TECHNICAL RESPONSE TO ITEMS 5, 6, AND 7
ORDER R-8161-A
OIL CONSERVATION DIVISION

as pertains to Application for Permit by

PETRO-THERMO CORPORATION

by

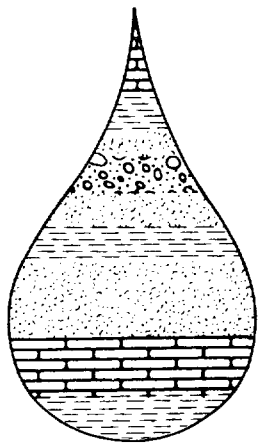
Geohydrology Associates, Inc.

prepared for

POLLUTION CONTROL, INC.

and

SNYDER RANCHES, INC.



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September 16, 1986

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PETRO-THERMO CORPORATION

The Petro-Thermo Corporation has submitted an application to construct a disposal facility for waste materials from oil and gas field operations, including produced salt water and solid wastes. This facility would be located on lands owned by the State of New Mexico in the SW/4 SE/4 NE/4 of Section 16, T. 20 S., R. 32 E., NMPM, Lea County, New Mexico (fig. 1).

At a hearing that was held on April 10, 1986, testimony was presented in behalf of Pollution Control, Inc. and Snyder Ranches, Inc., that there presently are insufficient data available to predict the effects of the Petro-Thermo Corporation's facility on Laguna Plata and lands adjoining the proposed site. This report addresses Items 5, 6, and 7 of Order R-8161-A and pertains to the inadequate monitor-well design and the need for additional subsurface information at the proposed site.

The location, design, and number of monitoring wells was outlined in a letter dated February 18, 1986, from R. L. Stamets, Director of the Oil Conservation Division, to Mr. John Weber of Hobbs, New Mexico. A copy of the letter is attached. This letter proposed that Petro-Thermo Corporation drill and complete three

