CASE 2242: Application of OCC to consider changes in Rule 107 & 112 for admin. approval for multiple slim-hole completions.

option, Transcript,
mill Exhibits, Etc.

.

DOCKET: REGULAR HEARING THURSDAY, APRIL 13, 1951

OIL CONSERVATION COMMISSION - 9 A.M. - HIGH SCHOOL CAFETERIA 1300 EAST SCHARBAUER, HOBBS, NEW MEXICO

ALLOWABLE:

- (1) Consideration of the oil allowable for May, 1961.
- (2) Consideration of the allowable production of gas for May, 1961, from nine prorated pools in Lea County, New Mexico, also consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba and Sandoval Counties, New Mexico, for May, 1961.

CASE 2241:

Application of Potash Company of America for an extension of the potash-oil area. Applicant, in the above-styled cause, seeks an extension of the potash-oil area as set forth in Order R-111-A, and amendments thereto, to include the following-described acreage: Township 20 South, Range 29 East, NMPM, Eddy County, New Mexico

Section 13: SW/4 NW/4 and NW/4 SW/4 Section 14: SE/4 NE/4 and NE/4 SE/4

CASE 2242:

Application of the Oil Conservation Commission on its own motion to consider certain changes in the definition section of its Rules and certain changes in the definitions in Rule 107, and to consider amending Rule 112 to provide, among other things, for administrative approval for multiple slimhole completions.

CASE 2243:

Application of Gulf Oil Corporation for an amendment of Rule 309 (a). Applicant, in the above-styled cause, seeks an amendment of Rule 309 (a) to permit the installation of lease automatic custody transfer equipment dithout the necessity of notice and hearing.

CASE 2244:

Southeastern New Mexico nomenclature case calling for an order creating new pools and extending existing pools in Chaves, Eddy, Lea and Roosevelt Counties, New Mexico, and for an order defining the vertical limits of a certain Pool:

(a) Create a new oil pool, the vertical limits to be the Abo formation. This pool is to be designated as the Allison-Abo Pool and described as:

TOWNSHIP 9 SOUTH, RANGE SO EAST, NMPM SECTION 11: NW/

DHL COI	BEFORE THE NSTAVATION COMMISSION TAFE, HEW MEXICO
Gia	EAHIBIT NO. 7
CASE	2242

CASE 2242 - PROPOSED RULES CHANGES

- 1. Abolish the numbering system in the definition section of the Rule Book.
- 2. Delete "Dual Completion" from definitions.
- 3. Insert "Conventional Completion" and define as follows:

Conventional Completion shall mean a well completion in which the production string of casing has an outside diameter in excess of 2.875 inches.

4. Insert "Tubingless Completion" and define as follows:

Tubingless completion shall mean a well completion in which the production string of casing has an outside diameter of 2.875 inches or less.

5. Insert "Multiple Completion (Conventional)" and define as follows:

Multiple Completion (Conventional) shall mean a completion in which two or more common sources of supply are produced through one or more strings of tubing installed within a single casing string, with the production from each common source of supply completely segregated by means of packers.

6. Insert "Multiple Completion (Tubingless) and define as follows:

Multiple Completion (Tubingless) shall mean a completion in which two or more common sources of supply are produced through an equal number of casing strings cemented in a common well-bore, each such string of casing having an outside diameter of 2.875 inches or less, with the production from each common source of supply completely segregated by use of cement.

7. Insert "Multiple Completion (Combination)" and define as follows:

Multiple Completion (Combination) shall mean a multiple completion in which two or more common sources of supply are produced through a combination of two or more conventional diameter casing strings cemented in a common wellbore, or a combination of small diameter and conventional

diameter casing strings cemented in a common well-bore, the latter of which might or might not be a Multiple Completion (Conventional).

8. Amend Rule 107 (e), 2nd line, to read, "....shall have authority to approve tubingless completions without..."

Amend Rule 107 (e) (3), 2nd line, to read "....which might make the tubingless method of completion..."

9. Amend Rule 112-A, Multiple Completions, to read in its entirety as follows:

Rule 112-A - MULTIPLE COMPLETIONS

- The multiple completion of any well may be permitted only by order of the Commission after notice and hearing, except as hereinafter provided. Multiple completion of any well without prior approval by the Commission shall be solely at the operator's risk and shall in no way commit the Commission to subsequent approval thereof.
- II. DUAL COMPLETIONS (CONVENTIONAL)

The Secretary-Director of the Commission shall have the authority to grant an exception to the requirements of Rule 112-A (I) and approve the dual completion of a well without notice and hearing where application has been filed in due form; and

- (a) The well is to be dually completed within the limits of two defined poels or within one mile thereof, and the Commission has previously authorized the similar dual completion of a well in the same zones as proposed, after notice and hearing; or the well is to be dually completed outside the limits of a defined pool and there is a similar dual completion in the same zones within one mile of the proposed dual completion which has previously been authorized by the Commission after notice and hearing, provided however that in Rio Arriba, San Juan, and Sandoval Counties, a proposed gas-gas dual completion may be approved even though it is not within defined pools nor within one mile of a previously authorized dual completion of similar nature, if both the upper zone and the lower zone of the proposed dual completion have been recognized by the Commission as being gas producing zones suitable for dual completion; and
- (b) The applicant proposes to utilize one of the mechanical installations described below:

- 1. The well is to be completed as a gas-gas dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through a single string of tubing and the tubing-casing annulus.
- 2. The well is to be completed as a gas over oil dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through the tubing-casing annulus and a single string of tubing respectively.
- 3. The well is to be completed as an oil over gas dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through a single string of tubing and the tubing-casing annulus respectively by means of a crossover flow assembly.
- 4. The well is to be completed as an oil-oil dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing; and
- (c) All strings of tubing used for the production of oil in the proposed dual completion will have a nominal inside diameter of not less than 1.670 inches nor greater than 2.50 inches; and
- (d) The packer used to segregate the separate zones of the dual completion shall be a production-type packer and shall effectively prevent communication between all producing zones.

III. MULTIPLE COMPLETIONS (TUBINGLESS AND COMBINATION)

The Secretary-Director of the Commission shall have the authority to grant an exception to the requirements of Rule 112-A (I) and approve the multiple completion of a well without notice and hearing where application has been filed in due form; and

(a) The well is to be a multiple completion (tubingless or combination) within the limits of two defined pools or within one mile thereof, and the Commission has previously authorized the similar multiple completion of a well in the same zones as proposed, after notice and hearing; or the

well is to be so multiply completed outside the limits of a defined pool and there is a similar multiple completion in the same zones within one mile of the proposed multiple completion which has previously been authorized by the Commission after notice and hearing, provided however that in Rio Arriba, San Juan and McKinley Counties, any such proposed multiple completion may be authorized even though it is not within defined pools nor within one mile of a previously authorized multiple completion of similar nature, if a similar multiple completion within the same zones as proposed has been authorized after notice and hearing; and

- (b) The applicant proposes to employ one of the following methods of completion:
 - 1. Multiple Completion (Tubingless) utilizing two or more small diameter casing strings (2.875 inches O.D. or less), one to each common source of supply, all cemented in a common well-bore.
 - 2. Multiple Completion (Combination) utilizing a combination of small diameter (2.875 inches 0. D. or less) and conventional diameter (greater than 2.875 inches) casing strings, all cemented in a common well-bore. Provided however, that if any conventional diameter casing in said multiple completion is used for the production of two separate common sources of supply, the rules pertaining to Dual Completions (Conventional) in Rule 112-II (b) (c) and (d) above shall also apply; and
- (c) Sufficient cement shall be used in said multiple completion to extend throughout each pay and a minimum of 100 feet above.
- (d) Centralizers or turbolizers shall be installed on each joint of casing throughout each pay and on a minimum of three joints above.
- (e) Directional perforating equipment shall be used in perforating all intervals in any casing string in said multiple completion which intervals are in a zone through which one or more other casing strings pass.
- (f) The requirements of paragraph (c) and (d) may be modified

for multiple completions within given common sources of supply and within a given area if, in the opinion of the Secretary-Director, circumstances warrant such modification.

IV. ADMINISTRATIVE PROCEDURE

Application for administrative approval of a multiple completion shall be made in quadruplicate, with two copies of the application to be mailed to the Commission's Santa Fe office, and two copies to the District office for the area in which the well is located. Application shall be made on the Commission Form entitled, "Application for Multiple Completion," and shall be accompanied by the following:

- (a) Diagrammatic Sketch of the Multiple Completion, showing all casing strings, including diameters and setting depths, quantities used and top of cement, perforated intervals, tubing strings, including diameters and setting depth, location of packers, side door chokes, and such other information as may be pertinent.
- (b) Plat showing the location of all wells on applicant's lease, all offset wells on offset leases, and the names and addresses of operators of all leases offsetting applicant's lease.
- (c) Waivers consenting to such multiple completion from each offset operator, or in lieu thereof, evidence that said offset operators have been furnished copies of the application.
- (d) Electrical log of the well or other acceptable log with tops and bottoms of producing zones and intervals of perforation indicated thereon. (If such log is not available at the time application is filed, it shall be submitted as hereinafter provided.)

The Secretary-Director may approve the multiple completion, if after a period of 20 days following the filing of the application no operator has filed objection to the proposed dual completion.

V. Application for public hearing to authorize a multiple completion shall be made in triplicate to the Commission's Santa Fe office. Application shall be made on the Commission Form entitled "Application for Multiple Completion," and shall set forth all material facts relative to the common sources of supply involved and the manner and method of completion proposed. Application shall be accompanied by an exhibit showing the location of all wells on applicant's lease and all offset wells on offset leases.

- VI. All multiple completions, whether approved after hearing or by administrative procedure, shall be subject to the following rules:
 - (a) Prior to actual multiple completion of a well, operator shall make adequate pressure tests of the casing to determine that no casing leaks exist. Results of casing tests shall be reported to the Commission on Form C-103.
 - (b) The well shall be completed and thereafter produced in such a manner that there will be no commingling of hydrocarbons from the separate strata.
 - (c) The operator shall commence a segregation test and/or packer leakage test not later than seven days after actual multiple completion of the well. Segregation tests and/or packer leakage tests shall also be made any time the packer is disturbed and at such other intervals as the Commission may prescribe. The operator shall also make all other tests and determinations deemed necessary by the Commission. Offset operators as well as the Commission shall be notified of the time such tests are to be commenced. Tests may be witnessed by representatives of offset operators and of the Commission at their election. Results of such tests shall be filed with the Commission within 15 days after the completion of tests; provided however, that in the event a segregation test or packer leakage test indicates that there is communication between the separate strata, the operator shall immediately notify the Commission and commence remedial action on the well.
 - (d) A packer setting affidavit shall accompany the report of the initial segregation test and packer leakage test.
 - (e) The well shall be so equipped that reservoir pressures may be determined for each of the separate strata and further, be so equipped that meters may be installed and the gas, oil and gas, and oil produced from each of the separate strata may be accurately measured, and the gas-oil ratio or the gas-liquid ratio thereof determined.
 - (f) Within 15 days after the completion of the well, the operator shall furnish the Commission with a diagrammatic sketch of the mechanical installation which was actually used in completing the well together with a report of the gravity, gas-oil ratio or gas-liquid ratio, and reservoir pressure for each of the separate zones, and the log of the well if the same has not been previously submitted.

Uss National

Buttress
Thread
Tubing

USS

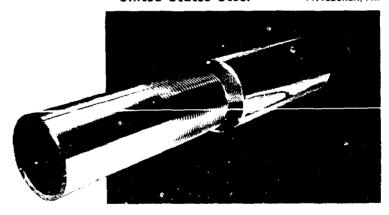
National Tube
Division
United

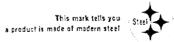




National Tube Division of United States Steel

PITTSBURGH, PA.





An Important Development in Oil Country Tubular Products

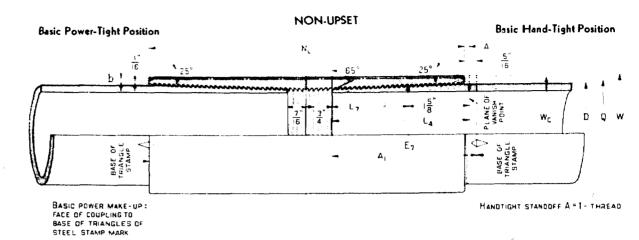
The growing number of multiple completion wells in recent years has emphasized the oil well tubing problem of hole clearance between the casing and the tubing. The non-upset API tubing joint, offering the best clearance, has a tensile strength of less than 75 per cent of the tubing body. Increasing joint strength, comparable to the tubing body by the use of an external upset, requires a larger O.D. coupling and results in the loss of clearance. Clearly there has been a need for a non-upset tubing joint offering maximum clearance without sacrificing strength.

National Tube Division, developer of the Buttress Thread for casing joints, accepted this challenge with an extensive program of research on the application of the Buttress Thread to tubing, including thread forms, flank angles, and the effects of physical properties on joint efficiency. The result of this long study and practical application is a non-upset tubing with joint strength comparable to the plain end tubing body-USS National Buttress-Thread Tubing. This new joint is designed for: maximum clearance; high-tensile and compression strength; gas-leak tightness at 15,000 psi and with 100 temperature cycles between about 60 F and 200 F; ability to withstand at least 12 repeated make-ups and breaks without thread damage or impairment to joint performance; accurate threads and better finish due to carbide threading practice.

