

OILFIELD RESEARCH, INC.

1204 FIRST AVENUE • EVANSVILLE, INDIANA 47710 • TELEPHONE 424-2907 (DAY OR NIGHT)

WALDO, OHIO

October 30, 1975

Columbia Gas Transmission Corp.
P. O. Box 1273
Charleston, West Virginia 25325

IN RE: Caldwell Colton Mineral Lease
Well No. 20289-T
Wayne County, West Virginia

ATTN: Mr. Sherwood Spencer

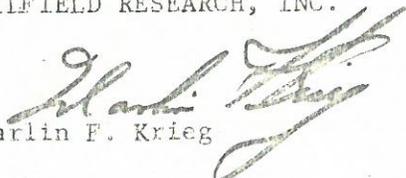
Gentlemen:

The Corniferous formation was diamond cored in the subject well. Twenty samples representing 26.8 feet from the interval 3840.0 - 3866.8 feet were analyzed in our Ohio laboratory. These samples were analyzed using whole core techniques and the enclosed tabulation presents the results.

It should be noted that the measured permeability of certain samples was due to horizontal fractures and/or to weak bedding planes. Weighed averages for specific portions of the core are given on the enclosed tabulation. If there are any questions regarding these laboratory measurements, please call at your convenience.

Very truly yours,

OILFIELD RESEARCH, INC.


Marlin F. Krieg

MFK:csr

6C: Addressee



C O R E A N A L Y S I S



OILFIELD RESEARCH, INC.

WHOLE CORE ANALYSIS REPORT

Company Columbia Gas Transmission Corp. Elevation 768 GL File No. 75010035
 Lease Caldwell Colton Mineral Well 20289-T Formation Corniferous Date Cored _____
 Field _____ Drig. Fluid _____ Date Report 10/30/75
 County Wayne State W. Va. Type Of Core Diamond Permit No. _____
 Location _____ Remarks Sampled by Client

LITHOLOGICAL ABBREVIATIONS

SAND-SD	DOLOMITE-DOL	ANHYDRITE-ANHY	SANDY-SOY	FINE-FN	CRYSTALLINE-XLN	BROWN-BRN	FRACTURED-FRAC	SLIGHTLY-SL/
SHALE-SH	CHERT-CH	CONGLOMERATE-CONG	SHALEY-SHY	MEDIUM-MED	GRAIN-GRN	GRAY-GY	LAMINATION-LAM	VERY-V/
LIME-LM	GYPSUM-GYP	FOSSILIFEROUS-FOSS	LIMEY-LMY	COARSE-CSE	GRANULAR-GRNL	VUGGY-VGY	STYLOLITIC-STY	WITH-W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCS		POROSITY PERCENT	LITHOLOGY AND REMARKS
		HORIZONTAL			
		MAX.	90°		

BASAL CORNIFEROUS

Bulk Wet Density

Sample No.	Depth (ft)	Permeability (Max)	Permeability (90°)	Porosity (%)	Bulk Wet Density	Lithology and Remarks	
1	3840.0-41.0	32.	31.	0.19	4.2	2.80	Horz frags & vugs
2	3841.0-42.2	33.	25.	0.19	4.0	2.74	" " "
3	3842.2-43.8	<i>gas</i> 2.7	2.2	0.27	3.8	2.78	" " "
4	3843.8-45.0	19.	17.	0.14	4.4	2.76	Horz frags & bedding pl.
5	3845.0-46.3	12.	6.0	0.13	3.2	2.79	" "
6	3846.3-47.8	14.	11.	0.15	3.0	2.81	" "
7	3847.8-49.0	14.	9.0	<0.10	2.4	2.87	" "
8	3849.0-50.5	<0.10	<0.10	<0.10	1.8	2.87	
9	3850.5-52.2	<0.10	<0.10	<0.10	1.1	2.72	
10	3852.2-53.9	<0.10	<0.10	<0.10	1.1	2.79	
11	3853.9-55.2	<0.10	<0.10	<0.10	1.7	2.76	
12	3855.2-56.8	5.4	1.5	0.10	2.4	2.72	Horz. frags & bedding pl.
13	3856.8-58.3	19.	16.	<0.10	3.5	2.69	" " " "
14	3858.3-59.8	29.	29.	<0.10	4.4	2.69	" " " "
15	3859.8-60.8	<i>gas</i> 27.	24.	0.22	5.4	2.61	" " " "
16	3860.8-62.0	29.	24.	<0.10	3.2	2.67	" " " "
17	3862.0-63.3	<0.10	<0.10	<0.10	2.9	2.71	
18	3863.3-65.0	<0.10	<0.10	<0.10	1.8	2.67	
19	3865.0-66.4	<0.10	<0.10	<0.10	2.3	2.69	
20	3866.4-66.8	<0.10	<0.10	<0.10	2.5	2.69	

