenic origin for their desorbed coalbed gases.



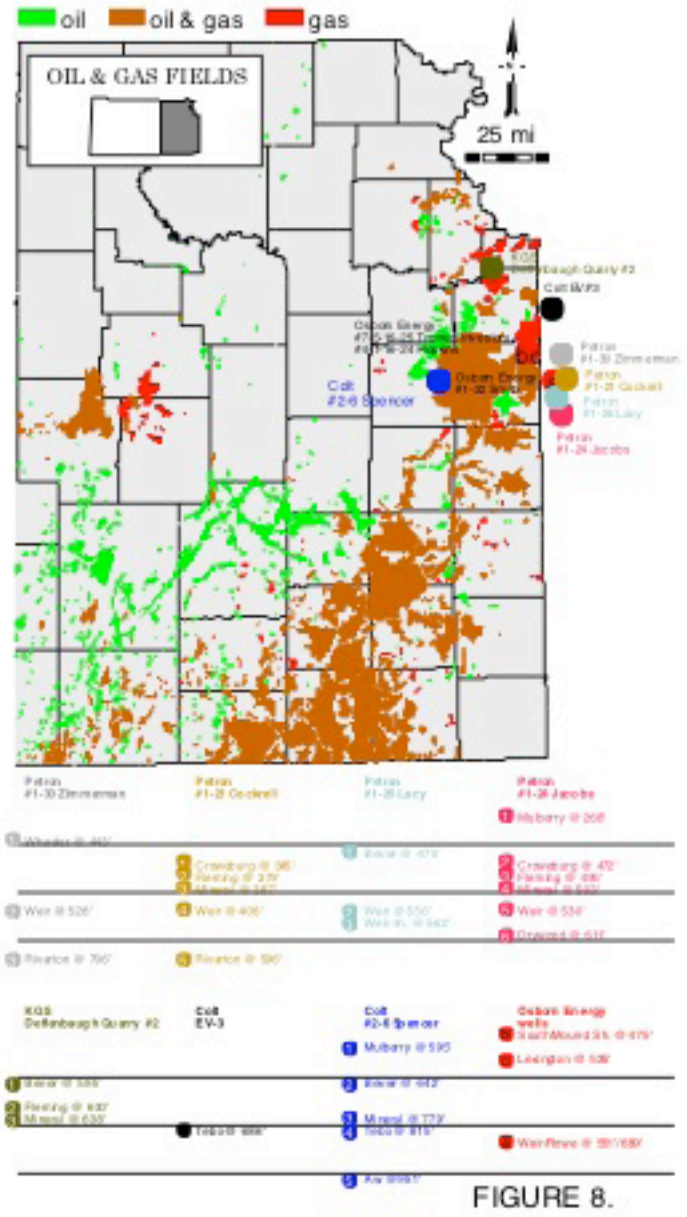


FIGURE 8. Isotope and Chemistry cross-plot for Petron and nearby CBM gases.

The isotopic chemistry of the gases is shown in Table 6.

TABLE 6. Isotopes of the Petron gases.

SAMPLE	$\delta^{13}CO_2$ per mil	$\delta^{13}C1$ per mil	$\delta DC1$ per mil	$\delta^{13}C2$ per mil	$\delta^{13}C3$ per mil
#1-24 Jacobs					
Mulberry, 268’ 3.5”	-49.00	-54.62	-217.3		
Croweburg, 472’ 6.0”	-10.31	-60.51	-223.8	-33.50	
Fleming, 495’ 3.0”	-3.57	-59.57	-225.1	-32.34	-30.27
Mineral, 503’ 4.0”	-59.84	-58.73	-222.7	-32.19	-30.47
Weir-Pitt, 530’ 8.0”	0.86	-59.11	-221.8	-28.60	
Drywood, 610’ 8.0”	-8.82	-62.48	-222.2	-33.88	-29.51
#1-26 Lacy					
Bevier, 474’ 6.0”	-25.81	-63.01	-221.4	-41.88	
Weir-Pitt, 556’ 1.0”	0.71	-61.48	-223.8		
Sh., in Weir-Pitt, 561’ 9.5”	-2.43	-60.59	-223.5		
#1-21 Cockrell					
Croweburg, 344’ 7.0”	-11.97	-60.74	-221.2	-36.82	-18.49
Fleming, 379’ 4.0”	-9.89	-61.95	-224.8	-34.30	
Mineral, 387’ 2.5”	-6.83	-62.05	-227.7	-34.05	
Weir-Pitt, 405’ 6.0”	5.50	-62.61	-225.9	-34.94	
Riverton, 596’ 1.0”	-13.40	-65.47	-223.8	-41.12	
#1-30 Zimmerman					
Wheeler, 443’ 3.0”	-16.09	-65.00	-224.5	-43.07	-25.85
Weir-Pitt, 525’ 9.5”		-65.90	-224.2	-41.92	
Riverton, 705’ 8.0”		-68.06	-227.6	-45.40	

Raw (i.e., uncorrected for atmosphere) hydrocarbon percentages for the desorbed gases are in Table 7.

TABLE 7a. Raw hydrocarbon percentages in the desorbed gases.

Sample	methane (%)	ethane (%)	propane (%)	n-butane (%)	isobutane (%)	n-pentane (%)	iso-pentane (%)	hexane + (%)
#1-24 Jacobs								
Mulberry, 268' 3.5"	53.82	0.0157	0	0	0	0	0	0
Croweburg, 472' 6.0"	63.37	0.0316	0.0045	0	0.0056	0	0	0
Fleming, 495' 3.0"	84.06	0.0956	0.3320	0.1200	0.0733	0.0116	0.0245	0.0074
Mineral, 503' 4.0"	36.39	0.0584	0.2230	0.0763	0.0474	0.0091	0.0141	0.0060
Weir-Pitt, 530' 8.0"	92.39	0.0674	0	0	0	0	0	0
Drywood, 610' 8.0"	42.55	0.0851	0.0786	0.0093	0.0142	0	0.0016	0
#1-26 Lacy								
Bevier, 474' 6.0"	37.86	0.0290	0.0029	0	0	0	0	0
Weir-Pitt, 556' 1.0"	70.47	0.0136	0	0	0	0	0	0
Sh., in Weir-Pitt, 561' 9.5"	62.80	0.0207	0.0021	0	0	0	0	0
#1-21 Cockrell								
Croweburg, 344' 7.0"	50.30	0.0869	0.0175	0.0470	0.0562	0.0019	0.0130	0.0019
Fleming, 379' 4.0"	55.75	0.0774	0.0036	0	0.0037	0	0	0
Mineral, 387' 2.5"	78.62	0.1280	0.0111	0	0	0	0	0
Weir-Pitt, 405' 6.0"	70.06	0.1460	0.0021	0	0	0	0	0
Riverton, 596' 1.0"	70.06	0.0967	0.0093	0.0012	0	0	0	0
#1-30 Zimmerman								
Wheeler, 443' 3.0"	68.67	0.1450	0.1080	0.0852	0.0645	0.0305	0.0429	0.0278
Weir-Pitt, 525' 9.5"	78.92	0.1080	0.0132	0.0010	0.0025	0.0028	0.0021	0
Riverton, 705' 8.0"	52.34	0.0448	0.0022	0	0.0011	0	0	0

TABLE 7b. Raw non-hydrocarbon percentages in the desorbed gases.

SAMPLE	nitrogen (%)	oxygen (%)	argon (%)	carbon dioxide (%)	helium (%)
#1-24 Jacobs					
Mulberry, 268’ 3.5”	43.46	0.375	0.5340	1.80	0
Croweburg, 472’ 6.0”	30.72	4.960	0.3750	0.53	0.0024
Fleming, 495’ 3.0”	13.09	1.200	0.1600	0.82	0.0042
Mineral, 503’ 4.0”	53.04	8.920	0.5890	0.63	0
Weir-Pitt, 530’ 8.0”	5.83	0.580	0.0763	1.05	0.0022
Drywood, 610’ 8.0”	47.59	8.270	0.5780	0.81	0.0107
#1-26 Lacy					
Bevier, 474’ 6.0”	51.63	8.68	0.626	1.17	0.0020
Weir-Pitt, 556’ 1.0”	26.82	0.92	0.299	1.47	0.0018
Sh., in Weir-Pitt, 561’ 9.5”	35.37	0.18	0.399	1.23	0.0028
#1-21 Cockrell					
Croweburg, 344’ 7.0”	40.17	8.21	0.508	0.58	0.0028
Fleming, 379’ 4.0”	36.28	6.64	0.428	0.81	0.0064
Mineral, 387’ 2.5”	16.98	3.06	0.195	1.00	0.0020
Weir-Pitt, 405’ 6.0”	24.72	3.40	0.291	1.38	0.0046
Riverton, 596’ 1.0”	24.80	4.24	0.288	0.49	0.0172
#1-30 Zimmerman					
Wheeler, 443’ 3.0”	25.64	4.50	0.313	0.37	0.0067
Weir-Pitt, 525’ 9.5”	17.25	3.05	0.205	0.42	0.0220
Riverton, 705’ 8.0”	38.46	8.39	0.433	0.31	0.0152

Recalculating the component gases minus any contribution by air entails using the volume of oxygen in each sample, and using the ratios of the other atmospheric gases to oxygen. The composition of dry atmosphere was taken to be that stated in Weaver (1966). The percentage of air by volume according to Weaver (1966): nitrogen, 78.00; oxygen, 20.95; argon, 0.93; carbon dioxide, 0.03; neon, 0.0018; helium 0.0005; methane, 0.0002; krypton, 0.0001; nitrous oxide, 0.00005; hydrogen, 0.00005; xenon, 0.000008; ozone, 0.000001.

