Case. Number.

4462

Application,

Transcripts.

Small Exhibts.

ETC.

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE
87501

GOVERNOR
DAVID F. CARGO
CHAIRMAN

LAND COMMISSIONER
ALEX J. ARMIJO
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

December 1, 1970

Re: Case No. 4462
Order No. R-4071

Applicant:

Continental Oil Company

Mr. Jason Kellahin
Kellahin & Fox
Attorneys at Law
Post Office Box 1769
Santa Fe, New Mexico

Dear Sir:

Enclosed herewith is a copy of the above-referenced Commission order recently entered in the subject case. Letter pertaining to conditions of approval and maximum allowable to follow.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC x
State Engineer

Other

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:

CASE No. 4462
Order No. R-4071

APPLICATION OF CONTINENTAL OIL COMPANY
FOR DOWNHOLE COMMINGLING, RIO ARRIBA
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9:30 a.m. on November 18, 1970, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 1st day of December, 1970, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, 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 the applicant, Continental Oil Company, seeks authority to commingle production from an undesignated Gallup oil pool and an undesignated Dakota oil pool in the well-bores of four wells to be drilled in Township 25 North, Range 4 West, NMPM, West Lindrith Area, Rio Arriba County, New Mexico, as follows:

Jicarilla 22 Well No. 5 - Unit L - Section 22
Jicarilla 28 Well No. 9 - Unit A - Section 28
Jicarilla 28 Well No. 10 - Unit L - Section 28
Jicarilla 28 Well No. 11 - Unit B - Section 33

(3) That each well previously completed in the above-described pools have been capable of only low marginal production.

(4) That the evidence indicates that wells completed in the future in said pools will be capable of only low marginal production.

(5) That the reservoir characteristics of the above-described Gallup and Dakota oil pools are such that underground waste would not be caused by the proposed commingling in the well-bores of the four wells to be drilled.

(6) That the granting of authorization to complete the subject wells as requested should permit the drilling of wells that would not otherwise be drilled and should result in the recovery of oil from each of the commingled zones in each of the subject four wells that would not otherwise be recovered thereby preventing waste, and will not violate correlative rights.

(7) That the mechanics of the proposed completions are feasible and in accord with good conservation practices.

(8) That in order to allocate the commingled production to each of the commingled zones in the subject wells, 53% of the commingled oil production should be allocated to the Gallup zone, 47% of the commingled oil production to the Dakota zone, 39% of the commingled gas production to the Gallup zone, and 61% of the commingled gas production to the Dakota zone in each of the subject four wells.

(9) That approval of the subject application will prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, Continental Oil Company, is hereby authorized to drill and complete each of the following four wells in Township 25 North, Range 4 West, NMPM, West Lindrith Area, Rio Arriba County, New Mexico, in such a manner as to produce oil from undesignated Gallup and Dakota oil pools through a single string of tubing, commingling in the well-bores the production from each of said pools:

Jicarilla 22 Well No. 5 - Unit L - Section 22
Jicarilla 28 Well No. 9 - Unit A - Section 28
Jicarilla 28 Well No. 10 - Unit L - Section 28
Jicarilla 28 Well No. 11 - Unit B - Section 33

(2) That the applicant shall complete, operate, and produce said wells in accordance with the provisions of Rule 112-A of the Commission Rules and Regulations insofar as said rule is not inconsistent with this order.

(3) That as to each of said wells, 53% of the commingled oil production shall be allocated to the Gallup zone, 47% of the commingled oil production to the Dakota zone, 39% of the commingled gas production to the Gallup zone, and 61% of the commingled gas production to the Dakota zone.

(4) That as to each well, commingling in the well-bore shall continue only so long as the commingled production does not exceed 50 barrels of oil per day nor 100 barrels of water per day.

(5) That as to each well, the maximum amount of gas which may be produced daily from the commingled zones shall be determined by multiplying 2000 by the top unit allowable for the Gallup zone.

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

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

DAVID F. CARGO, Chairman

ALEX J. ARMIJO, Member

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

esr/

#4462
Issued 11/18-70
Rec. 11/23-70

Grant ~~Continental~~ ~~Pan Am~~. Permission to commingle production from the Dakota Oil & Gallup oil zones in the following 4 wells:

Cont	–	Jic. 22	#5 – L	22 – 25 – 4
"		Jic. 28	9 – A	28 " "
"		" 28	10 – L	28 – 25 – 4
"		Jic. 28	11 – B	33 – 25 – 4

Operator shall ~~B~~ report production

Gallup Oil Prod = 53% of Commingled Prod.
Dakota Oil Prod. = 47% " " "
Gallup Gas Prod = 39% " " "
Dakota Gas Prod = 61% " " "

Docket No. 25-70

DOCKET: REGULAR HEARING - WEDNESDAY - NOVEMBER 18, 1970

OIL CONSERVATION COMMISSION - 9 A.M. - MORGAN HALL, STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

ALLOWABLE: Consideration of the allowable production of gas for December, 1970, from fifteen prorated pools in Lea, Eddy, Roosevelt and Chaves Counties, New Mexico, and also presentation of purchaser's nominations for said pools for the six-month period beginning January 1, 1971. Consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico, for December, 1970.

CASE 4453: In the matter of the hearing called by the Oil Conservation Commission on its own motion to consider the promulgation of an order prohibiting the flaring or venting of casinghead gas in the State of New Mexico on or after December 31, 1970, when certain conditions exist. Copies of the proposed order will be circulated by way of the Commission's general mailing list and will be available upon request made to the Commission at its Santa Fe office.

* * * * * * * * * * * * * * * * * *

THE FOLLOWING CASES WILL BE HEARD BEFORE DANIEL S. NUTTER, EXAMINER, OR ELVIS A. UTZ, ALTERNATE EXAMINER, IN THE OIL CONSERVATION COMMISSION CONFERENCE ROOM ON THE SECOND FLOOR OF SAID BUILDING AT 9:30 A.M.

CASE 4454: Southeastern New Mexico nomenclature case calling for the extension of certain pools in Lea, Chaves and Roosevelt Counties, New Mexico.

(a) Extend the Baum-Upper Pennsylvanian Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 14 SOUTH, RANGE 32 EAST, NMPM
SECTION 11: N/2 and SW/4

(b) Extend the Double L-Queen Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 14 SOUTH, RANGE 30 EAST, NMPM
SECTION 31: SE/4

(c) Extend the Maljamar Grayburg-San Andres Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 17 SOUTH, RANGE 33 EAST, NMPM
SECTION 27: SE/4

(d) Extend the North Vacuum-Abo Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM
SECTION 14: NW/4
SECTION 27: NE/4

(e) Extend the Vada-Pennsylvanian Pool in Roosevelt County,

(Case 4454 continued)

New Mexico, to include therein:

TOWNSHIP 8 SOUTH, RANGE 35 EAST, NMPM
SECTION 33: NE/4

CASE 4455: In the matter of the hearing called by the Oil Conservation Commission for the creation of a new oil pool and for the assignment of a discovery allowable, Sandoval County, New Mexico. The Commission, at the request of Refiners Petroleum Corporation, will consider the creation of a new oil pool for the production of oil from the Dakota formation comprising the NE/4 of Section 25, Township 22 North, Range 3 West, Sandoval County, New Mexico, said pool having been discovered by said corporation's Cuba Union Well No. 1 located in Unit A of said Section 25. Also to be considered will be the assignment of approximately 34,390 barrels of discovery allowable to said well.

CASE 4456: Application of Pan American Petroleum Corporation for expansion of pressure maintenance project, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks authority to expand its Cato Baskett Pressure Maintenance Project, Cato-San Andres Pool, by the conversion to water injection of its Baskett "D" Wells Nos. 1 and 2, located respectively, in Units G and A of Section 11, Township 8 South, Range 30 East, Chaves County, New Mexico.

CASE 4457: Application of Tenneco Oil Company for the creation of a new pool, assignment of discovery allowable, and promulgation of special pool rules, McKinley County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new pool for the production of oil from the "D" zone of the Dakota formation for its Don Ne Pah Well No. 1 located in Unit D of Section 18, Township 17 North, Range 8 West, McKinley County, New Mexico, and for the assignment of an oil discovery allowable to said well. Applicant further seeks the promulgation of special rules for said pool, including provisions for 80-acre spacing units with wells to be drilled in either the northwest or southeast quarter-quarter sections.

CASE 4458: Application of Continental Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the South Eunice Unit Area comprising 2720 acres, more or less, of Federal and Fee lands in Sections 20, 21, 22, 28, 29, and 33, Township 22 South, Range 36 East, South Eunice Pool, Lea County, New Mexico.

CASE 4459: Application of Continental Oil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in its South Eunice Unit Area by the injection of water into the Seven Rivers and Queen formations through 30 wells located in Sections 20, 21, 22, 28, 29, and 33, Township 22 South, Range 36 East, South Eunice Pool, Lea County, New Mexico.

CASE 4460: Application of Continental Oil Company for a non-standard gas proration unit, Lea County, New Mexico. Applicant, in the above-styled cause,

(Case 4460 continued)

seeks the consolidation of two existing non-standard gas proration units into one 480-acre non-standard unit comprising the N/2 and SE/4 of Section 23, Township 22 South, Range 36 East, Jalmat Gas Pool, Lea County, New Mexico, to be dedicated to its Meyer B-23 Wells Nos. 1, 2, and 3, located in Units C, O, and E, respectively, of said Section 23. Applicant further seeks authority to produce the allowable from any of said wells in any proportion.

CASE 4461: Application of Continental Oil Company for a non-standard gas proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the consolidation of two existing non-standard gas proration units into one 120-acre non-standard unit comprising the E/2 SW/4 and NW/4 SE/4 of Section 9, Township 21 South, Range 37 East, Blinebry Gas Pool, Lea County, New Mexico, to be dedicated to its Hawk B-1 Wells Nos. 2 and 6, located in Units J and N, respectively, of said Section 9. Applicant further seeks authority to produce the allowable assigned to said unit from either of said wells in any proportion.

CASE 4462: Application of Continental Oil Company for downhole commingling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle production from an undesignated Gallup oil pool and undesignated Dakota oil pool in the wellbores of four wells to be drilled in Township 25 North, Range 4 West, West Lindrith Field, Rio Arriba County, New Mexico, as follows:

Jicarilla 22 Well No. 5 - Unit L - Section 22
Jicarilla 28 Well No. 9 - Unit A - Section 28
Jicarilla 28 Well No. 10 - Unit L - Section 28
Jicarilla 28 Well No. 11 - Unit B - Section 33

CASE 4463: Application of Roger C. Hanks for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Pennsylvanian formation underlying the NE/4 of Section 18, Township 9 South, Range 36 East, Vada-Pennsylvanian Pool, Lea County, New Mexico, said acreage to be dedicated to applicant's Ford Federal Well No. 1 located in the NW/4 NE/4 of said Section 18. Also to be considered will be the costs of drilling said well, a charge for the risk involved, a provision for the allocation of actual operating costs, and the establishment of charges for supervision of said well.

CASE 4451: (Readvertised)

Application of Union Oil Company of California for a non-standard oil proration unit, Roosevelt County, New Mexico. Applicant, in the above-styled cause, seeks approval for an 80-acre non-standard oil proration unit comprising the SW/4 SE/4 of Section 17 and the NW/4 NE/4 of Section 20, Township 8 South, Range 38 East, Bluitt-San Andres Associated Pool, Roosevelt County, New Mexico, to be dedicated to a well to be drilled at a standard location in the NW/4 NE/4 of said Section 20.

Docket No. 25-70

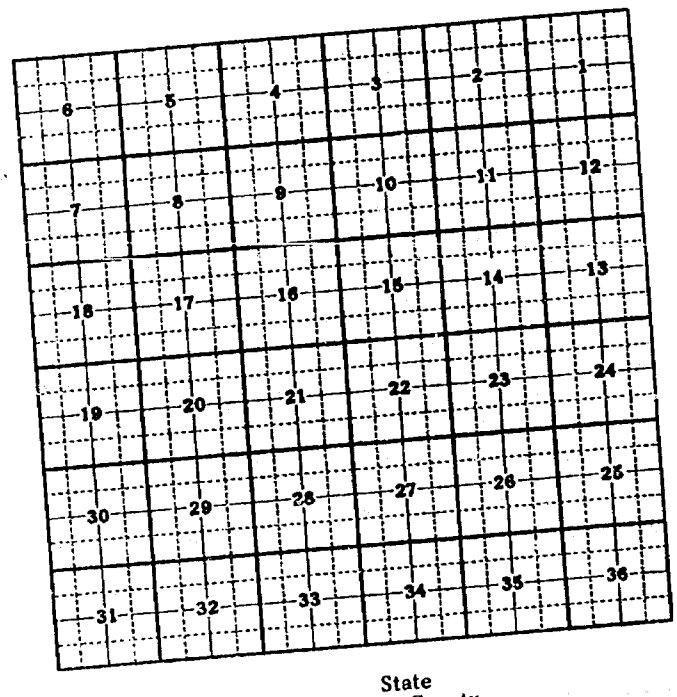
CASE 4464: Application of Pan American Petroleum Corporation for authority to over-produce a gas well's allowable, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to over-produce the allowable of its Gallegos Canyon Unit Well No. 185, located in Unit D of Section 33, Township 28 North, Range 12 West, Basin-Dakota Pool, San Juan County, New Mexico, in the amount of 19,311 MCF. According to applicant, this amount of gas, produced by other wells in the Gallegos Canyon Unit and with royalty and taxes already paid, was injected into the subject well to create a reservoir back-pressure prior to fracturing on work-over. Applicant seeks authority to produce, without being subject to allowable, royalty, or taxes, the volume of gas injected into the well.

One
Campbell Act
8
marked
Exhibits
(Item 21)

Name Ph.

Address

Remarks:



State

or County

T R

BEFORE EXAMINER
OIL CONSERVATION COM
EXHIBIT NO. 1
CASE NO. 1462

R. 4 W.

NORTHWEST PRODUCTION

NORTHWEST
218 N. CAMPBELL
EL PASO, TEXAS

HUMBLE OIL
P.O. BOX 1287
ROSWELL N. MEXICO

HUMBLE

CONOCO OPERATES GALLUP & DAKOTA PROD., EL PASO OPERATES PICTURED CLIFFS.
P.O Box 990
Farmington, N. Mexico

CONOCO OPERATES GALLUP & DAKOTA; HUMBLE & AZTEC O&G OPERATE PICTURED CLIFFS

JICARILLA -20

JICARILLA -22

28-9

28-10

28-1

28-11

JICARILLA -30

HUMB. E.; & AZTEC
2000 First
Dallas, Texas

CONOCO; Nat'l Bank

EL PASO

NORTHWEST PROD. OPERATES PICTURED CLIFFS & BROOKS HALL GALLUP, GRANEROS, & DAKOTA OPERATES

NORTHWEST & BROOKS HALL PRODUCTION

T 25 N

T 24 N

-LEGEND-

- GALLUP PICTURED CLIFFS WELL
- DAKOTA PRODUCING WELL
- GALLUP (Oil)-DAKOTA (Gas) DUAL
- GALLUP-DAKOTA (Oil)
- GALLUP PRODUCING WELL (PICTURED CLIFFS)
- SHUT-IN WELL
- DUAL GALLUP-GRANEROS
- GALLUP (Oil)-DAKOTA (Oil)--Seperate Strings of Casing.

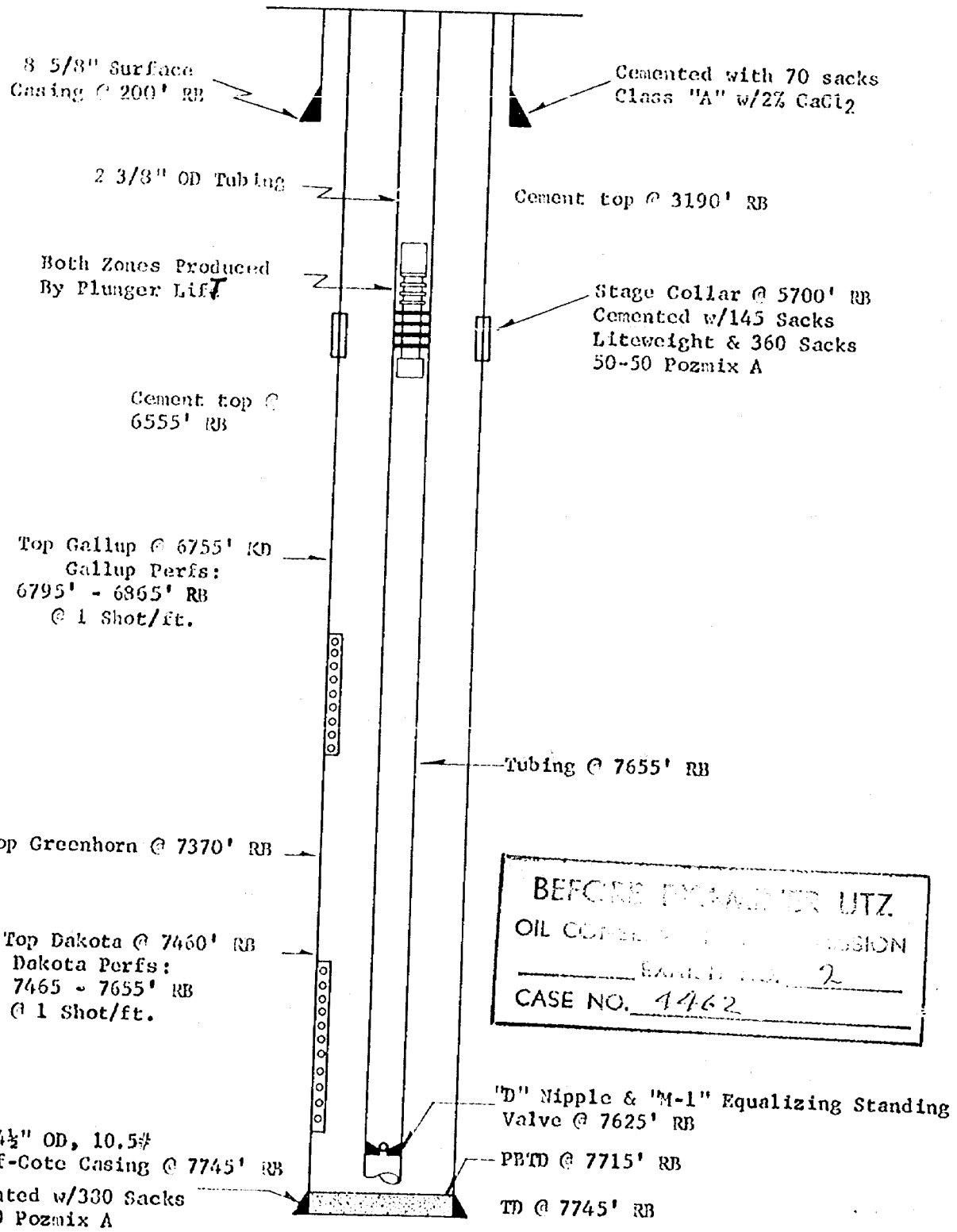
WEST LINDRITH BLOCK
JICARILLA APACHE LEASES
Rio Arriba County, New Mexico

EXHIBIT "B"

Engineer J.A Mazza Drawn by [illegible] 12-12-67
1-69
8-70

PRODUCTION DEPARTMENT
CONTINENTAL OIL COMPANY

PROPOSED
DOWNHOLE COMMINGLING INSTALLATION
(all depths estimated)



BEFORE EXAMINER UTZ.
OIL CONSERVATION COMMISSION
EXHIBIT NO. 2
CASE NO. 4462

Centralizers located 10' and 60' above casing Setting depth and 90' thereafter to 6600' RB; Also one centralizer 30' above and 30' below stage collar.

CONTINENTAL OIL COMPANY
PRODUCTION DEPARTMENT
Casper, Wyoming

WEST LINDRITH
EXHIBIT "A" 2

Proposed Downhole Commingling Installation — Jicarilla 28-9

County: Rio Arriba State: New Mexico

Engineer: J.A. Mazzo Draftsman: B.S. Date: 8-24-70

Scale — No Scale Well Status Posted to:

43 FC
4-10-68

Production and Exploration

DEPARTMENT Production REG./DIV. Casper AFE NO. 12-61-1657

Type: (1) 1. D & E 2. Misc. 3. D & T

Group: (1) 1. Dev. 2. Maint. 3. Expl. 4. Inv.

(0) O. Onshore 1. Offshore Div. Code 12

Date Appr. Lease Code 7155213

Project Title (Limit 30 Spaces)

D&E Jicarilla 28 No. 9

Conoco Int. Ex Oil 1.0000000 In Oil

Field or Block

West Lindrith

TD and Obj.

Horizon(s) 7745' Dual Gallup-Dakota

Land Lease No.

Oil Pmt. Name No.

Date Completed

(1) Location, Geological Province (2) Division of Int. (3) Justification

(1) NE NE Section 28, T25N, R4W, Rio Arriba County, New Mexico
G.P. San Juan Basin

(2) Conoco - 1.0000000

(3) Refer to Sensitivity Analysis - Proposed West Lindrith Development, Rio Arriba County, New Mexico (File No. PET-941.34-CF October 5, 1970).

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 3
CASE NO. 4462

EXHIBIT 3

Description	Acct. No. FTRE	Mtl. & Depr. Intangibles Gross $	Acct. No. FTRE	Expense Intangibles Gross $
Second Hand Equipment — Warehouse	8			XXXXXXXX
Material Purchased — Dr.	9	25,200		XXXXXXXX
Total Material		25,200		XXXXXXXX
Fuel, Water, Lubricants, Electricity	103		403	2,500
Location Damages, Roads — Bridges	107		407	2,500
Salvage & Dismantling Costs	108		408	
Drilling Contract — Footage	111		411	34,800
Drilling Contract — Daywork	112		412	6,200
Drilling Bits & Reamers		XXXXXXXX	413	
Fishing Tool Expense		XXXXXXXX	414	
Directional Drilling Costs		XXXXXXXX	415	
Mud Materials, Chemicals, & Services		XXXXXXXX	416	5,500
Cement & Cementing Service		XXXXXXXX	417	5,000
Noncontrollable Materials	118	500	418	2,500
Tender Costs and Rentals		XXXXXXXX	419	
Boatel Service	120		420	
Special Drilling Tool Rental		XXXXXXXX	421	1,000
Coring Costs	125		425	
Drill Stem Tests		XXXXXXXX	426	
Perforating		XXXXXXXX	427	2,700
Acidizing, Fracturing, Shooting		XXXXXXXX	428	22,600
Well Surveys, Electrical & Mud Logging		XXXXXXXX	429	1,500
Transportation	131	500	431	2,000
Boats, Barges, Tugs — Cost — Rental	132		432	
Helicopters, Planes — Cost — Rental		XXXXXXXX	433	
Overhead — Partner Operated	136		436	
District Expense		XXXXXXXX	437	400
Company Labor & Supervision	138	200	438	800
Contract Labor	139	4,000	439	1,000
Platforms — Fabrication & Installation	141		441	
Platform Maintenance	142		442	
Keyways — Well Structures		XXXXXXXX	445	
Sales Tax (Controllable Material)		XXXXXXXX	444	900
Miscellaneous Costs	145		445	500
Subtotal — Intangibles		5,200		92,400
Dry or Bottom Hole Contribution Rec.		XXXXXXXX	448	
Total Intangibles		5,200		92,400
Total Cash & Warehouse Outlay		30,400		92,400
Material on Hand	1			XXXXXXXX
Grand Total		30,400		92,400
Grand Total — Mtl. & Depr. Intangibles and Expense Intangibles				122,800

(Use Only For Expl. or Limited Expl. Well)

Block Number

Gross Ac. Net Ac.

Budget Project No. Hdqts. 1

Remaining Balance (Before This AFE)

Net Recovery

Net Profit

Rate of Return Payout Period

Cash and Warehouse Outlay

Gross Cost 122,800

Conoco Net 122,800

Approvals: Date

Div:

For AFE Purposes Only [illegible]

Land: John E. Runnels [illegible]

Geol: [illegible]

Hdqts:

Final Approval

Distribution:

RAB RLA CES MPL TWS JAB
WCB(3) DLB KMM(2) CAN RJE
BEA(2)

AFE No. 12-61-1657

DRILLING MEMORANDUM

JICARILLA 28 WELL NO. 9
RIO ARRIBA COUNTY, NEW MEXICO

Location: NE NE* Section 28, T25N, R4W, Rio Arriba County, New Mexico

* NOTE: This well should be located no greater than 350 feet from the West quarter-quarter section line and will conform to the NMOCC spacing regulations which state a well shall not be located closer than 330 feet from such boundary. This off-center location is desired to obtain usable pressures for determining reservoir drainage.

Interest: Conoco - 100% W.I.

Elevation: 6950' GL (estimated)

Objectives: Dual complete in Gallup and Dakota.

Total Depth: 7745'

Estimated Tops:

Pictured Cliffs Sand	3293'
Lewis Shale	3325'
Chacra Sand	4130'
Mesaverde Sand	4927'
Mancos Shale	5600'
Gallup Sand	6755'
Greenhorn Lime	7370'
Graneros Shale	7440'
Dakota Sand	7460'
T.D.	7745'

Drilling Fluid:

Drill surface hole with water. Drill out from surface with water-gel low solids system to T.D. Do not exceed mud weight of 9.0 #/gal. Maintain water loss between 6-8 cc's and viscosity approximately 40 cp. Add lost circulation material if needed in the Gallup or Mesaverde sections. (Final mud program will be submitted before initiation of well.)

Casing:

Surface 200' - 8 5/8" OD, 24#, J-55, ST&C

Production 100' - 4 1/2" OD, 10.5#, JE-55, BTRC
7645' - 4 1/2" OD, 10.5#, JE-55, ST&C

Copies to: WCB KWM(3) BEA RET RJE IRR File

Casing: (Continued)

Casing opposite Gallup and Dakota zones to be "RUFF-COTED" (approximately 250' each zone). "RUFF-COTE" should be applied in the shop at temperatures no lower than 65° F. If "RUFF-COTING" is applied on location, ambient temperature should be in excess of 65° F. for a setting time of 8-12 hours.

Float equipment to consist of a guide shoe and Baker Model "G" No. 109-11 differential fill collar or equivalent located 1 joint above guide shoe. Centralizers to be located 10' and 60' above guide shoe and at 90' intervals thereafter. Scratchers will be required as indicated by Drilling Foreman.

Stage collar and cement basket to be set at approximately 5700' or 100' below Mancos top.

Hole Size: Surface hole to be 12 1/4" to approximately 200'. Remainder to consist of 7 7/8" hole to T.D.

Cement: Surface Pipe

Cement to surface with neat Class "A" containing 2% $CaCl_2$ (70 sacks required for gauged hole).

Slurry Weight	=	15.6 #/gal.
Yield	=	1.18 $ft.^3$/sack
Pipe Capacity	=	0.3576 $ft.^3$/ft.
Annular Capacity	=	0.4127 $ft.^3$/ft.
Compressive Strength	=	555 psi @ 12 Hours and 60° F.

Production String (Cement in 2 stages)

STAGE 1:

Precede 1st stage with 500 gal. mud flush. Cement with 380 sacks 50-50 Poz. A, containing 2% gel, 6 1/4 #/sack Gilsonite, and 1/2% CFR-2 (volume calculated assuming gauged hole + 60% excess to bring cement top 200' above Gallup).

Slurry Weight	=	13.97 #/gal.
Slurry Yield	=	1.32 $ft.^3$/sack

Minimum rate for annular turbulence = 3.7 BPM (use 5-8 BPM).

Cement: (Continued)

Compressive Strength = 24 Hours, 1309 psi
48 Hours, 3015 psi
Water Ratio = 5.53 gal./sack

STAGE 2:

Precede 2nd stage with Halco Liteflush.

Cement out of stage collar with 145 sacks Halliburton Liteweight cement containing 1/2% CFR-2.

Liteweight
Slurry Weight = 12.7 #/gal.
Slurry Yield = 1.840 ft.^{3}/sack

Minimum rate for annular turbulence = 1.7 BPM (use 5-8 BPM).

Compressive Strength = 24 Hours, 415 psi
48 Hours, 771 psi

Follow lead slurry with 360 sacks 50-50 Poz. A, 2% gel, 6 1/4 #/sack Gilsonite, 1/2% CFR-2 (volumes calculated for gauged hole with 30% excess to bring cement top 100' above Pictured Cliffs).

Hole Caliper logs will be run over productive intervals.

Volumes will be re-calculated based on actual gauge.

Hole Deviation Requirements:

Well Depth Feet	Max. Distance Between Surveys Feet	Max. Dev. From Vert. Degrees	Max. Allowable Change Of * Angle Between Any Two Surveys Degrees
0-5000	400	5	1 1/2
5000-7000	100	6	1 1/2
7000-T.D.	100	8	2

* (a) Reduce proportionately for survey intervals less than 100 feet, but do not use intervals shorter than 30 feet.

(b) If these limits are exceeded and the distance is more than 100 feet, contractor shall take immediate surveys no more than 100 feet apart. If such immediate surveys show that above limits for any interval have been exceeded, contractor shall correct hole deviation to within limits of above specifications.

Special Services:

Geolograph.

Sampling:

Collect samples at 30' intervals from 3000' to 6200' and every 10' interval from 6200' to T.D. Samples to be taken to Four Corners Sample Cut Company, in Farmington, New Mexico.

Logging: Run FDC-Gamma Ray-Caliper over Chacra, Mesaverde, Gallup and Dakota.

Tests: No cores or DST's.

Remarks: It is very important to keep a constant surveillance of the mud system and maintain mud weights between 8.7 - 9.0 #/gal. throughout the drilling operation, as the Gallup zone can cause severe lost circulation problems. Lost circulation was experienced while drilling 30-4 in Section 31. In addition, because of the natural fractured system in the Gallup, care should be taken to eliminate any surging while running drill pipe and casing.

Drilling Procedure:

1. Drill 12 1/4" hole to approximately 200'.
2. Run 8 5/8" surface casing and cement to surface.
3. WOC 12 hours and nipple up.
4. Drill 7 7/8" hole with water-gel low solids mud as directed.
5. Run log as directed.
6. Run 4 1/2" OD casing with stage collar 100' below Mancos top. Cement 1st stage and slack off 6000-8000# on casing after bumping plug. Open ports on stage collar, break circulation immediately, and circulate mud for 4 hours. Run 2nd stage cement operation as directed.
7. Move off rotary rig and move in completion unit.

8. WOC 18 hours.

9. Run temperature survey to locate cement top.

pce

Prepared by: J. A. Mazza, Production Engineer

APPROVED:

_____
Supervising Production Engineer

_____
Division Drilling Superintendent

_____
Division Manager

P&A PROCEDURE

In the event the subject well is abandoned, it will be necessary to contact the New Mexico Oil Conservation Commission for verbal approval of the work. The people who should be contacted in order of preference, are as follows:

During Working Hours:

NMOCC (Aztec)	505-334-6178
USGS (Durango)	303-247-5144

After Working Hours:

NMOCC	Emery Arnold	505-334-6987
	Al Kendrick	505-325-8300
USGS	Jerry Long	303-247-0028
	Ed Schmidt	303-247-9918

1. After logging and testing, go in hole open-ended and spot plug from top of Dakota to 100' above Dakota top.
2. Pull up and spot 100' plug to Gallup top.
3. Pull up and spot 100' plug across Chacra.
4. Pull up and spot 100' plug across Pictured Cliffs.
5. Pull up and spot plug across Ojo Alamo.
6. Pull up and set plug 50' in and 50' out of 8 5/8".
7. Set 25' plug in surface 8 5/8". Set 10' length of 4" pipe in the surface plug so that 4' of it projects above ground level. The top of the 4' should be capped and a well sign attached.
8. Rig down and move off rig. Clean up location.

PROPOSED WELL PLAN OUTLINE

WELL NAME: Jicarilla 28-9 COUNTY: Rio Arriba

LOCATION: NENE Sec. 28, T25N, R4W STATE: New Mexico

DEPTH	FORMATION TOPS & TYPE	DRILLING PROBLEMS	TYPE OF FORMATION EVALUATION	HOLE SIZE	CASING SIZE	CASING DEPTH	FRACTURE GRADIENT	FORMATION PRESSURE GRADIENT	MUD WEIGHT	MUD T.V.
	NASATCH			12¼"	8 5/8"	200				
	Wasatch Sand & Shale			7 7/8"					8.7-9.0 #/gal	Gel
1000	Animas OJO ALAMO Fresh Wtr. Sd.									
2000	KIRTLAND Sand & Shale	LOST CIRCULATION								
3000	Pict.Cliff Sd.	Gas Productive	FDC Log				/psi ft	.2/psi ft		
4000	LEWIS SHALE									
	Chacra Sand	Gas Productive	FDC Log				.7psi ft	.2psi ft		
5000	LEWIS SHALE									
	MESA VERDE Sand And Shale	Gas Productive	FDC Log				.7psi ft	.34psi ft		
6000	MANCOS SHALE									
7000	Gallup Sand & Shale	Lost Circulation Hole Washouts	FDC Log				.7psi ft	.35psi ft		
	Greenhorn Lime									
	Dakota Sand & Shale		FDC Log	7 7/8"	4½"	7745'	.705psi	.35psi		
8000	TD 7745'									

Date October 7, 1970 Prepared by J. A. Mazza

Approved: _____ _____

DISTRIBUTION OF ENGINEERING WELL DATA
CASPER DIVISION

WELL NO. 28-9 FIELD WEST LINDRITH COUNTY RIO ARRIBA STATE NEW MEXICO

	PRIMARY LOGS			SECONDARY LOGS Bond, Correlation, etc.		CORE ANALYSES		D.S.T.
	Field Print	Final	Sepia Film	Field	Final	Prelim.	Final	Report
Distr. Mgr. Prod. - W.C.B.	1	1		1	1	1	1	1
Dist. Mgr. Prod. - R.L.A.	*	1					1	1
Prod. Research Mgr. - P.R.C.		1					1	1
Well Operating Supervisor	1			1				
Division Geologist - MG	1	1				1	1	1
Exploitation Geologist - R.J.E.		1	1	1	1	1	1	1
RED-Perm. Eval. Supv. - D. J. Timko	1							
Rky. Mtn. Well Log Service 1700 Champa St., Denver.***		1						
STATE **								
U.S.G.S. **								
PARTNERS **								
TOTAL								

* - Headquarters needs log field prints only on significant stepouts.
** - Requirements for State, U.S.G.S. and partners will vary by location.
*** - Logs for Rocky Mtn. Well Log Service should be held until we receive a release request from them.

NOTE: Service companies should be advised to send all copies of logs or reports to Division Production Office at 200 North Wolcott.

Revised 9-24-68

COMPLETION MEMORANDUM

JICARILLA 28 WELL NO. 9

Location: NE NE Section 28, T25N, R4W, Rio Arriba County, New Mexico

Elevation: 6950' GL; 6964' KB

Casing: 8 5/8", 24#, J-55 set at 200' KB
100' - 4 1/2" OD, 10.5#, JE-55, BTRC
7645' - 4 1/2" OD, 10.5#, JE-55, ST&C

Completion Procedure:

1. After moving out rotary rig, move in completion unit, pick up 2 7/8" tubing and drill out stage collar and pressure test to 1500 psig.

2. Circulate to T.D. and displace hole with 1% KCl water.

3. Pull tubing, move in logging unit, and run Gamma Ray with collar locator. Run Cement Bond log if full returns are not obtained during 1st stage cementing. If poor primary cement job is evident, it will be necessary to squeeze before stimulation. Squeeze volumes and procedures will be determined by engineer.

4. Move in eight (8) 500 barrel frac tanks and install frac head (minimum of 110,000 gal. required for 3 stage stimulation - suggest 140,000 gal. (3,330 bbl.) fluid on location for staging and includes load, flush, and tank bottoms). Perforate and sand frac in accordance to procedure below. Swab well in if necessary.

