THE APPLICATION OF CONSOLIDATED OIL & GAS, INC., FOR A DUAL COMPLETION.

ORDER NO. MC-1388

ADMINISTRATIVE ORDER
OF THE OIL CONSERVATION COMMISSION

Under the provisions of Rule 112-A, Consolidated Oil & Gas, Inc., made application to the New Mexico Oil Conservation Commission on September 20, 1963, for permission to dually complete its Apache Well No. 2-16 located in Unit C of Section 16, Township 26 North, Range 3 West, NMPM, Rio Arriba County, New Mexico, in such a manner as to produce gas from the Pictured Cliffs formation adjacent to the Tapacito-Pictured Cliffs Pool and the Blanco-Mesaverde Pool.

NOW, on this 10th day of October, 1963, the Secretary-Director finds:

(1) That application has been duly filed under the provisions of Rule 112-A of the Commission's Rules and Regulations;

(2) That satisfactory information has been provided that all operators of offset acreage have been duly notified; and

(3) That no objections have been received within the waiting period as prescribed by said rule.

(4) That the proposed dual completion will not cause waste nor impair correlative rights.

(5) That the mechanics of the proposed dual completion are feasible and consonant with good conservation practices.

IT IS THEREFORE ORDERED:

That the applicant herein, Consolidated Oil & Gas, Inc., be and the same is hereby authorized to dually complete its Apache Well No. 2-16 located in Unit C of Section 16, Township 26 North, Range 3 West, NMPM, Rio Arriba County, New Mexico, in such a manner as to produce gas from the Pictured Cliffs formation adjacent to the Tapacito-Pictured Cliffs Pool and the Blanco-Mesaverde Pool through parallel strings of tubing.

PROVIDED HOWEVER, That applicant shall complete, operate, and produce said well in accordance with the provisions of Rule 112-A.

PROVIDED FURTHER, That applicant shall take packer-leakage tests upon completion and annually thereafter during the Annual Deliverability Test Period for the Blanco-Mesaverde Pool.

IT IS FURTHER ORDERED:

That jurisdiction of this cause is hereby retained for the entry of such further orders as the Commission may deem necessary.

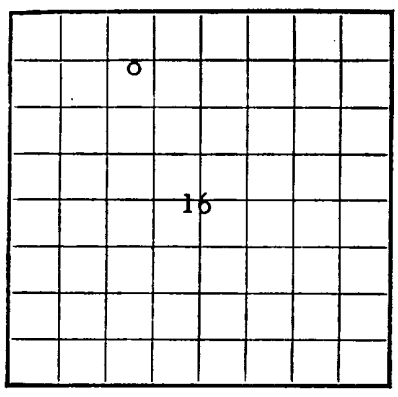
DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

A. L. PORTER, Jr.
Secretary-Director

S E A L

Form 9-330



LOCATE WELL CORRECTLY

Form approved.
Budget Bureau No. 42-R355.4.

U. S. LAND OFFICE Jicarilla
SERIAL NUMBER Apache
LEASE OR PERMIT TO PROSPECT 116

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOG OF OIL OR GAS WELL

Company Consolidated Oil & Gas, Inc. Address 4150 E. Mexico Ave., Denver 22, Colo.

Lessor or Tract Apache Field Tapicito PC - Blanco MV State Rio Arriba

Well No. 2-16 Sec. 16 T. 26N R. 3W Meridian NMPM County Rio Arriba

Location 790 ft. {N./S.} of N. Line and 1850 ft. {E./W.} of W. Line of Sec. 16 Elevation 7043' KB
(Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed W. H. Williams

Date September 25, 1963 Title Chief Engineer

The summary on this page is for the condition of the well at above date.

Commenced drilling February 2, 1963 Finished drilling February 22, 1963

OIL OR GAS SANDS OR ZONES

(Denote gas by G)

No. 1, from 3694 to 3788 No. 4, from ____ to ____

No. 2, from 5856 to 5958 No. 5, from ____ to ____

No. 3, from ____ to ____ No. 6, from ____ to ____

IMPORTANT WATER SANDS

No. 1, from ____ to ____ No. 3, from ____ to ____

No. 2, from ____ to ____ No. 4, from ____ to ____

CASING RECORD

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated From—	Perforated To—	Purpose
9-5/8	38			319	guide				surface
7	23			3956	float				production
4-1/2	10.5			2043	float				liner
4-1/2	11.6			213					

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
9-5/8	308	270			
7	3947	144	Pump & Plug		
4-1/2	6005	361	Pump & Plug		

PLUGS AND ADAPTERS

Heaving plug—Material ____ Length ____ Depth set ____

Adapters—Material ____ Size ____

SHOOTING RECORD

Size	Shell used	Explosive used	Quantity	Date	Depth shot	Depth cleaned out
Mesaverde - Sand Water Frac with 100,000 lbs. and 95,728 gals.						
Pictured Cliffs - Sand Water Frac with 100,000 lbs. and 94,970 gals.						

TOOLS USED

Rotary tools were used from 0 feet to 6366 feet, and from ____ feet to ____ feet

Cable tools were used from ____ feet to ____ feet, and from ____ feet to ____ feet

DATES

____, 19____ Put to producing July 15, 1963

The production for the first 24 hours was ____ barrels of fluid of which ____% was oil; ____% emulsion; ____% water; and ____% sediment. Gravity, °Bé. ____

If gas well, cu. ft. per 24 hours PC - 558 MV - 937 Gallons gasoline per 1,000 cu. ft. of gas ____

Rock pressure, lbs. per sq. in. PC: SITP 999, SICP 1011; MV: SITP 1183

If gas well, cu. ft. per 24 hours MV - 937 PC - 558 Gallons gasoline per 1,000 cu. ft. of gas ____

Rock pressure, lbs. per sq. in. PC: SITP 999, SICP 1011; MV: SITP 1183

EMPLOYEES

Huron Drilling Company, Driller ____, Driller

Contractor, Driller ____, Driller

FORMATION RECORD

FROM—	TO—	TOTAL FEET	FORMATION
PERFORATIONS			FORMATION TOPS
Pictured Cliffs			Pictured Cliffs 3632 (/3411)
3694	3714		Cliff House 5497 (/1546)
3742	3760		Point Lookout 5850 (/1193)
3780	3788		
Mesaverde			
5856	5867		
5890	5894		
5928	5932		
5952	5958		

FOR ADDITIONAL INFORMATION - SEE ATTACHED HISTORY

FORMATION RECORD—Continued [OVER]

16—43094-5

FOLD | MARK

DRILLING & COMPLETION HISTORY
CONSOLIDATED OIL & GAS, INC.
APACHE NO. 2-16
Rio Arriba County, New Mexico
September 14, 1963

Location: 790' F/NL, 1850' F/WL, Section 16
T26N, R3W, NMPM

Elevations: 7030.6' GL
7042.6' KB

Spud: February 2, 1963

Drilling Completed: February 22, 1963

Well Completed: July 9, 1963

Total Depth: 6366' Drilled
5992' PBTD

Casing: Surface: 9 5/8" set at 308' KB. Cemented with 270 sx regular cement, 4% $CaCl_2$.

Production: 7" 23# intermediate casing set at 3947', cemented with 144 sx regular.
4 1/2" 10.5 & 11.6# casing set as liner from 3747' to 6005', cemented with 361 sx 50-50 Pozmix.

Tubing: 1 1/2" EUE tubing set in Baker Model "D" packer at 5760'
1" EUE tubing set at 3597' (see report for detail on gas lift valves)

Logs: Lane Wells Induction - Electric and Gamma Ray/Neutron

Cores & Drillstem Tests: None

Formation Tops (Log):

Pictured Cliffs:	3632' (+3411)
Cliff House:	5497' (+1546)
Point Lookout:	5850' (+1193)

Producing Perforations:

MV	PC
5856-67'	3694-3714'
5890-94'	3742-60'
5928-32'	3780-88'
5952-58'	

Treatment: MV Sand-water frac with 100,000 lbs sand and 95,730 gals water

PC Sand-water frac with 100,000 lbs sand and 94,970 gals water

Initial Potential: MV Flow volume thru 3/4" choke - 937 MCFD

PC Flow volume thru 3/4" choke - 558 MCFD

Calculated Absolute Open Flow Potential: 590 MCFD

WELL: APACHE NO. 2-16

790' F/NL, 1850' F/WL, Sec. 16, T26N-R3W

FIELD: Blanco Mesaverde, Tapicito Pictured Cliffs

COUNTY: Rio Arriba STATE: New Mexico

ELEVATIONS: 7030.6' GL

7042.6' KB

1/31/63

Moving in rotary rig.

2/1/63

Finished moving in rotary and rigged up. Present operation, drilling rat hole.

2/2/62

Depth 310'. Drilled 310' of 15" surface hole. Present operation, circulating, waiting on cementing equipment.

