GW - 54

GENERAL CORRESPONDENCE

YEAR(S):

1993 - 1989

FLARE PIT CLOSURE PROJECT WINGATE FRACTIONATING PLANT MCKINLEY COUNTY, NEW MEXICO

RECEIVED

NOV 01 1993

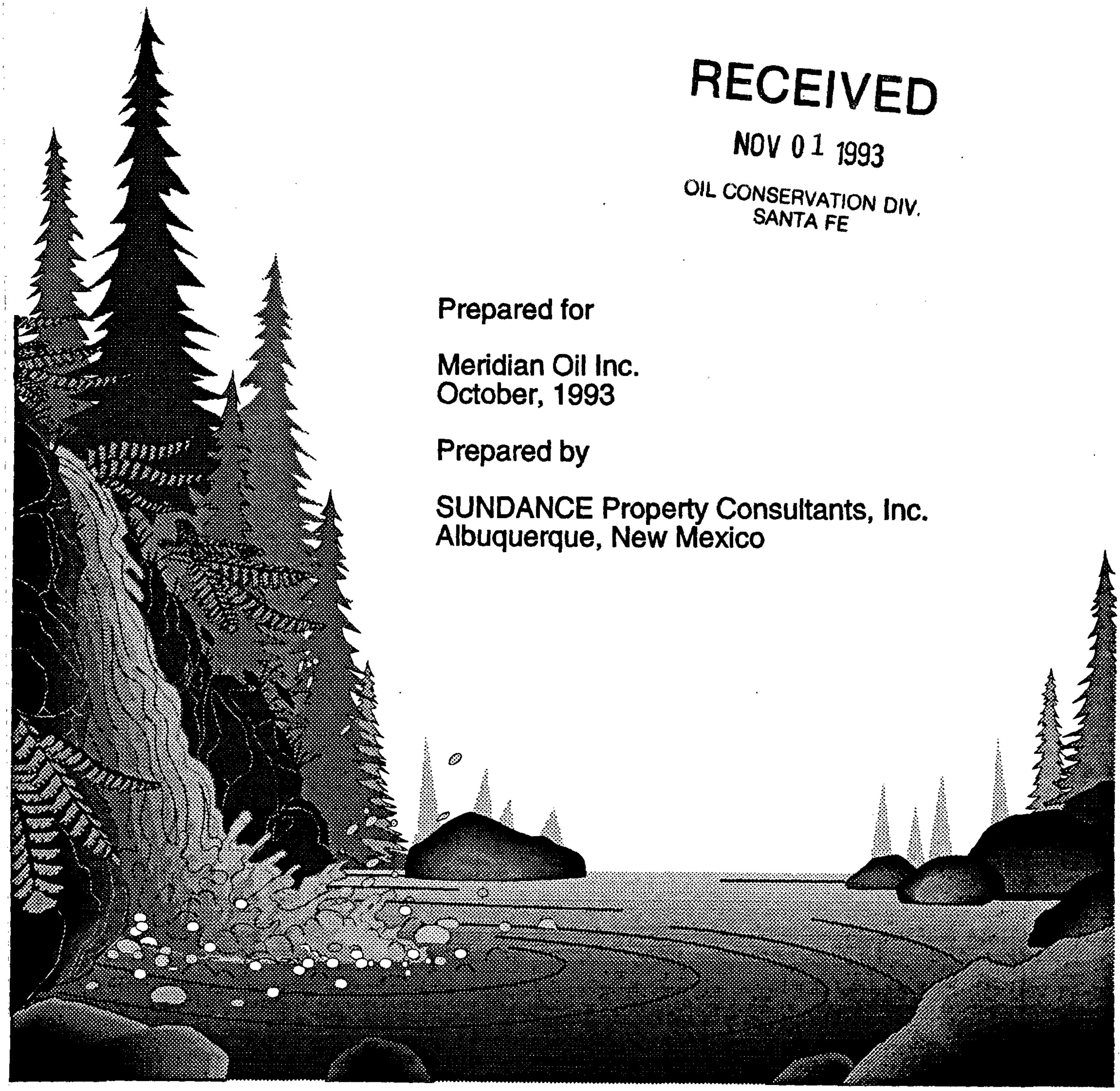
OIL CONSERVATION DIV.
SANTA FE

Prepared for

Meridian Oil Inc.
October, 1993

Prepared by

SUNDANCE Property Consultants, Inc.
Albuquerque, New Mexico



Flare Pit Closure Project
Wingate Fractionating Plant

I. INTRODUCTION

This report documents the activities and current status of the Wingate Flare Pit Closure Project. It includes a description of the site assessment, remediation efforts, and recommendations for future actions.

The flare pit is a circular structure (80 ft. diameter x 7 ft. deep) located adjacent to the candle flare, approximately 100 meters NE of the main facility. The site is surrounded by a chain link fence and access is provided through a locked gate.

The pit was recently taken out of service, after many years of use as an emergency/upset flare facility. Meridian Oil, Inc. (MOI) has contracted with **SUNDANCE** Property Consultants, Inc. (SPCI) to evaluate and implement site closure activities, in accordance with NMOCD guidelines.

II. SITE ASSESSMENT

A site assessment was initiated on September 14, 1993, to determine the extent to which soils and ground water may have been impacted by previous site operations.

A. General Site Characteristics

Depth to Ground Water - based on a review of previously installed ground water monitoring wells at the Wingate facility, depth to ground water was estimated at approximately 8 - 10 feet. This estimate was later confirmed during excavation at the site.

Wellhead Protection Area - the horizontal distance to the nearest domestic water source was determined to be approximately 900 ft. to the facility's domestic water well (east and upgradient of the flare pit).

Surface Water Bodies - the nearest surface water body, a seasonal channel of the Rio Puerco River, was determined to be approximately 1200 ft. north and downgradient of the flare pit. No other surface water bodies are present in close proximity to the site.

B. Soil and Water Remediation Levels

The general site characteristics discussed above, were compared with NMOCD guidelines, resulting in the following ranking scores:

Ranking Criteria	Ranking Score
Depth to Ground Water	20
Wellhead Protection	20
Distance to Surface Water	0
Total Ranking Score	40

A total ranking score of 40 results in the following recommended remediation levels for soil:

Benzene	**10 mg/l**
BTEX	**50 mg/l**
TPH	**100 mg/l**

New Mexico Water Quality Control Commission (WQCC) ground water standards provide the required remediation levels for ground water contaminants. Relevant hydrocarbon component limitations are:

Benzene	**0.01 mg/l**
Toluene	**0.75 mg/l**
Ethylbenzene	**0.75 mg/l**
Total xylenes	**0.62 mg/l**

C. Soil/Waste Characteristics

Soil sampling procedures followed NMOCD guidelines. Field testing was performed utilizing a PID organic vapor meter for headspace analysis as a substitute for Benzene and BTEX (100 ppm criteria). In addition, a PETRO RISc™ Soil Test kit was used to screen TPH levels in the field. This testing protocol conforms to EPA SW-846 method 4030 for petroleum hydrocarbons.

Initial sampling indicated the flare pit soil exceeded criteria contamination levels for both Benzene and BTEX vapor and TPH, particularly at sample points in the southern half of the pit (located closest to the flare tip). PID values showed a high peak of 139.5 ppm and TPH values ranged between 100 ppm - 2000 ppm. Contamination exceeding criteria levels was found to a depth of a least 3 feet at some sampling locations.

Based on these results, remediation of the site was determined to be necessary.

III. REMEDIATION ACTIVITIES

On September 27, 1993, MOI submitted a remediation/closure plan to NMOCD. Approval of this plan was provided by NMOCD letter of October 1, 1993.

A. Soils

The remediation effort required the excavation of approximately 285 yds^3 of contaminated soil from the pit area. Six to eight feet of soil was removed from the pit bottom and lower sides; until soil samples met the remediation criteria. A confirmation sample for TPH was sent to an independent laboratory and confirmed a TPH value of 16.4 mg/kg (ppm) after excavation (see Attachment A).

The 285 yds^3 contaminated soil was placed in a landfarm in an area immediately adjacent to the flare pit (within the fenced area and behind the locked gate). The final landfarm configuration was 140 ft. x 110 ft. x 6 inches, surrounded by a containment berm. Initial (October 24, 1993) TPH measurements in the landfarm were 1300 ppm, 576 ppm, and 336 ppm resulting in an average value of 737 ppm.

Further remediation of the soil will be accomplished through volatilization and bioremediation. The landfarm is scheduled to be tilled and watered on a bi-weekly basis until the remediation criteria levels are achieved.

B. Ground Water

In the course of the excavation activities at the flare pit, shallow ground water was encountered within the pit (at 8-10 ft.). At the request of Mr. Deny Foust of NMOCD, samples were taken and analyzed for BTEX with the following results (see Attachment B):

	Benzene	Toluene	Ethylbenzen	Xylenes
9/23/93	0.370 mg/l	0.078 mg/l	0.008 mg/l	0.085 mg/l
10/7/93	0.031 mg/l	ND	ND	ND

Since both BTEX samples show an exceedance of the WQCC standard for Benzene, the flare pit remains open at this time, pending satisfactory remediation of the ground water.

It should be noted that the ground water contamination at this site appears to be very localized i.e. to the immediate vicinity of the flare pit. This is based on the fact that a ground water monitoring well (B-8/WMW-3) is located approximately 250 feet downgradient of the pit and has not shown any contamination to date.

IV. RECOMMENDATIONS

A. Soil

Based on the confirmation TPH measurement, it appears that sufficient material has been excavated from the flare pit such that minimal contaminated material remains. The remaining soil is well below the remediation level of 100 ppm TPH.

The landfarm should continue to be tilled and watered on a bi-weekly basis until remediation levels are obtained. It is proposed that TPH monitoring samples be obtained on a monthly basis.

B. Ground Water

Since the ground water contamination at the site appears to be very localized, additional monitoring wells are not recommended. Continued monitoring of the existing downgradient well should be sufficient.

Regarding remediation of the water within the pit, it is recommended that the natural processes of volatilization/dissipation be allowed to operate, at least for up to 9 months. It is suggested that quarterly samples be obtained to monitor BTEX levels. If remediation criteria levels are met during any quarter, closure of the pit should be implemented immediately.

In the event remediation levels for BTEX are not achieved within 9 months, a more active technique (i.e. air stripping) may need to be developed for the site.

Attachment A

Flare Pit Soil Data

ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109
3332 Wedgewood, Suite E-5 • El Paso, Texas 79925

Received: 09/24/93

REPORT
Results by Sample

Work Order # 93-09-159

SAMPLE ID **FLARE PIT WINGATE** FRACTION **01A** TEST CODE **STRPH** NAME **TRPH/EPA 418.1**
Date & Time Collected **09/23/93 08:30:00** Category **SOIL**

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Total Petroleum HCs	16.4	5.0	1.0	09/24/93

Notes and Definitions for this Report:

EXTRACTED 09/23/93
ANALYST JCB
UNITS mg/Kg
BATCH_ID STRPH-114
PRCNT_MOIST ___

Attachment B

Flare Pit Ground Water Data

ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109

3332 Wedgewood, Suite E-5 • El Paso, Texas 79925

Received: 09/29/93

REPORT

Results by Sample

Work Order # 93-09-190

SAMPLE ID **WINGATE FLARE PIT** FRACTION **01A** TEST CODE **WBTEX** NAME **BTEX/EPA 602**

Date & Time Collected **09/28/93 15:15:00** Category **WATER**

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Benzene	370	1.0	10	09/29/93
Toluene	78	1.0	10	09/29/93
Ethylbenzene	8.3	1.0	1.0	09/29/93
P-&m-xylene	72	1.0	10	09/29/93
O-xylene	13	1.0	1.0	09/29/93

Notes and Definitions for this Report:

EXTRACTED ____

ANALYST NO

FILE ID 017

UNITS ug/L

BATCH_ID WGCVOA-085

COMMENTS N/A

Received: 10/07/93

REPORT
Results by Sample

Work Order # 93-10-058

SAMPLE ID FLARE PIT

FRACTION 02A TEST CODE WBTEX NAME BTEX/EPA 602
Date & Time Collected 10/07/93 08:45:00 Category WATER

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Benzene	31	1.0	1.0	10/11/93
Toluene	ND	1.0	1.0	10/11/93
Ethylbenzene	ND	1.0	1.0	10/11/93
P-&m-xylene	ND	1.0	1.0	10/11/93
O-xylene	ND	1.0	1.0	10/11/93

Notes and Definitions for this Report:

EXTRACTED ________
ANALYST NQ
FILE ID 009
UNITS ug/L
BATCH_ID NGCVOA-092
COMMENTS N/A

FIRE TRAINING PIT CLOSURE PROJECT WINGATE FRACTIONATING PLANT MCKINLEY COUNTY, NEW MEXICO

RECEIVED

NOV 22 1993

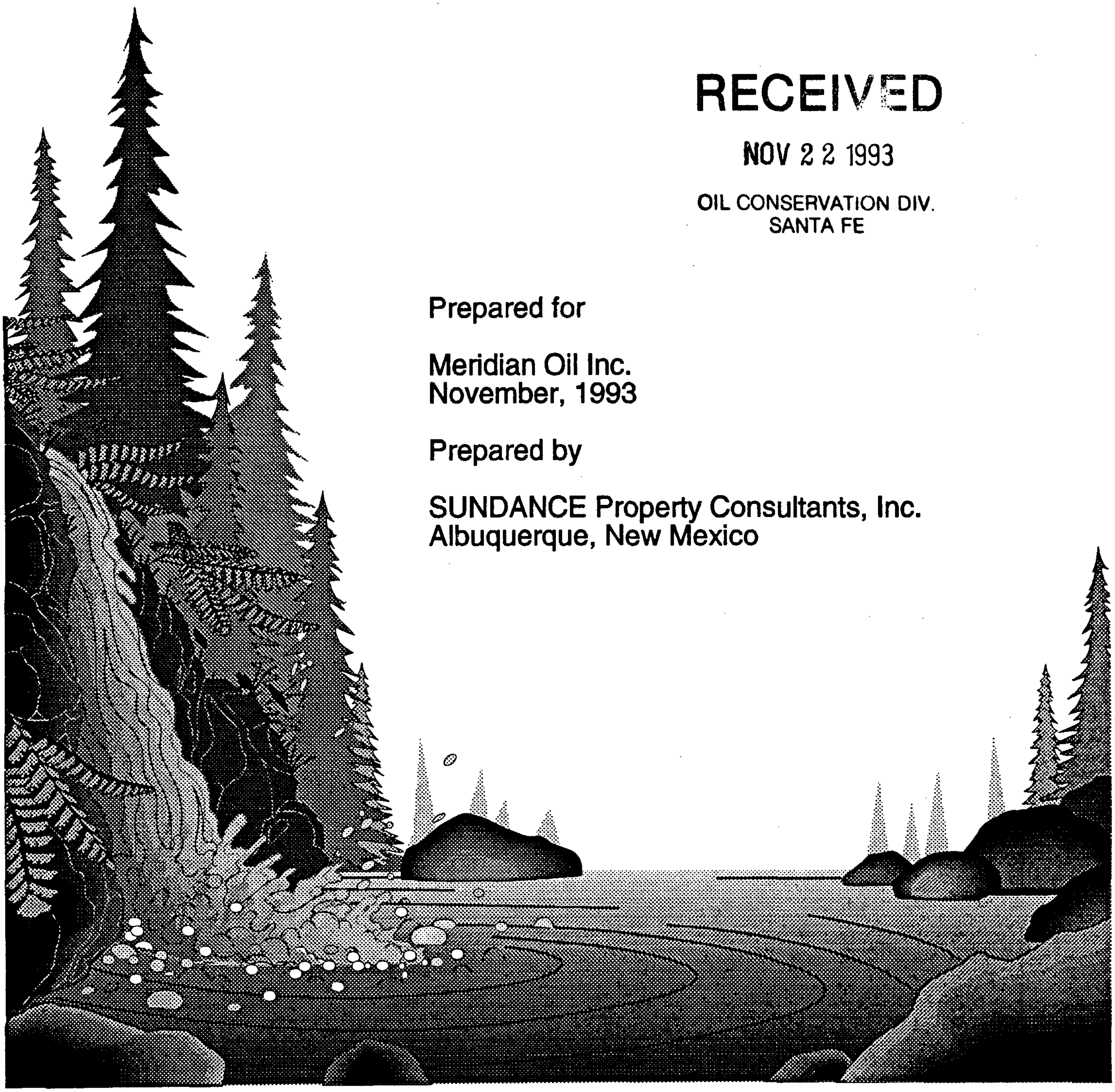
OIL CONSERVATION DIV.
SANTA FE

Prepared for

Meridian Oil Inc.
November, 1993

Prepared by

SUNDANCE Property Consultants, Inc.
Albuquerque, New Mexico



FIRE TRAINING PIT CLOSURE PROJECT
WINGATE FRACTIONING PLANT
MCKINLEY COUNTY, NEW MEXICO

Prepared for

Meridian Oil, Inc.
November, 1993

Prepared by

SUNDANCE Property Consultants, Inc.
Albuquerque, New Mexico

Fire Training Pit Closure Project
Wingate Fractionating Plant

I. INTRODUCTION

This report documents the activities and current status of the Wingate Fire Training Pit Closure Project. It includes a description of the site assessment, remediation efforts, and recommendations for future actions.

The fire training pit is a rectangular structure (approximately 35 ft. x 32 ft. x 2 ft.) located approximately 500 meters East of the main facility.

The pit was recently taken out of service, after many years of use as a fire training facility. Meridian Oil, Inc. (MOI) has contracted with SUNDANCE Property Consultants, Inc. (SPCI) to evaluate and implement site closure activities, in accordance with NMOCD guidelines.

II. SITE ASSESSMENT

A site assessment was initiated on September 14, 1993, to determine the extent to which soils and ground water may have been impacted by previous site operations.

A. General Site Characteristics

Depth to Ground Water - based on a review of previously installed ground water monitoring wells at the Wingate facility, depth to ground water was estimated at approximately 8 - 10 feet.

Wellhead Protection Area - the horizontal distance to the nearest domestic water source was determined to be approximately 500 ft. to the facility's domestic water well (north and west of the fire training pit).

Surface Water Bodies - the nearest surface water body, a seasonal channel of the Rio Puerco River, was determined to be approximately 1500 ft. north and downgradient of the fire training pit. No other surface water bodies are present in close proximity to the site.

B. Soil and Water Remediation Levels

The general site characteristics discussed above, were compared with NMOCD guidelines, resulting in the following ranking scores:

Ranking Criteria	Ranking Score
Depth to Ground Water	20
Wellhead Protection	20
Distance to Surface Water	0
Total Ranking Score	40

A total ranking score of 40 results in the following recommended remediation levels for soil:

Benzene	**10 mg/kg**
BTEX	**50 mg/kg**
TPH	**100 mg/kg**

New Mexico Water Quality Control Commission (WQCC) ground water standards provide the required remediation levels for ground water contaminants. Relevant hydrocarbon component limitations are:

Benzene	**0.01 mg/l**
Toluene	**0.75 mg/l**
Ethylbenzene	**0.75 mg/l**
Total xylenes	**0.62 mg/l**

C. Soil/Waste Characteristics

Soil sampling procedures followed NMOCD guidelines. Field testing was performed utilizing a PID organic vapor meter for headspace analysis as a substitute for Benzene and BTEX (100 ppm criteria). In addition, a PETRO RISc™ Soil Test kit was used to screen TPH levels in the field. This testing protocol conforms to EPA SW-846 method 4030 for petroleum hydrocarbons.

Initial sampling indicated the flare pit soil exceeded criteria contamination levels for both Benzene and BTEX vapor and TPH, in a small portion in the northern half of the pit. PID values showed a high peak of 101.6 ppm and TPH values ranged between 100 ppm - 2000 ppm. Contamination exceeding criteria levels was found to a depth of a least 2.5 feet at some sampling locations.

Since the fire training facility is not directly associated with gas production and processing, waste generated at the site is not exempt from RCRA regulations. As a result, a composite sample of the contaminated soil was obtained on September 29, 1993, and tested for hazardous waste characteristics. The sample results did not exceed any of the RCRA characteristic criteria, and the waste material was confirmed to be non-hazardous (see Attachment A).

Based on these results, remediation of the site was determined to be necessary, utilizing NMOCD guidelines for Unlined Surface Impoundments.

III. REMEDIATION ACTIVITIES

On September 27, 1993, MOI submitted a remediation/closure plan to NMOCD. Approval of this plan was provided by NMOCD letter of October 1, 1993.

A. Soils

The remediation effort required the excavation of approximately 45 yds^3 of contaminated soil from the pit area. Approximately four (4) feet of soil was removed from the pit bottom and lower sides; until soil samples met the remediation criteria. A confirmation sample for TPH was sent to an independent laboratory and confirmed a TPH value of 72.4 mg/kg (ppm) after excavation (see Attachment B).

The 45 yds^3 of contaminated soil was placed in a landfarm in an area immediately adjacent to the fire training pit. The final landfarm configuration was 57 ft. x 37 ft. x 6 inches, surrounded by a containment berm. Initial (October 7, 1993) TPH measurement in the landfarm was 15,500 ppm.

Further remediation of the soil will be accomplished through volatilization and bioremediation. The landfarm is scheduled to be tilled and watered on a bi-weekly basis until the remediation criteria levels are achieved.

B. Ground Water

During excavation of the contaminated soil at the fire training pit, ***ground water was not encountered.***

IV. RECOMMENDATIONS

A. Soil

Based on the confirmation TPH measurement, it appears that sufficient material has been excavated from the flare pit such that minimal contaminated material remains. The remaining soil is well below the remediation level of 100 ppm TPH. Based on this result, authorization from NMOCD should be obtained to backfill the fire training pit with clean soil material.

The landfarm should continue to be tilled and watered on a bi-weekly basis until remediation levels are obtained. It is proposed that TPH monitoring samples be obtained on a monthly basis.

Attachment A

Fire Training Pit

RCRA Characteristic Test Data

ASSAIGAI
ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109
3332 Wedgewood, Suite E-5 • El Paso, Texas 79925

Assaigai Analytical Labs
7300 Jefferson NE
Albuquerque, NM 87109

Attn: MARLEAH M. MARTIN
Phone: (505)345-8964

MERIDIAN OIL
3535 EAST 30TH STREET
FARMINGTON, NM 87402

Attn: MIKE FRAMPTON
Invoice Number:

Order #: 93-09-191
Date: 10/06/93 09:33
Work ID: WINGATE
Date Received: 09/29/93
Date Completed: 10/06/93
Client Code: MER01

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
01	WINGATE FIRE PIT		

ND = None Detected D_F = Dilution Factor NT = Not Tested
B = Analyte was present in the blank J = Estimated value
E = Estimated Value,Concentration exceeds calibration range
MULTIPLY THE LIMIT BY THE DILUTION FACTOR.

For Certified By
Marleah Martin

ASSAIGAI
ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109
3332 Wedgewood, Suite E-5 • El Paso, Texas 79925

REPORT
Work Order # 93-09-191
Received: 09/29/93
Results By Test

TEST CODE default units	Sample 01 (entered units)
PRCTSX	N/A
% (Percent)	
T8270X	N/A
N/A	
TCLPXX	N/A
N/A	
TCLPZX	N/A
N/A	
TCVHGX	N/A
N/A	
TFAAX	N/A
N/A	
TGFAAX	N/A
N/A	

REPORT Work Order # 93-09-191
Received: 09/29/93 Results by Sample

SAMPLE ID WINGATE FIRE PIT FRACTION 01C TEST CODE SCORR NAME CORROSIV(NACE)/SW846 1110
Date & Time Collected 09/28/93 15:50:00 Category SOIL

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Corrosivity (NACE)	ND	6.0	1.0	9/30/93

Notes and Definitions for this Report:

EXTRACTED 09/30/93
ANALYST JB
UNITS MM/YR
BATCH_ID SNACE-002
COMMENTS

 REPORT Work Order # 93-09-191
Received: 09/29/93 Results by Sample

SAMPLE ID WINGATE FIRE PIT FRACTION 01C TEST CODE SPH NAME pH/SW846 9045
Date & Time Collected 09/28/93 15:50:00 Category SOIL

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
pH	7.7	0.10	1.0	09/29/93

Notes and Definitions for this Report:

EXTRACTED
ANALYST TSH
UNITS pH Units
BATCH_ID SPH-036
COMMENTS N/A

Received: 09/29/93

REPORT
Results by Sample

Work Order # 93-09-191

SAMPLE ID WINGATE FIRE PIT FRACTION 01C TEST CODE SREACT NAME REACTIVITY/SW846 7-3
Date & Time Collected 09/28/93 15:50:00 Category SOIL

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Sulfide	NON-REACT	500	1.0	10/05/93
Cyanide	NON-REACT	250	1.0	10/05/93

Notes and Definitions for this Report:

EXTRACTED 10/04/93
ANALYST DH
UNITS mg/Kg OF WASTE
BATCH_ID SREACT-021
COMMENTS

ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109
3332 Wedgewood, Suite E-5 • El Paso, Texas 79925

REPORT

Work Order # 93-09-191

Received: 09/29/93

Results by Sample

SAMPLE ID WINGATE FIRE PIT FRACTION 01B TEST CODE T8270 NAME TCLP SVOA/METHOD 1311/8270

Date & Time Collected 09/28/93 15:50:00 Category SOIL

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
2-Methylphenol / O-Cresol	ND	0.0010	3.0	10/02/93
3/4-Methylphenol / M/P-Cresol	ND	0.0020	3.0	10/02/93
Hexachloroethane	ND	0.0010	3.0	10/02/93
Nitrobenzene	ND	0.0010	3.0	10/02/93
Hexachlorobutadiene	ND	0.0010	3.0	10/02/93
2,4,6-Trichlorophenol	ND	0.0010	3.0	10/02/93
2,4,5-Trichlorophenol	ND	0.0010	3.0	10/02/93
2,4-Dinitrotoluene	ND	0.0010	3.0	10/02/93
Hexachlorobenzene	ND	0.0010	3.0	10/02/93
Pentachlorophenol	ND	0.0010	3.0	10/02/93
Pyridine	ND	0.0010	3.0	10/02/93

Notes and Definitions for this Report:

EXTRACTED 10/01/93
ANALYST JS
FILE ID S1670.D
UNITS mg/L
BATCH_ID TVOA-59
TCLP_XT_DATE 09/29/93

 REPORT Work Order # 93-09-191

Received: 09/29/93 Results by Sample

SAMPLE ID WINGATE FIRE PIT FRACTION 01B TEST CODE 1METAL NAME TCLP METALS/1311/SW846 AA

Date & Time Collected 09/28/93 15:50:00 Category SOIL

PARAMETER	RESULT	LIMIT	D_F	DATE_EXT	DATE_ANAL
Arsenic, As	ND	0.0050	1.0	10/01/93	10/04/93
Barium, Ba	6.0	0.50	1.0	10/01/93	10/04/93
Cadmium, Cd	0.004	0.0030	1.0	10/01/93	10/04/93
Chromium, Cr	ND	0.020	1.0	10/01/93	10/04/93
Lead, Pb	ND	0.10	1.0	10/01/93	10/04/93
Mercury, Hg	ND	0.00020	1.0	10/04/93	10/04/93
Selenium, Se	ND	0.0050	1.0	10/01/93	10/04/93
Silver, Ag	ND	0.010	1.0	10/01/93	10/04/93

Notes and Definitions for this Report:

ANALYST KH

UNITS mg/L

BATCH_ID WCVAA-087,WGFAA-266,WFAAA-243,TCLP-141

TCLP_XT_DATE 09/29/93

 REPORT Work Order # 93-09-191

Received: 09/29/93 Results by Sample

SAMPLE ID WINGATE FIRE PIT FRACTION 01A TEST CODE Z8240 NAME ZHE/VOA/METHOD 1311/8240

Date & Time Collected 09/28/93 15:50:00 Category SOIL

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Vinyl Chloride	ND	0.0010	1.0	10/01/93
1,1-Dichloroethene	ND	0.0010	1.0	10/01/93
Chloroform	ND	0.0010	1.0	10/01/93
1,2-Dichloroethane	ND	0.0010	1.0	10/01/93
2-Butanone (MEK)	ND	0.0010	1.0	10/01/93
Carbon Tetrachloride	ND	0.0010	1.0	10/01/93
Trichloroethene	ND	0.0010	1.0	10/01/93
Benzene	ND	0.0010	1.0	10/01/93
Tetrachloroethene	ND	0.0010	1.0	10/01/93
Chlorobenzene	ND	0.0010	1.0	10/01/93
1,4-Dichlorobenzene	ND	0.0010	1.0	10/01/93

Notes and Definitions for this Report:

EXTRACTED ________

ANALYST JS

FILE ID V3134

UNITS mg/L

BATCH_ID TVOA-59

TCLP_XT_DATE 09/29/93

ASSAIGAI ANALYTICAL LABORATORIES

7300 JEFFERSON, N.E.
ALBUQUERQUE, NEW MEXICO 87109
(505) 345-8964

3711 ADMIRAL, SUITE C
EL PASO, TEXAS 79925
(915) 593-6000

Chain of Custody Record

Lab job no.: 9191 Date 9-29-93

Page 1 of 1

Client: Meridian Oil
Project Manager: MIKE FRAMPTON
Address: 3535 E. 30th St. Farmington
Telephone No.: 326-9841
Project Name/Number: Wingate 87402
Fax. No.:
Contract/Purchase Order/Quote:
Samplers: *(Signature)*

Analysis Required

Laboratory Sample Number	Field Sample Number	Location	Date	Time	Sample Type	Type/Size of Container	Preservation Temp.	Preservation Chemical	No. of Containers	TCLP VOA	TCLP SVOA, Metals (RCRA)	Ph, React, Cor.					3 Day
61A	Wingate Fire Pit		7/28	1550	S	4oz VOA	4°C	none	1	X							Due 10/4/93
1B	↓		↓	↓	↓	8oz Glass	↓	↓			X						
1C	↓		↓	↓	↓	↓	↓	↓				X					

Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Received by:
Signature: Kevin Myers	9/29	Signature: Jenkins	Signature:		Signature:
Printed: K. MYERS	9:10	Printed: Jenkins	Printed:		Printed:
Company:		Company: AAL	Company:		Company:
Reason:		Reason:	Reason:		Reason:

Method of Shipment:
Shipment No.:
Special Instructions:

Comments: 50% Sur-Charge
CALL KEVIN W/ VERBAL 275-7183

After analysis, samples are to be:
- ☐ Disposed of (additional fee)
- ☐ Stored (30 days max)
- ☐ Stored over 30 days (additional fee)
- ☐ Returned to customer

Attachment B

Fire Training Pit Soil Data

Confirmation TPH Sample

ASSAIGAI
ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109 3332 Wedgewood, Suite E-5 • El Paso, Texas 79925

Assaigai Analytical Labs
7300 Jefferson NE
Albuquerque, NM 87109

Attn: MARLEAH M. MARTIN
Phone: (505)345-8964

MERIDIAN OIL
3535 EAST 30TH STREET
FARMINGTON, NM 87402

Attn: MIKE FRAMPTON
Invoice Number:

Order #: 93-11-042
Date: 11/08/93 16:56
Work ID: FIRE PIT
Date Received: 11/04/93
Date Completed: 11/08/93
Client Code: MER01

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
01	FIRE TRAINING PIT		

ND = None Detected D_F = Dilution Factor NT = Not Tested
B = Analyte was present in the blank J = Estimated value
E = Estimated Value,Concentration exceeds calibration range
MULTIPLY THE LIMIT BY THE DILUTION FACTOR.

Certified By
for Marleah Martin

ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109
3332 Wedgewood, Suite E-5 • El Paso, Texas 79925

Received: 11/04/93

REPORT
Results by Sample

Work Order # 93-11-042

SAMPLE ID **FIRE TRAINING PIT** FRACTION **01A** TEST CODE **STRPH** NAME **TRPH/EPA 418.1**
Date & Time Collected **11/03/93 09:15:00** Category **SOIL**

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Total Petroleum HCs	72.4	5.0	1.0	11/05/93

Notes and Definitions for this Report:

EXTRACTED 11/05/93
ANALYST DS
UNITS mg/Kg
BATCH_ID STRPH-127
PRCNT_MOIST ___

ASSAIGAI ANALYTICAL LABORATORIES

Chain of Custody Record

Lab job no.: 11-042 Date 11/4/93

Page 1 of 1

7300 JEFFERSON, N.E.
ALBUQUERQUE, NEW MEXICO 87109
(505) 345-8964

3711 ADMIRAL, SUITE C
EL PASO, TEXAS 79925
(915) 593-6000

MELQUIADES ALANIS
6411 LOCAL UNO
CIUDAD JUAREZ, CHIHUAHUA MEXICO 32320

Client MERIDIAN OIL

Address

City/State/Zip

Project Name/Number

Contact/Purchase Order/Quote

Project Manager/Contact MIKE FRAMPTON

Telephone No.

Fax. No.

Samplers: *(Signature)* KC Myers

Analysis Required

Remarks: 24 TAT

Laboratory Sample Number	Field Sample Number/Location	Date	Time	Sample Type	Type/Size of Container	Preservation Temp.	Preservation Chemical	No. of Containers	TRPH								Remarks
01A	FIRE TRAINING PIT	11/3/93	2:15	S	4 oz GLASS	4°C		1	X								

Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Received by:
Signature Kevin Myers	Date	Signature [signature]	Signature	Date	Signature
Printed	Time	Printed THOMAS POTH	Printed	Time	Printed
Company SUMMIT CONSULTANTS		Company AAL	Company		Company
Reason		Reason	Reason		Reason

Method of Shipment:

Shipment No.

Special Instructions:

Comments: CALL KEVIN MYERS W/ RESULTS 292-0055
SEND REPORTS TO MERIDIAN & KEVIN MYERS
24 hr TAT

After analysis, samples are to be:

- [x] Disposed of (additional fee)
- [ ] Stored (30 days max)
- [ ] Stored over 30 days (additional fee)
- [ ] Returned to customer

MERIDIAN OIL

OIL CONSERVATION DIVISION
RECEIVED

'93 DE ... AM 9 34

December 20, 1993

Certified - P 142 129 965

William C. Olson, Hydrogeologist
Energy, Minerals, & Natural Resources Dept.
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504

Re: Fire Training Pit Closure
Discharge Plan GW-54
Closure Report - Addendum #1

Dear Mr. Olson:

Meridian Oil Inc. is submitting additional information pursuant to your request described in your November 22, 1993 correspondence (Certified Mail - P 667 242 412).

Attached for your information is a map showing the location of the excavated area and landfarm and a figure showing soil sampling locations. Also attached are the field PID and Petro Risc soil measurements made initially and after excavation was completed.

If you have any questions please call me at (505) 326-9841.

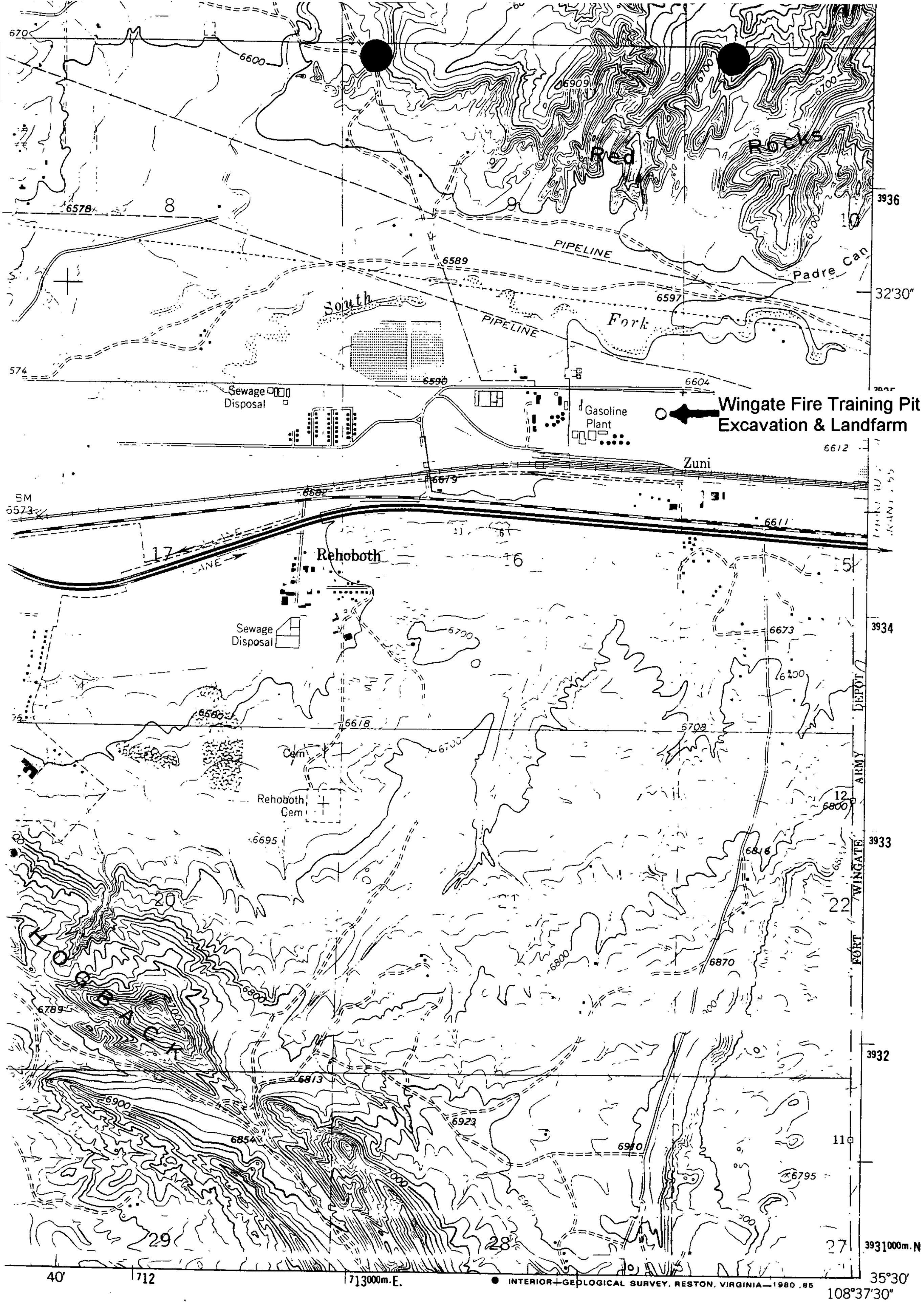
Sincerely,

Michael J. Frampton
Sr. Staff Environmental Representative

Attachment: Map (2 Page)
Sample Locations
Field PID Results (1 Page)
Petro Risc Soil Results (1 Page)

cc: Denny Foust - OCD, Aztec, N.M.
Wingate Plant Closures: Fire Training

mjf/sn/c:winftran



MILE

ROAD CLASSIFICATION

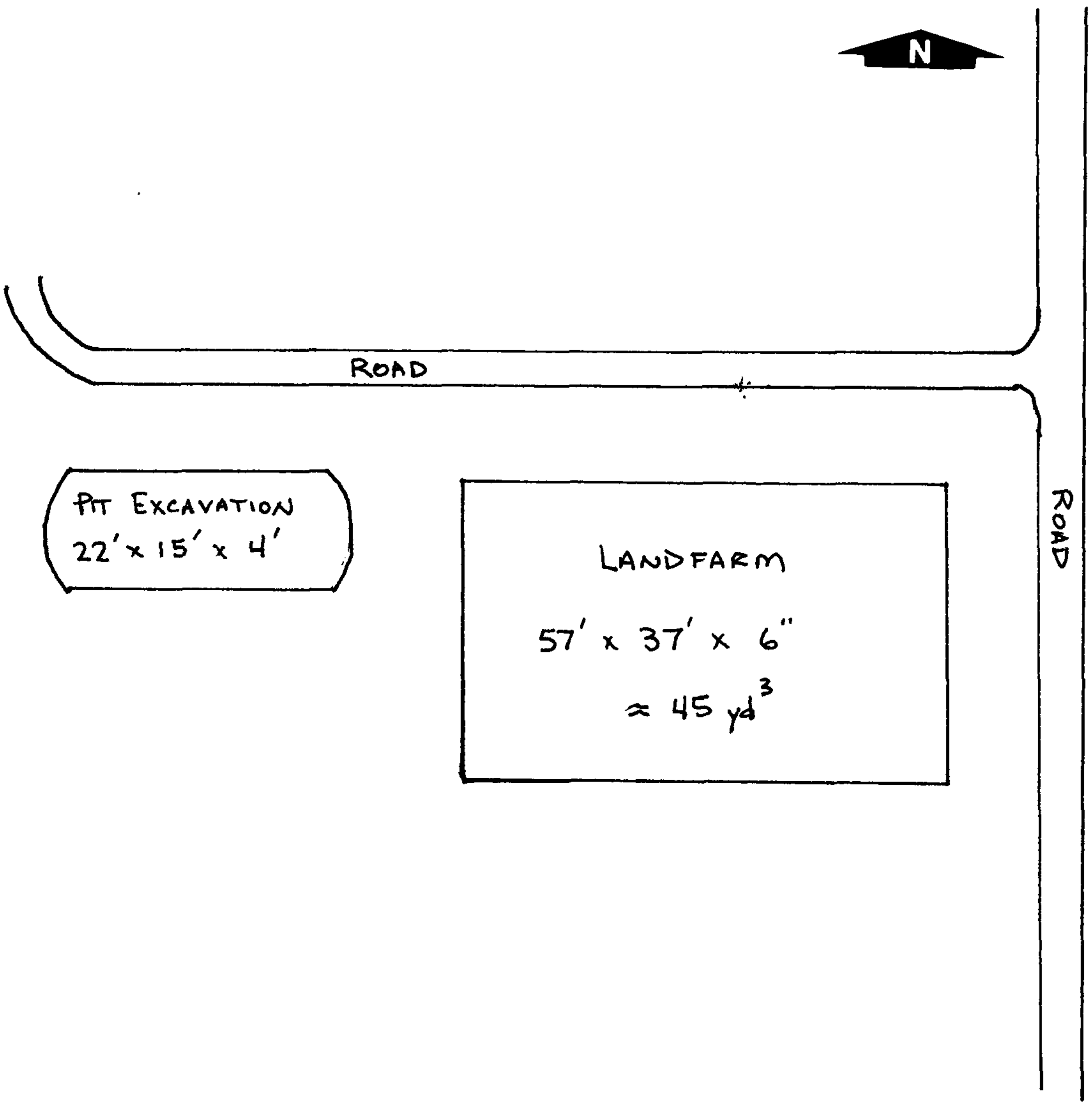
Heavy-duty .... Light-duty ....

(FORT WIN 4254

1

WINGATE FIRE TRAINING PIT

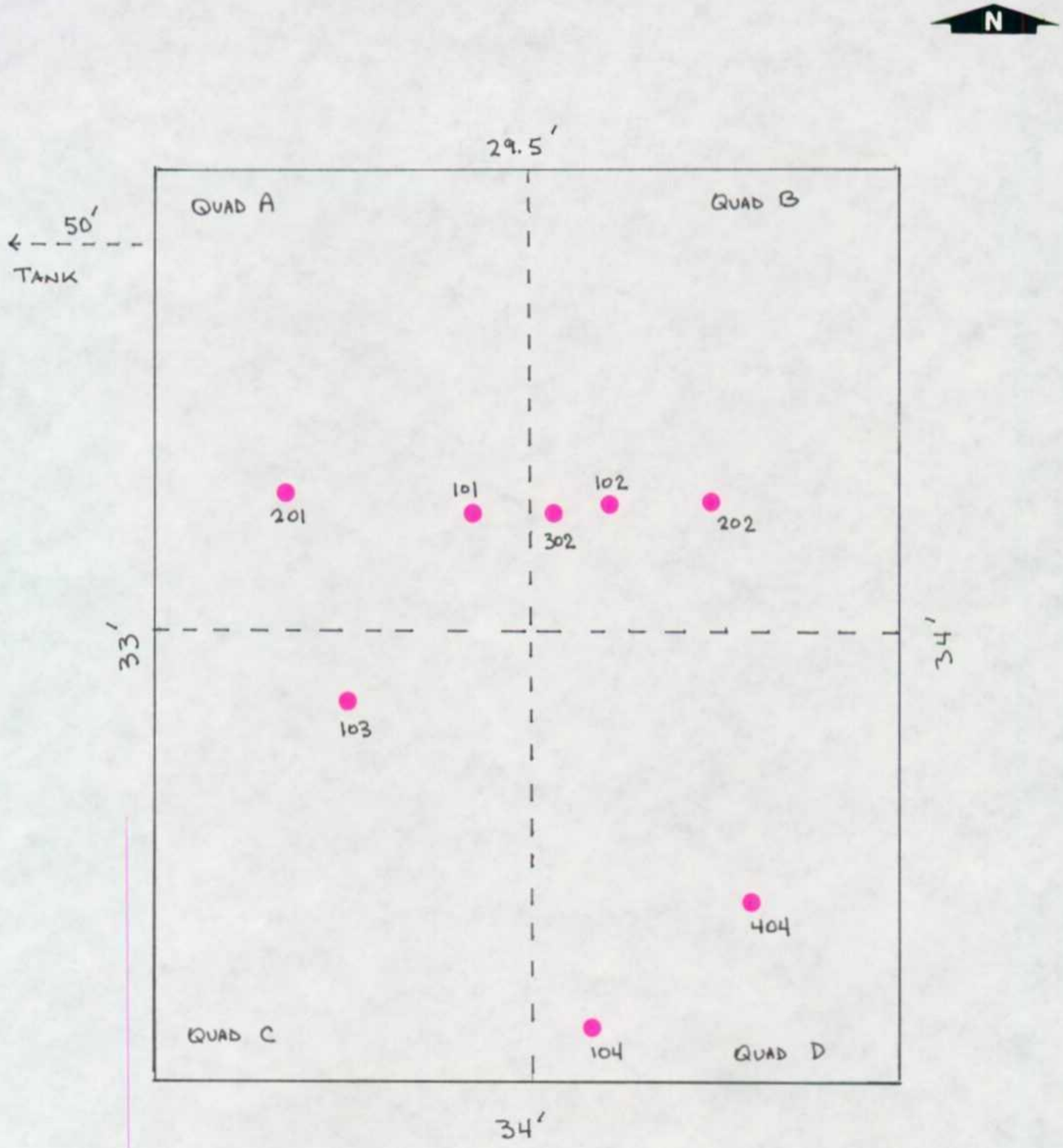
EXCAVATION & LANDFARM



WINGATE FIRE TRAINING PIT

SAMPLE LOCATIONS

PID, TPH/PETRO RISC, TCLP



NOT TO SCALE

Wingate Pit Closure Project
Field PID Results
Fire Training Pit

Date/Time	Grid #	Sample #	Depth	Peak - ppm
9-16 1502	A	S-101	6"	0.7
9-16 1509	B	S-102	6"	0.6
9-16 1520	C	S-103	6"	0.6
9-16 1514	D	S-104	6"	0.5
9-17 0940	A	M-101	1½'	101.6 *
9-17 1025	A	D-101	2½'	68.4
9-17 1345	B	M-102	1½'	1.6
9-17 1235	D	M-104	1½'	0.9
9-20 1145	B	M-102	2'1"	4.5
9-20 1105	C	M-103	27"	0.9
9-20 1445	B	M-202	24"	0.9
		After Excavation		
10-6 1455	Composite		0-4'	4.9

SUNDANCE Consultants, Inc.

FIRE TRAINING PIT

Data for PETRO RISc™ Soil Test

Operator: K.C. MYERS Date: 9-16 thru 9-20 1993 Location: FIRE TRAINING PIT

Sample ID		ΔOD standards	OD sample 100 ppm	Interpret.	OD sample 500 ppm	Interpret.	Notes	
A	S-101	-0.04	+0.15	< 100	+0.14	< 500	6"	OK
D	S-104	-0.06	+0.02	< 100	+0.49	< 500	6"	OK
A	M-101	-0.10	-0.54	> 100	-0.06	> 500	1½'	EXCEEDS STANDARD
A	D-101	-0.05	-0.48	> 100	-0.07	> 500	2½'	EXCEEDS STANDARD
B	M-102	-0.08	-0.51	> 100	-0.12	> 500	25"	EXCEEDS STANDARD
C	M-103	-0.07	+0.27	< 100	+0.30	< 500	27"	OK
B	M-202	-0.01	+0.24	< 100	+0.41	< 500	27"	OK
			TCLP	COMPOSITE	SAMPLE			
B	302	0-22"						
D	404	0-12"						
B	202	21"-27"						
C	103	24"-30"						
D	104	18"-24"						
A	201	0-13"						

4

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

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

December 3, 1993

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-241-887

Mr. Michael J. Frampton
Meridian Oil, Inc.
P.O. Box 4289
Farmington, New Mexico 87499-4289

RE: FLARE PIT CLOSURE
MERIDIAN OIL WINGATE PLANT
MCKINLEY COUNTY, NEW MEXICO

Dear Mr. Frampton:

The New Mexico Oil Conservation Division (OCD) has reviewed the Meridian Oil, Inc. (MOI) October 29, 1993 "FLARE PIT CLOSURE PROJECT, WINGATE FRACTIONATING PLANT, MCKINLEY COUNTY, NEW MEXICO" and MOI's November 21, 1993 "FLARE PIT CLOSURE, DISCHARGE PLAN GW-54, CLOSURE REPORT - ADDENDUM #1. These documents present the results of MOI's remedial activities associated with the closure of the former unlined flare pit at the Wingate Fractionating Plant.

The soil remediation actions as documented in the above referenced reports appear to have adequately removed contaminated soils related to the use of the pit. The ground water monitoring recommendations which are contained in the above referenced reports are approved with the following conditions:

1. MOI will notify OCD at least 72 hours in advance of all sampling activities such that the OCD may have the opportunity to witness the events and/or split samples.

2. Upon completion of landfarming the contaminated soils, MOI will submit an analysis of the final contaminant levels in the landfarmed soils to OCD for approval.

Please be advised that OCD approval does not relieve MOI of future liability if remaining soil contaminants are found to pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve MOI of responsibility for compliance with any other federal, state or local laws and/or regulations

If you have any questions, please call me at (505) 827-5885.

Sincerely,

William C. Olson

William C. Olson
Hydrogeologist
Environmental Bureau

xc: OCD Aztec Office

MERIDIAN OIL

November 21, 1993

Certified - P 142 129 934

William C. Olson, Hydrogeologist
Energy, Minerals, & Natural Resources Dept.
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504

Re: Flare Pit Closure
Discharge Plan GW-54
Closure Report - Addendum #1

Dear Mr. Olson:

Meridian Oil Inc. is submitting additional information pursuant to your request described in your November 16, 1993 correspondence (Certified Mail - P 667 242 408).

Attached for your information is a map showing the location of the excavated area and landfarm. Also attached are the field PID measurements made initially and after excavation was complete. Water quality monitoring will be conducted at two locations. The open excavation will be monitored quarterly in December, March, June and September. The downgradient monitoring well (WMH-3) will be monitored semi-annually in March and September. Monitoring will continue at both locations until water quality criteria is met at the open excavation. Analytical results of water quality samples will be forwarded to your office as they become available.

If you have any questions please call me at (505) 326-9841.

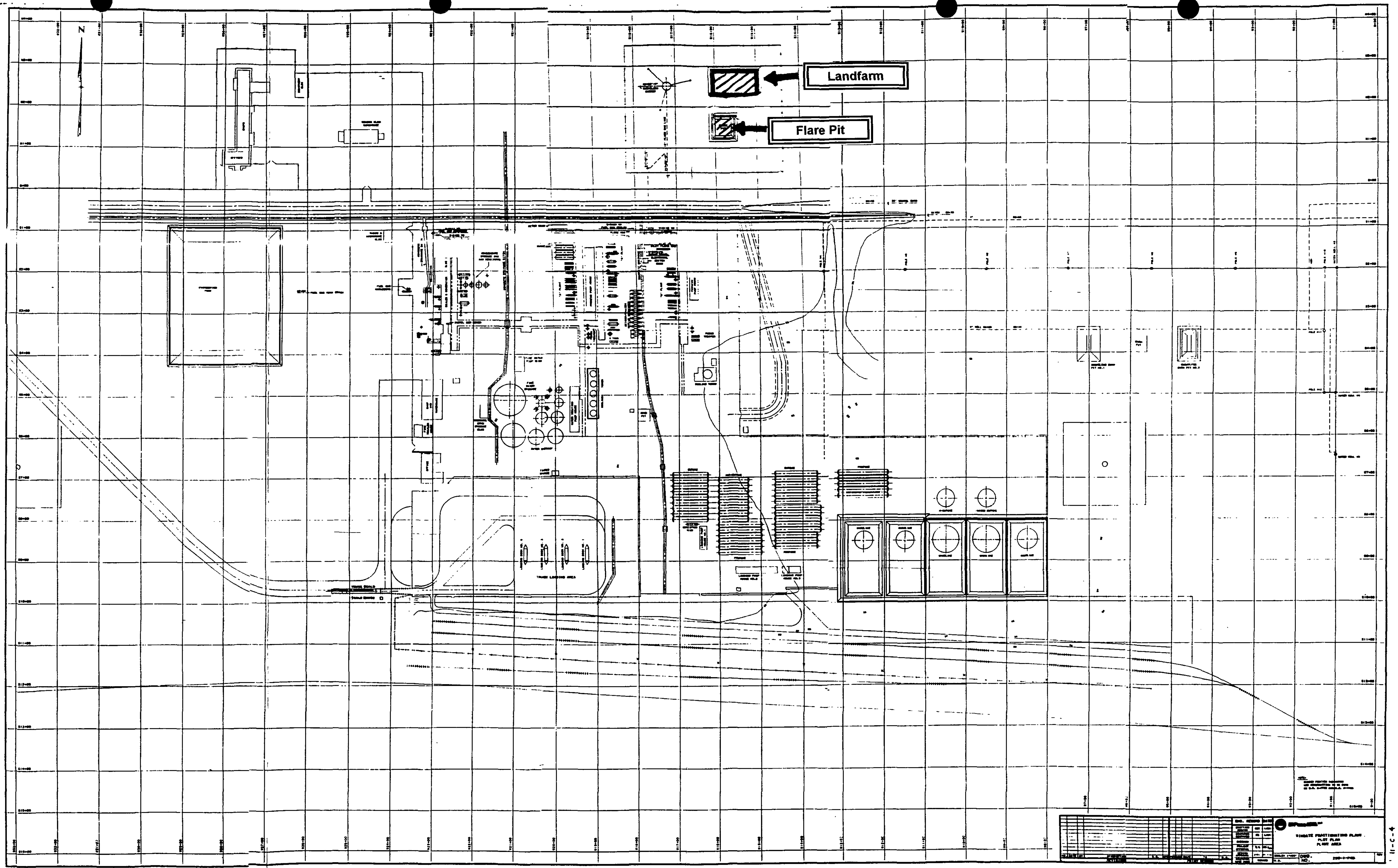
Sincerely,

Michael J. Frampton
Sr. Staff Environmental Representative

Attachment: Map (1 Page)
Field PID Results (5 Pages)

cc: Denny Foust - OCD, Aztec, N.M.
Wingate Plant Closures: Flare Pit

mjf/sn/c:winflar1


Landfarm
Flare Pit

Wingate Pit Closure Project
Field PID Results
Flare Pit

Date/Time	Grid #	Sample #	Depth	Peak - ppm
9/14 1255	A	S-101	0-6"	3.5
9/14 1257	A	S-201	0-6"	1.6
9/14 1300	A	S-301	0-6"	3.8
9/14 1303	A	S-401	0-6"	0.5
9/14 1304	A	S-501	0-6"	0.6
9/14 1320	B	S-102	0-6"	3.7
9/14 1322	B	S-202	0-6"	0.5
9/14 1325	B	S-302	0-6"	11.8
9/14 1328	B	S-402	0-6"	0.4
9/14 1329	B	S-502	0-6"	0.8
9/14 1340	C	S-103	0-6"	4.6
9/14 1342	C	S-203	0-6"	2.5
9/14 1345	C	S-303	0-6"	2.9
9/14 1350	C	S-403	0-6"	139.5
9/14 1354	C	S-503	0-6"	3.2
9/14 1410	D	S-104	0-6"	8.4
9/14 1411	D	S-204	0-6"	3.5
9/14 1414	D	S-304	0-6"	2.4
9/14 1417	D	S-404	0-6"	98.3
9/14 1418	D	S-504	0-6"	1.5

Wingate Pit Closure Project
Field PID Results
Flare Pit

Date/Time	Grid #	Sample #	Depth	Peak - ppm
9-15 1320	D	M-104	1-1½'	68.4
	D	D-104	2-2½	105.5
9-15 1345	C	M-403	1-1½'	15.8
9-15 1350	C	D-403	2-2½'	101.2
9-15 1400	B	M-102	1-1½'	3.6
9-15 1410	B	D-102	2-2½'	2.2
9-16 1010	A	M-501	1-1½'	3.5
9-16 1014	A	D-501	2-2½'	4.8
9-21 1405	A	ED-101	4'	1.8
9-21 1407	B	ED-102	4'	14.4
9-22 0818	D	ED-104	5'	37.3
9-22 1013	C	ED-103	4'	119.6
9-22 1019	C	ED-203	5'	70.9
9-22 1300	D	ED-204	6'	0.7
9-22 1305	C	ED-303	5'	0.8
9-22 1420	C	ED-403	6'	1.5

SUNDANCE Consultants, Inc.

Flare Pit Wingate

Surface Samples 0-6"

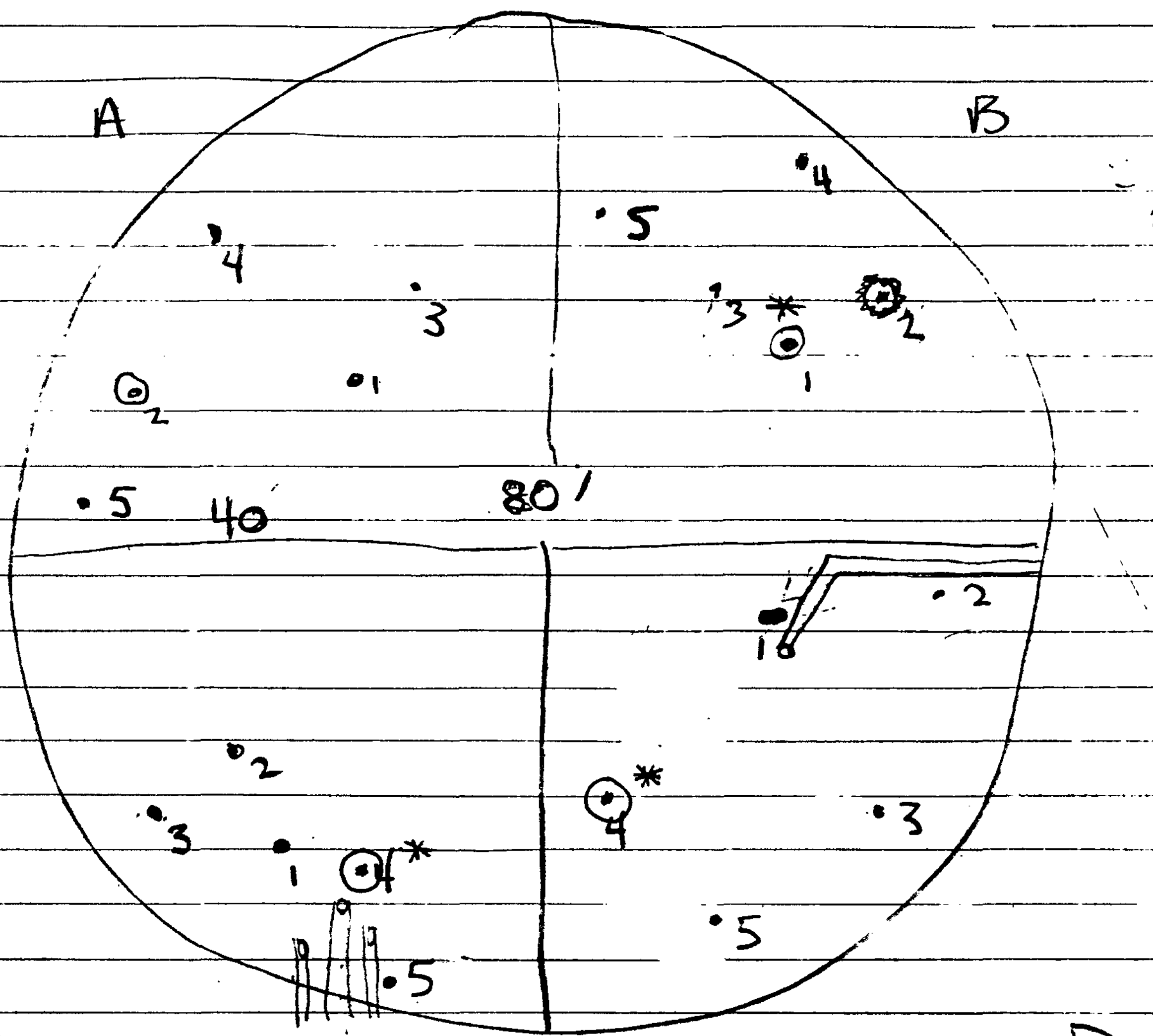
Flare

A

S101
201
301
401
501

B

202
302
402
502



C

S103
203
303
403
503

D

S104
204
304
404
504

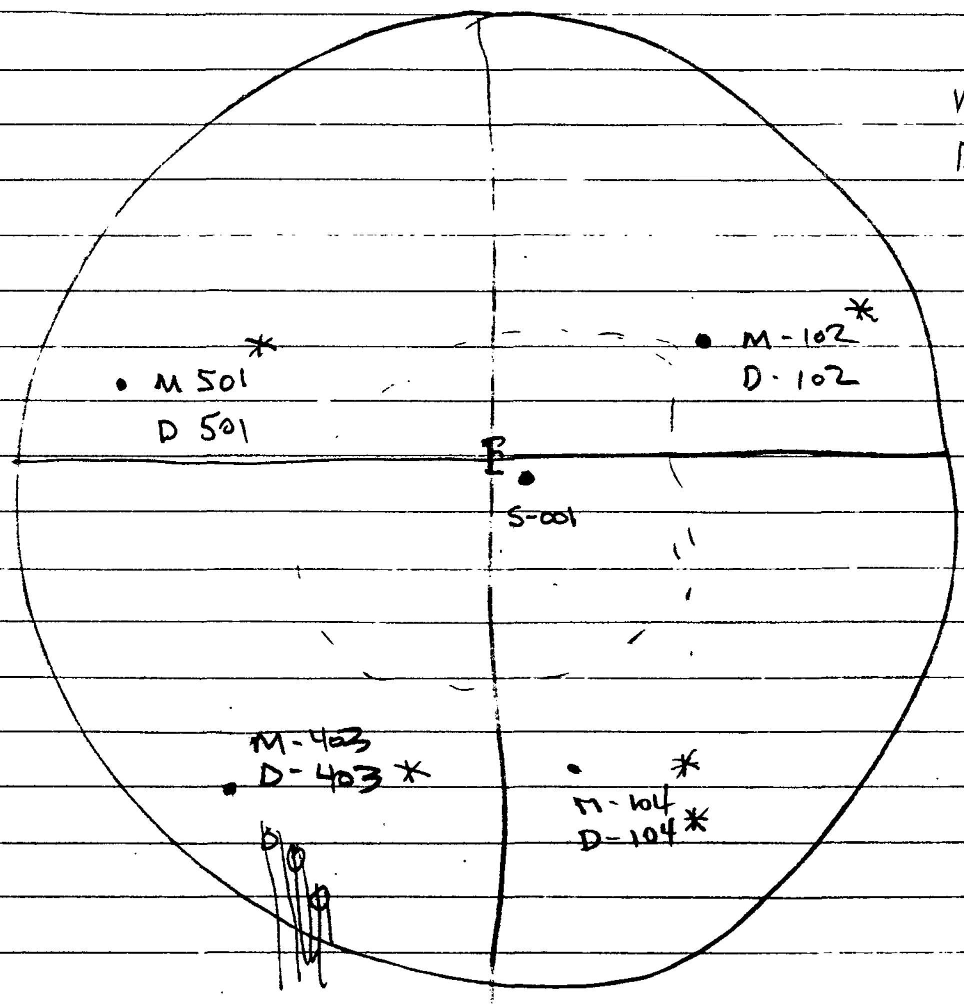
Flare Pit Wingate
9-15-93

N

A

B

M-102*
D-102



C

M-403
D-403*

D

M-104*
D-104*

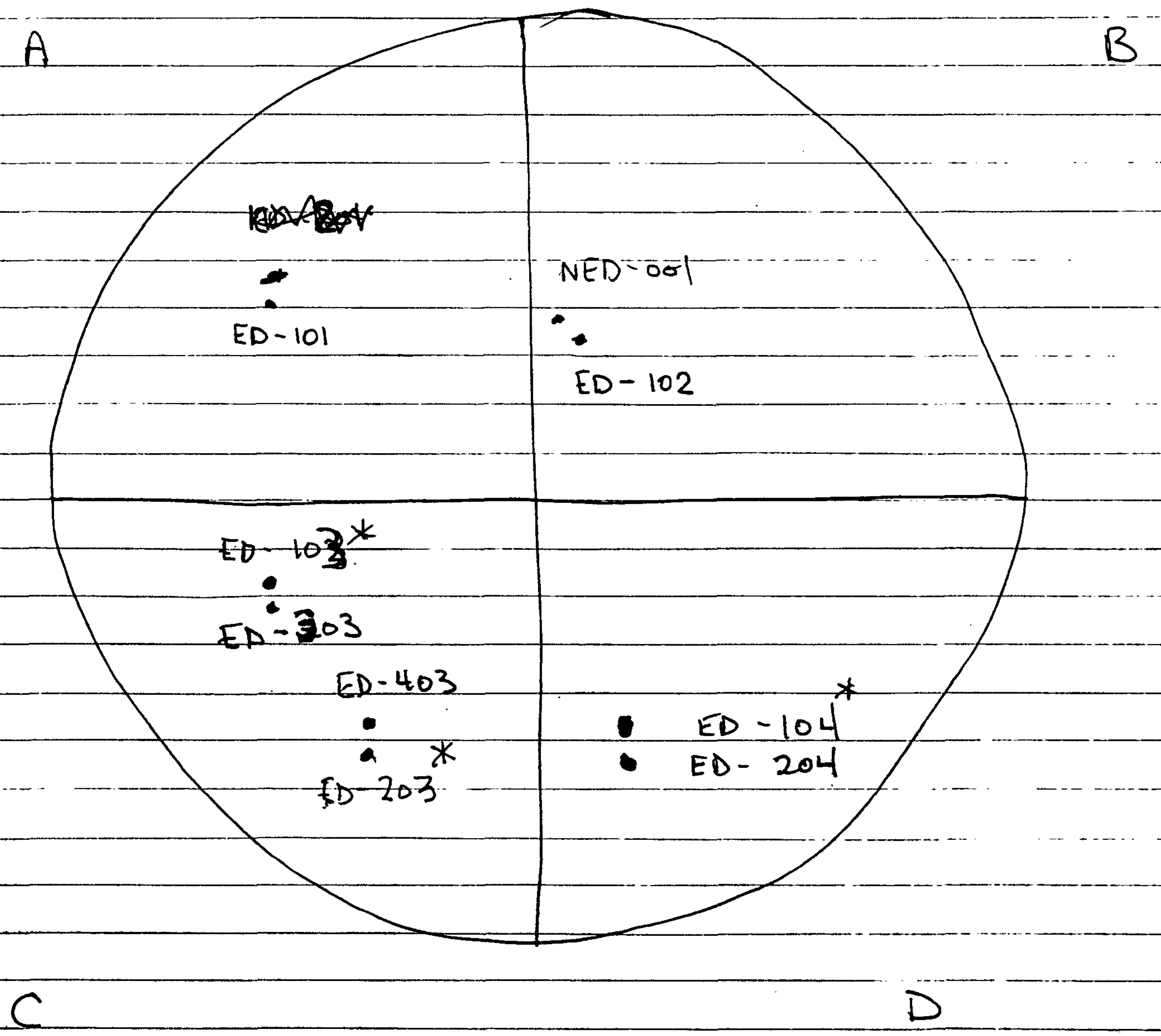
M= 1-1½'
D= 2-2½'

* = Exceeds Standard

Flare Pit

9-21-93 / 9-22-93

After Excavation



101- 5'
001- 5'
102- 5'
103- 3'
203- 5'

104 - 5'
204 - 6'

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

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

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

November 22, 1993

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-242-412

Mr. Michael J. Frampton
Meridian Oil, Inc.
P.O. Box 4289
Farmington, New Mexico 87499-4289

RE: FIRE TRAINING PIT CLOSURE REPORT
MERIDIAN OIL WINGATE PLANT
MCKINLEY COUNTY, NEW MEXICO

Dear Mr. Frampton:

The New Mexico Oil Conservation Division (OCD) is in the process of reviewing the Meridian Oil, Inc. (MOI) November 19, 1993 "FIRE TRAINING PIT CLOSURE PROJECT, WINGATE FRACTIONATING PLANT, MCKINLEY COUNTY, NEW MEXICO". This report presents the results of MOI's remedial activities associated with the closure of the former unlined fire training pit at the Wingate Fractionating Plant.

