

COLUMBIA ET AL KOTANEELEE YT B-38 (H-38)

AOF WELL TEST

COLUMBIA ET AL KOTANEELEE

YT B-38

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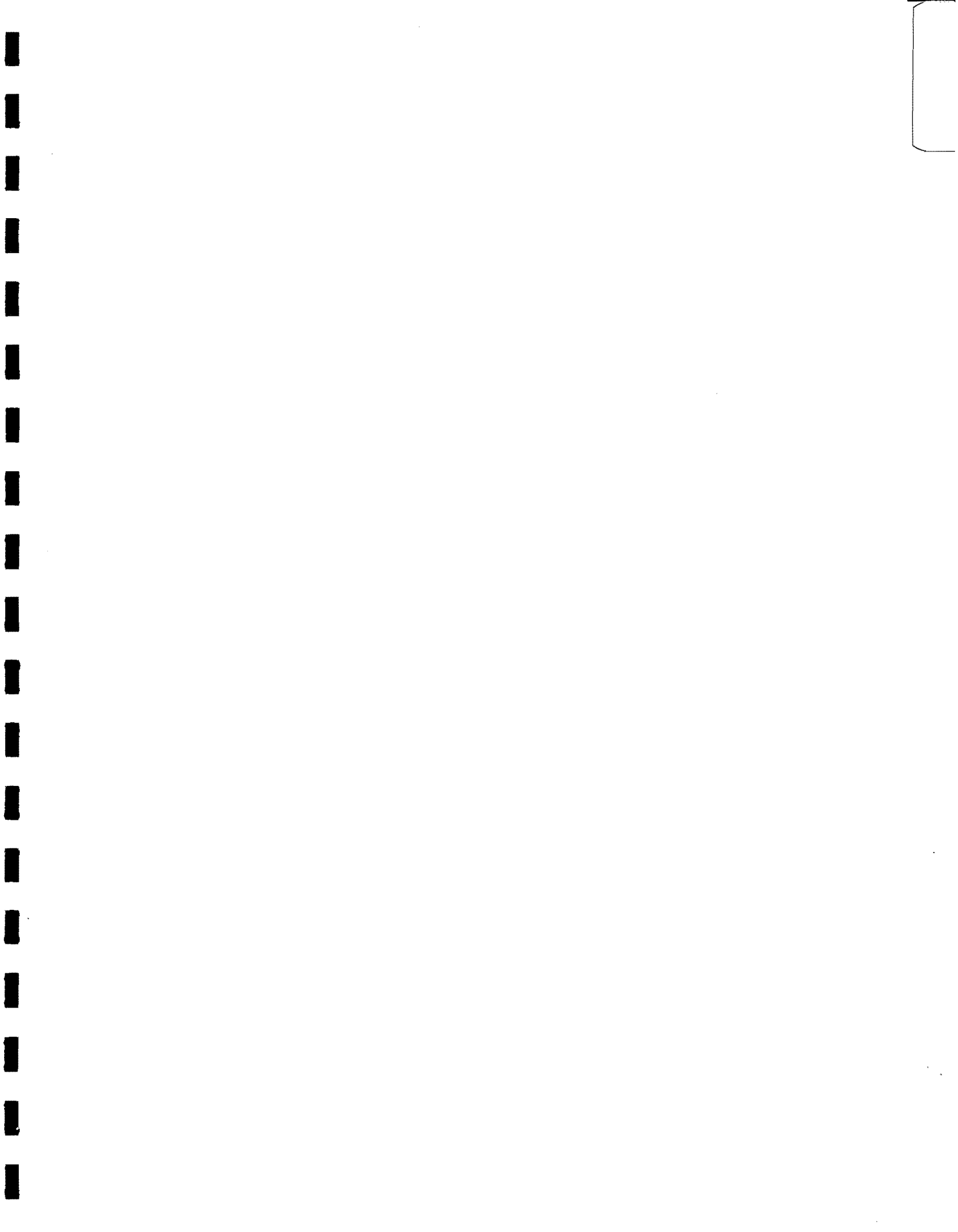
SUMMARY

Columbia et al Kotaneelee YT B-38

The producing Nahanni formation of this well was tested for AOF potential during the month of June, 1980. The modified isochronal test procedure was used to obtain the AOF potential of this well. The following results were obtained from the test data:

1. Shut in reservoir pressure 38 735 kPa (5618 psia).
2. Shut in wellhead pressure 31 199 kPa (4525 psia).
3. The sandface AOF at stable conditions is 7483.0 E3M3 (265.6 MMcfd).
4. The wellhead AOF at stable conditions is 2712.0 E3M3 (96.3 MMcfd).
5. The "N" was calculated to be 0.500 for wellhead and 0.529 for the sandface AOF.
6. The sandface "C" was calculated to be 0.103799 E3M3/kPa² (0.2845 E-01 MMcfd/psia²).
7. The wellhead "C" was calculated to be 0.868975 E-01 E3M3/kPa² (0.2218 E-01 MMcfd/psia²).

The method of testing, assumptions, calculations, plot of sandface and wellhead AOF, wellhead deliverability and all test data are in the following sections.



TEST PROCEDURE

During the month of June, 1980, an AOF test was conducted on the producing formation (Nahanni) of the Columbia et al Kotaneelee YT B-38 well, after the well had been stimulated. A modified isochronal procedure was used to obtain the AOF potential.

The bottom hole pressures were measured with bottom hole pressure recorders and surface measurements were made with a dead weight tester.

A separator was installed on the flow line and the well was produced in four hour intervals. The well was produced at rates of 1149.5 E3M3 (40.8 MMcfd), 1510.1 E3M3 (53.6 MMcfd) and 1718.6 E3M3 (61.0 MMcfd) for the test. The stabilized flow was obtained at a rate of 1986.3 E3M3 (70.5 MMcfd).

Columbia et al Kotaneelee YT B-38

Metric Units

Gas Well Back Pressure Test Results

Specific Gas Gravity	0.715
Formation Temperature	177 ^o C
Critical Pressure	4585 kPa
Critical Temperature	221 ^o K
H ₂ S Content	2.35 MOL %
CO ₂ Content	12.78 MOL %
Stabilized Wellhead Pressure	31 199 kPa
Stabilized Bottom Hole Pressure	38 735 kPa
Tubing Size	44.3 mm

Gas Rate E3M3	WH °C	WHP Flow kPa	WHP Stat kPa	BHP Flow kPa	BHP Stat kPa	(Pf ² - Ps ²)		(Pc ² - Pw ²)	
						E3	kPa	E3	kPa
1150	89	28599	31178	38121	38638	39693		154145	
1510	107	26462	31530	37790	38652	65881		293882	
1719	110	24476	31475	37507	38624	85036		391555	
1986	121	21243	31199	36990	38611	122494		522109	

Wellhead Coefficients

N = 0.500

C = 0.925791 E-01 E3M3/kPa²

AOF = 2889 E3M3 per day

Sandface Coefficients

N = 0.529

C = 0.109208 E3M3/kPa²

AOF = 7873 E3M3 per day

@ stabilized conditions

N = 0.500

C = 0.868975 E-01 E3M3/kPa²

AOF = 2712 E3M3 per day

N = 0.529

C = 0.103799 E3M3/kPa²

AOF = 7483 E3M3 per day

Columbia et al Kotaneelee YT B-38

English Units

Gas Well Back Pressure Test Results

Specific Gas Gravity	0.715
Formation Temperature	350°F
Critical Pressure	665 psia
Critical Temperature	397°R
H ₂ S Content	2.35 MOL %
CO ₂ Content	12.78 MOL %
Stabilized Wellhead Pressure	4525 psia
Stabilized Bottom Hole Pressure	5618 psia
Tubing Size	4.5" O.D.

Gas Rate MMcfd	WH Temp. °F	WHP Flow psia	WHP Stat psia	BHP Flow psia	BHP Stat psia	(Pf ² - Ps ²) psia ²	(Pc ² - Pw ²) psia ²
40.8	192	4148	4522	5529	5604	834974	3242580
53.6	225	3838	4573	5481	5606	1385874	6182086
61.0	230	3550	4565	5440	5602	1788804	8236726
70.5	250	3081	4525	5365	5600	2576774	10983065

Wellhead Coefficients.

N = 0.500
 C = 0.2266 E-01 MMcf/psia²
 AOF = 102.526 MMcfd

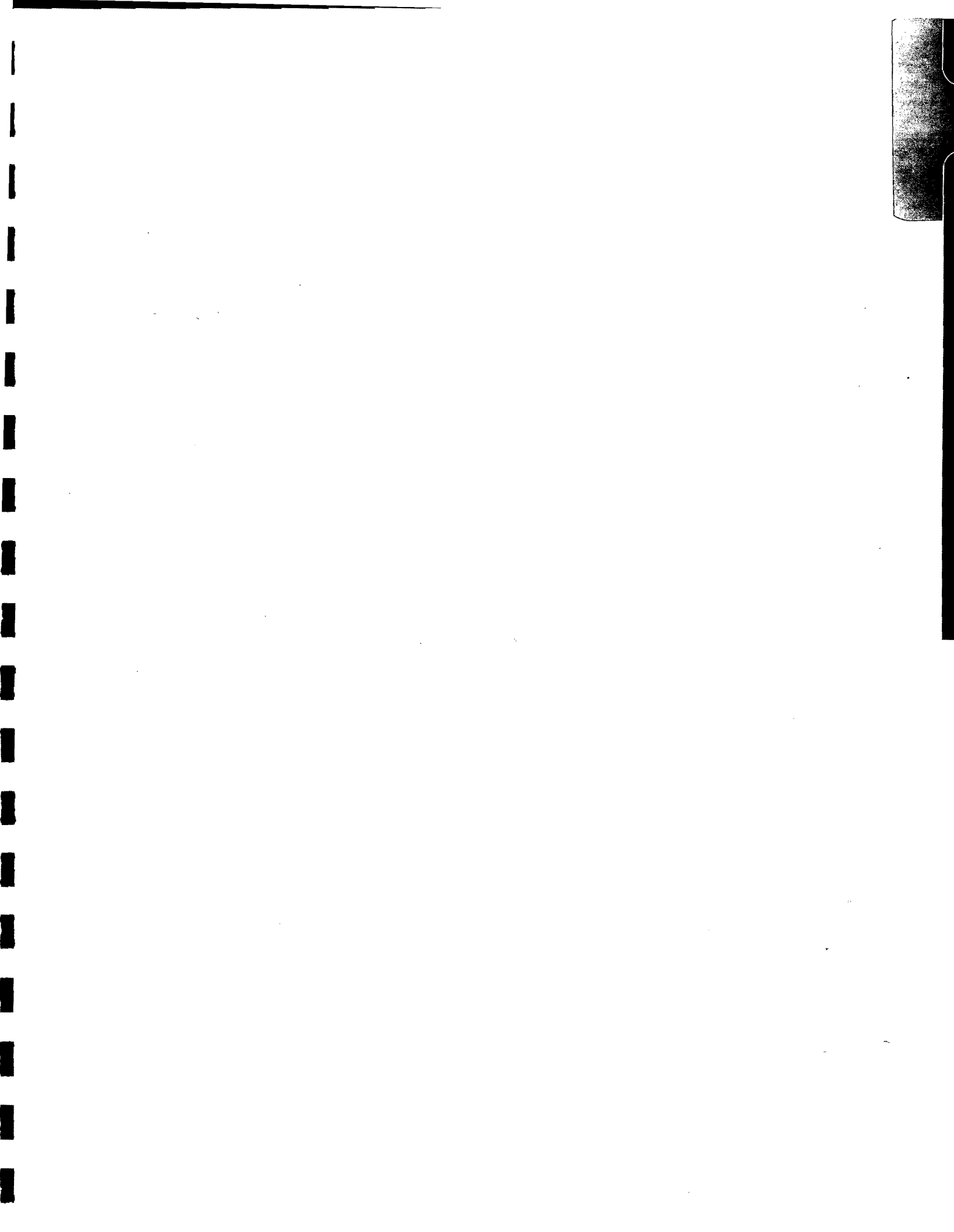
Sandface Coefficients

N = 0.529
 C = 0.2994 E-01 MMcf/psia²
 AOF = 279.444 MMcfd

@ Stabilized Conditions

N = 0.500
 C = 0.2127 E-01 MMcf/psia²
 AOF = 96.260 MMcfd

N = 0.529
 C = 0.2845 E-01 MMcf/psia²
 AOF = 265.601 MMcfd



COLUMBIA et al KOTANEELEE YT B-38 SANDFACE A.O.F.

