

DRILLING & COMPLETION HISTORY

CONSOLIDATED OIL & GAS, INC.

TRIBAL "C" NO. 4-6

Rio Arriba County, New Mexico
August 6, 1962

Location:	1190' F/SL & 820' F/EL, Section 6 T26N-R3W, NMPM																							
Elevations:	7116' GL 7127' KB - all measurements from KB																							
Spud:	June 2, 1962																							
Drilling Completed:	June 26, 1962																							
Well Completed	July 12, 1962																							
Total Depth:	8260' Drilled 8260' PBD																							
Casing:																								
Surface:	10 3/4" 40# J-55 cemented at 307' with 250 sx. 2% CaCl ₂ cement.																							
Production:	7 5/8" 26.40# & 33.70# cemented at 4041' with 75 sx. cement, 45 sx. 40% Diacel followed by 195 sx. 50/50 Pozmix. Top of cement 2750' (Temp. log).																							
	5 1/2" 15.5# & 17# J-55 liner 3948'-8260' cemented with 90 sx. 40% Diacel, 90 sx. 50% Pozmix.																							
Tubing:	1 1/2" 2.90# V-50 EUE set in Baker Model "D" packer at 7975'																							
	1" IJ landed at 3787'.																							
Logs:	Lane Wells Induction Electric, Acoustic and Radioactivity Logs																							
Cores & Drillstem Tests:	None																							
Formation Tops: (Log)	<table border="0"> <tr> <td>Pictured Cliffs Fm.</td> <td>3842'</td> <td>(+3285')</td> </tr> <tr> <td>Pictured Cliffs Ss.</td> <td>3846'</td> <td>(+3281')</td> </tr> <tr> <td>Pt. Lookout</td> <td>5970'</td> <td>(+1157')</td> </tr> <tr> <td>Mancos</td> <td>6163'</td> <td>(+ 964')</td> </tr> <tr> <td>Gallup</td> <td>6995'</td> <td>(+ 132')</td> </tr> <tr> <td>Greenhorn</td> <td>7975'</td> <td>(- 848')</td> </tr> <tr> <td>Dakota (Graneros Sd.)</td> <td>8074'</td> <td>(- 947')</td> </tr> </table>			Pictured Cliffs Fm.	3842'	(+3285')	Pictured Cliffs Ss.	3846'	(+3281')	Pt. Lookout	5970'	(+1157')	Mancos	6163'	(+ 964')	Gallup	6995'	(+ 132')	Greenhorn	7975'	(- 848')	Dakota (Graneros Sd.)	8074'	(- 947')
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Treatment:	<p>Dakota - Sand water frac with 117,500# 20-40 & 40-60 sand, 171,000 gal. slicked water and 1000 gal. acid.</p> <p>Pictured Cliffs - Sand water frac with 100,000# 20-40 sand and 84,000 gal. water</p>																							
Initial Potential:																								
Dakota:	Flow volume thru 3/4" choke: 1457 MCFD																							
Pictured Cliffs:	Flow volume thru 3/4" choke: 3532 MCFD Calculated Absolute Open Flow Potential: 3697 MCFD																							

WELL: TRIBAL "C" NO. 4-6
1190' F/SL, 820' F/EL, Sec. 6-T26N-R3W
FIELD: Basin Dakota, Tapacito Pictured Cliffs
COUNTY: Rio Arriba STATE: New Mexico
ELEVATIONS: 7116' GL
7128' KB

6/16/62

Depth 5013'. Drilled 223' of shale. Hit moisture at 5013'. Presently blowing well, no solid show of moisture, will dust for short intervals.

6/17/62

Depth 5579'. Drilled 569' of sand and shale. Blowing hole, making light spray of water. Dev. 3/4° at 5100'.

6/18/62

Depth 5811'. Drilled 232' of sand and shale. Dev. 1/2° at 5600'. Blowing hole, rig broke down and have not determined what the problem is.

6/19/62

Blowing hole at 5811'. Well dusting, no sign of moisture, should have rig repaired and be back drilling at approximately 8 p.m. tonight.

6/20/62

Rotary rig will be in operation about 10 a.m. Well showing no moisture.

6/21/62

Depth 6065'. Drilled 254' of sand and shale in 8 hours drilling time. Dev. 1/2° at 6000'. Drilling ahead.

6/22/62

Depth 6900'. Drilled 835' of sand and shale. Making trip for Bit 15. Dev. 1° at 6900'.

6/23/62

Depth 7985'. Drilled 1085' sand and shale. Making trip for Bit 16. Dev. 1° at 7550'.

6/24/62

TD 8250'. Drilled 265' for sand and shale. Pulling out of hole to run logs.

6/2/62

Moving in rotary rig.

6/3/62

Spudded in at 8 p.m. 6/2/62. Drilled 125' of 15" hole. Present operation, drilling.

6/4/62

Drilled 182' of 13 3/4" hole to 307'. Ran 307' of 10 3/4" OD, 8 round, 40#, J-55, S. T. & C. casing set at 307' KB. Cemented with 250 sx. regular 2% CaCl₂ cement. Plug down 1:30 a.m. 6/4/62. Good returns on cement. Dev. 3/4° at 225'. WOC.

6/5/62

Drilling at 960'. Drilled 653' of sand and shale. Drilling with Bit 1. Dev. 3/4° at 500', pressured up on surface casing to 800# for 15 minutes, held OK.

6/6/62

Depth 2100'. Drilled 1140' of sand and shale. Present operation - making trip for Bit 3. Mud 9.3. Vis. 33. Dev. 1° at 1040', 3/4° at 1560' and at 2000'.

6/7/62

Depth 2532'. Drilled 432' of sand and shale. Mud 9.2. Vis. 33. Water loss 18. Dev. 1 1/2° at 2450'.

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6/8/62

Drilling at 2980'. Drilled 448' of sand and shale. Drilling with Bit 5. Mud 9.2. Vis. 36. Water loss 12. Sand content 1/4%.

6/9/62

Drilling at 3262'. Drilled 282' of sand and shale. Drilling with Bit 7. Weight 9.3. Vis. 40. Dev. 1 1/4° at 3,000'.

6/10/62

Depth 3620'. Drilled 358' of sand and shale. Tripping for Bit 9. Mud at. 9.3. Vis. 45. Dev. 1° at 3530'.

6/11/62

Depth 3777'. Drilled 157' of sand and shale. Working on mud pump. Bit No. 9 in hole. Mud 9.3. Vis. 44. Water loss 7.6. PH 8.5.

6/12/62

Depth 4030'. Drilled 253' of sand and shale. Mud 9.4. Vis. 68. Water loss 1.2. Sand content 1%.

6/13/62

Logged well. Ran 38 joints 3 1/2" ex-line casing, total 1542.43', ran 63 joints 2 1/4" x 8 round S. T. & C. total 2508.53'. Total joints 101 7 1/8" total 4330.96', loss above KB 10.50'. 7 5/8" casing set at 4040.46' KB. Float collar at 3998.96' KB. Cemented with 75 sx. regular. 45 sx. 40% Dia-cel "D". Tailed in with 195 sx. 50-50 Pozmix. 4% gel. 4% CC. Total material 315 sx. Good returns for 252 sx., lost circulation for 53 sx., regained on last 10 sx. Bump plug with 1500#, released pressure. Float held. Plug down at 4 a.m. of 13/62.

6/14/62

Ran temperature survey at 4 p.m. 6/13/62. Found top of cement at 2750'. Blew 7 5/8" casing down. Drilling on float collar at 3999' drilling with gas.

6/15/62

Depth 4790'. Drilled 740' of sand and shale. In 1 1/2 hours drilling with Bit 11. Dev. 1 1/2° at 4300'.

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6/25/62

Depth 8260'. Drilled 10' of sand. Making trip for Bit 18. Ran log to 8250', not deep enough, approximately TD will be 8300'. Well making heavy spray of oil and distillate and 200 MCFD gas.

6/26/62

Ran 119 joints of 5 1/2" casing for total of 4311.20'. 62 joints of this pipe was 17# for 1905' and 57 joints was 15# for 2321.20'. pipe set at 8259.61' KB. Float collar at 3233.81', top of liner at 3948.36'. Cemented with 90 sx. of regular cement, 40% dia-cel D, tailed in with 90 sx. 50-50 Pozmix, 4% gel. Bumped plug with 1500#, held OK. Plug down at 6:30 a.m. 6/26/62. Laying down drill pipe.

6/27/62

Finished laying down drill pipe. Moved rotary rig off.

6/28/62

Waiting on completion rig.

6/29/62

Waiting on completion rig.

6/30/62

Waiting on completion rig.

7/1/62

Waiting on completion rig.

7/2/62

Waiting on completion rig.

7/3/62

Will move in completion rig today.

7/4/62

Moved in completion rig. Rigged up, picked up 3960' 2 7/8" tubing, ran 6 3/4" bit to top of liner at 3948', no cement on top of liner. Pressured up on top of liner, pumped in 300# at 3 BPM.