2/3/62

Depth 380'. Drilled 70'. Rigged up and ran 10 joints 9 5/8" surface pipe. Total pipe 319', set at 308' KB. Cemented with 270 sx. regular cement, 4% $CaCl_2$. Good returns. Drilled out of pipe, pipe started to shift in hole. Present operation, cementing pipe from top of hole.

2/4/63

Depth 1497'. Drilled 1117' of sand and shale. Making trip for Bit 2. Mud 8.9. Vis. 38. Dev. 1/2° at 800', 1° at 1250'. Recemented top of surface with 26 sx. Everything OK now.

2/5/63

Drilling at 2435'. Drilled 938' of sand and shale. Drilling with Bit 2. Mud 9.2. Water loss 7.4. Dev. 1 1/2° at 1550', 2° at 2050'.

WELL: APACHE NO. 2-16

2/6/63

Depth 3030'. Drilled 697' of sand and shale. Drilling with Bit 4. Mud 9.3. Vis. 38. Dev. 1° at 2550', 1° at 2900'.

2/7/63

Depth 3432'. Drilled 400' of sand and shale. Present operation, drilling with Bit 5. Mud 9.5. Vis. 36. Dev. 1 1/2° at 3235'.

2/8/63

Depth 3862'. Drilled 430' of sand and shale. Present operation, drilling with Bit 6. Mud 9.3. Vis. 40. Dev. 27° at 3600'.

2/9/63

Depth 3950'. Drilled 88', logging tool hit bridge at 3100'. Went back in hole with drill pipe and conditioned hole to TD. Ran logs. Present operation, coming out of hole with logging tool and preparing to run casing.

2/10/63

Ran 97 joints 7" 23#, 8-round casing, total pipe 3955.76', less above KB 9.00', float collar at 3904.76' KB, pipe set at 3946.76' KB. One centralizer on shoe joint, one centralizer at 3350' KB. Cemented with 144 sx. regular 4% gel. Good returns on cement job, present operation, going in hole blowing down at 1800'.

2/11/63

Finished blowing hole to 3807', hit cement, blew and dried hole up. Drilled 140' of cement. Present operation, drilling at 3938', well dusting.

2/12/63

Depth 5080'. Drilled 1130'. Drilling with Bit 7. Dev. 1° at 4350', 3/4° at 4820'.

2/13/63

Depth 5498'. Drilled 418' of sand and shale. Present operation, blowing hole in prep to pressure up, had some moisture at 5468'. From 5468' to 5478' well dusted some, 5478' to 5498' no dust. Have been blowing hole five hours, hole indicates trying to dry up. Have hit no visible moisture, no show of gas.

WELL: APACHE NO. 2-16

2/14/63

Depth 5552'. Drilled 54', no dust, Present operation, pulling out of hole at present with drill pipe in preparation to squeeze.

2/15/63

Went back to bottom, cleaned up hole, came out of hole, put Baker retainer on, set packer at 5436' KB. After setting packer, pulled 20,000#, then set 45,000# down on packer, stayed OK. Loaded drill pipe with water. Pressured up hole below packer, started taking fluid at 600#. Pumped 6 bbls. water into open hole below Baker packer, started leaking, shut pressure down, pulled 20,000# on Baker packer, packer held. Set back down on packer 45,000#, could not move packer. Started pumping down drill pipe, packer still leaking, got loose from packer, came out of hole. Present operation, blowing hole down at 3900'.

2/16/63

Depth 5633'. Drilled 83', cleaned out to packer, drilled packer. Well dusted for 83', stopped dusting. Went in hole with drill pipe open ended and spotted 200 sx. regular cement with 2% $CaCl_2$. Present operation, WOC. Spotted 1000' of water on top of cement.

2/17/63

After spotting cement, went back in hole with drill pipe and bit, found top of cement at 4536'. Blew and dried up at this depth, started drilling cement, drilled to 5100', no cement from 5100' to 5300' (200'). Present operation, blowing hole at 5300', trying to get well to dust.

2/18/63

Depth 5485'. Blowing hole, drilled 185' of cement. Have been blowing at this depth for 4 hours. Well started to show a little dust.

2/19/63

Cleaned out, drilled cement from 5485' to 5535', (50). Came out of hole with drill pipe, very muddy and dirty. Went back in hole with drill pipe, worked and cleaned hole up, started injecting soap at 5535' (1 qt. per 4 gals. water every 15 minutes). Drilled cement from 5535' to 5640' (original TD), total 115'. Pipe dragging heavy, blew and cleaned hole. Drilled from 5640' to 5648', 8' of new hole, well trying to dust. Present operation, making connection to drill ahead.

WELL: APACHE NO. 2-16

2/20/63

Depth 5906'. Drilled 258'. Used 10 gal. OK Chemical and 1 gal. T-99. Present operation, flushing hole with soap and water.

2/21/63

Depth 6366'. Drilled 460' of sand and shale. Dev. 1° at 5950'. Used 6 gal. OK and 2 gal. T-99. Present operation, thawing out stem pipe and rotary hose and making trip for Bit 11.

2/22/63

Went back in hole with bit. Hole had 150' of fillup. Cleaned out to 6286', picked up to make connection. Hole sluffed in on top of bit. Worked pipe for 3 hours, got pipe loose, came up into intermediate with bit. Started blowing hole down. Present operation, blowing and cleaning hole at 5856', 510' off of bottom. As soon as hole is cleaned will come out of hole with drill pipe to run casing.

2/23/63

Conditioned hole and ran total of 2256.49 4 1/2" casing, 2043' of 10.5# 213 of 11.6#, set at 6005' KB, float collar at 5972' KB, top of liner at 3747' KB., cemented with 361 sx. 50-50 Pozmix, 4% Gel, plug down at 5:30 a.m., 2-23-63. Present operation coming of hole with drill pipe.

2/24/63

Finished coming out of hole, lay down hanger tool. Go back in hole with drill pipe, found top of cement at 3600'. Laid down drill pipe, shut rig down, waiting on roads to dry up.

2/25/63

Shut down due to muddy roads.

2/26/63

Shut down due to bad weather and road conditions.

2/27/63

Shut down due to muddy roads.

WELL: APACHE NO. 2-16

2/28/63

Shut down due to road conditions.

3/1/63

Shut down due to road conditions.

3/2/63

Shut down due to mud.

3/3/63

Shut down due to mud.

3/4/63

Will start up today.

3/5/63

Starting up rig. Put 6 1/4" bit on, started picking up 2 3/8" tubing at 4 p.m. March 4. Hit first bridge of cement at 2900'. Rig up pump broke circulation and cleaned hole up. Ran tubing on to 3150'. Presently drilling cement at 3150'.

3/6/63

Found top of liner at 3740'. Drilled float collar and cleaned out to 5992'. Pressured up to 1300 lbs. Present operation-logging. Log indicates base of Mesaverde at 5977'.

3/7/63

Finished logging. Released rotary rig 9:30 a.m. March 6, 1963.

3/28/63

Waiting on completion.

3/29/63

Waiting on completion rig.

WELL: APACHE NO. 2-16

3/30/63

Rig up to perforate and run correlation log. Got to depth of 5930'; lack 53' getting to bottom, apparently a bridge or fillup. Could not perforate. Pressured up on casing with Dowell pump to 2900# for 10 minutes. Pressure held okay.

4/1/63

Waiting on completion rig.

4/9/63

Will move in completion rig today.

4/10/63

Moved in completion rig, rigged up. Present operation, picking up 2 3/8" completion string. Have about two-thirds of string picked up as of 6 a.m.

4/11/63

Finished running tubing to 5980'. Hit bridge at 5940'. Put pump on. Circulated out. Came out of hole with tubing and bit. Rig up Go perforaters.

Perforated Mesaverde 2 per foot 5958'-5952'; 5932'-5928'; 5894'-5890'; 5867'-5856'; fifty holes.

Rig up Dowell (4 pumps)

Mesaverde

Breakdown: 1 pump	2600-2200#	Breakdown and fill	16 bbls
All pumps on:	2100#	Treatment fluid	95,728 gals
Max. treatment pressure	2300#	Over Fludh	none
Min. treatment pressure	1800#	lbs. sand 20-40	100,000#
Avg. treatment pressure	2100#	Avg. injection rate	40.8 BPM
Final treatment pressure	2000#	Rubber balls	20
Instant shut in	600#	Flush	7,600 gals
5 min. shut in	600#		

Lost one pump after having 60,000# of sand in. Injection rate before losing pump 45.0 BPM. Rig up Go perforaters. Set Go magnesium plug @ 3830' K.B.