While the remedial activities appear to have adequately removed contaminated soils related to the use of the pit, the OCD has the following comments, questions and requests for information regarding the above referenced report:

1. The report does not contain a map showing the excavated area and the location of the landfarming area. Please provide OCD with a map delineating the areas excavated and the location of the landfarm.

2. The report stated that benzene, toluene, ethylbenzene, xylene (BTEX) and photoionization detector (PID) measurements were made initially and after excavation was complete, however, neither the results nor the sample locations were provided in the report. Please provide the OCD with this information.

Receipt of the above information will allow the OCD to complete a review of the above referenced report.

If you have any questions, please call me at (505) 827-5885.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: OCD Aztec Office

MERIDIAN OIL

November 19, 1993

Certified - P 142 129 933

William C. Olson, Hydrogeologist
Energy, Minerals, & Natural Resources Dept.
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504

**Re: Fire Training Pit Closure
Discharge Plan GW-54
Closure Report**

Dear Mr. Olson:

Meridian Oil Inc. (MOI) is submitting a closure report pursuant to your request described in your October 1, 1993 correspondence (Certified Mail - P 667 242 394).

The attached report documents the activities and current status of the fire training closure project. The report includes a description of the site assessment and remediation efforts. The pit has been cleaned to below OCD guideline levels. Landfarming will continue until remediation targets are achieved.

If you have any questions please call me at (505) 326-9841.

Sincerely,

Michael J. Frampton
Sr. Staff Environmental Representative

Attachment: Fire Training Pit Closure Project Report

cc: Denny Foust - OCD, Aztec, N.M.
Greg Kardos - MOI
Wingate Plant Closures: Fire Training

mjf/sn/c:winfire

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

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

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

November 16, 1993

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-242-408

Mr. Michael J. Frampton
Meridian Oil, Inc.
P.O. Box 4289
Farmington, New Mexico 87499-4289

RE: FLARE PIT CLOSURE
MERIDIAN OIL WINGATE PLANT
MCKINLEY COUNTY, NEW MEXICO

Dear Mr. Frampton:

The New Mexico Oil Conservation Division (OCD) is in the process of reviewing the Meridian Oil, Inc. (MOI) October 29, 1993 "FLARE PIT CLOSURE PROJECT, WINGATE FRACTIONATING PLANT, MCKINLEY COUNTY, NEW MEXICO". This report presents the results of MOI's remedial activities associated with the closure of the former unlined flare pit at the Wingate Fractionating Plant.

While the remedial activities appear to have adequately removed contaminated soils related to the use of the pit, the OCD has the following comments, questions and requests for information regarding the above referenced report:

1. The report does not contain a map showing the excavated area. Please provide OCD with a map delineating the areas excavated.

2. The report stated that benzene, toluene, ethylbenzene, xylene (BTEX) and photoionization detector (PID) measurements were made initially and after excavation was complete, however, these results were not provided in the report. Please provide the OCD with this information.

3. The report recommends water quality monitoring of the downgradient monitor well and the open excavation but does not include a sampling schedule. Please provide OCD with a sampling schedule for these proposed sampling points.

Receipt of the above information will allow the OCD to complete a review of the above referenced report.

If you have any questions, please call me at (505) 827-5885.

Sincerely,

William C. Olson

William C. Olson
Hydrogeologist
Environmental Bureau

xc: OCD Aztec Office

MERIDIAN OIL

October 29, 1993 Federal Express

William C. Olson, Hydrogeologist
Energy, Minerals, & Natural Resources Dept.
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504

RECEIVED
NOV 1 1993
OIL CONSERVATION DIV.
SANTA FE

Re: Flare Pit Closure
Discharge Plan GW-54
Closure Report

Dear Mr. Olson:

Meridian Oil Inc. (MOI) is submitting a closure report pursuant to your request described in your October 1, 1993 correspondence (Certified Mail - P 667 242 393).

The attached report documents the activities and current status of the flare pit closure project. The report includes a description of the site assessment, remediation efforts, and recommendation for future actions.

If you have any questions please call me at (505) 326-9841.

Sincerely,

Michael J. Frampton
Sr. Staff Environmental Representative

Attachment: Flare Pit Closure Project Report

cc: Denny Foust - OCD, Aztec, N.M.
Greg Kardos - MOI
Wingate Plant Closures: Flare Pit

mjf/sn/c:winflare

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

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

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

October 1, 1993

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-242-393

Michael J. Frampton
Meridian Oil, Inc.
P.O. Box 4289
Farmington, New Mexico 87499-4289

RE: FLARE PIT CLOSURE
MERIDIAN OIL WINGATE PLANT
MCKINLEY COUNTY, NEW MEXICO

Dear Mr. Frampton:

The New Mexico Oil Conservation Division (OCD) has reviewed the Meridian Oil, Inc. (MOI) September 27, 1993 "DISCHARGE PLAN GW-54 WINGATE FRACTIONATING PLANT - FLARE PIT CLOSURE".

The OCD approves of the above referenced closure plan with the following conditions:

1. MOI will notify OCD at least one week in advance of the final sampling of the landfarmed soils such that OCD may have the opportunity to split samples.

2. A report containing the results of the investigation will be submitted to OCD by November 1, 1993.

Please be advised that OCD approval does not limit you to the work proposed should the activities fail to adequately remediate contaminants related to operation of the flare pit. In addition, OCD approval does not relieve you of responsibility for compliance with any other federal, state or local laws and/or regulations.

If you have any questions, please call me at (505) 827-5885.

Sincerely,

William C. Olson

William C. Olson
Hydrogeologist
Environmental Bureau

xc: OCD Aztec Office

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

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

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

October 1, 1993

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-242-394

Mr. Michael J. Frampton
Meridian Oil, Inc.
P.O. Box 4289
Farmington, New Mexico 87499-4289

RE: FIRE TRAINING PIT CLOSURE
MERIDIAN OIL WINGATE PLANT
MCKINLEY COUNTY, NEW MEXICO

Dear Mr. Frampton:

The New Mexico Oil Conservation Division (OCD) has reviewed the Meridian Oil, Inc. (MOI) September 27, 1993 "DISCHARGE PLAN GW-54, WINGATE FRACTIONATING PLANT, FIRE TRAINING PIT CLOSURE".

The OCD approves of the above referenced closure plan with the following conditions:

1. MOI will notify OCD at least one week in advance of sampling the soils from the pit for hazardous waste characteristics such that OCD may have the opportunity to split samples.

2. MOI will submit the results of the hazardous waste characteristic tests to OCD for approval prior to landfarming the contaminated soils.

Please be advised that OCD approval does not limit you to the work proposed should the activities fail to adequately remediate contaminants related to operation of the flare pit. In addition, OCD approval does not relieve you of responsibility for compliance with any other federal, state or local laws and/or regulations.

If you have any questions, please call me at (505) 827-5885.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: OCD Aztec Office

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

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

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

October 1, 1993

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-242-395

Mr. Michael J. Frampton
Meridian Oil, Inc.
P.O. Box 4289
Farmington, New Mexico 87499-4289

RE: TRAIN RACK GROUND WATER CONTAMINATION
MERIDIAN OIL WINGATE PLANT
MCKINLEY COUNTY, NEW MEXICO

Dear Mr. Frampton:

The New Mexico Oil Conservation Division (OCD) has reviewed the Meridian Oil, Inc. (MOI) September 27, 1993 "DISCHARGE PLAN GW-54, WINGATE FRACTIONATING PLANT, TRAIN RACK GROUND WATER CONTAMINATION" and September 24, 1993 "MERDIAN OIL INC. WINGATE FRACTIONATING PLANT, GALLUP, NEW MEXICO, FINAL REPORT, PRELIMINARY GROUNDWATER INVESTIGATION".

The OCD approves of the recommendations in the above referenced documents with the following conditions:

1. Monitor well WMW-5 will be installed with at least 5 feet of well screen above the water table and 10 feet of well screen below the water table.

2. MOI will notify OCD at least one week in advance of all ground water sampling events such that OCD may have the opportunity to split samples.

3. MOI will submit a report on the installation of the proposed monitor well WMW-5 to OCD by December 1, 1993. The report will include a completion schematic for the monitor well and the results of water quality sampling.

4. MOI will notify OCD of the types of nutrients to be applied during the bioremediation activities prior to their use.

5. The semi-annual sampling will include measurements of the water table elevations from all facility monitor wells.

6. MOI will submit semi-annual reports containing the laboratory analytical results of the monitor well sampling and a water table potentiometric map to OCD on April 1 and October 1 of each year.

Please be advised that OCD approval does not limit you to the work proposed should the activities fail to adequately define or remediate contaminants related to MOI's operations. In addition, OCD approval does not relieve you of responsibility for compliance with any other federal, state or local laws and/or regulations.

If you have any questions, please call me at (505) 827-5885.

Sincerely,

William C. Olson

William C. Olson
Hydrogeologist
Environmental Bureau

xc: OCD Aztec Office

MERIDIAN OIL

September 27, 1993 *Federal Express*

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

RECEIVED
SEP 29 1993
OIL CONSERVATION DIV.
SANTA FE

Re: Discharge Plan GW-54
Wingate Fractionating Plant
Train Rack Ground Water Contamination

Dear Mr. Olsen:

On August 17, 1992 the OCD approved the referenced plan. A groundwater contamination investigation was a condition of approval for the discharge plan. Meridian Oil Inc. (MOI) submitted the required plan of December 10, 1992. The groundwater investigation was conducted on April 6 and 7, 1993. Preliminary results of the investigation were reviewed with the OCD (Bill Olsen and Roger Anderson) at a meeting in Santa Fe on June 28, 1993. Attached is the final report on the April 6 and 7, 1993 groundwater investigation.

Based upon the findings of the investigation MOI is proposing the following course of action to address the groundwater contamination:

1. Groundwater monitoring will continue at the facility. Sampling frequency will be increased to semi-annual monitoring beginning in 1994. Groundwater monitoring will be conducted as described in Section 6.1 of the attached report. If sample results for WMW-4 reveal the presence of BTEX at concentrations higher than Water Quality Control Commission (WQCC) groundwater standards for two successive groundwater monitoring periods, MOI will notify and consult NMOCD for further direction.

2. One additional monitoring well will be installed at the facility. The approximate location of the additional well (WMW-5) is shown in Figure 3 of the attached report. The well will be completed consistent with the well schematic shown in Attachment I. The well will be completed to a depth of approximately 24 feet.

3. An insitu bioremediation program will be instituted along the train rack. Nutrients will be applied on an annual basis to stimulate and augment natural bioremediation. The program will continue until groundwater contaminants are below applicable WQCC criteria.

Installation of the new monitoring well is currently scheduled for the second week of October. If you have any questions please call me at 326-9841. Thank you for your consideration of this proposal.

Sincerely,

Michael J. Frampton
Sr. Staff Environmental Representative

Attachments: Final Report Preliminary Groundwater Investigation
Attachment I - Well Construction

cc: Richard Duarte - EPNG
Greg Kardos - MOI
Wingate Plant GW Issues: Correspondence

mjf/sn/wingw54t

Meridian Oil Inc., 3535 East 30th St., P.O. Box 4289, Farmington, New Mexico 87499-4289, Telephone 505-326-9700

Analytical Results

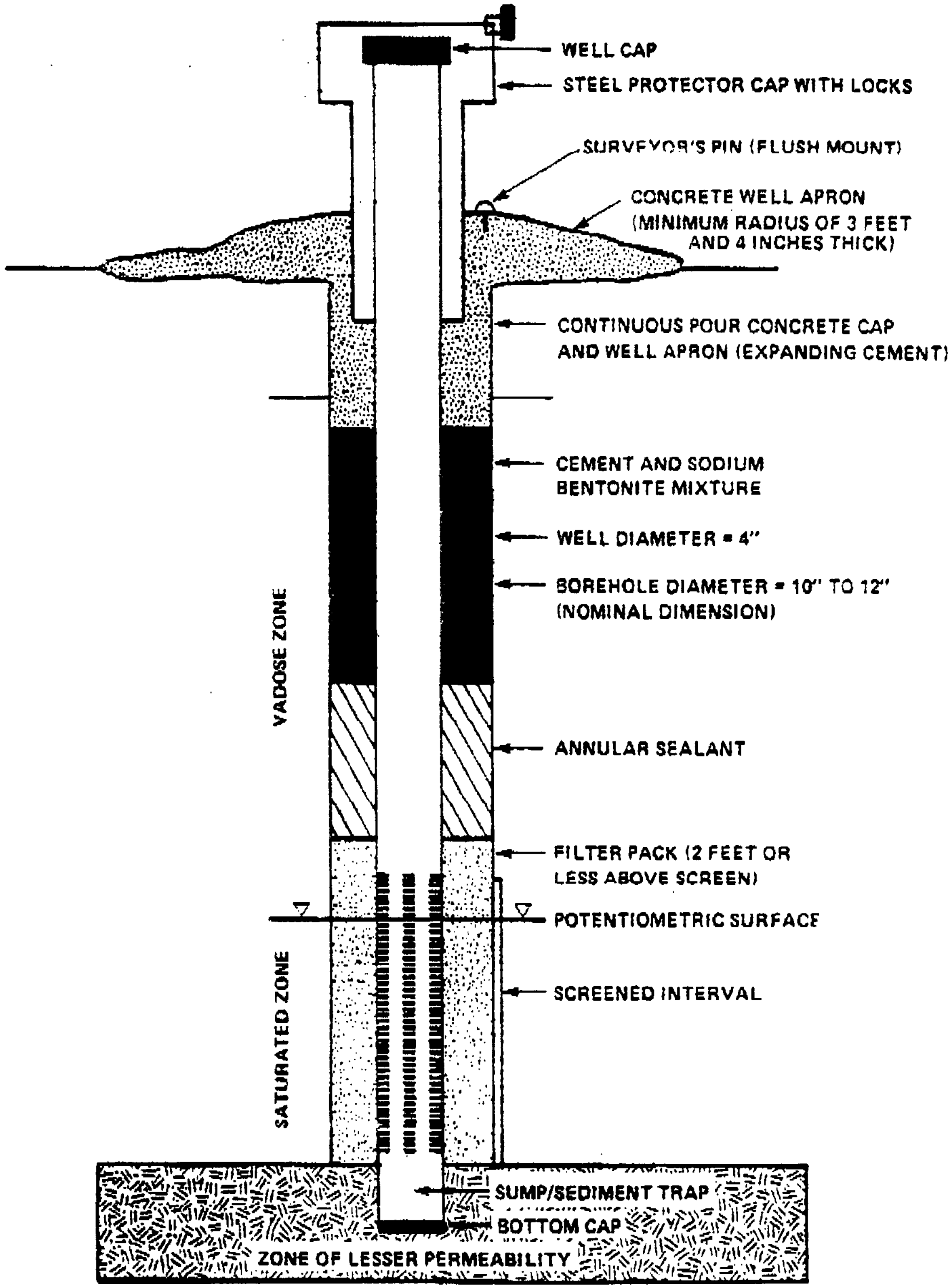
Meridian Oil Inc. - Wingate Plant
Gallup, New Mexico

April 6 & 7, 1993

Sample I.D.	Probe Hole Number	Depth (feet)	Concentration (μg/L) Benzene	Toluene	Ethylbenzene	Total Xylenes	Comments
Blank-04	NA	NA	ND (1)	ND (1)	ND (1)	ND (1)	QC-System Blank
Blank-05	NA	NA	ND (1)	ND (1)	ND (1)	ND (1)	QC-Reagent Blank
GW-13	PH-12	15	ND (1)	ND (1)	ND (1)	ND (1)	Groundwater
GW-14	PH-13	7	24	ND (1)	3	2	Groundwater
GW-15	PH-14	7	9	ND (1)	ND (1)	ND (1)	Groundwater
GW-16	PH-15	7	ND (1)	ND (1)	ND (1)	ND (1)	Groundwater
GW-17	PH-16	7	262	ND (1)	ND (1)	ND (1)	Groundwater
GW-18	PH-17	15	51	ND (1)	6	5	Groundwater
GW-19	PH-18	15	4320	ND (1)	73	36	Groundwater
GW-20	PH-19	15	19	12	3	4	Groundwater
GW-21	PH-20	15	ND (1)	ND (1)	ND (1)	ND (1)	Groundwater
GW-22	PH-21	20	ND (1)	ND (1)	ND (1)	ND (1)	Groundwater
GW-22D	PH-21	20	ND (1)	ND (1)	ND (1)	ND (1)	QC-Duplicate
Blank-06	NA	NA	ND (1)	ND (1)	ND (1)	ND (1)	QC-System Blank
GW-23	PH-22	15	ND (1)	ND (1)	ND (1)	ND (1)	Groundwater
GW-24	PH-23	15	4	ND (1)	ND (1)	ND (1)	Groundwater
GW-25	PH-24	7	ND (1)	ND (1)	ND (1)	ND (1)	Groundwater

D duplicate analysis
ND not detected at lower quantifiable limit indicated in parentheses
QC quality control
μg/L micrograms per Liter of headspace vapor analyzed

ATTACHMENT I



MERDIAN OIL INC.

WINGATE FRACTIONATING PLANT
GALLUP, NEW MEXICO

FINAL REPORT

PRELIMINARY GROUNDWATER INVESTIGATION

SEPTEMBER 24, 1993

TABLE OF CONTENTS

MERIDIAN OIL, INC.
WINGATE PLANT
GALLUP, NEW MEXICO

PRELIMINARY GROUNDWATER INVESTIGATION

1.0 INTRODUCTION

Wingate Plant is a facility which fractionates a mixed liquefied petroleum gas stream into usable products. The feed stock is received via pipelines from four natural gas facilities. The facility products include propane, normal butane, isobutane, natural gas liquid (light gasoline) and mixed butane. A facility map is presented in Figure 1, Appendix A.

On April 9, 1992, Meridian Oil, Inc. (MOI) submitted a Discharge Plan to the New Mexico Oil Conservation Division (NMOCD). In summary, the Discharge Plan stated that the presence of BTEX had been detected within the plant property. The BTEX levels are low however, exceed New Mexico WQCC standards. It is believed by MOI that the contamination is possibly related to historic accidental releases of hydrocarbons from the train loading rack area. At the time, the extent of contamination was unknown. On August 17, 1992, NMOCD approved the Discharge Plan with six conditions. The sixth condition included a groundwater investigation that would delineate the extent of contamination.

Pursuant to the Discharge Plan condition, NMOCD required an investigation proposal by December 18, 1992 which was submitted on December 10, 1992. The plan submitted by MOI consisted of the use of a "Geoprobe"-type instrument to determine the horizontal contamination boundary. This investigative equipment consisted of a hydraulic probe unit used to collect groundwater samples from the saturated zone and analyzed for BTEX. On January 14, NMOCD approved the plan. The geoprobe survey was conducted on April 6 and 7, 1993. All analytical results were provided by the geoprobe contractor on April 26, 1993.

2.0 FIELD SURVEY

2.1 Overview

Horizontal contamination boundaries were established by use of the geoprobe-type instrument operated by Burlington Environmental, Inc. This system includes a hydraulic probe unit mounted on the back of a van. Twenty-five groundwater samples were collected from 24 probehole locations and analyzed on-site using a laboratory quality gas chromatograph (GC) within the van. The GC was set to analyze total Benzene, Toluene, Ethylbenzenes and total Xylenes (BTEX) using "modified" USEPA method 8010/8020. The detection limit was set at 5 parts per billion (ppb) of benzene. Probehole locations are illustrated in Figure 2, Appendix A.

2.2 Sample Collection

A rectangular sample grid was established at 100-foot intervals near the train rack. Groundwater samples were collected from the saturated zone. The saturated zone was estimated from existing monitoring well geologic logs and historic depth to water data. The groundwater sampling depth is documented in Table 1, Appendix B.

3.0 DATA ACQUISITION

3.1 Groundwater Sampling and Analysis

A hydraulic probe driving unit was used to drive and withdraw the groundwater sampling probes. A hydraulic hammer was used where necessary to assist in driving through unusually hard soils. The probes consisted of three-foot sections of one-inch-diameter threaded steel pipes with a detachable drive point.

After the probe was inserted into the groundwater, an unused section of polyethylene tubing was inserted through the probe into the water table. The aboveground end of the tubing was connected to a peristaltic vacuum pump. A controlled vacuum was pulled to draw the groundwater to the surface. The pump was turned off, the tubing disconnected from the pump, and the water in the tubing drained from the bottom into a 40-milliliter (mL) glass vial sealed with a Teflon-lined septum screw cap. The sample was immediately given to the GC technician for on-site analysis.

The samples were prepared and analyzed using field modifications to United States Environmental Protection Agency (USEPA) SW-846 Method 3810 (static headspace screening) and Method 8010/8020. The field modifications provide USEPA Level II field screening data for establishing the identity and relative concentration of compounds detected.

A 20-mL aliquot of the groundwater sample was placed into a headspace vial containing 3 grams of reagent grade potassium carbonate. The sample vial was heated to 70°C for ten minutes to equilibrate the volatile components between the liquid and the air in the vial. An aliquot of up to 500 microliters of the headspace was collected by inserting a syringe through the septum of the vial and pulling the headspace sample into the syringe. The aliquot was then injected directly into the GC.

A Hewlett-Packard Model 5890A Series II gas chromatograph (GC) was used for the analysis of the groundwater samples. Compound separation and detection was performed using a 30-meter wide-bore DB-624 capillary column and a photo-ionization detector (PID) fitted with a 10.2 eV lamp. The analysis was performed with an oven temperature of 60°C with a total analysis time of 10 minutes. Table 1 contains groundwater sampling depths, ground elevation, groundwater elevation, groundwater sampling elevation, and benzene concentration. Appendix C contains analytical results for all BTEX components.

Sample component concentrations were measured based on an external standard calibration. Known concentrations of benzene, toluene, ethylbenzene, m&p-xylenes, and o-xylene were injected as a calibration gas mixture into the GC. Compound peak area versus standard concentrations were used to calculate sample concentrations. The computing integrator performs the calculation but will occasionally mislabel a peak and the calculation must be performed by hand.

Compound identification was based on comparison of target compound retention times with sample retention times. A reference peak compound, α, α, α-trifluorotoluene, was added to each sample to aid in target compound identification. Compounds are considered as tentatively identified. Sample matrices and coeluting compounds can make peak recognition and identification difficult.

The lower quantifiable limit (LQL) is the lowest concentration of a compound that can be practicably measured relative to the injection volume, and the detector sensitivity. The LQL is calculated from the current target compound response factor, sample size, and the estimated peak area that would have been detected under the given conditions. For this survey, the LQL for the target compounds was one microgram of compound detected per liter of headspace vapor analyzed (μg/L).

Analytical results for the groundwater samples analyzed by this technique will not necessary be the same as those obtained by submitting the same groundwater sample for laboratory analysis. Different techniques are used in each case and, although method sensitivities and accuracies are comparable, different results are possible.

3.2 Field Analytical Quality Control

Quality control is an essential part of an analytical test methodology. Quality control procedures increase the confidence in the analytical results and are used to evaluate the reproducibility of the data.

The GC was calibrated prior to sample analysis using a single-point external standard calibration procedure. Known concentrations of each of the target compounds were prepared as a gas-phase standard. The USEPA recommends instrument calibration be performed at least once every 12 hours. The calibration helps to evaluate the operating conditions of the GC and to calculate compound concentrations in samples.

A chromatographic system blank is analyzed at the beginning of each survey day, prior to calibration and analyzing samples. The system blank is used as a means of indicating that sample carryover has not occurred. In addition, a system blank is analyzed after every 10 samples, or at least daily for each survey. If sample carryover has occurred, the concentration detection in the system blank can be subtracted from any subsequent samples containing that compound. A probe rod blank is analyzed prior to sample collection to ensure that the sample probe is free of contamination.

A duplicate sample analysis is performed after every 10 samples, or at least once daily for each survey. The duplicate analysis serves to demonstrate analytical reproducibility. Duplicate samples results of plus or minus 20 percent of the original sample results are considered acceptable.

A calibration check standard is analyzed periodically during the survey day. The check standard is used to validate target compound retention times and identification and to verify compound response factors. Calibration check standard concentrations results of plus or minus 20 percent of the original calibration are considered acceptable.

An internal reference peak compound α, α, α-trifluorotoluene, (α, α, α-TFT) is added to all samples to aid in target compound identification. This reference compound serves to increase the accuracy of target compound recognition and provides qualitative sample injection information. The α, α, α-TFT is used as an internal reference peak compound because of the unlikely detection of the compound in samples collected on site.

4.0 DATA INTERPRETATION

Twenty-five groundwater samples were collected from 24 probeholes and analyzed on-site for benzene, toluene, ethylbenzene, and total xylenes. Figure 2, Appendix A, shows probehole locations and detected benzene concentrations.

Based on the analytical results, the area adjacent to the railroad loading racking exhibits the highest benzene concentrations (> 500 μg/L). Probehole PH4 had the highest benzene concentration west of monitoring well WMW-2. Six probeholes east of this monitoring well also had high benzene concentrations (PH1, PH3, PH7, PH8, PH9, and PH18).

The survey results an aerial pattern which delineates the extent of hydrocarbon contamination. The analytical results show the hydrocarbon contamination is concentrated along the midsection of the railroad loading rack. Historical monitor well data also indicates (or suggests) that groundwater is flowing in a northwesterly direction. It is along this northwest direction, that the higher concentrations of benzene were detected. Figure 2 shows reported benzene concentrations.

Data obtained from this probe survey and previous groundwater investigations consistently suggest the hydrocarbon contamination is generally concentrated within the railroad loading rack area. Furthermore, the hydrocarbon plume is contained within the railroad loading rack area. Plume migration has not been observed since it was first detected in 1990 when the initial groundwater investigation was conducted.

5.0 SITE EVALUATION

Based on existing or present monitoring at the site, including current and previous groundwater investigations, the following site characteristics have been established:

- A thick clay unit with permeabilities found to be less than 10^{-7} cm/sec is present beneath the site.
- Perched aquifer conditions exist within the site perimeter due to the underlying clay unit. This unit has been detected throughout the site which directly controls the localized perched aquifer.
- There are no known or nearby receptors from this perched aquifer.
- Tight sands are prevalent in the area, resulting in minimal groundwater velocity. Based on aquifer test data for the San Andres/Glorieta, transmissivity and storage coefficient values range between ≤5 to 3,740 ft^2/day, and 7.6×10^{-5} to 1.3×10^{-4}, respectively.
- Based on the above factors, common remediation technologies are not practically or economically feasible for direct application at this site.

Analytical results for all site monitoring wells completed in the perched aquifer are provided in Tables 2 and 3, Appendix B. Regional groundwater quality data is provided in Table 4, Appendix B.

In general, collected data indicates hydrocarbon contamination is contained within the train loading rack area. The hydraulic head in the shallow aquifer indicates that the upward flow is limited and restricted by the clayey-rich intermediate unit previously identified in the 1992 Discharge Plan. Therefore, the hydrocarbon plume is not expected to migrate at any detectable rate. Furthermore, the geoprobe survey delineated the extent of contamination in the horizontal direction and established the vertical containment of the contamination by the thick clay unit.

6.0 RECOMMENDATIONS

Based on the observations and information contained in Sections 4 and 5 above, MOI recommends the following: (1) a continuation of the groundwater monitoring program with a change in sampling frequency from the current to semi-annually beginning in 1994, (2) install an additional monitoring well, and (3) initiate passive bioremediation. Each point is further described below.

6.1 Groundwater Monitoring

Currently, EPNG is monitoring the groundwater on a quarterly basis while MOI monitors on an annual basis, as required by the Discharge Plan. The contamination is isolated to the perched aquifer; therefore, a continuation of the groundwater monitoring program is proposed. The monitoring program will consist of water sample collection from WMW-1, 2, 4, and 5 on a semi-annually basis; a sample from WMW-3 will be collected annually. Sampling will include analysis for BTEX.

EPNG and MOI will each sample once per year, split samples during the first year, and share all results. Monitoring periods would take place during two critical periods in the hydrological cycle at the site, based on data collected during the current year. While EPNG will decrease its monitoring well sampling events, this proposed monitoring program will continue to fulfill requirements of the 1992 Discharge Plan.

Monitoring well WMW-4 will be observed closely since it is located downgradient of WMW-2 and is within the area of concern. If sample results for WMW-4 reveal the presence of benzene at concentrations higher than groundwater standard for two successive groundwater monitoring periods, MOI will notify and consult NMOCD for further direction.

6.2 Monitoring Well Installation

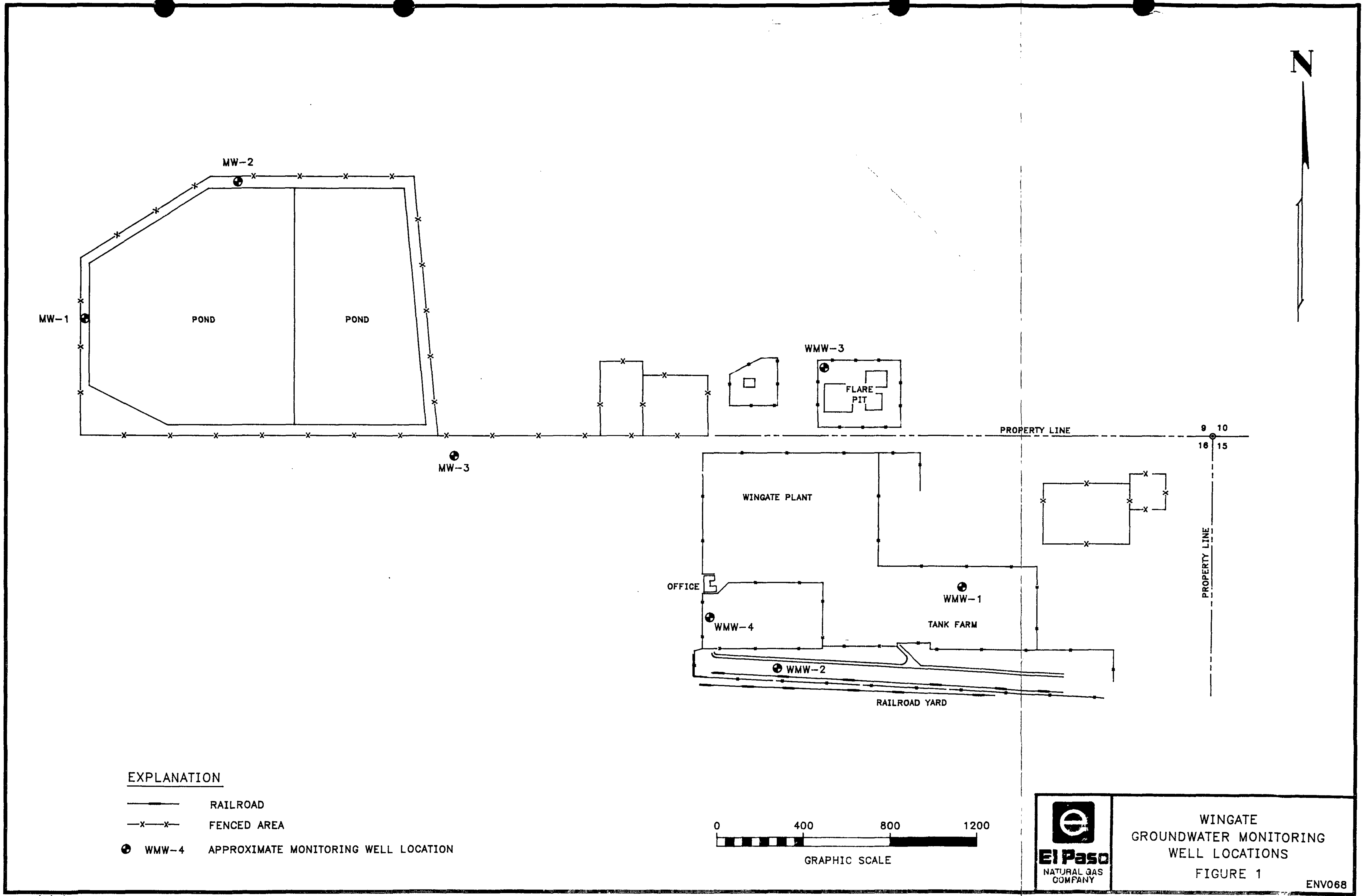
MOI proposes to install an additional monitor well. This monitor well will be number WMW-5 and will be located in a strategic region north of WMW-2 to insure proper monitoring of the plume in the groundwater gradient direction. Figure 3, Appendix A, illustrates the location of this new monitoring well. NMOCD will be notified prior to any drilling activity at the site.

6.3 Passive Bioremediation

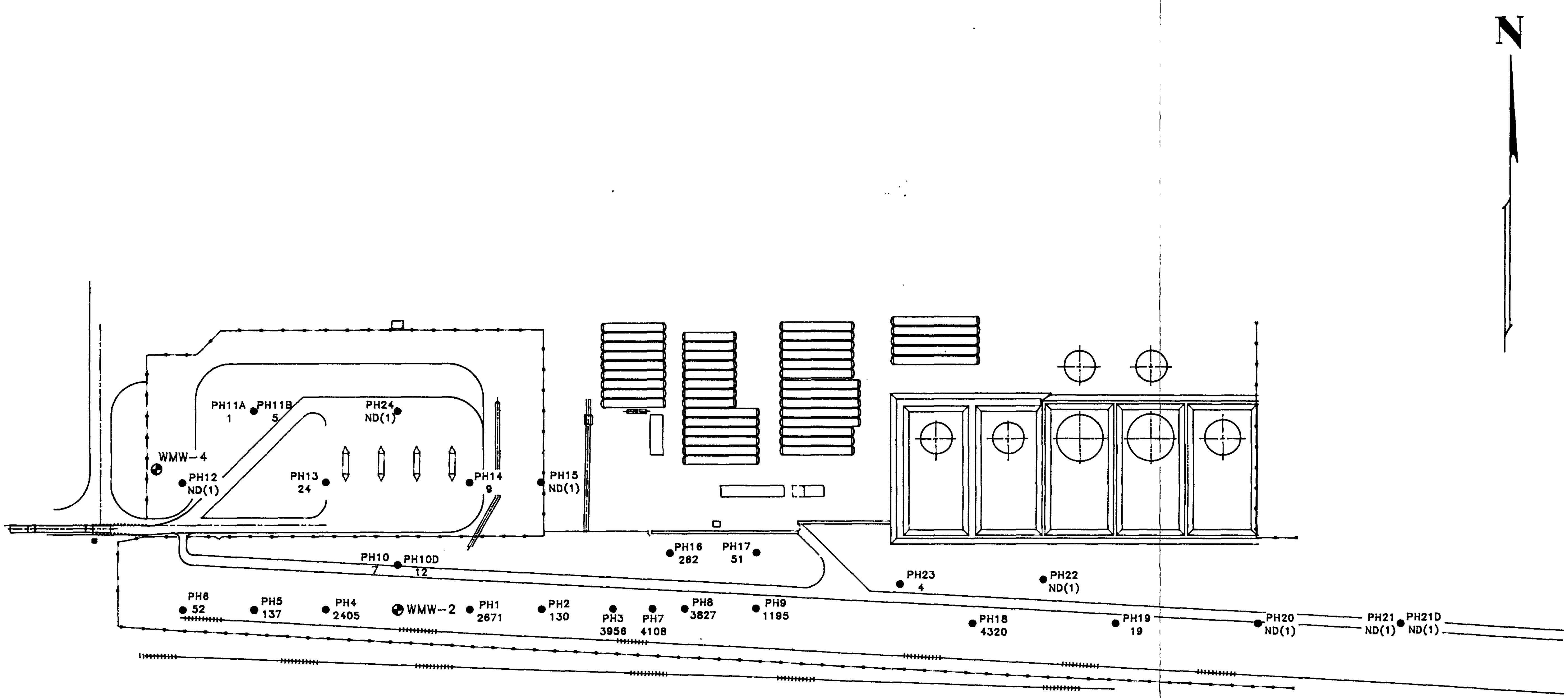
MOI will attempt passive bioremediation within the area of concern. Since groundwater is relatively shallow and hydrocarbon concentrations are relatively low, the addition of nutrients should initiate or enhance passive remediation of the contaminants in the soil above the saturated zone.

APPENDIX A

FIGURES 1, 2, AND 3


N
MW-2
MW-1
POND
POND
MW-3
WMW-3
FLARE PIT
PROPERTY LINE
9
10
16
15
WINGATE PLANT
OFFICE
WMW-1
WMW-4
TANK FARM
WMW-2
RAILROAD YARD
PROPERTY LINE
EXPLANATION
RAILROAD
FENCED AREA
WMW-4 APPROXIMATE MONITORING WELL LOCATION
0
400
800
1200
GRAPHIC SCALE
El Paso
NATURAL GAS COMPANY
WINGATE
GROUNDWATER MONITORING
WELL LOCATIONS
FIGURE 1
ENV068

FM117 (7/90)



EXPLANATION

RAILROAD

FENCED AREA

WMW-4 APPROXIMATE MONITORING WELL LOCATIONS

PH23 4 APPROXIMATE PROBE HOLE LOCATION AND BENZENE REPORTED CONCENTRATION (μg/L)

NOTE:

ND(1) NOT DETECTED AT LOWER QUANTIFIABLE LIMIT INDICATED IN PARENTHESES

0 150 300 450

GRAPHIC SCALE

El Paso NATURAL GAS COMPANY

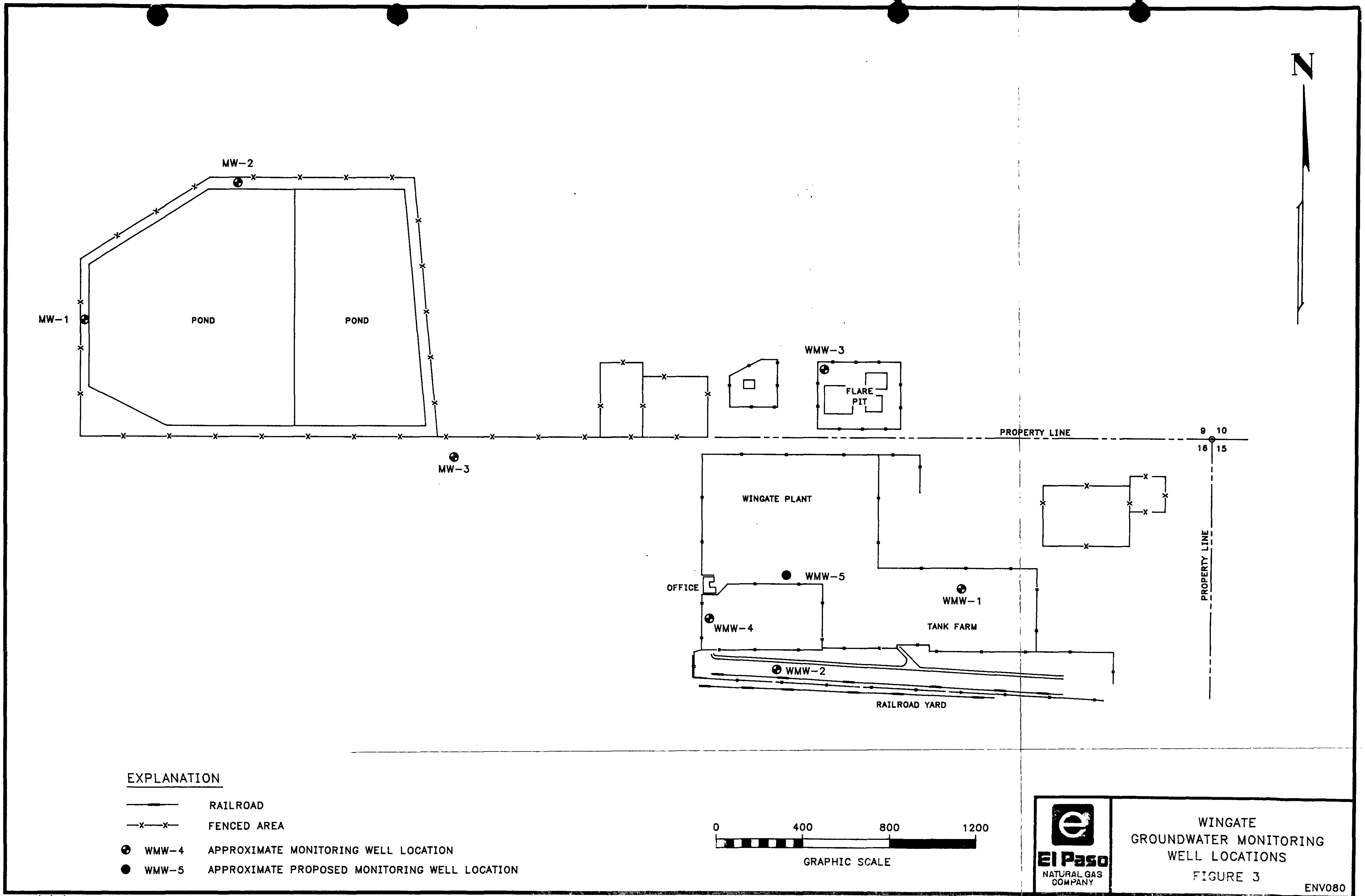
WINGATE
RAILROAD LOADING AREA
PROBE HOLE LOCATIONS

FIGURE 2

ENV069

5/26/93

FM117 (7/90)



WINGATE
GROUNDWATER MONITORING
WELL LOCATIONS
FIGURE 3

ENV080

FM117 (7/90)

APPENDIX B

TABLES 1, 2, 3, AND 4

PROBE HOLE NUMBER	GROUNDWATER SAMPLING DEPTH (FEET)	GROUND ELEVATION (FEET)	GROUNDWATER ELEVATION (FEET)	GROUNDWATER SAMPLING ELEVATION (FEET)	BENZENE ($\mu g/L$)
PH1	8	6594.00	6586.00	6586.00	2671
PH2	7	6594.59	6587.59	6587.59	130
PH3	7	6595.21	6592.96	6588.21	3956
PH4	20	6593.86	6573.86	6573.86	2405
PH5	20	6593.99	6584.82	6573.99	137
PH6	15	6593.63	6585.63	6578.63	52
PH7	7	6595.05	6592.80	6588.05	4108
PH8	7	6595.40	6588.40	6588.40	3827
PH9	7	6595.92	6588.92	6588.92	1195
PH10	7	6594.06	6590.31	6587.06	7
PH10D	7	6594.06	6590.31	6587.06	12
PH11A	20	6593.05	6590.30	6573.05	1
PH11B	7	6593.05	6590.30	6586.05	5
PH12	15	6592.54	6587.29	6577.54	ND(1)
PH13	7	6593.61	6590.11	6586.61	24
PH14	7	6594.38	6591.46	6587.38	9
PH15	7	6594.48	6591.81	6587.48	ND(1)
PH16	7	6595.09	6591.09	6588.08	262
PH17	15	6595.22	6590.22	6580.22	51
PH18	15	6596.33	6590.83	6581.33	4320
PH19	15	6597.21	6592.21	6582.21	19
PH20	15	6598.91	6584.41	6593.91	ND(1)
PH21	20	6599.23	6589.65	6579.23	ND(1)
PH21D	20	6599.23	6589.65	6579.23	ND(1)
PH22	15	6595.43	6589.51	6580.43	ND(1)
PH23	15	6595.17	6591.17	6580.17	4
PH24	7	6594.09	6589.67	6587.09	ND(1)
WMH-2	–	6593.92	–	–	–
WMH-4	–	6592.51	–	–	–

ND(1) NOT DETECTED AT LOWER QUANTIFIABLE LIMIT INDICATED IN PARENTHESES

El Paso NATURAL GAS COMPANY

WINGATE PLANT
PROBE HOLE AND
GROUNDWATER MONITORING
LOCATIONS – CHART
TABLE 1

ENV078

FM10 (Rev. 1/93)

Table 2
Evaporation Pond Monitoring Wells

		MW-1				MW-2				MW-3		
Laboratory Data	6/23/90	07/14/90	11/15/91	1/22/92	6/23/90	7/14/90	11/15/91	1/22/92	6/23/90	7/14/90	11/15/91	1/21/92
pH	8.4	8.3	8.07	8.07	8.5	8.4	7.98	8.19	8.1	7.8	7.85	7.91
TDS	490	570	838	722	1,010	1,400	1100	1220	1,350	520	486	478
Alkalinity, Total	420	444	566	510	735	281	795	772	659	419	417	411
Bicarbonate	414	444	689	622	695	271	970	939	659	419	509	502
Carbonate	6	<1	0	0	40	10	0	0	<1	<1	0	0
Calcium (Ca)	11.3	9.9	5.27	3.56	18.2	18.8	12.1	14.1	46.8	0.5	32.4	32.0
Chloride (Cl)	15.7	20.9	43	36.0	50	79	47.6	66.7	140	21.8	16	16.9
Fluoride (F)	0.83	0.97	1.82	1.45	1.49	1.77	2.95	2.87	1.32	1.09	1.00	1.01
Hardness	63.6	54.4	13.1	18.9	96.5	92.6	38.5	36.7	186	1.2	102	125
Hydroxide	<1	<1			<1	<1			<1	<1		
Iron (Fe)	0.216	1.40		5.81	3.111	2.34		16.98	0.067	0.658		0.60
Magnesium (Mg)	8.6	7.2	<0.1	2.44	12.4	11.1	2.05	0.40	16.7	<0.1	5.23	11.0
Manganese (Mn)	0.174	0.228		0.25	0.290	1.36		0.68	0.242	0.481		0.46
Nitrate (as N)	<0.06	<0.06	<0.02	<0.02	<0.06	<0.06	<0.02	<0.02	<0.06	<0.06	<0.02	<0.02
Nitrite			<0.02	<0.02			<0.02	<0.02			<0.02	<0.02
Potassium			<0.1	0.73			0.3	0.96			0.2	0.33
Silica				10.7				8.30				12.4
Sodium (Na)	172	176	328	267	362	470	445	435	445	120	162	150
Sulfate (SO4)	1.0	19	86.5	51.9	73	240	112	150	280	26	18.9	16.1
Antimony (Sb)				0.063				ND				ND
Arsenic (As)	<0.005	<0.005		0.006	<0.005	0.021		0.020	<0.005	0.007		0.009
Barium (Ba)	0.248	0.235			0.158	0.175			0.110	0.139		
Beryllium (Be)				ND				ND				ND
Cadmium (Cd)	<0.005	0.006		0.003	<0.005	0.006		0.003	<0.005	<0.005		ND
Chromium (Cr)	<0.01	<0.01		ND	<0.01	<0.01		0.03	<0.01	<0.01		ND
Copper (Cu)	<0.02	<0.02		ND	<0.02	<0.02		ND	<0.02	<0.02		ND
Lead (Pb)	0.002	<0.002		ND	<0.002	0.004		ND	0.004	<0.002		ND
Mercury (Hg)	<0.0002	<0.0002		ND	<0.0002	<0.0002		ND	<0.0002	<0.0002		ND
Nickel (Ni)				ND				ND				ND
Selenium (Se)	<0.005	<0.005		ND	<0.005	<0.005		ND	<0.005	<0.005		ND
Silver (Ag)	<0.01	<0.01		ND	<0.01	<0.01		ND	<0.01	<0.01		0.02
Thallium (Tl)				ND				ND				ND
Zinc (Zn)	<0.010	0.043		0.03	0.015	0.120		0.04	<0.010	0.094		0.03
TPH - ug/l			ND				2.6				ND	
Benzene - ug/l			ND	ND			ND	ND			0.2	ND
Toluene - ug/l			ND	ND			ND	ND			0.2	3.9
Ethylbenzene - ug/l			ND	ND			ND	ND			0.4	0.6
Total Xylenes - ug/l			ND	ND			0.1	ND			1.7	4.4

All results in mg/l unless otherwise indicated.

Table 3
Wingate Plant Monitoring Wells

Laboratory Data	WMH-1				WMH-2							
	7/17/80	7/10/91	10/28/91	1/21/92	7/17/80	7/10/91	8/1/91	10/28/91	11/1/90	12/4/91	12/31/91	1/21/92
pH	7.9	7.38	7.84	7.70	7.6	7.83		8.34		7.87	8.03	8.03
TDS	780	4,270	3,490	4,620	1,200	4,280	3,050	3,370	3,060	3,060	2,640	2,230
Bicarbonate		1,230	1,110	1,340		2,610		2,090		1,770	1,590	1,450
Calcium (Ca)		242	230	286		82		63.6		49.2	42.4	42.4
Carbonate		0	0			0	732	19.5		0	0	0
Chloride (Cl)	38	467	425	593	38	1110		842	714	714	623	522
Fluoride (F)	1.3	0.65	0.46	0.43	1.4	1.36		1.5		1.84	1.79	1.63
Hardness		848	804	1000		408		191		205	187	188
Hydroxide												
Iron (Fe)	5.2				2							
Magnesium (Mg)		59.5	56	70.2		49.5		7.91		20.1	19.8	19.9
Manganese (Mn)	0.24				0.19							
Nitrate (as N)	<0.01	<0.04	<0.02	<0.02	<0.01	0.12		<0.02		3.45	<0.02	<0.02
Nitrite		<0.04	<0.02	<0.02				<0.02		<0.02	<0.02	<0.02
Potassium (K)		1150	2.9	2.56		2.02		0.5		0.98	0.61	0.08
Silica												
Sodium (Na)		1,150	1,010	1,300		1,600		1,300		1,020	964	828
Sulfate (SO4)		1,690	1,400	1,840		34.6		49.4		9.88	16.9	14.8
Total Organic N	0.07				1.8							
Aluminum (Al)	0.7				0.9							
Antimony (Sb)		ND										
Arsenic (As)	<0.005	0.008			<0.005	0.01						
Barium (Ba)	0.29				0.14							
Beryllium (Be)		ND				ND						
Cadmium (Cd)	<0.01	0.002			<0.01	ND						
Chromium (Cr)	<0.02	0.02			<0.02	ND						
Cobalt (Co)	<0.05				<0.05							
Copper (Cu)	0.01	0.02			0.02	0.01						
Cyanide	<0.005				<0.005							
Lead (Pb)	<0.05	0.02			<0.05	0.02						
Mercury (Hg)	<0.005	ND			<0.005	ND						
Molybdenum (Mo)	<0.05				<0.05							
Nickel (Ni)	<0.04	0.03			<0.04	0.01						
Selenium (Se)	0.005	ND			<0.005	ND						

Table 3
(continued)

Laboratory Data	WMH-1				WMH-2							
	7/17/90	7/10/91	10/28/91	1/21/92	7/17/90	7/10/91	9/1/91	10/28/91	11/1/90	12/4/91	12/31/91	1/21/92
Silver (Ag)	<0.01	ND			<0.01	ND						
Thallium (Tl)		ND				ND						
Zinc (Zn)	0.01	0.14			0.05	0.14						
TPH - ug/l		9.5	ND			191,000	38,500	4,000	6,800	6.800	18,460	
Benzene - ug/l		ND	ND	ND		26,800	5,400	5,700	2,520	2,520	2,540	3,090
Ethylbenzene - ug/l		ND	ND	1.3		ND		164	990	990	2,090	129
Toluene - ug/l		ND	ND	8.2		6,800	5,400	5,300	1,610	1,610	1,600	1,320
Total Xylenes - ug/l		ND	ND	7.9		1,145	1,127	1,067		374	1,900	1 020

All results in mg/l unless otherwise indicated.

Table 3
(continued)

Laboratory Data	WMH-3				WMH-4		
	7/17/90	7/10/91	10/28/91	1/22/92	7/10/91	10/28/91	1/21/92
pH	7.3	7.79	8.08	8.37	7.81	8.82	8.06
TDS	540	3,800	6,570	5,930	1,780	1,780	1,750
Bicarbonate		720	1,350	1,260	1,000	1,060	921
Calcium (Ca)		120	236	163	25.2	61.5	19.4
Carbonate		0	0	13.8	0	65.7	0
Chloride (Cl)	23	693	1210	1050	125	157	125
Fluoride (F)	1.2	0.65	0.81	0.86	1.36	1.63	1.51
Hardness		460	732	634	125	278	100
Hydroxide							
Iron (Fe)	1.4						
Magnesium (Mg)		39.1	35	55.4	15.1	30.3	12.6
Manganese (Mn)	0.38						
Nitrate (as N)	<0.1	10.3	6.66	3.56	<0.04	<0.02	2.36
Nitrite			<0.02		<0.04	<0.02	
Potassium (K)		15	2.9	1.91	2.95	1.2	0.36
Silica							16.7
Sodium (Na)		1170	2140	1880	638	640	622
Sulfate (SO4)		1450	2520	2170	548	519	492
Total Organic N	<0.3						
Aluminum (Al)	0.5						
Antimony (Sb)		ND			ND		
Arsenic (As)	<0.005	0.013			0.010		
Barium (Ba)	0.12						
Beryllium (Be)		0.006			ND		
Cadmium (Cd)	<0.01	ND			ND		
Chromium (Cr)	<0.02	0.03			ND		
Cobalt (Co)	<0.05						
Copper (Cu)	<0.01	0.02			0.01		
Cyanide	<0.005						
Lead (Pb)	<0.05	0.03			ND		
Mercury (Hg)	<0.005	ND			ND		
Molybdenum (Mo)	<0.05						
Nickel (Ni)	<0.04	0.04			0.01		
Selenium (Se)	<0.005	ND			ND		
Silver (Ag)	<0.01	ND			ND		

Table 3
(continued)

Laboratory Data	WMH-3				WMH-4		
	7/17/90	7/10/91	10/28/91	1/22/92	7/10/91	10/28/91	1/21/92
Thallium (Tl)		ND			ND		
Zinc (Zn)	0.05	0.15			0.06		
TPH - ug/l		7.8	ND		14.7	ND	
Benzene - ug/l		ND	3.1	44.3	ND	1.3	19
Ethylbenzene - ug/l		ND	ND	1.3	ND	ND	11
Toluene - ug/l		ND	ND	18.3	ND	ND	40
Total Xylenes - ug/l		ND	ND	7.7	ND	ND	51

All results in mg/l unless otherwise indicated.

Table 4
Regional Groundwater Quality Data

Constituent	WELL #3 (ON SITE) T15N 417W S16 NE/NE/NE 04/09/76	WELL #3 (ON SITE) T15N R 17W S16 NE/NE/NE 04/04/89	WELL #4 (ON SITE) T15N R 17W S16 NE/NE/NE 04/14/89	WELL #6 (OFF SITE) T15N R16W S20 SE/SE/NE 04/04/89	WELL #7 (OFF SITE) T15N R16W S20 NW/SE/NE 04/09/89	WELL #7 (OFF SITE) T15N R16W S20 NW/SE/NE 04/14/89
pH	8.2	7.7	7.7	7.8	7.75	7.6
Alkalinity, Total	174	202	191	164	166	166
Calcium	62	40	107	156	344	154
Chloride	64	34	16	17	14	16
Fluoride	–	0.39	0.24	0.23	–	0.23
Hardness, Total	118	190	420	628	680	710
Iron, Dissolved	–	0.15	0.13	0.12	–	0.1
Iron, Total	–	0.37	7.9*	0.35	–	0.15
Magnesium	56	22	37	58	336	79
Maganese, Dissolved	–	0.12	0.16	0.14	–	0.14
Manganese, Total	–	0.17	0.22	0.17	–	0.17
Nitrate (as NO3)	–	<0.1	<0.1	<0.1	–	<0.1
Nitrate (as NO2)	–	0.03	0.06	0.02	–	0.03
Potassium	–	5.1	6.7	5.2	–	5.4
Silica	–	9.4	8.2	7.1	–	7.1
Sodium	–	237	82	75	–	39
Specific Conductance (umhos)	1360	1215	1171	1199	1340	1173
Sulfate	502	478	410	614	679	618
Total Dissolved Solids	888	932	944	1058	1135	921
Turbidity	9.2	–	–	–	4.4	–
BOD		<1	<1	<1	–	<1
COD		<1	<1	<1	–	<1
Ammonia Nitrogen (as NH4)		0.35	0.25	0.29	–	0.13
TOC		0.67	0.62	1.09	–	0.68

Units expressed in mg/l

APPENDIX C

ANALYTICAL RESULTS

Analytical Results

Meridian Oil Inc. - Wingate Plant
Gallup , New Mexico

April 6 - 7, 1993

Sample I.D.	Probe Hole Number	Depth (feet)	Concentration (µg/L)				Comments
			Benzene	Toluene	Ethylbenzene	Total Xylenes	
Blank-01	NA	NA	ND (1)	ND (1)	ND (1)	ND (1)	QC-System Blank
Blank-02	NA	NA	ND (1)	ND (1)	ND (1)	ND (1)	QC-Reagent Blank
GW-01	PH-1	8	2671	ND (1)	6	8	Groundwater
GW-02	PH-2	7	130	ND (1)	2	8	Groundwater
GW-03	PH-3	7	3956	20	26	64	Groundwater
GW-04	PH-4	20	2405	7	33	204	Groundwater
GW-05	PH-5	20	137	6	14	18	Groundwater
GW-06	PH-6	15	52	ND (1)	1	3	Groundwater
GW-07	PH-7	7	4108	4478	116	981	Groundwater
GW-08	PH-8	7	3827	12	86	488	Groundwater
GW-09	PH-9	7	1195	ND (1)	1	4	Groundwater
GW-10	PH-10	7	7	ND (1)	ND (1)	ND (1)	Groundwater
GW-10D	PH-10	7	12	ND (1)	3	3	QC-Duplicate
Blank-03	NA	NA	ND (1)	ND (1)	ND (1)	ND (1)	QC-System Blank
GW-11	PH-11	20	1	1	ND (1)	1	Groundwater
GW-12	PH-11	7	5	ND (1)	ND (1)	ND (1)	Groundwater

D duplicate analysis
ND not detected at lower quantifiable limit indicated in parentheses
QC quality control
µg/L micrograms per Liter of headspace vapor analyzed

MERIDIAN OIL

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SEP 29 1993

OIL CONSERVATION DIV.
SANTA FE

September 27, 1993

Federal Express

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

Re: Discharge Plan GW-54
Wingate Fractionating Plant - Flare Pit Closure

On August 17, 1992, the OCD approved the referenced plan. Closure of an abandoned flare pit was a condition of discharge plan approval. Pursuant to the closure requirement Meridian Oil Inc. (MOI) intends to close the abandoned flare pit.

MOI proposes to close the flare pit following OCD "Unlined Surface Impoundment Closure Guidelines". A site assessment has been conducted. Contamination is minor with TPH generally below 2,000 ppm and BTEX generally less than 100 (PID readings). Contaminated soils have been excavated from the pit. The target cleanup criteria used for this project was 100 ppm TPH and 10 ppm BTEX (100 ppm PID reading). Soil and water sampling procedures followed OCD recommendations described in Section 3 of referenced guidelines. In addition, MOI used a field TPH sampling method to assist in directing excavation. The field methodology conforms to EPA SW-846 Method 4030 for screening for petroleum hydrocarbons.

Remediation efforts were managed according to criteria described in Section 4 of the referenced guidelines. Excavated materials will be landfarmed in a one-time application on location. The location is secured by a fence and locked gate and the landfarmed media will be bermed. Treatment will be consistent with OCD guidelines.

The landfarm will be operated until contaminated soils meet recommended soil remediation levels. A closure report will be submitted upon termination of remediation activities.

On September 23, 1993 Denny Foust visited the flare pit. Mr. Foust requested that a berm be constructed around the contaminated media to be landfarmed. Mr. Foust also requested that a ground water sample (if ground water becomes apparent in the excavation) be collected and analyzed for hydrocarbon contamination. Both requests have been incorporated into the site work plan and analytical results will be reported in the closure report.

If you have any questions please call me at (505) 326-9841.

Sincerely,

Michael J. Frampton
Sr. Staff Environmental Representative

cc: Denny Foust - OCD, Aztec, N.M.
Wingate Plant Discharge Plan: Correspondence
Greg Kardos - MOI

mjf/sn/winggw54

MERIDIAN OIL

September 27, 1993

Federal Express

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

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OIL CONSERV
SANTA F

Re: Discharge Plan GW-54
Wingate Fractionating Plant
Fire Training Pit Closure

Dear Mr. Olsen:

On August 17, 1992 the OCD approved the referenced plan. Closure of an abandoned fire training pit was a condition of discharge plan approval. Pursuant to the closure requirement, Meridian Oil Inc. (MOI) intends to close the abandoned fire training pit.

MOI proposes to close the fire training pit following OCD "Unlined Surface Impoundment Closure Guidelines" (February 1993). A preliminary site assessment has been conducted at the fire training pit. Contamination appears to be minor with TPH generally below 2,000 ppm and BTEX generally less than 100 ppm (headspace analysis using PID organic vapor meter). Soil sampling procedures have followed OCD recommendations described in Section 3 of the guidelines. In addition, MOI has used a field TPH analysis method to evaluate contamination levels. The field methodology conforms to EPA SW-846 method 4030 for screening for petroleum hydrocarbons.

MOI intends to conduct additional sampling at this site in order to determine specific remedial actions. Since the petroleum contaminated soil at this site is not RCRA exempt, characterization testing is planned in order to determine RCRA status. Should the soil exceed RCRA criteria, the remediation and disposal will conform to EPA/ED requirements. Should the soil test RCRA nonhazardous, MOI proposes to remediate the soil using an onsite landfarm, in accordance with Section 4 of OCD's guidelines. The landfarm will be operated in a bermed area adjacent to the pit, until the contaminated soils meet recommended soil remediation levels. A closure report will be submitted upon termination of remediation activities.

If you have any questions please call me at 326-9841.

Sincerely,

Michael J. Frampton
Sr. Staff Environmental Representative

cc: Denny Foust - OCD Aztec
Greg Kardos - MOI
Wingate Plant Discharge Plan: Correspondence

mjf/sn/wngw53fr

10:00 am 6/28/93

OCD/Meridian/EPNG meeting on Wingate Gas Plant

Bill Olson - OCD
Mike Frampton - Meridian
Phil Baca - EPNG
Richard Duarte "
Roger Anderson - OCD

24 probe holes around rail loading area
25 samples taken (water)
contamination localized around loading area

recommendation by EPNG & Meridian

- monitoring of water quality thru 1993 quarterly
  in 1994 semiannually

- install additional MW
- If standards continue to be exceed will consult with OCD
- Nutrient addition to promote biodegradation of contam.
  in soil & water

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☑ Telephone ☐ Personal	Time 1445	Date

Originating Party	Other Parties
Mike Frampton – Meridian	Bill Olson – Envir. Bureau

Subject

Meridian Wingate Ground Water Investigation

Discussion

G.W. investigation activities to begin on 4/6 – 4/7

Requested use of bentonite as a seal for hydropunch holes instead of grout

Conclusions or Agreements

Bentonite use O/K

Distribution
File

Signed Bill Olson

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

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

January 14, 1993

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-242-318

Michael J. Frampton
Meridian Oil, Inc.
P.O. Box 4289
Farmington, New Mexico 87499-4289

**RE: GROUND WATER CONTAMINATION INVESTIGATION PROPOSAL
MERIDIAN OIL WINGATE PLANT
MCKINLEY COUNTY, NEW MEXICO**

Dear Mr. Frampton:

The New Mexico Oil Conservation Division (OCD) has completed a review of the Meridian Oil, Inc. (MOI) December 10, 1992 "GROUNDWATER ASSESSMENT WINGATE PLANT WORK PLAN".

The OCD approves of the above referenced work plan with the following conditions:

1. Upon completion of sampling activities, all boreholes will be sealed with a bentonite grout.

2. A report containing the results of the investigation will be submitted to OCD within 60 days of completion of the water quality sampling.

The OCD understands that investigation work at the site will begin in the spring of 1993. Please contact the OCD at least one week prior to commencement of work so that the OCD may have the opportunity to have a representative present to split samples.

Please be advised that OCD approval does not limit you to the work proposed should the investigation fail to completely define the extent of contamination related to operation of the Wingate

Plant. In addition, OCD approval does not relieve you of liability for compliance with any other laws and/or regulations.

If you have any questions, please call me at (505) 827-5885.

Sincerely,

William C. Olson

William C. Olson
Hydrogeologist
Environmental Bureau

xc: Denny Foust, OCD Aztec Office

MERIDIAN OIL

December 10, 1992

Certified Mail - P 794 519 392

Roger Anderson
New Mexico Oil Conservation Division
P.O. Box 2088
State Land Office Building
Santa Fe, New Mexico 87504

RE: Discharge Plan GW-54
Ground Water Contamination Investigation Proposal

Dear Mr. Anderson:

Pursuant to your Department's letter dated August 17, 1992 Meridian Oil Inc. (MOI) is submitting the requested investigation proposal for the contaminants described in Discharge Plan GW-54.

MOI and El Paso Natural Gas Company (EPNG) will be jointly conducting this investigation. EPNG will be primarily responsible for the field investigation while MOI will remain the point of contact with the NMOCD. MOI requests that all correspondence and questions concerning this plan and its implementation be directed to MOI.

I look forward to receiving your comments on the proposed investigation plan. I will be out of the office from December 14 through December 25, 1992. If you have any questions, please call me at your convenience at (505) 326-9841.

Sincerely,

Michael J. Frampton
Sr. Staff Environmental Representative

Attachment - 5 pages Ground Water Assessment Work Plan

xc: Pamela K. Kirschner - EPNG
G.C. Kardos - MOI
Wingate Discharge Plan: Correspondence

MJF/vka:gwater

GROUNDWATER ASSESSMENT
WINGATE PLANT
WORK PLAN

I. BACKGROUND

The Wingate Plant is currently owned and operated by Meridian Oil Production, Inc., (MOPI). The plant was contructed by El Paso Natural Gas (EPNG) in 1953, and operated by them until 1990. The facility is located approximately six miles east of Gallup, New Mexico on U.S. Highway No. 66., in McKinley County, New Mexico. The facility fractionates mixed liquified petroleum products.

