NEW MEXICO OIL CONSERVATION DIVISION

STATE LAND OFFICE BUILDING

STATE OF NEW MEXICO

CASE NO. 10640

IN THE MATTER OF:

The Application of Arapaho Oil & Gas, for Salt Water Disposal, Eddy County, New Mexico.

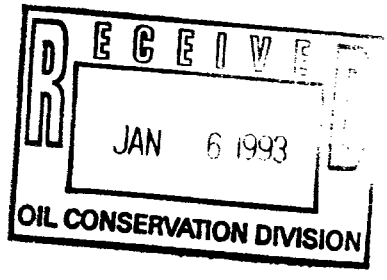
BEFORE:

MICHAEL E. STOGNER

Hearing Examiner

State Land Office Building

December 17, 1992



REPORTED BY:

CARLA DIANE RODRIGUEZ
Certified Court Reporter
for the State of New Mexico

ORIGINAL

A P P E A R A N C E S

FOR THE NEW MEXICO OIL CONSERVATION DIVISION:

ROBERT G. STOVALL, ESQ.
General Counsel
State Land Office Building
Santa Fe, New Mexico 87504

FOR THE APPLICANT:

CAMPBELL, CARR, BERGE & SHERIDAN, P.A.
Post Office Box 2208
Santa Fe, New Mexico 87504-2208
BY: **WILLIAM F. CARR, ESQ.**

I N D E X

E X H I B I T S

EXAMINER STOGNER: Call next case, out of order, No. 10640.

MR. STOVALL: Application of Arapaho Oil & Gas for salt water disposal, Eddy County, New Mexico.

EXAMINER STOGNER: Call for appearances.

MR. CARR: May it please the Examiner, my name is William F. Carr with the Santa Fe law firm, Campbell, Carr, Berge & Sheridan. We REPRESENT Arapaho Oil & Gas, and I have one witness.

EXAMINER STOGNER: Any other appearances?

Will the witness please stand to be sworn.

RANDALL L. HARRIS

Having been first duly sworn upon his oath, was examined and testified as follows:

EXAMINATION

BY MR. CARR:

Q. Would you state your name for the record?

A. My name is Randall Harris.

Q. Where do you reside?

A. I reside in Lake Arthur, New Mexico.

Q. Mr. Harris, by whom are you employed?

A. I'm employed as an exploration geologist and exploration manager for Ray Westhal Operating, Incorporated. However, today i AM representing Arapaho as an agent.

Q. Have you previously testified before this Division?

A. Yes, I have.

Q. At the time of that testimony were your credentials as a geologist accepted and made a matter of record?

A. Yes, they were.

Q. Are you familiar with the application filed in this case on behalf of Arapaho Oil & Gas?

A. Yes, sir, I am.

Q. And are you familiar with the proposed disposal well?

A. Yes, I am.

MR. CARR: Are the witness' qualifications acceptable?

EXAMINER STOGNER: They are.

Q. Mr. Harris, would you briefly state what you seek with this application?

abandoned wells, and also states the one-half mile area of review.

Q. And there are well symbols that indicate P & A'd wells and oil and gas wells within that area?

A. Yes, that's correct.

Q. Behind that is an additional plat. Does this plat show all leasehold ownership within two miles of the proposed injection well?

A. Yes, it does.

Q. Do any wells within the area of review actually penetrate the injection zone?

A. Yes. There are nine wells that penetrate the injection zones, and on the plat that we discussed earlier those have large circles drawn around them for easy identification.

Q. Does Exhibit No. 1 contain the information which is required by OCD rules of the C-108 for each of those wells?

A. Yes, it does.

Q. Are there any plugged and abandoned wells within the area of review?

A. Yes. There is one well that has penetrated the Lovington sand and that is the

A. We seek approval to convert the Arapaho Oil & Gas Cave State #3 into a water disposal well.

Q. Let's refer to what has been marked as Arapaho Exhibit No. 1. Would you identify that, please?

A. Yes. Exhibit No. 1 is a completed Form C-108 application for authorization to inject.

Q. What are going to be the injection zones in this well?

A. The injection zone will be the Lovington sand of the San Andres formation.

Q. Is this a new well or are you converting an older well?

A. We're converting an old well. It was originally drilled by JEM Resources in January of 1984, to test the Lovington sand.

Q. Is it currently producing?

A. Yes, it's currently producing somewhat less than one barrel per day.

Q. Could you refer to the plat contained in Exhibit No. 1, I think that's on page 6, and review that for Mr. Stogner?

A. The plat is a land map that gives locations of all wells, producing, plugged and

Highland Corporation #4 Levers, located in the southwest/southwest of Section 33 of 16/29.

Q. Could you review the schematic drawing on page 4 of this exhibit for the proposed injection well, and review for the Examiner exactly what Arapaho is proposing to do?

A. This well is currently perforated in the Lovington sand at a depth of 2449 through 2464. They propose to just inject into the same perforations without any additional stimulation.

They proposed to run 2-3/8ths plastic lined tubing and set it in a Baker Locset packer at 2400 feet.

Q. Will the annular space be filled with a fluid?

A. Yes.

Q. And will there be a pressure gauge at the surface to monitor the pressure in the annular space as required by the Federal Underground Injection Rules?

A. Yes.

Q. Into exactly what formation did you indicate you were proposing to inject?

A. We're going to propose to inject into the Lovington sand. It's within the San Andres

formation. It's approximately 50 foot into the San Andres formation and is approximately 24-feet thick in this well.

Q. What is the source of the water that you propose to inject into this well?

A. The source of water is other producing San Andres wells and Grayburg wells within this same area.

Q. These are Arapaho-operated wells?

A. Yes, these are all Arapaho-operated wells.

Q. What is Arapaho currently doing with that water?

A. They are currently disposing in other disposal wells within the unit.

Q. The reason for this application, is just they need additional capacity?

A. They're anticipating additional recompletions, which inevitably will bring in more water in this advanced stage of depletion.

Q. What volumes of water are they proposing to dispose of in this well?

A. They are anticipating 300 barrels of water per day on an average.

Q. What will the maximum rate be?

A. 400.
Q. Is this going to be a closed system?
A. Yes, it will be closed.
Q. Will injection be on vacuum or will you be required to use pressure?
A. Initially we believe that the pressure will be on vacuum until such time as the reservoir does catch up with energy. And we anticipate probably 150 pounds being necessary to put 300 barrels of water a day.
Q. Do you have a maximum pressure figure that you're anticipating needing to use?
A. The maximum pressure we envision would be 450 pounds.
Q. Would a pressure limitation of two-tenths pound per foot of depth to the top of the injection interval be satisfactory for the Arapaho proposal?
A. Yes.
Q. Does Exhibit No. 1 contain water analyses of the injection fluid?
A. Yes, it does.
Q. Do you anticipate any compatibility problems by injecting this water into this formation?

A. No. We have taken two water samples from the San Andres and from the Grayburg formations, different wells, and compared that to the water that has come out of the Cave State #3, and they are all compatible.

Q. Are there fresh water zones in the area?

A. None that have been found, although it's possible from surface to 250 foot in depth.

Q. There are no fresh water wells within the area of review?

A. No.

Q. Is a log of the proposed injection well on file with the Commission?

A. Yes, it is.

Q. Is Exhibit No. 2 a copy of an affidavit confirming that notice of today's hearing has been provided in accordance with OCD rules and with the requirements of Form C-108?

A. Yes, sir.

Q. To whom has notice been givin?

A. It has been sent to Fina Oil & Gas, and to the State Land Office.

Q. Does this include the surface owner and all offsetting operators within a half-mile of

the proposed injection well?

A. Yes, it does.

Q. Are you aware of similar applications that have been granted in this immediate area for disposal?

A. Yes, there's been several applications that have been granted.

Q. Are there any that you can identify in particular?

A. The most current one was approximately two years ago, converting the Red 12 #29. That would be located in the southeast of the southwest corner of the same section, Section 40.

Q. Is that injecting or disposing of water into the same formation?

A. Disposing in the San Andres formation.

Q. Have you examined the available geologic and engineering information on this area?

A. Yes, I have.

Q. As a result of that investigation, have you found evidence of any open faults or other hydrologic connections between the disposal zone and any underground source of drinking water?

A. No. There is no evidence.

Q. In your opinion, will approval of this application be in the best interest of conservation, the prevention of waste and the protection of correlative rights?

A. I do.

Q. Were Exhibits 1 and 2 prepared by you or compiled at your direction?

A. Yes, they were.

MR. CARR: At this time, Mr. Stogner, we move the admission of Arapaho Exhibits 1 and 2.

EXAMINER STOGNER: Exhibits 1 and 2 will be admitted into evidence at this time.

MR. CARR: That concludes my direct examination of Mr. Harris.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Harris, in looking at the plat, page 6 of Exhibit No. 1, there's quite a few oil wells within the half-mile review. What formation are those wells producing from?

A. The ones with the circles around them are producing out of the San Andres formation.

Q. How about the ones without the circles?

A. Without, they are producing from the

Grayburg.

Q. What's the pool out here that this production is attributed to?

A. The Cave Queen-Grayburg-San Andres.

Q. And that's considered common source in supply?

A. Yes, sir. There may be a clarification on that. The premier sand of the pool has been unitized.

Q. Okay. And you're referring to the Cave Unit belonging to Arapaho Oil & Gas as indicated on 6?

A. Yes.

Q. And that is the premier?

A. Yes. The premier is unitized sand of the Grayburg formation, but it is within the Cave Queen-Grayburg-San Andres pool.

Q. Is that an active waterflood?

A. No.

Q. Okay. Now, your source water again is going to be water from this particular area, from this unit, from the surrounding wells?

A. Yes, sir.

Q. Now, this well in this particular injection interval have been producing you said,

up to one barrel of oil per day?

A. Yes, that is correct.

Q. Are there any other wells surrounding immediately offsets that are producing from the same correlative interval?

A. There is one. It would be the Theos, which is located in Section 5 in the southwest of the northeast quarter. That is perforated exclusively in the Lovington sand interval also.

Q. Is there any stimulation technique or stimulation that is done to any of these wells within this half-mile review of the producing wells?

A. In the Lovington sand?

Q. We're talking about a common source and supply. We're talking about the Cave Grayburg-San Andres pool.

A. Yes, they all have been fracture-treated. Fracture treatments have ranged everywhere from 10,000 gallons, 20,000-pound sand, all the way up to 80,000 gallons, 100,000-pound sand. This pool has gone through numerous operators and numerous frac techniques.

Q. And you want to keep the injection or

the disposal within that, what you call the Lovington sand interval, but if it's been that badly fractured out there, what's the possibility of being able to do that?

A. It's about 50 feet into the San Andres, and that is zero percent porosity for that 50 feet. Below the Lovington sand it's virtually no porosity, either, until you get down into the lower slaughter (phonetic) section, approximately 500 feet lower. So I wouldn't anticipate much communication problems.

Q. Do you have a log in here that shows me that?

A. No, sir.

Q. Could you provide me one, a type log, per say?

A. Yes. The premier is waterflooded throughout this area.

Q. I thought you said it wasn't?

A. Oh, no, the premier is--I'm sorry, it's disposed. The premier originally was a waterflood. It has been abandoned. The wells that were considered injection wells have been reclassified as disposal wells.

Q. How many of those are there out there?

A. There are three.
Q. Are they on this map?
A. Yes, they are.
Q. Which ones are they?
A. The current producing ones, one of them is listed as the Hodges Federal #1, which is in the northwest of the northeast. On the land map it does show it as a dry hole. However, there is an injection arrow drawn through it.
MR. STOVALL: In Section 5, right?
THE WITNESS: Yes, sir, in Section 5.
Q. Northwest of the southeast?
A. No, northeast.
MR. STOVALL: Right on the edge of your half-mile area circled there, is that right?
Q. Looking at the northwest/northeast, I see two wells, #1 and 4. Or am I looking at Section 4, not 5? Okay, I'm sorry. Okay. The other two?
A. In the same section, Section 5, would be actually Unit P, southeast/southeast, and the third one that is currently under injection--I've lost it. Excuse me a minute. I had them right here in front of me.
Well #27, that's the one I just gave

you. Northwest quarter of the northwest quarter of Section 5, Well #8. I'm sorry, northwest quarter of the northeast quarter.

MR. STOVALL: We already discussed that one, didn't we?

THE WITNESS: We had that one, too. I'm sorry.

A. No, that must be the only two. I'm sorry. The other one has been plugged and abandoned. That was Kay pool #13.

Q. Now, you mentioned something about the #29 well that's down there in, I believe, Unit N of Section 4?

A. Yes, that's in the lower part of the San Andres.

Q. What kind of well?

A. A disposal well.

Q. In the San Andres. Do you have casing records of all the wells within the half-mile area of review?

A. Yes, sir.

Q. Is that in a tabulated form?

A. No, that's in the form of the completion reports. The one tabulated form, the schematic, is from the plugged and abandoned

well, the Levers.

Q. You say that's the only P & A'd well out there?

A. That has penetrated the Lovington sand, yes, sir.

Q. So when I see the other P & A markings, they don't penetrate that deep?

A. No.

Q. Are those wells covered in your tabulation?

A. No. They were not put into the C-108.

Q. Of the other wells that you reviewed, are there any potential communication through inadequate casing programs?

A. No, sir. They all have adequate cement behind the casing.

Q. Were you notified that this was to go to hearing or did you request this to go to hearing?

A. My understanding of the C-108, any time that you request to dispose in a formation that is currently producing within a mile, that necessitates a hearing.

Q. Okay. Do you anticipate any type of, say, waterflood activity that this might

stimulate some movement or production?

A. Not very likely, sir.

Q. And why is that, since we have a common source of supply out there?

A. The Lovington sand that we're going to be actually disposing in has been tested in two wells that I'm familiar with, including this one, and the production has been extremely low; noneconomic.

Q. But it's a common source of supply. You seem to be talking about several different pay zones out there, but it's a common source of supply. You got me confused here and you didn't provide me a type log of any kind to substantiate your reasoning that we have several different pay zones out there, like this Lovington sand, that premier, the San Andres, the Grayburg.

There again, it's common sources of supply. You got me very confused. Is there an impermeable layer between each one of these zones? But you said it's frac'd? But we're not going to have any type of communication problems per say from the injection from this well. Am I to understand this right?

A. The Grayburg wells, none of those have

penetrated through the Lovington sand. They were all completed from the Grayburg and higher. Therefore, I would not anticipate, from injecting into the Lovington sand, any communication up to those wells.

Q. And why is that?

A. They were not drilled deep enough to penetrate it.

Q. How about some of the wells that have penetrated?

A. They are perforated in the San Andres carbonate, 3- to 500 feet below the Lovington sand interval.

Q. And the cement is adequate to--

A. Yes, sir. They are virtually circulated, almost every one of them.

Q. Okay, now those wells have fracture treatment, is there any possibility that fracture came up into this Lovington sand?

A. Through the porosity that's in the San Andres carbonates, not very likely. We're talking about a 400-foot vertical fracture; not very likely in the San Andres.

EXAMINER STOGNER: Mr. Carr, if you'll provide me an adequate type log?

MR. CARR: We will, that will indicate each of the zones and the structure in between.

EXAMINER STOGNER: Yes, if you would, please, and describe that somewhat.

Any other questions of this witness at this time?

MR. STOVALL: Not me.

EXAMINER STOGNER: I'll hold the record open until I get that particular information, then, if there is nothing further in this particular case.

MR. CARR: We have nothing further, Mr. Stogner.

EXAMINER STOGNER: Let's take an extended recess for 30 minutes, then and reconvene at 1:00 o'clock.

(And the proceedings concluded.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10640 heard by me on December 1992.

Oil Conservation Division, Examiner

CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Carla Diane Rodriguez, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I caused my notes to be transcribed under my personal supervision; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL December 28, 1992.

Carla Diane Rodriguez

CARLA DIANE RODRIGUEZ, RPR
CCR No. 4

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

RECEIVED
NOV 16 1992
OIL CONSERVATION DIVISION

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: ☐ Secondary Recovery ☐ Pressure Maintenance ☒ Disposal ☐ Storage
Application qualifies for administrative approval? ☐ yes ☒ no

II. Operator: ARAPAHO OIL & GAS

Address: P.O. Dwr. 9 Carlsbad New Mexico 88221

Contact party: Randall L. Harris Phone: (505) 365-2237

III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? ☐ yes ☒ no
If yes, give the Division order number authorizing the project _____.

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

* VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

* X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)

* XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: Randall L. Harris Title Agent-Geologist

Signature: _____ Date: 11/2/92

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal. _____

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate Division district office.

BEFORE EXAMINER STOGNER
OIL CONSERVATION DIVISION
ARAPAHO EXHIBIT NO. 1
CASE NO. 10640

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; location by Section, Township, and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;

(3) the formation name and depth with expected maximum injection rates and pressures; and

(4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

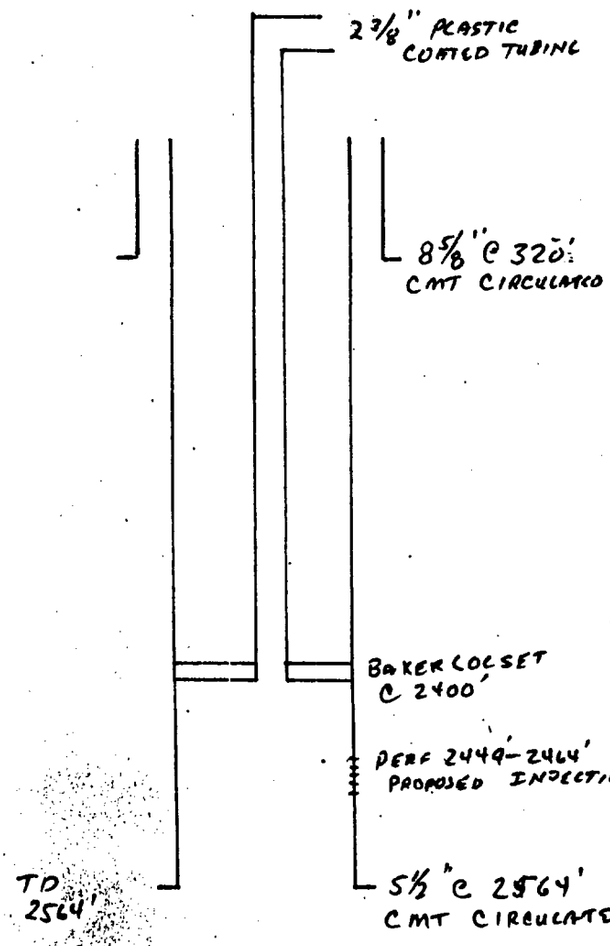
NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

III. WELL DATA

INJECTION WELL DATA SHEET

OPERATOR	LEASE			
Araphoe Oil & Gas	Cave State #3			
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE
3	1650 FNL & 330 FWL	4	17 South	29 East

Schematic



Tabular Data

Surface Casing

Size 8 5/8" Cemented with 320 sx.

TOC Circulated feet determined by visual

Hole size 12¼"

Intermediate Casing

Size _____" Cemented with _____ sx.

TOC _____ feet determined by _____

Hole size _____

Long string

Size 5½" Cemented with 925 sx.

TOC circulated feet determined by visual

Hole size 7 7/8"

Total depth 2564

Injection interval

2449 feet to 2464 feet perforated

(perforated or open-hole, indicate which)

Tubing size 2 3/8 lined with plastic (material) set in a

Baker Loc Set (brand and model) packer at 2400 feet

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation San Andres

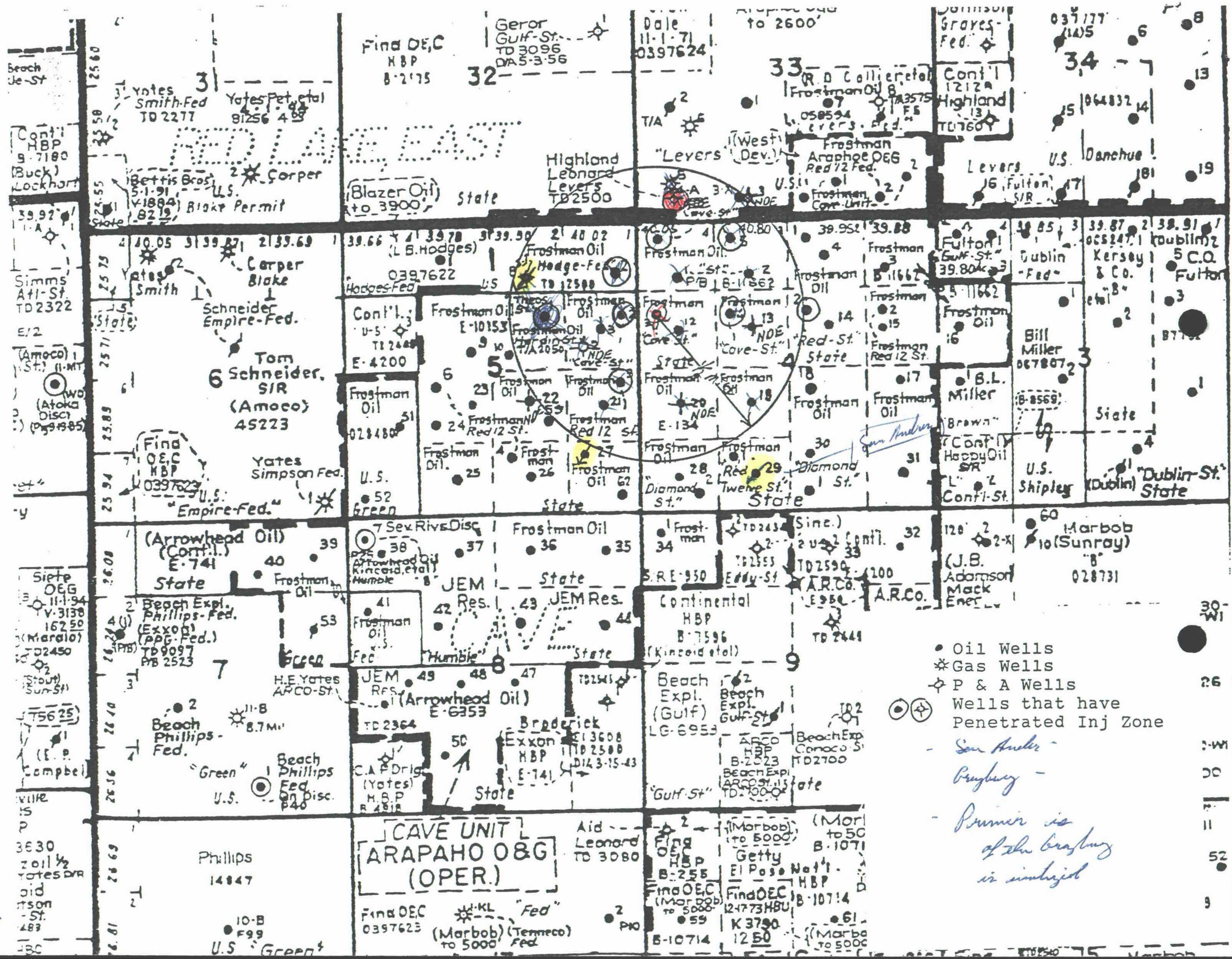
2. Name of Field or Pool (if applicable) Cave Grayburg-SanAndres

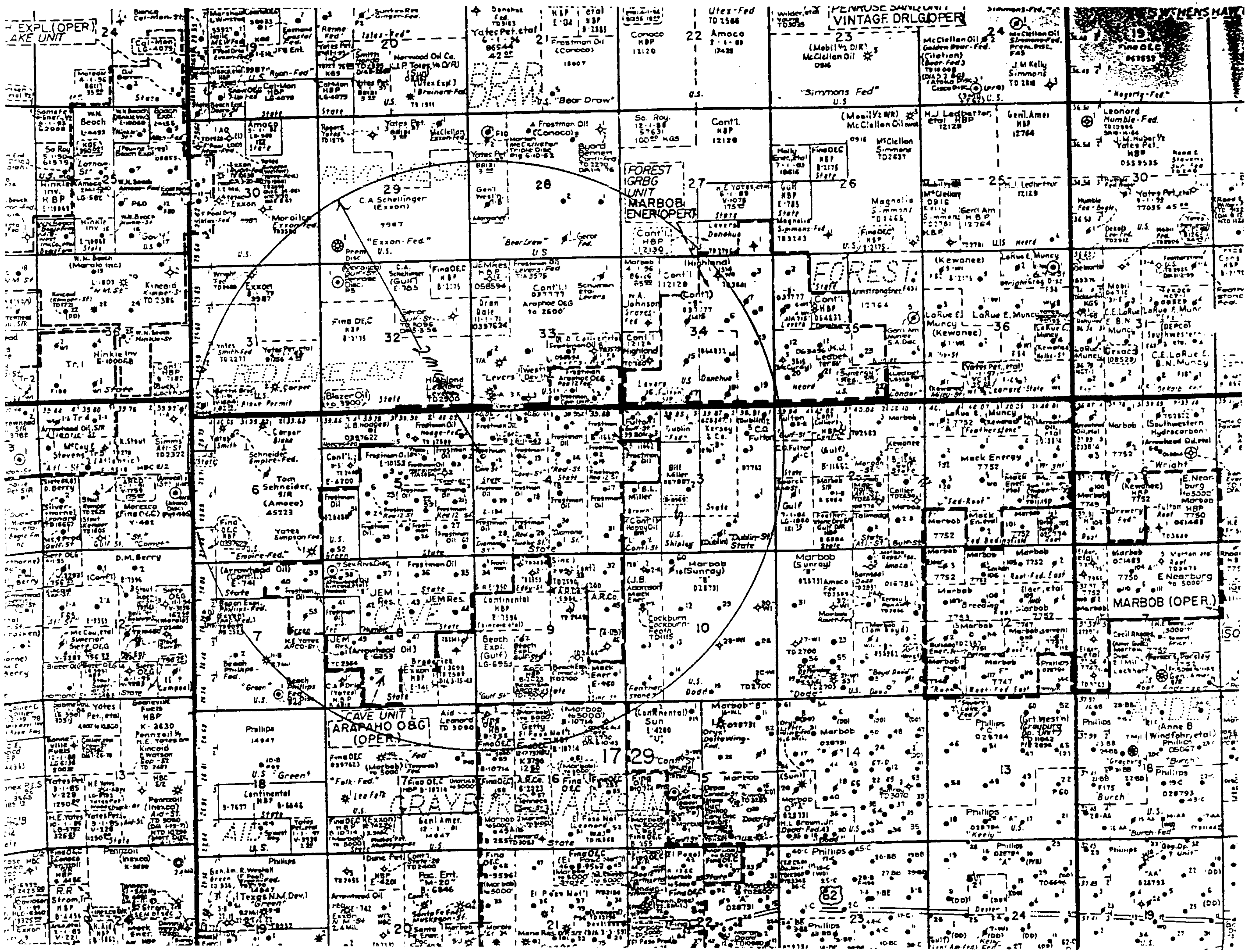
3. Is this a new well drilled for injection? ☐ Yes ☒ No

   If no, for what purpose was the well originally drilled? Oil Production

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail (sacks of cement or bridge plug(s) used) No other zones have been perforated

5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area. Grayburg 2360'-2390


RED LAKE EAST
Oil Wells
Gas Wells
P & A Wells
Wells that have Penetrated Inj Zone
- San Andres -
Grayburg -
- Premier is of the Grayburg is included
CAVE UNIT
ARAPAHO O&G (OPER.)
Tom Schneider, S/R (Amoco) 45223
Frostman Oil
Highland Leonard Levers TD2500
Continental HBP B-7596 (Kincaid et al)
Beach Expl. (Gulf) LG-6953
Phillips 14847
Marbob 10 (Sunray) "B" 028731
Bill Miller 067807
Dublin-St. State
JEM Res.
Arrowhead Oil E-6353
Broderick Exxon HBP E-741
Yates Simpson Fed.
Beach Phillips Fed.
Blazer Oil to 3900
Find OE,C HBP B-2175
6.



EXPL (OPER)
LAKE UNIT
PENROSE SAND UNIT
VINTAGE DRLG OPER
FOREST GRBG UNIT
MARBOB ENER (OPER)
MARBOB (OPER.)
CAVE UNIT
ARAPAHO O&G (OPER)
BEAR DRAW
RED LAKE EAST
FOREST
CAVE
2 MI

IV. Nine wells have penetrated the proposed injection zone within the ½ mile radius of the proposed injection well, with one well plugged. Well data attached.

VII. The average daily volume of 300 BWPD at 2 BPM. Expected maximum of 400 BWPD.

The system will be closed.

Average injection pressure of 150#, maximum of 450#.

Source of injection water is from the SanAndres Formation. Analysis of the water is attached.

The disposal zone does produce within one mile of the proposed injection well. Water analysis is attached.

VII. The proposed injection zone is the Lovington Sand of the SanAndres Formation. The Lovington Sand is a fine-grained Quartz sand with varing amounts of shales. It is 26 feet thick, at a depth of 2448-2474'. There is no sources of drinking water overlying or underlying the injection interval.

IX. No stimulation of the injection zone is proposed.

X. Well history is attached.

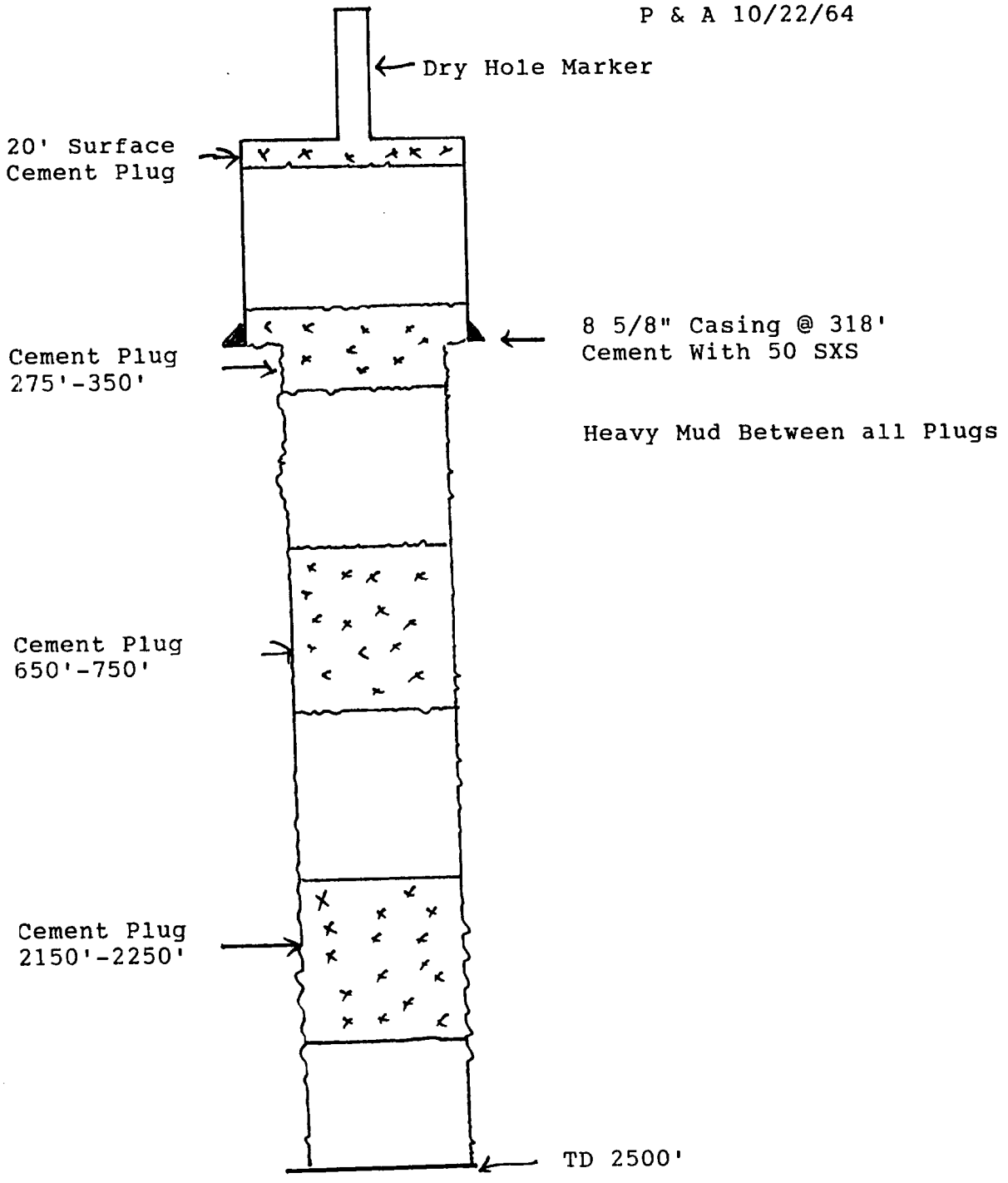
XI. There is no producing fresh water wells within one mile of the proposed disposal well.

XII. All available geologic and engineering data has been examined. No evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water has been found.

VI. WELL HISTORIES IN AREA OF REVIEW

Highland Corp.
4-Levers
330 FSL & 660 FWL
T16S-R29E

P & A 10/22/64



LEASE OR PERMIT TO PROSPECT .....

MAR 27 1959

U. S. GEOLOGICAL SURVEY
ARTESIA, NEW MEXICO

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

LOCATE WELL CORRECTLY

NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL
NOTICE OF INTENTION TO CHANGE PLANS
NOTICE OF INTENTION TO PULL OR ALTER CASING
NOTICE OF INTENTION TO SHOOT OR ACIDIZE
NOTICE OF INTENTION TO ABANDON WELL

SUBSEQUENT REPORT OF WATER SHUT-OFF
SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING
SUBSEQUENT REPORT OF ALTERING CASING
SUBSEQUENT REPORT OF RE-DRILLING OR REPAIR
SUBSEQUENT REPORT OF ABANDONMENT

LOG OF OIL OR GAS WELL

Company Highland Corporation Address 3926 Wilshire Boulevard, Los Angeles 5, California

Lessor or Tract Levers Field Forest State New Mexico

Well No. 4 Sec. 33 T. 16S R. 29E Meridian NMPM County Eddy

Location 330 ft. [N.] of South and 660 ft. [E.] of W Line of Sec. 33 Elevation
(Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed W. J. Pennington

Date March 16, 1959 Title Agent

The summary on this page is for the condition of the well at above date.

Commenced drilling January 24, 1959 Finished drilling February 20, 1959

OIL OR GAS SANDS OR ZONES

(Denote gas by G)

No. 1, from ..... to ..... No. 4, from ..... to .....

No. 2, from ..... to ..... No. 5, from ..... to .....

No. 3, from ..... to ..... No. 6, from ..... to .....

IMPORTANT WATER SANDS

No. 1, from 1175 to 1192 No. 3, from ..... to .....

No. 2, from ..... to ..... No. 4, from ..... to .....

CASING RECORD

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated From—	Perforated To—	Purpose
8 5/8				318					

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
5/8	318	50			

PLUGS AND ADAPTERS

N. M. O. C. C. COPY

[redacted]

Form 9-331a
(Feb. 1961)

No. 42-R358.4.

(SUBMIT IN TRIPLICATE)

Land Office Las Cruces
Lease No. [redacted]
Unit LC 037777A

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL		SUBSEQUENT REPORT OF WATER SHUT-OFF	
NOTICE OF INTENTION TO CHANGE PLANS		SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF		SUBSEQUENT REPORT OF ALTERING CASING	
NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL		SUBSEQUENT REPORT OF RE-DRILLING OR REPAIR	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE		SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO PULL OR ALTER CASING		SUPPLEMENTARY WELL HISTORY	X
NOTICE OF INTENTION TO ABANDON WELL			

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

10-28, 19 64

Well No. 4-Lewis is located 350 ft. from [S] line and 660 ft. from [W] line of sec. 35

[redacted] (Sec. and Sec. No.) 16 - 29 (Twp.) (Range) (Meridian)

Cave Pool (Field) Eddy (County or Subdivision) New Mexico (State or Territory)

The elevation of the derrick floor above sea level is ..... ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

Mudded hole from 2500' to 2350'- set 100' cement plug from 2250' to 2150' - set 100'cement plug from 750' to 650'set cement plug 350' to 275' Set 20' plug at surface.Heavy mud placed between all plugs. Back filled pit, cleaned location & Set regulation Marker

RECEIVED
JAN 14 1965
O. C. C.
ARTESIA, OFFICE

RECEIVED
NOV 5 1964
GEOLOGICAL SURVEY
ROSWELL, NEW MEXICO

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Highland Corp.

Address 3926 Wilshire Blvd.

Los Angeles 5, Calif.

By W. J. Pennington

Title Agent

GPO 914974

Title Agent

later than twenty days after completion of well. Follow instructions in Rules and Regulations of the Commission. Submit in QUINTUPLICATE. If State Land submit 6 Copies

AREA 640 ACRES
LOCATE WELL CORRECTLY

Continental Oil Company / State B-5
(Company or Operator) (Lease)

Well No. 2, in NE ¼ of SE ¼, of Sec. 5, T. 17S, R. 29E, NMPM.

Cave Pool, Eddy County.

Well is 1980 feet from South line and 660 feet from East line of Section 5. If State Land the Oil and Gas Lease No. is B-7556

Drilling Commenced March 14, 19 57 Drilling was Completed March 24, 19 57

Name of Drilling Contractor Denver Drilling Company

Address Odessa, Texas

Elevation above sea level at Top of Tubing Head 3616 The information given is to be kept confidential until ....., 19.....

OIL SANDS OR ZONES

No. 1, from 2370 to 2388 No. 4, from ..... to .....

No. 2, from ..... to ..... No. 5, from ..... to .....

No. 3, from ..... to ..... No. 6, from ..... to .....

IMPORTANT WATER SANDS

Include data on rate of water inflow and elevation to which water rose in hole.

No. 1, from ..... to ..... feet. .....

No. 2, from ..... to ..... feet. .....

No. 3, from ..... to ..... feet. .....

No. 4, from ..... to ..... feet. .....

CASING RECORD

SIZE	WEIGHT PER FOOT	NEW OR USED	AMOUNT	KIND OF SHOE	CUT AND PULLED FROM	PERFORATIONS	PURPOSE
7 5/8	24#	New	720	Guide Shoe			
4 1/2	9.5#	New	2393	Guide Shoe & Float	Collar		

MUDDING AND CEMENTING RECORD

SIZE OF HOLE	SIZE OF CASING	WHERE SET	NO. SACKS OF CEMENT	METHOD USED	MUD GRAVITY	AMOUNT OF MUD USED
	7 5/8	720	350	Pump & plug		
	4 1/2	2393	50	Pump & plug		

RECORD OF PRODUCTION AND STIMULATION

(Record the Process used, No. of Qts. or Gals. used, interval treated or shot.)

See attached sheet

DISTRIBUTION		
SANTA FE	✓	
FILE	✓	✓
U.S.G.S.		
LAND OFFICE		
OPERATOR	✓	

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

JUL 1982

O. C. D.
ARTESIA, OFFICE

Form C-103
Revised 10-1-78

5a. Indicate Type of Lease
State [x] Fee [ ]

5. State Oil & Gas Lease No.
B 11662

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT —" (FORM C-101) FOR SUCH PROPOSALS.)

OIL WELL [x] GAS WELL [ ] OTHER- ✓

7. Unit Agreement Name
CAVE POOL UNIT

Name of Operator
J E M Resources, Inc.

8. Farm or Lease Name
CAVE POOL UNIT

Address of Operator
P. O. Box 648 Artesia, New Mexico 88210

9. Well No.
5

Location of Well
UNIT LETTER C, 1980 FEET FROM THE W LINE AND 990 FEET FROM THE N LINE, SECTION 4 TOWNSHIP 17 RANGE 29 NMPM.

10. Field and Pool, or Wildcat
Cave Pool G-SA

15. Elevation (Show whether DF, RT, GR, etc.)
GR 3582

12. County
Eddy

Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK [ ]	PLUG AND ABANDON [ ]	REMEDIAL WORK [x]	ALTERING CASING [ ]
TEMPORARILY ABANDON [ ]		COMMENCE DRILLING OPNS. [ ]	PLUG AND ABANDONMENT [ ]
PULL OR ALTER CASING [ ]	CHANGE PLANS [ ]	CASING TEST AND CEMENT JOB [ ]	
OTHER [ ]		OTHER Deepen and change designation from CPU #5 to State #2 [ ]	

Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

Well was drilled out from original TD of 2417 to 2519. Lovington sand of the San Andres Formation was encountered at 2455-2465. Set packer at 2391 and treated with 10,000 gal. gelled water and 10,000 # sand. Swabbed back most of treatment and installed pump. 24 hour test 7-1-82 - 4 bbls oil and no water, gas TSTM. Left packer set at 2391- open hole 2417 -2519.

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

SIGNED Dalton Bell TITLE President DATE 7-2-82

APPROVED BY Mike Williams TITLE OIL AND GAS INSPECTOR DATE AUG 2 1982

CONDITIONS OF APPROVAL, IF ANY:

GEOLOGICAL SURVEY Artesia, New Mexico

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

NM 011331

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

1a. TYPE OF WELL: OIL WELL [X] GAS WELL [ ] DRY [ ] Other

b. TYPE OF COMPLETION: NEW WELL [ ] WORK OVER [ ] DEEP-EN [X] PLUG BACK [ ] DIFF. RESVR. [ ] Other DEC 11 1981

7. UNIT AGREEMENT NAME: ~~Cave Pool Unit~~

8. FARM OR LEASE NAME: Hodges Federal

2. NAME OF OPERATOR: J E M Resources, Inc. / O. C. D. ARTESIA, OFFICE

9. WELL NO.: F 2

3. ADDRESS OF OPERATOR: Box 648 Artesia, N. Mex. 88210

10. FIELD AND POOL, OR WILDCAT: Cave Grbg-San Andres

4. LOCATION OF WELL (*Report location clearly and in accordance with any State requirements*)*
At surface 990 Fr N. & 330 Fr E Sec. 5-17-29
At top prod. interval reported below Same
At total depth Same

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: Sec 5 17 29 NMPM

14. PERMIT NO.	DATE ISSUED	12. COUNTY OR PARISH	13. STATE
		Eddy	N. Mex.

15. DATE SPUDDED	16. DATE T.D. REACHED	17. DATE COMPL. (*Ready to prod.*)	18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*	19. ELEV. CASINGHEAD
5-5-80	7-24-80	9-1-81	3603 DF	3601

20. TOTAL DEPTH, MD & TVD	21. PLUG, BACK T.D., MD & TVD	22. IF MULTIPLE COMPL., HOW MANY*	23. INTERVALS DRILLED BY	ROTARY TOOLS	CABLE TOOLS
2505 (Old TD 2426)			→	77'	2'

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*
2450-2460 San Andres (Lovington)

25. WAS DIRECTIONAL SURVEY MADE: No

26. TYPE ELECTRIC AND OTHER LOGS RUN
Gamma Ray-Neutron

27. WAS WELL CORED: No

RECEIVED DEC 09 1981 OIL & GAS U.S. GEOLOGICAL SURVEY ROSWELL, NEW MEXICO

28. CASING RECORD (*Report all strings set in well*)

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
Old Casing Info On File. New is Open Hole 79'					

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT	SCREEN (MD)

ACCEPTED FOR RECORD PETER W. CHESTER DEC 9 1981 U.S. GEOLOGICAL SURVEY ROSWELL, NEW MEXICO

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)

31. PERFORATION RECORD (*Interval, size and number*)
Open Hole 2426-2505

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
2450-60	500 Gal Mud Acid
"	30,000 Gal Gel. H_2O &
	30,000 # Sand

33.* PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (*Flowing, gas lift, pumping—size and type of pump*)	WELL STATUS (*Producing or shut-in*)
9-2-81	Fl.	S.I.

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD →	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
9-2-81	24	16/64			150MCFPD	0	

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE →	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
150	0(Pack)		Same			

34. DISPOSITION OF GAS (*Sold, used for fuel, vented, etc.*)
Sold

TEST WITNESSED BY: Bell & Logsdon.

35. LIST OF ATTACHMENTS
Gamma Ray- Neutron Logs, Explanation of Number & Lease Designation

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED _____ TITLE Pres. DATE _____

*(See Instructions and Spaces for Additional Data on Reverse Side)

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OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

DEC 17
DEC 18 1984
O C D
ARTESIA, OFFICE

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

State ☒ Fee ☐

5. State Oil & Gas Lease No.: B-7596

1a. TYPE OF WELL: OIL WELL [X] GAS WELL [ ] DRY [ ] OTHER

b. TYPE OF COMPLETION: NEW WELL [X] WORK OVER [ ] DEEPEN [ ] PLUG BACK [ ] DIFF. RESVR. [ ] OTHER

7. Unit Agreement Name:

8. Farm or Lease Name: Red Twelve State

2. Name of Operator: J.E.M. Resources Inc.

9. Well No.: 3

3. Address of Operator: P.O. Box 2938 Ruidoso, N.M. 88345

10. Field and Pool, or Wildcat: Cave GB/SA

4. Location of Well: UNIT LETTER I LOCATED 2310 FEET FROM THE South LINE AND 330 FEET FROM THE East LINE OF SEC. 5 TWP. 17S RGE. 29E NMPM

12. County: Eddy

15. Date Spudded	16. Date T.D. Reached	17. Date Compl. (Ready to Prod.)	18. Elevations (DF, RKB, RT, GR, etc.)	19. Elev. Cashinghead
9-5-84	9-12-84	10-3-84	3603 GR	3604

20. Total Depth	21. Plug Back T.D.	22. If Multiple Compl., How Many	23. Intervals Drilled By	Rotary Tools	Cable Tools
3550	3528		→	All	

24. Producing Interval(s), of this completion — Top, Bottom, Name: 3004-3434 San Andres

25. Was Directional Survey Made: NO

26. Type Electric and Other Logs Run: CNL/FDC/DLL

27. Was Well Cored: NO

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT LB./FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
8 5/8	24#	350	12¼	350 sxs	None
5½	17#	3550	7 7/8	850 sxs	none

29. LINER RECORD

SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN

30. TUBING RECORD

SIZE	DEPTH SET	PACKER SET
2 5/8	3450	Free

31. Perforation Record (Interval, size and number): 3004-3434 37 0.36 cal. shots

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED
3004-3434	5500 gal 15% HCL
	130,000 gal gel wtr.
	243,000 # 20/40 sd

33. PRODUCTION

Date First Production	Production Method (Flowing, gas lift, pumping — Size and type pump)	Well Status (Prod. or Shut-in)
10-20-84	Pump	Prod

Date of Test	Hours Tested	Choke Size	Prod'n. For Test Period →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Gas — Oil Ratio
11-28-84	24	7/8"		60	200	250	~~40:1~~ 3333:1

Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Oil Gravity — API (Corr.)
0	20#					

34. Disposition of Gas (Sold, used for fuel, vented, etc.): Sold

Test Witnessed By: Rex Glenn

35. List of Attachments: Logs Deveation Survey

36. I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief.

SIGNED _____ TITLE Geologist DATE 12/14/84

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

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OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

RECEIVED

5a. Indicate Type of Lease: State [XX] Fee [ ]
5. State Oil & Gas Lease No.: B 7017

1a. TYPE OF WELL: Oil Well [XX] Gas Well [ ] Dry [ ] Other
b. TYPE OF COMPLETION: New Well [XX] Work Over [ ] Deepen [ ] Plug Back [ ] Diff. Resvr. [ ] Other

7. Unit Agreement Name: CPU
8. Farm or Lease Name: Cave pool Unit
2. Name of Operator: JEM Resources Inc. ✓
9. Well No.: 57
3. Address of Operator: P.O. Box 2938 Ruidoso NM. 88345
10. Field and Pool, or Wildcat: Cave GB/SA
4. Location of Well: Unit Letter F Located 1650 Feet from the North Line and 1650 Feet from the West Line of Sec. 4 Twp. 17 S Rge. 29 E NMPM
12. County: Eddy

15. Date Spudded	16. Date T.D. Reached	17. Date Compl. (Ready to Prod.)	18. Elevations (DF, RKB, RT, GR, etc.)	19. Elev. Cashinghead
2/14/84	2/19/84	3/25/84	3589 Gr.	3590

20. Total Depth	21. Plug Back T.D.	22. If Multiple Compl., How Many	23. Intervals Drilled By	Rotary Tools	Cable Tools
2556	2545		→	all	

24. Producing Interval(s), of this completion — Top, Bottom, Name: 2421-2500 Grayburg/Sanandres
25. Was Directional Survey Made: no
26. Type Electric and Other Logs Run: CNL/FDC GRN/CCL
27. Was Well Cored: no

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT LB./FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
8 5/8	24	355	12¼	225 Circulated	none
5½	15.5	2556	7 7/8	550 Circulated	none

29. LINER RECORD

SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN

30. TUBING RECORD

SIZE	DEPTH SET	PACKER SET
2 3/8	2510	free

31. Perforation Record (Interval, size and number): 2421-2500 24 .42 cal.

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED
2421-2500	5250 gal 15% HCl
	35,000 gal KCl wtr
	50,000# 20/40 sd

33. PRODUCTION

Date First Production	Production Method (Flowing, gas lift, pumping — Size and type pump)	Well Status (Prod. or Shut-in)
~~2421-2500~~ 3-26-84	pump 1.75" locno	prod

Date of Test	Hours Tested	Choke Size	Prod'n. For Test Period →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Gas—Oil Ratio
4/1/84	24	7/8"		48	62	20	1.29

Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Oil Gravity — API (Corr.)

34. Disposition of Gas (Sold, used for fuel, vented, etc.): vented
Test Witnessed By: Jay Roye

35. List of Attachments: Deviation survey logs

36. I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief.

SIGNED _____ TITLE Geologist DATE 4/26/84

DISTRIBUTION		
SANTA FE		
FILE		
U.S.G.S.		
LAND OFFICE		
OPERATOR		

NEW MEXICO OIL CONSERVATION COMMISSION

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

Form C-105
Revised 1-1-65

5a. Indicate Type of Lease: State [X] Fee [ ]

5. State Oil & Gas Lease No.: B-11662

1a. TYPE OF WELL

b. TYPE OF COMPLETION: NEW WELL [X] WORK OVER [ ] DEEPEN [ ] PLUG BACK [ ] DIFF. RESVR. [ ] OTHER [ ]

OIL WELL [ ] GAS WELL [ ] DRY [ ] OTHER [ ]

7. Unit Agreement Name:

8. Farm or Lease Name: cave state

2. Name of Operator: J.E.M. Resources Inc.

9. Well No.: 1

3. Address of Operator: P.O. Box 2938 Ruidoso, N.M. 88345

10. Field and Pool, or Wildcat: CAve-Grbg-SA

4. Location of Well

UNIT LETTER D LOCATED 330 FEET FROM THE North LINE AND 330 FEET FROM THE West LINE OF SEC. 4 TWP. 17S RGE. 29E NMPM

12. County: Eddy

15. Date Spudded	16. Date T.D. Reached	17. Date Compl. (Ready to Prod.)	18. Elevations (DF, RKB, RT, GR, etc.)	19. Elev. Cashinghead
11-15-83	12-9-83	12-27-83	3602.2 GR	3604

20. Total Depth	21. Plug Back T.D.	22. If Multiple Compl., How Many	23. Intervals Drilled By	Rotary Tools	Cable Tools
2540	2504		→	2540	

24. Producing Interval(s), of this completion — Top, Bottom, Name

2464-~~2465~~ 2475 San Andres

25. Was Directional Survey Made: NO

26. Type Electric and Other Logs Run: CNL/FDC GRN CMT. BOND

27. Was Well Cored: NO

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT LB./FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
8 5/8	24#	338	12¼	220 sxs Circulated	0
5½	15.5	2540	7 7/8	1320 sxs Circulated	0

29. LINER RECORD

SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN

30. TUBING RECORD

SIZE	DEPTH SET	PACKER SET
2 3/8	2403	

31. Perforation Record (Interval, size and number)

2464-75
Total 28 .40 cal.

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED
2464-75	1250 gal 15% HCl
"	60,000 gal Gel H20
	125,000 #sd.

33. PRODUCTION

Date First Production	Production Method (Flowing, gas lift, pumping — Size and type pump)	Well Status (Prod. or Shut-in)
12-27-83	Pump 1½" Loc-No	Prod.

Date of Test	Hours Tested	Choke Size	Prod'n. For Test Period →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Gas—Oil Ratio
1-15-84	24	7/8		42	110	20	2682

Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Oil Gravity — API (Corr.)

34. Disposition of Gas (Sold, used for fuel, vented, etc.): vented

Test Witnessed By: Herb Spencer

35. List of Attachments: Logs Deviation Survey

36. I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief.

SIGNED _____ TITLE Geologist DATE 1/20/84

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

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OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

5a. Indicate Type of Lease: State [XX] Fee [ ]
5. State Oil & Gas Lease No.:

1a. TYPE OF WELL
b. TYPE OF COMPLETION
OIL WELL [XX] GAS WELL [ ] DRY [ ] OTHER
NEW WELL [XX] WORK OVER [ ] DEEPEN [ ] PLUG BACK [ ] DIFF. RESVR. [ ] OTHER

7. Unit Agreement Name: C.P.U.
8. Farm or Lease Name: Cave Pool Unit
9. Well No.: 64
10. Field and Pool, or Wildcat: Cave GB/SA

2. Name of Operator: J.E.M. Recources Inc. ✓
3. Address of Operator: P.O. Box 2938, Ruidoso NM 88345
4. Location of Well
UNIT LETTER C LOCATED 330 FEET FROM THE North LINE AND 1650 FEET FROM THE West LINE OF SEC. 4 TWP 17 S RGE. 29 E NMPM
12. County: Eddy

15. Date Spudded	16. Date T.D. Reached	17. Date Compl. (Ready to Prod.)	18. Elevations (DF, RKB, RT, GR, etc.)	19. Elev. Cashinghead
4/9/84	4/15/84	5/11/84	3588 Gr.	3589

20. Total Depth	21. Plug Back T.D.	22. If Multiple Compl., How Many	23. Intervals Drilled By →	Rotary Tools	Cable Tools
2683	2550			all	

24. Producing Interval(s), of this completion — Top, Bottom, Name: 2212-2262, 2458-2519 Grayburg/SanAndres
25. Was Directional Survey Made: no
26. Type Electric and Other Logs Run: CNL/FDC/GR, CBL/CCL
27. Was Well Cored: no

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT LB./FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
8 5/8	24#	345	12¼	275 Circulated	none
5½	15.5#	2683	7 7/8	950 Circulated	none

29. LINER RECORD

SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN

30. TUBING RECORD

SIZE	DEPTH SET	PACKER SET
2 3/8	2520	free

31. Perforation Record (Interval, size and number)
2458-2519, 20, .40 cal
2212-2262, 20, .40 cal

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED
2458-2519	3000 gal 15% HCl
2212-2262	1500 gal 15% HCl
all Perfs	30,000 gal gel KCl+
	42,000# 20/40 sd

33. PRODUCTION

Date First Production	Production Method (Flowing, gas lift, pumping — Size and type pump)	Well Status (Prod. or Shut-in)
5/1/84	Pump and Flow	Prod

Date of Test	Hours Tested	Choke Size	Prod'n. For Test Period →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Gas — Oil Ratio
6/1/84	24 Hr.	7/8"		45	175	15	3.8:1

Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Oil Gravity — API (Corr.)

34. Disposition of Gas (Sold, used for fuel, vented, etc.): Vented
Test Witnessed By: Jay Roye
35. List of Attachments: Deviation survey
36. I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief.

SIGNED [signature] TITLE Geologist DATE 6/7/84

OFF ADR

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OIL CONSERVATION DIVISION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

ARTESIA, OFFICE

5a. Indicate Type of Lease: State [X] Fee [ ]

5. State Oil & Gas Lease No.: B-7596

1a. TYPE OF WELL: O

b. TYPE OF COMPLETION: NEW WELL [X] WORK OVER [ ] DEEPEN [ ] PLUG BACK [ ] DIFF. RESVR. [ ] OTHER [ ]

OIL WELL [X] GAS WELL [ ] DRY [ ] OTHER [ ]

Completed

7. Unit Agreement Name:

8. Farm or Lease Name: RED STATE

2. Name of Operator: J.E.M. RESOURCES INC

9. Well No.: 2

3. Address of Operator: P.O BOX 2938, RUIDOSO NM 88345

10. Field and Pool, or Wildcat: CAVE GB/SA

4. Location of Well: UNIT LETTER G LOCATED 1650 FEET FROM THE NORTH LINE AND 2310 FEET FROM THE EAST LINE OF SEC. 4 TWP. 17 S RGE. 29 E NMPM

12. County: EDDY

15. Date Spudded	16. Date T.D. Reached	17. Date Compl. (Ready to Prod.)	18. Elevations (DF, RKB, RT, GR, etc.)	19. Elev. Cashinghead
6/25/84	7/1/84	7/9/84	3585 GR.	3587

20. Total Depth	21. Plug Back T.D.	22. If Multiple Compl., How Many	23. Intervals Drilled By →	Rotary Tools	Cable Tools
3118	3075			ALL	

24. Producing Interval(s), of this completion — Top, Bottom, Name: 2621-2999 SAN ANDRES

25. Was Directional Surv Made: X/O

26. Type Electric and Other Logs Run: CNL/FDC DLL/RXO

27. Was Well Cored: X/O

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT LB./FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
8 5/8	24 #	350	12 1/4	250 SXS CIR	NONE
5 1/2	15.5 #	3118	7 7/8	800 SXS CIR	NONE

29. LINER RECORD

SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN

30. TUBING RECORD

SIZE	DEPTH SET	PACKER SET
2 3/8	3005	NO PKR

31. Perforation Record (Interval, size and number): 2621-2999 25 .40 CAL

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED
2621-2999	3300 GAL 15% NEFE
	140,000 GAL GEL H_2O +
	195,000 # 20/40 Sd

33. PRODUCTION

Date First Production	Production Method (Flowing, gas lift, pumping — Size and type pump)	Well Status (Prod. or Shut-in)
7/14/84	Pump	PROD

Date of Test	Hours Tested	Choke Size	Prod'n. For Test Period →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Gas — Oil Ratio
7/16/84	24 hr.	7/8		100	300	200	300

Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Oil Gravity — API (Corr.)

34. Disposition of Gas (Sold, used for fuel, vented, etc.): SOLD

Test Witnessed By: REX GLEN

35. List of Attachments: LOGS DEVIATION SURVEY

36. I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief.

SIGNED [signature] TITLE CONSULTING GEOLOGIST DATE 8/6/84

STATE OF NEW MEXICO
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OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

5a. Indicate Type of Lease: State [X] Fee [ ]
5. State Oil & Gas Lease No.: E4200

1a. TYPE OF WELL: OIL WELL [ ] GAS WELL [ ] DRY [ ] OTHER
b. TYPE OF COMPLETION: NEW WELL [X] WORK OVER [ ] DEEPEN [ ] PLUG BACK [ ] DIFF. RESVR. [ ] OTHER

7. Unit Agreement Name:
8. Farm or Lease Name: Cave State
2. Name of Operator: J.E.M. Resources Inc.
9. Well No.: 2
3. Address of Operator: P.O. Box 2938 Ruidoso, N.M. 88345
10. Field and Pool, or Wildcat: Cave - Grbg - SA
4. Location of Well: UNIT LETTER H LOCATED 1650 FEET FROM THE North LINE AND 330 FEET FROM THE east LINE OF SEC. 5 TWP. 17S RGE. 29E NMPM
12. County: Eddy

15. Date Spudded	16. Date T.D. Reached	17. Date Compl. (Ready to Prod.)	18. Elevations (DF, RKB, RT, GR, etc.)	19. Elev. Cashinghead
12-11-83	12-16-83	1-5-84	3406 GR	3408

20. Total Depth	21. Plug Back T.D.	22. If Multiple Compl., How Many	23. Intervals Drilled By	Rotary Tools	Cable Tools
2530	2505		→	2530	

24. Producing Interval(s), of this completion — Top, Bottom, Name: 2447-2468 San Andres
25. Was Directional Survey Made: no
26. Type Electric and Other Logs Run: CNL /FDC / Cmt. Bond CCL
27. Was Well Cored: no

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT LB./FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
8 5/8	24#	327	12¼	481 sxs Circulated	none
5½	15.5 #	2530	7 7/8	875 sxs Circulated	none

29. LINER RECORD

SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN

30. TUBING RECORD

SIZE	DEPTH SET	PACKER SET
2 3/8	2420	

31. Perforation Record (Interval, size and number)
2447-2468 28 .40 cal shots.

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED
2447-2468	2500 gal 15% HCl
" "	70,000 gal Gel Wtr.
	120,000 # sd.

33. PRODUCTION

Date First Production	Production Method (Flowing, gas lift, pumping — Size and type pump)	Well Status (Prod. or Shut-in)
1-5-84	PUMP 1½". Loc NO	Prod.

Date of Test	Hours Tested	Choke Size	Prod'n. For Test Period →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Gas — Oil Ratio
1-15 84	24	7/8"		411	111	18	2707

Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Oil Gravity — API (Corr.)

34. Disposition of Gas (Sold, used for fuel, vented, etc.): ented
Test Witnessed By: Herb Spencer
35. List of Attachments

36. I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief.

SIGNED [signature] TITLE GEOLOGIST DATE 1-20-84

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ENERGY AND MINERALS DEPARTMENT

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OIL CONSERVATION DIVISION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

5a. Indicate Type of Lease: State [X] Fee [ ]

5. State Oil & Gas Lease No.: E 10163

1a. TYPE OF WELL: OIL WELL [X] GAS WELL [ ] DRY [ ] OTHER

b. TYPE OF COMPLETION: NEW WELL [X] WORK OVER [ ] DEEPEN [ ] PLUG BACK [ ] DIFF. RESVR. [ ] OTHER

7. Unit Agreement Name:

8. Farm or Lease Name: Theos State

2. Name of Operator: J.E.M. Resources INC.

9. Well No.: 1

3. Address of Operator: P.O. Box 2938 Ruidoso, NM 88345

10. Field and Pool, or Wildcat: Cave Gb-Sa

4. Location of Well

UNIT LETTER G LOCATED 1650 FEET FROM THE North LINE AND 1650 FEET FROM THE East LINE OF SEC. 5 TWP. 17 S RGE. 29 E NMPM

12. County: Eddy

15. Date Spudded	16. Date T.D. Reached	17. Date Compl. (Ready to Prod.)	18. Elevations (DF, RKB, RT, GR, etc.)	19. Elev. Cashinghead
12/29/83	1/4/84	1/12/84	3613 Gr.	3615

20. Total Depth	21. Plug Back T.D.	22. If Multiple Compl., How Many	23. Intervals Drilled By	Rotary Tools	Cable Tools
2550	2522		→	2550	

24. Producing Interval(s), of this completion — Top, Bottom, Name: SanAndres 2453-2467

25. Was Directional Surv Made: no

26. Type Electric and Other Logs Run: GrN CBL CCL

27. Was Well Cored: no

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT LB./FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
8 5/8	24	324	12¼	350 sxs Circulated	none
5½	15.5	2550	7 7/8	735 sxs Circulated	none

29. LINER RECORD

SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN

30. TUBING RECORD

SIZE	DEPTH SET	PACKER SET
2 3/8	2400	

31. Perforation Record (Interval, size and number)

2453-2467 28 .40 cal shots

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED
2453-2467	2500 gal 15% HCl
	40,000 gal gel KCl wtr
	76,000# sd

33. PRODUCTION

Date First Production	Production Method (Flowing, gas lift, pumping — Size and type pump)	Well Status (Prod. or Shut-in)
1/14/84	Pump	Prod

Date of Test	Hours Tested	Choke Size	Prod'n. For Test Period →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Gas—Oil Ratio
1/24/84	24	7/8		50	285	12	5700

Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Oil Gravity — API (Corr.)

34. Disposition of Gas (Sold, used for fuel, vented, etc.): vented

Test Witnessed By: Herb Spencer

35. List of Attachments: Logs Deviation survey

36. I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief.

SIGNED _____ TITLE Geologist DATE 1/27/84

VII. SOURCE & ANALYSIS OF INJECTION FLUID

WATER ANALYSIS REPORT
furnished by TRETOLITE CHEMICALS

COMPANY:	ARAPAHO
LEASE:	C. P. U.
SAMPLE POINT:	S. W. D.
SAMPLE DATE:	4-23-90
SAMPLE TEMP.:	N/A

pH:	7.0
H2S:	POS
SPECIFIC GRAVITY:	1.095

TITRATED AND CALCULATED IONS

	MILLIGRAMS PER LITER	MILLIEQUIVALENTS PER LITER
HCO3	366.00	6.00
Cl	76254.00	2148.00
SO4	3500.00	72.92
Ca	46800.00	2340.00
Mg	0.00	0.00
Na	0.00	0.00

IONIC STRENGTH = 3.48
TOTAL HARDNESS = 18500.0 mg/ltr.
TOTAL DISSOLVED SOLIDS = 124663.7 mg/ltr.

PROBABLE MINERAL COMPOSITION AND ION PAIRING

	MILLIEQUIVALENTS PER LITER	MILLIGRAMS PER LITER
Ca(HCO3)2	6.00	486.24
CaSO4	72.92	4963.44
CaCl2	2148.00	119214.00
Mg(HCO3)2	0.00	0.00
MgSO4	0.00	0.00
MgCl2	0.00	0.00
NaHCO3	0.00	0.00
Na2SO4	0.00	0.00
NaCl	0.00	0.00

CALCULATED SCALING TENDENCIES

SCALING INDEX
CaCO3 @ 80 DEG F. = 2.0
CaCO3 @ 120 DEG F. = 2.5

SATURATION POINT
CaSO4 @ 70 DEG F. = 368.3 MG/LTR.
CaSO4 @ 110 DEG F. = 365.7 MG/LTR.

(THIS SAMPLE CONTAINED 4963.4 MG/LTR. CaSO4)

WATER ANALYSIS REPORT
furnished by TRETOLITE CHEMICALS

COMPANY:	ARAPAHO
LEASE:	CAVE #2
SAMPLE POINT:	WATER TANK
SAMPLE DATE:	4-23-90
SAMPLE TEMP.:	N/A
pH:	7.0
H2S:	POS
SPECIFIC GRAVITY:	1.07

TITRATED AND CALCULATED IONS

	MILLIGRAMS PER LITER	MILLIEQUIVALENTS PER LITER
HCO3	793.00	13.00
Cl	41535.00	1170.00
SO4	625.00	13.02
Ca	35600.00	1780.00
Mg	9963.00	816.64
Na	0.00	0.00

IONIC STRENGTH = 3.20
TOTAL HARDNESS = 130000.0 mg/ltr.
TOTAL DISSOLVED SOLIDS = 66874.8 mg/ltr.

PROBABLE MINERAL COMPOSITION AND ION PAIRING

	MILLIEQUIVALENTS PER LITER	MILLIGRAMS PER LITER
Ca(HCO3)2	13.00	1053.52
CaSO4	13.02	886.33
CaCl2	1170.00	64935.00
Mg(HCO3)2	0.00	0.00
MgSO4	0.00	0.00
MgCl2	0.00	0.00
NaHCO3	0.00	0.00
Na2SO4	0.00	0.00
NaCl	0.00	0.00

CALCULATED SCALING TENDENCIES

SCALING INDEX
CaCO3 @ 80 DEG F. = 2.1
CaCO3 @ 120 DEG F. = 2.6

SATURATION POINT
CaSO4 @ 70 DEG F. = 473.5 MG/LTR.
CaSO4 @ 110 DEG F. = 469.3 MG/LTR.

(THIS SAMPLE CONTAINED 886.3 MG/LTR. CaSO4)

X. DATA ON INJECTION WELL

WATER ANALYSIS REPORT
furnished by TRETOLITE CHEMICALS

COMPANY:	ARAPAHO
LEASE:	CAVE POOL UNIT #3
SAMPLE POINT:	WATER TANK
SAMPLE DATE:	4-23-90
SAMPLE TEMP.:	N/A

pH:	7.0
H2S:	POS.
SPECIFIC GRAVITY:	1.03

TITRATED AND CALCULATED IONS

	MILLIGRAMS PER LITER	MILLIEQUIVALENTS PER LITER
HCO3	451.40	7.40
Cl	21726.00	612.00
SO4	2500.00	52.08
Ca	2480.00	124.00
Mg	947.70	77.68
Na	10805.47	469.80

IONIC STRENGTH = 0.80
TOTAL HARDNESS = 10100.0 mg/ltr.
TOTAL DISSOLVED SOLIDS = 38889.5 mg/ltr.

PROBABLE MINERAL COMPOSITION AND ION PAIRING

	MILLIEQUIVALENTS PER LITER	MILLIGRAMS PER LITER
Ca(HCO3)2	7.40	599.70
CaSO4	52.08	3545.31
CaCl2	64.52	3580.67
Mg(HCO3)2	0.00	0.00
MgSO4	0.00	0.00
MgCl2	77.68	3699.14
NaHCO3	0.00	0.00
Na2SO4	0.00	0.00
NaCl	469.80	27464.68

CALCULATED SCALING TENDENCIES

SCALING INDEX
CaCO3 @ 80 DEG F. = 0.3
CaCO3 @ 120 DEG F. = 0.8

SATURATION POINT
CaSO4 @ 70 DEG F. = 3405.1 MG/LTR.
CaSO4 @ 110 DEG F. = 3419.3 MG/LTR.

(THIS SAMPLE CONTAINED 3545.3 MG/LTR. CaSO4)

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SANTA FE, NEW MEXICO 87501

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

5a. Indicate Type of Lease: State [XX] Fee [ ]

5. State Oil & Gas Lease No.: ~~B-7956~~ ~~B-7596~~

1a. TYPE OF WELL: OIL WELL [X] GAS WELL [ ] DRY [ ] OTHER

b. TYPE OF COMPLETION: NEW WELL [X] WORK OVER [ ] DEEPEN [ ] PLUG BACK [ ] DIFF. RESVR. [ ] OTHER

7. Unit Agreement Name:

8. Farm or Lease Name: Cave ~~State~~ Pool Unit

9. Well No.: ~~#~~ #56

2. Name of Operator: J.E.M. Resources Inc.

3. Address of Operator: P.O. Box 2938 Ruidoso NM. 88345

10. Field and Pool, or Wildcat: Cave Gb/Sa

4. Location of Well: UNIT LETTER E LOCATED 1650 FEET FROM THE North LINE AND 330 FEET FROM THE West LINE OF SEC. 4 TWP. 17 S RGE. 29 E NMPM

12. County: Eddy

15. Date Spudded	16. Date T.D. Reached	17. Date Compl. (Ready to Prod.)	18. Elevations (DF, RKB, RT, GR, etc.)	19. Elev. Cashinghead
1/4/84	1/9/84	1/17/84	3600 Gr.	3602

20. Total Depth	21. Plug Back T.D.	22. If Multiple Compl., How Many	23. Intervals Drilled By	Rotary Tools	Cable Tools
2564	2514		→	2564	

24. Producing Interval(s), of this completion — Top, Bottom, Name: SanAndres 2449-2464

25. Was Directional Survey Made: no

26. Type Electric and Other Logs Run: Gr/N CCL CBL

27. Was Well Cored: no

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT LB./FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
8 5/8	24	340	12¼	320 sxs Circulated	none
5½	15.5	2564	7 7/8	925 sxs Circulated	none

29. LINER RECORD

SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN

30. TUBING RECORD

SIZE	DEPTH SET	PACKER SET
2⅞	2525	

31. Perforation Record (Interval, size and number)

2449-2464 30 .40 cal shots

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED
2449-2464	2000 gal 15% HCl
	25,000 gal gel KCl wtr
	35,000# sd

33. PRODUCTION

Date First Production	Production Method (Flowing, gas lift, pumping — Size and type pump)	Well Status (Prod. or Shut-in)
1/18/84	Pump	prod

Date of Test	Hours Tested	Choke Size	Prod'n. For Test Period →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Gas—Oil Ratio
1/24/84	24	7/8		62	385	30	6210

Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Oil Gravity — API (Corr.)

34. Disposition of Gas (Sold, used for fuel, vented, etc.): vented

Test Witnessed By: Herb Spencer

35. List of Attachments: Deviation Survey Logs

36. I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief.

SIGNED [signature] TITLE Geologist DATE 1/27/84

INDICATE FORMATION TOPS IN CONFORMANCE WITH GEOGRAPHICAL SECTION OF STATE

Southeastern New Mexico			Northwestern New Mexico		
T. Anhy	T. Canyon		T. Ojo Alamo	T. Penn. "B"	
T. Salt 306	T. Strawn		T. Kirtland-Fruitland	T. Penn. "C"	
B. Salt 660	T. Atoka		T. Pictured Cliffs	T. Penn. "D"	
T. Yates	T. Miss		T. Cliff House	T. Leadville	
T. 7 Rivers 1088	T. Devonian		T. Menefee	T. Madison	
T. Queen 1647	T. Silurian		T. Point Lookout	T. Elbert	
T. Grayburg 2040	T. Montoya		T. Mancos	T. McCracken	
T. San Andres 2392	T. Simpson		T. Gallup	T. Ignacio Qtzte	
T. Glorieta	T. McKee		Base Greenhorn	T. Granite	
T. Paddock	T. Ellenburger		T. Dakota	T.	
T. Blinebry	T. Gr. Wash		T. Morrison	T.	
T. Tubb	T. Granite		T. Todilto	T.	
T. Drinkard	T. Delaware Sand		T. Entrada	T.	
T. Abo	T. Bone Springs		T. Wingate	T.	
T. Wolfcamp	T.		T. Chinle	T.	
T. Penn.	T.		T. Permian	T.	
T Cisco (Bough C)	T.		T. Penn. "A"	T.	

OIL OR GAS SANDS OR ZONES

No. 1, from ..... to ..... No. 4, from ..... to .....

No. 2, from ..... to ..... No. 5, from ..... to .....

No. 3, from ..... to ..... No. 6, from ..... to .....

IMPORTANT WATER SANDS

Include data on rate of water inflow and elevation to which water rose in hole.

No. 1, from ..... to ..... feet. .....

No. 2, from ..... to ..... feet. .....

No. 3, from ..... to ..... feet. .....

No. 4, from ..... to ..... feet. .....

FORMATION RECORD (Attach additional sheets if necessary)

From	To	Thickness in Feet	Formation	From	To	Thickness in Feet	Formation
0	306	306	Red clay + Calichie				
306	660	354	Salt				
660	1088	428	Red sand + anhy.				
1088	1647	559	Red sand + Dolo.				
1647	2040	393	Anhy + sands				
2040	2392	352	Dolo + sands				
2392	2564	172	Dolo.				

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OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-103
Revised 10-1-78

5a. Indicate Type of Lease: State [X] Fee [ ]

5. State Oil & Gas Lease No. B-7596

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT —" (FORM C-101) FOR SUCH PROPOSALS.)

1. OIL WELL [X] GAS WELL [ ] OTHER-

7. Unit Agreement Name

2. Name of Operator: J.E.M. Resources Inc

8. Farm or Lease Name: Cave ~~State~~ Pool Unit

3. Address of Operator: P.O. Box 2938 Ruidoso NM,88345

9. Well No. ~~8~~ 56

4. Location of Well: UNIT LETTER E, 1650 FEET FROM THE North LINE AND 330 FEET FROM THE West LINE, SECTION 4 TOWNSHIP 17 S RANGE 29 E NMPM.

10. Field and Pool, or Wildcat: Cave Gb/Sa

15. Elevation (Show whether DF, RT, GR, etc.): 3600 Gr.

12. County: Eddy

16. Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK [ ]	PLUG AND ABANDON [ ]	REMEDIAL WORK [ ]	ALTERING CASING [ ]
TEMPORARILY ABANDON [ ]		COMMENCE DRILLING OPNS. [ ]	PLUG AND ABANDONMENT [ ]
PULL OR ALTER CASING [ ]	CHANGE PLANS [ ]	CASING TEST AND CEMENT JOB [X]	
OTHER [ ]		OTHER Perf and Frac [ ]	

17. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

1/13/84 Run GrN CBL CCL logs
1/14/84 Pressure test csng to 1000# held for 30 min
Perf 2449-2464 2 spf .40 cal (30 shots)
Acid w/ 2000 gal 15% HCl 3.6 BPM @ 1900 PSI ISDP 1100# 15 min 0#
Swab well back

1/16/84 Frac perf 2449-2464 w/25,000 gal Gel KCl Wtr 35,000# 20/40
27 BPM @ 2400# ISDP 2100 15 min 1600#

1/17/84 Swab well back

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

SIGNED _____ TITLE Geologist DATE 1/24/84

APPROVED BY Mike Williams TITLE OIL AND GAS INSPECTOR DATE FEB 06 1984

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LAND OFFICE		
OPERATOR		

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Revised 10-1-78

5a. Indicate Type of Lease: State [x] Fee [ ]

5. State Oil & Gas Lease No. B 7596

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT —" (FORM C-101) FOR SUCH PROPOSALS.)

1. OIL WELL [x] GAS WELL [ ] OTHER-

7. Unit Agreement Name

2. Name of Operator
J.E.M. Resources Inc

8. Farm or Lease Name
Cave State

3. Address of Operator
P.O. Box 2938 Ruidoso NM 88345

9. Well No.
3

4. Location of Well
UNIT LETTER E , 1650 FEET FROM THE North LINE AND 330 FEET FROM THE West LINE, SECTION 4 TOWNSHIP 17 S RANGE 29 E NMPM.

10. Field and Pool, or Wildcat
Cave - G-SA

15. Elevation (Show whether DF, RT, GR, etc.)
3600 gr.

12. County
Eddy

16. Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK [ ]	PLUG AND ABANDON [ ]	REMEDIAL WORK [ ]	ALTERING CASING [ ]
TEMPORARILY ABANDON [ ]		COMMENCE DRILLING OPNS. [ ]	PLUG AND ABANDONMENT [ ]
PULL OR ALTER CASING [ ]	CHANGE PLANS [ ]	CASING TEST AND CEMENT JOB [x]	
OTHER [ ]		OTHER [ ]	

17. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

1/7/84 Hit water flow @ 1745 est 40 Gal per min

1/9/84 TD 2564 Water flow died
Ran 73 Jts. 5½" 15.5# csng set at 2564
Cmt W/ 650 SXS Pacesetter lite 2% CaCl2 Tailed in W/
275 SXS 50/50 poz 4# Hiseal ¼ Celloseal 3% KCl
Plug down @ 12:37 AM 1/10/84 Circulated 168 SXS to pit.
Woc 18 Hrs.

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

SIGNED [signature] TITLE Geologist DATE 1/12/84

APPROVED BY Original Signed By Leslie A. Clements TITLE Supervisor District II DATE JAN 25 1984

CONDITIONS OF APPROVAL, IF ANY:

ENERGY AND MINERALS DEPARTMENT

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OIL CONSERVATION DIVISION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

Form C-103
Revised 10-1-7

5a. Indicate Type of Lease: State [X] Fee [ ]

5. State Oil & Gas Lease No. B 7596

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT —" (FORM C-101) FOR SUCH PROPOSALS.)

1. OIL WELL [X] GAS WELL [ ] OTHER-

7. Unit Agreement Name

2. Name of Operator: Diamondback Petroleum Inc.

8. Farm or Lease Name: Cave State

3. Address of Operator: P.O. Box 2938, Ruidoso, NM.

9. Well No. 5

4. Location of Well: UNIT LETTER E, 1650 FEET FROM THE North LINE AND 330 FEET FROM THE West LINE, SECTION 4 TOWNSHIP 17S RANGE 29E NMPM.

10. Field and Pool, or Wildcat: Cave Y-SR

15. Elevation (Show whether DF, RT, GR, etc.): 3600 GR.

12. County: Eddy

16. Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK [ ]	PLUG AND ABANDON [ ]	REMEDIAL WORK [ ]	ALTERING CASING [ ]
TEMPORARILY ABANDON [ ]		COMMENCE DRILLING OPNS. [X]	PLUG AND ABANDONMENT [ ]
PULL OR ALTER CASING [ ]	CHANGE PLANS [ ]	CASING TEST AND CEMENT JOB [X]	
OTHER [ ]		OTHER [ ]	

17. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

1/4/84 Spud 12¼" hole @ 10:00 PM

1/5/84 TD 340' Ran 340' 8 5/8" 24# csng
Cmt W/ 225 sxs class "C" 2% CaCl2 95 sxs class "C" neat
Pd @ 9:31 PM WOC 18 hrs Nipple up BOP Pressure test Csng to
800 PSI held 30 min

1/6/84 Drilled out W/ 7 7/8" bit

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

SIGNED [signature] TITLE Geologist DATE 1/10/84

Original Signed By
Leslie A. Clements
Supervisor District II

APPROVED BY [ ] TITLE [ ] DATE JAN 25 1984

CONDITIONS OF APPROVAL, IF ANY: