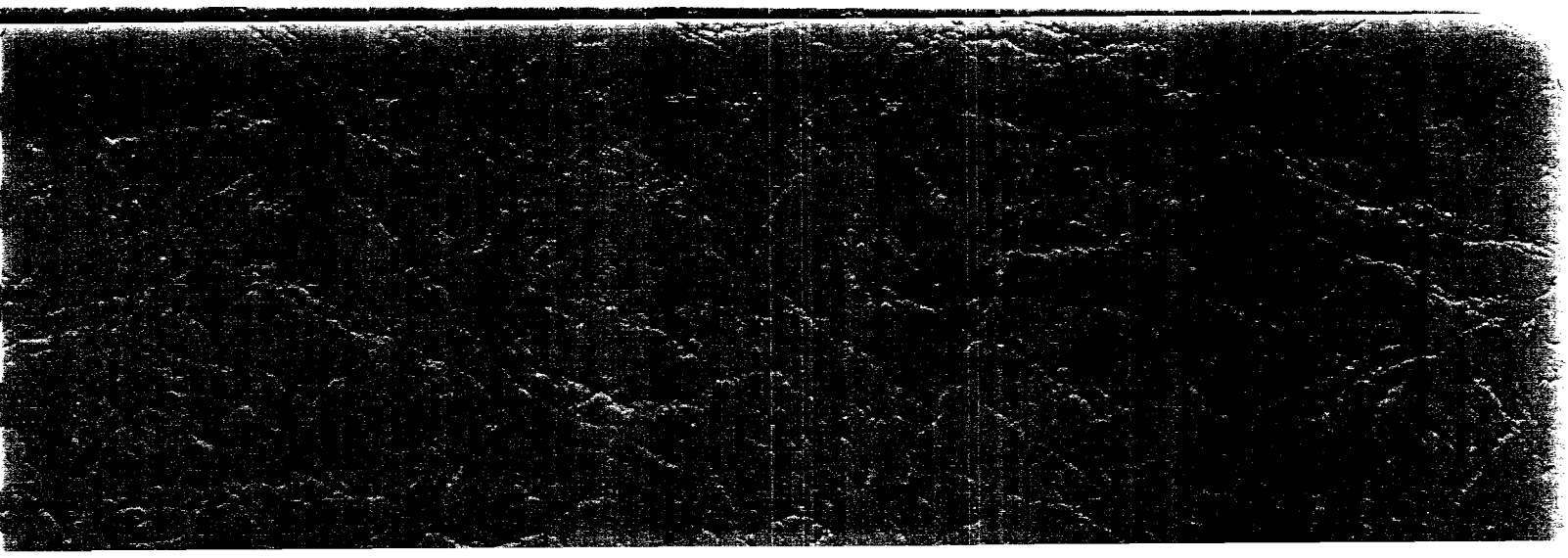

WALSH
ENGINEERING & PRODUCTION
CORPORATION
Executive Bldg. - 413 W. Main
P. O. Box 254
Farmington, New Mexico
87401

PETROLEUM ENGINEERING
RESERVOIR STUDIES
EVALUATIONS
GEOLOGICAL STUDIES

EWELL N. WALSH, P.E.

WALSH
ENGINEERING & PRODUCTION
CORPORATION
EXECUTIVE BLDG. - 413 W. MAIN
P. O. BOX 254
FARMINGTON, NEW MEXICO
87401

LEASE MANAGEMENT
CONTRACT DRILLING
DRILLING SUPERVISION
WORKOVER SUPERVISION

TELEPHONE 325-4203

Case No. 5629
ODESSA NATURAL CORPORATION
POOL CREATION
and
SPECIAL POOL RULES
Rio Arriba and Sandoval Counties,
New Mexico
February 18, 1976

Dave Thomas
Concurs.