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7/5/62

Came out of hole with 2 7/8" tubing. Ran 7 5/8" Baker full-bore packer set at 3800'. Pressured up on back side to 1100#, pressure held throughout squeeze job. Pumped in through 2 7/8" tubing at 1400# at 6 BPM. Squeezed well with 100 sx. of neat cement 2% CaCl₂. Maximum squeeze pressure 2100#, standing pressure 2000#. Released pressure, pressured back up to 2000#, pressure held. Completed at 5 p.m. 7/4/62. Finished picking up 2 7/8" tubing-on cement, started drilling cement at 5 a.m. 7/5. Tagged cement at 3888'. Drilling cement at 3918'.

7/6/62

Prepare to perforate. Pressure on liner to 1500#, held OK. Pulled out of hole, working hole with 4 3/4" bit to 3948' (top of liner). Drilled 20' of firm cement at 3948' - 3968'. Pressured to 1500#, held OK. Drilled firm 340' cement on top of guide shoe, drilled out to 8268'. Circulated and cleaned hole, pressured up with Western pump truck to 2000#, held OK. Spotted 1000 gal. BDA on bottom, pulled out of hole. Logged well with Lane Wells Gamma Ray Neutron log.

7/7/62

Perforated four per foot (with jets), 8240' - 8260'. Acid treatment, 1000 gal. 15% spear head.

First Stage: 8 bbls. acid, 1 pump at 4 BPM, pumped in at 1500#, minimum pressure 1400#, no apparent break, 9 minute pressure to 850#.

Second Stage: 8 bbls. acid, 1 pump at 4 BPM at 1500#, no break, 7 minute pressure down to 800#.

Third Stage: 8 bbls. acid, 1 pump at 4 BPM at 1600#, no break. Rig up Western Company to frac.

First Stage Frac: 8240'-8260' (5 pumps)

Breakdown w/1 pump	1500#	Breakdown & fill	58 bbls.
All pumps on	2900#	Flush	268 bbls.
Maximum pressure	2900#	Overflush	30 bbls.
Maximum treating press.	2900#	Treating fluid	29400 gal.
Minimum treating press.	2500#	Sand 40-60	20000 lbs.
Average treating press.	2650#	Injection rate	39.9 BPM
Instant shut in	1700#	Rubber balls	none
5 minute shut in	1300#	7# J-2 per 1000 gal. water.	

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7/7/62 Cont'd.

Set Baker bridge plug top drillable at 8228' KB.

Second Stage Frac: Perforated 4 per foot 8202'-8223', 8174'-8186'

Breakdown w/1 pump	1800#	Breakdown & fill	42 bbls.
All pumps on	2200#	Flush	268 bbls.
Maximum pressure	2600#	Overflush	30 bbls.
Maximum treating press.	2600#	Treating fluid	45260 gal.
Minimum treating press.	2000#	Sand 20-40	20000 lbs.
Average treating press.	2200#	Sand 40-60	20000 lbs.
Instant shut-in	1600#	inj. rate	40 BPM
5 minute shut in	1500#	Rubber balls	35
		7# J-2 per 1,000 gal. water	

Set bridge plug at 8120' KB. Perforated 8076'-8094' four per foot.

Third Stage Frac: (5 pumps)

Breakdown w/1 pump	1800#	Breakdown & fill	46 bbls.
All pumps on	2400#	Flush	268 bbls.
Maximum pressure	2625#	Overflush	none
Maximum treating press.	2625#	Treating fluid	42840 gal.
Minimum treating press.	2200#	Sand 20-40	40000 lbs.
Average treating press.	2400#	Injection rate	41.3 BPM
Instant shut in	1900#	Rubber balls	40
5 minute shut in	1800#	7# J-2 per 1,000 gal. water	

Set bridge plug at 4048' KB. Perforated 2 per foot E 90'-3914', 3857'-3870'. 74 holes.

Fourth Stage Frac: PC (5 pumps)

Breakdown w/1 pump	800#	Breakdown & fill	55 bbls.
All pumps on	800#	Flush	166 bbls.
Maximum pressure	1050#	Overflush	none
Maximum treating press.	1050#	Treating fluid	83160 gal.
Minimum treating press.	700#	Sand 20-40	100000 lbs.
Average treating press.	900#	inj. rate	67.3 BPM
Instant shut in	500#	Rubber balls	50
5 minute shut in	400#		

Job completed at 9 p.m. 7/6/62.

Started blowing well down at 11 p.m. Blew well to 1400#. well started showing gas and unloading water. Cleaned out to bridge plug 4049', on

WELL:

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7/7/62 Cont'd.

plug at 6 a.m. 7/7/62. Well gauged 7592 MCFD, making lot of water and sand.

