DRILLING AND COMPLETION HISTORY

HURON DRILLING COMPANY, INC.

HURON NO. 3-2
Rio Arriba County, New Mexico
January 16, 1964

LOCATION:		975' FNL, 810' FEL, Section 2 T26N-R4W, NMPM
ELEVATIONS:		7233' GL 7245' KB - all measurements from KB
SPUD:		November 1, 1963
DRILLING COMPLETED: WELL COMPLETED:		December 12, 1963 December 29, 1963
TOTAL DEPTH:		6330' (Drilled) 6297' (Plug Back)
CASING:		
	Surface:	12-3/4", 33# casing set at 306', cemented with 250 sx. regular 2% $CaCl_2$.
	Intermediate:	8-5/8", 32# casing set at 4222' with 260 sx. 50/50 Pozmix with 2% gel, 2% $CaCl_2$.
	Production:	5-1/2" liner hung from 4113' to 6330' cemented with 350 sx. 50/50 Pozmix, 4% gel.
TUBING:		1" EUE tubing set at 4001.5'. 1-1/2" EUE tubing set at 5847'. Baker Model D packers at 5802' and 5845'.
LOGS:		Welex Gamma Ray/Neutron
CORES & DRILLSTEM TESTS:		None
FORMATION TOPS: (Log)		Pictured Cliffs 4000' (+3245') Cliffhouse 5776' (+1469') Point Lookout 6126' (+1119')
PRODUCING PERFORATIONS:		PC: 4010' - 4066', 4076' - 4085' MV: 5814' - 5826', 6166' - 6171', 6194' - 6200', 6204' - 6208', 6220' - 6240', 6253' - 6265', 6273' - 6279'
TREATMENT:	PC	Sand water frac with 59,700 gal. water and 100,000 lbs. sand.
	MV	Sand water frac with 85,900 gal. water and 100,000 lbs. sand.
INITIAL POTENTIAL	PC	Flow volume thru 3/4" choke: 1343 MCFD Calculated Absolute Open Flow Potential: 8297 MCFD
	MV	Flow volume thru 3/4" choke: 2925 MCFD

WELL: HURON NO. 3-2

975' FNL, 810' FEL, Section 2-T26N-R4W

FIELD: Blanco Mesaverde, Tapicito Pictured Cliffs

COUNTY: Rio Arriba STATE New Mexico

ELEVATIONS: 7233' GL

7245' KB

10-31-63

Moving in rotary rig.

11-1-63

Completed moving rotary on to location. Will rig up and break tower today.

11-2-63

Finished rigging up. Drilling rat hole. Spudded in at 4:00 p.m. Presently drilling at 50' a 17" hole.

11-3-63

Depth 170', drilled 120' of 17" hole. 1/2° dev. at 100'. Had pump trouble, changed out pump.

11-4-63

Depth 306' of 17" hole; ran 17 jts. (294') of 13" OD casing. Set at 306' KB, and cemented with 250 sx reg., 2% $CaCl_2$. Presently pumping down plug.

11-5-63

Cement circulated good. Nippled up. Pressured up to 1000#. Depth, 616'. Drilled 310', sand and shale. Drilling with Bit #1. Drilling a 10-5/8" hole. Mud weight, 8.3; viscosity, 32; water loss, 21. 3/4° dev. at 500'.

11-6-63

Depth, 1550'. Drilled 934', sand and shale. Present operation: Drilling with Bit #2. Mud weight, 9#; viscosity, 36; water loss, 21. 1° dev. at 895'. 1° dev. at 1292'.

WELL: HURON NO. 3-2

11-7-63

Depth, 2317'. Drilled 760', sand and shale. Drilling with Bit #3. Mud weight, 9.5; viscosity, 39; water loss, 8. 1° dev. at 2239'.

11-8-63

Depth, 2885'. Drilled 568', sand and shale. Drilling with Bit #4. Mud weight, 9.6; viscosity, 38; water loss, 9.2. 1-1/4° dev. at 2700'.