WELL: APACHE NO. 2-16

4/11/63 (con't)

Perforated 4 per foot 3788'-3780'; 3760'-3742'; 2 per foot 3714'-3694'. Perforated 3788'-3780' on overlap of liner, rigged up Dowell. Pressured up to 2300#, broke to 1500#. Went ahead, finished perforating. This was to check for penetration on overlap. Rig up Dowell (4 pumps)

Pictured Cliffs

Breakdown: 1 pump	2300#	Breakdown and fill	420 gals
All pumps on	1700#	Treatment fluid	94,970
Max. treatment pressure	2900#	Overflush	none
Min. treatment pressure	1700#	lbs. sand 20-40	100,000#
Avg. treatment pressure	2300#	Avg. injection rate	45.9 BPM
Final treatment	2900#	Rubber balls	90
Instant shut in	1000#	Flush	6,300 gals
5 min. shut in	1000#	complete @ 1:35 a.m. 4-11-63	

Present operation, blowing hole at 1600.

4/13/63

Blew well down to 5400'. No increase in gas, well making 800 MCFD, plugged bit, pulled out of hole, unplugged bit. Went back in hole blowing down, present operation, blowing well at 4300'. Well making 2" stream of water and sand. Gauged well at 8 a.m., gauged 400 MCFD. Well appears to be logging.

4/14/63

Present operation, blowing well on bottom. Well making 248 MCFD with 2" stream of water and sand. Have been blowing on bottom for 12 hours.

4/15/63

Set Model D packer at 5760'. Landed 1 1/2" tubing and rigged up to run 1" tubing. Both zones making 150 MCFD.

4/16/63

Ran 178 joints 1 1/2" 8 round tubing, total tubing 5722.98'. One sub 10.19 and one sub 8.93 plus 12' from KB. Landed tubing at 5754' KB. Ran 116 joints of 1" tubing 3647.63' plus 12' KB. Landed tubing at 3659.63' KB. One jet collar at 3349'KB. One jet collar at 2839' KB. Finished at 4 p.m. 4-15-63.

WELL: APACHE NO. 2-16

4/23/63

Opened PC. tubing. 820/820 yesterday. After 2 hours of blowing, casing pressure 610#. Well making approximately 300 MCFD. PC unloaded lots of water. Moved in Signal small rig. Will swab MV this a.m.

4/24/63

Rigged up swabbing unit. Found fluid down hole at 2700'. Swabbed from 2700' to 4700' for 6 hours. Could not lower fluid level. No sign of gas. Present operation, perparing to pull both strings of tubing this a.m.

4/25/63

Pulled 1" and 1 1/2" tubing. Will install gas lift valves today and run 1 1/2" tubing back in.

4/26/63

Ran 175 joints 1 1/2" tubing, set @ 5617.73' KB with 7 Camco gas lift valves @ 583.64', 907.69', 1392.15', 2072.02', 2882.99', 3758.73' and 4602.18'.

4/29/63

Line pressure 430#. Well jetting some water and gas on its own.

5/1/63

Casing pressure 415#. Builds up slowly to 450# then unloads water. Est. unloading depth 3500'. Unloading water at rate of 100 BPD. Gas too small to measure.

5/2/63

Casing pressure 430#. Jetting and unloading water @ rate of 48 BPD on its own. Installed check valves and gas supply line and turned gas on.

5/3/63

Line pressure 450#. Unloaded 92 BW.

5/4/63

Line pressure 480#. Unloading at rate of 121 BPD, gas too small to measure.

5/6/63

Unloading okay. 460# line pressure, 420# casing pressure, 76 BWPD.

WELL: APACHE NO. 2-16

5/7/63

Unloading okay. 477# line pressure, 420# casing pressure, 78 BWPD.

5/8/63

Shut line gas off. Casing pressure 390#, 367 MCFD, 66 BWPD.

5/8/63 thur 5/14/63

Produced as follows: Avg. casing pressure - 363 psi, avg. MCFPD - 250 MCFD, Avg. BWPD - 55 BWPD.

5/14/63

Shut in at 6:30 a.m.

5/23/63

8 day SIP - 995# casing, 995# tubing. Opened well, after 3 1/2 hours, making 1,000 MCFD plus 50 BWPD, casing pressure 440#. Shut well in.

5/24/63

23 hour SIP - 760/760. Opened well up.

5/25/63 thru 5/29/63

Well produced as follows: Avg. casing pressure - 365 psi, avg. MCFD - 242 MCFD, avg. BWPD - 70 BWPD.

5/30/63

24 hours SIP - 600/600.

6/20/63

21 day SIP - 1045/1045

6/30/63

Pulled 1 1/2" tubing. Removed gas lift vlaves. Reran 5763.48' 1 1/2" EUE tubing and landed in Baker Model "D" packer at 5760'.