Gallup-Dakota Perforating and Fracturing Procedure

NOTE: The Gallup and Dakota will be perforated in one set-up. The well will then be stimulated in three (3) stages down 2 7/8" tubing using a Baker Retrievable Model "C" bridge plug and full bore cementer. Either Halliburton's MY-T-FRAC-60 or Dowell's WIDE-FRAC (YF6G) will be used as the fluid medium.

1. With hole loaded with 1% KCl perforate Dakota "J", Dakota "D", and Gallup 1 shot per foot as indicated by engineer. Use Schlumberger 3 3/8" Hyperjet - 13.5 gram NMX charge (0.52" x 9.38" penetration in Berea sandstone) or equivalent.

2. Install frac head.

3. Pick up bridge plug and packer on 2 7/8" tubing and set bridge plug below bottom of Dakota "J" perforations. Set packer above top of Dakota "J" perforations.

4. Hook up frac trucks and test lines and fittings to 5000 psi.

5. Sand-frac Dakota "J" down 2 7/8" tubing as follows: (Maximum allowable surface pressure 4000 psi at 10 BPM).

4,300 gal. 1% KCl w/50 #/1,000 gal. ADOMITE AQUA and 10 #/1,000 gal. WG-6
6,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
1,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA and 1/2 #/gal. 10-20 sand
2,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA and 1 #/gal. 10-20 sand
3,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA and 2 #/gal. 10-20 sand
3,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA and 3 #/gal. 10-20 sand
4,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA in first 2,000 gal. MY-T-FRAC-60 only and 4 #/gal. 10-20 sand

6. Flush with 2,100 gal. 1% KCl water.

7. Release packer, retrieve bridge plug, and set bridge plug between Dakota "J" and "D" perforations. Set packer above Dakota "D" perforations.

8. Sand-frac Dakota "D" using same volumes and procedure as outlined in (5) above. (Maximum allowable surface pressure 4000 psi at 10 BPM.)

9. Flush with 2,100 gal. 1% KCl.

10. Release packer, retrieve bridge plug, and set bridge plug below bottom of Gallup perforations. Set packer above Gallup perforations and frac Gallup down 2 7/8" tubing as follows: (Maximum allowable surface pressure 4000 psi at 10 BPM).

15,000 gal. 1% KCl w/50 #/1,000 gal. ADOMITE AQUA and 10 #/1,000 gal. WG-6
8,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
2,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA and 1/2 #/gal. 10-20 sand

10. (Continued)

3,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
and 1 #/gal. 10-20 sand
6,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
and 2 #/gal. 10-20 sand
6,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
and 3 #/gal. 10-20 sand
15,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
in first 7,500 gal. MY-T-FRAC-60 only
and 4 #/gal. 10-20 sand

11. Flush with 2,000 gal. 1% KCl water.

12. Shut-in well for 12 hours or overnight.

13. Retrieve bridge plug and packer and retrieve 2 7/8" frac string. Pick up 2 3/8" OD producing string containing from the bottom up the following:

(a) 2' sub with pinned collar.

(b) "D" nipple to be set opposite bottom of Dakota perforations.

14. Swab well in if necessary and allow to clean up.

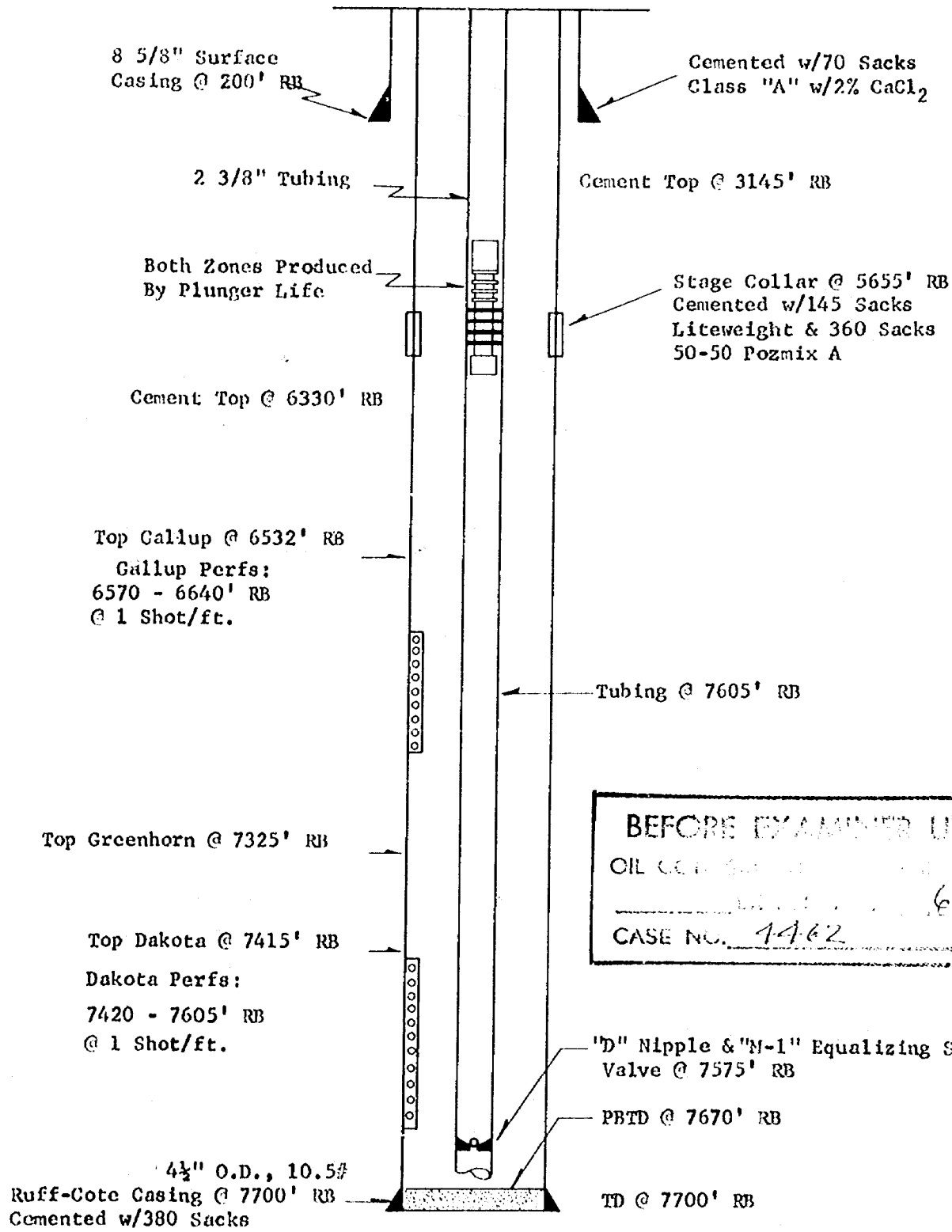
15. Install tubing stop and bumper spring one joint above "D" nipple.

16. Install surface intermitter and start well on plunger lift using a cycle frequency of ten-30 minute cycles. Adjust cycle frequency and flow duration depending on well performance.

pce

Prepared by: J. A. Mazza, Production Engineer

PROPOSED
DOWNHOLE COMMINGLING INSTALLATION
(All Depths Estimated)



BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 6
CASE NO. 1462

Centralizers Located 10' and 60' above casing setting depth and 90' thereafter to 6600' Rb; Also one centralizer 30' above and 30' below stage collar.

CONTINENTAL OIL COMPANY
PRODUCTION DEPARTMENT
Casper, Wyoming

WEST LINDRITH
EXHIBIT "B" 6
Proposed Downhole Commingling Installation—Jicarilla 28-10
County: Rio Arriba State: New Mexico
Engineer: J.A. Mozzo Draftsman: B.S. Date: 8-24-70
Scale = No Scale Well Status Posted to:

R. 4 W.

NORTHWEST PRODUCTION

NORTHWEST
218 N. CAMPBELL
EL PASO, TEXAS

HUMBLE OIL
P.O. BOX 1287
ROSWELL N. MEXICO

HUMBLE

CONOCO OPERATES GALLUP & DAKOTA PROD., EL PASO OPERATES PICTURED CLIFFS.
P.O. Box 990
Farmington, N. Mexico

CONOCO OPERATES GALLUP & DAKOTA; HUMBLE & AZTEC O & G OPERATE PICTURED CLIFFS

JICARILLA - 20

JICARILLA - 22

JICARILLA - 30

JICARILLA 28

HUMBLE;
& AZTEC
2000 First Nat'l Bank
Dallas, Texas

CONOCO;

EL PASO

NORTHWEST PROD. OPERATES PICTURED CLIFFS & BROOKS HALL GALLUP, GRANEROS, & DAKOTA

NORTHWEST & BROOKS HALL PRODUCTION

T 25 N

T 24 N

-LEGEND-

- GALLUP PRODUCING WELL
- DAKOTA PRODUCING WELL
- GALLUP(Oil)-CHACRA(Gas) DUAL; GALLUP(Oil)-DAKOTA(Oil) DUAL
- GAS PRODUCING WELL (PICTURED CLIFFS)
- SHUT-IN WELL
- DUAL GALLUP-GRANEROS
- GALLUP(Oil)-DAKOTA(Oil)-Seperate Strings of Casing.

WEST LINDRITH BLOCK

JICARILLA APACHE LEASES

Rio Arriba County, New Mexico

EXHIBIT "2"

Engineer J.A. Mazza Drawn by N.E.D. 12-12-67
1-69
8-70

PRODUCTION DEPARTMENT
CONTINENTAL OIL COMPANY

13-245 FC
REV. 10-69

AUTHORITY FOR EXPENDITURE

Production and Exploration

DEPARTMENT Production REG./DIV. Casper AFE NO. 12-61-1658

Type: (1) 1. D & E 2. Misc. 3. D & T	Field or Block
Group: (1) 1. Dev. 2. Maint. 3. Expl. 4. Inv.	West Lindrith
(0) 0. Onshore 1. Offshore Div. Code 12	TD and Obj.
Date Appr. Lease Code 7155213	Horizon(s) 7700' - Dual Gallup-Dakota
Project Title (Limit 30 Spaces)	Land Lease No.
D&E Jicarilla 28 No. 10	Oil Pmt. Name No.
Conoco Int. Ex Oil 1.0000000 In Oil	Date Completed

(1) Location, Geological Province (2) Division of Int. (3) Justification

(1) NW SW Section 28, T25N, R4W, Rio Arriba County, New Mexico
G.P. San Juan Basin

(2) Conoco - 1.0000000

(3) Refer to Sensitivity Analysis - Proposed West Lindrith Development, Rio Arriba County, New Mexico (File No. PET-941.34-CF October 5, 1970).

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 6
CASE NO. 4162

Description	Acct. No. FTRE	Mtl. & Depr. Intangibles Gross $	Acct. No. FTRE	Expense Intangibles Gross $
Second Hand Equipment — Warehouse	8			XXXXXXXX
Material Purchased — Dr.	9	28,700		XXXXXXXX
Total Material		28,700		XXXXXXXX
Fuel, Water, Lubricants, Electricity	103		403	2,500
Location Damages, Roads -- Bridges	107		407	2,500
Salvage & Dismantling Costs	108		408	
Drilling Contract -- Footage	111		411	34,600
Drilling Contract — Daywork	112		412	6,200
Drilling Bits & Reamers		XXXXXXXX	413	
Fishing Tool Expense		XXXXXXXX	414	
Directional Drilling Costs		XXXXXXXX	415	
Mud Materials, Chemicals, & Services		XXXXXXXX	416	5,500
Cement & Cementing Service		XXXXXXXX	417	5,000
Noncontrollable Materials	118	500	418	2,500
Tender Costs and Rentals		XXXXXXXX	419	
Boatel Service	120		420	
Special Drilling Tool Rental		XXXXXXXX	421	1,000
Coring Costs	125		425	
Drill Stem Tests		XXXXXXXX	426	
Perforating		XXXXXXXX	427	2,700
Acidizing, Fracturing, Shooting		XXXXXXXX	428	22,600
Well Surveys, Electrical & Mud Logging		XXXXXXXX	429	1,500
Transportation	131	500	431	2,000
Boats, Barges, Tugs -- Cost -- Rental	132		432	
Helicopters, Planes -- Cost -- Rental		XXXXXXXX	433	
Overhead — Partner Operated	136		436	
District Expense		XXXXXXXX	437	400
Company Labor & Supervision	135	200	438	800
Contract Labor	139	4,000	439	1,000
Platforms -- Fabrication & Installation	141		441	
Platform Maintenance	142		442	
Keyways — Well Structures		XXXXXXXX	443	
Sales Tax (Controllable Material)		XXXXXXXX	444	900
Miscellaneous Costs	145		445	500
Subtotal -- Intangibles		5,200		92,200
Dry or Bottom Hole Contributions Rec.		XXXXXXXX	448	
Total Intangibles		5,200		92,200
Total Cash & Warehouse Outlay		33,900		92,200
Material on Hand	1			XXXXXXXX
Grand Total		33,900		92,200
Grand Total -- Mtl. & Depr. Intangibles and Expense Intangibles				126,100

(Use Only For Expl. or Limited Expl. Well:

Block Number

Gross Ac. Net Ac.

Budget Project No. Hdqts. 1

Remaining Balance (Before This AFE)

Net Recovery

Net Profit

Rate of Return Payout Period

Cash and Warehouse Outlay

Gross Cost 126,100

Conoco Net 126,100

Approvals: Date

Div:

For AFE Purposes Only 10/8/70

Land: John E. Foreman Jr. A.L.

Geol: R. L. Kanuckel 10/8/70

Hdqts:

Final Approval

Distribution:

RAB RLA CES MPL TWS JAB
WCB(3) DLB KWM(2) CAH RJE
BEA(2)

AFE No. 12-61-1658

CCD Job No. 1013

DRILLING MEMORANDUM

JICARILLA 28 WELL NO. 10
RIO ARRIBA COUNTY, NEW MEXICO

Location: C NW SW Section 28, T25N, R4W, Rio Arriba County, New Mexico

Interest: Conoco - 100% W.I.

Elevation: 6980' GL (estimated)

Objectives: Dual complete in Gallup and Dakota.

Total Depth: 7700'

Estimated Tops:

Pictured Cliffs Sand	3248'
Lewis Shale	3280'
Chacra Sand	4085'
Mesaverde Sand	4882'
Mancos Shale	5555'
Gallup Sand	6532'
Greenhorn Lime	7325'
Graneros Shale	7395'
Dakota Sand	7415'
T.D.	7700'

Drilling Fluid:

Drill surface hole with water. Drill out from surface with water-gel low solids system to T.D. Do not exceed mud weight of 9.0 #/gal. Maintain water loss between 6-8 cc's and viscosity approximately 40 cp. Add lost circulation material if needed in the Gallup or Mesaverde sections. (Final mud program will be submitted before initiation of well.)

Casing:

Surface 200' - 8 5/8" OD, 24#, J-55, ST&C

Production

100' - 4 1/2" OD, 10.5#, JE-55, BTRC
7600' - 4 1/2" OD, 10.5#, JE-55, ST&C

Casing opposite Gallup and Dakota zones to be "RUFF-COTED" (approximately 250' each zone). "RUFF-COTE" should be applied in the shop at temperatures no lower than 65° F. If "RUFF-COTING" is applied on location, ambient temperature should be in excess of 65° F. for a setting time of 8-12 hours.

Copies to: WCB KWM(3) BEA RET RJE LKR File

Casing: (Continued)

Float equipment to consist of a guide shoe and Baker Model "G" No. 109-11 differential fill collar or equivalent located 1 joint above guide shoe. Centralizers to be located 10' and 60' above guide shoe and at 90' intervals thereafter. Scratchers will be required as indicated by Drilling Foreman.

Stage collar and cement basket to be set at approximately 5655' or 100' below Mancos top.

Hole Size: Surface hole to be 12 1/4" to approximately 200'. Remainder to consist of 7 7/8" hole to T.D.

Cement: Surface Pipe

Cement to surface with neat Class "A" containing 2% $CaCl_2$ (70 sacks required for gauged hole).

Slurry Weight	=	15.6 #/gal.
Yield	=	1.18 $ft.^3$/sack
Pipe Capacity	=	0.3576 $ft.^3$/ft.
Annular Capacity	=	0.4127 $ft.^3$/ft.
Compressive Strength	=	555 psi @ 12 Hours and 60° F.

Production String (Cement in 2 stages)

STAGE 1:

Precede 1st stage with 500 gal. mud flush. Cement with 380 sacks 50-50 Poz. A, containing 2% gel, 6 1/4 #/sack Gilsonite, and 1/2% CFR-2 (volume calculated assuming gauged hole + 60% excess to bring cement top 200' above Gallup).

Slurry Weight	=	13.97 #/gal.
Slurry Yield	=	1.32 $ft.^3$/sack

Minimum rate for annular turbulence = 3.7 BPM (use 5-8 BPM).

Compressive Strength	=	24 Hours, 1309 psi 48 Hours, 3015 psi
Water Ratio	=	5.53 gal./sack

Cement: (Continued)

STAGE 2:

Precede 2nd stage with Halco Liteflush.

Cement out of stage collar with 145 sacks Halliburton Liteweight cement containing 1/2% CFR-2.

Liteweight
Slurry Weight = 12.7 #/gal.
Slurry Yield = 1.840 ft.^{3}/sack

Minimum rate for annular turbulence = 1.7 BPM (use 5-8 BPM).

Compressive Strength = 24 Hours, 415 psi
48 Hours, 771 psi

Follow lead slurry with 360 sacks 50-50 Poz. A, 2% gel, 6 1/4 #/sack Gilsonite, 1/2% CFR-2 (volumes calculated for caused hole with 30% excess to bring cement top 100' above Pictured Cliffs).

Hole Caliper logs will be run over productive intervals.

Volumes will be re-calculated based on actual gauge.

Hole Deviation Requirements:

Well Depth Feet	Max. Distance Between Surveys Feet	Max. Dev. From Vert. Degrees	Max. Allowable Change Of * Angle Between Any Two Surveys Degrees
0-5000	400	5	1 1/2
5000-7000	100	6	1 1/2
7000-T.D.	100	8	2

* (a) Reduce proportionately for survey intervals less than 100 feet, but do not use intervals shorter than 30 feet.

(b) If these limits are exceeded and the distance is more than 100 feet, contractor shall take immediate surveys no more than 100 feet apart. If such immediate surveys show that above limits for any interval have been exceeded, contractor shall correct hole deviation to within limits of above specifications.

Special Services:

Geolograph.

Sampling:

Collect samples at 30' intervals from 3000' to 6200' and every 10' interval from 6200' to T.D. Samples to be taken to Four Corners Sample Cut Company, in Farmington, New Mexico.

Logging: Run FDC-Gamma Ray-Caliper over Chacra, Mesaverde, Gallup and Dakota.

Tests: No cores or DST's.

Remarks: It is very important to keep a constant surveillance of the mud system and maintain mud weights between 8.7 - 9.0 #/gal. throughout the drilling operation, as the Gallup zone can cause severe lost circulation problems. Lost circulation was experienced while drilling 30-4 in Section 31. In addition, because of the natural fractured system in the Gallup, care should be taken to eliminate any surging while running drill pipe and casing.

Drilling Procedure:

1. Drill 12 1/4" hole to approximately 200'.
2. Run 8 5/8" surface casing and cement to surface.
3. WOC 12 hours and nipple up.
4. Drill 7 7/8" hole with water-gel low solids mud as directed.
5. Run log as directed.
6. Run 4 1/2" OD casing with stage collar 100' below Mancos top. Cement 1st stage and slack off 6000-8000# on casing after bumping plug. Open ports on stage collar, break circulation immediately, and circulate mud for 4 hours. Run 2nd stage cement operation as directed.
7. Move off rotary rig and move in completion unit.

8. WOC 18 hours.

9. Run temperature survey to locate cement top.

pce

Prepared by: J. A. Mazza, Production Engineer

APPROVED:

_____
Supervising Production Engineer

_____
Division Drilling Superintendent

_____
Division Manager

P&A PROCEDURE

In the event the subject well is abandoned, it will be necessary to contact the New Mexico Oil Conservation Commission for verbal approval of the work. The people who should be contacted in order of preference, are as follows:

During Working Hours:

NMOCC (Aztec)	505-334-6178
USGS (Durango)	303-247-5144

After Working Hours:

NMOCC	Emery Arnold	505-334-6987
	Al Kendrick	505-325-8300
USGS	Jerry Long	303-247-0028
	Ed Schmidt	303-247-9918

1. After logging and testing, go in hole open-ended and spot plug from top of Dakota to 100' above Dakota top.
2. Pull up and spot 100' plug to Gallup top.
3. Pull up and spot 100' plug across Chacra.
4. Pull up and spot 100' plug across Pictured Cliffs.
5. Pull up and spot plug across Ojo Alamo.
6. Pull up and set plug 50' in and 50' out of 8 5/8".
7. Set 25' plug in surface 8 5/8". Set 10' length of 4" pipe in the surface plug so that 4' of it projects above ground level. The top of the 4' should be capped and a well sign attached.
8. Rig down and move off rig. Clean up location.

PROPOSED WELL PLAN OUTLINE

WELL NAME: Jicarilla 28-10 COUNTY: Rio Arriba

LOCATION: CNWSW Sec. 28, T25N-R4W STATE: New Mexico

DEPTH	FORMATION TOPS & TYPE	DRILLING PROBLEMS	TYPE OF FORMATION EVALUATION	HOLE SIZE	CASING SIZE	CASING DEPTH	FRACTURE GRADIENT	FORMATION PRESSURE GRADIENT	MUD WEIGHT	MUD TYPE
	WASATCH			12¼"	8 5/8"	200'				
	Wasatch Sand & Shale			7 7/8"					8.7-9.0 #/gal	Gel
1000	Animas OJO ALAMO Frsh. Wtr. Sd.									
	KIRTLAND Sand & Shale	LOST CIRCULATION								
2000										
3000										
	Pict. Cliffs SD Gas Productive		FDC Log				.7psi ft	.27psi ft		
4000	LEWIS SHALE									
	Chacra Sand	Gas Productive	FDC Log				.7psi ft	.29 psi ft		
5000	LEWIS SHALE									
	MESA VERDE Sand & Shale	Gas Productive	FDC Log				.7 psi ft	.34 psi ft		
6000	MANCOS SHALE									
7000	GALLUP Sand & Shale	Lost Circulation Hole Washouts	FDC Log				.7psi ft	.34 psi ft		
	Greenhorn Lime		FDC Log							
	DAKOTA Sand & Shale		FDC log	7 7/8"	4½"	7700'	.705psi ft	.35psi ft		
8000	TD 7700'									

Date October 8, 1970 Prepared by J. A. Howard

Approved: Div. Engineer

K. W. Smith
DRILLING SUPT.

Distribution: WCB, KWM(3), BEA, RGT, RJW, DAN, File

DISTRIBUTION OF ENGINEERING WELL DATA
CASPER DIVISION

WELL NO. 28-10 FIELD WEST LINDRITH COUNTY RIO ARRIBA STATE NEW MEXICO

	PRIMARY LOGS				SECONDARY LOGS Bond, Correlation, etc.		CORE ANALYSES		D.S.T.
	Field Print	Final	Sepia	Film	Field	Final	Prelim.	Final	Report
Divn. Mgr. Prod. - W.C.B.	1	1			1	1	1	1	1
Dist. Mgr. Prod. - R.L.A.	*	1						1	1
Prod. Research Mgr. - F.R.C.		1						1	1
Well Operating Supervisor	1				1				
Division Geologist - EC	1	1					1	1	1
Exploitation Geologist - R.J.E.		1	1		1	1	1	1	1
PES-Form. Eval. Supv. - D. J. Timko	1.								
Rky. Mtn. Well Log Service 1753 Champa St., Denver.***		1							
STATE **									
U.S.G.S. **									
PARTNERS **									
TOTAL									

* - Headquarters needs log field prints only on significant stepouts.
** - Requirements for State, U.S.G.S. and partners will vary by location.
*** - Logs for Rocky Mtn. Well Log Service should be held until we receive a release request from them.

NOTE: Service companies should be advised to send all copies of logs or reports to Division Production Office at 200 North Wolcott.

Revised 9-24-58

COMPLETION MEMORANDUM

JICARILLA 28 WELL NO. 10

BEFORE EXAMINER
OIL CONSERVATION DIVISION
EXHIBIT NO. 6
CASE NO. 11962

Location: NW SW Section 28, T25N, R4W, Rio Arriba County, New Mexico

Elevation: 6980' GL; 6994' KB

Casing: 8 5/8", 24#, J-55 set at 200' KB
100' - 4 1/2" OD, 10.5#, JE-55, BTRC
7600' - 4 1/2" OD, 10.5#, JE-55, ST&C

Completion Procedure:

1. After moving out rotary rig, move in completion unit, pick up 2 7/8" tubing and drill out stage collar and pressure test to 1500 psig.

2. Circulate to T.D. and displace hole with 1% KCl water.

3. Pull tubing, move in logging unit, and run Gamma Ray with collar locator. Run Cement Bond log if full returns are not obtained during 1st stage cementing. If poor primary cement job is evident, it will be necessary to squeeze before stimulation. Squeeze volumes and procedures will be determined by engineer.

4. Move in eight (8) 500 barrel frac tanks and install frac head (minimum of 110,000 gal. required for 3 stage stimulation - suggest 140,000 gal. (3,330 bbl.) fluid on location for staging and includes load, flush, and tank bottoms). Perforate and sand frac in accordance to procedure below. Swab well in if necessary.

Gallup-Dakota Perforating and Fracturing Procedure

NOTE: The Gallup and Dakota will be perforated in one set-up. The well will then be stimulated in three (3) stages down 2 7/8" tubing using a Baker Retrievable Model "C" bridge plug and full bore cementer. Either Halliburton's MY-T-FRAC-60 or Dowell's WIDE-FRAC (YF6G) will be used as the fluid medium.

1. With hole loaded with 1% KCl perforate Dakota "J", Dakota "D", and Gallup 1 shot per foot as indicated by engineer. Use Schlumberger 3 3/8" Hyperjet - 13.5 gram RDX charge (0.52" x 9.38" penetration in Berea sandstone) or equivalent.

2. Install frac head.

3. Pick up bridge plug and packer on 2 7/8" tubing and set bridge plug below bottom of Dakota "J" perforations. Set packer above top of Dakota "J" perforations.

4. Hook up frac trucks and test lines and fittings to 5000 psi.

5. Sand-frac Dakota "J" down 2 7/8" tubing as follows: (Maximum allowable surface pressure 4000 psi at 10 BPM).

    4,300 gal. 1% KCl w/50 #/1,000 gal. ADOMITE AQUA and 10 #/1,000 gal. WG-6
    6,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
    1,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA and 1/2 #/gal. 10-20 sand
    2,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA and 1 #/gal. 10-20 sand
    3,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA and 2 #/gal. 10-20 sand
    3,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA and 3 #/gal. 10-20 sand
    4,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA in first 2,000 gal. MY-T-FRAC-60 only and 4 #/gal. 10-20 sand

6. Flush with 2,100 gal. 1% KCl water.

7. Release packer, retrieve bridge plug, and set bridge plug between Dakota "J" and "D" perforations. Set packer above Dakota "D" perforations.

8. Sand-frac Dakota "D" using same volumes and procedure as outlined in (5) above. (Maximum allowable surface pressure 4000 psi at 10 BPM.)

9. Flush with 2,100 gal. 1% KCl.

10. Release packer, retrieve bridge plug, and set bridge plug below bottom of Gallup perforations. Set packer above Gallup perforations and frac Gallup down 2 7/8" tubing as follows: (Maximum allowable surface pressure 4000 psi at 10 BPM).

    15,000 gal. 1% KCl w/50 #/1,000 gal. ADOMITE AQUA and 10 #/1,000 gal. WG-6
    8,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
    2,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA and 1/2 #/gal. 10-20 sand

10. (Continued)

3,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
and 1 #/gal. 10-20 sand
6,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
and 2 #/gal. 10-20 sand
6,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
and 3 #/gal. 10-20 sand
15,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
in first 7,500 gal. MY-T-FRAC-60 only
and 4 #/gal. 10-20 sand

11. Flush with 2,000 gal. 1% KCl water.

12. Shut-in well for 12 hours or overnight.

13. Retrieve bridge plug and packer and retrieve 2 7/8" frac string. Pick up 2 3/8" OD producing string containing from the bottom up the following:

(a) 2' sub with pinned collar.

(b) "D" nipple to be set opposite bottom of Dakota perforations.

14. Swab well in if necessary and allow to clean up.

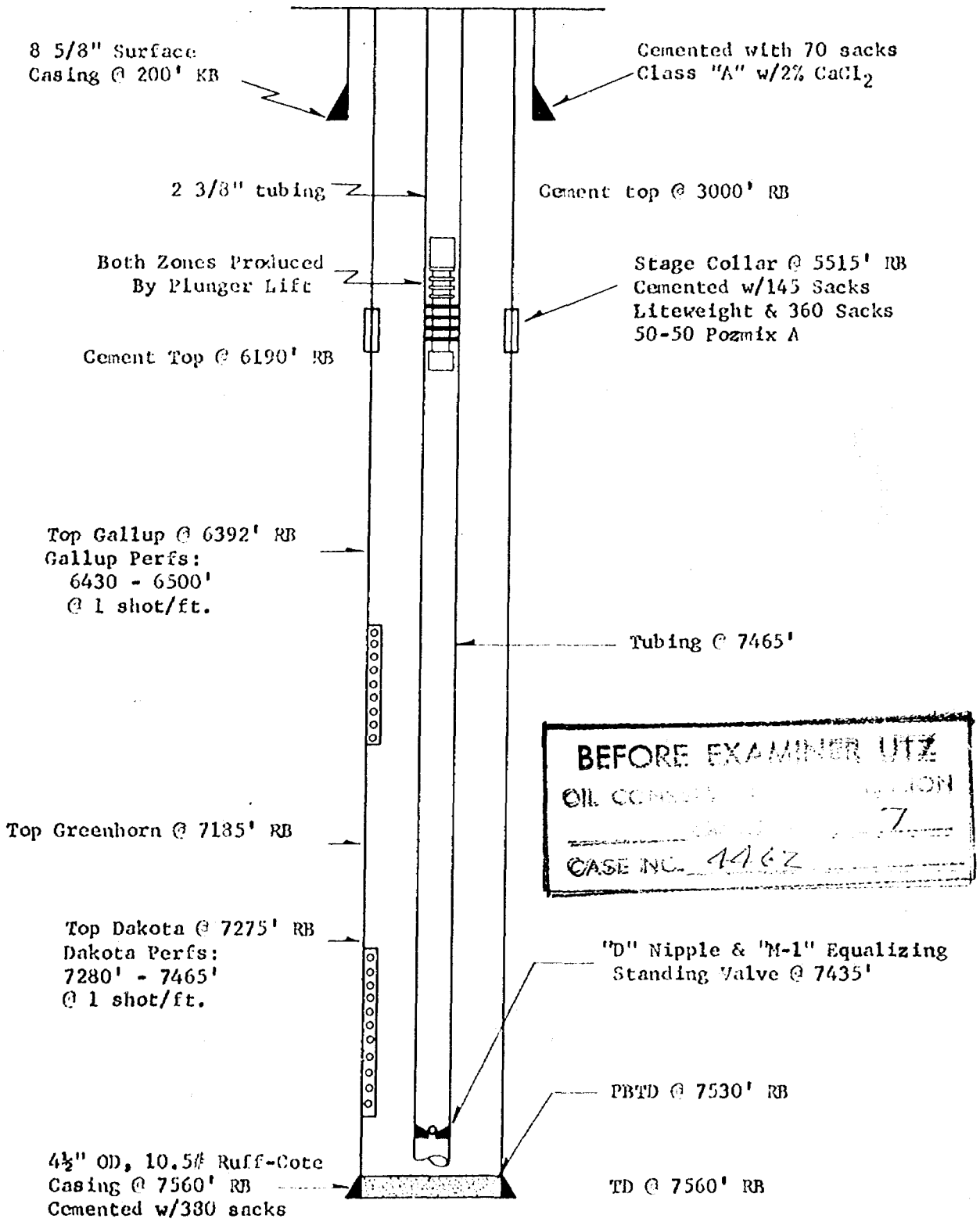
15. Install tubing stop and bumper spring one joint above "D" nipple.

16. Install surface intermitter and start well on plunger lift using a cycle frequency of ten-30 minute cycles. Adjust cycle frequency and flow duration depending on well performance.

pce

Prepared by: J. A. Mazza, Production Engineer

PROPOSED DOWNHOLE COMMINGLING INSTALLATION
(All Depths Estimated)



Centeralizers located 10' and 60' above casing setting depth and 90' thereafter to 6600' RB. Also, one centralizer 30' above and 30' below stage collar.

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 7
CASE NO. 4462

CONTINENTAL OIL COMPANY
PRODUCTION DEPARTMENT
Casper, Wyoming

WEST LINDRITH
EXHIBIT "B" 7
Proposed Downhole Commingling Installation—Jicarilla 28-11

County: Rio Arriba State: New Mexico

Engineer: J.A. Mozzo Draftsman: B.S. Date: 8-24-70

Scale = No Scale Well Status Posted to:

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 2
CASE NO. 4142

R. 4 W.

NORTHWEST PRODUCTION
NORTHWEST 218 N. CAMPBELL EL PASO, TEXAS
HUMBLE OIL P.O. BOX 1287 ROSWELL N.MEXICO
HUMBLE

CONOCO OPERATES GALLUP & DAKOTA PROD., EL PASO OPERATES PICTURED CLIFFS. P.O. Box 990 Farmington, N. Mexico

CONOCO OPERATES GALLUP & DAKOTA; HUMBLE & AZTEC O & G OPERATE PICTURED CLIFFS

JICARILLA - 20

JICARILLA - 22

JICARILLA - 30

JICARILLA 28

HUMBLE; & AZTEC 2000 First Nat'l Bank Dallas, Texas

CONOCO;

EL PASO

NORTHWEST PROD. OPERATES PICTURED CLIFFS & BROOKS HALL GALLUP, GRANEROS, & DAKOTA

NORTHWEST & BROOKS HALL PRODUCTION

T 25 N

T 24 N

-LEGEND-

- GALLUP PRODUCING WELL
- DAKOTA PRODUCING WELL
- GALLUP (Oil) - CHACRA (Gas) DUAL
- GALLUP (Oil) - DAKOTA (Oil) DUAL
- GAS PRODUCING WELL (PICTURED CLIFFS)
- SHUT-IN WELL
- DUAL GALLUP - GRANEROS
- GALLUP (Oil) - DAKOTA (Oil) - Seperate Strings of Casing.

WEST LINDRITH BLOCK

JICARILLA APACHE LEASES
Rio Arriba County, New Mexico

EXHIBIT "2"

Engineer J.A. Mazza Drawn by N.E.P. 12-12-67
1-69
8-70

PRODUCTION DEPARTMENT
CONTINENTAL OIL COMPANY

AUTHORITY FOR EXPENDITURE

Production and Exploration

13-245 Pc
REV. 10-69

DEPARTMENT Production REG./DIV. Casper AFE NO. 12-61-1659

Type: (1) 1. D & E 2. Misc. 3. D & T	Field or Block
Group: (1) 1. Dev. 2. Maint. 3. Expl. 4. Inv.	West Lindrith
(0) O. Onshore 1. Offshore Div. Code 12	TD and Obj.
Date Appr. Lease Code 7155213	Horizon(s) 7560' Dual Gallup-Dakota
Project Title (Limit 30 Spaces)	Land Lease No.
D&E Jicarilla 28 No. 11	Oil Pmt. Name No.
Conoco Int. Ex Oil 1.0000000 In Oil	Date Completed

(1) Location, Geological Province (2) Division of Int. (3) Justification

(1) NW NE Section 33, T25N, R4W, Rio Arriba County, New Mexico
G.P. San Juan Basin

(2) Conoco - 1.0000000

(3) Refer to Sensitivity Analysis - Proposed West Lindrith Development, Rio Arriba County, New Mexico (File No. PET-941.34-CF October 5, 1970).

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT 7
CASE NO. 4462

EXHIBIT 3

Description	Acct. No. FTRE	Mtl. & Depr. Intangibles Gross $	Acct. No. FTRE	Expense Intangibles Gross $
Second Hand Equipment — Warehouse	8			XXXXXXXX
Material Purchased — Dr.	9	28,300		XXXXXXXX
Total Material		28,300		XXXXXXXX
Fuel, Water, Lubricants, Electricity	103		403	2,500
Location Damages, Roads — Bridges	107		407	2,500
Salvage & Dismantling Costs	108		408	
Drilling Contract — Footage	111		411	34,000
Drilling Contract — Daywork	112		412	6,200
Drilling Bits & Reamers		XXXXXXXX	413	
Fishing Tool Expense		XXXXXXXX	414	
Directional Drilling Costs		XXXXXXXX	415	
Mud Materials, Chemicals, & Services		XXXXXXXX	416	5,500
Cement & Cementing Service		XXXXXXXX	417	5,000
Noncontrollable Materials	118	500	418	2,500
Tender Costs and Rentals		XXXXXXXX	419	
Boatel Service	120		420	
Special Drilling Tool Rental		XXXXXXXX	421	1,000
Coring Costs	125		425	
Drill Stem Tests		XXXXXXXX	426	
Perforating		XXXXXXXX	427	2,700
Acidizing, Fracturing, Shooting		XXXXXXXX	428	22,600
Well Surveys, Electrical & Mud Logging		XXXXXXXX	429	1,500
Transportation	131	500	431	2,000
Boats, Barges, Tugs — Cost — Rental	132		432	
Helicopters, Planes — Cost — Rental		XXXXXXXX	433	
Overhead — Partner Operated	136		436	
District Expense		XXXXXXXX	437	400
Company Labor & Supervision	138	200	438	800
Contract Labor	139	4,000	439	1,000
Platforms — Fabrication & Installation	141		441	
Platform Maintenance	142		442	
Keyways — Well Structures		XXXXXXXX	443	
Sales Tax (Controllable Material)		XXXXXXXX	444	900
Miscellaneous Costs	145		445	500
Subtotal — Intangibles		5,200		91,600
Dry or Bottom Hole Contributions Rec.		XXXXXXXX	448	
Total Intangibles		5,200		91,600
Total Cash & Warehouse Outlay		33,500		91,600
Material on Hand	1			XXXXXXXX
Grand Total		33,500		91,600
Grand Total — Mtl. & Depr. Intangibles and Expense Intangibles				125,100

CCD Job No. 101

(Use Only For Expl. or Limited Expl. Well)

Block Number

Gross Ac. Net Ac.

Budget Project No. Hdqts. 1

Remaining Balance (Before This AFE)

Net Recovery

Net Profit

Rate of Return Payout Period

Cash and Warehouse Outlay

Gross Cost 125,100

Conoco Net 125,100

Approvals: Date

Div:

For AFE Purposes only 10/6/70

Land: John E. Branch 10-6-70

Geol: R. Emmanuel 10/6/70

Hdqts:

Final Approval

Distribution:

RAB RLA CES MPL TWS JAB
WCB(3) DLB KWN(2) CAN RJE
BEA(2)

AFE No. 12-61-1659

DRILLING MEMORANDUM

JICARILLA 28 WELL NO. 11
RIO ARRIBA COUNTY, NEW MEXICO

Location: C NW NE Section 33, T25N, R4W, Rio Arriba County, New Mexico

Interest: Conoco - 100% W.I.

Elevation: 6855' GL (estimated)

Objectives: Dual complete in Gallup and Dakota.

Total Depth: 7560'

Estimated Tops:

Pictured Cliffs Sand	3108'
Lewis Shale	3140'
Chacra Sand	3945'
Mesaverde Sand	4742'
Mancos Shale	5415'
Gallup Sand	6392'
Greenhorn Lime	7185'
Graneros Shale	7255'
Dakota Sand	7275'
T.D.	7560'

Drilling Fluid:

Drill surface hole with water. Drill out from surface with water-gel low solids system to T.D. Do not exceed mud weight of 9.0 #/gal. Maintain water loss between 6-8 cc's and viscosity approximately 40 cp. Add lost circulation material if needed in the Gallup or Mesaverde sections. (Final mud program will be submitted before initiation of well.)

Casing:

Surface 200' - 8 5/8" OD, 24#, J-55, ST&C

Production

100' - 4 1/2" OD, 10.5#, JE-55, BTRC
7460' - 4 1/2" OD, 10.5#, JE-55, ST&C

Casing opposite Gallup and Dakota zones to be "RUFF-COTED" (approximately 250' each zone). "RUFF-COTE" should be applied in the shop at temperatures no lower than 65° F. If "RUFF-COTING" is applied on location, ambient temperature should be in excess of 65° F. for a setting time of 8-12 hours.

Copies to: WCB KWM(3) DFA PET RJE LKR File

Casing: (Continued)

Float equipment to consist of a guide shoe and Baker Model "G" No. 109-11 differential fill collar or equivalent located 1 joint above guide shoe. Centralizers to be located 10' and 60' above guide shoe and at 90' intervals thereafter. Scratchers will be required as indicated by Drilling Foreman.

Stage collar and cement basket to be set at approximately 5515 or 100' below Mancos top.

Hole Size: Surface hole to be 12 1/4" to approximately 200'. Remainder to consist of 7 7/8" hole to T.D.

Cement: Surface Pipe

Cement to surface with neat Class "A" containing 2% $CaCl_2$ (70 sacks required for gauged hole).

Slurry Weight	=	15.6 #/gal.
Yield	=	1.18 $ft.^3$/sack
Pipe Capacity	=	0.3576 $ft.^3$/ft.
Annular Capacity	=	0.4127 $ft.^3$/ft.
Compressive Strength	=	555 psi @ 12 Hours and 60° F.

Production String (Cement in 2 stages)

STAGE 1:

Precede 1st stage with 500 gal. mud flush. Cement with 380 sacks 50-50 Poz. A, containing 2% gel, 6 1/4 #/sack Gilsonite, and 1/2% CFR-2 (volume calculated assuming gauged hole + 60% excess to bring cement top 200' above Gallup).

Slurry Weight	=	13.97 #/gal.
Slurry Yield	=	1.32 $ft.^3$/sack

Minimum rate for annular turbulence = 3.7 BPM (use 5-8 BPM).

Compressive Strength	=	24 Hours, 1309 psi 48 Hours, 3015 psi
Water Ratio	=	5.53 gal./sack

Cement: (Continued)

STAGE 2:

Precede 2nd stage with Halco Liteflush.

Cement out of stage collar with 145 sacks Halliburton Liteweight cement containing 1/2% CFR-2.

Liteweight
Slurry Weight = 12.7 #/gal.
Slurry Yield = 1.840 ft.^{3}/sack

Minimum rate for annular turbulence = 1.7 BPM (use 5-8 BPM).

Compressive Strength = 24 Hours, 415 psi
48 Hours, 771 psi

Follow lead slurry with 360 sacks 50-50 Poz. A, 2% gel, 6 1/4 #/sack Gilsonite, 1/2% CFR-2 (volumes calculated for gauged hole with 30% excess to bring cement top 100' above Pictured Cliffs).

Hole Caliper logs will be run over productive intervals.

Volumes will be re-calculated based on actual gauge.

Hole Deviation Requirements:

Well Depth Feet	Max. Distance Between Surveys Feet	Max. Dev. From Vert. Degrees	Max. Allowable Change Of * Angle Between Any Two Surveys Degrees
0-5000	400	5	1 1/2
5000-7000	100	6	1 1/2
7000-T.D.	100	8	2

* (a) Reduce proportionately for survey intervals less than 100 feet, but do not use intervals shorter than 30 feet.

(b) If these limits are exceeded and the distance is more than 100 feet, contractor shall take immediate surveys no more than 100 feet apart. If such immediate surveys show that above limits for any interval have been exceeded, contractor shall correct hole deviation to within limits of above specifications.

Special Services:

Geolograph.

Sampling: Collect samples at 30' intervals from 3000' to 6200' and every 10' interval from 6200' to T.D. Samples to be taken to Four Corners Sample Cut Company, in Farmington, New Mexico.

Logging: Run FDC-Gamma Ray-Caliper over Chacra, Mesaverde, Gallup and Dakota.

Tests: No cores or DST's.

Remarks: It is very important to keep a constant surveillance of the mud system and maintain mud weights between 8.7 - 9.0 #/gal. throughout the drilling operation, as the Gallup zone can cause severe lost circulation problems. Lost circulation was experienced while drilling 30-4 in Section 31. In addition, because of the natural fractured system in the Gallup, care should be taken to eliminate any surging while running drill pipe and casing.

Drilling Procedure:

1. Drill 12 1/4" hole to approximately 200'.
2. Run 8 5/8" surface casing and cement to surface.
3. WOC 12 hours and nipple up.
4. Drill 7 7/8" hole with water-gel low solids mud as directed.
5. Run log as directed.
6. Run 4 1/2" OD casing with stage collar 100' below Mancos top. Cement 1st stage and slack off 6000-8000# on casing after bumping plug. Open ports on stage collar, break circulation immediately, and circulate mud for 4 hours. Run 2nd stage cement operation as directed.
7. Move off rotary rig and move in completion unit.

8. WOC 18 hours.

9. Run temperature survey to locate cement top.

pce

Prepared by: J. A. Mazza, Production Engineer

APPROVED:

_____
Supervising Production Engineer

_____
Division Drilling Superintendent

_____
Division Manager

P&A PROCEDURE

In the event the subject well is abandoned, it will be necessary to contact the New Mexico Oil Conservation Commission for verbal approval of the work. The people who should be contacted in order of preference, are as follows:

During Working Hours:

NMOCC (Aztec)	505-334-6178
USGS (Durango)	303-247-5144

After Working Hours:

NMOCC	Emery Arnold	505-334-6987
	Al Kendrick	505-325-8300
USGS	Jerry Long	303-247-0028
	Ed Schmidt	303-247-9918

1. After logging and testing, go in hole open-ended and spot plug from top of Dakota to 100' above Dakota top.
2. Pull up and spot 100' plug to Gallup top.
3. Pull up and spot 100' plug across Chacra.
4. Pull up and spot 100' plug across Pictured Cliffs.
5. Pull up and spot plug across Ojo Alamo.
6. Pull up and set plug 50' in and 50' out of 8 5/8".
7. Set 25' plug in surface 8 5/8". Set 10' length of 4" pipe in the surface plug so that 4' of it projects above ground level. The top of the 4' should be capped and a well sign attached.
8. Rig down and move off rig. Clean up location.

PROPOSED WELL PLAN OUTLINE

WELL NAME: Jicarilla 28-11 COUNTY: Rio Arriba

LOCATION: CNWNE Sec. 33, T25N, R4W STATE: New Mexico

DEPTH	FORMATION TOPS & TYPE	DRILLING PROBLEMS	TYPE OF FORMATION EVALUATION	HOLE SIZE	CASING SIZE	CASING DEPTH	FRACTURE GRADIENT	FORMATION PRESSURE GRADIENT	MUD WEIGHT	MUD TYPE
	WASATCH			12¼"	8 5/8"	200'				
	Wasatch Sand & Shale			7 7/8"					8.7-9.0 #/gal	Gel
1000	ANIMAS OJO ALAMO FRSH. WTR. SD.									
2000	KIRTLAND Sand & Shale	LOST CIRCULATION								
3000	Pict. Cliff Sd.	Gas Productive	FDC Log				.7 psi/ft	.27 psi/ft		
	LEWIS SHALE									
4000	Chacra Sand	Gas Productive	FDC				.7 psi/ft	.3 psi/ft		
	LEWIS SHALE									
5000	MESA VERDE Sand & Shale	Gas Productive	FDC Log				.7psi/ft	.34psi/ft		
	MANCOS SHALE									
6000										
	GALLUP Sand & Shale	LOST CIRCULATION Hole Washouts	FDC Log				.7 psi/ft	.34 psi/ft		
7000	Greenhorn Lime		FDC Log							
	DAKOTA Sand & Shale		FDC Log	7 7/8"	4½"	7560'	.705psi/ft	.35psi/ft		
	TD 7560'									
8000										

Date: October 8, 1970 Prepared by: J. A. Mazza

Approved: _____ _____
Drilling Supt.

DISTRIBUTION OF ENGINEERING WELL DATA
CASPER DIVISION

WELL NO. 28-11 FIELD WEST LINDRITH COUNTY RIO ARRIBA STATE NEW MEXICO

	PRIMARY LOGS				SECONDARY LOGS Bond, Correlation, etc.		CORE ANALYSES		D.S.T.
	Field Print	Final	Sepia	Film	Field	Final	Prelim.	Final	Report
Distr. Mgr. Prod. - W.C.B.	1	1			1	1	1	1	1
Hdq. Mgr. Prod. - R.L.A.	*	1						1	1
Prod. Research Mgr. - F.R.C.		1						1	1
Well Operating Supervisor	1				1				
Division Geologist - EC	1	1							
Exploitation Geologist - R.J.E.		1	1		1	1	1	1	1
PED-Form. Eval. Supv. - D. J. Timko	1						1	1	1
Rky. Mtn. Well Log Service 1753 Champa St., Denver.***		1							
STATE **									
U.S.G.S. **									
PARTNERS **									
TOTAL									

* - Headquarters needs log field prints only on significant stepouts.
** - Requirements for State, U.S.G.S. and partners will vary by location.
*** - Logs for Rocky Mtn. Well Log Service should be held until we receive a release request from them.

NOTE: Service companies should be advised to send all copies of logs or reports to Division Production Office at 200 North Wolcott.

Revised 9-24-58

EXHIBIT # 3

BEFORE EXAMINER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 7
CASE NO. 9162

COMPLETION MEMORANDUM

JICARILLA 28 WELL NO. 11

Location: NW NE Section 33, T25N, R4W, Rio Arriba County, New Mexico

Elevation: 6855' GL; 6869' KB

Casing: 8 5/8", 24#, J-55 set at 200' KB
100' - 4 1/2" OD, 10.5#, JE-55, BTRC
7460' - 4 1/2" OD, 10.5#, JE-55, ST&C

Completion Procedure:

1. After moving out rotary rig, move in completion unit, pick up 2 7/8" tubing and drill out stage collar and pressure test to 1500 psig.

2. Circulate to T.D. and displace hole with 1% KCl water.

3. Pull tubing, move in logging unit, and run Gamma Ray with collar locator. Run Cement Bond log if full returns are not obtained during 1st stage cementing. If poor primary cement job is evident, it will be necessary to squeeze before stimulation. Squeeze volumes and procedures will be determined by engineer.

4. Move in eight (8) 500 barrel frac tanks and install frac head (minimum of 110,000 gal. required for 3 stage stimulation - suggest 140,000 gal. (3,330 bbl.) fluid on location for staging and includes load, flush, and tank bottoms). Perforate and sand frac in accordance to procedure below. Swab well in if necessary.

Gallup-Dakota Perforating and Fracturing Procedure

NOTE: The Gallup and Dakota will be perforated in one set-up. The well will then be stimulated in three (3) stages down 2 7/8" tubing using a Baker Retrievable Model "C" bridge plug and full bore cementer. Either Halliburton's MY-T-FRAC-60 or Dowell's WIDE-FRAC (YF6G) will be used as the fluid medium.

1. With hole loaded with 1% KCl perforate Dakota "J", Dakota "D", and Gallup 1 shot per foot as indicated by engineer. Use Schlumberger 3 3/8" Hyperjet - 13.5 gram RDX charge (0.52" x 9.38" penetration in Berea sandstone) or equivalent.

2. Install frac head.

3. Pick up bridge plug and packer on 2 7/8" tubing and set bridge plug below bottom of Dakota "J" perforations. Set packer above top of Dakota "J" perforations.

4. Hook up frac trucks and test lines and fittings to 5000 psi.

5. Sand-frac Dakota "J" down 2 7/8" tubing as follows: (Maximum allowable surface pressure 4000 psi at 10 BPM).

   4,300 gal. 1% KCl w/50 #/1,000 gal. ADOMITE AQUA and 10 #/1,000 gal. WG-6
   6,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
   1,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA and 1/2 #/gal. 10-20 sand
   2,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA and 1 #/gal. 10-20 sand
   3,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA and 2 #/gal. 10-20 sand
   3,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA and 3 #/gal. 10-20 sand
   4,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA in first 2,000 gal. MY-T-FRAC-60 only and 4 #/gal. 10-20 sand

6. Flush with 2,100 gal. 1% KCl water.

7. Release packer, retrieve bridge plug, and set bridge plug between Dakota "J" and "D" perforations. Set packer above Dakota "D" perforations.

8. Sand-frac Dakota "D" using same volumes and procedure as outlined in (5) above. (Maximum allowable surface pressure 4000 psi at 10 BPM.)

9. Flush with 2,100 gal. 1% KCl.

10. Release packer, retrieve bridge plug, and set bridge plug below bottom of Gallup perforations. Set packer above Gallup perforations and frac Gallup down 2 7/8" tubing as follows: (Maximum allowable surface pressure 4000 psi at 10 BPM).

    15,000 gal. 1% KCl w/50 #/1,000 gal. ADOMITE AQUA and 10 #/1,000 gal. WG-6
    8,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
    2,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA and 1/2 #/gal. 10-20 sand

10. (Continued)

3,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
and 1 #/gal. 10-20 sand
6,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
and 2 #/gal. 10-20 sand
6,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
and 3 #/gal. 10-20 sand
15,000 gal. MY-T-FRAC-60 w/25 #/1,000 gal. ADOMITE AQUA
in first 7,500 gal. MY-T-FRAC-60 only
and 4 #/gal. 10-20 sand

11. Flush with 2,000 gal. 1% KCl water.

12. Shut-in well for 12 hours or overnight.

13. Retrieve bridge plug and packer and retrieve 2 7/8" frac string. Pick up 2 3/8" OD producing string containing from the bottom up the following:

(a) 2' sub with pinned collar.

(b) "D" nipple to be set opposite bottom of Dakota perforations.

14. Swab well in if necessary and allow to clean up.

15. Install tubing stop and bumper spring one joint above "D" nipple.

16. Install surface intermitter and start well on plunger lift using a cycle frequency of ten-30 minute cycles. Adjust cycle frequency and flow duration depending on well performance.

pce

Prepared by: J. A. Mazza, Production Engineer

INITIAL PRODUCTION HISTORY - GALLUP/DAKOTA COMPLETIONS - WEST LINDRITH FIELD

Well No. and Location	Clean-up Period	Initial Packer Leakage Test	Production First Three Complete Months (BOPD)
22-1 2080' FSL, 1900' FEL Sec. 22, T25N, R4W	Completed with 2 separate strings of casing. Cleaned up each zone separately. Undesignated Gallup (3-1-61) IPP = 55 BOPD, 205 MCFPD Undesignated Dakota (3-15-61) IPP = 61 BOPD, 382 MCFPD Total = 116 BOPD, 587 MCFPD	Undesignated Gallup (3-24-61) = 48 BOPD, 179 MCFPD Undesignated Dakota (4-1-61) = 144 BOPD, 1012 MCFPD Total = 192 BOPD, 1191 MCFPD	4-61 5-61 6-61 Undesignated Gallup 16.7 14.9 10.3 Undesignated Dakota 21.1 15.4 15.9 Total 37.8 30.3 26.2
22-2 2140' FSL, 1980' FEL Sec. 21, T25N, R4W	Commingled rates during clean-up: Initial Rate (6-9-69) = 212 BOPD, 263 BLWPD, 249 MCFPD Rate prior to shut-in (7-3-69) = 89 BOPD, 4 BLWPD, 450 MCFPD	Undesignated Gallup (7-7-69) = 45 BOPD, 135 MCFPD Undesignated Dakota (7-11-69) = 28 BOPD, 590 MCFPD Total = 73 BOPD, 725 MCFPD	8-69 9-69 10-69 Undesignated Gallup 37.4 27.7 19.0 Undesignated Dakota 23.3 17.2 11.2 Total 60.7 44.9 30.2
22-3 990' FNL, 890' FWL Sec. 22, T25N, R4W	Commingled rates during clean-up: Initial Rate (6-28-69) = 107 BOPD, 408 BLWPD, 524 MCFPD Rate prior to shut-in (7-15-69) = 47 BOPD, 18 BLWPD, 420 MCFPD	Undesignated Gallup (8-8-69) = 45 BOPD, 305 MCFPD Undesignated Dakota (8-12-69) = 25 BOPD, 800 MCFPD Total = 70 BOPD, 1105 MCFPD	9-69 10-69 11-69 Undesignated Gallup 7.4 6.5 7.7 Undesignated Dakota 17.2 15.2 19.0 Total 24.6 21.7 26.7
22-4 2080' FSL, 2290' FEL Sec. 15, T25N, R4W	Not Available	Undesignated Gallup (8-30-69) = 38 BOPD, 75 MCFPD Undesignated Dakota (9-5-69) = 28 BOPD, 94 MCFPD Total = 66 BOPD, 169 MCFPD	10-69 11-69 12-69 Undesignated Gallup 17.4 17.2 14.5 Undesignated Dakota 12.6 12.1 10.2 Total 30.0 29.3 24.7
28-1 1980' FSL, 1980' FEL Sec. 28, T25N, R4W	Completed with 2 separate strings of tubing. Cleaned up each zone separately. Undesignated Gallup (7-21-60) IPP = 56 BOPD, 284 MCFPD Undesignated Dakota (2-1-59) IPP = 117 BOPD, 284 MCFPD	These are initial tests after installation of downhole dual flow choke: Undesignated Gallup (1-3-65) = 0 BOPD, 180 MCFPD Undesignated Dakota (2-9-65) = 21 BOPD, 200 MCFPD Total = 21 BOPD, 380 MCFPD Undesignated Gallup (6-11-65) = 0 BOPD, 97 MCFPD Undesignated Dakota (6-27-65) = 26 BOPD, 194 MCFPD Total = 26 BOPD, 291 MCFPD	7-65 8-65 9-65 Undesignated Gallup 19.1 15.7 14.8 Undesignated Dakota 11.2 9.2 8.7 Total 30.3 24.9 23.5
28-2 660' FNL, 660' FWL Sec. 27, T25N, R4W	Completed with 2 separate strings of casing. Cleaned up each zone separately. Undesignated Gallup (10-21-60) = 88 BOPD, 330 MCFPD Undesignated Dakota (10-21-60) = 56 BOPD, 177 MCFPD Total = 134 BOPD, 507 MCFPD	Undesignated Gallup (11-19-60) = 26.7 BOPD, 84 MCFPD Undesignated Dakota (11-22-60) = 15.0 BOPD, 1040 MCFPD Total = 41.7 BOPD, 1124 MCFPD	12-60 1-61 2-61 Undesignated Gallup 9.0 0 5.7 Undesignated Dakota 18.6 0 6.4 Total 27.6 0 12.1
28-3 990' FSL, 790' FEL Sec. 34, T25N, R4W	Completed with 2 separate strings of tubing. Cleaned up each zone separately Undesignated Gallup (10-11-65) IPP = 72 BOPD, 13 BLWPD Undesignated Dakota (11-11-65) IPF = 50 BOPD, 12 BLWPD Total = 122 BOPD, 25 BLWPD	Installed downhole dual flow choke in January 1966. Undesignated Gallup (1-29-66) = 12 BOPD, 26 MCFPD Undesignated Dakota (1-25-66) = 98 BOPD, 284 MCFPD Total = 110 BOPD, 310 MCFPD	2-66 3-66 4-66 Undesignated Gallup 0 1.9 21.9 Undesignated Dakota 24.6 22.0 28.9 Total 24.6 23.9 50.8

Well No. and Location	Clean-up Period	Initial Packer Leakage Test	Production First Three Complete Months (BOPD)
28-4 485' FNL, 760' FWL Sec. 34, T25N, R4W	Commingled rates during clean-up: Initial Rate (10-21-68) = 507 BOPD, 127 BLWPD, G TSTM Rate prior to shut-in (10-30-68) = 11 BOPD, 0 BLWPD, 21 MCFPD	Undesignated Gallup (11-4-68) = 27 BOPD, 106 MCFPD Undesignated Dakota (11-8-68) = 33 BOPD, 109 MCFPD Total = 60 BOPD, 215 MCFPD	12-68 1-69 2-69 Undesignated Gallup 5.9 4.5 5.3 Undesignated Dakota 6.1 4.5 5.2 Total 12.0 9.0 10.5
28-5 1920' FSL, 1920' FEL Sec. 33, T25N, R4W	Commingled rates during clean-up: Initial Rate (11-27-68) = 32 BOPD, 270 BLWPD, 260 MCFPD Rate prior to shut-in (12-6-68) = 56 BOPD, 92 BLWPD, 172 MCFPD	Undesignated Gallup (12-11-68) = 10 BOPD, 117 MCFPD Undesignated Dakota (12-15-68) = 138 BOPD, 1058 MCFPD Total = 148 BOPD, 1175 MCFPD	1-69 2-69 3-69 Undesignated Gallup 3.1 3.5 2.8 Undesignated Dakota 42.3 48.1 39.3 Total 45.4 51.6 42.1
28-6 710' FNL, 660' FWL Sec. 33, T25N, R4W	Commingled rates during clean-up: Initial Rate (12-21-68) = 116 BOPD, 212 BLWPD, 246 MCFPD Rate prior to shut-in (12-29-68) = 80 BOPD, 14 BLWPD, 209 MCFPD	Undesignated Gallup (1-2-69) = 23 BOPD, 52 MCFPD Undesignated Dakota (1-6-69) = 115 BOPD, 174 MCFPD Total = 138 BOPD, 226 MCFPD	2-69 3-69 4-69 Undesignated Gallup 7.4 7.3 6.8 Undesignated Dakota 37.3 36.2 33.7 Total 44.7 43.5 40.5
28-7 1980' FSL, 1980' FEL Sec. 27, T25N, R4W	Commingled rates during clean-up: Initial Rate (11-11-68) = 163 BOPD, 429 BLWPD, 360 MCFPD Rate prior to shut-in (11-19-68) = 49 BOPD, 2 BLWPD, 435 MCFPD	Undesignated Gallup (11-24-68) = 30 BOPD, 109 MCFPD Undesignated Dakota (11-28-68) = 90 BOPD, 196 MCFPD Total = 120 BOPD, 305 MCFPD	12-68 1-69 2-69 Undesignated Gallup 12.2 9.2 10.5 Undesignated Dakota 36.6 27.6 31.4 Total 48.8 36.8 41.9
28-8 890' FNL, 1980' FWL Sec. 28, T25N, R4W	Commingled rates during clean-up: Initial Rate (5-17-69) = 189 BOPD, 194 BLWPD, 316 MCFPD Rate prior to shut-in (5-29-69) = 66 BOPD, 54 BLWPD, 177 MCFPD	Undesignated Gallup (6-6-69) = 44 BOPD, 104 MCFPD Undesignated Dakota (6-10-69) = 22 BOPD, 88 MCFPD Total = 66 BOPD, 192 MCFPD	7-69 8-69 9-69 Undesignated Gallup 33.9 29.6 24.5 Undesignated Dakota 16.9 14.8 12.3 Total 50.8 44.4 36.8
30-3 1850' FSL, 1850' FEL Sec. 32, T25N, R4W	Completed with 2 separate strings of tubing. Clean-up each zone separately. Undesignated Gallup (12-3-65) IPP = 84 BOPD, 74 BLWPD, G TSTM Undesignated Dakota (10-21-65) IPP = 27 BOPD, 17 BLWPD, G TSTM	Installed downhole commingling choke January, 1966. Undesignated Gallup (1-28-66) = 95 BOPD, 250 MCFPD Undesignated Dakota (2-1-66) = 33 BOPD, 80 MCFPD Total = 128 BOPD, 330 MCFPD	2-66 3-66 4-66 Undesignated Gallup 11.6 11.3 34.7 Undesignated Dakota 12.9 2.3 18.2 Total 24.5 13.6 52.9

CONTINENTAL OIL CO. — STATE- NEW MEXICO — FIELD- WEST LINDRITH — RESERVOIR- UNDESIGNATED GALLUP/DAKOTA

CASPER DIVISION — LEASE- JICARILLA 22 — WELL NO- # 1

BEFORE EXAMINER UTZ
OIL CC
CASE NO. 4462

10000-00
1000-00
100-00
10-00
1-00

BBLS OR MCF/DAY

GAS

OIL

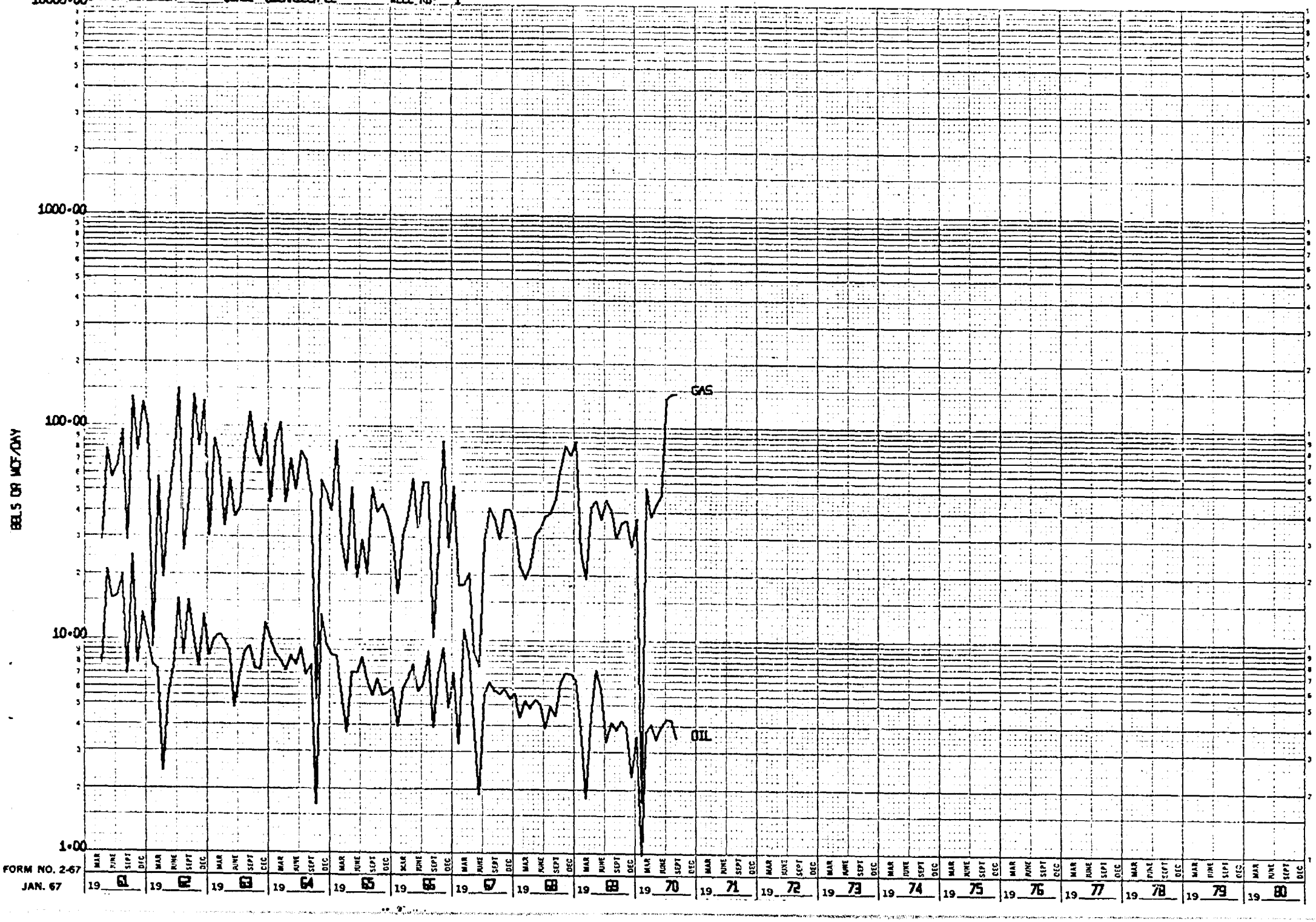
FORM NO. 2-67
JAN. 67

MAR JUNE SEPT DEC

19 61 | 19 62 | 19 63 | 19 64 | 19 65 | 19 66 | 19 67 | 19 68 | 19 69 | 19 70 | 19 71 | 19 72 | 19 73 | 19 74 | 19 75 | 19 76 | 19 77 | 19 78 | 19 79 | 19 80

CONTINENTAL OIL CO. — STATE: NEW MEXICO — FIELD: WEST LINDRITH — RESERVOIR: UNDESIGNATED GALLUP

CASPER DIVISION — LEASE: JICARILLA 22 — WELL NO: 1



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. STATE: NEW MEXICO FIELD: WEST LINDRITH RESERVOIR: UNDESIGNATED DAKOTA

LEASE: JICARILLA 22 WELL NO. 1

JASPER DIVISION

BBLS OR MCF/DAY

10000.00
1000.00
100.00
10.00
1.00

GAS

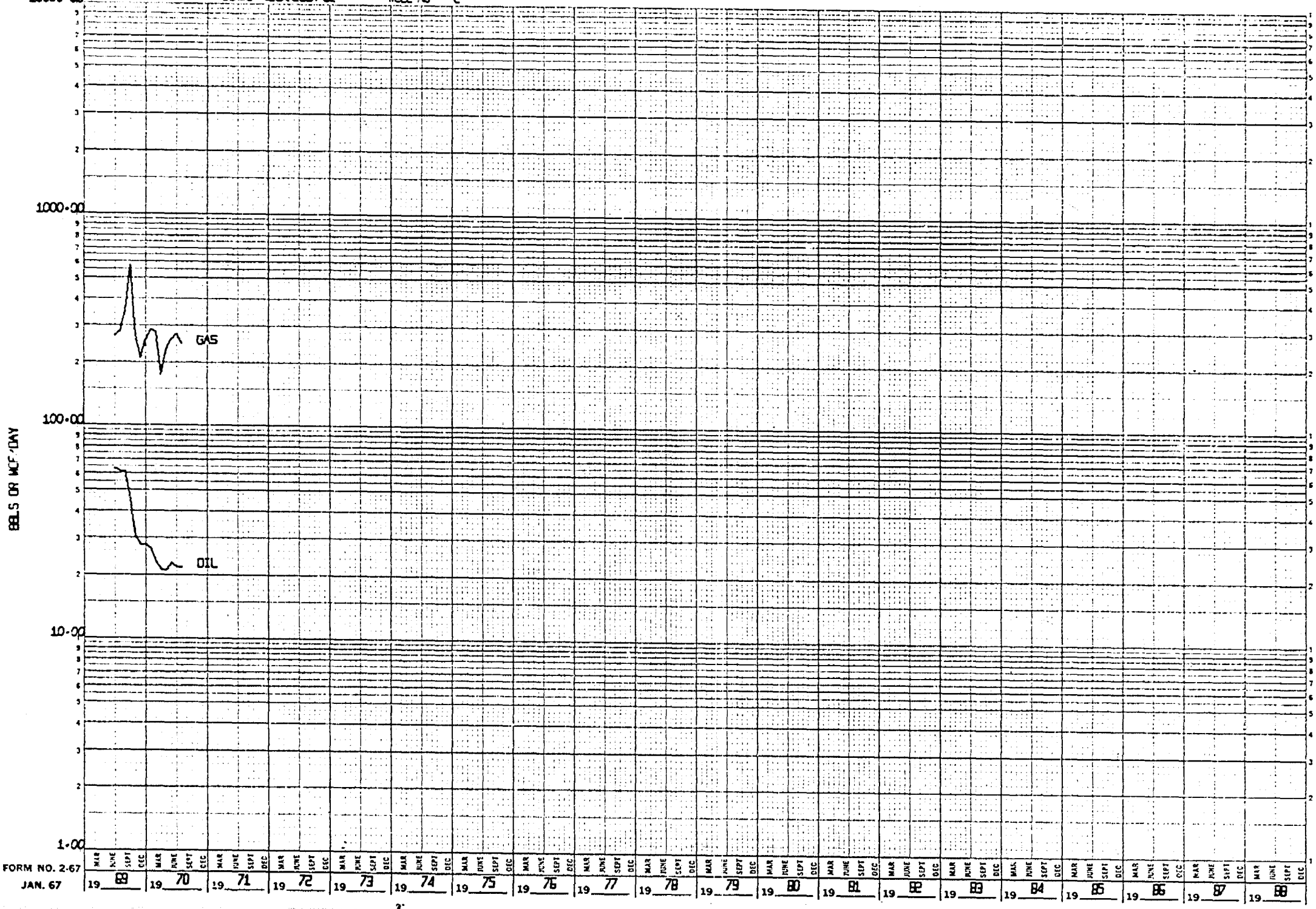
OIL

19 61	19 62	19 63	19 64	19 65	19 66	19 67	19 68	19 69	19 70	19 71	19 72	19 73	19 74	19 75	19 76	19 77	19 78	19 79	19 80
MAR	MAR	MAR	MAR	MAR	MAR	MAR	MAR	MAR	MAR	MAR	MAR	MAR	MAR	MAR	MAR	MAR	MAR	MAR	MAR
JUNE	JUNE	JUNE	JUNE	JUNE	JUNE	JUNE	JUNE	JUNE	JUNE	JUNE	JUNE	JUNE	JUNE	JUNE	JUNE	JUNE	JUNE	JUNE	JUNE
SEPT	SEPT	SEPT	SEPT	SEPT	SEPT	SEPT	SEPT	SEPT	SEPT	SEPT	SEPT	SEPT	SEPT	SEPT	SEPT	SEPT	SEPT	SEPT	SEPT
DEC	DEC	DEC	DEC	DEC	DEC	DEC	DEC	DEC	DEC	DEC	DEC	DEC	DEC	DEC	DEC	DEC	DEC	DEC	DEC

FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. — STATE: NEW MEXICO — FIELD: WEST LINDRITH — RESERVOIR: DAKOTA GALLUP

CASPER DIVISION — LEASE: JICARILLA 22 — WELL NO. 2

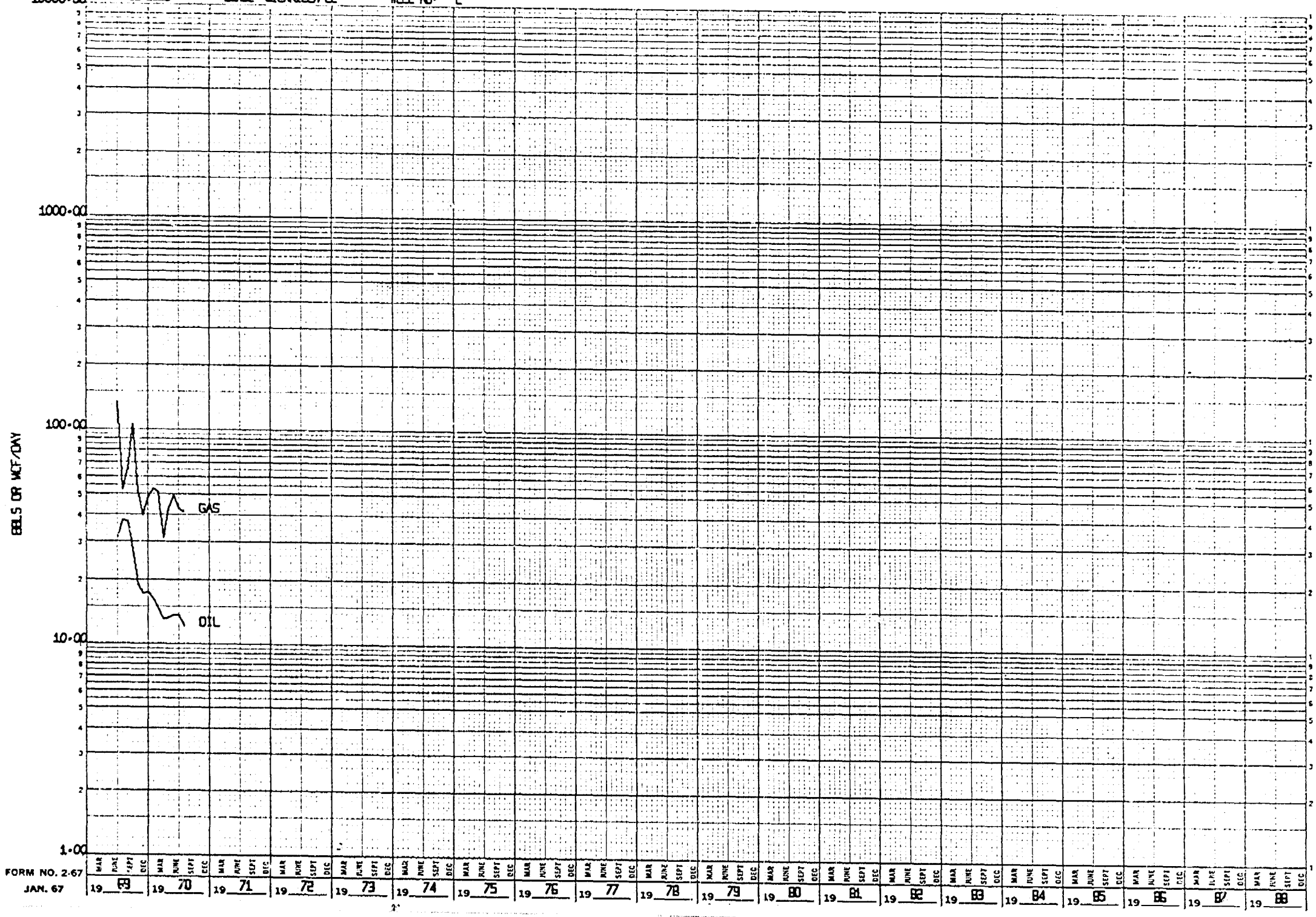


FORM NO. 2-67
JAN. 67

19 69	19 70	19 71	19 72	19 73	19 74	19 75	19 76	19 77	19 78	19 79	19 80	19 81	19 82	19 83	19 84	19 85	19 86	19 87	19 88
MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC	MAR JUNE SEPT DEC

CONTINENTAL OIL CO. — STATE: NEW MEXICO — FIELD: WEST LINDRITH — RESERVOIR: UNDESIGNATED GALLUP

CASPER DIVISION — LEASE: JICARILLA 22 — WELL NO. 2



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. STATE- NEW MEXICO FIELD- WEST LINDRITH RESERVOIR- UNDESIGNATED DAKOTA

CASPER DIVISION LEASE- JICARILLA 22 WELL NO- 2

BBLS OR MCF/DAY

10000-00

1000-00

100-00

10-00

1-00

GAS

OIL

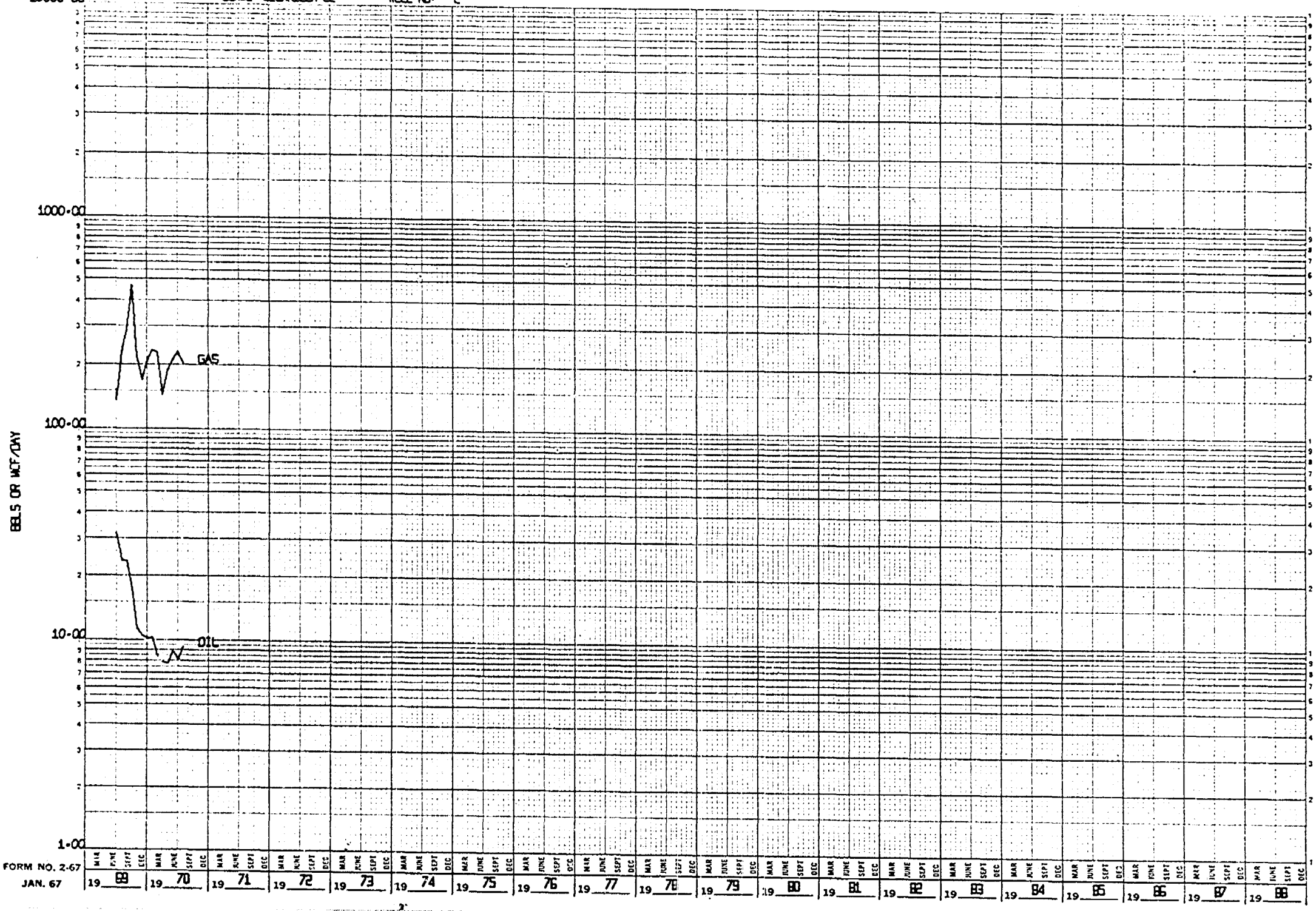
FORM NO. 2-67
JAN. 67

MAR JUNE SEPT DEC

19 69 19 70 19 71 19 72 19 73 19 74 19 75 19 76 19 77 19 78 19 79 19 80 19 81 19 82 19 83 19 84 19 85 19 86 19 87 19 88

CONTINENTAL OIL CO. STATE- NEW MEXICO FIELD- WEST LINDRITH RESERVOIR- UNDESIGNATED DAKOTA

CASPER DIVISION LEASE- JICARILLA 22 WELL NO- 2



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. — STATE: NEW MEXICO — FIELD: WEST LINDRITH — RESERVOIR: DAKOTA-GALLUP

CASPER DIVISION — LEASE: JICARILLA 22 — WELL NO. 3

BBLS OR MCF/DAY

10000.00
1000.00
100.00
10.00
1.00

GAS

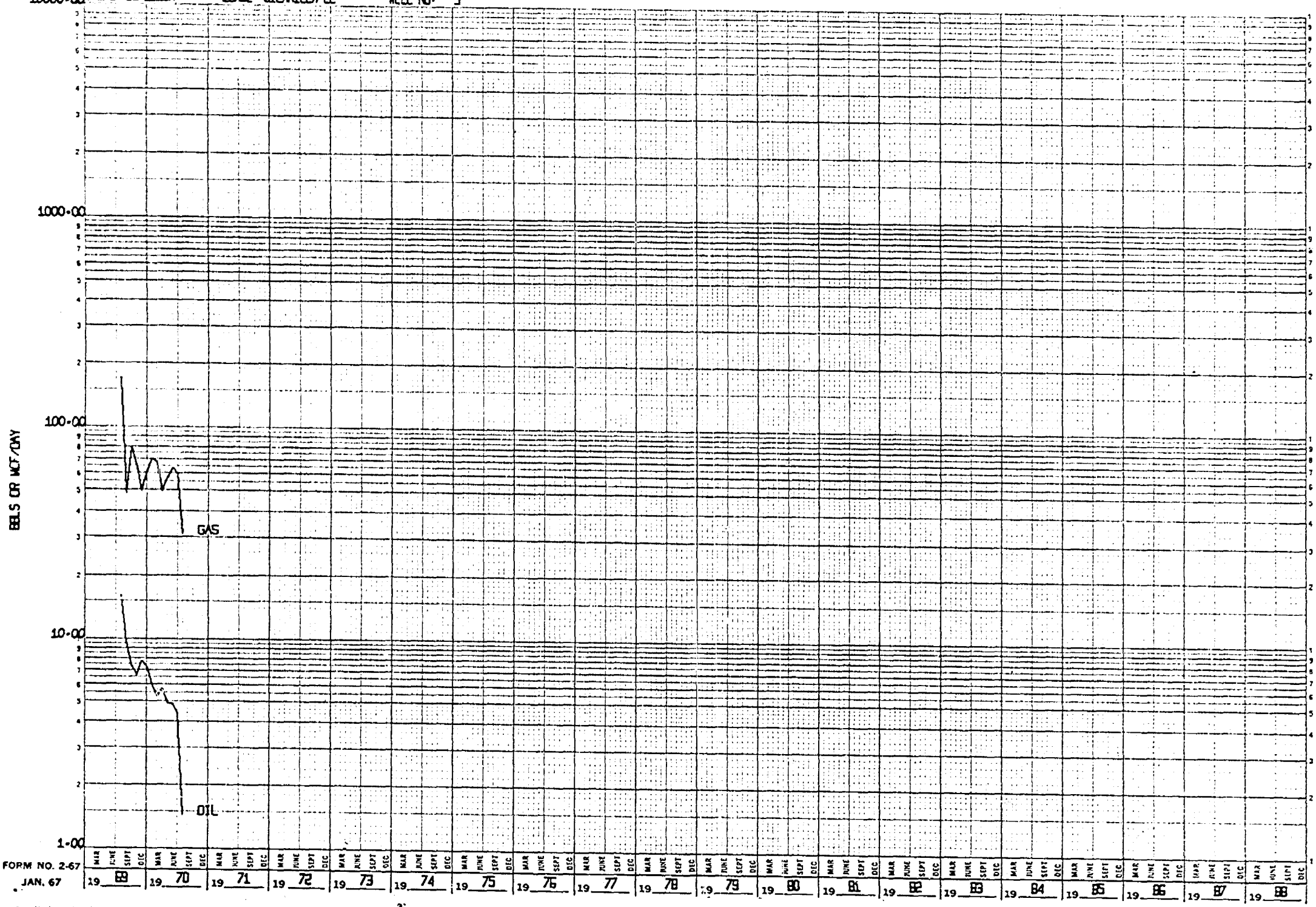
OIL

MAR	JUNE	SEPT	DEC
19 69	19 70	19 71	19 72
19 73	19 74	19 75	19 76
19 77	19 78	19 79	19 80
19 81	19 82	19 83	19 84
19 85	19 86	19 87	19 88

FORM NO. 2-67
JAN. 67

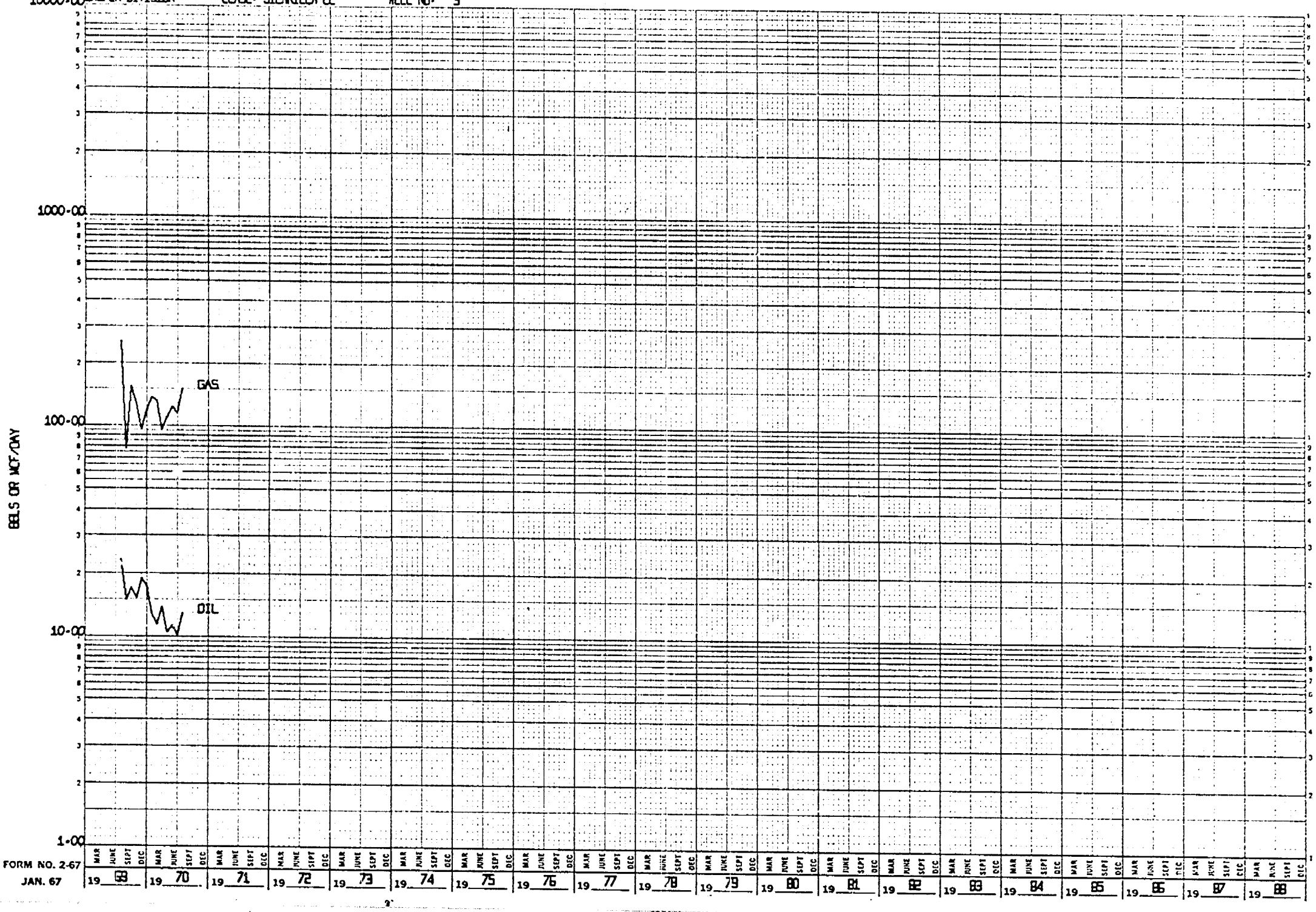
CONTINENTAL OIL CO. — STATE: NEW MEXICO — FIELD: WEST LINDRITH — RESERVOIR: UNDESIGNATED GALLUP

CASPER DIVISION — LEASE: JICARILLA 22 — WELL NO. 3



FORM NO. 2-67
JAN. 67

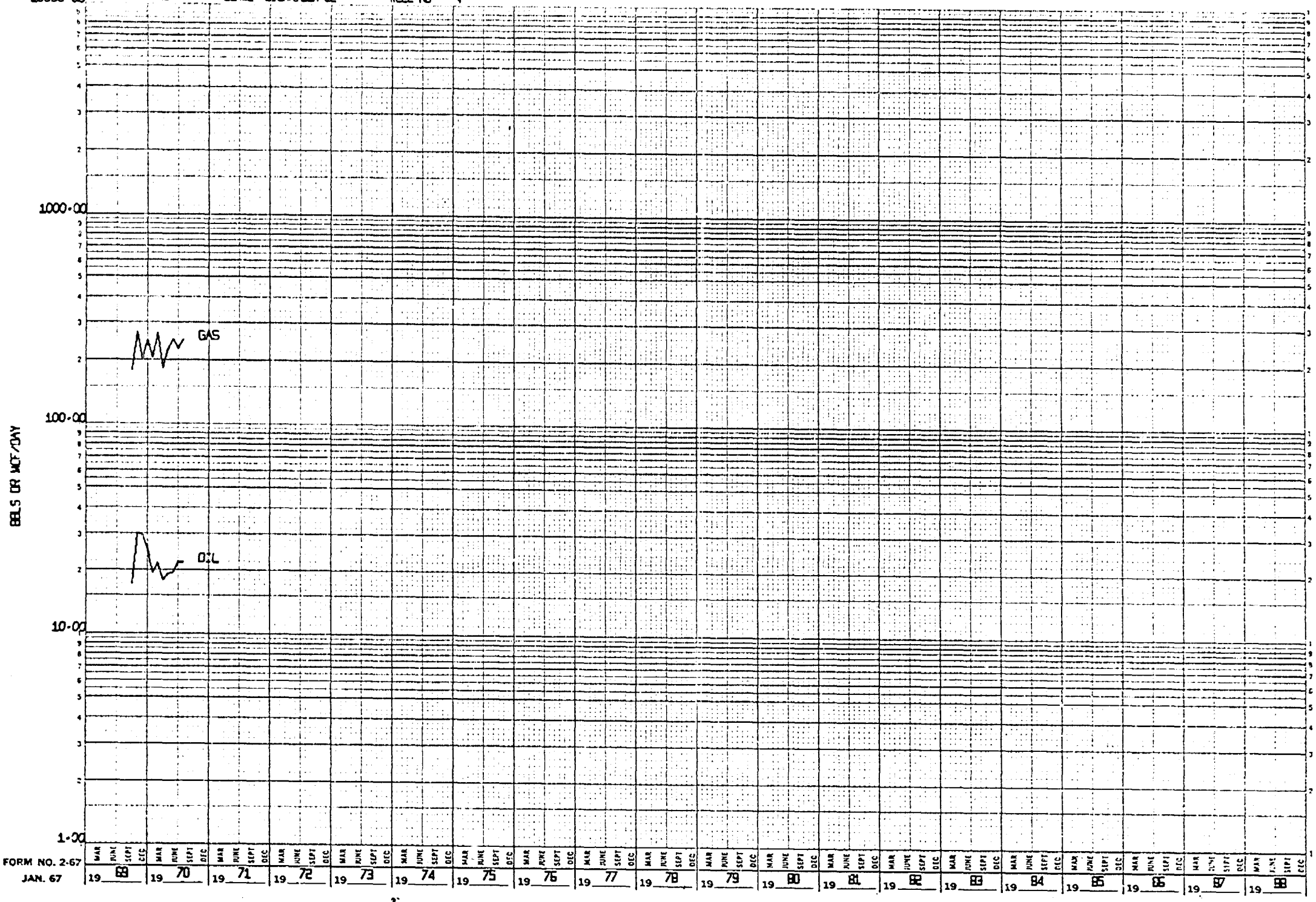
CONTINENTAL OIL CO. — STATE: NEW MEXICO — FIELD: WEST LINDRITH — RESERVOIR: UNDESIGNATED DAKOTA
CASPER DIVISION — LEASE: JICARILLA 22 — WELL NO: 3



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. — STATE: NEW MEXICO — FIELD: WEST LINDRITH — RESERVOIR: DAKOTA-GALLUP

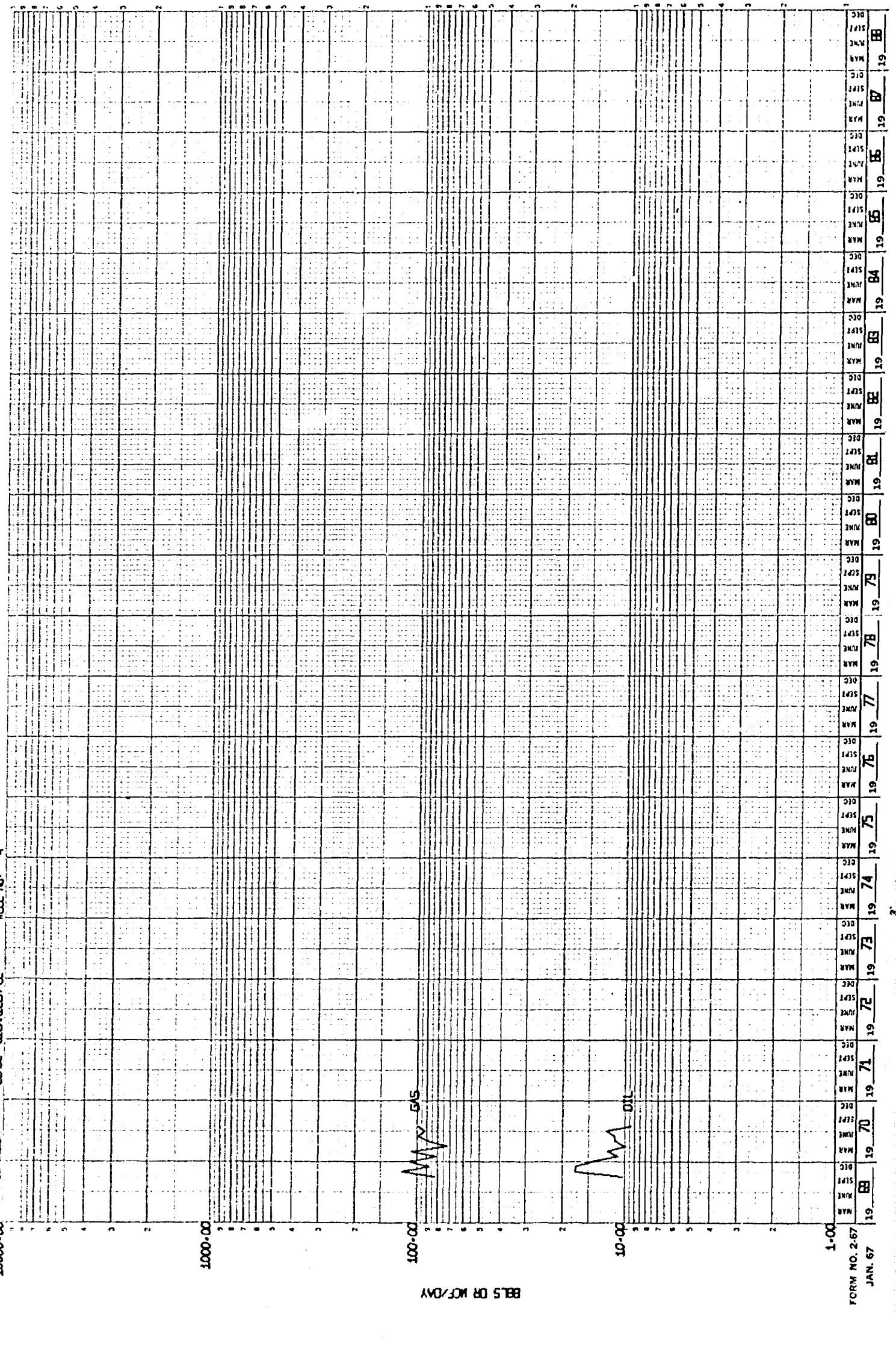
CASPER DIVISION — LEASE: JICARILLA 22 — WELL NO: 4



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. STATE: NEW MEXICO FIELD: WEST LINDRITH RESERVOIR: UNDESIGNATED GALLUP

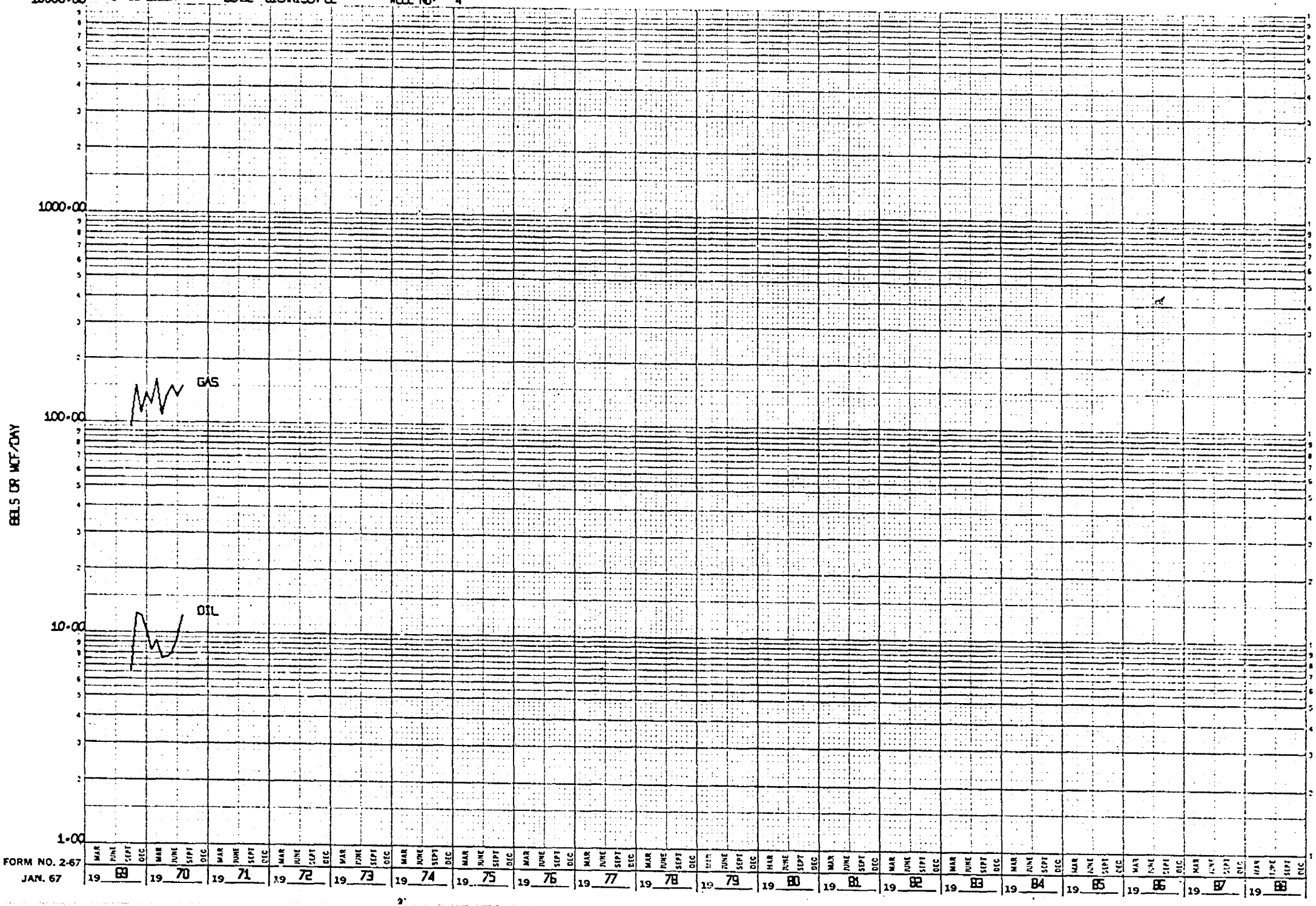
CASPER DIVISION LEASE: JICARILLA 22 WELL NO. 4



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. — STATE· NEW MEXICO — FIELD· WEST LINDRITH — RESERVOIR· UNDESIGNATED DAKOTA

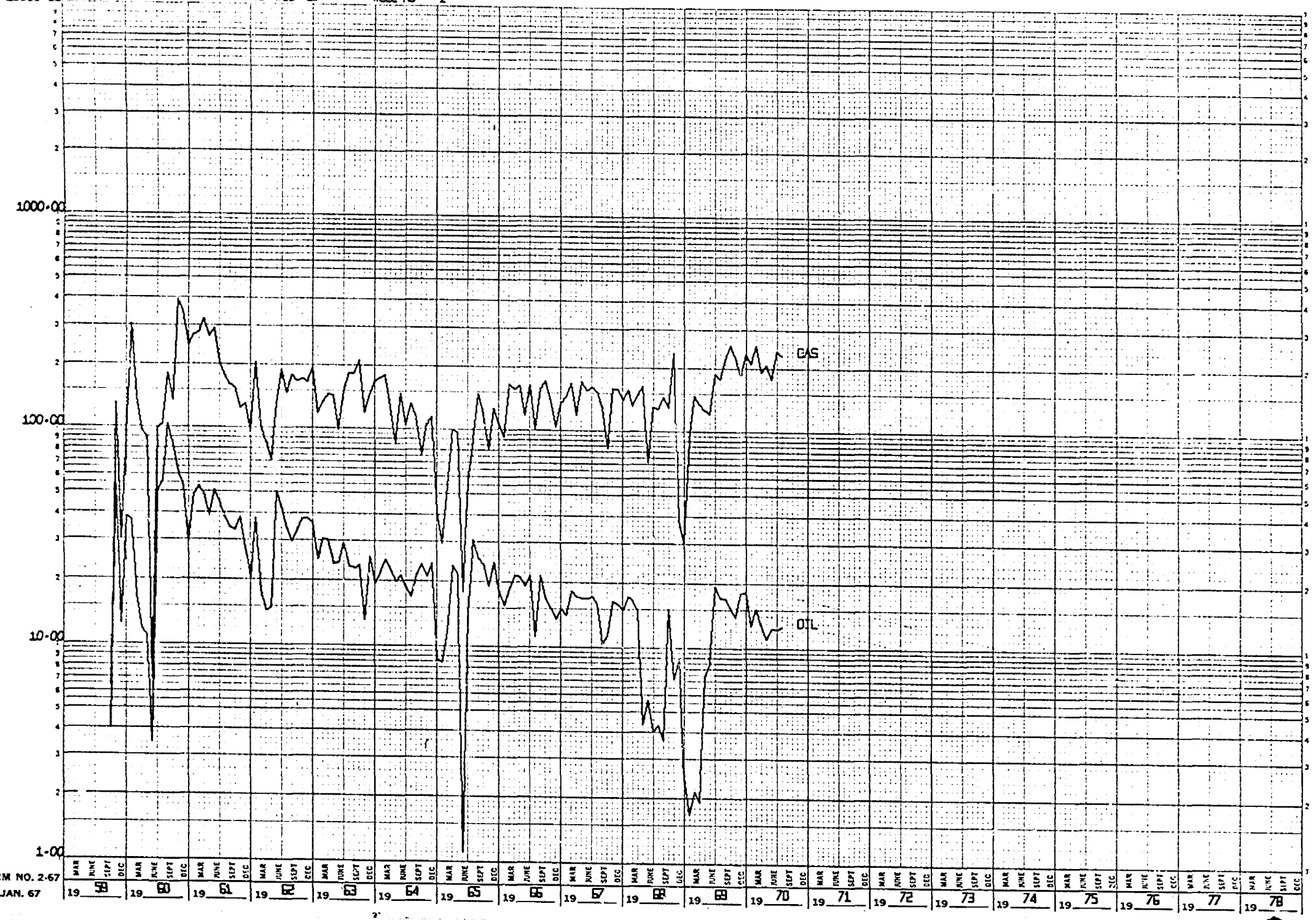
CASPER DIVISION — LEASE· JICARILLA 22 — WELL NO· 4



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. — STATE- NEW MEXICO — FIELD- WEST LINDRITH — RESERVOIR- DAKOTA-GALLUP