OUTSTANDING FEATURES OF USS NATIONAL BUTTRESS-THREAD TUBING

- 1. Provides a joint with tensile strength comparable to that of the body of the tubing, with maximum clearance for multiple completion well practice.
- 2. Has no external or internal upset; no cold working, swaging, expanding, etc. on the pipe ends. (Therefore has extended life in service because it can be easily repaired in the field.)
- 3. Contour of the coupling ends, square or beveled, provides minimum interference when running.
- 4. The electro tin plating (.0020" Avg.) on coupling threads assures gas-leak tightness and reduces make-up torque and tonging.
- 5. The rugged flat-crested buttiess thread is highly resistant to joint damage.
- 6. The joint permits repeated make-ups and breaks without galling.
- 7. Flat crests and roots, parallel to the pipe axis, give good stabbing characteristics. They also provide fast make-up and reduce cross-threading, giving maximum running speed.

THREADING DATA FOR USS NATIONAL SEAMLESS DIAMOND ® BUTTRESS-THREAD TUBING



Pipe		Thre	ads†						Coupling			
		Total		Pitch	End of pipe to	Outside	diameter	Calcı wel	ilated ght	Length:		
Size: outside diameter	Number per inch	length: end of pipe to vanish point	Perfect length	diameter at plane of perfect thread length	base of triangle stamp	Regular	Special clear- ance	Regular	Special clear- ance	regular or special clearance	Chamfer diameter	Bearing face width
D		L_4	L ₇	E ₇	\mathbf{A}_1	w	W _c			NL	Q	ъ
		•	I	ns.				L	s.		Ins.	
2 23/8 27/8 31/2 4 41/2	8 8 8 8 8	3.250 3.625 3.625 3.625 3.625 3.625	1.625 2.000 2.000 2.000 2.000 2.000 2.000	1.962 2.337 2.837 3.462 3.962 4.462	3 ⁷ / ₁₆ 3 ¹³ / ₁₆ 3 ¹³ / ₁₆ 3 ¹³ / ₁₆ 3 ¹³ / ₁₆	2.500 2.875 3.500 4.250 4.750 5.200	2.250 2.700 3.220 3.865 4.400 4.920	4.25 5.55 8.24 11.86 13.41 13.96	2.20 3.78 4.84 6.21 7.62 8.84	73/4 81/2 81/2 81/2 81/2 81/2 81/2	2.125 2.500 3.000 3.625 4.125 4.625	5/32 5/32 3/16 3/16 3/16 3/16

†Taper 3/4-inch per foot measured on the diameter.

For weights, additional dimensions and performance properties see page 5. For additional notes, see page 9.

GROSS LINEAL FOOTAGE FROM NET FOOTAGE-MULTIPLICATION FACTORS

Size:	Nominal: weight per foot		Make-up	Multiplica	* ation factor
outside diameter	threads and coupling	Number of threads per inch	loss per joint	Average les	ngth of joint
Ins.	Lbs.		Ins.	20 Ft.	30 Ft.
2	3.40	8	3.438	1.0145	1.0096
23/8, 27/8, 31/2, 4, 41/2	ALL	8	3.812	1.0161	1.0107

 $^{{}^*\}text{To}$ obtain the gross or shipping length, multiply the net length in feet by the multiplication factor.

USS NATIONAL SEAMLESS DIAMOND ® BUTTRESS-THREAD TUBING

NON-UPSET **DIMENSIONS**

		Weight	per foot	1		Dime	ensions			Calcu weig			Areas		
	nete				Tubing			Coupling		coup				7, 8	
ze:	diar	and and ng	DI.I.				Outsid	le dia.	Length:	i	8	Plain	Regular	Spec. clear-	
, in	outside diameter	Nominal threads ar coupling	Plain end	Wall thick- ness	Inside di- ameter	Drift di- ameter	Regular	3, # Spec. clear- ance	regular or special clearance	Regular	Spec. clear- ance	end	cou- pling	ance cou- pling	
L	ns.	Lt	s.		* · · · · ·	I	ns.			Lt	s.		Sq. Ins.	and the second s	
2 2 2	3/8 7/8	3.40 4.60 6.40	3.23 4.43 6.16	.165 .190 .217	1.670 1.995 2.441	1,576 1,901 2,347	2.500 2.875 3.500	2.250 2.700 3.220	73/4 81/2 81/2	4.25 5.55 8.24	2.20 3.78 4.84	.951 1.304 1.812	2.068 2.505 3.669	1.135 1.739 2.191	
4	11/2 1 11/2	9.20 10.90 12.60	8.81 10.46 12.24	.254 .262 .271	2.992 3.476 3.958	2.867 3.351 3.833	4.250 4.750 5.200	3.865 4.400 4.920	8½ 8½ 8½ 8½	11.86 13.41 13.96	6.21 7.62 8.84	2.590 3.077 3.600	5.224 5.909 6.184	2.770 3.394 3.958	

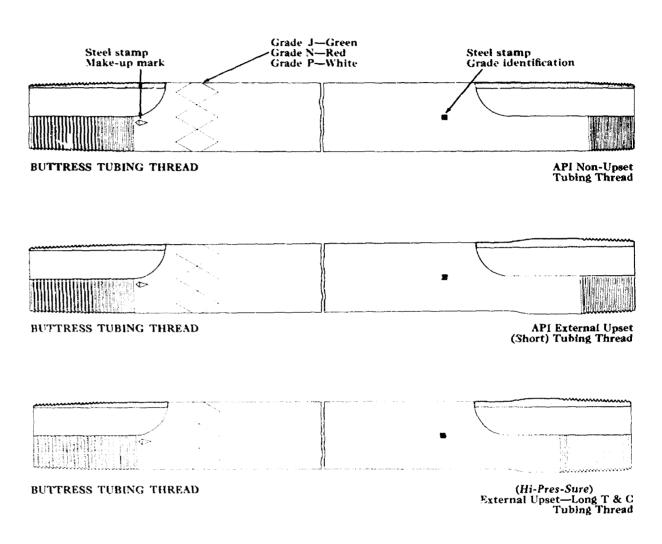
INTERNAL PRESSURES, COLLAPSE, AND TENSION PROPERTIES

		:		Inte	rnal pressu	res				Minimum ;	properties	;	
er.	t ling	1		Test ³			F :	Ten	sion			Ten	sion
: amet	ial: er foo coup	ĺ		s of gth	P198		!	Regula	r coup.	Colla	ıpse	Spec. cle	ar. coup.
Size: outside diameter	Nominal: weight per foot threads and coupling	Steel grade	4 Mill	At fiber stress equal to 80% of min, yield strength	Special clearance coupling	Yield (min.)	Ultimate (min.)	Equiv. length S. F. 2	Yield load	Setting depth S. F. 11/8	Pres- sure	Equiv. length S. F. 2	s, s Yield load
Ins.	Lbs.				psi			Ft.	Lbs.	Ft.	psi	Ft.	Lbs.
2	3.40	J N P	3000 10600 13900	7300 10600 13900	6200 9000	7940 11550 15160	14440 15880 17900	7690 11190 14690	52310 76090 93870	13120 17160 23220	7380 9650 13060	7890 11190	52310 76990
23/8	4.60	J N P	3000 10200 13400	7000 10200 13400	6000 8700	7700 11200 14700	14000 15400 17360	7800 11340 14880	71730 104340 136940	12760 16690 22580	7180 9380 12700	7800 11340	71730 104340
27/8	6.40	J N P	3000 9700 12700	6600 9700 12700	5600 8200	7260 10570 13870	13210 14530 16380	7790 11320 14860	99660 144960 190260	12090 15820 21400	6800 8900 12040	7798 11320	99660 144960
31/2	9.20	J N P	3000 9300 12200	6400 9300 12200	5400 7900	6980 10160 13340	12700 13970 15750	7740 11260 14789	142460 207220 271970	11660 15250 20640	6560 8580 11610	7740 112 6 0	142460 207220
4	10.90	J N P	3000 8400 11000	5800 8400 11000	4900 7100	\$300 9170 12040	11480 12610 14210	11290 14820	153220 246140 323050	10220 13370 18080	5750 7520 10170	7760 11290	169220 246140
41/2	12.60	J N P	3000 7700 10100	5300 7700 10100	4500 6500	5790 8440 10070	10540 11590 13070	7860 11430 15000	198030 288040 378050	9080 11880 16050	5110 6680 9030	7860 11430	198030 288040

NOTE: USS National Seamless Diamond B Buttress-Thread Tubing has 8 Diamond B Buttress Threads per inch. Taper 34-inch per foot measured on the diameter.
For additional notes, see page 9.

USS NATIONAL SEAMLESS DIAMOND ® BUTTRESS-THREAD TUBING

CROSS-OVER NIPPLE DETAIL (External threads)

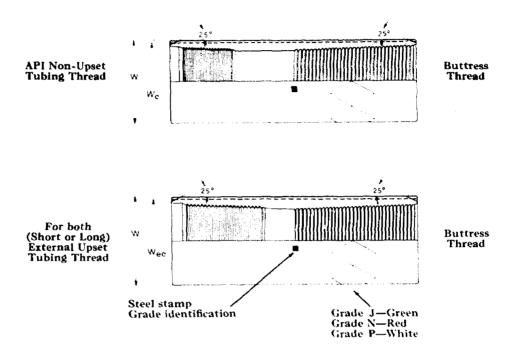


Furnished in Minimum Lengths of 3, 4, 6, 8, 10 Ft. and Range - 2

Cross-over joints can be furnished with proper couplings made up on nipples handling-tight or power-tight.

USS NATIONAL DIAMOND ® BUTTRESS-THREAD TUBING

CROSS-OVER COUPLING DETAIL (Internal threads)
AND COUPLING O.D. DIMENSIONS



Couplings regularly furnished with rounded corners both ends, or beveled both ends as ordered.

Size	Buttro Non-Up		Buttress to Ext-Upset API and Ext-Upset Long T&C			
inches	Coupling O	.D., inches	Coupling O.D., inch			
	W	W _c	W	W _{ec}		
2.000 2.375 2.875 3.500 4.000 4.500	2.875 3.509 4.250 4.750 5.200	2.700 3.220 3.865 4.400 4.920	3.063 3.668 4.500 5.000 5.553	2.910 3.460 1.180		

NOTE: For detail thread dimensions of buttress-thread tubing, see page 4. For detail thread dimensions of API non-upset T&C joints, see page 10. For detail thread dimensions of API external upset T&C and long T&C (Hi-Pres-Sure) joints, see pages 11 and 12.

JOINT AND THREADING DETAIL USS NATIONAL SEAMLESS DIAMOND ® BUTTRESS THREAD TUBING

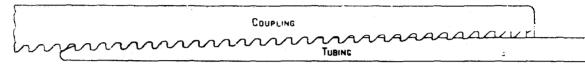
(Coupling threads electro tin-plated .0020 inch average thickness)



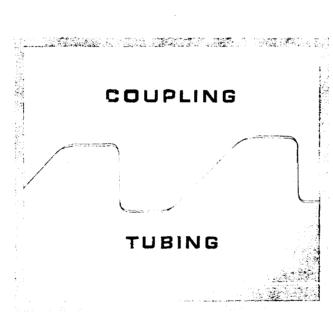
Basic Power-Tight Position

Cut Away Section of Joint

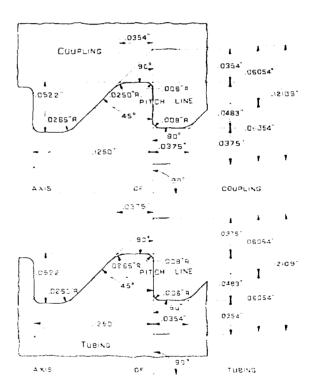
Basic Hand-Titht Position



Enlarged Section of Joint (Basic Power-Tight Position)



Enlarged Mated Thread Profile



TENSILE REQUIREMENTS

	Yield	ition, min. nt in 2 in.				
Grade	strength min., psi		strength min., psi	Strip specimens	Full-section specimens	:
TUDING J-55. N-80. P-105 (Deep-Well)	55,000 80,000 105,000	:	75,000 100,000 120,000	20 16 15	25 18 17	

RANGE LENGTHS

ALL LENGTHS IN FEET

and the second s		
	Ran	ıge
	1	2
TUDING Total range length, incl.	20-24	28-32
Range length for 100 per cent of carload: Permissible variation, max. Permissible length, min.	2 20	2 28

NOTES

The permissible variation in weight for any length of tubing is $6\frac{1}{2}$ per cent above and $3\frac{1}{2}$ per cent below; but the carload weight shall not be more than $1\frac{3}{4}$ per cent under the calculated weight.

Furnished with threads and coupling unless otherwise ordered.

For tables of tensile requirements and range lengths, see above.

The weight per foot of tubing with threads and coupling is based on a length of 20 feet, including the coupling.

Field conditions vary so widely that definite safety factors for collapse or tension cannot be recommended.

