CASE 3718: Application of CABOT CORPORATION for salt water disposal, Lea County, New Mexico.

Case No.

3718

Application, Transcript,
Small Exhibits, Etc.

GOVERNOR
DAVID F. CARGO
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

P. O. BOX 2088
SANTA FE

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

January 31, 1968

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

Re: Case No. 3718
Order No. R-3374
Applicant:
Cabot Corporation

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.
Secretary-Director

ALP/ir

Carbon copy of order also sent to:

Hobbs OCC X
Artesia OCC
Aztec OCC
Other D. E. Gray - State Engineer Office

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. 3718
Order No. R-3374

APPLICATION OF CABOT CORPORATION
FOR SALT WATER DISPOSAL, LEA COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on January 24. 1968, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 31st day of January, 1968, 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, Cabot Corporation, is the owner and operator of the H. L. Lowe "C" Well No. 1, located in Unit O of Section 26, Township 13 South, Range 37 East, NMPM, King Field, Lea County, New Mexico.

(3) That the applicant proposes to utilize said well to dispose of produced salt water into the Wolfcamp, Pennsylvanian, Mississippian, and Devonian formations in the overall interval from 9406 feet to 12,690 feet.

(4) That the injection should be accomplished through 2 3/8-inch internally plastic-coated tubing installed in a packer set at approximately 9400 feet; that the casing-tubing annulus should be filled with an inert fluid; and that a pressure

gauge should be attached to the annulus or the annulus left open at the surface in order to determine leakage in the tubing or packer.

(5) That approval of the subject application will prevent the drilling of unnecessary wells and otherwise prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, Cabot Corporation, is hereby authorized to utilize its H. L. Lowe "C" Well No. 1, located in Unit O of Section 26, Township 13 South, Range 37 East, NMPM, King Field, Lea County, New Mexico, to dispose of produced salt water into the Wolfcamp, Pennsylvanian, Mississippian, and Devonian formations, injection to be accomplished through 2 3/8-inch tubing installed in a packer set at approximately 9400 feet, with injection in the overall interval from approximately 9406 feet to 12,690 feet;

PROVIDED HOWEVER, that the tubing shall be internally plastic-coated; that the casing-tubing annulus shall be filled with an inert fluid; and that a pressure gauge shall be attached to the annulus or the annulus left open at the surface in order to determine leakage in the tubing or packer.

(2) That the applicant shall submit monthly reports of its disposal operations in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

(3) 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

CABOT CORPORATION P. O. BOX 1101, PAMPA, TEXAS

CABLE ADDRESS CABLAK PAMPA
TELEPHONE MOHAWK 4-2581

Case 3718

January 8, 1968

Mr. Brady Lowe
1512 Great Plains Building
Lubbock, Texas

Dear Mr. Lowe:

Attached is a copy of New Mexico Oil Conservation Commission Form C-108 requesting authority to dispose of salt water into Cabot's Lowe "C" #1 in the Wolfcamp, Pennsylvanian (Atoka), Mississippian, and Devonian formations. As you are aware, this well is currently being used to dispose of water into the Wolfcamp formation. However, the high injection pressure required to dispose of water in this well has made it imperative that we obtain approval to dispose of water into additional formations. This matter has been set for hearing on January 24 in Santa Fe, New Mexico. We respectfully request you sign the waiver on the bottom of this letter and forward one copy to the New Mexico Oil Conservation Commission, P. O. Box 2088, Santa Fe, New Mexico, 87501.

Yours very truly,

W. M. Sargent, Jr.
Chief Petroleum Engineer

WMSJr:mn
Encl.

MAIN OFFICE

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The undersigned hereby waives objection to Cabot Corporation disposing of water in their Lowe "C" No. 1 well, Section 26-T13S-R37E, Lea County, New Mexico, utilizing the Wolfcamp, Pennsylvanian (Atoka), Mississippian and Devonian formations.

Brady Lowe

Date 1-10-68

Case 3718

Form C-108
Revised 1-1-65

NEW MEXICO OIL CONSERVATION COMMISSION

APPLICATION TO DISPOSE OF SALT WATER BY INJECTION INTO A POROUS FORMATION

OPERATOR: Cabot Corporation		ADDRESS: P. O. Box 4395, Midland, Texas	
LEASE NAME: H. L. LOWE "C"	WELL NO.: 1	FIELD: King	COUNTY: Lea

LOCATION: UNIT LETTER 0; WELL IS LOCATED 1650 FEET FROM THE east LINE AND 467 FEET FROM THE south LINE, SECTION 26 TOWNSHIP 13S RANGE 37E NMPM.

CASING AND TUBING DATA

NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY
SURFACE CASING	13-3/8"	363'RBM	400	Surface	Circulation
INTERMEDIATE	8-5/8"	4,630'RBM	2400	215'	Temp. Survey
LONG STRING	5-1/2"	11,565'RBM	1200	8750'	Temp. Survey
TUBING	2-3/8"	9,400'	NAME, MODEL AND DEPTH OF TUBING PACKER: Baker Model "D"		

NAME OF PROPOSED INJECTION FORMATION	TOP OF FORMATION	BOTTOM OF FORMATION
Wolfcamp, Atoka, Mississippian, Devonian	~~12,665'~~ 9406' (top W.C.)	12,690' (T.D.)

IS INJECTION THROUGH TUBING, CASING OR ANNULUS?	PERFORATIONS OR OPEN HOLE?	PROPOSED INTERVAL(S) OF INJECTION
Tubing	Open hole	9406' to 12,690'

IS THIS A NEW WELL DRILLED FOR DISPOSAL?	IF ANSWER IS NO, FOR WHAT PURPOSE WAS WELL ORIGINALLY DRILLED?	HAS WELL EVER BEEN PERFORATED IN ANY ZONE OTHER THAN THE PROPOSED INJECTION ZONE?
No	Oil production	No

LIST ALL SUCH PERFORATED INTERVALS AND SACKS OF CEMENT USED TO SEAL OFF OR SQUEEZE EACH

DEPTH OF BOTTOM OF DEEPEST FRESH WATER ZONE IN THIS AREA	DEPTH OF BOTTOM OF NEXT HIGHER OIL OR GAS ZONE IN THIS AREA	DEPTH OF TOP OF NEXT LOWER OIL OR GAS ZONE IN THIS AREA
approximately 300'		none

ANTICIPATED DAILY INJECTION VOLUME (BBLS.) MINIMUM	MAXIMUM	OPEN OR CLOSED TYPE SYSTEM	IS INJECTION TO BE BY GRAVITY OR PRESSURE?	APPROX. PRESSURE (PSI)
1,500 BPD	2,500 BPD	Closed	Pressure	Vacuum

ANSWER YES OR NO WHETHER THE FOLLOWING WATERS ARE MINERALIZED TO SUCH A DEGREE AS TO BE UNFIT FOR DOMESTIC, STOCK, IRRIGATION, OR OTHER GENERAL USE —	WATER TO BE DISPOSED OF	NATURAL WATER IN DISPOSAL ZONE	ARE WATER ANALYSES ATTACHED?
	Yes	Yes	No

NAME AND ADDRESS OF SURFACE OWNER (OR LESSEE, IF STATE OR FEDERAL LAND): Mr. Brady Lowe, 1512 Great Plains Building, Lubbock, Texas

LIST NAMES AND ADDRESSES OF ALL OPERATORS WITHIN ONE-HALF (½) MILE OF THIS INJECTION WELL: None

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HAVE COPIES OF THIS APPLICATION BEEN SENT TO EACH OF THE FOLLOWING?	SURFACE OWNER	EACH OPERATOR WITHIN ONE-HALF MILE OF THIS WELL	THE NEW MEXICO STATE ENGINEER
	Yes	Yes	Yes

ARE THE FOLLOWING ITEMS ATTACHED TO THIS APPLICATION (SEE RULE 701-B)	PLAT OF AREA	ELECTRICAL LOG	DIAGRAMMATIC SKETCH OF WELL
	Yes	No (previously submitted)	Yes

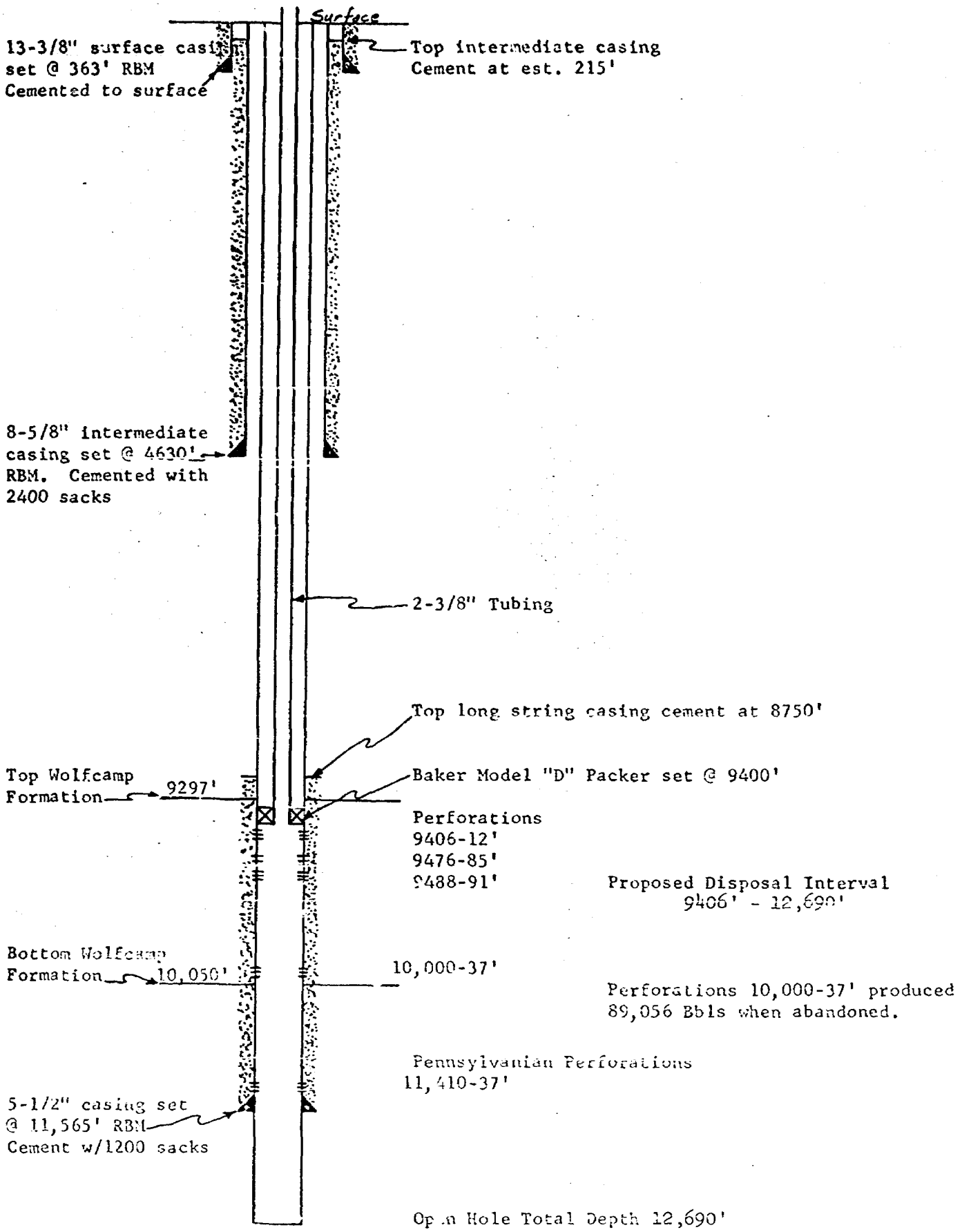
I hereby certify that the information above is true and complete to the best of my knowledge and belief.

(Signature)	(Title)	(Date)
	Chief Petroleum Engineer	January 8, 1968

NOTE: Should waivers from the State Engineer, the surface owner, and all operators within one-half mile of the proposed injection well, not accompany this application, the New Mexico Oil Conservation Commission will hold this application for a period of 15 days from the date of receipt by the Commission's Santa Fe office. If at the end of the 15-day waiting period no protest has been received by the Santa Fe office, the application will be processed. If a protest is received, the application will be set for hearing, if the applicant so requests. SEE RULE 701.

Case 3718

CABOT CORPORATION
LOWE "C" NO. 1
Proposed Salt Water Disposal Well



CASE 3715: Application of Gulf Oil Corporation for an amendment to Order No. R-3345, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Order No. R-3345, which order authorized the Gulf Stuart Langlie Mattix Unit Waterflood Project. Applicant proposes to substitute the Stuart "B" Well No. 2 located in Unit I and the Stuart "C" Well No. 3 located in Unit K as water injection wells in said project in lieu of the Stuart "A" Well No. 1 located in Unit J and the Stuart "D" Well No. 4 located in Unit L, all in Section 10, Township 25 South, Range 37 East, Langlie-Mattix Pool, Lea County, New Mexico.

CASE 3716: Application of Carter Foundation Production 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 Ellenburger formation through the perforated interval from 9580 to 9680 feet in its E. C. Hill "E" Federal Well No. 5 located in Unit E of Section 35, Township 23 South, Range 37 East, Teague-Ellenburger Pool, Lea County, New Mexico.

CASE 3651 (Reopened):

Application of Tenneco Oil Company for an amendment to Order No. R-3315, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the re-opening of Case No. 3651 and the amendment of Order No. R-3315 entered therein which order promulgated temporary pool rules for the North Morton-Pennsylvanian Pool, Lea County, New Mexico, including the establishment of 80-acre proration units for a period of one year. Applicant now seeks the amendment of said order to provide for 160-acre spacing and proration units on a temporary basis.

CASE 3717: Application of Aztec Oil & Gas Company for a dual completion and salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the authority to dually complete its State "AJ" Well No. 2 located in Unit N of Section 1, Township 18 South, Range 36 East, Arkansas Junction-San Andres Pool, Lea County, New Mexico, in such a manner as to permit the production of oil from the Upper San Andres formation in the interval from 5047 to 5079 feet and to permit the disposal of produced salt water in the Lower San Andres formation in the interval from 5430 to 5462 feet through parallel strings of 2-inch tubing.

CASE 3718: Application of Cabot Corporation for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water in the Wolfcamp, Pennsylvanian, Mississippian, and Devonian formations in the overall interval from 9406 to 12,689 feet in its H. L. Lowe "C" Well No. 1 located in Unit N of Section 26, Township 13 South, Range 37 East, King-Devonian Pool, Lea County, New Mexico.

Docket No. 3-68

DOCKET: EXAMINER HEARING - WEDNESDAY - JANUARY 24, 1968

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

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

CASE 3704 (Continued from the December 20, 1967, Examiner Hearing)

Application of New Mexico Salt Water Disposal Company, Inc., for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Bough "D" zone of the Pennsylvanian formation in the perforated interval from 9844 to 9875 feet in its Ainsworth Well No. 1 located in Unit H of Section 19, Township 9 South, Range 34 East, Vada-Pennsylvanian Pool, Lea County, New Mexico.

CASE 3711: In the matter of the hearing called by the Oil Conservation Commission upon its own motion to consider the amendment of Rule 509 of the Commission Rules and Regulations and Commission Form C-109 to permit the production of the bonus discovery oil allowable assigned to multiple discovery wells to be produced from any discovery zone in any proportion; and to further amend said rule to permit applications for the bonus discovery allowable to be heard on dockets other than the regular pool nomenclature docket in instances where the applicant will present the evidence.

CASE 3712: In the matter of the hearing called by the Oil Conservation Commission upon its own motion to consider the amendment of Rule 701 of the Commission Rules and Regulations and secondary recovery Orders Nos. R-1244, R-1311, R-1456, R-1470, R-1505, R-2064, R-2178-B, R-2268-A, R-2269, R-2403, R-2541, R-2622, R-2664, R-2700, and R-2795, to delete therefrom all references to the State Engineer or the State Engineer Office.

CASE 3713: In the matter of the hearing called by the Oil Conservation Commission upon its own motion to consider the amendment to Rule 103 of the Commission Rules and Regulations to require that well identification signs for wells drilled hereafter shall designate the location of said wells by quarter-quarter section rather than quarter section as now required.

CASE 3714: Application of Continental Oil Company for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dually complete its State "O" Well No. 1 located in Unit F of Section 16, Township 17 South, Range 32 East, Lea County, New Mexico, in such a manner as to permit the production of gas from the perforated interval 3140 to 3160 feet, Maljamar-Queen Gas Pool and the injection of water for secondary recovery purposes into the Grayburg-San Andres formations in the interval from 3700 to 4050 feet through parallel strings of 2-inch tubing.

Case 3718

CABOT CORPORATION P. O. BOX 1101, PAMPA, TEXAS

CABLE ADDRESS CABLAK PAMPA
TELEPHONE MOHAWK 4-2581

January 9, 1968

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

Attention Mr. Dan Nutter

Gentlemen:

Attached are three copies of Form C-108 requesting salt water disposal authority for Cabot Corporation's Lowe "C" No. 1 well located in Section 26, T13S, R37E, Lea County. Also included are three copies of location plat and schematic diagram of proposed completion. This matter has been set for hearing on the January 24th docket. Copies of letters of transmittal to the State Engineer and the surface owner are also attached.

Yours very truly,

W. M. Sargent, Jr.
Chief Petroleum Engineer

WMSJr:mn
Encls.

COPY

CABOT CORPORATION

BOX 1101
PAMPA, TEXAS

Case 3718

January 9, 1968

New Mexico State Engineer Office
Capitol Building
Santa Fe, New Mexico 87501

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Dear Sir:

Cabot Corporation has made application to the New Mexico Oil Conservation Commission for permission to dispose of produced salt water into our Lowe "C" No. 1 well located in SW/4 SE/4 Section 26, T13S, R37E, Lea County. Permission is being requested to dispose into the Pennsylvanian (Atoka), Mississippian, and Devonian formations, in addition to the currently utilized Wolfcamp formation.

Attached is a copy of the application, including plat and schematic drawing. A copy of the electric log was previously submitted in 1965 upon application for permission to dispose of water into the Wolfcamp formation in this well.

This matter has been set for hearing on the January 24th docket.

Yours very truly,

W. M. Sargent, Jr.
Chief Petroleum Engineer

WMSJr:mn
Encls.

cc: New Mexico O. C. C.

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 24, 1968

IN THE MATTER OF:

The Application of Cabot Corporation for salt water disposal, Lea County, New Mexico

CASE NO. 3718

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: We will call Case 3718.

MR. HATCH: Application of Cabot Corporation for salt water disposal, Lea County, New Mexico.

MR. EATON: I am Paul Eaton, of the firm of Hinkle, Bondurant & Christy, Roswell, New Mexico, representing Cabot Corporation. We have one witness.

(Witness sworn.)

(Whereupon, Applicant's Exhibits 2 through 5 marked for identification.)

* * * * * * *

W I L L I A M M. S A R G E N T, J U N I O R, called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. EATON:

Q Please state your name, address, occupation and employer.

A William M. Sargent, Junior, from Pampa, Texas, employed by Cabot Corporation as a petroleum engineer.

Q Are you familiar with the application of Cabot Corporation in this case?

A I am.

Q Are you familiar with the property and the proposed injection well involved in this case?

A I am.

Q Have you previously testified before the Commission as a petroleum engineer?

A Yes, I have.

Q Have your qualifications been accepted by the Commission?

A Yes.

MR. EATON: Will you accept this witness?

MR. NUTTER: Yes, sir.

Q (By Mr. Eaton) What does Cabot Corporation seek by its application?

A Cabot Corporation is asking for authority to dispose of produced salt water in their H. F. Lowe "C" No. 1 well located in Section 26, Township 13 South, Range 37 East, Lea County, into the Atoka, Mississippian and Devonian Formations, in addition to the already approved and being utilized Wolfcamp Formation.

Q Mr. Sargent, referring to your application which is on file with the Commission, in the application, it states name of proposed injection formation, and you have shown there Wolfcamp, Atoka, Mississippian, Devonian and then the next box on the application form says top of formation, and you have a figure of 12,665 feet. Is that a correct figure?

A No, that is not correct, and we wish to change

that to 9,297, as the top of the Wolfcamp Formation.

Q Referring you to Exhibit 1 which, Mr. Examiner, is the location plat which was submitted with the application and which we would like identified as Exhibit No. 1.

MR. NUTTER: Yes, I pulled one out here, and identified it as Exhibit No. 1.

MR. EATON: All right.

Q (By Mr. Eaton) Please state what that represents.

A This is a map of the area that the disposal well is in. The well is on the northern flank of the King Field located in the southeas of the southwest quarter, no excuse me, the southwest of the southeast quarter of Section 26, 13, 37, indicated on this map of the producing wells in the area and within a two-mile radius of wells which have produced in the past.

Q Does the map also indicate the formations from which the wells are producing, or have produced?

A Yes, sir, it does.

Q And does it show the lessees within that two-mile radius?

A Yes.

Q Would you state the name of the lease on which the proposed injection well is located and what is the well

designation?

A The well is on the H. L. Lowe lease and its designation is "1 C".

Q Is Cabot Corporation the operator of the lease and well, at least as to the formations proposed to be injected?

A We are.

Q Mr. Sargent, would you please give the history of this injection well?

A This well was originally drilled as an oil well into the Devonian. However, on drillstem test, it yielded only a small amount of oil and considerable water. We then completed the well as an oil producer from the Wolfcamp Formation and produced approximately 87,000 barrels of oil. Upon depletion of the oil from the Wolfcamp Formation, we requested authority from the Oil Conservation Commission to utilize this well as a water disposal well in the Wolfcamp Formation.

MR. NUTTER: When was that, Mr. Sargent?

THE WITNESS: This was in January, 1965.

MR. NUTTER: Thank you.

A Since that date, we have utilized it as a water disposal well for water produced from the King Field.

Q Has a copy of the electric log for that well

previously been submitted to the Commission?

A It has.

Q Referring, Mr. Sargent, to what has been marked as Exhibit No. 2, please state what that exhibit reflects.

A Exhibit 2 is a schematic drawing of the proposed completion of this well. Indicated on this drawing is surface casing set at 363 feet, Rotary Bushing measurements, cemented back to surface. Cement did circulate. 8 - 5/8ths intermediate casing was set at 4630 and cemented with 2400 sacks. The top of cement was determined by temperature survey, to be at 215 feet, well up within the surface casing. Five and one-half inch production casing was set at 11,565 feet, Kelly Bushing measurements, and cemented with 1200 sacks. Cement was determined to be at 8,750 by temperature survey. Indicated reperforations in the Wolfcamp Zone from 9406 to 10,037, which are currently being utilized for disposal of produced water. In addition, we propose to utilize perforations in the Pennsylvanian Atoka at 11,410 to 37 feet, and open hold section from 11,565 to total depth of 12,690, covering Mississippian and Devonian Formations. Tubing will be set at approximately 9400 feet, utilizing a Baker Model "D" packer, the tubing will be plastic-lined. In addition, the annular space

between tubing and casing will be filled with treated salt water.

Q As I understand, you propose to inject into the Wolfcamp Atoka, the Mississippian and the Devonian?

A This is correct.

Q Does Exhibit No. 2 reflect the depths of those formations?

A It does.

Q Referring now to Exhibit No. 3, please state what that exhibit represents.

A Exhibit No. 3 is a structure map with the datum being the top of the Devonian Formation. This indicates the location of the proposed disposal well in respect to the other wells in the field. I would like to point out one change on this map, in that the well to the right of the disposal well colored in red, has been plugged and abandoned.

Q That is the well shown on the Little B?

A Yes, that's right. This map indicates the major faults within this producing field and the complexity of the formation here. You will note that from this map, that the top of the Devonian, the Lowe "C", is approximately 8800 feet subsea elevation, whereas the direct offset well topped the Devonian at minus 8309, or approximately 500 feet higher.

This is true of all the producing wells in the field with the exception of the two southernmost wells, which are fairly low on the structure.

Q Now, referring to Exhibit No. 4, will you please state what that exhibit reflects?

A Exhibit 4 is a very generalized cross-section running from north to south through the field, starting with our H. L. Lowe "C" No. 1 well, running through the "P" State No. 1 "S", at the extreme southern end of the field. Once again this map illustrates the complexity of the Devonian reservoir and the numerous faults encountered on this north-south cross-section. I will state that these are only the major faults and there are numerous minor faults which are not shown, either on the structure map or the cross-section. This indicates that water will be put into the Mississippian section and the Devonian. We feel that water will go into the Devonian on gravity here and that in all probability, disposal will be limited to the Devonian, even though the other formations are exposed.

We are currently injecting into the Wolfcamp under 2500 pounds surface pressure. The Atoka perforations were treated and won't yield any fluid on completion attempt, so we feel that even though they are open they will not

accept fluid except under very high pressures. The Mississippian section has scattered small porosity breaks, but they did not indicate production or any signs of production when we were drilling and did not even warrant testing as we drilled the well. So we feel that in all probability the water will be disposed of into the Devonian Formation. The oil-water contact was encountered in the H. L. Lowe "C" No. 1 maybe there were ten foot of oil column there when we drilled the well and this was not enough to effect a completion in this particular well. This corresponded very well with the oil-water contact found in the H. L. Fleet No. 1, which is the fourth well from the left on the cross-section.

However, in the producing history of this field, the wells tended to water out rather rapidly from perforations well below the top of the formation and we are now producing the wells from perforations located near the top of the Devonian, and produce considerable amounts of water through these perforations. We don't feel that there will be any problems encountered in injecting water into the Devonian Formation at the location proposed.

Q Mr Sargent, Exhibit No. 4 does reflect letter symbols "D" and "U"; what do those symbols mean?

A Those represent the "up" and "down" thrown sides

of the faults.

Q Were Exhibits 1 through 4 prepared by you or under your direction?

A Yes.

Q Referring now to Exhibit No. 5, please state what this exhibit represents.

A Exhibit No. 5 are water analyses from the Devonian Formation, the Wolfcamp Formation and the Pennsylvanian Formation, the three producing formations in the King Field. These indicate that the water is highly mineralized, non-potable, not suitable for livestock or agricultural use.

Q Were these analyses prepared at the request of Cabot Corporation?

A Yes, they were.

Q What kind of fluid will be injected?

A Salt water, as indicated on the analyses.

Q What is the source of the salt water?

A Produced salt water from the King Field.

Q What volume of salt water do you anticipate will be injected?

A From 2,000 to 2500 hundred barrels of water per day.

Q I believe you stated that you anticipate that

you will inject this water by gravity?

A We anticipate that the Devonian will take the water by gravity.

Q If it doesn't, do you have the equipment available to inject it under pressure?

A Yes, we are currently injecting water into the Wolfcamp under 1200 pounds surface pressure. If pressure is required, the equipment on location will be utilized.

Q Will a pressure gauge be attached to the annulus or will the annulus be left open at the surface in order to detect leakage in the tubing or packer?

A Yes, it will.

Q In your opinion, is the well cased and cemented in such a manner that there will be no danger to oil or gas or fresh water reservoirs which may be encountered by the well?

A Yes.

Q Have copies of the application been sent to the State Engineer and to the surface owner?

A Yes, they have.

Q Are there any offset operators other than Cabot?

A No.

Q Will Cabot Corporation notify the Commission of

the date of commencement of the injection operations and will it keep an accurate record and report monthly to the Commission the volumes of fluid injected and injection pressures?

A Yes.

Q In your opinion, will approval of this application prevent the drilling of unnecessary wells and otherwise prevent waste and protect correlative rights?

A Yes.

MR. EATON: Mr. Examiner, we move the admission of Exhibits 1 through 5.

MR. NUTTER: Cabot's Exhibits 1 through 5 will be admitted in evidence.

(Whereupon, Applicant's Exhibits 1 through 5 admitted into evidence.)

MR. EATON: I have no further questions of the witness.

CROSS EXAMINATION

BY MR. NUTTER:

Q You stated that you had previously submitted a log, was that at the time that the well was originally authorized for injection into the Wolfcamp?

A Yes, sir, that was a hearing in 1965.

Q Do you happen to know the case number?

A No, I don't, I neglected to look it up.

Q Do you know the Order number that authorized it?

A I certainly don't. That just slipped my mind to look that up.

Q We can probably find it. A log was submitted; do you recall whether the log was for the entire depth of the well or --

A Yes, sir, we submitted a regular electric log.

Q It hadn't been cut off at the Wolfcamp?

A No.

Q Because that was the subject of that hearing?

A No, we submitted the entire log.

Q It would go all the way down to the Devonian?

A Yes.

Q This thing was authorized for disposal in 1965, how many barrels has the Wolfcamp taken to date, do you have any idea?

A 706,000 barrels.

Q And now the injection pressure is up to some 600 pounds?

A 2500, 2300 to 2500, depending on volumes.

Q How much are you currently injecting into the well, Mr. Sargent?

A Between 2,000 and 2500 barrels. Let me back up.

We are using two wells in the field; this is taking approximately half of it, say from a thousand to fifteen hundred barrels a day.

Q Is the Fleet down here a salt water disposal?

A Yes, it is, in the Wolfcamp.

Q You do still have some Wolfcamp production, and you have a Penn well or two?

A Yes, sir, the Penn well is the H.L. Fleet No. 1 in the northeast of the southwest of Section 35, that is the northeast of the southeast, excuse me, that is the Penn well; the Devonian is the State "C" No. 2 in the northwest of the northwest of Section 36. That's a Wolfcamp well. The rest of the wells in the field are Devonian.

Q Approximately 4,000 barrels a day is being produced, of water?

A Of water, 2,000 to 2500.

Q So each of these wells is taking about ten hundred to twelve hundred each?

A Yes, sir.

Q Has water production fairly well stabilized or is it going up?

A I believe it's stabilized due to capacity of the pump equipment.

Q Apparently from the structural map, the two nearest wells which are producing from any of these zones which you will be disposing of, are the Read No. 2 which is a southeast diagonal offset and the Read No. 4 which is a south offset?

A Yes, sir.

Q And it appears that the vertical difference between the top of the Devonian, between the Lowe "C" No. 1 and the Read No. 2, would be about 360 feet and it would be approximately 391 feet between the Lowe "C" No. 1 and the Read No. 4?

A 491 on the Read 4.

Q Right. And the nearest Pennsylvanian well would be over almost a mile away because it's down in the northeast southeast of Section 35.

A Yes, it would be approximately three-quarters of a mile.

Q And the nearest Wolfcamp well is approximately half a mile to the southeast, being your State "C" 2 and it's also some 400 feet higher than the Devonian?

A Yes, and separated by numerous faults. I believe the faulting would effectively separate the Wolfcamp and Pennsylvanian reservoirs from the injection zone in the H. L. Lowe "C".

Q Now, the Forest Lowe No. 1 is shown on Exhibit 1 as being a producer from the Wolfcamp, but Exhibit 3 shows it as being abandoned.

A Exhibit 1 should be corrected to show that well as plugged and abandoned.

Q That well has been abandoned, too?

A Yes.

Q Now, I got the top of the cement, on the long string, you said it was 8750?

A Yes.

Q What was the top on the intermediate?

A 215 feet.

Q That's back up in the surface piping?

A Yes, sir, that is indicated on the exhibit, too.

MR. NUTTER: Are there any other questions of Mr. Sargent? He may be excused.

(Witness excused.)

MR. NUTTER: Do you have anything further, Mr. Eaton?

MR. EATON: No, sir, Mr. Nutter.

MR. NUTTER: Does anyone have anything they wish to offer in Case 3718?

MR. HATCH: The Commission has received a waiver from

Brady Lowe to this application, a waiver of objection to the disposal.

MR. NUTTER: Thank you, Mr. Hatch. If nothing further in Case 3718, we will take the case under advisement and the hearing is adjourned.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

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

WITNESS my hand and seal this 5th day of February, 1968.

Ada Dearnley
Ada Dearnley

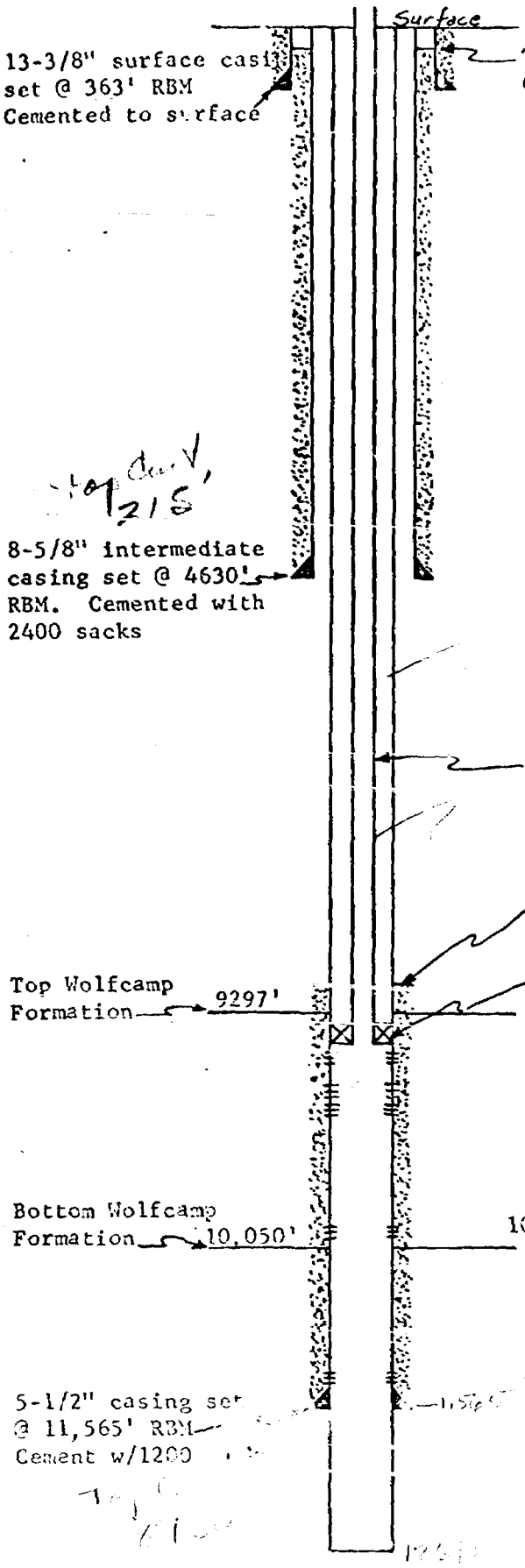
I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3718, heard by me on 1/24, 1968.

..... Examiner
New Mexico Oil Conservation Commission

I N D E X

EXHIBITS	MARKED	OFFERED AND ADMITTED
Applicant's 2 through 5	2	12

CABOT CORPORATION
LOWE "C" NO. 1
Proposed Salt Water Disposal Well



Proposed Disposal Interval
9406' - 12,690'

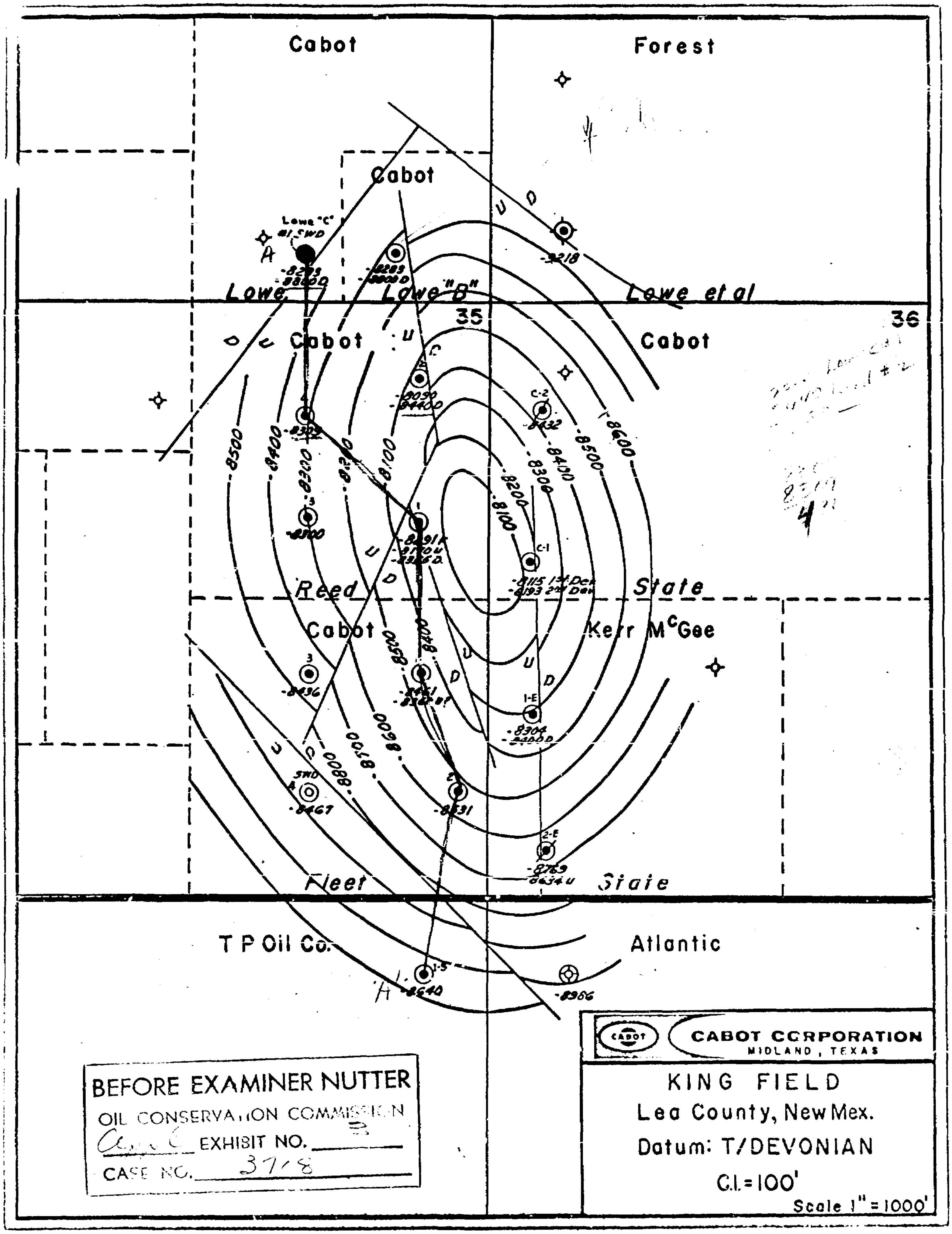
Perforations 10,000-37' produced
89,056 Bbls when abandoned.

Top Mississippian Formation 11,790'
Bottom Mississippian Formation 12,529'

Top Devonian Formation 12,665'

Open Hole Total Depth 12,690'

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 2
CASE NO.



BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
Cabot EXHIBIT NO. 3
CASE NO. 3718

A CABOT CORP. H.L. LOWE No. 1-C | CABOT CORP. REED No. 4 | CABOT CORP. REED No. 1 | CABOT CORP. H. FLEET No. 1 | CABOT CORP. H. FLEET No. 2 | T.P.C. & O. STATE No. 1-S A'

N — 7500 DATUM — S

11500 11500 11500 11500 11500 11500

C U U D D U U D D U U D

MISS. MISS. MISS.

12000 12000 12000 12000 12000 12000

W.D. W.D. W.D.

DEV. DEV. DEV.

12500 12500 12500 12500 12500 12500

T.D. 12,689 T.D. 12,585 T.D. 12,670 T.D. 12,841 P.B. 11,050 T.D. 12,625 12,664

T 13 S

R-37-E

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 4
CASE NO. 3718

CABOT CORPORATION
MIDLAND, TEXAS

KING FIELD
Lea Co., New Mex.
N-S Cross Section

SCALE: Horiz. 1" = 1000'
Vert. 1" = 200'

FORM LR 4A

CHEMICAL PROCESS
DIVISION OF BJ SERVICE, INC.
LABORATORY REPORT

BRINE OR WATER ANALYSIS DEPTH: 12,700' FORMATION: Devonian

Company Cabot Carbon Co. Farm State C Well No. 2

Location ____ County Lea State New Mexico Date 8-2-57

Pool King Samples Submitted by Mr. O'Quinn

SPECIFIC GRAVITY: 1.079
pH: 6.9

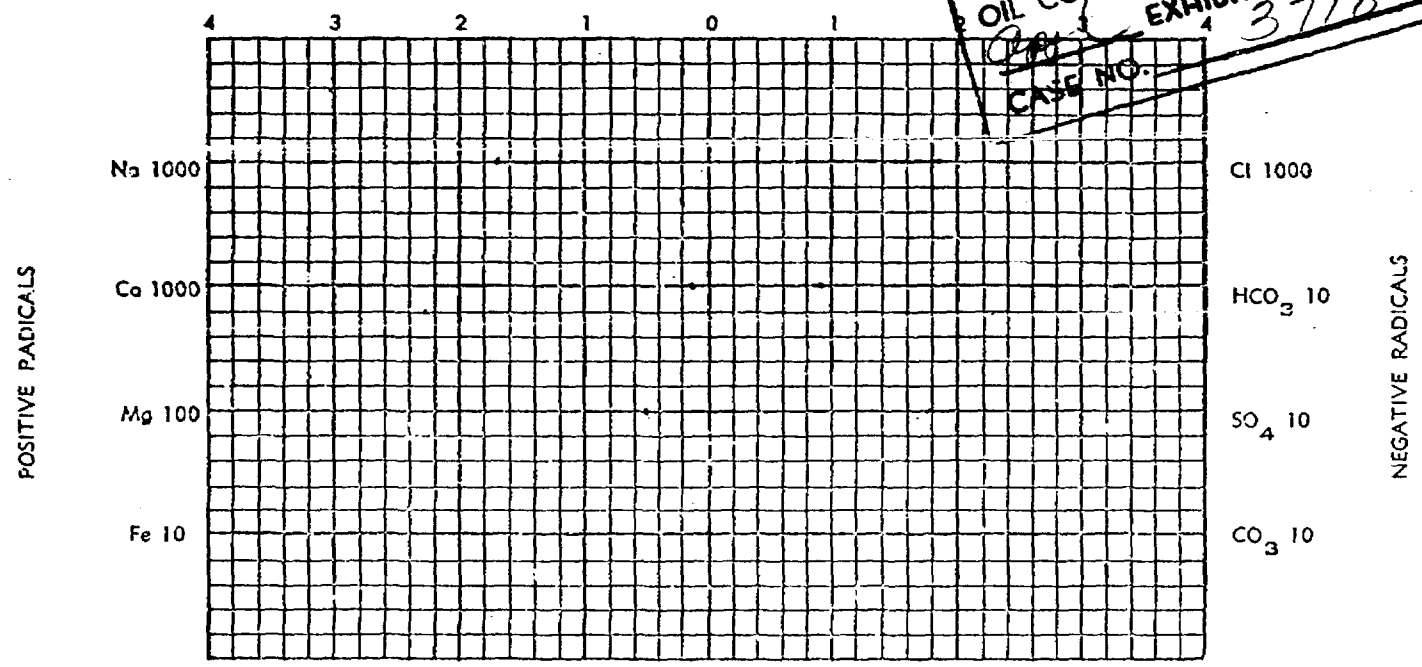
PRINCIPAL CONSTITUENTS

RADICAL	PARTS PER MILLION	REACTING VALUE	%TOTAL REACTING VALUE
SODIUM	39,200	1701.65	45.33
CALCIUM	2,460	123.00	3.28
MAGNESIUM	635	52.20	1.39
CHLORIDE	65,500	1850.00	49.29
SULPHATE	855	17.80	.47
BICARBONATE	550	9.05	.24

PRIMARY SALINITY:	90.66	PER CENT TOTAL REACTING VALUE
SECONDARY SALINITY:	8.86	PER CENT TOTAL REACTING VALUE
SECONDARY ALKALINITY:	.48	PER CENT TOTAL REACTING VALUE

General Remarks: Sample taken 8-1-57

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 5
CASE NO. 3718



Scale: Milliequivalents Per Liter

LAB. NO. 131-B Hobbs

DISTRICT Hobbs

ANALYZED BY AJ Signed [signature]

3M 11-56 2160 ABC PRESS, CRECKENRIDGE

DOWELL DIVISION OF THE DOW CHEMICAL COMPANY

FIELD LABORATORY REPORT

WATER ANALYSIS

TO: Cabot Carbon Company (Oil div.)

Box 4395

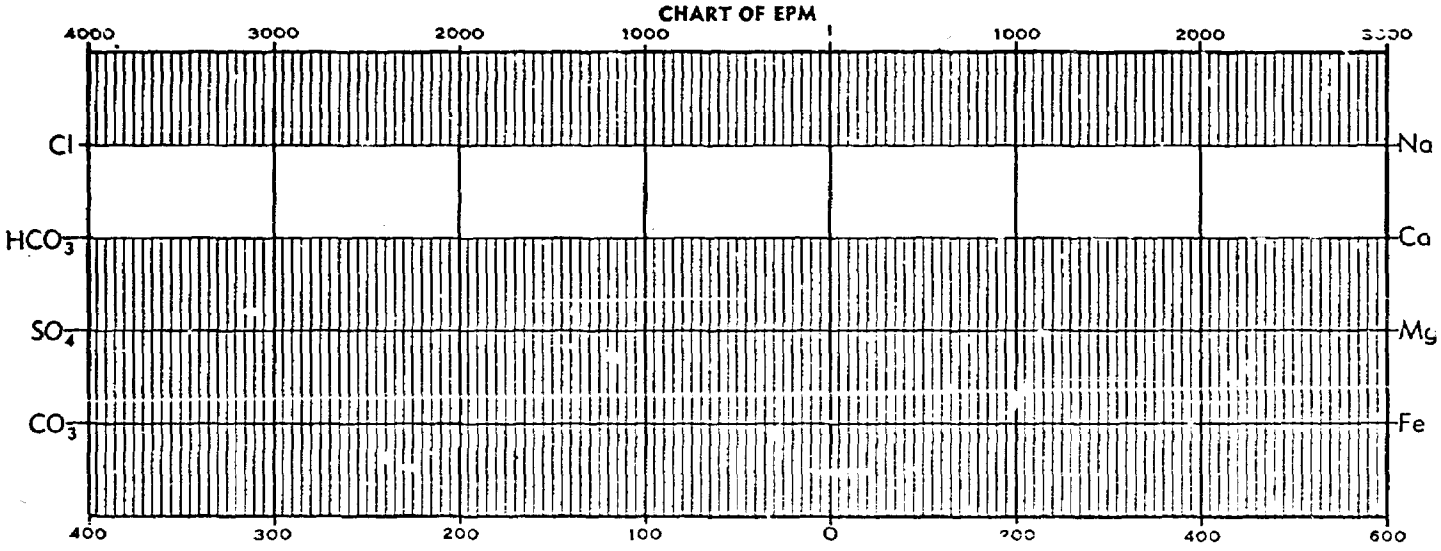
Midland, Texas

LABORATORY LOCATION: Hobbs, N.M.	REPORT NUMBER: 1501
COMPANY: Cabot Carbon	WELL: Fleet #1
POOL: King	LOCATION:
COUNTY: Lea	STATE: New Mexico
FORMATION: Penn	DEPTH: 10,000 Approximately
SUBMITTED BY: Bill Ross	TESTS DESIRED: Analysis
DATE SAMPLE SUBMITTED: 5-18-60	
SAMPLE SOURCE: Swab	

	PPM	EPM		PPM	EPM
CALCIUM	6000	300	CHLORIDE	92100 ✓	2579
MAGNESIUM	1470	120	SULFATE	1980	41
SODIUM	51245	2201	BICARBONATE	100	1
IRON			CARBONATE		
HYDROGEN SULFIDE			HYDROXIDE		

SPECIFIC GRAVITY: 1.117 AT 78 °F | pH 7.3 | $CoCl_2/MgCl_2$ | % SALT SATURATION:

CHART OF EPM



REMARKS:

James P. Glasgow 5-18-60

CHEMIST DATE

DWL-- 31-B

FORM LR 4A

B. J. SERVICE, INC.

LABORATORY REPORT

BRINE OR WATER ANALYSIS DEPTH: 10,172-10,179 FORMATION: Wolfcamp

Company Cabot Carbon Co. Form H.L. Lowe B Well No. 1

Location _____ County Lea State New Mexico Date 7-18-56

Pool King Samples Submitted by Mr. Hauk

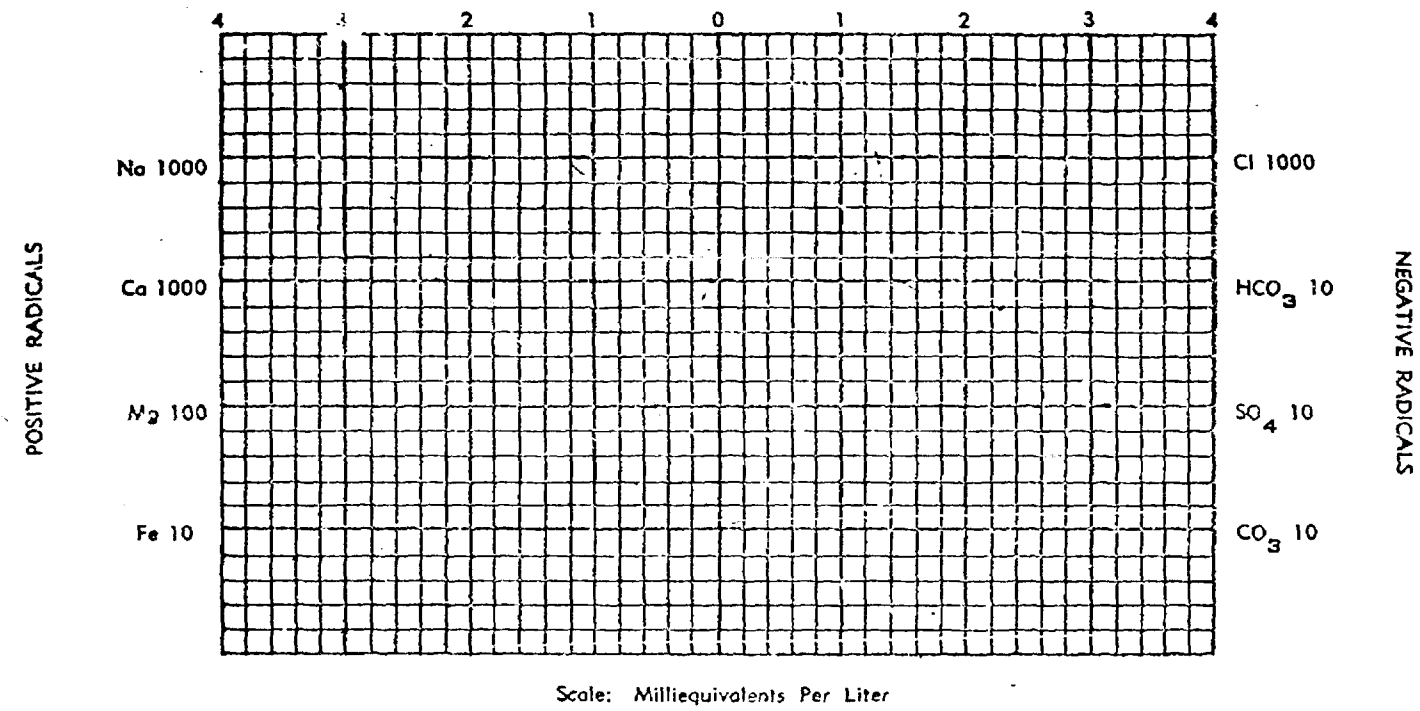
SPECIFIC GRAVITY: 1.062
pH: 7.6

PRINCIPAL CONSTITUENTS

RADICAL	PARTS PER MILLION	REACTING VALUE	%TOTAL REACTING VALUE
SODIUM	27,800	1208.30	45.23
CALCIUM	1,550	77.50	2.90
MAGNESIUM	606	49.90	1.87
CHLORIDE	45,700	1290.00	48.28
SULPHATE	1,510	31.40	1.18
BICARBONATE	870	14.30	.54

PRIMARY SALINITY:	90.46	PER CENT TOTAL REACTING VALUE
SECONDARY SALINITY:	8.46	PER CENT TOTAL REACTING VALUE
SECONDARY ALKALINITY:	1.08	PER CENT TOTAL REACTING VALUE

General Remarks:



Scale: Milliequivalents Per Liter

LAB. NO. 280-B Hobbs

DISTRICT Hobbs

ANALYZED BY AJ Signed _____

2M 3-58 32820 AEC—BRECKENRIDGE