

CASE 5017: Appli. of ATLANTIC
RICHFIELD FOR A WATERFLOOD
PROJECT, LEA COUNTY, NEW MEXICO.

CASE No.

5017

Application,

Transcripts,

Small Exhibits

ETC.

dearnley, meier & mc cormick

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
OIL CONSERVATION COMMISSION CONFERENCE ROOM
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO
Wednesday, June 27, 1973

EXAMINER HEARING

IN THE MATTER OF:

Application of Atlantic Richfield Company
for a unit agreement, Lea County, New
Mexico.

Case No. 5016

AND

IN THE MATTER OF:

Application of Atlantic Richfield Company
for a waterflood project, Lea County, New
Mexico.

Case No. 5017

BEFORE: Elvis A. Utz,
Examiner

TRANSCRIPT OF HEARING

1 MR. UTZ: Call Case 5016.

2 MR. CARR: Case 5016, application of Atlantic
3 Richfield Company for a unit agreement, Lea County, New
4 Mexico.

5 MR. HINKLE: Clarence Hinkle of Hinkle, Bondurant,
6 Cox & Eaton, Roswell, appearing on behalf of Atlantic
7 Richfield. I'd like for you also to call Case 5017,
8 and I'd like to make a motion that these be consolidated
9 for purposes of taking testimony, inasmuch as testimony
10 will overlap.

11 MR. UTZ: We will also call Case 5017, which is a
12 companion case to this.

13 MR. CARR: Case 5017, application of Atlantic
14 Richfield Company for a waterflood project, Lea County,
15 New Mexico.

16 MR. HINKLE: We have eight exhibits, one witness.

17 MR. CARR: Mr. Hinkle, would you like to move that
18 these be consolidated now?

19 MR. HINKLE: Yes, I move that these two cases be
20 consolidated.

21 MR. UTZ: Cases 5016 and 5017, Case 5016 being a
22 unit agreement and 5017 being a waterflood project for
23 that unit, will be consolidated for purposes of hearing,
24 separate orders will be written.

25 *****

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1 JAMES D. JOHNSON,
2 a witness, having been first duly sworn according to law, upon
3 his oath, testified as follows:

4 DIRECT EXAMINATION

5 BY MR. HINKLE:

6 Q State your name, your residence, and by whom you are
7 employed.

8 A My name is James D. Johnson, I'm employed by the Land
9 Department of Atlantic Richfield Company. I reside in
10 Midland, Texas.

11 Q Have you previously testified before the Commission or
12 one of its Hearing Examiners?

13 A No, sir, I have not.

14 Q What is your position with Atlantic Richfield?

15 A I am a land man.

16 Q Are you familiar with the operations of Atlantic
17 Richfield in New Mexico and in particular in the area
18 that's involved in this unit?

19 A Yes, sir, I am.

20 Q Have you made a study of the wells and so forth?

21 A Yes, sir.

22 Q Have you been in charge of getting the unit agreement
23 signed up?

24 A Yes, sir, I monitored the sign-up on the unit agreement.

25 Q Are you familiar with the applications of Atlantic

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1 Richfield in these cases?

2 A Yes, sir, I am.

3 Q What is Atlantic Richfield seeking to accomplish by
4 Case 5016?

5 A Atlantic Richfield is seeking approval of a unit
6 agreement in connection with the waterflood project for
7 the Seven Rivers-Queen area.

8 Q Have you prepared, or has there been prepared under your
9 direction, exhibits for introduction into this case?

10 A Yes, sir, there have.

11 Q And the ones that you have referred to are the ones that
12 have been marked Exhibits 1 and 2?

13 A Yes, sir.

14 Q Refer to Exhibit 1 and explain what it is.

15 A Exhibit 1 is a plat which shows the boundaries of the
16 proposed Seven Rivers-Queen Unit area. It also shows
17 within a two-mile radius the acreage surrounding the
18 unit area. The producing wells are shown within and
19 without the unit area. The State lands within the unit
20 area are cross-hatched in yellow on the plat and the
21 fee lands are in white. The plat also shows two bordering
22 secondary recovery projects, Conoco's South Unit, and
23 Marathon's South Unit.

24 MR. HINKLE: I might say, Mr. Examiner, that this
25 plat will be referred to by the next witness, who is an

- 1 engineer, with respect to the cross sections and the
2 injection wells which are shown.
- 3 Q (By Mr. Hinkle) Do you have any further comments with
4 respect to this exhibit?
- 5 A No, sir.
- 6 Q Does this also show the acreage ownership?
- 7 A Yes, sir, it does.
- 8 Q Refer to Exhibit 2 and explain what this is and what it
9 shows.
- 10 A Exhibit 2 is a letter from the Commissioner of Public
11 Lands, which states that the proposed Seven Rivers-Queen
12 Unit Agreement has been approved as to form and content.
- 13 Q Now, you are familiar with the proposed form of the unit
14 agreement which has been filed with the application in
15 this case, are you not?
- 16 A Yes, sir.
- 17 Q Is Atlantic Richfield designated as the operator?
- 18 A Yes, we are.
- 19 Q What formation is being unitized?
- 20 A The unitized formation, reading from Paragraph 2-J in the
21 unit agreement, being the bottom 100 feet of the Seven
22 Rivers and the entire Queen formations, same being that
23 heretofore established underground reservoir encountered
24 in the drilling by the Gulf Oil Corporation of its J. R.
25 Jalmat I Number 10 Well between the depths of 3,468 feet

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as identified on Frontier's Isotron Log dated February 13, 1961, run in said well, which is located in the southwest quarter of the northwest quarter of Section 2, Township 23 South, Range 36 East, Lea County, New Mexico.

Q Is this form of unit agreement in substantially the same form as unit agreements heretofore approved by the Commission which cover State and fee lands?

A Yes, sir, it is.

Q There is nothing unusual about it in that respect?

A No, sir.

Q What is the primary purpose of the unit agreement?

A The purpose of the unit agreement is to institute a waterflood project, conserve natural resources.

Q Now, I believe you stated that you had been in charge of obtaining the execution of the unit agreement. What is the present status of execution of the agreement?

A All of the working interest owners in the tracts and the unit area have consented to the agreement, and 99 percent of the royalty interest have consented thereto.

Q So it's just about ready to be filed and approved by the Commissioner of Public Lands?

A Yes, sir.

MR. HINKLE: We'd like to offer in evidence Exhibits

1 and 2.

MR. UTZ: Without objection, Exhibits 1 and 2 will

1 be entered into the record of this case. Are there
2 questions of the witness?

3 (No response.)

4 CROSS-EXAMINATION

5 BY MR. UTZ:

6 Q As I understand the unitized area, it's the bottom 100
7 feet of the Seven Rivers?

8 A Yes, sir.

9 MR. UTZ: The witness may be excused.

10 JERRY TWEED,

11 a witness, having been first duly sworn according to law, upon
12 his oath, testified as follows:

13 DIRECT EXAMINATION

14 BY MR. HINKLE:

15 Q State your name, address, by whom you are employed.

16 A Jerry Tweed, Midland, Texas. I'm employed by Atlantic
17 Richfield Company.

18 Q What is your position with Atlantic Richfield?

19 A I'm Area Petroleum Engineer responsible for New Mexico.

20 Q Have you previously testified before the Commission or
21 one of its Hearing Examiners?

22 A Yes, I have.

23 Q And had your qualifications as a petroleum engineer made
24 a matter of record with the Commission?

25 A Yes, sir.

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1 MR. HINKLE: Are the witness' qualifications
2 acceptable?

3 MR. UTZ: Yes, they are.

4 Q (By Mr. Hinkle) You are familiar with the applications
5 of Atlantic Richfield in this case?

6 A Yes, I am.

7 Q What is Atlantic Richfield seeking to accomplish by
8 Application 5017?

9 A We are asking approval to convert 28 wells to injection
10 to initiate a waterflood project in the area that we call
11 the Seven Rivers-Queen Unit.

12 Q Now, have you prepared, or has there been prepared under
13 your supervision, certain exhibits for introduction in
14 this case which have been marked as Exhibits 3 through 8?

15 A Yes, there have.

16 Q Let us go first to Exhibit 1 and explain what this shows
17 with respect to the injection wells.

18 A The red triangles on Exhibit 1 are the proposed injection
19 wells for this project. If you will note, Conoco's
20 South Unit, which offsets us to the north and west, the
21 triangles shown are their current injection wells. With
22 the initiation of our project, both Conoco and Marathon,
23 to the east, will convert offsetting injection wells.
24 This pattern is an 80-acre 5-spot pattern. There would
25 be a continuous pattern across all three units.

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1 Q And you've had the cooperation of Conoco and Marathon
2 in the South Eunice Unit?

3 A Yes, we have.

4 Q Have you had any objections from any offset owners or
5 anyone?

6 A No, we have not. I might add, that shown in yellow on
7 here is the State acreage. The yellow acreage is the
8 Langly Matrix Pool. The rest of the acreage to the
9 north, the white acreage, is in the South Eunice Pool.
10 The vertical limits for both pools are identical, they
11 are the bottom 100 feet of the Seven Rivers and to the
12 base of the Queen formation; and this is the unitized
13 interval for our project. They are on the same large
14 anticlinal structure and they were named separate pools
15 some years ago, before drilling showed both pools to be
16 continuous and to connect.

17 Q Now, does Exhibit 1 indicate the cross sections which you
18 will refer to in subsequent exhibits?

19 A Yes, A-A', shown in the green, is the east-west cross
20 section; and B-B' is the north to south cross section
21 which will be referred to.

22 Q Now, refer to Exhibit 3 and explain what this shows.

23 A Exhibit 3 is a structure map of the area. This structure
24 is a large anticlinal north-south trending anticlinal
25 structure. In the vicinity of the unit, there is a

1 terracing effect in the vicinity of the unit, and we
2 are on approximately the west side of this large
3 anticlinal structure. There is not a lot of structural
4 relief in the unit boundary.

5 Q Now, refer to Exhibit 4 and explain this.

6 A Exhibit 4 is a west to east cross section which was
7 labeled A-A' on Exhibit 1. In the green and yellow-
8 colored sand stringers are the Seven Rivers formation.
9 The red is the Queen. We plan to flood all three of the
10 intervals where they are below the gas-oil contact.

11 The gas-oil contact is approximately a minus 150 feet,
12 and where they are below this interval, they will be
13 opened and flooded.

14 Q Does this show the continuity of these formations over
15 the entire area?

16 A Yes, it shows the sands to be quite continuous over this
17 area.

18 Q Now, refer to Exhibit 5, please.

19 A Exhibit 5 is a north-south cross section. Again, the
20 Seven Rivers sands are colored green and yellow, and then
21 the Queen sand is colored red. This also shows the sand
22 stringers to be continuous over the unitized interval.

23 Q Now, refer to Exhibit 6-A, which is a composite exhibit
24 of several diagrammatic sketches of the injection wells,
25 and explain this.

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1 A Exhibits 6-A through 6-AB, which are 28 of these, are
2 the diagramatic sketches for the injection wells. They
3 show the injection well number, the current well number,
4 the proposed unit number, the casing sizes, the amount of
5 cement, the top of the cement on the casing, proposed
6 perforations, where we intend to set the packer, and
7 total depth. These break into about three categories.
8 We intend to inject below packer into the producing
9 horizons. In most cases, we will be injecting -- like
10 6-A, we will be injecting through perforations below a
11 packer. There are a few cases where we will be injecting
12 into both perforations and an openhole interval, such as
13 in 6-G. We will have a packer set above the perforations;
14 we will inject into both perforated intervals and an
15 openhole interval in the wellbore.

16 There are, I believe, two cases where there will be
17 squeezed perforations above the packer and we will inject
18 into open perforations below the packer, such as in
19 Exhibit 6-I. The perforations shown squeezed here are
20 above the gas-oil contact, and it will be necessary to
21 squeeze them off to prevent channeling of water through
22 the gas horizon.

23 Q In your opinion, by the completion of the injection wells
24 in the manners which are portrayed by these diagramatic
25 sketches, will it confine injection of water to the three

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- 1 formations that you have indicated would be waterflooded?
- 2 A Yes, it will. We plan to have an inert non-productive
- 3 fluid in the annulus of each injection well, and the
- 4 pressure gauge set at the surface.
- 5 Q Would you have plastic-coated tubing?
- 6 A Either plastic-coated or cement-lined tubing in the
- 7 injection well.
- 8 Q Any further comment with respect to diagramatic sketches?
- 9 A No.
- 10 Q Now, referring to Exhibit 7, explain what this shows.
- 11 A Exhibit Number 7 is a decline curve of the unitized area.
- 12 It shows essentially a common solution gas-type depletion
- 13 mechanism for the area. You will note the gas-oil ratio
- 14 has increased somewhat over the years with the harmonic-
- 15 type decline. At the current time, there have been 56
- 16 wells drilled within the unit boundaries to the Seven
- 17 Rivers-Queen formations. There are currently 39
- 18 productive and they are averaging approximately 86 barrels
- 19 a day from the 39 wells or slightly over 2 barrels a day
- 20 per well. They are near depletion. They have recovered
- 21 some 2.9 million barrels of oil and have remaining about
- 22 60,000 barrels of primary oil. We anticipate that the
- 23 flood will recover an additional 2.8 million barrels of
- 24 oil over a 12-year period.
- 25 Q Now, refer to Exhibit 8 and explain what this shows.

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1 A Exhibit 8 is simply how we propose to renumber the
2 unitized wells. The proposed unit numbering system is
3 on Exhibit 8.

4 Q The injection wells are shown the same as those on
5 Exhibit 1, this just shows the manner in which they will
6 be renumbered?

7 A Right.

8 Q Now, are you asking for a project allowable?

9 A Yes, we are. We are asking that the Commission allow us
10 a project allowable for the unit.

11 Q As provided for in Rule 701 of the Commission?

12 A Yes.

13 Q Have you also requested that if these applications are
14 approved, that you be granted administrative approval to
15 make any changes which might be necessary in the location
16 of the injection wells?

17 A Yes, we have. We ask that this be included. We don't
18 anticipate at this time any changes; but some could arise.

19 Q In your opinion, if these applications are approved, will
20 it be in the interest of conservation and prevention of
21 waste?

22 A Yes, it will.

23 Q And it will also protect the correlative rights of others?

24 A Yes, it will.

25 MR. HINKLE: We would like to offer Exhibits 3

1 through 8.

2 A I have one other comment. Referring back to Exhibit
3 Number 1, within the unitized area there are also
4 numerous gas wells that are completed in the Jalmat
5 gas horizon. The Jalmat consisting of the Yates and
6 all but the bottom 100 feet of the Seven Rivers formation.
7 These are not being unitized and none of the gas wells
8 penetrate the unitized interval. They are all producers
9 above the unitized interval.

10 Q Do you have any further comments on these exhibits?

11 A No.

12 MR. HINKLE: I would like to offer Exhibits 3 through
13 8 into evidence.

14 MR. UTZ: Without objection, Exhibits 3 through 8
15 will be entered into the record of this case.

16 MR. HINKLE: That is all I have on Direct
17 Examination.

18 CROSS-EXAMINATION

19 BY MR. UTZ:

20 Q Mr. Tweed, the heading on all parts of Exhibit 6 show a
21 description of the wells and the well name as far as the
22 old name, the new name, and the old name. Now, do you
23 want to use the new name when we write the order on this?

24 A Yes, sir.

25 Q And all these headings show the proper locations?

1 A Right.

2 Q Now, I had some question in regard to your cross sections
3 where you show the gas-oil contact at a minus 150.

4 A Yes, sir.

5 Q The green-colored zone is what zone?

6 A The green and the yellow are sands in the Seven Rivers
7 formation.

8 Q And all those will be unitized?

9 A Yes, sir.

10 Q Well, now, what are the wells above the 150 foot level
11 from the Arco C. Jones Number 5 East? Are they gas wells
12 or oil wells?

13 A The wells east are oil wells; they are all oil wells,
14 generally.

15 Q Why are they above the gas-oil contact, then?

16 A The Seven Rivers in this area is above the gas-oil
17 contact. The wells are completed below the gas-oil
18 contact in the Queen formation. There is portions of the
19 pool or portions of the unitized area where the --
20 about 100 feet of Seven Rivers is above the gas-oil
21 contact.

22 Q No gas wells are completed in that zone?

23 A Not generally. There are a few wells completed up
24 there that make high gas-oil ratios; none of them are
25 classified as gas wells. But some people open the entire

1 section, the Queen and the Upper Seven Rivers.

2 Q Well, let's take the R. Jones Number 5 as an example.

3 Is that completed in either the green or yellow zone or
4 Seven Rivers?

5 A No, sir.

6 Q Well, you listed it as an injection well?

7 A Yes.

8 Q Where are you going to inject there?

9 A We are going to inject below the gas-oil contact in the
10 Queen.

11 Q Then, I misunderstood your unitized area. I thought it
12 was only the lower 100 feet of the Seven Rivers.

13 A It's Seven Rivers and Queen.

14 Q It's Seven Rivers and Queen?

15 A Yes, it's the lower 100 feet of the Seven Rivers to the
16 base of the Queen. This is the vertical limits of both
17 the South Eunice Pool and the Langly Matrix Pool that are
18 being unitized. It corresponds with the vertical limits.

19 Q Then, to make a flat statement, you will not inject any
20 water above the 150 foot level, above the gas-oil contact?

21 A I couldn't say for sure that we won't. The gas-oil
22 contact is not a definitive contact; it's a gradational
23 area. We have made efforts, where possible, to inject
24 below the gas-oil contact at all times; and there may be
25 a few wells that might get us at minus 135 or 140. For

1 instance, I believe there are a few wells that get above
2 a minus 150, to a degree.

3 For instance, if you will look at the cross section,
4 the C. Jones Number 5 and the C. Jones Number 8, it
5 might be advantageous, since the C. Jones -- if the C.
6 Jones Number -- I don't remember which of these is an
7 injection well right offhand, but if the Number 8 were an
8 injection well --

9 Q You show that as an injection well.

10 A It might be advantageous to inject above the gas-oil
11 contact in this well to drive oil to the Number 5 Well
12 which has the same zone below the gas-oil contact.

13 Q Okay. Now, in order to describe your injection zones as
14 simply as possible, can we say that all 28 wells will
15 have water injected below a packer and through perforations
16 or openholes in the Seven Rivers or Queen?

17 A That is true.

18 MR. UTZ: Are there other questions of the witness?

19 MR. HINKLE: I might ask him one other question.

20 REDIRECT EXAMINATION

21 BY MR. HINKLE:

22 Q Is it the intention of Atlantic Richfield to put all of
23 these injection wells on at the same time, approximately
24 the same time?

25 A Yes, it is.

- 1 Q So the whole waterflood would start at the same time?
- 2 A Right.
- 3 Q Where are you going to obtain your water?
- 4 A We plan to obtain our water from Continental Oil Company's
- 5 Dan Singer Water Supply System. Their water supply
- 6 well is located in Unit D of Section 7, 23 South, Range
- 7 36 East.
- 8 Q Is that fresh water?
- 9 A Well, it has a chloride content of 25,600 parts per
- 10 million.
- 11 Q Would you also reinject produced water?
- 12 A Yes, sir, we would reinject any produced water, if it
- 13 becomes available.
- 14 Q What would be your initial volume of injection?
- 15 A We would initially inject approximately 8,000 barrels of
- 16 water per day at a maximum pressure of 2,000 pounds.
- 17 Q What is your estimate of the time before you will get
- 18 response that would be effective?
- 19 A We estimate that we will start receiving response within
- 20 9 to 12 months of the starting of the injection.
- 21 MR. HINKLE: Thank you.
- 22 MR. UTZ: Are there other questions of the witness?
- 23 (No response.)
- 24 MR. UTZ: The witness may be excused. Are there
- 25 statements in the case?

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(No response.)

MR. UTZ: The case will be taken under advisement.
The hearing is adjourned.

R E P O R T E R ' S C E R T I F I C A T E

I, JOHN DE LA ROSA, a Court Reporter, 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.
I do hereby certify that the foregoing
is a complete record of the proceedings
of the Examiner hearing of Case No. 5016
heard by me on June 27, 1973.
John De La Rosa
COURT REPORTER
Examiner
New Mexico Oil Conservation Commission

WITNESS

I N D E X

PAGE

JAMES D. JOHNSON

Direct Examination by Mr. Hinkle

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Cross-Examination by Mr. Utz

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JERRY TWEED

Direct Examination by Mr. Hinkle

8

Cross-Examination by Mr. Utz

15

Redirect Examination by Mr. Hinkle

18

E X H I B I T S

OFFERED

ADMITTED

Exhibits 1 and 2

7

7 & 8

Exhibits 3 through 8

14 & 15

15

DOCKET: EXAMINER HEARING - WEDNESDAY - JUNE 27, 1973

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

The following cases will be heard before Elvis A. Utz, Examiner, or Daniel S. Nutter, Alternate Examiner:

CASE 4983: (Continued from the June 6, 1973, Examiner Hearing)

Application of Gulf Oil Corporation for simultaneous well dedication and non-standard locations, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the simultaneous dedication of two wells to a standard 640-acre gas proration unit comprising all of Section 35, Township 21 South, Range 36 East, Eumont Gas Pool, Lea County, New Mexico, said wells being the W. A. Ramsay (NCT-A) Wells Nos. 20 and 7 at non-standard locations in the center of Units E and N, respectively, of said Section 35.

CASE 4966: (Continued from the June 6, 1973, Examiner Hearing)

Application of Read & Stevens, Inc. for compulsory pooling, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests underlying the N/2 of Section 36, Township 12 South, Range 30 East, Chaves County, New Mexico, to be dedicated to a well to be drilled to the Queen formation in Unit B of said Section 36, in the Southeast Chaves Queen Gas Area. Also to be considered will be the cost of drilling and completing said well and the allocation of such costs as well as actual operating costs and charges for supervision. Also to be considered is the designation of applicant as operator of the well and a 200 percent charge for risk involved in drilling said well.

CASE 5008: Application of Hondo Drilling Company for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Delaware formation in the perforated interval from 5034 feet to 5038 feet, or in the alternative, from 5128 feet to 5134 feet in its Gulf "NW" State Well No. 2 located in Lot 6 of Section 6, Township 24 South, Range 33 East, Triple "X" Delaware Pool, Lea County, New Mexico.

CASE 5009: Application of Wendell C. Welch for an oil treating plant permit, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority for the construction and operation of an oil treating plant for the purpose of treating and reclaiming sediment oil at a site in the SE/4 of Section 35, Township 17 South, Range 27 East, Eddy County, New Mexico.

- CASE 5010: Application of Yates Petroleum Corporation for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests down to and including the Pennsylvanian formation underlying the N/2 of Section 18, Township 18 South, Range 26 East adjacent to the West Atoka Morrow Gas Pool, Eddy County, New Mexico, to be dedicated to a well to be drilled 1650 feet from the North line and 660 feet from the West line of said Section 18, the unorthodox location of which was previously approved by Commission Order No. R-4508. Also to be considered will be the cost of drilling and completing said well and the allocation of such costs as well as actual operating costs and charges for supervision. Also to be considered is the designation of applicant as operator of the well and up to 200 percent charge for risk involved in drilling said well.
- CASE 5011: Application of El Paso Natural Gas Company for extension of Order No. R-4342, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks the extension of the provisions of Order No. R-4342, which order authorized the applicant to produce certain non-marginal wells in the San Juan 32-9 Unit Area, Blanco Mesaverde Pool, San Juan County, New Mexico, at full capacity while conducting tests, making up said overproduction by underproducing other non-marginal wells within the participating area.
- CASE 5012: Application of Gandy Construction for an oil treating plant permit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority for the construction and operation of an oil treating plant for the purpose of treating and reclaiming sediment oil at a site in the SE/4 of Section 11, or the SW/4 of Section 12, Township 10 South, Range 35 East, Lea County, New Mexico.
- CASE 5013: Application of Phillips Petroleum 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 Grayburg-San Andres formation through its Lea Wells Nos. 4 and 6 located in Units I and O, respectively, of Section 29, Township 17 South, Range 34 East, Vacuum Grayburg-San Andres Pool, Lea County, New Mexico.
- Applicant further seeks an administrative procedure for the drilling of additional injection and producing wells at orthodox and unorthodox locations without further notice and hearing.
- CASE 5014: Application of Cities Service Oil Company for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests underlying the W/2 of Section 26, Township 25 South, Range 24 East, adjacent to the Washington Ranch-Morrow Gas Pool, Eddy County, New Mexico, to be dedicated to a well to be drilled at an orthodox location for said unit.

(Case 5014 continued from page 2)

Also to be considered will be the cost of drilling and completing said well and the allocation of such costs as well as actual operating costs and charges for supervision. Also to be considered is the designation of applicant as operator of the well and up to 200 percent charge for risk involved in drilling said well.

CASE 5015: Application of Michael P. Grace II and Corinne Grace for compulsory pooling, Eddy County, New Mexico. Applicants, in the above-styled cause, seek an order pooling all mineral interests down to and including the Morrow formation underlying the S/2 of Section 16, Township 24 South, Range 26 East, adjacent to the White City-Pennsylvanian Gas Pool, Eddy County, New Mexico, to be dedicated to a well to be drilled at an orthodox location for said unit. Also to be considered will be the cost of drilling and completing said well and the allocation of such costs as well as actual operating costs and charges for supervision. Also to be considered is the designation of applicant as operator of the well and up to 200 percent charge for risk involved in drilling said well.

CASE 4988: (Continued and Readvertised)

Application of Texaco Inc. for down-hole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle production from the Blinebry, Tubb, and Drinkard Oil Pools in the wellbore of its A. H. Blinebry Well No. 28 located in Unit A of Section 29, Township 22 South, Range 38 East, Lea County, New Mexico.

CASE 5016: Application of Atlantic Richfield Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Seven Rivers-Queen Unit Area comprising 2262 acres, more or less, of State and Fee lands in Townships 22 and 23 South, Range 36 East, Lea County, New Mexico.

CASE 5017: Application of Atlantic Richfield Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in its Seven Rivers-Queen Unit Area by the injection of water into the Seven Rivers and Queen formations through 28 wells located in Sections 27, 34, and 35, Township 22 South, Range 36 East, and Sections 2 and 3, Township 23 South, Range 36 East, Lea County, New Mexico.

CASE 5018: Southeastern nomenclature case calling for an order for the creation, extension and contraction of certain pools, and the assignment of an oil discovery allowable, 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 Humble City-Wolfcamp Pool. The discovery well is the Pubco Petroleum Corporation

(Case 5018 continued from page 3)

Shipp No. 4 located in Unit 1 of Section 11, Township 17 South, Range 37 East, NMPM. Said pool would comprise:

TOWNSHIP 17 SOUTH, RANGE 37 EAST, NMPM
Section 11: SW/4

Also the assignment of an oil discovery allowable of approximately 47,970 barrels of oil to the aforesaid Shipp Well No. 4.

(b) Create a new pool in Lea County, New Mexico, classified as an oil pool for Queer production and designated as the Shinnery-Queen Pool. The discovery well is the Burleson & Huff Cinco de Mayo Federal No. 1 located in Unit C of Section 24, Township 18 South, Range 32 East, NMPM. Said pool would comprise:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM
Section 24: NW/4

(c) Contract the Bagley-Pennsylvanian Pool in Lea County, New Mexico, by the deletion of the following described area:

TOWNSHIP 11 SOUTH, RANGE 33 EAST, NMPM
Section 34: S/2 NE/4

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

TOWNSHIP 11 SOUTH, RANGE 33 EAST, NMPM
Section 34: S/2 NE/4

(e) Contract the South Prairie-Cisco Pool in Roosevelt County, New Mexico, by the deletion of the following described area:

TOWNSHIP 8 SOUTH, RANGE 36 EAST, NMPM
Section 28: NW/4

(f) Extend the East Brunson-Granite Wash Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM
Section 13: NW/4

(g) Extend the Drinkard Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 22 SOUTH, RANGE 36 EAST, NMPM
Section 1: NE/4

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM
Section 6: N/2

(h) Extend the Flying "M"-San Andres Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 9 SOUTH, RANGE 33 EAST, NMPM
Section 7: NE/4

(i) Extend the Justis Tubb-Drinkard Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 12: NW/4

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. 5017
Order No. R-4589

APPLICATION OF ATLANTIC RICHFIELD
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 June 27, 1973,
at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 13th day of July, 1973, the Commission,
a quorum being present, having considered the testimony, the
record, and the recommendations of the Examiner, and being
fully advised in the premises,

FINDS:

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

(2) That the applicant, Atlantic Richfield Company, seeks
authority to institute a waterflood project in the Seven Rivers-
Queen Unit Area by the injection of water into the Seven Rivers
and Queen formations through 28 injection wells in Sections 27,
34, and 35, Township 22 South, Range 36 East, NMPM, South Eunice
Pool, and Sections 2 and 3, Township 23 South, Range 36 East,
NMPM, Langlie Mattix Pool, Lea County, New Mexico.

(3) That applicant proposes to inject water through
tubing, set in a packer into the Seven Rivers or Queen forma-
tion through perforations or the open hole; the annulus to
be filled with inert fluid with a pressure gauge at the surface.

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

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

-2-

Case No. 5017

Order No. R-4589

(6) 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, Atlantic Richfield Company, is hereby authorized to institute a waterflood project in the Seven Rivers-Queen Unit Area, South Eunice and Langlie Mattix Pools, by the injection of water into the Seven Rivers and Queen formations through the following-described wells:

LEA COUNTY, NEW MEXICO
TOWNSHIP 22 SOUTH, RANGE 36 EAST, NMPM

<u>Well Name</u>	<u>Well No.</u>	<u>Location</u>	<u>Section</u>
Gulf A. L. Christmas "A"	6	330' FNL & 990' FEL	27
ARCO Shipley "A"	5	660' FNL & 2080' FWL	27
ARCO Shipley "A"	3	1980' FNL & 660' FWL	27
Gulf A. L. Christmas "A"	4	1980' FNL & 1980' FEL	27
A. L. Christmas "A"	8	1980' FSL & 660' FEL	27
ARCO Mattie Shipley	3	1980' FSL & 1980' FWL	27
ARCO Mattie Shipley	4	660' FSL & 660' FWL	27
Gulf A. L. Christmas "A"	7	660' FSL & 1980' FEL	27
ARCO R. M. Jones	3	660' FNL & 1980' FWL	35
ARCO C. Jones	6	660' FNL & 660' FEL	34
ARCO C. Jones	3	660' FNL & 1980' FWL	34
ARCO C. Jones	9	1980' FNL & 660' FWL	34
ARCO C. Jones	8	1980' FNL & 1980' FEL	34
ARCO R. Jones	5	1980' FNL & 660' FWL	35
Gackle R. Jones	3	1980' FSL & 1980' FWL	35
ARCO O. L. Jones "C"	1	2310' FSL & 990' FEL	34
ARCO Hale	2	1980' FSL & 1980' FWL	34
ARCO Hale	5	660' FSL & 660' FWL	34
ARCO O. L. Jones "B"	2	990' FSL & 2310' FEL	34
Gackle R. Jones	4	660' FSL & 660' FWL	35

TOWNSHIP 23 SOUTH, RANGE 36 EAST, NMPM

Gulf Janda "I" State	4	660' FNL & 660' FEL	2
Gulf Janda "I" State	5	660' FNL & 1980' FWL	2
Gackle Sinclair State "B"	7	660' FNL & 660' FEL	3
Gackle Sinclair State "B"	6	660' FNL & 2310' FWL	3
Gackle Sinclair State "B"	9	1980' FNL & 660' FWL	3
Gackle Sinclair State "B"	11	1980' FNL & 1980' FEL	3
Gulf Janda "I" State	10	1980' FNL & 660' FWL	2
Janda "I" State	8	1980' FNL & 1980' FEL	2

-3-

Case No. 5017
Order No. R-4589

(2) That the subject waterflood project is hereby designated the Seven Rivers-Queen Unit Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

(3) That injection into each of the above-authorized water injection wells shall be through internally plastic-coated tubing set in a packer which shall be set as near as is practicable to the uppermost perforation or the casing-shoe, in open-hole completions. The casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge at the surface.

(4) 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.

(5) 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



I. R. Trujillo
I. R. TRUJILLO, Chairman

Alex J. Armijo
ALEX J. ARMILLO, Member

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

S E A L

dr/

5017

Heard 6-27-73

Rec. 6-28-73

✓ Grant Atlantic permission to
convert 28 wellbore injection
for their Seven Rivers Queen
Levee. A. 11

✓ Log wells is on Diagramatic
sketches of Exhibit 6

✓ All injection will be thru
tubing under a packer and
into the S. B. or Queen thru
perforations & open hole.

✓ Cement to be filled w/
inert fluid w/ pressure gauge
at surface.

John R.



OIL CONSERVATION COMMISSION

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

GOVERNOR
BRUCE KING
CHAIRMAN
LAND COMMISSIONER
ALEX J. ARMIJO
MEMBER
STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

July 16, 1973

Mr. Clarence Hinkle
Hinkle, Bondurant, Cox & Eaton
Attorneys at Law
Post Office Box 10
Roswell, New Mexico 88201

Re: Case No. _____
Order No. 5017
Applicant: R-4589
Atlantic Richfield

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, JR.
Secretary-Director

ALP/ir

Copy of order also sent to:

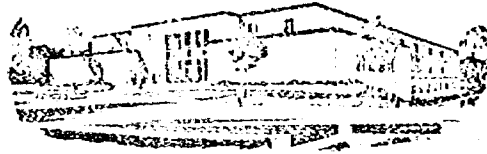
Hobbs OCC _____
Artesia OCC x _____
Aztec OCC _____

Other _____
State Engineer Office

State of New Mexico



ALEX J. ARMIJO
COMMISSIONER



Commissioner of Public Lands

March 24, 1971

P. O. Box 1148
SANTA FE, NEW MEXICO

Atlantic Richfield Company
P. O. Box 1610
Midland, Texas 79701

Re: Seven Rivers Queen Unit
Lea County, New Mexico

ATTENTION: Mr. John R. Nolen ✓

Gentlemen:

We wish to advise you that the proposed Seven Rivers-Queen Unit, Lea County, New Mexico, has been approved as to form and content by the Commissioner of Public Lands as of this date.

Under Tract 11, of the Exhibit "B", Lease B-229 should show the assignment No. which is B-229-1.

Please remit your Twenty-Five (\$25.00) Dollar filing fee.

Sincerely yours,

Gordon G. Marcum, II
GORDON G. MARCUM, II, Director
Oil and Gas

AJA/GGM/s

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 2
CASE NO. 5016 & 5017
Submitted by Atlantic Richfield
Hearing Date 6-27-73

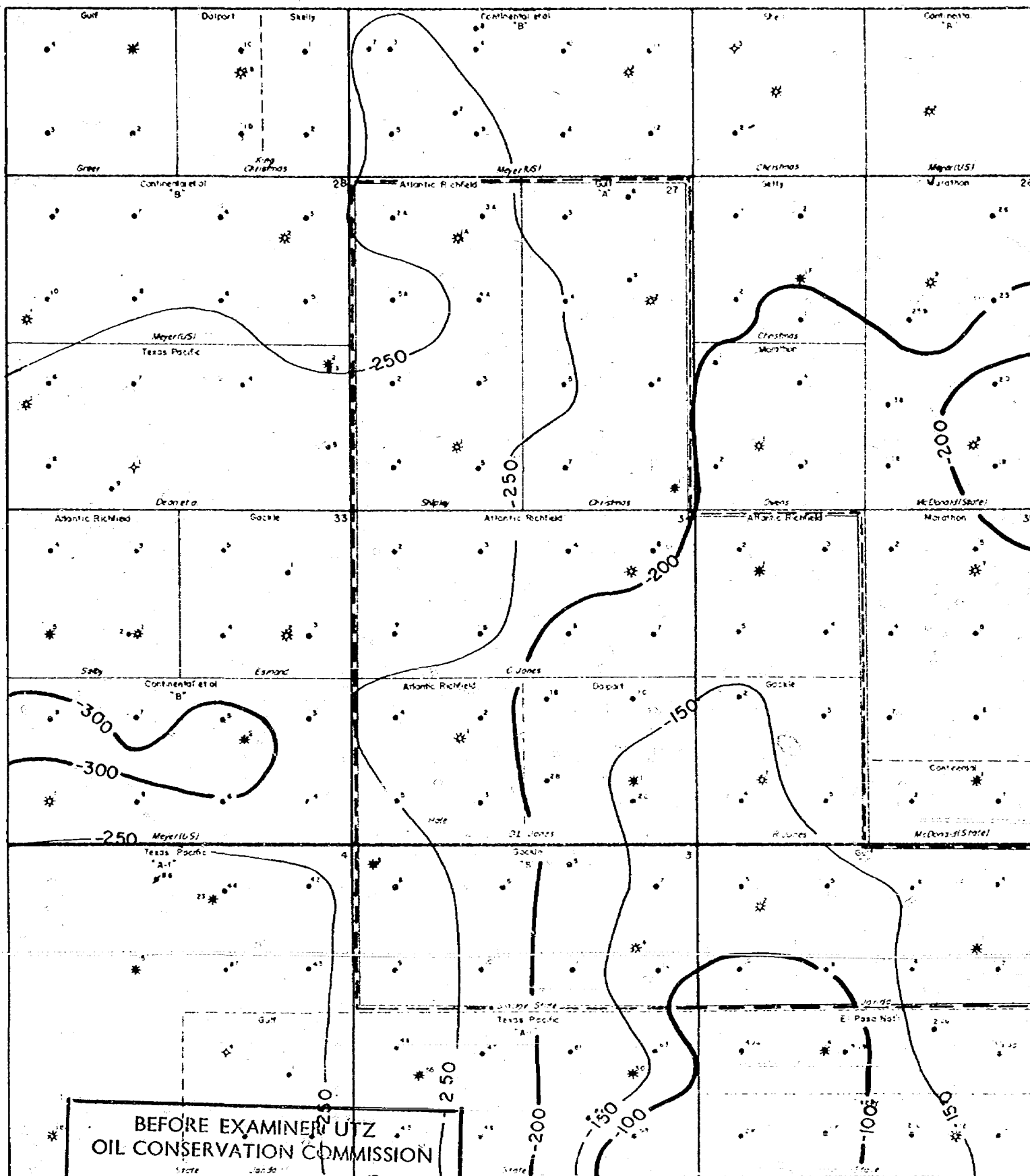
RECEIVED
MAR 26 1971
ATLANTIC RICHFIELD COMPANY
LAND DEPT.

Exhibit No. 2

R 36 E

T
22
S

T
23
S

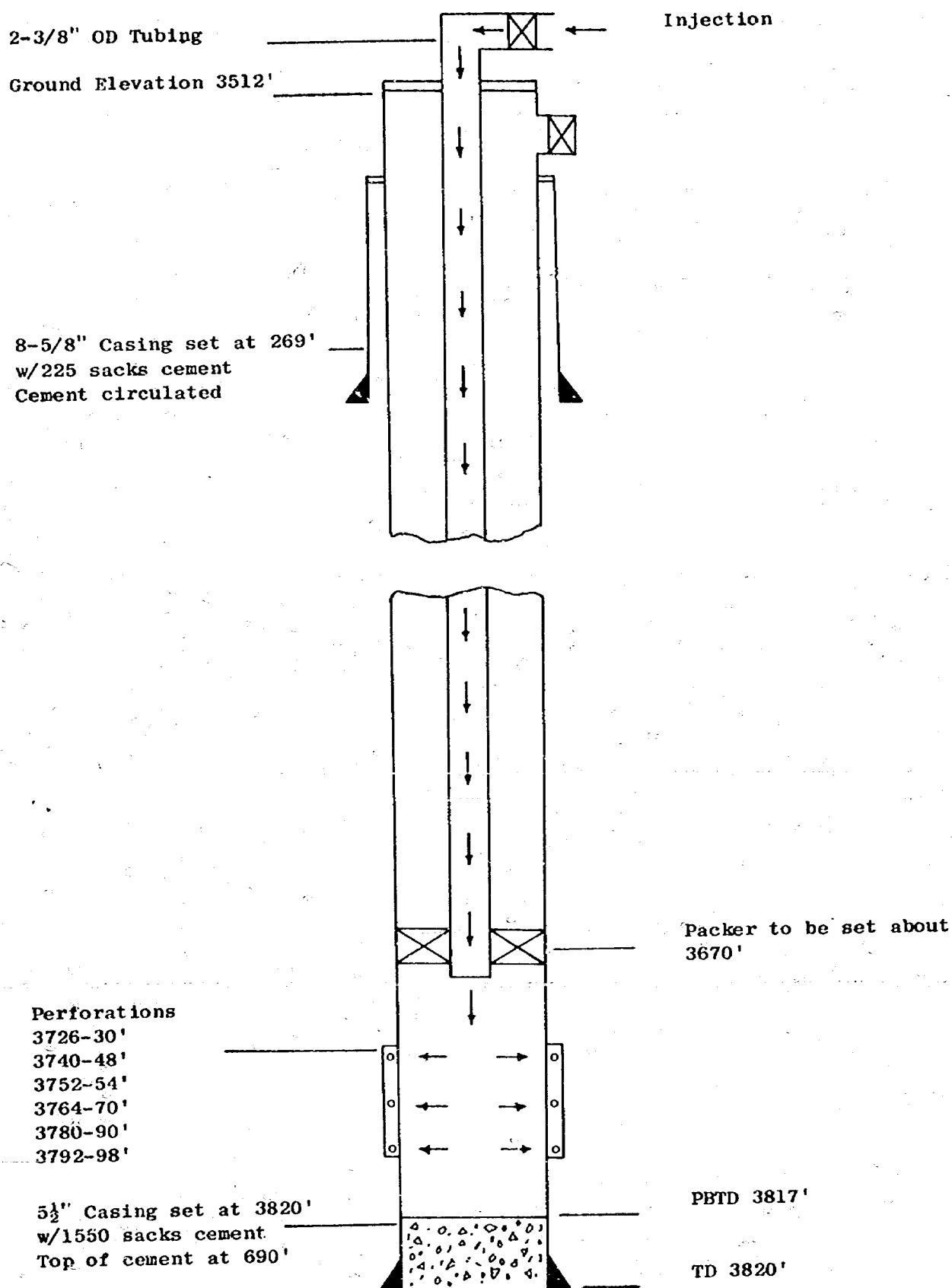


BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 3
CASE NO. 5016 & 5017
Submitted by Atlantic Richfield
Hearing Date 6-27-73

Exhibit No. 3

ATLANTIC RICHFIELD CO.
STRUCTURE MAP
TOP OF QUEEN
LEA CO NEW MEXICO
DRAWN BY S.M. DATE 4-11-73
SCALE 1" = 1000'
FIG. NO.

ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 1 (Gulf A. L. Christmas "A" No. 6)
330' FNL & 990' FEL Section 27, T-22S, R-36E
Lea County, New Mexico



BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION

EXHIBIT NO. 6

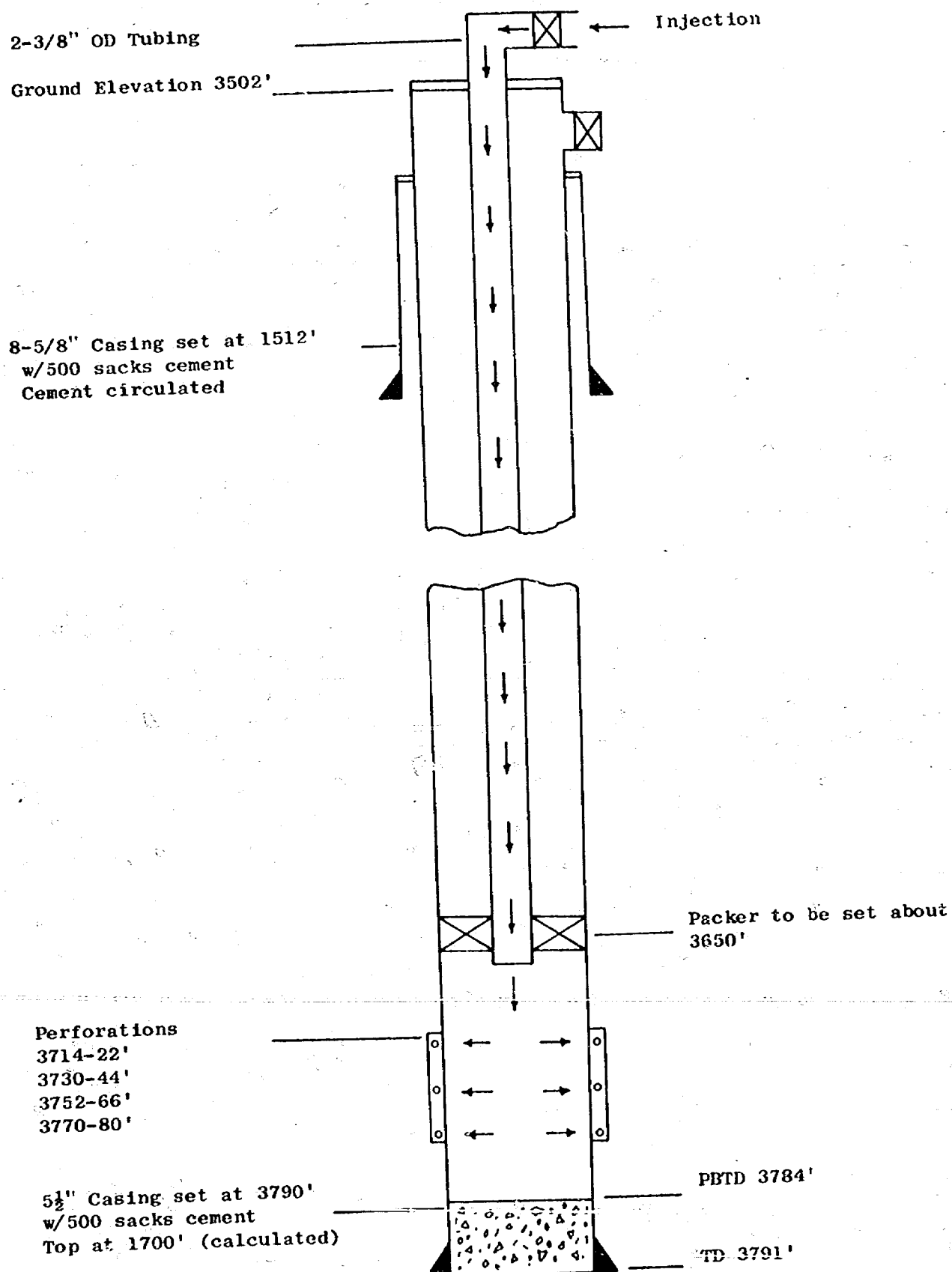
CASE NO. 50164 5017

Submitted by Atlantic Richfield

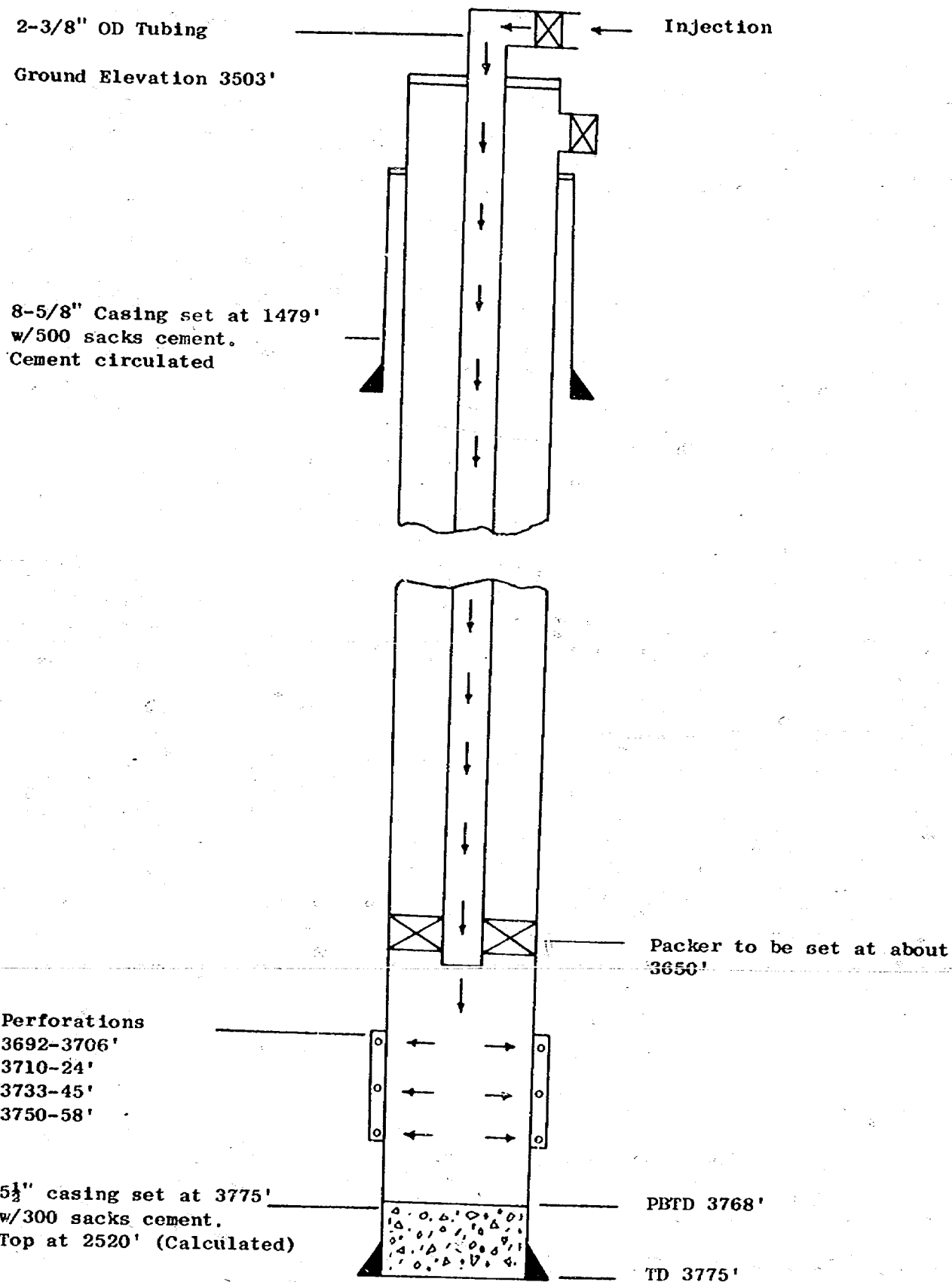
Hearing Date 6-27-73

EXHIBIT NO. 6-A

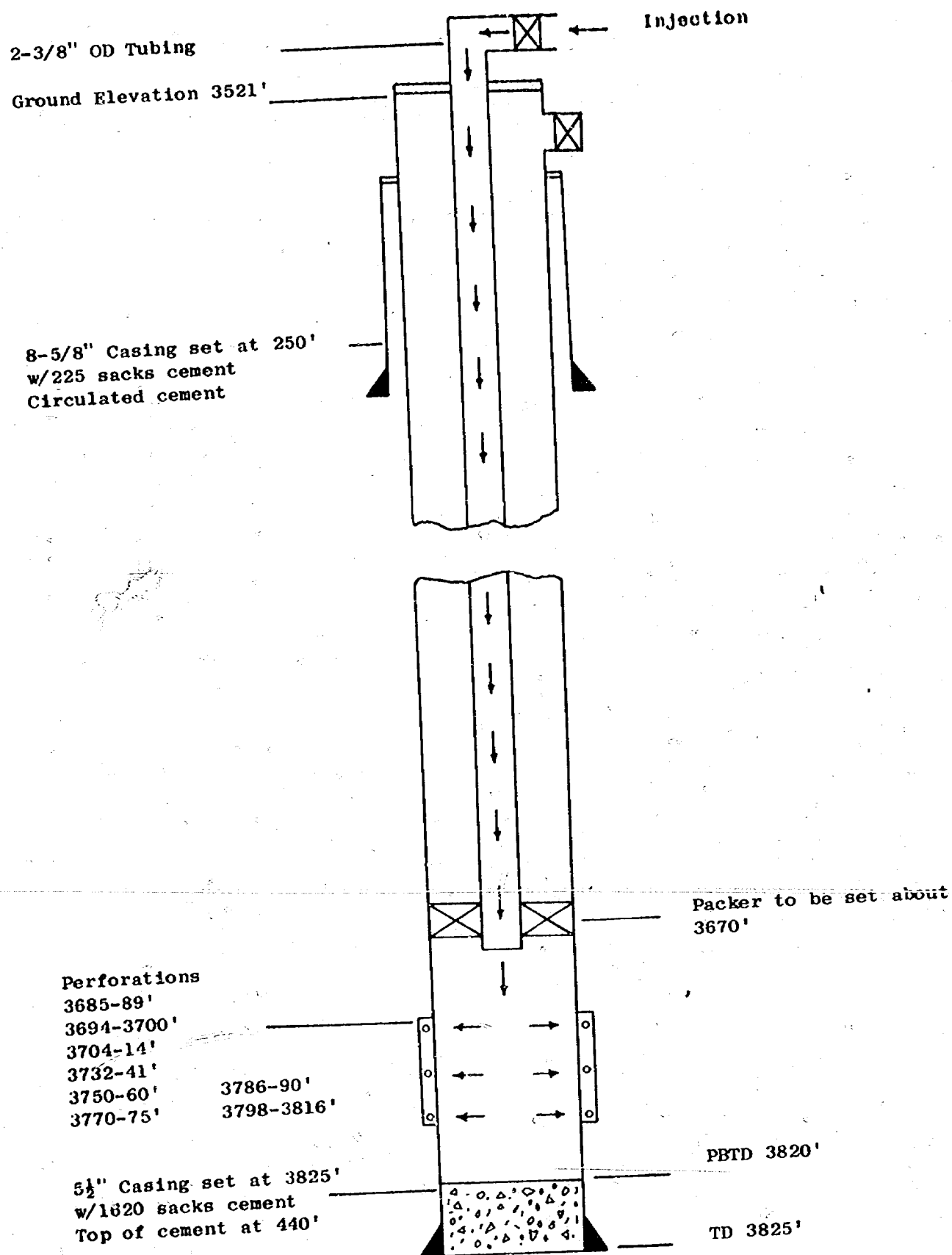
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVER QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 3 (ARCO Shipley "A" No. 5)
 660' FNL & 2080' FWL Section 27, T-22S, R-36E
 Lea County, New Mexico



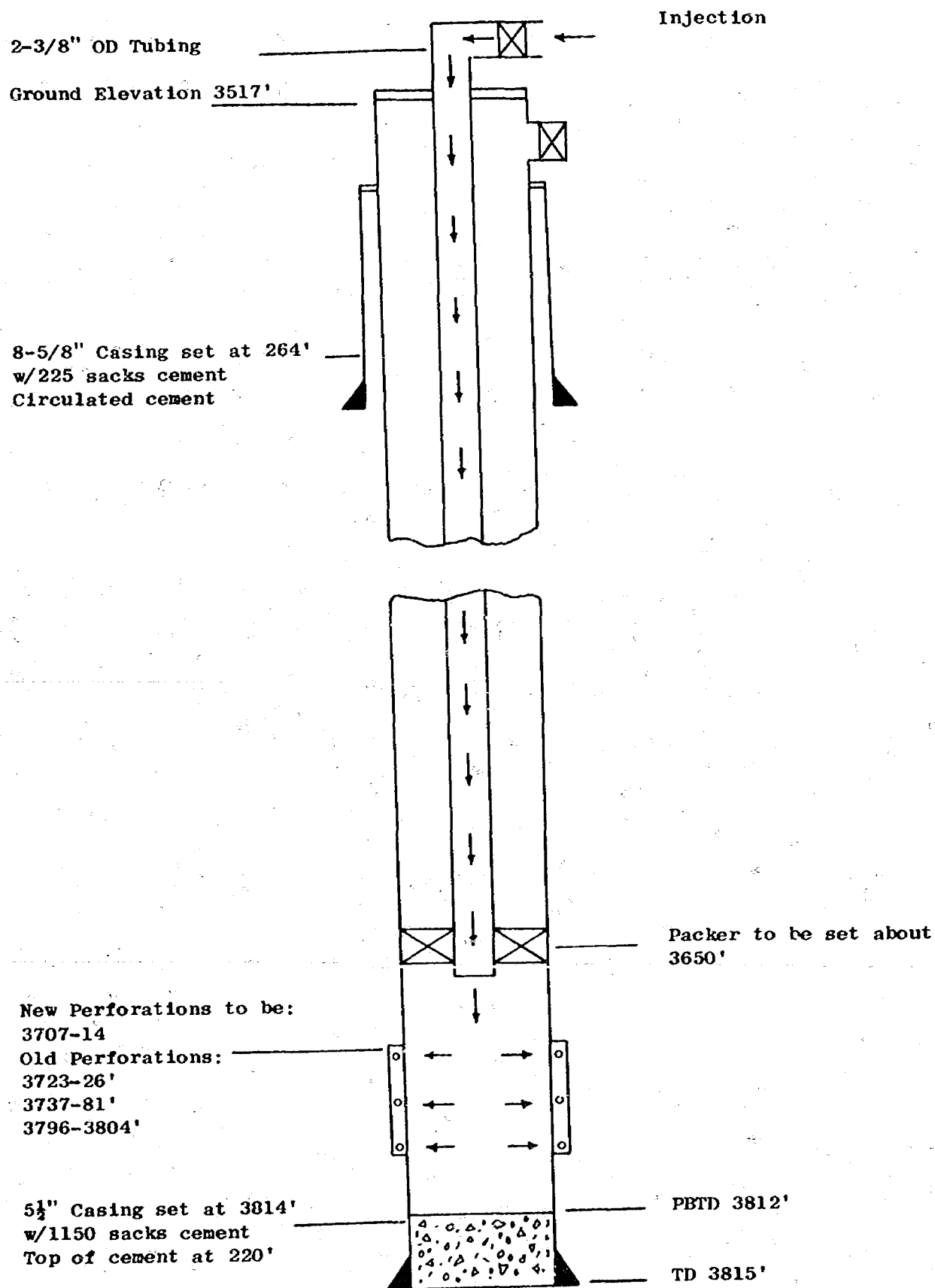
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 5 (ARCO Shipley "A" No. 3)
 1980' FNL & 660' FWL Section 27, T-22S, R-36E
 Lea County, New Mexico



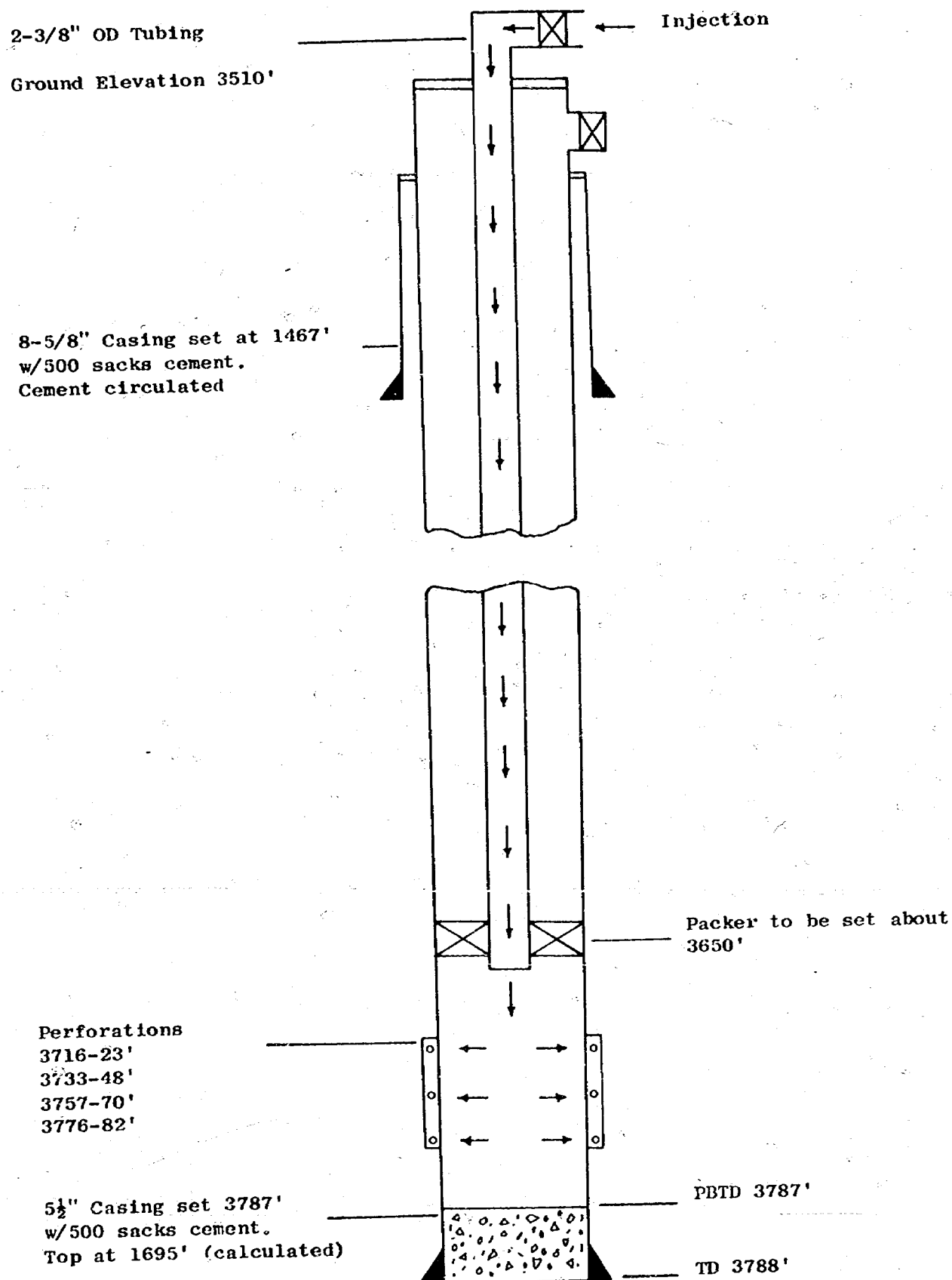
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 7 (Gulf A. I., Christmas "A" No. 4)
 1980' FNL & 1980' FEL Section 27, T-22N, R-36E
 Lea County, New Mexico



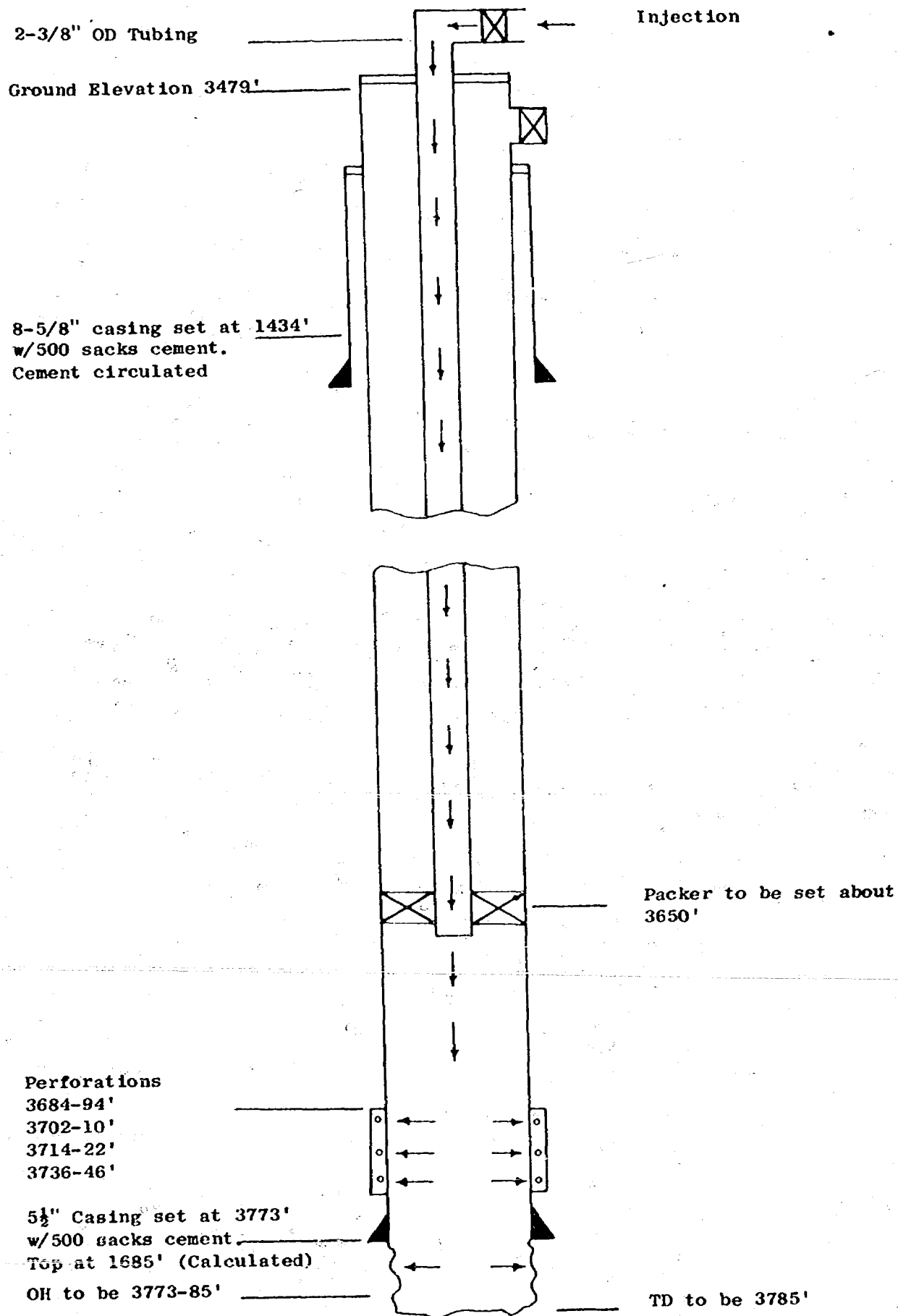
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 9 (A. L. Christmas "A" No. 8)
1980' FSL & 660' FEL Section 27, T-22S, R-36E
Lea County, New Mexico



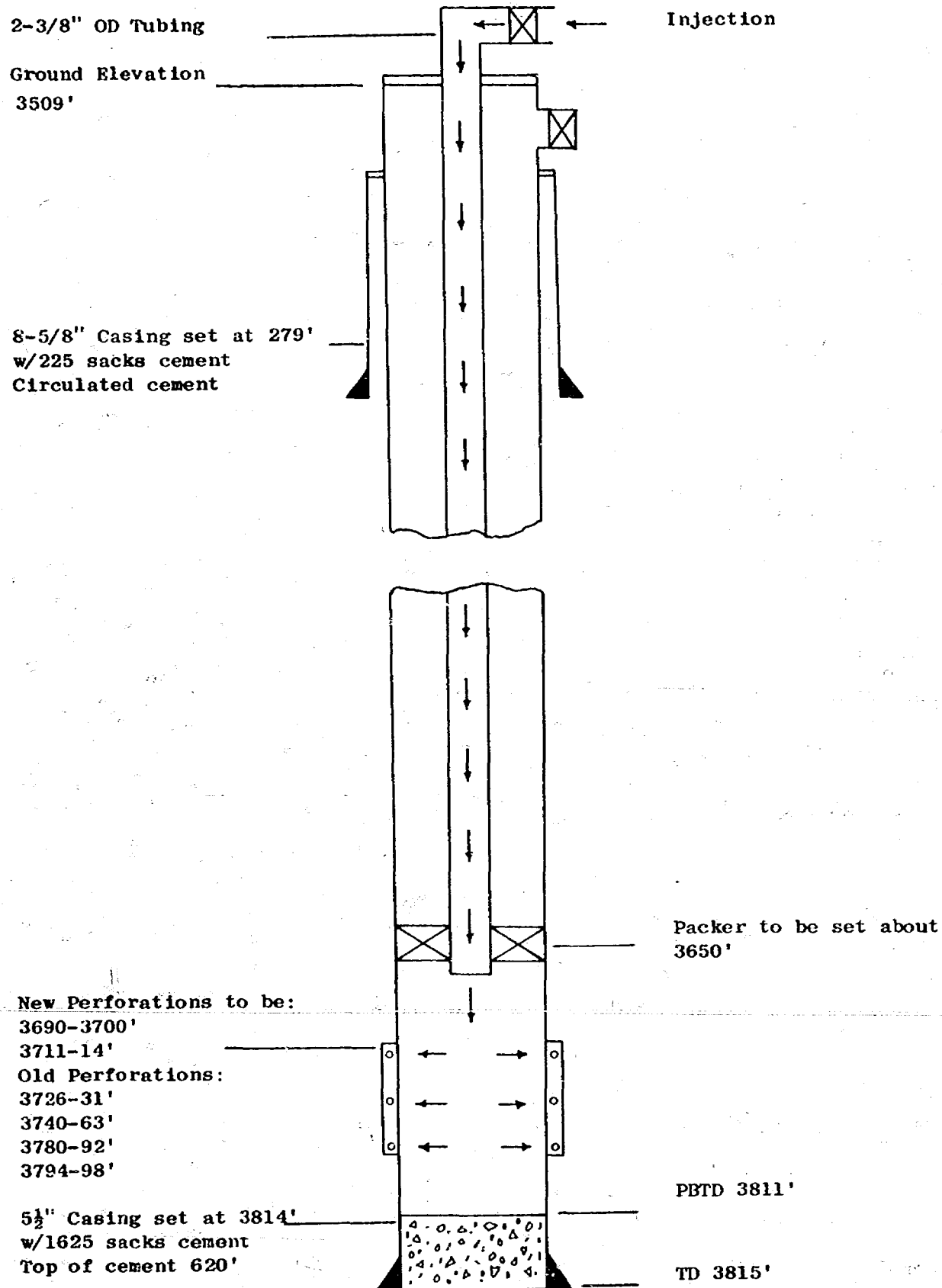
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 11 (ARCo Mattie Shipley No. 3)
1980' FSL & 1980' FWL Section 27, T-22S, R-36E
Lea County, New Mexico



ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 13 (ARCo Mattie Shipley No. 4)
660' FSL & 660' FWL Section 27, T-22S, R-36E
Lea County, New Mexico



ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 15 (Gulf A. L. Christmas "A" No. 7)
 660' FSL & 1980' FEL Section 27, T-22S, R-36E
 Lea County, New Mexico



ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 17 (ARCo R. M. Jones No. 3)
 660' FNL & 1980' FWL Section 35, T-22S, R-36E
 Lea County, New Mexico

2-3/8" OD Tubing

Injection

8-5/8" Casing set at 306'
 w/200 sacks cement.
 Cement circulated

Perforations
 3603-71'
 To be squeezed

Packer to be set about
 3685'

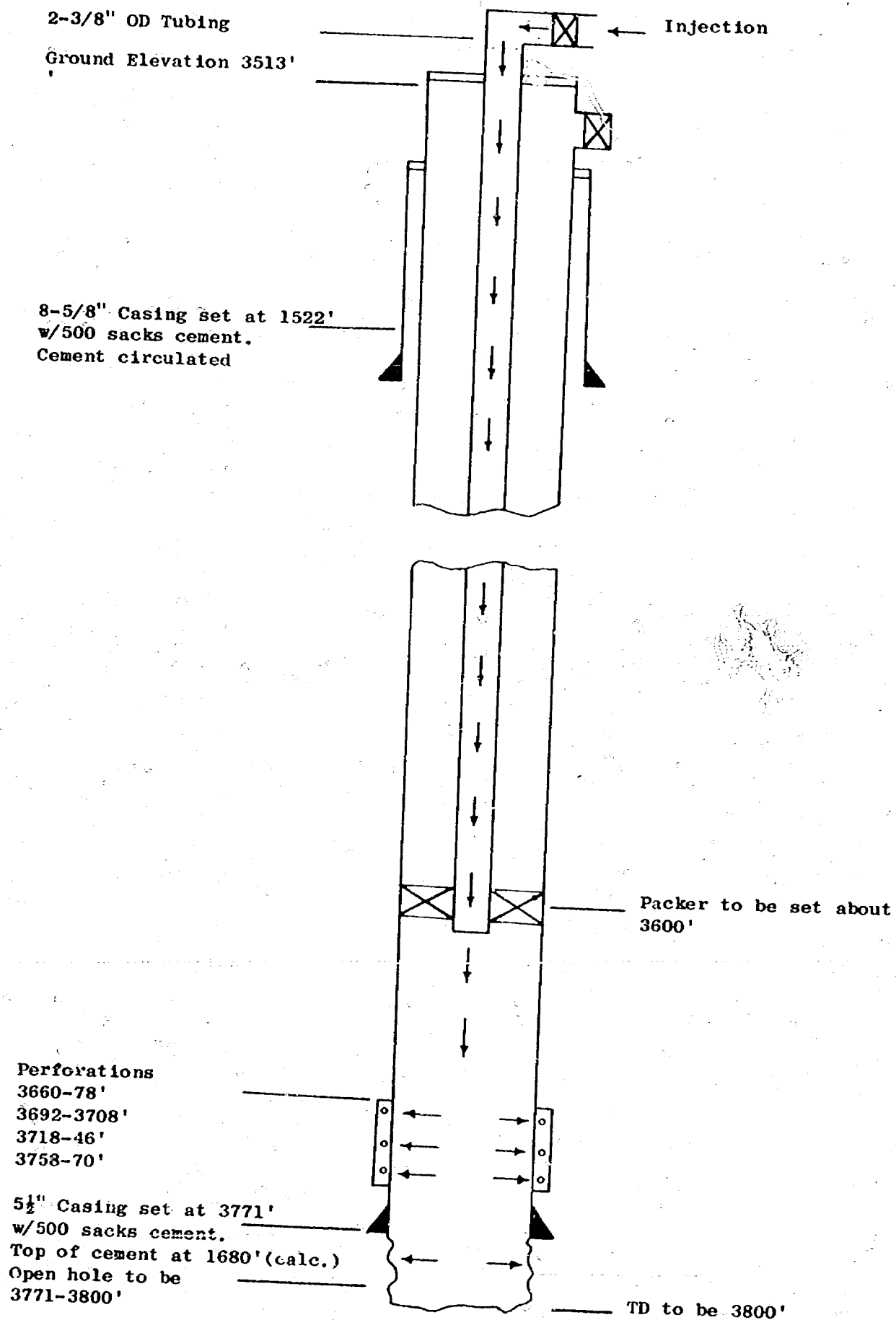
Perforations
 3691-3721'
 3733-57'
 3761-69'

5 1/2" Casing set at 3825'
 w/100 sacks cement around
 shoe and 100 sacks cement
 through two-stage tool at
 1353'. Top of cement at
 980'

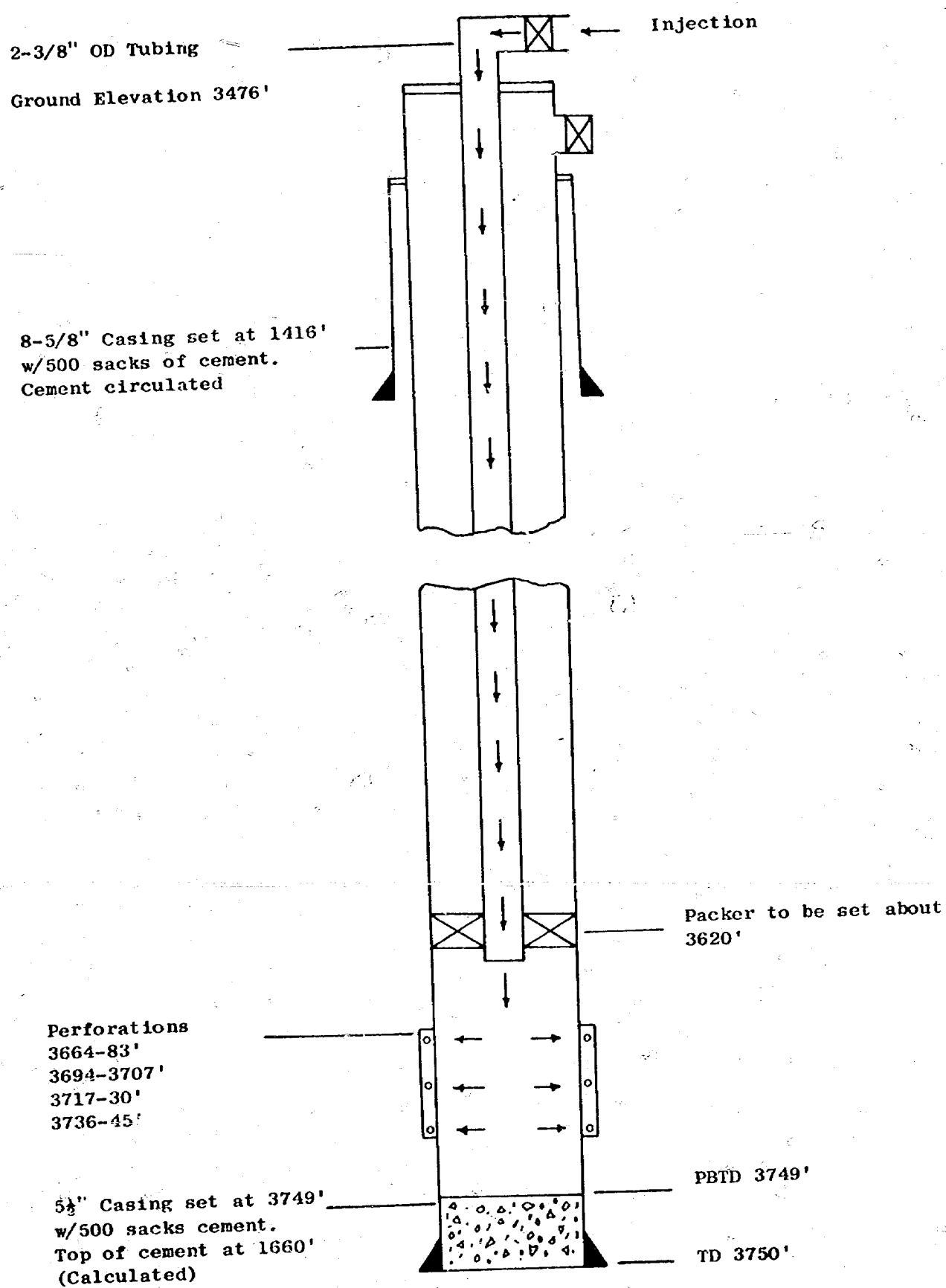
PBTD 3780'

TD 3825'

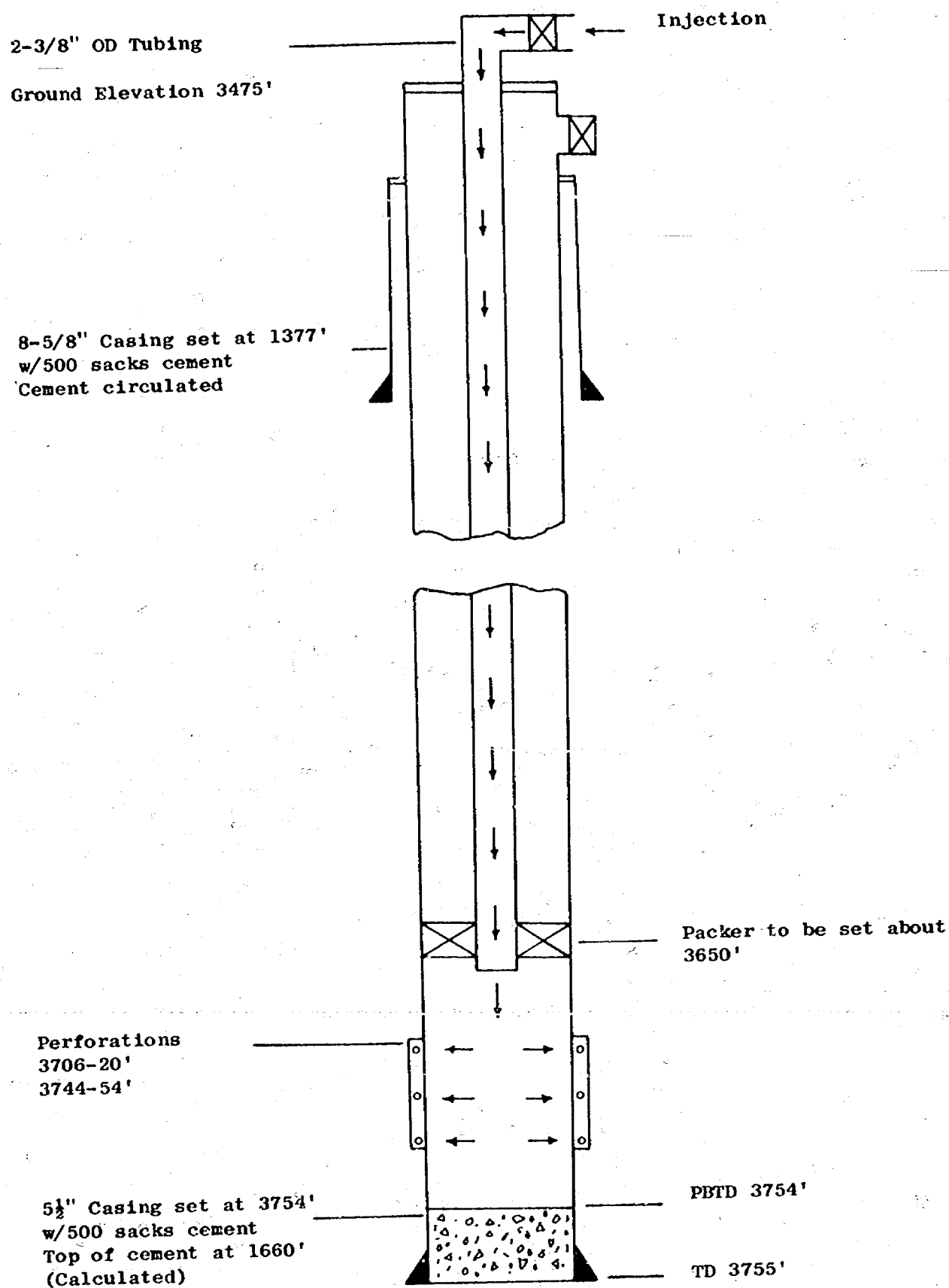
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 19 (ARCo C. Jones No. 6)
660' FNL & 660' FEL Section 34, T-22S, R-36E
Lea County, New Mexico



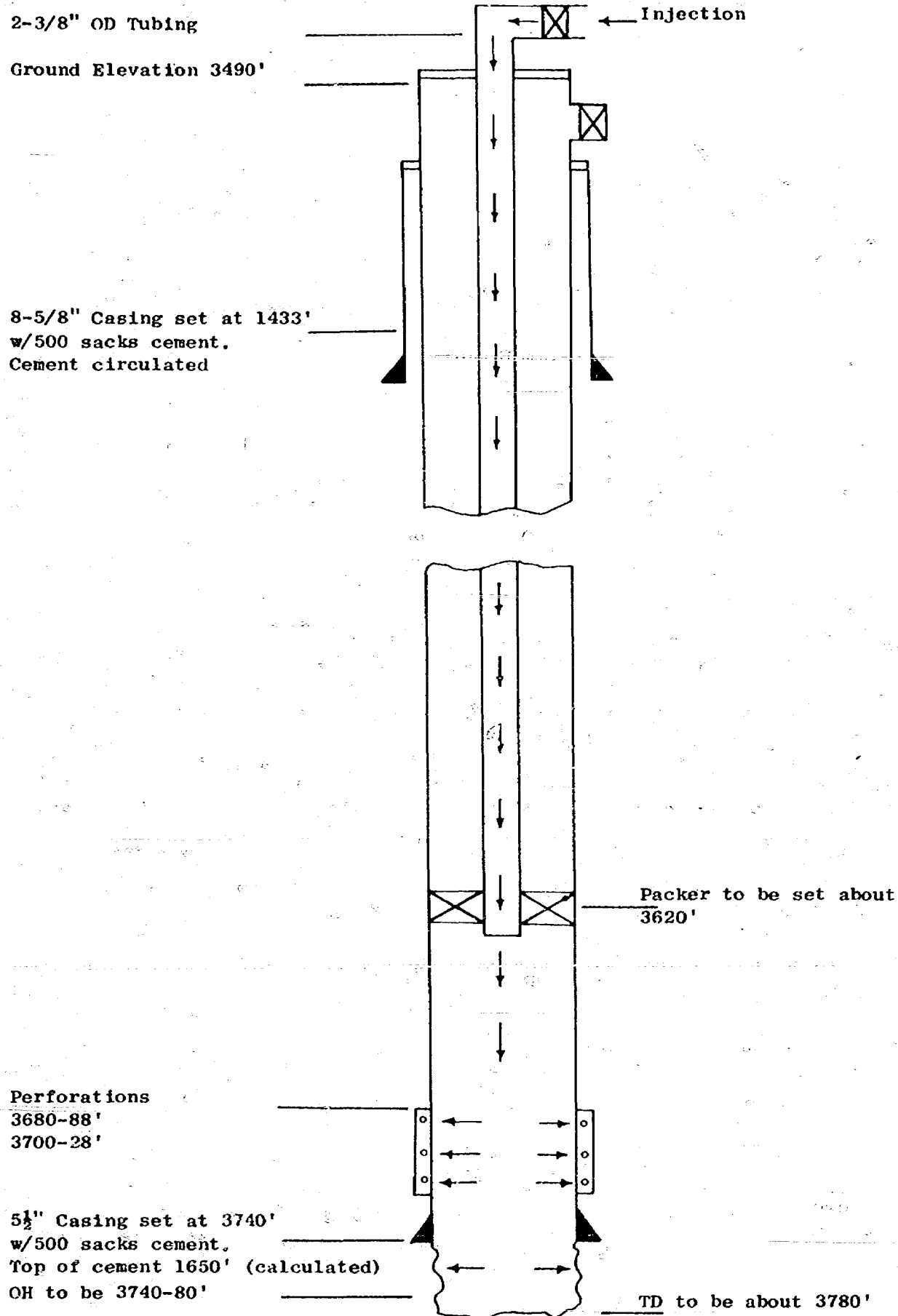
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 21 (ARCO C. Jones No. 3)
660' FNL & 1980' FWL Section 34, T-22S, R-36E
Lea County, New Mexico



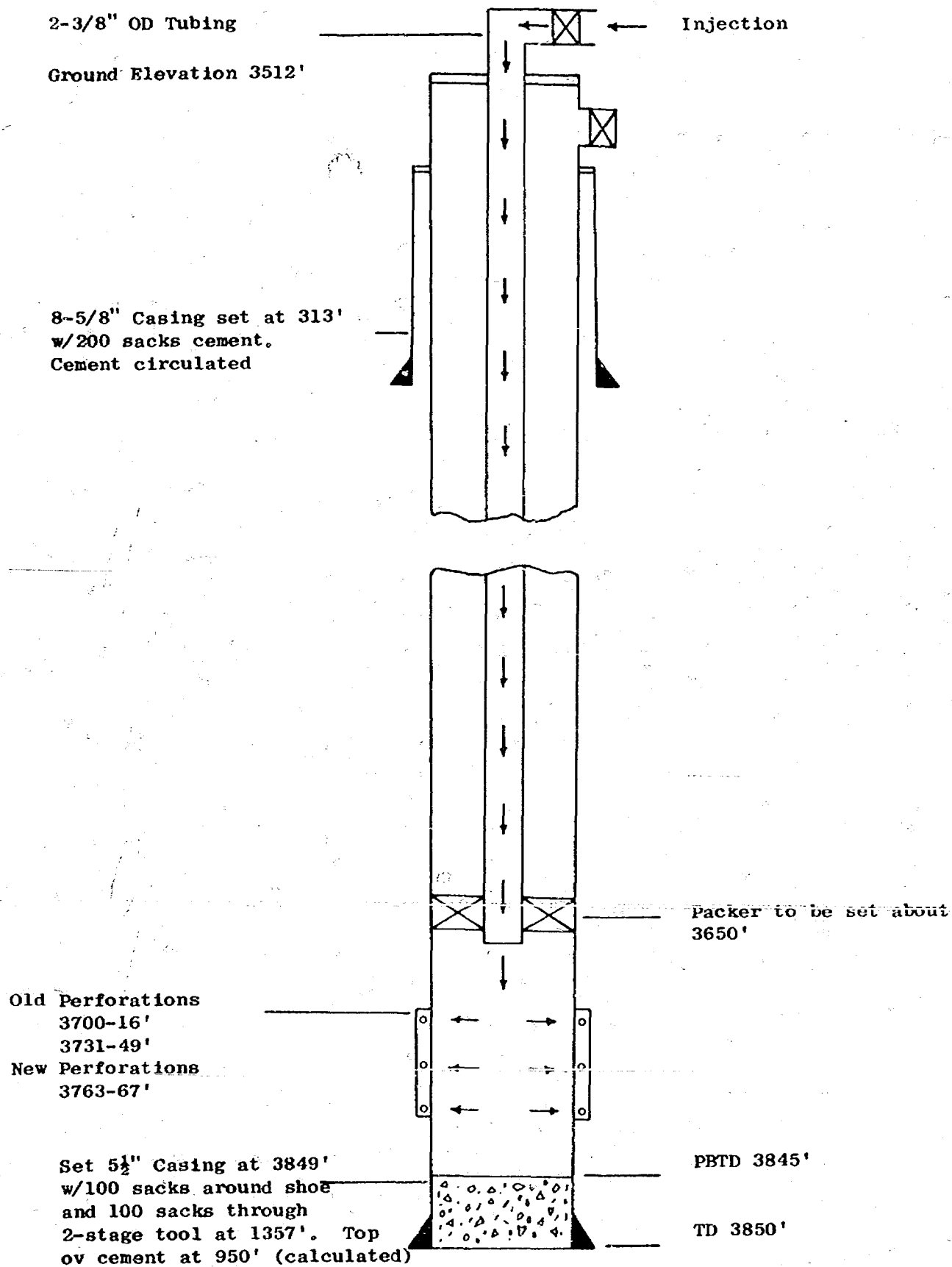
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 23 (ARCo C. Jones No. 9)
1980' FNL & 660' FWL Section 34, T-22S, R-36E
Lea County, New Mexico



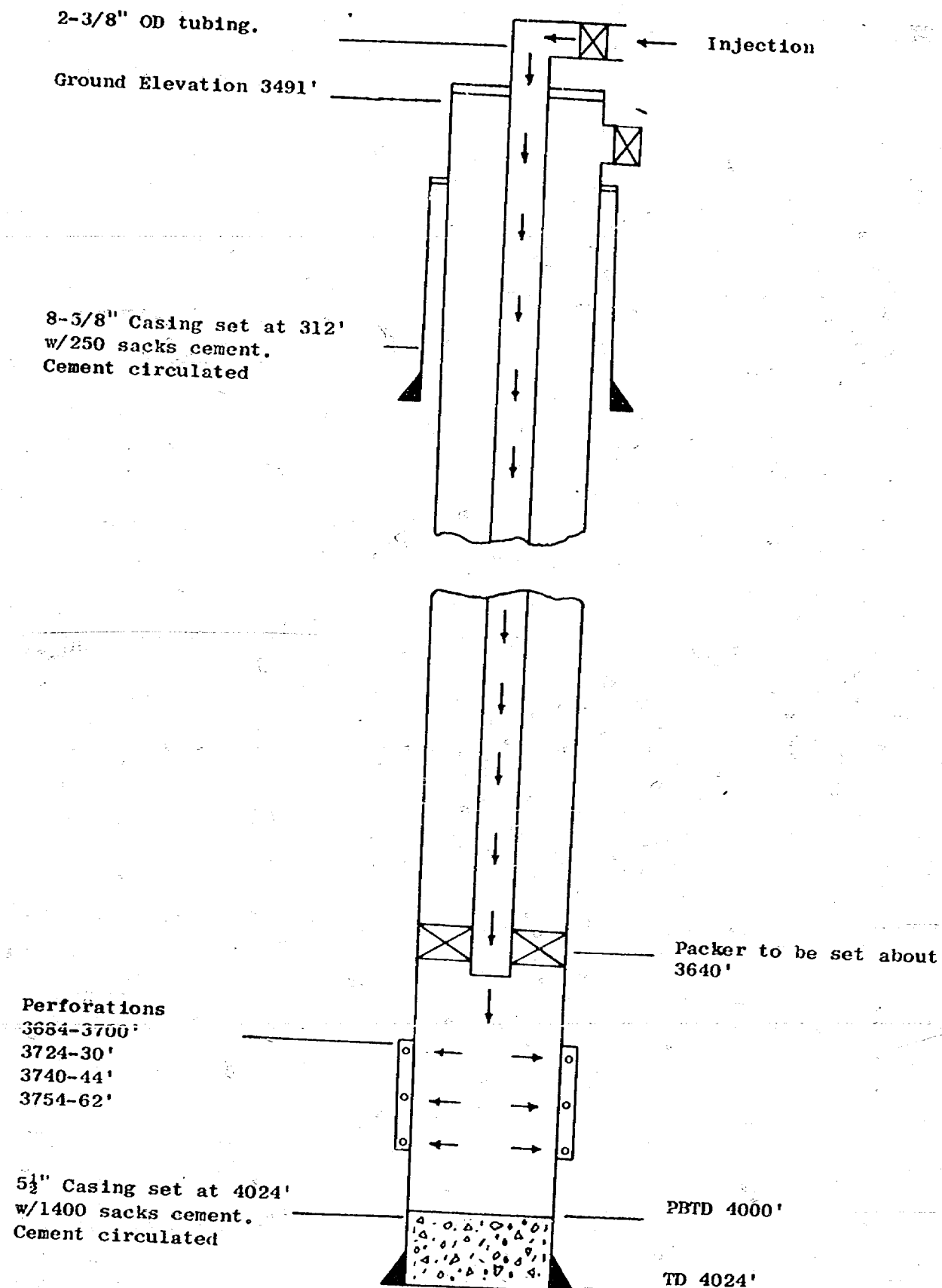
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 25 (ARCo C. Jones No. 8)
1980' FNL & 1980' FEL, Section 34, T-22S, R-36E
Lea County, New Mexico



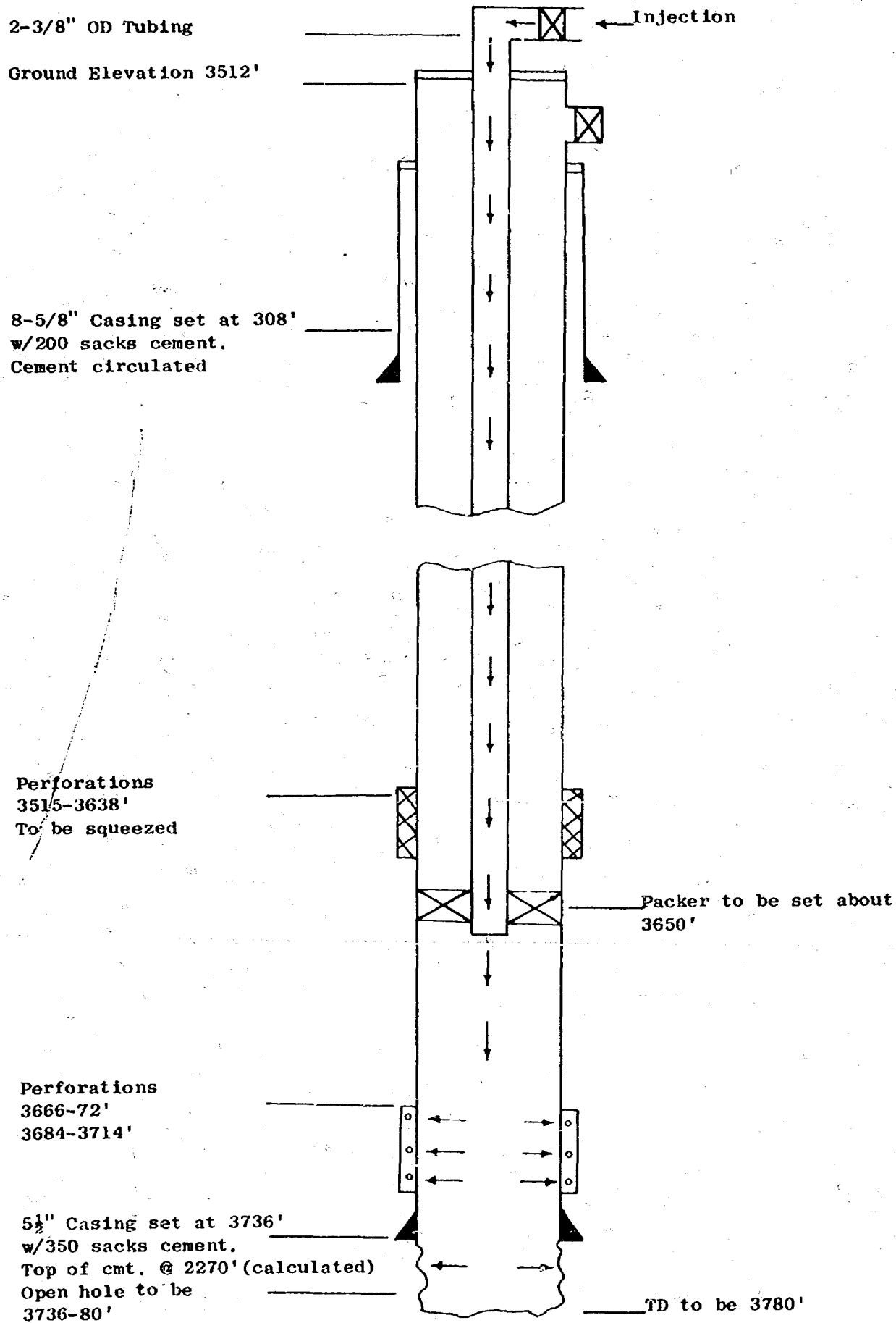
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 27 (ARCo R. Jones No. 5)
 1980' FNL & 660' FWL Section 35, T-22S, R-36E
 Lea County, New Mexico



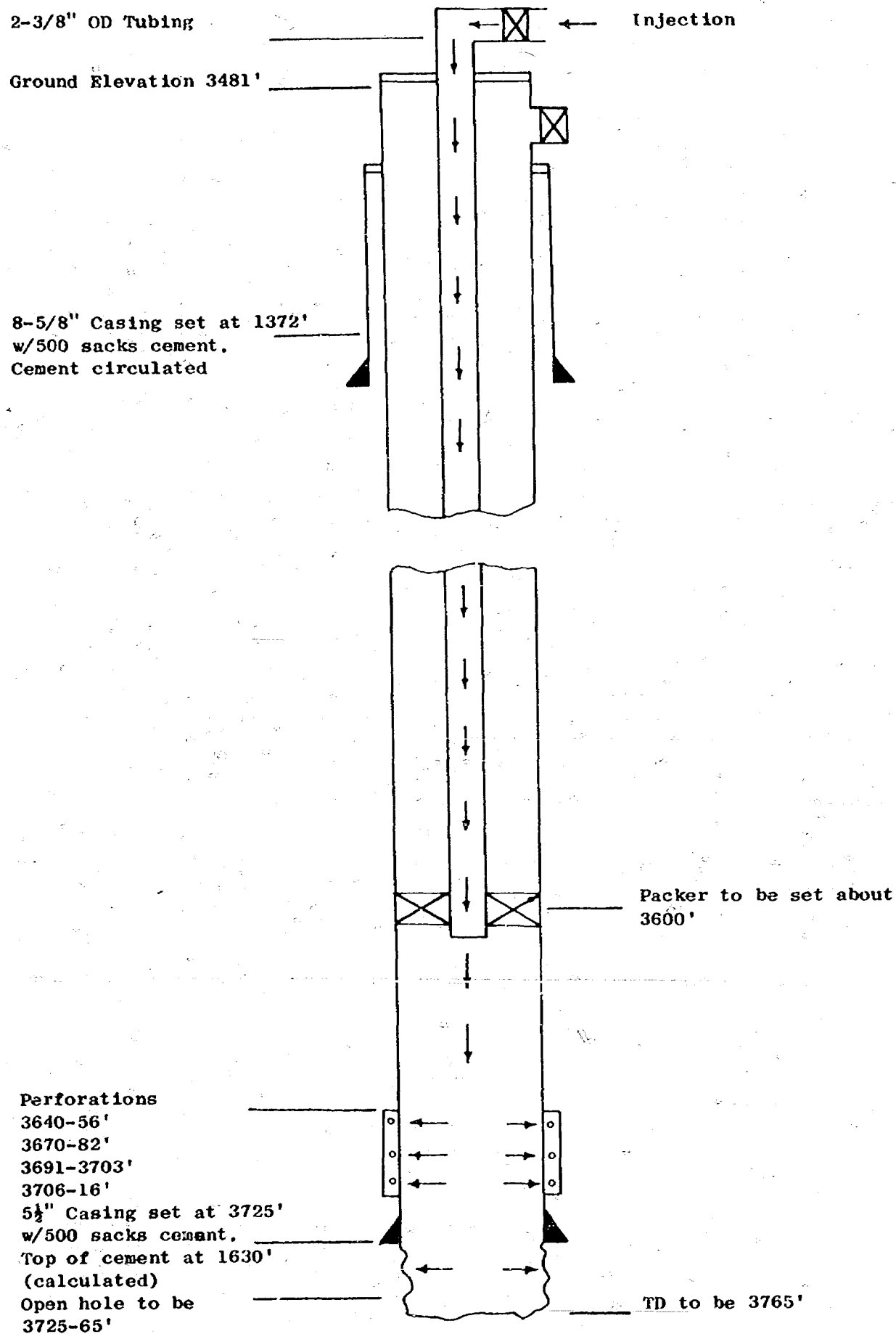
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 29 (Gackle R. Jones No. 3)
1980' FSL & 1980' FWL Section 35, T-22S, R-36E
Lea County, New Mexico



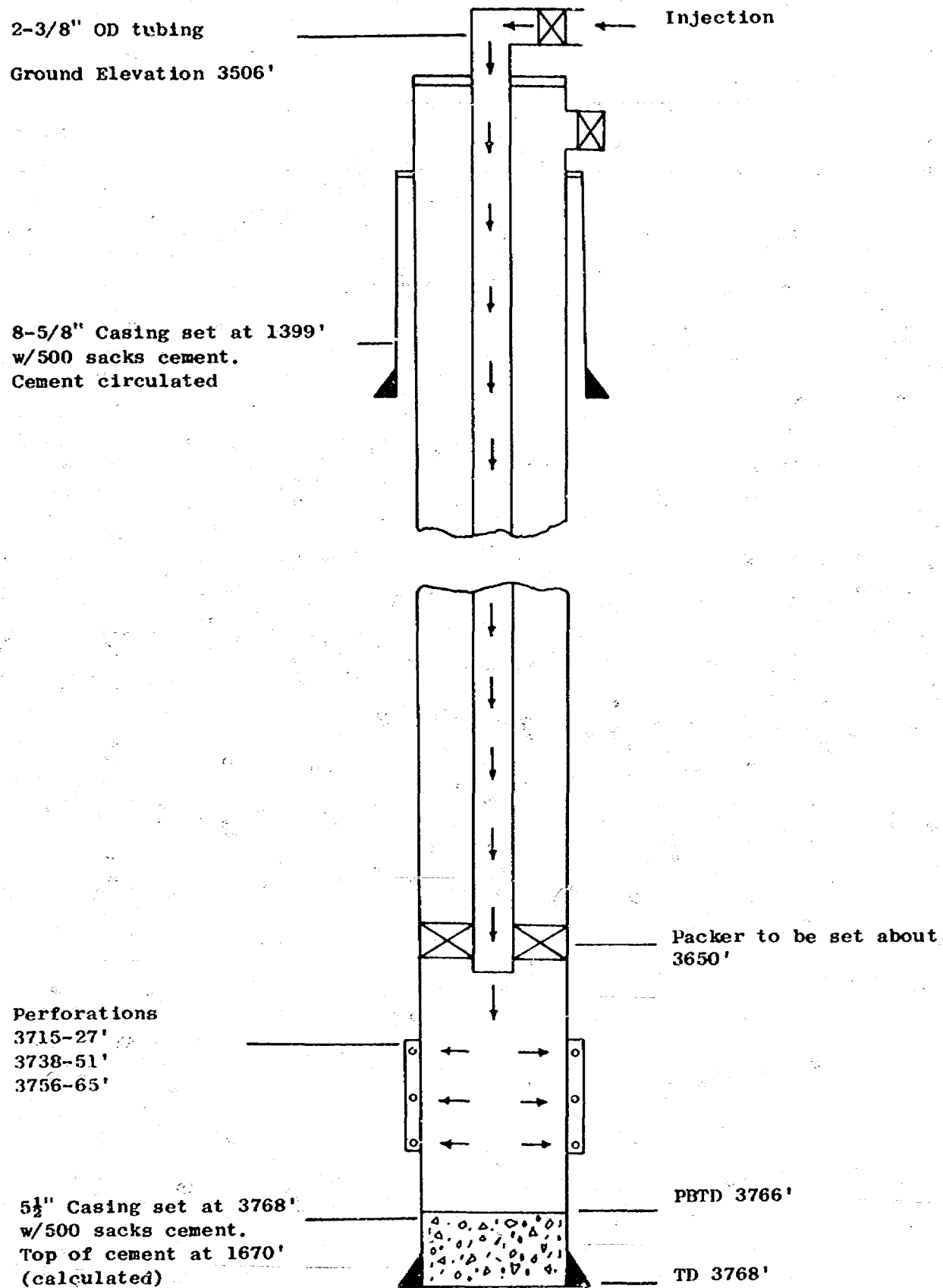
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 31 (ARCo O. L. Jones "C" No. 1)
2310' FSL & 990' FEL Section 34, T-22S, R-36E
Lea County, New Mexico



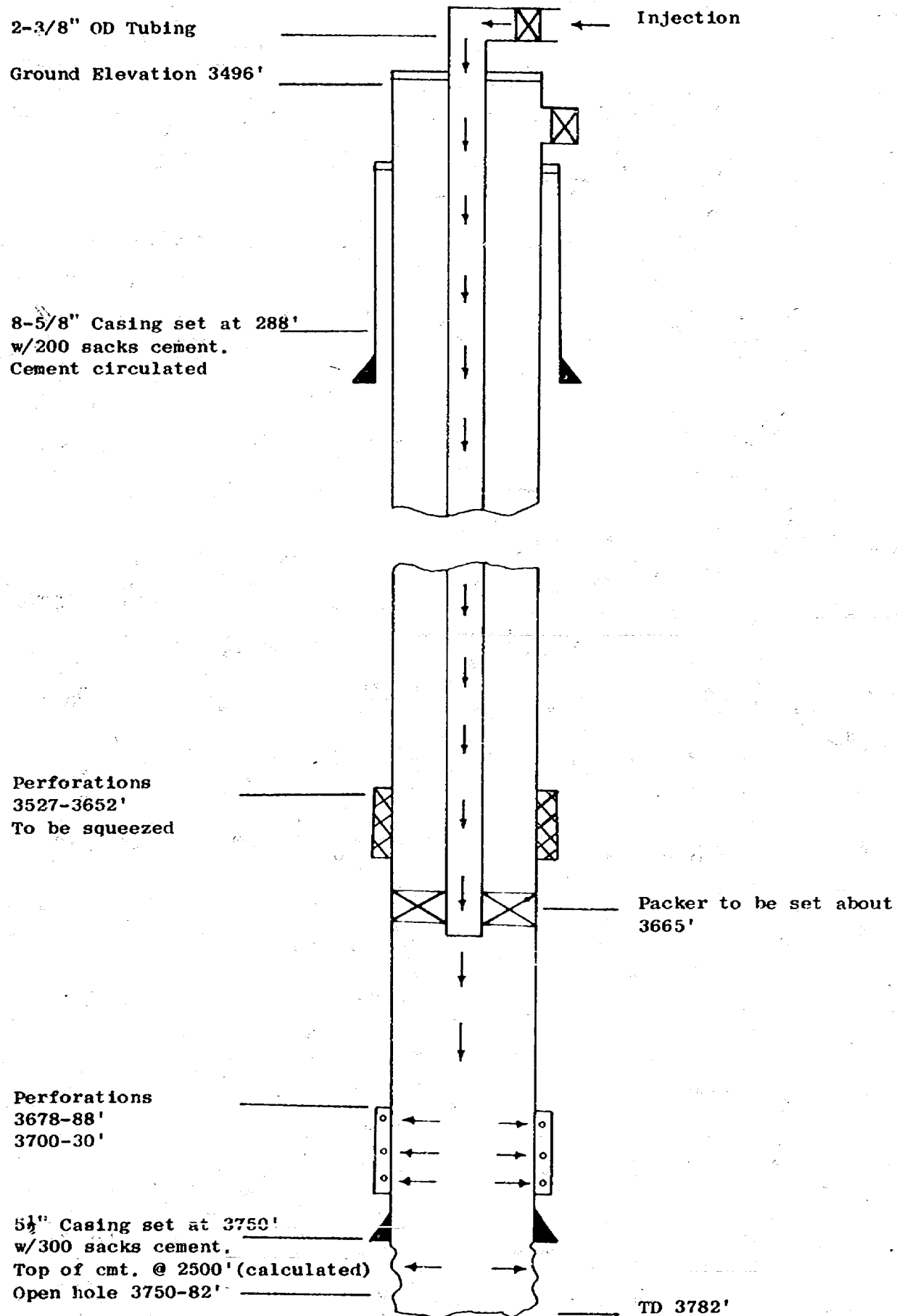
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 33 (ARCO Hale No. 2)
 1980' FSL & 1980' FWL Section 34, T-22S, R-36E
 Lea County, New Mexico



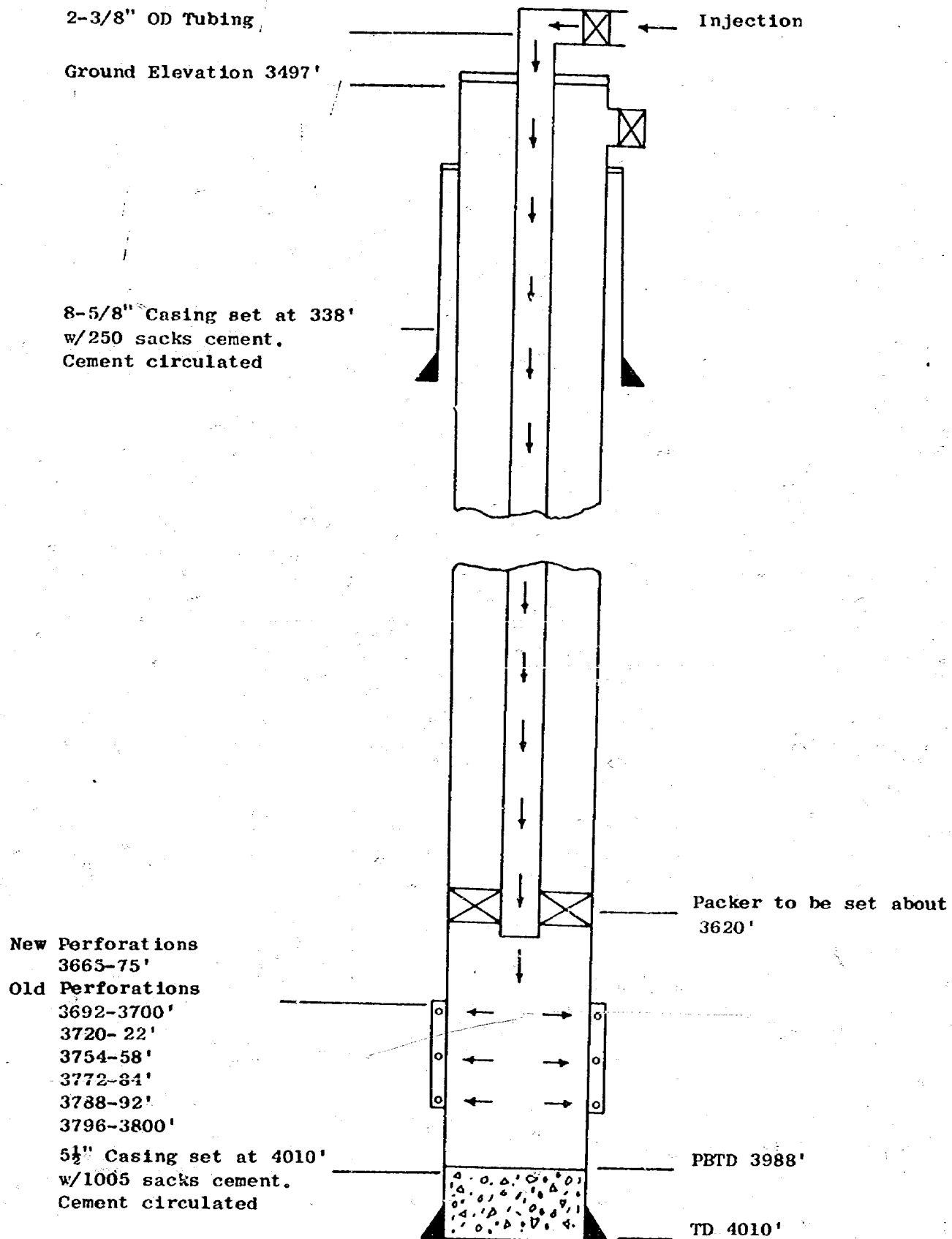
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 35 (ARCo Hale No. 5)
660' FSL & 660' FWL Section 34, T-22S, R-36E
Lea County, New Mexico



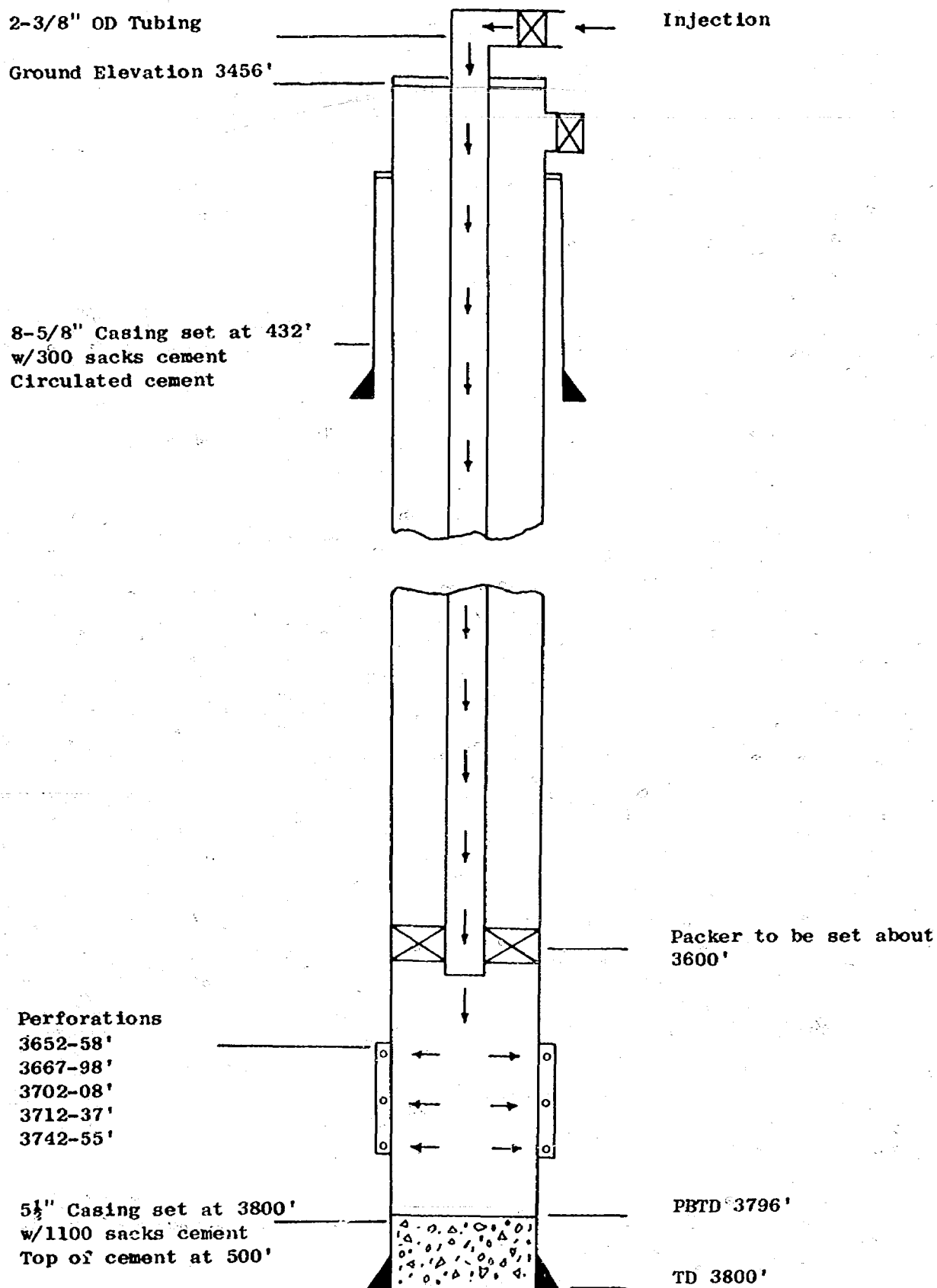
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 37 (ARCo O. L. Jones "B" No. 2)
990' FSL & 2310' FEL Section 34, T-22S, R-36E
Lea County, New Mexico



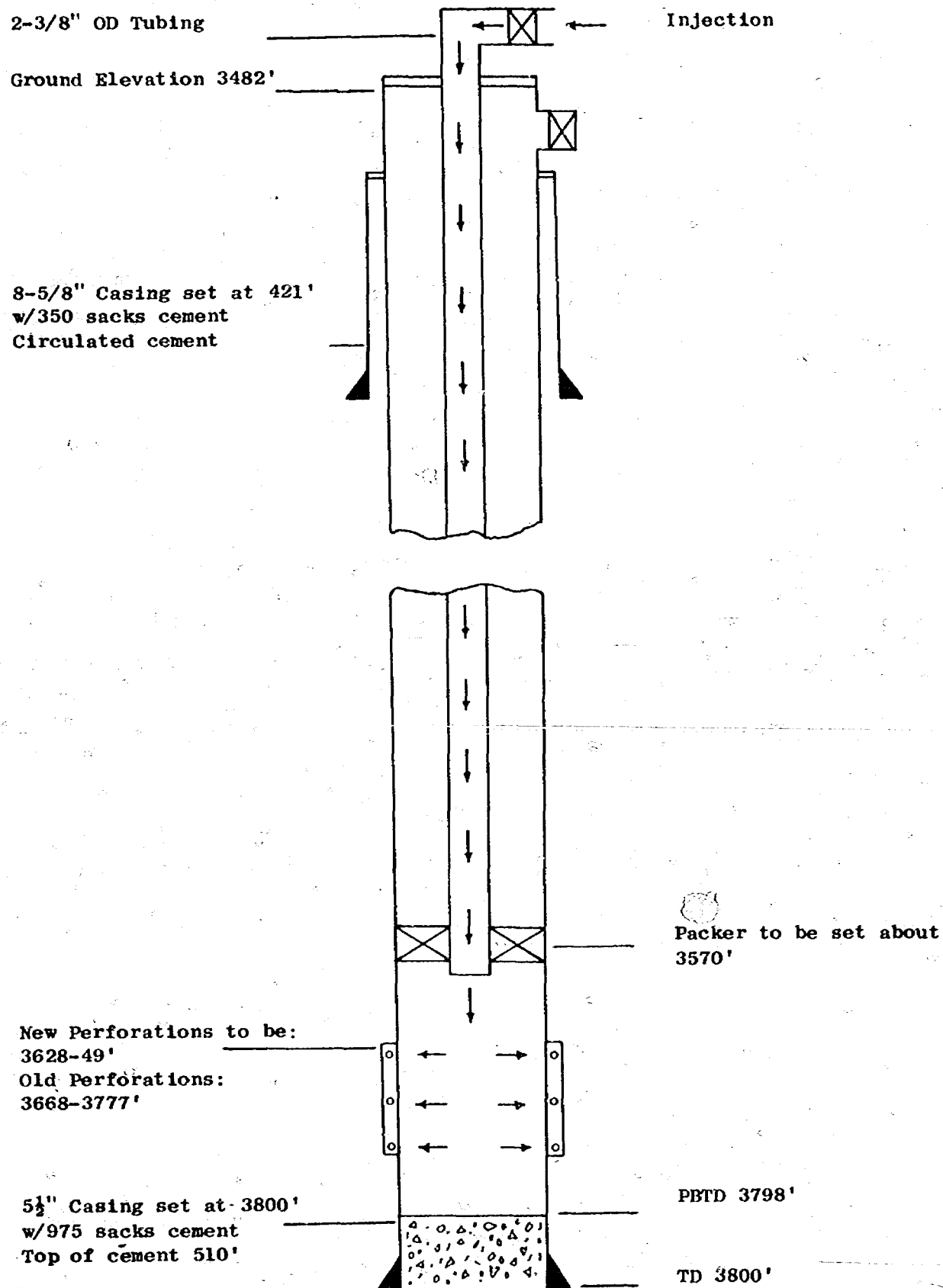
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 39 (Gackle R. Jones No. 4)
660' FSL & 660' FWL Section 35, T-22S, R-36E
Lea County, New Mexico



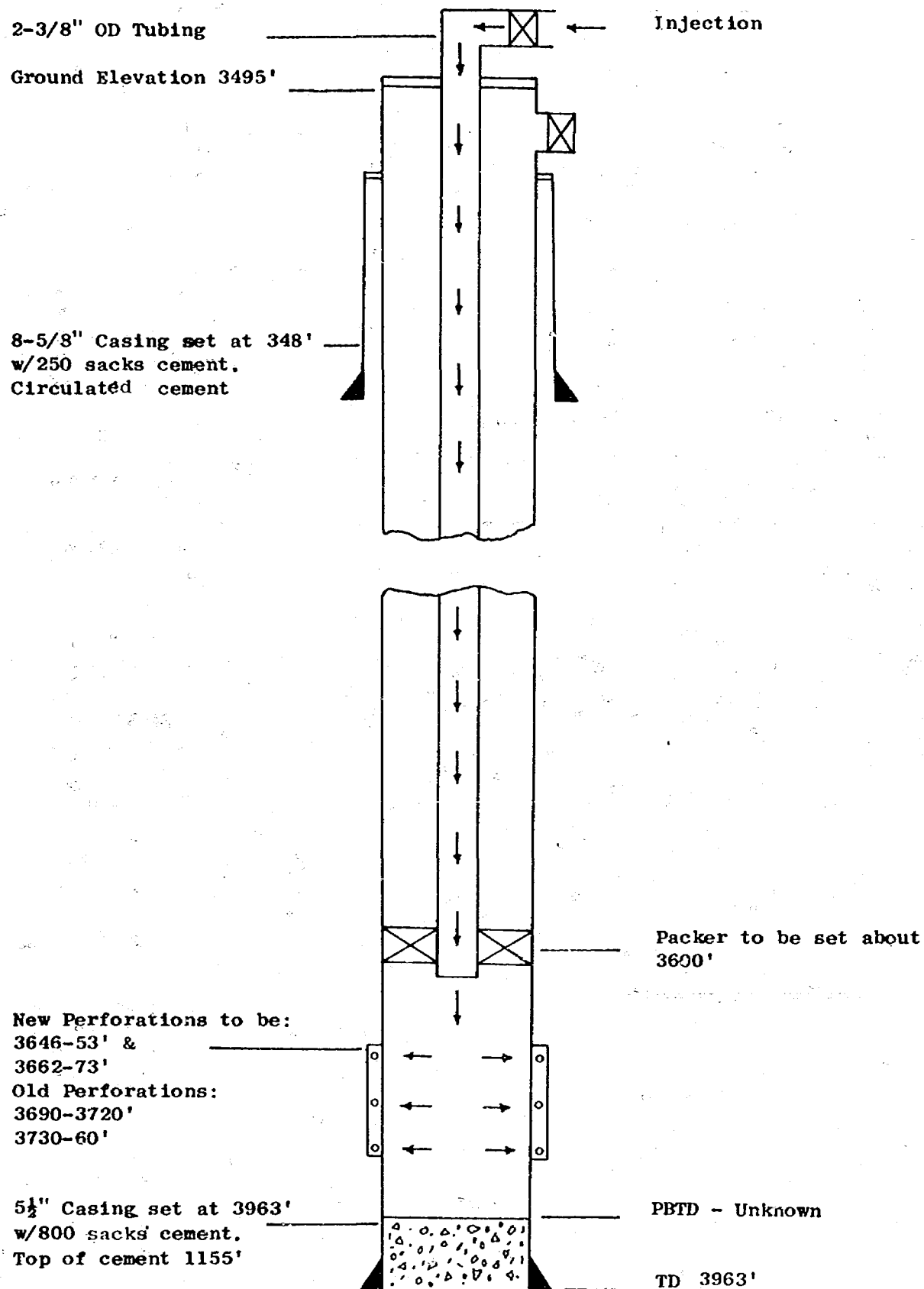
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 41 (Gulf Janda "I" State No. 4)
 660' FNL & 660' FEL Section 2, T-23S, R-36E
 Lea County, New Mexico



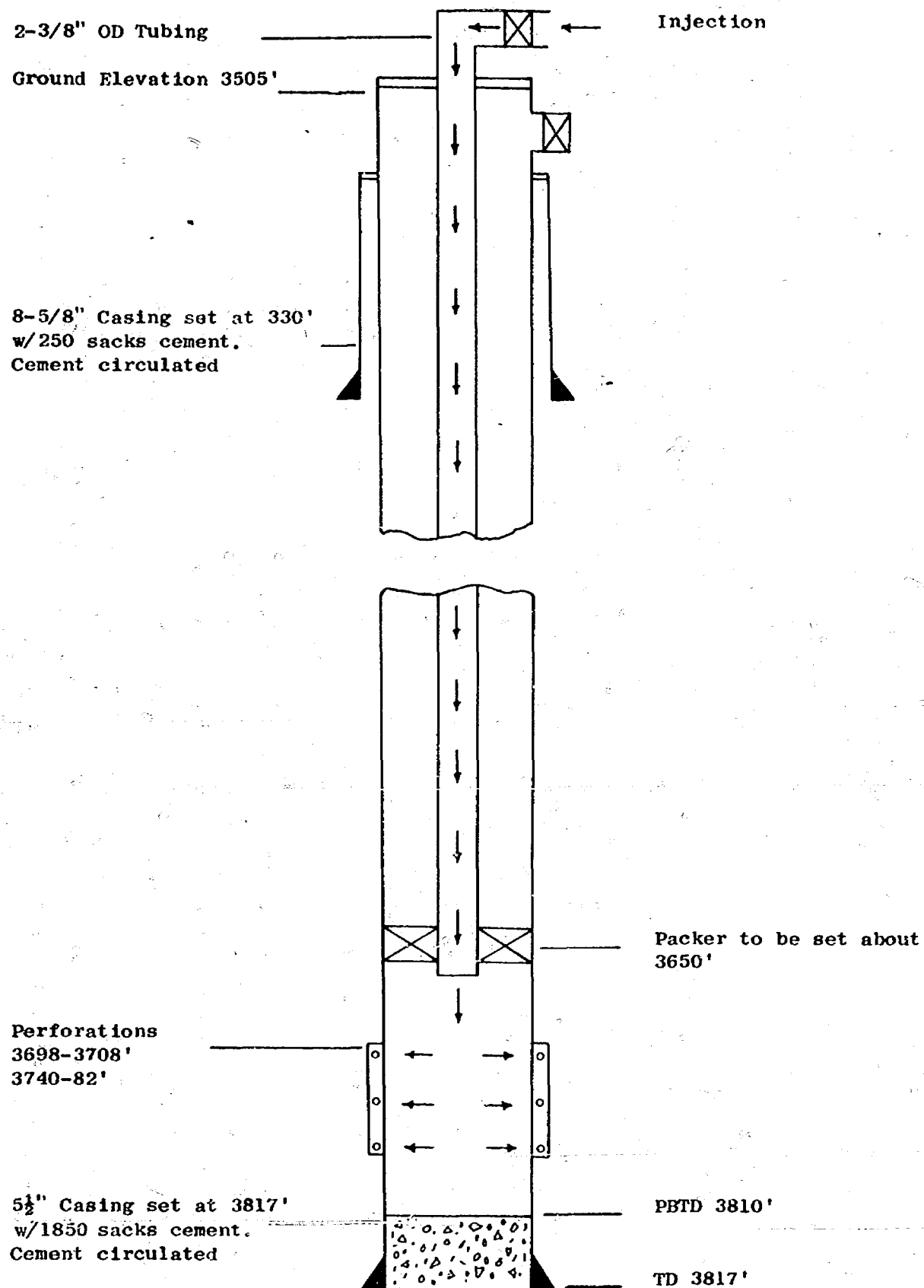
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 43 (Gulf Janda "I" State No. 5)
 660' FNL & 1980' FWL Section 2, T-23S, R-36E
 Lea County, New Mexico



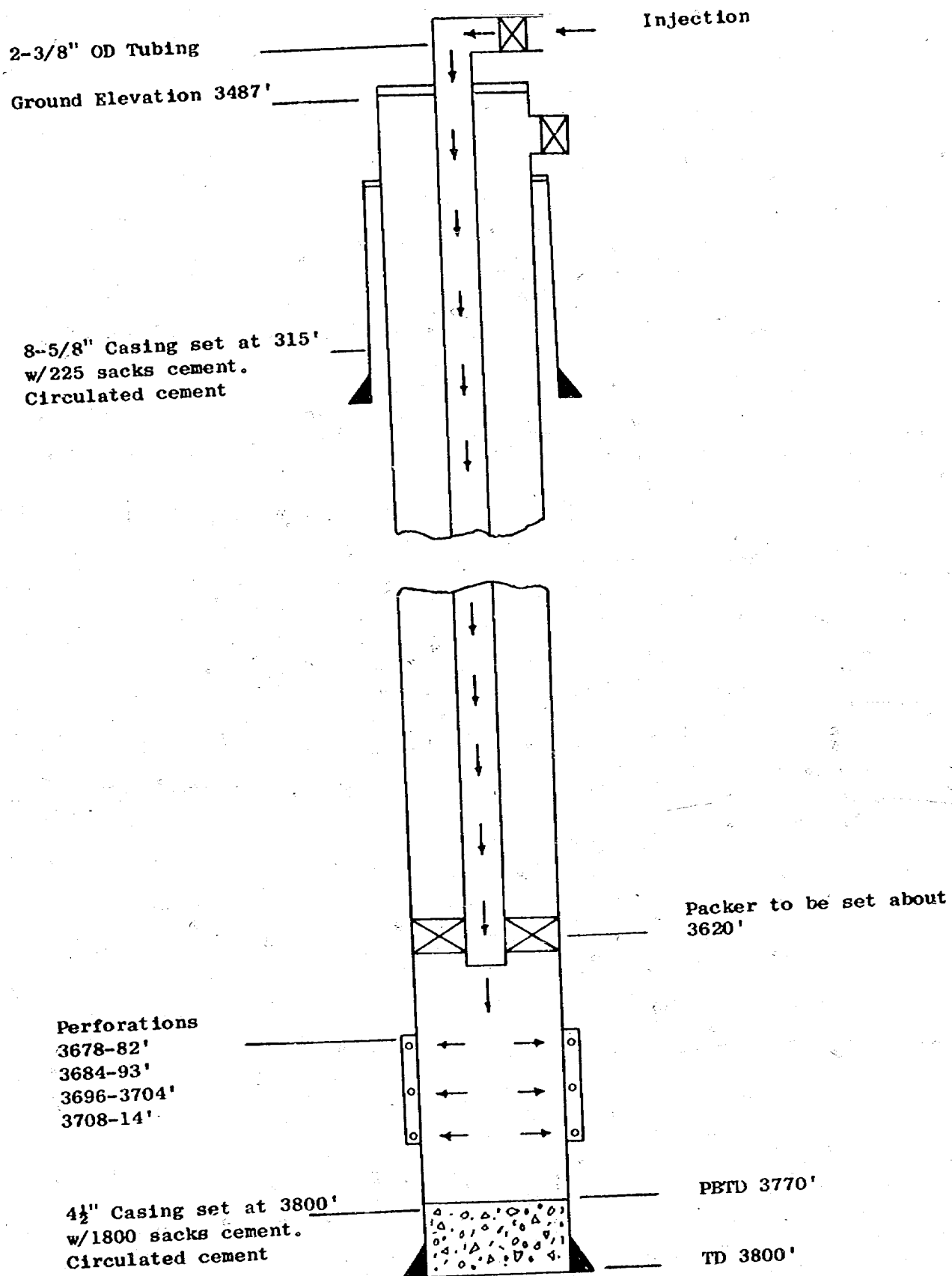
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 45 (Gackle Sinclair State "B" No. 7)
660' FNL & 660' FEL Section 3, T-23S, R-36E
Lea County, New Mexico



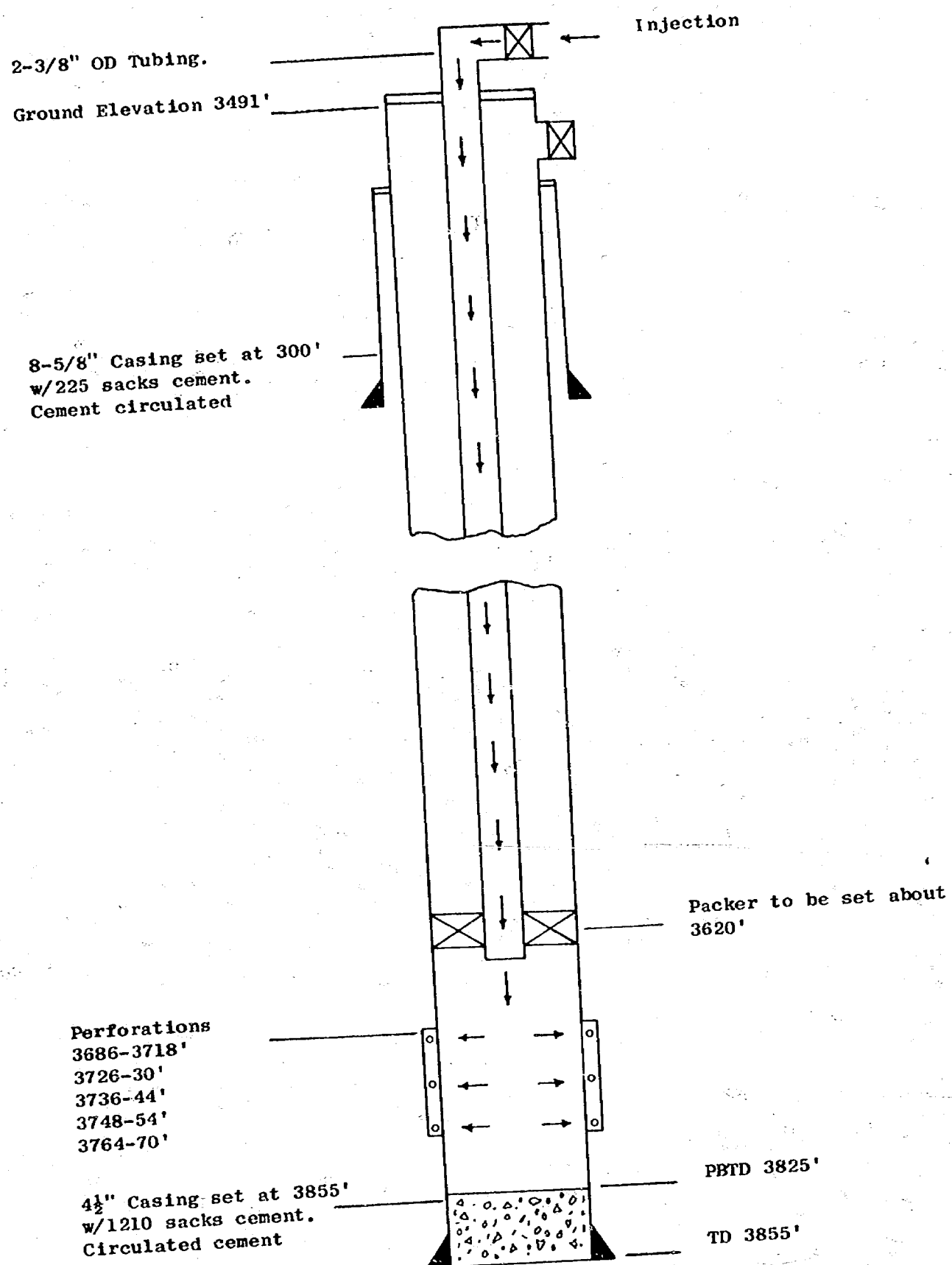
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 47 (Gackle Sinclair State "B" No. 6)
660' FNL & 2310' FWL Section 3, T-23S, R-36E
Lea County, New Mexico



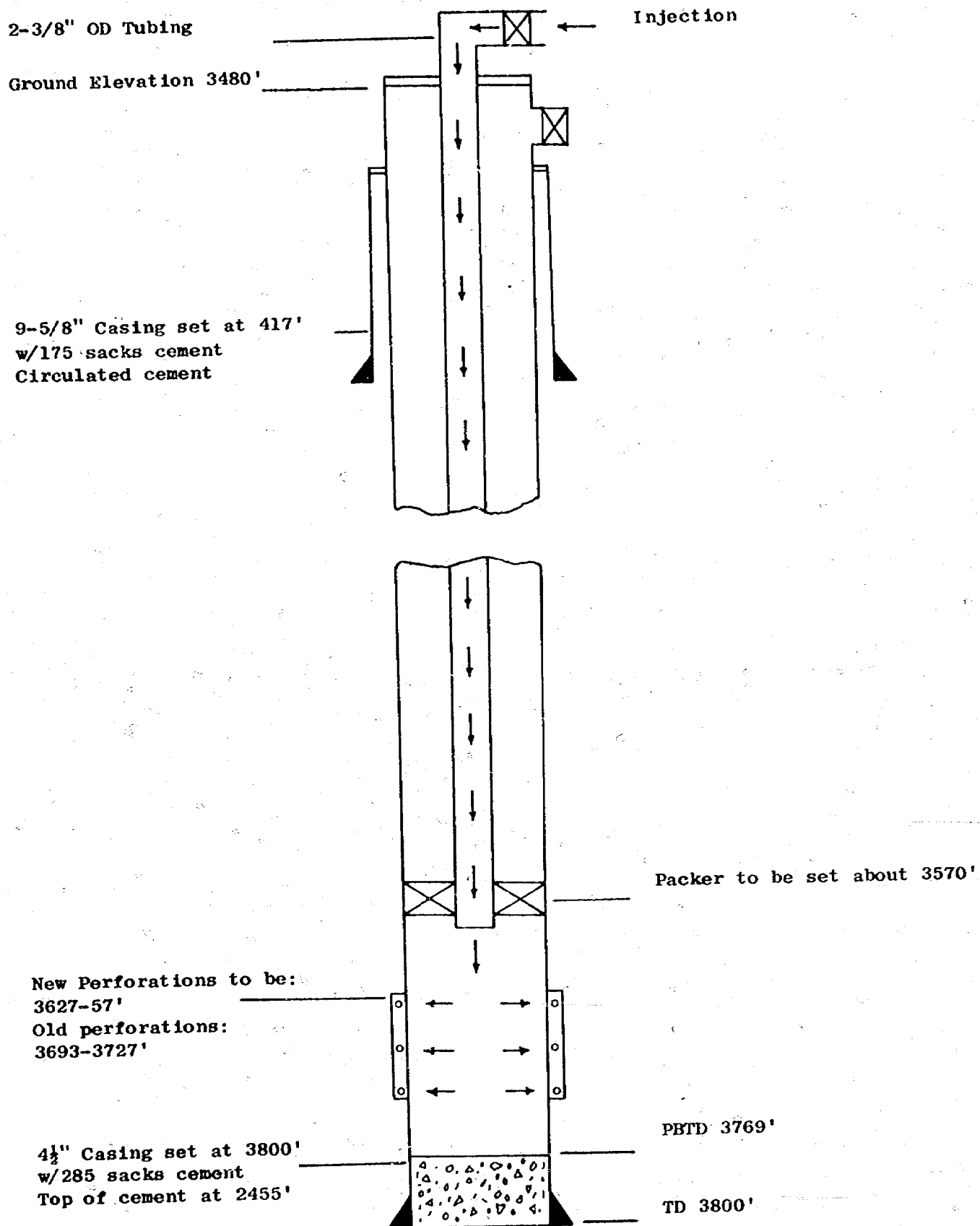
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 49 (Gackle Sinclair State "B" No. 9)
1980' FNL & 660' FWL Section 3, T-23S, R-36E
Lea County, New Mexico



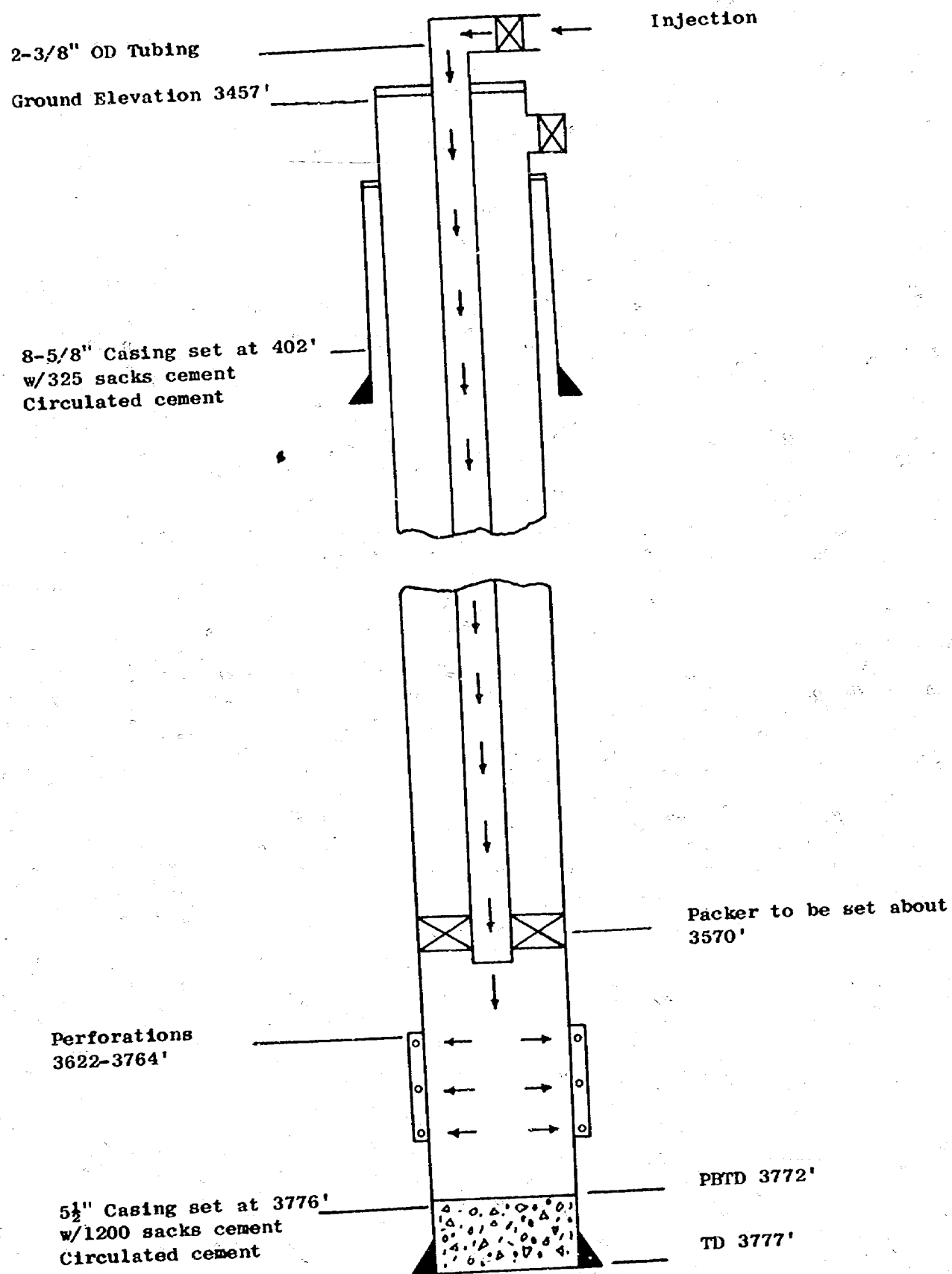
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 51 (Gackle Sinclair State "B" No. 11)
1980' FNL & 1980' FEL Section 3, T-23S, R-36E
Lea County, New Mexico

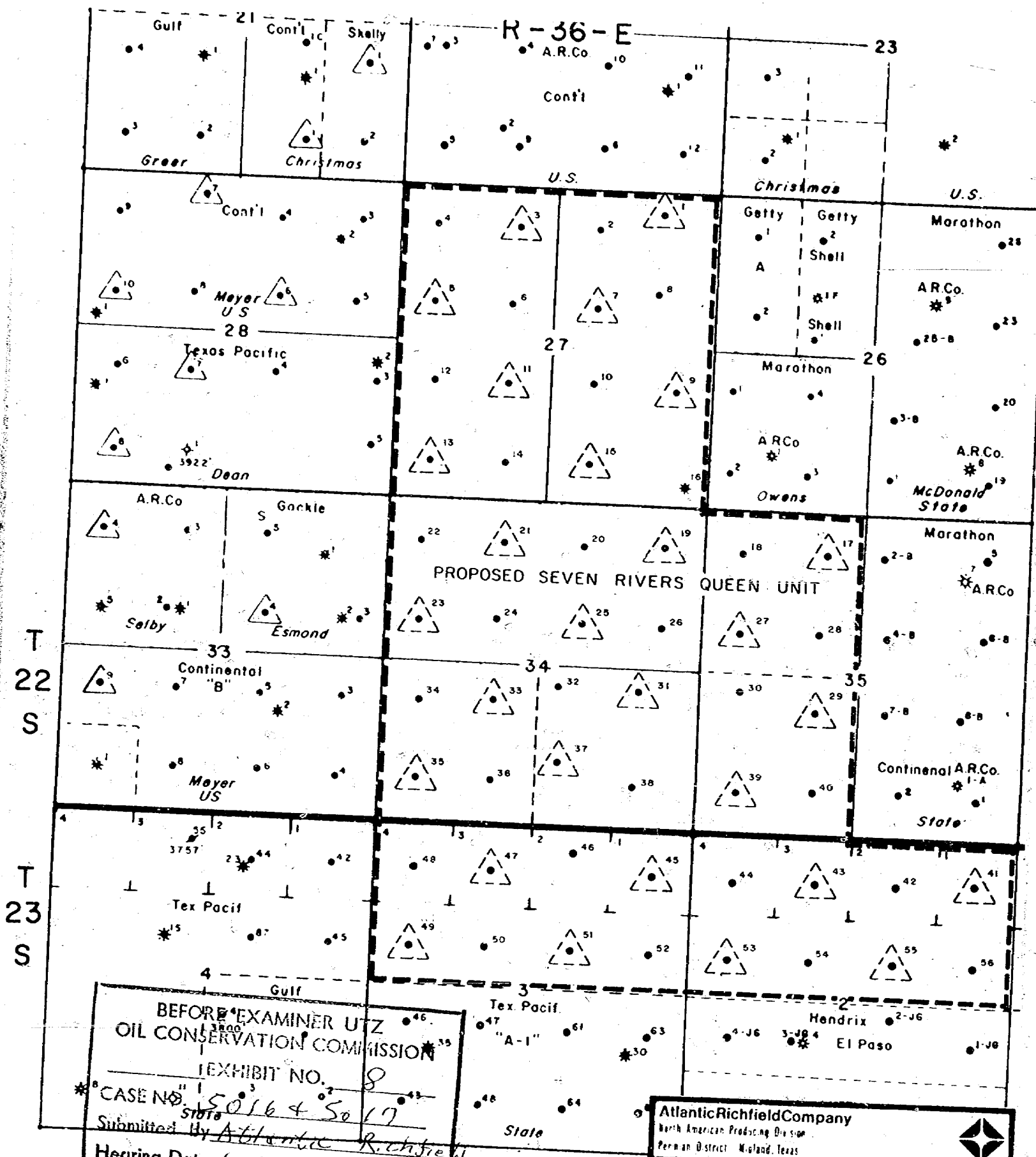


ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Unit Well No. 53 (Gulf Janda "I" State No. 10)
 1980' FNL & 660' FWL Section 2, T-23S, R-36E
 Lea County, New Mexico



ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 55 (Janda "I" State No. 8)
 1980' FNL & 1980' FEL Section 2, T-23S, R-36E
 Lea County, New Mexico





PROPOSED INJECTION WELLS



PROPOSED UNIT BOUNDARY

Exhibit No. 8

Atlantic Richfield Company

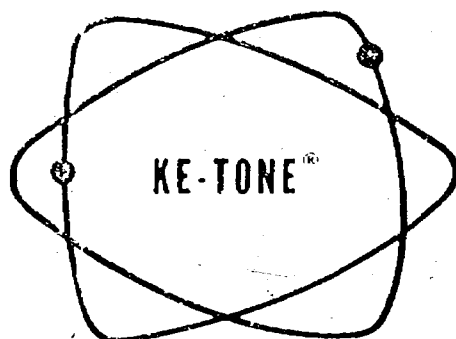
North American Producing Division
Permian District Midland, Texas



PROPOSED SEVEN RIVERS QUEEN UNIT
LEA COUNTY, NEW MEXICO

SCALE: 1" = 2000'

TELEPHONE: HOBBS 393-7751
AREA CODE - 505



UNITED CHEMICAL CORPORATION

OF NEW MEXICO

601 NORTH LEECH

P. O. BOX 1499

HOBBS, NEW MEXICO 88240

SFS
REM
JS-FIC

Company Continental Oil Company

Field _____

Lease Dancinger BWSW

Sampling Date 1-4-73

Type of Sample _____

WATER ANALYSIS

IONIC FORM	me/l	mg/l
Calcium (Ca++)	71.06	1,424
Magnesium (Mg++)	42.35	515
Sodium (Na+) (Calculated)	695.94	16,000
Iron (Total)		
Carbonate (HCO ₃ -)	10.40	634
Carbonate (CO ₃ -)	NOT	FOUND
Hydroxide (OH-)	NOT	FOUND
Sulphate (SO ₄ -)	77.03	3,700
Chloride (Cl-)	721.92	25,600
6.8 pH c 68°F		
Dissolved Solids on Evap. at 103° - 105° C		
Hardness as CaCO ₃	113.41	5,671
Carbonate Hardness as CaCO ₃ (temporary)	10.40	520
Non-Carbonate Hardness as CaCO ₃ (permanent)	103.01	5,151
Alkalinity as CaCO ₃	10.40	520
Specific Gravity c 68° F 1.032		

MOORE BUSINESS FORMS INC. L.

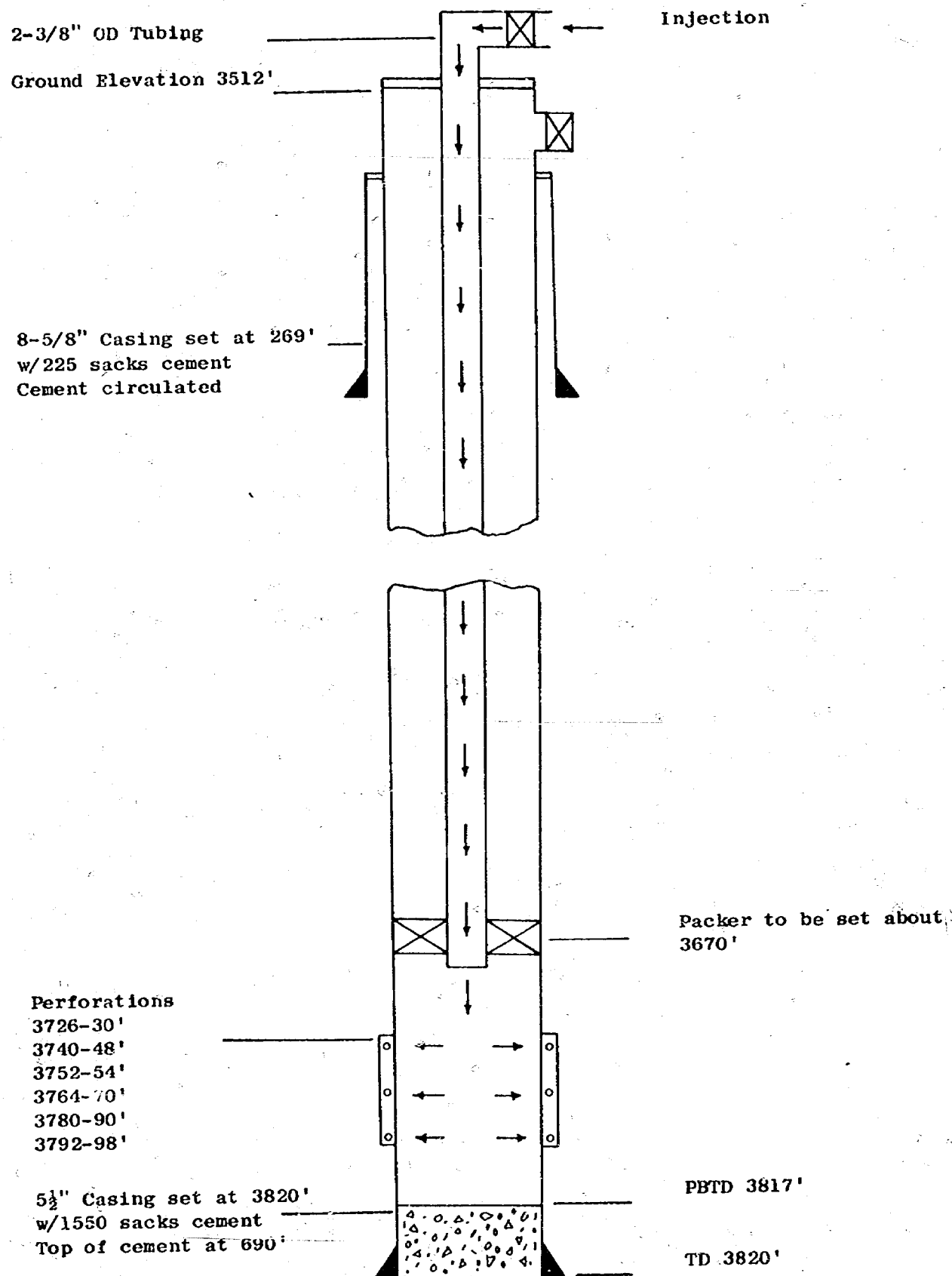
• mg/l = milligrams per Liter

• me/l = milliequivalents per Liter

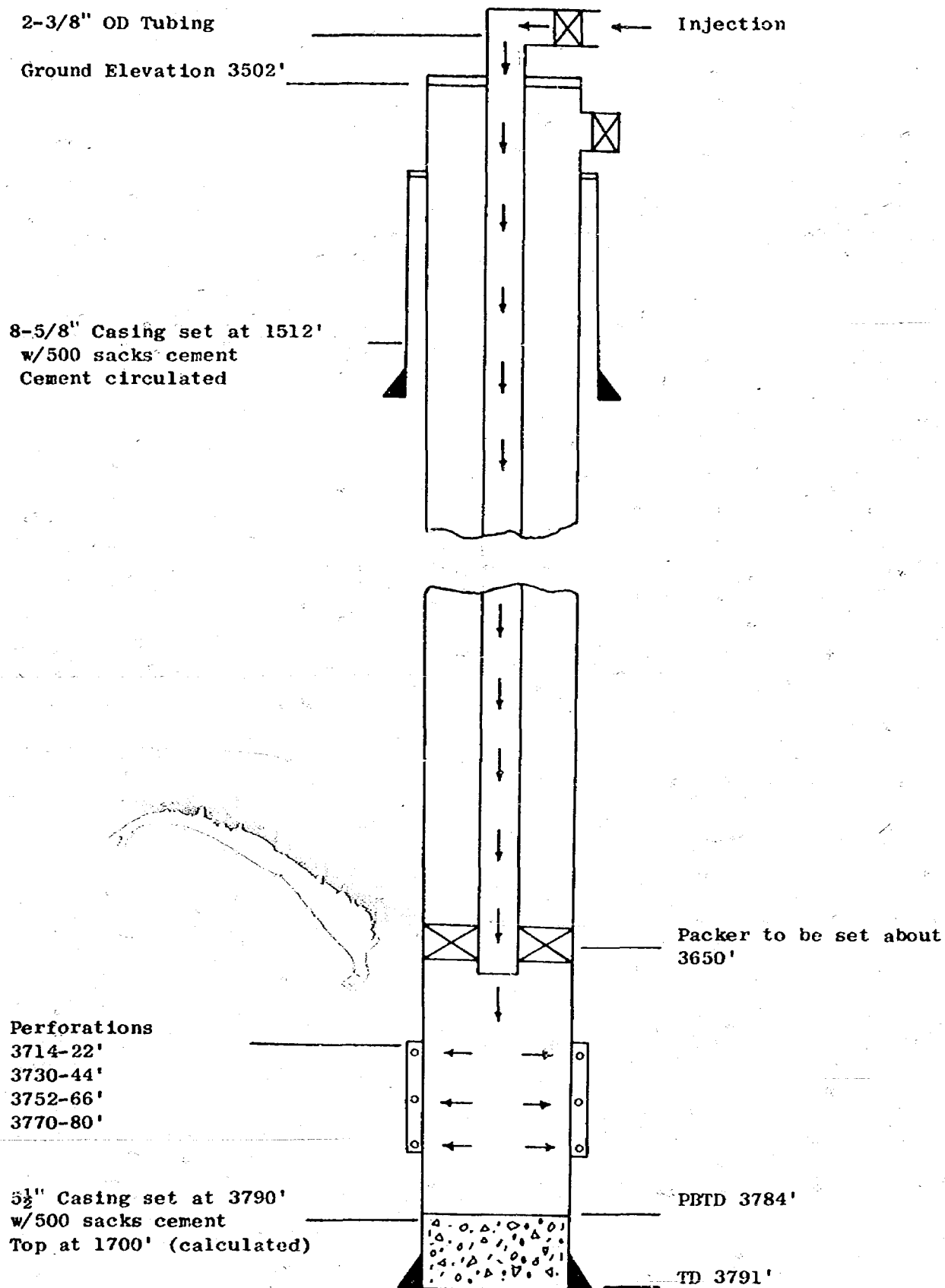
CaCO₃ S. I. only slightly positive at 86° (0.03)
CaSO₄ S. I. Negative

Makes Water Work

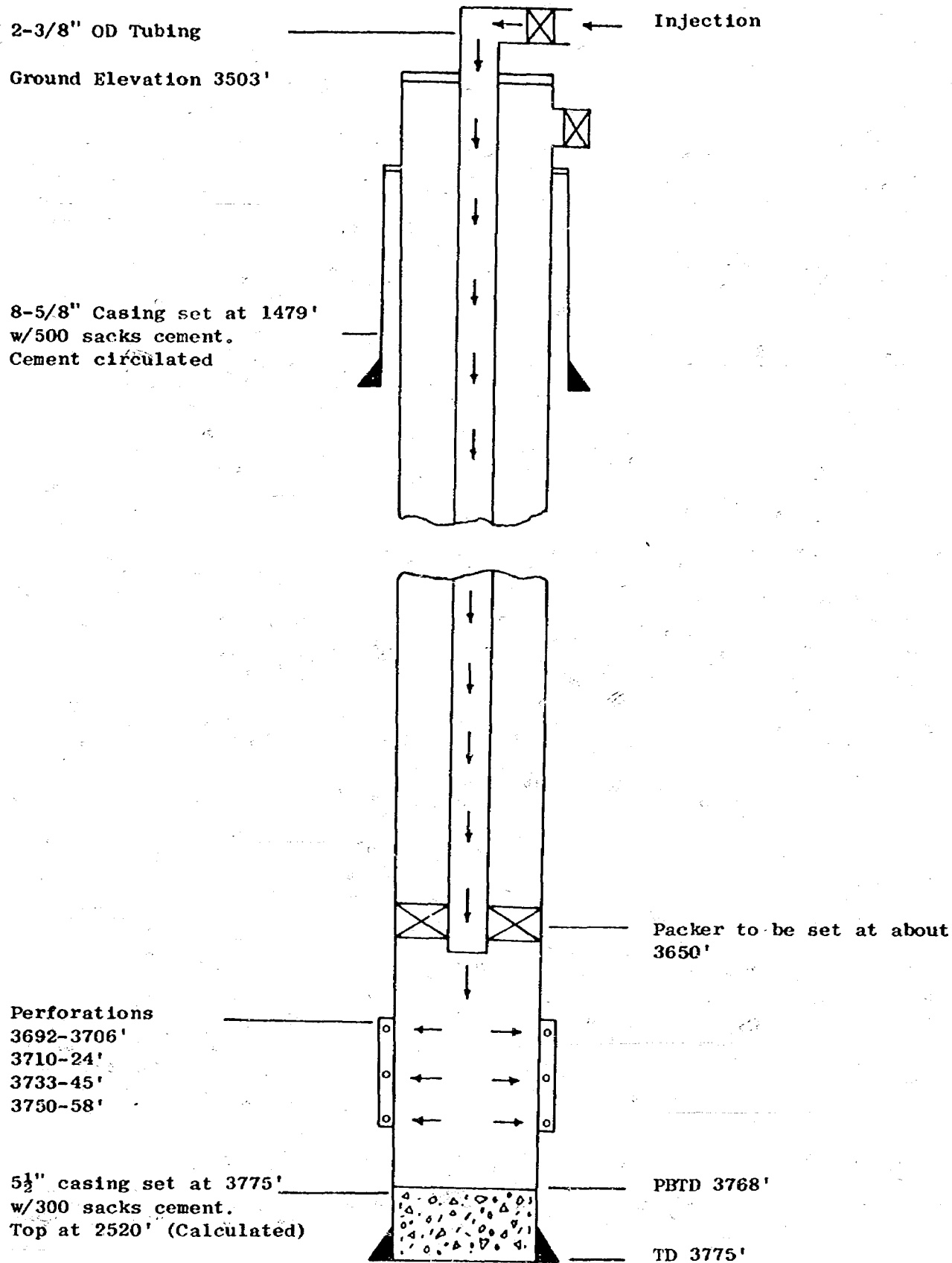
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 1 (Gulf A. L. Christmas "A" No. 6)
330' FNL & 990' FEL Section 27, T-22S, R-36E
Lea County, New Mexico



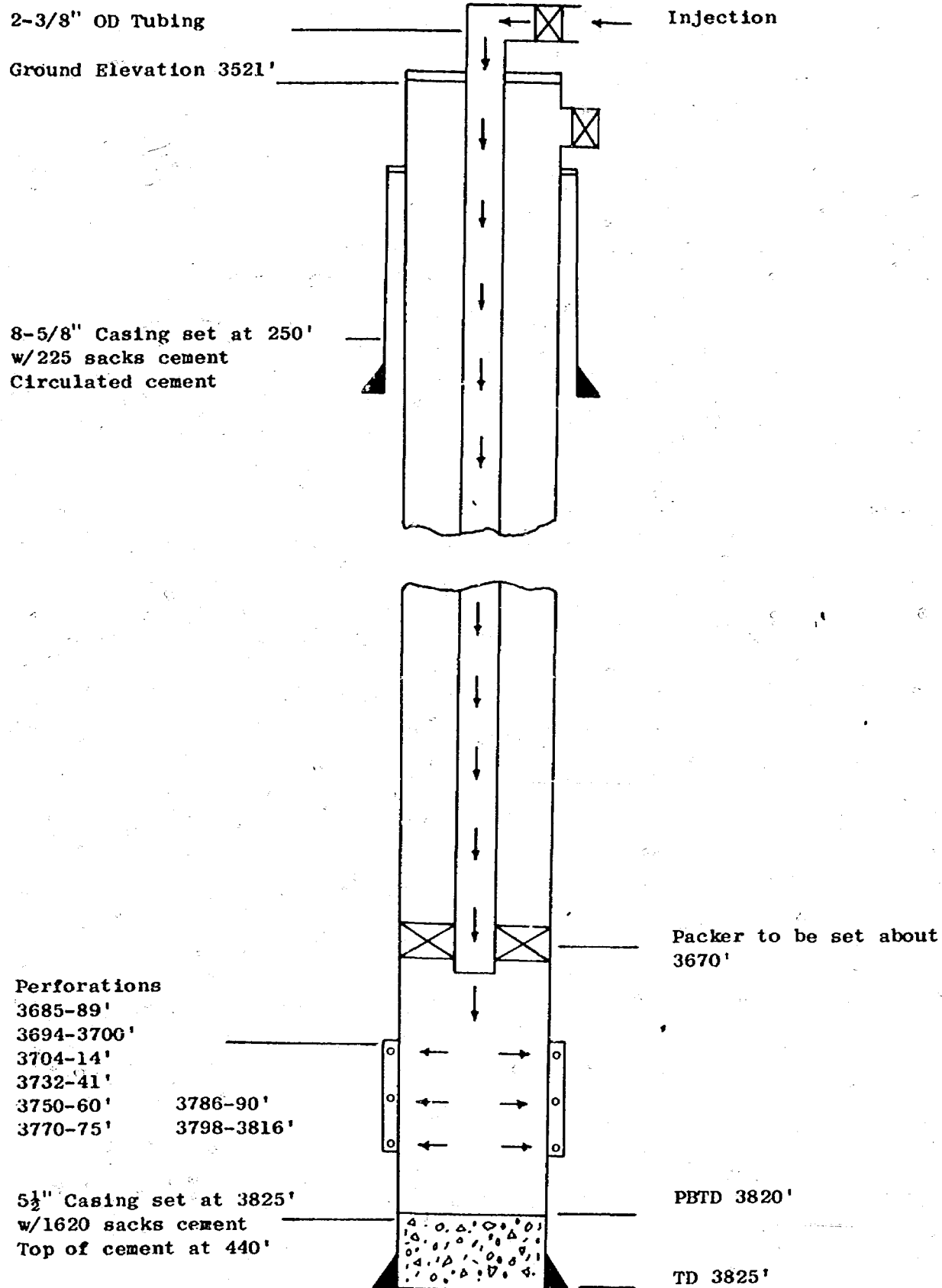
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 3 (ARCo Shipley "A" No. 5)
660' FNL & 2080' FWL Section 27, T-22S, R-36E
Lea County, New Mexico



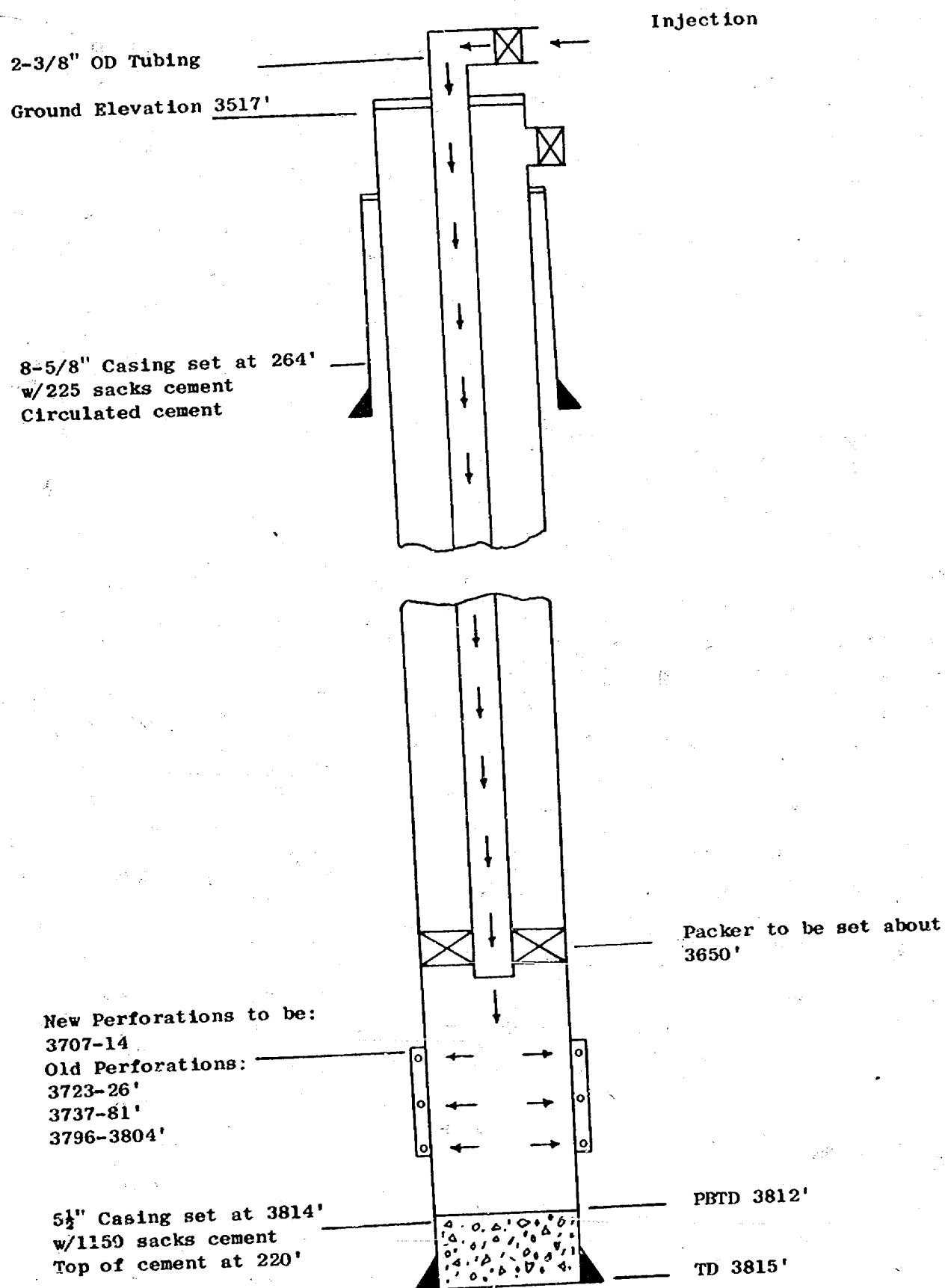
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 5 (ARCO Shipley "A" No. 3)
1980' FNL & 660' FWL Section 27, T-22S, R-36E
Lea County, New Mexico



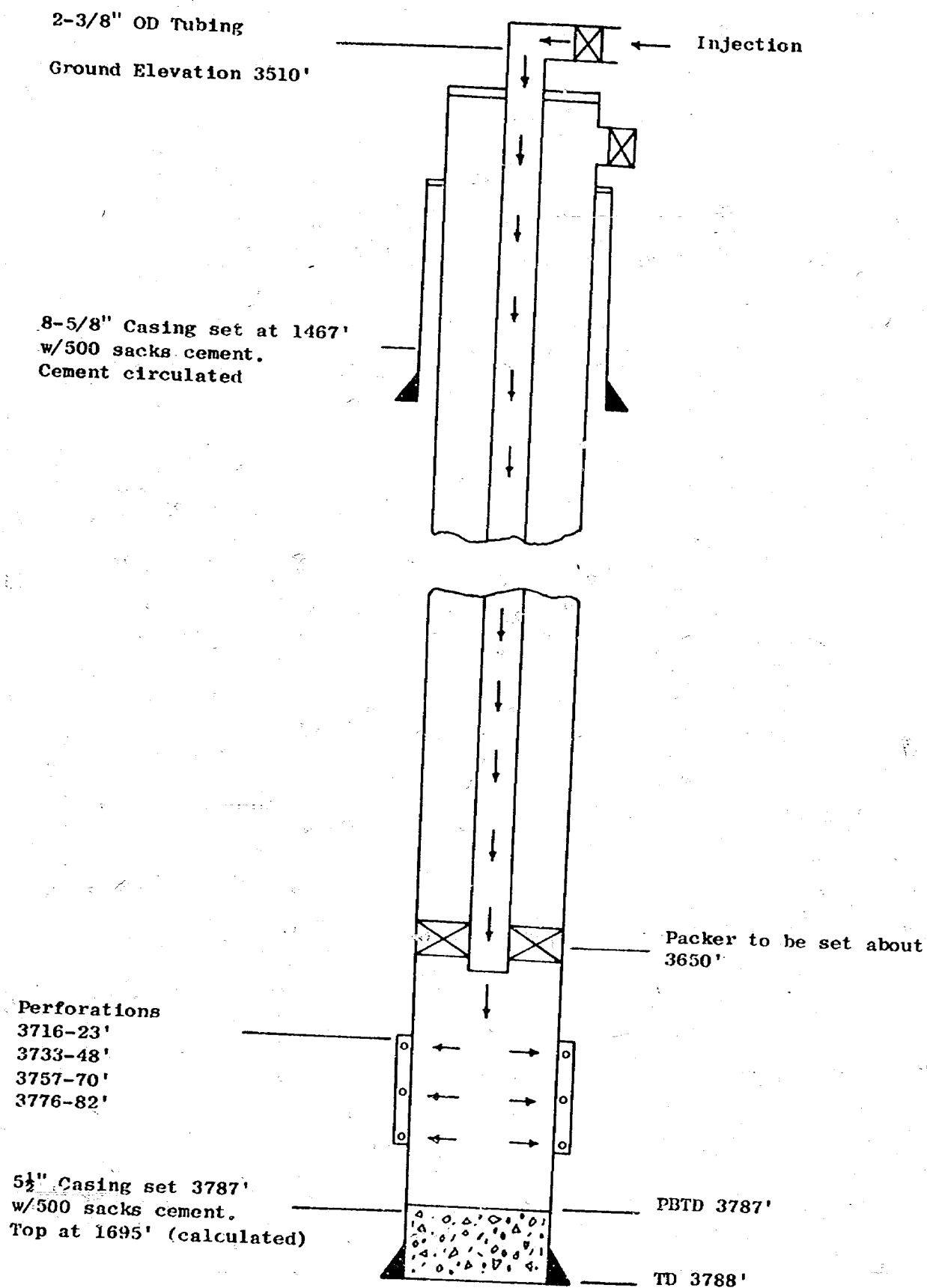
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 7 (Gulf A. I. Christmas "A" No. 4)
1980' FNL & 1980' FEL Section 27, T-22S, R-36E
Lea County, New Mexico



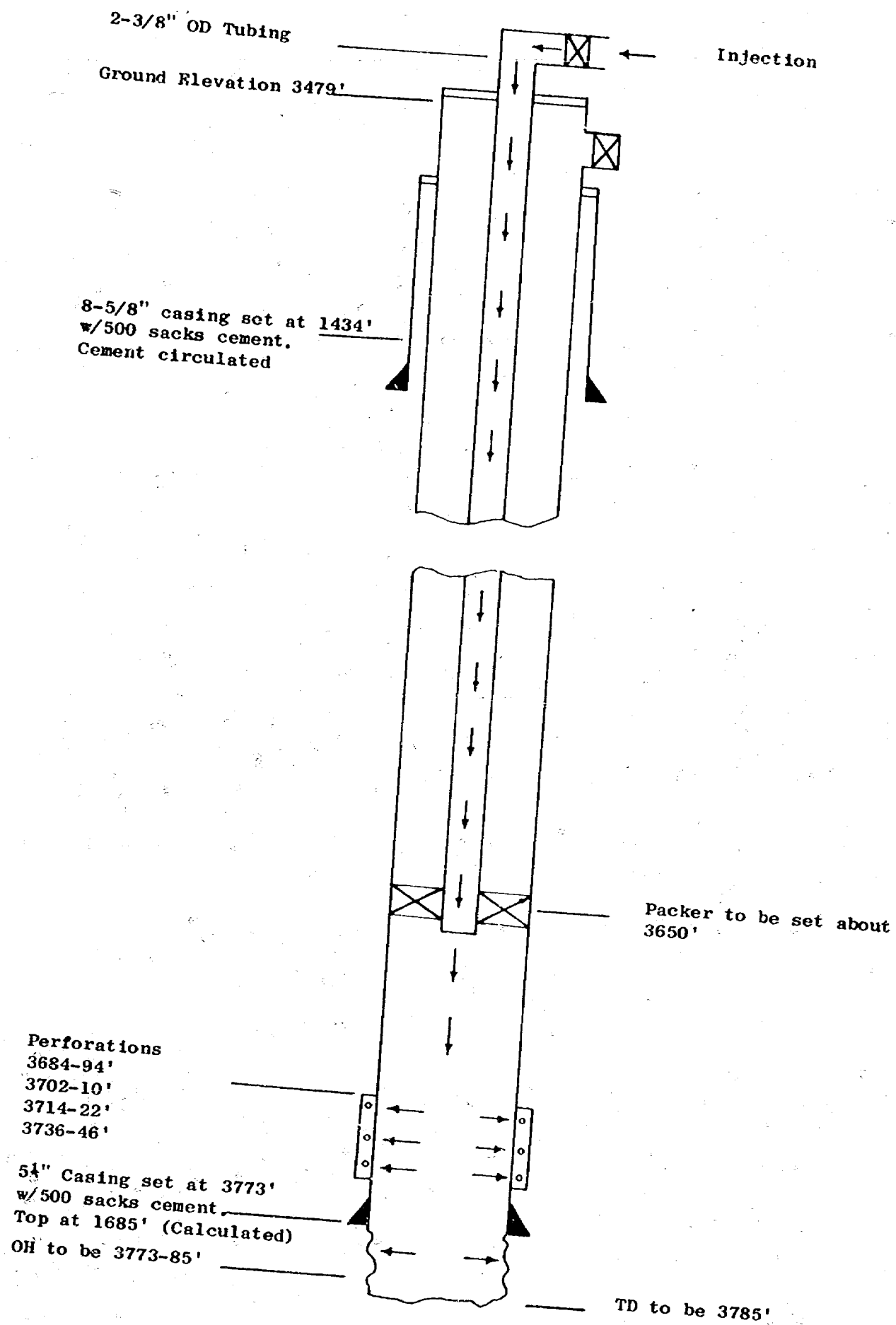
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 9 (A. L. Christmas "A" No. 8)
1980' FSL & 660' FEL Section 27, T-22S, R-36E
Lea County, New Mexico



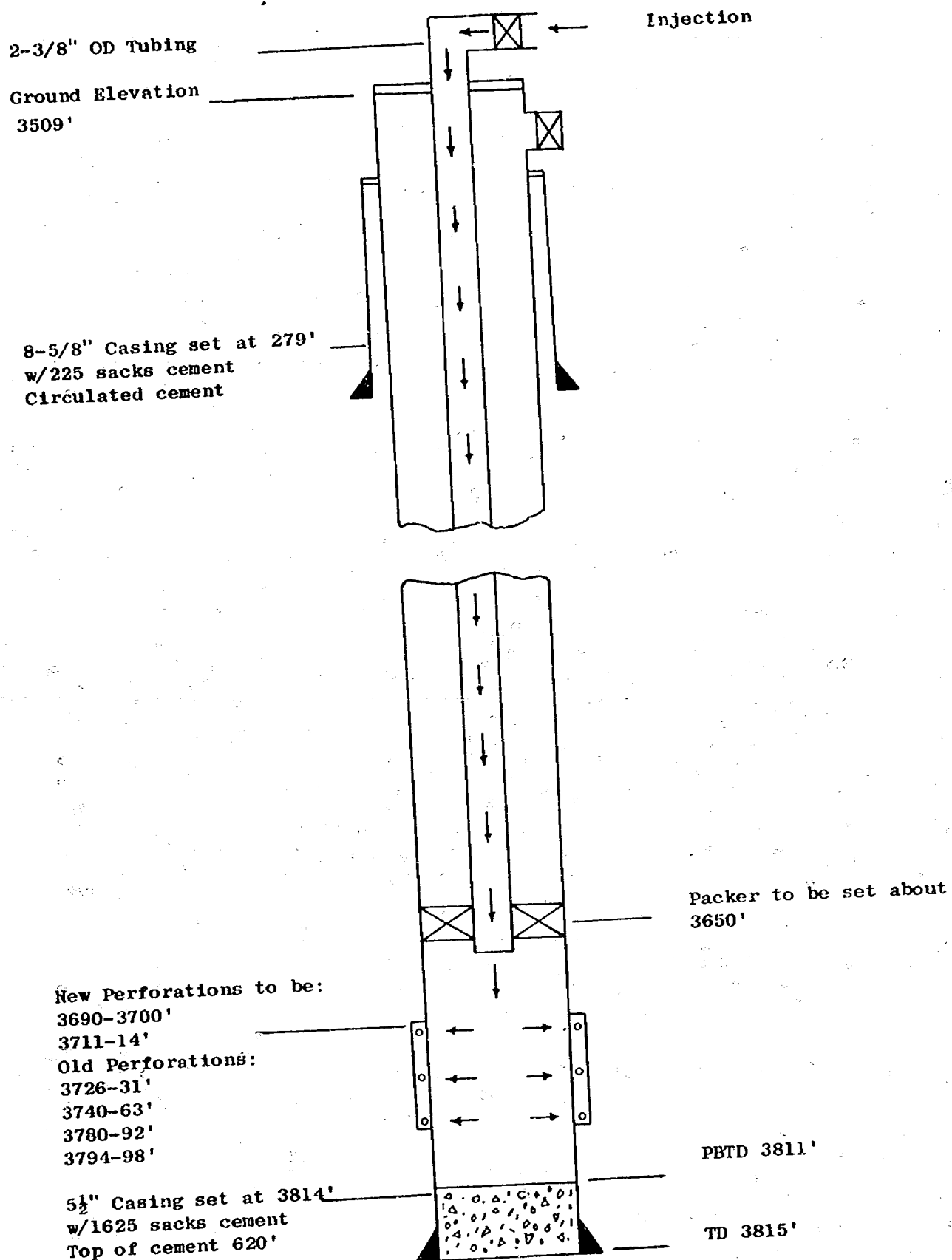
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 11 (ARCo Mattie Shipley No. 3)
1980' FSL & 1980' FWL Section 27, T-22S, R-36E
Lea County, New Mexico



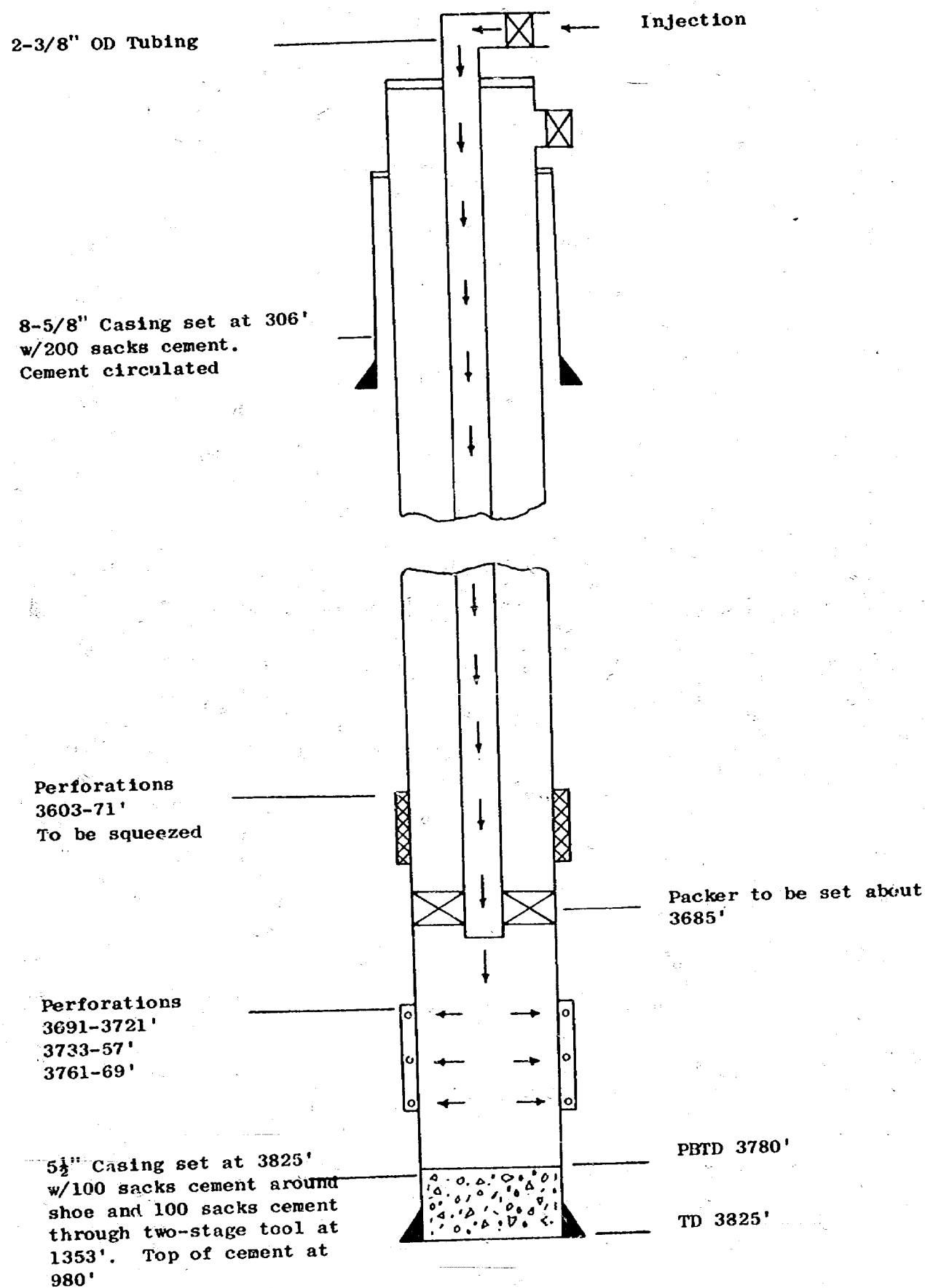
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 13 (ARCO Mattie Shipley No. 4)
660' FSL & 660' FWL Section 27, T-22S, R-36E
Lea County, New Mexico



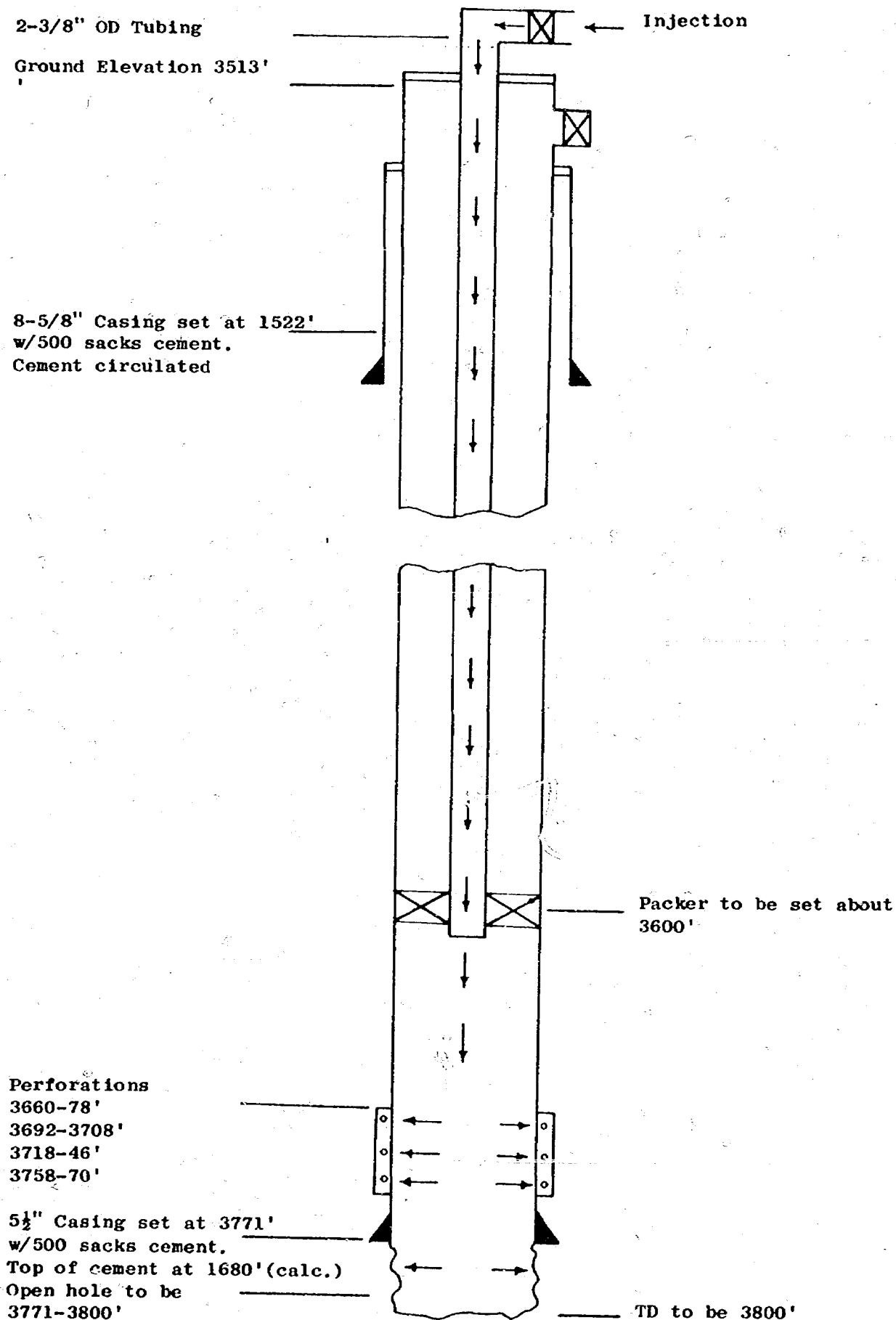
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 15 (Gulf A. L. Christmas "A" No. 7)
 660' FSL & 1980' FEL Section 27, T-22S, R-36E
 Lea County, New Mexico



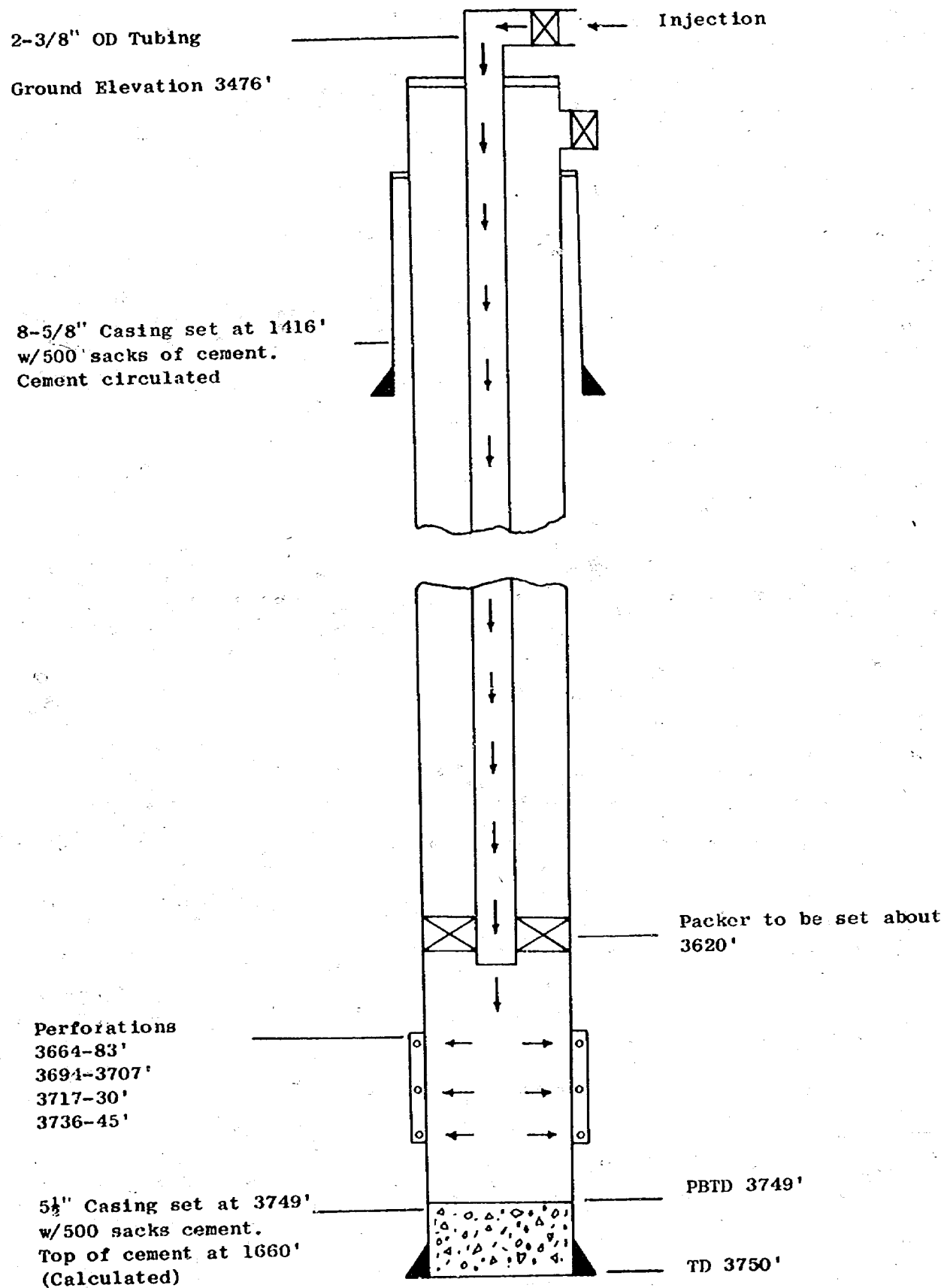
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 17 (ARCo R. M. Jones No. 3)
 660' FNL & 1980' FWL Section 35, T-22S, R-36E
 Lea County, New Mexico



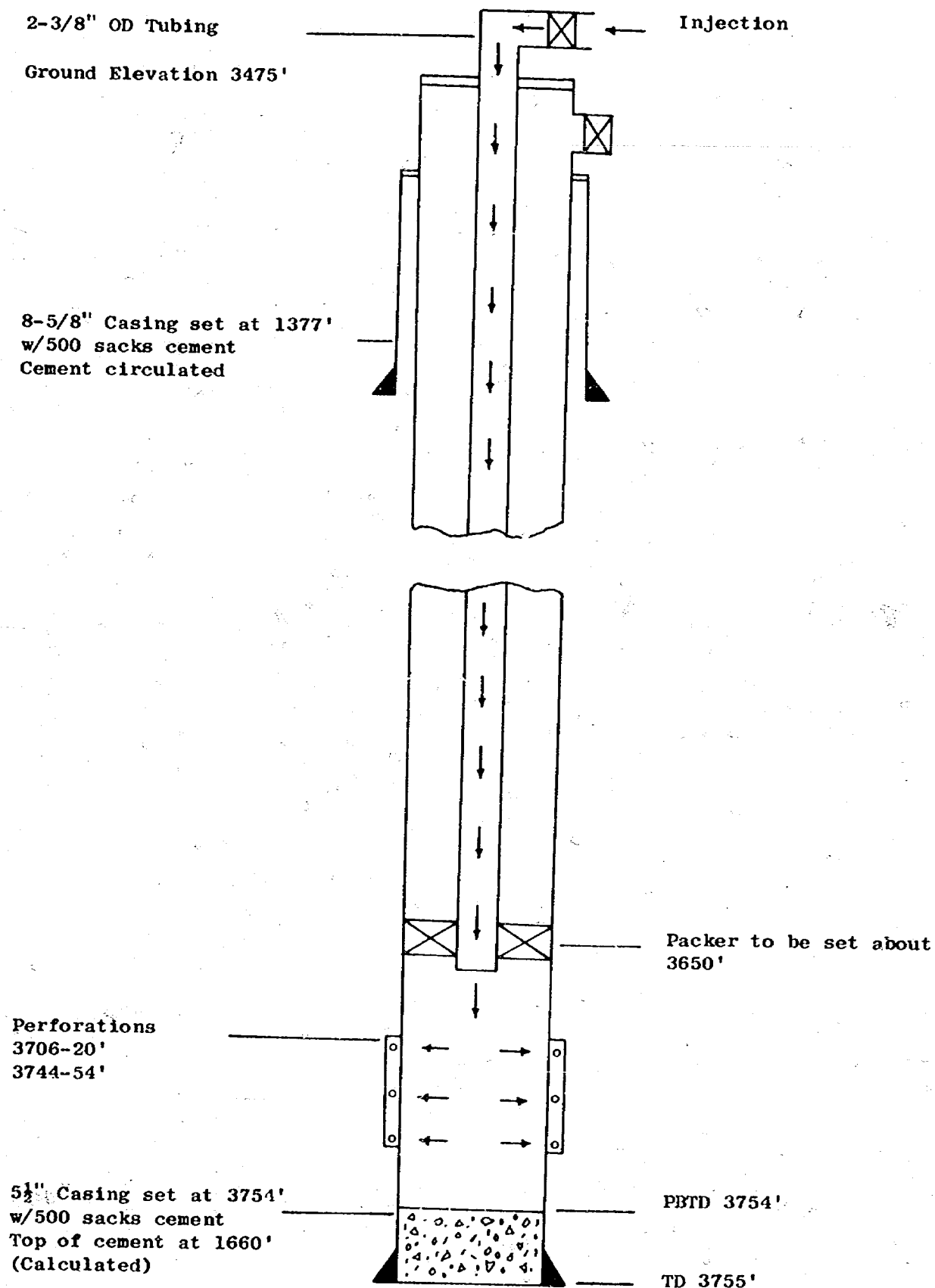
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 19 (ARCo C. Jones No. 6)
 660' FNL & 660' FEL Section 34, T-22S, R-36E
 Lea County, New Mexico



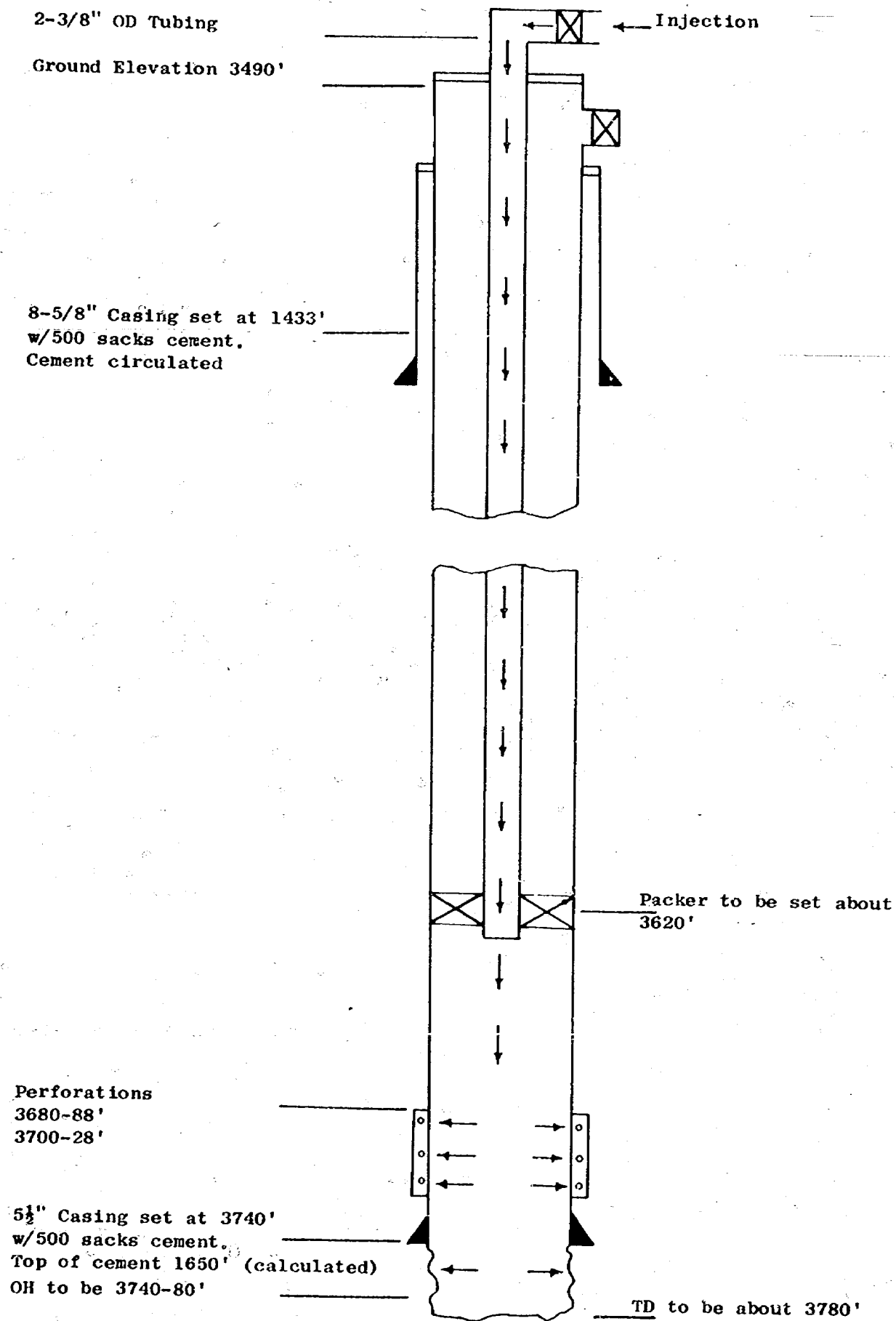
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 21 (ARCO C. Jones No. 3)
 660' FNL & 1980' FWL Section 34, T-22S, R-36E
 Lea County, New Mexico



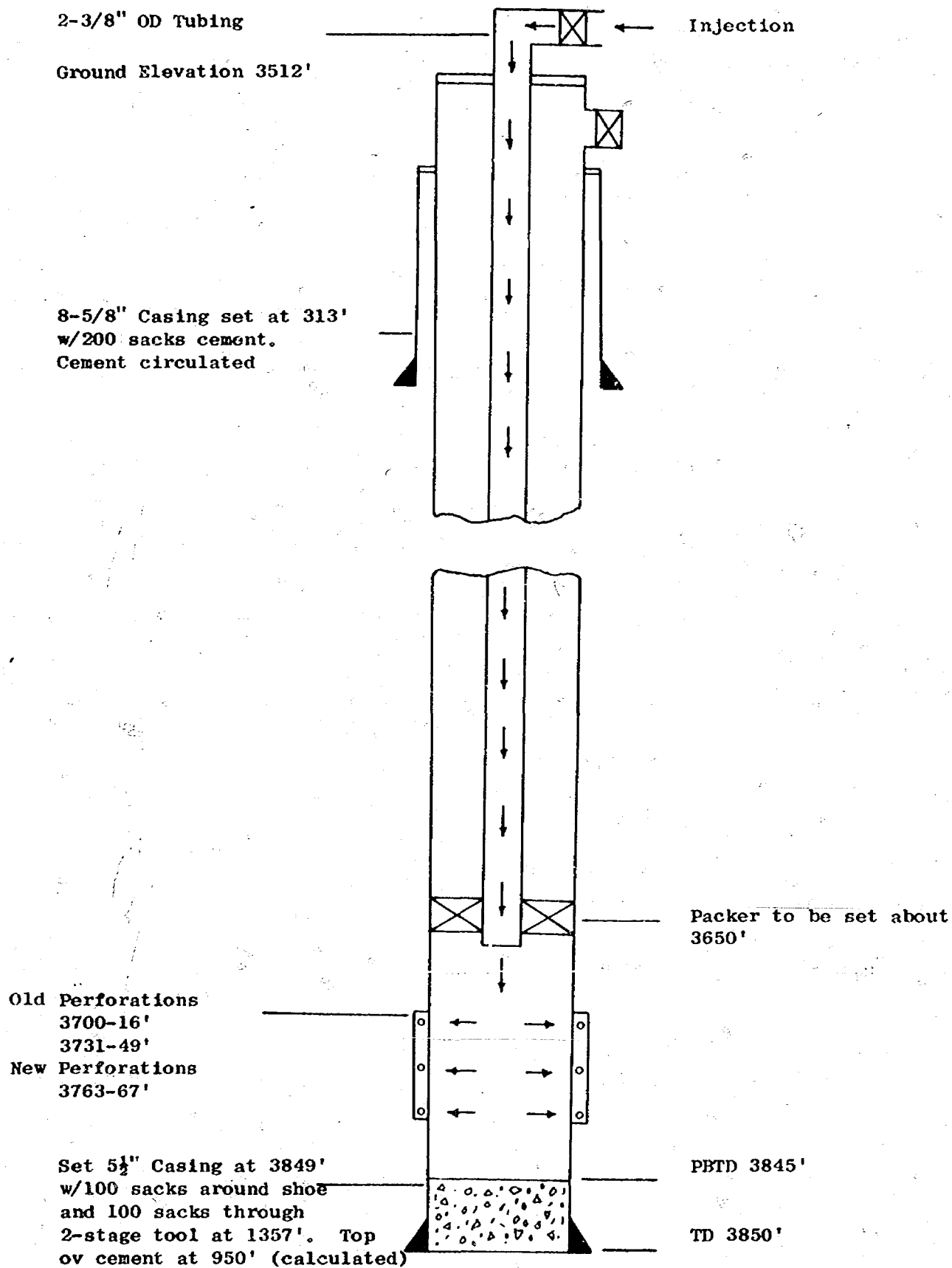
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 23 (ARCo C. Jones No. 9)
 1980' FNL & 660' FWL Section 34, T-22S, R-36E
 Lea County, New Mexico



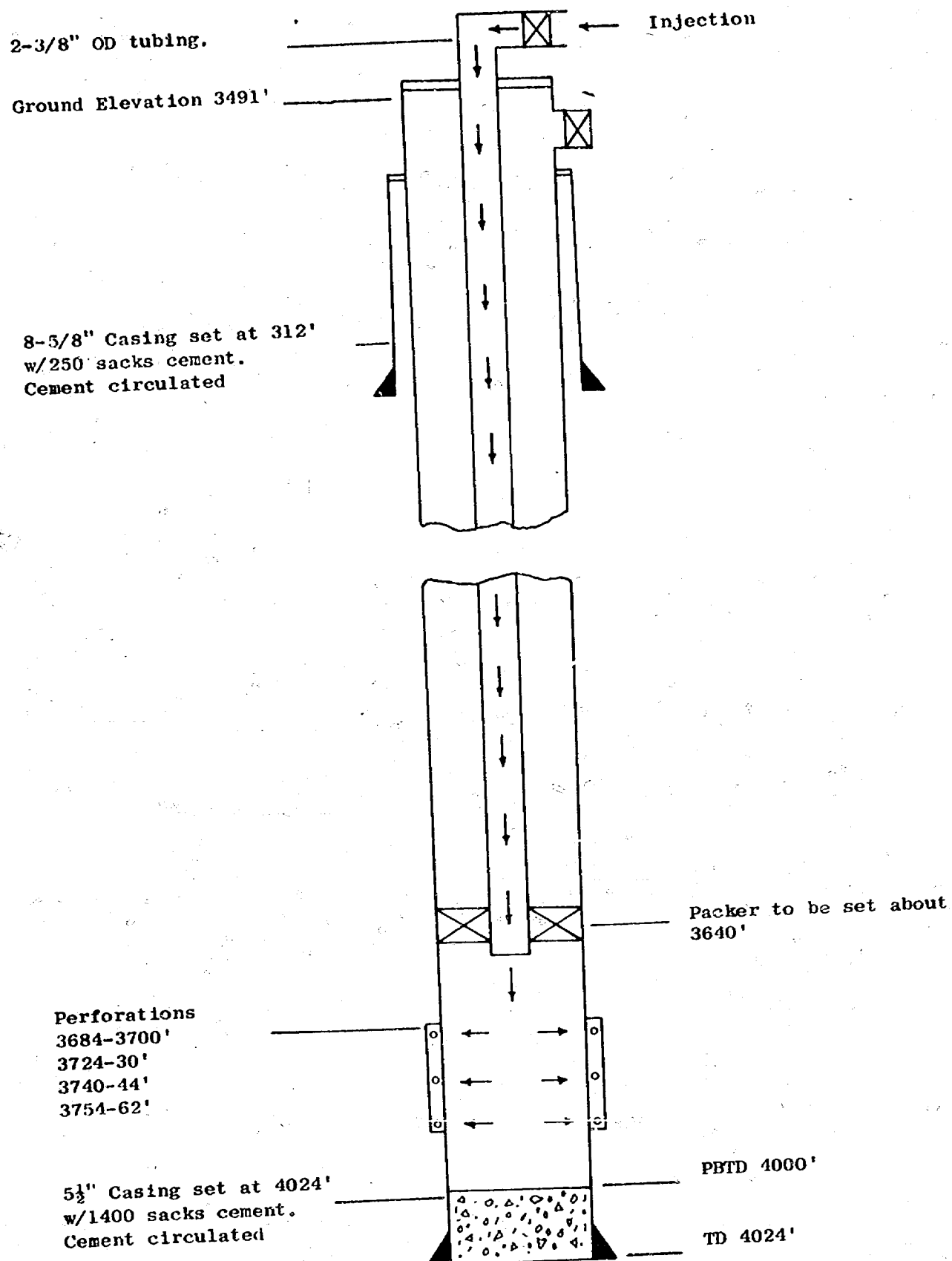
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 25 (ARCo C. Jones No. 8)
1980' FNL & 1980' FEL Section 34, T-22S, R-36E
Lea County, New Mexico



ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 27 (ARCo R. Jones No. 5)
 1980' FNL & 660' FWL Section 35, T-22S, R-36E
 Lea County, New Mexico



ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 29 (Gackle R. Jones No. 3)
1980' FSL & 1980' FWL Section 35, T-22S, R-36E
Lea County, New Mexico



ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 31 (ARCo O. I. Jones "C" No. 1)
2310' FSL & 990' FEL Section 34, T-22S, R-36E
Lea County, New Mexico

2-3/8" OD Tubing

Ground Elevation 3512'

8-5/8" Casing set at 308'
w/200 sacks cement.
Cement circulated

Perforations
3515-3638'
To be squeezed

Perforations
3666-72'
3684-3714'

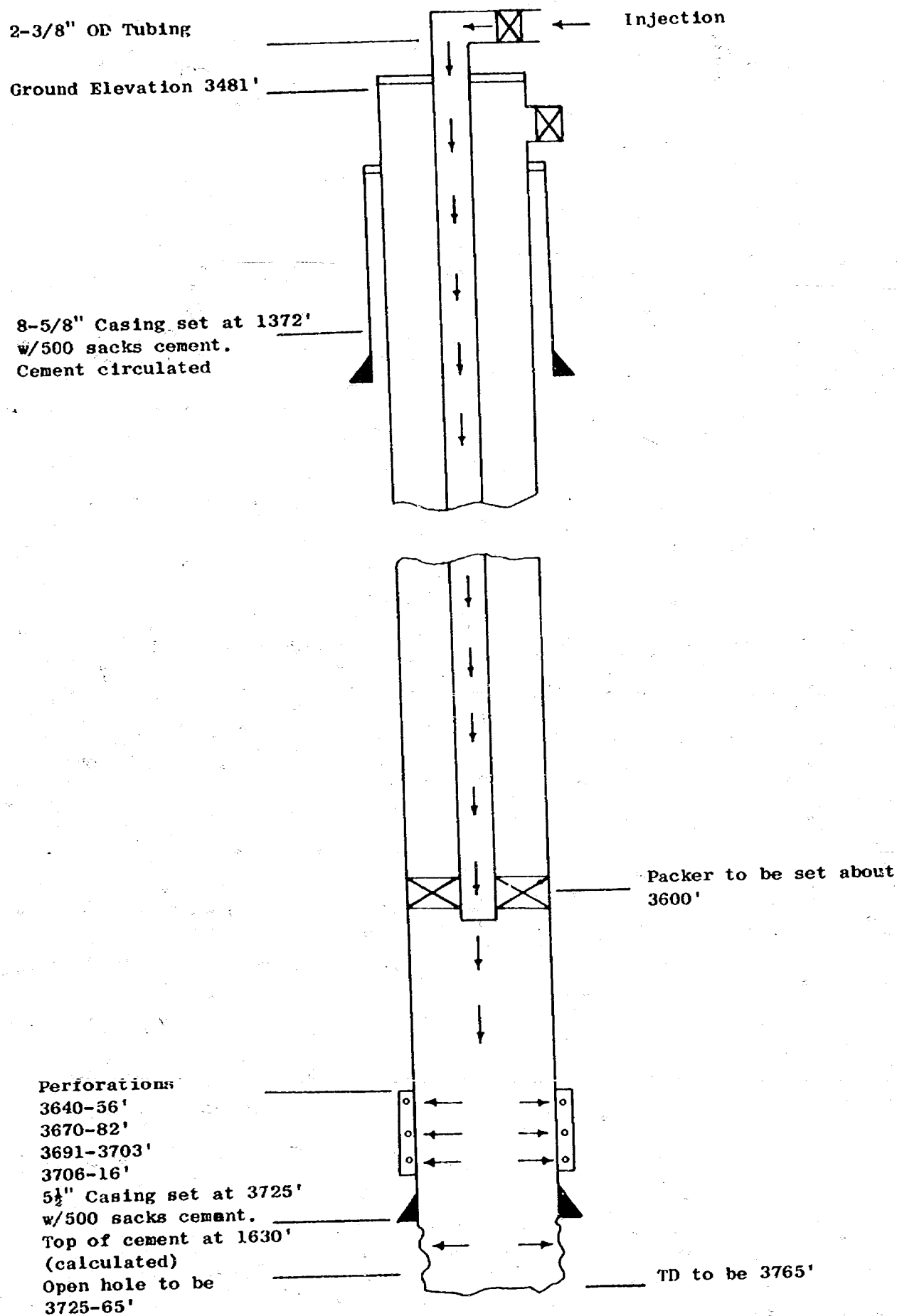
5 1/2" Casing set at 3736'
w/350 sacks cement.
Top of cmt. @ 2270' (calculated)
Open hole to be
3736-80'

Injection

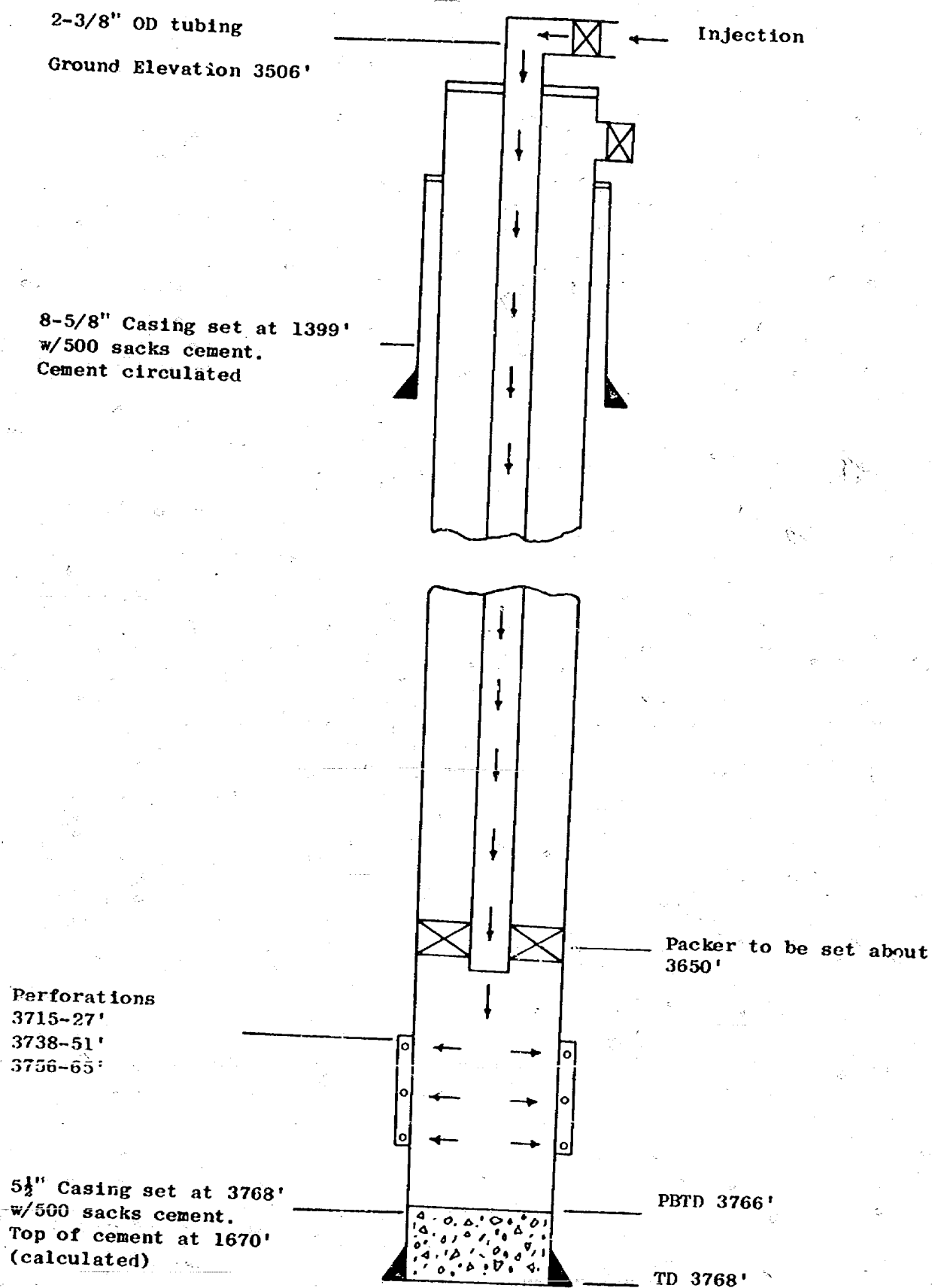
Packer to be set about
3650'

TD to be 3780'

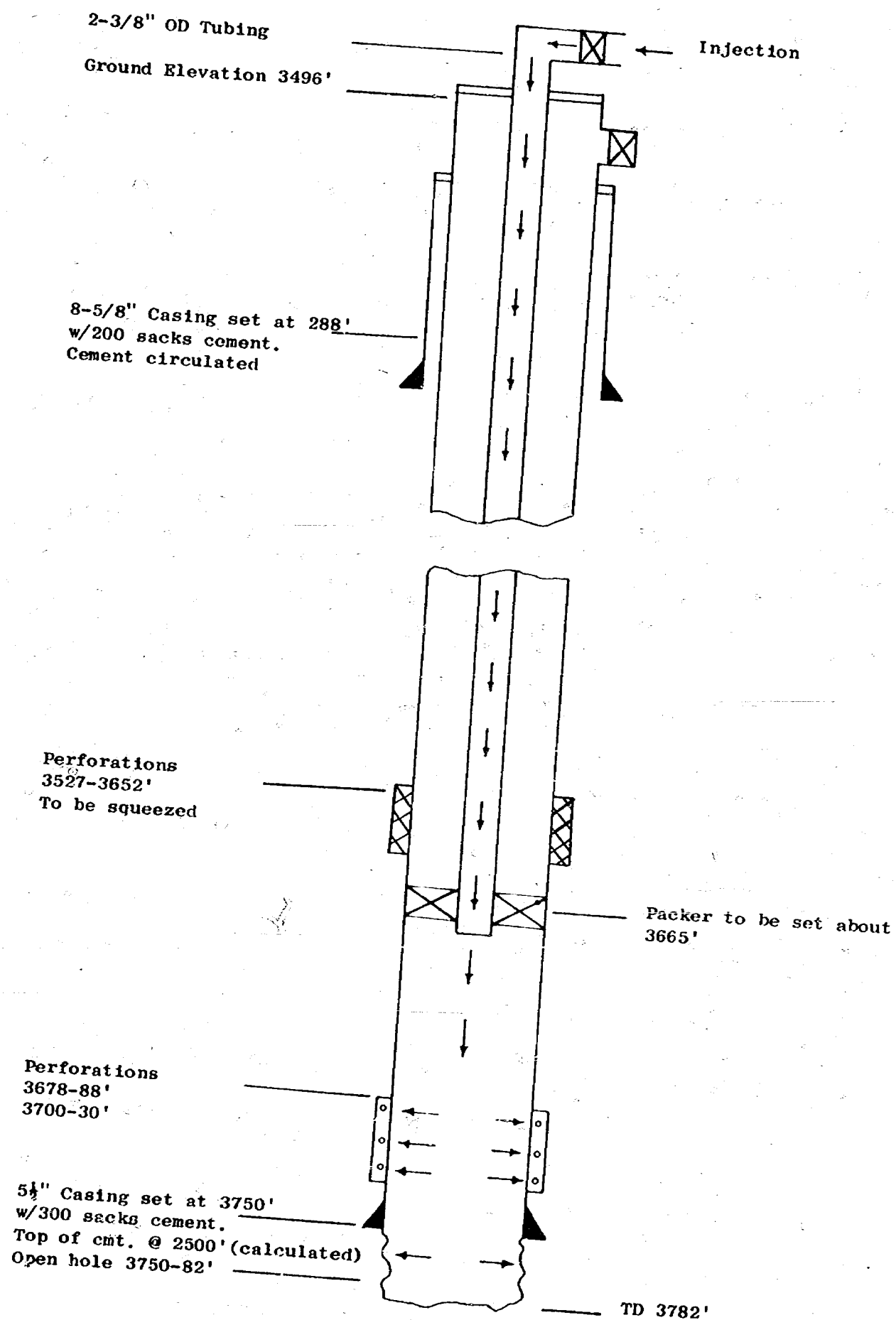
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 33 (ARCO Hale No. 2)
 1980' FSL & 1980' FWL Section 34, T-22S, R-36E
 Lea County, New Mexico



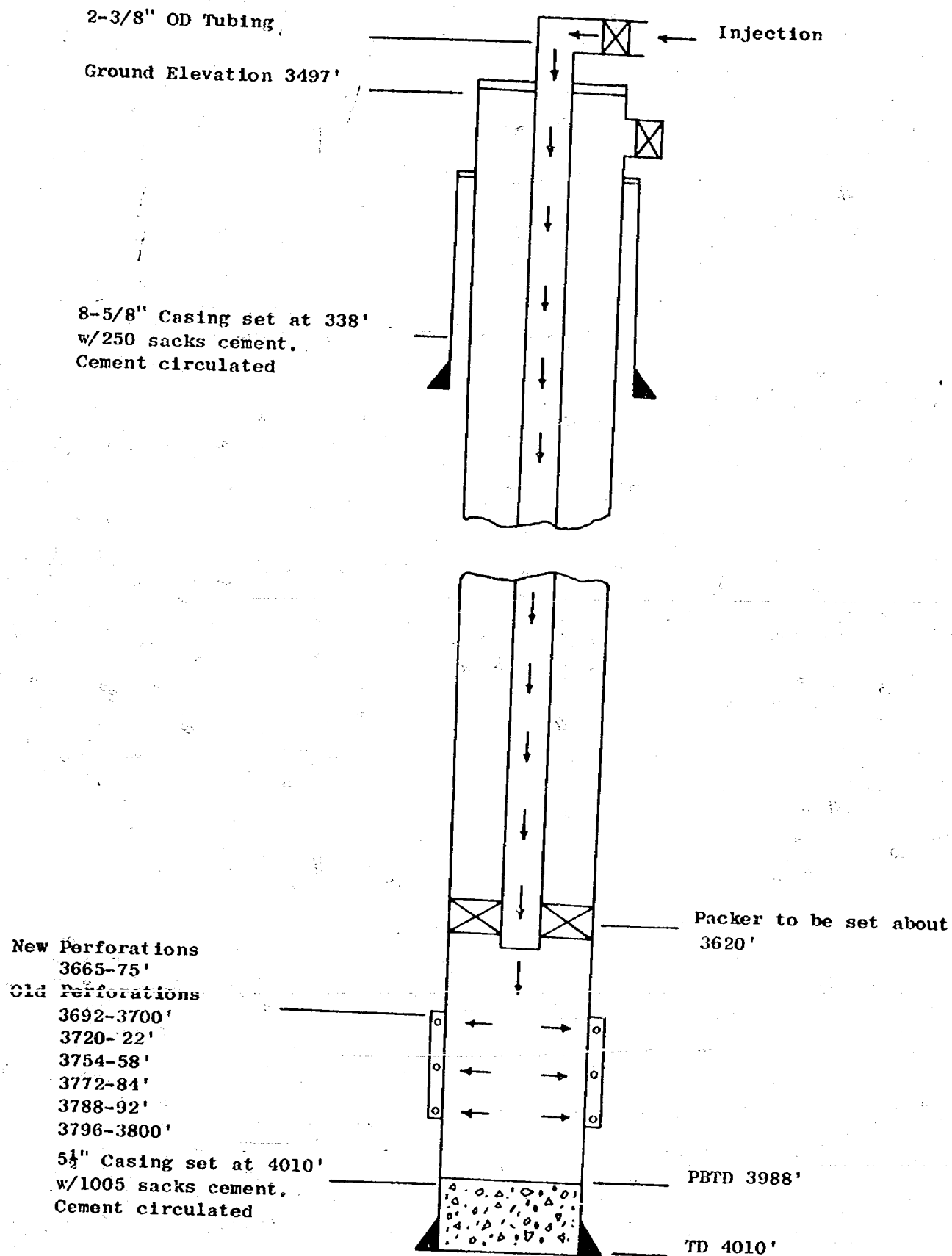
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 35 (ARCo Hale No. 5)
 660' FSL & 660' FWL Section 34, T-22S, R-36E
 Lea County, New Mexico



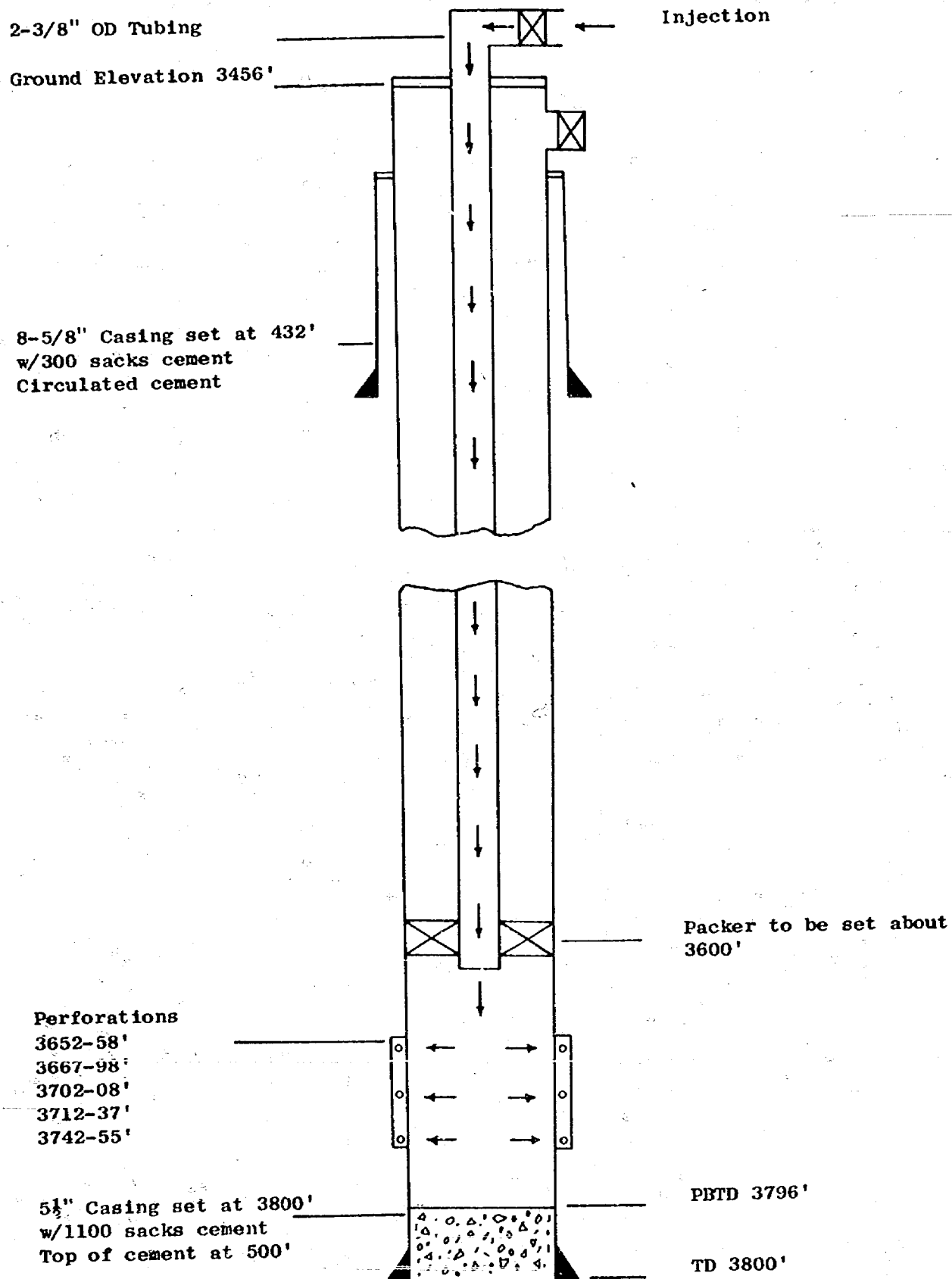
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 37 (ARCo O. L. Jones "B" No. 2)
 990' FSL & 2310' FEL Section 34, T-22S, R-36E
 Lea County, New Mexico



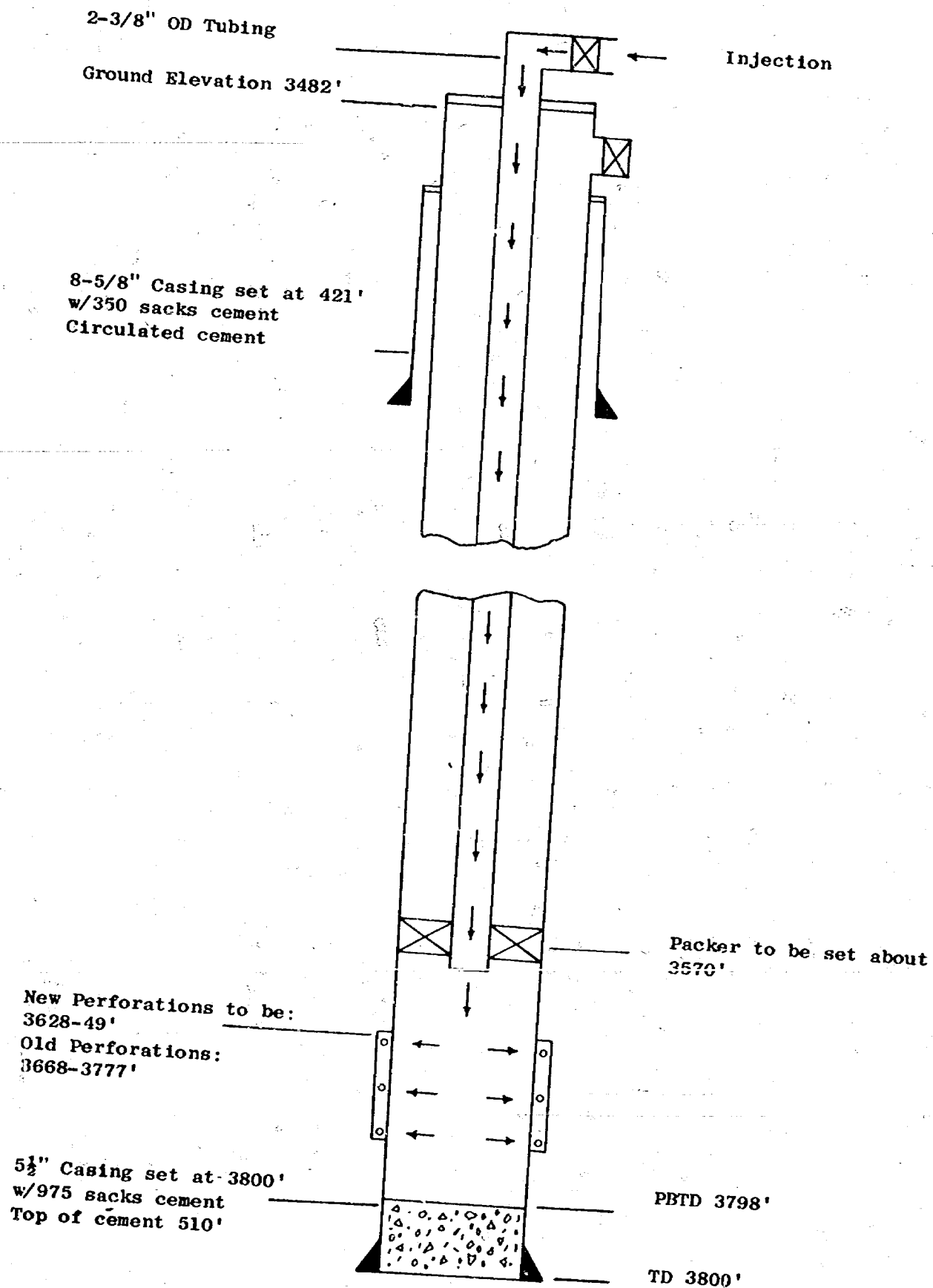
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 39 (Gackle R. Jones No. 4)
 660' FSL & 660' FWL Section 35, T-22S, R-36E
 Lea County, New Mexico