²Since salt water is practically always encountered in drilling, the length of string is based upon 2 feet of water column to each pound of collapsing pressure

³Test pressures for tubing furnished with special clearance couplings of the same grade are approximately 85 per cent of regular high-test pressures. Tubing furnished with special clearance couplings of one steel grade higher than the tubing grade

shall be tested to the regular high-test pressure. Unless otherwise specified, Grade J-55 tubing with regular or special clearance couplings will be tested to a maximum pressure of 3000 psi.

Present mill equipment limits test pressure to 15,000 psi. API test pressures 10,000 psi maximum.

'Tension setting depths for Buttress-Thread tubing are not related to those for casing which are based on joint pull-out strength. Tension setting depths shown are determined as the product of the minimum yield strength for the grade and the plain end area of the tubing or the effective metal area of the regular or special clearance coupling, whichever is smaller.

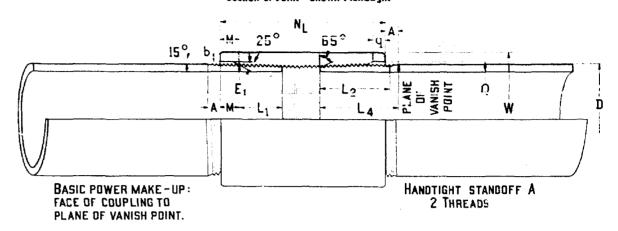
Based on 8712 per cent for internal pressure at minimum yield strength.

'Root of the regular or special clearance coupling thread at the first perfect thread on the pipe when made up to the power-tight position.

³On tubing furnished with special clearance couplings it is standard practice to furnish couplings in one steel grade higher than the tubing grade but P-105 is our present highest grade.

THREADING DATA FOR USS NATIONAL SEAMLESS DIAMOND ® TUBING (API)

NON-UPSET
Section of Joint—Shown Handtight



Pipe	foot			Threads	†		Coupling						
meter	weight per foot and coupling		Length:		Total length:	Pitch			Rec	ess		Length:	
Size: outside diameter	Nominal: weig threads and	Number per inch	pipe to hand- tight plane	Effec- tive length	end of pipe to vanish point	diameter at hand- tight plane	Outside diameter	Length	Diameter	Depth	Bearing face width	coupling to hand- tight plane	
D	ž	Num	L ₁	L ₂	L ₄	E ₁	w	N _L	Q	q	ъ	M	
Ins.	Lbs.	-		Ins.									
1.900	2.75	10	.729	1.206	1.375	1.83826	2.200	33/4	1.963	5/16	1/16	.446	
23/8	4.00 4.60 5.80	10	.979	1.456	1.625	2.31326	2.875	41/4	2.438	5∕16	3/16	.446	
27/8	6.40 8.60	10	1.417	1.894	2.063	2.81326	3.500	5½	2.938	5∕16	3∕16	.446	
31/2	7.70 9.20 *10.20 12.70	10	1.667	2.144	2.313	3.43826	4.250	55/8	3.563	5/16	3/16	.446	
4	9.50	8	1.591	2.140	2.375	3.91395	4.750	53/4	4.063	3/8	3/16	.534	
41/2	12.60	8	1.779	2.328	2.563	4.41395	5.200	61/8	4.563	3/8	3/16	.534	

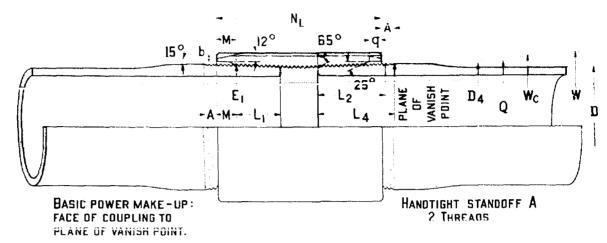
[†]Taper 3/4-inch per foot measured on the diameter.

^{*}On direct mill shipments only.

THREADING DATA FOR USS NATIONAL SEAMLESS DIAMOND ® TUBING (API)

EXTERNAL-UPSET

Section of Joint-Shown Handtight



Pipe	a ot		-	Threads	ŧ		:			Cou	pling			
ieter	weight per foot and coupling		Length:		Total	Pitch	Outside diameter	Outside	diameter		Rece	ss	width	Length:
Size: outside diameter	Nominal: weig threads and	Number per inch	end of pipe to hand- tight plane	Effec- tive length	length: end of pipe to vanish point	diameter at hand- tight plane	external upset	Regular	Special clear- ance	Length	Diameter	Depth	Bearing face	coupling to hand- tight plane
D	Z	Nun	L ₁	L ₂	L ₄	E	D ₄	w	W _c	N _L	Q	q	b	M
Ins.	Lbs.			Ins.										
1.050	1.20	10	.479	.956	1.125	1,25328	1.315	1.660		31/4	1.378	5/16	3/32	.446
1.315	1.80	10	. 604	1.081	1.250	1.40706	1.469	1.900		31/2	1.531	5/16	3/32	.446
1.660	2.40	10	.729	1.206	1.375	1.75079	1.812	2.200		33/4	1.875	5/16	1/8	.446
1.900	2.90	10	.792	1.269	1.438	2.03206	2.094	2.500	1	37/8	2.156	5/16	1/8	.446
23/8	4.70 5.95	8	1.154	1.703	1.938	2.50775	2.594	3.063	2.910	47/8	2.656	3/8	5/32	.534
27/8	6.50 8.70	8	1.341	1.890	2.125	3.00775	3.094	3.668	3.460	51/4	3.156	3/8	7/32	.534
31/2	9.30 12.95	8	1.591	2.140	2.375	3.66395	3.750	4.500	4.180	53/4	3.813	3/8	1/4	.534
4	11.00	8	1.716	2.265	2.500	4.16395	4.250	5.000	·	6	4.313	3/8	1/4	.534
41/2	12.75	3	1.841	2.390	2.625	4.66395	4.750	5.563		61/4	4.813	3/8	1/4	.534

†Taper 3/4-inch per foot measured on the diameter.

THREADING DATA FOR

USS NATIONAL SEAMLESS DIAMOND ® Hi-Pres-Sure TUBING

EXTERNAL-UPSET LONG T&C

Basic Power-Tight Position Basic Hand-Tight Position D D4 0 W_C W BASIC POWER MAKE-UP: FACE OF COUPLING TO PLANE OF VANISH POINT HANDTIGHT STANDOFF A = 2 THREADS

Pipe	Pipe Threads†				Externa	l upset	Coupling, long T & C					
Size:	Length: end of		Total length:	Pitch diameter			Outside	Outside diameter		Diameter	Bearing	
outside diameter	pipe to hand- tight plane	Effective length	end of pipe to vanish point	at hand- tight plane	Outside diameter	Total length	Regular	Special clearance	regular O.D. or special clearance	of recess	face width	
D	L ₁	L ₂	L ₄	E ₁	D_4	Leu	w	w _c	N _L	Q	b	
					In	ıs.						
23/8	1.779	2,328	2.563	2.50775	2.594	31/2	3.063	2.910	61/8	2.656	5/32	
27/8	2.091	2.640	2.875	3.00775	3.094	33/4	3.668	3.460	63/4	3.156	7/32	
31/2	2.341	2,890	3.125	3.66395	3.750	4	4.500	4.180	71/4	3.813	1/4	

¹Tentative API Std. 5AX.

GROSS LINEAL FOOTAGE FROM NET FOOTAGE-MULTIPLICATION FACTORS

Size:	Nominal: weight per foot		Make-up	Multiplication factor Average length of joint			
outside diameter	threads and coupling	Number of threads per inch	loss per joint				
Íns.	Lbs.		Ins.	20 Ft	30 Ft.		
23/8	All	8	2.563	1.0108	1.0072		
27/8	All	8	2.875	1.0121	1.0081		
31/2	A11	8	3.125	1.0132	1.0088		

^{*}To obtain the gross or shipping length, multiply the net length in feet by the multiplication factor.

¹⁸ round threads per inch: taper $^3\!4$ -inch per foot measured on the diameter. Tolcrance on total length of external upset, $L_{eu}=\pm \frac{1}{2}$ -inch.



Et

National Tube Division of United States Steel

525 William Penn Place · Pittsburgh 30, Pennsylvania

District Sales Offices

Atlanta

New Orleans

Boston

New York

Chicago

Philadelphia

Dallas

Pittsburgh

Denver

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Pacific Coast Distributors Columbia-Geneva Steel Division

San Francisco Seattle

Los Angeles

Salt Lake City

Portland

Export Distributors United States Steel Export Company

New York City



CONTINENTAL OIL COMPANY

LEGAL DEPARTMENT

DENVER 2, COLORADO

A. T. SMITH
GENERAL ATTORNEY
C. R. HAMPTON
F. E. RADLOFF
W. M. GRIFFITH
G. H. MAYBERRY
R. A. HOLLERN
ATTORNEYS

April 11, 1961

Oil & Gas Conservation Commission State Land Building Santa Fe, New Mexico

Re: Case No. 2242

Dear Sir:

Reference is made to the subject case wherein the Oil Conservation Commission on its own motion is considering amending Rule 112 to provide, among other things, for administrative approval for multiple slimhole completions. Continental Oil Company would favor such an amendment, and would like to respectfully suggest to the commission that slimhole completions be defined to include a maximum of four and one-half inch casing.

Very truly yours,

William M. Griffith

bv

cc: John Tynan

Ralph Vertrees M. A. MacLennan

CASE 2242 - PROPOSED RULES CHANGES

- 1. Abolish the numbering system in the definition section of the Rule Book.
- 2. Delete "Dual Completion" section of definitions.
- 3. Insert "Conventional Completion" and define as follows: Conventional Completion shall mean a well completion in which the production string of casing has an outside diameter in excess of 2.875 inches.
- 4. Insert "Tubingless Completion" and define as follows: Tubingless completion shall mean a well completion in which the production string of casing has an outside diameter of 2.875 inches or less.
- 5. Insert "Multiple Completion (Conventional)" and define as follows:

Multiple Completion (Conventional) shall mean a completion in which two or more common sources of supply are produced through one or more strings of tubing installed within a single casing string, with the production from each common source of supply completely segregated by means of packers.

6. Insert "Multiple Completion (Tubingless)" and define as follows:

Multiple Completion (Tubingless) shall mean a completion in which two or more common sources of supply are produced through an equal number of casing strings cemented in a common well-bore, each such string of casing having an outside diameter of 2.875 inches or less, with the production from each common source of supply completely segregated by use of cement.

7. Insert "Multiple Completion (Combination)" and define as follows:

Multiple Completion (Combination) shall mean a multiple completion in which two or more common sources of supply are produced through a combination of two or more conventional diameter casing strings or a combination of small diameter and conventional diameter casing strings common will-base, (the latter of which might or might not be a Multiple Completion (Conventional).

8. Amend Rule 107 (e), 2nd line, to read, "...shall have authority to approve tubingless completions without..."

Amend Rule 107 (e) (3), 2nd line, to read ".... which might make the tubingless method of completion..."

9. Amend Rule 112-A, Multiple Completions, to read in its entirety as follows:

Rule 112-A - MULTIPLE COMPLETIONS

- I. The multiple completion of any well may be permitted only by order of the Commission after notice and hearing, except as here-inafter provided. Multiple completion of any well without prior approval by the Commission shall be solely at the operator's risk and shall in no way commit the Commission to subsequent approval thereof.
- II. DUAL COMPLETIONS (CONVENTIONAL)

The Secretary-Director of the Commission shall have the authority to grant an exception to the requirements of Rule 112-A (I) and approve the dual completion of a well without notice and hearing where application has been filed in due form; and

(a) The well is to be dually completed within the limits of two defined pools or within one mile thereof, and the Commission has previously authorized the similar dual completion of a well in the same zones as proposed, after notice and hearing; or the well is to be dually completed

outside the limits of a defined pool and there is a similar dual completion in the same zones within one mile of the proposed dual completion which has previously been authorized by the Commission after notice and hearing, provided however that in Rio Arriba, San Juan, and Sandoval Counties, a proposed gas-gas dual completion may be approved even though it is not within defined pools nor within one mile of a previously authorized dual completion of similar nature, if both the upper zone and the lower zone of the proposed dual completion have been recognized by the Commission as being gas producing zones suitable for dual completion; and

- (b) The applicant proposes to utilize one of the mechanical installations described below:
 - 1. The well is to be completed as a gas-gas dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through a single string of tubing and the tubing-casing annulus.
 - 2. The well is to be completed as a gas over oil dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through the tubing-casing annulus and a single string of tubing respectively.
 - 3. The well is to be completed as an oil over gas dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through a single string of tubing and the tubing-casing annulus respectively by means of a crossover flow assembly.

- 4. The well is to be completed as an oil-oil dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing; and
- (c) All strings of tubing used for the production of oil in the proposed dual completion will have a nominal inside diameter of not less than 1.670 inches nor greater than 2.50 inches; and
- (d) The packer used to segregate the separate producting the dual completion shall be a production-type sones of the dual completion will be a permanent type pocker and shall effectively prevent communical production packer.