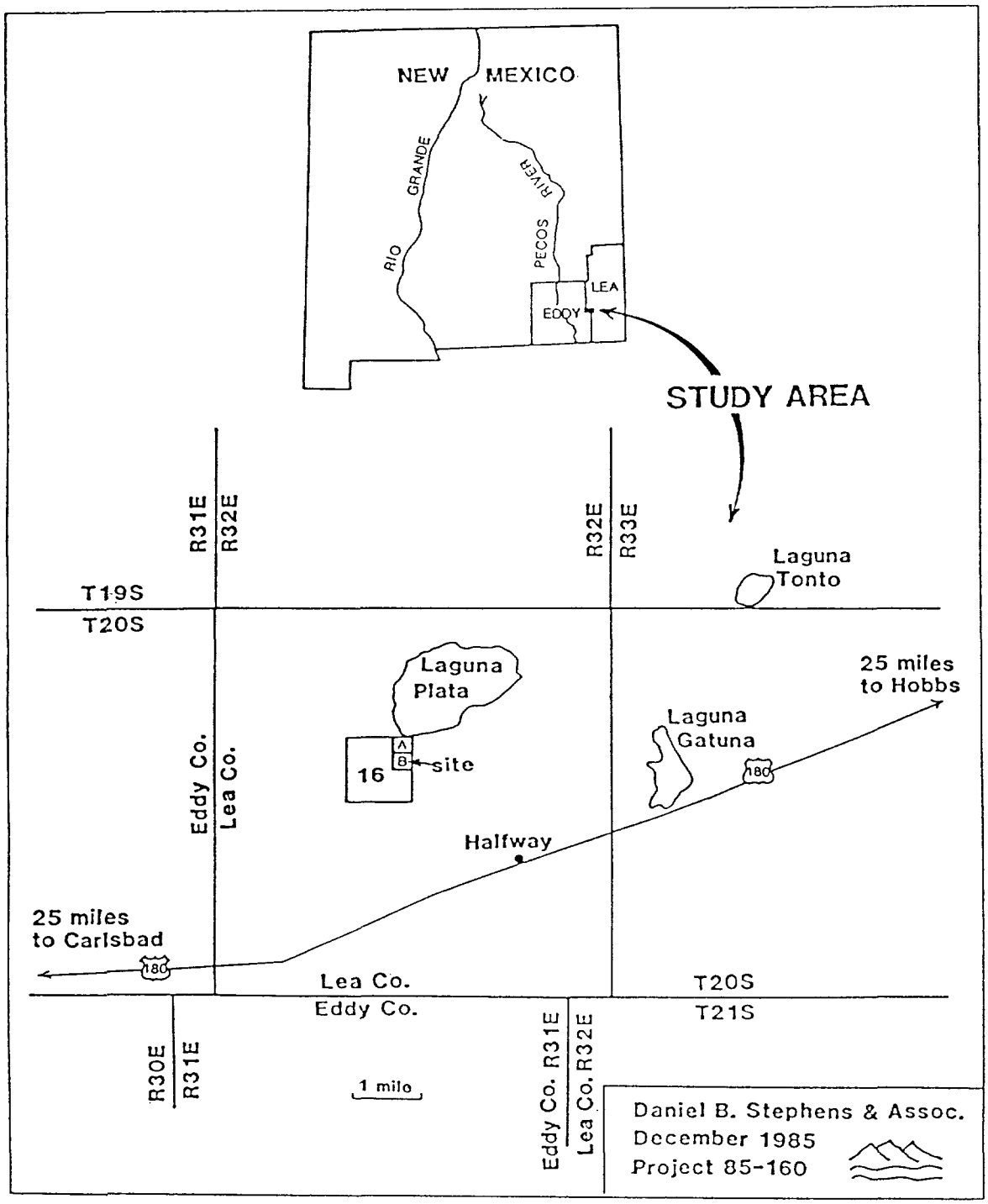


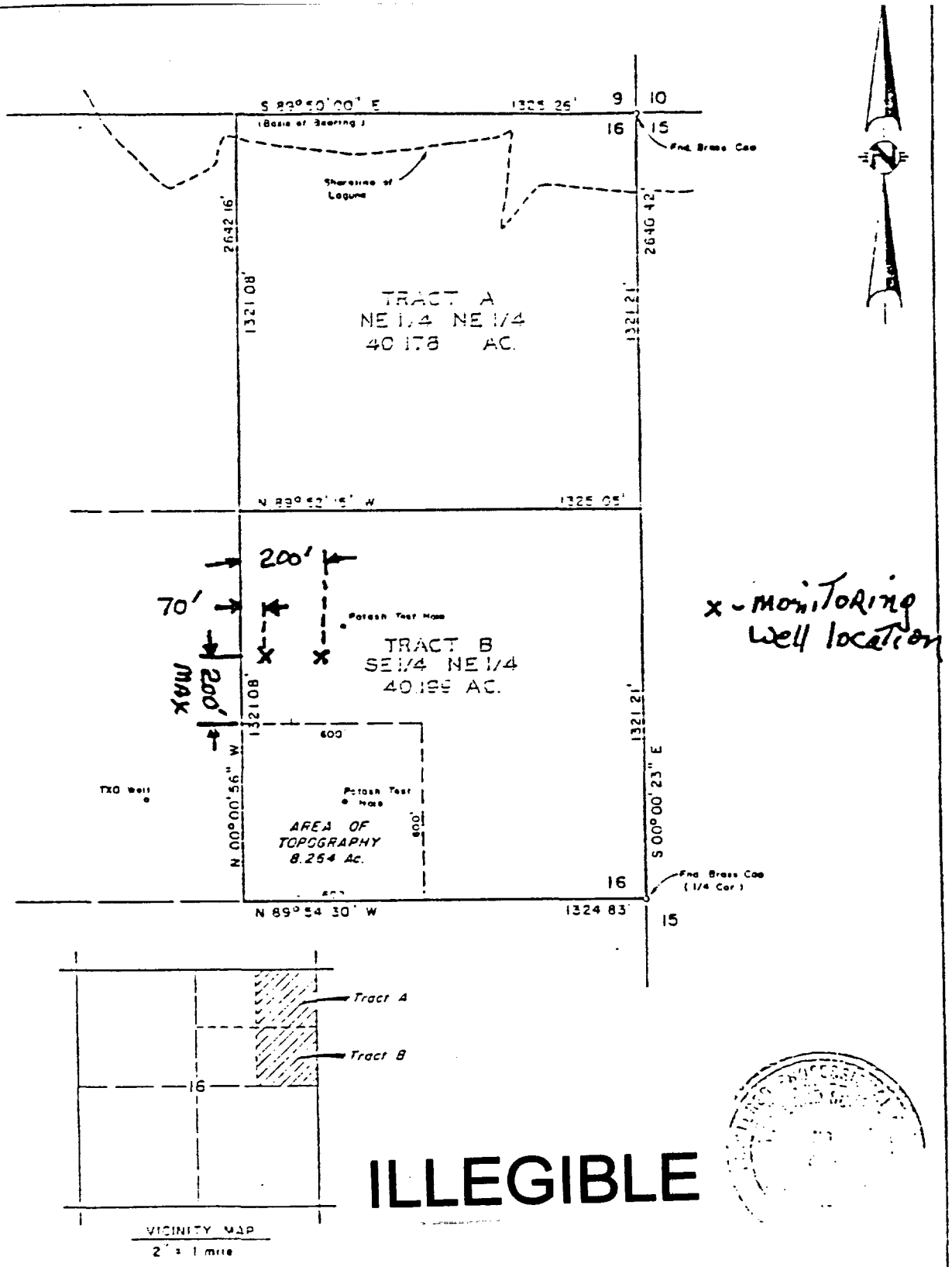
Figure 1 - Location Map

Daniel B. Stephens and Associates

monitoring wells north of Tract B at the proposed site (fig. 2). This letter also proposed a monitoring schedule and recommended specific analyses for each sample. It is the position of Pollution Control, Inc. and Snyder Ranches, Inc., that the recommendations of February 18 are insufficient to protect the fragile environment of Laguna Plata and the surrounding State lands.

Testimony has been presented by Petro-Thermo Corporation which assumes that the configuration of the "redbeds" is similar to that of the surface topography; they have further assumed that the water table in the alluvium slopes in the same direction as the surface topography. They have also assumed that Laguna Plata is located in a closed depression and that there is no outflow from Laguna Plata. Although all of these assumptions have been made in a report prepared by Daniel B. Stephens and Associates of Socorro, New Mexico, to Petro-Thermo Corporation, no supporting documentation has been presented to support these assumptions.

It is noteworthy that earlier testimony before the Oil Conservation Division does not support the assumptions of Petro-Thermo Corporation. In Case No. 4047 (March 19, 1969), documentation was submitted which shows that Laguna Plata is not a closed depression; rather there is outflow toward the west and into Nash Draw and the Pecos River. This study was made in February 1969 by Ed Reed and Associates. Further, detailed studies by Geohydrology Assocites, Inc., in 1978, 1979, and 1984 referred to by Petro-Thermo Corporation do not support these assumptions. In fact, Figure 3 of the 1984 report clearly shows that Laguna Plata is not a closed depression, and that the ground-water movement is different from that



I HEREBY CERTIFY THAT THIS PLAT WAS MADE FROM NOTES TAKEN IN THE FIELD IN A BONA FIDE SURVEY MADE UNDER MY SUPERVISION, AND THAT THE SAME IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF

JOHN W WEST, NM PE & LS No 676
TEXAS RPS No 1128
RONALD J EIDSON, NM LS No 3239
TEXAS RPS No 1693

AREA, ETC.

Two tracts of land being the SE¼ NE¼ and the SE¼ NE¼ of Section 16, T 20 S, R 32 E, N.M.P.M., Lea County, New Mexico.

JOHN W WEST ENGINEERING COMPANY
CONSULTING ENGINEERS HOBBS, NEW MEXICO

Scale	Drawn By
Date	Sheet

Figure 2

suggested by Petro-Thermo. This illustration and information were presented before the Division as Case No. 8292 on August 8, 1984.

Data presented at the April 9, 1986, hearing by Petro-Thermo indicated that a nearby spring was highly mineralized and therefore the site was justified. However, on September 4, 1986, a sample was collected from the same spring which indicates that potable water is present which has a total dissolved solids content of 1,618 mg/l (milligrams per liter). This analysis was made by Unichem, Inc.

No subsurface data have been presented by the applicant to establish the assumption that all seepage from the proposed pits will migrate vertically before entering the water table. The alluvial sediments in the Laguna Plata area typically are very discontinuous and there is a great deal of intertonguing of lithic units. No subsurface data have been presented to show that there are no shallow clay units which would perch the seepage within the root zone of the vegetation and destroy the grass cover in the area and on adjoining lands.

Inasmuch as the Division has approved the proposed Petro-Thermo facility as described, the following recommendations are made which will provide data to supplement the assumptions on which the approval was granted. These recommendations will also help to protect the environment of Laguna Plata and the surrounding lands. These may also help to prevent hydrocarbons from ultimately entering Nash Draw and the Pecos River. In the event that contamination does escape from Laguna Plata, the monitoring wells could be used as part of a clean-up operation.

1. A total of eight (8) wells should be drilled around the perimeter of the proposed facility (fig. 3). Each of these wells should be located at a site not more than 40 feet from the nearest proposed facility. Drilling and completion of these wells should be done as soon as practical so that back-ground water levels and water-quality data can be obtained prior to installation of the facility.

2. All wells should be drilled with air from the surface to a minimum of five (5) feet below the top of the redbeds and completed as shown in Figure 3. Wrapped PVC screen with 0.050 slot should be set from a depth of four (4) feet to total depth.

3. Geophysical logs should be run in each hole in order to identify zones of porosity which will be likely paths for migration of contamination away from the site.

4. Each well should be tested to determine the production capability of the strata that have been penetrated. This may be done by conventional pumping methods or by slug-test techniques. Aquifer characteristics are needed in order to determine rates of ground-water movement and the production capacity in the event that the wells are eventually used for clean-up of a contamination plume.

5. Wrapped, PVC screen should be used for completion of the wells in order to reduce well loss and to improve efficiency in the event that clean-up is necessary.

6. All wells should be measured and sampled every three (3) months for the first two (2) years after installation. The Oil Conservation Division should be notified within ten (10) days after the measurements are made. If any well remains dry after 24 months, the measurements may be made semi-annually until fluids are again found.

7. All fluids produced from the monitoring wells should be sampled and analyzed in accordance with the February 18, 1986, letter. All analyses should be made by an Environmental Protection Agency approved laboratory with copies of the results being submitted to the Oil Conservation Division.

50 YEARS

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

1935 - 1985

TONEY ANAYA
GOVERNOR

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

February 18, 1986

Mr. John Weber
Maddox, Renfrow & Saunders
Attorneys at Law
P.O. Box 5370
Hobbs, NM 88241

Dear Mr. Weber:

In accordance with Paragraph 2 of Division Order R-8161, a plan for the installation and sampling of monitor wells at the proposed Laguna Plata Petro-Therm site has been discussed by Environmental Bureau Chief David Boyer, Petro-Therm Engineer James Thornton, and consultant hydrologist Dr. Daniel Stephens. Agreement has been reached that three shallow monitor wells will be installed prior to operation, inspected monthly for fluids, and sampled every six months if fluids are detected. The particulars of well location, completion and type of sampling are provided below:

1) Two monitoring wells shall be located at a distance no greater than 200 feet north of the north boundary of the 8.264 acre area within Tract B as shown on the attached plat map. These two wells shall be located at distances of approximately 70 and 200 feet east of the west boundary line of Tract B. The third well shall be installed within Tract B to the north of the first two wells at a location to be agreed to after further surface inspection of topographic and geologic features.

2) Monitoring wells shall be drilled through the alluvium with the base completed in the first clay, claystone or shale in the redbeds. The wells shall be constructed of 4-inch diameter PVC pipe which is slotted or perforated from a distance of 4 feet beneath the surface to total depth, and shall be adequately gravel packed or otherwise completed to allow fluids to enter the well for sampling, but to prevent silting. The wells shall have the upper four feet cemented to prevent surface fluid entry.

3) The wells shall be checked monthly for fluids and the results reported monthly to the Division's office in Santa Fe.

4) Upon detection of fluids in any of the monitoring wells, sampling of these fluids shall take place and be repeated at six-month intervals. Samples shall be analyzed for heavy metals and purgeable aromatic hydrocarbons as listed on the attached sheet. A copy of the results shall be submitted to the Division office in Santa Fe for review as to the nature and threat to human health, if any, of allowing such seepage movement to continue towards Laguna Plata. This review will take into consideration the fact that Laguna Plata is not, and does not have the potential to be, a drinking water source.

The plan described above will satisfy the requirements of Paragraph 2 of the above order. As provided for in the order, the Director of the Division may by administrative order rescind the authorization and/or require additional conditions be met if it is determined that such rescission or additional conditions would serve to protect fresh water supplies from contamination, assure the protection of human health or livestock, and the prevention of waste.

If you have any questions on the monitoring and sampling aspects of this order, please contact Mr. David Boyer at the above address or at 827-5812.

Sincerely,

R. L. STAMETS
Director

RLS/DB/dp

cc: David Boyer, OCD Santa Fe
Jerry Sexton, OCD Hobbs
Fran Cherry, BLM Carlsbad
Daniel Stephens, Socorro

PETRO - THERM ANALYSIS
OF WATER SAMPLES

Water samples from the monitoring wells shall be analyzed for the following dissolved hydrocarbons (BTX):

Benzene	o-xylene
Ethylbenzene	m-xylene
Toluene	p-xylene

The suggested method is EPA Method 602 which is a purgeable aromatic scan and costs less than the use of a gas chromatograph/mass sprectrometer. Minimum detection limit should be 10 ppb (or 0.01 mg/l). The standard sample is 40 ml collected in a glass vial with a teflon septum seal. No air should be trapped between the water and the seal.

Water samples should be analyzed using an inductively coupled argon plasma scan (ICAP) with a minimum detection limit of 100 ppb (0.1 mg/l). One scan provides concentrations for the following elements:

Aluminum	Lead
Barium	Magnesium
Beryluim	Manganese
Boron	Molybdenum
Cadmuim	Nickel
Calcium	Silicon
Chronimum	Silver
Cobalt	Strontium
Copper	Tin
Iron	Vanadium
	Zinc

In addition samples shall be analyzed for arsenic, and mercury using atomic adsorption methods. Minimum detection levels should be 10 ppb (0.01 mg/l) for arsenic and 1 ppb (0.001 mg/l) for mercury. A single one quart plastic container should be sufficient for all of the heavy metal analyses. Samples should be preserved with 5 ml of concentrated nitric acid.

The use of scans will provide much information on contaminants but is very much less time consuming and expensive than individual analyses. Your consultant can provide you with the names of several laboratories that will provide these services at a reasonable cost. The laboratory selected should also provide further information on sampling and preservation procedures. Contact the OCD or your consultant for the desired method of sampling to prevent false results from being obtained.