AVERAGES

3840.0-49.0	17.	13.	0.16	3.6	2.79	(9.0')
3855.2-62.0	21.	18.	<0.10	3.7	2.68	(6.8')

*calcite
dolomite
quartz*

*2.71
2.85
2.65*



this - 800' off - 6181 *Wayne 1581*
Wayne 465
DOWELL DIVISION OF THE DOW CHEMICAL COMPANY

LABORATORY REPORT

Columbia Gas Transmission
 Caldwell-Cotton Mineral 20,2nd 9T
 Wayne, West Virginia

DATE: 11/6/75

LAB LOCATION: Newark

TYPE OF SAMPLE: Core

LAB NO. EL 4605

DESCRIPTION: There were 2^o samples from 3840' to 3867' S. NO. 44364

Analysis of the sample to determine solubility in 15X was requested.

Acid Solubility Tests

The solubility of the samples was determined by the gravimetric method. This method determines the maximum solubility of the sample in excess acid. The difference between the 15X and Mud Acid solubilities represents the approximate silicate content in the sample.

<u>Sample Depth(ft)</u>	<u>Percent Soluble in 15X</u>	<u>Mud Acid</u>
3840	94.6	-
3841	95.2	95.7
3842	95.1	-
3843	98.0	-
3844	89.9	90.3
3845	93.9	95.4
3846	95.5	-
3847	99.3	-
3848	94.1	-
3849	89.3	91.2
3850	81.9	83.0
3851	64.4	66.7
3852	57.1	62.1
3853	79.4	83.2
3854	66.0	70.3
3855	54.3	57.5
3856	68.9	71.1
3857	76.9	78.8
3858	58.8	60.9
3859	56.4	57.7

gas zone

gas ?

clays

DISTRIBUTION:

J. L. Norton, G. P. Boland, S. J. Siers, L. C. Taylor, C. M. Stout,
 F. C. Berger and Tulsa Lab.

Columbia Gas Transmission
Lab No. EL 4605
Page 2
November 6, 1975

<u>Sample Depth (ft)</u>	<u>Percent Soluble in 15X</u>	<u>Mud Acid</u>
3860	26.2	28.5
3861	44.4	46.3
3862	19.2	23.0
3863	31.2	40.9
3864	23.6	27.4
3865	16.1	28.1
3866	34.2	40.1
3867	40.7	44.4

There were small pockets of crystalline CaCO_3 at depths 3848, 3849, 3855 and 3856.

J. A. Bieberbach

J. A. Bieberbach

JAB/mk

DOWELL

3 BOXES

OILFIELD RESEARCH, INC.

WHOLE CORE DATA SHEET

COMPANY COLUMBIA GAS TRANS ELEVATION _____ DATE CORED _____
 LEASE CALDWELL - Cotton Acreage WELL 20,289-T FORMATION BASAL CORNIFEROS DATE REPORT _____
 FIELD _____ DRIG. FLUID _____
 COUNTY WAYNE STATE W. VA TYPE OF CORE 3 1/2 DIA
 LOCATION _____ REMARKS _____

BULK WET
DENSITY

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY		POROSITY %	RESIDUAL LIQUID SATURATION % PORE SPACE		CORE DESCRIPTION	
		HORIZONTAL	VERTICAL		OIL	WATER		
		MAX.	90°					
1	3840-4110	32	31	119	4.2		2.80	HORIZ FR - 4105
2	4212	33	25	119	4.0		2.79	" "
3	4318	2.2	2.7	127	3.8		2.78	" "
4	4510	19	17	114	4.4		2.76	" BEDDING PLACES
5	4623	12	6.0	113	3.2		2.79	" "
6	4718	14	11	115	3.0		2.81	" "
7	4910	18	9.0	101	2.4		2.87	" "
8	5015	10.1	10.1	10.1	1.8		2.87	
9	5212	10.1	10.1	10.1	1.1		2.72	
10	5319	10.1	10.1	10.1	1.1		2.79	
11	5512	10.1	10.1	10.1	1.7		2.76	
12	5618	3.4	1.5	10	2.9		2.72	HORIZ FR & BEDDING PLACES
13	5813	19	16	107	3.5		2.69	" "
14	5918	29	29	107	4.4		2.69	" "
15	6018	27	24	132	5.4		2.61	" "
16	6210	29	24	10.1	3.2		3.67	" "
17	6313	10.1	10.1	10.1	2.9		2.71	
18	6510	10.1	10.1	10.1	1.8		2.67	
19	6614	10.1	10.1	10.1	2.3		2.69	
20	6675	10.1	10.1	10.1	2.5		2.69	