



# United States Department of the Interior

GEOLOGICAL SURVEY  
RESTON, VA. 22092

January 13, 1993

Larry Brady  
Kansas Geological Survey  
1930 Constant Ave., Campus West  
Lawrence, Kansas 66047

Dear Larry,

Enclosed please find the results of the gas analyses that Dudley performed on your samples and the ultimate and proximate analyses from Geochemical Testing. Because each state had a different set of analyses done on a variety of samples, we will need to talk about how best to represent the data in the final report. I'll play around with presentation of the data from all the states, so please let me know if you have any specific ideas. Also please let me know if you have further problems resulting from the contract situation.

Thank you,

Brenda Pierce

U.S.G.S. ORGANIC GEOCHEMISTRY NATURAL GAS REPORT

*CGS Gas Leak - No isot req*

LABNO	SAMP ID	LOCATION	FNAME	ST	WETNESS	%AIR	%C1	%CO2	%C2	%C3	%iC4	%nC4	%iC5	%nC5	
92100001	MILLER RNCH LEAK	N 1W 67 5	-0-	CO	0.8803	5.54	82.74	0.47	8.7	1.8	0.36	0.29	0.05	0.05	
ADDNL : MILLER RNCH LEAK WATTENBERG							AIR-FREE ANALYSIS :								
DATE OUT: 110292							LAB PREP#: 17200-0-		EST % OTHR PEAKS:		H2S = -0-		HYDROGEN = -0-		

ISOTOPES: 13C1: -0-      13C2: -0-      13C3: -0-      13C CO2: -0-      DEL 34S: -0-      DEL H/D C1: -0-

LABNO	SAMP ID	LOCATION	FNAME	ST	WETNESS	%AIR	%C1	%CO2	%C2	%C3	%iC4	%nC4	%iC5	%nC5	
92100002	1 CARL A MILLER F	N 1W 67 5	-0-	CO	0.823	3.65	77.72	1.91	11.15	3.55	0.85	0.82	0.18	0.17	
ADDNL : PROD GAS WATTENBERG							AIR-FREE ANALYSIS :								
DATE OUT: 110292							LAB PREP#: 17201-0-		EST % OTHR PEAKS:		H2S = -0-		HYDROGEN = -0-		

ISOTOPES: 13C1: -0-      13C2: -0-      13C3: -0-      13C CO2: -0-      DEL 34S: -0-      DEL H/D C1: -0-

LABNO	SAMP ID	LOCATION	FNAME	ST	WETNESS	%AIR	%C1	%CO2	%C2	%C3	%iC4	%nC4	%iC5	%nC5	
92100003	1 MILLER CASING G	N 1W 67 5	-0-	CO	0.8729	2.27	84.15	1.33	9.4	2.	0.38	0.34	0.07	0.06	
ADDNL : CASING GAS WATTENBERG							AIR-FREE ANALYSIS :								
DATE OUT: 110292							LAB PREP#: 17202-0-		EST % OTHR PEAKS:		H2S = -0-		HYDROGEN = -0-		

ISOTOPES: 13C1: -0-      13C2: -0-      13C3: -0-      13C CO2: -0-      DEL 34S: -0-      DEL H/D C1: -0-

LABNO	SAMP ID	LOCATION	FNAME	ST	WETNESS	%AIR	%C1	%CO2	%C2	%C3	%iC4	%nC4	%iC5	%nC5	
92101001	1 GUNNELS	N 44W 3322	LNGN	MO	0.9973	26.7	70.17	2.93	0.19	0.	0.	0.	0.	0.	
ADDNL : CANISTER G-161							AIR-FREE ANALYSIS :								
DATE OUT: 111792							LAB PREP#: 17366-0-		EST % OTHR PEAKS:		H2S = -0-		HYDROGEN = -0-		

