

CASE 3539: Application of SKELLY
OIL CO. for a waterflood project,
Lea County, New Mexico.

CASE No.

3539

Application,
TRANSCRIPTS,
SMALL Exhibits
ETC.

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. 3539
Order No. R-3208

APPLICATION OF SKELLY OIL COMPANY
FOR A WATERFLOOD PROJECT, LEA COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on March 15, 1967, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 17th day of March, 1967, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Skelly Oil Company, seeks permission to institute a waterflood project in the Skelly Penrose "A" Unit Area, Langlie-Mattix Pool, by the injection of water into the Penrose Sand of the Queen formation through 30 injection wells in Sections 33 and 34, Township 22 South, Range 37 East, NMPM, and Sections 3, 4, 9, and 10, Township 23 South, Range 37 East, NMPM, Lea County, New Mexico.

(3) That the wells in the project area are in an advanced state of depletion and should properly be classified as "stripper" wells.

(4) That the proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

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CASE No. 3539

Order No. R-3208

(5) That the subject application should be approved and the project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

IT IS THEREFORE ORDERED:

(1) That the applicant, Skelly Oil Company, is hereby authorized to institute a waterflood project in the Skelly Penrose "A" Unit Area, Langlie-Mattix Pool, by the injection of water into the Penrose Sand of the Queen formation through the following-described 30 wells in Lea County, New Mexico:

OPERATOR	LEASE	WELL NO.	UNIT	SECTION	TOWNSHIP	RANGE
Skelly	King "A"	2	L	33	22 South	37 East
Skelly	King "A"	3	N	33	22 South	37 East
Skelly	H. O. Sims	5	J	33	22 South	37 East
Skelly	H. O. Sims	15	P	33	22 South	37 East
Skelly	H. O. Sims	9	L	34	22 South	37 East
Skelly	H. O. Sims	8	N	34	22 South	37 East
Skelly	E. Sims	5	B	3	23 South	37 East
Skelly	H. O. Sims	4	D	3	23 South	37 East
Skelly	Sims "D"	1	F	3	23 South	37 East
Skelly	R. R. Sims	5	L	3	23 South	37 East
Skelly	Sims "C"	1	N	3	23 South	37 East
Skelly	E. Sims	1	J	3	23 South	37 East
Skelly	E. Sims	3	P	3	23 South	37 East
Skelly	H. O. Sims	13	B	4	23 South	37 East
Skelly	H. O. Sims	2	H	4	23 South	37 East
Skelly	A. L. King	1	F	4	23 South	37 East
Samedan	Hughes "A-1"	6	L	4	23 South	37 East
Samedan	Hughes "A-1"	2	J	4	23 South	37 East
Skelly	R. R. Sims	1	P	4	23 South	37 East
Skelly	R. R. Sims	4	N	4	23 South	37 East
Skelly	G. W. Sims	3	B	9	23 South	37 East
Skelly	G. W. Sims	7	H	9	23 South	37 East
Samedan	Hughes "A-2"	7	J	9	23 South	37 East
Samedan	Hughes "A-2"	8	P	9	23 South	37 East
Skelly	G. W. Sims	4	D	10	23 South	37 East
Skelly	G. W. Sims	5	F	10	23 South	37 East
Skelly	G. W. Sims	6	B	10	23 South	37 East
Skelly	W. P. Sims	2	H	10	23 South	37 East
Samedan	Hughes "A-2"	11	L	10	23 South	37 East
Samedan	Hughes "A-2"	4	J	10	23 South	37 East

(2) That the subject waterflood project is hereby designated the Skelly Penrose "A" Waterflood Project and shall be governed

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CASE No. 3539

Order No. R-3208

by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.


(3) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

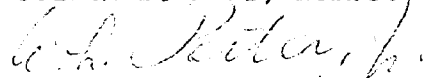
(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION


DAVID F. CARGO, Chairman


GUYTON B. HAYS, Member


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

S E A L

esr/

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO

March 29, 1967

C

Mr. Booker Kelly
White, Gilbert, Koch & Kelly
Attorneys at Law
Post Office Box 787
Santa Fe, New Mexico

O

Dear Sir:

P

Reference is made to Commission Order No. R-3208, recently entered in Case No. 3539, approving the Skelly Penrose "A" Waterflood Project.

Y

Injection is to be through the 30 authorized injection wells, each of which shall be equipped with internally plastic-coated tubing set in a packer, said packer being set within 50 feet of the uppermost perforations, or in the case of an open-hole completion, within 50 feet of the casing shoe.

As to allowable, our calculations indicate that when all of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 2548 barrels per day when the normal unit allowable is 42 barrels or less.

Please report any error in this calculated maximum allowable immediately, both to the Santa Fe office of the commission and the appropriate district proration office.

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO

-2-

Mr. Booker Kelly
White, Gilbert, Koch & Kelly
Attorneys at Law
Santa Fe, New Mexico
March 29, 1967

C In order that the allowable assigned to the project may be kept
current, and in order that the operator may fully benefit from
the allowable provisions of Rule 701, it behooves him to promptly
O notify both of the aforementioned commission offices by letter of
any change in the status of wells in the project area, i.e., when
active injection commences, when additional injection or producing
wells are drilled, when additional wells are acquired through pur-
chase or unitization, when wells have received a response to water
injection, etc.

P Your cooperation in keeping the commission so informed as to the
status of the project and the wells therein will be appreciated.

Very truly yours,

Y

A. L. PORTER, Jr.
Secretary-Director

ALP/DSN/lr

cc: Mr. Frank Irby
State Engineer Office
Santa Fe, New Mexico

Oil Conservation Commission
Hobbs, New Mexico

U.S. Geological Survey
Hobbs, New Mexico

State of New Mexico
Oil Conservation Commission



P. O. BOX 2088
SANTA FE

Re: Case No. 3539
Order No. R-3208
Applicant:
SKELLY OIL COMPANY

A. L. PORTER, Jr.
Secretary-Director

Other _____



SKELLY OIL COMPANY

P. O. Box 1650
TULSA, OKLAHOMA 74102

PRODUCTION DEPARTMENT

C. L. BLACKSHER, VICE PRESIDENT
W. P. WHITMORE, MGR. PRODUCTION
W. D. CARSON, MGR. TECHNICAL SERVICES
ROBERT G. HILTZ, MGR. JOINT OPERATIONS
GEORGE W. SELINGER, MGR. CONSERVATION

March 6, 1967

Re: Case No. 3539 -
Application of Skelly Oil Company to
Waterflood Skelly Fenrose "A" Unit,
Langlie-Mattix Pool,
Lea County, New Mexico

Mr. S. E. Reynolds, State Engineer
State Engineer Office
State Capitol
Santa Fe, New Mexico 87501

Attention: Mr. Frank E. Irby, Chief
Water Rights Division

Gentlemen:

Thank you for your letter of March 2, 1967, in which you pointed out certain discrepancies in our exhibits. We, also, wish to apologize for not including a copy of the application with our letter of February 21, 1967. A copy of this application is attached.

In the second paragraph of your letter you point out the incorrect description on the diagrammatic sketch of the H. O. Sims No. 2 well. The correct location should be 1980' from the north line and 660' from the east line of Section 4, Township 23 South, Range 37 East.

In the third paragraph of your letter you point out an apparent discrepancy between our diagrammatic sketch and map, Exhibit "A", for the G. W. Sims No. 6 well, located 660' from the north line and 1980' from the east line of Section 10, Township 23 South, Range 37 East. In this case the diagrammatic sketch is correct, and Exhibit "A" should be corrected to reflect the proper lease lines, in that the NW/4 NE/4 of said Section 10 is part of the same base lease as the NW/4 of Section 10 and the NE/4 of Section 9.

I talked to our Hobbs office Friday and they informed me that they had just received an analysis of the water to be used for injection and that they were

Mr. S. E. Reynolds, State Engineer
March 6, 1967
Page 2

forwarding this to you. If they have not already done so, by carbon copy of this letter we are requesting that they do so immediately.

If we can be of further assistance, please advise. Again, my apologies for having caused you the inconvenience of pointing out errors in our exhibits.

Yours very truly,

(Signed) GEORGE W. SELINGER



RJS:br
Attach. 1

cc-Mr. A. L. Porter, Jr. ← COPY FOR
Mr. L. C. White

Mr. V. E. Fletcher
Skelly Oil Company
Box 730
Hobbs, New Mexico 88240



STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

J. E. REYNOLDS
STATE ENGINEER

March 14, 1967

ADDRESS CORRESPONDENCE TO:
STATE CAPITOL
SANTA FE, N. M.

Mr. A. L. Porter, Jr.
Secretary-Director
Oil Conservation Commission
Santa Fe, New Mexico

Dear Mr. Porter:

Reference is made to the application of Skelly Oil Company which seeks authorization to inject water into their Skelly Penrose "A" Unit wells for secondary recovery which is the subject of your Case 3539. Further reference is made to my letter of March 2, 1967 to Skelly Oil Company pertaining to this application.

In discussion today with Messrs. Cox, Stuckey and Fletcher, I have been advised that the H. O. Sims #2 well is located in Sec. 4 instead of Sec. 5 and is 1980' FNL and 660' FEL. They have handed me a corrected copy of the schematic diagram for the well which is identical to the original diagram of the well except for the footage location. This takes care of my question in the second paragraph of my letter of March 2nd.

The third paragraph of my letter of March 2nd pertains to the lease designation and my questions pertaining to the lease designation are now satisfied by a corrected Exhibit "A."

On March 8th I received a copy of the application and water analyses from W. P. Sims #2 well and from the wells in the S $\frac{1}{2}$ of Sec. 3, T. 24 S., R. 36 E. The analysis of the water from the W. P. Sims #2 is of no interest to me since this well will be converted to an injection well and water from it will not be used for injection. The water sample from the wells in S $\frac{1}{2}$ of Sec. 3 referred to above is of composite sample from 3 wells which are producing both oil and water, the water having a total of 8,292 milligrams per liter of dissolved solids.

Mr. Stuckey stated that Skelly has 7 wells in the S½ of Sec. 3, 3 of which are now producing oil and water from the Seven Rivers formation and the water is being used for secondary recovery purpose in their Skelly Penrose "B" Unit, and further states that these 3 wells are capable of producing more water and oil than is now being pumped. The one other well is equipped and is being used as a standby in the event one of the 3 previously mentioned wells encounters trouble. Two other wells are not equipped but are ready to be equipped and can produce both water and oil from the Seven Rivers formation. The 7th well is now producing gas from the Yates formation but can be converted to produce water and oil from the Seven Rivers formation when needed.

In summary, all 7 of these wells can be used to produce both oil and water and will be used to supply water for both the "A" and "B" Units. It is my understanding, from Mr. Stuckey, that these wells are approaching or have reached economic limits for oil production but since there is a need for the water the overall economic picture is such that they can produce them economically for the dual purpose.

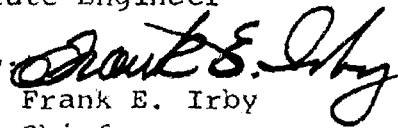
In view of the statements of Mr. Stuckey and Mr. Cox, it appears that the granting of this application will not cause a threat of contamination to any fresh waters which may exist in the area. Therefore, this office offers no objection to the granting of the application.

FEI/ma
cc-Mr. V. E. Fletcher
Mr. G. W. Selinger

Yours truly,

S. E. Reynolds
State Engineer

By


Frank E. Irby
Chief

Water Rights Div.

March 2, 1967

Skelly Oil Company
P. O. Box 1650
Tulsa, Oklahoma 74102

Attn. Mr. George W. Selinger

Gentlemen:

I have received a copy of your letter to the Secretary-Director of the Oil Conservation Commission purporting to transmit the original and 4 copies of your application which seeks approval of a secondary recovery project in your proposed Skelly Penrose "A" Unit area in the Langlie-Mattix Pool. Enclosed with the copy of this letter was a plat marked Exhibit A showing a portion of the Langlie-Mattix Pool and schematic drawings of 30 proposed injection wells within the "A" Unit. No copy of the application was enclosed and no other exhibits were enclosed. I would appreciate receiving a copy of the application and any other exhibits which may have been prepared for this case.

On the schematic diagram of the H. O. Sims No. 2 well, the description is given as follows: 1980' FWL and 660' FEL, Sec. 5, T. 23 S., R. 37 E. According to Exhibit A, the proposed Skelly Penrose "A" Unit will not include Sec. 5 but there is a No. 2 well in the SE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of Sec. 4 in the H. O. Sims lease. Probably there was an error in the description. Possibly, I should also mention that the footage location refers to the west and east lines of the section instead of the north and east lines.

On one of the diagrammatic sketches of the wells, there is listed G. W. Sims #6 well located as follows: 600' FNL and 1980' FEL Sec. 10, T. 23 S., R. 37 E. According to Exhibit A, the location given on the sketch would place the well in the W. P. Sims lease rather than in the G. W. Sims lease.

Please advise me as to the source and analysis of water to be used for injection purposes in this unit.

FEI/ma

cc-Mr. A. L. Porter, Jr.
Mr. L. C. White

Yours truly,

S. E. Reynolds
State Engineer

By:

Frank E. Irby
Chief
Water Rights Div.

DOCKET: REGULAR HEARING - WEDNESDAY - MARCH 15, 1967

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

- ALLOWABLE: (1) Consideration of the oil allowable for April, 1967;
- (2) Consideration of the allowable production of gas for April, 1967, from thirteen prorated pools in Lea, Eddy and Roosevelt Counties, New Mexico. Consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico, for April, 1967.

CASE 3538: Application of Skelly Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the approval of the Skelly Penrose "A" Unit Area, comprising 2,427 acres, more or less, of fee and federal lands in Townships 22 and 23 South, Range 37 East, Lea County, New Mexico.

CASE 3539: Application of Skelly Oil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Penrose Sand of the Queen formation through 30 wells on its Penrose "A" Unit Area, Langlie-Mattix Pool, Lea County, New Mexico.

CASE 3540: Southeastern New Mexico nomenclature case calling for an order creating, extending and abolishing certain pools in Chaves, Lea and Roosevelt Counties, New Mexico:

- (a) Create a new pool in Lea County, New Mexico, classified as an oil pool for Wolfcamp production and designated as the North Vacuum-Wolfcamp Pool, comprising the following-described area:

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM
SECTION 3: NE/4

Further, for the assignment of approximately 53,445 barrels of oil discovery allowable to the discovery well, Pennzoil Company's Gallagher State Well No. 1, located in Unit A of said Section 3.

- (b) Create a new pool in Lea County, New Mexico classified as an oil pool for San Andres production and designated as the Ranger Lake-San Andres Pool. The discovery well is the Corinne Grace Ranger Lake No. 3, located in Unit N of Section 11, Township 12 South, Range 34 East, NMPM. Said pool described as:

TOWNSHIP 12 SOUTH, RANGE 34 EAST, NMPM
SECTION 11: SW/4

- (c) Abolish the South Anderson-Wolfcamp Pool described as:

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
SECTION 23: NW/4

March 15, 1967 Regular Hearing

- (d) Extend the Anderson-Ranch Wolfcamp Pool to include therein:

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
SECTION 23: NW/4

- (e) Extend the Chaveroo-San Andres Pool to include therein:

TOWNSHIP 7 SOUTH, RANGE 33 EAST, NMPM
SECTION 31: W/2

TOWNSHIP 8 SOUTH, RANGE 32 EAST, NMPM
SECTION 1: NW/4

- (f) Extend the Flying "M"-San Andres Pool to include therein:

TOWNSHIP 9 SOUTH, RANGE 33 EAST, NMPM
SECTION 22: SW/4

- (g) Extend the Inbe-Pennsylvanian Pool to include therein:

TOWNSHIP 11 SOUTH, RANGE 33 EAST, NMPM
SECTION 24: W/2

TOWNSHIP 11 SOUTH, RANGE 34 EAST, NMPM
SECTION 5: SW/4

- (h) Extend the Milnesand-San Andres Pool to include therein:

TOWNSHIP 8 SOUTH, RANGE 35 EAST, NMPM
SECTION 21: SW/4

- (i) Extend the Todd-Lower San Andres Pool to include therein:

TOWNSHIP 7 SOUTH, RANGE 36 EAST, NMPM
SECTION 30: SE/4

- (j) Extend the Vada-Pennsylvanian Pool to include therein:

TOWNSHIP 9 SOUTH, RANGE 34 EAST, NMPM
SECTION 20: NE/4



SKELLY OIL COMPANY

P. O. BOX 1650

TULSA, OKLAHOMA 74102

PRODUCTION DEPARTMENT

C. L. BLACKSHER, VICE PRESIDENT
W. P. WHITMORE, MGR. PRODUCTION
W. D. CARSON, MGR. TECHNICAL SERVICES
BARTON W. RATLIFF, MGR. JOINT OPERATIONS
GEORGE W. SELINGER, MGR. CONSERVATION

February 21, 1967

Case 3539

Re: Application for Approval of Secondary
Recovery Project, Skelly Penrose "A"
Unit Area, Langlie-Mattix Pool,
Lea County, New Mexico.

VIA AIR MAIL SPECIAL DELIVERY

Mr. A. L. Porter, Jr., Secretary-Director
Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico 87501

Dear Mr. Porter:

We are attaching original and four copies of our application for approval of secondary recovery project in our proposed Skelly Penrose "A" Unit Area of the Langlie-Mattix Pool of Lea County, New Mexico.

This is a companion case to the application of the Unit Agreement application being filed at the same time, and as previously discussed with you and your staff we would like to have this matter heard before the full Commission on March 15, also.

By carbon copy of this letter we are forwarding a copy of the application, together with the exhibits, to the State Engineer's office.

Yours very truly,

George W. Selinger

RJJ:br
Attach.

cc-State Engineer
P. O. Box 1079
Santa Fe, New Mexico w/ attach.

DOCKET MAILED

Date 3-2-67

BEFORE THE NEW MEXICO OIL CONSERVATION COMMISSION

IN THE MATTER OF THE APPLICATION OF SKELLY OIL)
 COMPANY FOR AN ORDER AUTHORIZING THE INJECTION)
 OF FLUID FOR SECONDARY RECOVERY PURPOSES INTO)
 THE LANGLEIE-MATTIX POOL ON THE SKELLY PENROSE)
 "A" UNIT, LOCATED IN PORTIONS OF SECTIONS 33)
 AND 34, TOWNSHIP 22 SOUTH, RANGE 37 EAST, AND)
 PORTIONS OF SECTIONS 3, 4, 9 AND 10, TOWNSHIP)
 23 SOUTH, RANGE 37 EAST, LEA COUNTY, NEW MEXICO,)
 AND FOR THE PROMULGATION OF SPECIAL RULES)
 GOVERNING THE OPERATION OF SAID UNIT.)

CASE NO. 3539

FILED _____

HEARING 3/15/67

A P P L I C A T I O N

Comes now Skelly Oil Company and alleges and states:

1. That it is the operator of the Skelly Penrose "A" Unit containing 2,426.85 acres, more or less, of federal and fee lands described as follows:

Township 22 South, Range 37 East
 S/2 Section 33,
 SW/4 Section 34,

Township 23 South, Range 37 East
 S/2 N/2, W/2 SW/4, SE/4 SW/4, NW/4 SE/4, E/2 SE/4 and Lots 2, 3
 and 4 of Section 3,
 S/2, S/2 NE/4, SE/4 NW/4 and Lots 1, 2 and 3 of Section 4,
 W/2 of Section 9,
 N/2, N/2 SW/4, SW/4 SW/4, NW/4 SE/4 of Section 10
 All in Lea County, New Mexico.

2. That an application for approval of the Unit Agreement for said Unit has been filed with this Commission.

3. That in order to carry out the secondary recovery operations as contemplated by the Unit Agreement, to prevent waste and to recover oil and associated hydrocarbons which would not otherwise be recovered, applicant desires to inject fluid into certain wells within the Unit Area for injection into the Langlie-Mattix Pool, pursuant to Rule 701 of this Commission.

4. That applicant proposes to convert the following 30 wells and utilize the same for injection purposes:

<u>OPERATOR, LEASE, AND WELL NO.</u>	<u>UNIT LOCATION</u>	<u>SEC.</u>	<u>TWP.</u>	<u>RANGE</u>
Skelly - H. O. Sims #9 ✓	L	34	22S	37E
Skelly - H. O. Sims #5 ✓	J	33	22S	37E
Skelly - King "A" #2 ✓	L	33	22S	37E
Skelly - King "A" #3 ✓	N	33	22S	37E
Skelly - H. O. Sims #15 ✓	P	33	22S	37E
Skelly - H. O. Sims #8 ✓	N	34	22S	37E
Skelly - E. Sims #5 ✓	B	3	23S	37E
Skelly - H. O. Sims #4 ✓	D	3	23S	37E
Skelly - H. O. Sims #13 ✓	B	4	23S	37E
Skelly - A. L. King #1 ✓	F	4	23S	37E
Skelly - H. O. Sims #2 ✓	H	4	23S	37E
Skelly - Sims "D" #1 ✓	F	3	23S	37E
Skelly - E. Sims #1	J	3	23S	37E
Skelly - R. R. Sims #5	L	3	23S	37E
Samedan - Hughes "A" #2	J	4	23S	37E
Samedan - Hughes "A" #6	L	4	23S	37E
Skelly - R. R. Sims #4	N	4	23S	37E
Skelly - R. R. Sims #1	P	4	23S	37E
Skelly - Sims "C" #1	N	3	23S	37E
Skelly - E. Sims #3	P	3	23S	37E
Skelly - G. W. Sims #6	B	10	23S	37E
Skelly - G. W. Sims #4	D	10	23S	37E
Skelly - G. W. Sims #3	B	9	22S	37E
Skelly - G. W. Sims #7	H	9	22S	37E
Skelly - G. W. Sims #5	F	10	22S	37E
Skelly - W. P. Sims #2	H	10	22S	37E

(Continued)

<u>OPERATOR, LEASE, AND WELL NO.</u>	<u>UNIT LOCATION</u>	<u>SEC.</u>	<u>TWP.</u>	<u>RANGE</u>
Samedan - Hughes "A" #4	J	10	22S	37E
Samedan - Hughes "A" #11	L	10	22S	37E
Samedan - Hughes "A" #7	J	9	22S	37E
Samedan - Hughes "A" #3	P	9	22S	37E

All in Lea County, New Mexico

5. That attached hereto and made a part hereof is a map, labeled Exhibit "A", which shows the location of the proposed injection wells and the location of all other wells within a radius of two miles from said proposed injection wells, and the formation from which said wells are producing, and that also indicated on said exhibit are the lessees within said two-mile radius.

6. That attached hereto and made a part hereof is Exhibit "B" which contains the diagrammatic sketches of the proposed injection wells showing the casing strings, including diameter and setting depths, quantities used and top of cement, perforated or open hole intervals, tubing strings, including diameters and setting depths, and the type and location of packers.

7. That the formation sought to be waterflooded and into which injection will be made is the Penrose Sand formation underlying the Unit Area, the same being the heretofore established underground reservoir which has been found to occur between the depths of 3,279 feet and 3,673 feet in Skelly Oil Company's Sims "D" No. 2 well (located S/2 SE/4 NW/4 of Section 3-T23S-R37E, Lea County, New Mexico) as indicated by Schlumberger's electric log No. 1, taken November 5, 1948, said log being measured from a derrick floor elevation of 3,308 feet above sea level.