METRIC UNITS

46 7403

LOGARITHMIC 3 X 3 CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

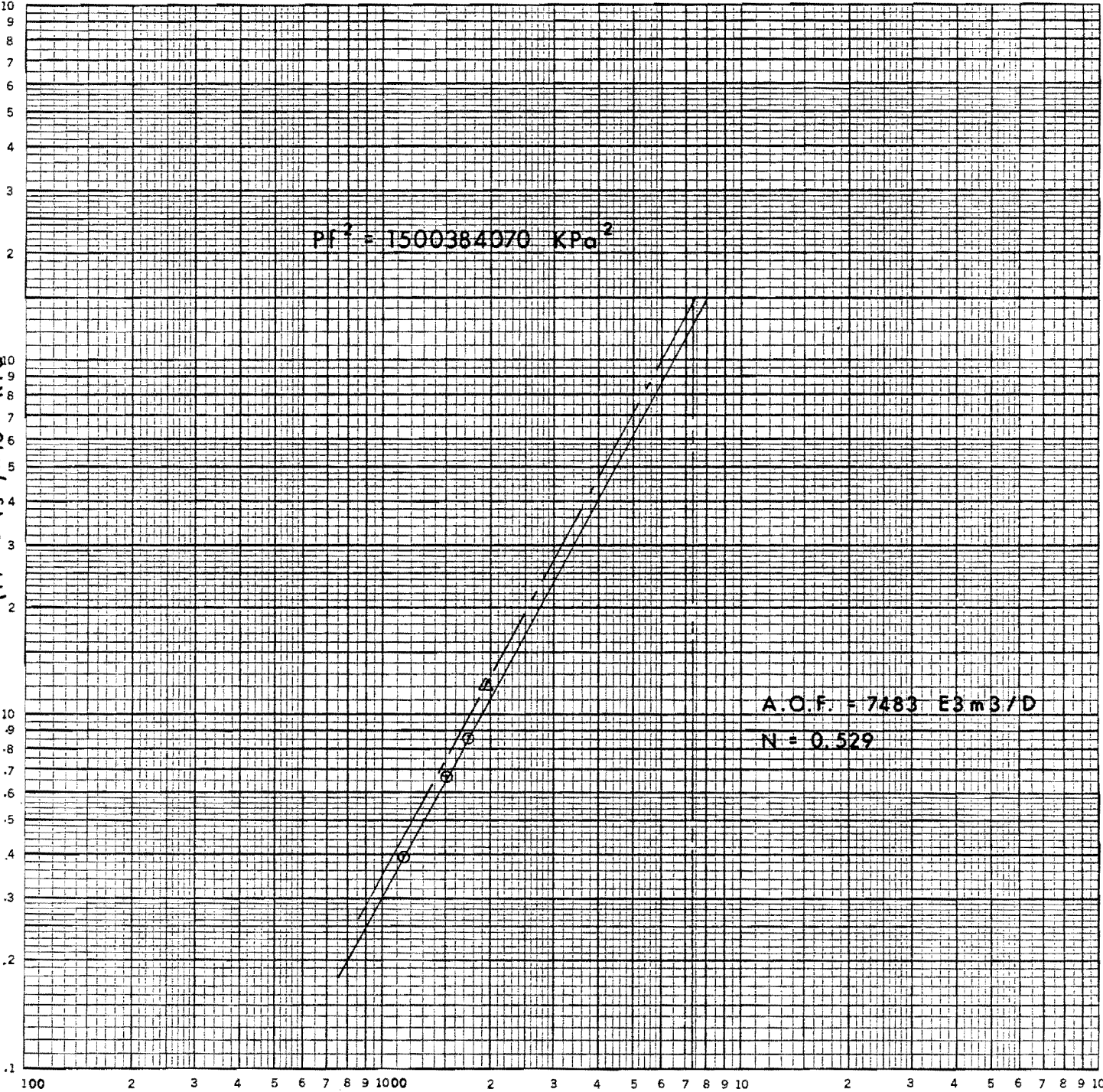
$(Pf^2 - Ps^2) \times 10^8 - KPa$

$Pf^2 = 1500384070 \text{ KPa}^2$

A.O.F. = 7483 E3m3/D

N = 0.529

Q (E3m3/D)



COLUMBIA et al KOTANEELEE YT B38 WELLHEAD A.O.F.

METRIC UNITS

114.3 mm O.D. TUBING

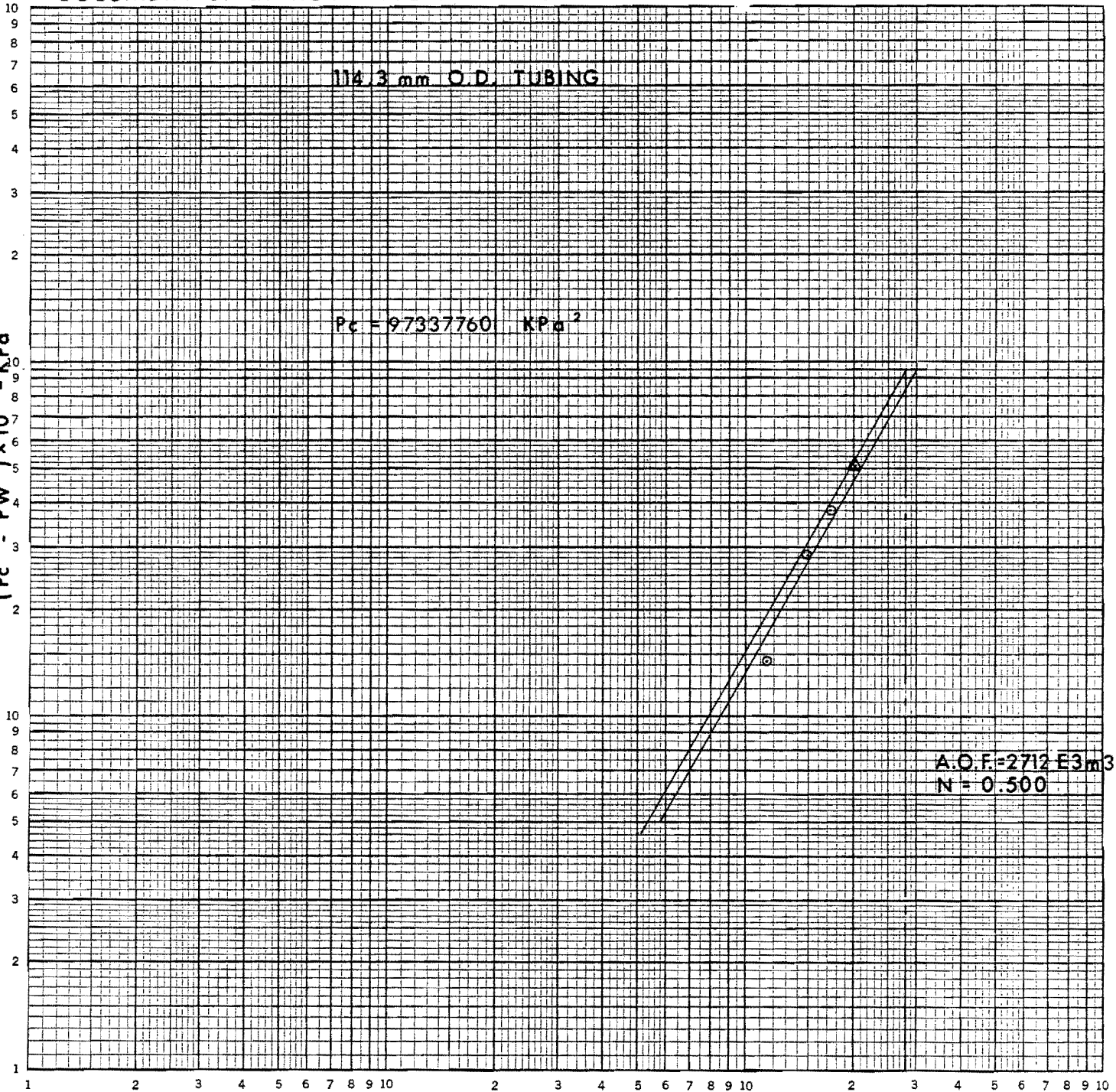
$P_c = 97337760 \text{ KPa}^2$

46 7403
 $(P_c^2 - PW^2) \times 10^8 - KPa^2$

LOGARITHMIC 3 X 3 CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

A.O.F. = 2712 E3 m³
N = 0.500

Q (E3 m³ / D)



10 000

20 000

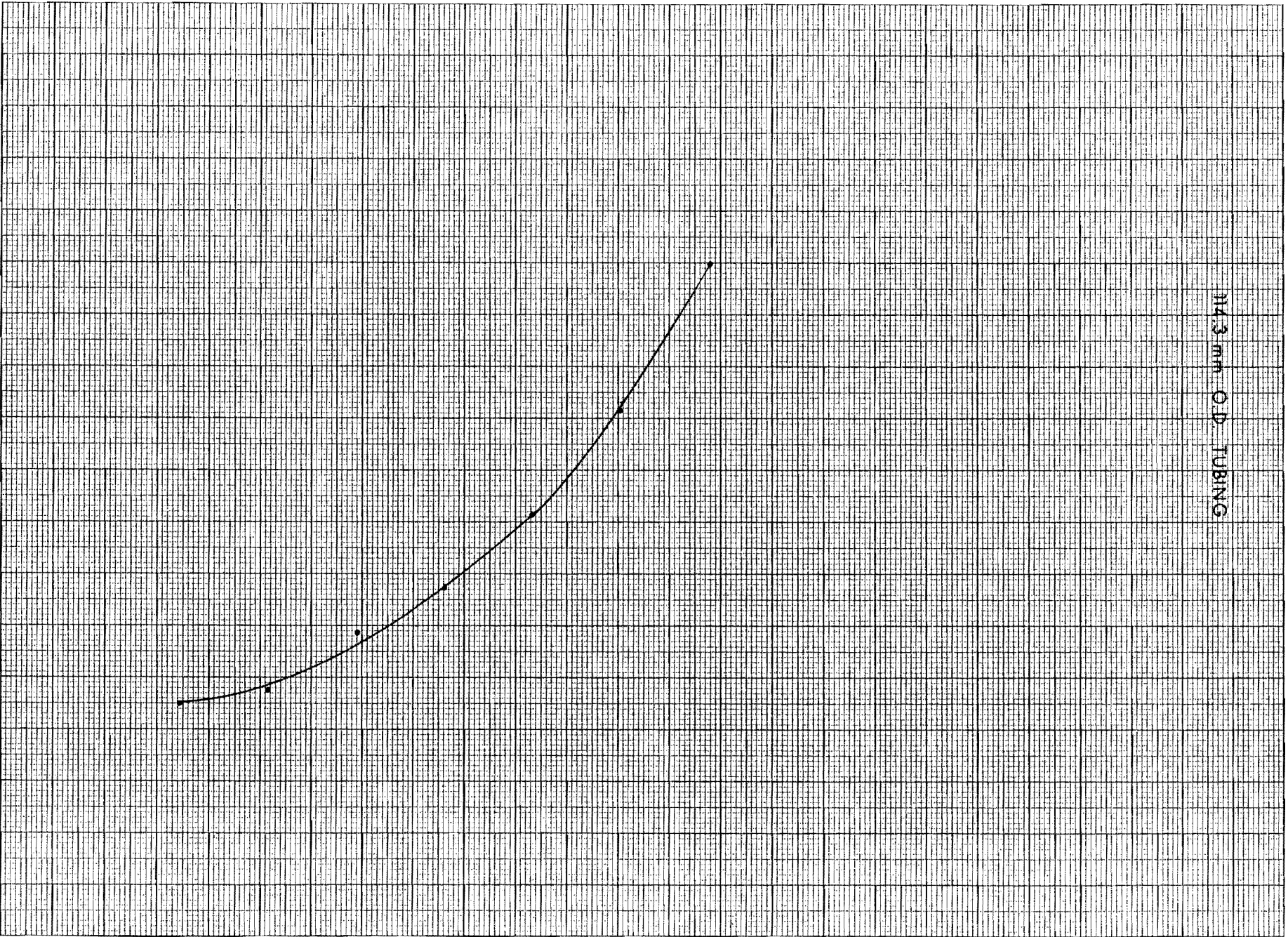
30 000

KPa
WELLHEAD PRESSURE

1000
2000
3000
FLOW (E3 m³ / D)

114.3 mm O.D. TUBING

COLUMBIA et al KOTANELEE YT B-38 WELLHEAD DELIVERABILITY METRIC UNITS



COLUMBIA et al KOTANEELEE YT B-38 SANDFACE A.O.F.

ENGLISH UNITS

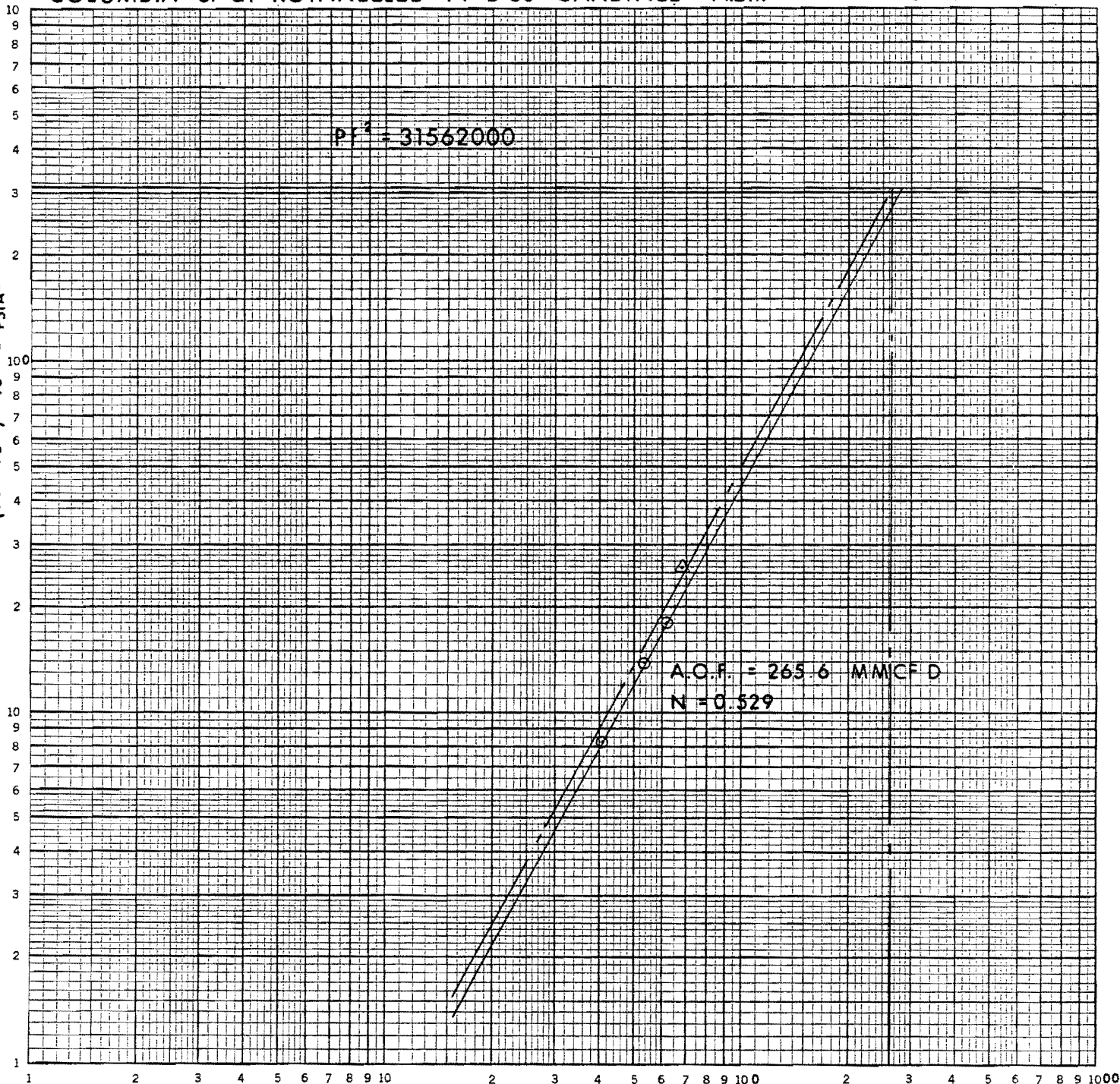
$(Pf^2 - Ps^2) \times 10^{-5} - PSIA^2$

LOGARITHMIC 3 X 3 CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

$Pf^2 = 31562000$

A.O.F. = 265.6 MMCF D
N = 0.529

Q (MMCFD)



COLUMBIA et al KOTANEELEE YT B-38 WELLHEAD AOF

ENGLISH UNITS

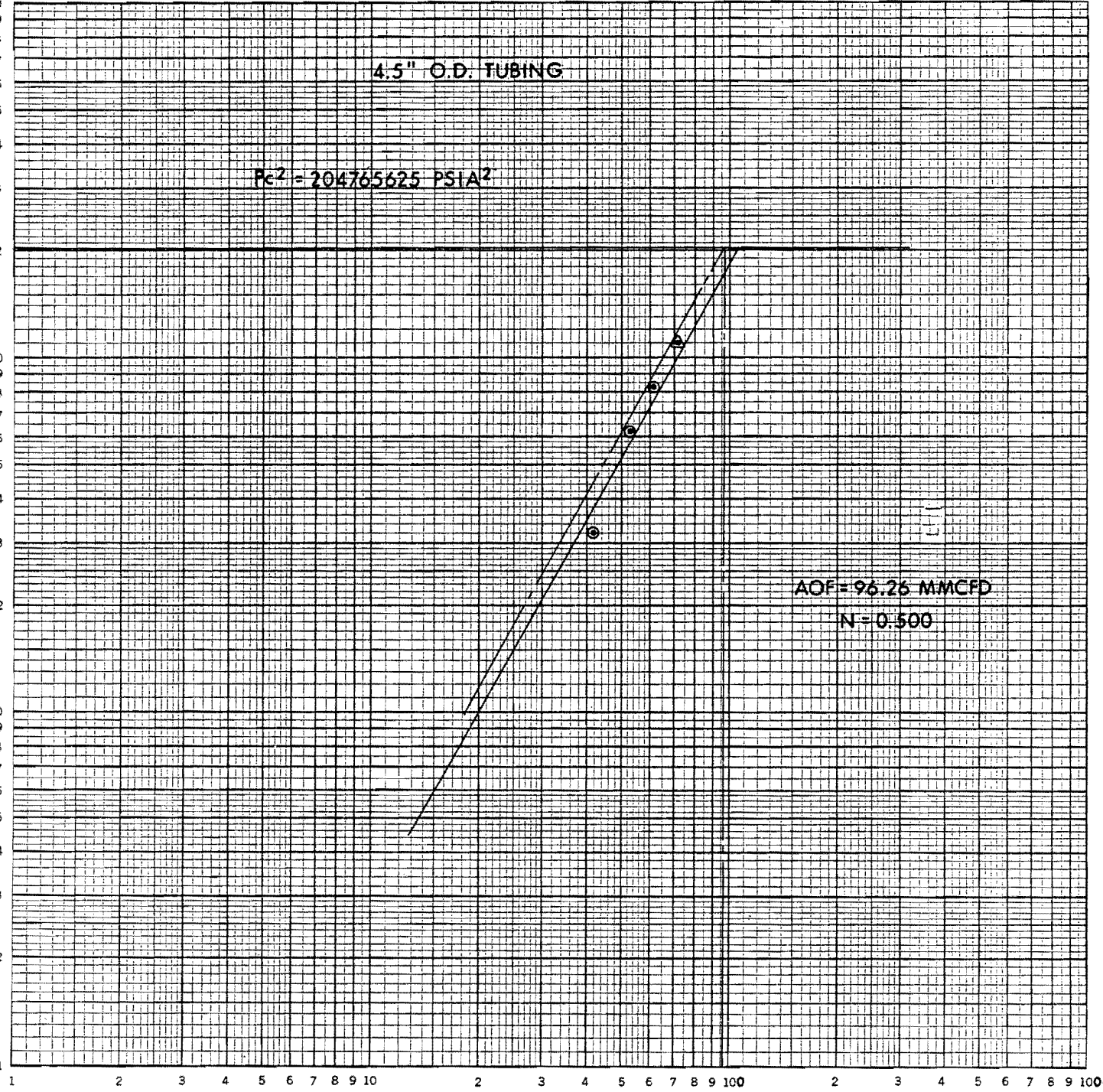
46 7403
 $(P_c^2 - P_w^2) \times 10^6 - \text{PSIA}^2$

LOGARITHMIC 3 X 3 CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

4.5" O.D. TUBING

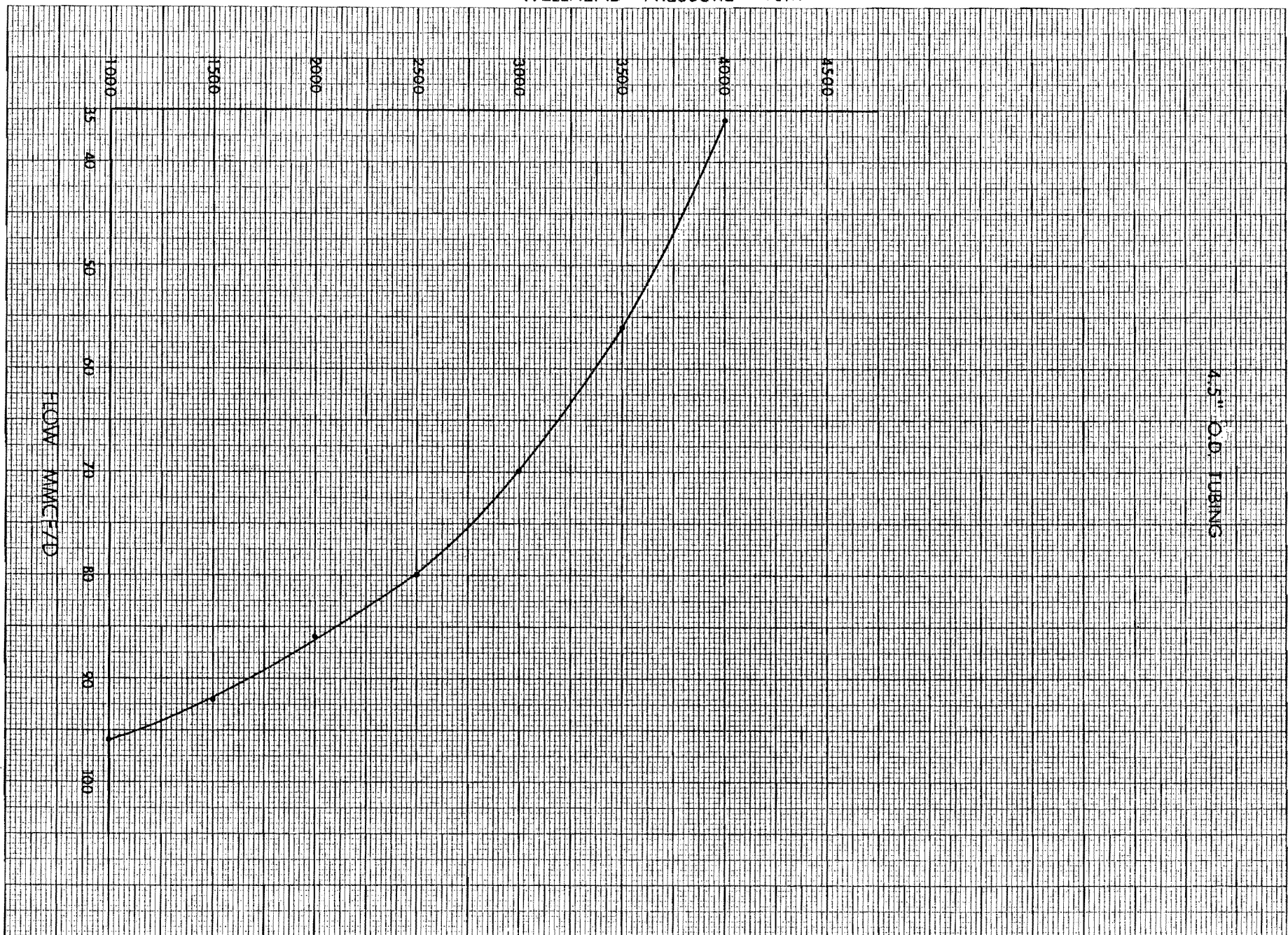
$P_c^2 = 204765625 \text{ PSIA}^2$

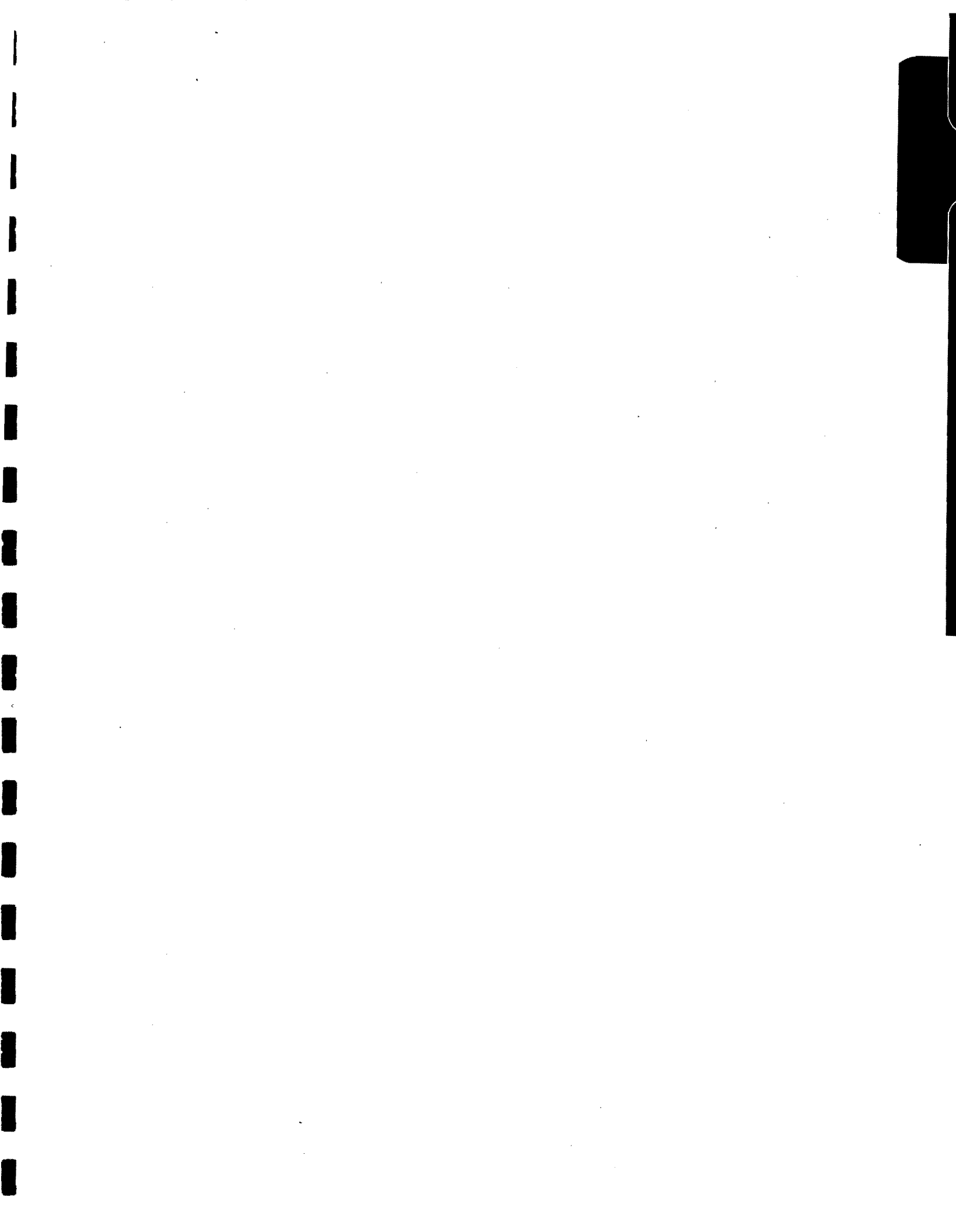
AOF = 96.26 MMCFD
N = 0.500



Q (MMCFD)

WELLHEAD PRESSURE - PSIA





FLUID PRODUCTION

WELL No. COLUMBIA ET AL KOTANEELEE YT H-38

DATE 1980-06-22

SHEET No. 02 JOB No. 4312

TIME	TANK NO. 1				TANK NO. 2				TEMP. °F °C	TANK NO. 2				TANK NO. 1			
	CONDENSATE		WATER		PROD.		SHIPPING			CONDENSATE		WATER		PROD.		SHIPPING	
	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER		Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER
	mm	m ³	mm	m ³	m ³	m ³	m ³	m ³		mm	m ³	mm	m ³	m ³	m ³	m ³	m ³
02:30			92.1	153.5							11.8	19.7					
			2340	24.4							300	3.1					
04:30			105.5	175.9		22.4											
			2680	28.0		3.6											
06:30			108.7	181.2		5.3											
			2760	28.8		.8											
08:30			116.9	194.9		13.7											
			2970	31.0		2.2											
10:00			124.4	207.4		12.5											
			3160	33.0		2.0											
10:30			125.2	208.7		1.3											
			3180	33.2		.2											
12:00											26.0	43.3		23.6			
											660	6.9		3.8			
14:00											37.8	63.0		19.7			
											960	10.0		3.1			
16:00											49.6	82.7		19.7			
											1260	13.1		3.1			
18:00											65.4	109.0		26.3			
											1660	17.3		4.2			
20:00											78.0	130.0		21.0			
											1980	20.7		3.4			
22:00											90.6	151.0		21.0			
											2300	24.0		3.3			
24:00											103.9	173.2		22.2			
											2640	27.5		3.5			
TOTALS						55.2					TOTALS				153.5		
						8.8									24.4		

REMARKS: CLEAN - UP. 02:30-STARTED
FLOWING THROUGH SEPARATOR.

