NM1 - 8

GENERAL CORRESPONDENCE

YEAR(S):

1995-1990

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE

OIL CONSERVATION DIVISION
RECEIVED
'95 AUG 24 AM 8 52

New Mexico DRUG FREE It's a State of Mind!

GARY E. JOHNSON
GOVERNOR

JENNIFER A. SALISBURY
CABINET SECRETARY

1000 RIO BRAZOS ROAD
AZTEC, NEW MEXICO 87410
(505) 334-6178 FAX: (505) 334-6170

August 23, 1995

Darlene Schmitz
T-n-T Construction, Inc.
HCR 74, Box 115
Lindrith NM 87029

RE: Bonding of T-n-T Construction Disposal Facilities.

Dear Mrs. Schmitz:

When bonding was mentioned during our meeting of August 3, 1995, in which we discussed the new Oil Conservation Division Rule 711, you pointed out that T-n-T Construction had no bonds in place. Further questioning by Chris Eustice and myself, revealed T-n-T Construction had not been required to post a bond on either the evaporation facility or the land farm. Chris Eustice and I would like to express our appreciation to T-n-T Construction for bringing this problem to our attention. We appreciate your cooperation and look forward to a continuing constructive relationship.

Yours truly,

Denny G. Foust
Environmental Geologist

DF/sh

XC: Environmental File
DGF File
Chris Eustice

NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

August 4, 1995

CERTIFIED MAIL
RETURN RECEIPT NO.P-176-012-166

Mr. Tony Schmitz
T-n-T Construction, Inc.
HCR 74, Box 115
Lyndrith, New Mexico 87029

RE: Bonding Requirements
T-n-T Disposal Facility
Rio Arriba County, New Mexico

Dear Mr. Schmitz:

The New Mexico Oil Conservation Division (OCD) has reviewed T-n-T Construction, Inc.'s (T-n-T) file and has discovered there is no bond for the referenced facility. The OCD considers the landfarm and evaporation facility to be one contiguous facility requiring a single twenty five thousand dollar ($25,000) bond for the facility. T-n-T shall have a surety cash bond in the amount of $25,000 in a form approved by the Division by August 18, 1995.

In addition, the OCD conducted an inspection of the facility August 3, 1995 and determined that overspray from the spray system is pooling on top of the berms and is a potential threat to the integrity of the berms. T-n-T must find a way to stop the overspray or the OCD will ask that T-n-T either install an anemometer with an automatic shutoff or cease operating the sprayers.

If you have any questions don't hesitate to call me at (505) 827-7153.

Sincerely,

Chris Eustice
Geologist

cc: OCD Aztec Office, Denny Foust

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

July 3, 1995

CERTIFIED MAIL
RETURN RECEIPT NO.P-176-012-152

Mr. Tony Schmitz
T-n-T Construction, Inc.
HCR 74, Box 115
Lyndrith, New Mexico 87029

RE: Modification Request
T-n-T Disposal Facility
Rio Arriba County, New Mexico

Dear Mr. Schmitz:

The New Mexico Oil Conservation Division (OCD) has received T-n-T Construction, Inc.'s (T-n-T) request dated May 28, 1995 for authorization to apply iron sulfide water to the landfarm by spreading the fluid onto six (6) inches of dirt and two (2) inches of absorbent pellets. Based upon the information provided the request is hereby denied.

The OCD has set out specific permit conditions for the purpose of protecting ground water, surface waters and the environment. A permit condition common to all landfarm facilities is that free liquids will not be applied to the landfarm nor will be allowed to pool or gather.

If you have any questions don't hesitate to call me at (505) 827-7153.

Sincerely,

Chris Eustice
Geologist

Chris Eustice

From: Denny Foust
To: Chris Eustice
Subject: RE: T&T Construction Facility Expansion Request
Date: Tuesday, May 23, 1995 8:02AM

CHRIS,
MY PRIMARY CONCERN WAS THE DRAINAGE DIVERSION--SHOULD APPROVAL BE LINKED TO DRAINING THE EARTHEN POND INTO THIS COMPLETED POND AND LINING THE EARTHEN POND (LOWER POND).

From: Chris Eustice
To: Denny Foust
Cc: Fran Chavez
Subject: T&T Construction Facility Expansion Request
Date: Monday, May 22, 1995 1:31PM
Priority: High

Gentleman,

As you know, T&T has applied for authorization to expand their existing facility by adding another evaporation pond. I feel this proposal is administratively approvable and woulld like you to provide me ,in writing, any technical concerns you have for the proposed facility expansion. Please respond by 3:00pm Tuesday May 23rd.

Thanks

Chris Eustice

From: Denny Foust
Date sent: Tuesday, May 23, 1995 7:53AM
To: Chris Eustice
Subject: Registered: Denny Foust

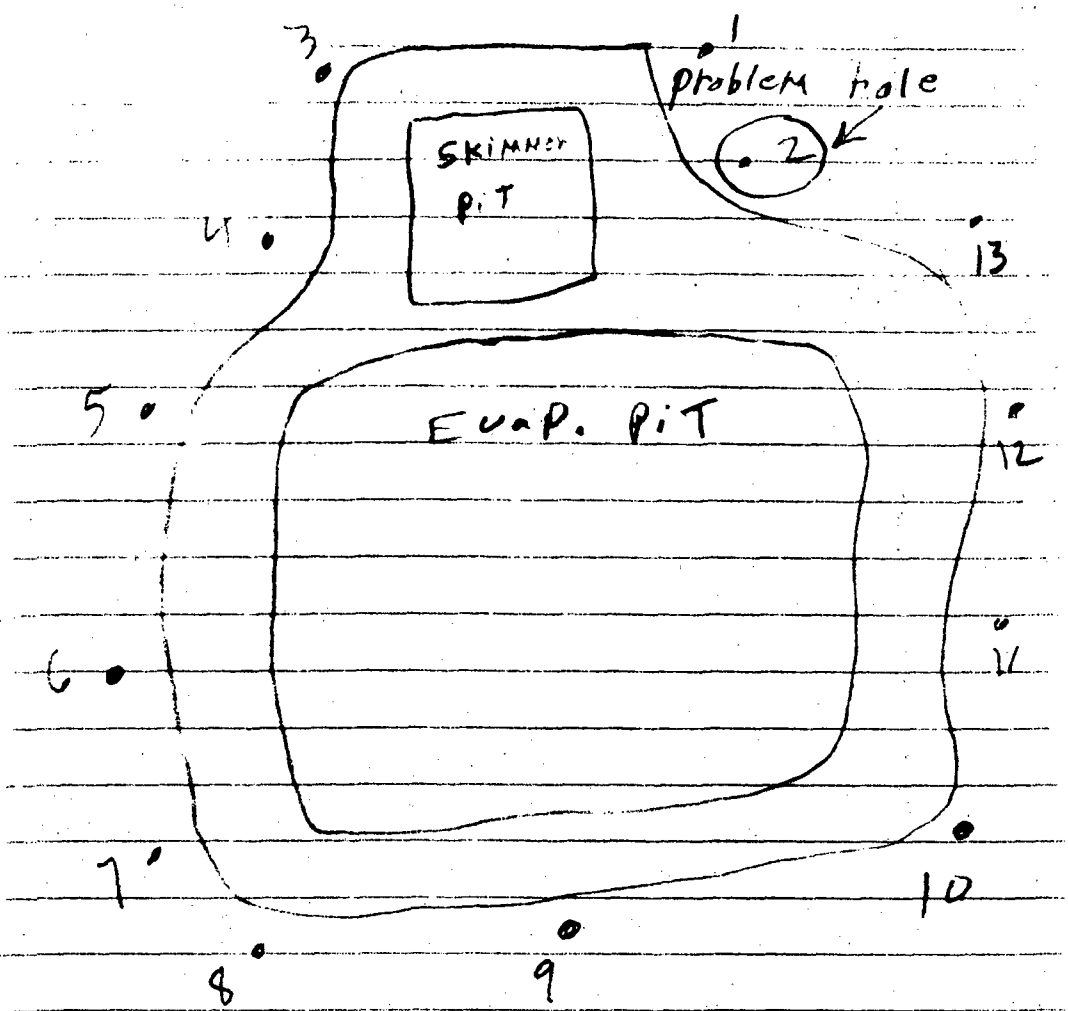
Your message
To: Denny Foust
Subject: T&T Construction Facility Expansion Request
Date: Monday, May 22, 1995 1:31PM
was accessed on
Date: Tuesday, May 23, 1995 7:53AM

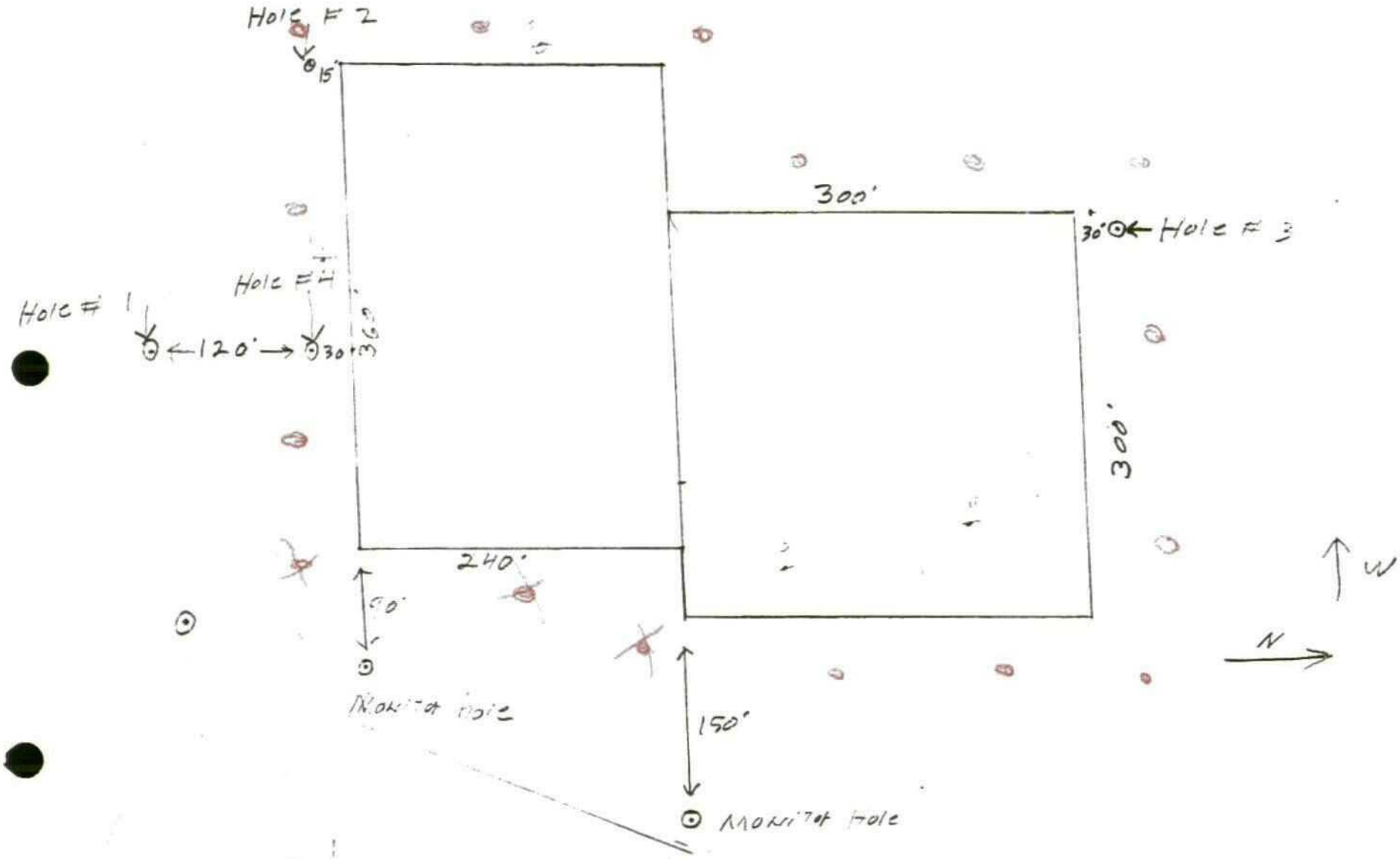
All other wells dry

#3 - 6" water -12

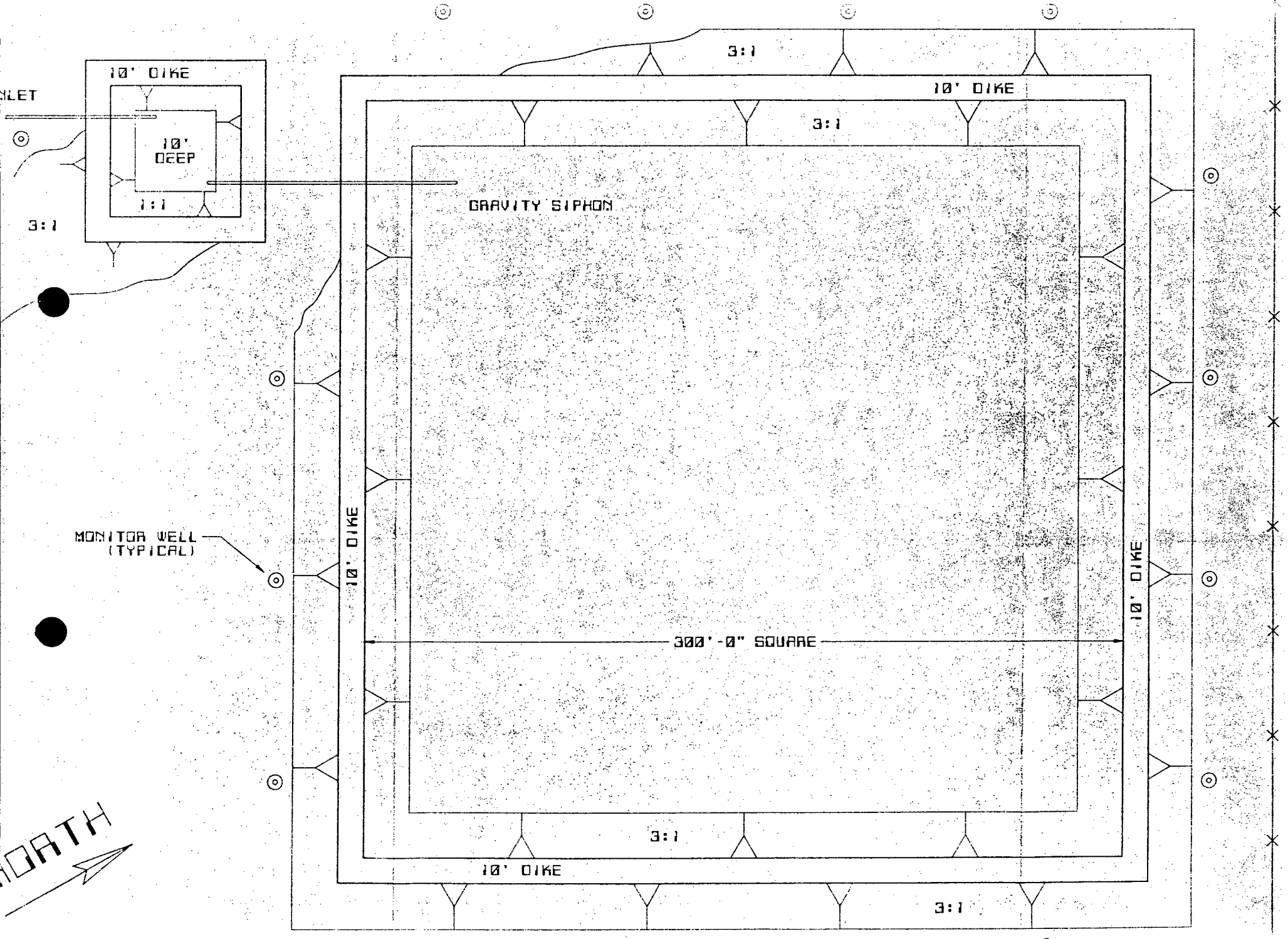
#6 - 8' water -13 Bailed to 18"

8-24 - 6' [redacted] -2-days .44 #2





T-N-T Construction Inc.
Tony Schmitz
Star Rt.
Lindrith, N.M. 87029


10' DIKE
10' DEEP
1:1
3:1
GRAVITY SIPHON
MONITOR WELL
(TYPICAL)
300'-0" SQUARE

T-n-T Construction, Inc.
Tony L. Schmitz, President
HCR 74, Box 115
Lindrith, New Mexico 87029

4/20/95

Oil Conservation Division
2400 S. Pacheco
Santa Fe, New Mexico 87505

Dear Roger Anderson:

We would like to ask for permission to make an addition to our Water Disposal Facilities and Dirt Farm to treat iron sulfide and tank bottoms.

We purpose two 400 barrel storage tanks and open top steel pits to act as settling and skimmer pits to seperate as much of the water and oil as possible before taking the iron sulfide to our Dirt Farm. The oil will go in our other oil tanks and the water will go to the evaporation pits. The remainder will go to the Dirt Farm into cells and treated with 6 inches of loose dirt and 2 inches of pelleted absorbant and remediated.

Thank you for your consideration.

Sincerely;

Tony L. Schmitz

Tony L. Schmitz, President

cc: OCD, Aztec

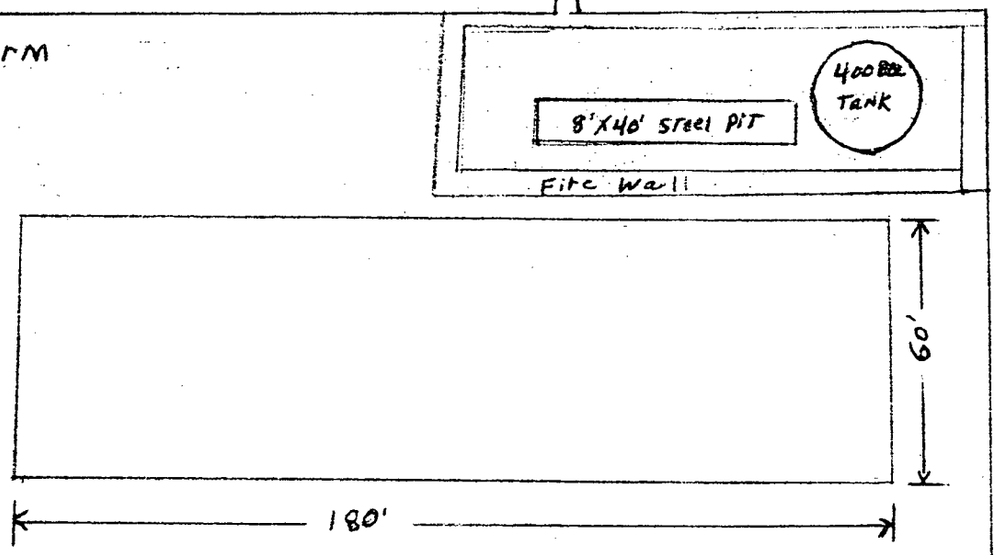
HWY-537 → North

Entrance to dirt Farm

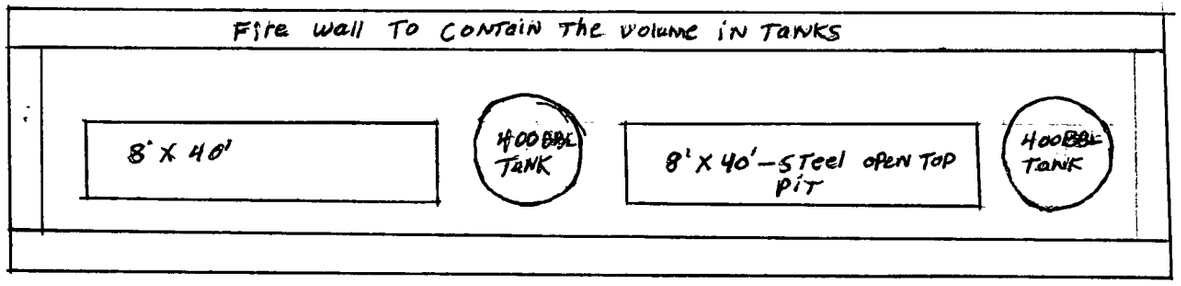
Dirt Farm

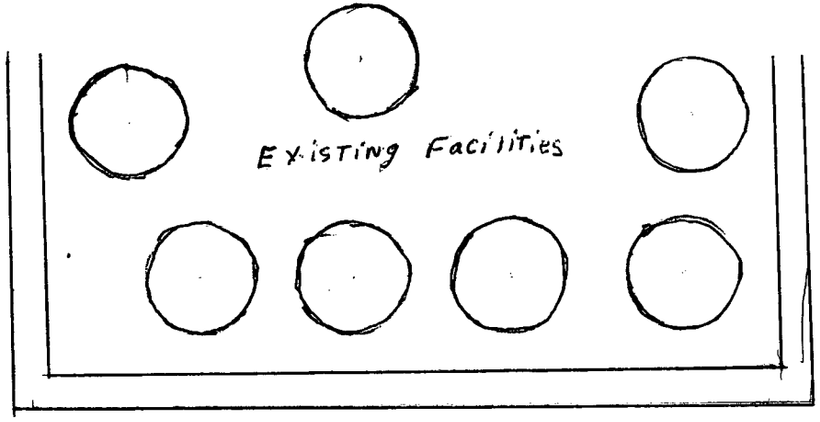
We visited the Tierra Environmental Facility and like the method they are using for remediating iron sulfide and tank bottoms. We would like to have permission for the same kind of operation.

The 180' x 60' cell will be diked off to contain fluids and divert run off water. 6" of loose dirt will be prepared and 2" of pelleted absorbant, that we will purchase from Tierra Environmental, will be spread over the surface.



New Purposed Addition





DEPARTMENT
OIL CONSERVATION
DIVISION

Notice is hereby given that pursuant to the New Mexico Oil Conservation Division Regulations, the following application has been submitted to the Director of the Oil Conservation Division, 2040 S. Pacheco, Santa Fe, New Mexico 87505, Telephone (505) 827-7131:

(NM-01-0008) T & T Construction, Inc., Tony L. Schmitz, President, HCR-74 Box 115, Lindrith, New Mexico, 87029, has submitted for approval an application to expand their existing commercial surface waste disposal facility located in the NE/4 SE/4 of Section 7, Township 25 North, Range 3 West, NMPM, Rio Arriba County, New Mexico. The applicant proposes to construct an additional evaporation pond with two layers of impermeable synthetic liner to prevent leaching to the subsurface. A leak detection system will be installed between the two layers to monitor the integrity of the primary synthetic liner. Produced water associated with oil and gas production will be disposed of in a lined pond for evaporation. The permit application addresses the construction, operations, spill/leak prevention and monitoring procedures to be incorporated at the proposed site. The ground water most likely to be affected by an accidential release is at a depth of 150 feet with a total dissolved solids concentration of approximately 1300 parts per million.

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 application may be viewed at the above address between 8:00 a.m. and 4:00 p.m. Monday thru Friday. Prior to the ruling on any proposed application, 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. Request for public hearing shall set forth the reasons why a hearing shall be held. A hearing will be held if the director determines that there is significant public interest.

If no hearing is held, the Director will approve or disapprove the application based on the information available. If a public hearing is held, the Director will approve the application based on the information in the application and information presented at the hearing.

GIVEN under the Seal of

County of Rio Arriba

I, Robert Trapp, being first duly sworn declare and say that I am the Publisher of the Rio Grande Sun, a weekly newspaper, published in the English language, and having a general circulation in the City of Espanola and County of Rio Arriba, State of New Mexico, and being a newspaper duly qualified to publish legal notices and advertisements under the provisions of Chapter 167 of the Session Laws of 1937; that the publication, a copy of which is hereto attached, was published in said paper once each week for ..... consecutive weeks, and on the same day of each week in the regular issue of the paper during the time of publication, and that the notice was published in the newspaper proper, and not in any supplement, the first publication being on the 30th day of March 1995 and the last publication on the 30th day of March 1995; that payment for said advertisement has been (duly made), or (assessed as court costs); that the undersigned has personal knowledge of the matters and things set forth in this affidavit.

Robert Trapp
Publisher

Subscribed and sworn to before me this 30th day of March, A.D., 1995

Ruth D. Trapp
Notary Public

My Commission expires
5-11-97

BILL
$ 38.16
$ .....
$ 5.00
$ 43.16
$ 2.67
$ 45.83
.....
UN
.....

JR DISCOUNT ON
IF PAID

... CA - Classified Advertising — DA - Display Advertising — SS - Stand Sales

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

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GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 22nd day of March, 1995.

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

Journal: April 3, 1995.

STATE OF NEW MEXICO
County of Bernalillo SS

Bill Tafoya being duly sworn declares and says that he is Classified 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, Chapter 167, Session Laws of 1937, and that payment therefore has been made of assessed as court cost; that the notice, copy of which is hereto attached, was published in said paper in the regular daily edition, for 1 times, the first publication being of the 3rd day of April, 1995, and the subsequent consecutive publications on _____, 1995

Bill Tafoya

OFFICIAL SEAL
Megan Millage
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires: 5-20-98

Sworn and subscribed to before me, a notary Public in and for the County of Bernalillo and State of New Mexico, this 3rd day of, April 1995

Megan Millage

PRICE $34.28
Statement to come at end of month.

OK to pay
CE

CLA-22-A (R-1/93) 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 the New Mexico Oil Conservation Division Regulations, the following application has been submitted to the Director of the Oil Conservation Division, 2040 S. Pacheco, Santa Fe, New Mexico 87505, Telephone (505) 827-7131:

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GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 22nd day of March, 1995.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

SEAL

WILLIAM J. LEMAY, Director

February 8, 1995

Roger Anderson
New Mexico Oil Conservation Division
Environmental Bureau
2040 South Pacheco
Santa Fe, NM 87505

RE: Application for **Expansion of an Exixting Surface Disposal Facility**, $NE\frac{1}{4}$, $SE\frac{1}{4}$, Sec. 7, T25N, R3W, Rio Arriba, Co. New Mexico.

Dear Mr. Anderson:

The attached Application for Expansion of an Existing Commercial Surface Waste Disposal Facility is submitted for OCD review and approval. The facility is an expansion of an existing commercial facilities located in the $E\frac{1}{2}$, Sec. 7, T25N, R3W in Rio Arriba County. The expansion is designed in accordance with applicable New Mexico Oil and Gas Conservation Division (OCD) Guidelines, Design and Construction permits as well as OCD Rule 711.

The proposed expansion would be used as an overflow storage facility for waste water coming from ponds completed by TNT in the late 1980's to the east.

Please note that a large portion of this report was completed by James W. Gurney, Consulting Geologist in Farmington, NM who can be contacted by the OCD should additional information be needed or if clarification of data contained within the application is required.

Should the OCD have further questions regarding the attached application please contact:

Tony L. Schmitz
or
Craig Schmitz
TNT Construction, Inc.
HCR-74 Box 115
Lindrith, NM 87029

James W. Gurney
Far West Resources, Inc.
Box 1461
Farmington, NM 87401

Sincerely,

Tony L. Schmitz, President
TNT Construction, Inc.
HCR-74 Box 115

Lindrith, NM 87029
(505) 774-6663

Copies: Aztec OCD (1)
Santa Fe OCD (3)
TNT (1)

NM-01-0008

TNT Construction, Inc.

HRC 74 - Box 115

Lindrith, NM 87029

RECEIVED

MAR 13 1995

Oil Conservation Division

Expansion of an Existing Surface Waste Disposal Facility

in

NE1/4, SE1/4, Sec. 7, T25N, R3W
Rio Arriba County, New Mexico

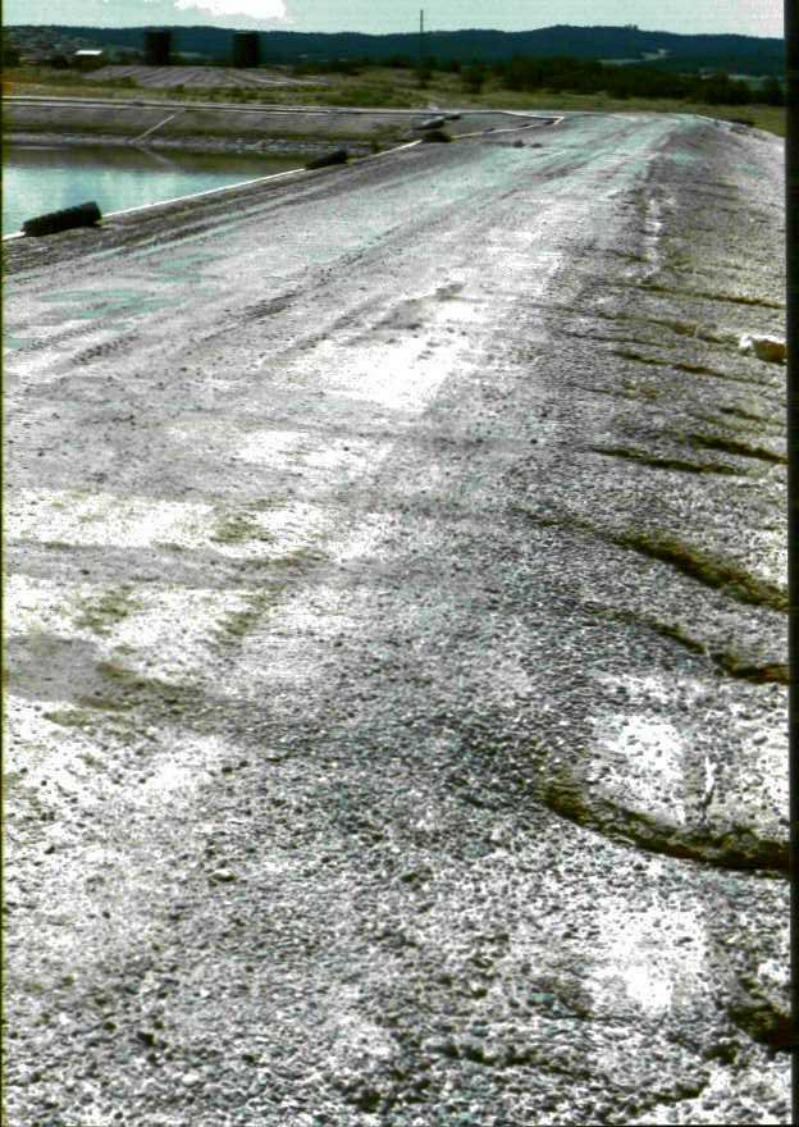
January 31, 1995

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

2040 South Pacheco
P.O. Box 6429
Santa Fe, New Mexico 87505-5472

TnT
Upper Pond
8-3-95

TuT
Upper Pond
8-3-95



TNT
Lower Fond
8-3-95

TnT

Lower Pond

8-3-95

TnT
Landfarm
8-3-95

TnT
Landfarm
8-3-95

T n T

~~Jandfoon~~ Upper Pond

8-3-87

TuT

Upper Pond

8-3-85

TNT Construction, Inc.

HRC 74 - Box 115

Lindrith, NM 87029

Expansion of an Existing Surface Waste Disposal Facility

in

NE1/4, SE1/4, Sec. 7, T25N, R3W
Rio Arriba County, New Mexico

January 31, 1995

TABLE OF CONTENTS

APPENDIX

From OCD Form 5/93

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

APPLICATION FOR SURFACE WASTE DISPOSAL FACILITY

Commercial Facility

I. Type of Operation

The purpose of the facility is the disposal of produced water from local oil and gas operations by evaporation in open ponds. TNT Construction, Inc. (TNT) presently operates a commercial surface waste disposal facility at the permit location. Disposed water is trucked to the location and unloaded into above ground tanks with the oil collected and stored for future treating and sale. The produced water is then stored in an evaporative pond permitted in 1987, overflow from the 1987 pond goes to a second pond permitted in 1990, and overflow from 1990 pond will go to a third pond as requested in this application. An aeration and evaporation system will be utilized on the third (expansion) pond, similar to the systems in use on the two existing ponds.

II. OPERATOR

A. The owner of the facility is:
TNT Construction, Inc.
HCR 74 - Box 115
Lindrith, NM 87029

B. Contact Person:
Tony L. Schmitz, (505) 774-6663 or 774-6551
Craig Schmitz (505) 774-6663 or 774-6551

III. LOCATION

The proposed expansion pond is located in NE1/4, SE1/4, Section 7, Township 25 North, Range 3 West, NMPM, in Rio Arriba County, New Mexico, as shown on Index Map, (**Figure 1**). **Figure 1** is a portion of the

Schmitz Ranch Quadrangle, a 7.5 minute Series Topographic sheet. The facility is located to the west of existing evaporative ponds presently operated by TNT. The proposed expansion pond will be constructed in accordance with a site plan submitted herein to the OCD, subject to any modifications directed by the OCD.

IV. IS THIS AN EXPANSION OF AN EXISTING FACILITY?

Yes. This is an application for an expansion pond at an existing facility. Original approval and authorization of existing evaporation ponds from the OCD are attached.

V. ATTACH THE NAME AND ADDRESS OF THE LAND OWNER OF THE DISPOSAL FACILITY SITE AND LAND OWNERS OF RECORD WITHIN 1/2 (ONE-HALF) MILE OF THE SITE.

A. The proposed expansion waste disposal pond is located on private land owned by:

TNT Construction, Inc. (a NM Corporation)
Tony Lee Schmitz, President
HCR 74 - Box 115
Lindrith NM 87029
(505) 774-6663
(505) 774-6551

B. There is only one other landowner of record within one-half mile of the site in Section 7, a John C. Huffman, see **Figure 1.** in Appendix. A letter and proof of notification (certified letter with return receipt) to John C. Huffman describing the proposed operation by TNT is attached, see Appendix.

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

A. The only disposed/produced water from oil/gas wells in the area. No other fluids or solids will be disposed of at the site.

B. A description of the facility diagramming the location of proposed fence, pond, and dike locations can be found on **Figure 1 and Figure 2** in the Appendix of this report.

VII. Attach detailed engineering designs with diagrams prepared in accordance with Division guide lines for the construction/ installation of the following: ponds, leak detection systems, aeration systems, enhanced evaporation (spray) systems, waste treatment systems, and security systems.

A. The proposed lined evaporative pit will be used as an overflow for disposed/produced water having already entered the main evaporative ponds to the east **(Figure 2).** Disposed water will be piped from the existing storage/ evaporation pond(s) to the proposed expansion pond via a siphon/pipe system and valves as shown on **Figure 2A.**

B. Attached are engineering design specifications and diagrams for the evaporation pond, including the leak detection system. In addition are diagrams of the aeration and spray system. No materials or effluents other than produced/disposed water will be discharged into the proposed pond.

C. Surface Impoundment (pond) will have the following dimensions:

AREA (ft^2)	VOLUME (bbls)	DEPTH (ft)	SLOPE*
90,000	116,000	10	2:1 min.

* 2:1 minimum horizontal to vertical slope on inside and 3:1 on the outside slopes.

D. The pit will be constructed partially in cut and fill. The dikes will be built of tightly compacted shale/clay which exhibits a permeability coefficient of 3.8×10^{8} centermeters/second or about .04 feet per year, based on Western Technologies report dated 5/2/88 as prepared for TNT, (attached). The subsurface consists primarily of clay and weathered sandy clay. The freeboard for the levees/berms will be one and one-half feet (1.5'), the projected depth of the pond is ten feet (10'), and the maximum height of water would be eight one-half feet (8.5'), **Figure 3.** Embankments/berms will rise at least one and one-half feet (1.5') above perimeter ground and will be level.

The top of the embankment/berm will be twelve feet (12') wide to accommodate equipment, etc. and will have a 3:1 slope on the outside and a 2:1 minimum slope on the inside.

The proposed disposal pit is not located along any water course, lake bed, sink-hole or other geological depression.

VII-Cont. General Construction Requirements:

A. The ponds will be out of any water courses.

B. Design and Construction

1. The natural evaporative capacity for each pond is estimated at 175 BWPD, based on a net evaporation rate of 48 inches/year and a 90,000 ft^2 of surface area. The holding capacity of the proposed pond is approximately 116,000 barrels of water. Sprayers will be installed to assist in the evaporative process. Depending upon the amount of daily use and efficiency of the sprayers an additional 800+ BWPD may be evaporated. Sprayers will be used on warm days only during the winter months. Potential pond volumes are unknown and subject to market conditions.

2. Wave calculations for a pond with a fetch of 300 feet or less can only be estimated. The ponds presently in use to the east and operated by TNT have yet to see waves over three to five inches (3"-5") in height. Sustained winds necessary to produce waves on a fetch of less than 300 feet are not common in the general area. With rainfall estimated at an annual rate of less than 10 inches for the area a one and one-half foot (1.5') freeboard should be more than adequate to contain the produced water under any environmental conditions. Liner markings or a permanent device of some sort will be installed to accurately measure freeboard.

3. The inside slopes of the pond are planned at 2:1 to 3:1 and the outside slopes will be 3:1, horizontal to vertical.

4. The width of the top of the berm (levee) will be at least 12 feet, see **Figure 3.**

5. The pond will be equiped with an **aeration system.** The aeration system will be placed in the pond bottom and will consist of a network of perforated one inch (1") and two inch (2") PVC or HDPE pipe, see **Figure 4.** The system will be able to circulate either a liquid or gaseous (air) medium. The system will consist of a two inch (2") trunk line and one inch (1") laterals every fifty feet (50') . The laterals will be perforated with 1/32 inch holes on ten foot (10') centers. The system will be anchored to the bottom with sand tubes, or elevated off the pond floor using a comparable system which will not harm the primary liner. This aeration system will be capable of pumping gas or liquid mediums. The liquid will be pumped by splitting the sprayer pump and introducing the liquid through a venturi type hopper. Air will be supplied to the system by an air compressor of adequate size; the make/model is unknown at this time. The hydrostatic pressure at 8.5 feet of water is estimated at 3.75 psi. The efficiency of the compressor will be reduced by altitude. An **alternative Aeration System** (design) is also presented in **Figure 4a.** The system is very similar to the above describe system except the 2" main line is located along the berm edge and each lateral is controled by a valve. Air holes are spaced ten feet (10') apart on the 1" laterals and range from 2/32" at the valve end, to 3/32" at the far end.

6. Upon completion of construction "as built" completion diagrams certified by a registered professional engineer shall be submitted.

C. Synthetic Lined Ponds

1. The synthetic material used to line the evaporative pits will be impermeable, flexible, and resistant to potential environmental hazards.

2. The liners will be at least thirty (30) mil. thick with good resistance to tears and punctures.

3. The proposed pond will be lined and have a leak detection system, see **Figure 5.** The secondary liner will be made of 30+ mil PVC or equivalent.The primary liner will be made of 30+ mil XR-5 or equivalent, see attached engineering data sheets. The specification sheet for the liners are attached. The primary liner is resistant to sunlight, hydrocarbons, fungus, algae, bacteria and salt water. The secondary liner is resistant to hydrocarbons, fungus, algae, bacteria and salt water. Each liner will be laid in

the pond by rolls and then seamed together. Additional information on the construction of the lined ponds is discussed later.

D. Leak Detection System

1. The leak detection system will be installed between the primary and secondary liner. The appropriate OCD office will be notified at least 24 hours before scheduled installation of the primary liner to afford the opportunity for a Division representative to inspect the leak detection system, see **Figure 6.**

2. The system will consist of a network of one inch (1") perforated PVC pipe laterals installed between the primary and secondary liners, see **Figure 5.** The one inch (1") laterals will be on a 2% slope, spaced forty feet (40') apart, and drain into a two inch (2") PVC pipe. The two inch (2") pipe will be located on a 1% slope and will drain to a covered sump outside of the berm/ embankment. The sump will consist of corrosion proof twelve inch (12") PVC pipe and assessories, see **Figure 7.** The network will be of sufficient density so that no point on the pond bottom is more than twenty feet (20') from a one inch (1") lateral, see **Figure 6.** Washed sand or 'pea' gravel may be used between the secondary and primary liners to allow transport of the fluids to the drainage pipes, however a 7-10 oz. 'Geotextile' fabric may also be used between the liners. The slope of all drainage lines and pond bed will be at least six inches (6") per fifty feet (50'), a 1% grade.

E. Preparation of Pond Bed for Installation of Liners

The following procedure for site preparation and earth work for the embankments and basin portions of the proposed lined pit are as follows:

1. Strip all loose surface soils, vegetation, roots and debris from the pond and embankment areas to a distance of five feet (5') beyond the perimeter of the new construction. Removal should extend one foot (1') below the existing grade or one foot (1') below the bottom of the embankment, which ever is deeper. The soil may be stockpiled and used to revegetate areas where clay is striped for use in the construction of the embankments.

2. Clean and widen depressions, washes, swales, etc. for level working areas or eliminate potential erosion of the perimeter area of the embankments.

3. No material will be placed which is frozen or where the inplace material is frozen.

4. Proof-roll the exposed subgrade in the embankment and pond areas to densify materials which may have been loosened during the stripping and excavation process. Proof-rolling may be accomplished by a sheep's foot roller in lifts not to exceed nine inches (9") or by a minimum of two (2) passes of a loaded scraper or equivalent.

5. All soft areas or deep soil horizons will be removed and replaced with compacted soil. Lift thicknesses will be six to nine inches (6"-9") maximum. All fill material used in the berm walls will be compacted to at least 95% of the maximum dry density of the clays utilized (ASTM 698). Material used in construction should not be allowed to dry between layers or stages of embankment construction. When drying has occurred, dry material will be reconditioned to proper water content using produced or brine water prior to placing subsequent lifts. All surfaces to be covered by liners will be smooth so as not to damage the liners. The bed of the pond and inside grade of the levee shall be smooth and compacted, free of holes, rocks, stumps, clods, or any other debris which may rupture the liner.

6. A trench will be excavated on the top of the levee the entire perimeter of the pond for the purpose of anchoring the flexible liners. This trench shall be located a minimum of nine inches (9") from the slope peak and shall be a minimum of twelve inches (12") deep, see **Figure 3.**

7. The liner shall rest smoothly on the pond bed and the inner face of the levees, and shall be of sufficient size to extend down to the bottom of the anchor trench and come back out a minimum of two inches (2") from the trench on the side furthest from the pond, see **Figure 3.** Significant folds will be placed at each corner of the pond to allow for the contraction and expansion of the liners due to temperature/climatic variations.

8. Venting of gas that may accumulate beneath the liner from either organic material or natural gas is not considered a problem in the area. The soil horizon will be entirely removed and natural gas bearing

formations in the area are at a considerable depth. The water table, based on area water wells is at a depth of over 300 feet and shale/clay beds under-lying the area have very low permeabilities, see Western Technologies report in Appendix. If vents are required by the OCD, two gas vents will be installed on each side of the pond. The vents will be located approx-imately nine inches 9" down from the berm break, see **Figure 5.**

9. An anchor of used casing or weighted PVC pipe will be placed over the liner in the anchor trench and the trench back-filled.

10. If a sand and/or 'pea' gravel layer between the secondary and primary liners is used, it shall be placed in such a manner that the risk of tearing the liner is minimized.

11. If the lining material used for the primary liner is not sun-resistance, at least one inch (1") of sand or other suitable material shall be spread uniformly to cover the liner over the floor of the pit. Gravel or other wave-resistant material with sufficient angle of repose to remain in place shall be used to cover the sloping inner wall of the levee. A geotextile liner shall be placed beneath any gravel layer to provide protection for the primary liner. Any gravel or sand layers used to protect the primary liner from the sun shall extend to the anchor trench. A liner boot will be used for any pipe that penetrates the primary and/or secondary liner, see **Figure 8.** A boot may be required on the discharge pipe coming from an existing pond or venting.

12. At any point of discharge into the pond, no fluid force shall be directed toward the liner. Discharge into the proposed pond from the existing ponds to the east shall not be directly onto the platic/PVC liner. To prevent abrasion or wear to the liner from the discharge pipe, embankment splash guards will be installed, see **Figure 3 or 8.**

13. Appropriate rip-rap will be installed to prevent damage to the exposed liner, if necessary.

14. A positive drainage system will be provided around the base (toe) of the outside slope of the embankment throughout the life of the proposed pond.

F. Sprayer Evaporation Systems

1. The pond will be equiped with a **sprayer system.** The sprayer system will be similar to the sprayer system presently in use on the ponds to the east operated by TNT, see diagram on **Figure 9.** Sprayers will be located on all four sides of the pond near the top of the berm/embankment, see **Figure 9.** Water will be pumped into a four inch (4") PVC trunk line, which will feed water into several secondary three inch (3") PVC pipes. Flow into the three inch (3") PVC pipe is controlled by valves on all four sides of the impoundment. Water exits the PVC pipe through brass sprayers facing the interior of the pond. Spray nozzles are spaced on twelve foot (12') centers along the three inch (3") PVC secondary pipe, see **Figure 9.** The sprayers will be supplied by a centrifical pump with a capacity of about fourteen (14) BWPD. The pumps will be powered by either a gas or electric motor.

2. The sprayer system will be operated in such a manner as to keep the salt water spray contained within the impoundment.

G. Fences, Signs and Netting.

1. A three (3) or four (4) strand barb wire fence will be constructed and maintained in good condition around the proposed expansion pond and tied into the fence already in place around the existing ponds to the east. Adequate space will be provided between the fence and levees for passage of maintenance vehicles. The fence will be adequate to prevent livestock from entering the facility area. No fences will be located on the embankments/levees, see **Figure 2.**

2. Signs are already posted at the facility entrance identifying the operator of the facility, location and emergency numbers.

3. The facility is not hazardous to migratory birds. No migratory birds have been seen within the existing ponds to the east and TNT requests that an exception be granted by the OCD requiring netting.

VIII. Spill/leak Prevention and Reporting Procedures

A. Leak Prevention and Contingency Plan

1. The leak detection system will be the only means in which leaks can be detected. The sump will be inspected daily during fill up and weekly there after. TNT will keep records of such inspections, and kept on file at the facility for OCD inspection at any time.

2. If Fluids are found in the leak detection sump the following steps will be undertaken:

a. The OCD at Aztec and Santa Fe will be notified within 24 hours or one working day of the detection of fluid in the sump.

b. A sample of the fluid in the sump and the pond will be tested to determine the source.

c. Receiving fluids for disposal in the affected pond will cease immediately and fluids from the sump will be immediately and continuously pumped back into the affected pond.

d. Enhanced evaporation using the installed sprayer system will begin immediately providing the spray can be contained within the embankments in accordance with provisions of this application.

3. If a leak is determined to exist in the primary liner, TNT will undertake the following measures under the direction of the OCD:

a. Enhanced evaporation will continue, provided atmospheric conditions are such that the spray can be contained within the pond and the leak detection sump will be continually pumped and fluid recycled into the pond.

b. Some fluids will be removed from the affected pond and transferred to the existing two ponds to the east. The amount of transfer will depend on available space in the existing ponds and the amount of fluids that need to be removed from the effected pond.

c. Sprayers at the existing ponds will be utilized at maximum capacity to make room for additional fluids from the leaking lined pond. The recycling of sump water, pumping water to existing ponds and enhanced evaporation at all three evaporative ponds would continue until such time as the sump dries out on the affected pond.

d. Fluid removal and evaporation will continue until the fluid level is below the location of the leak in the liner. This will indicate the level in the pond at which the leak is located.

4. The location and cause of the leak will be determined and repaired. The liners will be tested for leaks upon refilling the lined pond. If additional leaks are found, the pond will be redrained and evaporated below the leak level as determined by sump dry-out. Time of repair will be determined by evaporation rates and available storage space in existing ponds to the east. The leak detection system will be completely drained before resuming the introduction of fluids into the pond. TNT would also comply with any other measures required by the OCD to rectify the situation.

IX. Operation and Maintenance

A. Requirements For Receipt of Fluids.

1. Disposal at this facility will be in accordance with previously approved OCD regulations for TNT's present operations. An attendant is on duty when disposed fluids arrive at the facility and the facility is secured when no attendant is present.

2. No produced water shall be received at the facility unless the transporter has a valid Form C-133 (Authorization to Move Produced Water) on file with the Division.

3. Only liquids that are non-hazardous by the U.S. Environmental Protection Agency under Resource Conservation Recovery Act (RCRA) Subtitle C exemption or by characteristic testing are being accepted at the facility. Only produced/ disposed water is presently accepted at the facility.

4. All liquids accepted for disposal shall be tested for hydrogen sulfide concentrations. All liquids with measurable hydrogen sulfide concentrations shall either be treated immediately or not accepted at the facility.

5. TNT will keep and make available for inspection records for each calendar month on the source, location, volume, type of waste (produced water), date of disposal, and hauling company that disposes water at the

existing facility. Records of H_2S measurements and treatment volumes shall be maintained in the same manner. Such records shall be maintained for a period of two (2) years from date of disposal.

6. TNT presently files C-117-A, C-118, and C-120-A as required by the OCD.

7. Fluids shall not be accepted if introduction of the fluid will cause the proposed pond and the existing ponds to rise above their approved or authorized freeboard.

B. Pond Maintenance

1. Outside walls (berms/leeves) and the positive drainage system around the proposed lined pond will be inspected weekly for erosion or after a significant rainfall, and maintained in a prudent manner.

2. No oil shall be allowed in the proposed pond.

C. General Operational Requirements

1. TNT operating personnel are trained in the operation, calibration, maintenance and safety requirements of all tested equipment used at the facility. TNT has been operating two (2) evaporation ponds for over seven (7) years at this facility.

2. At least 1000 gallons of a treatment chemical shall be stored on-site and shall not be retained for a period in excess of the manufacturer's stated shelf life. Expired chemicals may be disposed of in the pond.

3. Any accumulated sludge/oil etc. from the main facility skimmer pond is disposed of in accordance with the OCD.

4. If any of the required systems become inoperative, the OCD Aztec District Office will be notified immediately.

X. Closure Plan

A. When the facility is to be closed or this permitted pond closed, TNT shall provide for removal of all liquids and/or wastes, back-filling, grading and mounding of ponds, and clean up of any contamination of soils. Wastes shall be disposed of in accordance with rules and regulations and statutes in effect at the time of closure.

B. The OCD will be notified when operation of the facility is discontinued for a period in excess of six months or when the facility is to be dismantled.

XI. Site Characteristics - Fresh Water Protection Demonstration

A. The following hydrologic/geologic information is required to be submitted with all applications.

1. Hydrologic Features

a. The only significant stream in the area is Canon de Los Ojitos one half mile to the southeast and it is considered an intermittent stream. A topographic high separates the planned expansion pond to the east. All water wells within on mile of the proposed pond are shown on **Figure 1** and are owned or operated by either TNT or the Schmitz Ranch. These water wells are for domestic or stock use and penetrate aquifers at a depth of 300 to 900 feet. Ground water was not encountered in over 30 monitor or stratigraphic test wells drilled within 50 to 800 feet from the east edge of the proposed expansion pond site, see **Figure 10.** Figure 10 shows only the wells along the east side of the proposed location.

b. Cuttings from stratigraphic tests and monitor wells suggest that the near surface sandstone lenses are dry, oxidized and above any water table at the proposed pond location. Sandstone outcrops in the area dip to the north/northeast at about 1 degree. If water were introduced into the sand lenses encountered in some of the stratigraphic and monitor wells drilled in the near area, the water would move by gravity to the lowest part of the sand lens and the down dip to the north/northeast. These sand lenses are considered to be encased in clay/shale and are discontinuous in nature.

c. A water sample cannot be obtained in the immediate area since no ground water has been encountered, therefore no analysis is available.

Water wells in the general area that have encountered ground water at depths of 300-900 feet contain an estimated 500-1000 ppm TDS.

d. Stratigraphic test wells and monitor wells along the east side of the proposed expansion pond and the west side of an existing pond to the east, permitted in 1990, indicated that sand lenses in the area are 1-17 feet in thickness, 50-300 feet wide and 300 to 800 feet in length. Outcrops in the area support very small sand channels within a dominate non-marine clay/shale sequence. Sands are very fine to coarse-grained and were laid down in a fluvial environment.

2. Geologic Description of Pond Site

a. The San Jose Formation (Eocene Age) is the youngest Tertiary rock unit found within the San Juan Basin and occurs at the surface throughout a great portion of the basin and the general area of the proposed site. This sequence consists of interbedded shale/claystone, sandstones and mudstones of continental origin with a maximum thickness of 2700 feet in the basin center and about 900-1000 feet in the study area. In the study area (pond site location) sporadic fluvial sandstone lenses outcrop within a dominate clay/shale mudstone environment consisting of illite, montmorillonite and bentonite.

b. The name and depth of the most shallow aquifer can only be estimated. It is thought to be the Cuba Mesa Member of the San Jose Formation, as described by Brimhall in 1973 publication of the Four Corners Geological Society occurring at a depth from 300-900 feet.

c. Correlation of sand and clay/shale horizons indicate that there are few, if any sands in the immediate area of the proposed pond side. There are no prominent sand outcrops directly up-dip of the proposed pond site. Monitor wells and stratigraphic wells within 100 feet of the proposed pond site encountered little sand. The excavated base of the proposed pond site should have 15 + feet of impermeable clay/shale at its base. Copies of the nearest drillers (geologic) logs, **Figures 10 & 11a, b, c, etc.,** illustrate the underlying stratigraphy.

3. Flood Protection

a. The facility is located east of a small intermittent stream which drains about 1/4 to 1/2 square mile of area. The site will be topographically higher than the drainage and all necessary dirt work (diversion ditches) will be performed along the west side of the proposed pond to assure that during a worse case senario the pond embankments will be protected, see **Figure 2.** A 1.5 foot freeboard should be sufficient to contain a worse case senario of major precipita-tion, assuming the pond is at the 1 1/2 foot freeboard position when a major rainstorm occurs.

b. A positive drainage system will be provided around the base (toe) of the outside slope of the embankment throughout the life of the proposed pond.

c. TNT will immediately notify the OCD of any flooding or washout which might occur which have affected or damaged the pond embankments. Any damage that might occur to the facility will be repaired immediately.

XII. Proof of Notice

A. There is only one other landowner of record within one-half mile of the site in Section 7, a John C. Huffman, see **Figure 1.** in Appendix. A letter and proof of notification (certified letter with return receipt) to John C. Huffman describing the proposed operation by TNT is attached, see Appendix.

John C. Huffman
1520 Zuni Drive
Farmington, NM 87401

XIII. H_2S Prevention and Contingency Plan

A. In order to prevent and control harmful concentrations of hydrogen sulfide (H_2S), the following procedures shall be followed.

1. Daily tests shall be conducted and records made and maintained of the pH in the pond, and if the pH falls below 7.0 remedial steps shall be taken immediately to raise the pH.

2. Weekly tests shall be conducted and records made and retained at the facility of the dissolved sulfide concentrations in the pond.

3. Tests shall be conducted, and records made and retained at the facility of such tests, to determine the dissolved oxygen levels in each pond.

a. If any tests show a dissolved residual oxygen level of less than 0.5 ppm, steps shall be undertaken to raise the oxygen level to at least 0.5 ppm, which measures may include adding bleach, potassium permanganate, or increase aeration.

B. In order to prevent any harm by hydrogen sulfide gas, tests of ambient H_2S levels shall be conducted, and records made and retained. Such tests shall be made at varying locations around the berm of the pond and shall be conducted twice a day. The wind speed and direction shall be recorded in conjuction with each test.

1. If an H_2S reading of 0.1 ppm or greater is obtained:

a. A second reading shall be take on the downwind berm within one hour.

b. The dissolved oxygen and dissolved sulfide levels of the pond shall be tested immediately and the need for immediate treatment determined.

c. Tests for H_2S levels shall be made at the fence line downwind from the problem pond.

2. If two consecutive H_2S readings of 0.1 ppm or greater are obtained:

a. The operator shall notify the OCD, Aztec office of the OCD immediately. There are no residences within one mile of the faciliity and only one residence within three (3) miles of the facility, the Schmitz Ranch (TNT).

b. TNT shall continue to monitor the facility and continue to lower the Hydrogen sulfide problem in the pond.

3. If H_2S readings of 10.0 ppm or greater are encountered, TNT will notify the OCD and the following public safety agencies if the OCD so dictates.

Rio Arriba County Fire Marshal at 588-7254
New Mexico State Police at 289-3443
Rio Arriba County Sheriff at 588-7271

a. No one lives within one-half mile of the facility.

XIV. Additional Information

A. The operator will notify the Division of any changes or additional information changes in conditions which may be relevant to this permit.

XV. Certification

If the foregoing information contained within this application is acceptable to the New Mexico Oil Conservation Division (OCD), please notify TNT Construction, Inc. of its approval or of any additional terms and conditions necessary to obtain its approval.

Please note that this report was prepared by James W. Gurney, Geologist in Farmington, NM, who consulted with TNT Construction on the planned evaporation facility.

"I Tony L Schmitz, certify that I am familiar with the information in this report, OCD Rules and Regulations regarding an evaporative pond expansion as submitted with this application, and that such information is true, accurate and complete to the best of my knowledge."

Authorized Signature

3/3/95
Date

Tony L Schmitz
Printed Name of Person Signing

President, TNT Construction, Inc.
Title

JWG/pjg-jwg

Copies: Aztec OCD District Office-1
Santa Fe OCD State Office-1
TNT Construction, Inc.-2
Far West Resources, Inc.-1

APPENDIX

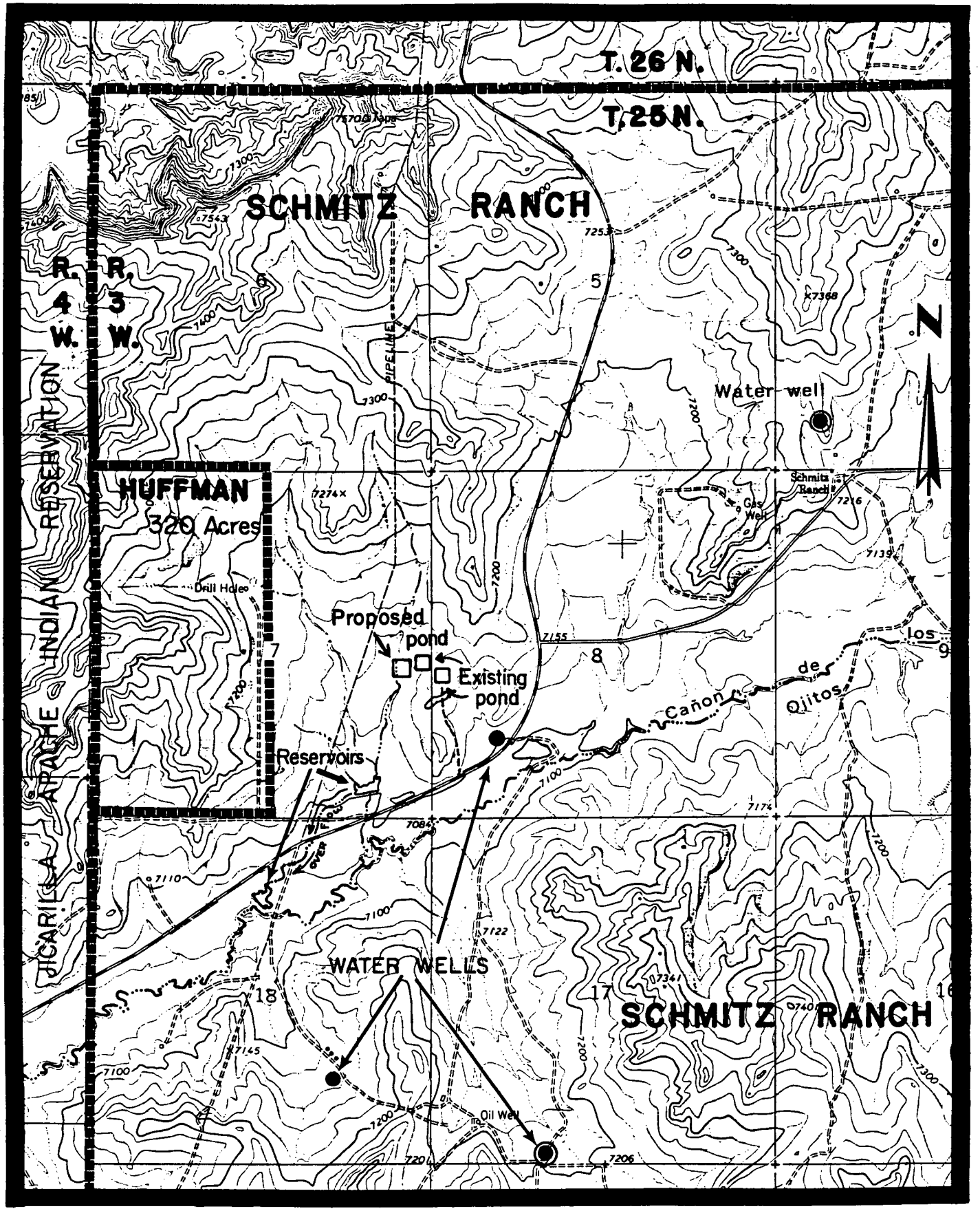


Figure 1. Index map showing proposed and existing ponds, water wells, major drainages, surface owners and topography.

LOCATION OF PROPOSED POND AND EXISTING PONDS TO EAST

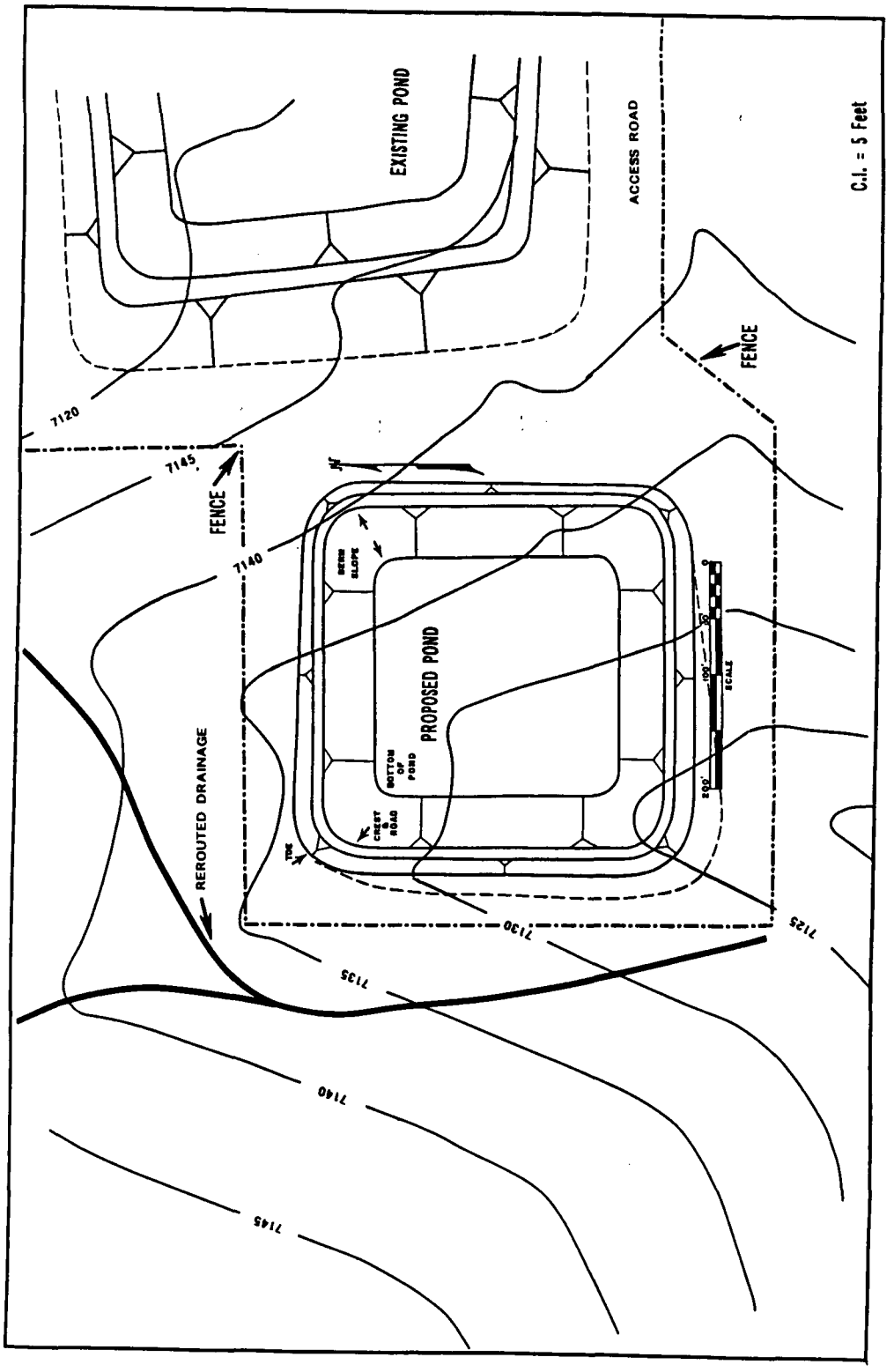


Figure 2. Plan map showing the location of the propose evaporation pond, exsisting ponds, and proposed fence line locations.

GENERALIZED CROSS SECTION PROPOSED POND-EXISTING POND SHOWING DETAIL-DIMENTIONS, N.T.S.

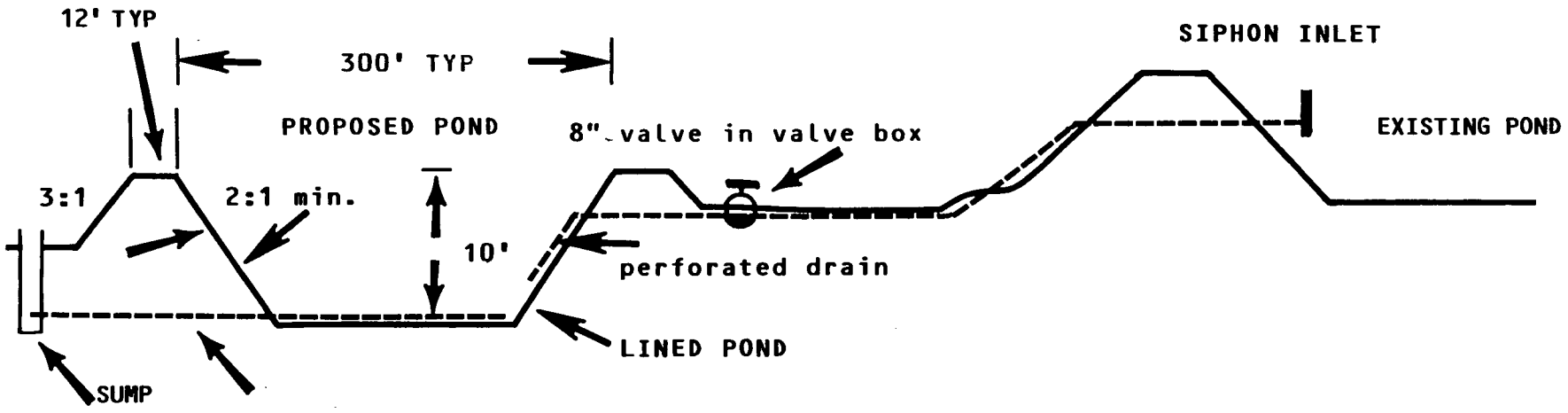


Figure 2A. Generalized cross-section showing some of the dimentions of the proposed pond, detail, and transfer system of fluids from existing pond to proposed pond.

X-SECTION
WATER TRANSFER DETAIL, N.T.S.

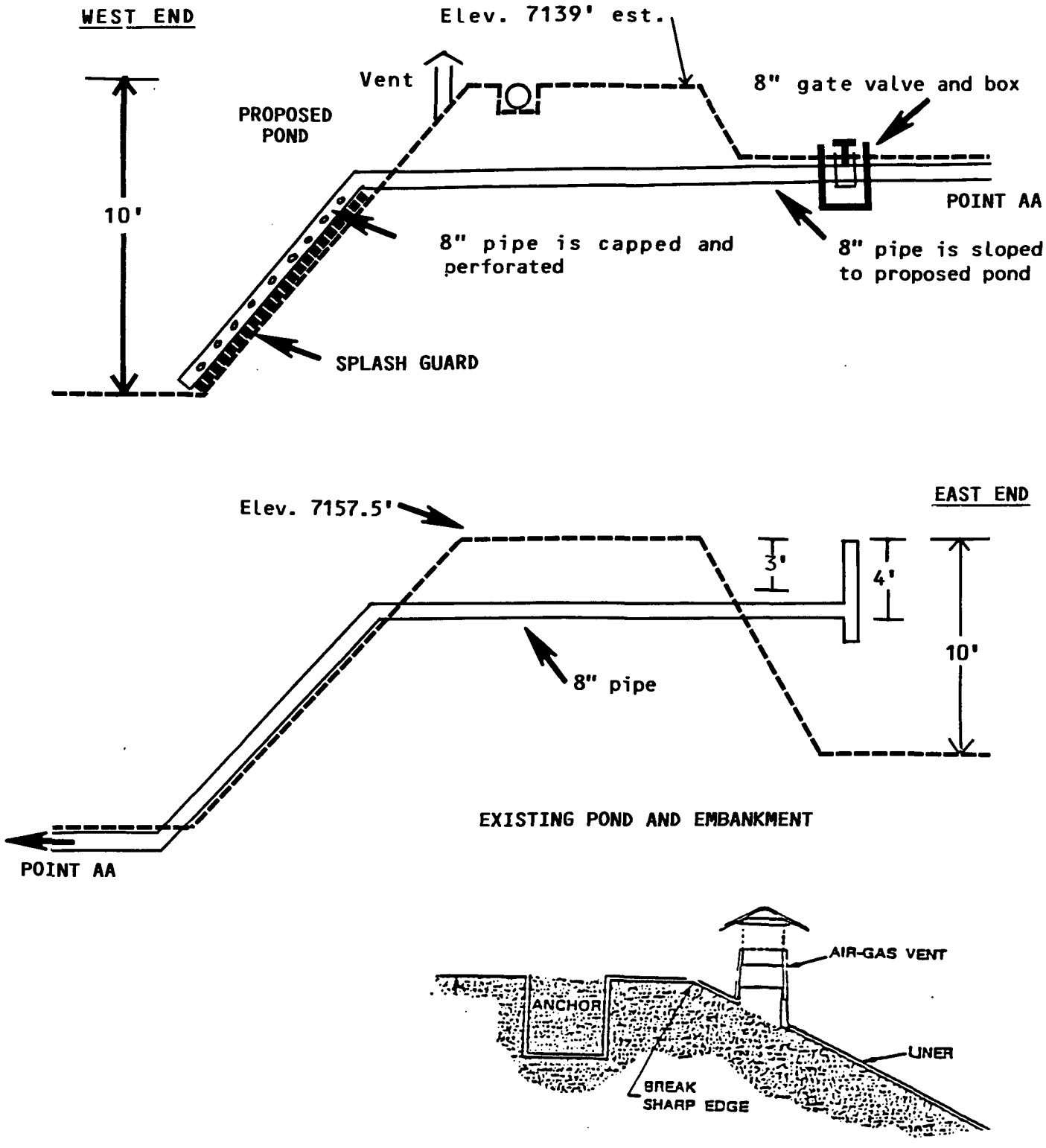


Figure 3. Cross-section showing the proposed placement of a siphon (in-take) pipes, gate valve, splash guard, and perforated discharge pipe in the transfer of water from the existing pond to the east to the proposed expansion pond through an eight inch (8") transfer pipe.

AERATION SYSTEM DETAIL, N.T.S.

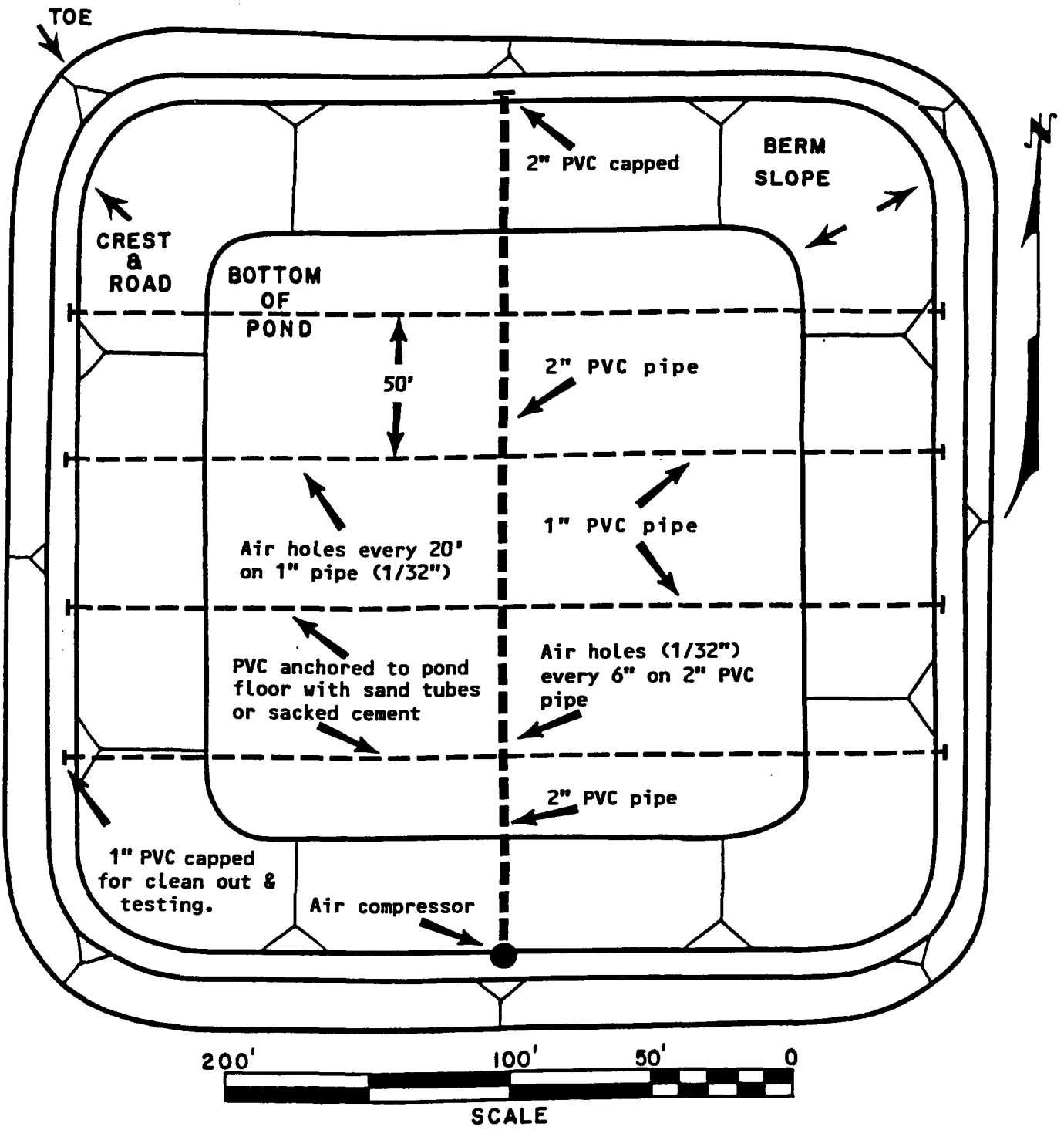


Figure 4. Aerations system showing the location and spacing of 1" laterals, 2" main pipe, slopes, perforations, and air compressor.

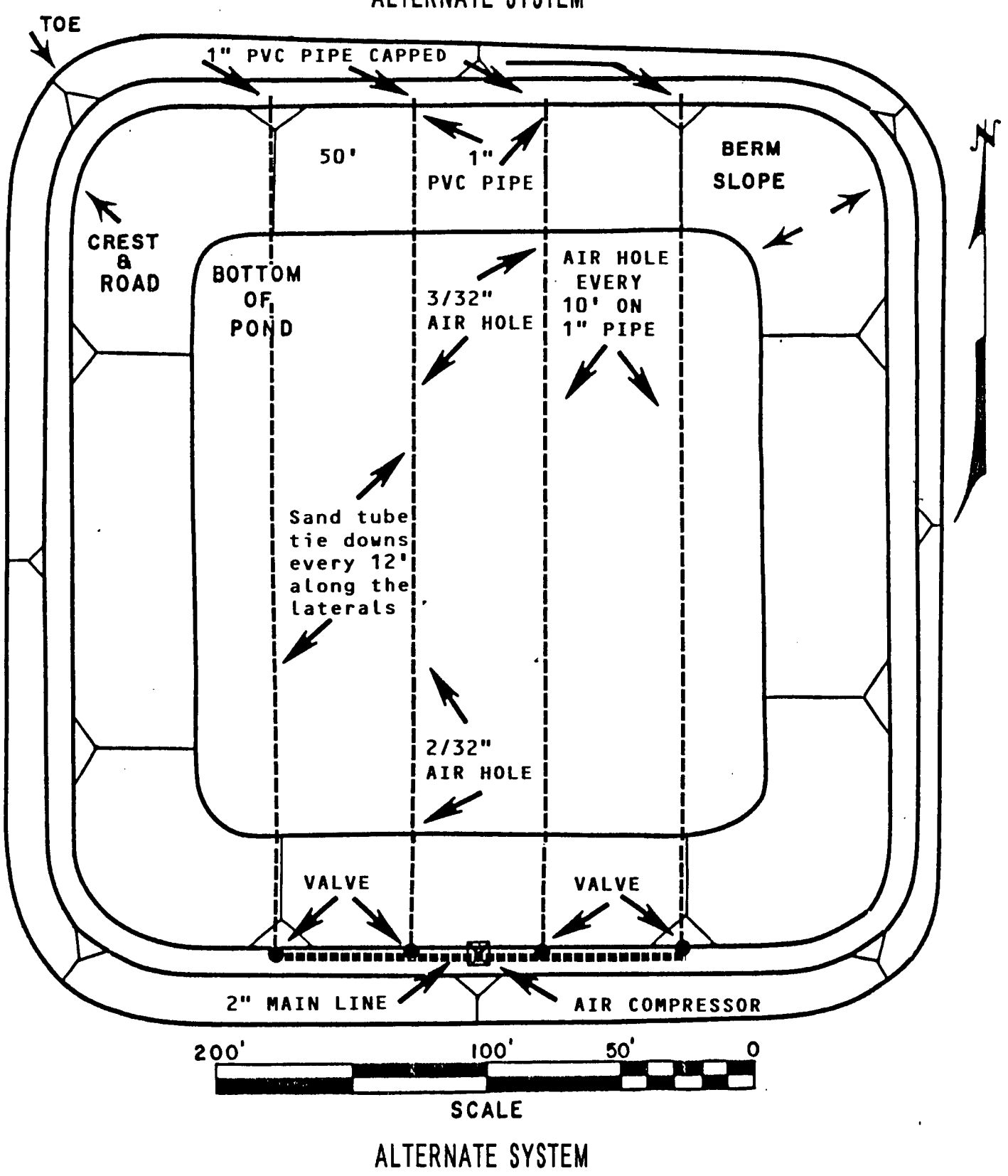


Figure 4a. Aerations system showing the location and spacing of 1" laterals, 2" main pipe, slopes, perforations, and air compressor.

LINER DETAIL, N.T.S.

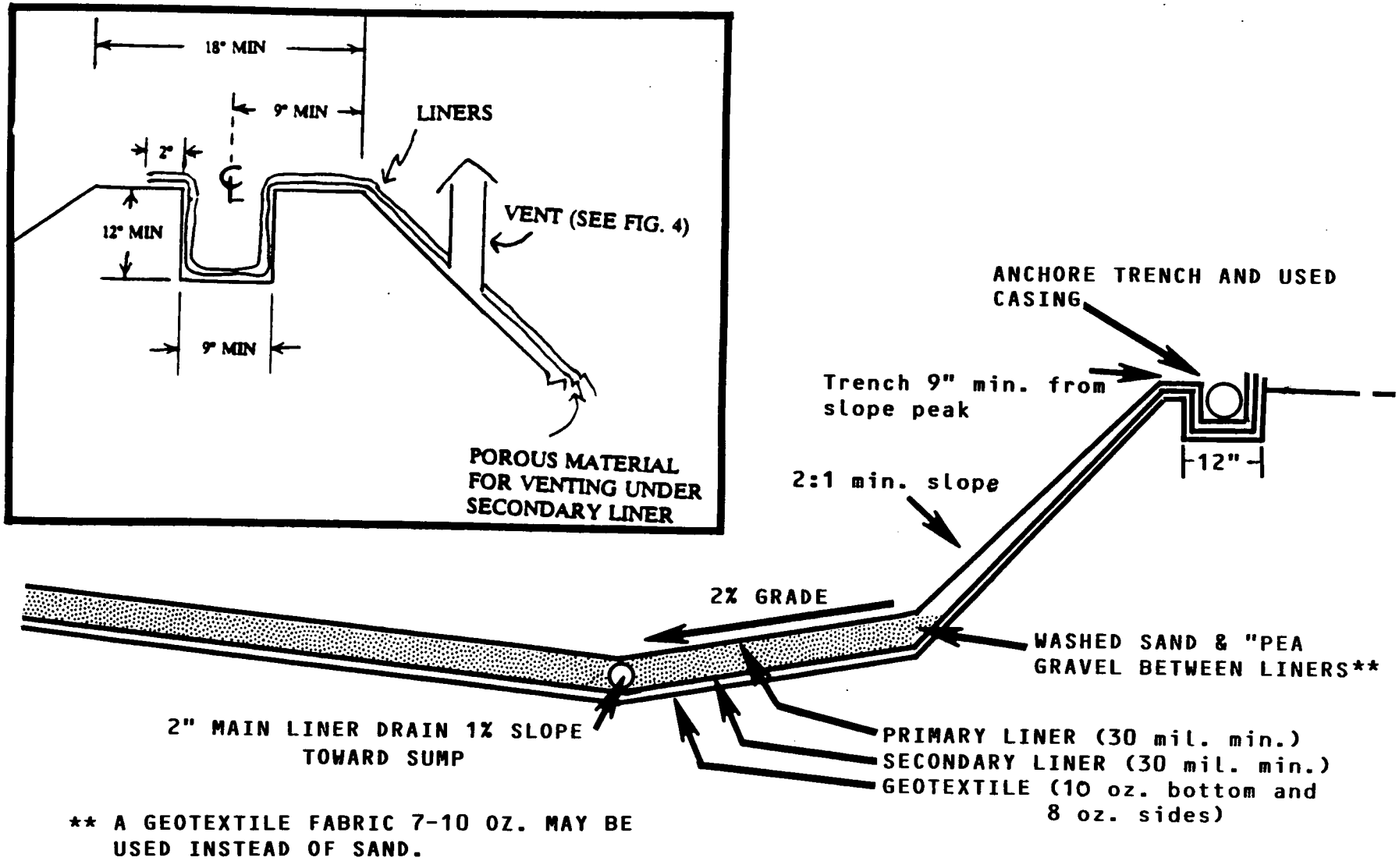


Figure 5. Cross-section of the pond bottom showing the primary and secondary liners, geotextile, sand or 'pea' gravel, and anchor trench detail.

LEAK DETECTION SYSTEM DETAIL, N.T.S.

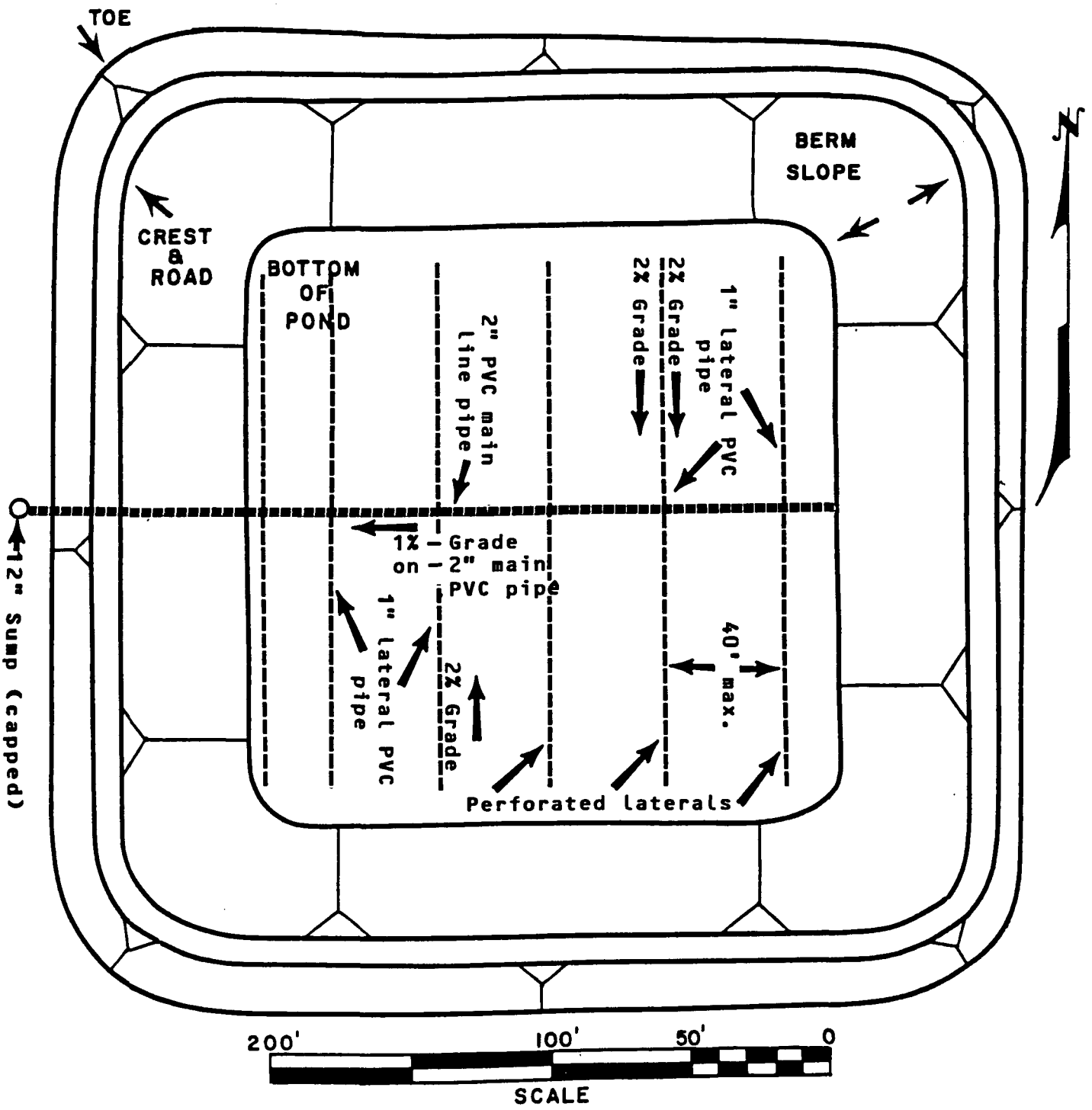


Figure 6. The leak detection system consists of a series of 1" perforated pipe draining into a 2" trunk line which drains into a sump out side of the pond. The system is located between the primary and secondary liners in a bed of sand/pea gravel.

SUMP SYSTEM DETAIL, N.T.S.

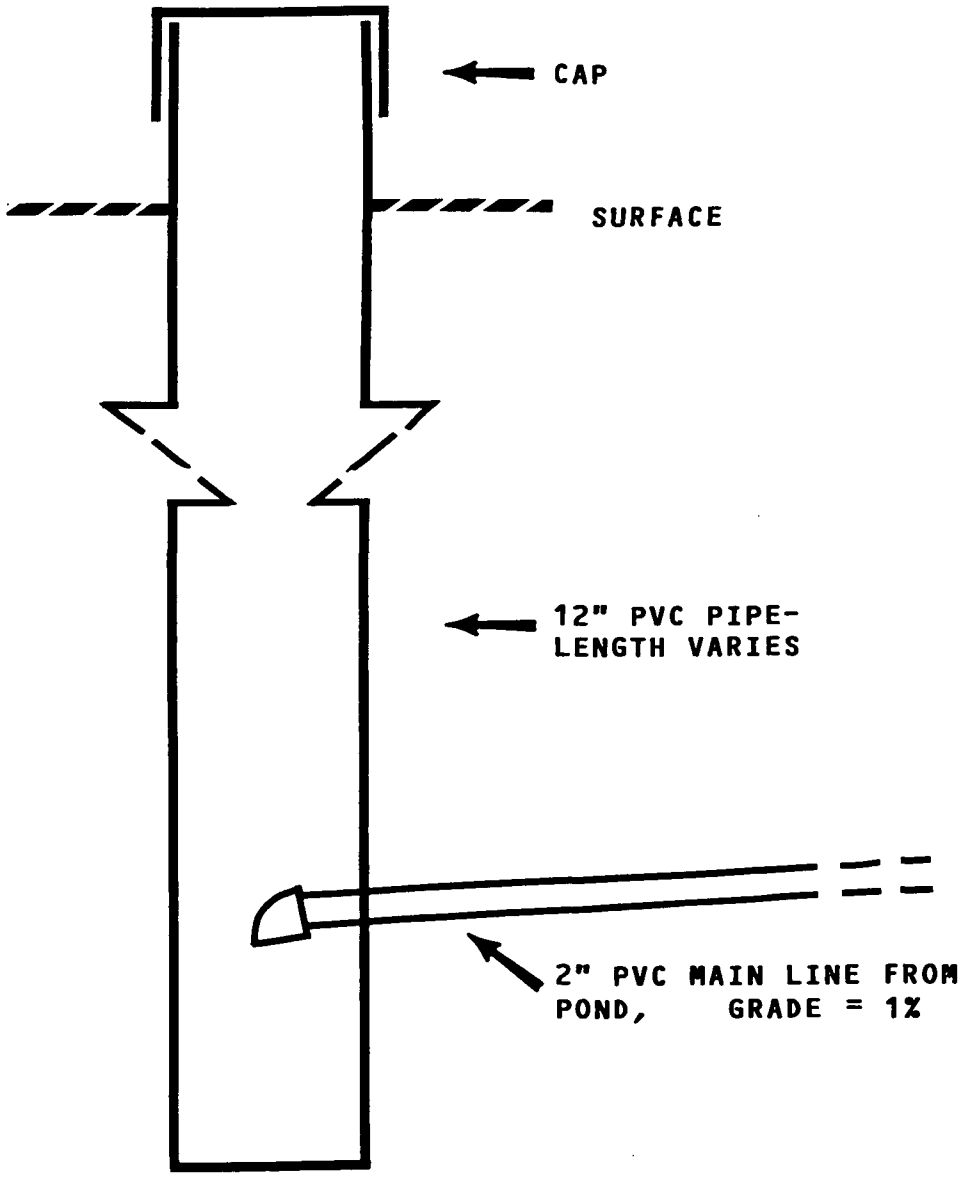


Figure 7. Sump detail showing cap, pipe size and 2" inlet of PVC pipe coming from the leak detection system within the pond bottom.

LINER BOOT, SPLASH GUARD AND LINER DETAIL, N.T.S.

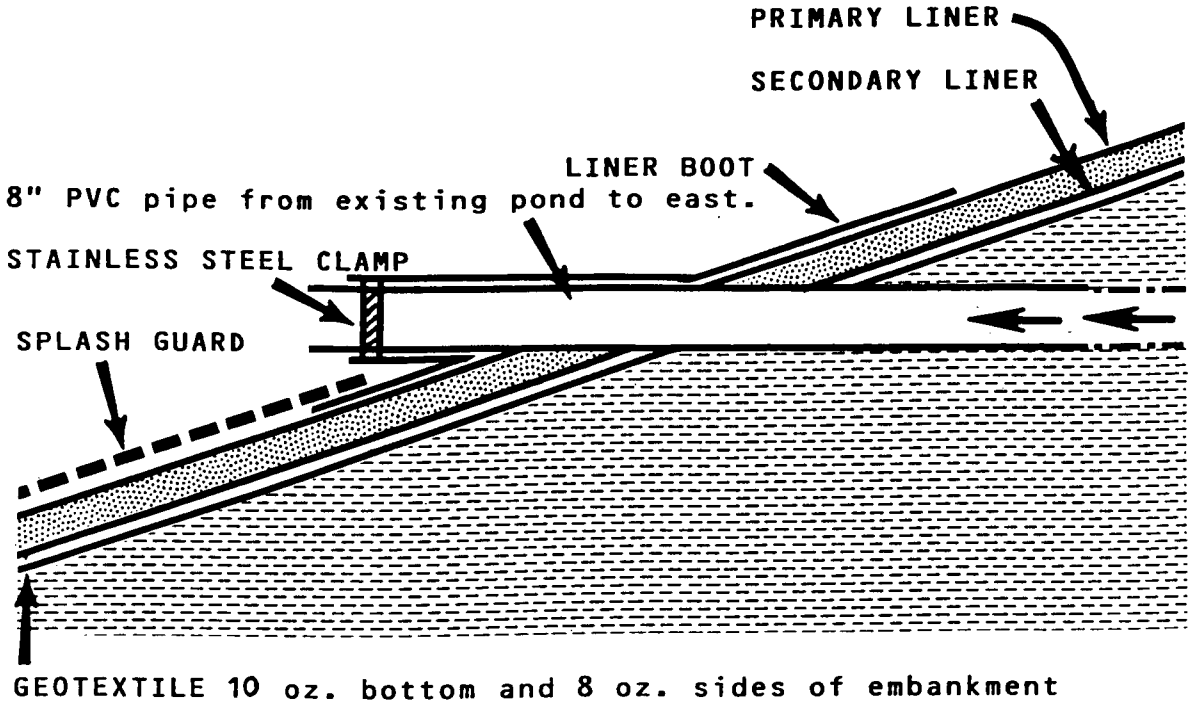


Figure 8. Cross-section of liner boot placement, if needed for discharge pipe or air vent placement.

SPRAYER SYSTEM DETAIL, N.T.S.

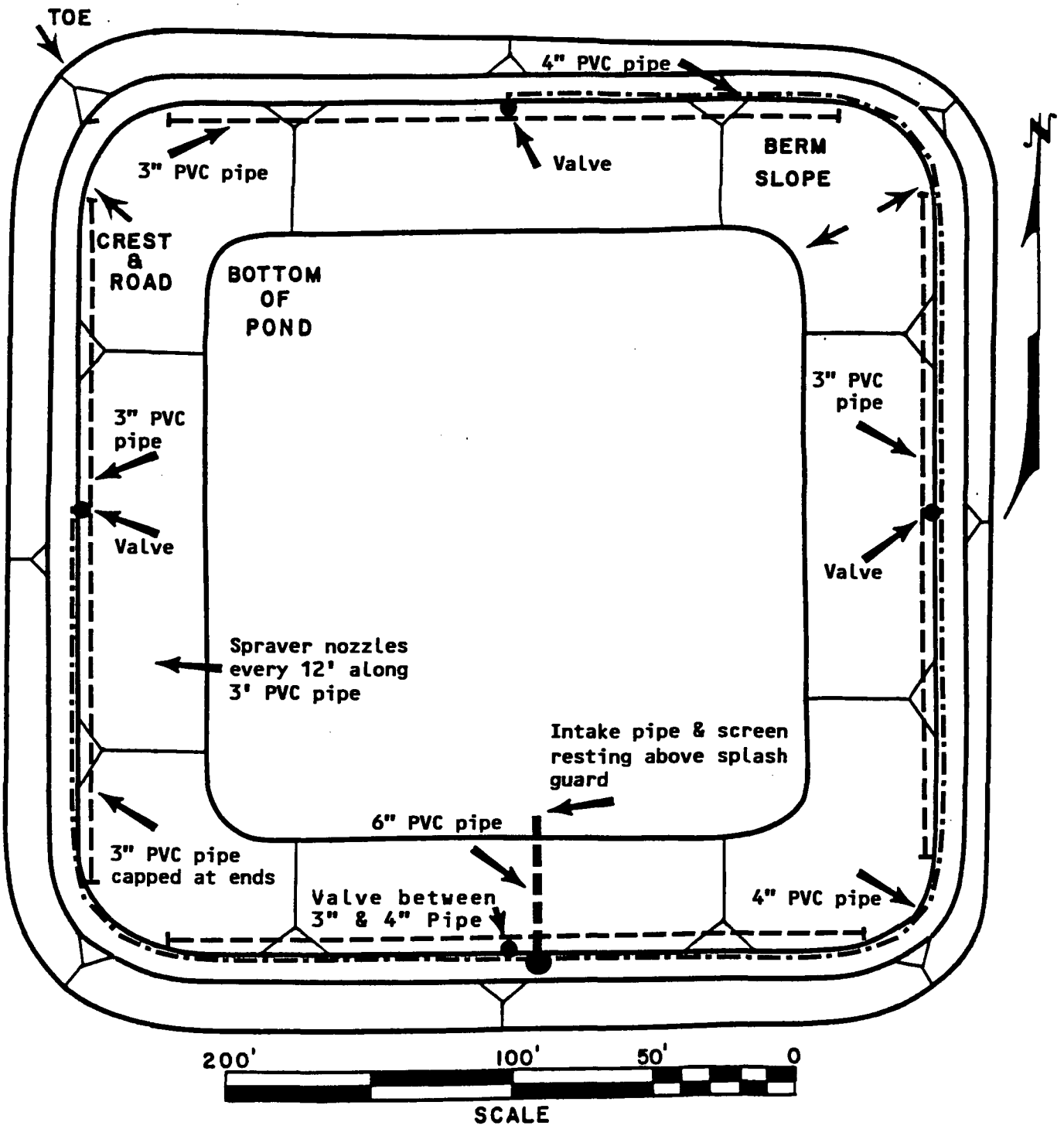


Figure 9. Sprayers are located on all four sides of the pond and are feed by a four inch PVC pipe. Pipe sizes, nozzel spacings, pump, intake pipe, and valve locations are shown in the illustration.

MONITOR AND STRATIGRAPHIC TEST WELL LOCATIONS

EAST OF THE PROPOSED POND LOCATION

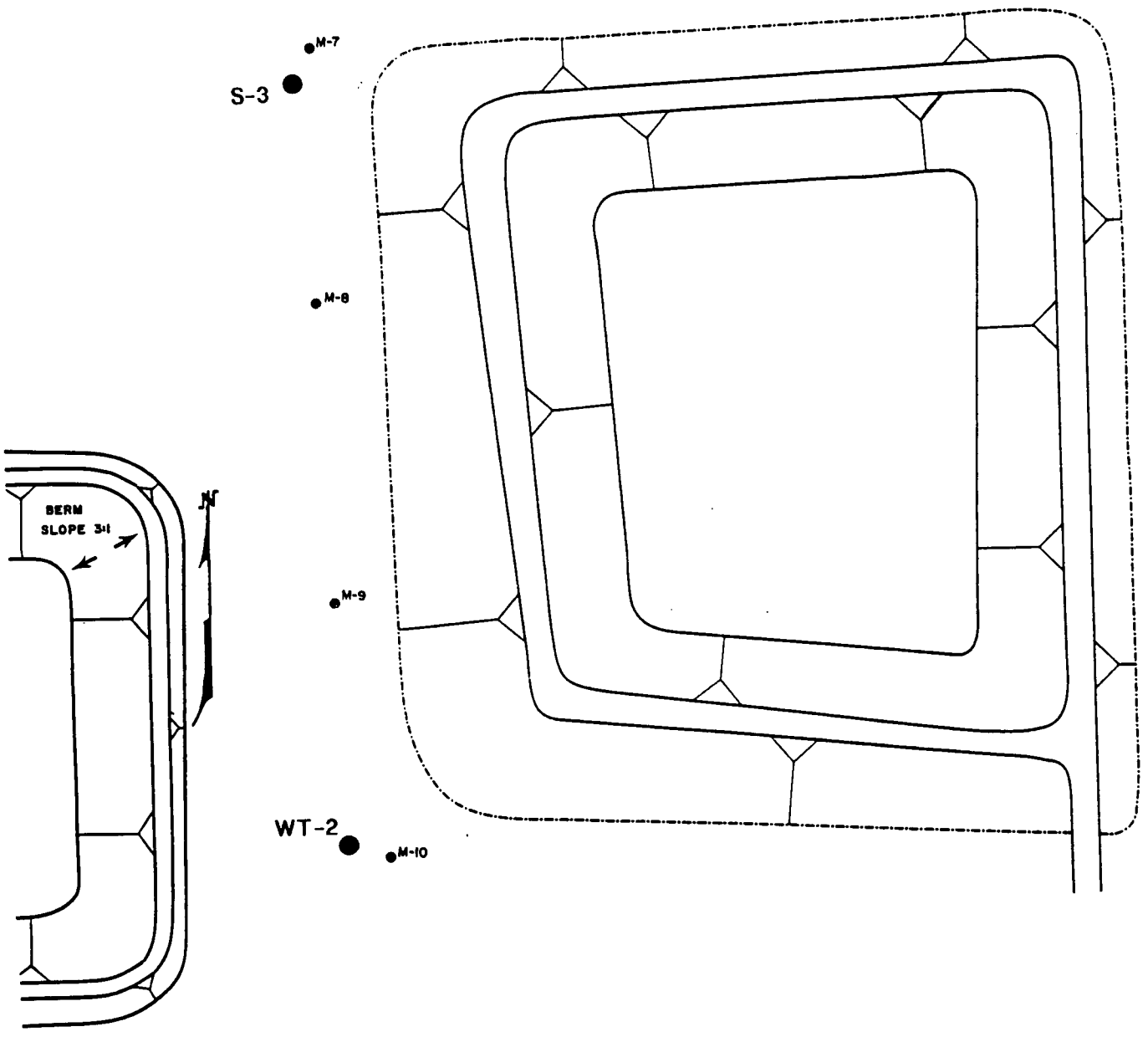


Figure 10. Map showing the monitor and stratigraphic well tests between the existing pond to the east and the proposed pond.

DRILLERS LOG

Drill Hole No.: M-7

Date Completed: 8-23-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7150.4 ft.

DEPTH (FT)	DESCRIPTION
0 - 12	**Shale:** med brown, dark red brown.
12 - 14	**Sand:** light yel brown, very fine, angular sandstone, silty throughout, dry.
14 - 21	**Shale:** med gray, no light blue-gray siltstone in this hole.
21 - 26	**Shale:** light to med red-brown, silty top foot, with some thin siltstone interbeds, sandy.
26 - 30	**Shale:** light to med red-brown, silty top foot.
30 - 38	**Shale:** med red-brown, silty at base.
TD = 38	
	Note: No moisture in any sands, hard, light blue-gray siltstone **not** observed in this drill hole.
CASING	
0 - 26	4 inch heavy wall PVC pipe, perforated from 11-14 and 21-26 feet.

Figure 11a.

DRILLERS LOG

Drill Hole No.: M-8

Date Completed: 8-24-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7146.5 ft.

DEPTH (FT)	DESCRIPTION
0 - 17	**Shale:** med brown, dark red brown.
17 - 18	**Siltstone:** light red-brown, gray-brown.
18 - 20	**Shale:** med brown-tan, no light blue-gray siltstone in this hole.
20 - 25	**Shale:** med red-brown, silty top foot.
25 - 28	**Sand:** light to med yellow-brown or tan, very silty at top.
28 - 38	**Shale:** med red-brown, silty at base.
TD = 38	
	Note: No moisture in any sands, light blue-gray siltstone **not** observed in this drill hole.
CASING	
0 - 28	4 inch heavy wall PVC pipe, perforated from 17-20 and 24-28 feet.

Figure 11b.

DRILLERS LOG

Drill Hole No.: M-9

Date Completed: 8-24-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7143.9 ft.

DEPTH (FT)	DESCRIPTION
0 - 16	**Shale:** med brown, dark red brown,a few thin siltstone interbeds (3-6 inches).
16 - 32	**Sand:** light to med yellow-brown or tan, very silty at top to med coarse at base, fine-grained, angular. typical channel sand deposit.
32 - 40	**Shale:** med red-brown.
TD = 40	
	Note: No moisture in any sands, light blue-gray siltstone **not** observed in this drill hole.
CASING	
0 - 32	4 inch heavy wall PVC pipe, perforated from 16-32 feet.

Figure 11c.

DRILLERS LOG

Drill Hole No.: M-10

Date Completed: 8-24-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7140.9 ft.

DEPTH (FT)	DESCRIPTION
0 - 18	**Shale:** med brown, dark red brown,a few thin siltstone interbeds (3-6 inches)near base.
18 - 24	**Shale:** med brown-tan, dark red brown,a few thin siltstone and sand interbeds (3-6 inches)near base.
24 - 29	**Shale-Sand:** med brown-tan, dark red brown shale, sands are yellow brown, fine to coarse-grained, sand interbeds (3-6 inches)near base.
29 - 33	**Sand:** light to med yellow-brown or tan, coarse-grained at base, fine-grained, angular, typical channel sand.
33 - 39	**Shale:** med red-brown.
TD = 39	
	Note: No moisture in any sands, light blue-gray siltstone **not** observed in this drill hole.
CASING	
0 - 32	4 inch heavy wall PVC pipe, perforated from 23-33 feet.

Figure 11d.

DRILLERS LOG

Datum: Assumed elevation of NE corner of proposed pit is 60.3 feet.

WELL NO. S-3
ELEVATION: 54.5 FEET
DATE COMPLETED: 7-5-88
LOCATION: 25 FEET WEST OF NW CORNER OF PROPOSED PIT.
No water encountered in well (AIR DRILLED).

Depth in Feet	Description
0-18	Claystone/Shale; verigated light-med. rdbn, silty at 7-8 feet.
18-24	Shale; verigated light-med. rdbn.
24-29	Shale, verigated light-med. rdbn, several hard (1"-3") siltstone stringers at 24-25 feet.
29-33	Shale/Siltstone; rdbn to tan, 29-30 feet 5% sand, angular, fine-grained.
33-40	Shale; med. rdbn, silty at 38 feet.
40-41	Siltstone; tan-med. rdbn.

Figure 11e.

WELL NO. WT-2
ELEVATION: 46 FEET
DATE OF COMPLETION: 3/30/88
LOCATION: 250 FEET WEST AND 25 FEET NORTH OF WELL NO. S-1.
No water encountered in the well (AIR DRILLED).

Depth in Feet	Description
0-25	Claystone; verigated rdbn, some thin sandy layers.

Figure 11f.

FAR WEST RESOURCES, INC.

P.O. BOX 1461 • FARMINGTON, NM 87499
(505) 325-8100

May 23, 1994

Certified Mail
Return Receipt Requested

John C. Huffman
1520 Zuni Drive
Farmington, NM 87401

Dear Mr. Huffman:

Rule 711, paragraph A.2 of the New Mexico Oil Conservation Division's Rules and Regulations, requires notification of all landowners of record within one-half mile of any proposed water disposal/evaporation site or the expansion/addition of an existing disposal/evaporation site. As the landowner of the W 1/2 of Section 7, T25N, R3W, T-N-T Construction is hereby notifying you of our plans.

Please be advised that T-N-T Construction, Inc. proposes to enlarge its existing disposal site by constructing an additional evaporative pit west of its existing facility in the E 1/2, Section 7, T25N, R3W, Rio Arriba County, New Mexico. Operation of this facility and the proposed evaporation pit will be by T-N-T Construction, Inc. (Tony L. Schmitz, President).

The proposed lined evaporation pond will be constructed in accordance with all applicable State of New Mexico Oil Conservation Division Rules and Regulations. The Oil Conservation Division (OCD) will review and approve all plans and specifications of the proposed expansion of the existing facility to insure protection of the environment

If you have any questions regarding the present operation or the proposed expansion please contact Tony L. Schmitz, T-N-T Construction HCR 74 - Box 115 Lindrith, NM 87029 (505) 774-6663 or 774-6551. You may also contact the NMOCD in Santa Fe, NM P.O. Box 2088, Santa Fe, NM 87504, (505)827-5800 regarding the regulatory process or general information.

Sincerely,

James W. Gurney

James W. Gurney
Geologist 325-8181 or 325-8100
for T-N-T Construction, Inc.
HCR 74 - Box 115
Lindrith, NM 87029

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

John C. Huffman
1520 Zuni Drive
Farmington, NM 87401

4a. Article Number
p 144 971 809

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
5-28-94

5. Signature (Addressee)

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, December 1991 ☆U.S. GPO: 1992—323-402 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

GEOTECHNICAL SERVICES FOR:

Evaporation Pond
Lindrith, New Mexico
WT No. 3121K072

Lawrence E Cyrova

9-3-91

Submitted to:

TNT Construction, Inc.
Star Route
Lindrith, New Mexico 87029

Attention: Mr. Craig Schmitz

Invoice No. 31210129

September 3, 1991

WESTERN TECHNOLOGIES INC.
The Quality People

ARIZONA

Phoenix
P.O. Box 21387 85036
3737 East Broadway Road
Phoenix, Arizona 85040
(602) 437-3737

Mesa
952 East Baseline Road, No. 104
Mesa, Arizona 85204
(602) 926-2113

Sun City
17200 North Dysart Road, No. 13
P.O. Box 2431
Sun City, Arizona 85372
(602) 975-2154

Flagstaff
2400 East Huntington Drive
Flagstaff, Arizona 86004
(602) 774-8708

Lakeside
Route 1, Box 1030
Lakeside, Arizona 85929
(602) 368-5568

Tucson
3480 South Dodge Boulevard
Tucson, Arizona 85713
(602) 748-2262

Sierra Vista
1827 South Paseo San Luis
Sierra Vista, Arizona 85635
(602) 458-0364

Laughlin / Bullhead City
1610 Riverview Drive, No. 5
Bullhead City, Arizona 86442
(602) 758-8378

CALIFORNIA

Concord
1001 Galaxy Way, No. 107
Concord, California 94520
(415) 689-9378

Riverside
16801 Van Buren Boulevard, Suite A
Riverside, California 92504
(714) 780-7482

COLORADO

Golden
13949 West Colfax Avenue, No. 140
Golden, Colorado 80401
(303) 233-2991

NEVADA

Las Vegas
3611 West Tompkins Avenue
Las Vegas, Nevada 89103
(702) 798-8050

Environmental Services
4085 Nevso Drive, Suite G
Las Vegas, Nevada 89103
(702) 252-0580

NEW MEXICO

Albuquerque
8305 Washington Place, N.E.
Albuquerque, New Mexico 87113
(505) 823-4488

Farmington
400 South Lorena Avenue
Farmington, New Mexico 87401
(505) 327-4966

WESTERN TECHNOLOGIES INC.

400 South Lorena Avenue
Farmington, New Mexico 87401
(505) 327-4966 • fax 327-5293

TNT Construction, Inc.
Star Route
Lindrith, New Mexico 87029

September 3, 1991

Attn: Mr. Craig Schmitz

Re: Evaporation Pond
Lindrith, New Mexico

Job No. 3121K072
Inv. No. 31210129

Our geotechnical engineering report for the existing evaporation pond is attached. The work was performed in accordance with our proposal of July 16, 1991.

Soils at the site generally consisted of sandy clay with low to moderate load bearing capabilities. The surface soils are underlain by sandstone with moderate to high load bearing capabilities. The sandy clays were used for construction of an existing evaporation pond which uses a synthetic liner to minimize infiltration of water into the sandstone.

We are prepared to review your plans and specifications for consistency with the recommendations, and to provide the construction observation and testing recommended.

Sincerely,
WESTERN TECHNOLOGIES INC.
Geotechnical Engineering Services

Lawrence E. Cynova

Lawrence E. Cynova, P.E.

9-3-91

Copies to: Addressee (3)
Bob Stannard (1)

/cb

TNT Construction, Inc.
Job No. 3121K072

TABLE OF CONTENTS

Geotechnical Engineering Evaluation
Evaporation Pond
Lindrith, New Mexico

INTRODUCTION

This report contains the results of our geotechnical engineering evaluation of the existing Evaporation Pond which is located northwest of Lindrith, New Mexico. The purpose of these services is to provide results of field and laboratory testing, to evaluate the existing pond dikes, and to provide engineering recommendations for the pond liners.

PROPOSED CONSTRUCTION

The evaporation pond will have primary and secondary synthetic liners with a fabric or geonet located between the liners to transmit water to the leak detection system.

SITE CONDITIONS

At the time of our exploration, the pond was empty except for several inches of rain water in the bottom. This water was in the process of being pumped out at the time of exploration. The pond has bottom plan dimensions of 175 by 180 feet. The pond has top of dike dimensions of 300 by 320 feet, the top of dike width is approximately 10 to 15 feet. The pond has a storage capacity of 13.5 acre feet of water. The maximum height of the dike is 14 feet. The maximum depth of the water in the pond will be approximately 10 feet. Another evaporation pond which is in operation is located approximately 500 feet northwest of this pond.

SCOPE OF SERVICES

Three borings were drilled to depths of 18 to 26 feet at the locations shown on the site plan. During exploration, subsoils were visually examined and sampled at selected intervals.

The following tests were performed on selected soil samples:

- Water content
- Dry density

The following tests were taken from our previous soils report dated May 2, 1988, Job No. 3128J024 for the nearby pond:

- Shear strength
- Gradation
- Plasticity Index
- Permeability
- ASTM D698 proctor

Test results were used in the evaluation of this pond and earthwork recommendations.

Western Technologies Inc. performed the services described in this report to develop engineering information for the purposes defined in the "Introduction." We did not intend to uncover nor identify any contaminated subsurface materials that may contain hazardous or flammable substances. Identification of such substances requires specialized exploration techniques and analyses which were not used in this investigation.

INTERPRETATION OF SUBSURFACE CONDITIONS

Subsurface Exploration: Three test borings were drilled on top of the dikes. As presented on Logs of Borings, surface fill soils to depths of 5 to 6 feet in all test borings were found to be sandy clay of firm to stiff consistency and low to medium plasticity. The near surface soils to depths of 15 to 26 feet in all test borings consisted of sandy clay of stiff consistency and low to medium plasticity. The materials underlying the near surface soils in test borings 1 and 3 and extending to the full depth of exploration consisted of sandstone.

Groundwater levels were checked at the completion of the field exploration, no water was encountered. A more accurate evaluation of groundwater conditions would require installing and monitoring piezometers over an extended time period.

Geology: The proposed water evaporation pond is to be located in unconsolidated surficial clay material derived from the local topography. This material was deposited as alluvium washed down from the surrounding foothills and probably originated as a shale from the San Jose Formation. This formation is Eocene in age and is described as a buff, fine to coarse grained arkosic sandstone, conglomeratic sandstone and interbedded gray and red shale which makes up a large percentage of the San Juan Basin. In the northern part of the basin, this formation contains some volcanic debris, including andesite pebbles, but the proportion of volcanic debris and sandstone decreases southward.

ANALYSIS PROCEDURES

General: We understand that the evaporation pond will store water throughout the year. The pond will be filled with water

from oil and gas production. The water will be evaporated by spraying the water into the air. Observations indicate that all the soils exposed on the dikes are probably clay, although sandstone may exist near the bottom of the pond even though it was not observed due to the ponded rainwater. It is understood that a synthetic flexible membrane liner will be used for both primary and secondary liners. The west dike and the east dike, which are the highest dikes, were chosen for stability analysis.

Material Properties: The on-site clay materials exhibit properties of low to moderate cohesion and low to moderate angles of internal friction in both compacted and undisturbed conditions. These materials are underlain by sandstone at a moderate depth. The sandstone materials are much stronger in the undisturbed state than the embankment fill or native clay. Based upon our observations, the results of laboratory testing, and our experience with similar materials, the following material properties were used for analysis of the embankment and foundation soils:

Compacted Clay
Dry unit weight - 112 pcf
Angle of internal friction - 12°
Cohesion - 300 pcf

Undisturbed Clay
Dry unit weight - 110 pcf
Angle of internal friction - 16°
Cohesion - 600 psf

Assumed conservative sandstone foundation material properties are as follows:

Sandstone
Dry unit weight - 140 pcf
Angle of internal friction - 30°
Cohesion - 2500 psf

Slope Stability Analysis: The static stability of the highest embankment slopes were analyzed using strength parameters obtained from laboratory and field testing. A computer program (SB-SLOPE Program developed by Digital Research Inc.) using simplified Bishop's analysis was utilized for analysis of both the upstream and downstream slopes for the indicated embankment configurations.

The following table presents the results of the analysis:

EAST DIKE

Condition	Slope	Factor of Safety
Steady state seepage	Downstream	
Static	3.4:1	3.2
Rapid drawdown	Upstream	
Static	5.5:1	4.8

WEST DIKE

Condition	Slope	Factor of Safety
Steady state seepage	Downstream	
Static	4.2:1	8.3
Rapid drawdown	Upstream	
Static	6.8:1	6.9

A minimum factor of safety of 1.5 is recommended for both the steady state and rapid drawdown conditions in the Design of Dams, by the New Mexico State Engineer's Office.

After reviewing the Deformation Analyses - Embankment Dams section of the "Procedure on Design Criteria and Safety of Dams", considerations, we believe that seismic analysis is not necessary. This is due to the fact that the embankment and foundation materials are not subject to liquification. The dikes are densely compacted, the slopes will be 3 horizontal to 1 vertical or flatter and the static factor of safety is greater than 1.5 in all cases.

The pond will have primary and secondary liners consisting of synthetic flexible membrane materials with a fabric geonet located between the liners. If a rip occurs in a seam or a hole develops in the liner, the low permeability of the clay would require a considerable period of time for the water to seep far beyond the pond. It is understood the pond will be equipped with a leak detection system located between the two liners.

DISCUSSION AND RECOMMENDATIONS:

General: We anticipate that the existing clay soils will be compacted below the secondary liner. The in-place densities obtained during exploration indicate that the fill was originally compacted to a density higher than 95 percent of maximum density. The pond liner may be satisfactorily supported upon prepared subgrade. If subsoil conditions other than those identified during the field explorations are encountered during construction or should design plans change, this firm should be contacted for supplemental review and recommendations.

The following general conclusions and recommendations are presented:

1. Native and fill soils below levels of surface soil disturbance are generally of moderate densities and will afford support for the anticipated liners. Stable conditions should be verified at the time of construction by proof rolling with a heavily loaded dump truck or scraper.

2. Excavation of the design pond base should be possible with conventional earthmoving equipment, unless sandstone is encountered, then large equipment or blasting may be required.

Synthetic Liner: Several types of synthetic liner systems, which include reinforced PVC or other plastic membranes placed on a prepared subgrade, may be used. Plastic liners vary from 10 to 120 mills in thickness with varying chemical compositions. If construction or maintenance traffic is anticipated within the liner area, a soil blanket may be used above and below the membrane for protection. In addition, a protective soil cover on the membrane may be required due to high winds experienced during storms or spring weather or should the pond be empty. Prior to placement of the bottom liner, the subgrade should be prepared as recommended in "Site Preparation and Earthwork." The protective soil cover placed below the membrane, requirements for a subdrain system and the maximum slope on which the liner is placed should meet the requirements of the liner manufacturer. It is understood there will be a leak detection system between the two liners.

Site Preparation and Earthwork: The following procedure is recommended for site preparation and earthwork for the bottom liner portions of the evaporation pond.

1. Strip all loose surface soils, vegetation, roots and debris from the pond and liner area to a horizontal distance of 5 feet beyond the perimeter of the new construction.

2. Clean and widen depressions, swales, etc., to form level working areas to accomodate compaction equipment and liner placement.

3. No material should be placed which is frozen or where the in-place material is frozen.

4. Proof-roll the exposed subgrade in the embankment and pond liner areas with a heavy piece of construction equipment to densify materials which may have been loosened during the stripping and excavation process.

   Proof-rolling may be accomplished by a minimum of 2 passes of a heavily loaded scraper, dump truck or equivalent. All soft areas should be removed and replaced with compacted fill.

5. Place and compact all fill in the bottom or the sides of the pond in horizontal lifts to the finished grade levels. Lift thicknesses should be compatible with compaction equipment used to achieve the required uniform densities.

6. All subgrade preparation, liner fill placement and compaction should be accomplished under observation and testing to assess compliance with project specifications.

All material under the liner should be compacted to at least 95% of the maximum dry density as determined by ASTM: D-698 methods or the manufacturer's compaction specifications, if higher, and at a water content of 1 percent below optimum to 3 percent above optimum.

Drainage: Positive drainage should be provided around the proposed pond during construction and maintained throughout the life of the proposed development.
Borrow excavation, surface stripping, subgrade preparation, and liner preparation and placement should be accomplished under the observation and testing directed by a soils engineer to assess compliance with recommendations.

Corrosion: We recommend a Type II portland cement be used for all concrete on and below grade.

CLOSURE

Our conclusions and recommendation are predicated on observation and testing of the earthwork and foundation preparations directed by a geotechnical engineer. It would be logical for Western Technologies to provide these services since we are most qualified to determine consistency of field conditions with those data used in our analyses.

Deviations from our recommendations by the plans, written specifications, or field applications shall relieve us of responsibility unless our written concurrence with such deviations has been obtained.

DEFINITION OF TERMINOLOGY

ALLOWABLE SOIL BEARING CAPACITY ALLOWABLE FOUNDATION PRESSURE	The recommended maximum contact stress developed at the interface of the foundation element and the supporting material.
BACKFILL	A specified material placed and compacted in a confined area.
BASE COURSE	A layer of specified material placed on a subgrade or subbase.
BASE COURSE GRADE	Top of base course.
BENCH	A horizontal surface in a sloped deposit.
CAISSON	A concrete foundation element cast in a circular excavation which may have an enlarged base. Sometimes referred to as a cast-in-place pier.
CONCRETE SLABS-ON-GRADE	A concrete surface layer cast directly upon a base, subbase or subgrade.
CRUSHED ROCK BASE COURSE	A base course composed of crushed rock of a specified gradation.
DIFFERENTIAL SETTLEMENT	Unequal settlement between or within foundation elements of a structure.
ENGINEERED FILL	Specified material placed and compacted to specified density and/or moisture conditions under observation of a representative of a soil engineer.
EXISTING FILL	Materials deposited through the action of man prior to exploration of the site.
EXISTING GRADE	The ground surface at the time of field exploration.
EXPANSIVE POTENTIAL	The potential of a soil to expand (increase in volume) due to the absorption of moisture.
FILL	Materials deposited by the action of man.
FINISHED GRADE	The final grade created as a part of the project.
GRAVEL BASE COURSE	A base course composed of naturally occurring gravel with a specified gradation.
HEAVE	Upward movement.
NATIVE GRADE	The naturally occurring ground surface.
NATIVE SOIL	Naturally occurring on-site soil.
ROCK	A natural aggregate of mineral grains connected by strong and permanent cohesive forces. Usually requires drilling, wedging, blasting or other methods of extraordinary force for excavation.
SAND AND GRAVEL BASE	A base course of sand and gravel of a specified gradation.
SAND BASE COURSE	A base course composed primarily of sand of a specified gradation.
SCARIFY	To mechanically loosen soil or break down existing soil structure.
SETTLEMENT	Downward movement.
SOIL	Any unconsolidated material composed of discrete solid particles, derived from the physical and/or chemical disintegration of vegetable or mineral matter, which can be separated by gentle mechanical means such as agitation in water.
STRIP	To remove from present location.
SUBBASE	A layer of specified material placed to form a layer between the subgrade and base course.
SUBBASE GRADE	Top of subbase.
SUBGRADE	Prepared native soil surface.

METHOD OF SOIL CLASSIFICATION
(ASTM D 2487)

COARSE-GRAINED SOILS

LESS THAN 50% FINES*

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
GW	WELL-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LESS THAN 5% FINES	GRAVELS More than half of coarse fraction is larger than No. 4 sieve size
GP	POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LESS THAN 5% FINES	
GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, MORE THAN 12% FINES	
GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, MORE THAN 12% FINES	
SW	WELL-GRADED SANDS OR GRAVELLY SANDS, LESS THAN 5% FINES	SANDS More than half of coarse fraction is smaller than No. 4 sieve size
SP	POORLY-GRADED SANDS OR GRAVELLY SANDS, LESS THAN 5% FINES	
SM	SILTY SANDS, SAND-SILT MIXTURES, MORE THAN 12% FINES	
SC	CLAYEY SANDS, SAND-CLAY MIXTURES, MORE THAN 12% FINES	

NOTE:
Coarse-grained soils receive dual symbols if they contain 5 to 12% fines (e.g. SW-SM, GP-GC, etc.)

FINE-GRAINED SOILS

MORE THAN 50% FINES*

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS	SILTS AND CLAYS Liquid limit less than 50
CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
OL	ORGANIC SILTS OR ORGANIC SILTY-CLAYS OF LOW PLASTICITY	
MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDS OR SILTS, ELASTIC SILTS	SILTS AND CLAYS Liquid limit more than 50
CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY	
PT	PEAT, MUCK, AND OTHER HIGHLY ORGANIC SOILS	HIGHLY ORGANIC SOILS

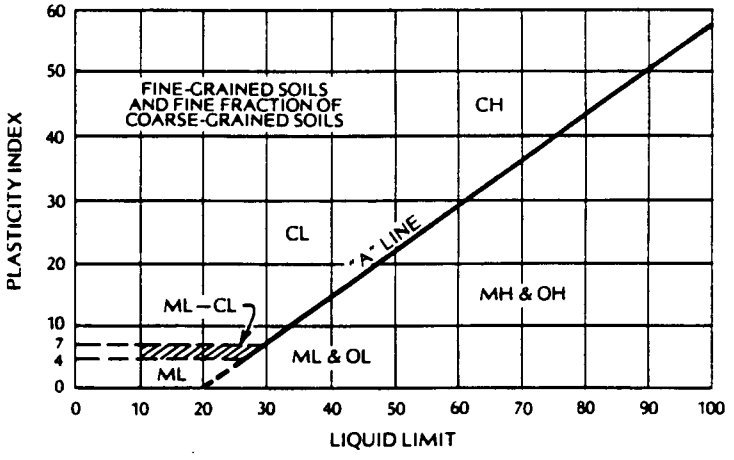
NOTE:
Fine-grained soils receive dual symbols if their limits plot in the hatched zone on the Plasticity Chart (ML-CL)

SOIL SIZES

COMPONENT	SIZE RANGE
BOULDERS	ABOVE 12 in.
COBBLES	3 in. to 12 in.
GRAVEL	No. 4 to 3 in.
Coarse	¾ in. to 3 in.
Fine	No. 4 to ¾ in.
SAND	No. 200 to No 4
Coarse	No. 10 to No. 4
Medium	No. 40 to No. 10
Fine	No. 200 to No. 40
*FINES (Silt or Clay)	BELOW No. 200

NOTE:
Only sizes smaller than three inches are used to classify soils.

PLASTICITY CHART



BORING LOG NOTES

The number shown in "LOG OF BORING NO." refers to the approximate location of the same number indicated on the "Site Plan" as positioned in the field by pacing from property lines and/or existing features.

"ELEVATION" refers to ground surface elevation at the boring location relative to the indicated "DATUM" established by interpolation from contours on the "Site Plan".

"TYPE/SIZE BORING" refers to the exploratory equipment used in the boring where HSA = hollow-stem auger.

"N" in "Blows/Foot" refers to the number of blows of a 140-pound weight, dropped 30 inches, required to advance a two-inch-outside-diameter split-barrel sampler a distance of 1 foot, Standard Penetration Test (ASTM D1586). Refusal to penetration is defined as more than 100 blows per foot.

"R" in "Blows/Foot" refers to the number of blows of a 140-pound weight, dropped 30 inches, required to advance a 2.42-inch-inside-diameter ring sampler a distance of 1 foot. Refusal to penetration is considered more than 50 blows per foot.

"Sample Type" refers to the form of sample recovery, in which N = Split-barrel sample and R = Ring sample.

"Dry Density, pcf" refers to the laboratory-determined dry density in pounds per cubic foot.

"Water Content, %" refers to the laboratory-determined moisture content in percent (ASTM D2216).

"Unified Classification" refers to the soil type as defined by "Method of Soil Classification". The soils were classified visually in the field and, where appropriate, classifications were modified by visual examination of samples in the laboratory and/or by appropriate tests.

These notes and boring logs are intended for use in conjunction with the purposes of our services defined in the text. Boring log data should not be construed as part of the construction plans nor as defining construction conditions.

Boring logs depict our interpretations of subsurface conditions at the locations and on the date(s) noted. Variations in subsurface conditions and soil characteristics may occur between borings. Groundwater levels may fluctuate due to seasonal variations and other factors.

In general, terms and symbols on the boring logs conform with "Standard Definitions of Terms and Symbols Relating to Soil and Rock Mechanics" (ASTM D653).

LOG OF BORING NO. 1

Project Evaporation Pond — Job No. 3121K072

Elevation 7154' — Datum Project Contour Drawing

Type/Size Boring 7" Auger — Rig Type CME-55

Groundwater Conditions No groundwater encountered on 07/24/91 — Date 07/24/91

Depth, feet	Blows, Foot C	Blows, Foot N/R	Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
					PL	CL	FILL 0 to 5.5 feet. SANDY CLAY; red to brown, firm to stiff. Trace of small gravel.
					<PL		
		28	R	115	14.3		
		11	N				
5							
					SL-PL	CL	SANDY CLAY; red to brown, stiff. Trace of coarse grained sand. Moisture content increases from 16 to 19 feet. Firm to stiff 16 to 19 feet.
		48	R	120	12.0		
		18	N				
10							
		16	N				
15							
					PL		
		34	R	109	17.6		
20					<PL		
		50/2"	N		SLT. DAMP to DAMP		SANDSTONE; gray, moderately hard. Light cementation.
25							
							Stopped at 25 feet.
30							

LOG OF BORING NO. 2

Project Evaporation Pond — Job No. 3121K072

Elevation 7154' — Datum Project Contour Drawing

Type/Size Boring 7" Auger — Rig Type CME-55

Groundwater Conditions No groundwater encountered on 07/24/91 — Date 07/24/91

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
					PL	CL	FILL 0 to 6 feet. SANDY CLAY; red to brown, firm to stiff. Trace of gravel.
			G				
		20	R	114	16.1		
5			N				
					PL	CL	SANDY CLAY; red to brown, stiff.
		33	R	110	18.1		
10		12	N				
15		50/5"	N				
		50/4"	N				
20							
		50/4"	N				
25							
							Auger refusal at 26 feet.
30							

LOG OF BORING NO. 3

Project Evaporation Pond — Job No. 3121K072

Elevation 7154' — Datum Project Contour Drawing

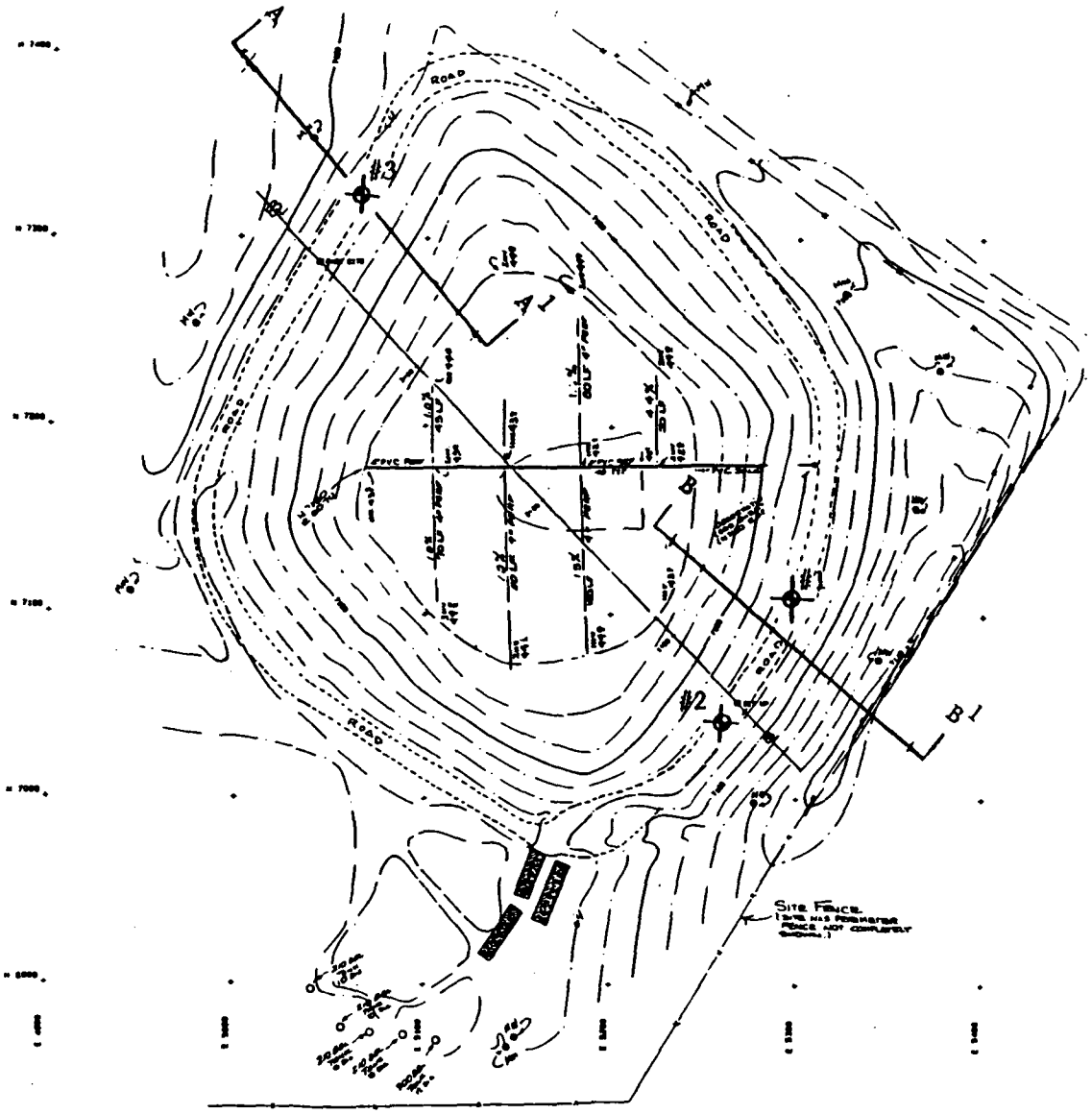
Type/Size Boring 7" Auger — Rig Type CME-55

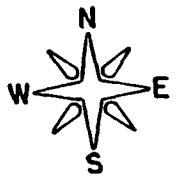
Groundwater Conditions No groundwater encountered on 07/24/91 — Date 07/24/91

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
					PL	CL	FILL 0 to 5 feet. SANDY CLAY; red to brown, firm to stiff.
					<PL		
		22	R	113	15.8		
		13	N				
5							
					<PL	CL	SANDY CLAY; red to brown, stiff.
		50/8"	R	123	9.2		
		50/3"	N				
10							
		68	N				
15							
					SLT. DAMP		SANDSTONE; gray to tan, moderately hard. Light cementation.
		50/3"	N				
20							Auger refusal at 18 feet.
25							
30							

Prepared By J.M. Boyd Date 08/28/91 Job No. 3121K072

Checked By _____ Date _____ Client TNT Construction





LEGEND

Test Boring Location

A — A1 Location of slope cross-section

Prepared By J.M. Boyd Date 08/28/91 Job No. 3121K072

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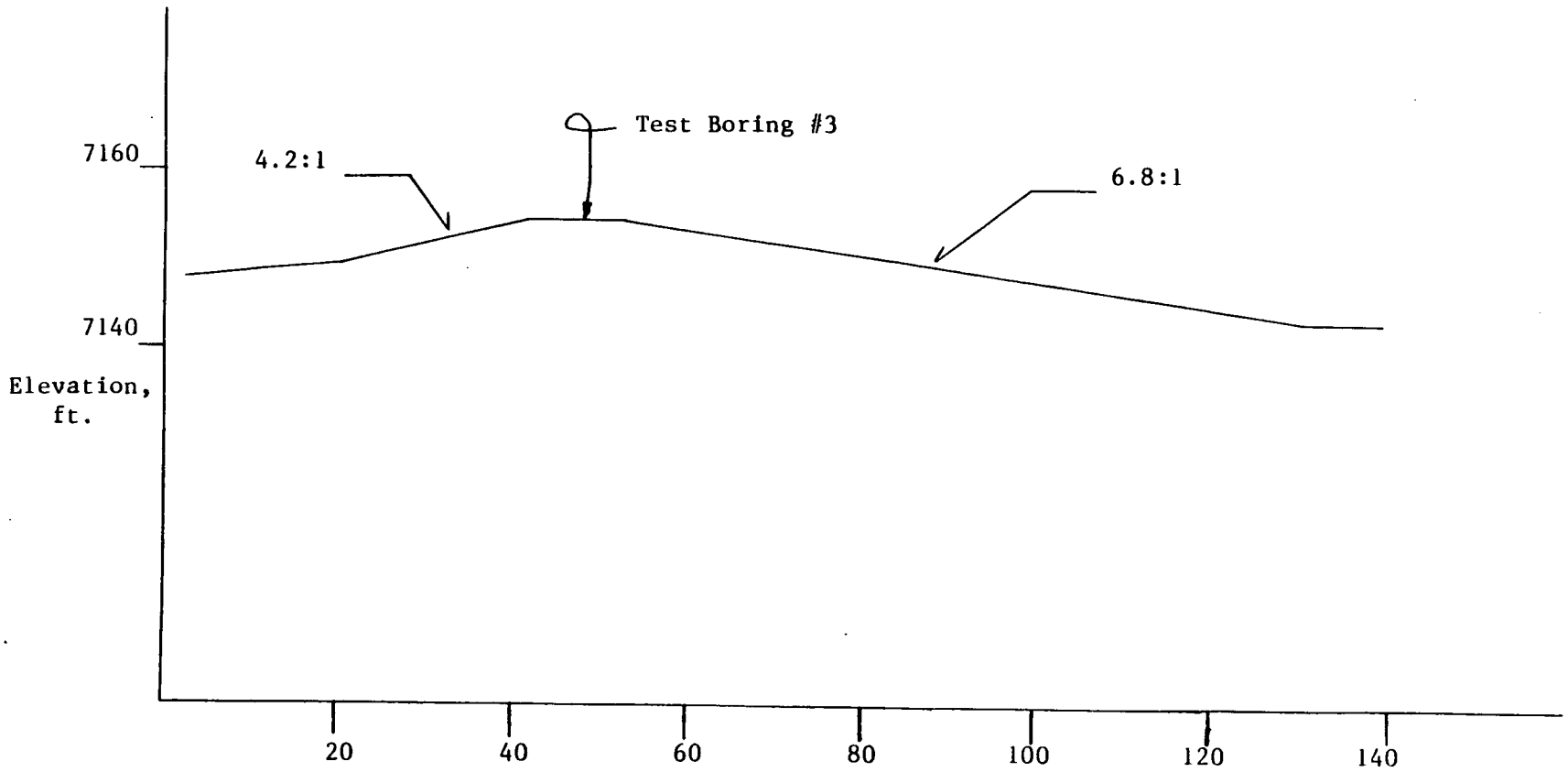
Evaporation Pond - Slope Cross-Section

WEST DIKE - SECTION A



Prepared By J.M. Boyd Date 08/28/91 Job No. 3121K072

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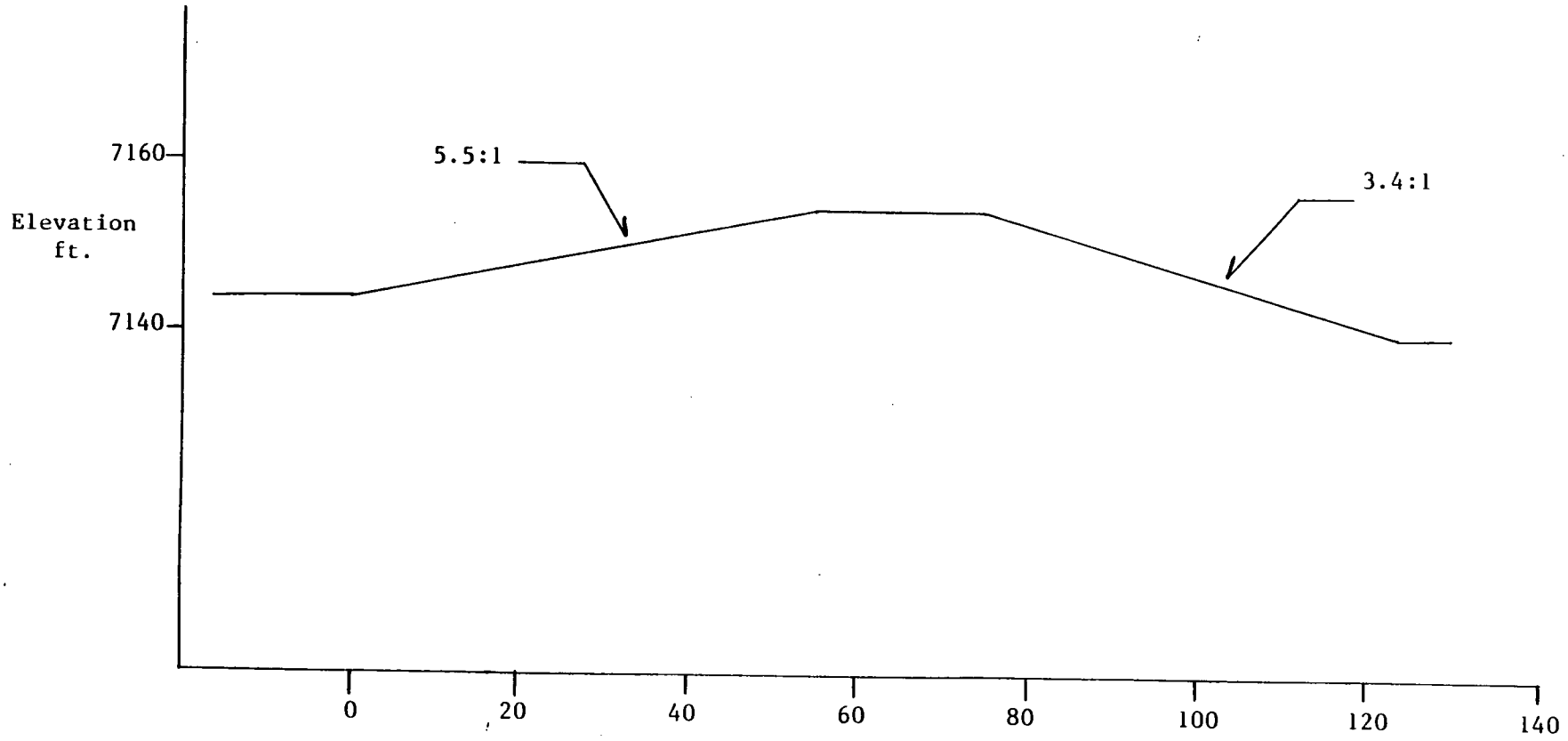
Evaporation Pond - Slope Cross Section

EAST DIKE - SECTION B



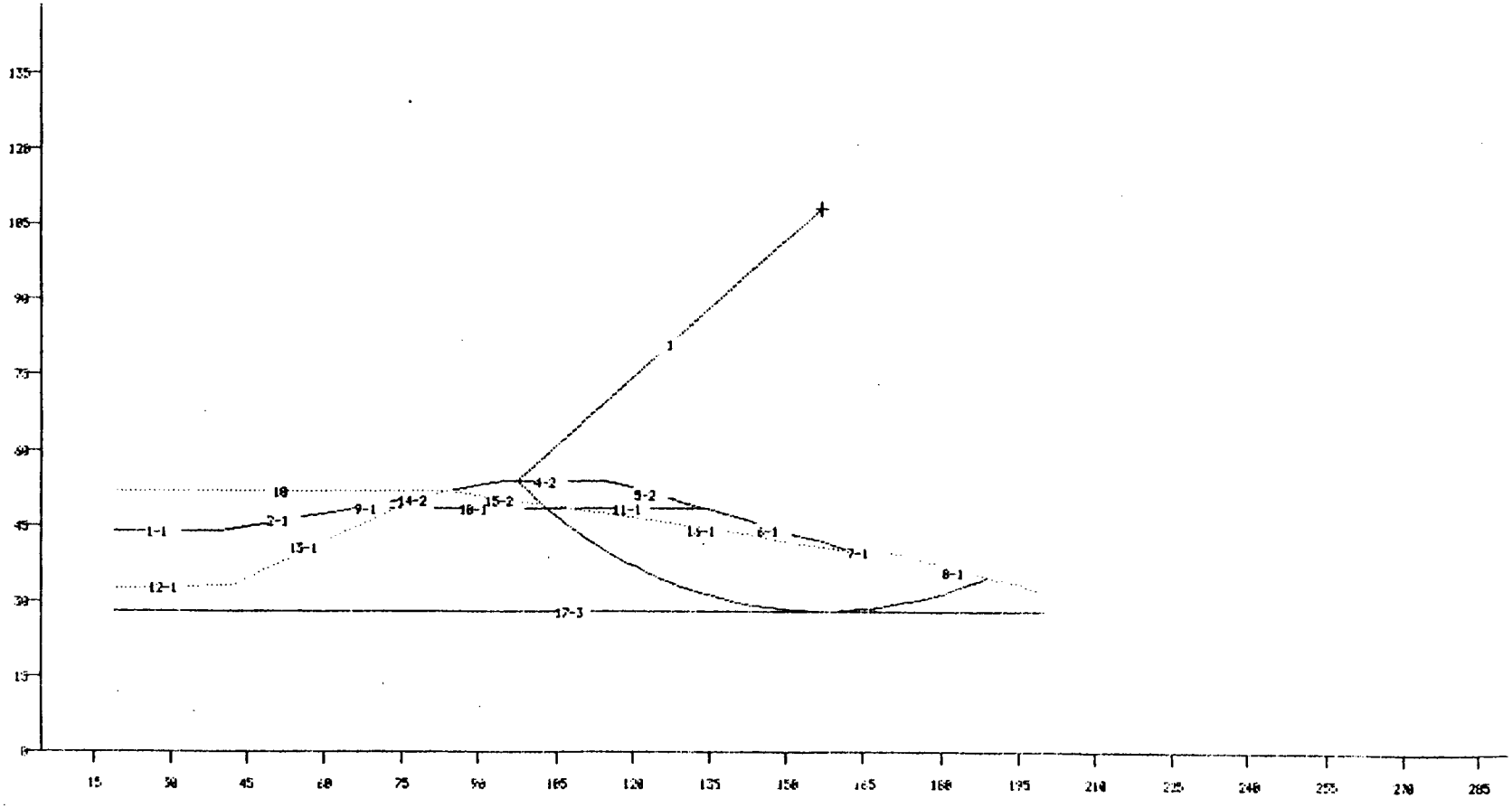
SB-SLOPE

Simplified Bishop Slope Stability Analysis

PROJECT: EVAPORATION POND: EAST DIKE, HOLE IN LINER, STEADY STATE FLOW
LOCATION: LINDRITH, NEW MEXICO
FILE: TNTES1
PARTIAL SLOPE CROSS SECTION

SOIL*	DENSITY	COHESION	PHI
1	110.0	600.0	16.0
2	112.0	300.0	12.0
3	140.0	2500.0	30.0

CIRCLE	X	Y	RADIUS	FS
1	157.0	108.0	80.0	3.18



* Number after hyphen('-') is Soil Type

Western Technologies Inc. - Phoenix, AZ

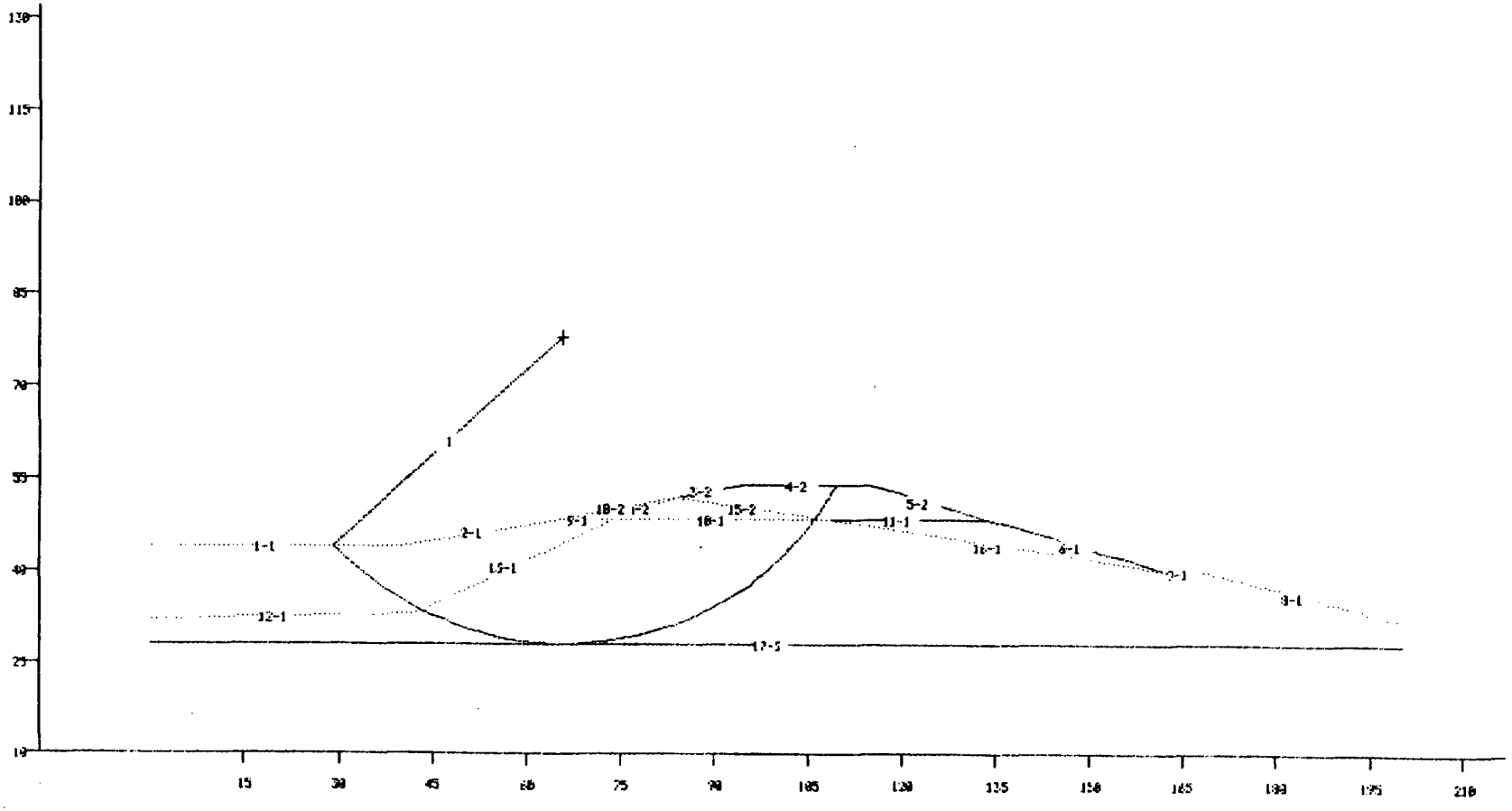
SB-SLOPE

Simplified Bishop Slope Stability Analysis

PROJECT: EVAPORATION POND: EAST DIKE, RAPID DRAWDOWN
LOCATION: LINDRITH, NEW MEXICO
FILE: TNTERD1
COMPLETE SLOPE CROSS SECTION

CIRCLE	X	Y	RADIUS	FS
1	66.0	78.0	50.0	4.78

SOIL*	DENSITY	COHESION	PHI
1	110.0	600.0	16.0
2	112.0	300.0	12.0
3	140.0	2500.0	30.0



* Number after hyphen('-') is Soil Type

Western Technologies Inc. - Phoenix, AZ

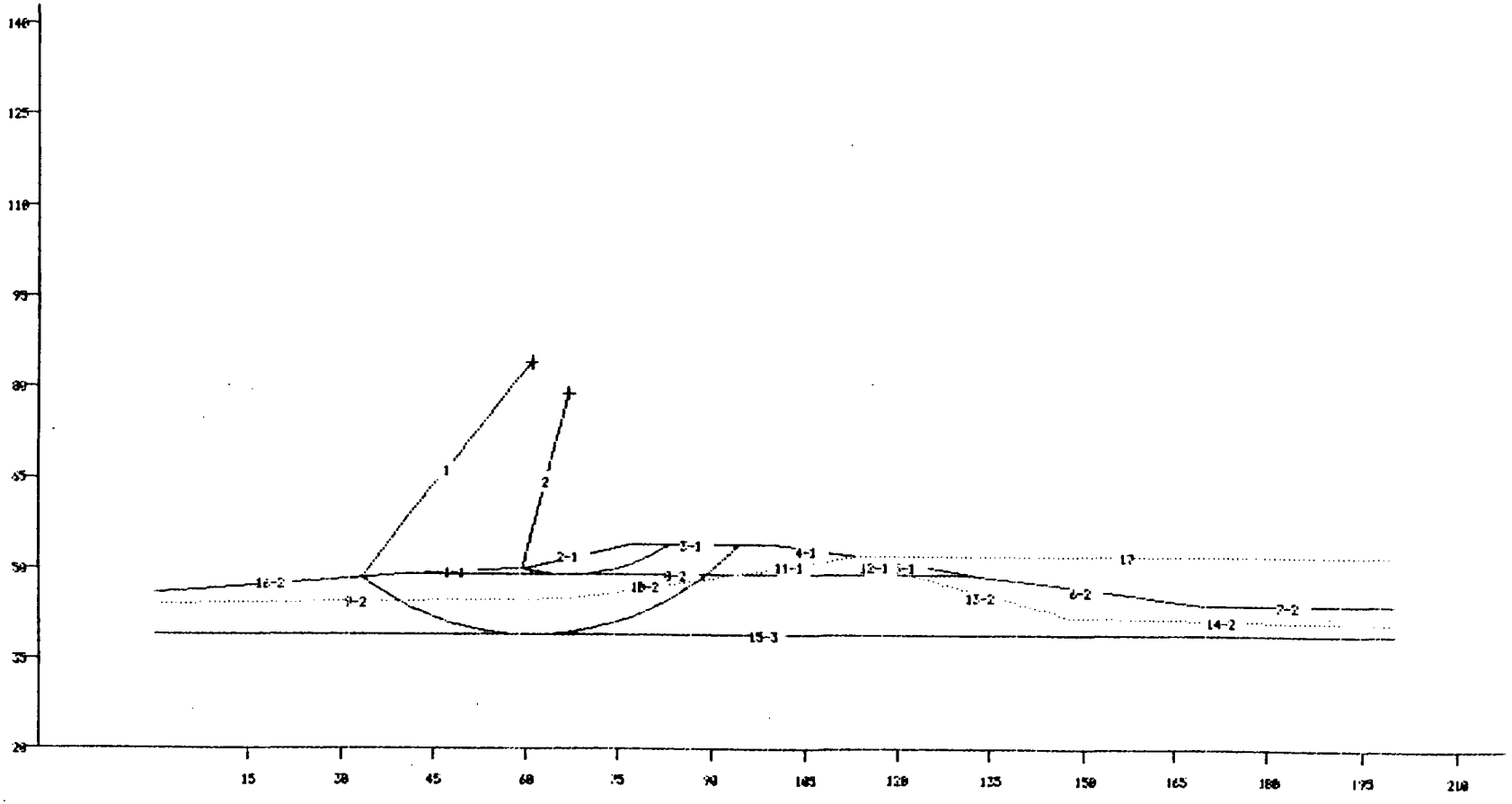
SB-SLOPE

Simplified Bishop Slope Stability Analysis

PROJECT: EVAPORATION POND: WEST DIKE, HOLE IN LINER, STEADY STATE
LOCATION: LINDRITH, NEW MEXICO
FILE: TNTWS1
COMPLETE SLOPE CROSS SECTION

CIRCLE	X	Y	RADIUS	FS
1	61.0	84.0	45.0	9.40
2	67.0	79.0	30.0	8.31

SOIL*	DENSITY	COHESION	PHI
1	112.0	300.0	12.0
2	110.0	600.0	16.0
3	140.0	2500.0	30.0



* Number after hyphen('-') is Soil Type

Western Technologies Inc. - Phoenix, AZ

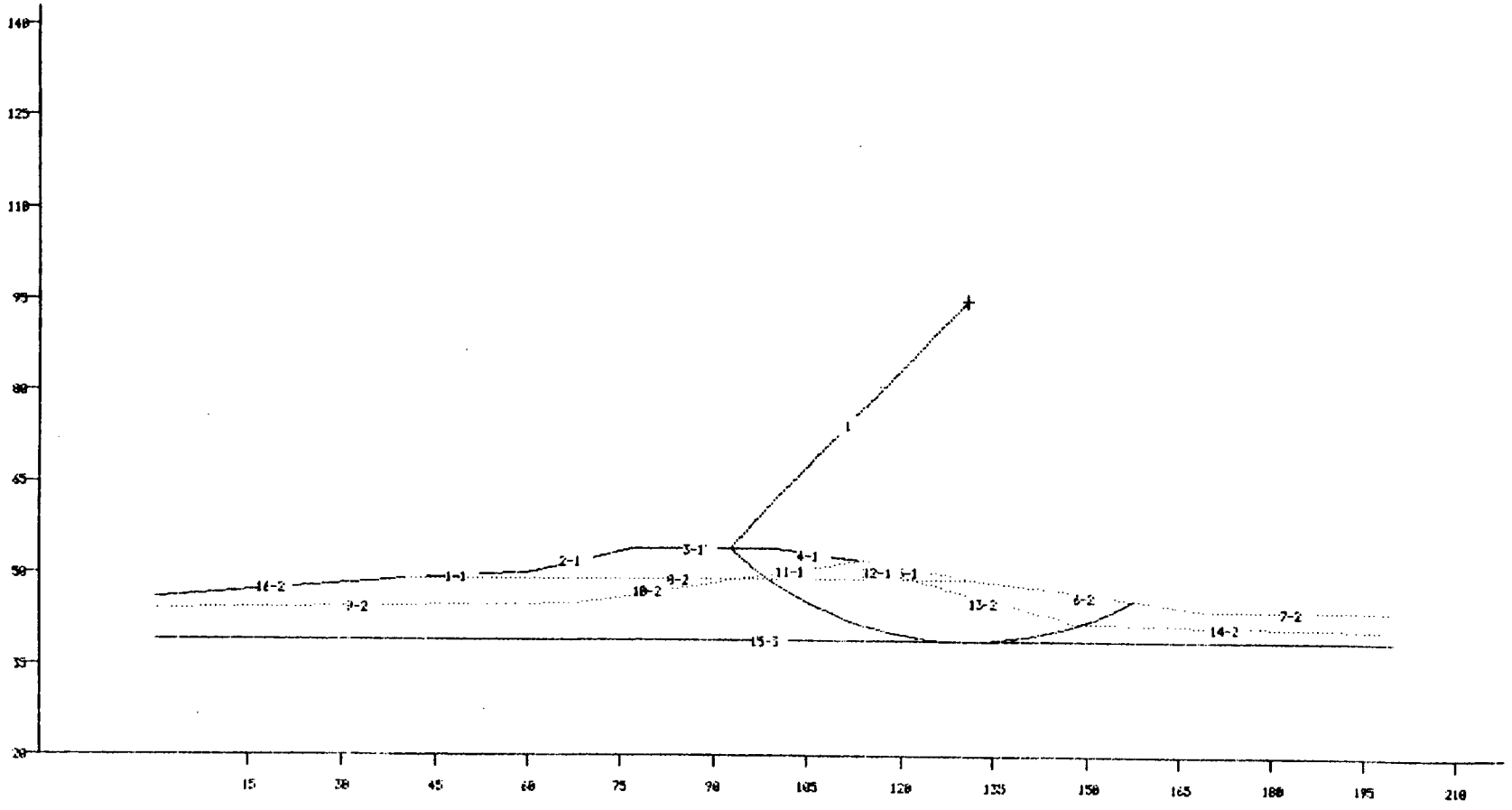
SB-SLOPE

Simplified Bishop Slope Stability Analysis

PROJECT: EVAPORATION POND: WEST DIKE, RAPID DRAWDOWN
LOCATION: LINDRITH, NEW MEXICO
FILE: TNTWRD1
COMPLETE SLOPE CROSS SECTION

CIRCLE	X	Y	RADIUS	FS
1	131.0	95.0	56.0	6.93

SOIL*	DENSITY	COHESION	PHI
1	112.0	300.0	12.0
2	110.0	600.0	16.0
3	140.0	2500.0	30.0



* Number after hyphen('-') is Soil Type

Western Technologies Inc. - Phoenix, AZ

TECHNICAL DATA and SPECIFICATIONS for

XR-5®

Chemical, Oil and High Temperature Resistant Geomembrane

Seaman Corporation
INDUSTRIAL FABRIC DIVISION
1000 Venture Blvd.
Wooster, Ohio 44691
(216) 262-1111

SEAMAN CORPORATION XR-5® CHEMICALLY RESISTANT GEOMEMBRANE

PRODUCT FEATURES

1. COMPOSITE DESIGN —
High strength from polyester base fabric, environmental and chemical resistance from Ethylene Interpolymer Alloy (EIA) coating

2. HEAT RESISTANCE —
Has contained salt water up to 100°C for years

3. CHEMICAL RESISTANCE —
EIA coating provides wide range of compatibility including acids, oils, and methane

4. HEAT WELDABLE —
Thermal weldable for seams as strong as the membrane. Factory panels over 15,000 square feet for less field seaming

5. STABILITY —
Low thermal expansion-contraction properties

* XR-5 IS A REGISTERED TRADEMARK OF SEAMAN CORPORATION

CONTENTS

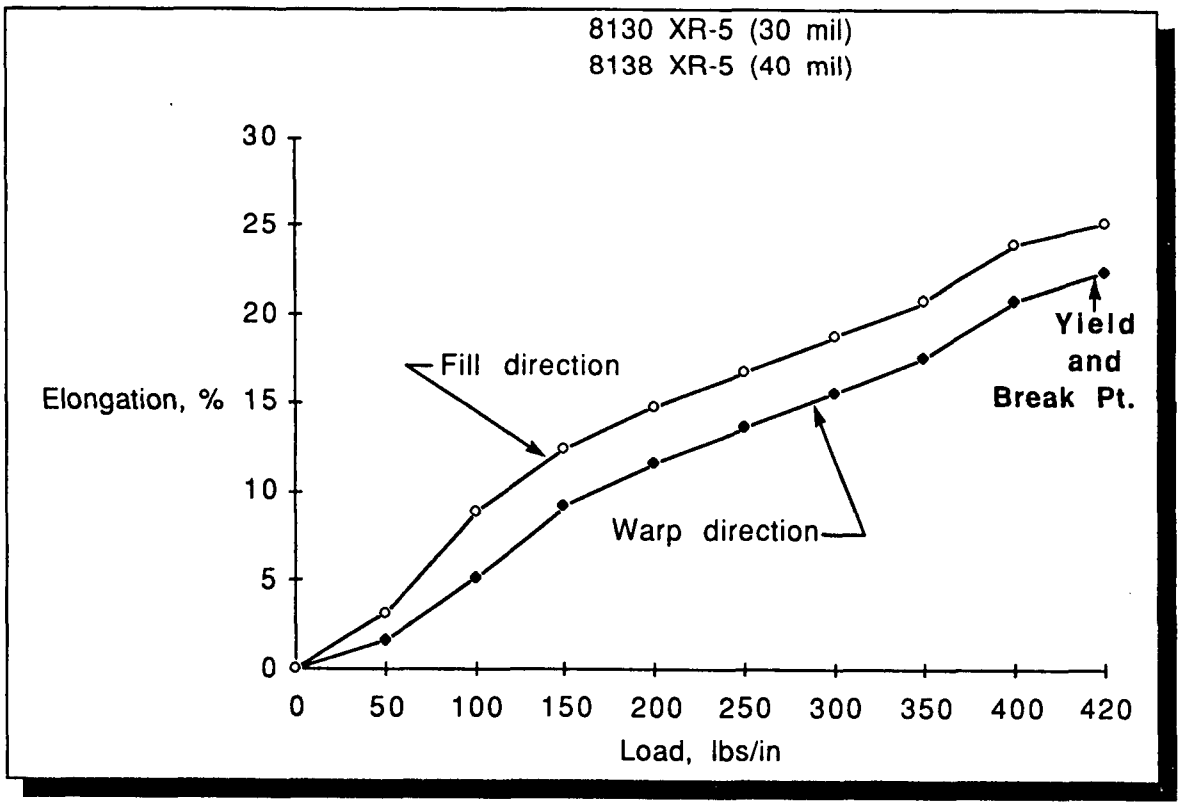
SECTION A - PHYSICAL PROPERTIES

PART A-1: MATERIAL SPECIFICATIONS

8130 XR-5' : Property	Test Method	Requirement *
1. Thickness	ASTM 751	30 mils minimum (8130) 40 mils nominal (8138)
2. Weight	ASTM D-751	30.0 ± 2 oz./sq. yd. (8130) 38.0 ± 2 oz./sq. yd. (8138)
3. Tear Strength	ASTM D-751 Tongue Tear (8" X 10" sample)	125 lbs./125 lbs.*
4. Breaking Yield Strength	ASTM-D-751 Grab Tensile	475 lbs./425 lbs.
5. Low Temperature	ASTM-D-2136 4 hrs. — 1/8" mandrel	−30°F. No cracking
6. Dimensional Stability (each direction)	ASTM-D-1204 212°F. – 1 hr.	2% max.
7. Hydrostatic Resistance	ASTM-D-751 Method A	500 psi (min.)
8. Blocking Resistance 180°F.	Method 5872 Fed. Std. 191a	#2 Rating Max.
9. Adhesion—Ply. lbs./in. of width	ASTM-D-413 2" per min.	9 lbs./in. (min.) or film tearing bond
10. Adhesion—heat sealed seam lbs./in. of width	ASTM-D-751	10 lbs./in. (min.)
11. Dead Load Seam shear strength	(Mil-T-52983E Para. 4.5.2.19 2" overlap seam	Must withstand 210 lbs./in. @ 70°F. 105 lbs./in. @ 160°F.
12. Abrasion Resistance (Taber Method)	Method 5306 Fed. Std. 191a H-18 Wheel 1000 gm. load	2000 cycles before fabric exposure 50 mg./100 cycles max. wt. loss
13. Weathering Resistance	Carbon-Arc Atlas Weather-o-meter	8,000 hrs. No appreciable changes or stiffening or cracking of coating
14. Water Absorption	ASTM-D-471, Section 12 7 days	5% max. @ 70°F. 12% max. @212°F.
15. Wicking	Shelter-Rite procedure	1/8" max.
16. Puncture Resistance	ASTM D751 Ball Tip FTMS 101C Method 2065	650 lbs. min. 800 lbs. (typ.) 140 lbs. (typ.)
17. Coefficient of Thermal Expansion/Contraction	ASTM E-228	8 X 10 -6 in/in °F. (max.)

* As Produced

PART A-2: ELONGATION PROPERTIES (UNIAXIAL)
STRESS VS. STRAIN 8130 and 8138 XR-5



Test Method: Method 5102, Fed. Std. 191, 12 inch/min. speed.

SECTION B — CHEMICAL/ENVIRONMENTAL RESISTANCE

PART B-1: XR-5® FLUID RESISTANCE GUIDELINES

The data below is the result of laboratory tests and is intended to serve only as a guide. No performance warranty is intended or implied. The degree of chemical attack on any material is governed by the conditions under which it is exposed. Exposure time, temperature, and size of the area of exposure usually varies considerably in application, therefore, this table is given and accepted at the user's risk. Confirmation of the validity and suitability in specific cases should be obtained.

When considering XR-5 for specific applications, it is suggested that a sample be tested in actual service before specification. Where impractical, tests should be devised which simulate actual service conditions as closely as possible.

EXPOSURE	RATING
AFFF	A
Acetic Acid (5%)	B
Acetic Acid (50%)	C
Ammonium Phosphate	T
Ammonium Sulfate	T
Antifreeze (ethylene glycol)	A
Animal Oil	A
Aqua Regia	X
ASTM Fuel A (100% Iso-octane)	A
ASTM Oil #2 (Flash pt. 240°C)	A
ASTM Oil #3	A
Benzene	X
Calcium Chloride Solutions	T
Calcium Hydroxide	T
20% Chlorine Solution	A
Clorox	A
Conc. Ammonium Hydroxide	A
Corn Oil	A
Crude Oil	A
Diesel Fuel	A
Ethanol	A
Ethyl Acetate	C
Ethyl Alcohol	A
Fertilizer Solution	A
#2 Fuel Oil	A
#6 Fuel Oil	A
Furfural	X
Gasoline	B
Glycerin	A
Hydraulic Fluid	A
Hydrocarbon Type II (40% Aromatic)	C
Hydrochloric Acid (50%)	A
Hydrofluoric Acid (5%)	A
Hydrofluoric Acid (50%)	A
Hydrofluosilicic Acid (30%)	A
Isopropyl Alcohol	T
Ivory Soap	A
Jet A	A
JP-4 Jet Fuel	A

EXPOSURE	RATING
JP-4 Jet Fuel	A
JP-5 Jet Fuel	A
JP-8 Jet Fuel	A
Kerosene	A
Magnesium Chloride	T
Magnesium Hydroxide	T
Methanol	A
Methyl Alcohol	A
Methyl Ethyl Ketone	X
Mineral Spirits	A
Naptha	A
Nitric Acid (5%)	B
Nitric Acid (50%)	C
Perchloroethylene	C
Phenol	X
Phenol Formaldehyde	B
Phosphoric Acid (50%)	A
Phosphoric Acid (100%)	C
Phthalate Plasticizer	C
Potassium Chloride	T
Potassium Sulphate	T
Raw Linseed Oil	A
SAE-30 Oil	A
Salt Water (25%)	B
Sea Water	A
Sodium Acetate Solutions	T
Sodium Bisulfite Solution	T
Sodium Hydroxide (60%)	A
Sodium Phosphate	T
Sulphuric Acid (50%)	A
50% Tanic Acid	A
Toluene	C
Transformer Oil	A
Turpentine	A
Urea Formaldehyde	A
UAN	A
Vegetable Oil	A
Water (200°F.)	A
Xylene	X
Zinc Chloride	T

Ratings are based on visual and physical examination of samples after removal from the test chemical after the samples of Black XR-5 were immersed for 28 days at room temperature. Results represent ability of material to retain its performance properties when in contact with the indicated chemical.

RATING KEY:
A—Fluid has little or no effect
B—Fluid has minor to moderate effect
C—Fuild has severe effect
T—No data-likely to be acceptable
X—No data-not likely to be acceptable

PART B-2: COMPARATIVE CHEMICAL RESISTANCE

The table below lists a variety of chemicals and indicates the action of each material when in contact with Black XR-5, CPE, Hypalon, Urethane, and supported PVC. Membrane samples were totally immersed in each of the chemicals for a period of 28 days at room temperature. The rating system is indicated as:

A — Fluid has little or no effect at R.T.
B — Fluid has minor to moderate effect at R.T.
C — Fluid has severe effect at R.T.

Chemical	XR-5®	Hypalon	Urethane	CPE	PVC
Kerosene	A	C	A	C	C
Diesel Fuel	A	C	A	C	C
Ohio Crude Oil	A	B	A	B	C
Hydraulic Fluid	A	C	A	B	C
Naptha	A	B	A	B	C
Conc. Ammonia Hydroxide	A	A	C	A	A
50% Acetic Acid	C	B	C	B	C
50% Phosphoric Acid	A	B	C	A	A
50% Hydrochloric Acid	A	A	C	A	A
50% Nitric Acid	C	B	C	A	C
50% Sulfuric Acid	A	C	C	C	A
60% Sodium Hydroxide	A	A	C	B	C
Methyl Alcohol	A	A	A	A	C
JP-4 Jet Fuel	A	B	A	B	C
Salt Water 180°F	A	B	B	B	C
Phthalate Plasticizers	B	C	A	C	C
SAE-30 Oil	A	A	A	A	C
Raw Linseed Oil	A	A	A	A	C

All technical information published in the brochure refers to the Black XR-5; other colors may not have the same chemical resistance as the black. If a color other than black is required, we suggest you check with Seaman Corporation as to the compatability and resistance to that particular chemical environment.

The above ratings were arrived at by visual and physical examination of the membrane samples after their removal from the test chemical. When considering XR-5® for specific application, it is important to study the requirements such as permeability, service temperature, concentration, size to be contained, etc. Sample of XR-5® should be tested close to actual service conditions and also Seaman Corporation should be consulted.

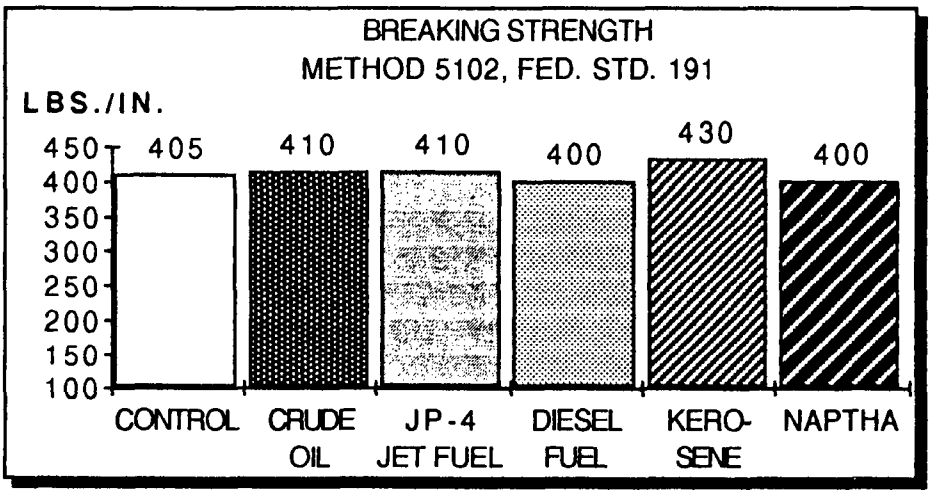
FUEL COMPATIBILITY — LONG TERM IMMERSION

TEST: Samples of 8130 XR® DC-7 Black were immersed in Diesel Fuel, JP-4 Jet Fuel, Crude Oil, Kerosene, and Naptha for 6½ years.

The samples were then taken out of the test chemicals, blotted and dried for 24 hours. The samples were observed for blistering, swelling, stiffening, cracking or delamination of the coating to the fiber.

RESULTS: It was found in all cases the 8130 XR-5®, after immersion for six years, maintained the strength and there was no evidence of blistering, swelling, stiffening, cracking or delamination.

The strip tensile strength or breaking strength of the samples was measured after six years of immersion and the following are the results.



LONG TERM SEAM ADHESION

11 YEARS IMMERSION
METHOD 5970 OF FEDERAL TEST METHOD STANDARD NO. 191
LBS./IN.

Seam samples of 8130 XR-5® were dielectrically welded together and totally immersed in the liquids for 11 years. The samples were taken out, dried for 24 hours and visually observed for any signs of swelling, cracking, stiffening or degradation of the coating. The coating showed no appreciable degradation and no stiffening, swelling, cracking or peeling.

The adhesion, or resistance to separation of the coating from the base cloth, was then measured by Method 5970 of Federal Test Method Standard No. 191. Results show 8130 XR-5® has maintained the seam strength over the long period.

	Control	Crude Oil	JP-4 Jet Fuel	Diesel Fuel	Kerosene	Naptha
8130 XR-5® DC-7 Black Lbs./in.	20+	18	33	25	40	33*

* The naptha sample was sticky.

IMMERSION: January, 1979 to March, 1990

We believe this information is the best currently available on the subject. It is offered as a possible helpful suggestion in experimentation you may care to undertake along these lines. It is subject to revision as additional knowledge and experience are gained. We make no guarantee of results and assume no obligation or liability whatsoever in connection with this information.

PART B-3: COMPARATIVE CHEMICAL PERMEABILITY DATA

Tested According to ASTM D814-55 Inverted Cup Method

Perhaps a more meaningful test is determination of the diffusion rate of the liquid chemical through the membrane. The vapor transmission rate of Style 8130 XR-5, 30 Mil Hypalon laminate, and 30 Mil CPE laminate to various chemicals was determined by the ASTM D814-55 inverted cup method. All tests were run at room temperature and results are shown in the table.

Chemical	8130 XR-5 Black	30 Mil Hypalon Laminate	30 Mil CPE Laminate
	Fl. oz./ft.²/24 hours	Fl. oz./ft.²/24 hours	Fl. oz./ft.²/24 hours
Water	0.0086	0.0079	0.034
#2 Diesel Fuel	0.0029		
Jet A	0.0104		
Kerosene	0.0134	0.147	0.223
Hi-Test Gas	0.184	1.51	2.280
Ohio Crude Oil	0.003	0.014	0.010
Low-Test Gas	0.523	—	—
Raw Linseed Oil	0.001	0.006	0.008
Ethyl Alcohol	0.021	0.073	—
Naphtha	0.0369	0.376	0.096
Perchloroethylene	1.797	—	—
Hydraulic Fluid	0.0006	0.009	1.110
100% Phosphoric Acid	0.320	Not available	Not available
50% Phosphoric Acid	0.023	Not available	Not available
Ethanol (ASTM E-96)	0.06		

NOTE: The tabulated values are measured **Vapor Transmission Rates (VTR)**. Normal soil testing methods to determine permeability are impractical for synthetic membranes. An "equalivalent hydraulic" permeability coefficient can be calculated but is not a direct units conversion. Contact Seaman Corporation for additional technical information.

Part B-4: SEAM STRENGTH

Style 8130 XR-5 Black Seam Strength After Immersion

Two pieces of Style 8130 were heat sealed together (seam width 1 inch overlap) and formed into a bag. Various oils and chemicals were placed in the bags so that the seam area was entirely covered. After 28 days at R.T., the chemicals were removed and one inch strips were cut across the seam and the breaking strengths immediately determined. Results are listed below.

Chemical	Seam Strength
None	340 lbs. fabric break—No Seam Failure
Kerosene	355 lbs. fabric break—No Seam Failure
Ohio Crude Oil	320 lbs. fabric break—No Seam Failure
Hydraulic Fluid	385 lbs. fabric break—No Seam Failure
Toluene	0 lbs. adhesion failure
Naphtha	380 lbs. fabric break—No Seam Failure
Perchloroethylene	390 lbs. fabric break—No Seam Failure

Even though 1-inch overlap seam is used in the tests to study the accelerated effects, it is recommended that XR-5 be used with a 2-inch nominal overlap seams in actual application. In some cases where temperatures exceed 160°F and application demands extremely high seam load it may be necessary to use a wider width seam.

PART B-5: SOIL BURIAL RESISTANCE

30 DAY SOIL BURIAL TEST

The samples were weighed, then placed on a 4-inch bed of active, compacted soil and covered with a 1-inch layer, of loosely packed soil. After 30 days in a chamber maintained at 85°F. to 90°F., and 90% relative humidity, the samples were recovered, rinsed with water, air dried and reweighed for % weight loss determination.

	30 Day Soil Burial			
	Weight (gms)			
Sample	Before Soil Burial	After 30 days Soil Burial	Weight Loss (gms)	% Weight Loss
8130 XR-5 DC-7 Black	39.50	39.40	0.1	0.25

8 MONTHS SOIL BURIAL

Samples of 8130 XR-5® DC-7 Black were actually buried in Sarasota, Florida soil. After 8 months the sampes were removed and returned to our laboratory for testing. Visual examination of the exposed samples showed no evidence of cracking, blistering, swelling or delamination.

Trapezoidal tear and strip tensile strength was measured to determine the effect of soil burial on the physical properties. The results show the fabric has maintained the physical integrity.

Sample	Trapezoid Tear ASTM D-2263				Strip Tensile ASTM D-751			
	Original		Exposed		Original		Exposed	
	Warp	Fill	Warp	Fill	Warp	Fill	Warp	Fill
8130 XR-5® DC-7 Black	56	66	52	56	400	400	360	440
	54	68	58	56	400	390	410	380
	55	67	55	56	400	395	385	410
	Values in lbs.				Values in lbs./in.			

PART B-6: WEATHERING RESISTANCE

ACCELERATED WEATHERING TEST

XR-5 has been tested in the carbon arc weatherometer for over 10,000 hours of exposure. The sample showed no loss in flexibility and no significant color change. Based on field experience of Seaman Corporation products and similar weatherometer exposure tests, XR-5 should have an outdoor weathering life significantly longer than competitive geomembranes, particularly in tropical or subtropical applications.

EMMAQUA Testing: ASTM E-838-81 was performed on a modified form of XR-5, FiberTite, used in the single-ply roofing industry. After 3 million Langleys in Arizona, no signs of degradation were noted with no evidence of cracking, blistering, swelling or adhesion failure of the coating.

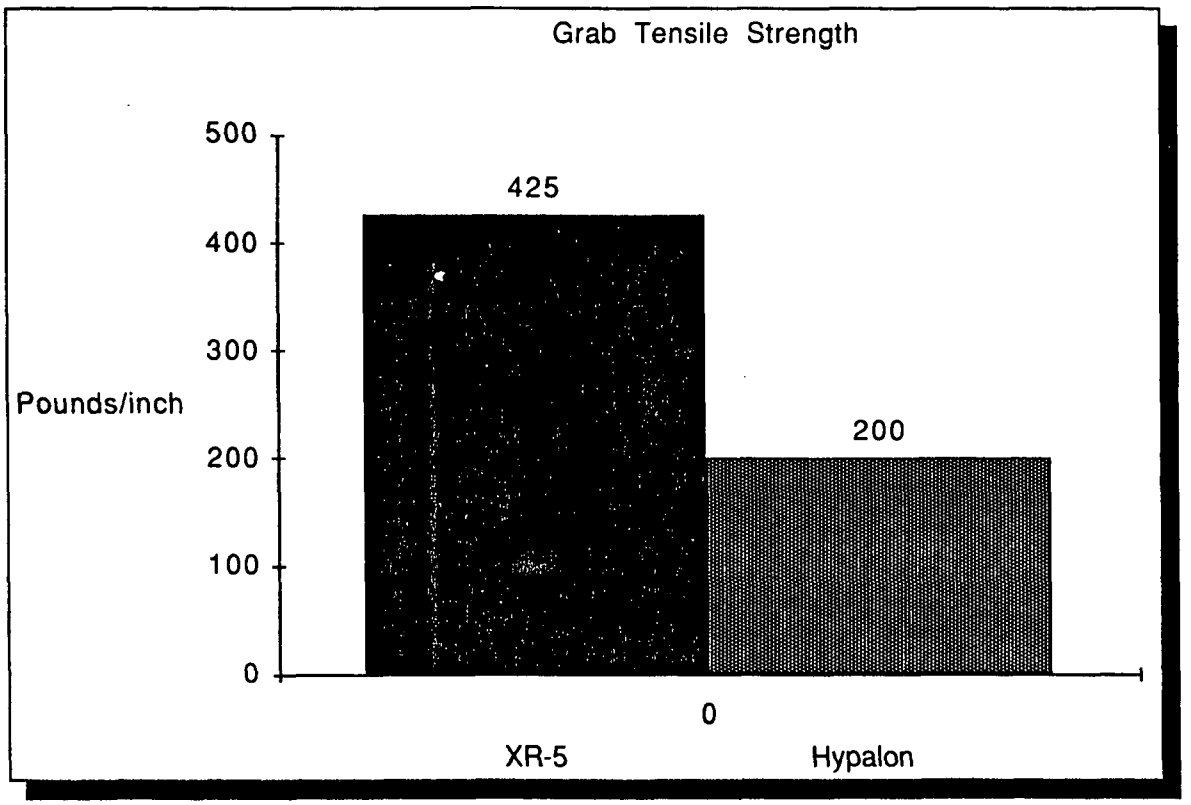
PART B-7: XR-5/HYPALON STRENGTH

1. PHYSICAL STRENGTH

Test specimens of materials were cut and tested to the indicated standards. Similar specimens were then immersed in water at 180°F for 14 days and tested again to determine if there was any significant change in physical properties. The following results were noted:

Method	Strip Tensile—Method 5102		Trapezoid Tear—Method 5136		Hydrostatic Resistance—Method 5512	
	Original (lbs./in.)	Exposed (lbs./in.)	Original (lbs.)	Exposed (lbs.)	Original	Exposed
8130 XR-5 Black	394 x 393	363 x 363	36 x 40	34 x 33	750 psi	690 psi
Hypalon Reinforced 10 x 10	195 x 172	117 x 127	85 x 137	80 x 74	470 psi	305 psi
CPE Reinforced 10 x 10	165 x 138	Sample deteriorated unable to test	63 x 68	Sample deteriorated unable to test	390 psi	Sample deteriorated unable to test

GRAB STRENGTH—XR-5 VS. HYPALON



Test Method: ASTM D-751 Grab Method

2. ADHESION AND BONDED SEAM STRENGTH

Samples of typical seams were constructed and immersed in water at 160°F for 10 days to determine the high temperature moisture affect on seam strength performance. The following results were noted:

Material	Peel Adhesion— Method 5970		Bonded Seam Strength— ASTM D 751	
	Original	Exposed	Original	Exposed
8130 XR-5 Black				
Electronic Weld	20 + lbs./inch	20 + lbs./inch	389 lbs.	339 lbs.
Cemented	Not Recommended		Not Recommended	
Hypalon Reinforced 10 x 10				
Electronic Weld	20 + lbs./inch	7 lbs./inch	298 lbs.	270 lbs.
Cemented	20 + lbs./inch	7 lbs./inch	297 lbs.	263 lbs.
CPE Reinforced 10 x 10				
Electronic Weld	20 + lbs./inch	12 lbs./inch	305 lbs.	290 lbs.
Cemented	20 + lbs./inch	2 lbs./inch	312 lbs.	90 lbs.

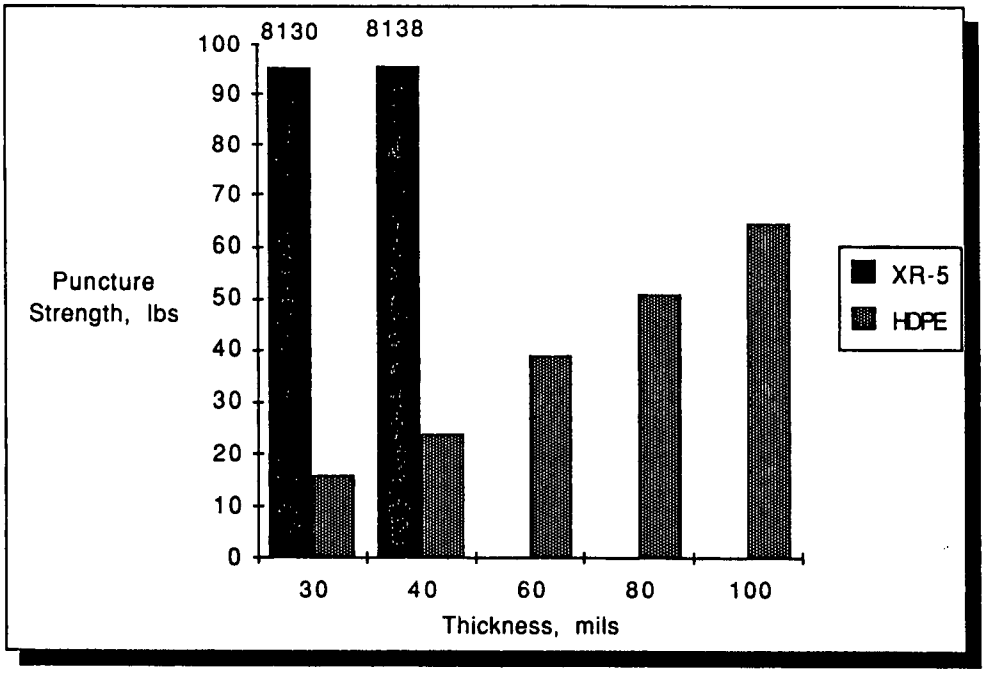
We believe this information is the best currently available on the subject. It is offered as a possible helpful suggestion in experimentation you may care to undertake along these lines. It is subject to revision as additional knowledge and experience are gained. We make no guarantee of results and assume no obligation or liability whatsoever in connection with this information.

SECTION C — XR-5/HDPE COMPARATIVE PROPERTIES

PART C-1: PUNCTURE RESISTANCE

1. FTMS 191, Method 5120 (Room Temperature)

PUNCTURE RESISTANCE, XR-5 VS. HDPE



Test Method: FTMS 191, Method 5120; Screwdriver tip (0.312" x 0.031"), 45 degree angle

2. FTMS Method 2065 (Room Temperature)*

	8130 XR-5	Polyflex HDPE		Gundle Lining HD	
Thickness, mils	33	40	60	60	80
Force, lbs.	168	66	85	85	—
Elongation, inches	0.44	0.67	0.27	0.26	—

3. FTMS Method 2065 (70°C)*

	8130 XR-5	Polyflex HDPE		Gundle Lining HD	
Thickness, mils	33	40	60	60	80
Force, lbs.	109	32	45	46	—
Elongation, inches	0.65	0.25	0.27	0.26	—

4. FTMS Method 2065 (100°C)*

	8130 XR-5	Polyflex HDPE		Gundle Lining HD	
Thickness, mils	33	40	60	60	80
Force, lbs.	92	24	27	34	—
Elongation, inches	0.49	0.58	0.34	0.35	—

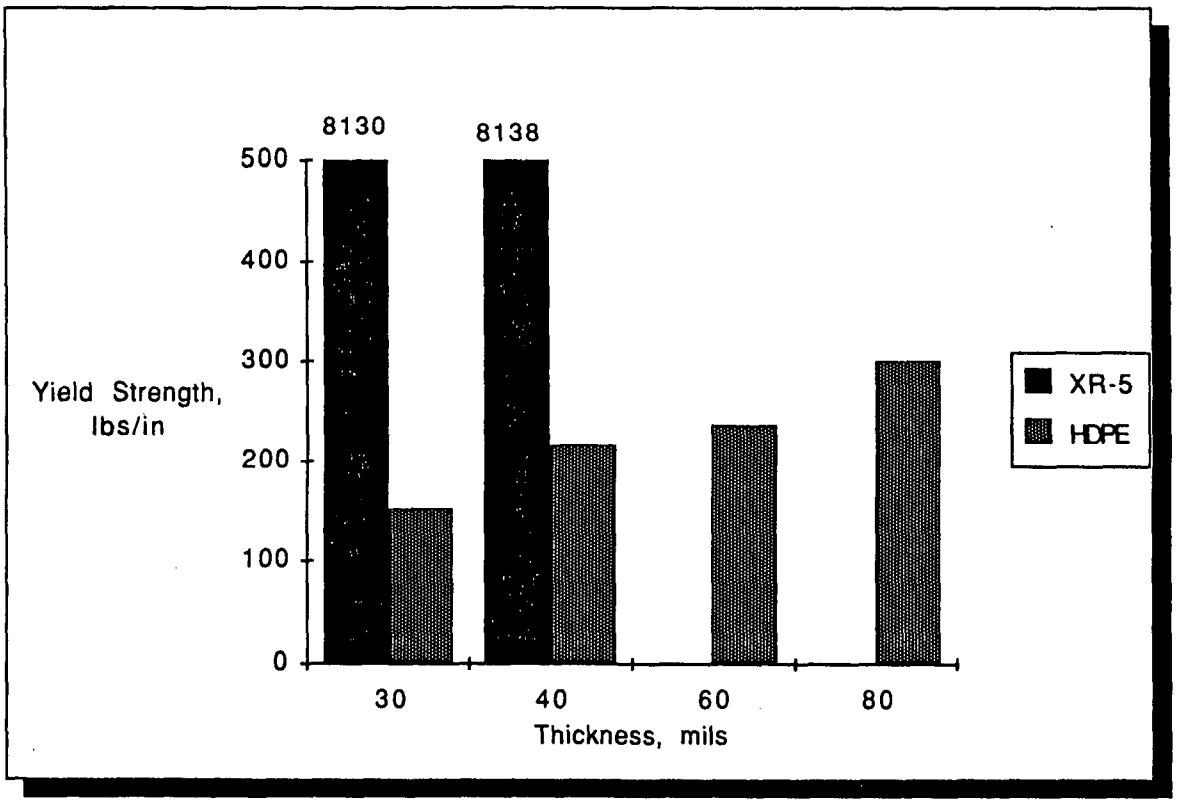
*Data provided by E.I. DuPont de Nemours & Co., Wilmington, Delaware

4. ASTM D 751 Ball Burst Puncture

	8130 XR-5	Gundle Lining HD	
Thickness, mils	33	60	80
Force, lbs.	888	228	399

PART C-2: YIELD STRENGTH

1. Yield Strength, XR-5 VS. HDPE



Test Method: Grab Tensile, ASTM D751, 70 Deg. C

*Data provided by E.I. DuPont de Nemours & Co., Wilmington, Delaware

2. Strip Tensile, ASTM D751, Room Temperature*

	8130 XR-5	Polyflex HDPE		Gundle Lining HD	
Thickness, mils	33	40	60	60	80
Yield Strength lbs./in.	280	120	150	145	167
Yield Elongation, %	20	20	20	20	45

3. Strip Tensile, ASTM D751, 70°C*

	8130 XR-5	Polyflex HDPE		Gundle Lining HD	
Thickness, mils	33	40	60	60	80
Yield Strength, lbs./in.	200	66	90	88	127
Yield Elongation, %	20	20	18	18	15

PART C-3: TEAR STRENGTH

1. Tongue Tear (8" x 10" Specimens), ASTM D751, Room Temperature*

	8130 XR-5	Polyflex HDPE
Thickness, mils	33	60
Tear Strength, lbs.	230	130

*Data provided by E.I. DuPont de Nemours & Co., Wilmington, Delaware

2. Tongue Tear (8" x 10" Specimens), ASTM D751, 70°C*

	8130 XR-5	Polyflex HDPE
Thickness, mils	33	60
Tear Strength, lbs.	160	105

3. Graves Tear, ASTM D624, Die C, Room Temperature*

	8130 XR-5	Polyflex HDPE		Gundle Lining HD	
Thickness, mils	33	60	80	60	80
Tear Strength, lbs.	940	533	538	577	880

4. Graves Tear, ASTM D624, Die C, 70°C*

	8130 XR-5	Gundle Lining HD
Thickness, mils	33	80
Tear Strength, lbs.	700	575

*Data provided by E.I. DuPont de Nemours & Co., Wilmington, Delaware

SECTION D — EXAMPLE FABRICATION/INSTALLATION SPECIFICATIONS

1.01 SCOPE OF WORK

1.02 PRODUCTS

1.03 SUBMITTALS

1.04 FACTORY FABRICATION

1.05 INSPECTION AND TESTING OF FACTORY SEAMS

1.06 CERTIFICATION AND TEST REPORTS

1.07 PANEL PACKAGING AND STORAGE

1.08 QUALIFICATIONS OF SUPPLIERS

1.09 SUBGRADE PREPARATION BY OTHERS

1.10 LINING INSTALLATION

1.11 XR-5 FIELD SEAMING

1.12 INSPECTION

1.13 PATCHING

1.14 WARRANTY

SPECIFICATION FOR GEOMEMBRANE LINER

GENERAL

1.01 SCOPE OF WORK

Furnish and install flexible membrane lining in the areas shown on the drawings. All work shall be done in strict accordance with the project drawings, these specifications and membrane lining fabricator's approved shop drawings.

Geomembrane panels will be supplied sufficient to cover all areas, including, appurtenances, as required in the project, and shown on the drawings. The fabricator/installer of the liner shall allow for shrinkage and wrinkling of the field panels.

1.02 PRODUCTS

The lining material shall be 8130 XR-5® as manufactured by Seaman Corporation, (1000 Venture Boulevard, Wooster, Ohio 44691; 216-262-1111), with the following physical specifications:

Base - (Type)	Polyester
Fabric - (Weight)	6.5 oz./sq. yd.
Finished Coated Weight *(ASTM D-751)*	30± 2 oz./sq. yd.
Tongue Tear *(ASTM D-751, Tongue Method) (8"x10" Sample)*	125/125 lbs. min.
Trapezoid Tear *(FTMS 191a Method 5136)*	35/35 lbs. min.
Grab Yield Tensile *(ASTM D-751, Grab Method)*	475/425 lbs. min.
Strip Yield Tensile *(ASTM D-751, Cut Strip Method)*	400/350 lbs. min.
Elongation @ Yield (%)	20% min.
Adhesion *(ASTM D-751, Adhesion Para. b)*	10 lbs./in. min.
Hydrostatic Resistance *(ASTM D-751, Method A Proc. 1)*	500 psi min.
Puncture Resistance *(FTMS 101C Method 2065)*	140 lbs. (typ)
Puncture Resistance *(ASTM D-751 Ball Tip)*	650 lbs. min. (800 lbs. typ.)
Dead Load *(Mil-T-52983 E)* Room Temperature	210 lbs. min.
(Para. 4.5.2.19) (2" overlap seam, 4 hours) 160°F.	105 lbs. min.
Cold Crack *(Mil-C-20696 C) (Para. 4.4.6)*	Pass @ −30°F.
Weathering Resistance *(Carbon-Arc Atlas Weather-o-meter)* with no appreciable changes or stiffening or cracking of coating	8,000 hours min.
Dimensional Stability *(ASTM D-1204, 212°F. 1 hour, each direction)*	2% Max.
Water Absorption *(ASTM D-471, 7 days)*	5% max. @ 70°F. 12% max. @ 212°F.
Abrasion Resistance *(Taber Method, Method 5306, Fed. Std. 191a, H-18 Wheel, 100g load)*	2000 cycles before fabric exposure; 50mg/100 cycles max. wgt. loss
Coefficient of Thermal Expansion/Contraction *(ASTM E-228)*	8 x10 -6 in./in./°F. (max.)

1.03 SUBMITTALS

The fabricator of panels used in this work shall prepare shop drawings with a proposed panel layout to cover the liner area shown in the project plans. Shop drawings shall indicate the direction of factory seams and shall show panel sizes consistent with the material quantity requirements of 1.01.

Details shall be included to show the termination of the panels at the perimeter of lined areas, the methods of sealing around penetrations, and methods of anchoring.

Placement of the lining shall not commence until the shop drawings and details have been approved by the Owner, or his representative.

1.04 FACTORY FABRICATION

The individual XR-5® liner widths shall be factory fabricated into large sheets custom designed for this project so as to minimize field seaming. The number of factory seams must exceed the number of field seams by a factor of at least 10.

A two-inch overlap seam done by heat or RF welding is recommended. The surface of the welded areas must be dry and clean. Pressure must be applied to the full width of the seam on the top and bottom surface while the welded area is still in a melt-type condition. On a hot air welder, the bottom surface must be flat to insure that the entire seam is welded properly. Enough heat shall be applied in the hot air welding process that a visible bead is extruded from both edges being welded. The bead insures that the material is in a melt condition and a successful chemical bond between the two surfaces is accomplished.

2″ seams must withstand a minimum of 210 pounds per inch dead load at 70°F. and 105 pounds per inch at 160°F. as outlined in Mil-T-52983E. All seams must equal or exceed parent material in strength.

1.05 INSPECTION AND TESTING OF FACTORY SEAMS

The fabricator shall perform 100% continuous visual inspection of each linear foot of seam as it is produced. Upon discovery of any defective seam, the fabricator shall stop production of panels used in this work and shall repair the seam, and determine and rectify the cause of the defect prior to continuation of the seaming process.

The fabricator must provide a Quality Control procedure to the owner or his representative which details his method of visual inspection and periodic system checks to ensure leak-proof factory fabrication.

1.06 CERTIFICATION AND TEST REPORTS

Prior to installation of the panels, the fabricator shall provide the Owner, or his representative, with written certification that the factory seams were inspected in accordance with Section 1.05.

1.07 PANEL PACKAGING AND STORAGE

Factory fabricated panels shall be accordian-folded, or rolled, onto a sturdy wooden pallet designed to be moved by a forklift or similar equipment. Each factory fabricated panel shall be prominently and indelibly marked with the panel size. Panels shall be protected as necessary to prevent damage to the panel during shipment.

Panels which have been delivered to the project site shall be stored in a dry area.

1.08 QUALIFICATIONS OF SUPPLIERS

The fabricator of the lining shall be experienced in the installation of flexible membrane lining, and shall provide the Owner, or his representative with a list of not less than five (5) projects and not less than 1 million square feet of successfully installed XR-5® synthetic lining. The project list shall show the name, address, and telephone number of an appropriate party to contact in each case.

The installer shall provide similar documentation.

1.09 SUBGRADE PREPARATION BY OTHERS

Lining installation shall not begin until a proper base has been prepared to accept the membrane lining. Base material shall be free from angular rocks, roots, grass and vegetation. Foreign materials and protrusions shall be removed, and all cracks and voids shall be filled and the surface made level, or uniformly sloping as indicated on the drawings. The prepared surface shall be free from loose earth, rocks, rubble and other foreign matter. Generally, no rock or other object larger than USCS sand (SP) should remain on the subgrade in order to provide an adequate safety factor against puncture. Geotextiles may be used to compensate for irregular subgrades. The subgrade shall be uniformly compacted to ensure against settlement. The surface on which the lining is to be placed shall be maintained in a firm, clean, dry and smooth condition during lining installation.

1.10 LINING INSTALLATION

Prior to placement of the liner, the installer will indicate in writing to the owner or his representative that he believes the subgrade to be adequately prepared for the liner placement.

The lining shall be placed over the prepared surface in such a manner as to assure minimum handling. The sheets shall be of such lengths and widths and shall be placed in such a manner as to minimize field seaming.

In areas where wind is prevalent, lining installation should be started at the upwind side of the project and proceed downwind. The leading edge of the liner shall be secured at all times with sandbags or other means sufficient to hold it down during high winds.

Sandbags or rubber tires may be used as required to hold down the lining in position during installation. Materials, equipment or other items shall not be dragged across the surface of the liner, or be allowed to slide down slopes on the lining. All parties walking or working upon the lining material shall wear soft-sole shoes.

Lining sheets shall be closely fit and sealed around inlets, outlets and other projections through the lining. Lining to concrete seals shall be made with a mechanical anchor, or as shown on the drawings. All piping, structures and other projections through the lining shall be sealed with approved sealing methods.

1.11 XR-5® FIELD SEAMING

All requirements of Sections 1.04 and 1.05 apply. A visible bead should be extruded from the hot air welding process.

Field fabrication of lining material will not be allowed.

1.12 INSPECTION

All field seams will be tested using the Air Lance Method. A compressed air source will deliver 55 psi minimum to a 3/16 inch nozzle. The nozzle will be directed to the lip of the field seam in a near perpendicular direction to the length of the field seam. The nozzle will be held 4 inches maximum from the seam and travel at a rate not to exceed 40 feet per minute. Any loose flaps of 1/8" or greater will require repair.

All field seams can also be inspected utilizing the Vacuum Box Technique, as described in ASTM D35.1.89, Standard Practice for Seam Evaulation by Negative Pressure Method, except a pressure of 3 to 5 psi should be used. All leaks shall be repaired and tested.

All joints, on completion of the work, shall be tightly bonded. Any lining surface showing injury due to scuffing, penetration by foreign objects, or distress from rough subgrade, shall as directed by the Owner, or his representative, be replaced or covered, and sealed with an additional layer of lining of the proper size, in accordance with the patching procedure.

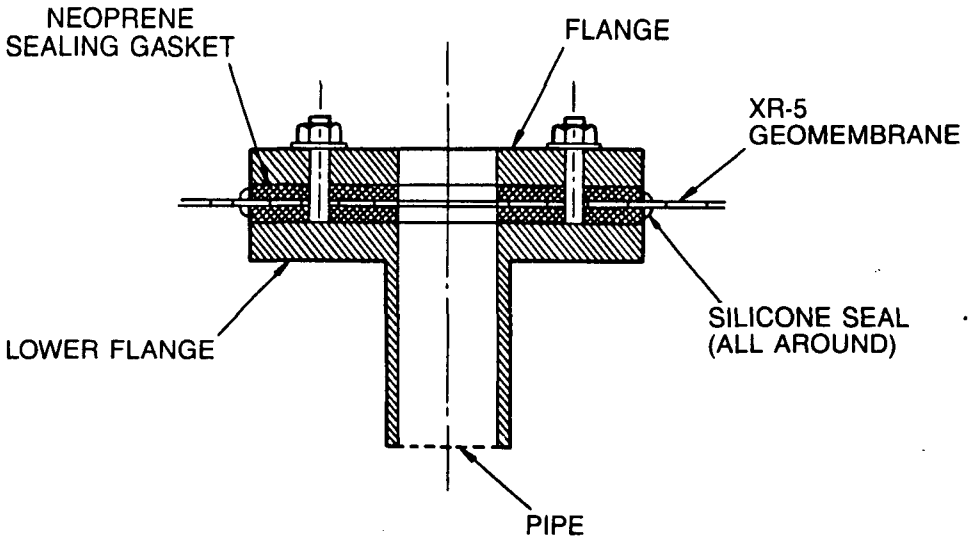
1.13 PATCHING

Any repairs to the lining shall be patched with the lining material. The patch material shall have rounded corners and shall extend a minimum of four inches (4″) in each direction from the damaged area.

Seam repairs or seams which are questionable should be cap stripped with a 1″ wide strip of the liner material. The requirements of Section 1.11 apply to this cap stripping.

1.14 WARRANTY

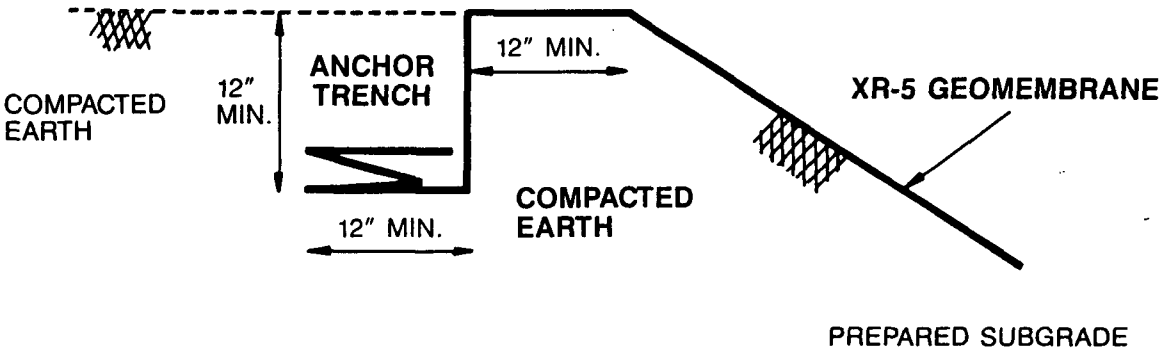
The lining material shall be warranted on a pro-rated basis for 10 years against both weathering and chemical compatability in accordance with Seaman Corporation warranty for XR-5 Style 8130. A test immersion will be performed by the owner and the samples evaluated by the manufacturer. Workmanship of installation shall be warrantied for one year on a 100% basis.



Seaman Corporation
INDUSTRIAL FABRICS DIVISION
1000 Venture Blvd., Wooster, Ohio 44691

FLANGE CONNNECTION TO PIPE SECTION

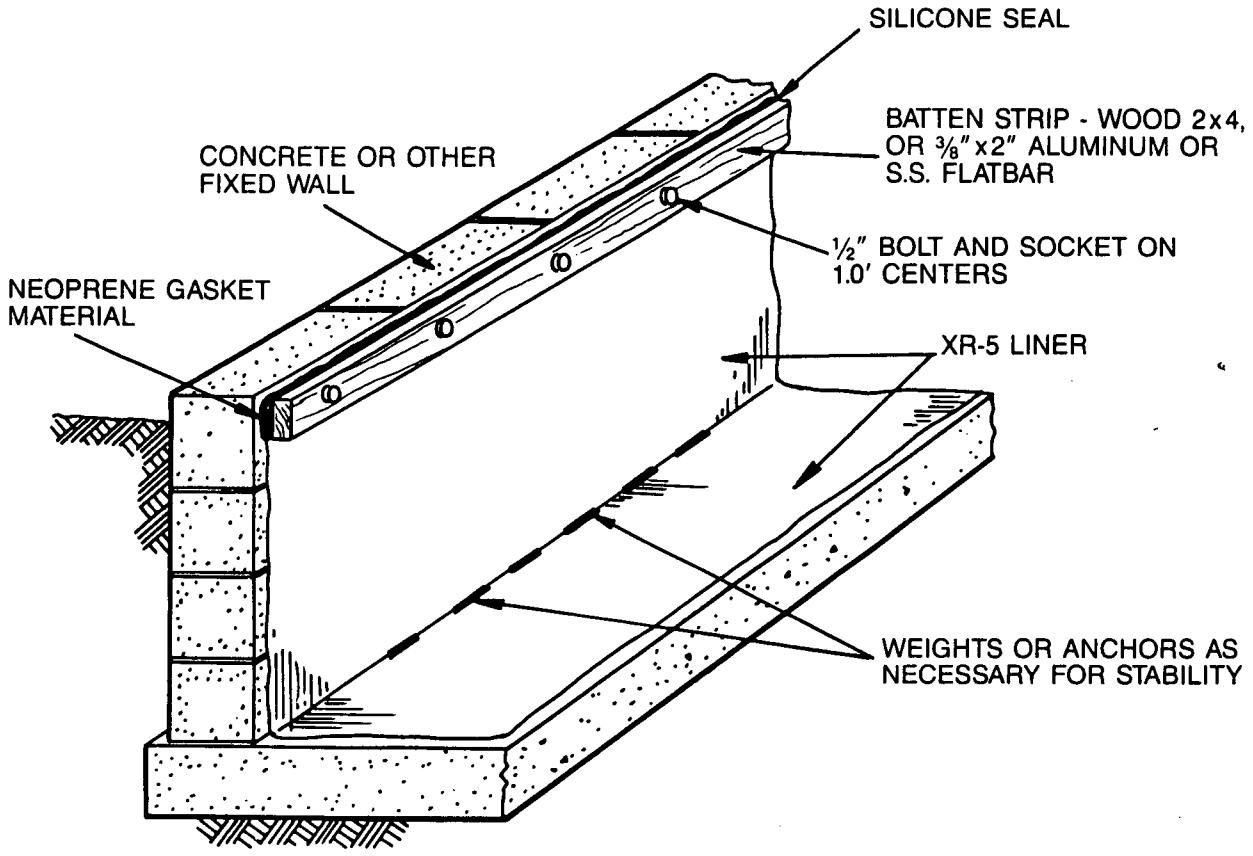
SCALE: NONE	
SHEET 1 OF 1	DRAW. NO. XRD-019



Seaman Corporation
INDUSTRIAL FABRICS DIVISION
1000 Venture Blvd., Wooster, Ohio 44691

ELEVATION VIEW
TYPICAL ANCHOR DETAILS
XR-5 LINER

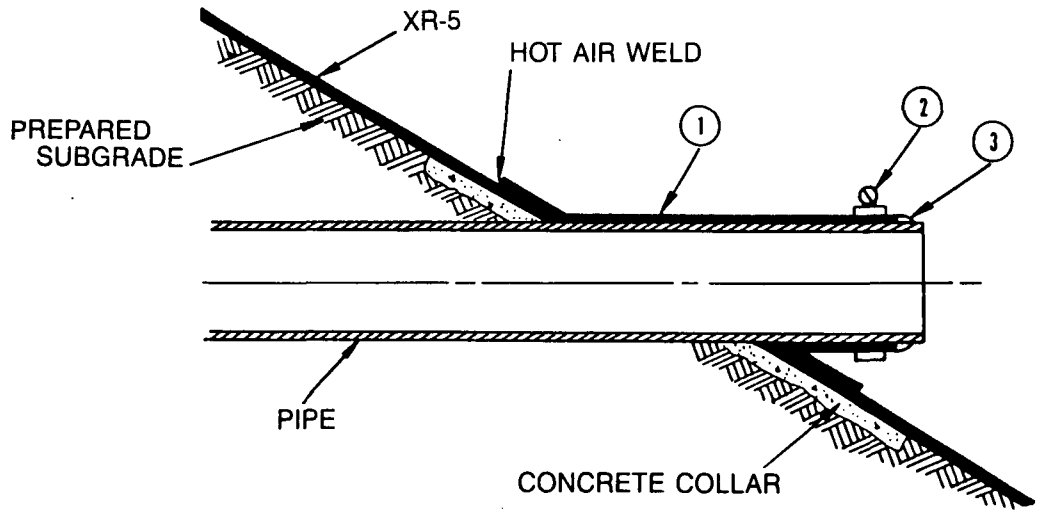
SCALE: NONE	
SHEET 1 OF 1	DRAW. NO. XRD-001



Seaman Corporation
INDUSTRIAL FABRICS DIVISION
1000 Venture Blvd., Wooster, Ohio 44691

ANCHORING DETAIL XR-5 LINER TO FIXED WALL

SCALE: NONE	
SHEET *1* OF *1*	DRAW. NO. *XRD-023*

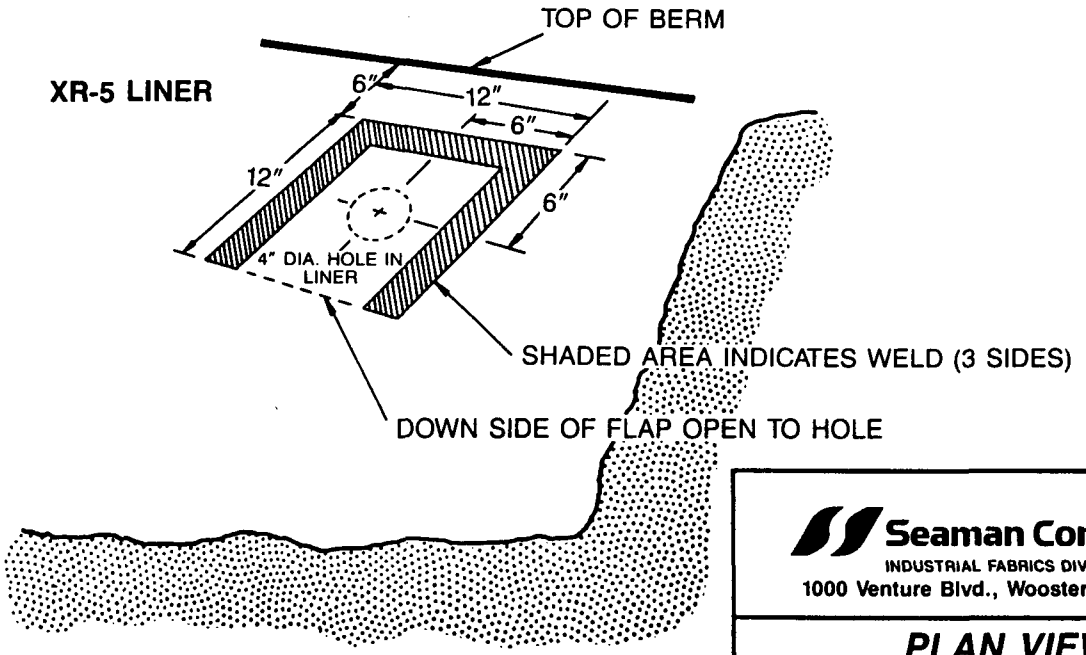


① - *PREFORMED FLASHING (XR-5)*
② - *STAINLESS STEEL CLAMP (ASSUMES COMPATIBILITY)*
③ - *SILICONE SEALANT (AS COMPATIBLE)*

Seaman Corporation
INDUSTRIAL FABRICS DIVISION
1000 Venture Blvd., Wooster, Ohio 44691

ELEVATION VIEW TYPICAL PIPE PUNCTURE SEAL DETAIL XR-5 LINER

SCALE: NONE	
SHEET *1* OF *1*	DRAW. NO. *XRD-018*



Seaman Corporation
INDUSTRIAL FABRICS DIVISION
1000 Venture Blvd., Wooster, Ohio 44691

PLAN VIEW FLAP VENT DETAIL XR-5 LINER

SCALE: NONE	
SHEET *1* OF *1*	DRAW. NO. *XRD-012*

SECTION E — WARRANTY INFORMATION

WARRANTY

XR-5 is offered with Seaman Corporation standard warranty which addresses weathering and chemical compatibility for a 10-year period. A test immersion is required with subsequent testing and approval by Seaman Corporation.

PART E-1: INSTRUCTIONS FOR XR-5® TEST IMMERSIONS AND WARRANTY REQUESTS

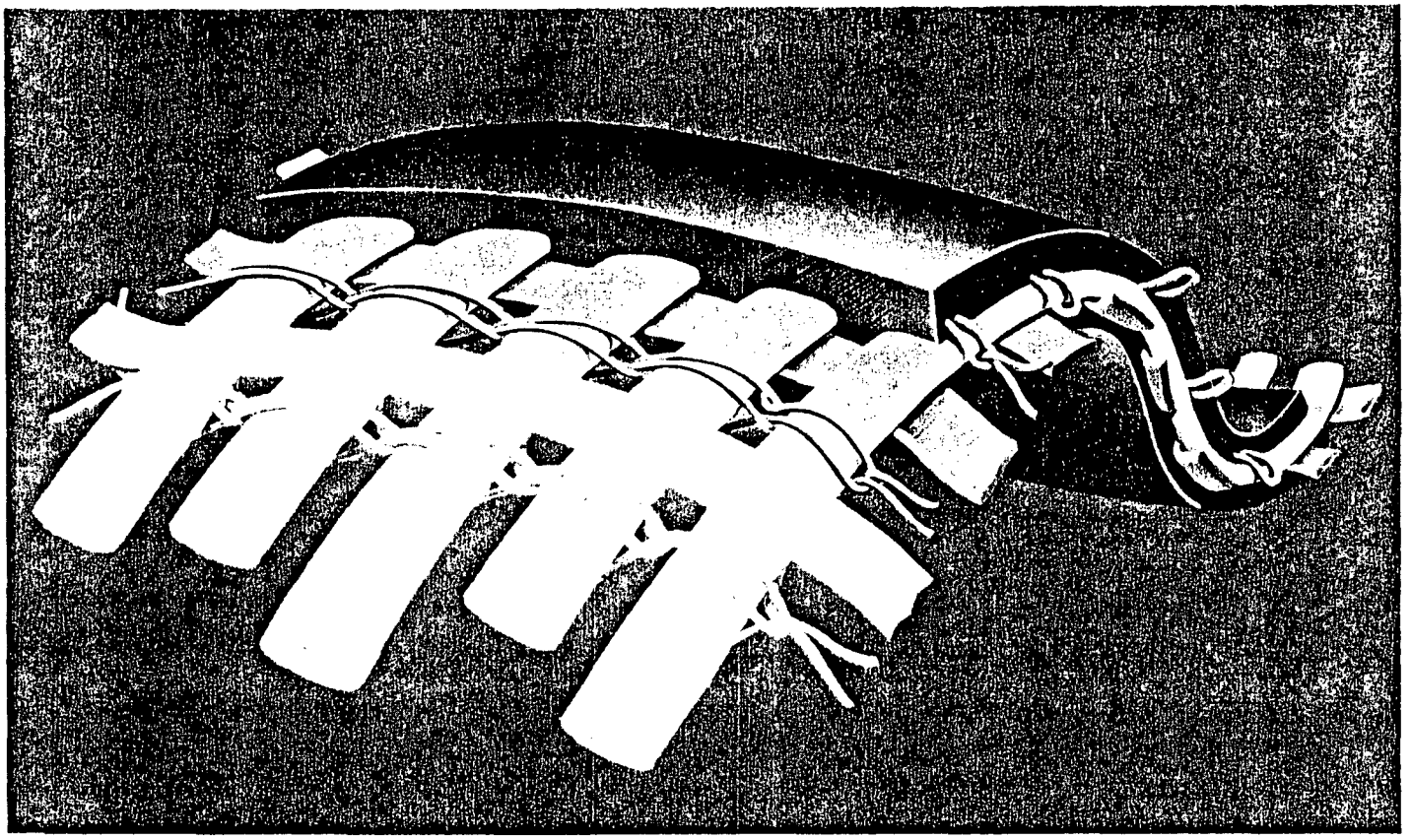
1. Completely immerse six Style 8130 XR-5 samples (8-1/2" x 11" size) in the liquid to be contained.

2. At the end of approximately thirty days, retrieve three of the samples. The samples should be rinsed with fresh water and dried.

3. Send the three samples to:
   Attn: Geomembrane Department
   Seaman Corporation
   1000 Venture Blvd.
   Wooster, Ohio 44691

4. Keep the other three samples immersed until further notice in case longer immersion data is required.

5. Complete and return the information form (Section E-2) on the liner application.



XR-5: High Performance Composite Geomembrane

Seaman Corporation

INDUSTRIAL FABRIC DIVISION
1000 [illegible]ture Blvd.
Wc [illegible].o 44691
[illegible]. 262-1111

 10/89

INTEGRA PLASTICS INC.

TECHNICAL SPECIFICATION SHEET
80 MIL BLACK-HDPE

Properties	Test Method	Value
Density	ASTM-D-1505	.948
Profile Thickness	ASTM D-1593	80 mil
Tensile Strength Yield	ASTM D-638	200 lbs.
Tensile Strength Break	ASTM D-638	330 lbs.
Tear Strength	ASTM 1004	63 lbs.
Puncture Resistance	FTMS-101	120 lbs.

The values listed above are typical properties and are intended to be used as guidelines only. No guarantee or warranty regarding performances of this product is made by Integra Plastics, Inc., FKA/Ultra Flex, Inc. as the manner of use, handling, and conditions are beyond our control. Install in accordance with accepted industry standards.

RECORD OF PHONE CONVERSATION (W/CHRIS EUSTICE)

Date: 8-2-94 Time: 1100 AM

RE: Permission request to spread cement on roads at TNT

Name: Darlene Schmitz

Company: T-n-T Construction, Inc.

T-n-T had requested in a letter dated ~~8-2-94~~ 7-27-94 that they be allowed to spread wet cement on their facility roads.

Per RCA, I gave them the verbal go ahead with the condition that the cement be confined to the roads within the facility proper and that it be worked into the existing surface. All conditions necessary to assure that the cement not run off the road

Comments/Followup:

T-n-T agrees to all conditions and will administer with utmost care.

7/23/94

OIL CONSERVATION DIVISION
RECEIVED
'94 JUL 27 AM 8 50

T-n-T Construction, Inc.
HCR 74, Box 115
Lindrith, New Mexico 87029

New Mexico
Energy, Minerals and Natural Resources Dept.
Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87504

Dear Kathy Brown:

T-n-T Construction, Inc. would like to request permission to accept wet cement. We propose to spray the wet cement on the roads around the soil remediation facility and the evaporation pit for dust control. It would be sprayed thin enough that it would not run off the roads.

Meridian has requested that we accept the cement from their drilling operations, so if possible could we have verbal approval as soon as possible.

Thank you for your consideration.

Sincerely;

Tony Lee Schmitz, President

Tony Lee Schmitz

cc: OCD Aztec District Office

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

April 8, 1994

CERTIFIED MAIL
RETURN RECEIPT NO. P-111-334-310

Mr. Tony L. Schmitz
T-n-T Construction, Inc.
HCR 74 Box 115
Lindrith, New Mexico 87029

RE: **ACCEPTANCE OF DRILLING MUD**
T-n-T DISPOSAL FACILITY
RIO ARRIBA COUNTY, NEW MEXICO

Dear Mr. Schmitz:

The New Mexico Oil Conservation Division (OCD) received on March 7, 1994, your guide lines for accepting drilling mud at your disposal facility located in Section 5 and Section 8, Township 25 North, Range 3 West, NMPM, Rio Arriba County, New Mexico. The proposed guidelines address the method and location that the mud will be spread onto the landfarm. The OCD approves of the method and location of spreading mud onto the landfarm as proposed in your guidelines. However, prior to spreading any drilling mud onto the landfarm it must first be received at your settling pit facility.

The settling pit installation and utilization was approved by the OCD on November 16, 1993 and included approval to accept drilling muds into the pit. Based upon your previously approved permit conditions and OCD requirements for handling drilling muds, T-n-T is authorized to accept drilling muds at the settling pit and to then spread them onto the landfarm under the following conditions:

1. Drilling muds will be received directly into the settling pit and an adequate freeboard will be maintained to prevent spillage and overflow of liquid from the tank. The OCD may require a pad and curb beneath the tank if future conditions warrant.

2. Any free oil will be removed from the drilling mud prior to removal of the mud from the settling pit. The oil will be stored in above ground closed top tanks.

3. Free water will be removed from the drilling mud prior to removal of the mud from the settling pit. The water will be stored in above ground closed top tanks and may then be spread on the landfarm for dust control and to enhance bioremediation in accordance with the September 8, 1992 Rule 711 permit approval for T-n-T's Landfarm.

4. Mud will be spread in accordance with the September 8, 1992 Rule 711 permit approval including prevention of ponding, pooling, and run-off. Mud will not be spread on soils being actively remediated.

5. No mud will be accepted at the facility without prior approval from the OCD District Supervisor to move the mud from the drilling location. In addition, each incoming load of drilling mud will be accompanied by the following information: 1) well operator name, 2) the well name and location from which the mud was transported, 3) transporter, 4) description of mud program (ie. mud composition including volume and type of chemicals added), and 5) exact cell location where the material is to be remediated. Mud records will be maintained on file at the facility for five years from the date of receipt.

6. Remediation levels for recycling of drilling mud will be in accordance with the September 8, 1992 Rule 711 permit approval. District approval must be obtained in order to remove reconditioned mud from the facility.

7. Loads of drilling mud which contain miscellaneous hydrocarbons exceeding 2/10 of 1% of the total volume of mud must be accompanied by an OCD approved C-117A from the well operator. Accumulations of miscellaneous hydrocarbons must be reported monthly on form C-112 and transportation of these hydrocarbons shall be permitted only by an approved C-104.

Please be advised that this approval does not relieve you of liability should your operation result in actual pollution of surface waters, ground waters, or the environment actionable under other laws and/or regulations. In addition, the OCD approval does not relieve you of liability for compliance with any other laws and/or regulations.

If you have any questions please do not hesitate to contact Chris Eustice at (505) 827-5824.

Sincerely,

Kathy M. Brown
Geologist

xc: Denny Foust, OCD Aztec Office

DISCHARGE PLAN INSPECTION REPORT FOR
REFINERIES, GAS PLANTS AND COMPRESSOR STATIONS

rev. 12/93

OPERATOR: TNT

FACILITY NAME: Commercial Evaporation Pond

GW-#:

TYPE: brine water disposal

LOCATION:

COUNTY: Rio Arriba

INSPECTION DATE: March 22, 1994

INSPECTOR(S): R. Anderson, B. Myers

CONTAINMENT

Berms: berms around tanks need to be rebuilt to maintain overflows. Large berm east of tank area to keep runoff on-site.

Sumps: Truck unloading sump filled with frozen oily water. Site attendant said that tank line froze during winter, liquids overflowed when filling tank, dumping into sump area.

WASTE STREAM

Liquid: Overspray from ponds reaching surrounding trees, salt starting to affect them. Spray pressure needs regulating to keep it on ponds.

Solid: Landfarm all bermed, but doesn't look to have been disced in a while.

signature Robert D. Myers II

date 4/7/94

Roger Anderson - I have an original copy

OIL CONSERVATION DIVISION
RECEIVED
'94 MAR 7 AM 8 39

OIL CONSERVATION DIVISION
RECEIVED
'94 MAR 7 AM 8 39

T-n-T Construction
HCR 74 BOX 115
Lindrith N.M. 87029

Oil Conservation Division
1000 Rio Brazos Rd.
Aztec, New Mexico 87410

Dear, Denny Foust

This will be the following guide lines for accepting drilling mud. We propose to use the Northeast corner of the facility. A 300 ft. by 200 ft. area will be divided into 20 ft. by 300 ft. cells by berms shown in exhibit #1 and #2.

Drilling mud will be transported in by water truck or other transportation. It will be spread evenly with equipment as needed to a maximum of 4 inches.

Treatment zone monitoring will follow the original permit for the land farm. When lift is dry it will be stock pilled with equipment and be utilized in off site uses.

Sincerely,

Tony Schmitz

Tony Schmitz
T-N-T Construction

Exhibit #1

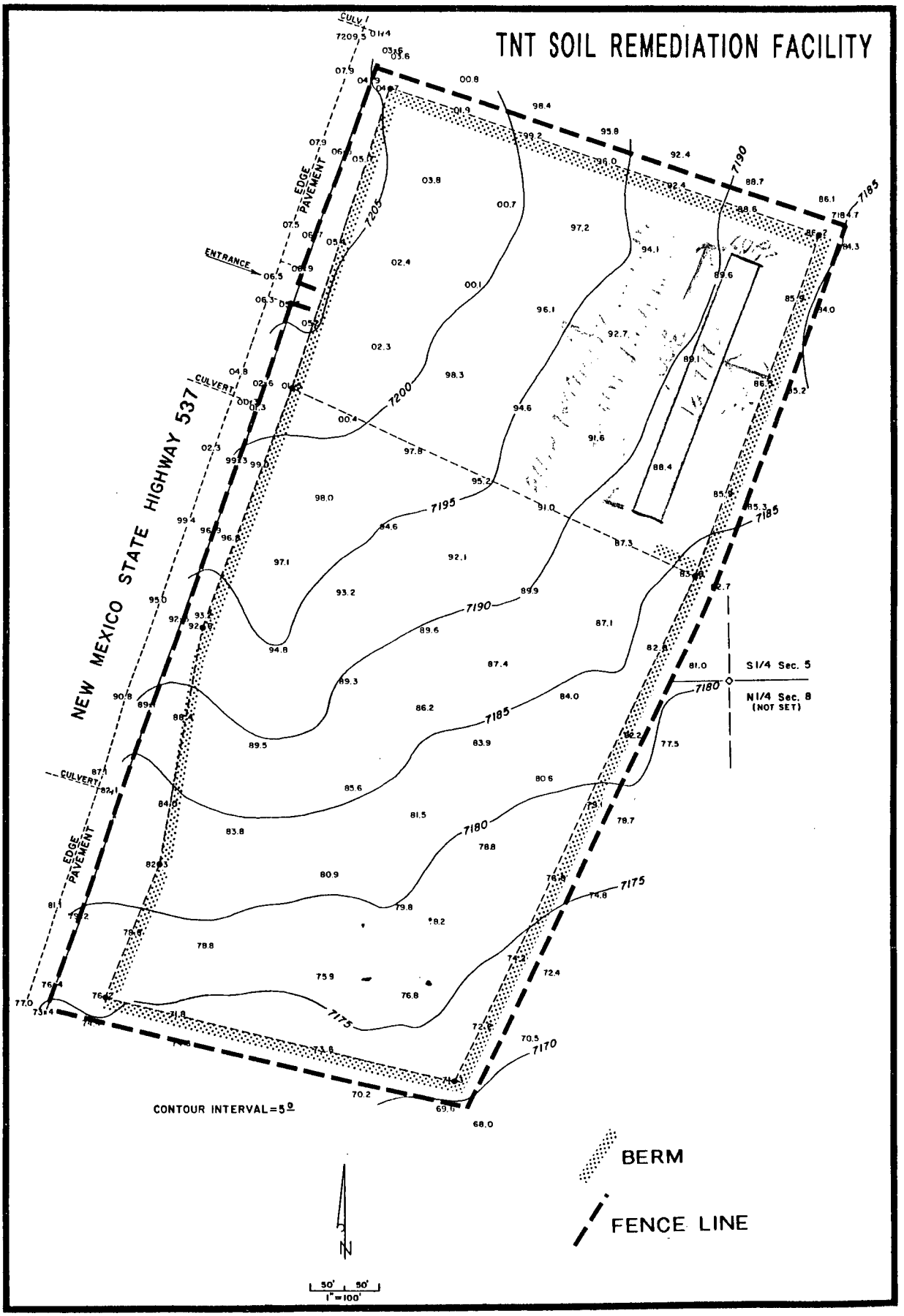
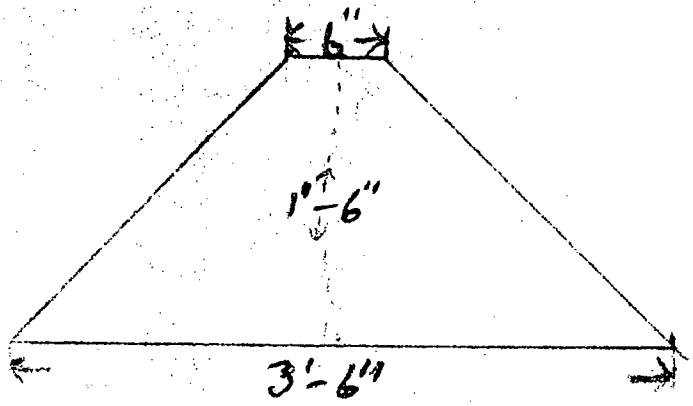


Figure 5. A diagram showing the location of ponding areas (blue) along the perimeter berm (stippled) where normal or 100 year run-off waters are projected to pool.

exhibit #2



DIMENTIONS OF BERMS

STATE OF NEW MEXICO
ENERGY, MINERALS and NATURAL RESOURCES DIVISION
OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE

RECEIVED
'94 JAN 20 AM 9 30

New Mexico DRUG FREE It's a State of Mind!

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

1000 RIO BRAZOS ROAD
AZTEC, NEW MEXICO 87410
(505) 334-6178

January 18, 1994

T-N-T Construction Inc
Attn. Tony Schmitz
HCR 74 Box 115
Lindrith NM 87029

RE: Drilling Mud Landfarming

Dear Mr. Schmitz:

As per my conversation with Roger Anderson on January 14, 1994, Santa Fe needs the following materials to review for approval of a drilling mud landfarm operation such as we discussed as being feasible. T-N-T will submit a proposal detailing the plans to level certain cells, berm these cells (size, location of cells on plat, height and width of dikes). Explain the proposed method of spreading drilling mud and the maximum depth/thickness to be applied. It is suggested that T-N-T have the operator file a list of the commercial mud additives before accepting the mud. Acceptance will be by permit as required for all commercial landfarms in Oil Conservation District III. Propose treatment zone monitoring procedures T-N-T wishes to utilize.

If you have questions feel free to call me at 505-334-6178. I have a 10:00 AM meeting at the Apache office January 25, 1994. I will attempt to visit your office in the afternoon. If T-N-T should have a rough draft of the drilling mud landfarming proposal available we could review it January 25th.

Yours truly,

Denny G. Foust

Denny G. Foust
Environmental Geologist

XC: OCD Environmental Bureau
Environmental File
DGF File

T-n-T Construction, Inc
Tony Lee Schmitz, Pres.
HCR 74 Box 115
Lindrith, New Mexico 87029
774-6663

October 25, 1993

Oil Conservation Division
1000 Rio Brazos Rd.
Aztec, New Mexico 87410

Dear Mr. Denny Foutz:

I would like to request permission to use a metal pit, 8 foot by 28 foot, for a settling pit for water, iron sulfide and dirt. I have had requests to take these as a result of oil companies changing out production pits or installing fiberglass or metal pits. It will be liquid enough to pick up with a water truck. I need to let it settle for several days for any oil or water to come to the top. Then the oil and water can be pulled off with a water truck and taken to the disposal. The iron sulfide and dirt can be spread on the ground inside of level dikes to keep it from running and keep rain water out of it. It will be treated as contaminated soil.

I have had requests to take drilling mud and would like to request permission to accept it, if it could be handled in the same manner as described above.

Thank you for your consideration.

Sincerely;

Tony Schmitz

Tony Schmitz

cc: OCD, Santa Fe

Roger

OIL CONSERVATION DIVISION
RECEIVED

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July 16, 1993

Field Inspection by Denny G. Foust
Aztec District III

TnT Commercial Evaporation Ponds, J-8-25N-03W, Rio Arriba County, New Mexico

The lower clay lined pit tested 0.2 ppm H2S and the upper plastic lined pond tested 0.1 ppm H2S on H2S Monitor HS-82A. TnT's instrument correlates to OCD's readings. The high readings were obtained in ambient air on the downwind side of the individual ponds while sprayers were in operation at 11:30 AM on July 15, 1993. Clayton Post was present representing TnT. Mr. Post was informed of the readings. The ponds are still black in color and are experiencing serious blowover from the sprayer systems. The ponds are three to four feet below capacity, both ponds were at or near capacity in early May. Water has been disposed of by evaporation and also utilized for highway construction under permit from the Aztec District. The TnT ponds do not have aeration and have only been subjected to chemical treatment sporadically. The sprayer intakes are located on the bottom near the sprayer pumps. Probable solutions for this ongoing problem with H2S include regular chemical maintenance, better circulation including getting chemicals on the bottom of the ponds and aeration.

GEOMAT Inc. 909 ½ West Apache ◆ Farmington, New Mexico 87401 ◆ 505-327-7928

T.N.T. Construction, Inc.
HRC 74-Box 115
Lindrith, NM 87029

May 20, 1993

Attention: Mr. Tony L. Schmitz

Regarding: Observations of Soil
Remediation Facility, Area I
Lindrith, New Mexico

GEOMAT No. 1752

Gentlemen:

As you requested, we have performed visual observations, field measurements and testing, and laboratory testing for the above referenced project. The purpose of our services was to evaluate the as-constructed berms and receiving area for general conformance with the specifications as described on Page 6 of your Application for a Soil Remediation Facility, dated June 1, 1992. The visual observations and field work were performed by *GEOMAT* Inc. personnel on May 9, 1993.

The cross-sectional dimension of each of the four berms was measured at one location for each berm. The measured berm slopes are depicted in the table as horizontal to vertical distances from the top edge of the berm to the existing ground elevation. The berm measurements are summarized in the table on the following page.

These measurements were performed after the project was completed and it should be noted that *GEOMAT* Inc. personnel were not on site during the construction of this facility.

BERM MEASUREMENTS

Measurement Location	Berm Width at Top (feet)	Berm Height (feet)	Measured Slope Horizontal to Vertical	
			Inside Slope	Outside Slope
West Dike, 50′ From North End	2	2.50	16:3	10:2
North Dike, 50′ From East End	2	3.00	14:3	9:3
East Dike, 50′ From South End	2	3.75	13:3½	14:4
South Dike, 25′ From West End	3	3.50	10:3	12:4

NOTE: The above dimensions were measured with a hand-held eye level, stadia rod, and conventional tape measure. Therefore, the level of accuracy of these dimensions are limited and approximate.

A field density test was performed on each of the four berms. The approximate locations and the results of this testing are presented in the following table.

FIELD DENSITY TEST RESULTS

Test Location	Field Dry Density (pcf)	Field Moisture Content (%)	Laboratory Test and Field Compaction Results	
			Laboratory Dry Density (pcf)	Degree of Compaction (%)
West Berm, 50' From North End	109.6	17.8	119.3	92
North Berm, 50' From East End	106.2	13.7	119.3	89
East Berm, 50' From South End	103.8	14.9	119.3	87
South Berm, 25' From West End	105.4	14.1	119.3	88

The above compaction results are based on an ASTM D698 maximum dry density-optimum moisture content relationship laboratory test. The results of this test were 119.3 pcf maximum dry density and 12.0% optimum moisture content. The soil tested was visually classified as a sandy clay.

The receiving area, on-site, was an excavation lined with a synthetic liner which we understand is 40 mil thick. The excavation was 3 to 4 feet deep and had plan dimensions of 35 feet wide and 80 long. We understand this excavation was to be backfilled following our observations.

GEOMAT Inc. personnel were not on-site full time during the construction of this facility and, therefore, the measurements and test results reported herein are only valid for the approximate test locations indicated. The results of our visual observations, field measurements and testing, and laboratory testing indicated the items checked at the referenced locations generally conform with the specifications as contained in the Application for a Soil Remediation Facility.

We appreciate the opportunity to be of service to you on this project. If you have any questions or comments we will be most happy to discuss them with, you at your convenience.

Sincerely Yours,
GEOMAT Inc.

GEORGE A. MADRID
NEW MEXICO
9110
REGISTERED PROFESSIONAL ENGINEER

George A. Madrid, P.E.
Principal Engineer

Raymond F. Johnston, E.I.T.
Field Engineer

Distribution: Addressee (3)

STATE OF NEW MEXICO

ENERGY, MINERALS and NATURAL RESOURCES DIVISION

OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

1000 RIO BRAZOS ROAD
AZTEC, NEW MEXICO 87410
(505) 334-6178

Certified Mail Receipt #P 987 892 064

April 29, 1993

T-N-T Construction Inc
Attn: Darlene Schmitz
HCR 74 - Box 115
Lindrith, NM 87029

RE: Commercial Water Disposal Facilities Annual Laboratory Analysis of Leak Detection System Fluids and Comparison to Pond Fluids

Dear Ms. Schmitz:

You are hereby directed to initiate an annual laboratory analysis of leak detection system fluids. The annual testing shall consist of sampling any fluids contained in the leak detection system of any commercial disposal pond to analyze for volatile aromatic hydrocarbons utilizing EPA method 602 and analyze for major cations/anions. A sample of pond water will also be analyzed for comparison. The Oil Conservation Division will split samples with the operators on this initial testing. Operators will furnish a satisfactory method for obtaining an uncontaminated water sample. Sampling should be completed by May 17, 1993.

Please contact Denny Foust at 505-334-6178 to schedule sampling and for any further information.

Yours truly,

Denny G. Foust
Environmental Geologist

XC: OCD-Environmental Bureau
DGF File
Environmental File

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

DRUG FREE

MEMORANDUM

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

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

TO: ALL COMMERCIAL SURFACE DISPOSAL FACILITIES

FROM: WILLIAM J. LEMAY, Director
Oil Conservation Division

SUBJECT: DOCUMENTATION REQUIRED FOR ACCEPTANCE OF WASTE

DATE: APRIL 2, 1993

The Oil Conservation Division (OCD) has issued a number of Rule 711 permits for commercial surface disposal facilities which allow the facilities to accept certain types of wastes. The OCD has not previously listed the documentation that should accompany all waste accepted at these facilities. Attached is a list of the documentation to accompany any waste accepted by an OCD-permitted commercial disposal facility. Listed are the certifications and tests required for the various classifications of waste. Also attached is a list of the oil and gas wastes exempted from EPA "hazardous waste" classification.

This documentation provides protection from hazardous waste regulations for the waste generator, transporter and disposal facility and facilitates OCD oversight. Please note that certain types of non-oilfield wastes can also be accepted by a disposal facility under its OCD Rule 711 permit. The OCD is currently in the process of developing an information form to accompany each load of waste received at a disposal facility. Until that form is finalized, each facility may develop and use its own forms and shall retain these records at the facility.

If you have any questions regarding the technical aspects of the documentation needed, please call **Roger Anderson** at **505/827-5812**.

DOCUMENTATION REQUIRED TO ACCEPT WASTES
COMMERCIAL SURFACE DISPOSAL FACILITIES
(April 1, 1993)

1. Exempt Oilfield Waste: A "Certification of Waste Status" signed by a corporate official of the waste generator certifying that the wastes are generated from oil and gas exploration and production operations and are exempt from Resource Conservation and Recovery Act (RCRA) Subtitle C regulations.

2. Exempt, Non-Oilfield Waste: A "Certification of Waste Status" signed by the New Mexico Environment Department (NMED) or the appropriate regulatory agency for non-oilfield wastes which are exempt from RCRA Subtitle C regulations. Acceptance is on a case-by-case basis only after OCD approval from both Santa Fe and the appropriate district office.

3. Non-exempt, Non-hazardous Waste from OCD Permitted Facilities: The analytical results of *Hazardous Waste Characterization. The test for hazardous characteristics for a particular waste may be effective for one year from the date of analysis, if, the subsequent wastes from the same waste stream are accompanied by a statement from a corporate official that there has been no change in the processes employed or the chemicals stored/used at the facility generating the waste. Acceptance is on a case-by-case basis only after OCD approval from both Santa Fe and the appropriate district office.

4. Non-Exempt, Non-hazardous, Non-Oilfield Waste: The analytical results of *Hazardous Waste Characterization **and** a "Certification of Waste Status" certifying the non-hazardous classification of the wastes signed by the NMED or appropriate regulatory agency. Acceptance of waste is on a case-by-case basis only after OCD approval from both Santa Fe and the appropriate district.

5. Hazardous Waste: At no time will wastes which are hazardous by either listing or testing be accepted at an OCD permitted disposal facility.

* Includes corrosivity, reactivity, ignitability, and toxic constituents and a certification that no listed hazardous wastes are contained within the wastes. The samples for these analyses and results will be obtained from the wastes prior to removal from the generator's facility and without dilution in accordance with EPA SW-846 sampling procedures.

EPA WASTE CLASSIFICATION
O & G EXPLORATION AND PRODUCTION WASTES*

Oil and Natural Gas Exploration and Production Materials and Wastes Exempted by EPA from Consideration as "Hazardous Wastes" (provided non-exempt waste which is or may be "hazardous" has not been added):

- Produced water;
- Drilling fluids;
- Drill cuttings;
- Rigwash;
- Drilling fluids and cuttings from offshore operations disposed of onshore;
- Geothermal production fluids;
- Hydrogen sulfide abatement wastes from geothermal energy production;
- Well completion, treatment, and stimulation fluids;
- Basic sediment and water and other tank bottoms from storage facilities that hold product and exempt waste;
- Accumulated materials such as hydrocarbons, solids, sand, and emulsion from production separators, fluid treating vessels, and production impoundments;
- Pit sludges and contaminated bottoms from storage or disposal of exempt wastes;
- Workover wastes;
- Gas plant dehydration wastes, including glycol-based compounds, glycol filters, filter media, backwash, and molecular sieves;
- Gas plant sweetening wastes for sulfur removal, including amines, amine filters, amine filter media, backwash, precipitated amine sludge, iron sponge, and hydrogen sulfide scrubber liquid and sludge;
- Cooling tower blowdown;
- Spent filters, filter media, and backwash (assuming the filter itself is not hazardous and the residue in it is from an exempt waste steam);
- Packing fluids;
- Produced sand;
- Pipe scale, hydrocarbon solids, hydrates, and other deposits removed from piping and equipment prior to transportation;
- Hydrocarbon-bearing soil;
- Pigging wastes from gathering lines;
- Wastes from subsurface gas storage and retrieval, except for nonexempt wastes listed below;
- Constituents removed from produced water before it is injected or otherwise disposed of;
- Liquid hydrocarbons removed from the production stream but not from oil refining;
- Gases from the production stream, such as hydrogen sulfide and carbon dioxide, and volatilized hydrocarbons;
- Materials ejected from a producing well during the process known as blowdown;
- Waste crude oil from primary field operations and production;
- Light organics volatilized from exempt wastes in reserve pits or impoundments or production equipment;
- *Liquid and solid wastes generated by crude oil and crude tank bottom reclaimers****.

Materials and Wastes Not Exempted (may be a "hazardous waste" if tests or EPA listing define as "hazardous") **:

- Unused fracturing fluids or acids;
- Gas plant cooling tower cleaning wastes;
- Painting wastes;
- Oil and gas service company wastes, such as empty drums, drum rinsate, vacuum truck rinsate, sandblast media, painting wastes, spent solvents, spilled chemicals, and waste acids;
- Vacuum truck and drum rinsate from trucks and drums transporting or containing non-exempt waste;
- Refinery wastes;
- *Liquid and solid wastes generated by refined oil and product tank bottom reclaimers****;
- Used equipment lubrication oils;
- Waste compressor oil, filters, and blowdown;
- Used hydraulic fluids;
- Waste solvents;
- Waste in transportation pipeline-related pits;
- Caustic or acid cleaners;
- Boiler cleaning wastes;
- Boiler refractory bricks;
- Boiler scrubber fluids, sludges, and ash;
- Incinerator ash;
- Laboratory wastes;
- Sanitary wastes;
- Pesticide wastes;
- Radioactive tracer wastes;
- Drums, insulation, and miscellaneous solids.

---

* Source: Federal Register, Wednesday, July 6, 1988, p.25,446 - 25,459.

** See important note on 1990 disposal restrictions for non-exempt waste on reverse.

*** See reverse side for explanation of oil and tank bottom reclaimer listings.

(rev. NMOCD 9/91)

NOTES:

1. As of September 25, 1990, any facility disposing of 1.1 tons or more of **non-exempt** waste per month with benzene as a constituent (e.g. oily liquid or solids, or aromatic wastes) is disposing of hazardous waste if, after testing, benzene levels of liquids, and of liquid leachate from solids are above 0.5 milligrams per liter (equivalent to 500 parts per billion). Benzene is a naturally occurring constituent of crude oil and refined product (especially gasoline), and is also used as a cleaning solvent. (Other types of solvents and chemicals have been subject to hazardous waste rules for several years.)

   As of March 29, 1991, facilities disposing of between 0.11 and 1.1 tons of **non-exempt** waste per month became subject to the same rules. Regulation of such facilities is the responsibility of either the US Environmental Protection Agency or the New Mexico Environment Department (dependent on jurisdiction transfer from USEPA).

   The following OCD regulated facilities, especially, may be subject to hazardous waste rules for disposal of wastes and contaminated soils containing benzene:

   - Oil and gas service companies having wastes such as vacuum truck, tank, and drum rinsate from trucks, tanks and drums transporting or containing non-exempt waste.
   - Crude oil treating plants and crude tank bottom reclaimers using benzene solvent, or liquids containing benzene as cleaning solutions.
   - Transportation pipelines and mainline compressor stations generating waste, including waste deposited in transportation pipeline-related pits.

   Source: Federal Register, Thursday, March 29, 1990, p.11,798 - 11,877.

2. In April, 1991, EPA clarified the status of oil and tank bottom reclamation facilities:

   A. Those wastes that are derived from the processing by reclaimers of only exempt wastes from primary oil and gas field operations are also exempt from the hazardous waste requirements. For example, wastes generated from the process of recovering crude oil from tank bottoms are exempt because the crude storage tanks are exempt.

   B. Those reclaimer wastes derived from non-exempt wastes (eg. reclamation of used motor oil, refined product tank bottoms), or that otherwise contain material which are not uniquely associated with or intrinsic to primary exploration and production field operations would not be exempt. An example of such non-exempt wastes would be waste solvent generated from the solvent cleaning of tank trucks that are used to transport oil field tank bottoms. The use of solvent is neither unique nor intrinsic to the production of crude oil.

   Source: EPA Office of Solid Waste and Emergency Response letter opinion dated April 2, 1991, signed by Don R. Clay, Assistant Administrator.

CORN CONSTRUCTION CO.

New Mexico Contractor's License #28273

P.O. Box 92797
Albuquerque, New Mexico 87199-2797

(505) 822-1776

November 19, 1992

Mr. Bill LeMay
Director Oil Conservation Division
P.O. Box 2088
Santa Fe, N.M. 87504

Dear Mr. LeMay:

Corn Construction Co. is working on State Highway 537 located near the intersection of State Highway 44 north of Cuba. This is a Federal Highway Administration project on the Jicarilla-Apache Indian Reservation.

We are obtaining water from T & T Construction Inc. to meet the demands of the earthwork portion of our contract. This letter is to inform you the water from T & T will not run off the construction site, be allowed to pond, or affect any waterway. It's sole usage is for the construction operations. Our intended completion date for construction operations is August 1993.

If you should have any questions, please do not hesitate to call me at the number listed above.

Sincerely,

Marvin R. Appel
Vice President

Nov. [illegible] 1992

Oil Conservation Division
1000 Rio Brazos Rd.
Aztec, N.M. 87410

OIL CONSERVATION DIVISION
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Frank Chavez:

T-N-T Construction, Inc. would like to renew authorization to use disposal water from the main storage pit for construction of 2 miles of ~~State~~ Highway 537 - Contracton name is INCA.

Also T-N-T needs authorization to use the disposal water on another 5 miles of State Highway 537 - Contractor name is Corn Construction Co, of Grand Function, Colo.

Some will be used this fall but the majority will be used next spring when it gets warm enough to work.

An analisis on the water was run on 9/17/91

Thank you for your consideration.

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T-N-T Construction
Darlene Schmitz
HCR 74- Box 115
Lindrith, N.M. 87029

Attn
Kathy Brown

Sept. 3, 1992

Oil Conservation Division
P.O. Box 2088
Santa Fe, N.M. 87504-2088

OIL CONSERVATION DIVISION
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Dear Kathy Brown:

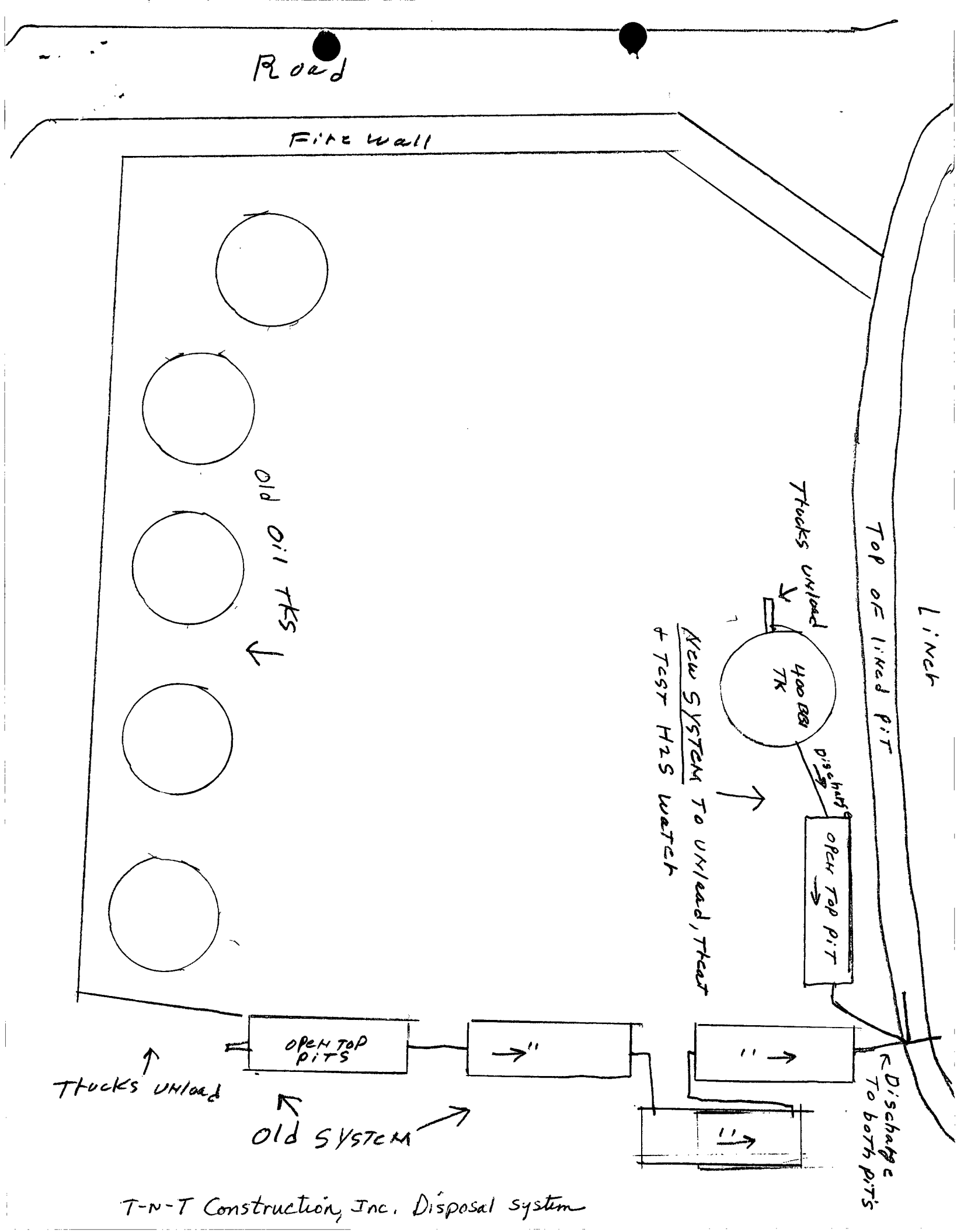
Enclosed is drawings for proposed additional Tanks to facilitate treatment of H_2S. These Tanks will keep the H_2S water seperate until it has been treated, then it will gravity flow into the main pit.

We need to start as soon as possible, so would appreciate verbal approval if possible.

Thank you.

Darlene Schmitz
T-N-T Construction Inc.
HCR 74-Box 115
Lindrith, NM 87029
774-6663

Verbal Approval Given
9/23/92
KMB



T-N-T Construction, Inc. Disposal system

Western Technologies Inc.
The Quality People
Since 1955

400 South Lorena Avenue
Farmington, New Mexico 87401
(505) 327-4966 • fax 327-5293

May 22, 1992

TNT Construction, Inc.
Star Route
Lindrith, New Mexico 87029

Attn: Mr. Craig Schmitz

Re: As-Built Evaporation Pond, Lindrith, New Mexico
Invoice No. 31220062

As you requested, we have reviewed our geotechnical engineering report, as-built drawings and made a field visit to make observations for the above referenced project. The purpose of our review was to compare the partially built pond to the original plans and our recommendations.

The pond configuration or dirt work was not changed during construction except for slight sloping of the bottom for the leak detection system. The lateral pipe slopes toward the middle of the pond and was connected to a single detector pipe which travels to the edge of the pond. The lateral pipe and single middle detector pipe were surrounded with gravel which is rapped with filter fabric. All of the bottom liner was in place except the road to the bottom and most of the thick fabric between the liners was in place except for half of the bottom and at each location of the lateral pipes.

It is our opinion that the pond is being built as the drawings indicate and according to our geotechnical engineering report.

TNT Construction, Inc.
Invoice No. 31220062

If you have any questions concerning this letter, please contact us.

Sincerely,
WESTERN TECHNOLOGIES INC.

Lawrence E. Cynova

Lawrence E. Cynova, P.E.

5-22-92

Distribution: Addressee (3)
State Engineer-Eluid L. Martinez (1)

/cb:0331C

Roger

Western Technologies Inc.
The Quality People
Since 1955

400 South Lorena Avenue
Farmington, New Mexico 87401
(505) 327-4966 • fax 327-5298

OIL CONSERVATION DIVISION
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OIL CON. DIV
DIST. 3

May 22, 1992

TNT Construction, Inc.
Star Route
Lindrith, New Mexico 87029

Attn: Mr. Craig Schmitz

Re: As-Built Evaporation Pond, Lindrith, New Mexico
Invoice No. 31220062

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TNT Construction, Inc.
Invoice No. 31220062

If you have any questions concerning this letter, please contact us.

Sincerely,
WESTERN TECHNOLOGIES INC.

Lawrence E. Cynova

Lawrence E. Cynova, P.E.
5-22-92

Distribution: Addressee (3)
State Engineer-Eluid L. Martinez (1)

/cb:0331C

TNT Construction, Inc.

HCR 74 - Box 115
Lindrith, NM 87029
(505) 774-6663

August 4, 1992

Re: Commercial Landfarm Request
Additional Information Request, dated 7-23-92
TNT Construction, Inc.
Rio Arriba County, NM

Kathy M. Brown, Geologist
New Mexico Oil Conservation Division
Box 2088
Santa Fe, New Mexico 87504

Dear Kathy Brown:

The following information is in response to your letter dated July 23, 1992 as submitted to Tony L. Schmitz, TNT Construction, Inc.

1a. TNT proposes to construct a lined receiving area for temporary storage of contaminated soils. Any contaminated soils received at the facility which are located outside of the lined receiving area will be spread and disked within 72 hours of receipt, see response 5a for more information on receiving area.

1b. All contaminated soils will be spread in 6 inch lifts or less and will be disked a minimum of one time every two weeks (biweekly) to enhance biodegradation of contaminants.

1c. TNT will receive a certified statement from the 'waste generator' that all of the contaminants in the soil received by TNT are from RCRA Subtitle C exempt wastes.

1d. OCD approval will be obtained prior to the addition of any substances to enhance biodegradation of soils landfarmed (i.e. chemicals/fertilizers, manure, nutrients, bacteria/bugs). There will be no ponding, pooling, or run-off of water during the application of non-waste water to the surface.

1e. No free liquids or soils with free liquids will be accepted at the facility.

1f. When loads of soil are received at the TNT facility an attendant will be on duty.

2. Attached is a map of all private residences within 1 mile of the proposed facility (see **Exhibit A**). There is only one residence within one mile of the landfarm facility, the Schmitz Ranch, where the Tony Schmitz family resides. The Schmitz Ranch is

located on fee lands owned by Tony Schmitz. A map showing the surface ownership and boundaries of lands within one mile of the landfarm facility is attached (**see Exhibit A**). The only land owner within 1/2 mile of the landfarm, other than Tony Schmitz, is Mrs. Clarence Vogel, 1410 Sigma Chi St., Albuquerque, NM 87104.

3. TNT submitted a letter to the sole landowner of record (Mrs. Clarence Vogel) within 1/2 mile of the proposed landfarm notifying them of the landfarm application on June 6, 1962 and the original certified mail return receipt is attached. A copy of the letter sent to Mrs. Vogel can be found in the original Landfarm Application - Appendix.

4. TNT in accordance with OCD Rule 116 "will notify the Division of any fire, break, spill, or blowout occurring at any injection or disposal facility .... such facility". TNT commits to notifying the Division of any fire, break, spill or blowout in accordance with the provisions set forth in OCD Rule 116.C.

5a. Attached is a diagram showing the location of the receiving area, cross-hatched (**see Exhibit B and C**). The receiving area will be about 35 by 80 feet in size. Contaminated soils received at the facility will, most often, be dumped within a designated cell and spread within 72 hours.

5b. Attached is a photo reduction of the landfarm survey map showing the berm location on all four sides of the facility (**see Exhibit D**). In section VII, page 6 in the Application TNT states that the berm will be constructed to a finished grade of three (3) feet or more. TNT has taken a conservative approach to how high the berm needs to be in areas of possible ponding due to rain run-off during normal or potential 100 year storms and has intentionally raised those berms in those areas.

The height of the berm is based on topographic elevations, potential ponding requirements, and a second 6 inch lift sometime in the future. The height of the berm will be:

North Side 3+ feet along the north side of the facility;

East Side 4 feet high along the north end of the east side, 3+ feet along the center portion of the east side, and from 3-7 feet high along the south end of the east side of the facility;

South Side 3- 7 feet high (west to east) along the south side of the facility;

West Side 3+ feet along the entire west side of the facility.

About 90-100 feet of the berm on the south side at the southeast corner should be 6-7 feet high and about 100-110 feet of berm should be 6 feet along the east side at the southeast corner of the facility. TNT intends to keep the top of the berm level (at a constant elevation) along most of the south side of the facility. Therefore, as ground

elevations change the actual height of the berm will change accordingly, the elevation of the top of the berm along most of the south side and about 300 feet of the east berm will remain constant. The projected berm heights are shown with hollow numbers on the attached map **(see Exhibit D).**

5c. There are no pipelines underlying the proposed landfarm facility.

5d. Two small portable building (100-200 square feet) will be located with in the 'yard' area of the proposed facility for attendants use and storage ofnon-hazardous supplies, tools, and sampling equipment **(see Exhibit B).**

If fertilizers and/or bacterial substances are utilized to enhance bioremediation, OCD approval will be requested as stated in paragraph 1d. The physical nature and volume of said substances that might be used is not known at this time. OCD approval will be obtained prior to the addition of any substances to enhance biodegradation of soils landfarmed (ie. chemicals/ fertilizers, manure, nutrients, bacteria/bugs). Storage, spill prevention and containment measures would be addressed at that time with the Division.

A 50 bbl water tank will be placed above ground within the 'yard' area near the west berm as shown on **Exhibit B.** Only non-waste (stock-surface run-off) water will be stored in the tank, which will be used for irrigation of the contaminated soil lifts.

6. Because a landfarm is designated to remediate cantaminated soils and not transfer contaminants into the underlying native soil and/or ground water, TNT will monitor a treatment zone not to exceed two (2) feet beneath the landfarm. TNT commits to the following conditions as required by the OCD:

6a. A background sample must be taken for each cell prior to placement of any contaminated soils in the cell. A minimum of one random soil sample will be taken from each individual cell six (6) months after the first contaminated soils are received in the cell and then annually thereafter. The sample will be taken at two to three (2-3) feet below the native ground surface.

6b. The soil samples will be analyzed for total petroleum hydrocarbons (TPH) and volatile aromatic organics (BTEX) using approved EPA methods. The results will be submitted to the OCD Santa Fe Office within thirty (30) days of receipt from the laboratory.

6c. After obtaining the soil samples the boreholes will be filled with an impermeable material such as bentonite cement.

6d. Any cells that have moisture added to them will be analyzed on a quarterly basis following the requirements above.

7. TNT commits to close the facility in accordance with all OCD rules and regulations

in effect at the time of closure. This inclcudes achieving the soil standard level which is in effect at closure time.

Before commencing construction a surety bond in the amount of $25,000 in a form approved by the Division will be posted by TNT.

If additional information is needed or the material is presented is unclear or insufficient please call as soon as possible.

Sincerely.

Tony L. Schmitz

Tony L. Schmitz
President

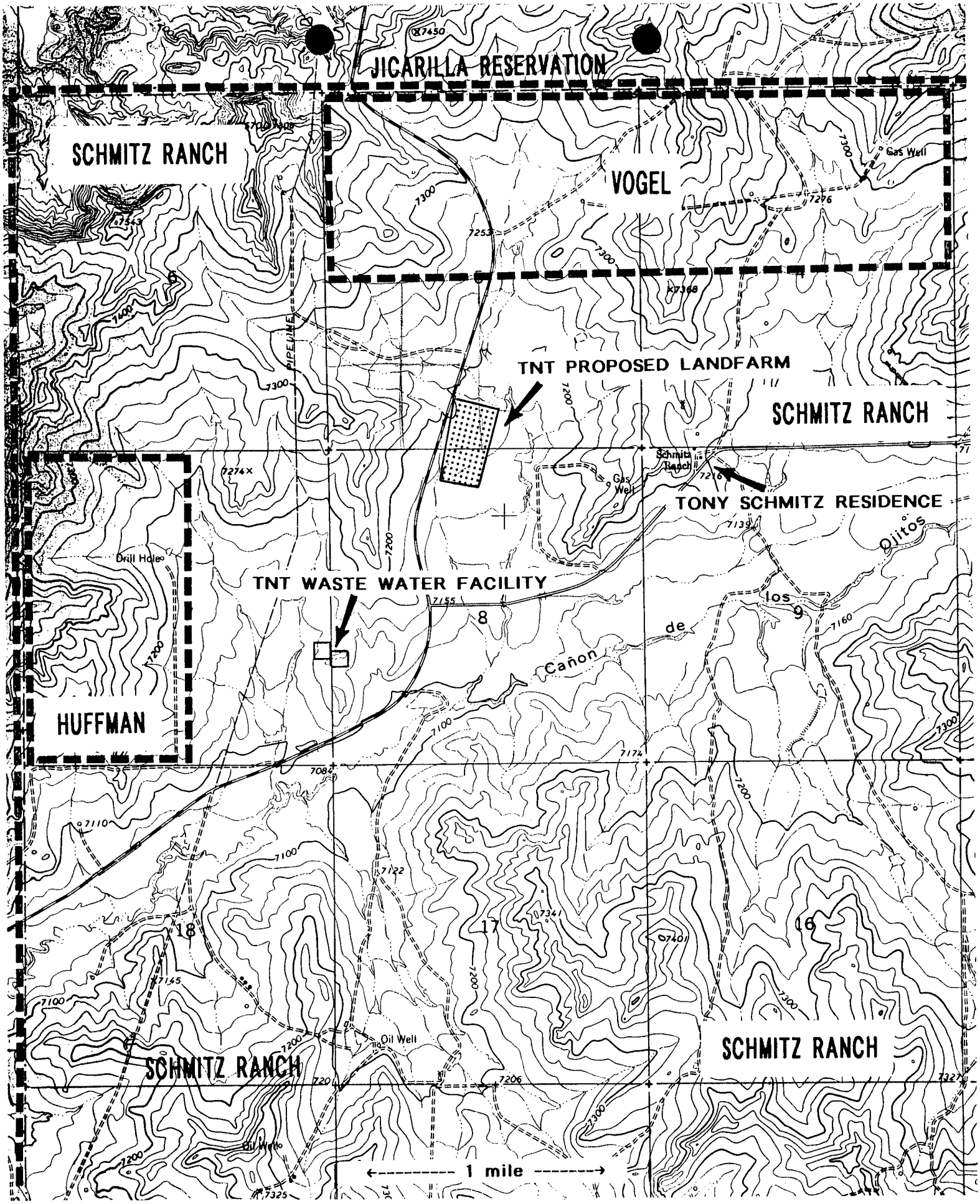

Exhibit A. A photocopy of the Schmitz Ranch, NM topographic sheet showing boundary lines of property ownership and the only residence within one mile of the proposed landfarm.

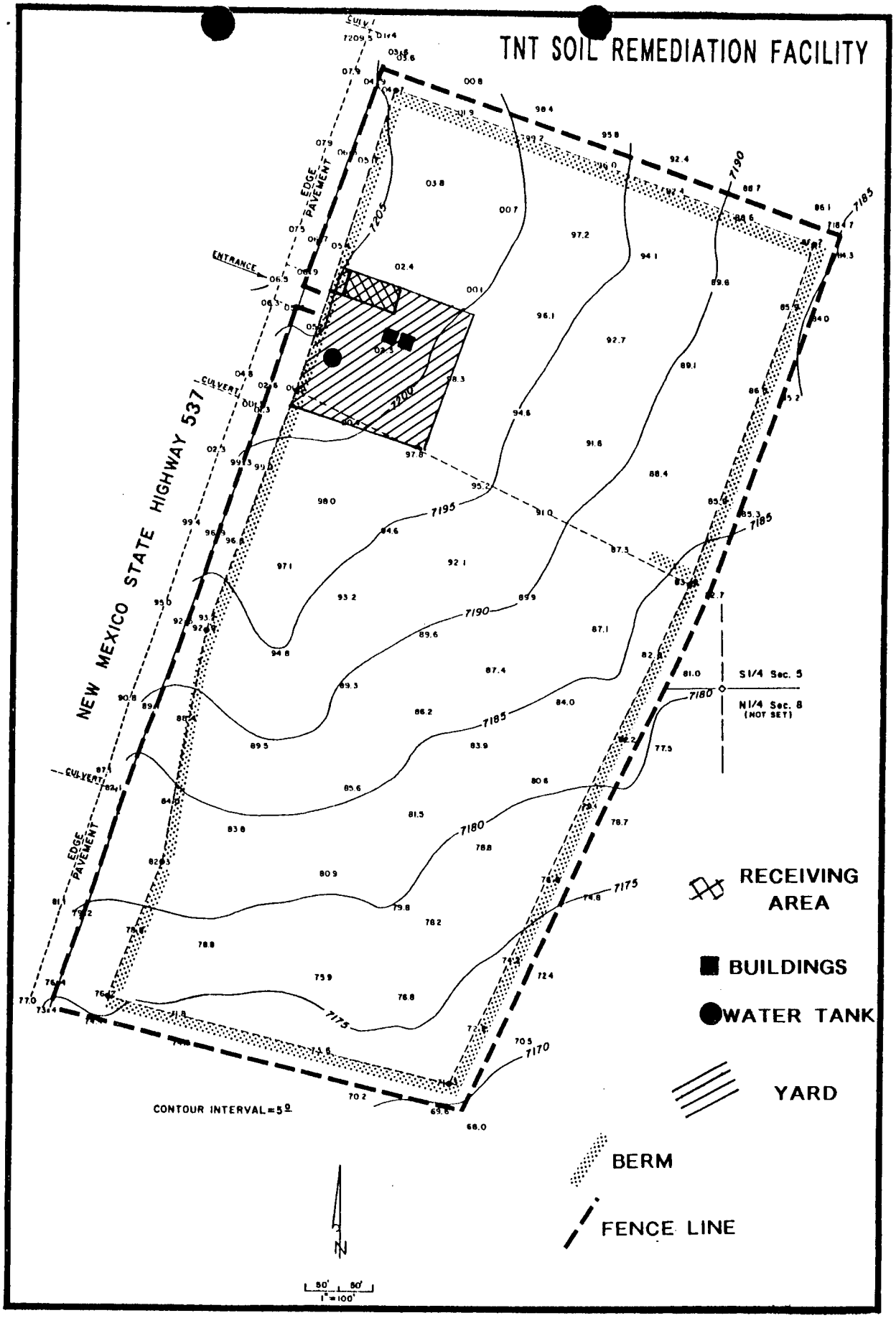

Exhibit B. Map showing the location of 'yard', receiving area, buildings, water tank, and general landfarm facilities.

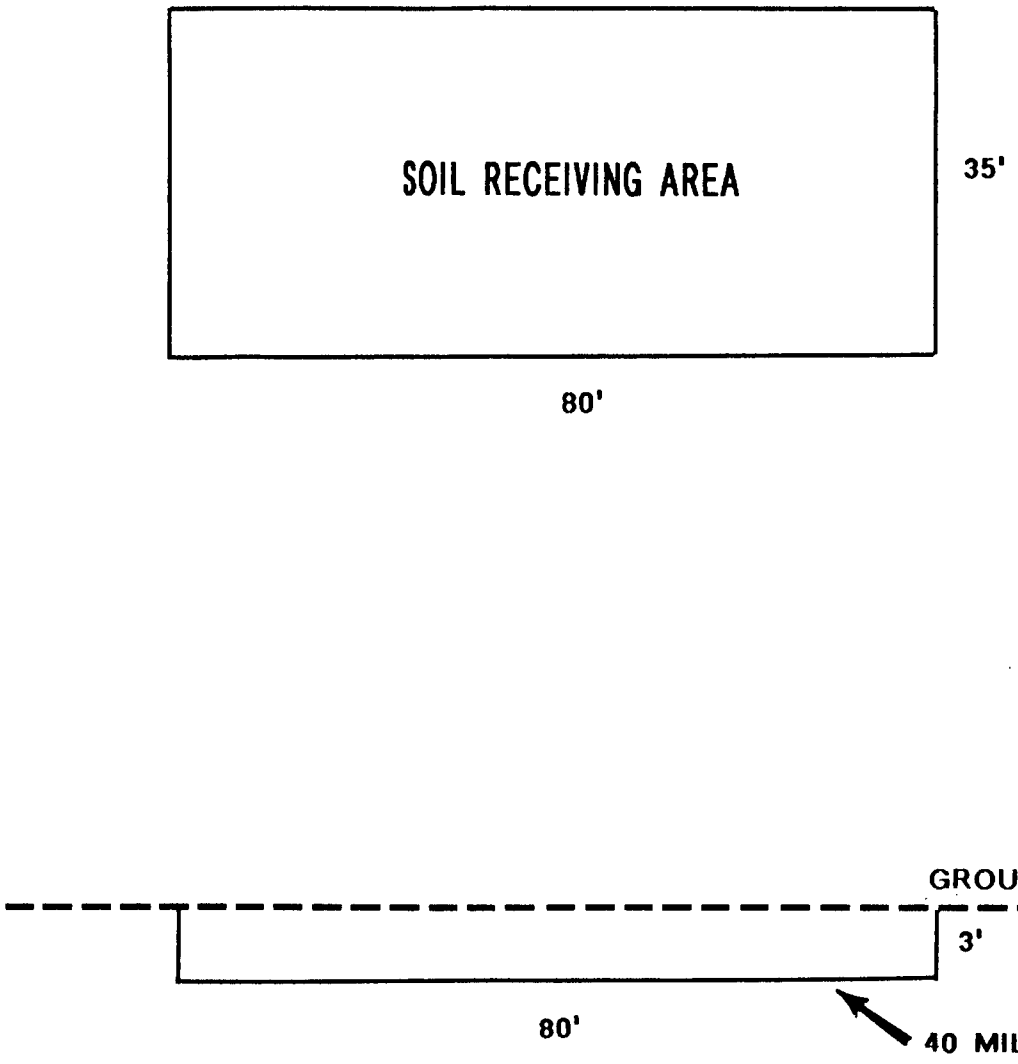

Exhibit C. Diagram showing the size of the poposed lined soil receiving area.

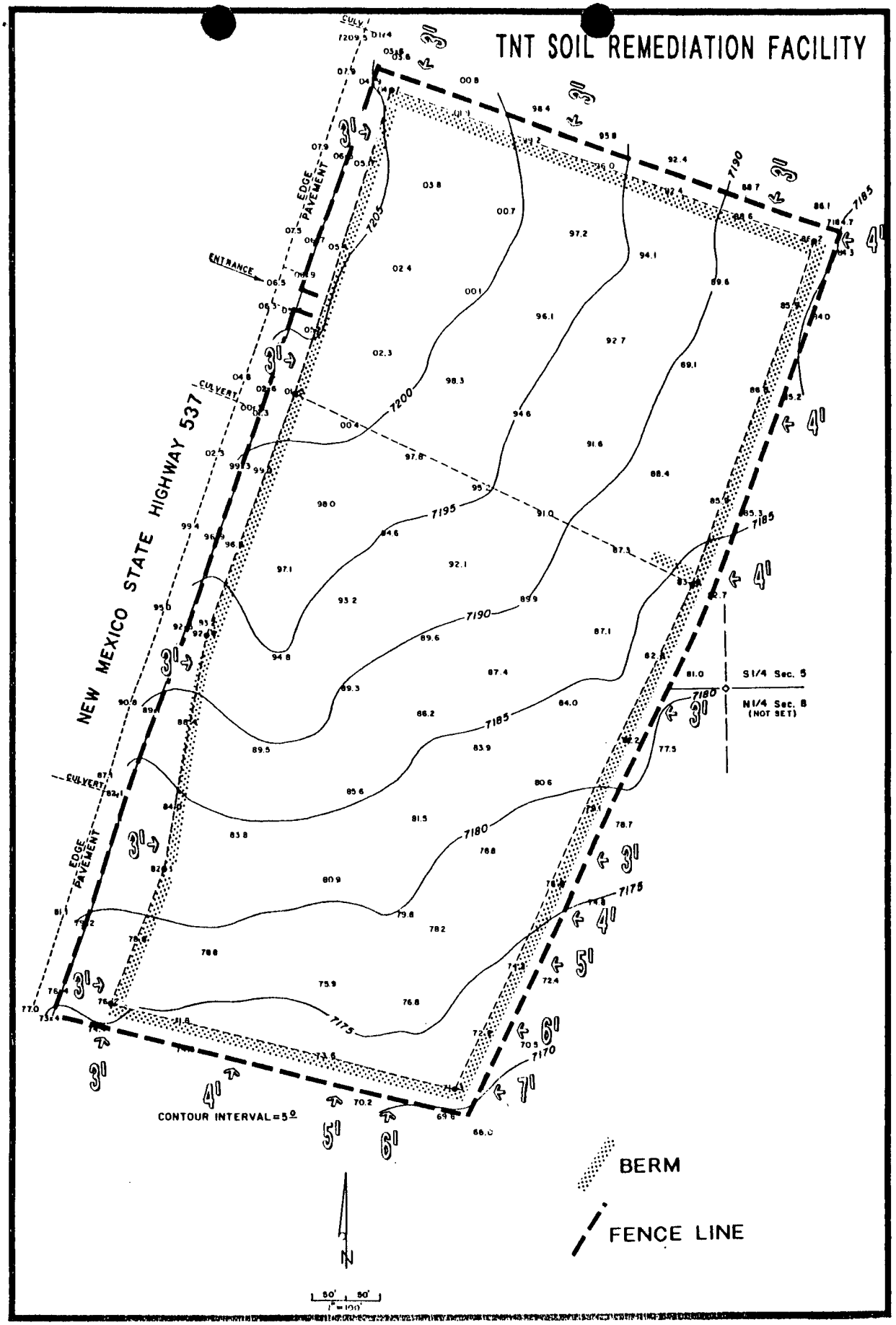

Exhibit D. Map of landfarm facility showing berm (stippled), and the projected height of the berm in feet (hollow numbers) around the perimeter of the facility.

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

July 23, 1992

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

CERTIFIED MAIL
RETURN RECEIPT NO. P-670-683-655

Mr. Tony L. Schmitz
TNT Construction, Inc.
Star Route
Lindrith, New Mexico 87029

RE: **Commercial Landfarm Request**
TNT Construction, Inc.
Rio Arriba County, New Mexico

Dear Mr. Schmitz:

The Oil Conservation Division (OCD) has received and is in the process of reviewing the above referenced application for an oil field related solids landfarm located in the SW/4 SE/4 and SE/4 SW/4 of Section 5 and the NE/4 NW/4 of Section 8, Township 25 North, Range 3 West, NMPM, Rio Arriba County, New Mexico. The following comments and requests for additional information are based on review of the application, dated June 1, 1992. In order for the review process to continue the OCD requires the following information:

1. The OCD has stringent requirements for the operation of all OCD regulated landfarms. Although TNT has committed to a large majority of the requirements, a commitment to the following conditions is required prior to OCD approval of commercial landfarms:

   a. TNT has proposed to construct a lined receiving area for temporary storage of contaminated soils. There is no time limit for spreading contaminated soils which are stockpiled in the lined receiving area. However, any contaminated soils received at the facility which are located outside of the lined receiving area must be spread and disked within 72 hours of receipt.

b. TNT has proposed to disk contaminated soils "based on degree of contamination, but at least monthly". The OCD requires all contaminated soils to be spread on the surface in six inch lifts or less and to be disked a minimum of one time every two weeks (biweekly) to enhance biodegradation of contaminants.

c. TNT has stated "Any contaminated soil brought to the landfarm facility will be certified by laboratory analysis." Please note that the OCD does not require soils which are non-hazardous by the RCRA Subtitle C exemption to have a laboratory analysis performed on them prior to disposal at OCD regulated landfarms. However, the disposal facility must receive a certified statement from the waste generator that all of the contaminants in the soil are from RCRA Subtitle C exempted wastes.

d. TNT has proposed to use 'bugs' or bacteria should the remediation process be shown not to be progressing at a satisfactory pace. OCD approval must be obtained prior to the addition of any substances to enhance biodegradation of the soils landfarmed (ie. chemical additives, manure, nutrients, bugs, etc.). However, the OCD will permit the application of non-waste water to the surface to increase the moisture content to 5-15% of the total weight of the soil to promote bacterial growth and improved bioremediation times. The application method will be as specified in the permit application. There will be no ponding, pooling or run-off of water allowed during the application phase or afterwards.

e. No free liquids or soils with free liquids will be accepted at the facility.

f. TNT has stated "When loads of soil can be monitored or otherwise isolated for inspection before disposal, an attendant may not be at the facility". Because of the restrictions on the types of soils that a landfarm can receive and the changes in federal hazardous waste regulations the OCD requires that disposal occur only when an attendant is on duty.

2. 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 on this map the property boundaries of your facility and the property boundaries of the surrounding landowners within 1/2 mile (ie. parties notified in accordance with OCD Rule 711).

3. TNT has submitted a letter to the sole landowner of record within 1/2 mile of the proposed landfarm notifying them of the landfarm application. Provide the OCD with proof (certified mail receipt, letter of acknowledgement, etc.) that the landowner has received notification of the application.

4. TNT has committed to notifying the OCD Director or staff of all releases from the facility within two (2) working days. Please note that OCD Rule 116 requires that "the Division be notified of any fire, break, spill, or blowout occurring at any injection or disposal facility ... such facility". The OCD requires TNT to commit to notifying the Division of any fire, break, spill, or blowout in accordance with the provisions set forth in Rule 116.C.

5. The OCD has several questions concerning the construction of TNT's proposed landfarm. Submit the appropriate information in response to the following questions:

   a. Your facility diagram shows the entrance to the facility but does not indicate where the soil receiving area will be located. Please submit a diagram showing the size and location of the proposed lined soil receiving area.

   b. Under Part VIII. of the application TNT states that the berm well be at least four (4) feet high in the areas where rain fall would pond within the facility. Under Part XI.6. of the application TNT states that flood control will be provided by constructing a berm four (4+) feet along the south and east side and six (6) feet in the south corner of the facility. How far west and north will the 6 foot portion of the berm extend? What will be the height of the north and west side of the berm? Within 24 hours of any precipition event which results in standing water, the water will be disposed of at TNT disposal ponds.

   c. Are there any pipelines crossing your property? If there are any pipelines then the following items must be addressed. What is the size, depth, composition, and contents of the pipeline? What measures will TNT take to guarantee that the pipeline(s) will not be broken or damaged while disking soils? Who owns the pipeline(s)? TNT must provide the OCD with evidence that the pipeline owner has received a copy of your landfarm application. Please note that if TNT proposes to add moisture to the soils to enhance biodegradation then the OCD will require a buffer zone on either side of pipeline for moisture addition.

   d. Does TNT plan to construct any buildings (office, equipment storage, etc.) on the premises and if so where will they be located? Does TNT plan to store or use any chemicals or materials which may cause contamination if spilled onto the ground surface? If so, what spill prevention/containment measures will be taken? Does TNT plan to install any pits, ponds, or tanks (either above or below ground) at the facility? If so, describe in detail and indicate what spill prevention/containment methods will be incorporated into the design.

6. Because a land farm is designed to remediate contaminated soils and not transfer contaminants into the underlying native soil and/or groundwater, the OCD requires land

farms to monitor a treatment zone not to exceed two (2) feet beneath the land farm. A commitment to the following conditions is required prior to OCD approval of commercial land farms:

a. A background sample must be taken for each cell prior to placement of any contaminated soils in the cell. A minimum of one random soil sample will be taken from each individual cell six (6) months after the first contaminated soils are received in the cell and then annually thereafter. The sample will be taken at two to three (2-3) feet below the native ground surface.

b. The soil samples will be analyzed for total petroleum hydrocarbons (TPH) and volatile aromatic organics (BTEX) using approved EPA methods. The results will be submitted to the OCD Santa Fe Office within thirty (30) days of receipt from the laboratory.

c. After obtaining the soil samples the boreholes will be filled with an impermeable material such as bentonite cement.

d. Any cells that have moisture added to them will be analyzed on a quarterly basis following the requirements above.

7. TNT must provide a commitment to close the facility in accordance with all OCD rules and regulations in effect at the time of closure. This includes achieving the soil standard level which is in effect at closure time.

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

Kathy M. Brown
Geologist

xc: Denny Foust, OCD Aztec Office

CHECKLIST FOR COMPLIANCE WITH RULE 711

FACILITY NAME: TNT Construction, Inc - Landfarm

AREA: Schmitz Ranch, Rio Arriba County

LOCATION: SW/4 SE/4 & SE/4 SW/4 Sect. 5, T25N, R3W
NE/4 NW/4, Sec. 8, T25N, R3W

MAILING ADDRESS: Star Route
Lindrith, NM 87029

CONTACT PERSON: Tony Schmitz (Vice Pres.)

PHONE NO.: (505) 774-6663

DATE OF REVIEW: July 1992 - KMB

1. Affidavit of verification (disposal application signed).

   Yes

2. OCD public notice issued (commercial facilities).

   Yes

3. Proof that owners and occupants within 1/2 mile were notified, including copy of letter, certified mail receipt, names and addresses.

   Have letter to the 1 other landowner, but no certified mail receipt

4. A $25,000 bond is required as of 12/30/88 for commercial facilities prior to commencing construction. Committed to prior to construction.

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

   Yes

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

   Yes

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.

Need to address things left off Exhibit A.

8. Routine inspection and maintenance plan requires commitments to Rule 711 operating requirements including:

   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. Yes

? b. Disposal permitted only when attendant is on duty, otherwise the facility must be secured. ~~Not~~ Proposed an exception on page 9 of application

   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.

N/A

9. Plan for disposal of approved waste solids or liquids.

Few minor committments lacking
Need treatment zone monitoring

7. Geohydrological evidence that fresh water will not be affected.

Yes, groundwater > 300 ft

10. Contingency plan for reporting and cleanup of spills or releases.

Yes - need commitment to
OCD Rule 116

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

Need commitment to
OCD regs/standards @ time
of closure

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 ..... in 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

July 1, 19 92

and ending with the issue of

July 1, 19 92

And that the cost of publishing said notice is the sum of $ 43.20

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

Joyce Clemens

Subscribed and sworn to before me this 28th day of July, 19 92

Mrs. Jean Denver

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:

Doug Foutz Construction Company, Charles L. Klunder, 606 S. Miller, 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 W/2 SE/4, Section 5, 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 enhance biodegradation of contaminants. The ground water most likely to be affected by any accidental discharges is at a depth in excess of 150 feet and has an estimated total dissolved solids content of approximately 800 mg/l to 1600 mg/l. The permit application addresses the construction, operations, spill/leak prevention and monitoring procedures to be utilized at the site.

Environmental Spill Control, Inc., Dwayne Taylor, P.O. Box 5890, 6210 Lovington Highway, Hobbs, New Mexico 88240, has submitted an application to construct and operate a portable thermal treatment facility for the disposal of wastes generated in conjunction with the production of oil and gas. The portable treatment unit is designed to reduce and destroy hydrocarbon contaminated wastes. The ground water most likely to be affected by any accidental discharges is variable and site specific since this is a portable operation. The OCD will require all operations to be self-contained to prevent any contaminants from reaching the ground surface. The permit application addresses the construction, operations, spill/leak prevention and monitoring procedures to be utilized during operations.

T-N-T Construction, Inc., Tony L. Schmitz, Star Route, Lindrith, New Mexico, 87029, has submitted an application to construct and operate a commercial landfarm facility for remediation of hydrocarbon contaminated soils. The proposed facility is in the SW/4 SE/4 and SE/4 SW/4 of Section 5 and the NE/4 NW/4 of Section 8, Township 25 North, Range 3 West, NMPM, Rio Arriba 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 enhance biodegradation of contaminants. The ground water most likely to be affected by any accidental discharges is at a depth in excess of 300 feet with a total dissolved solids content of approximately 1300 mg/l. The permit application addresses the construction, operations, spill/leak prevention and monitoring procedures to be utilitaed at the site.

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 23rd day of June, 1992.

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

SEAL

Published in the Lovington Daily Leader July 1, 1992.

AFFIDAVIT OF PUBLICATION

No. 29726

STATE OF NEW MEXICO,
County of San Juan:

CHRISTINE HILL being duly sworn, says: "That she is the NATIONAL AD MANAGER of The Farmington Daily Times, a daily newspaper of general circulation published in English in Farmington, said county and state, and that the hereto attached LEGAL NOTICE

was published in a regular and entire issue of the said Farmington Daily Times, a daily newspaper duly qualified for the purpose within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico for ONE consecutive (days) (//////) on the same day as follows:

First Publication FRIDAY, JULY 3, 1992

Second Publication

Third Publication

Fourth Publication

and the cost of publication was $ 58.21

Christine Hill

Subscribed and sworn to before me this 20th day of JULY, 1992.

Connie Andras

Notary Public, San Juan County, New Mexico

My Comm expires: July 3, 1993

COPY OF PUBLICATI

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

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GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe New Mexico, on this 23rd day of June, 1992.

STATE OF NEW MEXIC
OIL CONSERVATION DIVISIO
WILLIAM J. LEMAY, Direct

SEAL

Legal No 29726 published in the Farmington Daily Times, Farmington, New Mexic on Friday, July 3, 1992.

OIL CONSER[illegible]N DIVISION

STATE OF NEW MEXICO } ss.
[illegible] of Rio Arriba }

Robert Trapp, being first duly sworn, declare and say that I am the Publ[illegible] of the Rio Grande Sun, a weekly newspaper published in the English lan[illegible] and having a general circulation in the City of Espanola and County of [illegible]iba, State of New Mexico, and being a newspaper duly qualified to pub[illegible]l notices and advertisements under the provisions of Chapter 167 of the [illegible] Laws of 1937; that the publication, a copy of which is hereto attached,

[illegible]lished in said paper once each week for ..... consecutive weeks, and [illegible]me day of each week in the regular issue of the paper during the time [illegible]ation, and that the notice was published in the newspaper proper, and [illegible] supplement, the first publication being on the 2nd day of July 19 92 and the last publication on the 2nd day July 19 92, that payment for said advertisement has [illegible] made), or (assessed as court costs); that the undersigned has person[illegible]dge of the matters and things set forth in this affidavit.

Robert Trapp Publisher

Subscribed and sworn to before me this 2nd day of July, A.D., 1992

Notary Public

My Commission expires

Legal Notices

contaminated soils. The proposed facility is in the W/2 SE/4, Section 5, 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 enhance biodegradation of contaminants. The ground water most likely to be affected by any accidental discharges is at a depth in excess of 150 feet and has an estimated total dissolved solids content of approximately 800 mg/l to 1600 mg/l. The permit application addresses the construction, operations, spill/leak prevention and monitoring procedures to be utilized at the site.

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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 (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.

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GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 23rd day of June, 1992.

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

(SEAL)

(Published July 2, 1992)

NOTICE OF PUBLICATION
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ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
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JP - Job Printing — OS - [illegible] — DA - Display Advertising — SS - Stand Sales

1½% i[illegible] ed on unpaid balance after 30 days

96

32

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OIL CONSERVATION DIVISION

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GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 23rd day of June, 1992.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

S E A L

WILLIAM J. LEMAY, Director

APPLICATION FOR A SOIL REMEDIATION FACILITY

RECEIVED
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OIL CONSERVATION DIV.
SANTA FE

SW 1/4, SE 1/4, SEC, 5, T.25N., R.3W.
SE 1/4, SW 1/4, SEC, 5, T.25N., R.3W.
NE 1/4, NW 1/4, SEC. 8, T.25N., R.3W.
IN
RIO ARRIBA COUNTY, NEW MEXICO

June 1, 1992

T-N-T CONSTRUCTION, INC.
STAR ROUTE
LINDRITH, NEW MEXICO 87029
(505) 774-6663

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

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 Soil Remediation Facility (land farm)

II. OPERATOR: TNT Construction, Inc.

ADDRESS: Star Route Lindrith, NM 87029

CONTACT PERSON: Tony Schmitz PHONE: (505) 774-6663

III. LOCATION: SW SE /4 SE SW /4 Section 5 Township 25N Range 3W SEE ~~Attached~~ Map

Submit large scale topographic map showing exact location. ATTACHED

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.

--------SEE ATTACHED REPORT----------

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: TONY L SCHMITZ Title: PRESIDENT

Signature: [signature] Date: 6-1-92

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

TABLE OF CONTENTS

FIGURES

APPLICATION FOR CONSTRUCTION AND OPERATION OF A SOIL REMEDIATION FACILITY IN SECTIONS 5 AND 8, T.25N., R.3W., RIO ARRIBA COUNTY, NEW MEXICO

The following information and application are submitted by TNT Construction, Inc. (TNT) to the New Mexico Oil Conservation Division (OCD) for review and approval. The information addresses material required by the New Mexico Oil Conservation Division in the **'Guidelines For Application For Waste Storage/Disposal Facility Permits (revised 11-90)'**, rule 711. The purpose of this report is to detail information as required for OCD authorization to operate this site for soil remediation.

I. TYPE OF OPERATION:

T-N-T Construction, Inc. (TNT) proposes to construct and operate a commercial soil remediation facility for bioremediating hydrocarbon contaminated soils. These hydrocarbon contaminated soils, solids, and sludges will have been excavated from production, exploration, and processing activities within the area as a result of their mediation efforts. Only substances classified as non-hazardous by RCRA Subtitle C exemption or by characteristic testing will be accepted at the facility. Solids from operations not currently exempt under RCRA Subtitle C will be tested for appropriate hazardous constituents prior to disposal with approval from the OCD. TNT proposes to clean up these hydrocarbon contaminated soils through soil bioremediation techniques.

II. OPERATOR:

T-N-T Construction, Inc. (a New Mexico Corporation)
Star Route
Lindrith, NM 87029
505-774-6663

The following are representatives for TNT Construction, Inc. at the above aforementioned telephone number and address:

Tony L. Schmitz, President
Tony Schmitz, Vice President
Craig Schmitz, Board Member

III. LOCATION OF DISPOSAL SITE:

The 20.5 acre remediation site is specifically located on parts of a 120 acre tract described as:

SW 1/4, SE 1/4, SEC. 5, T.25N., R.3W.;
SE 1/4, SW 1/4, SEC. 5, T.25N., R.3W.;
NE 1/4, NW 1/4, SEC. 8, T.25N., R.3W
in Rio Arriba County, New Mexico,
see **Figure 1.**

The facility is generally located 8 miles NW of Lindrith, New Mexico near Highway 537 on the 'Schmitz Ranch, N. Mex.' Quadrangle, a 1:24000" (7.5 Minute Series) USGS topographic sheet, see **Figure 1.** and **Exhibit A.,** a survey map of the proposed facility.

IV. EXPANSION REQUEST:

Not applicable.

V. LAND OWNERSHIP:

The remediation facility is located on fee acreage owned by TNT Construction, Inc., Tony L. Schmitz, President, Star Route, Lindrith, NM 87029. The boundary of lands owned by Tony L. Schmitz are designated by a broad dashed line on **Figure 1.** There is one other land owner within 1/2 mile of the proposed facility other than lands held by TNT and Schmitz Ranch, see Appendix for letter of notification. TNT is owned and operated by the Schmitz family.

The surface of the proposed facility is presently covered by sparse to moderate growth of weeds, grass, and sage brush, see **Figure 2.** The property is presently undeveloped pasture land. Drainage/washes that pass near the margins of the proposed facility are one to three feet deep and are grass covered. A fence, located along the east side of the proposed property and along Highway 537, is presently being replaced this spring by a government highway agency. Highway 537 is being widened and resurfaced through the Schmitz Ranch, north to Dulce, NM.

VI. STORAGE/DISPOSAL FACILITIES DESCRIPTION:

The proposed facility will be used to bioremediate hydrocarbon contaminated soils from point sources within the general area, specifically the southern portion of the San Juan Basin in Rio Arriba, Sandoval, and San Juan Counties, New Mexico. Hydrocarbon contaminated soils will come primarily from oil/gas production pits undergoing remediation.

The facility will consist of nearly flat land completely enclosed by a three (3) foot minimum high berm to contain or prevent the entering of any rain, melted snow or any other surface waters into or onto the facility or areas where hydrocarbon contaminated soils are stored or spread, see **Exhibit A.** A higher berm of 3-6 feet will be built where ponding of water may occur on the down slope side of the facility. **Exhibit A.** is a surveyed map of the proposed facility showing the location of the Highway 537, proposed entrance road, surface impoundments, soil receiving area, berms, ponding areas for run-off water, fence lines, and other survey data.

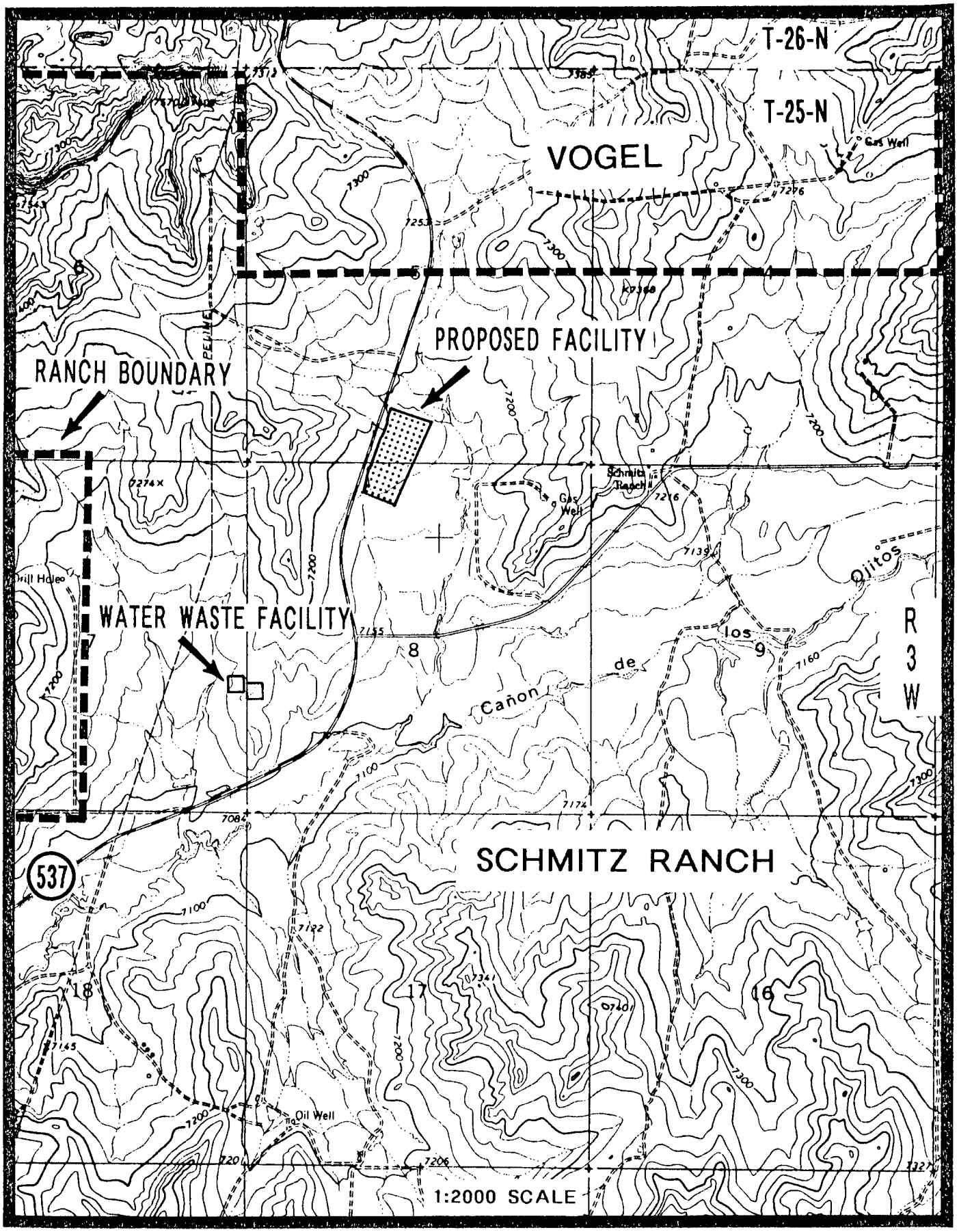


Figure 1. A photo copy of a portion of the 'Schmitz Ranch, N. Mex.' Quadrangle. USGS Topographic Series in Rio Arriba County, NM. The Schmitz Ranch boundary is shown with a dashed line and the proposed soil remediation facility is shown as an irregular shaped rectangle at the north end of Section 8. The Waste Water Facility also operated by TNT is shown in Section 7.

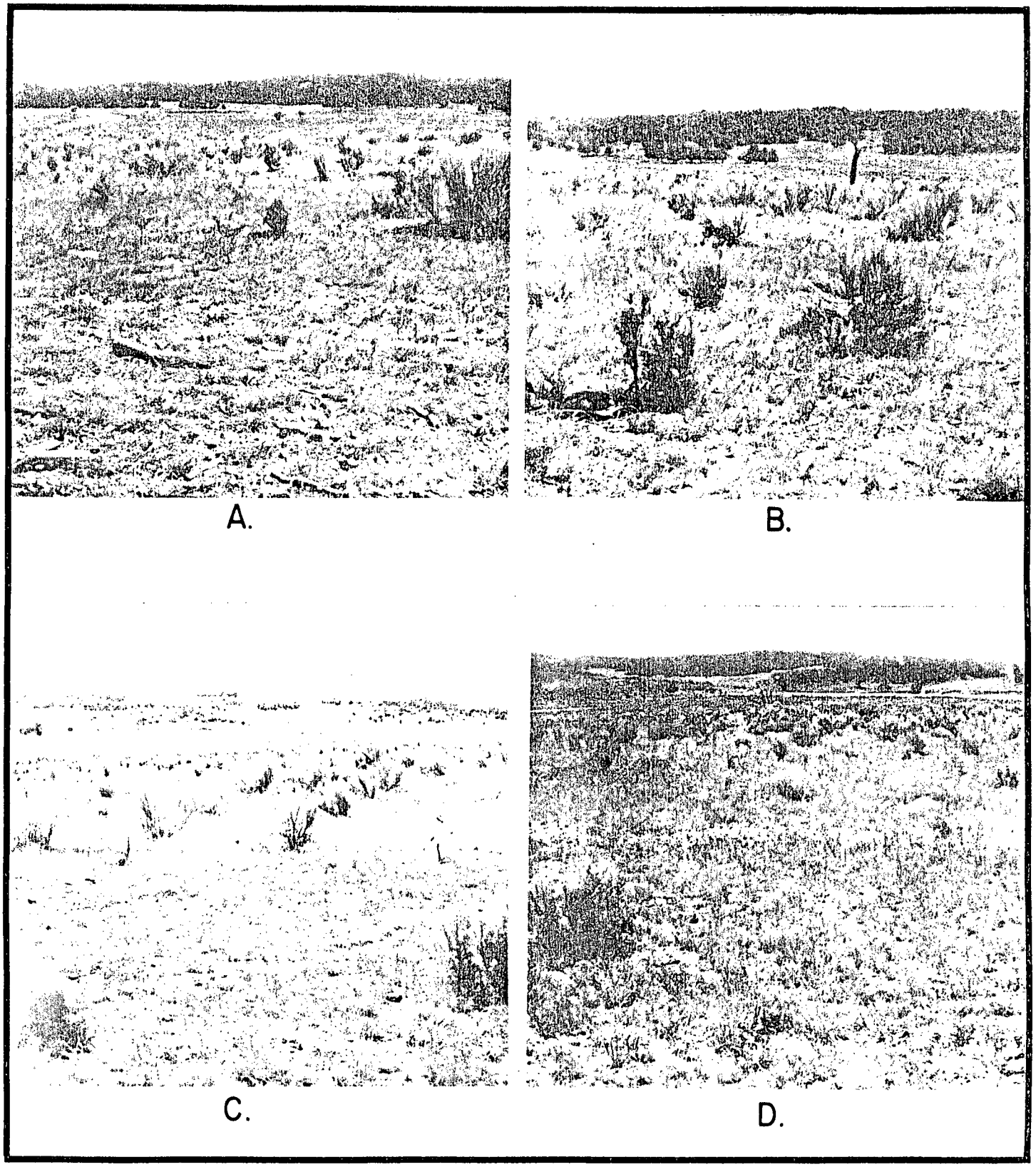


Figure 2. Four photographs of the proposed site taken from the west side of the site looking across the proposed facility. (A) Upper-Left, a view to the north ; (B) Upper-Right, a view to the northeast; (C) Lower-Left, a view to the southeast; and (D) Lower-Right, a view to the south.

VII. ENGINEERING DESIGN:

The facilities will consist of a receiving area for stock piling the above described contaminated soils waiting to be spread on the ground in layers no deeper than six (6) inches and disked or tilled on a monthly basis. Any contaminated soil brought to the land farm facility will be certified by laboratory analysis. Material brought to the land farm by the owner/operator (TNT) will have been tested prior to delivery and acceptance. Material brought to the land farm by others will be accompanied by a laboratory certification identifying the constituents of the material to be remediated or be tested by TNT through an independent laboratory prior to remediation. Only solids that are non-hazardous by RCRA Subtitle C exemption or by characteristic testing will be accepted at the facility. Solids from operations not currently exempt under RCRA Subtitle C will be tested for appropriate hazardous constituents prior to disposal and submitted to the OCD for approval to dispose such solids.

Areas or 'cells' will be dedicated to soils of similar contamination. Contaminated soils will be disked or tilled by tractor or similar equipment based on degree of contamination, but at least monthly. Sludges, tank bottoms, and waxes will be mixed with clean soils or peat to dilute the contamination so as to enhance the bioremediation process and total remediation of the contained hydrocarbon. An independent laboratory analysis of each area or 'cell' will be conducted periodically in order to monitor effectiveness of the remediation programs. 'Bugs' or bacteria may be utillized and introduced to the contaminated soil, should the remediation process be shown not to be progressing at a satisfactory pace.

No solids will be spread on previously spread solids until a laboratory measurement of total petroleum hydrocarbons (TPH) in the previous lift is less than 100 ppm and the sum of all aromatic hydrocarbons is less than 50 ppm, and benzene is less than 10 ppm. Comprehensive records of the laboratory analyses and the sampling locations will be maintained by TNT. Authorization from the OCD will be obtained prior to application of successive lifts.

An attendant will be present when the facility is open for receipt of contaminated soils. At all other times the facility will be locked and secured to prevent unauthorized dumping. Comprehensive records of all material disposed of at the facility will be maintained. The records for each load will include:

1. Origin of contaminated soil and operator
2. Analysis for hazardous constituents, if required
3. Transporter of contaminated soils
4. Date received at the facility

Surface, stock or drinking water may be used periodically to increase the moisture content to 5-15% of the total weight of the contaminated soil, so as to moisten the soil and promote bacterial growth, resulting in improved bioremediation times. Water (non-waste water) may be applied to the surface

of soils already spread on the ground. Water would be distributed by either the use of irrigation sprinkler systems or by water truck with sprinkling devices. Nitrogen/phosphate fertilizers may be utilized as a nutrient to enhance bacterial growth, and improve the remediation time of contaminated soils. Soil samples would be taken on a periodic basis to test effectiveness of any enhanced bioremediation processes employed within the facility.

Berm construction would be in accordance with normal earth work practices. Fill dirt used in the construction of the berms will be compacted in horizontal lifts to the finished grade of three (3) feet or more. Lift thicknesses will be compatible with compaction equipment used to achieve uniform densities. Lift thicknesses will be in intervals of about nine (9) inches. A 3:1 (horizontal to vertical) slope will be maintain on the outside slopes of the berm during construction. A slope no steeper than 2:1 (horizontal-vertical) grade will be maintained on the inside of the berm, see **Figure 3.** The berms will be constructed of tightly compacted shale/clay and shall be at least 18 inches wide at the top. No fill dirt will be placed which is frozen or where in-place soil is frozen.

Clay soils at the proposed facility are similar to clays at the waste water facility, 5/8 mile to the southwest, which were tested for permeability and exhibited a permeability coefficient of 3.8 to $9.8x10^{8}$ centimeters/second or about .04 feet per year (Western Technologies report dated May 2, 1988. These clay rich soils should prevent any downward migration of surface water or associated contaminated materials resulting from the remediation process.

A receiving area for temporary storage of contaminated soils will be escavated,lined with plastic/ fabric, and covered with 3 feet of clay/dirt.

A positive drainage system will be provided around the outside base (toe) of the berm on the north, west, and east sides to prevent erosion from possible run-off waters outside of the facility. A barbed wire fence shall be constructed and maintained in good condition around the facility perimeter. Adequate space will be provided for maintenance and the passage of vehicles along the perimeter of the facility. A fence already exists along the west side of the facility. A gate and cattle guard will be installed on the road entering the facility. The fence shall be constructed so as to prevent any livestock from entering the facility area. Fences shall not be constructed on the berms, see **Figure 3.**

A sign not less than 12" X 24" with lettering of not less than two (2") inches shall be posted in a conspicuous place at the entrance to the facility. The sign will be maintained in legible condition and shall identify the operator of the soil remediation facility, the location of the facility by quarter-quarter, section, township, range; and emergency telephone numbers.

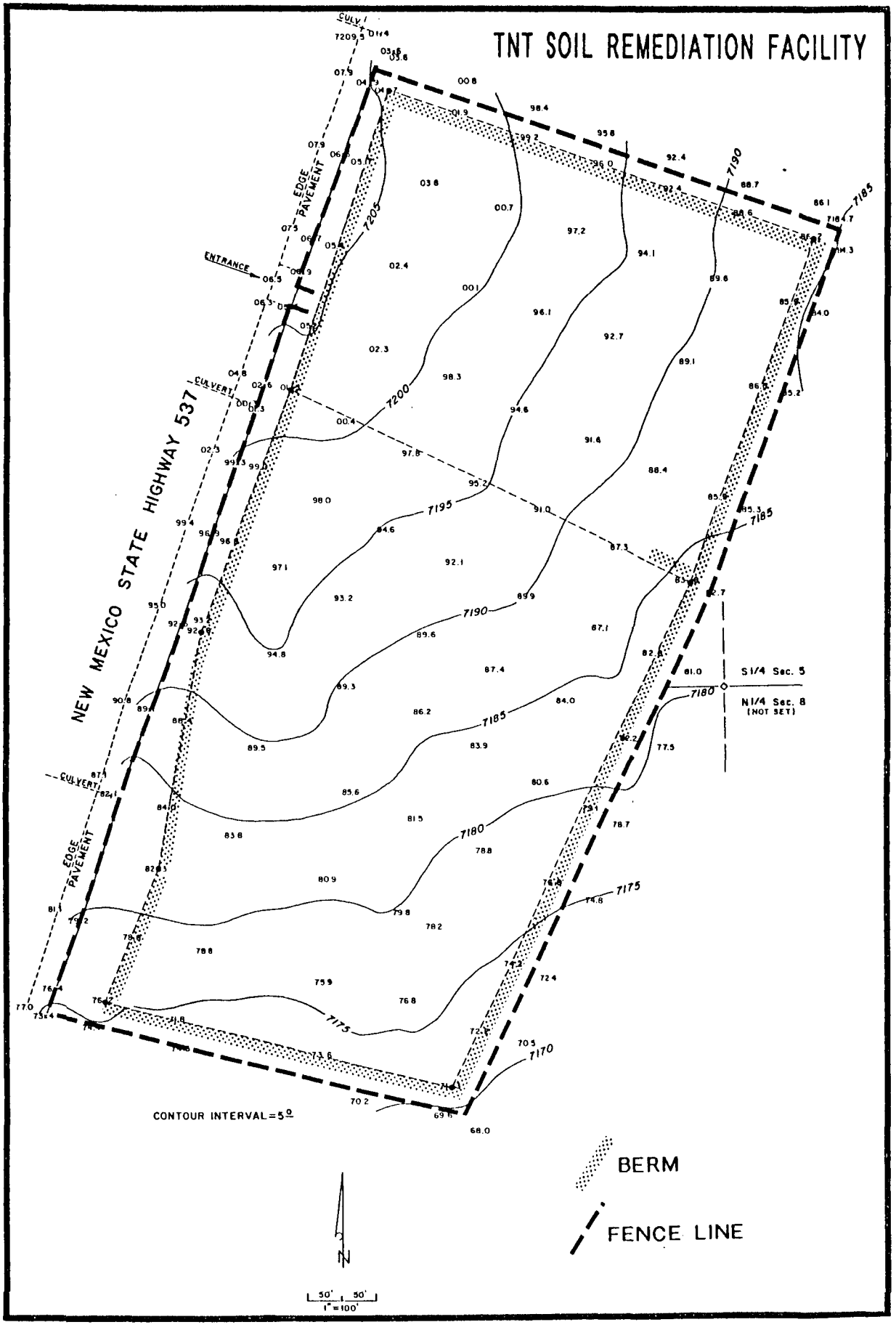


Figure 3. A photo reduction of the surveyed facility showing berms (stippled), Fence lines (heavy dashed line), and the entrance to the proposed facility.

Agencies to be Notified:

Rio Arriba County Fire Marshal -- (505) 588-7254
New Mexico State Police -- (505) 289-3443
Rio Arriba County Sheriff -- (505) 588-7271

VIII. CONTINGENCY PLANS

There are no existing drainages within the planned facility. Drainages outside the berm perimeter will be properly contoured to control erosion. Since the facility is located on a gentle hill and no significant arroyas or other surface drainages are near by, it would be highly unlikely that water would ever enter or breach the perimeter berm. The berm perimeter shall be maintained in such a manner as to prevent erosion. Inspections of the outside berm area shall be made after any rainfall of any consequence.

Any surface water containing possible hydrocarbons released due to berm failure, from the facility as a result of heavy rains and subsequent run-off, would be removed from the area of release and returned to the facility for remediation, should the area of release be determined to be contaminated through sampling techniques.

No spills are anticipated at the facility since no waste water or liquids are to be processed at the facility. Run-off from seasonal rain storms and snow melt will be contained within the facility by the perimeter berm. The berm will be at least four (4) feet high in the areas were rain fall and subsequent run-off will pond within the facility even during potential 100 year storms. Studies have shown that once contaminated soils have been spread in a six (6") lift and properly tilled, rain water run-off crossing remediated soils picks up little or no hydrocarbons. Necessary dirt equipment will be on or near the facility at all times. In the event of a release from the facility the OCD Director or staff will be notified within two (2) working days.

IX. ROUTINE INSPECTION AND MAINTENANCE PLAN

Berms, dikes, fences, and remediation areas will be inspected periodically. Any repairs or general maintenance will be performed immediately. Records of dates, kinds of inspections, and types of repairs shall be maintained. Perimeter berms will be maintained is such a manner to prevent erosion from within or outside the berm perimeter.

TNT shall keep and make available for inspection records for each calendar month on the source, location, volume, and type of soil waste, analysis for hazardous constituents (if required), date of disposal, and hauling company that disposes of contaminated soils to the facility. Such records will be maintained for a period of two (2) years from date of disposal at the facility.

Disposal at the facility shall occur only when an attendant is on duty. The facility shall be secured when no attendant is present. When loads of soil can be monitored or otherwise isolated for inspection before disposal, an attendant may not be at the facility.

X. CLOSURE:

All plans and specifications shall be submitted to and approved by the OCD prior to closure. The OCD will be notified when the facility discontinues the acceptance of soils for a period of six months or more, or when the facility is to be dismantled/permanently closed.

Upon closure of the facility no new material will be accepted. Existing soil remediation programs will continue untill soil remediation programs meet OCD standards and are verified by independent laboratory testing. TNT will remove all such buildings, tanks, equipment or hardware that would not be used in normal ranching operations. The area will be seeded with natural grasses and allowed to return to its natural state or the lands may be used for pasture or growing crops by the Schmitz Ranch. Berms will be leveled and returned to their natural contours and reseeded. Any berms needed in the ranching operation for control of errosion or ponding of water for stock use will be salvaged. A representative of the OCD will inspect the site to determine that restoration is adequate or in compliance with future ranching activities.

XI. SITE CHARACTERISTICS - FRESH WATER PROTECTION DEMONSTRATION:

The proposed land farm/remediation facility will not adversely impact the ground water in the area. The following is a list of water, streams (perennial or intermittent), water wells, and surface water storage facilities within the general area of the proposed facility, see **Figure 4.**

1. **Surface Water -** The nearest surface water is located along Canon de Los Qjitos 3/4 miles to the south, an intermittent stream with numerous man made stock ponds along its length on the Schmitz Ranch. The Canon do los Qjitos is a tributary of the Canada Larga and Largo Canyon intermittent streams. Largo Canyon empties into the San Juan River some 70+ miles down stream from the proposed facility.

2. **Other Facilities -** Two waste disposal ponds are located 5/8 of a mile to the southwest of the proposed remediation facility and are presently operated by TNT.

3. **Water Wells -** One water well is located 3/4 of a mile to the east in the SW 1/4. SW 1/4, Sec. 4, T. 25 N., R. 3 W. and another well one mile to the south in SW 1/4, SW 1/4, Sec. 8, T. 25 N., R. 3 W. Both wells are owned and maintained by the Schmitz Ranch and used for domestic or stock use.

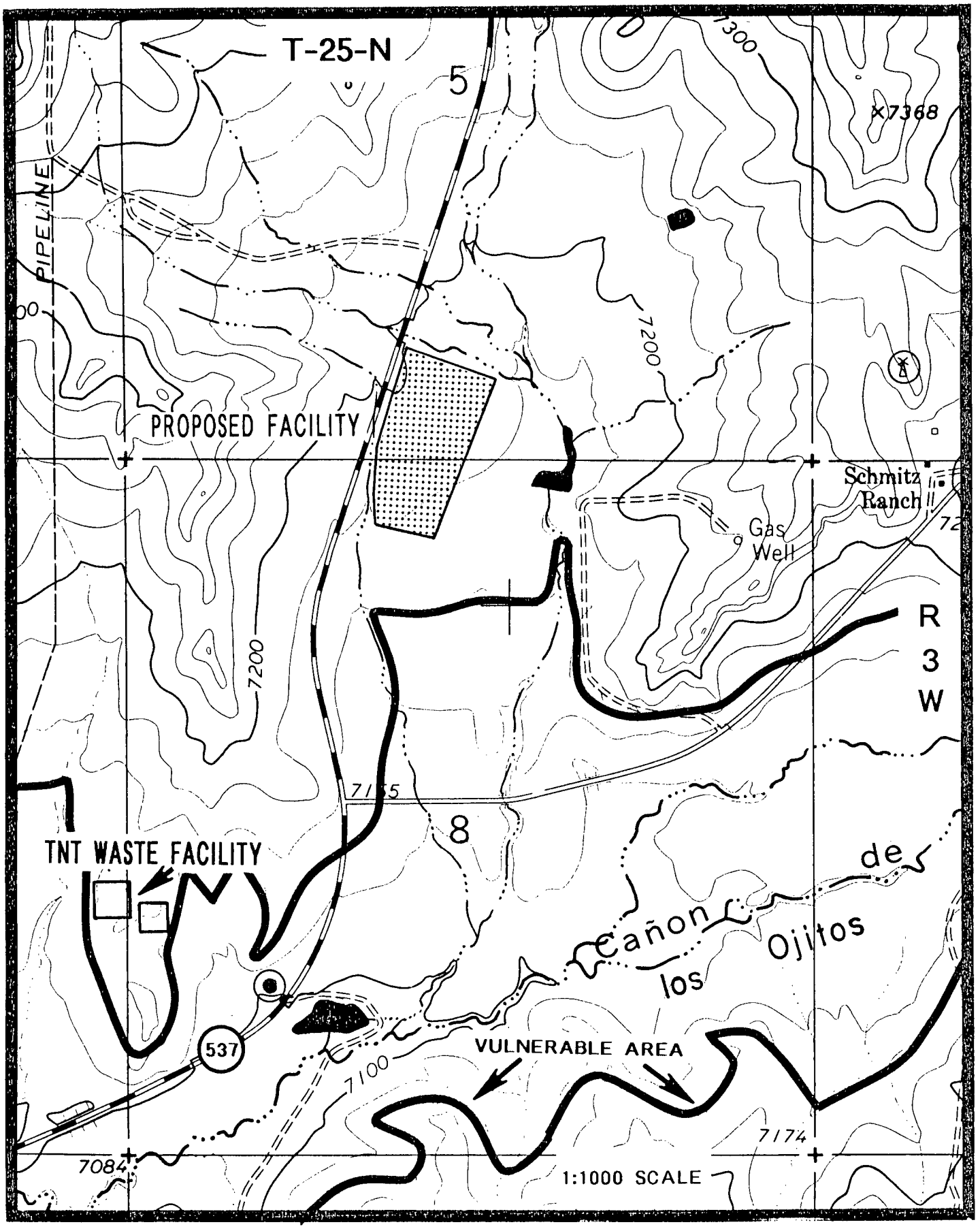


Figure 4. A photo enlargement of Sections 5 and 8 from the 'Schmitz Ranch N. Mex.' Quadrangle Sheet. Water wells are represented by 1/4 inch circles, primary intermittent streams are highlighted, stock ponds are shaded, and a heavy black line denotes the boundary of the vulnerable area.

4. **Ground Water** - Ground water was not encountered at or near the surface to a depth of 300 feet in either well or any other well within the general area, during drilling or completion. Monitor wells and stratigraphic test wells drilled at the waste disposal facility 5/8 of a mile to the southwest did not encounter fresh water. This drilling, coupled with the water depths encountered in the two water wells described above, suggests that the water table in the area is at a depth of more than 300 feet and in some cases at a depth of 900 feet.

5. **Stock Ponds** - A stock pond (reservoir) is located 800 feet to the east of the proposed facility and would be an additional barrier for some water over-flow resulting from an unlikely breach of the berm along the east sides of the facility.

6. **Flood Control** - The facility is located on nearly flat ground at and along the flanks of a gently dipping hill with about 5-10 feet of maximum relief from one side of the facility to the other. Annual rain fall is about 3-6 inches per year in the general area and is considered to be a semi-arrid to arid environment. Topographically, surface water run-off from the proposed facility would be primarily to the east and to the south with some run-off to the north, see **Figure 5.** Run-off waters would pond at numerous locations along the berm, rather than one central location. Multiple ponding areas would improve the containment ability of the perimeter berm by dispersing run-off waters.

The amount of water generated during a 100 year storm would be confined by the berm located along the east and south sides of the facility. Assuming 43,560 square feet in an acre and a rain fall of two (2) inches during a six (6) hour period with 50% estimated as run-off, then approximately 74,181 cubic feet of water would be required to be contained along the berm on the south and east side of facility during a 100 year storm.

(20.5 acres) X (43,560 sq. ft/acre) X (.1666 ft. water) X (.50) = 74,181 cubic feet of water

With a dike height of four (4+) feet along the south and east side, 6 feet in the south corner of the facility (5 feet maximum water depth in south corner), an average water depth of two (2) feet along the south side and 1.5 feet in the northeast corner, the berm would have a holding capacity of approximately 185,000 cubic feet of water or a run-off equivalent to 5+ inches of rain in 24 hours during a prjected 100 year storm.

7. **Geology** - The San Jose Formation (Eocene Age) is the youngest Tertiary rock unit found within the San Juan Basin and occurs at the surface throughout a great deal of the central part of the San Juan Basin and the entire study area. The San Jose consists of interbedded shales, sandstones, and mudstones of continental origin with a maximum thickness of 2700 feet in the basin center or about 1000-1500 feet in the study area.

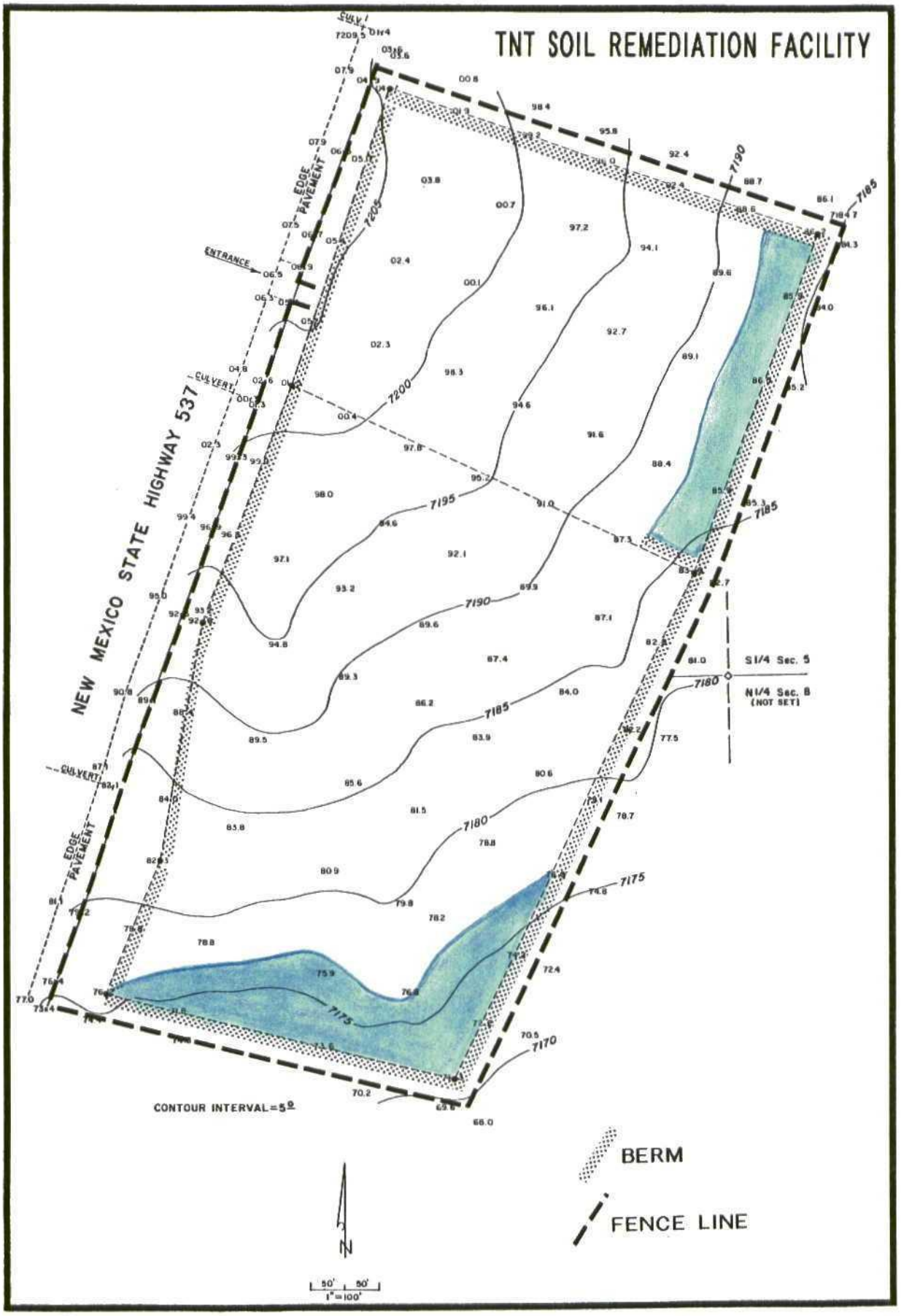


Figure 5. A diagram showing the location of ponding areas (blue) along the perimeter berm (stippled) where normal or 100 year run-off waters are projected to pool.

Tan to brown verigated clay-shale/mudstones with sporadic sandstone lenses make up the stratigraphy of the general land farm location and beds dip to the north at about 1 degree. The abundance of swelling clay/mudstones containing abundant bentonite is attested to by the familiar popcorn weathering habit of these units within the area. Illite, montmorillonite, and bentonite are the major consituents of the clay/mudstone portion of the San Jose Formation at the proposed facility. No sandstones crop out on the grounds of the proposed facility nor are their any outcrops visible up dip to the south toward Canyon de los Ojitos, which might underlie the land farm. No surface alluvium deposits exist on the property.

XII. PROOF OF NOTICE:

One land owner ~~other~~ of record other than the applicants (Tony Schmitz/TNT) have title to lands within 1/2 mile of the proposed land farm facility, see **Figure 1.** The north half of sections 4 and 5 are held by Mrs. Clarence Vogel of Albuquerque, NM. No one lives on the property and is used for graising of farm animals.

XIII. CONTINGENCY PLAN FOR H_2S:

No hydrogen sulphide problems are expected due to the nature of the waste facility. However, monitoring for H_2S will be conducted by facility personnel and should concentrations of 5-9 ppm be encountered by testing , appropriate chemical treatment programs will be implemented.

XIV. ADDITIONAL INFORMATION:

Two copies of the application will be provided to the OCD office in Santa Fe, NM and one copy to the District OCD office in Aztec, NM. Additional copies will be available from TNT, upon request. .

A registered professional engineer will submit as-built plans for the proposed facility as soon after construction as possible.

Before commencing construction, TNT shall post a surety or cash bond in the amount of $25,000, in a form approved by the Division, conditioned upon compliance with statues of the State of New Mexico and rules of the OCD, and satisfactory clean up of the facility upon cessation of operation, in accordance with the basic closure plan herein submitted. TNT will notify the Division of any material change affecting the bond filed for this facility and will, in any case, report the status of the bond annually to the Division.

XV. CERTIFICATION:

If the foregoing information contained within this application is acceptable to the New Mexico Oil Conservation Division, please notify TNT Construction, Inc. upon approval. Should their be additional information needed to commence construction and operation please notify TNT personel as soon as convenient, TNT (505) 774-6663 or Jim Gurney (505) 325-8181.

This application was prepared by James W. Gurney, a consulting geologist in Farmington, NM, with the assistance of Tony and Craig Schmitz of TNT Construction, Inc.

I, James W. Gurney, consulting geologist, certify that I am familiar with the information contained in and submitted with this application and that such information is true, accurate, and complete to the best of my knowledge.

James W. Gurney — Name
Geologist — Title
6-1-92 — Date

I, Tony L. Schmitz, President of TNT Construction, Inc., certify that I am familiar with the information contained in and submitted with this application and that such information is true, accurate, and complete to the best of my knowledge.

Tony L. Schmitz — Name
President — Title
6-1-92 — Date

APPENDIX

TNT Construction, Inc
Star Route
Lindrith, NM 87029

June 1, 1992

Mrs. Clarence Vogel
1401 Sigma Chi St.
Albuquerque, NM 87104

Re: Permit App;ication to State of New Mexico Oil Conservation Division for operation of a land Farm Facility:

Dear Mrs. Vogel,

TNT Construction, Inc. (Tony Schmitz family) is applying to the State of New Mexico Oil Conservation Division (OCD) for a permit allowing TNT to operate a land Farm Facility. OCD Rule 711, requires that land owners, located within one half mile of the proposed facility be notified of pending applications by the applicant. The proposed facility is just less than one-half mile to the south of your lands in the north-half of Section 5, in Township 25 North, Range 3 West in Rio Arriba County, New Mexico., please see the attached land map.

The proposed land farm is specifically in SW 1/4, SE 1/4, SEC. 5, T.25N., R.3W.; SE 1/4, SW 1/4, SEC. 5, T.25N., R.3W.; NE 1/4, NW 1/4, SEC. 8, T.25N., R.3W. in Rio Arriba County, New Mexico.

The land farm intends to accept non hazardous oil field waste solids and soils as described in RCRA Subtitle C or by characteristic testing analysis. The material will be applied to the land surface and natralized by atmospheric exposure and by organisms contained within the soils. Berms will surround the facility in order to prevent and materials from leaving the facility as a result of excess rain-fall. Note that the facility is topographically lower than your acreage to the north and should pose no problems with surface run-off, see the attached land map. The facility will also be fenced. The operation from a cosmetic view point will appear no different than land prepared for the planting of crops. Once the soils and solids are remediated (decontaminated) the soils can be used as top soil, fill, or any other use where normal dirt or soil might be utilized. The process utilized at the facility has been and is now an established technology for remediating hydrocarbon contaminated soils.

Please direct any comments to:
New Mexico Oil Conservation Divison, State Land Office Building
P. O. Box 2088 Santa Fe , New Mexico 87504-2088

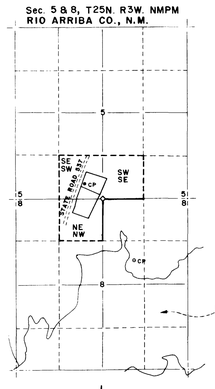
Thank you for your cooperation.

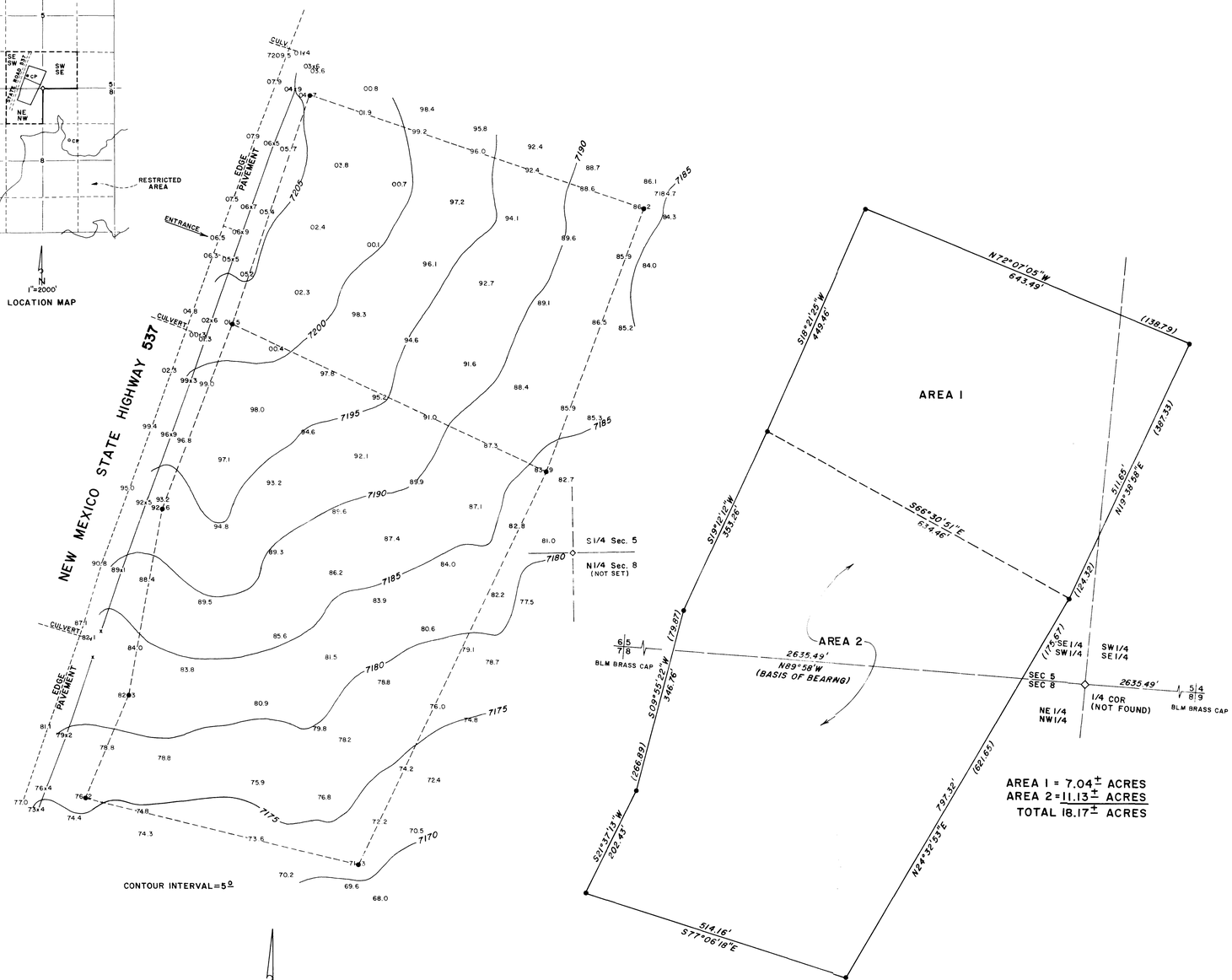
Sincerely,

James W. Gurney

James W. Gurney
Geologist for TNT Construction, Inc.

SOIL REMEDIATION FACILITY FOR T.N.T. CONSTRUCTION INC.





● = 1/2" REBAR W/CAP #5979

AREA I = 7.04± ACRES
AREA 2 = 11.13± ACRES
TOTAL 18.17± ACRES

DESCRIPTION
(SEE LOCATION MAP)

A TRACT OF LAND BEING THE SW1/4 SE1/4 AND THE SE1/4 SW1/4 OF SECTION 5, AND THE NE1/4NW1/4 OF SECTION 8, ALL IN T-25-N, R-3-W, N.M.P.M., RIO ARRIBA COUNTY, NEW MEXICO.

STATE OF NEW MEXICO)
) ss.
COUNTY OF SAN JUAN)

I, EDGAR L. RISENHOOVER, BEING FIRST DULY SWORN, UPON MY OATH, STATE THAT I AM THE REGISTERED PROFESSIONAL LAND SURVEYOR WHO MADE THE MAP OF THE T.N.T. CONSTRUCTION SOIL REMEDIATION FACILITY AND THAT SUCH MAP CONSISTING OF 1 SHEET WAS PREPARED FROM FIELD NOTES OF ACTUAL SURVEYS BY ME OR UNDER MY DIRECTION AND THAT THE SAME ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND IN ACCORDANCE WITH NEW MEXICO MINIMUM STANDARDS.

Edgar L. Risenhoover
EDGAR L. RISENHOOVER

LICENSE NO. 5979

SUBSCRIBED AND SWORN BEFORE ME THIS 31st DAY OF May, 1992

Donna J. Risenhoover
NOTARY PUBLIC

MEXICO
8-21-94

Edgar L. Risenhoover
EDGAR L. RISENHOOVER
PROFESSIONAL LAND SURVEYOR
NEW MEXICO REGISTRATION NO. 5979

BASIN SURVEYING INC.
665 CR 1191
FARMINGTON, NEW MEXICO

T.N.T. CONSTRUCTION INC.		
TRACT IN SECTIONS 5 & 8, T25N, R 3W, NMPM, RIO ARRIBA CO., N.M.	SCALE 1"=100'	DRAWN BY G.T.
		REVISED
SOIL REMEDIATION FACILITY		
DATE 5/29/92	APPROVED BY	DRAWING NUMBER SHEET 1

EXHIBIT A

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

October 10, 1991

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

Mr. Tony L. Schmitz, President
T-n-T Construction, Inc.
HCR 74, Box 115
Lindrith, New Mexico 87029

RE: Sampling Results

Dear Tony:

Attached are some additional results for samples taken in August and September. The most recent pond sample from the clay lined pond (Pond #2) shows a higher level of benzene (a natural component of crude oil) than found in the August sample reported to you earlier (164 ppb vs. 72 ppb). However, both samples are below EPA's level of 500 ppb, the level at which EPA considers benzene hazardous. Nevertheless, you should avoid any prolonged exposure to this water since benzene is known to cause cancer. The monitor well sampled continues to show very high levels of salt contaminants (but not benzene) and should continue to be pumped out with the water transferred to the pond for disposal.

Also enclosed is a site map showing some of the monitor wells. Using this map or another, please number them with the current numbering system used and return a map to me. Include any wells not shown on the sheet and show which of the wells are equipped with handpumps.

If you have any questions regarding this letter, please call Roger Anderson at (505) 827-5884.

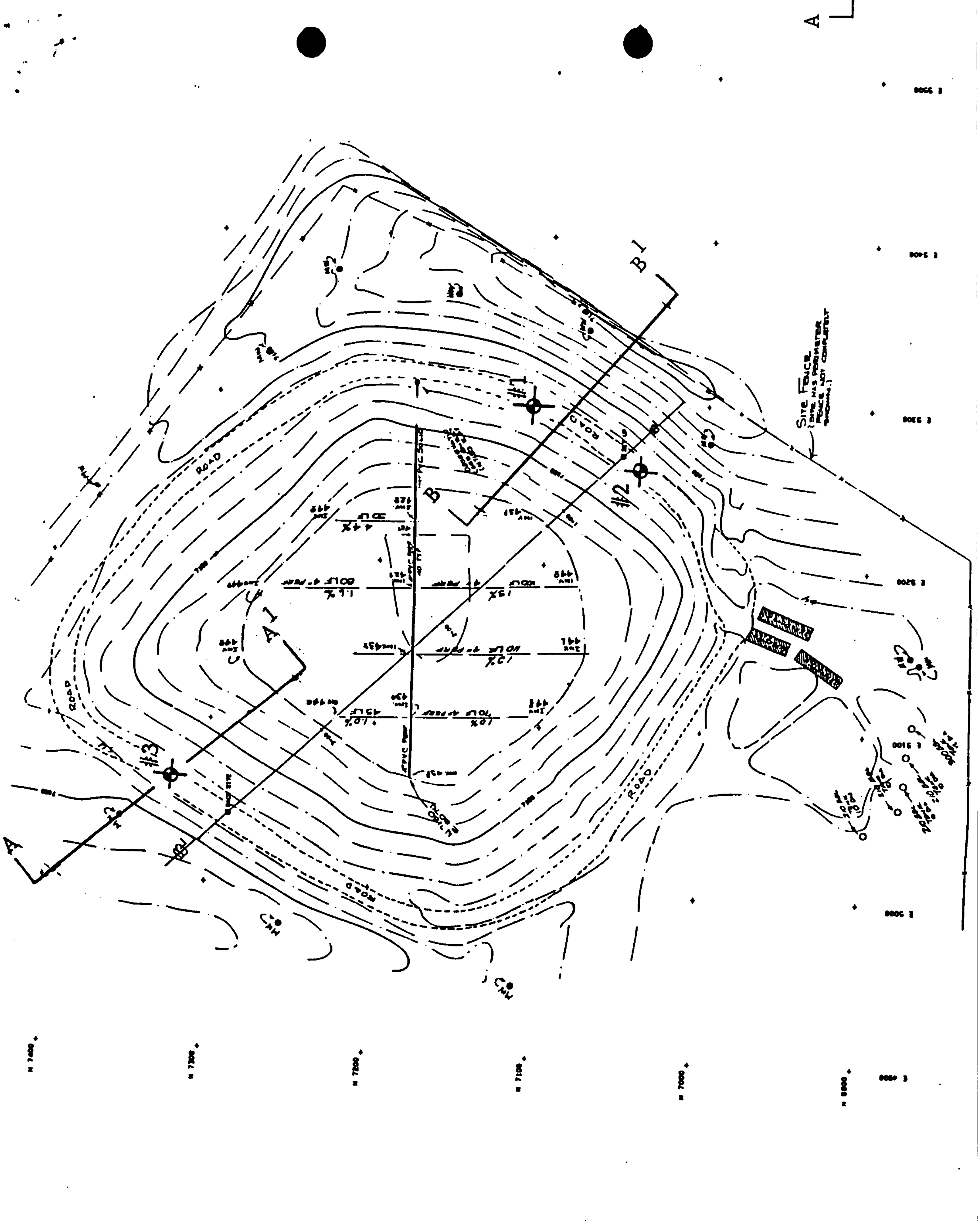
Sincerely,

Dave

David G. Boyer
Environmental Bureau Chief

encl.

cc: OCD Aztec Office



A
A
B
#1
#2
#3
ROAD
ROAD
ROAD
ROAD
SITE FENCE

SAN JUAN ENGINEERS
2101 SAN JUAN BOULEVARD FARMINGTON, NEW MEXICO 87401 TELEPHONE: 505-325-7535

September 26, 1991

State of New Mexico
Oil Conservation Division
P. O. Box 2088
Santa Fe, NM 87504-2088

63521

ATTN: Roger Anderson

RE: Rehabilitation of Evaporation Pond
TNT Construction

Dear Mr. Anderson:

This letter will confirm our telephone conversation this morning regarding your review of our plans for the referenced project.

Your comment referred to the spacing of the leak detection laterals. I have added a dimension of "40 feet (max)" to the Plan Sheet 1. Enclosed is a copy of Sheet 1 showing this revision highlighted.

Based upon our telephone conversation, I have forwarded final plans to TNT Construction and notified them your approval letter is forthcoming.

Very truly yours,

SAN JUAN ENGINEERS

Robert B. Stannard

Robert B. Stannard, Jr., P.E.
Vice President

RBS/ig
Enclosure

xc: Craig Schmitz, TNT Construction

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

September 27, 1991

BRUCE KING
GOVERNOR

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

CERTIFIED MAIL
RETURN RECEIPT REQUESTED -
P 756-903-829

Mr. Vincent R. Martinez
Mountain States Constructors, Inc.
Post Office Box 6325
Albuquerque, NM 87197

Re: **USE OF TNT DISPOSAL WATER**

Dear Mr. Martinez:

I have received your letter of September 25, 1991, requesting OCD authorization to use approximately 4,000,000 gallons of wastewater produced during oil extraction activities for **NM 537** road construction during the next eight months. The water will be obtained from TNT Disposal, an OCD permitted disposal facility.

Although this water is exempted by Congress from regulation as a "hazardous waste", OCD has tested the water to determine if any parameters exceed EPA standards for "hazardous waste". Results of this testing (enclosed) show that such standards are not exceeded for benzene or metals which are known to be present in this wastewater. However, this water does contain levels of salt that would pollute fresh water if this water reached surface streams or ground water. Therefore, OCD will place conditions on its use and Mountain States Construction, Inc., will be responsible for proper use and disposal as stated below.

Based on the information in your letter and in current laboratory analyses, OCD approves of the use of this water as proposed with the following conditions:

1. Water will be applied by truck directly onto the road surface in such quantities that no excess water runs off into roadside ditches or watercourses.

2. Excess water remaining at the end of each day's construction shall be stored in trucks or tanks such that water does not drip or drain to the ground surface overnight. Alternatively, such water may be returned to TNT's disposal pond.

Please be advised that OCD approval does not relieve you of liability should your operation result in actual pollution of surface waters, ground waters or the environment which may be actionable under other laws and/or regulations. In addition, this approval does not relieve you of responsibility for compliance with other county, state, tribal, and federal laws and/or regulations.

If you have any questions, please contact **Roger Anderson** of my staff at **(505) 827-5884**.

Sincerely,

DAVID G. BOYER, Hydrogeologist
Environmental Bureau Chief

DGB/dp

cc: OCD Aztec District Office
TNT Disposal, Lindrith

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

OIL CONSERVATION DIVISION
RECEIVED
'91 SEP 26 AM 8 51

CLIENT:	NMOCD	DATE REPORTED:	09/17/91
ID:	9108142011		
SITE:	TNT Main Pond	DATE RECEIVED:	08/16/91
LAB NO:	F6947	DATE COLLECTED:	08/14/91

Lab pH (s.u.)	8.44	
Lab conductivity, umhos/cm	31300	
Lab resistivity, ohm-m	0.319	
Total dissolved solids (180), mg/L	19700	
Total dissolved solids (calc), mg/L	16500	
Total alkalinity as CaC03, mg/L	1710	
Total hardness as CaC03, mg/L	238	
Sodium absorption ratio	168	
Fluoride, mg/L	1.21	
	mg/L	meq/L
Bicarbonate as HC03	1980	32.5
Carbonate as C03	54.9	1.83
Chloride	8580	242
Sulfate	259	5.4
Calcium	41.4	2.07
Magnesium	32.7	2.69
Potassium	567	14.5
Sodium	5970	260
Major cations		279
Major anions		282
Cation/anion difference		0.5 %

Inter-Mountain Laboratories, Inc

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT: NMOCD
ID: 9108142011
SITE: TNT Main Pond
LAB NO: F6947

DATE REPORTED: 09/17/91
DATE RECEIVED: 08/16/91
DATE COLLECTED: 08/14/91

Trace metals by AA (dissolved concentration), mg/L

	Analytical Result:	Detection Limit:
Arsenic (As)	ND	<0.005
Cadmium (Cd)	ND	<0.002
Mercury (Hg)	ND	<0.001
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

Trace metals by ICAP (dissolved concentration), mg/L

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	0.1	<0.1
Boron (B)	3.26	<0.01
Barium (Ba)	1.7	<0.5
Beryllium (Be)	ND	<0.005
Calcium (Ca)	35.5	<0.5
Cobalt (Co)	ND	<0.02
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	1.21	<0.05
Potassium (K)	595.8	<0.1
Manganese (Mn)	0.07	<0.02
Molybdenum (Mo)	ND	<0.02
Magnesium (Mg)	36.7	<0.5
Sodium (Na)	6667	<0.5
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	15.1	<0.05
Thallium (Tl)	ND	<0.1
Vanadium (V)	ND	<0.05
Zinc (Zn)	ND	<0.01

ND - Analyte "not detected" at the stated detection limit.

Wanda Orso
Water Lab Manager

Inter-Mountain Laboratories, Inc.

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

VOLATILE AROMATIC HYDROCARBONS

Client:	NMOCD	Report Date:	09-26-91
Sample ID:	TNT Main Pond	Date Sampled:	08-14-91
Laboratory Number:	6947	Date Received:	08-16-91
Analysis Requested:	8020	Date Analyzed:	09-11-91
Sample Matrix:	Water	Preservative:	Cool & HgCl2
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	72.0	0.5
Toluene	81.9	0.5
Chlorobenzene	ND	0.5
Ethylbenzene	ND	0.5
p,m-Xylene	63.7	0.5
o-Xylene	26.0	0.5
1,3-Dichlorobenzene	ND	0.5
1,4-Dichlorobenzene	ND	0.5
1,2-Dichlorobenzene	ND	0.5

SURROGATE RECOVERIES:

Parameter	Percent Recovery
4-Bromofluorobenzene	90.2 %

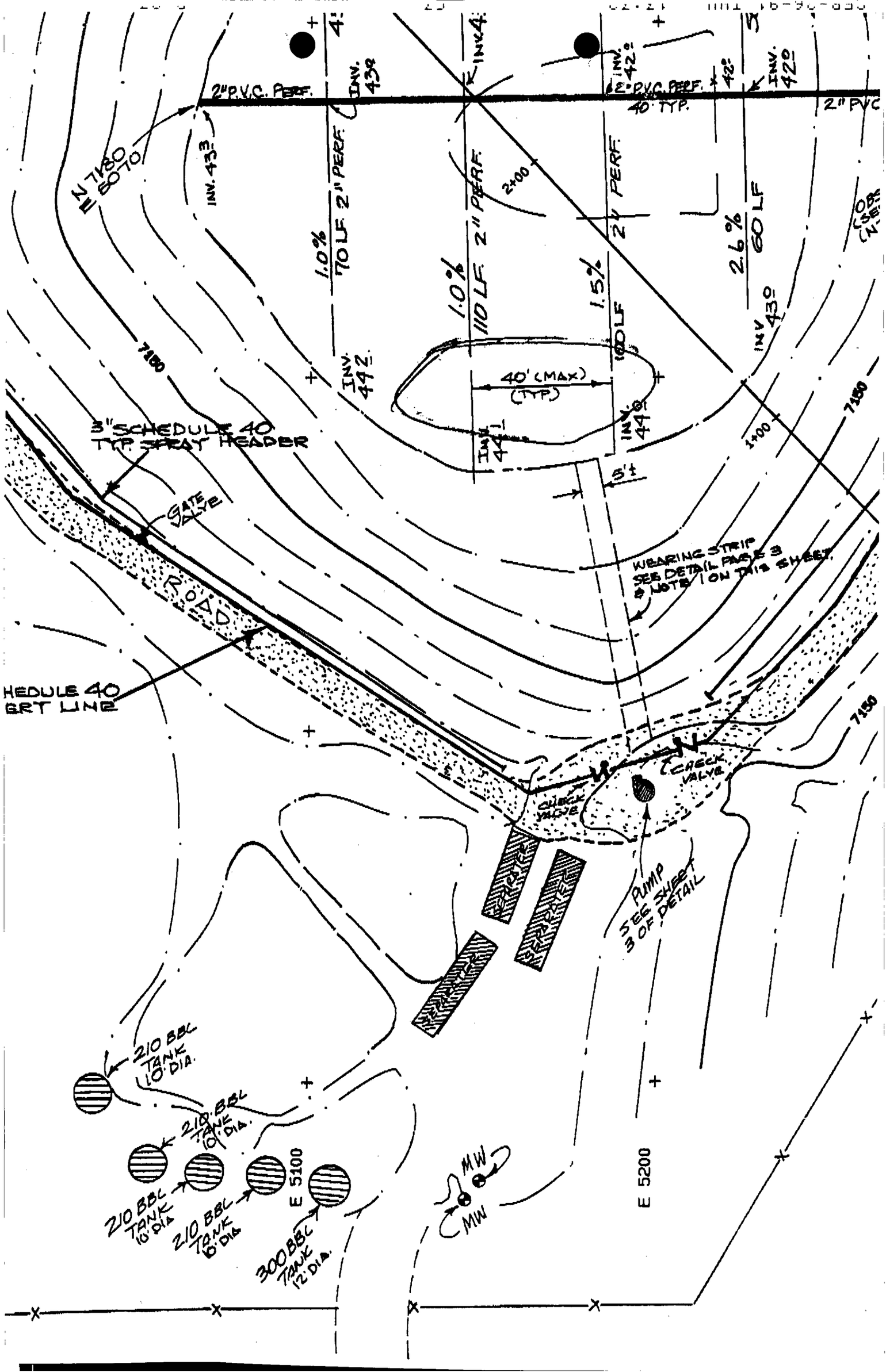
Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Tony Tristano

Analyst


2" P.V.C. PERF.
INV. 439
INV. 442
INV. 441
INV. 430
INV. 420
2" P.V.C. PERF.
40' TYP.
2" PVC
N 7180
E 6070
INV. 433
70 LF 2" PERF.
1.0%
110 LF 2" PERF.
1.0%
100 LF
1.5%
2" PERF.
60 LF
2.6%
2+00
1+00
7150
40' (MAX)
(TYP)
5'±
3" SCHEDULE 40
TYP. SPRAY HEADER
GATE VALVE
ROAD
WEARING STRIP
SEE DETAIL PAGE 3
& NOTE 1 ON THIS SHEET
HEDULE 40
GRT LINE
CHECK VALVE
CHECK VALVE
PUMP
SEE SHEET
3 OF DETAIL
210 BBL
TANK
10' DIA.
210 BBL
TANK
10' DIA.
210 BBL
TANK
10' DIA.
210 BBL
TANK
10' DIA.
300 BBL
TANK
12' DIA.
E 5100
E 5200
MW
MW

MOUNTAIN STATES CONSTRUCTORS, INC.

Post Office Box 6325 / Albuquerque, New Mexico 87197 / Telephone (505) 345-4401

25 September 1991

David Boyer
New Mexico Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

Dear David,

We are requesting the use of water, which is being collected and stored by Tony and Darlene Schmitz.

We would like to use this water during processing roadway materials for use on F.H.W.A. Project #FLH 1352(8) on Highway 537.

We will need approximately 4,000,000 gallons for use from approximately 10/21/91 thru 5/30/92. It is my understanding that there will be some stipulations tied to the use of this water.

If any questions arise, or any additional information is necessary, please contact Tim Dudley or myself at 345-4401.

Your response to this request is anticipated.

Sincerely,

Mountain States Constructors, Inc.

FOR Jacqueline M. Cory
Vincent R. Martinez
Agent

VRM:jc

MOUNTAIN STATES CONSTRUCTORS, INC.

Post Office Box 6325 / Albuquerque, New Mexico 87197 / Telephone (505) 345-4401

25 September 1991

David Boyer
New Mexico Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

Dear David,

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Your response to this request is anticipated.

Sincerely,

Mountain States Constructors, Inc.

FOR Jacqueline M. Cory
Vincent R. Martinez
Agent

VRM:jc

September 18, 1991

New Mexico Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87501

APPLICATION FOR LINING OF FIRST COMMERCIAL SURFACE DISPOSAL FACILITY, SW/4, SEC.8,T.25N. R.3W, RIO ARRIBA COUNTY, NEW MEXICO

The following information and permit application are submitted for your review and approval. The information addresses the material required in the New Mexico Oil Conservation Division (OCD) "Guidelines for Permit Application, Design and Construction of Waste Storage/Disposal Pits" (revised 2/88) and Rule 711 of the Division's Rules and Regulations promulgated June 2, 1988.

I. General Information.

A. Name and Owner of Legally Responsible Party:

T-n-T Construction, Inc. (a New Mexico Corporation)
Tony L. Schmitz, President
HCR 74, Box 115
Lindrith, New Mexico 87029
(505) 7746663

B. Name of Local Representative:

The name of the local representative or contact person for T-n-T Construction, Inc. is Tony L. Schmitz at the above address and phone number.

C. The evaporation pond is located in: SW/4, Sec. 8, T.25N., R.3W., see Figure 1.

D. Affirmation:

Certification by an authorized representative of T-n-T Construction, Inc. that information submitted in this application is true, accurate and complete to the best of the applicant's knowledge; and such information is in compliance with OCD Rules and Regulations. An affirmation and signature is shown at the end of this document.

II. Proposed Construction.

A. Evaporation pond #1 will have a primary and secondary synthetic liner installed with a fabric or geonet located between the liners to transmit to the leak detection system.

If the foregoing information contained within this application is acceptable to the New Mexico Oil Conservation Division (OCD) and the New Mexico State Engineers's Office, please notify T-N-T Construction, Inc. Should their be additional information needed to commence construction please notify me at your convenience. It is the intention of T-N-T construction to have the proposed facility completed by fall, if at all possible.

"I, Tony L. Schmitz, certify that I am familiar with the information contained in and submitted with this application and that such information is true, accurate, and complete to the best of my knowledge."

Tony Lee Schmitz
(Authorized Signature)

9/18/91
(Date)

Tony Lee Schmitz
(Printed Name of Person Signing)

President
(Title)

Copies:
New Mexico State Engineer's Office

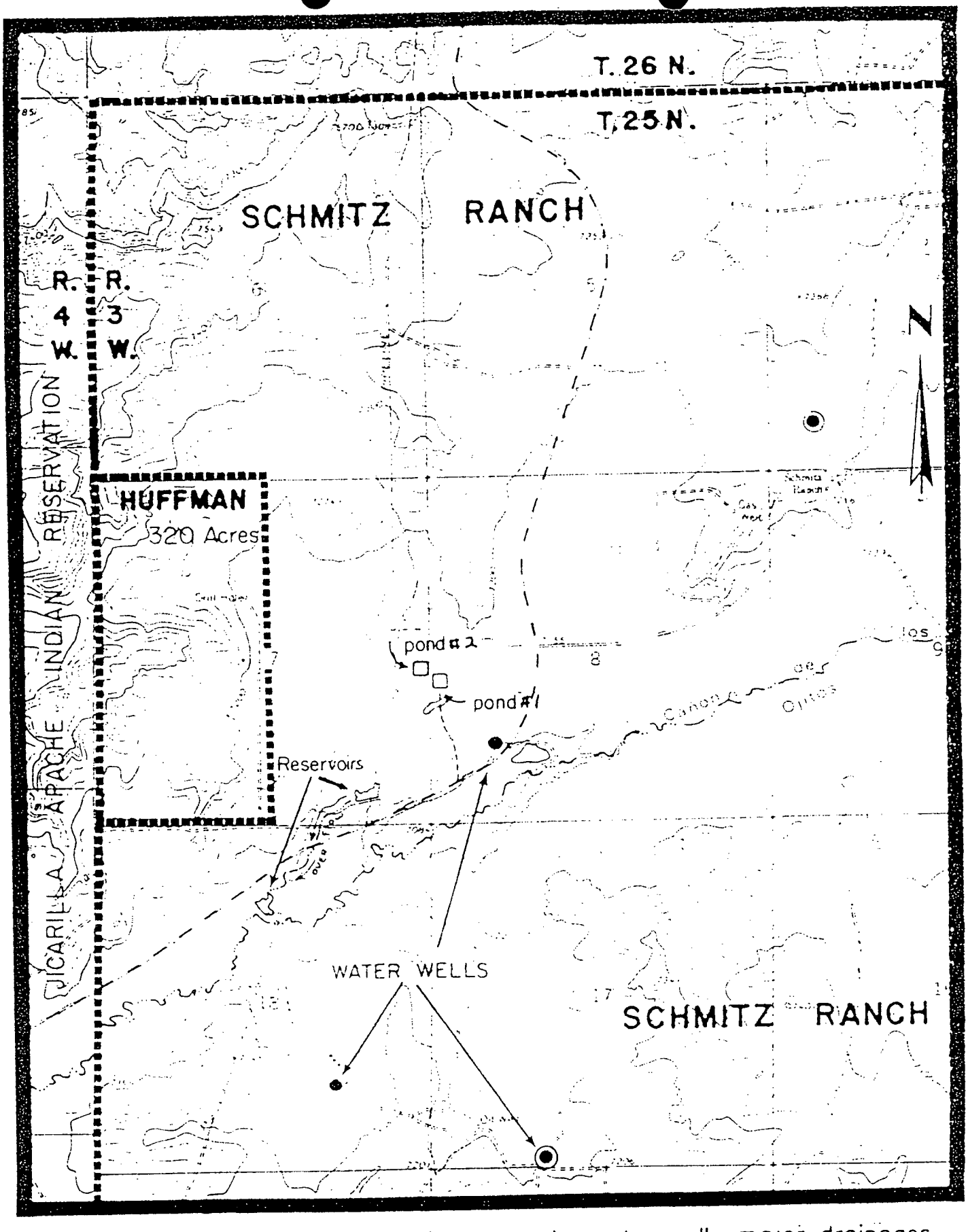


Figure 1. Index map showing existing ponds, water wells, major drainages, surface owners and topography.

SAN JUAN ENGINEERS
2101 SAN JUAN BOULEVARD FARMINGTON, NEW MEXICO 87401 TELEPHONE: 505-325-7535

September 13, 1991

63521

State of New Mexico
Oil Conservation Division
P. O. Box 2088
Santa Fe, NM 87504-2088

ATTN: Roger Anderson

RE: Rehabilitation of Evaporation Pond

Dear Mr. Anderson:

Enclosed are three (3) sets of the plans for the rehabilitation of an evaporation pond for TNT Construction. This pond, the original evaporation pond at Schmitz Ranch near Lindrith, developed some water in the monitoring wells. The original pond construction utilized a clay liner.

The rehabilitation project utilizes a double liner system, with the primary liner of CPE and the secondary of PVC. A conventional "header-lateral" leak detection system will be used. We also envision installing sprayers to increase evaporation. These sprayers will be very similar to those originally installed.

As we have discussed over the telephone, this is a rehabilitation of an existing pond, not new construction. As such, we are only making the existing pond meet the OCD regulations, not designing for some desired evaporative throughput. Our client tells us that their mode of operation has been, and will continue to be, to accept water as long as sufficient capacity exists, then to turn away deliveries.

After you have reviewed the drawings, please contact us with any questions.

Very truly yours,

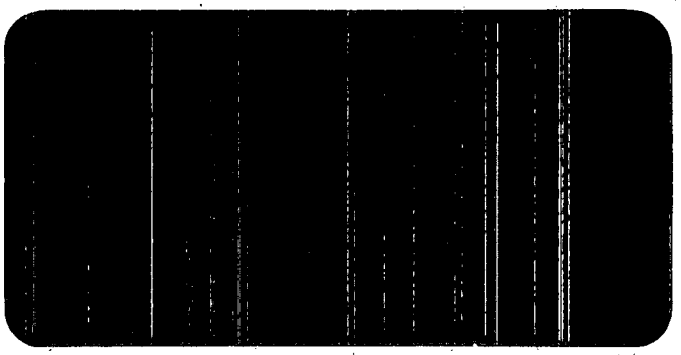
SAN JUAN ENGINEERS

Robert B. Stannard, Jr., P.E.
Vice President

RBS/ig
Enclosures

RBS/ig
xc: Craig Schmitz

1991



WESTERN TECHNOLOGIES INC.

The Quality People

GEOTECHNICAL SERVICES FOR:

Evaporation Pond
Lindrith, New Mexico
WT No. 3121K072

Submitted to:

TNT Construction, Inc.
Star Route
Lindrith, New Mexico 87029

Attention: Mr. Craig Schmitz

Invoice No. 31210129

September 3, 1991

WESTERN TECHNOLOGIES INC.
The Quality People

ARIZONA

Phoenix
P.O. Box 21387 85036
3737 East Broadway Road
Phoenix, Arizona 85040
(602) 437-3737

Mesa
952 East Baseline Road, No. 104
Mesa, Arizona 85204
(602) 926-2113

Sun City
17200 North Dysart Road, No. 13
P.O. Box 2431
Sun City, Arizona 85372
(602) 975-2154

Flagstaff
2400 East Huntington Drive
Flagstaff, Arizona 86004
(602) 774-8708

Lakeside
Route 1, Box 1030
Lakeside, Arizona 85929
(602) 368-5568

Tucson
3480 South Dodge Boulevard
Tucson, Arizona 85713
(602) 748-2262

Sierra Vista
1827 South Paseo San Luis
Sierra Vista, Arizona 85635
(602) 458-0364

Laughlin / Bullhead City
1610 Riverview Drive, No. 5
Bullhead City, Arizona 86442
(602) 758-8378

CALIFORNIA

Concord
1001 Galaxy Way, No. 107
Concord, California 94520
(415) 689-9378

Riverside
16801 Van Buren Boulevard, Suite A
Riverside, California 92504
(714) 780-7482

COLORADO

Golden
13949 West Colfax Avenue, No. 140
Golden, Colorado 80401
(303) 233-2991

NEVADA

Las Vegas
3611 West Tompkins Avenue
Las Vegas, Nevada 89103
(702) 798-8050

Environmental Services
4085 Nevso Drive, Suite G
Las Vegas, Nevada 89103
(702) 252-0580

NEW MEXICO

Albuquerque
8305 Washington Place, N.E.
Albuquerque, New Mexico 87113
(505) 823-4488

Farmington
400 South Lorena Avenue
Farmington, New Mexico 87401
(505) 327-4966

WESTERN TECHNOLOGIES INC.

400 South Lorena Avenue
Farmington, New Mexico 87401
(505) 327-4966 • fax 327-5293

TNT Construction, Inc.
Star Route
Lindrith, New Mexico 87029

September 3, 1991

Attn: Mr. Craig Schmitz

Re: Evaporation Pond
Lindrith, New Mexico

Job No. 3121K072
Inv. No. 31210129

Our geotechnical engineering report for the existing evaporation pond is attached. The work was performed in accordance with our proposal of July 16, 1991.

Soils at the site generally consisted of sandy clay with low to moderate load bearing capabilities. The surface soils are underlain by sandstone with moderate to high load bearing capabilities. The sandy clays were used for construction of an existing evaporation pond which uses a synthetic liner to minimize infiltration of water into the sandstone.

We are prepared to review your plans and specifications for consistency with the recommendations, and to provide the construction observation and testing recommended.

Sincerely,
WESTERN TECHNOLOGIES INC.
Geotechnical Engineering Services

Lawrence E. Cynova

Lawrence E. Cynova, P.E.

9-3-91

Copies to: Addressee (3)
Bob Stannard (1)

/cb

TNT Construction, Inc.
Job No. 3121K072

TABLE OF CONTENTS

Geotechnical Engineering Evaluation
Evaporation Pond
Lindrith, New Mexico

INTRODUCTION

This report contains the results of our geotechnical engineering evaluation of the existing Evaporation Pond which is located northwest of Lindrith, New Mexico. The purpose of these services is to provide results of field and laboratory testing, to evaluate the existing pond dikes, and to provide engineering recommendations for the pond liners.

PROPOSED CONSTRUCTION

The evaporation pond will have primary and secondary synthetic liners with a fabric or geonet located between the liners to transmit water to the leak detection system.

SITE CONDITIONS

At the time of our exploration, the pond was empty except for several inches of rain water in the bottom. This water was in the process of being pumped out at the time of exploration. The pond has bottom plan dimensions of 175 by 180 feet. The pond has top of dike dimensions of 300 by 320 feet, the top of dike width is approximately 10 to 15 feet. The pond has a storage capacity of 13.5 acre feet of water. The maximum height of the dike is 14 feet. The maximum depth of the water in the pond will be approximately 10 feet. Another evaporation pond which is in operation is located approximately 500 feet northwest of this pond.

SCOPE OF SERVICES

Three borings were drilled to depths of 18 to 26 feet at the locations shown on the site plan. During exploration, subsoils were visually examined and sampled at selected intervals.

The following tests were performed on selected soil samples:

- o Water content
- o Dry density

The following tests were taken from our previous soils report dated May 2, 1988, Job No. 3128J024 for the nearby pond:

- o Shear strength
- o Gradation
- o Plasticity Index
- o Permeability
- o ASTM D698 proctor

Test results were used in the evaluation of this pond and earthwork recommendations.

Western Technologies Inc. performed the services described in this report to develop engineering information for the purposes defined in the "Introduction." We did not intend to uncover nor identify any contaminated subsurface materials that may contain hazardous or flammable substances. Identification of such substances requires specialized exploration techniques and analyses which were not used in this investigation.

INTERPRETATION OF SUBSURFACE CONDITIONS

Subsurface Exploration: Three test borings were drilled on top of the dikes. As presented on Logs of Borings, surface fill soils to depths of 5 to 6 feet in all test borings were found to be sandy clay of firm to stiff consistency and low to medium plasticity. The near surface soils to depths of 15 to 26 feet in all test borings consisted of sandy clay of stiff consistency and low to medium plasticity. The materials underlying the near surface soils in test borings 1 and 3 and extending to the full depth of exploration consisted of sandstone.

Groundwater levels were checked at the completion of the field exploration, no water was encountered. A more accurate evaluation of groundwater conditions would require installing and monitoring piezometers over an extended time period.

Geology: The proposed water evaporation pond is to be located in unconsolidated surficial clay material derived from the local topography. This material was deposited as alluvium washed down from the surrounding foothills and probably originated as a shale from the San Jose Formation. This formation is Eocene in age and is described as a buff, fine to coarse grained arkosic sandstone, conglomeratic sandstone and interbedded gray and red shale which makes up a large percentage of the San Juan Basin. In the northern part of the basin, this formation contains some volcanic debris, including andesite pebbles, but the proportion of volcanic debris and sandstone decreases southward.

ANALYSIS PROCEDURES

General: We understand that the evaporation pond will store water throughout the year. The pond will be filled with water

from oil and gas production. The water will be evaporated by spraying the water into the air. Observations indicate that all the soils exposed on the dikes are probably clay, although sandstone may exist near the bottom of the pond even though it was not observed due to the ponded rainwater. It is understood that a synthetic flexible membrane liner will be used for both primary and secondary liners. The west dike and the east dike, which are the highest dikes, were chosen for stability analysis.

Material Properties: The on-site clay materials exhibit properties of low to moderate cohesion and low to moderate angles of internal friction in both compacted and undisturbed conditions. These materials are underlain by sandstone at a moderate depth. The sandstone materials are much stronger in the undisturbed state than the embankment fill or native clay. Based upon our observations, the results of laboratory testing, and our experience with similar materials, the following material properties were used for analysis of the embankment and foundation soils:

Compacted Clay
Dry unit weight - 112 pcf
Angle of internal friction - 12°
Cohesion - 300 pcf

Undisturbed Clay
Dry unit weight - 110 pcf
Angle of internal friction - 16°
Cohesion - 600 psf

Assumed conservative sandstone foundation material properties are as follows:

Sandstone
Dry unit weight - 140 pcf
Angle of internal friction - 30°
Cohesion - 2500 psf

Slope Stability Analysis: The static stability of the highest embankment slopes were analyzed using strength parameters obtained from laboratory and field testing. A computer program (SB-SLOPE Program developed by Digital Research Inc.) using simplified Bishop's analysis was utilized for analysis of both the upstream and downstream slopes for the indicated embankment configurations.

The following table presents the results of the analysis:

EAST DIKE

Condition	Slope	Factor of Safety
Steady state seepage	Downstream	
Static	3.4:1	3.2
Rapid drawdown	Upstream	
Static	5.5:1	4.8

WEST DIKE

Condition	Slope	Factor of Safety
Steady state seepage	Downstream	
Static	4.2:1	8.3
Rapid drawdown	Upstream	
Static	6.8:1	6.9

A minimum factor of safety of 1.5 is recommended for both the steady state and rapid drawdown conditions in the Design of Dams, by the New Mexico State Engineer's Office.

After reviewing the Deformation Analyses - Embankment Dams section of the "Procedure on Design Criteria and Safety of Dams", considerations, we believe that seismic analysis is not necessary. This is due to the fact that the embankment and foundation materials are not subject to liquification. The dikes are densely compacted, the slopes will be 3 horizontal to 1 vertical or flatter and the static factor of safety is greater than 1.5 in all cases.

The pond will have primary and secondary liners consisting of synthetic flexible membrane materials with a fabric geonet located between the liners. If a rip occurs in a seam or a hole develops in the liner, the low permeability of the clay would require a considerable period of time for the water to seep far beyond the pond. It is understood the pond will be equipped with a leak detection system located between the two liners.

DISCUSSION AND RECOMMENDATIONS:

General: We anticipate that the existing clay soils will be compacted below the secondary liner. The in-place densities obtained during exploration indicate that the fill was originally compacted to a density higher than 95 percent of maximum density. The pond liner may be satisfactorily supported upon prepared subgrade. If subsoil conditions other than those identified during the field explorations are encountered during construction or should design plans change, this firm should be contacted for supplemental review and recommendations.

The following general conclusions and recommendations are presented:

1. Native and fill soils below levels of surface soil disturbance are generally of moderate densities and will afford support for the anticipated liners. Stable conditions should be verified at the time of construction by proof rolling with a heavily loaded dump truck or scraper.

2. Excavation of the design pond base should be possible with conventional earthmoving equipment, unless sandstone is encountered, then large equipment or blasting may be required.

Synthetic Liner: Several types of synthetic liner systems, which include reinforced PVC or other plastic membranes placed on a prepared subgrade, may be used. Plastic liners vary from 10 to 120 mills in thickness with varying chemical compositions. If construction or maintenance traffic is anticipated within the liner area, a soil blanket may be used above and below the membrane for protection. In addition, a protective soil cover on the membrane may be required due to high winds experienced during storms or spring weather or should the pond be empty. Prior to placement of the bottom liner, the subgrade should be prepared as recommended in "Site Preparation and Earthwork." The protective soil cover placed below the membrane, requirements for a subdrain system and the maximum slope on which the liner is placed should meet the requirements of the liner manufacturer. It is understood there will be a leak detection system between the two liners.

Site Preparation and Earthwork: The following procedure is recommended for site preparation and earthwork for the bottom liner portions of the evaporation pond.

1. Strip all loose surface soils, vegetation, roots and debris from the pond and liner area to a horizontal distance of 5 feet beyond the perimeter of the new construction.

2. Clean and widen depressions, swales, etc., to form level working areas to accomodate compaction equipment and liner placement.

3. No material should be placed which is frozen or where the in-place material is frozen.

4. Proof-roll the exposed subgrade in the embankment and pond liner areas with a heavy piece of construction equipment to densify materials which may have been loosened during the stripping and excavation process.

   Proof-rolling may be accomplished by a minimum of 2 passes of a heavily loaded scraper, dump truck or equivalent. All soft areas should be removed and replaced with compacted fill.

5. Place and compact all fill in the bottom or the sides of the pond in horizontal lifts to the finished grade levels. Lift thicknesses should be compatible with compaction equipment used to achieve the required uniform densities.

6. All subgrade preparation, liner fill placement and compaction should be accomplished under observation and testing to assess compliance with project specifications.

All material under the liner should be compacted to at least 95% of the maximum dry density as determined by ASTM: D-698 methods or the manufacturer's compaction specifications, if higher, and at a water content of 1 percent below optimum to 3 percent above optimum.

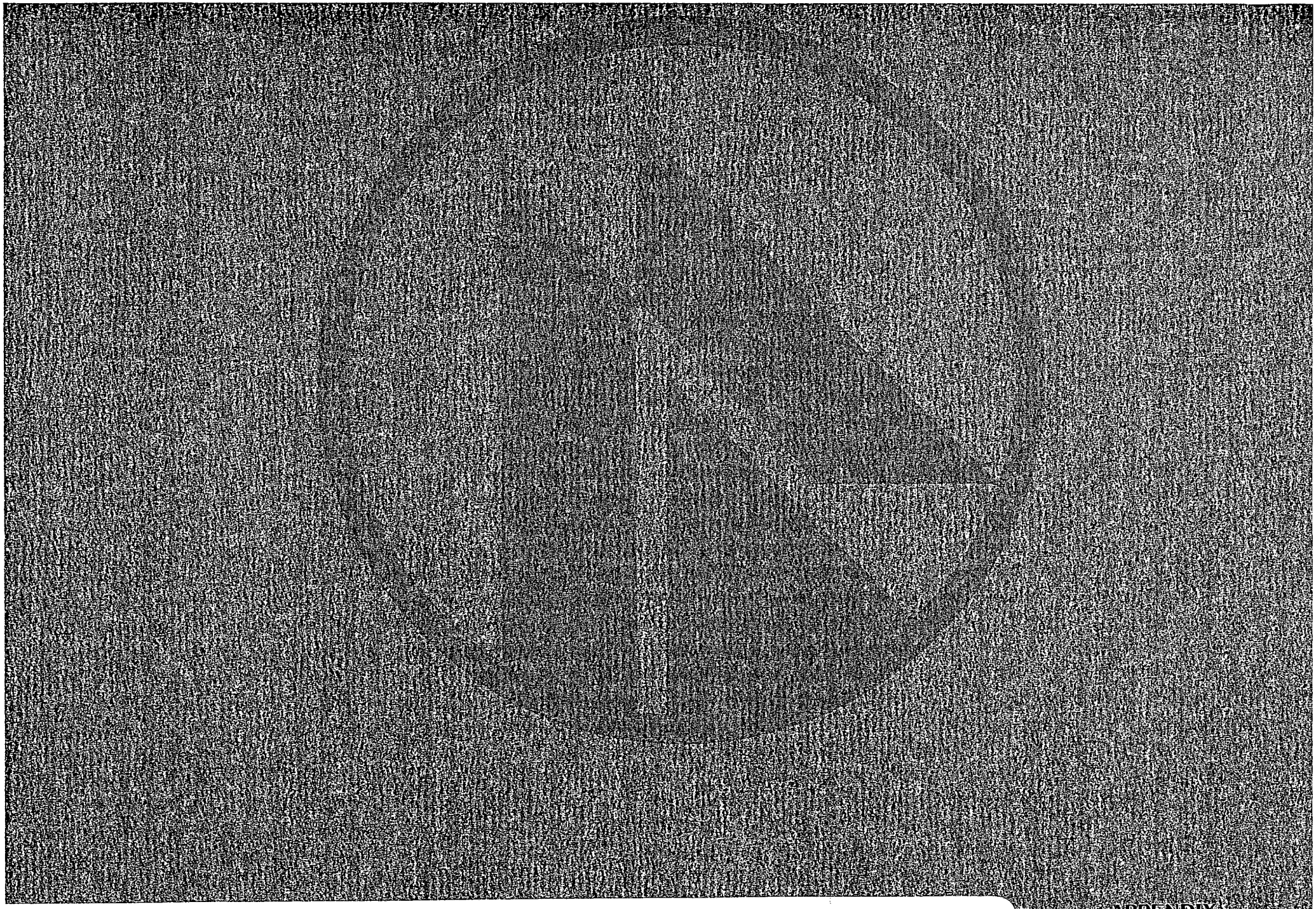
Drainage: Positive drainage should be provided around the proposed pond during construction and maintained throughout the life of the proposed development.
Borrow excavation, surface stripping, subgrade preparation, and liner preparation and placement should be accomplished under the observation and testing directed by a soils engineer to assess compliance with recommendations.

Corrosion: We recommend a Type II portland cement be used for all concrete on and below grade.

CLOSURE

Our conclusions and recommendation are predicated on observation and testing of the earthwork and foundation preparations directed by a geotechnical engineer. It would be logical for Western Technologies to provide these services since we are most qualified to determine consistency of field conditions with those data used in our analyses.

Deviations from our recommendations by the plans, written specifications, or field applications shall relieve us of responsibility unless our written concurrence with such deviations has been obtained.



APPENDIX

DEFINITION OF TERMINOLOGY

ALLOWABLE SOIL BEARING CAPACITY ALLOWABLE FOUNDATION PRESSURE	The recommended maximum contact stress developed at the interface of the foundation element and the supporting material.
BACKFILL	A specified material placed and compacted in a confined area.
BASE COURSE	A layer of specified material placed on a subgrade or subbase.
BASE COURSE GRADE	Top of base course.
BENCH	A horizontal surface in a sloped deposit.
CAISSON	A concrete foundation element cast in a circular excavation which may have an enlarged base. Sometimes referred to as a cast-in-place pier.
CONCRETE SLABS-ON-GRADE	A concrete surface layer cast directly upon a base, subbase or subgrade.
CRUSHED ROCK BASE COURSE	A base course composed of crushed rock of a specified gradation.
DIFFERENTIAL SETTLEMENT	Unequal settlement between or within foundation elements of a structure.
ENGINEERED FILL	Specified material placed and compacted to specified density and/or moisture conditions under observation of a representative of a soil engineer.
EXISTING FILL	Materials deposited through the action of man prior to exploration of the site.
EXISTING GRADE	The ground surface at the time of field exploration.
EXPANSIVE POTENTIAL	The potential of a soil to expand (increase in volume) due to the absorption of moisture.
FILL	Materials deposited by the action of man.
FINISHED GRADE	The final grade created as a part of the project.
GRAVEL BASE COURSE	A base course composed of naturally occurring gravel with a specified gradation.
HEAVE	Upward movement.
NATIVE GRADE	The naturally occurring ground surface.
NATIVE SOIL	Naturally occurring on-site soil.
ROCK	A natural aggregate of mineral grains connected by strong and permanent cohesive forces. Usually requires drilling, wedging, blasting or other methods of extraordinary force for excavation.
SAND AND GRAVEL BASE	A base course of sand and gravel of a specified gradation.
SAND BASE COURSE	A base course composed primarily of sand of a specified gradation.
SCARIFY	To mechanically loosen soil or break down existing soil structure.
SETTLEMENT	Downward movement.
SOIL	Any unconsolidated material composed of discrete solid particles, derived from the physical and/or chemical disintegration of vegetable or mineral matter, which can be separated by gentle mechanical means such as agitation in water.
STRIP	To remove from present location.
SUBBASE	A layer of specified material placed to form a layer between the subgrade and base course.
SUBBASE GRADE	Top of subbase.
SUBGRADE	Prepared native soil surface.

METHOD OF SOIL CLASSIFICATION
(ASTM D 2487)

COARSE-GRAINED SOILS

LESS THAN 50% FINES*

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
GW	WELL-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LESS THAN 5% FINES	GRAVELS More than half of coarse fraction is larger than No. 4 sieve size
GP	POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LESS THAN 5% FINES	
GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, MORE THAN 12% FINES	
GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, MORE THAN 12% FINES	
SW	WELL-GRADED SANDS OR GRAVELLY SANDS, LESS THAN 5% FINES	SANDS More than half of coarse fraction is smaller than No. 4 sieve size
SP	POORLY-GRADED SANDS OR GRAVELLY SANDS, LESS THAN 5% FINES	
SM	SILTY SANDS, SAND-SILT MIXTURES, MORE THAN 12% FINES	
SC	CLAYEY SANDS, SAND-CLAY MIXTURES, MORE THAN 12% FINES	

NOTE:
Coarse-grained soils receive dual symbols if they contain 5 to 12% fines (e.g. SW-SM, GP-GC, etc.)

FINE-GRAINED SOILS

MORE THAN 50% FINES*

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS	SILTS AND CLAYS Liquid limit less than 50
CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
OL	ORGANIC SILTS OR ORGANIC SILTY-CLAYS OF LOW PLASTICITY	
MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDS OR SILTS, ELASTIC SILTS	SILTS AND CLAYS Liquid limit more than 50
CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY	
PT	PEAT, MUCK, AND OTHER HIGHLY ORGANIC SOILS	HIGHLY ORGANIC SOILS

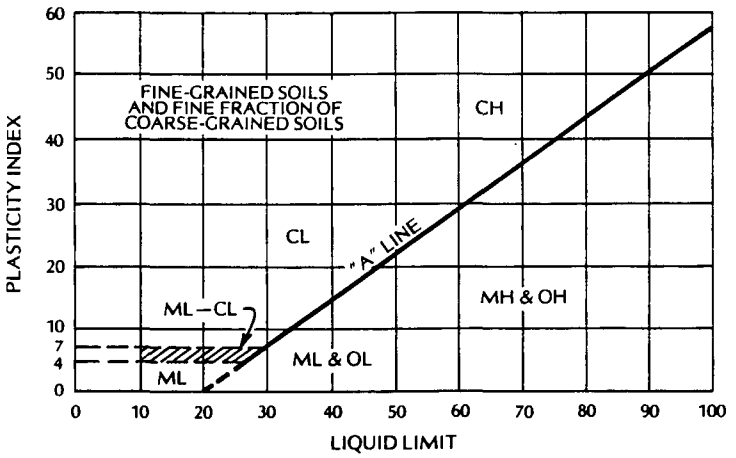
NOTE:
Fine-grained soils receive dual symbols if their limits plot in the hatched zone on the Plasticity Chart (ML-CL)

SOIL SIZES

COMPONENT	SIZE RANGE
BOULDERS	ABOVE 12 in.
COBBLES	3 in. to 12 in.
GRAVEL	No. 4 to 3 in.
Coarse	¾ in. to 3 in.
Fine	No. 4 to ¾ in.
SAND	No. 200 to No 4
Coarse	No. 10 to No. 4
Medium	No. 40 to No. 10
Fine	No. 200 to No. 40
*FINES (Silt or Clay)	BELOW No. 200

NOTE:
Only sizes smaller than three inches are used to classify soils.

PLASTICITY CHART



BORING LOG NOTES

The number shown in "LOG OF BORING NO." refers to the approximate location of the same number indicated on the "Site Plan" as positioned in the field by pacing from property lines and/or existing features.

"ELEVATION" refers to ground surface elevation at the boring location relative to the indicated "DATUM" established by interpolation from contours on the "Site Plan".

"TYPE/SIZE BORING" refers to the exploratory equipment used in the boring where HSA = hollow-stem auger.

"N" in "Blows/Foot" refers to the number of blows of a 140-pound weight, dropped 30 inches, required to advance a two-inch-outside-diameter split-barrel sampler a distance of 1 foot, Standard Penetration Test (ASTM D1586). Refusal to penetration is defined as more than 100 blows per foot.

"R" in "Blows/Foot" refers to the number of blows of a 140-pound weight, dropped 30 inches, required to advance a 2.42-inch-inside-diameter ring sampler a distance of 1 foot. Refusal to penetration is considered more than 50 blows per foot.

"Sample Type" refers to the form of sample recovery, in which N = Split-barrel sample and R = Ring sample.

"Dry Density, pcf" refers to the laboratory-determined dry density in pounds per cubic foot.

"Water Content, %" refers to the laboratory-determined moisture content in percent (ASTM D2216).

"Unified Classification" refers to the soil type as defined by "Method of Soil Classification". The soils were classified visually in the field and, where appropriate, classifications were modified by visual examination of samples in the laboratory and/or by appropriate tests.

These notes and boring logs are intended for use in conjunction with the purposes of our services defined in the text. Boring log data should not be construed as part of the construction plans nor as defining construction conditions.

Boring logs depict our interpretations of subsurface conditions at the locations and on the date(s) noted. Variations in subsurface conditions and soil characteristics may occur between borings. Groundwater levels may fluctuate due to seasonal variations and other factors.

In general, terms and symbols on the boring logs conform with "Standard Definitions of Terms and Symbols Relating to Soil and Rock Mechanics" (ASTM D653).

LOG OF BORING NO. 1

Project Evaporation Pond — Job No. 3121K072

Elevation 7154' — Datum Project Contour Drawing

Type/Size Boring 7" Auger — Rig Type CME-55

Groundwater Conditions No groundwater encountered on 07/24/91 — Date 07/24/91

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
5					PL	CL	FILL 0 to 5.5 feet. SANDY CLAY; red to brown, firm to stiff. Trace of small gravel.
		28	R	115	<PL 14.3		
		11	N				
10					SL-PL	CL	SANDY CLAY; red to brown, stiff. Trace of coarse grained sand. Moisture content increases from 16 to 19 feet. Firm to stiff 16 to 19 feet.
		48	R	120	12.0		
		18	N				
15		16	N		PL		
		34	R	109	17.6		
20					<PL		
25		50/2"	N		SLT. DAMP to DAMP		SANDSTONE; gray, moderately hard. Light cementation.
30							Stopped at 25 feet.

LOG OF BORING NO. 2

Project Evaporation Pond — Job No. 3121K072

Elevation 7154' — Datum Project Contour Drawing

Type/Size Boring 7" Auger — Rig Type CME-55

Groundwater Conditions No groundwater encountered on 07/24/91 — Date 07/24/91

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
					PL	CL	FILL 0 to 6 feet. SANDY CLAY; red to brown, firm to stiff. Trace of gravel.
			G				
		20	R	114	16.1		
5			N				
					PL	CL	SANDY CLAY; red to brown, stiff.
		33	R	110	18.1		
10		12	N				
15		50/5"	N				
		50/4"	N				
20							
		50/4"	N				
25							
							Auger refusal at 26 feet.
30							

LOG OF BORING NO. 3

Project: Evaporation Pond — Job No.: 3121K072

Elevation: 7154' — Datum: Project Contour Drawing

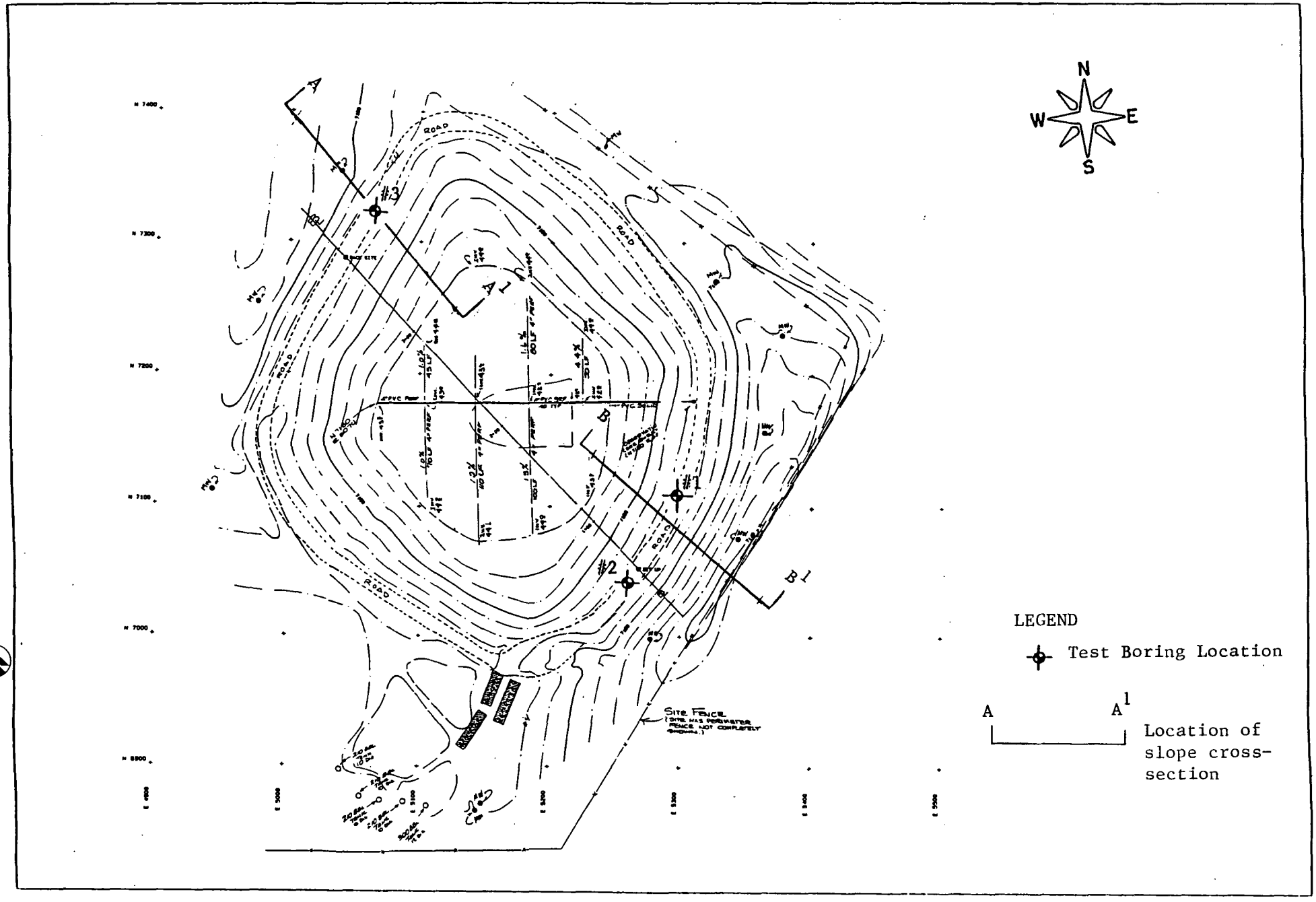
Type/Size Boring: 7" Auger — Rig Type: CME-55

Groundwater Conditions: No groundwater encountered on 07/24/91 — Date: 07/24/91

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
0					PL	CL	FILL 0 to 5 feet. SANDY CLAY; red to brown, firm to stiff.
					<PL		
		22	R	113	15.8		
		13	N				
5							
					<PL	CL	SANDY CLAY; red to brown, stiff.
		50/8"	R	123	9.2		
		50/3"	N				
10							
		68	N				
15							
					SLT. DAMP		SANDSTONE; gray to tan, moderately hard. Light cementation.
		50/3"	N				
20							Auger refusal at 18 feet.
25							
30							

Prepared By J.M. Boyd Date 08/28/91 Job No. 3121K072

Checked By _____ Date _____ Client TNT Construction

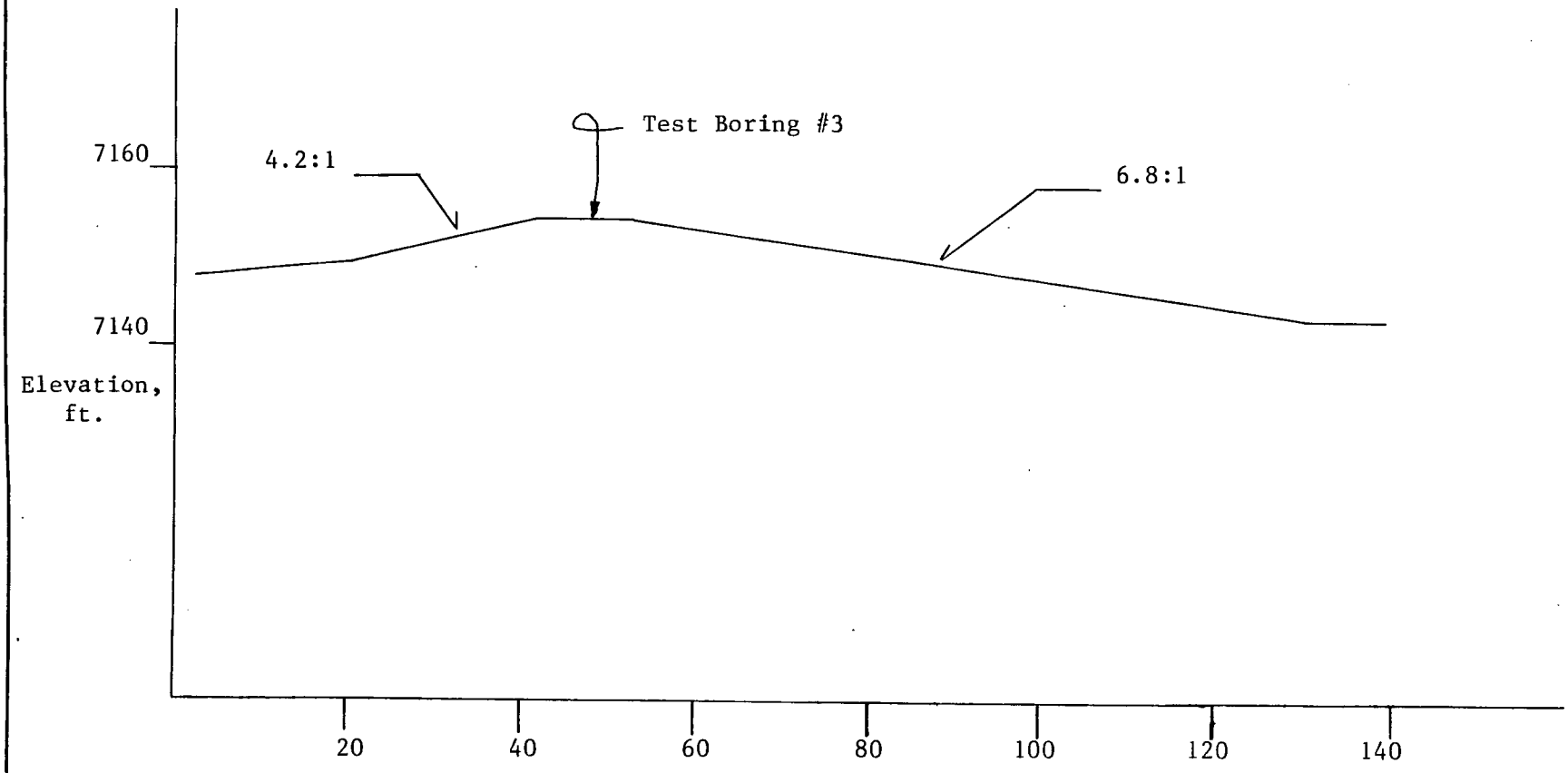


Prepared By J.M. Boyd Date 08/28/91 Job No. 3121K072

Checked By _____ Date _____ Client TNT Construction

Evaporation Pond - Slope Cross-Section

WEST DIKE - SECTION A

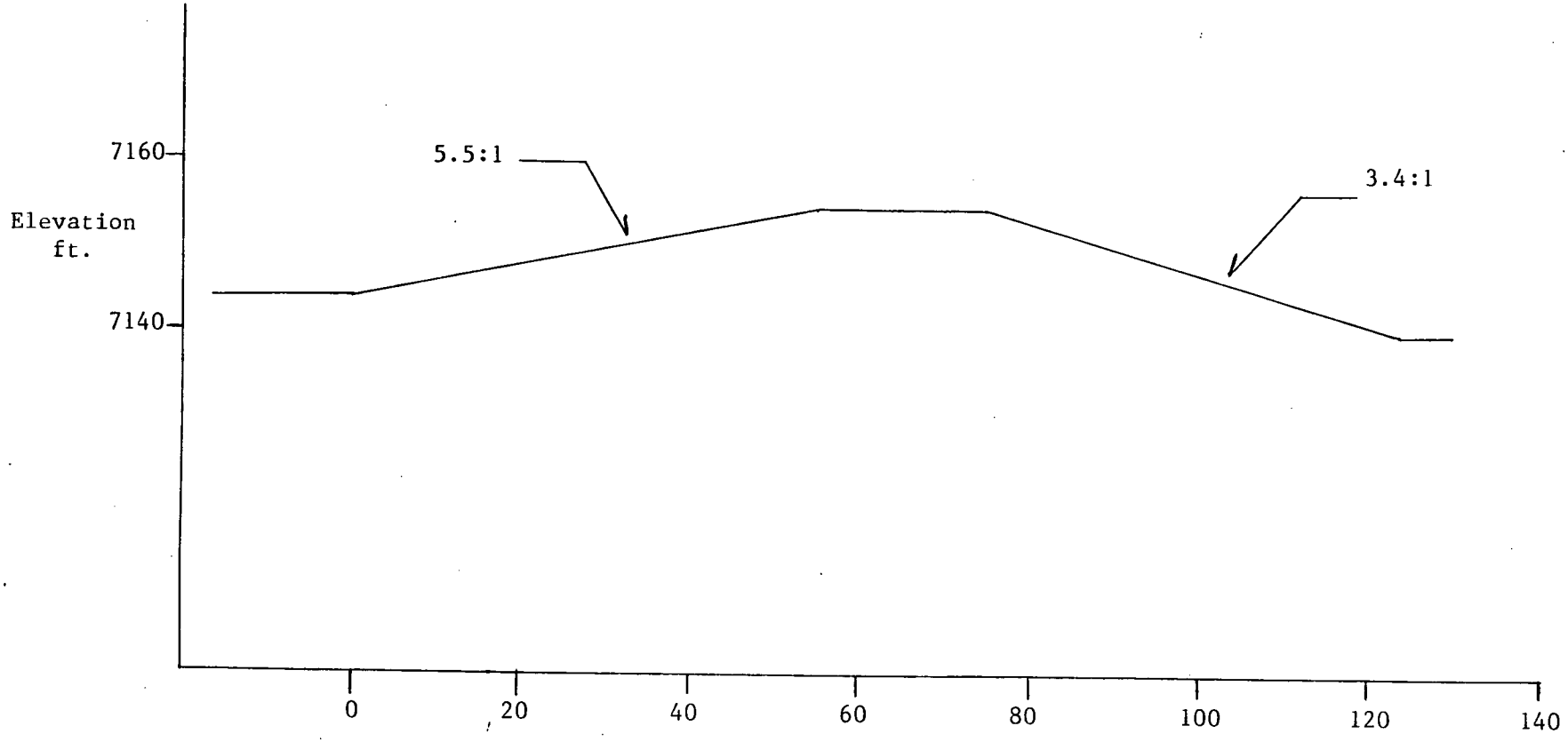


Prepared By J.M. Boyd Date 08/28/91 Job No. 3121K072

Checked By _____ Date _____ Client TNT Construction

Evaporation Pond - Slope Cross Section

EAST DIKE - SECTION B



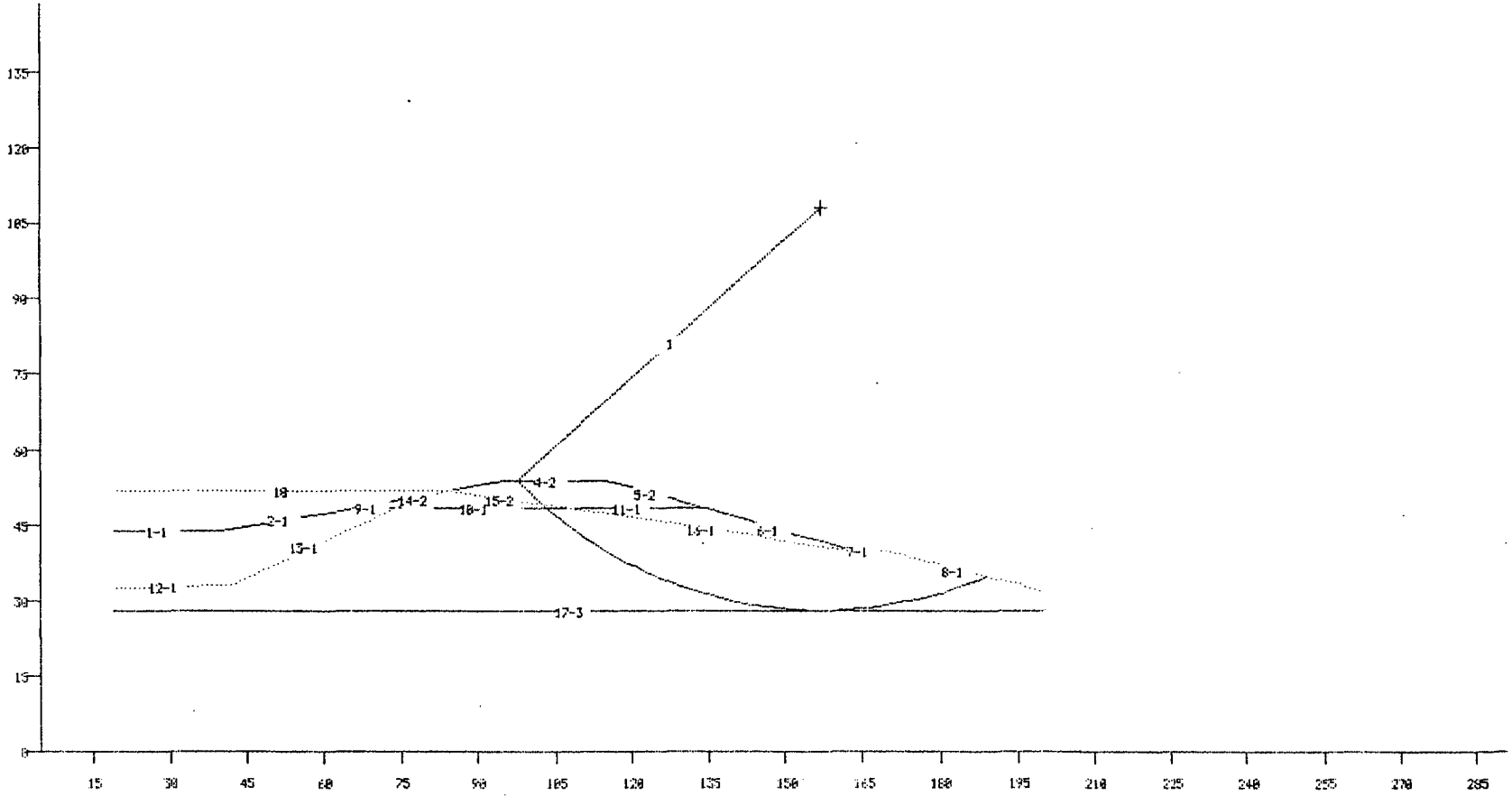
SB-SLOPE

Simplified Bishop Slope Stability Analysis

PROJECT: EVAPORATION POND: EAST DIKE, HOLE IN LINER, STEADY STATE FLOW
LOCATION: LINDRITH, NEW MEXICO
FILE: TNTES1
PARTIAL SLOPE CROSS SECTION