III. MULTIPLE COMPLETIONS (TUBINGLESS AND COMBINATION)

The Secretary-Director of the Commission shall have the authority to grant an exception to the requirements of Rule 112-A (I) and approve the multiple completion of a well without notice and hearing where application has been filed in due form; and

(a) The well is to be a multiple completion (tubingless or combination) within the limits of two defined pools or within one mile thereof, and the Commission has previously authorized the similar multiple completion of a well in the same zones as proposed, after notice and hearing; or the well is to be so multiply completed outside the limits of a defined pool and there is a similar multiple completion in the same zones within one mile of the proposed multiple completion which has previously been authorized by the Commission after notice and hearing, provided however that in Rio Arriba, San Juan, and McKinley Counties, any such proposed multiple completion may be authorized even though it is not within defined pools nor within one mile of a

previously authorized multiple completion of similar completion
nature, if a similar multiple within the same zones
as proposed has been authorized after notice and
hearing; and

- (b) The applicant proposes to employ one of the following methods of completion:
 - Multiple Completion (Tubingless) utilizing
 two or more small diameter casing strings
 (2.875 inches O.D. or less), one to each common
 source of supply, all cemented in a common wellbore.
 - 2. Multiple Completion (Combination) utilizing a combination of small diameter (2.875 inches 0.D. or less) and conventional diameter (greater than 2.875 inches) casing strings, all cemented in a common well-bore. Provided however, that if any conventional diameter casing in said multiple completion is used for the production of two separate common sources of supply, the rules pertaining to Dual Completions (Conventional) in Rule 112-II (b) (c) and (d) above shall also apply; and
- (c) Sufficient cement shall be used in said multiple completion to extend throughout each pay and a minimum of 100 feet above.
- (d) Centralizers or turbolizers shall be installed on each joint of casing throughout each pay and on a minimum of three joints above.
- (e) Directional perforating equipment shall be used in perforating all intervals in any casing string in said multiple completion which intervals are in a zone through which one or more other casing strings pass.

(f) The requirements of paragraph (c) and (d) may be modified for multiple completions within given common sources of supply and within a given area if, in the opinion of the Secretary-Director, circumstances warrant such modification.

IV. ADMINISTRATIVE PROCEDURE

Application for administrative approval of a multiple completion shall be made in quadruplicate, with two copies of the application to be mailed to the Commission's Canta Pe office, and two copies to the District office for the area in which the well is located. Application shall be made on the Commission Form entitled, "Application for Multiple Completion," and shall be accompanied by the following:

- (a) Diagrammatic Sketch of the Multiple Completion, showing all casing strings, including diameters and setting depths, quantities used and top of cement, perforated intervals, tubing strings, including diameters and setting depth, location of packers, side door chokes, and such other information as may be pertinent.
- (b) Plat showing the location of all wells on applicant's lease, all offset wells on offset leases, and the names and addresses of operators of all leases offsetting applicant's lease.
- (c) Waivers consenting to such multiple completion from each offset operator, or in lieu thereof, evidence that said offset operators have been furnished copies of the application.
- (d) Electrical log of the well or other acceptable log with tops and bottoms of producing zones and intervals of perforation indicated thereon. (If such log is not available at the time application is filed, it shall be submitted as hereinafter provided.)

The Secretary-Director may approve the multiple completion, if after a period of 20 days following the filing of the application no operator has filed objection to the proposed dual completion.

- V. Application for public hearing to authorize a multiple? completion shall be made in triplicate to the Commission's Santa Fe office. Application shall be made on the Commission Form entitled "Application for Multiple Completion," and shall set forth all material facts relative to the common sources bf supply involved and the manner and method of completion proposed. Application shall be accompanied by an exhibit showing the location of all wells on applicant's lease and all offset wells on offset leases.
- VI. All multiple completions, whether approved after hearing or by administrative procedure, shall be subject to the following rules:
 - (a) Prior to actual multiple completion of a well, operator shall make adequate pressure tests of the casing to determine that no casing leaks exist. Results of casing tests shall be reported to the Commission on Form C-103.
 - (b) The well shall be completed and thereafter produced in such a manner that there will be no commingling of hydrocarbons from the separate strata.
 - (c) The operator shall commence a segregation test and/or packer leakage test not later than seven days after actual multiple completion of the well. Segregation tests and/or packer leakage tests shall also be made any time the packer is disturbed and at such other intervals as the Commission

may prescribe. The operator shall also make all other tests and determinations deemed necessary by the Commission. Offset operators as well as the Commission shall be notified of the time such tests are to be commenced. Tests may be witnessed by representatives of offset operators and of the Commission at their election. Results of such tests shall be filed with the Commission within 15 days after the completion of tests; provided however, that in the event a segreation test or packer leakge test indicates that there is communication between the separate strata, the operator shall immediately notify the Commission and commence remedial action on the well.

- (d) A packer setting affidavit shall accompany the report of the initial segregation test and packer leakage test.
- (e) The well shall be so equipped that reservoir pressures may be determined for each of the separate strata and further, be so equipped that meters may be installed and the gas, oil and gas, and oil produced from each of the separate strate may be accurately measured, and the gas-oil ratio or the gas-liquid ratio thereof determined.
- (f) Within 15 days after the completion of the well, the operator shall furnish the Commission with a diagrammatic sketch of the mechanical installation which was actually used in completing the well together with a report of the gravity, gas-oil ratio or gas-liquid ratio, and reservoir pressure for each of the separate zones, and the log of the well if the same has not been previously submitted.

BEFORE THE OIL CONSERVATION COMMISSION

OF

STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF THE OIL CONSERVATION COMMISSION ON ITS OWN MOTION FOR ADOPTION OF RULES FOR ADMINISTRATIVE APPROVAL OF SLIM HOLE COMPLETIONS.

Case No. 2242

ENTRY OF APPEARANCE

Come now Kellahin & Fox, P. O. Box 1713, Santa Fe, New Mexico, and enter their appearance in the above captioned case in behalf of Amerada Petroleum Corporation in association with Mr. H. D. Bushnell, a member of the Oklahoma Bar.

By Jason W. Kellahin

DEFORE THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

> CASE No. 2242 Order No. R-1957

APPLICATION OF THE OIL CONSERVATION COMMISSION ON ITS OWN MOTION TO COMSIDER CERTAIN CHANGES IN THE DEFINITION SECTION OF ITS EVERS AND CERTAIN CHANGES IN THE DEFINITIONS IN RULE 107, AND TO CONSIDER AMENDING RULE 112 TO PROVIDE, AMONG OTHER THINGS, FOR ADMINISTRATIVE APPROVAL FOR MULTIPLE SLIMHOLE COMPLETIONS.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on April 13, 1961, at Hobbs, New Mexico, before the Oil Conservation Commission of New Nexico, hereinafter referred to as the "Commission."

MOW, on this 28th day of April, 1961, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

PINDS:

- (1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.
- (2) That certain changes should be made in the definitions, rules and regulations of the Commission pertaining to multiple completions in order to improve nomenclature and facilitate the administration of requests for approval of multiple completions.
- (3) That the numbering system of the definition section of the Commission's rules and regulations should be abolished.
- (4) That the definition of "Dual Completion" should be deleted from the definition section of the Commission's rules and regulations.
- (5) That the terms "Conventional Completion", "Tubingless Completion", "Multiple Completion (Conventional)", "Multiple Completion (Tubingless)", and "Multiple Completion (Combination)" should be defined for nomenciature purposes.

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- (6) That Rule 107 (e) should be amended to conform to the newly defined nomenclature.
- (7) That Rule 112-A should be revised to provide for administrative approval of multiple completions meeting certain minimum standards.

IT IS THEREFORE ORDERED:

- (1) That the numbering system of the definition section of the Commission's rules and regulations is hereby abolished.
- (2) That the definition of "Dual Completion" is hereby deleted from the definition section of the Commission's rules and regulations.
- (3) That the following definitions are hereby adopted and made a part of the definition section of the Commission's rules and regulations:

CONVENTIONAL COMPLETION shall mean a well completion in which the production string of casing has an outside diameter in excess of 2.875 inches.

TUBINGLESS COMPLETION shall mean a well completion in which the production string of casing has an outside diameter of 2.875 inches or less.

MULTIPLE COMPLETION (CONVENTIONAL) shall mean a completion in which two or more common sources of supply are produced through one or more strings of tubing installed within a single casing string, with the production from each common source of supply completely segregated by means of packers.

MULTIPLE COMPLETION (TUBINGLESS) shall mean a completion in which two or more common sources of supply are produced through an equal number of casing strings cemented in a common well-bore, each such string or casing having an outside diameter of 2.875 inches or less, with the production from each common source of supply completely segregated by use of cement.

MULTIPLE COMPLETION (COMBINATION) shall mean a multiple completion in which two or more common sources of supply are produced through a combination of two or more conventional diameter casing strings cemented in a common well-bore, or a combination of small diameter and conventional diameter casing strings cemented in a common well-bore, the conventional diameter strings of which might or might not be a Multiple Completion (Conventional).

-3-CASE No. 2242 Order No. R-1957

(4) That Rule 107 (e) is hereby amended to read in its entirety as follows:

The Commission's District Supervisors or their representatives shall have authority to approve tubingless completions without the necessity of administrative approval or notice and hearing when the following conditions exist:

- (1) The well is to be completed with a total depth of 5,000 feet or less,
- (2) The well is not a wildcat (it is not more than one mile from an existing well producing from the same common source of supply to which it is projected),
- (3) No known corrosive or pressure problems exist which might make the tubingless method of completion undesirable,
- (4) The well will not be a dual completion,
- (5) The tubing used as a substitute for casing Will be either 2 3/8-inch OD or 2 7/8-inch OD.
- (5) That Rule 112-A is hereby revised to read in its entirety as follows:

RULE 112-A - MULTIPLE COMPLETIONS

- I. The multiple completion of any well may be permitted only by order of the Commission after notice and hearing, except as hereinafter provided. Multiple completion of any well without prior approval by the Commission shall be solely at the operator's risk and shall in no way commit the Commission to subsequent approval thereof.
- II. DHAL COMPTENTIONS (CONVENTIONAL)

The Secretary-Director of the Commission shall have the authority to grant an exception to the requirements of Rule 112-A (I) and approve the dual completion of a well without notice and hearing where the application has been filed in due form; and

(a) The well is to be dually completed within the limits of two defined pools or within one mile thereof, and the Commission has previously authorized the similar dual completion of a well in the same zone as proposed, after notice and hearing; or the well

-4-CASE No. 2242 Order No. R-1957

is to be dually completed outside the limits of a defined pool and there is a similar dual completion in the same zones within one mile of the proposed dual completion which has previously been authorized by the Commission after notice and hearing, provided however that in Rio Arriba, San Juan, Sandoval, and McKinley Counties, a proposed gas-gas dual completion may be approved even though it is not within defined pools nor within one mile of a previously authorized dual completion of similar nature, if both the upper zone and the lower zone of the proposed dual completion have been recognized by the Commission as being gas producing zones suitable for dual completion; and

- (b) The applicant proposes to utilize one of the mechanical installations described below:
 - 1. The well is to be completed as a gas-gas dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through a single string of tubing and the tubing-casing annulus.
 - 2. The well is to be completed as a gas over oil dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through the tubing-casing annulus and a single string of tubing respectively.
 - 3. The well is to be completed as an oil over gas dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through a single string of tubing and the tubing-casing annulus respectively by means of a crossover flow assembly.
 - 4. The well is to be completed as an oil-oil dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing; and
- (c) All strings of tubing used for the production of oil in the proposed dual completion will have a nominal inside diameter of not less than 1.670 inches nor greater than 2.50 inches; and
- (d) The packer used to segregate the separate zones of the dual completion shall be a production-type packer

-5-CASE No. 2242 Order No. R-1957

and shall effectively prevent communication between all producing somes.

III. MULTIPLE COMPLETIONS (TUBINGLESS AND COMPLETION)

The Secretary-Director of the Commission shall have the authority to grant an exception to the requirements of Rule 112-A (I) and approve the multiple completion of a well without notice and hearing where application has been filed in due form; and

- (a) The well is to be a multiple completion (tubingless or combination) within the limits of defined pools or within one mile thereof, and the Commission has previously authorized the similar multiple completion of a well in the same momes as proposed, after notice and hearing; or the well is to be so multiply completed outside the limits of a defined pool and there is a similar multiple completion in the same zones within one mile of the proposed multiple completion which has previously been authorized by the Commission after notice and hearing, provided however that in Rio Arriba, San Juan, Sandoval, and McKinley Counties, any such proposed multiple completion may be authorized even though it is not within defined pools nor within one mile of a previously authorized multiple completion of similar nature, if a similar multiple completion within the same zones as proposed has been authorized after notice and hearing; and
- (b) The applicant proposes to employ one of the following methods of completion:
 - 1. Multiple Completion (Tubingless) utilizing two or more small diameter casing strings (2.875 inches OD or less), one to each common source of supply, all cemented in a common well-bore.
 - 2. Multiple Completion (Combination) utilizing a combination of small diameter (2.875 inches CD or less) and conventional diameter (greater than 2.875 inches) casing strings, all cemented in a common well-bore. Provided however, that if any conventional diameter casing in said multiple completion is used for the production of two separate common sources of supply, the rules pertaining to Dual Completions (Conventional) in Rule 112-A II (b) (c) and (d) above shall also apply; and
- (c) Sufficient cement shall be used in said multiple

-5-CASE No. 2242 Order No. R-1957

completion to extend throughout each pay and a minimum of 100 feet above; and

- (d) Centralizers and/or turbolizers shall be installed on each joint of casing throughout each pay and on a minisum of three joints above; and
- (e) Directional perforating equipment shall be used in perforating all intervals in any casing string in said multiple completion which intervals are in a some through which one or more other casing strings pass.
- (f) The requirements of paragraphs (c) and (d) may be modified for multiple completions within given common sources of supply and within a given area if, in the opinion of the Secretary-Director, circumstances warrant such modification.