ISOTOPES: 13C1: -59.73      13C2: -0-      13C3: -0-      13C CO2: -0-      DEL 34S: -0-      DEL H/D C1: -0-

LABNO	SAMP ID	LOCATION	FNAME	ST	WETNESS	%AIR	%C1	%CO2	%C2	%C3	%iC4	%nC4	%iC5	%nC5	
92101002	1 GUNNELS	N 44W 3322	ROWE	MO	0.9511	81.34	12.46	5.43	0.3	0.34	0.	0.	0.	0.	
ADDNL : -0-							AIR-FREE ANALYSIS :								
DATE OUT: 111792							LAB PREP#: 17367-0-		EST % OTHR PEAKS:		H2S = -0-		HYDROGEN = -0-		

ISOTOPES: 13C1: -58.52      13C2: -0-      13C3: -0-      13C CO2: -0-      DEL 34S: -0-      DEL H/D C1: -0-

LABNO	SAMP ID	LOCATION	FNAME	ST	WETNESS	%AIR	%C1	%CO2	%C2	%C3	%iC4	%nC4	%iC5	%nC5	
92120001	1 EDMONDS KGS WELL	S 9E 2235	UNKN	KS	-0-	99.9	0.	0.	0.	0.	0.	0.	0.	0.	
ADDNL : 2							AIR-FREE ANALYSIS :								
DATE OUT: 111792							LAB PREP#: 17234-0-		EST % OTHR PEAKS:		H2S = -0-		HYDROGEN = -0-		

ISOTOPES: 13C1: INSUF      13C2: -0-      13C3: -0-      13C CO2: -0-      DEL 34S: -0-      DEL H/D C1: -0-

LABNO	SAMP ID	LOCATION	FNAME	ST	WETNESS	%AIR	%C1	%CO2	%C2	%C3	%iC4	%nC4	%iC5	%nC5	
92120002	1 EDMONDS KGS WELL	S 9E 2235	BVIR	KS	-0-	99.9	0.	0.	0.	0.	0.	0.	0.	0.	
ADDNL : 3							AIR-FREE ANALYSIS :								
DATE OUT: 111792							LAB PREP#: 17235-0-		EST % OTHR PEAKS:		H2S = -0-		HYDROGEN = -0-		

ISOTOPES: 13C1: -46.13      13C2: -0-      13C3: -0-      13C CO2: -0-      DEL 34S: -0-      DEL H/D C1: -0-

*CGS well*

LABNO SAMP ID LOCATION FNAME ST WETNESS %AIR %C1 %CO2 %C2 %C3 %iC4 %nC4 %iC5 %nC5  
92120003 1 EDMONDS KGS WELL S 9E 2235 SCMN KS -0- 99.9 0. 0. 0. 0. 0. 0. 0.  
ADDNL : 6 AIR-FREE ANALYSIS : 0. 0. 0. 0. 0. 0.  
DATE OUT: 111992 LAB PREP#: 17403-0- EST % OTHR PEAKS: H2S = -0- HYDROGEN = -0-

ISOTOPES: 13C1: INSUF 13C2: -0- 13C3: -0- 13C CO2: -0- DEL 34S: -0- DEL H/D C1: -0-

LABNO SAMP ID LOCATION FNAME ST WETNESS %AIR %C1 %CO2 %C2 %C3 %iC4 %nC4 %iC5 %nC5  
92120004 1 EDMONDS KGS WELL S 9E 2235 TEBO KS -0- 99.9 0. 0. 0. 0. 0. 0. 0.  
ADDNL : 7 AIR-FREE ANALYSIS : 0. 0. 0. 0. 0. 0.  
DATE OUT: 111992 LAB PREP#: 17404-0- EST % OTHR PEAKS: H2S = -0- HYDROGEN = -0-

ISOTOPES: 13C1: INSUF 13C2: -0- 13C3: -0- 13C CO2: -0- DEL 34S: -0- DEL H/D C1: -0-

LABNO SAMP ID LOCATION FNAME ST WETNESS %AIR %C1 %CO2 %C2 %C3 %iC4 %nC4 %iC5 %nC5  
92120005 1 EDMONDS KGS WELL S 9E 2235 UNKN KS -0- 99.9 0. 0. 0. 0. 0. 0. 0.  
ADDNL : 9 AIR-FREE ANALYSIS : 0. 0. 0. 0. 0. 0.  
DATE OUT: 111992 LAB PREP#: 17405-0- EST % OTHR PEAKS: H2S = -0- HYDROGEN = -0-

ISOTOPES: 13C1: INSUF 13C2: -0- 13C3: -0- 13C CO2: -0- DEL 34S: -0- DEL H/D C1: -0-

LABNO SAMP ID LOCATION FNAME ST WETNESS %AIR %C1 %CO2 %C2 %C3 %iC4 %nC4 %iC5 %nC5  
92120006 1 EDMONDS KGS WELL S 9E 2235 BVIR KS -0- 99.9 0. 0. 0. 0. 0. 0. 0.  
ADDNL : 10 AIR-FREE ANALYSIS : 0. 0. 0. 0. 0. 0.  
DATE OUT: 111992 LAB PREP#: 17406-0- EST % OTHR PEAKS: H2S = -0- HYDROGEN = -0-

ISOTOPES: 13C1: INSUF 13C2: -0- 13C3: -0- 13C CO2: -0- DEL 34S: -0- DEL H/D C1: -0-

LABNO SAMP ID LOCATION FNAME ST WETNESS %AIR %C1 %CO2 %C2 %C3 %iC4 %nC4 %iC5 %nC5  
92120007 1 EDMONDS KGS WELL S 9E 2235 MNRL KS -0- 99.9 0. 0. 0. 0. 0. 0. 0.  
ADDNL : 11 AIR-FREE ANALYSIS : 0. 0. 0. 0. 0. 0.  
DATE OUT: 111992 LAB PREP#: 17407-0- EST % OTHR PEAKS: H2S = -0- HYDROGEN = -0-

ISOTOPES: 13C1: INSUF 13C2: -0- 13C3: -0- 13C CO2: -0- DEL 34S: -0- DEL H/D C1: -0-

LABNO SAMP ID LOCATION FNAME ST WETNESS %AIR %C1 %CO2 %C2 %C3 %iC4 %nC4 %iC5 %nC5  
92120008 1 EDMONDS KGS WELL S 9E 2235 UNKN KS -0- 99.9 0. 0. 0. 0. 0. 0. 0.  
ADDNL : 16 AIR-FREE ANALYSIS : 0. 0. 0. 0. 0. 0.  
DATE OUT: 111792 LAB PREP#: 17236-0- EST % OTHR PEAKS: H2S = -0- HYDROGEN = -0-

ISOTOPES: 13C1: INSUF 13C2: -0- 13C3: -0- 13C CO2: -0- DEL 34S: -0- DEL H/D C1: -0-

LABNO SAMP ID LOCATION FNAME ST WETNESS %AIR %C1 %CO2 %C2 %C3 %iC4 %nC4 %iC5 %nC5  
92120009 1 EDMONDS KGS WELL S 9E 2235 MNRL KS 0.8756 82.05 13.79 2.29 1.96 0. 0. 0. 0.  
ADDNL : 4+5 = 4 AIR-FREE ANALYSIS : 76.82 12.8 10.9 0. 0. 0. 0.  
DATE OUT: 111792 LAB PREP#: 17237-0- EST % OTHR PEAKS: H2S = -0- HYDROGEN = -0-

ISOTOPES: 13C1: INSUF 13C2: -0- 13C3: -0- 13C CO2: -0- DEL 34S: -0- DEL H/D C1: -0-

LABNO SAMP ID LOCATION FNAME ST WETNESS %AIR %C1 %CO2 %C2 %C3 %iC4 %nC4 %iC5 %nC5  
92120010 1 EDMONDS KGS WELL S 9E 2235 TEBO KS -0- 99.9 0. 0. 0. 0. 0. 0. 0.  
ADDNL : 8 AIR-FREE ANALYSIS : 0. 0. 0. 0. 0. 0.  
DATE OUT: 111792 LAB PREP#: 17238-0- EST % OTHR PEAKS: H2S = -0- HYDROGEN = -0-

ISOTOPES: 13C1: INSUF 13C2: -0- 13C3: -0- 13C CO2: -0- DEL 34S: -0- DEL H/D C1: -0-

LABNO SAMP ID LOCATION FNAME ST WETNESS %AIR %C1 %CO2 %C2 %C3 %iC4 %nC4 %iC5 %nC5  
92120011 1 EDMONDS KGS WELL S 9E 2235 TEBO KS -0- 99.9 0. 0. 0. 0. 0. 0. 0.  
ADDNL : 15 AIR-FREE ANALYSIS : 0. 0. 0. 0. 0. 0. 0.  
DATE OUT: 111992 LAB PREP#: 17408-0- EST % OTHR PEAKS: H2S = -0- HYDROGEN = -0-

ISOTOPEs: 13C1: -46.18 13C2: -0- 13C3: -0- 13C CO2: -0- DEL 34S: -0- DEL H/D C1: -0-

LABNO SAMP ID LOCATION FNAME ST WETNESS %AIR %C1 %CO2 %C2 %C3 %iC4 %nC4 %iC5 %nC5  
92120011 1 EDMONDS KGS WELL S 9E 2235 TEBO KS 0.9608 89.48 7.6 1.28 0.31 0. 0. 0. 0. 0.  
ADDNL : 15 AIR-FREE ANALYSIS : 72.24 12.2 2.95 0. 0. 0. 0.  
DATE OUT: 111792 LAB PREP#: 17245estimate EST % OTHR PEAKS: H2S = -0- HYDROGEN = -0-

ISOTOPEs: 13C1: -46.18 13C2: -0- 13C3: -0- 13C CO2: -0- DEL 34S: -0- DEL H/D C1: -0-

LABNO SAMP ID LOCATION FNAME ST WETNESS %AIR %C1 %CO2 %C2 %C3 %iC4 %nC4 %iC5 %nC5  
92120012 1 EDMONDS KGS WELL S 9E 2235 UNKN KS 0.9899 62.2 35.19 2.42 0.16 0.2 0. 0. 0. 0.  
ADDNL : 17 AIR-FREE ANALYSIS : 93.1 6.4 0.42 0.53 0. 0. 0. 0.  
DATE OUT: 111792 LAB PREP#: 17360-0- EST % OTHR PEAKS: H2S = -0- HYDROGEN = -0-

ISOTOPEs: 13C1: INSUF 13C2: -0- 13C3: -0- 13C CO2: -0- DEL 34S: -0- DEL H/D C1: -0-

LABNO SAMP ID LOCATION FNAME ST WETNESS %AIR %C1 %CO2 %C2 %C3 %iC4 %nC4 %iC5 %nC5  
92120013 1 EDMONDS KGS WELL S 9E 2235 RVRN KS 0.9929 59.56 39.26 0.86 0.28 0. 0. 0. 0. 0.  
ADDNL : 18 AIR-FREE ANALYSIS : 97.08 2.13 0.69 0. 0. 0. 0.  
DATE OUT: 111792 LAB PREP#: 17361-0- EST % OTHR PEAKS: H2S = -0- HYDROGEN = -0-

ISOTOPEs: 13C1: -59.39 13C2: -0- 13C3: -0- 13C CO2: -0- DEL 34S: -0- DEL H/D C1: -0-

LABNO SAMP ID LOCATION FNAME ST WETNESS %AIR %C1 %CO2 %C2 %C3 %iC4 %nC4 %iC5 %nC5  
92120014 1 EDMONDS KGS WELL S 9E 2235 RVRN KS 0.9921 67.37 31.48 0.88 0.25 0. 0. 0. 0. 0.  
ADDNL : 19 AIR-FREE ANALYSIS : 96.48 2.7 0.77 0. 0. 0. 0.  
DATE OUT: 111792 LAB PREP#: 17362-0- EST % OTHR PEAKS: H2S = -0- HYDROGEN = -0-

ISOTOPEs: 13C1: -59.14 13C2: -0- 13C3: -0- 13C CO2: -0- DEL 34S: -0- DEL H/D C1: -0-

LABNO SAMP ID LOCATION FNAME ST WETNESS %AIR %C1 %CO2 %C2 %C3 %iC4 %nC4 %iC5 %nC5  
92120015 1 EDMONDS KGS WELL S 9E 2235 UNKN KS 0.9919 80.81 15.86 3.19 0.13 0. 0. 0. 0. 0.  
ADDNL : 21 AIR-FREE ANALYSIS : 82.65 15.6 0.68 0. 0. 0. 0.  
DATE OUT: 111792 LAB PREP#: 17363-0- EST % OTHR PEAKS: H2S = -0- HYDROGEN = -0-

ISOTOPEs: 13C1: -46.17 13C2: -0- 13C3: -0- 13C CO2: -0- DEL 34S: -0- DEL H/D C1: -0-

LABNO SAMP ID LOCATION FNAME ST WETNESS %AIR %C1 %CO2 %C2 %C3 %iC4 %nC4 %iC5 %nC5  
92120016 1 EDMONDS KGS WELL S 9E 2235 UNKN KS 0.9918 80.16 16.93 2.76 0.14 0. 0. 0. 0. 0.  
ADDNL : 22 AIR-FREE ANALYSIS : 85.33 13.9 0.71 0. 0. 0. 0.  
DATE OUT: 111792 LAB PREP#: 17364-0- EST % OTHR PEAKS: H2S = -0- HYDROGEN = -0-

ISOTOPEs: 13C1: -47.28 13C2: -0- 13C3: -0- 13C CO2: -0- DEL 34S: -0- DEL H/D C1: -0-

Rock Eval work  
From D. Rice

# Kansas coals

✓  
PROJECT #92-134

SAMPLE #	DEPTH	SAMPLE WT	T MAX	S1 MG/GM	S2 MG/GM	S3 MG/GM	PI	S2/S3	PC	TOC	HI	OI
92134001	835.9	7.6	442	5.78	261.05	3.28	0.02	79.58	22.23	68.69	380	4
92134002	873.5	7.7	442	2.59	142.33	5.58	0.02	25.5	12.07	53.01	268	10
92134003	757	8.1	442	1.23	116.54	5.55	0.01	20.99	9.81	61.5	189	9
92134004	800.8	7.7	443	4.28	286.75	4.54	0.01	63.16	24.25	77.99	367	5
92134005	875.4	7.6	454	2.36	157.89	8.02	0.01	19.68	13.35	59	267	13
92134006	936.2											
92134007	998.9	6.9	440	1.44	322.31	7.68	0	41.97	26.97	76.84	419	10
92134008	1055.3	6.9	467	0.43	324.63	10.28	0	31.57	27.08	74.19	437	13
92134009	1056.4	6.6	445	5.15	290.9	8.48	0.02	34.3	24.67	70.99	409	11
92134010	1075.2	7	447	3.14	203.42	11.14	0.02	18.26	17.21	71.77	283	15
92134011	1157.5	7.9	445	0.75	336.2	6.45	0	52.12	28.07	79.86	420	8

Sample #	Coalbed	Depth top of Sample (ft)	Lost Gas (cc)	Desorbed Gas (cc)	Wt. Sample (g)	Gas Content (cc/gm)	Measured Residual Gas (cc)	Time Measure Residual (days)	Lost + Desorb Gas (cf/ton)	Ash (wt %)	Moisture Content (wt %)	Normalized Gas Content (cf/ton)
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)
9	unnamed	757	29	305	610	.548	57	210	18	18.48	5.6	21
4*	Mineral	836	30	563	922	.643	108	312	21	15.21	7.0	26
8*	Tebo	874	20	701	795	.907	225	285	29	14.79	5.6	34
15	Tebo	875	43	492	676	.791	175	210	25	20.32	5.3	32
17	unnamed	999	75	1043	829	1.349	122	145	43	15.88	3.6	51
18	Riverton	1055	100	1364	641	2.284	177	145	73	8.44	3.4	80
19	Riverton	1056	95	1348	557	2.591	164	145	83	11.97	6.2	94
21	unnamed	1075	58	588	312	2.071	148	206	66	14.25	5.2	77
22	unnamed	1158	80	523	296	2.037	61	166	65	23.96	3.9	86

\* Samples collected from KGS Edmonds #1. The rest of the samples are from KGS Edmonds #1A.