SOIL*	DENSITY	COHESION	PHI
1	110.0	600.0	16.0
2	112.0	300.0	12.0
3	140.0	2500.0	30.0

CIRCLE	X	Y	RADIUS	FS
1	157.0	108.0	80.0	3.18



* Number after hyphen('-') is Soil Type

Western Technologies Inc. - Phoenix, AZ

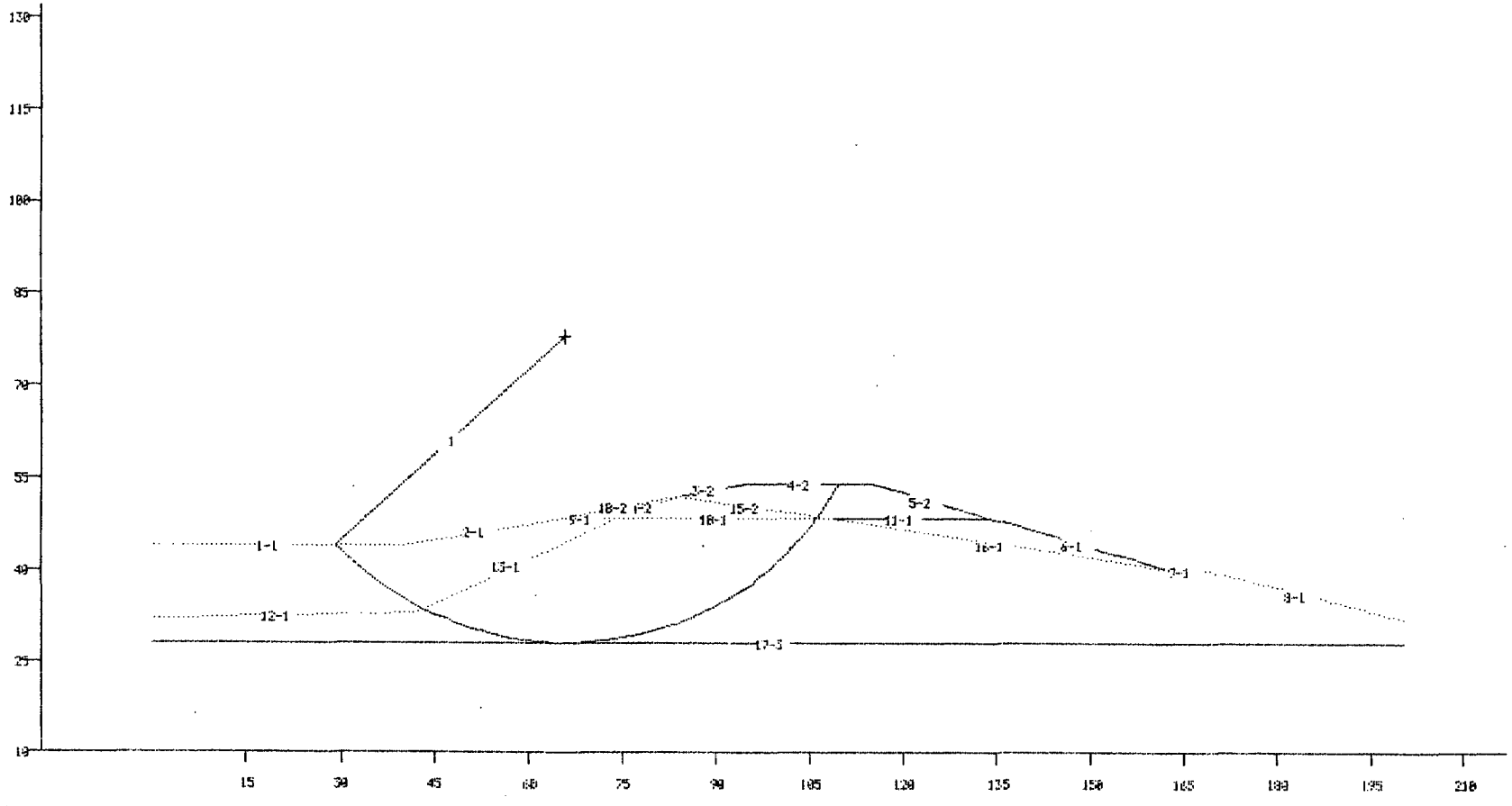
SB-SLOPE

Simplified Bishop Slope Stability Analysis

PROJECT: EVAPORATION POND: EAST DIKE, RAPID DRAWDOWN
LOCATION: LINDRITH, NEW MEXICO
FILE: TNTERD1
COMPLETE SLOPE CROSS SECTION

SOIL*	DENSITY	COHESION	PHI
1	110.0	600.0	16.0
2	112.0	300.0	12.0
3	140.0	2500.0	30.0

CIRCLE	X	Y	RADIUS	FS
1	66.0	78.0	50.0	4.78



* Number after hyphen('-') is Soil Type

Western Technologies Inc. - Phoenix, AZ

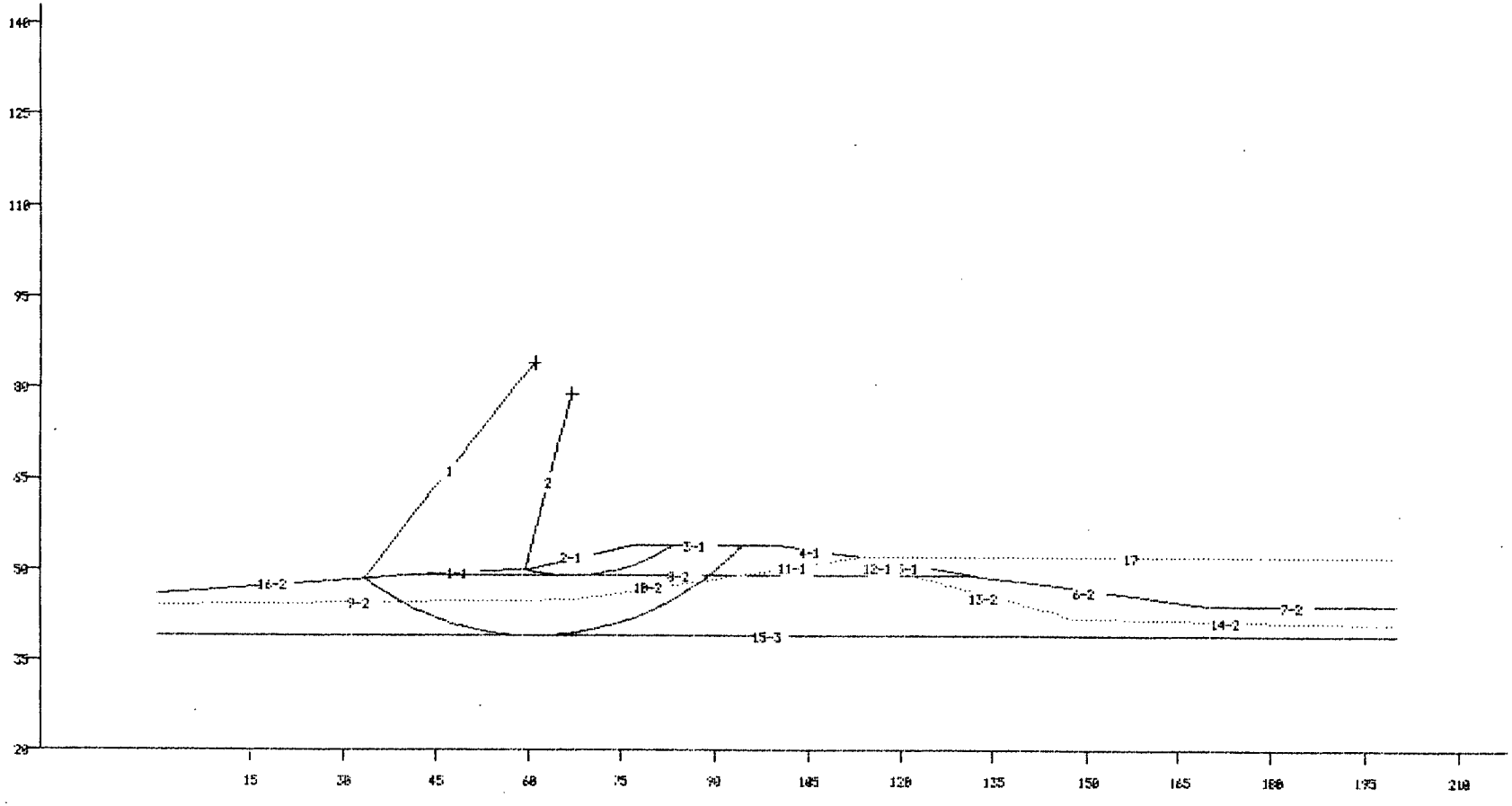
SB-SLOPE

Simplified Bishop Slope Stability Analysis

PROJECT: EVAPORATION POND: WEST DIKE, HOLE IN LINER, STEADY STATE
LOCATION: LINDRITH, NEW MEXICO
FILE: TNTWS1
COMPLETE SLOPE CROSS SECTION

SOIL*	DENSITY	COHESION	PHI
1	112.0	300.0	12.0
2	110.0	600.0	16.0
3	140.0	2500.0	30.0

CIRCLE	X	Y	RADIUS	FS
1	61.0	84.0	45.0	9.40
2	67.0	79.0	30.0	8.31



* Number after hyphen('-') is Soil Type

Western Technologies Inc. - Phoenix, AZ

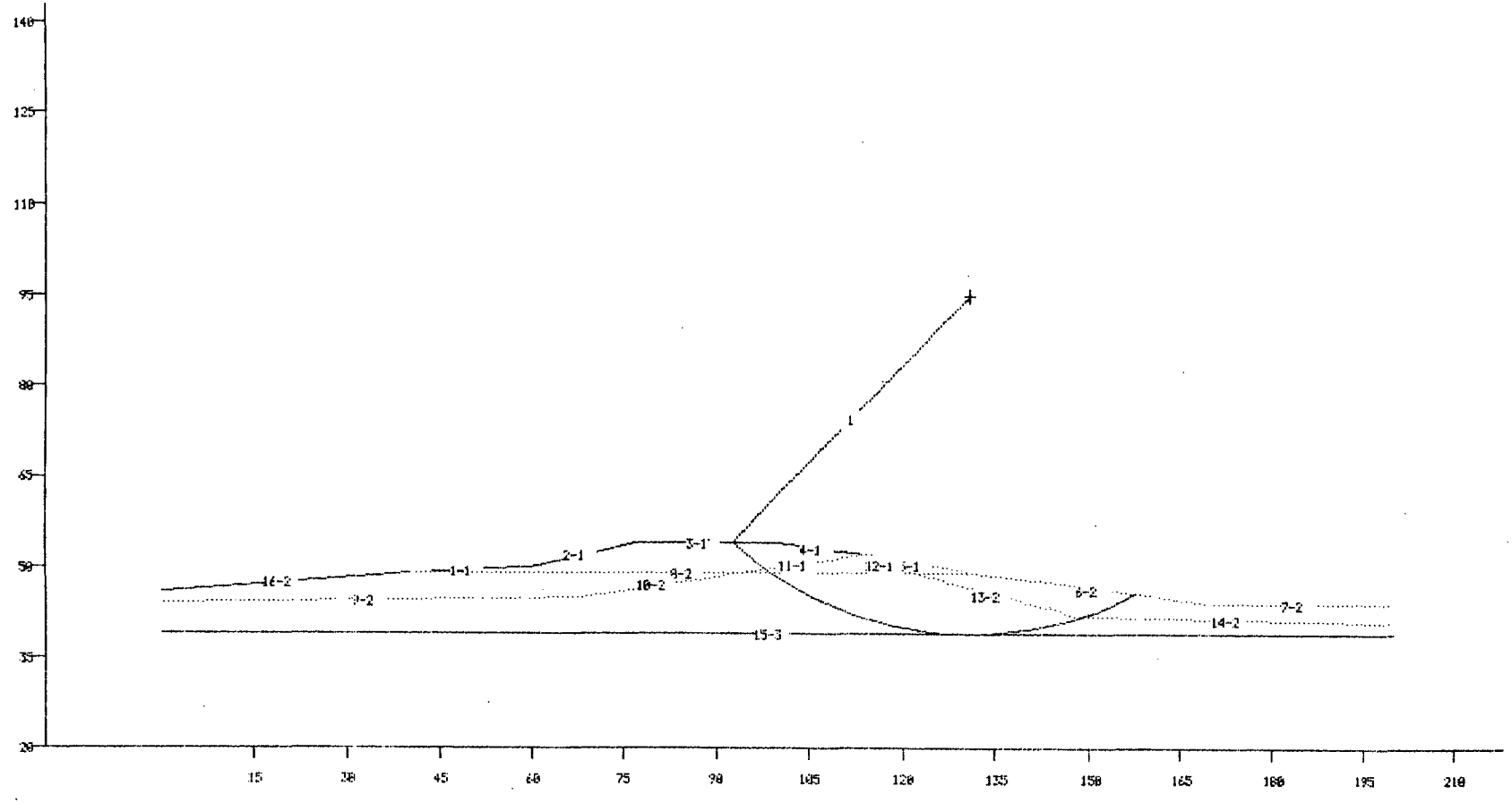
SB-SLOPE

Simplified Bishop Slope Stability Analysis

PROJECT: EVAPORATION POND: WEST DIKE, RAPID DRAWDOWN
LOCATION: LINDRITH, NEW MEXICO
FILE: TNTWRD1
COMPLETE SLOPE CROSS SECTION

SOIL*	DENSITY	COHESION	PHI
1	112.0	300.0	12.0
2	110.0	600.0	16.0
3	140.0	2500.0	30.0

CIRCLE	X	Y	RADIUS	FS
1	131.0	95.0	56.0	6.93



* Number after hyphen('-') is Soil Type

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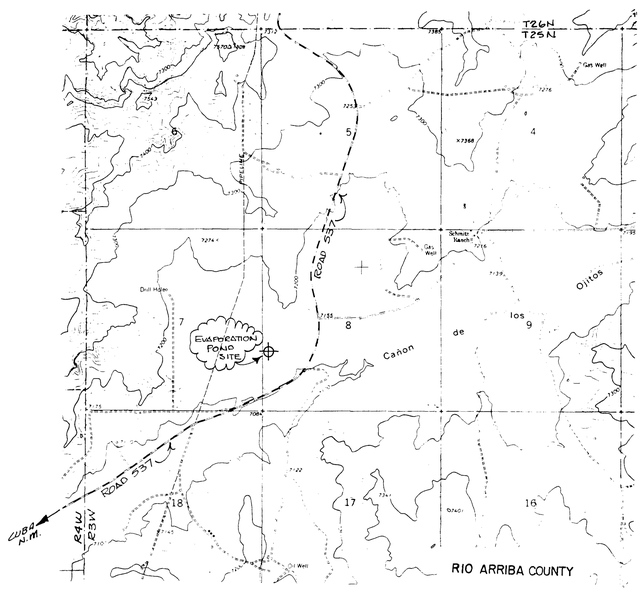
TNT CONSTRUCTION

EVAPORATION POND PROJECT



LOCATION MAP-SCALE: 1" = 2000'

LIST OF SHEETS

NOT APPROVED
FOR CONSTRUCTION

RECEIVED
SEP 16 1991
OIL CONSERVATION DIV

SAN JUAN ENGINEERS

2101 SAN JUAN BLVD.

FARMINGTON, N. M. 87401

(505) 325-7535

DESIGN BY RBS

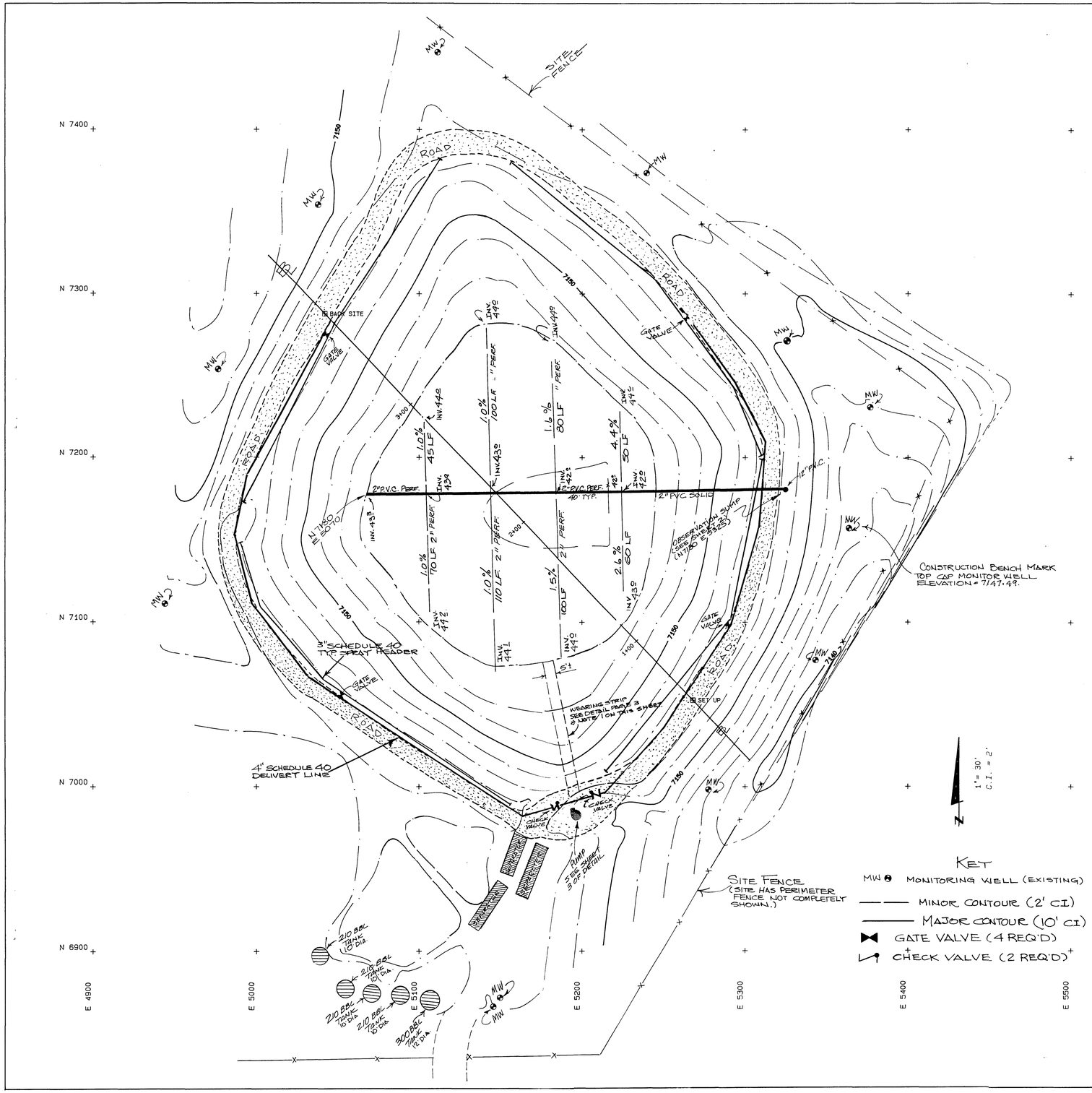
DRAWN BY JLM

APPRV'D BY RBS

No.	Date	By	Revision

JOB NO. 63521

ROBERT B. STANDLEY JR. NEW MEXICO 9155 REGISTERED PROFESSIONAL ENGINEER 9/6/91



KEY

- MW ● MONITORING WELL (EXISTING)
- ——— MINOR CONTOUR (2' CI)
- ——— MAJOR CONTOUR (10' CI)
- ⋈ GATE VALVE (4 REQ'D)
- ⊢● CHECK VALVE (2 REQ'D)

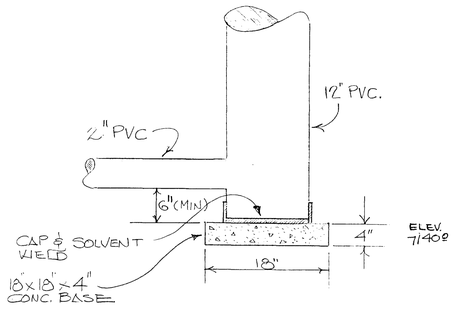
NOTE 1.
PUMP LOCATION APPROXIMATE ONLY. MAY BE ADJUSTED IN FIELD, MOVE ALSO WEARING STRIP

ACTUAL SUCTION PIPE LENGTH DEPENDANT ON LOCATION SELECTED.

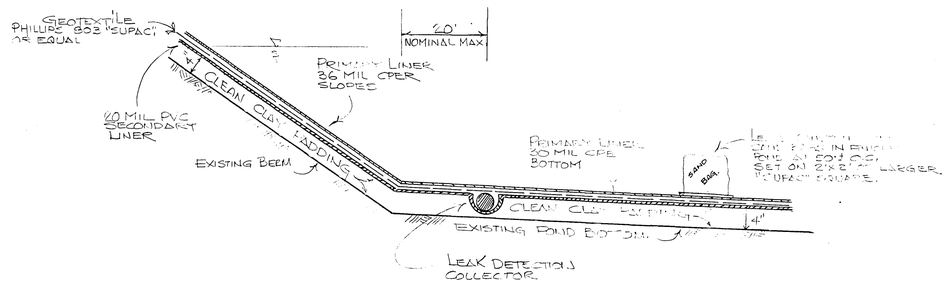
TNT CONSTRUCTION
EVAPORATION POND
PLAN

SCALE:	DATE:	REVISED:	DRAFTED BY:	SHEET	OF
HORIZ. 1"=30'			STANNARD	1	5
	63521		CHECKED BY:		

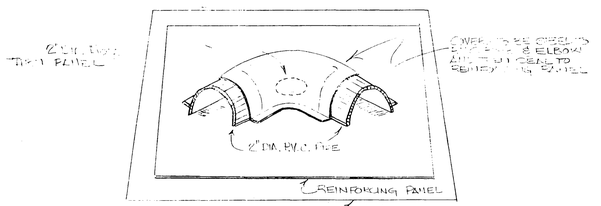
SAN JUAN ENGINEERS
2101 SAN JUAN BLVD.
FARMINGTON, N.M. 87401



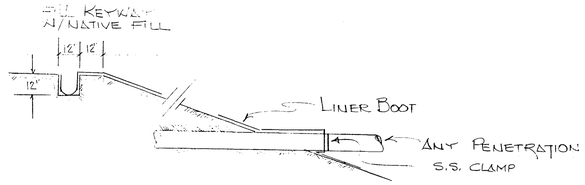
OBSERVATION SUMP DETAIL



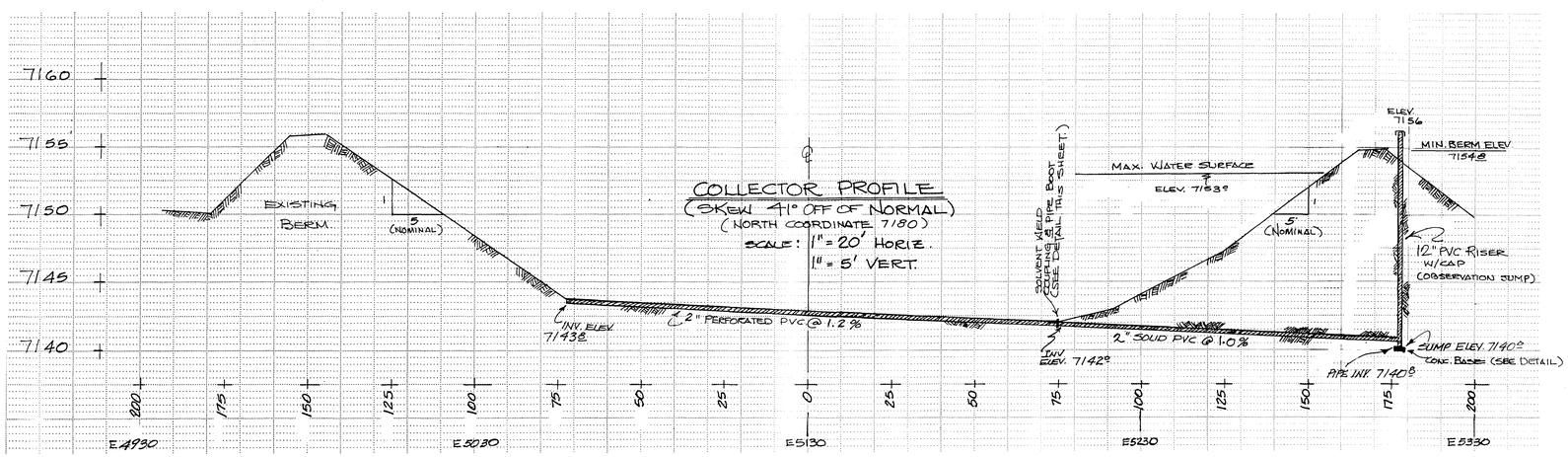
LINER INSTALLATION DETAIL



BERM-VENT DETAIL (20 REQD AT 50'OC.)



PENETRATION OF SECONDARY LINER BY LEAK DETECTION SYSTEM.



NOTES:

UNDERDRAIN TO BE 2" SCHEDULE 40.

PERFORATED PVC PIPE TO BE 2"Φ, PVC. SCH. 40, PERFORATED.
SOLID PVC TO BE 2"Φ SCH. 40 WELD ALL JOINTS,

PRIMARY LINER TO BE 36 MIL (MIN) CPER OR EQUIV., BOTTOM TO BE 30 MIL CPE

SECONDARY LINER TO BE 20 MIL PVC OR EQUIV.

LINER AND UNDERDRAIN TO BE SLOPED AS SHOWN, WARP SECONDARY LINER AS SHOWN.

BOOTS & CEMENT TO BE SUPPLIED BY LINER MFR.

CONSTRUCTION TO BE IN CONFORMANCE WITH "SPEC FOR DESIGN & CONSTRUCTION OF LINED EVAPORATION PITS PUBLISHED BY N.M.O.C.D.

LINER MANUFACTURER TO SUPERVISE INSTALLATION OF LINERS & APPURTANENCES.

TNT CONSTRUCTION

EVAPORATION POND PROJECT

DETAIL SHEET

SCALE: AS NOTED	DATE: 8/19/91	REVISED	DRAFTED BY: RBS	SHEET: 2	OF: 5
DETAIL SHEET	PROJECT NO.: 63521		CHECKED BY: RBS		

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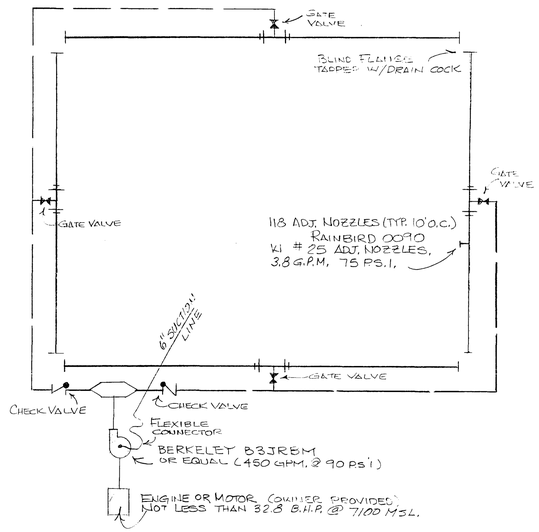
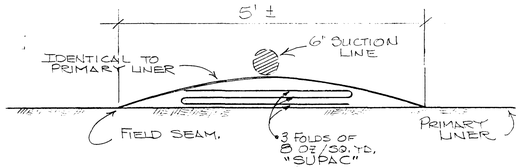
2101 SAN JUAN BLVD.
FARMINGTON, N. M. 87401



PIPING SCHEMATIC
U.T. S,

KEY

- GATE VALVE (4 REQ'D)
- CHECK VALVE (2 REQ'D)
- 3" SCH. 40 P.V.C.
- 4" SCH. 40 P.V.C.
- VAN STONE STYLE FLANGES (3") 16 REQ.D. (SPEARS 854-030 OR EQUAL)



WEARING STRIP DETAIL
(TO BE FIELD LOCATED UNDER SUCTION)

PRINCIPAL ITEMS MATERIALS LIST

940 FT. 4" SCH. 40 PVC PIPE

1240 FT. 3" SCH 40 PVC PIPE DRILLED & TAPPED 10 FT. C.C.

2 - 4" X 3" PVC TEES

2 - 4" X 3" PVC ELS

4 - 3" FLANGED GATE VALVE

16-3" VAN STONE FLANGES

8 - 3" BLIND FLANGES TAPPED WITH DRAINS

2 - 4" AMES A1113-46 CHECK VALVES

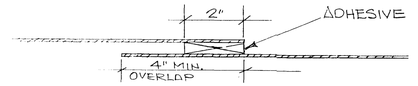
62 - 3" PIPE "FEET", AMES 2-169

1 - FABRICATED 6" X 30" MANIFOLD W/CONNECTIONS FOR 4" LINES, GAUGE, AND PRIMING PUMP

1 - BERKELEY B3ZRJBM PUMP

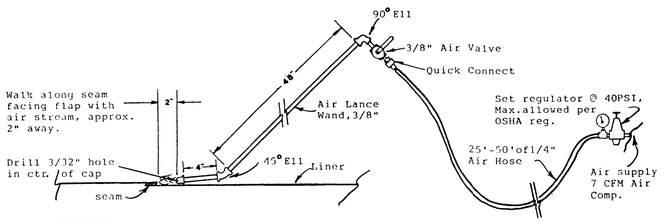
1 - STATIONERY ENGINE, WITH NOT LESS THAN 45 BHP CONTINUOUS SEA LEVEL RATING, TO DELIVER NOT LESS THAN 32.8 BHP CONTINUOUS AT 7100' MSL

6" SUCTION PIPE, FLEX HOSE, STRAINED AND APPURTENANCES
118 RAINBIRD #25 ADJ. NOZZLE 10192



FIELD SEAM DETAIL
PVC OR CPE

FIELD SEAM TESTING-AIR LANCE METHOD: In addition to a visual inspection, the installation contractor shall furnish all the necessary equipment and shall test in the presence of the engineer or inspector.
The test consists of using a 3/32" air nozzle held at a 45 degree angle to the field seam approximately 2" off the edge of the material using a minimum of 30 psi-maximum 40 psi.
The air shall be directed towards the seam edge, upper edge and surface to detect loose edges. Riffles indicating unbonded areas within the seam or other undesireable seam conditions shall be patched using care to extend the patch a minimum of 3" beyond all affected areas. The patch should then be tested using the same air lance test method.



MATERIAL LIST, 3/8" WAND

1-CAP
1-4" NIPPLE
1-45 DEGREE ELL
1-48" of 3/8" PIPE
1-90 DEGREE ELL
1-SHORT NIPPLE
1-AIR VALVE
1-QUICK CONNECT
1-25'of 1/4" AIR HOSE

PUMPING HYDRAULICS

THRUPUT - 450 G.P.M. @ 90 P.S.I. (208 FT.)

EVAPORATION - MNFR'S ESTIMATED EVAPORATION
16,000 GAL./12 HR."RUN" (5%)

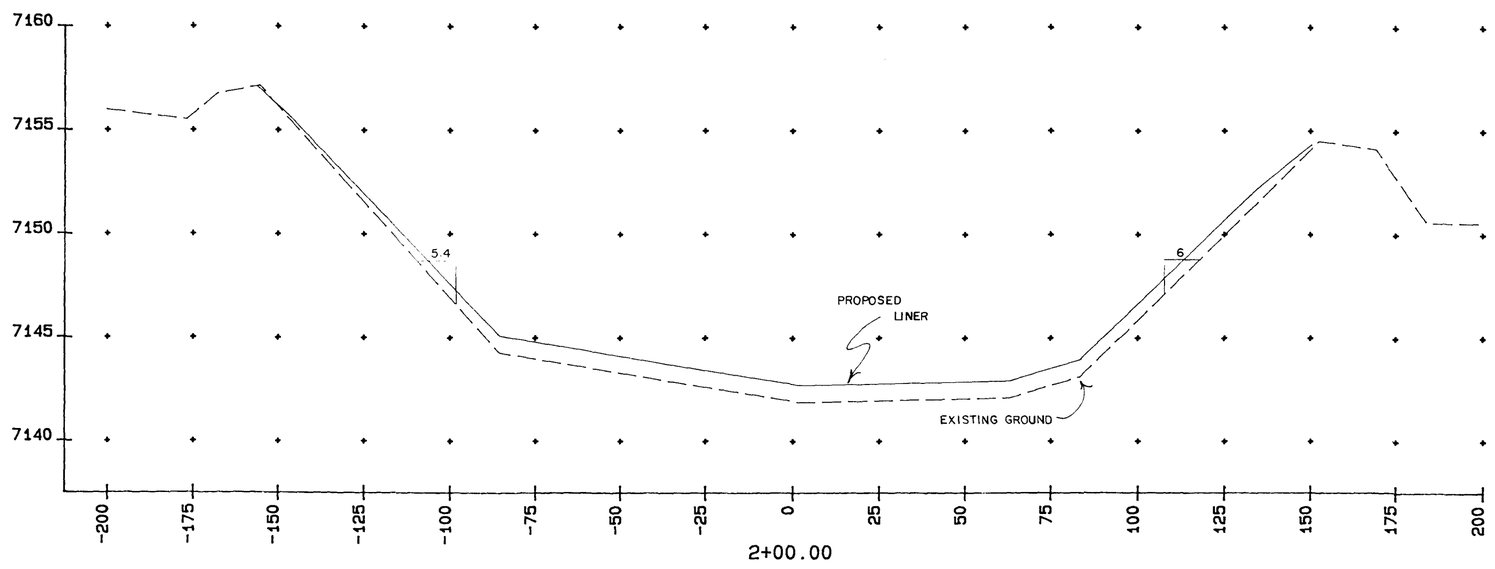
NPSH - ELEVATION 7000 FT. MSL
(BAROMETRIC = 26.1 FT.)
REQUIRED NPSH = 9 FT.
AVAILABLE NPSH = 26.1.
- 12.0 LIFT
- 5.35 SUCTION LOSS.
- 0.89 VAPOR PRESSURE
7.86 FT. AVAILABLE (MIN)

THUS WHEN WATER DEPTH IS ABOUT 10.86 BELOW SUCTION (WATER DEPTH ABOUT 2' OR ELEVATION 7144) SUFFICIENT NPSH AVAILABLE.

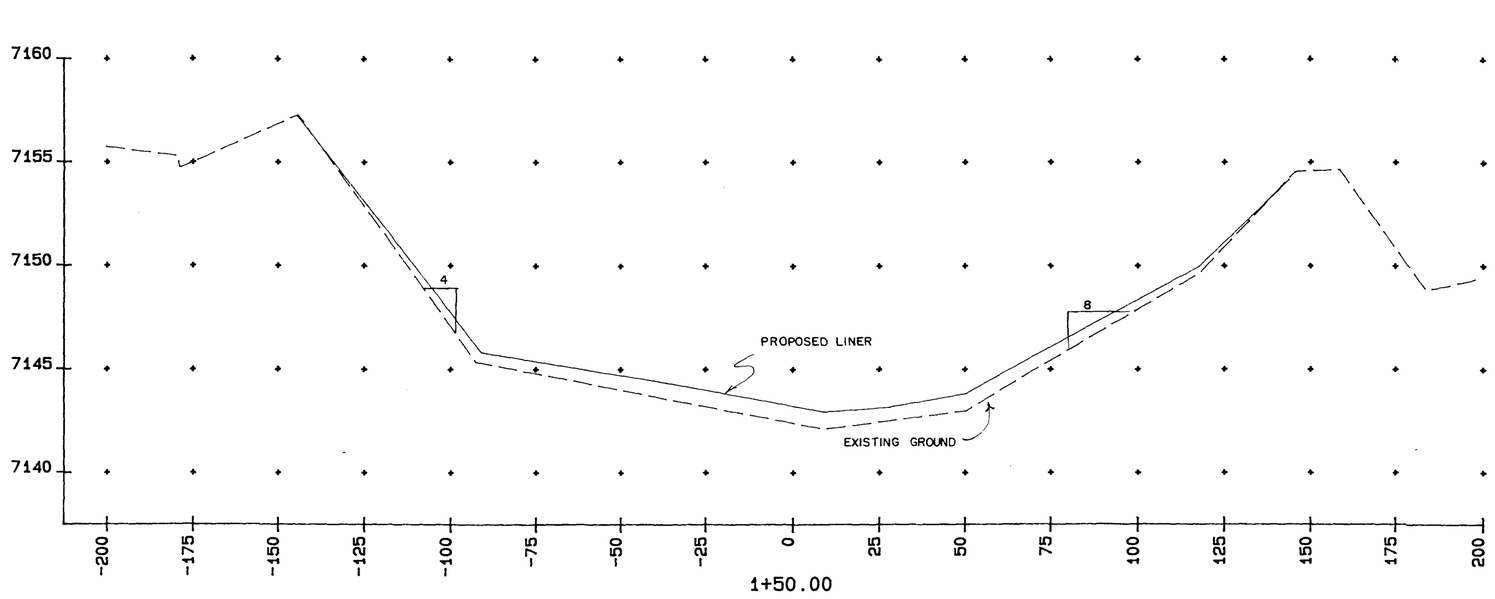
TNT CONSTRUCTION
EVAPORATION POND PROJECT
DETAIL SHEET

SCALE	DATE	REVISED	DRAFTED BY	SHEET	OF
AS NOTED	8/19/91		RBS	3	5
DETAIL SHEET	PROJECT NO. 63521		CHECKED BY RBS		

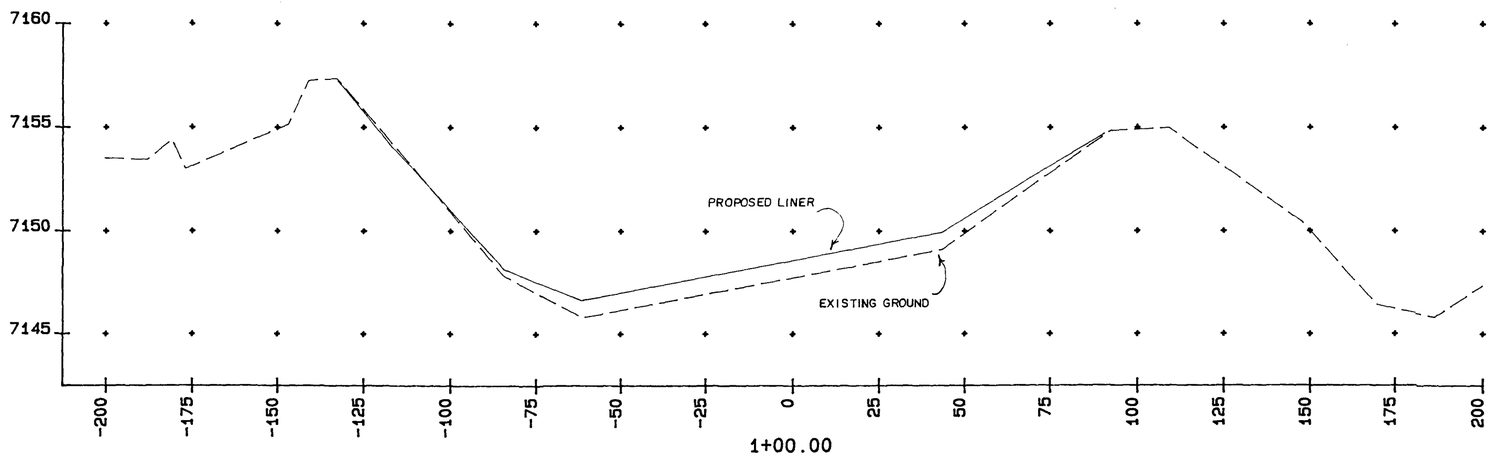
SAN JUAN ENGINEERS
2101 SAN JUAN BLVD.
FARMINGTON, N. M. 87401



2+00.00



1+50.00



1+00.00

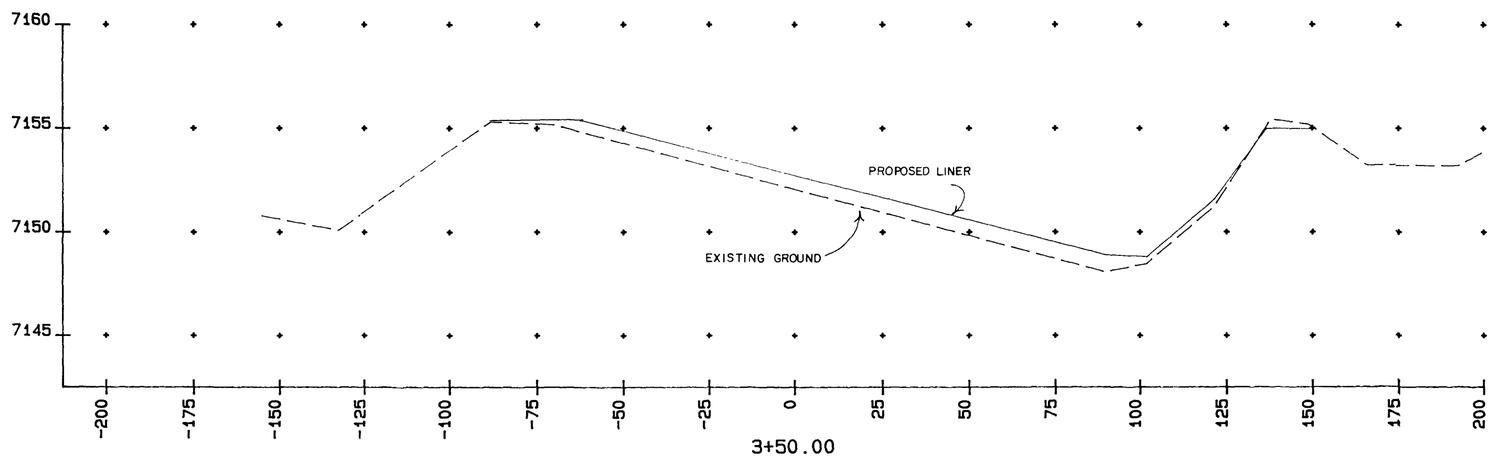
TNT CONSTRUCTION

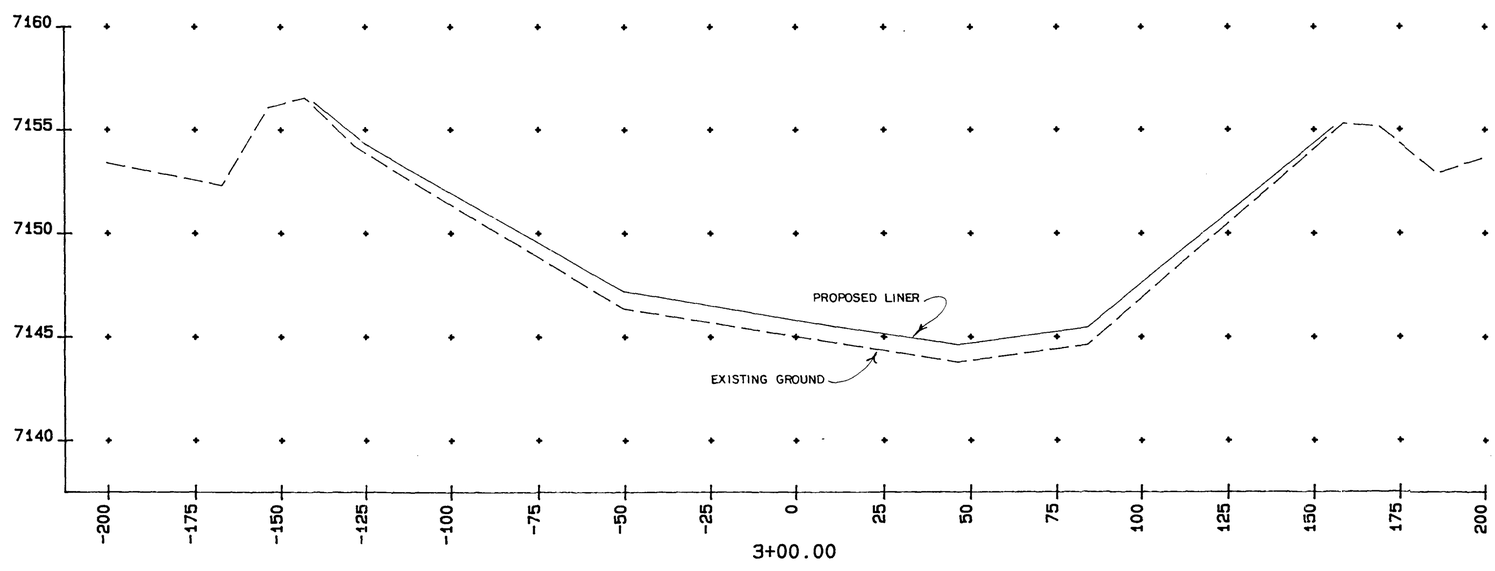
EVAPORATION POND PROJECT

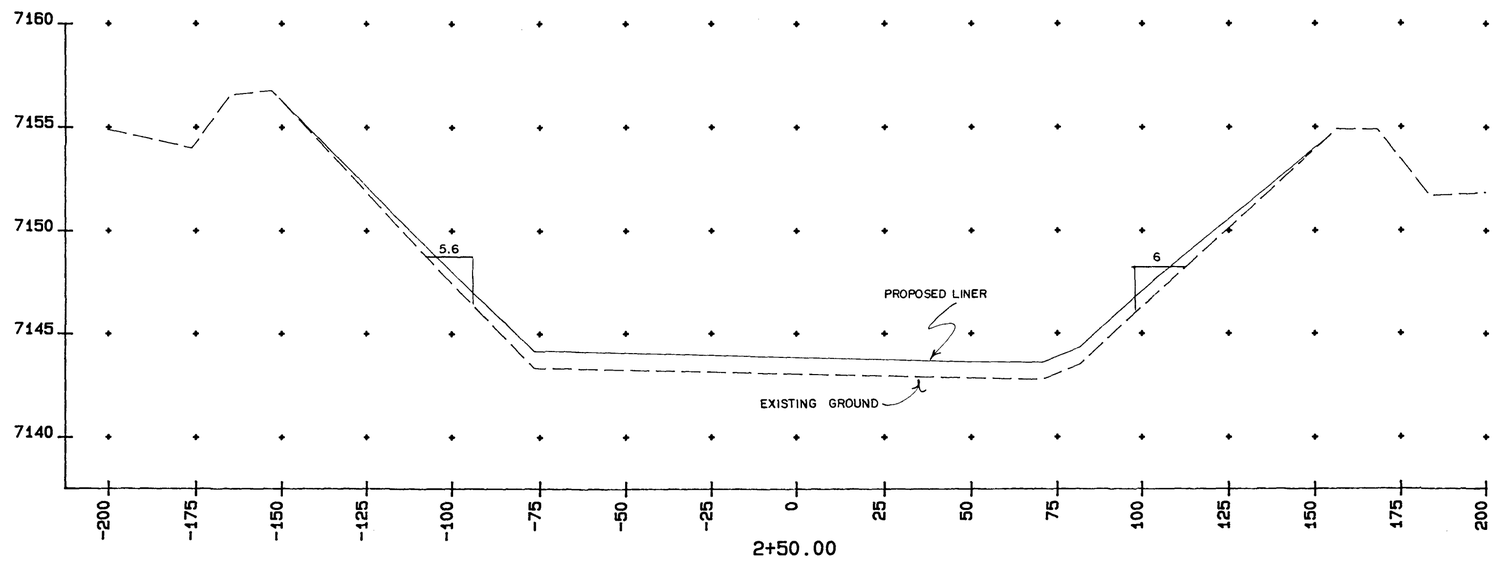
EARTHWORK CROSS SECTIONS

SCALE	DATE	REVISED	DRAFTED BY	SHEET	OF
1"= 30'	8/19/91		RBS	4	
1"= 5'	PROJECT NO. 63521		CHECKED BY RBS		5

SAN JUAN ENGINEERS
2101 SAN JUAN BLVD.
FARMINGTON, N. M. 87401







TNT CONSTRUCTION
EVAPORATION POND PROJECT
EARTHWORK CROSS SECTIONS

SCALE	DATE	REVISED	DRAFTED BY	SHEET	OF
1"= 30'	8/19/91		RBS	5	
1"= 5'	PROJECT NO. 63521		CHECKED BY RBS		5

SAN JUAN ENGINEERS
2101 SAN JUAN BLVD.
FARMINGTON, N. M. 87401

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

April 29, 1991

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

CERTIFIED MAIL
RETURN RECEIPT NO. P-327-278-113

Ms. Darlene Schmitz
TnT Construction, Inc.
Star Route
Lindrith, New Mexico 87029

RE: Repair of Out-of-Service Pond #1

Dear Ms. Schmitz:

This letter is sent in response to questions you asked during our phone conversation of April 24th regarding putting your pond #1 (originally approved January 19, 1987) back in service. The pond is currently out-of-service due to leaks detected in at least two monitor wells. You state the wells are still producing fluids even through the pond has been drained. This indicates that a significant amount of fluid from the pond entered the subsurface and remain in proximity to the wells.

Because of the leak in the clay liner together with the continued presence of fluids in the monitor wells, your options for putting the pond back in service using the existing liner are limited. As long as fluids remain in the monitor wells, use of a repaired clay liner will not be authorized because future leaks could not be differentiated from the current fluids. When fluids are no longer present and before resuming use of a clay liner, OCD will require continued monitoring for some period of time to ensure that fluids have actually dissipated.

The options you have are as follows:

1. Installation of a dual membrane synthetic liner with a leak detection system intermediate between the two liners. Advantages include discontinuance of checking monitor wells (except for removal of existing fluids), positive knowledge of integrity, and capture of fluids if a leak does occur. Cautions include the need for purchase of U-V resistant liner material, and material that can withstand cold winter temperatures.

2. Installation of a single synthetic liner with positive leak detection over the repaired clay liner. The clay liner would need to be repaired with clay placed over and worked into the native material and then compacted. A layer of sand or other material more than 1000 times as permeable as the clay will need to placed over the clay. This together with a system of laterals and leak detection sump would replace use of the monitoring wells for leak detection. However, without a second liner, fluids can enter the leak detection system from the soil causing false indication of a leak.

3. Repair of the pond with clay. The pond would need to be reconstructed and certified in the same manner as your new clay-lined pond. However, we could not authorize placement of fluids in the pond until we are assured that the current monitoring wells are and will remain free of fluids.

In summary, the fastest way to put the pond back in operation would be to reline it with dual synthetic liners. I am enclosing our most recent technical criteria for your use. Since the facility has already been approved, we would only need to review and approve the engineering design for the new liners. This could be accomplished quickly once your designs were submitted.

If you have any questions, please contact me at 928-5812.

Sincerely,

David G. Boyer, Hydrogeologist
Environmental Bureau Chief

DGB/sl

Enclosure

cc: OCD Aztec Office

OIL CONSERVATION DIVISION
RECEIVED

'91 FEB 19 AM 9 05

February 15, 1991

Energy and Minerals Department
Oil Conservation Division
P.O. Box 2088
Santa Fe, N.M. 87504-2088

Dear Dave Boyer:

T-n-T Construction, Inc. would like to receive permission from the Oil Conservation Division to accept underground storage tank water from Daniel B. Stephens and Associates. This water is coming from #90-140-Mino's site in Espanola, N.M. Thank you.

Sincerely;
Darlene Schmitz
T-n-T Construction, Inc.
Darlene Schmitz, Sec.

STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

Carl L. Slingerland
STATE ENGINEER

BATAAN MEMORIAL BUILDING
STATE CAPITOL
SANTA FE, NEW MEXICO 87503

September 24, 1990

Mr. Tony L. Schmitz
Star Route
Lindrith, New Mexico 87029

CERTIFIED RETURN
RECEIPT REQUESTED

Re: File No. 4320

Dear Mr. Schmitz:

A review of State Engineer Office files indicates that we have not received the completion report, as-built drawings and the engineer's certificate as required under condition #3 of your permit (#4320) to construct an evaporation pond dam. We are advised by the New Mexico Oil Conservation Division (OCD) that the pond has been built and is being used.

Please submit the required documents to the State Engineer immediately and contact Mr. Donald T. Lopez, P.E., at 827-6140 if further discussion of this matter is necessary.

Sincerely,

Carl L. Slingerland
State Engineer

By

Eluid L. Martinez, Chief
Technical Division

ELM*CEM*hl

cc: Dave Boyer, OCD
Dave Stone, Water Rights Division

DANIEL B. STEPHENS & ASSOCIATES, INC.
CONSULTANTS IN GROUND-WATER HYDROLOGY

• GROUND-WATER CONTAMINATION • UNSATURATED ZONE INVESTIGATIONS • WATER SUPPLY DEVELOPMENT •

September 24, 1990

David Boyer
Program Manager
N.M. Oil Conservation Division
Santa Fe, New Mexico 87503

Re: Disposal of Pumped Water From Carnue Pumping Test

Dear Dave:

I just wanted to thank you for your help in securing a disposal site for the pumped water from a pumping test we conducted in Carnue (Tijeras Canyon) east of Albuquerque over the period September 13 and 14, 1989. The well turned out to make very little water: we only managed a 0.6 gallons per minute pumping rate for the 25^{+}-hour test, and that rate yielded over 40 feet of drawdown. We stored the water on site during the test in a 500-bbl. frac tank (more than enough volume!), and all told we generated about 1200 gallons of water.

The pumped water was hauled off on the afternoon of the 14th by a Mr. Dudley Welch of Lindrith, and the water was disposed of at TNT Construction, Incorporated's lagoon in Lindrith. I have yet to receive the disposal manifest from Mr. Welch, although he said he will get that information to me.

During the pumping test, Cindy Ardito collected at least three water samples for chemical analysis, and as soon as those results are available to me I will send copies to you. I have enclosed for your records a copy of the letter I sent to TNT which describes the source of the pumped water.

Again, thanks for all your help in getting me in touch with the proper folks to arrange disposal. It sure made life easier for this preliminary, investigative work at the Carnue site. I anticipate there will be future design work at UST sites that can be hastened by having such disposal options available for similar, one-time discharges. Your agency's cooperation is greatly appreciated.

Sincerely,

Daniel B. Stephens and Associates

Gregory Lewis
Project Manager

GL/tlw

4415 Hawkins NE Albuquerque, New Mexico 87109 (505) 345-4567 FAX 345-4560

September 13, 1990

Energy and Minerals Department
Oil Conservation Division
P. O. Box 2088
Santa Fe, N. M. 87504-2088

Dear Sir:

Am sending this letter to document my conversation with Bill Oleson on September 12, 1990 that T-n-T Construction, Inc. received verbal approval from the Oil Conservation Division to accept Underground Storage Tank water, aproximately 20,000 to 30,000 gallons, from Danial Stephens Associates.

Greg Lewis of Danial Stephens Associates stated that they have approval from the E. I. D. to dispose of this water in our facility.

Sincerely;
Darlene Schmitz
T-n-T Construction, Inc.
Darlene Schmitz, Sec.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☑ Telephone ☐ Personal	Time 1440	Date 9/12/90
Originating Party		**Other Parties**
Mrs. Schmitz - TNT Construction		Bill Olson - OCD Santa Fe

Subject

Accepting UST water at TNT Pit

Discussion

Dan Stephens and Assoc. contacted TNT requesting disposal of approx 20-30,000 gallons of pump test water from Tijeras Canyon UST site on Thurs. 9/13/90

I gave her verbal approval and directed her to send OCD a letter documenting TNT request to OCD and OCD verbal approval along with Stephens and Assoc. request for disposal stating origin of water

Conclusions or Agreements

She will send letter to OCD.

Distribution

TNT file

Signed Bill Olson

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

ANALYSIS REQUEST FORM

Contract Lab IML Contract No.

OCD Sample No. 900904 1620

Collection Date	Collection Time	Collected by —Person/Agency
9/4/90	1620	Olson / Anderson /OCD

SITE INFORMATION

Sample location TNT Disposal

Collection Site Description

MW-13

Township, Range, Section, Tract:

SEND FINAL REPORT TO ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
PO Box 2088
Santa Fe, NM 87504-2088

SAMPLING CONDITIONS

☒ Bailed ☐ Pump ☐ Dipped ☐ Tap

Water level 40.41

Discharge

Sample type grab

pH(00400)

Conductivity (Uncorrected) 7750 µmho

Water Temp. (00010) 15.5 °C

Conductivity at 25° C µmho

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted: 2 vials, 2 liters

☒ **NF:** Whole sample (Non-filtered)
☐ **F:** Filtered in field with 0.45 µ membrane filter
☐ **PF:** Pre-filtered w/45 µ membrane filter

☒ **NA:** No acid added
☐ **A:** HCL
☐ **A:** 2ml H_2SO_4/L added
☐ **A:** 5ml conc. HNO_3 added
☐ **A:** 4ml fuming HNO_3 added

FIELD COMMENTS:

LAB ANALYSIS REQUESTED:

ITEM	DESC	METHOD	ITEM	DESC	METHOD	ITEM	DESC	METHOD
☐ 001	VOA	8020	☐ 013	PHENOL	604	☐ 026	Cd	7130
☐ 002	VOA	602	☐ 014	VOC	8240	☐ 027	Pb	7421
☐ 003	VOH	8010	☐ 015	VOC	624	☐ 028	Hg(L)	7470
☐ 004	VOH	601	☐ 016	SVOC	8250	☐ 031	Se	7740
☒ 005	SUITE	8010-8020	☐ 017	SVOC	625	☒ 032	ICAP	6010
☐ 006	SUITE	601-602	☐ 018	VOC	8260	☒ 033	CATIONS/ANIONS	
☐ 007	HEADSPACE		☐ 019	SVOC	8270	☐ 034	N SUITE	
☐ 008	PAH	8100	☐ 020	O&G	9070	☐ 035	NITRATE	
☐ 009	PAH	610	☐ 022	AS	7060	☐ 036	NITRITE	
☐ 010	PCB	8080	☐ 023	Ba	7080	☐ 037	AMMONIA	
☐ 011	PCB	608	☐ 024	Cr	7190	☐ 038	TKN	
☐ 012	PHENOL	8040	☐ 025	Cr6	7198	☐	OTHER	

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS
GOVERNOR

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

April 24, 1990

CERTIFIED MAIL
RETURN RECEIPT NO. P-918-402-140

Mr. Tony Schmitz
T-N-T CONSTRUCTION, INC.
Star Route
Lindrith, New Mexico 87029

RE: Application for Spray Evaporation System and As Built Completion Report, Waste Disposal Pond #2

Dear Mr. Schmitz:

The Oil Conservation Division (OCD) has reviewed your application for installation of a spray evaporation system for the newly constructed pond at your permitted commercial disposal facility located in SE/4, Section 7, Township 25 North, Range 3 West, NMPM, Rio Arriba County, New Mexico. The design specifications are acceptable and your application is hereby approved with the following conditions:

1. Spray nozzels will be directed in the general direction of the pit center. Spraying beyond the bermed area will not be allowed.

2. The spray system will not be operated when wind velocities are high enough to carry wind drifted liquids and/or salts beyond the bermed area of the pit.

3. Berms of the pit will be maintained so that any erosion from the spay will be kept at a minimum and berm integrity will not be decreased.

This letter will also confirm the verbal approval of the As Built report, and authorization to operate the newly constructed pond. This approval was given by Mr. David Boyer of my staff to Mrs. Darla Schmitz in their phone conversation of April 9th.

If there are any questions concerning the spray evaporation approval, please feel free to contact Roger Anderson at 827-5884.

Sincerely,

William J. LeMay
Director

WJL/DGB/sl

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS
GOVERNOR

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

MEMORANDUM

TO: TNT FILE

FROM: WILLIAM OLSON, Geologist
Oil Conservation Division

DATE: APRIL 20, 1990

SUBJECT: SUMMARY OF CONTINGENCY MEASURES FOR TNT PIT LEAKS

---

1. Contingency Measures for Leaks (7-14-86 TNT Application)

   "If a leak should be detected, the pond and monitor wells will be the containment vessels. No further deliveries will be accepted. Artificial means will be employed to expedite the evaporation process. Due to the geologic nature of the site, downward percolation is less probable than horizontal migration. This being the case, the monitor wells will serve as the conduit to remove the contaminating water."

2. The January 19, 1987 OCD approval of the evaporation pit was conditional on monthly checks of the monitor wells, sample analyses and a corrective action proposal will be submitted to OCD if produced water fluids are present.

3. The March 3, 1988 OCD letter on the Facility Expansion Application for TNT requires 1) quarterly reports on water levels and conductivity from monitor wells due to the presence of fluids in current monitor wells; 2) if a determination of the fluid origin by OCD finds that fluids are from the pit, TNT will "cease acceptance of disposal fluids until the source of fluids in the monitor wells is determined" and "submit proposals and timetables for removing the source, determining the extent and degree of contamination, and for mitigating contamination." These requirements were restated on OCD's June 20, 1988 letter to TNT.

4. A October 24, 1988 OCD letter to TNT (re. Application for Enlargement at Surface Disposal Facility) states "The OCD must be notified immediately if fluid is discovered in any of the monitor wells surrounding the proposed pond."

5. In the November 4, 1988 letter from TNT to OCD, TNT agrees that "The OCD shall be notified immediately if fluid is discovered in any of the monitor wells surrounding the proposed pond."

From IML by Phone

HCO_3	300
CO_3	0
CL	6000
SO_4	2400
Ca	900
Mg	480
K	11
Na	3200
TDS (180)	14,000

T-N-T Disposal 7/31/89

(1) Monitor well 13 had fluids
No odor of H_2S or aromatics
Salty taste
Makes ~5 gallons/day.

First water ~7/20. Old
mud pit has water,
due to rainfall didn't
being dried out.

Tony will ~~not~~ pump out
and cores and see
if water stops, if not
will have to work on
pond.
Sample for +/- IML 1834
8907311745

(2) New pond ready to go
except for monitor wells.
* Jim Burney told to contact
us before drilling, told
Tony not to spray or add
fluids to new pond until
wells in * 325-8181

Inter·Mountain Laboratories, Inc.

OIL CONSERVATION DIVISION
RECEIVED
90 MAR 5 AM 9 42

CLIENT: OCD - TNT
SAMPLE: 8907311735
SITE: MW-13
LAB NO: F1834

DATE REPORTED: 08/21/89
DATE RECEIVED: 08/01/89
DATE COLLECTED: 07/31/89

Lab pH	8.10
Lab Conductivity, umhos/cm	16204
Lab resistivity, ohm-m	0.6171
Total Dissolved Solids (180), mg/l	13970
Total Dissolved Solids (calc), mg/l	13089
Total Alkalinity as CaCO3, mg/l	245.63
Total Acidity as CaCO3, mg/l	0.00
Total Hardness as CaCO3, mg/l	4262.48
Sodium Absorption Ratio	21.28
Fluoride, mg/l	0.16

	mg/l	meq/l
Bicarbonate as HCO3	299.67	4.91
Carbonate as CO3	0.00	0.00
Chloride	5934.33	167.40
Sulfate	2407.27	50.15
Calcium	912.56	45.54
Magnesium	482.91	39.71
Potassium	11.20	0.29
Sodium	3193.60	138.91
Major Cations		224.45
Major Anions		222.46
Cation/Anion Difference		0.44 %

C. Neal Schaeffer
Senior Chemist

File Copy
1990

AS BUILT REPORT FOR ENLARGEMENT OF A COMMERCIAL SURFACE DISPOSAL FACILITY

SE1/4, Sec.7, T.25N., R.3W.
RIO ARRIBA COUNTY, NEW MEXICO

RECEIVED
FEB 19 1990
OIL CONSERVATION DIV.
SANTA FE

T-N-T CONSTRUCTION, INC.
STAR ROUTE
LINDRITH, NM 87029

TABLE OF CONTENTS

AS BUILT REPORT FOR ENLARGEMENT OF A COMMERCIAL SURFACE DISPOSAL FACILITY, SE/4, SEC.7, T.25N., R.3W., RIO ARRIBA COUNTY, NEW MEXICO.

The following **AS BUILT** information is submitted for review and approval. The information addresses the required material of the New Mexico Oil Conservation Division (OCD) and the New Mexico State Engineer' Office (Dams Division).

The evaporative pit was constructed during the summer months of 1989. Construction guidelines were the proposed Technical Construction Information described on pages 2 through 5 of the proposed Application for 'Enlargement of a Commercial Surface Disposal Facility' submitted in late 1988 (attached) and the Geotechnical Engineering Evaluation Water Disposal Pond Highway 537, Lindrith, New Mexico, as prepared by Western Technologies Inc. of Farmington, New Mexico (attached). Approval of the **AS BUILT** water disposal pond in accordance with Western Technologies geothechnical engineering report of May 2,1988 (WT No. 3129J024 attached) can be found at the front of said report as enclosed.

An aeration/sprayer system was not proposed in the original Application for Expansion of an Evaporation Pond (attached) but is incorporated into this **AS Built** report for OCD approval. An aeration system and sprayers will be utilized to prevent anerobic conditions from forming in the pond and evaporation of water.

SPRAYERS

The sprayer system, Figure A, is similar to the system presently used on the existing evaporation pond to the southeast, operated by T-N-T Construction, Inc. Sprayers will be located on all four sides of the pond. Water will be pumped into a four (4) inch PVC header pipe. Water is then fed into a secondary system of three (3) inch PVC pipe; flow into the three (3) inch pipe is controlled by valves on all four sides of the reservoir. Water exits the PVC pipe through brass sprayers facing the interior of the pond. Sprayer nozzles are spaced around the pond on 12 foot centers.

Water is pumped from the pond through a six (6) inch pipe located in the southeast corner of the pond, Figure A. The suction pipe is forty (40) feet long and is supported two (2) feet off of the bottom of the pond. Supports are setting on a 3 X 6 foot slab of cement. The T-shaped intake manifold has screens on it to prevent foreign material from entering the pump.

AERATION

The aeration system, Figure A-1, will utilize one (1) and two (2) inch PVC pipe, with compressed air being pumped to the interior portion of the pond and released through small holes in the PVC pipe. This system will be utilized when necessary to control potential hydrogen sulphide gas generated within the pond.

Figure A-1 is a diagram showing the location and distribution of the aeration system. Compressed air is pushed through a two (2) inch PVC header pipe by a compressor located on the east side of the reservoir. Air then flows into six (6), one (1) inch diameter PVC pipes at Tees on either side of the

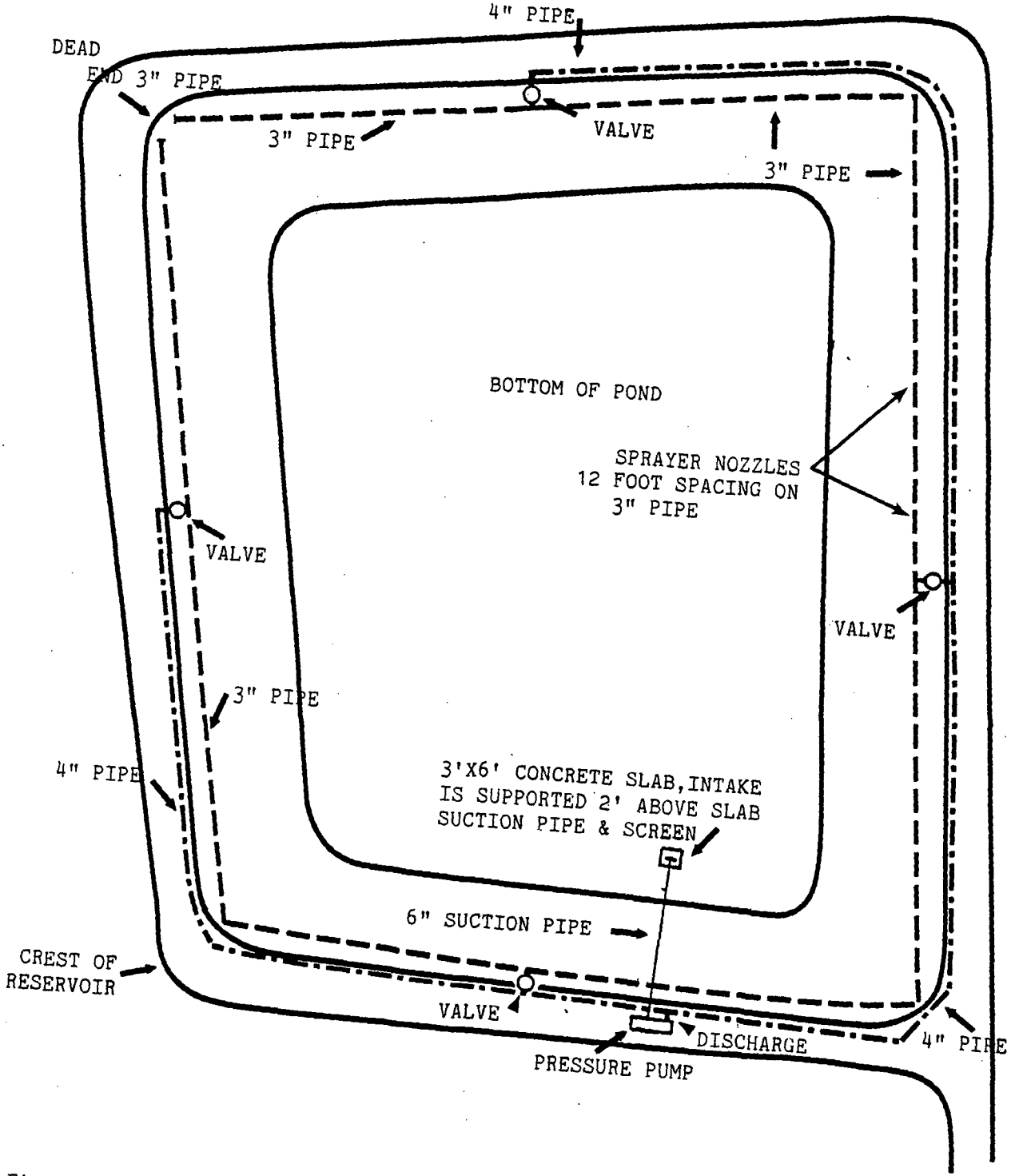


Figure A. Sprayer system, diagram illustrates the distribution of three and four inch PVC pipe, pressure pump, intake system, valve locations, suction pipe and sprayer nozzle spacing.

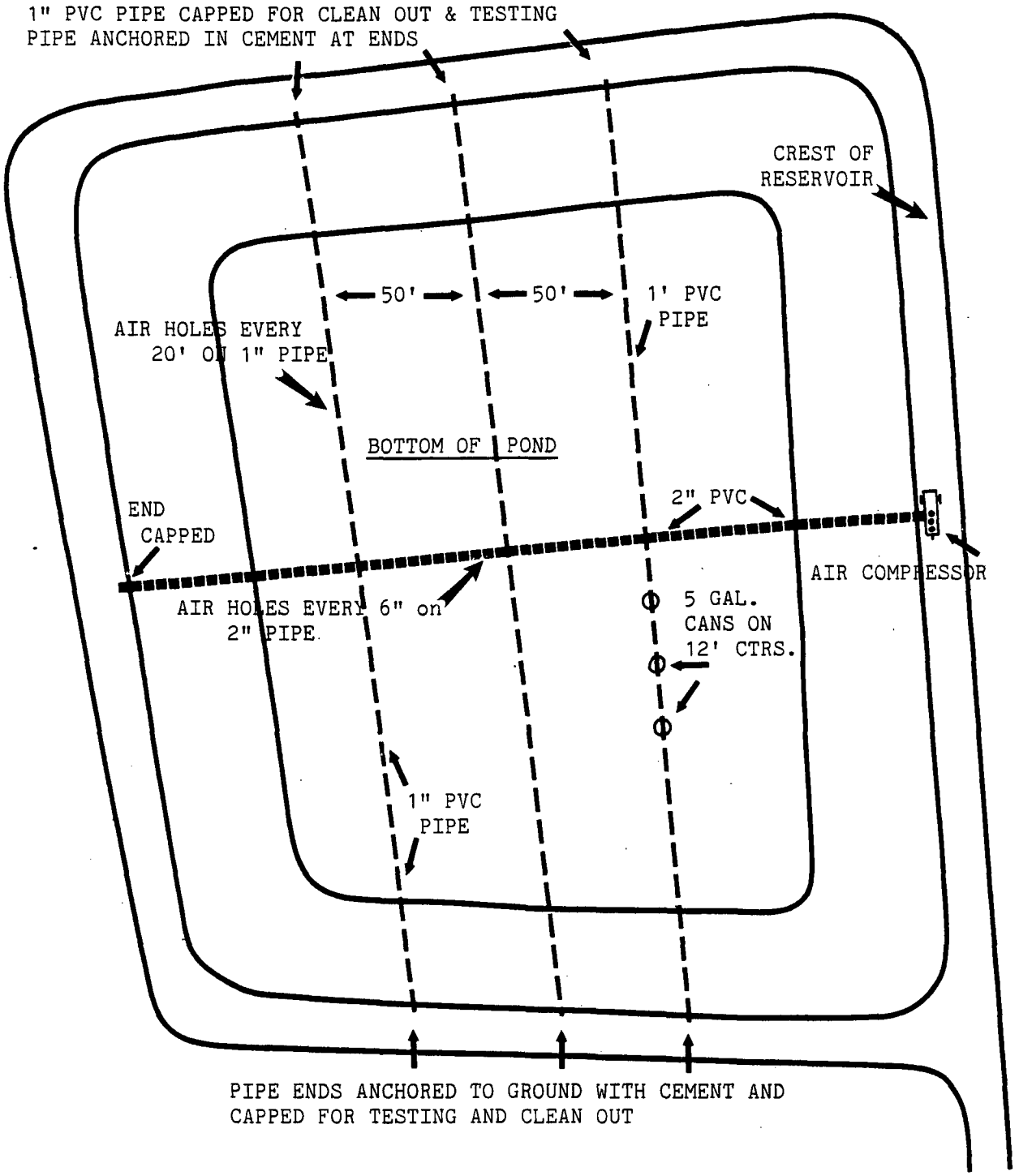


Figure A-1. Aeration System, Diagram illustrates the distribution of pipe sizes, air compressor location, air holes, pipe line locations and air openings. The aeration system is elevated twelve (12) inches above the pond floor by cement filled buckets located on 12 foot centers..

two inch pipe at fifty foot intervals. Compressed air exits the one (1) inch pipe through a cluster of eight holes 1/32 inch in diameter. The cluster of eight (8) holes are located every twenty (20) feet on the one (1) inch PVC pipe.

One (1) and two (2) inch aeration pipes are elevated and secured twelve (12) inches above the pond floor by buckets filled with cement and placed on twelve (12) foot centers along the pipe lines within the interior of the pond.

The aeration system was pressure tested prior to the drilling of the 1/32 inch holes at 80 psi. The system was checked for leaks at this time. The aeration system was again tested with 105 CFM compressed air, maintained at 20 psi pressure after holes were drilled. The ends of the one (1) and two (2) inch PVC pipes are anchored in cement. Threaded caps were utilized on the pipe ends so that the system can be cleaned and tested.

MONITOR WELLS

Fourteen monitor wells were completed around the perimeter of the **As Built** disposal facility. Well locations are shown on Figure B and Plate 2 of 3 (pocket of report). Cross sections utilizing the monitor wells are shown on Plate 3 of 3 (pocket of report). Monitor wells were placed proportionally around the perimeter of the pond near the toe of the outside edge of the levee or about 60-90 feet from the crest of the levee. Wells are located away from the newly constructed positive drainage around the toe of the pond.

No fresh water was found when the fourteen monitor wells were drilled. The wells were drilled with air and a 6 1/2 inch bit. Monitor wells were drilled to a depth of at least five (5) feet below the bottom of a sandstone horizon indicated on the log boring No. 1 drilled by Western Technologies (see attached Application Report appendix). Sandstone sections were sporadically encountered at a depth of 7 and 32 feet, depending upon elevation.

A typical monitor well completion is shown on Figure C. Wells were plugged back to the bottom of the sandstone section with clay cuttings and bentonite. Each well was completed with four (4) inch PVC pipe perforated (slotted every six (6) inches) adjacent to any sand horizon encountered. The annuls opposite perforated sections was packed with pea gravel (1/4 to 3/8 inch in diameter) extending one (1) foot above the top of the sandstone section to the base of the sand horizon. Whenever the above referenced sandstone horizon was not encountered, pipe was set and slotted through an equivalent interval as proposed by the OCD. The annuls of the remaining portions of the well above the perforated section was packed with clay cuttings and bentonite to within five (5) feet of the surface.

PVC casing was cemented in-place five (5) feet from the surface to one (1) foot above the ground, mounded to the casing, extending laterally two feet around the casing. The well head extends two feet above ground level and is capped. A list of the monitor wells completed, well depths, depth of casing, and section perforated and packed with pea gravel are shown on Figure D.

Monitor well data will be collected on a monthly basis and furnished to the OCD quarterly while the pond is in use. Descriptions of Quarterly Report

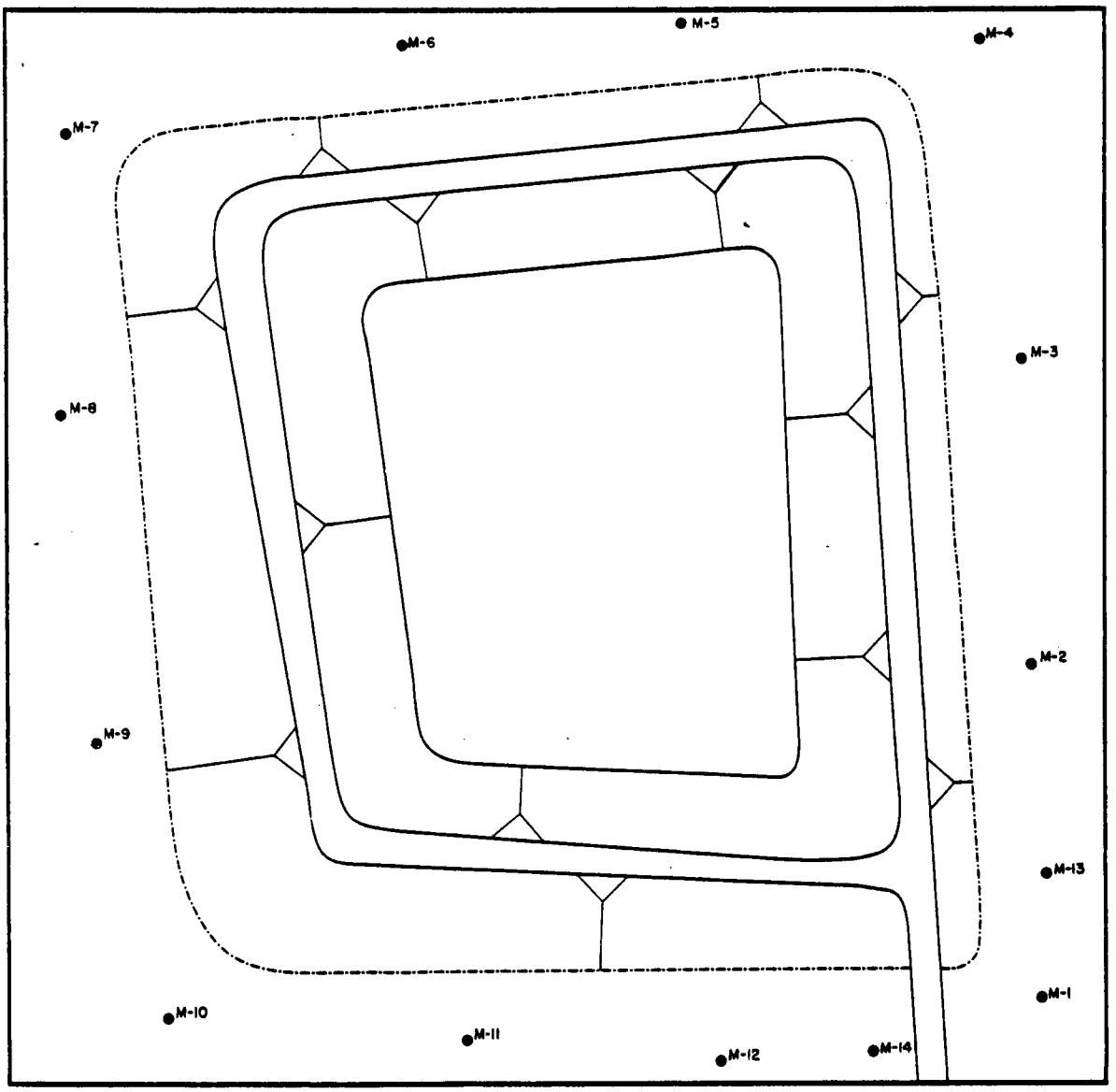


Figure B. Fourteen monitor wells were drilled in August, 1989 around the perimeter of the AS BUILT disposal pond. The wells ranged in depth from 35 to 45 feet depending upon elevation.

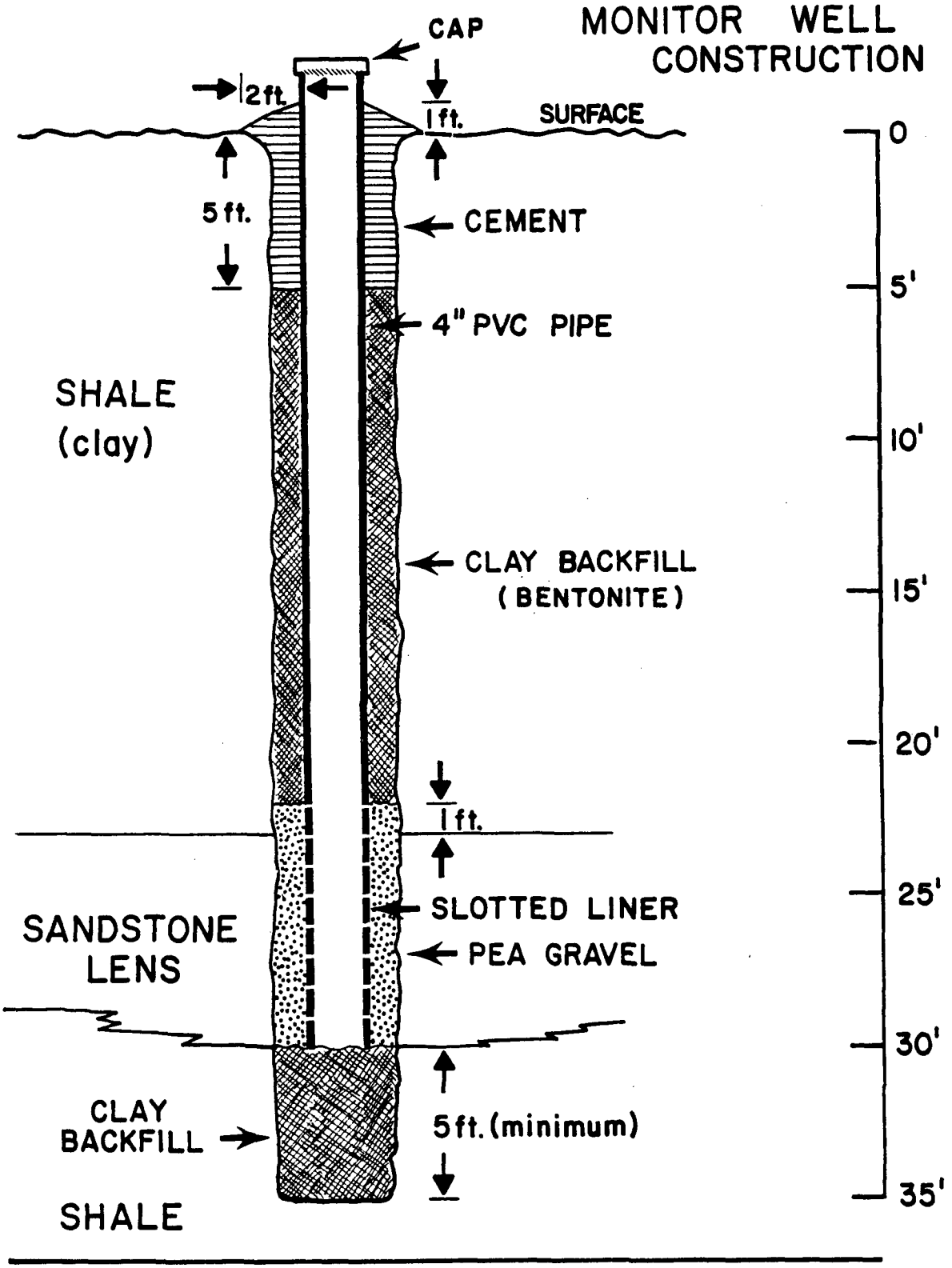


Figure C. Monitor well construction, cross-section.