The percentages (recalculated to 100% and 2 decimal places) of component gases in the samples, without air, are in Table 8.

TABLE 8. Recalculated percentages of component gases, excluding atmosphere.

SAMPLE	C1 (%)	C2 (%)	C3 (%)	n-C4 (%)	i-C4 (%)	n-C5 (%)	i-C5 (%)	C6+ (%)	N_2 (%)	Ar (%)	CO_2 (%)	He (%)
#1-24 Jacobs												
Mulberry, 268' 3.5"	54.80	0.02	0	0	0	0	0	0	42.83	0.53	1.83	0
Croweburg, 472' 6.0"	83.00	0.04	0.01	0	0.01	0	0	0	16.05	0.20	0.68	0
Fleming, 495' 3.0"	89.16	0.10	0.35	0.13	0.08	0.01	0.03	0.01	9.15	0.11	0.87	0
Mineral, 503' 4.0"	63.33	0.10	0.39	0.13	0.08	0.02	0.02	0.01	34.51	0.34	1.07	0
Weir-Pitt, 530' 8.0"	95.04	0.07	0	0	0	0	0	0	3.76	0.05	1.08	0
Drywood, 610' 8.0"	70.26	0.14	0.13	0.02	0.02	0	0	0	27.74	0.35	1.32	0.02
#1-26 Lacy												
Bevier, 474' 6.0"	64.60	0.05	0	0	0	0	0	0	32.95	0.41	1.98	0
Weir-Pitt, 556' 1.0"	73.72	0.01	0	0	0	0	0	0	24.46	0.27	1.54	0
Sh., in Weir-Pitt, 561' 9.5"	63.33	0.02	0	0	0	0	0	0	35.01	0.39	1.24	0
#1-21 Cockrell												
Croweburg, 344' 7.0"	82.67	0.14	0.03	0.08	0.09	0	0.02	0	15.78	0.24	0.93	0
Fleming, 379' 4.0"	81.59	0.11	0.01	0	0.01	0	0	0	16.91	0.20	1.17	0.01
Mineral, 387' 2.5"	92.06	0.15	0.01	0	0	0	0	0	6.54	0.07	1.17	0
Weir-Pitt, 405' 6.0"	83.61	0.17	0	0	0.	0	0	0	14.39	0.17	1.64	0.01
Riverton, 596' 1.0"	87.81	0.12	0.01	0	0	0	0	0	11.30	0.13	0.61	0.02
#1-30 Zimmer-man												
Wheeler, 443' 3.0"	87.43	0.18	0.14	0.11	0.08	0.04	0.05	0.04	11.31	0.14	0.46	0.01
Weir-Pitt, 525' 9.5"	92.36	0.13	0.02	0	0	0	0	0	6.90	0.08	0.49	0.03
Riverton, 705' 8.0"	87.26	0.07	0	0	0	0	0	0	12.04	0.10	0.50	0.02

Based on the above percentages, gas quality can be calculated by the atmosphere-out gas percentages and the BTU content of the hydrocarbon component gases (Table 9).

*TABLE 9. Heating value, total non-flammable gas percentages, and hydrocarbon wetness (i.e., (1-[C1/ΣCn]) *100).*

SAMPLE	calculated BTU (BTU/cubic ft)	total non-HC gas (%)	hydrocarbon wetness (%)
#1-24 Jacobs			
Mulberry, 268' 3.5"	580	45.19	0.03
Croweburg, 472' 6.0"	879	16.94	0.07
Fleming, 495' 3.0"	963	10.13	0.78
Mineral, 503' 4.0"	691	35.92	1.18
Weir-Pitt, 530' 8.0"	1006	4.89	0.07
Drywood, 610' 8.0"	750	29.42	0.44
#1-26 Lacy			
Bevier, 474' 6.0"	684	35.34	0.08
Weir-Pitt, 556' 1.0"	779	26.27	0.02
Sh., in Weir-Pitt, 561' 9.5"	670	36.65	0.04
#1-21 Cockrell			
Croweburg, 344' 7.0"	884	16.96	0.44
Fleming, 379' 4.0"	865	18.29	0.15
Mineral, 387' 2.5"	976	7.78	0.18
Weir-Pitt, 405' 6.0"	887	16.21	0.21
Riverton, 596' 1.0"	931	12.05	0.15
#1-30 Zimmerman			
Wheeler, 443' 3.0"	943	11.93	0.73
Weir-Pitt, 525' 9.5"	979	7.49	0.16
Riverton, 705' 8.0"	924	12.66	0.09

Total BTU was calculated using the following BTUs for each of the hydrocarbon component gases: methane (1057), ethane (1847), propane (2639), n-butane (3401), i-butane (3427), n-pentane (4204), i-pentane (4230), and hexane+ (4963).

The BTU calculations (Table 9) indicate that some of the shallower coals (Figure 9, 10), such as the Mulberry and Croweburg, may have low heat content unacceptable for sell to pipelines (i.e., nominally <950 BTU/scf). Production would require upgrading to reject the nitrogen, and in some cases, removing carbon dioxide in addition to the nitrogen.

Inasmuch as the #1-26 Lacy cores were canistered dry, their BTU calculations may be slightly lower than they really may be. Corrections for atmospheric contamination are based on oxygen content, and a coal canistered in a canister with its ambient space filled with air will tend to oxidize, thus removing oxygen from the interior of the canister. An under-correction for atmospheric contamination will thus result, and to a certain extent, the gas content of the coal also will be under-measured. The accounting for the effects of the dry canistering of the lacy samples is somewhat hard to measure. A program written to account for mixing in the canister of atmosphere and desorbed gas indicates that substantially more oxygen should have been present in the three #1-26 Lacy desorption canisters. Specifically, this program predicted that Bevier coal should have had 280 ccs of oxygen in its canister at the time of gas sampling instead of the 176 ccs indicated by the percentage of oxygen (8.68%) assayed with its gas chemical analysis. The Weir-Pittsburg coal should have had 134 ccs of oxygen in the canister at the time of gas sampling instead of the 16 ccs indicated by the percentage of oxygen (0.92%) assayed with its gas chemical analysis. The shale in the Weir-Pittsburg Formation should have had 144 ccs of oxygen in its canister at the time of gas sampling instead of the 3 ccs indicated by the percentage of oxygen (0.18%) assayed with the gas chemical analysis. Addition of these missing amounts of oxygen would have respectively increased the measured gas contents of the Bevier coal, Weir-Pittsburg coal, and Weir-Pittsburg shale in the #1-26 Lacy well by 4, 3, and 2 scf/ton.

The unresolved problem, however, in accounting for the lost oxygen is that when the theoretical amount of oxygen that should be present in the canisters is mathematically extracted from the canister together with other atmospheric gases in their set ratio to oxygen, an over-correction occurs where more nitrogen is subtracted from the canister than is actually present according to the gas analysis. The calculated percentages of nitrogen in the Bevier coal, Weir-Pittsburg coal, and Weir-Pittsburg shale are respectively -8.22%, -7.64%, and -1.24%. At present, no quantitative estimates can be made as to the correct BTUs for the #1-26 Lacy gas analyses, but their heating values are likely better than what is indicated by their gas analyses.

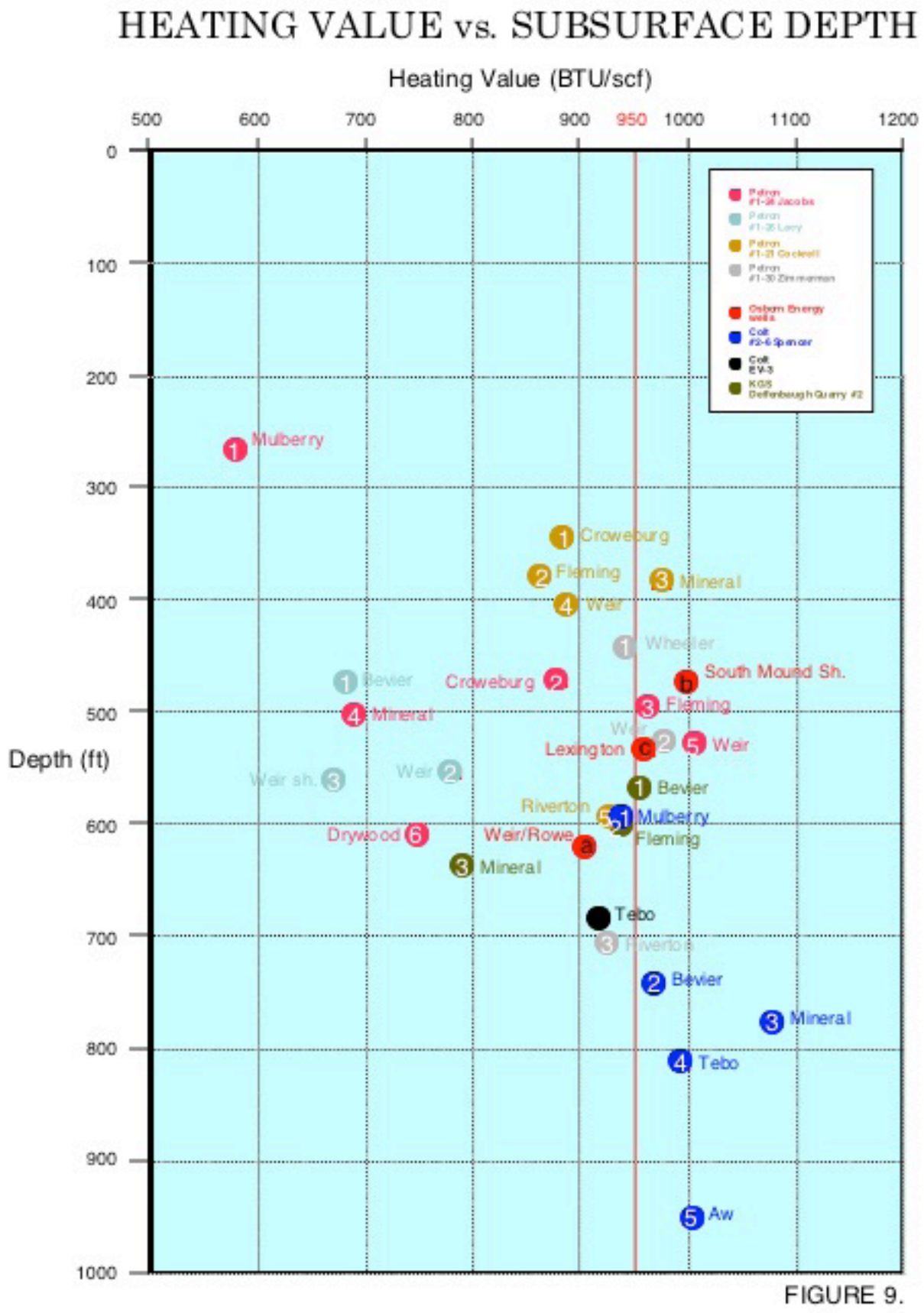


FIGURE 9. Depth vs. BTU content of Petron gases and other nearby desorption tests.

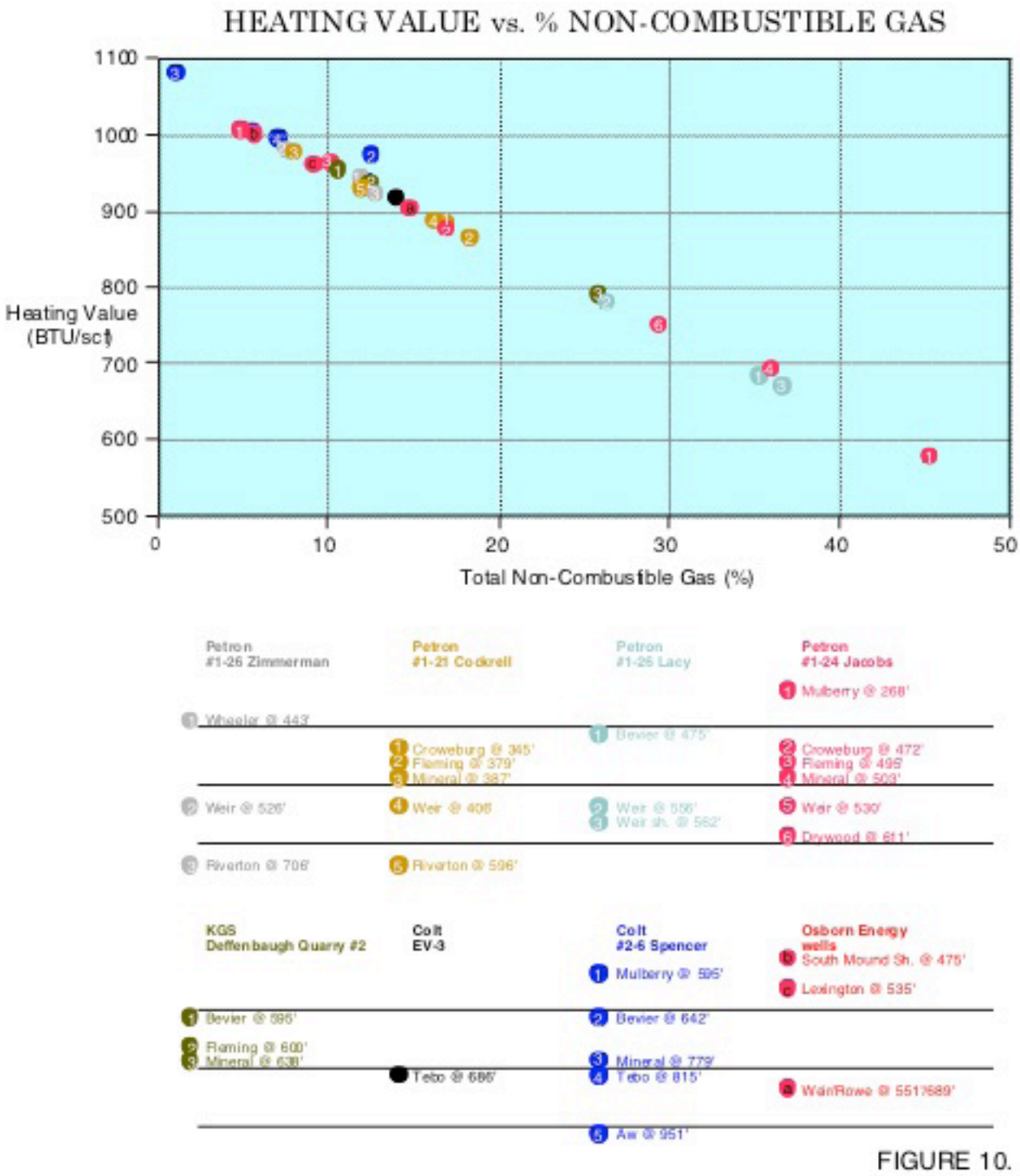


FIGURE 10.

FIGURE 10. BTU content vs. non-hydrocarbon gas percentages for Petron gases and other nearby desorption tests.

Adsorbed Gas-in-Place Calculation

Adsorbed gas-in-place (GIP) is calculated based on desorption data—desorbed gas content, coal/shale thickness, and coal/shale density. The adsorbed GIP is presented by well and stratigraphic unit in Table 10. Shales with gas content less than 10 scf/ton were not considered. Any coal or shale less than 10 inches thick were not considered in the summed adsorbed gas-in-place unless that sample was part of a thicker unit with other samples considered.

TABLE 10. Adsorbed gas-in-place for major coals/shales in the four wells.

#1-24 Jacobs	Gas Content (scf/ton)	Density (grams/cc)	Thickness (inches)	Gas per Acre (cubic ft)
Mulberry, 268’ 3.5”	26	1.43	10.5	44,235
Lexington, 310’ 0.0”	37	1.36	10	57,017
Mulky, 371’ 2.0”	36	1.27	11.5	59,576
Croweburg, 472’ 6.0”	68	1.40	8	(too thin)
Fleming, 495’ 3.0”	46	1.32	18	123,843
Mineral, 503’ 4.0”	46	1.45	13.5	102,029
Sh., above Weir-Pitt, 529’ 5.0”	13	2.09	15	46,179
Weir-Pitt, 530’ 8.0”	95	1.37	21	309,692
Drywood, 610’ 8.0”	53	1.38	7.5	(too thin)
			SUM	**742,571**

#1-26 Lacy	Gas Content (scf/ton)	Density (grams/cc)	Thickness (inches)	Gas per Acre (cubic ft)
Lexington, 330’ 7.5”	28	1.37	12	52,159
Mulky, 389’ 0.0”	31	1.27	11.5	51,301
Bevier, 474’ 6.0”	54	1.58	11.5	111,117
Croweburg, 495’ 6.0”	43	1.48	6.5	(too thin)
Weir-Pitt, 556’ 1.0”	106	1.32	18	285,377
Sh., in Weir-Pitt, 561’ 9.5”	31	2.11	21	155,643
			SUM	**655,656**