7/8/62

Blew and cleaned well until 6 p.m. 7/7/62. Picked up to make connection to drill plug at 4048', float cut out in tubing. Pumped in 50 bbls. water, made connection. Before drilling plug at 8 p.m. well gauged 7972 MCFD. Drilled plug at 4048'. Well did not kill itself. Pumped 50 bbls. water in, pulled 24 joints 2 7/8" tubing. Broke U-Joint on rig. Waiting on parts.

7/9/62

Got rig repaired at 9:30 a.m. 7/8. Could not make connection due to leak back in tubing, pumped 50 bbls. of water in hole, pulled tubing out of hole, found 3 joints above bit with hose caused from sand cut coming from PC. Went back in well, blowing on own. Blowing down at 7300 MCFD, well making lot of water, some sand, good show of oil from Graneros.

7/10/62

Blew well on to 8120' (bridge plug), well shows some oil no increase in gas from Graneros. Drilled bridge plug at 8120', water came in top section of Dakota. Pulled five stands of tubing, blew well from this depth (7820'), well made 4" stream of water for two hours. Blew on down to bridge plug at 8120', finished drilling plug loose, pushed plug on to next bridge plug at 8228'. Blew and cleaned well at this depth till midnight. Well making 1" stream of water and some sand. Well logging at this point. Gauged well, well making 5000 MCFD. Drilled bridge plug at 8228', well started making 3" stream of water and lots of sand. Blew and cleaned well at 8228' until 5 a.m. Finished drilling plug loose and pushed on to PBTD of 8266'. On bottom at 5:30 a.m., blew and cleaned well until 8 a.m. Well cleaned up free of sand, still making 1 1/2" stream of water. Gauged well, well making 5208 MCFD. Well still logging, started laying down 2 7/8" tubing at 8:45 a.m. 7/10/62.

7/11/62

Finished laying down 2 7/8" tubing, set Model D, ran 1 1/2" and 1" tubing and preparing to pump out pump-out plug on Dakota side. Will have detailed packer and tubing setting information tomorrow.

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WELL:

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7/7/62 Cont'd.

Set Baker bridge plug top drillable at 8228' KB.

Second Stage Frac: Perforated 4 per foot 8202'-8223', 8174'-8186'

Breakdown w/1 pump	1800#	Breakdown & fill	42 bbls.
All pumps on	2200#	Flush	268 bbls.
Maximum pressure	2600#	Overflush	30 bbls.
Maximum treating press.	2600#	Treating fluid	45260 gal.
Minimum treating press.	2000#	Sand 20-40	20000 lbs.
Average treating press.	2200#	Sand 40-60	20000 lbs.
Instant shut-in	1600#	inj. rate	40 BPM
5 minute shut in	1500#	Rubber balls	35
		7# J-2 per 1,000 gal. water	

Set bridge plug at 8120' KB. Perforated 8076'-8094' four per foot.

Third Stage Frac: (5 pumps)

Breakdown w/1 pump	1800#	Breakdown & fill	46 bbls.
All pumps on	2400#	Flush	268 bbls.
Maximum pressure	2625#	Overflush	none
Maximum treating press.	2625#	Treating fluid	42840 gal.
Minimum treating press.	2200#	Sand 20-40	40000 lbs.
Average treating press.	2400#	Injection rate	41.3 BPM
Instant shut in	1900#	Rubber balls	40
5 minute shut in	1800#	7# J-2 per 1,000 gal. water	

Set bridge plug at 4048' KB. Perforated 2 per foot E 90'-3914', 3857'-3870'. 74 holes.

Fourth Stage Frac: PC (5 pumps)

Breakdown w/1 pump	800#	Breakdown & fill	55 bbls.
All pumps on	800#	Flush	166 bbls.
Maximum pressure	1050#	Overflush	none
Maximum treating press.	1050#	Treating fluid	83160 gal.
Minimum treating press.	700#	Sand 20-40	100000 lbs.
Average treating press.	900#	inj. rate	67.3 BPM
Instant shut in	500#	Rubber balls	50
5 minute shut in	400#		

Job completed at 9 p.m. 7/6/62.

Started blowing well down at 11 p.m. Blew well to 1400#. well started showing gas and unloading water. Cleaned out to bridge plug 4049', on

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7/12/62

Set Baker Model D packer at 7975' KB. Ran 244 joints of 1 1/2" tubing, V-50, 1.90 OD, 10-round, EUE, 2.90# for total of 7941.47', plug 1 1/2" pup joint 10', plus one 1 1/2" pup joint 8', plus 1 1/2" pup joint 6', plus one 1 1/2" pup joint 2' for total pipe and pup joints of 7967.47' plus 12' for KB. Tubing landed at 7979.47' KB. Ran 121 joints of 1" continuous 1.315 OD, 1.80#, 10-round, 1J for total of 3774.55' plus 12' for KB. Tubing landed at 3786.55' KB. Rig released at 9:30 a.m. 7/11. DK started flowing at 9:30 after 3 hours of flowing well gauged 1450 MCFD with 1" stream of water and good show of oil. After blowing and cleaning DK for 21 hours, well gauged 1024 MCFD with heavy spray of oil and from 1/4" to 1" stream of water. Ran Guiberson rubber adaptors on three joints of 1 1/2" tubing across from PC perfs. Shut in 7 a.m. 7/12/62

7/13/62

Shut in for test.

7/14/62

Shut in for test.

7/15/62

Shut in for test.

7/16/62

Shut in for test.

7/17/62

Shut in for test.

7/21/62

Tested Well. Test sheet will follow.

7/22/62

S. I. final report.

DATE July 20, 1962

Operator Consolidated Oil & Gas, Inc.		Lease Tribal "C" 4-6	
Location 1190' FSL 820' FFL Sec. 6 T 26N. R 3W		County Rio Arriba	State New Mexico
Formation Pictured Cliffs		Pool Tapicito	
Casing Diameter 7 5/8 & 5 1/2	Set At: Feet 4040	Tubing Diameter 1 3/5	Set At: Feet 3787
Pay Zone: From 3857	To 3914	Total Depth: Pkr.	
Stimulation Method Sand Water Frac		Flow Through Casing X	Flow Through Tubing

Choke Size, Inches .750		Choke Constant: C 14,1605	
Shut-in Pressure, Casing, PSIG 1044	- 12 = PSIA 1056	Days Shut-in 7	Shut-in Pressure, Tubing, PSIG 1043
Flowing Pressure: P 243	- 12 = PSIA 255	Working Pressure: Pw 246	- 12 = PSIA 258
Temperature: T 40	°F n = .75	Fp (From Testes) 1.036	Gravity .7

$$\text{CHOKE VOLUME} = Q = C \times P_r \times F_1 \times F_2 \times F_{pv}$$

$$Q = 14,1605 \times 255 \times 1.0198 \times .9258 \times 1.036 = 3532 \text{ MCF/D}$$

$$\text{OPEN FLOW} = Aof = Q \left(\frac{P_r^2}{P_c^2 - P_w^2} \right)^n$$

$$Aof = \left(\frac{1,115,136}{1,048,572} \right)^n = 1.063^n$$

$$Aof = 3697 \text{ MCF/D}$$

TESTED BY: A. A. Prather

WITNESSED BY:

OPEN FLOW TEST DATA

DATE July 20, 1962

Operator Consolidated Oil & Gas, Inc.		Lease Tribal "C" 4-6	
Location 1190' FSL 820' FFL Sec. 6 T 26N. R 3W		County Rio Arriba	State New Mexico
Formation Dakota		Pool Basin	
Casing Diameter 7 5/8 & 5 1/2	Set At: Feet 8260	Tubing Diameter 1 1/2	Set At: Feet 7979
Pay Zone: From 8076	To 8260	Total Depth: 8260	
Stimulation Method Sand Water Frac		Flow Through Casing	Flow Through Tubing X

Choke Size, Inches .750		Choke Constant: C 14,1605	
Shut-in Pressure, Casing, PSIG ---	- 12 = PSIA ---	Days Shut-in 7	Shut-in Pressure, Tubing, PSIG 2497
Flowing Pressure: P 96	- 12 = PSIA 108	Working Pressure: Pw ---	- 12 = PSIA ---
Temperature: T 44	°F n = .75	Fp (From Testes) 1.013	Gravity .7

$$\text{CHOKE VOLUME} = Q = C \times P_r \times F_1 \times F_2 \times F_{pv}$$

$$Q = 14,1605 \times 108 \times 1.0158 \times .9258 \times 1.013 = 1457 \text{ MCF/D}$$

$$\text{OPEN FLOW} = Aof = Q \left(\frac{P_r^2}{P_c^2 - P_w^2} \right)^n$$

$$Aof = \left(\frac{P_r^2}{P_c^2 - P_w^2} \right)^n$$

$$Aof = \text{MCF/D}$$

TESTED BY: A. A. Prather

WITNESSED BY: