

DRILLING AND COMPLETION HISTORY

CONSOLIDATED OIL & GAS, INC.

CONSOLIDATED-HALE NO. 2-15

San Juan County, New Mexico
June 22, 1961

Location: 990' FNL & 1650' FWL, Section 15
T26N-R8W, N. M. P. M.

Elevation: 7060' Ground
7072' K. B. - all measurements from K. B.

Spud: March 13, 1961

Drilling Completed: April 6, 1961
Well Completed: May 19, 1961

Total Depth: 7436' Drilled
7428' Plug Back

Casing:
Surface: 9 5/8", 36# H-40 cemented at 194' w/180 sx
2% CaCl₂ cement.
Production: 5 1/2", 15.5# & 17# J-55 cemented at 7435'
w/170 sx 50/50 Pozmix & 4% gel plus 85 sx
neat thru shoe, and 150 sx 50/50 Pozmix and 4%
gel cement thru stage collar at 5508', 150 sx
50/50 Pozmix & 4% gel thru stage collar at 2990'.

Tubing: MV - 1" CW hung at 5170'.
DK - 1 1/2" IJ J-55 hung at 7225' in Baker
Model "D" Packer set at 7218'.

Logs: Schlumberger Induction-Electric

Cores and Drillstem Tests: None

Formation Tops: (Log)

Pictured Cliffs	2878'	(+ 4194')
Mesa Verde		
Cliffhouse	4443'	(- 2629')
Menefee	4644'	(- 2428')
Pt. Lookout	5196'	(- 1876')
Mancos	5483'	(- 1589')
Gallup	6293'	(+ 779')
Greenhorn	7136'	(- 64')
Dakota	7226'	(- 154')

Producing Perforations:

	MV	DK
	5201' - 5209'	7228' - 7250'
	5220' - 5230'	7292' - 7328'
	5255' - 5259'	7359' - 7368'
	5285' - 5290'	7375' - 7391'
	5314' - 5321'	7395' - 7399'
	5327' - 5335'	7406' - 7414'

Treatment: Sand-water Frac:
Mesaverde: 80,000# (20-40 mesh) sand,
80,000 gal. water, 100 balls
Dakota: 129,000# (40-60 and 20-40 mesh)
sand, 145,000 gal. water, 750 gal.
acid, 135 balls in two stages.

Initial Potential: MV Flow volume thru 3/4" choke: 150 MCFD
DK Flow volume against 400 PSI - 22 hr. test -
average rate 1200 MCFD.

WELL: CONSOLIDATED-HALE NO. 2-15
(990' F/NL & 1650' F/WL of Sec. 15-26N-8W, NMPM)
 FIELD: Basin - Dakota
 COUNTY: San Juan STATE: New Mexico
 ELEVATIONS: 7060' GD
7072' KB

3/12/61

Moving on rotary tools.

3/13/61

Rigging up rotary tools.

3/14/61

Spudded in at 10:00 p.m. Drilled 120' 15" hole. Dev. 3/4° at 90'.

3/15/61

Drilling at 905'. Drilled 195' 15" hole. Ran 194' (6 joints) of 9 5/8" - 36# H-40 casing set at 194' KB. Cemented with 180 sx regular 2% CaCl₂. Plug down 1:00 p.m. WOC. Drilled 710' sand and shale. Drilling with Bit No. 1. Using water. Dev. 1/4° at 670'. Pressured up on surface pipe at 700 PSI before drilling out. Held OK 30 minutes.

3/16/61

Depth 2225'. Drilled 1320'. Shale and sand. Making trip for Bit No. 3. Mud - 9.5. Vis. - 41. Dev. - 3/4° at 1290' and 3/4° at 1800'.

3/17/61

Depth - 2575'. Drilled 350' sand and shale. Present operation - drilling with Bit No. 4. Mud - 10. Vis. - 73. Dev. - 1° at 2300'.

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3/25/61

Depth 5430'. Drilled 263'. Shale and sand. Present operation - drilling with Bit No. 15. Mud - 9.8. Vis. - 40. Water loss - 7.4.

3/26/61

Depth 5794'. Drilled 357'. Formation - shale and sand. Drilling with Bit No. 16. Mud - 9.6. Vis. - 50. Water loss - 6.

3/27/61

Depth 6170'. Drilled 367'. Formation shale and sand. Making trip for Bit No. 18. Vis. - 44. Mud 9.7. Water loss - 6.2.

3/28/61

Drilling at 6516' with Bit 19. Formation shale and sand. Mud 9.8. Vis. 43. Water loss 6.8. 7 3/4 hours drilling, 7 3/4 hours trips, 8 1/2 hours rig and pump repair.

3/29/61

Making trip for Bit No. 21 at 6560'. Drilled 244'. Formation shale and sand. Mud 9.8. Vis. 44. Water loss 7.8. Dev. 1° at 6288'. 14 3/4 hours drilling, 8 1/2 hours trips, 3/4 hours other.

3/30/61

Drilling at 6747' with Bit No. 21. Drilled 187'. Shale and sand. Mud 9.6. Vis. 43. Water loss 6.8. 13 1/2 hours drilling, 7 1/2 hours trips and working on motors, 3 hours lost circulation, lost at 6678'.

3/31/61

Making trip at 6985' for Bit No. 23. Drilled 238'. Sand and shale. Mud 9.6. Vis. 46. Water loss 7. 14 hours trip, 8 1/2 hours trip and one-half 1 1/2 hours other.

4/1/61

Making trip at 7224' - Bit 24. Drilled 239'. Sand and shale. Mud 9.7. Vis. 54. Water loss 7.8. 15 1/2 hours drilling, 7 1/2 hours trips, 1 hour other.

WELL: CONSOLIDATED-HALE

3/18/61

Depth 3330'. Drilled 665'. Formation - shale and sand. Present operation - drilling with Bit No. 5. Mud - 9.7. Vis. - 35. Dev. - 1° at 2800'.

3/19/61

Depth 3805'. Drilled 575'. Formation - shale and sand. Present operation - drilling with Bit No. 6. Mud 9.6. Vis. - 38. Dev. - 1° at 3250'.

3/20/61

Depth - 4072'. Drilled 267'. Formation - shale and sand. Present operation - drilling with Bit No. 8. Mud - 9.7. Vis. - 40. Dev. - 3/4° at 3700'.

3/21/61

Depth 4300'. Drilled 228'. Sand and shale. Drilling with Bit No. 9. Mud - 9.7. Vis. - 58.

3/22/61

Depth - 4545'. Drilled - 245'. Formation - sand and shale. Present operation - drilling with Bit No. 10. Mud - 9.6. Vis. - 39. Water loss - 7.2.

3/23/61

Depth 4767'. Drilled 222'. Formation - sand and shale. Present operation - making trip for Bit No. 12. Mud - 9.6. Vis. - 40. Water loss - 7.

3-24-61

Depth 5167'. Drilled 400'. Formation - shale and sand. Present operations - drilling with Bit No. 13. Mud - 9.6. Vis. - 38. Water loss - 7.6. Dev. - 1/2° at 5028'.

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4/2/61

Depth 7296'. Sand and shale. Drilled 72'. Drilling with Bit 25. Mud 9.7. Vis. 62. Water loss 8.

4/3/61

Depth 7354'. Coming out of hole to log. Drilled 58'. Sand. Mud 9.8. Vis. 65. Bit No. 26.

4/4/61

Depth 7400'. Drilled 46'. Sand. Making trip for Bit No. 28. Mud 9.7. Vis 63. Water loss 7.4. Had 4 3/4 hours logging - were not deep enough.

4/5/61

TD 7436'. Drilled 36'. Sand. Going in hole to lay down drillpipe and run casing. Mud 9.7. Vis. 75. Water loss 7.6.

4/6/61

Depth 7441'. Drilled 5'. Sand. Running 5 1/2" casing. 70 joints in hole. Mud 9.7. Vis. 75. Water loss 7.2.

4/7/61

WOC. MORT. Released rig at midnight. Completed running casing as follows: 124 joints (7464') 5 1/2" - J-55 casing set at 7435' KB (total depth of hole by casing tally 7436' KB). Makeup of casing string as follows from bottom to top: 2911' of 5 1/2" - 17# - ST&C; 2922' of 5 1/2" 15.5# - ST&C; 1602' of 5 1/2" - 15.5# - LT&C.

Float collar at 7401' KB. Howco type DV stage cementing collars at 5508' (Mesaverde) and 2990' (Pictured Cliffs). Metal petal baskets at 5143' and 5540'. Four centralizers spaced throughout Dakota zone, two throughout Mesaverde interval, and one at the top of the Pictured Cliffs.

Performed three stage cementing jobs as follows:

Dakota - cemented with 170 sx 50/50 Pozmix with 4% gel, followed by 85 sx of regular cement with 6% gel. Bumped plugs with 3000 PSIG - checked floats - OK. Good returns throughout job.

WELL: CONSOLIDATED-HALE NO. 2-154/7/61 Cont'd

Mesaverde - cemented with 150 sx 50/50 Pozmix with 4% gel. Bumped plugs at 2000 PSIG - checked floats - OK. Good returns throughout job.

Pictured Cliffs - cemented with 150 sx 50/50 Pozmix with 4% gel. Bumped plugs at 2000 PSIG - checked floats - OK. Good returns throughout job.

5/11/61

Moving on completion rig.

5/12/61

Going in hole with completion tubing and bit to drill out cement plug and proceed with completion.

5/13/61

Coming out of hole to frac.

Cleaned out to 7428' PBTD after drilling stage collars opposite both Mesaverde and Pictured Cliffs and float collar opposite the Dakota. Displaced 750 gallons 15% mud acid on bottom - retrieved tubing and bit. Pressure tested casing to 3000 PSIG indicating all stage collars and casing shoe holding satisfactorily.

5/14/61

Preparing to perforate for upper stage Dakota frac - perforated with 2 bullets and 2 jets per foot for lower stage Dakota frac as follows: 7359' to 7368'; 7375' to 7380'; 7380' to 7391'; 7395' to 7399'; 7406' to 7414'.

Soaked away acid at 1200 PSIG after obtaining breakdown at 2200 PSIG. Performed lower stage Dakota frac as follows: 63,000# sand (13,000# 40-60 mesh and 50,000# 20-40 mesh sand), 75,000 gallons water (all treated with J-101), 50 balls, 750 gallons 15% HCl, 37 BPM, 2400 PSIG average. The first 20 balls were injected after 30,000# sand with a slight pressure increase to 2200 PSIG. Dropped 10 balls after 40,000# sand with pressure @ 1900 PSIG increasing to 2000 PSIG. Dropped 20 additional balls after 55,000# sand with pressure increase to 3000 PSIG. Flushed at 14 BPM at 3000 PSIG. Had standing pressure of 1200 PSIG at surface. Lubricated in magnesium bridge plug and set at 7350'.

WELL: CONSOLIDATED-HALE NO. 2-155/19/61

Running 1" Mesaverde completion tubing.

Recovered fish - see 5/18/61 report. Ran Dakota completion tubing, 231 joints of 1 1/2" integral joint. landed in Model "D" packer at 7218' with following equipment detail:

7194' (231) joints + 1 - 6' pup on top + 1 - 2" EUE x 6' pup above locator sub + approximately 1' donut equaling 7207' set at 7218' KB.

5/20/61

Allowing Dakota zone to blow and clean up - making approximately 1 MMCFD - very wet. Ran 1" regular - CW Mesaverde completion tubing as follows: 161 joints (5160') set at 5170' KB. Jet collars at 4463' and 3951'.

5/23/61

Dakota continuing to blow and clean up frac water making 800 MCFD but real wet with heavy percentage of free oil. Mesaverde has 700 PSIG on casing but will not sustain natural flow as yet. It will be necessary to clean Dakota for a few days, after which time we can kick off the Mesaverde with Dakota pressure.

5/25/61

Dakota blowing and cleaning up - making 1100 MCFD with a considerable amount of oil along with frac water. Well appears to be getting stronger in the Dakota.

The Mesaverde zone kicked off this morning with the aid of Dakota pressure and is now flowing and cleaning up frac water on its own.

5/29/61

The Mesaverde zone has continued to flow and clean up on its own intermittently. Periodically it has been necessary to aid flow with Dakota gas pressure.

Have continued to flow Dakota intermittently. The surface tubing head pressure builds rapidly to 1800 PSIG in a few hours after shut in. The Dakota clean up liquid stream appears to contain quite a bit of green oil production.

WELL: CONSOLIDATED-HALE NO. 2-155/15/61

Cleaning out sand at 6850' after upper stage Dakota frac and Mesaverde frac.

Perforated with 2 bullets and 2 jets per foot as follows: 7228' to 7250'; 7292' to 7328'. Performed upper stage Dakota frac as follows: Injected 66,000# 20-40 mesh sand at average of 37 BPM at 2500 PSIG. Used 85 balls with only little reaction, 70,000 gallons water with J-101. The last 15,000# sand was injected at a rate of 2# per gallon. Had sustained surface shut-in pressure of 1100 PSIG. Perforated with 2 bullets per foot for Mesaverde frac as follows: 5201' to 5209'; 5220' to 5230'; 5255' to 5259'; 5285' to 5290'; 5314' to 5321'; 5327' to 5335'. Injected 80,000# 20-40 mesh sand at average rate of 48 BPM with average injection pressure of 2100 PSIG. Injected ball sealers as follows: 20 balls after 20,000# sand; 20 balls after 30,000# sand; 15 balls after 40,000# sand; 10 balls after 50,000# sand; 10 balls after 60,000# sand; 25 balls after 68,000# sand, for a total of 100 balls. Pressure increased slowly from 2000 to 2200 PSIG throughout job. Had standing pressure of 1100 PSIG one hour after job-opened well and allowed to flow back for four hours, after which time the well died. Went in hole with tubing and bit to clean out to bottom.

5/16/61

Tripping for plugged bit. Ready to drill bridge plug at 7350'.

5/17/61

Drilling bridge plug junk and cleaning out sand at 7370'. Have been losing 50 to 70 barrels water per hour all night.

5/18/61

Fishing. Cleaning out bridge plug junk and frac sand to 7428' PBTD. Pulled tubing and bit in preparation for final completion procedures. Ran Baker Model "D" permanent completion packer on wire line and set at 7218' KB. In rigging up Dakota completion string, elevators failed and dropped following fish: 18" x 1" stinger. Model "D" seal units, locator sub, and one joint of 1 1/2" integral joint tubing.

WELL: CONSOLIDATED-HALE NO. 2-155/30/61

Shut in Mesaverde zone yesterday a.m. with 850 PSIG on casing. It has continued to clean up intermittently on its own but still bringing lots of frac water.

The Dakota appears to be relatively well cleaned up. In flowing it to the pits, it makes a heavy spray of green oil. Shut in for initial pressure build up and potential testing.

5/31/61

Both Dakota and Mesaverde zones shut in preliminary to additional initial testing.

Ran three hour preliminary potential test on Dakota. Had 1852 PSIG tubing head pressure after 24 hours shut in. Test results were as follows:

Time After Opening to Atmosphere Thru 3/4" Choke	Tubing Pressure
15 minutes	330 PSIG
120 "	112 "
135 "	108 "
150 "	102 "
165 "	122 "
	(Bringing heavy slug oil and frac water)
180 "	78 "
	(1300 MCFD)

Mesaverde had 975 PSIG wellhead pressure following 24 hours shut in. The zone was opened to the atmosphere and had 825 PSIG after one hour, which declined to 525 PSIG after 7 hours. The gas volume was quite variable and immeasurable because of the very wet liquid stream. Substantial additional clean up will be necessary.

6/2/61

Dakota formation has now been shut in for 48 hours. Will continue shut in period for additional five days and perform initial routine three hour potential test through 3/4" choke as well as additional testing through special equipment to more accurately determine actual volumes of oil

WELL: CONSOLIDATED-HALE NO. 2-15

6/2/61 (Cont'd)

as well as gas productivity. Surface pressure was 1870 PSIG after the first 24 hours. We have seen considerable life from the Mesa-verde formation, but it has not been sufficient to sustain flow for more than 12 to 15 hours at a time without logging off because of the heavy volumes of produced frac water coming through the restricting 1" tubing string. Will attempt further clean up by flowing intermittently through casing.

6/5/61

Dakota remains shut in with 1960 PSIG tubinghead pressure yesterday.

Mesaverde had 900 PSIG tubinghead pressure - opened through tubing and allowed to clean up for 7 hours while it unloaded heavy slugs of frac water and green oil during the first two hours. It then settled quite steadily to a 1/2" stream of frac water with moderate oil cut and steady flow of gas - estimated at 500 MCFD.

6/8/61

The Dakota has remained shut in but will be tested today. Had 1980 PSIG tubinghead pressure yesterday.

The Mesaverde had 775 PSIG tubinghead pressure yesterday. It was opened through the tubing and flowed heavy frac water heads for about 30 minutes with gas too small to measure. Will instigate further Mesa-verde cleanup using Dakota gas supply.

6/9/61

Dakota shut in after running initial potential test on Dakota yesterday. See test data sheet dated 6/8/61.

Mesaverde is being allowed to clean up additionally before testing.

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6-13-61

Took 22 hour test with well tester against 400 pounds back pressure. Averaged approximately 1.2 million cubic feet per day during 22 hours against simulated line pressure. Produced 97 bbls of 48° gravity oil and 36 bbls frac water in 22 hrs. Initial hour gas rate at 1.9 million cubic feet per day and last hour at 900,000 cubic feet per day. Gas rate fairly steady during last 16 hours of test - between 900,000 and 1.3 million cubic feet per day.

6/14/61 to 6/15/61

Cleaning up Mesa Verde frac water with aid of Dakota gas. Mesa Verde starting to show more life on its own. Will continue to flow on an intermittent basis until Mesa Verde is cleaned up.