	TANK # 1				TANK # 2			
	COND.	COND.	WATER	WATER	COND.	COND.	WATER	WATER
OPENING GAUGE	0.0	0.0	153.5	24.4	0.0	0.0	19.7	3.1
PLUS PRODUCTION			55.2	8.8			153.5	24.4
TOTALS			208.7	33.2			173.2	27.5
MINUS SHIPPING								
CLOSING GAUGE	0.0	0.0	208.7	33.2	0.0	0.0	173.2	27.5

FLUID PRODUCTION

WELL No. COLUMBIA ET AL. KOTANEELEE YT H-38

DATE 1980-06-24

SHEET No. 04 JOB No. 4312

RUN #	TIME ON	TIME OFF	GRAVITY	FLOW RATE
1	10:00	14:00		40.00
				1127.0

TIME	TANK NO. 1								TEMP. °F °C	TANK NO. 2							
	SIZE 400 BBLs				63 M3					SIZE 400 BBLs				63 M3			
	CONDENSATE		WATER		PROD.		SHIPPING			CONDENSATE		WATER		PROD.		SHIPPING	
	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER		Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER
mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.	mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.		
10:00			13.4	22.3							114.2	190.4					
			340	3.5							2900	30.3					
12:00											115.7	192.9		2.5			
											2940	30.7		.4			
14:00			13.4	22.3							122.8	204.7		11.8			
			340	3.5							3120	32.5		1.8			
TOTALS								TOTALS						14.3			
														2.2			

REMARKS: 10:00-FLOWED WELL ON RUN #1.
14:00-END OF RUN #1; WELL SHUT IN.

	TANK # 1				TANK # 2			
	COND.	COND.	WATER	WATER	COND.	COND.	WATER	WATER
OPENING GAUGE	0.0	0.0	22.3	3.5	0.0	0.0	190.4	30.3
PLUS PRODUCTION							14.3	2.2
TOTALS			22.3	3.5			204.7	32.5
MINUS SHIPPING								
CLOSING GAUGE	0.0	0.0	22.3	3.5	0.0	0.0	204.7	32.5

FLUID PRODUCTION

SHEET No. 05 JOB No. 4312

RUN #	TIME ON	TIME OFF	GRAVITY	FLOW RATE
2	18:00	22:00		53.60
				1510.1

TIME	TANK NO. 1								TEMP. °F °C	TANK NO. 2							
	CONDENSATE		WATER		PROD.		SHIPPING			CONDENSATE		WATER		PROD.		SHIPPING	
	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER		Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER
	mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.		mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.
18:00			13.4	22.3							122.8	204.7					
			340	3.5							3120	32.5					
20:00											136.2	227.0			22.3		
											3460	36.1			3.6		
22:00			13.4	22.3							145.7	242.9			15.9		
			340	3.5							3700	38.6			2.5		
TOTALS									TOTALS						38.2		
															6.1		

REMARKS: 18:00--FLOWED WELL ON RUN #2.
22:00--SHUT WELL IN/ END OF
RUN #2.

	TANK # 1				TANK # 2			
	COND.	COND.	WATER	WATER	COND.	COND.	WATER	WATER
OPENING GAUGE	0.0	0.0	22.3	3.5	0.0	0.0	204.7	32.5
PLUS PRODUCTION							38.2	6.1
TOTALS			22.3	3.5			242.9	38.6
MINUS SHIPPING								
CLOSING GAUGE	0.0	0.0	22.3	3.5	0.0	0.0	242.9	38.6

FLUID PRODUCTION

WELL No. COLUMBIA ET AL KOTANEELEE YT H-38

DATE 1980-06-25

SHEET No. 06 JOB No. 4312

RUN #	TIME ON	TIME OFF	GRAVITY	FLOW RATE
3	02:00	06:00		61.00
				1718.6

TIME	TANK NO. 1				SIZE				400 BBL'S				63 M3				TEMP. °F °C	TANK NO. 2				SIZE				400 BBL'S				63 M3						
	CONDENSATE		WATER		PROD.		SHIPPING		CONDENSATE		WATER		PROD.		SHIPPING			CONDENSATE		WATER		PROD.		SHIPPING		CONDENSATE		WATER		PROD.		SHIPPING				
	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER		Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER			
	mm	m ³	mm	m ³	m ³	m ³	m ³	m ³	mm	m ³	mm	m ³	m ³	m ³	m ³	m ³		mm	m ³	mm	m ³	m ³	m ³	m ³	m ³	mm	m ³	mm	m ³	m ³	m ³	m ³	m ³			
02:00			13.4	22.3															145.7	242.9																
			340	3.5															3700	38.6																
04:00																			163.8	273.1			30.2													
																			4160	43.4			4.8													
06:00			13.4	22.3															174.0	290.1			17.0													
			340	3.5															4420	46.1			2.7													
TOTALS										TOTALS													47.2													
																							7.5													

REMARKS: 02:00--FLOWED WELL ON RUN #3.
06:00--WELL SHUT IN; END OF
RUN #3.

	TANK # 1				TANK # 2			
	COND.	COND.	WATER	WATER	COND.	COND.	WATER	WATER
OPENING GAUGE	0.0	0.0	22.3	3.5	0.0	0.0	242.9	38.6
PLUS PRODUCTION							47.2	7.5
TOTALS			22.3	3.5			290.1	46.1
MINUS SHIPPING								
CLOSING GAUGE	0.0	0.0	22.3	3.5	0.0	0.0	290.1	46.1

FLUID PRODUCTION

WELL No. COLUMBIA ET AL KOTANEELEE YT H-38

DATE 1980-06-25

SHEET No. 07 JOB No. 4312

RUN # 4	TIME ON 10:00	TIME OFF	GRAVITY	FLOW RATE 70.50 1986.3
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TIME	TANK NO. 1				SIZE				400 BBL'S				63 M3				TEMP. °F °C	TANK NO. 2				SIZE				400 BBL'S				63 M3									
	CONDENSATE		WATER		PROD.		SHIPPING		CONDENSATE		WATER		PROD.		SHIPPING			CONDENSATE		WATER		PROD.		SHIPPING		CONDENSATE		WATER		PROD.		SHIPPING							
	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER		Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER						
	mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.	mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.		mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.	mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.						
10:00			13.4	22.3															174.0	290.1																			
			340	3.5															4420	46.1																			
12:00			43.3	72.2			49.9																																
			1100	11.5			8.0																																
14:00			59.1	98.5			26.3																																
			1500	15.7			4.2																																
16:00			71.7	119.5			21.0																																
			1820	19.0			3.3																																
18:00			89.0	148.4			28.9																																
			2260	23.6			4.6																																
20:00			98.4	164.0			15.6																																
			2500	26.1			2.5																																
22:00			111.8	186.4			22.4																																
			2840	29.6			3.5																																
24:00			124.4	207.4			21.0												174.0	290.1																			
			3160	33.0			3.4												4420	46.1																			
TOTALS							185.1												TOTALS																				
							29.5																																

REMARKS: EXTENDED RUN, 10:00-FLOWED
WELL ON RUN #4.

	TANK # 1				TANK # 2			
	COND.	COND.	WATER	WATER	COND.	COND.	WATER	WATER
OPENING GAUGE	0.0	0.0	22.3	3.5	0.0	0.0	290.1	46.1
PLUS PRODUCTION			185.1	29.5				
TOTALS			207.4	33.0			290.1	46.1
MINUS SHIPPING								
CLOSING GAUGE	0.0	0.0	207.4	33.0	0.0	0.0	290.1	46.1

PORTA-TEST SYSTEMS, LTD.
P.O. BOX 5510 STATION L
EDMONTON, ALBERTA T6C 4E9

COMPANY COLUMBIA GAS DEVELOPMENT OF CANADA LTD.

FLUID PRODUCTION

WELL No. COLUMBIA ET AL KOTANEELEE YT H-38

DATE 1980-06-26

SHEET No. 08 JOB No. 4312

RUN #	TIME ON	TIME OFF	GRAVITY	FLOW RATE
4		10:00		70.50 1986.3

TIME	TANK NO. 1				SIZE				400 BBL'S				63 M3				TEMP. °F °C	TANK NO. 2				SIZE				400 BBL'S				63 M3					
	CONDENSATE		WATER		PROD.		SHIPPING		CONDENSATE		WATER		PROD.		SHIPPING			CONDENSATE		WATER		PROD.		SHIPPING		CONDENSATE		WATER		PROD.		SHIPPING			
	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER		Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER		
	mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.	mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.		mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.	mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.		
00:01			124.4	207.4															174.0	290.1															
			3160	33.0															4420	46.1															
02:00			137.8	229.7			22.3																												
			3500	36.5			3.5																												
04:00			147.2	245.4			15.7																												
			3740	39.0			2.5																												
06:00			161.4	269.1			23.7																												
			4100	42.8			3.8																												
08:00			170.1	283.6			14.5																												
			4320	45.1			2.3																												
10:00			183.5	305.9			22.3												174.0	290.1															
			4660	48.6			3.5												4420	46.1															
TOTALS						98.5				TOTALS																									
						15.6																													

REMARKS: EXTENDED RUN. 10:00-END OF RUN #4.

	TANK # 1				TANK # 2			
	COND.	COND.	WATER	WATER	COND.	COND.	WATER	WATER
OPENING GUAGE	0.0	0.0	207.4	33.0	0.0	0.0	290.1	46.1
PLUS PRODUCTION			98.5	15.6				
TOTALS			305.9	48.6			290.1	46.1
MINUS SHIPPING								
CLOSING GUAGE	0.0	0.0	305.9	48.6	0.0	0.0	290.1	46.1

PORTA-TEST SYSTEMS, LTD.

P.O. BOX 5510 STATION L
EDMONTON, ALBERTA T6C 4E9

COMPANY COLUMBIA GAS DEVELOPMENT OF CANADA LTD.

TEST DATA SHEET

WELL No. COLUMBIA ET AL KOTANEELEE YT H-38

DATE 1980-06-21

SHEET No. 01 JOB No. 4312

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
				x
				99.52

TIME	CHOKE SIZE IN. mm	WELLHEAD READINGS				HEATER BATH TEMP. °F °C	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS					
		FLOW PROVER PSIG Pga/kPa	FLOW TEMP. °F °C	TUBING PRESS. PSIG Pga/kPa	ANNULUS PRESS. PSIG Pga/kPa		STATIC PRESS.		DIFF. IN. Pga/kPa	M.R. TEMP. °F °C	ORIFICE SIZE IN. mm	FLOW RATE MMCF/D 10 ³ m ³ /d	STATIC PRESS. PSIG Pga/kPa	DIFF. IN. Pga/kPa	M.R. TEMP. °F °C	ORIFICE SIZE IN. mm	FLOW RATE MMCF/D 10 ³ m ³ /d
							DEAD WT. PSIG Pga/kPa	METER PSIG Pga/kPa									
13:50																	
13:50				4300													
				29647													
14:10																	
14:10																	
14:15	1.00			3225													
	25.40			22235													
14:20				3350													
				28	23097												
14:30																	
14:30	50/64																
	19.84																
14:40				3800													
				37	26200												
15:10																	
15:10	46/64			3900													
	18.26			30	26889												
15:20																	
15:20	48/64			3900													
	19.05			33	26889												
15:30				3950													
				36	27234												
16:00				4000													
				40	27579												

REMARKS: 14:40-TAPED THERMOMETER TO WELLHEAD RISER? THERMOMETER WOULD NOT STAY IN THERMOWELD DUE TO VIBRATION.

TEST DATA SHEET

SHEET No. 02 JOB No. 4312

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
				x 99.52

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER BATH TEMP.	HIGH STAGE SEPARATOR READINGS						LOW STAGE SEPARATOR READINGS													
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE									
							DEAD WT.	METER										IN.	°F	IN.	MMCF/D	PSIG	IN.	°F	IN.	MMCF/D
							PSIG	PSIG																		
16:30	48/64			4005																						
	19.05		38	27613						24																
16:50	STARTED TO SEPARATE FLUID & GAS.																									
16:55	METER INTO SERVICE.																									
16:55											4.500															
											114.30															
17:00				4005				1040	98.00									44.000								
			38	27613				7170	24.38	37								239.65								
17:30				4005				1040	98.00																	
			41	27613				7170	24.38	41																
18:00				4000				1000	96.00																	
			45	27579				6895	23.88	45																
18:30	INCREASED CHONE.																									
18:30	1.00			3427				1260	160.00									60.000								
	25.40		50	23628				8687	39.81	62								690.43								
19:00				3408				1290	168.00																	
			50	23497				8894	41.80	68																
19:30				3418				1290	168.00																	
			52	23566				8894	41.80	68																
20:00				3425				1290	168.00																	
			52	23614				8894	41.80	72																
20:30				3428				1290	168.00																	
			53	23635				8894	41.80	73																
21:00				3426				1290	168.00									60.000								
			55	23621				8894	41.80	73								690.43								
21:30				3428				1290	168.00																	
			55	23635				8894	41.80	74																

REMARKS: 18:30-RIGGED IN DEADWEIGHT.

PORTA-TEST SYSTEMS, LTD.
P.O. BOX 5510 STATION L
EDMONTON, ALBERTA T6C 4E9

COMPANY COLUMBIA GAS DEVELOPMENT OF CANADA LTD.

TEST DATA SHEET

WELL No. COLUMBIA ET AL KOTANEELEE YT H-38

DATE 1980-06-21

SHEET No. 03 JOB No. 4312

HIGH STAGE METER RUN SIZE	<u>6.065</u>	<u>154.050</u>	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	<u>3000</u>	x	<u>400.00</u>
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	<u>20684</u>
				x <u>99.52</u>

TIME	CHOKE SIZE	WELLHEAD READINGS					HEATER BATH TEMP.	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS													
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.	STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE										
																	DEAD WT.	METER	PSIG	IN.	MMCF/D	PSIG	IN.	°F	IN.	MMCF/D
																	PSIG	PSIG	IN.	°F	IN.	MMCF/D	PSIG	IN.	°F	IN.
IN.	PSIG	°F	PSIG	PSIG	°F	PSIG	PSIG	IN.	°F	IN.	MMCF/D	PSIG	IN.	°F	IN.	MMCF/D										
mm	Pga/kPa	°C	Pga/kPa	Pga/kPa	°C	Pga/kPa	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d										
21:40	SHUT	WELL IN	CASING VALVE LEAKING	SOUR GAS.																						
21:45	RIGGED	IN GAUGE	TO MONITOR	CASING PRESSURES.																						
21:55				4595																						
				56	31681																					
22:00	REOPENED	WELL THROUGH	SEPARATOR.																							
22:00				4595																						
				56	31681																					
22:10	72/64																									
	28.58																									
22:20	78/64																									
	30.96																									
22:30				2869				1500	216.00		4.500															
			50	19781				10342	53.74	84	14.30															
23:00				2880																						
			47	19857																						
23:30				2881																						
			50	19864																						
24:00	SHUT	IN WELL	TO CHECK	CHOKE AND REPAIR	LEAKS AT																					
24:00	SEPARATOR.																									

REMARKS:

PORTA-TEST SYSTEMS, LTD.
P.O. BOX 5510 STATION L
EDMONTON, ALBERTA T6C 4E9

COMPANY COLUMBIA GAS DEVELOPMENT OF CANADA LTD.

TEST DATA SHEET

WELL No. COLUMBIA ET AL. KOTANEELEE YT H-38

DATE 1980-06-22

SHEET No. 04 JOB No. 4312

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
				x 99.52

TIME	CHOKE SIZE IN. mm	WELLHEAD READINGS				HEATER BATH TEMP. °F °C	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS					
		FLOW PROVER PSIG Pga/kPa	FLOW TEMP. °F °C	TUBING PRESS. PSIG Pga/kPa	ANNULUS PRESS. PSIG Pga/kPa		STATIC PRESS.		DIFF. IN. Pga/kPa	M.R. TEMP. °F °C	ORIFICE SIZE IN. mm	FLOW RATE MMCF/D 10 ³ m ³ /d	STATIC PRESS. PSIG Pga/kPa	DIFF. IN. Pga/kPa	M.R. TEMP. °F °C	ORIFICE SIZE IN. mm	FLOW RATE MMCF/D 10 ³ m ³ /d
							DEAD WT. PSIG Pga/kPa	METER PSIG Pga/kPa									
02:30		OPENED WELL THROUGH SEPARATOR															
02:30	48/64			4548				4.500									
	19.05			31357				114.30									
03:00				4010				780	124.00								
			35	27648				5378	30.85	35						44.000	
03:30				4012				780	128.00								
			83	27662				5378	31.85	43						239.65	
04:00				4040				780	128.00								
			89	27855				5378	31.85	49							
04:30				4048				780	128.00								
			96	27910				5378	31.85	51							
05:00		INCREASED CHONE.															
05:00	54/64			4065				780	128.00								
	21.43		96	28027				5378	31.85	55							
05:30				3831				950	152.00								
			99	26414				6550	37.82	62							
06:00				3850				950	152.00								
			107	26545				6550	37.82	68							
06:30				3850				950	152.00								
			107	26545				6550	37.82	69							
07:00				3842	300			950	154.00								
			106	26489	2068			6550	38.32	70							
07:30				3850	325			950	154.00								
			106	26545	2241			6550	38.32	72							
08:00				3852	340			950	154.00								
			107	26558	2344			6550	38.32	73							
08:30				3852	350			950	156.00								
			108	26558	2413			6550	38.81	75							

REMARKS:

TEST DATA SHEET

SHEET No. 06 JOB No. 4312

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
				x 99.52

TIME	CHOKE SIZE	WELLHEAD READINGS					HEATER	HIGH STAGE SEPARATOR READINGS						LOW STAGE SEPARATOR READINGS					
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.	BATH TEMP.		STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	
								DEAD WT.	METER										
								PSIG	PSIG										IN.
IN.	PSIG	°F	PSIG	PSIG	°F	PSIG	PSIG	Pga/kPa	°C	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d			
16:00	62/64			3522	500			1150	194.00			4.500	60.900						
	24.61		114	24283	3447			7929	48.27	85		114.30	715.79						
16:15	INCREASED CHOKE.																		
16:15	70/64																		
	27.78																		
16:30				3162	500			1320	224.00				71.000						
			114	21801	3447			9101	55.73	85			.35						
17:00				3162	500			1320	224.00										
			114	21801	3447			9101	55.73	91									
17:30				3162	500			1320	224.00				70.100						
			114	21801	3447			9101	55.73	92			974.99						
18:00				3162	500			1320	224.00										
			114	21801	3447			9101	55.73	92									
18:30				3162	500			1320	224.00										
			115	21801	3447			9101	55.73	92									
19:00				3162	500			1320	228.00										
			116	21801	3447			9101	56.73	92									
19:30				3162	500			1320	228.00										
			120	21801	3447			9101	56.73	92									
20:00	DECREASED CHOKE.																		
20:00	46/64			4150	540			1320	228.00										
	18.24		120	28613	3723			9101	56.73	92									
20:30				4150	550			720	130.00										
			118	28613	3792			4964	32.34	74									
21:00				4150	550			720	130.00										
			116	28613	3792			4964	32.34	69									
21:30				4150	550			720	130.00										
			113	28613	3792			4964	32.34	67									

REMARKS:

TEST DATA SHEET

SHEET No. 07 JOB No. 4312

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
				x 99.52

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER BATH TEMP.	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS											
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE						
							DEAD WT.	METER										PSIG	IN.	MMCF/D	PSIG	IN.	MMCF/D
							PSIG	PSIG										PSIG	IN.	MMCF/D	PSIG	IN.	MMCF/D
IN.	°F	PSIG	PSIG	°F	PSIG	PSIG	IN.	°F	mm	10 ³ m ³ /d	PSIG	IN.	°F	IN.	MMCF/D								
mm	Pga/kPa	°C	Pga/kPa	Pga/kPa	°C	Pga/kPa	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d							
22:00	46/64			4150	560			720	130.00		4.500	40.800											
	18.24		109	28613	3861			4964	32.34	66	14.30	149.50											
22:30				4150	560			710	130.00														
			109	28613	3861			4895	32.34	66													
23:00				4150	560			710	130.00														
			109	28613	3861			4895	32.34	66													
23:30				4150	575			710	130.00														
			109	28613	3964			4895	32.34	66													
24:00				4150	575			710	130.00														
			109	28613	3964			4895	32.34	66													

REMARKS:

TEST DATA SHEET

WELL No. COLUMBIA ET AL KOTANEELEE YT H-38

DATE 1980-06-24

SHEET No. 09 JOB No. 4312

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
				x
				99.52

TIME	CHOKE SIZE IN. mm	WELLHEAD READINGS				HEATER BATH TEMP. °F °C	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS					
		FLOW PROVER PSIG Pga/kPa	FLOW TEMP. °F °C	TUBING PRESS. PSIG Pga/kPa	ANNULUS PRESS. PSIG Pga/kPa		STATIC PRESS.		DIFF. IN. Pga/kPa	M.R. TEMP. °F °C	ORIFICE SIZE IN. mm	FLOW RATE MMCF/D 10 ³ m ³ /d	STATIC PRESS. PSIG Pga/kPa	DIFF. IN. Pga/kPa	M.R. TEMP. °F °C	ORIFICE SIZE IN. mm	FLOW RATE MMCF/D 10 ³ m ³ /d
							DEAD WT. PSIG Pga/kPa	METER PSIG Pga/kPa									
09:45		PRESSURE TO CHOKE.															
09:45				4445					4.500								
				30647					114.30								
10:00		OPENED WELL THROUGH SEPARATOR.															
10:00				4445	800												
				30647	5516												
10:05		INTELLIGENCE LINE TO BACK PRESSURE VALVE FROZE OFF.															
10:05	45/64																
	17.84																
10:10		FLUID AT SURFACE.															
10:15				3950	900												
			41	27234	6205												
10:20		LET SEPARATOR CARRY OVER? TRIED TO ATTAIN HEAT IN															
10:20		METER RUN? METR FROZE OFF? DIFFERENTIAL SIDE.															
10:30				3982	950												
			46	27455	6550												
11:00		SEPARATING GAS & FLUID.															
11:00				4032	1040												
			56	27799	7170												
11:05		METER FROZE OFF? REPAIRED.															
11:25		METER INTO SERVICE.															

REMARKS:

TEST DATA SHEET

WELL No. COLUMBIA ET AL KOTANEELEE YT H-38

DATE 1980-06-24

SHEET No. 10 JOB No. 4312

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
				x
				99.52

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER	HIGH STAGE SEPARATOR READINGS						LOW STAGE SEPARATOR READINGS													
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		BATH TEMP.	STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE								
								DEAD WT.	METER										PSIG	IN.	PSIG	IN.	MMCF/D	PSIG	IN.	MMCF/D
								PSIG	PSIG																	
11:30	45/64			4075	1100			740	116.00		4.500															
	17.86		66	28096	7584			5102	28.86	15	114.30															
12:00			68	4092	1140		690	710	126.00			40.800														
				28213	7860		4757	4895	31.35	22		149.50														
12:30				4119	1175			700	126.00																	
			77	28399	8101			4826	31.35	28																
13:00				4130	1200			700	126.00																	
			82	28475	8274			4826	31.35	34																
13:30				4137	1240			700	126.00																	
			86	28523	8549			4826	31.35	39																
14:00				4148	1250			700	126.00																	
			89	28599	8618			4826	31.35	44																
14:00	WELL SHUT IN	END OF FLOW RATE	#1.	BLEED ANNULUS TO O.																						
14:15	RECORDED BUILD UPS.																									
14:15				4585																						
				31612	0																					
15:00				4572	50																					
				31523	345																					
15:30				4550	100																					
				31371	689																					
16:00				4548	150																					
				31357	1034																					
16:30				4535	175																					
				31267	1207																					
17:30				4522	200																					
				31178	1379																					
17:30	PRESSURE TO CHOKE.																									

REMARKS:

TEST DATA SHEET

SHEET No. 11 JOB No. 4312

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
				x
				99.52

TIME	CHOKE SIZE IN. mm	WELLHEAD READINGS				HEATER BATH TEMP. °F °C	HIGH STAGE SEPARATOR READINGS						LOW STAGE SEPARATOR READINGS				
		FLOW PROVER PSIG Pga/kPa	FLOW TEMP. °F °C	TUBING PRESS. PSIG Pga/kPa	ANNULUS PRESS. PSIG Pga/kPa		STATIC PRESS.		DIFF. IN. Pga/kPa	M.R. TEMP. °F °C	ORIFICE SIZE IN. mm	FLOW RATE MMCF/D 10 ³ m ³ /d	STATIC PRESS. PSIG Pga/kPa	DIFF. IN. Pga/kPa	M.R. TEMP. °F °C	ORIFICE SIZE IN. mm	FLOW RATE MMCF/D 10 ³ m ³ /d
							DEAD WT. PSIG Pga/kPa	METER PSIG Pga/kPa									
18:00		OPENED WELL THROUGH SEPARATOR FOR RUN #2.															
18:00	54/64			4522	200												
	21.43			31178	1379												
18:30			71	3728	250			920	162.00		4.500						
19:00			88	25703	1724			6343	40.31	28	114.30						
				3786	250			920	164.00								
19:30				26103	1724			6343	40.80	44							
				3820	250			920	168.00		53.000						
20:00			94	26338	1724			6343	41.80	54	493.22						
				3833	275			920	168.00								
20:30			100	26427	1896			6343	41.80	61							
				3834	275			920	168.00								
21:00			104	26434	1896			6343	41.80	64							
				3836	275			920	168.00								
21:30			107	26448	1896			6343	41.80	65							
				3838	275			924	920	168.00	53.600						
22:00			107	26462	1896			6371	6343	41.80	66	510.12					
				3850	300			920	168.00								
22:00			110	26545	2068			6343	41.80	66							
22:00		SHUT WELL IN? END OF RUN #2.															
22:30		RECORDED BUILD UPS.															
22:30				4600													
				31716													
23:00				4600													
				31716													

REMARKS:

TEST DATA SHEET

WELL No. COLUMBIA ET AL KOTANEELEE YT H-38 DATE 1980-06-24

SHEET No. 12 JOB No. 4312

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
			x	99.52

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER	HIGH STAGE SEPARATOR READINGS						LOW STAGE SEPARATOR READINGS				
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE
							DEAD WT.	METER									
							PSIG	PSIG									
mm	Pga/kPa	°C	Pga/kPa	°C	Pga/kPa	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d		
23:30	RECORDED BUILD UPS.																
23:30				4573													
				31529													
24:00				4573													
				31529													

REMARKS:

TEST DATA SHEET

SHEET No. 15 JOB No. 4312

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
				x
				99.52

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS													
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		BATH TEMP.	STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE							
								DEAD WT.	METER										PSIG	IN.	PSIG	MMCF/D	PSIG	IN.	MMCF/D
								PSIG	PSIG										IN.	MMCF/D	PSIG	IN.	MMCF/D		
IN.	°F	PSIG	PSIG	°F	PSIG	PSIG	IN.	°F	IN.	10 ³ m ³ /d	PSIG	IN.	°F	IN.	10 ³ m ³ /d										
mm	°C	Pga/kPa	Pga/kPa	°C	Pga/kPa	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d										
13:00	72/64			3090	440																				
	28.58		113	21305	3034																				
13:30			113	21305	3034																				
14:00			113	21305	3034																				
14:30			114	21305	3034																				
15:00			114	21318	3034																				
15:30			116	21318	3034						71.000														
16:00			116	21305	3034						.35														
16:30			117	21305	2965																				
17:00			117	21339	2930		1292	1300	236.00			70.500													
17:30			117	21339	2930		8908	8963	58.72	91		986.26													
18:00			117	21339	2930			1300	234.00	92															
18:30			117	21318	2930			8963	58.22	93															
19:00			117	21318	2930			1300	234.00	93															
19:30			118	21318	2930			8963	58.22	93															
20:00			118	21318	2930			1300	234.00	93															

REMARKS:

TEST DATA SHEET

SHEET No. 16 JOB No. 4312

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
				x
				99.52

TIME	CHOKE SIZE IN. mm	WELLHEAD READINGS				HEATER BATH TEMP. °F °C	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS					
		FLOW PROVER PSIG Pga/kPa	FLOW TEMP. °F °C	TUBING PRESS. PSIG Pga/kPa	ANNULUS PRESS. PSIG Pga/kPa		STATIC PRESS.		DIFF. IN. Pga/kPa	M.R. TEMP. °F °C	ORIFICE SIZE IN. mm	FLOW RATE MMCF/D 10 ³ m ³ /d	STATIC PRESS. PSIG Pga/kPa	DIFF. IN. Pga/kPa	M.R. TEMP. °F °C	ORIFICE SIZE IN. mm	FLOW RATE MMCF/D 10 ³ m ³ /d
							DEAD WT.	METER									
							PSIG Pga/kPa	PSIG Pga/kPa									
20:30	72/64			3092	425		1300	234.00		4.500							
	28.58		118	21318	2930		8963	58.22	93	114.30							
21:00				3092	425		1300	234.00									
			118	21318	2930		8963	58.22	93								
21:30				3092	425		1300	234.00									
			118	21318	2930		8963	58.22	93								
22:00				3092	425		1300	234.00			70.500						
			118	21318	2930		8963	58.22	93		986.26						
22:30				3087	425		1300	234.00									
			118	21284	2930		8963	58.22	93								
23:00				3087	425		1300	234.00									
			118	21284	2930		8963	58.22	93								
23:30				3087	425		1300	234.00									
			118	21284	2930		8963	58.22	92								
24:00				3087	425		1300	234.00			70.500						
			118	21284	2930		8963	58.22	92		986.26						

REMARKS:

TEST DATA SHEET

WELL No. COLUMBIA ET AL KOTANEELEE YT H-38 DATE 1980-06-26

SHEET No. 17 JOB No. 4312

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
				x 99.52

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER BATH TEMP. °C	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS					
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE
		IN. PSIG	°F	PSIG	PSIG		DEAD WT. PSIG	METER PSIG	IN.	°F	IN.	MMCF/D	PSIG	IN.	°F	IN.	MMCF/D
		mm Pga/kPa	°C	Pga/kPa	Pga/kPa		Pga/kPa	Pga/kPa	Pga/kPa	°C	Pga/kPa	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C	mm
00:30	72/64			3087	425			1300	234.00			4.500					
	28.58		118	21284	2930			8963	58.22	90		114.30					
01:00				3087	425			1300	234.00			70.500					
			118	21284	2930			8963	58.22	90		986.26					
01:30				3087	425			1300	234.00								
			118	21284	2930			8963	58.22	91							
02:00				3087	425			1300	234.00								
			118	21284	2930			8963	58.22	91							
02:30				3087	425			1300	234.00								
			118	21284	2930			8963	58.22	91							
03:00				3087	425			1300	234.00								
			118	21284	2930			8963	58.22	92							
03:30				3087	425			1300	234.00								
			118	21284	2930			8963	58.22	92							
04:00				3084	425			1300	234.00								
			118	21263	2930			8963	58.22	92							
04:30				3084	425			1300	234.00								
			118	21263	2930			8963	58.22	92							
05:00				3084	425			1300	234.00								
			118	21263	2930			8963	58.22	92							
05:30				3084	425			1300	234.00								
			118	21263	2930			8963	58.22	92							
06:00				3082	425			1300	234.00								
			121	21249	2930			8963	58.22	92							
06:30				3082	410			1300	234.00								
			121	21249	2827			8963	58.22	91							
07:00				3082	410			1300	232.00			70.500					
			121	21249	2827			8963	57.72	91		986.26					
07:30				3082	400			1300	232.00								
			121	21249	2758			8963	57.72	91							

REMARKS:

TEST DATA SHEET

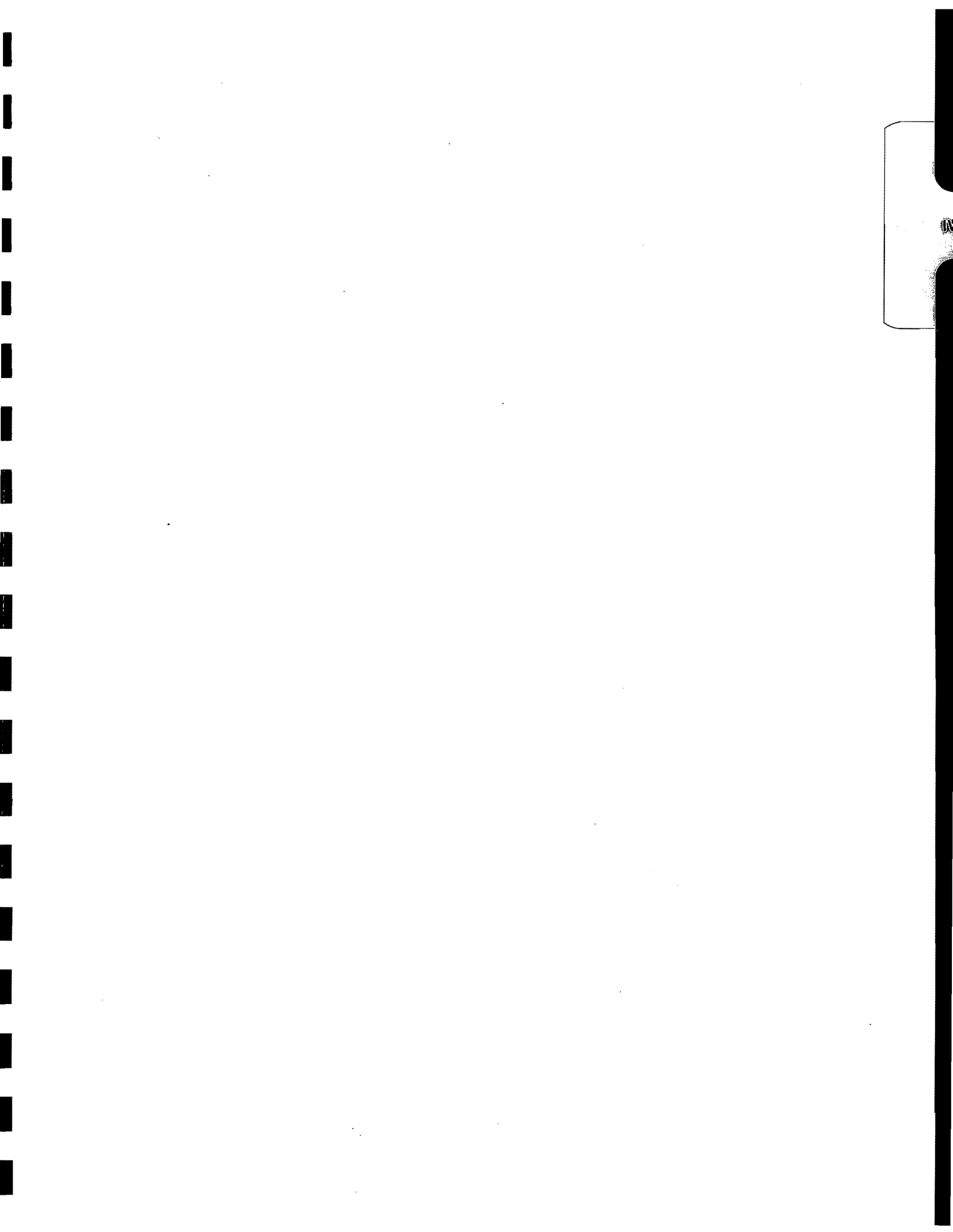
WELL No. COLUMBIA ET AL KOTANEELEE YT H-38 DATE 1980-06-26

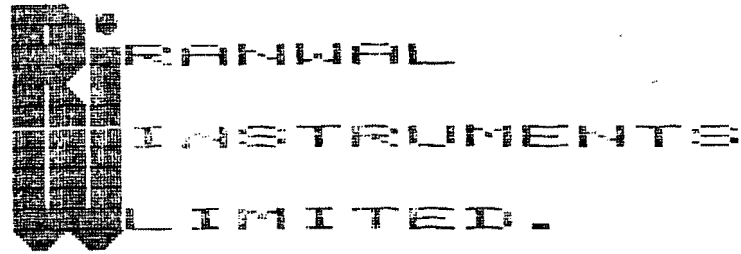
SHEET No. 18 JOB No. 4312

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
				x
				99.52

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER BATH TEMP.	HIGH STAGE SEPARATOR READINGS						LOW STAGE SEPARATOR READINGS					
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	
		IN.	°F	PSIG	PSIG		DEAD WT.	METER										IN.
		mm	°C	Pga/kPa	Pga/kPa		°F	PSIG	PSIG	Pga/kPa	°C	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d
08:00	72/64			3082	400		1285	1300	232.00			4.500						
	28.58		121	21249	2758		8860	8963	57.72		91	114.30						
08:30				3081	400			1300	232.00									
			121	21243	2758			8963	57.72		91							
09:00				3081	400			1300	232.00									
			121	21243	2758			8963	57.72		91							
09:30				3081	400			1300	232.00									
			121	21243	2758			8963	57.72		91							
10:00				3081	400			1300	232.00									
			121	21243	2758			8963	57.72		91							
10:00	SHUT	WELL IN	END OF RUN #4.															
10:15	RECORDED	BUILD	UPS.															
10:15				4600														
				31716														
11:00				4585														
				31612														
13:00				4565														
				31474														
15:00				4555														
				31405														
16:30				4550														
				31371														
18:00				4533														
				31254														
20:00				4525														
				31199														
20:00	SHUT	IN MASTER	VALVES	END OF BUILD	UPS.													

REMARKS:





BASIC DATA

COMPANY COLUMBIA GAS DEVELOPMENT OF CANADA LTD.

WELL NAME COLUMBIA ET AL KOTOWEELEE YT H-38

LOCATION H - 38

FIELD & POOL KOTOWEELEE

SURVEY COMPANY BONNETTS WIRELINE SERVICES LTD.

TEST BY _____

COMPUTED BY RANVAL INSTRUMENTS LTD.

REMARKS : FLOW AND BUILDUP JUN 24-27/80 PG 1 - 3

GRAPH 4

RANVAL

BI ANNUAL INSTRUMENTS LIMITED.

SUBSURFACE PRESSURE MEASUREMENTS

1 BASIC DATA

COMPANY:	COLUMBIA GAS DEVELOPMENT OF CANADA		
ADDRESS:	CALGARY ALBERTA		
WELL NAME:	COLUMBIA ET AL KOTOWEELEE YT H-38		
LOCATION:	H - 38		
FIELD & POOL:	KOTOWEELEE		
TYPE OF TEST:	FLOW AND BUILDUP		
DATE OF TEST:	JUNE 24 - 27 1980		
STATUS:			
PRODUCING THROUGH:	TUBING		
PERF/OPEN HOLE INTERVAL:	3540.6 - 3619.5		M(CF)
ELEVATION (CF):	678.2		M
ELEVATION (KB):	685.8		M
POOL DATUM:			M(SUBSEA)
MPP INTERVAL (CF):	3580.1		M
DATUM DEPTH OF WELL (CF):			M

2 STATIC TEST

TUBING PRESSURE (DWG):	30647		KPA
CASING PRESSURE (DWG):			KPA
SHUT IN TIME:			
RUN DEPTH FROM (CF):	TOP 3528.1 BOT 3529.9		M
ON / OFF BOTTOM:	JUN 24/80 0625HRS - JUN 27/80 0800HRS		
TEMPERATURE @ RUN DEPTH:	OVER 147.4		C°
SURFACE TEMPERATURE:			C°
GRADIENT @ RUN DEPTH:			KPA/M
PRESSURE @ RUN DEPTH:			KPA
PRESSURE @ MPP:			KPA
DATUM DEPTH PRESSURE:			KPA

REMARKS: ELEMENT NO 59333 BOTTOM INSTRUMENT - INSTRUMENT MALFUNCTION.