CASPER DIVISION — LEASE- JICARILLA 28 — WELL NO- 1



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. CASPER DIVISION

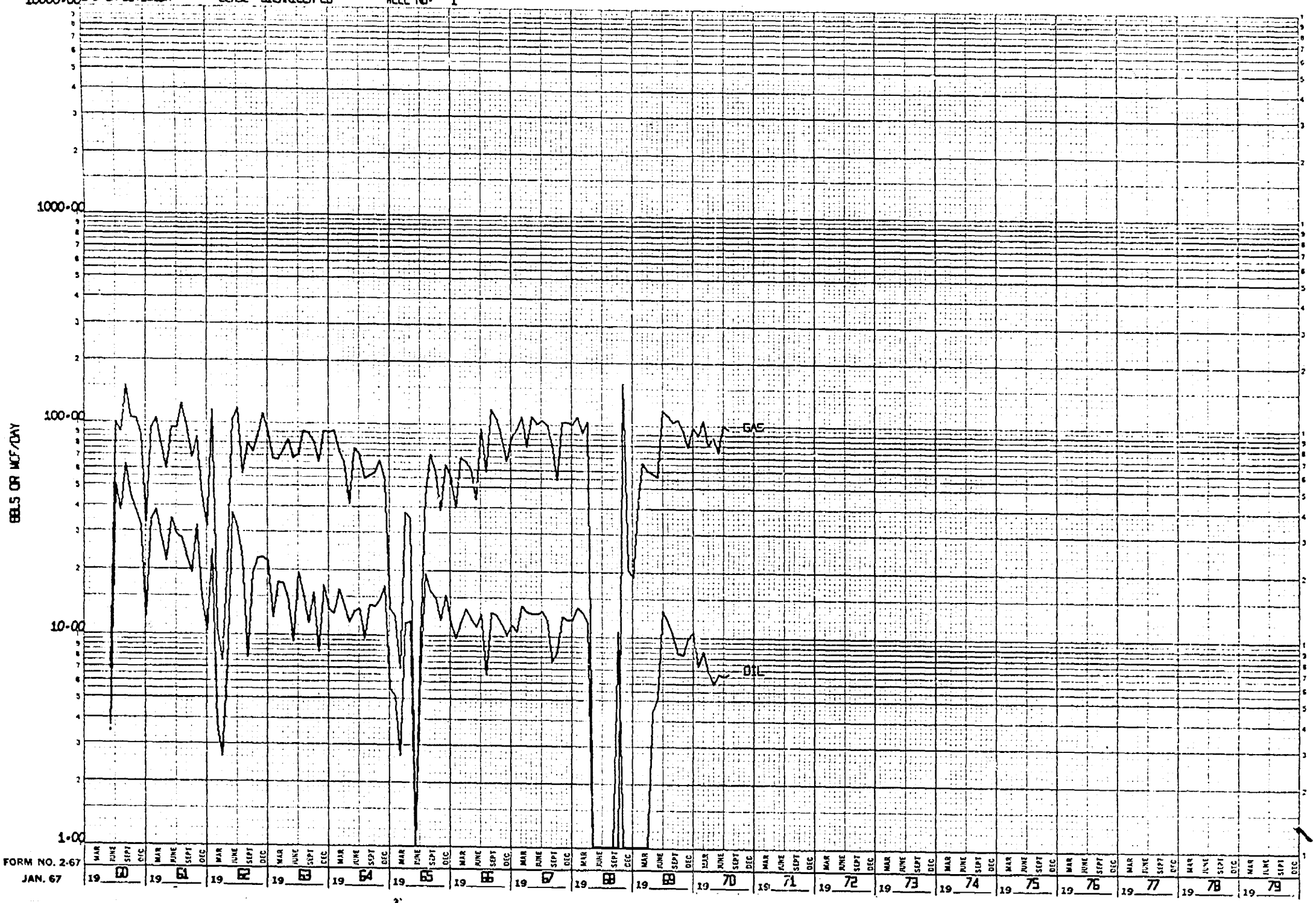
STATE· NEW MEXICO

LEASE· JICARILLA 28

FIELD· WEST LINDRITH

WELL NO· 1

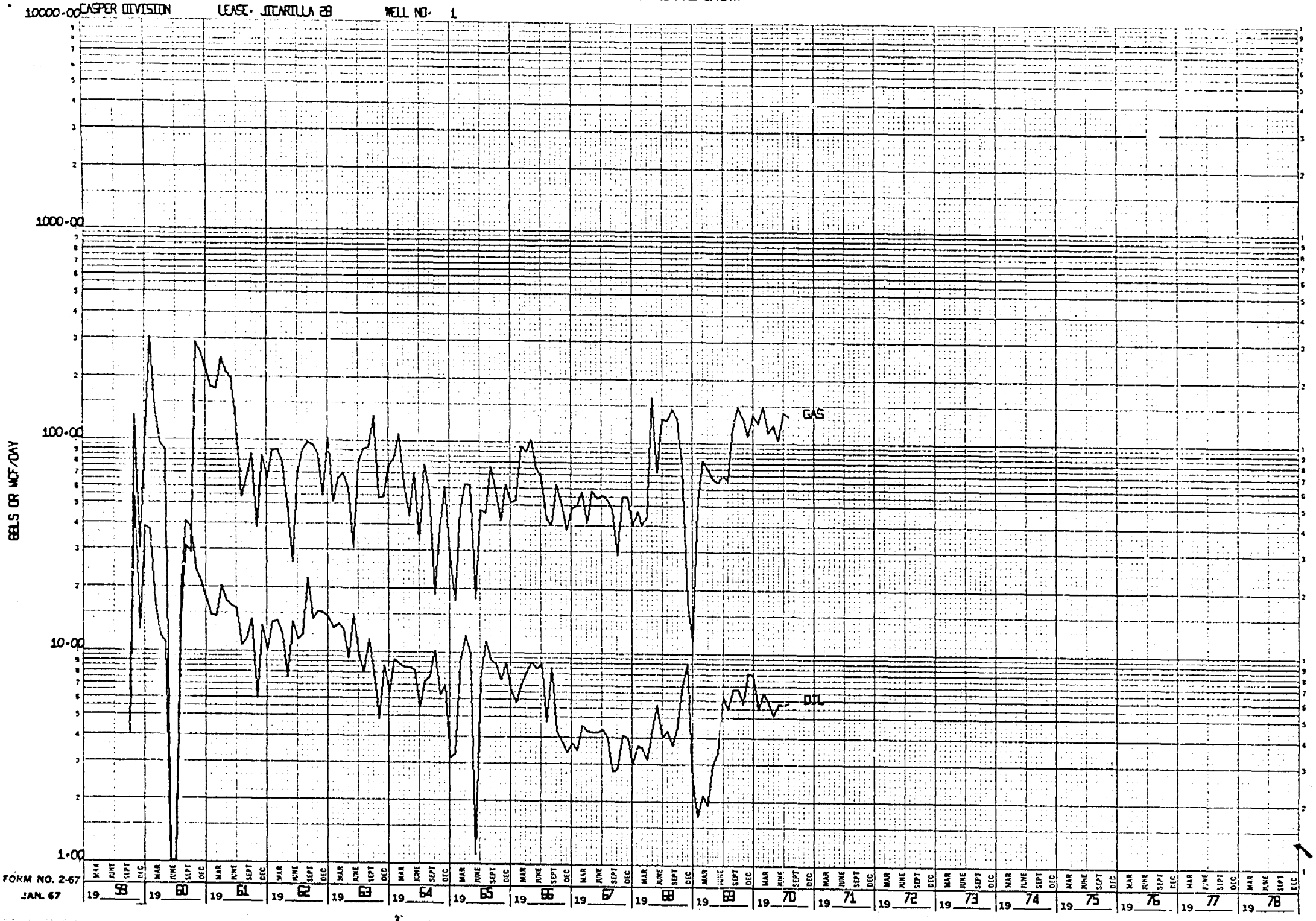
RESERVOIR· UNDESIGNATED GALLUP



FORM NO. 2-67
JAN. 67

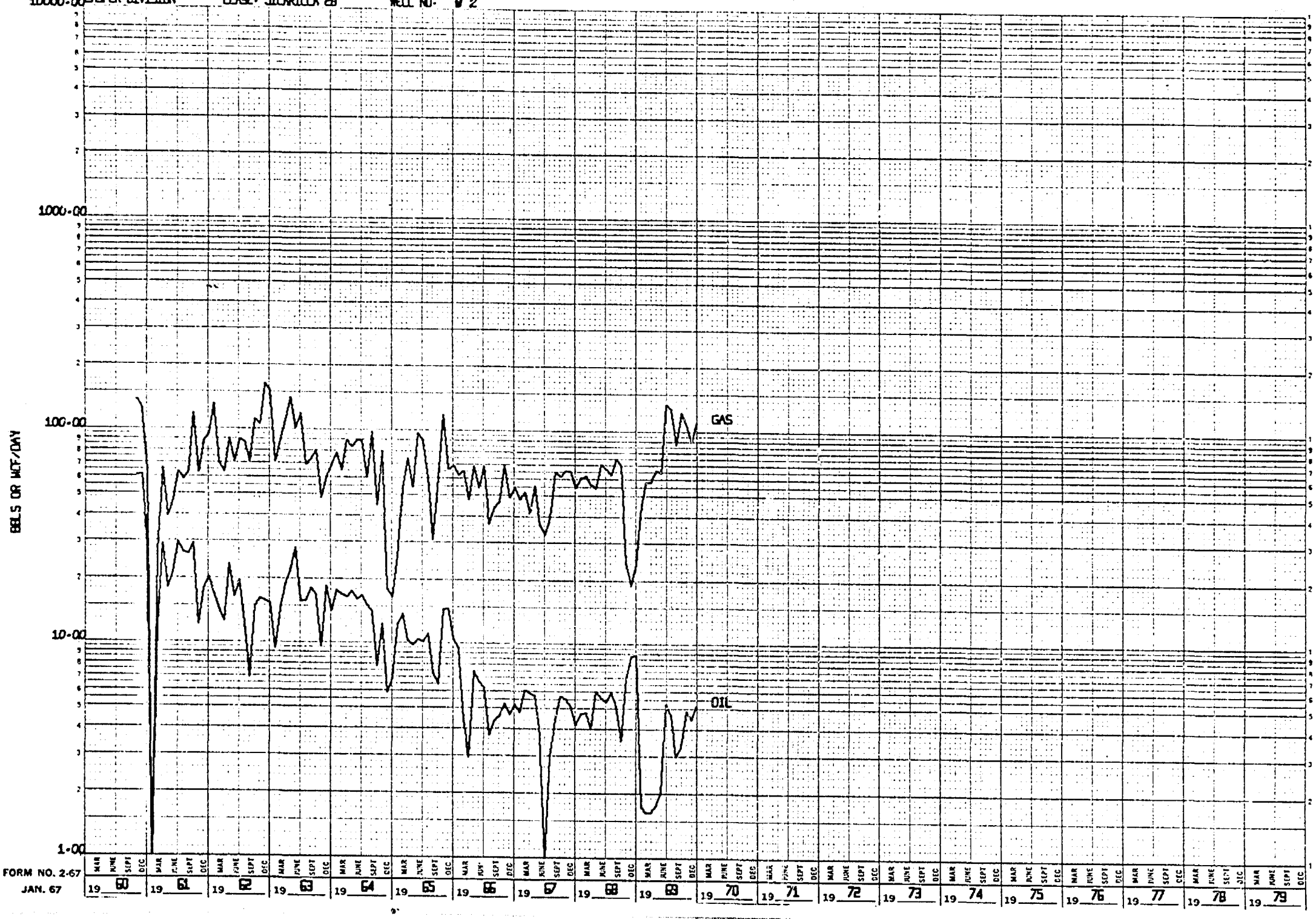
CONTINENTAL OIL CO. — STATE: NEW MEXICO — FIELD: WEST LINDRITH — RESERVOIR: UNDESIGNATED DAKOTA

CASPER DIVISION — LEASE: JICARILLA 28 — WELL NO: 1



FORM NO. 2-67
JAN. 67

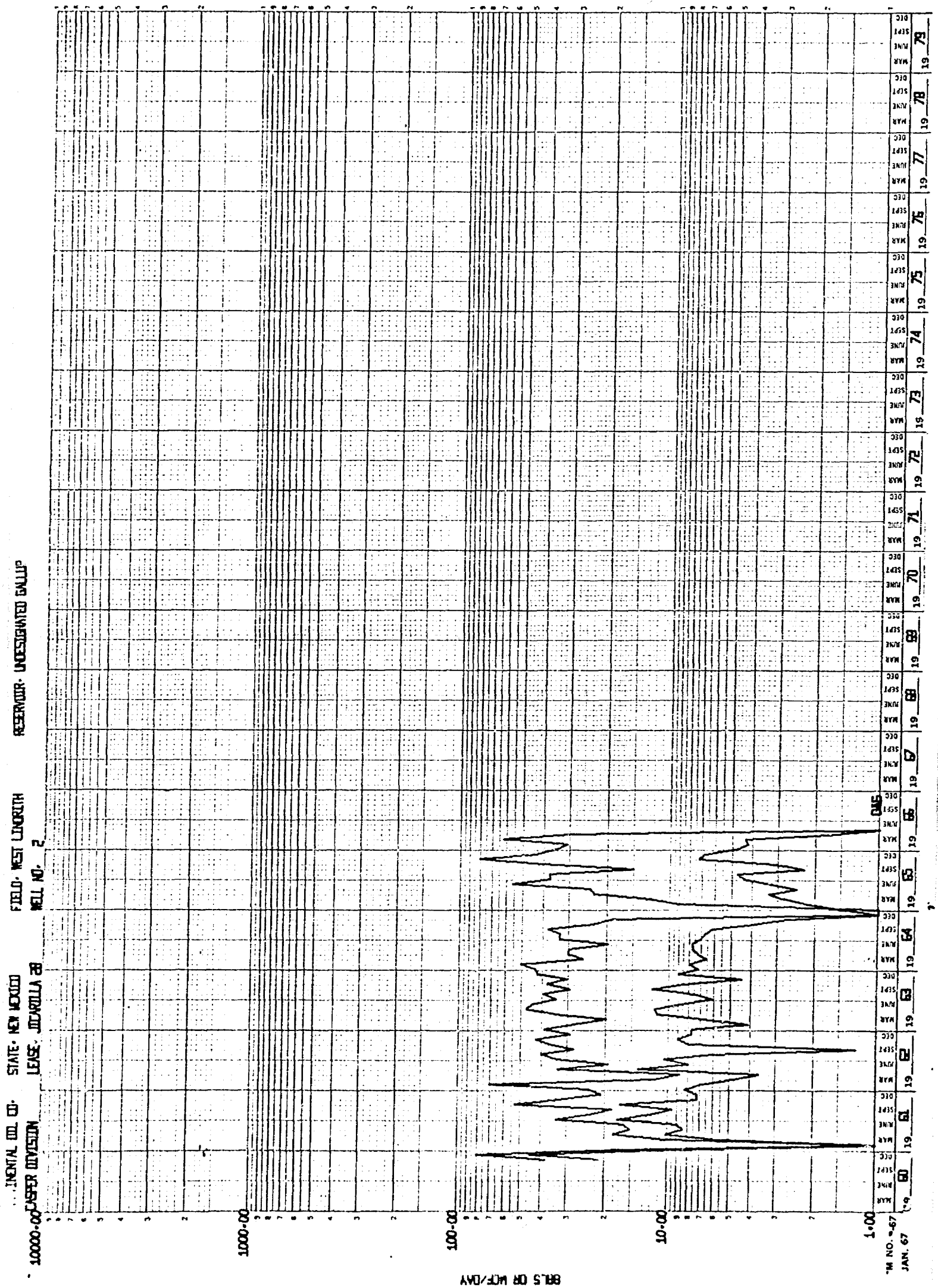
..TINENTAL OIL CO. STATE· NEW MEXICO FIELD· WEST LINDRITH RESERVOIR· UNDESIGNATED GALLUP/DAKOTA
CASPER DIVISION LEASE· JICARILLA 28 WELL NO· # 2



FORM NO. 2-67
JAN. 67

...INENTAL OIL CO. STATE: NEW MEXICO FIELD: WEST LINDRITH RESERVOIR: UNDESIGNATED

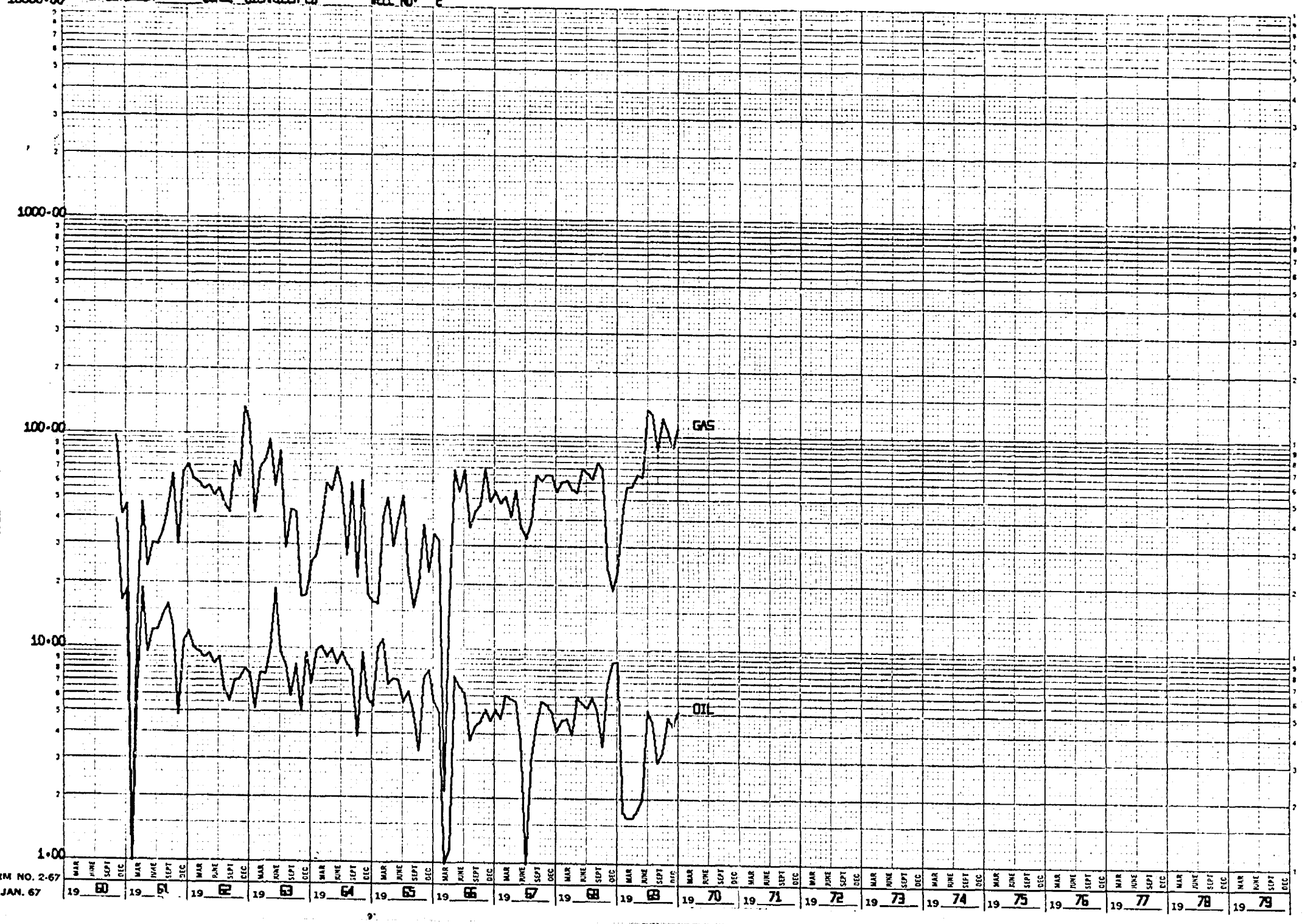
...CASPER DIVISION LEASE: JICARILLA 28 WELL NO. 2



TM NO. 4-67
JAN. 67

CONTINENTAL OIL CO. — STATE- NEW MEXICO — FIELD- WEST LINDRITH — RESERVOIR- UNDESIGNATED DAKOTA

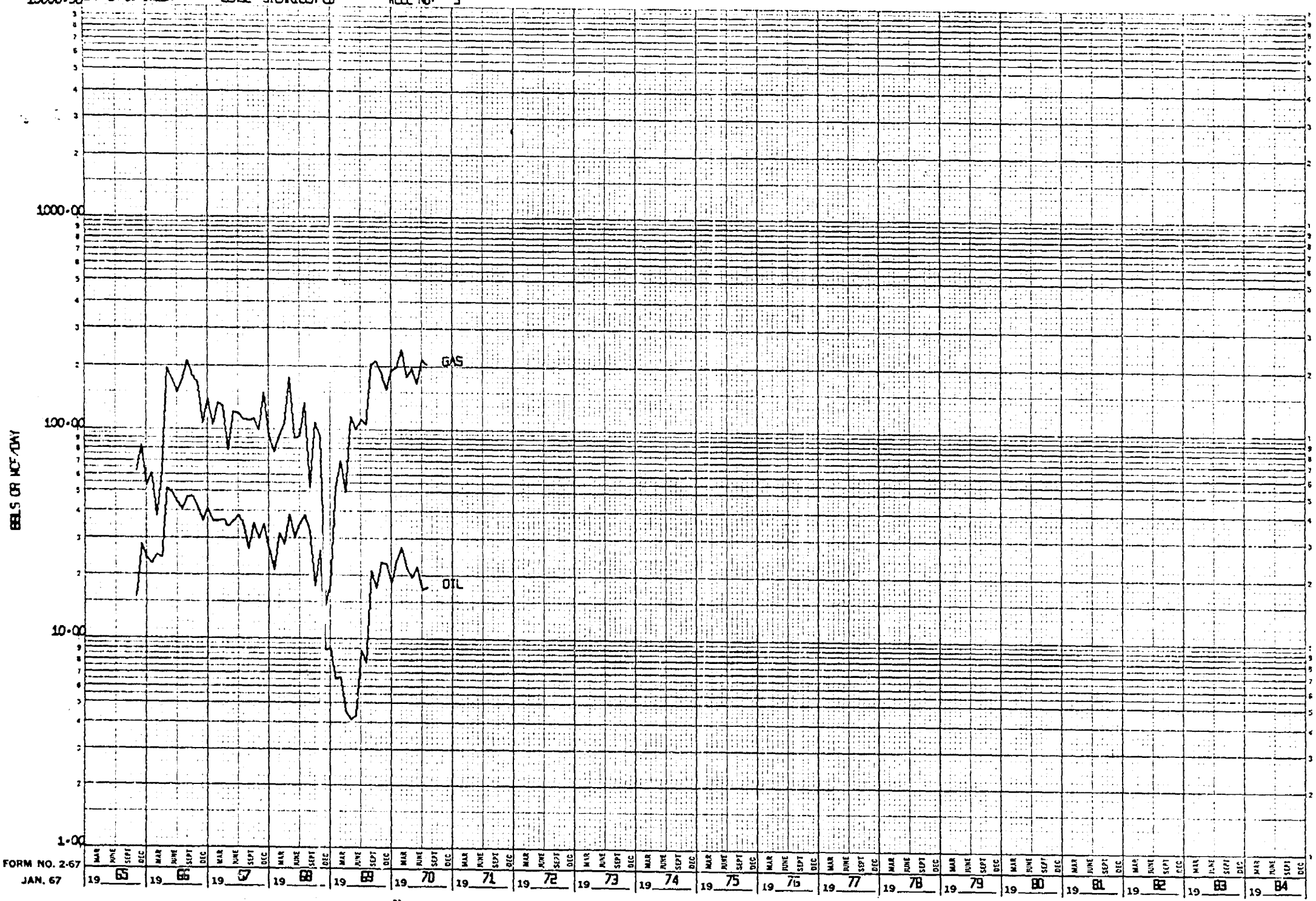
CASPER DIVISION — LEASE- JICARILLA 28 — WELL NO- 2



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. — STATE· NEW MEXICO — FIELD· WEST LINDRITH — RESERVOIR· DAKOTA-GALLUP

CASPER DIVISION — LEASE· JICARILLA 28 — WELL NO· 3



FORM NO. 2-67
JAN. 67

MAR JUNE SEPT DEC

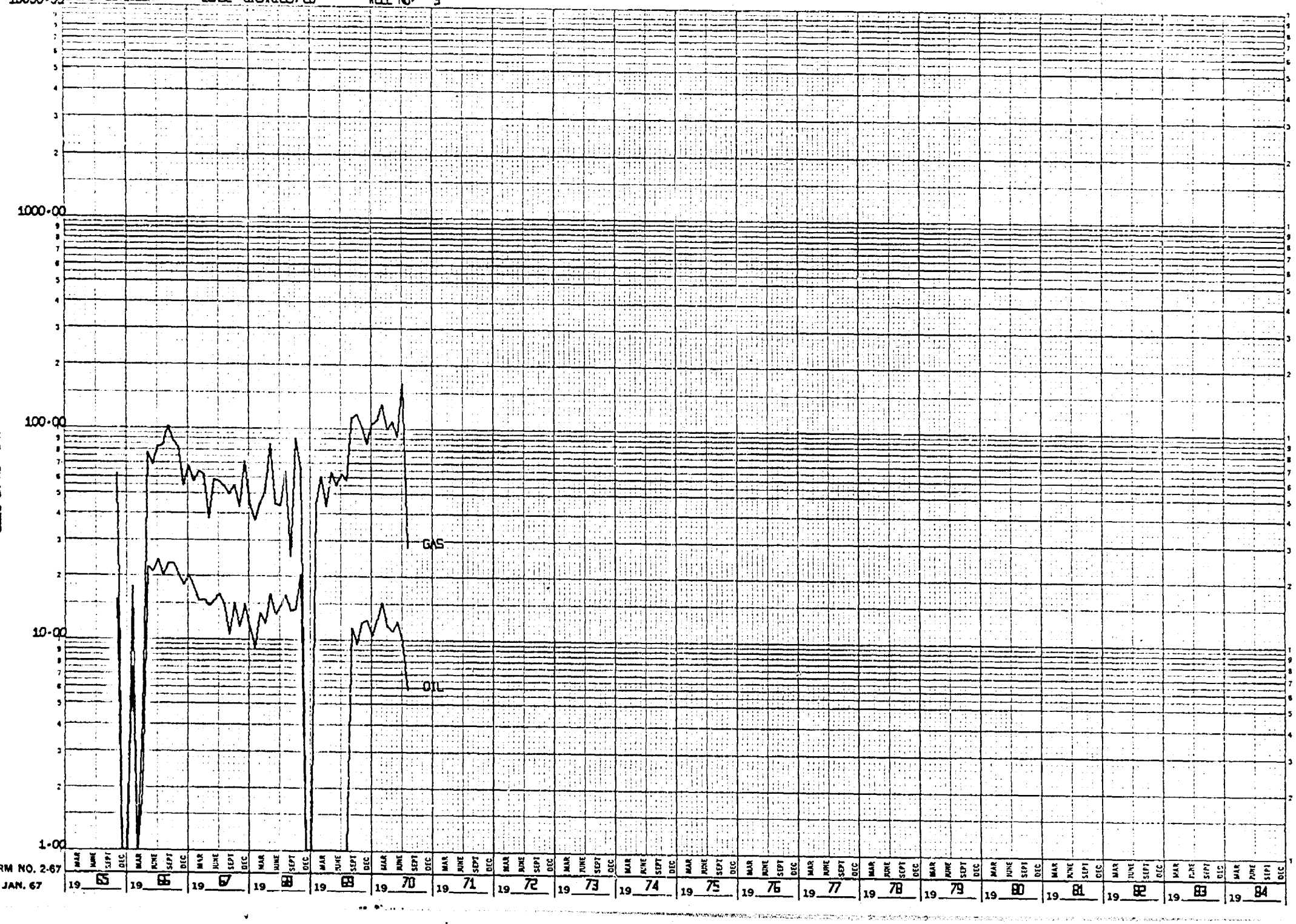
19 65 | 19 66 | 19 67 | 19 68 | 19 69 | 19 70 | 19 71 | 19 72 | 19 73 | 19 74 | 19 75 | 19 76 | 19 77 | 19 78 | 19 79 | 19 80 | 19 81 | 19 82 | 19 83 | 19 84

CONTINENTAL OIL CO. — CASPER DIVISION

STATE: NEW MEXICO — LEASE: JICARILLA 28

FIELD: WEST LINDRITH — WELL NO: 3

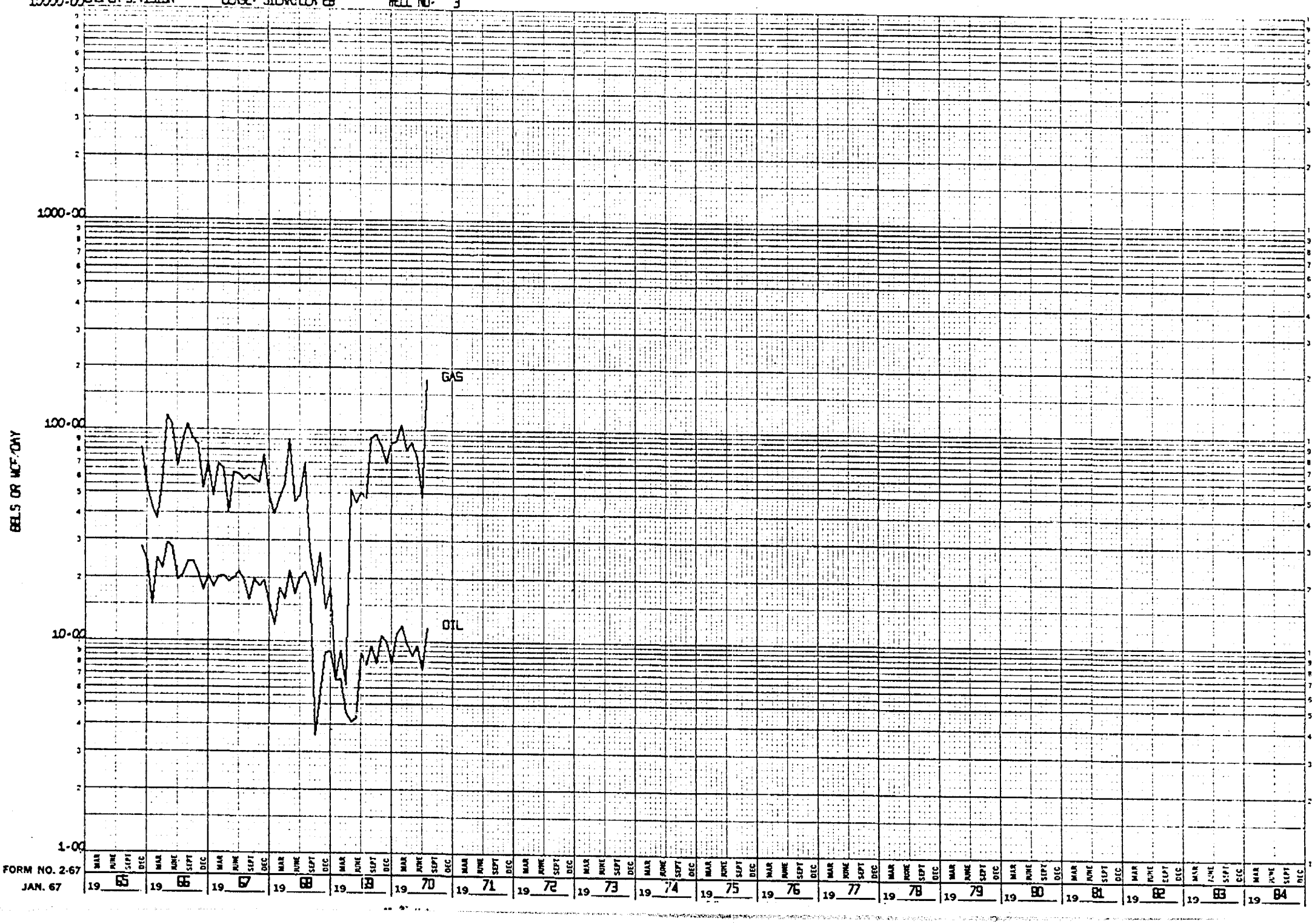
RESERVOIR: UNDESIGNATED GALLUP



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. STATE- NEW MEXICO FIELD- WEST LINDRITH RESERVOIR- UNDESIGNATED DAKOTA

CASPER DIVISION LEASE- JICARILLA 28 WELL NO- 3



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. — STATE- NEW MEXICO — FIELD- WEST LINDRITH — RESERVOIR- DAKOTA-GALLUP

CASPER DIVISION — LEASE- JICARILLA 28 — WELL NO- 4

BBLS OR MCF/DAY

10000-00
1000-00
100-00
10-00
1-00

GAS

OIL

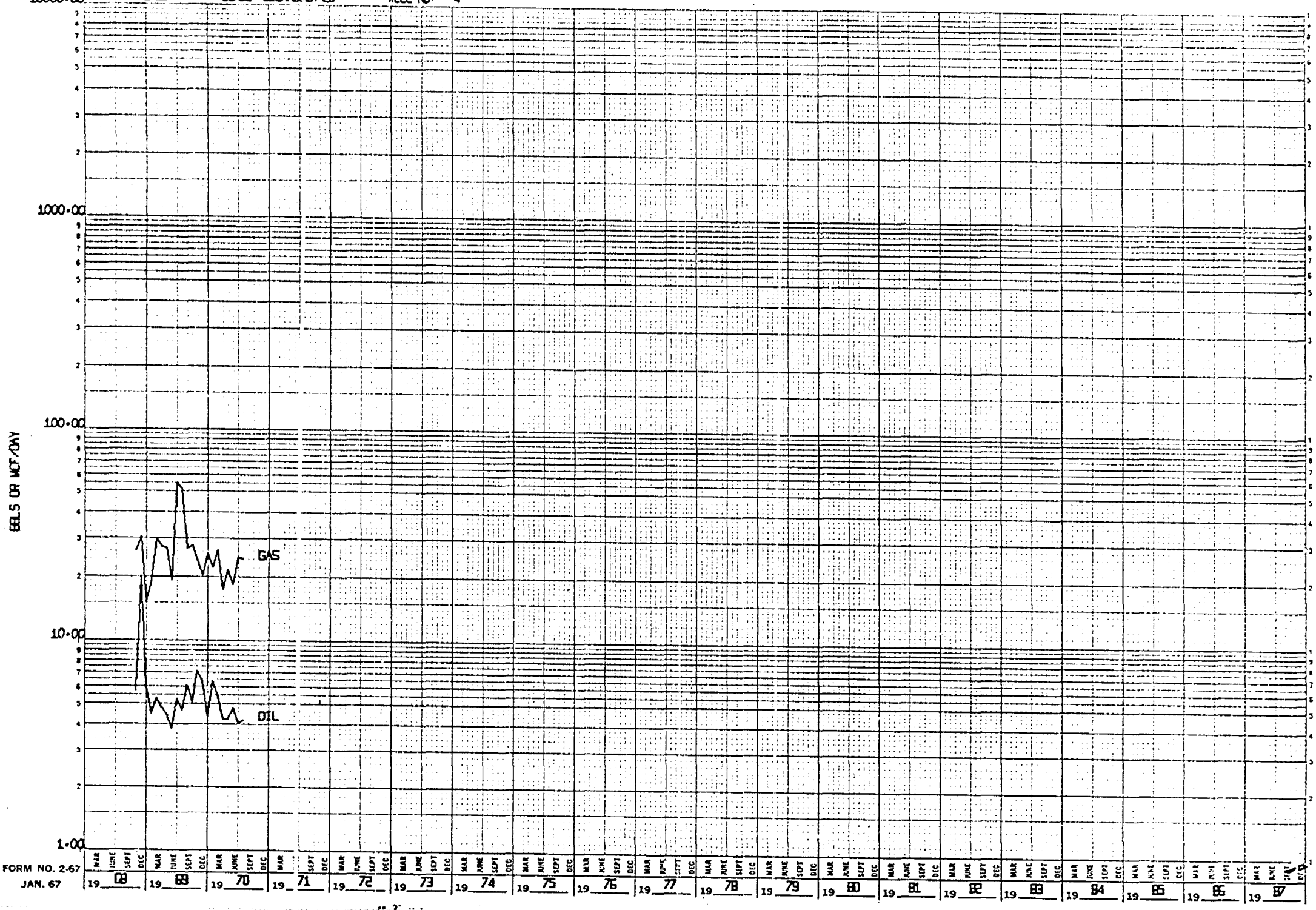
MAR JUNE SEPT DEC

19 68 | 19 69 | 19 70 | 19 71 | 19 72 | 19 73 | 19 74 | 19 75 | 19 76 | 19 77 | 19 78 | 19 79 | 19 80 | 19 81 | 19 82 | 19 83 | 19 84 | 19 85 | 19 86 | 19 87

FORM NO. 2-67
JAN. 67

STATE· NEW MEXICO FIELD· WEST LINDRITH RESERVOIR· UNDESIGNATED GALLUP

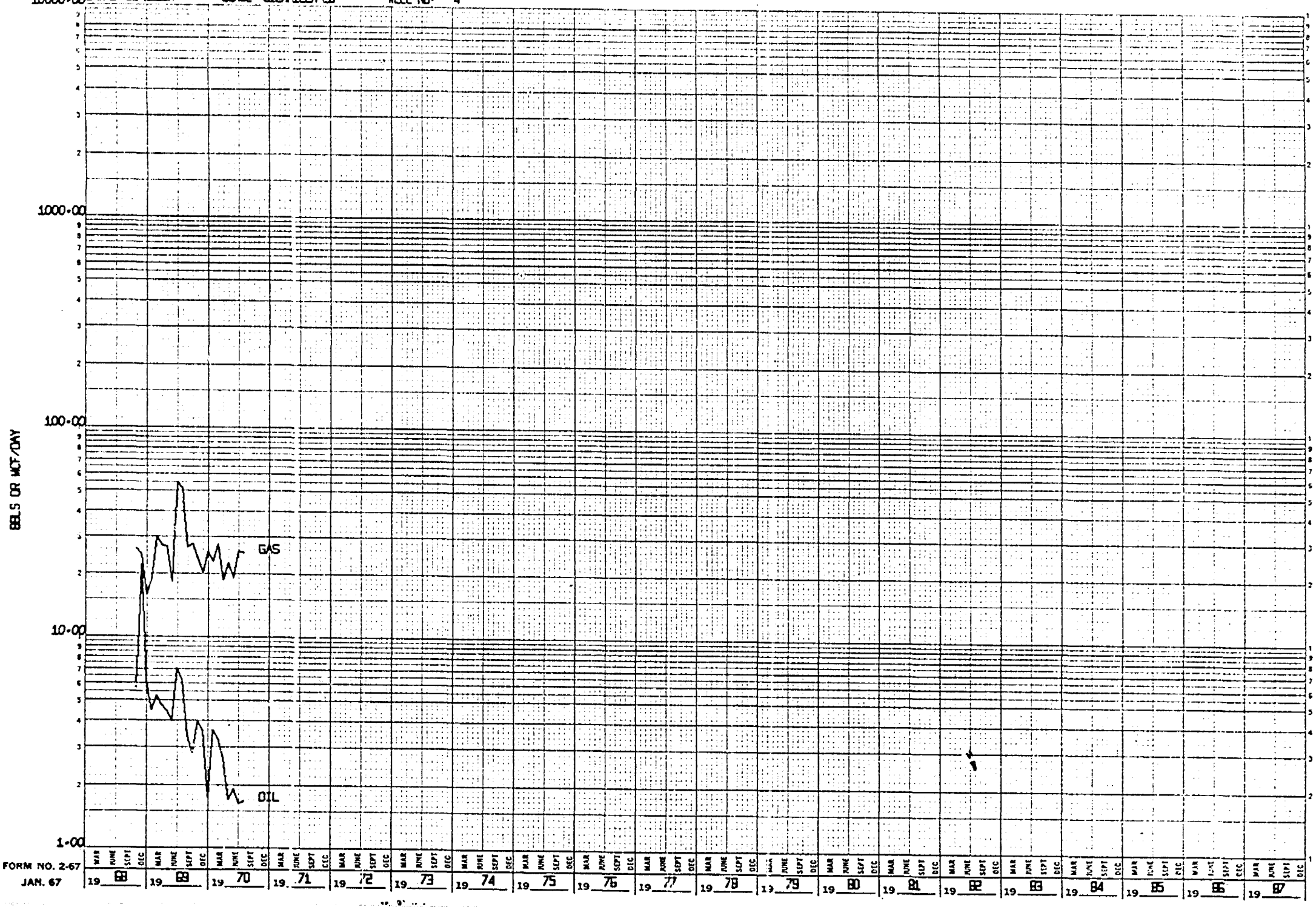
CASPER DIVISION LEASE· JICARILLA 28 WELL NO· 4



FORM NO. 2-67
JAN. 67

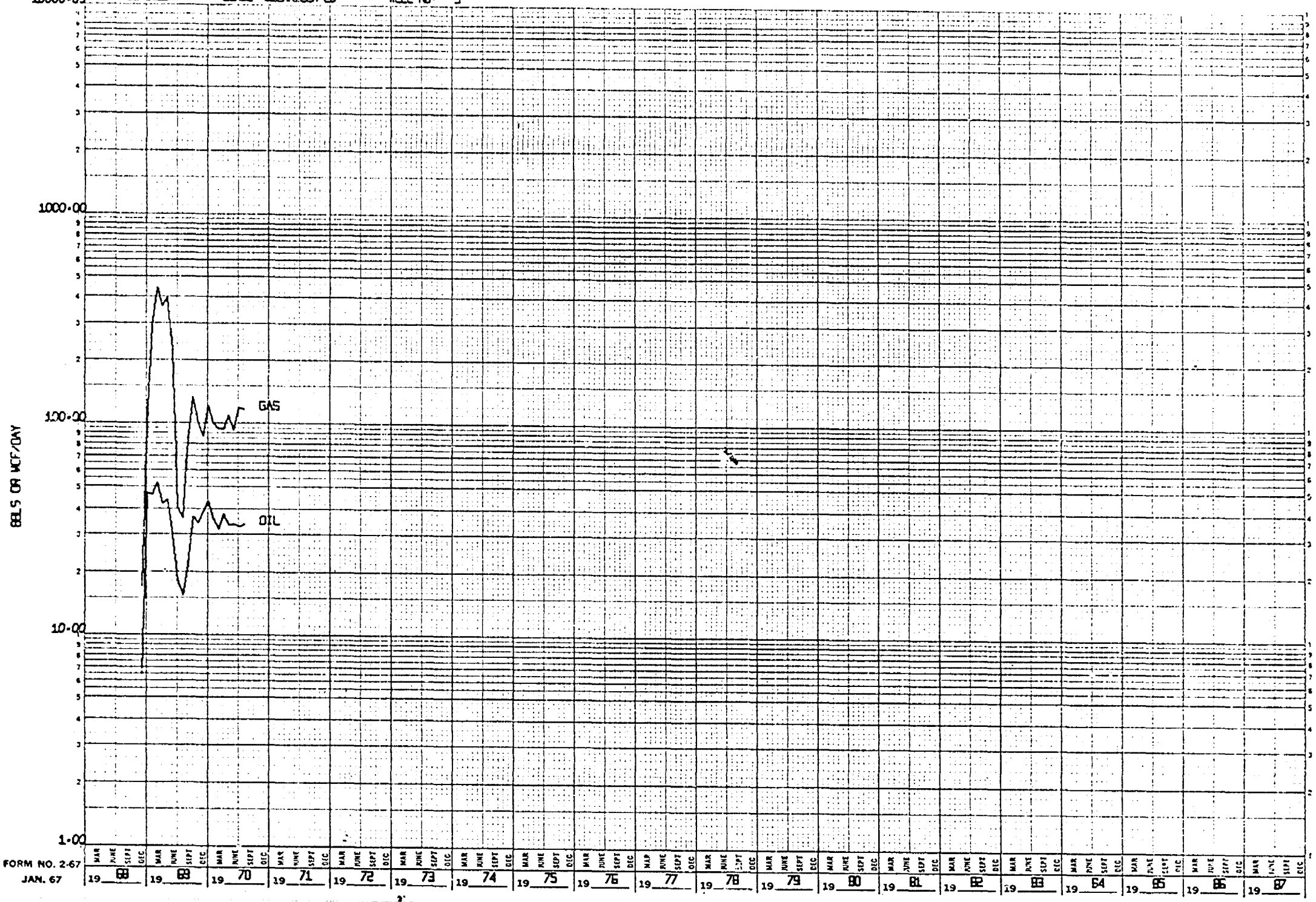
CONTINENTAL OIL CO. — STATE: NEW MEXICO — FIELD: WEST LINDRITH — RESERVOIR: UNDESIGNATED DAKOTA

CASPER DIVISION — LEASE: JICARILLA 28 — WELL NO: 4



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. STATE· NEW MEXICO FIELD· WEST LINDRITH RESERVOIR· DAKOTA-GALLUP
CASPER DIVISION LEASE· JICARILLA 29 WELL NO· 5



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. CASPER DIVISION

STATE· NEW MEXICO
LEASE· JICARILLA 2E

FIELD· WEST LINDRITH
WELL NO· 5

RESERVOIR· UNDESIGNATED GALLUP

BBLS OR MCF/DAY

10000·00
1000·00
100·00
10·00
1·00

GAS
OIL

MAR JUNE SEPT DEC

19 68 | 19 69 | 19 70 | 19 71 | 19 72 | 19 73 | 19 74 | 19 75 | 19 76 | 19 77 | 19 78 | 19 79 | 19 80 | 19 81 | 19 82 | 19 83 | 19 84 | 19 85 | 19 86 | 19 87

FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. CASPER DIVISION

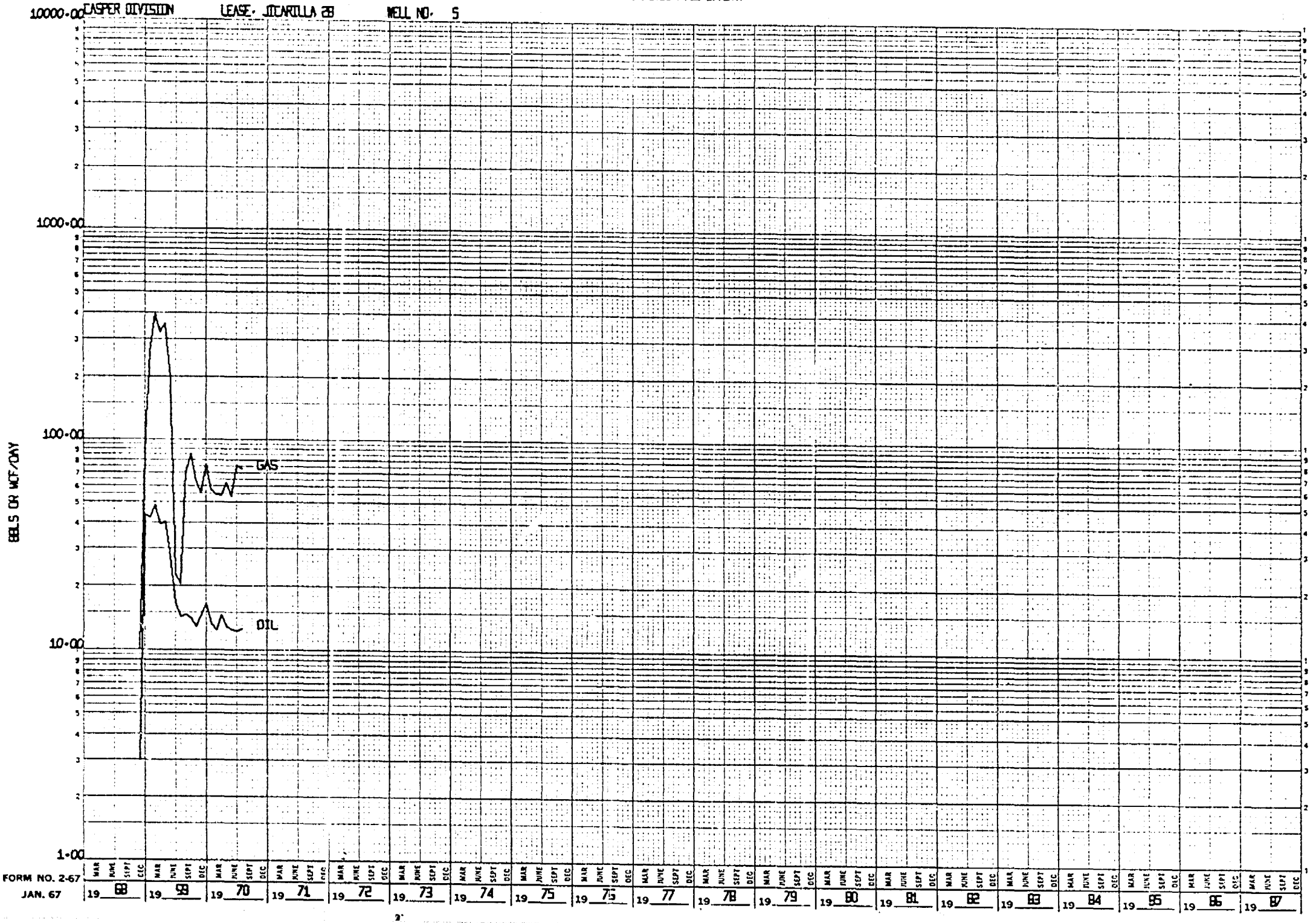
STATE· NEW MEXICO

LEASE· JICARILLA 28

FIELD· WEST LINDRITH

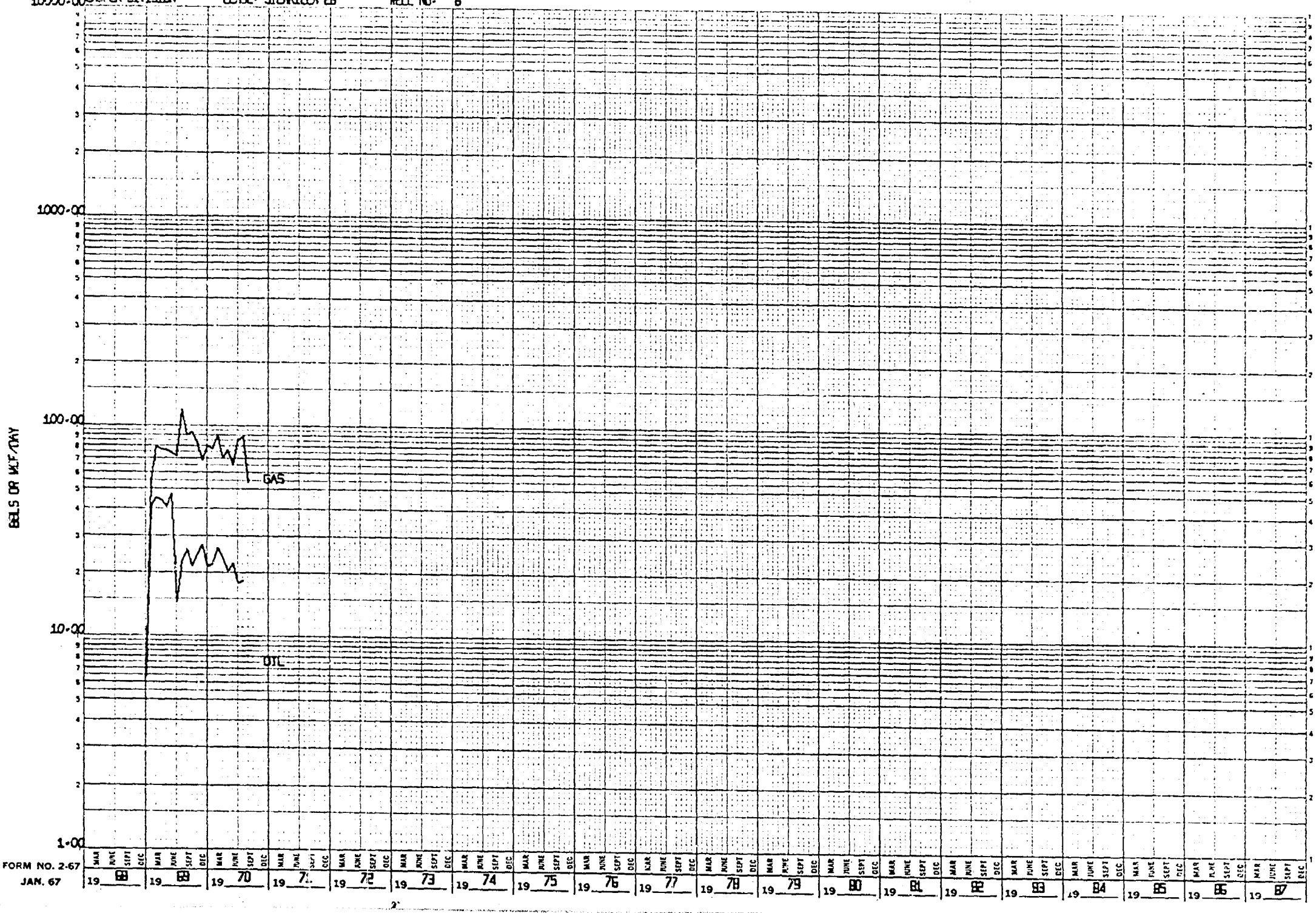
WELL NO· 5

RESERVOIR· UNDESIGNATED DAKOTA



FORM NO. 2-67
JAN. 67

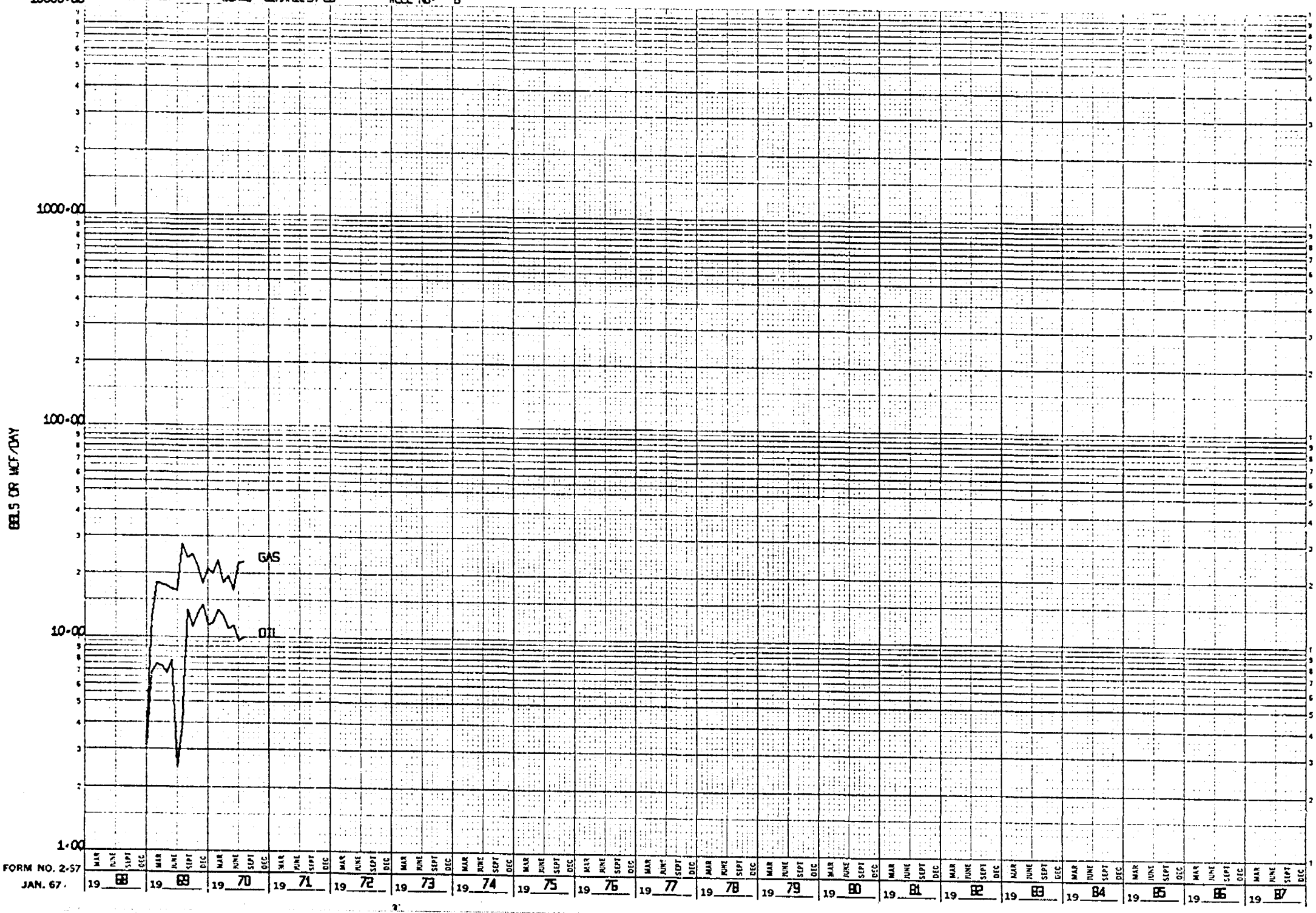
CONTINENTAL OIL CO- CASPER DIVISION | STATE- NEW MEXICO | LEASE- JICARILLA 28 | FIELD- WEST LINDRITH | WELL NO- 6 | RESERVOIR- DAKOTA-GALLUP



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. — STATE: NEW MEXICO — FIELD: WEST LINDRITH — RESERVOIR: UNDESIGNATED GALLUP

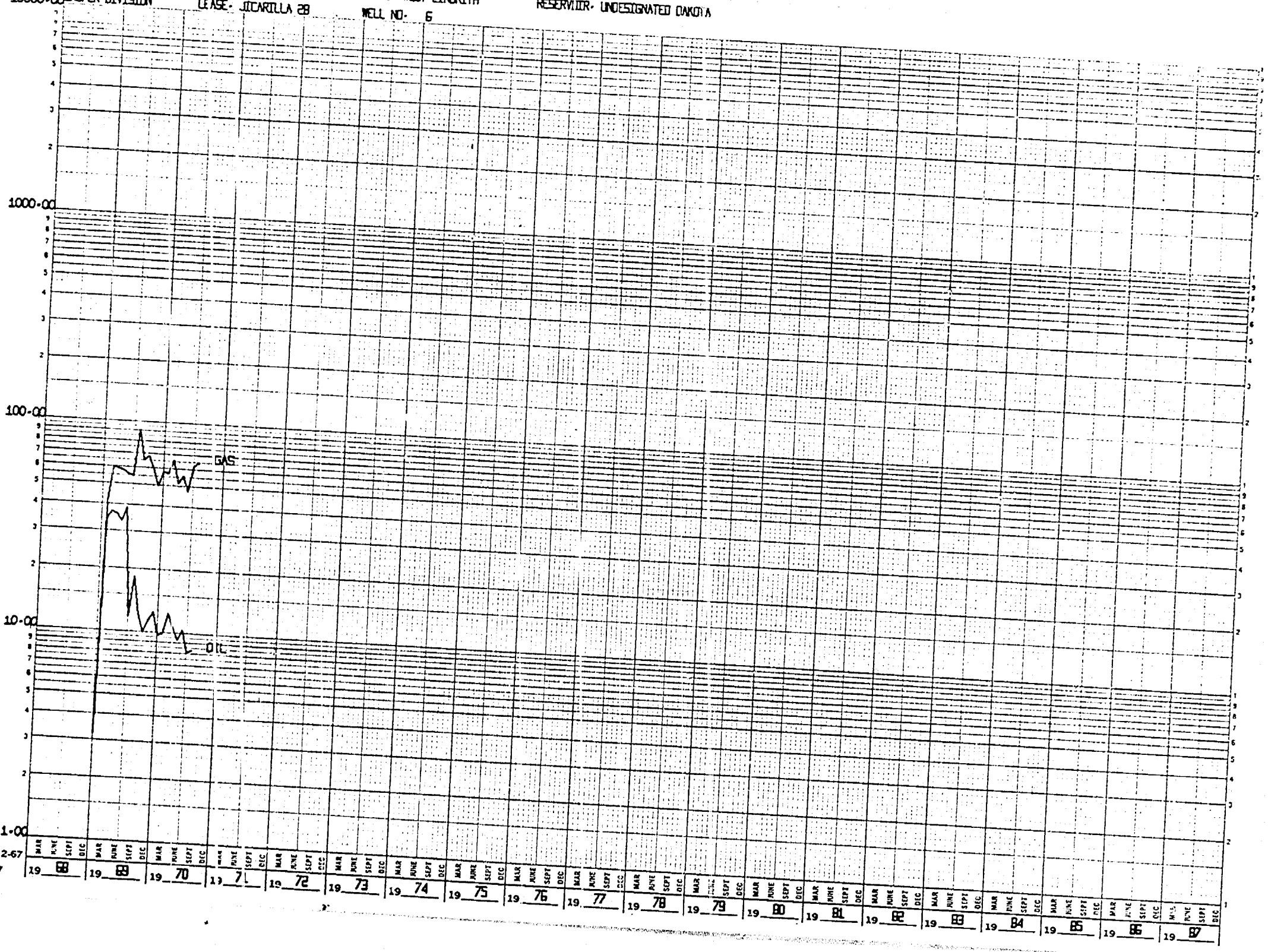
CASPER DIVISION — LEASE: JICARILLA 28 — WELL NO: 6



FORM NO. 2-57
JAN. 67

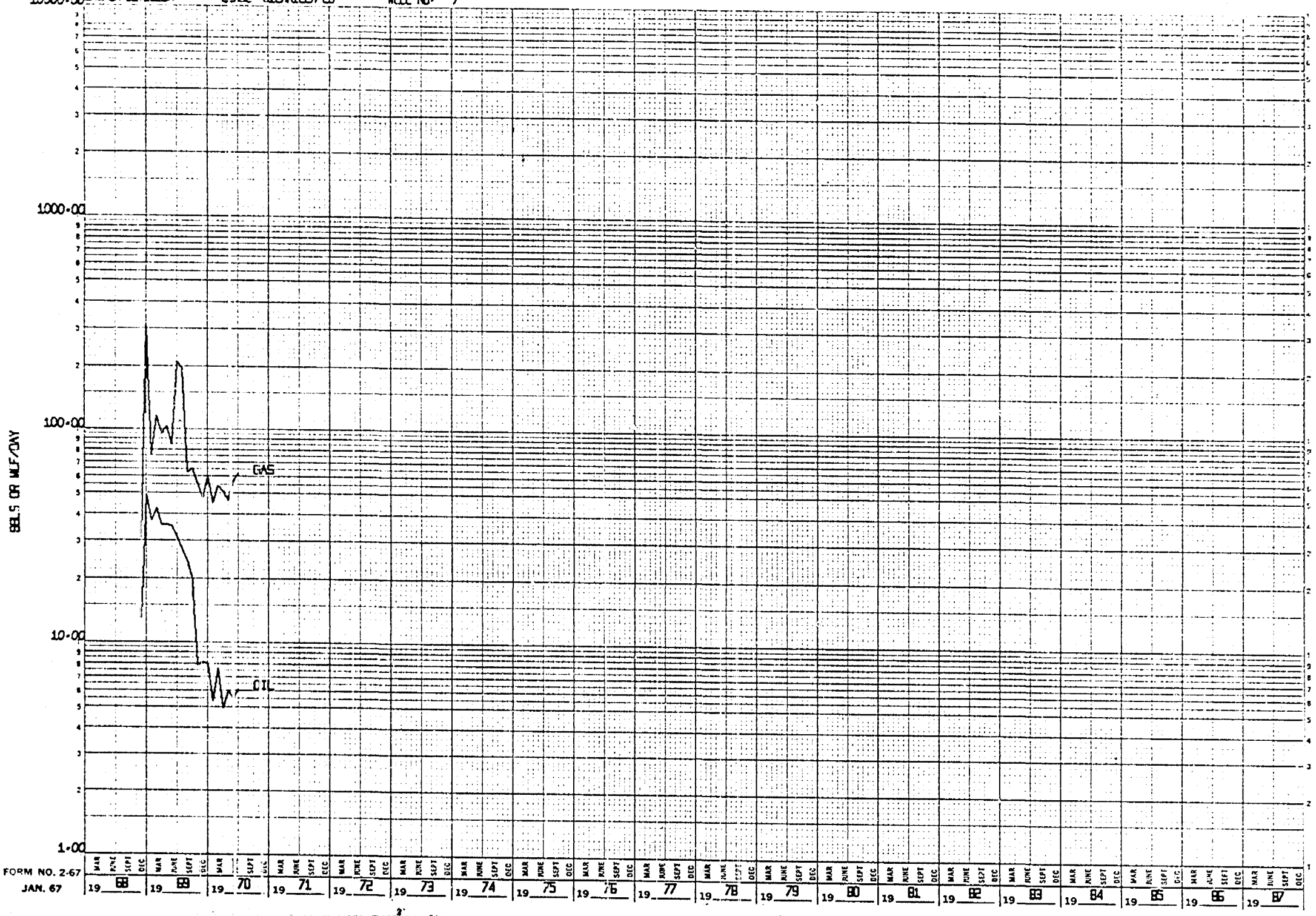
CONTINENTAL OIL CO. — STATE· NEW MEXICO — FIELD· WEST LINDRITH — RESERVOIR· UNDESIGNATED DAKOTA

CASPER DIVISION — LEASE· JICARILLA 28 — WELL NO· 6



FORM NO. 2-67
JAN. 67

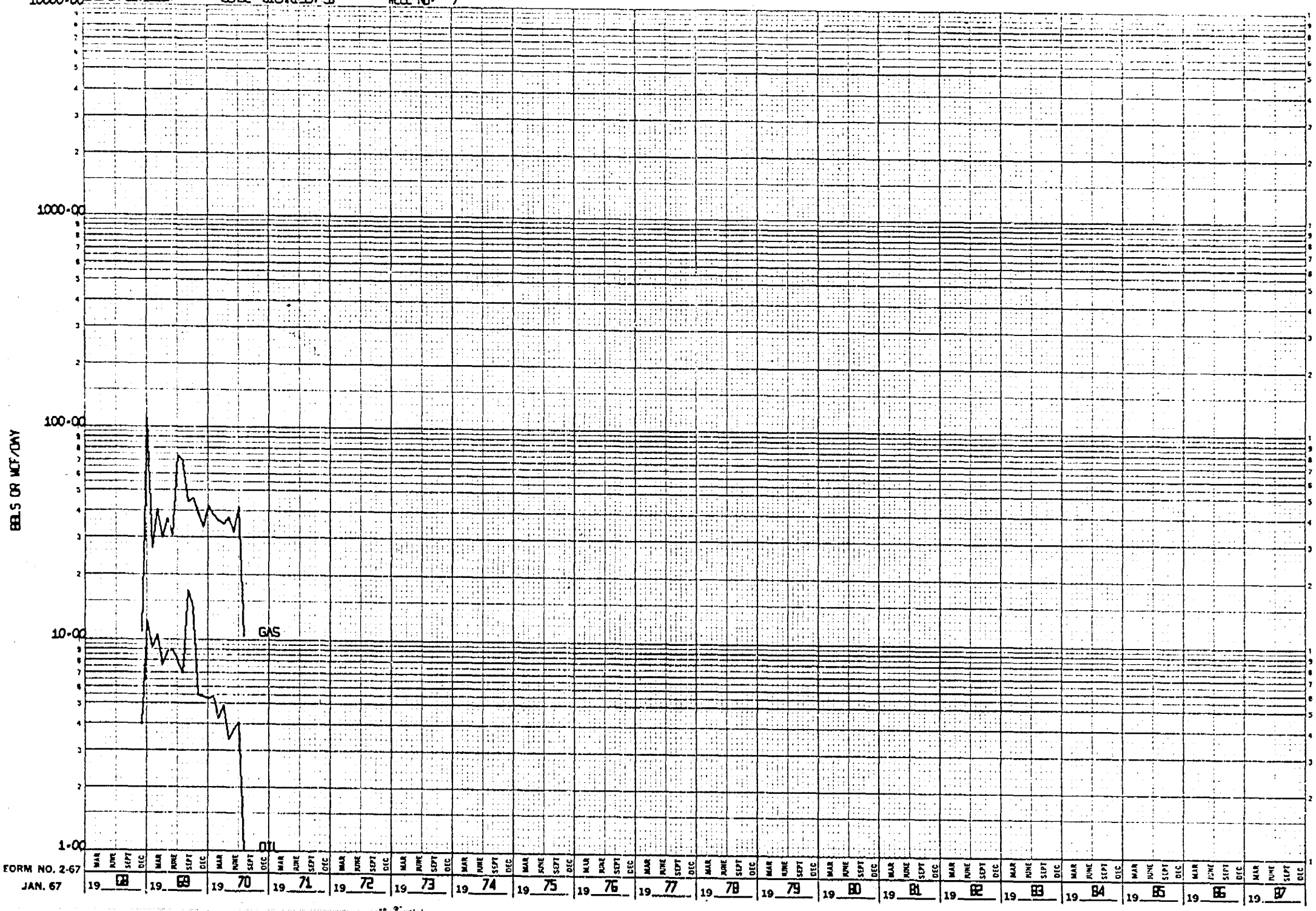
CONTINENTAL OIL CO. CASPER DIVISION | STATE· NEW MEXICO | LEASE· JICARILLA 28 | FIELD· WEST LINDRITH | WELL NO· 7 | RESERVOIR· DAKOTA-GALLUP



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. — STATE: NEW MEXICO — FIELD: WEST LINDRITH — RESERVOIR: UNDESIGNATED GALLUP

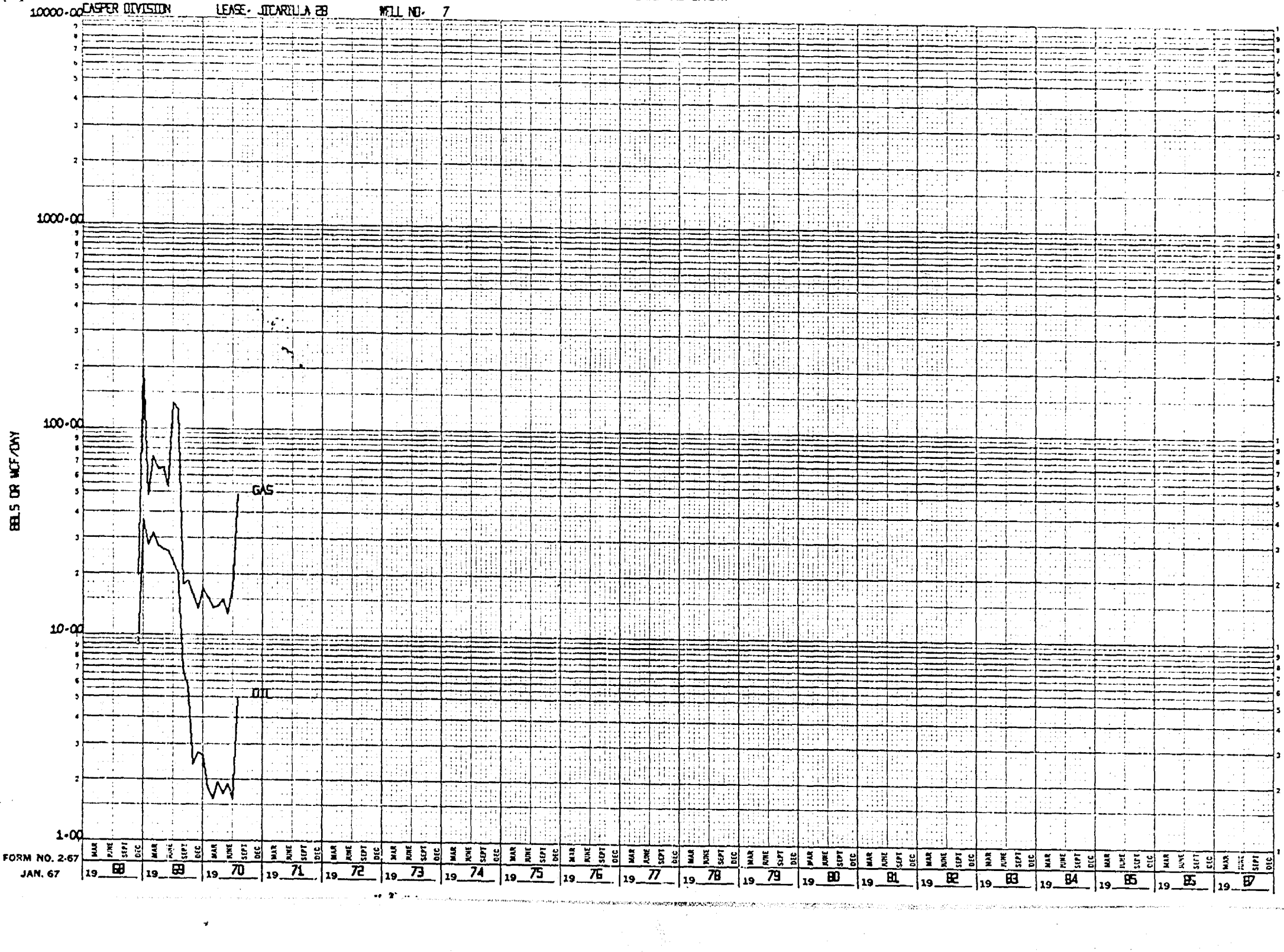
CASPER DIVISION — LEASE: JICARILLA 38 — WELL NO: 7