11-9-63

Depth, 3266'. Drilled 381'. Drilling with Bit #5. Mud weight, 9.4; viscosity, 37; water loss, 9.6. 1-1/2° dev. at 3200'.

11-10-63

Depth, 3636'. Drilling with Bit #6. Drilled 370', sand and shale. Mud weight, 9.3; viscosity, 38; water loss, 9.4.

11-11-63

Depth, 3836'. Drilled 200', sand and shale. Drilling with Bit #7. Mud weight, 9#; viscosity, 41; water loss, 9.6. Added 30 sx of loss circulation material as pretreatment. Began injecting gas at 3840'. 1/2° dev. at 3740'.

11-12-63

Depth, 4110'. Drilled 274', sand and shale. Drilling with Bit #8. Mud weight, 9.7; viscosity, 47; water loss, 9.6.

11-13-63

Depth 4240'. Drilled 130'; circulated hole. Made short trip; came out of hole. Presently running 8-5/8" 32# casing. Lack 20' being on bottom with casing. No lost circulation as of now.

11-14-63

Ran 133 jts. of 8-5/8" 32# casing, set at 4222' from KB. Float collar at 4118' KB. Pipe set 18' off bottom, due to bridge. Pretreated with 320 bbls. of mud with 35% Hydracine, using 6 gals. with 100 bbls. Cemented with 260 sx of 50-50 Pozmix with 2% gel, 2% $CaCl_2$. Pumped plug at 8:30 a.m., 11-13-63. Pressured up to 1250# with rig pump, held for 15 min., began blowing down at 7:00 p.m., 11-13-63. Presently blowing down at 3900'.

WELL: HURON NO. 3-2

11-15-63

Drilled float collar and shoe; went to 4240'. No cement in shoe joint, or below pipe. Blew for 6 hrs. with no decrease in moisture. Made 10' of hole, apparently dry. Made additional 10', moisture increased. Blew hole 4 hrs. with no change. Drilled 5' with moisture remaining constant. 1/4" stream of water with small amount of mud. Pulled up into pipe 4174', blew for 2-1/2 hrs. No change in quantity; however, water did clear up some. Lowered to bottom and blew 4 hrs. Came out of hole to squeeze. TD, 4264'.

11-16-63

Ran Baker Full-Bore Packer to 2000'. Set packer and pressured up to 2000 psi on backside. Pumped down drill pipe at 700 psi, 7.5 BPM. Released packer and ran to 4112'. Pressured up to 2000 psi on backside. Pumped in at 7.5 BPM, 700 psi. Started cement, cleared tool by 1 bbl. Cement set for 40 min., moved 1/2 bbl. 800 psi pressure. 30-min. standing pressure 400 psi. Moved 1/2 bbl., 1500 psi pressure. 45-min. standing pressure, 1200 psi. Moved cement 1/2 bbl., 2000 psi. 20-min. standing pressure 1975 psi. Released pressure, no bleed back. Released packer and came out of hole. Left 4.5 bbl. slurry in 8-5/8" casing. 15 bbls. in formation. Used 100 sx reg. cement, with 4% CaCl. Job completed 6:00 p.m. Presently blowing down. Top of cement at 4129'. Making estimated 1.0 million natural before squeeze. Gas unloaded drill pipe at 3400'.

11-17-63

Made 769'. Drilling in sand and shale with Bit #9. 1/4° dev. at 4650'. P. T. D. 5083'.

11-18-63

Depth, 5762'. Drilled 729', sand and shale. Drilling with Bit #10. 1-1/2° dev. at 5280'.

11-19-63

Depth, 5855'. Pulled out of hole to change bit. Had 3 drill collars back in hole. Well caught fire at 3:00 p.m. Present operation: Extinguishing fire.

WELL: HURON NO. 3-2

11-20-63

Fire extinguished. (Mailing detailed report.)

11-21-63

Fire out 6:30 a.m., 11-20-63. Fire going out "blooey" line. Packed off around drill collar. Cut and laid down drill pipe. Will pull drill collars out this morning, and set magnesium bridge plug.

11-22-63

Rigged up and pulled 3 - 6-1/2" drill collars and bit out of hole. Rigged up Welex and ran and set magnesium bridge plug in 8-5/8" casing at 3025'. Huron Drilling Company shut down awaiting insurance adjuster.

11-23-63

Waiting on Huron Drlg. Co. to move out rotary.

11-24-63

Waiting on insurance company approval to move out rig.

11-25-63

Same.

11-26-63

Same.

12-6-63

No report.

12-7-63

Preparing to lay down derrick.

12-8-63

Moving out rig after laying down derrick.

WELL: HURON NO. 3-2

12-9-63

Should be rigged up by Noon, ready to go in hole; blowing down and drilled plug at 3025'.

12-10-63

Changed out rams on blowout preventer. Started back up with drill pipe. Presently blowing down at 2400'.

12-11-63

Depth, 5878'. Drilled 23' of sand and shale. Made trip for plug bit. Drilling with Bit #12. Dusting good.

12-12-63

TD 6330', presently logging.

12-13-63

Ran Welex Gamma-Ray/Neutron log, and 71 jts. 5-1/2" 15.5# J-55 casing (2213.18'), plus casing shoe (0.90'), liner hanger (2.80'), for a total of 2216.88', set as liner from 4112.87' KB to 6329.75' KB. Float collar at 6297.41' KB. Cemented with 350 sx. 50-50 posmix, 4% gel. Bumped plug with 1800#, held.

12-14-63

Waiting on completion rig.

12-21-63

Moved in completion rig. Go in hole to top of liner. (No cement above liner top). Present operation, loading hole in preparation to pressure up.

12-22-63

Pressure up on liner to 2750. held ok. Clean out to float collar at 6297'. Pressured up to 2750, held OK. Present operation, blowing down at 3580'.

12-23-63

Blew down to 5800'. Perforated 6273-6279', 6253-6265', 6220-6240', 6204-6208', 6194-6200', 6166-6171', two per foot. Gas increased with each run. Gauged at 250 MCF. Hooked up Halliburton, 4-HT 400's. Treated with 100,000 lbs. 20-40 sand.

WELL: HURON NO. 3-2

12-23-63

Loaded hole	0 psi	Initial injection rate	69 BPM
Pumped in	700 psi	Max. injection rate	92 BPM
Max. treating pressure	2000 psi	Final injection rate	78 BPM
Min. treating pressure	500 psi	Avg. injection rate	87 BPM
Final Treat. press.	1600 psi	Sand	100,000 lbs. 20-40
Avg. treating pressure	1200 psi	Treatment volume	85,900 gal.
Instant SI pressure	Vacuum	Balls	70 balls in 112 holes
Job complete at 9:30 p.m.		Overflush	25 bbls.

Set Baker top drillable mg. bridge plug at 5900'. Perforated 5814'-5826', two per foot. Set bridge plug at 5750'. Perforated 4076'-4085', 4010'-4066', two per foot. Hooked up Halliburton, four - HT 400's.

Broke w/1 pump	1700 psi	Initial injection rate	87 BPM
Pumped in all trks	1000 psi	Max. injection rate	92 BPM
Max. treat. press.	3000 psi	Final injection rate	45 BPM
Min. treat. press.	900 psi	Average injection rate	76 BPM
Final treat. press.	3000 psi	Sand	100,000 lbs. 20-40
Avg. treat. press.	1430 psi	Treatment volume	59,700 gal.
Instant SI pressure	1850 psi	Balls	95 in 130 holes
5 min. SI pressure	1400 psi	Overflush	None
10 min. SI press.	500 psi		
Job complete at 3:30 a.m.			

This treatment was balled off with 500 lbs. of sand left in pipe.

12-25-63

Drilled on bridge plug five hours, came out of hole and shut down.

12-26-63

Preparing to drill plug at 5750' and 5900'.

12-27-63

Finished drilling plug at 5750', got top of plug drilled off at 5900'. Came back up 10', rotated till tubing started torqueing up. Started working tubing, pulled 5400# and pulled tubing in two, three joints below surface. Well making 1 million and started trying to unload. Gauged well, now making 3 3/4 million before drilling second plug. Overshot on way to location.

WELL: HURON NO. 3-2

12-28-63

Drilled and pushed plug to bottom. Rigged up Welex. Set Baker Model "D" packer at 5845' and 5802'.

12-29-63

Ran 3.75' seal unit, 0.25' x-over, P.S.I., seating nipple 0.60', 4.0' sub P.S.I. sliding sleeve 1.50, 32.64' jt., 3.45' seal unit and locator sub, 53 joints of 1 1/2" EUE tubing, four Baker 2 1/16" blast joints, 122 joints 1 1/2" EUE plus 14' of subs for a total of 5834.67' set at 5846.67' KB. Seating nipple had plug in place and sliding sleeve run in open position. Ran a total of 127 joints of 1" EUE for a total of 3989.53' landed at 4001.53' KB. Jet collars at 3350' and 3750'.

12-30-63

Cliffhouse 1120 psi after 12 hours, preparing to test and then pull plug to test MV. PC 700 psi after 12 hours.

12-31-63

Cliffhouse 1175 psi. Ran 3 hour test. 850 MCFD, pulled plug to test MV. PC 820/820.

OPEN FLOW TEST DATA

DATE January 11, 1964

Operator: Huron Drilling Company, Inc.		Lease: Huron No. 3-2	
Location: 975'FNL, 810'FEL, Sec. 2, T26N, R4W		County: Rio Arriba	State: New Mexico
Formation: Pictured Cliffs		Pool: Tapacito	
Casing: Diameter: 8-5/8"	Set At: Feet: 4247	Tubing: Diameter: 1"	Set At: Feet: 3990
Pay Zone: From: 4010	To: 4085	Total Depth: 4300	
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: 996	- 12 = PSIA: 1008	Days Shut-In		Shut-in Pressure, Tubing, PSIG: 996	- 12 = PSIA: 1008
Flowing Pressure: P, PSIG: 87	- 12 = PSIA: 99			Working Pressure: Pw, PSIG: 935	- 12 = PSIA: 947
Temperature: T, °F: 38	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 = 14.1605 x 99 x 1.0218 x .9258 x 1.013 = 1343 MCF/D

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

Aof = $\left(\frac{1,016,064}{119,255} \right)^n = 8.52^{.85} = 6.1782$

Aof = 8297 MCF D

TESTED BY Johnny Walker

WITNESSED BY _____

OPEN FLOW TEST DATA

DATE January 3, 1964

Operator: Huron Drilling Company, Inc.		Lease: Huron No. 3-2	
Location: 975'FNL, 810'FEL, Sec. 2, T26N, R4W		County: Rio Arriba	State: New Mexico
Formation: Mesaverde		Pool: Blanco	
Casing: Diameter: 5-1/2"	Set At: Feet: 6330	Tubing: Diameter: 1-1/2"	Set At: Feet: 5847
Pay Zone: From: 6194	To: 6279	Total Depth: 6330	
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: 1167	+ 12 = PSIA: 1179	
Flowing Pressure: P PSIG: 204	+ 12 = PSIA: 216		Working Pressure: P_w PSIG: ---	+ 12 = PSIA: ---	
Temperature: T °F: 51	n = 0.75		Fpv (From Tables): 1.027	Gravity: 0.70	

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

Q = 14.1605 x 216 x 1.0058 x .9258 x 1.027 = 2925 MCF/D

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

Aof = $\left(\quad \right)^n$ =

Aof _____ MCF/D

TESTED BY Clyde Phillips

WITNESSED BY _____

H. D. Hale, President