Two groundwater investigations were conducted in 1990. Three monitoring wells (MW series) were installed by EPNG in July, 1990 to provide hydrogeologic information around the existing ponds. In August, 1990 four wells (WMW series) and 9 boreholes were installed as part of a property transfer assessment by John Mathes & Associates.

During the property transfer assessment hydrocarbon contamination was identified in the groundwater in the train loading rack area. This contamination is possibly related to historic accidental release of hydrocarbons when the facility was owned and operated by EPNG. The extent of contamination is unknown at this time.

MOPI and EPNG have conducted periodic sampling events of all groundwater monitoring wells since 1990. Attached is a summary table of groundwater data acquired during 1991 and 1992 at this facility.

MOPI submitted a Discharge Plan to New Mexico Oil Conservation Division (NMOCD) in April 1992. The plan was approved in August 1992, with the provision that MOPI submit a plan to delineate the extent of groundwater contamination at the loading rack. Pursuant to a letter agreement between MOPI and EPNG, EPNG proposes to perform a groundwater survey to investigate the extent of this contamination.

II. EXTENT OF CONTAMINATION

The presence of BTEX has consistently been detected in WMW-02, (Figure A) with levels exceeding New Mexico WQCC standards. WMW-02 is the closest to the loading rack, and has a total depth of 24 feet. During drilling operations in 1990, hydrocarbon odor and/or discolored soil were identified between 3 to 24 feet in WMW-02. Groundwater was first encountered at a depth of 13 feet. Plastic clay was encountered from 5 to 20 feet. In borehole B-03, which is approximately 300 feet east of WMW-02, hydrocarbon odors were identified at a depth of 3 feet. Plastic clay was also encountered from 4 to 17 feet in this boring. Groundwater was encountered at a depth of 11 feet.

In other boreholes adjacent to the loading rack, no hydrocarbon contamination was encountered. In borehole B-06, 700 feet down gradient of WMW-02, no hydrocarbon odors were identified. Clay was encountered from the surface to a depth of 10 feet and again at a depth of 17 feet. A gravelly sand was encountered at an interval of 10 to 17 feet. Groundwater was first encountered at 11 feet.

No hydrocarbon odor or stain was encountered in bore hole 13, which is 350 feet down gradient from the loading rack. Because of its location downgradient of WMW-2, this boring hole was completed as WMW-4. This monitor well is 20 feet deep; sandy clay was encountered in the boring up to 15 feet, and fine sand was encountered between 15 and 20 feet. Groundwater samples obtained from this well have reported BTEX levels below WQCC standards.

MOPI reported trace levels of BTEX below WQCC standards in MW-03, 1800 feet down gradient from the loading rack in November 1991 and January 1992. EPNG samples in April 1992 show less than 1 mg/L for each BTEX component.

III. INVESTIGATIVE SURVEY

To determine the horizontal boundaries of the contamination around WMW-2, a preliminary survey using a "Geoprobe"-type instrument is proposed. This investigative equipment includes a hydraulic probe unit mounted on the back of a van. Groundwater samples will be collected and analyzed using a laboratory quality gas chromatograph within the van. This GC can be set to analyze individual and total BTEX and individual and total volatile components. The detection limit will be 5 ppb of benzene. From the information gathered on detected hydrocarbons, a horizontal area of contamination will be determined. This information will be used to evaluate the need for future work.

IV. *SAMPLE FREQUENCY*

It is proposed that a rectangular sample grid be established with probe holes taken at 100 feet intervals near the train rack (see Figure B). Groundwater samples will be collected from the saturated zone. Borings will be advanced until the sample collected is determined to be below 5 ppb benzene, or until refusal. If a boring has a non-detect reading, another sample will be taken halfway between (50 feet) from the last positive detection and the non-detect boring. This will be done to have a better understanding of the boundary perimeter.

The present WMW-02 will be the starting point. We propose to move north, east and west from this well. Additionally, there will be an attempt to take a sample upgradient of WMW-2 on the south side of the loading rack. There may be difficulty in positioning the equipment in this area because of soil conditions which worsen with inclement weather.

V. SPECIFICATIONS

Listed below are some specifications which will be included in any bid package presented on this project:

1. When a borehole has been sampled and water level measurements completed, it shall be backfilled with proper filling material to the surface of the hole. No borehole shall be left unfilled overnight.

2. The mobile unit should consist of a mounted probe for soil probing, equipped with accessories for groundwater sampling and power supply.

3. The mobile laboratory should be equipped to perform headspace analysis on

groundwater samples. Concentrations should be able to be detected in the ppb range.

4. The contractor shall at all times prevent the contamination or cross-contamination of all borehole locations. Proper clothing shall consist of appropriate outerwear, and latex, vinyl, or PVC gloves. Protocol procedures for sampling and analyses shall be followed throughout field activities. Gloves shall be changed between borehole locations. Clean, new gloves shall be worn when sampling and analyzing soil and groundwater samples.

5. The contractor will be obligated to provide contractor's personnel with adequate safety equipment including hardhat, safety shoes, safety eyewear, and items the contractor deems appropriate to insure safe working conditions.

VI. SCHEDULE

Work will proceed within 90 days of acceptance of this plan, subject to contractor availability and adequate weather conditions. It is anticipated that this sampling event will be conducted in the first quarter of 1993.

Figure A
Wingate Plant - Borehole and Monitor Well Locations

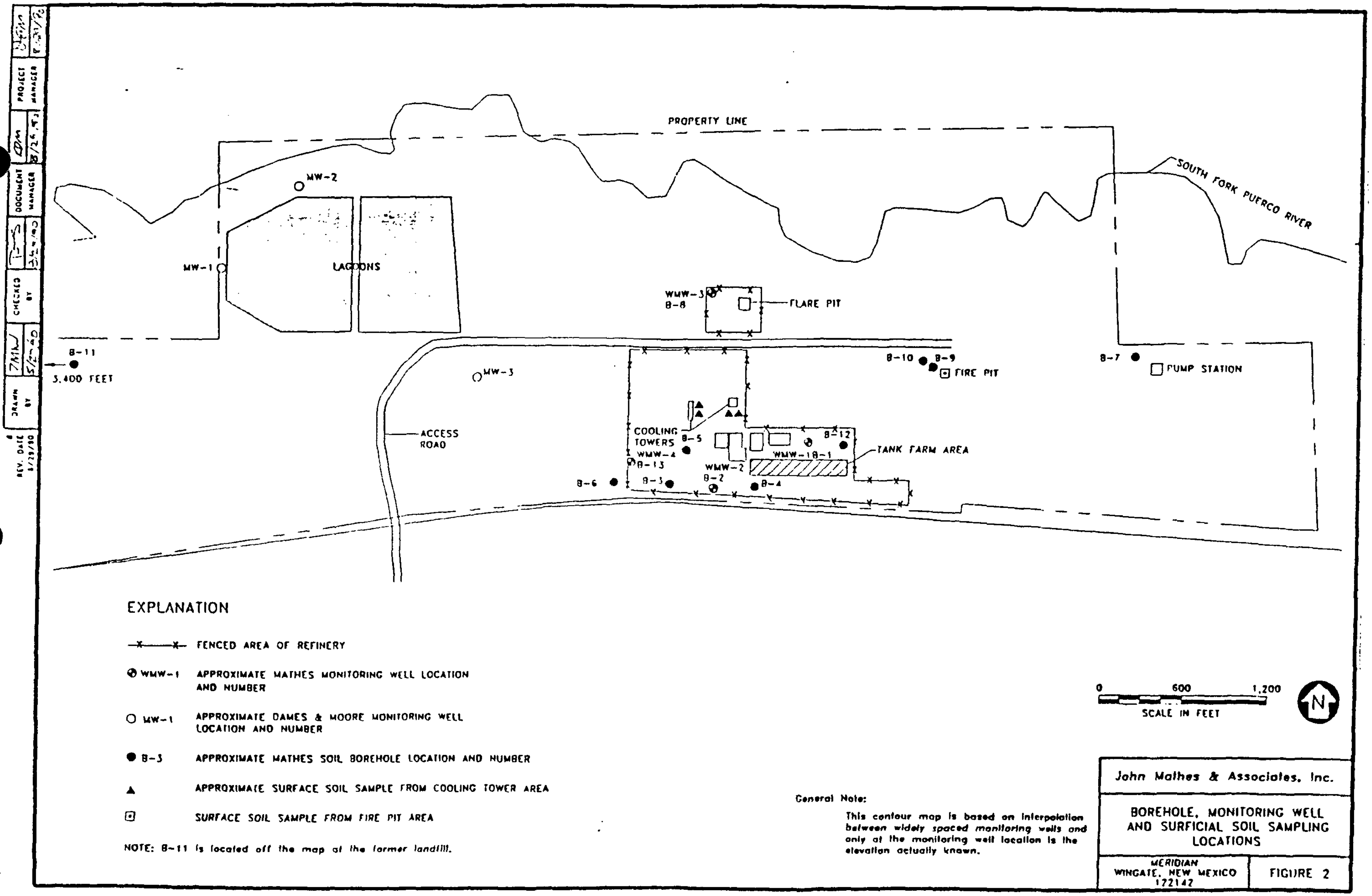
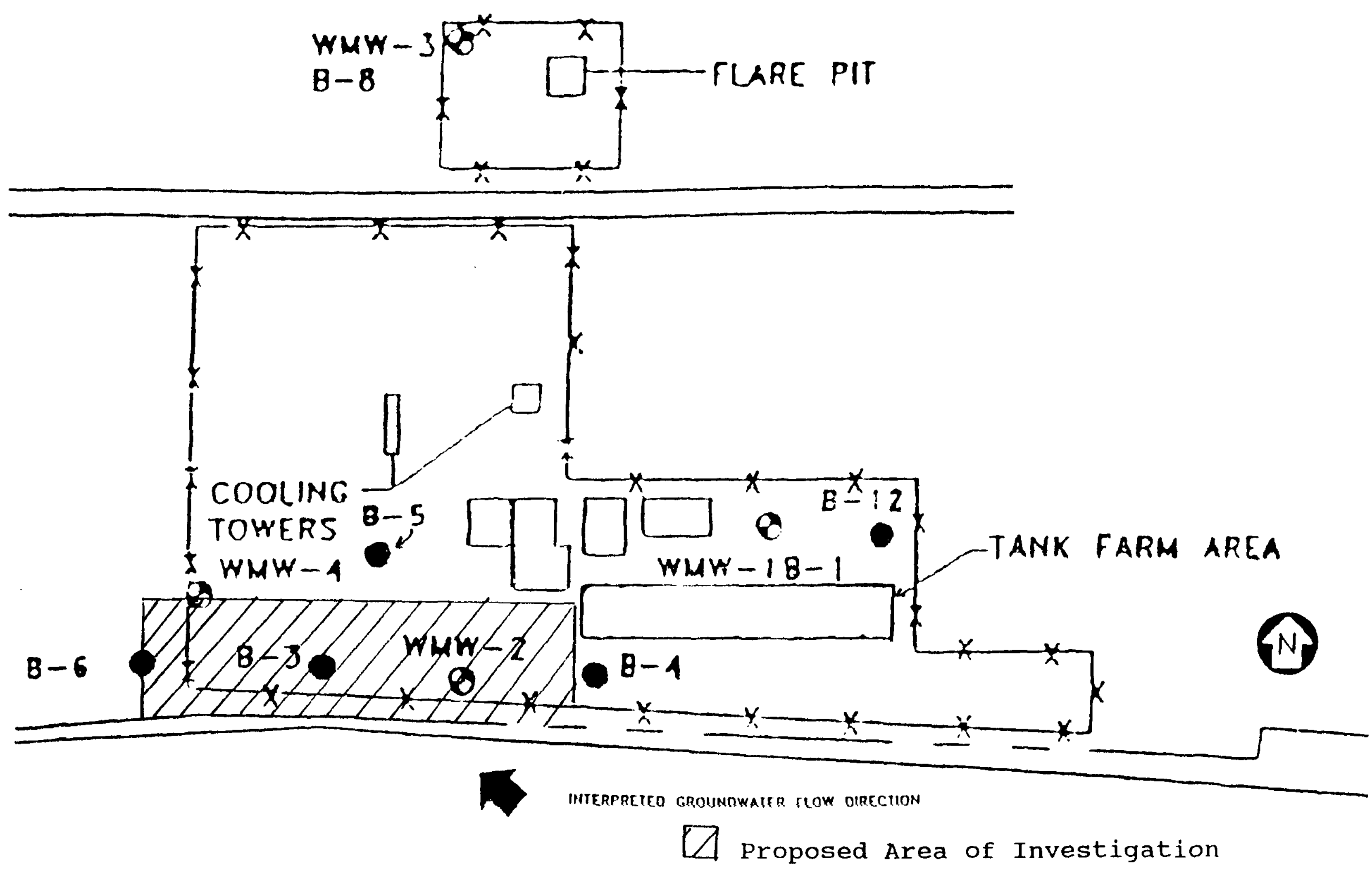


Figure B
Wingate Plant - Proposed Area of Investigation



Wingate Monitoring Well Summary

Well No.	Sampled By	Benzene	Toluene	Ethyl benzene	Total Xylenes	Gasoline	TPH
Standard		10	750	750	620		
MCLs		5 µg/L	1000 µg/L	700 µg/L	10000 µg/L		µg/L
MW-1							
11/15/91	Mer.	ND	ND	ND	ND	-	ND
1/22/92	Mer.	ND	ND	ND	ND	-	-
1/22/92	EPNG	<.5	<.5	<.5	<.5	-	-
4/28/92	EPNG	<1	<1	<1	<1	<100	-
MW-2							
11/15/91	Mer.	ND	ND	ND	0.1	-	2.6
1/22/92	Mer.	ND	ND	ND	ND	-	-
1/22/92	EPNG	<.5		<.5	<.5	-	-
4/28/92	EPNG	<1	<1	<1	<1	<100	-
MW-3							
11/15/91	Mer.	0.2	0.2	0.4	1.7	ND	-
1/21/92	Mer.	ND	3.9	0.6	4.4	-	-
Jan 92	EPNG	-	-	-	-	-	-
4/28/92	EPNG	<1	<1	<1	<1	<100	-
WMW-1							
7/10/91	Mer.	ND	ND	ND	ND	-	9.5
10/28/91	Mer.	ND	ND	ND	ND	-	ND
1/21/92	Mer.	ND	1.3	8.2	7.9	-	-
2/5/92	EPNG	<.5	<.5	<.5	<.5	-	-
4/29/92	EPNG	<1	<1	<1	<1	<100	-
WMW-2							
7/10/91	Mer.	26800	6800	ND	1145	-	191000
9/1/91	Mer.	5400	-	5400	1127	-	36500
10/28/91	Mer.	5700	5300	164	1067	-	4000
11/1/91	Mer.	2520	1610	990	-	-	6800
12/4/91	Mer.	2520	1610	990	374	-	6800
12/31/91	Mer.	2540	1600	2090	1900	-	18460
1/21/92	EPNG	3090	1320	129	1020	-	-
2/6/92	EPNG	30000	6000	<500	<500	-	-
4/29/92	EPNG	3700	2300	73	510	30000	-
WMW-3							
7/10/91	Mer.	ND	ND	ND	ND	-	7.8
10/28/91	Mer.	3.1	ND	ND	ND	-	ND
1/22/92	Mer.	44.3	18.3	1.3	7.7	-	-
1/22/92	EPNG	1.2	<.5	<.5	<.5	-	-
4/29/92	EPNG	<1	<1	<1	<1	<100	-

WMW-4

7/10/91	Mer.	ND	ND	ND	ND	–	14.7
10/28/91	Mer.	1.3	ND	ND	ND	–	ND
1/21/92	Mer.	1.9	4	1.1	5.1	–	–
2/6/92	EPNG	0.7	<.5	<.5	<.5	–	–
4/29/92	EPNG	3	<1	<1	<1	<100	–

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Certified Mail - P 794 519 874

Roger Anderson
New Mexico Oil Conservation Division
P.O. Box 2088
State Land Office Building
Santa Fe, New Mexico 87504

RE: Discharge Plan GW-54
Modifications and Closure Schedule

Dear Mr. Anderson:

Listed below is Meridian Oil's proposed compliance schedule for the modifications and closures described in Section 6.0 of the referenced plan and your Department's letter dated August 17, 1992 (William J. LeMay).

Requirement	Start Date	Comments
Fee	10-15-92	$3335
Sump Inspection	July 1993	Clean & visually inspect - annual
Leak Detection	Not Applicable	
Drum Storage	July 1993	Curb
Flare Pit	July 1993	Closure
Fire Training Grounds	July 1993	Closure
NPDES Stormwater	10-01-92/04-01-93/10-01-93	Copies of to OCD
Annual Monitoring	January 1993	GWC, Metals, BTEX
Fuel Storage Upgrade	July 1993	Containment dikes & pans in storage areas
Acid Storage Upgrade	July 1993	Cement line basin
Septic reconfigure	December 1992	Install storage vessel
GW Contamination		Investigation plan by 12/18/92

If you have any comments or questions please call me at 326-9841.

Sincerely,

Michael J. Frampton
Sr. Staff Environmental Representative

cc: Wingate Plant Discharge Plan : Correspondence

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Certified Mail - P 794 519 870

August 27, 1992

Roger Anderson
New Mexico Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504

RE: Hydrotest Water Disposal
Wingate Fractionating Plant
Discharge Plan GW-54

Dear Mr. Anderson:

Meridian Oil (MOI) will shut down the referenced facility on September 13, 1992 to perform annual maintenance and to replace several existing pipelines. MOI will hydrotest the new pipelines with fresh water originating from our four fresh water supply groundwater wells. Hydrotest activities will generate approximately 4,500 gallons of hydrotest water. MOI proposes to dispose of this hydrotest water in the evaporation ponds described in the referenced discharge plan. Only minor levels of contaminants will be added to the fresh water from the hydrotest of the new pipe. MOI believes these minor contaminants will not compromise the operation or integrity of the evaporation ponds. With this letter, MOI requests your approval for the proposed disposal. With your approval MOI will dispose of the water around the 15th of September.

Thank you for your consideration of this request. If you have any questions, please call me at 326-9841.

Sincerely,

Michael J. Frampton
Sr. Staff Environmental Representative

Verbal approval 9/1/92 RA

MJF/vka:hydrotst

Meridian Oil Inc., 3535 East 30th St., P.O. Box 4289, Farmington, New Mexico 87499-4289, Telephone 505-326-9700

Affidavit of Publication

STATE OF NEW MEXICO
) SS
COUNTY OF McKINLEY

VALERIE De La O being duly sworn upon oath, deposes and says:

As LEGAL CLERK of The Independent, a newspaper published in and having a general circulation in McKinley County, New Mexico and in the City of Gallup, New Mexico and having a general circulation in Cibola County, New Mexico and in the City of Grants, New Mexico and having a general circulation in Apache County, Arizona and in the City of St. Johns and in the City of Window Rock, Arizona therein: that this affiant makes this affidavit based upon personal knowledge of the facts herein sworn to. That the publication, a copy of which is hereto attached was published in said newspaper during the period and time of publication and said notice was published in the newspaper proper, and not in a supplement thereof,

for ONE TIME, the first publication being on the 24TH day of APRIL, 1992 the second publication being on the ______ day of ______, 19___ the third publication on the ______ day of ______, 19___

and the last publication being on the ______ day of ______, 19___.

That such newspaper, in which such notice or advertisement was published, is now and has been at all times material hereto, duly qualified for such purpose, and to publish legal notices and advertisements within the meaning of Chapter 12, of the statutes of the State of New Mexico, 1941 compilation.

Valerie De La O

Affiant.

Sworn and subscribed to before me this 23RD day of JUNE, A.D., 1992.

Diane Chavez

Notary Public

My commission expires

JUNE 22, 1993

LEGAL NOTICE
SANTA FE, SANTA FE COUNTY
NEW MEXICO

NOTICE OF PUBLICATION

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

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

(GW-33) - Western Gas Resources, Inc., Shauna Doven, Environmental Coordinator, 12200 N. Pecos Street, Suite 230, Denver, Colorado 80234-3439, has submitted a discharge plan modification application for the previously approved discharge plan for their San Juan River Gas Processing Plant which is located in Section 1, Township 29 North, Range 15 West, NMPM, San Juan County, New Mexico. The modification proposes the addition of a non-hazardous landfill which will accept industrial solid waste from the gas plant facility. No liquids or hazardous wastes will be accepted at the site. Groundwater most likely to be affected by an accidental discharge is at a depth ranging from 15 to 110 feet with a total dissolved solids concentration of 17,500 mg/l. The discharge plan modification addresses how spills, leaks, and other accidental discharges to the surface will be managed.

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

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

STATE OF NEW MEXICO

OIL CONSERVATION DIVISION

WILLIAM J. LEMAY, Director

Legal #8068 Published in The Independent April 24, 1992.

Affidavit of Publication

STATE OF NEW MEXICO
) SS
COUNTY OF McKINLEY

VALERIE De La O being duly sworn upon oath, deposes and says:

As LEGAL CLERK of The Independent, a newspaper published in and having a general circulation in McKinley County, New Mexico and in the City of Gallup, New Mexico and having a general circulation in Cibola County, New Mexico and in the City of Grants, New Mexico and having a general circulation in Apache County, Arizona and in the City of St. Johns and in the City of Window Rock, Arizona therein: that this affiant makes this affidavit based upon personal knowledge of the facts herein sworn to. That the publication, a copy of which is hereto attached was published in said newspaper during the period and time of publication and said notice was published in the newspaper proper, and not in a supplement thereof,

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Affiant.

Sworn and subscribed to before me this 23RD day of JUNE, A.D., 19 92.

Notary Public

My commission expires

JUNE 22, 1993

LEGAL NOTI

SANTA FE, SANTA FE COUNTY

NEW MEXICO

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

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STATE OF NEW MEXICO

OIL CONSERVATION DIVISION

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Legal #8068 Published in The Independent April 24, 1992.

2735 2M BUTLER'S Gallup

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

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

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

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION
s/William J. LeMay, Director

Journal: April 23, 1992

STATE OF NEW MEXICO
County of Bernalillo ss

OIL CONSER. ON DIVISION
REC: VED
'92 APR 27 AM 9 13

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

for 1 times, the first publication being on the 23 day

of Apl, 1992, and the subsequent consecutive

publications on ...., 1992.

Thomas J. Smithson

Sworn and subscribed to before me, a Notary Public in and for the County of Bernalillo and State of New Mexico, this 23 day of Apl, 1992.

Bernadette Ortiz

12-18-93

PRICE $31.12

Statement to come at end of month.

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

VIT OF PUBLICATION

No. 29360

OF NEW MEXICO,
of San Juan:

ISTINE HILL being duly
says: "That she is the
ATIONAL AD MANAGER of
rmington Daily Times, a daily
per of general circulation
shed in English in Farmington ,
county and state, and that the
attached LEGAL NOTICE

ublished in a regular and entire
of the said Farmington Daily
, a daily newspaper duly quali-
for the purpose within the
ng of Chapter 167 of the 1937
on Laws of the State of New
o for ONE consecutive
) (/////) on the same day as
ws:

Publication THURSDAY, APRIL 23, 1992

d Publication

l Publication

h Publication

he cost of publication was $ 50.56

Christine Hill

ubscribed and sworn to before me
30th day of
APRIL , 1992 .

Connie Andrae

tary Public, San Juan County,
Mexico

omm expires: JULY 3, 1993

COPY OF PUBLICATI

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

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

STATE OF N
OIL CONSERVATI
WILLIAM J. LE

SEAL

Legal No 29360 published in the Farmington Daily Times, Far Mexico on Thursday, April 23, 1992.

Affidavit of Pub[illegible]cation

STATE OF NEW MEXICO
) SS
COUNTY OF McKINLEY

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Diane Chavez

Notary Public

My commission expires

JUNE 22, 1993

2735 2M BUTLER'S Gallup

LEGAL NOTICE
SANTA FE, SANTA FE COUNTY
NEW MEXICO

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OIL CONSERVATION DIVISION

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STATE OF NEW MEXICO

OIL CONSERVATION DIVISION

WILLIAM J. LEMAY, Director

Legal #8068 Published in The Independent April 24, 1992

OIL CONSER[illegible] ON DIVISION
REC[illegible] VED

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NOTICE OF PUBLICATION

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ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

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STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

WILLIAM J. LEMAY, Director

S E A L

MERIDIAN OIL

OIL CONSER... N DIVISION
REC...VED

'92 APR ... AM 9 44

April 15, 1992

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

Certified Mail P 117 121 722

RE: Discharge Plan - Wingate Fractionating Plant
Filing Fee

Dear Mr. LeMay:

Attached is the $50.00 filing fee for the referenced discharge plan that was recieved by your department on April 9, 1992.

If you or your staff have questions please contact me at (505) 326-9841.

Sincerely,

Michael J. Frampton
Sr. Staff Environmental Representative

Attachment - $50.00 check to NMED Water Quality Management

Discharge Plan

Wingate Fractionating Plant

Meridian Oil Inc.

Submitted
April 9, 1992

Table of Contents

List of Tables

List of Figures/Maps

List of Drawings

(all drawings are located in pocket)

1.0 GENERAL INFORMATION

A. Name of Discharger or Legally Responsible Party

C.R. Owen
Regional Vice President
Meridian Oil, Inc.
P.O. Box 4289
Farmington, New Mexico 87449-4289
(505) 326-9760

B. Name of Local Representative or Contact Person

MOI requests that all correspondence regarding this plan be sent to:

Michael Frampton
Senior Staff Environmental Representative
Meridian Oil, Inc.
P.O. Box 4289
Farmington, New Mexico 87499-4289
(505) 326-9841

MOI requests that copies of correspondence also be sent to:

Danny W. Hill
Plant & Pipeline Manager
Meridian Oil, Inc.
P.O. Box 4289
Farmington, New Mexico 87499-4289
(505) 326-9504

C. Location

Meridian Oil, Inc. (MOI) Wingate Plant is located approximately six miles east of Gallup, New Mexico, on U.S. Highway No. 66. It includes portions of sections 16 and 17, township-15-north, Range-17-West lying north of AT&SF Railroad in McKinley County, New Mexico. The exact location of the plant is at latitude 35°32'36" north and longitude 108°38'30" west. The elevation is 6593 feet above sea level.

Portions of Section 9, 10 and 15 are leased from the Navajo Indian Tribe.

D. Type of Natural Gas Operation

Wingate Plant, is a facility which fractionates a mixed liquefied petroleum gas stream into usable products. Its feed stock is received via pipelines from four natural gas facilities and consists of hydrocarbons with the majority of molecules containing from two to six carbon atoms along with small amounts containing up to ten and higher carbon atoms. The products of the facility are propane, normal butane, isobutane, natural gas liquid (light gasoline) and mixed butane.

E. Copies

Three copies of this discharge plan have been provided to the Santa Fe office of the OCD. The OCD will make available copies for District offices and public review.

F. Affirmation

I hereby certify that I am familiar with the information contained in and submitted with this application and that such information is true, accurate and complete to the best of my knowledge and belief.

4/8/92

Signature Date

Mr. C.R. Owen
Regional Vice President

2.0 PLANT PROCESSES

2.1 OVERVIEW

The Wingate Plant discharges approximately 30,000,000 gallons of wastewater per year. Virtually all of the wastewater is non-contact water. 75% of the wastewater is blown-down from the plant boilers, cooling towers and water treatment equipment. The remaining 25% is domestic wastewater. Less then 400 gallons per year of contact water from the inlet surge tanks is discharged with the wastewater. The TDS of the waste stream averages less than 3,000 ppm.

Groundwater which may be affected by operations at the Wingate plant is at a depth of 5 to 30 feet and is a non-potable water supply due to the high TDS level.

The plant feed stock is split into the product components using a distillation chain. Three parallel and largely duplicate sections exist in the facility producing propane, mixed butane and natural gas liquid (light gasoline). They are called "A", "B", and "C" Plants. Typically "A" and "B" Plant run continuously and "C" Plant is used during peak demand. The mixed butane from these three sections are fed to a fourth section (deisobutanaizer plant) where normal butane and isobutane are produced.

Finished product is stored in a large tank farm. Spherical tanks are used for natural gas liquid (light gasoline) and part of the normal butane storage. These have containment dikes surrounding them. Other products which are gaseous under atmospheric pressure are stored in undiked horizontal tanks. There is no underground product storage.

Product is transported from the site via pipeline, tank trucks and railway tank cars. Giant Refinery, the largest customer, receives product via a pipeline extending approximately 15 miles to the east. Giant maintains a pumping station on the Wingate property. Both the pipeline and the pumping station are property of Giant Refinery.

Natural gas from an El Paso Natural Gas (EPNG) transmission pipeline located north of the plant is used to provide utilities. Vapors recovered from product loading supplement gas from EPNG which is burned in boilers to produce steam. Electricity is produced by both steam driven turbines and natural gas fueled engines. The generating capacity of the plant is 2094 KVA.

Underground piping is used extensively throughout the plant for water and wastewater. Process piping is aboveground except for areas between the shipping pumps and the truck and train loading rack. The product pipeline to Giant Refinery is also underground. Underground tanks have never been used at the Wingate Plant.

A vapor recovery system exists to recover all vapors vented during loading and from many relief valves. Product tanks and tower relief valves vent to atmosphere. When this system is overloaded, the excess gas is fed to a candlestick flare and is burned. Two emergency flare pits exist to burn flammable liquid and gas caused by major upsets and to replace the candlestick flare when it requires maintenance.

Water is supplied to the plant by four deep (in excess of 1000 feet) wells. Two are on MOI property and two are six miles east of the plant. The well water is treated to remove iron, then stored in five ground level tanks for plant and fire water use, and one overhead tank for domestic use. The overhead tank is chlorinated.

One-half of the cooling tower make-up water is softened using sodium zeolite ion exchange and stored in a ground level tank for use. Boiler feed water make-up is purified using a reverse osmosis unit and stored in a ground level tank for use. The reverse osmosis unit replaced an evaporator and was placed in service on July 1, 1990.

Two cooling water systems are used. A large cooling tower feeds "A", "B", and boiler/auxiliary Plants. It is continuously loaded. A smaller system is loaded intermittently for "C" Plant. One boiler system, consisting of five gas fired boilers, feeds all four plant sections.

Wastewater is fed to the evaporation pond via a general waste sump and brine sump. These sumps receive the waste streams from cooling tower blowdown, boiler blowdown, filter back wash, softener regenerating streams and reverse osmosis effluent.

Six septic tanks exist on the site. Three drain to the general waste sump, one ties into the line from the general waste sump, one empties directly into the pond and one has a leach field.

There are two evaporation ponds. The east pond receives water directly from the plant. The west pond receives overflow from the east pond.

In addition to the fractionating plant, two other facilities are adjacent to the Wingate property which are owned by El Paso Natural Gas Company. They are the EPNG Gallup Pipeline District office, shops and yard and the EPNG Gallup General warehouse. They both receive domestic water from and discharge septic tank effluent to the Wingate systems and are connected to the fire water system.

2.2 PLANT PROCESS DESCRIPTION

A schematic diagram of the processes that handle the various liquefied petroleum gas components is shown on Drawing Number 5158.

Process feed arrives at the Wingate Plant via pipeline from EPNG's Chaco Plant and Conoco's San Juan Gas Plant in northwest New Mexico, Mobil's McElmo Creek Plant in southeast Utah, and Texaco's Aneth Plant in southeastern Utah. A maximum of 1,080,000 gallons per day of feed liquids are received and fed into six incoming feed tanks. The feed is sent to three plant sections, A, B, and C, where the liquid is fractionated into propane, mixed butane and a natural gas (light gasoline or straight run gasoline) liquid consisting of pentane, hexane and higher molecular weight components. A separate plant unit contains a distillation column used to fractionate mixed butane into normal and isobutane components.

Iron sponge units on the propane streams are used to remove sulfur that is in the form of hydrogen sulfide. Heavier organic sulfides are removed from the natural gas liquid (light gasoline) streams by perco treaters which convert sulfides to disulfides. Propane and butane streams are odorized with ethyl mercaptan as they are loaded for shipment at a concentration of 1.5 pounds per 10,000 gallons of product. Product which the customer may store underground or process is not odorized.

Product at the Wingate Plant is stored in a tank farm consisting of 49 spherical and horizontal tanks. All horizontal tanks containing propane or butane are undiked since these products are gaseous at atmospheric pressure. Spherical tanks containing the natural gas liquid (light gasoline) and normal butane have unlined spill containment dikes of earth or concrete.

Product leaves the plant via pipeline, railway tank cars and tanker trucks. Giant refinery receives product via a 15 mile pipeline which extends east of the plant. Tank cars and tanker trucks are loaded at a facility which includes a deluge system in case of fire, an extensive lightning rod system and a vapor recovery system. The vapor recovery system condenses and recovers liquids lost in depressurizing and venting the tankers during loading operations. Condensed liquids are removed by scrubbers and returned to the plant inlet. Vapors are compressed and used as boiler fuel with excess being sent to the candlestick flare. When the vapor recovery system is overloaded, the excess is burned off in a candlestick flare. Two emergency flare pits exist to burn off gas and liquid in the event of a major upset. Complete combustion of liquid occurs in these pits so no liquid hydrocarbons reach the ground.

2.3 WATER SYSTEM

Water is supplied to the Wingate Fractionating plant by four groundwater wells. The water is passed through a series of pretreatment processes and into a set of raw water storage tanks prior to distribution to the plant and miscellaneous water systems.

Some of the water for plant use is softened by sodium zeolite ion exchange. This water is then used in the "A & B" cooling water system and the "C" cooling water system. The steam system and engine jackets use soft water which has been further purified using a reverse osmosis system.

Wastewater from the water systems is discharged to an evaporation pond via a general waste sump and a brine sump. The waste streams received by the sumps include the cooling tower blowdown, the filter backwash, the boiler blowdown, reverse osmosis effluent and the softener regeneration processes. There are two evaporation ponds in series. Wastewater is discharged into the east pond and overflows into the west pond.

The general flow diagram is outlined in the Water Flow Block Diagram, Drawing 5151. The water equipment diagram, Drawing 5152, shows all water systems except the cooling water and steam systems.

2.3.1 <u>Wells and Pretreatment System</u>

Water is supplied to the plant by four production wells in excess of 1,000 feet deep. Two of these wells are located on MOI property and two are located approximately six miles east of the plant. The onsite wells, #3 and #4, have pump capacities of 60 gallons/minute and 75 gallons/minute, respectively. The offsite wells #6 and #7 have pump capacities of 300 gallons/minute and 200 gallons/minute, respectively. Well construction data for all four Plant water supply wells is presented in Table 2-1, Samples of all four wells were taken by

Table 2-1

Water Supply Wells Completion Data

	WELL #3 (on site)	WELL #4 (on site)	WELL #6 (offsite)	WELL #7 (offsite)
Location	T15N R17W S16 NE/NE/NE	T15N R17W S16 NE/NE/NE	T15N R16W S28 SE/SE/NE	T15N R16W S20 NW/SE/NE
Completion Date	04/53	05/53	03/58	02/67
Total Depth (ft)	2,012	1,941	1,275	1,384,
Casing Depth (in/ft)	16-76 12-3/4-185 8-5/8-1,614 6-2.012	12-3/4-131 8-5/8-1,610	16-264 12-3/4-1,033	16-180 12-33/4-1,296
Static Water Level 10/89 (ft)	Flowing Artesian	89	Flowing Artesian	Flowing Artesian
Pumping Water Level 10/89 (ft)	810	Not measured	290	310
Well Yield (gpm)	55	67	261	237

Table 2-2

Water Supply Well Water Analysis

	WATER WELL#3	WATER WELL#4	WATER WELL#6	WATER WELL#7
pH	7.7	7.7	7.8	7.6
Alkalinity (as CaCO3)	0	0	0	0
Total Alkalinity (asCacO3)	202	191	164	166
Chloride (as Cl)	34	16	17	16
Sulfate (as SO4)	478	410	614	618
Total Hardness (as CaCO3)	190	420	628	710
Calcium (as Ca)	40	107	156	154
Magnesium (as Mg)	22	37	58	79
Sodium (calculated as Na)	237	82	75	39
Silica (as SiO2)	0.39	0.24	0.23	0.23
Fluoride (as F)	5.1	6.7	5.2	5.4
Total Iron (Fe)	0.37	7.9*	0.35	0.15
Dissolved Iron (Fe)	0.15	0.13	0.12	0.1
Total Manganese (Mn)	0.17	0.22	0.17	0.17
Dissolved Manganese	0.12	0.16	0.14	.14
Total Dissolved Solids	932	944	1058	921
Biological Oxygen Demand	<1	<1	<1	<1
Chemical Oxygen Demand	<1	<1	<1	<1
Ammonia Nitrogen (as NH4)	.35	.25	.29	.13
Nitrate (as NO3)	<.1	<.1	<.1	<.1
Nitrite (as NO2)	.03	.06	.02	.03
Total Organic Carbon	.67	.62	1.09	.68
Specific Conductance	1215	1171	1199	1173

Concentrations in ppm, specific conductance in micromhos(mhos).

The iron content may be high as well #4 had recently been serviced.

Sample date: April 4, 1989

MOI personnel on April 4, 1989 to be analyzed. The results of the analysis are presented in Table 2-2.

The water is transported via a pumping and underground piping system to the pretreatment processes located at MOI. Pretreated consists of aeration which oxidizes iron to a form which precipitates as iron (III) hyroxide. Pretreated water is then passed through filters to remove the iron. The filters are permanent and are cleaned by backwashing rather than replacement. Filter backwash is piped to the general waste sump. The water is stored in five ground level tanks for plant use and one overhead tank for domestic use. The overhead tank is chlorinated.

2.3.2 Water Treatment Systems

Some of the raw water is treated with a sodium zeolite ion exchange softening system. This system removes calcium and magnesium ions and replaces them with sodium ions. The softened water is used as 1/2 of the makeup for the "A & B" cooling tower, the "C" cooling tower and after further treatment, the steam system. The softeners are regenerated using a saturated brine (NaCl Solution) from the salt pit. The regeneration stream is discharged to the general waste sump. The soft water is stored in a ground level tank.

A portion of the soft water is treated with a reverse osmosis unit to remove dissolved ions. This water is stored in a ground level tank and is used as makeup for the steam system. The concentrated waste stream is discharged to the general waste sump.

2.3.3 "A & B" Cooling Water System

The "A & B' plant cooling water system is diagrammed in Drawing 5155. The water in this system is cooled through the evaporation process via spraying in a cooling tower. A portion of the cooled water is passed through a sidestream filter to control the level of suspended solids in the circulating water. A controller maintains the proper level of total dissolved solids in the cooling water by adjusting the blowdown stream. The blowdown and side stream filter backwash are discharged to the general waste sump Cooling water pH is controlled using H_2So_4.

The cooling water is pumped to the process condensers and heat exchangers. The condensers which utilize the cooling water include "A" plant depropanizer, debutanizer, "B" plant stabilizer and depropanizer overhead product condensers. The coolers which utilize the cooling water include the debutanizer natural gas liquid (light gasoline), butane, and propane coolers, the depropanizer butane and propane coolers and the propane dehydrator cooler. The piping system is designed to allow the condensers to be backwashed by reversing the flow of water in the condenser and draining the reversed stream directly to the waste line feeding the evaporation pond. A small portion of this stream is also used as bearing cooling water for the product pumps.

Cooling water is also used in the boiler plant in the closed loop cooling water system (engine jacket and oil water coolers) and in the starting and instrument air coolers, fan and feed water pump bearing coolers, and boiler blowdown sample coolers.

The "A & B" cooling water is returned to the cooling tower after passing through the coolers and condensers listed in this section.

2.3.4 "C" Cooling Water System

The "C" plant cooling water system is diagrammed in Drawing 5156. A portion of the cooling tower water is passed through a side stream filter to control the level of suspended solids in the circulating water. The level of total dissolved solids in the water is controlled by a constant blowdown stream. The side stream filter backwash and the blowdown are discharged to the brine sump. Cooling water pH is controlled using H_2So_4.

"C" plant cooling water is used in the process condensers and heat exchangers, including stabilizer and depropanizer overhead product condensers and butane, propane, natural gas liquids (light gasoline), and dehydrator coolers. The water is then recycled to the cooling tower. The "C" plant condensers are backwashed using the same method as in the "A" and "B" plants. A small portion of the stream also provides bearing cooling water for the product pumps.

2.3.5 Steam System

A part of the softened water is treated with a reverse osmosis unit to remove the dissolved salts for use in the steam system. The steam system is shown in Drawing 5157. The plant capacity is 201,000 pounds of steam per hour (65,000 lb/hour at 100 psig and the remainder at 400 psig).

The water from the reverse osmosis unit is used for the boiler feed water make-up. It is conducted into a feed line that connects a set of condensate storage tanks then pumped into the deaeration heaters and then is transferred through a preheater to the boilers. The water is deaerated to prevent air buildup in the steam lines and to prevent oxygen corrosion in the boilers and steam systems.

Steam is distributed to electrical generators, reboilers, preheaters, and steam driven pumps throughout the "A & B" Plant, the "C" Plant and the boiler plant. The equipment that utilizes the steam for heat exchange include the stabilizer, depropanizer, debutanizer, mixed butane, and the iso-butane preheaters and reboilers. The equipment that utilizes the steam for a power source include the stabilizer, stand-by, depropanizer, and iso-butane feed pumps, reflux pumps, #4 and #5 electrical generators, the boiler feed pumps and cooling tower spray pumps in both "A & B" and "C" cooling systems.

After passing through the process equipment, the condensate is returned to the set of condensate storage tanks for reuse. Fin-fan condensers are used to condense some of the exhausted steam.

2.3.6 Domestic and Firewater System

Water for domestic use is chlorinated and fed to the plant from an elevated storage tank. EPNG's general warehouse and pipeline district office also receive domestic water and fire water from the plant.

Two fire water pumps feed fire hydrants and monitors throughout the property and a deluge system in the train and truck loading areas. A runoff pond exists to capture and evaporate water from the deluge system. The pond has received no water from the fire water system but it has been filled with fresh water and stocked with fish. Water will no longer be added to this pond except in an emergency when the deluge system is activated. An additional utility pump is connected to the fire water system and is used for various utility applications and to clean equipment.

2.4 WATER BALANCE/EFFLUENT SOURCES

2.4.1 Waste Streams

Waste streams originate from the backwashing of the iron filters in the pretreatment system, from the regeneration of the sodium zeolite ion exchanger, from the reverse osmosis waste, from the boiler and cooling tower blowdowns, from the backwashing of the condensers, from the backwashing of the side stream filters and from the septic tank systems. The only wastewater in contact with process streams (hydrocarbons) is the flow from the inlet feed tank water legs. This amounts to less than one gallon per day. Table 2-3 lists the waste streams with their flows.

The waste streams are directed to either the general waste sump, the brine sump, or are discharged directly to the evaporation pond. The wastes from the general waste and brine sumps are subsequently discharged into the evaporation ponds.

The general waste sump provides a waste collection point for the iron filter backwash, the softener regeneration water, the reverse osmosis waste, the boiler blowdown waste, the "A & B" side stream filter backwash, the "A & B" cooling tower blowdown water, the boiler house drain water, and the plant northeast, northwest and southwest septic tank water. The general waste sump may include some surface water runoff.

The brine sump provides a waste collection point for the overflow from the salt pit, the "C" cooling tower blowdown water, and the overflow from the plant northeast, northwest and southwest septic tanks. The waste in the brine sump may also include some surface water runoff.

The backwash from the condensers, the water from the inlet feed surge tanks, and the discharge from the warehouse septic tank are discharged into the waste stream between the sumps and the evaporation ponds. The water from the inlet feed surge tanks is the only contact water discharged to the evaporation pond. This water is entrained in the feed stock from the incoming pipeline. Any condensed water is removed via a manual valve in water legs on the six feed tanks. It is discharged to an open drain pipe and is pumped to the metered line to the evaporation pond. All other contact water and water which is produced in the process is sent to the candlestick flare to incinerate any hydrocarbon compounds which may be present.

Domestic discharges are made through six septic tanks. One septic tank in the southeast corner of the plant, is fed by one low use restroom. It has a leach field and does not empty into the evaporation ponds. The other three septic tanks in the processing plant area are discharged into the general waste sump. The septic tank for EPNG's general warehouse discharges into a metered line to the evaporation pond. The septic tank for EPNG's pipeline district office discharges into the pond through an unmetered line.

Table 2-3

Wastewater Streams

Stream	Flow
Iron Filter Backwash	2,325 gal/day
Sodium Zeolite Regeneration	12,890 gal/day
Boiler Blowdown	28,000 gal/day
A & B" Cooling Tower Blowdown	26,400 gal/day
C" Cooling Tower Blowdown	360 gal/day
A & B" Side Stream Filter Backwash	7,500 gal/day
C" Side Stream Filter Backwash	575 gal/day
Reverse Osmosis Unit Waste Stream	14,400 gal/day
Process Feed Water Legs (Contact)	1 gal/day
Septic Tanks	
District Office	1,600 gal/day
Warehouse	1,600 gal/day
Plant (to general waste sump)	5,135 gal/day
Plant (to leach field)	50 gal/day
Pond Influx	94,960 gal/day

2.4.2 Water Balance

A water balance has been calculated from flowmeter data collected on April 10 and May 30, 1990. This data was supplemented using information on water treatment regeneration and blowdown schedules. Estimates of domestic sewage were made based on number of workers in various areas. The balance is accurate for the period covered but water use can vary as a function of plant production and climate. The temperature and humidity will have a large effect on cooling water usage. Table 2-4 lists the minimum cooling water temperature which may be obtained throughout the year. These temperatures are never achieved in practice but they demonstrate the large difference in cooling capacity of an evaporative tower from summer to winter. During the winter a part of the cooling load is obtained from conduction of heat in the water to cold air instead of from evaporation of the cooling water. The production load of the plant effects both cooling water and boiler water usage. During the period of the balance, "C" plant was in little use which accounts for the low makeup water the "C" plant cooling tower. Table 2-5 gives well water production and plant hydrocarbon production for various months from 1988 to 1992.

Approximately 305,000 gallons of water per day (gpd) are produced by the inlet wells. This can vary depending on which well is on. The majority of the water, approximately 60% of the total, is produced by inlet Well #7. This load can be shifted to Well #6 or be distributed more evenely between the four wells. Approximately 200,000 gpd (65%) is utilized by the "A & B" cooling system, approximately 3,000 gpd (1%) is utilized by the "C" cooling system, and 11,300 gpd (4%) is utilized by the domestic system. Boiler feed make-up water is estimated to be 60,000 gpd (20%). The remaining 10% is used in water treatment regeneration and blowdown streams. The rate of waste from the main inlet into the evaporation pond is approximately 95,000 gpd (31% of well flow). The water balance is shown on Drawing 5151.

94,528,000 gallons of well water was used in 1989. From the water balance, the flow to the evaporation ponds would be 31 percent of this flow or 30,000,000 gallons per year. A totalizing flow meter was installed in the pipe discharging waste to the ponds. It became operational in February 1990. Discharges to the ponds since flow meter installation are shown in Table 2-6.

The capacity of the ponds to evaporate water is determined by subtracting the annual rainfall (9.66 inches) from the annual lake evaporation rate (52.00 inches). The monthly and annual rainfall and evaporation data are presented in Table 2-4. The net evaporation rate is 42.34 inches/year. Using the surface area of 1,173,000 square feet, the annual evaporation capacity of the ponds is 31,000,000 gallons. Evaporative capacity exceeds wastewater inflow.

Table 2-4

Monthly Weather Data & Cooling Water Temperatures

	Mean Temp. F	Normal Precipitation Inches	Mean Relative Humidity %	Cooling Water Min. Temp F	Lake Evaporation Inches
January	28.8	0.63	75	32	0.59
February	33.6	0.54	65	32	0.78
March	38.9	0.63	54	33	1.31
April	46.9	0.41	50	40	3.19
May	55.5	0.38	33	43	5.94
June	65.1	0.40	38	52	9.03
July	70.9	1.52	60	62	11.06
August	68.7	1.61	58	60	9.20
September	62.0	0.95	59	54	6.05
October	51.2	1.30	50	43	3.16
November	38.3	0.67	55	33	1.09
December	30.2	0.62	72	32	0.06
Year	49.2	9.66	58	43	52.0

Source: NOAA & USDA

Table 2-5

Well Water Usage and Plant Production

Month	Well Water (gallons)	Plant Production (gallons)
1988		
January	6,869,700	30,272,776
February	5,750,100	26,380,556
March	5,321,600	22,685,502
April	6,164,400	17,488,575
May	5,746,500	24,874,015
June	8,847,600	19,441,101
July	7,373,500	15,109,098
August	8,842,100	23,888,268
September	4,767,400	23,035,496
October	4,284,400	15,935,274
November	6,201,500	15,808,874
December	6,129,900	21,474,719
1988 TOTAL	76,298,700	256,394,254
1989		
January	5,330,200	27,818,123
February	9,021,300	22,263,065
March	7,758,400	26,029,011
April	8,531,100	24,039,436
May	10,404,500	20,547,167
June	6,,464,100	19,905,292
July	12,038,300	24,632,457
August	3,948,300	23,447,143
September	8,161,500	24,316,557
October		29,022,340
November		25,229,383
December		27,056,834
1989 TOTAL	94,528,100	294,306,808

Table 2-5
(continued)

Month	Well Water (gallons)	Plant Production (gallons)
1990		
January	6,938,300	28,341,060
February	9,616,510	24,062,850
March	7,501,180	27,398,137
April	7,495,870	19,594,803
May	6,569,200	24,262,884
June	10,320,700	22,578,022
July	6,042,270	21,679,253
August	8,431,830	18,539,414
September	7,670,840	23,711,620
October	8,068,000	18,283,706
November	3,724,740	24,447,234
December	17,863,790	26,046,594
1990 TOTAL		278,945,577
1991		
January	6,875,100	25,418,680
February	5,399,810	17,214,197
March	12,136,070	23,317,302
April	5,438,190	22,596,762
May	6,903,300	23,020,949
June	7,303,320	17,527,933
July	13,782,550	18,210,300
August	17,011,870	22,150,703
September	12,204,130	22,438,746
October	12,068,300	22,379,776
November	5,266,388	19,842,738
December	10,577,740	21,977,707
1991 TOTAL		256,095,793

Table 2-6

Wastewater Flow to Evaporation Ponds

1990	GPD
February	2,249,600
March	1,952,100
April	2,105,300
May	2,490,300
June	2,513,500
July	154,200
August	2,219,500
September	1,017,900
October	2,298,900
November	2,168,400
December	823500
1990 Total	21,384,200
1991	
January	1,00600
February	1,371,700
March	1,092,100
April	977,000
May	2,167,600
June	1,179,300
July	1,393,300
August	2,129,400
September	1,668,900
October	***
November	***
December	***
1991 Total	12,146,300

*** Flow meter to ponds was defective.

1991 total represents a partial total.

2.4.3 Stormwater

Storm water is routed to a discharge ditch by five shallow cement lined depressions. The drainage ditch runs to the west along the north edge of the plant. It empties into a larger ditch about 2,300 feet west of the plant processing area. The larger ditch flows northwest for about another 2,300 feet and discharges into the Rio Puerco. In management of stormwater runn off MOI will comply with the National Pollutant Discharge Elimination System (NPDES) stormwater requirements to be promulgated for New Mexico.

2.4.4 Wastewater Recycle

Due to a general lack of sufficient groundwater in McKinley County, New Mexico, wastewater from the east evaporation pond has been requested for use in dust control during road construction and the withdrawal approved. None has been used since 1990. No contaminant in the water would prevent its use in this manner. Water will be taken from the east rather than the west pond due to the lower concentration of dissolved solids.

2.5 QUALITY CHARACTERISTICS

2.5.1 Evaporation Pond Wastewater Analysis

On April 6, 1990 and January 22, 1992, wastewater grab samples were collected from the east and west evaporation ponds. Samples were obtained from four different locations at each pond (Drawing 5153-4) at a distance of approximately four feet from the waterline using a Wheaton grab sampler. These samples were then field-composited and stored in ice chests for shipment to the laboratory. Water samples which were to be used for metals analyses were not filtered as per a discussion with NMOCD (Roger Anderson, March 30, 1990); however, these samples were preserved with nitric acid. Those samples for which volatile halocarbons/aromatic analyses (EPA Methods 601/602) were to be performed were collected so that no headspace existed in the sample bottles.

Laboratory results are summarized in Table 2-7.

Table 2-7

Evaluation Pond Water Analysis

Constituent	Units	West Pond 4/6/90	West Pond 1/22/92	East Pond 4/6/90	East Pond 1/22/92
Arsenic (As)	mg/l	0.011		<0.005	
Barium (Ba)	mg/l	0.078		0.045	
Cadmium (Cd)	mg/l	<0.005		<0.005	
Chromium (Cr)	mg/l	<0.01		<0.01	
Cyanide (Cn)	mg/l	<0.01		<0.01	
Lead (Pb)	mg/l	0.029		0.028	
Mercury (Hg)	mg/l	<0.0002		<0.0002	
Selenium (Se)	mg/l	<0.025		<0.025	
Silver (Ag)	mg/l	<0.01		<0.01	
Bicarbonate	mg/l		275		210
Calcium	mg/l		856		731
Carbonate	mg/l		0		0
Chloride (Cl)	mg/l	36000	31320	4180	6310
Copper (Cu)	mg/l	0.03		<0.02	
Fluoride (F)	mg/l	2.44	1.09	0.67	0.73
Iron (Fe)	mg/l	0.066	0.32	0.088	0.57
Manganese (Mn)	mg/l	0.165	0.34	0.071	0.09
Nitrate (NO3 as N)	mg/l	<0.06	<0.02	<0.06	<0.02
Potassium	mg/l		231		71.0
Silica	mg/l		19.4		32.2
Sodium	mg/l		19910		4400
Sulfate	mg/l		7710		3420
Sulfate (SO4)	mg/l	10000	7710	2400	3420
Total Dissolved Solids (TDS)	mg/l	75800	65400	10000	15900
pH		7.73	8.14	8.63	8.20
Alkalinity			225		165
Hardness			9350		2960
Polychlorinated biphenyls (PCBs)	ug/l	<2.5		<2.5	
Benzene	ug/l	<5.0	0.8	<5.0	1.3
Toluene	ug/l	<5.0	0.5	<5.0	0.8
Ethylbenzene	ug/l	<5.0	ND	<5.0	ND
Total xylenes	ug/l	<5.0	ND	<5.0	0.5
Carbon Tetrachloride	ug/l	<2.0		<2.0	
1,2-dichloroethane (EDC)	ug/l	<2.0		<2.0	
1,1-dichloroethylene (1,1-DCE)	ug/l	<2.0		<2.0	
1,1,2,2-tetrachloroethylene (PCE)	ug/l	<2.0		<2.0	
1,1,2-trichloroethylene (TCE)	ug/l	<2.0		<2.0	
Methylene chloride	ug/l	<20.0		<20.0	
1,1-dichloroethane	ug/l	<2.0		<2.0	
Ethylene dibromide (EDB)	ug/l	<0.01		<0.01	
1,1,1-trichloroethane	ug/l	<2.0		<2.0	
1,1,2-trichloroethane	ug/l	<2.0		<2.0	
1,1,2,2-tetrachloroethane	ug/l	<2.0		<2.0	

Table 2-7
(continued)

Constituent	Units	West Pond 4/6/90	West Pond 1/22/92	East Pond 4/6/90	East Pond 1/22/92
Vinyl choride	ug/l	<2.0		<2.0	
Benzo-a-pyrene	ug/l	<10		<10	
Acrolein	ug/l	<50.0		<50.0	
Acrylonitrile	ug/l	<50.0		<50.0	
Aldrin	ug/l	<0.25		<0.25	
Benzidine	ug/l	<100		<100	
Carbon Tetrachloride	ug/l	<2.0		<2.0	
Chlordane	ug/l	<2.5		<2.5	
Monochlorobenzene	ug/l	<5.0		<5.0	
Hexachlorobenzene	ug/l	<10		<10	
1,2-dichloroethane	ug/l	<2.0		<2.0	
Hexachloroethane	ug/l	<10		<10	
1,1,2,2-tetrachloroethane	ug/l	<2.0		<2.0	
1,1,1-trichloroethane	ug/l	<2.0		<2.0	
1,1,2-trichloroethane	ug/l	<2.0		<2.0	
2,4-dichlorophenol	ug/l	<10		<10	
2,4,5-trichlorophenol	ug/l	<50		<50	
2,4,6-trichlorophenol	ug/l	<10		<10	
Bis)2-chloroethyl) Ether	ug/l	<10		<10	
Bis (2-chloroisopropyl) Ether	ug/l	<10		<10	
Chloroform	ug/l	<2.0		<2.0	
DDT	ug/l	<0.5		<0.5	
Dichlorobenzene	ug/l	<5.0		<5.0	
Dichlorobenzidine	ug/l	<20		<20	
1,1-dichloroethylene	ug/l	<2.0		<2.0	
Dichloropropenes	ug/l	<2.0		<2.0	
Dieldrin	ug/l	<0.5		<0.5	
2,4-dinitrotoluene	ug/l	<10		<10	
Endosulfan	ug/l	<0.5		<0.5	
Endrin	ug/l	<0.5		<0.5	
Bromodichloromethane	ug/l	<2.0		<2.0	
Bromomethane	ug/l	<2.0		<2.0	
Chloromethane	ug/l	<2.0		<2.0	
Dichlorodifluoromethane	ug/l	<2.0		<2.0	
Trichlorofluoromethane	ug/l	<5.0		<5.0	
Heptachlor	ug/l	<0.25		<0.25	
Hexachlorobutadiene	ug/l	<10		<10	
Hexachlorocyclopentadiene	ug/l	<10		<10	
Isophorone	ug/l	<10		<10	
Nitrobenzene	ug/l	<10		<10	
Dinitrophenols	ug/l	<50		<50	
N-nitrosodimethylamine	ug/l	<10		<10	
N-nitrosodiphenylamine	ug/l	<10		<10	
Pentachlorophenol	ug/l	<50		<50	
Phenol	ug/l	<10		<10	
Dibutyl Phthalate	ug/l	<10		<10	
Di-2-ethylhexyl Phthalate	ug/l	<10		<10	
Diethyl Phthalate	ug/l	<10		<10	
Dimethyl Phthalate	ug/l	<10		<10	

Table 2-7
(continued)

		West Pond	West Pond	East Pond	East Pond
Polychlorinated Biphenyls (PCBs)	ug/l	<2.5		<2.5	
Anthracene	ug/l	<10		<10	
Benzo (k) Fluoranthene	ug/l	<10		<10	
Fluoranthene	ug/l	<10		<10	
Fluorene	ug/l	<10		<10	
Phenanthrene	ug/l	<10		<10	
Pyrene	ug/l	<10		<10	
Tetrachloroethylene	ug/l	<2.0		<2.0	
Toxaphene	ug/l	<5.0		<5.0	
Trichloroethylene	ug/l	<2.0		<2.0	
1,1-dichloroethane	ug/l	<2.0		<2.0	
Ethylene Dibromide (EDB)	ug/l	<0.01		<0.01	
Cis-1, 2-dichloroethylene	ug/l	<2.0		<2.0	
Trans-1,2-Dichloroethylene	ug/l	<2.0		<2.0	
Naphthalene	ug/l	<10		<10	
2-Methylnaphthalene	ug/l	<10		<10	

On May 30, 1990, field personnel tested the pH of the evaporation ponds and of the flow to the evaporation ponds. The sample from the pipe leading to the ponds was taken at a sample valve installed in the flow meter manifold. The pond samples were taken at the same locations as the samples for analyses. The pH average for the east and west pond was 8.63 and 7.73, respectively. The pH of the incoming stream to the pond was 8.64.

2.5.2 Evaporation Pond Influent Analysis

On July 18, 1990 samples were taken from the six inch line discharging to the east evaporation pond. The sample point is south of the pipeline office and is shown in Drawing 5153-3. Organics were tested for using BTEX test 8020. No organics were detected in the water. The detection limit was 0.5 UG/L. General chemistry as well as toxic metals were tested for using EPA methodologies. The level of total dissolved solids is of greatest concern due to its potential to add solids to groundwater. TDS was 3510 MG/L. The results from the above tests are shown in Table 2-8.

Table 2-8

Evaporation Pond Influent Water Analysis

Carbonate (CaCO3)	mg/l	20
Bicarbonate (CaCO3)	mg/l	418
Hydroxide (CaCo3)	mg/l	<1
Total Alkalinity (as CaCO3)	mg/l	438
Chloride	mg/l	220
Fluoride	mg/l	0.93
Nitrate as Nitrogen	mg/l	0.48
pH		8.5
Phosphate, Ortho (as P)	mg/l	1.29
Sulfate	mg/l	1700
Total Dissolved Solids	mg/l	3510
Silver	mg/l	<0.01
Arsenic	mg/l	<0.1
Barium	mg/l	<0.01
Calcium	mg/l	25.4
Cadmium	mg/l	0.005
Chromium	mg/l	0.01
Copper	mg/l	<0.02
Iron	mg/l	0.868
Mercury	mg/l	<0.0002
Potassium	mg/l	34.8
Magnesium	mg/l	11.3
Sodium	mg/l	1170
Lead	mg/l	<0.05
Selenium	mg/l	<0.05
Silica	mg/l	38.7
Zinc	mg/l	<0.01
Benzene (ug/l)	ug/l	<0.5
Toluene (ug/l)	ug/l	<0.5
Ethybenzene (ug/l)	ug/l	<0.5
Total Xylenes (ug/l)	ug/l	<0.5

2.6 SPILL/LEAK PREVENTION AND HOUSEKEEPING PROCEDURES

2.6.1 Operating and Maintenance Procedures

The Wingate Plant is operated in a manner to prevent and mitigate any unplanned releases to the environment. The plant is manned 24 hours per day and 365 days per year including holidays. Plant process and storage units are regularly observed by a number of personnel during normal operations, and any evidence or sign of spill/leaks are routinely reported to supervisory personnel so that repairs or cleanup can be promptly effected. Routine maintenance procedures conducted at the Wingate Plant also help to assure that equipment remains functional and that the possibility of spills/leaks is minimized.

2.6.2 Chemical and Environmental Hazards

A number of process and non-process chemicals or additives used at the Wingate Plant could present a threat to the environment only in the event of a major spill or release. A list of products stored in quantities of greater than 55 gallons is presented in Table 2-9. The majority of the chemicals are stored in small quantities (55 gallons to 3,000 gallons) and any spills or leaks would be very small in volume and easily contained in the immediate area.

A spill of wastewater could result from possible dike failure of the evaporation pond. The spill would flow into the Puerco River and would possibly degrade the groundwater quality by increasing the dissolved salt content. The wastewater contains no hazardous contaminate in concentration high enough to be of concern.

2.6.3 Cleanup Procedures

Cleanup procedures would obviously vary with the nature and extent of any unplanned release. Spills of acids and bases are relatively easy to control and

Table 2-9

Chemicals Used at Wingate Plant

Chemical	Description	Use or Storage Location	Amount
ACETYLENE	GAS	SHOP	3 BOTTLES
AMBERLITE IR-120 PLUS	ION EXCH.RESIN	CHEM STOR	742 LB
ANSUL PURPLE K	FIRE RETARDENT	WAREHOUSE	2,250 LB
CALCIUM CHLORIDE	SOLID	CHEM STOR	2,900 LB
CAUSTIC SODA BEADS	SOLID BASE	CHEM STOR	700 LB
CCH - DRY CHLOIRINE	BIOCIDE	COOLING TOWER	300 LBS
DELVAC 1200	DIESEL OIL	WAREHOUSE	110 GAL
DELVAC 1300	10--30W OIL	WAREHOUSE	110 GAL
DENSE SODA ASH	Na2Co3	CHEM STOR	2,500 LB
DIESEL FUEL	LIQUID	SHOP	500 GAL
DIXICHLOR (SODIUM HYPOCHLORITE)	DOMESTIC WATER TREATMENT	WAREHOUSE	275 GAL
ETHYL MERCAPTAN	LIQ.ODORIZER	LPG STOR	3,000 GAL
GASOLINE LEADED-REGULAR	LIQUID	SHOP	380 GAL
H.T.H.	BIOCIDE CA(OCL)2	CHLORINE TABLE	500 LB
HELIUM	GAS	LAB	10 BOTTLES
HI YIELD ENZYME 400	POWDER	CHEM STOR	100 LB
HYDROGEN	GAS	LAB	1 BOTTLE
ICE FOE	CACL2	MELT ICE	10,000 LB
LIQUICHLOR	NaOCl	COOLING TOWER	200 GAL
METHANOL	LIQUID	FRAC PLANT	1,000 GAL
NITROGEN	GAS	SHOP & LAB	18 BOTTLES
OIL MOBIL DELVAC 1230	BEARING LUBE	WAREHOUSE	165 GAL
OIL MOBIL DTE 20	TURBINE OIL	WAREHOUSE	165 GAL
OIL MOBIL DTE HEAVY MED	TURBINE OIL	WAREHOUSE	165 GAL
OIL MOBIL PEGASUS 490	ENGINE OIL	WAREHOUSE	165 GAL
OIL MOBIL SUPER 10W30	ENGINE OIL	WAREHOUSE	73 GAL
OIL MOBIL SUPER 10W40	ENGINE OIL	WAREHOUSE	73 GAL
OIL WHITE 22	BEARING LUBE	WAREHOUSE	110 GAL
OXYGEN	GAS	SHOP	5 BOTTLES
PURPLE K	POTASSIUM SALT	FIRE EXTINGUISHER	3000 LB
SULFURIC ACID	LIQUID	COOLING TOWER	2,200 GAL
TRIAD WO-44	DEPOSIT INHIBITOR	CHEM STOR	220 GAL
UNICHEM 1000	DISPERSANT	WATER TREAT	110 GAL
UNICHEM 1705	INHIBITOR	COOLING TOWER	165 GAL
UNICHEM 1710	INHIBITOR	WATER TREAT	1,000 GAL
UNICHEM 3030	INHIBITOR	CHEM STOR	165 GAL

UNICHEM 3140	O2 SCAVENGER	CHEM STOR	165 GAL
UNICHEM 3270	INHIBITOR	WAREHOUSE	165 GAL
UNICHEM 544	BIOCIDE	COOLING TOWER	165 GAL
UNICHEM 7156	PIPELINE INHIBITOR	WAREHOUSE	110 GAL
UNICHEM ALPHA 512	MICROBIOCIDE	WATER TREAT	165 GAL
UNICHEM ALPHA 544	MICROBIOCIDE	WATER TREAT	110 GAL
UNICIHEM 1700	DISPERSANT	WATER TREAT	165 GAL
UREABOR	HERBICIDE	CHEM STOR	2500 LB

general procedures would include neutralization of the material in-place before a final evaluation is made on its ultimate disposal. Once neutralization is confirmed by sampling, it is quite probable that no further actions will be required to ensure protection of human health and the environment.

If a chemical spill occurs, general cleanup procedures would involve minor earthwork to prevent migration, and recovery of as much free liquid as possible. Recovered chemical would then be transported off-site for reclamation or disposal. Any organic chemical which may have soaked in the soil will be left in place and will be disked periodically to enhance biodegradation.