Schedules and spill/leak prevention and procedures are listed in the Application for Enlargement on pages 5 to 7 (attached).

Two Isopach Maps (Figures E and F) of the sands underlying the **AS BUILT** pond were constructed to determine possible configurations of channel sand development and the thickness of shale (claystone) horizons directly beneath the pond. In the original Application drilling data indicated that the sands encountered in the area are laterally discontinuous or typical channel sands in a paleocontinental environment. Sand sections appear to be more prevalent to the east and north. These sands are heavily oxidized and dry suggesting that they are above existing water tables. Ground water was encountered in existing water wells in the general area at a depth in excess of 300 feet commonly 900 feet.

A north-south trending fault with about 9 feet of displacement is believed to exist along the east side of the **As Built** pond. The location of this fault is based on the displacement a thin light blue-gray calcareous siltstone bed encountered in the wells drilled on the north and east side of the pond.

MONITOR WELL COMPLETIONS

WELL NO.	DEPTH (FT)	CASING DEPTH (FT)	PERFORATED INTERVAL (FT)
M-1	40	20	13-20
M-2	44	26	12-17 & 20-26
M-3	42	32	25-32
M-4	45	35	26-35
M-5	41	35	20-31
M-6	40	31	19-30
M-7	38	26	11-14 & 21-26
M-8	38	28	17-20 & 24-28
M-9	40	32	16-32
M-10	39	32	23-33
M-11	34	24	15-24
M-12	35	23	14-23
M-13	39	21	7-21
M-14	35	23	9-23

Figure D. Monitor well completions, total depths drilled, casing depths and perforation intervals.

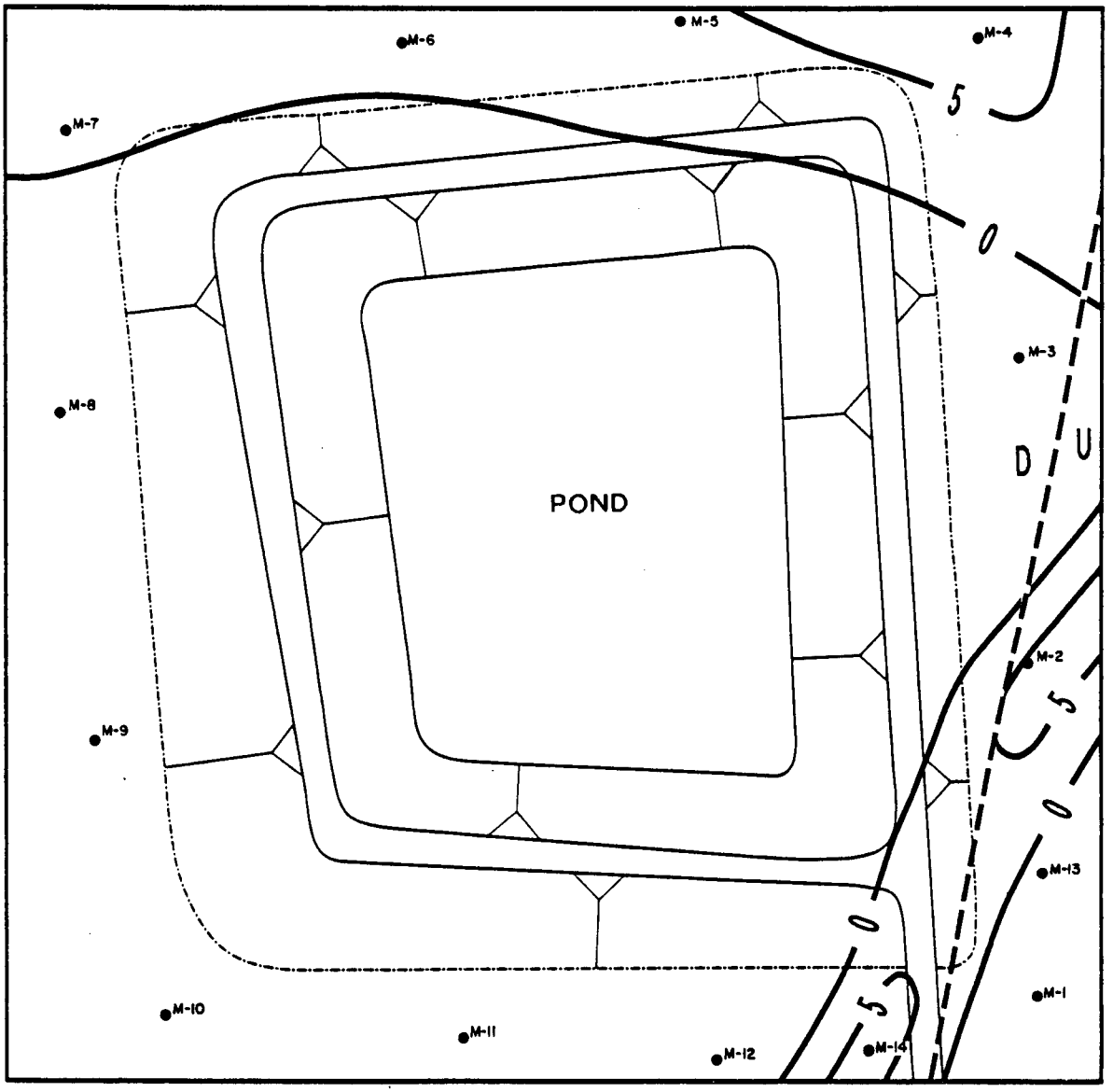


Figure E. Isopach map of sands occurring above a light blue/gray, calcareous, sandy siltstone (see Cross Section Plate, in back pocket). This sand horizon appears to be restricted to the east and north side of the reservoir. Intersection of the blue/gray marker bed at two different depths in monitor wells along the east side of the reservoir, suggests that a fault exists trending north-south direction. The west side of the fault is down thrown nine (9) feet and may act as a barrier for any water which may have entered the sand from the east.

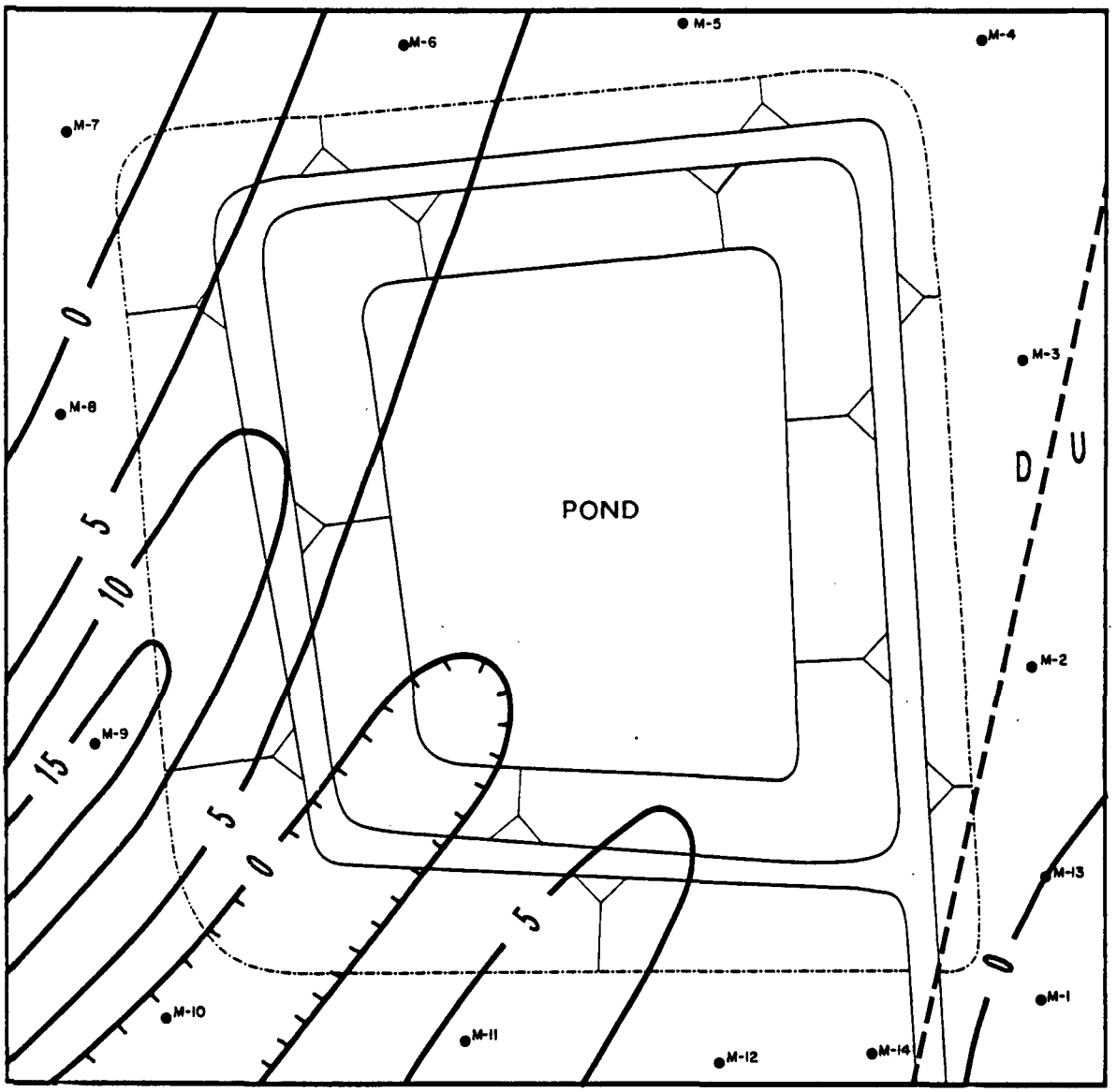


Figure F. An Isopach map of sands occurring directly below the light blue/gray, sandy siltstone. Sands sections were encountered in primarily three wells, M-6, M-9 and M-11. Erratic sand thickness and the lack of continuity from well to the next, suggests channel sand with widths of less than 150 feet. The north-south orientation illustrated in the above plat is based on source rock supply during early Tertiary time.

The attached information and AS BUILT completion report are submitted for OCD review and approval. The facility was constructed in compliance with the attached information as required in the New Mexico Oil and Gas Conservation Division (OCD) "Guidelines for Permit Application, Design and Construction of Waste Storage/Disposal Pits" (revised 2/88 and rule 711 of the Divisions Rules and Regulations promulgated June 2, 1988. The attached is also amended to include any additions as requested or submitted between the OCD and T-N-T Construction, Inc. since submission of the above application.

AFFIRMATION

"I Tony L. Schmitz, certify that I am familiar with the information contained in and submitted with this **AS BUILT** report and that such information and construction of said facility are true, accurate and complete to the best of my knowledge."

(Authorized Signature)	2/11/1990 (Date)
Tony L. Schmitz (Printed Name of Person Signing)	President (Title)

TLS/jwg
Copies: Aztec OCD District Office
New Mexico State Engineer's office

DRILLERS LOG

Drill Hole No.: M-1

Date Completed: 8-23-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7154.4 ft.

DEPTH (FT)	DESCRIPTION
0 - 9	**Shale:** light brown, red brown, thin siltstone interbeds, less than 5% sand, very fine-grained.
9 - 14	**Shale-Siltstone:** light yellow brown to red brown, no sand.
14 - 20	**Siltstone-Sand:** sand at base, light brown-tan, heavy limonitic and hemotitic staining, fine to coarse-grained, poor sorting, damp.
20 - 40	**Shale:** light-med brown, thin siltstone interbeds.
TD = 40	
	Note: the interval between 14 and 20 feet was damp from moisture possibly from the upper pit to the east.

CASING

0 - 20	4 inch heavy wall PVC pipe, perforated from 13-20 feet.

DRILLERS LOG

Drill Hole No.: M-2
Date Completed: 8-23-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7154.0 ft.

DEPTH (FT)	DESCRIPTION
0 - 12	**Shale:** med yellow brown, red brown, a few thin siltstone interbeds, no sand.
12 - 13	**Shale-Siltstone:** light yellow brown to red brown, no sand.
13 - 17	**Sand-Siltstone:** very silty, sand at base, med brown-tan, heavy limonitic and hemotitic staining, fine to coarse-grained, poor sorting.
17 - 21	**Shale:** med brown.
21 - 23	**Sand-Siltstone:** med gray brown.
23 - 24	**Siltstone:** light blue-gray calcareous cement/hard.
24 - 26	**Siltstone-Sand:** tan-red brown, very fine-med-grained, 50% sand top foot.
26 - 44	**Shale:** med red brown, a few siltstone beds 2-4 inch thick.
TD = 44	
	Note: No moisture in any sands, hard, light blue-gray siltstone observed in drill holes around the north east corner of pond.

CASING

0 - 26	4 inch heavy wall PVC pipe, perforated from 12-17 and 20-26 feet.

DRILLERS LOG

Drill Hole No.: M-3

Date Completed: 8-23-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7157.0 ft.

DEPTH (FT)	DESCRIPTION
0 - 11	**Shale:** brown, red brown, silty.
11 - 12	**Siltstone:** sandy, yellow brown to red brown.
12 - 21	**Shale:** silty, med brown-tan, 1-3% sand, very fine-grained.
21 - 27	**Shale:** med brown, some thin siltstone interbeds.
27 - $27\frac{1}{2}$	**Siltstone:** sandy, light blue gray, gray-brown, calcareous cement/hard.
$27\frac{1}{2}$ - 32	**Sand:** tan-red brown, very silty, very fine to med-grained, angular, dry, hemotitic staining of grains.
32 - 42	**Shale:** med red brown, very little siltstone.
TD = 42	
	Note; light blue siltstone thinning to the north.
CASING	
0 - 32	4 inch heavy wall PVC pipe, perforated from 25 to 32 feet.

DRILLERS LOG

Drill Hole No.: M-4

Date Completed: 8-23-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7162.7 ft.

DEPTH (FT)	DESCRIPTION
0 - 16	**Shale:** med yellow brown, red brown, a few thin siltstone interbeds about 2-4 inches thick, no sand.
16 - 20	**Shale:** light yellow brown to red brown, no siltstone or sand.
20 - 24	**Shale:** SAA, hard drilling.
24 - 27	**Siltstone:** silty, sand at base, med brown-tan, heavy.
27 - 33	**Sand:** light yel brown, very fine, angular sandstone with no shale or siltstone interbeds, dry.
33 - $33\frac{1}{4}$	**Siltstone:** light blue-gray, sandy, drilled very slow, calcareous cement, .
$33\frac{1}{4}$ - 35	**Sand:** light yellow-brown, very fine-grained, angular, dry.
35 - 45	**Shale:** light to med red-brown, silty at top two feet. 50% sand top foot.
TD = 45	
	Note: No moisture in any sands, hard, light blue-gray siltstone observed in this drill holes and others around the north east side of the pond.

CASING

0 - 35	4 inch heavy wall PVC pipe, perforated from 26-35 feet.

DRILLERS LOG

Drill Hole No.: M-5

Date Completed: 8-23-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7158.4 ft.

DEPTH (FT)	DESCRIPTION
0 - 18	**Shale:** med brown, red brown, a few (2-6 inch) thin siltstone interbeds, no sand.
18 - 21	**Shale:** light yellow brown to red brown, silty.
21 - $26\frac{1}{2}$	**Sand:** light yel brown, very fine, angular sandstone with no shale or siltstone interbeds, dry.
$26\frac{1}{2}$ - 27	**Siltstone:** light blue-gray, sandy, drilled very slowly, calcareous cement, about 3-6 inches thick.
27 - 31	**Sand:** light yel brown, very fine, angular sandstone with no shale or siltstone interbeds, dry.
31 - 36	**Shale:** light to med red-brown, silty top three feet.
36 = 41	**Shale:** light to med red-brown.
TD = 41	Note: No moisture in any sands, hard, light blue-gray siltstone observed in this drill holes and others around the north east side of the pond.

CASING

0 - 35	4 inch heavy wall PVC pipe, perforated from 20-31 feet.

DRILLERS LOG

Drill Hole No.: M-6

Date Completed: 8-23-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7156.0 ft.

DEPTH (FT)	DESCRIPTION
0 - 20	**Shale:** med brown, red brown, a few (2-6 inch) thin siltstone interbeds near base, no sand.
20 - 23	**Sand:** light yel brown, very fine, angular sandstone with no shale or siltstone interbeds, dry.
23 - $23\frac{1}{4}$	**Siltstone:** light blue-gray, sandy, drilled very slowly, calcareous cement, about 3-6 inches thick.
$23\frac{1}{4}$ - 30	**Sand:** light yel brown, very fine to med, angular sandstone with some siltstone interbeds, dry.
30 - 40	**Shale:** light to med red-brown, silty top foot.
TD = 40	
	Note: No moisture in any sands, hard, light blue-gray siltstone observed in this drill holes and others around the north east side of the pond.

CASING

0 - 31	4 inch heavy wall PVC pipe, perforated from 19-30 feet.

DRILLERS LOG

Drill Hole No.: M-7

Date Completed: 8-23-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7150.4 ft.

DEPTH (FT)	DESCRIPTION
0 - 12	**Shale:** med brown, dark red brown.
12 - 14	**Sand:** light yel brown, very fine, angular sandstone, silty throughout, dry.
14 - 21	**Shale:** med gray, no light blue-gray siltstone in this hole.
21 - 26	**Shale:** light to med red-brown, silty top foot, with some thin siltstone interbeds, sandy.
26 - 30	**Shale:** light to med red-brown, silty top foot.
30 - 38	**Shale:** med red-brown, silty at base.
TD = 38	
	Note: No moisture in any sands, hard, light blue-gray siltstone **not** observed in this drill hole.
CASING	
0 - 26	4 inch heavy wall PVC pipe, perforated from 11-14 and 21-26 feet.

DRILLERS LOG

Drill Hole No.: M-8

Date Completed: 8-24-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7146.5 ft.

DEPTH (FT)	DESCRIPTION
0 - 17	**Shale:** med brown, dark red brown.
17 - 18	**Siltstone:** light red-brown, gray-brown.
18 - 20	**Shale:** med brown-tan, no light blue-gray siltstone in this hole.
20 - 25	**Shale:** med red-brown, silty top foot.
25 - 28	**Sand:** light to med yellow-brown or tan, very silty at top.
28 - 38	**Shale:** med red-brown, silty at base.
TD = 38	
	Note: No moisture in any sands, light blue-gray siltstone **not** observed in this drill hole.
CASING	
0 - 28	4 inch heavy wall PVC pipe, perforated from 17-20 and 24-28 feet.

DRILLERS LOG

Drill Hole No.: M-9

Date Completed: 8-24-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7143.9 ft.

DEPTH (FT)	DESCRIPTION
0 - 16	**Shale:** med brown, dark red brown,a few thin siltstone interbeds (3-6 inches).
16 - 32	**Sand:** light to med yellow-brown or tan, very silty at top to med coarse at base, fine-grained, angular. typical channel sand deposit.
32 - 40	**Shale:** med red-brown.
TD = 40	
	Note: No moisture in any sands, light blue-gray siltstone **not** observed in this drill hole.
CASING	
0 - 32	4 inch heavy wall PVC pipe, perforated from 16-32 feet.

DRILLERS LOG

Drill Hole No.: M-10

Date Completed: 8-24-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7140.9 ft.

DEPTH (FT)	DESCRIPTION
0 - 18	**Shale:** med brown, dark red brown,a few thin siltstone interbeds (3-6 inches)near base.
18 - 24	**Shale:** med brown-tan, dark red brown,a few thin siltstone and sand interbeds (3-6 inches)near base.
24 - 29	**Shale-Sand:** med brown-tan, dark red brown shale, sands are yellow brown, fine to coarse-grained, sand interbeds (3-6 inches)near base.
29 - 33	**Sand:** light to med yellow-brown or tan, coarse-grained at base, fine-grained, angular, typical channel sand.
33 - 39	**Shale:** med red-brown.
TD = 39	
	Note: No moisture in any sands, light blue-gray siltstone **not** observed in this drill hole.
CASING	
0 - 32	4 inch heavy wall PVC pipe, perforated from 23-33 feet.

DRILLERS LOG

Drill Hole No.: M-11

Date Completed: 8-24-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7142.0 ft.

DEPTH (FT)	DESCRIPTION
0 - 18	**Shale:** med brown, dark red brown,a few thin sandstone interbeds (3-6 inches)near base.
18 - 24	**Sand:** light to med yellow-brown or tan, coarse-grained at base, fine-grained, angular, typical channel sand.
24 - 34	**Shale-Siltstone:** med brown-tan, dark red brown.
TD = 34	
	Note: No moisture in any sands, light blue-gray siltstone **not** observed in this drill hole.
CASING	
0 - 24	4 inch heavy wall PVC pipe, perforated from 15-24 feet.

DRILLERS LOG

Drill Hole No.: M-12

Date Completed: 8-24-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7145.1 ft.

DEPTH (FT)	DESCRIPTION
0 - 12	**Shale:** med brown, dark red brown.
12 - 15	**Siltstone:** med red-brown, sandy at base, fine-grained.
15 - 19	**Shale:** med brown-tan, dark red brown.
19 - 23	**Sand:** very red brown, fine to coarse grained, dry, heavy hemotitic staining on grains.
23 - 35	**Shale:** med brown-tan, dark red brown.
TD = 35	
	Note: No moisture in any sands, light blue-gray siltstone **not** observed in this drill hole.

CASING

0 - 23	4 inch heavy wall PVC pipe, perforated from 14-23 feet.

DRILLERS LOG

Drill Hole No.: M-13

Date Completed: 8-24-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7155.4 ft.

DEPTH (FT)	DESCRIPTION
0 - 16	**Shale:** med brown, dark red brown.
16 - $16\frac{1}{2}$	**Siltstone:** light blue-gray, sandy, fine-grained, calcareous cement, sand grains are oxidized.
$16\frac{1}{2}$ - 21	**Sand:** very red brown, fine to coarse grained, dry, heavy hemotitic staining on grains.
21 - 22	**Shale:** med brown, dark gray-brown.
22 - 28	**Shale:** silty, med brown, dark gray-brown.
28 - 32	**Shale-Siltstone:** tan, red brown, mostly shale.
32 - 39	**Shale:** med brown-tan, dark red brown.
TD = 39	
	Note: No moisture in any sands, light blue-gray siltstone observed in this drill hole.

CASING

0 - 21	4 inch heavy wall PVC pipe, perforated from 7-21 feet. The interval from 7-15 feet was perforated because of the interval does contain sands in the immediate area.

DRILLERS LOG

Drill Hole No.: M-14

Date Completed: 8-24-89

Drill Hole Size: $6\frac{1}{2}$ in. OD

Elevation: 7148.8 ft.

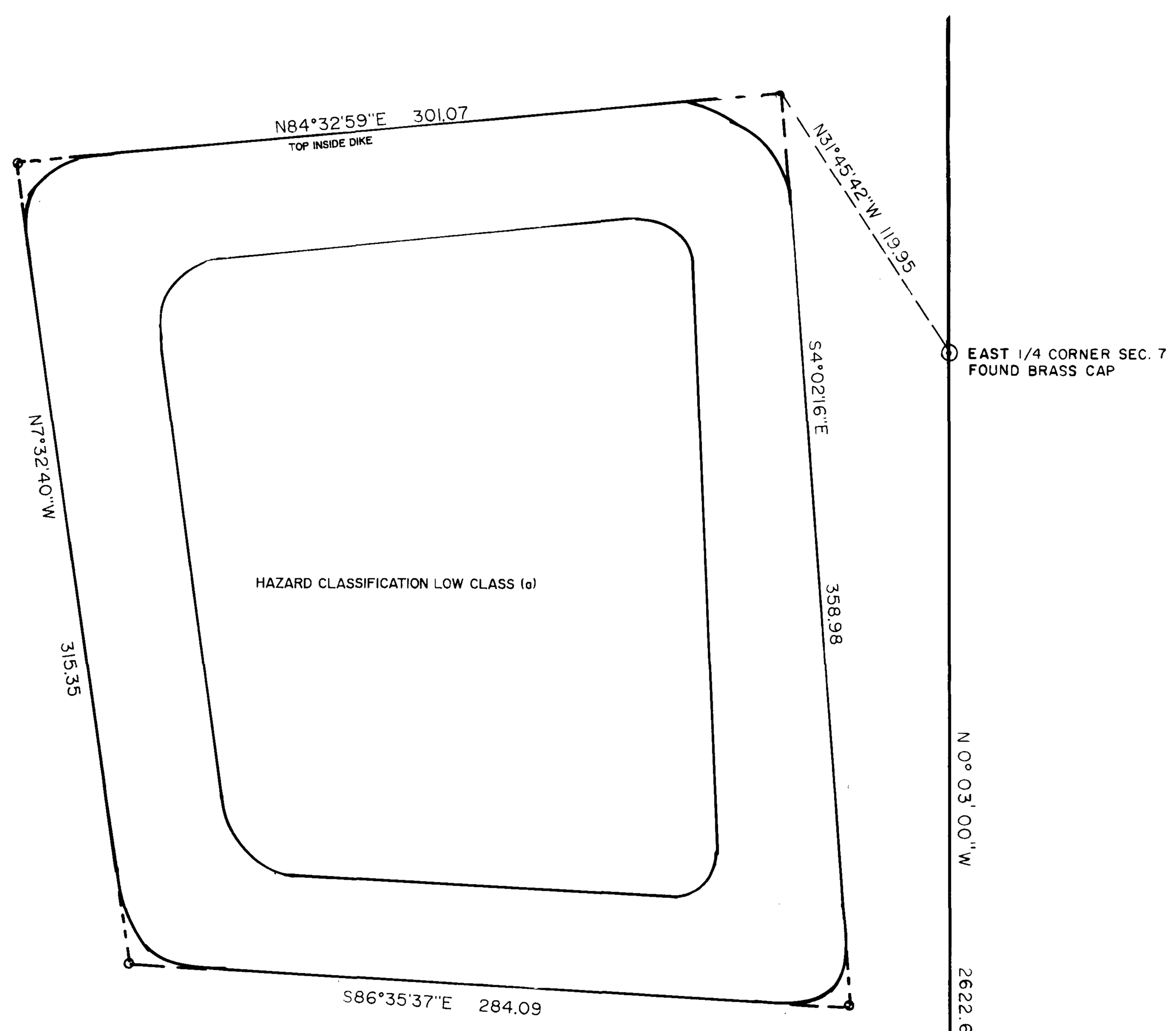
DEPTH (FT)	DESCRIPTION
0 - 9	**Shale:** med brown, dark red brown.
9 - 10	**Shale-Siltstone:** tan, red brown, mostly shale.
10 - 16	**Sand:** very red brown, fine to coarse grained, dry, heavy hemotitic staining on grains.
16 - 18	**Shale-Siltstone:** tan, red brown, mostly shale.
18 - 19	**Siltstone:** light blue-gray, sandy, fine-grained, calcareous cement, sand grains are oxidized.
19 - 23	**Sand:** very yellow brown, fine to coarse grained, dry, heavy hemotitic and limonitic staining on grains.
23 - 35	**Shale:** med brown, dark gray-brown.
TD = 35	
	Note: No moisture in any sands, light blue-gray siltstone observed in this drill hole.
CASING	
0 - 23	4 inch heavy wall PVC pipe, perforated from 9-23 feet.

MONITOR WELL COMPLETIONS

WELL NO.	DEPTH (FT)	CASING DEPTH (FT)	PERFORATED INTERVAL (FT)
M-1	40	20	13-20
M-2	44	26	12-17 & 20-26
M-3	42	32	25-32
M-4	45	35	26-35
M-5	41	35	20-31
M-6	40	31	19-30
M-7	38	26	11-14 & 21-26
M-8	38	28	17-20 & 24-28
M-9	40	32	16-32
M-10	39	32	23-33
M-11	34	24	15-24
M-12	35	23	14-23
M-13	39	21	7-21
M-14	35	23	9-23

EVAPORATION PIT FOR T.N.T. CONSTRUCTION INC.
ASBUILT DRAWING

PLAN VIEW
Scale: 1" = 50'



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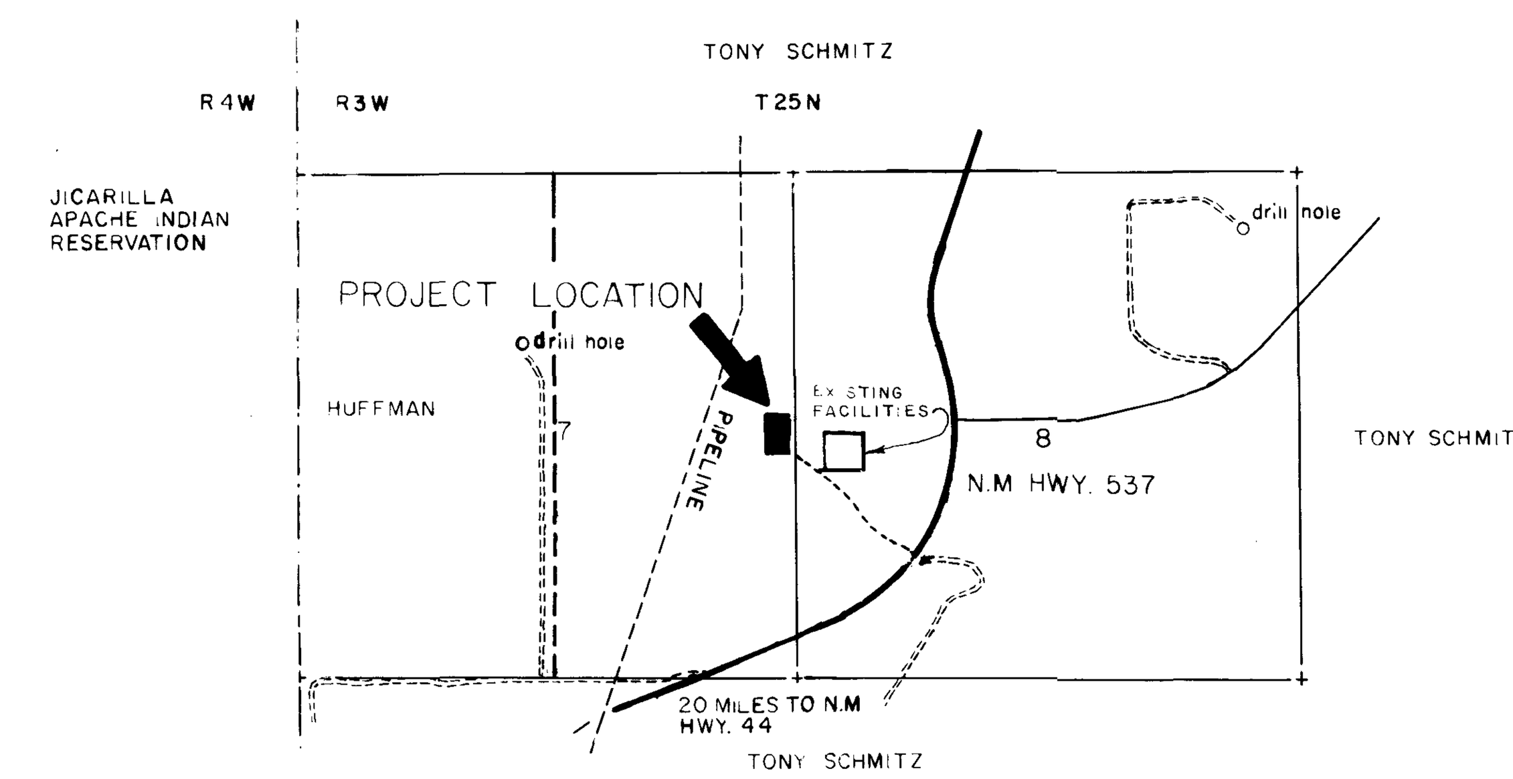
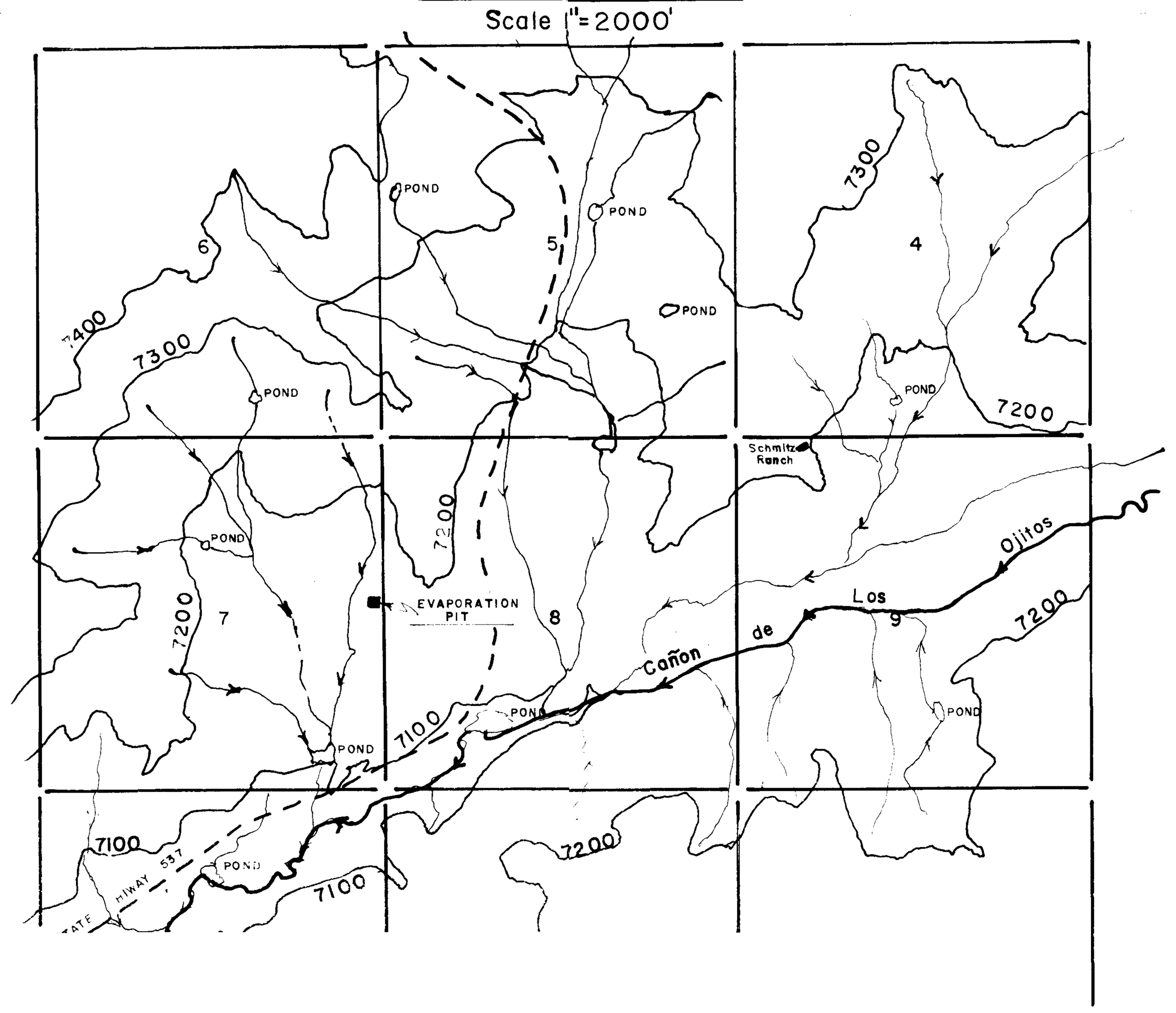


VICINITY MAP
Scale: 1" = 2000'

SHEET(1) = LOCATION & FILING SHEET
SHEET(2) = TOPOGRAPHY & DETAILS
SHEET(3) = SOIL ID MAP

MAP OF DRAINAGE AREA
Scale 1" = 2000'



EXISTING FACILITIES

SPECIFICATIONS FOR POND CONSTRUCTION

1. Strip all loose surface soils, vegetation, roots and debris from the pond and embankment areas to a horizontal distance of five (5) feet beyond the perimeter of the new construction. Removal should extend one foot below the existing grade or one foot below the bottom of the embankment, whichever is deeper. The soil may be stock piled and used to revegetate areas where clay is stripped for use in the construction of the embankments.

2. Clean and widen depressions, washes, swales, etc., to form level working areas to accommodate compaction equipment and fill placement. Removal should extend 3 feet below the existing grade or until all loose soil is removed from the washes.

3. No material will be placed which is frozen or where the in-place material is frozen.

4. Proof-roll the exposed subgrade in the embankment and pond areas to densify materials which may have been loosened during the stripping and excavation process. Proof-rolling may be accomplished by a minimum of two (2) passes of a loaded scraper or equivalent. All soft areas or deep soil horizons will be removed and replaced with compacted fill.

5. Compacted clay liners shall be a minimum of two (2) feet thick uniformly throughout the bottom and sides of the pit, with an extra two (2) feet of clay liner at the toes of sidewall slopes and under aerators.

6. Place and compact all embankment fill in horizontal lifts to the finished grade levels. Lift thicknesses will be compatible with compaction equipment used to achieve the required uniform densities. Lift thicknesses will be in intervals of nine (9) inches or less. The maximum size of rock used for fill will be six inches.

7. All fill material should be compacted to at least 95% of the maximum dry density of the clays utilized (ASTM D-698). Fill which is below 10 feet will be compacted to 95-100% of its maximum dry density.

8. The material used in construction should not be allowed to dry between layers or stages of berm construction. When drying has occurred, the dry material will be reconditioned to proper water content with produced or brine water prior to placing subsequent material.

9. When the compacted surface of any layer is too smooth to bond properly with the succeeding, the layer should be scarified or roughened to provide a satisfactory bonding of surfaces before the next layer is placed.

10. At any point of discharge into the pond, no fluid force shall be directed onto the clay lining. To prevent erosion under aerators and on levees splash guards will be installed and will include appropriate rip-rap (secured tires) synthetic materials, discharge tubes with upward facing outlets or various weirs.

11. A positive drainage system will be provided around base (toe) of the outside slope of the proposed embankment throughout the life of the proposed pond.

12. A fence will be constructed around the facility perimeter. Adequate space will be provided between the fence and levees for passage of maintenance vehicles. The fence will be constructed of woven and barbed wire. The fence will be constructed so as to prevent livestock from entering the facility area and to prevent any dumping of produced/waste materials that have not been processed through the existing facility in Section 8.

13. The State Engineer has full authority regarding inspection during construction and full power to act if specifications are not met.

State of New Mexico)
)ss.
County of Santa Fe)

I hereby certify that the accompanying maps and statements have been examined by me and approved as to form and content, and were duly accepted for filing on the_______day of_____________, 19___.

State Engineer

ASBUILT MAP
of the
T.N.T. CONSTRUCTION WATER DISPOSAL FACILITY

T.N.T. Construction , Applicant
Located in Rio Arriba County, State of New Mexico.
All courses true

Scale of Map, 1 inch = 50 feet

The undersigned, Tony L. Schmitz, claimant, whose post office address is STAR ROUTE LINDRITH, NM 87029 , County of Rio Arriba, State of New Mexico has caused to be located by a qualified Registered Land Surveyor the T.N.T. CONSTRUCTION WATER DISPOSAL FACILITY as herein described and indicated, hereby makes these several statements relative thereto and offers these maps and statements for acceptance and filing in compliance with the laws of the State of New Mexico.

The T.N.T. Construction Water Disposal Facility has the following properties; maximum height above foundation 15.1 feet; maximum length, 460 feet; maximum width at base, 146 feet; crest width, 16.35 feet; slope of upstream face, 3 horizontal to one vertical; slope of downstream face, 3 horizontal to one vertical; top of dam elevation, 7157.5 feet; bottom of pond elevation, 7146 feet; high water line elevation, 7154.5 feet; freeboard distance 3 feet. The dam will be constructed of well compacted native clay materials. The dam will have a 2 foot thick compacted clay liner. The surface area of the pond at high water line is, 2.26 acres; the capacity at high water line is, 14.65 acre feet.

State of New Mexico)
)ss.
County of Rio Arriba)

I, Tony L. Schmitz, being first duly sworn, upon my oath, state that I have read and examined the accompanying maps and statements consisting of THREE(3) sheets and know the contents thereof and representations thereon, and state that the same are true and correct to the best of my knowledge and belief.

Tony Lee Schmitz
Claimant

Subscribed and sworn before me this_______ day of___________,1990

OFFICIAL SEAL
JOHN T. MARTIN

Notary Public

State of New Mexico)
)ss.
County of San Juan)

I, Cecil B. Tullis, being first duly sworn, upon my oath, state that I am the Registered Professional Land Surveyor who made the maps of the T.N.T Construction Water Disposal Facility and that such maps consisting of 2 sheets were prepared from field notes of actual surveys by me or under my direction and that the same are true and correct to the best of my knowledge and belief

Cecil B. Tullis
Cecil B. Tullis

License No. 9672

Subscribed and sworn before me this_______ day of___________,1990

OFFICIAL SEAL
JOHN T. MARTIN

Notary Public

CECIL B. TULLIS
NEW MEXICO
9672
REGISTERED PROFESSIONAL LAND SURVEYOR

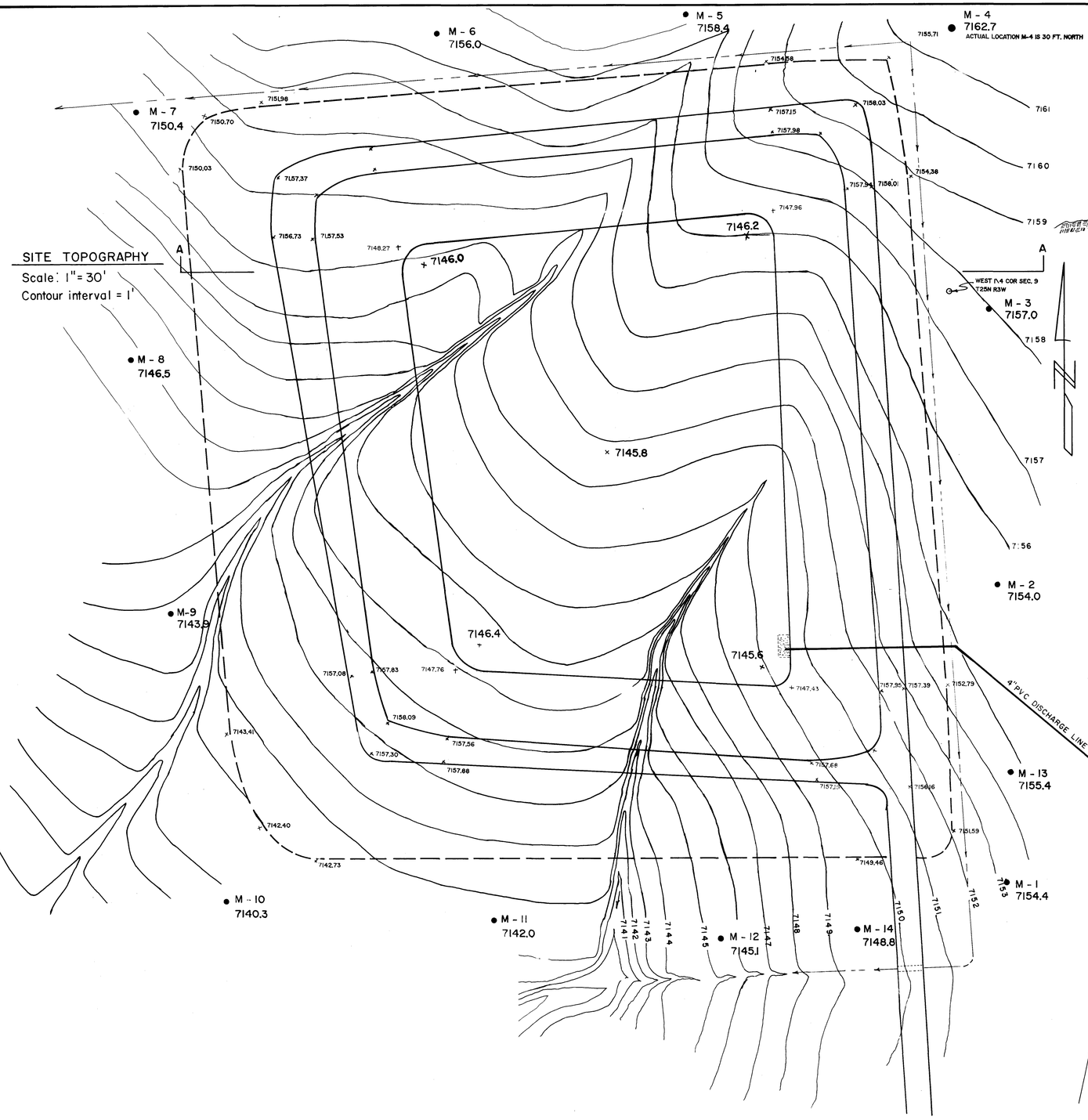
RECEIVED
FEB 19 1990
OIL CONSERVATION DIV.
SANTA FE

HIGH COUNTRY SURVEYS
FARMINGTON, NEW MEXICO

DECEMBER 18 1989

SHEET 1 OF 3

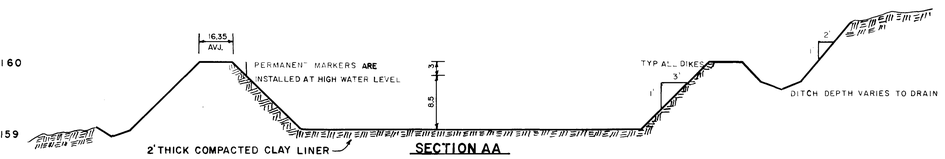
ASBUILT DRAWING FOR TNT CONSTRUCTION INC.



SITE TOPOGRAPHY

Scale: 1" = 30'

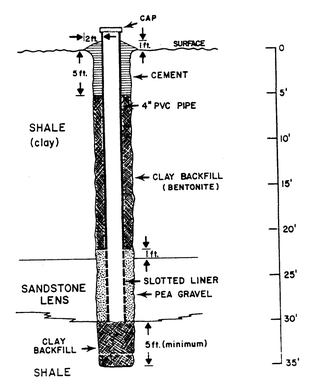
Contour interval = 1'



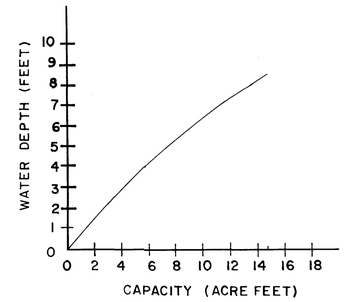
SECTION AA

N.T.S.

MONITOR WELL (TYPICAL)



POND CAPACITY

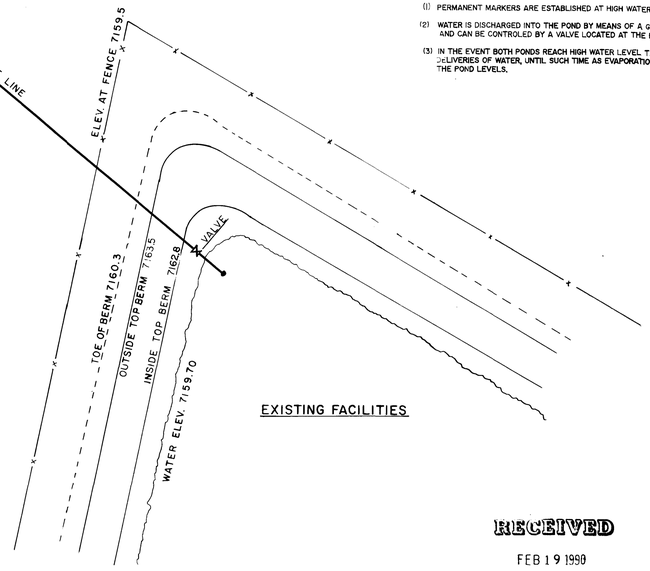


POND WATER LEVEL MANAGEMENT

(1) PERMANENT MARKERS ARE ESTABLISHED AT HIGH WATER LINE ELEV. 7154.5

(2) WATER IS DISCHARGED INTO THE POND BY MEANS OF A GRAVITY FLOW SYSTEM, AND CAN BE CONTROLED BY A VALVE LOCATED AT THE EXISTING POND

(3) IN THE EVENT BOTH PONDS REACH HIGH WATER LEVEL T.N.T. CONSTRUCTION WILL CEASE TO ACCEPT DELIVERIES OF WATER, UNTIL SUCH TIME AS EVAPORATION, NATURAL AND \ OR SPRAYER ENHANCED LOWERS THE POND LEVELS.



EXISTING FACILITIES

RECEIVED

FEB 19 1990

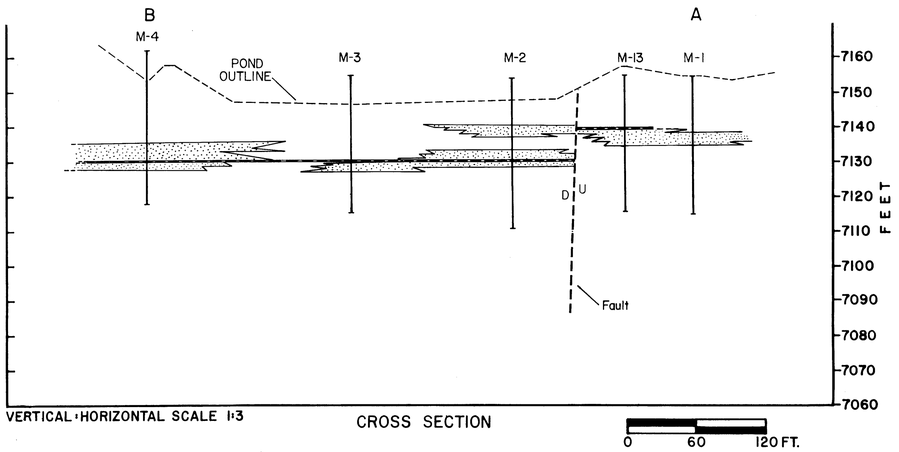
OIL CONSERVATION DIV.
SANTA FE

DECEMBER 18 1989

SHEET 2 OF 3

HIGH COUNTRY SURVEYS

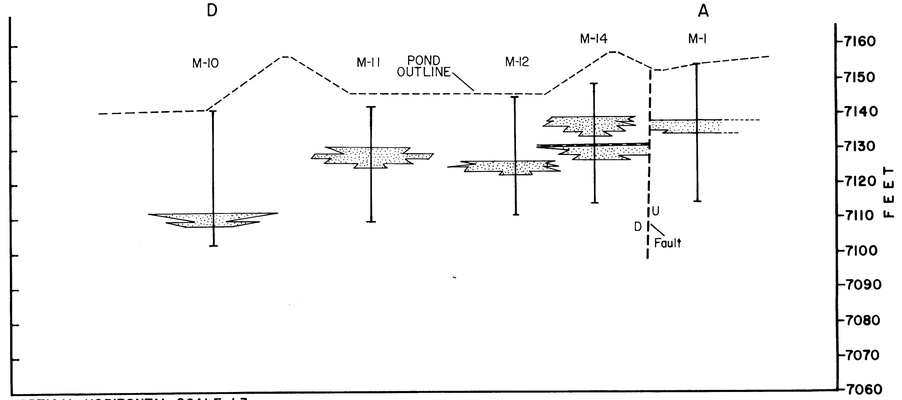
FARMINGTON NEW MEXICO



VERTICAL · HORIZONTAL SCALE 1:3

CROSS SECTION

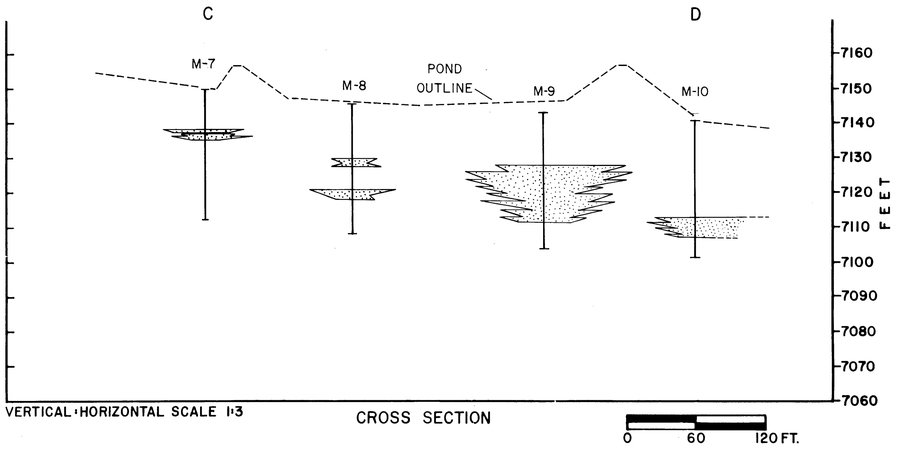
0 60 120 FT.



VERTICAL · HORIZONTAL SCALE 1:3

CROSS SECTION

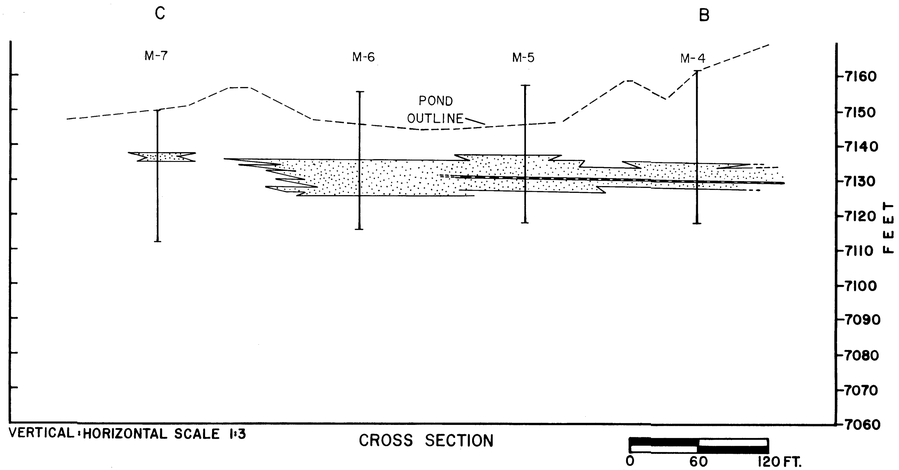
0 60 120 FT.



VERTICAL · HORIZONTAL SCALE 1:3

CROSS SECTION

0 60 120 FT.

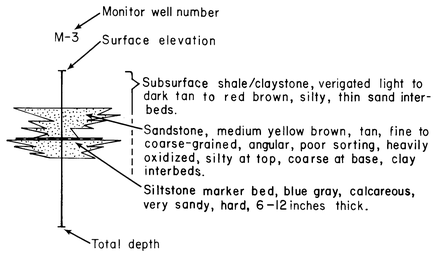


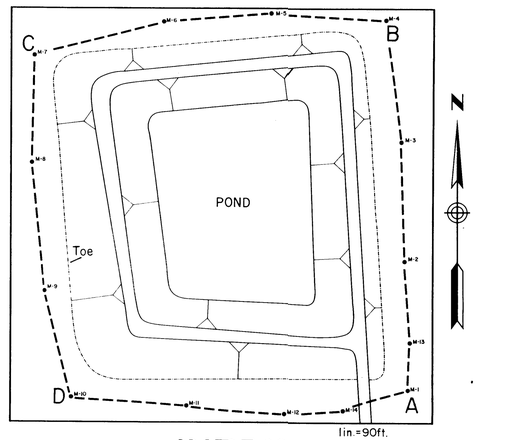
VERTICAL · HORIZONTAL SCALE 1:3

CROSS SECTION

0 60 120 FT.

LEGEND





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TNT CONSTRUCTION, INC.

SE1/4, Sec.7, T.25N., R.3W. Rio Arriba County, New Mex.

CROSS SECTIONS OF MONITOR WELLS

SURFACE DISPOSAL FACILITY

BY: James W. Hurney 2/5/90

WESTERN TECHNOLOGIES INC.

400 South Lorena Avenue
Farmington, New Mexico 87401
(505) 327-4966

T-N-T Construction
Star Route
Lindrith, New Mexico 87029

February 9, 1990

Attention: Mr. Tony Schmitz

Project: Water Disposal Pond
Lindrith, New Mexico

WT No. 31200016
Addendum No. 1

This is an Addendum to our letter of January 30, 1990 regarding the above referenced project. The as-built compacted clay liner thickness should have read 3 feet minimum. We apologize for our error and hope it has not caused you any inconveniences.

Sincerely,
WESTERN TECHNOLOGIES INC.

GEORGE A. MADRID NEW MEXICO 9110 REGISTERED PROFESSIONAL ENGINEER

George A. Madrid, P.E.

Distribution: Addressee (7)

/cb

WESTERN TECHNOLOGIES INC.

400 South Lorena Avenue
Farmington, New Mexico 87401
(505) 327-4966

T-N-T Construction, Inc.
Star Route
Lindrith, New Mexico 87029

January 30, 1990

Attention: Mr. Tony Schmitz

Project: Water Disposal Pond
Lindrith, New Mexico

WT No. 31200016

As requested by Jim Gurney, we have reviewed our geotechnical engineering report of May 2, 1988 (WT No. 3129J024), laboratory and field test reports, and the enclosed as-built drawings for the above referenced project. The purpose of our review was to assess compliance of construction of the pond with design parameters and recommendations contained in our geotechnical engineering report for the lower of two proposed ponds.

The results of our review are tabulated below.

FEATURE	AS-BUILT	DESIGN/RECOMMENDED
Compacted clay liner, feet thick	2 Minimum	2 Minimum
Embankment top width, feet minimum	12	12
Maximum height of embankment above existing ground, feet	15.1	16
Maximum water depth, feet	8.5	10
Embankment upstream and downstream slopes, horizontal to vertical	3:1	3:1
Clay liner permeability, cm/sec	9.8×10^{-8}	3.8×10^{-8}
Fill compaction, ASTM D698	95% minimum density @ 3% below to 3% above optimum moisture content	SAME

Water Disposal Pond
Lindrith, New Mexico
WT No. 31200016

The above results indicate the pond was constructed in accordance with our recommendations.

We appreciate working with you on this project. If you have any questions or comments, we will be most happy to discuss them with you.

Sincerely,
WESTERN TECHNOLOGIES INC.

GEORGE A. MADRID NEW MEXICO 9110 REGISTERED PROFESSIONAL ENGINEER

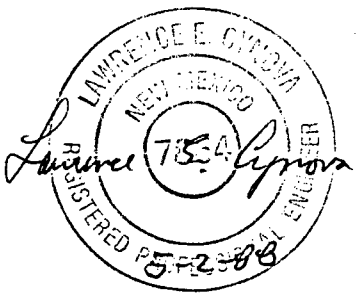
George A. Madrid, P.E. Reviewed by: Lawrence E. Cynova, P.E.

Distribution: Addressee (7 w/1 enclosure)

/cb

Geotechnical Services For:

Water Disposal Pond
Lindrith, New Mexico
Project No. 3128J024



Submitted to:

Tony Schmitz
Star Route Lindrith
Lindrith, NM 87029

Attn: Mr. Tony Schmitz

May 2, 1988
Inv. No. 31280028

WESTERN TECHNOLOGIES INC.
The Quality People

ARIZONA

Phoenix
3737 East Broadway Road
P.O. Box 21387
Phoenix, Arizona 85036
(602) 437-3737

Mesa
952 East Baseline Road, No. 104
Mesa, Arizona 85204
(602) 926-2113

Sun City
17200 North Dysart Road, No. 13
P.O. Box 2431
Sun City, Arizona 85372
(602) 975-2154

Flagstaff
2400 East Huntington Drive
Flagstaff, Arizona 86004
(602) 774-8708

Lakeside
Route 1, Box 1030
Lakeside, Arizona 85929
(602) 368-5568

Tucson
3480 South Dodge Boulevard
Tucson, Arizona 85713
(602) 748-2262

Sierra Vista
1827 South Paseo San Luis
Sierra Vista, Arizona 85635
(602) 458-0364

Laughlin / Bullhead City
1610 Riverview Drive, No. 5
Bullhead City, Arizona 86442
(602) 758-8378

CALIFORNIA

Newport Beach
4400 MacAuthur Boulevard
Newport Beach, California 92660
(714) 955-4977

COLORADO

Denver
303 East 17th Avenue, No. 910
Denver, Colorado 80203
(303) 894-8327

NEVADA

Las Vegas
3611 West Tompkins Avenue
Las Vegas, Nevada 89103
(702) 798-8050

NEW MEXICO

Albuquerque
8305 Washington Place, N.E.
Albuquerque, New Mexico 87113
(505) 823-4488

Farmington
400 South Lorena Avenue
Farmington, New Mexico 87401
(505) 327-4966

WESTERN TECHNOLOGIES INC.

400 South Lorena Avenue
Farmington, New Mexico 87401
(505) 327-4966

Tony Schmitz
Star Route Lindrith
Lindrith, New Mexico 87029

May 2, 1988

Attn: Mr. Tony Schmitz

Re: Water Disposal Pond
Lindrith, New Mexico

Job No. 3128J024
Inv. No. 31280028

Our geotechnical engineering report for the Water Disposal Pond is attached. The work was performed in accordance with our proposal of March 22, 1988.

Soils at the site generally consisted of sandy clay with low to moderate load bearing capabilities. The existing clays can be used for construction of pond embankments.

We are prepared to review your plans and specifications for consistency with the recommendations, and to provide the construction observation and testing recommended.

Sincerely,
WESTERN TECHNOLOGIES, INC.
Geotechnical Engineering Services

Lawrence E. Cynova, P. E.

Reviewed by: George A. Madrid, P. E.

/cb

Copies to: Addressee (3)

TABLE OF CONTENTS

Geotechnical Engineering Evaluation
Water Disposal Pond
Highway 537
Lindrith, New Mexico

INTRODUCTION

This report contains the results of our geotechnical engineering evaluation for the proposed Water Disposal Pond to be located west of Highway 537 near Lindrith, New Mexico. The purpose of these services is to provide results of field and laboratory testing, to evaluate the use of site soils for construction of the dikes, and to provide engineering recommendations for construction of the dikes.

PROPOSED CONSTRUCTION

The proposed construction will consist of two ponds constructed next to each other but at different levels. The upper pond will have plan dimensions of approximately 300 by 300 feet with a surface area of approximately 2 acres and a storage capacity of approximately 20 acre feet. The lower pond will have plan dimensions of approximately 360 by 240 feet with a surface area of approximately 2 acres and a storage capacity of approximately 20 acre feet. The ponds will be constructed partially in cut and fill. It is understood that the top width of the dikes will be approximately 12 feet with a 3 to 1 (horizontal to vertical) slope on the inside and outside. Also it is understood that the free board for the dikes will be 3 feet and the maximum depth of the water will be 10 feet.

SITE CONDITIONS

At the time of our exploration, the site was undeveloped property. The site contained a sparse to moderate growth of weeds, grass and brush. Site drainage was to the southwest on a

gradual and uniform slope. A fence is located on the east side of the site. A dirt road is located on the south side of the site. Two small washes are located on the site, which consist of shallow swales.

SCOPE OF SERVICES

Four borings were drilled to depths of 6 to 25 feet at the locations shown on the site plan. During exploration, subsoils were visually examined and sampled at selected intervals.

The following tests were performed on selected soil samples:

- Water content
- Dry density
- Compression
- Expansion
- Shear strength
- Gradation
- Plasticity Index
- Permeability

Test results were used in the development of foundation and earthwork recommendations.

Western Technologies Inc. performed the services described in this report to develop engineering information for the purposes defined in the "Introduction." We did not intend to uncover nor identify any contaminated subsurface materials that may contain hazardous or flammable substances. Identification of such substances requires specialized exploration techniques and analyses which were not used in this investigation.

INTERPRETATION OF SUBSURFACE CONDITIONS

Exploration: As presented on Logs of Borings, surface soils and subsoils to depths of 6 to 25 feet, which is the full depth of exploration, in all test borings except test boring 1 were found to be sandy clay of firm to stiff consistency and medium plasticity. The materials underlying the surface soils in test boring 1 and extending to the full depth of exploration consisted of sandstone underlain by claystone. A groundwater table was not encountered in any boring at the time of exploration.

Geology: The proposed water disposal pond is to be located in unconsolidated surficial clay material derived from the local topography. This material was deposited as alluvium washed down from the surrounding foothills and probably originated as a shale from the San Jose Formation. This formation is Eocene in age and is described as the buff, fine to coarse grained arkosic sandstone, conglomeratic sandstone and interbedded gray and red shale which makes up a large percentage of the San Juan Basin. In the northern part of the basin, this formation contains some volcanic debris, including andesite pebbles, but the proportion of volcanic debris and sandstone decreases southward.

ANALYSIS PROCEDURES

General: We understand that the proposed Water Disposal Ponds will store water throughout the year. The ponds will be filled with water from oil and gas production. The water will be evaporated by spraying the water into the air. We believe that all soils in the pond areas will be clay, as indicated on the test boring logs, but if a sand lense is encountered in the side of a dike, then the sand lense should be plated with 2 feet of compacted clay. If a sand lense is encountered in the bottom then it should be removed. The south dike, which is the deepest

fill, and the dike between the two ponds, were chosen for stability analysis.

Material Properties: The on-site undisturbed and compacted clay materials exhibit properties of low cohesion and low to moderate angles of internal friction. The underlying sandstone materials encountered in test boring 1 had nil cohesion and moderate to moderately high angles of internal friction. Based upon our observations, the results of laboratory testing, and our experience with similar materials, the following material properties were assigned to the embankment and foundation soils:

Undisturbed Clays
Dry unit weight - 105 pcf
Angle of internal friction - 16°
Cohesion - 600 psf

Compacted Clays
Dry unit weight - 108 pcf
Angle of internal friction - 12°
Cohesion - 300 psf

Sandstone
Dry unit weight - 140 pcf
Angle of internal friction - 30°
Cohesion - 0 psf

Slope Stability Analysis: The static stability of anticipated embankment slopes was analyzed using strength parameters obtained from laboratory and field testing. The analysis was conducted on those dike configurations as discussed with the client for the project. A computer program (SB-SLOPE program developed by Digital Research Inc.) using simplified Bishop's Analysis was performed for both the upstream and downstream slopes for the anticipated embankment configurations.

The following table presents the results of the analysis:

Section	Condition	Slope	Factor of Safety
Dike between Ponds	Steady State Seepage	Downstream	3.8
	Rapid Drawdown	Upstream	2.7
South Dike	Steady State Seepage	Downstream	2.5
	Rapid Drawdown	Upstream	2.3

A minimum factor of safety of 1.5 is recommended under the steady state condition and rapid drawdown in the design of dams, by the New Mexico State Engineer Office.

After reviewing the Deformation Analysis - Embankment Dams section of the manual for the Procedure on Design Criteria and Safety of Dams, for seismic considerations, seismic analysis is not necessary. This is due to the fact that the proposed embankments and foundations are not subject to liquifaction. Also, the dikes will be densely compacted, the slopes will be 3 horizontal to 1 vertical and the static factor of safety is greater than 1.5.

Seepage Analysis: The ponds will be constructed with compacted clay and the surrounding soils are clay. A permeability test indicates the permeability coefficient of the native sandy clay is 3.8×10^{-8} centimeters per second or 0.04 feet per year.

Piping, which is the movement of material by seepage forces in the foundation and embankments, is not expected due to the anticipated very low seepage quantity.

DISCUSSION AND RECOMMENDATIONS

General: Based on the results of this investigation, we anticipate that the existing clay soils could be used for construction of embankments. It is anticipated that the northeast sides of the ponds will be cut and the southwest sides will be fill. The pond may be satisfactorily supported upon prepared subgrade. If subsoil conditions other than those identified during the field exploration are encountered during construction or should design plans change, this firm should be contacted for supplemental review and recommendations.

The following general conclusions and recommendations are presented:

1. Surface soils in native undeveloped areas are loose to depths of approximately one foot. The surface soils in the washes are loose to depths of probably several feet. Therefore, these zones are not deemed suitable for support of earth embankments. However, removal and replacement of native soils in embankment foundation areas can provide adequate support characteristics of these zones.

2. Native soils below levels of surface soil disturbance are generally of moderate densities and will afford support for anticipated embankments.

3. Excavation of the design pond base should be possible with conventional earthmoving equipment.

Embankment: Homogeneous embankments for construction of the storage pond were analyzed. Homogeneous embankments are constructed using the same soil type throughout the embankment. The soil borings indicate that the materials for homogeneous embankments are readily available on the site.

The proposed homogeneous embankment may be constructed with the on-site clay soils identified during exploration, provided site preparation and earthwork is accomplished as recommended hereinafter. The upstream embankment should be constructed no steeper than 3 to 1 (horizontal to vertical). The downstream embankment should be constructed no steeper than 3 to 1 (horizontal to vertical).

Materials: An investigation of borrow materials in the pond area was performed and test boring logs are provided. The logs indicate there are clays in the cut portion of the pond which would be used for construction of the dikes. A permeability test was also conducted on the soils from these test borings. Based on these test boring logs and permeability test we believe that the on-site soils are suitable to construct the dikes.

Site Preparation and Earthwork: The following procedure is recommended for site preparation and earthwork for the embankment portions of the water disposal pond.

1. Strip all loose surface soils, vegetation, roots and debris from the pond and embankment area to a horizontal distance of 5 feet beyond the perimeter of the new construction. Removal should extend 1 foot below the existing grade or 1 foot below the bottom of the embankment, whichever is deeper. This soil could be used for revegetating if it is needed.

2. Clean and widen depressions, washes, swales, etc., to form level working areas to accommodate compaction equipment and fill placement. Removal should extend 3 feet below the existing grade or until all loose soil is removed from the washes.

3. No material should be placed which is frozen or where the in-place material is frozen.

4. Proof-roll the exposed subgrade in the embankment and pond areas to densify materials which may have been loosened during the stripping and excavation process. Proof-rolling may be accomplished by a minimum of 2 passes of a loaded scraper or equivalent. All soft areas should be removed and replaced with compacted fill.

5. Place and compact all embankment fill in horizontal lifts to the finished grade levels. Lift thicknesses should be compatible with compaction equipment used to achieve the required uniform densities. The maximum size of rock used for fill should be 6 inches.

6. All subgrade preparation, fill placement and compaction should be accomplished under observation and testing to assess compliance with project specifications. All fill material should be compacted to at least 95% of the maximum dry density as determined by ASTM: D-698 methods and at a moisture content of 3% below optimum to 3% above optimum. Fill which is below 10 feet should be compacted to at least 100% of the maximum dry density as determined by ASTM D-698 methods and at a moisture content of 3% below to 3% above optimum.

7. The material should not be allowed to dry between layers or stages of berm construction. When drying has occurred, the dry material should be reconditioned to the proper water content and recompacted prior to placing subsequent material. Between stages of berm construction the embankment should be covered by at least 2 feet of temporary fill.

8. When the compacted surface of any layer is too smooth to bond properly with the succeeding, the layer should be scarified of otherwise roughened to provide a satisfactory bonding surface before the next layer of fill material is placed.

Drainage: Positive drainage should be provided around tbe proposed lagoon during construction and maintained throughout the life of the proposed development.

Borrow excavation, basin excavation, surface stripping, subgrade preparation, and embankment fill placement should be accomplished under the observation and testing directed by a soils engineer to assess compliance with recommendations.

Post Construction Maintenance: During the life of the water disposal pond, burrowing animals should not be allowed to dig holes in the embankments.

Corrosion: We recommend a Type II portland cement be used for all concrete on and below grade.

CLOSURE

Our conclusions and recommendations are predicated on observation and testing of the earthwork and foundation preparations directed by a geotechnical engineer. It would be logical for Western Technologies Inc. to provide these services since we are most qualified to determine consistency of field conditions with those data used in our analyses.

Deviations from our recommendations by the plans, written specifications, or field applications shall relieve us of responsibility unless our written concurrence with such deviations has been obtained.

METHOD OF SOIL CLASSIFICATION
(ASTM D 2487)

COARSE-GRAINED SOILS

LESS THAN 50% FINES*

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
GW	WELL-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LESS THAN 5% FINES	GRAVELS More than half of coarse fraction is larger than No. 4 sieve size
GP	POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LESS THAN 5% FINES	
GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, MORE THAN 12% FINES	
GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, MORE THAN 12% FINES	
SW	WELL-GRADED SANDS OR GRAVELLY SANDS, LESS THAN 5% FINES	SANDS More than half of coarse fraction is smaller than No. 4 sieve size
SP	POORLY-GRADED SANDS OR GRAVELLY SANDS, LESS THAN 5% FINES	
SM	SILTY SANDS, SAND-SILT MIXTURES, MORE THAN 12% FINES	
SC	CLAYEY SANDS, SAND-CLAY MIXTURES, MORE THAN 12% FINES	

NOTE:
Coarse-grained soils receive dual symbols if they contain 5 to 12% fines (e.g. SW-SM, GP-GC, etc.)

FINE-GRAINED SOILS

MORE THAN 50% FINES*

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS	SILTS AND CLAYS Liquid limit less than 50
CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
OL	ORGANIC SILTS OR ORGANIC SILTY-CLAYS OF LOW PLASTICITY	
MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDS OR SILTS, ELASTIC SILTS	SILTS AND CLAYS Liquid limit more than 50
CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY	
PT	PEAT, MUCK, AND OTHER HIGHLY ORGANIC SOILS	HIGHLY ORGANIC SOILS

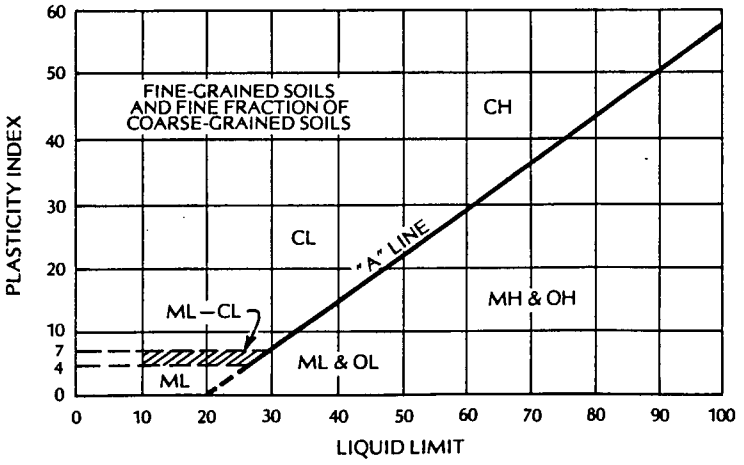
NOTE:
Fine-grained soils receive dual symbols if their limits plot in the hatched zone on the Plasticity Chart (ML-CL)

SOIL SIZES

COMPONENT	SIZE RANGE
BOULDERS	ABOVE 12 in.
COBBLES	3 in. to 12 in.
GRAVEL	No. 4 to 3 in.
Coarse	¾ in. to 3 in.
Fine	No. 4 to ¾ in.
SAND	No. 200 to No 4
Coarse	No. 10 to No. 4
Medium	No. 40 to No. 10
Fine	No. 200 to No. 40
*FINES (Silt or Clay)	BELOW No. 200

NOTE:
Only sizes smaller than three inches are used to classify soils.

PLASTICITY CHART



DEFINITION OF TERMINOLOGY

ALLOWABLE SOIL BEARING CAPACITY ALLOWABLE FOUNDATION PRESSURE	The recommended maximum contact stress developed at the interface of the foundation element and the supporting material.
BACKFILL	A specified material placed and compacted in a confined area.
BASE COURSE	A layer of specified material placed on a subgrade or subbase.
BASE COURSE GRADE	Top of base course.
BENCH	A horizontal surface in a sloped deposit.
CAISSON	A concrete foundation element cast in a circular excavation which may have an enlarged base. Sometimes referred to as a cast-in-place pier.
CONCRETE SLABS-ON-GRADE	A concrete surface layer cast directly upon a base, subbase or subgrade.
CRUSHED ROCK BASE COURSE	A base course composed of crushed rock of a specified gradation.
DIFFERENTIAL SETTLEMENT	Unequal settlement between or within foundation elements of a structure.
ENGINEERED FILL	Specified material placed and compacted to specified density and/or moisture conditions under observation of a representative of a soil engineer.
EXISTING FILL	Materials deposited through the action of man prior to exploration of the site.
EXISTING GRADE	The ground surface at the time of field exploration.
EXPANSIVE POTENTIAL	The potential of a soil to expand (increase in volume) due to the absorption of moisture.
FILL	Materials deposited by the action of man.
FINISHED GRADE	The final grade created as a part of the project.
GRAVEL BASE COURSE	A base course composed of naturally occurring gravel with a specified gradation.
HEAVE	Upward movement.
NATIVE GRADE	The naturally occurring ground surface.
NATIVE SOIL	Naturally occurring on-site soil.
ROCK	A natural aggregate of mineral grains connected by strong and permanent cohesive forces. Usually requires drilling, wedging, blasting or other methods of extraordinary force for excavation.
SAND AND GRAVEL BASE	A base course of sand and gravel of a specified gradation.
SAND BASE COURSE	A base course composed primarily of sand of a specified gradation.
SCARIFY	To mechanically loosen soil or break down existing soil structure.
SETTLEMENT	Downward movement.
SOIL	Any unconsolidated material composed of discrete solid particles, derived from the physical and/or chemical disintegration of vegetable or mineral matter, which can be separated by gentle mechanical means such as agitation in water.
STRIP	To remove from present location.
SUBBASE	A layer of specified material placed to form a layer between the subgrade and base course.
SUBBASE GRADE	Top of subbase.
SUBGRADE	Prepared native soil surface.

SOIL PROPERTIES

Job No. 3128J024

Boring No.	Depth, ft	Soil Class.	Soil Property		Compression/Consolidation			Expansion			Shear Strength			Water Soluble Matter, PPM		Remarks
			Initial Dry Density pcf	Initial Water Content, %	Surcharge KSF	Total Comp. %	Void Ratio	Surcharge KSF	Expansion %	Max. Swell Pressure KSF	Test Method	C KSF	ø Deg.	Salts	Sulfates	
2	3 - 4	CL	115	10.6							DS	0.6	16			
4	0 - 5	CL	108(1)	16.3							DS	0.3	12			
4	0 - 5	CL	108(1)	9.1				0.1(3)	+7.0					0.1	< 0.1	

Boring No.	Depth, ft	Comments

Note: Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.

LEGEND

Shear Strength Test Method
- DS Direct Shear
- DS Direct Shear (saturated)
- UC Unconfined Compression
- UU Unconsolidated Undrained
- CU Consolidated Undrained w/pore press.
- CU Consolidated Undrained
- CD Consolidated Drained

REMARKS

1. Compacted density (approx. 95% of ASTM D698 max. density at moisture content slightly below optimum).
2. Compacted density (approx. 95% of ASTM D1557 max. density at moisture content slightly below optimum).
3. Submerged to approximate saturation.
4.