Ewell N. Walsh

Ewell N. Walsh, P. E.
State of New Mexico
Registration No. 4324

I N D E X

FIGURES

PETROLEUM ENGINEERING
RESERVOIR STUDIES
EVALUATIONS
GEOLOGICAL STUDIES

EXELL N. WALSH, P.E.
President

WALSH
ENGINEERING & PRODUCTION
CORPORATION
EXECUTIVE BLDG. - 413 W. MAIN
P. O. BOX 254
FARMINGTON, NEW MEXICO
87401

LEASE MANAGEMENT
CONTRACT PUMPING
DRILLING SUPERVISION
WORKOVER SUPERVISION

TELEPHONE 325-3203

DISCOVERY WELL

The discovery well for the proposed new oil pool was:

Dave M. Thomas, Jr.
Chacon Jicarilla Apache "D", No. 1
875'FNL, 1140'FEL, Section 23-T23N-R3W
Sandoval County, New Mexico

Refer to Map of Area.

The well was originally drilled with Keesee and Thomas as operator. On February 13, 1975, the operator was changed to Dave M. Thomas, Jr.

The original acreage dedication was 320 acres in the W/2 Section 23-T23N-R3W, however, after completion as an oil well, the acreage dedication was changed to 40 acres in the NE/4NE/4, Section 23-T23N-R3W, on September 13, 1974.

The well was drilled as a wildcat gas well. After completion as an oil well, the unorthodox wildcat oil well location was approved by the New Mexico Oil Conservation Commission in Order No. R-4886.

Figure No. 1 is a copy of a portion of the Induction Electrolog, of the subject well, indicating the tops of formations and perforations.

Top of Formations:

Greenhorn	7215'
Graneros (Base of Greenhorn)	7280'
Dakota "A"	7303'
Dakota "B"	7418'
Dakota "C"	Not present
Dakota "D"	7510'
Burro Canyon	7586'

Four and one-half (4½") inch production casing was set at 7545'. A cementing stage collar is at 3298'. Calculated top of cement, 1st stage - 5900', 2nd stage ' 2550' (Protect Pictured Cliffs Formation).

Perforations

Dakota "A"	7315'-7325' ✓
	7338'-7345' ✓

Perforations were sandwater fraced with 61,000 gals. water and 60,000 lbs. sand.

Due to low gas production it was necessary to install pumping equipment to produce the oil. The pump seating nipple is at 7285'.

Figure No. 2 and 3 are copies of the initial and subsequent GOR Tests. The Initial Potential for the well was - 95 BOPD, 55 MCFPD, GOR - 579 cubic feet gas per barrel oil, on September 4, 1974.

The current assigned allowable is 81 BOPD.

current prod about 45 BOPD

The current producing rate for the well is 30 BOPD and 23 MCFPD.

The gravity of the oil being produced is 47 ^{o}API at 60^{o}F.

Due to the low volume of gas, at a separator pressure of approximately 35 psig, being produced, an application for Exception to No-Flare Rule 306 was submitted to the New Mexico Oil Conservation Commission and approved as NFO Permit No. E-3-120, January 15, 1976.

Figure No. 4 is a copy of the Gas Analysis of the gas produced by the well.

Due to problems with hole conditions a porosity log was not run. From information on other wells in the area, it is estimated that the reservoir properties are:

Dakota "A" Zone

Porosity	- 8 to 11%
Water Saturation	- 40 to 50%

Dakota "B" Zone

Porosity	- 7 to 9%
Water Saturation	- 40 to 50%

It is proposed to workover the well to perforate and sandwater fracture the Dakota "B" Zone, 7425' to 7435'. During

the completion of the Odessa Natural Corporation wells Chacon Jicarilla "D" No. 1 and 2 in Sections 15 and 16-T23N-R3W, it was determined that the Dakota "B" Zone could produce sufficient natural gas to produce the well on a flowing basis instead of pumping.

SUBSEQUENT DEVELOPMENT WELLS

ODESSA NATURAL CORPORATION
CHACON JICARILLA "D", NO. 1

1. Location:
   1020'FSL, 1720'FEL, Section 15-T23N-R3W
   Rio Arriba County, New Mexico

2. Tops of Formations. Figure No. 5

Greenhorn	7203'
Graneros (Base of Greenhorn)	7230'
Dakota "A"	7250'
Dakota "B"	7364'
Dakota "C"	Not Present
Dakota "D"	7455'
Burro Canyon	7530'

   NOTE: Corrected depth on log. It was determined that the original Induction-Electric Log recorded the formations 21' shallower than actual depth. Unless stated all depths refer to original recorded depths.

