NM - 46

GENERAL CORRESPONDENCE

YEAR(S): 1990-1991

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

October 9, 1992

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

CERTIFIED MAIL
RETURN RECEIPT NO. P-670-241-872

Mr. Dale Gandy
549 Disposal, Inc. 1000369
P.O. Box 827
Tatum, New Mexico 88267

RE: **Request for Surface Waste Disposal Facility**
549 Disposal Inc.
Lea County, New Mexico

Dear Mr. Gandy:

The Oil Conservation Division (OCD) has received your August 7, 1992 response to the OCD's June 19, 1992 correspondence requesting additional information on the above referenced application for a produced water surface disposal facility. The following comments and requests for additional information are based on review of your August 7, 1992 correspondence. In order for the review process to continue the OCD requires the following information:

1. The OCD has stated previously that they are concerned with the possibility of contaminants either reaching groundwater below your proposed site or migrating off of your property along the surface of the redbed and contaminating groundwater. You have presented no solid, conclusive evidence that there is no groundwater below the proposed site or that the groundwater in Section 16, T-18-S, R-32-E, is of insufficient yield and has no reasonably foreseeable beneficial use.

   Pursuant to 70-2-12.B.(21) NMSA 1978, the OCD is required "to regulate the disposition of nondomestic wastes resulting from the exploration, development, production or storage of crude oil or natural gas to protect public health and the environment."

Based on the above two paragraphs, at this time the OCD will not allow the construction and operation of unlined pits at the proposed disposal facility. If you still plan to construct the proposed facility, please submit engineering designs for double-lined ponds with leak detection. In addition, submit engineering designs for all below grade sumps and/or tanks which also must be double-lined with leak detection.

2. At this time the OCD does not require installation of an aeration system since you have committed to a maximum water depth of three feet in you proposed ponds. Please note that you will be required to install and aeration system if the water depth in the ponds exceeds three feet or if the ponds emit any measurable quantity of H2S.

3. The OCD is currently revising all surface disposal facility permits to include specific requirements for H2S monitoring and contingency plans. This includes, but is not limited to, measuring the concentrations of H2S around the perimeter of the ponds and dissolved oxygen and sulfide levels within the ponds. Approval of all OCD 711 surface disposal facilities will be subject to specific H2S monitoring and contingency plans.

Please note that OCD Rule 711 requires that before commencing construction, all commercial surface waste disposal facilities shall have a surety or cash bond in the amount of $25,000 in a form approved by the Division.

Submission of the above requested information will allow the review process to continue. If you have any questions please do not hesitate to contact me at (505) 827-5884.

Sincerely,

Kathy M. Brown
Geologist

xc: OCD Hobbs Office

549 DISPOSAL, INC.
P.O. BOX 827
TATUM, NEW MEXICO 88267

August 7, 1992

Kathy M. Brown
Geologist
Energy, Minerals and National Resource Department
Oil Conservation Division
P.O. Box 2088
Santa Fe, NM 87504

RE: Request for Surface Waste Disposal Facility
549 Disposal, Inc.
Lea County, New Mexico

Dear Ms. Brown:

In response to your letter of June 19, 1992 requesting information based on review of application.

1. A and B, please find enclosed a letter from hydrologist Jim Wright.

2. Rule 711, please find enclosed copies of letter of surface land within 1/2 mile of proposed site.

3. There is no residence within a three mile area of the proposed site.

4. Operation of disposal facilities will be in accordance with ODC rules and regulations.

   a. As per ODC letter
   b. As per ODC letter
   c. As per ODC letter
   d. As per ODC letter
   e. As per ODC letter
   f. As per ODC letter

5. A. No oil will be allowed in the ponds. Should an upset occur in the treating process, a skimmer system in the skim pond will be used to remove any remaining oil from the produced water prior to the evaporation ponds.

   B. Ponds will maintain a minimum of 2' freeboard.

549 DISPOSAL, INC.
P.O. BOX 827
TATUM, NEW MEXICO 88267

6. Tankage:
   3-750 barrel gunbarrels
   3-500 barrel settling tanks
   2-500 barrel skim oil tanks

   Total tankage = 4750 barrels
   Berm volume required = 4750 X 1.33 = 6320 barrels
   Berm dimension requirements = 3' X 200' X 60'
   Berm dimension requirements = 36,000 cubic feet
   Berm dimension requirements = 6411 barrels

   All tanks to be placed on gravel pads.

7. Sumps-leak from sump would not impact ground water.

8. All treating facility operations will be performed in accordance with OCD Rule 312.

549 Disposal, Inc. facilities will adhere and promptly respond to all ODC rules and regulations.

In reference to an aeration system, 549, Inc. does not plan to have over 3' of water in the pits. Should we need more fluid level or if an H2S problem should occur in ponds, 549, Inc. will install an aeration system.

549, Inc. would be willing to monitor wells if required by ODC.

If there are any other questions that I might help you with please feel free to contact me.

Yours truly,

Dale Gandy
President

DG/ag

Enclosures

1a. The statement on page 2 of the report entitled, "Proposal for a Surface Water Disposal Facility in Lea County, New Mexico", which states that the alluvium underlying the proposed water disposal site is unsaturated is based on conversations with ranchers in the area and writer's personal knowledge of the general area. In the Querecho Plains area, the only water in the alluvial material is located in sub-surface draws which are filled with re-worked Triassic materials. This material will not yield sufficient quantities of water to produce it for beneficial use. Since the proposed site is located on a Triassic nose, it was concluded by the writer to be unsaturated (See figure II in the pocket of report). The thickness of the alluvium is supported by driller logs of seismic holes in section 9, Township 18 South, Range 32 East and by electric logs of oil wells.

1b. The test hole drilled in section 16 of Township 18 South, Range 32 East was drilled in an area where there was a significant subsurface draw. The hole was drilled with rotary air tools on September 3, 1991. The hole was 5-1/4 inch diameter uncased hole which the driller completed at 11:50 A.M. and was declared to be a dry hole by the driller. Based on past experience, the writer felt that given enough time sufficient water would seep into the hole to obtain a water sample. A water sample was collected from this hole on September 20, 1991. A series of depths to water below land surface were made on this test hole and a discharge recovery test was plotted which shows the long term well yield to be on the order of 0.00016 gallons per minute. Since this data was obtained and analyzed after the report was submitted we are attaching a copy of this curve for your information.

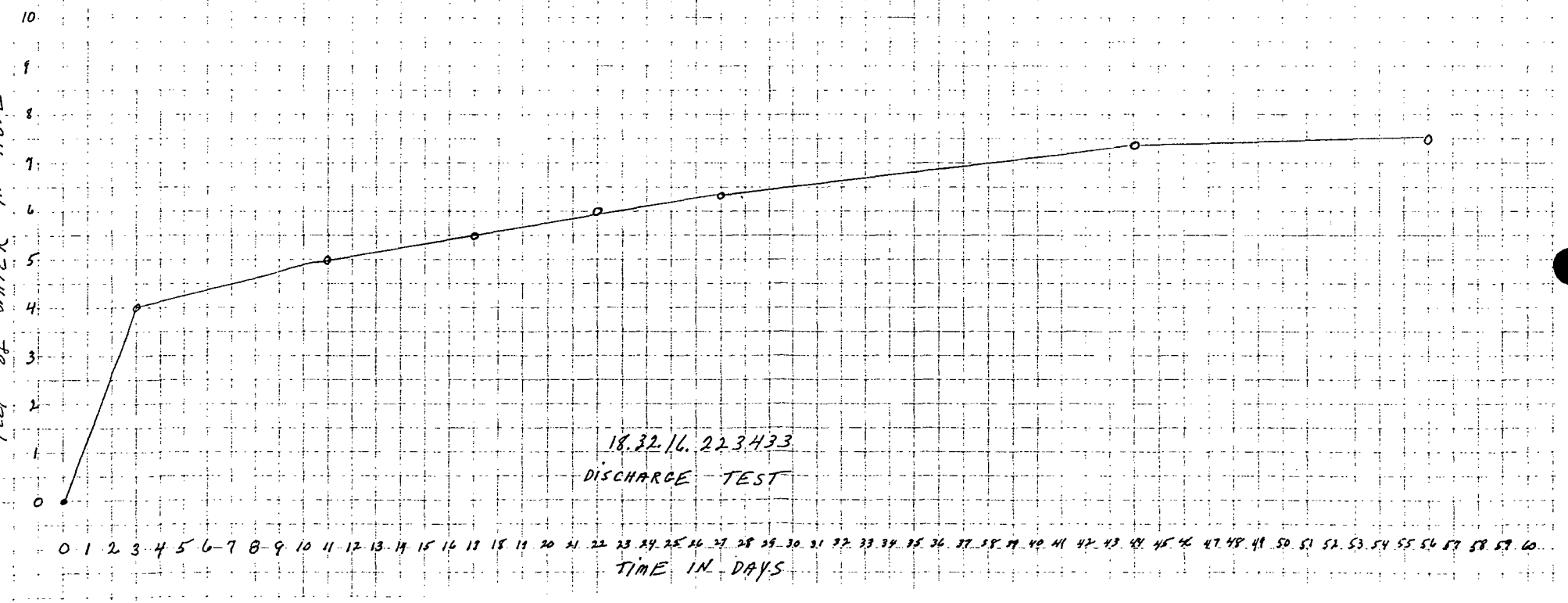
It is the writer's opinion that there is insufficient yield to apply this water to beneficial use, however, water discharged at the proposed site will move away from section 16 (See figure I and II in the pocket of report).

Well Drilled 9/3/91 with Rotary air tools
5¼" diameter hole
Red Bed @ 94'
Total Depth of Hole on 9/6/91 = 92'

NOTE: 1 Foot of WATER = 1.13 gallons

SHORT TERM well yield $\frac{4(1.13)}{3(1440)} = 0.0010$ GPM

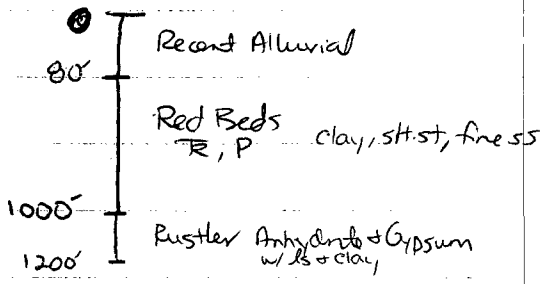
LONG TERM well yield $\frac{4(1.13)}{30(1440)} = 0.00016$ GPM



18.32.16.223433
DISCHARGE TEST

549 Hydro Info

Proposed Site: Recent alluvial
9-T18S-R32E



State alluvium is 80' & unsaturated. How do you know?
Claim transport direction is S-SW following R erosional surfaces

R Aquifer Main Water in Area. Gradient is SW

State well in Sec 7, T18S, R32E produced from R & not alluvial material. What proof? Owner says 500', 410' casing

Test hole: NE/4 NE/4, Sec 16-T18S-R32E
Drill 9/3/91 - dry
Water @ 88.15 on 9/6/92, 9' saturated sed.s
Estimate water production < 0.10 gpm
Quality: TDS - 742 ppm Cl - 147 ppm

18.32.20.14 DTW = 168' TDS = 844 ppm

CHECKLIST FOR COMPLIANCE WITH RULE 711

FACILITY NAME: 549 Disposal Inc.

LOCATION: W/2 NW/4, Sec 9, T18S, R32E, Lea County

MAILING ADDRESS: P.O. Box 827
Tatum, NM 88267

CONTACT PERSON: Mr. Dale Gandy

ORDER NO.:

DATE OF REVIEW: June 1992

1. OCD public notice issued (commercial facilities).

   OK - 5/20/92

2. Proof that owners and occupants within 1/2 mile were notified, including copy of letter and certified mail receipt. Provided copies of certified mail receipts but not of letters to landowners.

3. A $25,000 bond is required as of 12/30/88 for commercial facilities prior to commencing construction. Did not address

4. Affidavit of verification (disposal application signed).

   OK - signed

5. Plat and topo maps showing location in relation to governmental surveys and roads, watercourses, water wells and dwellings within one mile.

   Need better map showing access to facility off of major roads. Also need to include property boundaries & facility boundaries - do they coincide.

6. Names and addresses of facility site landowners and landowners of record within one-half mile.

   Need map showing boundaries of adjoining landowners within ½ mile
   Is landowner Billy Williams or Williams & Son Cattle Co.? Same?

7. Description of facility with a diagram indicating location of fences and cattleguards, and detailed engineering construction/installation diagrams of pits, liners, dikes, piping, sprayers, and tanks. Any aeration system or chemicals added to control H_2S? Any below grade tanks? Sump have leak detection? secondary containment? Containment @ loading area? Above ground tanks bermed, graveled pads? Pond details → freeboard, netting, no oil commitment.

8. Routine inspection and maintenance plan requires commitments to Rule 711 operating requirements including: Commited to operation + maintenance according to OCD guidelines.

   a. Monthly reports kept on site (2 year retention period) of source, location, volume and type of waste, date of disposal, and hauling company that disposes of wastes at the facility.

   b. Disposal permitted only when attendant is on duty, otherwise the facility must be secured.

   c. Netting requirements, may be waived by District Supervisor.

   d. All motor vehicles transporting produced water to the facility must have a valid Form C-133, on file with the Division.

9. Plan for disposal of approved waste solids or liquids.
Want to also be permitted as a treating plant? Where would the treated hydrocarbons then go to? Containment for treating units, engineering designs?

7. Geohydrological evidence that fresh water will not be affected.
Unlined pits. Hydro/Geo info. under separate cover.

10. Contingency plan for reporting and cleanup of spills or releases.
OK - Committed to OCD Rule 116.
H_2S Contigency plan - is it consistent w/ other disposal facilities? Contingency plans?

11. Closure plan. After operations have ceased for 6 consecutive months the OCD must be notified and and clean-up operations initiated.

OK

F PUBLICATION

No. 29501

W MEXICO,
an Juan:

E HILL being duly
: "That she is the
AL AD MANAGER of
ton Daily Times, a daily
f general circulation
n English in Farmington ,
and state, and that the
ched LEGAL NOTICE

ed in a regular and entire
e said Farmington Daily
ily newspaper duly quali-
e purpose within the
Chapter 167 of the 1937
s of the State of New
ONE consecutive
//) on the same day as

cation SUNDAY, MAY 17, 1992

ication

cation

ication

t of publication was $ 49.71

Christine Hill

ed and sworn to before me
2ND day of
ne, 1992.

Connie Andrae

blic, San Juan County,
o

ires: JULY 3, 1993

COPY OF PUBLICATI

NOTICE OF PUBLICATION
STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to New Mexico Oil Conservation Commissic Regulations the following applications to construct and operate a commercial surfac waste disposal facility have been submitted for approval to the Director of the C Conservation Division, State Land Office Building, P.O. Box 2088, Santa Fe, New Mexic 87504-2088, Telephone (505) 827-5800:

Tierra Environmental Company Inc., Richard Cheney, President, 909 West Apache, Farmington, New Mexico 87401, has submitted an application to construct and operate a commercial landfarm facility for remediation of hydrocarbon contaminated soils. The proposed facility is in the NW/4 SE/4, Section 2, Township 29 North, Range 12 West, NMPM, San Juan County, New Mexico. The facility is proposed to consist of a land management area where solids containing "non-hazardous" contaminants will be spread on the ground surface in six inch lifts or less and periodically turned to enhance biodegradation of contaminants. The ground water most likely to be affected by any accidental discharges is at a depth in excess of 100 feet and has an estimated total dissolved solids content of approximately 800 mg/l.

549 Disposal, Inc., Dale Gandy, P.O. Box 827, Tatum, New Mexico 88267, has submitted an application to construct and operate a commercial surface disposal facility for brine water generated in conjunction with the production of oil and gas. The proposed location of the facility is the W/2 NW/4, Section 9, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico. Produced water will be trucked to the facility and unloaded into skimmer tanks where the hydrocarbon free produced water will pass into storage tanks and then finally into a series of below grade, unlined, evaporation ponds. The permit application addresses the construction, operations, spill/leak prevention and monitoring procedures to be utilized at the facility. The ground water most likely to be affected by an accidental discharges is at a depth of 85 feet with a total dissolved solids content of approximately 750 mg/l.

Any interest person may obtain further information from the Oil Conservatior Division and may submit written comments to the Director of the Oil Conservatio Division at the address given above. The discharge plan application may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. Prior to ruling o any proposed discharge plan or its modification, the Director of the Oil Conservatior Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted to him and public hearing may be requested b any interested person. Requests for public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed plar based on information available. If a public hearing is held, the director will approve or disapprove the proposed plan based on information in the plan and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe New Mexico, on this 7th day of May, 1992.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION
WILLIAM J. LEMAY, Director

SEAL

Legal No 29501 published in the Farmington Daily Times, Farmington, New Mexico on Sunday, May 17, 1992.

Affidavit of Publication

STATE OF NEW MEXICO)
) ss.
COUNTY OF LEA)

JOyce Clemens being first duly sworn on oath deposes and says that he is Adv. Director of THE LOVINGTON DAILY LEADER, a daily newspaper of general paid circulation published in the English language at Lovington, Lea County, New Mexico; that said newspaper has been so published in such county continuously and uninterruptedly for a period in excess of Twenty-six (26) consecutive weeks next prior to the first publication of the notice hereto attached as hereinafter shown; and that said newspaper is in all things duly qualified to publish legal notices within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico.

That the notice which is hereto attached, entitled

Notice Of Publication

and numbered ~~the~~

~~Court of Lea~~ ~~County, New Mexico~~, was published in a regular and entire issue of THE LOVINGTON DAILY LEADER and not in any supplement thereof, ~~once each week on the same day of the week~~, for one (1) day ~~consecutive weeks~~, beginning with the issue of

May 15, 19 92

and ending with the issue of

May 15, 19 92

And that the cost of publishing said notice is the sum of $ 35.64

which sum has been (Paid) (~~Assessed~~) as Court Costs

Joyce Clemens

Subscribed and sworn to before me this 18th day of May, 19 92

Mrs. Jean Hewett

Notary Public, Lea County, New Mexico

My Commission Expires Sept. 28, 19 94

LEGAL NOTICE
NOTICE OF PUBLICATION
STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to New Mexico Oil Conservation Commission Regulations, the following applications to construct and operate a commercial surface waste disposal facility have been submitted for approval to the Director of the Oil Conservation Division, State Land Office Building, P.O. Box 2088, Santa Fe, New Mexico 87504-2088, Telephone (505) 827-5800:

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Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge plan application may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. Prior to ruling on any proposed discharge plan or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted to him and public hearing may be requested by any interested person. Requests for public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed plan based on information available. If a public hearing is held, the director will approve or disapprove the proposed plan based on information in the plan and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 7th day of May, 1992.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION
WILLIAM J. LEMAY,
Director

SEAL

Published in the Lovington Daily Leader May 15, 1992.

NOTICE OF PUBLICATION
STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge plan renewal applications have been submitted to the Director of the Oil Conservation Division, State Land Office Building, P.O. Box 2088, Santa Fe, New Mexico 87504-2088, Telephone (505) 827-5800:

Tierra Environmental Company Inc., Richard Cheney, President, 909 West Apache, Farmington, New Mexico 87401, has submitted an application to construct and operate a commercial landfarm facility for remediation of hydrocarbon contaminated soils. The proposed facility is in the NW/4 SE/4, Section 2, Township 29 North, Range 12 West, NMPM, San Juan County, New Mexico. The facility is proposed to consist of a land management area where solids containing "non-hazardous" contaminants will be spread on the ground surface in six inch lifts or less and periodically stirred to enchance biodegradation of contaminants. The ground water most likely to be affected by any accidental discharges is at a depth in excess of 100 feet and has an estimated total dissolved solids content of approximately 800 mg/l.

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Any interested person may obtain further information from the Oil conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge plan application may be viewed at the above address between 8:00 a.m. and 5:00 p.m., Monday through Friday. Prior to ruling on any proposed discharge plan or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted to him and public hearing may be requested by any interested person. Requests for public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed plan based on information available. If a public hearing is held, the director will approve or disapprove the proposed plan based on information in the plan and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on the 16th day of April, 1992.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION
s/William J. LeMay, Director
Journal: May 20, 1992

S[illegible]TE OF NEW MEXICO
County of Bernalillo ss

[illegible]IL CONSER[illegible]ON DIVISION
REC[illegible]VED
'92 MAY 26 AM 9 27

Thomas J. Smithson being duly sworn declares and says that he is National Advertising manager of the **Albuquerque Journal**, and that this newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chaper 167, Session Laws of 1937, and that payment therefore has been made or assessed as court costs; that the notice, a copy of which is hereto attached, was published in said paper in the regular daily edition,

for 1 times, the first publication being on the 20 day of May, 1992, and the subsequent consecutive publications on ....., 1992.

Thomas J Smithson

OFFICIAL SEAL
Notary Public Bernadette Ortiz
BERNADETTE ORTIZ
NOTARY PUBLIC-NEW MEXICO
BOND FILED WITH SECRETARY OF STATE
Commission Expires 12-8-93

Sworn and subscribed to before me, a Notary Public in and for the County of Bernalillo and State of New Mexico, this 20 day of May, 1992.

PRICE $30.84

Statement to come at end of month.

CLA-22-A (R-12/92) ACCOUNT NUMBER C81184

NOTICE OF PUBLICATION

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to New Mexico Oil Conservation Commission Regulations, the following applications to construct and operate a commercial surface waste disposal facility have been submitted for approval to the Director of the Oil Conservation Division, State Land Office Building, P.O. Box 2088, Santa Fe, New Mexico 87504-2088, Telephone (505) 827-5800:

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If no public hearing is held, the Director will approve or disapprove the proposed plan based on information available. If a public hearing is held, the director will approve or disapprove the proposed plan based on information in the plan and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 7th day of May, 1992.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

S E A L

WILLIAM J. LEMAY, Director

Lynx Petroleum Consultants, Inc.
P. O. Box 1979
3325 Enterprise Drive
Hobbs, New Mexico 88241
505 392-6950 Fax: 505 392-7886

April 7, 1992

William J. LeMay, Director
Oil Conservation Division
P.O. Box 2088
Santa Fe, NM 87504-2088

Re: Application of 549 Disposal, Inc. for a Surface Waste Disposal Facility, Lea County, New Mexico

Dear Mr. LeMay:

Enclosed in triplicate is the above referenced Application of 549 Disposal, Inc. The application conforms to the O.C.D. Guidelines for Permit Application, Design and Construction of Waste Storage/Disposal Facilities and to Rules 312 and 711. The hydrology report was sent under separate cover and is dated October, 1991. The surface land owners within a one-half mile radius have been furnished a copy of this application.

The applicant respectfully requests that the Division issue public notice and administratively approve the subject application.

Sincerely,

Marc L. Wise
Agent for 549 Disposal, Inc.

MLW/ad
enc

State of New Mexico
Energy, Minerals and Natural Resources Department
OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, NM 87501

RECEIVED
APR 10 1992
OIL CONSERVATION DIV.
SANTA FE

APPLICATION FOR SURFACE WASTE DISPOSAL FACILITY

(Refer to OCD Guidelines for assistance in completing the application.)

I. Type: ☒ Produced Water ☐ Drilling Muds ☐ Treating Fluids
☐ Solids ☐ Other _____

II. OPERATOR: 549 Disposal, Inc.
ADDRESS: P.O. Box 827, Tatum, NM 88267
CONTACT PERSON: Mr. Dale Gandy PHONE: 396-4948

III. LOCATION: W /4 NW /4 Section 9 Township 18-S Range 32-E
Submit large scale topographic map showing exact location.

IV. IS THIS AN EXPANSION OF AN EXISTING FACILITY? ☐ Yes ☒ No

V. Attach the name and address of the landowner of the disposal facility site and landowners of record within one-half mile of the site.

VI. Attach description of the facility with a diagram indicating location of fences, pits, dikes, and tanks on the facility.

VII. Attach detailed engineering designs with diagrams prepared in accordance with Division guidelines for the construction/installation of the following: pits or ponds; leak-detection systems; aerations sytems; enhanced evaporation (spray) systems; waste treating systems and security systems.

VIII. Attach a contingency plan for reporting and clean-up of spills or releases.

IX. Attach a routine inspection and maintenance plan to ensure permit compliance.

X. Attach a closure plan.

XI. Attach geological/hydrological evidence demonstrating that disposal of oil field wastes will not adversely impact fresh water.

XII. Attach proof that the notice requirements of OCD Rule 711 have been met. (Commercial facilities only.)

XIII. Attach a contingency plan in the event of a release of H_2S.

XIV. Attach such other information as is necessary to demonstrate compliance with any other OCD rules, regulations and/or orders.

XV. CERTIFICATION

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

Name: Marc Wise Title: Agent

Signature: Marc Wise Date: 3/30/92

DISTRIBUTION: Original and one copy to Santa Fe with one copy to appropriate Division District Office.

APPLICATION FOR PRODUCED WATER
SURFACE DISPOSAL PERMIT

549 DISPOSAL INC.

I. TYPE OF OPERATION

This facility will receive produced water for disposal into unlined, below grade, surface evaporation pits. The produced water will be trucked to the facility and unloaded into a skimmer tank where the fluid will be processed. Any residual sediment oil will be removed from the produced water and treated for resale. The hydrocarbon free fluid will be released to the surface evaporation pits.

II. OPERATOR

549 Disposal, Inc., P. O. Box 827, Tatum, NM, 88267. Representative Mr. Dale Gandy, (505) 396-4948.

III. LOCATION OF DISPOSAL PIT

The location of the proposed surface water disposal facility is the W/2 NW/4 of Section 9, Township 18 South, Range 32 East, Lea County, New Mexico. Exhibit "A" is a large scale topographic map showing access to the facility site.

IV. EXPANSION REQUEST

This is not an application for expansion of an existing facility.

V. LAND OWNERSHIP

The surface land at the proposed facility site is owned by Williams and Son Cattle Company. Exhibit "B" is a lease map delineating land ownership boundaries.

VI. STORAGE/DISPOSAL FACILITIES DESCRIPTION

A. The fluid accepted for disposal at the proposed site will be produced water.

B. Produced water will be unloaded into 750 barrel skimmer tanks. Gravity separation will allow for any hydrocarbons to be removed to the oil storage tanks for processing. Hydrocarbon free produced water will pass to the 500 barrel storage tanks for additional settling time and then to a 400' X 15' X 10' netted, below grade, skim pond. The produced water will then be siphoned into a series of 300' X 300' X 8' below grade, unlined, evaporation pits. (See Exhibit C - Proposed Surface Disposal Facility Layout)

VII. ENGINEERING DESIGN

A. Technical Data

1. Surface Impoundments - An average of 5000 barrels per day of produced water will be trucked to the proposed site. The water will pass through three 750 barrel skim tanks, three 500 barrel storage tanks, and a 400' X 15' X

VII. A. 1. Technical Data (Continued)

10' (10,000 barrel) skim pond before being siphoned to four 300' X 300' X 8' (125,000 barrel each) below grade evaporation pits.

2. Oil Treatment - Any reclaimed oil from the skimmer system will be stored in two 500 barrel oil storage tanks and treated for resale subject to O.C.D. Rule 312.

3. Landfarming - Not applicable

B. General Construction Requirements

Location, design and construction requirements as set forth in the O.C.D. Guidelines For Permit Application, Design, and Construction of Waste Storage /Disposal Facilities will be followed.

VIII. SPILL/LEAK PREVENTION AND REPORTING PROCEDURES

A. All pits will be below grade and unlined with no leak detection equipment installed. Daily observation and weekly inspection will occur. O.C.D. will be notified of any leak as per Rule 116.

B. A retaining dike will be constructed around all skimmer tanks and storage tanks. Float operated sumps will be used at the unloading area. No leak detection is planned other than daily observation. Spill notification and reports will be filed as per O.C.D. Rule 116.

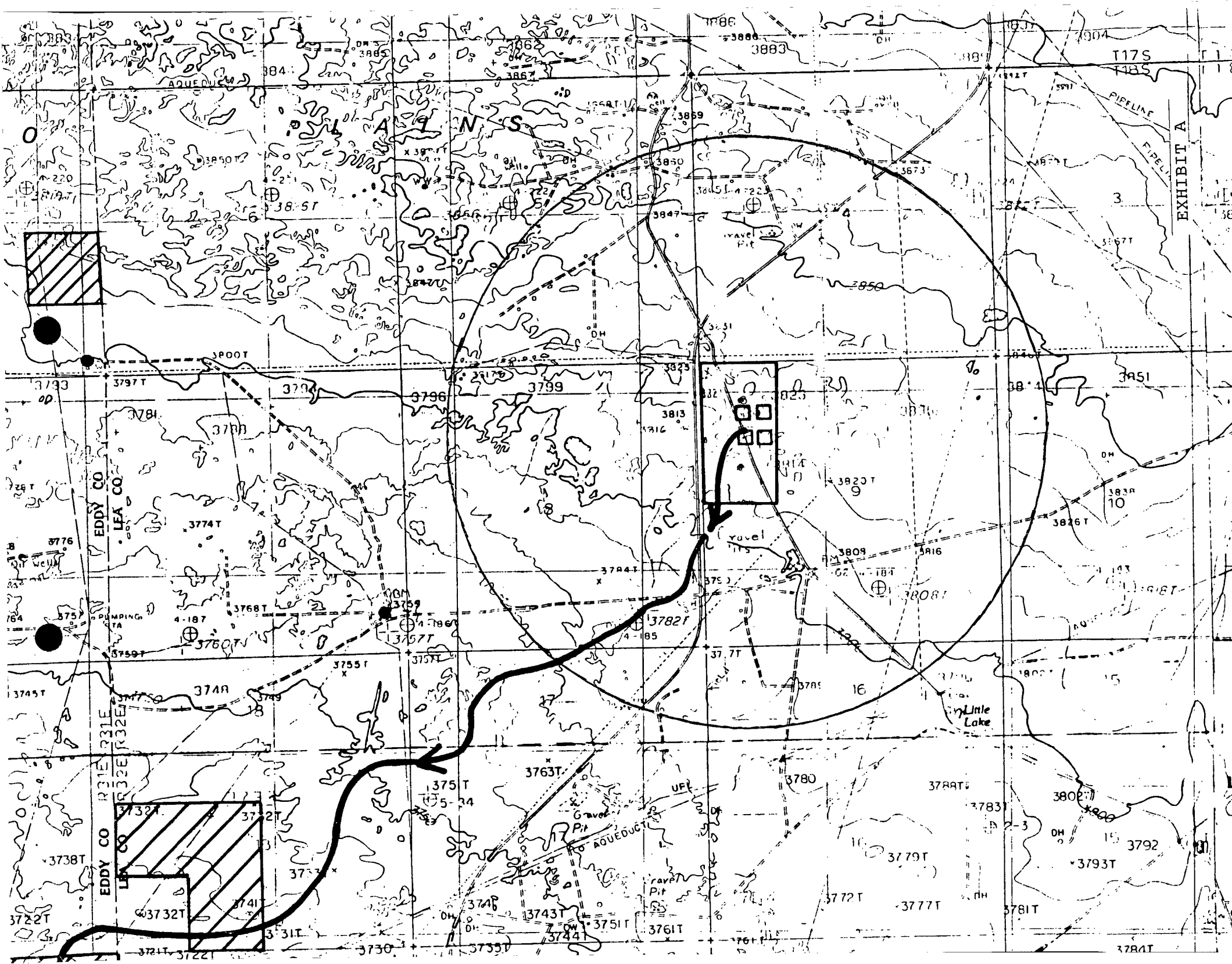
EXHIBIT A
T17S
R31E
R32E
EDDY CO
LEA CO
OLAINS
Little Lake
Gravel Pit
PUMPING STA
AQUEDUCT
PIPELINE

Lynx Petroleum Consultants, Inc.
P. O. Box 1979
3325 Enterprise Drive
Hobbs, New Mexico 88241
505 392-6950 Fax: 505 392-7886

March 30, 1992

Virgil Linam Est.
P.O. Box 743
Hobbs, NM 88240

Re: Application for Surface Waste Disposal Facility
W/2 NW/4 of Section 9, T-18S, R-32E
Lea County, New Mexico

Dear Sir:

549 Disposal, Inc. is filing the subject application with the Oil Conservation Division. Our records indicate that you are a surface land owner within 1/2 mile of the proposed project. In compliance with Rule 711, we have enclosed a copy of their application for your records.

If you have any questions, you may contact me, as agent for 549 Disposal, Inc. Any comments or objections must be filed with the Oil Conservation Division within 30 days.

Sincerely,
Lynx Petroleum Consultants, Inc.

Marc L. Wise

MLW/ad
enc

Lynx Petroleum Consultants, Inc.
P. O. Box 1979
3325 Enterprise Drive
Hobbs, New Mexico 88241
505 392-6950 Fax: 505 392-7886

March 30, 1992

Williams & Son Cattle Co.
P.O. Box 30
Maljamar, NM 88264

Re: Application for Surface Waste Disposal Facility
W/2 NW/4 of Section 9, T-18S, R-32E
Lea County, New Mexico

Dear Sir:

549 Disposal, Inc. is filing the subject application with the Oil Conservation Division. Our records indicate that you are a surface land owner within 1/2 mile of the proposed project. In compliance with Rule 711, we have enclosed a copy of their application for your records.

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Sincerely,
Lynx Petroleum Consultants, Inc.

Marc L. Wise

MLW/ad
enc

Lynx Petroleum Consultants, Inc.
P. O. Box 1979
3325 Enterprise Drive
Hobbs, New Mexico 88241
505 392-6950 Fax: 505 392-7886

March 30, 1992

U.S.A.
Bureau of Land Management
P.O. Box 1778
Carlsbad, NM 88221

Re: Application for Surface Waste Disposal Facility
W/2 NW/4 of Section 9, T-18S, R-32E
Lea County, New Mexico

Dear Sir:

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If you have any questions, you may contact me, as agent for 549 Disposal, Inc. Any comments or objections must be filed with the Oil Conservation Division within 30 days.

Sincerely,
Lynx Petroleum Consultants, Inc.

Marc L. Wise

MLW/ad
enc

This land Sec 9 in R32 18S has been in my family's ranch for nearly 100 years. And to the best of my knowledge there is no shallow water. We have drilled several water wells for windmill and there is no water except at a depth of 550'

Williams & Son Cattle Co.
Billy S. Williams

Notary
Connie Gail Kimbell
7-31-95

Commission Expired
June 6, 1994

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

June 19, 1992

CERTIFIED MAIL
RETURN RECEIPT NO. P-670-683-646

Mr. Dale Gandy
549 Disposal, Inc.
P.O. Box 827
Tatum, New Mexico 88267

RE: **Request for Surface Waste Disposal Facility**
549 Disposal Inc.
Lea County, New Mexico

Dear Mr. Gandy:

The Oil Conservation Division (OCD) has received and is in the process of reviewing the above referenced application for a produced water surface disposal facility located in the W/2 NW/4, Section 9, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico. The following comments and requests for additional information are based on review of the application, dated March 30, 1992. In order for the review process to continue the OCD requires the following information:

1. The OCD is concerned with the possibility of contaminants migrating off of your property along the surface of the redbed and contaminating groundwater. Your hydrological report entitled "Proposal for a Surface Water Disposal Facility in Lea County, New Mexico," is not adequate to justify the installation of unlined pits based on the following:

    a. On page 2 of said report you state that "the alluvium underlying the proposed waste water disposal site is unsaturated and is about 80 feet thick". There is no evidence presented to support this conclusion since there is no indication that a water well has ever been drilled beneath the proposed facility or anywhere within Section 9.

b. The test hole drilled in Section 16, Township 18 South, Range 32 East has 9 feet of saturated sediments. By statue the OCD can not allow the contamination of any protectable groundwater. The State Engineer defines protectable water as all underground waters containing 10,000 mg/l or less dissolved solids which may have a reasonably foreseeable beneficial use. "Reasonable foreseeable" has been taken to mean a time period not less than 200 years and in other instances thousands of years. The water in the test hole has a total dissolved solids concentration of 742 mg/l. Unless you can provide evidence that this water has no reasonably foreseeable beneficial use then this water must be protected.

To justify the use of unlined ponds you must demonstrate that operations at your proposed facility will not impact protectable groundwater. If you can not satisfactorily demonstrate this then the ponds must be double-lined with leak detection. Enclosed are the OCD Engineering Design Guidelines for Construction of Waste Storage/Disposal Ponds.

2. Rule 711 requires the applicant to give written notice of the application to all owners of surface lands and occupants within one-half (1/2) mile and to provide the OCD with a copy and proof of such notice. Your application contains a copy of the signed certified mail receipts, however there are no copies of the letters sent to the landowners and occupants within 1/2 mile. Please submit copies of the notifications sent to the required landowners/occupants.

3. The OCD is concerned about the impact of disposal facilities on private residences. Please submit a map showing all private residences within one mile of the proposed facility. Include the name and land status of the resident. Include all land ownership boundaries around the proposed facility. The lease map submitted in your application is not clear.

4. The OCD has stringent requirements for the operation of all OCD regulated disposal facilities. A commitment to the following conditions is required prior to OCD approval of commercial surface disposal facilities:

   a. Disposal at the facility will only occur when an attendant is on duty. The facility will be secured when no attendant is on duty. The facility will be fenced and a sign posted identifying the operator, the location of the facility and the emergency telephone numbers.

   b. No produced water will be received at the facility unless the transporter has a valid Form C-133 on file with the Division.

c. Only liquids that are non-hazardous under the RCRA Subtitle C exemption or by characteristic testing will be accepted at the facility. Liquids from operations not currently exempt under RCRA Subtitle C will be tested for appropriate hazardous constituents and must receive OCD approval prior to disposal. Non hazardous, non oil field wastes may be accepted on a case-by-case basis after prior approval from the OCD.

d. The operator shall keep and make available for inspection records for each calendar month on the source, location, volume and type of waste, analysis for hazardous constituents, date of disposal, and waste hauling company. The records will be maintained from a period of two (2) years from the date of disposal.

e. The operator will file forms C-117-A, C-118, and C-120-A as required by OCD rules.

f. To protect migratory birds, all tanks exceeding 16 feet in diameter, and exposed pits and ponds will be screened netted or covered. Upon written application by the operator, an exception may be granted by the district supervisor upon a showing that an alternative method will protect migratory birds or that the facility is not hazardous to migratory birds.

5. The OCD has stringent requirements for ponds at commercial surface disposal facilities. Please address or commit to the following items:

a. No oil will be allowed in the ponds. Note that OCD Rule 310 prohibits oil from being stored or retained in earthen reservoirs or in open receptacles.

b. The ponds will maintain a minimum freeboard of two feet unless you can demonstrate that a smaller freeboard will not allow fluids to spill out of the ponds.

c. Will there be any type of aeration system installed in the ponds? If not, demonstrate why an aeration system is not needed to prevent anaerobic conditions from forming and promoting the generation and emission of H2S.

6. The OCD requires all above ground tanks other then fresh water to be bermed to contain a volume one-third more than the largest tank or all interconnected tanks, and to be placed on gravel pads. Submit the holding capacity of the proposed containment dike around the tanks, and what type of material the tanks will be placed on.

7. All new sumps must be approved by the OCD prior to installation and must incorporate secondary containment and leak detection in their designs. Enclosed are the OCD Guidelines for the Selection and Installation of Below-Grade Produced Water Tanks, which are also applicable to sumps. The sumps proposed in your application do not have leak detection or secondary containment. Unless you can demonstrate that a leak from your sump would not impact protectable groundwater you will be required to install secondary containment with leak detection. Submit engineering designs for the sumps at your proposed facility.

8. Your application for a commercial surface disposal facility includes the request to operate a waste oil treating facility. Treating facilities are typically permitted separately under OCD Rule 312. However, since the OCD has jurisdiction over both types of facilities it is possible to include both facilities under the OCD Rule 711, and only require one $25,000 bond. To permit the treating facility under Rule 711 the OCD requires a commitment to conduct all treating facility operations in accordance with OCD Rule 312.

Please note that OCD Rule 711 requires that before commencing construction, all commercial surface waste disposal facilities shall have a surety or cash bond in the amount of $25,000 in a form approved by the Division.

Submission of the above requested information will allow the review process to continue. If you have any questions please do not hesitate to contact me at (505) 827-5884.

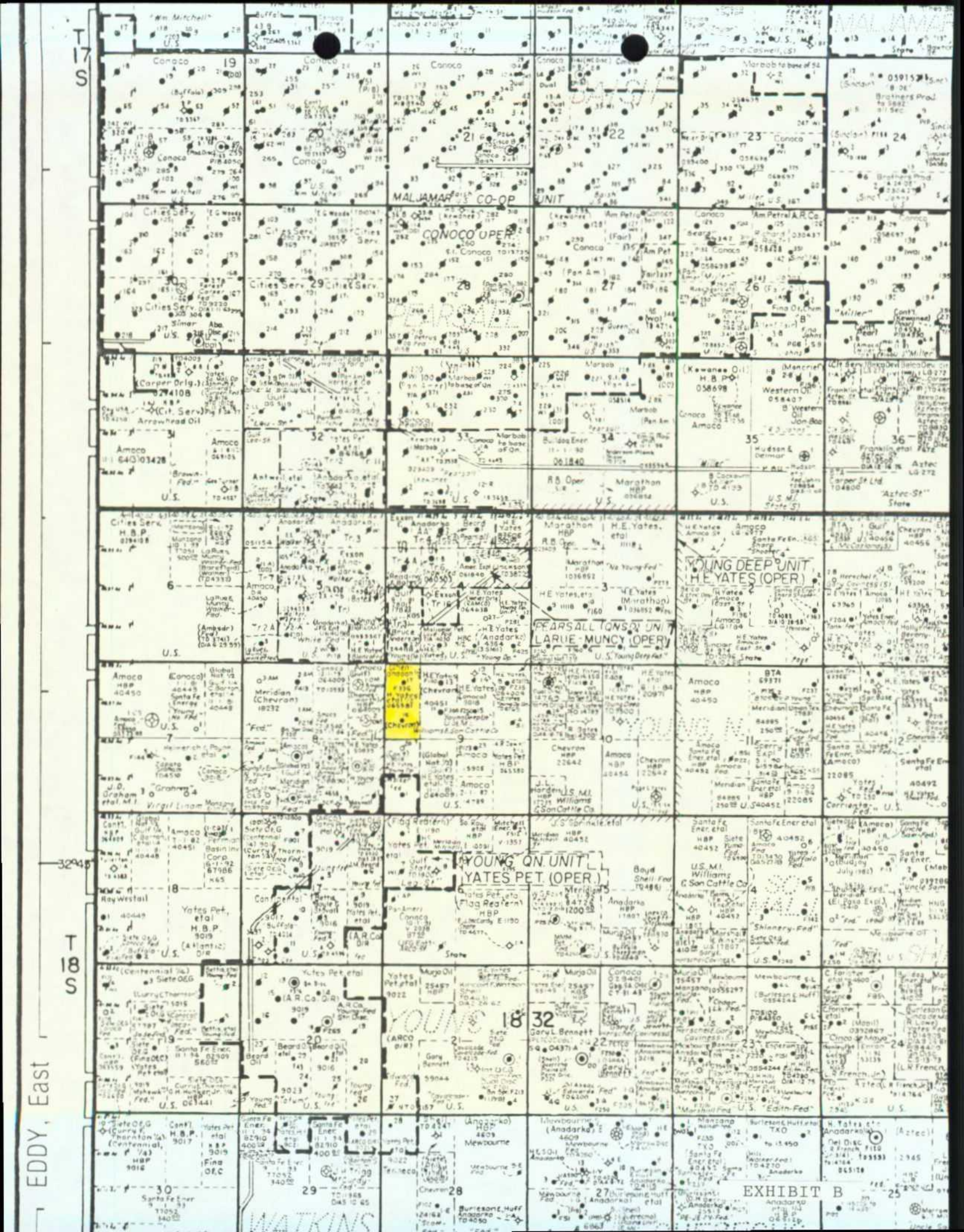
Sincerely,

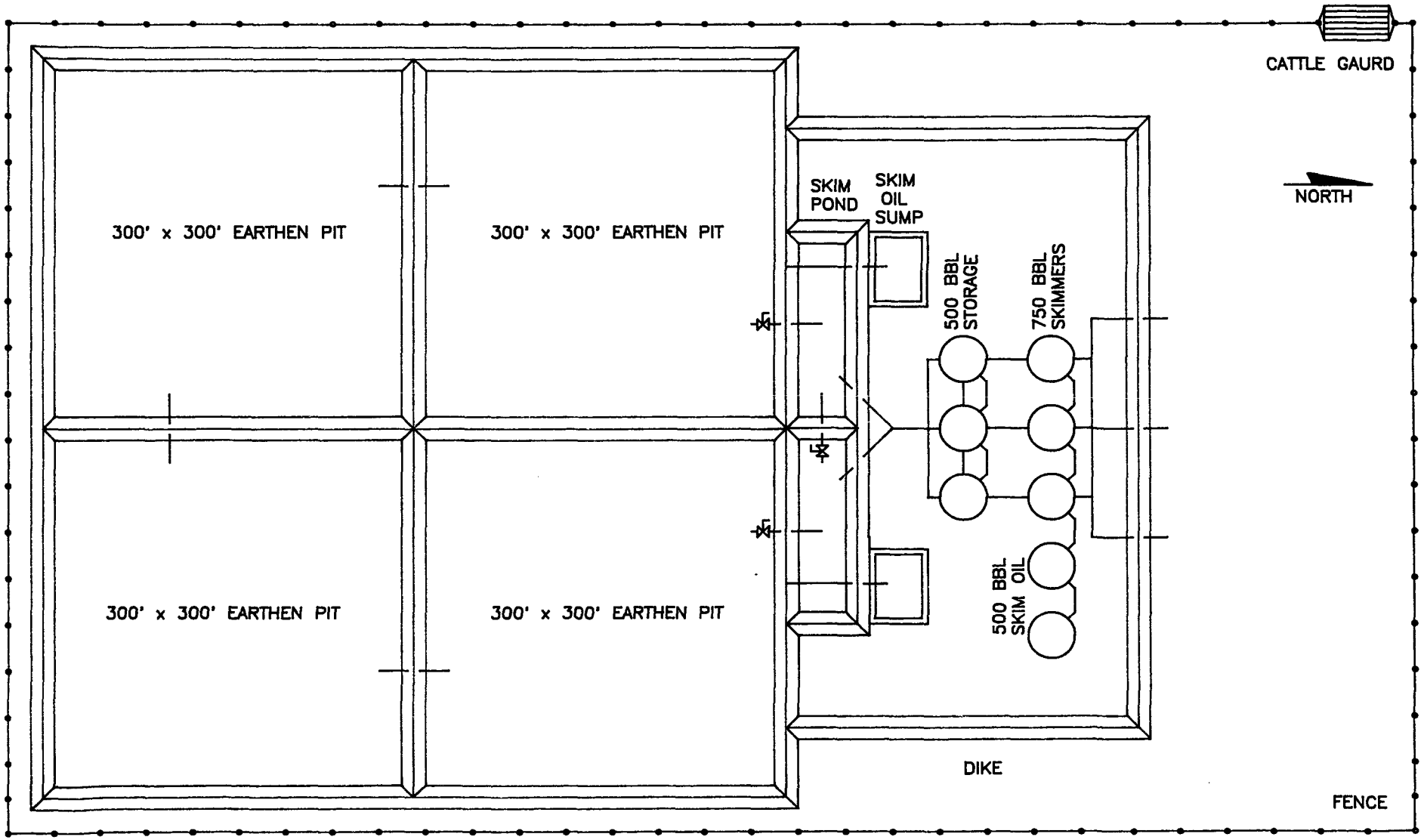
Kathy Brown

Kathy M. Brown
Geologist

Attachments

xc: Chris Eustice, OCD Hobbs Office


T 17 S
T 18 S
EDDY, East
MALJAMAR CO-OP UNIT
CONOCO UPER
YOUNG DEEP UNIT H.E. YATES (OPER)
PEARSALL TONSON UNIT LARUE-MUNCY (OPER)
YOUNG QN. UNIT YATES PET. (OPER.)
YOUNG
WATKINS
EXHIBIT B



NOT TO SCALE

EXHIBIT C

549 DISPOSAL INC.	DRWG. NO. 1	3/17/92
PROPOSED SURFACE DISPOSAL FACILITY		
W/2 NW/4 SEC. 9, T-18S, R-32E, LEA COUNTY, NM		

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.
1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)* 2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
U.S.A.
Bureau of Land Management
P.O. Box 1778
Carlsbad, NM 88221

4. Article Number
P 119 159 386

Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
X Betty Hall

7. Date of Delivery
4-1-92

8. Addressee's Address *(ONLY if requested and fee paid)*

PS Form 3811, Apr. 1989 ★U.S.G.P.O. 1989-238-815 DOMESTIC RETURN RECEIPT

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.
1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)* 2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
Virgil Linam Est.
P.O. Box 743
Hobbs, NM 88241

4. Article Number
P 119 159 385

Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
X William A Linam

7. Date of Delivery
4-2-92

8. Addressee's Address *(ONLY if requested and fee paid)*

PS Form 3811, Apr. 1989 ★U.S.G.P.O. 1989-238-815 DOMESTIC RETURN RECEIPT

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.
1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)* 2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
Williams & Son Cattle Co.
P.O. Box 30
Maljamar, NM 88264

Billy S. Williams

4. Article Number
P 119 159 384

Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
X

7. Date of Delivery
4-6-92 PB

8. Addressee's Address *(ONLY if requested and fee paid)*

PS Form 3811, Apr. 1989 ★U.S.G.P.O. 1989-238-815 DOMESTIC RETURN RECEIPT

EXHIBIT D

PROPOSAL FOR A SURFACE WATER DISPOSAL FACILITY IN LEA COUNTY, NEW MEXICO

PREPARED FOR
549 DISPOSAL INC.
TATUM, NEW MEXICO
OCTOBER 1991

BY
JAMES I. WRIGHT
CONSULTING HYDROLOGIST
ROSWELL, NEW MEXICO

TABLE OF CONTENTS

PROPOSAL FOR A SURFACE WATER DISPOSAL FACILITY IN LEA COUNTY, NEW MEXICO

INTRODUCTION

On April 25, 1991 Dale Gandy called and asked me to start doing an investigation on a proposed salt water disposal facility to be located in the NW 1/4 of Section 9 Township 18 South Range 32 East. Mr. Gandy proposes to construct four or five 300 feet by 300 feet surface pits in the W 1/2 NW 1/4.

The proposed site is on fee land and is presently owned by Billy Williams. After reviewing the existing geological and hydrological reports covering the general area, I started collecting basic hydrological data in the vicinity of the proposed site for evaluation.

Data was collected from the New Mexico State Engineer, the U.S. Geological Survey, U.S. Bureau of Land Management and the New Mexico Oil Conservation Division.

GENERAL GEOLOGY

The site is located in western Lea County in the northern portion of the Querecho Plains. There are no springs in the vicinity of the proposed site.

A geologic map of southern Lea County taken from the U.S. Bureau of Mines Groundwater Report 6 is included in this report as Figure III. An inspection of this map shows that the surface

geology consists of alluvial material in the vicinity of the proposed site.

LOCAL GEOLOGY

The area covered by this study includes most of Township 18 South,Range 32 East, and the East tier of Section's in Township 18 South, Range 31 East, with the principal area of interest being Section 9 of Township 18 South, Range 32 East. The Quaternary alluvium in the immediate vicinity of Section 9 varies in thickness from 40 feet to 100 feet. The underlying Red Beds of Triassic and Permian age are approximately 900 feet thick. These formations consist predominantly of clays and siltstones, but some very fine grained sandstone may also be present. The upper part of these Red Beds is believed to be Chinle Formation and the lower portion Dewey Lake Red Beds.These formations are underlain by the Rustler Formation which is about 200 feet thick in this area. The Rustler Formation consists primarily of anhydride or gypsum with some limestones and clay.

HYDROLOGY

The alluvium underlying the proposed waste water disposal site is unsaturated and is about 80 feet thick. Water disposed of in unlined pits located in the W 1/2 NW 1/4 of section 9, Township 18 South, Range 32 East will move downward under the force of gravity to the top of the relatively impermeable

Triassic Formation. It will then move generally down gradient following the erosional surfaces of the Triassic in a south-southwesterly direction toward the SE 1/4 of Section 25, Township 18 South, Range 31 East. (see figure II)

The average annual rainfall in the area of the proposed disposal site averages between 13 and 14 inches per year and is not considered to be a significant source of recharge.

The principle source of ground water in the area covered by this report are from wells completed in the Triassic Formation. The gradient of the potentiometric surface of the wells completed in this aquifer is to the southwest at about 60 feet per mile according to a report by Mercer and Orr entitled "Review and Analysis of Hydrogeologic Conditions Near the Site of a Potential Nuclear-Waste Repository Eddy and Lea Counties,New Mexico" Records of these wells are shown in Table 1 of this report. Some water is also obtained from water transmission lines which deliver Ogallala water from the Buckeye area to the potash mines located in western Eddy County. As far as we can determine there is no production of water from the alluvium any where in the localized area of the proposed disposal site.

Testimony in previous hearings before the Oil Conservation Division was that a well at 18.32.07.44233 and a well located at 18.32.16.22433 were producing from alluvial material at depths of 100 feet or less. We have confirmed that the well in section 7 produced water from the Triassic rather than the alluvium. We were unable to find any one who had specific knowledge of the

well in section 16, however the ranchers in the area doubted that there was any shallow water in section 16. A test hole located at 18.32.16.223433, drilled by Larry Felkins using rotary air tools to a depth of 100 feet on September 3, 1991 was dry.

On September 6, 1991 the writer measured the water level in this test hole. The water level was 88.15 feet below land surface and the total depth of the hole was 92 feet below land surface. In 76 hours following the completion of the hole it has filled in to 2 feet above the base of the alluvium and 6 feet of water has seeped into the bore hole. The water level in this test hole was measured again on September 14, 1991 and found to be 87.15 feet below land surface. It was measured again on September 20, 1991 at 86.65 feet below land surface. It was also measured on September 25, 1991 and September 30, 1991. The depth to water below land surface was 86.16 feet and 85.67 feet respectively. The water in this hole has increased 2.48 feet in 24 days or about 0.10 feet per day. This indicates an extremely low permeability in the formation surrounding the test hole. It is the writers opinion that this well will produce less than 0.10 of a gallon per minute.

QUALITY

Water samples collected by State Engineer employees and analyzed for chlorides and conductivity by their laboratory are

shown in appendix "C". All of these water samples are from wells producing water from the Triassic Formation, except for the test hole located in section 16, Township 18 South, Range 32 East which was completed in the alluvium. A well located in SW 1/4 SW 1/4 SE 1/4 SE 1/4 of Section 7, Township 18, South Range 32 East which is shown as an alluvium well in Wright's report on Contamination of Fresh Ground-Water Supplies in Southeastern New Mexico has been determined to be Triassic. The writer spoke with Faye Klein, owner of the well and she said this well was about 500 feet deep. A field check made by Jim Wright on July 12, 1991 found 19 joints of 3 inch tubing laying next to this well. Indications were that pump was set at about 410 feet in this well. Water level in the unequipped well was 83.57 feet below top of casing. Evidence at the well site supported Faye Klein's statement that the well was about 500 feet deep.

Another field check of the wells located in the NE 1/4 SE 1/4 SE 1/4 of Section 7, Township 18 South, Range 32 East was made by Jim Wright on September 3, 1991. The depth of the abandoned well was measured and found to be 230 feet. This confirms Mrs Klein's statement that the well had caved in and she had to drill a new well. The total depth of the new well was also measured. Pump had been pulled from the well and the depth was determined to be 375 feet. The water level was 320 feet below land surface. No water sample was collected since the well was unequipped.

SUMMARY AND CONCLUSIONS

The alluvium in the vicinity of Section 9, Township 18 South, Range 32 East is unsaturated. The only water wells presently being used in this area are wells completed in the Triassic Formation. A stock well located in the SE 1/4 SE 1/4 NW 1/4 SE 1/4 SE 1/4 of Section 7, Township 18 South, Range 32 East is 540 feet deep and reportedly produces 12 gallons per minute from a water bearing zone between 498 and 510 feet below land surface. Several hundred feet of clay separates the overlying alluvium from this water zone. This well is located about 1 1/2 miles southwest of the proposed disposal site and is the closest water well to the site.

The test hole drilled in the SW 1/4 SW 1/4 SE 1/4 SW 1/4 NE 1/4 NE 1/4 of Section 16, Township 18 South, Range 32 East does have about 9 feet of saturated sediments, however due to the type of material in which the water is encountered it can not be produced in significant quantities and consequently can not be put to beneficial use.

In my opinion the disposal of brine in surface disposal pits located in the W 1/2 NW 1/4 of Section 9, Township 18 South, Range 32 East will not contaminate any fresh ground water supplies. Water from these pits will migrate downward until it reaches the base of the alluvium. Since the upper part of the Triassic is relatively impermeable (*0.0000000097 centimeters per second) the water will move laterally down gradient and

eventually discharge with the water disposed of in Section 25, Township 18 South, Range 31 East which is already an approved disposal area.

*Reed, Ed L., and Associates Inc., March 1983, Proposal for Surface Salt Water Disposal, Lea County, New Mexico: Consultants Report Prepared for Wallen Production Company, p 6.

WELL-NUMBERING SYSTEM

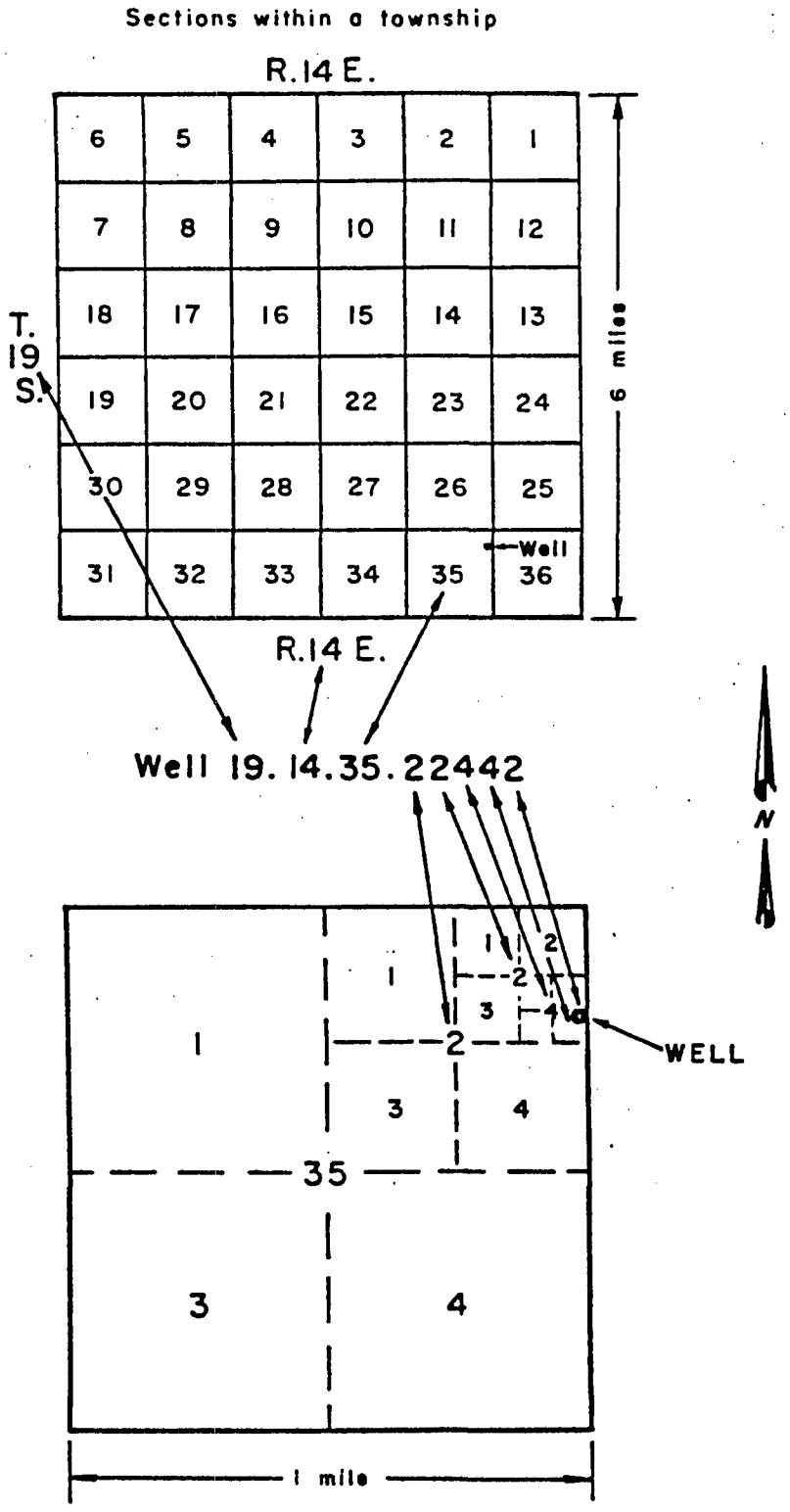
The system of numbering wells in New Mexico is based on the common subdivisions in sectionized land, and, by means of it, the well number, in addition to designating the well, locates its position to the nearest 0.625-acre tract in the land net. The segment denotes the township north or south of the New Mexico base line; the second denotes the range east or west of the New Mexico principal meridians; and the third denotes the section. An "N" is added to the first segment of the well number if the well is north of the base line, but no letter is added if the well is south of the base line. Similarly, where wells are located west of the meridian, a "W" is added to the second segment of the well number of those wells west of the meridian but no letter is added if the well is east of the meridian.

The fourth segment of the number, which consists of five digits, denotes the particular 0.625-acre tract in which the well is situated. For this purpose the section is divided into four quarters numbered 1, 2, 3, and 4, in the normal reading order, for the northwest, northeast, southwest, and southeast quarters, respectively. The first digit of the fourth segment gives the quarter section, which is a tract of 160 acres. Similarly, the quarter section is divided into four 40-acre tracts numbered in the same manner, and the second digit denotes the 40-acre tract. The 40-acre tract is divided into four 10-acre tracts and the third digit denotes the 10-acre tract. The 10-acre tract is divided into four 2.5-acre tracts and the fourth digit denotes the 2.5-acre tract. The 2.5-acre tract is divided into four tracts containing 0.625 acres each and the fifth digit determines this tract. Thus, well 12.36.24.12311 in Lea County is in the NW 1/4 NW 1/4 SW 1/4 NE 1/4 NW 1/4 Sec. 24, T. 12 S., R. 36 E. If a well cannot be located accurately to a 10-acre tract, a zero is used as the third digit, and if it cannot be located accurately within a 40-acre tract, zeros are used for both the second and third digits. If the well cannot be located more closely than the section, the fourth segment of the well number is omitted.

Letters a, b, c, - - - - - - are added to the last segment to designate the second, third, fourth and succeeding wells in the same 0.625-acre tract.

The following diagram shows the method of numbering the tracts within a section:

Diagram: System of numbering wells in New Mexico.



REFERENCES CITED

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Hendrickson, G. E., and Jones, R. S., 1952, Geology and Ground Water Resources, Eddy county, New Mexico: New Mexico Bureau of Mines and Mineral Resources Ground-Water Report 3, 163 p.

Mercer, J. W., and Orr, B. R., February 1977, Reveiw and Analysis of Hydrogeologic Conditions near the Site of a Potential Nuclear-Waste Repository, Eddy and Lea Counties, New Mexico: U. S. Geological Survey open-file report 77-123, 35 p.

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RECORD OF DRILL HOLES IN THE VICINITY OF SECTION 9 T 18 S R 32 E

LOCATION NUMBER	OWNER	AQUIFER	HOLE DEPTH	LAND SURFACE ELEVATION	WATER LEVEL	DATE MEASURED	POTENTIOMETRIC ELEVATION	THICKNESS OF ALLUVIUM	DEPTH TO RED BED	RED BED ELEVATION	CASING SIZE	USE OF WATER	REMARKS
18.31.01.44432	WILLIAMS BRO.	TRIASSIC		3797	460.42	04-07-71	3337				13 3/8"	STOCK	WINDMILL
18.31.01.44432	WILLIAMS BRO.	TRIASSIC		3797	454.56	05-27-76	3342				13 3/8"	STOCK	WINDMILL
18.31.01.44432	WILLIAMS BRO.	TRIASSIC		3797	454.29	01-26-86	3343				13 3/8"	STOCK	WINDMILL
18.31.01.44432	WILLIAMS BRO.	TRIASSIC		3797	453.62	09-25-90	3343						
18.31.12.231444	MAXWELL OIL	TRIASSIC	690	3778	435.54	03-07-68	3342				8 5/8"	SRO	PUMP JACK
18.31.12.231444	MAXWELL OIL	TRIASSIC	690	3778	435.34	04-07-71	3343				8 5/8"	NONE	PUMP JACK
18.31.12.231444	MAXWELL OIL	TRIASSIC	690	3778	434.45	05-27-76	3344				8 5/8"	NONE	PUMP JACK
18.31.12.231444	MAXWELL OIL	TRIASSIC	690	3778	433.76	04-11-83	3344				8 5/8"	NONE	PUMP JACK
18.31.12.231444	MAXWELL OIL	TRIASSIC	690	3778	433.76	01-26-87	3344				8 5/8"	NONE	SAMPLED
18.31.12.231444	MAXWELL OIL	TRIASSIC	690	3778	433.04	09-25-90	3345				8 5/8"	NONE	SAMPLED
18.31.12.314112	MAXWELL OIL	TRIASSIC	485	3761		12-08-65	UNK				7"	DOMESTIC	"RANSPOT"
18.31.12.41122	MAXWELL OIL	TRIASSIC	520	3770	461R	12-08-65	UNK				7"	SRO	PUMP JACK
18.31.14.22133	BOB JOHNSON	TRIASSIC	400	3731	289.05	12-08-65	3442				8 5/8"	NONE	PRODUCES
18.31.14.22133	BOB JOHNSON	TRIASSIC	400	3731	377.31	04-06-71	3354				8 5/8"	NONE	15BBL/DAY
18.31.14.22133	BOB JOHNSON	TRIASSIC	400	3731	376.92	05-27-76	3354				8 5/8"	NONE	
18.31.14.22133	BOB JOHNSON	TRIASSIC	400	3731	375.81	04-11-83	3355				8 5/8"	NONE	
18.31.14.22133	BOB JOHNSON	TRIASSIC	400	3731	377.06	01-26-87	3354				8 5/8"	NONE	SAMPLED
18.31.14.22133	BOB JOHNSON	TRIASSIC	400	3731	376.64	09-25-90	3354				8 5/8"	NONE	SAMPLED
18.31.35.31324	K. SANDERS	TRIASSIC	300	3631	261.08	04-05-71	3370				8 5/8	DOMESTIC	PRODUCES
18.31.35.31324	K. SANDERS	TRIASSIC	300	3631	260.53	05-27-76	3370				8 5/8	DOMESTIC	25BBL/DAY
18.31.35.31324	K. SANDERS	TRIASSIC	300	3631	260.51	04-11-83	3370				8 5/8	DOMESTIC	
18.31.35.31324	K. SANDERS	TRIASSIC	300	3631	261.01	01-26-87	3370				8 5/8	DOMESTIC	PUMP JACK
18.32.05.13322	ANADARKO	RUSTLER	990	3859	700.00	12-02-65	3159	UNK	UNK		8 1/4"	NONE	REPT. WL.
18.32.07.44233	LINAM RANCH	TRIASSIC	500	3759	80.80	05-26-76	3678	64	64	3695	6 5/8"	STOCK	WINDMILL
18.32.07.44233	LINAM RANCH	TRIASSIC	500	3759	82.19	03-12-81	3677	64	64	3695	6 5/8"	STOCK	WINDMILL
18.32.07.44233	LINAM RANCH	TRIASSIC	500	3759	81.50	03-25-86	3678	64	64	3695	6 5/8"	STOCK	WINDMILL
18.32.07.44233	LINAM RANCH	TRIASSIC	500	3759	82.47	05-14-91	3677	64	64	3695	6 5/8"	STOCK	UNEQUIPPED
18.32.07.44233	LINAM RANCH	TRIASSIC	500	3759	82.57	07-12-91	3676	64	64	3695	6 5/8"	STOCK	WL BY J.W.
18.32.07.442331	FAYE KLEIN	TRIASSIC	540	3758	320.41	09-03-91	3438	64	64	3694	6 5/8"	STOCK	PUMP JACK
18.32.16.223433	BILLY WILLIAMS	NONE	100	3789	DRY	09-03-91		94	94	3695	UNCASED	NONE	TEST HOLE
18.32.16.223433	BILLY WILLIAMS	ALLUVIUM	92	3789	88.15	09-06-91	3701	94	94	3695	UNCASED	NONE	TEST HOLE
18.32.16.223433	BILLY WILLIAMS	ALLUVIUM	92	3789	87.15	09-14-91	3702	94	94	3695	UNCASED	NONE	TEST HOLE
18.32.16.223433	BILLY WILLIAMS	ALLUVIUM	92	3789	86.65	09-20-91	3702	94	94	3695	UNCASED	NONE	SAMPLED
18.32.16.223433	BILLY WILLIAMS	ALLUVIUM	92	3789	86.16	09-25-91	3703	94	94	3695	UNCASED	NONE	
18.32.16.223433	BILLY WILLIAMS	ALLUVIUM	92	3789	85.67	09-30-91	3703	94	94	3695	UNCASED	NONE	
18.32.16.22433	STATE OF NM	UNKNOWN	UNK	3789	84.18	03-18-68	3705	UNK	UNK			NONE	WL IN COL.
18.32.16.22433	STATE OF NM	UNKNOWN	UNK	3789		05-27-76	UNK					NONE	DRY @ 98'
18.32.20.14411	NEWMONT OIL	TRIASSIC	270	3740	215.85	03-18-68	3524				7"	DOMESTIC	RECOVERING
18.32.20.14411	NEWMONT OIL	TRIASSIC	270	3740	179.35	02-23-71	3561				7"	NONE	UNEQUIPPED
18.32.20.14411	NEWMONT OIL	TRIASSIC	270	3740	173.51	05-27-76	3566				7"	NONE	UNEQUIPPED
18.32.20.14411	NEWMONT OIL	TRIASSIC	270	3740	168.27	03-12-81	3572				7"	NONE	UNEQUIPPED
18.32.20.14411	NEWMONT OIL	TRIASSIC	270	3740	168.23	09-24-81	3572				7"	NONE	UNEQUIPPED
18.32.20.14411	NEWMONT OIL	TRIASSIC	270	3740	165.60	03-25-86	3574				7"	NONE	UNEQUIPPED
18.32.20.14411	NEWMONT OIL	TRIASSIC	270	3740	164.34	05-14-91	3576				7"	NONE	UNEQUIPPED

RECORD OF DRILL HOLES IN THE VICINITY OF SECTION 9 T 18 S R32E

LOCATION NUMBER	OWNER	AQUIFER	HOLE DEPTH	LAND SURFACE ELEVATION	WATER LEVEL	DATE MEASURED	POTENTI-OMETRIC ELEVATION	THICKNESS OF ALLUVIUM	DEPTH TO RED BED	RED BED ELEVATION	CASING SIZE	USE OF WATER	REMARKS
18.32.22.32322	P.C.OF TEXAS	TRIASSIC		3763	431.60	03-18-68	3331				7"	CWD	CP-482
18.32.22.32322	ANADARKO	TRIASSIC		3763	434.41	04-06-71	3329				7"	CWD	NO POWER
18.32.22.32322	ANADARKO	TRIASSIC		3763	427.89	05-21-76	3335				7"	CWD	NO POWER
18.32.22.32322	ANADARKO	TRIASSIC		3763	428.24	03-12-81	3335				7"	CWD	NO POWER
18.32.22.32322	ANADARKO	TRIASSIC		3763	429.49	03-25-86	3334				7"	CWD	NO POWER
18.32.34.22200		TRIASSIC		3725	117.42	12-08-65	3608				6"	STOCK	WINDMILL
18.32.34.22200		TRIASSIC		3725	117.46	03-18-68	3608				6"	NONE	WINDMILL
18.32.34.22200		TRIASSIC		3725	117.46	04-06-71	3608				6"	NONE	WINDMILL
18.32.34.22200		TRIASSIC		3725	117.39	05-21-76	3608				6"	NONE	WINDMILL
18.32.34.22200		TRIASSIC		3725	117.28	03-12-81	3608				6"	NONE	WINDMILL
18.32.34.22200		TRIASSIC		3725	DRY	04-01-86	UNK				6"	NONE	WINDMILL

A P P E N D I X "A"

LOGS OF SEISMIC HOLES

18.31.1.11110
LS ELEV. 3810

0- 24 SAND & CALICHE
24- 60 SANDY CLAY & GRAVEL
60-100 RED CLAY

18.31.1.21113
LS ELEV. 3820

0- 20 SAND & CALICHE
20- 50 GRAVEL & SANDY SHALE
50-100 RED SHALE

18.31.1.44133
LS ELEV. 3801

0- 6 SAND
6- 18 CALICHE
18- 35 SAND & GRAVEL
35- 65 SAND
65- 75 GRAVEL
75- 90 BLUE SHALE
90-200 RED BED

18.31.1.44212
LS ELEV. 3810

0- 55 SAND & SANDY CLAY
55- 85 GRAVEL & SAND ROCK
85-115 CLAY
115-160 RED BED & SHALE

18.31.12.33331
LS ELEV. 3740

0- 24 RED SHALE & CALICHE
24- 59 GRAVEL & SANDY SHALE
59-127 RED SHALE
127-301 RED BED
301-342 RED SHALE & WATER SAND
342-371 RED SHALE & LIME STREAKS
371-415 LIMESTONE

18.31.12.42440
LS ELEV. 3775

0- 50 SAND & SAND ROCK
50- 60 GRAVEL
60- 83 SAND STONE
83-130 RED CLAY
130-160 RED BED AND SHALE

18.31.12.43331
LS ELEV. 3754

0- 24 SAND & CALICHE
24- 70 SANDY CLAY
70-160 RED SHALE & CLAY

18.31.12.44444
LS ELEV. 3759

0- 24 CALICHE & SAND
24- 62 SANDY SHALE
62- 65 GRAVEL
65-100 RED SHALE

18.31.13.11112
LS ELEV. 3743

0-20 SAND & CALICHE
20-50 SANDY CLAY
50-70 SAND & GRAVEL
70-150 RED SANDY SHALE
150-215 RED & BLUE CLAY
215-360 RED BED

18.31.13.24221
LS ELEV. 3737

0-15 SAND
15-70 CLAY & GRAVEL
70-120 RED BED

LOGS OF SEISMIC HOLES

18.31.13.24444
LS ELEV. 3725

0- 27 CALICHE
27- 36 SANDY SHALE
36- 72 SAND & GRAVEL
72-100 RED SHALE

18.31.13.44444
LS ELEV. 3716

0- 5 SAND
5- 18 CALICHE
18- 60 SAND & GRAVEL
60-100 RED CLAY

18.31.24.11121
LS ELEV. 3704

0- 60 SAND & GRAVEL
60-160 SHALE

18.31.24.24444
LS ELEV. 3702

0- 8 SAND
8- 18 CALICHE
18- 70 SHALE & GRAVEL
70-100 RED CLAY

18.31.25.14214
LS ELEV. 3680

0- 15 SAND & CALICHE
15- 50 SANDY CLAY & SAND
50- 53 GRAVEL
53-100 SAND
100-150 RED CLAY

18.31.25.22222
LS ELEV. 3702

0-100 SAND & LEDGES
100-172 BLUE & RED SHALE
172-195 RED BED

18.31.25.22243
LS ELEV. 3702

0- 60 SAND & SAND ROCK
60- 80 SANDROCK
80-110 SANDY CLAY
110-140 RED BED & SAND ROCK STRINGERS
140-145 SAND ROCK
145-160 RED BED & SHALE

18.31.25.42442
LS ELEV. 3685

0- 30 SAND & CALICHE
30- 80 CLAY
80-110 GRAVEL
110-140 SHALE & CLAY

18.31.25.44334
LS ELEV. 3669

0- 26 SAND
26- 41 SANDY RED SHALE
41- 98 SAND & GRAVEL
98-220 RED BED

18.31.35.41322
LS ELEV. 3634

0- 50 SANDY WITH GRAVEL
50-100 SAND SHALE & CLAY

LOGS OF SEISMIC HOLES

18.31.35.43420
LS ELEV. 3626

0- 17 SAND & CALICHE
17- 58 SANDY CLAY & GRAVEL
58-100 RED CLAY

18.31.36.11221
LS ELEV. 3659

0- 2 SURFACE
2- 80 SAND & CALICHE
80-400 RED CLAY & SANDSTONE

18.31.36.22222
LS ELEV. 3670

0- 24 CALICHE & SAND
24- 42 SAND
42-102 GRAVEL & SANDY SHALE
102-272 RED SHALE
272-321 RED SHALE & LIME STREAKS
321-352 SAND & RED SHALE
352-420 BROKEN LIME & RED SHALE

18.31.36.42222
LS ELEV. 3659

0- 26 SAND & CALICHE
26- 48 SANDY CLAY
48- 82 SAND & GRAVEL
82-120 RED CLAY

18.31.36.44420
LS ELEV. 3659

0- 70 SANDSTONE & SANDY CLAY
70- 87 GRAVEL & SAND ROCK
87-110 SHALE
110-160 RED CLAY

18.32.2.43422
LS ELEV. 3879

0- 8 SAND
8- 14 CALICHE & GRAVEL
14- 58 SAND
58- 90 GRAVEL
90-200 RED BED

18.32.2.44444
LS ELEV. 3886

0- 40 SAND & CALICHE
40- 70 SAND & GRAVEL
70-100 SHALE

18.32.3.43311
LS ELEV. 3870

0- 5 SAND
5- 12 CALICHE
12- 25 GRAVEL
25- 70 SAND & GRAVEL
70- 75 CONGLOMERATE
75- 90 SANDY CLAY
90-120 RED BED

18.32.3.44412
LS ELEV. 3870

0- 14 SAND
14- 18 CALICHE
18- 68 SAND & GRAVEL
68- 97 SANDY SHALE
97-200 RED BED

18.32.4.31112
LS ELEV. 3850

0- 10 SAND
10- 60 SAND
60- 67 GRAVEL
67-100 RED SHALE

LOGS OF SEISMIC HOLES

18.32.4.42133
LS ELEV. 3863

0- 80 SAND & CALICHE
80-103 RED SANDY CLAY
103-140 SANDSTONE
140-150 RED SANDY CLAY

18.32.4.44421
LS ELEV. 3852

0- 3 SAND
3- 20 CALICHE
20- 58 SANDY CLAY & GRAVEL
58-200 RED BED

18.32.5.33310
LS ELEV. 3806

0- 21 CALICHE & SAND
21- 64 SANDY SHALE
64-100 RED SHALE

18.32.5.43312
LS ELEV. 3824

0- 24 CALICHE & SAND
24- 67 SANDY SHALE
67-100 RED SHALE

18.32.5.44233
LS ELEV. 3830

0- 5 SAND
5- 19 CALICHE
19- 50 SAND & SANDY CLAY
50- 70 SANDY CLAY & GRAVEL
70- 92 SHALE
92-200 RED BED

18.32.6.11333
LS ELEV. 3819

0- 22 SAND & CALICHE
22- 50 SAND
50- 60 GRAVEL
60-275 RED CLAY
275-360 LIME & SHALE
360-440 LIME

18.32.6.31333
LS ELEV. 3807

0- 26 SAND & CALICHE
26- 55 SAND
55- 85 GRAVEL
85-120 RED CLAY

18.32.7.11111
LS ELEV. 3788

0- 24 CALICHE
24- 46 SANDY SHALE
46- 67 SAND & GRAVEL
67-224 RED SHALE
224-301 RED SHALE & GRAVEL
301-376 SAND & SANDY SHALE
376-408 LIME & RED SHALE
408-470 LIMESTONE

18.32.7.24243
LS ELEV. 3784

0- 50 SAND & CALICHE
50- 80 SAND & SANDY CLAY
80- 85 GRAVEL
85-150 RED CLAY

18.32.8.24231
LS ELEV. 3810

0- 45 SAND & CALICHE
45- 70 SANDY CLAY
70- 85 GRAVEL
85-150 RED CLAY

LOGS OF SEISMIC HOLES

18.32.8.31110
LS ELEV. 3770

0- 10 SAND
10- 23 CALICHE
23- 43 SAND
43- 61 GRAVEL & SAND
61-100 RED SHALE

18.32.9.11111
LS ELEV. 3827

0- 20 LOSE CALICHE
20- 60 SAND & GRAVEL
60-160 RED CLAY
160-270 RED SHALE
270-340 BROKEN LIME & SHALE

18.32.9.21111
LS ELEV. 3837

0- 28 CALICHE & SAND
28- 37 SANDY SHALE
37- 79 SAND & GRAVEL
79-100 RED SHALE

18.32.9.33333
LS ELEV. 3787

0- 18 CALICHE
18- 80 SAND & SANDSTONE
80-155 RED CLAY

18.32.10.11111
LS ELEV. 3848

0- 23 CALICHE
23- 60 SANDY CLAY
60-100 RED CLAY

18.32.10.11333
LS ELEV. 3841

0- 10 SAND
10- 30 CALICHE
30-165 SAND ROCK & GRAVEL
165-200 RED BED

18.32.10.21111
LS ELEV. 3869

0- 15 SAND & CALICHE
15- 90 SANDY CLAY & GRAVEL
90-180 RED CLAY
180-220 GREY SANDSTONE (DAMP)
220-350 SHALE
350-550 RED & GREY SHALE WITH ROCK STREAKS

18.32.10.21313
LS ELEV. 3860

0- 18 SANDY CLAY
18- 30 CALICHE
30- 82 SAND ROCK
82-120 RED BED

18.32.10.22240
LS ELEV. 3861

0- 12 SAND
12- 16 CALICHE
16- 28 SAND & CALICHE
28- 61 SAND & GRAVEL
61-200 RED BED

18.32.10.33333
LS ELEV. 3806

0- 20 CALICHE
20- 63 SAND
63-360 RED SHALE
360-430 BROKEN LIME

LOGS OF SEISMIC HOLES

18.32.11.12244
LS ELEV. 3866

0- 7 SAND
7- 12 CALICHE
12- 25 SAND & GRAVEL
25- 80 SANDY CLAY & GRAVEL
80-120 RED BED

18.32.11.24444
LS ELEV. 3865

0- 25 SANDY & CALICHE
25- 65 SAND & GRAVEL
65-100 SHALE

18.32.11.32444
LS ELEV. 3841

0- 10 SANDY CLAY
10- 22 CALICHE & GRAVEL
22- 60 SAND ROCK
60- 70 GRAVEL
70-120 RED BED

18.32.11.44444
LS ELEV. 3841

0- 34 CALICHE & SAND
34- 42 SANDY SHALE
42- 71 GRAVEL
71-100 RED SHALE

18.32.12.11111
LS ELEV. 3886

0-20 CALICHE
20-41 SANDY CLAY
41-69 GRAVEL
69-90 RED CLAY

18.32.12.34444
LS ELEV. 3856

0- 30 CALICHE & SAND
30- 44 SANDY SHALE
44- 73 GRAVEL
73-100 RED SHALE

18.32.12.44200
LS ELEV. 3865

0- 40 CALICHE & SAND
40- 60 CLAY
60- 90 RED CLAY
90-140 RED BED & SHALE

18.32.12.44444
LS ELEV. 3862

0- 27 CALICHE & SAND
27- 51 SANDY SHALE
51- 64 GRAVEL
64-100 RED SHALE

18.32.13.24421
LS ELEV. 3836

0- 15 SAND
15- 60 CALICHE & SAND ROCK
60-100 CLAY
100-140 RED BED & SHALE

18.32.13.34330
LS ELEV. 3808

0- 15 SAND
15- 65 GRAVEL & SAND ROCK
65- 75 CLAY
75- 90 HARD ROCK
90-118 HARD ROCK
118-140 CLAY

LOGS OF SEISMIC HOLES

18.32.13.44433
LS ELEV. 3817

0- 14 SAND
14- 30 CALICHE
30- 60 SANDY CLAY
60- 85 GRAVEL
85-130 RED BED
130-140 RED BED & SHALE

18.32.14.22112
LS ELEV. 3838

0- 15 SAND
15- 35 GRAVEL
35- 65 SANDSTONE
65- 75 CONGLOMERATE
75-120 RED BED

18.32.14.24444
LS ELEV. 3825

0- 65 SAND & GRAVEL
65-100 SHALE

18.32.14.34442
LS ELEV. 3793

0- 10 SAND
10- 30 CALICHE
30- 60 SAND ROCK
60- 80 GRAVEL
80-120 RED BED

18.32.14.44444
LS ELEV. 3806

0- 75 SANDY & GRAVEL
75-100 SHALE

18.32.15.21111
LS ELEV. 3823

0- 20 SANDY
20- 60 SANDY CLAY & GRAVEL
60-100 CLAY

18.32.15.22224
LS ELEV. 3822

0- 20 LOOSE SAND
20- 40 CALICHE
40- 65 RED SANDY CLAY
65- 80 SAND & GRAVEL
80-200 RED BED

18.32.15.24422
LS ELEV. 3807

0- 25 LOOSE SAND
25- 41 CALICHE
41- 70 RED SANDY CLAY
70-200 RED BED

18.32.15.32122
LS ELEV. 3775

0- 42 SAND & SANDY SHALE
42-100 RED SHALE

18.32.15.33333
LS ELEV. 3784

0- 18 CALICHE
18- 60 CLAY & SAND
60-155 RED CLAY

LOGS OF SEISMIC HOLES

18.32.16.33333
LS ELEV. 3761

0-100 SAND & GRAVEL
100-135 RED BED

18.32.16.41200
LS ELEV. 3781

0- 55 SAND & CALICHE
55- 70 GRAVEL & SAND
70-150 RED CLAY

18.32.17.11112
LS ELEV. 3755

0- 8 SAND
8- 40 SAND
40- 60 GRAVEL
60-100 RED SHALE

18.32.17.13340
LS ELEV. 3749

0- 21 SAND CALICHE
21- 64 SANDY SHALE
64- 77 GRAVEL
77-100 RED SHALE

18.32.17.21112
LS ELEV. 3776

0- 21 SAND & CALICHE
21- 44 SANDY SHALE
44- 82 SAND & GRAVEL
82-120 RED SHALE

18.32.17.33211
LS ELEV. 3750

0- 20 SAND
20- 70 SANDY CLAY
70-100 CLAY & GRAVEL
100-140 RED BED

18.32.17.33334
LS ELEV. 3734

0- 25 SAND & CALICHE
25- 66 SANDY SHALE
66- 74 GRAVEL
74-100 RED SHALE

18.32.17.43440
LS ELEV. 3758

0- 18 SAND
18- 70 SANDY CLAY
70-104 GRAVEL & CLAY
104-140 RED BED

18.32.18.11122
LS ELEV. 3755

0- 20 SAND & CALICHE
20- 41 GRAVEL & SAND
41-100 RED SHALE

18.32.18.21122
LS ELEV. 3754

0- 10 SAND
10- 25 CALICHE
25- 60 SAND & GRAVEL
60-100 RED SHALE & CLAY

18.32.18.22222
LS ELEV. 3759

0- 60 SAND & LEDGES
60- 85 GRAVEL
85-130 RED BED

18.32.18.24441
LS ELEV. 3751

0- 55 SAND & CALICHE
55- 75 SANDY CLAY & SAND
75- 83 GRAVEL
83-300 RED CLAY

LOGS OF SEISMIC HOLES

18.32.21.42411
LS ELEV. 3762

0- 8 SAND
8- 20 CALICHE
20- 92 SAND ROCK & GRAVEL
92-140 RED BED

18.32.22.41131
LS ELEV. 3755

0- 10 SAND
10- 25 CALICHE
25- 60 SANDY CLAY
60-120 CLAY
120-160 CLAY & SHALE

18.32.23.33331
LS ELEV. 3754

0- 90 SAND & GRAVEL
90-110 SHALE
110-160 RED BED

18.32.24.22222
LS ELEV. 3820

0- 18 SAND & CALICHE
18- 95 SAND & GRAVEL & SANDSTONE
95-175 RED BED & LEDGES
175-200 BLUE CLAY & SANDSTONE
200-215 SANDSTONE

18.32.24.42210
LS ELEV. 3799

0- 20 SAND & CALICHE
20- 60 SANDY CLAY & SAND
60- 80 SAND & GRAVEL
80-160 RED CLAY & SHALE

18.32.22.12122
LS ELEV. 3782

0- 27 SAND & CALICHE
27- 58 SAND & GRAVEL
58-100 RED SHALE

18.32.23.11122
LS ELEV. 3785

0- 8 SAND
8- 30 SAND & CALICHE
30- 55 SAND
55- 85 GRAVEL
85- 95 BLUE SHALE
95-200 RED BED

18.32.23.44442
LS ELEV. 3775

0- 10 SAND
10- 20 CALICHE
20- 40 SANDSTONE
40- 70 SANDY CLAY
70- 75 GRAVEL
75-120 RED BED

18.32.24.33340
LS ELEV. 3769

0- 26 SAND & CALICHE
26- 70 SANDY CLAY & SAND
70- 78 GRAVEL
78-120 RED CLAY

18.32.24.43330
LS ELEV. 3776

0- 27 CALICHE
27- 64 SAND & GRAVEL
64-120 RED SHALE & SANDROCK

LOGS OF SEISMIC HOLES

18.32.25.24221
LS ELEV. 3773

0- 5 SAND
5- 30 CALICHE
30- 85 SANDY CLAY
85-160 RED BED

18.32.25.32344
LS ELEV. 3747

0- 28 CALICHE & SAND
28- 85 SANDY CLAY & SAND ROCK
85-140 RED BED

18.32.26.12122
LS ELEV. 3769

0- 10 SANDY CLAY
10- 15 CALICHE
15- 25 SANDSTONE
25- 50 SAND
50- 70 SANDY CLAY
70- 80 GRAVEL
80-120 RED BED

18.32.26.33231
LS ELEV. 3732

0- 30 SAND & CALICHE
30- 90 SANDSTONE & CLAY
90-140 RED BED & SHALE

18.32.26.24444
LS ELEV. 3749

0- 21 CALICHE & WET SAND
21- 49 SAND & GRAVEL
49- 71 GRAVEL & RED SHALE
71-100 RED SHALE

18.32.26.44444
LS ELEV. 3733

0- 27 CALICHE & SAND
27- 40 SANDY SHALE
40- 64 GRAVEL
64- 72 GRAVEL & RED SHALE
72-100 RED SHALE

18.32.27.22111
LS ELEV. 3762

0- 15 SAND
15- 25 CALICHE
25- 65 SAND & SANDSTONE
65-105 SANDY CLAY
105-140 RED BED

18.32.27.32110
LS ELVE. 3732

0- 30 SAND & CALICHE
30- 56 SAND & SANDY CLAY
56-100 RED CLAY & SHALE

18.32.27.33113
LS ELEV. 3720

0- 18 SAND
18- 45 CALICHE
45- 80 SAND & ROCK
80-110 RED CLAY
110-140 RED BED

18.32.27.43113
LS ELEV. 3725

0- 12 SAND
12- 38 CALICHE & SAND ROCK
38- 85 SANDY CLAY
85- 95 GRAVEL
95-140 RED BED

LOGS OF SEISMIC HOLES

18.32.28.11111
LS ELEV. 3739

0- 95 SAND & GRAVEL
95-130 RED BED

18.32.28.12433
LS ELEV. 3735

0- 10 SAND
10- 30 CALICHE
30- 80 SANDY CLAY
80-140 RED BED

18.32.28.13333
LS ELEV. 3724

0- 24 SAND & CALICHE
24- 59 SANDY SHALE
59- 72 GRAVEL
72-100 RED SHALE

18.32.28.22443
LS ELEV. 3742

0- 15 SAND
15- 90 SAND ROCK & GRAVEL
90-140 RED BED

18.32.28.33333
LS ELEV. 3717

0- 20 WET SAND
20- 32 SAND & CALICHE
32- 70 SANDY SHALE & GRAVEL
70-100 RED SHALE

18.32.28.34213
LS ELEV. 3724

0- 10 SAND
10- 45 CALICHE & SAND ROCK
45- 90 SAND ROCK & GRAVEL
90-140 RED BED

18.32.29.21440
LS ELEV. 3722

0- 50 SAND & CALICHE
50- 70 SANDY CLAY & SAND
70-80 GRAVEL & SAND
80-150 RED CLAY

18.32.29.31443
LS ELEV. 3702

0- 30 CALICHE & SAND
30- 50 CLAY
50- 70 GRAVEL
70-140 RED BED

18.32.30.31134
LS ELEV. 3681

0- 80 SAND & CALICHE
80-117 GRAVEL & SAND
117-150 RED CLAY

18.32.30.41342
LS ELEV. 3702

0- 35 CALICHE
35- 70 SANDY CLAY
70- 90 GRAVEL
90-140 RED BED

LOGS OF SEISMIC HOLES

18.32.31.33331
LS ELEV. 3656

0- 20 SAND
20- 50 SHALE
50- 95 SAND & GRAVEL
95-140 SHALE

18.32.31.43411
LS ELEV. 3671

0- 10 SAND
10- 20 CALICHE
20- 75 SANDY CLAY
75- 90 GRAVEL
90-120 SHALE & SAND
120-160 RED CLAY

18.32.32.22222
LS ELEV. 3712

0- 18 CALICHE
18- 60 SAND
60-155 RED CLAY

18.32.33.14213
LS ELEV. 3701

0- 10 SAND
10- 25 CALICHE
25- 90 SANDY CLAY
90-140 RED BED

18.32.33.333442
LS ELEV. 3676

0- 12 SAND
12- 22 SAND & CALICHE
22- 85 SAND & GRAVEL
85-200 RED BED

18.32.34.12133
LS ELEV. 3709

0- 4 SAND
4- 21 CALICHE
21- 82 SANDY CLAY & SAND
82-108 SAND & GRAVEL
108-260 RED BED

18.32.34.44430
LS ELEV. 3699

0- 6 SAND
6- 18 CALICHE
18- 60 SAND & RED CLAY
60-116 SAND & GRAVEL
116-220 RED BED

18.32.35.24444
LS ELEV. 3723

0- 22 CALICHE & SAND
22- 43 SAND & GRAVEL
43- 68 RED SHALE & GRAVEL
68-100 RED SHALE

18.32.35.44444
LS ELEV. 3709

0- 20 CALICHE
20- 60 SAND & GRAVEL
60-100 RED CLAY

LOGS OF WATER WELLS
AND EXPLORATORY HOLES

LOCATION: 18.31.12.41122
LAND SURFACE ELEV. 3770
OWNER: MAXWELL OIL CO.
DRILLER: GEISER DRG. CO.
DATE DRILLED:
FILE NUMBER:

0-260	RED AND CALICHE
260-270	GYP WATER
270-440	RED BED
440-490	SAND WATER

REMARKS:

LOCATION: 18.32.7.442331
LAND SURFACE ELEV. 3758
OWNER: FAYE L. KLEIN
DRILLER: LARRY'S DRILLING
DATE DRILLED: 1-29-85
FILE NUMBER: CP-672

0- 6	BLOWSAND
6- 12	GRAY & WHITE SAND
12- 16	SOFT CALICHE
16- 64	BROWN CLAY
64-150	RED CLAY
150-220	BROWN CLAY
220-498	RED CLAY WITH STREAKS OF BROWN & GRAY CLAY
498-510	SMALL GRAVEL, BROWN CLAY
510-540	BROWN & RED CLAY

REMARKS: WATER BEARING FORMATION 498-510

LOCATION: 18.32.16.223433
LAND SURFACE ELEV. 3789
OWNER: BILLY WILLIAMS
DRILLER: LARRY FELKINS
DATE DRILLED: 9-3-91
FILE NUMBER:

0- 20	SAND
20- 36	SAND, SOME GRAVEL
36- 42	SAND, SOME GRAVEL, RED CLAY
42- 70	RED CLAY & SAND
70- 79	RED CLAY, SOME GRAVEL
79- 85	SAND
85- 94	SAND & GRAVEL
94-100	RED CLAY

REMARKS: EXPLORATORY HOLE - DRY UPON COMPLETION

LOGS OF WATER WELLS
AND EXPLORATORY HOLES

LOCATION: 18.32.26.11143
LAND SURFACE ELEV. 3761
OWNER: T X O PROD.
DRILLER: CORKY GLENN
DATE DRILLED: 5-9-85
FILE NUMBER: CP-677

0- 12	SAND-LOOSE
12- 24	CLAY
24- 47	CALICHE
47- 58	SAND
58- 84	SANDY CLAY
84-102	RED CLAY STICKY
102-116	SAND & GRAVEL
116-142	RED CLAY STICKY
142-315	BROWN CLAY
315-325	PURPLE CLAY
325-378	RED CLAY
378-408	PINK RED CLAY
408-440	BROWN SHALE & BLUE STREAKS
440-500	BROWN SHALE-GRAINY
500-530	SAND ROCK-FINE
530-545	BROWN SHALE
545-605	SAND ROCK-MEDIUM
605-616	BROWN SHALE
616-675	SAND ROCK
675-700	RED SHALE

REMARKS: DRY HOLE - WELL PLUGGED

LOCATION: 18.32.32.111244
LAND SURFACE ELEV. 3699
OWNER: DUVAL CORPORATION
DRILLER: BOYLES BROS.
DATE DRILLED: 6-22-77
FILE NUMBER: 0-13-002

AT 274 TRIASSIC
(CHINLE WATER)
AT 575 TRIASSIC
(SANTA ROSA WATER)

REMARKS: EXPLORATORY HOLE - PLUGGED

A P P E N D I X "B"

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Gulf
IDENTIFYING NAME: Spinkie B Fed #1

LOCATION: 2310 feet from N line and 1980 feet from W line,
Section 1, Township 18 South, Range 32 East.

TOTAL DEPTH: 9250 CASING RECORD: 13 3/8 / 456

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☐ G ☐ E ☑

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3911.5
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3924

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	95	Elev	3829
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1326	Elev	2598
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from SEO
on 2/1, 1985 by JDW

File No. _____ Location No. 18.32.1.14244

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: A. P. A. INC.
IDENTIFYING NAME: Virginia #1

LOCATION: 1650 feet from N line and 1650 feet from W line,
Section 4, Township 18 South, Range 32 East.

TOTAL DEPTH: 3729 CASING RECORD: _____

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☑ G ☐ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3870
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3879

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	62	Elev	3817
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1145	Elev	2733
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCC
on 10/14, 1970 by JDW

File No. _____ Location No. 18.32.4.14100

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Harvey Yates
IDENTIFYING NAME: Young Deep Unit #12

LOCATION: 1650 feet from S line and 330 feet from E line,
Section 4, Township 18 South, Range 32 East.

TOTAL DEPTH: 8960 CASING RECORD: 8 5/8/2686

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3855
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3868

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	82	Elev	3786
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1185	Elev	2683
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCD
on 9/3, 1991 by Wright

File No. _____ Location No. 18.32.4.42400

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Harvey Yates
IDENTIFYING NAME: Young Deep Unit 4 #1

LOCATION: 660 feet from S line and 1980 feet from E line,
Section 4, Township 18 South, Range 32 East.

TOTAL DEPTH: 12957 CASING RECORD: 9 5/8/4580

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3862
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3877

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	92	Elev	3785
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1163	Elev	2714
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCD
on 9/3, 1991 by Wright

File No. _____ Location No. 18.32.4.43000

SUMMARY RECORD OF FORMATIONS ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Harvey Yates
IDENTIFYING NAME: Young Deep "4" Fed. #2

LOCATION: 660 feet from S line and 660 feet from E line,
Section 4, Township 18 South, Range 32 East.

TOTAL DEPTH: 8650 CASING RECORD: 8 5/8"/3010

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____

Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3852.5
Other Datum : _____ Elev _____

LOG DATUM: KB Elev 3868

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	86	Elev	3782
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1208	Elev	2660
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCD
on 9/3, 1991 by JDW

File No. _____ Location No. 18.32.4.44000

SUMMARY RECORD OF FORMATIONS ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Albert Gackle operator
IDENTIFYING NAME: Graham #1

LOCATION: 2011 feet from W line and 1980 feet from S line,
Section 7, Township 18 South, Range 32 East.

TOTAL DEPTH: 4510 CASING RECORD: 7"/298

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____

Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3774
Other Datum : _____ Elev _____

LOG DATUM: KB Elev 3782

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	77	Elev	3705
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	965	Elev	2817
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCC
on 10/14, 1970 by JDW

File No. _____ Location No. 18.32.7.3200

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Meridian Oil Inc.
IDENTIFYING NAME: Federal "AM" #2

LOCATION: 660 feet from N line and 1980 feet from W line,
Section 8, Township 18 South, Range 32 East.

TOTAL DEPTH: 8900 CASING RECORD: 8 5/8 / 2806

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3802
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3819

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	100	Elev	3719
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1148	Elev	2671
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCD
on 9/3, 1991 by JDW

File No. _____ Location No. 18.32.8.12000

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Amoco
IDENTIFYING NAME: Fed. "AF" Com #1

LOCATION: 1980 feet from S line and 1980 feet from W line,
Section 8, Township 18 South, Range 32 East.

TOTAL DEPTH: 12820 CASING RECORD: 9 5/8 / 4926

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☑ G ☐ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3756
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3775

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	53	Elev	3722
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1051	Elev	2724
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCD
on 9/3, 1991 by JDW

File No. _____ Location No. 18.32.8.32000

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Heyco
IDENTIFYING NAME: Young Deep Unit #17

LOCATION: 660 feet from N line and 660 feet from W line,
Section 9, Township 18 South, Range 32 East.

TOTAL DEPTH: 9250 CASING RECORD: 8 5/8 / 2650

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____

Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source Log Elev 3825.1
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3837

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	85	Elev	3752
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1100	Elev	2737
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCD
on 9/3, 1991 by JDW

File No. _____ Location No. 18.32.9.11000

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Heyco
IDENTIFYING NAME: Young Deep Unit #16

LOCATION: 1980 feet from N line and 660 feet from W line,
Section 9, Township 18 South, Range 32 East.

TOTAL DEPTH: 9400 CASING RECORD: 8 5/8 / 2640

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____

Estimated Reliability: P ☐ F ☑ G ☐ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source Log Elev 3827.6
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3839

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	?	Elev	
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1101	Elev	2738
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCD
on 9/3, 1991 by JDW

File No. _____ Location No. 18.32.9.13000

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Hyco
IDENTIFYING NAME: Young Disp Unit #23

LOCATION: 2310 feet from S line and 1980 feet from E line,
Section 9, Township 18 South, Range 32 East.

TOTAL DEPTH: 9091 CASING RECORD: 8 5/8 / 2755

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☑ G ☐ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3816.4
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3828

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	902	Elev	3738
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1148	Elev	2680
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCD
on 9/3, 1991 by JSW

File No. _____ Location No. 18.32.9.4/2133

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Harvey Yater
IDENTIFYING NAME: Young Disp Unit #1

LOCATION: 660 feet from N line and 660 feet from W line,
Section 10, Township 18 South, Range 32 East.

TOTAL DEPTH: 4500 CASING RECORD: 13 3/8 / 640

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3848.8
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3863.8

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	86	Elev	3778
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1211	Elev	2653
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCD
on 9/3, 1991 by JSW

File No. _____ Location No. 18.32.10.11000

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Harvey Yates
IDENTIFYING NAME: Young Deep Unit #26

LOCATION: 1650 feet from N line and 1650 feet from W line,
Section 10, Township 18 South, Range 32 East.

TOTAL DEPTH: 9390 CASING RECORD: 8⅝ / 2798

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☑ G ☐ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source Log Elev 3843
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3857

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	100	Elev	3757
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1221	Elev	2636
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCD
on 9/3, 1991 by JDW

File No. _____ Location No. 18.32.10.14100

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Gulf
IDENTIFYING NAME: Lea State HS #2

LOCATION: 660 feet from N line and 660 feet from W line,
Section 16, Township 18 South, Range 32 East.

TOTAL DEPTH: 3870 CASING RECORD: 4½ / 3867

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source _____ Elev _____
Other Datum : _____ Elev _____
LOG DATUM: 10' AGL Elev 3802

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	100	Elev	3702
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1095	Elev	2707
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCC
on 2/12, 1970 by JDW

File No. _____ Location No. 18.32.16.1100

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Gulf
IDENTIFYING NAME: Lea State HS #1

LOCATION: 1980 feet from N line and 660 feet from W line,
Section 16, Township 18 South, Range 32 East.

TOTAL DEPTH: 4100 CASING RECORD: _____

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3779
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3789

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	117	Elev	3672
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1078	Elev	2711
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCC
on 2/12, 1970 by JDH

File No. _____ Location No. 18.32.16.1300

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Gulf
IDENTIFYING NAME: Lea State HS #3

LOCATION: 1980 feet from N line and 1980 feet from W line,
Section 16, Township 18 South, Range 32 East.

TOTAL DEPTH: 3900 CASING RECORD: 7/1075

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3786
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3793

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	118 ?	Elev	3675 ?
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1100	Elev	2693
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCC
on 2/12, 1970 by JDH

File No. _____ Location No. 18.32.16.1400

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Pan American
IDENTIFYING NAME: State "AP" #1

LOCATION: 2310 feet from S line and 330 feet from W line,
Section 16, Township 18 South, Range 32 East.

TOTAL DEPTH: 3837 CASING RECORD: 8 5/8/1084

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3775
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3783

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	120	Elev	3663
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1073	Elev	2710
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from SE
on 9/23, 1969 by JDW

File No. _____ Location No. 18.32.16.3/100

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Buffalo Oil Co
IDENTIFYING NAME: Thomas Coop #3

LOCATION: 1650 feet from S line and 1980 feet from W line,
Section 17, Township 18 South, Range 32 East.

TOTAL DEPTH: 3808 CASING RECORD: 8 5/8/345 5 1/2/3808

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3750
Other Datum : _____ Elev _____
LOG DATUM: RDB Elev 3758

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	113	Elev	3645
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1001	Elev	2757
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from SE
on 12/17, 1970 by JDW

SV
File No. _____ Location No. 18.32.17.323422

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Buffalo Oil Co
IDENTIFYING NAME: Thomas S Cof #4

LOCATION: 460 feet from S line and 990 feet from W line,
Section 17, Township 18 South, Range 32 East.

TOTAL DEPTH: 3812 CASING RECORD: 8 5/8/349

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3739
Other Datum : _____ Elev _____
LOG DATUM: RT Elev 3747

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	90	Elev	3657
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	972	Elev	2775
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCC
on 10/7, 1970 by JJ

SL
File No. _____ Location No. 18.32.17.334142

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: John H. Beard
IDENTIFYING NAME: Fed. Tatum #2

LOCATION: 990 feet from S line and 2310 feet from W line,
Section 20, Township 18 South, Range 32 East.

TOTAL DEPTH: 4050 CASING RECORD: 8 5/8/1023

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3750
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3761

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	127	Elev	3634
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1014	Elev	2747
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCC
on 2/12, 1970 by JJ

File No. _____ Location No. 10.32.20.34200

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: International Oil and Gas
IDENTIFYING NAME: Sivian Fed. #1

LOCATION: 1980 feet from S line and 660 feet from E line,
Section 21, Township 18 South, Range 32 East.

TOTAL DEPTH: 11747 CASING RECORD: 8 5/8 / 3465

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____

Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3760
Other Datum : _____ Elev _____

LOG DATUM: KB Elev 3774

FORMATION TOPS:

Quat-Tert (Undivided)	Depth _____	Elev _____
Quaternary alluvium	Depth _____	Elev _____
Ogallala formation	Depth _____	Elev _____
Cretaceous (Undivided)	Depth _____	Elev _____
Triassic (Undivided)	Depth _____	Elev _____
Chinle formation	Depth 106	Elev 3668
Santa Rosa sandstone	Depth _____	Elev _____
Permian (Undivided)	Depth _____	Elev _____
Dewey Lake formation	Depth _____	Elev _____
Rustler formation	Depth 1095	Elev 2679
Salado formation	Depth _____	Elev _____
_____	Depth _____	Elev _____
_____	Depth _____	Elev _____
_____	Depth _____	Elev _____

Data obtained from OCC
on 2/12, 1970 by J Dw

File No. _____ Location No. 18.32.21.4200

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Shell
IDENTIFYING NAME: Quercho Plains Unit #1

LOCATION: 1980 feet from S line and 1980 feet from W line,
Section 22, Township 18 South, Range 32 East.

TOTAL DEPTH: 11686 CASING RECORD: 13 3/8 / 736 9 5/8 / 4538

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____

Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3757
Other Datum : _____ Elev _____

LOG DATUM: RT Elev 3773

FORMATION TOPS:

Quat-Tert (Undivided)	Depth _____	Elev _____
Quaternary alluvium	Depth _____	Elev _____
Ogallala formation	Depth _____	Elev _____
Cretaceous (Undivided)	Depth _____	Elev _____
Triassic (Undivided)	Depth _____	Elev _____
Chinle formation	Depth 98	Elev 3675
Santa Rosa sandstone	Depth _____	Elev _____
Permian (Undivided)	Depth _____	Elev _____
Dewey Lake formation	Depth _____	Elev _____
Rustler formation	Depth 1100	Elev 2673
Salado formation	Depth _____	Elev _____
_____	Depth _____	Elev _____
_____	Depth _____	Elev _____
_____	Depth _____	Elev _____

Data obtained from SE
on 9/23, 1969 by J Dw

File No. _____ Location No. 18.32.22.32000

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Gulf
IDENTIFYING NAME: Fed. McCurdy #1

LOCATION: 660 feet from N line and 660 feet from E line,
Section 25, Township 18 South, Range 32 East.

TOTAL DEPTH: 7200 CASING RECORD: 8 5/8 / 1542

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☐ Other _____
Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source Log Elev 3778
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3788

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	90 ±	Elev	3698 ±
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1207	Elev	2581
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCC
on 2/12, 1970 by JDH

File No. _____ Location No. 18.32.25.2200

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Gulf
IDENTIFYING NAME: Fed. Helberg "E" #1

LOCATION: 1980 feet from N line and 660 feet from E line,
Section 31, Township 18 South, Range 32 East.

TOTAL DEPTH: 11,600 CASING RECORD: 8 5/8 / 3206

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☑ F ☐ G ☐ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source Log Elev 3689
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3707

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	120	Elev	3587
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1080	Elev	2627
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from USGS
on 11/9, 1966 by IMC

File No. _____ Location No. 18.32.31.2400

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: General Operating Co.
IDENTIFYING NAME: Fed. VCST #1 2

LOCATION: 1650 feet from S line and 2310 feet from E line,
Section 31, Township 18 South, Range 32 East.

TOTAL DEPTH: 4264 CASING RECORD: 8 5/8 / 543

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3672
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3682

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	120	Elev	3562
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1051	Elev	2631
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCC
on 12/14, 1976 by JDW

File No. _____ Location No. 18.32.31.41300

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Texaco
IDENTIFYING NAME: USA Malem #1

LOCATION: 660 feet from S line and 660 feet from E line,
Section 31, Township 18 South, Range 32 East.

TOTAL DEPTH: 11473 CASING RECORD: 8 5/8 / 3207

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-S ☑ Other _____
Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source _____ Elev _____
Other Datum : _____ Elev _____
LOG DATUM: 17' AGL - KB Elev 3688

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	108	Elev	3580
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1078	Elev	2610
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from OCC
on 2/12, 1970 by JDW

File No. _____ Location No. 18.32.31.4400

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: Dural Corp.
IDENTIFYING NAME: L-1

LOCATION: 330 feet from N line and 660 feet from W line,
Section 32, Township 18 South, Range 32 East.

TOTAL DEPTH: 2070 CASING RECORD: 4/11 95

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source USHST Elev 3695
Other Datum : _____ Elev _____
LOG DATUM: G. L. Elev 3695

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	104	Elev	3591
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1066	Elev	2629
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from SE
on 6/28, 1972 by J. Dod

File No. _____ Location No. 18.32.32.111244

SUMMARY RECORD OF FORMATIONS
ENCOUNTERED IN WELL OR DRILL HOLE

COMPANY OR OWNER: US Smelting-Refining-Mining
IDENTIFYING NAME: Fusk State #1

LOCATION: 660 feet from S line and 660 feet from W line,
Section 32, Township 18 South, Range 32 East.

TOTAL DEPTH: 11600 CASING RECORD: 8 5/8/3211

TYPE OF LOG:
Drill ☐ Samp ☐ Elec ☐ GR-N ☑ Other _____
Estimated Reliability: P ☐ F ☐ G ☑ E ☐

REFERENCE ELEVATIONS:
Land Surface: Source log Elev 3678
Other Datum : _____ Elev _____
LOG DATUM: KB Elev 3693

FORMATION TOPS:

Quat-Tert (Undivided)	Depth		Elev	
Quaternary alluvium	Depth		Elev	
Ogallala formation	Depth		Elev	
Cretaceous (Undivided)	Depth		Elev	
Triassic (Undivided)	Depth		Elev	
Chinle formation	Depth	120	Elev	3573
Santa Rosa sandstone	Depth		Elev	
Permian (Undivided)	Depth		Elev	
Dewey Lake formation	Depth		Elev	
Rustler formation	Depth	1100	Elev	2583
Salado formation	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	
_____	Depth		Elev	

Data obtained from USHS
on 11/9, 1944 by IWC

File No. _____ Location No. 18.32.32.3300

A P P E N D I X "C"

RECORD NUMBER: 1

WELL OWNER			LOCATION OF WELL	
MAXWELL OIL CO.			18.31.12.231444	
AQUIFER TRIASSIC		DEPTH OF HOLE 690FT	LAND SURFACE ELEVATION 3778	
WATER LEVEL 433.76		DATE MEASURED 01/26/87	WATER TABLE ELEVATION 3344	
THICKNESS OF ALLUVIUM		DEPTH TO RED BED Unknown	RED BED ELEVATION Unknown	
CASING SIZE 8 5/8"	USE OF WATER NONE	CHLORIDES 222 PPM	CONDUCTIVITY 1235 M-MHOS	DATE SAMPLED 01/26/87
REMARKS TRIP SAMPLER @ 689 FT.				

RECORD NUMBER: 2

WELL OWNER			LOCATION OF WELL	
MAXWELL OIL CO.			18.31.12.231444	
AQUIFER TRIASSIC		DEPTH OF HOLE 690FT	LAND SURFACE ELEVATION 3778	
WATER LEVEL 433.04		DATE MEASURED 09/25/90	WATER TABLE ELEVATION 3345	
THICKNESS OF ALLUVIUM		DEPTH TO RED BED Unknown	RED BED ELEVATION Unknown	
CASING SIZE 8 5/8"	USE OF WATER NONE	CHLORIDES 505 PPM	CONDUCTIVITY 1960 M-MHOS	DATE SAMPLED 09/25/90
REMARKS TRIP SAMPLER @ 600 FEET				

RECORD NUMBER: 3

WELL OWNER			LOCATION OF WELL	
"RANSPOT WELL" MAXWELL OIL CO.			18.31.12.314112	
AQUIFER TRIASSIC		DEPTH OF HOLE 485FT	LAND SURFACE ELEVATION 3761	
WATER LEVEL Unknown		DATE MEASURED / /	WATER TABLE ELEVATION Unknown	
THICKNESS OF ALLUVIUM		DEPTH TO RED BED Unknown	RED BED ELEVATION Unknown	
CASING SIZE 7"	USE OF WATER DOMSTIC	CHLORIDES 18 PPM	CONDUCTIVITY 710 M-MHOS	DATE SAMPLED 12/08/65
REMARKS TEMPERATURE OF WATER IS 68 DEGREES F				

RECORD NUMBER: 4

WELL OWNER			LOCATION OF WELL	
MAXWELL OIL CO.			18.31.12.41122	
AQUIFER TRIASSIC	DEPTH OF HOLE 520FT		LAND SURFACE ELEVATION 3770	
WATER LEVEL Unknown	DATE MEASURED / /		WATER TABLE ELEVATION Unknown	
THICKNESS OF ALLUVIUM	DEPTH TO RED BED Unknown		RED BED ELEVATION Unknown	
CASING SIZE 7"	USE OF WATER WATER FLOOD	CHLORIDES 24 PPM	CONDUCTIVITY 670 M-MHOS	DATE SAMPLED 12/08/65
REMARKS TEMPERATURE OF WATER IS 69 DEGREES F				

RECORD NUMBER: 5

WELL OWNER			LOCATION OF WELL	
VIRGIL LINAM			18.32.07.44233	
AQUIFER TRIASSIC	DEPTH OF HOLE		LAND SURFACE ELEVATION 3759	
WATER LEVEL Unknown	DATE MEASURED 12/08/65		WATER TABLE ELEVATION Unknown	
THICKNESS OF ALLUVIUM	DEPTH TO RED BED Unknown		RED BED ELEVATION Unknown	
CASING SIZE 6 5/8"	USE OF WATER STOCK	CHLORIDES 19 PPM	CONDUCTIVITY 605 M-MHOS	DATE SAMPLED 12/08/65
REMARKS TEMPERATURE OF WATER IS 70 DEGREES F				

RECORD NUMBER: 6

WELL OWNER			LOCATION OF WELL	
FAYE KLEIN			18.32.07.44233A	
AQUIFER TRIASSIC	DEPTH OF HOLE		LAND SURFACE ELEVATION 3759	
WATER LEVEL Unknown	DATE MEASURED / /		WATER TABLE ELEVATION Unknown	
THICKNESS OF ALLUVIUM	DEPTH TO RED BED Unknown		RED BED ELEVATION Unknown	
CASING SIZE	USE OF WATER STOCK	CHLORIDES 6 PPM	CONDUCTIVITY 597 M-MHOS	DATE SAMPLED 09/24/81
REMARKS TEMP.OF WATER IS 66 DEGREES F--PUMPED 10 MINUTES BEFORE SAMPLING (CP-636)				

RECORD NUMBER: 7

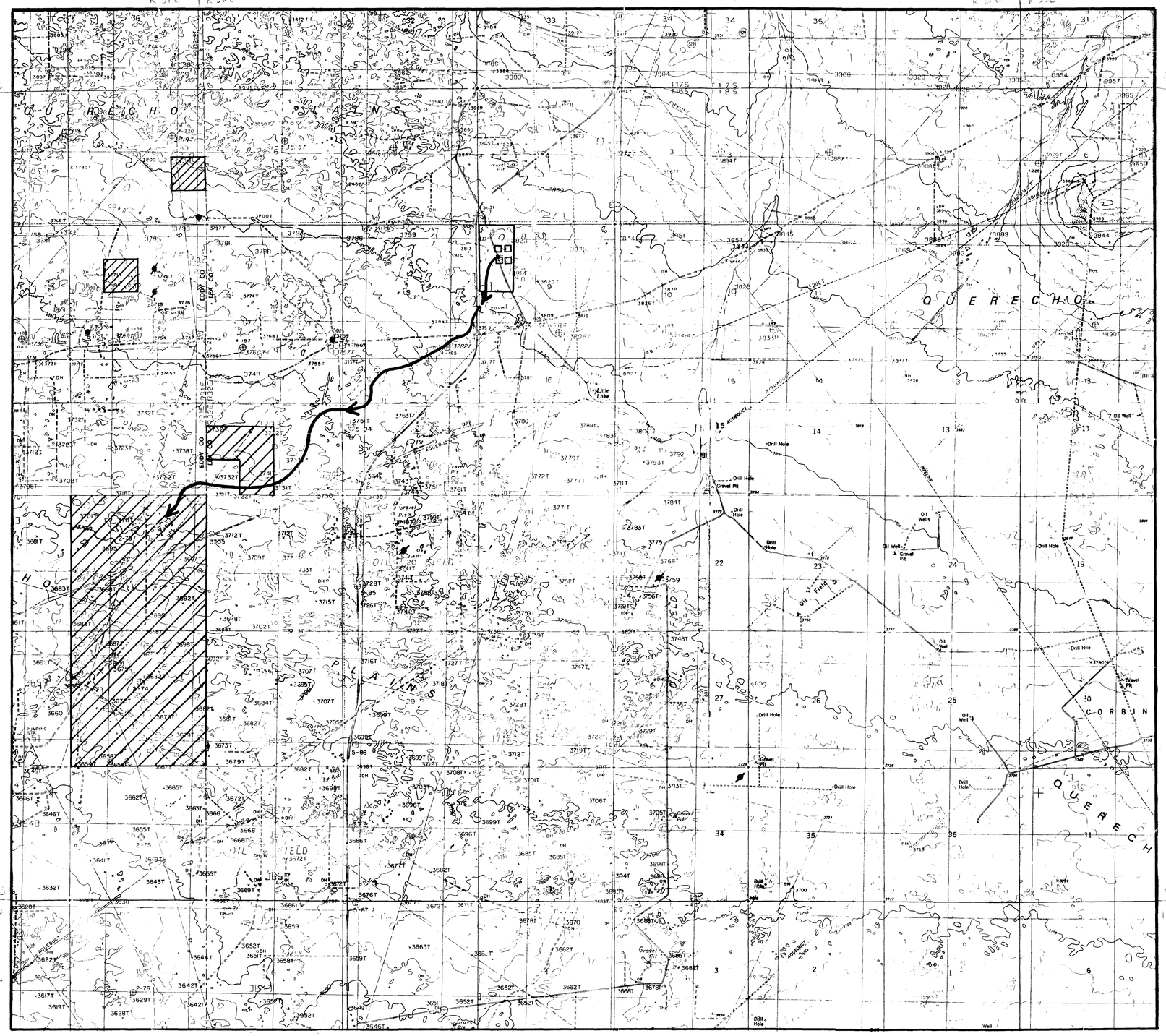
WELL OWNER			LOCATION OF WELL	
BILLY WILLIAMS			18.32.16.223433	
AQUIFER	DEPTH OF HOLE		LAND SURFACE ELEVATION	
ALLUVIUM	92FT.		3789	
WATER LEVEL	DATE MEASURED		WATER TABLE ELEVATION	
86.65	09/20/91		3702	
THICKNESS OF ALLUVIUM	DEPTH TO RED BED		RED BED ELEVATION	
94FT.	94		3695	
CASING SIZE	USE OF WATER	CHLORIDES	CONDUCTIVITY	DATE SAMPLED
NONE	NONE	147 PPM	1060 M-MHOS	09/20/91
REMARKS				
TRIP SAMPLER @ 91 FEET				

RECORD NUMBER: 8

WELL OWNER			LOCATION OF WELL	
NEWMONT OIL CO.			18.32.20.14411	
AQUIFER	DEPTH OF HOLE		LAND SURFACE ELEVATION	
TRIASSIC	270FT		3740	
WATER LEVEL	DATE MEASURED		WATER TABLE ELEVATION	
168.23	09/24/81		3572	
THICKNESS OF ALLUVIUM	DEPTH TO RED BED		RED BED ELEVATION	
	Unknown		Unknown	
CASING SIZE	USE OF WATER	CHLORIDES	CONDUCTIVITY	DATE SAMPLED
7"	DOMESTIC	253 PPM	1205 M-MHOS	09/24/81
REMARKS				
TEMPERATURE OF WATER IS 70 DEGREES F--TRIP SAMPLER @ 180 FEET				

RECORD NUMBER: 9

WELL OWNER			LOCATION OF WELL	
NEWMONT OIL CO.			18.32.20.14411	
AQUIFER	DEPTH OF HOLE		LAND SURFACE ELEVATION	
TRIASSIC	270FT		3740	
WATER LEVEL	DATE MEASURED		WATER TABLE ELEVATION	
168.23	09/24/81		3572	
THICKNESS OF ALLUVIUM	DEPTH TO RED BED		RED BED ELEVATION	
	Unknown		Unknown	
CASING SIZE	USE OF WATER	CHLORIDES	CONDUCTIVITY	DATE SAMPLED
7"	DOMESTIC	226 PPM	1112 M-MHOS	10/14/81
REMARKS				
TEMPERATURE OF WATER IS 70 DEGREES F--TRIP SAMPLER @ 202 FEET				



JAMES I. WRIGHT
CONSULTING HYDROLOGIST
ROSWELL, NEW MEXICO

PROPOSED DISPOSAL SITE LOCATION, AREAS PERMITTED FOR SURFACE DISPOSAL OF BRINE, LOCATION OF WATER WELLS AND TOPOGRAPHY IN THE VICINITY OF SECTION 9, TOWNSHIP 18 SOUTH, RANGE 32 EAST LEA COUNTY, NEW MEXICO - 1991

FIGURE I

1 .5 0 1 MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 FEET
1 .5 0 1 2 KILOMETERS
1000 0 1000 2000 METERS

CONTOUR INTERVAL 10 FEET

LEGEND

- ● — EQUIPPED WELL
- ⌀ — UNEQUIPPED WELL
- ▭ — PROPOSED SITE
- ▨ — AREA PERMITTED FOR SURFACE DISPOSAL OF BRINE
- ↙ — PATH OF SURFACE DRAINAGE

EXPLANATION

Sand

Thin cover of drift sand in most places; locally dunes 20-40 feet high

Qal

Alluvium

Sand and gravel along dry washes; silt and sand in lake beds; includes some wind-deposited sand around depressions

To

Ogallala formation

Chiefly sand, poorly to well-cemented with calcium carbonate; contains some clay, silt, and gravel; capped in most places by caliche

Pleistocene and Recent — QUATERNARY

Pliocene — TERTIARY

Ku

Cretaceous rocks, undifferentiated

Slumped blocks of buff, tan, or white fossiliferous limestone

Rc / Rs / Rd

Dockum group

Rc–*Chinle formation, red and green claystone, minor siltstone, and fine-grained sandstone;* Rs–*Santa Rosa sandstone, red to white poorly sorted, coarse-grained, crossbedded sandstone;* Rd–*rocks of the Dockum group, undifferentiated*

Upper Triassic — TRIASSIC

CRETACEOUS

3500

Contours on the red-bed surface

Dashed where approximate or inferred. Contour interval 50 feet. Datum mean sea level

Geology by Alexander Nicholson, Jr., 1953-4. Contours on buried red-bed surface compiled by Alexander Nicholson, Jr., Alfred Clebsch, Jr., and S. R. Ash from shothole logs, 1960.

Base adapted from New Mexico State Highway Department, general highway map, 1941.

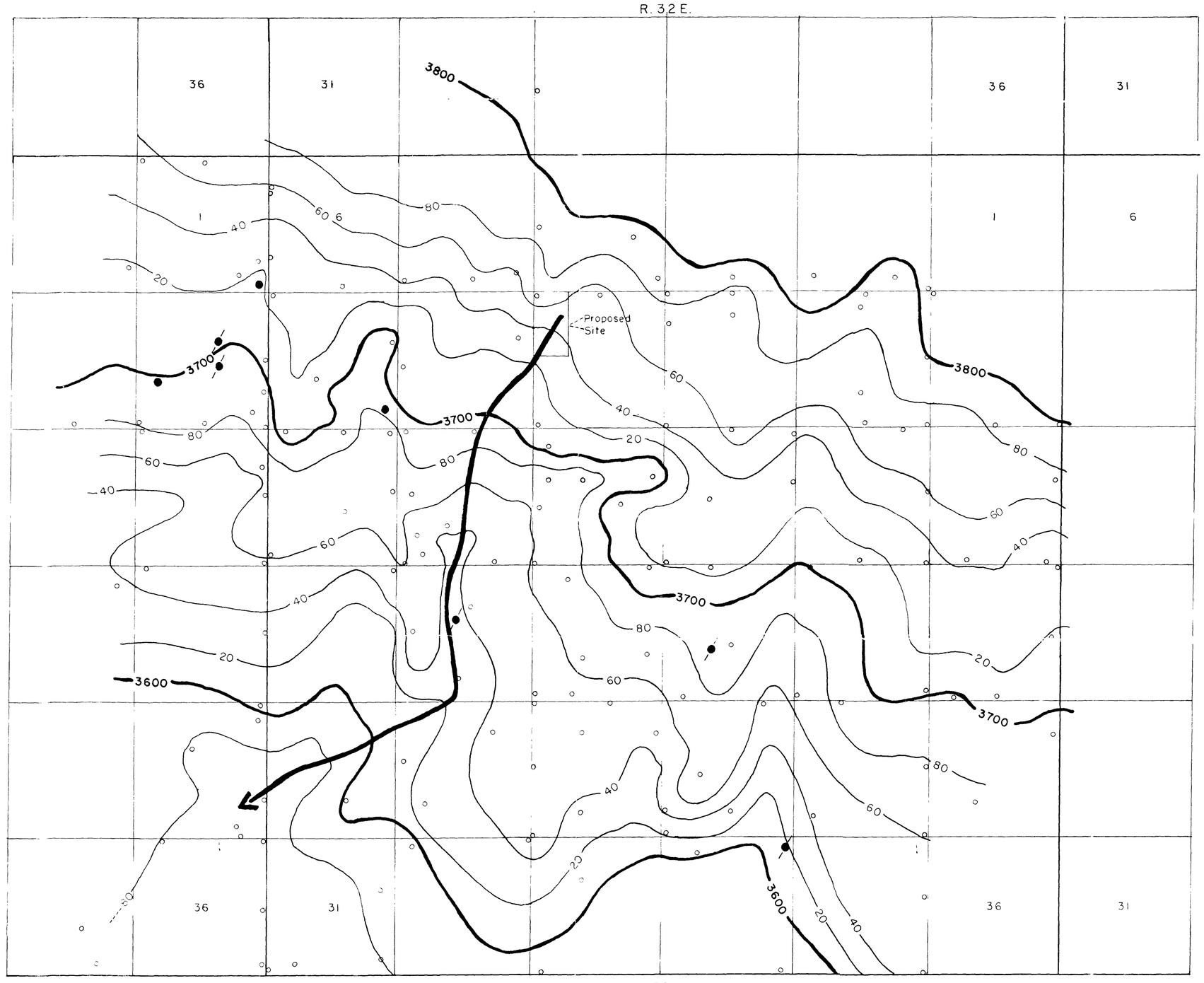
PLATE 1. GEOLOGIC MAP OF SOUTHERN LEA COUNTY, NEW MEXICO

Figure III

R. 32 E.

T. 18 S.

R 32 E.



N

Altitude and Configuration of the Triassic "Red Beds" in the Vicinity of Section 9, Township 18 South, Range 32 East, N.M.P.M.

LEGEND

- ○ - Drilled Hole
- ● - Water Well
- ● - Abandoned Water Well
- ~ - Contour Interval is 20 feet
- ↙ - Direction of flow of Seepage from pits

1/2 0 1 mile

SCALE

James I. Wright Consulting Hydrologist Roswell, New Mexico

Figure II

NM OIL CONSERVATION DEPT

WELL LOG # Young Deep Unit #17

REMOVED FROM FILE

General Correspondence 1992-1991. **BOX**

NUMBER 26

RETURNED TO CUSTOMER