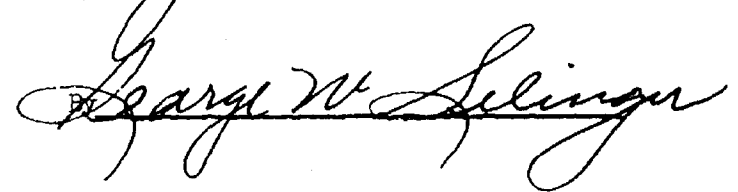
8. That the fluid sought to be injected is water, and the anticipated volumes to be injected are 9,555 barrels per day, and that the source of said injection fluid is water produced from the Seven Rivers formation in association with oil production from Skelly's Eugene Coats lease in Section 3, Township 24 South, Range 36 East, Lea County, New Mexico. Applicant, also, contemplates reinjection of produced water from the Penrose Sand.

WHEREFORE, PREMISES CONSIDERED, applicant prays that this Commission set this matter down for hearing, that notice hereof be given as required by law, and that at the conclusion of said hearing, based on the evidence adduced, enter its order granting the applicant permission to conduct a waterflood project on the Skelly Penrose "A" Unit by utilizing as injection wells the wells above described, with said secondary recovery project to be governed by the provisions of Rule 701, for permission to expand or change the waterflood program by administrative means without the necessity of a separate hearing, for appropriate field rules if necessary, and for such other orders, rules and regulations as may be necessary in the premises.

Respectfully submitted,

SKELLY OIL COMPANY

George W. Selinger
Ronald J. Jacobs
Its Attorneys



Of Counsel:
L. C. White
White, Gilbert, Koch & Kelly
P. O. Box 787
Santa Fe, New Mexico

SKELLY PENROSE "A" UNIT

Skelly Oil Company, as operator of the proposed Skelly Penrose "A" Unit, has presented an application for approval of this project as a waterflood unit; and a companion application for permit to commence water injection into thirty (30) proposed injection wells.

Exhibit "A-1" is a plat showing the project area. This was submitted with the application for approval of the waterflood unit.

Exhibit "A-2" is a map showing lessees, location of wells included in the project, location of the proposed injection wells, and all other wells within a radius of two (2) miles from the proposed injection wells. This exhibit also shows the formation from which these wells are producing or have produced. This exhibit was presented with the application for permit to inject into thirty wells.

Also included on this exhibit are waterflood projects in the area which are currently in operation. The following projects may be noted:

- (1) State "M" Project (Humble Oil - November, 1963).
- (2) Skelly Penrose "B" Unit (Skelly Oil - August, 1966).
- (3) Langlie Mattix Penrose Sand Unit (Anadarko Oil - December 1964).

The success of projects 1 and 3 is indicated by their expansion since the start of initial injection programs. Additional expansion for Project No. 3 is now underway. Project No. 2 started injection on August 20, 1966. Some limited response has already been noted. Completion of the injection pattern for the Skelly Penrose "B" Unit is awaiting lease line agreements with the proposed Skelly Penrose "A" Unit and other adjacent operating or proposed units.

Skelly proposes to inject water into the Langlie Mattix Formation on a full scale basis to stimulate recovery of the secondary reserves. The proposed injection pattern is an 80-acre five-spot requiring conversion of 30 wells to injection service. Anticipated injection rates are 9,555 BWP/D or an average of approximately 300 BWP/D per injection well. The water supply source will be Skelly's Jal Water System. This System is presently delivering produced water from the Seven Rivers Formation to the adjacent Skelly Penrose "B" Unit. The Seven Rivers water is produced in association with oil production from wells located in Section 3, T-24-S, R-36-E, Lea County, New Mexico.

Injected fluid will be confined to the unitized interval. Injection will be down internally lined tubing set on a packer approximately 50 feet above the casing seat or uppermost perforation. Primary cementing operations at the time of original completion of the well should prevent fluid migration up the hole behind the casing. Periodic injectivity surveys will be run to monitor injection and check for channels behind the pipe. Any mechanical failure will be promptly repaired when detected. *The annular space between the tubing and casing will be filled with an inhibited fluid.*

Normal waterflood allowable for the 60 Project Area wells would be 2546 barrels per day. $(59 \times 42 = 2478 \text{ B/D})$. $(66.85/40 = 1.671 \times 42 = 68)$. $(2478 + 68 = 2546 \text{ BPD})$. Operators report that 4,149,602 barrels of stock tank oil have been produced from the Unit Area to January 1, 1967. Deducting 170,383 barrels of secondary oil recovered to January 1, 1967 by the H. O. Sims pilot flood; leaves 3,959,219 barrels of primary production from the Unit Area to January 1, 1967. The Average cumulative primary production per well is 65,987 STB.

A copy of this application for the waterflood project, the area map, downhole schematic diagrams of the proposed injection wells, and water analysis data have been sent to the State Engineer's Office, Capitol Building, Santa Fe, New Mexico.

Exhibit "B" is downhole diagrammatic sketches of the thirty (30) proposed injection wells. Shown on the sketches are all casing strings, diameters, and setting depths, quantities of cement used, tops of cement, perforated or openhole intervals, tubing strings-including diameters and setting depth-, and

type and location of the packer. These sketches were presented with the application for permit to inject. An error in location description was noted on the schematic for the H.O. Sims No. 2 well and a corrected copy is hereby submitted.

(Discuss Same as Hughes "A-1" in 2.) (Copy of completion)

Exhibit "C" is a primary performance graph for the Unit Area and indicates no remaining primary oil. Ultimate primary recovery for the Unit Area was established at 3,934,638 barrels by the Engineering Subcommittee study in January, 1964. Increased rate in 1958, '59, '60, '61 and '62 due to drilling of 10 wells during 1957-1961 period.

The proposed Skelly Penrose "A" Unit is located in all or parts of Sections 33 and 34, T-22-S, R-37-E; and Sections 3, 4, 9, and 10, T-23-S, R-37-E, Lea County, New Mexico and contains 2,426.85 acres of Federal and Fee Lands. The oil pay formation in the Unit Area is the Penrose Sand, a lower member of the Queen formation, in the Langlie Mattix Pool. The New Mexico Oil Conservation Commission nomenclature designates the vertical limits of the Langlie Mattix Pool as those formations encountered between the lower 100 feet of the Seven Rivers Formation and the base of the Queen Formation. This is our proposed unitized interval.

Development of the Penrose Sand within the Unit Area was started with the drilling of Skelly Oil Company's H. O. Sims Well No. 1, which was completed December 7, 1936; and proceeded rapidly with most of the sixty (60) Langlie Mattix (Penrose) producers being completed by 1940. Development of the Unit Area has been on regular 40-Acre spacing. Four (4) additional wells were drilled to formations below the Langlie Mattix. Skelly's R. R. Sims No. 7, which produces oil from the Blinbry Formation, is the only one of these currently on production. Skelly's H. O. Sims No. 16, originally drilled to the Drinkard Formation, has been plugged back and recompleted in the Glorieta Formation as a water supply well for the pilot waterflood which is in operation on Skelly's H. O. Sims Lease. Skelly's Sims "D" No. 2 and Ellen Sims No. 6 wells, which were drilled to the Drinkard, are plugged and abandoned. Of the 60 Langlie Mattix producers completed on the 2400 acre Unit Area, 52 wells are currently producing; 6 wells are shut in; and 2 wells are currently serving as injection wells for the pilot waterflood. Monthly oil production rate for the Unit Area is 4846 barrels (December 1966) with 2483 barrels attributable to secondary operations of the pilot flood and 2363 barrels attributable to primary recovery. This is an average of 1.5 BOPD per producing well, which is the approximate Economic Limit. Primary recovery in the Unit Area is approximately 100% complete. Injection in the pilot was started in August 1953.

Presented as Exhibit "D" are well completion data for wells in the Unit Area. Shown in this tabulation are Operator; Lease and Well Number; Location; Elevation; Total Depth; Casing Program-including Diameter, Setting Depth, and Volume of Cement Used-; and the Producing Interval. Also noted under "Remarks" are those wells scheduled for injection service.

Of the 60 project area wells, 10 wells are completed through perforations; 49 wells are completed with open hole intervals; and one well is completed with both perforations and open hole section.

Exhibit "E" is supplemental well data showing completion date, initial and current producing rates, and cumulative oil production to January 1, 1967. Current daily oil production from wells in the Unit Area ranges from 6 to 43 BOPD, with an average of 2.2 BOPD per well, consisting of 1.5 BOPD primary and 1.7 BOPD secondary. Water production from the Unit Area is approx. 197 BOPD. This produced water will be re-injected.

Exhibit "F" is available well logs on proposed injection wells. Of the 30 proposed injection wells, only 6 have been logged. We have presented five of these in this exhibit. Log on the Samudra Hughes "A-2" No. 8 is not available.

Presented as Exhibit "G" are analyses of produced water from the Unit Area and from the water supply source. Water injection in the Unit's wells will be through internally lined tubing set in a tension-type packer set approximately 50 feet above the casing seat or uppermost perforation. Injection rates of approximately 300 BPD per well at maximum injection wellhead pressures of approximately 1850 psi are anticipated.

Geology and Reservoir Characteristics

The oil pay in the proposed Penrose "A" Unit is the Penrose Sand, a lower member of the Queen Formation. The Penrose Top is encountered from depths of 3475 feet to 3650 feet; an average depth of 3540 feet. The Penrose Sand is described as lenticular, closely cemented sand lenses contained in a dense dolomitic limestone which was deposited during Permian Age along the western edge of the Central Basin Platform. The oil reservoir is contained in a generally northwest trending anticlinal stratigraphic trap which is broken by small "saddles".

Core analyses available on leases adjacent to the proposed unit indicate porosity to be 13 per cent and permeability to range from 5 to 150 md.

Gas is usually present in those areas where the Penrose Top is encountered above 200 feet subsea elevation. Arithmetic average gross Penrose section thickness below -200 feet is 107 feet in the "A" Unit Area.

The Grayburg Formation, immediately below the Penrose, is essentially water bearing. Static water levels have been encountered at subsea elevations of -375' to -443' in various wells.

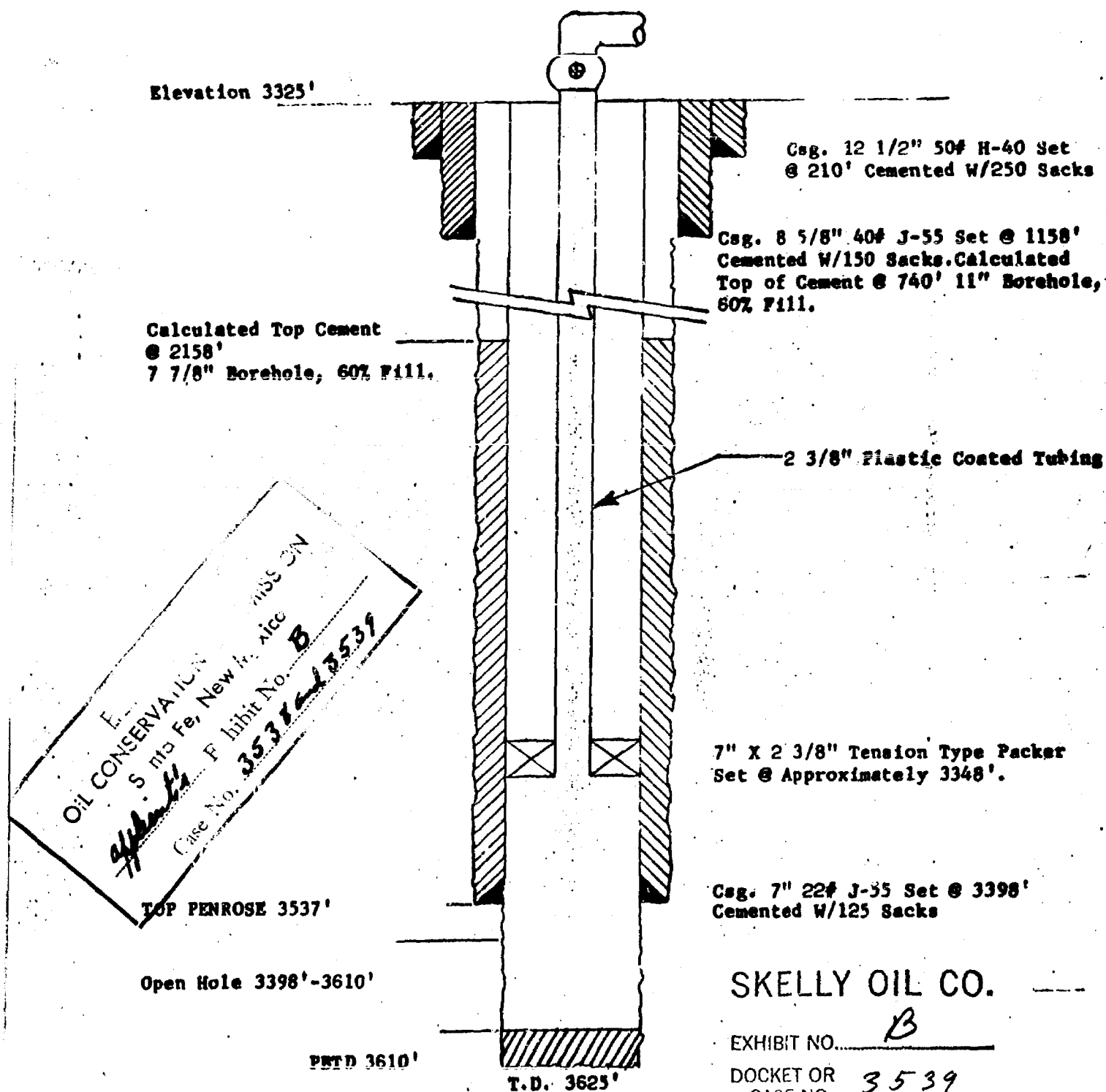
The primary driving mechanism of the Penrose is solution gas, producing oil of approximately 36 degrees API gravity. The gas zones present in the upper Penrose, as well as the immediately higher Queen and Seven Rivers Formations are present as localized gas stringers, found in the higher portions of the general anticlinal effect. There is no evidence to suggest that the Penrose Formation contains enough continuous vertical permeability that the gas zones could have furnished energy as a principal driving force in the production of primary oil from the Penrose.

Secondary oil reserves by waterflood of the Skelly Penrose "A" Unit have been estimated at 3.96 million barrels. These reserves assume that recoverable secondary oil would be equal to the estimated ultimate primary recovery. Waterflood performance is anticipated to yield a peak producing rate of 2650 B/D in three (3) years after the start of injection. Life of the waterflood project has been estimated at 12 years from the start of injection.

PROPOSED SKELLY PENROSE "A" UNIT WIV

SAMEDAN OIL CORPORATION

HUGHES "A1" NO. 2
1980' FSL & 1980' FEL, Sec. 4, T-23-S, R-37-E
LEA COUNTY, NEW MEXICO



SKELLY OIL CO.

EXHIBIT NO. B

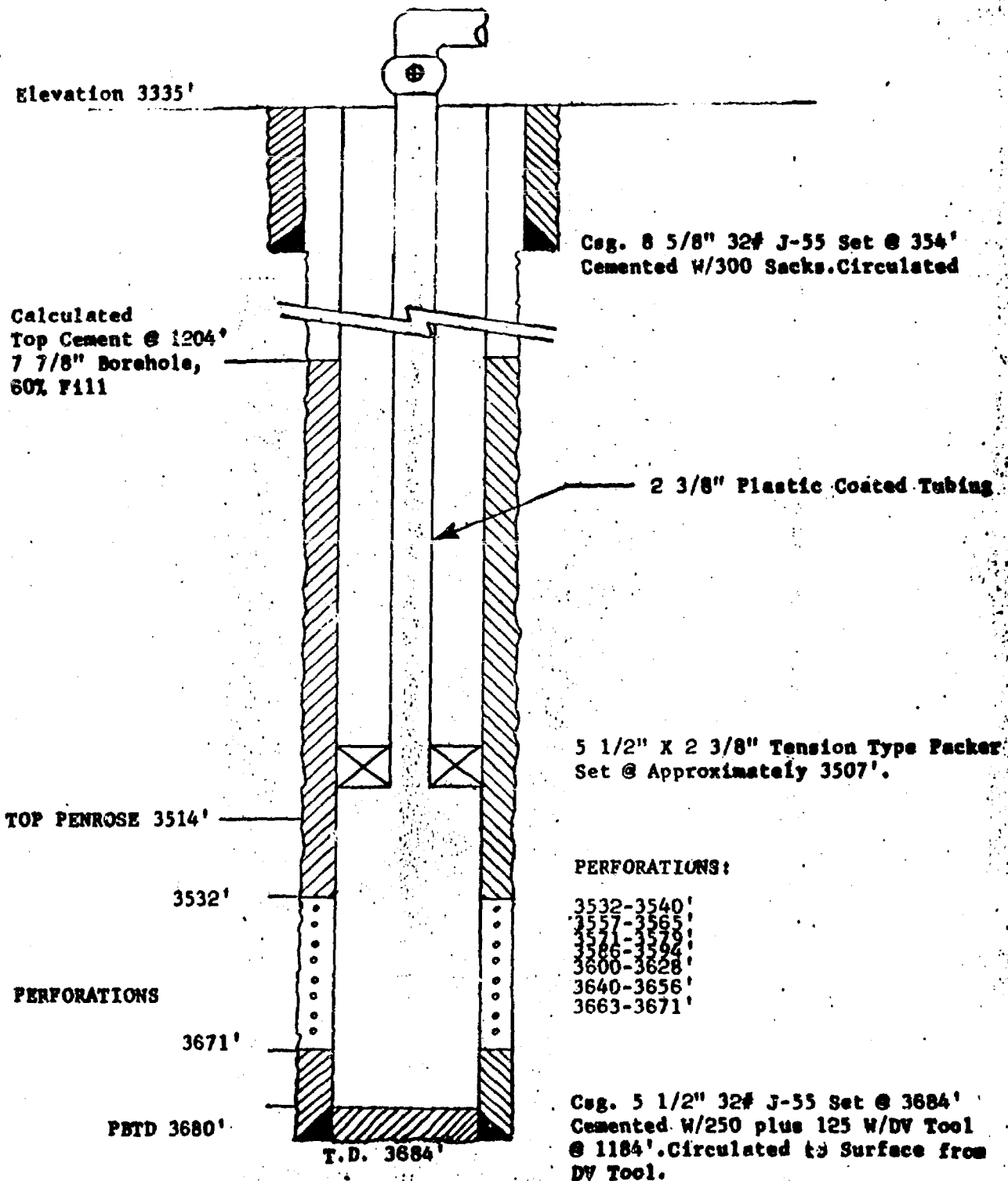
DOCKET OR CASE NO. 3539

DATE 3-15-67

PROPOSED SKELLY PENROSE "A" UNIT WTW

SAMEDAN OIL CORPORATION

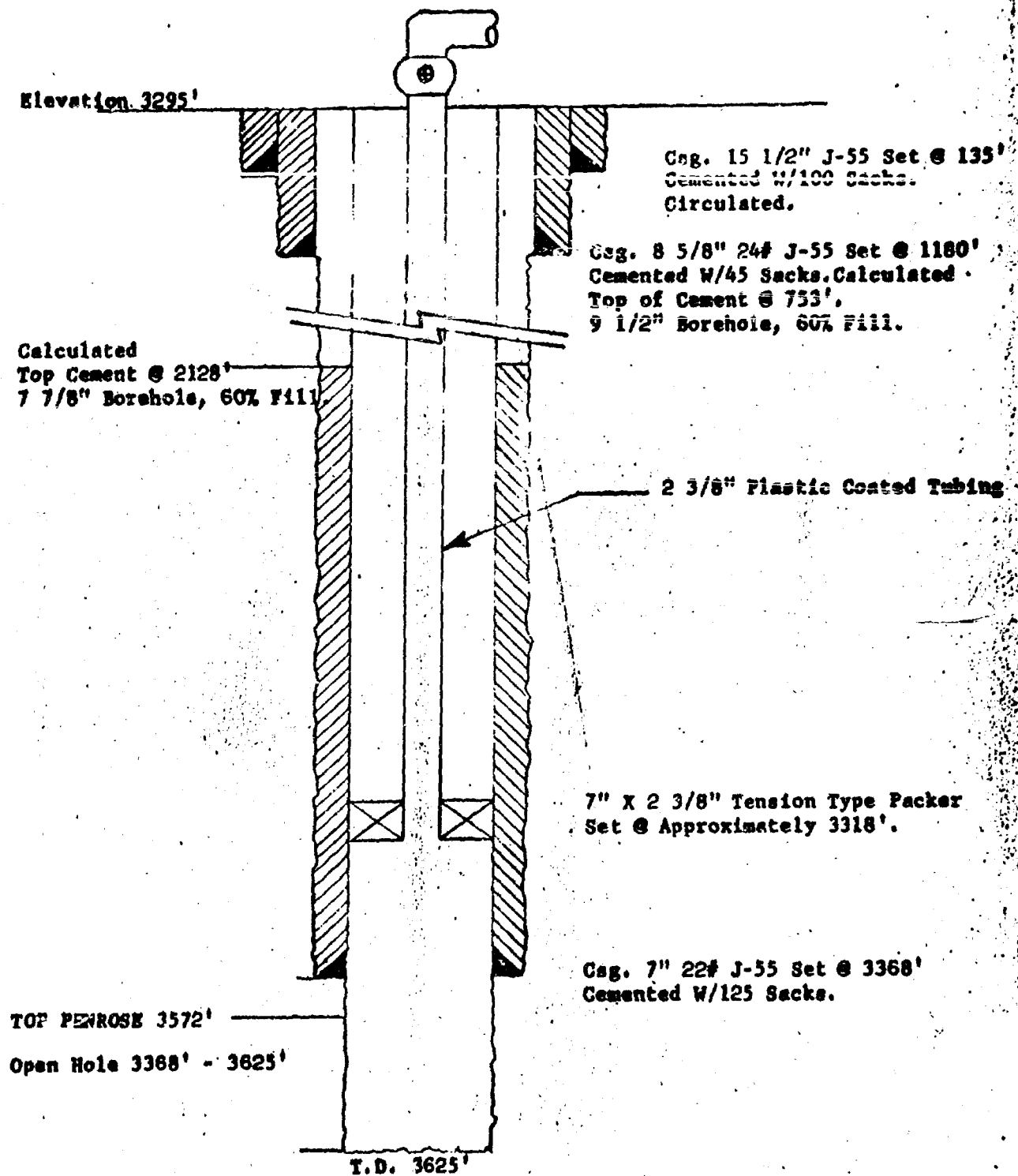
HUGHES "A1" NO. 6
1980' FSL & 660' FWL, Sec. 4, T-23-8, R-37-E
LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WTW

