GW - 25

GENERAL CORRESPONDENCE

YEAR(S):

1988 - 1980

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

July 22, 1988

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. R. A. Peterson, Plant Manager
WARREN PETROLEUM COMPANY
P. O. Box 67
Monument, New Mexico 88265

RE: Evaporation Pond Liner Replacement
Discharge Plan GW-25
Monument Gas Plant

Dear Mr. Peterson:

The Oil Conservation Division (OCD) has received your request, dated July 14, 1988, for approval for the replacement of the evaporation pond liner at the above referenced facility. Based on the drawings submitted and the information contained in the scope of work, the design is sufficient to protect ground water and is approved for installation with the following conditions:

1. All fluid will be removed from the leak detection system prior to discharging any fluids into the repaired pond.

2. The leak detection system will be inspected monthly. If fluids are observed in the sump, the OCD will be notified immediately. A sample of the fluids will be analyzed to determine their origin. The analysis will be supplied to the OCD.

Please be advised that this approval does not relieve you of liability should your operation result in actual pollution of surface of ground waters which may be actionable under other laws and/or regulations.

If you have any questions, please do not hesitate to call me at (505) 827-5885.

Sincerely,

Roger Anderson

Roger Anderson
Environmental Engineer

RA:sl

cc: OCD - Hobbs

Chevron

Warren Petroleum Company
A Division of Chevron U.S.A. Inc.
P.O. Box 1589, Tulsa, OK 74102

Manufacturing Department

September 29, 1986

RECEIVED
OCT - 2 1986
OIL CONSERVATION DIVISION
SANTA FE

R. L. Stamets, Director
Energy and Minerals Department
Oil Conservation Division
State of New Mexico
P. O. Box 2088
Santa Fe, New Mexico

Attention: David G. Boyer
Hydrogeologist

Gentlemen:

Re: Warren Petroleum Company
Division of Chevron U.S.A. Inc.
Eunice (GW-5), Monument (GW-25), Saunders (GW-26)
Vada (GW-27) Gas Processing Plants
Lea County, New Mexico

Attached is material which we have added to the subject discharge plans. This information consists of a waste management plan for all of the facilities and a description of the emergency pit for our Saunders Plant

If you find that you have any questions or need additional information, please call Linda Johnson or me at (918) 560-4138.

Very truly yours,

WARREN PETROLEUM COMPANY

L. T. Reed
Lead Engineer

LTR/LLJ/ar
Attachment

WASTE MANAGEMENT PLAN

MONUMENT GAS PROCESSING PLANT

This Waste Management Plan has been developed to meet Corporate and Governmental requirements concerning disposal of various operating materials at the end of its useful life.

At the present time, the Monument Plant does not generate any RCRA hazardous wastes. If or when it should be determined a hazardous waste exists, it will be disposed of according to RCRA standards with documentation and proper manifests in an approved hazardous waste disposal site. Formal contracts will be negotiated and disposal sites will be selected per Chevrons current approved hazardous waste site list.

1. The following list shows the types, expected amounts, and source of wastes which are generated at the Monument facility:

ITEM	TYPE	EXPECTED AMOUNT	SOURCE	DISPOSAL METHOD
Filters	Amine, Dust, Oil Product, Charcoal Air, Etc.	800 cartridges/yr	Amine, oil, gas filter cases, air intake cases	Waste Control of NM
Cooling Tower Blowdown	Water	600 Bbls/Day	Cooling Tower	Rice Disposal P/L
Boiler Blowdown	Water	200 Bbls/Day	Waste Heat, Waste Reclaimer, Holman Boilers	Rice Disposal P/L
Plant Trash	Paper, Wood, cardboard, household items, small concrete, etc.	9 yards/week	Office, Shop etc.	Waste Control of NM
Cooling Tower Basin Sludge	Sludge, slurry mix	2 yards/year	Cooling Tower	Pollution Control Inc.
Oil/Scrubber Tank Bottoms	Oil sludge, sand, dirt, scrubber bottoms	Infrequent varied amounts	Scrubbers, oil tanks	Pollution Control Inc.
Solvent	Varsol	200 gals/year	Parts washing bin	Oil Recovery Tank
Steel Drums	Lube oil, antifreeze, chemicals, LPG odorizer	60 drums/year 12 disposed of locally	Outside vendors	Emptied and returned to vendc or crushed and delivered to Waste Control of NM
Concrete		Infrequent varied amounts	Various in-plant	Plant landfill
Molecular sieve, activated alumina, sulfur plt catalyst, ion exchange resin, etc.	Solid particles	Infrequent, varied amounts	Dehydrators, sulfur plant water treaters	Plant landfill
Amine	DEA	Infrequent negligible amounts	Amine System drips	Rice Disposal P/L
Hydrogen Sulfide		500 MSCFD	Amine System, Green Gas, Sulfur plant	Sulfur Conversion incineration

ITEM	TYPE	EXPECTED AMOUNT	SOURCE	DISPOSAL METHOD
Wash Water	Water	50 Bbls/day	Engine Room Plant Area	Rice Disposal P/L
Produced Water from Compression	Water	100 Bbls/day	Scrubbers	Rice Disposal P/L
Brine Water		300 Bbls/Month	Water Treaters	Rice Disposal P/L
Hydrostatic Test Water	Water	Infrequent varied amounts	Pipeline, vessel tests	Rice Disposal P/L
Sump or Pit Sludge	Sand, dirt, waste/wash water, sediment	2 yards/year	Waste water pits	Pollution Control Inc.
Scrap Iron		20 tons/year	Old piping, etc.	Scrap retail dealers
Oil contaminated dirt	Dirt	Infrequent varied amounts	Spills	Tilled into plant landfill dirt
Used Oil	Motor Oil	15 Bbls/Year	Engines, Equipment	Oil Recovery tanks
Scrubber Oil/ Condensate	Oil	250 Bbls/Month	Scrubbers	Oil Recovery Tanks
Asbestos Insulation		Infrequent varied amounts	Old insulated lines	Outside contracto

1a. If PCB's are encountered, they are tagged and when necessary disposed of according to approved methods.

2. For the listed wastes, operating procedures are followed to minimize the amounts generated such as:

   Steel drums - exchanged with vendors
   Molecular sieve - sent in for regeneration if practical
   Hydrostatic test water - air is used for pressure testing to eliminate water disposal problems
   Filters - changed based on differential indicators not set time intervals
   Blowdowns - Controlled based upon water tests
   Amine - Recovered and reused where practical
   Engine Oil - Changed only when contamination is indicated

3. All wastes listed in No. 1 have been properly classified as hazardous or non-hazardous. If a waste cannot be positively identified as hazardous or non-hazardous, then the Warren Petroleum Environmental Affairs Department is contacted to recommend an outside company to do testing and analysis.

4. The necessary safety precautions for handling each waste listed in No. 1 above is taken to avoid adverse health affects. The Safety Department and Environmental Department are contacted when specific precautions are needed. Reference to the Material Safety Data Sheets (MSDS) is made concerning proper handling of all products.

5. Potential for waste recyling is considered when the use of wastes is feasible in alternative processes, such as re-injecting water into a producing formation for enhanced oil recovery.

K a Peterson

Plant Manager Approval

[illegible]

Environmental Department Approval

State of New Mexico
Energy and Minerals Department

OIL CONSERVATION DIVISION
P. O. Box 2088
Santa Fe, New Mexico 87501

NOTIFICATION OF FIRE, BREAKS, SPILLS, LEAKS, AND BLOWOUTS

Name of Operator	Address
Warren Petroleum Company	P. O. Box 67, Monument, New Mexico

Report Of	Fire	Break	Spill	Leak	Blowout	Other*
			XX			

Type of Facility	Drlg Well	Prod Well	Tank Btty	Pipe Line	Gaso Plnt	Oil Rfy	Other*
					XX		

Name of Facility
Warren Petroleum - Monument Plant #118

Location of Facility (Quarter/Quarter Section or Footage Description)	Sec.	Twp.	Rge.	County
SW ¼	36	19-S	36-E	Lea

Distance and Direction from Nearest Town or Prominent Landmark
3 Miles Southwest of Monument, New Mexico

Date and Hour of Occurrence	Date and Hour of Discovery
4:00 PM - June 3, 1986	8:00 AM, June 4, 1986

Was Immediate Notice Given?	Yes	No	Not Required	If Yes, To Whom
			XX	Jerry Saxton

By Whom	Date and Hour
K. A. Peterson	9:00 AM June 5, 1986

Type of Fluid Lost	Quantity Of Loss	Volume Recovered
Diesel Fuel	BO / BW	BO / BW

Did Any Fluids Reach A Watercourse?	Yes	No	Quantity
		X	

If Yes, Describe Fully**

Describe Cause of Problem and Remedial Action Taken**

Driver was delivering diesel to overhead tank. When he backed in to fill tank he bumped piping coming from tank and broke a nipple out. Tank fill line is being modified so that a lock can be placed on it and access gained by a Supervisor only. Filling will be supervised.

Describe Area Affected and Cleanup Action Taken**

Diesel was contained around area of tank. Soil has been removed, spread out, and mixed in with dry soil.

Description of Area	Farming	Grazing	Urban	Other*
				caliche surface within plant yard

Surface Conditions	Sandy	Sandy Loam	Clay	Rocky	Wet	Dry	Snow
				X			

Describe General Conditions Prevailing (Temperature, Precipitation, Etc.)**

Temperature upper 70's with widely scattered rain showers.

I Hereby Certify That the Information Above is True and Complete to the Best of My Knowledge and Belief

Signed K A Peterson Title Plant Manager Date 6-5-86

*Specify **Attach Additional Sheets If Necessary

NM-5

Chevron
Warren Petroleum Company
A Division of Chevron U.S.A. Inc.
P.O. Box 67, Monument, NM 88265

Manufacturing Department

JAN 31 1986
CONSERVATION DIVISION

January 28, 1986

State of New Mexico
Energy and Minerals Department
Director Conservation Division
P. O. Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Dave Boyer

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Dear Mr. Boyer,

Per your request and our telephone conversation this date, we will no longer be submitting the monthly "Disposal Water Report" for the Monument Plant #118. We have reviewed our records and cannot find a request from your department for this report. It is also not required as part of our approved discharge plan. Based on your suggestion, the attached report for the month of December, 1985 will be the last one submitted.

I appreciate you working with us and finding ways to reduce our paperwork.

If we can be of further assistance, please feel free to call.

K A Peterson

K. A. Peterson
Plant Manager

KAP/jr
Attachments
cc: L. T. Reed

Chevron

Warren Petroleum Company
A Division of Chevron U.S.A. Inc.
P.O. Box 67, Monument, NM 88265

Manufacturing Department

January 27, 1986

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 31,496 Bbls. of brine into the E-M-E System for the month of December, 1985. Reference: Rice Engineering Invoice #50-0016 dated 1-20-86.

K A Peterson

K. A. Peterson

KAP/jr
Attachment

ICE *Engineering Corporation*

PHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

REMIT TO:
DEPT L-511P
PITTSBURGH, PA. 15264

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER: 50-0016

INVOICE DATE: 1-20-85

SOLD TO:

2310
Warren Petroleum Company
Monument, NM 88265

SHIP TO:

ORDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID

PRODUCT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the EME SWD System for the month of December, 1985.				
	Meter Reading: 1-1-86 750,326				
	12-1-85 718,830				
	31,496				
	TOTAL BARRELS	31,496			
	First 2,500 bbl.				$ 450.00
	Next 20,000 bbl.		.055		$1,100.00
	Last 8,996 bbl.		.045		$ 404.82
					$1,954.82
	TAX 4.25%				$ 83.08
	TOTAL				$2,037.90

PLEASE REMIT TO THE FOLLOWING ADDRESS:
Rice Engineering Corporation
Dept. L-511P
Pittsburgh, PA 15264

TERMS:
THIS IS NO CASH DISCOUNT. THE AMOUNTS SHOWN BELOW ARE NET AMOUNTS.

90% OF INVOICE TOTAL IS DUE NET 30 DAYS
10% OF INVOICE TOTAL IS DUE NET 40 DAYS

Received
1-24-86

Chevron

Warren Petroleum Company
A Division of Chevron U.S.A. Inc.
P.O. Box 67, Monument, NM 88265

Manufacturing Department

RECEIVED
OCT 28 1985
OIL CONSERVATION DIVISION
SANTA FE

October 24, 1985

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 21,808 Bbls. of brine into the E-M-E System for the month of September, 1985. Reference: Rice Engineering Invoice #50-0012 dated 10-18-85.

K. A. Peterson

K. A. Peterson
Plant Manager

KAP/jr
Attachment

RICE Engineering Corporation

TELEPHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

REMIT TO:
DEPT L-51
PITTSBURGH, PA. 15264

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER: 50-0012

INVOICE DATE: 10-18-85

SOLD TO:
2310
WARREN PETROLEUM COMPANY
Monument, NM 88265

SHIP TO:

ORDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID

PRODUCT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the EME SWD System for the month of September, 1985.				
	Meter reading: 10-1-85 527843				
	9-1-85 506035				
	21808				
	TOTAL BARRELS	21,808			
	First 2,500 bbl.				$ 450.00
	Next 19,308 bbl.		.055		$1,061.94
					$1,511.94
	TAX 4.25%				$ 64.26
	TOTAL				$1,576.20

ORIGINAL

PLEASE REMIT TO THE FOLLOWING ADDRESS:

Rice Engineering Corporation
Dept. L-511P
Pittsburgh, PA 15264

90% DUE NET 30
10% DUE NET 40

Date Fwd
For Pay
Approved

received
10-21-85

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

50 YEARS
1935 - 1985

TONEY ANAYA
GOVERNOR

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

October 18, 1985

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Warren Petroleum Co.
P.O. Box 1589
Tulsa, OK 74102

Attention: Ms. L. T. Reed

Re: Dicharge Plans for Monument (GW-25), Saunders (GW-26) and Vada (GW-27) Gas Processing Plants - Lea County, NM

Dear Ms. Reed:

The information that was stipulated for approval of the subject discharge plans has been reviewed and accepted by OCD. The above-listed discharge plans are hereby approved for a period of five years. This approval will expire July 31, 1990, and you should submit an application for new approval in ample time before that date.

Hydrostatic tests on the Saunders underground wastewater piping will be required for discharge plan renewal in 1990. Hydrostatic tests of underground wastewater piping at the Vada plant will not be required until 1995.

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

Sincerely,

R. L. Stamets

R. L. STAMETS
Director

RLS/JB/dp

cc: Oil Conservation Division - Hobbs

P 505 905 886

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Warren Pet. Co.	
Street and No. P.O. Box 1589	
P.O., State and ZIP Code Tulsa, OK 74102	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date	

PS Form 3800, Feb. 1982

Chevron

Warren Petroleum Company
A Division of Chevron U.S.A. Inc.
P.O. Box 1589, Tulsa, OK 74102

Manufacturing Department

October 14, 1985

R. L. Stamets
State of New Mexico
Oil Conservation Division
Energy and Minerals Department
P.O. Box 2088
Santa Fe, New Mexico 87501

Attn: Philip Baca

RE: Discharge Plans for Monument (GW-25), Saunders (GW-26) and Vada (GW-27) Gas Processing Plants - Lea County, New Mexico

Dear Mr. Baca:

With regard to the subject discharge plans, the following information is submitted in accordance with your request of July 31, 1985.

The discharge plans were conditionally approved pending submittal of the requested information by October 18, 1985.

As such, attached please find a drawing for each of the subject plants showing the underground waste water pipelines. The approximate age, material, thickness and pipe diameter are indicated. Steel pipelines are connected by welding; polyethylene lines are joined by butt fusion; PVC pipe is installed using PVC contact cement.

The majority of the disposal of solid waste not governed by the Resource Conservation and Recovery Act (non-RCRA solid waste) at the Monument Plant is by a solid refuse collector, Waste Control of New Mexico. The remainder of the solid waste is disposed of at the plant site. It consists mostly of lumber, scrap metal, rock, debris, etc. All non-RCRA solid waste is removed from the Saunders and Vada Plants by Waste Control of New Mexico, Inc.

The information provided herein is in answer to your letter of July 31, 1985 as we have interpreted your questions. If you find that you need further information, please feel free to contact Linda Johnson or myself at (918) 560-4138.

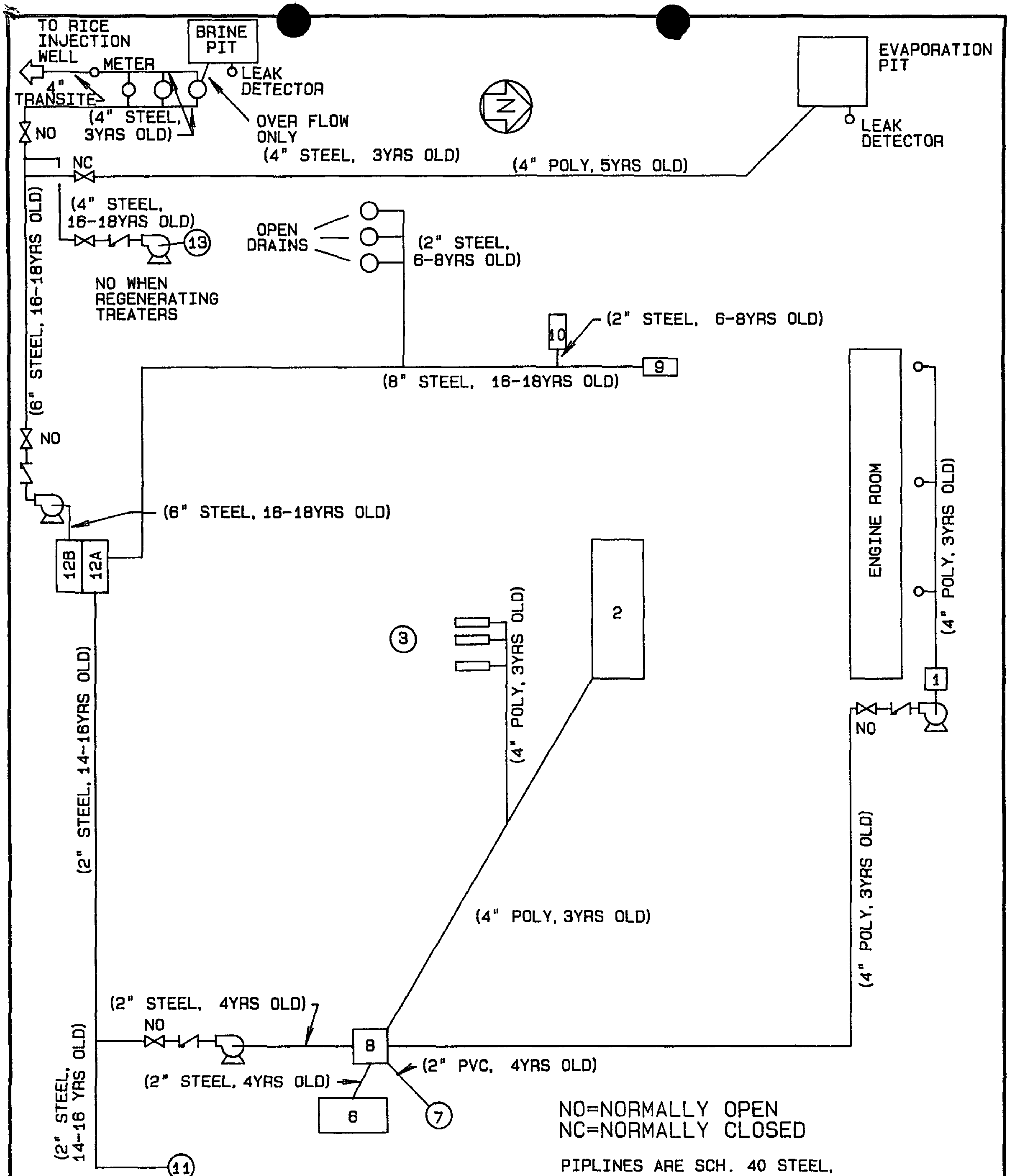
Very truly yours,

Linda Johnson

for

L. T. Reed, Director
Environmental Affairs

LLJ/cd



NO=NORMALLY OPEN
NC=NORMALLY CLOSED

PIPLINES ARE SCH. 40 STEEL, SDR-11 POLYETHYLENE & PVC PIPE AS NOTED

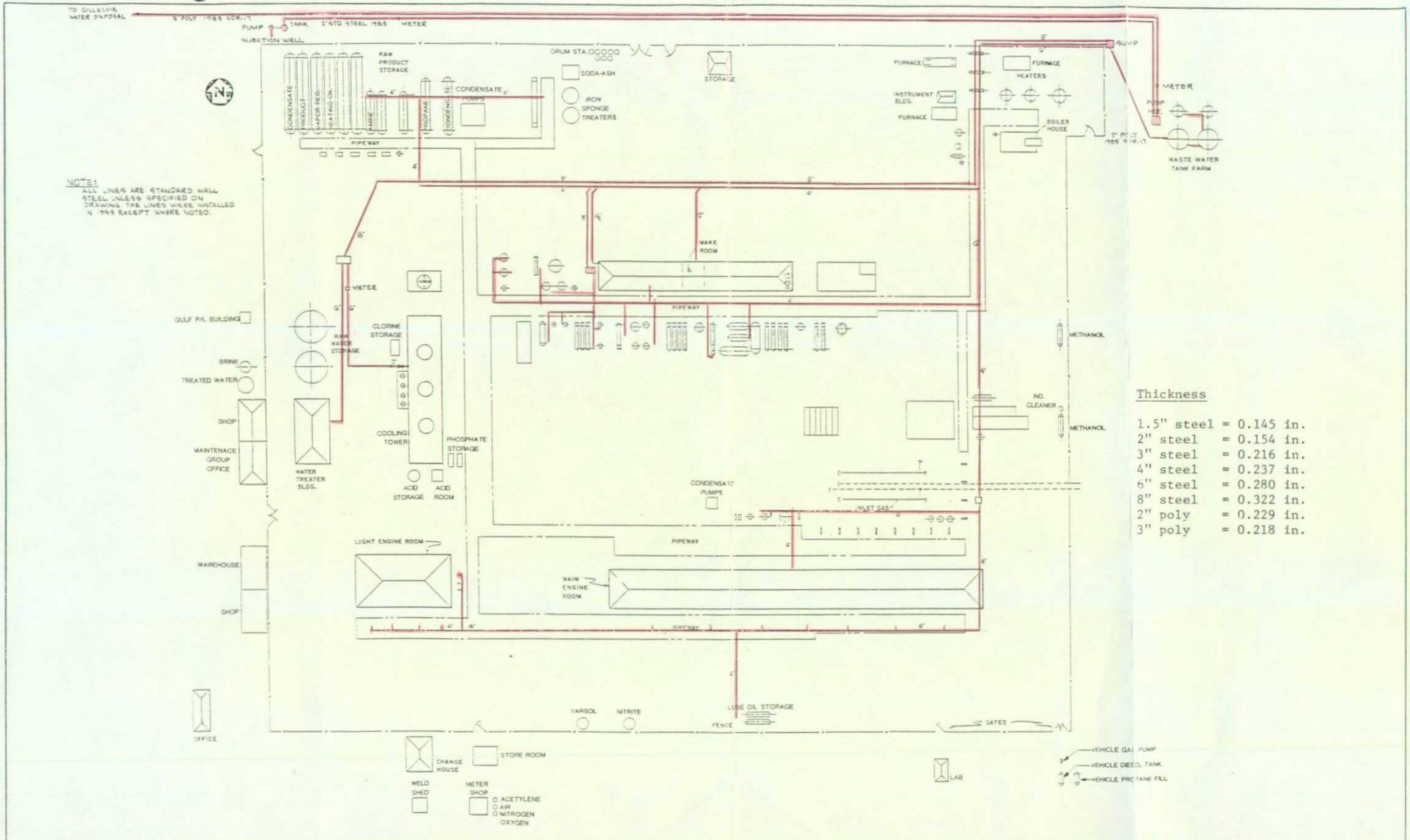
LEGEND

1-NORTH ENGINE ROOM SUMP
2-COOLING TOWER
3-CONDENSORS
4-BOILER
5-BOILER
6-BOILER
7-H_2S SCRUBBER
8-EAST SUMP
9-SOUTH ENGINE ROOM SUMP
10-CONDENSORS
11-CONDENSATE TANK
12A-SKIMMER
12B-SOUTH SUMP
13-ZEOLITE H_2O TREATER

THICKNESS

STEEL 2"=0.154"
STEEL 4"=0.237"
STEEL 6"=0.280"
STEEL 8"=0.322"
POLY 4"=0.409"
PVC 2"=0.300"
TRANS. 4"=RICE LINE

NO. OF UNITS REQUIRED THUS		WO-AFE NO.	
WARREN PETROLEUM COMPANY A DIVISION OF GULF OIL CORPORATION			
WASTE WATER SYSTEM LAYOUT PLANT 118 MONUMENT LEA, COUNTY, NM.			
DRAWN HPK	DATE 10/11/85	SCALE NONE	
CHECKED LLJ	DATE 10/11/85	DRAWING NO. 118-1001-0	
APPR. PDA	DATE 10/11/85		



Thickness

1.5" steel	= 0.145 in.
2" steel	= 0.154 in.
3" steel	= 0.216 in.
4" steel	= 0.237 in.
6" steel	= 0.280 in.
8" steel	= 0.322 in.
2" poly	= 0.229 in.
3" poly	= 0.218 in.

GENERAL NOTES | GENERAL NOTES | DWG. NO. | REFERENCE DRAWINGS | NO. | REVISION | BY | DATE | CHK. | APPR | NO. | REVISION | BY | DATE | CHK. | APPR | APPR OR NO. | ISSUE | DATE | PRELIM. | CONST.

WARREN PETROLEUM COMPANY

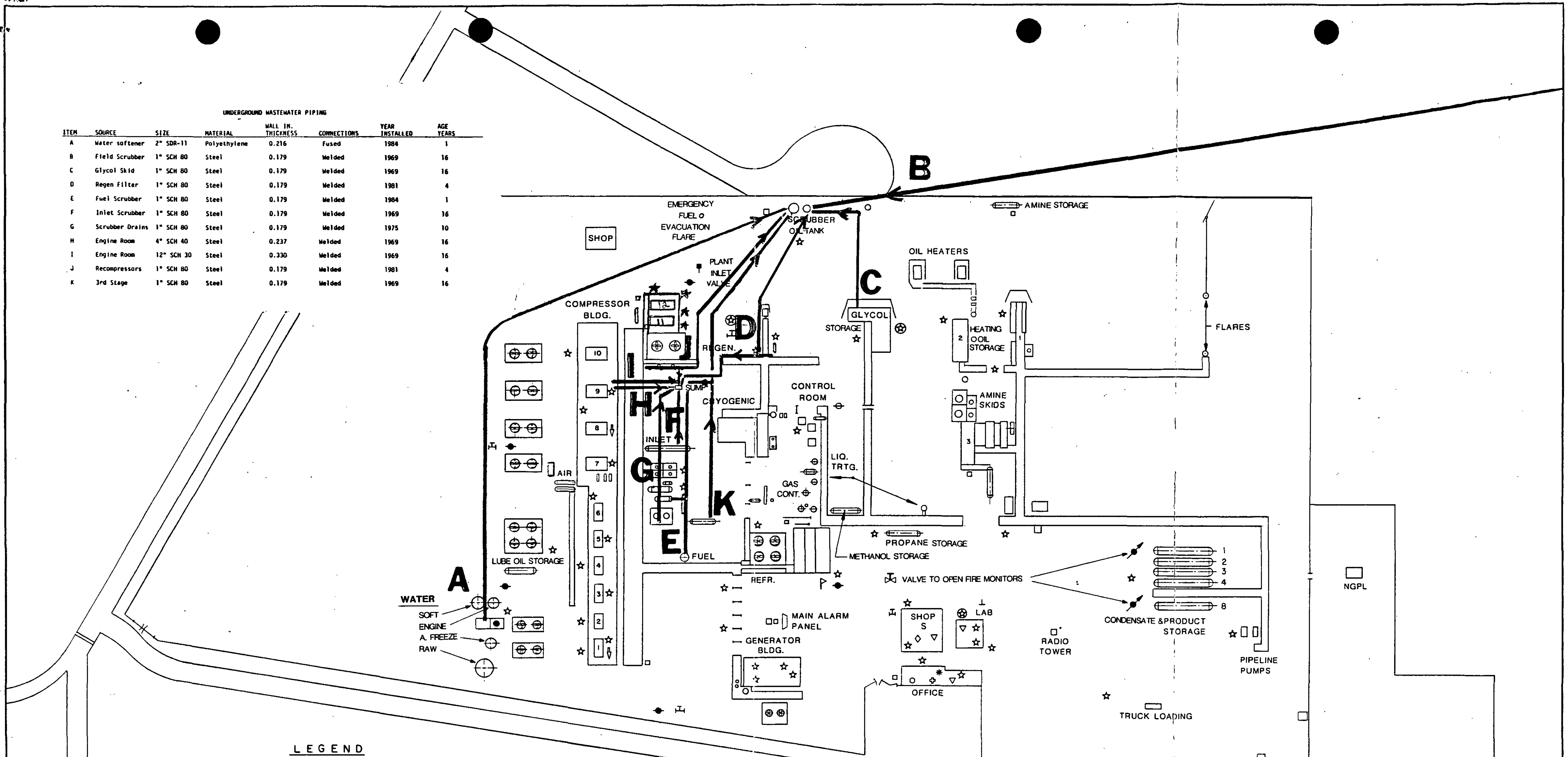
PLANT LAYOUT

PLT 146 SAUNDERS LOVINGTON NM

DRAWN | DATE | SCALE NONE
CHECKED | DATE
APPR | DATE

UNDERGROUND WASTEWATER PIPING

ITEM	SOURCE	SIZE	MATERIAL	WALL IN. THICKNESS	CONNECTIONS	YEAR INSTALLED	AGE YEARS
A	Water softener	2" SDR-11	Polyethylene	0.216	Fused	1984	1
B	Field Scrubber	1" SCH 80	Steel	0.179	Welded	1969	16
C	Glycol Skid	1" SCH 80	Steel	0.179	Welded	1969	16
D	Regen Filter	1" SCH 80	Steel	0.179	Welded	1981	4
E	Fuel Scrubber	1" SCH 80	Steel	0.179	Welded	1984	1
F	Inlet Scrubber	1" SCH 80	Steel	0.179	Welded	1969	16
G	Scrubber Drains	1" SCH 80	Steel	0.179	Welded	1975	10
H	Engine Room	4" SCH 40	Steel	0.237	Welded	1969	16
I	Engine Room	12" SCH 30	Steel	0.330	Welded	1969	16
J	Recompressors	1" SCH 80	Steel	0.179	Welded	1981	4
K	3rd Stage	1" SCH 80	Steel	0.179	Welded	1969	16



LEGEND

- HYDRANT
- HYDRANT WITH MONITOR
- MONITOR
- FIRE EXTINGUISHER
- WHEEL UNIT FIRE EXTINGUISHER
- FIRE EXTINGUISHER – WATER
- FIRE HOSE CART
- FIRE PLUG W/MONITOR
- FIRE PLUG
- GAS MASK
- OXYGEN MASK
- SHOWER, EYEWASH
- EMERGENCY WHISTLE
- FOAM
- PLANT SHUT-DOWN VALVES
- H_2S GAS DETECTOR
- EMERGENCY OXYGEN
- AIR SOCK
- FIRE PUMP
- FIRE BLANKET
- FIRE SUIT
- FIRE SUIT W/RESPIRATOR
- SMOKE DETECTORS
- FIRST AID STATION
- SHUTDOWN STATION

VADA PLANT 139
EMERGENCY EQUIPMENT LAYOUT

GENERAL NOTES	GENERAL NOTES	DWG. NO.	REFERENCE DRAWINGS

NO.	REVISION	BY	DATE	CHK.	APPR	NO.	REVISION	BY	DATE	CHK.	APPR
1	Rev. per Plant Info. (B.D.M.)	R.I.H.	2-19-85								

AFE OR NO		
ISSUE		
DATE	PRELIM.	CONST.

WARREN PETROLEUM COMPANY
A DIVISION OF GULF OIL CORPORATION
TULSA, OKLAHOMA

PLANT LAYOUT

VADA PLANT-139 LEA CO., N.M.

DRAWN R.I.H.	DATE 11-28-84	SCALE
CHECKED	DATE	
APPR	DATE	

[redacted]

Chevron

Warren Petroleum Company
A Division of Chevron U.S.A. Inc.
P.O. Box 67, Monument, NM 88265

Manufacturing Department

September 20, 1985

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 59,058 Bbls. of brine into the E-M-E System for the month of August, 1985. Reference: Rice Engineering Invoice # 50-0009 dated 9-16-85.

David L [illegible]
For KAP

KAP/jr
Attachment

RICE Engineering Corporation

TELEPHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

REMIT TO:
DEPT L-511P
PITTSBURGH, PA. 15264

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER: 50-0009

INVOICE DATE: 9-16-85

SOLD TO:
2310
WARREN PETROLEUM COMPANY
Monument, NM 88265

SHIP TO:

ORDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID

PRODUCT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the EME SWD System for the month of August, 1985.				
	Meter reading: 9-1-85 506035 8-1-85 446977 59058				
	TOTAL BARRELS	59,058			
	First 2,500 bbl.				$ 450.00
	Next 20,000 bbl.		.055		$1,100.00
	Last 36,558 bbl.		.045		$1,645.11
					$3,195.11
	TAX 4.25%				$ 135.79
	TOTAL				$3,330.90

PLEASE REMIT TO THE FOLLOWING ADDRESS:

Rice Engineering Corporation
Dept. L-511P
Pittsburgh, PA 15264

90% DUE NET 30
10% DUE NET 40

received
9-19-85

Chevron

Warren Petroleum Company
A Division of Chevron U.S.A. Inc.
P.O. Box 67, Monument, NM 88265

Manufacturing Department

AUG 29 1985
OIL CONSERVATION DIVISION
SANTA FE

August 27, 1985

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 52,001 Bbls. of brine into the E-M-E System for the month of July, 1985. Reference: Rice Engineering Invoice # 50-0008 dated 8-20-85.

K A Peterson

KAP/jr
Attachment

RICE *Engineering Corporation*

TELEPHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

REMIT TO:
DEPT L-511P
PITTSBURGH, PA. 15264

INVOICE

ORIGINAL

PLEASE REFER TO OUR NU[redacted]
ON ALL CORRESPONDE[redacted]
AND REMITTANCE

INVOICE: 50-00[redacted]

INVOICE DATE: 8-20-85

SOLD TO: 2310
WARREN PETROLEUM COMPANY
Monument, NM 88265

SHIP TO:

YOUR ORDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID

PRODUCT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the EME SWD System for the month of July, 1985.			received 8-26-85	
	Meter reading: 8-1-85 446977 7-1-85 394976 52001				
	TOTAL BARRELS	52,001			
	First 2,500 bbl.				$ 450.00
	Next 20,000 bbl.		.055		$1,100.00
	Last 29,501 bbl.		.045		$1,327.55
					$2,877.55
	TAX 4.25%				$ 122.30
	TOTAL				$2,999.85
	PLEASE REMIT TO THE FOLLOWING ADDRESS: Rice Engineering Corporation Dept. L-511P Pittsburgh, PA 15264 90% DUE NET 30 10% DUE NET 40				

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

TONEY ANAYA
GOVERNOR

50 YEARS
1935 - 1985

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

July 31, 1985

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Warren Petroleum Co.
P. O. Box 1589
Tulsa, Oklahoma 74102

Attention: Ms. L. T. Reed

Dear Ms. Reed:

The following discharge plans have been reviewed by OCD:

- Warren Petroleum Co.'s Monument gas processing plant located in the SW/4 of Section 36, Township 19 South, Range 36 East, NW/4 of Section 36, Township 20 South, Range 36 East, NMPM, Lea County, New Mexico.

- Warren Petroleum Co.'s Saunders gas processing plant located in Section 34, Township 14 South, Range 33 East, NMPM, Lea County, New Mexico.

- Warren Petroleum Co.'s Vada gas processing plant located in Section 23, Township 10 South, Range 33 East, NMPM, Lea County, New Mexico.

The above-listed discharge plans for Warren Petroleum Co.'s Monument (GW-25), Saunders (GW-26), and Vada (GW-27) gas processing plants are hereby approved with the following conditions:

1. Within sixty (60) days of receipt of this letter, the following information concerning any underground wastewater piping for all three plants must be provided:

   - A drawing indicating all underground wastewater pipelines for each plant.

-The approximate age and diameter of all underground wastewater pipelines.

-The material specifications and thickness for all underground wastewater pipelines.

-The installation method (e.g. welded, bell and spigot, etc...) for all underground wastewater pipelines.

The information requested is necessary to evaluate the potential for the underground piping to leak and possibly contaminate the groundwater.

2. Within sixty (60) days of receipt of this letter, submit information on the methods for disposal of non-RCRA solid waste disposal including domestic and industrial refuse (e.g., spent catalyst, etc...). This information is required to assure that such disposal methods will not create the potential for groundwater contamination.

The approved discharge plans consist of the plan dated March 1, 1985 and the materials dated May 13, 1985 and July 9, 1985, submitted as supplements to the discharge plan.

The discharge plan was submitted pursuant to Section 3-106 of the NM Water Quality Control Commission Regulations. It is approved pursuant to Section 3-109.F., which provides for possible future amendment of the plan. Please be advised that the approval of this plan does not relieve you of liability should your operation result in actual pollution of surface or ground waters which may be actionable under other laws and/or regulations.

There will be no routine monitoring or reporting requirements.

Please note that Section 3-104 of the regulations requires that "When a plan has been approved, discharges must be consistent with the terms and conditions of the plan." Pursuant to Section 3-107.C., you are required to notify the director of the facility expansion, production increase, or process modification that would result in any significant modification in the discharge of water contaminants.

P 505 905 952

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Warren Petroleum Co.	
Street and No.	
P.O., State and ZIP Code P.O. Box 1589, OK., 7410?	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date	

PS Form 3800, Feb. 1982

Pursuant to Subsection 3-109.G.4., this plan approval is for a period of five years. This approval will expire July 31, 1990, and you should submit an application for new approval in ample time before that date.

Please be aware that pending evaluation of the wastewater piping information requested in this letter, submittal of results of hydrostatic tests on the plants' underground wastewater piping may be required for discharge plan renewal. You will be notified of this within ninety (90) days of OCD's receipt of the information requested in this letter.

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

Sincerely,

R. L. Stamets

R. L. STAMETS,
Director

RLS/PB/dr

cc: Oil Conservation Division - Hobbs

Chevron
Warren Petroleum Company
A Division of Chevron U.S.A. Inc.
P.O. Box 1589, Tulsa, OK 74102

Manufacturing Department

RECEIVED
JUL 15 1985
OIL CONSERVATION DIVISION
SANTA FE

July 9, 1985

Mr. Philip L. Baca
Environmental Engineering Specialist
State of New Mexico
Energy and Minerals Department
Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87501

RE: Monument, Saunders and Vada Discharge Plans - Information Requested for Continued Review Process

Dear Mr. Baca:

The attached information is provided as you requested in your letter of May 17, 1985.

If you have any questions or need further information, please contact Linda Johnson or me at (918) 560-4138.

Very truly yours,

L. T. Reed, Director
Environmental Affairs

LTR/LLJ/dm

Attachment

INFORMATION REQUESTED
FOR
CONTINUED EVALUATION
OF
DISCHARGE PLANS
FOR
MONUMENT, SAUNDERS & VADA
GAS PROCESSING PLANTS

PART A (1): CHEMICAL ANALYSES.

Additional Chemical analyses for the Monument, Saunders and Vada Plants are attached

Concerning the January 30, 1985 chemical analysis submitted as Appendix B with our updated discharge plans of March 1, 1985, it is our understanding that the specific conductance and total dissolved solids for the Monument and Saunders plants, as well as the ratio between the two parameters, are within expected ranges. For the Vada Plant, the pH and alkalinity are the first indications that amine entered the waste water. Amine has a low specific conductance but a high total dissolved solid calculated count.

PART A (2): SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN - PART II, ALTERNATE A.

(a) All pipeline safety regulations are administered through the New Mexico Corporation Commission as well as the U.S. Department of Transporation. As such, Warren works directly with those agencies with regard to pipeline field and reporting matters.

(b) The term vaporization, used to describe hydrocarbon compounds, is used as a general term to indicate the quality of the material mentioned.

A discharge or spill, as defined by federal and state regulations, is at hand when there is a reasonable probability that the discharged material will reach surface, or subsurface water. Warren has had no spills from delivery lines.

Please note that there is an excess flow valve which will shut off product flow if there is any failure in the connection.

PART A (3): DISPOSAL METHODS

Warren works directly with the U.S. Environmental Protection Agency, Region VI Office and the New Mexico Environmental Improvement Division for continued compliance with Resource Conservation and Recovery Act (RCRA) regulations.

PART B (1): MONUMENT PLANT SPILL PLAN

(a) Any water removed from diked area by vacuum truck is hauled from the plant be Oil Processing Company who in turn reclaims the oil and disposes of the remaining waste water into an approved injection well. Pure rainwater is allowed to evaporate from the plant yard.

(b) As stated in Section I, Part A (5) of the March 1, 1985 Updated Discharge Plans, plant inspections are made at a minimum of three time per day, and most of the time, it is made once every four hours. Any leaks are found and repaired as soon as possible. When tanks are in need of repair, they are either reworked or replaced. Since this method has proved successful in that no spills have occurred from the storage tanks, any other, more formal, means for corrosion checks are not deemed necessary at this time. If we do suspect a problem, a thickness test is run on the tank.

PART B (2) SCHEMATIC OF WASTEWATER SYSTEM FOR MONUMENT PLANT

Attached please find a revised schematic of the Monument Plant Wastewater System.

PART B (3) ACCUMULATION OF SLUDGE FOR MONUMENT PLANT

There has been no accumulation of sludge in the skimmers. Any particles are apparently held in suspension and removed by vacuum.

PART B (4) EVAPORATION PIT LINING MATERIALS FOR MONUMENT PLANT

The lining materials used for the evaporation pit are 36 mil chlorinated polyethylene (CPE) laminate and 30 mil CPE.

PART B (5): EVAPORATION PIT/BRINE PIT AT THE MONUMENT PLANT

The Evaporation Pit is located 1200 feet to the northwest of the amine coolers. The Brine Pit is located 1300 feet to the southwest of the amine coolers. The evaporation pond is usually dry. The brine pond contains only enough water to prevent wind damage to the liner. A plot plan is attached showing these directions from the amine coolers.

PART B (6): SUMP/PUMP INFORMATION FOR THE MONUMENT PLANT

The capacity of each sump is as follows:

North Engine Room Sump 7,200 gallons
South Engine Room Sump 10,200 gallons
East Sump 13,400 gallons
South Sump 11,300 gallons

The capacity of the sump into which all effluent flows is 520 BBLS stored in three tanks. Any overflow would go to the brine pit. The effluent in the tanks is then sent to the Rice Engineering well by gravity feed. There is no pump on the discharge line to Rice Engineering. The sump capacities upstream of the three tanks are listed above. We do not have pump curves for the two pumps that deliver effluent to the three tanks.

PART B (7): MINIMUM FREEBOARD-MONUMENT PLANT

For the Evaporation Pond, the freeboard would be at least two feet beneath the top of the level.

The freeboard for the Brine Pond would be at least two feet beneath the top of the level.

PART C (1): SAUNDERS PLANT EFFLUENT

The Saunders Plant has experienced no process changes that would cause a variance in the quality of the plant effluent from the two dates you question which are February 23, 1983 and January 30, 1985. An evaluation of, and a comparison between, the two samples must be made in light of the fact that the samples are waste water and by that nature, the components will vary. A comparison of each sample with the background analysis will provide further information.

We stated in our March 1, 1985 Update For Discharge Plans along with the January 30, 1985 analyses that to obtain highly consistent analyses of the effluent would be difficult due to the several sources throughout each plant which combine to provide the whole.

PART C (2): SAUNDERS PLANT CONDENSATE

The condensate is held in the storage tank at a pressure of 210 psig. The major constituents of the condensate are: methane (1%), ethane (35%), propane (28%), butanes (17%), pentanes (8%), hexane (11%).

PART C (3): SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN-PART II, ALTERNATE A FOR THE SAUNDERS PLANT.

(a) Sludge accumulation is very slow. When necessary, any sludge is hauled by Gandy vacuum truck to their approved treatment site.

TEL. 512-884-0371 PO BOX 2552 78403

JORDAN LABORATORIES, INC.
CHEMISTS AND ENGINEERS
CORPUS CHRISTI, TEXAS
JUNE 27, 1985

WARREN PETROLEUM COMPANY
P.O. BOX 1589
TULSA, OKLAHOMA 74102

REPORT OF ANALYSIS

IDENTIFICATION: W.P.C. VADA
10:00 AM 6-6-85

	MG/L
PHENOLS	13
BENZENE	19.0
TOLUENE	12.0
ORTHOXYLENE AND PARAXYLENE	0.74
METAXYLENE	0.79
ALUMINUM	0.02
ARSENIC	0.006
BORON	1.8
CADMIUM	0.0006
MOLYBDENUM	0.01
NICKEL	0.05

LAB. NO. M23-3541

RESPECTFULLY SUBMITTED,

Carl Crownover

CARL F. CROWNOVER

TEL. 512-884-0371

PO BOX 2552 78403

JORDAN LABORATORIES, INC.
CHEMISTS AND ENGINEERS
CORPUS CHRISTI, TEXAS
JUNE 27, 1985

WARREN PETROLEUM COMPANY
P.O. BOX 1589
TULSA, OKLAHOMA 74102

REPORT OF ANALYSIS

IDENTIFICATION: W.P.C. SAUNDERS
11:00 AM 6-6-85

	MG/L
PHENOLS	1.3
BENZENE	13.0
TOLUENE	16.0
ORTHOXYLENE AND PARAXYLENE	3.7
METAXYLENE	4.6
ALUMINUM	0.04
ARSENIC	0.029
BORON	0.74
CADMIUM	<0.0001
MOLYBDENUM	0.03
NICKEL	0.02

LAB. NO. M23-3540

RESPECTFULLY SUBMITTED,

Carl Crownover

CARL F. CROWNOVER

TEL. 512-884-0371

PO BOX 2552 78403

JORDAN LABORATORIES, INC.
CHEMISTS AND ENGINEERS
CORPUS CHRISTI, TEXAS

JUL 2 1985

JUNE 27, 1985

WARREN PETROLEUM COMPANY
P.O. BOX 1589
TULSA, OKLAHOMA 74102

REPORT OF ANALYSIS

IDENTIFICATION: W.P.C. MONUMENT
2:00 PM 6-6-85

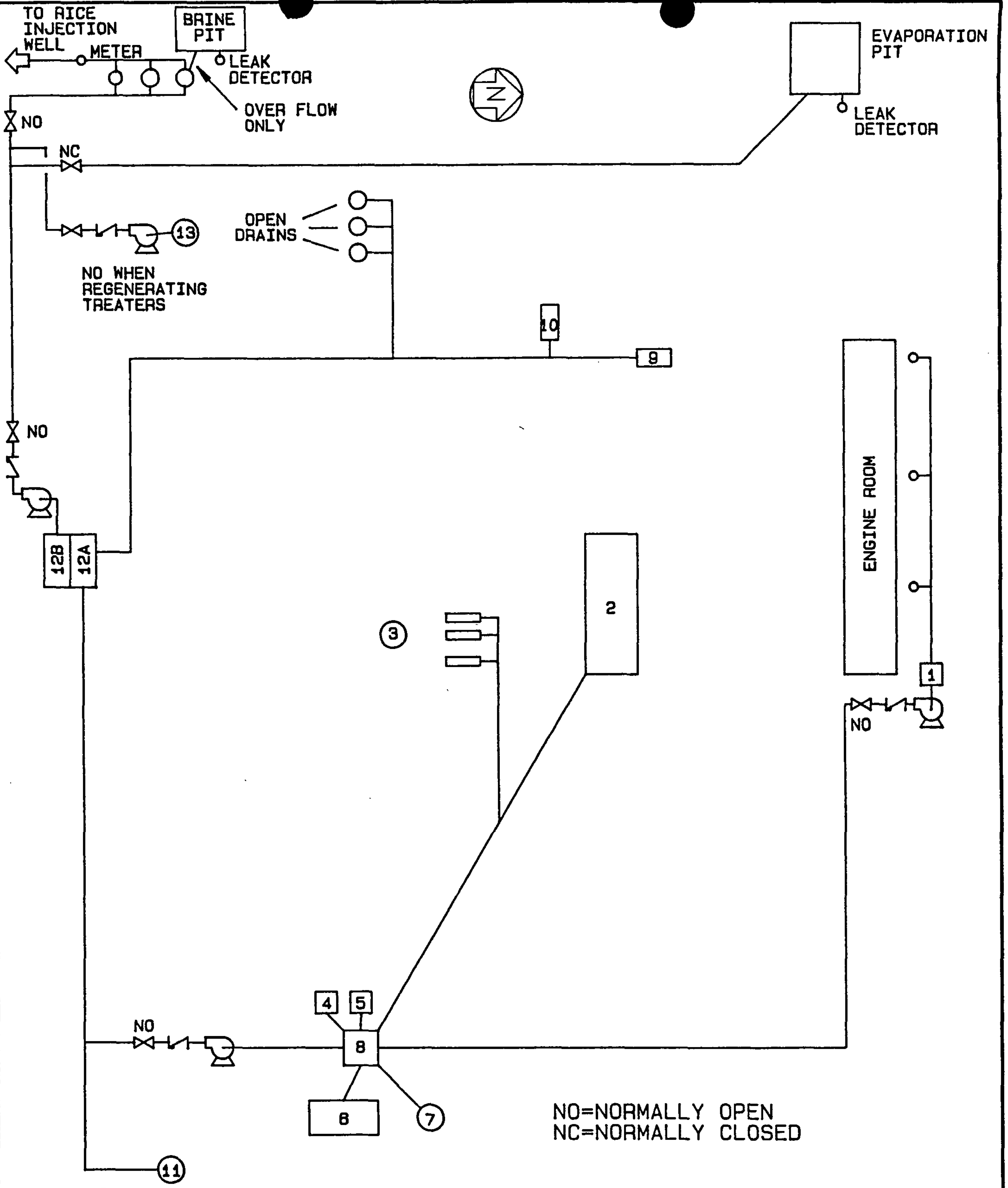
	MG/L
PHENOLS	0.08
BENZENE	0.12
TOLUENE	0.33
ORTHOXYLENE AND PARAXYLENE	0.60
METAXYLENE	0.66
ALUMINUM	0.50
ARSENIC	0.018
BORON	0.56
CADMIUM	<0.0001
MOLYBDENUM	0.01
NICKEL	<0.01

LAB. NO. M23-3539

RESPECTFULLY SUBMITTED,

Carl Crownover

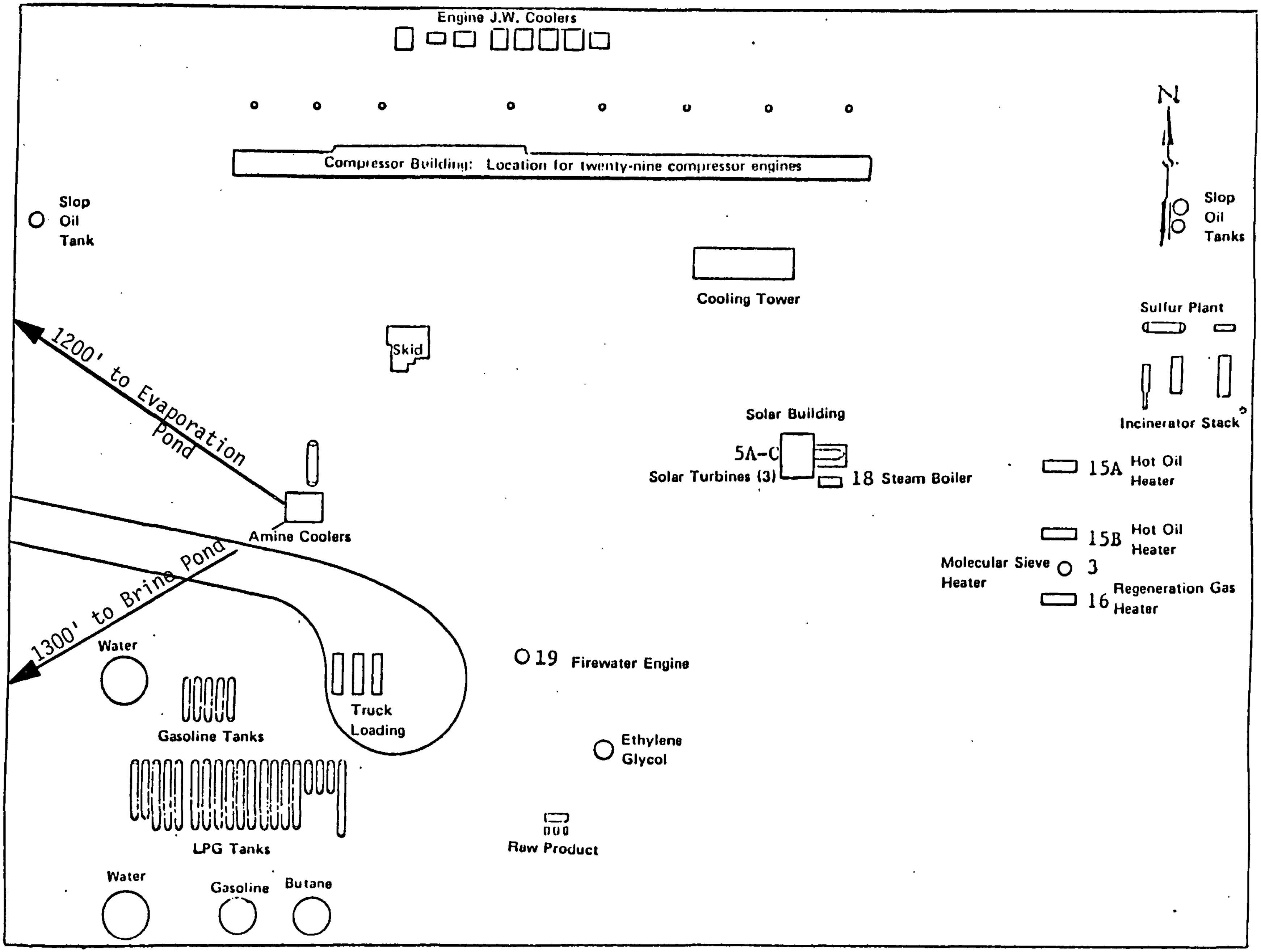
CARL F. CROWNOVER



LEGEND

1-NORTH ENGINE ROOM SUMP
2-COOLING TOWER
3-CONDENSORS
4-BOILER
5-BOILER
6-BOILER
7-H_2S SCRUBBER
8-EAST SUMP
9-SOUTH ENGINE ROOM SUMP
10-CONDENSORS
11-CONDENSATE TANK
12A-SKIMMER
12B-SOUTH SUMP
13-ZEOLITE H_2O TREATER

NO. OF UNITS REQUIRED THUS			WO-AFE NO.
WARREN PETROLEUM COMPANY A DIVISION OF GULF OIL CORPORATION			
WASTE WATER SYSTEM LAYOUT			
PLANT 118 MONUMENT		LEA, COUNTY, NM.	
DRAWN HPK	DATE 6/25/85	SCALE NONE	
CHECKED LLJ	DATE 6/25/85	DRAWING NO.	
APPR. PDA	DATE 6/25/85	118-1001-0	



WARREN PETROLEUM COMPANY
MONUMENT PLANT
PLOT PLAN

NOTICE OF PUBLICATION
STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
SANTA FE, NEW MEXICO

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission regulations, Warren Petroleum Co., L. T. Reed, Authorized Agent, P.O. Box 1589, Tulsa, Oklahoma 74102, has submitted for approval the following discharge plans to the Director of the Oil Conservation Division, P. O. Box 2088, State Land Office Building, Santa Fe, New Mexico 87501 (505) 827-5800.

Warren Petroleum Co., Monument Gas Processing Plant (SW/4 Section 36, Township 19 South, Range 36 East, NW/4 Section 1, Township 20 South, Range 36 East, NMPM, Lea County, New Mexico) proposes to continue disposing of approximately 50,000 gallons per day of industrial wastewater into a commercial Class II injection well currently operating near the plant. The wastewater is transported to the injection well via pipeline. In the event of an emergency shutdown at the injection well, a lined pond with a leak detection system and a capacity of approximately one million gallons will be used to contain the wastewater temporarily. The wastewater is composed of effluents from cooling towers and process vessels. The wastewater has a total dissolved solids concentration of approximately 2800 mg/l. The ground water most likely to be affected by any non-injection discharges is at depths of 35 to 60 feet with total dissolved solids concentrations ranging from 500 to 3000 mg/l.

Warren Petroleum Co., Saunders Gas Processing Plant (SW/4 Section 34, Township 14 South, Range 33 East, NMPM, Lea County, New Mexico) proposes to continue disposing of approximately 25,000 gallons per day of industrial wastewater into a commercial Class II injection well currently operating near the plant. The wastewater is transported to the injection well via pipeline. In the event of an emergency shutdown at the injection well, the wastewater will be stored in four tanks with a total combined capacity of approximately 100,000 gallons until the wastewater can be transported by truck to an approved disposal site. The wastewater is composed of effluents from cooling towers and process vessels. The wastewater has a total dissolved solids concentration range of 3,800 to 10,000 mg/l. The ground water most likely to be affected by any non-injection discharges is at a depth of approximately 100 feet with a total dissolved solids concentration of approximately 600 mg/l.

Warren Petroleum Co., Vada Gas Processing Plant (NW/4 Section 23, Township 10 South, Range 33 East, NMPM, Lea County, New Mexico), proposes to continue disposing of approximately 630 gallons per day of industrial wastewater into two storage tanks with a total combined capacity of approximately 12,000 gallons. From the tanks, the wastewater is transported via truck to an approved disposal site. The wastewater has a total dissolved solids concentration of approximately

15,000 mg/l. The ground water most likely to be affected is at a depth of approximately 35 feet with an estimated total dissolved solids concentration of 1000 mg/l.

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. 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 a public hearing may be requested by an 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 the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 17th day of May, 1985.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

R. L. Stamets

R. L. STAMETS
Director

S E A L

Warren Petroleum Company

MANUFACTURING DEPARTMENT

June 28, 1985

P. O. Box 67
Monument, New Mexico 88265

RECEIVED
JUL 3 1985
OIL CONSERVATION DIVISION
SANTA FE

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 81,422 Bbls of brine into the E-M-E System for the month of May, 1985.

Reference: Rice Engineering Invoice # 50-0005 dated 6-18-85.

K A Peterson

KAP/jr

CE Engineering Corporation

IONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

REMIT TO:
DEPT L-511P
PITTSBURGH, 15264

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER: 50-0005

INVOICE DATE: 6-18-85

TO: 2310

WARREN PETROLEUM COMPANY
Monument, NM 88265

SHIP TO:

received
10-21-85

DER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID

T CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the EME SWD System for the month of May, 1985				
	Meter reading: 6-1-85 340153				
	4-20-85 258731				
	81422				
	TOTAL BARRELS	81,422			
	First 2,500 bbl.				$ 450.00
	Next 20,000 bbl.		.055		$1,100.00
	Last 58,922 bbl.		.045		$2,651.49
					$4,201.49
	TAX 4.25%				$ 178.56
	TOTAL				$4,380.05

PLEASE REMIT TO THE FOLLOWING ADDRESS:

Rice Engineering Corporation
Dept. L-511P
Pittsburgh, PA 15264
90% DUE NET 30
10% DUE NET 40

ORIGINAL

Date Fwd For Pay 6-28-85

Approved

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

May 28, 1985

JUN 3 1985
OIL CONSERVATION DIVISION
SANTA FE

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 58,658 Bbls of brine into the E-M-E System for the month of April, 1985.

Reference: Rice Engineering Invoice # 50-0004 dated 5-20-85.

B.R. Terrell

BRT/jr

Chevron
Warren Petroleum Company
A Division of Gulf Oil Corporation
P.O. Box 1589, Tulsa, OK 74102

May 13, 1985

State of New Mexico
Energy and Minerals Department
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87501

Attn: Philip L. Baca
Environmental Engineer

Re: Monument, Saunders and Vada Discharge Plans - Information Requested for Continued Review Process

Dear Mr. Baca:

According to your request of May 3, 1985, the following information is offered so that the public notification of our subject Discharge Plans can be completed by your agency. This material was given to you by telephone on May 13, 1985.

The effluent disposal rate for our Monument Plant is 1200 barrels per day. The evaporation pond is usually dry. The brine pond contains only enough water to prevent wind damage to the liner.

For our Saunders Plant, the amount of total dissolved solids in the effluent will vary due to the fact that several sources combine to form the waste water. Waste water analyses have shown a range of total dissolved solids from 3881 ppm to 10,589 ppm.

For the Vada Plant, the amount of discharge to the API holding tanks is 15 barrels per day; the actual combined storage for the two tanks is 300 bbls. The maximum capacity of the west tank is 300 bbls; for the east tank is 210 bbls.

We are currently gathering information to answer your letter of April 1, 1985. If in the meantime, you find that you have any questions or need further information, please contact Linda Johnson or me at (918) 560-4138.

Very truly your,

L. T. Reed, Director
Environmental Affairs

STATE OF NEW MEXICO

OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

[✓] Telephone [ ] Personal	Time 8:30 am	Date 5/13/85

Originating Party	Other Parties
L. Johnson - Warren Pet. Co.	P. Baca - OCD

Subject Information requested by P. Baca in phone conversation of 5/13/85.

Discussion Ms. Johnson conveyed the following info. to me so that a Public Notice could be drafted:

~~Monument~~ Saunders Plant: TDS ranges from 3,881 to 10,589

Monument Plant: Brine Pond has water added to it to protect membrane & evap. pond is usually dry.
Effluent rate is 1200 BBL/Day.

Vada Plant: API tanks combined capacity is 300 BBL.
Effluent rate is 15 BBL/Day

Conclusions or Agreements P. Baca will prepare Public Notice for Publication.

Distribution

Signed Philip L. Baca

STATE OF NEW MEXICO

OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☑ Telephone ☐ Personal	Time 9^45 am	Date 5-3-85

Originating Party	Other Parties
P. Baca - OCD	Warren Pet. Co. - L. Johnson

ubject Advertisement information for Warren's Monument Saunders, and Vada discharge plans.

ssion I informed Ms. Johnson we needed information on the Monument ponds (lined), Saunders effluent (accurate TDS), Vada effluent rate, and Vada holding tank capacity. I also informed her on our sampling and preserving techniques for water sampling. I told her that we need to have the information requested in the OCD letter of 4-1-85 by 6-7-85.

onclusions or Agreements Ms. Johnson will phone in the information requested for the advertisement and will submit the additional requested information by June 7, 1985.

stribution

Signed Philip L. Baca

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

April 19, 1985

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

RECEIVED
APR 22 1985
OIL CONSERVATION DIVISION
SANTA FE

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 34199 Bbls of brine into the E-M-E System for the month of March, 1985.

Reference: Rice Engineering Invoice # 50-0448 dated 4-17-85.

B R Terrell jcr

BRT/jr

Gulf

A DIVISION OF GULF OIL CORPORATION

ICE Engineering Corporation

PHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

REMIT TO:
DEPT L-511P
PITTSBURGH, PA. 15264

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER: 50-0448

INVOICE DATE: 4-17-85

LD TO: 2310

WARREN PETROLEUM COMPANY
Monument, NM 88265

SHIP TO:

ORDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID

UCT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the EME SWD System for the month of March, 1985				
	Meter reading: 3-20-85 200073				
	3-01-85 165874				
	34199				
	TOTAL BARRELS	34,199			
	First 2,500 bbl.				$ 450.00
	Next 20,000 bbl.		.055		$1,100.00
	Last 11,699 bbl.		.045		$ 526.46
					$2,076.46
	TAX 4.25%				88.25
	TOTAL				$2,164.71

PLEASE REMIT TO THE FOLLOWING ADDRESS:

Rice Engineering Corporation
Dept. L-511P
Pittsburgh, PA 15264

90% DUE NET 30
10% DUE NET 40

received
4-18-85

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

TONEY ANAYA
GOVERNOR

50 YEARS
1935 - 1985

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

April 1, 1985

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Warren Petroleum Company
P.O. Box 1589
Tulsa, OK 74102

Attention: Ms. L. T. Reed

Re: Discharge Plans for Monument, Saunders, and Vada Plants

Dear Ms. Reed:

We have received your updated discharge plans dated March 1, 1985, for the Warren Petroleum Co. Monument, Saunders, and Vada gas processing plants. To continue with the review process, we must request the following information:

A. Information needed for the Monument, Saunders, and Vada Plants:

1. The Chemical analysis of the effluent streams for all three plants lacked an analysis for several constituents. Please obtain water samples of the effluent stream for each plant and have them analyzed for phenols, aluminum(Al), boron (B), molybdenum (Mo), nickel (Ni), arsenic (As), cadmium (Cd), benzene, toluene, and meta-, ortho-, and para-xylenes. In a phone conversation with Ms. L. Johnson on 3/22/85, it was indicated that Warren Petroleum Co. had been quoted a price of $1,000 per plant for an analysis for benzene, toluene, and the xylenes. This price seems to be very high as prices generally range from $75-$100 per sample for the same scan using gas chromatograph analysis (this price range is based upon our own experience with the State Laboratory and with private laboratories). The analysis for Al, B, Mo, Ni, As, and Cd can probably all be done with one ICAP Scan. The

analysis for phenols can be done by colorimetric /distillation methods. The water analysis submitted with the discharge plan had a specific conductance with a value smaller than the value for the total dissolved solids for each plant. Please comment as this is an unusual phenomenon. Please describe the method used for collecting the samples and indicate whether or not the samples were filtered and/or acidified.

2. The following questions pertain to the Spill Prevention Control Countermeasure Plan, Part II, Alternate A:

a. In Sections C.1. a & b you indicate that buried pipelines are wrapped, coated, and cathodically protected to reduce corrosion. Please submit a drawing showing all buried pipelines and the location of the sacrificial anodes used for cathodic protection. Please submit information on the materials of construction for the pipe and sacrificial anodes. Also state the nature of the wrapping material and pipe coating. How old are the buried pipelines?

b. In Section D.3 you state that the products loaded and unloaded at the facilities are gaseous at atomospheric conditions. What about the gasoline tanks at the Monument plant and the condensate tanks at the Saunders and Vada plants? Have "flash evaporation" calculations been made for these fluids to prove immediate vaporization? Are "quick disconnect" fittings (e.g., Kanvalok or Snap-tite) used on transfer lines to minimize spills from delivery lines?

3. Appendix D gives a good process description of the gas processing industry. Please indicate the methods used for the three N.M. plants in question. If a molecular sieve dehydration system is used, please indicate the frequency and disposal methods used for replacing the spent dessicant, and the type of dessicant used.

B. Information need for the Monument Plant:

1. The following questions pertain to the Spill Prevention and Countermeasure Plan, Part II, Alternate A included in Appendix C.

a. When a vacuum truck picks up water from diked areas, where is the water disposed of? Where is the pure rainwater drained to? (Ref. Section A.1 and A.3)

b. In Section B.3, you indicate that tanks are externally inspected for rust, corrosion, and leaks. What is the frequency of such an inspection and what is the method of inspection? Please comment on the possibility of checking for internal corrosion (e.g., using ultrasonics) for tanks that contain corrosive substances.

2. The schematic of the wastewater system for the Monument plant included in Part V of the Spill Prevention and Countermeasure Plan is a bit confusing. Please clarify the schematic by submitting the following information:

a. Indicate the flow path directions; I believe the drawings for the pumps near items 14B and 15 are backwards.

b. Label normally open and normally closed valves.

c. Include any paths that deposit effluent in the slop oil tanks; e.g., from skimmers 14A and 2.

d. Locate any check valves that are in the system to prevent backflow.

3. Does any sludge accumulate in the skimmers? If so, how and where is it disposed of?

4. Provide information on the lining materials used for the evaporation pit.

5. Please locate the evaporation and brine pits on the plot plan for the Monument plant included in Appendix G. Your discharge plan infers that both pits are generally dry, is this a correct assumption?

6. What is the capacity of the sump to which all the effluent flows prior to being pumped to the injection well? Provide pump specifications for the pump used to transport effluent to the injection well; a pump curve with the operating point indicated will be sufficient.

7. What is the minimum freeboard allowed in the evaporation and brine pits?

C. Information needed for the Saunders Plant:

1. The chemical analysis for the effluent submitted with this discharge plan varies significantly with the analysis submitted with your injection well application (SWD-255). The analysis for the discharge plan and injection well application are attached for your inspection. Have any process changes been made that would explain such a change?

2. At what pressure is the condensate held in the storage tank? What are the major constituents of the condensate?

3. The following questions concern Part II, Alternate A of your Spill Pervention Control and Countermeasure Plan:

a. Section A.2 indicates that oil and water are separated in the storage tank. Does any sludge accumulate in this tank, and if so, how and where is it disposed of?

b. In Section B.3 you state that no internal tank inspections are made since no corrosive products are stored; however, the effluent wastewater is probably mildly corrosive (on the order of 0.01 in./yr. for steel) and the acid is most definitely corrosive. Please comment on the possibility of a routine check for internal corrosion (e.g., using ultrasonic methods) on the wastewater and acid storage tanks. What type of acid is stored and what is its concentration?

c. Section D.3. states that products loaded/unloaded will vaporize at atmospheric pressure. Does the condensate tank ever unload its contents to a carrier? What is the method of unloading? Are hoses with "quick disconnect" fittings (e.g., "Kanvalok" or "Snaptite") used to help prevent spills from the delivery hose?

4. Is the average discharge rate from the plant still 450 barrels/day? How was this measured?

D. Information needed for the Vada plant:

1. Is the condensate at this plant similar in nature to the condensate at the Saunder plant?

2. The following questions pertain to Part II, Alternate A of the Spill Prevention and Countermeasure Plan:

a. How is the buried tank for the generator sump checked for leaks? Please comment on the possibility of checking for internal corrosion in the scrubber oil tanks and generator sump.

b. If complete condensate vaporization can't be shown, please comment on the methods used (i.e., type of delivery hose and fittings) to prevent spills during condensate loading to a tanker truck.

3. In the wastewater system schematic included in Appendix H, does the design for the open drains (#8 on schematic) include provisions to prevent backflow onto the ground should a flow surge or plug-up occur at the main plant sump (#7 on schematic)? What is the capacity of the main plant sump pump? What is the capacity of the back-up pump? What is the plant effluent discharge rate? How was this rate measured?

4. Does any sludge accumulate in the sumps or scrubber oil tanks? If so, how is this removed and where is it disposed of?

Your cooperation in this effort is greatly appreciated. If you have any questions concerning this letter, or the discharge plan review process, please feel free to call me at (505) 827-5812.

Sincerely,

PHILIP L. BACA
Environmental Engineer

PLB/dp

Enc.

cc: R. L. Stamets, Director
J. Sexton, OCD Hobbs Office

P 505 905 918

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Warren Pet. Company	
Street and No. P.O. Box 1589	
P.O., State and ZIP Code Tulsa, OK 74102	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date	

PS Form 3800, Feb. 1982

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

March 19, 1985

RECEIVED
MAR 22 1985
OIL CONSERVATION DIVISION
SANTA FE

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

RE: Disposal Water at the Monument Plant #118

Please be advised that the Monument Plant #118 disposed 49,593 barrels of brine into the E-M-E System for the month of February, 1985.

Reference: Rice Engineering Invoice #50-0445, dated 2-28-85.

B. R. Terrell

BRT/aw
Attachment

RICE *Engineering Corporation*

TELEPHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

REMIT TO:
DEPT L-511P
PITTSBURGH, PA. 15264

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER: 50-0445

INVOICE DATE: 2-28-85

SOLD TO: 2310
Warren Petroleum Company
Monument, NM 88265

SHIP TO:

YOUR ORDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID
			NET 30	

PRODUCT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the EME SWD System for the month of February, 1985				
	Meter reading: 3-1-85 165874				
	2-1-85 116281				
	49593				
	TOTAL BARRELS	49,593			
	First 2,500 bbl				$ 450.00
	Next 20,000 bbl		.055		1,100.00
	Last 27,093 bbl		.045		1,219.19
					$2,769.19
	TAX 4.25%				117.69
	TOTAL				$2,886.88

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

February 26, 1985

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

RE: Disposal Water at the Monument Plant #118

Please be advised that the Monument Plant #118 disposed 36,400 barrels of brine into the E-M-E System for the month of January, 1985.

Reference: Rice Engineering Invoice #50-0433, dated 2-20-85.

B.R. Terrell

BRT/aw
Attachment

RICE Engineering & Operating, Inc.

CONSULTING ENGINEERS - SALT WATER DISPOSAL SPECIALISTS

TELEPHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER 50-0433

02-20-85
INVOICE DATE

SOLD TO:
2310
Warren Petroleum Co.
Monument, NM 88265

SHIP TO:

R ORDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID
			Net 30	

DUCT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the EME SWD System for the month of January, 1985				
	Meter reading: 2-1-85 116,281				
	1-1-85 79,881				
	36,400				
	Total Barrels	36,400			
	First 2500 bbl				450.00
	Next 20,000 bbl		.055		1,100.00
	Last 13,900 bbl		.045		625.50
					2,175.50
	TAX 4.25%				92.46
					2,267.96

received
2-26-85

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

January 28, 1985

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

RE: Disposal Water at the Monument Plant #118

Please be advised that the Monument Plant #118 disposed 39,283 barrels of brine into the E-M-E System for the month of December, 1984.

Reference: Rice Engineering Invoice #50-0424, dated 1-18-85.

B. R. Terrell

BRT/aw

RICE Engineering & Operating, Inc.

CONSULTING ENGINEERS - SALT WATER DISPOSAL SPECIALISTS

TELEPHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER: 50-0424

INVOICE DATE: 1-18-85

SOLD TO:
2310
Warren Petroleum Co.
Monument, NM 88265

SHIP TO:

YOUR ORDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID	
			Net 30		

PRODUCT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the EME SWD System for the month of December, 1984.				
	Meter reading: 1-1-85 79,881 12-1-84 40,598 39,283				
	Total Barrels	39,283			
	First 2500 bbl				$450.00
	Next 20,000 bbl		.055		1,100.00
	Last 16,783 bbl		.045		755.24
					$2,305.24
	TAX 4.25%				97.97
					$2,403.21

COPY

received
1-25-85

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

December 28, 1984

DEC 31 1984

RECEIVED

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 2500 Bbls of brine into the E-M-E System for the month of November, 1984.

Reference: Rice Engineering Invoice # 50-0407 dated 12-19-84.

B. R. Terrell KP

BRT/sm

Warren Petroleum Company
MANUFACTURING DEPARTMENT
P. O. Box 67
Monument, New Mexico 88265

November 27, 1984

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

RE: Disposal Water at the Monument Plant #118

Please be advised that the Monument Plant #118 disposed 8,096 Bbls. of brine into the E-M-E System for the month of October, 1984. Reference: Rice Engineering Invoice # 50-0398 dated 11-20-84.

B. R Terrell

BRT/vh

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

TONEY ANAYA
GOVERNOR

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

December 28, 1984

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Warren Petroleum Co.
P.O. Box 1589
Tulsa, OK 74102

Attention: Ms. L. T. Reed

Dear Ms. Reed:

We have received your letter dated December 17, 1984, requesting an extension to operate the Vada, Monument and Saunders gas processing plants without approved discharge plans. By your letter, we understand that the information requested by OCD will be submitted by March 1, 1985.

Pursuant to Section 3-106.A. of the New Mexico Water Quality Control Commission Regulations and for good cause shown, Warren Petroleum Co. is hereby granted its request for an extension until June 30, 1985, to operate the Vada, Monument, and Saunders gas processing plants without approved discharge plans provided that all information requested by the OCD in a letter dated November 6, 1984, and phone conversation with Ms. L. Johnson on December 21, 1984, is submitted by March 1, 1985.

It is our understanding that operations at the Snyder Ranch Plant were discontinued on July 2, 1984. Therefore, a discharge plan for the plant will not be required at this time; however, upon resumption of operations, the OCD must be notified and a discharge plan must be submitted within 120 days of resumption, unless a request for an extension is granted.

If you have any questions on this extension, or on the discharge plan process, please feel free to contact Dave Boyer or Phil Baca at (505) 827-5812.

Sincerely,

R. L. Stamets

R. L. STAMETS
Director

RLS/PB/dp

cc: OCD-Hobbs

P 505 905 792

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Attn: L. T. Reed Warren Petroleum Co.	
Street and No. P.O. Box 1589	
P.O., State and ZIP Code Tulsa, OK 74102	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date	

PS Form 3800, Feb. 1982

STATE OF NEW MEXICO

OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☑ Telephone ☐ Personal	Time 11:30	Date 12/21/84

Originating Party	Other Parties
OCD - (P. Baca)	Warren Petroleum - (Linda Johnson)

Subject D.P. For Monument, Saunders, and Vada Gas Processing Plants

Discussion Expanded information on what was needed for water analysis. Outlined what we needed from WQCC 3-103 and added ethylbenzene, p, m, o-xylenes. Told her we also needed analysis of water in brine pond.

Conclusions or Agreements

Distribution

Signed P.L. Baca

ANB

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 1589
Tulsa, Oklahoma 74102

RECEIVED
DEC 21 1984
OIL CONSERVATION DIVISION
SANTA FE

December 17, 1984

State of New Mexico
Energy and Minerals Department
Oil Conservation Division
Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attn: Philip L. Baca, Environmental Engineer

Re: Discharge Plans for Vada, Monument, Saunders, and Snyder Ranch

Dear Mr. Baca:

We are gathering the information that you requested in your letter of November 6, 1984 for the referenced discharge plans and plan to have it to you by March 1, 1985. We would appreciate your approval of this time schedule and your approval of our operating the Vada, Monument, and Saunders Gas Processing Plants without approved discharge plans until we can get this information to you.

The operation of the Snyder Ranch Plant discontinued on July 2, 1984, therefore, we will not be submitting a discharge plan for the Snyder Ranch Gas Processing Plant at this time.

We appreciate your help in compiling these plans. Please feel free to call me or Linda Johnson at (918) 560-4119 if you have any questions.

Very truly yours, 560-4138 ← Linda Johnson

LTReed

L. T. Reed, Director
Environmental Affairs

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

TONEY ANAYA
GOVERNOR

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 875C:
(505) 827-5800

December 14, 1984

Warren Petroleum Co.
P. O. Box 1589
Tulsa, Oklahoma 74102

Attention: Ms. L. T. Reed

Dear Ms. Reed:

Please find enclosed a copy of the New Mexico Water Quality Control Commission regulations as amended through November 17, 1983. Please note Section 3-106 of the regulations which outlines the time limits, time extension allowances, and information required for discharge plans.

As per our phone conversation of December 13, we look forward to receiving a request for time extensions with respect to submitting revised discharge plans and for discharging without approved discharge plans at your Monument, Saunders, Vada, and Snyder Ranch plants. If possible, please include a schedule for submitting the plans with your request for an extension.

Please feel free to call me at (505) 827-5812 if you have any questions concerning the discharge plans.

Sincerely,

Philip L. Baca

PHILIP L. BACA
Environmental Engineer

PLB/dr

enc.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

TONEY ANAYA
GOVERNOR

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

November 6, 1984

Warren Petroleum Company
P.O. Box 1589
Tulsa, Oklahoma 74102

Attention: Mr. L. T. Reed

Dear Sir:

We have received your updated discharge plans for the Warren Petroleum Company Monument, Saunders, and Vada gas processing plants. To continue with the review process, we must request the following information:

A. Information needed for the Monument, Saunders, and Vada discharge plans.

1) Topographic maps of plant sites.

2) Chemical Analysis of plant effluent stream. Should include analyis for TDS, ph, major cations/anions, heavy metals, hydrocarbons (i.e. benzene, phenols, toluene). Give a brief description of sampling technique. Indicate whether or not (and why) major fluctuations in the results can be expected.

3) Description of waste oil disposal (from equipment or process), if any.

4) Description of procedures addressing containment and clean-up in case of spills.

5) Description of inspection procedures (and frequency) for leaks in piping and equipment.

6) A brief description of the plant process; a process flow diagram would be helpful.

7) Describe site characteristics:

- Hydrologic Features: Provide the name, description, and location of any bodies of water, streams (indicate perrenial or intermittent), other water courses (arroyos, canals, drains, etc.), and ground water discharge sites (water wells, seeps, springs, swamps) within one mile of the outside perimeter of the facility. For water wells, specify use of water. Provide the depth to, and total dissolved solids concentration (in mg/l) of the ground water most likely to be affected, and direction of flow, if known. Include any sources of information or methods of deriving information.

- Geologic Description: Include soil type(s), name of aquifer(s), aquifer material (e.g. alluvium, basalt, etc.), and depth to rock at base of alluvium (if available).

- Flood Protection: Provide information on flooding potential and protection measures (curbs, berms, channels, etc.), if applicable.

B. Information needed for the Monument discharge plan only:

1) Contingency plan in the event of a shut-down at the injection well.

2) Status of old evaporation pit. Is it filled in? If not, will it ever be used as part of a contingency plan? If so, please send construction details.

3) Is overflow to brine pit allowed to evaporate, or is it pumped to the injection well during periods of low effluent flow from the production area?

4) Provide a plant layout similar to that provided in the Vada plant discharge plan.

C. Information needed for the Saunders discharge plan only:

1) Status of the retention ponds. Are they filled in, or will they be used as part of a contingency plan? If so, please send construction details.

2) Describe the contingency plan in the event of a shut-down at the Gillespie injection well.

3) Provide a schematic diagram of the waste water disposal system (similar to that submitted for the Monument plant) including process waste lines and plant drainage.

4) Provide a plant layout similar to that provided for the Vada plant discharge plan.

5) Describe the disposition, volume, and materials of construction for the four surge tanks.

6) Is there a periodic inspection of the polyethylene pipeline to the Gillespie injection well? Is there a periodic inspection of the check valve? At what depth below the lease road is the pipeline to the Gillespie well? What measures were taken to prevent fractures in the pipeline due to heavy (mass) road traffic?

D. Information needed for the Vada discharge plan only:

1) Provide a schematic diagram of the waste water disposal system (similar to that submitted for the Monument plant) including process waste lines and drainage.

2) Is the area around the API tanks curbed? Is there a level indicator for the tanks?

3) Provide the quantity of effluent discharged and method of measurement.

4) Describe sump construction; provide drawings, if available.

5) Describe a contingency plan in the event of a tank shut-down (i.e. leaks, filled to capacity, etc.) or sump pump shut-down.

Your continued cooperation in this effort will greatly expedite the review process. If you have any questions, please do not hesitate to call me at (505) 827-5812.

Sincerely,

Philip L. Baca

PHILIP L. BACA
Environmental Engineering Specialist

PLB/dp

cc: R. L. Stamets, Director
D. G. Boyer

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

October 19, 1984

RECEIVED
OCT 25 1984
OIL CONSERVATION DIVISION
SANTA FE

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 34,891 Bbls of brine into the E-M-E System for the month of September, 1984.

Reference: Rice Engineering Invoice # 50-0389 dated 10-17-84.

B. R. Terrell

B. R. Terrell

BRT/jr

ICE Engineering & Operating, Inc.

ONSULTING ENGINEERS - SALT WATER DISPOSAL SPECIALISTS

ELEPHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER 50-0389

10-17-84 INVOICE DATE

OLD TO:
2310
Warren Petroleum Co.
Monument, NM 88265

SHIP TO:

ORDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID	
			Net 30		

UCT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the EME SWD System for the month of September, 1984				
	Meter reading: 9-21-84 91,999				
	9-01-84 70,647				
	21,352	21,352			
	New Dial: 10-01-84 13,539				
	9-21-84 0				
	13,539	13,539			
	Total Barrels	34,891			
	First 2500 bbl				$ 450.00
	Next 20,000 bbl		.055		1100.00
	Last 12,391 bbl		.045		557.60
					$2107.60
	TAX 4.25%				89.57
					$2197.17

Warren Petroleum Company

MANUFACTURING DEPARTMENT

September 21, 1984

P. O. Box 67
Monument, New Mexico 88265

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 30,814 Bbls of brine into the E-M-E System for the month of August, 1984.

Reference: Rice Engineering Invoice # 50-0375 dated 9-19-84.

K A Peterson

BRT/jr

ICE Engineering & Operating, Inc.

ONSULTING ENGINEERS - SALT WATER DISPOSAL SPECIALISTS

ELEPHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER 50-0375

9-19-84 INVOICE DATE

LD TO:
2310
Warren Petroleum Company

Monument, NM 88265

SHIP TO:

ORDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID	
			Net 30		

UCT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the EME SWD System for the Month of August, 1984.				
	Total Barrels Estimated - Meter down.	30,814			
	First 2,500 bbl.				$ 450.00
	Next 20,000 bbl.		.055		1100.00
	Last 8,314 bbl.		.045		374.13
					$1924.13
	TAX 4.25%				81.78
					$2005.91

received
9-21-84

Warren Petroleum Company

MANUFACTURING DEPARTMENT

August 22, 1984

P. O. Box 67
Monument, New Mexico 88265

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 37,357 Bbls of brine into the E-M-E System for the month of July, 1984.

Reference: Rice Engineering Invoice # 50-0371 dated 8-17-84.

B. R. Jewell

BRT/jr
Attachment

ICE Engineering & Operating, Inc.

ONSULTING ENGINEERS - SALT WATER DISPOSAL SPECIALISTS

LEPHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER 50-0371

8-17-84 INVOICE DATE

LD TO:
2310
Warren Petroleum Co.
Monument, NM 88265

SHIP TO:

ORDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID	
			Net 30		

UCT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the EME SWD System for the month of July, 1984				
	Meter reading: 8-1-84 57,950				
	7-1-84 20,593				
	37 ,357	37,357			
	Total Barrels				
	First 2500 bbl				
	Next 20,000 bbl		.055		450.00
	Last 14,857 bbl		.045		668.57
					2218.57
	Tax 4.25%				94.28
					2312.85

RECEIVED
AUG 28 1984
OIL CONSERVATION DIVISION
SANTA FE

Warren Petroleum Company

MANUFACTURING DEPARTMENT

June 22, 1984

P. O. Box 67
Monument, New Mexico 88265

RECEIVED
JUN 28 1984
OIL CONSERVATION DIVISION
SANTA FE

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 51,914 Bbls of brine into the E-M-E System for the month of May, 1984.

Reference: Rice Engineering Invoice # 50-0353 dated 6-18-84.

B. R. Terrell

B. R. Terrell

BRT/jr

RICE Engineering & Operating, Inc.

CONSULTING ENGINEERS - SALT WATER DISPOSAL SPECIALISTS

TELEPHONE 316-793-5483 · 1020 HOOVER · GREAT BEND, KANSAS 67530

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER: 50-0353

INVOICE DATE: 6-18-84

SOLD TO:
2310
Warren Petroleum Co.

Monument, NM 88265

SHIP TO:

YOUR ORDER NUMBER	DATE SHIPPED	VIA:	TERMS	COLLECT / PREPAID
			Net 30	

PRODUCT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the EME SWD System for the month of May, 1984				
	Meter reading 6-1-84 107,613				
	5-1-84 55,699				
	51,914				
	First 2500 bbl				450.00
	Next 20,000 bbl		.055		1100.00
	Last 29,414 bbl		.045		1323.63
					2,873.63
	Tax				122.13
					2,995.76

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

May 22, 1984

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 39,071 Bbls of brine into the E-M-E System for the month of ~~March~~ April, 1984.

Reference: Rice Engineering Invoice # 50-0338 dated 5-17-84.

B. R. Terrell

B. R. Terrell

BRT/jr

ICE Engineering & Operating, Inc.

NSULTING ENGINEERS - SALT WATER DISPOSAL SPECIALISTS

LEPHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER: 50-0338

INVOICE DATE: 5-17-84

D TO

2310
Warren Petroleum Co.

Monument, New Mexico 88265

SHIP TO

ORDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID
			Net 30	

UCT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the EME SWD System for the month of March, 1984				
	Meter reading 5-1-84 55,699				
	4-1-84 16,628				
	39,071				
	First 2500 bbl				450.00
	Next 20,000 bbl		.055		1100.00
	Last 16,571 bbl		.045		745.70
					2295.70
	Tax				97.57
					2393.27

received

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

April 23, 1984

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 30,040 Bbls of brine into the E-M-E System for the month of March, 1984.

Reference: Rice Engineering Invoice # 50-0327 dated 4-10-84.

B. R. Terrell

BRT/jr

RECEIVED
APR 25 1984
OIL CONSERVATION DIVISION
SANTA FE

Warren Petroleum Company
MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

March 27, 1984

RECEIVED
MAR 30 1984
OIL CONSERVATION DIVISION
SANTA FE

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 27,595 Bbls of brine into the E-M-E System for the month of February, 1984.

Reference: Rice Engineering Invoice # 50-315 dated 3-10-84.

B. R. Terrell

B. R. Terrell

BRT/jr

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

February 24, 1984

RECEIVED
FEB 29 1984
OIL CONSERVATION DIVISION
SANTA FE

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 50,897 Bbls of brine into the E-M-E System for the month of January, 1984.

Reference: Rice Engineering Invoice # 50-0309 dated 2-10-84.

BRT/jr

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

January 24, 1984

RECEIVED
JAN 26 1984
OIL CONSERVATION DIVISION
SANTA FE

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 35,208 Bbls of brine into the E-M-E System for the month of December, 1983.

Reference: Rice Engineering Invoice # 50-0298 dated 1-10-84.

B. R. Terrell

B. R. Terrell

BRT/jr

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

December 28, 1983

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 29,416 Bbls of brine into the E-M-E System for the month of November, 1983.

Reference: Rice Engineering Invoice #50-0292 dated 12-10-83.

B. R. Terrell jr

B. R. Terrell

BRT/jr

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

November 22, 1983

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 55,330 Bbls of brine into the E-M-E System for the month of October, 1983.

Reference: Rice Engineering Invoice # 50-0280 dated 11-10-83.

B. R. Terrell

B. R. Terrell

BRT/jr

CE Engineering & Operating, Inc.

NSULTING ENGINEERS - SALT WATER DISPOSAL SPECIALISTS

EPHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER 50-0280

11-10-83 INVOICE DATE

TO:
2310
WARREN PETROLEUM CO.
MONUMENT, NM 88265

SHIP TO:

RDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID
			NET 30	

CT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the E-M-E SWD System for the month of October, 1983				
	Meter Reading: 11-1-83 71,348				
	10-1-83 16,018				
	55,330				
	First 2500 bbl				450.00
	Next 20,000 bbl		.055		1100.00
	Last 32,830 bbl		.045		1477.35
					3027.35
	TAX				128.66
					3156.01

Warren Petroleum Company
MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

October 21, 1983

RECEIVED
OCT 28 1983
OIL CONSERVATION DIVISION
SANTA FE

State Of New Mexico
Energy And Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118.

Please be advised that the Monument Plant #118 disposed 26,588 Bbls. of brine into the E-M-E System for the month of September, 1983.

Reference: Rice Engineering Invoice 50-0272 dated 10-10-83.

B. R. [signature]

BRT/th
Attachment

ICE Engineering & Operating, Inc.

NSULTING ENGINEERS - SALT WATER DISPOSAL SPECIALISTS

EPHONE 316-793-5483 — 1020 HOOVER — GREAT BEND, KANSAS 67530

INVOICE

CUSTOMER COPY

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER: [illegible]

INVOICE DATE: [illegible]

D TO

[illegible]

en [illegible]

SHIP TO

RDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID	
			[illegible]		

CT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the E-M-T SWD System for the month of September, 1983.				
	Meter Reading: 10-1-83 367,746 bbl				
	Meter Reading: 9-1-83 341,158 bbl				
	26,588 bbl				
	New Dial 16,018 bbl				
	42,606 bbl				
	First 2500 bbl				450.00
	Next 20,000 bbl		.055		1100.00
	Last 20,106 bbl		.045		904.77
					2454.77
	TAX				104.33
					2559.10

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

September 26th, 1983

RECEIVED
SEP 30 1983
OIL CONSERVATION DIVISION
SANTA FE

State Of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118.

Please be advised that the Monument Plant #118 disposed 14,365 Bbls. of brine into the E-M-E System for the month of August, 1983.

Reference: Rice Engineering Invoice #50-0270 dated 09-10-83.

B. R. Terrell

BRT/th

ICE Engineering & Operating, Inc.

NSULTING ENGINEERS - SALT WATER DISPOSAL SPECIALISTS

EPHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

D TO:
2310
Warren Petroleum Co.
Monument, NM 88265

SHIP TO:

INVOICE NUMBER: 50-0270

INVOICE DATE: 9-10-83

RDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID
			NET 30	

CT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the E-M-E SWD System for the month of August, 1983.				
	Meter Reading: 9-1-83 341,158 bbl				
	Meter Reading: 8-1-83 329,033 bbl				
	12,125 bbl				
	Additional Water Hauled 2,240 bbl				
	14,365				
	First 2500 bbl				450.00
	Next 11,865 bbl		.055		652.58
					1102.58
	TAX				46.86
					1149.44

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

August 22nd, 1983

RECEIVED

AUG 26 1983

EID: WATER
POLLUTION CONTROL

State Of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118.

Please be advised that the Monument Plant #118 disposed 2,988 Bbls. of brine into the E-M-E System for the month of July, 1983.

Reference: Rice Engineering Invoice #50-0253 dated 08-10-83.

B.R. Terrell

BRT/th

ΞE Engineering & Operating, Inc.

ULTING ENGINEERS - SALT WATER DISPOSAL SPECIALISTS

ONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER 50-0253

INVOICE DATE 8-10-83

D:
310
arren Petroleum Co.
onument, NM 88265

SHIP TO

ER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID	
			NET 30		

CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the E-M-E SWD System for the month of July, 1983.				
	Meter Reading: 8-1-83 329,033 bbl				
	Meter Reading: 7-1-83 326,045 bbl				
	2,988 bbl				
	First 2500 bbl				450.00
	Next 488 bbl		.055		26.84
					476.84
	Sales Tax				20.27
					497.11

Warren Petroleum Company
MANUFACTURING DEPARTMENT
P. O. Box 67
Monument, New Mexico 88265

July 19th, 1983

State Of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118.

Please be advised that the Monument Plant #118 disposed 15,994 Bbls. of brine into the E-M-E System for the month of June, 1983.

Reference: Rice Engineering Invoice #50-0243 dated 07-10-83.

B. R. Terrell
Kap

BRT/th

RICE Engineering & Operating, Inc.

CONSULTING ENGINEERS - SALT WATER DISPOSAL SPECIALISTS

TELEPHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER: 50-0243

INVOICE DATE: 7-10-83

SOLD TO:

2310
Warren Petroleum Co.
Monument, NM 88265

SHIP TO:

YOUR ORDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID
			NET 30	

PRODUCT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the E-M-E SWD System for the month of June, 1983.				
	Meter Reading: 7-1-83 326.045 bbl				
	Meter Reading: 6-1-83 310,051 bbl				
	15,994 bbl				
	First 2500 bbl				450.00
	Next 13,494 bbl		.055		742.17
					1192.17
	Sales Tax				50.67
					1242.84

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

June 17th, 1983

RECEIVED
JUN 22 1983
OIL CONSERVATION DIVISION
SANTA FE

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 37,777 Bbls of brine into the E-M-E System for the month of May, 1983.

Reference: Rice Engineering Invoice # 50-0233 dated 6-10-83.

B. R. Terrell
kof

BRT/jr

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

May 24, 1983

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Ref: DISPOSAL WATER AT THE MONUMENT PLANT #118

Please be advised that the Monument Plant #118 disposed 39,255 Bbls of brine into the E-M-E System for the month of April, 1983.

Reference: Rice Engineering Invoice # 50-0225 dated 5-10-83.

B. R. Terrell

B. R. Terrell

BRT/jr

APR 25

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

APRIL 19, 1983

RECEIVED
APR 25 1983
OIL CONSERVATION DIVISION
SANTA FE

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

RE: Disposal Water at the Monument Plant #118

Please be advised that the Monument Plant #118 disposed 45,331 Bbls. of brine into the E-M-E System for the month of March, 1983.

Reference: Rice Engineering Invoice # 50-0216 dated 4-10-83.

George W. Finch

George W. Finch

GWF/jr

Warren Petroleum Company
MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

March 18th, 1983

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

RE: Disposal Water at the Monument Plant #118

Please be advised that the Monument Plant #118 disposed 26,286 Bbls. of brine into the E-M-E System for the month of February, 1983.

Reference: Rice Engineering Invoice # 50-0206 dated 3-10-83.

George W. Finch
G. W. Finch

GWF:th

RICE Engineering & Operating, Inc.

CONSULTING ENGINEERS - SALT WATER DISPOSAL SPECIALISTS

TELEPHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

INVOICE

CUSTOMER COPY

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER: 50-0206

INVOICE DATE: 3-10-83

SOLD TO:
2310
Warren Petroleum Co.
Monument, NM 88265

SHIP TO:

YOUR ORDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID
			NLT 30	

PRODUCT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the E-M-E System for the month of February, 1983.				
	Meter Reading 3-1-83 187,688 bbl				
	Meter Reading 2-1-83 161,402 bbl				
	26,286 bbl				
	First 2500 bbl.				
	Next 20,000 bbl.		@ .055		450.00
	Last 3786 bbl.		.045		1100.00
					170.37
					1720.37
	TAX				68.81
					1789.18

RECEIVED
FEB 28 1983
OIL CONSERVATION DIVISION
SANTA FE

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

February 23rd, 1983

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

RE: Disposal Water at the Monument Plant #118

Please be advised that the Monument Plant #118 disposed 26,210 Bbls. of brine into the E-M-E System for the month of January, 1983.

Reference: Rice Engineering Invoice # 50-0199 dated 02-10-83.

George W. Finch by VC
George W. Finch

GWF/jr

RICE *Engineering & Operating, Inc.*

CONSULTING ENGINEERS - SALT WATER DISPOSAL SPECIALISTS

TELEPHONE 316-793-5483 1020 HOOVER GREAT BEND, KANSAS 67530

INVOICE

ORIGINAL

PLEASE REFER TO OUR NUMBER ON ALL CORRESPONDENCE AND REMITTANCES

INVOICE NUMBER: 50-0199

INVOICE DATE: 2-10-83

SOLD TO:
2310
Warren Petroleum Co.
Monument, NM 88265

SHIP TO:

YOUR ORDER NUMBER	DATE SHIPPED	VIA:	TERMS:	COLLECT / PREPAID
			NET 30	

PRODUCT CODE	DESCRIPTION	QUANTITY	LIST PRICE	DISCOUNT	TOTAL
	For the disposal of brine into the E-M-E System for the month of January, 1983.				
	Meter Reading 2-1-83 161,402 bbl				
	Meter Reading 1-1-83 135,192 bbl				
	26,210 bbl				
	First 2500 bbl.				450.00
	Next 20,000 bbl.		@ .055		1100.00
	Last 3710 bbl.		.045		166.95
					1716.95
	TAX				68.68
					1785.63

RECEIVED
JAN 31 1983
OIL CONSERVATION DIVISION
SANTA FE

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

January 27, 1983

State of New Mexico
Energy and Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

RE: Disposal Water at the Monument Plant #118

Please be advised that the Monument Plant #118 disposed 22,045 Bbls. of brine into the E-M-E System for the month of December, 1982.

Reference: Rice Engineering Invoice # 50-0191 dated 1-10-83.

George W. Finch
George W. Finch

GWF/jr

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

TONEY ANAYA
GOVERNOR

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

June 7, 1983

Warren Petroleum Company
P. O. Box 67
Monument, New Mexico 88265

Attention: G. W. Finch

Re: Submittal of Engineering Plans and Specifications for a Brine Storage Pond to be Built at Monument Plant No. 118, Lea County, New Mexico

Dear Sir:

The Engineering plans and specifications of the future brine storage pond to be built at Monument Plant No. 118, Lea County, New Mexico, are hereby approved. Permission for solicitation of bids and to begin construction may proceed as soon as possible.

At various phases of construction, the brine storage pond will need to be inspected by the Hobbs District Office. Please contact Mr. Jerry Sexton, Hobbs District Office Supervisor and coordinate such matters with him. The Hobbs District Office will need a set of plans and specifications for their files.

If you have any questions concerning this matter, please contact Oscar Simpson at (505) 827-5822.

Sincerely,

Joe D. Ramey

JOE D. RAMEY
Director

JDR/OS/dp

cc: Hobbs District Office

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

TONEY ANAYA
GOVERNOR

February 23, 1984

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

Warren Petroleum Company
P. O. Box 1589
Tulsa, Oklahoma 74102

Attention: Mr. J. E. Moody

Gentlemen:

I have reviewed materials submitted for discharge plans for your Monument and Saunders Gasoline Plants and find them insufficient in numerous details that will be necessary before approval can be considered. Instead of trying to list all the items necessary, I am attaching a copy of an approved discharge plan that was submitted by El Paso Natural Gas Company. This plan certainly covers all areas of operation that should be addressed in a discharge plan.

Please look this over with the idea that Warren would submit similar plans for the Monument and Saunders plants within 90 days.

I would request that you return the El Paso plan by March 15, 1984. If you would like to meet and discuss your discharge plans, let me know and we can arrange a convenient time.

Yours very truly,

JOE D. RAMEY
Director

JDR/fd

enc.

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 1589
Tulsa, Oklahoma 74102

May 25, 1984

Oil Conservation Division
Energy and Minerals Department
State of New Mexico
P. O. Box 2088
Santa Fe, New Mexico 87501

Attn: Mr. Joe E. Ramey, Director

Re: Discharge Plans for Monument, Saunders and Vada Gas Processing Plants

Dear Mr. Ramey:

This letter is to confirm our recent conversation with regard to the subject information.

Warren expects to submit further details for the Discharge Plans as you requested in your letters of February 23 and 24, 1984, on or before December 30, 1984. Sept. 30, 1984 submission date

If you have any questions or need further information, please contact Linda Johnson or me at (918) 560-4119.

Very truly yours,

L. T. Reed, Director
Environmental Affairs

LTR:am

RECEIVED
MAY 31 1984
OIL CONSERVATION DIVISION
SANTA FE

Warren Petroleum Company
MANUFACTURING DEPARTMENT
P. O. Box 67
Monument, New Mexico 88265

RECEIVED
MAY 05 1983

May 3rd, 1983

393-2823
John Fulgensi

State Of New Mexico
Energy And Minerals Department
P.O. Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Dear Mr. Simpson:

Please find attached the sieve analysis for the sand and gravel to be used in the construction of a brine pond at the Monument Plant.

If you have any questions please advise.

Sincerely,

George W. Finch

G. W. Finch
Plant Manager,
Monument Plant #118

GWF/th

Attachment

cc: J. E. Moody - Tulsa

ATL ENGINEERING SERVICES

Albuquerque Testing Laboratory, Inc.
532 Jefferson N.E. (87108)
P. O. Box 4101 (87106)
Albuquerque, New Mexico
(505) 268-4537

Caprock Sand and Gravel
P.O. Box 151
Hobbs, New Mexico 88240

ATL Lab No. 5426

Report Date: December 16, 1981

Attention: Mr. Bill J. Woolley

TEST RESULTS

PROJECT: Plant Use

Source of Material: One (1) sample of sand and one (1) sample of aggregate submitted to our laboratory on December 10, 1981.

SIEVE ANALYSIS TEST: (ASTM C-117 & C-136 - Cumulative % Passing)

Sieve Size	Aggregate	ASTM C-33* Specifications	Sand	ASTM C-33 Specifications
1"	100	95-100		
3/4"	70			
1/2"	19*	25-60		
3/8"	3		100	100
No. 4	1	0-10	94*	95-100
No. 8	1	0-5	76	80-100
No. 16			63	50-85
No. 30			46	25-60
No. 50			20	10-30
No. 100			5	2-10
No. 200			2.5	
Material Finer than No. 200 Sieve by Washing			2.3	

SAND EQUIVALENT TEST: (ASTM C-2418)

	66.7	
	67.2	
	67.9	
Average	67.4	75%, maximum

Respectfully Submitted,

ATL ENGINEERING SERVICES

*Size 57

Dale S. Decker

Dale S. Decker, P.E.

DSD/co

RECEIVED
APR 04 1983
OIL CONSERVATION DIVISION
SANTA FE

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

MARCH 30, 1983

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPT.
P. O. BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

Attention: Mr. Oscar Simpson

Ref: Brine Pond at the Monument Plant #118

Dear Mr. Simpson,

Please find enclosed the revised plans and Scope of Work for the proposed modifications to the brine pond at the Warren Petroleum Company, Monument Plant. Also enclosed are liner samples and specifications. The sieve analysis of gravel and sand will be forwarded at a later date.

If you have any questions, please advise.

George W. Finch
G. W. Finch

GWF/jr
Attachments
cc: J. E. Moody - Tulsa

"SCOPE OF WORK"

1. <u>LOCATION</u>

   A. The Brine Pit is not near any water course, lake beds, sink holes, or other depressions, thus the existing pit will be upgraded.

2. <u>DESIGN AND CONSTRUCTION</u>

   A. The existing pit is 225' X 225' X 8'. The levees are 4'6" above ground level. The pit will be drained by pumping all the brine water to Rice Engineering Company, rinsed with fresh water and again drained by pumping the water to Rice Engineering Company. The liner will then be removed and disposed of by burying near the site of the brine pit. If large amounts of salt and debris exist they will be disposed of in an approved sanitary landfill.

   B. The pond will be excavated to 9'6" below ground level as depicted in the drawings. The levees will be graded and 95% compacted with the excavated material to make the surface smooth and uniform. The existing slopes (1:3 inside and outside) of the levees will be retained. The top of the LEVEES liners will be 95% compacted with crushed caliche after the liners have been installed.

   C. The pit will be double lined and in the following sequence, 36 mil PVC liner, leakage detection system, 4" (min.) sand pad, and 75 mil fiberglass liner. All liners will be anchored in a suitable anchor ditch to be described later. A Mirafi 140N soil support will be used to prevent sand from filtering into the leak system ditch.

3. <u>LEAKAGE DETECTION SYSTEM</u>

   A. The leakage detection system will consist of 6" SCH 40 PVC pipe located in a gravel filled ditch sloping 1':100' (minimum). The ditch will be located down the center of the pit and will drain into a sump outside of the pit.

   B. The 6" SCH 40 PVC pipe will be preforated with 5/8" O.D. holes 5" on center at a 120° angle. The pipe will be set in the bottom of the ditch so that the holes are facing downward. The ditch will then be backfilled with ½" - 1" washed gravel.

C. The 6" SCH 40 PVC pipe will connect to a steel sump located outside of the pit. The sump will consist of 36" OD ERW pipe (.250"W) with a ¼" steel cap welded on the bottom. A 6" steel nipple will be welded to the side for connection to the 6" SCH 40 PVC pipe. A 6" changeover coupling will be used to join the PVC and steel pipe. The watertight cover will be constructed of ¼" steel plate. The entire outside surface of the sump will be coated with pipe dope to prevent corrision.

D. After the leakage detection system is constructed, one 4" sand pad will be spread over the bottom of the pit. A Mirafi 140N soil support will be placed between the gravel and sand to prevent sand from filtering into the ditches. The support will extend up the sides of the pond and anchor into the ditch.

4. <u>POND LINERS</u>

A. An EPA approved 36 mil minimum thickness PVC liner will be used for the bottom liner. This liner is not oil or sun resistant but will not be exposed to either medium.

B. An EPA approved 75 mil thickness fibergalss top liner will be used. This liner is sun and oil resistant.

C. The joints of both liners will be sealed according to the attached drawings.

D. The liners will be laid as evenly and wrinkle-free as possible and shall rest smoothly on the pit-bed and the inner face of the levees.

E. Both liners will anchor into the anchor ditch. The anchor ditch will be 2' from inside edge of the pit and will be 18" deep X 9" wide. The liners will extend to the bottom of the anchor ditch and 6" beyond. The ditch will be backfilled with excavated material.

KOTE LINE Inc.
713 - 465-7545 9225 Katy Freeway Suite 325 Houston, Texas 77024
915 - 563-0576 12101 East Highway 80 P.O. Box 4595 Odessa, Texas 79760

TYPICAL LAMINATE PHYSICAL PROPERTIES

"KEM-LINE" FRP LINING

PROPERTY	UNITS	VALUE
Tensile Strength	PSI	21,000
Tensile Modulus	PSI X 10^5	17
Elongation	%	5
Flexural Strength	PSI	28,000
Flexural Modulus	PSI X 10^5	10
Heat Distortion Temperature	^oF	210^o
Barcol Hardness	-	35
Normal Temperature Range	^oF	$-20^o/220^o$

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"FIBRE-LINE" FRP pond liners are fabricated with a low viscosity resilient Isophthalic Polyester resin containing Styrene Monomer. Kote-Flex resin is thixotropic and promoted for pond liner sheets where toughness, chemical resistance and flexability are required.

STANDARDS FOR SANITARY LANDFILL LINERS

(a) Permeability - The "FRP" liner is suitable for use as an impermeable barrier with a value of permeability of 1×10^{-7} cm/sec. or less.

Note: The Polyester resins are used for the manufacture of fiberglass tanks and lining of steel tanks and vessels.

(b) Resistance to Leachate - The manufacturers warranty states that the membrane is capable of preventing leachate from reaching the soil under the membrane.

(c) TYPICAL LAMINATE PHYSICAL PROPERTIES OF "FIBRE-LINE" FRP LINING

PROPERTY	UNIT	VALUE
Specific Gravity (Resin)	-	1.1
Factory & Field Seam Strength	-	Exceeds that of parent material
Thickness	Mil - Minimum Mil - Average	65 75
Glass Content	%	31
Tensile Strength ASTM - D-638	PSI	14,800
Compressive Strength ASTM - D-695	PSI	25,000
Flexural Strength ASTM - D-790	PSI	25,000
Flexural Modulus	PSI $\times 10^6$	1.0

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(c) Con't) TYPICAL LAMINATE PHYSICAL PROPERTIES OF

"FIBRE-LINE" FRP LINING

PROPERTY	UNIT	VALUE
Izod Impact ASTM - D-256	(Ft.-lbs./in). Notched Unnotched	 13.7 16.6
Barcol Harness ASTM - D-785	-	45-50
Water Absorption	24 hr., $25^{o}C$,%	.17
Elongation ASTM - D-638	%	4.0
Normal Temperature Usage Range	^{o}F	$-20^{o}/180^{o}$
Heat Distortion Point	$^{o}C/^{o}F$	$88^{o}/192^{o}$
Ultraviolet Effects With Aging By Weathermeter G-23 ASTM - D-1435	Outdoor Exposure 1 Year	Yellowing & Caulking
Oxygenated Solvents	"FIBRE-LINE" "KEM-LINE"	Poor Good
Aromatic Solvents (100% Level)	"FIBRE-LINE" "KEM-LINE"	Poor Good
Aromatic Solvents (50% or Less)	"FIBRE-LINE"	Good
Halogenate Solvents	"FIBRE-LINE" "KEM-LINE"	Poor Good
Petroleum Solvents	"FIBRE-LINE" "KEM-LINE"	Good Good
Methane Gas	"FIBRE-LINE" "KEM-LINE"	Good Good

Note: Used in Waste and Sewage plants.

General	"FIBRE-LINE" Acids (except for concentrate H_2SO_4 and HNO_3)	Good
	"KEM-LINE	Good

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(c) Con't TYPICAL LAMINATE PHYSICAL PROPERTIES OF

"FIBRE-LINE" FRP LINING

PROPERTY	UNIT	VALUE
Burial	"FIBRE-LINE"	Good
	"KEM-LINE	Good

Note: Many uses. Buried Gas Tanks, Fiberglass pipe, Fiberglass Vessels.

I certify the above information to be true and correct to the best of my knowledge.

Eileen Perlmutter
Witness

Hal K. Jarrell
Hal K. Jarrell President

POLYCOR POLYESTER RESINS

939-I-032

939-I-032 is a low viscosity, resilient isophthalic polyester resin containing styrene monomer. This resin is thøxotropic and promoted for filament winding and pit liners where toughness, chemical resistance, and flexibility is required.

TYPICAL PROPERTIES OF LIQUID RESIN

Brookfield Viscosity, 25°C., cps.	
#3 Spindle @ 60 rpm	300-500
Thixotropic Index, Minimum	2
Color	Clear
Stability, uncatalyzed in dark	
@ 25°C., Minimum, Months	3

TYPICAL CURING PROPERTIES 25°C., 1% MEKP into 100 Gram Mass

Gel Time, Minutes	10
Total Time to Peak, Minutes	17
Peak Exotherm, °C.	177

PROPERTIES OF 1/8" UNFILLED CASTING

Flexural Strength, psi.	16,000
Flexural Modulus, psi.	$.41 \times 10^6$
Tensile Strength, psi.	9,500
Barcol Hardness	40-45
Heat Distortion Temp. °C.	88
Water Absorption, 24 hrs., 25°C.,%	.2
Elongation, %	3.6

PROPERTIES OF 1/8" LAMINATE (3 Plies 1½ oz. Mat 30% glass)

Flexural Strength, psi.	24,800
Flexural Modulus, psi.	$.95 \times 10^6$
Tensile Strength, psi.	13,000
Izod Impact, Unnotched	16.6
Barcol Hardness	45-50
Water Absorption 24 hrs., 25°C.,%	.17
Flongation, %	4.0

Results obained with this data cannot be guaranteed and final determination of the suitability of any information or material for the use contemplated or the manner of use is the sole responsibility of the user.

COOK PAINT AND VARNISH COMPANY
General Offices: Kansas City, Mo — Factories: Kansas City, Detroit, Houston

MIRAFI TYPICAL PROPERTY VALUES*

PROPERTY	UNIT	TEST METHOD	140N
WEIGHT	oz/sy	ASTM D-3776-79	4.5
THICKNESS	mils	ASTM D-1777-64	60
GRAB STRENGTH	lb	ASTM D-1682-64	120
GRAB ELONGATION	%	ASTM D-1682-64	55
MODULUS (10% ELONGATION)	lb	ASTM D-1682-64	N/A
TRAPEZIOD TEAR STRENGTH	lb	ASTM D-1117-80	50
MULLEN BRUST STRENGTH	psi	ASTM D-3786-80[1]	210
PUNCTURE STRENGTH	lb	ASTM D-3787-80[2]	70
ABRASION RESISTANCE	lb	ASTM D-3884-80[3] & D-1682-64	N/A
COEF. OF PERMEABILITY,k	cm/sec	CFMC-GET-2	0.2
WATER FLOW RATE	gal/min/sf	CFMC-GET-2	225
AIR FLOW RATE	cf/min/sf	ASTM D-737	225
EQUIVALENT OPENING SIZE(EOS)	US Std. Sieve	COE CW 02215-77	100+
OPEN AREA	%	COE Method	N/A
RETENTION EFFICIENCY (Suspended Solids)	%	Virginia DOT VTM-51	N/A
SLURRY FLOW RATE	gal/min/sf	Virginia DOT VTM-51	N/A
GRADIENT RATIO	---	COE CW 02215-77	3
ULTRAVIOLET RADIATION STABILITY	%	ASTM G-26/ D-1682-64 [4]	0
ASPHALT RETENTION	oz/sf	Texas DOT Item 3099	N/A
SHRINKAGE FROM ASPHALT	%	Texas DOT Item 3099	N/A

1 Diaphragm Bursting Tester

2 Tension Testing Machine with ring clamp; steel ball replaced with a 5/16" diameter solid steel cylinder(with hemispherica tip) centered within the ring clamp.

[3] ASTM D-1682 as above after abrasion as required by ASTM D-3884 Rotary Platform, Double Head Method; rubber-base abrasive wheels equal to CS-17 "Calibrase" by Taber Instrument Co.;1kg load per wheel; 1,000 revolutions.

[4] ASTM D-1682 as above after 250 cycles in Xenon-arc weathermoeter (Type BH or Type C apparatus as described in ASTM G-26). One cycle consists of 102 minutes of light only followed by 18 minutes of light with water spray.

* The product specifications are average values. For minimum certified values contact your local Mirafi representative or the Mirafi Technical Department at 1-800-438-1855.

KOTE LINE INC.
713-463-8861 18007 Hollywell Houston Texas 77084
915 - 563-0576 12101 East Highway 80 P.O. Box 6343 Midland, Texas 79701

STANDARD SPECIFICATIONS

POLYVINYL CHLORIDE PLASTIC LININGS

I. GENERAL REQUIREMENTS

The work covered by these specifications consists of installing polyvinyl chloride (PVC) plastic linings in the water containment structures.

II. PVC MATERIALS

A. General. The materials supplied under these specifications shall be first quality products designed and manufactured specifically for the purpose of this work, and which have been satisfactorily demonstrated by prior use to be suitable and durable for such purposes.

B. Description of PVC Materials. PVC (polyvinyl chloride) plastic lining shall consist of widths of calendered PVC sheeting fabricated into large sections by means of solvent-bonded factory seams into a single piece, or into the minimum number of large pieces required to fit the facility.

1. Physical Characteristics. The PVC materials shall have the physical characteristics.

PROPERTY	SPECIFICATION LIMIT	TEST METHOD
Thickness	Specified ± 10%	
Specific Gravity	1.24 - 1.30	
Tensile Strength, psi, min.	2200	ASTM D882-B
Elongation, % min.	300%	ASTM D882-B
100% Modulus, psi	1000 - 1600	ASTM D882-B
Elmendorfer Tear, gms/mil, min.	160	ASTM 689
Graves Tear, lbs/in. min.	270	ASTM D1004
Water extraction, % max.	0.35	ASTM D1239
Volatility, % max.	0.7	ASTM D1203
Impact Cold Cract, °F	-20	ASTM 1790
Dimensional Stability, max. % (100°C-15 minutes)	5	
Outdoor Exposure, sun hours	1500	
Solvent Bonded Seam Strength, % of Tensile, min.	80%	
Resistance to Burial		Formulation shall have passed USBR Test (specially formulated for resistance to micro-biological attack)
Alkali Resistances		Passes Corps. of Eng. CRD-572-61

Color - Gray (Std.)
Factory Seals - 3/4" solvent bonded

2. PVC Polyvinyl Chloride Materials shall be manufactured from domestic virgin polyvinyl chloride resin and specifically compounded for use in hydraulic facilities. Reprocessed material shall not be used.

III. FACTORY FABRICATION

Individual widths of PVC materials shall be fabricated into large sections by solvent bonding into a single piece, or into the minimum number of pieces, up to 100 feet wide, as required to fit the facility. Lap joints with a minimum joint width of 3/4 inch shall be used. After fabrication, the lining shall be accordion folded in both directions and packaged for minimum handling in the field.

IV. PLACING OF PVC LINING

A. General. The PVC lining shall be placed over the prepared surfaces to be lined in such a manner as to assure minimum handling. It shall be sealed to all concrete structures and other openings through the lining in accordance with details shown on drawings. The lining shall be closely fitted and sealed around inlets, outlets, and other projections through the lining. Any portion of lining damaged during installation by any cause shall be removed or repaired by using an additional piece of lining as specified hereinafter.

1. Field Joints. Lap joints of the same kind as used in the factory shall be used to seal factory-fabricated pieces of PVC together in the field. Lap joints shall be formed by lapping the edges of pieces a minimum of two inches. The contact surfaces of the pieces shall be wiped clean to remove all dirt, dust, moisture, or other foreign materials. Sufficient vinyl-to-vinyl bonding solvent shall be applied to both contact surfaces in the joint area and the two surfaces pressed together immediately. Any wrinkles shall be smoothed out.

2. Joints to Structures. All curing compounds and coatings shall be completely removed from the joint area. Joining of PVC to concrete shall be made with vinyl-to-concrete adhesive. The minimum width of concrete shelf provided for the cemented joint shall be eight inches, and batten strips shall be used to reinforce the adhesive bond.

3. Repairs to PVC. Any necessary repairs to the PVC shall be patched with the lining material itself and vinyl-to-vinyl bonding solvent.

4. Quality of Workmanship. 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 be replaced or covered and sealed with an additional layer of PVC of the proper size.

Warren Petroleum Company
MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

December 29, 1982

State of New Mexico
Energy and Minerals Department
P. O. Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Dear Mr. Simpson,

The following summarizes the progress made on the brine pond at the Warren Petroleum Company, Monument Plant. As per your phone call on December 20, 1982, the plans mailed to you on November 11th are being revised. These revised plans and specifications should be ready for you early in January, 1983. As soon as the plans are approved a contractor will be selected and the construction will begin.

If you have any questions, please advise.

George W. Finch by vc

George W. Finch

GWF/jr

cc: J. E. Moody, Tulsa

Warren Petroleum Company
MANUFACTURING DEPARTMENT

7932823

P. O. Box 67
Monument, New Mexico 88265

November 11, 1982

State of New Mexico
Energy and Minerals Department
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

RECEIVED
NOV 18 1982
OIL CONSERVATION DIVISION
SANTA FE

ATTENTION: Mr. Oscar Simpson

Re: Brine Storage Pond at the Monument Plant

Dear Mr. Simpson,

Attached are the revised plans and specifications for the construction of a new brine pond at the Warren Petroleum Company, Monument Plant. Specifications for the fiberglass and PVC liners and the Soil support media are also enclosed.

If you have any questions, comments, or recommendations please contact me.

Sincerely,

George W. Finch

George W. Finch

GWF/jr
Attachments
cc: J. E. Moody, Tulsa

"SCOPE OF WORK"

1. LOCATION

   A. The Brine Pit is not near any water course, lake-beds, sink holes, or other depressions, thus the existing pit will be upgraded.

2. DESIGN AND CONSTRUCTION

   A. The existing pit is 255' X 255' X 8'. The levees are 4' 6" above ground level. The pit will be drained by pumping all the brine water to Rice Engineering Company, rinsed with fresh water and again drained by pumping the water to Rice Engineering Company. The liner will then be removed and disposed of in an environmentally acceptable manner.

   B. The pond will be excavated to 9'6" below ground level as depicted in the drawings. The levees will be upgraded and 95% compacted with the excavated material to make the surface smooth and uniform. The existing slopes (1:3 inside and outside) of the levees will be retained. The top of the liners will be 95% compacted with crushed ? caliche after the liners have been installed.

   C. The pit will be double lined and in the following sequence, 36 mil PVC liner, leakage detection system, 4" sand pad, and 75 mil fiber-glass liner. All liners will be anchored in a suitable anchor ditch to be described later. A Mirafi 140N soil support will be used to prevent sand from filtering into the leak system ditches.

3. LEAKAGE DETECTION SYSTEM

   A. The leakage detection system will consist of 4" SCH 40 PVC pipe located in a gravel filled ditch sloping 1':100' (minimum) connected to 6" SCH.40 PVC pipe located in the center of the pit sloping 1':100' (Minimum) to a sump outside of the pit.

   B. The 4" SCH.40 PVC pipe will be perforated with 5/8" O.D. holes 5" on center at a 120° angle. The pipe will be set in the bottom of the ditch so that the holes are facing downward. The ditch will then be backfilled with ½"-1" washed gravel.

C. The 6" SCH.40 PVC pipe will not be perforated. The ditch for the 6" Sch. 40 PVC pipe will be backfilled with the excavated material. Both the 4" and 6" SCH.40 PVC pipe will be joined with solvent welded couplings.

D. The 6" SCH.40 PVC pipe will connect to a steel sump located outside of the pit. The sump will consist of 36" O.D. ERW pipe (.250"W) with a ¼" steel cap welded on the bottom. A 6" steel nipple will be welded to the side for connection to the 6" SCH.40 PVC pipe. A 6" changeover coupling will be used to join the PVC and steel pipe. The watertight cover will be constructed of ¼" steel plate. The entire outside surface of the sump will be coated with pipe dope to prevent corrision.

E. After the leakage detection system is constructed, a 4" sand pad will be spread over the bottom of the pit. A Mirafi 140N soil support will be placed between the gravel and sand to prevent sand from filtering into the ditches. The support will extend a minimum of 2' from the edge of the ditch.

4. <u>POND LINERS</u>

A. An EPA approved 36 mil minimum thickness PVC liner will be used for the bottom liner. This liner is not oil or sun resistant but will not be exposed to either medium.

B. An EPA approved 75 mil thickness fiberglass top liner will be used. This liner is sun and oil resistant.

C. The joints of both liners will be sealed according to the attached drawings.

D. The liners will be laid as evenly and wrinkle-free as possible and shall rest smoothly on the pit-bed and the inner face of the levees,

E. Both liners will anchor into the anchor ditch. The anchor ditch will be 2' from inside edge of the pit and will be 18" deep X 9" wide. The liners will extend to the bottom of the anchor ditch and 6" beyond. The ditch will be backfilled with excavated material.

MIRAFI TYPICAL PROPERTY VALUES*

PROPERTY	UNIT	TEST METHOD	140N
WEIGHT	oz/sy	ASTM D-3776-79	4.5
THICKNESS	mils	ASTM D-1777-64	60
GRAB STRENGTH	lb	ASTM D-1682-64	120
GRAB ELONGATION	%	ASTM D-1682-64	55
MODULUS (10% ELONGATION)	lb	ASTM D-1682-64	N/A
TRAPEZIOD TEAR STRENGTH	lb	ASTM D-1117-80	50
MULLEN BRUST STRENGTH	psi	ASTM D-3786-80[1]	210
PUNCTURE STRENGTH	lb	ASTM D-3787-80[2]	70
ABRASION RESISTANCE	lb	ASTM D-3884-80[3] & D-1682-64	N/A
COEF. OF PERMEABILITY,k	cm/sec	CFMC-GET-2	0.2
WATER FLOW RATE	gal/min/sf	CFMC-GET-2	225
AIR FLOW RATE	cf/min/sf	ASTM D-737	225
EQUIVALENT OPENING SIZE(EOS)	US Std. Sieve	COE CW 02215-77	100+
OPEN AREA	%	COE Method	N/A
RETENTION EFFICIENCY (Suspended Solids)	%	Virginia DOT VTM-51	N/A
SLURRY FLOW RATE	gal/min/sf	Virginia DOT VTM-51	N/A
GRADIENT RATIO	---	COE CW 02215-77	3
ULTRAVIOLET RADIATION STABILITY	%	ASTM G-26/ D-1682-64 [4]	0
ASPHALT RETENTION	oz/sf	Texas DOT Item 3099	N/A
SHRINKAGE FROM ASPHALT	%	Texas DOT Item 3099	N/A

1 Diaphragm Bursting Tester

2 Tension Testing Machine with ring clamp; steel ball replaced with a 5/16" diameter solid steel cylinder(with hemispherical tip) centered within the ring clamp.

[3] ASTM D-1682 as above after abrasion as required by ASTM D-3884 Rotary Platform, Double Head Method; rubber-base abrasive wheels equal to CS-17 "Calibrase" by Taber Instrument Co.;1kg load per wheel; 1,000 revolutions.

[4] ASTM D-1682 as above after 250 cycles in Xenon-arc weathermoeter (Type BH or Type C apparatus as described in ASTM G-26). One cycle consists of 102 minutes of light only followed by 18 minutes of light with water spray.

* The product specifications are average values. For minimum certified values contact your local Mirafi representative or the Mirafi Technical Department at 1-800-438-1855.

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"KEM-LINE" FRP LINING

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Barcol Hardness	-	35
Normal Temperature Range	^oF	$-20^o/220^o$

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STANDARDS FOR SANITARY LANDFILL LINERS

(a) Permeability - The "FRP" liner is suitable for use as an impermeable barrier with a value of permeability of 1 X 10^{-7} cm/sec. or less.

Note: The Polyester resins are used for the manufacture of fiberglass tanks and lining of steel tanks and vessels.

(b) Resistance to Leachate - The manufacturers warranty states that the membrane is capable of preventing leachate from reaching the soil under the membrane.

(c) TYPICAL LAMINATE PHYSICAL PROPERTIES OF "FIBRE-LINE" FRP LINING

PROPERTY	UNIT	VALUE
Specific Gravity (Resin)	-	1.1
Factory & Field Seam Strength	-	Exceeds that of parent material
Thickness	Mil - Minimum Mil - Average	65 75
Glass Content	%	31
Tensile Strength ASTM - D-638	PSI	14,800
Compressive Strength ASTM - D-695	PSI	25,000
Flexural Strength ASTM - D-790	PSI	25,000
Flexural Modulus	PSI X 10^6	1.0

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(c) Con't) TYPICAL LAMINATE PHYSICAL PROPERTIES OF

"FIBRE-LINE" FRP LINING

PROPERTY	UNIT	VALUE
Izod Impact ASTM - D-256	(Ft.-lbs./in). Notched Unnotched	 13.7 16.6
Barcol Harness ASTM - D-785	-	45-50
Water Absorption	24 hr.,25^{o}C,%	.17
Elongation ASTM - D-638	%	4.0
Normal Temperature Usage Range	^{o}F	$-20^{o}/180^{o}$
Heat Distortion Point	$^{o}C/^{o}F$	$88^{o}/192^{o}$
Ultraviolet Effects With Aging By Weathermeter G-23 ASTM - D-1435	Outdoor Exposure 1 Year	Yellowing & Caulking
Oxygenated Solvents	"FIBRE-LINE" "KEM-LINE"	Poor Good
Aromatic Solvents (100% Level)	"FIBRE-LINE" "KEM-LINE"	Poor Good
Aromatic Solvents (50% or less)	"FIBRE-LINE"	Good
Halogenate Solvents	"FIBRE-LINE" "KEM-LINE"	Poor Good
Petroleum Solvents	"FIBRE-LINE" "KEM-LINE"	Good Good
Methane Gas	"FIBRE-LINE" "KEM-LINE"	Good Good
Note: Used in Waste and Sewage plants.		
General	"FIBRE-LINE" Acids (except for concentrate H_2SO_4 and HNO_3) "KEM-LINE	Good Good

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"FIBRE-LINE" FRP LINING

PROPERTY	UNIT	VALUE
Burial	"FIBRE-LINE"	Good
	"KEM-LINE	Good

Note: Many uses. Buried Gas Tanks, Fiberglass pipe, Fiberglass Vessels.

I certify the above information to be true and correct to the best of my knowledge.

Eileen Perlmutter
Witness

Hal K. Jarrell
Hal K. Jarrell President

POLYCOR POLYESTER RESINS

939-I-032

939-I-032 is a low viscosity, resilient isophthalic polyester resin containing styrene monomer. This resin is thøxotropic and promoted for filament winding and pit liners where toughness, chemical resistance, and flexibility is required.

TYPICAL PROPERTIES OF LIQUID RESIN

Brookfield Viscosity, 25°C., cps.	
#3 Spindle @ 60 rpm	300-500
Thixotropic Index, Minimum	2
Color	Clear
Stability, uncatalyzed in dark	
@ 25°C., Minimum, Months	3

TYPICAL CURING PROPERTIES 25°C., 1% MEKP into 100 Gram Mass

Gel Time, Minutes	10
Total Time to Peak, Minutes	17
Peak Exotherm, °C.	177

PROPERTIES OF 1/8" UNFILLED CASTING

Flexural Strength, psi.	16,000
Flexural Modulus, psi.	$.41 \times 10^6$
Tensile Strength, psi.	9,500
Barcol Hardness	40-45
Heat Distortion Temp. °C.	88
Water Absorption, 24 hrs., 25°C.,%	.2
Elongation, %	3.6

PROPERTIES OF 1/8" LAMINATE (3 Plies 1½ oz. Mat 30% glass)

Flexural Strength, psi.	24,800
Flexural Modulus, psi.	$.95 \times 10^6$
Tensile Strength, psi.	13,000
Izod Impact, Unnotched	16.6
Barcol Hardness	45-50
Water Absorption 24 hrs., 25°C.,%	.17
Flongation, %	4.0

Results obained with this data cannot be guaranteed and final determination of the suitability of any information or material for the use contemplated or the manner of use is the sole responsibility of the user.

COOK PAINT AND VARNISH COMPANY
General Offices: Kansas City Mo.

KOTE LINE inc.
713-463-8861 18007 Hollywell Houston Texas 77084
915-563-0576 12101 East Highway 80 P.O. Box 6343 Midland, Texas 79701

STANDARD SPECIFICATIONS

POLYVINYL CHLORIDE PLASTIC LININGS

I. GENERAL REQUIREMENTS

The work covered by these specifications consists of installing polyvinyl chloride (PVC) plastic linings in the water containment structures.

II. PVC MATERIALS

A. General. The materials supplied under these specifications shall be first quality products designed and manufactured specifically for the purpose of this work, and which have been satisfactorily demonstrated by prior use to be suitable and durable for such purposes.

B. Description of PVC Materials. PVC (polyvinyl chloride) plastic lining shall consist of widths of calendered PVC sheeting fabricated into large sections by means of solvent-bonded factory seams into a single piece, or into the minimum number of large pieces required to fit the facility.

1. Physical Characteristics. The PVC materials shall have the physical characteristics.

PROPERTY	SPECIFICATION LIMIT	TEST METHOD
Thickness	Specified $\pm$ 10%	
Specific Gravity	1.24 - 1.30	
Tensile Strength, psi, min.	2200	ASTM D882-B
Elongation, % min.	300%	ASTM D882-B
100% Modulus, psi	1000 - 1600	ASTM D882-B
Elmendorfer Tear, gms/mil, min.	160	ASTM 689
Graves Tear, lbs/in. min.	270	ASTM D1004
Water extraction, % max.	0.35	ASTM D1239
Volatility, % max.	0.7	ASTM D1203
Impact Cold Cract, ^{o}F	-20	ASTM 1790
Dimensional Stability, max. % (100^{o}C-15 minutes)	5	
Outdoor Exposure, sun hours	1500	
Solvent Bonded Seam Strength, % of Tensile, min.	80%	
Resistance to Burial		Formulation shall have passed USBR Test (specially formulated for resistance to micro-biological attack)
Alkali Resistances		Passes Corps. of Eng. CRD-572-61

Color - Gray (Std.)
Factory Seals - 3/4" solvent bonded

2. PVC Polyvinyl Chloride Materials shall be manufactured from domestic virgin polyvinyl chloride resin and specifically compounded for use in hydraulic facilities. Reprocessed material shall not be used.

III. FACTORY FABRICATION

Individual widths of PVC materials shall be fabricated into large sections by solvent bonding into a single piece, or into the minimum number of pieces, up to 100 feet wide, as required to fit the facility. Lap joints with a minimum joint width of 3/4 inch shall be used. After fabrication, the lining shall be accordion folded in both directions and packaged for minimum handling in the field.

IV. PLACING OF PVC LINING

A. General. The PVC lining shall be placed over the prepared surfaces to be lined in such a manner as to assure minimum handling. It shall be sealed to all concrete structures and other openings through the lining in accordance with details shown on drawings. The lining shall be closely fitted and sealed around inlets, outlets, and other projections through the lining. Any portion of lining damaged during installation by any cause shall be removed or repaired by using an additional piece of lining as specified hereinafter.

1. Field Joints. Lap joints of the same kind as used in the factory shall be used to seal factory-fabricated pieces of PVC together in the field. Lap joints shall be formed by lapping the edges of pieces a minimum of two inches. The contact surfaces of the pieces shall be wiped clean to remove all dirt, dust, moisture, or other foreign materials. Sufficient vinyl-to-vinyl bonding solvent shall be applied to both contact surfaces in the joint area and the two surfaces pressed together immediately. Any wrinkles shall be smoothed out.

2. Joints to Structures. All curing compounds and coatings shall be completely removed from the joint area. Joining of PVC to concrete shall be made with vinyl-to-concrete adhesive. The minimum width of concrete shelf provided for the cemented joint shall be eight inches, and batten strips shall be used to reinforce the adhesive bond.

3. Repairs to PVC. Any necessary repairs to the PVC shall be patched with the lining material itself and vinyl-to-vinyl bonding solvent.

4. Quality of Workmanship. 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 be replaced or covered and sealed with an additional layer of PVC of the proper size.

Warren Petroleum Company

MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

October 19th, 1982

State Of New Mexico
Energy And Minerals Department
Director Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

OCT 21 1982
OIL CONSERVATION DIVISION
SANTA FE

Attention: Mr. Oscar Simpson

RE: Brine Storage Pond At The Monument Plant.

Dear Mr. Simpson:

The following summarizes the progress made toward construction of an acceptable Brine Pond at the Warren Petroleum Company, Monument Plant. As of September 9, 1982 the capital expenditure for this project was approved. We received notification of this about ten days later. Currently we are working on revised plans and specifications for the Pond as per your letter dated September 17, 1982. The revisions should be ready for your approval November 1, 1982. If you have any questions or recommendations please contact me.

Sincerely,

George W. Finch

G. W. Finch
Warren Petroleum Company
Monument Plant

GWF:th

Gulf

A DIVISION OF GULF OIL CORPORATION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

September 17, 1982

Warren Petroleum Company
P.O. Box 67
Monument, NM 88265

ATTENTION: G. W. Finch

RE: Review of Plans and Specifications on Relining WPC Brine Pit

Dear Sir:

I have reviewed your preliminary plans and specifications submitted for your brine pond construction at Warren Petroleum Company's Monument Plant as submitted with your letter of August 16, 1982.

The following comments in regard to this submittal will need to be promptly addressed:

1. Item - 2B - Give Specifications on the gradation of the caliche to be used, the thickness of the caliche, and the degree of compaction. Show placement of caliche on plans.

2. Item - 2D - What medium or material will be placed between the top liner and bottom liner for structual support and also to transmit possible leakage to the collection system. The bottom liner will have to be extended to the top of all the sides of the levees and anchored in an appropriate manner. Submit detailed specifications, construction and fabrication details on the leak-detection system.

3. Item - 2E - The OCD will not permit the use of the asphalt liner for a bottom liner. It is not structurally suitable as a liner. Submit specifications on the fiberglass liner with detailed fabrication and construction details.

4. Item - 2F - Submit specifications on regrading and compaction, especially the degree of compaction.

5. Item - 2G - Submit detailed drawings illustrating your trench and anchor techniques to be used with explicit instructions and explanations.

6. Item - 3A - Submit specifications, construction and fabrication details on leak-detection system. Illustrate onset of plans.

7. Item - 3B - The leak detection system shall have a slope at least 6" per 50 feet on all footage of the collection system, even up to the sump. Submit detailed drawings and specifications on materials to be used including the sump.

8. Submit a detailed set of plans with specifications on construction and materials. Plans shall be of scale 1" =30'

9. Submit an outline for disposal for the salts and debris in the old pit.

I am attaching 2 sets of plans that El Paso used at Jal #4 Plant. Please follow the same type of format to illustrate your construction of the brine pond.

If you have any questions concerning this matter, please call me at (505) 827-2534.

Sincerely,

Oscar Simpson

Oscar Simpson
Water Resource Specialist

OS/dp

Enc.

Warren Petroleum Company
MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

September 15, 1982

State of New Mexico
Energy and Minerals Department
Oil Conservation Division
P. O. Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

RECEIVED
SEP 20 1982
OIL CONSERVATION DIVISION
SANTA FE

Attention: Mr. Oscar Simpson

Ref: Brine Storage Pond at the Monument Plant

Dear Mr. Simpson,

The following summarizes the progress made toward construction of a new brine pond at the Warren Petroleum Company, Monument Plant. On August 16, 1982 an A.F.E. was submitted to Warren Management for approval. An approved A.F.E. (Authority for Expenditure) is necessary in order for capitol money to be available to complete this project. As you are aware, on August 16, 1982 the plans and specifications for the brine pond were sent to you for review. We are currently awaiting your recommendations.

Sincerely,

George W. Finch
G. W. Finch

GWF/jr
cc: R. H. Brotherton
J. E. Moody

WARREN PETROLEUM COMPANY

MANUFACTURING — ENGINEERING

TULSA, OKLAHOMA

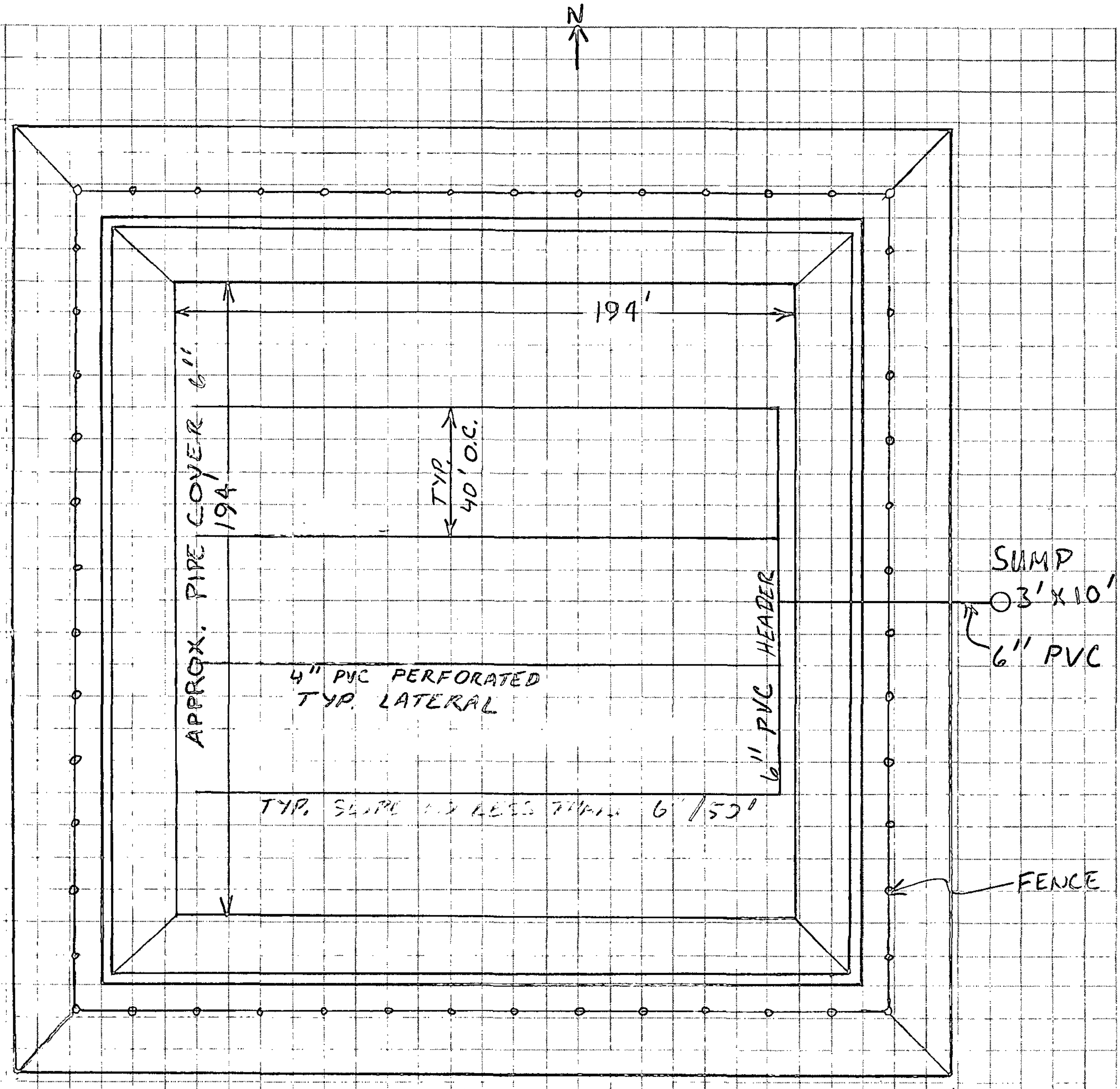
DATE Aug. 13, 19 9[illegible]

JOB NO. ______

AFE ______

BY [illegible] CHECK ______

JOB: TOP VIEW OF BRINE PIT



GULF 80773

SHEET ______ OF ______

WARREN PETROLEUM COMPANY

MANUFACTURING — ENGINEERING

TULSA, OKLAHOMA

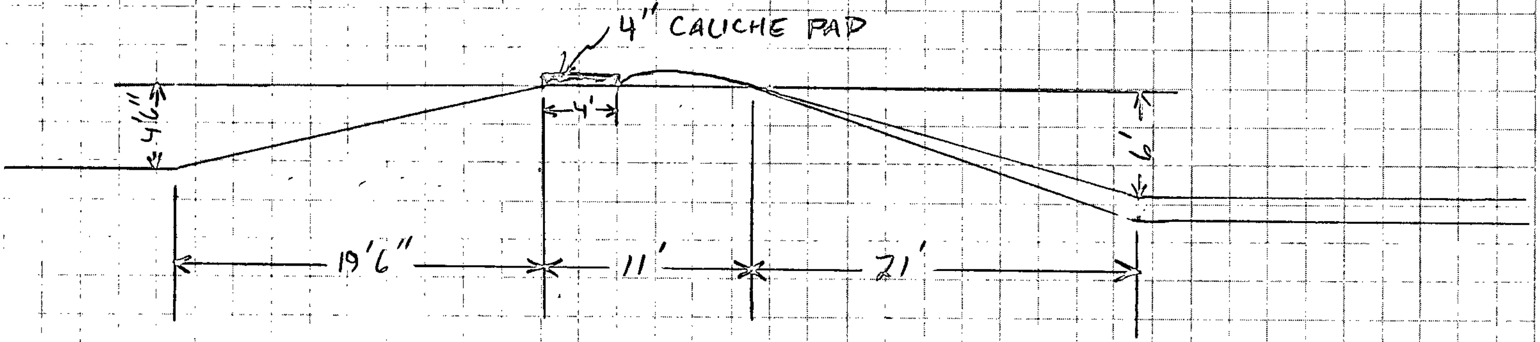
DATE Aug. 13 ,19 82

JOB NO. ______

AFE ______

BY AMF CHECK ______

JOB: END VIEW OF LEVEE



GULF 80773

SHEET ______ OF ______

Warren Petroleum Company
MANUFACTURING DEPARTMENT

P. O. Box 67
Monument, New Mexico 88265

August 16, 1982

RECEIVED
AUG 19 1982
OIL C... ION DIVISION
...A FE

State of New Mexico
Energy and Minerals Department
Oil Conservation Division
P. O. Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Oscar Simpson

Re: BRINE STORAGE POND AT THE MONUMENT PLANT

Dear Mr. Simpson,

This letter is to inform you that Warren Petroleum Company intends to comply with Rule 703 of the Rules and Regulations of the New Mexico Oil Conservation Division and Section 3-104 of the Water Quality Control Commission Regulations. Thus, as per your letter dated August 6, 1982, plans and specifications for re-lining the brine pit are enclosed.

If you have any questions, comments, or recommendations, feel free to call me at (505) 393-2823.

Sincerely,

George W. Finch
G. W. FINCH

GWF/jr

cc: R. H. Brotherton
J. E. Moody

The following is a proposed Scope of Work for the upgrade of the brine pit at the Warren Petroleum Company, Monument Plant. Storage will be rpovided for approximately 2,000,000 Gal. of 10 lb. brine. Please refer to the attached drawings when reviewing this Scope of Work.

SCOPE OF WORK

1. LOCATION
   A. The brine pit is not near any water course, lake-beds, sink-holes, or other depressions, thus the existing pit will be upgraded.

2. DESIGN AND CONSTRUCTION
   A. The pit is approximately 245' X 245' X 7'. The levees are over 4' above ground level. The upper pit liner will be approximately 6' below the ground level.
   B. The levees will be compacted with caliche to make the surface smooth and uniform.
   C. The top of the levees will be flat and level and at least 10' wide. A 4" thick caliche pad will be constructed over the top of the levee and around the entire perimeter of the pit.
   D. The pit will be double lined and in the following sequence: liner, leakage detection system, liner. The bottom liner will extend a minimum of 3' up the side of the levees.
   E. The existing liner will be repaired and used for the bottom liner. The top liner will be fiberglass 75 mil average thickness. Both liners are resistant to hydrocarbons, salt and aqueous acids and alkalis. They are also sun, rot, and fungus resistant.
   F. The bed of the pit and the inside grades of the levee will be smooth and compacted, and free of holes, rocks, stumps, clods, or any other debris which might rupture the liner.
   G. A trench will be dug on the top of the levee the entire perimeter of the pit for the purpose of anchoring the top liner. This trench will be located a minimum of 18" from the slope break and will be a minimum of 18" deep.

3. LEAKAGE DETECTION SYSTEM
   A. The leakage detection system will be built on top of the first liner and will be inspected and approved by the Oil Conservation Commission prior to installation of the final liner. The 4"

3. <u>LEAK DETECTION SYSTEM (Cont'd)</u>

perforated pipe will be 40' on center, so that no point is more than 20' from a drainage canal.

B. The leakage detection system will consist of perforated pipe sloped 1':100' (minimum) connected into a common header located at the outer perimeter of the pit. The header will connect into steel sump located on the outside perimeter of the levees. The perforated pipe will be 4" PVC and the insdie dimensions of the sump are 3' diameter X 18' tall. The header will be 6" PVC pipe.

4. <u>INSTALLATION OF FLEXIBLE MEMBRANE LINERS</u>

A. The liner will be put in place only after the pit-bed leakage detection system, and levee walls have been inspected and approved by an <u>Oil Conservation Commission Representative</u>.

B. The pit liner shall be installed and joints sealed according to the manufacturer's specifications and with the approval of the <u>Oil Conservation Commission Representative</u>.

C. The liner shall be laid as evenly and wrinkle-free as possible and shall rest smoothly on the pit-bed and the inner face of the levees, and shall be of sufficient size to extend down to the bottom of the anchor trench.

D. The fiberglass top liner will anchor past the asphalt liner.

5. <u>FENCES AND SIGNS</u>

A. The existing fence will be repaired where necessary.

B. A sign not less than 12" X 24" with lettering of not less than two inches shall be posted in a conspicuous place on the fence surrounding the brine pit installation. The sign will be maintained in legible condition and will identify the operator (WARREN PETROLEUM CO.) of the brine pit, the location of the system by quarter-quarter section, township and range, and the permit number of the permit authorizing the installation.

STATE OF NEW MEXICO

ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

August 6, 1982

Warren Petroleum Company
P.O. Box 67
Monument, NM 88265

ATTENTION: Mr. John Fulgenzi

RE: Brine Storage Pond
at Monument Plant

Dear Mr. Fulgenzi:

During the summer of 1981, the Oil Conservation Division (OCD) personnel made an inspection of Warren's Monument Plant in relation to Warren Petroleum Company's application for a discharge plan for this plant. One point of contention to receiving the discharge plan was that Warren would have to re-line their brine pond. The inspection of the brine pond revealed that the old asphalt liner had numerous cracks ranging from one to four inches wide throughout the liner, allowing leakage of brine water to escape and contaminate ground water in the area.

Subsequent telephone conversations concerning this matter since the inspection resulted in our request for Warren to submit plans and specifications for a double-lined brine pond. This request was based on Warren's construction requests and the permeability of the underlying soil.

As of this date, the OCD has not received any plans and specifications for the brine pond. The OCD has been patient with Warren in trying to resolve this matter and cannot allow on-going pollution to continue any longer. Therefore, Warren Petroleum Company is requested to submit to the Oil Conservation Division plans and specifications for our review and comment for the brine pond at your Monument Plant within 30 days from the date of this letter.

Within 6 months from the date of this letter, Warren shall have re-lined the brine pond to OCD's specifications and permitting procedures or it will cease operations of the brine pond and associated appurtenances. You are hereby notified that you are in violation of Rule 703 of the Rules and Regulations of the New Mexico Oil Conservation Division and Section 3-104 of the Water Quality Control Commission regulations. Warren shall also submit monthly progress reports summarizing the progress made toward meeting the above requirements.

Under the provisions of the New Mexico Oil and Gas Act (Section 70-2-31) and the New Mexico Water Quality Act (Section 74-6-10) violations of these Acts are punishable by civil penalties of up to $1,000 per day for each day of each violation.

The Oil Conservation Division will grant a 6 month variance to these violations if Warren agrees to comply with the above requirements. I have received and enclosed some plans and specifications from Phillips Petroleum on the design of brine storage facilities that may interest you. You are in no way obligated to use the plans and specifications. These plans, so far, are the most cost effective to use on the design for brine storage facilities.

If you have any questions regarding this matter, please call met at (505) 827-2534.

Sincerely,

Oscar Simpson

Oscar Simpson
Water Resource Specialist

OS/dp

Enc.

Warren Petroleum Company

MANUFACTURING DEPARTMENT

July 28, 1981

P. O. Box 1589
Tulsa, Oklahoma 74102

State of New Mexico
Energy and Minerals Department
Oil Conservation Division
P. O. Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Joe D. Ramey,
Division Director

Re: Discharge Plans
Monument Plant

Dear Mr. Ramey:

Warren Petroleum Company, a division of Gulf Oil Corporation, is submitting the following formal waste water discharge plan for the Monument Gas Processing Plant, located in Section 1, Township 20S, Range 31E and Section 36, Township 19S, Range 36E, in Lea County, New Mexico.

The liquid waste from the plant includes general plant run-off, cooling tower blowdown, brine from the zeolite softener, boiler blowdown, inlet scrubber water, compressor (interstage scrubbers) condensate water, and water from the H_2S scrubber are disposed of by using a lined evaporation pond, located in the Northwest Corner of the plant.

The evaporation pond was previously approved by the New Mexico Oil Conservation Commission on September 13, 1977 with the condition that it comply with the NMOCC "Specifications for the Design and Construction of lined Evaporation Pits" with the following exceptions:

1. There would be less than 600 square feet of evaporative surface per barrel per day of water placed in the pit.

2. The excavation would be more than six inches deep in some places.

The evaporation pond has a leak detection drainage system which is spaced such that no point in the pond would be more than 20 ft. from the drainage grid.

The amount of waste water generated at the plant is approximately 30,000 barrels per month. Due to the lack of the evaporative surface needed to dispose of this quantity of water, we maintain a disposal contract with an injection well firm to get rid of all excess waste water. The injection well, designated Rice EMEI 1, is located in Section 1, Township 20S, Range 36E in Lea County, New Mexico.

REPORT TO: Water Pollution Control Section
Environmental Improvement Division
Health & Environment Department
P. O. Box 968 - Crown Building
Santa Fe, NM 87503
ATTENTION: Boyer

LAB NUMBER: ___

DATE RECEIVED 7/22/81

DATE REPORTED 11/24/81 MJ
Initials

Warren Pet EID AN&OF

WATER OR WASTEWATER ANALYSES-ENERGY DEVELOPMENT MONITORING PROGRAM

Sample Location 8107160925 Warren Pond

Lat/Long ° ' " ; ° ' " T ___ R ___ S ___

Station/Well Code ___ NPDES No ___ Outfall No ___

Collected ___ (Date) ___ (Time) By Boyer/Hicks (Name) WPCB (Unit)

Pumping Conditions ___

Water Level ___ pH (00400) 8.0

Staff Gage Height ___ Conductivity (Uncorrected) 33,0000 µmho

Control Structure ___

Water Temp (00010) ___ °C

Discharge ___

Sample Type ___ Conductivity at 25°C (00094) ___ µmho

METAL ANALYSES

From NF, A-HNO$_3$ sample:		Date Analyzed	From F, A-HNO$_3$ sample:		Date Analyzed
☒ Arsenic, total	301. µg/l	8/27/81	☐ Arsenic, dissolved	µg/l	
☒ Barium, total	300. µg/l	8/5/81	☐ Barium, dissolved	µg/l	
☒ Cadmium, total	1.0 µg/l	9/8/81	☐ Cadmium, dissolved	µg/l	
☒ Lead, total	22.0 µg/l	11/10/81	☐ Lead, dissolved	µg/l	
☐ Molybdenum, tot	µg/l		☐ Molybdenum, diss	µg/l	
☐ Selenium, total	µg/l		☐ Selenium, diss	µg/l	
☐ Uranium, total	µg/l		☐ Uranium, diss	µg/l	
☐ Vanadium, total	µg/l		☐ Vanadium, diss	µg/l	
☐ Zinc, total	µg/l		☐ Zinc, dissolved	µg/l	

Remarks ☒ Chromate (total Cr): 360. µg/l 7/28/81
☒ Copper: 286. µg/l 7/29/81

This form accompanies 1 sample(s) marked as follows to indicate field treatment (circle):
NF, A-HNO$_3$: Whole sample; acidified with 5 ml conc HNO$_3$/l
F, A-HNO$_3$: Filtered sample (0.45 µ membrane filter); acidified with 5 ml conc HNO$_3$/l

Environmental improvement Division
Health & Environment Department
P. O. Box 968 - Crown Building
Santa Fe, NM 87503
ATTENTION: Boyer

DATE RECEIVED 7-22-81

DATE REPORTED ________ Initials

WATER OR WASTEWATER ANALYSES-ENERGY DEVELOPMENT MONITORING PROGRAM

Sample Location 8107160911 Warren pipe

Lat/Long ° ' " ; ° ' " T ____ R ____ S ____

Station/Well Code ________ NPDES No ________ Outfall No ________

Collected 8107160911 By Hicks / Boyer WPCB
Date Time Name Unit

Pumping Conditions ________

Water Level ________ pH (00400) 9.0

Staff Gage Height ________ Conductivity (Uncorrected) 1800 µmho

Control Structure ________ Water Temp (00010) 30° °C

Discharge ________

Sample Type ________ Conductivity at 25°C (00094) ________ µmho

METAL ANALYSES

From NF, A-HNO$_3$ sample:		Date Analyzed	From F, A-HNO$_3$ sample:		Date Analyzed
☒ Arsenic, total	18.0 µg/l	8/27/81	☐ Arsenic, dissolved	µg/l	
☒ Barium, total	200 µg/l	8/5/81	☐ Barium, dissolved	µg/l	
☒ Cadmium, total	<1.0 µg/l	9/8/81	☐ Cadmium, dissolved	µg/l	
☒ Lead, total	<5.0 µg/l	11/10/81	☐ Lead, dissolved	µg/l	
☒ ~~Molybdenum, tot~~	µg/l		☐ Molybdenum, diss	µg/l	
☐ Selenium, total	µg/l		☐ Selenium, diss	µg/l	
☐ Uranium, total	µg/l		☐ Uranium, diss	µg/l	
☐ Vanadium, total	µg/l		☐ Vanadium, diss	µg/l	
☐ Zinc, total	µg/l		☐ Zinc, dissolved	µg/l	

Remarks ☒ Chromate (as total Cr) : 35. µg/l 7/28/81
☒ Copper : <50 µg/l 7/27/81

This form accompanies 1 sample(s) marked as follows to indicate field treatment (circle):

NF, A-HNO$_3$: Whole sample; acidified with 5 ml conc HNO$_3$/l

F, A-HNO$_3$: Filtered sample (0.45µ membrane filter); acidified with 5 ml conc HNO$_3$/l

Environmental Improvement Division
Health & Environment Department
P. O. Box 968 - Crown Building
Santa Fe, NM 87503
ATTENTION: Dave Boyer

DATE RECEIVED 7-22-81

DATE REPORTED ______ Initials

WATER OR WASTEWATER ANALYSES-ENERGY DEVELOPMENT MONITORING PROGRAM

Sample Location 81071511150 Monument Draw
BYRD - Beard well

Lat/Long ° ' "; ° ' " T ___ R ___ S ___

Station/Well Code ______ NPDES No ______ Outfall No ______

Collected ______ By ______
Date Time Name Unit

Pumping Conditions ______

Water Level ______ pH (00400) 7.3

Staff Gage Height ______ Conductivity (Uncorrected) 5700 µmho

Control Structure ______ Water Temp (00010) 21° °C

Discharge ______

Sample Type ______ Conductivity at 25°C (00094) ______ µmho

METAL ANALYSES

From NF, A-HNO_3 sample:		Date Analyzed	From F, A-HNO_3 sample:		Date Analyzed
☒ Arsenic, total	17.0 µg/l	8/27/81	☐ Arsenic, dissolved	µg/l	
☒ Barium, total	200 µg/l	8/5/81	☐ Barium, dissolved	µg/l	
☒ Cadmium, total	<1.0 µg/l	9/8/81	☐ Cadmium, dissolved	µg/l	
☒ Lead, total	<5.0 µg/l	11/10/81	☐ Lead, dissolved	µg/l	
☐ Molybdenum, tot	µg/l		☐ Molybdenum, diss	µg/l	
☐ Selenium, total	µg/l		☐ Selenium, diss	µg/l	
☐ Uranium, total	µg/l		☐ Uranium, diss	µg/l	
☐ Vanadium, total	µg/l		☐ Vanadium, diss	µg/l	
☐ Zinc, total	µg/l		☐ Zinc, dissolved	µg/l	

Remarks ☒ Copper <50µg/l 7/27/81 ☒ Chromate (total Cr): <5.0 7/29/8

This form accompanies 1 sample(s) marked as follows to indicate field treatment (circle):

NF, A-HNO_3: Whole sample; acidified with 5 ml conc HNO_3/l

F, A-HNO_3: Filtered sample (0.45µ membrane filter); acidified with 5 ml conc HNO_3/l

NM Energy and Minerals Department

July 28, 1981

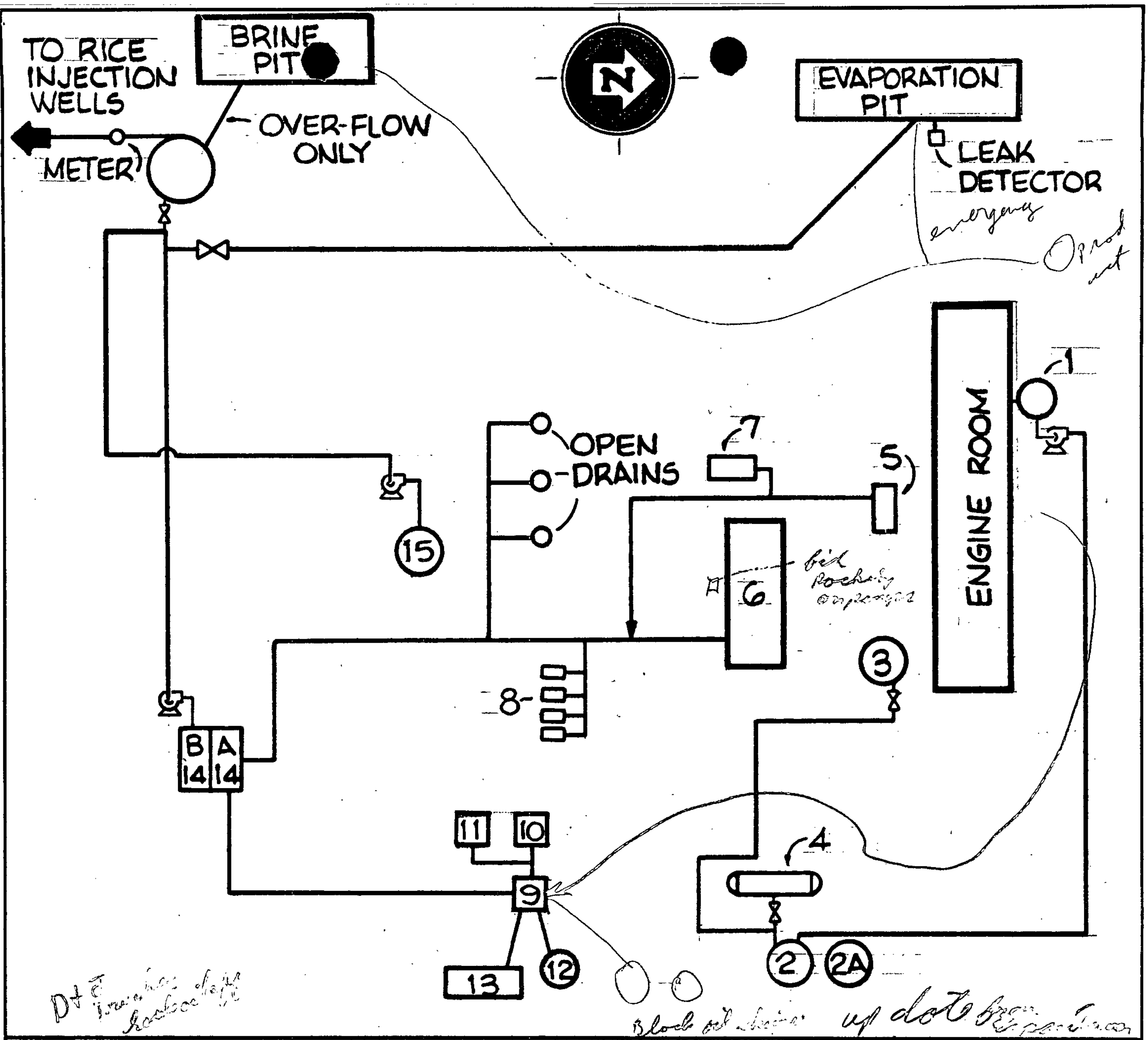
Attached is a map of the waste water system and one of the evaporation pond construction. Should you have any questions or need additional information, please call either Lynn Reed or me at (918) 560-4117.

Very truly yours,

Debra J. Johnson

for J. E. Moody, Manager
Environmental and Services

JEM:DFJ:de
Attachments



LEGEND

1. NORTH ENG. ROOM SUMP
2. SKIMMER TANK
2-A. BLACK OIL TANK
3. 2ND STAGE SCRUBBER
4. 1ST STAGE SCRUBBER
5. SOUTH ENGINE ROOM SUMP
6. COOLING TOWER
7. CONDENSORS
8. CONDENSORS
9. EAST SUMP
10. BOILER
11. BOILER
12. H_2S SCRUBBER
13. BOILER
14-A SKIMMER
14-B. SOUTH SUMP
15. ZEOLITE H_2O TREATERS
16. 3RD STAGE SCRUBBER

NO.	REVISIONS	BY	DATE	CHK.	APPR.	ISSUED CONST. DATE	ISSUED CONST. BY

NO. OF UNITS REQUIRED, THUS

WO-AFE NO.

WARREN PETROLEUM CORPORATION

TULSA, OKLAHOMA

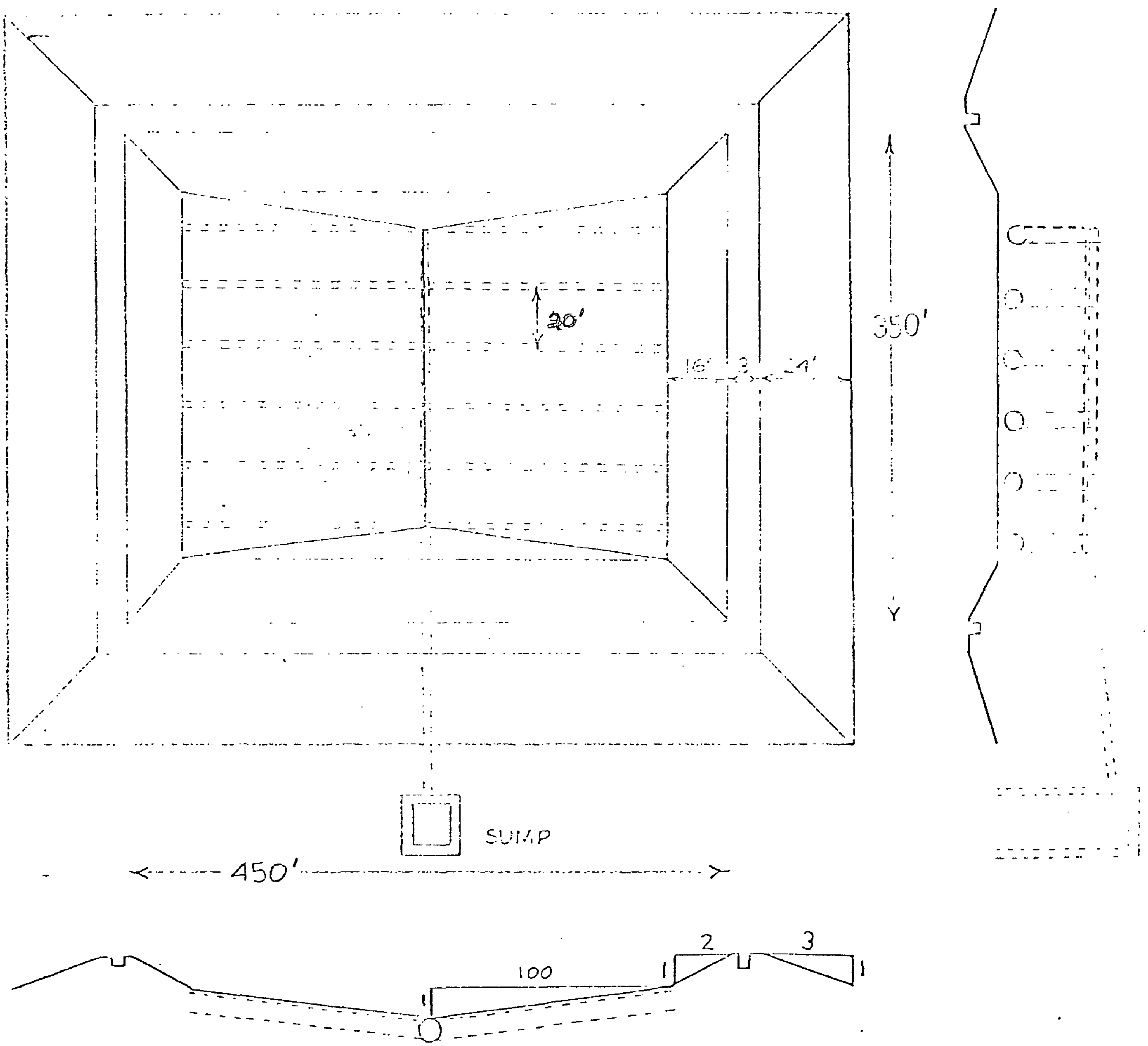
R-WPC-341-B

WASTE WATER SYSTEM

MONUMENT PLT. MONUMENT, N.M.

DRAWN WKC	DATE 7-28-81	SCALE —
CHECKED	DATE	DRAWING NO.
APPROVED	DATE	

JUNE 15, 1977 EVAPORATION PIT



235+241

OCD Lea County

STATE OF NEW MEXICO

SCIENTIFIC LABORATORY DIVISION (HED)
700 Camino de Salud NE, Albuquerque, NM 87106 Phone: 843-9240

Biological, Chemical and Physical ANALYSES of WASTEWATER

DATE RECEIVED 3-9-81	LAB NO. HM-900	USER CODE
Collection date	City or Location Monument, NM	
Collected by	County Warren Pet Corp.	Region
Owner	FIELD DETERMINED PARAMETERS	By

Send Final Report to: Warren Petroleum Co. Box-67 Monument, NM

FIELD DETERMINED PARAMETERS			
☐ pH		☐ Dissolved Oxygen mg/l	
☐ Water Temperature, °C		☐ Chlorine Residual, mg/l	
☐ Settleable Solids, ml/l		☐	

OTHER INFORMATION

STORET NO.:

RECEIVED JUN 17 1981 OIL CONSERVATION DIVISION SANTA FE

Source
- ☒ Wastewater Treatment Plant
- ☐ LAGOON
- ☐ Other:
- ☐ Other:
- ☒ DRAIN
- ☐ LAKE
- ☐ STREAM

RIVER BASIN
- ☐ Rio Grande
- ☐ Canadian
- ☐ Little Colorado
- ☐ Other - specify:
- ☐ Pecos
- ☐ Gila
- ☐ San Juan

OWNERSHIP
- ☐ Municipal
- ☐ MDSWA
- ☐ Private
- ☐ Industrial
- ☐ Commercial
- ☐ Other:

LOCATION
- ☐ Influent
- ☐ Primary
- ☐ Secondary
- ☐ Effluent
- ☐ Digester
- ☐ Trickling Filter

ORGANIC PARAMETERS	mg/l	NUTRIENTS	mg/l	PHYSICAL PARAMETERS	mg/l	OTHER PARAMETERS		HEAVY METAL and TOXIC CHEMICAL PARAMETERS	mg/l
☐ BOD - 5 DAY 20 °C		☐ Phosphate (As P)		☐ Residue Total Non-Filterable (Suspended)		☐ Surfactants (As LAS), mg/l		☑ As	0.006
☐ COD		☐ Nitrogen, Nitrate (As N)		☐ Residue Total Filterable (Dissolved)		☐ Conductance Micromhos 25 °C		☑ Se	<0.005
☐ TOC		☐ Nitrogen Ammonia (As N)		☐ Residue Total		☐ Color Units		☑ Cd	0.007
☐ DOC		☐ Nitrogen Total Kjeldahl (As N)		☐ Residue Total Fixed Solids		☐ Turbidity Jackson Units Supernatant		☑ Cr	1.37
☐		☐		☐ Residue Volatile		☐ Turbidity Jackson Units Total		☑ Ba	2.1
☐		☐		☑ Ni	<0.010	☑ Cu	.038	☑ Hg	0.0008
SAMPLE TREATMENT ☐ None		☐ Refrigerate		☐ H_2SO_4, 2ml/l		☐ HNO_3, 3-5ml/l (for metals)		☑ Pb	.012
								☑ Ag	<0.001

REMARKS

RECEIVED MAY 18 1981 POLLUTION CONTROL

Date	
Analyst	
Reviewed by	
Date reported	5/4/81

SLD 710 Form Revised 5/78 (Replaces EIA 008)

WHITE—*Originator* PINK—*EID Field Office* CANARY—*EID Program Office* GOLDENROD—*SLD File Copy*

. 235+241

STATE OF NEW MEXICO ENVIRONMENT

SCIENTIFIC LABORATORY DIVISION (HED)
700 Camino de Salud NE, Albuquerque, NM 87106 Phone: 843-9240

Biological Chemical and Physical ANALYSES of WASTEWATER

Lea Coun

DATE RECEIVED 3-9-81	LAB NO. HM-900	USER CODE

Collection date	City or Location Monument, NM		
Collected by	County Warren Pet Corp.	Region	
Owner	FIELD DETERMINED PARAMETERS	By	
Send Final Report to: Warren Petroleum Co. Box-67 Monument, NM	☐ pH	☐ Dissolved Oxygen mg/l	
	☐ Water Temperature, °C	☐ Chlorine Residual, mg/l	
	☐ Settleable Solids, ml/l	☐	
	OTHER INFORMATION		

STORET NO.:

Source
☑ Wastewater Treatment Plant
☐ LAGOON ☐ DRAIN
☐ Other: ☐ LAKE
☐ Other: ☐ STREAM

RIVER BASIN		OWNERSHIP	LOCATION
☐ Rio Grande	☐ Pecos	☐ Municipal	☐ Influent
☐ Canadian	☐ Gila	☐ MDSWA	☐ Primary
☐ Little Colorado	☐ San Juan	☐ Private	☐ Secondary
☐ Other - specify:		☐ Industrial	☐ Effluent
		☐ Commercial	☐ Digester
		☐ Other:	☐ Trickling Filter

ORGANIC PARAMETERS	mg/l	NUTRIENTS	mg/l	PHYSICAL PARAMETERS	mg/l	OTHER PARAMETERS		HEAVY METAL and TOXIC CHEMICAL PARAMETERS	mg/l
☐ BOD - 5 DAY 20°C		☐ Phosphate (As P)		☐ Residue Total Non-Filterable (Suspended)		☐ Surfactants (As LAS), mg/l		☑ As	0.00[illegible]
☐ COD		☐ Nitrogen, Nitrate (As N)		☐ Residue Total Filterable (Dissolved)		☐ Conductance Micromhos 25 °C		☑ Se	<0.005
☐ TOC		☐ Nitrogen Ammonia (As N)		☐ Residue Total		☐ Color Units		☑ Cd	0.007
☐ DOC		☐ Nitrogen Total Kjeldahl (As N)		☐ Residue Total Fixed Solids		☐ Turbidity Jackson Units Supernatant		☑ Cr	1.37
☐		☐		☐ Residue Volatile		☐ Turbidity Jackson Units Total		☑ Ba	2.1
☐		☐		☑ Ni	<0.010	☑ Cu	.038	☑ Hg	0.000[illegible]
SAMPLE TREATMENT ☐ None		☐ Refrigerate		☐ H_2SO_4, 2ml/l		☐ HNO_3, 3-5ml/l (for metals)		☑ Pb	.012
								☑ Ag	<0.001

REMARKS

RECEIVED

MAY 18 1981

Date /

Analyst

Reviewed by

Date reported 5/4/81

SLD 710 Form Revised 5/78 (Replaces EIA 008)

WHITE—*Originator* PINK—*EID Field Office*
CANARY—*EID Program Office* GOLDENROD—*SLD File Copy*

POLLUTION CONTROL

. 235+241

STATE OF NEW MEXICO
SCIENTIFIC LABORATORY DIVISION (HED)
700 Camino de Salud NE, Albuquerque, NM 87106 Phone: 843-9240

Biological, Chemical and Physical ANALYSES of WASTEWATER Lea Cou

DATE RECEIVED 3-9-81	LAB NO. HM-900	USER CODE

Collection date
City or Location Monument, NM
Collected by
County Warren Pet Corp.
Region
Owner
By

Send Final Report to: Warren Petroleum Co. Box-67 Monument, NM

FIELD DETERMINED PARAMETERS

☐ pH		☐ Dissolved Oxygen mg/l	
☐ Water Temperature, °C		☐ Chlorine Residual, mg/l	
☐ Settleable Solids, ml/l		☐	

OTHER INFORMATION

STORET NO.:

Source
☑ Wastewater Treatment Plant
☐ LAGOON ☐ DRAIN
☐ Other: ☐ LAKE
☐ Other: ☐ STREAM

RIVER BASIN
☐ Rio Grande ☐ Pecos
☐ Canadian ☐ Gila
☐ Little Colorado ☐ San Juan
☐ Other - specify:

OWNERSHIP
☐ Municipal
☐ MDSWA
☐ Private
☐ Industrial
☐ Commercial
☐ Other:

LOCATION
☐ Influent
☐ Primary
☐ Secondary
☐ Effluent
☐ Digester
☐ Trickling Filter

ORGANIC PARAMETERS	mg/l	NUTRIENTS	mg/l	PHYSICAL PARAMETERS	mg/l	OTHER PARAMETERS		HEAVY METAL and TOXIC CHEMICAL PARAMETERS	mg/l
☐ BOD - 5 DAY 20 °C		☐ Phosphate (As P)		☐ Residue Total Non-Filterable (Suspended)		☐ Surfactants (As LAS), mg/l		☑ As	0.000
☐ COD		☐ Nitrogen, Nitrate (As N)		☐ Residue Total Filterable (Dissolved)		☐ Conductance Micromhos 25 °C		☑ Se	<0.00
☐ TOC		☐ Nitrogen Ammonia (As N)		☐ Residue Total		☐ Color Units		☑ Cd	0.00
☐ DOC		☐ Nitrogen Total Kjeldahl (As N)		☐ Residue Total Fixed Solids		☐ Turbidity Jackson Units Supernatant		☑ Cr	1.37
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SAMPLE TREATMENT ☐ None		☐ Refrigerate		☐ H_2SO_4, 2ml/l		☐ HNO_3, 3-5ml/l (for metals)		☑ Pb	.012
								☑ Ag	<0.00

REMARKS

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MAY 18 1981
POLLUTION CONTROL

Date
Analyst
Reviewed by
Date reported 5/4/81

SLD 710 Form Revised 5/78 (Replaces EIA 008)
WHITE—Originator PINK—EID Field Office
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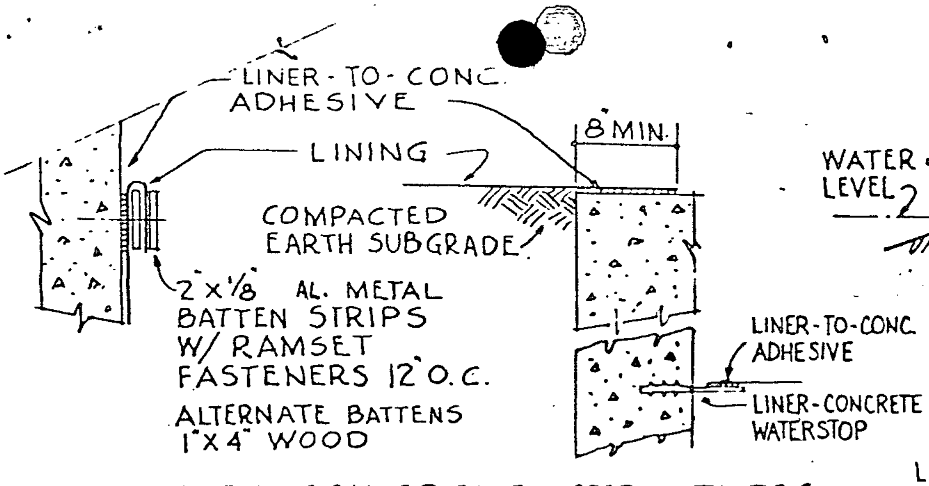
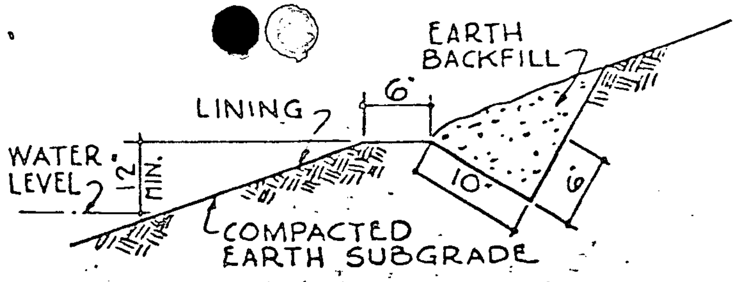
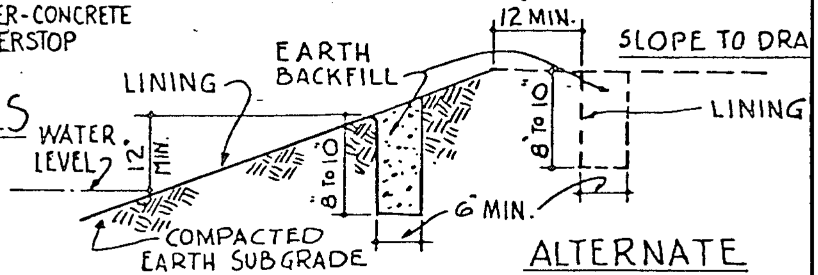


ANCHOR TO CONCRETE STRUCTURES



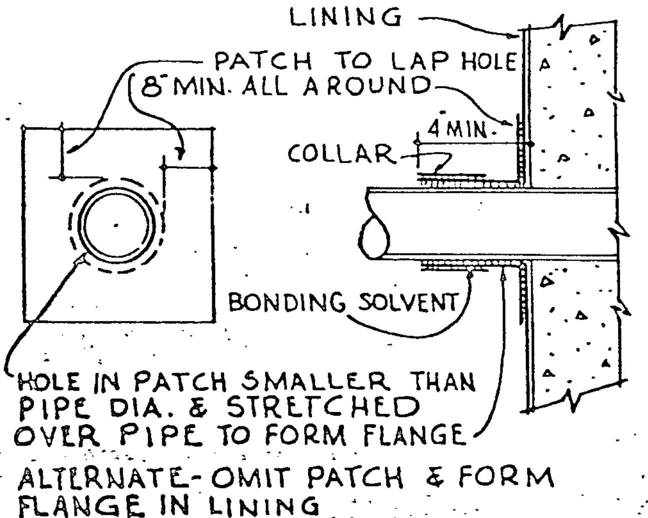
ANCHOR - METHOD #1



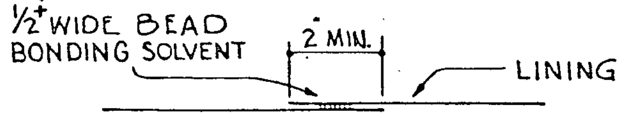
ALTERNATE

ANCHOR - METHOD #2

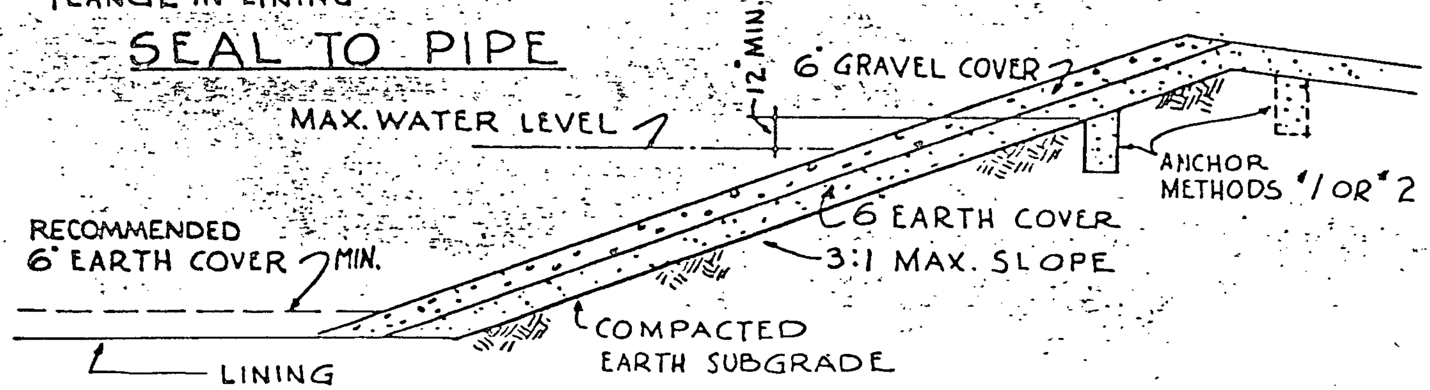
TOP OF SLOPE ANCHORAGE



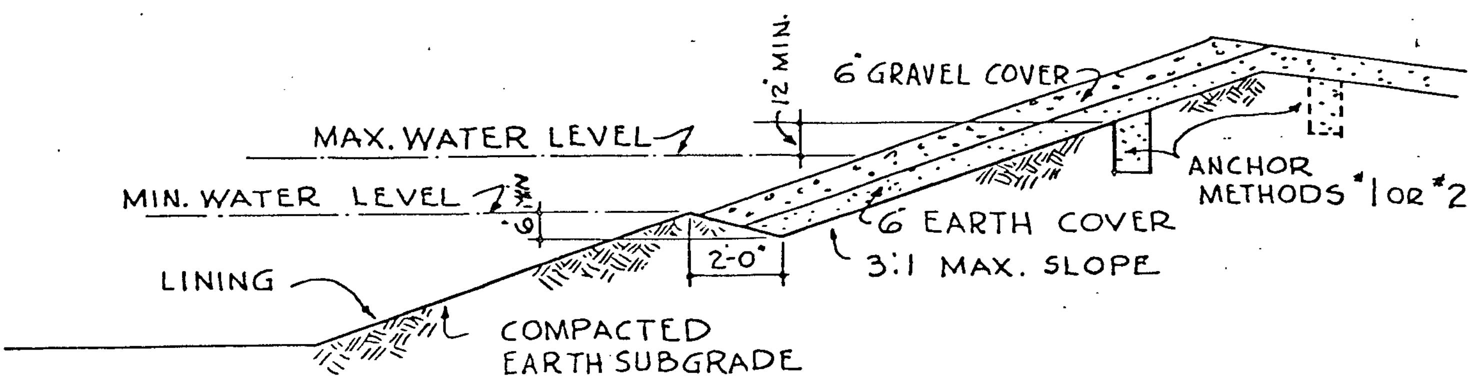
SEAL TO PIPE



TYPICAL LAP JOINT



EARTH & GRAVEL COVER - FULL SLOPES



EARTH & GRAVEL COVER - PARTIAL SLOPES

1. LOCATION

(A) Evaporation pits shall not be located in any watercourse o in any lake-bed, sink-hole, or other depression. Pits adjacent to any such watercourse or depression shall be located safely above th high-water level of such watercourse or depression.

2. DESIGN AND CONSTRUCTION

(A) Evaporation pits shall be so designed and constructed as to provide a minimum of 600 square feet of evaporative surface for each barrel (42 U. S. gallons) of water to be placed in said pits o a daily average basis throughout the year.

(B) Pits shall be located on level ground and shall be approxi mately square. They shall be constructed by excavating and levelli a maximum of six inches below ground level. Excavated material sha be used to form the levees around the pit, said levees to rise a mi mum of 18 inches above ground level.

(C) Levees shall be compacted and shall be so constructed as t have an inside grade no flatter than 1:2. Levees shall have an out side grade no steeper than 1:3 (See Fig. 3).

(D) The top of levees shall be flat and level and shall be at least 18 inches wide.

3. MATERIALS

(A) Materials used for lining evaporation pits shall be imperm able and may be rigid, semi-rigid, or flexible.

(B) If rigid or semi-rigid materials are used, leak-proof expa sion joints shall be provided, or the material shall be of sufficie thickness and strength to withstand, without cracking, expansion an contraction and settling movements in the underlying earth.

(C) If flexible membrane types of materials are used, they sha be of at least 30 mil thickness and shall have good resistance to tears or punctures.

(D) All materials used for lining evaporation pits shall be resistant to hydrocarbons, salts, and aqueous acids and alkalis.

They shall be fungus- and rot-resistant and shall be sun-resistant or provision made to protect the material from the sun as specified in Section 6 (E).

4. LEAKAGE DETECTION SYSTEM

(A) A leakage detection system of an approved design shall be built into the pit-bed and shall be inspected and approved by the Commission prior to installation of the liner.

(B) Leakage detection systems may consist of but are not necessarily limited to approved fail-safe electric detection devices or the drainage-and-sump method.

(C) If an electric grid detection system is used, provision must be made for adequately testing all components to ensure the system remains functional.

(D) If the drainage-and-sump method of leakage detection system is used, a network of gravel-packed drainage canals or slotted or perforated drainage pipes shall be installed. The network shall be of sufficient density that no point in the evaporation pit-bed shall be more than 20 feet from a drainage canal or drainage pipe or a lateral thereof. Slope for all drainage lines and laterals shall be at least six inches per 50 feet. All drainage shall be to the outer perimeter of the pit and shall gather into concrete or corrosion-proof metal sumps. (See Fig. 2)

5. PREPARATION OF PIT-BED FOR INSTALLATION OF LINER

(A) The bed of the pit and the inside grades of the levee shall be smooth and compacted and shall be free of holes, rocks, stumps, clods, or any other debris which might rupture the liner. In extremely rocky areas, it will probably be necessary to cover the pit-bed with a compacted layer of sand or other suitable material.

(B) Drainage canals shall be dug and sloped prior to requesting inspection of the pit-bed. They shall not be gravel-filled nor shall they receive the slotted drainage pipe (if used) until after the slope and direction of drainage has been approved.

(C) A trench shall be dug on the top of the levee the entire perimeter of the pit for the purpose of anchoring flexible liners.

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(B) Drainage canals shall be dug and sloped prior to requesting inspection of the pit-bed. They shall not be gravel-filled nor shall they receive the slotted drainage pipe (if used) until after the slope and direction of drainage has been approved.

(C) A trench shall be dug on the top of the levee the entire perimeter of the pit for the purpose of anchoring flexible liners.

This trench shall be located nine inches out from the slope break and shall be a minimum of six inches deep. (See Fig. 3)

6. INSTALLATION OF FLEXIBLE MEMBRANE LINERS

(A) The liner shall be put in place only after the pit-bed, leakage detection system, and levee walls have been inspected and approved by a Commission representative.

(B) The pit liner shall be installed and joints sealed according to manufacturer's specifications and with approval of the Commission representative.

(C) The liner shall be laid as evenly and wrinkle-free as possible and shall rest smoothly on the pit-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 to come back out and a minimum of two inches beyond. (See Fig. 3)

(D) An anchor of used pipe, old sucker-rods, or other similar material shall be placed over the liner in the anchor trench and said trench backfilled. The anchor shall extend the entire perimete of the evaporation pit.

(E) If the lining material used for the pit is not sun-resistan at least one inch 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. This material shall extend at least to the anchor trench.

7. HEADER PIT OR SETTLING TANK

(A) A header pit capable of containing a minimum of 30 days produced water shall be installed to receive the salt water to be evaporated prior to running it into the evaporation pit.

(B) Header pits shall be constructed similarly to evaporation pits (including minimum depth of two feet from top of levee to floor of pit and leakage detection system) and shall be lined with neoprene or some other highly oil-resistant material of at least 30-mil thickness.

(C) Syphons or other suitable means shall be employed to draw water from well beneath the oil-water interface in the header pit for transfer to the evaporation pit. The syphon shall be located as far possible from the inflow line into the header pit.

(D) Header pits shall at all times be kept free of appreciable oil build-up to avoid running oil into the evaporation pit.

(E) A settling tank with a minimum capacity of 30 days water production may be used in lieu of a header pit provided that it shall be maintained in leak-proof condition and provided that the water draw-off connection shall be so located and the water-oil interface so maintained as to prevent any flow of oil into the evaporation pit.

8. FENCES AND SIGNS

(A) A fence shall be constructed and maintained in good condition around the evaporation pit installation. Fences shall be constructed with a minimum of four strands of barbed wire on sturdy posts no more than 20 feet apart. Corners shall be braced in two directions. Fences shall not be constructed on the levees.

(B) A sign not less than 12" x 24" with lettering of not less than two inches shall be posted in a conspicuous place on the fence surrounding the evaporation pit installation. The sign shall be maintained in legible condition and shall identify the operator of the evaporation system, the location of the system by quarter-quarter section, township and range, and the permit number of the permit authorizing the installation.

DAILY WATER CONTROL REPORT

PLANT # 18 DATE March 27, 1968 MONUMENT, NEW MEXICO

Results in PPM	P	M	CL	PO4	SO3	Cone	CrO4	H	CaCo3	Ph	Pen19	Tet75	Fe	626	
Waste Heat															
Steam Generator															
Boiler Feed															
Treated Water															
.aw Water															
North Pritchard															
East Pritchard															
West Pritchard															
Oil Coolers															
Clark 500's															
Test on waste water, in parts per million															
West Disposal Pit:															
	172	500	20	0		0				11.0					
Overflow Pit:															
	80	292	1700	0				592		9.5					
.earl Queen															
Iron Condensate															
Iron Still															
Iron Low Rundown															

REMARKS

LAB TESTER CHEMIST

DAILY WATER CONTROL REPORT

PLANT # 18 DATE March 27, 1968 MONUMENT, NEW MEXICO

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Waste Heat															
Steam Generator															
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West Pritchard															
Oil Coolers															
Clark 500's															
[illegible]	Test on waste water, in parts per million														
[illegible]	West Disposal Pit:														
[illegible]	172	500	20	0		0				11.0					
[illegible]	Overflow Pit:														
[illegible]	80	292	1700	0				592		9.5					
earl Queen															
Iron Condensate															
Iron Still															
Iron Low Rundown															

REMARKS

LAB TESTER CHEMIST

WARREN PETROLEUM COMPANY

MANUFACTURING — ENGINEERING

TULSA, OKLAHOMA

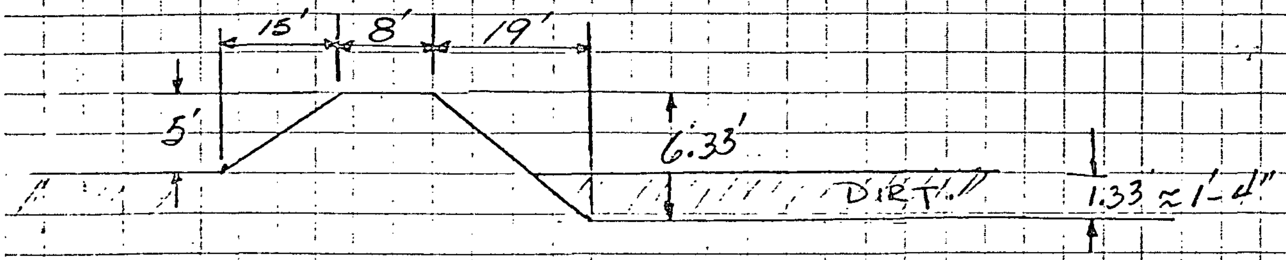
JOB NO.

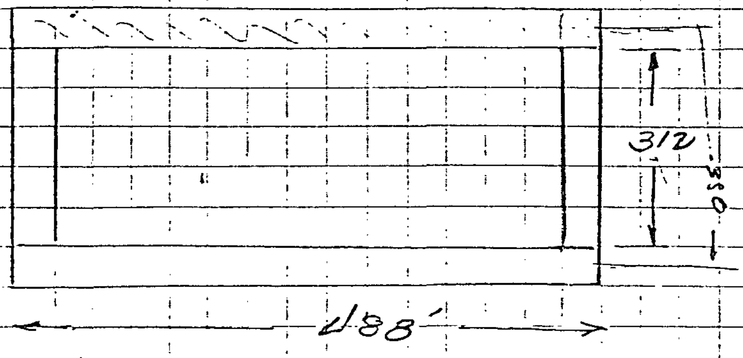
AFE

BY CHECK

DATE ,19 JOB:

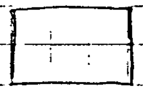
Calculations.





Soil Volumes;

 ⟹ $15 \times 5 \times 488 \times 2 = 73{,}200$
$15 \times 5 \times 312 \times 2 = 46{,}800$

 ⟹ $8 \times 5 \times 488 \times 2 = 39{,}040$
$8 \times 5 \times 312 \times 2 = 24{,}960$

TOT 184,000 cuft. Compact Soil.

Volume build-up - 90%

$184{,}000 \times .9 = \underline{165{,}600}$ cuft of Soil needed for levees

Soil to be excavated (approx)

$1.33 \times 404 \times 312 = 167{,}644$ cuft.

GULF 80773

SHEET OF

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR
LARRY KEHOE
SECRETARY

Oscar

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

April 6, 1981

Mr. J. E. Moody
Warren Petroleum Company
P. O. Box 1589
Tulsa, Oklahoma 74102

Re: Request for Discharge Plans

Dear Mr. Moody:

Under provisions of the regulations of the Water Quality Control Commission you are hereby notified that the filing of discharge plans for Warren's Monument Plant (1-T20S-36E) and (36-T19S-36E) is required. Discharge plans are defined in Section 1-101.1 of the regulations and a copy of the regulations is enclosed for your convenience.

These plans should cover all discharge of effluent at the plant sites or adjacent to the plant sites. Section 3-106A of the regulations requires submittal of the discharge plans within 120 days of receipt of this notice unless an extension of this time period is sought and approved.

The discharge plans should be prepared in accordance with Part 3 of the Regulations. Due to a recent court decision references to "toxic pollutants" may be ignored.

If there are any questions on this matter, please do not hesitate to call me or Oscar Simpson at 827-3260. Mr. Simpson has been assigned responsibility for review of all discharge.

Very truly yours,

JOE D. RAMEY
Division Director

JDR/OS/og

cc: Oil Conservation Division - Hobbs
Warren Petroleum Co., P. O. Box 67
Monument, New Mexico

OCD GENERAL GUIDELINES FOR
THE WATER QUALITY CONTROL COMMISSION REGULATIONS
WQCC 81-2 PART III DISCHARGE PLAN

i Cover letter from the Owner

ii Summary of Discharge Plan Report

iii Table of Contents

I. Introduction

II. History and Background of the Plant

III. Environmental Description

A) Geology

B) Geomorphology

C) Climate

D) Surface Hydrology

1. General

2. Site Specific (Plant Area)

E) Hydrogeology

1. General

2. Site Specific (Plant Area)

IV. Water Quality

A) Surface Water

1. General

2. Site Specific (Plant Area)

a) isopach map of water quality
1 mi radius

b) water table map (1 mi radius)

IV. Plant Description

A) Refinery location, property boundaries, and labeled description of refinery facilities on a aerial photo of 1" = 100' scale.

B) Schematic flow diagram and description of products and waste water produced.

C) Refinery process description listing and describing chemicals and additives used to process and make products.

D) Description and schematic of cooling tower treatment system.

E) Description and schematic of closed cooling system.

F) Description, location, and schematics of supply system. Submit complete analysis of supply water as per A, B, and C of Section 3-103, Part III, WQCC 81-2.

Refer to Section 3-107 for collection, preserving and testing procedures.

V. Present water use and disposal practices of liquid and solid wastes.

A) Submit complete analysis of waste water and solid waste as per A, B, and C of Section 3-103, Part III, WQCC 81-2 and Section 3-107 for collection, preserving, and testing.

VI. Proposed Discharge Plan

A) Methods proposed to dispose of solid and liquid waste.

B) Projected time frames

C) Contingency Plan

D) Monitoring Plan

E) Inspection Program

F) Reporting Program

G) Conclusions

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

LARRY KEHOE
SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

April 6, 1981

Mr. J. E. Moody
Warren Petroleum Company
P. O. Box 1589
Tulsa, Oklahoma 74102

Re: Request for Discharge Plans

Dear Mr. Moody:

Under provisions of the regulations of the Water Quality Control Commission you are hereby notified that the filing of discharge plans for Warren's Monument Plant (1-T20S-36E) and (36-T19S-36E) is required. Discharge plans are defined in Section 1-101.1 of the regulations and a copy of the regulations is enclosed for your convenience.

These plans should cover all discharge of effluent at the plant sites or adjacent to the plant sites. Section 3-106A of the regulations requires submittal of the discharge plans within 120 days of receipt of this notice unless an extension of this time period is sought and approved.

The discharge plans should be prepared in accordance with Part 3 of the Regulations. Due to a recent court decision references to "toxic pollutants" may be ignored.

If there are any questions on this matter, please do not hesitate to call me or Oscar Simpson at 827-3260. Mr. Simpson has been assigned responsibility for review of all discharge.

Very truly yours,

JOE D. RAMEY
Division Director

JDR/OS/og

cc: Oil Conservation Division - Hobbs
Warren Petroleum Co., P. O. Box 67
Monument, New Mexico

MAY 1980

BEFORE THE ENVIRONMENTAL IMPROVEMENT DIVISION

CONSTITUENT AGENCY OF THE WATER QUALITY
CONTROL COMMISSION

STATE OF NEW MEXICO

IN THE MATTER OF THE REQUEST)
BY THE ENVIRONMENTAL IMPROVEMENT)
DIVISION THAT CLIMAX CHEMICAL)
COMPANY SUBMIT A WATER DISCHARGE)
PLAN)

JUSTIFICATION FOR NO DISCHARGE PLAN

AND ALTERNATIVE

APPLICATION FOR DISCHARGE PLAN

Geohydrologic Evaluation by
Geohydrology Associates, Inc.
Albuquerque, New Mexico

Paul M. Bohannon
HINKLE, COX, EATON, COFFIELD & HENSLEY
P. O. Box 10
Roswell, New Mexico 88201
Attorneys for Climax Chemical Company

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I.

INTRODUCTION

At the request of Climax Chemical Company of Monument, New Mexico, a study of the hydrologic conditions in the vicinity of the Climax facility was made by Geohydrology Associates, Inc., of Albuquerque, New Mexico. The study was initiated in May 1980.

Climax is a chemical manufacturing company with facilities located in Sections 34 and 35, T. 19 S., R. 36 E. Lea County, New Mexico. This is approximately 15 miles west-southwest of Hobbs, New Mexico. The company began operation at this site in 1962. Climax Chemical produces various products from sodium chloride. As a result of this process, waste products are discharged to evaporation ponds located at the plant site.

The purpose of this investigation was to evaluate the geohydrologic conditions at the plant site and surrounding areas. Identification of waste products which may have leaked from the evaporation ponds was a primary goal of the study. In addition, Climax wanted to determine the long-range effects that could be expected from continued operation at the site. The results of this investigation would provide the basis of a Discharge Plan to be submitted to the Environmental Improvement Division of the New Mexico Health and Environment Department.

The study of the area was quite comprehensive. A detailed literature and file search was conducted. Additional file data were collected from Climax Chemical, as well as from the U.S. Geological Survey, State Engineer Office, and the New Mexico Oil Conservation District. A field reconnaissance was made of the region, which included inventory of existing wells. Field measurements of specific conductance and pH also were made during the inventory. An extensive drilling and testing program was conducted which included installation of numerous test holes and subsequent aquifer testing of these holes.

During the course of investigation in behalf of Climax Chemical Company, several interim reports have been prepared. As data have been collected, such as in the case of the test drilling, some of the earlier findings have changed or been modified. Therefore we consider this report to contain a summary of all of the previous investigations. Any changes in interpretation of the data are included in this report.

The system of numbering wells is shown in Figure 1. This numbering system is based on township and range, with location in the section to nearest 20 acres. All locations are measured from the New Mexico principal meridian.

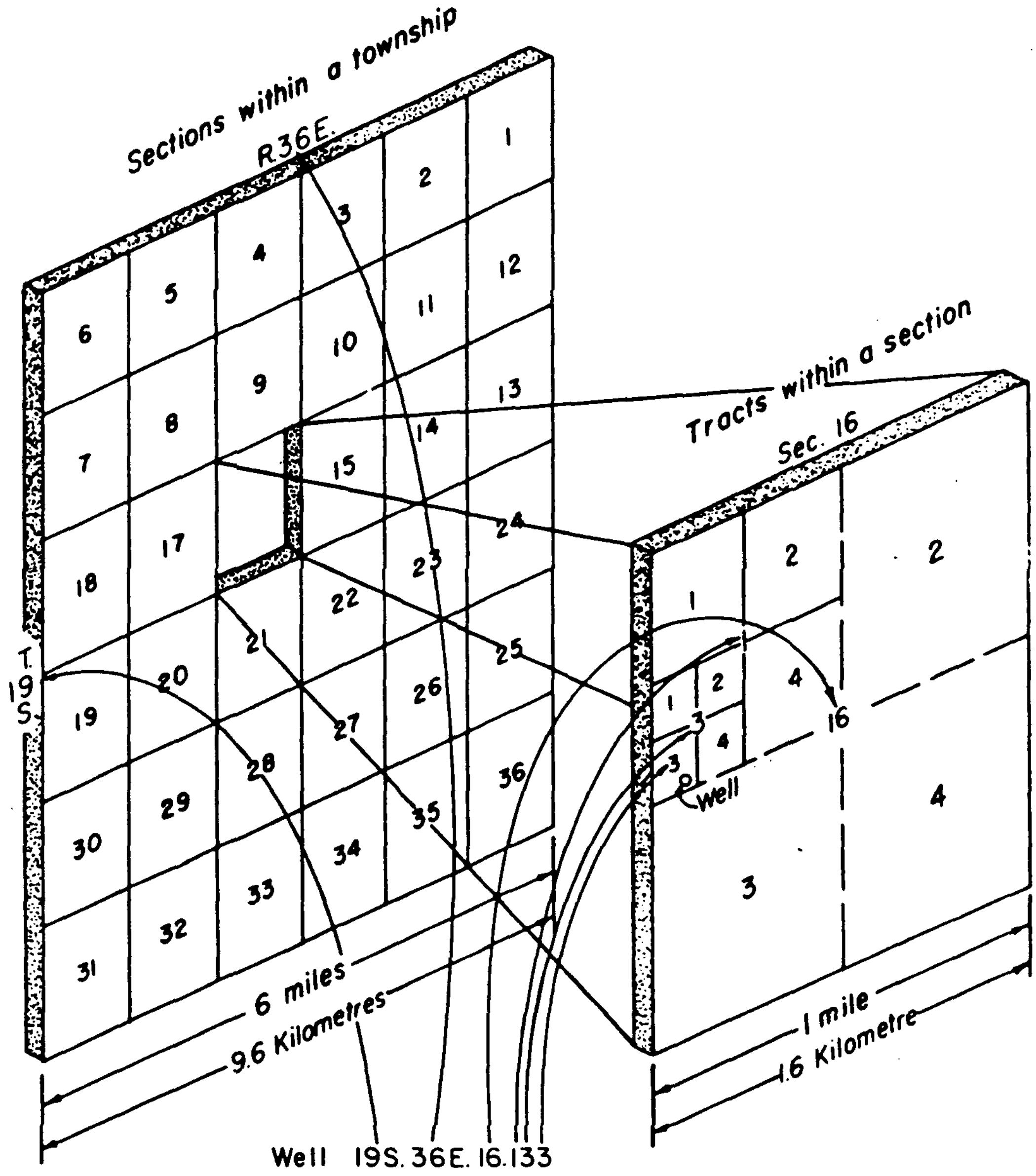


FIGURE 1. System of numbering wells in New Mexico.

II.

GEOHYDROLOGIC CONDITIONS

A. Chinle "Redbeds" and Older Rocks

The geology and ground-water resources of southern Lea County have been described in detail by Nicholson and Clebsch (1961). Southern Lea County includes parts of the Delaware basin, the back reef or shelf area, and the Central basin platform of the Permian basin. According to their work, there is as much as 12,000 feet of geologic strata overlying the basement rocks in the vicinity of Monument, New Mexico. However, only the upper 2,000 feet of these rocks are pertinent to this study because deeper rocks contain non-potable water.

A thick sequence of evaporite deposits, mainly halite containing some anhydrite, accumulated in the Delaware basin of west Texas and southeastern New Mexico. These evaporites are the source of the sodium chloride that is produced by solution mining at the Climax facilities. Four wells were drilled by Climax to tap these deposits at depths ranging from 2,420 to 2,616 feet below land surface.

The evaporite deposits are overlain by the Rustler Formation which generally consists of red siltstone and shale. In the potash mining area of western Lea and Eddy Counties, the basal Rustler generally consists of a so-called rubble zone which resulted from solution of the salt deposits and collapse of the overlying Rustler. This rubble zone is called the Brine Aquifer in the Nash Draw area where it is capable of producing large quantities of saturate brine to wells in the area (Geohydrology Assoc., 1979, p. 8). It could not be determined if the Brine Aquifer is developed near Monument. Nicholson and Clebsch (1961) did not consider this to be an aquifer in southern Lea County, however their study was concerned with fresh water aquifers, which would not include the rubble zone.

There is a thick sequence of rock overlying the rubble zone in the vicinity of the Climax plant. These deposits include the Pierce Canyon redbeds (Vine, 1959), the Santa Rosa sandstone, and the Chinle shale, or redbeds. The maximum thickness of these deposits in Lea County is 2,000 feet (Nye, p. 370).

According to Nicholson and Clebsch (1961, p. 35), there are sandstone strata in the Chinle which are similar to the underlying Santa Rosa. The Santa Rosa is a fine- to coarse-grained sandstone containing minor shale layers. Quartz sand grains predominate, and numerous minor constituents are present. Gypsum is common as a secondary mineral.

These sandstones are recharged in west-central Lea County, and the ground water migrates toward the south and southwest (Nicholson and Clebsch, 1961, p. 57). The water in these sandstones also discharges downward into the older, more premeable rocks, which are also characterized by highly mineralized water.

According to Ash (1963, sheet 1), "The rocks of Triassic age contain some water but they are not considered to be highly productive aquifers." These generally have very low permeabilities, and yield small quantities of water to wells (Nicholson and Clebsch, 1961, p. 57). Oil Center, approximately ten miles from the plant, is the only community that obtains its public supply from these rocks, and the well has a sustained yield of only 6 gpm.

Well No. 13 was drilled at the south edge of the Climax plant as a test hole for brine production. The strata penetrated by this well were:

0 to 37 feet -- alluvium

37 to 165 feet -- redbeds

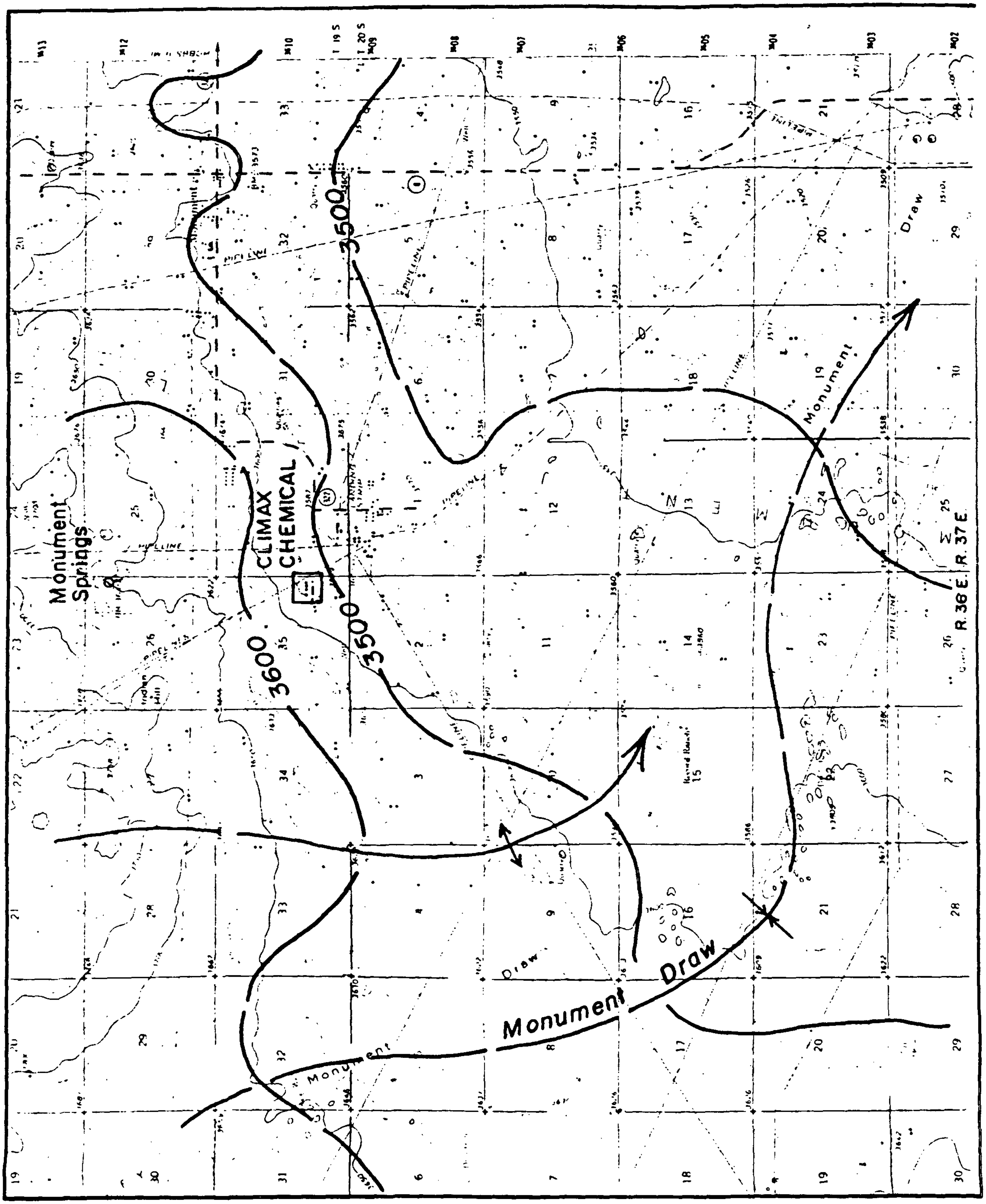
165 to 180 feet -- sandstone

It should be noted that natural gas was produced and flaired from the sandstone for nearly two years after completion. All water produced was highly mineralized. This sandstone probably represents a sandstone stratum in the upper part of the Chinle shale deposits, or redbeds.

B. <u>Post-Chinle Erosional Surface</u>

Figure 2 shows contours on part of the buried erosion surface of the redbeds. This map is located on a regional illustration prepared by Nicholson and Clebsch (1961, plate 1), and modified by data collected during this investigation. This surface is highly irregular but has only moderate relief. It has undergone two or more episodes of erosion, depending on the locality.

Although data were sufficient for Nicholson and Clebsch (1961, p. 43) to map the erosion surface in only part of the area, certain features of the surface are hydrologically


Monument Springs
CLIMAX CHEMICAL
3600
3500
3500
Monument Draw
Monument
Monument
Draw
R. 36 E. R. 37 E.
T. 19 S.
T. 20 S.
PIPELINE

important and give a clue to the configuration of the surface in other parts of the region. Closed depressions on the surface of the redbeds are common. These features have probably formed by the collapse of the Chinle rocks into cavities in the underlying salt beds by gradual subsidence as the salt has been removed by solution by ground water. Distinctive shapes of the buried valleys, such as a tendency of some to be wider near the heads of the valleys than farther downstream, particularly in the southwestern part of the county, strengthen the concept that the redbeds' surface was formed in part by solution and collapse processes.

The redbed surface apparently is depressed throughout the length of Monument Draw. Theis (1954) collected data on wells drilled about 10 miles southeast of Climax in T. 21 S., R. 37 E. These wells show a clearly defined channel eroded into the redbeds at a depth of about 50 feet. At the northern end of the Draw, water is withdrawn for irrigation of about 40 acres in Section 32, T. 19 S., R. 36 E., approximately three and a half miles west of Climax, and outside the area of influence Climax. According to Nicholson and Clebsch (1961, p. 44), it is probable that the draw was at one time a perennial stream which cut through the Ogallala and into the underlying redbeds. As the climate of the region changed and erosive power of the stream declined because of increased aridity, the channel was filled with alluvial material and windblown deposits.

C. Post-Chinle Deposits

In the vicinity of the Climax Chemical plant, there are two geologic units that are important from a geohydrologic standpoint: the Ogallala Formation and the alluvial deposits.

North of the Climax plant, the redbeds are overlain by the Ogallala Formation. These deposits from the High Plains of northern Lea County, and the west boundary is marked by an escarpment known as Mescalero Ridge. However in the vicinity of Monument, New Mexico, the relief is more subdued and less clearly defined. The Ogallala is a major aquifer in parts of Lea County where it has sufficient thickness. Springs act as natural discharge points of ground water from the Ogallala deposits. Most of these are located along the contact of the permeable Ogallala and the impermeable Chinle redbeds below. Several of these springs are located along the base of Mescalero Ridge in Eddy County. Monument Springs discharges ground water from the Ogallala-Chinle contact in Section 26, T. 19 S., R. 36 E. (fig. 2).

Following deposition of the Ogallala deposits, a prolonged period or erosion reworked the fringe areas of the Ogallala and created the Mescalero Ridge. The reworked Ogallala deposits now form the bulk of the alluvial material that has accumulated in the so-called laguna Valley of Nicholson and Clebsch (1961, p. 9).

The Climax site is located on the edge of the Laguna Valley where a relatively thin sequence of alluvial material is present.

These deposits are generally fine grained and poorly sorted; the upper surface is characterized by stabilized dunes and windblown deposits of sand and silt.

D. Ground-Water Conditions

A regional water table contour map prepared by Nicholson and Clebsch (1961, pl. 2) shows the elevation of the water table in the vicinity of the Climax plant. A portion of the map is shown in Figure 3. This map shows that the water table surface slopes toward the southeast regionally. The average gradient is approximately 35 feet per mile.

The work by Nicholson and Clebsch was based primarily on an inventory of wells that were in use in 1953-1955. Most of these wells were used for domestic and stock purposes; there was very little industry in the vicinity of Monument. The map shows a rather large area north and west of Oil Center where the water table is in the redbeds and the overlying alluvial material is unsaturated. Work conducted in behalf of Climax Chemical has shown that this is not the case.

Test drilling data.--During the early phase of construction, a total of 13 test holes were drilled in the vicinity of the plant site (table 1; Appendix A). The first well to be drilled, which was subsequently identified as Well No. 13, was a shallow brine test well. There were 37 feet of dry alluvial material overlying the redbeds and deeper sandstones. This well was drilled by Van Noy Drilling Company of Oil Center, New Mexico, in late September 1961. Only a very abbreviated drillers' log is available.

A Series of 12 test holes were subsequently drilled by Abbott Brothers of Hobbs, New Mexico, in mid-October 1961.

Table 1. Records of wells and test holes in the vicinity of Climax Chemical plant, Lea County, NM.

Location	Owner or Tenant	Depth of Well (ft)	Diameter or Size	Date Completed	Depth to Water	Date of Measurement	Use of Water or Well	Depth to Redbeds (ft)	Field Specific Conductance (μmhos)	pH	Altitude of Land Surface	Remarks
19.36.26.414	Climax TH4-10	65		10/61			Test	45			3657	L.
27.424	Cooper(?)	19.2			dry	3/3/81	Stock				3635	
32.144	T.P.Childress	51	10	1961	29	3/27/81	Irriga.	51			3647	
33.333	unknown	40.7	8		dry	3/26/81	Stock				3628	
33.444	unknown						Stock		1800	7.8	3628	
34.212	Cooper(?)		6		20.30	3/3/81	Stock		1260	7.5	3680	C.
35.111	Climax TH5-10	55		10/61			Test	40			3655	L.
35.1311	Climax TH1-3	38	4	3/81	28.39	3/4/81	Test	30	2250	6.5	3637	C.,L.,T.
35.231	Climax TH3-10	65		10/61			Test	35			3605	L.
35.233	Climax TH3-3	38	4	3/81	dry	3/27/81	Test	30			3615	L.
35.3233	Climax TH2-3	65	4	3/81	43.11	3/4/81	Test	52	1025	7.2	3529	C.,L.,T.
35.3311	Climax	56			44.88	3/3/81	Stock		1490	7.1	3617	C.
35.3434	Climax	65	10		36.56	3/3/81	Stock		940	7.4	3601	C.
35.421	Climax TH2-10	70		10/61			Test	45			3598	L.
35.4422	Climax TH13	180	12	9/61			Test	37			3590	C.
35.4423	Climax TH4-3	39	4	3/81	8.70	3/4/81	Test	30	>5000	7.2	3589	C.,L.,T.
36.3131	Climax TH5-3	39	4	3/81	12.70	3/4/81	Test	35	>5000	7.1	3588	C.,L.,T.
36.3133	Climax TH1-10	75		10/61			Test	60			3588	L.
36.314	Climax TH12-9	40	4	9/81	33.27	9/10/81	Test	35	>5000	7.1	3585	C.,L.,T.
36.3242	Climax TH11-10	65		10/61			Test	37			3586	L.
36.3243	Climax TH12-10	66		10/61			Test	38			3587	C.,L.
36.3244	Climax TH10-10	66	6	10/61	25.42	3/3/81	Test	40	>5000	7.6	3587	C.,L.,T.
36.442	Climax TH6-9	55	4	9/81	22.95	9/10/81	Test	52	>5000	7.1	3580	C.,L.,T.
19.37.17.433	unknown						Stock		800	8.2	3675	
19.323	unknown	+85			59.55	10/23/81	Indust.		500	7.5	3692	
29.333	unknown						Stock		820	7.0	3597	
32.332	unknown	35.1	8		32.7	3/26/81	Stock		1000	7.6	3566	
20.35. 1.212	unknown	+79			49.20	10/23/81	Stock		1500	8.6	3648	
19.431	unknown	94.5			86.35	10/23/81	Aband.				3645	
20.36. 1.122	Climax TH5-9	40	4		18.21	9/9/81	Test	35	>5000	6.5	3577	Oil stain on water C.,L.,T.
1.144	Climax TH11-9	60	4	9/81	22.96	9/10/81	Test	59	>5000	7.1	3570	C.,L.,T.
1.344	Climax TH10-9	60	4	9/81	23.70	9/10/81	Test	57	>5000	6.3	3565	C.,L.,T.
2.1131	Climax TH9-10	82		10/61			Test	57			3610	L.
2.1133	Climax TH8-10	82		10/61			Test	60			3607	L.
2.1134	Climax TH6-10	92		10/61			Test	80			3607	L.

Table 1. (concluded)

Location	Owner or Tenant	Depth of Well (ft)	Diameter or Size	Date Completed	Depth to Water	Date of Measurement	Use of Water or Well	Depth to Redbeds (ft)	Field Specific Conductance (µmhos)	pH	Altitude of Land Surface	Remarks
20.36.2.114	Climax TH7-10	87		10/61			Test	63			3605	Oil stain on water; L.
2.223	Climax	70	8		27.46	3/3/81	Aband.		4720	7.7	3585	C.
3.331	unknown	45.8	8		35.18	3/26/81	Stock		920	7.7	3620	
9.422	unknown	32.0	8		27.66	3/26/81	Stock		800	7.2	3605	
11.422	unknown		8				Stock		3980	7.0	3568	
12.123	Climax TH7-9	55	4	9/81	24.77	9/10/81	Test	52	>5000	6.7	3222	Oil stain on water; C.,L.,T.
12.133	Climax TH8-9	60	4	9/81	26.72	9/10/81	Test	58	>5000	6.7	3570	C.,L.,T.
12.222	unknown				plug		Aband.				3556	
12.223	unknown				plug		Aband.				3561	
14.122	Climax TH9-9	60	4	9/81	35.50	9/10/81	Test	55	3400	7.8	3565	C.,L.,T.
15.222	unknown	42.2			30.34	3/26/81	Stock		1300	7.2	3574	
22.311	unknown	92.6			88.8	10/22/81	Aband.				3605	
32.111	unknown	>295			165.75	10/23/81	Aband.				3648	
35.422	unknown								1600	7.0	3545	
36.134	unknown	186			118.55	10/22/81	Stock		1700	8.0	3545	
20.37. 4.113	unknown				30.36	6/27/81	Aband.				3559	
4.341	unknown		8				Stock		1280	7.1	3553	
6.113	unknown				plug		Aband.				3573	
6.133	Climax TH1-9	60	4	9/81	22.59	9/9/81	Test	59	>5000	6.8	3568	strong odor; C.,L.,T.
6.311	Climax TH2-9	60	4	9/81	24.66	9/9/81	Test	58	>5000	6.0	3564	C.,L.,T.
6.333	Climax TH3-9	60	4	9/81	23.82	9/10/81	Test	57	>5000	6.4	3557	C.,L.,T.
7.133	Climax TH4-9	60	4	9/81	23.20	9/10/81	Test	52	3720	7.7	3550	C.,L.,T.
7.234	B. Barber	53.5	8		24.59	9/9/81	Stock		>5000		3554	C.,L.
9.331	unknown	52.5			39.50	10/22/81	Stock		3600	8.4	3540	
18.333	unknown	15.8	8		dry	3/26/81	Aband.				3540	
19.214	unknown	25.6	4		dry	3/25/81	Aband.				3532	
20.433	unknown	55.4			28.78	3/26/81	Stock		2650	7.5	3512	
28.244	unknown						Stock		>5000	7.8	3495	
29.343							Stock		2700	7.9	3525	
30.441							Stock		4500	7.9	3520	
31.444							Stock		1950	8.2	3540	
35.423	A.S. Redden	102			51.23	10/22/81	Stock		1050	7.8	3470	
21.35.16.222					>155	10/23/81	Stock		1300	8.3	3580	
24.241	Shell well						Stock		750	8.5	3590	
21.36. 7.231		>182			158.60	10/23/81	Stock		1000	9.4	3584	
9.144	Starr						Stock		2450	7.0	3565	
16.224							Stock		>5000	7.9	3580	
17.344							Stock		1250	8.1	3640	

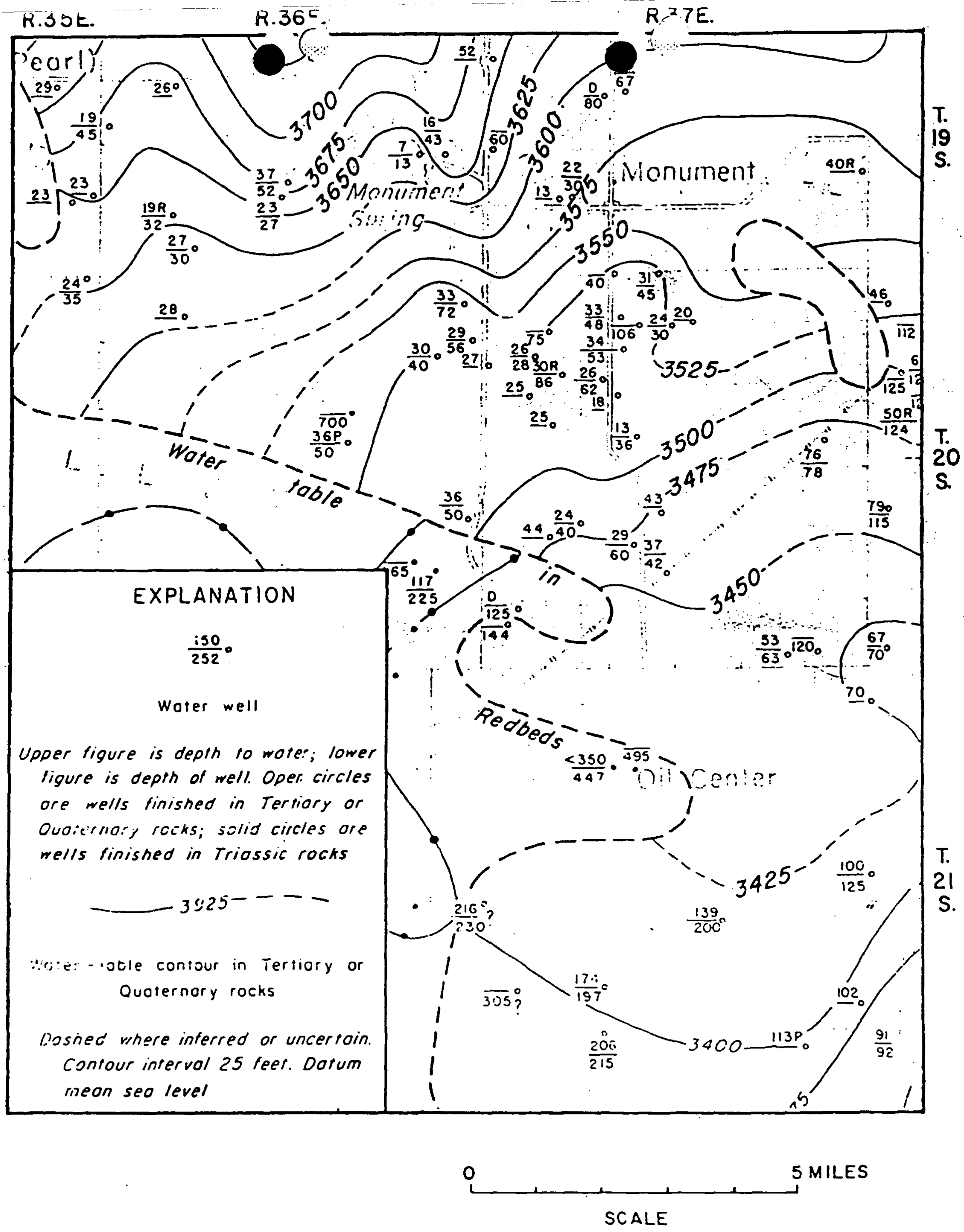


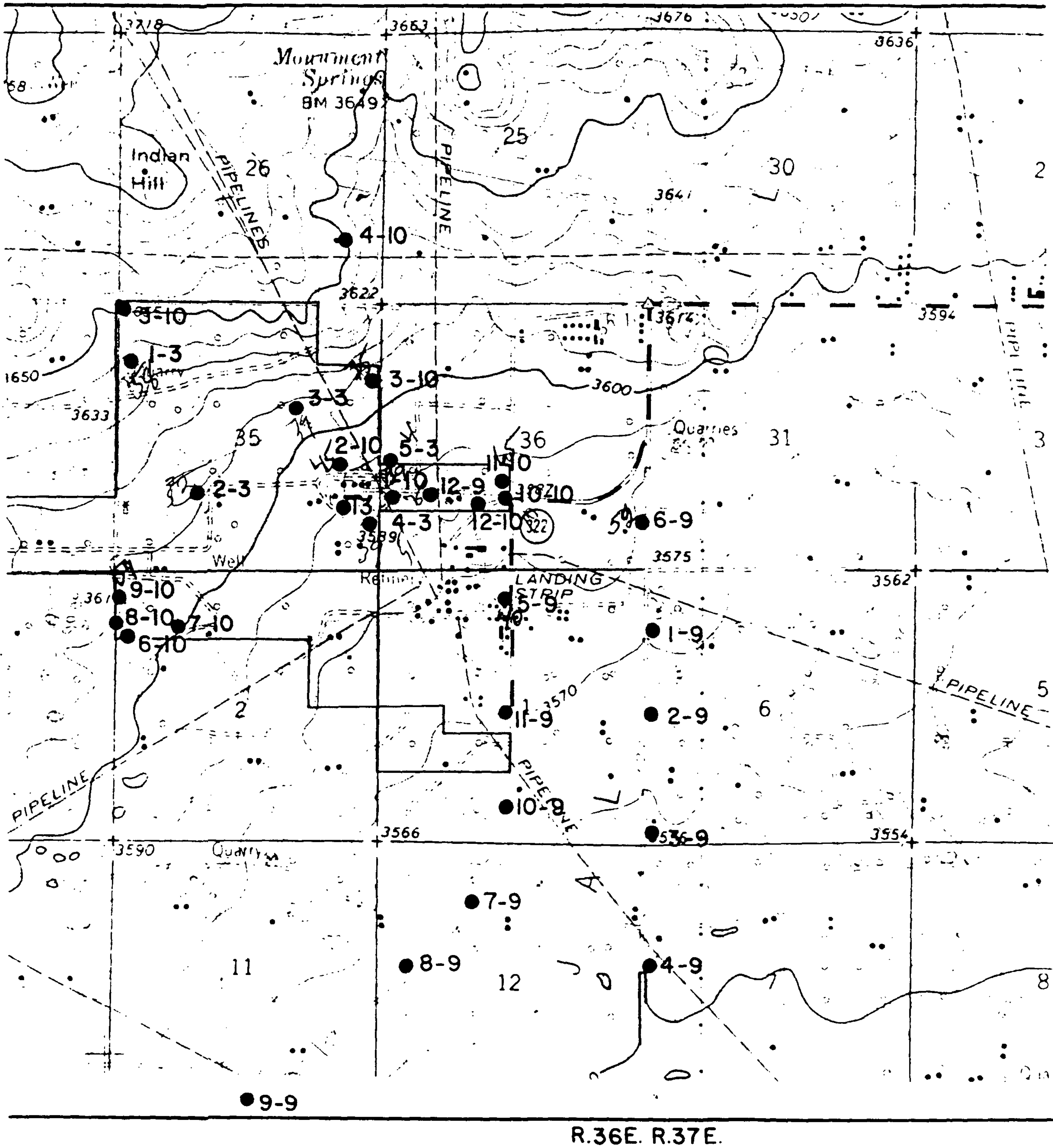
FIGURE 3. Water-table contour map based on data from the mid-1950's (after Nicholson and Clebsch, 1961).

Sample logs submitted by the drilling contractor are included with this report as Appendix A. Additional drilling was completed in March 1981 and September 1981 under the supervision of Geohydrology Assoc., Inc., as part of this water-resources evaluation. The lithologic logs are also included in Appendix A. During the earlier exploration by Climax Chemical and for the more recent hydrologic investigation, a total of 30 test holes have been drilled within a two-mile radius of the Climax plant. The locations of these test holes are shown in Figure 4.

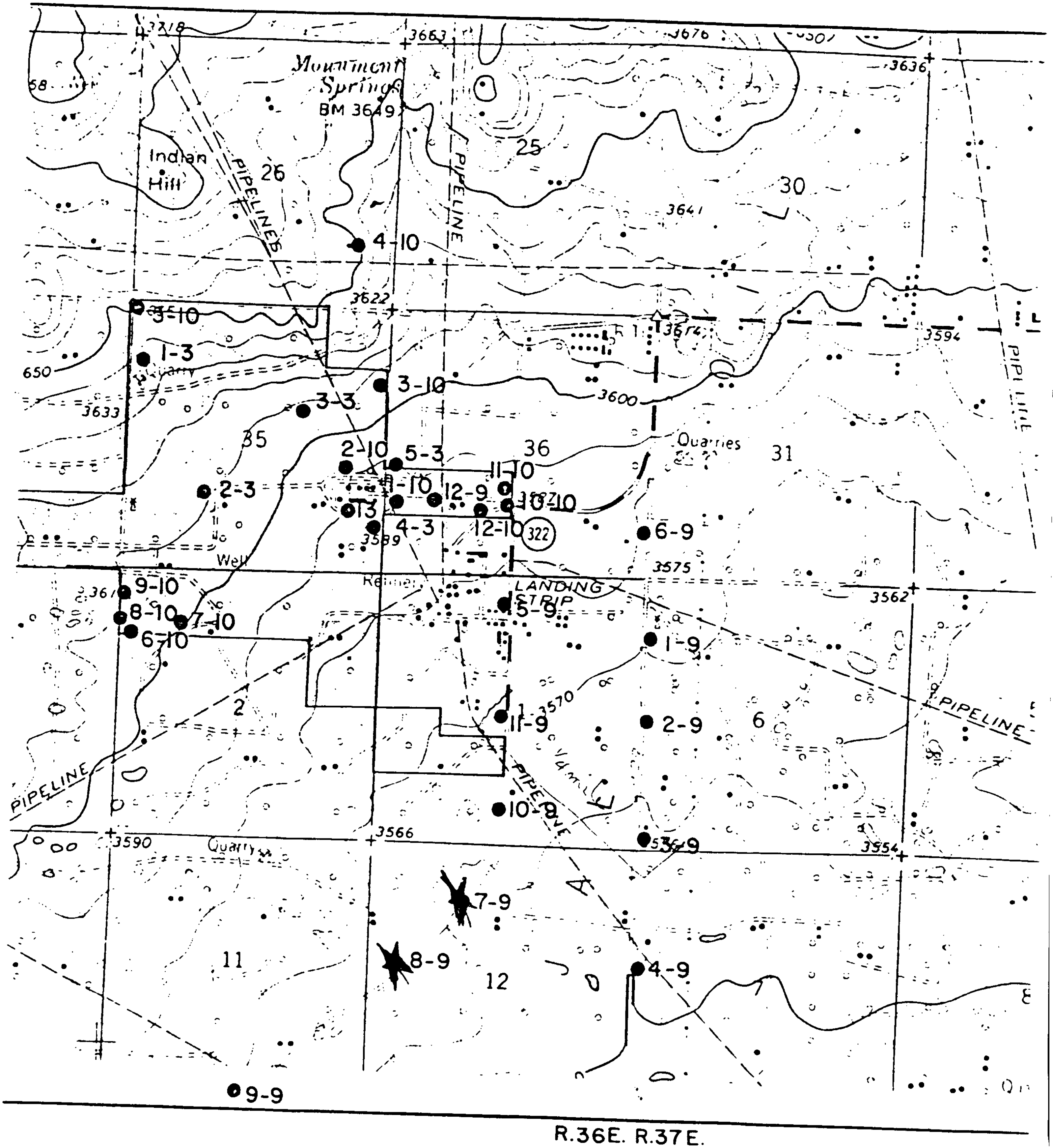
(With the exception of Well No. 13 which was the first test hole drilled by Climax, all test holes have been numbered consecutively during each drilling program. For the purpose of clarity in this report, the assigned well number is used, and this is followed by the month of completion. For example, the fourth well drilled in March 1981 is designated No. 4-3.)

The results of the various drilling programs show that the alluvium in the vicinity of Climax consists of unconsolidated fine to coarse sand with some gravel being present. There are stringers of silt and clay within the sand zones. Also, the material generally becomes more coarse grained with depth. Some eaolian sand is locally present on the surface. There is a persistent caliche zone of variable thickness generally present at depths of less than 25 feet.

The test drilling programs have provided extensive geologic and hydrologic control for the alluvial deposits. It is generally assumed that the redbeds, which underlie the alluvium, are impermeable and act as the lower limit or base of the



owing location of test holes that have been drilled by Climax Chemical as part of hydrologic estigations - shaded area shows Climax property boundaries.



owing location of test holes that have been drilled by Climax Chemical as part of hydrologic
estigations - shaded area shows Climax property boundaries.

* resample

shallow ground water in the alluvium. The upper surface of these redbeds is somewhat irregular, but has a general slope toward the southeast (fig. 5). Northwest of the Climax plant the slope is about 70 feet per mile whereas to the southeast the slope is only about 40 feet per mile. The same general trends were shown by Nicholson and Clebsch (1961, pl. 1) but in much less detail. A bedrock high in the form of a nose extends from the vicinity of Climax toward the east-southeast beneath the Warren Petroleum and El Paso Natural Gas sites. These test holes did not identify any significant bedrock features such as channels which would act as conduits for the movement of ground water away from the Climax site.

A water-table contour map was prepared from the various sources of information; the 1981 test holes served as the primary control (fig. 6). This map shows two noteworthy features. First, there is an area of dry alluvium in the northern part of Section 35 and northwest of the plant site. Second, southeast of the plant site is a "nose" on the water table which may represent a plume of waste products. Although this nose extends to the approximate position of the El Paso Natural Gas plant, it is not apparent beyond that point.

For the purposes of comparison, the contours used by Nicholson and Clebsch for 1955 data are shown in Figure 6. With the exception of minor local changes such as the "nose" described above, there has been very little change in the water table since the earlier work was done in 1955. Also, it should

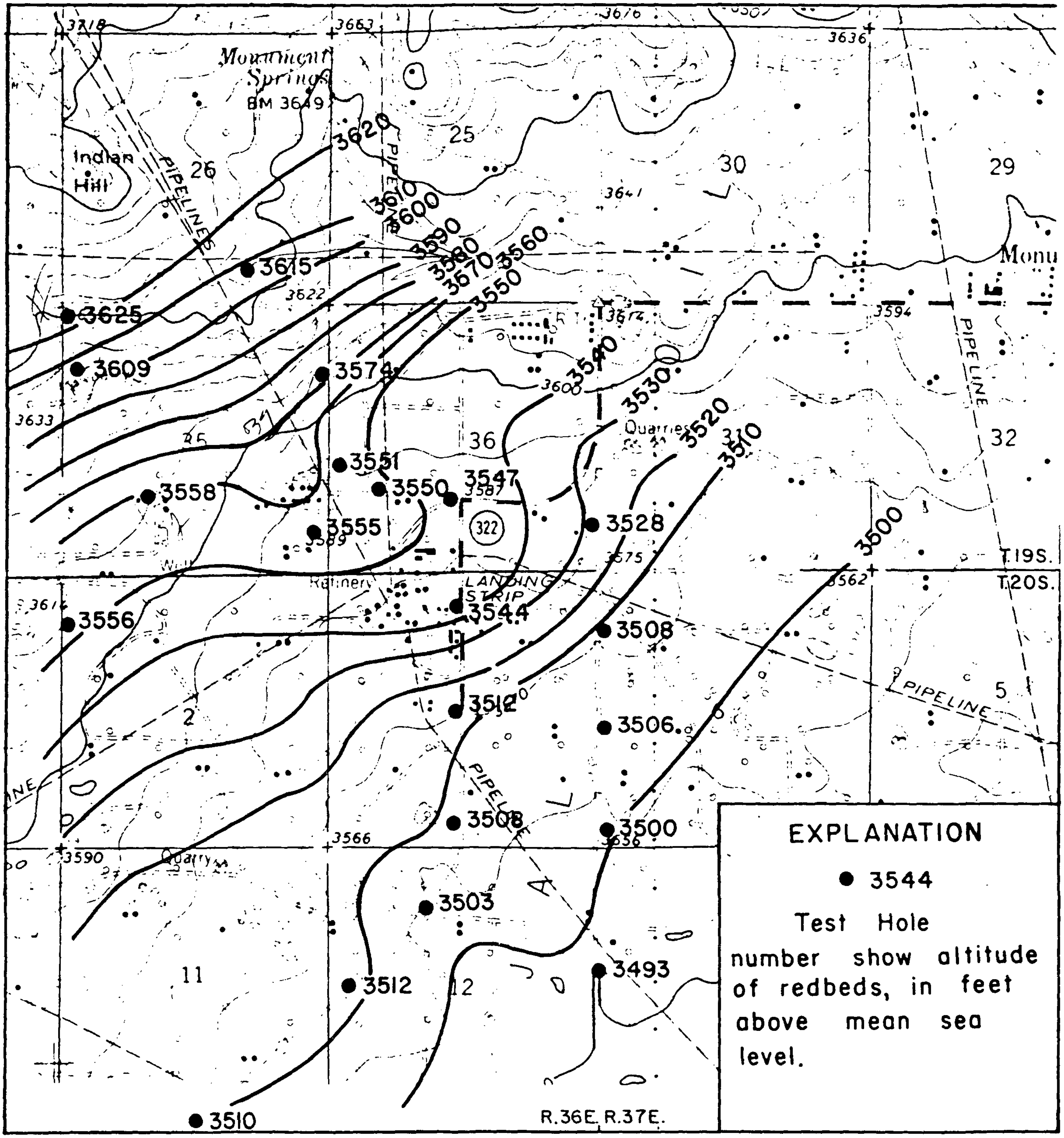
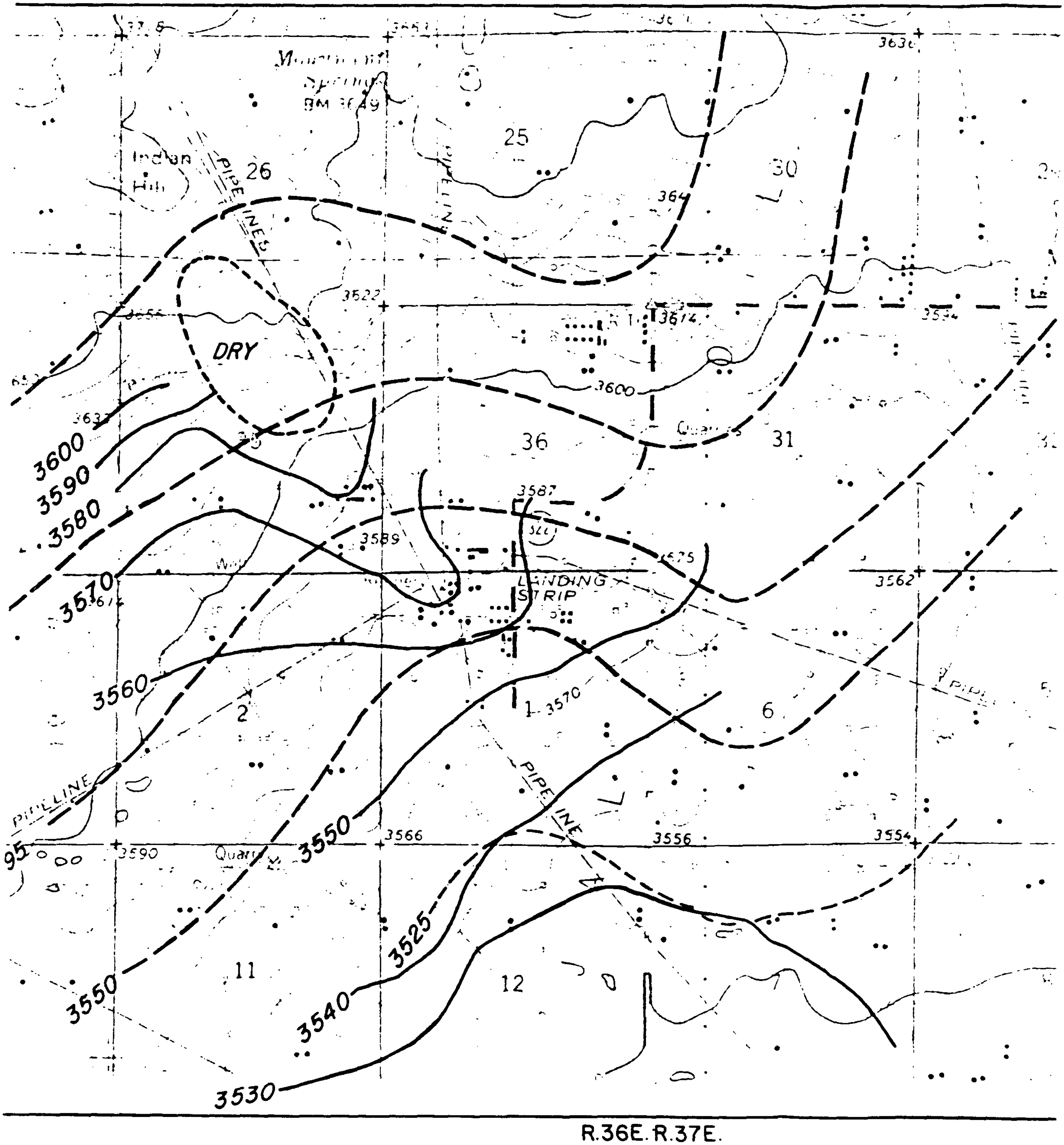


FIGURE 5. Map of the "redbed" surface based on recent test drilling.

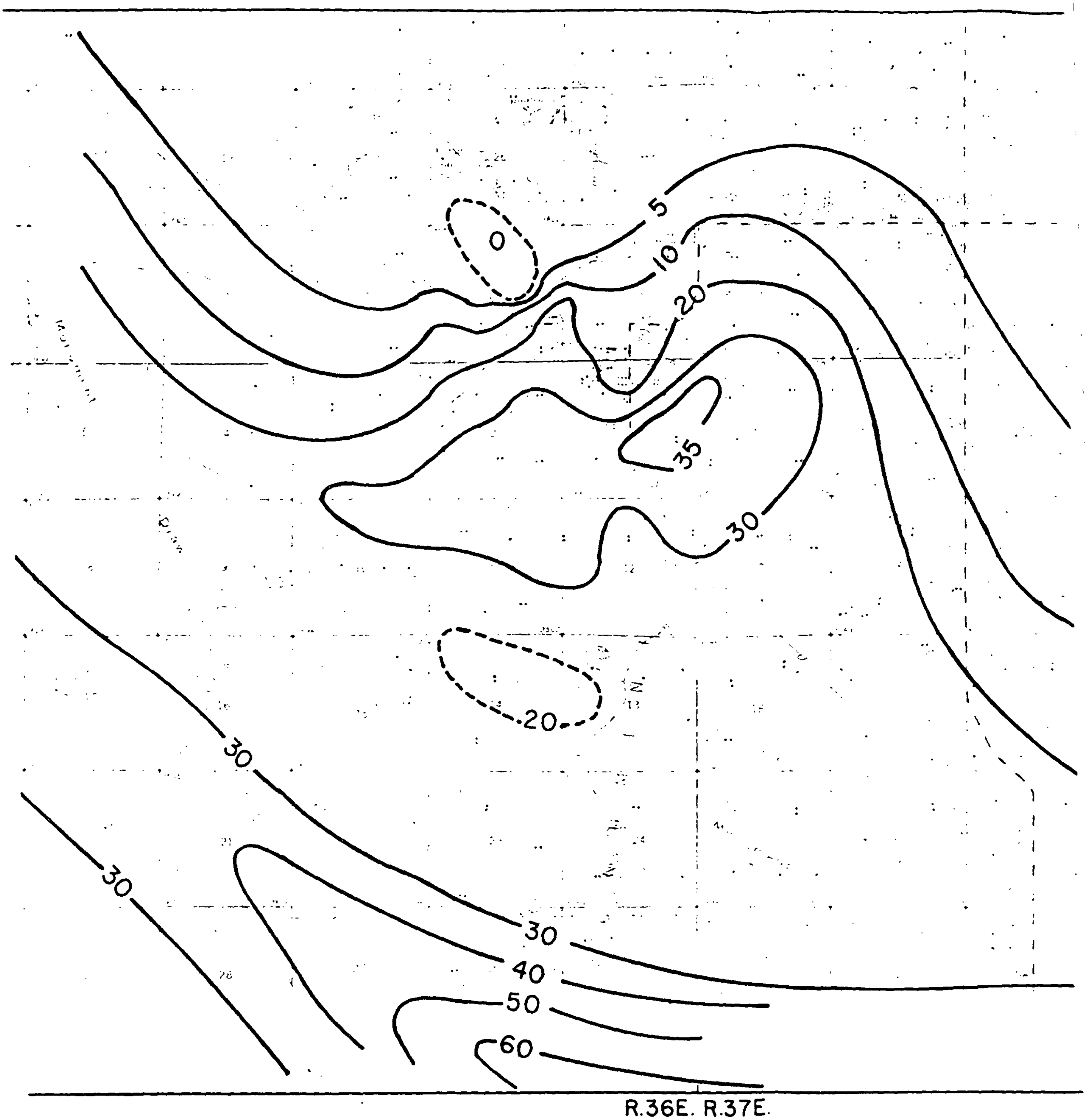


showing comparison of 1981 versus mid-1950's water-table contour map.
olid contours are 1980; dashed contours are 1955.

be noted that the earlier workers did not have as much subsurface control as is now available.

In general, the amount of saturation in the alluvium increases from north to south from Mescalero Ridge to Monument Draw (fig. 7). There are areas of zero saturation along the face of the Ridge; one of these is present in Section 35 northwest of Climax. Elsewhere the saturation is generally less than 5 feet along the Ridge with the thickness 20 to 30 feet being common. Near the plant site, the greatest thickness was noted in test holes drilled in Section 1, T. 20 S., R. 3 E. The amount of saturation shown in Figure 7 is somewhat misleading because the map reflects the configuration of the eroded redbeds below the alluvium and the configuration of the water table above. The greatest thickness noted is in Monument Draw; however it should be noted that the surface position of the Draw shown on the map is about two miles north of the subsurface position.

Aquifer characteristics.--In order to determine the rate at which ground water migrates through the alluvial aquifers, it is necessary to measure the hydrologic characteristics of the aquifer material. Two previous studies have been conducted in Lea County, and data were obtained from these reports. Nicholson and Clebsch (1961, p. 61) reported the results of a study in which the transmissibilities of alluvium near Jal ranged from 16,000 to 23,000 gpd (gallons per day) per foot. This is equivalent to about 2,140 to 3,075 ft^2/day (feet squared per day) respectively. These deposits were



7. Map showing saturated thickness of the alluvium in the vicinity of Climax Chemical. Contour interval variable, in feet.

significantly thicker than the alluvium at Climax Chemical, and the Jal tests were a considerable distance from the plant.

In order to obtain more site-specific information of the aquifer characteristics of the alluvium, a series of aquifer tests were conducted on the test holes that had been installed as part of this hydrologic investigation. Bouwer and Rice (1976, p. 423-428) described a method for determining the transmissivity of an unconfined aquifer that is either partially or completely penetrated by a well. The Climax test holes met the necessary criteria, therefore this testing technique was used for the tests.

A total of 16 tests were conducted (fig. 8). The results of these tests were quite varied with a range in transmissivity of 1 ft^2/day to 1,081 ft^2/day. This wide range of transmissivity values reflect the varied lithologic characteristics of the alluvium which is both fluvial and eolian in origin. The only pattern in distribution of the transmissivity values seems to be a general increase in value from west to east; however there is no obvious explanation for this trend.

Ash (1963, sheet 2) estimated that the Ogallala Formation in northern Lea County has an average porosity of about 35 percent. In general the Ogallala is more highly lithified than the alluvium which was derived from the Ogallala deposits; however specific permeability data in the vicinity of Climax is not available.

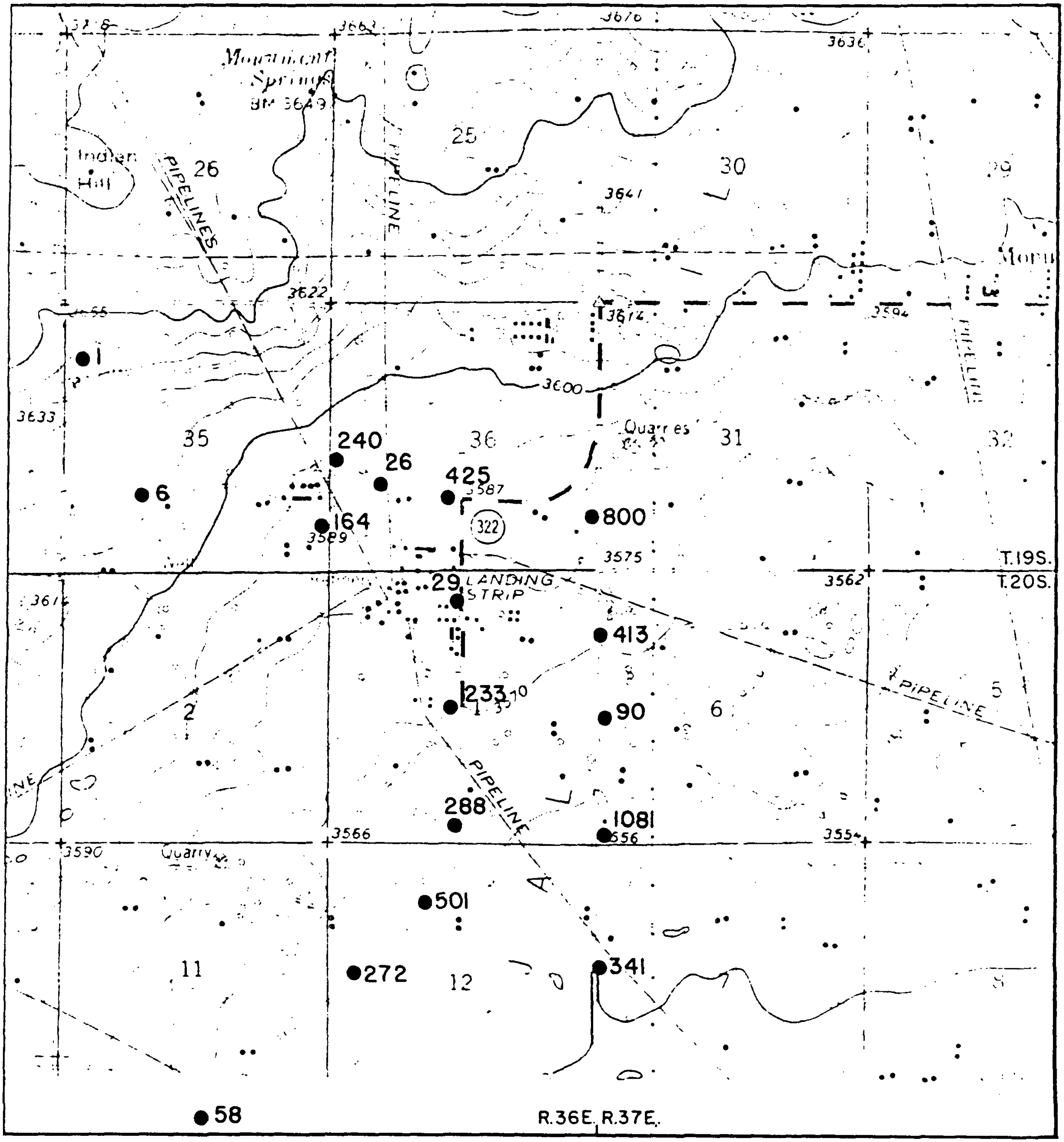


FIGURE 8. Map showing transmissivity (ft[2]/day) of alluvial aquifer deposits as measured in test holes.

Water-quality.--The chemical quality of water in an aquifer generally is indicative of the type of sediments which comprise the aquifer. Sand and gravel deposits are relatively inert, consequently water in this type of deposit is usually low in mineral content. This chemical balance between the ground water and the sediment type may be upset when contaminating substances enter the ground water.

Most of the water samples collected by Nicholson and Clebsch were analyzed between 1953 and 1955. As such they represent the ground-water characteristics prior to most of the industrial development near the Climax plant. Unfortunately the samples were collected at widely spaced intervals and therefore give a very general picture of the ground-water quality. Also, most of the wells sampled during the 1950's are no longer in operation and comparative samples could not be obtained.

Nicholson and Clebsch (1961, p. 100) described the water from the alluvium of Lea County as ". . . generally high in silica (65 to 82 ppm), moderately high in calcium-plus-magnesium, low in sodium-plus-potassium, moderately low in sulfate and chloride, and moderately high in dissolved solids."

The water-quality parameters most important in this study are specific conductance, pH, sulfate, and chloride (table 2). Specific conductance is an indicator of total mineralization of water. The pH is a measure of the acidity of the ground water. Both specific conductance and pH are parameters that can be measured under field conditions, as was done for this study (table 1). In fact, pH frequently

Table 2. Discharge from the Climax Chemical Company plant at Monument, New Mexico.

Date	Description	Quantity	Remarks
pre-1981	Process water	0-100 gpm	Variable rate based on plant level, etc.
	Brine well injection overflow	0-100 gpm	Intermittent based on injection needs
	Brine well injection water	75 gpm	Continuous but variable
	Waste hydrochloric acid	0.2 gpm (avg)	Intermittent
	Spent sulfuric acid	2.5 gpm (avg)	About 1 truckload per day spent acid
	Off-spec sodium sulfate	1.0 ton/day	Intermittent--stockpiled for recovery
	Waste oil	200 gal/month	Used for roadway dust suppression
1981	Process water	0- 60 gpm	Most will be sprayed on off-spec sodium sulfate for dust suppression
	Brine well injection overflow	0	Plant switched to dry sodium chloride
	Brine well injection water	0	Process discontinued; wells plugged
	Waste hydrochloric acid	0.1 gpm (avg)	Weak acid recovery system installed
	Spent sulfuric acid	0	Process discontinued
	Off-spec sodium sulfate	1.0 ton/day	No change
	Waste oil	0	Process discontinued
post-1981	Brine wells		Plugged and abandoned

changes in a sample from the time of collection until measured in the laboratory, therefore a field pH is a more accurate value than laboratory pH. Sulfate and chloride are anions that are common in virtually all ground water.

These four quality parameters are important in this study because each may be an indicator of chemical waste products entering the system. The waste released by Climax is very acidic and high in total mineralization. High sulfate levels are typical of the Climax discharge whereas high chlorides are characteristic of oil field brines which are extensively produced in the region.

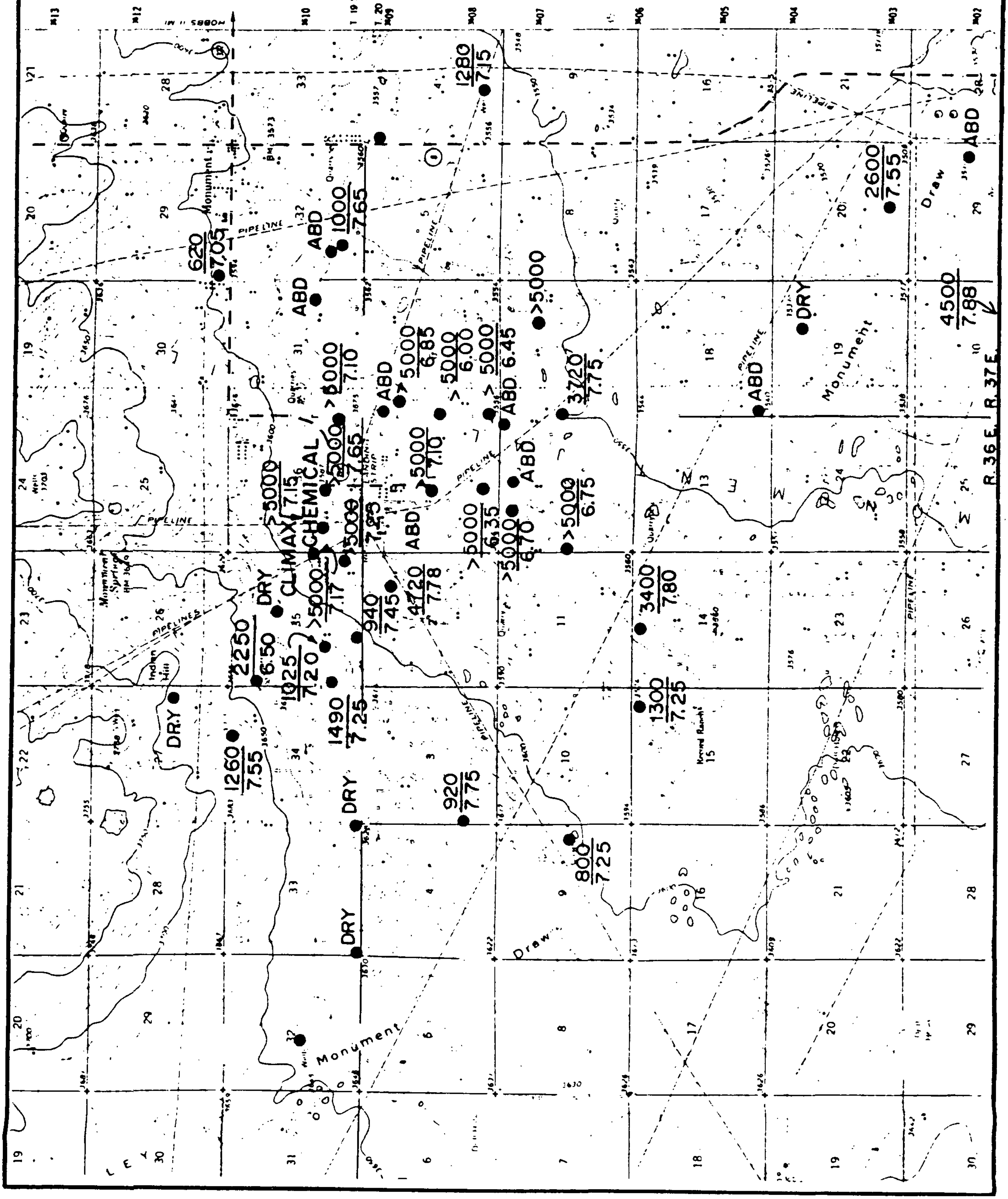
Throughout most of New Mexico, the specific conductance multiplied by 0.65, is a good approximation of the total dissolved solids expressed in milligrams per liter (mg/l). For example, a sample having 4,100 micromhos would have about 2,665 mg/l dissolved solids. Water having more than 1,000 mg/l dissolved solids is considered slightly saline by the Geological Survey (Kelly and others, 1970, p. 3). Until recently the Public Health Service (1962, p. 7) recommended that water containing more than 500 mg/l was not suitable for drinking water.

The specific conductance does not necessarily provide a complete indicator of water quality. For example, a water sample near Monument showed a specific conductance of only 620 micromhos; however, the water had a distinct hydrogen sulfide odor and there was oil standing on the stock tank into which the well was pumping. Likewise, water from the Record Ranch has a field conductance of 1,300 micromhos, yet the water is reported to be "gype" and unfit for drinking. The ranch house obtains its water from cisterns which collect rainwater.

Nicholson and Clebsch (1961, table 8) gave the chemical composition for water samples from 24 alluvium wells in southern Lea County. In these samples the specific conductance ranged from 376 to 7,500 mg/l and had an average of 2,043 mg/l. The two most highly mineralized samples were collected from the same well in T. 20 S., R. 36 E., Section 15, which is down gradient and west of the plant. This well, which is located at the Record Ranch, had a specific conductance of 6,780 mg/l on March 30, 1954, and it had increased to 7,500 mg/l when sampled a second time on September 9, 1958. It should be noted that this increasing mineralization was taking place prior to the construction of the Climax plant in 1962.

During the well inventory that was conducted during March 1981 and the subsequent drilling, the specific conductance was measured in the field. These values show a wide range in chemical quality (fig. 9), from 620 mg/l near Monument to greater than 5,000 mg/l in a number of wells and test holes located near Climax and southeast of the plant site. (Five thousand micromhos is roughly equivalent to 3,250 mg/l dissolved solids which would be classified as moderately saline, non-potable water.) It should be noted that there are several abandoned windmills in the vicinity of the highly mineralized water.

Nicholson and Clebsch (1961, table 8) reported the pH for 15 samples of alluvial water in southern Lea County. The pH


CLIMAX CHEMICAL
PIPELINE
Monument
Draw
R. 36 E.
R. 37 E.
T. 19 S.
T. 20 S.
HOBBS 11 MI.
ABD
DRY

values in these samples ranged from 7.2 to 8.1, and the average pH was 7.5. Some of the lowest values and the highest values were measured in wells located less than one mile apart in Section 4, T. 20S., R. 37 E. and approximately four miles east of the Climax site. However, this wide range in pH was recorded between 1954 and 1958 and at least four years before construction of the Climax facility.

During the hydrologic study for Climax Chemical, the pH was measured at 27 wells or test holes completed in the alluvium (fig. 9). In these samples the pH ranged from 6.00 to 7.88 and averaged 7.17.

Test hole 1-3 was drilled immediately adjacent to an acid disposal pit located about one mile northwest of the plant site. Although the pH of the waste sulfuric acid was about 2.0, the sample registered a pH of 6.5. The other samples near the Climax plant showed values of 7.17 or above. The lowest pH values in the area were found southeast of the plant site in the vicinity of the abandoned wells. Other low pH values were found in water samples from Monument and a stock well located about four miles east of the plant.

In the past the Public Health Service (1962, p. 7) has used the recommended maximum level of 250 mg/l for sulfate and chloride in drinking water. Although these standards have been relaxed (Environmental Protection Agency, 1976), the concentration of 250 mg/l provides a useful guide.

One of the principal waste products generated by Climax Chemical is off-spec sodium sulfate. This is a white power that is stacked north of the plant. The sodium sulfate is soluble and exposed to the weather where precipitation can dissolve the waste product before infiltrating to the ground-water level in the alluvium. Inasmuch as sulfate does not readily react with other constituents in the aquifer, an elevated sulfate concentration in the ground water indicates the presence of a contaminant.

Excluding the two samples from the Record Ranch, which were extremely high, downgradient and to the west, reported by Nicholson and Clebsch, 21 samples from the alluvium had a range of sulfate levels from 54 mg/l to 841 mg/l with an average of 236 mg/l. This is very close to the upper limit formerly recommended by the Public Health Service. In the vicinity of the Climax plant the range is much greater, from 33 mg/l to 10,200 mg/l and an average of 1,560 mg/l (fig. 10). The highest concentrations were found in the immediate vicinity of Climax; the lowest concentration of 33 mg/l was present only a short distance southeast downgradient near El Paso Natural Gas.

The choloride concentration levels in 24 samples reported by Nicholson and Clebsch ranged from 39 mg/l to 1,240 mg/l and averaged 335 mg/l. Of these 24 samples, the level of 250 mg/l recommended by the Public Health Service was exceeded in 11 samples. Inasmuch as these samples were collected and analyzed in the mid-1950's, it must be assumed that these must represent the background levels for chloride concentration in the alluvial aquifer.

Samples collected during this ground-water investigation show a wide range in chloride concentrations, from 154 mg/l

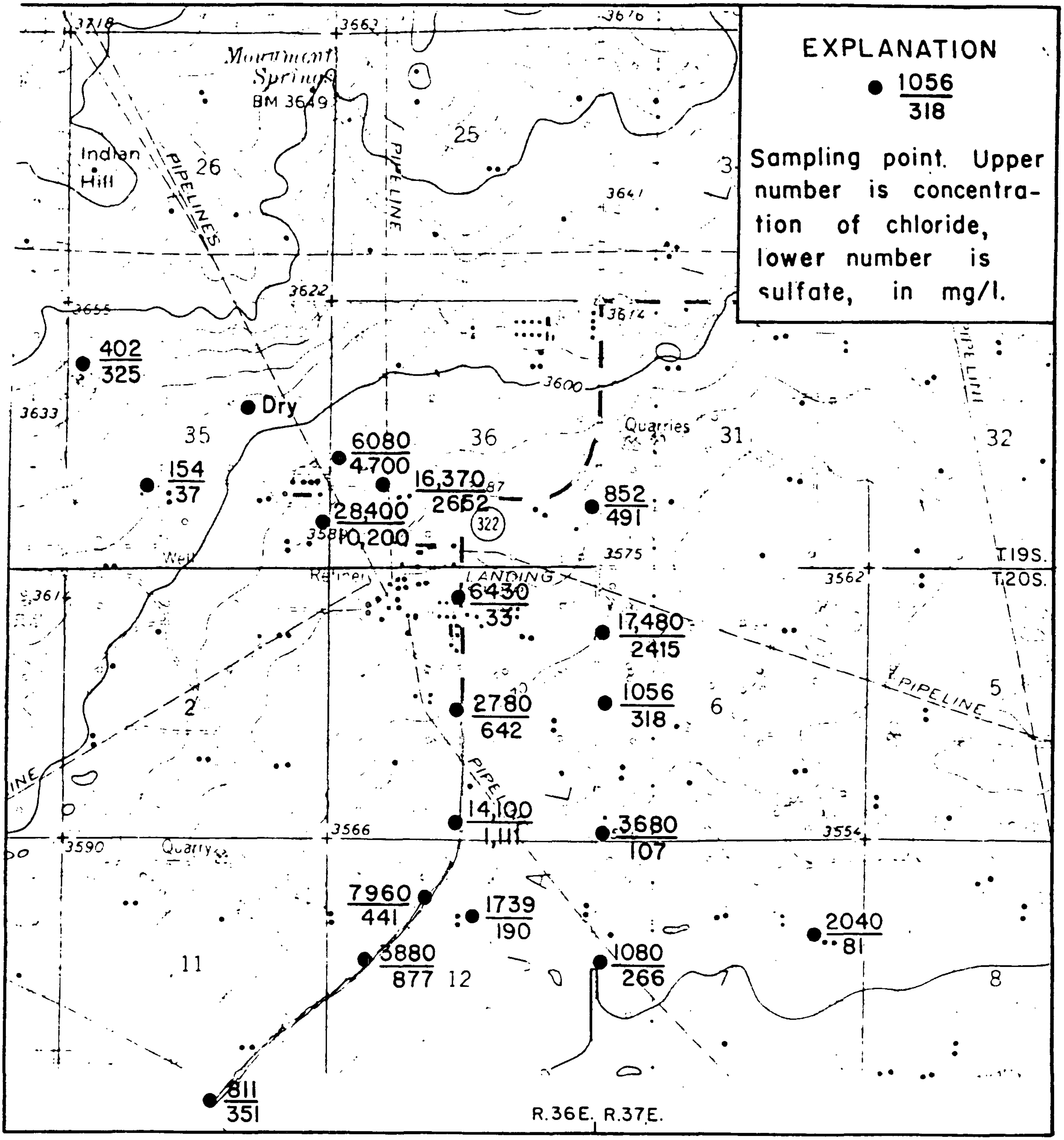


FIGURE 10. Map showing concentration of chloride and sulfate in samples collected from test holes and wells.

west of the plant of 28,400 mg/l at the plant site itself. However, concentrations greater than 1,000 mg/l were found in all of the test holes south and east of Climax (fig. 10).

There are two sources of chloride contamination that may be influencing the quality of water in the alluvium near the plant. Climax Chemical has used an unlined evaporation pond for disposal of chloride-contaminated wash water from the plant. Prior to 1981 the quantity of wash water varied from zero to 100 gpm, but it was reduced to a maximum of 60 gpm in 1981. Oil field brines are the other source of chlorides.

Several different studies have concluded that the oil field brines of Lea County are a major source of contamination for the alluvial aquifer. Parker (1955, p. 626) concluded that ground-water contamination was taking place. Until recently unlined ponds were used to dispose of the brine that was produced from oil wells. Ash (1963, sheet 2) calculated that as much as 96 percent of the brine seeps to the water table and only 4 percent is lost by evaporation. However, since the salts do not evaporate with the water, the salts become more concentrated as evaporation occurs. As a result, the concentration of the infiltrating brine is greater than that actually produced from the well. Nicholson and Clebsch (1961, p. 71) reported that oil and brine were being produced in almost equal quantities from wells prior to 1956. These works calculated that nearly 74,000 acre-feet of brine was produced in Lea County, and virtually all of this was emptied into unlined ponds at the production site.

One of the major areas of brine disposal was in T. 20 S., Rs. 36 and 37 E. which is directly south of the Climax plant (fig. 11). This is the same area in which high specific conductance and chlorides are found in test holes (figs. 9 and 10), and there are several abandoned windmills in the same area. Although each disposal pond represents a point-source of contamination, the original density of ponds and the subsequent infiltration of the brine probably is the major cause of contamination to alluvial ground water in the area.

Phreatophytes.--These deep-rooted, salt tolerant plants may have a significant bearing on the migration of ground water in the vicinity of the Climax facility. Phreatophytes are plants that depend upon ground water that lies within reach of their roots for their water supply. Many plants of this type are tolerant of high salt levels in the ground water, and phreatophytes also have the capability of sending tap roots as much as 60 feet below land surface (Kearney and Peebles, 1951, p. 402). According to Robinson (1958, p. 1), phreatophytes annually use from a few tenths of an acre-foot per acre to more than 7 acre-feet per acre.

The most common phreatophytes in the vicinity of Climax Chemical are mesquite, rabbitbush, and greasewood. In any given area the amount of ground-water consumption depends on plant density, composition of the vegetation, and meteorlogical factors. However one species of mesquite is capable of using 3.3 acre-feet of ground water per acre when the density is

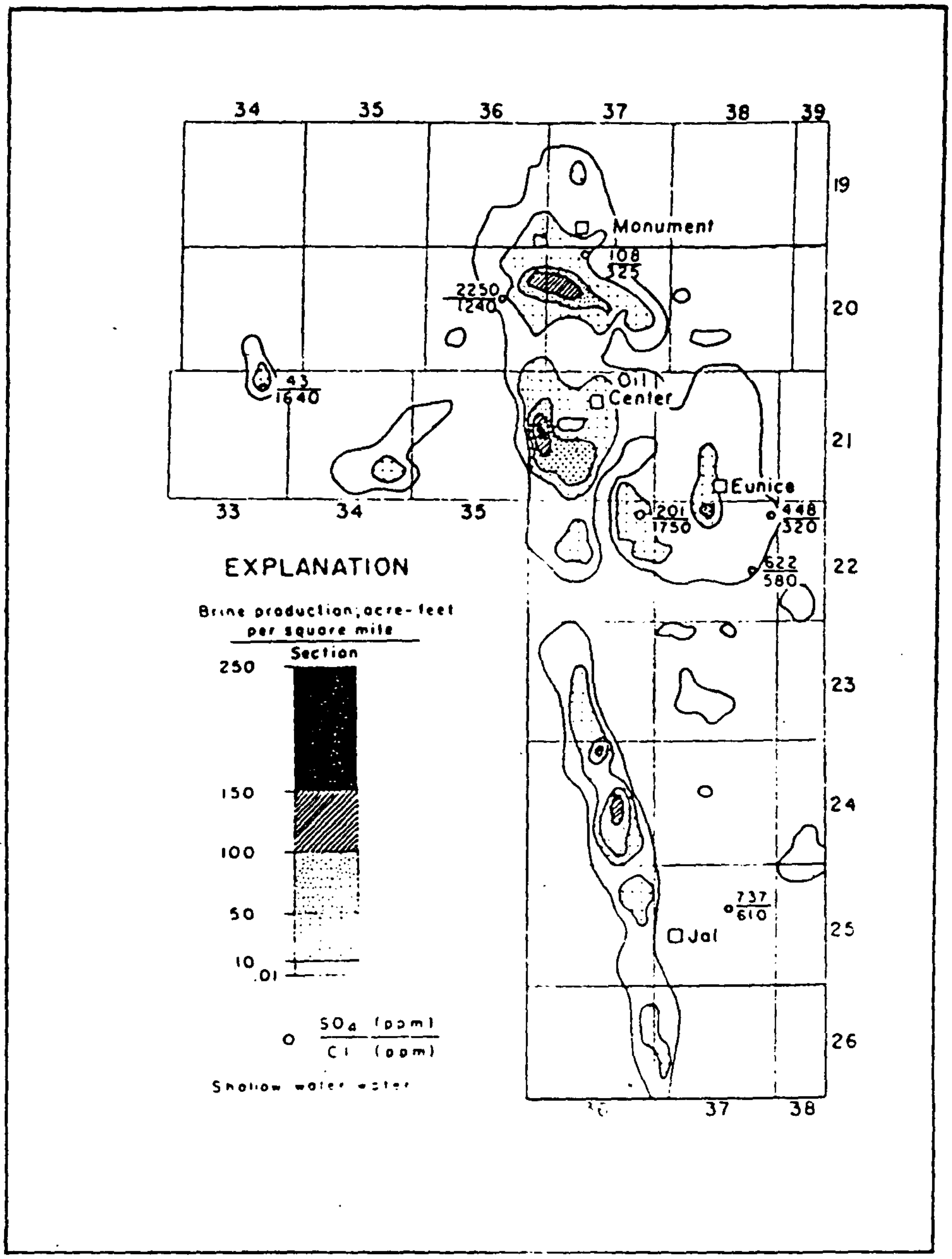


FIGURE 11. Oil-field brine production in southern Lea County, New Mexico, 1952 (after Nicholson and Clebsch, 1961).

100 percent (Gatewood and others, 1950, p. 195). If it is assumed that Climax is releasing 40 gpm waste wtaer at a constant rate, and if mesquite density is assumed to be only 10 percent, then the total Climax discharge would be consumed by the mesquite on approximately 200 acres of land.

III.

COMPUTER MODEL OF SOLUTE TRANSPORT AND DISPERSION

As originally designed, and prior to implementation of the Environmental Improvement Division regulations, the Climax plant produced seven different types of discharge. Subsequently plant operations have been modified in order to reduce the quantity of discharge.

The plant by-products include both solids and liquids (table 3). The off-specification sodium sulfate (Na_2SO_4) is a white powder. Process water is used in normal plant operation, during which the total mineralization is increased by salt. The process water is sprayed onto the stockpiles for dust suppression. The waste oil is a plant by-product that has been used for application on the gravel roads as a means of dust suppression. The brine-well injection had been an integral part of the solution-mining process used by Climax, but it was phased out in 1981.

Throughout its period of operation, Climax has disposed of spent acid in unlined pits on the plant site. The disposal of spent sulfuric acid was discontinued in 1981; however small quantities of spent hydrochloric acid still are being discharged at the plant.

Owing to the variability in quantity and quality of the waste products during the past 20 years of operation, the discharge of Climax has varied as to quantity and quality. Furthermore, oil field brine discharge is known to have affected the groundwater

Table 3. Chemical analyses of samples collected in vicinity of Climax plant.

Location	Identifier or Description	Date of Analysis	Analysis in ppm (parts per million) or mg/l (milligrams per liter)										pH
			Calcium (Ca)	Magnesium (Mg)	Potassium (K)	Sodium (Na)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Nitrate (NO_3)	Sulfate (SO_4)	Chloride (Cl)	Total Dissolved Solids	
19.36.34.212	windmill	3/6/81	71.2	23.7	8.3	94.2	180	>0.1	0.95	85	146.6		7.60
35.1311	TH 1-3	3/6/81	211.2	60	7.25	870.7	552	>0.1	0.85	325	402		7.10
35.3233	TH 2-3	3/6/81	171	24.9	4.48	74.0	240	>0.1	0.50	37	154.4		7.57
35.3311	windmill	3/6/81	68.3	18.9	3.78	144.5	210	>0.1	2.3	140	212.4		7.32
35.3434	windmill	3/6/81	119.4	43.0	19.9	106.8	680	>0.1	7.1	25	204		7.26
35.4422	TH 13	11/2/61	35.2	6.7		828.5	224.5		1047.7		453.3		8.1
35.4423	TH 4-3	3/6/81	433.5	148.5	100	4878	378	>0.1	0.75	4700	6080		7.31
36.3131	TH 5-3	3/6/81	1438	504	266	19780	1498	>0.1	1.05	10200	28400		6.66
36.314	TH 12-9	9/18/81								2652	16370	33260	
36.3244	TH 10-10	3/6/81	38.6	34.8	16.2	673.2	378	>0.1	0.45	185	1020		7.65
36.442	TH 6-9	9/18/81								491	852	8832	
19.37.29.344	Monument School	6/27/80	138		3.6	50	120			57.8	124		
20.36. 1.122	TH 5-9	9/18/81								33	6430	11986	
1.144	TH 11-9	9/18/81								642	2780	6436	
1.344	TH 10-9	9/18/81								1111	14100	28380	
2.223	Abd. well	3/6/81	69	61.5	15.7	844	98	>0.1	0.70	395	1405		7.9
12.123	TH 7-9	9/18/81								441	7960	11988	
12.133	TH 8-9	9/18/81								879	3880	8952	
14.122	TH 9-9	9/18/81								351	811	1976	
20.37. 6.133	TH 1-9	9/18/81								2415	17480	33892	
6.311	TH 2-9	9/18/81								318	1056	10712	
6.333	TH 3-9	9/18/81								107	3680	7672	
7.133	TH 4-9	9/18/81								266	1080	2080	
7.234	B.Barber	9/18/81								81	2040	4152	

system prior to, and during, the
Chemical. In addition, there are
operations in the immediate vicinity
of these firms have filed a Disch
define their effects on the hydrologic s

The complexity of the discharge
bility of appreciable hydrologic data
that the hydrologic system should be
a digital model. An existing program
Resources Division of the U.S. Geological Survey was used for this phase of the study. The model, entitled "Computer Model of Two-Dimensional Solute Transport and Dispersion in Ground Water" (Konikow and Bredehoeft, 1978) is ideally suited for the manipulation of large quantities of water-quality data.

Note to program

The purpose of this particular model is to compute the concentration of a dissolved chemical, such as sulfate, in an aquifer at any specified place and time. Specifically, the computer model calculates the transient changes in the concentration of the nonreactive solute in flowing ground water. The program solves two simultaneous partial differential equations. One equation is the ground-water flow equation, which describes the head distribution in the aquifer. The second equation describes the chemical concentration in the system, or solute-transport. By coupling the flow equation with the solute-transport equation, the model can be applied to both steady-state and transient flow problems.

In order for this model to be used properly, some reasonable assumptions have been made to satisfy these equations. Following is a list of the main assumptions that were carefully evaluated before applying the model to the alluvial aquifer system in the vicinity of the Climax plant site.

1. Darcy's law is valid and hydraulic-head gradients are the only significant driving mechanism for fluid flow.

2. The porosity and hydraulic conductivity of the aquifer are constant with time and porosity being uniform in space.

3. Gradients of fluid density, viscosity, and temperature do not affect the velocity distribution.

4. No chemical reactions occur that affect the concentration of the solute, and fluid properties, or the aquifer properties.

5. Ionic and molecular diffusion are negligible contributors to the total dispersive flux.

6. Vertical variations in head and concentration are negligible.

7. The aquifer is homogeneous and isotropic with respect to the coefficients of longitudinal and transverse dispersivity.

These assumptions are considered legitimate within the alluvial aquifer system. Sufficient information is known about the system that these assumptions may be made. The degree to which the field conditions deviate from these assumptions is relatively small and would not limit the reliability of the model for this particular problem.

A. Input Data

The model was programmed to track the changes in sulfates through the alluvial aquifer system. Both sodium and chloride are discharged by Climax, but these ions also are strongly indicative of the oil field brines. Therefore sulfate was selected because it is the only chemical parameter that can be solely attributed to Climax.

The geologic framework for the area, as well as the hydrologic characteristics of the aquifer, have been described in the preceding section of this report. This is based on the extensive drilling, testing and sampling programs conducted as part of this investigation, and we believe that it is adequate to provide accurate computed results.

The principal input data requirements for modeling the sulfate movement in the aquifer system are tabulated below:

1. Saturated thickness of the aquifer
2. Water-table configuration
3. Background levels of sulfate in the aquifer
4. Aquifer parameters
5. Longitudinal and transverse dispersivity
6. Infiltration rate of the waste products

Saturated thickness of aquifer.--Although the thickness of the alluvial deposits reach a thickness of more than 50 feet in the vicinity of the Climax plant, only the lower part of these deposits are saturated with ground water. The saturated thickness map (fig. 7) shows that in the northern part of the area, less than five feet of alluvium is saturated. Locally, near Monument and the Climax plant, the alluvium is dry. South of Climax the saturated thickness varies between 20 and 30 feet except where thicknesses of greater than 60 feet are present in Monument Draw. The computer image of this saturated thickness map is shown in Figure 12.

Water-table configuration.--Two water table contour maps have been prepared of this area in the past; the first by Nicholson and Clebsch (1961, plate 1) from data collected in the mid-1950's; the second contour map was based on data collected for this study. While the two maps generally agree on a regional basis, minor changes with time are obvious in the 1981 contours (fig. 6).

For the purposes of modeling, the water-table contour map was constructed with the lowest point at the southeast corner of the project area. This reflects the gradual rise from 3 feet (above an arbitrary datum) to 175 feet (fig. 13).

Background levels of sulfate in the aquifer system.--For the purposes of this study, it has been estimated that the pre-development level of sulfates in the alluvial aquifer was approximately 100 mg/l.

Nicholson and Clebsch presented data from 12 wells in the vicinity of Monument and Climax which averaged 98 mg/l sulfate. These samples were collected between 1954 and 1958 and are sufficiently low in mineralization so that they probably were not affected by oil field brine. (The Record Ranch samples

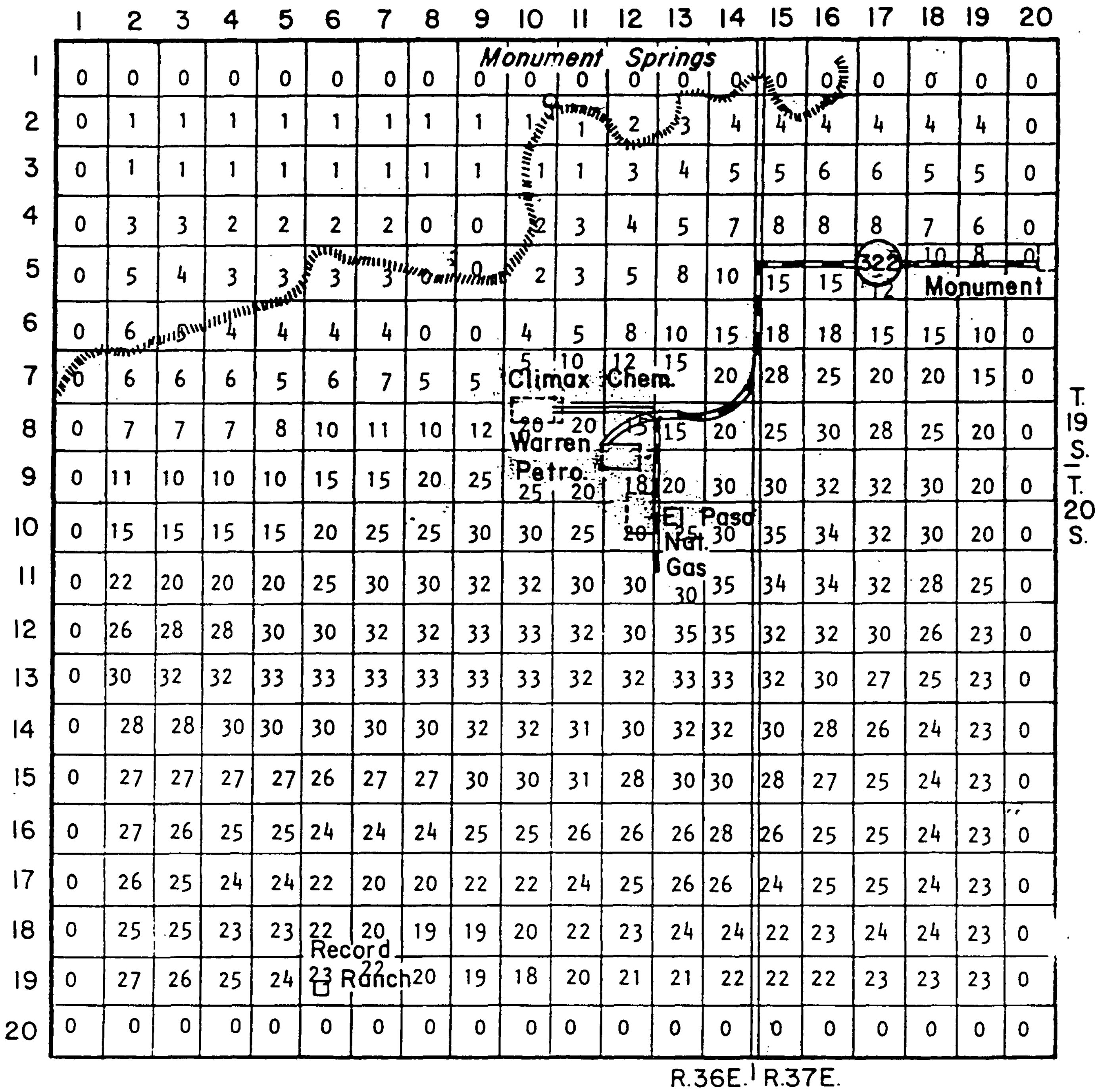


FIGURE 12. Computer map showing distribution of saturated thickness of alluvium. (compare with fig. 7).

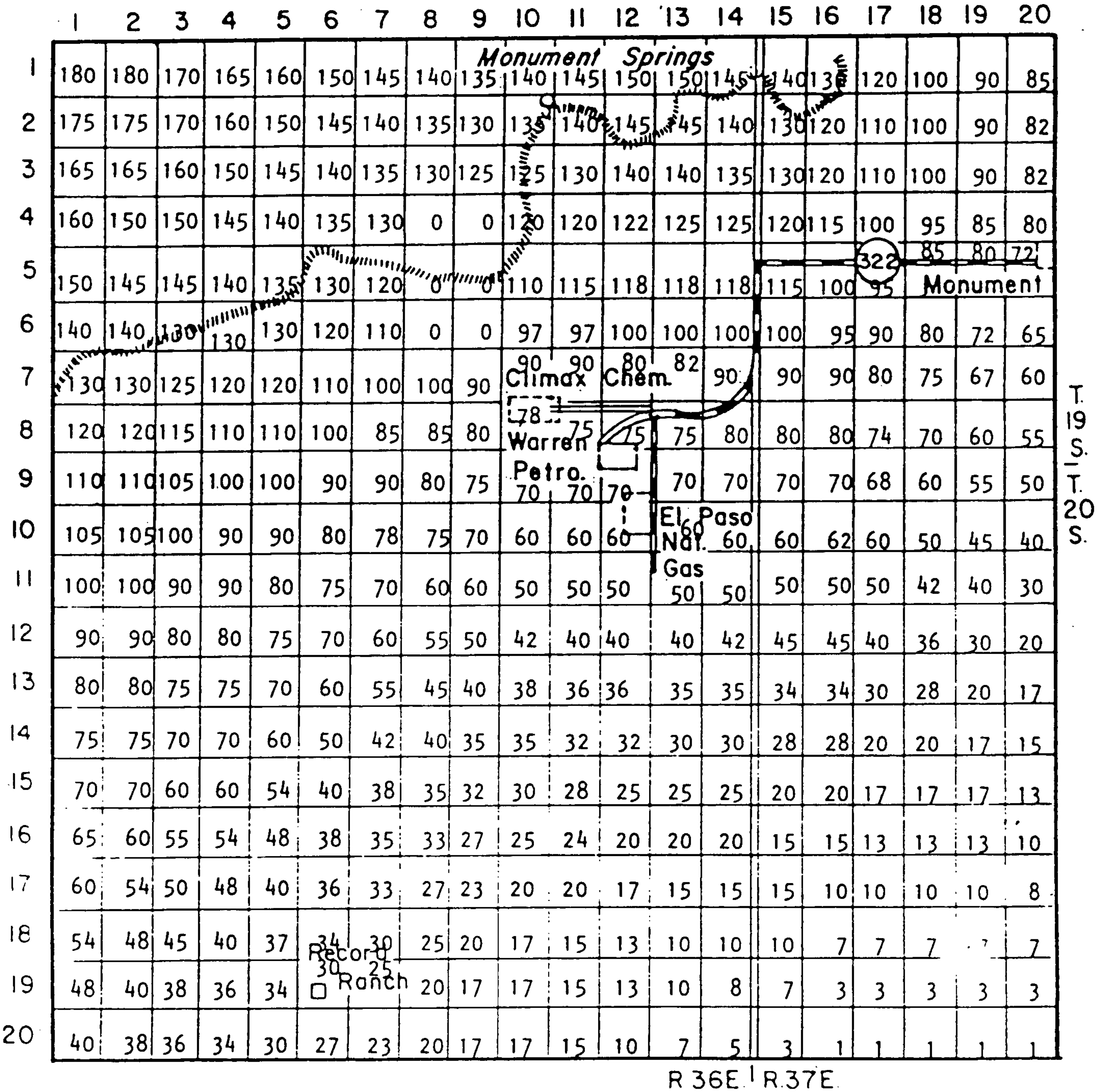


FIGURE 13. Computer map showing water-table measured above an arbitrary datum.

have been ignored because of the high level of mineralization and the questionable completion data.) Also, most workers believe that much of the water in the alluvial aquifer was derived by the southward movement of ground water in the Ogallala aquifer. Assuming that this is the case, 23 samples from the Ogallala contained an average of 116 mg/l sulfate. On the basis of these early samples, it seems that the assumption of 100 mg/l sulfate for the uncontaminated alluvium water should be reasonably accurate.

Aquifer parameters.--Three aquifer parameters are required in order to use the solute-transport model. These are: transmissivity, coefficient of storage, and effective porosity.

A total of 17 aquifer tests were conducted on wells and test holes in the vicinity of Climax. These tests reveal a wide range in transmissivity values from 1 ft^2/day northwest of the plant to 1,081 ft^2/day southeast of Climax (fig. 8). For the purposes of modeling the transmissivities in the area, a value was assigned to each node in the program (fig. 14). In those areas where test data is lacking, the transmissivity values were estimated on the basis of the available data. Conservative values of transmissivity have been used where there is a question of the true values, thus producing results that show greater rates of movement and impact.

Within the scope of this project it was not possible to conduct the necessary tests for measuring the coefficient of storage. Fortunately the value of this parameter does not change significantly with water-table aquifers. Throughout most of

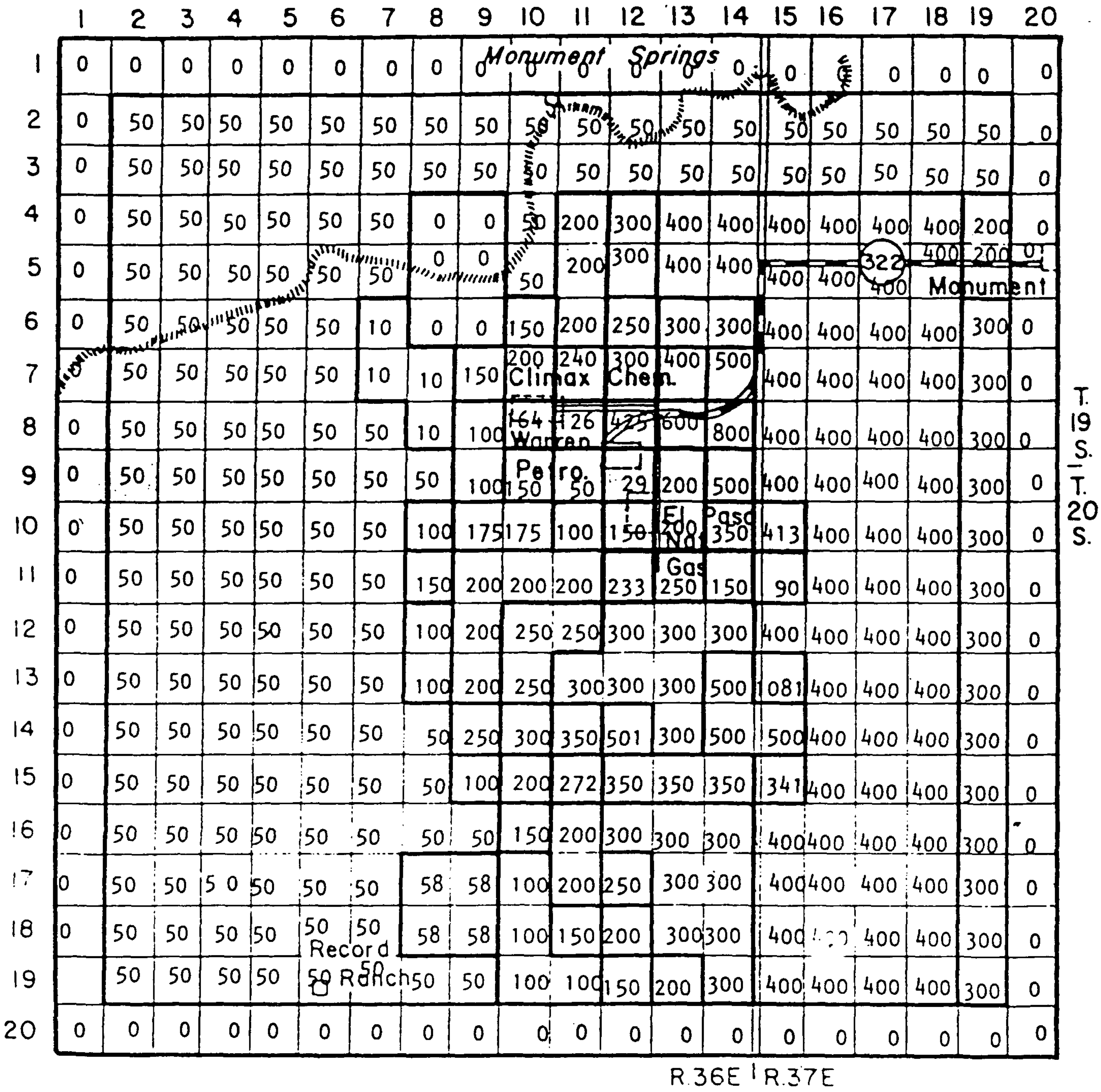


FIGURE 14. Computer map showing distribution of transmissivity in project area.

the country the coefficient of storage in water-table deposits ranges from about 0.1 to 0.3 (dimensionless) and averages about 0.2 (Lohman, 1972, p. 8). However for the purposes of modeling the area, the coefficient of storage is set at zero throughout the model (Konikow and Bredehoeft, 1978, p. 77).

The effective porosity for the modeled area was assumed to be 20 percent. This value is believed to be very conservative; however the results would show greater impacts than would normally be expected. As pointed out in an earlier section of this report (Aquifer Characteristics), Ash (1963, sheet 2) estimated that the Ogallala Formation in northern Lea County has an average porosity of about 35 percent. Inasmuch as the Ogallala is older and generally more lithified than the alluvium, a lower effective porosity would be expected. In other area it is not uncommon for unconsolidated alluvial material to range from 10 to 40 percent effective porosity. Therefore the value of 20 percent used in this modeling problem should be conservative but realistic.

Longitudinal and Transverse Dispersivity.--A literature and file search for this project indicated that dispersivity values are very difficult to determine without using a two-well injection tracer test. While tests of this type have been conducted at the WIPP site west of Climax Chemical, the tests were conducted in a different rock type and are not applicable to this problem.

Several tests have been conducted in alluvial deposits in Colorado which should be similar to those in Lea County (Konikow and Bredehoeft, 1974; Konikow, 1977). The values obtained from these studied gave consistent values. Therefore, for the purposes of this project, the longitudinal dispersivity was assumed to be 100 feet; the transverse dispersivity was 0.33 times the longitudinal value.

Infiltration rate of the waste products.--As shown in Table 3, there is a wide range in the quantity and quality of discharge from the Climax plant. During the past 19 years of operation from 1962 to 1981, the discharge ranged from zero to as much as 100 gpm. Likewise, there was a variety of waste products discharged to the disposal pits, as well as the dry calcium sulfate which was stored on the ground and exposed to the elements. Therefore, through the process of calibration, the model was used to integrate these variables and calculate the quantity and quality of the discharge from the plant during its history of operation. This is explained more fully in the following section of this report.

B. Application of Simulation Model

The solute-transport model was written in FORTRAN IV and originally compiled on the IBM system. After publication of the original model, an update was made which provides more accurate results. This update was included in the Climax study.

The model is based on a square, block-centered, finite-difference grid. It allows for input from any number and location of injection wells, but for this study only one well was simulated at the plant site. The model also allows for varying transmissivity, boundary conditions, and initial head and solute concentrations. The program permits the simulation of up to five nodes as hypothetical observation wells, from which a summary table of head and concentration versus time is printed out.

The node array used for this particular study is shown in Figure 15. Four hundred nodes with an equidimension of 1,320 feet (quarter mile square) were used. The waste discharge by Climax was simulated by a hypothetical injection well at the plant site. Four hypothetical observation wells were selected for showing the concentration increase with time. A 20-year time frame was used.

The model was calibrated using the sulfate data shown in Figure 10.

C. Output Data

As has been stated in a preceding section, the quantity and quality of the discharge from Climax during the first 20 years of operation is unknown. Therefore certain assumptions were made in order to begin calibration of the model. First, it was assumed that the waste products from the plant were a saturated brine in which 30 percent of the ions were sulfate, or approximately 100,000 mg/l sulfate. Also, since the discharge rate was estimated to range from zero to 100 gpm, it was assumed "worst case purposes" that the discharge was 100 gmp for 20 years. The results of this computer run showed sulfate levels much higher and more widespread than the 1981 data shown in Figure 10.

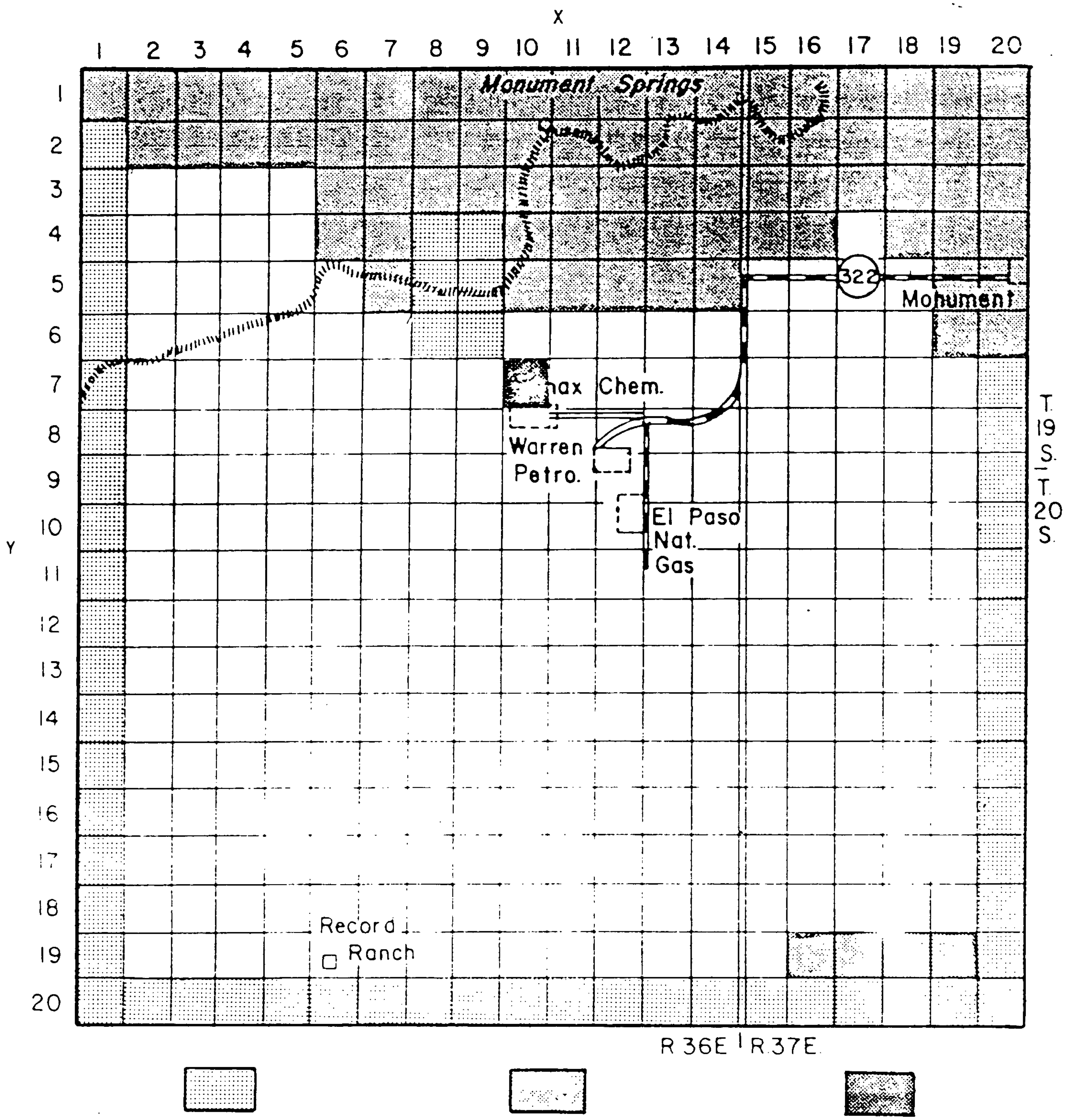


FIGURE 15. Computer map showing node array used to simulate hydrologic system.

The model has the capability of calculating the increase in concentration with time at five hypothetical observation wells. One such well was located directly northeast of the plant at a site matching that of test hole 5-3. The computer run with an estimated 100,000 mg/l sulfates showed that the background sulfate levels were quickly displaced, and within a period of about five years the concentrations approached 100,000 mg/l sulfate. Subsequent computer runs were made simulating concentrations of 10,500 and 10,200 mg/l sulfate. The results showed that after 20 years of discharge, a well located at the site of 5-3 should have a concentration of 10,125 mg/l sulfate (fig. 16). Since hole 5-3 has the highest sulfate level measured in any sample, 10,200 mg/l, and since displacement occurs quite rapidly, it may be concluded that the average concentration from Climax is approximately 10,200 mg/l sulfate.

Similar calibration techniques were used to determine the discharge rate used by Climax. Although the assumed concentration of 10,200 mg/l sulfate data accurately matched the measured results for wells in the immediate vicinity of the plant site, high concentrations were much more widespread. Inasmuch as conservative aquifer parameters were used, and the transmissivity values were well documented, the widespread sulfate concentrations produced by the model could only be attributed to excessive discharge rates. Therefore a series of calibration runs were made using a concentration of 10,200 mg/l and discharge rates of 80, 60, and 40 gpm.

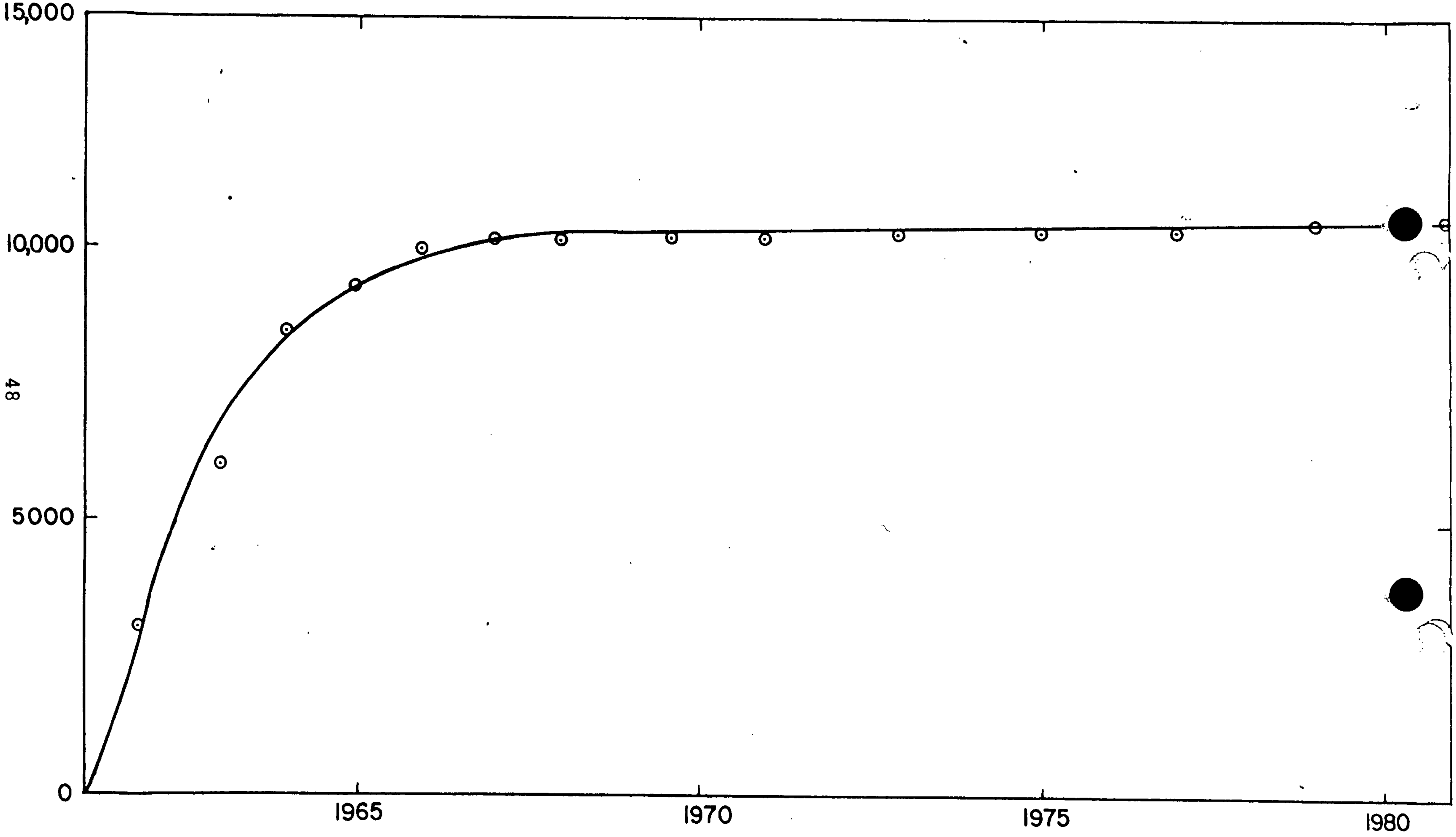


FIGURE 16. Plot of sulfate concentrations versus time for hypothetical observation well at site of test hole 5-3.

The computer run using 60 gpm more nearly matched the actual sample data than the runs at 80 and 40 gpm. From this it was concluded that the average discharge from the Climax plant was approximately 60 gpm for the first 20 years of plant operation, although the range in discharge reported by Climax was from zero to 100 gpm (table 3).

Through the process of calibration, by varying the sulfate concentrations and the discharge rate, it was possible to achieve a good match between the available field data and the computer output (fig. 17). The resulting computer map is based on all of the available field data which has been incorporated into the model, plus the value of average sulfate concentration and discharge rate determined by calibration. Thus Figure 17 is the computer duplication of the ground-water quality environment resulting from 20 years of discharge by Climax Chemical between the years 1962 and 1982.

The maximum areal extent of influence by the Climax sulfate discharge is 3.51 square miles, as shown by the 101 mg/l contour on Figure 17. This contour represents an increase of 1 mg/l sulfate above the background of 100 mg/l. The area of 1,000 mg/l sulfate is 1.61 square miles, and the 5,000 mg/l sulfate levels are present beneath 0.79 square miles. The map shows an area of 10,000 mg/l sulfate beneath and north of the plant site which has a total areal extent of 0.11 square miles.

Variations between the sample results and the computer printout is due primarily to the difference between the "point"

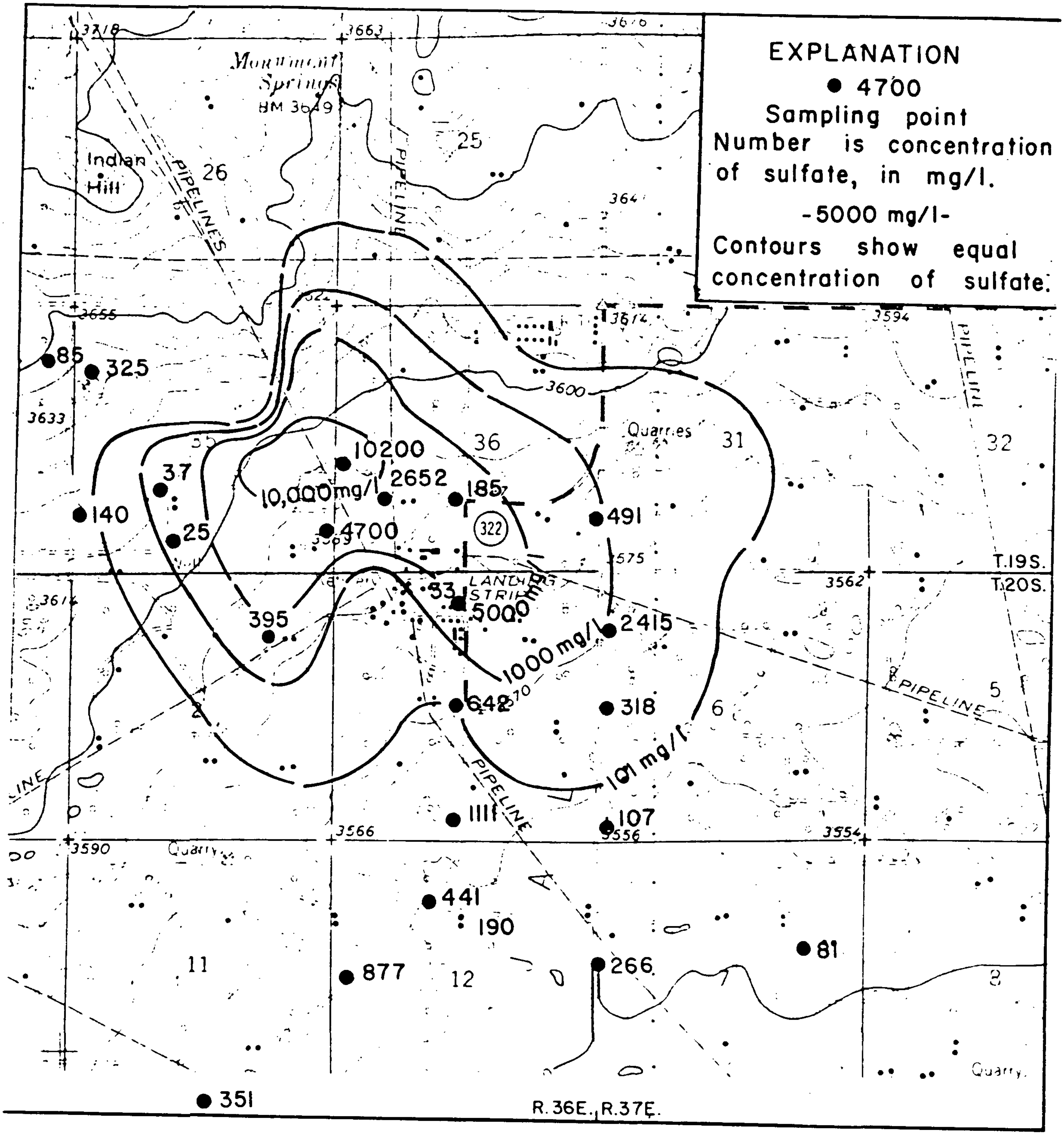


FIGURE 17. Computer simulated sulfate distribution map for year 1982.

samples and the size of the computer nodes. In the case of a test-hole sample, the sulfate results are representative of a very small area of the aquifer that was influenced by sample collection--perhaps only a radius of a few feet from the well bore. However each node represents an area of one-fourth mile over which the chemical quality is averaged by the computer.

As a result of recent (1981) plant modifications made by Climax Chemical, the discharge rate has been reduced 40 percent (table 3). As has been shown by model calibration, the average discharge for the first 20 was 60 gpm, but with the reduction in discharge, future operations should result in an average discharge of about 36 gpm. Thus when the production is averaged for past and future operation in 20-year increments, the averages would become 60, 48, and 43 gpm.

Time	Concentration	Average Discharge
1962-1982	10,200 mg/l	60 gpm
1962-2002	10,200	48
1962-2022	10,200	43

Assuming that Climax Chemical is granted approval to discharge at the present site for the next 20 years, the resulting area of impact would increase only slightly from its present position (fig. 18). The area of 5,000 mg/l contamination increases from 0.79 square miles to 0.81 square miles, and the 10,000 mg/l area increases from 0.11 to above 0.13 square miles. Projections to the year 2022 show similar small increases (fig. 19). The 101 mg/l contour becomes considerably more lobate by the year 2022 due to the higher transmissivities in

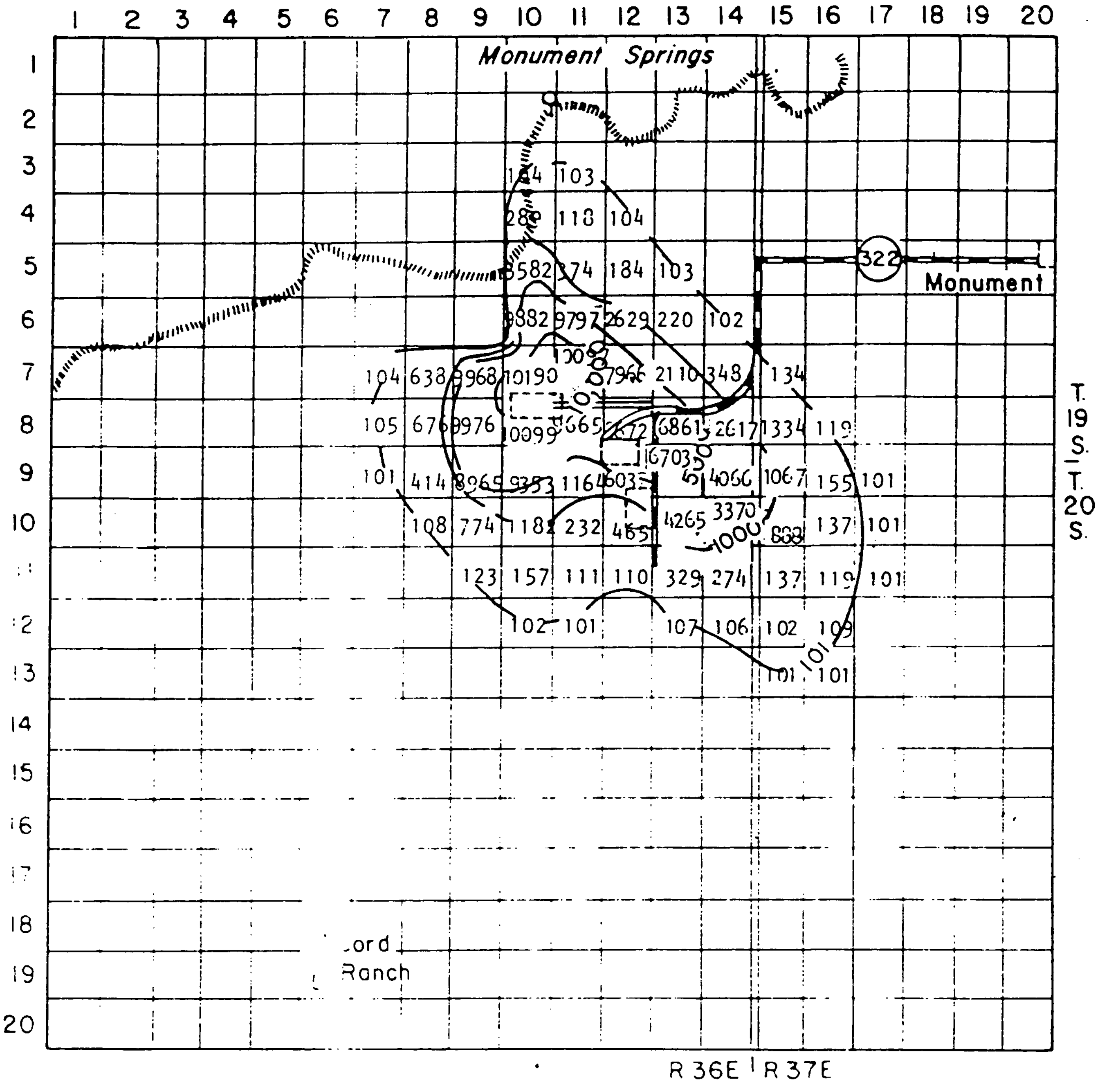


FIGURE 18. Computer simulated sulfate distribution map for year 2002.

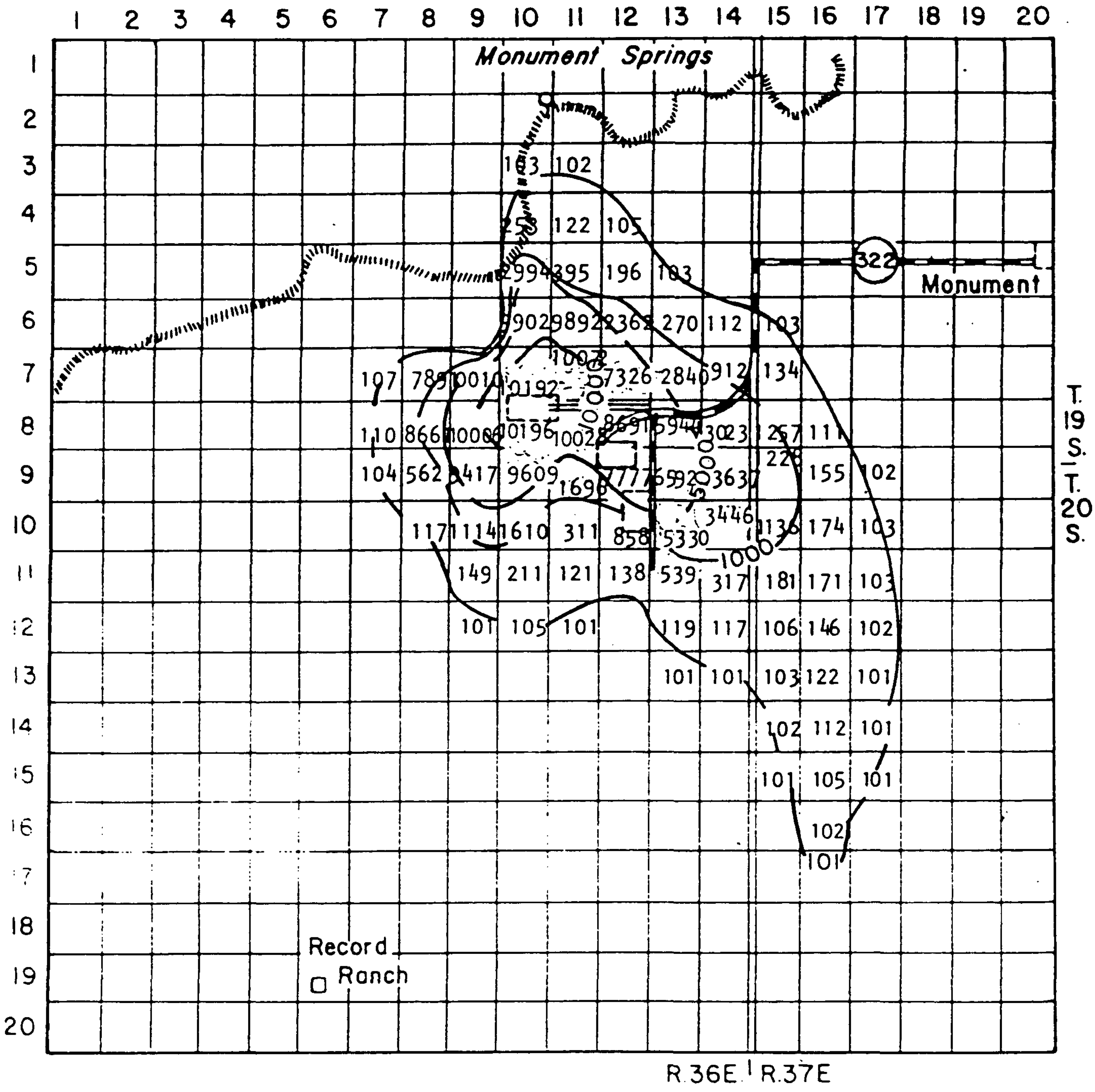


FIGURE 19. Computer simulated sulfate distribution map for year 2022.

that region, but the higher concentrations do not change appreciably.

When the 1982 water-quality data are superimposed on the area of impact projected for the year 2022, nearly all of Climax impact is centered in an area which presently (1982) is highly mineralized (fig. 20). The major growth area is in the same region where high contamination by oil field brines is known to be present (fig. 11). Thus Climax will increase the sulfate levels in the ground water which is already contaminated by brine.

One hydrologic parameter that is not incorporated in the digital model is the effects of phreatophytes on the Climax discharge. The above projections (figs. 18 and 19) assume total infiltration of the discharge to the ground-water system. A small part of this discharge actually would be lost by evaporation in the disposal ponds. It has been shown that one acre of mesquite with 100 percent coverage is capable of consuming 3.3 acre-feet of ground water per year. At an average discharge of 48 gpm from 1962 to 2002, only 23 acres of mesquite would be required to consume the entire volume of discharge. It is obvious that these deep-rooted plants would have a moderating influence on the growth of the area of influence.

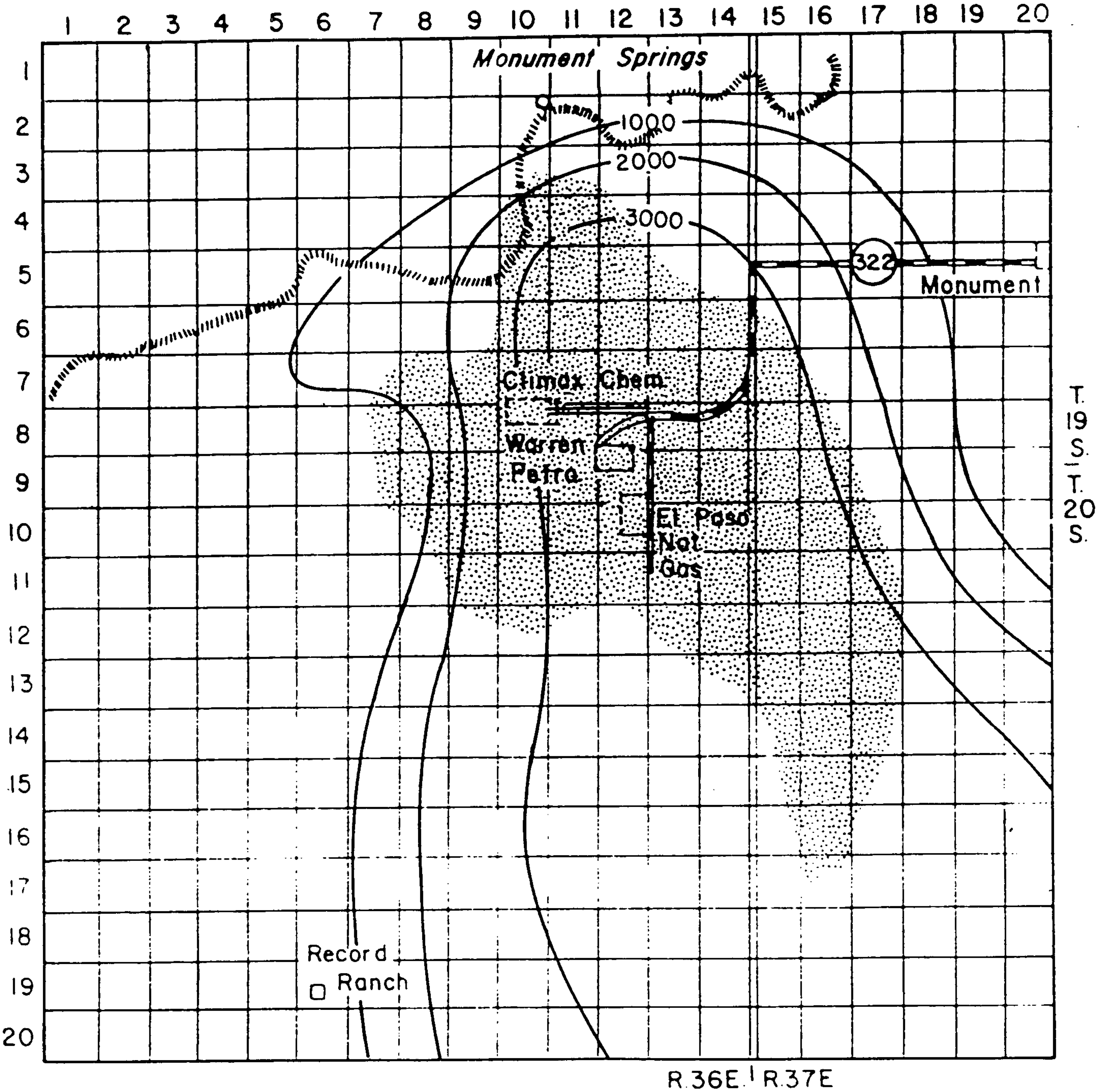


FIGURE 20. Map showing total dissolved solids, in mg/l, for 1982 and the area of impact projected for year 2022 (fig. 19) shown by shaded area.

D. Conclusions Based on Digital Modeling

The computer model developed by Konikow and Bredehoeft (1978) is ideally suited for evaluating water-quality changes with time. This model was used to evaluate the alluvial aquifer which underlies the Climax Chemical plant. As a result of the modeling and calibration, the following conclusions have been drawn:

1. Most of the pre-discharge ground water in the aquifer is displaced by plant discharge within the first five years. From that time, only slight increases in mineralization are noted.

2. The sulfate concentration in discharge by Climax Chemical has averaged about 10,200 mg/l for the past 20 years. This is based on rate of increase in mineralization and the fact that the highest sulfate level found in any test well is 10,200 mg/l sulfate.

3. The average discharge of waste products by Climax has been about 60 gpm for the first 20 years of operation. Although Climax recognizes a range in discharge from zero to 100 gpm, the variety of gypes and sources of waste have precluded actual measurement. By model calibration, the best fit of quality data is obtained using an average of 60 gpm.

4. Due to recent plant and operation modifications, there has been a decrease in discharge of about 40 percent. Therefore the continuous discharge for the future operations should be about 36 gpm.

5. Most of the area impacted by Climax Chemical is within an area that has previously experienced contamination from oil field brines. Assuming continued operation by Climax to the year 2022, the discharge plume would remain within this previously contaminated area.

6. Calculation of a water budget was beyond the scope of this study. Nevertheless, evaporation from discharge ponds and transpiration can account for the total discharge from Climax. This would tend to dissipate the plume and slow the growth rate.

7. During 1981 Climax Chemical made a number of changes in plant operation which has significantly reduced the amount of waste being discharged by the plant. Use of the brine wells has been discontinued; spent sulfuric acid and waste oil are no longer being produced and discharged. The net improvement is a 40 percent reduction in daily discharge from the plant.

8. As a result of the field studies and modeling that has been conducted by Climax, it is concluded that continued operation does not create a hazard to potable water supplies in the area. The Climax discharge will extend into an area of oil field brine contamination where all of the previously existing stock and domestic wells have been abandoned prior to 1981.

9. As has been shown, the rate of movement of the waste plume varies with the hydrologic parameters, including gradient and transmissivity. In general the movement is toward the east and south, which also is the region where water in the alluvium has been contaminated by oil-field brines. However, if it is assumed that there is no ground-water loss by evapotranspiration, the average horizontal movement of the 1,000 mg/l iso-sulfate contour is about 22 feet per year.

IV.

OBJECTIONS

This Justification of No Discharge Plan and Alternate Application for Discharge Plan is submitted subject to the following objections:

1. The W.Q.C.C. has failed to require Climax, by regulation, to submit a Discharge Plan, as required by N.M. Stat. Ann. §74-6-5A (1978).

2. Climax is not discharging a water contaminant directly or indirectly into water as required by N.M. Stat. Ann. §74-6-5 (1978) and any regulatory requirement beyond that statutory standard is illegally expansive and void.

3. The discharge by Climax is effectively confined to an area entirely within the boundaries of Climax without combination with water.

V.

JUSTIFICATION OF NO DISCHARGE PLAN

It is respectfully submitted that Climax is not required to submit a Discharge Plan.

A. There is No Prohibited Contamination.

Water Quality regulation ("W.Q.") 3-104 is the touchstone of the discharge plan requirement:

> Unless otherwise provided by these regulations, no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly <u>into ground water</u> unless he is discharging pursuant to a discharge plan approved by the director. (emp. sup.)

Thus, in order for the Discharge Plan requirement to apply, the discharge must relate to "ground water". This fundamental requirement is consistent with the stated purpose of the regulations:

> <u>The purpose of these regulations</u> controlling discharges onto or below the surface of the ground <u>is to protect all ground water of the State of New Mexico</u> which has an existing concentration of 10,000 mg/l or less TDS . . . (emp. sup.)

W.Q. Reg. 3-101A. Hence, it is clear that "ground water" is the first key to the Discharge Plan requirement.

W.Q. Reg. 1-101M defines "ground water" as:

> interstitial water which occurs in saturated earth material which is capable of entering a well in sufficient amounts to be utilized as a water supply.

Although "water supply" is not expressly defined by the W.Q. regulations, it is nevertheless clearly explained in W.Q. Reg. 1-101(F) which defines "Water Supply System" as

> a system of pipes, structures, and facilities through which potable water is obtained, treated and distributed to the public. (emp. sup.)

Ignoring the terminology of W.Q. Reg. 1-101(F) relating to the "system" of "water supply system", it is readily evident that "water supply" means "potable water".

Having established that "ground water" must be potable water, attention is next directed to whether "ground water" is involved here.

The foregoing geohydrological evaluation demonstrates that the closest potable water is approximately 10 miles from the point of discharge. Hence, there is no discharge into ground water; the necessary conclusion is that a Discharge Plan is not required.

B. The "Nose" is Reducing in Size.

Prior discharges over the last 20 years were estimated to have been 60 gmp for purpose of modeling. The increase of the nose on a 36 gpm discharge over the next 20 years, excluding evaporation loss and plant loss, would be from 0.79 miles to 0.81 miles, or a horizontal movement of 440 feet. With evaporation and plant use, an actual reduction would occur.

Thus, there is no risk of regulated pollution.

C. Assuming a Worst Case, the Discharge Still Will Not Reach a Water Supply.

As stated above, even assuming a worst case, the movement is only 22 feet per year. It must be kept in mind that as each year beyond the 20th passes, the average gpm decreases, so the movement rate likewise decreases. This rate of 22 feet per year would not permit adequate movement to ground water in the reasonably foreseeable future, as contemplated by the W.Q. Reg. 3-109(C).

Further support is found in W.Q. Reg. 3-106(C)(2), which enumerates the requirements of a Discharge Plan. It is specifically decreed that the application for Discharge Plan must reflect the

> location of the discharge and of any bodies of water, water courses and ground water discharge sites <u>within one mile of the outside perimeter of the discharge site</u> (emp. sup.) . . . .

The foresight and wisdom of the Water Quality Control Commission ("W.Q.C.C.") is reflected in the foregoing regulation. The W.Q.C.C. realized that distances in excess of one mile were not likely of consequence. When viewed in the present matter, the W.Q.C.C. was patently correct.

There is little doubt that a Discharge Plan is not required.

VII

PROPOSED MONITORING PROGRAM

During 1981 several steps were taken to reduce the amount of waste products being discharged by Climax Chemical. However in order to monitor the effects of discharge during future operations, the following monitoring program should be implemented and maintained by the company.

1. Wells Nos. 2-3, 4-3, 5-3, and 10-10 should be measured semi-annually to monitor the changes in ground-water levels at the plant site. A gradual decline in levels should occur in wells 4-3, 5-3, and 10-10 as a result of the reduction of waste discharge that was implemented by Climax during 1981.

Well No. 2-3 should react in accordance with the natural ground-water fluctuations showing seasonal trends.

2. Water samples should be collected from each of the four wells on a semi-annual basis. Analyses should include, but not necessarily be limited to, the following parameters:

Total dissolved solids	Sulfate
Sodium	Chloride
Calcium	pH

In the event that there is a significant increase in any of these parameters, more frequent samples should be collected as required to identify the problem area.

3. Care should be taken in the application of process water to the off-spec sodium sulfate in the plant area. Only a minimum of water should be used in order to prevent ponding of the water and subsequent infiltration to the underlying deposits.

VI.

ALTERNATIVE APPLICATION FOR DISCHARGE PLAN

Recognizing the complexity of the matter as well as the EID's desire to have the matter expeditiously resolved, the matters contained herein are submitted in the alternative as Application for Discharge Plan, subject to prior objections.

W.Q. Reg. 3-109(C) provides that the Director shall approve the application if

> The person proposing to discharge demonstrates that approval of the discharge plan will not result in concentrations in excess of the standards of Section 3-103 at any place of withdrawal of water <u>for present or reasonably foreseeable future use</u>. (emp. sup.)

Prior analysis undeniably justifies the requisite conclusion of W.Q. Reg. 3-109(C). Reference is made to the W.Q. regulations for all other reasons and legal basis for support.

Logs and Test of Water Wells Drilled
Abbott Brothers
Water Well Contractors
Hobbs, New Mexico

TH 7-10
20.36. 2.114
Water Well #7

0 -- 3	soil
3 -- 17	calichi
17 -- 60	sand
60 -- 63	water sand
63 -- 87	red bed

Tested for 2 hours
at 12 gal/min.

TH 8-10
20.36. 2.1133
Water Well #8

0 -- 3	soil
3 -- 18	calichi
18 -- 55	sand
55 -- 60	water sand
60 -- 82	red bed

Tested for 1 hour
at 10 gal/min.

TH 9-10
20.36. 2.1131
Water Well #9

0 -- 2	soil
2 -- 20	calichi
20 -- 45	sand
45 -- 55	sandy clay
55 -- 57	water sand
57 -- 82	red bed

Made about 10 gal/min

TH 10-10
19.36.36.3244
Water Well #10

0 -- 1	soil
1 -- 18	calichi
18 -- 28	sand rock
28 -- 35	sand
35 -- 40	water sand
40 -- 74	red bed

Made 15 gal/min.

TH 11-10
19.36.36.3242
Water Well #11

0 -- 1	soil
1 -- 18	calichi
18 -- 35	rock
35 -- 37	water sand
37 -- 65	red bed

Dry hole

TH 12-10
19.36.36.3243
Water Well #12

0 -- 2	soil
2 -- 18	calichi
18 -- 37	sand rock
37 -- 38	water sand
38 -- 66	red bed

Made about 1 gal/min.

Logs and Test of Water Wells Drilled
Abbott Brothers
Water Well Contractors
Hobbs, New Mexico

TH 1-10
19.36.36.3133
Water Well #1

0 -- 1 soil
1 -- 20 calichi
20 -- 40 sand
40 -- 41 water sand
41 -- 60 sand
60 -- 75 red bed
Tested for one hour
at 1½ gals/min.

TH 2-10
19.36.35.421
Water Well #2

0 -- 2 soil
2 -- 22 calichi
22 -- 45 sand
45 -- 70 red bed
Dry hole

TH 3-10
19.36.35.231
Water Well #3

0 -- 2 soil
2 -- 18 calichi
18 -- 35 sand
35 -- 65 red bed
Dry hole

TH 4-10
19.36.26.414
Water Well #4

0 -- 1 soil
1 -- 18 calichi
18 -- 19 water sand
19 -- 45 sand
45 -- 65 red bed
Tested for one hour.
Made 1 gal/min.

TH 5-10
19.36.35.111
Water Well #5

0 -- 3 soil
3 -- 21 calichi
21 -- 30 sand
30 -- 40 sandy clay
40 -- 55 red bed
Dry hole

TH 6-10
20.36. 2.1134
Water Well #6

0 -- 4 soil
4 -- 15 calichi
15 -- 65 sand
65 -- 70 water sand
70 -- 80 sand clay
80 -- 92 red bed
Tested for 4 hours at 25 gal/min.

CLIMAX CHEMICAL

TH 5-3

Hole #5 - T. 19 S., R. 36 E., Sec. 36.313 (3/4/81)

Lithologic Log

Depth	Description
0-5	caliche, with some sand, light brown
5-10	as above
10-15	sand with caliche fragments, some gypsum fragments light brown, calcium carbonate cement
15-20	same as above, slightly moist
20-25	caliche rock and sand; light brown, saturated
25-30	caliche rock and sand; some gypsum fragments, light brown, saturated
30-35	same as above
35-39	red beds, shale and mudstone, caliche fragments, saturated
39	TOTAL DEPTH

CLIMAX CHEMICAL
TH 4-3
Hole #4 - T. 19 S., R. 36 E., Sec. 35.442 (3/4/81)

Lithologic Log

Depth	Description
0-5	soil, brown, sandy with alot of clay
5-10	sand and caliche; brown, abundant clay
10-15	same as above except moist
15-20	as above
20-25	soil and caliche; light brown saturated
25-30	sand and caliche with gypsum fragments, borwn, saturated, very coarse grained
30-35	mudstone and shale, brown red, large caliche fragments, saturated
35-39	mudstone and shale; abundant clay, deep red, caliche fragments; saturated
39	TOTAL DEPTH

CLIMAX CHEMICAL

TH 3-3

Hole #3 - T. 19 S., R. 36 E., Sec. 35.233 (3/4/81)

Lithologic Log

Depth	Description
0-5	soil, very sandy; red grained, poorly cemented; clay abundant; light brown; caliche fragments
5-10	sand; buff in color; fine grained gypsum and caliche fragments, some clay
10-15	sand and caliche; light brown to buff
15-20	sand and caliche; light brown, calcium carbonate cement
20-30	same as above
30-35	red siltstone and mudstone, dry, mostly silt
35-39	red siltstone, dry; no calcium carbonate at all
39	TOTAL DEPTH

CLIMAX CHEMICAL

TH 2-3

Hole #2 - T. 19 S., R. 36 E., Sec. 35.323 (3/4/81)

Lithologic Log

Depth	Description
0-5	sand and soil; buff in color, unconsolidated ; medium-coarse grained
5-10	sand; light brown, medium-fine grained
10-15	caliche; some sand; light brown to gray; calcium carbonate cement; dry
15-20	sand; light brown, fine grained, calcium carbonate cement; caliche or limey sand fragments; dry
20-25	sand and caliche; brown, poorly cemented caliche fragments; calcium carbonate cement
25-30	sand; brown, very poorly cemented, caliche fragments; calcium carbonate cement
30-35	same as above; dry
35-40	sand; light brown, fine grained; dry
40-45	sand, light brown to buff; some clay present, medium to fine grained, dry
45-50	sand and caliche; light brown, mostly sand; medium grained, with caliche fragments
50-52	red bed; dry; sandy mudstone with larger quartz inclusions; mostly clay
52-55	same as above
55-58	moist, mudstone, red, gypsum and caliche fragments; mostly clay
58-60	mudstone; dark red to brown; sandy, moist; gypsum and caliche fragments present
60-65	shaley mudstone, slightly moist, deep red to brown, sandy; mostly clay
65	TOTAL DEPTH

CLIMAX CHEMICAL
TH 1-3
Hole #1 - T. 19 S., R. 36 E., Sec. 35. 131 (3/3/81)

Lithologic Log

Depth	Description
0-5	sand; medium-coarse grained, buff color, unconsolidated
5-10	sand; medium-fine grained, buff color, poorly cemented
10-15	sandstone, medium-grained with larger pieces up to ½" diameter, buff color, some chert; gypsum fragments brown
15-20	sandstone, buff to brown; large chert fragments common, medium grained, some limey sand fragments
20-25	shaley-limestone; white to gray, quartz grains (medium) inclusions, some chert (caliche)
25-30	mudstone; red, shoft, moist, mostly clay
30-35	mudstone; red-brown; green clay mineral inclusions
35-40	mudstone; shale, red brown, moist green shaley inclusions; mostly clay
40-45	shaley mudstone; purple-red, moist, green shaley inclusions
45-50	shale; purple; soft; slightly moist, crumbly
50-55	mudstone; red; slightly moist; crumbly
55-58	shale, purple red, crumbly, soft
58	TOTAL DEPTH

CLIMAX CHEMICAL COMPANY

Sample Log - TH 12-9
Date: September 10, 1981
T. 19 S., R. 36 W., Sec. 36.314
Samples by David J. Cline, Geohydrology Assoc., Inc.

Depth	Description
0- 5	caliche; white; soft
5- 15	sand, light brown; caliche fragments
15- 35	same as above; moist
35- 40	red bed at 35'
40	TOTAL DEPTH

Perforations from 40' to 20'

CLIMAX CHEMICAL COMPANY

Sample Log - TH 11-9
Date: September 10, 1981
T. 20 S., R. 36 E., Sec. 1.144
Samples by David J. Cline, Geohydrology Assoc., Inc.

Depth	Description
0- 5	soil; brown sandy
5- 15	caliche
15- 40	sand, light brown; caliche fragments
40- 45	sand and caliche; buff; medium-grained
45- 50	sand and caliche; medium-grained
50- 55	sand and caliche fragments; light pink to brown
55- 60	red bed at 59' - 60'
60	TOTAL DEPTH

Perforations from 60' to 40'

CLIMAX CHEMICAL COMPANY

Sample Log - TH 10-9
Date: September 10, 1981
T. 20 S., R. 36 E., Sec. 1.344
Samples by David J. Cline, Geohydrology Assoc., Inc.

Depth	Description
0- 5	soil; sandy; brown
5- 10	caliche; white
10- 15	caliche; light brown
15- 20	sand; red brown; caliche fragments
20- 30	sand; medium grained; red, slightly moist
30- 35	same as above; caliche fragments
35- 40	same, saturated
40- 45	sand and caliche; buff fine
45- 50	sand; medium-coarse
50- 55	sand; very coarse, chert fragments
55- 60	red bed at 57'
60	TOTAL DEPTH

Perforations from 60' to 40'

CLIMAX CHEMICAL COMPANY

Sample Log - TH 9-9
Date: September 10, 1981
T. 20 S., R. 36 E., Sec. 14.122
Samples by David J. Cline, Geohydrology Assoc., Inc.

Depth	Description
0- 15	caliche
15- 25	sand; light brown; fine; caliche fragments
25- 35	caliche and sand
35- 40	caliche; most; sand; medium-grained
40- 50	sand medium-grained; some caliche
50- 55	sand; medium-grained; some red shale red bed at 55'
55- 60	red shale
60	TOTAL DEPTH

Perforations from 55' to 35'

CLIMAX CHEMICAL COMPANY

Sample Log - TH 8-9
Date: September 10, 1981
T. 20 S., R. 36 E., Sec. 12.133
Samples by David J. Cline, Geohydrology Assoc., Inc.

Depth	Description
0- 20	caliche
20- 30	sand and caliche
30- 35	same as above; slightly moist
35- 40	same; moist
40- 50	sand; fine; light brown; saturated; well-sorted
50- 55	sand; medium-fine; red
55- 60	red sand and shale; red bed at 58'
60	TOTAL DEPTH

Perforations from 60' to 40'

Not as much water as previous holes

CLIMAX CHEMICAL COMPANY

Sample Log - TH 7-9
Date: September 10, 1981
T. 20 S., R. 36 E., Sec. 12.123
Samples by David J. Cline, Geohydrology Assoc., Inc.

Depth	Description
0- 5	soil; brown; fine sand and clay
5- 15	caliche; white; soft
15- 20	sand; brown; fine-grained; caliche fragments
20- 35	sand and caliche
35- 40	caliche; some fine sand; slightly moist
40- 50	sand; coarse; chert fragments; caliche
50- 55	red bed-52'
55	TOTAL DEPTH

Perforations from 55' to 35'

CLIMAX CHEMICAL COMPANY

Sample Log - TH 6-9
Date: September 10, 1981
T. 19 S., R. 36 E., Sec. 36.442
Samples by David J. Cline, Geohydrology Assoc., Inc.

Depth	Description
0- 15	caliche; white to buff
15- 20	sand; brown, medium-grained; dry
20- 30	sand and caliche fragments; brown; medium-grained
30 -35	same as above; moist
35- 40	same as above; saturated
40- 45	sand and caliche fragments; brown; medium-fine grained; wet
45- 50	sand and shale; red
50- 55	red bed-52'
55	TOTAL DEPTH

Perforations from 55' to 35'

CLIMAX CHEMICAL COMPANY

Sample Log - TH 5-9
Date: September 9, 1981
T. 20 S., R. 36 E., Sec. 1.122
Samples by David J. Cline, Geohydrology Assoc., Inc.

Depth	Description
0- 5	caliche; white, hard; dry
5- 15	sand and caliche; light brown, soft; dry
15- 20	same as above only buff color and slightly moist; smells like kerosene
20- 25	caliche; some chert fragments; gray to blue
25- 30	same as above; slightly moist
30- 40	red shale, clay, saturated-33'
40	TOTAL DEPTH

Perforations from 40' to 20'

CLIMAX CHEMICAL COMPANY

Sample Log - TH 4-9
Date: September 9, 1981
T. 20 S., R. 37 E., Sec. 7.133
Samples by David J. Cline, Geohydrology Assoc., Inc.

Depth	Description
0- 5	soil; brown; sandy; clay
5- 10	caliche; white
10- 20	sand; caliche fragments, light brown, medium-grained; dry
20- 25	caliche; some sand; buff; moist
25- 35	same as above; a little more sand
35- 40	caliche and sand, light brown; medium-grained, saturated
40- 50	sand; medium-grained; fair sorting; brown caliche fragments; saturated
50- 55	red bed at 52'
55	TOTAL DEPTH

Perforations from 55' to 35'

CLIMAX CHEMICAL COMPANY

Sample Log - TH 3-9
Date: September 9, 1981
T. 20 S., R. 37 E., Sec. 6.333
Samples by David J. Cline, Geohydrology Assoc., Inc.

Depth	Description
0- 5	soil, gray-brown; sandy; clay
5- 15	sand and caliche fragments, light brown; medium-grained; fair sorting
15- 20	sand and caliche; more caliche than above; buff medium-grained; dry
20- 35	sand, clayey, brown; caliche fragments; fine- to medium-grained; moist
35- 40	sand and caliche fragments; medium-grained; wet
40- 50	same as above; saturated
50- 55	sand and caliche; coarse- to medium-grained, pink; saturated
55- 60	red bed; shale-57'
60	TOTAL DEPTH

Perforations from 60' to 40'

CLIMAX CHEMICAL COMPANY

Sample Log - TH 2-9
Date: September 9, 1981
T. 20 S., R. 37 E., Sec. 6.311
Samples by David J. Cline, Geohydrology Assoc., Inc.

Depth	Description
0- 5	soil; brown, sandy
5- 10	sand and caliche; brown; red grain
10- 15	caliche; light gray-light brown
15- 20	sandstone, red-brown, medium grain, hard
20- 25	sand and caliche fragments; medium-coarse grain; light brown; dry
25- 30	sand; medium grain, well sorted; sub-rounded; light brown; dry
30- 35	same as above; caliche fragments
35- 40	sand and caliche; fine grain; light brown, saturated
40- 55	sand and clay; light brown-reddish, saturated
55- 60	red bed; shale at 58'
60	TOTAL DEPTH

Perforations from 60' - 40'

CLIMAX CHEMICAL COMPANY

Sample Log - TH 1-9
Date: September 9, 1981
T. 20 S., R. 37 E., Sec. 6.133
Samples by David J. Cline, Geohydrology Assoc., Inc.

Depth	Description
0- 5	soil; sandy; light brown
5- 10	caliche; light brown to pink; sand (clayey)
10- 15	sand; some caliche; sand light brown, medium-grained, soft; dry
15- 20	caliche; light brown, soft; dry
20- 25	sand and caliche; light brown, gummy; slightly moist; mostly sand
25- 35	caliche; light brown-gray, slightly moist
35- 40	caliche with sand; light brown; saturated
40- 45	sand; coarse-fine, poorly sorted; pink-brown; saturated
45- 55	sand and silt; clayey; pink; fine-grained
55- 60	shale; red; sandy; caliche fragments (60'); red bed at 59-60'
60	TOTAL DEPTH

Cased to TD with 4" schedule 40 PVC

Perforations from 60' - 40'

Chevron

Warren Petroleum Company
A Division of Chevron U.S.A. Inc.
P.O. Box 67, Monument, NM 88265

Manufacturing Department

August 04, 1989

State of New Mexico
Oil Conservation Division
P. O. Box 2088
Land Office Building
Santa Fe, New Mexico 87405-2088

Atten: Dave Boyer

Dear Dave,

Per your conversation with Urmas Kelmser, Senior Hydrogelolgist with Chevron, we have established monitoring well locations at Warren Petroleum's Monument Plant in Lea County, New Mexico. Two wells will be drilled beginning August 17th by International Technology Corporation (IT Corp) in Albuquerque. James Dawson with IT Corp. made a site visit and evaluation yesterday, August 3rd. Attached for your information is a plot plan indicating the location these wells will be drilled. The information gained from these wells will then be used to determine further actions.

To date we have pumped only 5.8 gallons of condensate from the existing monitoring well. We are able to pump an average 300-500 milliliters every 4-6 days. When pumped we are able to remove all condensate from the top of the water.

With the two additional and one existing monitoring wells we hope to define a plume if there is one and the water gradient as well as an indication as to what has happened.

We are convinced that there is not an existing contamination source from our facility. Whether or not a previous problem has existed will hopefully be determined by the additional monitoring wells.

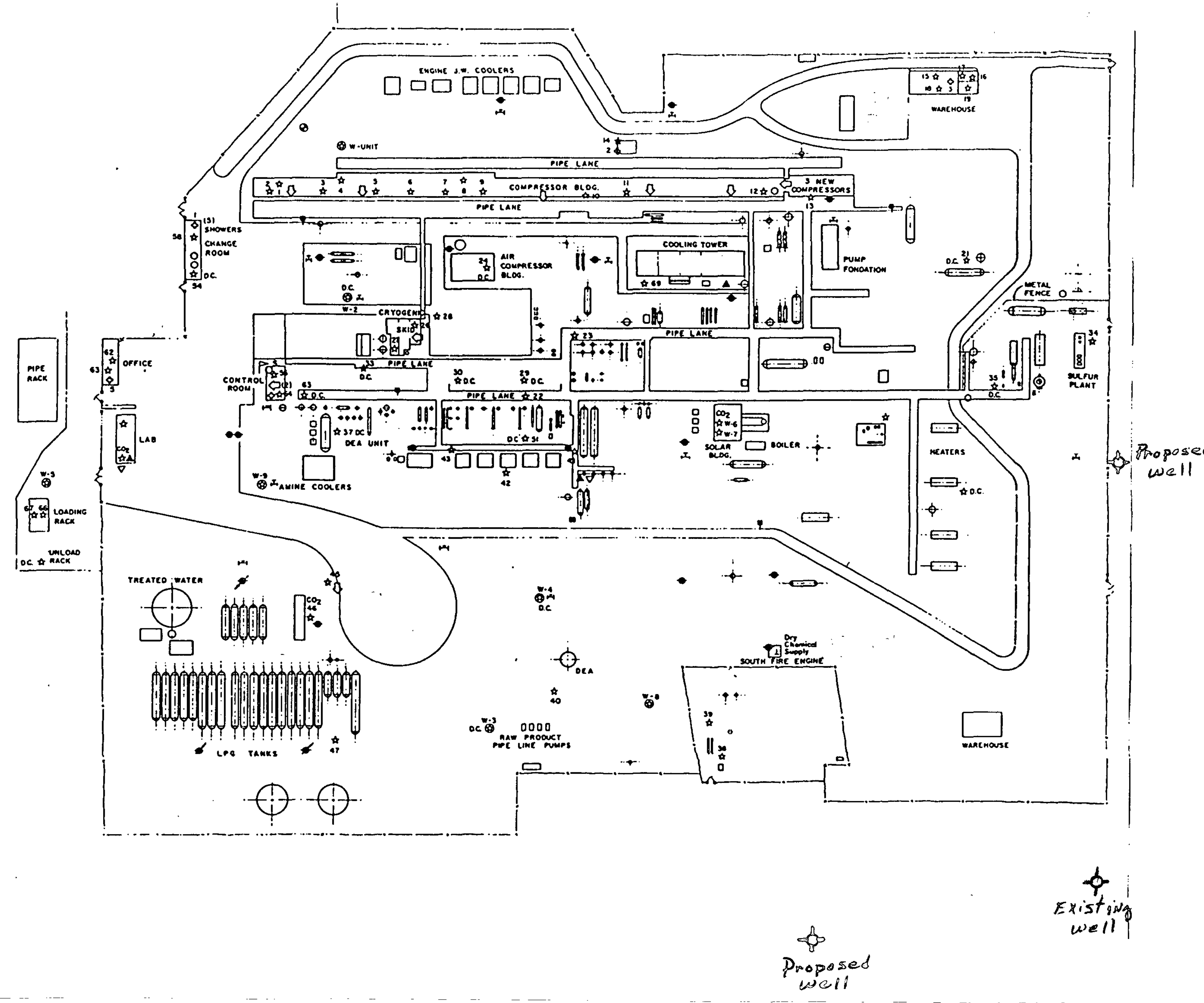
if you have any questions, please feel free to call me at 393-2823 or Urmas Kelmser at (415) 620-5953.

K a Peterson
K. A. Peterson
Plant Manager

KAP/jr
cc: M. L. Ingram
Urmas Kelmser
L. T. Reed

WARREN PETROLEUM COMPANY

MONUMENT PLANT



Chevron

Warren Petroleum Company
A Division of Chevron U.S.A. Inc.
P.O. Box 67, Monument, NM 88265

Manufacturing Department

October 6, 1989

State of New Mexico
Oil Conservation Division
P. O. Box 2088
Land Office Building
Santa Fe, New Mexico 87405-2088

Attention: Dave Boyer

Dear Dave,

Attached for your information is a map showing the locations of three (3) ground water monitoring wells drilled by International Technology Corporation (IT Corp.) August 18-21, 1989. After completion these wells were allowed to sit and on September 5th each was bailed to determine if condensate was present. Well WP-3 showed 6" of condensate, WP-1 showed 1/4" of condensate and WP-2 0" of condensate.

We moved our pump from the original monitoring well to WP-3 and began pumping. At first we were able to pump pretty hard and fast but within the last week and a half this rate has dropped off. We have recently had to raise this pump to keep from pumping water on this well. As of October 4, 1989 we have recovered 2048.5 gallons from WP-3. The total from all wells to date is 2054.3 gallons. This well will continue to be pumped and monitored. This along with our hydrogeologist report from IT Corp. which was received this week will be evaluated to determine our next step.

If you have any questions, please feel free to call me at 393-2823 or Urmas Kelmser at (415) 620-5953.

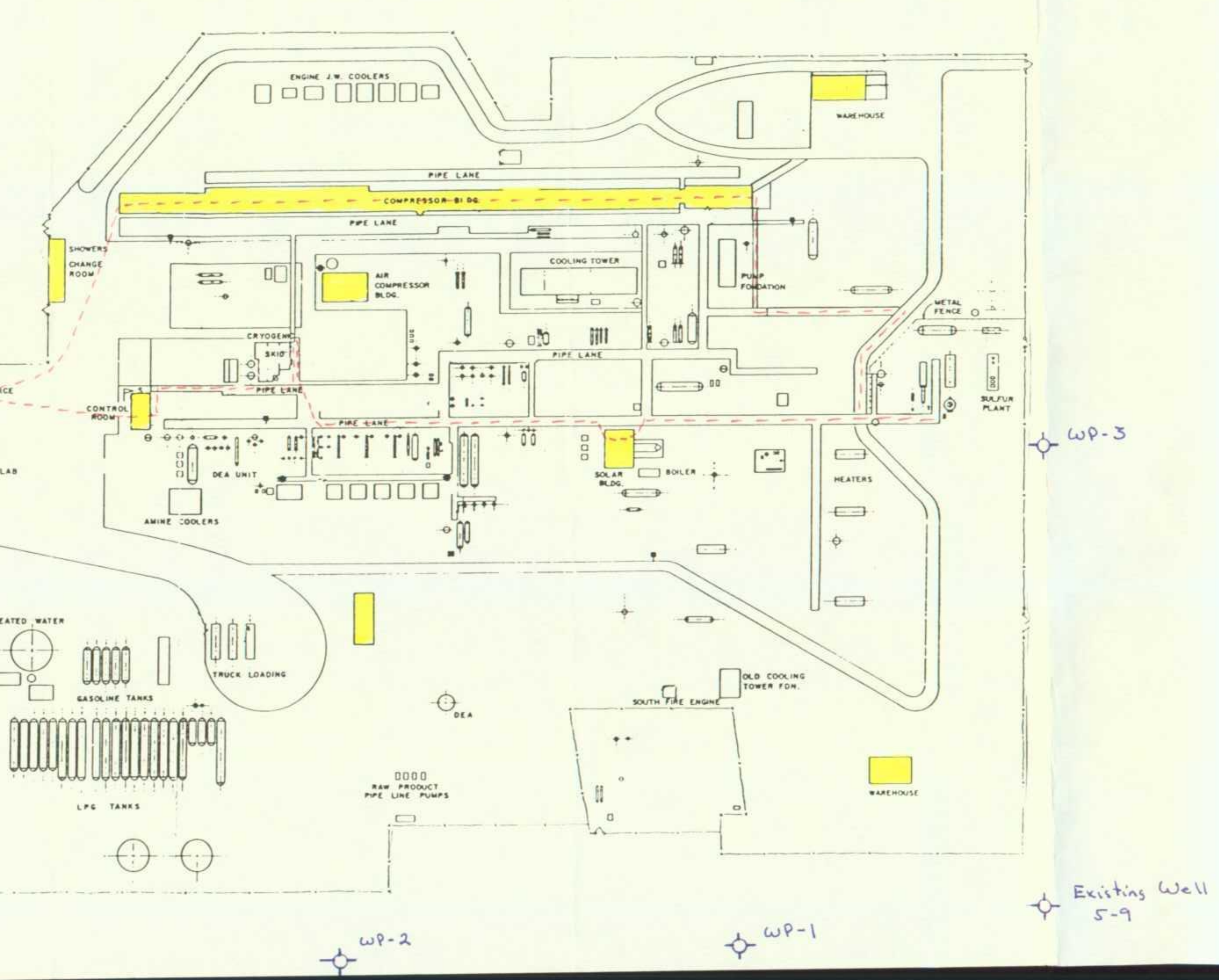
K A Peterson
K. A. Peterson
Plant Manager

KAP/aw

cc: M. L. Ingram
Urmas Kelmser
L. T. Reed

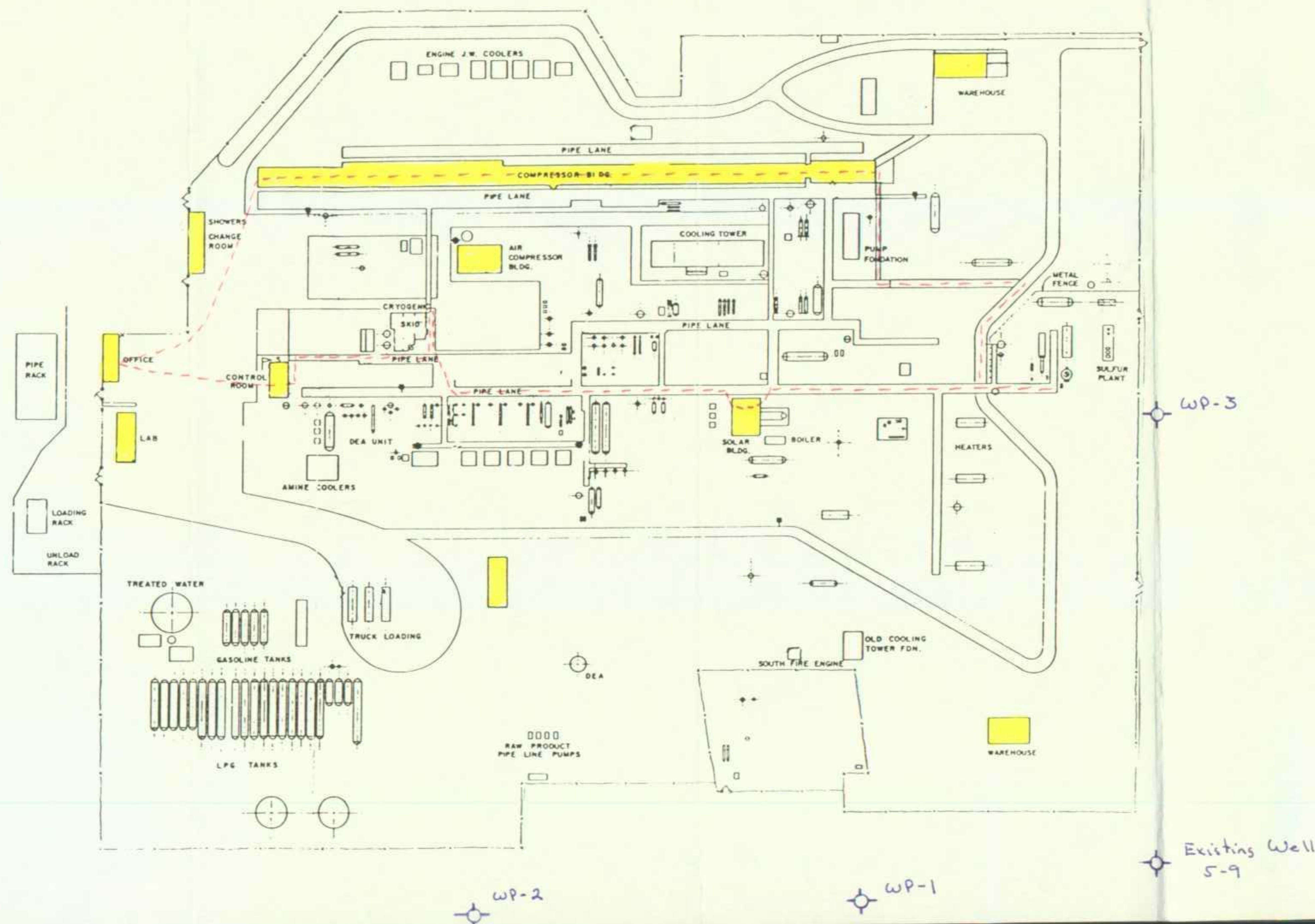
WARREN PETROLEUM COMPANY

MONUMENT PLANT

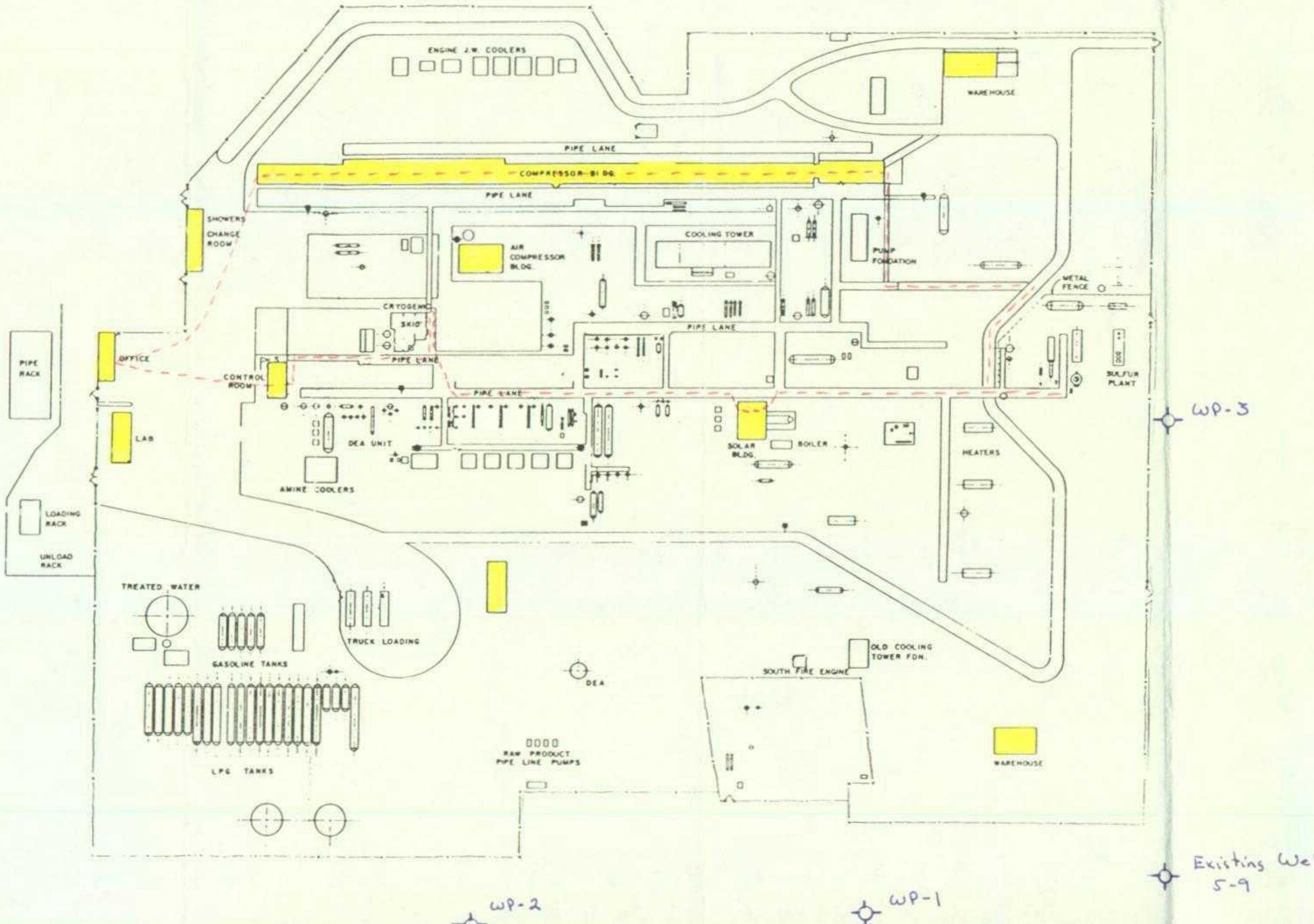


WARREN PETROLEUM COMPANY

MONUMENT PLANT



WARREN PETROLEUM COMPANY
MONUMENT PLANT



Chevron

Warren Petroleum Company
A Division of Chevron U.S.A. Inc.
P.O. Box 67, Monument, NM 88265

Manufacturing Department

December 18, 1989

State of New Mexico
Oil Conservation Division
Land Office Building
P. O. Box 2088
Santa Fe, New Mexico 87405-2088

Attention: Dave Boyer

Dear Dave,

Attached for your reference is a copy of a map previously sent showing the locations of three (3) ground water monitoring wells at Warren Petroleums Monument Gas Processing Plant in Lea County, New Mexico. As of this date we are continuing to pump well WP-3 but at a slower rate. To-date we have recovered 8,643.5 gallons (205.8 barrels) of condensate from this well. Our pumping rate has been reduced from an initial 110 gallons per day during the first 44 days to around 60 gallons per day over the last month. We have had to raise our pump one quarter to one half inch periodically to avoid pumping water.

On December 15, 1989 we bailed wells 5-9, WP-1 and WP-2. Well 5-9 showed 1-1/2" of condensate and WP-1 showed 1-3/4" of condensate while WP-2 showed 0" (not even a trace).

I feel we are making headway on this problem as Well 5-9 shows a considerable reduction from previous samples.

We will continue to pump this well and keep you informed.

If you have any questions, please feel free to call me at 393-2823 or Urmas Kelmser at (415) 620-5953.

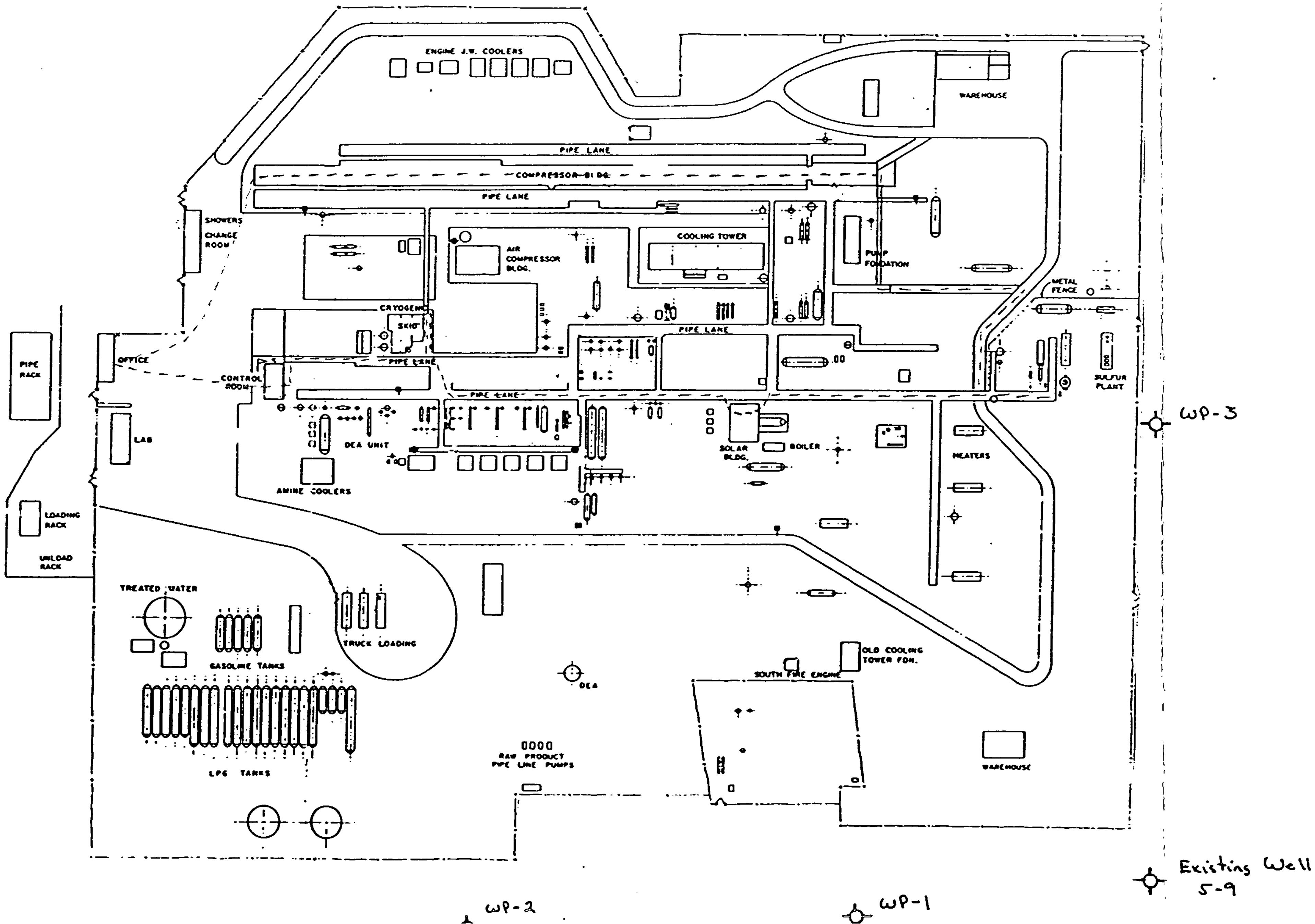
David K Shiel

K. A. Peterson
Plant Manager

KAP/sm
attachment
cc: L. T. Reed
M. L. Ingram
Urmas Kelmser

WARREN PETROLEUM COMPANY

MONUMENT PLANT



Chevron

Warren Petroleum Company
A Division of Chevron U.S.A. Inc.
P.O. Box 67, Monument, NM 88265

Manufacturing Department

March 19, 1990

State of New Mexico
Oil Conservation Division
Land Office Building
P. O. Box 2088
Santa Fe, New Mexico 87405-2088

Attention: Dave Boyer

Dear Dave,

Attached for your reference is a copy of a map previously sent showing the locations of three (3) ground water monitoring wells at Warren Petroleums Monument Gas Processing Plant in Lea County, New Mexico. As of this date we are continuing to pump well WP-3. To-date we have recovered 12,293.5 gallons (292.7 barrels) of condensate from this well. Our pumping rate is now down to 48 gallons per day over the last 76 days (since my last letter). We have had to continue to raise our pump one-quarter to one-half inch periodically to avoid pumping water.

On March 16, 1990 we bailed our three open test wells. Well 5-9 showed 1-3/4" of condensate, WP-1 showed 7" and WP-2 showed 0" as before.

We are studying the increase of condensate in WP-1. This is surprising since no known source of condensate is or has been in the vicinity of this well.

We will be pumping this well within 3 weeks to study its characteristics and the reaction on the other wells.

If you have any questions, please feel free to call me at 393-2823 or Urmas Kelmser at (415) 620-5953.

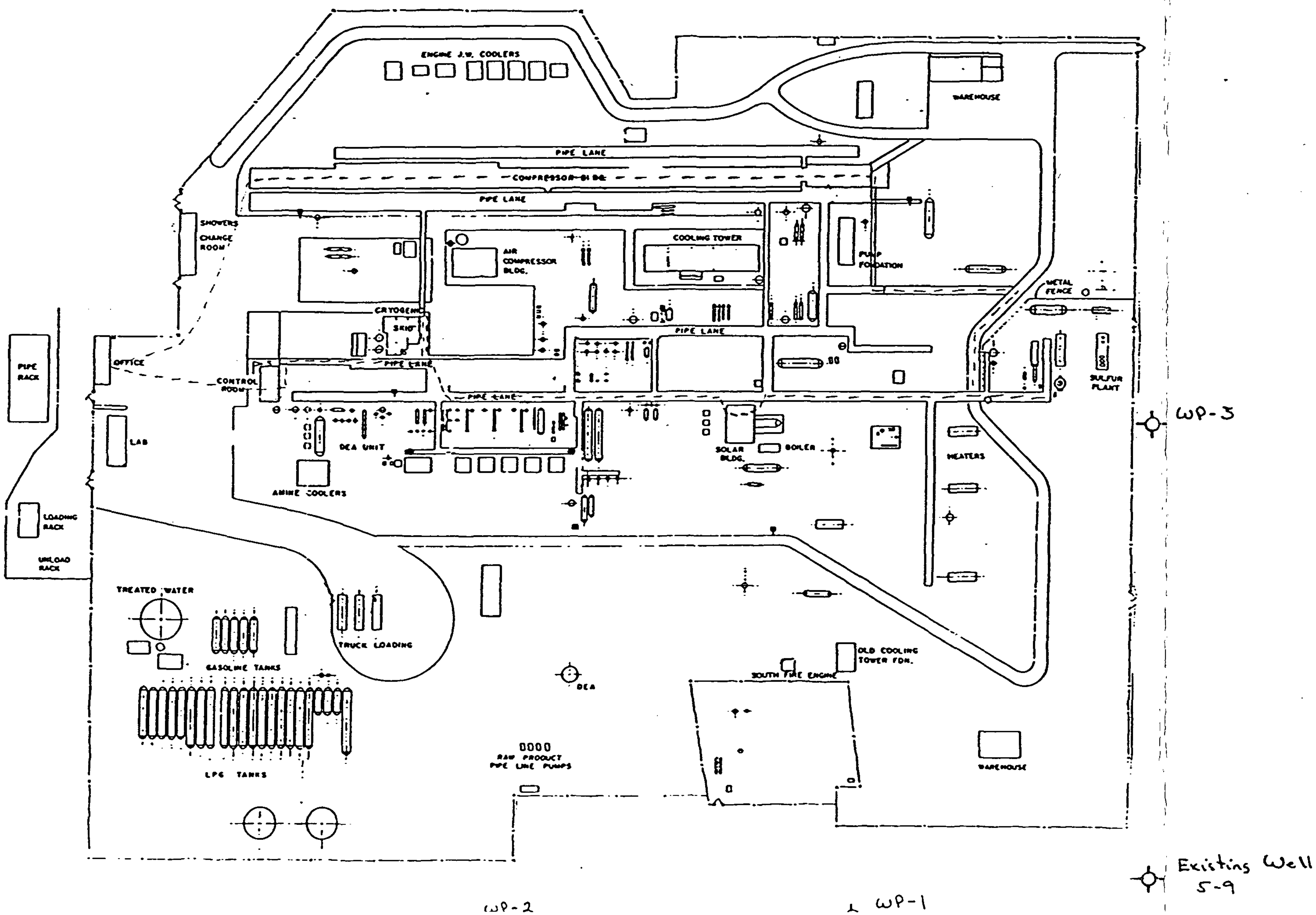
K. A. Peterson

K. A. Peterson
Plant Manager

KAP/sm
attachment
cc: L. T. Reed
M. L. Ingram
Urmas Kelmser

WARREN PETROLEUM COMPANY

MONUMENT PLANT



Chevron

Warren Petroleum Company
A Division of Chevron U.S.A. Inc.
P.O. Box 67, Monument, NM 88265

Manufacturing Department

August 6, 1990

State of New Mexico
Oil Conservation Division
Land Office Building
P. O. Box 2088
Santa Fe, New Mexico 87405-2088

Attention: Dave Boyer

Dear Dave,

Attached for your reference is a copy of a map previously sent showing the locations of three (3) ground water monitoring wells at Warren Petroleums Monument Gas Processing Plant in Lea County, New Mexico. We are continuing to pump well WP-3 and as indicated in my letter of March 19, 1990 have also pumped well WP-1. To date we have recovered 18,088.5 gallons (430 barrels) of condensate from these wells. Our pumping rate has averaged 42 gallons per day over the last 139 days. The pumps were shut off and all wells were bailed on this date after sitting for 72 hours. The results were WP-1 - 1/2" of condensate; WP-2 - 0" condensate; WP-3 - 3/4" of condensate; and well 5-9 - 3/4" condensate. These show a dramatic improvement from the March 19th levels.

I believe we are continuing to make progress on these wells and will keep you informed.

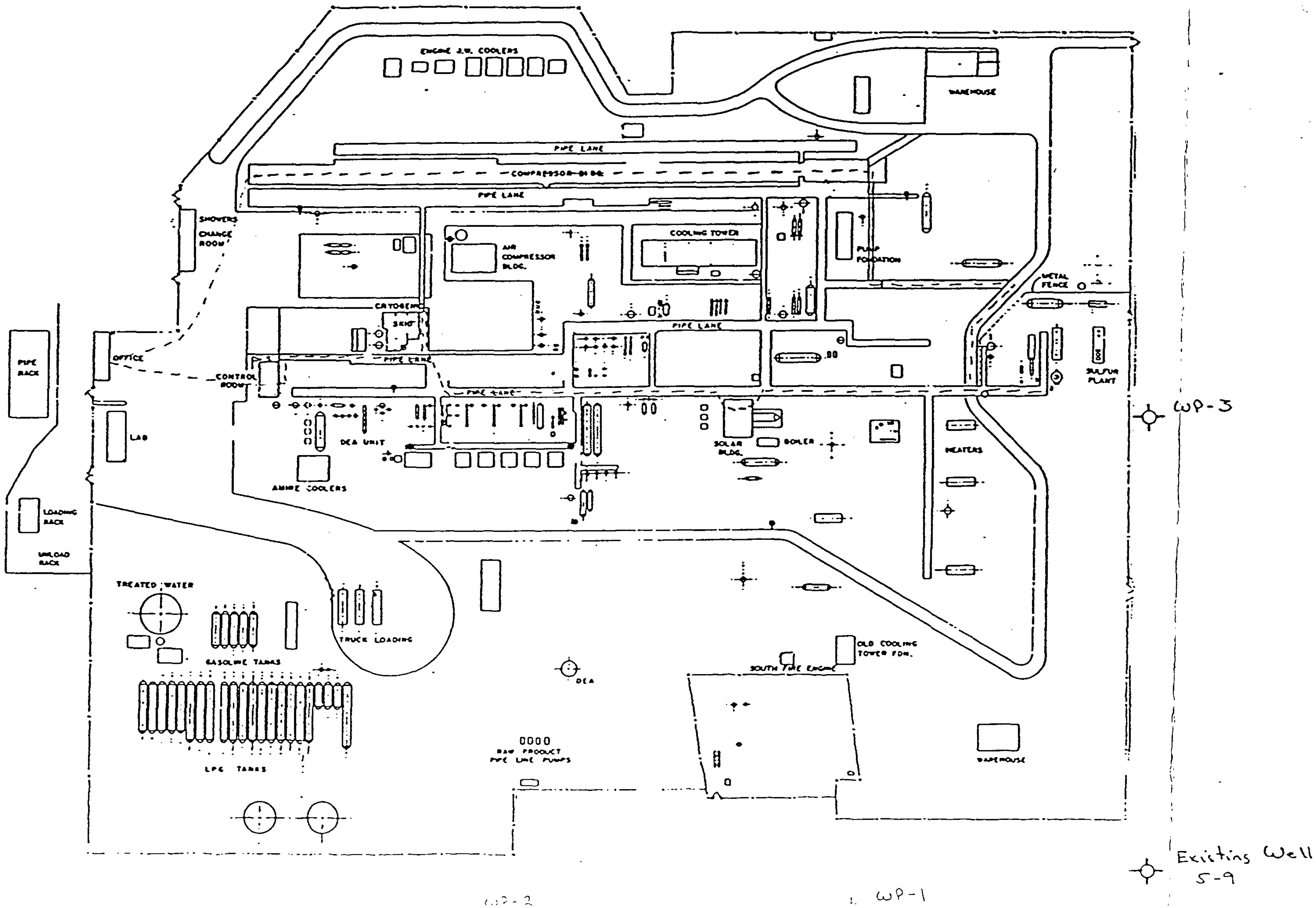
If you have any questions, please feel free to call me at 393-2823 or Urmas Kelmser at (415) 620-5953.

K A Peterson
K. A. Peterson
Plant Manager

KAP/sm
attachment
cc: L. T. Reed
B. G. Schulz
Urmas Kelmser

WARREN PETROLEUM COMPANY

MONUMENT PLANT



262-1864

August 16, 1991

Jimmie T. Cooper → 397-2045
Box 55
Monument, NM 88265

Chris Shuey
S.W. Research & Information Center
262-1862 office
877-1067 hm

Dear Sir:

This letter is to inform you of Climax Chemical Company's petition to the New Mexico Environment Department's Hazardous and Radioactive Materials Bureau (**HRMB**) requesting Alternate Concentration Limits for hazardous constituents present in the groundwater below the Climax Chemical facility west of Monument, New Mexico. Groundwater samples taken from the upper-most aquifer below Climax Chemical Company's Monument, New Mexico plant contain Cadmium, Silver, 1,1,1, Trichloroethylene and Ethylene Dichloride in concentrations above the safe drinking water standards. Climax Chemical has provided evidence that Alternate Concentration Limits should be granted because the contamination does not pose a threat to human health or the environment. The requested limits are above the safe drinking water standard and could pose a danger to human health should individuals drink, eat or inhale significant amounts of contaminated water or soils. The health of individuals who do not intend to use the groundwater or come in contact with it would not be threatened.

Climax Chemical Company's Monument, New Mexico plant is located three miles west of Monument, New Mexico in Lea County. The plant is a producer of hydrochloric acid and sodium sulfate. Immediately adjacent to and downgradient of Climax Chemical is the Warren Petroleum Company (Chevron) refinery. The upper-most aquifer beneath the refinery has been significantly impacted by hydrocarbon contamination. Due to past oil-field brine contamination of this same aquifer the Oil Conservation Division (**OCD**) of the New Mexico Energy Minerals and Natural Resources Department is only requiring the refinery to recover hydrocarbon product floating on top of the groundwater within the aquifer.

Climax Chemical Company's argument for granting the Alternate Concentration Limits is: "the water downgradient from Climax Chemical has been contaminated beyond usability by the petroleum industry through brine disposal and hydrocarbon leakage. The addition of Heavy Metal and Volatile Organic contamination above the safe drinking water standard as the Climax plume moves through this area will not adversely affect the usability of the aquifer, since it is already unusable without the effect of Climax's constituents."

At this time the HRMB has no evidence that landowners are using groundwater from the contaminated aquifer. Should you now be using or anticipate using groundwater from the upper-most aquifer beneath your property and have questions or comments concerning the petition for granting of Climax Chemical Company's petition request for Alternate Concentration Limits please contact Steve Alexander at 827-2929 or write: New Mexico Environment Department, Hazardous and Radioactive Materials Bureau, 1190 Saint Francis Drive, P.O. Box 26110, Santa Fe, New Mexico, 87502, Attention: Steve Alexander. Please respond within thirty (30) days following receipt of this notification.

Sincerely,

Steven M. Alexander, Water Resources Specialist
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department

Chevron
Warren Petroleum Company
A Division of Chevron U.S.A. Inc.
P.O. Box 67, Monument, NM 88265

Manufacturing Department

OIL CONSERV ON DIVISION
REC ED
'91 OCT 8 AM 8 51

October 2, 1991

State of New Mexico
Oil Conservation Division
Land Office Building
P. O. Box 2088
Santa Fe, New Mexico 87405-2088

Attention: Mr. Dave Boyer

Dear Mr. Boyer,

Attached for your reference is a copy of a map previously sent showing the locations of three (3) ground water monitoring wells at Warren Petroleums Monument Gas Processing Plant in Lea County, New Mexico. We are continuing to pump well WP-3 and as indicated in our letter of March 19, 1990 have also pumped well WP-1. To date we have recovered 26348.5 gallons (627 barrels) of condensate from these wells. Our pumping rate has averaged 20 gallons per day over the last 418 days. The attached table shows our pumping activity for the past 12 months.

The pumps were shut off and all wells were bailed on this date after sitting for 72 hours. The results were WP-1 - 0" of condensate; WP-2 - 0" condensate; WP-3 - 1/4" of condensate; and well 5-9 - 1/4" condensate. These show an improvement from the August, 1990 levels.

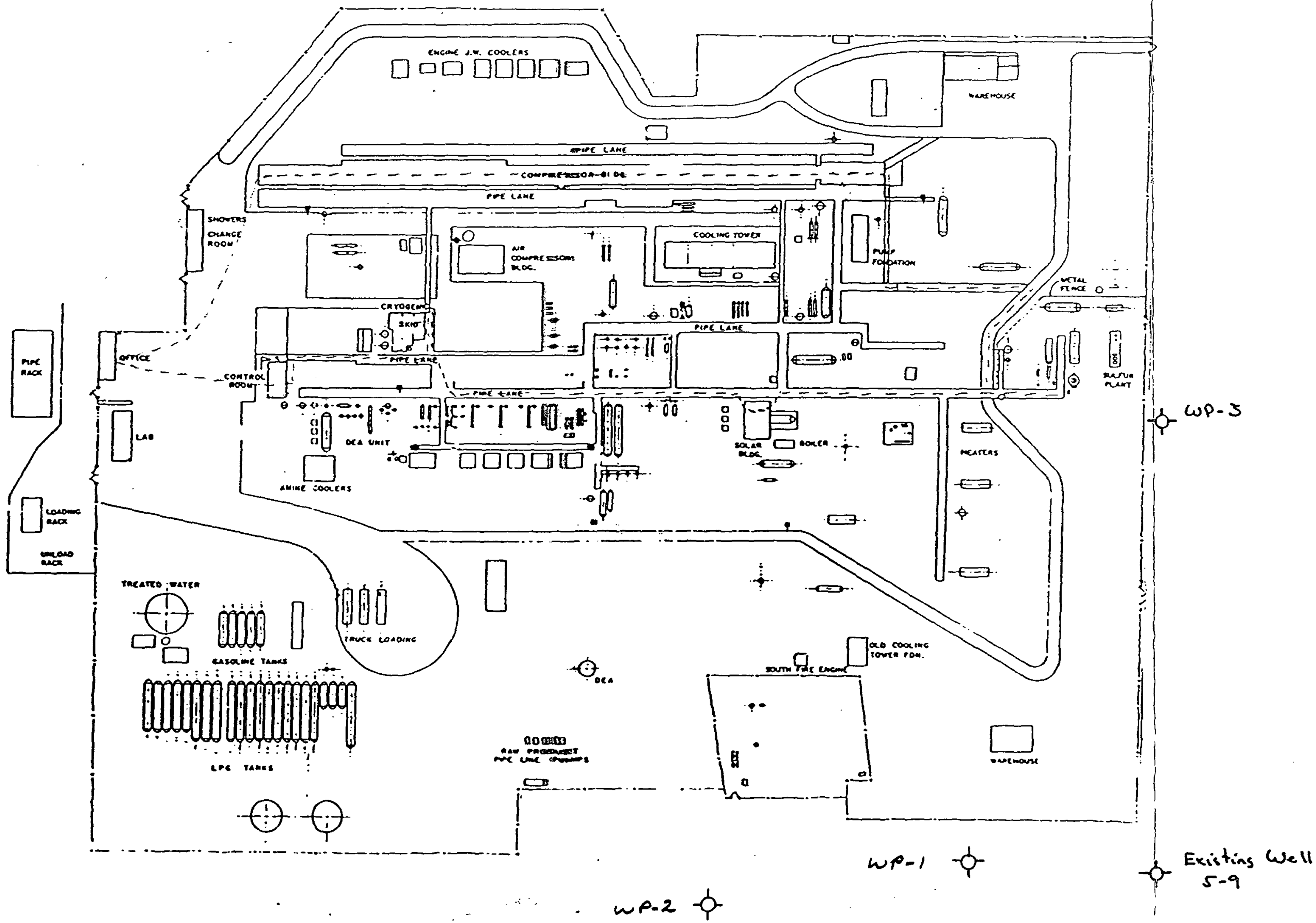
If you have any questions, call me at 393-2823 or Urmas Kelmser at (510) 620-5953.

C. L. Coarsey
PLANT MANAGER

CLC/mdm
attachment
cc: L. T. Reed
B. G. Schulz
Urmas Kelmser
M. C. Smith
S. T. Wilson

WARREN PETROLEUM COMPANY

MONUMENT PLANT



MONUMENT GROUND WATER MONITORING WELLS

Period Mo/day - Mo/day	Total Days	Gallons Recovered	Period Average Gals/Day	Cumulative Average Gals/Day (8/90 - 9/91)
8/3 - 8/30	28	1510	54	54
8/31 - 9/26	27	1770	66	60
9/27 - 10/30	34	1790	53	57
10/31 - 11/27	28	610	22	49
11/28 - 12/14	17	510	30	46
12/15 - 1/27	44	475	11	37
1/28 - 2/9	13	110	8	35
2/10 - 3/3	22	90	4	32
3/4 - 4/11	39	230	6	28
4/12 - 7/11	91	160	2	21
7/12 - 8/16	36	240	7	20
8/17 - 9/24	39	765	20	20
Total (8/3/90 - 9/24/91)	418	8260		

	Days	Gallons	Rate
Total reported on 8-2-90	139	18088.5	130
Total from 8-3-90 thru 9-24-91	418	8260	20
Total from beginning thru 9-24-91	557	26348.5	47

SOUTHWEST RESEARCH AND INFORMATION CENTER
P.O. Box 4524 Albuquerque, NM 87106 505-262-1862

OIL CONSERV· ·ON DIVISION
REC· ·VED
'91 DEC 6 AM 8 34

December 4, 1991

Mr. Bruce Swanton, Bureau Chief
Mr. Steve Alexander, Water Resource Specialist
Hazardous and Radioactive Waste Bureau
N.M. Environment Department
525 Camino de los Marquez
Santa Fe, NM 87501

Dear ~~Mr. Swanton~~ Bruce and ~~Mr. Alexander~~ Steve —:

Enclosed please find my photos of the Climax Chemical Company plant site and surrounding waste management units. These photos were taken on November 20, 1991. The descriptions on each photo are based on my field notes and recollection of what I saw. I have retained the negatives. This batch is yours to keep. Please share them with Richard Ohrbom of the Department's Ground Water Bureau.

Two of the photos confirm the presence of fluids in the largest of the three spent sulfuric acid pits that are located more than a mile and a half northwest of the plant site.

The three photos that I have taped together show a panorama view of the storm water runoff pond on the southeast corner of the site; a fourth photo of this same area shows salt deposition on the ground downstream of the downstream berm of the pond. The rancher who leases the state land in this area, Mr. J. R. "Red" Byrd, reported recent spills from this pond. Water was standing in an arroyo/dirt road immediately downstream from the pond on the day I was there.

I was accompanied on this field trip by Mr. Byrd. I was also there at the request of Mr. Jimmie T. Cooper, a rancher who owns land north of the Climax plant. They both expressed concern about acid deposition from the plant's stacks. I observed extensive rust and corrosion of fences and tanks in the plant area during my visit and felt a stinging sensation on my skin when standing downwind of the plant stacks on the evening of November 20. Mr. Cooper said he replaces corroded fencing on his property north of the plant "every year or so" but has not replaced fencing located upwind of the plant "in 50 years."

For 20 years a continuing tradition of effective citizen action

As we discussed during my visit to your office on November 25, there appears to be the need for a Department-wide effort to address the many environmental issues related to the Climax plant and an interagency effort (between the Department and the Oil Conservation Division) to address the wide range of water pollution and waste management problems that are apparent in the oil fields near the town of Monument. This seems especially important since the oil-field issues may negatively affect the ability of the Department to implement and enforce its requirements for non-petroleum operations that are within its jurisdiction.

Please feel free to call me if you have questions about the enclosed photos or want to discuss these matters in more detail.

Sincerely,

Chris Shuey, Director
Community Water Quality Program

Enclosures.

xc: J. R. Byrd, Monument
Jimmie T. Cooper, Monument
Richard Ohrbom, NMED/Ground Water
Bill Olson, NMOCD/Environmental Bureau
Kathleen Sisneros, NMED/WMD

Lab No. ACCU LABS 77-521,07-12

ORGANIC ANALYSIS REQUEST FORM

(1)

REPORT TO: DAVID BOYER
N.M. OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, NM 87504-2088

Sample No. 8903301105
DATE REC. ______
PRIORITY ______
PHONE(S): 827-5812

COLLECTION CITY: Monument ; COUNTY: Lea

COLLECTION DATE/TIME CODE: (Year-Month-Day-Hour-Minute) 8|9|0|3|3|0| ~~1|0|0|0~~ 1105

LOCATION CODE: (Township-Range-Section-Tracts) | | | + | | | + | + | | | (10N06E24342)

SUBMITTER: David Boyer

SAMPLE TYPE: WATER ☒, SOIL ☐, FOOD ☐, OTHER: ______

This form accompanies 2 Septum Vials, ____ Glass Jugs, and/or ____ ______

Samples were preserved as follows:

- ☐ NP: No Preservation; Sample stored at room temperature.
- ☒ P-Ice Sample stored in an ice bath (Not Frozen).
- ☐ P-AA Sample Preserved with Ascorbic Acid to remove chlorine residual.
- ☒ P-HCl Sample Preserved with Hydrochloric Acid (2 drops/40 ml)

ANALYSES REQUESTED: Please check the appropriate box(es) below to indicate the type of analytical screens required. Whenever possible list specific compounds suspected or required.

PURGEABLE SCREENS

- ☐ (753) Aliphatic Headspace (1-5 Carbons)
- ☒ (754) Aromatic & Halogenated Purgeables
- ☐ (765) Mass Spectrometer Purgeables
- ☐ (766) Trihalomethanes
- ☐ (774) SDWA VOC's I (8 Regulated +)
- ☐ (775) SDWA VOC's II (EDB & DBCP)

Other Specific Compounds or Classes

- ☐ ______
- ☐ ______

EXTRACTABLE SCREENS

- ☐ (751) Aliphatic Hydrocarbons
- ☐ (755) Base/Neutral Extractables
- ☐ (758) Herbicides, Chlorophenoxy acid
- ☐ (759) Herbicides, Triazines
- ☐ (760) Organochlorine Pesticides
- ☐ (761) Organophosphate Pesticides
- ☐ (767) Polychlorinated Biphenyls (PCB's)
- ☐ (764) Polynuclear Aromatic Hydrocarbons
- ☐ (762) SDWA Pesticides & Herbicides

Remarks: ______

FIELD DATA:

pH= 7 ; Conductivity= 19,500 umho/cm at 18.5 °C; Chlorine Residual= ____ mg/l

Dissolved Oxygen= ____ mg/l; Alkalinity= ____ mg/l; Flow Rate ____ ____/____

Depth to water 25.36 ft.; Depth of well 60.4 ft.; Perforation Interval ____-____ ft.; Casing: ______

Sampling Location, Methods and Remarks (i.e. odors, etc.) No odor
Road(side) Monitor well - 1 mile south of pavement on county road, E side of Road. (Originally Climax Exp. well)

I certify that the results in this block accurately reflect the results of my field analyses, observations and activities.(signature collector): David B Boyer Method of Shipment to the Lab: ~~Express~~ freight

CHAIN OF CUSTODY

I certify that this sample was transferred from DB to DM at (location) ALR 11483 W 48TH AVE on 4/5/89 - 12:25 and that the statements in this block are correct. Evidentiary Seals: Not Sealed ☐ OR Seals Intact: Yes ☒ No ☐

Signatures [signature] ______

For OCD use: Date owner notified: ______ Phone or Letter? Initials ______

Contract Lab A[illegible]u LABS
Contract No. 77-521.07-123

GENERAL WATER CHEMISTRY and NITROGEN ANALYSIS

DATE RECEIVED	LAB NO.	Sample No. 8903301105
Collection DATE 89/03/30	SITE INFORMATION ►	Sample location Road(side) Monitor well
Collection TIME 1105		Collection site description 1 mile S of Pavement on cty road West of Warren Plant Located on W. side Rd (4" PVC well)
Collected by — Person/Agency Boyer/Anderson /OCD		Station/well code
		Owner

SEND FINAL REPORT TO ►
ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg, PO Box 2088
Santa Fe, NM 87504-2088

Attn: David Boyer

Phone: 827-5812

SAMPLING CONDITIONS

☒ Bailed ☐ Pump ☐ Dipped ☐ Tap	Water level 25.36'	Discharge	Sample type Grab
pH (00400) 7	Conductivity (Uncorrected) 19,500 µmho	Water Temp. (00010) 18.5 °C	Conductivity at 25°C (00094) µmho

Field comments Bailed 8 bails with 3" OD bailer, 36T long (Well was installed as exploratory for Climax chem)

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted 1	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 µmembrane filter	☐ A: 2 ml H_2SO_4/L added
☒ NA: No acid added	☐ Other-*specify*:	☐ A: 5ml conc. HNO_3 added	☐ A: 4ml fuming HNO_3 added

ANALYTICAL RESULTS from SAMPLES

NA		Units	Date analyzed
☒ Conductivity (Corrected) 25°C (00095)		µmho	
☐ Total non-filterable residue (suspended) (00530)		mg/l	
☒ Other: Lab pH			
☐ Other:			
☐ Other:			
A-H_2SO_4			
☐ Nitrate-N +, Nitrate-N total (00630)		mg/l	
☐ Ammonia-N total (00610)		mg/l	
☐ Total Kjeldahl-N ( )		mg/l	
☐ Chemical oxygen demand (00340)		mg/l	
☐ Total organic carbon ( )		mg/l	
☐ Other:			
☐ Other:			

From NF, NA Sample:

			Date Analyzed
☒ Calcium		mg/l	
☒ Potassium		mg/l	
☒ Magnesium		mg/l	
☒ Sodium		mg/l	
☒ Bicarbonate		mg/l	
☒ Chloride		mg/l	
☒ Sulfate		mg/l	
☒ Total Solids		mg/l	
☒ CO_3			
☒ Br			
☒ Cation/Anion Balance			

Analyst	Date Reported	Reviewed by

Laboratory remarks

FOR OCD USE -- Date Owner Notified ________ Phone or Letter? ________ Initals ________

Contract Lab Accu-Labs

Contract No. 77-[illegible]21-07-123

HEAVY METAL ANALYSIS FORM

Date Received		Lab No.	Sample No. 890330 1105

COLLECTION DATE & TIME: yy | mm | dd | hh | mm

COLLECTED BY:

COLLECTION SITE DESCRIPTION
WARREN ROAD
MONITOR WALL

TO:

OWNER:

ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg., PO Box 2088
SANTA FE, NM 87504-2088

ATTN: D BOYER
TELEPHONE: 827-5812

SITE LOCATION:
County:

Township, Range, Section, Tract: (10N06E24342)

STATION/ WELL CODE:

LATITUDE, LONGITUDE:

SAMPLING CONDITIONS:

☒ Bailed ☐ Pump ☐ Dipped ☐ Tap	Water Level:	Discharge:	Sample Type: GRAB

pH(00400)	Conductivity(Uncorr.) µmho	Water Temp.(00010) °C	Conductivity at 25°C (00094) µmho

FIELD COMMENTS:

SAMPLE FIELD TREATMENT Check proper boxes:		LAB ANALYSIS REQUESTED:
☒ WPN: Water Preserved w/HNO_3 Non-Filtered	☐ WPF: Water Preserved w/HNO_3 Filtered	☐ ICAP Scan Mark box next to metal if AA is required.

ANALYTICAL RESULTS (MG/L)

ELEMENT	ICAP VALUE	AA VALUE	ELEMENT	ICAP VALUE	AA VALUE
Aluminum	☒	☐	Silicon	☐	☐
Barium	☒	☐	Silver	☒	☐
Beryllium	☐	☐	Strontium	☒	☐
Boron	☒	☐	Tin	☐	☐
Cadmium	☒	☐	Vanadium		☐
Calcium	☐	☐	Zinc	☒	☐
Chromium	☐	☒ ICP	Arsenic		☒
Cobalt	☒	☐	Selenium		☒
Copper	☒	☐	Mercury		☒ ICP
Iron	☒	☐		☐	☐
Lead	☐	☒		☐	☐
Magnesium	☐	☐		☐	☐
Manganese	☒	☐		☐	☐
Molybdenum	☒	☐		☐	☐
Nickel	☒	☐		☐	☐

LAB COMMENTS:

For OCD Use: Date Owner Notified: Phone or Letter? Initials:	ICAP Analyst Date Analyzed	Reviewer Date Reveived

Accu-Labs Research, Inc.

11485 W. 48th Avenue Wheat Ridge, Colorado 80033 (303) 423-2766

May 9, 1989

RECEIVED
MAY 17 1989
OIL CONSERVATION DIV.
SANTA FE

Mr. David Boyer
NM Oil Conservation Division
State Land Office Bldg.
P.O. Box 2088
Santa Fe, NM 87504-2088

RE: 9649-29859-20
Date Samples Rec'd: 4-5-89
P.O. No. 77-521.07-123

REPORT OF ANALYSIS

ALR Designation Sponsor Designation	9649-29859-20-1 8903301105 3-30-89	9649-29859-20-2 8903291000 3-29-89	9649-29859-20-3 8903291400 3-29-89
GC/MS VOLATILE ORGANICS, µg/L:			
Chloromethane	<10	<10	<100
Bromomethane	<10	<10	<100
Vinyl chloride	<10	<10	<100
Chloroethane	<10	<10	<100
Methylene chloride	<5	<5	<50
1,1-Dichloroethene	<5	<5	<50
1,1-Dichloroethane	<5	<5	<50
Total 1,2-Dichloroethene	<5	<5	<50
Chloroform	<5	<5	<50
1,2-Dichloroethane	<5	<5	<50
1,1,1-Trichloroethane	<5	<5	<50
Carbon tetrachloride	<5	<5	<50
Bromodichloromethane	<5	<5	<50
1,2-Dichloropropane	<5	<5	<50
c-1,3-Dichloropropene	<5	<5	<50
Trichloroethene	<5	<5	<50
Benzene	<5	<5	2200
Dibromochloromethane	<5	<5	<50
1,1,2-Trichloroethane	<5	<5	<50
t-1,3-Dichloropropene	<5	<5	<50
2-Chloroethylvinyl ether	<5	<5	<50
Bromoform	<5	<5	<50
1,1,2,2-Tetrachloroethane	<5	<5	<50
Tetrachloroethene	<5	<5	<50

Accu-Labs Research, Inc.

May 9, 1989

RECEIVED

MAY 17 1989

OIL CONSERVATION DIV.
SANTA FE

Mr. David Boyer
NM Oil Conservation Division

RE: 9649-29859-20
Date Samples Rec'd: 4-5-89
P.O. No. 77-521.07-123

REPORT OF ANALYSIS

ALR Designation	9649-29859-20-1	9649-29859-20-2	9649-29859-20-3
Sponsor Designation	8903301105 3-30-89	8903291000 3-29-89	8903291400 3-29-89
Determination: µg/L			
Toluene	<5	<5	2000
Chlorobenzene	<5	<5	<50
Ethyl benzene	<5	<5	500
Total Dichlorobenzenes	<5	<5	<50
Total Xylenes	<5	<5	1300
Determination: mg/L			
Aluminum, total	0.9	<1*	0.3
Barium, total	0.12	2.9	0.31
Boron, total	0.7	110	2.7
Cadmium, total	<0.005	<0.05*	<0.005
Calcium, total	2600	15,000	900
Chromium, total	<0.005	<0.05*	0.043
Cobalt, total	<0.005	<0.05*	<0.005
Copper, total	0.026	<0.05*	0.076
Iron, total	0.96	5.1	44
Magnesium, total	610	8900	230
Manganese, total	0.16	19	0.54
Mercury, total	0.002	<0.002*	0.006
Molybdenum, total	<0.005	<0.05*	0.007
Nickel, total	<0.01	<0.1*	0.05
Potassium, total	35	3900	110
Silver, total	<0.005	<0.005	<0.005
Sodium, total	6500	81,000	4300
Strontium, total	30	350	45
Zinc, total	0.026	0.06	0.16
Total Alkalinity, (as $CaCO_3$ to pH 4.5)	290	220	350

May 9, 1989

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OIL CONSERVATION DIV.
SANTA FE

Mr. David Boyer
NM Oil Conservation Division

RE: 9649-29859-20
Date Samples Rec'd: 4-5-89
P.O. No. 77-521.07-123

REPORT OF ANALYSIS

ALR Designation	9649-29859-20-1	9649-29859-20-2	9649-29859-20-3
Sponsor Designation	8903301105 3-30-89	8903291000 3-29-89	8903291400 3-29-89
Determination: mg/L			
Carbonate (as CO_3)	<5	<5	37
Bicarbonate (as HCO_3)	350	270	350
pH	7.0	6.9	8.6
Specific Conductance, µmhos/cm	47,000	600,000	28,000
Arsenic, total	0.005	0.60	0.032
Lead, total	0.023	0.084	0.017
Selenium, total	<0.005	<0.25*	0.017
Total Solids	29,000	350,000	16,000
Bromide	16	830	<40*
Chloride	15,000	190,000	8100
Sulfate (as SO_4)	1600	2300	890
Ion Balance	100	94	99

Contract Lab Acc● LABS
Contract No. 77-521.07-123

GENERAL WATER CHEMISTRY and NITROGEN ANALYSIS

DATE RECEIVED	LAB NO.	Sample No. 8903301000
Collection DATE 89103130	SITE INFORMATION ►	Sample location Warren Monument - SE Mon Well
Collection TIME 1000		Collection site description 4" PVC well on W. side of road to EPNG monument a 100' N of cattle guard
Collected by — Person/Agency Boyer/Anderson OCD		Station/well code
		Owner

SEND FINAL REPORT TO ►

ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg, PO Box 2088
Santa Fe, NM 87504-2088

Attn: David Boyer

Phone: 827-5312

SAMPLING CONDITIONS

☒ Bailed ☐ Dipped ☐ Pump ☐ Tap	Water level 25.2 to product	Discharge	Sample type Grab
pH (00400) —	Conductivity (Uncorrected) — µmho	Water Temp. (00010) °C	Conductivity at 25°C (00094) µmho

Field comments 5-6" light weight product on water

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted 1	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 µmembrane filter	☐ A: 2 ml H_2SO_4/L added
☒ NA: No acid added	☐ Other-*specify*:	☐ A: 5ml conc. HNO_3 added	☐ A: 4ml fuming HNO_3 added

ANALYTICAL RESULTS from SAMPLES

NA		Units	Date analyzed
☒ Conductivity (Corrected) 25°C (00095) ✓		µmho	
☐ Total non-filterable residue (suspended) (00530)		mg/l	
☒ Other: Lab pH ✓			
☐ Other:			
☐ Other:			
A-H_2SO_4			
☐ Nitrate-N +, Nitrate-N total (00630)		mg/l	
☐ Ammonia-N total (00610)		mg/l	
☐ Total Kjeldahl-N ( )		mg/l	
☐ Chemical oxygen demand (00340)		mg/l	
☐ Total organic carbon ( )		mg/l	
☐ Other:			
☐ Other:			

From NF, NA Sample:			Date Analyzed
☒ Calcium ✓		mg/l	
☒ Potassium ✓		mg/l	
☒ Magnesium ✓		mg/l	
☒ Sodium ✓		mg/l	
☒ Bicarbonate ✓		mg/l	
☒ Chloride ✓		mg/l	
☒ Sulfate ✓		mg/l	
☒ Total Solids ✓		mg/l	
☒ CO_3 ✓			
☒ Br ✓			
☒ Cation/Anion Balance			

Analyst	Date Reported	Reviewed by

Laboratory remarks

FOR OCD USE -- Date Owner Notified__________ Phone or Letter?________ Initals________

Accu-Labs Research, Inc.

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MAY 17 1989

OIL CONSERVATION DIV.
SANTA FE

Mr. David Boyer
NM Oil Conservation Division

RE: 9649-29859-20
Date Samples Rec'd: 4-5-89
P.O. No. 77-521.07-123

REPORT OF ANALYSIS

ALR Designation	9649-29859-20-10	9649-29859-20-11	9649-29859-20-12
Sponsor Designation	8903291420 3-29-89	8903301000 3-30-89	8903301355 3-30-89
GC/MS VOLATILE ORGANICS, µg/L:			
Chloromethane	Not Analyzed	Not Analyzed	<100
Bromomethane			<100
Vinyl chloride			<100
Chloroethane			<100
Methylene chloride			<50
1,1-Dichloroethene			<50
1,1-Dichloroethane			<50
Total 1,2-Dichloroethene			<50
Chloroform			<50
1,2-Dichloroethane			<50
1,1,1-Trichloroethane			<50
Carbon tetrachloride			<50
Bromodichloromethane			<50
1,2-Dichloropropane			<50
c-1,3-Dichloropropene			<50
Trichloroethene			<50
Benzene			380
Dibromochloromethane			<50
1,1,2-Trichloroethane			<50
t-1,3-Dichloropropene			<50
2-Chloroethylvinyl ether			<50
Bromoform			<50
1,1,2,2-Tetrachloroethane			<50
Tetrachloroethene			<50

Accu-Labs Research, Inc.

May 9, 1989

Mr. David Boyer
NM Oil Conservation Division

RECEIVED

MAY 17 1989

OIL CONSERVATION DIV.
SANTA FE

RE: 9649-29859-20
Date Samples Rec'd: 4-5-89
P.O. No. 77-521.07-123

REPORT OF ANALYSIS

ALR Designation	9649-29859-20-10	9649-29859-20-11	9649-29859-20-12
Sponsor Designation	8903291420 3-29-89	8903301000 3-30-89	8903301355 3-30-89
Determination: µg/L			
Toluene			580
Chlorobenzene			<50
Ethyl benzene			<50
Total Dichlorobenzenes			<50
Total Xylenes			390
Determination: mg/L			
Aluminum, total	0.3	--	--
Barium, total	0.09	--	--
Boron, total	0.1	--	--
Cadmium, total	<0.005	--	--
Calcium, total	170	52	--
Chromium, total	0.005	--	--
Cobalt, total	<0.005	--	--
Copper, total	0.041	--	--
Iron, total	0.88	--	--
Magnesium, total	23	48	--
Manganese, total	0.028	--	--
Mercury, total	<0.001*	--	--
Molybdenum, total	0.007	--	--
Nickel, total	0.02	--	--
Potassium, total	50	6.2	--
Silver, total	<0.005	--	--
Sodium, total	1100	2300	--
Strontium, total	0.88	--	--
Zinc, total	0.019	--	--
Total Alkalinity, (as $CaCO_3$ to pH 4.5)	110	1600	--

Accu-Labs Research, Inc.

May 9, 1989

RECEIVED

MAY 17 1989

OIL CONSERVATION DIV.
SANTA FE

Mr. David Boyer
NM Oil Conservation Division

RE: 9649-29859-20
Date Samples Rec'd: 4-5-89
P.O. No. 77-521.07-123

REPORT OF ANALYSIS

ALR Designation Sponsor Designation	9649-29859-20-10 8903291420 3-29-89	9649-29859-20-11 8903301000 3-30-89	9649-29859-20-12 8903301355 3-30-89
Determination: mg/L			
Carbonate (as CO_3)	<5	31	--
Bicarbonate (as HCO_3)	130	1900	--
pH	8.3	8.4	--
Specific Conductance, µmhos/cm	5900	12,000	--
Arsenic, total	<0.005	--	--
Lead, total	<0.005	--	--
Selenium, total	<0.005	--	--
Total Solids	3100	5800	--
Bromide	<2*	<200*	--
Chloride	1500	2400	--
Sulfate (as SO_4)	500	270	--
Ion Balance	108	101	--

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Lab Accu Labs
No. 77-521,07-123

ORGANIC ANALYSIS REQUEST FORM

REPORT TO: DAVID BOYER
N.M. OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, NM 87504-2088

Sample No. 890330 1000
DATE REC. ______
PRIORITY ______
PHONE(S): 827-5812

COLLECTION CITY: Monument ; **COUNTY:** Lea

COLLECTION DATE/TIME CODE: (Year-Month-Day-Hour-Minute) 8|9|0|3|3|0| ~~[illegible]~~ 1000

LOCATION CODE: (Township-Range-Section-Tracts) | | | + | | | + | + | | | (10N06E24342) R2B

SUBMITTER: David Boyer

SAMPLE TYPE: WATER ☐, SOIL ☐, FOOD ☐, OTHER: Product (Hydrocarbon)

This form accompanies 2 Septum Vials, ______ Glass Jugs, and/or ______ ______

Samples were preserved as follows:

- ☐ NP: No Preservation; Sample stored at room temperature.
- ☒ P-Ice . Sample stored in an ice bath (Not Frozen).
- ☐ P-AA Sample Preserved with Ascorbic Acid to remove chlorine residual.
- ☐ P-HCl Sample Preserved with Hydrochloric Acid (2 drops/40 ml)

ANALYSES REQUESTED: Please check the appropriate box(es) below to indicate the type of analytical screens required. Whenever possible list specific compounds suspected or required.

PURGEABLE SCREENS

- ☐ (753) Aliphatic Headspace (1-5 Carbons)
- ☐ (754) Aromatic & Halogenated Purgeables
- ☐ (765) Mass Spectrometer Purgeables
- ☐ (766) Trihalomethanes
- ☐ (774) SDWA VOC's I (8 Regulated +)
- ☐ (775) SDWA VOC's II (EDB & DBCP)

Other Specific Compounds or Classes

- ☒ Screen for I.D. as to
- ☐ type of product

EXTRACTABLE SCREENS

- ☐ (751) Aliphatic Hydrocarbons
- ☐ (755) Base/Neutral Extractables
- ☐ (758) Herbicides, Chlorophenoxy acid
- ☐ (759) Herbicides, Triazines
- ☐ (760) Organochlorine Pesticides
- ☐ (761) Organophosphate Pesticides
- ☐ (767) Polychlorinated Biphenyls (PCB's)
- ☐ (764) Polynuclear Aromatic Hydrocarbons
- ☐ (762) SDWA Pesticides & Herbicides

Remarks: Fingerprint for product type
Product on water table (was clear amber liquid when collected)

FIELD DATA:

pH= ______; Conductivity= ______ umho/cm at ______ °C; Chlorine Residual= ______ mg/l

Dissolved Oxygen= ______ mg/l; Alkalinity= ______ mg/l; Flow Rate ______ ______/______

Depth to water ~25 ft.; Depth of well 40.4 ft.; Perforation Interval ______-______ ft.; Casing: ______

Sampling Location, Methods and Remarks (i.e. odors, etc.)
Warren Monument S.E. Mon. Well on Road to EPNG, ~100' N of cattleguard

I certify that the results in this block accurately reflect the results of my field analyses, observations and activities.(signature collector): David G Boyer Method of Shipment to the Lab: Freight Express

CHAIN OF CUSTODY

I certify that this sample was transferred from DB to DM
at (location) ALR on 4/5/89 - 12:25 and that
the statements in this block are correct. Evidentiary Seals: Not Sealed ☐ OR Seals Intact: Yes ☐ No ☐
Signature: [signature]

For OCD use: Date owner notified: ______ Phone or Letter? Initials ______

Mr. David Boyer
NM Oil Conservation Division

RECEIVED

MAY 17 1989

OIL CONSERVATION DIV.
SANTA FE

RE: 9649-29859-20
Date Samples Rec'd: 4-5-89
P.O. No. 77-521.07-123

REPORT OF ANALYSIS

ALR Designation	9649-29859-20-19	9649-29859-20-20
Sponsor Designation	8903301000 3-30-89	8904032105 Trip Blank 4-3-89
GC/MS VOLATILE ORGANICS, µg/L:		
Chloromethane	Not Analyzed	<10
Bromomethane		<10
Vinyl chloride		<10
Chloroethane		<10
Methylene chloride		<5
1,1-Dichloroethene		<5
1,1-Dichloroethane		<5
Total 1,2-Dichloroethene		<5
Chloroform		<5
1,2-Dichloroethane		<5
1,1,1-Trichloroethane		<5
Carbon tetrachloride		<5
Bromodichloromethane		<5
1,2-Dichloropropane		<5
c-1,3-Dichloropropene		<5
Trichloroethene		<5
Benzene		<5
Dibromochloromethane		<5
1,1,2-Trichloroethane		<5
t-1,3-Dichloropropene		<5
2-Chloroethylvinyl ether		<5
Bromoform		<5
1,1,2,2-Tetrachloroethane		<5
Tetrachloroethene		<5

Accu-Labs Research, Inc.

May 9, 1989

Mr. David Boyer
NM Oil Conservation Division

RE: 9649-29859-20
Date Samples Rec'd: 4-5-89
P.O. No. 77-521.07-123

REPORT OF ANALYSIS

ALR Designation	9649-29859-20-19	9649-29859-20-20
Sponsor Designation	8903301000 3-30-89	8904032105 Trip Blank 4-3-89
Determination: µg/L		
Toluene		<5
Chlorobenzene		<5
Ethyl benzene		<5
Total Dichlorobenzenes		<5
Total Xylenes		<5
Determination: %		
C7	27	
C8	9.9	
C9	8.5	
C10	6.9	
C11	5.2	
C12	11	
C13	16	
C14	9.1	
C15	3.5	
C16	1.2	
C17	0.9	
C18	0.2	
C19	0.3	

RECEIVED
MAY 17 1989
OIL CONSERVATION DIV.
SANTA FE

* Higher detection limit due to sample viscosity.

These samples are scheduled to be discarded 30 days after the date of this report.

Chris Shugarts
Chris Shugarts
Organics Chemistry
Supervisor

Mary Fabisiak
Mary Fabisiak
Water Laboratory
Supervisor

CS/MF/dh
da

Contract Lab Acc -LABS
Contract No. 77-521.07-123

GENERAL WATER CHEMISTRY and NITROGEN ANALYSIS

DATE RECEIVED	LAB NO.	Sample No. 8903291420
Collection DATE 89 03 29	SITE INFORMATION ►	Sample location Warren Monument
Collection TIME		Collection site description Discharge from Climax Chemical under fence to Warren well yard
Collected by Person/Agency Boyer/Anderson/OCD		Station/well code
		Owner

SEND FINAL REPORT TO ►

ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg, PO Box 2088
Santa Fe, NM 87504-2088

Attn: David Boyer

Phone: 827-5812

SAMPLING CONDITIONS

☐ Bailed ☐ Pump ☒ Dipped ☐ Tap	Water level	Discharge	Sample type Grab
pH (00400) 7	Conductivity (Uncorrected) 2850 µmho	Water Temp. (00010) 23 °C	Conductivity at 25°C (00094) µmho

Field comments Water discharging under fence and ponds on Warren oily soil treatment area.

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted 1	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 µmembrane filter	☐ A: 2 ml H_2SO_4/L added
☒ NA: No acid added	☐ Other-*specify*:	☐ A: 5ml conc. HNO_3 added	☐ A: 4ml fuming HNO_3 added

ANALYTICAL RESULTS from SAMPLES

NA		Units	Date analyzed
☒ Conductivity (Corrected) 25°C (00095)		µmho	
☐ Total non-filterable residue (suspended) (00530)		mg/l	
☒ Other: Lab pH			
☐ Other:			
☐ Other:			
A-H_2SO_4			
☐ Nitrate-N +, Nitrate-N total (00630)		mg/l	
☐ Ammonia-N total (00610)		mg/l	
☐ Total Kjeldahl-N ( )		mg/l	
☐ Chemical oxygen demand (00340)		mg/l	
☐ Total organic carbon ( )		mg/l	
☐ Other:			
☐ Other:			

From NE, NA Sample:			Date Analyzed
☒ Calcium		mg/l	
☒ Potassium		mg/l	
☒ Magnesium		mg/l	
☒ Sodium		mg/l	
☒ Bicarbonate		mg/l	
☒ Chloride		mg/l	
☒ Sulfate		mg/l	
☒ Total Solids		mg/l	
☒ CO_3			
☒ Br			
☒ Cation/Anion Balance			

Analyst	Date Reported	Reviewed by

Laboratory remarks

FOR OCD USE -- Date Owner Notified ______ Phone or Letter? ______ Initals ______

Contract Lab ACCU LABS
Contract No. 77-[illegible]21,07-123

HEAVY METAL ANALYSIS FORM

/8

Date Received		Lab No.		Sample No. 890329 1420

COLLECTION DATE & TIME: yy 89 | mm 03 | dd 29 | hh 14 | mm 20

COLLECTED BY: BOYER ANDERSON

COLLECTION SITE DESCRIPTION WARREN MONUMENT flow FROM Climax Chem

TO:

ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg., PO Box 2088
SANTA FE, NM 87504-2088

ATTN: DAVE BOYER
TELEPHONE: 827-5812

OWNER:

SITE LOCATION:
County: LEA

Township, Range, Section, Tract: (10N06E24342)

STATION/ WELL CODE:

LATITUDE, LONGITUDE:

SAMPLING CONDITIONS:

☐ Bailed ☒ Dipped	☐ Pump ☐ Tap	Water Level:	Discharge:	Sample Type: GRAB

pH(00400)	Conductivity(Uncorr.) µmho	Water Temp.(00010) °C	Conductivity at 25°C (00094) µmho

FIELD COMMENTS:

SAMPLE FIELD TREATMENT Check proper boxes:		LAB ANALYSIS REQUESTED:
☒ WPN: Water Preserved w/HNO_3 Non-Filtered	☐ WPF: Water Preserved w/HNO_3 Filtered	☐ ICAP Scan Mark box next to metal if AA is required.

ANALYTICAL RESULTS (MG/L)

ELEMENT	ICAP VALUE	AA VALUE	ELEMENT	ICAP VALUE	AA VALUE
Aluminum	☒	☐	Silicon	☐	☐
Barium	☒	☐	Silver	☒	☐
Beryllium	☐	☐	Strontium	☒	☐
Boron	☒	☐	Tin	☐	☐
Cadmium	☒	☐	Vanadium	☐	☐
Calcium	☐	☐	Zinc	☒	☐
Chromium		☒	Arsenic		☒
Cobalt	☒	☐	Selenium		☒
Copper	☒	☐	Mercury		☒
Iron	☒	☐		☐	☐
Lead		☒		☐	☐
Magnesium	☐	☐		☐	☐
Manganese	☒	☐		☐	☐
Molybdenum	☒	☐		☐	☐
Nickel	☒	☐		☐	☐

LAB COMMENTS:

For OCD Use:
Date Owner Notified:
Phone or Letter?
Initials:

ICAP Analyst ______ **Reviewer** ______

Date Analyzed ______ **Date Reveived** ______

May 9, 1989

Accu-Labs Research, Inc.

Mr. David Boyer
NM Oil Conservation Division

RE: 9649-29859-20
Date Samples Rec'd: 4-5-89
P.O. No. 77-521.07-123

REPORT OF ANALYSIS

ALR Designation	9649-29859-20-10	9649-29859-20-11	9649-29859-20-12
Sponsor Designation	8903291420 3-29-89	8903301000 3-30-89	8903301355 3-30-89
GC/MS VOLATILE ORGANICS, µg/L:			
Chloromethane	Not Analyzed	Not Analyzed	<100
Bromomethane			<100
Vinyl chloride			<100
Chloroethane			<100
Methylene chloride			<50
1,1-Dichloroethene			<50
1,1-Dichloroethane			<50
Total 1,2-Dichloroethene			<50
Chloroform			<50
1,2-Dichloroethane			<50
1,1,1-Trichloroethane			<50
Carbon tetrachloride			<50
Bromodichloromethane			<50
1,2-Dichloropropane			<50
c-1,3-Dichloropropene			<50
Trichloroethene			<50
Benzene			380
Dibromochloromethane			<50
1,1,2-Trichloroethane			<50
t-1,3-Dichloropropene			<50
2-Chloroethylvinyl ether			<50
Bromoform			<50
1,1,2,2-Tetrachloroethane			<50
Tetrachloroethene			<50

Mr. David Boyer
NM Oil Conservation Division

RECEIVED

MAY 17 1989

OIL CONSERVATION DIV.
SANTA FE

RE: 9649-29859-20
Date Samples Rec'd: 4-5-89
P.O. No. 77-521.07-123

REPORT OF ANALYSIS

ALR Designation Sponsor Designation	9649-29859-20-10 8903291420 3-29-89	9649-29859-20-11 8903301000 3-30-89	9649-29859-20-12 8903301355 3-30-89
Determination: µg/L			
Toluene			580
Chlorobenzene			<50
Ethyl benzene			<50
Total Dichlorobenzenes			<50
Total Xylenes			390
Determination: mg/L			
Aluminum, total	0.3	--	--
Barium, total	0.09	--	--
Boron, total	0.1	--	--
Cadmium, total	<0.005	--	--
Calcium, total	170	52	--
Chromium, total	0.005	--	--
Cobalt, total	<0.005	--	--
Copper, total	0.041	--	--
Iron, total	0.88	--	--
Magnesium, total	23	48	--
Manganese, total	0.028	--	--
Mercury, total	<0.001*	--	--
Molybdenum, total	0.007	--	--
Nickel, total	0.02	--	--
Potassium, total	50	6.2	--
Silver, total	<0.005	--	--
Sodium, total	1100	2300	--
Strontium, total	0.88	--	--
Zinc, total	0.019	--	--
Total Alkalinity, (as $CaCO_3$ to pH 4.5)	110	1600	--

May 9, 1989

RECEIVED

MAY 17 1989

OIL CONSERVATION DIV.
SANTA FE

Mr. David Boyer
NM Oil Conservation Division

RE: 9649-29859-20
Date Samples Rec'd: 4-5-89
P.O. No. 77-521.07-123

REPORT OF ANALYSIS

ALR Designation	9649-29859-20-10	9649-29859-20-11	9649-29859-20-12
Sponsor Designation	8903291420 3-29-89	8903301000 3-30-89	8903301355 3-30-89
Determination: mg/L			
Carbonate (as CO_3)	<5	31	--
Bicarbonate (as HCO_3)	130	1900	--
pH	8.3	8.4	--
Specific Conductance, µmhos/cm	5900	12,000	--
Arsenic, total	<0.005	--	--
Lead, total	<0.005	--	--
Selenium, total	<0.005	--	--
Total Solids	3100	5800	--
Bromide	<2*	<200*	--
Chloride	1500	2400	--
Sulfate (as SO_4)	500	270	--
Ion Balance	108	101	--

Lab ACCU-LABS
No. 77-521.07-12

ORGANIC ANALYSIS REQUEST FORM

REPORT TO: DAVID BOYER
N.M. OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, NM 87504-2088

Sample No. 8903291345
DATE REC. ______
PRIORITY ______
PHONE(S): 827-5812

COLLECTION CITY: Monument; COUNTY: Lea

COLLECTION DATE/TIME CODE: (Year-Month-Day-Hour-Minute) 8903291345

LOCATION CODE: (Township-Range-Section-Tracts) | | | + | | | + | + | | |(10N06E24342)

SUBMITTER: David Boyer

SAMPLE TYPE: WATER ☒, SOIL ☐, FOOD ☐, OTHER: ______

This form accompanies 2 Septum Vials, ____ Glass Jugs, and/or ____ ______

Samples were preserved as follows:

- ☐ NP: No Preservation; Sample stored at room temperature.
- ☒ P-Ice Sample stored in an ice bath (Not Frozen).
- ☐ P-AA Sample Preserved with Ascorbic Acid to remove chlorine residual.
- ☒ P-HCl Sample Preserved with Hydrochloric Acid (2 drops/40 ml)

ANALYSES REQUESTED: Please check the appropriate box(es) below to indicate the type of analytical screens required. Whenever possible list specific compounds suspected or required.

PURGEABLE SCREENS	EXTRACTABLE SCREENS
☐ (753) Aliphatic Headspace (1-5 Carbons)	☐ (751) Aliphatic Hydrocarbons
☒ (754) Aromatic & Halogenated Purgeables	☐ (755) Base/Neutral Extractables
☐ (765) Mass Spectrometer Purgeables	☐ (758) Herbicides, Chlorophenoxy acid
☐ (766) Trihalomethanes	☐ (759) Herbicides, Triazines
☐ (774) SDWA VOC's I (8 Regulated +)	☐ (760) Organochlorine Pesticides
☐ (775) SDWA VOC's II (EDB & DBCP)	☐ (761) Organophosphate Pesticides
Other Specific Compounds or Classes	☐ (767) Polychlorinated Biphenyls (PCB's)
☐ ______	☐ (764) Polynuclear Aromatic Hydrocarbons
☐ ______	☐ (762) SDWA Pesticides & Herbicides

Remarks: ______

FIELD DATA:

pH= 7.88; Conductivity= 3200 umho/cm at 23 °C; Chlorine Residual= ____ mg/l

Dissolved Oxygen= ____ mg/l; Alkalinity= ____ mg/l; Flow Rate ____ ____/____

Depth to water ____ ft.; Depth of well ____ ft.; Perforation Interval ____-____ ft.; Casing: ______

Sampling Location, Methods and Remarks (i.e. odors, etc.)

Warren Monument Plant - Cooling Tower Sample From ~~[illegible]~~ line in testing house

I certify that the results in this block accurately reflect the results of my field analyses, observations and activities.(signature collector): David H Boyer Method of Shipment to the Lab: Freight Express

CHAIN OF CUSTODY

I certify that this sample was transferred from DB to Dm at (location) ALR on 4/5/89 12:25 and that the statements in this block are correct. Evidentiary Seals: Not Sealed ☐ OR Seals Intact: Yes ☐ No ☐

Signature [signature]

For OCD use: Date owner notified: ______ Phone or Letter? Initials ______

Contract Lab AC[illegible]-LABS
Contract No. 77-521.07-123

GENERAL WATER CHEMISTRY and NITROGEN ANALYSIS

DATE RECEIVED	LAB NO.	Sample No. 8903291345
Collection DATE 89 03 29	SITE INFORMATION ►	Sample location Warren Monument
Collection TIME 1345		Collection site description Cooling tower Sample (from line in tottery house)
Collected by — Person/Agency Boyer / Anderson / OCD		

SEND FINAL REPORT TO ►

ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg, PO Box 2088
Santa Fe, NM 87504-2088

Attn: David Boyer

Phone: 827-5312

Station/well code

Owner

SAMPLING CONDITIONS

☐ Bailed ☐ Pump ☐ Dipped ☒ Tap	Water level	Discharge	Sample type Grab
pH (00400) 7.88	Conductivity (Uncorrected) 3200 µmho	Water Temp. (00010) 23 °C	Conductivity at 25°C (00094) µmho

Field comments

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted 1	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 µmembrane filter	☐ A: 2 ml H_2SO_4/L added
☒ NA: No acid added	☐ Other-*specify*:	☐ A: 5ml conc. HNO_3 added	☐ A: 4ml fuming HNO_3 added

ANALYTICAL RESULTS from SAMPLES

NA		Units	Date Analyzed
☒ Conductivity (Corrected) 25°C (00095)		µmho	
☐ Total non-filterable residue (suspended) (00530)		mg/l	
☒ Other: Lab pH			
☐ Other:			
☐ Other:			

A-H_2SO_4		Units	Date Analyzed
☐ Nitrate-N +, Nitrate-N total (00630)		mg/l	
☐ Ammonia-N total (00610)		mg/l	
☐ Total Kjeldahl-N ( )		mg/l	
☐ Chemical oxygen demand (00340)		mg/l	
☐ Total organic carbon ( )		mg/l	
☐ Other:			
☐ Other:			

From NF, NA Sample:

		Units	Date Analyzed
☒ Calcium		mg/l	
☒ Potassium		mg/l	
☒ Magnesium		mg/l	
☒ Sodium		mg/l	
☒ Bicarbonate		mg/l	
☒ Chloride		mg/l	
☒ Sulfate		mg/l	
☒ Total Solids		mg/l	
☒ CO_3			
☒ Br			
☒ Cation/Anion Balance			

Analyst	Date Reported	Reviewed by

Laboratory remarks

FOR OCD USE -- Date Owner Notified ________ Phone or Letter? ________ Initals ________

Contract Lab ACCU-LABS
Contract No. 77-521.07-123

HEAVY METAL ANALYSIS FORM

Date Received	/ /	Lab No.		Sample No. 8903291345

COLLECTION DATE & TIME: yy 89 mm 03 dd 29 hh 13 mm 45

COLLECTION SITE DESCRIPTION Warren Monument Cooling Tower - Sample from line in testing house

COLLECTED BY: Boyer/Anderson OCD

OWNER:

TO:

ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg., PO Box 2088
SANTA FE, NM 87504-2088

ATTN: D. Boyer
TELEPHONE: 827-5812

SITE LOCATION:
County: Lea

Township, Range, Section, Tract: (10N06E24342)

STATION/ WELL CODE:

LATITUDE, LONGITUDE:

SAMPLING CONDITIONS:

☐ Bailed ☐ Pump ☐ Dipped ☒ Tap	Water Level:	Discharge:	Sample Type: Grab
pH(00400) 7.88	Conductivity (Uncorr.) 3200 µmho	Water Temp. (00010) 23 °C	Conductivity at 25 °C (00094) µmho

FIELD COMMENTS:

SAMPLE FIELD TREATMENT Check proper boxes:		LAB ANALYSIS REQUESTED:
☒ WPN: Water Preserved w/HNO_3 Non-Filtered	☐ WPF: Water Preserved w/HNO_3 Filtered	☐ ICAP Scan Mark box next to metal if AA is required.

ANALYTICAL RESULTS (MG/L)

ELEMENT	ICAP VALUE	AA VALUE	ELEMENT	ICAP VALUE	AA VALUE
Aluminum	☒	☐	Silicon	☐	☐
Barium	☒	☐	Silver	☒	☐
Beryllium	☐	☐	Strontium	☒	☐
Boron	☒	☐	Tin	☐	☐
Cadmium	☒	☐	Vanadium	☐	☐
Calcium	☐	☐	Zinc	☒	☐
Chromium	☐	☒	Arsenic		☒
Cobalt	☒	☐	Selenium		☒
Copper	☒	☐	Mercury		☒
Iron	☒	☐		☐	☐
Lead	☐	☒		☐	☐
Magnesium	☐	☐		☐	☐
Manganese	☒	☐		☐	☐
Molybdenum	☒	☐		☐	☐
Nickel	☒	☐		☐	☐

LAB COMMENTS:

For OCD Use:
Date Owner Notified:
Phone or Letter?
Initials:

ICAP Analyst ______ **Reviewer** ______

Date Analyzed ______ **Date Reveived** ______

Accu-Labs Research, Inc.

Mr. David Boyer
NM Oil Conservation Division

RECEIVED

MAY 17 1989

OIL CONSERVATION DIV.
SANTA FE

RE: 9649-29859-20
Date Samples Rec'd: 4-5-89
P.O. No. 77-521.07-123

REPORT OF ANALYSIS

ALR Designation	9649-29859-20-7	9649-29859-20-8	9649-29859-20-9
Sponsor Designation	8903291645 3-29-89	8903291345 3-29-89	8903291210 3-29-89
GC/MS VOLATILE ORGANICS, µg/L:			
Chloromethane	<10	<10	<100
Bromomethane	<10	<10	<100
Vinyl chloride	<10	<10	<100
Chloroethane	<10	<10	<100
Methylene chloride	<5	<5	<50
1,1-Dichloroethene	<5	<5	<50
1,1-Dichloroethane	<5	<5	<50
Total 1,2-Dichloroethene	<5	<5	<50
Chloroform	<5	<5	<50
1,2-Dichloroethane	<5	<5	<50
1,1,1-Trichloroethane	<5	<5	<50
Carbon tetrachloride	<5	<5	<50
Bromodichloromethane	<5	<5	<50
1,2-Dichloropropane	<5	<5	<50
c-1,3-Dichloropropene	<5	<5	<50
Trichloroethene	<5	<5	<50
Benzene	13	<5	3400
Dibromochloromethane	<5	<5	<50
1,1,2-Trichloroethane	<5	<5	<50
t-1,3-Dichloropropene	<5	<5	<50
2-Chloroethylvinyl ether	<5	<5	<50
Bromoform	<5	<5	<50
1,1,2,2-Tetrachloroethane	<5	<5	<50
Tetrachloroethene	<5	<5	<50

Accu-Labs Research, Inc.

May 9, 1989

Mr. David Boyer
NM Oil Conservation Division

RECEIVED

MAY 17 1989

OIL CONSERVATION DIV.
SANTA FE

RE: 9649-29859-20
Date Samples Rec'd: 4-5-89
P.O. No. 77-521.07-123

REPORT OF ANALYSIS

ALR Designation Sponsor Designation	9649-29859-20-7 8903291645 3-29-89	9649-29859-20-8 8903291345 3-29-89	9649-29859-20-9 8903291210 3-29-89
Determination: µg/L			
Toluene	<5	<5	3500
Chlorobenzene	<5	<5	<50
Ethyl benzene	<5	<5	670
Total Dichlorobenzenes	<5	<5	<50
Total Xylenes	<5	<5	1400
Determination: mg/L			
Aluminum, total	<0.1	0.1	<1*
Barium, total	0.10	0.27	0.9
Boron, total	0.2	0.7	9.3
Cadmium, total	<0.005	<0.005	<0.05*
Calcium, total	160	570	3500
Chromium, total	<0.005	0.008	<0.05*
Cobalt, total	<0.005	<0.005	<0.05*
Copper, total	0.048	0.070	<0.05*
Iron, total	1.7	1.6	2.5
Magnesium, total	24	72	980
Manganese, total	0.069	0.027	1.1
Mercury, total	0.0007	<0.001*	0.002
Molybdenum, total	<0.005	0.011	<0.05*
Nickel, total	<0.01	0.01	<0.1*
Potassium, total	4.3	26	570
Silver, total	<0.005	<0.005	<0.005
Sodium, total	120	280	19,000
Strontium, total	1.0	4.6	65
Zinc, total	0.022	0.024	<0.05
Total Alkalinity, (as $CaCO_3$ to pH 4.5)	280	110	1600

May 9, 1989

Mr. David Boyer
NM Oil Conservation Division

RECEIVED

MAY 17 1989

OIL CONSERVATION DIV.
SANTA FE

RE: 9649-29859-20
Date Samples Rec'd: 4-5-89
P.O. No. 77-521.07-123

REPORT OF ANALYSIS

ALR Designation	9649-29859-20-7	9649-29859-20-8	9649-29859-20-9
Sponsor Designation	8903291645 3-29-89	8903291345 3-29-89	8903291210 3-29-89
Determination: mg/L			
Carbonate (as CO_3)	<5	<5	<5
Bicarbonate (as HCO_3)	330	140	1900
pH	7.5	7.2	7.3
Specific Conductance, µmhos/cm	1600	5400	120,000
Arsenic, total	0.008	0.015	0.72
Lead, total	<0.005	<0.005	<0.005
Selenium, total	<0.005	0.006	<0.005
Total Solids	930	3300	65,000
Bromide	--	11	<200*
Fluoride	1.4	--	--
Chloride	260	630	37,000
Sulfate (as SO_4)	110	1400	1300
Ion Balance	101	95	99

Lab ACCU-LABS
No. 77-52107-123

ORGANIC ANALYSIS REQUEST FORM

REPORT TO: DAVID BOYER
N.M. OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, NM 87504-2088

Sample No. 8903291400
DATE REC.
PRIORITY
PHONE(S): 827-5812

COLLECTION CITY: Monument ; COUNTY: Lea

COLLECTION DATE/TIME CODE: (Year-Month-Day-Hour-Minute) 8903291400

LOCATION CODE: (Township-Range-Section-Tracts) | | | + | | + | + | | |(10N06E24342)

SUBMITTER: David Boyer

SAMPLE TYPE: WATER ☒, SOIL ☐, FOOD ☐, OTHER:

This form accompanies 2 Septum Vials, ____ Glass Jugs, and/or ____

Samples were preserved as follows:

- ☐ NP: No Preservation; Sample stored at room temperature.
- ☒ P-Ice Sample stored in an ice bath (Not Frozen).
- ☐ P-AA Sample Preserved with Ascorbic Acid to remove chlorine residual.
- ☒ P-HCl Sample Preserved with Hydrochloric Acid (2 drops/40 ml)

ANALYSES REQUESTED: Please check the appropriate box(es) below to indicate the type of analytical screens required. Whenever possible list specific compounds suspected or required.

PURGEABLE SCREENS

- ☐ (753) Aliphatic Headspace (1-5 Carbons)
- ☒ (754) Aromatic & Halogenated Purgeables
- ☐ (765) Mass Spectrometer Purgeables
- ☐ (766) Trihalomethanes
- ☐ (774) SDWA VOC's I (8 Regulated +)
- ☐ (775) SDWA VOC's II (EDB & DBCP)

Other Specific Compounds or Classes

- ☐ ____
- ☐ ____

EXTRACTABLE SCREENS

- ☐ (751) Aliphatic Hydrocarbons
- ☐ (755) Base/Neutral Extractables
- ☐ (758) Herbicides, Chlorophenoxy acid
- ☐ (759) Herbicides, Triazines
- ☐ (760) Organochlorine Pesticides
- ☐ (761) Organophosphate Pesticides
- ☐ (767) Polychlorinated Biphenyls (PCB's)
- ☐ (764) Polynuclear Aromatic Hydrocarbons
- ☐ (762) SDWA Pesticides & Herbicides

Remarks:

FIELD DATA:

pH= 9.5 ; Conductivity= 18,000 umho/cm at 29 °C; Chlorine Residual= ____ mg/l

Dissolved Oxygen= ____ mg/l; Alkalinity= ____ mg/l; Flow Rate ____ ____/____

Depth to water ____ ft.; Depth of well ____ ft.; Perforation Interval ____-____ ft.; Casing: ____

Sampling Location, Methods and Remarks (i.e. odors, etc.)

Warren Monument - Final Effluent To Rice Injection Line (oil field wastewater disposal)

I certify that the results in this block accurately reflect the results of my field analyses, observations and activities.(signature collector): David G Boyer Method of Shipment to the Lab: Freight Express

CHAIN OF CUSTODY

I certify that this sample was transferred from DB to [illegible] at (location) ALR on 4/5/89 12:25 and that the statements in this block are correct. Evidentiary Seals: Not Sealed ☐ OR Seals Intact: Yes ☒ No ☐

Signature: [signature]

For OCD use: Date owner notified: ____ Phone or Letter? Initials ____

Contract Lab ACC[illegible]-LABS
Contract No. 77-521.07-123

GENERAL WATER CHEMISTRY and NITROGEN ANALYSIS

DATE RECEIVED		LAB NO.	Sample No. 8803291400
Collection DATE 89/03/29		SITE INFORMATION ►	Sample location Warren Monument
Collection TIME 1400			Collection site description Final Effluent To Rice Injection Line
Collected by — Person/Agency Boyer/Anderson /OCD			

SEND FINAL REPORT TO ►

ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg, PO Box 2088
Santa Fe, NM 87504-2088

Attn: David Boyer

Phone: 827-5812

Station/well code

Owner

SAMPLING CONDITIONS

☐ Bailed ☐ Pump ☐ Dipped ☒ Tap	Water level	Discharge	Sample type Grab
pH (00400) 9.5	Conductivity (Uncorrected) 18,000 µmho	Water Temp. (00010) 29 °C	Conductivity at 25°C (00094) µmho

Field comments: oil field wastewater sample from injection line tap

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted 1	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 µmembrane filter	☐ A: 2 ml H_2SO_4/L added
☒ NA: No acid added	☐ Other-*specify*:	☐ A: 5ml conc. HNO_3 added	☐ A: 4ml fuming HNO_3 added

ANALYTICAL RESULTS from SAMPLES

NA		Units	Date analyzed
☒ Conductivity (Corrected) 25°C (00095)		µmho	
☐ Total non-filterable residue (suspended) (00530)		mg/l	
☒ Other: Lab pH			
☐ Other:			
☐ Other:			
A-H_2SO_4			
☐ Nitrate-N +, Nitrate-N total (00630)		mg/l	
☐ Ammonia-N total (00610)		mg/l	
☐ Total Kjeldahl-N ( )		mg/l	
☐ Chemical oxygen demand (00340)		mg/l	
☐ Total organic carbon ( )		mg/l	
☐ Other:			
☐ Other:			

From NF, NA Sample:			Date Analyzed
☒ Calcium		mg/l	
☒ Potassium		mg/l	
☒ Magnesium		mg/l	
☒ Sodium		mg/l	
☒ Bicarbonate		mg/l	
☒ Chloride		mg/l	
☒ Sulfate		mg/l	
☒ Total Solids		mg/l	
☒ CO_3			
☒ Br			
☒ Cation/Anion Balance			

Analyst	Date Reported	Reviewed by

Laboratory remarks

FOR OCD USE -- Date Owner Notified ________ Phone or Letter? ________ Initals ________

Contract Lab ACCU-LABS

Contract No. 77-[illegible]1.07-123

HEAVY METAL ANALYSIS FORM

Date Received	/ /	Lab No.		Sample No. 8903291400

COLLECTION DATE & TIME:

yy	mm	dd	hh	mm
89	03	29	14	00

COLLECTION SITE DESCRIPTION Warren Monument Final Effluent to RICE SWD

COLLECTED BY: Boyer / Anderson OCD

TO:

OWNER:

ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg., PO Box 2088
SANTA FE, NM 87504-2088

ATTN: D. Boyer
TELEPHONE: 827-5812

SITE LOCATION:
County: Lea

Township, Range, Section, Tract: (10N06E24342)

STATION/ WELL CODE:

LATITUDE, LONGITUDE:

SAMPLING CONDITIONS:

[ ] Bailed [ ] Pump [ ] Dipped [ ] Tap	Water Level:	Discharge:	Sample Type:
pH(00400)	**Conductivity(Uncorr.)**	**Water Temp.(00010)**	**Conductivity at 25°C (00094)**
9.5	18,000 µmho	29 °C	µmho

FIELD COMMENTS: (oil field wastewater)

SAMPLE FIELD TREATMENT Check proper boxes:		**LAB ANALYSIS REQUESTED:**
[x] WPN: Water Preserved w/HNO_3 Non-Filtered	[ ] WPF: Water Preserved w/HNO_3 Filtered	[ ] ICAP Scan Mark box next to metal if AA is required.

ANALYTICAL RESULTS (MG/L)

ELEMENT	ICAP VALUE	AA VALUE	ELEMENT	ICAP VALUE	AA VALUE
Aluminum	[x]	[ ]	Silicon	[ ]	[ ]
Barium	[x]	[ ]	Silver	[x]	[ ]
Beryllium	[ ]	[ ]	Strontium	[x]	[ ]
Boron	[x]	[ ]	Tin	[ ]	[ ]
Cadmium	[x]	[ ]	Vanadium	[ ]	[ ]
Calcium	[ ]	[ ]	Zinc	[x]	[ ]
Chromium	[ ]	[x]	Arsenic		[x]
Cobalt	[x]	[ ]	Selenium		[x]
Copper	[x]	[ ]	Mercury		[x]
Iron	[x]	[ ]		[ ]	[ ]
Lead	[ ]	[x]		[ ]	[ ]
Magnesium	[ ]	[ ]		[ ]	[ ]
Manganese	[x]	[ ]		[ ]	[ ]
Molybdenum	[x]	[ ]		[ ]	[ ]
Nickel	[x]	[ ]		[ ]	[ ]

LAB COMMENTS:

For OCD Use:
Date Owner Notified:
Phone or Letter?
Initials:

ICAP Analyst ________ **Reviewer** ________

Date Analyzed ________ **Date Reveived** ________

Accu-Labs Research, Inc.
11485 W. 48th Avenue Wheat Ridge, Colorado 80033 (303) 423-2766

May 9, 1989

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MAY 17 1989
OIL CONSERVATION DIV.
SANTA FE

Mr. David Boyer
NM Oil Conservation Division
State Land Office Bldg.
P.O. Box 2088
Santa Fe, NM 87504-2088

RE: 9649-29859-20
Date Samples Rec'd: 4-5-89
P.O. No. 77-521.07-123

REPORT OF ANALYSIS

ALR Designation	9649-29859-20-1	9649-29859-20-2	9649-29859-20-3
Sponsor Designation	8903301105	8903291000	8903291400
	3-30-89	3-29-89	3-29-89
GC/MS VOLATILE ORGANICS, μg/L:			
Chloromethane	<10	<10	<100
Bromomethane	<10	<10	<100
Vinyl chloride	<10	<10	<100
Chloroethane	<10	<10	<100
Methylene chloride	<5	<5	<50
1,1-Dichloroethene	<5	<5	<50
1,1-Dichloroethane	<5	<5	<50
Total 1,2-Dichloroethene	<5	<5	<50
Chloroform	<5	<5	<50
1,2-Dichloroethane	<5	<5	<50
1,1,1-Trichloroethane	<5	<5	<50
Carbon tetrachloride	<5	<5	<50
Bromodichloromethane	<5	<5	<50
1,2-Dichloropropane	<5	<5	<50
c-1,3-Dichloropropene	<5	<5	<50
Trichloroethene	<5	<5	<50
Benzene	<5	<5	2200
Dibromochloromethane	<5	<5	<50
1,1,2-Trichloroethane	<5	<5	<50
t-1,3-Dichloropropene	<5	<5	<50
2-Chloroethylvinyl ether	<5	<5	<50
Bromoform	<5	<5	<50
1,1,2,2-Tetrachloroethane	<5	<5	<50
Tetrachloroethene	<5	<5	<50

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REPORT OF ANALYSIS

ALR Designation Sponsor Designation	9649-29859-20-1 8903301105 3-30-89	9649-29859-20-2 8903291000 3-29-89	9649-29859-20-3 8903291400 3-29-89
Determination: µg/L			
Toluene	<5	<5	2000
Chlorobenzene	<5	<5	<50
Ethyl benzene	<5	<5	500
Total Dichlorobenzenes	<5	<5	<50
Total Xylenes	<5	<5	1300
Determination: mg/L			
Aluminum, total	0.9	<1*	0.3
Barium, total	0.12	2.9	0.31
Boron, total	0.7	110	2.7
Cadmium, total	<0.005	<0.05*	<0.005
Calcium, total	2600	15,000	900
Chromium, total	<0.005	<0.05*	0.043
Cobalt, total	<0.005	<0.05*	<0.005
Copper, total	0.026	<0.05*	0.076
Iron, total	0.96	5.1	44
Magnesium, total	610	8900	230
Manganese, total	0.16	19	0.54
Mercury, total	0.002	<0.002*	0.006
Molybdenum, total	<0.005	<0.05*	0.007
Nickel, total	<0.01	<0.1*	0.05
Potassium, total	35	3900	110
Silver, total	<0.005	<0.005	<0.005
Sodium, total	6500	81,000	4300
Strontium, total	30	350	45
Zinc, total	0.026	0.06	0.16
Total Alkalinity, (as $CaCO_3$ to pH 4.5)	290	220	350

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ALR Designation Sponsor Designation	9649-29859-20-1 8903301105 3-30-89	9649-29859-20-2 8903291000 3-29-89	9649-29859-20-3 8903291400 3-29-89
Determination: mg/L			
Carbonate (as CO_3)	<5	<5	37
Bicarbonate (as HCO_3)	350	270	350
pH	7.0	6.9	8.6
Specific Conductance, µmhos/cm	47,000	600,000	28,000
Arsenic, total	0.005	0.60	0.032
Lead, total	0.023	0.084	0.017
Selenium, total	<0.005	<0.25*	0.017
Total Solids	29,000	350,000	16,000
Bromide	16	830	<40*
Chloride	15,000	190,000	8100
Sulfate (as SO_4)	1600	2300	890
Ion Balance	100	94	99