

DRILLING AND COMPLETION HISTORY

CONSOLIDATED OIL & GAS, INC.

ROBINSON BROS. 1-34

San Juan County, New Mexico

July 12, 1961

Location: 1235' F/SL & 760' F/EL, Section 34  
T32N-R13W, N.M.P.M.

Elevation: 5791' Ground  
5803' K.B. - all measurements from K.B.

Spud: May 4, 1961

Drilling Completed: May 30, 1961  
Well Completed: June 5, 1961

Total Depth: 6888' Drilled  
6876' Plug Back

Casing:  
Surface: 9 5/8", 32.30# H-40 cemented at 193' x/150 sx  
2% CaCl<sub>2</sub> cement.  
Production: 5 1/2", 14, 15.5 & 17# J-55 cemented at 6888'  
w/250 sx 4% Diamix A and 250 sx 4% Diamix A  
thru stage collar at 4761'.  
Tubing: MV - 1" Jalcon weld hung at 4408'  
DK - 1 1/2" IJ J-55 hung at 6611'

Logs: Lane Wells Induction Electrolog

Cores and Drillstem Tests: None

Formation Tops: (Log)

Pictured Cliffs	2036'	(+ 2767')
Mesaverde	3635'	(+ 2168')
Cliffhouse	3770'	(+ 2033')
Menefee	3885'	(+ 1918')
Pt. Lookout	4433'	(+ 1370')
Mancos	4794'	(+ 1009')
Greenhorn	6526'	(- 723')
Dakota	6640'	(- 837')

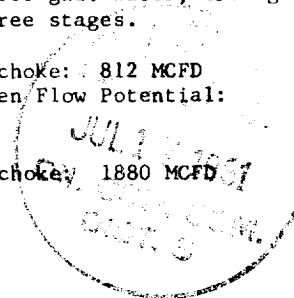
Producing Perforations:

	MV	DK
	4445' - 4453'	6657' - 6664' 6786' - 6792'
	4459' - 4469'	6672' - 6686' 6796' - 6800'
	4483' - 4513'	6694' - 6702' 6804' - 6808'
	4532' - 4551'	6724' - 6731' 6850' - 6872'
	4633' - 4641'	6742' - 6746'
	4660' - 4673'	6751' - 6756'
	4681' - 4692'	6766' - 6770'

Treatment: Sand-water frac:  
Mesaverde: 100,000# (20-40 mesh) sand, 100,000 gal. water.  
Dakota: 156,000# (40-60 and 20-40 mesh) sand, 151,000 gal. water, 1500 gal. acid in three stages.

Initial Potential: MV Flow volume thru 3/4" choke: 812 MCFD  
Calculated Absolute Open Flow Potential: 1790 MCFD

DK Flow volume thru 3/4" choke: 1880 MCFD



WELL: ROBINSON BROS. NO. 1  
1235' F/SL & 760' F/EL of Sec. 34-32N-13W, N. M. P. M.  
 FIELD: Basin Dakota and Blanco Mesaverde  
 COUNTY: San Juan STATE: New Mexico  
 ELEVATIONS: 5791.0' GD  
5803.0' KB

5/4/61

Rigging up.

5/5/61

Depth 193'. 13 3/4" hole. Dev. 3/4° at 160'. Running surface pipe.

5/6/61

Drilling with Bit No. 1 at 1245'. Dev. 1° at 1200'. Finished running surface casing. Ran 183' of 9 5/8" set at 193' KB. Cemented with 150 sx regular cement with 2% CC. Plug down 8 a.m. Friday.

5/8/61

Depth 2560'. Drilled 466'. Sand and shale. Drilling with Bit No. 9. Mud 9.1. Vis. 36.

5/9/61

Depth 3166'. Drilled 600'. Sand and shale. Trip for Bit No. 7. Vis. 39. Mud 9.1. Water loss 11.

5/10/61

Depth 3415'. Drilled 249'. Sand and shale. Making trip for Bit No. 8. Mud 9.1. Vis. 34. Water loss 12. 7% oil. Dev. 1/2° at 3250'.

5/11/61

Depth 3610'. Drilled 195'. Sand. Drilling with Bit No. 9. Mud 8.9. Vis. 35. Water loss 7.4.

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WELL: ROBINSON BROS. NO. 1-34

5/12/61

Depth 3729'. Drilled 119'. Sand. Making trip for Bit No. 12. Mud 9.2. Vis. 34. Water loss 9.2.

5/13/61

Depth 3870'. Drilled 141'. Sand and shale. Making trip for Bit 13. Mud 9.2. Vis. 37. Water loss 12. 7% oil.

5/14/61

Depth 3908'. Drilled 38'. Shale. Fishing for bit sub. Mud 9.5. Vis. 44. Water loss 11. Dev. 1/2° at 3800'.

5/15/61

Depth 3963'. Drilled 55. Shale. Drilling with Bit No. 16. Mud 9.3. Vis. 37. Water loss 14%. 6% oil.

5/16/61

Depth 4259'. Drilled 294'. Sand and shale. Tripping for Bit 18. Mud 9.3. Vis. 35. Water loss 10.

5/17/61

Depth 4515'. Drilled 225'. Sand and shale. Drilling with Bit No. 19. Mud 9.2. Vis. 35. Dev. 3/4° at 4340'. Water loss 9.8.

5/18/61

Depth 4673'. Drilled 158'. Sand and shale. Trip for Bit 21. Mud 9.1. Vis. 40. Water loss 9. Lost 50 barrels mud @ 4549'.

5/19/61

Depth 4852'. Drilled 179'. Trip for Bit 22. Mud 9.1. Vis. 40. Water loss 9.

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5/20/61

Depth 5062'. Drilled 216'. Sand and shale. Trip for Bit No. 24. Mud 9.4. Vis. 36. Water loss 10.2.

5/21/61

Depth 5385'. Drilled 325'. Sand and shale. Drilling with Bit No. 25. Mud 9.5. Vis. 35. Water loss 10.

5/22/61

Depth 5685'. Drilled 300'. Sand and shale. Drilling with Bit No. 26. Mud 9.4. Vis. 35. Water loss 7.8. Dev. 3/4° at 5575'.

5/23/61

Depth 6100'. Drilled 415'. Sand and shale. Drilling with Bit 27. Mud 9.4. Vis. 39. Water loss 10.

5/24/61

Depth 6390'. Drilled 490'. Sand and shale. Drilling with Bit 28. Mud 9.5. Vis. 48. Water loss 10.

5/25/61

Depth 6710'. Drilled 120'. Sand and shale. Trip for Bit 30. Mud, 9.4. Vis. 52. Water loss 8.6.

5/26/61

Depth 6735'. Drilled 25'. Sand. Drilling with Bit 31. Mud 9.8. Vis. 55. Water loss 8.

5/27/61

Depth 6824'. Drilled 89'. Sand. Trip for Bit 33. Mud 9.6. Vis. 61. Water loss 7.6.

5/28/61

Depth 6876'. Drilled 44'. Sand. Logging. Mud 9.6. Vis. 87.

WELL: ROBINSON BROS. NO. 1-34

5/29/61

Total depth 6886'. Running production casing. Drilled 10'. Sand. WOC.

5/31/61

Total depth 6886'. WOC. Rig released yesterday a.m. Ran 62 joints 5 1/2" J-55 casing and set at 6888' KB (casing tally depth was 6889' KB). Casing string from the bottom up consisted of the following: 65 joints of 17# ST&C - 2647'; 26 joints of 14# ST&C - 767'; 79 joints of 15.5# ST&C - 2457'; 32 joints of 15.5# LT&C - 1017'. Float collar at 6807' KB PBTD. Halliburton DV stage collar at 4761' KB.

Cemented lower stage opposite Dakota formation with 250 sacks B-J Ideal Regular Type 1 cement with 4% Diamix A. Also, added 47# of R-5 retarder. Bumped plugs with 1500 PSIG - checked floats - OK. Allowed three hours WOC before proceeding with upper stage cement job.

Cemented upper stage opposite Mesaverde formation with 250 sx of B-J Ideal Regular Type 1 cement with 4% Diamix A. Bumped plugs at 2000 PSIG and closed stage collar.

Utilized Weatherford scratchers and centralizers through critical Dakota and Mesaverde sections.

6/1/61

Moving on completion rig.

6/2/61

Running Correlation Log in preparation for perforating and fracing.

Picked up completion tubing and bit and drilled stage collar - found good hard cement. Went on to bottom and drilled float collar and good hard cement to 6876' PBTD. Spotted 750 gallons 15% HCl on bottom and pulled completion tubing.

WELL: ROBINSON-BROS. NO. 1-34

6/3/61

Cleaning out frac sand after performing two of the three Dakota frac stages.

Completed running Gamma Ray Correlation Logs. Perforated on ES-Induction Log Reference with two bullets and two jets per foot - 6850' to 6872'. Soaked away acid in three slow soaking stages as follows: 2200 PSIG breaking to 1600 PSIG, 1800 PSIG breaking to 600 PSIG, 2000 PSIG breaking to 1000 PSIG (last stage probably contaminated with water). Performed lower stage Dakota frac as follows: Injected 10,000# 40-60 mesh sand in 17,000 gallons water treated with Western Company's water loss additive only. Started injecting at 3200 PSIG building gradually to 3400 PSIG while increasing sand concentration from 1/4# to 3/4# per gallon. Sand laden fluid had average injection rate of 25 BPM. Standing pressure was 3100 PSIG in 15 minutes and remained at 2600 PSIG for several hours thereafter. Displaced additional 750 gallons 15% HCl (mud acid) to bottom and lubricated in cast iron bridge plug and set at 6834' KB.

Perforated with two jets and two bullets per foot the following intervals: 6724' to 6731' (communication noted immediately with lower zone after placing these perfs), 6742' to 6746', 6751' to 6756', 6766' to 6770', 6786' to 6792', 6796' to 6800', 6804' to 6808'.

Soaked away acid and performed second stage Dakota frac as follows: Acid soaked away in 3 stages beginning at 1500 PSIG and ending at 1200 PSIG. Started injecting at 2800 PSIG at 34 BPM. Continued at these conditions while increasing sand concentration from 1/4 to 1# per gal. until 23,000# sand injected - dropped 5 balls - still pumping at 2800 PSIG at 34 BPM. Dropped 5 balls while pumping at 2850 PSIG. After 39,000# sand injected and pumping at 2900 PSIG - dropped 5 additional balls. A ball-out to 3700 PSIG occurred when these balls hit, at which time 46,000# sand had been injected in formation w/sand concentration at 1 1/4# per gal. Unable to effect flush even after attempts to back flow and release ball and sand-out effect.

Summary: Injected 46,000# sand into formation (30,000# 40-60 and 16,000# 20-40 mesh), 50,000 gal water treated with Western Company's water loss additive only, 15 balls, 750 gal. 15% mud acid, 34 BPM, 2800 to 2900 PSIG.

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6/4/61

Going in hole with workover string to drill out bridge plug and clean out to bottom after third stage Dakota frac and Mesaverde frac.

Cleaned out after second stage Dakota frac to bridge plug at 6834'. Set magnesium bridge plug at 6708'. Perforated with two bullets and two jets per foot at the following upper Dakota intervals: 6657' to 6664', 6672' to 6686', 6694' to 6702'. No communication noted between these upper Dakota perfs and lower Dakota perfs. Performed upper stage Dakota frac as follows: Began injecting at 2100 PSIG with sand concentration building to 1 1/2# per gallon by the time 30,000# sand injected - then pumping at 2250 PSIG. Increased sand to 2# per gallon - pumping at 2300 PSIG at 51 BPM when 50,000 pounds sand injected. Reduced sand concentration to 1# per gallon and dropped 10 balls with pressure increase to 2375 PSIG. Then dropped 5 balls per minute until 80,000# sand injected, at which time pressure was 2425 PSIG with 60 balls injected. Then dropped 10 balls per minute with pressure of 2700 PSIG with 97,000# sand injected. Pressure increased to 2800 PSIG and then to 3200 PSIG by the time 100,000# sand injected, had 3500 PSIG injection pressure immediately at the end of the flush. Had standing pressure of 1600 PSIG. Set magnesium bridge plug on wire line at 4800'.

Stage summary:

100,000# sand (30,000# 40-60 mesh and 70,000# 20-40 mesh), 84,000 gallons water (all treated with Western Company's FLA and Slickum agent), 80 balls, 2100 to 2800 PSIG, 50 BPM.

Perforated with two jets per foot (ES-Induction Log reference), at the following Mesaverde intervals: 4445' to 4453', 4459' to 4469', 4483' to 4513', 4532' to 4551', 4633' to 4641', 4660' to 4673', 4681' to 4692'.

Performed Mesaverde sand-water frac as follows: Injected 100,000# 20-40 mesh sand using 120 balls while building injection pressure from 1500 PSIG initially to 2200 PSIG finally, utilized 1# sand per gallon. Averaged 68 BPM. Utilized 100,000 gallons untreated water.

6/5/61

Running 1 1/2" Dakota tubing string.

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6/5/61 (Cont'd)

Drilled out bridge plugs and cleaned out to 6874'. Lost approximately 1,000 barrels of water, principally to Mesaverde, during clean out operation. Cleaned out about 200' of frac sand above Dakota and cleared hole of all perforation junk with the exception of about 2' left on bottom. Laid down workover tubing string and set Baker Model "D" permanent completion type packer at 6611' KB.

6/6/61

Allowing Dakota zone to blow and clean up. Completed running completion tubing as follows:

Dakota: 210 joints of 1 1/2" IJ plus one 1 1/2" x 6' IJ sub on top plus one 2" EUE x 6 1/2" pup joint above locator sub for a total of 6603' set in Model D production packer at 6611' KB. Approximately 2' of compression left in tubing string.

Mesaverde: 133 joints of 1" regular Jalcon Weld (4397') set at 4408' KB. Set tubing jet collars at 3713' and 3217' KB.

Instigated natural Dakota flow very rapidly following eight shallow swab runs. Mesaverde will remain shut in until Dakota cleans up to a degree sufficient to use for instigating Mesaverde gas flow.

6/7/61

Dakota zone blowing frac water with strong indicated flow varying from 1.5 to 2.5 million cubic feet per day. No attempt has been made to instigate Mesaverde flow. Now have 125 PSIG casing pressure.

6/8/61

Cycling Dakota gas stream through Mesaverde in effort to instigate natural Mesaverde formation flow. The Dakota was left open on its own until about 8 p.m. The Dakota flow stream remains quite wet along with measured gas volumes varying from 1/2 to 2 million cubic feet per day.

6/9/61

Dakota shut in this a.m. Mesaverde continuing to flow and unload frac water on its own with 910 PSIG casing pressure.

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6/10/61

Shut in.

6/11/61

Shut in. Blew Dakota and Mesaverde for approximately 7 hours, cleaning up frac water with flow stream from each. Still very wet.

6/12/61

Shut in. Blew Mesaverde and Dakota approximately 7 hours, cleaning up frac water with flow stream. Still wet. Will allow both zones to clean up for a few more days before shutting in for 7 days for standard potential test.

6/13/61 to 6/15/61

Shut in for 7 day build up after allowing well to clean up frac water from both Mesaverde and Dakota for approximately 5 hrs. per day. Both zones fairly dry and ready for standard potential test.