7/1/63

MV - SIP after 27 hours - 1010 psi.
PC - Pressure - 0

OPEN FLOW TEST DATA

DATE July 22, 1963

Operator: Consolidated Oil & Gas, Inc.		Lease: Apache 2-16	
Location: 790'FNL & 1850'FWL, Sec. 16, T26N, R3W		County: Rio Arriba	State: New Mexico
Formation: Mesaverde		Pool: Blanco	
Casing: Diameter: 4-1/2" Liner	Set At: Feet: 3747 - 6005	Tubing: Diameter: 1-1/2"	Set At: Feet: 5760'
Pay Zone: From: 5856	To: 5958	Total Depth: 6005'	
Stimulation Method: Sand - water Frac.		Flow Through Casing:	Flow Through Tubing: X

Choke Size, Inches: 0.75	Choke Constant: C: 14.1605				
Shut-in Pressure, Casing, PSIG:	+ 12 = PSIA	Days Shut-in: 7	Shut-in Pressure, Tubing PSIG: 1171	+ 12 = PSIA	1183
Flowing Pressure: P PSIG: 57	+ 12 = PSIA	69	Working Pressure: P_w PSIG:	+ 12 = PSIA	
Temperature: T °F: 37	n = 0.75		Fpv (From Tables): 1.013	Gravity:	0.70(est)

CHOKE VOLUME = Q = C x P_t x F_t x F_g x F_{pv}

Q = 14.1605x69x1.0229x9258x1.013 = 937 MCF/D

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

Aof = $\left(\frac{\quad}{\quad}\right)^n$ =

Aof = _____ MCF/D

TESTED BY Aubrey Prater

WITNESSED BY Clyde Phillips

W. H. Williams, Chief Engineer

WELL: APACHE NO. 2-16

7/2/63

MV - 1010 tubing, PC - 320/320

7/4/63

Waiting on gas lift valves from Houston. Ran 3 hour test on MV. Beginning of test - tubing pressure 1082. At end of 3 hour, tubing flow pressure - 14#.

7/5/63

Waiting on gas lift valves.

7/9/63

Ran 1" tubing with gas lift valves. Landed tubing at 3597', valves set at 723.60', 740.6', 1477.82', 1855.19', 2228.59' and 2543.47'. These settings from bottom of hole.

7/10/63

Mv - 1050 tubing, PC - 525 tubing, 530 casing.

7/11/63

MV - 1085 tubing, PC - 475 tubing, 475 casing

7/13/63

MV - 925 tubing. PC - 675/675.

7/14/63

MV - 1030 tubing. PC - 800/800.

7/15/63

Ran 3 hour test on PC. Final tubing pressure 29#, casing 247, well dry.

7/22/63

Ran 3 hour test on MV, Final flow pressure - 57#. Heavy spray of water, trace of oil throughout test.

OPEN FLOW TEST DATA

DATE July 15, 1963

Operator: Consolidated Oil & Gas, Inc.		Lease: Apache 2-16	
Location: 790FNL & 1850'FWL, Sec. 16, T26N R3W		County: Rio Arriba	State: New Mexico
Formation: Pictured Cliffs		Pool: Tapicito	
Casing: Diameter: 7"	Set At: Feet: 3947	Tubing: Diameter: 1"	Set At: Feet: 359'
Pay Zone: From: 3694	To: 3788	Total Depth: 6005'	
Stimulation Method: Sand water frac.		Flow Through Casing:	Flow Through Tubing: X

Choke Size, Inches: 0.75	Choke Constant: C: 14.1605				
Shut-in Pressure, Casing, PSIG: 999	+ 12 = PSIA: 1011	Days Shut-in: 7	Shut-in Pressure, Tubing PSIG: 987	+ 12 = PSIA	999
Flowing Pressure: P PSIG: 29	+ 12 = PSIA	41	Working Pressure: P_w 247 PSIG	+ 12 = PSIA	259
Temperature: T °F: 35	n = 0.85		Fpv (From Tables): 1.013	Gravity:	0.70(est)

CHOKE VOLUME = Q = C x P_t x F_t x F_g x F_{pv}

Q = 14.1605x41x1.0249x.9258x1.013 = 558 MCF/D

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

Aof = $\left(\frac{1011^2}{1011^2 - 259^2}\right)^n = 1.070^{.85} = 1.059$

Aof = 590 MCF/D

TESTED BY Aubrey Prater

WITNESSED BY Clyde Phillips

W. H. Williams, Chief Engineer