3. Perforations

   7456'-7468' - Broke down and cleaned up with acid. Swab test indicated no oil, no gas and no water. Set permanent cast iron bridge plug at 7444'.

   7366'-7371' and 7376'-7380' - Broke down and cleaned up with acid. Swab test indicated show of gas and oil, no water. Sandwater frac with 47,110 gals water and 40,000 lbs sand. After cleanup - 1,200 MCFPD with spray of oil and frac water.

   7248'-7251', 7259'-7266', 7274'-7279' and 7285'-7290' - Sandwater frac with 84,700 gals water and 80,000 lbs. sand. After cleanup 2,600 MCFPD with heavy spray oil and frac water.

4. Initial Potential

Figure No. 6 is a copy of the initial GOR Test. The Initial Potential Test for the well was 142 BOPD, 1,385 MCFPD, GOR - 9753 cubic feet of gas per barrel of oil. Date of Initial Potential test was January 25, 1976

5. Current Production

The well is shut in while waiting for the gas purchasing company to install a gas line for gathering the gas.

ODESSA NATURAL CORPORATION
CHACON JICARILLA "D", NO. 2

1. Location

1777'FSL, 980'FEL, Section 16-T23N-R3W
Rio Arriba County, New Mexico

SI

2. Tops of Formations, Figure No. 7.

Greenhorn	7245'
Graneros (Base of Greenhorn)	7310'
Dakota "A"	7330'
Dakota "B"	7444'
Dakota "C"	Not Present
Dakota "D"	7537'
Burro Canyon	7620'

NOTE: Corrected depth on Log. It was determined that the original Induction Electric Log recorded the formations 26' shallower than actual depth. Unless stated all depths refer to original recorded depths.

3. Perforations

7446'-7456' Broke down and cleaned up with acid. Swab test indicated show of gas, no oil, no water. Sandwater frac with 45,000 gals water and 40,000 pounds of sand. After cleanup - 1,000 to 2,000 MCFPD with heavy spray of oil and frac water.

7330'-7333' Sandwater frac with 84,900 gals. water and
7338'-7358' 80,000 lbs. sand. Did not test after frac.

4. Initial Potential

Figure No. 8 is a copy of the initial GOR Test. The Initial Potential Test for the well was 120 BOPD, 1,064 MCFPD, GOR - 8870 cubic feet of gas per barrel of oil. Date of Initial Potential Test was January 12, 1976.

5. Gas Analysis

Figure No. 9 is a copy of the Gas Analysis of the gas produced by the well.

6. Current Production

The well is shut in while waiting for the gas purchasing company to install a gas line for gathering the gas.

RECOMMENDED POOL BOUNDARIES

VERTICAL

Refer to Figure No. 1, Induction Electrolog of Dave M. Thomas, Jr., Chacon Jicarilla Apache "D", No. 1.

The vertical boundary of the pool to include the interval commencing at the base of the Greenhorn formation, or top of the Graneros Shale, 7280', to such point 400 feet below the base of the Greenhorn formation. This interval has been previously used by the New Mexico Oil and Gas Conservation Commission in establishing the vertical boundaries of the Dakota formation for purposes of establishing a pool.

HORIZONTAL

The initial horizontal boundaries of the pool to include as follows, refer to Figure No. 10.

Township 23 N-Range 3 West

Rio Arriba County,
Section 14; W/2
Section 15; All
Section 16; E/2

Sandoval County,
Section 22; N/2
Section 23; All

RECOMMENDED SPECIAL POOL RULES

A. Each well completed or recompleted in the Oil Pool shall be spaced, drilled, operated, and produced in accordance with the Special Rules and Regulations hereinafter set forth.

B. Each well shall be located on a standard unit containing 320 acres, more or less, substantially in the form of a rectangle, which is a one-half section being a legal subdivision of the United States Public Land Surveys. The standard unit, 320 acres, can be either the North Half or South Half or can be East Half or West Half of a section being a legal subdivision of the United States Public Land Surveys.

C. The Secretary-Director of the Commission may grant an exception to the requirements of Rule B without notice and hearing when an application has been filed for a non-standard unit consisting of less than 320 acres or the unorthodox size or shape of the tract is due to a variation in the legal subdivision of the United States Public Land Surveys. All operators offsetting the proposed non-standard unit shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all offset operators or if no offset operator has entered an objection to the formation of the non-standard unit within 30 days after the Secretary-Director has received the application.

D. Each well shall be located no nearer than 330 feet to the outer boundary of the proration unit or to any governmental quarter-quarter section line nor nearer than 660 feet to the nearest well drilling to or capable of producing from the same pool.

E. The Secretary-Director may grant an exception to the requirements of Rule D without notice and hearing when an application has been filed for an unorthodox location necessitated by topographical conditions or the recompletion of a well previously drilled to another horizon. All operators having offsetting leases within 1320' to the proposed location shall be notified of the application by registered or certified mail, and

Suggested name

Chason - Dakota Oil Pool.

the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all operators offsetting the proposed location or if no objection to the unorthodox location has been entered within 20 days after the Secretary-Director has received the application.

F. A standard proration unit (316 through 324 acres) shall be assigned an allowable of 747 barrels oil per day, and in the event there is more than one well on a 320-acre proration unit, the operator may produce the allowable assigned to the unit from the wells on the unit in any proportion.

The allowable assigned to a non-standard proration unit shall bear the same ratio to a standard allowable as the acreage in such non-standard unit bears to 320 acres.

NOTE: The 747 barrels oil per day allowable is bases upon the following:

320-acre proration unit.	
First 40 acres	187 BOPD
80 BOPD for each additional 40 acres - 7 times 80 = 560 BOPD.	560 BOPD
Total	747 BOPD

G. That the limiting gas-oil ratio for the Oil Pool shall be 2,000 cubic feet of gas per barrel of oil produced.

H. The Secretary-Director of the Commission be authorized to grant, without notice and hearing, the conducting of interference tests with transfer of allowable from a shut in well to producing wells within the same lease.

I. The Special Pool Rules and Regulations would be considered temporary for a period not to exceed two years.

The recommendations for establishing the proposed pool boundaries and special rules will have no adverse effect on correlative rights.

N... MEX... OIL CONS... ATION COMMISSION

GAS-OIL RATIO TESTS

C-1..
Revised ...

Operator: Keesee & Thomas | Pool: Undesignated Dakota | County: Sandoval

Address: P. O. Box 2026, Farmington, New Mexico 87401

TYPE OF TEST - (X): Scheduled [ ] Completion [X] Special [ ]

LEASE NAME	WELL NO.	LOCATION U	LOCATION S	LOCATION T	LOCATION R	DATE OF TEST	STATUS	CHOKE SIZE	TBG. PRESS.	DAILY ALLOW-ABLE	LENGTH OF TEST HOURS	PROD. DURING TEST WATER BBLS.	GRAV. OIL	OIL BBLS.	GAS M.C.F.	GAS - OIL RATIO CU.FT./BBL
Chacon Jicarilla Apache "D"	1	A	23	23N	3W	9-26-74	F	2"	30	--	24	0	43	81	31	383

No well will be assigned an allowable greater than the amount of oil produced on the official test.

During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in which well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in order that well can be assigned increased allowables when authorized by the Commission.

Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60° F. Specific gravity base will be 0.60.

Report casing pressure in lieu of tubing pressure for any well producing through casing.

Mail original and one copy of this report to the district office of the New Mexico Oil Conservation Commission in accordance with Rule 301 and appropriate pool rules.

I hereby certify that the above information is true and complete to the best of my knowledge and belief.

for: Keesee & Thomas

Ewell N. Walsh, P.E., Presid.
Walsh Engr. & Prod. Corp.
(Title)

October 1, 1974
(Date)

Figure No. 2

NEW MEXICO OIL CONSERVATION COMMISSION
GAS - OIL RATIO TESTS

Operator	Pool	County
Dave M. Thomas, Jr.	Undesignated Dakota	Sandoval

Address	TYPE OF TEST - (X)	Scheduled		Completion		Special	X
P. O. Box 2026, Farmington, New Mexico 87401							

LEASE NAME	WELL NO.	LOCATION U	S	T	R	DATE OF TEST	STATUS	CHOKE SIZE	TBG. PRESS.	DAILY ALLOWABLE	LENGTH OF TEST HOURS	PROD. DURING TEST WATER BBLS.	GRAV. OIL	OIL BBLS.	GAS M.C.F.	GAS - OIL RATIO CU.FT. BBL
Chacon Jicarilla Apache "D"	1	A	23	23N	3W	1-10-76	P	2"	35	81	24	-0-	47	30	23	767

TEST FOR INFORMATION PURPOSES ONLY.

COPY OF TEST WAS NOT SENT TO NMOCC.

No well will be assigned an allowable greater than the amount of oil produced on the official test.

During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in which well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in order that well can be assigned increased allowables when authorized by the Commission.

Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60° F. Specific gravity base will be 0.60.

Report casing pressure in lieu of tubing pressure for any well producing through casing.

Mail original and one copy of this report to the district office of the New Mexico Oil Conservation Commission in accordance with Rule 301 and appropriate pool rules.

I hereby certify that the above information is true and complete to the best of my knowledge and belief.

(Title)

(Date)

FIGURE NO. 3

Form 23-111.7 (Rev. 5-62)

EL PASO NATURAL GAS COMPANY

SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS ☐ GAS CHROMATOGRAPHY ANALYSIS ☐

Date of Run 1-22-76 Analysis No. VF 28390

Sample From [redacted] Date Secured 1-13-76
Dave M. Thomas, Jr.

Sample Marked Chacon Jicarilla Apache D-1 Secured By A.N.

COMPONENT	MOL. %	G.P.M.	LIQ. VOL. %
Carbon Dioxide	0.83		
Hydrogen Sulfide			
Nitrogen	2.55		
Methane	60.93		
Ethane	16.71		
Propane	13.67	3.752	
I-Butane	1.30	0.424	
N-Butane	2.75	0.864	
I-Pentane	0.51	0.186	
N-Pentane	0.40	0.144	
Hexane	0.35	0.152	
TOTALS	100.00	5.524	

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1441

Colorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide

Mercaptans

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F.
Calculated from % Composition 0.871

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Run By Ross Checked By James

Remarks

R L Ahrens
H. L. Holder
R. Ullrich
R. E. Johnson
R. B. Herr
M. E. Blakely, Jr.
R. F. Lemon
Don Adams
Walch Engineering (1)
P.O. Box 254
Farmington, New Mexico

Column/s Used: AE & MS

Calculation By: NGPA

Carbon Dioxide: NGPA

Hydrogen Sulfide: Not Run

LOCATION AND WELL DATA

Sec. 15 T. 23 N. R. 3 W.

County: Sandoval

State: New Mexico

Formation:

Bomb Pressure: 59 @ 60° (FIGURE NO. 4)

NEW MEXICO OIL CONSERVATION COMMISSION
GAS – OIL RATIO TESTS

Revised 1-1-65

Operator: Odessa Natural Corporation | Pool: Undesignated Dakota | County: Rio Arriba

Address:

TYPE OF TEST – (X): Scheduled [ ] Completion [ ] Special [ ]

LEASE NAME	WELL NO.	LOCATION U	S	T	R	DATE OF TEST	STATUS	CHOKE SIZE	TBG. PRESS.	DAILY ALLOWABLE	LENGTH OF TEST HOURS	PROD. DURING TEST WATER BBLS.	GRAV. OIL	OIL BBLS.	GAS M.C.F.	GAS – OIL RATIO CU.FT./BBL.
Chacon Jicarilla "D"	1	O	15	23N	3W	1-25-76	F	3/4	1050	--	24	-0-	491	142	1,385	9753

No well will be assigned an allowable greater than the amount of oil produced on the official test.

During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in which well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in order that well can be assigned increased allowables when authorized by the Commission.

Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60° F. Specific gravity base will be 0.60.

Report casing pressure in lieu of tubing pressure for any well producing through casing.

Mail original and one copy of this report to the district office of the New Mexico Oil Conservation Commission in accordance with Rule 301 and appropriate pool rules.

I hereby certify that the above information is true and complete to the best of my knowledge and belief.

For: Odessa Natural Corp.

Ewell N. Walsh, P. E., Pres.
(Signature)
Walsh Engr. & Prod. Corp.
(Title)
February 2, 1976
(Date)

NEW MEXICO OIL CONSERVATION COMMISSION
GAS - OIL RATIO TESTS

C-116
Revised 1-1-65

Operator: Odessa Natural Corporation
Pool: Undesignated Dakota
County: Rio Arriba

Address: P. O. Box 3908, Odessa Texas 79760
TYPE OF TEST - (X): Scheduled [ ] Completion [X] Special [ ]

LEASE NAME	WELL NO.	LOCATION U	S	T	R	DATE OF TEST	STATUS	CHOKE SIZE	TBG. PRESS.	DAILY ALLOWABLE	LENGTH OF TEST HOURS	PROD. DURING TEST WATER BBLS.	GRAV. OIL	OIL BBLS.	GAS M.C.F.	GAS - OIL RATIO CU.FT/BBL.
Chacon Jicarilla "D"	2	I	16	23N	3W	1-12-76	F	3/4"	150	None	24	0	45.1	120	1,064	8867

No well will be assigned an allowable greater than the amount of oil produced on the official test.

During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in which well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in order that well can be assigned increased allowables when authorized by the Commission.

Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60° F. Specific gravity base will be 0.60.

Report casing pressure in lieu of tubing pressure for any well producing through casing.

Mail original and one copy of this report to the district office of the New Mexico Oil Conservation Commission in accordance with Rule 301 and appropriate pool rules.

I hereby certify that the above information is true and complete to the best of my knowledge and belief.

For Odessa Natural Corp.

Ewell N. Walsh

Ewell N. Walsh, Engineer, P.E., Pres.
Walsh Engineering & Prod. Corporation (Title)
Jan. 14, 1976 (Date)

EL PASO NATURAL GAS COMPANY

SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS [ ] GAS CHROMATOGRAPHY ANALYSIS [ ]

Date of Run 1-22-76 Analysis No. VF 28389

Sample From Odessa Natural Corp. Date Secured 1-13-76

Sample Marked Chacon Jicarilla D #2 Secured By AN

COMPONENT	MOL. %	G.P.M.	LIQ. VOL. %
Carbon Dioxide	0.48		
Hydrogen Sulfide			
Nitrogen	0.78		
Methane	71.78		
Ethane	14.51		
Propane	7.08	1.943	
I-Butane	1.19	0.388	
N-Butane	2.11	0.663	
I-Pentane	0.74	0.270	
N-Pentane	0.60	0.216	
Hexane	0.73	0.317	
TOTALS	100.00	3.799	

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1358

Calorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide Not Run

Mercaptans

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F.
Calculated from % Composition 0.793

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Run By Ross Checked By James

cc:
R L Ahrens
H. L. Holder
R. Ullrich
R. E. Johnson
R. B. Herr
M. E. Blakely, Jr.
R. F. Lemon
Don Adams
Walch Engineering (1)
P.O. Box 254
Farmington, New Mexico
File

Column/s Used: AE & MS

Calculation By: NGPA

Carbon Dioxide: NGPA

Hydrogen Sulfide: Not Run

LOCATION AND WELL DATA

Sec. 16 T. 23 N. R. 3 W.