#1-21 Cockrell	Gas Content (scf/ton)	Density (grams/cc)	Thickness (inches)	Gas per Acre (cubic ft)
Croweburg, 344’ 7.0”	87	1.27	7	(too thin)
Fleming, 379’ 4.0”	86	1.36	13	172,285
Mineral, 386’ 6.0”	59	1.74	6	69,794
Mineral, 387’ 2.5”	111	1.58	14.5	288,147
Mineral, 388’ 5.0”	105	1.47	22	384,765
Mineral, 390’ 3.0”	120	1.43	11	213,883
Weir-Pitt, 405’ 6.0”	101	1.46	10	167,086
Coal in Bj, 450’ 3.0”	65	1.35	8	(too thin)
Riverton, 596’ 1.0”	80	1.55	16	224,806
			SUM	**1,520,765**

#1-30 Zimmerman	Gas Content (scf/ton)	Density (grams/cc)	Thickness (inches)	Gas per Acre (cubic ft)
Wheeler, 443’ 3.0”	59	1.48	10	98,942
Sh., above Fleming, 487’ 8.0”	41	1.89	10	87,803
Fleming, 490’ 3.5”	72	1.39	15	170,100
Sh., over Weir-Pitt, 524’ 8.0”	15	2.10	13.5	48,185
Weir-Pitt, 525’ 9.5”	96	1.27	19.5	269,386
Coal in Bj, 567’ 7.0”	70	1.48	4	(too thin)
Riverton, 705’ 8.0”	93	1.33	11.5	161,175
			SUM	**835,592**

The Cockrell well, with its thick Mineral coal, has the greatest amount of adsorbed gas in place of all the wells. Weir-Pittsburg coal, together with superjacent or subjacent black shales also accounts for a large share of adsorbed GIP.

Sorption Time

Sorption time, or the time necessary for 63.2% of the gas to desorb from a sample, is a relative measure of the how readily gas will flow from a unit. Sorption times are illustrated and listed for each of the Petron wells in Figure 11. A relative synoptic depiction of adsorbed gas-in-place and sorption time is a crossplot of these two values for units in each well (Figure 12).

Isotherms

Methane isotherms were performed on four selected coals—the Fleming coal (379' 4") from the #1-21 Cockrell well, the Mineral coal (387' 2.5") from the #1-21 Cockrell well, the Weir-Pittsburg (530' 8") coal from the #1-24 Jacobs well, and the Riverton coal from the #1-21 Cockrell (596' 1") well.

The isotherms for these coals are presented at a common scale in Figure 13, with the gas contents and inferred pressure for each of the coals. The Fleming coal appears super-saturated with respect to its isotherm, but this may reflect that its desorbed gas may contain considerable carbon dioxide, which generally has an isotherm that is several times greater at a given pressure than pure methane. The gas analysis for the Fleming coal, however, does not reveal an extraordinary amount of carbon dioxide that would account for this apparent supersaturation.

The degree of undersaturation of the coals with respect to their isotherms appears to increase with the depth and age of the coals. The Mineral coal appears to be saturated, and the Weir-Pittsburg and Riverton data points (see Figure 13) are farther below from their isotherm curves.

The TerraTek moisture and ash-content assays are different from that analyzed for the coals by the KGS and Luman's Labs. This may reflect compositional differences with sample selection. Recalculating the dry, ash-free gas content of the coals using the TerraTek values, however, did not change the basic results of the data point depicting the saturation of the coals (see Figure 13b).

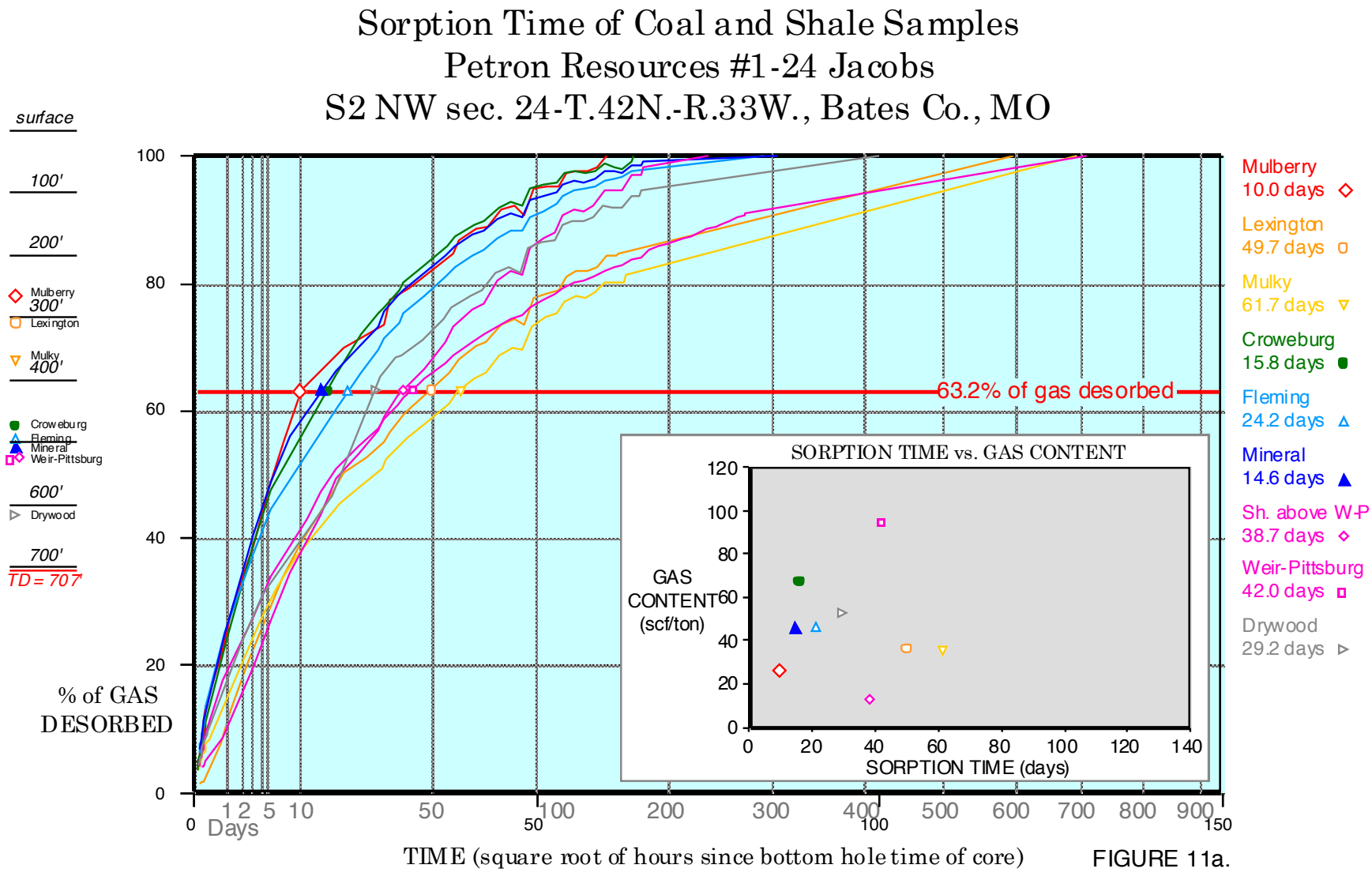


FIGURE 11a.

FIGURE 11a. Sorption times for #1-24 Jacobs well.

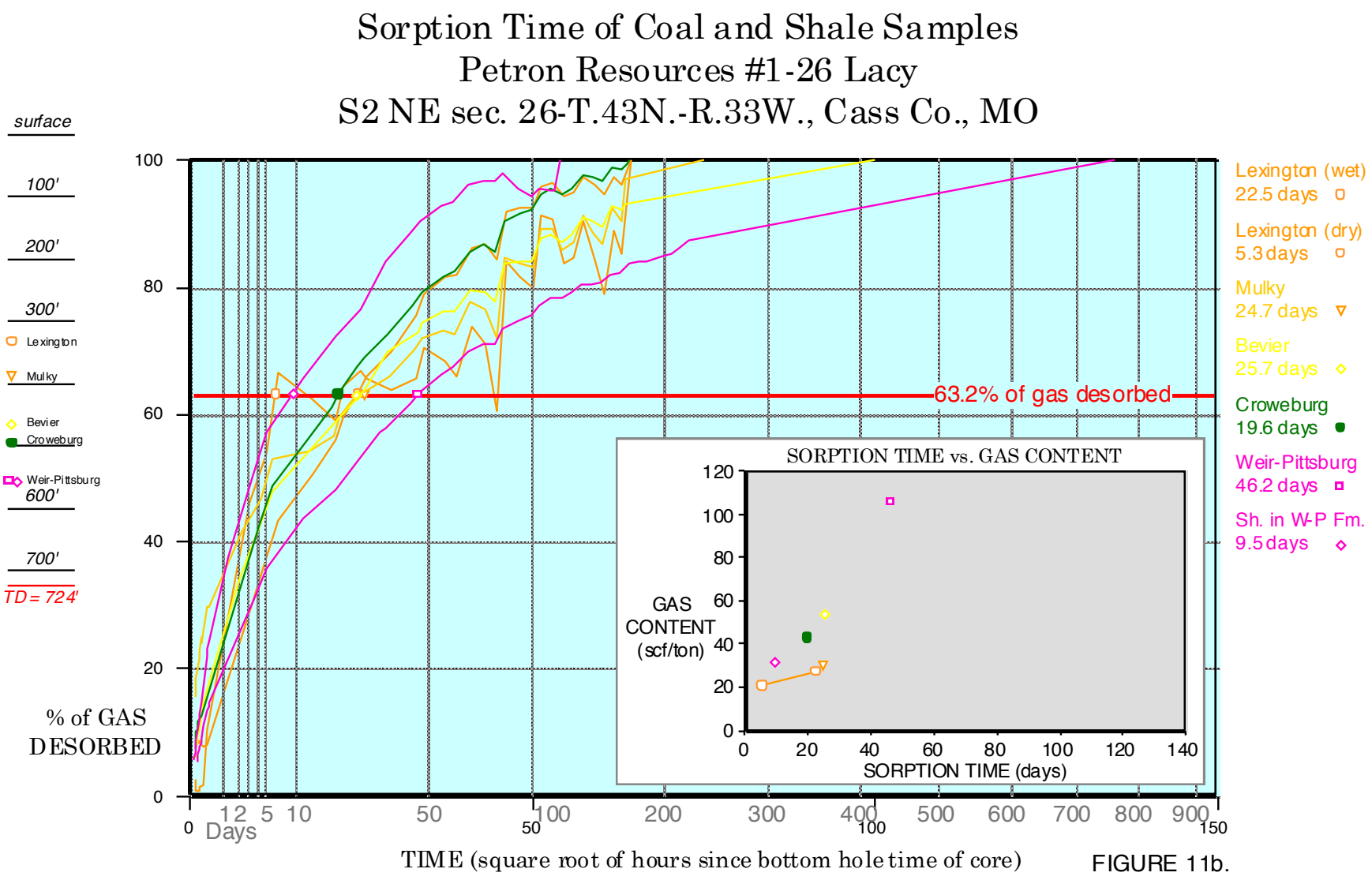


FIGURE 11b.

FIGURE 11b. Sorption times for #1-26 Lacy well.

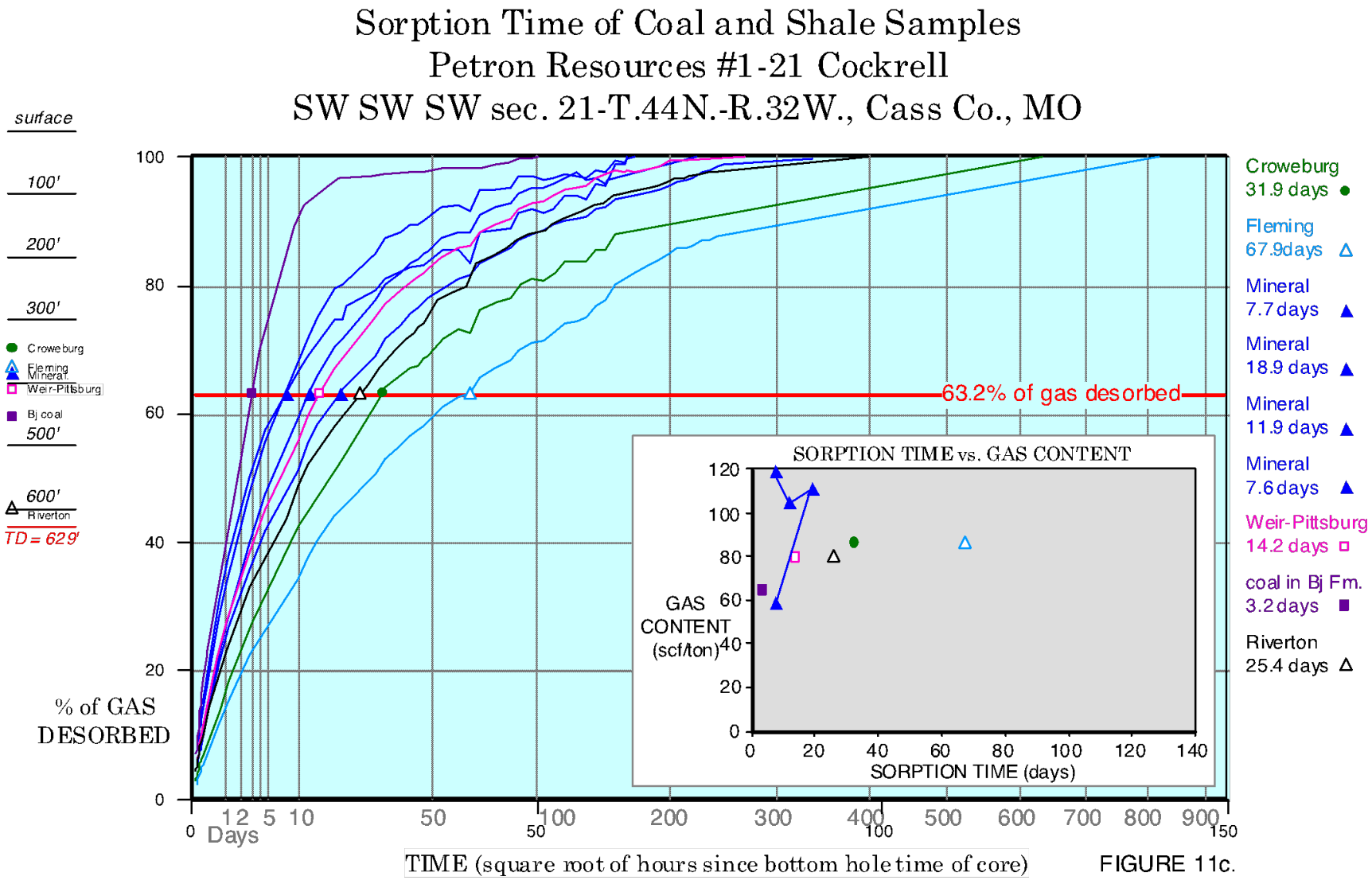


FIGURE 11c.

FIGURE 11c. Sorption times for #1-21 Cockrell well.

