Case No.

410

Application, Transcript,
Small Exhibits, Etc.

CASE 410: El Paso Natural Gas Co. application for approval of State-LPG No. 1 well 730' from W line, 450' from S line 33-23S-37E, Lea County

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

October 28, 1952

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Y

Mr. Warren L. Taylor
Division Geologist
El Paso Natural Gas Co.
Box 1384
Jal, N. M.

Dear Sir:

For your records and those of your El Paso office we transmit herewith two signed copies of Order R-201 which has been issued by this Commission in your Case 410, testimony having been presented on October 15, 1952.

Yours very truly,

W. B. Macey
Chief Engineer

WBMmr

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. 410
ORDER NO. R-201

THE APPLICATION OF EL PASO
NATURAL GAS COMPANY FOR AN
ORDER GRANTING PERMISSION TO
DRILL ITS STATE-LPG STORAGE WELL,
NO. 1, TO BE LOCATED 780 FEET
FROM THE WEST LINE AND 450 FEET
FROM THE SOUTH LINE OF SECTION 32,
TOWNSHIP 23 SOUTH, RANGE 37 EAST,
NMPM, LEA COUNTY, NEW MEXICO, SAID
WELL TO BE USED FOR THE STORAGE OF
LIQUEFIED PETROLEUM GAS.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause having come on for hearing at 9 o'clock a. m. October 15, 1952, at Santa Fe, New Mexico, before the Oil Conservation Commission, hereinafter referred to as the "Commission",

NOW, on this 20th day of October, 1952, the Commission, a quorum being present, having considered the testimony adduced and the exhibits received at said hearing, and being otherwise fully advised in the premises,

FINDS:

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

(2) That it would be in the interests of conservation to permit the applicant to use for the purpose of storing liquefied petroleum gases a well to be drilled to an approximate total depth of 2700 feet in the Salado formation; said well to be located 780 feet from the west line and 450 feet from the south line of Section 32, Township 23 South, Range 37 East, NMPM, Lea County, New Mexico, said well to be known as the LPG-Storage Well No. 1.

IT IS THEREFORE ORDERED:

(1) That the El Paso Natural Gas Company be, and the same hereby is given authority to drill a well to be known as the LPG-Storage Well No. 1, to be located 780 feet from the west line and 450 feet from the south line of Section 32, Township 23 South, Range 37 East, NMPM, Lea County, New Mexico; that said well is to be used for the storage of liquefied petroleum gases in the Salado formation.

(2) That the effectiveness of this order is conditional upon the following requirements:

(a) That the State-LPG Storage Well No. 1, be drilled to an approximate depth of 2700 feet.

(b) That casing be cemented at an approximate depth of 1400 feet.

Nothing in this order shall be deemed to relieve El Paso Natural Gas Company from liability to any person, firm or corporation, resulting from drilling or operation of such storage project.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

GUY SHEPARD, Member

R. R. SPURRIER, Secretary

[illegible] L-2041 [illegible] State Land Office

L-[illegible]

R-201
Case# 410

LEASE [illegible]

THIS AGREEMENT, made and entered into this 17th day of November, 1952, by and between the State of New Mexico, hereinafter called the Lessor and El Paso Natural Gas Company of El Paso, Texas, hereinafter called the Lessee.

WITNESSETH:

WHEREAS, the State of New Mexico has executed its Patent dated August 14, 1951, to El Paso Natural Gas Company, wherein and whereby the State of New Mexico did grant, bargain, sell and convey to El Paso Natural Gas Company and its successors and assigns, a tract of land described as that portion of the S 1/2 SW 1/4 of Section 32, T-23S, R-37E, N.M.P.M., lying west of the westerly right of way line of the Texas and New Mexico Railroad, being more particularly described as follows, to-wit;

> Beginning at the SW corner of Section 32, T-23S, R-37E, thence S 89° 59' E along the S boundary of said Section 32 a distance of 1997.9 feet to a point on the westerly right of way of the Texas and New Mexico Railroad; thence N 13° 26' E along said railroad right of way line a distance of 1357.? feet to a point on the N boundary of the S 1/2 SW 1/4 of said Section 32; thence N 89° 59' W along said N boundary line of S 1/2 SW 1/4 of said Section 32 a distance of 1710.9 feet to a point on the W boundary of said Section 32; thence S along the W boundary of said Section 32 a distance of 1320.0 feet to the point of beginning.
>
> This tract contains 47.14 acres, more or less, in the S 1/2 SW 1/4, Section 32, T-23S, R-37E;

subject to valid existing right, easements, rights of way, reservations and reserving to the State of New Mexico all minerals of whatsoever kind and reserving to said State or persons authorized by it, the right to prospect for, mine, produce and remove such minerals and to perform any and all acts necessary in connection therewith.

The Lessee desires to drill a storage well to be known as the El Paso Natural Gas Company State LPG Storage Well No. 1, to be located 730 feet from the W line and 450 feet from the S Line of Section 32 and to create a storage reservoir of approximately 50,000 barrels capacity for underground storage of liquified petroleum gases by dissolving a cavity in the salt section which is expected to lie under the above described tract of land, with the top of said salt section (sometimes referred to as the Salado Formation) at a depth of approximately 1400 feet below the surface and the base lying approximately 2700 feet below the surface. The cavity will have a diameter of approximately 24 feet and a depth of approximately 1300 feet.

NOW THEREFORE, for and in consideration of the sum of ___ten___ __dollars__ evidenced by Official Receipt No.____________ does hereby grant, demise, lease and let to the Lessee the above described land.

TO HAVE AND TO HOLD by the Lessee, its successors and assigns, so long as the premises shall be used for the purpose above specified, with a reversion of said land to the State of New Mexico upon the cessation of its use for the said purpose by the Lessee, its successors and assigns. The Lessee shall have the right to assign this lease with the approval of the Lessor.

Subject to valid existing rights.

IN WITNESS WHEREOF, the State of New Mexico has caused this instrument to be executed by its Commissioner of Public Lands, thereunto duly authorized, with the seal of his office affixed, the day and year first above written.

Guy Shepard
Lessor

EL PASO NATURAL GAS COMPANY
By ___[illegible]___
Vice President Lessee

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

September 25, 1952

C

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P

Y

Mr. Warren L. Taylor
Division Geologist
El Paso Natural Gas Co.
Box 1364
Jal, N. M.

Dear Sir:

Your application for permission to drill your State-LPG Well No. 1, as described in your application of September 16, 1952, has been set for hearing on October 15 as Case 410.

Very truly yours,

W. B. Macey
Chief Engineer

WBMtmr

EL PASO NATURAL GAS COMPANY

September 16, 1952

Box 1384 Jal, New Mexico

Mr. R. R. Spurrier
Secretary and Director,
New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Dear Sir:

Application is hereby made by El Paso Natural Gas Company for a public hearing before the Commission on October 15, 1952, for permission to drill a well for the storage of Liquefied Petroleum Gas. The well will be known as the El Paso Natural Gas Company, State - LPG Storage Well No. 1, located 780 feet from the West line and 450 feet from the South line of Section 32, Twp. 23S, Rge. 37E, NMPM, Lea County, New Mexico. We propose to drill the well with rotary drilling equipment to a total depth of approximately 2700 feet in the Salado Formation, creating a cavity in the salt section, or Salado Formation, the capacity to be approximately 50,000 barrels. The size of the cavity will be calculated from the volume of water injected and the salt concentration of the return stream.

We propose to use the following strings of casing and to cement them as indicated:

Size of Hole	Size of Casing	Weight per Foot	Depth	Sacks Cement
12 1/4	9 5/8	36 (New)	250	Circulate
8 3/4	7	23 (New)	1400	Circulate

Three and one half inch ($3\frac{1}{2}$") O. D. 9.3# per foot tubing will be installed to the total depth of the well.

Exhibits will be introduced showing (1) locations of producing wells in the immediate vicinity of the proposed well, location of the proposed well, locations of restricted drilling sites in the immediate area, and (2) a diagrammatic sketch of the completed storage well.

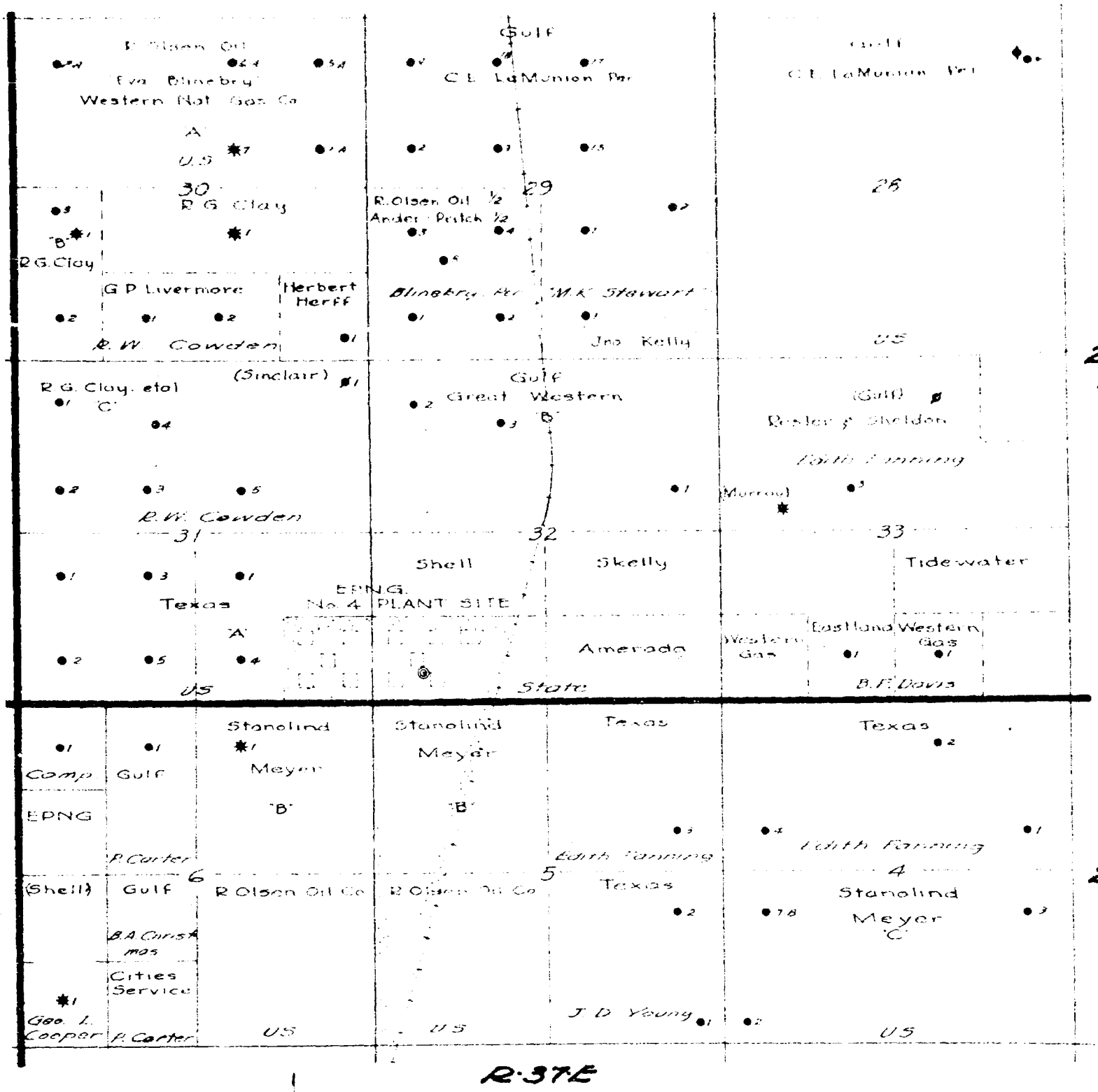
Yours very truly,

EL PASO NATURAL GAS COMPANY

Warren L. Taylor

Warren L. Taylor
Division Geologist

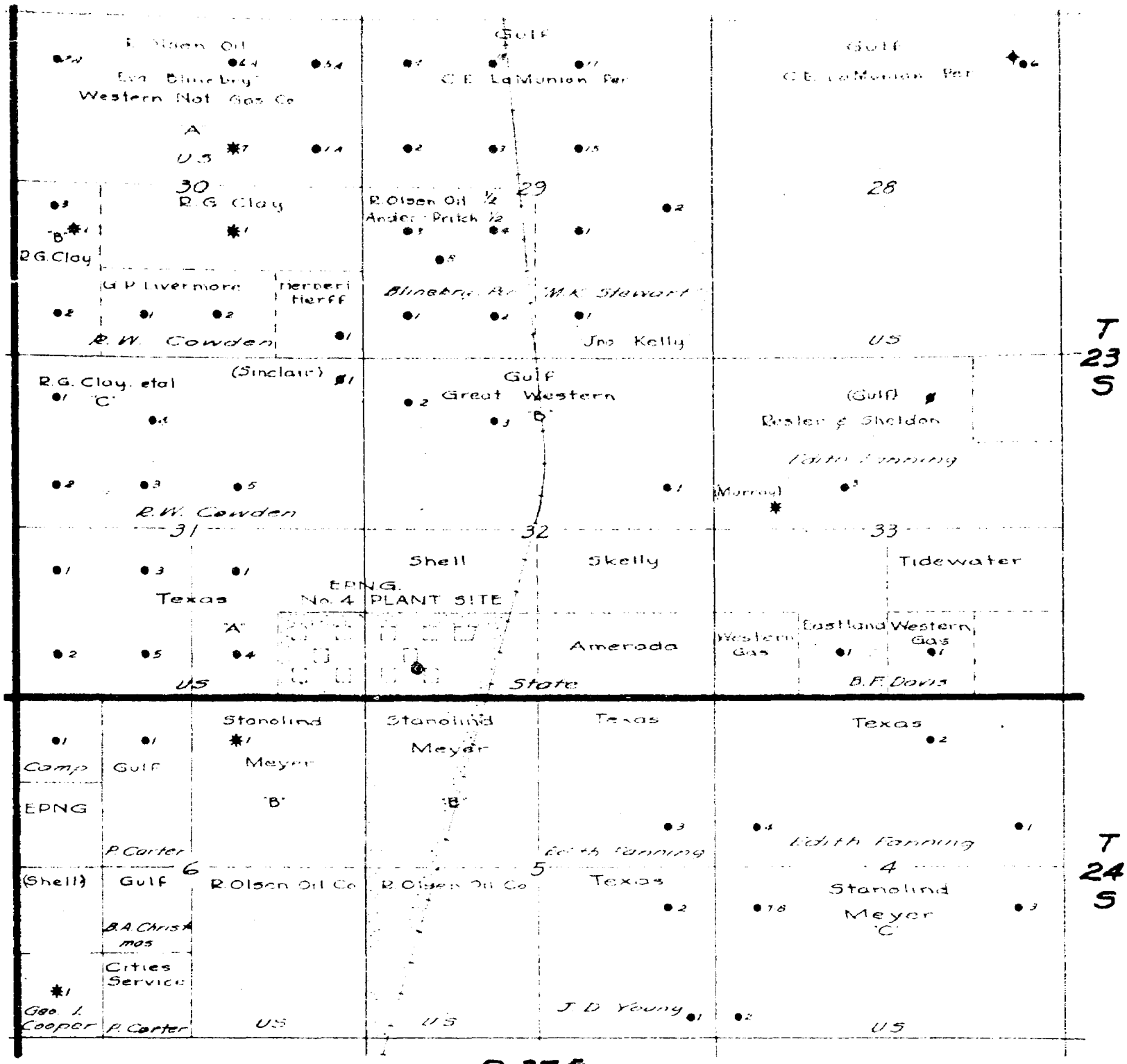
WLT:ds



LEGEND

- Producing Oil Wells
- Producing Gas wells
- Dry Holes
- Abandoned Locations
- Restricted Area for Drilling
- Proposed Location for LPG Storage Well

Ex. #1
Case 410



LEGEND

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- ◆ Dry Holes
- ✹ Abandoned Locations
- [ ] Restricted Area for Drilling
- ⊛ Proposed Location for LPG Storage Well

Ex. #1
Case 410

Summary of Proposed Underground Storage of Liquefied Petroleum Gases at El Paso Natural Gas Company's Jal No. 4 Gasoline Plant, Lea County, New Mexico

Due to fluctuations in the market of Liquefied Petroleum Gases during recent years, appreciable amounts of Liquefied Petroleum Gases have been wasted during the summer months due to lack of market and adequate above-ground steel tank storage. This has resulted because the cost of conventional above-ground steel tank storage of butane and propane prohibited conservation of summer L.P.G. production for winter sales. However, during the past three years underground storage of L.P.G. has been developed and numerous storage projects are now in operation in the West Texas - New Mexico area resulting in the conservation and efficient utilization of hydrocarbon liquids which would otherwise be wasted during seasons of slack sales.

It is the intent of El Paso Natural Gas Company to drill an underground storage well for the conservation of L.P.G. during seasons of wasted production at its Jal No. 4 Gasoline Plant site in Southeast Lea County, New Mexico.

This area of New Mexico is underlain by a massive salt bed, the Salado Formation, which is Permian in Age. Studies of logs of oil wells in the vicinity of the proposed underground storage well show the salt bed to be approximately 1370 feet thick at the proposed location of the storage well. The top of the salt bed is approximately 1400 feet below the surface, at sea level datum 1915 feet. The base of the salt bed is about 2780 feet below the surface at sea level datum 545 feet. It is the intent of El Paso Natural Gas Company to drill such a well in the following manner:

The well, to be known as El Paso Natural Gas Company's, State - L.P.G. Storage Well #1, is to be located 780 feet from the West line and 450 feet from the South line, Section 32, Twp. 23 S, Rge. 37 E, NMPM, Lea County, New Mexico. The State Land Oil and Gas Lease number is B-165 Assignment #1. We propose to drill the well with rotary drilling equipment to a maximum total depth of 2700 feet. New 9-5/8 inch casing will be set at a depth of approximately 250 feet with sufficient cement to circulate cement to the surface. Water wells drilled at the Plant site indicate that the "redbed" is encountered in this area at a depth of approximately 160 - 180 feet. One water well was drilled to a depth of 500 feet. At this total depth the well was still drilling in the "redbed". Water is encountered at a depth of approximately 120 feet. Therefore, 9-5/8 inch surface casing set in this manner will adequately protect the source of fresh water from any possible contamination.

New 7 inch casing will be set at approximately 1400 feet with sufficient cement to circulate cement to the surface. The exact depth of the setting of the 7 inch casing will be determined after an electric log has been run; that is, the production string will be set in the salt section or a selected anhydrite stringer in the salt section. The well will then be drilled to a maximum total depth of 2700 feet. The storage well will thus be completed 300 feet above the first productive formation or pay and be separated from it by approximately 100 feet of the lower Salado Formation and approximately 200 feet of anhydrite and brown dolomitic limestone, known as the Tansill Formation.

Upon completion of the drilling of the well, a storage reservoir of approximately 50,000 barrels will be developed by dissolving a cavity in the salt section. Fresh water will be injected through 3½ inch O.D. tubing installed to the total depth of the well and the return stream of water containing dissolved sodium chloride, will be circulated to the surface through the 7 inch casing. The reservoir capacity will be calculated from the metered volume of water injected and the sodium chloride concentration of the return stream. Core analyses of similar storage projects developed in the West Texas - New Mexico area, show the salt bed to be approximately 99.5% soluble. Computed diameters of similar storage projects indicate that a cavity of between 16 feet and 20 feet in diameter can be expected. Periodically during washing of the well and upon completion of the storage well and facilities as outlined above, it is intended to thoroughly test the completed project for successful storage conditions before product is admitted to the formation. This will be done by making the standard hydraulic test; that is, a pressure of approximately 500 - 600 pounds per square inch will be maintained for a period of 4 - 6 hours. Pressures will be observed by means of a dead-weight gauge. If no appreciable pressure drop is observed, product will then be admitted to the well.

1000 - psi fittings will be installed on all wellhead equipment and standard compressor and pumping equipment will be used.

The hazards of storing butane and propane above-ground in steel tanks are numerous. The threat of costly and misfortunate fires is ever-present. However, these hazards are greatly minimized in underground storage.

Respectfully submitted,

EL PASO NATURAL GAS COMPANY

Warren L. Taylor

Warren L. Taylor
Division Geologist

BEFORE THE

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

TRANSCRIPT OF PROCEEDINGS

CASE NO. 410

October 15, 1952
Regular Hearing

E. E. GREESON
ADA DEARNLEY
COURT REPORTERS
BOX 1203
PHONES [illegible]
ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO

Santa Fe, New Mexico.

October 15, 1952.

In the Matter of:

El Paso Natural's application for permission to drill State-LPG Storage Well No. 1, 780' from W Line and 450' from S Line 32-23S-37E, for storage of liquefied petroleum gas.

CASE NO. 410

TRANSCRIPT OF HEARING

(Notice of publication read by Mr. Graham.)

WARREN L. TAYLOR,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. HOWELL:

Q Will you state your name for the record, please?

A Warren L. Taylor.

Q What is your present position with El Paso Natural Gas Company?

A Division Geologist, Permian Division.

Q I don't believe you have filed with the Commission here any record of your qualifications. Will you state briefly, for the record, the training and experience you have had as a geologist to qualify you as an expert?

A Bachelor of Science Degree from Kansas State College, 1947, Master of Science Degree from the University of Illinois, 1949, one year in the geological department of Phillips Petroleum Company and three and one half years as Geologist for El Paso Natural Gas Company.

Q Mr. Taylor, the proposed location is within the boundaries of the El Paso Natural Gas Company, Jal No. 4 Plant site, is it not?

A Yes, it is.

Q That track of land was patented to the company by the State of New Mexico. It is located on State land, I believe, that has been patented?

A Yes, that is correct.

Q And does that plant produce liquid petroleum gasses in excess of the available market, during seasons of the year?

A Yes, due to seasonal fluctuations we have at certain times of the year an excess amount of liquid petroleum gasses.

Q What is done with the liquid petroleum gasses in excess of storage or market?

A In excess of present above ground steel tank storage, they are primarily flared or vented to the air.

Q Have you studied the formations underlying the proposed

location of this storage well?

A Yes, I have.

Q What data have you had available to study these formations?

A There are a number of oil wells in the immediate area of our plant site which are at the present time producing oil and the logs of these wells are available.

Q Will you state briefly to the Commission what formations are underlying at the depths to which you intend to drill this well?

A We propose to drill the well a maximum total depth of 2,700 feet, approximately 2,700 feet. A study of the logs in the area indicates that the salt bed which underlies the West Texas-New Mexico area or the Salado formation will be encountered at approximately 1,400 feet below the surface.

We propose to set 9 5/8 inch surface casing at a depth of approximately 250 feet, 7 inch casing at a depth of approximately 1,400 feet, continue to a total depth of approximately 2,700 feet, and install 3½ tubing to total depth and dissolve a cavity in the salt bed for the storage of the product.

Q Approximately what will be the diameter of the cavity that will be dissolved around the tubing?

A There have - or there is in the West Texas-New Mexico area at the present time a number of such projects, and due to plotting data on the fill up and so on, it has been estimated that the maximum capacity of the present storage projects or the maximum diameter of the present storage projects having the capa-

city of, which we propose is approximately 16 to 20 feet in diameter.

Q What provisions have you made to protect any underground water supply that may be in the area?

A We have drilled a number of water wells at the plant site and test holes to develop water in the area. I have those logs of the water wells available. They show, in general, that water is encountered at a depth of about 120 feet. The red bed is encountered at a depth of approximately 170 feet and we propose to set 9 5/8 inch surface casing at 250 feet with sufficient cement to circulate cement to the surface, and that will adequately protect the fresh water in the area.

Q That will prevent any pollution of water supply in the area?

A Yes, sir. We have drilled one well, one water well to a depth of 500 feet and did not completely penetrate the red-bed at that depth. So, we feel that 250 feet of 9 5/8 casing will protect the fresh water and that is in line with the surface casing program of oil wells in the immediate area.

Q In drilling into the salt formation, will you penetrate any oil and gas producing formations known in that area?

A No, we will be approximately 300 feet above the first producing formation.

Q What will be the capacity of the proposed storage?

A We propose to initially complete a 50,000 barrel storage well.

Q Will that, when completed, result in conserving liquid petroleum gasses that otherwise would be vented or flared for lack of market or storage condition?

A It will in that during season of slack market conditions the cost of conventional above ground steel tank storage prohibits storage of all products made during that time. Since the economics of underground storage make the per barrel cost of storage considerably less, it will prevent and save products for seasons where the market demand is greater.

Q Are there any other similar projects operating in that locality?

A Yes, there are a number.

Q Would you introduce those well logs as Exhibits? Do you have any other logs, Mr. Taylor?

(Marked El Paso Natural Gas Company's Exhibits Nos. 1 and 2, for identification.)

A No, I have no others.

Q You have here --

A (Interrupting) I have prepared a plat of the area showing our plant site oil wells in the area, restricted drilling sites on the plant site, and so on. I also have prepared a profile of the storage well showing the casing depths, total depths and so on.

MR. HOWELL: We will offer these exhibits?

MR. SPURRIER: You have two exhibits?

MR. HOWELL: Exhibit 1 is a plat showing the location of the

site and producing wells in the vicinity, and restricted drilling sites on the plant site, pursuant to a contract between the co-owner of the land and the oil and gas lessee. Exhibit 2 is a profile of the proposed storage well showing the depths and types and size of casing that will be installed, is that correct?

A That is correct, yes. In addition to those two Exhibits, I also have prepared a detailed summary for the Commissions convenience.

MR. HOWELL: As Exhibit 3, we have a summary of the testimony that has been put on about the surrounding facts.

(Marked El Paso Natural Gas Company's Exhibit No. 3, for identification.)

MR. GRAHAM: Have you made any application to the Land Office for an underground easement for that area?

MR. HOWELL: It has been patented.

MR. GRAHAM: But the minerals are retained by the State.

MR. HOWELL: The minerals are under lease. I can answer that because I feel that I am more familiar with that.

MR. GRAHAM: Some procedure has been established whereby the State land issues underground easements 1,300 feet under the ground?

MR. HOWELL: Yes.

MR. GRAHAM: That has been done and deeded to the State?

MR. HOWELL: Yes, we shall certainly consult with you. We took the position that the patent covered everything but the oil and gas.

MR. GRAHAM: It is merely for the surface, as I understand.

MR. SPURRIER: Is there any question of this witness? If not the witness may be excused.

(Witness excused.)

MR. SPURRIER: Does anyone have a comment? Without objection these Exhibits 1, 2 and 3 will be received.

(El Paso Natural Gas Company's Exhibits Nos. 1, 2 and 3, previously marked for identification were received in evidence.)

MR. SPURRIER: Next case on the Docket is Case 411.

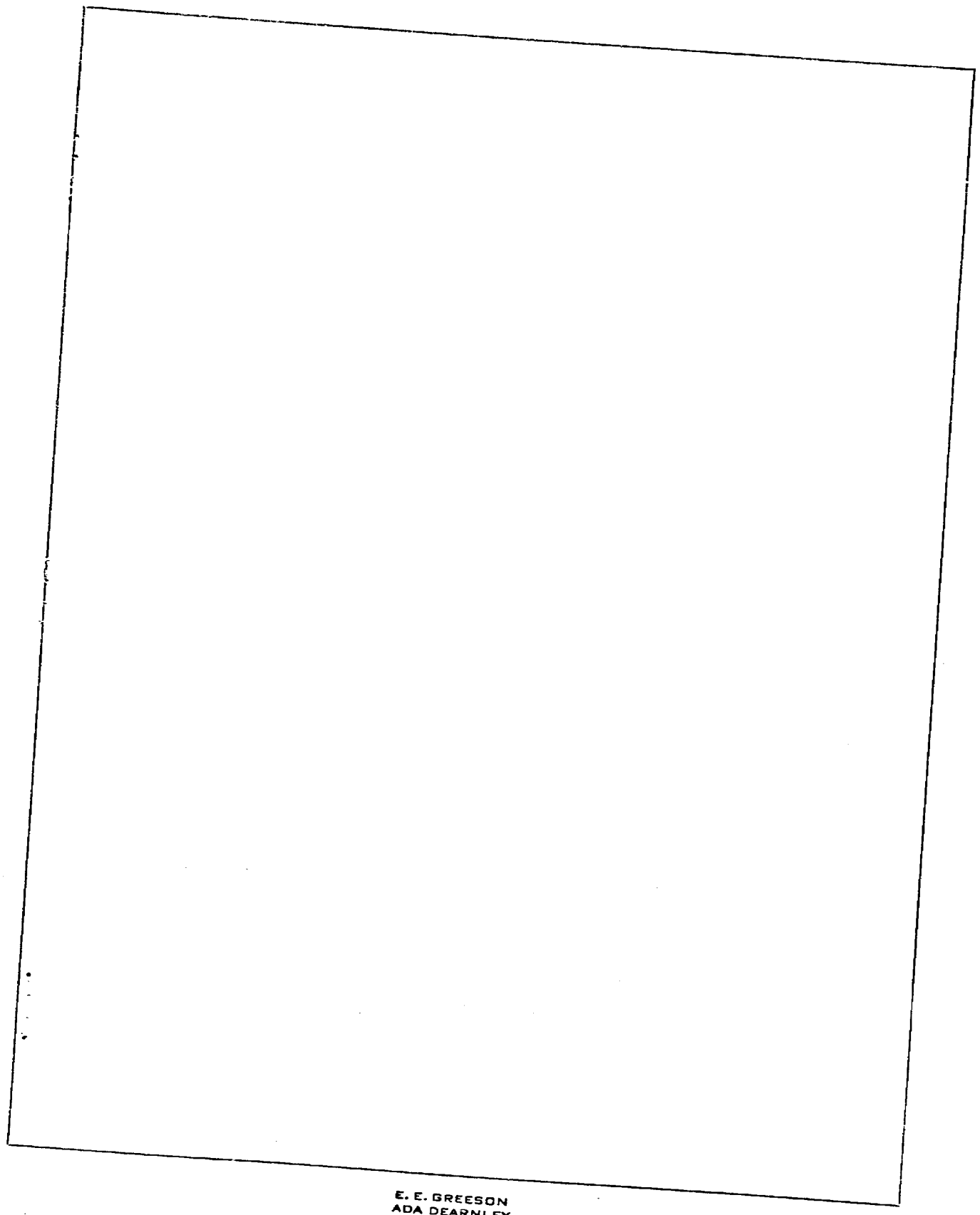
STATE OF NEW MEXICO)
: SS.
COUNTY OF BERNALILLO)

I hereby certify that the above and foregoing transcript of proceedings in Case No. 410, taken before the Oil Conservation Commission on October 15, 1952, at Santa Fe, New Mexico, is a true and correct record.

Dated in Albuquerque, New Mexico, this 26th day of October, 1952.

_____
Notary Public

My Commission Expires:
June 19, 1955.



E. E. GREESON
ADA DEARNLEY
COURT REPORTERS
BOX 1303
PHONES 5-9422 AND 5-9546
ALBUQUERQUE, NEW MEXICO

BEFORE THE

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

TRANSCRIPT OF PROCEEDINGS

CASE NO. 410

October 15, 1952
Regular New Mex.

E. E. GREESON
ADA DEARNLEY
COURT REPORTERS
BOX 1305
PHONES 5-9422 AND 5-9546
ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO

Santa Fe, New Mexico.

October 15, 1952.

In the Matter of:

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(Witness excused.)

MR. SPURRIER: Does anyone have a comment? Without objection these Exhibits 1, 2 and 3 will be received.

(El Paso Natural Gas Company's Exhibits Nos. 1, 2 and 3, previously marked for identification were received in evidence.)

MR. SPURRIER: Next case on the Docket is Case 411.

STATE OF NEW MEXICO)
: SS.
COUNTY OF BERNALILLO)

I hereby certify that the above and foregoing transcript of proceedings in Case No. 410, taken before the Oil Conservation Commission on October 15, 1952, at Santa Fe, New Mexico, is a true and correct record.

Dated in Albuquerque, New Mexico, this 26th day of October, 1952.

Notary Public

My Commission Expires:
June 19, 1955.

E. E. GREESON
ADA DEARNLEY
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