County: Sandoval

State: New Mexico

Formation:

Comb Pressure: 72 @ 60°F (FIGURE NO. 9)

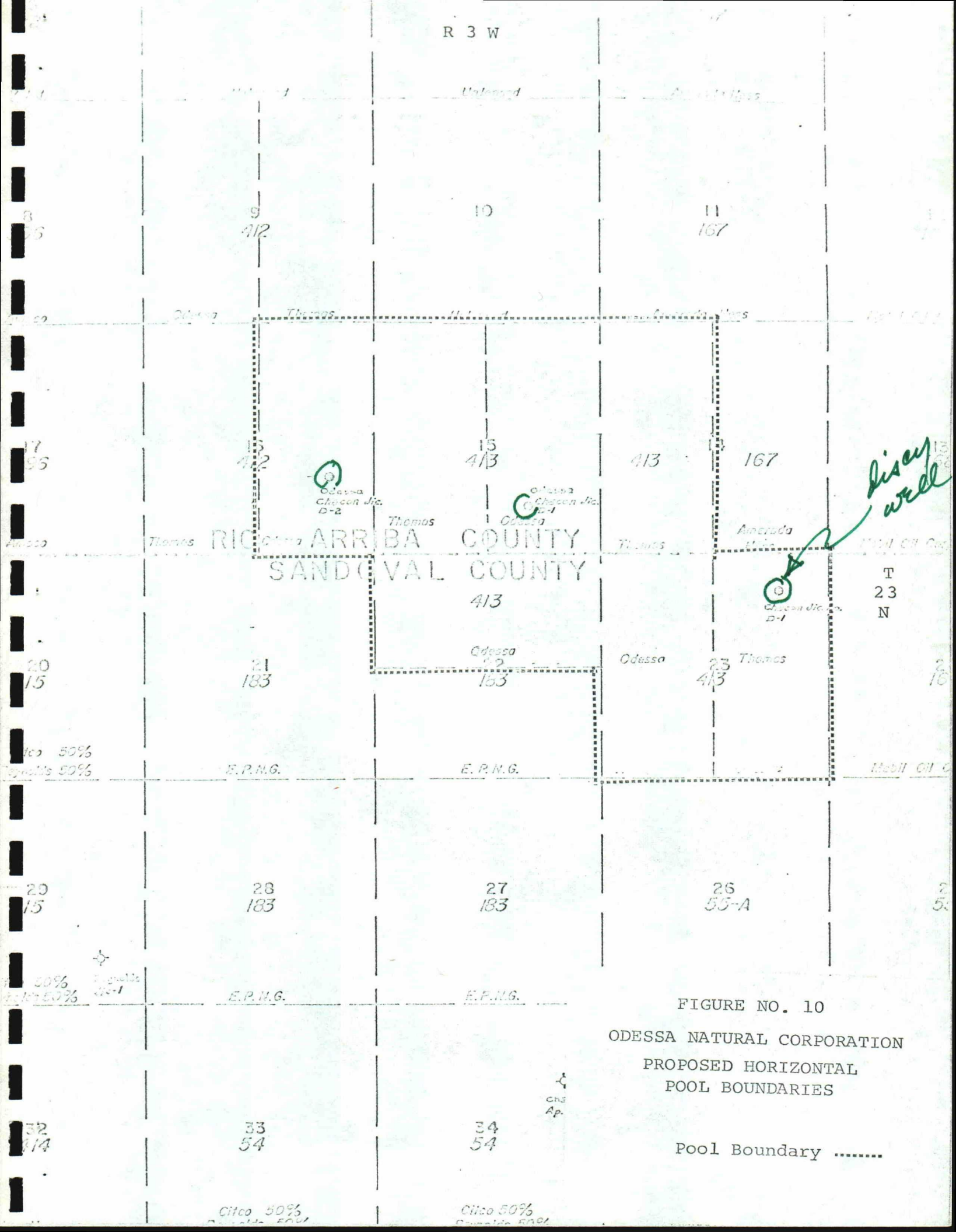

FIGURE NO. 10

ODESSA NATURAL CORPORATION

PROPOSED HORIZONTAL

POOL BOUNDARIES

Pool Boundary .....