SAMEDAN OIL CORPORATION

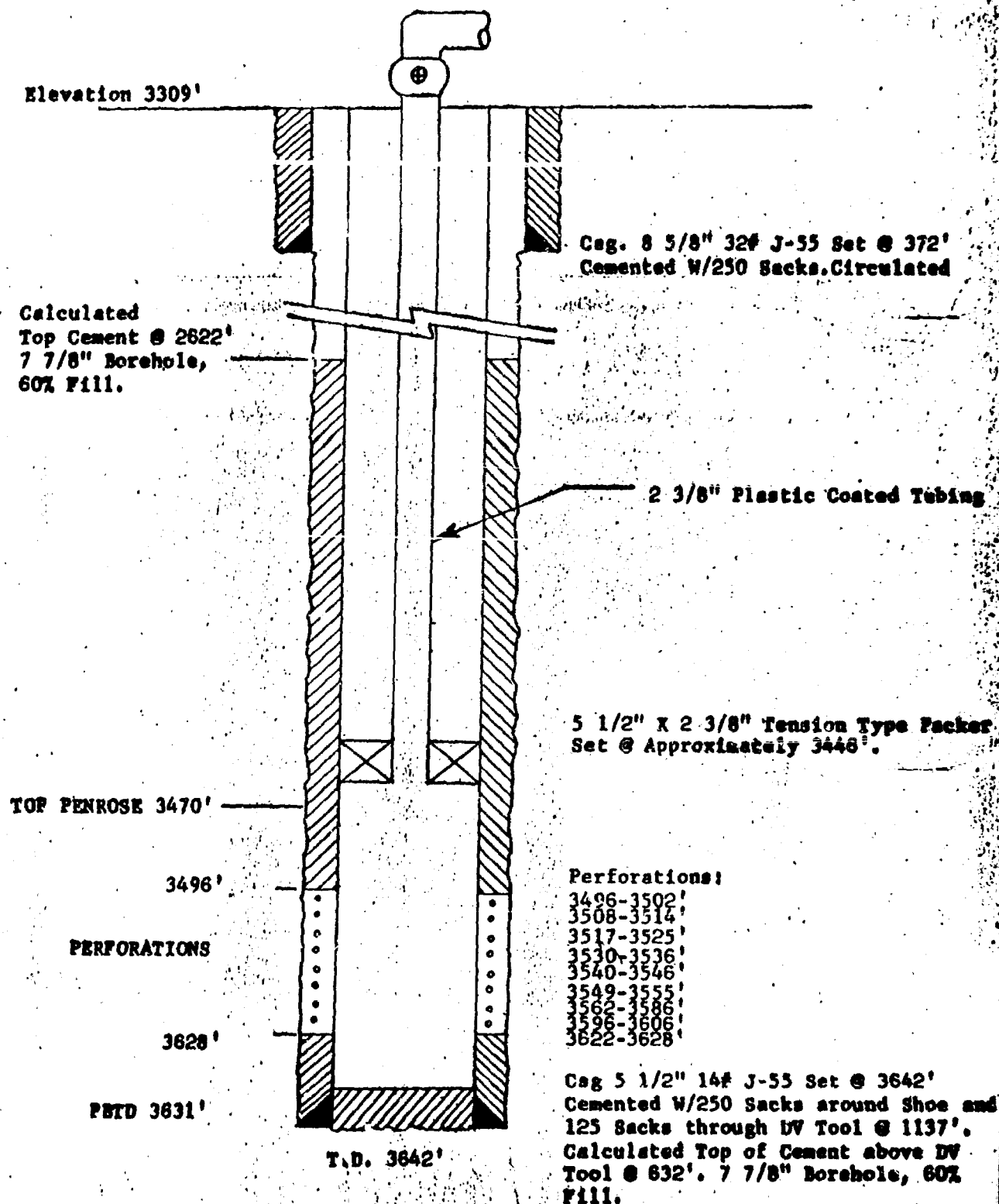
HUGHES "A2" NO. 4
1980' FSL & 1980' FEL, Sec. 10, T-23-S, R-37-E
LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WIW

SAMEDAN OIL CORPORATION

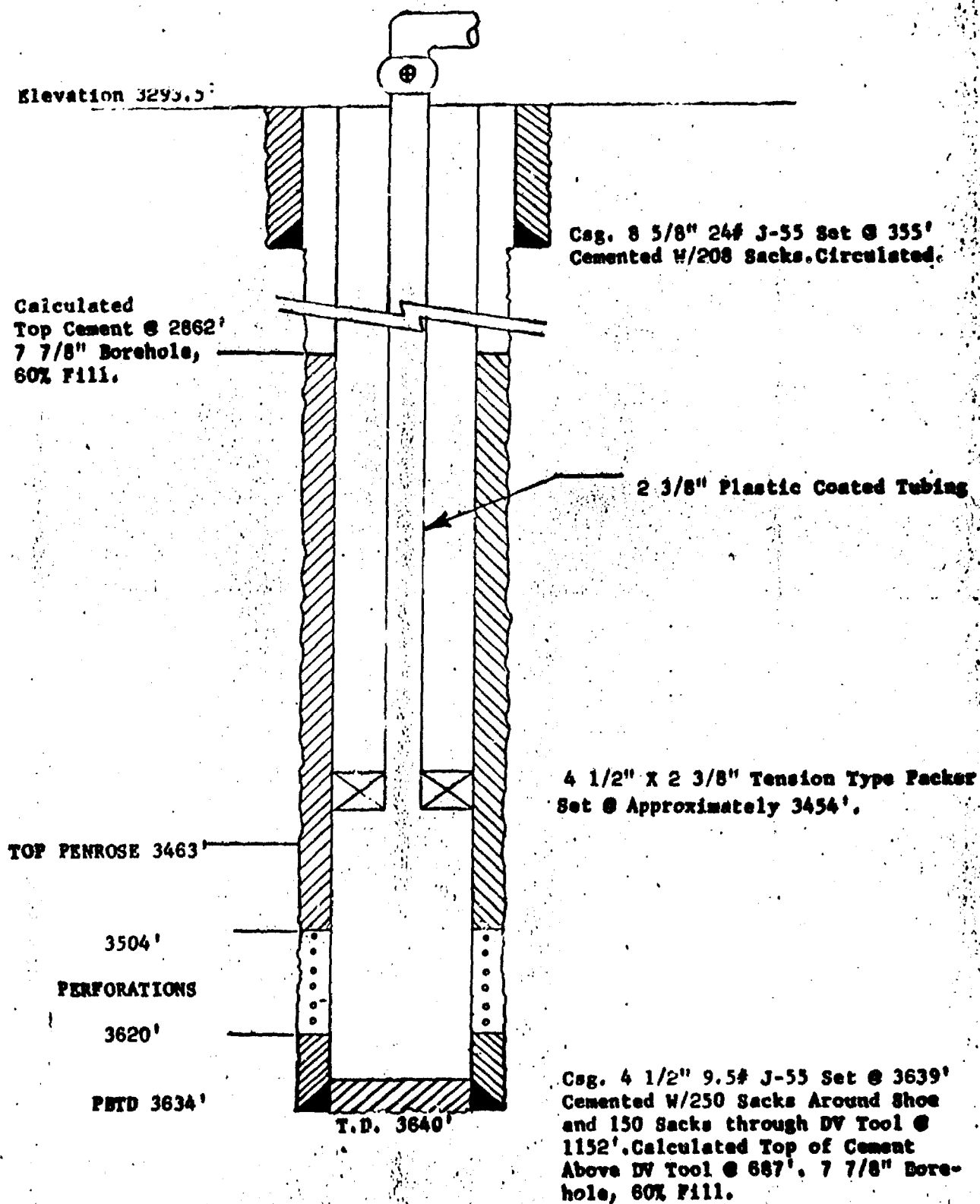
HUGHES "A2" NO. 7
1980' FSL & 1980' FEL, Sec. 9, T-23-S, R-37-E
LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WIW

SAMEDAN OIL CORPORATION

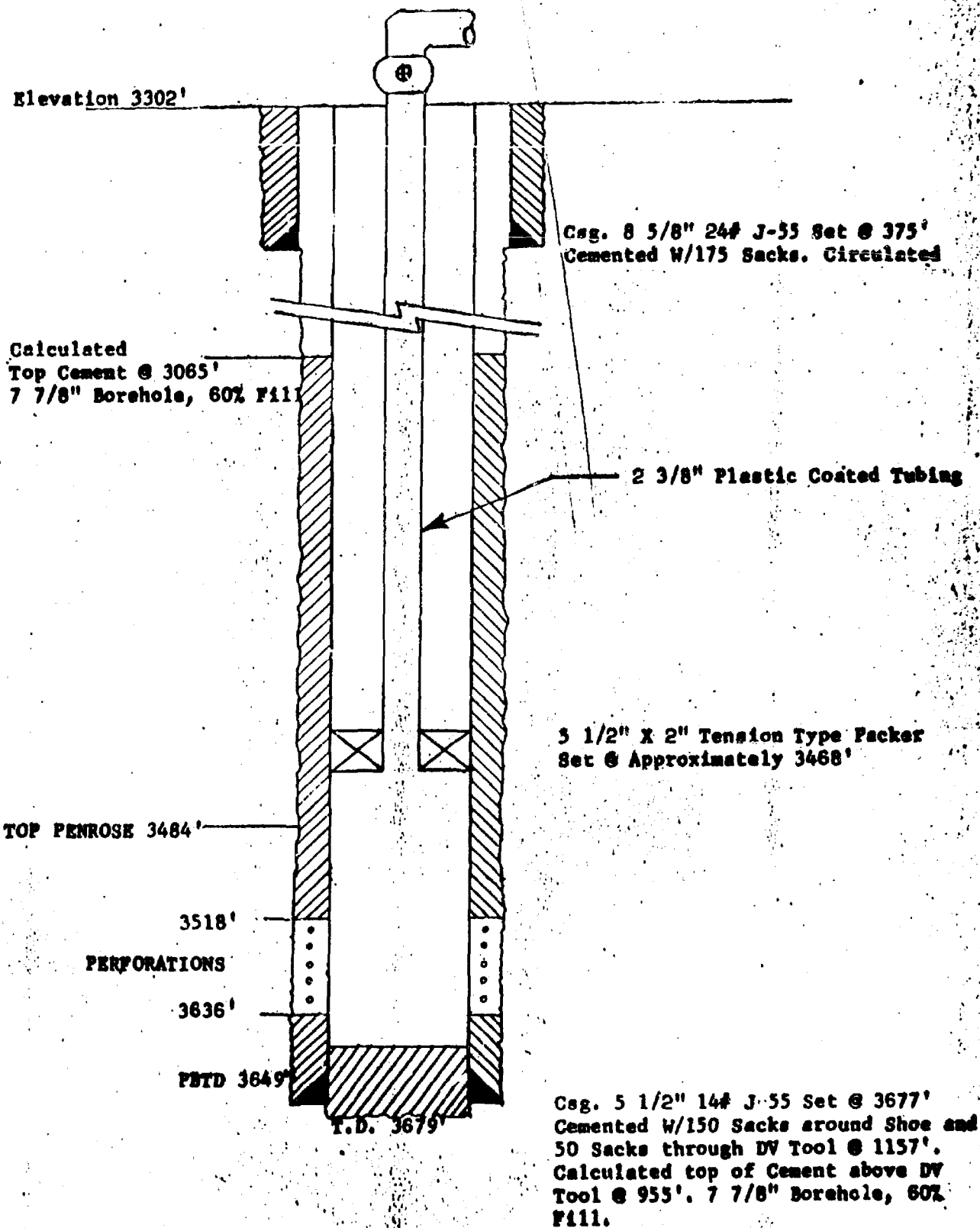
HUGHES "A2" NO. 8
660' FSL & 660' FEL, Sec. 9, T-23-S, R-37-E
LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WIW

SAMEDAN OIL CORPORATION

HUGHES "A2" NO. 11
1650' FSL & 330' FWL, Sec. 10, T-23-S, R-37-E
LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WIM

SKELLY OIL COMPANY

A. L. KING NO. 1
1980' FWL & 1980' FWL. Sec. 4, T-23-B, R-37-E
LEA COUNTY, NEW MEXICO

Elevation 3331'

TOP PENROSE 3558'

Open Hole 3350'-3683'

T.D. 3683'

Csg. 12 1/2" 45# Set @ 270'
Cemented W/200 Sacks. Circulated.

2 3/8" Plastic Coated Tubing

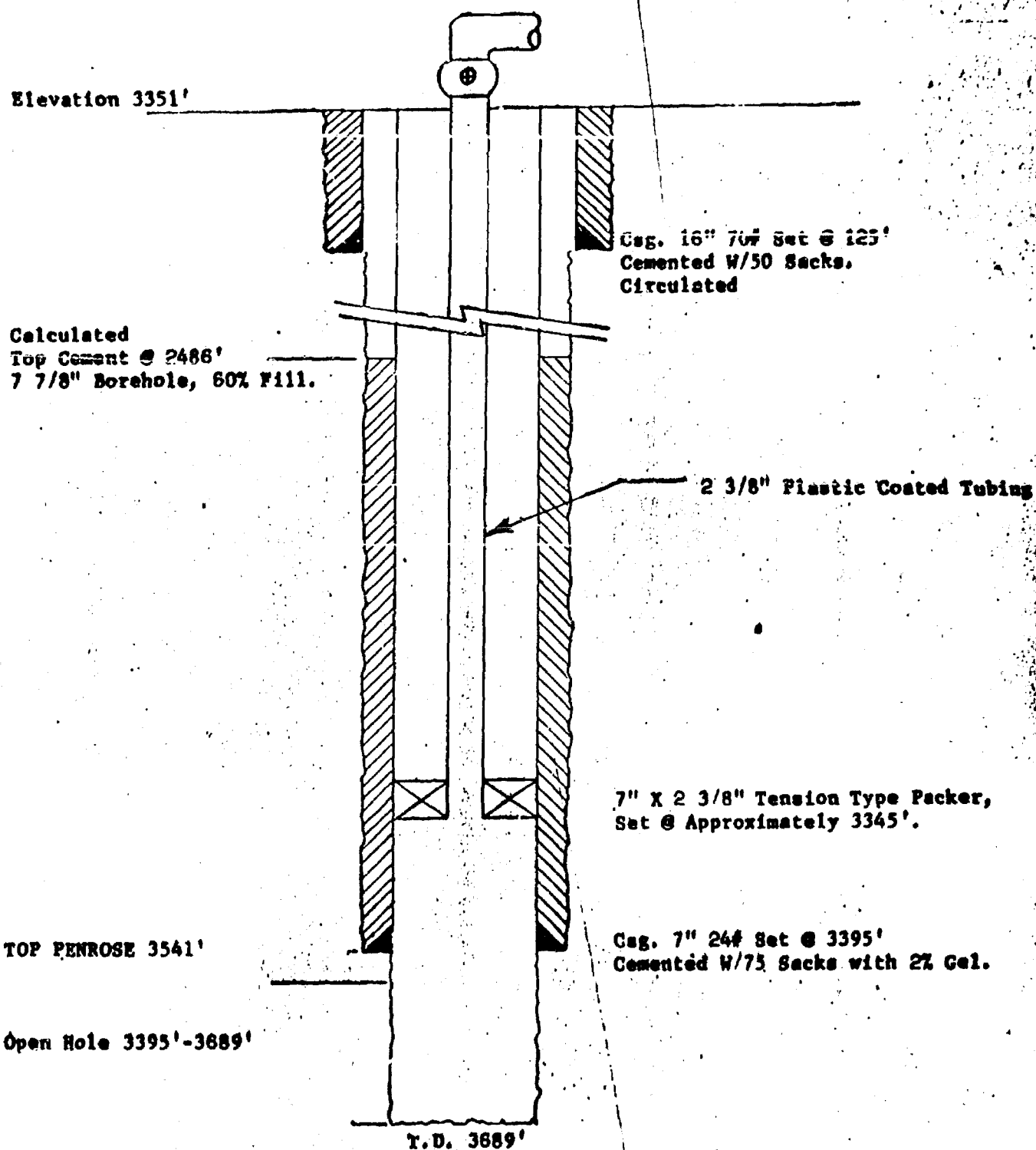
7" X 2 3/8" Tension Type Packer.
Set @ Approximately 3300'.

Csg. 7" 24# Set @ 3350'
Cemented W/400 Sacks around Shoe and
200 sacks through DV Tool @ 1186'.
Returns from Shoe to DV Tool and
from DV Tool to surface. Cement
Circulated.

PROPOSED SKELLY PENROSE "A" UNIT W/

SKELLY OIL COMPANY

KING "A" NO. 2
1980' FSL & 660' FWL, Sec. 33, T-22-S, R-37-E
LEA COUNTY, NEW MEXICO



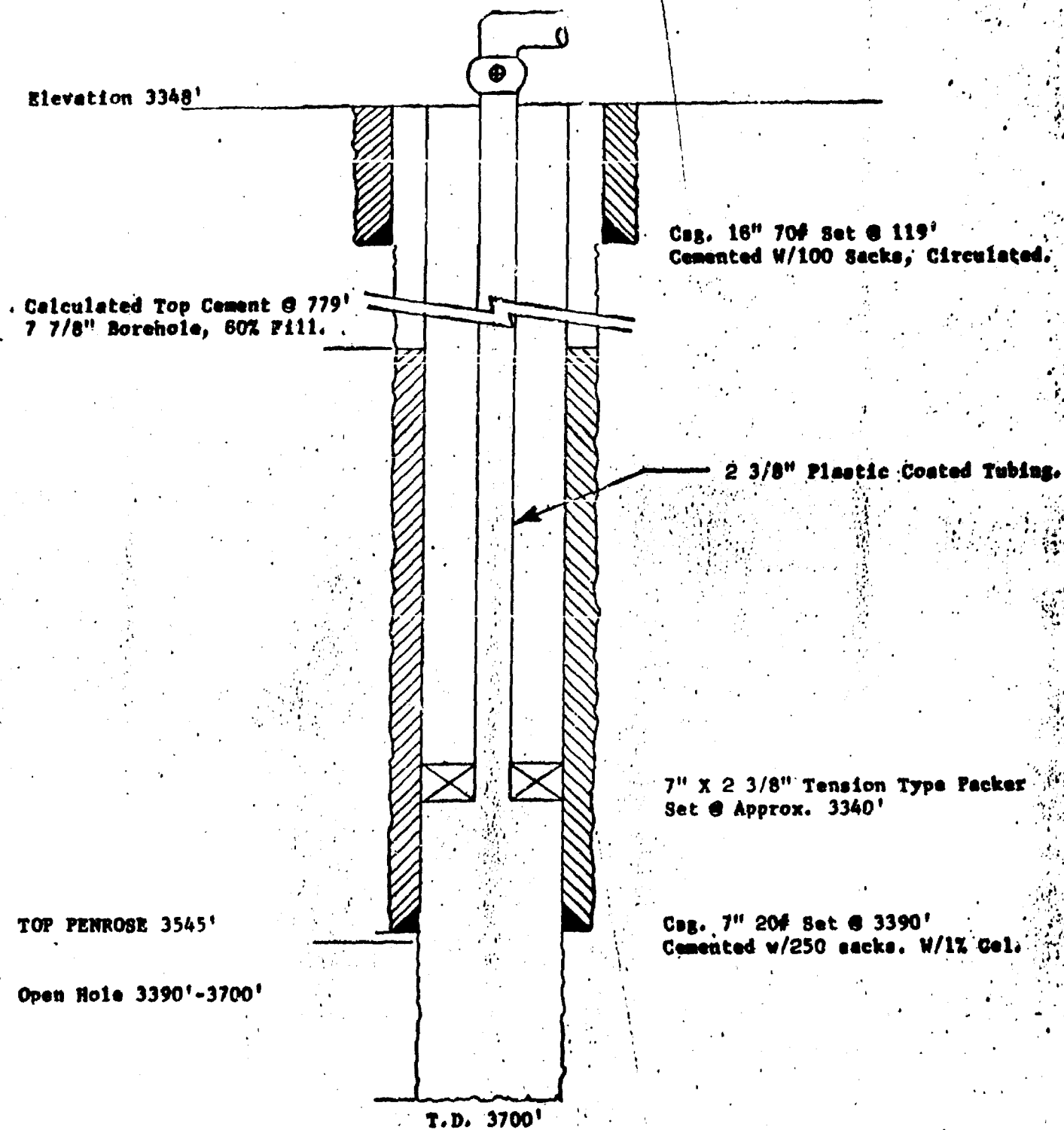
PROPOSED SKELLY PENROSE "A" UNIT WIW

SKELLY OIL COMPANY

KING "A" NO. 3

660' FSL & 1980' FWL, Sec. 33, T-22-S, R-37-E

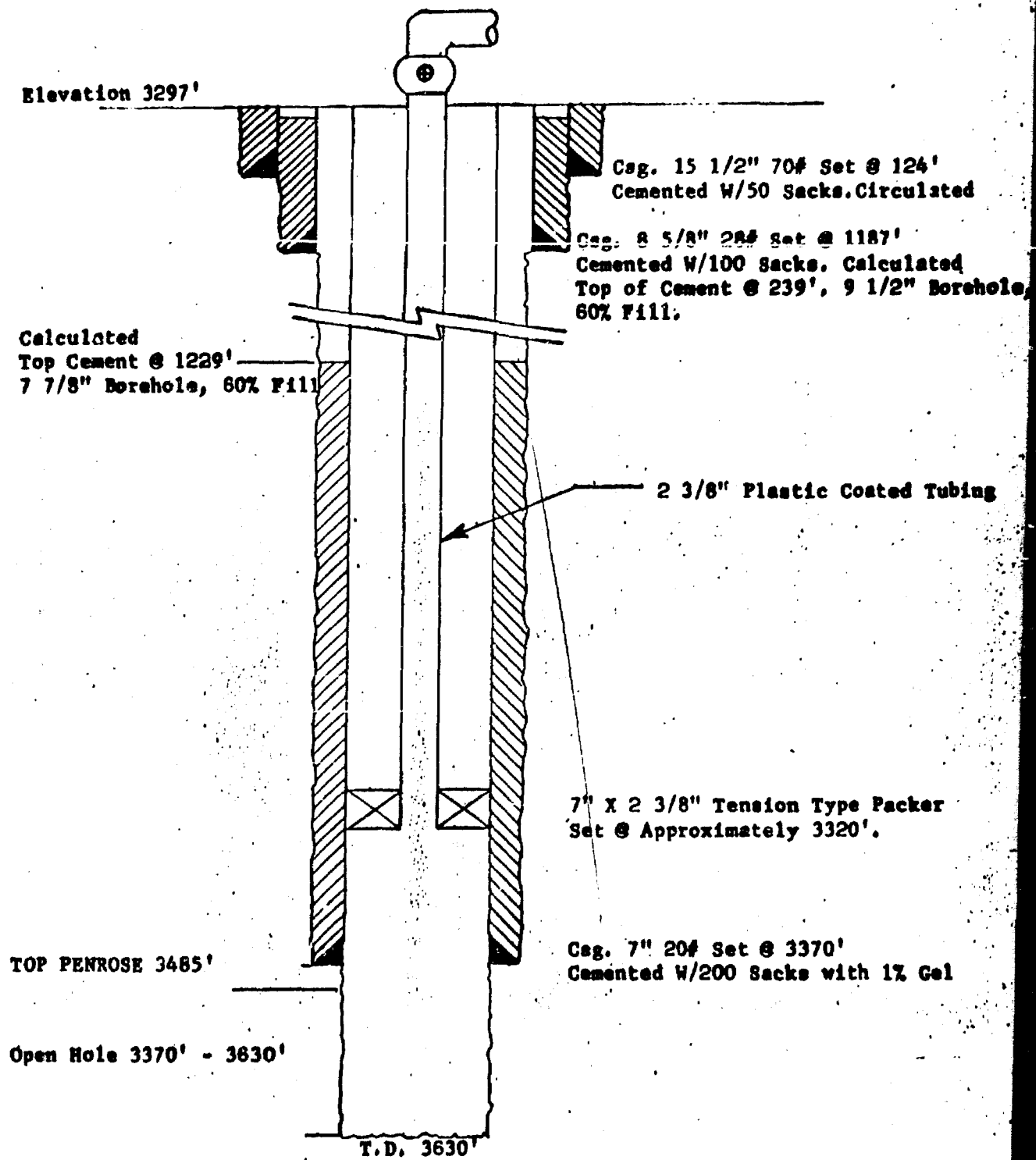
LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WIW

SKELLY OIL COMPANY

SIMS "C" NO. 1
740' FSL & 2000' FWL, Sec. 3, T-23-S, R-37-E
LEA COUNTY, NEW MEXICO

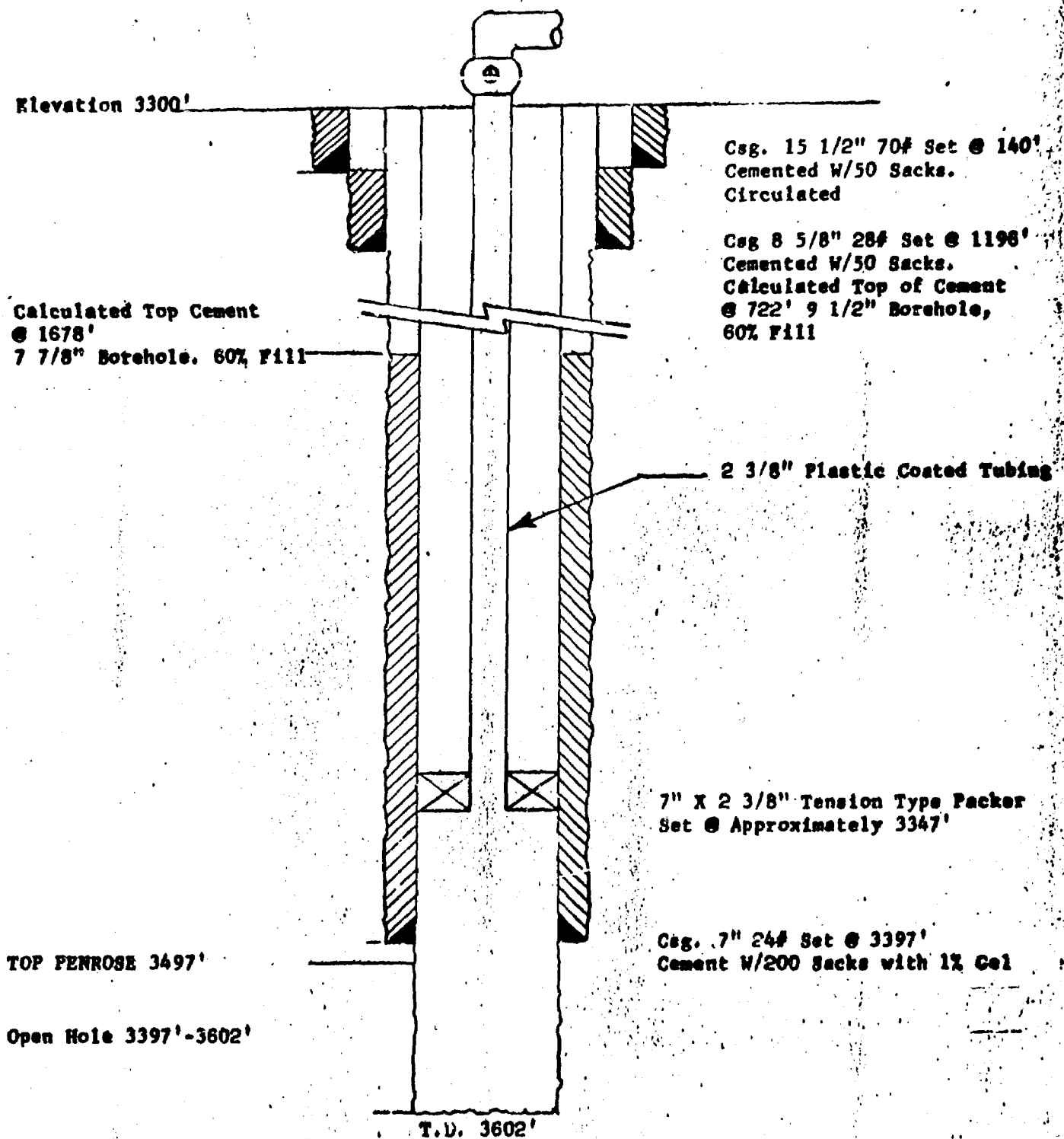


PROPOSED SKELLY PENROSE "A" UNIT WIW

SKELLY OIL COMPANY

SIMS "D" NO. 1

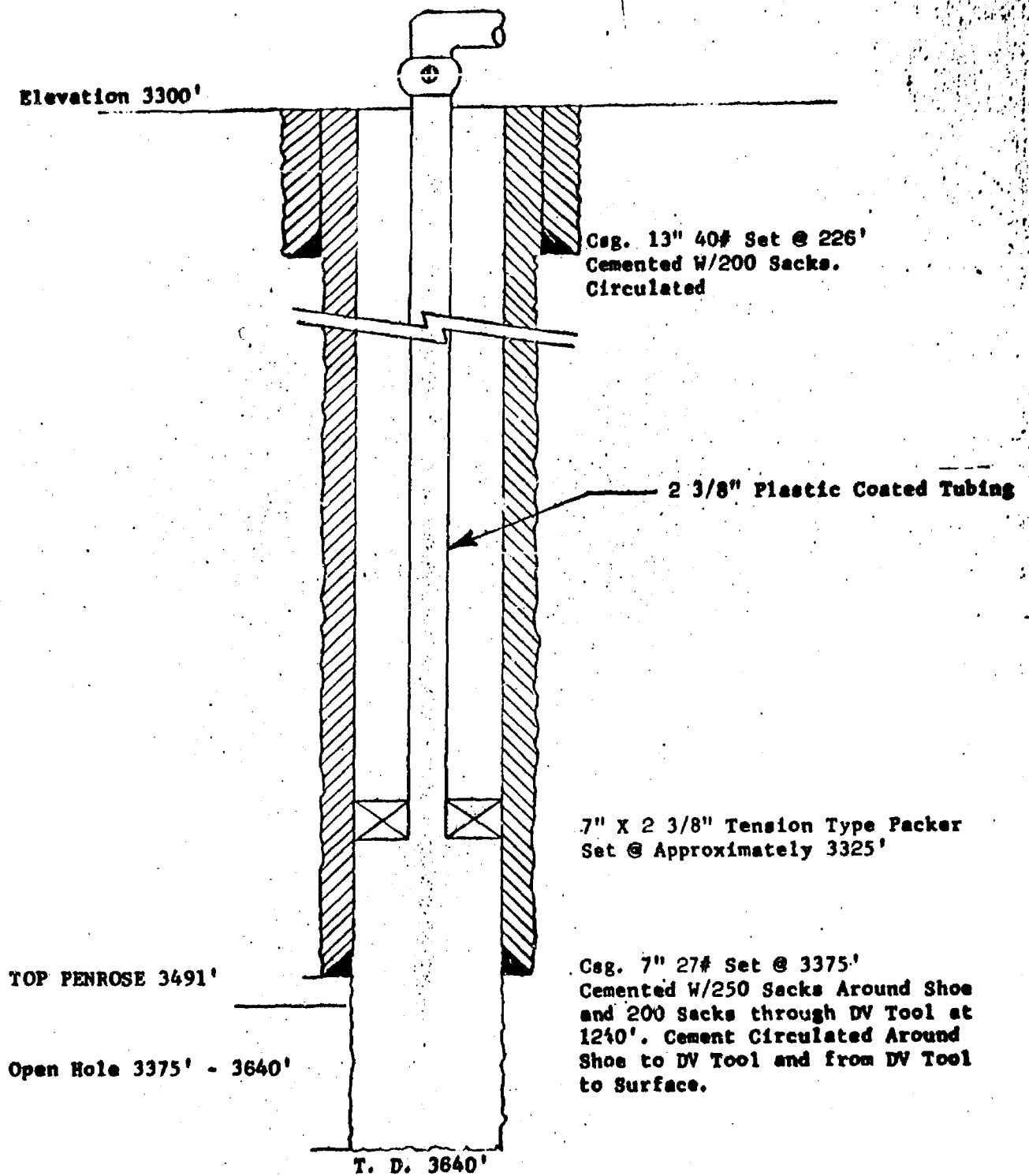
1980' FNL & 1980' FNL, Sec. 3, T-23-S, R-37-E
LEA COUNTY, NEW MEXICO



PROPOSED SKALLY PENROSE "A" UNIT W1W

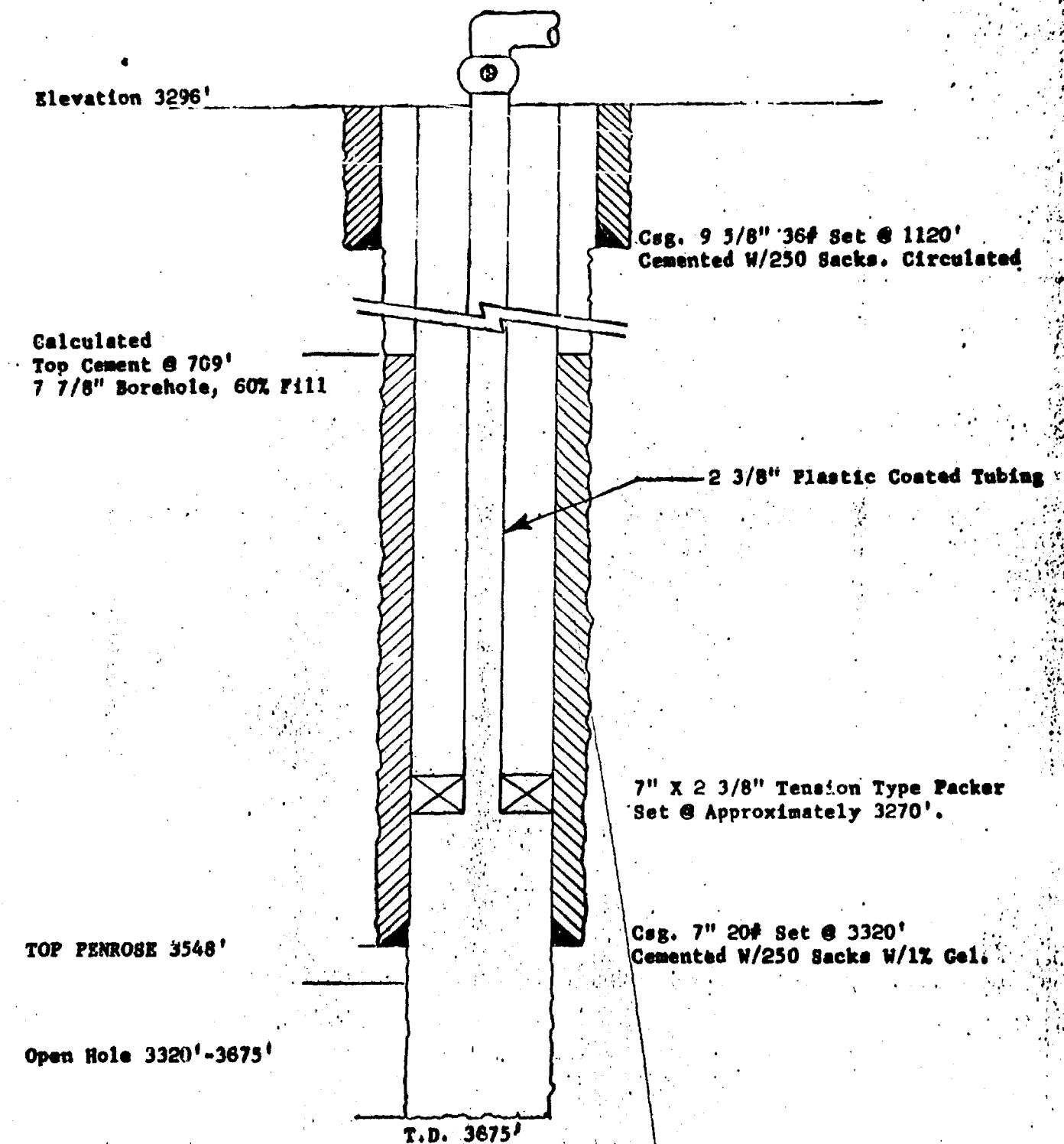
SKELLY OIL COMPANY

ELLEN SIMS NO. 1
1980' FSL & 1980' FEL, Sec. 3, T-23-S, R-37-E
LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WIW

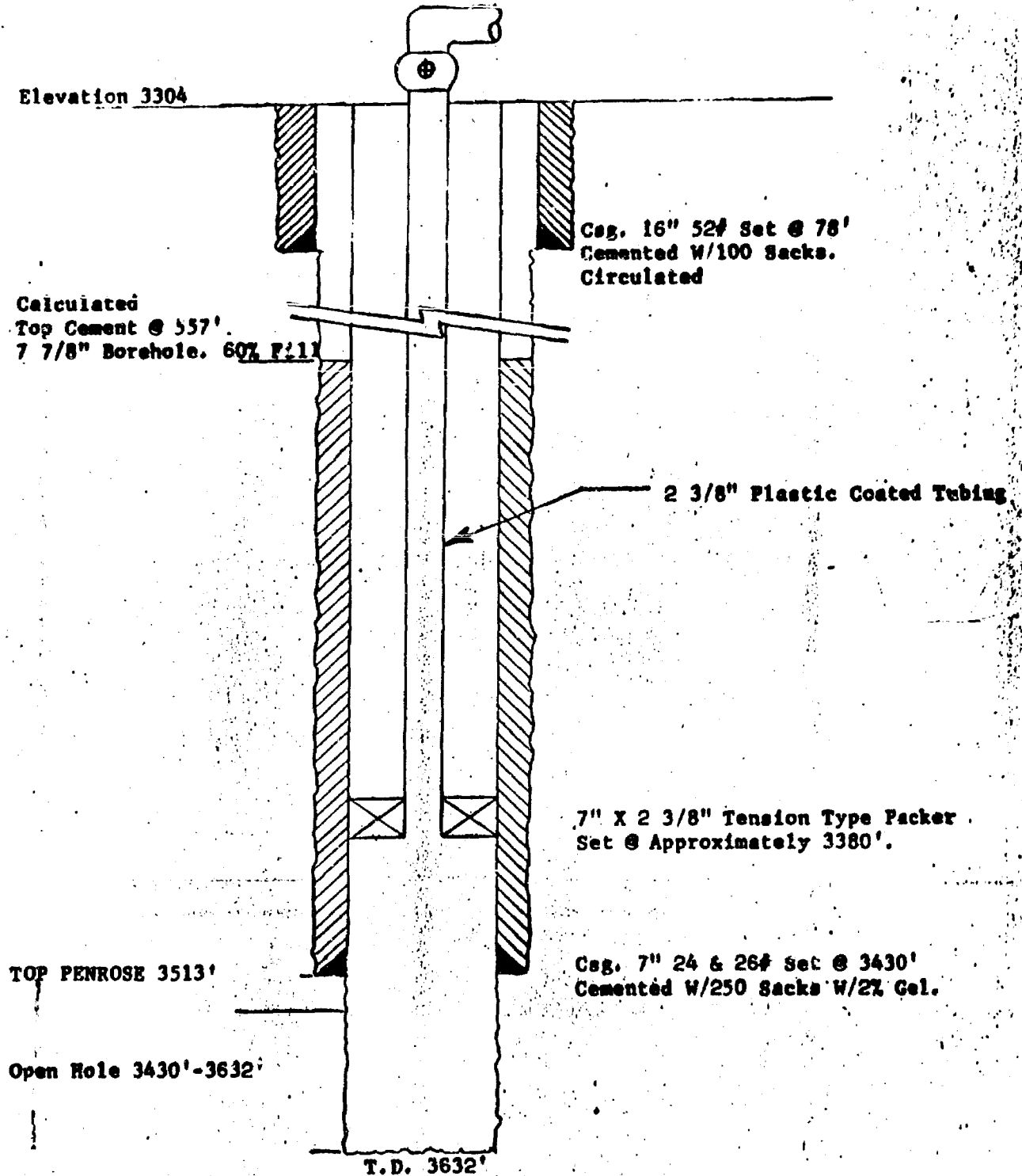
SKELLY OIL COMPANY
ELLEN SIMS NO.3
660' FSL & 660' FSL, Sec. 3, T-23-S, R-37-E
LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WIW

SKELLY OIL COMPANY

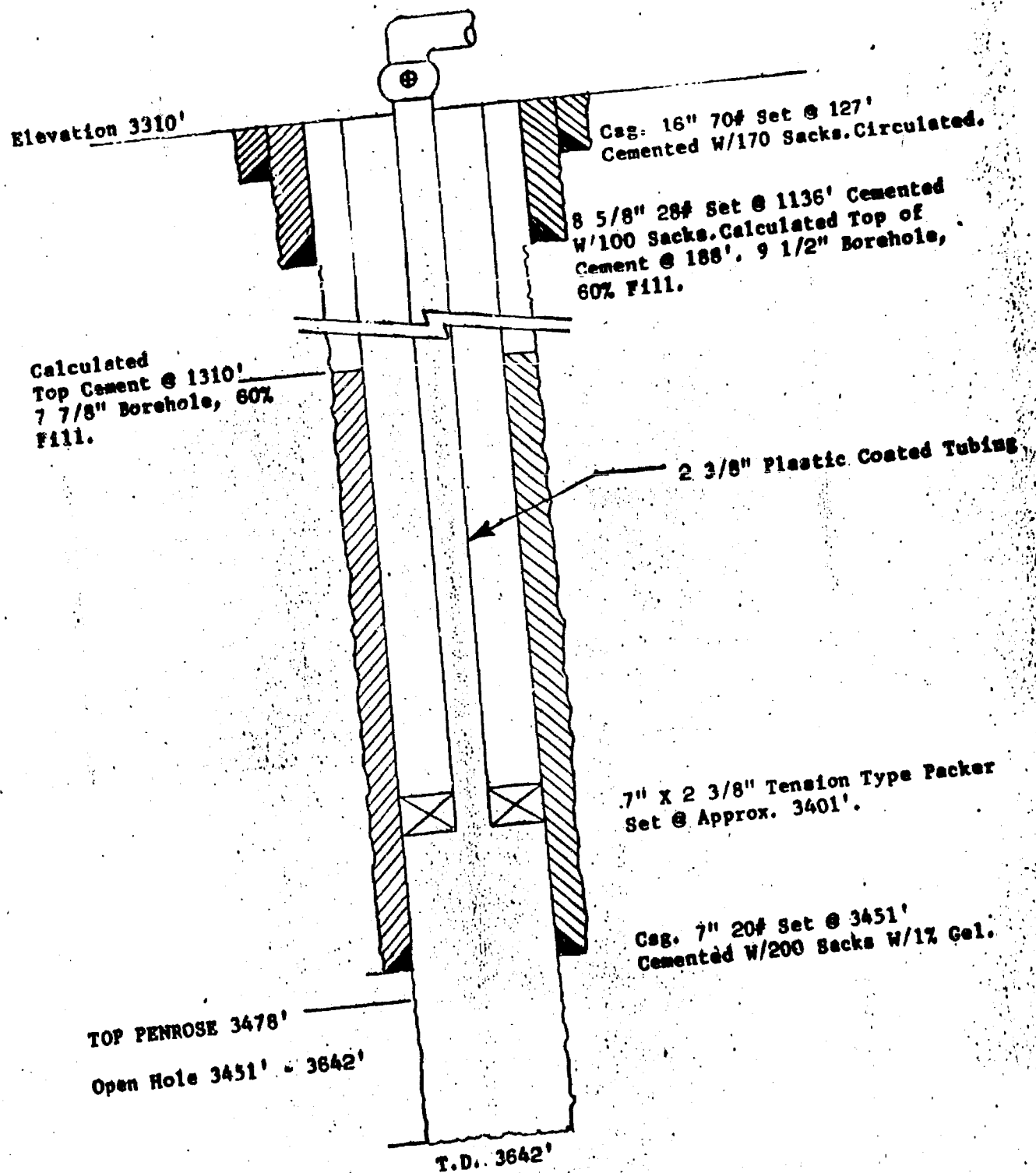
ELLEN SIMS NO. 5
330' FNL & 2310' FEL, Sec. 3, T-23-S, R-37-E
LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WTW

SKELLY OIL COMPANY

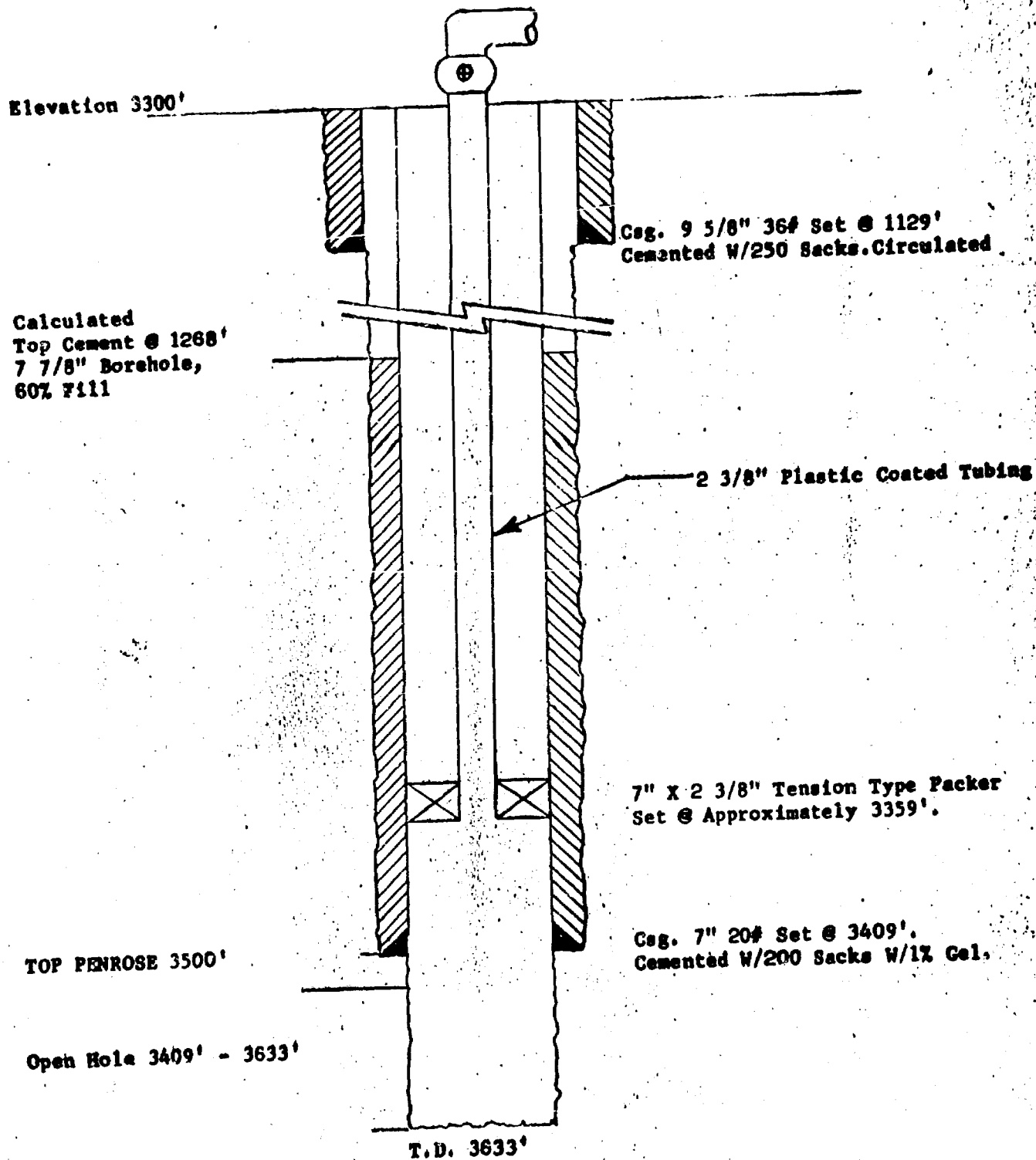
G. W. SIMS NO. 3
660' FWL & 1980' FEL, Sec. 9, T-23-S, R-37-E
LEA COUNTY, NEW MEXICO



PROPOSED PENROSE SKELLY "A" UNIT WII

SKELLY OIL COMPANY

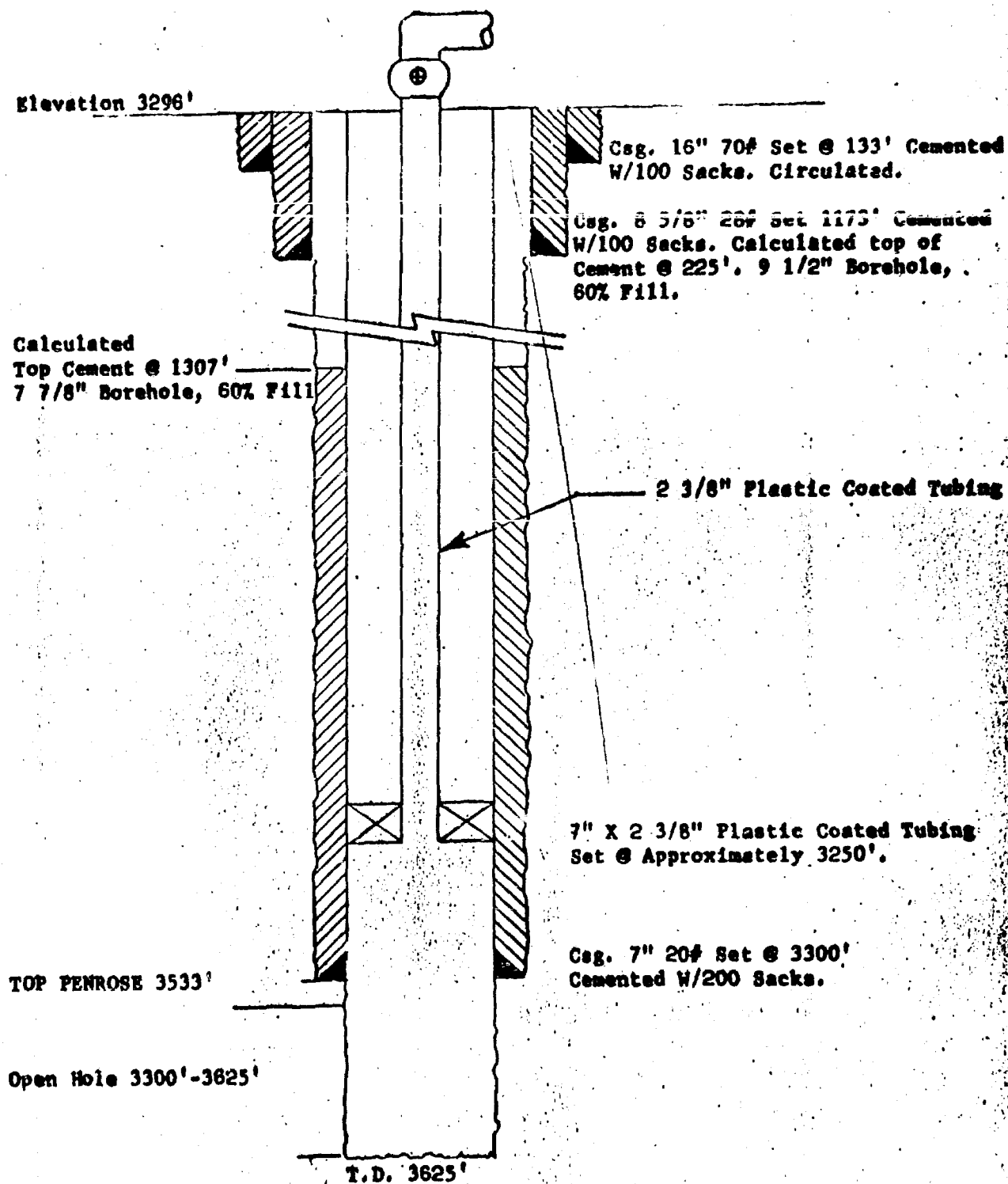
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660' FNL & 660' FWL, Sec. 10, T-23-S, R-37-E
LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WIW

SKELLY OIL COMPANY

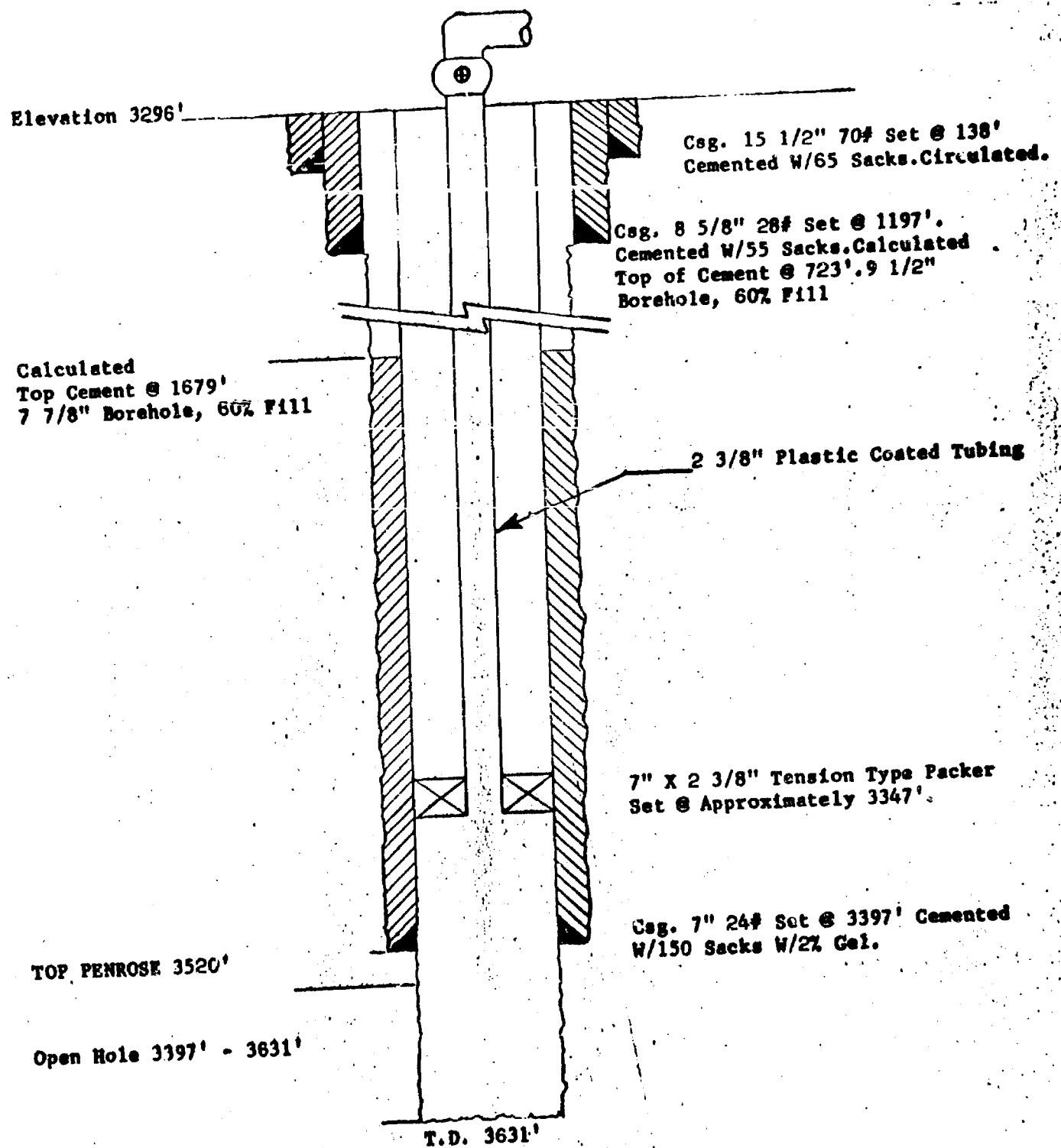
G. W. SIMS NO. 5
1980' FNL & 1980' FWL, Sec. 10, T-23S, R-37-E
LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WIW

SKELLY OIL COMPANY

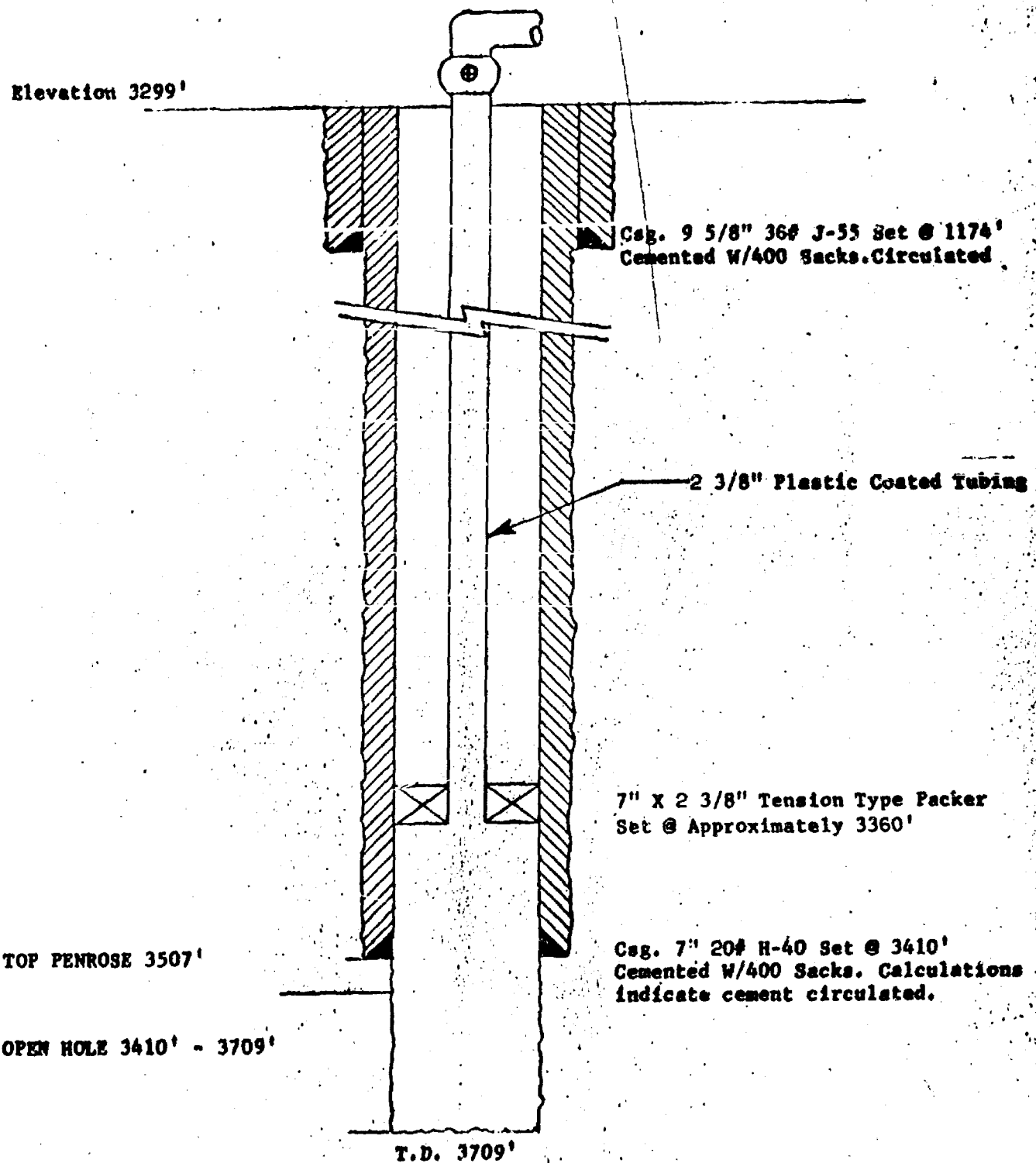
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660' FNL & 1980' FEL, Sec. 10, T-23-S, R-37-E
LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WIW

SKELLY OIL COMPANY

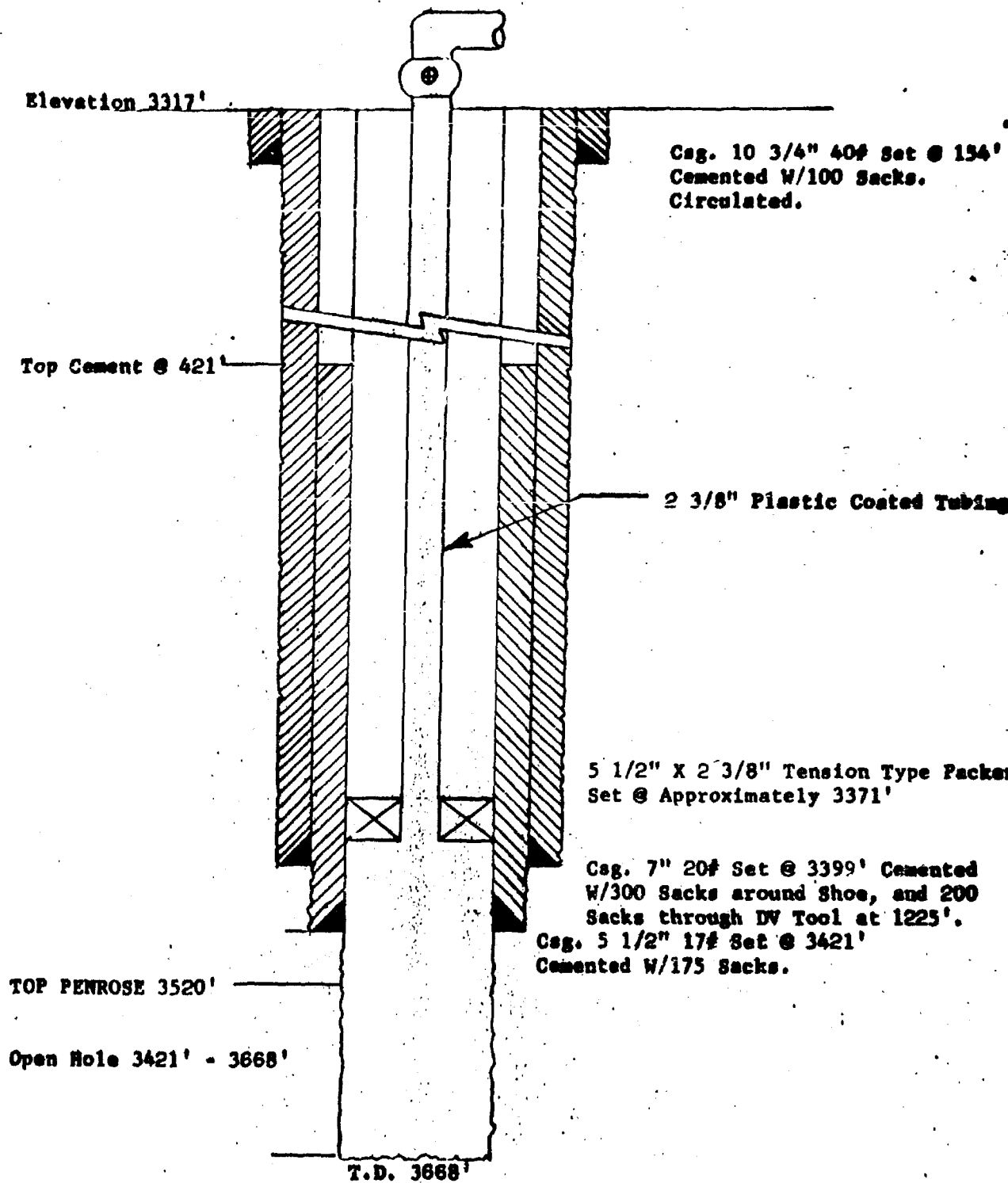
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LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WIW

SKELLY OIL COMPANY

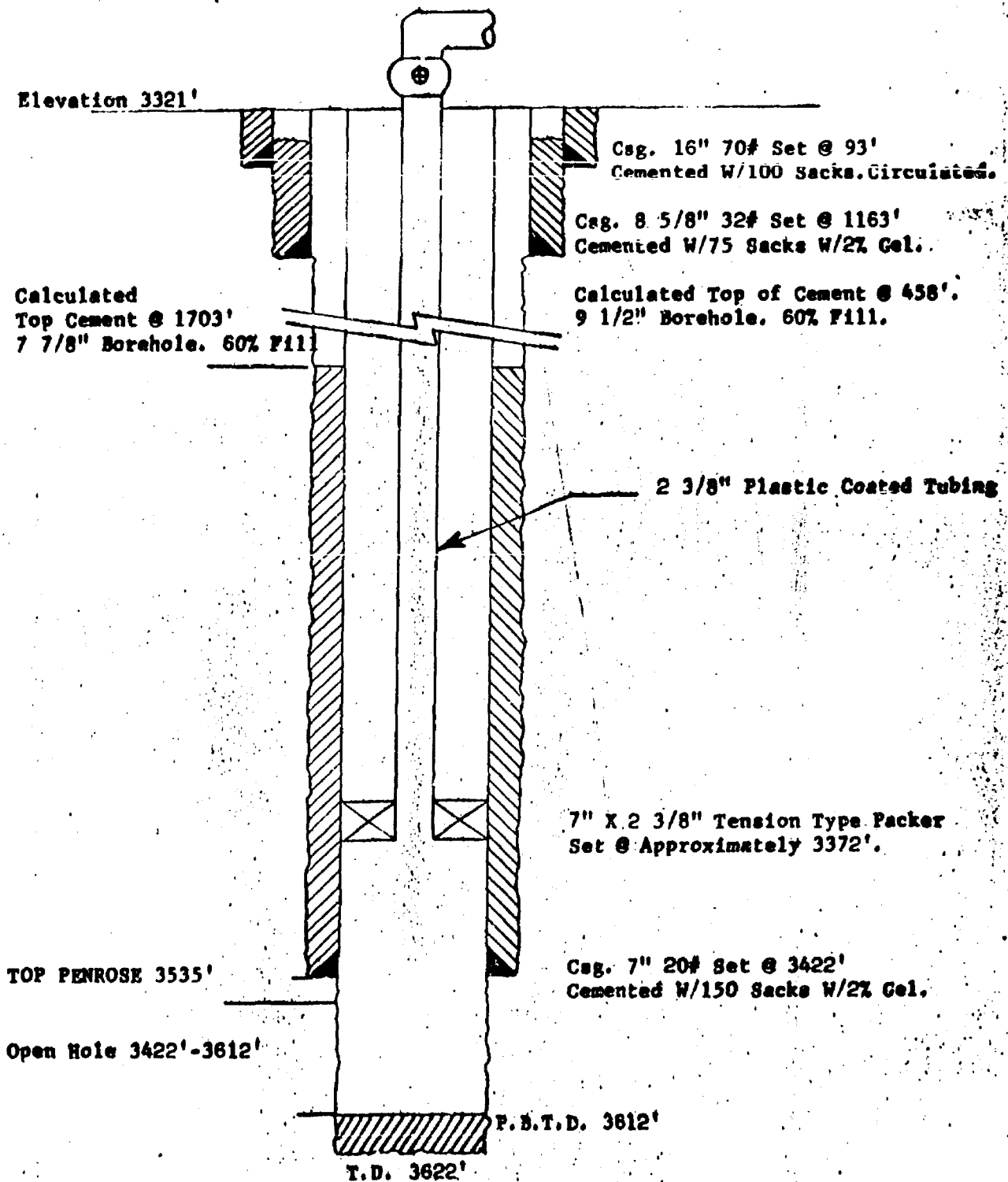
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LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WIW

SKELLY OIL COMPANY

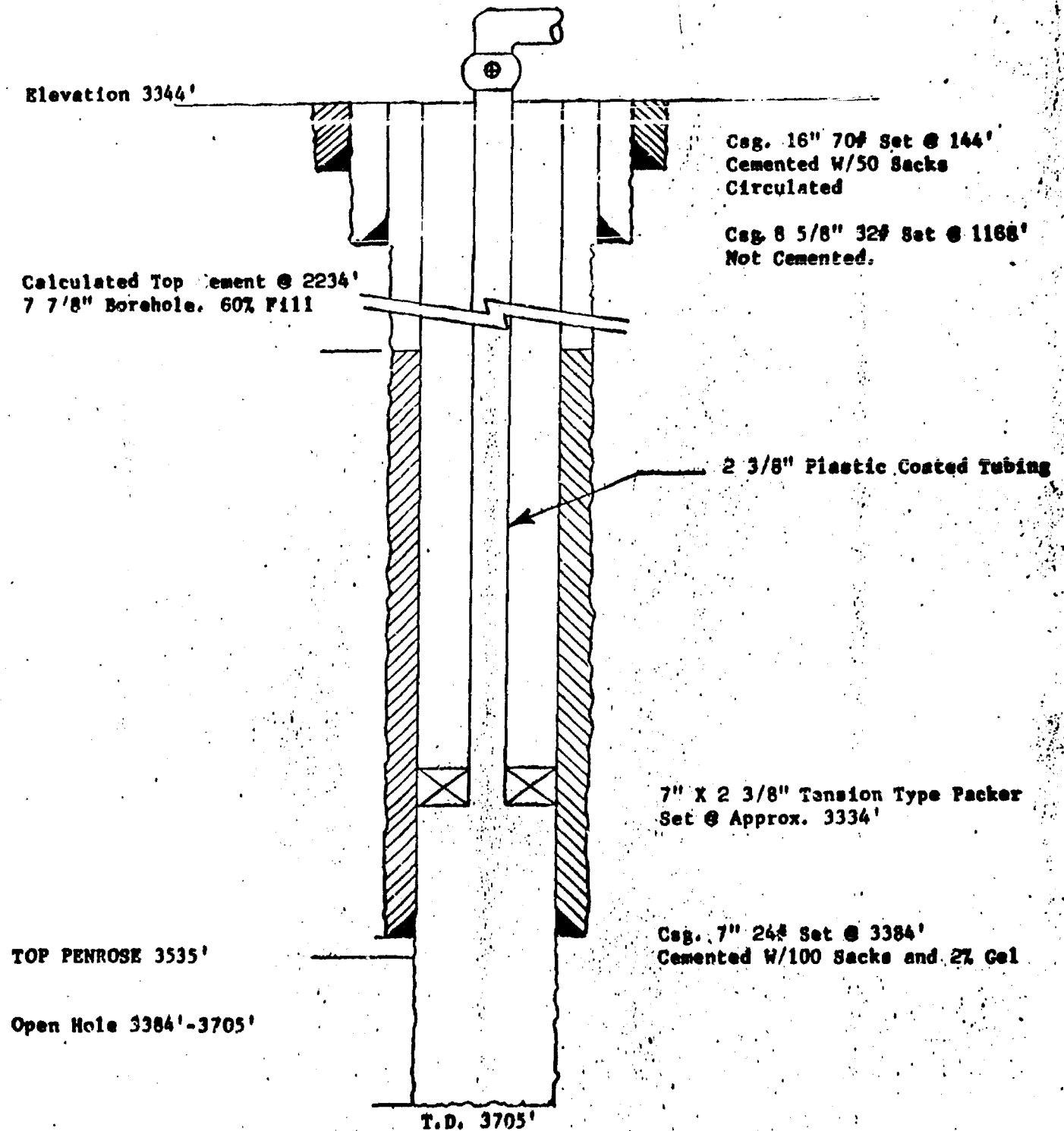
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LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WIW

SKELLY OIL COMPANY

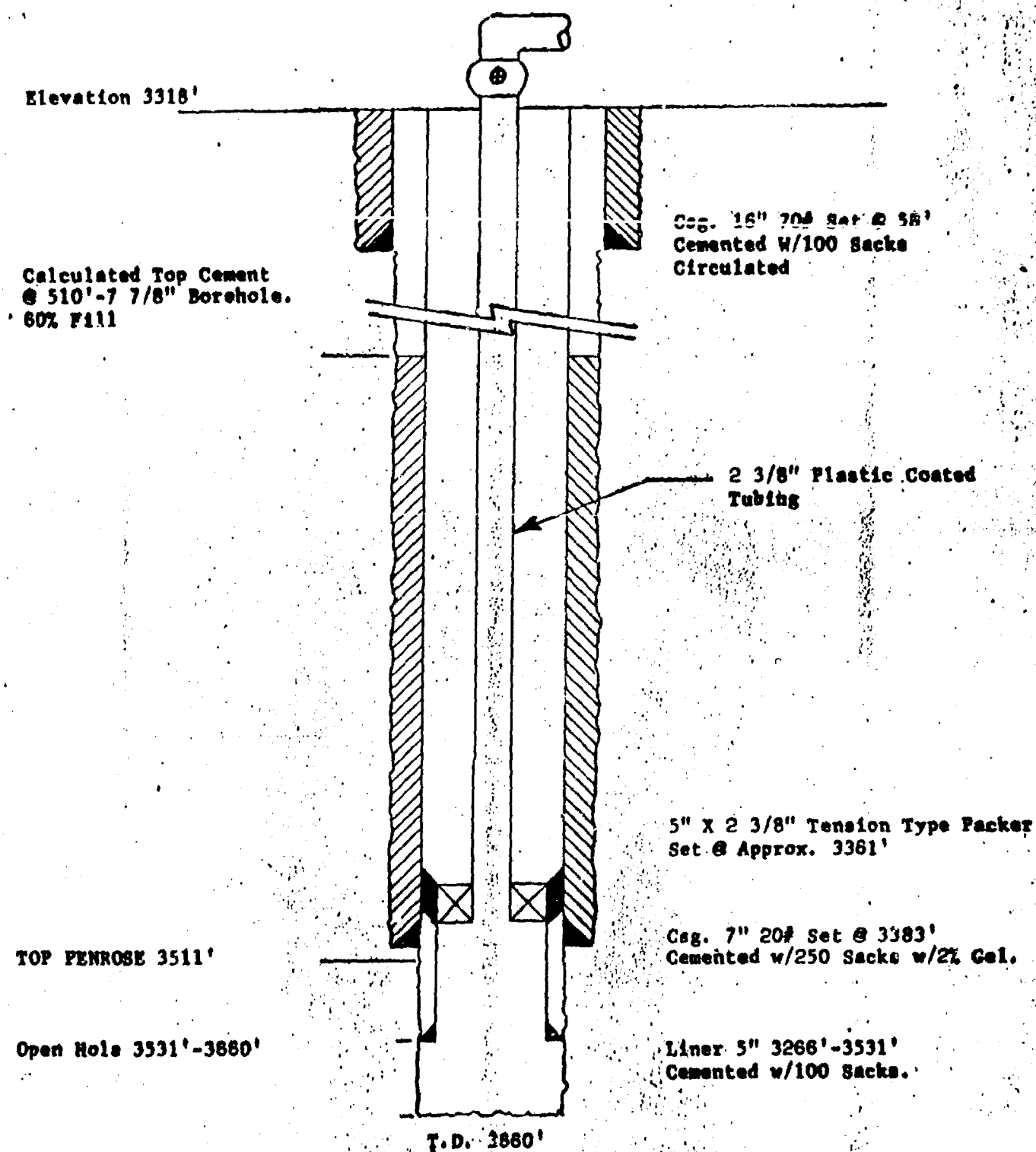
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1980' FSL & 1980' FEL, Sec. 33, T-22-S, R-37-E
LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT W1W

SKELLY OIL COMPANY

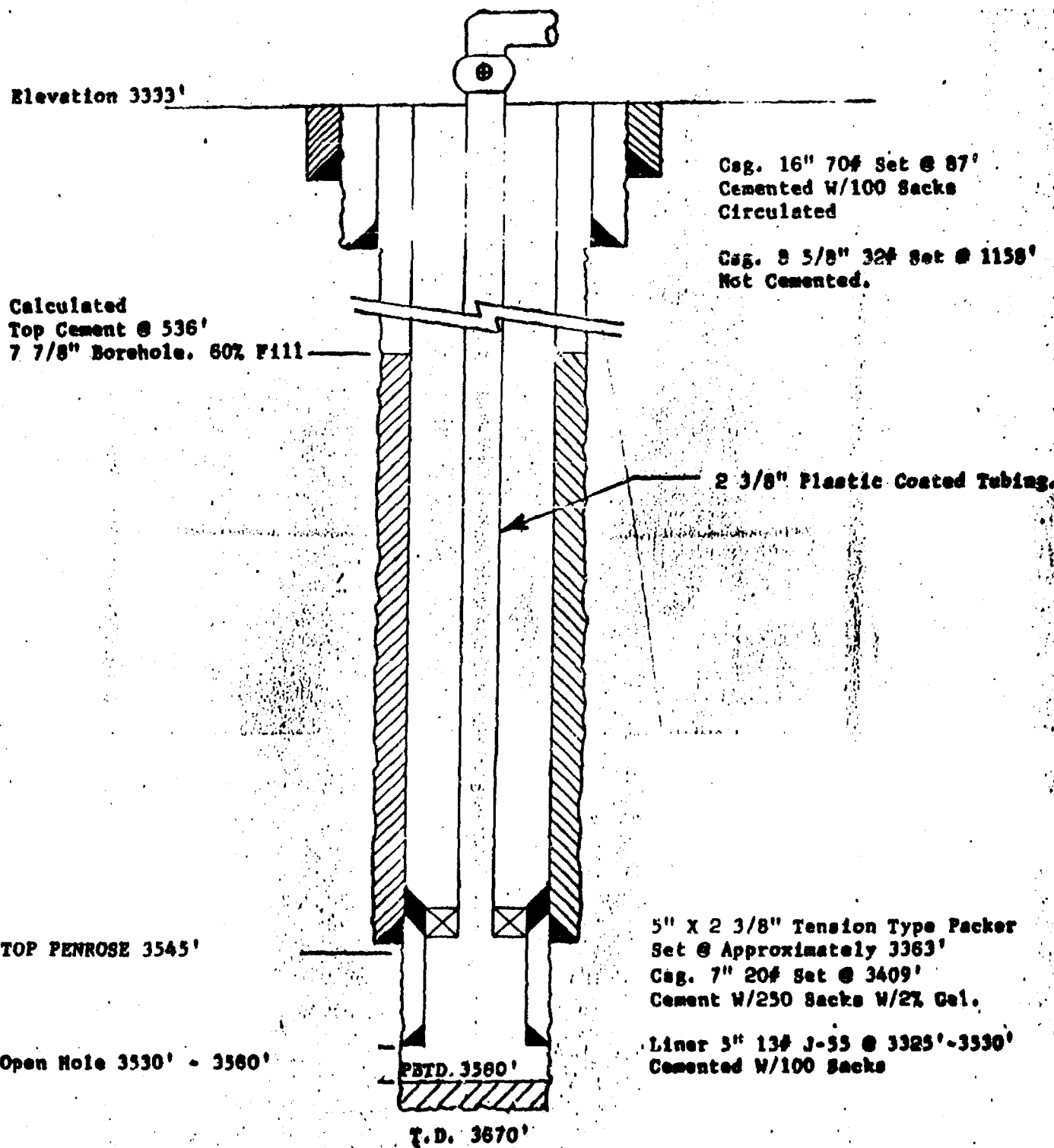
H. O. SIMS NO. 8
680' YSL & 1980' FWL, SECTION 34, T-22-S, R-37-E
LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WIW

SKELLY OIL COMPANY

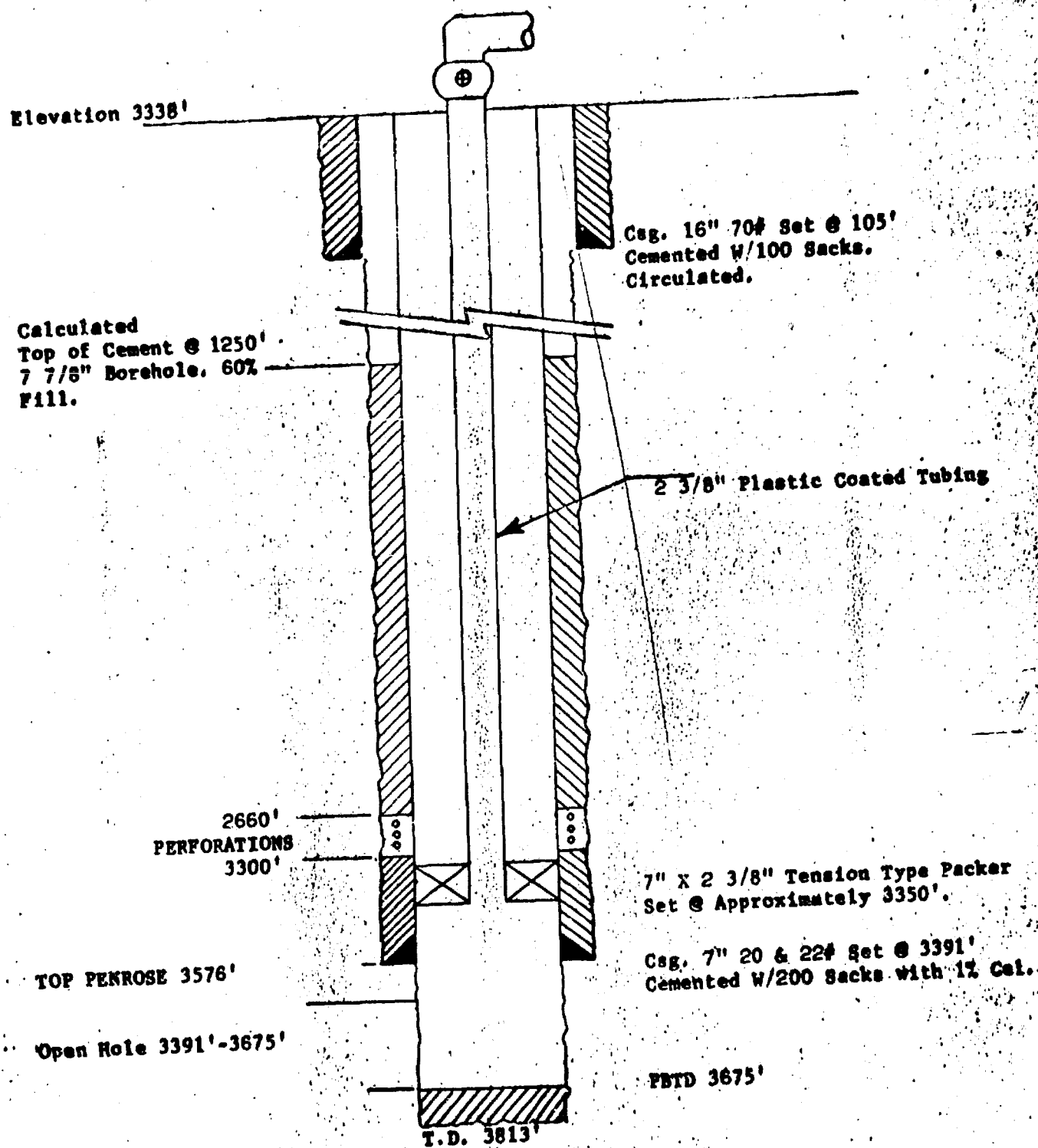
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LEA COUNTY, NEW MEXICO



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SKELLY OIL COMPANY

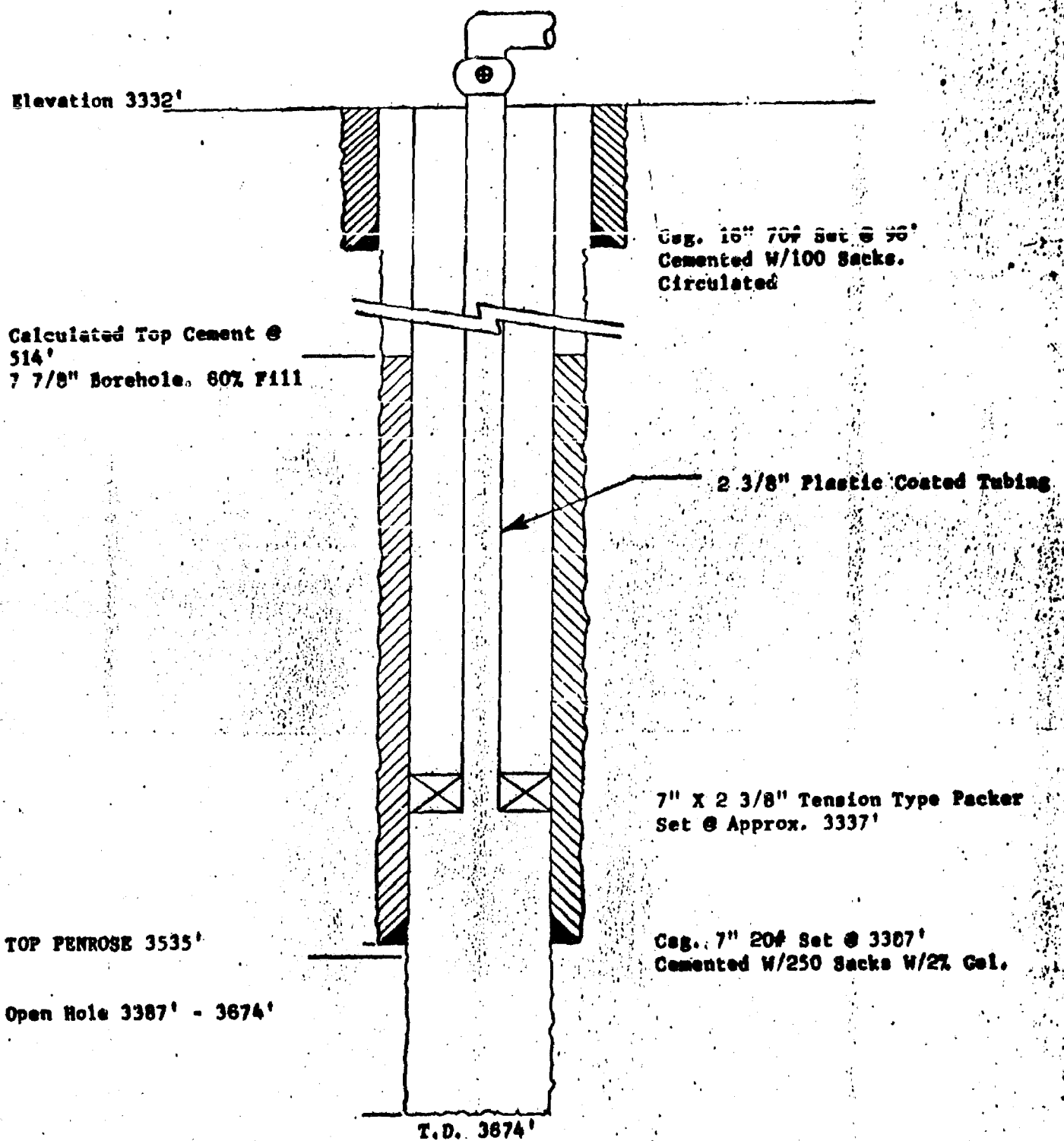
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LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WIW

SKELLY OIL COMPANY

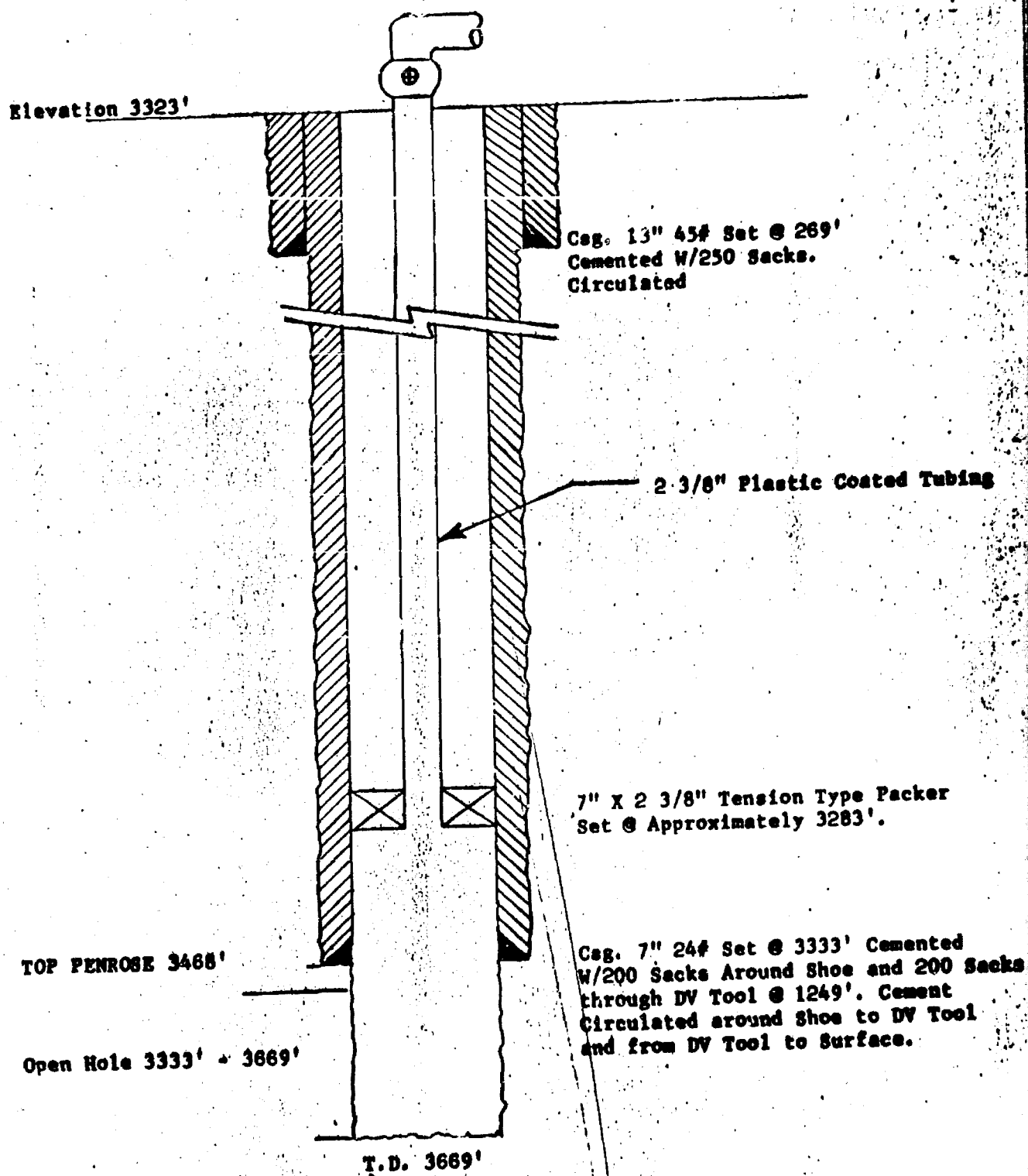
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LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WTW

SKELLY OIL COMPANY

R. R. SIMS NO. 1
660' FSL & 660' FEL, Sec. 4, T-23-S, R-37-E
LEA COUNTY, NEW MEXICO

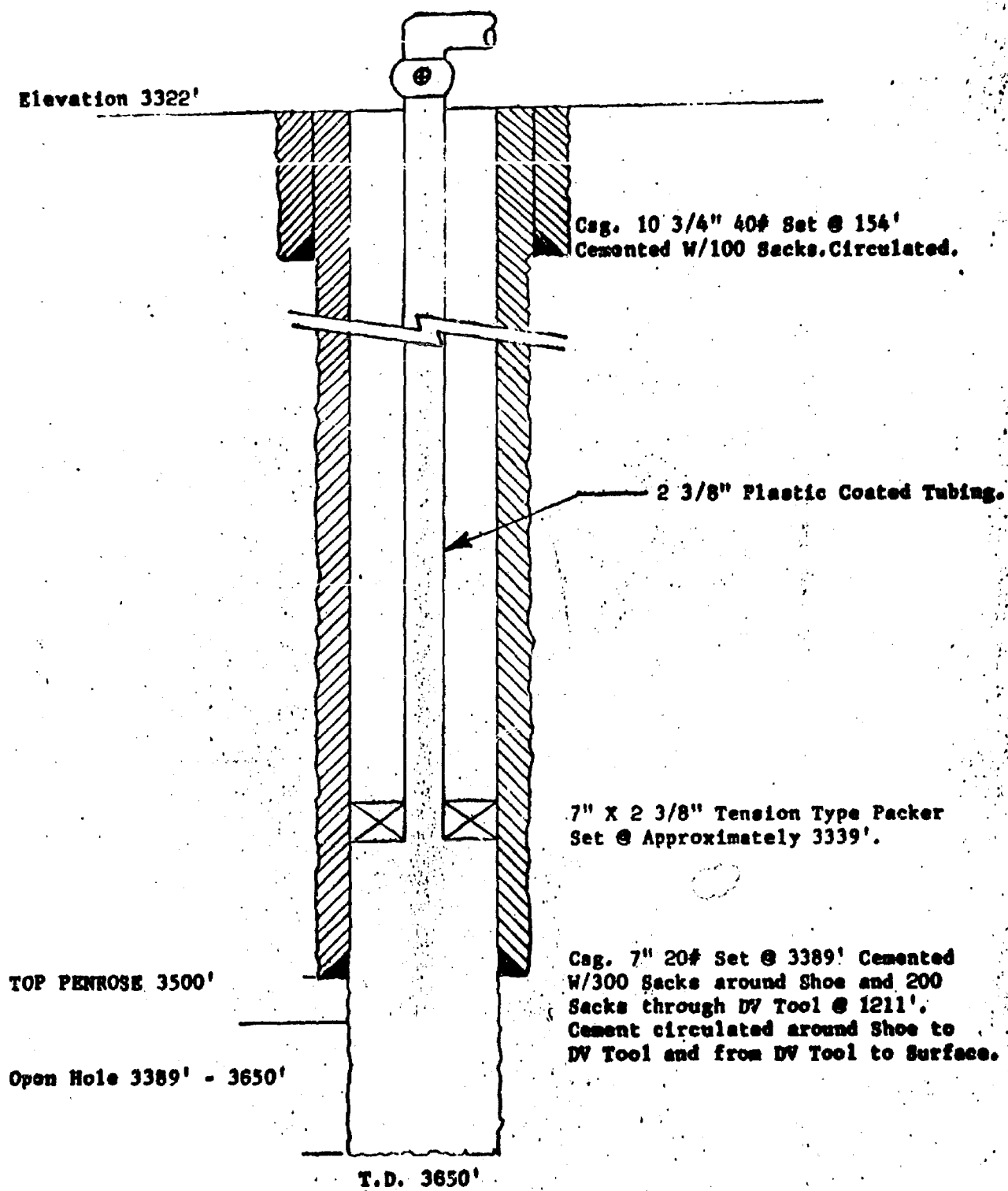


PROPOSED SKELLY PENROSE "A" UNIT WIW NO.

SKELLY OIL COMPANY

R. R. SIMS NO. 4

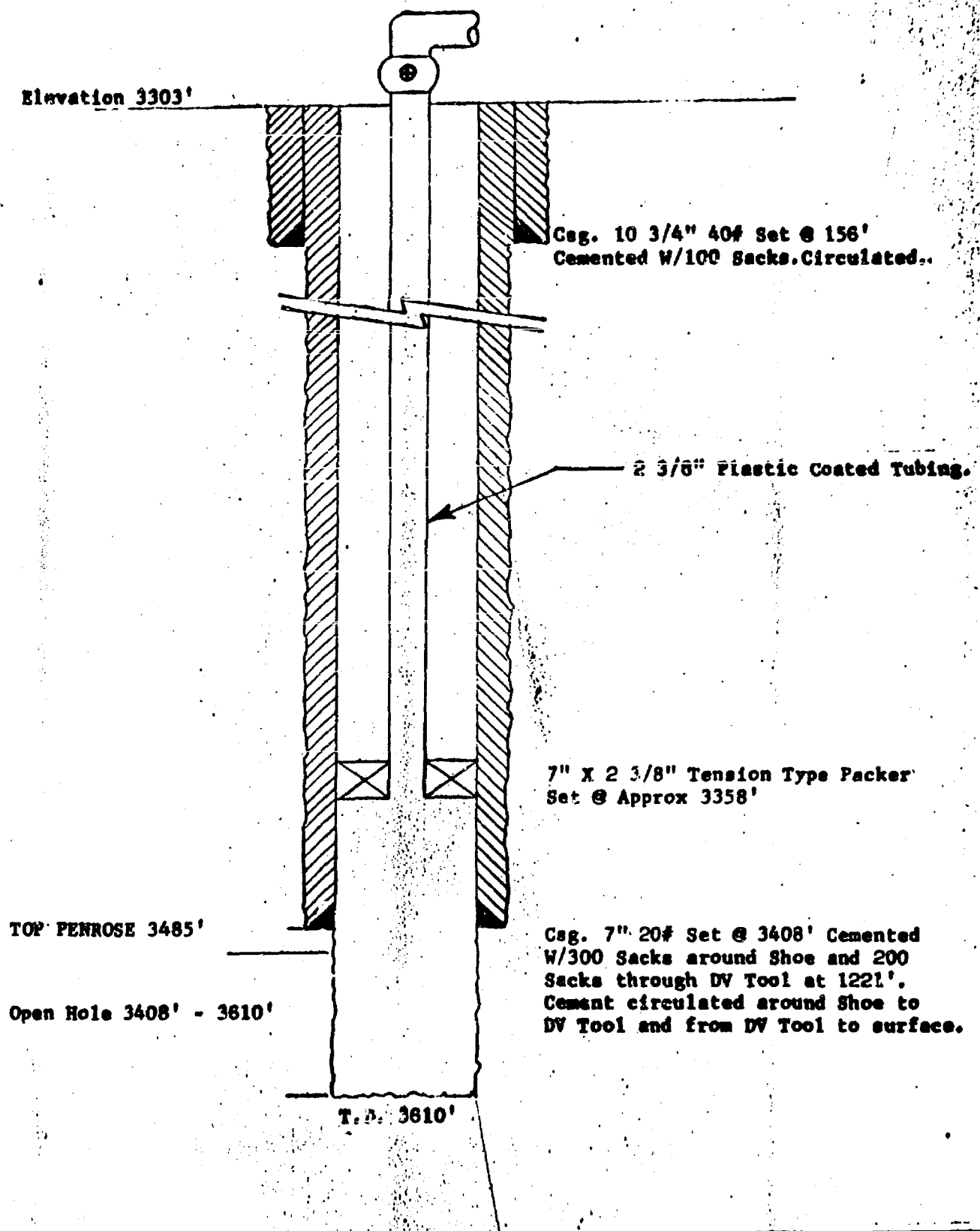
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LEA COUNTY, NEW MEXICO



PROPOSED SKELLY PENROSE "A" UNIT WTW

SKELLY OIL COMPANY

R. R. SIMS NO. 5
1980' FSL & 660' FWL, Sec. 3, T-23-S, R-37-E
LEA COUNTY, NEW MEXICO

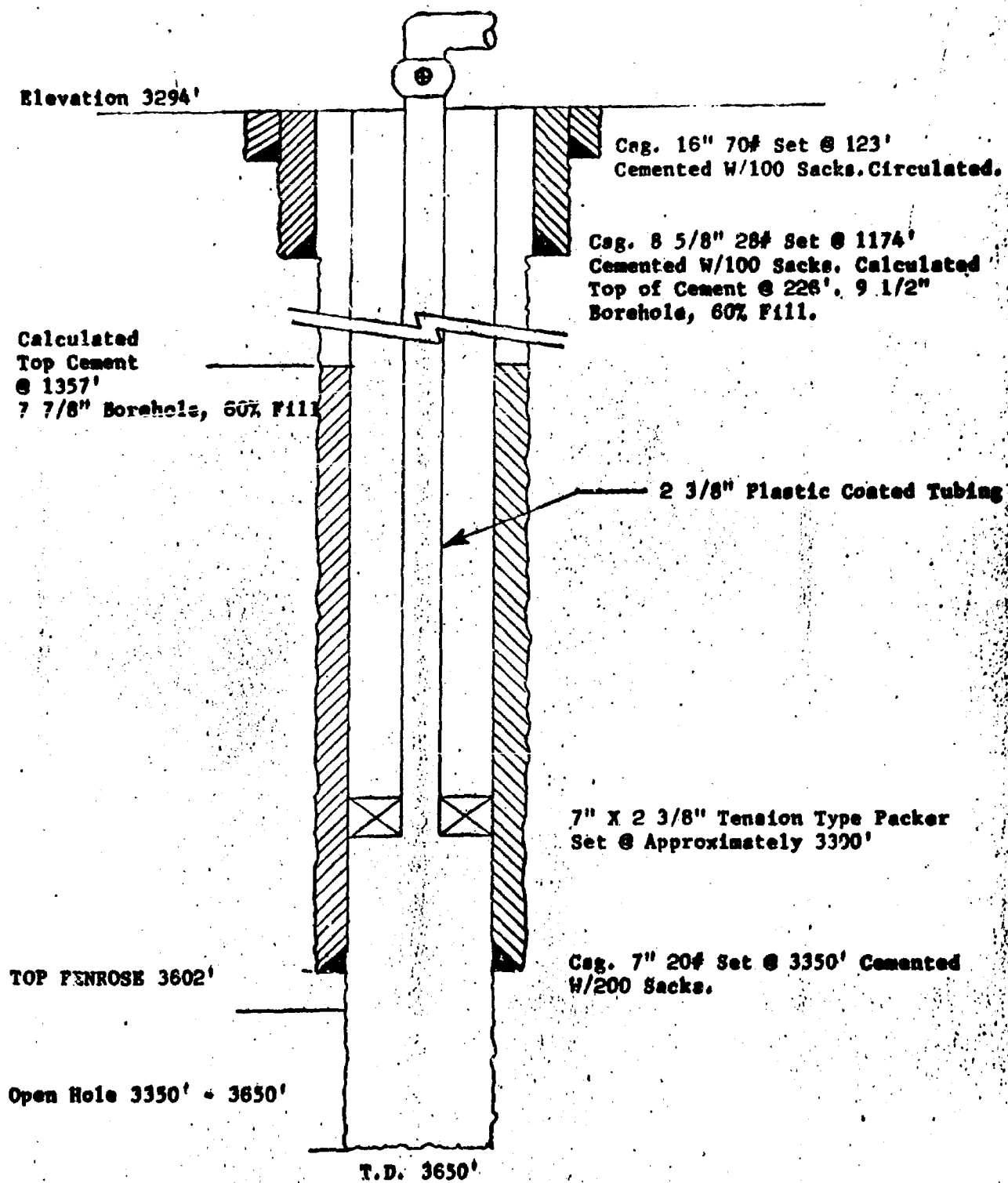


PROPOSED SKELLY PENROSE "A" UNIT WIW

SKELLY OIL COMPANY

W. P. SIMS NO. 2

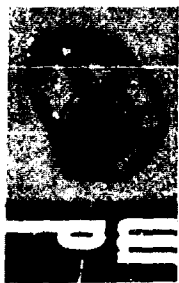
1980' TNL & 660' FEL, Sec. 10, T-23-S, R-37-E
LEA COUNTY, NEW MEXICO



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SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS

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Page 1

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
March 15, 1967

REGULAR HEARING

IN THE MATTER OF:)

Application of Skelly Oil Company for a)
unit agreement, Lea County, New Mexico.)

Application of Skelly Oil Company for a)
waterflood project, Lea County, New Mexico.)

) Cases No. 3538 &
3539
(consolidated)

BEFORE: A. L. (PETE) PORTER
GUYTON B. HAYS

TRANSCRIPT OF HEARING

dearnley-meier

SPECIALIZING IN: DEPOSITORS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS

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PAGE

2

MR. PORTER: Take up Case 3538.

MR. HATCH: Case 3538; Application of Skelly Oil Company for a unit agreement, Lea County, New Mexico.

MR. KELLY: Booker Kelly of White, Gilbert, Koch and Kelly, on behalf of the applicant. I have Mr. Jacobs associated with me and he will be putting on the testimony. We would like to have this case and the next one be consolidated for the purposes of testimony.

MR. PORTER: If there is no objection to the consolidation of the two cases, they will be consolidated for the purposes of testimony.

MR. KELLY: I would also like to ask for any other appearances at this time.

MR. PORTER: Are there any other appearances in Cases 3538 and 3539? Do we have any correspondence on either of these cases, Mr. Hatch?

MR. HATCH: We have a letter from the State Engineer which was handed to me this morning. I haven't had time to read it. I just got it. I am sure it does, and then there is correspondence from Samedan in one of the cases.

MR. PORTER: Would you indicate what that correspondence is?

MR. HATCH: "Samedan Oil Corporation, owner of certain working interest in the proposed unit, by this letter expresses

dearnley-meier
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1205 "FIRST NATIONAL BANK EAST" • PHONE 256-1294 • ALBUQUERQUE, NEW MEXICO 87103

concurrence and approval of the establishing of the proposed Skelly Penrose A Unit as defined in the application." This is dated March 9th, 1967, by George W. Putnam.

MR. PORTER: You have no other letters pertaining to the cases?

MR. HATCH: I believe that's all I have.

MR. PORTER: Apparently there are no appearances, Mr. Kelly.

MR. KELLY: We have three witnesses and ask that they be sworn at this time.

(Witnesses sworn.)

MR. JACOBS: We will call as our first witness Mr. A. H. Hurley and ask that he take the stand.

A. H. H U R L E Y, called as a witness herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JACOBS:

(Whereupon, Applicant's Exhibit 1 marked for identification.)

Q Will you please state your name, by whom you are employed, and in what capacity?

A My name is A. H. Hurley. I am employed by Skelly Oil Company as a Unitization Engineer.

Q Have you testified before this Commission on prior occasions and on such occasions have your qualifications as

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Unitization Engineer been recognized?

A Yes, sir, I have.

Q Are you familiar with the Skelly Penrose "A" Unit?

A Yes, I am.

MR. JACOBS: Are there any questions as to this witness qualifications?

MR. PORTER: No, the Commission considers the witness qualified.

Q (By Mr. Jacobs) Directing your attention to what has been marked for identification by the reporter as Exhibit Number 1, will you please relate to the Commission what this exhibit is and what it contains?

A This is the unit agreement for the development operation of the Skelly Penrose "A" Unit, Lea County, New Mexico and contains the text of the unit agreement for the purpose of putting together a unitized secondary recovery project.

Q Is the description of the unit agreement contained in the application?

A I believe it is.

Q Does the unit agreement also contain an Exhibit A, which is a list or shows a plat of the proposed unit area?

A Yes, sir, it does.

Q Does it cover portions of Section 33, 34 of 22 South, 37 East?

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A Yes, sir.

Q And portions of Section 3, 4, 9 and 10 of 23 South, 37 East, Lea County, New Mexico?

A It does.

Q It's all accurately described in the application and on the exhibits attached to the unit agreement, is that correct?

A That's correct.

Q What type of an agreement is this, Mr. Hurley?

A It's a more or less standard State Federal form unit agreement with the provisions relating to the Commissioner of Public Land removed since there is no State acreage involved.

Q So the lands included in the proposed Skelly Penrose "A" Unit are comprised of fee and Federal lands, is that correct?

A That is correct.

Q Does the proposed unit area contain 2,426.85 acres, more or less?

A That is correct.

Q You mentioned this as a standard type agreement; has this same type of agreement been utilized for other units in this area?

A Yes, sir, it has.

Q Are there any unusual provisions of this agreement

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that would distinguish it from other prior agreements?

A No, sir, not that I know of.

Q Would you please read for the record the definition of the unitized interval?

A That's under Section 2-M, Page 3, and it reads, "Unitized formation or Penrose Sand formation, means that interval underlying the unit area which is productive of unitized substances and the vertical limits of which extend from a point 100 feet above the base of the Seven Rivers formation to the base of the Queen formation. Said interval having been heretofore found to occur in Skelly Oil Company Simms Number 2D Well located in the south half southeast quarter of the northwest quarter of Section 3, Township 23 South, Range 37 East, Lea County, New Mexico, at an indicated depth of from 3,279 feet to 3,673 feet as recorded on the Schlumberger electric log run number one taken November 5th, 1948, said log being measured from the derrick floor elevation of 3,308 feet above sea level."

Q What is the purpose of forming this unit? Is it a development unit or waterflood unit, or what is the purpose?

A It's a unit for secondary recovery by waterflood.

Q In your opinion, does the unit agreement, proposed unit agreement, accomplish the purposes that it sets out to do? That is, that it provides for the proper agreement for the

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consolidation of leases in the conduct of waterflood operations?

A Yes, sir, it does.

Q Would you please relate to the Commission what the participation formula is within this unit?

A The participation formula is based 10 per cent on production for the period of January 1, 1963 to April 1, 1963, and 90 per cent on ultimate primary recovery.

Q What success have you had as to the ratification or joinder of parties within the proposed unit area? Let's take the working interest owners first.

A We have three working interest owners, Skelly, Samedan Oil Corporation, and Atlantic Richfield Company, all of whom have signed. It's 100 per cent signed as to working interest.

Q So that all the working interest owners within the proposed unit have ratified or joined in this unit agreement?

A That is correct.

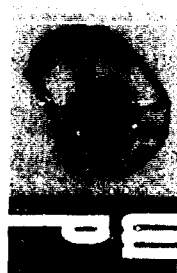
Q What success have you had with respect to the royalty interest and overriding royalty interest within the proposed unit area?

A Approximately 77.98 per cent of the royalty and overriding based on the participation formula have executed the agreement. There are five royalty owners in one family group who have not signed. All other royalty and overriding owners in the unit area have committed their interest to the agreement.

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Q On an area basis, Mr. Hurley, approximately what per cent of the royalty interest owners have ratified this unit agreement?

A 79.37 per cent.

Q Are all the tracts qualified or will they be qualified on the effective date of the unit?

A All tracts have been qualified; all except Tracts 7, 9, 13 and 14 were automatically qualified under provisions of Section 14 A of the unit agreement. Tracts 7, 9, 13 and 14 were qualified by the working interest owners under provision of Section 14 B of the unit agreement, so that all tracts are now qualified under provisions of the unit agreement.

Q In your opinion, Mr. Hurley, does this unit agreement, proposed unit agreement, protect the correlative rights of all of the interested parties within the unit area?

A Yes, sir, it does.

Q Does the unit agreement bind only those parties that have executed it?

A That is correct.

MR. JACOBS: That's all the questions we have on direct examination. We offer in evidence Exhibit 1.

MR. PORTER: Are there any questions of the witness? The exhibit will be admitted to the record.

(Whereupon, Exhibit 1 offered and admitted in evidence.)

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MR. PORTER: This is concerning the unit agreement?

MR. JACOBS: Yes. We have two additional witnesses on the waterflood program.

MR. PORTER: This witness won't testify as to the waterflood?

MR. JACOBS: That is correct.

MR. PORTER: The witness may be excused.

(Witness excused.)

O. V. S T U C K E Y, called as a witness herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JACOBS:

Q Will you please state your name, by whom you are employed, and in what capacity?

A O. V. Stuckey, Skelly Oil Company, Senior Production Engineer in Hobbs, New Mexico.

Q Have you heretofore testified before this Commission as Petroleum Engineer?

A I have.

Q On such occasions, have your qualifications as Petroleum Engineer been recognized?

A They have.

Q Are you familiar with the Skelly Penrose "A" Unit and the proposed injection project to be accomplished on this unit?

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A I am.

MR. JACOBS: Are there any questions of this witness' qualifications?

MR. PORTER: No questions.

Q (By Mr. Jacobs) Mr. Stuckey, what does Skelly Oil Company propose to do within this unit area?

A Skelly Oil Company proposes to commence water injection in the 30 proposed injection wells to increase recovery and secure maximum recovery, prevent waste.

(Whereupon, Exhibit A marked for identification.)

Q (By Mr. Jacobs) I direct your attention now to what has been marked by the reporter as Exhibit A. Would you please relate to the Commission what this exhibit shows?

A Exhibit A is a map showing lessees, location of wells included in the project, location of the proposed injection wells, and all other wells within a radius of two miles from the proposed injection wells. This exhibit also shows the formation from which these wells are producing, or have produced. This exhibit was presented with the application for permit to inject into 30 wells. However, this is a corrected copy. There was one error in lease line location on the original.

Q The original map that was submitted to the application has an error in the lease line and that has been corrected, is

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that right?

A That's right.

Q Would you point out just where the lease line correction occurs, Mr. Stuckey?

A There was, in Section 10 there was a line drawn separating the northwest quarter of the northeast quarter of Section 10, from the northwest quarter of Section 10. This 40-acre tract should be included in the G. W. Sims lease, which is the northeast quarter, which is the northwest quarter of this section.

Q Are there other waterflood projects in the immediately adjacent area to the proposed Skelly Penrose "A" unit?

A There are three waterflood projects immediately adjacent to this unit. The State M project operated by Humble Oil, which started injection in November, 1963. It is the unit outlined in the upper left-hand corner of this exhibit.

Q covers portions of Section 19, 20, 29 and 30, 31 of 22 South, 37 East?

A Right. Then there is the Skelly Penrose "B" Unit which is immediately to the west of the proposed unit area which became effective in July, 1965, and we commenced water injection in August of 1966 on this unit.

MR. HAYS: It's under your supervision?

A Yes, sir. Then, immediately to the north of the

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proposed Skelly Penrose "A" Unit is the Langlie Mattix Penrose Sand unit, which is operated by Anadarko Oil Company. This Anadarko Unit was expanded in the original pilot in that area in December of 1964 and is now experiencing a further expansion. The success of project one and three has been indicated by their expansion since the start of the initial programs. The additional expansion for project number three is now under way. Project number two started injection on August 20, 1966 and some limited response has already been noted. Completion of the injection pattern for these three units has been held up waiting on agreements with this proposed Skelly Penrose "A" Unit.

Q (By Mr. Jacobs) In other words, your study has indicated that a response has been experienced in the Anadarko Langlie Mattix Penrose Sand Unit and the Humble operated State M Unit, is that correct?

A Yes, sir.

Q Are there other units or waterflood projects being proposed in any other area, for instance, to the south of your unit?

A We are endeavoring to put together one unit immediately south of this area which would be our Skelly Penrose "C" Unit.

Q Just exactly what do you plan to do, Mr. Stuckey, with regard to conversion of wells, the pattern of injection, and

the amount of water you plan to utilize in this project?

A Skelly proposes to inject water into the Langlie Mattix on a full scale basis to stimulate the recovery of the secondary reserves. The proposed injection pattern is an 80-acre five-spot requiring conversion of 30 wells to injection service. The anticipated injection wells are 9,555 barrels per day for an average of approximately 300 barrels of water per day per injection well. The water supply will be Skelly's Jal Water System. This system is presently delivering produced water from the Seven Rivers formation to the adjacent Skelly Penrose "B" Unit. The Seven Rivers water is produced in association with oil production from wells located in Section 3, Township 23 South, Range 36 East.

MR. PORTER: Is that brackish water or brine, salt water?

A It is a brine.

MR. HAYS: I want to go off the record.

(Whereupon, a discussion was held off the record.)

MR. HAYS: Back on the record.

Q (By Mr. Jacobs) Mr. Stuckey, will you proceed then with an explanation of how you are going to inject this water?

A Injected fluid will be confined to the unitized interval. Injection will be down internally lined tubing set on a packer approximately 50 feet above the casing seat, or

uppermost perforation. Primary ~~cementing~~ operations at the time of the original completion of the well should prevent fluid migration up the hole behind the casing. Periodic injectivity surveys will be run to monitor injection and check for channels behind the pipe. Any mechanical failure will be promptly repaired when detected. The annular space between the tubing and casing will be filled with an inhibited fluid to prevent corrosive damage.

Q In your opinion, will this type of injection then prevent any contamination of any other zones and any fresh water sands that might occur in the area?

A In my opinion, following this program will ~~prevent~~ any contamination of any other zones and will confine the water to the unitized interval.

Q Do you propose to operate this waterflood project under the Rule 701 of the Conservation Commission?

A We do.

Q Have you calculated what the project allowable would be?

A The normal waterflood allowable for the 60 Project Area wells using the 42 barrels per day basis would be 2546 barrels per day. Operators report that 4,149,602 barrels of stock tank oil have been produced from the unit area to January 1, 1967. Deducting 170,383 barrels of secondary oil recovered

to January 1, 1967 by the H. O. Sims pilot flood leaves 3,959,219 barrels of primary production from the unit area up to January 1, 1967. This is an average cumulative primary production per well of 65,987 stock tank barrels.

Q Have you furnished the State Engineer with a copy of the application and the map and your diagrammatic sketches?

A We have, and also water analysis of produced and source water.

MR. JACOBS: I believe the Commission's file reflects that a letter has been received from the State Engineer indicating his approval of this project.

(Whereupon, Exhibit B marked for identification.)

Q (By Mr. Jacobs) I direct your attention now to what has been marked for identification as Exhibit B. Will you please relate to the Commission what this exhibit shows?

A Exhibit B is down hole diagrammatic sketches of the 30 proposed injection wells. Shown on the sketches are all casing strings, diameters, and setting depths, quantities of cement used, tops of cement, perforated or openhole intervals, tubing strings including diameters and setting depth, and type and location of the packer. These sketches were presented with the application for permit to inject. However, an error was noted in the location description on the schematic for the H. O. Sims Number 2 Well. A corrected copy is hereby

submitted. These exhibits contain the corrected copy.

Q It was merely an error in description of the location of that H. O. Sims Well Number 2?

A Description in the location.

(Whereupon, Exhibit C marked for identification.)

Q (By Mr. Jacobs) I direct your attention now to what has been marked for identification as Exhibit C. Would you please relate to the Commission what this exhibit shows?

A Exhibit C is a primary performance graph for the unit area, which shows the primary production from the unit area from the date of inception in 1963 up to January 1, 1967. This primary performance graph indicates there is no remaining primary oil for this unit. Ultimate primary unit for the study area was established as 3,934,638 barrels by the Engineering Subcommittee study in January, 1964. You will note that in the years 1958 through 1962 there is a sharp increase. This increased rate was due to drilling of ten wells during the 1957, 1961 period.

Q Will you please relate to the Commission then, the approximate location of this unit and the pool in which it is located, and which you propose to conduct these waterflood operations?

A The proposed Skelly Penrose "A" Unit is located in all or parts of Sections 33 and 34, Township 22 South, Range

37 East, and Sections 3, 4, 9 and 10, Township 23 South, Range 37 East, Lea County, New Mexico, contains 2426.85 acres, more or less, of Federal and fee lands. The oil pay formation in the unit area is the Penrose Sand, a lower member of the Queen formation in the Langlie Mattix Pool.

Q Has the New Mexico Oil Conservation Commission nomenclature designated the Penrose Sand or the Queen Sand of the Langlie Mattix Pool, rather?

A The New Mexico Oil Conservation Commission nomenclature designates the vertical limits of the Langlie Mattix Pool as those ~~formations~~ encountered between the lower 100 feet of the Seven Rivers formation and the base of the Queen formation. This is our proposed unitized interval.

Q Would you please relate to the Commission briefly the history and development of wells within this proposed area?

A The development of the Penrose Sand within the unit area was started with the drilling of Skelly Oil Company's H. O. Sims Well Number 1 which was completed December 7, 1936 and development proceeded rapidly with 50 of the 60 Langlie Mattix or Penrose producers being completed by 1940. Development of the unit area has been on regular 40-acre spacing. Four additional wells were drilled to formations below the Langlie Mattix. Skelly's R. R. Sims Number 7, which

is located in Unit K of Section 3, Township 23 South, Range 37 East, produces oil from the Blinebry formation, is the only one of these currently on production.

Skelly's H. O. Sims Number 16 located in Unit M of Section 34, Township 22 South, Range 37 East was originally drilled to the Drinkard formation, has been plugged and recompleted in the Glorieta formation as a water supply well for the pilot waterflood which is in operation on Skelly's H. O. Sims lease. Skelly's Sims D Number 2 located in Unit F of Section 3, 23 South, 37 East, and Ellen Sims No. 6 located in Unit J, Section 3, 23 South, 37 East, were originally drilled to the Drinkard and are plugged and abandoned.

Of the 60 Langlie Mattis producers completed on this approximately 2400 acre unit area, 52 wells are currently producing. Six wells are shut in and two wells are currently serving as injection wells for the pilot waterflood.

Monthly oil production rate for the unit area in December, 1966 was 4846 barrels of which 2363 barrels were attributed to primary recovery. This is an average of 1.5 barrels of oil per day per producing well, which is the approximate economic limit as shown on our Exhibit C. Therefore, primary recovery in the unit area is approximately 100 per cent complete.

Q Then, in your opinion, Mr. Stuckey, since the wells are at or near the economic limit, some sort of program is necessary to recover oil which would not otherwise be recovered, is that correct?

A It is.

(Whereupon, Exhibit D marked for identification.)

Q (By Mr. Jacobs) I direct your attention now to what has been marked for identification as Exhibit D. Would you please relate to the Commission what this exhibit shows?

A Presented as Exhibit D, well completion data for the 60 wells in the unit area, shown in this tabulation are operator, lease and well number, location, elevation, total depth, casing program, including diameter setting depth and volume of cement used, and the producing interval of each well. Also noted under remarks are those wells scheduled for injection service. Of the 60 project area wells, ten wells are completed through perforations, 49 wells are completed with openhole intervals and one well is completed with both perforations and openhole section.

(Whereupon, Exhibit E marked for identification.)

Q (By Mr. Jacobs) I direct your attention now to what has been marked for identification as Exhibit E. Would you please relate to the Commission what this exhibit shows?

A Exhibit E is supplemental well data showing completion date, initial and current producing rates and cumulative oil production to January 1, 1967. Current oil production from producing wells in the unit area ranges from zero to 43 barrels of oil per day with an average of 3.2 barrels of oil per day. This consists of 1.5 barrels of oil per day primary and 1.7 barrels of oil per day secondary. Water production from the unit area is approximately 197 barrels of water per day. This produced water will be reinjected under our plan of operations.

Q Then you do plan to reinject produced water back into the formation in furtherance of the waterflood project?

A That is correct.

(Whereupon, Exhibit F marked for identification.)

Q (By Mr. Jacobs) Mr. Stuckey, I direct your attention to what has been marked for identification as Exhibit F. What is that exhibit?

A Exhibit F is available well logs on the proposed injection wells. Of the 30 proposed injection wells, only six have been logged to date. We have presented five of these in this exhibit. The log on the Samedan Hughes "A-2" Number 8 Well is not available.

(Whereupon, Exhibit G marked for identification.)

Q (By Mr. Jacobs) I direct your attention now to what has been marked for identification as Exhibit G. Would you please relate to the Commission what this exhibit shows? What is Exhibit G, Mr. Stuckey?

A Presented as Exhibit G are analyses of produced water from the unit area and from the water supply source. Water injection in the unit wells will be through internally lined tubing set in a tension-type packer set approximately 50 feet above the casing seat or uppermost perforations. Injection rates of approximately 300 barrels of water per day at maximum injection wellhead pressures of approximately 1850 psi are anticipated.

Q Were Exhibits A through F prepared by you or under your supervision and direction?

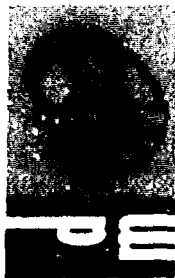
A They were.

Q Mr. Stuckey, do you feel that the water source that you anticipate using will be adequate to handle the waterflood project and any increases you might reasonably foresee in the future?

A I do.

MR. JACOBS: We would offer into evidence, Mr. Commissioner, Exhibits A through G.

MR. PORTER: Without objection, the exhibits will be admitted.



(Whereupon, Exhibits A through G offered and admitted in evidence.)

CROSS EXAMINATION

BY MR. PORTER:

Q Mr. Stuckey, I believe you indicated that the water would be from the Skelly Water System and that this comes from the Seven Rivers formation?

A Yes, sir.

Q At the present time, is this water being disposed of in pits?

A No, sir. We are limiting the water production rates to the water that we're putting to beneficial use on the Skelly Penrose B Unit, now. This, by use of larger lift equipment, we can increase --

Q Increase the volumes?

A -- increase the volumes to handle our needs for this unit.

Q Did you testify as to what you expect in the way of secondary recovery as compared to primary?

A No, sir.

MR. JACOBS: We have a witness who will cover that.

MR. PORTER: Oh, we have a witness. That's all the questions I have. Anyone else have a question?

CROSS EXAMINATION

BY MR. NUTTER:

Q Do I understand correctly that you already have some wells on this area that are injecting?

A Yes, sir, we do have.

Q That's the two wells in the extreme northeast corner of the unit which are on injection by virtue of an agreement with the Anadarko project, is that it?

A That is correct.

Q Have you had any response from water injection in that area as far as the producing wells in this Penrose "A" Unit are concerned?

A Yes, sir. We have. That is where we produce the secondary recovery which we have listed in our testimony, Mr. Nutter.

Q I think you mentioned in December that the unit as a whole had made 4800 barrels in December, is that correct?

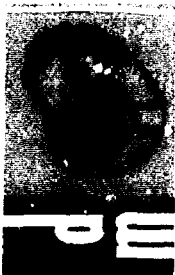
A In December the unit as a whole produced 4846 barrels.

Q And 2300 of it you said was primary?

A 2363 barrels.

Q So the other 2500 was secondary oil right up there in that corner?

A The other 2483 barrels we attributed to secondary operations.



Q That would be limited to that northeast corner there?

A Yes, sir.

Q You mentioned that you had calculated that your allowable would be 2546 based on a minimum of 42, that's for 60 units. I would calculate 2520, or is there an acreage factor attributable to some of those 40-acre tracts?

A There's an acreage factor. We use 59 times 42, we get 2478, and 66.85 divided by 40, which gives an acreage factor of 1.671.

MR. PORTER: Is that a unit where you have more than one well on a 40?

A No, sir. There are some acreage variations within the unit.

Q (By Mr. Nutter) Would you repeat that again for me please, the acreage factors that you used?

A We considered fifty-nine 40-acre tracts.

Q Fifty-nine 40's?

A Which would, times 42 would be 2478, then the additional acreage would be 66.85 divided by 40, gives a factor of 1.671 times 42, equals 68 barrels.

Q Now, that 66.85, that's not all on one 40-acre tract. That's the excess acreage on several 40's?

A Yes. I did not have the breakdown so I used that method for calculation.

Q The annulus between the tubing and the fluid will be filled with an inert fluid. Do you propose to keep the annulus open or have a pressure gauge so you could detect a leak if it should occur?

A We plan to install a pressure gauge to check periodically for that.

Q And all produced water will be reinjected?

A Yes, sir.

Q Now, these analyses on Exhibit G, this Coats Lease, that's the supply system, is it?

A Yes, sir.

Q That's in 24, 36?

A In Section 3, 24, 36.

Q The other analyses is some of the produced water that's right here in this area?

A Yes, sir. The other analysis is of the W. P. Sims Number 2, which is within the unit area.

MR. NUTTER: That's all, thank you.

CROSS EXAMINATION

BY MR. HAYS.

Q Now, we have been talking about "A" and this operation has already been going on in "B" over here to the left?

A Yes.

Q And both operations are the same, I take it, practically?



A No, sir.

Q What's the difference?

A There's a difference, reservoir-wise.

Q No. I mean in the amount of water you are putting in the ground, the way you are disposing of the water and everything like that. Are they similar?

A Yes, sir. We are reinjecting all produced water now and --

Q How about the north up here, where somebody else is operating, is theirs sort of like that too, or do you know?

A Generally, very similar, specifically, I couldn't --

MR. HAYS: Off the record.

(Whereupon, a discussion was held off the record.)

MR. HATCH: "In view of the statements of Mr. Stuckey and Mr. Cox, it appears that the granting of this application will not cause a threat of contamination to any fresh waters which may exist in the area, and therefore, this office offers no objection to the granting of the application." Frank E. Irby, State Engineer's Office.

MR. PORTER: Off the record, again.

(Whereupon, a discussion was held off the record.)

MR. PORTER: Back on the record. Were there any further questions of Mr. Stuckey? Had you completed your questions, Mr. Nutter?

MR. NUTTER: I had completed mine.

MR. PORTER: I think I had asked all the questions I had. Anyone else? The witness may be excused.

(Witness excused.)

J. T. C O X, called as a witness herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. JACOBS:

Q Would you please state your name, by whom you are employed, and in what capacity?

A My name is J. T. Cox. I am employed by Skelly Oil Company as a Senior Reservoir Engineer in Hobbs, New Mexico.

Q Have you on prior occasions testified before this Commission as a Petroleum Reservoir Engineer and on such occasions have your qualifications been recognized?

A Yes, they have.

Q Are you familiar with the reservoir characteristics with respect to the proposed Skelly Penrose "A" Unit area?

A Yes, I am.

MR. JACOBS: Any questions as to this witness' qualifications?

MR. PORTER: No, no questions.

Q (By Mr. Jacobs) Would you briefly relate to the Commission the geology and reservoir characteristics in the

Langlie Mattix Pool in this area?

A The oil pay in the Penrose "A" Unit is the Penrose Sand, a lower member of the Queen formation. The Penrose Top is encountered from depths of 3475 to 3650 feet for an average depth of 3540 feet. The Penrose Sand is described as a lenticular, closely cemented sand lenses contained in a dense dolomitic limestone deposited during Permian Age along the western edge of the Central Basin Platform. The oil reservoir is contained in a generally northwest trending anticlinal stratigraphic trap broken by small saddles.

Core analyses available on two wells adjacent to the proposed unit indicate porosity to be approximately 13 per cent and permeability in each of these two wells was five millidarcies and 150 millidarcies.

Gas is usually present in those areas where the Penrose Top is encountered above 200 feet subsea. The arithmetic average gross Penrose section thickness below the minus 200 foot subsea level is 107 feet thick.

The Grayburg formation immediately below the Penrose is essentially water bearing. Static water levels have been encountered at subsea elevations of minus 375 to minus 443 feet in various wells.

Q Mr. Cox, what is the primary mechanism for producing oil in this reservoir?

A The primary driving mechanism for the Penrose is solution gas, producing oil of approximately 36 degrees API gravity. The gas zones present in the upper Penrose as well as the immediately higher Queen and Seven Rivers formations are present as localized gas stringers, these are found in the higher portions of the general anticlinal effect. There is no evidence to suggest that the Penrose formation contains enough continuous vertical permeability that these gas zones could have furnished energy as a primary driving force in the production of primary oil from the Penrose.

Q Do you have an estimate as to the amount of secondary oil that has been recovered and will be recovered within this proposed unit area?

A Secondary oil reserves by waterflood of the Skelly Penrose "A" Unit have been estimated at 3.96 million barrels. These reserves assume that recoverable secondary oil would be equal to the estimated ultimate primary recovery. Waterflood performance is expected to yield a peak producing rate of approximately 2600 barrels per day three years after the injection project starts. Life of the injection project has been estimated to be twelve years from the start of injection.

Q Mr. Cox, do you know approximately how deep the fresh water sands occur in this area?

A Not specifically. I would say in the neighborhood of

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twelve to 1500 feet at the most.

Q Based on your reservoir studies and your observance of the waterfloods in the immediate area to the north and to the northwest, and based on your studies of the pilot waterflood that has been conducted in this area, do you have an opinion as to whether or not a waterflood project in the Skelly Penrose "A" Unit Area is feasible?

A Waterflood within the Penrose "A" Unit is feasible on the basis of evidence from successful offset operations.

Q In your opinion, is such a waterflood project reasonably necessary in order to recover oil which would otherwise not be recovered?

A Yes.

Q In your opinion, does the proposed injection project protect the co-equal and correlative rights of all the various interested owners, both signers and non-signers, to the proposed unit agreement?

A Yes.

MR. JACOBS: That's all the questions we have of this witness.

MR. PORTER: Your testimony is that you would expect actually it's about one to one recovery.

A Yes, sir, a one to one recovery.

MR. PORTER: Any questions, Mr. Nutter?



MR. NUTTER: One question. What per cent of the oil in place has been recovered or will be recovered on ultimate primary?

A An estimate of oil in place has not been made. Consequently, I could not give you a percentage of the recovery to date.

MR. PORTER: What would you ordinarily expect in this type of reservoir as a recovery factor?

A Probably 12 to 14 per cent.

MR. PORTER: There's a possibility we may, with secondary recovery, get 25 per cent of the oil in place or something like that?

A Yes, sir, I would anticipate this.

MR. HAYS: How much money are you figuring on spending in this water deal?

A I did not conduct an economic study of this particular unit.

MR. HAYS: Has anybody in your outfit told you how much you are going to spend on it?

MR. JACOBS: We don't have that with us.

A An economic study was conducted in 1964, indicating that the discounted, cumulative discounted cash flow before taxes --

MR. HAYS: Never mind. It's going to take you some time

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to figure it out. I will talk after.

MR. PORTER: It doesn't make any difference whether this is in the record or not. Any further questions? The witness may be excused.

(Witness excused.)

MR. JACOBS: We would request that the application be made a part of the record and with that we have nothing further to offer in this case.

MR. PORTER: It will be made a part of the record. Anything further to be offered in either one of these cases, Case 3538 or 3539?

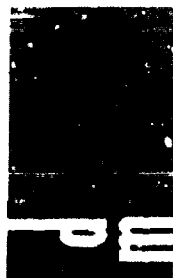
MR. HATCH: I have already read the letter from the State Engineer's Office.

MR. PORTER: The gist of the letter from the State Engineer is that they had examined the corrections that had been submitted and that they have no objections to the application. If nothing further to be offered, we will take the cases under advisement.

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EXHIBITS

NUMBER	MARKED	OFFERED	ADMITTED
Ex. 1	3	8	8
Ex. A	10	22	22
Ex. B	15	22	22
Ex. C	16	22	22
Ex. D	19	22	22
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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public 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.

Witness my Hand and Seal this 21st day of March, 1967.

Ada Dearnley
NOTARY PUBLIC

My Commission Expires

June 19, 1967.

TELEPHONE: HOBBS 393.6215



UNITED CHEMICAL CORPORATION

OF NEW MEXICO

601 NORTH LEECH

P. O. BOX 1499

HOBBS, NEW MEXICO 88240

Company Skelly Oil Company

Field Langlie-Mattix

Lease W. P. Sims #2 Sampling Date 2/28/67

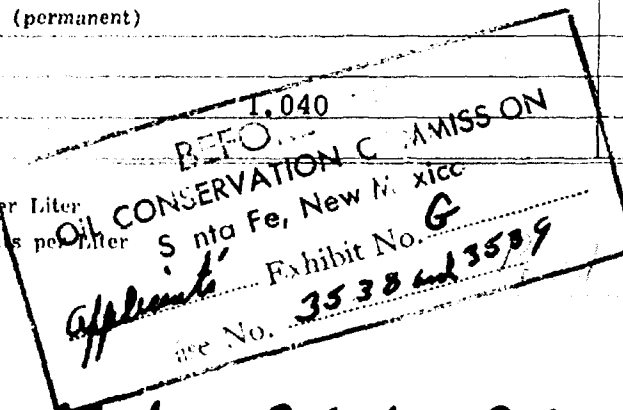
Type of Sample Stock tank drain off

WATER ANALYSIS

IONIC FORM	me/l *	mg/l *
Calcium (Ca ⁺⁺)	9.98	200
Magnesium (Mg ⁺⁺)	193.43	2352
Sodium (Na ⁺) (calculated)	867.58	19,946
Bicarbonate (HCO ₃ ⁻)	25.68	1567
Carbonate (CO ₃ ⁻)	9.76	293
Hydroxide (OH ⁻)	Not Found	
Sulphate (SO ₄ ⁻)	6.25	300
Chloride (Cl ⁻)	1029.30	36,500
pH c 68° F	8.7	
Dissolved Solids on Evap. at 103° - 105° C		
Hardness as Ca CO ₃	203.41	10,170
Carbonate Hardness, as CaCO ₃ (temporary)	25.68	1284
Non-Carbonate Hardness as CaCO ₃ (permanent)	177.73	8886
Alkalinity as CaCO ₃	25.68	1284
Specific Gravity c 68° F	1.040	

* mg/l = milligrams per Liter

* me/l = milliequivalents per Liter



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SKELLY OIL CO.

L. C. CASE, P. E.

CONSULTANT, OIL FIELD WATER PROBLEMS

206 SUNSET DRIVE

TULSA 14, OKLAHOMA

LUTHER 3-9307

LUTHER 3-3067

EXHIBIT NO. 6

DOCKET OR CASE NO. 3539

DATE 3-15-67

WATER ANALYSIS- Seven Rivers brine, Skelly Oil Company, Coates Lease.
Sampled at supply tank, 7/29/66

	Milligrams/liter	E.P.L.%(R.V.%)
Sodium, Na	2,005	32.19
Calcium, Ca	520	9.61
Magnesium, Mg	266	8.10
Sulfate, SO ₄	540	4.15
Chloride, Cl	3,595	37.55
Bicarbonate, HCO ₃	1,366	8.30
Carbonate, CO ₃	nil	0.00
Total	8,292	100.00%

Other determinations:

Sp.Gr. at 60°F 1.009
pH value 6.8
Hydrogen sulfide, H₂S - 408* (At supply tank, 7/29/66)

Hypothetical Combinations, milligrams/liter: * Milligrams/liter

Calcium bicarbonate, Ca(HCO ₃) ₂	1,816
Magnesium bicarbonate, Mg(HCO ₃) ₂	0.0
Sodium bicarbonate, NaHCO ₃	0.0
Calcium sulfate, CaSO ₄	241
Magnesium sulfate, MgSO ₄	462
Sodium sulfate, Na ₂ SO ₄	0.0
Calcium chloride, CaCl ₂	0.0
Magnesium chloride, MgCl ₂	675
Sodium chloride, NaCl	5,098
Total	8,292

Definition of water character:

Primary salinity	64.58
Secondary salinity	18.82
Primary alkalinity	0.00
Secondary Alkalinity	16.60
Total	100.00%

Remarks:

Considerable time was spent in an attempt to count the bacteria in a sample of this brine taken from the supply tank. The count was not accurate due to the very high H₂S, which darkened the agar. Final results were indicated to be as follows: Aerobic bacteria-- less than 500/ml in API agar. SO₄-reducers- 0 colonies in 18 days.

This brine shows no tendency to deposit gypsum, calculated from gypsum solubility data. This brine is incompatible with waters having appreciable dissolved iron or oxygen.