METRIC CALCULATIONS

SUBSURFACE PRESSURE MEASUREMENTS

Company Columbia Gas Development of Canada Ltd. Location H-38 Page 2 of 4

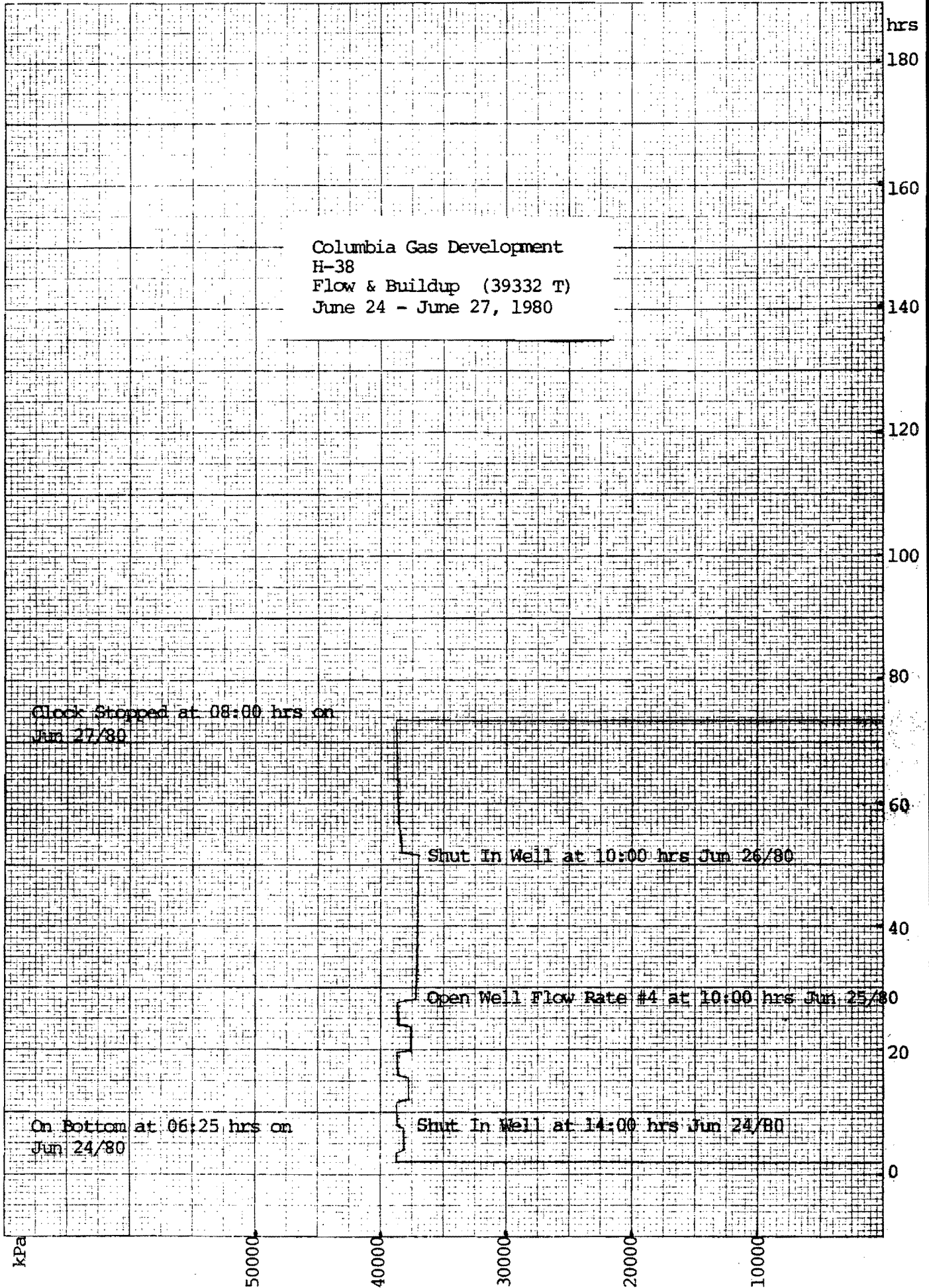
ELEMENT SERIAL NO. 39332 T RANGE 0-82737 psig CLOCK RANGE 180 hours \times D IH
 CALIBRATION EQUATION 1652.6 0.5 DATE OF LATEST CALIBRATION June 30, 1980

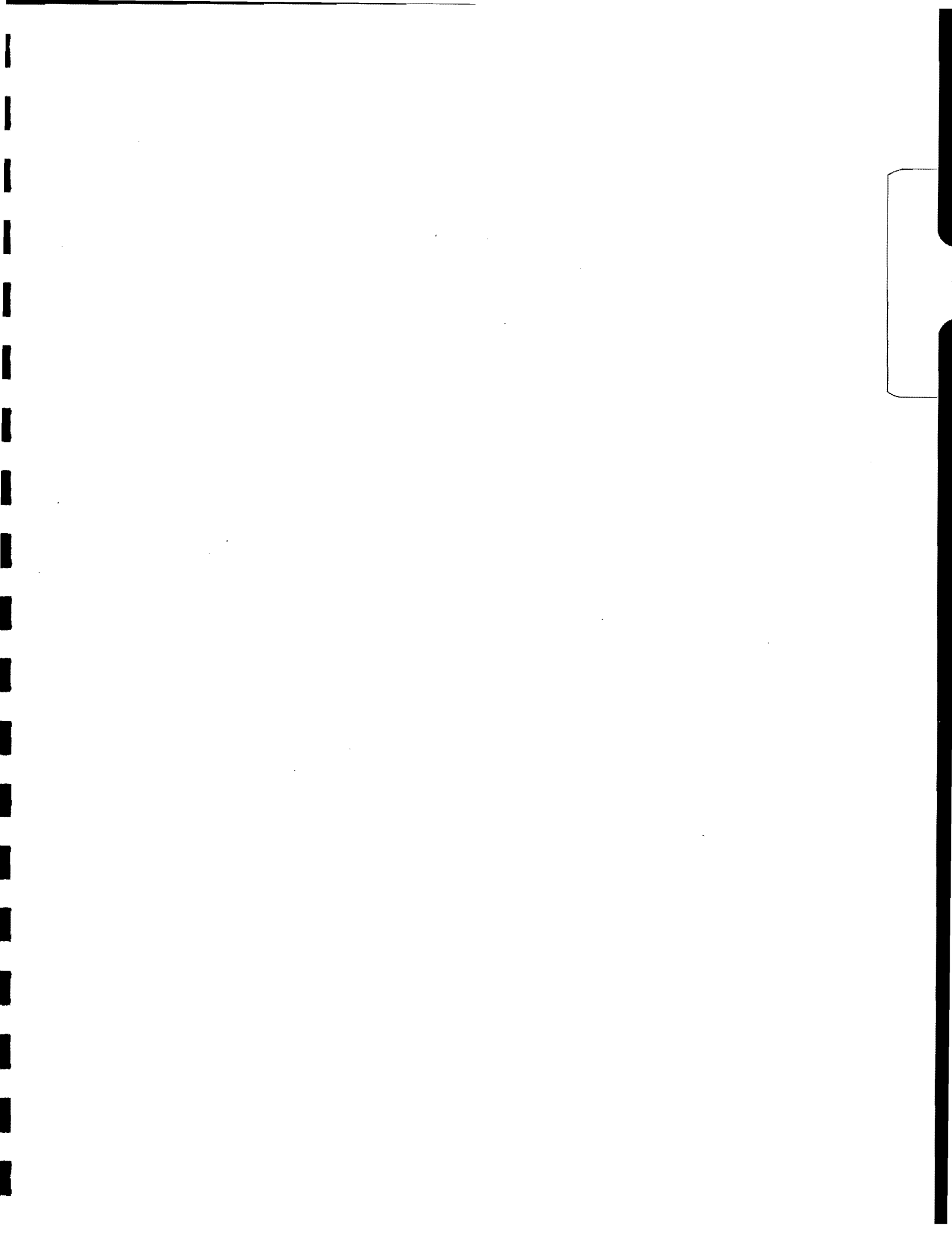
CHART READINGS AND CALCULATIONS

Date	Depth Below CF M.	ACC Hours	Time	Deflection in/mm	Correction P - PC kPa	Corrected Pressure kPa	Corrected Pressure psig
1980							
JUN 24	ON BOTTOM @ 0625HRS		JUNE 24/80				
	3528.1	0:00	6:25	Not Legible			
		1:00	7:25	Not Legible			
		2:00	8:25	23.419	2.3	38705.0	
		3:00	9:25	23.439	2.3	38738.1	
		3:35	10:00	23.439	2.3	38738.1	
	OPEN WELL FLOW RATE #1 @ 1000HRS		JUNE 24/80				
		0:00	10:00	23.439	2.3	38738.1	
		0:30	10:30	23.054	-2.4	38097.1	
		1:00	11:00	23.018	-2.4	38037.6	
		1:30	11:30	23.018	-2.4	38037.6	
		2:00	12:00	23.071	-2.4	38125.2	
		3:00	13:00	23.071	-2.4	38125.2	
		4:00	14:00	23.071	-2.4	38125.2	
	SHUT IN WELL @ 1400HRS		JUNE 24/80				
		0:00	14:00	23.071	-2.4	38125.2	
		0:30	14:30	23.343	-2.4	38574.7	
		1:00	15:00	23.368	2.3	38620.8	
		1:30	15:30	23.378	2.3	38637.3	
		2:00	16:00	23.338	-2.4	38566.8	
		3:00	17:00	23.382	2.3	38643.9	
		4:00	18:00	23.382	2.3	38643.9	
	OPEN WELL FLOW RATE #2 @ 1800HRS		JUNE 24/80				
		0:00	18:00	23.382	2.3	38643.9	
		0:30	18:30	22.882	-2.4	37812.9	
		1:00	19:00	22.882	-2.4	37812.9	
		1:30	19:30	22.890	-2.4	37826.1	
		2:00	20:00	22.890	-2.4	37826.1	
		3:00	21:00	22.870	-2.4	37793.1	
		4:00	22:00	22.870	-2.4	37793.1	
	SHUT IN WELL @ 2200HRS		JUNE 24/80				
		0:00	22:00	22.870	-2.4	37793.1	
		0:30	22:30	23.339	-2.4	38568.1	
		1:00	23:00	23.351	-2.4	38588.0	
		1:30	23:30	23.361	-2.4	38604.5	
JUN 25		2:00	0:00	23.370	2.3	38624.1	
		3:00	1:00	23.380	2.3	38640.6	
		4:00	2:00	23.388	2.3	38653.8	
	OPEN WELL FLOW RATE #3 @ 0200HRS		JUNE 25/80				
		0:00	2:00	23.388	2.3	38653.8	
		0:30	2:30	22.729	-2.4	37560.0	
		1:00	3:00	22.729	-2.4	37560.0	
		1:30	3:30	22.720	-2.4	37545.2	
		2:00	4:00	22.720	-2.4	37545.2	
		3:00	5:00	22.700	-2.4	37512.1	
		4:00	6:00	22.700	-2.4	37512.1	
	SHUT IN WELL @ 0600HRS		JUNE 25/80				
		0:00	6:00	22.700	-2.4	37512.1	
		0:30	6:30	23.304	-2.4	38510.3	

46 1242

K&E 20 X 20 TO THE INCH 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.





COLUMBIA ET AL KOTANEELEE YT H-38

June 15, 1980

0500 Arrived on location, rig up Nowsco and hot oil unit in preparation for acid frac job. Mix additives and heat acid. Pressure test lines to 63000 kPa. Pressured annulus to 21000 kPa and held for duration of treatment.
1707 Started 15% HCl acid and additives down tubing and achieved the following pressures and rates.

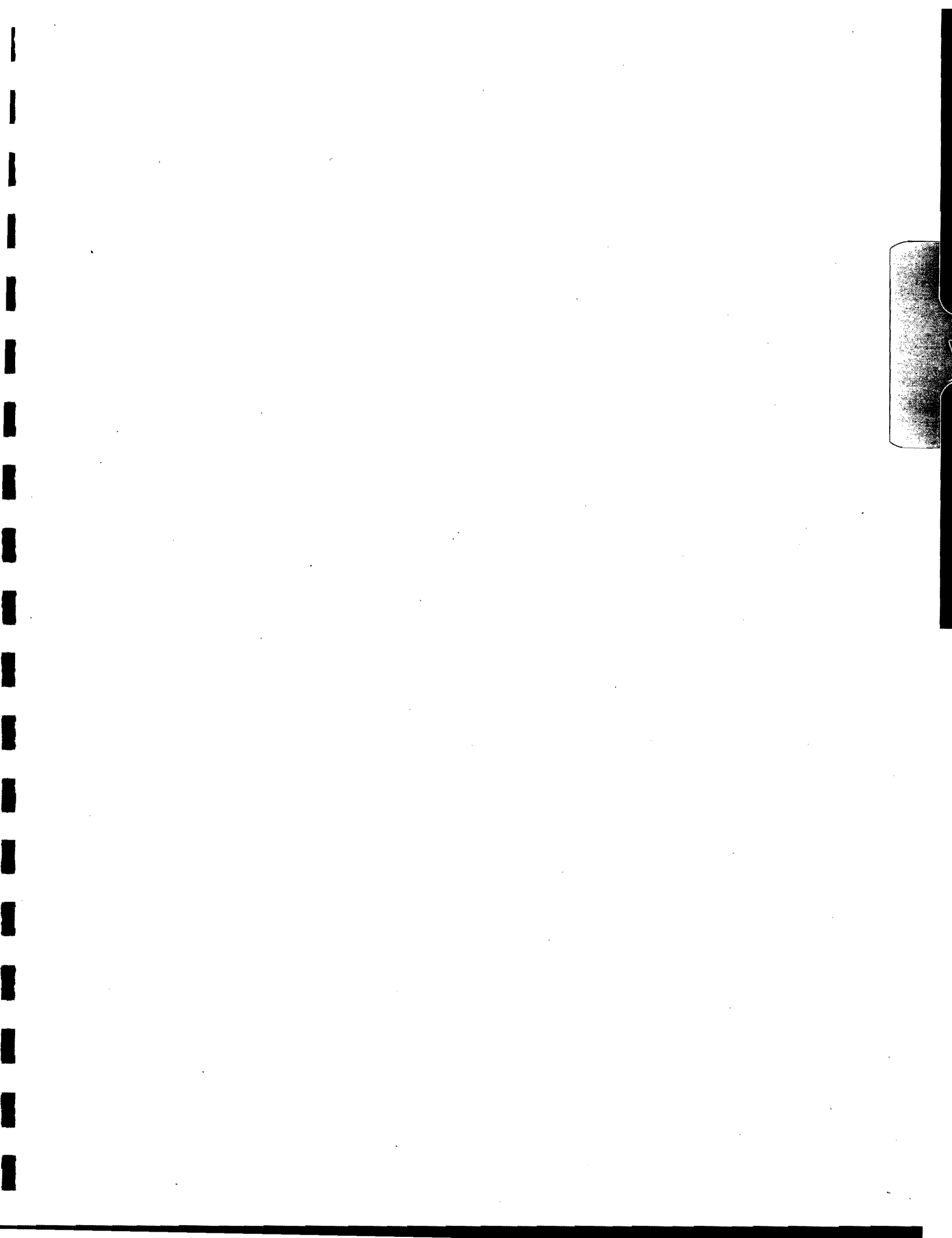
<u>TIME</u>	<u>CASING PRESSURE</u>	<u>TUBING PRESSURE</u>	<u>FLUID INJECTION RATE</u>
1707	21000	29500	-
1710	21000	28000	.4 m ³
1716	21000	28000	.4
1727	21000	24000	-
1745	21000	26000	2.6
1800	21000	28000	3.3
1809	21000	29500	4.0
1818	21000	26000	3.5
1827	21000	26500	4.0

Maximum injection pressure - 30000 kPa
Total acid, flush and CO₂ - 160 m³
Job completed at 1827 hours

Tear out Nowsco and move equipment to barge landing site for barging to Fort Nelson. Well shut in.

2320 Open well through production facilities to clean up.

0010 Closed in well for installation of portable testing equipment. Well shut in.





CHEMICAL & GEOLOGICAL LABORATORIES LTD.

EDMONTON FORT ST. JOHN CALGARY



WATER ANALYSIS

LABORATORY NUMBER

C80-1164

CONTAINER IDENTITY

LICENCE NUMBER

OPERATOR NAME

COLUMBIA GAS DEVELOPMENT OF CANADA LTD. 639 - 5th Ave. S.W. Calgary

CPA NUMBER

WELL NAME

Columbia et al Kotaneelee YT-H-38

ELEVATIONS
K.B. (meters) GRD

FIELD OR AREA

POOL OR ZONE

NAME OF SAMPLER

COMPANY

Porta Test

TEST TYPE

NO.

TEST RECOVERY

MULTIPLE RECOVERY

Y N

SAMPLING POINT

AMT. & TYPE OF CUSHION

MUD RESISTIVITY

@ 27°C

Test Interval (metres)

Separator

TYPE OF PRODUCTION

PUMPING

FLOWING

GAS LIFT

SWAB

PRODUCTION RATES

Perforations (metres)

WATER

m³/d OIL

m³/d GAS

10³m³/d

SEPARATOR

TREATER

RESERVOIR

SOURCE

GAUGE PRESSURE kPa

SEPARATOR

TREATER

RESERVOIR

SOURCE

TEMPERATURE °C

DATE SAMPLED (Y-M-D)

DATE RECEIVED (Y-M-D)

DATE REPORTED (Y-M-D)

ANALYST

OTHER INFORMATION

1980-06-26

1980-07-03

1980-07-09

D. Barber

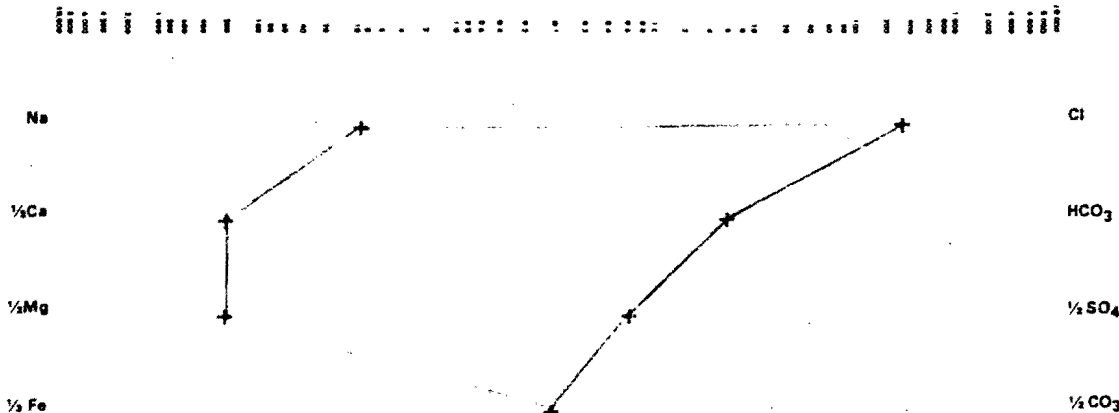
ION	$\frac{m \cdot V^{-1}}{g \cdot m^{-3}}$	Mass Fraction	$\frac{c}{mol \cdot m^{-3}}$	ION	$\frac{m \cdot V^{-1}}{g \cdot m^{-3}}$	Mass Fraction	$\frac{c}{mol \cdot m^{-3}}$	TOTAL SOLIDS	$\frac{m \cdot V^{-1}}{g \cdot m^{-3}}$
Na	230	0.0123	10.01	Cl	13 000	0.6927	366.60	EVAPORATED @ 110°C	EVAPORATED @ 180°C
K	23	0.0012	0.59	Br				25 370	
Ca	3 231	0.1722	80.62	I				AT IGNITION	CALCULATED
Mg	1 951	0.1040	80.19	HCO ₃	305	0.0163	5.00	14 990	18 765
Ba				SO ₄	25	0.0013	0.26	ORGANICS: PRESENT	
Sr				CO ₃	0	0.0000	0.00	RELATIVE DENSITY	REFRACTIVE INDEX
Fe	TRACE			OH	0	0.0000	0.00	1.011 @ 27°C	1.3370 @ 27°C

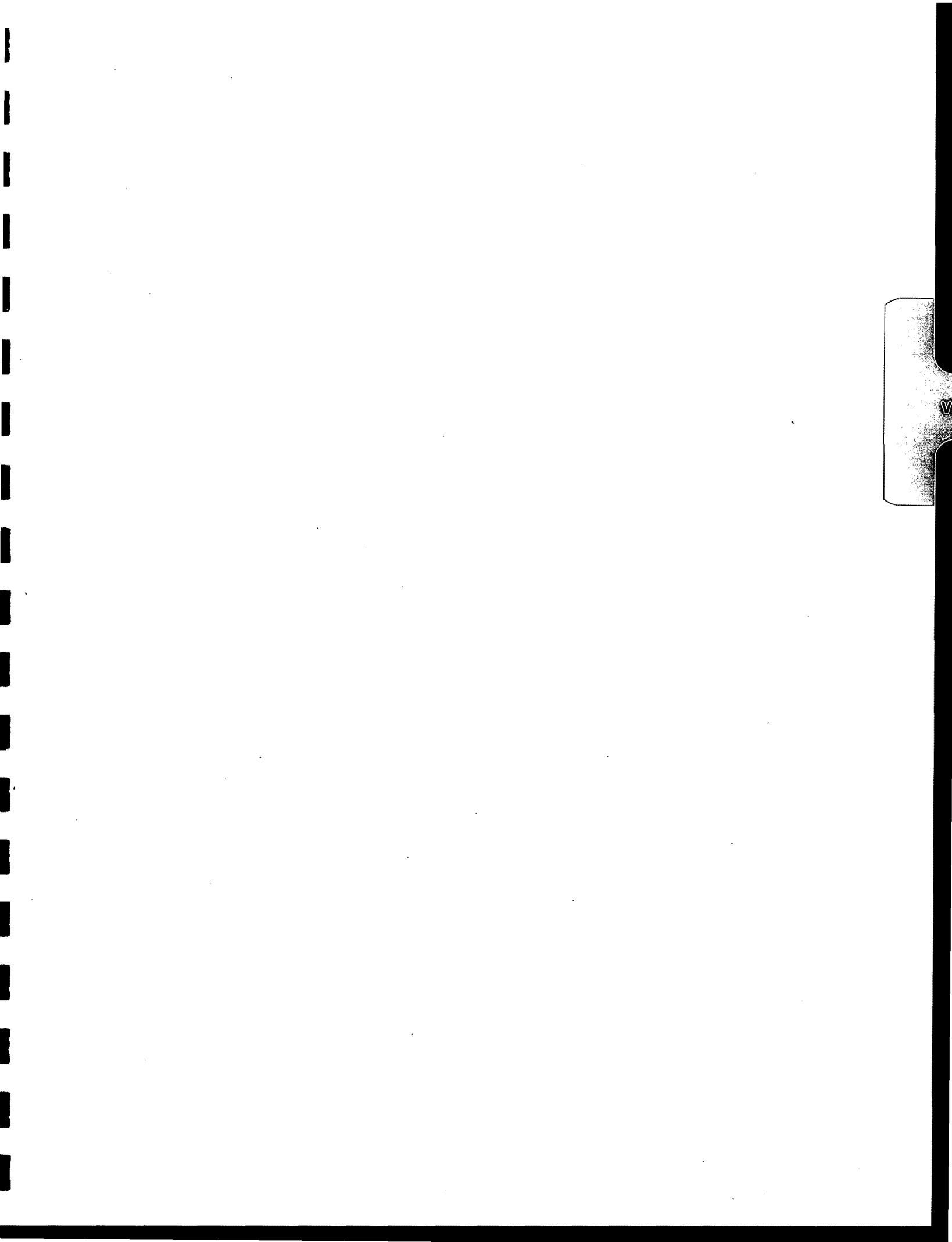
H₂S NIL

REMARKS

Yellow filtrate recovered from a sample containing a trace of sediment.

LOGARITHMIC PATTERN $c/mol \cdot m^{-3}$







CHEMICAL & GEOLOGICAL LABORATORIES LTD.

EDMONTON FORT ST. JOHN CALGARY



CONTAINER IDENTITY
5001, 5093

GAS ANALYSIS

LABORATORY NUMBER
C80-1639

LICENCE NUMBER

OPERATOR NAME

COLUMBIA GAS DEVELOPMENT OF CANADA LTD. 639 - 5th Avenue S.W. Calgary

CPA NUMBER

WELL NAME

Columbia et al Kotaneelee YT-H-38

FIELD OR AREA

POOL OR ZONE

NAME OF SAMPLER

Porta Test

TEST TYPE NO

TEST RECOVERY

MULTIPLE RECOVERY Y/N

SAMPLING POINT

AMT & TYPE OF CUSHION

MUD RESISTANCE

Separator

TYPE OF PRODUCTION

Test Interval (metres)

PUMPING

FLOWING

GAS LIFT

SWAB

PRODUCTION RATES

Perforations (metres)

WATER

m³/d

OIL

m³/d

GAS

GAUGE PRESSURE

kPa

SEPARATOR

TREATER

RESERVOIR

SOURCE

SAMPLED

DATE

1300

8900

SAMPLED

DATE

93

21

TEMPERATURE

C

DATE SAMPLED (Y-M-D)

DATE RECEIVED (Y-M-D)

DATE REPORTED (Y-M-D)

ANALYST

OTHER INFORMATION

1980-06-26

1980-07-07

1980-07-10

B. Anderson

COMP	MOLE FRACTION		PETROLEUM LIQUID CONTENT
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	
H ₂	0.0000	0.0000	
He	0.0016	0.0019	
N ₂	0.0335	0.0395	
CO ₂	0.1278	0.0000	
H ₂ S	0.0235	0.0000	
C ₁	0.7933	0.9347	
C ₂	0.0202	0.0238	
C ₃	0.0001	0.0001	0.3
IC ₄	0.0000	0.0000	0.0
NC ₄	0.0000	0.0000	0.0
IC ₅	0.0000	0.0000	0.0
NC ₅	0.0000	0.0000	0.0
C ₆	0.0000	0.0000	0.0
C ₇	0.0000	0.0000	0.0
C ₈	0.0000	0.0000	0.0
C ₉	0.0000	0.0000	0.0
C ₁₀₊	0.0000	0.0000	0.0
TOTAL	1.0000	1.0000	0.3

GROSS HEATING VALUE (MJ/M³)
NET AND 101.325 KPa

MOISTURE AND ACID GAS FREE
MEASURED

36.80

DETERMINED
AS SAMPLED

DETERMINED
AS RECEIVED

0

MOISTURE FREE AS SAMPLED
MEASURED

0.715

0.715

RELATIVE DENSITY

DETERMINED
AS RECEIVED

0.7581

PSEUDO CRITICAL PRESSURES (CALCULATED)

AS SAMPLED

209.7

4589

190.9

AS RECEIVED

33.87

RELATIVE MOLECULAR MASS

20.71

0.00

C6+ ML/MOL 0.000

GROSS HEATING VALUE AS PER AGA REPORT #5

31.88 MAJ/M³ @ 15C AND 101.325 KPa