IV. ADMINISTRATIVE PROCEDURE

Application for administrative approval of a multiple completion shall be made in quadruplicate, with two copies of the application to be mailed to the Commission's Santa Pe office, and two copies to the District office for the area in which the well is located. Application shall be made on the Commission Form entitled, "Application for Multiple Completion," and shall be accompanied by the following:

- (a) Diagrammatic Sketch of the Multiple Completion, showing all casing strings, including diameters and setting depths, centralizers and/or turbolizers and location thereof, quantities used and top of cement, perforated intervals, tubing strings, including diameters and setting depth, location of packers, side door chokes, and such other information as may be pertinent.
- (b) Plat showing the location of all wells on applicant's lease, all offset wells on offset leases, and the names and addresses of operators of all leases offsetting applicant's lease.
- (c) Waivers consenting to such multiple completion from each offset operator, or in lieu thereof, evidence that said offset operators have been furnished copies of the application.
- (d) Electrical log of the well or other acceptable log with tops and bottoms of producing zones and intervals of perforation indicated thereon. (If such log is not available at the time application is filed, it shall be submitted as hereinafter provided.)

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> The Secretary-Director may approve the multiple completion if, after a period of 20 days following the filing of the application, no operator has filed objection to the proposed multiple completion.

- V. Application for public hearing to authorize a multiple completion shall be made in triplicate to the Commission's Santa Fe office. Application shall be made on the Commission Form entitled "Application for Multiple Completion," and shall set forth all material facts relative to the common sources of supply involved and the manner and method of completion proposed. Application shall be accompanied by an exhibit showing the location of all wells on applicant's lease and all offset wells on offset leases.
- VI. All multiple completions, whether approved after hearing or by administrative procedure, shall be subject to the following rules:
 - (a) Prior to actual multiple completion of a well, operator shall make adequate pressure tests of the casing to determine that no casing loaks exist. Results of casing tests shall be reported to the Commission on Form C-103.
 - (b) The well shall be completed and thereafter produced in such a manner that there will be no commingling of hydrocarbons from the separate strata.
 - The operator shall commence a segregation test and/or packer leakage test not later than seven days after actual multiple completion of the well. Segregation tests and/or packer leakage tests shall also be made any time the packer is disturbed and at such other intervals as the Commission may prescribe. The operator shall also make all other tests and determinations deemed necessary by the Commission. Offset operators as well as the Commission shall be notified of the time such tests are to be commenced. Tests may be witnessed by representatives of offset operators and of the Commission at their election. Results of such tests shall be filed with the Commission within 15 days after the completion of tests; provided however, that in the event a segregation test or packer leakage test indicates that there is communication between the separate strata, the operator shall immediately notify the Commission and commence remedial action on the well.
 - (d) A packer setting affidavit shall accompany the report of the initial segregation test and packer leakage test, if applicable.

-8-CASE No. 2242 Order No. R-1957

- (e) The well shall be so equipped that reservoir pressures may be determined for each of the separate strata and further be so equipped that meters may be installed and the gas, oil and gas, and oil produced from each of the separate strata may be accurately measured, and the gas-oil ratio or the gas-liquid ratio thereof determined.
- (f) Within 15 days after the completion of the well, the operator shall furnish the Commission with a diagrammatic shetch of the mechanical installation which was actually used in completing the well together with a report of the gravity, gas-oil ratio or gas-liquid ratio, and reservoir pressure for each of the separate zones, and the log of the well if the same has not been previously submitted.
- (6) That the effective date of this order shall be May 1, 1961.

DONE at Santa Fe, New Mexico, on the day and year herein-above designated.

STATE OF MEN MEXICO OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

E. S. WALKER, Member

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A. L. PORTER, Jr., Member & Secretary

CASE 2242 - PROPOSED RULES CHANGES

- 1. Abolish the numbering system in the definition section of the Rule Book.
- 2. Delete "Dual Completion" from definitions.
- 3. Insert "Conventional Completion" and define as follows:

Conventional Completion shall mean a well completion in which the production string of casing has an outside diameter in excess of 2.875 inches.

4. Insert "Tubingless Completion" and define as follows:

Tubingless completion shall mean a well completion in which the production string of casing has an outside diameter of 2.875 inches or less.

Insert "Multiple Completion (Conventional)" and define as follows:

Multiple Completion (Conventional) shall mean a completion in which two or more common sources of supply are produced through one or more strings of tubing installed within a single casing string, with the production from each common source of supply completely segregated by means of packers.

. Insert "Multiple Completion (Tubingless) and define as follows:

Multiple Completion (Tubingless) shall mean a completion in which two or more common sources of supply are produced through an equal number of casing strings cemented in a common well-bore, each such string of casing having an outside diameter of 2.875 inches or less, with the production from each common source of supply completely segregated by use of cement.

7. Insert "Multiple Completion (Combination)" and define as follows:

Multiple Completion (Combination) shall mean a multiple completion in which two or more common sources of supply are produced through a combination of two or more conventional diameter casing strings cemented in a common wellbore, or a combination of small diameter and conventional

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diameter casing strings cemented in a common well-bore, the (latter) of which might or might not be a Multiple Completion (Conventional).

Harris of replacement

8. Amend Rule 107 [e,, 2nd line, to read, "....shall have authority to approve <u>tubingless</u> completions without..."

Amend Rule 107 (e) (3), 2nd line, to read "....which might make the <u>tubingless</u> method of completion...."

9. Amend Rule 112-A, Multiple Completions, to read in its entirety as follows:

Rule 112-A - MULTIPLE COMPLETIONS

- I. The multiple completion of any well may be permitted only by order of the Commission after notice and hearing, except as here-inafter provided. Multiple completion of any well without prior approval by the Commission shall be solely at the operator's risk and shall in no way commit the Commission to subsequent approval thereor.
- II. DUAL COMPLETIONS (CONVENTIONAL)

The Secretary-Director of the Commission shall have the authority to grant an exception to the requirements of Rule 112-A (I) and approve the dual completion of a well without notice and hearing where application has been filed in due form; and

- (a) The well is to be dually completed within the limits of two defined pools or within one mile thereof, and the Commission has previously authorized the similar dual completion of a well in the same zones as proposed, after notice and hearing; or the well is to be dually completed outside the limits of a defined pool and there is a similar dual completion in the same zones within one mile of the proposed dual completion which has previously been authorized by the Commission after notice and hearing, provided however that in Rio Arriba, San Juan, and Sandoval Counties, a proposed gas-gas dual completion may be approved even though it is not within defined pools nor within one mile of a previously authorized dual completion of similar nature, if both the upper zone and the lower zone of the proposed dual completion have been recognized by the Commission as being gas producing zones suitable for dual completion; and
- (b) The applicant proposes to utilize one of the mechanical installations described below:

- 1. The well is to be completed as a gas-gas dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through a single string of tubing and the tubing-casing annulus.
- 2. The well is to be completed as a gas over oil dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through the tubing-casing annulus and a single string of tubing respectively.
- 3. The well is to be completed as an oil over gas dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through a single string of tubing and the tubing-casing annulus respectively by means of a crossover flow assembly.
- 4. The well is to be completed as an oil-oil dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing; and
- (c) All strings of tubing used for the production of oil in the proposed dual completion will have a nominal inside diameter of not less than 1.670 inches nor greater than 2.50 inches; and

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- (d) The packer used to segregate the separate zones of the dual completion shall be a production-type packer and shall effectively prevent communication between all producing zones.

III. MULTIPLE COMPLETIONS (TUBINGLESS AND COMBINATION)

The Secretary-Director of the Commission shall have the authority to grant an exception to the requirements of Rule 112-A (I) and approve the multiple completion of a well without notice and hearing where application has been filed in due form; and

(a) The well is to be a multiple completion (tubingless or combination) within the limits of two defined pools or within one mile thereof, and the Commission has previously authorized the similar multiple completion of a well in the same zones as proposed, after notice and hearing; or the

well is to be so multiply completed outside the limits of a defined pool and there is a similar multiple completion in the same zones within one mile of the proposed multiple completion which has previously been authorized by the Commission after notice and hearing, provided however that in Rio Arriba, San Juan and McKinley Counties, any such proposed multiple completion may be authorized even though it is not within defined pools nor within one mile of a previously authorized multiple completion of similar nature, if a similar multiple completion within the same zones as proposed has been authorized after notice and hearing; and

- (b) The applicant proposes to employ one of the following methods of completion:
 - 1. Multiple Completion (Tubingless) utilizing two or more small diameter casing strings (2.875 inches O.D. or less), one to each common source of supply, all cemented in a common well-bore.
 - 2. Multiple Completion (Combination) utilizing a combination of small diameter (2.875 inches 0. D. or less) and conventional diameter (greater than 2.875 inches) casing strings, all cemented in a common well-bore. Provided however, that if any conventional diameter casing in said multiple completion is used for the production of two separate common sources of supply, the rules pertaining to Dual Completions (Conventional) in Rule 112-II (b) (c) and (d) above shall also apply; and
- (c) Sufficient cement shall be used in said multiple completion to extend throughout each pay and a minimum of 100 feet above; and _______
- (d) Centralizers at turbolizers shall be installed on each joint of casing throughout each pay and on a minimum of three joints above;
- (e) Directional perforating equipment shall be used in perforating all intervals in any casing string in said multiple completion which intervals are in a zone through which one or more other casing strings pass.
- (f) The requirements of paragraph (c) and (d) may be modified

for multiple completions within given common sources of supply and within a given area if, in the opinion of the Secretary-Director, circumstances warrant such modification.

IV. ADMINISTRATIVE PROCEDURE

Application for administrative approval of a <u>multiple</u> completion shall be made in quadruplicate, with two copies of the application to be mailed to the Commission's Santa Fe office, and two copies to the District office for the area in which the well is located. Application shall be made on the Commission Form entitled, "Application for Multiple Completion," and shall be accompanied by the following:

- (a) Diagrammatic Sketch of the Multiple Completion, showing all casing strings, including diameters and setting depths. Aquantities used and top of cement, perforated intervals, tubing strings, including diameters and setting depth, location of packers, side door chokes, and such other information as may be pertinent.
- (b) Plat showing the location of all wells on applicant's lease, all offset wells on offset leases, and the names and addresses of operators of all leases offsetting applicant's lease.
- (c) Waivers consenting to such <u>multiple</u> completion from each offset operator, or in lieu thereof, evidence that said offset operators have been furnished copies of the application.
- (d) Electrical log of the well or other acceptable log with tops and bottoms of producing zones and intervals of perforation indicated thereon. (If such log is not available at the time application is filed, it shall be submitted as hereinafter provided.)

The Secretary-Director may approve the <u>multiple</u> completion, if after a period of 20 days following the filing of the application no operator has filed objection to the proposed dual completion.

V. Application for public hearing to authorize a multiple completion shall be made in triplicate to the Commission's Santa Fe office. Application shall be made on the Commission Form entitled "Application for Multiple Completion," and shall set forth all material facts relative to the common sources of supply involved and the manner and method of completion proposed. Application shall be accompanied by an exhibit showing the location of all wells on applicant's lease and all offset wells on offset leases.

- VI. All multiple completions, whether approved after hearing or by administrative procedure, shall be subject to the following rules:
 - (a) Prior to actual multiple completion of a well, operator shall make adequate pressure tests of the casing to determine that no casing leaks exist. Results of casing tests shall be reported to the Commission on Form C-103.
 - (b) The well shall be completed and thereafter produced in such a manner that there will be no commingling of hydrocarbons from the separate strata.
 - (c) The operator shall commence a segregation test and/or packer leakage test not later than seven days after actual multiple completion of the well. Segregation tests and/or packer leakage tests shall also be made any time the packer is disturbed and at such other intervals as the Commission may prescribe. The operator shall also make all other tests and determinations deemed necessary by the Commission. Offset operators as well as the Commission shall be notified of the time such tests are to be commenced. Tests may be witnessed by representatives of offset operators and of the Commission at their election. Results of such tests shall be filed with the Commission within 15 days after the completion of tests; provided however, that in the event a segregation test or packer leakage test indicates that there is communication between the separate strata, the operator shall immediately notify the Commission and commence remedial action on the well.
 - (d) A packer setting affidavit shall accompany the report of the initial segregation test and packer leakage test if a price
 - (e) The well shall be so equipped that reservoir pressures may be determined for each of the separate strata and further, be so equipped that meters may be installed and the gas, oil and gas, and oil produced from each of the separate strata may be accurately measured, and the gas-oil ratio or the gas-liquid ratio thereof determined.
 - (f) Within 15 days after the completion of the well, the operator shall furnish the Commission with a diagrammatic sketch of the mechanical installation which was actually used in completing the well together with a report of the gravity, gas-oil ratio or gas-liquid ratio, and reservoir pressure for each of the separate zones, and the log of the well if the same has not been previously submitted.

PHILLIPS PETROLEUM COMPANY

PRODUCTION DEPARTMENT

L E FITZJARRALD

VICE PRESIDENT

BARTLESVILLE, OKLAHOMA

September 1, 1960

EARL GRIFFIN
MANAGEN

JACK TARNER
TECHNICAL ADVISER TO VICE PRES
H. S. KELLY
CHIEF ENGINEER

522 S 7/1 7 :

Mr. Dan Nutter New Mexico Oil Conservation Commission Santa Fe, New Mexico

Dear Dan:

I read in one of Nancy Royal's recent reports that you were seeking advice concerning terminology for tubingless completions where several strings of tubing are cemented, as casing, in a single drilling hole.

I took this matter up with Mr. H. S. Kelly, our chief engineer. Mr. Kelly and his staff are concerned with equipment used in oil and gas production, and therefore could be of some assistance. For whatever help it may be to you, I am pleased to attach herewith a copy of Mr. Kelly's reply to my inquiry.

I also might say I have been fascinated by the equation you and Morris developed to represent the depth bracket allowable.

Sincerely yours,

Poli Micola

O. P. Nicola, Jr.

OPN:hd Attach.

It's Performance That Counts
FLITE-FUEL --- TROP-ARTIC

In re: Terminology for Tubingless Completions

TO: Mr. O. P. Nicola, Jr.

PROM: Mr. Harold S. Kelly

In answer to your August 22, 1960 notegram, Humble Oil and Refining Company have been the foremost users and developers of the "tubingless" type completions. In view of the fact that Humble had first applied the term "tubingless" to these type of completions and the fact that the other operators and manufacturers have established this term through common usage, it is recommended that the term "single tubingless" completion be applied to all completion operations where one string of tubing is cemented in or is run as the oil string in lieu of 4-1/2" or larger casing. If two or more tubing strings are run and/or cemented in lieu of casing, this type of completion should be referred to as a "dual, triple, or quadruple tubingless" completion. The term "multiple tubingless" completion could be used when a broad reference is made to the dual, triple and quadruple tubingless completions.

To our knowledge, there is not an established terminology to describe those "tubingless" completions, having the inner "macaroni" strings except for those "single and multiple tubingless" completions having "hollow" sucker rods. However, in view of the fact that these inner strings could be 1-1/2", 2-1/16" or 2-3/8" O.D. tubing strings, we would be opposed to the use of "macaroni" in the wording describing these type completions. After considering the following terms; inner producing string, inner tube, inner flow tube, concentric string, and several others; we feel that the term "single tubingless" completion with an "inner flow string" would aptly describe flowing tubingless completions with an inner flow string. When the tubingless well is artificially lifted the term "with inner artificial lift string" could replace the phrase "inner flow string."

From the practical point of view, the important thing is for the Commission to accept and establish that terminology that has been and will be established through common usage by the industry. They should not establish rigid terminology at this time unless they are quite sure that the other companies will accept and establish this terminology through common usage. Phillips personnel will accept and help to establish any terminology that is based on common usage or is reasonable and represents the consensus of industry's opinion.

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obil Oil Company

A Division of Socony Mobil Oil Company, Inc.

P. O. BOX 2406. HOBBS NEW MEXICO

7100 Care 22112

August 19, 1960

Mr. Dan Nutter P. O. Box 871 Santa Fe, New Mexico

Dear Dan:

The attached table of completion nomenclature was made up by Wayne Gamble and myself and is our personal suggestion. This is in response to the plea for help in Nancy's last letter.

We have seen and experienced some of this naming trouble ourselves. However, we really appreciate the difficulties after making up the table. There are some shortcomings to the table but it gives a fairly good word picture. We hope that it will be of some assistance to you.

Yours very truly,

nrh

J. C. Gordon, Jr.

Sr. Production Engineer

NOMENCLATURE TABLE OF TYPE COMPLETIONS

No. of Formations Completed	No. of Casing Strings	Tubing	Nomenc!	lature
1	1	None	Single	2-7/8" tubingless completion
1	1	1	Single	
2	1	1	Dual	<pre>/" standard completion</pre>
2	1	2	Dual	<pre>/" standard completion</pre>
2	2	None	Dual	2-7/8" tubingless - 2-7/8" tubingless completion
2	2	1	Dual	2-7/8" tubingless - 4-1/2" standard completion
2	2	2	Dual	2-7/8" standard - 2-7/8" standard completion
3	1	2	Triple	
3 3	1	3	Triple	8-5/8" standard completion
3	2	1.	Triple	2-7/8" tubingless-dual 4-1/2" standard completion
3	2	2	Triple	2-7/8" standard-dual 4-1/2" standard completion
3	2	3	Triple	2-7/8" standard-dual 4-1/2" standard completion
3	3	None	Triple	<u>-</u>
3	3	1	Triple	2-7/8" tubingless-2-7/8" tubingless-2-7/8" standard completion
3	3	2	Triple	
3	3	3	Triple	

NOTES: 1) First word denotes number of formations completed - single, dual, triple.

- 2) Second "position" is size of casing string or strings and has entry for casing string.
- 3) Third "position" indicates if casing is tubingless or standard; i.e., casing with tubing.
- 4) Sizes shown in table are for illustration only.

J. C. Gordon, Jr.

H. W. Gamble

8-13-60

SUGGESTIONS ON TERMINOLOGY FOR MULTIPLE COMPLETIONS

STATE OF NEW MEXICO

MULTIPLE TUBINGLESS COMPLETION - could denote wells with more than one string of 2-7/8-inch OD casing cemented in the same bore hole. This terminology has become commonplace in the Industry even though a concentric string of small tubing may be used in a small casing string in some cases for artificial lift purposes.

Each casing string in a multiple tubingless completion serves as an independent well; abandonments or workovers in one producing outlet can be conducted without disturbing equipment or production in adjacent completions. Therefore, permanent identification of each completion in a multiple tubingless completion is feasible. A numerical suffix to the well number could be used; for example, a dual tubingless completion could be designated "John Doe 1-1 and 1-2" and a quadruple tubingless completion "John Doe 1-1, 1-2, 1-3, 1-4". This system of designating the producing outlets in a multiple tubingless completion would identify the well as a tubingless completion and would also avoid the problems that might be presented by employing nomenclature which would imply the relative level of producing intervals, such as "U" for upper, "I" for intermediate, and "L" for lower. With a suffix assigned permanently to each producing outlet, no change in nomenclature would be necessary in the event that a workover in one producing interval in a multiple tubingless completion resulted in a change in the productive interval level with respect to other producing intervals in adjacent strings.

combination Tubingless completion - could denote wells made by cementing side by side one or more strings of 2-7/8-inch OD casing and a larger string such as 4-1/2-inch OD casing. This type completion could also utilize the numerical suffix system of designating each 2-7/8-inch OD string, and a Roman numeral or alphabetical suffix could be used to identify the larger casing string.

CONVENTIONAL MULTIPLE COMPLETIONS - could be used to denote multiple completions obtained by installing one or more strings of tubing inside a string of casing with packers employed to isolate reservoirs. Existing regulations and labeling of conventional multiple completions appear to be entirely satisfactory. Therefore, obtaining a dual completion by installing a small packer and tubing string inside 2-7/8-inch OD casing in either a single or multiple tubingless completion could be handled by existing regulations.

Humble Oil & Refining Company
Humble Division
Houston (Texas
September 9, 1960

PRODUCTION DEPARTMENT

L.H. BYRD

OPERATIONS MANAGER

Mr. Dan Nutter
Oil Conservation Commission
107 Mabry Hall
Capitol Building
Santa Fe, New Mexico

Dear Dan:

In line with our recent telephone conversation and in response to the request in the <u>New Mexico Statehouse Reporting Service</u> dated August 12, 1960, attached are some suggestions concerning nomenclature for the various types of multiple completions.

As you know, any method of nomenclature used is strictly arbitrary; however, it is felt that the attached suggestions would serve the purpose. I would like to suggest again that, regardless of the nomenclature used, permanent well numbers be assigned the individual completions when the producing strings are cemented in the well bore. It is also felt that the Commission would do itself and the Industry a service by permitting, as soon as possible, administrative approval of multiple completions after the precedent has been established in a given pool.

We hope that this will be of use to you, and if we can cooperate in any other matter, please advise.

Sincerely,

LHB:mn Attachment

. . . ·

BEFORE THE

OIL CONSERVATION COMMISSION HOBBS, NEW MEXICO

April 13, 1961

IN THE MATTER OF:

CASE NO. 2242 Application of the Oil Conservation Commission on its own motion to consider certain changes in the Definition section of its Rules and certain changes in the definitions in Rule 107, and to consider amending Rule 112 to provide, among other things, for administrative approval for multiple slim-hole completions.

> Hobbs High School Cafeteria 1300 East Scharbauer Hobbs, New Mexico

BEFORE:

Edwin L. Mechem, Governor E. S. "Johnny" Walker, Land Commissioner A. L. "Pete" Porter, Secretary-Director

TRANSCRIPT OF HEARING

MR. PORTER: We will take Case No. 2242.

MR. MORRIS: Mr. Commissioner, we will have one witness,

Mr. Nutter.

MR. PORTER: Will you come forward and be sworn, please?

(Witness sworn.)

DAN NUTTER

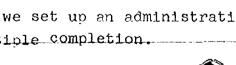
called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. MORRIS:



- Q Will the witness please state his name and position?
- Α Dan Nutter, Chief Engineer for the Oil Conservation Commission.
- Mr. Nutter, in your capacity with the Commission, have you made a study of the Rules and Regulations of the Commission pertaining to multiple completions in general?
 - Yes, I have.
- Would you state what rules have been considered in this study?
- Primarily the consideration is to Rule 112-A which deals with the multiple completion of wells. We are also considering some accompanying changes in the definition section of the Rule Book, and also some nomenclature changes in Rule 107.
- Is it your opinion that the rules you have mentioned in the definition section should be revised?
 - Yes, I believe it should be.
- What conditions have come to your attention that would indicate that a revision is necessary?
- Primarily, the thing that motivated the consideration of this rule change was the vast increase in the number of multiple completions in which a string of casing is used. In view of the fact we have quite a number of these and there was no actual provision for administrative approval of this type of multiple completion, we felt that it would alleviate the load of hearings to the operator as well as the Commission if we set up an administrative procedure to approve this type of multiple completion.



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PHONE CH 3.6691

In order to do that you are proposing certain changes in the definition of Rule 107(a) and Rule 112-A; is that correct?

That is correct.

Mr. Nutter, will you now proceed to give us your recommendations concerning the numbering system as presently used in the definition section of our Rules and Regulations?

Yes, sir. First of all, I'd like to point out that we have printed these proposed rule changes and have them available for the people to pick up as they come in.

Since you have called attention to the printed matter, would you have that marked as Commission's Exhibit No. 1?

Well, this is a work copy. The first thing would be to abolish the numbering system in the definition section of the Rule Book. The reason for this is that the numbering system has been in here for a long time and if you have any kind of a change in the definition section and you insert a new definition, it has either got to go in out of order or it requires renumbering the entire section; and the numbers themselves serve no useful purpose, so I'd suggest that all of the numbers in this section be deleted.

Isn't it true that if you're looking for a definition of dual completion, you have to look under "M"?

That is correct. Several years ago the thing was changed to dual completion, but rather than renumber the section at that time, they inserted dual completion under "M".



CH 3-6691

Mr. Nutter, what recommendations do you have concerning any deletions from the definition section of the Rules and Regulations?

Well, since dual completion is listed under "M" and since Α we have a lot of completions other than dual, I would therefore recommend that the definition of dual completion be deleted and some substitute definition be placed in the definition section. First of all, I would recommend that "Conventional Completion" be inserted in the definition section and defined as follows: Conventional Completion shall mean a well completion in which the production string of casing has an outside diameter in excess of 2.875 inches. In other words, this would mean any well in which the casing is larger than the tubing. Of course, we have some casing that's a little bit larger than 2.875, but we have to have a breaking point some where. We should also insert the definition of "Tubingless Completion" and define it as follows: Tubingless Completion shall mean a well completion in which the production string of casing has an outside diameter of 2.875 inches or less. This, in effect, would mean any well completed with a string of tubing used for casing. These two definitions that we have just gone into, it might be noted, are both for single completions.

Q These definitions that you have just given us appear as paragraphs 3 and 4 of Exhibit No. 1; is that correct?

A Yes, sir. Now, paragraph 5, we recommend that the definition "Multiple Completion (Conventional)" be inserted and de-



HONE CH 3-6691

fined as follows: Multiple Completion (Conventional) shall mean a completion in which two or more common sources of supply are produced through one or more strings of tubing installed within a single casing string, with the production from each common source of supply completely segregated by means of packers. You will recognize this as being the usual type of dual or triple completion in which you have annular casing or through tubing.

The next definition would be "Multiple Completion (Tubingless)" which would be defined as follows: Multiple Completion (Tubingless) shall mean a completion in which two or more common sources of supply are produced through an equal number of casing strings cemented in a common well-bore, each such string of casing having an outside diameter of 2.875 inches or less, with the production from each common source of supply completely segregated by use of cement. Now, this is the type of completion that we had quite a number of in recent months in which several strings of casing of small diameter are cemented in a single hole and the production is segregated in the definition by cement rather than a packer. We would then get into another type of multiple completion and call it "Multiple Completion (Combination)" and define it as follows: Multiple Completion (Combination) shall mean a multiple completion in which two or more common sources of supply are produced through a combination of two or more conventional diameter casing strings cemented in a common well-bore, or a combination of small diameter and conventional diameter casing



MONE CM 3-6691

strings cemented in a common well-bore, the latter of which might or might not be a Multiple Completion (Conventional). I'd like to note there a little miswording in the latter part of that definition, that the word "latter" should be scratched and the words "conventional diameter strings" used therefor. We recognize this as a multiple completion in which you can have a large diameter casing string as well as maybe one or two small diameter casing strings cemented in a well-bore, and the large diameter casing string may or may not be a dual completion or even a triple completion.

The definitions that you have just given us of Multiple Q Completions (Conventional, Tubingless, Combination) are as appear on Exhibit 1, paragraphs 5, 6 and 7; is that correct?

That is correct. I might point out that sometime last July or August we invited suggestions as to the proper nomen -. clature for this type of completion, and we received suggestions from quite a number of companies. We tried to glean the best of the suggestions from all of them and incorporate them in the series of definitions right here.

In the definition, Mr. Nutter, in paragraphs 5, 6 and 7, you refer to two or more common sources of supply. By that do you mean common sources as to each other?

No, sir, the statutory definition in which pool is synonymous with common source of supply.

Now, these definitions that we have just gone over in



paragraphs 3 to 7, inclusive, are intended nomenclature, is that correct?

- A This is correct.
- Q Mr. Nutter, would you now give us your recommendations concerning revision of Rule 107?

Visors or their representatives in the Commission District Offices to approve slim hole completions." We have noticed as we have indicated in these definitions here that there is a trend away from the use of the use of the words "slim hole" and these are appearing more frequently, and in order to make Rule 107 compatible with the definition section as we have proposed here today, we would substitute the words "tubingless completion" for "slim hole completion" in each place that it appears in Rule 107. We would amend Rule 107 (e), 2nd line, to read, "----shall have authority to approved tubingless completions without----". We would amend Rule 107 (e) (3), 2nd line, to read, "----which might make the tubingless method of completion----". Those are the only changes for Rule 107, just a matter of definition.

Q Now, turning to Rule 112-A would you give us your recommendations concerning the revision of that rule?

A Yes, sir. There would be no change whatsoever from the existing rule. We have inserted some additional verbiage and tried to make the rest of it compatible with the changes that were recommended here today. In Rule 112-A I is not changed at all.



IRC. PHONE CH 3-6691 CH 3-6691

In II. Dual Completions (Conventional) is not changed at all with the exception that in paragraph (a), the third line we have inserted the word "similar" and in the sixth line we have inserted the word "similar". There has also been a little bit of confusion when we get applications for administrative approval of dual completions whether one was similar or not, and it has never; actually been defined the way that it should be. I think this will clear it up.

Going on to section (b), paragraphs 1, 2, 3 and 4 are all identical as they appear in the rules today. In paragraph (c) there is a change. The present rule restricts the smallest diameter of the casing to be 1.750 inches. We have changed this 1.750 inches, the reason being a new type of tubing that National Tubing has come out with. I have this brochure which I'd like to offer as an exhibit in this case which goes into the details and specifications on this type of tubing. I think it's a tubing trend which will open up new avenues. I recommend that this type of tubing be authorized by including this change in the rule.

> MR. MORRIS: Will you have that marked as Exhibit 2? (Whereupon, Exhibit No. 2 marked in evidence.)

(By Mr. Morris) Will you proceed to paragraph D?

That is identical with the way it appears in the rule today. Now, Section III, Multiple Completions (Tubingless and Combination). We have pretty much followed the same format in Section III that we followed in Section II (Dual Completions).



ALBUQUERQUE, NEW MEXICO

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I'll read this section: "The Secretary-Director of the Commission shall have the authortity to grant an exception to the requirements of Rule 112-A(I) and approve the multiple completion of a well without notice and hearing where application has been filed in due form; and

- (a) The well is to be a multiple completion (tubingless or combination) within the limits of two defined pools or within one mile thereof, and the Commission has previously authorized the similar multiple completion of a well in the same zones as proposed, after notice and hearing; or the well is to be so multiply completed outside the limits of a defined pool and there is a similar multiple completion in the same zones within one mile of the proposed multiple completion which has previously been authorized by the Commission after notice and hearing, provided however that in Rio Arriba, San Juan and McKinley Counties, any such proposed multiple completion may be authorized even though it is not within defined pools nor within one mile of a previously authorized multiple completion of similar nature, if a similar multiple completion within the same zones as proposed has been authorized after notice and hearing; and
- (b) The applicant proposes to employ one of the following methods of completion:
- 1. Multiple completion (Tubingless) utilizing two or more small diameter casing strings (2.875) inches. O. D. or less, one to each common source of supply, all cemented in a common well-bore.



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Multiple Completion (Combination) utilizing a combination of small diameter (2.875 inches 0. D. or less) and conventional diameter (greater than 2.875 inches) casing strings, all cemented in a common well-bore. Provided however, that if any conventional diameter casing in said multiple completion is used for the production of two separate common sources of supply, the rules pertaining to Dual Completions (Conventional) in Rule 112-II (b), (c) and (d) above shall also apply; and

- (c) Sufficient cement shall be used in said multiple completion to extend throughout each pay and a minimum of 100 feet above," And then substitute for that period a semicolon, and insert the word "and" "(d)".
- "(d) Centralizers or turbolizers shall be installed on each joint of casing throughout each pay and on a minimum of three joints above; and
- "(e) Directional perforating equipment shall be used in perforating all intervals in any casing string in said multiple completion which intervals are in a zone through which one or more other casing strings pass.
- "(f) The requirements of paragraph (c) and (d) may be modified for multiple completions within given common sources of supply and within a given area if, in the opinion of the Secretary-Director, circumstances warrant such modification."
- what is the purpose and what will be the effect of this paragraph (f) that you have just read?



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I visualize several circumstances in which the Secretary-Director may want to increase the amount of -- the number of central izers that would be used. Also under some circumstances the 100 feet and the centralizers through this specific pay zone may not be necessary. In all probability, the first well in an area that would be approved would be the criterion as to what the subsequent wells that would be approved administratively would follow.

Would you now go through paragraph IV entitled "Administrative Procedure" pointing out where this has been changed from our existing rule?

Yes, sir. Essentially, paragraph IV is the same as paragraph 3 in the old rule and sets out the procedural policy of the Commission as far as approving multiple completions administratively. It also goes into detail on how to obtain it. We have had to add a few things and it reads as follows -- there is no other change in this paragraph except the Commission form will be changed -- and if this change is approved, it would read "Application for approval of a multiple completion" rather than a "dual completion. In paragraph (a) we have made a few minor changes there, and it would read: "Diagrammatic Sketch of the Multiple Completion, showing all casing strings, including diameters and setting depths, quantities used and top of cement. perforated intervals, tubing strings, including diameters and setting depth, location of packers, side door chokes, and such other information as may be pertinent.



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In the second paragraph of paragraph (d) the word "multiple" is a substitute for the word "dual" and in the third line of that paragraph that should be changed to "proposed multiple completion".

In paragraph V there is no change except in the fourth line where "Multiple Completion" has been substituted for "Dual Completion."

In paragraph VI, "All multiple completions has been substituted for "All Dual Completions". In paragraph (a) the words,
"Prior to actual multiple completion" has been changed from "Prior to actual dual completion."

Now, when we get to paragraph (c) in Paragraph VI, over on the right hand side where it says, "Segregation tests and/or packer leakage tests" that does not appear in the existing rule and in the third line the same thing applies. The reason for this is that in these multiple completions where you have several strings of tubing cement or casing cemented on a common well-bore and rely on cement to separate the zones, it would be improper to rely on packer leakage tests because there is no packer.

In Paragraph (d), we would make a change in this exhibit and add the words, "if applicable" to the end of the sentence.

A packer setting is not applicable in all cases. Outside of that, it would be as printed and distributed.

Mr. Nutter, in summary, would you explain briefly in what cases administrative approval is going to be able to be obtained under the rule changes that you have noted and in what



cases it is not going to be obtained?

Assuming that multiple completion has been approved after a hearing in an area and you had been able to get approval for a dual, triple, quadruple, quintuple or any other type of a multiple completion. If there were that many strings of tubing cemented in the well-bore you would also be able to get approval for a completion in which you have one, two or three, or how many ever, small diameter casing strings in the hole plus large conventional size casing strings which may be dually completed. You will note that it may be dual. We find that over in 3(b)(2). It says that if a multiple completion is used on a conventional diameter casing string, the rule pertaining to dual completion would apply. We have limited administrative approval of conventional multiple completions to duals rather than triples. In other words, we would still have a hearing on a triple completion if the conventional means are used to make that triple and the reason for it is that there is such a variety of equipment used for triples that we prefer to see those sketches at a hearing and be able to go into the details of the hook-up. However, triple completions or quadruple completions in a hole where you're relying on the cement, and if you have adequate cement and centralizers, you should be safe and there is not a great deal of detail that we feel we have to go into to approve those.

O Mr. Nutter, do you have anything further that you wish to express with regard to your proposed revisions of these defini-



tions and rules?

- No, sir. Α
- Did you prepare Exhibit 1 as amended?
- Yes, sir, I did.
- You were furnished Exhibit No. 2 by U. S. Steel?
- Yee, sir.

MR. MORRIS: At this time, Mr. Commissioner, I would : like to offer Exhibit Nos. 1, as amended and 2 into evidence.

MR. PORTER: Without objection, they are admitted.

Does anyone have a question?

QUESTIONS BY MR. PAYNE:

I note in paragraph 3, which is entitled "Multilple Completions (Tubingless and Combination), in paragraph (a) it provides that in Rio Arriba, San Juan and McKinley Counties, those proposed multiple completions may be authorized even though it is not within defined pools or within one mile of a previously authorized completion. Why do you have a dual rule in the northwest and not in the southwest?

Because of a much greater variety of producing horizons in the southwest. Up in the north we have four or five wellknown, well-defined gas producing areas, and a greater gas producing horizon that has broadened in the last three years and we know pretty well what kind of pressure can be anticipated in any of these zones. They don't present any pressure problem



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or any particular corrosive problem, and it's just a lot easier to assume that a multiple completion can be carried out without any difficulty in the northwest than in the southwest. In the southwest, you can run into anything there in the high pressure zones.

- We now would you define "similar"?
- A "Similar" is a very difficult word to define.
- Q You used it throughout the rule.
- A Yes, sir. "Similar" can mean something that's nearly like something else, but it's very difficult to say just how far it can be from being exactly the same, slightly different, and still be "similar."
- Q A gas-oil-gas triple completion has been approved. Would you approve administratively an oil-gas-oil triple completion?
 - A It would depend on whether or not there was an annular --
 - Q Assuming they are going to be produced the same way.
- A This has been one of the problems that we have been faced with before in a circumstance where the word "similar" doesn't answer the question. I would imagine that if the mechanical hook-up is the same, if you have authority to produce an oil zone through tubing and then you get a gas zone, certainlythere is no need for revision of the order.
- Q Then, in other words, you're going to leave it to the Secretary-Director, or to the discretion of the Secretary-Director?
 - A You're depending on the cement in these completions. A



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segregation of the centralizers will help you to get the pipe in the middle of the hole so that you know the cement has been circulated around there and the best way to know that is to get a good job on your cement.

If I understand your proposal, if one wanted to triply complete a well in a conventional manner, he still has to have a hearing, but on a tubingless or combination, he doesn't.

If that completion is limited to a dual, if the large diameter casing string is limited to a dual completion in combination.

- You propose to delete dual completion, in which there are ର only two zones. Why do you say that in your rule?
 - No, it's just understood, Mr. Payne. Α
- The rule does say in which two or more common sources of supply are completed in the same well, and two would be dual.

Referring to paragraph 6(e), Mr. Nutter, where it says oil produced from each of the separate strata may be accurately measured. You don't mean to imply there --

I didn't go into this paragraph with any thought of change from the existing rule. No, sir, this means that the oil or gas is to be produced separately and measured separately.

Do you think perhaps the word "may" should be deleted and "shall" substituted therefor?

There are three places in the paragraph that I think the word "may" is used in the sense that you can do it; that it's



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possible to do it, physically possible, not that it's optional to do it.

MR. PAYNE: Thank you.

MR. PORTER: Does anyone have a question of Mr. Nutter concerning the proposed rule changes?

QUESTIONS BY MR. UTZ:

Q Mr. Nutter, in reference to Rule 112-A(3)(a), at the top of page 4, do you believe it might be appropriate to ask Sandoval County?

A It probably would be.

MR. UTZ: That's all.

MR. PORTER: Anyone have a question? The witness may be excused.

(Witness excused.)

MR. PORTER: Does anyone have any further testimony to offer in this case? The Commission will take the case under advisement.

make on behalf of Sinclair. We would like to concur in all of the recommendations made by Mr. Nutter with one exception, and that is on his proposed amendment to Rule 112-A under Dual Completion, Paragraph C, where he lists the minimum tubing requirement from 1.75 down to 1.67, and in that respect, Sinclair believes that that matter should be left to the discretion of the Commission completely, and we would recommend that all reference to minimum



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tubing aize be deleted and that each well in each application that is submitted to the Commission be analyzed on the basis of the many variable factors involved—the well's depth, pressure, gas—oil ratio, type of fluids, whether gas or oil; those factors should be analyzed by the Commission.

Thank you.

MR. BRATTON: Humble Oil Company is in support of the rules authorizing administrative approval of multiple completions with a diameter of 2.875 because of the economical operational use of this type of installation.

MR. BUELL: PanAm would recommend that the Commission adopt the changes and additions recommended by Mr. Nutter. We feel that it will give an opportunity to operators to administratively use more economical techniques.

MR. ROBINSON: Ed Robinson, Texaco, Inc. Texaco wants to go on record in supporting Mr. Nutter's requests here on the tubing, in reducing the size of the tubing. We would like to point out that in production buttress tubing is in competition with the normal sized tubing, and with the tubing joint being milled out to 1.70 there is actually only .03 of an inch difference between the two tubings, and a saving of \$.50 a foot with the adoption of this new tubing. We believe this is a step in the right direction.

MR. BUSHNELL: Amerada is in accord with the recommendations of Mr. Nutter. There might be a provision we would like to



change, but generally we are in accord. We would like to say we agree with the recommendation of Sinclair.

Gulf Oil concurs in all features of all the recommendations proposed by Mr. Nutter.

MR. PORTER: Does anyone have a statement? If not, the Commission will take the case under advisement.



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STATE OF NEW MEXICO)
COUNTY OF BERNALILLO)

SS

I, Thomas F. Horne, Court Reporter, in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in machine shorthand and reduced to typewritten transcript under my personal supervision, and that the same is a true and correct record to the best of my knowledge, skill and ability.

Court Reporter

My Commission Expires:

JQUERQUE, NEW MEXI



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RSM/esr April 19, 1961

BEFORE THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

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CASE No. 2242

Order No. R- 195

APPLICATION OF THE OIL CONSERVATION COMMISSION ON ITS OWN MOTION TO CONSIDER CERTAIN CHANGES IN THE DEFINITION SECTION OF ITS RULES AND CERTAIN CHANGES IN THE DEFINITIONS IN RULE 107, AND TO CONSIDER AMENDING RULE 112 TO PROVIDE, AMONG OTHER THINGS, FOR ADMINISTRATIVE APPROVAL FOR MULTIPLE SLIM-HOLE COMPLETIONS.

ORDER OF THE COMMISSION

BY THE COMMISSION:

Hobbs,

This cause came on for hearing at 9 o'clock a.m. on April 13, 1961, at same of New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this day of April , 1961, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

- (1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.
- (2) That certain changes should be made in the definitions, rules and regulations of the Commission pertaining to multiple completions in order to improve nomenclature and facilitate the administration of requests for approval of multiple completions.
- (3) That the numbering system of the definition section of the Commission's rules and regulations should be abolished.
- (4) That the definition of "Dual Completion" should be deleted from the definition section of the Commission's rules and regulations.
- (5) That the terms "Conventional Completion", "Tubingless Completion", "Multiple Completion (Conventional)", "Multiple Completion (Tubingless)", and "Multiple Completion (Combination)" should be defined for nomenclature purposes.

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- (6) That Rule 107 (e) should be amended to conform to the newly defined nomenclature.
- (7) That Rule 112-A should be revised to provide for administrative approval of multiple completions meeting certain minimum standards.

IT IS THEREFORE ORDERED:

- (1) That the numbering system of the definition section of the Commission's rules and regulations is hereby abolished.
- (2) That the definition of "Dual Completion" is hereby deleted from the definition section of the Commission's rules and regulations.
- (3) That the following definitions are hereby adopted and made a part of the definition section of the Commission's rules and regulations:

CONVENTIONAL COMPLETION shall mean a well completion in which the production string of casing has an outside diameter in excess of 2.875 inches.

TUBINGLESS COMPLETION shall mean a well completion in which the production string of casing has an outside diameter of 2.875 inches or less.

MULTIPLE COMPLETION (CONVENTIONAL) shall mean a completion in which two or more common sources of supply are produced through one or more strings of tubing installed within a single casing string, with the production from each common source of supply completely segregated by means of packers.

MULTIPLE COMPLETION (TUBINGLESS) shall mean a completion in which two or more common sources of supply are produced through an equal number of casing strings cemented in a common well-bore, each such string of casing having an outside diameter of 2.875 inches or less, with the production from each common source of supply completely segregated by use of cement.

MULTIPLE COMPLETION (COMBINATION) shall mean a multiple completion in which two or more common sources of supply are produced through a combination of two or more conventional diameter casing strings cemented in a common well-bore, or a combination of small diameter and conventional diameter casing strings cemented in a common well-bore, the conventional diameter strings of which might or might not be a Multiple Completion (Conventional).

(4) That Rule 107 (e) is hereby amended to read in its entirety as follows:

The Commission's District Supervisors or their representatives shall have authority to approve tubingless completions without the necessity of administrative approval or notice and hearing when the following

conditions exist:

- (1) The well is to be completed with a total depth of 5,000 feet or less,
- (2) The well is not a wildcat (it is not more than one mile from an existing well producing from the same common source of supply to which it is projected),
- (3) No known corrosive or pressure problems exist which might make the tubingless method of completion undesirable,
- (4) The well will not be a dual completion,
- (5) The tubing used as a substitute for casing will be either 2 3/8-inch OD or 2 7/8-inch OD.
- (5) That Rule 112-A is hereby revised to read in its entirety as follows:

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I. The multiple completion of any well may be permitted only by order of the Commission after notice and hearing, except as hereinafter provided. Multiple completion of any well without prior approval by the Commission shall be solely at the operator's risk and shall in no way commit the Commission to subsequent approval thereof.

II. DUAL COMPLETIONS (CONVENTIONAL)

The Secretary-Director of the Commission shall have the authority to grant an exception to the requirements of Rule 112-A (I) and approve the dual completion of a well without notice and hearing where application has been filed in due form; and

- (a) The well is to be dually completed within the limits of two defined pools or within one mile thereof, and the Commission has previously authorized the similar dual completion of a well in the same zones as proposed, after notice and hearing; or the well is to be dually completed outside the limits of a defined pool and there is a similar dual completion in the same zones within one mile of the proposed dual completion which has previously been authorized by the Commission after notice and hearing, provided however that in Rio Arriba, San Juan, and Sandoval, Counties, a proposed gas-gas dual completion may be approved even though it is not within defined pools nor within one mile of a previously authorized dual completion of similar nature, if both the upper zone and the lower zone of the proposed dual completion have been recognized by the Commission as being gas producing zones suitable for dual completion; and
- (b) The applicant proposes to utilize one of the mechanical installations described below:

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- 1. The well is to be completed as a gas-gas dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through a single string of tubing and the tubing-casing annulus.
- 2. The well is to be completed as a gas over oil dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through the tubing-casing annulus and a single string of tubing respectively.
- 3. The well is to be completed as an oil over gas dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through a single string of tubing and the tubing-casing annulus respectively by means of a crossover flow assembly.
- 4. The well is to be completed as an oil-oil dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing; and
- (c) All strings of tubing used for the production of oil in the proposed dual completion will have a nominal inside diameter of not less than 1.670 inches nor greater than 2.50 inches; and
- (d) The packer used to segregate the separate zoncs of the dual completion shall be a production-type packer and shall effectively prevent communication between all producing zones.

III. MULTIPLE COMPLETIONS (TUBINGLESS AND COMBINATION)

The Secretary-Director of the Commission shall have the authority to grant an exception to the requirements of Rule 112-A (I) and approve the multiple completion of a well without notice and hearing where application has been filed in due form; and

(a) The well is to be a multiple completion (tubingless or combination) within the limits of the defined pools or within one mile thereof, and the Commission has previously authorized the similar multiple completion of a well in the same zones as proposed, after notice and hearing; or the

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well is to be so multiply completed outside the limits of a defined pool and there is a similar multiple completion in the same zones within one mile of the proposed multiple completion which has previously been authorized by the Commission after notice and hearing, provided however that in Rio Arriba, San Juan, and McKinley Counties, any such proposed multiple completion may be authorized even though it is not within defined pools nor within one mile of a previously authorized multiple completion of similar nature, if a similar multiple completion within the same zones as proposed has been authorized after notice and hearing; and

- (b) The applicant proposes to employ one of the following methods of completion:
 - 1. Multiple Completion (Tubingless) utilizing two or more small diameter casing strings (2.875 inches O.D. or less), one to each common source of supply, all cemented in a common well-bore.
 - 2. Multiple Completion (Combination) utilizing a combination of small diameter (2.875 inches 0. D. or less) and conventional diameter (greater than 2.875 inches) casing strings, all cemented in a common well-bore. Provided however, that if any conventional diameter casing in said multiple completion is used for the production of two separate common sources of supply, the rules pertaining to Dual Completions (Conventional) in Rule 112-II (b) (c) and (d) above shall also apply; and
- (c) Sufficient cement shall be used in said multiple completion to extend throughout each pay and a minimum of 100 feet above; and
- and/or
 (d) Centralizers turbolizers shall be installed on each joint of casing throughout each pay and on a minimum of three joints above; and
- (e) Directional perforating equipment shall be used in perforating all intervals in any casing string in said multiple completion which intervals are in a zone through which one or more other casing strings pass.
- (f) The requirements of paragraph (c) and (d) may be modified

for multiple completions within given common sources of supply and within a given area if, in the opinion of the Secretary-Director, circumstances warrant such modification.

IV. ADMINISTRATIVE PROCEDURE

Application for administrative approval of a multiple completion shall be made in quadruplicate, with two copies of the application to be mailed to the Commission's Santa Fe office, and two copies to the District office for the area in which the well is located. Application shall be made on the Commission Form entitled, "Application for Multiple Completion," and shall be accompanied by the following:

- (a) Diagrammatic Sketch of the Multiple Completion, showing all casing strings, including diameters and setting depths, quantities used and top of cement, perforated intervals, tubing strings, including diameters and setting depth, location of packers, side door chokes, and such other information as may be pertinent.
- (b) Plat showing the location of all wells on applicant's lease, all offset wells on offset leases, and the names and addresses of operators of all leases offsetting applicant's lease.
- (c) Waivers consenting to such multiple completion from each offset operator, or in lieu thereof, evidence that said offset operators have been furnished copies of the application.
- (d) Electrical log of the well or other acceptable log with tops and bottoms of producing zones and intervals of perforation indicated thereon. (If such log is not available at the time application is filed, it shall be submitted as hereinafter provided.)

The Secretary-Director may approve the multiple completion, if after a period of 20 days following the filing of the application no operator has filed objection to the proposed Vancial completion.

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V. Application for public hearing to authorize a multiple completion shall be made in triplicate to the Commission's Santa Fe office. Application shall be made on the Commission Form entitled "Application for Multiple Completion," and shall set forth all material facts relative to the common sources of supply involved and the manner and method of completion proposed. Application shall be accompanied by an exhibit showing the location of all wells on applicant's lease and all offset wells on offset leases.

- VI. All multiple completions, whether approved after hearing or by administrative procedure, shall be subject to the following rules:
 - (a) Prior to actual multiple completion of a well, operator shall make adequate pressure tests of the casing to determine that no casing leaks exist. Results of casing tests shall be reported to the Commission on Form C-103.
 - (b) The well shall be completed and thereafter produced in such a manner that there will be no commingling of hydrocarbons from the separate strata.
 - (c) The operator shall commence a segregation test and/or packer leakage test not later than seven days after actual multiple completion of the well. Segregation tests and/or packer leakage tests shall also be made any time the packer is disturbed and at such other intervals as the Commission may prescribe. The operator shall also make all other tests and determinations deemed necessary by the Commission. Offset operators as well as the Commission shall be notified of the time such tests are to be commenced. Tests may bewitnessed by representatives of offset operators and of the Commission at their election. Results of such tests shall be filed with the Commission within 15 days after the completion of tests; provided however, that in the event a segregation test or packer leakage test indicates that there is communication between the separate strata, the operator shall immediately notify the Commission and commence remedial action on the well.
 - (d) A packer setting affidavit shall accompany the report of the initial segregation test and packer leakage test, if applicable.
 - (e) The well shall be so equipped that reservoir pressures may be determined for each of the separate strata and further, be so equipped that meters may be installed and the gas, oil and gas, and oil produced from each of the separate strata may be accurately measured, and the gas-oil ratio or the gas-liquid ratio thereof determined.
 - (f) Within 15 days after the completion of the well, the operator shall furnish the Commission with a diagrammatic sketch of the mechanical installation which was actually used in completing the well together with a report of the gravity, gas-oil ratio or gas-liquid ratio, and reservoir pressure for each of the separate zones, and the log of the well if the same has not been previously submitted.

(6) That the effective date of this order shall be May 1, 1961.

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

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(2) That certain changer should he made in the definitions, ruler and regulations of the Commission pertaining to multiple completions in order to improve nomenclature and facilitate the administration of requests for improval of multiple completions.

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(6) That lule 107 (e) should be amended to conform to the newly defined nomenclature.