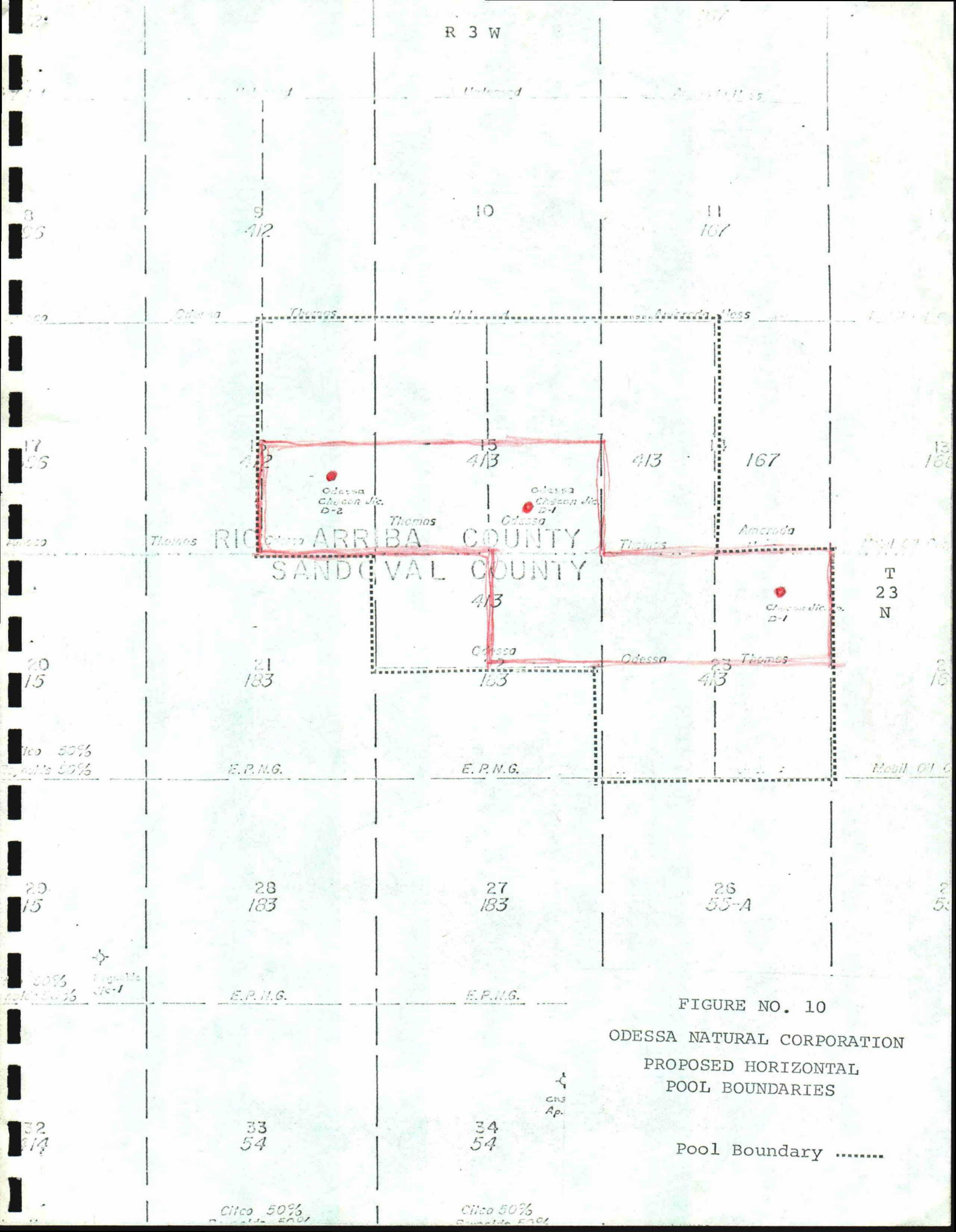

FIGURE NO. 10

ODESSA NATURAL CORPORATION

PROPOSED HORIZONTAL
POOL BOUNDARIES

Pool Boundary .....