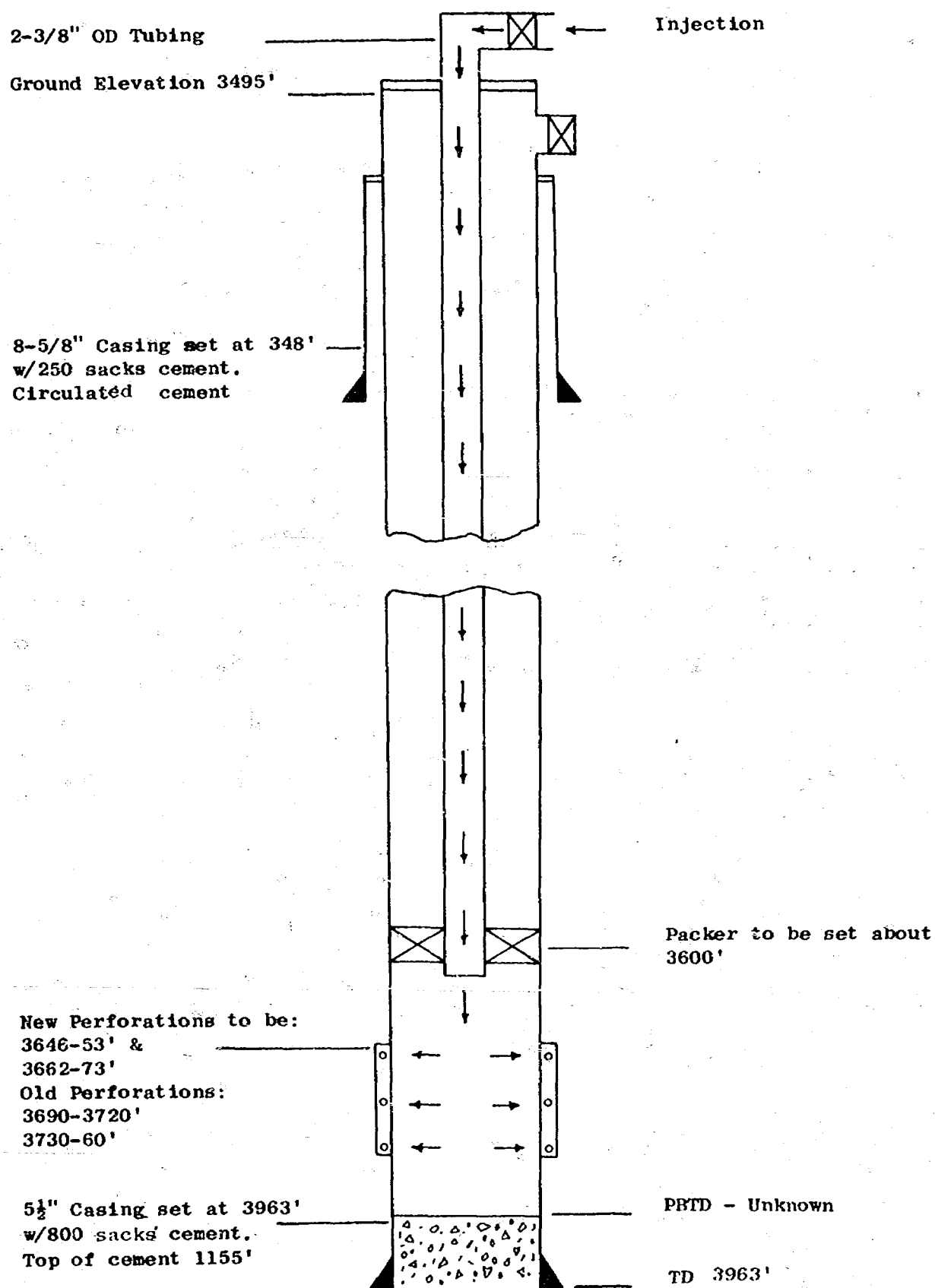
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 41 (Gulf Janda "I" State No. 4)
660' FNL & 660' FEL Section 2, T-23S, R-36E
Lea County, New Mexico



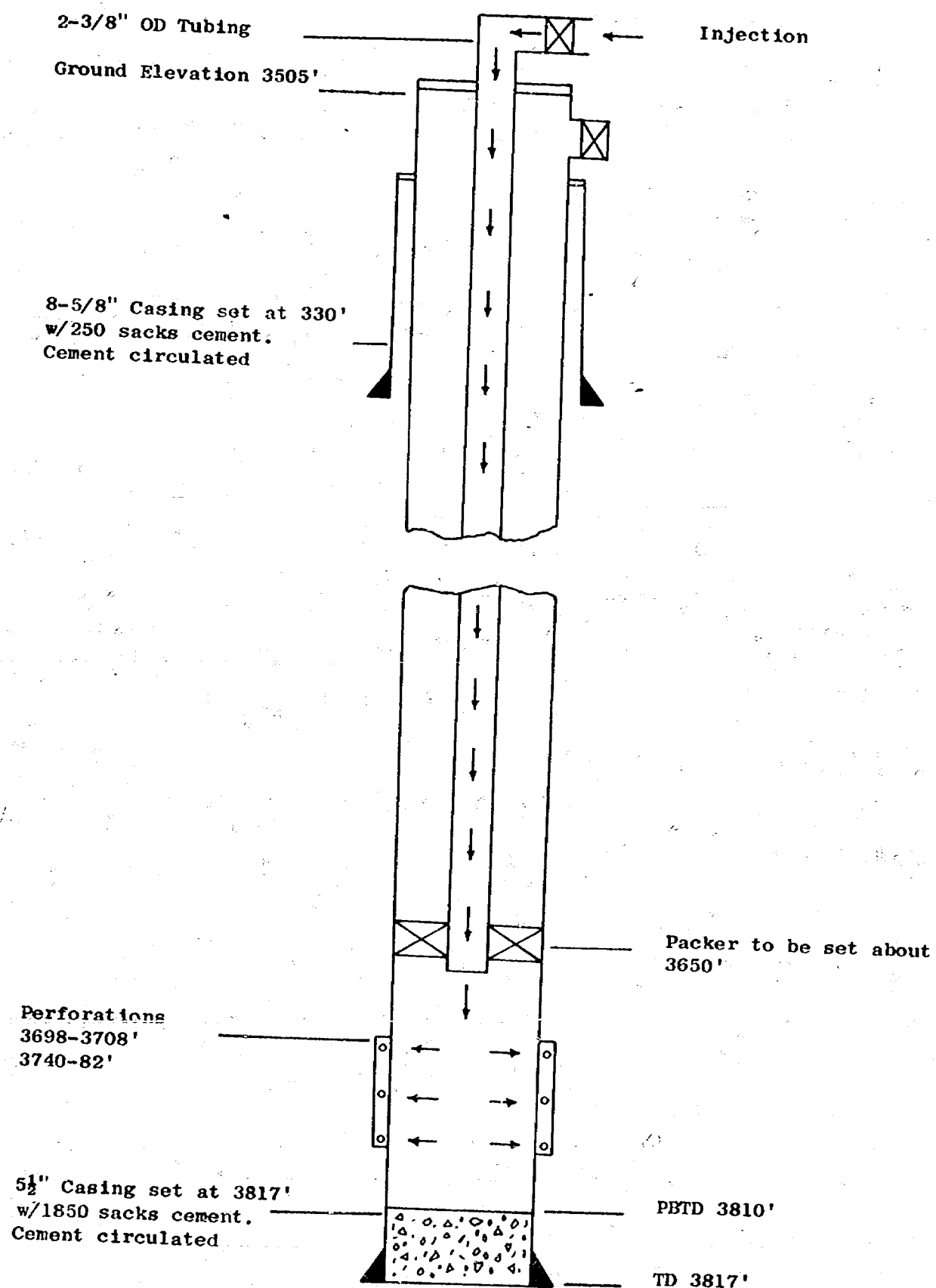
ATLANTIC RICHFIELD COMPANY
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 Schematic Drawing of Injection Well
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 Lea County, New Mexico



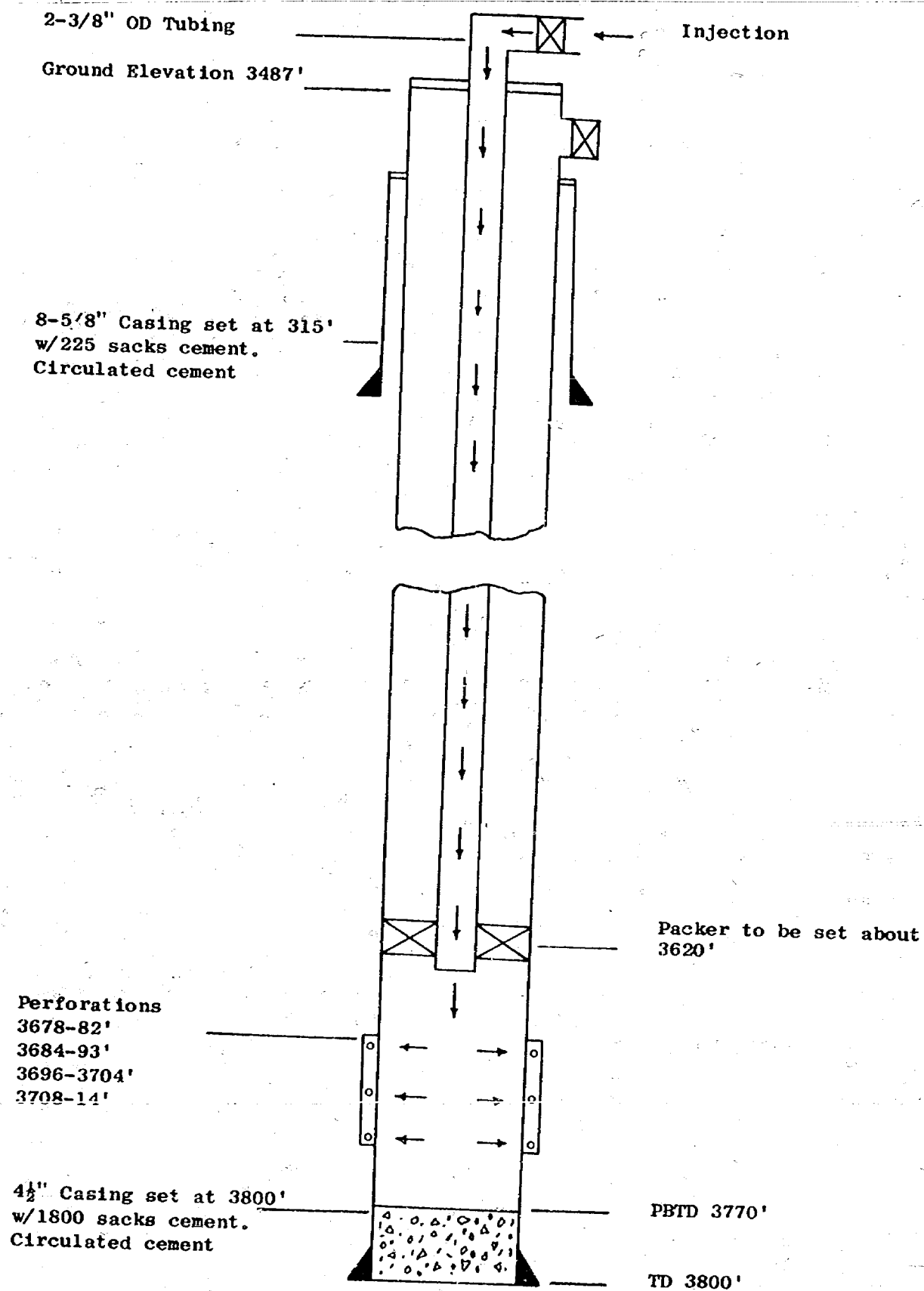
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 45 (Gackie Sinclair State "B" No. 7)
660' FNL & 660' FEL Section 3, T-23S, R-36E
Lea County, New Mexico



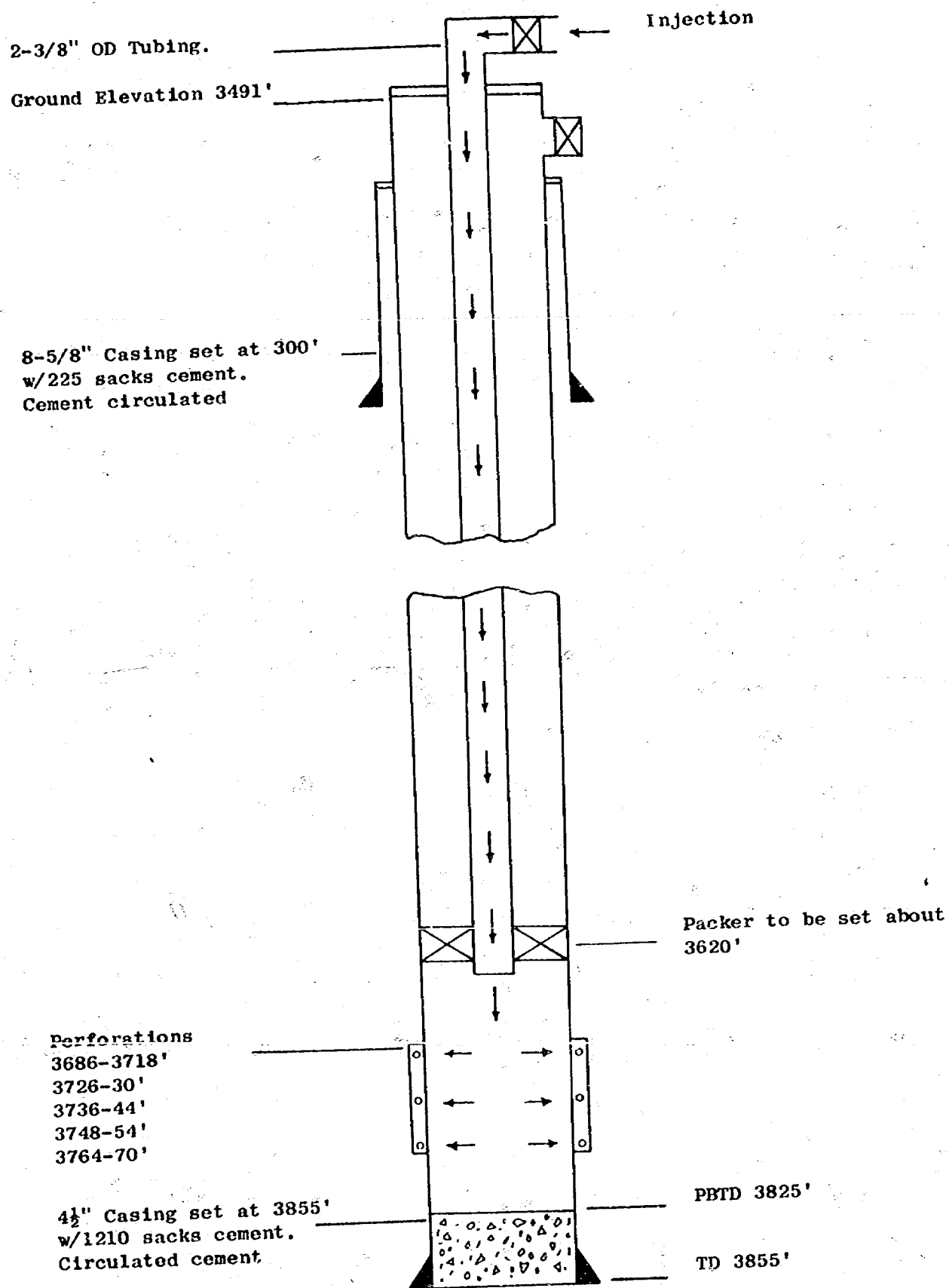
ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 47 (Gackle Sinclair State "B" No. 6)
 660' FNL & 2310' FWL Section 3, T-23S, R-36E
 Lea County, New Mexico



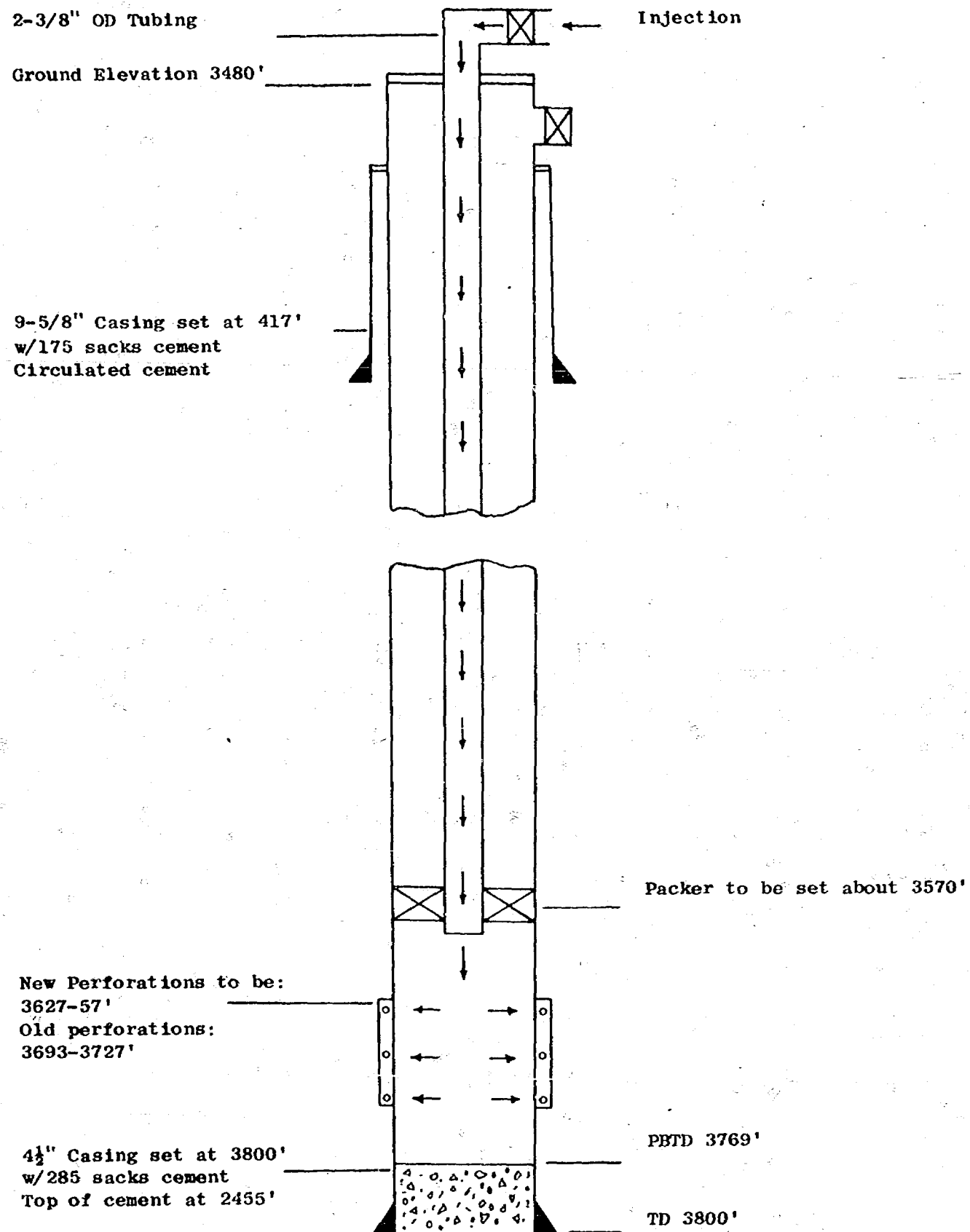
ATLANTIC RICHFIELD COMPANY
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 Schematic Drawing of Injection Well
 Unit Well No. 49 (Gackle Sinclair State "B" No. 9)
 1980' FNL & 660' FWL Section 3, T-23S, R-36E
 Lea County, New Mexico



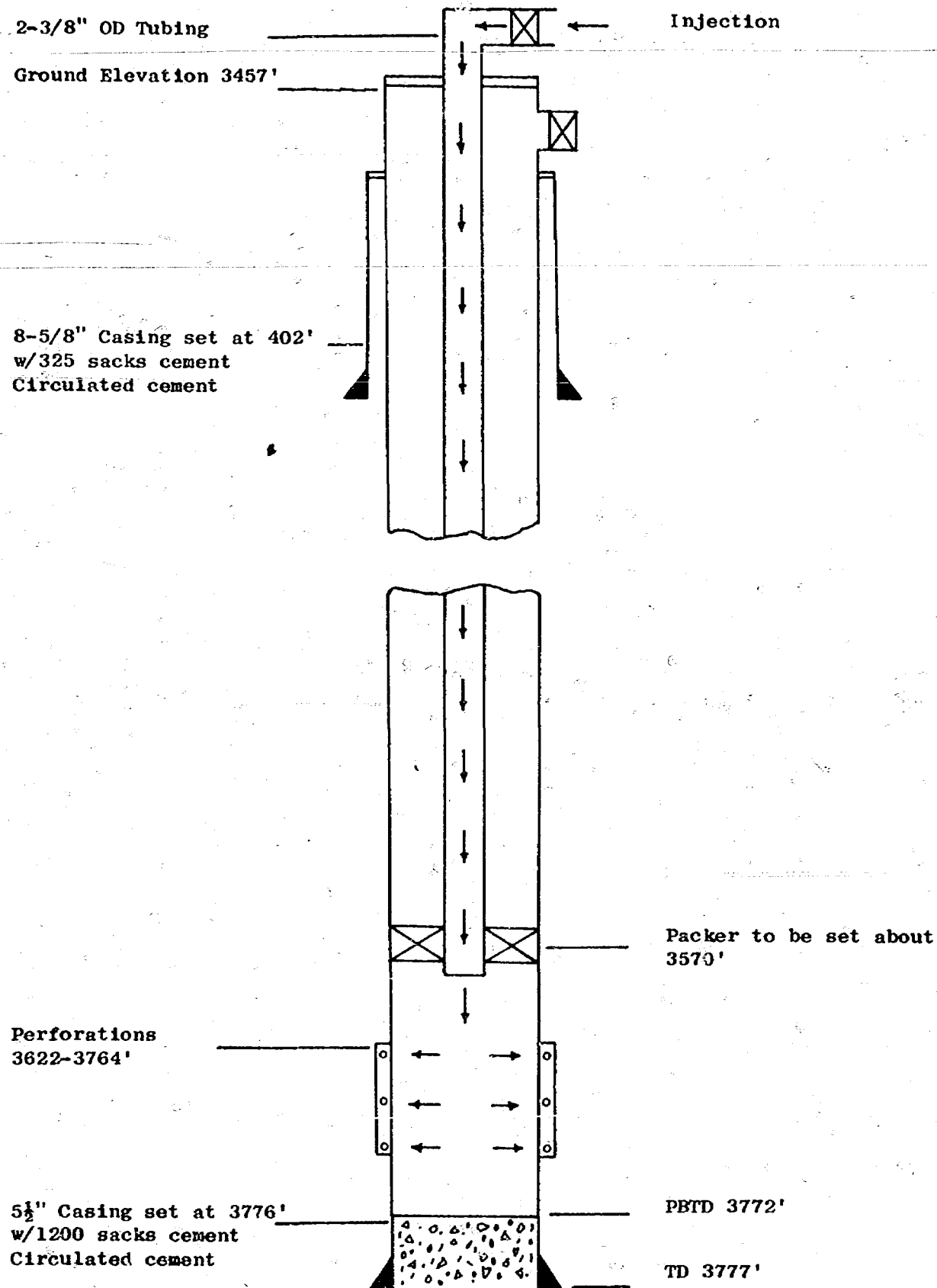
ATLANTIC RICHFIELD COMPANY
SEVEN RIVERS QUEEN UNIT
Schematic Drawing of Injection Well
Unit Well No. 51 (Gackle Sinclair State "B" No. 11)
1980' FNL & 1980' FEL Section 3, T-23S, R-36E
Lea County, New Mexico



ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Unit Well No. 53 (Gulf Janda "I" State No. 10)
 1980' FNL & 660' FWL Section 2, T-23S, R-36E
 Lea County, New Mexico



ATLANTIC RICHFIELD COMPANY
 SEVEN RIVERS QUEEN UNIT
 Schematic Drawing of Injection Well
 Unit Well No. 55 (Janda "I" State No. 8)
 1980' FNL & 1980' FEL Section 2, T-23S, R-36E
 Lea County, New Mexico



BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

APPLICATION OF ATLANTIC RICHFIELD
COMPANY FOR APPROVAL OF A WATERFLOOD
PROJECT IN CONNECTION WITH THE PROPOSED
UNIT AGREEMENT FOR THE SEVEN RIVERS -
QUEEN UNIT AREA EMBRACING 2262.36 ACRES
OF STATE AND FEE LANDS IN TOWNSHIPS 22
AND 23 SOUTH, RANGE 36 EAST, LEA COUNTY,
NEW MEXICO. APPLICANT PROPOSES TO INJECT
WATER INTO THE BOTTOM 100 FEET OF THE
SEVEN RIVERS FORMATION AND THE ENTIRE
QUEEN FORMATION THROUGH 28 INJECTION
WELLS. APPLICANT ALSO SEEKS ESTABLISH-
MENT OF ADMINISTRATIVE PROCEDURE WHEREBY
THE LOCATION OF THE INJECTION WELLS MAY
BE CHANGED.

Case 5-017

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

Comes now Atlantic Richfield Company, acting by and through the undersigned attorneys, and hereby makes application for approval of a waterflood project in connection with the proposed unit agreement for the Seven Rivers - Queen Unit Area embracing 2262.36 acres of state and fee lands in Townships 22 and 23 South, Range 36 East, Lea County, New Mexico. Applicant proposes to inject water into the bottom 100 feet of the Seven Rivers formation and the entire Queen formation through 28 injection wells. Applicant also seeks establishment of administrative procedure whereby the location of the injection wells may be changed, and in support thereof respectfully shows:

1. Applicant is in the process of formulating a unit agreement covering the Seven Rivers - Queen Unit Area which embraces 662.36 acres of the lands of the State of New Mexico and 1600 acres of fee lands in Townships 22 and 23 South, Range 36 East, Lea County, New Mexico, said lands being more particularly described as follows:

Township 22 South, Range 36 East, N.M.P.M.
Section 27 - All
Section 34 - All
Section 35 - W $\frac{1}{2}$

DOCKET MAILED

Date *6/12/73*

Township 23 South, Range 36 East, N.M.P.M.

Section 2 - N $\frac{1}{2}$

Section 3 - N $\frac{1}{2}$

containing 2262.36 acres, more or less

2. It is contemplated that applicant will be the unit operator under the terms of the unit agreement and the primary objective of the unit will be to formulate and put into effect a secondary recovery project in order to effect additional recovery of unitized substances, prevent waste and conserve natural resources consistent with good engineering practices.

3. There is attached hereto as Exhibit No. 1 a plat showing the outlines of the proposed unit area, the location of all wells producing from the Seven Rivers and Queen formations within the unit area and all other wells within a radius of two miles thereof and the formations from which the same are producing. This exhibit also indicates the ownership of the respective leases and the 28 proposed injection wells within the project area.

4. Applicant proposes to inject water into the unitized formation through the 28 injection wells indicated on Exhibit No. 1. It is anticipated that the injection of water will be started in all of the 28 wells at approximately the same time and that approximately 8,000 barrels of water per day will be injected. The water will be obtained from the Continental Oil Company - Danzinger Water Supply System which obtains saline water from the Capitan Reef. It is also anticipated that produced water from the project area will be reinjected.

5. There are filed herewith logs of the respective injection wells, together with diagrammatic sketches of each injection well showing all casing strings including diameters and setting depths, quantities used and tops of cement, perforated or open hole intervals, tubing strings including diameters and setting depths and the type and location of packers.

6. Applicant has made application for approval of the Seven Rivers - Queen Unit Agreement above referred to.

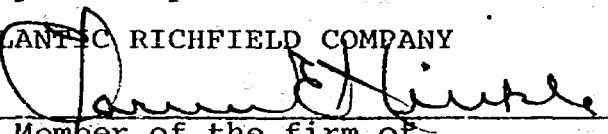
7. That applicant seeks the establishment of a project allowable in accordance with the provisions of Rule 701 of the Commission and also the establishment of an administrative procedure for any change in the injection wells which might prove to be necessary.

8. Applicant requests that this matter be set down for hearing at the examiner's hearing to be held on June 20, 1973.

Respectfully submitted,

ATLANTIC RICHFIELD COMPANY

By


Member of the firm of
HINKLE, BONDURANT, COX & EATON
Attorneys for Applicant

DRAFT

ac/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

CASE NO. 5017
Order No. R-4589

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

APPLICATION OF ATLANTIC RICHFIELD 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 June 27, 1973,
at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this July day of July, 1973, the Commission, a
quorum being present, having considered the testimony, the record,
and the recommendations of the Examiner, and being fully advised
in the premises,

FINDS:

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

(2) That the applicant, Atlantic Richfield Company, seeks
authority to institute a waterflood project in the Seven Rivers-
Queen Unit Area, ~~by the injection~~

of water into the Seven Rivers and Queen formations, ~~through 28~~

~~injection~~ wells in Sections 27, 34, and 35, Township 22 South,
South Eunice Pool,
Range 36 East, NMPM, and Sections 2 and 3, Township 23 South,
Langlie Mattix Pool,
Range 36 East, NMPM, Lea County, New Mexico.

(3) ~~That~~ That applicant proposes to
inject water through tubing, set
in a packer into the Seven Rivers
or Queen formation through
perforations or the open hole; the
annulus to be sealed with ...

through 28
injection

fluid with a pressure gauge at the surface.

insert findings
(3) + 12/17/70

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

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

DRAFT
ac/

-2-

Case No. 5017

Order No. R-

(C) 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, Atlantic Richfield Company, is hereby authorized to institute a waterflood project in the Seven Rivers-Queen Unit Area, South Eunice and Langlie Mattix Pools, by the injection of water into the Seven Rivers and Queen formations through the following-described wells:

Lea County, New Mexico
TOWNSHIP 22 SOUTH, RANGE 36 EAST, NMPM

Well Name	Well No	location	Section
1. Gulf A.L. Christmas "A"	6	330' FNL + 990' FEL	27
2. ARCO Shipley "A"	5	660' FNL + 5080' FWL	27
3. " " "A"	3	1980' FNL + 660' FWL	27
4. Gulf A.L. Christmas "A"	4	1980' FNL + 1980' FEL	27
5. A.L. Christmas "A"	8	1980' FSL + 660' FEL	27
6. ARCO Mattie Shipley	3	1980' FSL + 1980' FWL	27
7. " "	4	660' FSL + 660' FWL	27
8. Gulf A.L. Christmas "A"	7	660' FSL + 1980' FEL	27
9. ARCO R.M. Jones	3	660' FNL + 1980' FWL	35
10. ARCO C. Jones	6	660' FNL + 660' FEL	34
11. " " "	3	660' FNL + 1980' FWL	34
12. " " "	9	1980' FNL + 660' FWL	34
13. " " "	8	1980' FNL + 1980' FEL	34
14. ARCO R. Jones	5	1980' FNL + 660' FWL	35
15. Jackle R. Jones	3	1980' FSL + 1980' FWL	35
16. ARCO O.L. Jones "C"	1	2310' FSL + 990' FEL	34
17. ARCO Hale	2	1980' FSL + 1980' FWL	34
18. " "	5	660' FSL + 660' FWL	34
19. " "			

TOWNSHIP 23 SOUTH, RANGE 36 EAST, NMPM

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17. H.N.O. O.L. Jones "B"	2	990' FSL + 2310' FEL	34
20. Hackle R. Jones	4	660' FSL + 660' 660' FWL	35
21. Gulf Janda "I" State	4	660' FNL + 660' FEL	2
22. Gulf Janda "I" State	5	660' FNL + 1980' FWL	2
23. Hackle Seichair State "B"	7	660' FNL + 660' FEL	3
24. " " " "	6	660' FNL + 2310' FWL	3
25. " " " "	9	1980' FNL + 660' FWL	3
26. " " " "	11	1980' FNL + 1980' FEL	3
27. Gulf Janda "I" State	10	1980' FNL + 660' FWL	2
28. Janda "I" State	8	1980' FNL + 1980' FEL	2

(2) That the subject waterflood project is hereby designated
the Seven Rivers - Queen Unit Waterflood Project and shall

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

(4) ~~(2)~~ 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.

(5) ~~(1)~~ 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

(3) That injection into each of the above-authorized water injection wells shall be through internally plastic-coated tubing, ^{set in the} ~~which~~ ^{packer} which shall be set as near as is practicable to the uppermost perforation or the casing shoe, in open-hole completions. ~~Tubing~~ The casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge at the surface.