6/23/61

Shut in for continued Mesaverde build up and completion of packer leakage test next week. Completed initial official potential test and first phase of packer leakage test for Dakota yesterday, with the following results:

Time	Tubing Pres.	Temp.
1 hr.	249 PSIG	55°
2 hrs.	189 PSIG	47°
3 hrs.	*127 PSIG	47°
	*18±0 MCFD	

6/29/61

Shut in awaiting hookup. Completed initial official potential test for Mesaverde and final phase of packer leakage test yesterday with following results:

WELL: ROBINSON BROS. NO. 1-34

Time After Opening	Mesaverde		Temp.	Dakota Tubing
	Casing	Tubing		
0 min	1115 PSIG	1121 PSIG		1827 PSIG
15 "	1029 "	108 "	33°	
30 "	1001 "	102 "	33°	
45 "	972 "	99 "	33°	
60 "	955 "	96 "	33°	1823 PSIG
120 "	898 "	78 "	35°	1823 PSIG
180 "	897 "	*49 "	37°	1827 PSIG

\* Approximately 850 MCFD flowing

OPEN FLOW TEST DATA

DATE June 29, 1961

Operator	Consolidated Oil & Gas, Inc.	Lease	Robinson Bros. No. 1-34
Location	1235' FSL & 760' FEL of 34-32N-13W	County	San Juan
State	New Mexico	Pool	Blanco Mesaverde
Formation	Mesaverde	Tubing Diameter	1"
Casing Diameter	5 1/2"	Set At Feet	4408'
Total Depth	6888'	Flow Through Tubing	Yes
Pay Zone From	4445'	Flow Through Casing	Yes
Simulation Method	Sand-water frac		

Choke Size, inches	3/4"	Choke Constant: C	14,1605
Shut-in Pressure, Casing	PSIG 1115	Shut-in Pressure, Tubing	PSIG 1121
MV	1127	Days Shut-in	7
Flowing Pressure: P <sub>w</sub>	PSIG 49	Working Pressure: P <sub>w</sub>	PSIG 897
Temperature: T	37	F <sub>v</sub> (From Tables)	1.012
		Gravity	0.70

CHOKED VOLUME =  $Q = C \times P_w \times F_v \times F_a \times F_b \times F_{pv}$   
 $Q = 14,1605 \times 61 \times 1.022 \times 0.9258 \times 1.012 = 812$  MCF/D

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

$$\text{Aof} = \left( \frac{1,268,000}{443,000} \right)^n = 2.86 \times 0.75 = 2.2$$

Aof 1790 MCF/D

TESTED BY Pete Sanger  
 WITNESSED BY



OPEN FLOW TEST DATA

DATE June 2, 1961

Operator	Consolidated Oil & Gas, Inc.	Lease	Robinson Bros. No. 1-34
Location	1235' FSL & 760' FEL Sec. 34-32N-13W	County	San Juan
State	New Mexico	Pool	Basin
Formation	Mesaverde	Tubing Diameter	1 1/2"
Casing Diameter	5 1/2"	Set At Feet	6618
Total Depth	6876	Flow Through Tubing	X
Pay Zone From	6672	Flow Through Casing	X
Simulation Method	Sand-water frac		

Choke Size, inches	0.75	Choke Constant: C	14,1605
Shut-in Pressure, Casing	PSIG 127	Shut-in Pressure, Tubing	PSIG 1803
MV - St. Verde	139	Days Shut-in	7
Flowing Pressure: P <sub>w</sub>	PSIG 127	Working Pressure: P <sub>w</sub>	PSIG 1815
Temperature: T	47	F <sub>v</sub> (From Tables)	1.018
		Gravity	0.70

CHOKED VOLUME =  $Q = C \times P_w \times F_v \times F_a \times F_b \times F_{pv}$   
 $Q = 14,1605 \times 139 \times 1.0127 \times 0.9258 \times 1.018 = 1880$  MCF/D

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

Time	Tubing Pres.	Temp.
1 hr.	249 PSIG	55°
2 hrs.	189 PSIG	47°
3 hrs.	127 PSIG	47°

Aof MCF/D

TESTED BY SAMUEL  
 WITNESSED BY