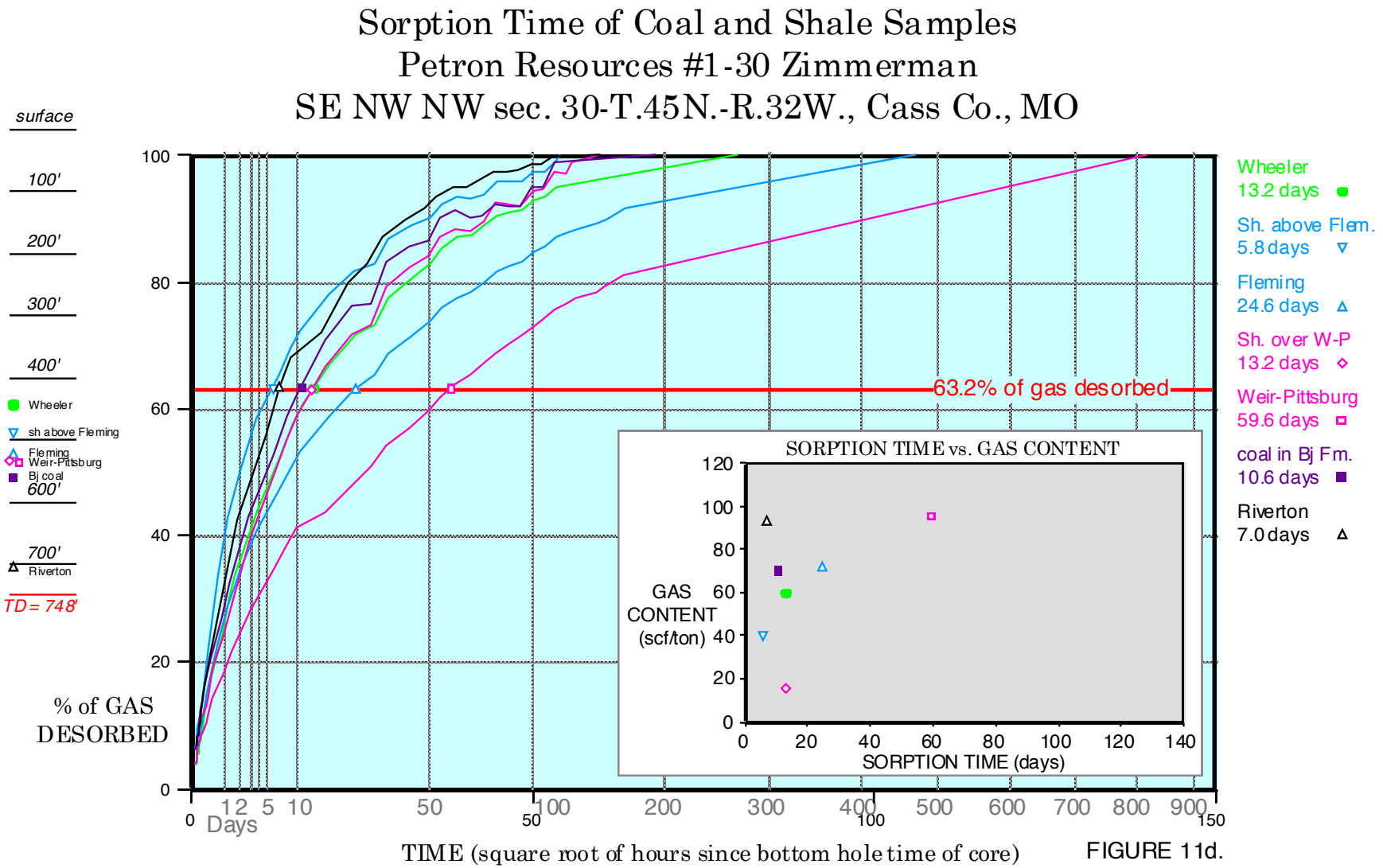


FIGURE 11d.

FIGURE 11d. Sorption times for #1-30 Zimmerman well.

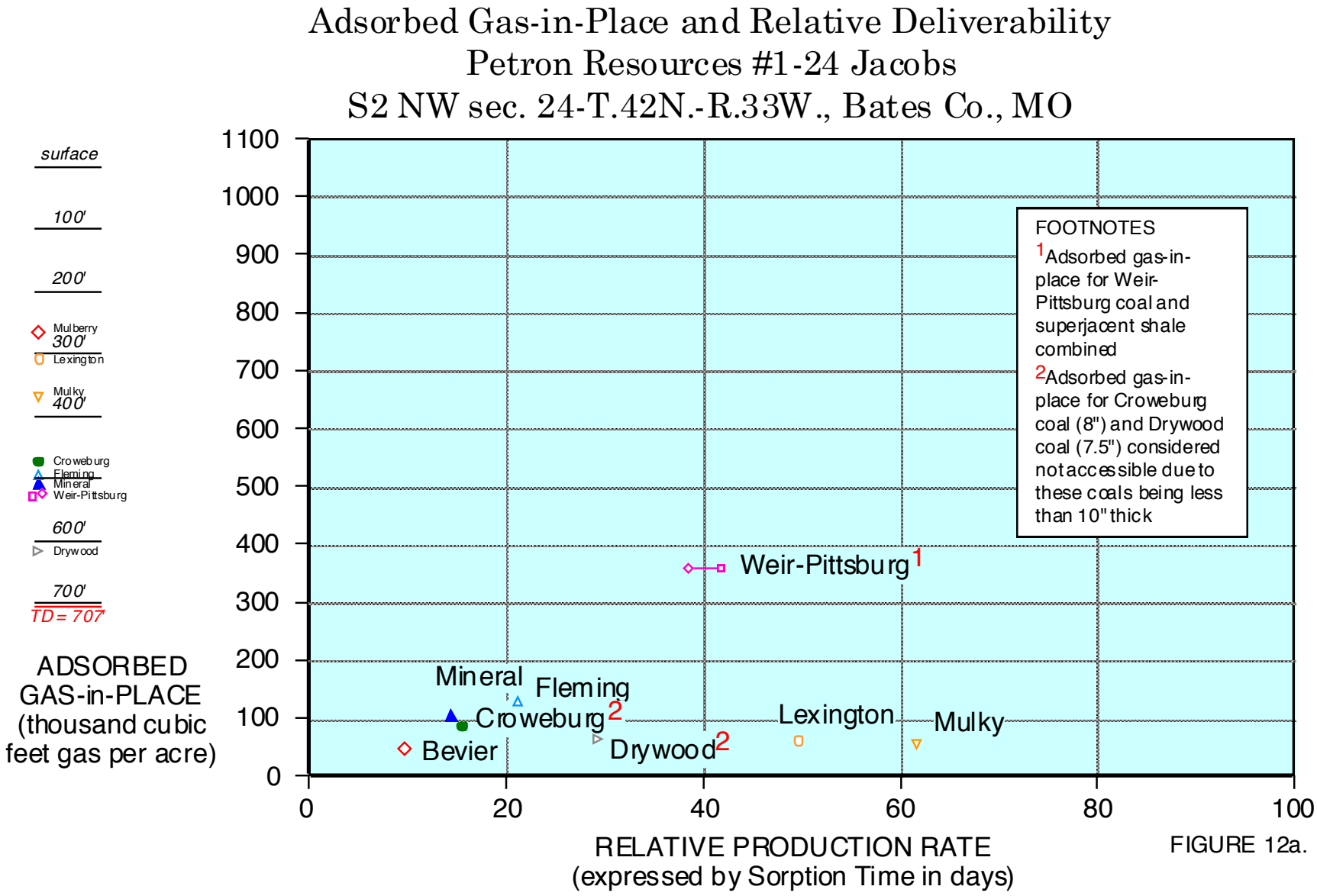


FIGURE 12a.

FIGURE 12a. Sorption times and adsorbed gas-in-place for #1-24 Jacobs well.

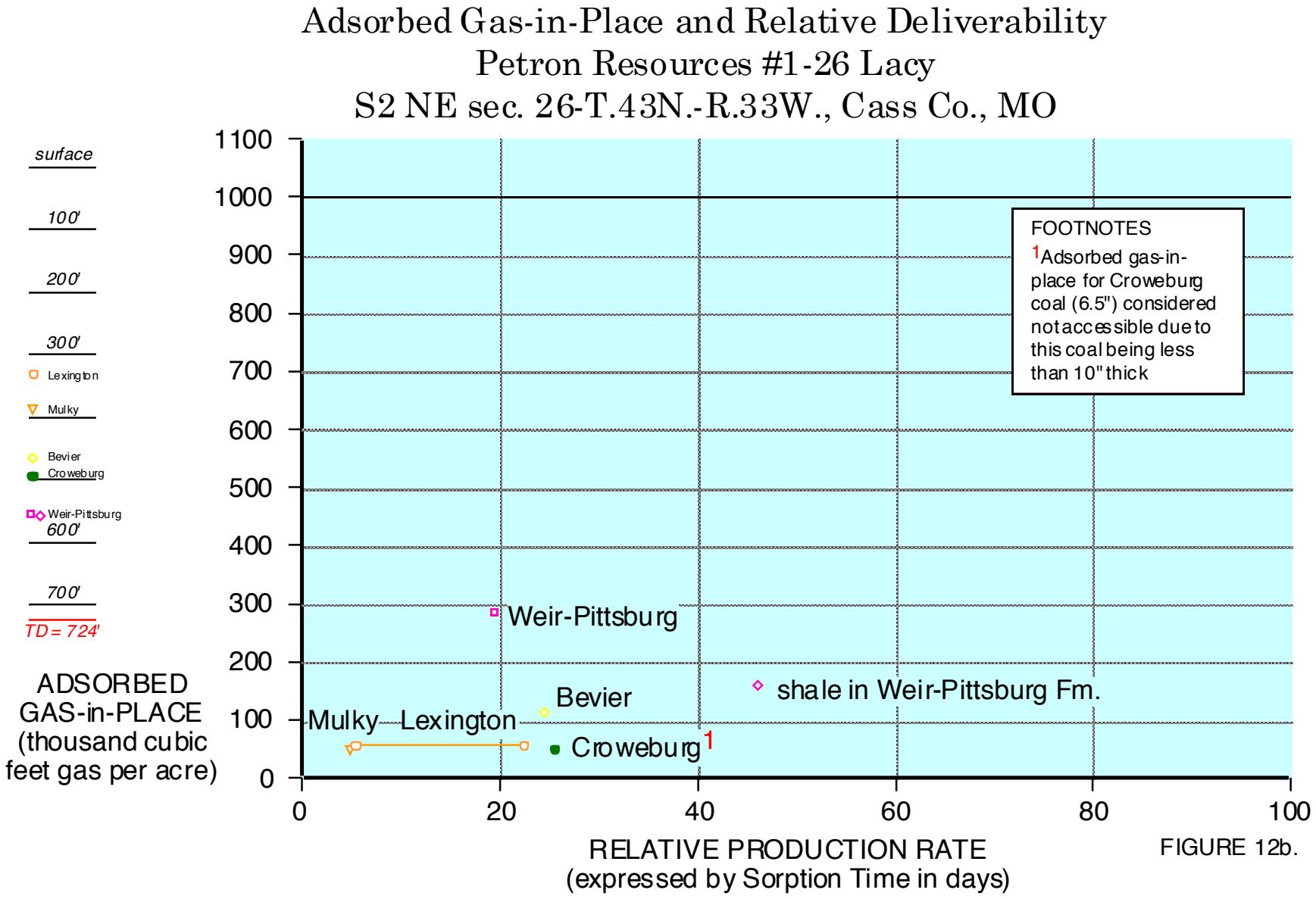


FIGURE 12b.

FIGURE 12b. Sorption times and adsorbed gas-in-place for #1-26 Lacy well.

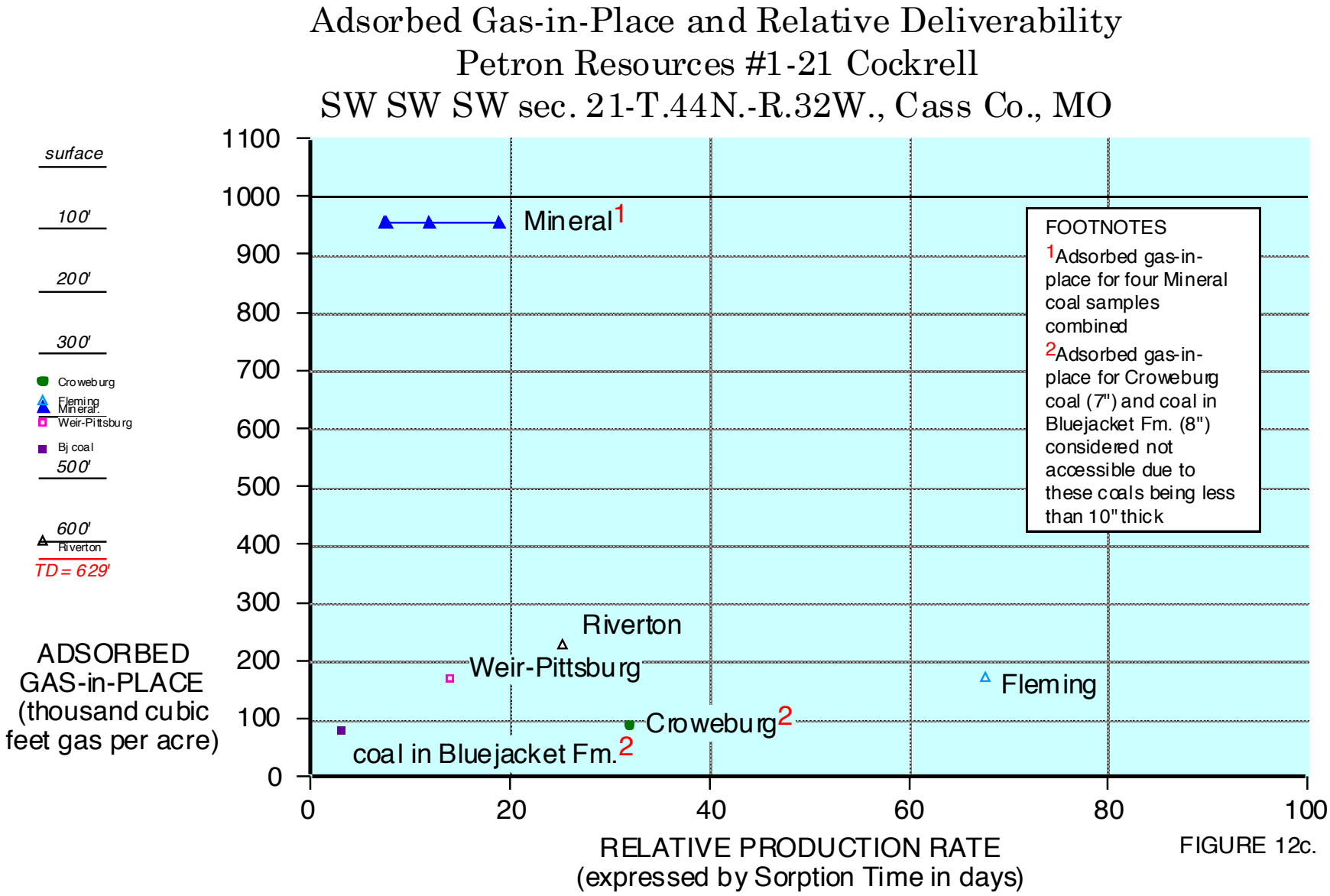


FIGURE 12c.

FIGURE 12c. Sorption times and adsorbed gas-in-place for #1-21 Cockrell well.

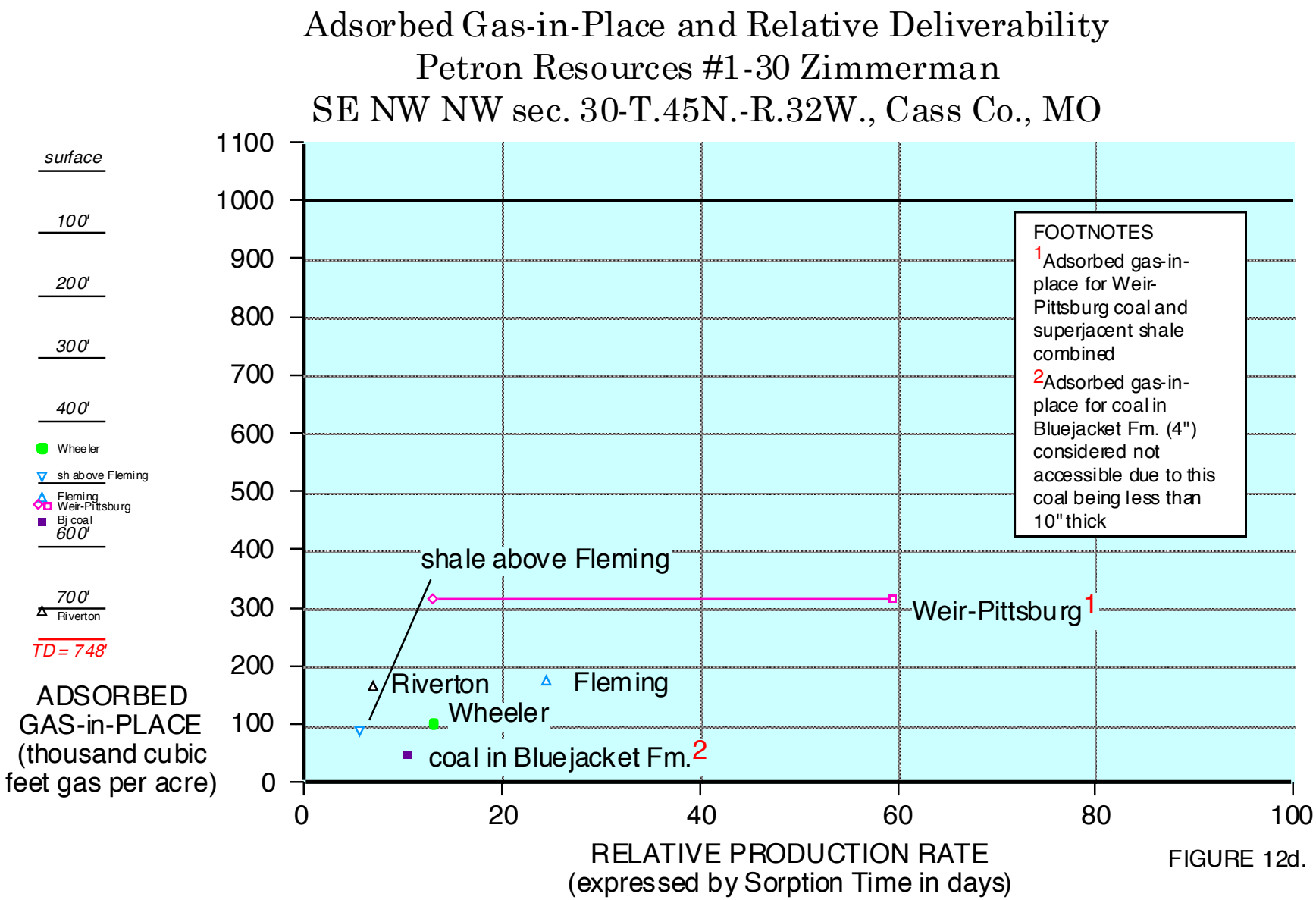


FIGURE 12d.

FIGURE 12d. Sorption times and adsorbed gas-in-place for #1-30 Zimmerman well.

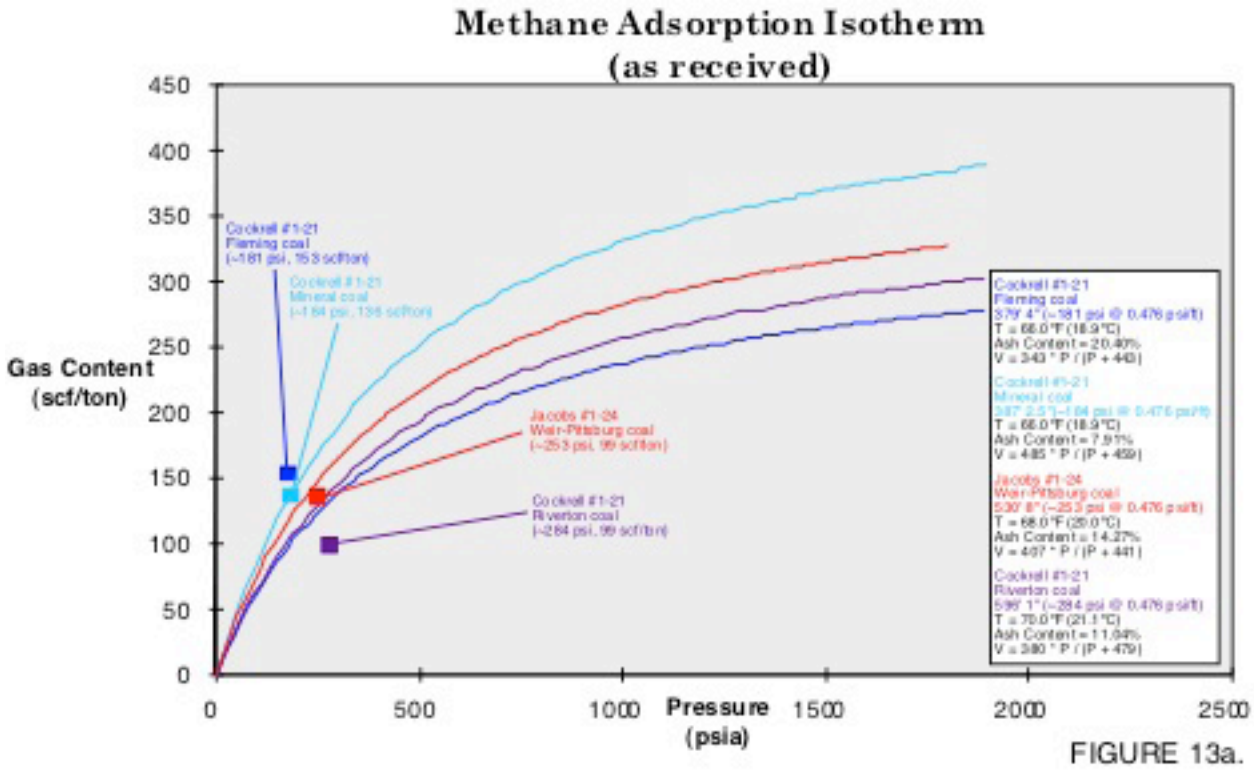


FIGURE 13a.

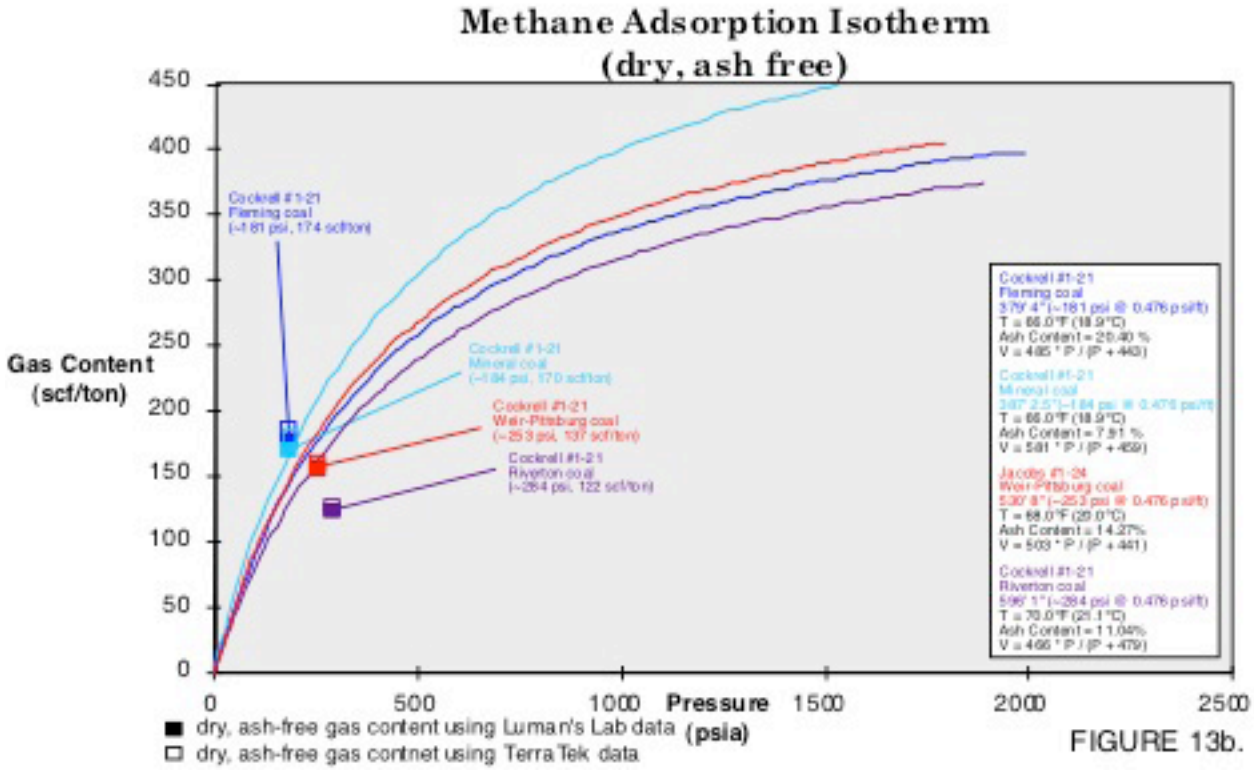


FIGURE 13b.

FIGURE 13a. Isotherms for four coals (Fleming, Mineral, Weir-Pittsburg, and Riverton), as-received basis.
FIGURE 13b. Isotherms for four coals (Fleming, Mineral, Weir-Pittsburg, and Riverton), moisture, ash-free basis.

RESULTS AND DISCUSSION

Coals in the four Petron wells were encountered between 268' and 705' depth. In this part of the Bourbon arch, regional dip is to the northwest at 10 to 20 ft per mile (Johnson, 2004). The southernmost well (#1-24 Jacobs) and the northernmost well (#1-30 Zimmerman) are separated by 24 miles distance (almost due north-south). Basement between these two wells dropped by 90 ft, which indicates a northward dip component of 3.75 feet per mile.

These coals encountered averaged 1 to 2 feet in thickness. The Mineral coal in the #1-21 Cockrell well, by virtue of its gas content (~105 scf/ton) and thickness (~4 1/2'), holds the greatest adsorbed gas-in-place per acre of all the coals encountered in the four Petron core holes drilled in late summer and fall 2007 in western Missouri. Weir-Pittsburg and Riverton coals also hold substantial adsorbed gas. These latter two coals appear to have poorer permeability as evidenced by longer sorption times than the Mineral coal. Dark shales above the Weir-Pittsburg coal may add to the gas it can produce, but other dark shales stratigraphically adjacent to other coals appear to have negligible or little gas that can contribute to gas produced by the coal.

Coals and shales in the region can vary in thickness. No individual coals were present in all four wells cored, thus further mapping will be necessary to anticipate the limit lines of some of the coals before development drilling.

Gas in the coals originated by biogenic and mixed biogenic-thermogenic processes. Most coals are borderline in rank between high-volatile C bituminous and high-volatile B bituminous grades.

Gas quality may be less than 950 BTU/scf (i.e., nominal pipeline quality) in some of the shallower coals in the four wells. Excess nitrogen is the main culprit, but percentages of carbon dioxide in excess of 1% may also dictate that some gas upgrading may be necessary before pipeline-quality gas can be sold.

Comparison of isotherms with gas content of the coals indicate that shallower coals are nearly saturated with respect to their gas. More dewatering of deeper coals may be necessary before these coals start desorbing gas, for they appear to be less saturated in gas content.

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Appendix 1. Notebook descriptions of the cores for the #1-24 Jacobs, #1-26 Lacy, #1-21 Cockrell, and #1-30 Zimmerman wells. Original vertical scale is 10' to 1". Please note that 10' should be added to all depths below 330' in the #1-30 Jacobs descriptions.

Appendix 2. Wellsite photos of core boxes from the #1-24 Jacobs, #1-26 Lacy, #1-21 Cockrell, and #1-30 Zimmerman wells. Please note that 10' should be added to all depths below 330' in the #1-30 Jacobs descriptions.

Appendix 3. Stratigraphic cross section correlating the four Petron core holes and a nearby core hole drilled by Osborn Energy.

Appendix 4. LAS files for the gamma ray log for the four Petron core holes.

Appendix 5. Isotherm reports, from TerraTek, for four coal samples from the Petron core holes. Note that the Weir-Pittsburg coal from the #1-24 Jacobs well is erroneously identified by TerraTek as "Mineral coal."