STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

TONEY ANAYA
GOVERNOR

December 15, 1986

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501-2088
(505) 827-5800

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Alan W. Ralston
Apollo Oil Company
P. O. Box 1737
Hobbs, New Mexico 88240

RE: Discharge Plan GW-36
Apollo Oil Company
State "E" Tract 18
Wells #21 and #22

Dear Mr. Ralston:

The ground water discharge plan (GW-36) for the Apollo Oil Company State "E" Tract 18 wells #21 and #22 Class I effluent (non-hazardous) injection wells, and associated surface facilities located in the NE/4 of Section 2, Township 17 South, Range 36 East (NMPM), Lea County, New Mexico, is hereby approved with the following provisions:

1. To prevent corrosion and provide maximum protection for the casing, injection shall be through plastic lined tubing with a packer set no more than 100 feet from the bottom of the long-string casing.

2. The casing-tubing annulus shall be filled with an inert fluid, and a minimum pressure of 100 psi maintained pursuant to WQCC 5-206.B.2.

3. Continuous monitoring devices shall be installed to provide a record of injection pressure (vacuum), flow rate, flow volume and annular pressure, pursuant to N.M. WQCC 5-207.B.2. Such devices shall be installed prior to injection of any industrial effluent.

4. Monthly reports of the disposal of produced water shall be submitted in accordance with Rules 704 and 1120 of the Division Class II Rules and Regulations.

5. For wastes other than produced water, the operator shall keep and make available for inspection, records for each calendar month on the source, location, volume and type of waste, date of disposal and pipeline or hauling company that disposes of fluids or materials in the facility. Such records shall be

maintained for a period of two years from the date of disposal. This requirement is pursuant to WQCC 3-107.A. and is needed to track the types and volumes of waste received by the facility.

6. The operator shall provide a representative analysis of the injected fluids quarterly pursuant to WQCC 5-208.A.2(a). Constituents to be analyzed for will be determined by the type of effluent received and will be determined through coordination with the OCD and the operator when specific types and sources of effluent are identified.

7. Mechanical integrity for each effluent disposal well shall be demonstrated yearly during the life of the well pursuant to WQCC 5-207.A. and Apollo letter of November 25, 1986. The type of test shall be approved by the Division and witnessed by an OCD respresentative.

8. The injection well or system shall be equipped with a pressure limiting switch or acceptable substitute which will limit the wellhead pressure on the injection well to no more than the requested 1650 psi injection pressure.

9. The operator shall immediately notify the supervisor of the Division's Hobbs district office of the failure of the tubing, casing, or packer in the wells or the leakage of water from around said wells, or associated surface facility, and take such steps as may be timely and necessary to correct such failure or leakage pursuant to WQCC 5-208.A.1.

10. Pursuant to WQCC 5-208.2, the following quarterly reports will be submitted to the Director:

    a) The analyses as required in (6) above.

    b) Monthly average, maximum and minimum values for injection pressure, flow rate and volume, and annular pressure.

    c) Any well workover.

The discharge plan was submitted pursuant to Section 3-106 of the New Mexico Water Quality Control Commission Regulations. It consists of the application dated September 17, 1986, and a supplement dated November 25, 1986. It is approved pursuant to Section 3-109.C. which provides for the possible future amendments of the plan. Please be advised that the approval of this plan does not relieve you of liability should your operation result in actual pollution of surface or ground waters which may be actionable under other laws and/or regulations.

Please note that Section 3-104 of the regulations requires that "when a plan has been approved, discharges must be consistent with the terms and conditions of the plan." Pursuant to Section 3-107.C., you are required to

notify the Director of any facility expansion or process modification that would result in any change in the discharge of water quality or volume. You are further required to notify the Director prior to the receipt of any industrial effluent.

On behalf of the staff of the Oil Conservation Division, I wish to thank you and your staff for your cooperation during this discharge plan review.

Sincerely,

R. L. STAMETS
Director

RLS:RCA:dp

cc: OCD, Hobbs
Joe Ramey, Hobbs
James E. Snipes, Lovington

File

APOLLO OIL COMPANY

November 25, 1986

P. O. BOX 1737
HOBBS, NEW MEXICO 88240
505-393-2273

B-2-17-36

Re: State 'E' Tract 18
Wells #21 and #22
Discharge Plan Application GW-36

New Mexico Oil Conservation Division
Box 2088
Santa Fe, New Mexico 87501-2088

Attn: Roger C. Anderson

Dear Sir:

Attached are discussion sheets and exhibits, which you requested in your letter of November 4, 1986, to complete Discharge Plan Application GW-36.

Should you require further information, please advise.

Yours truly,

Alan W. Ralston

Alan W. Ralston
Owner

AWR:md
Attachments

cc: Hobbs-OCD
James E. Snipes, Lovington
File

Exhibit A denotes the location of the only watercourse that would be affected in the event of a major spill, in excess of the capacity of the berm around the battery, or a rupture of the injection line. The feature is a depression locally referred to as a "buffalo wallow" with a size of approximately 5-8 acres and a capacity of around 80,000 barrels.

In the event of a spill due to equipment malfunction or line rupture, the system will be shut down until repairs are made and vacuum trucks will be employed to pick up any injection fluid spilled.

The entire system will be physically checked by company personnel twice daily. Injection pressures and annular pressure of the wells will be noted and any abnormalities reported immediately. Mechanical Integrity Tests will be conducted every five years, or at intervals required by the Division, by pressuring the tubing-casing annulas. Volumes injected in the wells will be continually metered and the meter read twice daily. Injection rates will be calculated from these daily readings. Apollo does not anticipate installing continuous metering equipment to record injection pressures and annular pressures at the wells since the twice a day visual inspections should be adequate. However, if the Division requires this in the final Discharge Plan, then eight-day recording meters will be installed at each well.

In the event of a well failure, that well will be shut-in immediately and will not be subject to injection until repairs are made.

The surface facility, Exhibit B, will comprise three tanks: a 750-barrel receiving tank, a 500-barrel injection tank, and a 300-barrel tank for collecting oils, sludges, and tank bottoms which may enter the system. Industrial effluent will enter the system via pipeline to the 750-barrel tank. This tank will have a high level activating float which will be connected to a valve on the pipeline and on the line from the truck terminal. If the fluid level reaches this critical height, then all lines coming into the tank will close; thereby preventing overflow of the receiving tank.

From the receiving tank, the effluent will siphon through a water leg to the 500-barrel injection tank. A high level switch will activate the pump and a low level switch will shut down the pump. Any oils, sludges, etc., will be skimmed off as needed and will be disposed of through Pollution Control.

Line valves are in place at each disposal well which gives Apollo the flexibility of injecting into either or both wells. Lines can be tested for leaks by closing both valves and pressuring the disposal line to approximately ten pounds. Apollo will test the

line prior to injecting any industrial effluent and yearly thereafter. The injection lines are four inch PVC and not subject to corrosion.

Injected fluids will enter the Abo reef well below the water-oil contact. It is anticipated that the fluids will migrate within the reef in a circular pattern, mixing with the natural fluids in the reef. Overall, injection in the reef at the Lovington Abo and Vacuum Abo has been greater than withdrawals. Water from trucking operations, from other formations in the area, and for several years from the Southern Union Refinery have more than surpassed the withdrawal of oil from the reservoirs. The Abo reef continues to be an excellent disposal zone despite this. Apollo would anticipate that the fluid levels would rise appreciably in the wells, perhaps to a level of 4000 feet, during maximum injection but not to the extent of requiring pressure to inject the fluids.

The trucking terminal will consist of up to six inlet points. Each point will be secured with a lock and only authorized truckers will be issued a key. A high level shut-down valve will be installed on the inlet line from the truck terminal which will close if the fluid level in the receiving tank reaches the critical height.

Mechanical integrity tests will be conducted on the wells by December 5, 1986. Pressure will be applied on the annular space between the long string of casing and the injection tubing and will establish the integrity of the casing, tubing and packers in the wells.

The Hobbs District Office will be notified prior to conducting the mechanical integrity tests so that they may witness the tests and results will be immediately submitted to the Division's Santa Fe office. After the December initial test, yearly mechanical tests will be conducted on the wells.

Exhibit C is a revised wellbore arrangement of Well #21. The original Exhibit for this well indicated a cement top of 8250 feet on the long string. An Acoustic Freepipe Locator Log run on January 30, 1979, indicated cement to 4814 feet. The well is essentially cemented from 8391 feet to the base of the intermediate casing at 3300 feet. The intermediate casing does not have cement over the interval from 1500 feet to the surface casing shoe at 269 feet. There is no safe and reasonable way to cement this interval at this time. The risk involved in perforating two strings of casing and cementing through the perforations does not justify the risk of collapsing casing or ending up with perforations which cannot be effectively squeezed. The interval open is in the red bed section and it would be reasonable to assume that these red beds have sloughed off and have filled the area making it virtually impermeable to fluid

movement. Also, static fluid levels were shot on the wells on November 12, 1986, and levels were found at 8029 feet in Well #21 and at 7998 feet in Well #22. At maximum injection rates, Apollo would not anticipate fluid levels close to the 1500 foot level.

Samples of the injected fluid will be collected and analyzed as soon as possible and the results forwarded to the Division's Santa Fe Office. A quarterly analysis will be submitted thereafter.

EXHIBIT A

N

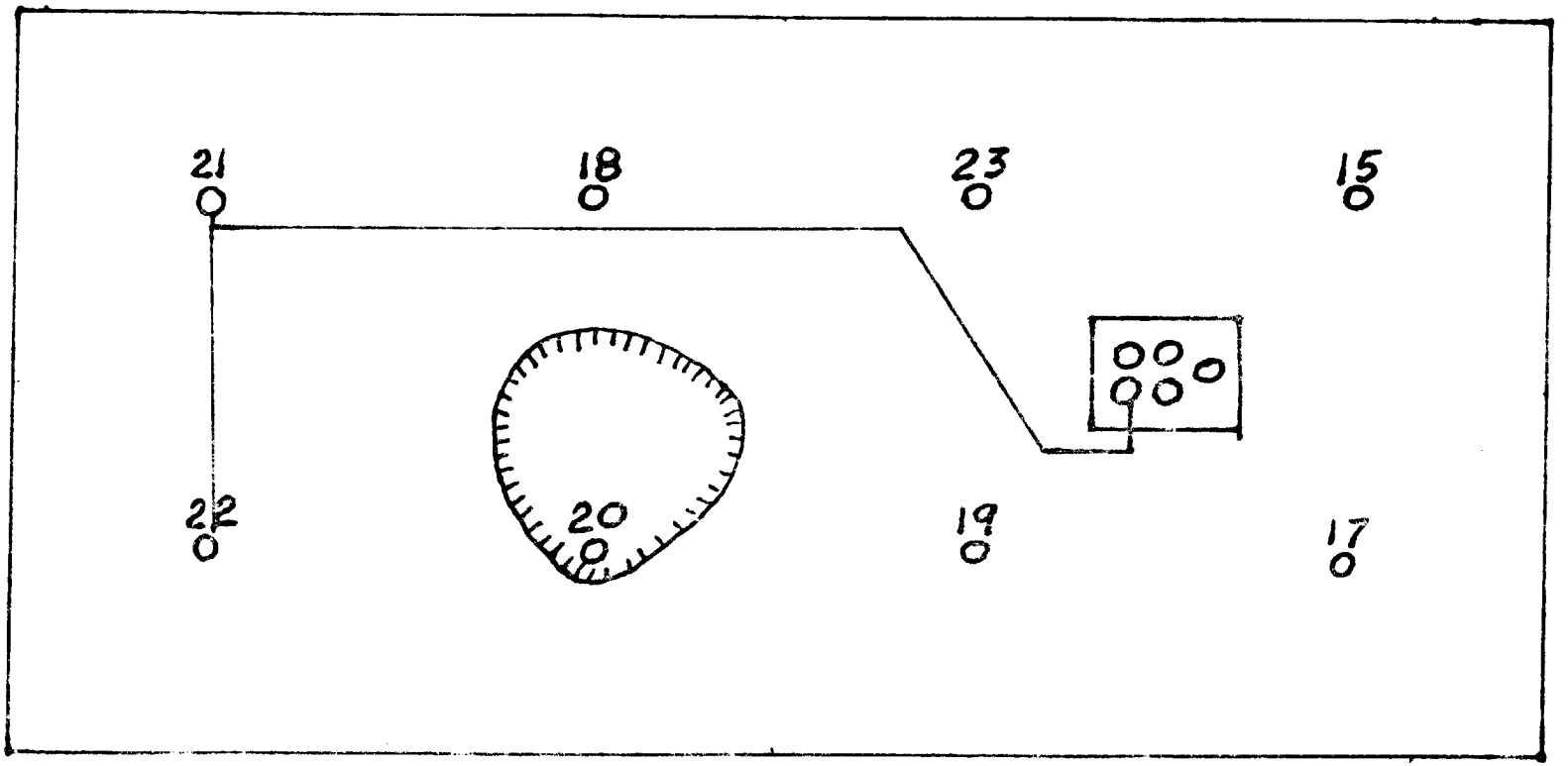


EXHIBIT B

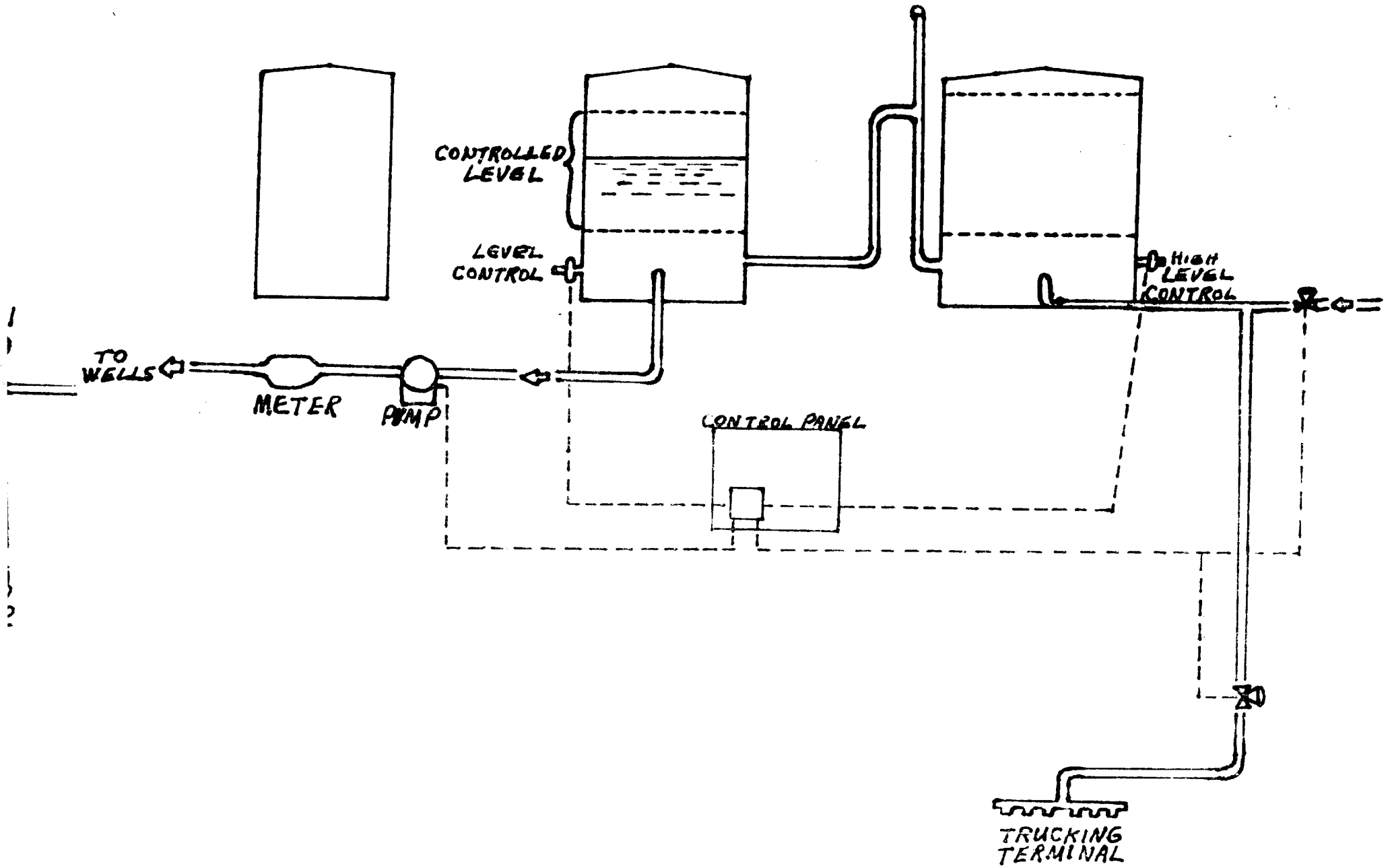
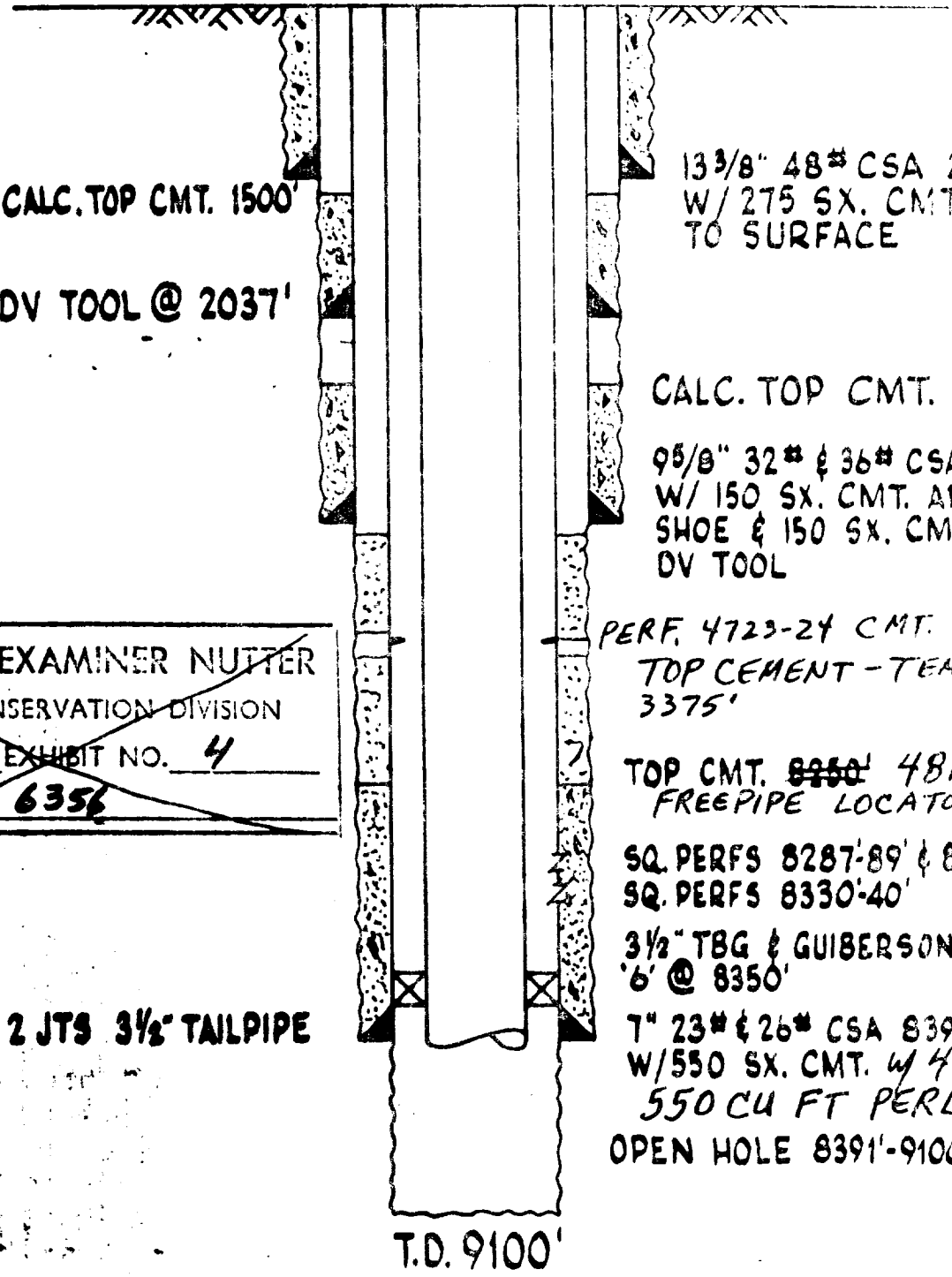

CONTROLLED LEVEL
LEVEL CONTROL
HIGH LEVEL CONTROL
TO WELLS
METER
PUMP
CONTROL PANEL
TRUCKING TERMINAL

EXHIBIT C

LOVINGTON ABO FIELD
LEA COUNTY, NEW MEXICO
STATE "E" TRACT 18 NO. 21

PROPOSED WELLBORE ARRANGEMENT FOR DISPOSAL



BEFORE EXAMINER NUTTER
OIL CONSERVATION DIVISION
Amoco EXHIBIT NO. 4
CASE NO. 6356