Job No. 3128J024

Boring No.	Depth, ft.	Soil Class.	Particle Size Distribution, %				Atterberg Limits			Moisture - Density Rel.			Specific Gravity	Permeability		'R' Value		Permeability K cm/sec
			Cobbles 3" to 12"	Gravel 3" to #4	Sand #4 to 200	Fines - 200	PL	LL	PI	Dry Density pcf	Optimum Moisture %	Meth.		Dry Density pcf	K Ft./Yr.	Corrected 'R'	Expansion Pressure psf	
4	0 - 5	CL												108	0.042			3.8×10^{-8}

Boring No.	Depth, ft.	Remarks
4	0 - 5	Maximum Density 113.5 pcf @ Optimum Moisture of 16.3% ASTM D-698

LEGEND

Moisture Density Relationship
1. Tested D-1556/AASHTO T-217
2. Tested ASTMD-2922/D-3017
3. Tested ASTMD-2922/AASHTO T-217
4. Rock correction applied to maximum dry density. AASHTO T-224
5. Other_____

Specific Gravity
6. Minus # 4
7. Plus # 4

Classification/Particle Size
8. Visual
9. Laboratory Tested

SOIL PROPERTIES

page ___ of ___ part

Type of Material Clay Job No. 3128J024

Source of Material Water Disposal Ponds

Test Procedure ASTM Tested/Calc. By J. Hutchinson/WT Date 03/30/88

Reviewed By L. Cynova/WT Date 04/20/88

Hole No.	Location	Depth	Classification		LL	PI	Sieve Analysis - Accum % Passing													Lab No./I.D.
			AASHTO	Unified			200	100	40	16	10	4	¼	⅜	¾	1	1½	2	3	
4		0 - 5		CL	40	22	66	76	93	99	100									

TABULATION OF TEST RESULTS

LOG OF BORING NO. 1

Project Water Disposal Pond — Job No. 3128J024

Elevation 83.5 — Datum Assumed Elev. 100.0 - S.E. Corner, N. Pond

Type/Size Boring 7" Auger — Rig Type CME-55

Groundwater Conditions No groundwater was encountered on 03/30/88 — Date 03/30/88

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
					PL-LL	CL	SANDY CLAY; brown, firm to stiff. Medium to high plasticity.
					PL		
5		50/9"	R	105	10.9		
		50/8.5"	R	NR-G			
		27	R	102	12.2		
10		12	S				
					SLT. DAMP		SANDSTONE; tan, fine to coarse grained sand. Light to moderate cementation.
15		50/1"	S				
		50/3"	S				
20							
25		50/5.5"	S		SL		CLAYSTONE; brown to red, stiff to very stiff.
							Stopped at 25 feet.
30							NR-G - No recovery, but took grab sample.

LOG OF BORING NO. 2

Project Water Disposal Pond Job No. 3128J024

Elevation 85.2 Datum Assumed Elev. 100.0 - S.E. Corner, N. Pond

Type/Size Boring 7" Auger Rig Type CME-55

Groundwater Conditions No groundwater was encountered on 03/30/88 Date 03/30/88

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
					PL	CL	SANDY CLAY; brown, firm to stiff. Medium to high plasticity. Some thin sand layers.
		50/8"	R	115	10.6		
5		50/6"	R	124	9.6		
		36	S				
10							
			G				
		24	S				
15							
		20	S				
20							
		19	S				
25							
							Stopped at 25 feet.
							G = 50# Grab (12-20 feet)
30							

LOG OF BORING NO. 3

Project Water Disposal Pond Job No. 3128J024

Elevation 98.0 Datum Assumed Elev. 100.0 - S.E. Corner, N. Pond

Type/Size Boring 7" Auger Rig Type CME-55

Groundwater Conditions No groundwater was encountered on 03/30/88 Date 03/30/88

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
					PL	CL	SANDY CLAY; brown, firm to stiff. Medium to high plasticity.
5		41	R	106	12.5		
							Stopped at 6 feet.
10							
15							
20							
25							
30							

LOG OF BORING NO. 4

Project Water Disposal Pond Job No. 3128J024

Elevation 98.1 Datum Assumed Elev. 100.0 - S.E. Corner, N. Pond

Type/Size Boring 7" Auger Rig Type CME-55

Groundwater Conditions No groundwater was encountered on 03/30/88 Date 03/30/88

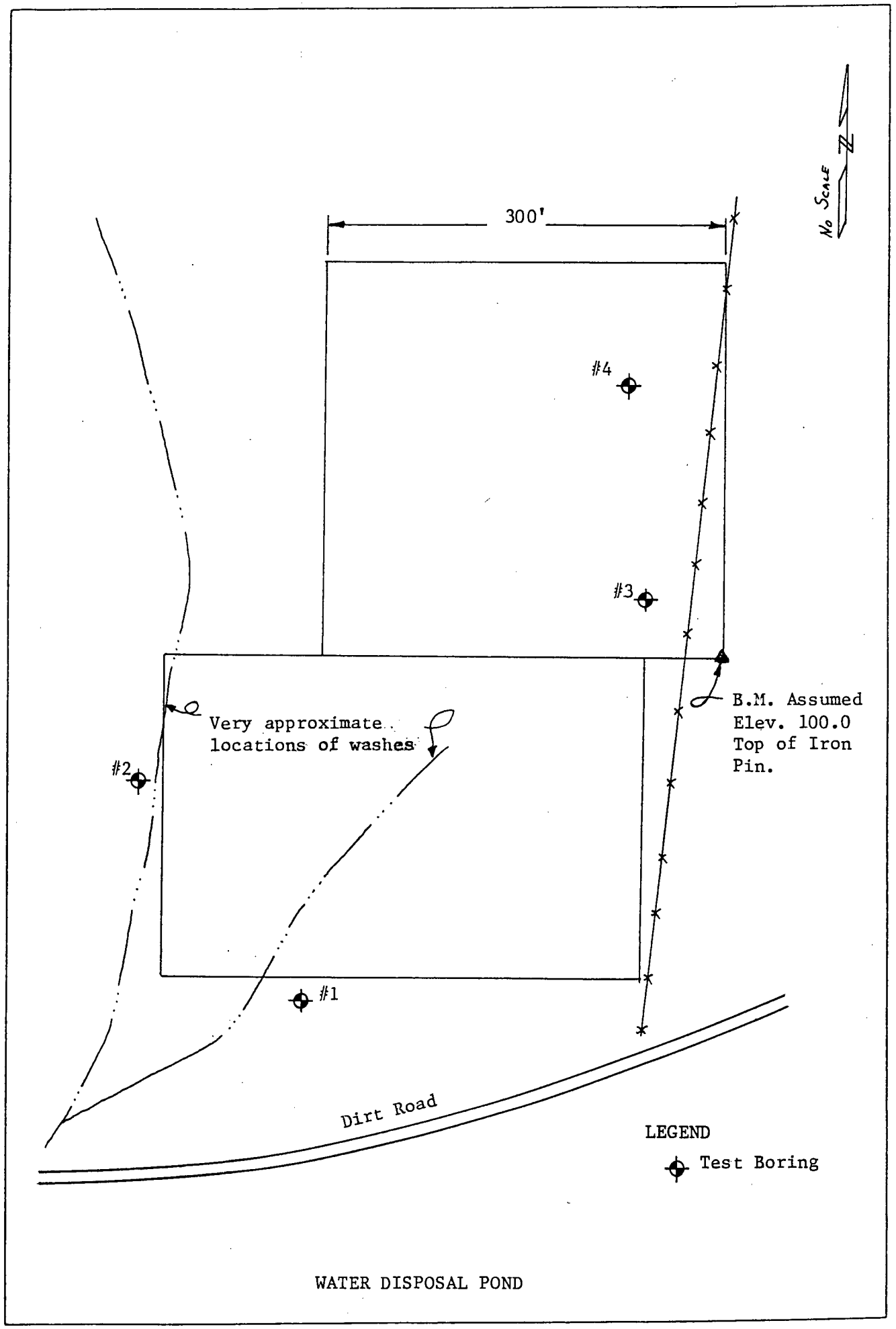
Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
5					PL	CL	SANDY CLAY; brown, firm to stiff. Medium to high plasticity.
		36	R	113	11.7		
10							Stopped at 6 feet.
15							
20							
25							
30							

Prepared By L. E. C. Date 04/21/88

Checked By _____ Date _____

Job No. 3128J024

Client Tony Schmitz



WATER DISPOSAL POND

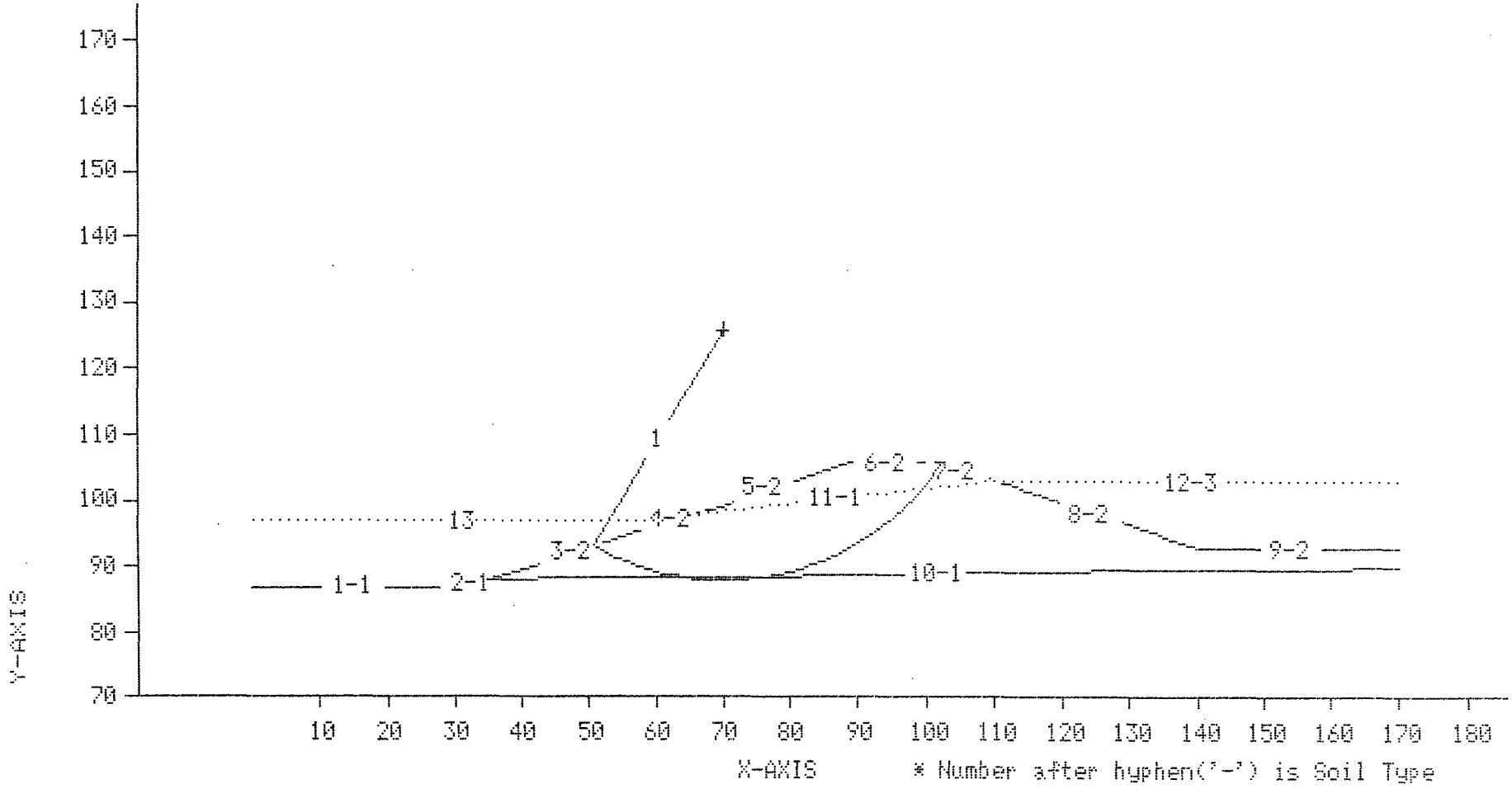
SB-SLOPE

Simplified Bishop Slope Stability Analysis

PROJECT: WATER DISPOSAL POND
LOCATION: LINDRITH, NEW MEXICO
FILE: LINDOU2
COMPLETE SLOPE CROSS SECTION

SOIL*	DENSITY	COHESION	PHI
1	105.0	600.0	16.0
2	108.0	300.0	12.0
3	62.4	0.0	0.0

CIRCLE	X	Y	RADIUS	FS
1	70.0	126.0	38.0	3.79



* Number after hyphen('-') is Soil Type

Western Technologies Inc. - Phoenix, AZ

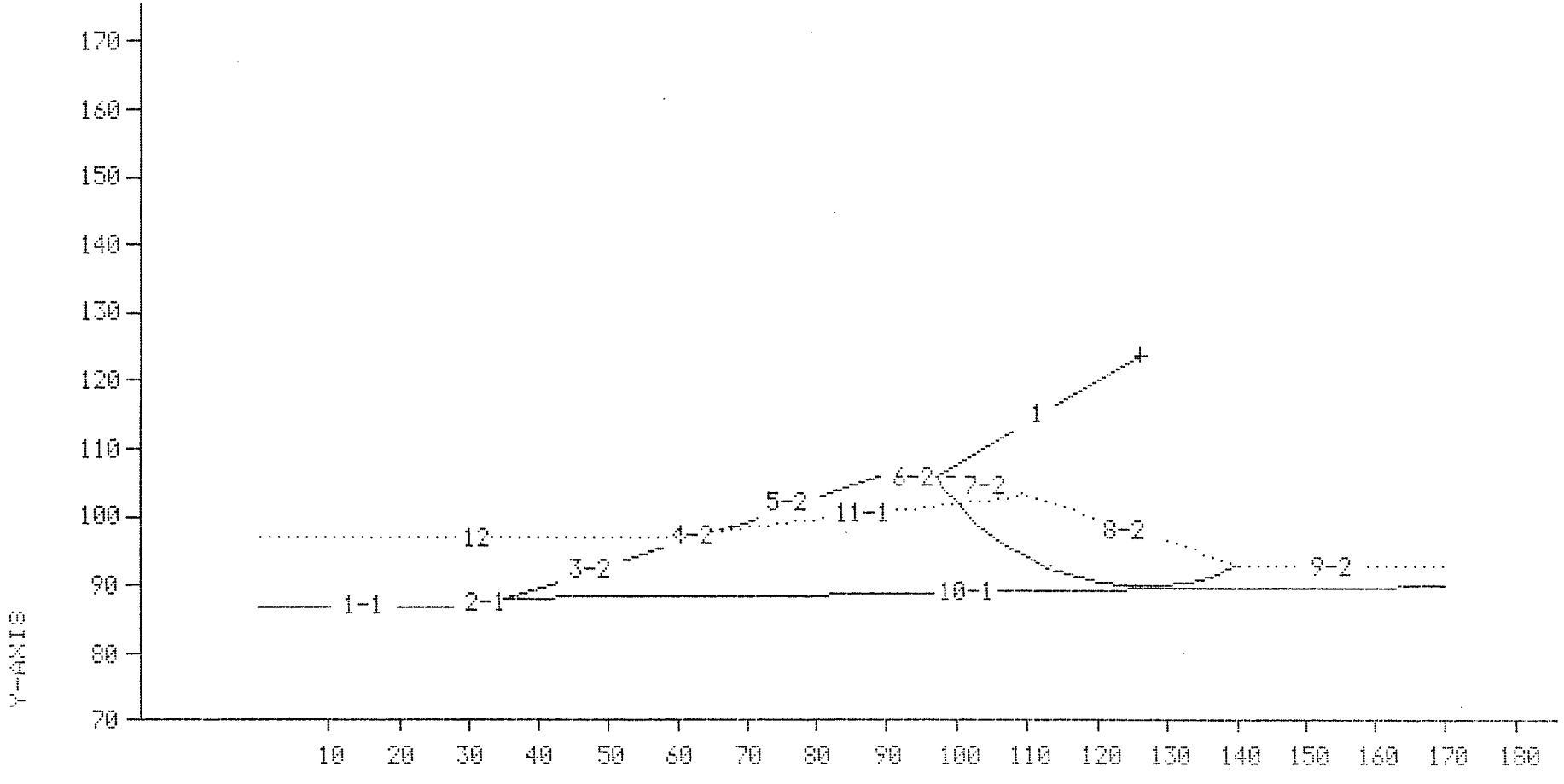
SB-SLOPE

Simplified Bishop Slope Stability Analysis

PROJECT: WATER DISPOSAL POND
LOCATION: LINDRITH, NEW MEXICO
FILE: LINDOU3
COMPLETE SLOPE CROSS SECTION

SOIL*	DENSITY	COHESION	PHI
1	105.0	600.0	16.0
2	108.0	300.0	12.0

CIRCLE	X	Y	RADIUS	FS
1	126.0	124.0	34.0	2.74



* Number after hyphen('-') is Soil Type

Western Technologies Inc. - Phoenix, AZ

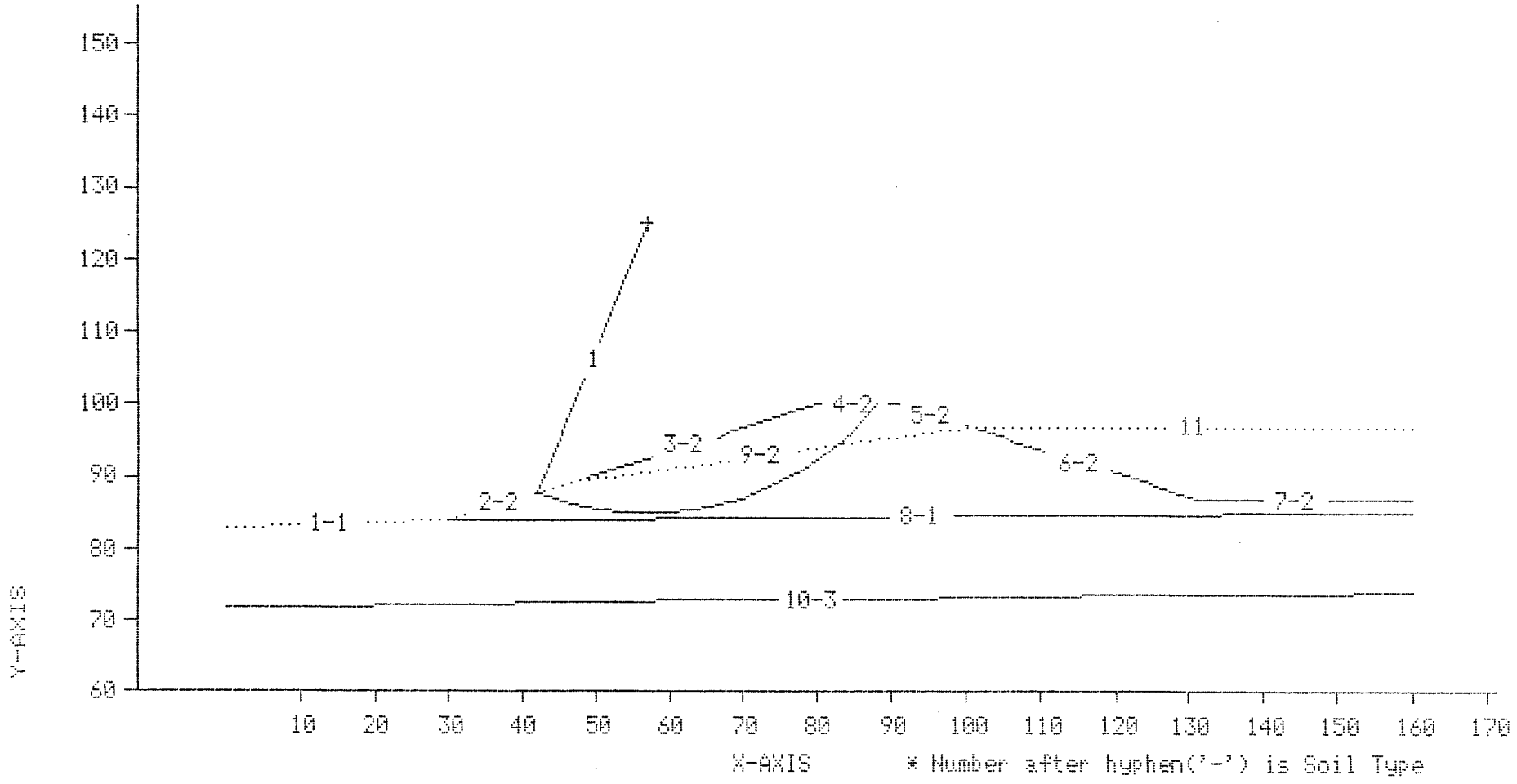
SB-SLOPE

Simplified Bishop Slope Stability Analysis

PROJECT: WATER DISPOSAL POND
LOCATION: LINDRITH,NEW MEXICO
FILE: LIN2
COMPLETE SLOPE CROSS SECTION

SOIL*	DENSITY	COHESION	PHI
1	115.0	600.0	16.0
2	108.0	300.0	12.0
3	140.0	0.0	30.0

CIRCLE	X	Y	RADIUS	FS
1	57.0	125.0	40.0	2.51



* Number after hyphen('-') is Soil Type

Western Technologies Inc. - Phoenix, AZ

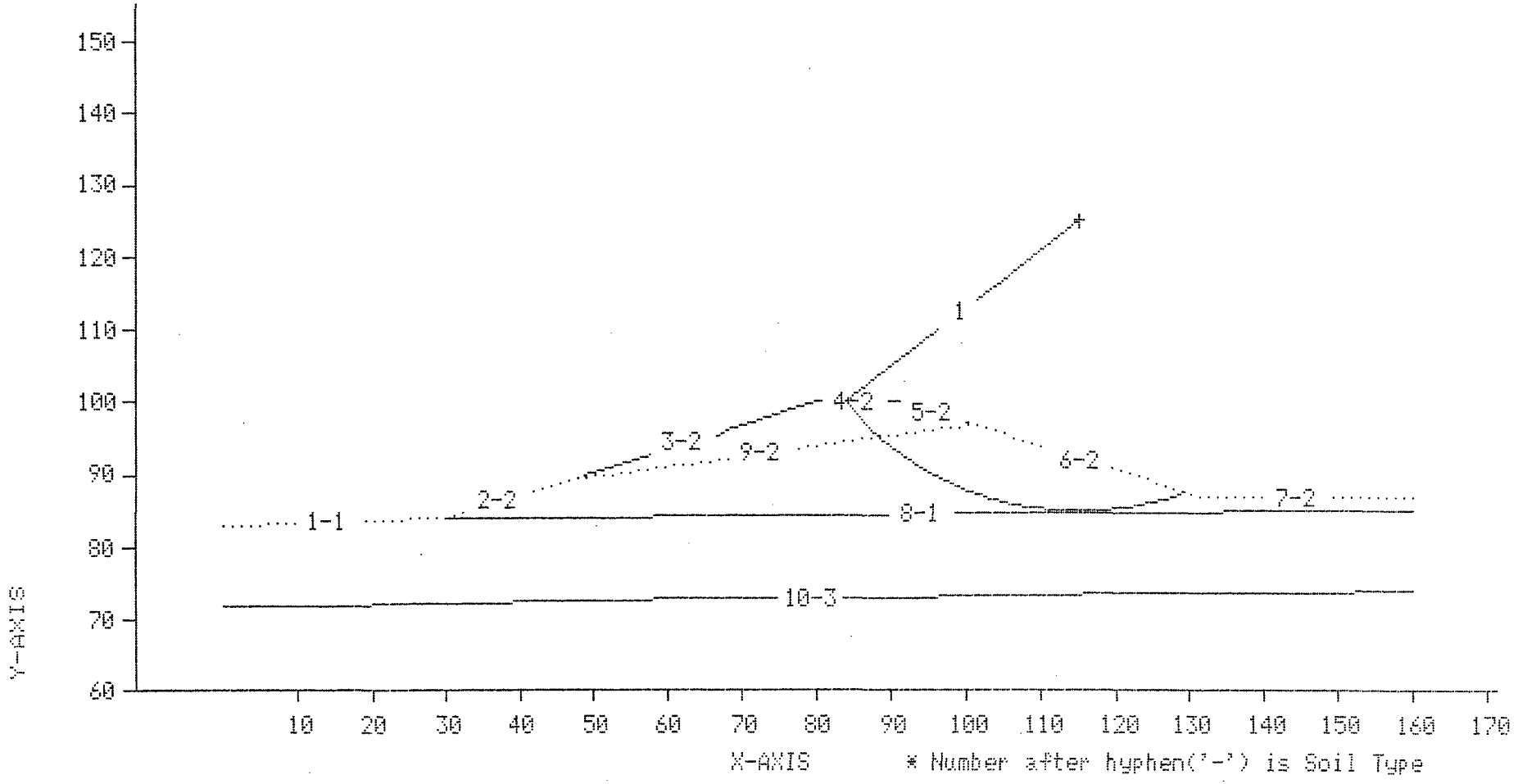
SB-SLOPE

Simplified Bishop Slope Stability Analysis

PROJECT: WATER DISPOSAL POND
LOCATION: LINDRITH, NEW MEXICO
FILE: LIN3
COMPLETE SLOPE CROSS SECTION

SOIL*	DENSITY	COHESION	PHI
1	115.0	600.0	16.0
2	108.0	300.0	12.0
3	140.0	0.0	30.0

CIRCLE	X	Y	RADIUS	FS
1	115.0	125.0	40.0	2.31



* Number after hyphen('-') is Soil Type

Western Technologies Inc. - Phoenix, AZ

APPLICATION FOR ENLARGEMENT OF A COMMERCIAL SURFACE DISPOSAL FACILITY

SE1/4, Sec.7, T.25N., R.3W.

Rio Arriba County, New Mexico

T-N-T Construction, Inc.

Star Route

Lindrith, NM 87029

TABLE OF CONTENTS

New Mexico Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87501

APPLICATION FOR ENLARGEMENT OF A COMMERCIAL SURFACE DISPOSAL FACILITY, SE/4, SEC. 7, T.25N. R.3W., RIO ARRIBA COUNTY, NEW MEXICO.

The following information and permit application are submitted for your review and approval. The information addresses the material required in the New Mexico Oil Conservation Division (OCD) "Guidelines for Permit Application, Design, and Construction of Waste Storage/Disposal Pits" (revised 2/88) and Rule 711 of the Division's Rules and Regulations promulgated June 2, 1988.

I. General Information.

A. Name and Owner of Legally Responsible Party:

T-N-T Construction, Inc. (a New Mexico Corporation)
Tony Leland Schmitz, President,
Star Route
Lindrith, New Mexico 87029
(505) 774-6663.

B. Name of Local Representative:

The name of the local representative or contact person for T-N-T Construction, Inc. is Tony Lee Schmitz at the above address and phone number.

C. Location:

The proposed evaporation pond is located in: NE/4, SE/4, Sec. 7, T.25N., R.3W. see Figure 1. The pit location is on surveyed lands on the Schmitz Ranch Quadrangle, Rio Arriba Co., New Mexico, a USGS 7.5 Minute Series (Topographic Sheet). The proposed pit will be directly west-northwest (about 200' W-NW) of the existing evaporation pit in the SW/4, Sec. 8, T.25N., R.3W., see also Figure 2.

Proposed Pit Size: 350' in a E-W direction and 400' in a N-S direction or 140,000 square feet of surface area, toe to toe.

D. Type of Operation:

The proposed evaporation pit will be used as an overflow for excess produced water from the existing approved evaporation pit in Section 8. Produced water will be siphoned (drained) from the pit in Section 8 into the proposed evaporation pit in Section 7. The siphoning/gravity feed procedure will be controlled through PVC pipe and valves installed in such a manner as to prevent any surface fluids (oil should it ever exist) from entering the Section 7 pit from the existing Section 8 pit. A schematic diagram of the proposed siphon/gravity feed system is

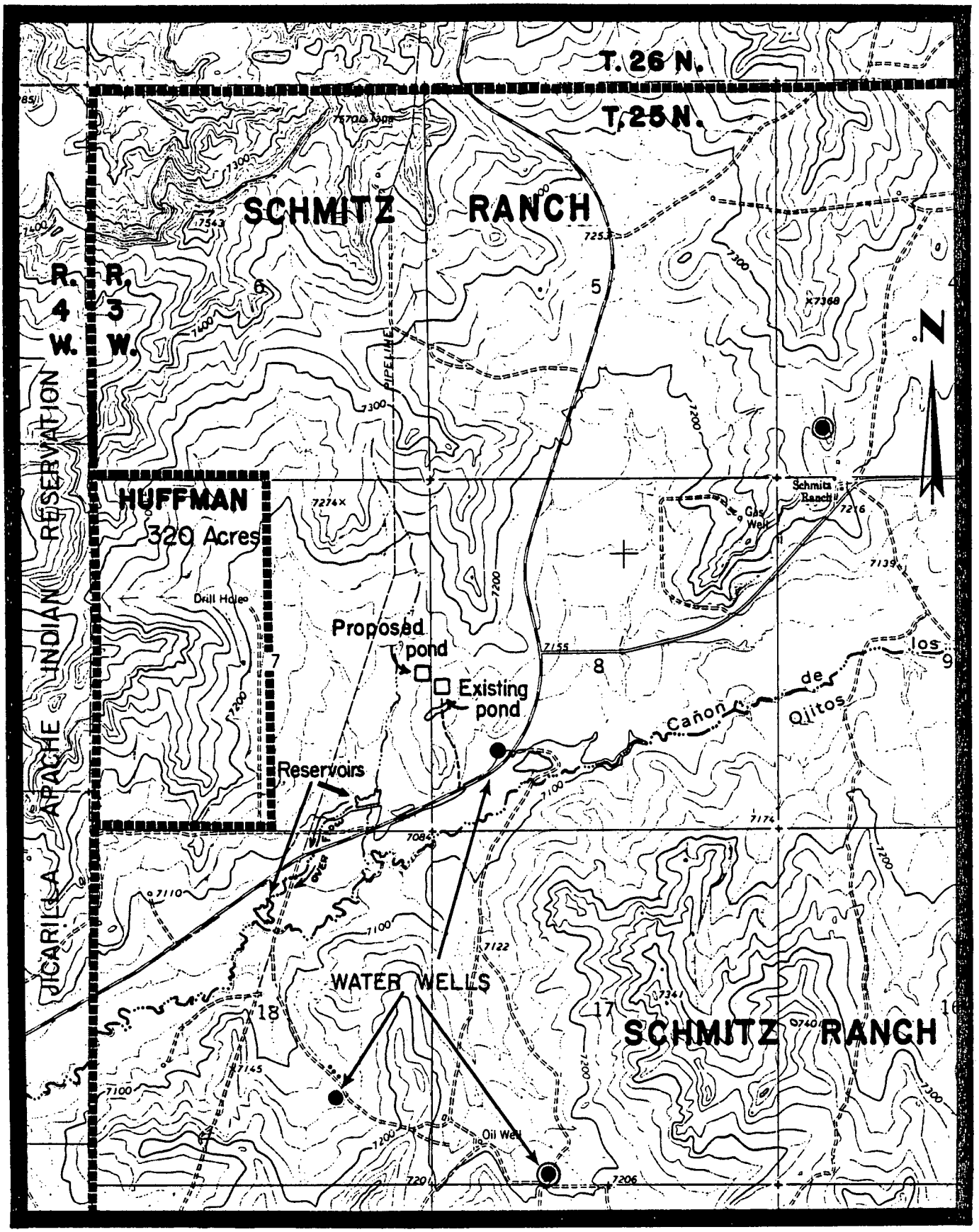


Figure 1. Index map showing proposed and existing ponds, water wells, major drainages, surface owners and topography.

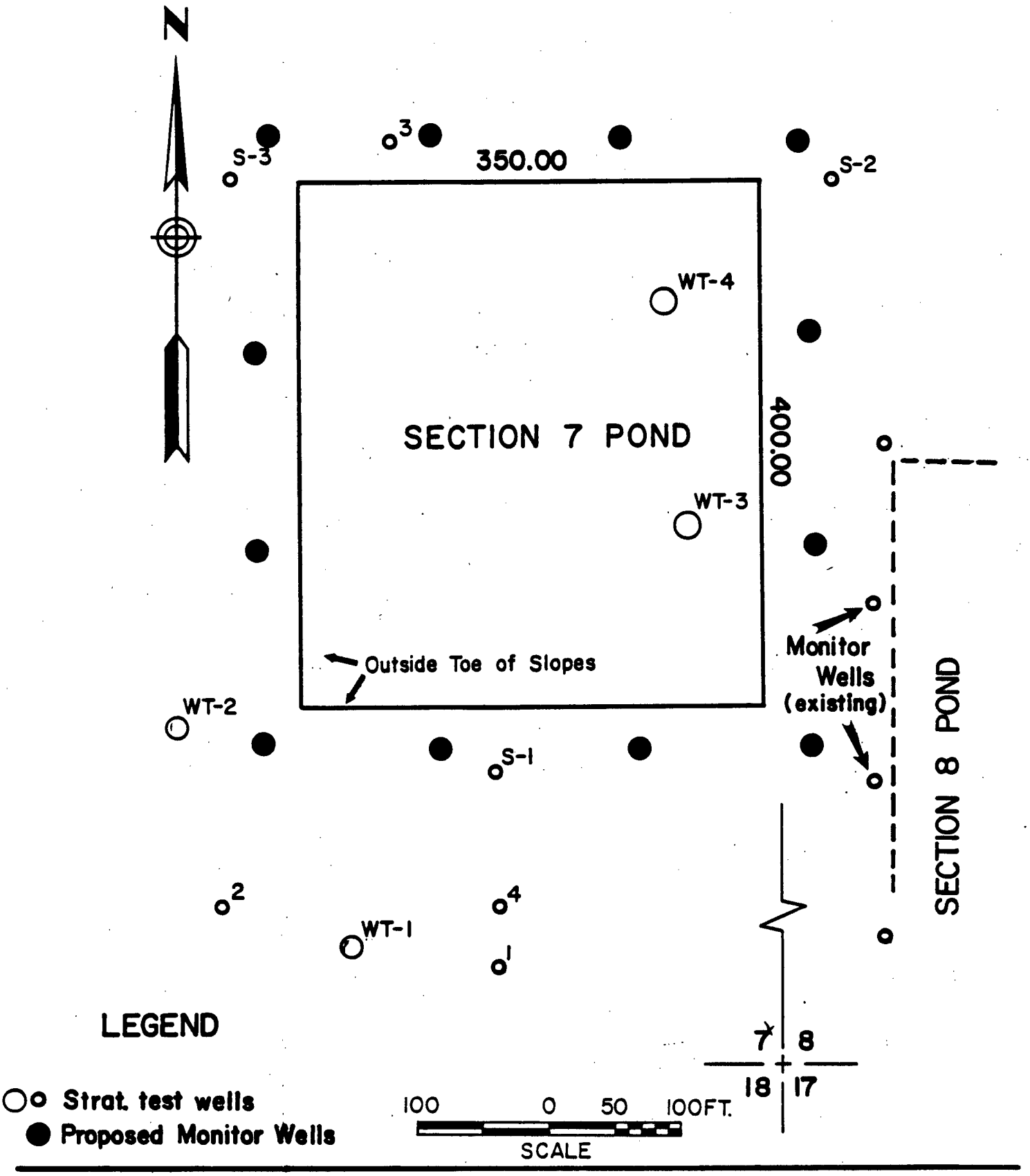


Figure 2. Pond and proposed monitor well locations.

illustrated later on in this application.

E. Landowners of Record within 1/2 mile of the Site: Only one landowner of record falls within 1/2 mile of the proposed site in Section 7, see Figure 1. A copy of proof of such notice, as addressed to John C. Huffman describing the proposed operation by T-N-T in Section 7, can be found in the Appendix of this application.

F. Copies:

Two copies of this application will be provided to the OCD office in Santa Fe and one copy to the District OCD office in Aztec. One additional copy will be provided the New Mexico State Engineer's office in Santa Fe for their review.

G. Affirmation:

Certification by an authorized representative of T-N-T Construction, Inc. that information submitted in this application is true, accurate and complete to the best of the applicant's knowledge; and such information is in compliance with OCD Rules and Regulations. An affirmation and signature is shown at the end of this document.

II. Proposed Operations

A. Storage/Disposal Facilities Description:

The proposed evaporative pit will be used as an overflow for disposed/produced water having already entered the main evaporative pond in Section 8, directly to the east-southeast. The waste/water from the Section 8 pit will be drained into the Section 7 pit via pipes utilizing a siphon mechanism, described later. The location of the site is shown in Figure 2 and on Plate I a, b & c (surface map and pond construction layouts in back pockets). No materials or effluents other than produced water will be discharged into the Section 7 pit. All disposed water will originate from the Section 8 evaporative pond.

B. Technical Construction Information:

The proposed clay lined evaporative pond (Section 7, T.25N., R.3W.) will consist of one pit (not two as originally planned) 400' X 350' with a surface area of about 2 acres, Plate I. The storage capacity of the proposed pit is estimated at 18-20 acre feet. The pit will be constructed partially in cut and fill. The dikes will be built of tightly compacted shale/clay which exhibit a permeability coefficient of 3.8×10^{8} centimeters/second or about .04 feet per year (Western Technologies, Inc. report dated 5-2-88). OCD 'Guidelines' call for the clays to have a maximum permeability of 1×10^{7} .

The widths of the dikes/levees will be approximately twelve (12) feet with at least a 3:1 (horizontal to vertical) slope on the inside and the outside slopes. The freeboard for the dikes will be three (3) feet and the maximum depth of the water is estimated at ten (10) feet.

Levees will rise at least three (3) feet above ground level and will be level, see Figures 2 and 3.

The proposed disposal pit is not located along any water course, lake bed, sink-hole, or other geological depression. The evaporation pits are designed and constructed to provided the minimum evaporation surface needed for the maximum yearly volume of anticipated liquid discharge into the pit. Since the volume of disposed water can be and will be controlled, the amount of discharge into the proposed pit will be governed by climatic-seasonal changes or the use of aerators-sprayers used during the year at the Section 8 pit.

The following procedure for a site preparation and earth work for the embankment and basin portions of the proposed clay lined pit as requested in the 'Guidelines' V.(A), V.(B), V.(D) V.(F) V.(G) and V.(H) are as follows:

1. Strip all loose surface soils, vegetation, roots and debris from the pond and embankment areas to a horizontal distance of five (5) feet beyond the perimeter of the new construction. Removal should extend one foot below the existing grade or one foot below the bottom of the embankment, whichever is deeper. The soil may be stock piled and used to revegetate areas where clay is stripped for use in the construction of the embankments.

2. Clean and widen depressions, washes, swales, etc., to form level working areas to accommodate compaction equipment and fill placement. Removal should extend 3 feet below the existing grade or until all loose soil is removed from the washes.

3. No material will be placed which is frozen or where the in-place material is frozen.

4. Proof-roll the exposed subgrade in the embankment and pond areas to densify materials which may have been loosened during the stripping and excavation process. Proof-rolling may be accomplished by a minimum of two (2) passes of a loaded scraper or equivalent. All soft areas or deep soil horizons will be removed and replaced with compacted fill.

5. Compacted clay liners shall be a minimum of two (2) feet thick uniformly throughout the bottom and sides of the pit, with an extra two (2) feet of clay liner at the toes of sidewall slopes and under aerators.

6. Place and compact all embankment fill in horizontal lifts to the finished grade levels. Lift thicknesses will be compatible with compaction equipment used to achieve the required uniform densities. Lift thicknesses will be in intervals of nine (9) inches or less. The maximum size of rock used for fill will be six inches.

7. All fill material should be compacted to at least 95% of the maximum dry density of the clays utilized (ASTM D-698). Fill which is below 10 feet will be compacted to 95-100% of its

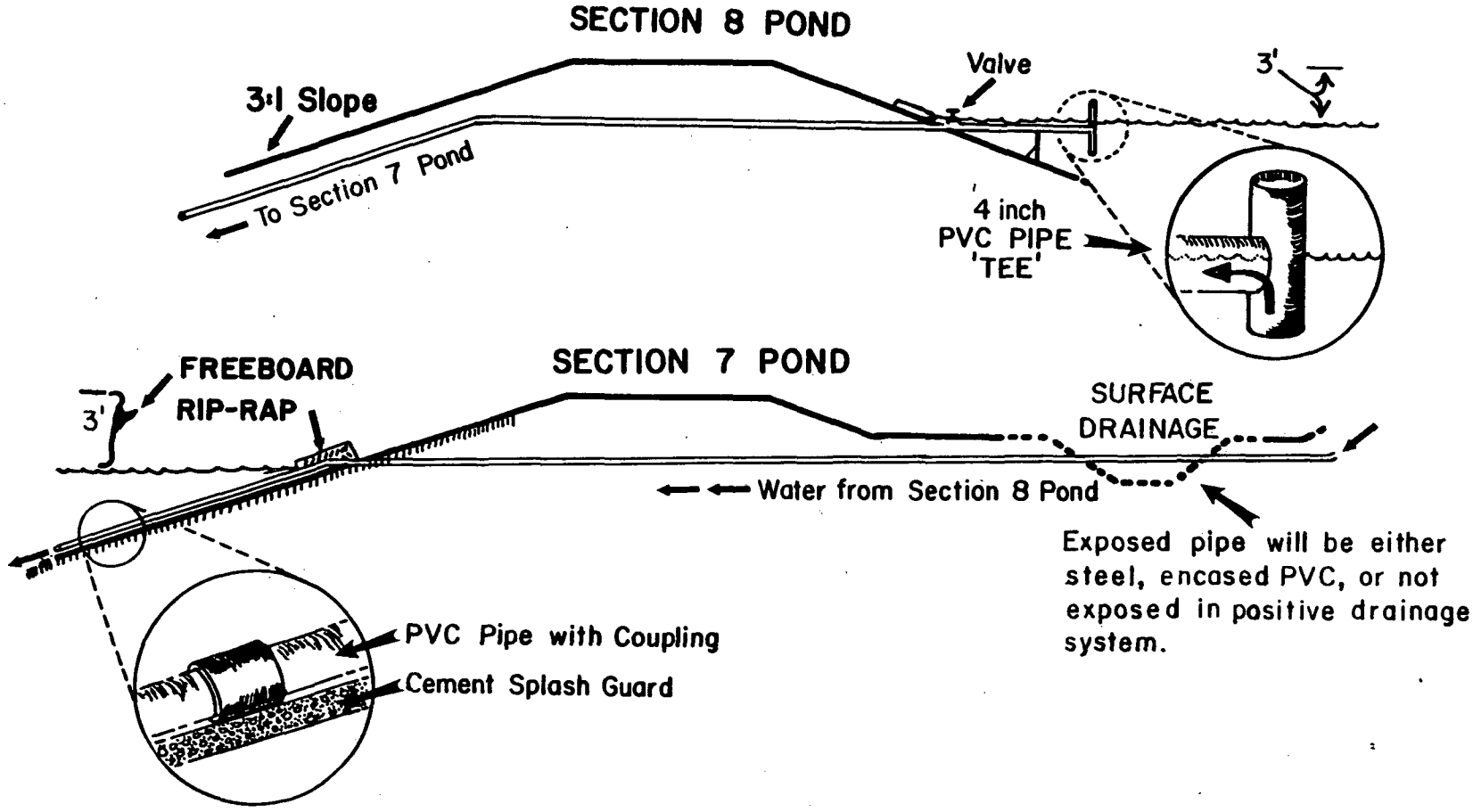


Figure 3. Cross section of ponds showing transfer of water from pit 8 to 7.

maximum dry density.

8. The material used in construction should not be allowed to dry between layers or stages of berm construction. When drying has occurred, the dry material will be reconditioned to proper water content with produced or brine water prior to placing subsequent material.

9. When the compacted surface of any layer is too smooth to bond properly with the succeeding, the layer should be scarified or roughened to provide a satisfactory bonding of surfaces before the next layer is placed.

10. At any point of discharge into the pond, no fluid force shall be directed onto the clay lining. To prevent erosion under aerators and on levees splash guards will be installed and will include appropriate rip-rap (secured tires) synthetic materials, discharge tubes with upward facing outlets or various weirs, see Figure 3.

11. A positive drainage system will be provided around base (toe) of the outside slope of the proposed embankment throughout the life of the proposed pond.

12. A fence will be constructed around the facility perimeter. Adequate space will be provided between the fence and levees for passage of maintenance vehicles. The fence will be constructed of woven and barbed wire. The fence will be constructed so as to prevent livestock from entering the facility area and to prevent any dumping of produced/waste materials that have not been processed through the existing facility in Section 8.

13. A registered professional engineer will submit as-built plans for the proposed pit as soon after construction as possible. Construction data supplied herein conforms to all the recommendations made to T-N-T in the Western Technologies' May 2, 1988 report. This report has already been provided to the OCD.

14. A 'sign' (12" x 24" with letters not smaller than 2") identifying T-N-T as operator of the disposal system, the location of the facility and emergency numbers already exists at the entrance to the facility in Section 8, where disposed water is presently being received.

15. Post construction maintenance of the pond's embankments will include regular inspections of the ponds integrity, holes produced by burrowing animals, storm damage, erosion resulting from water runoff or possible wind damage.

16. T-N-T Construction, Inc. is presently keeping and will make available for inspection records for each calendar month on the source, location, volume and type of waste (produced water), date of disposal, and hauling company that disposes of fluids at the Section 8 facility. Such records are being kept for two (2) years from date of disposal. The proposed Section 7 pond will not

directly receive disposed water from the operators. The proposed pond in Section 7 will be used for overflow from the Section 8 pond.

Should the water level of the Section 7 pit rise above the projected three (3) foot freeboard but remain below the 1 1/2 foot freeboard suggested by the OCD, see Figure 3, T-N-T will curtail the acceptance of additional disposed water at th Section 8 pit untill the water level in the Section 7 pit are lowered below the planned freeboard of three (3) feet.

17. The transfer of water from the Section 8 pit to the Section 7 pit will be accomplished through a gravity flow system in pipe as shown in Figure 3. Water will enter a 'Tee' constructed of 4" PVC pipe or steel pipe at a depth of 6-12 inches below the fluid surface of the Section 8 pond, see enlarged area on Figure 3. Water will enter the 'Tee' at maximum freeboard (three feet) of the Section 8 pit and flow by gravity to the Section 7 pit. Discharge into the Section 7 pit will be onto a concrete splash guard and the pipe will be adjusted to the existing water level of the pit, see enlarged area shown on Figure 3. The pipe line from the Section 8 pit to the Section 7 pit will buried one to two feet. However, should the pipe be exposed at the surface as shown in Figure 3, where it may cross the positive surface drainage ditch, steel pipe will be utilized or a protective cover will be put over the exposed PVC pipe.

C. Ancillary Equipment:

Aerators, sprayers or other types of evaporative equipment are not contemplated at this time. However, should such equipment be necessary to efficiently operate the facility or to keep in compliance with state regulations, T-N-T will notify the OCD and request their approval of any planned installation of said equipment. Sprayers and aerators would be installed in a manner similar to those presently being used on the Section 8 pond.

D. Spill/leak Prevention and Procedures:

1. Monitoring Wells:

Monitor wells will be located at prescribed intervals and depths around the containment pit and will be monitored monthly and fluids sampled, if present. Monitor well data, collected on a monthly basis, will be furnished to the OCD quarterly while the proposed containment pond is in use. Contained in this report will be water levels and conductivity of any fluids in the monitor wells and pits.

Monitor Well - Quarterly Report Schedule/Yearly

Report	Report Period	Date Due
1st. Quarterly Report	Jan., Feb. & March	April
2nd. Quarterly Report	April, May & June	July
3rd. Quarterly Report	July, August & Sept.	October
4th. Quarterly Report	Oct., Nov. & Dec.	January

If after review of the Quarterly Monitoring Reports, the OCD questions the origin of the fluids in the monitor wells, the following contingency plan will be put into operation by T-N-T:

(1) Cease acceptance of disposal fluids until the source of fluids in the monitor wells is determined;
(2) If the liquids are determined to be pit water, T-N-T will submit proposals and timetables for removing the source, determining the extent and degree of contamination, the impact, if any, on the hydrology of the immediate area and for mitigating contamination.

2. Monitor Well Location:

Twelve (12) monitor wells are proposed to be constructed in the same manner as T-N-T's present monitor wells surrounding the pond in Section 8. Placement of the new wells is shown on Figure 2. Each well will be proportionally spaced around the perimeter of the proposed pond near the base of the outside edge or toe of the proposed levee or about 50 feet perpendicular from the crest of the levee. Arroyos will be rerouted for flood protection and to prevent surface flow of water into the monitor wells.

3. Monitor Well Construction:

Proposed monitor wells, see Figure 4, for the Section 7 pond will be drilled to a depth of five feet below the bottom of the sandstone indicated on the log boring No. 1 drilled by Western Technologies. The log indicates that this depth would be about 28 feet. If no additional sands or sandstones are encountered through this interval, the wells will be plugged back to the bottom of the sandstone and completed with slotted liner (slotted four (4") PVC pipe) covering the entire sand lens and extending one foot above the top of the sandstone marker. If the above referenceD sandstone is not encountered in a monitor well, an equivalent total depth, based on strike and dip of the sand lens formation, will be drilled and the pipe slotted through an equivalent interval.

The following completion procedures for monitor wells will be followed unless an alternative procedure for construction is designated by the OCD. A diagram showing a cross section of a typical monitor well is shown in Figure 4. The depth of each monitor well and the locations of necessary slotting of the PVC liner is described in the paragraph above. Four (4) inch PVC pipe/casing

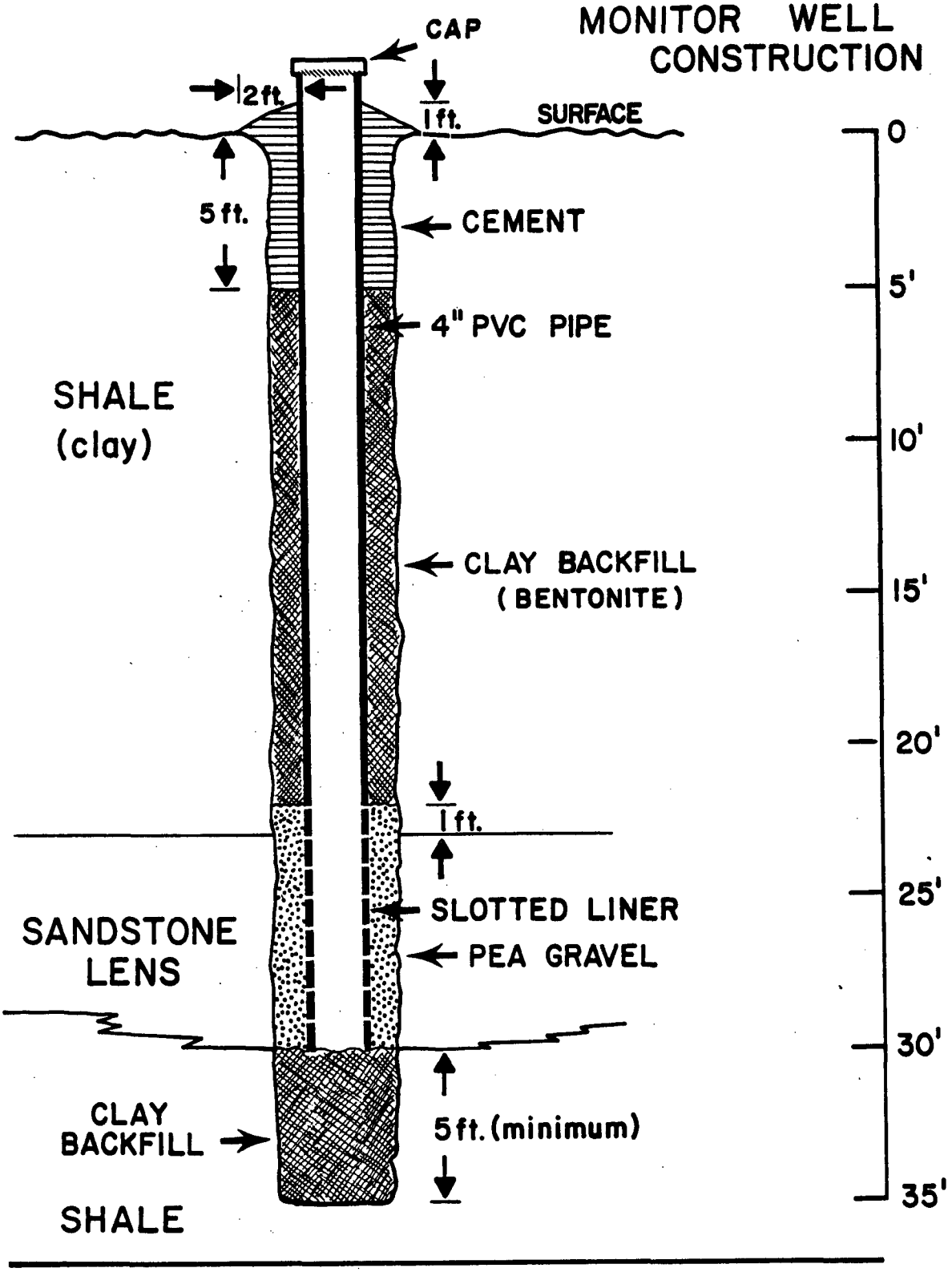


Figure 4. Monitor well construction, cross-section.

will be utilized in each monitor well. Each monitor well annulus will be backfilled with clean native clay or bentonite. Pea gravel will be placed in the well annulus adjacent to any slotted liner. The casing will be cemented five (5) feet from the surface to one foot above the surface, mounded to the casing and extended horizontally for a two foot radius. The wells will have caps and be suitably marked and protected from equipment, Figure 4.
A sample well log or drillers log of each monitor well will be recorded by a professional geologist and furnished to the OCD as soon as possible upon completion of the the drilling program.

4. H_2S Monitoring Program:

The schedule of proposed sampling locations and sample times for H_2S monitoring has been proposed by the OCD. H_2S readings will be made daily on each side of the proposed pond in Section 7 (see Figure 2.) and data reported to the OCD on a bimonthly basis, unless monthly reports would be satisfactory to the OCD.

H_2S Bimonthly Reports (24/year)

Report	Report Period	Date Due
1st. Half of Month	1st. - 15th	16th. - 31st.
2nd. Half of Month	16th. - 31st.	1st. - 15th. of following month

Sprayers and aerators would be installed (with OCD approval) should the H_2S levels in the air be found to be consistently high. Chemically treating of the pit would be an alternative solution.

Should air concentrations of H_2S reach 1 ppm at the top of the pond berm for two consecutive monitor readings, the OCD will be notified immediately.

(a) High H_2S Readings (Scenario):

If air concentrations of H_2S at the top of the pond berm reaches 10 ppm at any time, public safety personnel, such as the County Fire Marshall, County Sheriff's Department, New Mexico State Police, and the OCD will be notified. T-N-T Construction will cooperate with the OCD and appropriate public officials to correct any situation which may arise from the evaporative pond operation in order to protect the public health and safety. Requirements for pond treatment will include daily pH measurements, daily analyses of dissolved sulfides in the pond water, hourly H_2S monitoring, and such additional requirements determined after OCD review. Please realize that T-N-T will not permit the dumping of disposed water with dissolved H_2S contents that might endanger the public health and safety or result in endangering the operation of the facility.

Agencies to be Notified

Rio Arriba County Fire Marshall - (505) 588-7254
New Mexico State Police --------- (505) 289-3443
Rio Arriba County Sheriff ------- (505) 588-7271

5. Daily Levee and Siphon/Gravity Drain Inspection:

(a) Inspection:

Inspection of pond levees and the drainage system from the Section 8 pond will be conducted on a daily basis during the above H S and monitor well reporting procedure. Should any evidence of leakage be detected the pond will be shut in and repairs made. Any fluids which may have escaped will be returned to the pond and any significant soil contamination will be removed and returned to either pond 7 or 8.

(b) Worst Case Scenario (Major Levee Damage and Spill):

- OCD would be contacted immediately, as well as any other public officials as deamed necessary by the OCD or as shown earlier in this report.
- Immediate repairs of levee or gravity siphon systems.
- Should a major leak or loss of disposed fluid occur from pond 7, remaining fluids in pond 7 would be pumped back into pond 8 to a level where the leak or damage to the levee could be repaired. The positive drainage system around the toe of the levee should contain the fluids and route them to two holding (stock ponds) reservoirs located on the drainage directly to the west of the proposed pond on the Schmitz Ranch, see Figure 1. The two stock ponds are capable of holding the maximum amount of fluids that might exist in the Section 7 pond. Again the pond would be repaired. Fluids and contaminated soil would be returned to the Section 7 pit.
- An investigation by T-N-T and the OCD into the cause of the spill would be made along with recomendations on design changes prior to reuse of the evaporative facility. The operation would be subject to permit modification and OCD approvals.

F. Closure Plan:

T-N-T Construction will notify the OCD of cessation of operations. Upon cessation of disposal operations for six (6) consecutive months, T-N-T will complete cleanup of constructed facilities and restoration of the facility site within the following six (6) months unless an extention of time is granted by the OCD. The closure plan will be in accordance with an approved closure plan by the OCD. Prior to the reclamation of the surface, the ponds will be allowed to fully dry. The closure plan will include removal or demolition of buildings, removal of all tanks, vessels, equipment or hardware, containment and removal of fluids and chemicals, backfilling and grading of pits, removal or burial of contaminated soils, aquifer restoration (if necessary) and reclamation of the general facility site. The surface

of the facility will be returned as close as possible to its original contour. Existing levees and necessary top soil will be utilized in the restoration of the pond site and the surface area will be seeded with appropriate native grasses. Prior to the release of the bond covering the facility, a representative of the OCD will inspect the site to determine if restoration is adequate.

III. SITE CHARACTERISTICS:

A. Hydrologic Features.

1. The proposed evaporation pit is located in the SE/4, Section 7, T.25N., R.3W. in Rio Arriba County as shown on Figure 1. The only significant stream in the area is Canon de los Ojitos one-quarter mile to the southeast and it is considered an intermittent stream. A hill directly separates the planned facility from this arroyo to the east. All water wells within one mile of the proposed site are shown on Figure 1. and are owned and operated by either T-N-T or the Schmitz Ranch.

   Water wells within one (1) mile of the proposed evaporation pond are shown on Figure 1 as solid dots 1/8th inch in diameter. These wells are the property of the Schmitz Ranch and are for domestic or stock use. The wells tap ground water aquifers at depths from 300-900+ feet. Ground water was not encountered at or near the surface to depths of 300 feet in any of these water wells during their drilling or completion. This suggests that the top of the water table in this immediate area is quite deep.

2. Ground water was not encountered in any of the stratigraphic test wells or monitor wells drilled in Section 7 or 8.

3. Cuttings from stratigraphic tests and monitor wells suggest that the near surface sandstone occurrences are dry (above the water table) and presently being oxidized (limonite staining). Sandstone outcrops in the immediate area are generally dipping to the north (north 0-20 degrees east) at about one (1) degree. Strike directions are east 0-20 degrees south. If water were introduced into the sand lens encountered at the interval of 15-35 feet below the surface of the ground, the water would move by gravity to the lowest part of the channel and then down dip to the north-northeast.

   Outcrops in the area which may correlate with the tan sand encountered at about 25 feet in some of the test wells suggests that any water introduced into this sand would be confined, as the unit most likely has little or no lateral continuity with other sand at the same elevation. Sand outcrops pertaining to the horizon just below the surface in the proposed pit site are possibly 200-300 feet wide and 0-17 feet in thickness. Their length is more difficult to determine do to their N-S orientation, but could be 300-800 feet long.

   Figure 5. is an Isopach map of the tan sandstone lens occurring at a depth of 15-35 feet (depending on collar elevation of

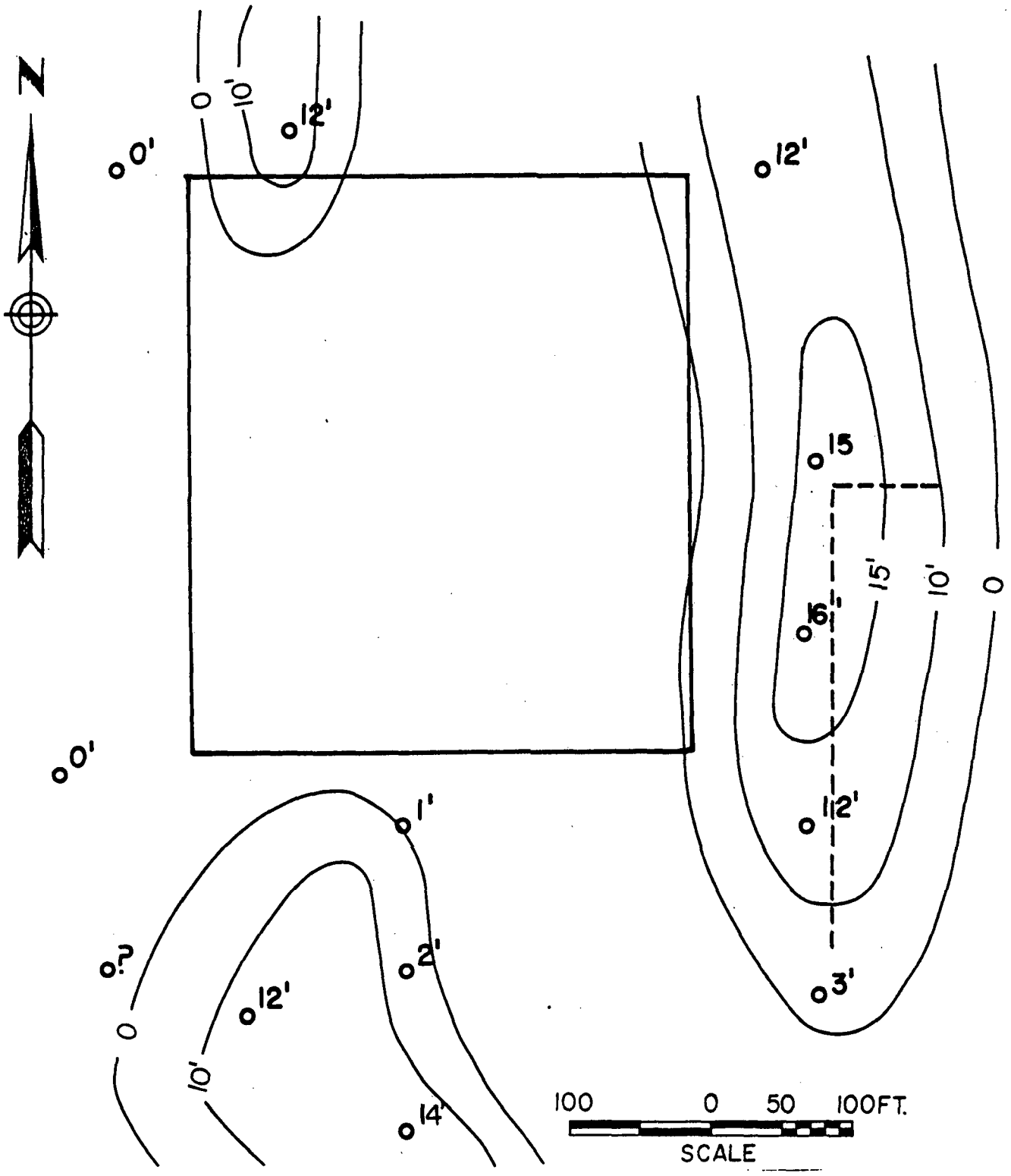


Figure 5. Isopach Map of sand lens at 15'-45' in depth, all contours approximate.

the test hole). Contours can be only be approximated do to the limited available data. However, there is sufficient data to support the above noted widths and lengths of these buried channel sands.

Cross sections of the proposed pit and the underlying lithologies are shown on Plate II. Driller's logs of the stratigraphic test wells drilled in the area of the proposed Section 7 pond are shown in the Appendix. Copies of several of the monitor wells located along the west and north side of the Section 8 pond are also included in this application.

Fine-grained tan sand at the top and coarse-grained and heavily oxidized (dark yellow-brown) arkosic sand at the base of these sandstone lenses suggest a typical channel sand of continental origin. The likelihood that the sandstone encountered at 20-30 feet in the test wells in Section 7 or 8 would act as a conduit/waterway to a water bearing sand/aquifer at a greater depth (300 feet or more) or down dip is considered unlikely.

B. Geologic Description of Pond Site:

1. San Jose Formation:

The San Jose Formation (Eocene Age) is the youngest Tertiary rock unit found within the San Juan Basin and occurs at the surface throughout a great portion of the central part of the basin and in the study area, see Figures 6. This sequence consists of interbedded shales, sandstones and mudstones of continental origin with a maximum thickness of 2700 feet in the basin center. The shale/mudstone portion of the San Jose commonly are silty, sandy, or contain beds and lenses of claystone, siltstone and poorly consolidated sandstone. The abundance of swelling clays/bentonite is attested to by the familiar popcorn weathering habit of these clay/mudstones within the study area. The San Jose was deposited in a fluvial environment consisting of continental sedimentation, derived primarily from the north in southern Colorado.

The primary aquifers in the area are basal sandstones of the San Jose Formation. The most shallow aquifers were encountered at depths in excess of three hundred (300) feet in water wells drilled in the area. These water bearing horizons may correlate with the Cuba Mesa Member of the San Jose Formation as described by Brimhall in 1973 publication of the Four Corners Geological Society.

A description of the composition of the shales/mudstones of the study area are contained in the Western Technologies, Inc. report (May 2, 1988) submitted to the OCD earlier. The pits will be located in unconsolidated-consolidated clay/mudstone composed of illite, montmorillonite and bentonite. The varigated color of the claystone encountered in the stratigraphic tests in the area suggests that mixed layered clays exist. No alluvium or sandstone outcrops were observed at the proposed pit site.

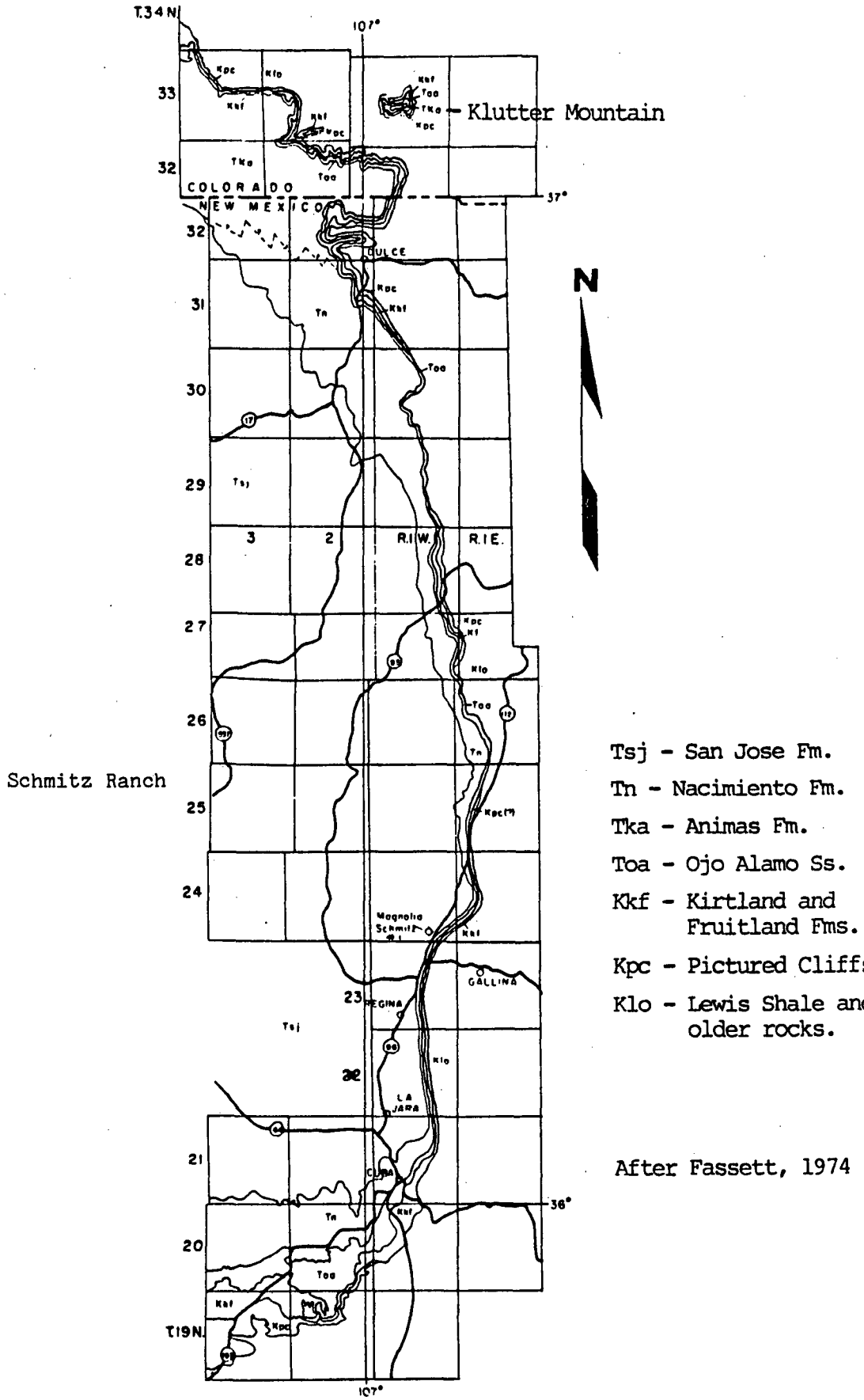


Figure 6. Geologic map of the eastern side of the San Juan Basin showing the surface location of the San Jose Formation.

Detailed geologic cross sections of the stratigraphy will be supplied the OCD upon completion of the proposed monitor wells shown on Figure 2. Lithologic descriptions (drillers logs) of the cuttings of these proposed monitor wells will also be included in this report.

If the foregoing information contained within this application is acceptable to the New Mexico Oil Conservation Division (OCD) and the New Mexico State Engineers's Office, please notify T-N-T Construction, Inc. Should their be additional information needed to commence construction please notify me at your convenience. It is the intention of T-N-T construction to have the proposed facility completed by fall, if at all possible.

Please note that portions of this report, in particular information pertaining to the geology of the proposed facility were provide by James W. Gurney, a consulting geologist in Farmington, NM.

"I, Tony L. Schmitz, certify that I am familiar with the information contained in and submitted with this application and that such information is true, accurate, and complete to the best of my knowledge."

Tony L. Schmitz — (Authorized Signature)

2/11/1990 — (Date)

TONY L SCHMITZ — (Printed Name of Person Signing)

PRESIDENT — (Title)

JWG/jwg
Copies: Aztec OCD District Office
New Mexico State Engineer's Office

APPENDIX

DRILLERS LOG

Datum: Assumed elevation of NE corner of proposed pit is 60.3 feet.

WELL NO. S-1
ELEVATION: 47.00 FEET
DATE COMPLETED: 7-5-88
LOCATION: ABOUT 175 FEET WEST AND 50 FEET SOUTH OF SE CORNER OF PROPOSED PIT.
No water encountered in formations (AIR DRILLED).

Depth in Feet	Description
0-20	Claystone/Shale; verigated rd-rdbn, weathered top 2 feet.
20-21	Claystone/Shale; verigated rd-rdbn, 5% silt.
21-30	Shale; verigated rdbn-rdgy. Several thin interbeds (2-3 inches thick) of tan-rdbn siltstone.
30-32	Shale/Siltstone; about 50% tan-rdbn siltstone.
32-35	Shale/Siltstone; SAA with 1-5% very fine sand.
35-41	Shale/Siltstone; tan-rdbn with 5-20% very fine-grained interbedded sand, yelbn-rdbn and tan, angular, fair sorting.
41-44	Siltstone/Shale; 10-20% interbedded tan sandstone.

DRILLERS LOG

Datum: Assumed elevation of NE corner of proposed pit is 60.3 feet.

WELL NO. S-2
ELEVATION: 61 FEET
DATE OF COMPLETION: 7-5-88
LOCATION: 50 FEET EAST OF NE CORNER OF PROPOSED PIT.
No water encountered in formations (AIR DRILLED)

Depth in Feet	Description
0-15	Claystone/Shale; verigated med rdbn-bn.
15-21	Claystone/Shale; several thin (1-4inch) interbeds of siltstone and sandstone, light to med. rdbn sand some of the sand med-grained.
21-24	Shale; med. rebn, silty
24-26	Shale; lt.-med.rdbn, 5-10% siltstone.
26-28	Siltstone; med. rdbn, sandy, sand in tan, fine grained, angular-subangular.
28-38	Sandstone; lt. tan, yelbn, very fine to med. grained, angualar-subangular, poor sorting.
38-50	Shale; verigated yelbn-gy and gybn, some silt at 44-45 feet,

DRILLERS LOG

Datum: Assumed elevation of NE corner of proposed pit is 60.3 feet.

WELL NO. S-3
ELEVATION: 54.5 FEET
DATE COMPLETED: 7-5-88
LOCATION: 25 FEET WEST OF NW CORNER OF PROPOSED PIT.
No water encountered in well (AIR DRILLED).

Depth in Feet	Description
0-18	Claystone/Shale; verigated light-med. rdbn, silty at 7-8 feet.
18-24	Shale; verigated light-med. rdbn.
24-29	Shale, verigated light-med. rdbn, several hard (1"-3") siltstone stringers at 24-25 feet.
29-33	Shale/Siltstone; rdbn to tan, 29-30 feet 5% sand, angular, fine-grained.
33-40	Shale; med. rdbn, silty at 38 feet.
40-41	Siltstone; tan-med. rdbn.

DRILLERS LOG

Datum: Assumed elevation of NE corner of proposed pit is 60.3 feet.

WELL NO. 1
ELEVATION: 49 FEET
DATE COMPLETED: UNKNOWN (1988)
LOCATION: 160 FEET SOUTH OF WELL NO. S-1.
No water encountered in the formations (AIR DRILLED).

Depth in Feet	Description
0-6	Claystone/Shale; red brown.
6-22	Sandstone; shaley and silty.

WELL NO. 2
ELEVATION: ABOUT 43 FEET
DATE OF COMPLETION: UNKNOWN (1988)
LOCATION: 100 FEET SOUTH AND 200 FEET WEST OF WELL NO. S-1
No water encountered in well (AIR DRILLED)

Depth in Feet	Description
0-22	Claystone/Shale; verigated red-red brown.

WELL NO. 3
ELEVATION: 56 FEET
DATE OF COMPLETION; UNKNOWN (1988)
LOCATION: 30 FEET NORTH AND 100 FEET EAST OF THE NW CORNER OF THE PROPOSED PIT.
No water encountered in the well (AIR DRILLED).

Depth in Feet	Description
0-13	Claystone/Shale; rdbn, silty.
13-17	Shale; blue.
17-20	Shale; rdbn, sandy.
20-22	Sand; tan.
22-32	Sand; tan.
32-37	Shale; verigated rdbn, blgy,
37-42	Shale, rdbn.

DRILLERS LOG

Datum: Assumed elevation of NE corner of proposed pit is 60.3 feet.

WELL NO. 4
ELEVATION: 45 FEET
DATE OF COMPLETION: UNKNOWN (1988)
LOCATION: 60 FEET NORTH OF (1) OR 100 FEET SOUTH OF WELL NO. S-1.
No water encountered in the well (AIR DRILLED).

Depth in Feet	Description
0-8	Claystone/Shale; rdbn.
8-18	Claystone/Shale; rdbn, silty some sand.
18-22	Shale; verigated gy-rd.
22-36	Shale; verigated gy-rd.
36-43	Shale; verigated rd-gy.

WELL NO. WT-1
ELEVATION: 44 FEET
DATE OF COMPLETION: 3/30/88
LOCATION: 150 FEET SOUTH AND 145 FEET WEST OF WELL S-1.
No water encountered in the well (AIR DRILLED).

Depth in Feet	Description
0-12	Claystone; rdbn, sandy.
12-23	Sandstone; tan, fine to coarse grained sand. light to moderate cementation.
23-25	Claystone/Shale; brown to red, stiff (consolidated).

WELL NO. WT-2
ELEVATION: 46 FEET
DATE OF COMPLETION: 3/30/88
LOCATION: 250 FEET WEST AND 25 FEET NORTH OF WELL NO. S-1.
No water encountered in the well (AIR DRILLED).

Depth in Feet	Description
0-25	Claystone; verigated rdbn, some thin sandy layers.

DRILLERS LOG

Datum: Assumed elevation of NE corner of proposed pit is 60.3 feet.

WELL NO. WT-3
ELEVATION: 59 FEET
DATE OF COMPLETION: 3/30/88
LOCATION: 200 FEET NORTH AND 160 FEET EAST OF WELL NO. S-1.
No water encountered in the well (AIR DRILLED).

Depth in Feet	Description
0-6	Claystone/Shale; brown-rdbn, sandy.

WELL NO. WT-4
ELEVATION: 59 FEET
DATE OF COMPLETION: 3/30/88
LOCATION: 125 FEET SOUTH AND 150 FEET WEST OF WELL NO. S-2.
No water encountered in the well (AIR DRILLED).

Depth in Feet	Description
0-6	Claystone; brown, sandy.

July 22, 1988

Certified Mail
Return Receipt Requested

John C. Huffman
Box 406
Farmington, NM 87499

Dear Mr. Huffman:

Rule 711, paragraph A.2. of The New Mexico Oil Conservation Division's Rules and Regulations, dated June 2, 1988, requires notification of all landowners of record within one-half mile of any proposed water disposal/evaporation site or the expansion/addition of an existing disposal/evaporation site.

Please be advised that T-N-T Construction, Inc. proposes to enlarge its existing water disposal site by constructing an additional evaporation pit directly west-northwest of its existing facility in the NW/4 NW/4, Section 8, Township 25 North, Range 3 West, Rio Arriba County, New Mexico. Operation of this facility and the proposed evaporation pit will be by T-N-T Construction, Inc. The proposed pit will be located in the NE/4 NE/4 SE/4, Section 7, Township 25 North, Range 3 West or about .4 miles due east of the east side of your acreage in the W/2 of Section 7, Township 25 North, Range 3 West.

The proposed site will be constructed in accordance with all applicable State of New Mexico Oil Conservation Division Rules-Regulations and in accordance with New Mexico State Engineer's Office Guidelines. Both State agencies will review and approve all plans and specifications of the proposed evaporation site prior to construction to insure protection of the environment.

If you have any questions regarding the operation or proposed construction please contact me, Tony Schmitz, T-N-T Construction, Inc., Star Route, Lindrith, New Mexico 87029 or call (505) 774-6663 at your convenience.

Sincerely,

Tony Schmitz
T-N-T Construction, Inc.
Star Route
Lindrith, NM 87029

ORIGINAL SIGNED AND ON File with OCD - Santa Fe, NM. (ORIG. APPLICATION)

File

David G. Boyer
Environmental Bureau Chief
New Mexico Oil Conservation Division
P.O. Box 2088
Santa Fe, NM 87501

February 6, 1990

Re: **AS BUILT** completion report for enlargement of a commercial surface disposal facility, SE/4, Sec. 7, T.25N., R.3W., Rio Arriba County, New Mexico.

Dear Mr. Boyer:

The attached information and **AS BUILT** completion report are submitted for OCD review and approval. The facility was constructed in compliance with the attached information, as required in the New Mexico Oil and Gas Conservation Division (OCD) "Guidelines for Permit Application, Design and Construction of Waste Storage/Disposal Pits" (revised 2/88 and rule 711 of the Divisions Rules and Regulations promulgated June 2, 1988). The attached is also amended to include any additions as requested or submitted between the OCD and T-N-T Construction, Inc. since submission of the above application.

Construction of the waste disposal pond, installation of sprayers/aeration systems, and drilling of the required monitor wells were completed in late summer, 1989 and are submitted for approval in the attached **AS BUILT** report. The attached report consists of the following materials:

1. Table of Contents.
2. **AS BUILT** Report (sprayer system, aeration system, monitor well data, survey drawings/monitor well cross sections, and T-N-T affirmation).
3. Certification of Engineering.
4. Western Technologies, Inc. Geotechnical Services Report.
5. Original 'Application for Enlargement of a Disposal Facility Report'.

The recently completed disposal pond will be used as the primary pond for the disposal of waste water upon approval by the OCD and State Engineer's Office.

Please note that portions of this report, in particular information pertaining to the geology and monitor well descriptions and completions, were provided by James W. Gurney, consulting geologist in Farmington, NM.

Should the OCD have further questions regarding the attached information please contact T-N-T Construction, Inc.

Sincerely,

Tony L. Schmitz
T-N-T Construction, Inc.
Star Route
Lindrith, NM 87029 (505) 774-6663

RECEIVED
FEB 19 1990
OIL CONSERVATION DIV.
SANTA FE

Attachments:
Copies: OCD District Office, Aztec
New Mexico State Engineer's Office

T-N-T Evap. Pit Tony Schantz

#6

5-15-88 - East hole 8-0" water .05 Didn't bail #6

#2 - 10' water - Bailed To 2' - .13

#3 - 18" 6" lower Than - 4-3-88 when I Fixed broken P.Pc & Bailed out ton off water - Bailed To 1'

All other Holes dry

6-22-88

#6 hole 8' water .05 bailed To 2'

#3 " 12" water .14

#2 - 12' water bailed To 2' - .17

6-24-88

#2 - 6' Bailed To 2' .27

6-25 88

#2 - 8' - Bailed To 2' - gained - 4' .29

6-26-88

#2 5' - Bailed To 2' - gained - 3' - .33

6-27-88

#2 - Gained - 3' - .31

6-28

#2 - Gained - 3' - .28

6-29

Didn't Bail - Rodger Anderson & Jamie Bailey - check

7-2

#2 - 12' made 10' - 4 days - Bailed-To-2' .40

7-3

#2 - gained - 3' .22

7-4

#2 - gained - 3' - .30

7-5 – 3'– .32

7-7 – " 5½' – .33

7-9 – " 5½' – .30

[illegible] – .34

7-15 " 8'– 4 days .43

7-18 " 7' 3" – .43

7-21 " 7'– 3" – .44

7-23 " 2'-6" 1 day .43

7-24 " 3-0 1 " .43

7-25 " 3-0 1 " .42

7-26 " 3-0 – 1 " .43

7-27 " 2-8 – 1 " – .43 Bailed To 2'-6"

7-27 – Hole #6 – 8'-0" water – Bailed To 36" .15

7-29 " 5'-6" 2 days – .43

7-31 " 5-6 " " – .43

8-1 " 3-0 1 day – .43

8-3 5-6 – 2 " .43

8-4 " 3-0 1 " .43

8-6 " 5-6 2 " .43

8-9 6-3 3 " .44

8-10 3-0 1 " .44

8-11 3-0 1 .43

8-13 6-0 2 " .44

8-20 13-0 7 " .44

8-22 6-0 2 " .44 – Checked all wells

#9 – 3'-2" (.03) – Bailed To 12" – Surface water

#11 – 6" mud .03 –

#1 – 6" water – .10