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. — STATE- NEW MEXICO — FIELD- WEST LINDRITH — RESERVOIR- UNDESIGNATED DAKOTA

CASPER DIVISION — LEASE- JICARILLA 28 — WELL NO- 7



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. — STATE: NEW MEXICO — FIELD: WEST LINDRITH — RESERVOIR: DAKOTA-GALLUP

CASPER DIVISION — LEASE: JICARILLA 28 — WELL NO: 8

EXHIBIT "E_3"

BBLS OR MCF/DAY

10000.00 · 1000.00 · 100.00 · 10.00 · 1.00

GAS

OIL

MAR · JUNE · SEPT · DEC

19 68 · 19 70 · 19 71 · 19 72 · 19 73 · 19 74 · 19 75 · 19 76 · 19 77 · 19 78 · 19 79 · 19 80 · 19 81 · 19 82 · 19 83 · 19 84 · 19 85 · 19 86 · 19 87 · 19 88

FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. CASPER DIVISION

STATE· NEW MEXICO LEASE· JICARILLA 28

WEST FIELD· LINDRITH WELL NO· 8

RESERVOIR· UNDESIGNATED GALLUP

EXHIBIT "E_2"

BBLS OR MCF/DAY

10000·00
1000·00
100·00
10·00
1·00

GAS

OIL

MAR JUNE SEPT DEC

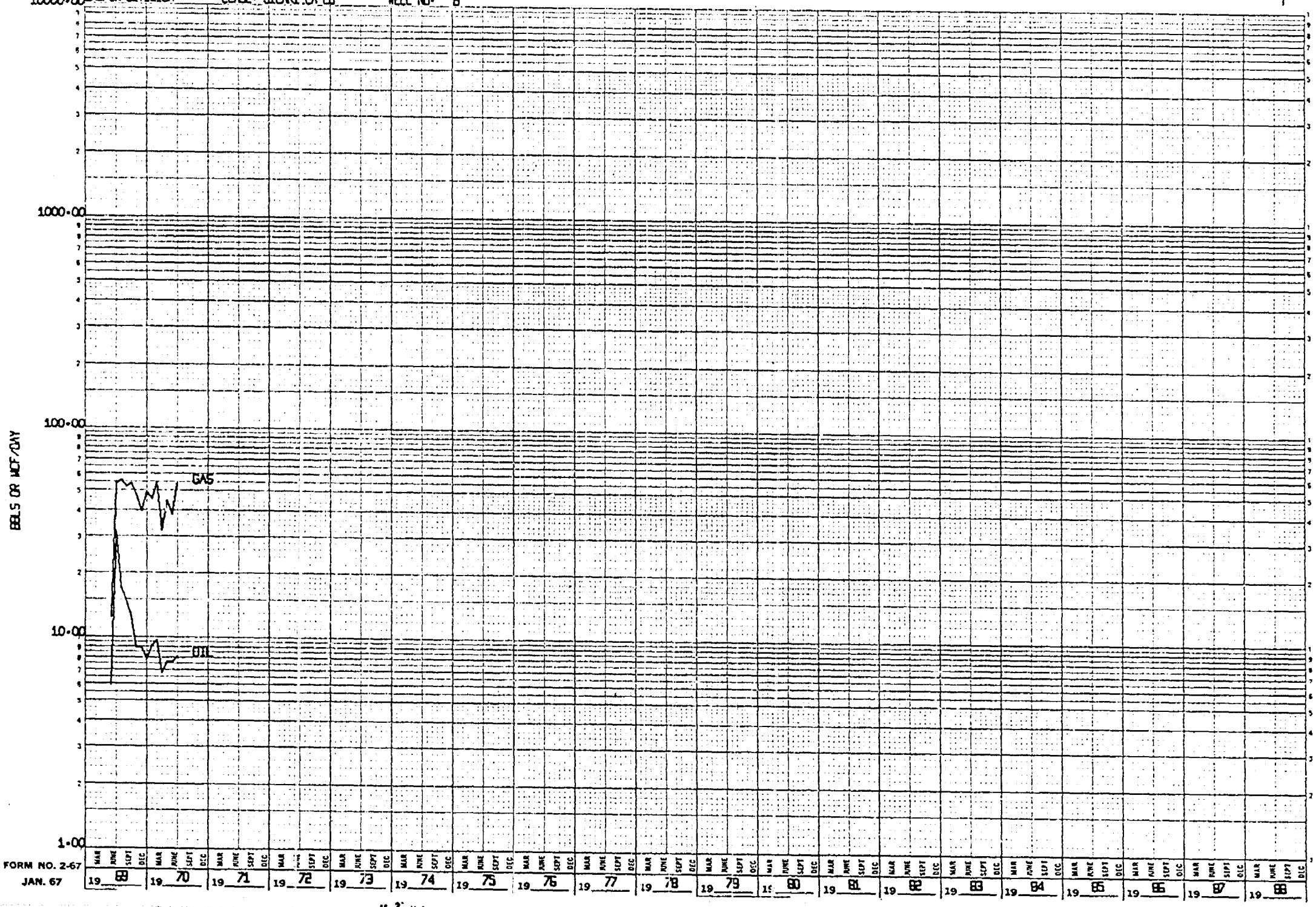
19 68 19 70 19 71 19 72 19 73 19 74 19 75 19 76 19 77 19 78 19 79 19 80 19 81 19 82 19 83 19 84 19 85 19 86 19 87 19 88

FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. STATE: NEW MEXICO FIELD: WEST LINDRITH RESERVOIR: UNDESIGNATED DAKOTA

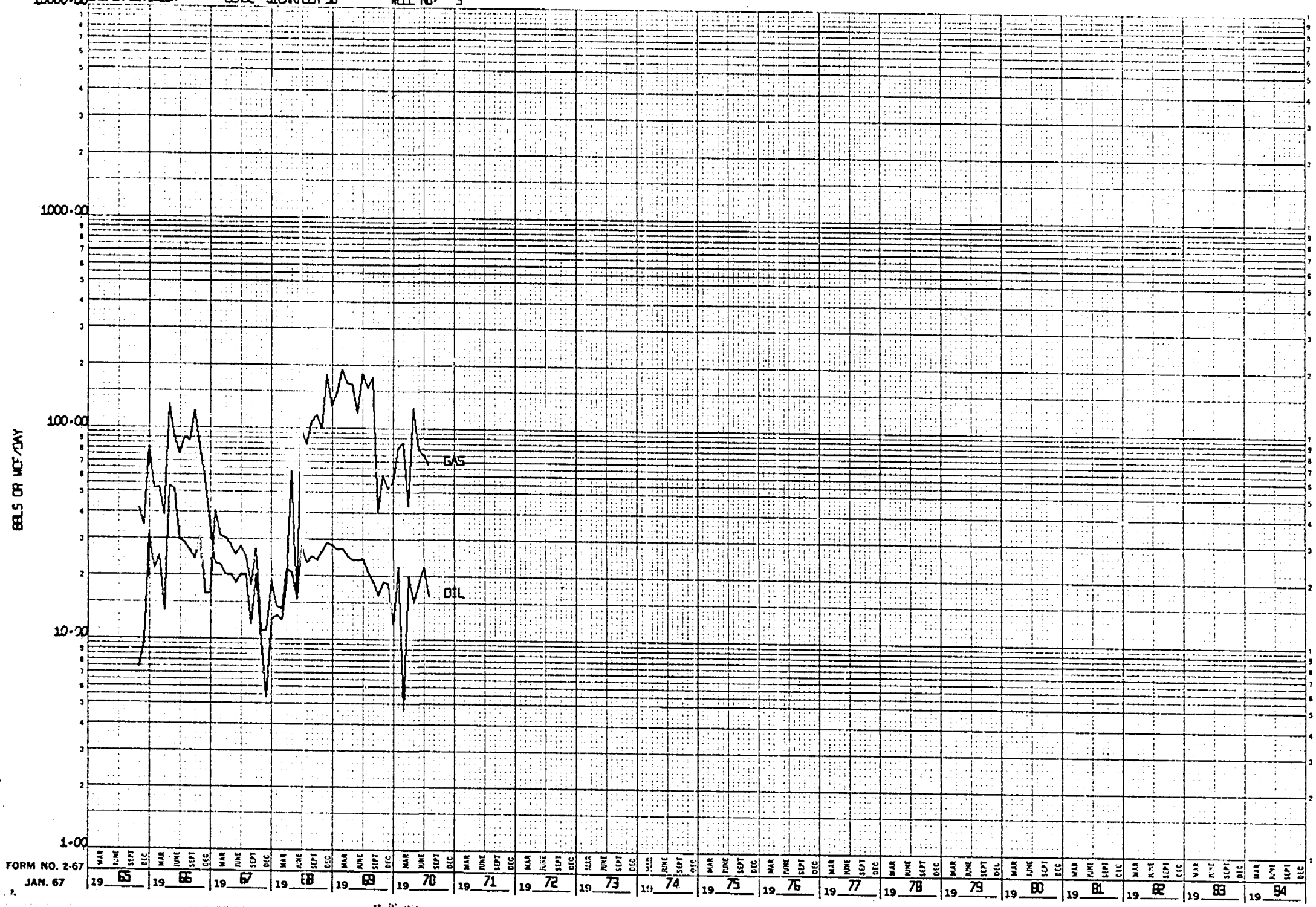
CASPER DIVISION LEASE: JICARILLA 28 WELL NO: 8

EXHIBIT "E$_1$"



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. STATE· NEW MEXICO FIELD· WEST LINDRITH RESERVOIR· DAKOTA-GALLUP
CASPER DIVISION LEASE· JICARILLA 30 WELL NO· 3



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. CASPER DIVISION

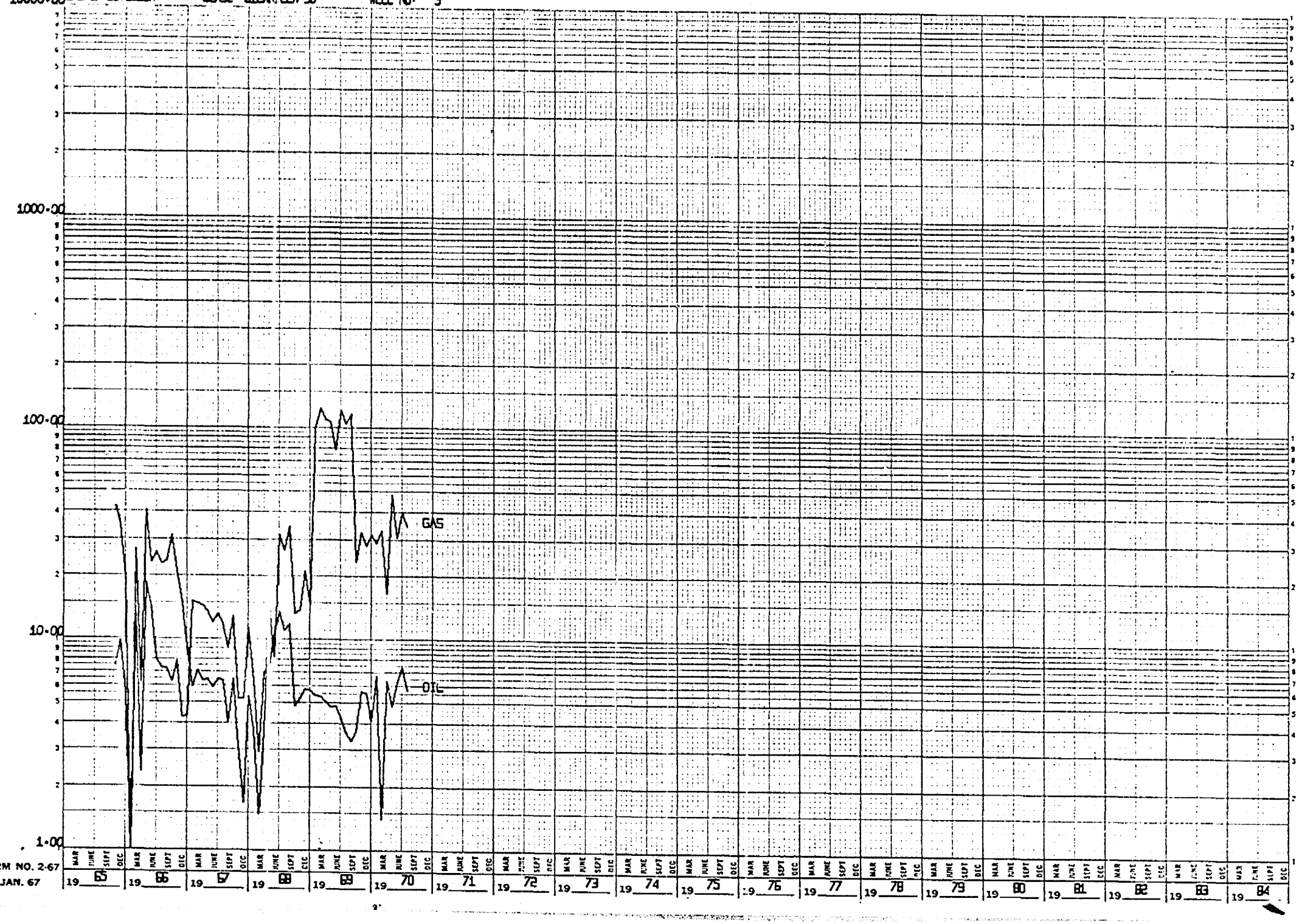
STATE· NEW MEXICO

LEASE· JICARILLA 30

FIELD· WEST LINDRITH

WELL NO· 3

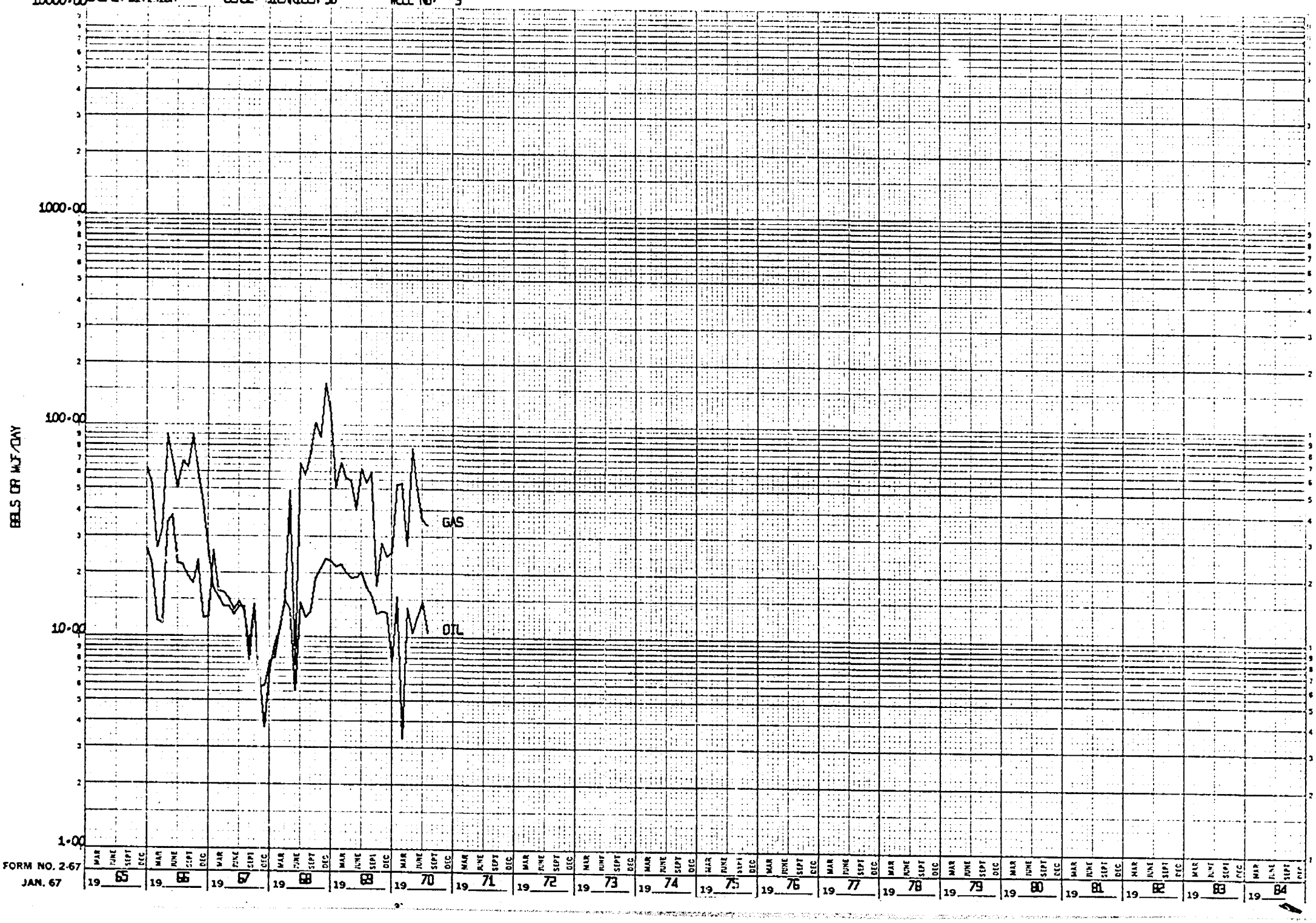
RESERVOIR· UNDESIGNATED DAKOTA



FORM NO. 2-67
JAN. 67

CONTINENTAL OIL CO. — STATE: NEW MEXICO — FIELD: WEST LINDRITH — RESERVOIR: UNDESIGNATED GALLUP

CASPER DIVISION — LEASE: JICARILLA 30 — WELL NO. 3



FORM NO. 2-67
JAN. 67

SUMMARY OF CORE DATA
GALLUP AND DAKOTA FORMATIONS
WEST LINDRITH FIELD

Well No.	No. of Samples	Avg K md	Avg Ø %	Avg S_w %	Avg S_{ro} %
Undesignated Gallup					
20-2	22	.17	4.7	46	34
28-1	30	.15	5.2	48	5
28-1(2nd Bench)	16	.13	6.0	38	6
22-1	7	.16	6.5	48	9
22-4	49	.15	4.4	52	27
Undesignated Dakota "D"					
28-1	27	.10	7.2	44	7
22-1	57	.39	10.0	44	7
22-4	3	.17	11.2	21	13
Undesignated Dakota "J"					
28-1	14	.08	7.9	48	7
22-1	62	.22	10.8	53	3

Average Reservoir Parameters:

Formation	NEP, Ft	Ø, %	S_w, %	K, md
Undesignated Gallup	16	5.5	45	0.2
Undesignated Dakota	25	9.4	42	0.19

FRACTURE TREATMENTS - GALLUP/DAKOTA COMPLETIONS - WEST LINDRITH FIELD

Well No.	Date	Formation	Perforations	Fluid Type	Fluid Gallons	Sand Lbs.	Sand Size	(Additives(#/1000 Gal.) Gel	Fluid Loss	Surfactant	Rate-BPM	Maximum Pressure	Average Pressure	ISIP	15 Minute SIP
22-1	12-22-60	Dakota	7932-8040	Oil	44,000	40,000	20-40	None	40 Mk II	None	21	3900	3700	2000	0
	12-22-60	Gallup	7142-7292	Oil	40,000	50,000	20-40	None	40 Mk II	None	25	3550	3400	600	250 (5)
	1-4-61	Dakota	7830-7898	Oil	61,000	50,000	20-40	None	40 Mk II	None	28	3700	3500	1800	1700 (10)
	1-5-61	Gallup	7142-7292	Oil	60,000	50,000	20-40	None	46 Mk II	None	30	3500	3100	1300	1300 (5)
22-2	6-4-69	Dakota	7562-7770	Water	47,000	79,000	10-20	50 J-2	50 AA	1 AF	43	3100	2700	2100	1600
	6-5-69	Gallup	6688-6786	Water	35,650	61,000	10-20	50 J-2	50 AA	1 AF	52	2900	2200	1600	900
	9-17-70	Dakota	7562-7770	Water	28,434	33,500	10-20	20 J-133	25 AA	1 YF6G	10.3	3600	3000	1950	1450
	9-18-70	Dakota	7562-7770	Water	20,244	20,500	10-20	20 J-133	50 AA	1 YF6G	10.3	3600	3000	1500	1350
22-3	6-24-69	Dakota	7578-7900	Water	45,392	79,000	10-20	50 J-2	50 AA	1 AF	38	4500	3000	2200	1500
	6-25-69	Gallup	6706-6786	Water	35,112	61,000	10-20	50 J-2	50 AA	1 AF	49	2800	2300	1400	1000
22-4	7-18-69	Dakota	7705-7958	Water	47,254	79,000	10-20	50 J-2	50 AA	1 AF	33	3800	3200	2100	1500
	7-18-69	Gallup	6896-7052	Water	22,874	40,500	10-20	50 J-2	50 AA	1 AF	39	4000	2800	1500	900
28-1	9-25-59	Dakota	7602-7617	Oil	29,000	42,000	20-40	None	100 Mk II	None	30	3500	3000	Vac	--
	10-8-59	Dakota	7396-7450	Oil	40,000	56,000	20-40	None	100 Mk II	None	23	3550	3000	2150	1925
	4-16-60	Gallup	6790-6855	Oil	46,500	50,000	20-40	None	27 Mk II	None	42	2500	2200	1800	1600 (5)
	5-21-60	Gallup	6695-6750	Oil	39,000	50,000	20-40	None	30 Mk II	None	34	2700	2600	1600	--
	6-16-60	Gallup	6525-6640	Oil	36,000	50,000	20-40	None	36 Mk II	None	47	4000	2100	2200	1300 (30)
28-2	9-25-60	Dakota	7638-7706	Oil	32,000	50,000	20-40	None	50 Mk II	None	18	4000	3000	2700	2200 (60)
	10-8-60	Dakota	7522-7887	Oil	45,000	50,000	20-40	None	40 Mk II	None	28	3300	3200	1800	1700 (5)
	10-8-60	Gallup	6786-6972	Oil	44,000	50,000	20-40	None	50 Mk II	None	30	4000	3400	1800	1300 (5)
	8-6-62	Gallup	6616-6785	Oil	60,000	47,000	20-40	None	20 Mk II	None	18	4000	2700	1800	1500
28-3	9-29-65	Dakota	7552-7616	Water	51,000	45,000	20-40	10 J-133	500 AA	None	38	2900	2600	2000	1750
	9-29-65	Dakota	7398-7472	Water	39,800	35,000	20-40	10 J-133	300 AA	None	41	2700	2400	1400	1250
	9-29-65	Gallup	6659-6699	Water	28,770	25,000	20-40	20 J-133	300 AA	None	41	3150	2400	1000	750
	9-29-65	Gallup	6562-6610	Water	42,000	45,000	20-40	20 J-133	500 AA	None	45	2000	1800	1000	800
28-4	10-17-68	Dakota	7341-7537	Water	27,722	36,000	10-20	50 J-2	50 AA	1 I-5	42	3000	2300	2000	1600
	10-17-68	Gallup	6493-6683	Water	45,444	78,000	10-20	50 J-2	50 AA	1 I-5	43	4000	2300	1300	1000
28-5	11-24-68	Dakota	7314-7533	Water	35,280	61,000	10-20	50 J-2	50 AA	1 I-5	44	3000	2500	2000	1500
	11-24-68	Gallup	6432-6524	Water	21,504	34,000	10-20	50 J-2	50 AA	1 I-5	45	2400	2000	1200	800
28-6	12-17-68	Dakota	7238-7454	Water	28,728	49,000	10-20	50 J-2	50 AA	1 I-5	44	3000	2500	2100	1600
	12-17-68	Gallup	6366-6568	Water	28,728	49,000	10-20	50 J-2	50 AA	1 I-5	48	2700	2100	1300	800
28-7	11-6-68	Dakota	7444-7600	Water	41,354	70,000	10-20	50 J-2	50 AA	1 I-5	40	3600	2700	2100	1600
	11-7-68	Gallup	6586-6906	Water	40,320	58,000	10-20	50 J-2	50 AA	1 I-5	25	5000	3500	1400	1200
28-8	5-13-69	Dakota	7490-7712	Water	38,514	66,500	10-20	50 J-2	50 AA	1 AF	46	2800	2300	1700	1600
	5-13-69	Gallup	6670-6738	Water	35,784	61,000	10-20	50 J-2	50 AA	1 AF	56	2600	2000	1200	1000
30-3	10-16-65	Dakota	7129-7328	Water	36,500	35,000	20-40	10 J-2	None	10 gal. AD	38	3500	2700	2200	--
	10-17-65	Gallup	6422-6470	Water	41,800	35,000	20-40	10 J-2	None	10 gal. AD	43	2500	2200	1400	--
	10-17-65	Gallup	6263-6368	Water	41,580	35,000	20-40	10 J-2	None	10 gal. AD	48	2300	2000	1200	--

R. 4 W.

T. 25 N.

+200
+204
+300
+400
+500
+600

JICARILLA 20
JICARILLA 22
JICARILLA 30
JICARILLA 28

12 7 8 9 10 11
13 18 17 16 15 14
24 19 20 21 22 23
25 30 29 28 27 26
36 31 32 33 34 35
1 6 5 4 3 2

20-4 G +373
22-4 G-D +279
22-3 G-D +322
20-3 G +411
21 22-2 G-D +347
22-5
22 22-1 G-D +323
20-2 G +455
30-1 +443
30-2 G +471
28-8 G-D +381
28-9
28-2 D (G-S-I) +368
28-10
28 28-1 G-D +437
27 28-7 G-D +361
5-A G +527
28-6 G-D +488
28-11
28-4 G-D +447
30-4 G-D +548
30-3 G-D +579
33 28-5 G-D +512
28-3 G-D +420
16-2 G-D +576

BEFORE [illegible] UTZ
OIL C[illegible] ION
CASE NO. 4462

LEGEND

- O LOCATION
- $\bullet_G$ GALLUP OIL WELL
- $\bullet_D$ DAKOTA OIL WELL
- G-C DUAL – GALLUP (Oil) CHACRA (Gas)
- G-D DUAL – GALLUP (Oil) DAKOTA (Oil-Gas)
- SHUT-IN WELL
- ABANDONED WELL

CONTINENTAL OIL COMPANY
PRODUCTION DEPARTMENT
Casper, Wyoming

WEST LINDRITH BLOCK
JICARILLA APACHE LEASES

STRUCTURE MAP—TOP 1st. GALLUP SAND

Contour Interval - 50'
County: Rio Arriba State: New Mexico
Engineer: J.A. Mazza Draftsman: B.S. Date: 7-23-70
Scale 1" = 1000' Well Status Posted to: 7-70

R. 4 W.

T. 25 N.

JICARILLA 20

JICARILLA 22

JICARILLA 30

JICARILLA 28

12 7 8 9 10 11

13 18 17 16 15 14

24 19 20 21 22 23

25 30 29 28 27 26

36 31 32 33 34 35

1 6 5 4 3 2

20-4 G 22'

20-3 G

20-2 G

30-1

30-2 G

22-4 G-D 10'

22-3 G-D 12'

21 22-2 G-D 12'

22-5

22 22-1 G-D

28-8 G-D 17'

28-9

28-2 D (G-S-I) 17'

28-10

28 28-1 G-D 20'

27 28-7 G-D 13'

5-A G 15'

30-4 G-C 7'

30-3 G-D 21'

28-6 G-D 14'

28-11

28-4 G-D 18'

33 28-5 G-D 13'

28-3 G-D 15'

16-2 G-D

20'

15'

10'

20'

15'

10'

15'

10'

BEFORE EXAMINER UTZ

OIL CONSERVATION COMMISSION

EXHIBIT NO. 16

CASE NO. 4462

LEGEND

- LOCATION
- G GALLUP OIL WELL
- D DAKOTA OIL WELL
- G-C DUAL – GALLUP (Oil) CHACRA (Gas)
- G-D DUAL – GALLUP (Oil) DAKOTA (Oil-Gas)
- SHUT-IN WELL
- ABANDONED WELL

CONTINENTAL OIL COMPANY
PRODUCTION DEPARTMENT
Casper, Wyoming

WEST LINDRITH BLOCK
JICARILLA APACHE LEASES

ISOPACH – NET GALLUP SAND

Contour Interval - 5'

County: Rio Arriba State: New Mexico

Engineer: R.E. Tate Draftsman: B.S. Date: 7-23-70

Scale = 4000' Well Status Posted to: 7-70

R. 4 W.

T. 25 N.

JICARILLA 20

JICARILLA 22

JICARILLA 30

JICARILLA 28

-600-

-500-

-300-

-200-

-635

-567

-531

-516

-514

-474

-403

-449

-480

-328

-433

-477

-371

-400

-300

-282

-361

-397

BEFORE [illegible] UTZ

OIL [illegible] ON

CASE NO. 4462

LEGEND

- LOCATION
- GALLUP OIL WELL
- DAKOTA OIL WELL
- G-C DUAL – GALLUP (Oil) CHACRA (Gas)
- G-D DUAL – GALLUP (Oil) DAKOTA (Oil-Gas)
- SHUT-IN WELL
- ABANDONED WELL

CONTINENTAL OIL COMPANY
PRODUCTION DEPARTMENT
Casper, Wyoming

WEST LINDRITH BLOCK
JICARILLA APACHE LEASES

STRUCTURE — TOP DAKOTA (GRANEROS)

Contour Interval - 50'

County: Rio Arriba State: New Mexico

Engineer: J.A. Mazza Draftsman: B.S. Date: 7-23-70

Scale = 4000' Well Status Posted to: 7-70

R. 4 W.

T. 25 N.

JICARILLA 20

JICARILLA 22

JICARILLA 30

JICARILLA 28

12 7 8 9 10 11

13 18 17 16 15 14

24 19 20 21 22 23

25 30 29 28 27 26

36 31 32 33 34 35

1 6 5 4 3 2

20-4 G 26'

20-3 G

20-2 G

30-1 17'

30-2 G

5-A G 8'

30-4 G-C 7'

30-3 G-D 19'

22-4 G-D 34'

22-3 G-D 49'

22-2 G-D 45'

22-5

22-1 G-D

28-8 G-D 44'

28-9

28-10

28-1 G-D

28-2 D (G-S-I) 41'

28-7 G-D 55'

28-6 G-D 45'

28-11

28-4 G-D 19'

28-5 G-D 45'

28-3 G-D 38'

16-2 G-D

20'

30'

40'

50'

10'

BEFORE [illegible] UTZ

OIL [illegible] ION

18

CASE [illegible] 4462

LEGEND

- LOCATION
- G GALLUP OIL WELL
- D DAKOTA OIL WELL
- G-C DUAL – GALLUP (Oil) CHACRA (Gas)
- G-D DUAL – GALLUP (Oil) DAKOTA (Oil-Gas)
- SHUT-IN WELL
- ABANDONED WELL

CONTINENTAL OIL COMPANY
PRODUCTION DEPARTMENT
Casper, Wyoming

WEST LINDRITH BLOCK
JICARILLA APACHE LEASES

ISOPACH – NET DAKOTA "D" + "J" SAND

Contour Interval – 5

County: Ric Arriba State: New Mexico

Engineer: R.E. Tate Draftsman: B.S. Date: 7-23-70

Scale = 4000' Well Status Posted to: 7-70

ESTIMATED ULTIMATE RECOVERY
GALLUP/DAKOTA COMPLETIONS
WEST LINDRITH FIELD

Well No.	Ultimate Recovery with Packer, STBO
22-2	46,850
22-3	34,156
22-4	36,727
28-1	129,222
28-3	87,226
28-5	83,355
28-6	52,483
28-8	51,645
30-3	83,617
Average	67,300

Two wells, 28-4 and 28-7, were not included in this average because of abnormally low estimated ultimate recoveries (8000 STBO and 14,000 STBO, respectively). Additional work will be performed on these wells in an attempt to increase estimated ultimate recovery.

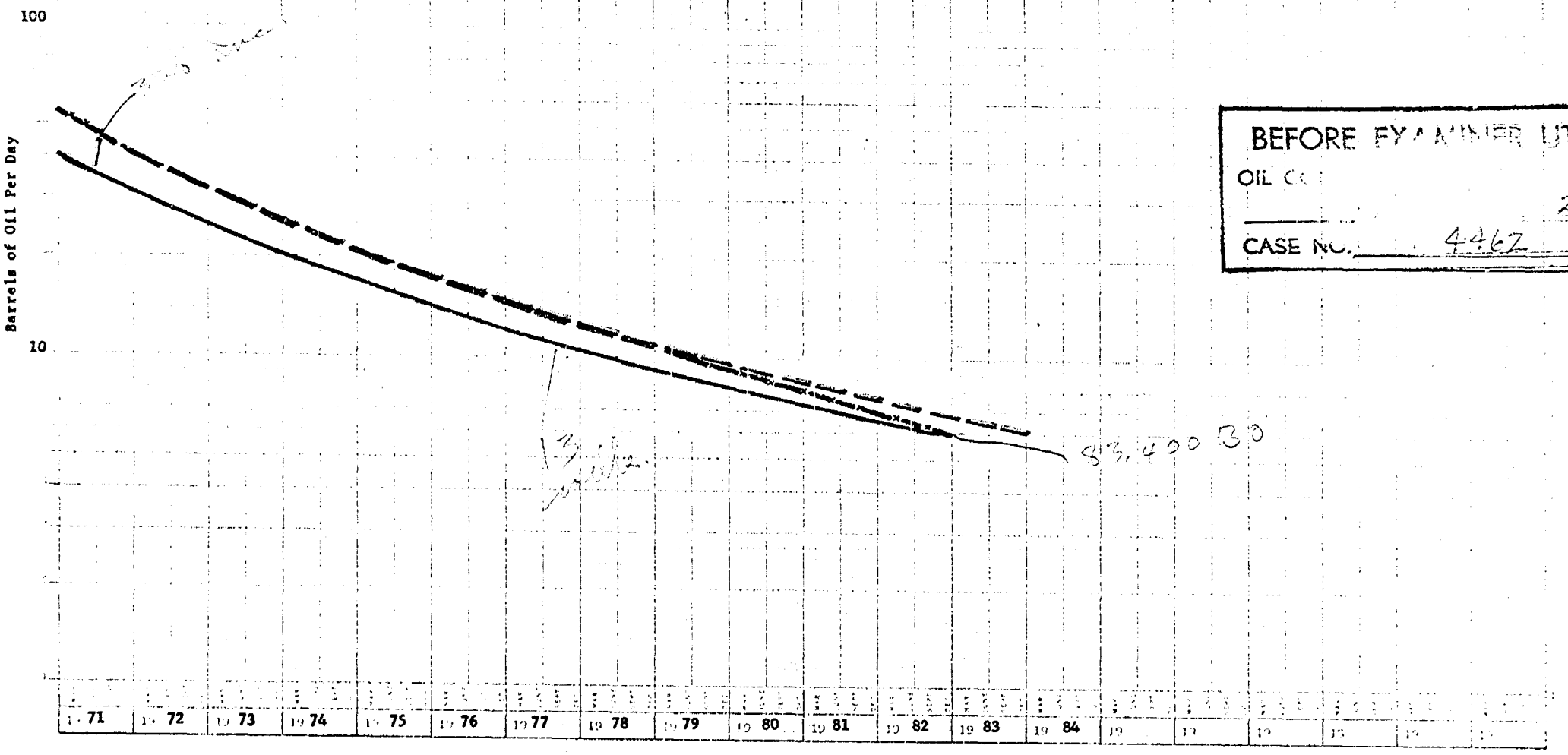
Two wells, 22-1 and 28-2, were completed with separate strings of casing. The estimated ultimate recoveries on these two wells are 58,470 STBO and 45,921 STBO, respectively.

ESTIMATED FUTURE PRODUCTION
GALLUP/DAKOTA COMPLETION

——— Completed with packer

— — — Completed with packer - remove after six months

—x—x— Completed Commingled



CUMULATIVE PRODUCTION
GALLUP/DAKOTA COMPLETIONS
WEST LINDRITH FIELD

Well No.	Formation	STBO 10-1-70	MCFG 10-1-70	Cumulative GOR CF/Bbl.
22-2	Gallup	9,228	26,800	2,904
	Dakota	6,107	106,899	17,504
	Total	15,335	133,699	8,719
22-3	Gallup	2,716	28,519	10,500
	Dakota	6,432	60,070	9,339
	Total	9,148	88,589	9,684
22-4	Gallup	4,600	35,969	8,037
	Dakota	3,784	50,842	13,436
	Total	8,384	86,811	10,354
28-1	Gallup	52,187	268,849	5,152
	Dakota	38,156	328,845	8,618
	Total	90,343	597,694	6,616
28-3	Gallup	19,907	111,183	5,585
	Dakota	27,108	114,809	4,235
	Total	47,015	225,992	4,807
28-5	Gallup	9,036	23,475	2,598
	Dakota	13,914	77,337	5,558
	Total	22,950	100,812	4,393
28-6	Gallup	6,044	15,282	2,528
	Dakota	10,760	37,988	3,530
	Total	16,804	43,270	2,575
28-8	Gallup	9,691	26,766	2,762
	Dakota	5,610	23,699	4,224
	Total	15,301	50,465	3,298
30-3	Gallup	27,573	77,618	2,815
	Dakota	13,547	56,039	4,137
	Total	41,120	133,657	3,250
Total Gallup		140,982	614,461	4,358
Total Dakota		125,418	856,528	6,829
Grand Total		266,400	1,470,989	5,522

Undesignated Gallup cumulative oil production represents 53% of the total. Undesignated Gallup cumulative gas production represents 42% of the total.

Well number 22-1, which is completed with two separate strings of casing, has the following cumulative production (10-1-70):

	STBO	MCFG	GOR, CF/Bbl.
Gallup	25,144	190,316	7,569
Dakota	22,903	293,480	12,814
Total	48,047	483,796	10,069

Undesignated Gallup cumulative oil production represents 52% of the total. Undesignated Gallup cumulative gas production represents 39% of the total.

Locations
32

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
November 18, 1970

EXAMINER HEARING

IN THE MATTER OF:

Application of Continental Oil Company for downhole commingling, Rio Arriba County, New Mexico. Case No. 4462

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: Case 4462.

MR. HATCH: Application of Continental Oil Company for a downhole commingling, Rio Arriba County, New Mexico.

MR. KELLAHIN: If the Examiner please, Jason Kellahin, Kellahin and Fox, Santa Fe, appearing for the Applicant. We have one witness I would like to have sworn.

(Witness sworn.)

(Whereupon, Applicant's Exhibits 1 through 21 were marked for identification.)

MR. UTZ: Any other appearances? There were none, so you may proceed.

FRANKLIN BALKE,

having been first duly sworn upon his oath, testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Franklin B. Balke.

Q How do you spell that, Mr. Balke?

A B-a-l-k-e.

Q By whom are you employed and in what position?

A Continental Oil Company, supervising production engineer, Casper Division.

Q Have you ever testified before the Oil Conservation Commission of New Mexico or one of its examiners?

A No, I have not.

Q For the benefit of the Examiner, would you briefly outline your education and experience?

A I graduated from Texas A & M with a BS degree in petroleum engineering in 1959. After two years with Uncle Sam, I worked one year with Continental Emsco as a sales engineer, four years with Shamrock Oil and Gas Corporation as a reservoir engineer and I have been employed by Continental Oil Company for four years; a year and a half as a production engineer, a year and a half as a reservoir engineer and one year as supervising engineer.

Q Now, in connection with your present assignment, does the area involved in this application in Case 4462 come under your jurisdiction?

A Yes, it does.

MR. KELLAHIN: Are the witness' qualifications acceptable?

MR. UTZ: Yes, sir, they are.

Q (By Mr. Kellahin) Briefly, Mr. Balke, what is proposed by the Applicant in this case?

A Continental proposes to drill four wells at the locations designated, Jicarilla 22 Well No. 5, Unit "L", Section 22, Township 25 North, Range 4 West; Jicarilla 28 Well No. 9, Unit "A", Section 28, Township 25 North, Range 4 West; Jicarilla 28 Well No. 10, Unit "L", Section 28, Township 25 North, Range 4 West; Jicarilla 28 Number 11, Unit "B", Section 33, Township 25 North, Range 4 West, all in the West Lindrith Field, Rio Arriba County, New Mexico.

Q Now, referring to what has been marked Exhibit No. 1, would you identify that exhibit?

A Exhibit No. 1 is an ownership plat reflecting wells within the sixteen section block of the West Lindrith Field. It reflects offset operators and owners of offset wells to our leases to the best of our knowledge.

Q Now, at the top of the block outlined the sixteen section block there is a legend giving the names of the operators. Is Continental Oil Company the operator of the Gallup and Dakota?

A Yes, they are.

Q And is the ownership in that sixteen section block common throughout, both as to the basic royalty, the working interest and the overriding royalties, if any?

A Yes, sir, it is.

Q So anything that is done in connection with this will not call for any separate accounting, is that correct --

A That is correct.

Q -- as to the two horizons we are talking about?

A That is correct.

Q Now, referring to what has been marked as Exhibit No. 2, would you identify that exhibit?

A Exhibit No. 2 is the proposed downhole commingling installation for Jicarilla Well 28 No. 9. In this proposal, we propose to produce both zones through one string of tubing with no packer in the hole. Both zones will be lifted by plunger lift.

Q Does that show the completion you propose to make for this well?

A Yes, it does. These are estimated perforations, estimated cement tops for this particular Well 28 No. 9.

Q Now, turning to what has been marked as Exhibit No. 3, would you identify that exhibit?

MR. UTZ: Isn't that supposed to be plunger lift instead of plunger life?

THE WITNESS: Yes, it is.

MR. UTZ: I was having a little trouble.

MR. KELLAHIN: That was discussed earlier.

MR. UTZ: I thought Continental had something new here.

MR. KELLAHIN: It's plunger lift.

Q (By Mr. Kellahin) Now, turning to Exhibit No. 3, would you discuss that exhibit?

A Exhibit No. 3 is the A. F. E. for the proposed 28 No. 9 Well. This exhibit indicates the estimated cost to drill and complete this well.

Q Now, that is as a commingled completion as proposed in this application, is that correct?

A That is correct.

Q What is the total cost on that?

A Total estimated cost for this well is $122,800.00.

Q Now, turning to Exhibit No. 4, would you identify that exhibit?

A Exhibit No. 4 is the drilling memorandum for the proposed 28 No. 9 Well.

Q In general what information is reflected by this exhibit?

A This exhibit exemplifies, we think, the most efficient way to drill this well and it also indicates that we will be using four and a half inch tubing -- casing, excuse me.

Q What has been used in your previous wells in this field?

A Five and a half inch casing.

Q But you now propose to use four and a half if you are permitted to commingle in the well bore, is that correct?

A That is correct.

Q Is there anything else you would like to point out in that exhibit?

A I don't believe so at this time.

Q Now, turning to Exhibit No. 5, would you identify that exhibit?

A Exhibit No. 5 is the completion memorandum for the proposed 28 No. 9 Well. This exhibit indicates how we intend to fract both the undesignated Gallup and the undesignated Dakota separately but clean them up commingled.

Q Now, turning to Exhibit No. 6, would you identify that exhibit?

A Exhibit 6 is the same series that we have just gone through, the first five exhibits, for the proposed Well 28 No. 10.

Q And 7 and 8, would you also identify those?

A Seven is the same series for the proposed Well 28 No. 11 and No. 8 is for the proposed Well 22 No. 5.

Q Those are all the same as you discussed in connection with Exhibit No. 6?

A That is correct.

Q Gives the same basic information as to each well?

A Yes, it does.

Q Now, turning to Exhibit No. 9, would you identify that exhibit, please?

A Exhibit 9 is the drilling and equipping cost for the wells drilled in 1968, 1969 and the proposed well, Gallup-Dakota completions in the West Lindrith Field. We have drilled eight wells in the last two years, four in 1968, four in 1969.

The average cost for these dual completions was $125,588.00 for the past two years, but the 1968 average indicates the average cost was $119,713.00. The average in 1969 was $131,462.00.

Q What accounted for this difference in cost?

A Increased cost to drill. There is some cores thrown in the 1969 average.

Q Would they add appreciably to your well cost or is it a general increase in cost that has caused the difference?

A A general increase in cost.

Q And the coring would not be material?

A No, it would not.

Q Now, referring to Exhibit No. 10, would you identify that exhibit?

A Exhibit 10 is the additional equipment and labor required to complete these Gallup-Dakota completions with a packer in the hole. This exhibit shows that it cost approximately $2,655.00 for equipment and $845.00 for labor or a grand total of $3,500.00

Q And that's just to run a packer and complete it for a dual completion?

A That's correct.

Q As has been the practice in the past?

A That's right.

Q Now, referring to Exhibit No. 11, would you identify that exhibit?

A No. 11 is the initial production history on 13 Gallup-Dakota completions in the West Lindrith Field. The first column is the well number and location of each of these thirteen wells. The second column indicates the clean up period on these wells after fract treatments. The third column is the initial packer leakage test taken on these wells. The fourth column reflects the production, the first three complete months for each of

these wells.

I would like to point out here that in column two the clean up period, we have started out as high as 212 barrels of oil per day which would be on 22 No. 2. On the second page on 28 No. 4, we started out with 507 barrels of oil per day.

Now, this is the combined rate from the Gallup and Dakota.

Q Now, all of these wells were dual completions with a packer set between the two horizons, is that correct?

A No. There are two wells, 22 No. 1 and 28 No. 2, that were completed with separate strings of casing.

Q But for purposes of determining the production from the two horizons, it would be essentially the same, you could determine the production from the Gallup and the Dakota separately --

A That's correct.

Q -- on all of the wells?

A Yes.

Q Now, in general, what does this reflect as to the continued production from these two zones? Does it decline?

A Yes, it does. As I stated the clean up period we

started out as high as 507 barrels of oil per day; on the initial packer leakage test a combined total of 192 barrels of oil per day was our highest and yet in the fourth column each of these wells reflects that within three months they were below a combined total of 50 barrels of oil per day.

Q Now, what is the significance of the total of 50 barrels per day, Mr. Balke?

A Once the combined total is below 50 barrels of oil per day, we can apply for administrative approval under Rule 303C to commingle these wells in the well bore.

Q Now, your Well 28-3 on this exhibit, I believe, shows 50.8 barrels per day after three months' production --

A That is correct.

Q -- from both zones. That would not qualify for administrative approval at that time, would it?

A No, it would not, but the next month the combined total was 49 barrels of oil per day and it never exceeded that.

Q Now, a similar situation, I believe, exists as to your 30-3 well.

A That's correct.

Q What is the situation on that well now?

A The month following this, it made 51 barrels of oil per

day and it has declined since that time and has never exceeded 30 barrels of oil per day combined total.

Q So, as of today, every one of these wells would qualify for administrative approval for downhole commingling under the Commission's Rules?

A Yes, sir. That is correct.

Q Now, referring to what has been marked as Exhibit No. 12, would you identify that exhibit?

A Exhibit 12 is a packet of production decline curves. Included in these curves is the production on the undesignated Gallup zone, undesignated Dakota zone and the combined total from the two zones for each of our thirteen Gallup-Dakota completions in the West Lindrith Field.

Q Is there anything in particular with these curves that you want to point out on any of the wells?

A Just where we discussed 28 No. 3, which was at 50.8 barrels of oil per day the third month and yet the fourth month it was below 50 barrels of oil per day, approximately 49, and on 30 No. 3, where it was at 52.9 after the third month, it was at 51 the fourth month and then declined and has never exceeded 30 barrels of oil per day and on all these curves our combined total

is less than 50 barrels of oil per day.

Q Are you presently commingling in any of these wells?

A Yes, we are.

Q You did get approval to commingle in the well bore subsequent to their decline to 50 barrels or below, is that correct?

A That is correct.

Q Now, referring to what has been marked as Exhibit No. 13, would you identify that exhibit?

A No. 13 is a summary of the core data that we have on our Gallup and Dakota Formations in the West Lindrith Field. I would like to point out here just how tight these two formations are in this area.

The average permeability for the Gallup is two-tenths of a milidarcie and for the Dakota, it's .19 milidarcies. Also, I would like to point out that the porosity on the Gallup is only 5.5 percent; the Dakota is 9.4 percent.

Q With the low porosities, does that indicate there is not a great deal of recoverable oil in this pool?

A That is correct.

Q Now, referring to what has been marked as Exhibit 14, would you identify that exhibit?

A No. 14 is a history of our fract treatments on each of these completions and in column six we want to point out with this that we have used large fract treatments on all of these wells in an attempt to get them to produce.

Q Has that fract treatment been successful or relatively successful or how would you characterize it? Did you stimulate production to any great degree?

A No, we did not.

Q Now, referring to what has been marked as Exhibit 15, would you identify that exhibit?

A Exhibit 15 is a structure map on the top of the first Gallup Sand merely indicating the regional dip. Also, on this map the red arrows indicate the four proposed wells; the solid red arrow indicates the well that we propose to drill in 1970.

Q That would be your first well?

A That is correct.

Q Now, referring to Exhibit 16, would you identify that exhibit?

A Sixteen is an isopach of the net Gallup Sand. Once again the four proposed wells are indicated on this map. The net effective -- the average net effective pay for the

isopach is sixteen feet.

Q And Exhibit No. 17.

A Seventeen is a structure map on the top of the Dakota which merely indicates the regional dip. Once again, the four proposed wells are indicated by red arrows.

Q And Exhibit 18.

A Eighteen is an isopach of the net Dakota "D" and "J" Sand. The net effective pay -- the average net effective pay for the Dakota is twenty-five feet and again the four proposed wells are indicated on the isopach.

Q Now, on the basis of the isopach and the information available to you and the core data and other sources, have you made an estimate of the recoverable reserves in this pool?

A We have made an estimate of the oil in place based on our core data and isopachs and for the Gallup Formation we estimate the oil in place to be 23,600,000 barrels of oil. For the Dakota Formation we estimate the oil in place to be 58,000 -- 58,400,000 stock tank barrels of oil.

Q Now, referring to Exhibit 19, would you discuss that exhibit?

A Nineteen is our estimated ultimate recovery on nine wells.

It indicates here that our average recovery from these Gallup-Dakota completions is 67,300 stock tank barrels of oil. Now, in this average, I have thrown out two wells, 28 No. 4 and 28 No. 7 merely because they have abnormally low estimated ultimate recoveries and I didn't feel it would be fair to throw these in. Additional work will be performed on these wells.

Q Now, what about your wells 22-1 and 28-2?

A These two wells were completed with separate strings of casing. For 22 No. 1 we estimate the ultimate recovery to be 58,470 stock tank barrels of oil and for 28 No. 2 we estimate it to be 45,921 stock tank barrels of oil.

Q Now, referring to Exhibit No. 20, would you identify that exhibit?

A Twenty is our estimate of future production and as you will see on this curve, we have three different lines. The first curve in red indicates that the average recovery from a Gallup-Dakota completion with a packer in the hole -- this is the red curve -- 67,300 barrels of oil.

The orange curve indicates a Gallup-Dakota completion with a packer in the hole initially and then removed after six months and as you will note, the orange curve after the six months goes up and then

declines; we are estimating approximately 83,400 stock tank barrels of oil recovery in this case.

The green curve is a Gallup-Dakota completion completed without a packer in the hole as we are proposing on these four wells. The average recovery here is 83,400 stock tank barrels of oil, the same as with completing with a packer and removing after six months.

Q So there is no additional recovery to be achieved by utilizing a packer when the well is initially completed, is that correct?

A That is correct.

Q And it does increase your cost?

A It does increase our cost.

Q Both as to the operation of the well and as to its completion?

A Yes, sir.

Q And is there any advantage to completing with a packer and leaving it in the hole, separating the zones throughout the life of the pool?

A No, there is not.

Q Would that actually result in a loss of recoverable oil?

A Yes. Economics show that -- in the loss of oil? Yes.

Q Recoverable oil, yes, sir.

A I want to talk about economics here a little bit. Taking our red curve, which is our average recovery from a Gallup-Dakota completion, with a packer we estimate 67,300 stock tank barrels of oil recovery and an initial investment of $128,500.00.

Now, this is based on using four and a half inch casing, installing our packer initially; economics show that net revenue before federal income tax is a minus $10,700.00.

Q Then, it's an economic loss to operate in that fashion, is that correct?

A That is correct.

Q Now, you have had experience in these two pools with commingling in the well bore, have you not?

A Yes, we have.

Q Have you found that a satisfactory method of producing?

A Yes.

Q Is it economical?

A Without the packer?

Q Without the packer?

A Yes, it is. We have just recently commingled eleven of these Gallup-Dakota completions. Lease production indicates that we are achieving approximately a 25

percent increase in rate.

Q You get a greater rate of recovery then when you commingle in the well bore, is that correct?

A That is correct.

Q Does it prolong the life of the well?

A It does prolong the life of the well.

Q That is the economic life, I'm saying.

A Yes.

Q Now, referring to Exhibit No. 21, would you identify that exhibit, please?

A Could we talk a little bit about economics on the various methods of completion?

Q Yes, sir.

A I would like to talk about those first. Referring back to Exhibit 20 here, if we drilled and equipped this well with four and a half inch casing, complete it with a packer initially and remove it after six months, it cost us an additional $3,500.00 to put the equipment in.

It cost us $1,700.00 to remove this equipment and our economics show that even though we will recover 83,400 stock tank barrels of oil, our rate of return for this venture will be 6.23 percent.

Q And the cost of money is higher than that today, is it not?

A It is. Yes, sir. Now, to talk about the economics of completing these Gallup-Dakota completions without a packer initially with four and a half inch casing, we can drill and equip these wells for $125,050.00. We reduce our operating cost by $500.00 per year strictly on eliminating the packer leakage test.

We would still recover 83,400 stock tank barrels of oil but our economics indicate that we would achieve a rate of return of 9.10 percent.

Q Now, Mr. Balke, if you do complete them in that fashion, how do you account for the production from the two zones or how do you propose to?

A I would like to refer then to Exhibit 21, which shows the cumulative production from the Gallup-Dakota completions as of October the 1st, 1970. This gives us our stock tank barrels of oil and our MCF of gas as of the 1st of October for the nine Gallup-Dakota completions.

Total cumulative production indicates that the undesignated Gallup represents 53 percent of the total oil and 42 percent of the total gas. So, we would propose

that the Gallup oil be given 53 percent, Dakota oil 47 percent, Gallup gas 42 percent, Dakota gas 58 percent.

Now, there is some basis for this. These cumulative production figures reflect all packer leakage tests taken on each of these wells. Each time we take a packer leakage test, of course, our lessee's report reflects this, any change in percentage from either zone.

Also, Well 22 No. 1, which is completed with two separate strings of casing, indicates that the Gallup oil represents 52 percent of that total and the gas represents 39 percent of the total.

Q Which is very close to your average figures for the other wells?

A That is correct.

Q As you previously testified, this won't affect the ownership or accounting in any way of your production other than statistical information, is that correct?

A Yes, sir. That is correct.

Q Because there is common ownership throughout?

A Yes, sir.

Q In your opinion, will the completion with commingling

in the well bore cause any damage to either the Dakota or the Gallup Formations?

A No, it will not.

Q And have you, on the basis of your previous completions for commingling, experienced any difficulties?

A No, we have not.

Q In your opinion, does it constitute waste to require completion with separation of the two zones at initial production from these wells?

A Yes, sir.

Q Do you recommend that you be permitted to complete the wells without a packer?

A Yes, sir, we do.

Q Were Exhibits 1 through 21 prepared by you or under your supervision?

A Yes, sir, they were.

MR. KELLAHIN: At this time I would like to offer in evidence Exhibits 1 through 21.

MR. UTZ: Without objection, Exhibits 1 through 21 will be entered into the record of this case.

MR. KELLAHIN: That completes the direct testimony.

MR. UTZ: Questions of the witness?

MR. ARNOLD: On Exhibit No. 20, I would like to

ask just one to understand something better here.

CROSS EXAMINATION

BY MR. ARNOLD:

Q The red line on there says "completed with packer." That represents the estimated future production if completed with a packer?

A Yes, sir.

Q The orange if it was completed with a packer which was removed after six months and then the green completed commingled. Why is it that would recover more oil out of the one where you removed the packer after six months than the one that you completed commingled to begin with?

A No, the recovery is the same. You only get it faster when you complete it without a packer.

Q I didn't understand that.

A You just get it faster. When you complete it with a packer and then remove it after six months, that first six months you are holding a back pressure on there; due to the plunger lift operation that is necessary you are holding a back pressure. If you complete it without the packer, then we are relieving that back pressure and we will get a higher initial rate but the recoveries on the orange and the green are exactly the same,

83,400 stock tank barrels.

Q Okay.

MR. ARNOLD: Thank you.

CROSS EXAMINATION

BY MR. UTZ:

Q Exhibit No. 20 is a projection, right?

A Yes, it is.

Q How much history did you have to base this projection on?

A On all three of the curves?

Q Yes.

A The red curve, of course, is based on thirteen wells that we have completed as Gallup-Dakota producers right now. We do have an indication from commingling that we have done in the past month that total lease production from the West Lindrith Field has gone from 200 barrels of oil per day to 250 or a twenty-five percent increase.

Now, the orange curve represents a thirty percent increase. We were forecasting a thirty percent increase in rate when we removed these packers. We have an indication that we are getting twenty-five percent.

Q Then, the slope of the curve is based on your barrels per pound drop, I presume?

A Yes, sir, on the production history from thirteen wells. Our first well was completed in 1959, and we do have production history since then.

Q Now, Exhibit 21, I want to understand a little bit better. Now, this is based on actual production from these wells?

A Yes, sir. That's correct. This is production prior to our commingling in the last month there.

Q And your total GOR is arrived at by adding the two zones production, which is separate at the present time, together --

A Yes, sir.

Q -- and dividing the oil into the gas?

A Yes, sir. That is correct.

Q Well, now, does this give you an accurate indication of what your commingled GOR will be?

A No, sir. I don't believe it does.

Q Well, what would you anticipate it in the way of a commingled GOR?

A I think this would be pure speculation on my part, but 4,000 to 1. That's all I can do is speculate at this time.

Q Do you think it will be lower than your Dakota GOR?

A Well, I can only speculate, of course; somewhere in between.

Q Well, yes.

A It's purely speculation now.

Q Now, you are basing this entire application, as I understand it -- and correct me if I am wrong -- on one premise, that you will recover as much oil commingled as you would by spending the extra $5,200.00 to put a packer in and take it out --

A Yes, sir.

Q -- and two, that this situation will arrive within a few months, even if you do put the packer in providing you get approval administratively?

A Yes, sir.

Q That estimate was what, five months, was it?

A Three months; past history indicates it's three months.

Q So these wells deplete from a completion very rapidly?

A Yes, sir, they do.

Q And then, later in life, they level out substantially?

A They level out. Substantially, it's a fairly low rate. It's a low rate. They do level out.

Q And your commingled initial rates on these wells ran as high as almost six hundred barrels a day; does my memory

serve me right?

A Yes, sir.

Q Your low was what?

A Thirty-two on 28 No. 5 on the second page of Exhibit 11. Now, this was during the clean up period. Now, on the initial packer leakage test, that well itself made a combined total of 148. The low on the initial packer leakage test was 200 barrels of oil per day.

Q Now, what if you got a real good gas well in either zone under your casing program with four and a half inch casing; would you still want to commingle?

A No, not if we got a gas well in one of the zones. Yet we have --

Q Could you still separate the zones, put a packer in the four and a half inch and produce one through tubing?

A Yes, sir.

Q What size tubing would that be?

A Two and three-eighths. Run two and three-eighths.

Q Run two and three-eighths and produce through four and a half, two and three-eighths annulus?

A Yes, sir.

Q Now, I guess the next logical question would be, what do you consider a gas well?

A I'm not sure whether I can answer that or not.

Q Well, historically the Gallup and the Dakota, too, has produced quite a bit of liquids, hasn't it?

A Yes, sir.

Q Even gas wells produce quite a bit of liquids.

A In some areas, yes, sir.

Q I don't believe anywhere in our Rules -- and correct me if I am wrong, Emery -- there is a definition of a gas well.

MR. ARNOLD: There are in the pool rules.

MR. UTZ: In certain pool rules, yes, but not in the Dakota or Gallup. Well, yes, some Gallup Pools, but in this area, no. So, it would appear that we may have to come up with an opinion as to what a gas well is, should you get a gas well. And, it is a potential reality, isn't it; it's possible?

THE WITNESS: It's possible. Of course, we have thirteen wells there that indicate they are not gas wells.

Q (By Mr. Utz) We also have practically all the rest of the San Juan Basin with Dakota gas wells, too.

A Yes, sir.

Q So, in my mind in writing an order such as this, we may well determine that we need such information. Would you

be in the position to give us any further information as far as what you would think a gas well would be?

A I don't believe at this time, no, sir.

MR. ARNOLD: If I might interject here.

MR. UTZ: I would be happy for you to.

MR. ARNOLD: The way the Basin Dakota Gas Pool is defined, these wells are actually within the limits of the Basin Dakota Gas Pool.

THE WITNESS: That's one reason we have never established an oil pool there because that gets to be a very sticky problem.

MR. UTZ: That would be considered oil wells in a gas pool?

MR. ARNOLD: Legally that's what they are at the moment.

MR. KELLAHIN: I believe in our application we referred to it as undesignated Dakota oil and Gallup oil on the assumption that the Commission just hadn't gotten around to designating it yet.

MR. UTZ: I'm afraid, Mr. Kellahin, the way our nomenclature of the Basin Dakota Gas Pool, your application doesn't fit it.

MR. KELLAHIN: We are not in a gas pool, is our

position. This is an oil pool.

MR. ARNOLD: I probably shouldn't have brought that up.

MR. KELLAHIN: I agree under the definition, the nomenclature of the Dakota Gas Pool this is in the Dakota Gas Pool laterally and vertically, but it is an oil pool. I think all the information we have offered here shows that it is an oil pool. Just as in the preceding cases, we had Blinebry Oil Wells and Blinebry Gas Wells; we have the same situation here.

MR. UTZ: We have a definition in that --

MR. ARNOLD: The question that Elvis brings up is a valid question because he also may reach the point where an oil pool does grade into the gas pool.

MR. UTZ: But in this application you have not requested that this area be removed from the Basin Dakota Gas Pool, have you?

MR. KELLAHIN: We didn't bring any nomenclature case, no, sir. Our application is essentially similar to the previous applications we have had in here in this particular block and the question hadn't come up before and we didn't anticipate it would this time.

If the Examiner please, if this is a problem, we

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If the Examiner please, if this is a problem, we

would like to have the opportunity to submit a suggestion as to some provision for definitions of a gas well and an oil well in this particular area, if that might be helpful --

MR. UTZ: I'm sure it would be.

MR. KELLAHIN: -- patterned after the orders in other similar cases.

MR. UTZ: Okay.

MR. KELLAHIN: You will do that; can you, Mr. Balke?

THE WITNESS: Yes, sir, I can.

MR. ARNOLD: I think that would be better than to try to define a pool there, define a definition.

MR. UTZ: Are there other questions of the witness? The witness may be excused.

(Witness excused.)

MR. UTZ: The case will be taken under advisement.

I N D E X

E X H I B I T S

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, GLENDA BURKS, Court Reporter in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings to the best of my knowledge, skill and ability.

Glenda Burks
Court Reporter

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 4462, heard by me on 11-14-73, 1973.

..., Examiner
New Mexico Oil Conservation Commission

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'70 Oct 27 AM 8 3

October 26, 1970

Case 4462

New Mexico Oil Conservation
Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Gentlemen:

Enclosed is an application for Continental Oil Company for authority to commingle production in the well bore, Rio Arriba County, New Mexico, for filing.

Please set it for hearing on November 18th if possible.

Thanking you, I am,

Yours very truly,

Jason Kellahin

Jason W. Kellahin

jwk:ls

DOCKET MAILED
Date 11-5-70

BEFORE THE

OIL CONSERVATION COMMISSION OF NEW MEXICO

IN THE MATTER OF THE APPLICATION
OF CONTINENTAL OIL COMPANY FOR
AUTHORITY TO COMMINGLE PRODUCTION
IN THE WELL BORE, RIO ARRIBA COUNTY,
NEW MEXICO.

Case 4402

A P P L I C A T I O N

Comes now Continental Oil Company and applies to the Oil Conservation Commission of New Mexico for authority to commingle production in the well bore in four wells to be drilled in the West Lindrith Field, Rio Arriba County, New Mexico, and in support thereof would show the Commission:

1. Applicant proposes to drill the following wells at the locations designated:

Jicarilla 22 Well No. 5, Unit L, Section 22,
Township 25 North, Range 4 West

Jicarilla 28 Well No. 9, Unit A, Section 28,
Township 25 North, Range 4 West

Jicarilla 28 Well No. 10, Unit L, Section 28,
Township 25 North, Range 4 West

Jicarilla 28 Well No. 11, Unit B, Section 33,
Township 25 North, Range 4 West

all in the West Lindrith Field, Rio Arriba County, New Mexico.

2. Applicant proposes to complete said wells in the Undesignated Gallup and Undesignated Dakota Pools, commingling production in the well bore. Production will be through one string of tubing, with no packer in the hole.

3. Approval for commingling of production in the Undesignated Gallup and Undesignated Dakota Pools has heretofore been granted by the Commission, in accordance with the Commission's rules and regulations for eleven existing dual completions

in the West Lindrith Field. Approval was given on the basis that the dual completions were marginal and Continental Oil Company, as operator, could not repay drilling, completion and operating costs, and realize a profit from the dual completions.

4. Completion of said wells as dual completions with a packer separating the productive horizons requires an additional initial expenditure of $3,500.00, and removal of the packer after production has declined entails an additional cost of $1,700 per well, or an additional cost of approximately $5,200 per well to segregate production initially. Packer leakage tests cost approximately $500 annually and give no meaningful information.

5. On the basis of experience with thirteen existing Undesignated Gallup and Undesignated Dakota completions in the West Lindrith Field, it has been determined that after only three months of production after initial completion of a well, the combined total production from the two pools is less than 50 barrels of oil per day. This combined production is then eligible for commingling under Rule 303C.

6. Commingling of production upon completion of the proposed wells will increase producing rates from said wells, resulting in greater ultimate recovery from the reservoirs, eliminate the expense of packer leakage tests.

7. Approval of this application is in the interests of conservation and the prevention of waste. Approval of the application will not result in damage to either producing

horizon, nor will the correlative rights of any operator be impaired.

8. Attached to this application are the following exhibits:

A. A diagramatic sketch of the proposed completion of each well showing all casing strings, estimated cement tops, perforations, tubing, etc.

B. Plat showing the location of the proposed wells, offset wells on offset leases, together with the names and addresses of owners of leases offsetting applicant's lease.

C. Copy of the AFE for each of the four proposed wells.

D. Copy of the drilling memorandum for each of the four proposed wells.

E. Copy of the completion memorandum for each of the four proposed wells.

WHEREFORE applicant prays that this application be set for hearing before the Commission or the Commission's duly appointed examiner, and that after notice and hearing as required by law, the Commission enter its order permitting applicant to drill, complete and produce the subject wells, commingling production in the well bore, the Undesignated Gallup and the Undesignated Dakota pools, as if they were in the same pool.

Respectfully submitted,

CONTINENTAL OIL COMPANY

By Jason W. Kellahin

KELLAHIN & FOX
P. O. Box 1769
Santa Fe, New Mexico 87501

ATTORNEYS FOR APPLICANT

DRAFT

GMH/esr
11-30-70

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:

CASE No. 4462

Order No. R-4071

APPLICATION OF CONTINENTAL OIL COMPANY FOR DOWNHOLE COMMINGLING, RIO ARRIBA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9:30 a.m. on November 18, 1970, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this _____ day of December, 1970, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, 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 the applicant, Continental Oil Company, seeks authority to commingle production from an undesignated Gallup oil pool and an undesignated Dakota oil pool in the well-bores of four wells to be drilled in Township 25 North, Range 4 West, NMPM, West Lindrith ~~Field~~ (area), Rio Arriba County, New Mexico, as follows:

Jicarilla 22 Well No. 5 - Unit L - Section 22
Jicarilla 28 Well No. 9 - Unit A - Section 28
Jicarilla 28 Well No. 10 - Unit L - Section 28
Jicarilla 28 Well No. 11 - Unit B - Section 33

(3) That each well previously completed in the above-described pools has been capable of only low marginal production.

(4) That the evidence indicates that wells completed in the future in said pools will be capable of only low marginal production.

(5) That the reservoir characteristics of the above-described Gallup and Dakota oil pools are such that underground waste would not be caused by the proposed commingling in the well-bores of the four wells to be drilled.

(6) That the granting of authorization to complete the subject wells as requested should permit the drilling of wells that would not otherwise be drilled and should result in the recovery of oil from each of the commingled zones in each of the subject four wells that would not otherwise be recovered thereby preventing waste, and will not violate correlative rights.

(7) That the mechanics of the proposed completions are feasible and in accord with good conservation practices.

(8) That in order to allocate the commingled production to each of the commingled zones in the subject wells, 53% of the commingled oil production should be allocated to the Gallup zone, 47% of the commingled oil production to the Dakota zone, 39% of the commingled gas production to the Gallup zone, and 61% of the commingled gas production to the Dakota zone in each of the subject four wells.

(9) That approval of the subject application will prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, Continental Oil Company, is hereby authorized to drill and complete each of the following four wells located in Township 25 North, Range 4 West, NMPM, West Lindrith Gallup Dakota, ~~Field~~, Rio Arriba County, New Mexico, in such a manner as to

produce oil from undesignated Gallup and Dakota oil pools through a single string of tubing, commingling in the well-bores the production from each of said pools:

Jicarilla 22 Well No. 5 - Unit L - Section 22
Jicarilla 28 Well No. 9 - Unit A - Section 28
Jicarilla 28 Well No. 10 - Unit L - Section 28
Jicarilla 28 Well No. 11 - Unit B - Section 33

(2) That the applicant shall complete, operate, and produce said wells in accordance with the provisions of Rule 112-A of the Commission Rules and Regulations insofar as said rule is not inconsistent with this order.

(3) That as to each of said wells, 53% of the commingled oil production shall be allocated to the Gallup zone, 47% of the commingled oil production to the Dakota zone, 39% of the commingled gas production to the Gallup zone, and 61% of the commingled gas production to the Dakota zone.

(4) That as to each well, commingling in the well-bore shall continue only so long as the commingled production does not exceed 50 barrels of oil per day nor 100 barrels of water per day.

(5) That as to each well, the maximum amount of gas which may be produced daily from the commingled zones shall be determined by multiplying 2000 by the top unit allowable for the Gallup zone.

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

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