Spills of organic materials which might occur at the drum storage area will be small in nature and easily contained. If a spill occurs, any free liquids will be contained by earthwork, recovered if possible and held in storage pending a decision on final disposal. Based on existing literature, analysis, and regulatory guidelines, any contaminated soil will either be left in place, transferred to other existing waste-management areas (if no incompatibilities exist), or transported off-site for proper disposal.

Potential releases could result from dike failure of the evaporation pond. Should a potential or actual release occur, some earth moving equipment is available on site or through contractors to repair damage to any dikes. Any liquids which have been released will be collected, where practical, and reintroduced into the wastewater system as is practical.

2.6.4 <u>Reporting</u>

Should a release of materials occur, MOI will comply in accordance with provisions described in NMOCD Rule & Regulation # 116.

2.6.5 <u>General Housekeeping Procedures</u>

MOI strives to reduce the potential for spills and leaks in all areas. Records from 1972 to present indicate that no reportable liquid spills are documented at the Wingate Plant. Interviews with plant personnel have also indicated that no reportable liquid spills occurred between the 1950's and 1972.

Non-process chemicals are used in relatively small quantities at the plant and are managed in a manner to prevent discharges to the environment. Any chemical spills which might occur would be immediately contained, controlled and any effects mitigated.

3.0 EFFLUENT DISPOSAL

3.1 EVAPORATION PONDS

Plant wastes streams are discharged to the evaporation ponds for final disposal by evaporation. The streams enter the east pond through a metered line containing most of the effluent and through an unmetered line from the district office containing only domestic waste. When the east pond is full the west pond receives the overflow. The east pond contains water throughout the year. The west pond only receives overflow during the winter months and sometimes dries up in the summer months. The east pond is contained in a 560 foot by 940 foot area and has a surface area of 480,000 square feet (11.0 acres). The west pond is contained in a 900 foot by 850 foot area and has a surface area of 693,000 square feet (15.9 acres). The north edges of the ponds are about 200 feet from the normally dry Rio Puerco. The east pond was placed in operation between 1968 and 1970. These ponds replaced smaller evaporation ponds which have been closed.

3.2 WASTE DISPOSAL

Waste oil from engines, generators, and motors is stored in drums on a concrete slab to the east of the processing area. The drums are periodically removed and recycled by Mesa Oil of Albuquerque, New Mexico.

Other wastes such as waste paper, office and domestic garbage and miscellaneous wastes are removed to a landfill by the City of Gallup, New Mexico.

3.3 MONITORING SYSTEM

A series of flow meters have been installed to measure incoming water and outgoing waste streams. They measure both flow rate and total flow. They are indicated on the process flow diagrams with a circle with the letters FIT inside. The letters stand for Flow Indicating Transmitter. These flowmeters will be read weekly and the total flow recorded.

Samples from the evaporation ponds will be obtained annually and analyzed for general water chemistry, priority pollutant metals and BTEX. Any records related to waste characteristics will be retained by MOI for at least five years as required by WQCC regulations. The results of the analysis will be reported to NMOCD to comply with the WQCC regulations. Any changes, anticipated or otherwise, to the disposal system will be reported to NMOCD.

3.4 PROPOSED MODIFICATIONS

3.4.1 Containment Dikes

Two small (500 gal) elevated tanks are used to provide gasoline and diesel fuel for plant vehicles. They are presently without spill containment dikes. Dikes or steel containment pans will be provided.

A cement containment dike will also be provided around the waste drum storage area. This is currently a cement pad which holds barrels of used oil prior to shipment to an oil reclamation facility.

3.4.2 Abandoned Flare Pit Closure

An abandoned 25 feet x 25 feet flare pit is located north of the plant. The pit contains runoff rain water and there is a gas line which is leaking natural gas products into it. An analysis of the water in the pit is listed in Table 3-1. The process line to the pit will be capped. The water, which contains some hydrocarbons, will be disposed of in accordance with NMOCD guidelines. The pit will then be closed in accordance with current environmental standards. Research has shown that petroleum residues can be degraded in a soil environment (Cresswell, 1977). The process usually involves the mixing of contaminated soil with fresh soil and harrowing to improve aeration, addition of fertilization to facilitate bacterial breakdown of the residue and the establishment of vegetation (Gudin and Syratt, 1975). Cresswell (1977) reports that healthy crops of wheat were grown on test plots in Oklahoma containing four to eight percent of oil in the upper six inches of soil. It was found that the oil, including oily waste from the bottoms of wastewater treatment pond, was held in the shallow soil zone in which it was originally applied and did not move vertically or horizontally in the soil. Such reclamation steps would improve the closure process and will be utilized where possible.

Table 3-1

Flare Pit Water Quality Analysis

Constituent	Units	Flare Pit 4/6/90
Arsenic (As)	mg/l	0.01
Barium (Ba)	mg/l	0.457
Cadmium (Cd)	mg/l	<0.005
Chromium (Cr)	mg/l	<0.01
Cyanide (Cn)	mg/l	0.04
Lead (Pb)	mg/l	0.003
Mercury (Hg)	mg/l	0.0005
Selenium (Se)	mg/l	<0.025
Silver (Ag)	mg/l	<0.01
Chloride (Cl)	mg/l	31
Copper (Cu)	mg/l	<0.02
Fluoride (F)	mg/l	0.35
Iron (Fe)	mg/l	6.78
Manganese (Mn)	mg/l	1.01
Nitrate (NO3 as N)	mg/l	<0.06
Total Dissolved Solids (TDS)	mg/l	860
Polychlorinated biphenyls (PCBs)	ug/l	<5.0
Benzene	ug/l	125
Toluene	ug/l	213
Ethylbenzene	ug/l	<12.5
Total xylenes	ug/l	43
Carbon Tetrachloride	ug/l	<5.0
1,2-dichloroethane (EDC)	ug/l	<5.0
1,1-dichloroethylene (1,1-DCE)	ug/l	<5.0
1,1,2,2-tetrachloroethylene (PCE)	ug/l	<5.0
1,1,2-trichloroethylene (TCE)	ug/l	<5.0
Methylene chloride	ug/l	<50.0
1,1-dichloroethane	ug/l	<5.0
Ethylene dibromide (EDB)	ug/l	<0.01
1,1,1-trichloroethane	ug/l	<5.0
1,1,2-trichloroethane	ug/l	<5.0
1,1,2,2-tetrachloroethane	ug/l	<5.0
Vinyl chloride	ug/l	<5.0
Benzo-a-pyrene	ug/l	<10
Acrolein	ug/l	<50.0
Acrylonitrile	ug/l	<50.0
Aldrin	ug/l	<5.0

Table 3-1
(continued)

Constituent	Units	Flare Pit 4/6/90
Benzidine	ug/l	<100
Carbon Tetrachloride	ug/l	<5.0
Chlordane	ug/l	<5.0
Monochlorobenzene	ug/l	<12.5
Hexachlorobenzene	ug/l	<10
1,2-dichloroethane	ug/l	<5.0
Hexachloroethane	ug/l	<10
1,1,2,2-tetrachloroethane	ug/l	<2.0
1,1,1-trichloroethane	ug/l	<2.0
1,1,2-trichloroethane	ug/l	<2.0
2,4-dichlorophenol	ug/l	<10
2,4,5-trichlorophenol	ug/l	<50
2,4,6-trichlorophenol	ug/l	<10
Bis)2-chloroethyl) Ether	ug/l	<10
Bis (2-chloroisopropyl) Ether	ug/l	<10
Chloroform	ug/l	<5.0
DDT	ug/l	<1.0
Dichlorobenzene	ug/l	<10.0
Dichlorobenzidine	ug/l	<20
1,1-dichloroethylene	ug/l	<5.0
Dichloropropenes	ug/l	<12.5
Dieldrin	ug/l	<1.0
2,4-dinitrotoluene	ug/l	<10
Endosulfan	ug/l	<1.0
Endrin	ug/l	<1.0
Bromodichloromethane	ug/l	<5.0
Bromomethane	ug/l	<5.0
Chloromethane	ug/l	<5.0
Dichlorodifluoromethane	ug/l	<5.0
Trichlorofluoromethane	ug/l	<12.5
Heptachlor	ug/l	<0.5
Hexachlorobutadiene	ug/l	<10
Hexachlorocyclopentadiene	ug/l	<10
Isophorone	ug/l	<10
Nitrobenzene	ug/l	<10
Dinitrophenols	ug/l	<50
N-nitrosodimethylamine	ug/l	<10
N-nitrosodiphenylamine	ug/l	<10

Table 3-1
(continued)

Constituent	Units	Flare Pit 4/6/90
Pentachlorophenol	ug/l	<50
Phenol	ug/l	32
Dibutyl Phthalate	ug/l	<10
Di-2-ethylhexyl Phthalate	ug/l	<10
Diethyl Phthalate	ug/l	<10
Dimethyl Phthalate	ug/l	<10
Polychlorinated Biphenyls (PCBs)	ug/l	<5.0
Anthracene	ug/l	<10
Benzo (k) Fluoranthene	ug/l	<10
Fluoranthene	ug/l	<10
Fluorene	ug/l	<10
Phenanthrene	ug/l	<10
Pyrene	ug/l	<10
Tetrachloroethylene	ug/l	<5.0
Toxaphene	ug/l	<10.0
Trichloroethylene	ug/l	<5.0
1,1-dichloroethane	ug/l	<5.0
Ethylene Dibromide (EDB)	ug/l	<0.01
Cis-1, 2-dichloroethylene	ug/l	<5.0
Trans-1,2-Dichloroethylene	ug/l	<5.0
Naphthalene	ug/l	<10
2-Methylnaphthalene	ug/l	<10

3.4.3 Sulfuric Acid Tanks

Sulfuric acid is stored in five 500 gallon tanks in two locations. The tanks have concrete containment walls but the containment floor is dirt. A concrete floor will be installed in the diked areas and the floor and walls will be coated with epoxy or other acid resistant material.

3.4.4 Drain Line to Evaporation Pond

The septic tank from the EPNG district office drains directly to the evaporation pond without going through a meter. The line will be connected to the main pond drain line which is metered.

3.4.5 Fire Training Pit

In the past, fire training has been conducted at a fire training pit. Oil was floated on water in the pit and set afire and then extinguished. Use of this pit has been discontinued. MOI proposes to close the pit in accordance with NMOCD guidelines.

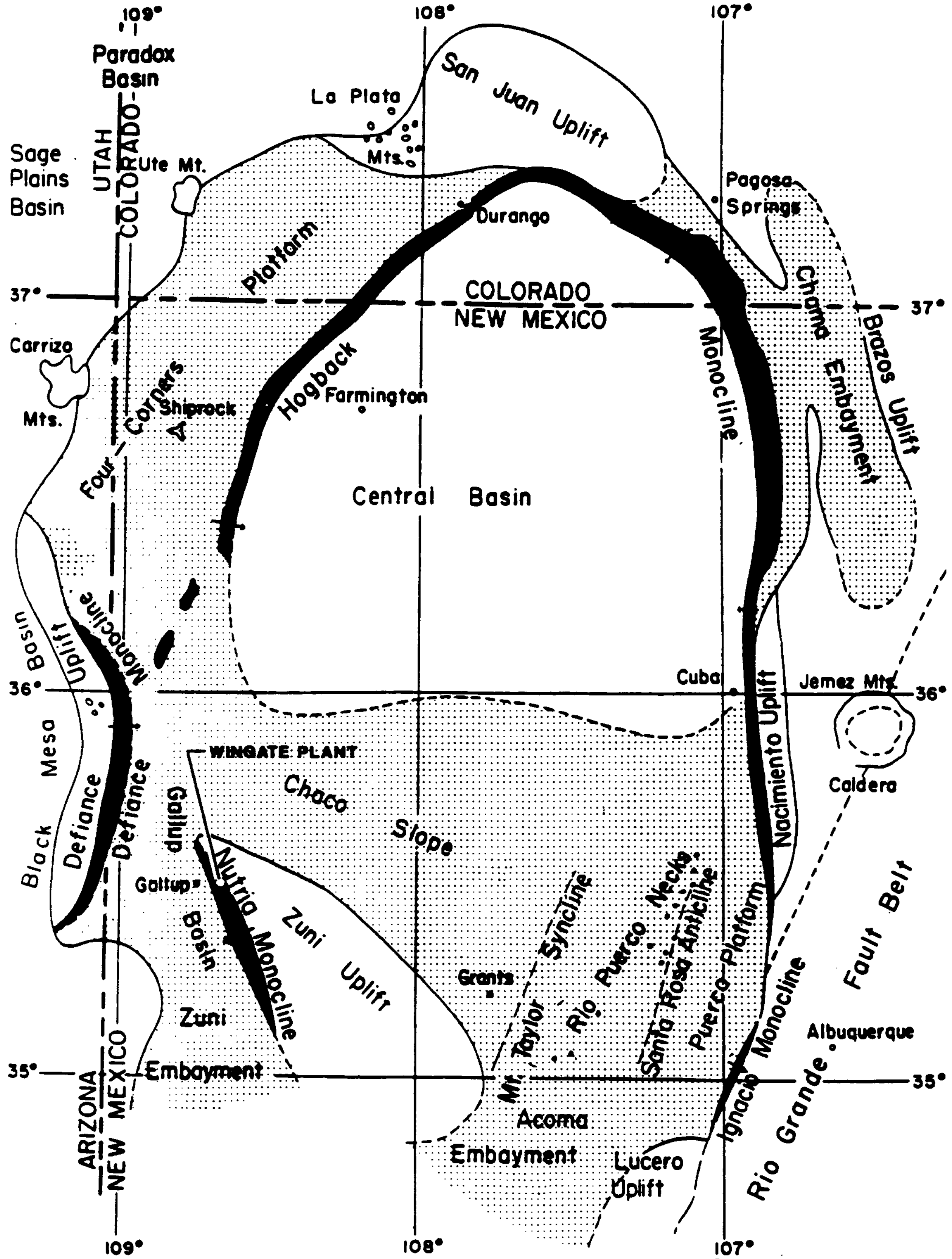
4.0 SITE CHARACTERISTICS

4.1 GEOLOGY DESCRIPTION

4.1.1 Regional Geology

The Wingate Plant is situated along the southwestern margin of the San Juan Basin designated the Zuni Uplift, in the Colorado Plateau physiographic Province (Figure 4-1). The Zuni Uplift is a northwest trending structural dome comprising an area approximately 55 miles in length by 20 miles in width. The site lies at the head of the western side of the uplift termed the Nutria Monocline. The San Juan Basin forms an asymmetric basin covering an area of about 25,000 square miles in northwestern New Mexico, and portions of northeastern Arizona, and southwestern Colorado. The basin is reported to contain as much as 15,000 feet of Paleozoic and Mesozoic sediments (Fassett and Hinds, 1971).

The regional geology in the area surrounding the Wingate Plant is shown in Figure 4-2, Based on available drilling log information the generalized Stratigraphic Column in Figure 4-3 was prepared. As shown, the surficial geology surrounding the site areas is comprised of Quartenary-ages alluvial deposits. Below the alluvium lies a thick sequence (on the order of 1,500 feet) of the Chinle Formation siltstones and mudstones. Underlying the Moenkopi Formation, also unconformably, are the Permian-ages San Andres Limestone, and Glorieta Sandstone (102 and 230 feet thick, respectively), which comprise the regional aquifer in the site area. The deepest onsite well is completed into the top portion of the Yeso Formation also of Permian age, described as a fine-grained Arkosic sandstone, to a depth of approximately 2,000 feet. Below the base of the Yeso Formation in descending order are the sandstone, claystone and siltstone of the Permian-ages Abo Formation, unnamed limestone and conglomerate rocks of Pennsylvania age, and Precambrian granitic and metamorphic rocks which comprise the basement rocks in the regions.



REGIONAL STRUCTURAL MAP SAN JUAN BASIN

Figure 4-1

DAMES & MOORE

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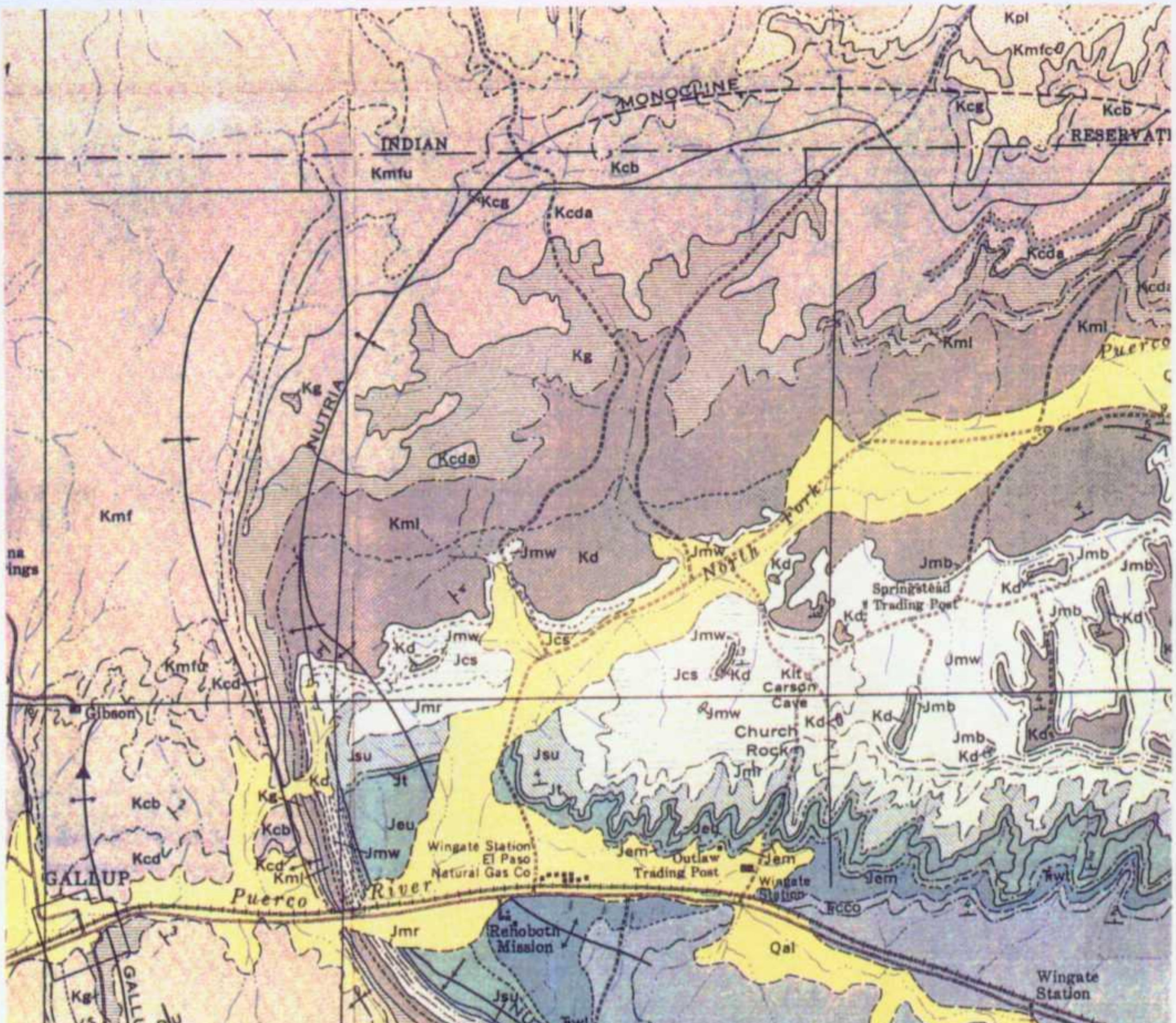

REGIONAL GEOLOGIC MAP

Figure 4-2

DAMES & MOORE

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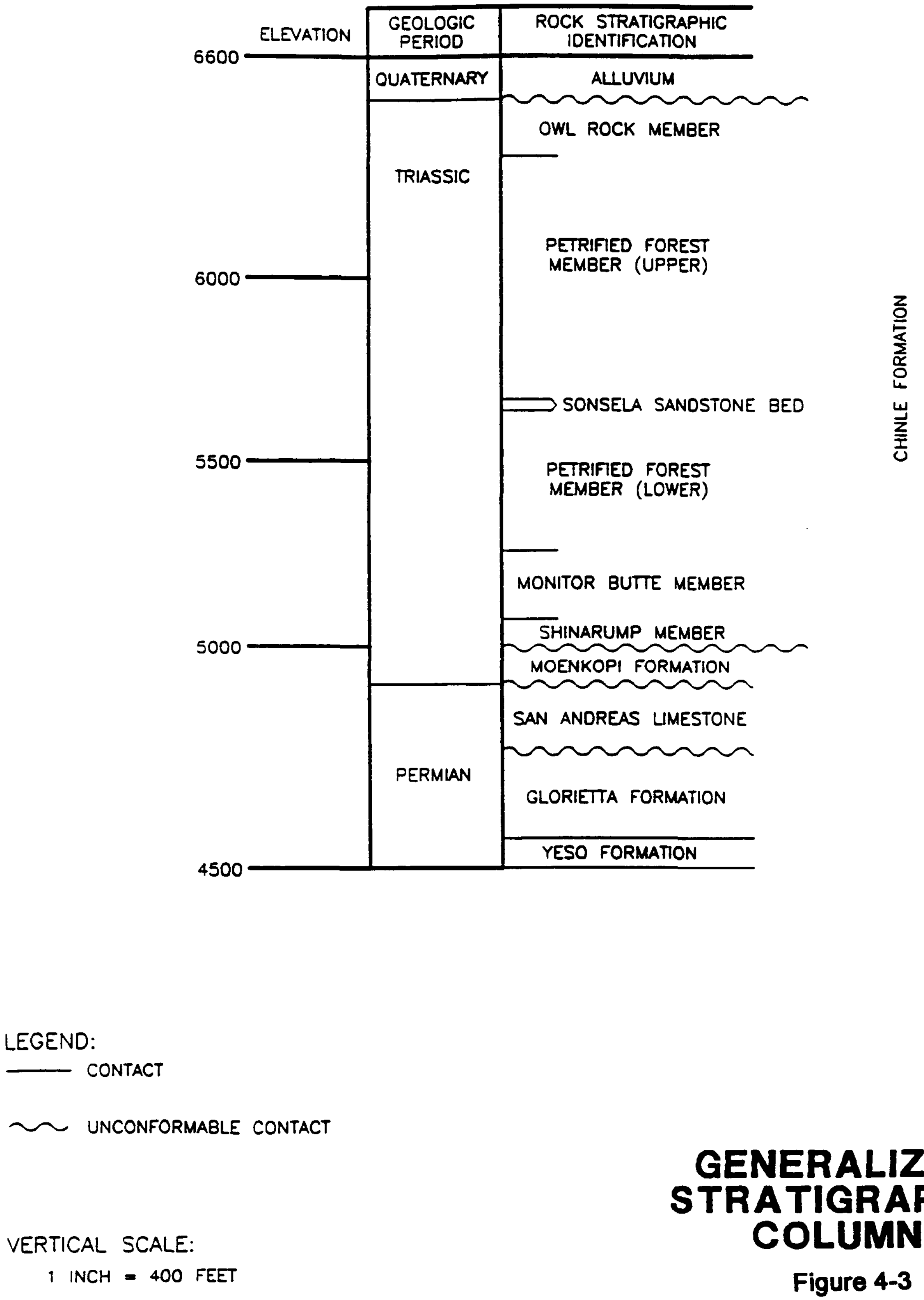

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GENERALIZED STRATIGRAPHIC COLUMN

Figure 4-3

DAMES & MOORE
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4.1.2 Local Geology

The site lies along the south side of an east-west trending alluvial drainage formed by the South Fork of the Puerco River. To the south of the site are the Zuni Mountains, reaching a maximum elevation of around 9,000 feet. North of the Plant, a massive red sandstone escarpment comprised of the Triassic/Durassic-aged sandstone and siltstone deposits of the Entreda and Wingate sandstones. It rises approximately 400 feet above the valley to an elevation of around 7,000 feet. The Wingate Plant property ranges in elevation from around 6,580 to 6,612 ft-MSL.

As shown in Figure 4-2, the surficial geology in the site area, consisting of Quaternary-ages alluvium. These strata dip to the northwest at approximately 2-3 degrees.

4.2 HYDROGEOLOGY

4.2.1 Regional Hydrogeology

The hydrogeology of the region is a function of geologic structure and hydraulic properties of the sedimentary formations deposited in the basin. Permeable sandstones and limestones, are typically interbedded with relatively impermeable shales, siltstones and mudstones, resulting in the formation of numerous confined aquifer systems in the Permian, Triassic, Jurassic, and Cretaceous-aged deposits. The northward dip of these strata in the southwestern portion of the San Juan Basin, in conjuction with the presence of impermeable overlying formations, result in recharge being limited to the outcrop exposure of the water-bearing unit, with progressively artesian conditions occurring to the north. The major regional aquifer in the site are is San Andres Limestone/Glorieta Sandstone of Permian age. Recharge to the San Andres/Glorieta aquifer occurs primarily in areas of the Zuni Mountains to the south of the site area.

As stated previously, the San Andres Limestone/Glorieta Sandstone formations constitute the primary aquifer in the region. This aquifer has been designated part of the C multiple-aquifer system (Cooley, etal 1969). The top of the San Andres is found at a depth of approximately 1,670 feet, according to driller's log data from onsite wells. The thickness of the combined aquifer system in the site area is reported to be about 330 feet. Driller's log data from offsite wells approximately six miles to the east, which service the Plant via pipeline indicate the top of the San Andres/Glorieta aquifer to be present locally at a depth of around 1,000 feet. Based on well data from the four active wells (two onsite and two offsite), the San Andres/Glorieta aquifer appears to become more productive to the east perhaps reflecting an increased degree of fracturing and/or solution cavities in that area.

Available aquifer test data for the San Andres/Glorieta report transmissivity and storage coefficient ranges of <5 to 3,740 ft^2/day, and 7.6×10^{-5} to 1.3×10^{-4}, respectively (Shomaker, 1971).

4.2.2 Local Hydrogeology

Shallow borings in the southwestern corner of the Plant site associated with a geotechnical investigation for a railroad overpass (Sergent, Hauskins and Beckwith, 1987), encountered between 40 and 80 feet of unconsolidated clays, silty clays, silty sands and gravels, prior to auger refusal in weathered siltstones and sandstone. The specific capacity of offsite wells completed in alluvium is reported to range from 0.19 to 1.75 gpm/ft (Shomaker, 1971). A review of driller's logs for the onsite water supply wells indicated alluvial thicknesses on the order of 100 feet. These logs variously report that the Chinle Formation or basal unit of the Wingate sandstone to underlie the alluvial fill deposits.

In order to better define the hydrogeology of the shallow alluvial aquifer and assess the impact of the Plant's wastewater impoundments (i.e. east and west evaporation ponds) three groundwater monitoring wells were installed around the impoundments (Dames & Moore 1990) and three additional test holes were drilled and four field permeability tests were conducted (Shomaker 1992). Two of the monitoring wells were sited downgradient (MW-1 & MW-2), and one upgradient to the approximate direction of shallow groundwater flow. The location of these monitoring wells (MW), bore holes (BH) and field tests (IT) are shown in Figure 4-4. In addition, four other wells were installed onsite as part of a property transfer environmental assessment (WMH-1,2,3,4). The location of these wells is shown in the Figure 4-5.

Three test holes were drilled around the ponds between January 6 and 8, 1992. Each hole was drilled to a depth of 26.5 feet. Split-spoon samples were collected to total depth in each hole. Core samples were collected in BH-3 from 12.5 to 14 (red clay), and 17.5 to 19 feet (dark red clayey silt). The core samples were submitted for laboratory analysis for column constant-head permeability tests. The laboratory was unable to saturate the samples after 21 days. The samples were sieved and found to be very fine-grained with 76 percent of the samples passing 200 mesh. The plasticitiy and liquid limit of both samples were 35 and 51, respectively, indicating both samples were high plasticity clays. The permeabilities were found to be less than 10^{-7} cm/sec.

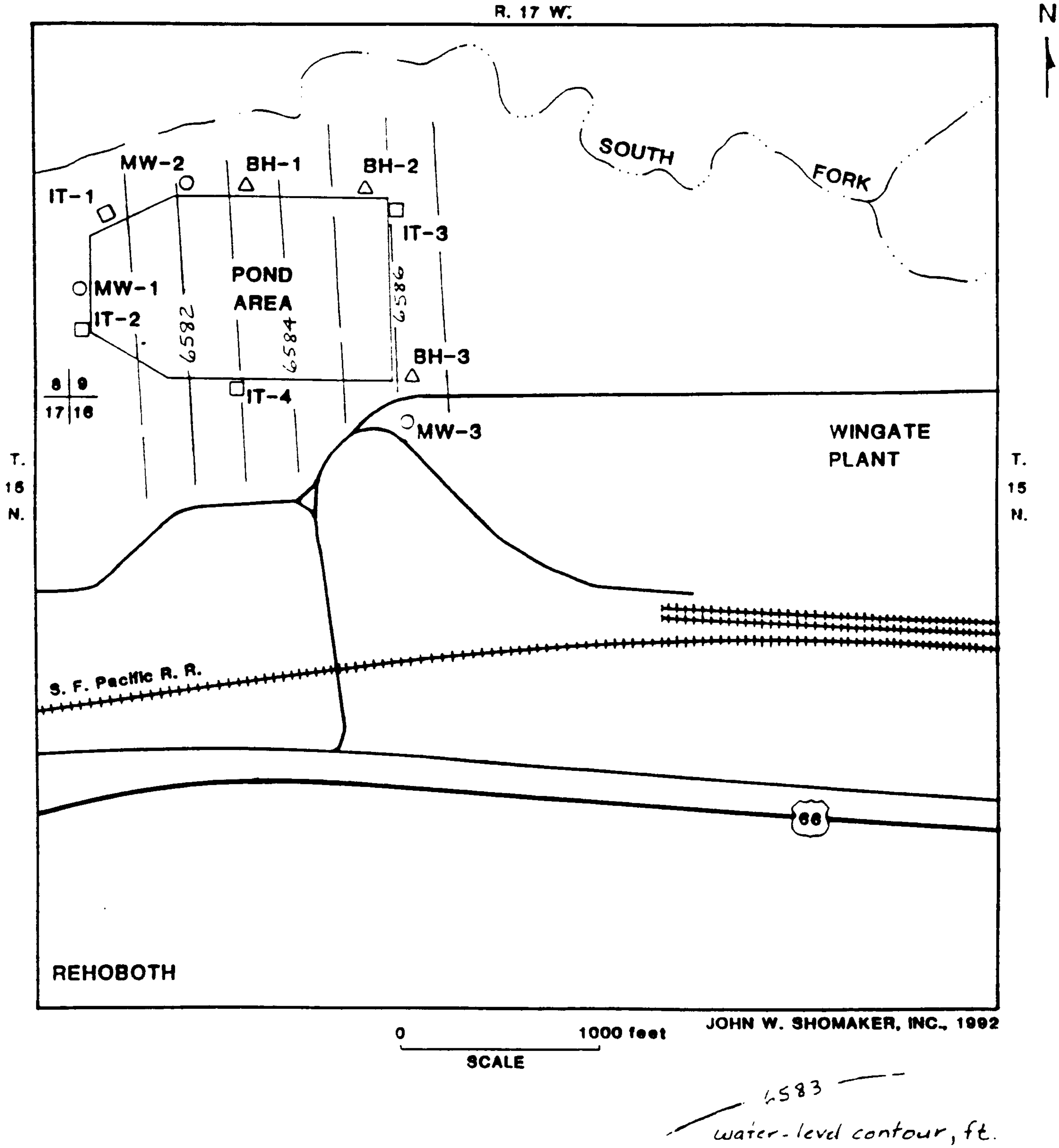
Based upon well logs, bore holes and cores, the stratigraphy of the alluvium under the ponds consists generally of three unconsolidated units which are illustrated in Figure 4-6. These units include (from the surface downward): an upper unit consisting of sands and silty clays to depths of four or five feet; an intermediate unit consisting of clay with minor silt and sands to depths of 15 to 23 feet; and a lower unit consisting of sands, silts and interbedded clay at depths from 15 to 55 feet. As discussed above, the hydraulic conductivity of the intermediate clay unit was determined to be less than 10^{-7} cm/sec. Saturated conditions were encountered only in the lower unit.

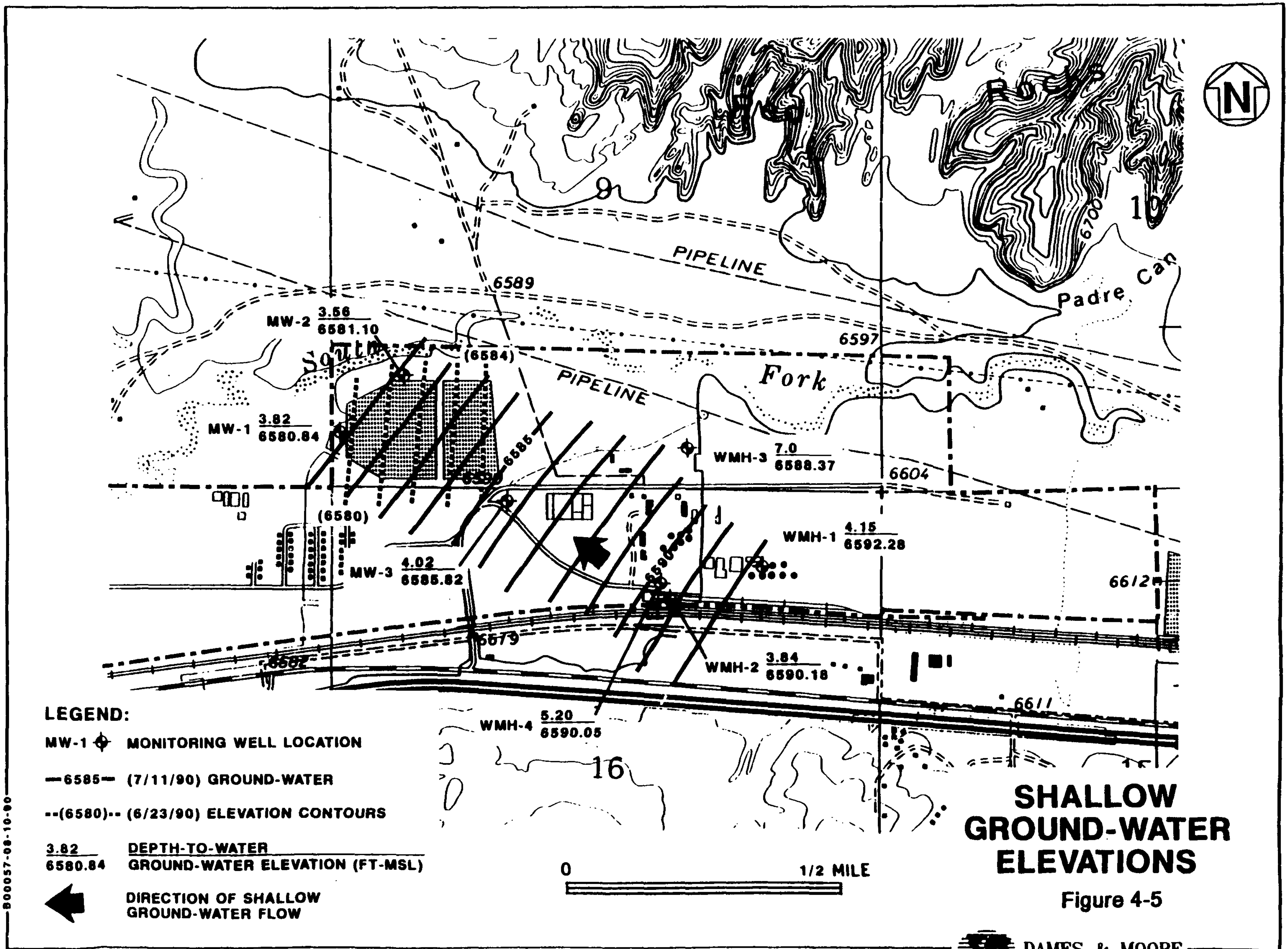
The shallow aquifer at the plant is in the shallow alluvium. In the pond area, the aquifer occurs in sands, silty sands interbedded with clays and silty clays of the lower unit at depths between 20 to 25 feet. Logs indicated soils were unsaturated to a depth of between 21 and 25 feet around the ponds. Saturated conditions were encountered below these depths. The potentiometric surface is about three feet below the land surface. The shallow aquifer, beneath the pond area, is confined by the overlying intermediate unit. This confining interval should restrict downward migration of water from the pond.

As shown by the water level contours in Figure 4-4 and 4-5, the direction of groundwater flow in the alluvial aquifer underlying the site is variable. Water levels in the evaporation pond monitoring wells, measured on June 23, 1990, indicate a westerly flow direction prevailed at the time. Water levels measured July 17, 1990 (Figure 4-5) indicated a northwesterly flow. Additional analysis on January 1, 1992 shifts the direction of flow back to a more westerly direction (Figure 4-4). This apparent shifting in flow direction suggests communication in the subsurface flow with the South Fork of the Puerco River east of the plant (Shomaker 1992, and Dames & Moore 1990).

Figure 4-4

Potentiometric Surface of Alluvial Aquifer





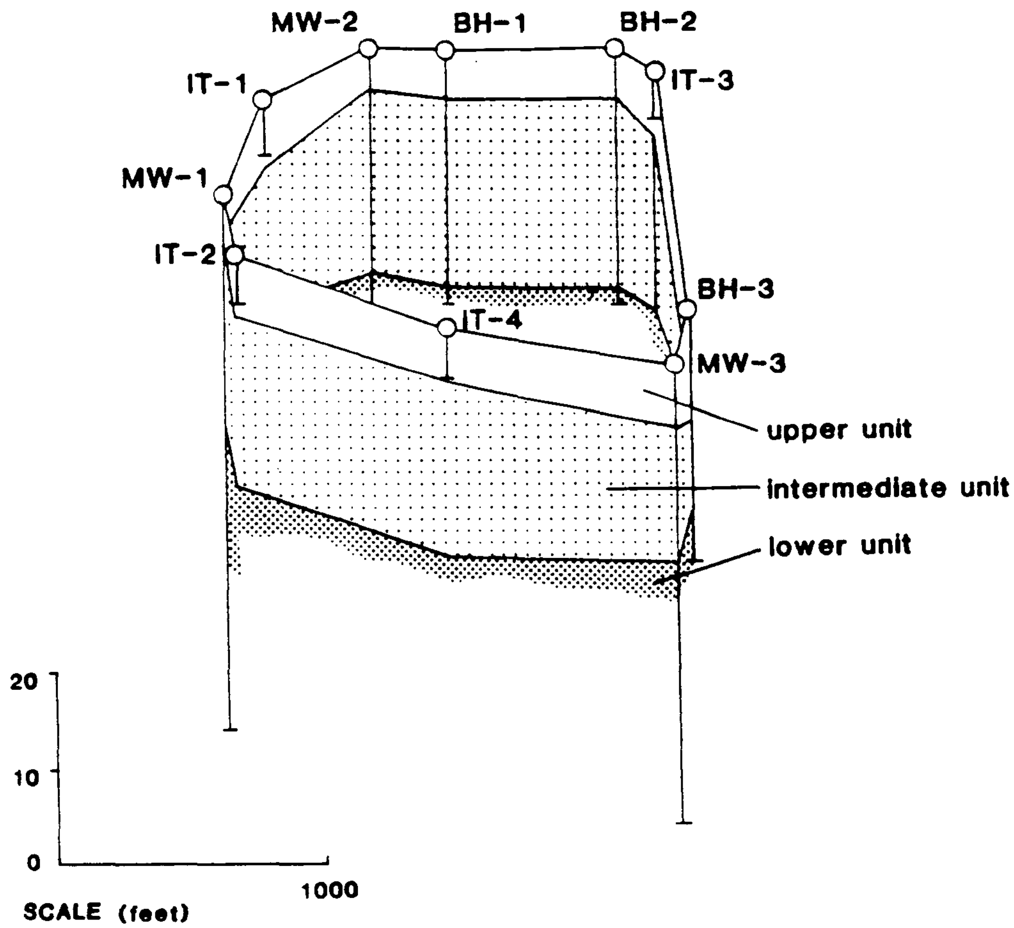
SHALLOW GROUND-WATER ELEVATIONS

Figure 4-5

DAMES & MOORE

Figure 4-6

Fence Diagram - Stratigraphic Relation Underlying Pond Area



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4.3 WATER QUALITY

4.3.1 Regional Aquifer

Water quality data for the four Plant water supply wells are presented in Table 4-1. The data for the onsite wells probably represent a composite of that found in the San Andres/Glorieta aquifer and the Sonsila Sandstone bed of the Chinle Formation. Groundwater from these wells meets New Mexico State water quality standards.

4.3.2 Alluvial Aquifer

The locations of wells within one mile of Wingate Plant and the onsite water supply wells are shown in Figure 4-7 (USGS, 1990). All the offsite wells listed are shallow alluvial wells to the east and upgradient of the facility. The available water quality data for these wells are presented in Table 4-2. Additional analyses of groundwater samples from the shallow alluvial aquifer in the area of the Wingate Plant were given in Shomaker (1971). The 11 reported analyses suggest the groundwater was generally a sodium-bicarbonate type, with total dissolved solids ranging from 692 to 954 mg/l.

Analyses of water samples from the pond monitoring wells indicate the shallow groundwater is similar to analyses reported in Shomaker (1971). Four sets of groundwater samples have been collected from the evaporation pond monitoring wells MW-1, MW-2, and MW-3. The results of these analyses are presented in Table 4-3. Concentrations of total dissolved solids, fluoride, iron, and maganese in MW-2, exceed New Mexico Water Quality Control Commission standards; the standards are 1,000, 1.6, 1.0 and 0.2 mg/l, respectively. Concentrations of manganese in MW-1 and MW-3 and iron in MW-1 exceed also exceed these standards.

The monitoring wells at the site are completed to a depth of about 58 feet and the depth of the first water-bearing zone is between 20 and 25 feet. By nature of this construction, these wells are open to more than one water-bearing interval. Therefore water produced from these wells is probably not representative of the uppermost water-bearing interval beneath the ponds. Water samples are composites of the 30+ feet of saturated interval open to the wells.

The hydraulic and stratigraphic relationships previously discussed suggest water in the pond is not likely to leak into the aquifer beneath the ponds. This interpretation is based upon the following:

- The clayey sediments in the intermediate unit underlying the ponds has a hydraulic conductivity less than 10^{-7} cm/sec.

- The intermediate interval is from 15 to 20 feet thick beneath the ponds.

- The confined hydraulic head in the shallow aquifer indicates upward flow is limited and restricted by the clay-rich intermediate unit.

The higher concentrations of total dissolved solids, chloride, biocarbonate, and sulfate in monitor wells MW-1 and MW-2 compared with well MW-3, may be due to communication with the South Fork. Such communication is suggested by the observed changes in direction of groundwater flow in the shallow aquifer. This appears to be influenced by flow and recharge from the South Fork, east of the Plant (Shomaker 1992, and Dames & Moore 1990). The concentration of total dissolved solids and other anions in water samples collected in November 1991 and January 1992, are not significantly greater than concentrations in water samples collected from the same wells in November 1990. This also suggests the quality of water is controlled by natural conditions not pond leakage.

The November 1991 and January 1992 samples from MW-3 showed trace levels of BTEX. MOI attributes these readings to inadequate decontamination of sampling equipment or contamination from upgradient sources. The second point is discussed in the following paragraphs. MW-2 also showed a trace of BTEX in November 1991. This result was not repeated in January 1992. MOI attributes the trace November reading to inadequate sampling equipment decontamination. In order to continue to demonstrate the absence of a significant impacts to aquifer water quality, MOI proposes to conduct annual water quality monitoring in MW-1 through MW-3 for general water chemistry, priority pollutant metals and BTEX.

Several additional sets of water quality samples have been collected from the WMH 1 through 4 monitoring wells. These data are presented in Table 4-4. These wells are upgradient of the evaporation ponds. There are no plant process discharges that can impact water quality in this area.

The most significant aspect of the data presented in Table 4-4 is the presence of BTEX consistently detected in WMH-2. BTEX levels exceed New Mexico WQCC standards. At this time, MOI believes the contamination is possibly related to a historic accidental release of hydrocarbon in the train loading rack area when the facility was owned and operated by EPNG. The extent of contamination is unknown at this time. MOI is prepared, and commits, to further investigate the BTEX contamination if the OCD determines that such action is warranted. MOI proposes that any follow-up assessment of the BTEX contamination be handled as a stand-alone investigation and not be linked to this Wingate Plant Discharge Plan.

Table 4-1

Regional Groundwater Quality Data

Constituent	WELL #3 (ON SITE) T15N 417W S16 NE/NE/NE 04/09/76	WELL #3 (ON SITE) T15N R 17W S16 NE/NE/NE 04/04/89	WELL #4 (ON SITE) T15N R 17W S16 NE/NE/NE 04/14/89	WELL #6 (OFF SITE) T15N R16W S20 SE/SE/NE 04/04/89	WELL #7 (OFF SITE) T15N R16W S20 NW/SE/NE 04/09/89	WELL #7 (OFF SITE) T15N R16W S20 NW/SE/NE 04/14/89
pH	8.2	7.7	7.7	7.8	7.75	7.6
Alkalinity, Total	174	202	191	164	166	166
Calcium	62	40	107	156	344	154
Chloride	64	34	16	17	14	16
Fluoride	–	0.39	0.24	0.23	–	0.23
Hardness, Total	118	190	420	628	680	710
Iron, Dissolved	–	0.15	0.13	0.12	–	0.1
Iron, Total	–	0.37	7.9*	0.35	–	0.15
Magnesium	56	22	37	58	336	79
Maganese, Dissolved	–	0.12	0.16	0.14	–	0.14
Manganese, Total	–	0.17	0.22	0.17	–	0.17
Nitrate (as NO3)	–	<0.1	<0.1	<0.1	–	<0.1
Nitrate (as NO2)	–	0.03	0.06	0.02	–	0.03
Potassium	–	5.1	6.7	5.2	–	5.4
Silica	–	9.4	8.2	7.1	–	7.1
Sodium	–	237	82	75	–	39
Specific Conductance (umhos)	1360	1215	1171	1199	1340	1173
Sulfate	502	478	410	614	679	618
Total Dissolved Solids	888	932	944	1058	1135	921
Turbidity	9.2	–	–	–	4.4	–
BOD		<1	<1	<1	–	<1
COD		<1	<1	<1	–	<1
Ammonia Nitrogen (as NH4)		0.35	0.25	0.29	–	0.13
TOC		0.67	0.62	1.09	–	0.68

Units expressed in mg/l

Table 4-2

Offsite Wells Adjacent to Wingate Plant

	Well 14.1 08/07/75	Well 14 .1A 08/07/75	Well 15.1321 03/65	Well 15.2414 03/65	MCL
pH (units)	8.5	8.5	7.7	7.7	6-9
Alkalinity, Total					
(as CaCo3)	315	524	418	–	–
Carbonate (as CaCO3)	61	83	–	–	–
Bicarbonate (as CaCO3)	260	470	5120	282	–
Hydroxide	–	–	–	–	–
Chloride (Cl)	50	82	23	50	250
Fluoride (F)	1.3	1.2	0.6	0.5	1.6
Nitrate (as N)	0.14	0.14	0.05	6.6	10
Sulfate (SO4)	210	39	173	340	600
Total Dissolved Solids (TDS)	739	747	692	932	1,000
Silver (Ag)	–	–	–	–	0.05
Arsenic (As)	–	–	–	–	0.1
Barium (Ba)	–	–	–	–	1.0
Calcium (Ca)	22	22	52	98	–
Cadmium (Cd)	–	–	–	–	0.01
Chromium (Cr)	–	–	–	–	0.05
Copper (Cu)	–	–	–	–	1.0
Iron (Fe)	–	–	–	–	1.0
Hardness	75	80	372	352	–
Mercury (Hg)	–	–	–	–	0.002
Magnesium (Mg)	4.8	6.1	59	26	–
Manganese (Mn)	–	–	–	–	0.2
Sodium (Na)	260	280	120	189	–
Lead (Pb)	–	–	–	–	0.05
Selenium (Se)	–	–	–	–	0.05
Zinc (Zn)	–	–	–	–	10
Silica (SiO2)	–	–	13	11	–
Potassium (K)	0.8	1.0	–	–	–
Boron (B2)	0.26	0.54	–	–	–

Units expressed in mg/l

Table 4-3

Evaporation Pond Monitoring Wells

		MW-1				MW-2				MW-3		
Laboratory Data	6/23/90	07/14/90	11/15/91	1/22/92	6/23/90	7/14/90	11/15/91	1/22/92	6/23/90	7/14/90	11/15/91	1/21/92
pH	8.4	8.3	8.07	8.07	8.5	8.4	7.98	8.19	8.1	7.8	7.85	7.91
TDS	490	570	838	722	1,010	1,400	1100	1220	1,350	520	486	478
Alkalinity, Total	420	444	566	510	735	281	795	772	659	419	417	411
Bicarbonate	414	444	689	622	695	271	970	939	659	419	509	502
Carbonate	6	<1	0	0	40	10	0	0	<1	<1	0	0
Calcium (Ca)	11.3	9.9	5.27	3.56	18.2	18.8	12.1	14.1	46.8	0.5	32.4	32.0
Chloride (Cl)	15.7	20.9	43	36.0	50	79	47.6	66.7	140	21.8	16	16.9
Fluoride (F)	0.83	0.97	1.82	1.45	1.49	1.77	2.95	2.87	1.32	1.09	1.00	1.01
Hardness	63.6	54.4	13.1	18.9	96.5	92.6	38.5	36.7	186	1.2	102	125
Hydroxide	<1	<1			<1	<1			<1	<1		
Iron (Fe)	0.216	1.40		5.81	3.111	2.34		16.98	0.067	0.658		0.60
Magnesium (Mg)	8.6	7.2	<0.1	2.44	12.4	11.1	2.05	0.40	16.7	<0.1	5.23	11.0
Manganese (Mn)	0.174	0.228		0.25	0.290	1.36		0.68	0.242	0.481		0.46
Nitrate (as N)	<0.06	<0.06	<0.02	<0.02	<0.06	<0.06	<0.02	<0.02	<0.06	<0.06	<0.02	<0.02
Nitrite			<0.02	<0.02			<0.02	<0.02			<0.02	<0.02
Potassium			<0.1	0.73			0.3	0.96			0.2	0.33
Silica				10.7				8.30				12.4
Sodium (Na)	172	176	328	267	362	470	445	435	445	120	162	150
Sulfate (SO4)	1.0	19	86.5	51.9	73	240	112	150	280	26	18.9	16.1
Antimony (Sb)				0.063				ND				ND
Arsenic (As)	<0.005	<0.005		0.006	<0.005	0.021		0.020	<0.005	0.007		0.009
Barium (Ba)	0.248	0.235			0.158	0.175			0.110	0.139		
Beryllium (Be)				ND				ND				ND
Cadmium (Cd)	<0.005	0.006		0.003	<0.005	0.006		0.003	<0.005	<0.005		ND
Chromium (Cr)	<0.01	<0.01		ND	<0.01	<0.01		0.03	<0.01	<0.01		ND
Copper (Cu)	<0.02	<0.02		ND	<0.02	<0.02		ND	<0.02	<0.02		ND
Lead (Pb)	0.002	<0.002		ND	<0.002	0.004		ND	0.004	<0.002		ND
Mercury (Hg)	<0.0002	<0.0002		ND	<0.0002	<0.0002		ND	<0.0002	<0.0002		ND
Nickel (Ni)				ND				ND				ND
Selenium (Se)	<0.005	<0.005		ND	<0.005	<0.005		ND	<0.005	<0.005		ND
Silver (Ag)	<0.01	<0.01		ND	<0.01	<0.01		ND	<0.01	<0.01		0.02
Thallium (Tl)				ND				ND				ND
Zinc (Zn)	<0.010	0.043		0.03	0.015	0.120		0.04	<0.010	0.094		0.03
TPH - ug/l			ND				2.6				ND	
Benzene - ug/l			ND	ND			ND	ND			0.2	ND
Toluene - ug/l			ND	ND			ND	ND			0.2	3.9
Ethylbenzene - ug/l			ND	ND			ND	ND			0.4	0.6
Total Xylenes - ug/l			ND	ND			0.1	ND			1.7	4.4

All results in mg/l unless otherwise indicated.

Table 4-4

Wingate Plant Monitoring Wells

Laboratory Data	WMH-1				WMH-2							
	7/17/90	7/10/91	10/28/91	1/21/92	7/17/90	7/10/91	9/1/91	10/28/91	11/1/90	12/4/91	12/31/91	1/21/92
pH	7.9	7.38	7.84	7.70	7.6	7.83		8.34		7.87	8.03	8.03
TDS	780	4,270	3,490	4,620	1,200	4,280	3,050	3,370	3,060	3,060	2,640	2,230
Bicarbonate		1,230	1,110	1,340		2,610		2,090		1,770	1,590	1,450
Calcium (Ca)		242	230	286		82		63.6		49.2	42.4	42.4
Carbonate		0	0			0	732	19.5		0	0	0
Chloride (Cl)	38	467	425	593	38	1110		842	714	714	623	522
Fluoride (F)	1.3	0.65	0.46	0.43	1.4	1.36		1.5		1.84	1.79	1.63
Hardness		848	804	1000		408		191		205	187	188
Hydroxide												
Iron (Fe)	5.2				2							
Magnesium (Mg)		59.5	56	70.2		49.5		7.91		20.1	19.8	19.9
Manganese (Mn)	0.24				0.19							
Nitrate (as N)	<0.01	<0.04	<0.02	<0.02	<0.01	0.12		<0.02		3.45	<0.02	<0.02
Nitrite		<0.04	<0.02	<0.02				<0.02		<0.02	<0.02	<0.02
Potassium (K)		1150	2.9	2.56		2.02		0.5		0.98	0.61	0.08
Silica												
Sodium (Na)		1,150	1,010	1,300		1,600		1,300		1,020	964	826
Sulfate (SO4)		1,690	1,400	1,840		34.6		49.4		9.88	16.9	14.8
Total Organic N	0.07				1.8							
Aluminum (Al)	0.7				0.9							
Antimony (Sb)		ND										
Arsenic (As)	<0.005	0.006			<0.005	0.01						
Barium (Ba)	0.29				0.14							
Beryllium (Be)		ND				ND						
Cadmium (Cd)	<0.01	0.002			<0.01	ND						
Chromium (Cr)	<0.02	0.02			<0.02	ND						
Cobalt (Co)	<0.05				<0.05							
Copper (Cu)	0.01	0.02			0.02	0.01						
Cyanide	<0.005				<0.005							
Lead (Pb)	<0.05	0.02			<0.05	0.02						
Mercury (Hg)	<0.005	ND			<0.005	ND						
Molybdenum (Mo)	<0.05				<0.05							
Nickel (Ni)	<0.04	0.03			<0.04	0.01						
Selenium (Se)	0.005	ND			<0.005	ND						

Table 4-4
(continued)

Laboratory Data	WMH-1				WMH-2							
	7/17/90	7/10/91	10/28/91	1/21/92	7/17/90	7/10/91	9/1/91	10/28/91	11/1/90	12/4/91	12/31/91	1/21/92
Silver (Ag)	<0.01	ND			<0.01	ND						
Thallium (Tl)		ND				ND						
Zinc (Zn)	0.01	0.14			0.05	0.14						
TPH - ug/l		9.5	ND			191,000	38,500	4,000	6,800	6.800	18,460	
Benzene - ug/l		ND	ND	ND		26,800	5,400	5,700	2,520	2,520	2,540	3,090
Ethylbenzene - ug/l		ND	ND	1.3		ND		164	990	990	2,090	129
Toluene - ug/l		ND	ND	8.2		6,800	5,400	5,300	1,610	1,610	1,600	1,320
Total Xylenes - ug/l		ND	ND	7.9		1,145	1,127	1,067		374	1,900	1,020

All results in mg/l unless otherwise indicated.

Gulf

Contamination [illegible]

from

[illegible] [illegible] Area

[illegible] [illegible] Property

Table 4-4
(continued)

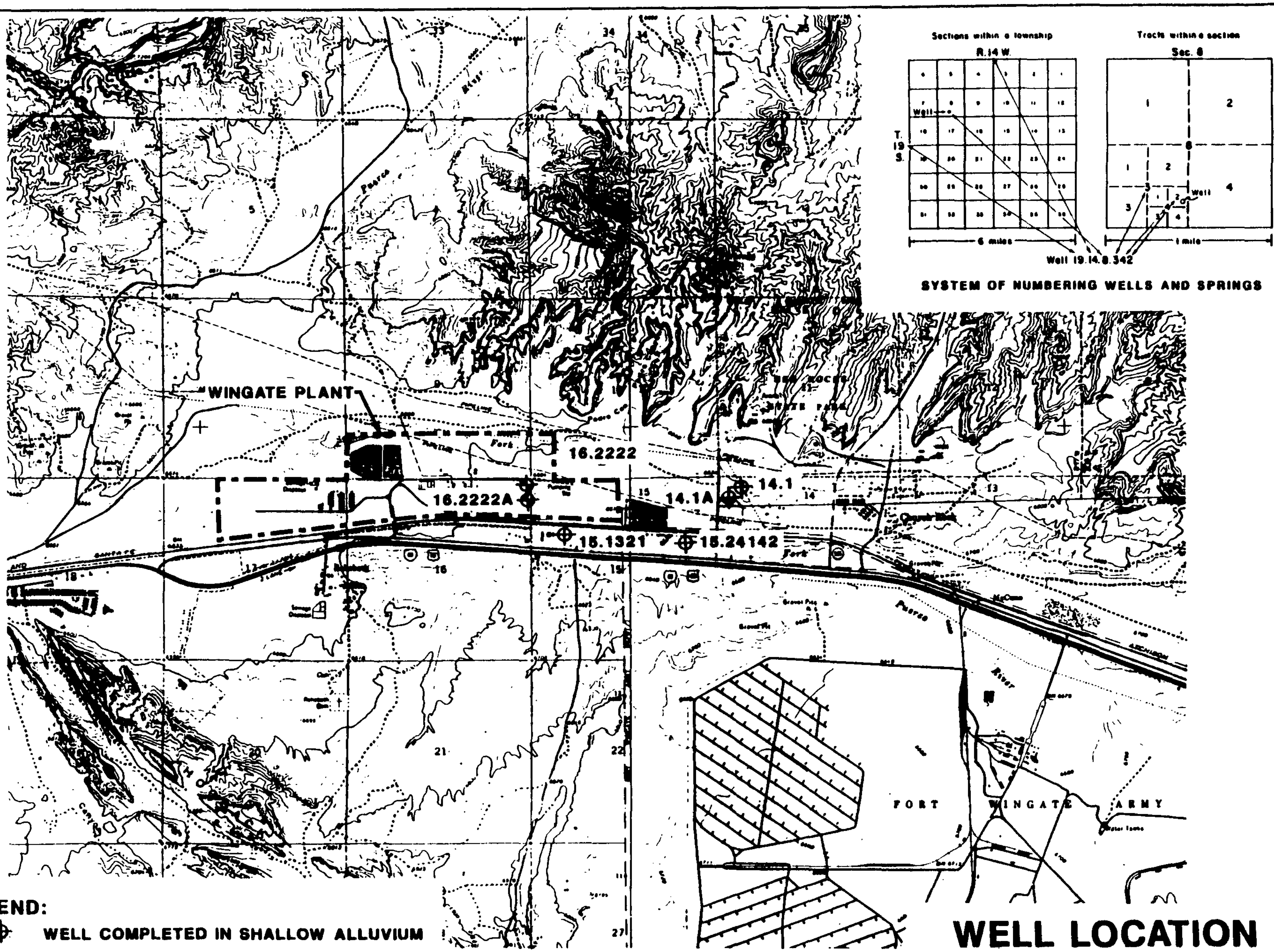
Laboratory Data	WMH-3				WMH-4		
	7/17/90	7/10/91	10/28/91	1/22/92	7/10/91	10/28/91	1/21/92
pH	7.3	7.79	8.08	8.37	7.81	8.82	8.06
TDS	540	3,800	6,570	5,930	1,780	1,780	1,750
Bicarbonate		720	1,350	1,260	1,000	1,060	921
Calcium (Ca)		120	236	163	25.2	61.5	19.4
Carbonate		0	0	13.8	0	65.7	0
Chloride (Cl)	23	693	1210	1050	125	157	125
Fluoride (F)	1.2	0.65	0.81	0.86	1.36	1.63	1.51
Hardness		460	732	634	125	278	100
Hydroxide							
Iron (Fe)	1.4						
Magnesium (Mg)		39.1	35	55.4	15.1	30.3	12.6
Manganese (Mn)	0.38						
Nitrate (as N)	<0.1	10.3	6.66	3.56	<0.04	<0.02	2.36
Nitrite			<0.02		<0.04	<0.02	
Potassium (K)		15	2.9	1.91	2.95	1.2	0.36
Silica							16.7
Sodium (Na)		1170	2140	1880	638	640	622
Sulfate (SO4)		1450	2520	2170	548	519	492
Total Organic N	<0.3						
Aluminum (Al)	0.5						
Antimony (Sb)		ND			ND		
Arsenic (As)	<0.005	0.013			0.010		
Barium (Ba)	0.12						
Beryllium (Be)		0.006			ND		
Cadmium (Cd)	<0.01	ND			ND		
Chromium (Cr)	<0.02	0.03			ND		
Cobalt (Co)	<0.05						
Copper (Cu)	<0.01	0.02			0.01		
Cyanide	<0.005						
Lead (Pb)	<0.05	0.03			ND		
Mercury (Hg)	<0.005	ND			ND		
Molybdenum (Mo)	<0.05						
Nickel (Ni)	<0.04	0.04			0.01		
Selenium (Se)	<0.005	ND			ND		
Silver (Ag)	<0.01	ND			ND		

Table 4-4
(continued)

Laboratory Data	WMH-3 7/17/90	WMH-3 7/10/91	WMH-3 10/28/91	WMH-3 1/22/92	WMH-4 7/10/91	WMH-4 10/28/91	WMH-4 1/21/92
Thallium (Tl)		ND			ND		
Zinc (Zn)	0.05	0.15			0.06		
TPH - ug/l		7.8	ND		14.7	ND	
Benzene - ug/l		ND	3.1	44.3	ND	1.3	1.9
Ethylbenzene - ug/l		ND	ND	1.3	ND	ND	1.1
Toluene - ug/l		ND	ND	18.3	ND	ND	4.0
Total Xylenes - ug/l		ND	ND	7.7	ND	ND	5.1

All results in mg/l unless otherwise indicated.

G.W.
Contamination
downgradient from
areas?
Need Further Program!



LEGEND:

- WELL COMPLETED IN SHALLOW ALLUVIUM
- WELL COMPLETED IN REGIONAL AQUIFIER

SOURCE: USGS ALBUQUERQUE NM
PROVISIONAL GROUND-WATER DATA 6/22/90

WELL LOCATION MAP

Figure 4-7

DAMES & MOORE
01889-115-022

B00058-08-10-90

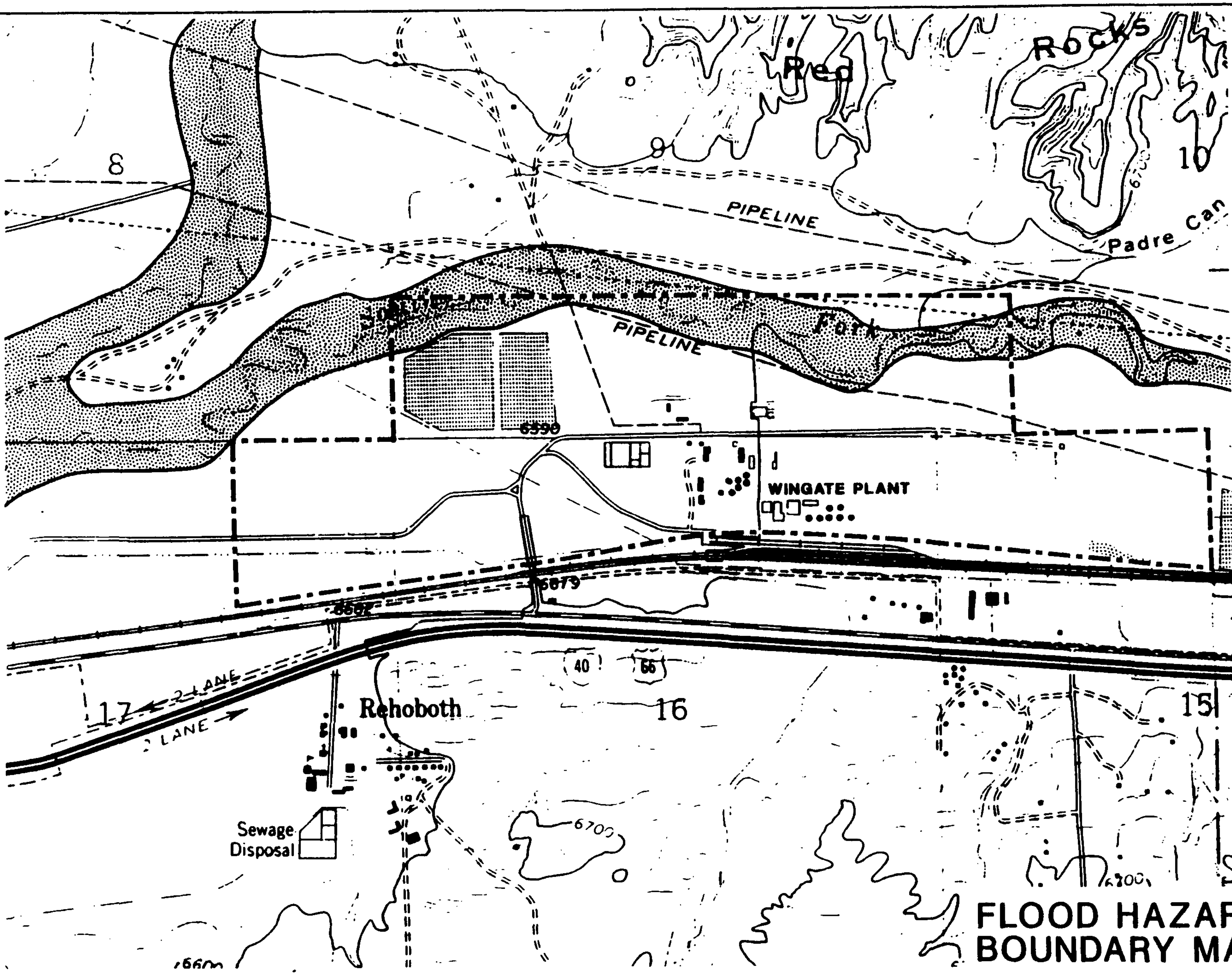
4.4 HYDROLOGIC FEATURES

The northern portion of the Wingate Plant property is bounded by the South Fork of the Puerco River. The Puerco River is an intermittent stream tributary to the Little Colorado River watershed. The confluence of the North and South forks occurs to the west of the Plant, upstream from the City of Gallup. The Puerco River (north and south branches) comprises a drainage area of approximately 558 square miles. No other surface water sources are known to be present within a one mile radius of the Wingate Plant.

Surface water runoff upgradient of the Plant property to the south is intercepted by the I-40 Freeway, and routed to the south around the facility. Runoff from the east of the Plant is channeled north to the Puerco River. Onsite run-off is routed to the north and south of the developed portion of the site, where it rejoins pre-existing natural drainages to the west.

4.5 FLOOD PROTECTION

The Flood Hazard Boundary Map for this portion of McKinley County (HUD, 1978) delineates the area described as "subject to special flood hazards" shown in Figure 4-8. This area is approximately that which would be inundated as a result of a 100-year flood flow in the Puerco River. Although it appears from this information that some undeveloped areas of the Plant property, outside the stream channel, may be subject to flooding, no facilities, with the possible exception of the evaporation ponds appears to be at risk as a result of flood flows in the Puerco River.



SOURCE: HUD FEDERAL INSURANCE ADMINISTRATION
McKINLEY CO. (UNINCORPORATED AREA)
PANAL NO. 3500390020A

0 1000 2000
SCALE IN FEET

FLOOD HAZARD BOUNDARY MAP

Figure 4-8

DAMES & MOORE
01889-115-022

500031-06-18-90

5.0 ADDITIONAL INFORMATION

5.1 SOIL PROPERTIES

Soil survey data for the Wingate Plant area is not available at this time from the U.S. Soil Conservation Service or New Mexico state agency (U.S. Soil Conservation Service, personal communication).

5.2 CLIMATE

The MOI Wingate Plant is located in a semi-arid region. Data recorded at the Wingate weather station show an annual precipitation of 9.66 inches. The mean annual temperature is 49.2 F. A monthly summary of temperatures, precipitation and relative humidity was previously presented in Table 2-4.

The prevailing winds are southwesterly although southeasterly and west-southwesterly winds are also common. Strong winds are predominant in the winter and spring months.

The area is prone to lightning strikes which necessitate an extensive protection system against lightning caused fires.

5.3 HISTORY OF OPERATION

The Wingate Plant was owned and operated by EPNG until October 1990. The initial section of the MOI Wingate Plant was the "A" plant. It was designed by Fluor Corporation to process 338,991 gallons per day of natural gas liquids. It was placed in service on October 28, 1953 and modified in May 1962.

The "B" plant section was designed by Sterns-Roger and Fish Engineering Corporations to process 659,038 gallons per day. This section was placed in service on October 25, 1956.

A deisobutanaizer section was designed by Fish Engineering. It was placed in service in December 1957. A new deisobutanaizer section was built in May 1962 and the original section was abandoned in place. The deisobutanaizer section currently produces 250,000 gallons per day of normal butane and 115,000 gallons per day of isobutane.

The "C" plant section was designed by Sterns-Roger Corporation to process 330,000 gallons per day. It was placed in service on April 7, 1967.

A train loading facility capable of handling 82 cars was placed in service on September 15, 1959. A major fire occurred at this facility in 1982. A deluge system and lightning protection system were installed as a result for both truck and train loading racks.

A company lodging camp consisting of forty-eight houses and twenty-three house trailers existed on the property and received utilities from the plant. The camp was retired and the houses and trailers were removed in 1986.

6.0 BASIS FOR APPROVAL

The existing site conditions at the Wingate Plant provide protection from present or future danger to groundwater. All plant processes are closed pipe, contained in tanks, or otherwise controlled to prevent leakage. Hydrogeologic assessments of the evaporation ponds have demonstrated that the pond waters are effectively contained by the natural impermeability of 12 to 15 feet of highly plastic clay ($< 10^{-7}$ cm/sec hydraulic conductivity). Slight elevated concentrations of several constituents in the shallow aquifer system is likely due to hydrogeologic communication with shallow alluvium groundwater of poor water quality and not infiltration from the evaporation ponds. MOI is committed to further investigation of observed BTEX contamination in the train rack area if such action is deemed necessary by the OCD.

To further enhance groundwater protection, as part of this discharge plan, MOI proposes the following plant modifications, practices and continued groundwater monitoring:

- Close the abandoned flare pit containing contaminated water.
- Close the fire training grounds to eliminate oil contamination of soil and prevent future contamination.
- Comply with applicable upcoming Stormwater Discharge NPDES requirements. MOI will supply the OCD with copies of applicable permits/plans developed under the Stormwater program.
- Monitor evaporation ponds and associated monitoring wells on an annual basis for general water chemistry, priority pollutant metals, and BTEX.
- Install fuel containment dikes or pans in plant vehicle fuel storage areas.
- Install a containment dike in the waste drum storage area.
- Install a concrete floor/liner in sulfuric acid storage area.
- Re-plumb the single septic tank that utilizes a leach line to the evaporation ponds.

MOI is wholly committed to carrying out sound disposal practices and to this end submits this plan outlining the proposed procedures. Likewise, MOI is committed to cooperating fully with NMOCD in honoring requests for additional information or clarification of existing information related to the Discharge Plan.

7.0 REFERENCES

Cooley, M.E., Harsburger, J.W., Akers, J.P., and Hardt, W.F., 1969, Regional Hydrogeology of the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah, USGS Professional Paper 521-A.

Cresswell, L.W., The Fate of Petroleum in a Soil Environment, 1977 Oil Spill Conference Proceedings, American Petroleum Institute Publication N. 4284, pp. 479-482, 1977.

Dames and Moore, Hydrogeologic Assessment Wingate Fractionating Plant For El Paso Natural Gas Company, 1990, unpublished report prepared for El Paso Natural Gas Company.

Gudin, C., and W.J. Syratt, Biological Aspects of Land Rehabilitation Following Hydrocarbon Contamination, Environmental Pollution, Volume 8:107-117, 1975.

National Oceanic and Atmospheric Administration, Climatography of the United States No. 81 (New Mexico), 1982.

National Oceanic and Atmospheric Administration, Mean Relative Humidity (%), Monthly and Annual, pp 61-62, 1970.

Personnel Communication, Mr. Ken Scheffy, U.S. Soil Conservation Service, Albuquerque, New Mexico, June 20, 1990.

Sergent, Hauskins, and Beckwith Engineers, 1987, EPNG Wingate Plant Railroad Bridge Overpass - Geotechnical Investigation Report, June 26, 1987.

Shomaker, J. W., 1971, Water Resources of Fort Wingate Army Depot and Adjacent Areas, McKinley County, New Mexico, USGS Open File Report MK-32, September 1971.

Shomaker and Associates, 1992, Hydrologic Evaluation of Evaporation Pond Area, Wingate Plant, McKinley County, New Mexico, unpublished report prepared for Meridian Oil, Inc.

U.S. Department of Agriculture, Annual Lake Evaporation map, USSCS, 1978.

U.S. Department of Housing and Urban Development, Federal Insurance Administration, 1978, Flood Hazard Boundary Map, Mckinley County, New Mexico.

U.S. Geological Survey, Well Information Database, McKinley County, New Mexico, June 6, 1990, Albuquerque, New Mexico.

STREAM	FLOW (gpd)
1	53,166
2	54,839
3	138,285
4	8303
5	304,593
6	301,696
7	2897
8	13,385
9	5000
10	1600
11	1600
12	50
13	5135
14	172,746
15	2665
16	1759
17	361
18	545
19	198,594
20	164,735
21	26,359
22	7500
23	12,900
24	74,152
25	14,375
26	59,777
27	21,690
28	38,088
29	906
30	90,856
31	1
32	93,363

REFERENCES TITLE	REFERENCES TITLE

REVISIONS

NO.	BY	DATE	DESCRIPTION

REVISIONS

NO.	BY	DATE	DESCRIPTION
5	MJF	4/5/92	MINOR REVIION
4	MAR	7/9/90	RELOCATED "C" CT MAKE UP AND MISC. CHANGES
3	MAR	6/8/90	RELOCATED LEMENTS, ADDED WATER BALANCE
2	TRW	4/12/90	MAJOR REVISON
1	TRW	3/28/90	COOLING TOIER MAKEUP/GENERAL WASTE SUMP FLOW METERS ADDED

SCALE: NONE		DATE
DESIGNED BY:	TRW	3-27-90
DRAWN BY:	MGO	3-27-90
CHECKED BY:	MAR	3-28-90
APPROVED BY:		
CLIENT APPROVAL BY:		

RECEIVED
APR 09 1992
OIL CONSERVATION DIV.
SANTA FE

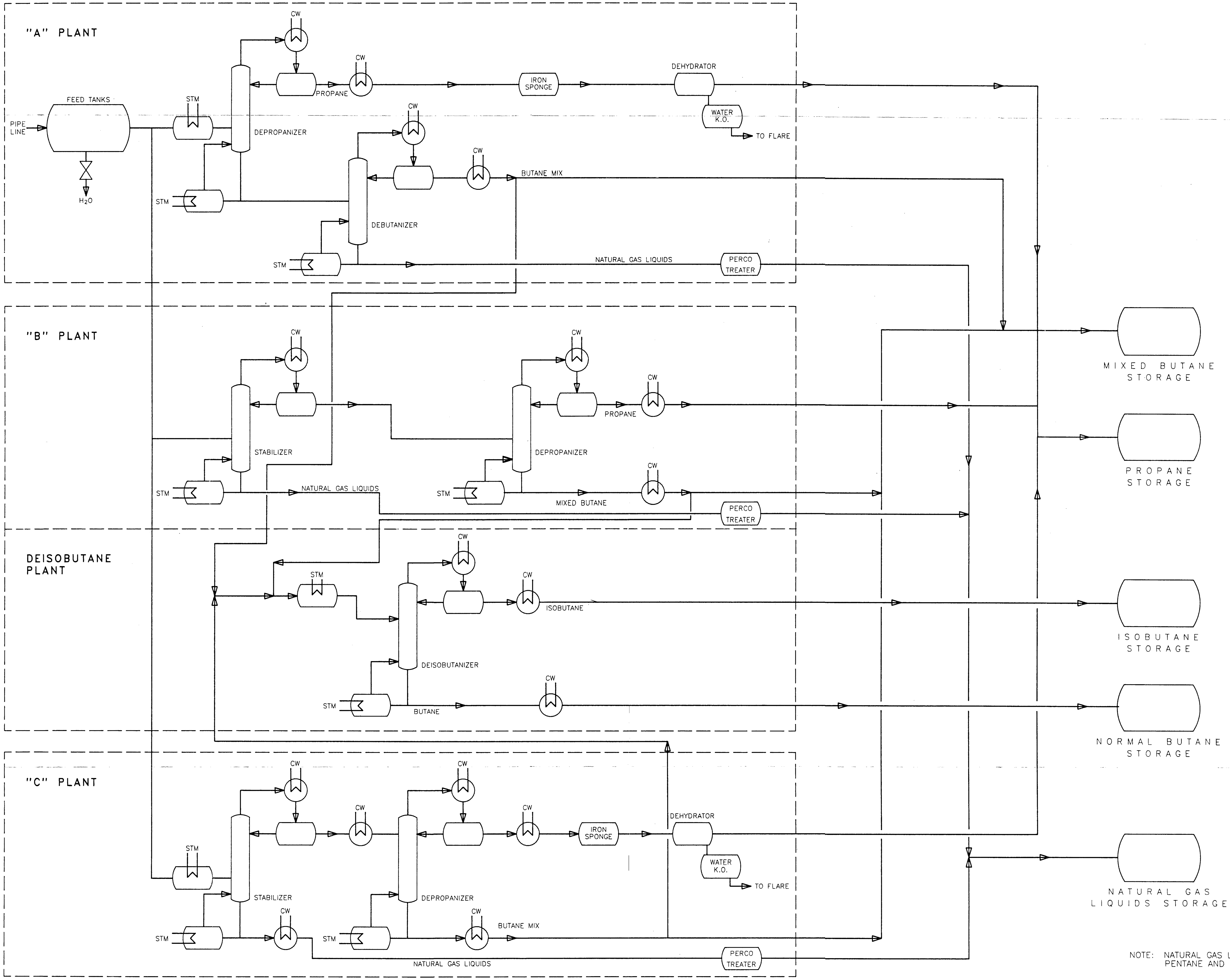
MERIDIAN OIL INC.

WATER FLOW BLOCK DIAGRAM

WINGATE FRACTIONATING PLANT

JOB NO. 01889-115-022

DRAWING NO. 5151 REV. 5



NOTE: NATURAL GAS LIQUIDS CONSIST PRIMARILY OF PENTANE AND HEXANE (LIGHT GASOLINE).

REFERENCES TITLE	REFERENCES TITLE

NO.	BY	DATE	REVISIONS DESCRIPTION
△			
△			
△			
△			
△			

NO.	BY	DATE	REVISIONS DESCRIPTION
△			
△			
△			
△			
△	MAR	5/31/90	MOVE PERCO TREATERS, DEHYDRATORS, ADD MIX BUTANE STORAGE.

SCALE: NONE		DATE
DESIGNED BY:	MAR	4-18-90
DRAWN BY:	WEH	4-18-90
CHECKED BY:	MAR	4-18-90
APPROVED BY:		
CLIENT APPROVAL BY:		

Dames & Moore
DESIGN SERVICES GROUP

EL PASO NATURAL GAS

PROCESS SCHEMATIC–WINGATE PLANT

WINGATE FRACTIONATING PLANT

JOB NO. 01889-115-022

DRAWING NO. 5158

REV. 1

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OIL CONSERVATION DIV.
SANTA FE

APR 09 1992
OIL CONSERVATION DIV.
SANTA FE

REFERENCES TITLE	REFERENCES TITLE	NO.	BY	DATE	REVISIONS DESCRIPTION	NO.	BY	DATE	REVISIONS DESCRIPTION
		△				△			
		△				△			
		△				△			
		△				△	MAR	7/9/90	RELOCATED DOMESTIC LINES.
		△				△	MAR	5/31/90	CORRECT FLOW PATHS.

SCALE:	NONE	DATE
DESIGNED BY:	MAR	4-30-90
DRAWN BY:	JBH	4-30-90
CHECKED BY:	MAR	4-30-90
APPROVED BY:		
CLIENT APPROVAL BY:		

Registered Professional Engineer (Chemical) Certificate No. 11041 Michael Aaron Rodgers Arizona, U.S.A.

Dames & Moore
DESIGN SERVICES GROUP

EL PASO NATURAL GAS
WATER EQUIPMENT DIAGRAM
WINGATE FRACTIONATING PLANT

JOB NO. 01889-115-022
DRAWING NO. 5152
REV. 2

BOILER BLOW DOWN DRAINS
GENERATOR AND BOILER BLDG.
BOILER HOUSE FLOOR DRAINS
DRAIN TO SUMP
4"
GENERAL WASTE SUMP
SEPTIC TANK DRAIN
PLANT FENCE
CHANGE HOUSE
SHOP AND WAREHOUSE
SEPTIC TANK DRAIN FROM OFFICE
OFFICE
DRAINLINE TO SUMP
SEPTIC TANK
RR
A/B BLOW DOWN AND BACKWASH LINE, 4" PVC
WATER LEGS TO POND
PROCESS PUMP HOUSE
CONDENSER BACKWASH B PLANT
"C" PLANT CONDENSER DRAIN
FIN FAN
PUMP HOUSE
MAIN (GENERAL) DRAIN LINE
A/B SIDE STREAM FILTER SURGE TANK BACKWASH
RO DRAIN
RO BLDG.
DIESEL FIRE PUMPS (2) BLDG.
IRON FILTER BACKWASH
SIDE STREAM FILTER BACKWASH LINE
A/B COOLING TOWER BLOW DOWN
DRAIN LINE FROM SOFTNERS TO GENERAL DRAIN LINE
WATER TREATER BLDG.
COOLING TOWER
SALT PIT
OVER FLOW
BRINE SUMP
BRINE LINE TO SOFTNERS
FIRE PUMP
WATER STORAGE TANKS
BRINE SUMP DRAIN
DRAIN LINE
"C" PLANT SEPTIC TANK
SUMP
"C" COOLING TOWER
"C" PLANT BLOW DOWN TO BRINE SUMP
DWG. 5153-4
DWG. 5153-2
DWG. 5153-3
DWG. 5153-1
DRAWING LOCATION KEY
LEGEND:
RR RESTROOM
N
TRUCK LOADING AREA
HORIZONTAL PRODUCT STORAGE TANKS
SPHERICAL PRODUCT STORAGE TANKS
SEPTIC TANK
LEACH FIELD
TRAIN LOADING AREA
PROPERTY LINE AND FENCE
S2+00 S3+00 S4+00 S5+00 S6+00 S7+00 S8+00 S9+00 S10+00 S11+00
W24+00 W23+00 W22+00 W21+00 W20+00 W19+00 W18+00 W17+00 W16+00 W15+00 W14+00 W13+00 W12+00 W11+00 W10+00 W9+00 W8+00
REFERENCES TITLE
REVISIONS NO. BY DATE DESCRIPTION
MAR 7/9/90 ADDED DRAIN LINES
Registered Professional Engineer (Chemical) CERTIFICATE NO. 11041 MICHAEL AARON RODGERS ARIZONA, U.S.A.
SCALE: 1"=50'
DATE
DESIGNED BY: MAR 6-7-90
DRAWN BY: WEH 6-7-90
CHECKED BY: MAR 6-7-90
APPROVED BY:
CLIENT APPROVAL BY:
Dames & Moore
DESIGN SERVICES GROUP
RECEIVED
APR 09 1992
OIL CONSERVATION DIV.
SANTA FE
EL PASO NATURAL GAS
WINGATE PLANT AND AREA
WINGATE FRACTIONATING PLANT
JOB NO. 01889-115-022
DRAWING NO. 5153-1
REV. 1

REFERENCES TITLE	REFERENCES TITLE	NO.	BY	DATE	REVISIONS DESCRIPTION	NO.	BY	DATE	REVISIONS DESCRIPTION
						1	MAR	7/9/90	ADDED DRAIN LINES

SCALE:	1"=50'	DATE
DESIGNED BY:	MAR	6-7-90
DRAWN BY:	WEH	6-7-90
CHECKED BY:	MAR	6-7-90
APPROVED BY:		
CLIENT APPROVAL BY:		

Dames & Moore
DESIGN SERVICES GROUP

EL PASO NATURAL GAS

WINGATE PLANT AND AREA

WINGATE FRACTIONATING PLANT

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APR 09 1992
OIL CONSERVATION DIV.
SANTA FE

JOB NO. 01889-115-022
DRAWING NO. 5153-2
REV. 1

REFERENCES TITLE	REFERENCES TITLE	NO.	BY	DATE	REVISIONS DESCRIPTION	NO.	BY	DATE	REVISIONS DESCRIPTION
		△				△			
		△				△			
		△				△			
		△				△			
		△				△	MAR	7/9/90	ADDED DRAIN LINES AND A MONITOR WELL

Registered Professional Engineer (Chemical) Certificate No. 11041 Michael Aaron Rodgers Arizona, U.S.A.

SCALE: 1"=50'		DATE
DESIGNED BY:	MAR	6-7-90
DRAWN BY:	WEH	6-7-90
CHECKED BY:	MAR	6-7-90
APPROVED BY:		
CLIENT APPROVAL BY:		

Dames & Moore
DESIGN SERVICES GROUP

RECEIVED
APR 09 1992
OIL CONSERVATION DIV.
SANTA FE

EL PASO NATURAL GAS

WINGATE PLANT AND AREA

WINGATE FRACTIONATING PLANT

JOB NO. 01889-115-022

DRAWING NO. 5153-3 REV. 1

REFERENCES TITLE	REFERENCES TITLE	REVISIONS NO.	BY	DATE	DESCRIPTION	REVISIONS NO.	BY	DATE	DESCRIPTION
		△				△			
		△				△			
		△				△			
		△				△			
		△				△	MAR	7/9/90	ADDED MONITOR WELLS

Registered Professional Engineer (Chemical) CERTIFICATE NO. 11041 MICHAEL AARON RODGERS Date Signed ARIZONA, U.S.A.

SCALE: 1"=50'		DATE
DESIGNED BY:	MAR	6-7-90
DRAWN BY:	WEH	6-7-90
CHECKED BY:	MAR	6-7-90
APPROVED BY:		
CLIENT APPROVAL BY:		

Dames & Moore
DESIGN SERVICES GROUP

EL PASO NATURAL GAS

WINGATE PLANT AND AREA

WINGATE FRACTIONATING PLANT

RECEIVED
APR 09 1992
OIL CONSERVATION DIV.
SANTA FE

JOB NO. 01889-115-022

DRAWING NO. 5153-4 REV. 1

REFERENCES TITLE	REFERENCES TITLE	REVISIONS NO.	BY	DATE	DESCRIPTION	REVISIONS NO.	BY	DATE	DESCRIPTION
		△				△			
		△				△			
		△				△			
		△				△			
		△				△	MAR	5/31/90	CORRECT FLOWS, ADD OIL COOLER AND CHEM PUMP.

SCALE: NONE		DATE
DESIGNED BY:	LWT	4-18-90
DRAWN BY:	WEH	4-18-90
CHECKED BY:	MAR	4-18-90
APPROVED BY:		
CLIENT APPROVAL BY:		

Dames & Moore
DESIGN SERVICES GROUP

EL PASO NATURAL GAS

A AND B PLANT COOLING WATER EQUIPMENT DIAGRAM

WINGATE FRACTIONATING PLANT

RECEIVED APR 09 1992 OIL CONSERVATION DIV. SANTA FE

JOB NO. 01889-115-022

DRAWING NO. 5155

REV. 1

REFERENCES TITLE	REFERENCES TITLE	REVISIONS NO.	BY	DATE	DESCRIPTION	REVISIONS NO.	BY	DATE	DESCRIPTION
		△				△	MAR	6/4/90	CORRECTED FLOWS

SCALE:	NONE	DATE
DESIGNED BY:	LWT	4-18-90
DRAWN BY:	WEH	4-18-90
CHECKED BY:	MAR	4-18-90
APPROVED BY:		
CLIENT APPROVAL BY:		

Dames & Moore
DESIGN SERVICES GROUP

EL PASO NATURAL GAS
PLANT COOLING WATER EQUIPMENT DIAGRAM
WINGATE FRACTIONATING PLANT

RECEIVED
APR 09 1992
OIL CONSERVATION DIV SANTA FE

JOB NO. 01889-115-022
DRAWING NO. 5156
REV. 1

REFERENCES TITLE	REFERENCES TITLE	NO.	BY	DATE	REVISIONS DESCRIPTION	NO.	BY	DATE	REVISIONS DESCRIPTION
		△				△			
		△				△			
		△				△			
		△				△			
		△				△	MAR	6/4/90	MAJOR REVISION

Registered Professional Engineer (Chemical) Certificate No. 11041 Michael Aaron Rodgers Arizona, U.S.A.

SCALE: NONE	DATE
DESIGNED BY: LWT	4-18-90
DRAWN BY: WEH	4-18-90
CHECKED BY: MAR	4-18-90
APPROVED BY:	
CLIENT APPROVAL BY:	

Dames & Moore
DESIGN SERVICES GROUP

EL PASO NATURAL GAS
STEAM SYSTEM
EQUIPMENT DIAGRAM
WINGATE FRACTIONATING PLANT

RECEIVED
APR 09 1992
OIL CONSERVATION DIV.
SANTA FE

JOB NO. 01889-115-022
DRAWING NO. 5157
REV. 1

MERIDIAN OIL

April 9, 1992

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

Hand Delivered

RE: Discharge Plan - Wingate Fractionating Plant

Dear Mr. LeMay:

Enclosed are two copies of the Discharge Plan for Meridian Oil, Inc.'s (MOI) Wingate Fractionating Plant near Gallup, NM. One additional copy has been supplied to the OCD regional office in Aztec.

On September 10,1990, the NMOCD granted MOI an extension until April 13, 1992 to file the wastewater discharge plan. Today's submission fulfills this filing requirement.

MOI is wholly committed to carrying out sound disposal practices and to this end submits this plan outlining the proposed procedures. Likewise, MOI is committed to cooperating fully with NMOCD in honoring requests for additional information or clarification of existing information related to the Discharge Plan. When you or your staff have questions please contact me at (505) 326-9841.

Sincerely,

Michael J. Frampton
Sr. Staff Environmental Representative

2 copies of Discharge Plan enclosed

cc: NMOCD Regional Office - Aztec

PROPOSED MEETING AGENDA

Wingate Wastewater Discharge Plan
January 10, 1992 - Santa Fe, New Mexico

Attendees:		
	Roger Anderson	OCD
	Bill Olsen	OCD
	Matt McEneny	Meridian Oil
	Mike Frampton	Meridian Oil
	John Bridges	El Paso Natural Gas

I. Introductions

II. Groundwater Concerns

III. Existing Draft Plan

IV. Proposed Monitoring Program

V. Evaporation Ponds - Ongoing Assessment

VI. Process and Stormwater Discharges

VII. Timetable

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS
GOVERNOR

December 26, 1990

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

CERTIFIED MAIL
RETURN RECEIPT NO. P-327-278-332

Mr. Thomas D. Hutchins, Manager
North Region Compliance Engineering
El Paso Natural Gas Company
P.O. Box 1492
El Paso, Texas 79978

**RE: Discharge Plan GW-54, Wingate Fractionating Plant
McKinley County, New Mexico**

Dear Mr. Hutchins:

The Oil Conservation Division (OCD) has received and reviewed your letter of December 12, 1990 and accompanying technical information on ground water levels and water quality analyses for the above facility. The information submitted verifies the results of previous hydrogeological work performed at the site and demonstrates that no hazard to ground water exists for continued short-term use of the ponds.

The letter of August 10, 1990 from W. J. LeMay, OCD Director, to EPNG required submittal of this information as one condition of continued operation of the facility without an approved discharge plan under New Mexico Water Quality Control Commission Regulations. The information submitted satisfies this condition and the facility may continue to discharge without an approved plan provided the remaining two conditions continue to be met.

If you have any questions concerning this letter, please contact me at the above address or by phone at (505) 827-5812.

Sincerely,

David G. Boyer

David G. Boyer, Hydrogeologist
Environmental Bureau Chief

cc : Frank Chavez, OCD Aztec District Office

El Paso Natural Gas Company

P. O. BOX 1492
EL PASO, TEXAS 79978
PHONE: 915-541-2600

December 12, 1990

Mr. David G. Boyer
Environmental Bureau Chief
New Mexico Oil Conservation Division
State Land Office Building
310 Old Santa Fe Trail, 206
Santa Fe, New Mexico 87504

RE: Requested Wingate Plant Information Per
Letter Dated September 10, 1990

Dear Mr. Boyer:

Enclosed please find the results of the additional water analyses for the evaporation pond monitor wells and the water level measurements per your request. The results verify previous tests indicating no hazard to groundwater exists for short term continued use of the ponds.

The groundwater elevation map is located in Tab A, ground and water elevation data is located in Tab B and the analytical results are located in Tab C. Information on the depth of the confined water in each of the pond monitor wells during drilling and prior to its artisan level is not available. Artisan conditions were not expected therefore, this information was not recorded. Tab D contains the monitor well logs and well construction summaries. Tab E contains copies of both your and Mr. LeMay's letters.

If you have questions concerning the requested information, feel free to call me at (915) 541-3531.

Sincerely,

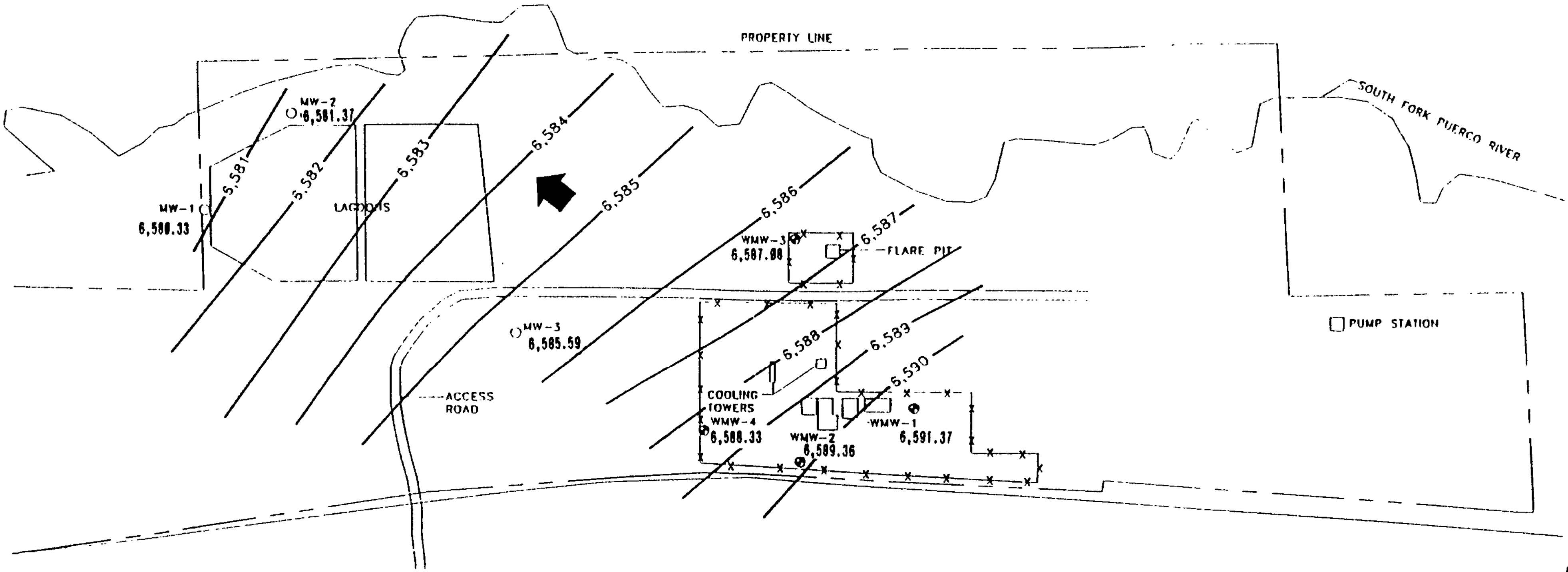
Thomas D. Hutchins

Thomas D. Hutchins, Manager
North Region Compliance Engineering

TDH/gg

Enclosure

c: G. Garibay
W. D. Hall
G. C. Kardos
W. J. LeMay, OCD
T. McMillin, Meridian Oil
G. J. Odegard
H. Van
File: 5204 (w/w)



EXPLANATION

—x——x— FENCED AREA OF REFINERY

WMW-1 6,591.37 APPROXIMATE MATHES MONITORING WELL LOCATION AND NUMBER WITH GROUNDWATER ELEVATION ABOVE NGVD, MEASURED November 2, 1990

MW-1 6,580.33 APPROXIMATE DAMES & MOORE MONITORING WELL LOCATION AND NUMBER WITH GROUNDWATER ELEVATION ABOVE NGVD, MEASURED November 1, 1990

INTERPRETED GROUNDWATER FLOW DIRECTION

—6,581— GROUNDWATER CONTOUR LINE (CONTOUR INTERVAL 1 FOOT)

0 600 1,200
SCALE IN FEET

N

General Note:

This contour map is based on interpolation between widely spaced monitoring wells and only at the monitoring well location is the elevation actually known.

GROUNDWATER ELEVATIONS AND FLOW DIRECTION

WINGATE PLANT

EL PASO NATURAL GAS COMPANY

GROUND AND WATER ELEVATION DATA
WINGATE PLANT
GALLUP, NEW MEXICO

NOVEMBER 1-2, 1990

WELL NUMBER	GROUND ELEVATION	TOP OF RISER ELEVATION	DEPTH TO WATER	GROUNDWATER ELEVATION
MW-1	6,582.93*	6,584.66	4.33	6,580.33
MW-2	6,584.99*	6,585.37	4.00	6,581.37
MW-3	6,588.95*	6,589.84	4.25	6,585.59
WMW-1	6,596.41	6,596.04	4.67	6,591.37
WMW-2	6,593.92	6,593.69	4.33	6,589.36
WMW-3	6,593.03	6,593.91	6.83	6,587.08
WMW-4	6,592.51	6,594.50	6.17	6,588.33

NOTE: ELEVATIONS IN FEET ABOVE NATIONAL GEODETIC VERTICAL DATUM (NGVD).

* TOP OF INNER CASING.

AnalyticalTechnologies,Inc. 2113 S. 48th Street Suite 107 Tempe, AZ 85282 (602) 438-1530

ATI I.D. 011554

November 26, 1990

El Paso Natural Gas Company
P.O. Box 4990
Farmington, NM 87499

Project Name/Number: Wingate Plant

Attention: John Lambdin

On 11/06/90, Analytical Technologies, Inc. received a request to analyze aqueous sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (602)438-1530.

M. Barry
Michael G. Barry
Project Manager

Robert V. Woods
Robert V. Woods
Laboratory Manager

RVW:clf
Enclosure

Corporate Offices: 5550 Morehouse Drive San Diego, CA 92121 (619) 458 9141

Analytical**Technologies**, Inc.

CLIENT : EL PASO NATURAL GAS, NEW MEXICO
PROJECT # : (NONE)
PROJECT NAME : WINGATE PLNT

DATE RECEIVED : 11/06/90
REPORT DATE : 11/26/90

ATI I.D. : 011554

ATI #	CLIENT DESCRIPTION		MATRIX	DATE COLLECTED
01	A90421	MW-3	AQUEOUS	11/01/90
02	A90422	MW-2	AQUEOUS	11/01/90
03	A90423	MW-1	AQUEOUS	11/01/90

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	3

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

AnalyticalTechnologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 011554

CLIENT : EL PASO NATURAL GAS, NEW MEXICO
DATE RECEIVED : 11/06/90
PROJECT # : (NONE)
PROJECT NAME : WINGATE PLNT
REPORT DATE : 12/03/90

PARAMETER	UNITS	01	02	03
CARBONATE (CACO3)	MG/L	<1	<1	<1
BICARBONATE (CACO3)	MG/L	420	802	465
HYDROXIDE (CACO3)	MG/L	<1	<1	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	420	802	465
CHLORIDE	MG/L	18	55	25
CONDUCTIVITY, (UMHOS/CM)		772	1680	877
PHENOLPHTHALEIN ALKALINITY	MG/L	<1	<1	<1
PH	UNITS	8.1	8.3	8.3
SULFATE	MG/L	17	120	29
TOTAL DISSOLVED SOLIDS	MG/L	490	1090	560

Analytical Technologies, inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : EL PASO NATURAL GAS, NEW MEXICO
PROJECT # : (NONE)
PROJECT NAME : WINGATE PLNT
ATI I.D. : 011554

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CARBONATE	MG/L	01155401	<1	<1	NA	NA	NA	NA
BICARBONATE	MG/L		420	426	1	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		420	426	1	NA	NA	NA
CARBONATE	MG/L	01075123	34	32	6	NA	NA	NA
BICARBONATE	MG/L		<1	<1	NA	NA	NA	NA
HYDROXIDE	MG/L		2	3	40	NA	NA	NA
TOTAL ALKALINITY	MG/L		36	35	3	NA	NA	NA
CARBONATE	MG/L	01154403	168	168	0	NA	NA	NA
BICARBONATE	MG/L		44	44	0	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		212	212	0	NA	NA	NA
CHLORIDE	MG/L	01155407	470	460	2	1500	1000	103
CONDUCTIVITY(UMHOS/CM)		01155407	5490	5550	1.0	NA	NA	NA
PHENOLPHTHALEIN ALKALI	MG/L	01155401	<1	<1	NA	NA	NA	NA
PHENOLPHTHALEIN ALKALI	MG/L	01161005	<1	<1	NA	NA	NA	NA
PH	UNITS	01155401	8.1	8.1	0	NA	NA	NA
PH	UNITS	01075123	8.98	8.97	0.1	NA	NA	NA
PH	UNITS	01154403	10.0	10.0	0	NA	NA	NA
SULFATE	MG/L	01155401	17	17	0	34	17	100
SULFATE	MG/L	01157306	120	120	0	220	100	100
TOTAL DISSOLVED SOLIDS	MG/L	01155405	1840	1840	0	NA	NA	NA
TOTAL DISSOLVED SOLIDS	MG/L	01156202	210	210	0	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 011554

CLIENT : EL PASO NATURAL GAS, NEW MEXICO
PROJECT # : (NONE)
PROJECT NAME : WINGATE PLNT

DATE RECEIVED : 11/06/90
REPORT DATE : 11/26/90

PARAMETER	UNITS	01	02	03
CALCIUM	MG/L	26.9	16.4	9.9
HARDNESS	MG/L	122	80.1	54.4
POTASSIUM	MG/L	<1.0	<1.0	<1.0
MAGNESIUM	MG/L	13.2	9.5	7.2
SODIUM	MG/L	158	435	220
SILICA	MG/L	12.4	8.1	11.8

AnalyticalTechnologies, Inc.

METALS - QUALITY CONTROL

CLIENT : EL PASO NATURAL GAS, NEW MEXICO
PROJECT # : (NONE)
PROJECT NAME : WINGATE PLNT

ATI I.D. : 011554

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CALCIUM	MG/L	01155404	152	153	0.7	204	50.0	104
HARDNESS	MG/L	01155404	621	625	0.6	NA	NA	NA
POTASSIUM	MG/L	01155404	2.8	2.8	0	52.5	50.0	99
MAGNESIUM	MG/L	01155404	58.6	59.0	0.5	85.4	25.0	107
SODIUM	MG/L	01155404	2100	2100	0	7380	5000	106
SILICA	MG/L	01155404	11.6	11.8	2	33.6	21.4	103

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

AnalyticalTechnologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 01155401

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: EL PASO NATURAL GAS, NEW MEXICO	DATE SAMPLED	: 11/01/90
PROJECT #	: (NONE)	DATE RECEIVED	: 11/06/90
PROJECT NAME	: WINGATE PLNT	DATE EXTRACTED	: N/A
CLIENT I.D.	: A90421	DATE ANALYZED	: 11/06/90
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
2-CHLOROETHYL VINYL ETHER	<0.5
1,3-DICHLOROBENZENE	<0.5
1,2 & 1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.2
TOTAL XYLENES	<0.5
TRICHLOROTRIFLUOROETHANE	<2.0

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	99
BROMOFLUOROBENZENE (%)	100

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 01155402

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: EL PASO NATURAL GAS, NEW MEXICO	DATE SAMPLED	: 11/01/90
PROJECT #	: (NONE)	DATE RECEIVED	: 11/06/90
PROJECT NAME	: WINGATE PLNT	DATE EXTRACTED	: N/A
CLIENT I.D.	: A90422	DATE ANALYZED	: 11/06/90
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
2-CHLOROETHYL VINYL ETHER	<0.5
1,3-DICHLOROBENZENE	<0.5
1,2 & 1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.2
TOTAL XYLENES	<0.5
TRICHLOROTRIFLUOROETHANE	<2.0

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	99
BROMOFLUOROBENZENE (%)	95

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 01155403

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT : EL PASO NATURAL GAS, NEW MEXICO
PROJECT # : (NONE)
PROJECT NAME : WINGATE PLNT
CLIENT I.D. : A90423
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 11/01/90
DATE RECEIVED : 11/06/90
DATE EXTRACTED : N/A
DATE ANALYZED : 11/06/90
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
2-CHLOROETHYL VINYL ETHER	<0.5
1,3-DICHLOROBENZENE	<0.5
1,2 & 1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.2
TOTAL XYLENES	<0.5
TRICHLOROTRIFLUOROETHANE	<2.0

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	96
BROMOFLUOROBENZENE (%)	102

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

		ATI I.D.	: 011554
CLIENT	: EL PASO NATURAL GAS, NEW MEXICO	DATE EXTRACTED	: 11/06/90
PROJECT #	: (NONE)	DATE ANALYZED	: 11/06/90
PROJECT NAME	: WINGATE PLNT	UNITS	: UG/L
CLIENT I.D.	: REAGENT BLANK	DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
2-CHLOROETHYL VINYL ETHER	<0.5
1,3-DICHLOROBENZENE	<0.5
1,2 & 1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	9.2
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.2
TOTAL XYLENES	<0.5
TRICHLOROTRIFLUOROETHANE	<2.0

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	106
BROMOFLUOROBENZENE (%)	100

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: EL PASO NATURAL GAS, NEW MEXICO	ATI I.D.	: 011554
PROJECT #	: (NONE)	DATE EXTRACTED	: 11/07/90
PROJECT NAME	: WINGATE PLNT	DATE ANALYZED	: 11/07/90
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
2-CHLOROETHYL VINYL ETHER	<0.5
1,3-DICHLOROBENZENE	<0.5
1,2 & 1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	1.7
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.2
TOTAL XYLENES	<0.5
TRICHLOROTRIFLUOROETHANE	<2.0

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	98
BROMOFLUOROBENZENE (%)	101

AnalyticalTechnologies, Inc

QUALITY CONTROL DATA

ATI I.D. : 011554

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT : EL PASO NATURAL GAS, NEW MEXICO
PROJECT # : (NONE)
PROJECT NAME : WINGATE PLNT
REF I.D. : 01155401

DATE ANALYZED : 11/07/90
SAMPLE MATRIX : AQUEOUS
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<0.2	20	21	105	21	105	0
TRICHLOROETHENE	<0.2	20	20	100	19	95	5
TETRACHLOROETHENE	<0.2	20	22	110	18	90	20
BENZENE	<0.5	20	19	95	18	90	5
BROMODICHLOROMETHANE	<0.2	20	19	95	17	85	11
CHLOROFORM	<0.2	20	21	105	20	100	5
1,1,1-TRICHLOROETHANE	<0.2	20	18	90	17	85	6
TOLUENE	<0.5	20	19	95	18	90	5
CHLOROBENZENE	<0.5	20	22	110	19	95	15
M-XYLENE	<0.5	20	21	105	18	90	15

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

Analytical Technologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 11-5-90 PAGE 1 OF 1

PROJECT MANAGER: JOHN LAMBOIN

COMPANY: EL PASO NATURAL GAS COMPANY
ADDRESS: 770 WEST NAVAJO
FARMINGTON N.M. 87499

BILL TO: JOHN LAMBOIN
COMPANY: EL PASO NATURAL GAS COMPANY
ADDRESS: 770 WEST NAVAJO

Dennis Bird — SAMPLERS: (Signature)
(505)599-2144 — PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	PURGEABLE AROMATIC HC 8020	PURGEABLE HALOCARBON 8010	GENERAL CHEMISTRY	Ph, PALK, Alk, Ca, Hard, Cl, SO4, Sol, EC, Mg	Na, K, TDS	NUMBER OF CONTAINERS
A90421	11-1-90	12:50	WATER	1	X	X	X			5
A90422	11-1-90	1500	WATER	2	X	X	X			5
A90423	11-1-90	1650	WATER	3	X	X	X			5
										3
										3
										3
										5
										1

PROJECT INFORMATION	
PROJECT NUMBER:	
PROJECT NAME:	Wingate Plant
PURCHASE ORDER NUMBER:	
VIA:	
TAT: ☐ 24 HRS ☐ 48 HRS ☐ 1 WK ☐ 2 WKS	

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	72
CHAIN OF CUSTODY SEALS	N
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	01184

SAMPLE DISPOSAL INSTRUCTIONS
☐ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

Comments:

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Dennis Bird Time: 1245	Signature: Time:	Signature: Time:
Printed Name: DENNIS BIRD Date: 11-5-90	Printed Name: Date:	Printed Name: Date:
Company: EL PASO NATURAL GAS	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: [signature] Time: 08
Printed Name: Date:	Printed Name: Date:	Printed Name: [illegible] Date: 11/6/90
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 438-1530 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

BORING MW-1

SURFACE ELEVATION: 6582 ±1 FEET

DEPTH IN FEET	TIME	SAMPLE NO./SAMPLE DEPTH	BLOWS/FT.	SAMPLES	SYMBOLS	DESCRIPTION
0					CL	RED, SANDY SILTY CLAY, VERY SOFT, DRY MINOR FINE SAND
5	9:33	1/5		■	CH	RED, CLAY, COHESIVE, MOIST, HIGH PLASTICITY
10	9:40	2/10		■		AS ABOVE
15	9:52	3/15		■		AS ABOVE
20	10:03	4/20		■		AS ABOVE
25	10:12	5/25		■	CL	RED, SANDY CLAY, COHESIVE, MOIST, HIGH PLASTICITY
30	10:20	6/30		■		AS ABOVE
35	10:28	7/35		■		AS ABOVE, INCREASING SAND
40	10:35	8/40		■		AS ABOVE, VERY MOIST
45	10:40	9/45		■		AS ABOVE
50	10:52	10/50		■	SC	GRAY TO RED GRAY CLAYEY SAND
55	11:05	11/55		■		AS ABOVE, INCREASING SAND
60						

BORING TERMINATED AT 56 FEET ON 6/20/90.

LOG OF BORING

D&M JOB#01889-115-022

BORING MW-2

SURFACE ELEVATION: 6584 ±1 FEET

DEPTH IN FEET	TIME	SAMPLE NO./SAMPLE DEPTH	BLOWS/FT.	SAMPLES	SYMBOLS	DESCRIPTION
0					CL	RED BROWN, SANDY SILT AND CLAY
5	9:30	1/5		■	CH	RED, CLAY, DRY, HIGH PLASTICITY
10	9:45	2/10		■		AS ABOVE
15	9:56	3/15		■		AS ABOVE, MOIST
20	10:03	4/20		■		AS ABOVE
25	10:20	5/25		■	CL	RED, SANDY CLAY, WET
30	10:26	6/30		■		AS ABOVE
35	10:33	7/35		■		AS ABOVE
40	10:52	8/40		■		AS ABOVE, INCREASING SAND
45	10:58	9/45		■		AS ABOVE
	11:00	10/48		■		AS ABOVE
50						

BORING TERMINATED AT 48 FEET ON 6/21/90.

LOG OF BORING

D&M JOB#01889-115-022

BORING MW-3

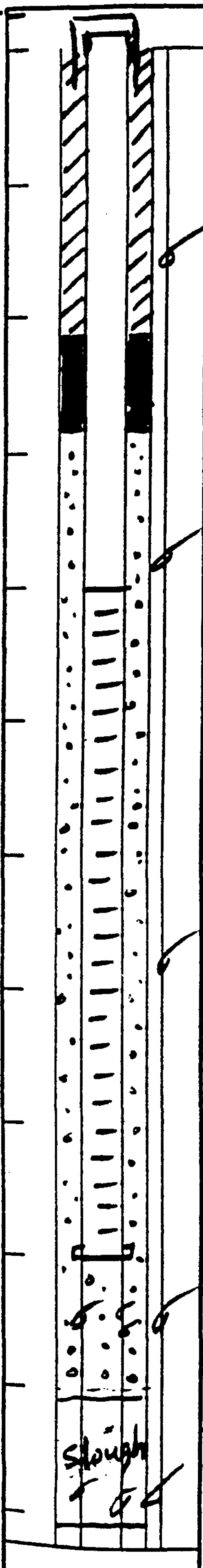
SURFACE ELEVATION: 6588 ±1 FEET

DEPTH IN FEET	TIME	SAMPLE NO./SAMPLE DEPTH	BLOWS/FT.	SAMPLES	SYMBOLS	DESCRIPTION
0					CL	RED, SANDY SILT AND CLAY, DRY
5	9:04	1/5		■		AS ABOVE, SILTY CLAY
					CH	RED, CLAY, MOIST, HIGH PLASTICITY
10	9:13	2/10		■		
15	9:35	3/15		■		AS ABOVE, WET, SWELLING CLAYS
20	9:50	4/20		■		AS ABOVE, MOIST
					CL	RED, SANDY CLAY, MOIST TO WET
25	9:58	5/25		■		AS ABOVE
30	10:05	6/30		■		AS ABOVE, INCREASING FINE SAND
35	10:11	7/35		■		AS ABOVE
40	10:15	8/40		■		AS ABOVE, INCREASING SAND
45	10:20	9/45		■	SC	RED GRAY, CLAYEY SANDS
	10:30	10/48		■		AS ABOVE
						BORING TERMINATED AT 48 FEET ON 6/22/90.
50						

LOG OF BORING

D&M JOB#01889-115-022

01183-115-000



Dames & Moore

Well No. MW-1

Boring No. X-Ref: ______

MONITOR WELL CONSTRUCTION SUMMARY

Survey Coords: ______

Elevation Ground Level ______

Top of Casing 6582.93 PVC

Drilling Summary:

Total Depth 56 ft
Borehole Diameter 11-inch
Casing Stick-up Height: PVC +0.5 ft
Driller Rodgers & Company Albuquerque, NM
Rig CME-75 Hollow stem auger
Bit(s) N/A
Drilling Fluid None
Protective Casing 6 5/8-inch locking steel

Construction Time Log:

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling	6-20-90	0926	6-20-90	1105
Geophys. Logging:				
Casing:	6-20-90	1220	6-20-90	1305
Filter Placement:	6-20-90	1315	6-20-90	1505
Cementing:	6-20-90	1630	6-20-90	1650
Development:				

Well Design & Specifications

Basis: Geologic Log ____ Geophysical Log ____
Casing String (s): C = Casing S = Screen.

Depth	String(s)	Elevation
+2 - 2	C1	-
+.5 - 20	C2	-
20 - 45	S1	-
45 - 45.2	End Cap	-
-		-

Casing: C1 6 5/8-inch O.D. locking steel

C2 4-inch sch 40 PVC flush-threaded, blank

Screen: S1 4-inch sch 40 PVC. flush threaded, .010 slot

S2 ______

Filter Pack: Colorado Silica Sand 10-20 mesh 14-51 feet with 12 sacks

Grout Seal: Type II Portland cement 0-11 feet with 3 sacks

Bentonite Seal: Pel Plug 1/4-inch bentonite pellets 11-14 feet with 3 buckets, 5 gallons each

Well Development:

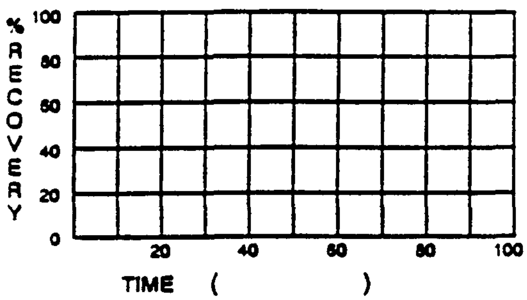
Well was evacuated of 400+ gallons with a 4-inch submersible pump. Q = 5gpm

Stabilization Test Data:

Time	pH	Spec. Cond.	Temp (C)

Recovery Data:

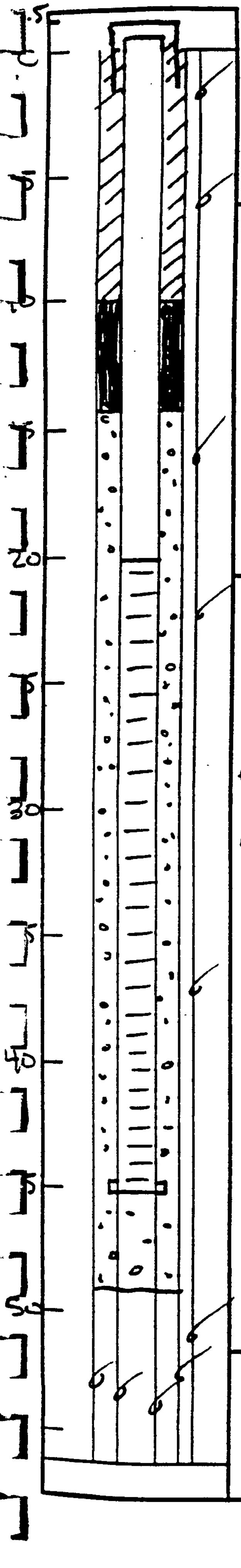
Q= S_o=



Comments: ______

SITE NAME EPNG

SUPERVISED BY B.C. Lauerman



Dames & Moore

Well No. MW-2

Boring No. X-Ref: ______

MONITOR WELL CONSTRUCTION SUMMARY

Survey Coords: ______

Elevation Ground Level ______

Top of Casing 6584.99 PVC

Drilling Summary:

Total Depth 48 ft

Borehole Diameter 11 inch

Casing Stick-up Height: PVC +1 ft

Driller Rodgers & Company Albuquerque, NM

Rig CME 75 Hollow stem auger

Bit(s) N.A.

Drilling Fluid None

Protective Casing 6 5/8-inch locking steel

Construction Time Log:

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling	6.21.90	0925	6.21.90	1410
Geophys. Logging:				
Casing:	6.21.90	1420	6.21.90	1450
Filter Placement:	6.21.90	1500	6.21.90	1630
Cementing:	6.21.90	1630	6.21.90	1730
Development:	6.23.90	1330	6.23.90	1610

Well Design & Specifications

Basis: Geologic Log ____ Geophysical Log ____

Casing String (s): C = Casing S = Screen.

Depth	String(s)	Elevation
+1.5 - 2.5	C1	-
+1 - 20	C2	-
20 - 45	S1	-
45 - 45.2	End Cap	-
-		-

Casing: C1 6 5/8-inch locking steel

C2 4-inch SCH 40 PVC flush-threaded, blank

Screen: S1 4-inch SCH 40 PVC flush-threaded, 0.010 slot

S2 ______

Filter Pack: Colorado Silica Sand 10-20 mesh 14-48 feet with 11 sacks

Grout Seal: Type II portland cement 0-10 feet 3 sacks

Bentonite Seal: Pel-Plug 1/4-inch bentonite pellets 10-14 feet with 2 buckets, 5 gallons each

Well Development:

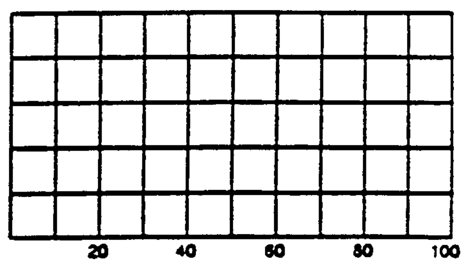
Well was evacuated of 500+ gallons with 4-inch submersible pump. Q = 5 gpm.

Stabilization Test Data:

Time	pH	Spec. Cond.	Temp (C)

Recovery Data:

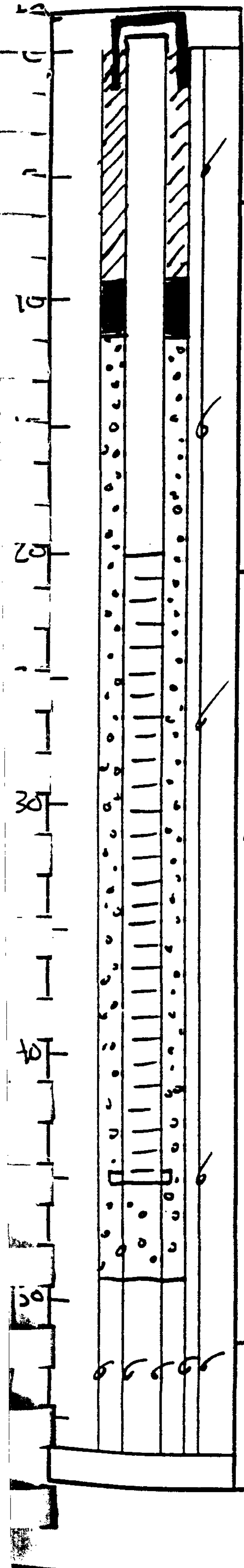
Q= S_o=



Comments: ______

SITE NAME EPNG

SUPERVISED BY B.C. Lauerman



Dames & Moore

Well No. MW-3

Boring No. X-Ref: ______

MONITOR WELL CONSTRUCTION SUMMARY

Survey Coords: ______

Elevation Ground Level ______

Top of Casing 6588.95 PVC

Drilling Summary:

Total Depth 48 ft

Borehole Diameter 11-inch

Casing Stick-up Height: PVC +1 ft

Driller Rodgers and Company Albuquerque, NM

Rig CME 75 Hollow Stem auger

Bit(s) N.A

Drilling Fluid None

Protective Casing 6 5/8-inch locking steel

Construction Time Log:

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling	6.22.90	0850	6.22.90	1034
Geophys. Logging:				
Casing:	6.22.90	1110	6.22.90	1130
Filter Placement:	6.22.90	1130	6.22.90	1330
Cementing:	6.22.90	1330	6.22.90	1400
Development:	6.23.90	1030	6.23.90	1230

Well Design & Specifications

Basis: Geologic Log ____ Geophysical Log ____

Casing String (s): C = Casing S = Screen.

Depth	String(s)	Elevation
+2 - 2	C1	-
+1 - 20	C2	-
20 - 45	S1	-
45 - 45.2	End Cap	-
-		-

Casing: C1 6 5/8-inch locking steel

C2 4-inch SCH 40 PVC flush-threaded, blank

Screen: S1 4-inch SCH 40 PVC flush threaded, .010 slot

S2 ______

Filter Pack: Colorado Silica Sand 10-20 mesh 12-48 feet with 12 sacks

Grout Seal: Type II portland cement 0-9 feet with 3 sacks

Bentonite Seal: Pel-Plug 1/4-inch bentonite pellets 9-12 feet with 2 buckets, 5 gallons each

Well Development:

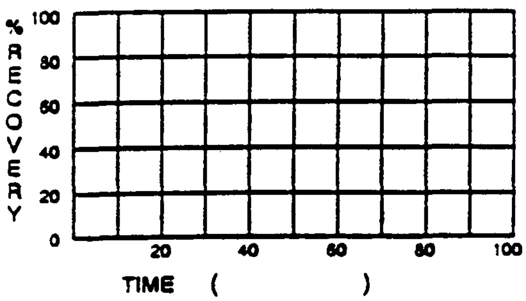
Well was evacuated of 500+ gallons with a 4-inch submersible pump. Q = 5 gpm

Stabilization Test Data:

Time	pH	Spec. Cond.	Temp (C)

Recovery Data:

Q= S_o=



Comments: ______

SITE NAME EPNG

LOCATION WINGATE PLANT

SUPERVISED BY B.C. LAUERMAN

DATE 6.22.90

OIL CONSER[illegible] [illegible]ON DIVISION
REC[illegible]VED

El Paso
Natural Gas Company

'90 SEP 21 AM 10 01

3801 ATRISCO, N. W.
ALBUQUERQUE, NEW MEXICO 87120
PHONE: 505-831-7700

September 18, 1990

Mr. Roger Anderson
New Mexico Oil Conservation Division
State Land Office
310 Old Santa Fe Trail #206
Santa Fe, New Mexico 87504

Dear Mr. Anderson:

Confirming our phone conversation of September 10, 1990, El Paso Natural Gas Company recently changed the media in the iron sponge filter at our Wingate Plant. This was done on September 11, 1990. Approximately 200 cubic feet of thoroughly wetted spent iron sponge was removed and spread on the ground surface on company property and will be allowed to weather for approximately ten days. After such time, the material will be buried in a shallow pit with eight to twelve inches of fill. The area will be documented in company records.

Should you have any questions, or wish to discuss this further, please give me a call at 505-831-7759.

Sincerely,

W. David Hall

W. David Hall, P.E.
Senior Engineer

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

September 10, 1990

CERTIFIED MAIL
RETURN RECEIPT NO. P-918-402-361

Mr. W. David Hall, Senior Engineer
El Paso Natural Gas Company
3801 Atrisco Northwest
Albuquerque, New Mexico 87120

RE: Wingate Plant Hydrogeologic Report Submittal

Dear Mr. Hall:

The Oil Conservation Division (OCD) has received the above report. The report generally demonstrates that continued short term use of the ponds is warranted although some discrepancies were seen in the sample results for pond monitor wells MW-2 and MW-3. Accordingly, I am requesting that EPNG conduct additional tests and provide the follow-up information listed below:

1. Remeasure water levels at all MW and WMH monitor wells and provide a water table map.

2. Resample the three evaporation pond monitor wells for general water chemistry, and purgeable aromatic and halogenated hydrocarbons. Water chemistry parameters include sodium, potassium, calcium, magnesium, chloride, sulfate and carbonate/bicarbonate.

3. Provide information, if available, on the depth of the confined water in each of the pond monitor wells during drilling and prior to its artisan level.

Formal approval to continue to use the ponds is being sent to Meridian Oil as part of their request for discharge plan extension. Additional field work, including installation of several more monitor wells, will be necessary if the ponds are to be in use beyond the term of the extension.

If you have any questions, please contact me at (505) 827-5812.

Sincerely,

Roger C. Anderson

for David G. Boyer, Hydrogeologist
Environmental Bureau Chief

DGB/sl

cc: OCD Aztec Office
K. E. Beasley, EPNG El Paso
Dean Priest, Meridian Oil

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

September 14, 1990

Mr. Kenneth E. Beasley, Manager
North Region Compliance Engineering
EL PASO NATURAL GAS COMPANY
P. O. Box 1492
El Paso, Texas 79978

RE: Discharge Plan GW-54
Wingate Fractionating Plant
McKinley County, New Mexico

Dear Mr. Beasley:

In our letter of September 10, 1990, approving an extension of time to discharge without an approved discahrge plant at the Wingate Plant, an error was made in the date shown in condition number 2. Condition 2 should read:

2. Submittal of the discharge plan for OCD review by August 13, 1992.

I apologize for any inconvenience this has caused.

Sincerely,

David G. Boyer

David G. Boyer, Hydrogeologist
Environmental Bureau Chief

DGB/sl

cc: OCD Aztec Office
Dean Priest, Meridian Oil

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

September 10, 1990

CERTIFIED MAIL
RETURN RECEIPT NO. P-918-402-360

Mr. Kenneth E. Beasley, Manager
North Region Compliance Engineering
EL PASO NATURAL GAS COMPANY
P. O. Box 1492
El Paso, Texas 79978

RE: Discharge Plan GW-54
Wingate Fractionating Plant
McKinley County, New Mexico

Dear Mr. Beasley:

On August 8, 1990, the Oil Conservation Division (OCD) received a request from Mr. Dean Priest of Meridian Oil for an extension of time of three years to operate the Wingate Plant without an approved discharge plan. Since we have not received formal notification of the plant sale, we are responding to your office. A decision on the request awaited EPNG's hydrogeological report on the facility which was received August 21, 1990. Information in the report supports a two-year extension of time for evaporation pond use.

Meridian's letter listed several estimates of time needed for evaluation of the plant operations, consultant evaluation, construction modifications and discharge plan compilation. WQCC Regulations only require approval of commitments to make necessary modifications, before plan approval, not completion of construction. Therefore, as discussed at the July 23, 1990 EPNG-Meridian-OCD meeting the term of the extension to discharge without and approved plan will be two years. The term of pond use is also two years although further short term or long term use will be authorized if such use is part of an approved discharge plan.

Pursuant to Section 3-106.A of the New Mexico Water Quality Control Commission Regulations and for good cause shown, El Paso Natural Gas Company is hereby granted an extension of time until August 13, 1992 to submit a discharge plan application and to operate the Wingate Fracturing Plant to December 13, 1992 without an approved discharge plan provided the following conditions are met.

1. Submittal to OCD within 90-days of receipt this letter results of the additional water analyses for the evaporation pond monitor wells, and water level measurements requested in Mr. David Boyer's September 10, 1990 letter to Mr. W. David Hall of EPNG. These tests are required to verify the results of previous tests that no hazard to ground water exists for short term continued use of the ponds.

2. Submittal of the discharge plan for OCD review by April 13, 1992.

3. Formal notification to OCD of transfer of the facility to Meridian and any conditions which may affect discharge plan preparation of this time extension.

This extension of time is valid for operation of the facility by EPNG or Meridian provided condition No. 3 is met.

If you have any questions, please feel free to contact David Boyer at (505) 827-5812 or Roger Anderson at (505) 827-5884.

Sincerely,

William J. LeMay
Director

WJL/DGB/sl

cc: OCD Aztec Office
Dean Priest, Meridian Oil

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

September 10, 1990

CERTIFIED MAIL
RETURN RECEIPT NO. P-918-402-361

Mr. W. David Hall, Senior Engineer
El Paso Natural Gas Company
3801 Atrisco Northwest
Albuquerque, New Mexico 87120

RE: Wingate Plant Hydrogeologic Report Submittal

Dear Mr. Hall:

The Oil Conservation Division (OCD) has received the above report. The report generally demonstrates that continued short term use of the ponds is warranted although some discrepancies were seen in the sample results for pond monitor wells MW-2 and MW-3. Accordingly, I am requesting that EPNG conduct additional tests and provide the follow-up information listed below:

1. Remeasure water levels at all MW and WMH monitor wells and provide a water table map.

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3. Provide information, if available, on the depth of the confined water in each of the pond monitor wells during drilling and prior to its artisan level.

Formal approval to continue to use the ponds is being sent to Meridian Oil as part of their request for discharge plan extension. Additional field work, including installation of several more monitor wells, will be necessary if the ponds are to be in use beyond the term of the extension.

If you have any questions, please contact me at (505) 827-5812.

Sincerely,

Roger C. Anderson

for David G. Boyer, Hydrogeologist
Environmental Bureau Chief

DGB/sl

cc: OCD Aztec Office
K. E. Beasley, EPNG El Paso
Dean Priest, Meridian Oil

DAMES & MOORE

OIL CONSER[illegible]ON DIVISION
RECE[illegible]VED

'90 AUG 22 AM 11 02

Registered Professional Engineer (Geological)
CERTIFICATE NO.
10313
WILLIAM MURRAY
GREENSLADE
Date Signed 8/20/90
ARIZONA, U.S.A.

HYDROGEOLOGIC ASSESSMENT
WINGATE FRACTIONATING PLANT
FOR
EL PASO NATURAL GAS COMPANY

DAMES & MOORE

August 21, 1990

D&M Job No. 01889-115-022

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0 SITE CHARACTERISTICS

1.1 GEOLOGY DESCRIPTION

1.1.1 Regional Geology

The Wingate Plant is situated along the southwestern margin of the San Juan Basin designated the Zuni Uplift, in the Colorado Plateau physiographic Province (Figure 1.1). The Zuni Uplift is a northwest trending structural dome comprising an area approximately 55 miles in length by 20 miles in width. The site lies at the head of the western side of the uplift termed the Nutria Monocline. The San Juan Basin forms an asymmetric basin covering an area of about 25,000 square miles in northwestern New Mexico, and portions of northeastern Arizona, and southwestern Colorado. The basin is reported to contain as much as 15,000 feet of Paleozoic and Mesozoic sediments (Cooley et al., 1969).

The regional geology in the area surrounding the Wingate Plant is shown in Figure 1.2. Based on available drilling log information the generalized Stratigraphic Column in Figure 1.3 was prepared. As shown, the surficial geology surrounding the site area is comprised of Quaternary-aged alluvial deposits. Below the alluvium lies a thick sequence (on the order of 1,500 feet) of Chinle Formation siltstones and mudstones. Underlying the Chinle Formation, in unconformable contact, is reported to be a 90-foot section of Moenkopi Formation siltstones and mudstones. Underlying the Moenkopi Formation, also unconformably, are the Permian-aged San Andres Limestone, and Glorieta Sandstone (102 and 230 feet thick, respectively), which comprise the regional aquifer in the site area. The deepest onsite well is completed into the top portion of the Yeso Formation also of Permian age, described as a fine-grained arkosic sandstone, to a depth of approximately 2,000 feet. Below the base of the Yeso Formation in descending order are the sandstone, claystone and siltstone of the Permian-aged Abo Formation, unnamed limestone and conglomerate rocks of Pennsylvania age, and Precambrian granitic and metamorphic rocks which comprise the basement rocks in the region.

1.1.2 Local Geology

The site lies along the south side of an east-west trending alluvial drainage formed by the South Fork of the Puerco River. To the south of the site are the Zuni Mountains, reaching a maximum elevation of around 9,000 feet. North of the Plant, a massive red sandstone escarpement comprised of the Triassic/Jurassic-aged sandstone and siltstone deposits of the Entrada and Wingate sandstones. It rises approximately 400 feet above the valley to an elevation of around 7,000 feet. The Wingate Plant property ranges in elevation from around 6,580 to 6,612 ft-MSL.

As shown in Figure 1.2, the surficial geology in the site area, consist of Quaternary-aged alluvium. These strata dip to the northwest at approximately 2-3 degrees.

1.2 HYDROGEOLOGY

1.2.1 Regional Hydrogeology

The hydrogeology of the region is a function of geologic structure and hydraulic properties of the sedimentary formations deposited in the Basin. Permeable sandstones and limestones, are typically interbedded with relatively impermeable shales, siltstones and mudstones, resulting in the formation of numerous confined aquifer systems in the Permian, Triassic, Jurassic, and Cretaceous-aged deposits. The northward dip of these strata in the southwestern portion of the San Juan Basin, in conjunction with the presence of impermeable overlying formations, result in recharge being limited to the outcrop exposure of the water-bearing unit, with progressively artesian conditions occurring to the north. The major regional aquifer in the site area is San Andres Limestone/Glorieta Sandstone of Permian age. Recharge to the San Andres/Glorieta aquifer occurs primarily in areas of the Zuni Mountains to the south of the site area.

As stated previously, the San Andres Limestone/Glorieta Sandstone formations constitute the primary aquifer in the region. This aquifer has been designated part of the C multiple-aquifer system (Cooley et al., 1969).

The top of the San Andres is found at a depth of approximately 1,670 feet, according to driller's log data from onsite wells. The thickness of the combined aquifer system in the site area is reported to be about 330 feet. Driller's log data from offsite wells approximately six miles to the east, which service the Plant via pipeline indicate the top of the San Andres/Glorieta aquifer to be present locally at a depth of around 1,000 feet. Based on well data from the four active wells (two onsite and two offsite), the San Andres/Glorieta aquifer appears to become more productive to the east perhaps reflecting an increased degree of fracturing and/or solution cavities in that area. Well construction data for all four Plant water supply wells is presented in Table 1.1. Available water quality data for these wells is contained in Table 1.2.

Available aquifer test data for the San Andres/Glorieta report transmissivity and storage coefficient ranges of ≤ 5 to 3,740 ft^2/day, and 7.6×10^{-5} to 1.3×10^{-4}, respectively (Shomaker, 1971).

1.2.2 Local Hydrogeology

Shallow borings in the southwestern corner of the Plant site associated with a geotechnical investigation for a railroad overpass (Sergent, Hauskins and Beckwith, 1987), encountered between 40 and 80 feet of unconsolidated clays, silty clays, silty sands and gravels, prior to auger refusal in weathered siltstones and sandstones. The specific capacity of offsite wells completed in alluvium is reported to range from 0.19 to 1.75 gpm/ft (Shomaker, 1971). A review of driller's logs for the onsite water supply wells indicated alluvial thicknesses on the order of 100 feet. These logs variously report that either the Chinle Formation or the basal unit of the Wingate sandstone underlie the alluvial fill deposits.

In order to better define the hydrogeology of the shallow alluvial aquifer and assess the impact of the Plant's wastewater impoundments (i.e. east and west evaporation ponds), three ground-water monitoring wells were installed around the impoundments. A more detailed discussion of the monitoring well installation and sampling program is provided in Appendix A. Two of these monitoring wells were sited downgradient, and one upgradient to the approximate direction of shallow ground-water flow. The location of these three wells (MW-1, MW-2, and MW-3) in relation to the evaporation ponds are shown in Figure 1.4. In addition, elevation data and contours for these and four other wells installed onsite as part of a property transfer environmental assessment (WMH-1, 2, 3, and 4) are also presented in the same figure.

As shown by the water level contours in Figure 1.4, the direction of ground-water flow in the alluvial aquifer underlying the site was to the northwest when measured on July 17, 1990. Water levels in the evaporation pond monitoring wells, measured on June 23, 1990, prior to the installation of the WMH series monitoring wells, indicate a more westerly flow direction prevailed at that time. This apparent shift in flow direction may be due to a reduction in the subsurface flow associated with the South Fork of the Puerco River, or conversely an increase in the ground-water flow component from the southern portion at the basin.

Boring logs from the evaporation pond monitoring wells (Appendix A) indicate the presence of an apparently continuous clay layer underlying the evaporation ponds at shallow depth. This clay unit appears to thin to the southeast in boring MW-3, and was not encountered in the WMH series borings. The areal extent of the clay unit to the north, west and south, is unknown.

Ground-water in the alluvial aquifer was found to occur under confined conditions. The upper water-bearing unit consisted of a sandy clay encountered below the clay layer. Following completion of the evaporation pond monitoring wells, water levels rose to within three feet of the surface. In contrast, ground-water in the WMH series wells, located to the southeast of the evaporation ponds, appeared to occur under unconfined conditions.

1.3 WATER QUALITY

1.3.1 Regional Aquifer

Water quality data for the four Plant water supply wells is presented in Table 1.2. The data for the onsite wells probably represent a composite of that found in the San Andres/Glorieta aquifer and the Sonsila Sandstone bed of the Chinle Formation. Ground-water from these wells meets New Mexico State water quality standards.

1.3.2 Alluvial Aquifer

Two rounds of ground-water samples have been collected from the evaporation pond monitoring wells MW-1, MW-2, and MW-3. The first samples were collected on June 23, 1990, following well installation and development. The second round of samples were obtained approximately three weeks later on July 14, 1990. These samples were analyzed for primary and secondary drinking water constituents. The results of these analyses are presented in Table 1.3.

Water samples were also collected from the WMH series monitoring wells on July 17, 1990. The results of these analyses are presented in Table 1.4.

1.4 HYDROLOGIC FEATURES

The northern portion of the Wingate Plant property is bounded by the South Fork of the Puerco River. The Puerco is an intermittent stream tributary to the Little Colorado River watershed. The confluence of the North and South forks occurs to the west of the Plant, upstream from the City of Gallup. The Puerco River (north and south branches) comprises a drainage area of approximately 558 square miles. No other surface water sources are known to be present within a one mile radius of the Wingate Plant.

Surface water runoff upgradient of the Plant property to the south is intercepted by the I-40 Freeway, and routed to the south around the facility. Runoff from the east of the Plant is channeled north to the Puerco River. Onsite run-off is routed to the north and south of the developed portion of the site, where it rejoins pre-existing natural drainages to the west.

1.5 FLOOD PROTECTION

The Flood Hazard Boundary Map for this portion of McKinley County (HUD, 1978) delineates the area described as "subject to special flood hazards" shown in Figure 1.5. This area is approximately that which would be inunated as a result of a 100-year flood flow in the Puerco River. Although it appears from this information that some undeveloped areas of the Plant property, outside the stream channel, may be subject to flooding, no facilities, with the possible exception of the evaporation ponds appears to be at risk as a result of flood flows in the Puerco River.

Table 1.1

DEEP WELL CONSTRUCTION DATA

	WELL NUMBER			
	#3 (ON SITE)	#4 (ON SITE)	#6 (OFFSITE)	#7 (OFFSITE)
Location	T15N R17W S16 NE/NE/NE	T15N R17W S16 NE/NE/NE	T15N R16W S28 SE/SE/NE	T15N R16W S20 NW/SE/NE
Completion Date	04/53	05/53	03/58	02/67
Total Depth (ft)	2,012	1,941	1,275	1,384
Casing Depth (in/ft)	16-76 12-3/4-185 8-5/8-1,614 6-2,012	12-3/4-131 8-5/8-1,610	16-264 12-3/4-1,033	16-180 12-3/4-1,296
Perforated Interval (ft-ft)	122-185 815-835 1,180-1,230	811-830 1,173-1,220 Open hole/1,941	Open hole 1,033-1,275	Open Hole 1,296-1,384
Static Water Level 10/89 (ft)	Flowing Artesian	89	Flowing Artesian	Flowing Artesian
Pumping Water Level 10/89 (ft)	810	Not measured	290	310
Well Yield (gpm)	55	67	261	237

Table 1.2

REGIONAL GROUND-WATER QUALITY DATA

Constituent[1]	WELL NUMBER: #3 (ON SITE) T15N R17W S16 NE/NE/NE 04/09/76	#3 (ON SITE) 04/04/89	#4 (ON SITE) T15N R17W S16 NE/NE/NE 04/14/89	#6 (OFF SITE) T15N R16W S20 SE/SE/NE 04/04/89	#7 (OFF SITE) T15N R16W S20 NW/SE/NE 04/09/89	#7 (OFF SITE) 04/14/89
pH	8.2	7.7	7.7	7.8	7.75	7.6
Alkalinity, Total (as $CaCO_3$)	174	202	191	164	166	166
Calcium	62	40	107	156	344	154
Chloride	64	34	16	17	14	16
Fluoride	—	0.39	0.24	0.23	—	0.23
Hardness, Total (as $CaCO_3$)	118	190	420	628	680	710
Iron, Dissolved	—	0.15	0.13	0.12	—	0.1
Iron, Total	—	0.37	7.9[2]	0.35	—	0.15
Magnesium	56	22	37	58	336	79
Manganese, Dissolved	—	0.12	0.16	0.14	—	0.14
Manganese, Total	—	0.17	0.22	0.17	—	0.17
Nitrate (as NO_3)	—	<0.1	<0.1	<0.1	—	<0.1
Nitrate (as NO_2)	—	0.03	0.06	0.02	—	0.03
Potassium	—	5.1	6.7	5.2	—	5.4
Silica	—	9.4	8.2	7.1	—	7.1
Sodium	—	237	82	75	—	39
Specific Conductance (umho)	1360	1215	1171	1199	1340	1173
Sulfate	502	478	410	614	679	618
Total Dissolved Solids	888	932	944	1058	1135	921
Turbidity	9.2	—	—	—	4.4	—
Biological Oxygen Demand (BOD)		<1	<1	<1	—	<1
Chemical Oxygen Demand (COD)		<1	<1	<1	—	<1
Ammonia Nitrogen (as NH_4)		0.35	0.25	0.29	—	0.13
Total Organic Carbon (TOC)		0.67	0.62	1.09	—	0.68

[1]All results in milligrams per liter (mg/l) unless otherwise noted.

[2]Iron concentration believed to be a result of recent well rehabilitation

Table 1.3

WATER QUALITY ANALYSES[1]
EVAPORATION POND MONITORING WELLS

Field Data	MW-1 6/23/90	MW-1 7/14/90	MW-2 6/23/90	MW-2 7/14/90	MW-3 6/23/90	MW-3 7/14/90	MCLs[2] Primary	MCLs[2] Secondary
pH	7.93	7.60	7.93	7.69	7.62	7.05		
Specific Conductance (umhos/cm)	1,400	600	1,700	1,300	1,500	520		
Temperature (°C)	—	16	—	15	—	16		
Laboratory Data								
pH	8.4	8.3	8.5	8.4	8.1	7.8		6-9
Alkalinity, Total (as $CaCo_3$)	420	444	735	281	659	419		
Carbonate (as $CaCO_3$)	6	<1	40	10	<1	<1		
Bicarbonate (as $CaCO_3$)	414	444	695	271	659	419		
Hydroxide	<1	<1	<1	<1	<1	<1		
Chloride (Cl)	15.7	20.9	50	79	140	21.8		250
Fluoride (F)	0.83	0.97	1.49	1.77	1.32	1.09	1.6	
Nitrate (as N)	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	10	
Sulfate (SO_4)	1.0	19	73	240	280	26		600
Total Dissolved Solids (TDS)	490	570	1,010	1,400	1,350	520		1,000
Silver (Ag)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	
Arsenic (As)	<0.005	<0.005	<0.005	0.021	<0.005	0.007	0.1	
Barium (Ba)	0.248	0.235	0.158	0.175	0.110	0.139	1.0	
Calcium (Ca)	11.3	9.9	18.2	18.8	46.8	0.5		
Cadmium (Cd)	<0.005	0.006	<0.005	0.006	<0.005	<0.005	0.01	
Chromium (Cr)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	
Copper (Cu)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		1.0
Iron (Fe)	0.216	1.40	3.111	2.34	0.067	0.658		1.0
Hardness	63.6	54.4	96.5	92.6	186	1.2		
Mercury (Hg)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.002	
Magnesium (Mg)	8.6	7.2	12.4	11.1	16.7	<0.1		
Manganese (Mn)	0.174	0.228	0.290	1.36	0.242	0.481		0.2
Sodium (Na)	172	176	362	470	445	120		
Lead (Pb)	0.002	<0.002	<0.002	0.004	0.004	<0.002	0.05	
Selenium (Se)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.05	
Zinc (Zn)	<0.010	0.043	0.015	0.120	<0.010	0.094		10

[1]All results reported in milligrams per liter (mg/l) unless otherwise indicated

[2]New Mexico Water Quality Control Commission Human Health Standard Sections 3-013(A&B) Maximum Contaminant Levels

Table 1.4

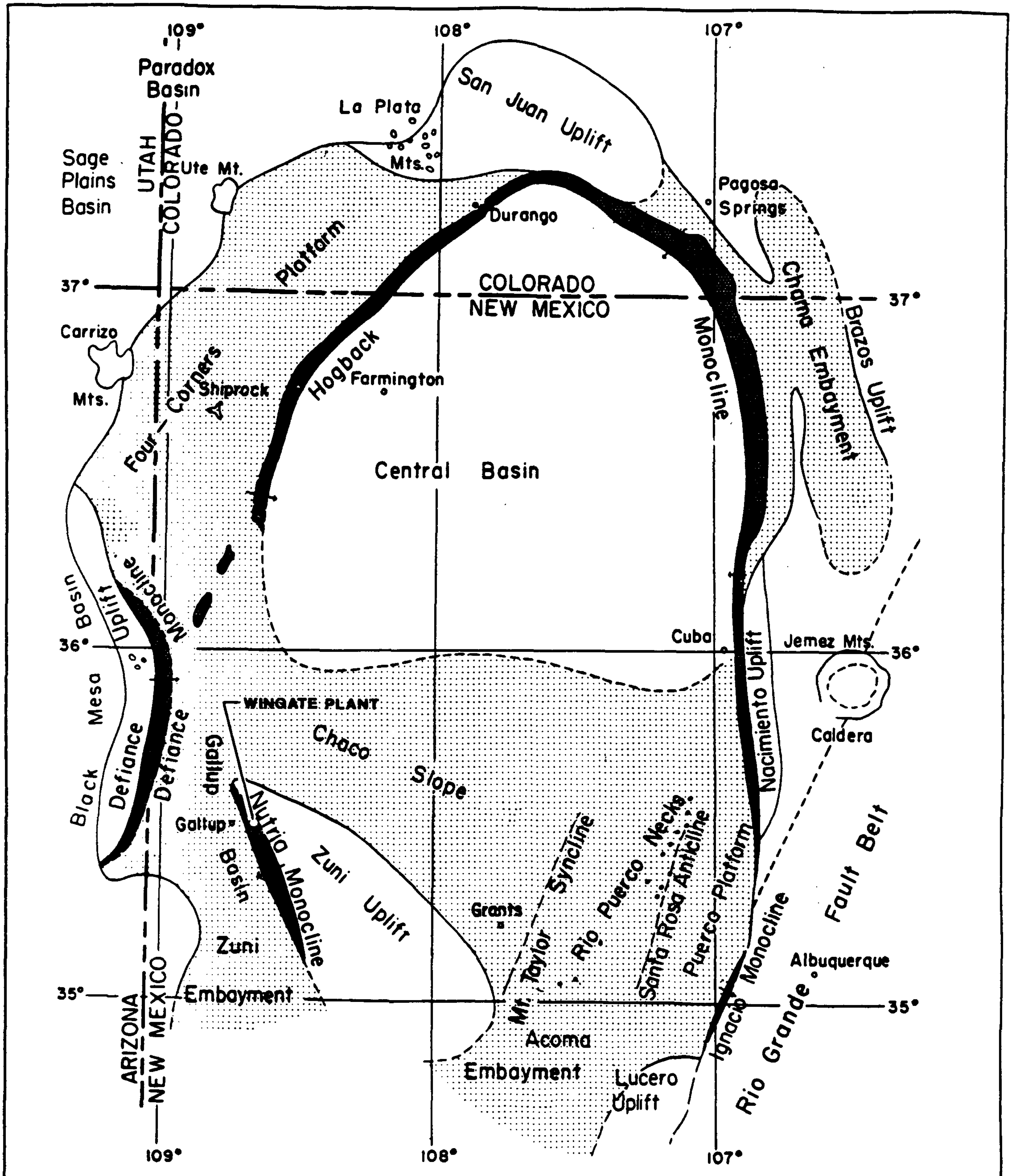
WATER QUALITY ANALYSES[1]
ENVIRONMENTAL ASSESSMENT MONITORING WELLS

Constituents	WMH-1	WMH-2	WMH-3	MCLs[2] Primary	MCLs[2] Secondary
pH	7.9	7.6	7.3	-	6-9
Alkalinity, Total (as $CaCo_3$)	-	-	-	-	-
Carbonate (as $CaCO_3$)	-	-	-	-	-
Bicarbonate (as $CaCO_3$)	-	-	-	-	-
Hydroxide	-	-	-	-	-
Chloride (Cl)	38	68	23	-	250
Fluoride (F)	1.3	1.4	1.2	1.6	-
Nitrate (as N)	<0.1	<0.1	<0.1	10	-
Sulfate (SO_4)	-	-	-	-	600
Total Dissolved Solids (TDS)	780	1,200	540	-	1,000
Silver (Ag)	<0.01	<0.01	<0.01	0.05	-
Arsenic (As)	<0.005	<0.005	<0.005	0.1	-
Barium (Ba)	0.29	0.14	0.12	1.0	-
Calcium (Ca)	-	-	-	-	-
Cadmium (Cd)	<0.01	<0.01	<0.01	0.01	-
Chromium (Cr)	<0.02	<0.02	<0.02	0.05	-
Copper (Cu)	0.01	0.02	<0.01	-	1.0
Iron (Fe)	5.2	2.0	1.4	-	1.0
Hardness	-	-	-	-	-
Mercury (Hg)	<0.005	<0.005	<0.005	0.002	-
Magnesium (Mg)	-	-	-	-	-
Manganese (Mn)	0.24	0.19	0.38	-	0.2
Sodium (Na)	-	-	-	-	-
Lead (Pb)	<0.05	<0.05	<0.05	0.05	-
Selenium (Se)	0.005	<0.005	<0.005	0.05	-
Zinc (Zn)	0.01	0.05	0.05	-	10
Aluminum (Al)	0.7	0.9	0.5	-	-
Molybdenum (Mo)	<0.5	<0.5	<0.5	-	-
Nickel (Ni)	<0.04	<0.04	<0.04	-	-
Cyanide	<0.005	<0.005	<0.005	-	-
Cobalt (Co)	<0.05	<0.05	<0.05	-	-
Total Organic Nitrogen	0.7	1.8	<0.3	-	-

[1]All results reported in milligrams per liter (mg/1)

[2]New Mexico Water Quality Control Commission Human Health Standard Sections 3-013(A&B) Maximum Contaminant Levels

Source: John Mathes & Associates

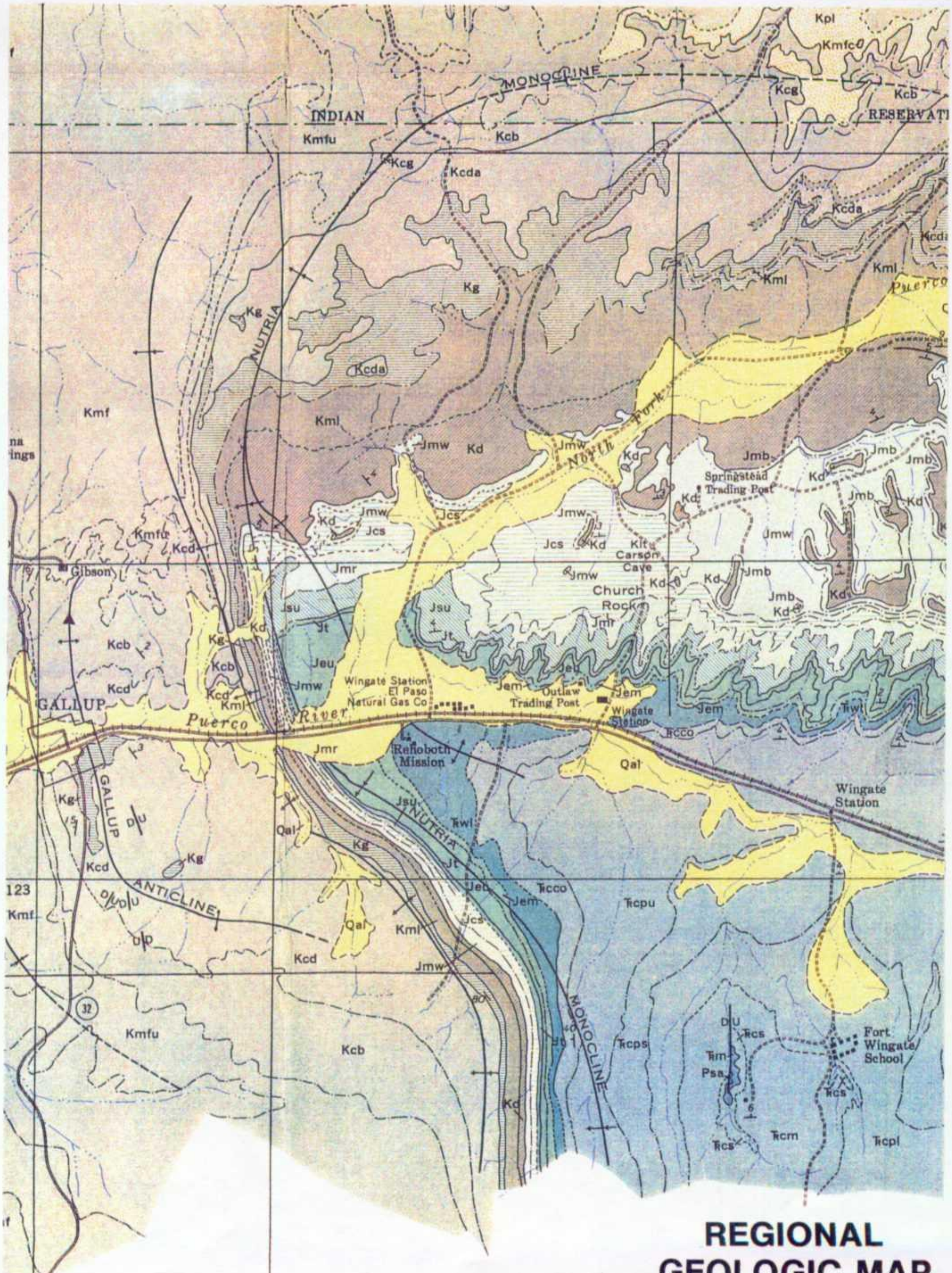


REGIONAL STRUCTURAL MAP SAN JUAN BASIN

Figure 1.1

DAMES & MOORE
01889-115-022

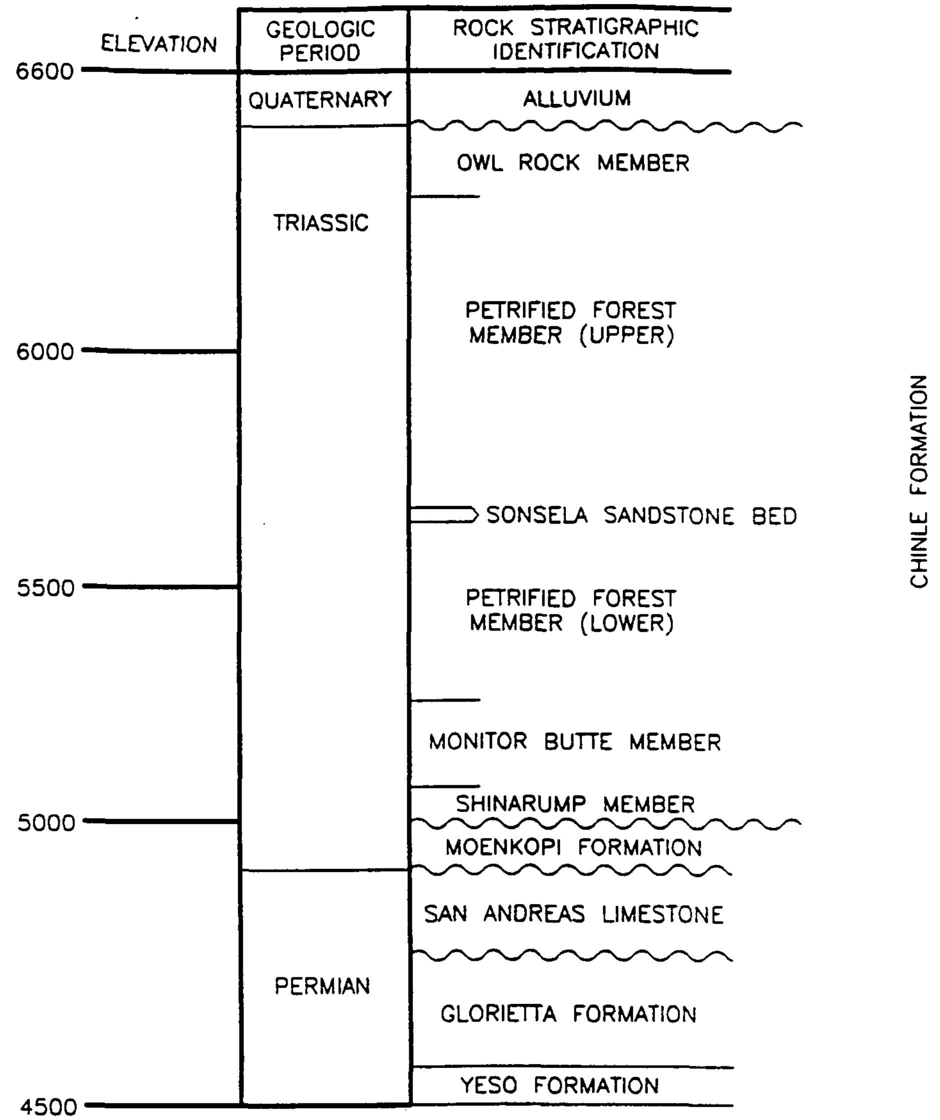
B00032-06-18-90



REGIONAL GEOLOGIC MAP

Figure 1.2

DAMES & MOORE



LEGEND:

CONTACT

UNCONFORMABLE CONTACT

VERTICAL SCALE:

1 INCH = 400 FEET

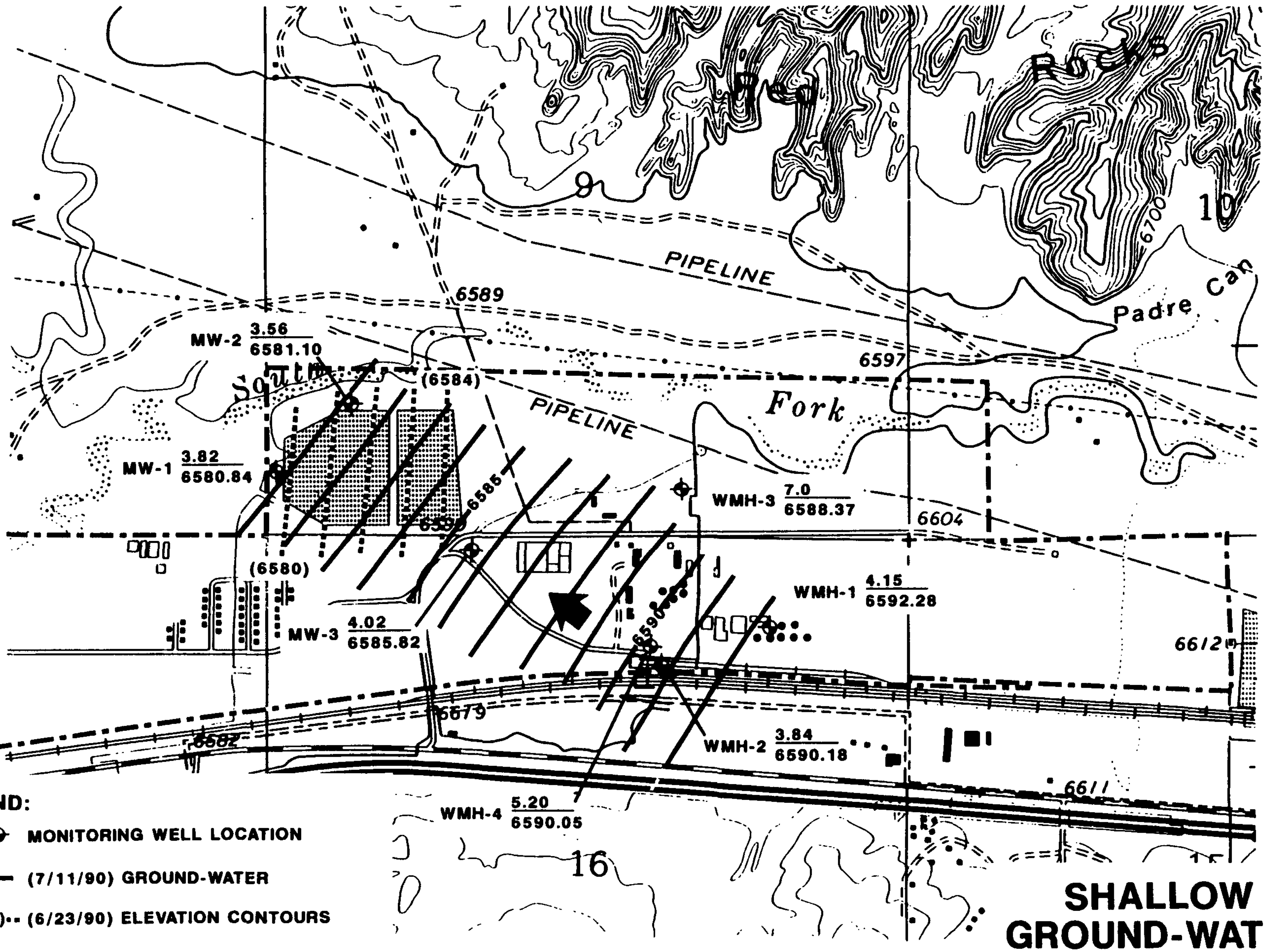
A0011-06-15-90

GENERALIZED STRATIGRAPHIC COLUMN

Figure 1.3

DAMES & MOORE

01889-115-022



LEGEND:

MW-1 ⊕ MONITORING WELL LOCATION

—6585— (7/11/90) GROUND-WATER

--(6580)-- (6/23/90) ELEVATION CONTOURS

3.82 / 6580.84 DEPTH-TO-WATER / GROUND-WATER ELEVATION (FT-MSL)

DIRECTION OF SHALLOW GROUND-WATER FLOW

0 — 1/2 MILE

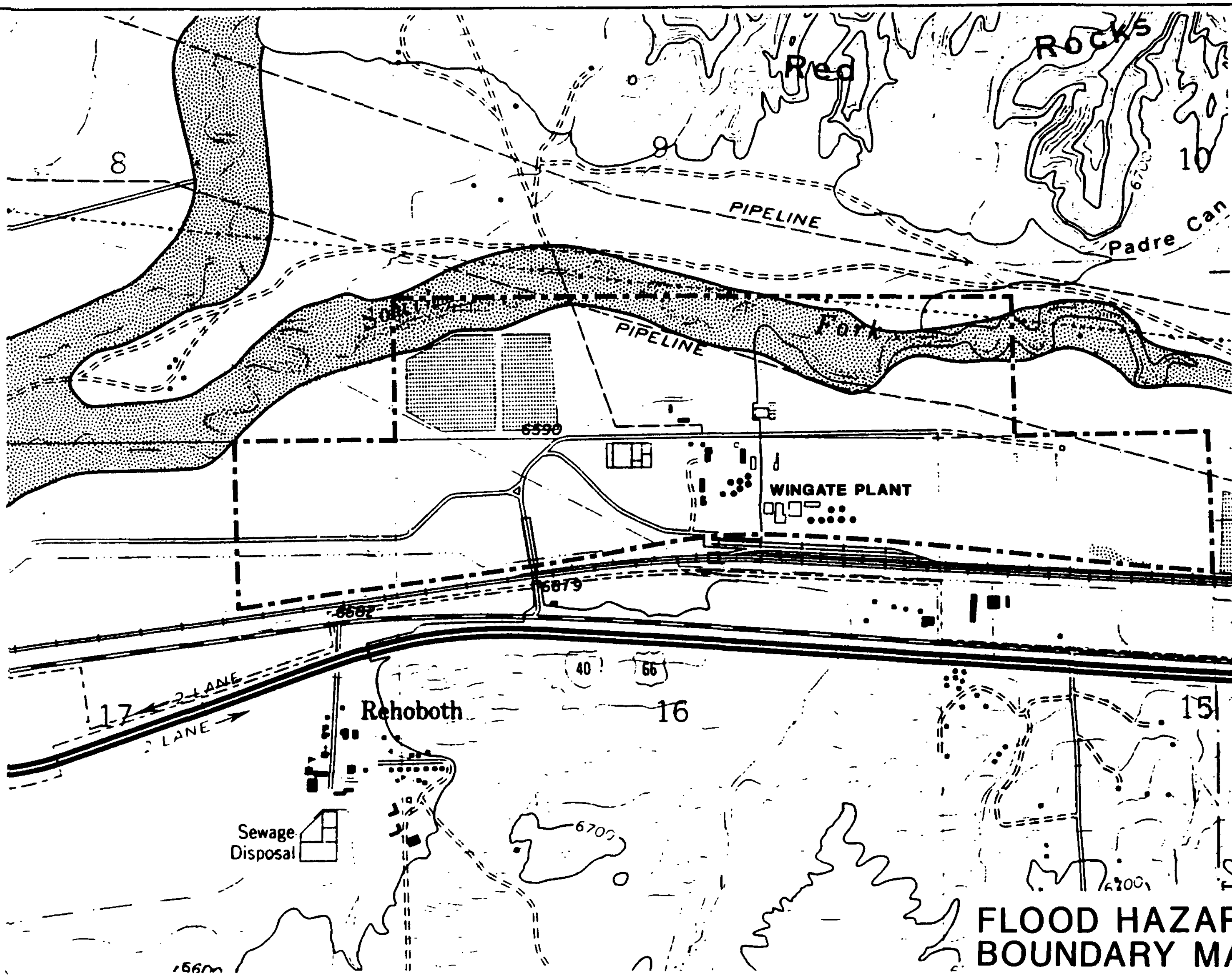
SHALLOW GROUND-WATER ELEVATIONS

Figure 1.4

DAMES & MOORE

01889-115-022

B00057-08-10-90



FLOOD HAZARD BOUNDARY MAP

Figure 1.5

SOURCE: HUD FEDERAL INSURANCE ADMINISTRATION
McKINLEY CO. (UNINCORPORATED AREA)
PANAL NO. 3500390020A

0 1000 2000
SCALE IN FEET

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01889-115-022

B00031-06-18-90

2.0 ADDITIONAL INFORMATION

2.1 EFFECT ON GROUND WATER USERS

2.1.1 Aquifer Units

As identified in the previous section, three water-bearing units underlie the Wingate Plant. These units are:

- o The San Andres Limestone/Glorieta Sandstone formations, designated as the regional aquifer,
- o The Sonsela Sandstone Bed of the Chinle Formation, also utilized by the onsite water supply wells, and
- o The basin fill alluvial deposits adjacent to the Puerco River, designated as the uppermost water-bearing zone.

2.1.2 San Andres/Glorieta Aquifer

The San Andres Limestone and Glorieta Sandstone formations of Permian age are present at depths of between 1,670 and 2,000 feet beneath the site area. This aquifer system occurs under confined conditions regionally, and is used for municipal, industrial, domestic and stock purposes. The depth of this aquifer, the presence of flowing artesian conditions, and thick sequence of relatively impermeable overlying formations, appear to preclude the possibility of contamination occurring as a result of the activities at the Wingate Plant.

2.1.3 Sonsela Sandstone Bed

The Sonsela Sandstone Bed, supporting the upper and lower parts of the Petrified Forest Member of the Chinle Formation, is screened in the onsite water supply wells at depths of between 811 and 835 feet. The presence of the overlying Upper Petrified Forest unit, and the confined conditions reported to occur within the unit, are also believed sufficient to preclude any potential contamination occurring due to activities at the Wingate Plant.

2.1.4 Shallow Alluvial Deposits

The uppermost water-bearing unit at the Wingate Plant site are the alluvial basin fill which underlie the Plant at the surface to a depth of approximately 100 feet.

The locations of wells within one mile of the Wingate Plant and the onsite water supply wells are shown in Figure 2.1 (USGS, 1990). All the offsite wells listed are shallow alluvial wells to the east and upgradient of the facility. The available water quality data for these wells are presented in Table 2.1. A number of additional wells were identified as part of a previous investigation at the Wingate Army Depot (Shomaker, 1971). However, even at the time of this earlier study most of these wells were reported to be capped or abandoned.

Based on the results of laboratory analyses of the wastewater in the evaporation ponds, the elevated constituents present in excess of New Mexico water quality standards are TDS (10,000 to 75,800 ug/l), chloride (4,180 to 26,000 mg/l) and sulfate (2,400 to 10,000 mg/l). A comparison of these values with those reported for the water quality data from the evaporation pond monitoring wells, WMH series monitoring wells, and offsite alluvial wells, resulted in the following conclusions:

- o The total dissolved solids (TDS) concentrations in the offsite alluvial wells ranged from approximately 500 to 950 mg/l. The remaining chemical parameters appeared to meet all other New Mexico State primary and secondary quality water requirements.

- o The range in TDS values for the onsite monitoring wells is from approximately 500 to 1,400 mg/l, with individual analysis for fluoride, iron and manganese in excess of state MCLs.

- o Although the TDS levels in MW-2 and MW-3 appear to be slightly elevated with respect to TDS concentration reported for offsite alluvial wells, from analyses during the period 1964-1975, they do not appear to be significantly higher than TDS concentrations observed in the WMH series monitoring wells upgradient from the evaporation ponds. Monitoring well MW-3 which exhibited the second highest TDS concentration of the onsite monitoring wells, is also upgradient to the evaporation ponds. Chloride and sulfate were also not found to differ significantly between monitoring wells downgradient and upgradient to the evaporation ponds.

The foregoing support a conclusion that the elevated concentrations noted for several constituents is not due to the infiltration of poor quality water from the evaporation ponds into the shallow ground-water system, but is characteristic of the relatively poor water quality present in the shallow aquifer system.

2.2 SOIL PROPERTIES

Soil survey data for the Wingate Plant area is not available at this time from the U.S. Soil Conservation Service or New Mexico state agency (U.S. Soil Conservation Service, personal communication).

2.3 CLIMATE

The El Paso Natural Gas Company (EPNG) Wingate Plant is located in a semi-arid region. Data recorded at the Wingate weather station shows an annual precipitation of 9.66 inches. The mean annual temperature is 49.2°F. A monthly summary of temperatures, precipitation and relative humidity is given in Table 2.2.

The prevailing winds are southwesterly although southeasterly and west-southwesterly winds are also common. Strong winds are predominant in the winter and spring months.

The area is prone to lightning strikes which necessitate an extensive protection system against lightning caused fires.

2.4 HISTORY OF OPERATION

The initial section of the EPNG Wingate Plant was the "A" plant. It was designed by Fluor Corporation to process 338,991 gallons per day of natural gas liquids. It was placed in service on October 28, 1953 and modified in May 1962.

The "B" plant section was designed by Sterns-Roger and Fish Engineering Corporations to process 659,038 gallons per day. This section was placed in service on October 25, 1956.

A deisobutanizer plant was designed by Fish Engineering. It was placed in service in December 1957. A new plant was built in May 1962 and the original plant was abandoned in place. It currently produces 250,000 gallons per day of normal butane and 115,000 gallons per day of isobutane.

The "C" plant section was designated by Sterns-Roger Corporation to process 330,000 gallons per day. It was placed in service on April 7, 1967.

A train loading facility capable of handling 82 cars was placed in service on September 15, 1959. A major fire occurred at this facility in 1982. A deluge system and lightning protection system were installed as a result for both truck and train loading racks.

A company lodging camp consisting of forty-eight houses and twenty-three house trailers existed on the property and received utilities from the plant. The camp was retired and the houses and trailers were removed in 1986.

Table 2.1

WATER QUALITY ANALYSES[1]
OFFSITE WELLS ADJACENT TO WINGATE PLANT

	14.1	14.1A	15.1321	15.2414	MCL[2]	
	08/07/75	08/07/75	03/65	03/65	Primary	Secondary
Laboratory Data						
pH (units)	8.5	8.5	7.7	7.7	-	6-9
Alkalinity, Total (as $CaCo_3$)	315	524	418	-	-	-
Carbonate (as $CaCO_3$)	61	83	-	-	-	-
Bicarbonate (as $CaCO_3$)	260	470	510	282	-	-
Hydroxide	-	-	-	-	-	-
Chloride (Cl)	50	82	23	50	-	250
Fluoride (F)	1.3	1.2	0.6	0.5	1.6	-
Nitrate (as N)	0.14	0.14	0.05	6.6	10	-
Sulfate (SO_4)	210	39	173	340	-	600
Total Dissolved Solids (TDS)	739	747	692	932	-	1,000
Silver (Ag)	-	-	-	-	0.05	-
Arsenic (As)	-	-	-	-	0.1	-
Barium (Ba)	-	-	-	-	1.0	-
Calcium (Ca)	22	22	52	98	-	-
Cadmium (Cd)	-	-	-	-	0.01	-
Chromium (Cr)	-	-	-	-	0.05	-
Copper (Cu)	-	-	-	-	-	1.0
Iron (Fe)	-	-	-	-	-	1.0
Hardness (as $CaCO_3$)	75	80	372	352	-	-
Mercury (Hg)	-	-	-		0.002	-
Magnesium (Mg)	4.8	6.1	59	26	-	-
Manganese (Mn)	-	-	-	-	-	0.2
Sodium (Na)	260	280	120	189	-	-
Lead (Pb)	-	-	-	-	0.05	-
Selenium (Se)	-	-	-	-	0.05	-
Zinc (Zn)	-	-	-	-	-	10
Silica (SiO_2)	-	-	13	11	-	-
Potassium (K)	0.8	1.0	-	-	-	-
Boron (B_2)	0.26	0.54	-	-	-	-

[1]All results reported in milligrams per liter (mg/l) unless otherwise indicated

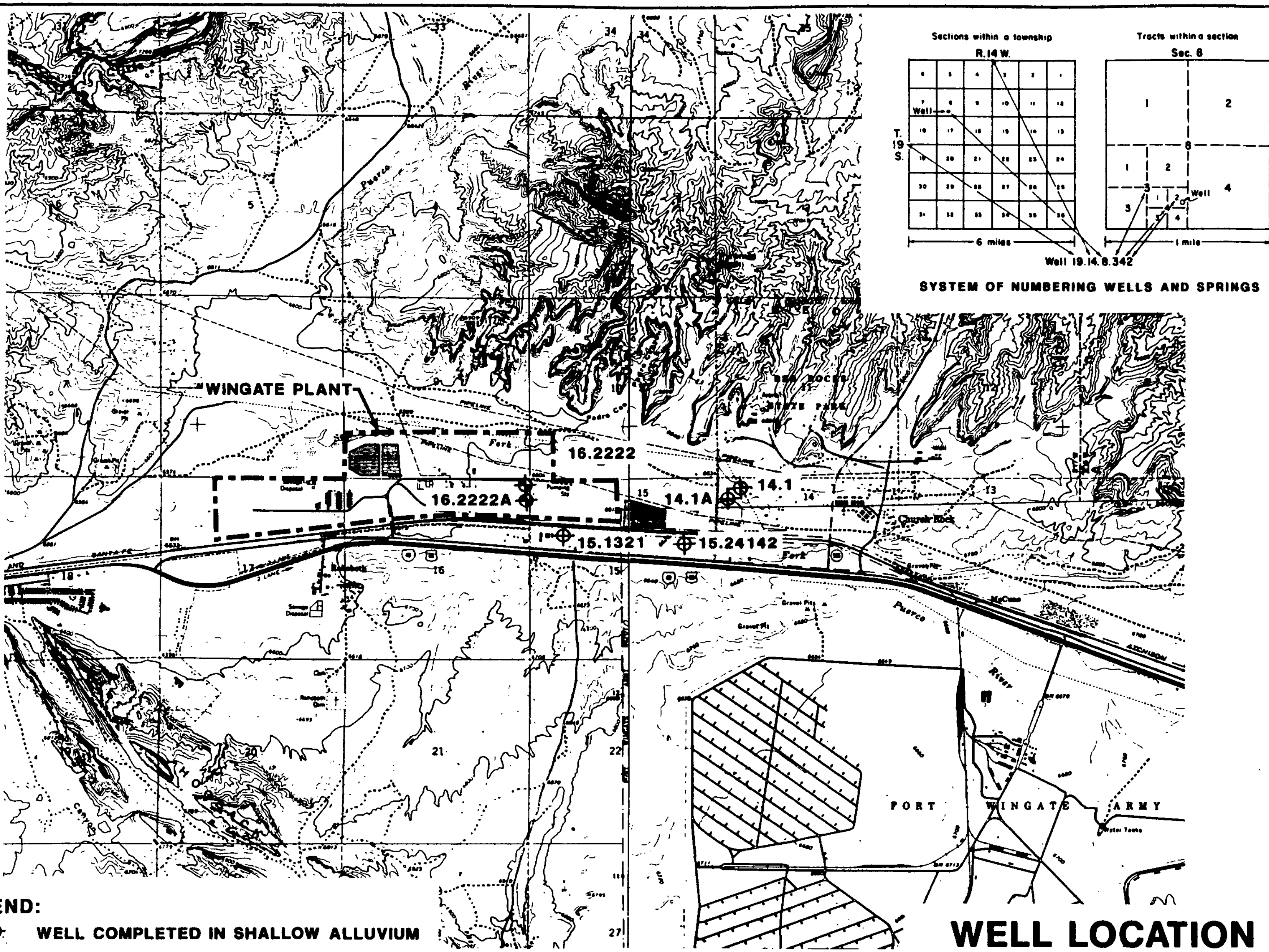
[2]New Mexico Water Quality Control Commission Human Health Standard Sections 3-013(A&B) Maximum Contaminant Levels

TABLE 2.2

MONTHLY WEATHER DATA
AND COOLING WATER TEMPERATURE

	Mean Temp, °F	Normal Precipitation Inches	Mean Relative Humidity %	Cooling Water Min. Temp °F	Lake Evaporation inches
Jan.	28.8	0.63	75	32°	0.59
Feb.	33.6	0.54	65	32°	0.78
March	38.9	0.63	54	33°	1.31
April	46.9	0.41	50	40°	3.19
May	55.5	0.38	33	43°	5.94
June	65.1	0.40	38	52°	9.03
July	70.9	1.52	60	62°	11.06
Aug.	68.7	1.61	58	60°	9.20
Sept.	62.0	0.95	59	54°	6.05
Oct.	51.2	1.30	50	43°	3.16
Nov.	38.3	0.67	55	33°	1.09
Dec.	30.2	0.62	72	32°	0.06
Year	49.2	9.66	58	43°	52.0

Source - NOAA, USDA



LEGEND:

- WELL COMPLETED IN SHALLOW ALLUVIUM
- WELL COMPLETED IN REGIONAL AQUIFIER

SOURCE: USGS ALBUQUERQUE NM
PROVISIONAL GROUND-WATER DATA 6/22/90

WELL LOCATION MAP

Figure 2.1

DAMES & MOORE
01889-115-022

B00058-08-10-90

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APPENDIX A

EVAPORATION POND
MONITORING WELL INSTALLATION

EVAPORATION POND

MONITORING WELL INSTALLATION

LOCATION

The evaporation ponds are located at the Wingate Natural Gas Processing Facility, east of Gallup, New Mexico.

PURPOSE AND SCOPE

In order to assess the impact of the Plant's wastewater evaporation ponds on the uppermost water-bearing unit, three monitoring wells were installed around the impoundments. Two of the wells were placed hydraulically downgradient, and one upgradient, of the ponds.

METHODOLOGY

The monitoring wells MW-1, MW-2, and MW-3, were installed during the period June 19-22, 1990, by Rodgers Drilling, of Albuquerque, New Mexico, utilizing a CME-75 truck-mounted drilling rig equipped with hollow-stem continuous flight augers. Boring logs were compiled based on drill cuttings. The borings were drilled to the following depths:

Boring	Depth (ft.)
MW-1	56
MW-2	48
MW-3	48

Boring logs for these sites are attached.

Well Completions

The monitoring wells shown in Figure 1, were constructed using 4-inch diameter schedule 40 PVC casing and screen consisting of 0.1-inch slot perforations. At the surface the PVC casing is protected by a 6-5/8 inch diameter steel casing and locking cap. The monitoring well construction data are summarized in Table A-1. The well elevations were surveyed on June 25, 1990, by Daggett Surveying, Inc., of Farmington, New Mexico.

Table A-1

MONITORING WELL CONSTRUCTION

	MW-1	MW-2	MW-3
Well Depth (ft.)	45	45	45
Screened Interval (ft-ft)	20-45	20-45	20-45
Elevation Top of PVC Casing	6,582.93	6,584.99	6,588.95
Elevation Top of Steel Casing	6,584.66	6,585.37	6,589.84

Well completion forms for each well are continued in Appendix B.

Boring Log Data

The boring logs indicated the presence of an apparently continuous clay unit underlying the surface impoundments at shallow depth. Based on the ground surface elevations at the three sites, the top of the clay unit appears to dip gently to the west. In the area immediately around the evaporation ponds, the clay layer reached a maximum thickness of 19 feet, at MW-1, apparently thinning toward the southeast, where it exhibited a thickness of 11 feet in MW-3. Boring log data is continued in Appendix B.

Underlying the relatively impermeable clays was a sandy clay zone which continued to the total depth of the boring, except in MW-2 which encountered a clayey sand at 45 feet. This unit constitutes the uppermost water-bearing unit at this location. The water-bearing unit is presumed to be under confined conditions due to the subsequent rise in water levels to within three feet of the surface following well completion.

Well Development

The monitoring wells were developed on June 23, 1990, utilizing a 4-inch diameter submersible pump. In order to facilitate the development process the pump was periodically raised and lowered opposite the screened portion of the well. Table A-2 summarizes the volume of water added to the well during installation of casing and screen and pumped during development.

Table A-2

MONITORING WELL DEVELOPMENT
AND PURGING

Units (gallons)	MW-1	MW-2	MW-3
Water Added During Completion	66	75	75
Water Pumped During Development	>400	>500	>500
Excess Water Removal	>334	>425	>425
Number of Saturated Casing Volumes	>12.3	>15.4	>15.4

Well Sampling

Following development and field measurement of pH and specific conductance, the monitoring wells were sampled on June 22, 1990 utilizing a nylon disposable bailer and line. A total of three one-liter containers were collected at each well. The water sample from each well intended for metal analyses was filtered in the field and preserved with HNO_3.

Upon collection the samples were labeled and immediately placed in an iced cooler for storage pending delivery to the laboratory conducting the analyses.

A second round of ground-water samples from MW-1, MW-2, and MW-3 were collected by El Paso Natural Gas personnel on July 14, 1990. The samples were obtained and by air-lift pumping preserved in a manner similar to that described above, after purging, and field measurement of pH, specific conductance, and temperature.

Standard chain-of-custody procedures were followed for all samples. Completed chain-of-custody forms and sample collection records are continued in Appendix C.

ANALYSES

The samples were delivered to Analytical Technologies, Inc. of Tempe, Arizona for analysis. The water samples were analyzed for primary and secondary drinking water parameters, in accordance with EPA methods.

RESULTS OF ANALYSES

The results of the analyses for primary and secondary drinking water standards are summarized in Table A-3. Laboratory data sheets for these analyses are continued in Appendix C.

A great deal of variability were observed between wells and also between successive samples from the sample well. This observation was particularly true for monitoring well MW-3, where concentration differences on the order of two orders of magnitude were reported for several constituents. MW-3 parameters which exceeded one order of magnitude difference between the June 23, 1990 and July 14, 1990 analyses included

NO

~~chloride~~, sulfate, calcium, hardness, and magnesium. In contrast, only sulfate and iron were found to exhibit a similar variability for MW-1 and MW-2, respectively. The reasons behind the observed variability are not known, and may be a function of the natural dynamics of the water-bearing unit.

Table A-3

WATER QUALITY ANALYSES[1]
EVAPORATION POND MONITORING WELLS

	MW-1		MW-2		MW-3		MCLs[2]	
Field Data	6/23/90	7/14/90	6/23/90	7/14/90	6/23/90	7/14/90	Primary	Secondary
pH	7.93	7.60	7.93	7.69	7.62	7.05		
Specific Conductance (umhos/cm)	1,400	600	1,700	1,300	1,500	520		
Temperature (°C)	—	16	—	15	—	16		
Laboratory Data								
pH	8.4	8.3	8.5	8.4	8.1	7.8		6-9
Alkalinity, Total (as $CaCO_3$)	420	444	735	281	659	419		
Carbonate (as $CaCO_3$)	6	<1	40	10	<1	<1		
Bicarbonate (as $CaCO_3$)	414	444	695	271	659	419		
Hydroxide	<1	<1	<1	<1	<1	<1		
Chloride (Cl)	15.7	20.9	50	79	140	21.8		250
Fluoride (F)	0.83	0.97	1.49	1.77	1.32	1.09	1.6	
Nitrate (as N)	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	10	
Sulfate (SO_4)	1.0	19	73	240	280	26		600
Total Dissolved Solids (TDS)	490	570	1,010	1,400	1,350	520		1,000
Silver (Ag)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	
Arsenic (As)	<0.005	<0.005	<0.005	0.021	<0.005	0.007	0.1	
Barium (Ba)	0.248	0.235	0.158	0.175	0.110	0.139	1.0	
Calcium (Ca)	11.3	9.9	18.2	18.8	46.8	0.5		
Cadmium (Cd)	<0.005	0.006	<0.005	0.006	<0.005	<0.005	0.01	
Chromium (Cr)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	
Copper (Cu)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		1.0
Iron (Fe)	0.216	1.40	3.111	2.34	0.067	0.658		1.0
Hardness	63.6	54.4	96.5	92.6	186	1.2		
Mercury (Hg)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.002	
Magnesium (Mg)	8.6	7.2	12.4	11.1	16.7	<0.1		
Manganese (Mn)	0.174	0.228	0.290	1.36	0.242	0.481		0.2
Sodium (Na)	172	176	362	470	445	120		
Lead (Pb)	0.002	<0.002	<0.002	0.004	0.004	<0.002	0.05	
Selenium (Se)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.05	
Zinc (Zn)	<0.010	0.043	0.015	0.120	<0.010	0.094		10

[1]All results reported in milligrams per liter (mg/l) unless otherwise indicated

[2]New Mexico Water Quality Control Commission Human Health Standard Sections 3-013(A&B) Maximum Contaminant Levels

APPENDIX B

BORING LOGS AND WELL COMPLETION FORMS

BORING MW-1

SURFACE ELEVATION: 6582 ±1 FEET

DEPTH IN FEET	TIME	SAMPLE NO./SAMPLE DEPTH	BLOWS/FT.	SAMPLES	SYMBOLS	DESCRIPTION
0					CL	RED, SANDY SILTY CLAY, VERY SOFT, DRY MINOR FINE SAND
5	9:33	1/5		■	CH	RED, CLAY, COHESIVE, MOIST, HIGH PLASTICITY
10	9:40	2/10		■		AS ABOVE
15	9:52	3/15		■		AS ABOVE
20	10:03	4/20		■		AS ABOVE
25	10:12	5/25		■	CL	RED, SANDY CLAY, COHESIVE, MOIST, HIGH PLASTICITY
30	10:20	6/30		■		AS ABOVE
35	10:28	7/35		■		AS ABOVE, INCREASING SAND
40	10:35	8/40		■		AS ABOVE, VERY MOIST
45	10:40	9/45		■		AS ABOVE
50	10:52	10/50		■	SC	GRAY TO RED GRAY CLAYEY SAND
55	11:05	11/55		■		AS ABOVE, INCREASING SAND
						BORING TERMINATED AT 56 FEET ON 6/20/90.
60						

LOG OF BORING

D&M JOB#01889-115-022

BORING MW-2

SURFACE ELEVATION: 6584 ±1 FEET

DEPTH IN FEET	TIME	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT.	SAMPLES	SYMBOLS	DESCRIPTION
0					CL	RED BROWN, SANDY SILT AND CLAY
5	9:30	1/5		■	CH	RED, CLAY, DRY, HIGH PLASTICITY
10	9:45	2/10		■		AS ABOVE
15	9:56	3/15		■		AS ABOVE, MOIST
20	10:03	4/20		■		AS ABOVE
25	10:20	5/25		■	CL	RED, SANDY CLAY, WET
30	10:26	6/30		■		AS ABOVE
35	10:33	7/35		■		AS ABOVE
40	10:52	8/40		■		AS ABOVE, INCREASING SAND
45	10:58	9/45		■		AS ABOVE
	11:00	10/48		■		AS ABOVE
50						BORING TERMINATED AT 48 FEET ON 6/21/90.

LOG OF BORING

D&M JOB#01889-115-022

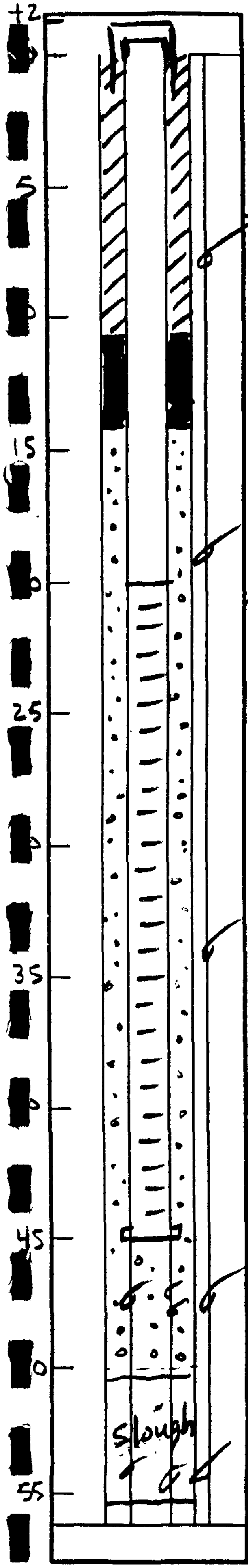
BORING MW-3

SURFACE ELEVATION: 6588 ±1 FEET

DEPTH IN FEET	TIME	SAMPLE NO./SAMPLE DEPTH	BLOWS/FT.	SAMPLES	SYMBOLS	DESCRIPTION
0					CL	RED, SANDY SILT AND CLAY, DRY
5	9:04	1/5		■		AS ABOVE, SILTY CLAY
					CH	RED, CLAY, MOIST, HIGH PLASTICITY
10	9:13	2/10		■		
15	9:35	3/15		■		AS ABOVE, WET, SWELLING CLAYS
20	9:50	4/20		■		AS ABOVE, MOIST
					CL	RED, SANDY CLAY, MOIST TO WET
25	9:58	5/25		■		AS ABOVE
30	10:05	6/30		■		AS ABOVE, INCREASING FINE SAND
35	10:11	7/35		■		AS ABOVE
40	10:15	8/40		■		AS ABOVE, INCREASING SAND
45	10:20	9/45		■	SC	RED GRAY, CLAYEY SANDS
	10:30	10/48		■		AS ABOVE
						BORING TERMINATED AT 48 FEET ON 6/22/90.
50						

LOG OF BORING

D&M JOB#01889-115-022



Dames & Moore

Well No. MW-1

Boring No. X-Ref:

MONITOR WELL CONSTRUCTION SUMMARY

Survey Coords:

Elevation Ground Level

Top of Casing 6582.93 PVC

Drilling Summary:

Total Depth 56 ft

Borehole Diameter 11-inch

Casing Stick-up Height: PVC +0.5 ft

Driller Rodgers & Company Albuquerque, NM

Rig CME-75 Hollow stem auger

Bit(s) N.A.

Drilling Fluid None

Protective Casing 6 5/8-inch locking steel

Construction Time Log:

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling	6.20.90	0926	6.20.90	1105
Geophys. Logging:				
Casing:	6.20.90	1220	6.20.90	1305
Filter Placement:	6.20.90	1315	6.20.90	1505
Cementing:	6.20.90	1630	6.20.90	1650
Development:				

Well Design & Specifications

Basis: Geologic Log ____ Geophysical Log ____

Casing String (s): C = Casing S = Screen.

Depth	String(s)	Elevation
+2 - 2	C1	-
+.5 - 20	C2	-
20 - 45	S1	-
45 - 45.2	End Cap	-
-		-

Casing: C1 6 5/8-inch O.D. locking steel

C2 4-inch sch 40 PVC flush-threaded, blank

Screen: S1 4-inch sch 40 PVC flush threaded, .010 slot

S2

Filter Pack: Colorado Silica Sand 10-20 mesh 14-51 feet with 12 sacks

Grout Seal: Type II portland cement 0-11 feet with 3 sacks

Bentonite Seal: Pel Plug 1/4-inch bentonite pellets 11-14 feet with 2 buckets, 5 gal. each

Well Development:

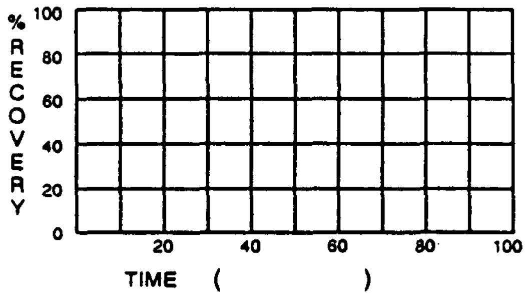
Well was evacuated of 400+ gallons with a 4-inch submersible pump. Q = 5gpm

Stabilization Test Data:

Time	pH	Spec. Cond.	Temp (C)

Recovery Data:

Q= S_o=



Comments:

SITE NAME EPNG

LOCATION WINGATE PLANT

SUPERVISED BY B.C. LAVERMAN

DATE 6.20.90

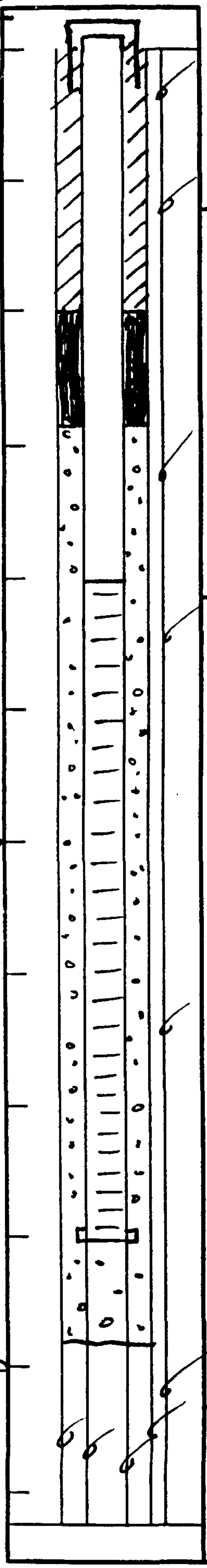
01187-115-022

Dames & Moore

Well No. MW-2
Boring No. X-Ref:

MONITOR WELL CONSTRUCTION SUMMARY

Survey Coords:
Elevation Ground Level
Top of Casing 6584.99 PVC



Drilling Summary:

Total Depth 48 ft
Borehole Diameter 11 inch
Casing Stick-up Height: PVC +1 ft
Driller Rodgers & Company Albuquerque, NM
Rig CME 75 Hollow stem auger
Bit(s) N.A.
Drilling Fluid None
Protective Casing 6 5/8-inch locking steel

Construction Time Log:

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling	6-21-90	0925	6-21-90	1410
Geophys. Logging:				
Casing:	6-21-90	1420	6-21-90	1450
Filter Placement:	6-21-90	1500	6-21-90	1630
Cementing:	6-21-90	1630	6-21-90	1730
Development:	6-23-90	1330	6-23-90	1610

Well Design & Specifications

Basis: Geologic Log ____ Geophysical Log ____
Casing String (s): C = Casing S = Screen.

Depth	String(s)	Elevation
+1.5 - 2.5	C1	-
+1 - 20	C2	-
20 - 45	S1	-
45 - 45.2	End Cap	-
-		-

Casing: C1 6 5/8-inch locking steel
C2 4-inch SCH 40 PVC flush-threaded, blank
Screen: S1 4-inch SCH 40 PVC flush-threaded, 0.010 slot
S2

Filter Pack: Colorado Silica Sand 10-20 mesh 14-48 feet with 11 sacks
Grout Seal: Type II portland cement 0-10 feet 3 sacks
Bentonite Seal: Pel-Plug 1/4-inch bentonite pellets 10-14 feet with 2 buckets, 5 gallons each

Well Development:

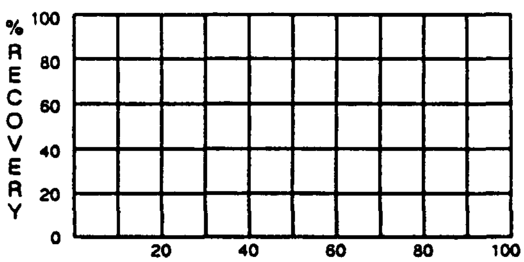
Well was evacuated of 500+ gallons with 4-inch submersible pump. Q = 5 gpm.

Stabilization Test Data:

Time	pH	Spec. Cond.	Temp (C)

Recovery Data:

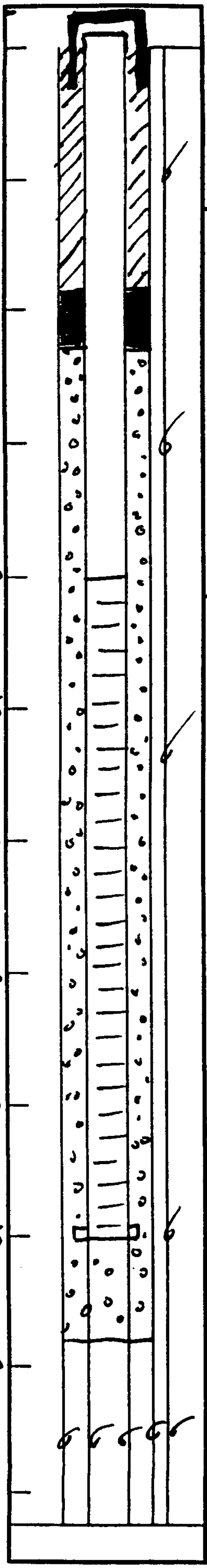
Q= S$_o$=



Comments:

SITE NAME EPNG
LOCATION WINGATE PLANT
SUPERVISED BY B.C. LAMERMAN
DATE 6.21.90

01184-115-022



Dames & Moore

Well No. MW-3

Boring No. X-Ref:

MONITOR WELL CONSTRUCTION SUMMARY

Survey Coords:

Elevation Ground Level

Top of Casing 6588.95 PVC

Drilling Summary:

Total Depth 48 ft

Borehole Diameter 11-inch

Casing Stick-up Height: PVC +1 ft

Driller Rodgers and Company Albuquerque, NM

Rig CME 75 Hollow stem auger

Bit(s) N.A

Drilling Fluid None

Protective Casing 6 5/8-inch locking steel

Construction Time Log:

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling	6.22.90	0850	6.22.90	1034
Geophys.Logging:				
Casing:	6.22.90	1110	6.22.90	1130
Filter Placement:	6.22.90	1130	6.22.90	1330
Cementing:	6.22.90	1330	6.22.90	1400
Development:	6.23.90	1030	6.23.90	1230

Well Design & Specifications

Basis: Geologic Log ____ Geophysical Log ____

Casing String (s): C = Casing S = Screen.

Depth	String(s)	Elevation
+2 - 2	C1	-
+1 - 20	C2	-
20 - 45	S1	-
45 - 45.2	End Cap	-
-		-

Casing: C1 6 5/8-inch locking steel

C2 4-inch SCH 40 PVC flush-threaded, blank

Screen: S1 4-inch SCH 40 PVC flush threaded, .010 slot

S2

Filter Pack: Colorado Silica Sand 10-20 mesh 12-48 feet with 12 sacks

Grout Seal: Type II portland cement 0-9 feet with 3 sacks

Bentonite Seal: Pel-Plug 1/4-inch bentonite pellets 9-12 feet with 2 buckets, 5 gallons each

Well Development:

Well was evacuated of 500+ gallons with a 4-inch submersible pump. Q = 5 gpm

Stabilization Test Data:

Time	pH	Spec. Cond.	Temp (C)

Recovery Data:

Q= S_0=

% RECOVERY 0 20 40 60 80 100

TIME 20 40 60 80 100 ( )

Comments:

SITE NAME EPNG

LOCATION WINGATE PLANT

SUPERVISED BY B.C. LAUERMAN

DATE 6.22.90

APPENDIX C

LABORATORY DATA SHEETS, WATER SAMPLE COLLECTION RECORDS AND CHAIN-OF-CUSTODY FORMS

ver. 6/22/89

6·23·90

WATER QUALITY SAMPLE COLLECTION RECORD

OWNER: EL PASO NATURAL GAS SAMPLE I.D. NO. MW-1

PROJECT: WINGATE PLANT

SOURCE AND TYPE OF SAMPLE:
WELL X SPRING ____
SURFACE WATER ____

JOB NO: 01885 - 115 - 022

SAMPLER(S): BCL
(PRINT) ANDY, BRIAN

AFFILIATION(S): D&M
RODGERS & CO.

INSTRUMENTATION

WATER LEVEL METER: S.T. CORRECTION FACTOR(CF): —— ft

pH METER (brand and model): Markson model 88
CALIBRATED WITH ph 4: X pH 7: X ~~pH 10:~~ -- ~~TIME:~~ 1020

SC METER (brand and model): Amber Science model 605
STANDARD SOLUTION USED: 2000. umhos/cm TIME: 1020

45.5 - 3.33 = 42.17 **WELL EVACUATION** Q = 5 gpm

DEPTH TO WATER(DTW+or-CF): -3.33 ft DATE@TIME MEAS.: 1006
ELEV.OF MEAS.POINT(ELEV): ____ ft SWL ELEV.(ELEV-DTW)= ____ ft
TOTAL DEPTH OF WELL (TD): 45.5 ft CASING DIA (d): 4 in
EVACUATION VOL. (((d/24)**2)(3.14)(TD-DTW)(7.48)(~~5~~)): 27.5 gal each

TIME SINCE EVACUATION START (min):	initial		final
VOLUME EVACUATED (gal):	0		400+
pH:	8.11		7.98
SPECIFIC CONDUCTANCE (umhos/cm):	1400.		1400.
TEMPERATURE (circle F or C):	—		
DEPTH TO WATER(DTW+or-CF):			

TOTAL VOL. EVAC.: 400+ gal DATE@TIME EVACUATED: 1845

EVACUATION EQUIPMENT: 4-inch submersible pump on 1-inch poly

SAMPLE COLLECTION

DEPTH TO WATER(DTW+or-CF): ____ ft DATE@TIME MEAS.: ____
DATE@TIME SAMPLED: 1845 WEATHER: Sunny, 95°F
SAMPLE APPEARANCE:
COLOR: clear TURBIDITY: some silt ODOR: none

ANALYSES-CONTAINERS: see chain-of-custody

SAMPLE COLLECTION EQUIPMENT: disposable bailer

COMMENTS: metals were field filtered w/ 0.45 micron filter

I certify that to the best of my knowledge the information recorded on this document is a true statement of fact.

[signature] 6-23-90
Signature of Sampler/Date

Signature of Sampler/Date

ver. 6/22/89

6.23.90

WATER QUALITY SAMPLE COLLECTION RECORD

OWNER: EL PASO NATURAL GAS SAMPLE I.D. NO. MW-2

PROJECT: WINGATE PLANT

SOURCE AND TYPE OF SAMPLE:
WELL X SPRING ____
SURFACE WATER ____

JOB NO: 01889 - 115 - 022

SAMPLER(S): BCL
(PRINT) ANDY, BRIAN

AFFILIATION(S): D&M
RODGERS & CO.

INSTRUMENTATION

WATER LEVEL METER: S.T. CORRECTION FACTOR(CF): —— ft

pH METER (brand and model): Markson model 88
CALIBRATED WITH ph 4: X pH 7: X ~~pH 10:~~ ____ ~~TIME:~~ 1020

SC METER (brand and model): Amber Science model 605
STANDARD SOLUTION USED: 2000. umhos/cm TIME: 1020

46 - 3.63 = 42.37

WELL EVACUATION

Q = 5gpm

DEPTH TO WATER(DTW+or-CF): 3.63 ft DATE@TIME MEAS.: 1000
ELEV.OF MEAS.POINT(ELEV): ____ ft SWL ELEV.(ELEV-DTW)= ____ ft
TOTAL DEPTH OF WELL (TD): 46 ft CASING DIA (d): 4 in
EVACUATION VOL. (((d/24)**2)(3.14)(TD-DTW)(7.48)(■)): 27.7 gal each

TIME SINCE EVACUATION START (min):	initial		final
VOLUME EVACUATED (gal):	∅		500+
pH:	7.97		7.93
SPECIFIC CONDUCTANCE (umhos/cm):	1700.		1700
TEMPERATURE (circle F or C):	—		
DEPTH TO WATER(DTW+or-CF):			

TOTAL VOL. EVAC.: 500+ gal DATE@TIME EVACUATED: 1030

EVACUATION EQUIPMENT: 4-inch submersible pump on 1-inch poly

SAMPLE COLLECTION

DEPTH TO WATER(DTW+or-CF): ____ ft DATE@TIME MEAS.: ____
DATE@TIME SAMPLED: 1030 WEATHER: Sunny, 95°F
SAMPLE APPEARANCE:
COLOR: clear TURBIDITY: some silt ODOR: none

ANALYSES-CONTAINERS: see chain-of-custody

SAMPLE COLLECTION EQUIPMENT: disposable bailer

COMMENTS: metals field filtered w/ 0.45 micron filter

I certify that to the best of my knowledge the information recorded on this document is a true statement of fact.

[signature] 6.23.90
Signature of Sampler/Date

Signature of Sampler/Date

ver. 6/22/89

6.23.90

WATER QUALITY SAMPLE COLLECTION RECORD

OWNER: EL PASO NATURAL GAS SAMPLE I.D. NO. MW-3

PROJECT: WINGATE PLANT

SOURCE AND TYPE OF SAMPLE:
WELL X SPRING ____
SURFACE WATER ____

JOB NO: 01889 - 115 - 022

SAMPLER(S): BCL
(PRINT) ANDY, BRIAN

AFFILIATION(S): D&M
RODGERS & CO.

INSTRUMENTATION

WATER LEVEL METER: S.T. CORRECTION FACTOR(CF): — ft

pH METER (brand and model): Markson model 88
CALIBRATED WITH ph 4: X pH 7: X ~~pH 10:~~ -- ~~TIME:~~ 1020

SC METER (brand and model): Amber Science model 605
STANDARD SOLUTION USED: 2000. umhos/cm TIME: 1020

46 - 3.87 = 42.13'

WELL EVACUATION

Q = 5 gpm

DEPTH TO WATER(DTW+or-CF): 3.87 ft DATE@TIME MEAS.: 0948
ELEV.OF MEAS.POINT(ELEV): ____ ft SWL ELEV.(ELEV-DTW)= ____ ft
TOTAL DEPTH OF WELL (TD): 46 ft CASING DIA (d): 4 in
EVACUATION VOL. (((d/24)**2)(3.14)(TD-DTW)(7.48)(3)): ____ gal each

	initial		final
TIME SINCE EVACUATION START (min):			
VOLUME EVACUATED (gal):	Ø		500+
pH:	7.66		7.62
SPECIFIC CONDUCTANCE (umhos/cm):	1500		1500.
TEMPERATURE (circle F or C):	—		—
DEPTH TO WATER(DTW+or-CF):			

TOTAL VOL. EVAC.: 500+ gal DATE@TIME EVACUATED: 1230

EVACUATION EQUIPMENT: 4-inch submersible pump on 1-inch poly

SAMPLE COLLECTION

DEPTH TO WATER(DTW+or-CF): ____ ft DATE@TIME MEAS.: ____
DATE@TIME SAMPLED: 1230 WEATHER: Sunny, 95°F
SAMPLE APPEARANCE:
COLOR: clear TURBIDITY: some silt ODOR: none

ANALYSES-CONTAINERS: see chain-of-custody

SAMPLE COLLECTION EQUIPMENT: disposable bailer

COMMENTS: metals field filtered with 0.45 micron filter

I certify that to the best of my knowledge the information recorded on this document is a true statement of fact.

6.23.90
Signature of Sampler/Date

Signature of Sampler/Date

AnalyticalTechnologies,Inc. 2113 S. 48th Street Suite 107 Tempe, AZ 85282 (602) 438-1530

ATI I.D. 006861

July 25, 1990

Dames & Moore
7500 N. Dreamy Draw Drive
Suite 145
Phoenix, AZ 85020

Project Name/Number: EPNG

Attention: Bob Harding

On 06/26/90, Analytical Technologies, Inc. received a request to analyze **aqueous** sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (602)438-1530.

Elizabeth Proffitt
Project Manager

Robert V. Woods
Laboratory Manager

RVW:clf
Enclosure
90-21

Analytical Technologies, Inc.

CLIENT : DAMES & MOORE, PHOENIX
PROJECT # : (NONE)
PROJECT NAME : EPNG

DATE RECEIVED : 06/26/90
REPORT DATE : 07/25/90

ATI I.D. : 006861

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	MW-1	AQUEOUS	06/23/90
02	MW-2	AQUEOUS	06/23/90
03	MW-3	AQUEOUS	06/23/90

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	3

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 006861

CLIENT : DAMES & MOORE, PHOENIX
PROJECT # : (NONE)
PROJECT NAME : EPNG

DATE RECEIVED : 06/26/90
REPORT DATE : 07/25/90

PARAMETER	UNITS	01	02	03
CARBONATE (CACO3)	MG/L	6	40	<1
BICARBONATE (CACO3)	MG/L	414	695	659
HYDROXIDE (CACO3)	MG/L	<1	<1	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	420	735	659
CHLORIDE	MG/L	15.7	50	140
FLUORIDE	MG/L	0.83	1.49	1.32
NITRATE AS NITROGEN	MG/L	<0.06	<0.06	<0.06
PH	UNITS	8.4	8.5	8.1
SULFATE	MG/L	1.0	73	280
TOTAL DISSOLVED SOLIDS	MG/L	490	1010	1350

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : DAMES & MOORE, PHOENIX
PROJECT # : (NONE)
PROJECT NAME : EPNG

ATI I.D. : 006861

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CARBONATE	MG/L	00690201	<1	<1	NA	NA	NA	NA
BICARBONATE	MG/L		144	142	1	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		144	142	1	NA	NA	NA
CHLORIDE	MG/L	00690201	120	120	0	330	200	105
FLUORIDE	MG/L	00686401	0.31	0.30	3	0.62	0.30	102
FLUORIDE	MG/L	00680707	1.99	1.97	1	4.01	2.00	101
NITRATE AS NITROGEN	MG/L	00755601	3.6	3.6	0	12.7	10.0	91
PH	UNITS	00690201	7.9	7.9	0	NA	NA	NA
SULFATE	MG/L	00690201	52	52	0	104	50	104
TOTAL DISSOLVED SOLIDS	MG/L	00684701	940	930	1	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 006861

CLIENT : DAMES & MOORE, PHOENIX
PROJECT # : (NONE)
PROJECT NAME : EPNG

DATE RECEIVED : 06/26/90
REPORT DATE : 07/25/90

PARAMETER	UNITS	01	02	03
SILVER	MG/L	<0.01	<0.01	<0.01
ARSENIC	MG/L	<0.005	<0.005	<0.005
BARIUM	MG/L	0.248	0.158	0.110
CALCIUM	MG/L	11.3	18.2	46.8
CADMIUM	MG/L	<0.005	<0.005	<0.005
CHROMIUM	MG/L	<0.01	<0.01	<0.01
COPPER	MG/L	<0.02	<0.02	<0.02
IRON	MG/L	0.216	0.111	0.067
HARDNESS	MG/L	63.6	96.5	186
MERCURY	MG/L	<0.0002	<0.0002	<0.0002
MAGNESIUM	MG/L	8.6	12.4	16.7
MANGANESE	MG/L	0.174	0.290	0.242
SODIUM	MG/L	172	362	445
LEAD	MG/L	0.002	<0.002	0.004
SELENIUM	MG/L	<0.005	<0.005	<0.005
ZINC	MG/L	<0.010	0.015	<0.010

Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : DAMES & MOORE, PHOENIX
PROJECT # : (NONE)
PROJECT NAME : EPNG
ATI I.D. : 006861

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
SILVER	MG/L	00686103	<0.01	<0.01	NA	0.08	0.10	80
ARSENIC	MG/L	00686501	<0.005	<0.005	NA	0.045	0.050	90
BARIUM	MG/L	00686103	0.110	0.110	0	0.218	0.100	108
CALCIUM	MG/L	00686103	46.8	47.8	2	96.9	50.0	100
CADMIUM	MG/L	00686103	<0.005	<0.005	NA	0.102	0.100	102
CHROMIUM	MG/L	00686103	<0.01	<0.01	NA	0.10	0.10	100
COPPER	MG/L	00686103	<0.02	<0.02	NA	0.11	0.10	110
IRON	MG/L	00686103	0.067	0.065	3	1.02	1.00	95
HARDNESS	MG/L	00686103	186	188	1	NA	NA	NA
MERCURY	MG/L	00684801	<0.0002	<0.0002	NA	0.0049	0.0050	98
MAGNESIUM	MG/L	00686103	16.7	16.9	1	41.2	25.0	98
MANGANESE	MG/L	00686103	0.242	0.243	1	0.351	0.100	109
SODIUM	MG/L	00686103	445	447	1	935	500	98
LEAD	MG/L	00686102	<0.002	0.002	NA	0.061	0.050	122
SELENIUM	MG/L	00686103	<0.005	<0.005	NA	STDA	CC=	.998
ZINC	MG/L	00686103	<0.010	<0.010	NA	0.104	0.100	104

$$\% \text{ Recovery} = \frac{\text{(Spike Sample Result - Sample Result)}}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{\text{(Sample Result - Duplicate Result)}}{\text{Average Result}} \times 100$$

...ytical Technologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 6·25·90 PAGE 1 OF 1

PROJECT MANAGER: Bob Harding

COMPANY: DAMES & MOORE
ADDRESS: 7500 N. DREAMY DRAW
PHX, AZ 85020

BILL TO:
COMPANY: SAME
ADDRESS:

SAMPLERS: (Signature)
PHONE NUMBER (602) 371-1110

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE (MOD 8015/8020)	BTXE (8020)	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	MTBE	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	The 13 Priority Pollutant Metals	The 8 EP Tox Metals by EP Tox Prep. (1310)	The 8 EP Tox Metals by Total Digestion	The 8 EP Tox Metals by TCLP	NUMBER OF CONTAINERS
MW-1	6-23-90	PM	H2O	1												✓	✓						5
MW-2	↓	↓	↓	2												✓	✓						5
MW-3	↓	↓	↓	3												✓	✓						5

PROJECT INFORMATION

PROJECT NO.:
PROJECT NAME: EPNG
P.O. NO.:
VIA:
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS	15
CHAIN OF CUSTODY SEALS	N
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	006861

SAMPLE DISPOSAL INSTRUCTIONS

☐ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

Comments:
Metals bottles were field-filtered w/ 0.45 micron filter

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: [signature] Time: 1200	Signature: [signature] Time:	Signature: [signature] Time: 11:20
Printed Name: B.C. LAUERMAN Date: 6·25·90	Printed Name: Date:	Printed Name: R. S. Harding Date: 6/26/90
Company: D&M	Company: Cutter Aviation	Company: D&M

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: [signature] Time: 12:00	Signature: [signature] Time: 11:20	Signature: [signature] Time: 11:20
Printed Name: BRETT BILLETT Date: 6-25-90	Printed Name: R S Harding Date: 6/26/90	Printed Name: Linda Eshelman Date: 6/26/90
Company: AEROCRAFTERS	Company: D&M	Analytical Technologies, Inc.

AnalyticalTechnologies, Inc. 2113 S. 48th Street Suite 107 Tempe, AZ 85282 (602) 438-1530

ATI I.D. 007676

August 8, 1990

Dames & Moore
7500 N. Dreamy Draw Drive
Suite 145
Phoenix, AZ 85020

Project Name/Number: 001889-115-022

Attention: Bob Harding

On 07/17/90, Analytical Technologies, Inc. received a request to analyze **aqueous** sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (602)438-1530.

Elizabeth Proffitt
Project Manager

Robert V. Woods
Laboratory Manager

RVW:clf
Enclosure
90-24

Analytical Technologies, Inc

CLIENT : DAMES & MOORE, PHOENIX		DATE RECEIVED : 07/17/90
PROJECT # : 001889-115-022		
PROJECT NAME : (NONE)		REPORT DATE : 08/08/90

ATI I.D. : 007676

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	MW-1	AQUEOUS	07/14/90
02	MW-2	AQUEOUS	07/14/90
03	MW-3	AQUEOUS	07/14/90

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	3

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

AnalyticalTechnologies, inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 007676

CLIENT : DAMES & MOORE, PHOENIX
PROJECT # : 001889-115-022
PROJECT NAME : (NONE)

DATE RECEIVED : 07/17/90
REPORT DATE : 08/08/90

PARAMETER	UNITS	01	02	03
CARBONATE (CACO3)	MG/L	<1	10	<1
BICARBONATE (CACO3)	MG/L	444	271	419
HYDROXIDE (CACO3)	MG/L	<1	<1	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	444	281	419
CHLORIDE	MG/L	20.9	79	21.8
FLUORIDE	MG/L	0.97	1.79	1.01
NITRATE AS NITROGEN	MG/L	<0.06	<0.06	<0.06
PH	UNITS	8.3	8.4	7.8
SULFATE	MG/L	19	240	26
TOTAL DISSOLVED SOLIDS	MG/L	570	1400	520

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : DAMES & MOORE, PHOENIX
PROJECT # : 001889-115-022
PROJECT NAME : (NONE) ATI I.D. : 007676

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CARBONATE	MG/L	00768403	16	16	0	NA	NA	NA
BICARBONATE	MG/L		206	204	1	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		222	220	1	NA	NA	NA
CARBONATE	MG/L	00767603	<1	<1	NA	NA	NA	NA
BICARBONATE	MG/L		419	423	1	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		419	423	1	NA	NA	NA
CHLORIDE	MG/L	00772701	220	220	0	430	200	105
FLUORIDE	MG/L	00767603	1.01	0.98	3	1.98	1.00	97
NITRATE AS NITROGEN	MG/L	00759005	2.8	2.8	0	7.6	5.0	96
PH	UNITS	00770801	8.1	8.1	0	NA	NA	NA
PH	UNITS	00767603	7.8	7.8	0	NA	NA	NA
SULFATE	MG/L	00765506	7.8	7.7	1	12	5	84
TOTAL DISSOLVED SOLIDS	MG/L	00767904	510	510	0	NA	NA	NA
TOTAL DISSOLVED SOLIDS	MG/L	00781002	450	470	7	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc

METALS RESULTS

ATI I.D. : 007676

CLIENT : DAMES & MOORE, PHOENIX
PROJECT # : 001889-115-022
PROJECT NAME : (NONE)

DATE RECEIVED : 07/17/90

REPORT DATE : 08/08/90

PARAMETER	UNITS	01	02	03
SILVER	MG/L	<0.01	<0.01	<0.01
ARSENIC	MG/L	0.005	0.021	0.007
BARIUM	MG/L	0.235	0.175	0.139
CALCIUM	MG/L	9.9	18.8	0.5
CADMIUM	MG/L	0.006	0.006	<0.005
CHROMIUM	MG/L	<0.01	<0.01	<0.01
COPPER	MG/L	<0.02	<0.02	<0.02
IRON	MG/L	1.40	2.34	0.658
HARDNESS	MG/L	54.4	92.6	1.2
MERCURY	MG/L	<0.0002	<0.0002	<0.0002
MAGNESIUM	MG/L	7.2	11.1	<0.1
MANGANESE	MG/L	0.228	1.36	0.481
SODIUM	MG/L	176	470	120
LEAD	MG/L	<0.002	0.004	<0.002
SELENIUM	MG/L	<0.005	<0.005	<0.005
ZINC	MG/L	0.043	0.120	0.094

Analytical Technologies, inc.

METALS - QUALITY CONTROL

CLIENT : DAMES & MOORE, PHOENIX
PROJECT # : 001889-115-022
PROJECT NAME : (NONE) ATI I.D. : 007676

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
SILVER	MG/L	00765504	<0.01	<0.01	NA	0.45	0.50	90
ARSENIC	MG/L	00767801	0.009	0.008	12	STDA	CC=	.998
BARIUM	MG/L	00765504	0.105	0.106	1	1.00	1.00	89
CALCIUM	MG/L	00768701	69.3	69.3	0	120	50.0	101
CADMIUM	MG/L	00765504	<0.005	<0.005	NA	0.483	0.500	97
CHROMIUM	MG/L	00768701	<0.01	<0.01	NA	0.09	0.10	90
COPPER	MG/L	00769109	0.03	0.03	0	0.12	0.10	90
COPPER	MG/L	00768701	<0.02	<0.02	NA	0.09	0.10	90
IRON	MG/L	00768701	0.259	0.268	3	1.25	1.00	99
HARDNESS	MG/L	00799907	299	298	0.3	NA	NA	NA
MERCURY	MG/L	00768701	<0.0002	<0.0002	NA	0.0049	0.0050	98
MAGNESIUM	MG/L	00768701	30.6	30.4	0.7	54.6	25.0	96
MANGANESE	MG/L	00765504	0.522	0.539	3	1.50	1.00	98
SODIUM	MG/L	00768701	163	161	1	207	50.0	88
SODIUM	MG/L	00767602	470	460	2	5670	5000	104
LEAD	MG/L	00767601	<0.002	<0.002	NA	0.053	0.050	106
SELENIUM	MG/L	00767801	<0.005	<0.005	NA	STDA	CC=	.997
ZINC	MG/L	00765505	0.012	0.013	8	0.526	0.500	103

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical**Technologies**,Inc.
Phoenix, Arizona

Chain of Custody

DATE 7/17/90 PAGE 1 OF 1

PROJECT MANAGER: BOB HARDING

COMPANY: DAMES & MOORE
ADDRESS:

BILL TO: DAMES & MOORE - Bob Harding
COMPANY:
ADDRESS:

SAMPLERS: (Signature) Harding

PHONE NUMBER (915) 541-5492

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE (MOD 8015/8020)	BTXE (8020)	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	MTBE	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	The 13 Priority Pollutant Metals	The 8 EP Tox Metals by EP Tox Prep. (1310)	The 8 EP Tox Metals by Total Digestion	The 8 EP Tox Metals by TCLP	NUMBER OF CONTAINERS
MW-1	7/14/90	445PM	AQUEOUS	1												✓	✓						3
MW-2	7/14/90	546PM	AQUEOUS	2												✓	✓						3
MW-3	7/14/90	356PM	AQUEOUS	3												✓	✓						3

PROJECT INFORMATION

PROJECT NO.:
PROJECT NAME:
P.O. NO.:
VIA:
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☒ 2 WKS

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS	9
CHAIN OF CUSTODY SEALS	Y
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	007676

SAMPLE DISPOSAL INSTRUCTIONS

☒ ATI Disposal @ ~~$5.00 each~~ ☐ Return ☐ Pickup (will call)

Comments:

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Robt S Harding Time: 1300	Signature: R Garland Time: 7:30	Signature: Time:
Printed Name: R Harding Date 7/16/90	Printed Name: Rob Garland Date 7/17/90	Printed Name: Date
Company: D&M	Company: D&M	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: R Garland Time: 1300 7/16/90	Signature: Time:	Signature: Marcia Smith Time: 7:30 am
Printed Name: Rob Garland Date: 7/16/90	Printed Name: Date:	Printed Name: MARCIA SMITH Date: 7/17/90
Company: D&M	Company:	Analytical Technologies, Inc. ATI

El Paso
Natural Gas Company

P. O. BOX 1492
EL PASO, TEXAS 79978
PHONE: 915-541-2600

August 21, 1990

Mr. David G. Boyer
Environmental Bureau Chief
New Mexico Oil Conservation Division
State Land Office Building
310 Old Santa Fe Trail, 206
Santa Fe, New Mexico 87504

Dear Mr. Boyer:

Enclosed please find the Wingate Plant hydrogeologic report in support of the Meridian Oil, Inc. August 5, 1990 request to continue current operation without an approved discharge plan (copy attached). The report includes geology, hydrogeology and all groundwater quality data to date.

As per your conversation with ESAD on August 17, OCD granted a hydrogeologic report submittal extension of one week. This report was originally due on August 19.

If you have questions concerning the requested extension, feel free to call me at (505) 831-7759.

Sincerely,

D. Hall
W. David Hall, P.E.
Senior Engineer

WDH/gg

Enclosure

cc: K. E. Beasley
G. Garibay
G. C. Kardos
G. J. Odegard
H. Van
File: 5204 (w/w) (w/ enslosure)

MERIDIAN OIL

OIL CONSERVATION DIVISION
RECEIVED

'90 AUG 8 AM 8 48

Mr. David Boyer
Oil Conservation Division
P.O. Box 2088
Land Office Building
Santa Fe, NM 87504-2088

Dear Mr. Boyer:

You are aware of the Meridian Oil and El Paso Natural Gas (EPNG) negotiations for transfer (purchase) of the Wingate Fractionation Plant. Current WQCC regulations would require an approved effluent discharge plan in order to continue to operate the plant after takeover. Meridian feels it would be impossible to adequately address and submit a detailed discharge plan for a plant we are operationally unfamiliar with. Meridian at this time would request the OCD to grant a three year extension to operate the plant without an approved discharge plan. Discharges would remain as currently operated by EPNG or any modifications made would be done so with OCD knowledge and input.

Attached, are some of the time restraints we currently foresee as reasons for the three year extension and submitted upon request once operations become more conversant. EPNG is submitting hydrological data which upon your review may assist and define measures Meridian will have to adopt in the future.

If you have any questions concerning this request, please notify me as indicated below.

Very truly yours,

Dean Priest

Dean Priest
Plant & Pipeline Superintendent

DDP/ks

WINGATE PLANT
EVALUATION FOR DISCHARGE PLAN SUBMITTAL

PROCESS	**TIME**
Current Operations Evaluation (in house)	6-12 Months
Consultant Operations Evaluation	6-12 Months
Modifications (construction, Equipment)	6-12 Months
Discharge Plan Compilation	6-12 Months

Total - 3 Years

EPNG, Meridian, OCD Meeting On Wingate Gas Plant

7/23/90 10:30 am

participants

Henry Van - EPNG
Dave Boyer - OCD
Roger Anderson - OCD
Bill Olson - OCD

Dave Hall - EPNG
Terry McMillen - Meridian

HV. - passed out G.C. and heavy metals results from MW-1, 2, 3 around the plant pond
Meridian taking over plant
Want ponds to continue thru Meridian permit
Looking for 2 yr extension of pond usage

Q

D.B - when will hydro report be prepared

HV. - Second draft should be ready this week

DB - Decision should be deferred until review of Hydrogeo

HV. Should submit report in advance ?

R.A. - D.P. could be extended with commitment to close in two yrs.

HV. - When D.P. due, plant will be Meridians

DB OCD needs hydrogeo info to make decision
Could be submitted as - Full D.P.
- partial D.P. (2 yrs)
- extension of current D.P. with commitments, schedules

HV - Will it be Meridian responsibility for D.P. when sold

D.B. - Yes same as San Juan plant (now Western Gas)

EPNG + Meridian will discuss options
and get back to OCD

9 AM 9 20

El Paso
Natural Gas Company

3801 ATRISCO, N. W.
ALBUQUERQUE, NEW MEXICO 87120
PHONE: 505-831-7700

June 6, 1990

Mr. David Boyer
New Mexico Oil Conservation Division
State Land Office
310 Old Santa Fe Trail #206
Santa Fe, New Mexico 87504

RE: Analyses of Pond Water Used For Road Construction - Wingate Plant

Dear Mr. Boyer:

Attached are copies of the analyses previously sent to you via the Fax. These analyses were performed per your letter of April 20, 1990 Item # 1.

To bring you up to date, the contractor for McKinley County used water for approximately 10 days after receiving the temporary approval. The water usage was discontinued about two to three weeks ago, and, to the best of my knowledge, is still not being used. I believe usage will continue at appropriate stages of their highway work pending your final approval.

If you require further information, please let me know. Thank you for your assistance in this matter.

Sincerely,

W. David Hall

W. David Hall, P.E.
Senior Engineer

OK by phone.
To Secretary
6/8/90
DGB

Rec'd 5-18-90
J.L.

AnalyticalTechnologies, Inc. 2113 S. 48th Street Suite 107 Tempe, AZ 85282 (602) 438-1530

ATI I.D. 005520

May 16, 1990

El Paso Natural Gas Company
P.O. Box 4990
Farmington, NM 87499

Project Name/Number: Wingate Plant, 5204

Attention: John Lambdin

On 05/03/90, Analytical Technologies, Inc. received a request to analyze aqueous sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (602)438-1530.

Elizabeth Proffitt
Project Manager

Robert V. Woods
Laboratory Manager

RVW:clf
Enclosure
90-14

Analytical Technologies, Inc.

CLIENT : EL PASO NATURAL GAS, NEW MEXICO   DATE RECEIVED : 05/03/90
PROJECT # : 5204
PROJECT NAME : WINGATE PLNT   REPORT DATE : 05/16/90

ATI I.D. : 005520

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	F90647	AQUEOUS	05/01/90
02	F90646	AQUEOUS	05/01/90

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00552001

TEST : BTEX (8020)

CLIENT	: EL PASO NATURAL GAS, NEW MEXICO	DATE SAMPLED	: 05/01/90
PROJECT #	: 5204	DATE RECEIVED	: 05/03/90
PROJECT NAME	: WINGATE PLNT	DATE EXTRACTED	: N/A
CLIENT I.D.	: F90647	DATE ANALYZED	: 05/08/90
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	110

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00552002

TEST : BTEX (8020)

CLIENT	: EL PASO NATURAL GAS, NEW MEXICO	DATE SAMPLED	: 05/01/90
PROJECT #	: 5204	DATE RECEIVED	: 05/03/90
PROJECT NAME	: WINGATE PLNT	DATE EXTRACTED	: N/A
CLIENT I.D.	: F90646	DATE ANALYZED	: 05/08/90
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	104

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : BTEX (8020)

		ATI I.D.	: 005520
CLIENT	: EL PASO NATURAL GAS, NEW MEXICO	DATE EXTRACTED	: 05/05/90
PROJECT #	: 5204	DATE ANALYZED	: 05/06/90
PROJECT NAME	: WINGATE PLNT	UNITS	: UG/L
CLIENT I.D.	: REAGENT BLANK	DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	90

Analytical Technologies, Inc

QUALITY CONTROL DATA

ATI I.D. : 005520

TEST : BTEX (8020)

CLIENT : EL PASO NATURAL GAS, NEW MEXICO
PROJECT # : 5204
PROJECT NAME : WINGATE PLNT
REF I.D. : 00599911

DATE ANALYZED : 05/07/90
SAMPLE MATRIX : AQUEOUS
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
BENZENE	<0.5	10	9.7	97	9.5	95	2
TOLUENE	<0.5	10	9.9	99	9.6	96	3
ETHYLBENZENE	<0.5	10	10	100	9.8	98	2
XYLENES	<0.5	30	30	100	29	97	3

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

EL PASO NATURAL GAS COMPANY
ENVIRONMENTAL SAMPLING DATA (File:BLANK3.WK1)

Facility Number |_|5|2|0|4| Sample Matrix Water Sample Number |E|9|0|6|4|7| Time |1|6|1|5| 24 Hr Clk.

Sample Location Wingate Plant Charge Blanket P.O.

Sampling Site Description Pond Outlet

Date Of Collection (MMDDYY) |0|5|0|1|9|0| Collection Method: |X| Grab |_| Composite ____ Hrs.

Sample Collected By Norman Norvelle / JOHN LAMBDIN Phone 599-2144 (505)

Laboratory Conducting Analysis ANALYTICAL TECHNOLOGIES

ANALYSIS REQUESTED (Check Appropriate Blocks)

	GENERAL CHEMISTRY		Organic Carbon		Selenium		ORGANICS		METHOD SCANS
	pH		Orthophosphate		Silver				TPHC - 418.1
	Alkalinity, Hydroxide		Total Phosphorous-P		Aluminum				EPA - 601
	Alkalinity, Carbonate		Total Phosphate		Antimony				EPA - 602
	Alkalinity, Bicarbonate		Meta-Phosphate		Beryllium				EPA - 610
	Acidity, Total		Color		Bismuth				EPA - 624
	Carbon Dioxide		Odor		Cobalt				EPA - 625
	Chloride		Conductivity		Copper				EPA - 8010
	Fluoride		Specific Gravity		Iron		RADIOCHEMISTRY		EPA - 8015
	Bromide		Total Dissolved Solids		Manganese		Gross Alpha	X	EPA - 8020 (BETX)
	Iodide		Total Suspended Solids		Molybdenum		Gross Beta		EPA - 8040
	Nitrate/Nitrite as N		Total Solids		Nickel		Radium 226		EPA - 8080
	Nitrate-N		Turbidity		Thallium		Radium 228		EPA - 8100
	Nitrite-N		Sodium		Tin		Strontium 90		EPA - 8240
	Ammonia		Potassium		Vanadium		Uranium		EPA - 8270
	Total Kjeldahl (TKN)-N		Dissolved Oxygen		Zinc		Tritium		
	Calcium as Ca		Phenols				Lead-210		
	Magnesium as Mg		Cyanide, Total		CHARACTERIZATIONS		Polonium-210		
	Total Hardness as CaCO3		Boron		Corrosivity		Radon		
	Silica		METALS		Ignitability				
	Sulfate		Arsenic		Reactivity (CN,S)		MICROBIOLOGICAL		OTHER
	Sulfide		Barium		TCLP (8 metals)		T.C. - MF		Asbestos
	Sulfite		Cadmium		TCLP (Organics)		T.C. - MPN		
	H2S as S		Chromium, Total		TCLP ( )		Fecal - MF		
	Cation/Anion Balance		Chromium, +6		EP TOX (8 Metals)		Fecal - MPN		
	Total Organic Carbon		Chromium, +3		EP TOX ( )				
	Chemical Oxygen Demand		Lead						
	Biological Oxygen Demand		Mercury, Total						
	Oil and Grease		Mercury, Organic						

COMMENTS/SPECIAL INSTRUCTIONS
Results and Analyses by May 15th 005520-01

All Invoices, Results and completed Chain of Custody Information to: John Lambdin, c/o EPNG, P.O. Box 4990, Farmington, N.M. 87499

CHAIN OF CUSTODY INFORMATION

RELINQUISHED BY 1.	RELINQUISHED BY 2.	RELINQUISHED BY 3.
John Lambdin 13:00		
(Signature) (time)	(Signature) (time)	(Signature) (time)
JOHN LAMBDIN 5/2/90		
(Print Name) (date)	(Print Name) (date)	(Print Name) (date)
El Paso Natural Gas Co.		
(Company)	(Company)	(Company)

RECEIVED BY 1.	RECEIVED BY 2.	RECEIVED BY 3.
[signature] 1200		
(Signature) (time)	(Signature) (time)	(Signature) (time)
[illegible] 5/3		
(Print Name) (date)	(Print Name) (date)	(Print Name) (date)
ATI		
(Company)	(Company)	(Company)

EL PASO NATURAL GAS COMPANY

ENVIRONMENTAL SAMPLING DATA (File:BLANK3.WK1) 1600 J-J

Facility Number 1|5|2|0|4 Sample Matrix Water Sample Number ~~F90669~~ 98 F90646 Time ~~1|6|1|5~~ 24 Hr Clk.

Sample Location Wingate Plant Charge Blanket P.O.

Sampling Site Description Pond ~~Outlet~~ JJ INLET

Date Of Collection (MMDDYY) 0|5|0|1|9|0 Collection Method: |X| Grab |_| Composite _____ Hrs.

Sample Collected By Norman Norvelle / JOHN LAMBDIN Phone 599-2144 (505)

Laboratory Conducting Analysis ANALYTICAL TECHNOLOGIES

ANALYSIS REQUESTED (Check Appropriate Blocks)

	GENERAL CHEMISTRY		Organic Carbon		Selenium		ORGANICS		METHOD SCANS
	pH		Orthophosphate		Silver				TPHC - 418.1
	Alkalinity, Hydroxide		Total Phosphorous-P		Aluminum				EPA - 601
	Alkalinity, Carbonate		Total Phosphate		Antimony				EPA - 602
	Alkalinity, Bicarbonate		Meta-Phosphate		Beryllium				EPA - 610
	Acidity, Total		Color		Bismuth				EPA - 624
	Carbon Dioxide		Odor		Cobalt				EPA - 625
	Chloride		Conductivity		Copper				EPA - 8010
	Fluoride		Specific Gravity		Iron		RADIOCHEMISTRY		EPA - 8015
	Bromide		Total Dissolved Solids		Manganese		Gross Alpha	X	EPA - 8020 (BETX)
	Iodide		Total Suspended Solids		Molybdenum		Gross Beta		EPA - 8040
	Nitrate/Nitrite as N		Total Solids		Nickel		Radium 226		EPA - 8080
	Nitrate-N		Turbidity		Thallium		Radium 228		EPA - 8100
	Nitrite-N		Sodium		Tin		Strontium 90		EPA - 8240
	Ammonia		Potassium		Vanadium		Uranium		EPA - 8270
	Total Kjeldahl (TKN)-N		Dissolved Oxygen		Zinc		Tritium		
	Calcium as Ca		Phenols				Lead-210		
	Magnesium as Mg		Cyanide, Total		CHARACTERIZATIONS		Polonium-210		
	Total Hardness as $CaCO_3$		Boron		Corrosivity		Radon		
	Silica		METALS		Ignitability				
	Sulfate		Arsenic		Reactivity (CN,S)		MICROBIOLOGICAL		OTHER
	Sulfide		Barium		TCLP (8 metals)		T.C. - MF		Asbestos
	Sulfite		Cadmium		TCLP (Organics)		T.C. - MPN		
	H_2S as S		Chromium, Total		TCLP ( )		Fecal - MF		
	Cation/Anion Balance		Chromium, +6		EP TOX (8 Metals)		Fecal - MPN		
	Total Organic Carbon		Chromium, +3		EP TOX ( )				
	Chemical Oxygen Demand		Lead						
	Biological Oxygen Demand		Mercury, Total						
	Oil and Grease		Mercury, Organic						

COMMENTS/SPECIAL INSTRUCTIONS

Results and Analyses by May 10th 005520-02

All Invoices, Results and completed Chain of Custody Information to: John Lambdin, c/o EPNG, P.O. Box 4990, Farmington, N.M. 87499

CHAIN OF CUSTODY INFORMATION

RELINQUISHED BY 1.	RELINQUISHED BY 2.	RELINQUISHED BY 3.
[illegible] 13:00		
(Signature) (time)	(Signature) (time)	(Signature) (time)
JOHN LAMBDIN 5/2/90		
(Print Name) (date)	(Print Name) (date)	(Print Name) (date)
El Paso Natural Gas Co.		
(Company)	(Company)	(Company)

RECEIVED BY 1.	RECEIVED BY 2.	RECEIVED BY 3.
[illegible] 1300		
(Signature) (time)	(Signature) (time)	(Signature) (time)
[illegible] 5/3		
(Print Name) (date)	(Print Name) (date)	(Print Name) (date)
ATI		
(Company)	(Company)	(Company)

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

[X] Telephone [ ] Personal	Time 10:30AM	Date 5/30/90

Originating Party	Other Parties
Dale Markley	Dave Boyer OCD
John Mathes & Ass, IL (618) 281-7173	

Subject: Wingate Frac. Plant

Discussion: Mathes called to say they were representing Meridian in the upcoming sale of the facility to them from EPNG. Markley wanted to obtain geologic information on the geology of the site, and wanted to know if they would have to line the ponds. I gave him John Shomaker's name for geology and Steve Cary for Superfund studies in the area. He wanted to know if a water balance would satisfy us on the lining.

Conclusions or Agreements: I told Markley that we had not received a discharge plan yet, but the submitter would have to demonstrate essentially no migration since have ~14,000 TDS in east pond, >100,000 TDS in west pond, and area was sensitive because of past problems and radioactive spills.

Distribution: Wingate File

Signed: D G Boyer

SENT BY:Xerox Telecopier 7021 ; 5-30-90 ; 7:54AM ; 8312339→ 5058275741;# 2

Rec'd 5-1? J-J.

AnalyticalTechnologies, Inc. 2113 S. 48th Street Suite 107 Tempe, AZ 85282 (602) 438-1530

ATI I.D. 005520

May 16, 1990

El Paso Natural Gas Company
P.O. Box 4990
Farmington, NM 87499

Project Name/Number: Wingate Plant, 5204

Attention: John Lambdin

On 05/03/90, Analytical Technologies, Inc. received a request to analyze aqueous sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (602)438-1530.

Elizabeth Proffitt
Project Manager

Robert V. Woods
Laboratory Manager

RVW:clf
Enclosure
90-14

AnalyticalTechnologies, Inc.

CLIENT : EL PASO NATURAL GAS, NEW MEXICO
PROJECT # : 5204
PROJECT NAME : WINGATE PLNT

DATE RECEIVED : 05/03/90
REPORT DATE : 05/16/90

ATI I.D. : 005520

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	F90647	AQUEOUS	05/01/90
02	F90646	AQUEOUS	05/01/90

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

EL PASO NATURAL GAS COMPANY

ENVIRONMENTAL SAMPLING DATA (File:BLANK3.WK1) / 600 J.J

Facility Number |5|2|0|4| Sample Matrix Water Sample Number |~~F9064~~ 98| Time |~~1~~|~~6~~|~~1~~|5| 24 Hr Clk.

Sample Location Wingate Plant F90646 Charge Blanket P.O.

Sampling Site Description Pond ~~[illegible]~~ J.J INLET

Date Of Collection (MMDDYY) |0|5|0|1|9|0| Collection Method: |X| Grab |_| Composite ____ Hrs.

Sample Collected By Norman Norvelle / JOHN LAMBDIN Phone 599-2144 (505)

Laboratory Conducting Analysis ANALYTICAL TECHNOLOGIES

ANALYSIS REQUESTED (Check Appropriate Blocks)

	GENERAL CHEMISTRY		Organic Carbon		Selenium		ORGANICS		METHOD SCANS
	pH		Orthophosphate		Silver				TPHC - 418.1
	Alkalinity, Hydroxide		Total Phosphorous-P		Aluminum				EPA - 601
	Alkalinity, Carbonate		Total Phosphate		Antimony				EPA - 602
	Alkalinity, Bicarbonate		Meta-Phosphate		Beryllium				EPA - 610
	Acidity, Total		Color		Bismuth				EPA - 624
	Carbon Dioxide		Odor		Cobalt				EPA - 625
	Chloride		Conductivity		Copper				EPA - 8010
	Fluoride		Specific Gravity		Iron		RADIOCHEMISTRY		EPA - 8015
	Bromide		Total Dissolved Solids		Manganese		Gross Alpha	X	EPA - 8020 (BETX)
	Iodide		Total Suspended Solids		Molybdenum		Gross Beta		EPA - 8040
	Nitrate/Nitrite as N		Total Solids		Nickel		Radium 226		EPA - 8080
	Nitrate-N		Turbidity		Thallium		Radium 228		EPA - 8100
	Nitrite-N		Sodium		Tin		Strontium 90		EPA - 8240
	Ammonia		Potassium		Vanadium		Uranium		EPA - 8270
	Total Kjeldahl (TKN)-N		Dissolved Oxygen		Zinc		Tritium		
	Calcium as Ca		Phenols				Lead-210		
	Magnesium as Mg		Cyanide, Total		CHARACTERIZATIONS		Polonium-210		
	Total Hardness as CaCO3		Boron		Corrosivity		Radon		
	Silica		METALS		Ignitability				
	Sulfate		Arsenic		Reactivity (CN,S)		MICROBIOLOGICAL		OTHER
	Sulfide		Barium		TCLP (8 metals)		T.C. - MF		Asbestos
	Sulfite		Cadmium		TCLP (Organics)		T.C. - MPN		
	H2S as S		Chromium, Total		TCLP ( )		Fecal - MF		
	Cation/Anion Balance		Chromium, +6		EP TOX (8 Metals)		Fecal - MPN		
	Total Organic Carbon		Chromium, +3		EP TOX ( )				
	Chemical Oxygen Demand		Lead						
	Biological Oxygen Demand		Mercury, Total						
	Oil and Grease		Mercury, Organic						

COMMENTS/SPECIAL INSTRUCTIONS Results and Analyses by May 10th 005520-02

All Invoices, Results and completed Chain of Custody Information to: John Lambdin, c/o EPNG, P.O. Box 4990, Farmington, N.M. 87499

CHAIN OF CUSTODY INFORMATION

RELINQUISHED BY 1.	RELINQUISHED BY 2.	RELINQUISHED BY 3.
John Lambdin 13:00		
(Signature) (time)	(Signature) (time)	(Signature) (time)
JOHN LAMBDIN 5/2/90		
(Print Name) (date)	(Print Name) (date)	(Print Name) (date)
El Paso Natural Gas Co.		
(Company)	(Company)	(Company)
RECEIVED BY 1.	**RECEIVED BY 2.**	**RECEIVED BY 3.**
[illegible] 1200		
(Signature) (time)	(Signature) (time)	(Signature) (time)
[illegible] 5/3		
(Print Name) (date)	(Print Name) (date)	(Print Name) (date)
ATI		
(Company)	(Company)	(Company)

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00552002

TEST : BTEX (8020)

CLIENT	: EL PASO NATURAL GAS, NEW MEXICO	DATE SAMPLED	: 05/01/90
PROJECT #	: 5204	DATE RECEIVED	: 05/03/90
PROJECT NAME	: WINGATE PLNT	DATE EXTRACTED	: N/A
CLIENT I.D.	: F90646	DATE ANALYZED	: 05/08/90
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	104

EL PASO NATURAL GAS COMPANY

ENVIRONMENTAL SAMPLING DATA (File:BLANK3.WK1)

Facility Number |_|5|2|0|4| Sample Matrix Water Sample Number |E|9|0|6|4|7| Time |1|6|1|5| 24 Hr Clk.

Sample Location Wingate Plant Charge Blanket P.O.

Sampling Site Description Pond Outlet

Date Of Collection (MMDDYY) |0|5|0|1|9|0| Collection Method: |X| Grab |_| Composite ____ Hrs.

Sample Collected By Norman Norvelle / JOHN LAMBDIN Phone 599-2144 (505)

Laboratory Conducting Analysis ANALYTICAL TECHNOLOGIES

ANALYSIS REQUESTED (Check Appropriate Blocks)

GENERAL CHEMISTRY	Organic Carbon	Selenium	ORGANICS	METHOD SCANS
pH	Orthophosphate	Silver		TPHC - 418.1
Alkalinity, Hydroxide	Total Phosphorous-P	Aluminum		EPA - 601
Alkalinity, Carbonate	Total Phosphate	Antimony		EPA - 602
Alkalinity, Bicarbonate	Meta-Phosphate	Beryllium		EPA - 610
Acidity, Total	Color	Bismuth		EPA - 624
Carbon Dioxide	Odor	Cobalt		EPA - 625
Chloride	Conductivity	Copper		EPA - 8010
Fluoride	Specific Gravity	Iron	RADIOCHEMISTRY	EPA - 8015
Bromide	Total Dissolved Solids	Manganese	Gross Alpha	X EPA - 8020 (BETX)
Iodide	Total Suspended Solids	Molybdenum	Gross Beta	EPA - 8040
Nitrate/Nitrite as N	Total Solids	Nickel	Radium 226	EPA - 8080
Nitrate-N	Turbidity	Thallium	Radium 228	EPA - 8100
Nitrite-N	Sodium	Tin	Strontium 90	EPA - 8240
Ammonia	Potassium	Vanadium	Uranium	EPA - 8270
Total Kjeldahl (TKN)-N	Dissolved Oxygen	Zinc	Tritium	
Calcium as Ca	Phenols		Lead-210	
Magnesium as Mg	Cyanide, Total	CHARACTERIZATIONS	Polonium-210	
Total Hardness as $CaCO_3$	Boron	Corrosivity	Radon	
Silica	METALS	Ignitability		
Sulfate	Arsenic	Reactivity (CN,S)	MICROBIOLOGICAL	OTHER
Sulfide	Barium	TCLP (8 metals)	T.C. - MF	Asbestos
Sulfite	Cadmium	TCLP (Organics)	T.C. - MPN	
H_2S as S	Chromium, Total	TCLP ( )	Fecal - MF	
Cation/Anion Balance	Chromium, +6	EP TOX (8 Metals)	Fecal - MPN	
Total Organic Carbon	Chromium, +3	EP TOX ( )		
Chemical Oxygen Demand	Lead			
Biological Oxygen Demand	Mercury, Total			
Oil and Grease	Mercury, Organic			

COMMENTS/SPECIAL INSTRUCTIONS

Results and Analyses by May [illegible] 005520-01

All Invoices, Results and completed Chain of Custody Information to: John Lambdin, c/o EPNG, P.O. Box 4990, Farmington, N.M. 87499

CHAIN OF CUSTODY INFORMATION

RELINQUISHED BY 1.	RELINQUISHED BY 2.	RELINQUISHED BY 3.
[illegible] 15:00		
(Signature) (time)	(Signature) (time)	(Signature) (time)
JOHN LAMBDIN 5/2/90		
(Print Name) (date)	(Print Name) (date)	(Print Name) (date)
El Paso Natural Gas Co.		
(Company)	(Company)	(Company)

RECEIVED BY 1.	RECEIVED BY 2.	RECEIVED BY 3.
[illegible] 1200		
(Signature) (time)	(Signature) (time)	(Signature) (time)
[illegible] 5/3		
(Print Name) (date)	(Print Name) (date)	(Print Name) (date)
ATI		
(Company)	(Company)	(Company)

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00552001

TEST : BTEX (8020)

CLIENT	: EL PASO NATURAL GAS, NEW MEXICO	DATE SAMPLED	: 05/01/90
PROJECT #	: 5204	DATE RECEIVED	: 05/03/90
PROJECT NAME	: WINGATE PLNT	DATE EXTRACTED	: N/A
CLIENT I.D.	: F90647	DATE ANALYZED	: 05/08/90
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	110

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : BTEX (8020)

CLIENT	: EL PASO NATURAL GAS, NEW MEXICO	ATI I.D.	: 005520
PROJECT #	: 5204	DATE EXTRACTED	: 05/05/90
PROJECT NAME	: WINGATE PLNT	DATE ANALYZED	: 05/06/90
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	90

AnalyticalTechnologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 005520

TEST : BTEX (8020)

CLIENT : EL PASO NATURAL GAS, NEW MEXICO
PROJECT # : 5204
PROJECT NAME : WINGATE PLNT
REF I.D. : 00599911

DATE ANALYZED : 05/07/90
SAMPLE MATRIX : AQUEOUS
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
BENZENE	<0.5	10	9.7	97	9.5	95	2
TOLUENE	<0.5	10	9.9	99	9.6	96	3
ETHYLBENZENE	<0.5	10	10	100	9.8	98	2
XYLENES	<0.5	30	30	100	29	97	3

$$\text{\% Recovery} = \frac{\text{(Spike Sample Result - Sample Result)}}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{\text{(Spiked Sample Result - Duplicate Spike Sample Result)}}{\text{Average of Spiked Sample}} \times 100$$

EL PASO NATURAL GAS CO.

ALBUQUERQUE DIVISION OFFICE

3801 Atrisco NW Albuquerque, NM 87120
FAX Phone (505)831-7739
Confirmation Phone (505)831-7700

TO	NAME Mr. David Boyer	PHONE
	COMPANY NMOCD	
	ADDRESS	
	FAX PHONE (505) 827-5741	
FROM	NAME David Hall	DATE 5-30-90
	PHONE (505) 831-7759	

☐ Please confirm receipt.

☐ No confirmation necessary.

9 Number of pages sent. (Including this page)

REMARKS:

RE: Hamilton Const. Co./McKinley County Water Use - EPNG Wingate Plant

Attached is the East Pond Water Analysis requested in your April 20, 1990 letter, Item #1. I will formalize this & follow through the mail but I wanted to forward for your info.

Thank You —

W. David Hall

W. DAVID HALL, P.E.

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS
GOVERNOR

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

April 27, 1990

CERTIFIED MAIL
RETURN RECEIPT NO. P-918-402-236

Mr. W. David Hall, Senior Engineer
El Paso Natural Gas Company
3801 Atrisco Northwest
Albuquerque, New Mexico 87120

Dear Mr. Hall:

I have received your telefax of April 25th which included an April 23rd letter from Hamilton Construction Company describing the proposed application of the wastewater and the disposal of any excess wastewater. These procedures are acceptable and, beginning immediately, the use of wastewater from the east pond is hereby approved. However, this approval is contingent on OCD receiving the results of the previously requested water analysis within 30-days.

If wastewater is to be used in this manner on a recurring basis, you are directed to incorporate complete procedures for use, excess water disposal, periodic testing and any other legal or environmental safeguards EPNG finds necessary, into the ground water discharge plan currently in preparation for submittal to OCD. Such procedures should also include a commitment to notify OCD at the seasonal start of such use and again upon cessation at the end of the construction season. The latter notification shall include an approximate volume of wastewater diverted from the pond.

If you have any questions, please contact me at 827-5812.

Sincerely,

David G. Boyer

David G. Boyer, Hydrogeologist
Environmental Bureau Chief

DGB/sl

cc: NMOCD Aztec District Office
NMEID Gallup
Ken Beasley, EPNG El Paso

El Paso
Natural Gas Company

3801 ATRISCO, N. W.
ALBUQUERQUE, NEW MEXICO 87120
PHONE: 505-831-7700

'90 APR 27 AM 9 55

April 25, 1990

Mr. David Boyer
New Mexico Oil Conservation Division
State Land Office
310 Old Santa Fe Trail #206
Santa Fe, New Mexico 87504

RE: Use of Wingate Plant Wastewater for Road Construction

Dear Mr. Boyer:

Attached is a letter from Hamilton Construction Company addressing the questions of Item #3 in your April 20, 1990 letter. I am also enclosing an aerial photograph showing the approximate location of the influent line to the east pond and the location of the water loading area to be used by the contractor.

The analysis required by Item #1 will be conducted and the results forwarded as soon as possible. A letter agreement will be entered into between El Paso and McKinley to assure compliance with NMOCD and EPNG requirements.

I hope this information is sufficient to answer your immediate concerns. As I conveyed during our phone conservation, an immediate need of approximately 50,000 gallons of water is required.

If you have any questions, please give me a call at 505-831-7759.

Sincerely,

W. David Hall

W. David Hall, P.E.
Senior Engineer

VERNON HAMILTON CONSTRUCTION COMPANY, INC.
P. O. BOX 2558
GALLUP, NEW MEXICO 87305
[redacted] • 863-3500
722-7855

APRIL 23, 1990

To: State of New Mexico
Energy, Minerals and Natural Resources

Re: Use of Wingate Plant wastewater

Dear Mr. Boyer:

This is in reply to your letter dated April 20, 1990.

1) Water will be applied by power spray only onto roadway construction.

2) We do not anticipate any excess water, however, if in the event this does occur, the water will be returned to El Paso's pond.

3) At the end of each day we will inform El Paso of any excess water.

If there may be any more questions, please feel free to call our office. The new number is 722-7855.

Thank You for your help,
Vernon Hamilton Construction Co.

Vernon I. Hamilton

Vernon I. Hamilton, President

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS
GOVERNOR

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

April 20, 1990

CERTIFIED MAIL
RETURN RECEIPT NO. P-918-402-147

Mr. W. David Hall, Senior Engineer
El Paso Natural Gas Company
3801 Atrisco Northwest
Albuquerque, New Mexico 87120

RE: Use of Wingate Plant Wastewater for Road Construction

Dear Mr. Hall:

The New Mexico Oil Conservation Division (NMOCD) has reviewed your letter of February 21, 1990, requesting permission for McKinley County to utilize Wingate Plant wastewater for road construction. After review of the request and phone discussion with you on April 9, we will need the following additional information submitted before we can continue review of the request:

1. Aromatic hydrocarbon analysis of the effluent entering the east pond;

2. The proposed location of the pumping site at the east pond;

3. A work plan for use of the water. Only water drawn from the east pond shall be used for road construction since it is of better quality than the west pond. However, since several constituents in the east pond exceed WQCC standards (some by a factor of ten or more), proper application of the water to prevent ponding or runoff is essential.

    a. How will the water be applied and what precautions will be taken to prevent runoff to arroyos or stream channels?

    b. What provisions will be made to ensure proper disposal of excess water? It shall not be allowed to discharge or drain into stream channels or arroyos, or onto the ground surface.

4. Provide specific information on the method EPNG will use (e.g. signed agreement or other legal document) to ensure that McKinley County properly utilizes and disposes of excess water in accordance with the work plan.

If you have any questions, please contact me at 827-5812.

Sincerely,

David G. Boyer

David G. Boyer, Hydrogeologist
Environmental Bureau Chief

DGB/sl

cc: NMOCD Aztec
NMEID Gallup
Ken Beasley, EPNG El Paso
James Radosevich, McKinley County

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

GARREY CARRUTHERS
GOVERNOR

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

April 19, 1990

CERTIFIED MAIL
RETURN RECEIPT NO. P-918-402-143

Mr. Kenneth E. Beasley, Manager
North Region Compliance Engineering
EL PASO NATURAL GAS COMPANY
P. O. Box 1492
El Paso, Texas 79978

RE: Discharge Plan GW-54
Wingate Plant
McKinley County, New Mexico

Dear Mr. Beasley:

The Oil Conservation Division (OCD) has received your request dated March 14, 1990 for an extension to August 13, 1990 for the submission of a discharge plan application for the above referenced facility.

Pursuant to Section 3-106 of the New Mexico Water Quality Control Commission (WQCC) regulations and for good cause shown, El Paso Natural Gas Company is hereby granted an extension until August 13, 1990 for submission of a discharge plan application for the Wingate Plant. This extension is granted to allow El Paso sufficient time to complete site specific investigations and formulate a comprehensive plan.

If you have any questions, please feel free to contact David Boyer at (505) 827-5812 or Roger Anderson at (505) 827-5884.

Sincerely,

William J. LeMay
Director

WJL/RCA/sl

cc: OCD Aztec Office

163717

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

ANALYSIS REQUEST FORM

Contract Lab ANA-LABS Contract No. 78-521.07-C

OCD Sample No. 9004161153

Collection Date	Collection Time	Collected by —Person/Agency
4/16/90	1153	ANDERSON/OLSON /OCD

SITE INFORMATION

Sample location EPNG - WINGATE

Collection Site Description

A/B COOLING TOWER

Township, Range, Section, Tract:

SEND FINAL REPORT TO

ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
PO Box 2088
Santa Fe, NM 87504-2088

SAMPLING CONDITIONS

☐ Bailed ☐ Pump
☒ Dipped ☐ Tap

Water level

Discharge

Sample type GRAB

pH(00400)

Conductivity (Uncorrected) 3200 μmho

Water Temp. (00010) 18°C

Conductivity at 25° C μmho

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted: 4 VIALS + 2

☒ NF: Whole sample (Non-filtered)
☐ F: Filtered in field with 0.45 μ membrane filter
☐ PF: Pre-filtered w/45 μ membrane filter

2 vi / ☒ NA: No acid added
2 v ☒ A: HCL
☐ A: 2ml H_2SO_4/L added
☐ A: 5ml ...
/ ☒ A: 4 ~~...~~ HNO_3 added

FIELD COMMENTS:

LAB ANALYSIS REQUESTED:

ITEM	DESC	METHOD	ITEM	DESC	METHOD	ITEM	DESC	METHO
☒ 001	VOA	8020	☐ 013	PHENOL	604	☐ 026	Cd	713
☐ 002	VOA	602	☐ 014	VOC	8240	☐ 027	Pb	74
☒ 003	VOH	8010	☐ 015	VOC	624	☐ 028	Hg(L)	747
☐ 004	VOH	601	☐ 016	SVOC	8250	☐ 031	Se	774
☐ 005	SUITE	8010-8020	☐ 017	SVOC	625	☒ 032	ICAP	601
☐ 006	SUITE	601-602	☐ 018	VOC	8260	☒ 033	CATIONS/ANIONS	
☐ 007	HEADSPACE		☐ 019	SVOC	8270	☐ 034	N SUITE	
☐ 008	PAH	8100	☐ 020	O&G	9070	☐ 035	NITRATE	
☐ 009	PAH	610	☐ 022	AS	7060	☐ 036	NITRITE	
☐ 010	PCB	8080	☐ 023	Ba	7080	☐ 037	AMMONIA	
☐ 011	PCB	608	☒ 024	Cr	7190	☐ 038	TKN	
☐ 012	PHENOL	8040	☐ 025	Cr6	7198	☐	OTHER	

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05/31/90

Environmental Bureau NM Oil D.
PO Box 2088
Santa Fe, NM 87504

RECEIVED

JUN 08 1990

OIL CONSERVATION DIV.
SANTA FE

Sample Identification: Sample #9004101153
Collected By: Anderson/Olson
Date & Time Taken: 04/10/90 1153
Other: EPNG- Wingate A/B Cooling Tower

Lab Sample Number: 163717 **Received:** 04/16/90

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Acrolein	<100	ug/l	0550	04/21/90	EPA Method 8240	PM
Acrylonitrile	<100	ug/l	0550	04/21/90	EPA Method 8240	PM
Benzene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Bromoform	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Bromomethane	<10	ug/l	0550	04/21/90	EPA Method 8240	PM
Carbon Tetrachloride	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Chlorobenzene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Chloroethane	<10	ug/l	0550	04/21/90	EPA Method 8240	PM
2-Chloroethylvinyl ether	<10	ug/l	0550	04/21/90	EPA Method 8240	PM
Chloroform	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Chloromethane	<10	ug/l	0550	04/21/90	EPA Method 8240	PM
Dibromochloromethane	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Bromodichloromethane	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
1,1-Dichloroethane	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
1,2-Dichloroethane	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
1,1-Dichloroethene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM

continued

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PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
trans-1,2-Dichloroethene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
1,2-Dichloropropane	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
cis-1,3-Dichloropropene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Ethyl benzene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Methylene Chloride	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
1,1,2,2-Tetrachloroethane	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Tetrachloroethene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Toluene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
1,1,1-Trichloroethane	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
1,1,2-Trichloroethane	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Trichloroethene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Vinyl Chloride	<10	ug/l	0550	04/21/90	EPA Method 8240	PM
trans-1,3-Dichloropropene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Alkalinity	53	mg/l	1400	04/26/90	EPA Method 310.1	DFK
Boron	1.6	mg/l	2100	05/09/90	EPA Method 212.3	DFK
Cation-Anion Balance	2.36	%	1100	05/31/90	ference	NT
Carbonate	<.5	mg/l	1500	04/26/90	APHA Method 263	DFK
Chloride	110	mg/l	1800	05/23/90	EPA Method 325.3	MLR
Specific Conductance	6000	Micromhos	2200	04/17/90	EPA Method 120.1	KLM
Bicarbonate	53	mg/l	1500	04/26/90	APHA Method 263	DFK
Sulfate	3200	mg/l	2000	05/22/90	EPA Method 375.4	MLR

continued

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PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Total Dissolved Solids	5020	mg/l	0800	05/24/90	EPA Method 160.1	MLR
pH	6.9	SU	1630	04/17/90	EPA Method 150.1	LB
Silver	<.03	mg/l	1700	04/19/90	EPA Method 272.1	GK
Aluminum	<.5	mg/l	1730	04/20/90	EPA Method 202.1	GK
Arsenic	<.005	mg/l	2215	04/23/90	EPA Method 206.2	GK
Barium	<.5	mg/l	1845	04/20/90	EPA Method 208.1	GK
Beryllium	<.01	mg/l	2100	05/22/90	EPA Method 210.2	GK
Calcium	14	mg/l	1700	04/26/90	EPA Method 215.1	GK
Cadmium	<.001	mg/l	1845	04/26/90	EPA Method 213.2	GK
Cobalt	<.5	mg/l	1845	04/19/90	EPA Method 219.2	GK
Chromium	.07	mg/l	1530	04/19/90	EPA Method 218.1	GDG
Copper	.06	mg/l	0930	04/19/90	EPA Method 220.1	GDG
Iron	2.6	mg/l	0815	04/25/90	EPA Method 236.1	GDG
Potassium	58	mg/l	1730	05/22/90	EPA Method 258.1	GK
Magnesium	4.4	mg/l	1730	04/25/90	EPA Method 242.1	GDG
Manganese	.03	mg/l	1540	04/23/90	EPA Method 243.1	GDG
Molybdenum	<.5	mg/l	1845	04/19/90	EPA Method 246.2	GK
Sodium	1600	mg/l	2130	04/24/90	EPA Method 273.1	GK
Nickel	<.1	mg/l	1610	04/19/90	EPA Method 249.1	GDG
Lead	<.001	mg/l	2200	04/26/90	EPA Method 239.2	GK
Antimony	<.2	mg/l	1815	05/22/90	EPA Method 204.2	GK

continued

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PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Selenium	<.005	mg/l	2315	04/19/90	EPA Method 270.2	GK
Silicon (as Silica)	25	mg/l	1615	04/20/90	APHA Method 303C	GK
Thallium	<.005	mg/l	1445	05/07/90	EPA Method 279.2	GDG
Vanadium	<2	mg/l	2200	04/19/90	EPA Method 286.2	GK
Zinc	.17	mg/l	0900	04/19/90	EPA Method 289.1	GDG

Quality Assurance for Sample Number 163717

Sample #	Description	Result	Units	Dup/Std Value	Spk Conc.	Percent	Time	Date	By
				Alkalinity					
	Standard	101	mg/l	100		101	1400	04/26/90	DFK
163802	Duplicate	765	mg/l	765		100	1400	04/26/90	DFK
				Boron					
	Standard	.50	mg/l	.50		100	2100	05/09/90	DFK
163716	Duplicate	1.9	mg/l	1.9		100	2100	05/09/90	DFK
				Chloride					
	Standard	71	ppm	1000			1800	05/23/90	MLR
163722	Duplicate	1073	ppm	1073		100	1800	05/23/90	MLR
163722	Spike		ppm			100	1800	05/23/90	MLR
				Specific Conductance					
	Standard	1400	Micromhos	1413		101	2200	04/17/90	KLM
163715	Duplicate	5195	Micromhos	5195		100	2200	04/17/90	KLM
				Sulfate					
	Standard	96	mg/kg	100		104	2000	05/22/90	MLR
	Standard	99	mg/kg	100		101	2000	05/22/90	MLR
165744	Duplicate	1275	mg/kg	1275		100	2000	05/22/90	MLR
165744	Spike		mg/kg		100	96	2000	05/22/90	MLR
				Total Dissolved Solids					
	Blank	.000	mg/l				0800	05/24/90	MLR
	Standard	1006	mg/l	1000		101	0800	05/24/90	MLR
163720	Duplicate	864	mg/l	868		100	0800	05/24/90	MLR
				Silver					
	Blank	<.03	mg/l				1700	04/19/90	GK
	Standard	.20	mg/l	.20		100	1700	04/19/90	GK
163718	Duplicate	<.03	mg/l	<.03		100	1700	04/19/90	GK
163718	Spike		mg/l		.20	95	1700	04/19/90	GK
				Aluminum					
	Blank	<.5	mg/l				1730	04/20/90	GK
	Blank	<.5	mg/l				1730	04/20/90	GK

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Quality Assurance for Sample Number 163717

Sample #	Description	Result	Units	Dup/Std Value	Spk Conc.	Percent	Time	Date	By
	Blank	<.5	mg/l				1730	04/20/90	GK
	Standard	1.0	mg/l	1.0		100	1730	04/20/90	GK
163715	Duplicate	<.5	mg/l	<.5		100	1730	04/20/90	GK
163766	Duplicate	<.5	mg/l	<.5		100	1730	04/20/90	GK
163715	Spike		mg/l		4.0	95	1730	04/20/90	GK
163766	Spike		mg/l		4.0	100	1730	04/20/90	GK
	Arsenic								
	Blank	<.005	mg/l				2215	04/23/90	GK
	Blank	<.005	mg/l				2215	04/23/90	GK
	Standard	.102	mg/l	.100		102	2215	04/23/90	GK
162814	Duplicate	<.005	mg/l	<.005		100	2215	04/23/90	GK
163717	Duplicate	<.005	mg/l	<.005		100	2215	04/23/90	GK
162814	Spike		mg/l		.100	107	2215	04/23/90	GK
163717	Spike		mg/l		.100	93	2215	04/23/90	GK
	Barium								
	Blank	<.5	mg/l				1845	04/20/90	GK
	Blank	<.5	mg/l				1845	04/20/90	GK
	Standard	1.0	mg/l	1.0		100	1845	04/20/90	GK
161742	Duplicate	79	mg/l	91		114	1845	04/20/90	GK
163715	Duplicate	<.5	mg/l	<.5		100	1845	04/20/90	GK
161742	Spike		mg/l		4.0	109	1845	04/20/90	GK
163715	Spike		mg/l		4.0	102	1845	04/20/90	GK
	Beryllium								
	Blank	<.01	mg/kg				2100	05/22/90	GK
	Blank	<.1	mg/kg				2100	05/22/90	GK
	Standard	.02	mg/kg	.02		100	2100	05/22/90	GK
165595	Duplicate	.4	mg/kg	.3		129	2100	05/22/90	GK
163715	Duplicate	<.01	mg/l	<.01		100	2100	05/22/90	GK
163716	Spike		mg/l		.50	92	2100	05/22/90	GK
	Calcium								
	Blank	.19	mg/l				1700	04/26/90	GK
	Blank	.11	mg/l				1700	04/26/90	GK
	Standard	.47	mg/l	.50		106	1700	04/26/90	GK
162261	Duplicate	230	mg/l	230		100	1700	04/26/90	GK
163802	Duplicate	3.0	mg/l	3.1		103	1700	04/26/90	GK
163715	Duplicate	140	mg/l	160		113	1700	04/26/90	GK
163718	Spike		mg/l		1.00	94	1700	04/26/90	GK
	Cadmium								
	Blank	<.001	mg/l				1845	04/26/90	GK
	Blank	<.001	mg/l				1845	04/26/90	GK
	Standard	.002	mg/l	.002		100	1845	04/26/90	GK
163716	Duplicate	<.001	mg/l	<.001		100	1845	04/26/90	GK
	Cobalt								
	Blank	<.5	mg/l				1845	04/19/90	GK
	Standard	10	mg/l	10		100	1845	04/19/90	GK
163715	Duplicate	<.5	mg/l	<.5		100	1845	04/19/90	GK

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Quality Assurance for Sample Number 163717

Sample #	Description	Result	Units	Dup/Std Value	Spk Conc.	Percent	Time	Date	By
163715	Spike		mg/l		10	98	1845	04/19/90	GK
	Chromium								
	Blank	<.05	mg/kg				1530	04/19/90	GDG
	Blank	<.05	mg/kg				1530	04/19/90	GDG
	Blank	<.05	mg/kg				1530	04/19/90	GDG
	Blank	<.01	mg/kg				1530	04/19/90	GDG
	Standard	.05	mg/kg	.05		100	1530	04/19/90	GDG
163377	Duplicate	.16	mg/l	.16		100	1530	04/19/90	GDG
163519	Duplicate	<.05	mg/l	<.05		100	1530	04/19/90	GDG
163715	Duplicate	<.05	mg/l	<.05		100	1530	04/19/90	GDG
163766	Duplicate	<.05	mg/l	<.05		100	1530	04/19/90	GDG
163850	Duplicate	.16	mg/l	.14		113	1530	04/19/90	GDG
163377	Spike		mg/l		.40	91	1530	04/19/90	GDG
163519	Spike		mg/l		.80	89	1530	04/19/90	GDG
163715	Spike		mg/l		.80	93	1530	04/19/90	GDG
163766	Spike		mg/l		.40	105	1530	04/19/90	GDG
163860	Spike		mg/l		.80	95	1530	04/19/90	GDG
	Copper								
	Blank	<.05	mg/l				0930	04/19/90	GDG
	Blank	<.05	mg/l				0930	04/19/90	GDG
	Blank	<.01	mg/l				0930	04/19/90	GDG
	Standard	.98	mg/l	1.0		102	0930	04/19/90	GDG
	Standard	.06	mg/l	.05		118	0930	04/19/90	GDG
163256	Duplicate	.21	mg/l	.21		100	0930	04/19/90	GDG
163519	Duplicate	<.05	mg/l	<.05		100	0930	04/19/90	GDG
163715	Duplicate	<.05	mg/l	<.05		100	0930	04/19/90	GDG
163860	Duplicate	.05	mg/l	.05		100	0930	04/19/90	GDG
163256	Spike		mg/l		.40	97	0930	04/19/90	GDG
163519	Spike		mg/l		.80	94	0930	04/19/90	GDG
163715	Spike		mg/l		.80	96	0930	04/19/90	GDG
163860	Spike		mg/l		.80	95	0930	04/19/90	GDG
	Iron								
	Blank	.2	mg/l				0815	04/25/90	GDG
	Blank	.2	mg/l				0815	04/25/90	GDG
	Blank	.1	mg/l				0815	04/25/90	GDG
	Blank	.1	mg/l				0815	04/25/90	GDG
	Standard	1.0	mg/l	1.0		100	0815	04/25/90	GDG
163715	Duplicate	.2	mg/l	.1		167	0815	04/25/90	GDG
163802	Duplicate	.5	mg/l	.5		100	0815	04/25/90	GDG
163802	Spike		mg/l		.80	103	0815	04/25/90	GDG
	Potassium								
	Blank	.05	mg/l				1730	05/22/90	GK
	Standard	.96	mg/l	1.00		104	1730	05/22/90	GK
163715	Duplicate	24	mg/l	24		100	1730	05/22/90	GK
	Magnesium								
	Blank	.008	mg/l				1730	04/25/90	GDG

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2600 DUDLEY ROAD — KILGORE, TEXAS 75662 — 214/984-0551

Analytical Chemistry • *Waste Treatment & Disposal* • *Equipment Sales*

Quality Assurance for Sample Number 163717

Sample #	Description	Result	Units	Dup/Std Value	Spk Conc.	Percent	Time	Date	By
163453	Duplicate	.001	mg/l	.001		100	2200	04/26/90	GK
163716	Duplicate	(.001	mg/l	(.001		100	2200	04/26/90	GK
163933	Duplicate	(.001	mg/l	(.001		100	2200	04/26/90	GK
163717	Spike		mg/l		.025	104	2200	04/26/90	GK
				Antimony					
	Blank	(.2	mg/kg				1815	05/22/90	GK
	Standard	1.0	mg/kg	1.0		100	1815	05/22/90	GK
163715	Duplicate	(.2	mg/l	(.2		100	1815	05/22/90	GK
165596	Duplicate	(2	mg/kg	(2		100	1815	05/22/90	GK
165596	Spike		mg/kg		2.5	97	1815	05/22/90	GK
				Selenium					
	Blank	(.005	mg/kg				2315	04/19/90	GK
	Standard	.109	mg/kg	.100		109	2315	04/19/90	GK
163717	Duplicate	(.005	mg/l	(.005		100	2315	04/19/90	GK
				Silicon (as Silica)					
	Blank	(2	mg/kg				1615	04/20/90	GK
	Standard	5.5	mg/kg	5.0		110	1615	04/20/90	GK
163715	Duplicate	13	mg/l	12		108	1615	04/20/90	GK
163715	Spike		mg/l		20	103	1615	04/20/90	GK
				Thallium					
	Blank	(.005	mg/l				1445	05/07/90	GDG
	Standard	.052	mg/l	.050		104	1445	05/07/90	GDG
163716	Duplicate	(.005	mg/l	(.005		100	1445	05/07/90	GDG
163718	Spike		mg/l		.100	90	1445	05/07/90	GDG
				Vanadium					
	Blank	(2	mg/l				2200	04/19/90	GK
	Standard	11	mg/l	10		110	2200	04/19/90	GK
163715	Duplicate	(2	mg/l	(2		100	2200	04/19/90	GK
				Zinc					
	Blank	.05	mg/l				0900	04/19/90	GDG
	Blank	.02	mg/l				0900	04/19/90	GDG
	Blank	.03	mg/l				0900	04/19/90	GDG
	Blank	.020	mg/l				0900	04/19/90	GDG
	Standard	.21	mg/l	.20		105	0900	04/19/90	GDG
163377	Duplicate	.01	mg/l	.03		200	0900	04/19/90	GDG
163530	Duplicate	2.6	mg/l	2.7		104	0900	04/19/90	GDG
163715	Duplicate	.02	mg/l	.01		167	0900	04/19/90	GDG
163860	Duplicate	.025	mg/l	.030		118	0900	04/19/90	GDG
163715	Duplicate	.02	mg/l	.01		167	0900	04/19/90	GDG
163377	Spike		mg/l		.40	100	0900	04/19/90	GDG
163530	Spike		mg/l		.40	100	0900	04/19/90	GDG
163860	Spike		mg/l		.40	97	0900	04/19/90	GDG

C. H. Whiteside

C. H. Whiteside, Ph.D., President

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07/23/90

Environmental Bureau NM Oil D.
PO Box 2088
Santa Fe, NM 87504

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OIL CONSERVATION DIV.
SANTA FE

Sample Identification: Sample #9004101153
Collected By: Anderson/Olson
Date & Time Taken: 04/10/90 1153
Other:
EPNG- Wingate A/B Cooling Tower

Lab Sample Number: 163717 **Received:** 04/16/90 Client: SNM1

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Acrolein	<100	ug/l	0550	04/21/90	EPA Method 8240	PM
Acrylonitrile	<100	ug/l	0550	04/21/90	EPA Method 8240	PM
Benzene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Bromoform	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Bromomethane	<10	ug/l	0550	04/21/90	EPA Method 8240	PM
Carbon Tetrachloride	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Chlorobenzene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Chloroethane	<10	ug/l	0550	04/21/90	EPA Method 8240	PM
2-Chloroethylvinyl ether	<10	ug/l	0550	04/21/90	EPA Method 8240	PM
Chloroform	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Chloromethane	<10	ug/l	0550	04/21/90	EPA Method 8240	PM
Dibromochloromethane	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Bromodichloromethane	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
1,1-Dichloroethane	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
1,2-Dichloroethane	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
1,1-Dichloroethene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM

continued

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Lab Sample Number: 163717 Continued

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
trans-1,2-Dichloroethene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
1,2-Dichloropropane	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
cis-1,3-Dichloropropene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Ethyl benzene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Methylene Chloride	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
1,1,2,2-Tetrachloroethane	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Tetrachloroethene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Toluene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
1,1,1-Trichloroethane	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
1,1,2-Trichloroethane	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Trichloroethene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Vinyl Chloride	<10	ug/l	0550	04/21/90	EPA Method 8240	PM
trans-1,3-Dichloropropene	<5	ug/l	0550	04/21/90	EPA Method 8240	PM
Alkalinity	53	mg/l	1400	04/26/90	EPA Method 310.1	DFK
Boron	1.6	mg/l	2100	05/09/90	EPA Method 212.3	DFK
Cation-Anion Balance	2.36	%	1100	05/31/90	ference	NT
Carbonate	<.5	mg/l	1500	04/26/90	APHA Method 263	DFK
Chloride	110	mg/l	1800	05/23/90	EPA Method 325.3	MLR
Specific Conductance	6000	Micromhos	2200	04/17/90	EPA Method 120.1	KLM
Bicarbonate	53	mg/l	1500	04/26/90	APHA Method 263	DFK
Sulfate	3200	mg/l	2000	05/22/90	EPA Method 375.4	MLR

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Lab Sample Number: 163717 Continued

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Total Dissolved Solids	5020	mg/l	0800	05/24/90	EPA Method 160.1	MLR
pH	6.9	SU	1630	04/17/90	EPA Method 150.1	LB
Silver	<.03	mg/l	1700	04/19/90	EPA Method 272.1	GK
Aluminum	<.5	mg/l	1730	04/20/90	EPA Method 202.1	GK
Arsenic	<.005	mg/l	2215	04/23/90	EPA Method 206.2	GK
Barium	<.5	mg/l	1845	04/20/90	EPA Method 208.1	GK
Beryllium	<.01	mg/l	2100	05/22/90	EPA Method 210.2	GK
Calcium	14	mg/l	1700	04/26/90	EPA Method 215.1	GK
Cadmium	<.001	mg/l	1845	04/26/90	EPA Method 213.2	GK
Cobalt	<.5	mg/l	1845	04/19/90	EPA Method 219.2	GK
Chromium	.07	mg/l	1530	04/19/90	EPA Method 218.1	GDG
Copper	.06	mg/l	0930	04/19/90	EPA Method 220.1	GDG
Iron	2.6	mg/l	0815	04/25/90	EPA Method 236.1	GDG
Potassium	58	mg/l	1730	05/22/90	EPA Method 258.1	GK
Magnesium	4.4	mg/l	1730	04/25/90	EPA Method 242.1	GDG
Manganese	.03	mg/l	1540	04/23/90	EPA Method 243.1	GDG
Molybdenum	<.5	mg/l	1845	04/19/90	EPA Method 246.2	GK
Sodium	1600	mg/l	2130	04/24/90	EPA Method 273.1	GK
Nickel	<.1	mg/l	1610	04/19/90	EPA Method 249.1	GDG
Lead	<.001	mg/l	2200	04/26/90	EPA Method 239.2	GK
Antimony	<.2	mg/l	1815	05/22/90	EPA Method 204.2	GK

continued

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Lab Sample Number: 163717 Continued

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Selenium	<.005	mg/l	2315	04/19/90	EPA Method 270.2	GK
Silicon (as Silica)	25	mg/l	1615	04/20/90	APHA Method 303C	GK
Thallium	<.005	mg/l	1445	05/07/90	EPA Method 279.2	GDG
Vanadium	<2	mg/l	2200	04/19/90	EPA Method 286.2	GK
Zinc	.17	mg/l	0900	04/19/90	EPA Method 289.1	GDG

Quality Assurance for Sample Number 163717

Sample #	Description	Result	Units	Dup/Std Value	Spk Conc.	Percent	Time	Date	By

Bill Reay

C. H. Whiteside, Ph.D., President

163719

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

ANALYSIS REQUEST FORM

Contract Lab ANA - LABS   Contract No. 78-521.07-013

OCD Sample No. 900416

Collection Date	Collection Time	Collected by —Person/Agency
4/16/96		ANDERSON/OLSON /OCD

SITE INFORMATION

Sample location: EPNG - WINGATE

Collection Site Description: WEST EVAP POND

Township, Range, Section, Tract:

SEND FINAL REPORT TO
ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
PO Box 2088
Santa Fe, NM 87504-2088

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted: 2 VIALS

- ☒ **NF:** Whole sample (Non-filtered)
- ☐ **F:** Filtered in field with 0.45 μ membrane filter
- ☐ **PF:** Pre-filtered w/45 μ membrane filter

- ☒ **NA:** No acid added
- ☐ **A:** HCL
- ☐ **A:** 2ml H_2SO_4/L added
- ☐ **A:** 5ml conc. HNO_3 added
- ☐ **A:** 4ml fuming HNO_3 added

FIELD COMMENTS:

SAMPLING CONDITIONS

☐ Bailed ☐ Pump
☒ Dipped ☐ Tap

Water level	
Discharge	
Sample type	GRAB
pH(00400)	
Conductivity (Uncorrected)	μmho
Water Temp. (00010)	
Conductivity at 25° C	μmho

LAB ANALYSIS REQUESTED:

ITEM	DESC	METHOD	ITEM	DESC	METHOD	ITEM	DESC	METHOD
☐ 001	VOA	8020	☐ 013	PHENOL	604	☐ 026	Cd	71
☐ 002	VOA	602	☐ 014	VOC	8240	☐ 027	Pb	74
☒ 003	VOH	8010	☐ 015	VOC	624	☐ 028	Hg(L)	74
☐ 004	VOH	601	☐ 016	SVOC	8250	☐ 031	Se	7
☐ 005	SUITE	8010-8020	☐ 017	SVOC	625	☐ 032	ICAP	6
☐ 006	SUITE	601-602	☐ 018	VOC	8260	☐ 033	CATIONS/ANIONS	
☐ 007	HEADSPACE		☐ 019	SVOC	8270	☐ 034	N SUITE	
☐ 008	PAH	8100	☐ 020	O&G	9070	☐ 035	NITRATE	
☐ 009	PAH	610	☐ 022	AS	7060	☐ 036	NITRITE	
☐ 010	PCB	8080	☐ 023	Ba	7080	☐ 037	AMMONIA	
☐ 011	PCB	608	☐ 024	Cr	7190	☐ 038	TKN	
☐ 012	PHENOL	8040	☐ 025	Cr6	7198	☐	OTHER	

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05/18/90

Environmental Bureau NM Oil D.
PO Box 2088
Santa Fe, NM 87504

Sample Identification: Sample #9004101225
Collected By: Anderson/Olson
Date & Time Taken: 04/10/90 1225
On Site Data: EPNG-Wingate West Evap Pond

Lab Sample Number: 163719 **Received:** 04/16/90

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Acrolein	<100	ug/l	0817	04/21/90	EPA Method 8240	PM
Acrylonitrile	<100	ug/l	0817	04/21/90	EPA Method 8240	PM
Benzene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Bromoform	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Bromomethane	<10	ug/l	0817	04/21/90	EPA Method 8240	PM
Carbon Tetrachloride	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Chlorobenzene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Chloroethane	<10	ug/l	0817	04/21/90	EPA Method 8240	PM
2-Chloroethylvinyl ether	<10	ug/l	0817	04/21/90	EPA Method 8240	PM
Chloroform	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Chloromethane	<10	ug/l	0817	04/21/90	EPA Method 8240	PM
Dibromochloromethane	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Bromodichloromethane	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
1,1-Dichloroethane	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
1,2-Dichloroethane	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
1,1-Dichloroethene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM

Continued

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PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
trans-1,2-Dichloroethene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
1,2-Dichloropropane	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
cis-1,3-Dichloropropene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Ethyl benzene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Methylene Chloride	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
1,1,2,2-Tetrachloroethane	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Tetrachloroethene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Toluene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
1,1,1-Trichloroethane	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
1,1,2-Trichloroethane	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Trichloroethene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Vinyl Chloride	<10	ug/l	0817	04/21/90	EPA Method 8240	PM
trans-1,3-Dichloropropene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM

C. H. Whiteside

C. H. Whiteside, Ph.D., President

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OIL CONSERVATION DIV.
SANTA FE

Environmental Bureau NM Oil D.
PO Box 2088
Santa Fe, NM 87504

Sample Identification: Sample #9004101225
Collected By: Anderson/Olson
Date & Time Taken: 04/10/90 1225
On Site Data: EPNG-Wingate West Evap Pond

Lab Sample Number: 163719 **Received:** 04/16/90 Client: SNM1

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Acrolein	<100	ug/l	0817	04/21/90	EPA Method 8240	PM
Acrylonitrile	<100	ug/l	0817	04/21/90	EPA Method 8240	PM
Benzene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Bromoform	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Bromomethane	<10	ug/l	0817	04/21/90	EPA Method 8240	PM
Carbon Tetrachloride	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Chlorobenzene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Chloroethane	<10	ug/l	0817	04/21/90	EPA Method 8240	PM
2-Chloroethylvinyl ether	<10	ug/l	0817	04/21/90	EPA Method 8240	PM
Chloroform	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Chloromethane	<10	ug/l	0817	04/21/90	EPA Method 8240	PM
Dibromochloromethane	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Bromodichloromethane	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
1,1-Dichloroethane	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
1,2-Dichloroethane	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
1,1-Dichloroethene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM

continued

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Analytical Chemistry • Waste Treatment & Disposal • Equipment Sales

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
trans-1,2-Dichloroethene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
1,2-Dichloropropane	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
cis-1,3-Dichloropropene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Ethyl benzene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Methylene Chloride	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
1,1,2,2-Tetrachloroethane	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Tetrachloroethene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Toluene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
1,1,1-Trichloroethane	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
1,1,2-Trichloroethane	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Trichloroethene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM
Vinyl Chloride	<10	ug/l	0817	04/21/90	EPA Method 8240	PM
trans-1,3-Dichloropropene	<5	ug/l	0817	04/21/90	EPA Method 8240	PM

Bill Peery

C. H. Whiteside, Ph.D., President

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AUG 03 1990

OIL CONSERVATION DIV.
SANTA FE

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT 163718

OIL CONSERVATION DIVISION

ANALYSIS REQUEST FORM

Contract Lab ANA - LABS Contract No. 78-521.07-013

OCD Sample No. 9004161210

Collection Date	Collection Time	Collected by —Person/Agency
4/16/90	1216	ANDERSON/OLSON /OCD

SITE INFORMATION

Sample location EPNG - WINGATE

Collection Site Description

C COOLING TOWER

Township, Range, Section, Tract:

SEND FINAL REPORT TO ▸
ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
PO Box 2088
Santa Fe, NM 87504-2088

SAMPLING CONDITIONS

☐ Bailed ☐ Pump
☒ Dipped ☐ Tap

Water level

Discharge

Sample type GRAB

pH(00400)

Conductivity (Uncorrected) 2725 μmho

Water Temp. (00010) 12.6 °C

Conductivity at 25° C ~~[illegible]~~ μmho

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted: 4 VIALS + 2

☒ **NF:** Whole sample (Non-filtered)
☐ **F:** Filtered in field with 0.45 μ membrane filter
☐ **PF:** Pre-filtered w/45 μ membrane filter

2VH ☒ **NA:** No acid added
2V ☒ **A:** HCL
☐ **A:** 2ml H_2SO_4/L added
☐ **A:** 5ml conc. HNO_3 added
1 ☒ **A:** ~~[illegible]~~ HNO_3 added

FIELD COMMENTS:

LAB ANALYSIS REQUESTED:

ITEM	DESC	METHOD	ITEM	DESC	METHOD	ITEM	DESC	METHOD
☒ 001	VOA	8020	☐ 013	PHENOL	604	☐ 026	Cd	7130
☐ 002	VOA	602	☐ 014	VOC	8240	☐ 027	Pb	7421
☒ 003	VOH	8010	☐ 015	VOC	624	☐ 028	Hg(L)	7470
☐ 004	VOH	601	☐ 016	SVOC	8250	☐ 031	Se	7740
☐ 005	SUITE	8010-8020	☐ 017	SVOC	625	☒ 032	ICAP	6010
☐ 006	SUITE	601-602	☐ 018	VOC	8260	☒ 033	CATIONS/ANIONS	
☐ 007	HEADSPACE		☐ 019	SVOC	8270	☐ 034	N SUITE	
☐ 008	PAH	8100	☐ 020	O&G	9070	☐ 035	NITRATE	
☐ 009	PAH	610	☐ 022	AS	7060	☐ 036	NITRITE	
☐ 010	PCB	8080	☐ 023	Ba	7080	☐ 037	AMMONIA	
☐ 011	PCB	608	☒ 024	Cr	7190	☐ 038	TKN	
☐ 012	PHENOL	8040	☐ 025	Cr6	7198	☐	OTHER	

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05/31/90

Environmental Bureau NM Oil D.
PO Box 2088
Santa Fe, NM 87504

RE[illegible]IVED

JUN 08 1990

OIL CONSERVATION DIV.
SANTA FE

Sample Identification: Sample #9004101210
Collected By: Anderson/Olson
Date & Time Taken: 04/10/90 1210
Others: EPNG- Wingate C Cooling Tower

Lab Sample Number: 163718 Received: 04/16/90

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Acrolein	<100	ug/l	0704	04/16/90	EPA Method 8240	PM
Acrylonitrile	<100	ug/l	0704	04/21/90	EPA Method 8240	PM
Benzene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Bromoform	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Bromomethane	<10	ug/l	0704	04/21/90	EPA Method 8240	PM
Carbon Tetrachloride	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Chlorobenzene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Chloroethane	<10	ug/l	0704	04/21/90	EPA Method 8240	PM
2-Chloroethylvinyl ether	<10	ug/l	0704	04/21/90	EPA Method 8240	PM
Chloroform	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Chloromethane	<10	ug/l	0704	04/21/90	EPA Method 8240	PM
Dibromochloromethane	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Bromodichloromethane	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
1,1-Dichloroethane	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
1,2-Dichloroethane	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
1,1-Dichloroethene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM

continued

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PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
trans-1,2-Dichloroethene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
1,2-Dichloropropane	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
cis-1,3-Dichloropropene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Ethyl benzene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Methylene Chloride	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
1,1,2,2-Tetrachloroethane	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Tetrachloroethene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Toluene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
1,1,1-Trichloroethane	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
1,1,2-Trichloroethane	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Trichloroethene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Vinyl Chloride	<10	ug/l	0704	04/21/90	EPA Method 8240	PM
trans-1,3-Dichloropropene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Alkalinity	23	mg/l	1400	04/26/90	EPA Method 310.1	DFK
Boron	.65	mg/l	2100	05/09/90	EPA Method 212.3	DFK
Cation-Anion Balance	2.47	%	1100	05/31/90	ference	NT
Carbonate	<.5	mg/l	1500	04/26/90	APHA Method 263	DFK
Chloride	70	mg/l	1110	04/18/90	EPA Method 325.3	DFK
Specific Conductance	6000	Micromhos	2200	04/17/90	EPA Method 120.1	KLM
Bicarbonate	23	mg/l	1500	04/26/90	APHA Method 263	DFK
Sulfate	3200	mg/l	2000	05/22/90	EPA Method 375.4	MLR

continued

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Lab Sample Number: 163718 Continued

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Total Dissolved Solids	4750	mg/l	0800	05/24/90	EPA Method 160.1	MLR
pH	6.9	SU	1630	04/17/90	EPA Method 150.1	LB
Silver	<.03	mg/l	1700	04/19/90	EPA Method 272.1	GK
Aluminum	<.5	mg/l	1730	04/20/90	EPA Method 202.1	GK
Arsenic	.017	mg/l	2215	04/23/90	EPA Method 206.2	GK
Barium	<.5	mg/l	1845	04/20/90	EPA Method 208.1	GK
Beryllium	<.01	mg/l	2100	05/22/90	EPA Method 210.2	GK
Calcium	35	mg/l	2345	05/29/90	EPA Method 215.1	GK
Cadmium	<.001	mg/l	1845	04/26/90	EPA Method 213.2	GK
Cobalt	<.5	mg/l	1845	04/19/90	EPA Method 219.2	GK
Chromium	.05	mg/l	1530	04/19/90	EPA Method 218.1	GDG
Chromium	.06	mg/l	0920	04/25/90	EPA Method 218.1	GDG
Copper	.46	mg/l	0930	04/19/90	EPA Method 220.1	GDG
Iron	3.9	mg/l	2115	05/14/90	EPA Method 236.1	GK
Potassium	100	mg/l	1730	05/22/90	EPA Method 258.1	GK
Magnesium	11.4	mg/l	1730	04/25/90	EPA Method 242.1	GDG
Manganese	.10	mg/l	1540	04/23/90	EPA Method 243.1	GDG
Molybdenum	<.5	mg/l	1845	04/19/90	EPA Method 246.2	GK
Sodium	1500	mg/l	2130	04/24/90	EPA Method 273.1	GK
Nickel	<.1	mg/l	1510	04/19/90	EPA Method 249.1	GDG
Lead	<.001	mg/l	2200	04/26/90	EPA Method 239.2	GK

continued

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Lab Sample Number: 163718 Continued

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Antimony	<.2	mg/l	1815	05/22/90	EPA Method 204.2	GK
Selenium	<.005	mg/l	2315	04/19/90	EPA Method 270.2	GK
Silicon (as Silica)	22	mg/l	1515	04/20/90	APHA Method 303C	GK
Thallium	<.005	mg/l	1445	05/07/90	EPA Method 279.2	GDG
Vanadium	<2	mg/l	2200	04/19/90	EPA Method 286.2	GK
Zinc	.84	mg/l	0800	04/19/90	EPA Method 289.1	GDG

Quality Assurance for Sample Number 163718

Sample #	Description	Result	Units	Dup/Std Value	Spk Conc.	Percent	Time	Date	By
				Alkalinity					
	Standard	101	mg/l	100		101	1400	04/26/90	DFK
163802	Duplicate	765	mg/l	765		100	1400	04/26/90	DFK
				Boron					
	Standard	.50	mg/l	.50		100	2100	05/09/90	DFK
163716	Duplicate	1.9	mg/l	1.9		100	2100	05/09/90	DFK
				Specific Conductance					
	Standard	1400	Micromhos	1413		101	2200	04/17/90	KLM
163715	Duplicate	5195	Micromhos	5195		100	2200	04/17/90	KLM
				Sulfate					
	Standard	96	mg/kg	100		104	2000	05/22/90	MLR
	Standard	99	mg/kg	100		101	2000	05/22/90	MLR
165744	Duplicate	1275	mg/kg	1275		100	2000	05/22/90	MLR
165744	Spike		mg/kg		100	96	2000	05/22/90	MLR
				Total Dissolved Solids					
	Blank	.000	mg/l				0800	05/24/90	MLR
	Standard	1005	mg/l	1000		101	0800	05/24/90	MLR
163720	Duplicate	864	mg/l	868		100	0800	05/24/90	MLR
				Silver					
	Blank	<.03	mg/l				1700	04/19/90	GK
	Standard	.20	mg/l	.20		100	1700	04/19/90	GK
163718	Duplicate	<.03	mg/l	<.03		100	1700	04/19/90	GK
163718	Spike		mg/l		.20	95	1700	04/19/90	GK
				Aluminum					
	Blank	<.5	mg/l				1730	04/20/90	GK
	Blank	<.5	mg/l				1730	04/20/90	GK
	Blank	<.5	mg/l				1730	04/20/90	GK
	Standard	1.0	mg/l	1.0		100	1730	04/20/90	GK

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Quality Assurance for Sample Number 163718

Sample #	Description	Result	Units	Dup/Std Value	Spk Conc.	Percent	Time	Date	By
163715	Duplicate	<.5	mg/l	<.5		100	1730	04/20/90	GK
163766	Duplicate	<.5	mg/l	<.5		100	1730	04/20/90	GK
163715	Spike		mg/l		4.0	95	1730	04/20/90	GK
163766	Spike		mg/l		4.0	100	1730	04/20/90	GK
				Arsenic					
	Blank	<.005	mg/l				2215	04/23/90	GK
	Blank	<.005	mg/l				2215	04/23/90	GK
	Standard	.102	mg/l	.100		102	2215	04/23/90	GK
162814	Duplicate	<.005	mg/l	<.005		100	2215	04/23/90	GK
163717	Duplicate	<.005	mg/l	<.005		100	2215	04/23/90	GK
162814	Spike		mg/l		.100	107	2215	04/23/90	GK
163717	Spike		mg/l		.100	93	2215	04/23/90	GK
				Barium					
	Blank	<.5	mg/l				1845	04/20/90	GK
	Blank	<.5	mg/l				1845	04/20/90	GK
	Standard	1.0	mg/l	1.0		100	1845	04/20/90	GK
161742	Duplicate	79	mg/l	91		114	1845	04/20/90	GK
163715	Duplicate	<.5	mg/l	<.5		100	1845	04/20/90	GK
161742	Spike		mg/l		4.0	109	1845	04/20/90	GK
163715	Spike		mg/l		4.0	102	1845	04/20/90	GK
				Beryllium					
	Blank	<.01	mg/kg				2100	05/22/90	GK
	Blank	<.1	mg/kg				2100	05/22/90	GK
	Standard	.02	mg/kg	.02		100	2100	05/22/90	GK
165596	Duplicate	.4	mg/kg	.3		129	2100	05/22/90	GK
163715	Duplicate	<.01	mg/l	<.01		100	2100	05/22/90	GK
163716	Spike		mg/l		.50	92	2100	05/22/90	GK
				Cadmium					
	Blank	<.001	mg/l				1845	04/26/90	GK
	Blank	<.001	mg/l				1845	04/26/90	GK
	Standard	.002	mg/l	.002		100	1845	04/26/90	GK
163716	Duplicate	<.001	mg/l	<.001		100	1845	04/26/90	GK
				Cobalt					
	Blank	<.5	mg/l				1845	04/19/90	GK
	Standard	10	mg/l	10		100	1845	04/19/90	GK
163715	Duplicate	<.5	mg/l	<.5		100	1845	04/19/90	GK
163715	Spike		mg/l		10	98	1845	04/19/90	GK
				Chromium					
	Blank	<.05	mg/kg				1530	04/19/90	GDG
	Blank	<.05	mg/kg				1530	04/19/90	GDG
	Blank	<.05	mg/kg				1530	04/19/90	GDG
	Blank	<.01	mg/kg				1530	04/19/90	GDG
	Standard	.05	mg/kg	.05		100	1530	04/19/90	GDG
163377	Duplicate	.16	mg/l	.16		100	1530	04/19/90	GDG
163519	Duplicate	<.05	mg/l	<.05		100	1530	04/19/90	GDG
163715	Duplicate	<.05	mg/l	<.05		100	1530	04/19/90	GDG

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Quality Assurance for Sample Number 163718

Sample #	Description	Result	Units	Dup/Std Value	Spk Conc.	Percent	Time	Date	By
163766	Duplicate	<.05	mg/l	<.05		100	1530	04/19/90	GDG
163960	Duplicate	.16	mg/l	.14		113	1530	04/19/90	GDG
163377	Spike		mg/l		.40	91	1530	04/19/90	GDG
163519	Spike		mg/l		.80	89	1530	04/19/90	GDG
163715	Spike		mg/l		.80	93	1530	04/19/90	GDG
163766	Spike		mg/l		.40	105	1530	04/19/90	GDG
163860	Spike		mg/l		.80	95	1530	04/19/90	GDG

Chromium

Sample #	Description	Result	Units	Dup/Std Value	Spk Conc.	Percent	Time	Date	By
	Blank	<.01	mg/l				0920	04/25/90	GDG
	Blank	<.05	mg/l				0920	04/25/90	GDG
	Standard	.06	mg/l	.05		118	0920	04/25/90	GDG
163771	Duplicate	6.8	mg/kg	6.6		103	0920	04/25/90	GDG
164101	Duplicate	.22	mg/l	.22		100	0920	04/25/90	GDG
164101	Spike		mg/l		1.68	101	0920	04/25/90	GDG

Copper

Sample #	Description	Result	Units	Dup/Std Value	Spk Conc.	Percent	Time	Date	By
	Blank	<.05	mg/l				0930	04/19/90	GDG
	Blank	<.05	mg/l				0930	04/19/90	GDG
	Blank	<.01	mg/l				0930	04/19/90	GDG
	Standard	.98	mg/l	1.0		102	0930	04/19/90	GDG
	Standard	.06	mg/l	.05		118	0930	04/19/90	GDG
163255	Duplicate	.21	mg/l	.21		100	0930	04/19/90	GDG
163519	Duplicate	<.05	mg/l	<.05		100	0930	04/19/90	GDG
163715	Duplicate	<.05	mg/l	<.05		100	0930	04/19/90	GDG
163860	Duplicate	.05	mg/l	.05		100	0930	04/19/90	GDG
163256	Spike		mg/l		.40	97	0930	04/19/90	GDG
163519	Spike		mg/l		.80	94	0930	04/19/90	GDG
163715	Spike		mg/l		.80	96	0930	04/19/90	GDG
163860	Spike		mg/l		.80	95	0930	04/19/90	GDG

Iron

Sample #	Description	Result	Units	Dup/Std Value	Spk Conc.	Percent	Time	Date	By
	Blank	.2	mg/l				2115	05/14/90	GK
	Blank	.2	mg/l				2115	05/14/90	GK
	Standard	2.2	mg/l	2.0		110	2115	05/14/90	GK
164957	Duplicate	1.6	mg/l	1.6		100	2115	05/14/90	GK
164957	Spike		mg/l		.90	104	2115	05/14/90	GK

Potassium

Sample #	Description	Result	Units	Dup/Std Value	Spk Conc.	Percent	Time	Date	By
	Blank	.05	mg/l				1730	05/22/90	GK
	Standard	.96	mg/l	1.00		104	1730	05/22/90	GK
163715	Duplicate	24	mg/l	24		100	1730	05/22/90	GK

Magnesium

Sample #	Description	Result	Units	Dup/Std Value	Spk Conc.	Percent	Time	Date	By
	Blank	.008	mg/l				1730	04/25/90	GDG
	Standard	.207	mg/l	.200		103	1730	04/25/90	GDG
163715	Duplicate	40	mg/l	39		103	1730	04/25/90	GDG
162261	Duplicate	20,000	mg/l	20,000		100	1730	04/25/90	GDG
163892	Duplicate	9.1	mg/l	9.1		100	1730	04/25/90	GDG
163802	Spike		mg/l		.400	100	1730	04/25/90	GDG

Manganese

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Quality Assurance for Sample Number 163718

Sample #	Description	Result	Units	Dup/Std Value	Spk Conc.	Percent	Time	Date	By
	Blank	<.03	mg/l				1540	04/23/90	GDG
	Blank	<.03	mg/l				1540	04/23/90	GDG
	Standard	.53	mg/l	.50		106	1540	04/23/90	GDG
163042	Duplicate	.10	mg/l	.08		122	1540	04/23/90	GDG
163119	Duplicate	.12	mg/l	.10		118	1540	04/23/90	GDG
163432	Duplicate	<.03	mg/l	.03		300	1540	04/23/90	GDG
163715	Duplicate	.27	mg/l	.25		108	1540	04/23/90	GDG
163802	Duplicate	.06	mg/l	.06		100	1540	04/23/90	GDG
163432	Spike		mg/l		.40	96	1540	04/23/90	GDG
163802	Spike		mg/l		.40	100	1540	04/23/90	GDG
	Molybdenum								
	Blank	<.5	mg/l				1845	04/19/90	GK
	Standard	10	mg/l	10		100	1845	04/19/90	GK
163715	Duplicate	<.5	mg/l	<.5		100	1845	04/19/90	GK
163715	Spike		mg/l		10	98	1845	04/19/90	GK
	Sodium								
	Blank	<4	mg/l				2130	04/24/90	GK
	Standard	11	mg/l	10		110	2130	04/24/90	GK
162261	Duplicate	98,000	mg/l	98,000		100	2130	04/24/90	GK
163432	Duplicate	42	mg/l	43		102	2130	04/24/90	GK
163715	Duplicate	1000	mg/l	1000		100	2130	04/24/90	GK
163802	Duplicate	440	mg/l	440		100	2130	04/24/90	GK
163432	Spike		mg/l		40	100	2130	04/24/90	GK
	Nickel								
	Blank	<.1	mg/l				1610	04/19/90	GDG
	Blank	<.1	mg/l				1610	04/19/90	GDG
	Blank	<.02	mg/l				1610	04/19/90	GDG
	Standard	.1	mg/l	.1		100	1610	04/19/90	GDG
163377	Duplicate	7.2	mg/l	7.2		100	1610	04/19/90	GDG
163715	Duplicate	<.1	mg/l	<.1		100	1610	04/19/90	GDG
163860	Duplicate	.03	mg/l	.03		100	1610	04/19/90	GDG
163715	Spike		mg/l		.40	110	1610	04/19/90	GDG
163060	Spike		mg/l		.40	108	1610	04/19/90	GDG
	Lead								
	Blank	.004	mg/l				2200	04/26/90	GK
	Blank	.013	mg/kg				2200	04/26/90	GK
	Blank	.001	mg/kg				2200	04/26/90	GK
	Standard	.027	mg/l	.025		108	2200	04/26/90	GK
	Standard	.024	mg/kg	.025		104	2200	04/26/90	GK
162404	Duplicate	.002	mg/l	<.001		300	2200	04/26/90	GK
163453	Duplicate	.001	mg/l	.001		100	2200	04/26/90	GK
163716	Duplicate	<.001	mg/l	<.001		100	2200	04/26/90	GK
163933	Duplicate	<.001	mg/l	<.001		100	2200	04/26/90	GK
163717	Spike		mg/l		.025	104	2200	04/26/90	GK
	Antimony								
	Blank	<.2	mg/kg				1815	05/22/90	GK

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Quality Assurance for Sample Number 163718

Sample #	Description	Result	Units	Dup/Std Value	Spk Conc.	Percent	Time	Date	By
	Standard	1.0	mg/kg	1.0		100	1815	05/22/90	GK
163715	Duplicate	<.2	mg/l	<.2		100	1815	05/22/90	GK
165595	Duplicate	<2	mg/kg	<2		100	1815	05/22/90	GK
165596	Spike		mg/kg		2.5	97	1815	05/22/90	GK
	Selenium								
	Blank	<.005	mg/kg				2315	04/19/90	GK
	Standard	.109	mg/kg	.100		109	2315	04/19/90	GK
163717	Duplicate	<.005	mg/l	<.005		100	2315	04/19/90	GK
	Silicon (as Silica)								
	Blank	<2	mg/kg				1615	04/20/90	GK
	Standard	5.5	mg/kg	5.0		110	1615	04/20/90	GK
163715	Duplicate	13	mg/l	12		108	1615	04/20/90	GK
163715	Spike		mg/l		20	103	1615	04/20/90	GK
	Thallium								
	Blank	<.005	mg/l				1445	05/07/90	GDG
	Standard	.052	mg/l	.050		104	1445	05/07/90	GDG
163716	Duplicate	<.005	mg/l	<.005		100	1445	05/07/90	GDG
163718	Spike		mg/l		.100	90	1445	05/07/90	GDG
	Vanadium								
	Blank	<2	mg/l				2200	04/19/90	GK
	Standard	11	mg/l	10		110	2200	04/19/90	GK
163715	Duplicate	<2	mg/l	<2		100	2200	04/19/90	GK
	Zinc								
	Blank	.05	mg/l				0900	04/19/90	GDG
	Blank	.02	mg/l				0900	04/19/90	GDG
	Blank	.03	mg/l				0900	04/19/90	GDG
	Blank	.020	mg/l				0900	04/19/90	GDG
	Standard	.21	mg/l	.20		105	0900	04/19/90	GDG
163377	Duplicate	.01	mg/l	.03		200	0900	04/19/90	GDG
163530	Duplicate	2.6	mg/l	2.7		104	0900	04/19/90	GDG
163715	Duplicate	.02	mg/l	.01		167	0900	04/19/90	GDG
163860	Duplicate	.025	mg/l	.030		118	0900	04/19/90	GDG
163715	Duplicate	.02	mg/l	.01		167	0900	04/19/90	GDG
163377	Spike		mg/l		.40	100	0900	04/19/90	GDG
163530	Spike		mg/l		.40	100	0900	04/19/90	GDG
163860	Spike		mg/l		.40	97	0900	04/19/90	GDG

C. H. Whiteside

C. H. Whiteside, Ph.D., President

ANA-LAB CORP.
THE COMPLETE SERVICE LAB

2600 DUDLEY ROAD — KILGORE, TEXAS 75662 — 214/984-0551

Analytical Chemistry • *Waste Treatment & Disposal* • *Equipment Sales*

07/23/90

Environmental Bureau NM Oil D.
PO Box 2088
Santa Fe, NM 87504

RECEIVED

AUG 03 1990

OIL CONSERVATION DIV.
SANTA FE

Sample Identification: Sample #9004101210
Collected By: Anderson/Olson
Date & Time Taken: 04/10/90 1210
Other:
EPNG- Wingate C Cooling Tower

Lab Sample Number: 163718 **Received:** 04/16/90 **Client:** SNM1

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Acrolein	<100	ug/l	0704	04/16/90	EPA Method 8240	PM
Acrylonitrile	<100	ug/l	0704	04/21/90	EPA Method 8240	PM
Benzene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Bromoform	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Bromomethane	<10	ug/l	0704	04/21/90	EPA Method 8240	PM
Carbon Tetrachloride	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Chlorobenzene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Chloroethane	<10	ug/l	0704	04/21/90	EPA Method 8240	PM
2-Chloroethylvinyl ether	<10	ug/l	0704	04/21/90	EPA Method 8240	PM
Chloroform	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Chloromethane	<10	ug/l	0704	04/21/90	EPA Method 8240	PM
Dibromochloromethane	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Bromodichloromethane	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
1,1-Dichloroethane	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
1,2-Dichloroethane	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
1,1-Dichloroethene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM

continued

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Analytical Chemistry • Waste Treatment & Disposal • Equipment Sales

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OIL CONSERVATION DIV.
SANTA FE

Lab Sample Number: 163718 Continued

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
trans-1,2-Dichloroethene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
1,2-Dichloropropane	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
cis-1,3-Dichloropropene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Ethyl benzene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Methylene Chloride	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
1,1,2,2-Tetrachloroethane	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Tetrachloroethene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Toluene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
1,1,1-Trichloroethane	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
1,1,2-Trichloroethane	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Trichloroethene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Vinyl Chloride	<10	ug/l	0704	04/21/90	EPA Method 8240	PM
trans-1,3-Dichloropropene	<5	ug/l	0704	04/21/90	EPA Method 8240	PM
Alkalinity	23	mg/l	1400	04/26/90	EPA Method 310.1	DFK
Boron	.65	mg/l	2100	05/09/90	EPA Method 212.3	DFK
Cation-Anion Balance	2.47	%	1100	05/31/90	ference	NT
Carbonate	<.5	mg/l	1500	04/26/90	APHA Method 263	DFK
Chloride	70	mg/l	1110	04/18/90	EPA Method 325.3	DFK
Specific Conductance	6000	Micromhos	2200	04/17/90	EPA Method 120.1	KLM
Bicarbonate	23	mg/l	1500	04/26/90	APHA Method 263	DFK
Sulfate	3200	mg/l	2000	05/22/90	EPA Method 375.4	MLR

continued

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OIL CONSERVATION DIV.
SANTA FE

Lab Sample Number: 163718 Continued

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Total Dissolved Solids	4750	mg/l	0800	05/24/90	EPA Method 160.1	MLR
pH	6.9	SU	1630	04/17/90	EPA Method 150.1	LB
Silver	<.03	mg/l	1700	04/19/90	EPA Method 272.1	GK
Aluminum	<.5	mg/l	1730	04/20/90	EPA Method 202.1	GK
Arsenic	.017	mg/l	2215	04/23/90	EPA Method 206.2	GK
Barium	<.5	mg/l	1845	04/20/90	EPA Method 208.1	GK
Beryllium	<.01	mg/l	2100	05/22/90	EPA Method 210.2	GK
Calcium	35	mg/l	2345	05/29/90	EPA Method 215.1	GK
Cadmium	<.001	mg/l	1845	04/26/90	EPA Method 213.2	GK
Cobalt	<.5	mg/l	1845	04/19/90	EPA Method 219.2	GK
Chromium	.06	mg/l	1530	04/19/90	EPA Method 218.1	GDG
Chromium	.06	mg/l	0920	04/25/90	EPA Method 218.1	GDG
Copper	.46	mg/l	0930	04/19/90	EPA Method 220.1	GDG
Iron	3.9	mg/l	2115	05/14/90	EPA Method 236.1	GK
Potassium	100	mg/l	1730	05/22/90	EPA Method 258.1	GK
Magnesium	11.4	mg/l	1730	04/25/90	EPA Method 242.1	GDG
Manganese	.10	mg/l	1540	04/23/90	EPA Method 243.1	GDG
Molybdenum	<.5	mg/l	1845	04/19/90	EPA Method 246.2	GK
Sodium	1500	mg/l	2130	04/24/90	EPA Method 273.1	GK
Nickel	<.1	mg/l	1610	04/19/90	EPA Method 249.1	GDG
Lead	<.001	mg/l	2200	04/26/90	EPA Method 239.2	GK

continued

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Analytical Chemistry • Waste Treatment & Disposal • Equipment Sales

Lab Sample Number: 163718 Continued

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Antimony	<.2	mg/l	1815	05/22/90	EPA Method 204.2	GK
Selenium	<.005	mg/l	2315	04/19/90	EPA Method 270.2	GK
Silicon (as Silica)	22	mg/l	1615	04/20/90	APHA Method 303C	GK
Thallium	<.005	mg/l	1445	05/07/90	EPA Method 279.2	GDG
Vanadium	<2	mg/l	2200	04/19/90	EPA Method 286.2	GK
Zinc	.84	mg/l	0900	04/19/90	EPA Method 289.1	GDG

Quality Assurance for Sample Number 163718

Sample #	Description	Result	Units	Dup/Std Value	Spk Conc.	Percent	Time	Date	By

Bill Peery

C. H. Whiteside, Ph.D., President

RECEIVED
AUG 03 1990
OIL CONSERVATION DIV.
SANTA FE

OIL CONSERVATION DIVISION
RECEIVED

'90 MAR 19 AM 9 10

El Paso
Natural Gas Company

P. O. BOX 1492
EL PASO, TEXAS 79978
PHONE: 915-541-2600

March 14, 1990

Mr. William J. LeMay
New Mexico Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87501

Subject: Request for Extension, Wingate Plant Wastewater Discharge Plan, GW-54

Dear Mr. LeMay:

On December 12, 1989 El Paso Natural Gas (El Paso) received your request to prepare a discharge plan for the Wingate Processing Plant located in McKinley County, New Mexico. Due to Christmas holidays the preparation of a scope of work for this project was delayed until early January. The scope was circulated for internal review and approval. From the scope we developed a proposal request to submit to several qualified consultants.

There have been several iterations with information requests from the respondents to the proposal request. Some of these questions were aptly answered by Mr. David Boyer's staff. We are making our final selection and anticipate commencing work on the plan on March 19.

El Paso is committed to preparing a comprehensive plan that demonstrates compliance with applicable regulations. For this reason, we respectfully request an extension for the deadline to submit the plan. Barring any unforeseen difficulties, El Paso would be able to deliver the final discharge plan to you on or before August 13, 1990.

Thank you for your consideration in this matter.

Sincerely yours,

Kenneth E. Beasley
Manager, North Region Compliance Engineering

El Paso
Natural Gas Company

OIL CONSERVATION DIVISION
RECEIVED

'90 FEB 26 AM 10 27

3801 ATRISCO NW
ALBUQUERQUE, NEW MEXICO 87120
831-7700
-7752

February 21, 1990

Mr. David Boyer
New Mexico Oil Conservation Division
State Land Office
310 Old Santa Fe Trail #206
Santa Fe, New Mexico 87504

Dear Mr. Boyer:

El Paso Natural Gas Company has received a request from McKinley County to utilize pond water from our Wingate Plant for road construction (copy attached). Mr. Ken Beasley of our El Paso office talked to you regarding this a few weeks ago. At that time you requested copies of the most recent water analysis for review. I am enclosing these.

McKinley County is anxious to begin construction of their facilities in order to be ready for the upcoming warm weather. Your timely attention to this matter is appreciated.

Sincerely,

W. David Hall

W. David Hall, P.E.
Senior Engineer

OPHELIA GONZALES-BASS
CHAIRPERSON

MARSHALL PLUMMER
COMMISSIONER

RAPHAEL MARTIN
COMMISSIONER

DONALD L. JORDAN
MANAGER

County of McKinley

P. O. Box 70
GALLUP, NEW MEXICO 87305—0070
505 — 722-3868

January 8, 1990

Mr. Gregory C. Kardos
El Paso Natural Gas Co.
P. O. Box 368
Gallup, New Mexico 87305

Dear Mr. Kardos:

After our meeting on January 5, 1990, I contacted Mr. Lord in Farmington. He suggested that all correspondence and discussions regarding the proposed water agreement be channeled through your office. I will therefore outline our proposal to E P N G as follows:

The McKinley County Commission and Vernon Hamilton Construction Company request permission to utilize any excess pond water located on your Wingate plant site. This water will be used for road construction purposes only.

McKinley County and Vernon Hamilton will provide all the necessary equipment required to pump the water from the pond into water trucks. Vernon Hamilton has indicated that he would pave the area from the existing paving to the pump site.

McKinley County and Vernon Hamilton both agree to provide E P N G any documents required to protect E P N G from any liability or responsibility for the pump, quantity or quality of water. In addition, both parties agree to abide by all E P N G safety requirements or regulations.

We appreciate your willingness to pursue this proposal and will be available to provide any information or documentation that may be required.

Sincerely,

James C. Radosevich

James C. Radosevich
Public Works Director

JCR/rmg

cc: Vernon Hamilton Inc.

CDS LABORATORIES
75 SUTTLE STREET
P.O. BOX 2605
DURANGO CO 81302
(303) 247-4220

CLIENT: El Paso Natural Gas
P O Box 4390
Farmington, NM 87419

ATTN: John Lambdin

CDS ID# 1185
SAMPLE DESCRIPTION:
A89156 Wingate Plant West Pond

SAMPLER:
DATE TAKEN: 10/17/89 TIME: 1400
DATE RECEIVED: 10/19/89 COC: Yes

TRACE METALS TOTAL DISSOLVED	mg/L	CHEMICAL PARAMETERS	mg/L	PHYSICAL PARAMETERS		
ALUMINUM		BICARBONATE as HCO3	218	ACIDITY as CaCO3		mg/L
ANTIMONY		HYDROXIDE as CaCO3		ALKALINITY as CaCO3	298	mg/L
ARSENIC		CARBONATE as CO3	80	COLOR		
BARIUM		BOD		CONDUCTIVITY		umho/cm
BERYLLIUM		BORON		DISSOLVED OXYGEN		mg/L
BISMUTH		COD		HARDNESS as CaCO3		mg/L
CADMIUM		CHLORIDE		pH	8.18	UNITS
CALCIUM	871	CHLORINE	64600	SPECIFIC GRAVITY		
CHROMIUM		CHLORINE DEMAND		TEMPRATURE		DEGREES C.
+3 FORM		COLIFORM-TOTAL/100ml		TOTAL COMBUSTABLE		mg/L
+6 FORM		COLIFORM-FECAL/100ml		TOTAL DISSOLVED SOLIDS	145,000	mg/L
COBALT		CYANIDE		TOTAL FILTERABLE SOLIDS		mg/L
COPPER		FLUORIDE	3.30	TOTAL SOLIDS		mg/L
IRON		MBAS		TOTAL SUSPENDED SOLIDS		mg/L
LEAD		AMMONIA-N		TOTAL SETTLEABLE SOLIDS		ml/L
MAGNESIUM	3450	NITRATE/NITRITE-N		TURBIDITY		NTU
MANGANESE		NITRATE-N				
MERCURY		NITRITE-N				
MOLYBDENUM		TOTAL KJELDAHL (TKN)-N		GROSS ALPHA		pCi/L
NICKEL		OIL AND GREASE		GROSS BETA		pCi/L
POTASSIUM		PHENOLS		RADIUM 226		pCi/L
SELENIUM		PHOSPHATE-P	.70	RADIUM 228		pCi/L
SILVER		TOTAL PHOSPHORUS-P		URANIUM (NATURAL)		pCi/L
SODIUM	24800	SILICA	9.1			
THALLIUM		SULFATE	20000	ENDRIN		mg/L
TIN		SULFIDE		LINDANE		mg/L
VANADIUM		SULFITE		METHOXYCHLOR		mg/L
ZINC		H2S as S		TOXAPHENE		mg/L
		SAR		2, 4, -D		mg/L
		TOC		2, 4, 5 -TP (silvex)		mg/L
		+/- BALANCE		TOTAL TRIHALOMETHANES		mg/L

COMMENTS:

APPROVED BY: Joe Bowden
DR. JOE BOWDEN, DIRECTOR

CHECKED BY: SKD

CDS LABORATORIES
75 SUTTLE STREET
P.O. BOX 2605
DURANGO CO 81302
(303) 247-4220

CLIENT: El Paso Natural Gas
P O Box 4990
Farmington, NM 87419

ATTN: John Lambdin

CDS ID# 1184
SAMPLE DESCRIPTION:
A89155 WINGATE PLANT
EAST POND OVERFLOW
SAMPLER:
DATE TAKEN: 10/17/89 TIME: 1400
DATE RECEIVED: 10/19/89 COC: Yes

TRACE METALS TOTAL DISSOLVED	mg/L	CHEMICAL PARAMETERS	mg/L	PHYSICAL PARAMETERS		
ALUMINUM		BICARBONATE as HCO_3	1	ACIDITY as $CaCO_3$		mg/L
ANTIMONY		HYDROXIDE as $CaCO_3$		ALKALINITY as $CaCO_3$	105	mg/L
ARSENIC	.001	CARBONATE as CO_3	104	COLOR		
BARIUM	< .5	BOD		RESISITIVITY		ohm-cm
BERYLLIUM		BORON		DISSOLVED OXYGEN		mg/L
BISMUTH		COD		HARDNESS as $CaCO_3$		mg/L
CADMIUM	< .005	CHLORIDE	5760	pH	9.58	UNITS
CALCIUM	528	CHLORINE		SPECIFIC GRAVITY		
CHROMIUM	< .01	CHLORINE DEMAND		TEMPRATURE		DEGREES C.
+3 FORM		COLIFORM-TOTAL/100ml		TOTAL COMBUSTABLE		mg/L
+6 FORM		COLIFORM-FECAL/100ml		TOTAL DISSOLVED SOLIDS	14400	mg/L
COBALT		CYANIDE		TOTAL FILTERABLE SOLIDS		mg/L
COPPER		FLUORIDE	.65	TOTAL SOLIDS		mg/L
IRON		MBAS		TOTAL SUSPENDED SOLIDS		mg/L
LEAD	.08	AMMONIA-N		TOTAL SETTLEABLE SOLIDS		ml/L
MAGNESIUM	291	NITRATE/NITRITE-N		TURBIDITY		NTU
MANGANESE		NITRATE-N				
MERCURY	< .001	NITRITE-N				
MOLYBDENUM		TOTAL KJELDAHL (TKN)-N		GROSS ALPHA		pCi/L
NICKEL		OIL AND GREASE		GROSS BETA		pCi/L
POTASSIUM		PHENOLS		RADIUM 226		pCi/L
SELENIUM	< .001	PHOSPHATE-P	.18	RADIUM 228		pCi/L
SILVER	< .01	TOTAL PHOSPHORUS-P		URANIUM (NATURAL)		pCi/L
SODIUM	3440	SILICA	8.0			
THALLIUM		SULFATE	3300	ENDRIN		mg/L
TIN		SULFIDE		LINDANE		mg/L
VANADIUM		SULFITE		METHOXYCHLOR		mg/L
ZINC		H_2S as S		TOXAPHENE		mg/L
		SAR		2, 4, -D		mg/L
		TOC	11.4	2, 4, 5 -TP (silvex)		mg/L
		+/- BALANCE		TOTAL TRIHALOMETHANES		mg/L

COMMENTS:

APPROVED BY: Joe Bowden
DR. JOE BOWDEN, DIRECTOR

CHECKED BY: SKD

CDS LABORATORIES
P O BOX 2605
DURANGO, CO 81302

(303) 247-4220

EL PASO NATURAL GAS
P O BOX 4990
FARMINGTON, NM 87419

NOVEMBER 23, 1989

METHOD 8020
AROMATIC VOLATILE ORGANICS

CDS ID: 1184
SAMPLE ID: A89155 Wingate Plant East Pond Overflow
DATE TAKEN: 10/17/89
DATE REC'D: 10/19/89
TIME: 1400

	mg/L	Detection Limit
Benzene	< .010	.010
Ethyl benzene	< .010	.010
Toluene	< .010	.010
Xylenes	< .010	.010

Approved by: ______________________ Checked by: SKD
Dr. Joe Bowden, Director

OIL CONSERVATION DIVISION

Santa Fe, New Mexico

TELECOPIER TRANSMITTAL SHEET

TO: DAVE Hall / EPNG ALB

FROM: DAVE BOYER, NM OCD (Phone 827-5812)

DATE: 4/20/90

NUMBER OF SHEETS (INCLUDING TRANSMITTAL SHEET): 2 (cover + 4/20 letter)

IF YOU HAVE ANY PROBLEMS WITH THIS TRANSMISSION, PLEASE CALL (505) 827-5806.

MESSAGE

Dave – In response to your phone call today, I will approve use of 50,000 gallons before submittal of the additional information provided I receive information on the material requested in item #3 of my letter.

Dave

FAX 831-7739

(505) 827-5741

03

RECEIVED
DEC 13 1989
OIL CON. DIV
DIST

ENVIRONMENTAL RELEASE REPORTING

1. Name of Reporter, Phone Number - G.C. Kardos, 505-611-4245
2. Company Name - El Paso Natural Gas
3. Mailing Address - P.O. Box 1492, El Paso, Texas

4. Geographical location of release - County, State, Section, Township, Range, distance from major geographical landmark (ideally a town) - Section 17, T-15-N, R-17-W, McKinley County, New Mexico. 6 Miles East of Gallup, New Mexico.

5. Type of Facility (Drilling Well, Producing Well, Tank Battery, Pipeline, Gasoline Plant, Oil Refinery, Other) - Fractionating Plant.

6. Name of Facility - Wingate Plant

7. Date and hour of occurrence - 7:30 P.M. 12/07/89

8. Did the spill reach a waterway? No

9. What was the environment where the release took place? (Soil, a wash, in a populated area, on pavement, in a building?) Gravel over soil. 120 feet X 15-20 feet area covered.

   a. Surface conditions (Sandy, Sandy loam, Clay, Rocky, Wet Dry Snow) Clayey soil under gravel, dry

   b. Describe General Conditions Prevailing (Temperature, Precipitation, etc.) dry, 35 degrees

10. Were there deaths, injuries, or evacuations? No

11. What was the material spilled? Mixed solution for chemical cleaning a boiler. Contained 2% Ammonium Hydroxide, .3% Sodium Bromate, .08% Sodium Sulfite, .5% Ammonium Bicarbonate, .6% HCl. pH of the solution as it was released was 5.9 - 6.1.

12. What was the amount spilled? 100 gallons

13. Where was the release from? A tank truck

14. What caused the release? While neutralizing the basic solution used to clean a boiler, foaming occurred which caused the release.

15. What was remedial action? Neutralize with Soda Ash to pH 7.

16. Volume of fluid recovered. None, soaked a couple of inches into the ground.

17. Were any state or local agencies notified? If so, to whom, by whom and date and hour. - Yes, NMOCD, Frank Chavez, K.E. Beasley, 12/7/89, 8:30 A.M.

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

December 8, 1989

CERTIFIED MAIL
RETURN RECEIPT NO. P-106-675-199

Mr. Kenneth E. Beasley, Manager
North Region Compliance Engineering
EL PASO NATURAL GAS COMPANY
P. O. Box 1492
El Paso, Texas 79978

RE: Discharge Plan GW-54
Wingate Gas Procesing Plant
McKinley County, New Mexico

Dear Mr. Beasley:

Under the provisions of the Water Quality Control Commission (WQCC) Regulations, you are hereby notified that the filing of a discharge plan is required for your existing Wingate Gas Processing Plant located in Section 16, Township 15 South, Range 17 East, (NMPM), McKinley County, New Mexico.

This notification of discharge plan requirement is pursuant to Sections 3-104 and 3-106 of the WQCC Regulations. The discharge plan, defined in Section 1.101.P. of the WQCC Regulations, should cover all discharges of effluent or leachate at the plant site or adjacent to the plant site. Included in the application should be plans for controlling spills and accidental discharges at the facility (including detection of leaks in buried underground tanks and/or piping), and closure plans for any ponds whose use will be discontinued.

A copy of the regulations is enclosed for your convenience. Also enclosed is a copy of an OCD guide to the preparation of discharge plans for gas processing plants. The guidelines are presently being revised to include berming of tanks, curbing and paving of process areas susceptible to leaks or spills and the disposition of any solid wastes. Please include these items in your ~~renewa~~l application. Three copies of your discharge plan should be submitted for review purposes.

Mr. Kenneth E. Beasley
December 8, 1989
Page -2-

Section 3-106.A. of the regulations requires a submittal of the discharge plan within 120 days of receipt of this notice unless an extension of this time period is sought and approved for good cause. Section 3-106.A also allows the discharge to continue without an approved discharge plan until 240 days after written notification by the Director of the OCD that a discharge plan is required. An extension of this time may be sought and approved for good cause.

If there are any questions on this matter, please feel free to call David Boyer at 827-5812, or Roger Anderson at 827-5884 as they have the assigned responsibility for review of all discharge plans.

Sincerely,

William J. LeMay
Director

WJL/RCA/sl

cc: OCD Aztec Office

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

3. Article Addressed to:
El Paso Natural Gas
PO BOX 1492
El Paso, TX 79978
attn: Kenneth Beasley

4. Article Number
P106675199

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

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Address
X

6. Signature — Agent
X

7. Date of Delivery

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

PS Form 3811, Mar. 1988 * U.S.G.P.O. 1988-212-865 DOMESTIC RETURN RECEIPT

El Paso
Natural Gas Company

3801 ATRISCO NW
ALBUQUERQUE, NEW MEXICO 87120

RECEIVED
JUN 15 1989
OIL CON. DIV
DIST. 3

RECEIVED
JUN 22 1989
OIL CONSERVATION DIV.
SANTA FE

June 13, 1989

Mr. Frank Chavez
State of New Mexico
Oil Conservation Division
1000 Rio Brazos Road
Aztec, New Mexico 87410

RE: Wastewater Hauling-Wingate Plant

Dear Mr. Chavez:

Per our discussion today, El Paso Natural Gas Company has received two requests to use water from the disposal ponds at Wingate Plant, McKinley County, New Mexico. The water will be used for road construction and dust suppression.

The disposal pond influent consists primarily of cooling tower blowdown, boiler blowdown and water softener regenerator blowdown.

Based on your verbal approval, we will notify the requesting parties they may proceed as required.

Sincerely,

W. D. Hall

W. D. Hall
Senior Compliance Engineer

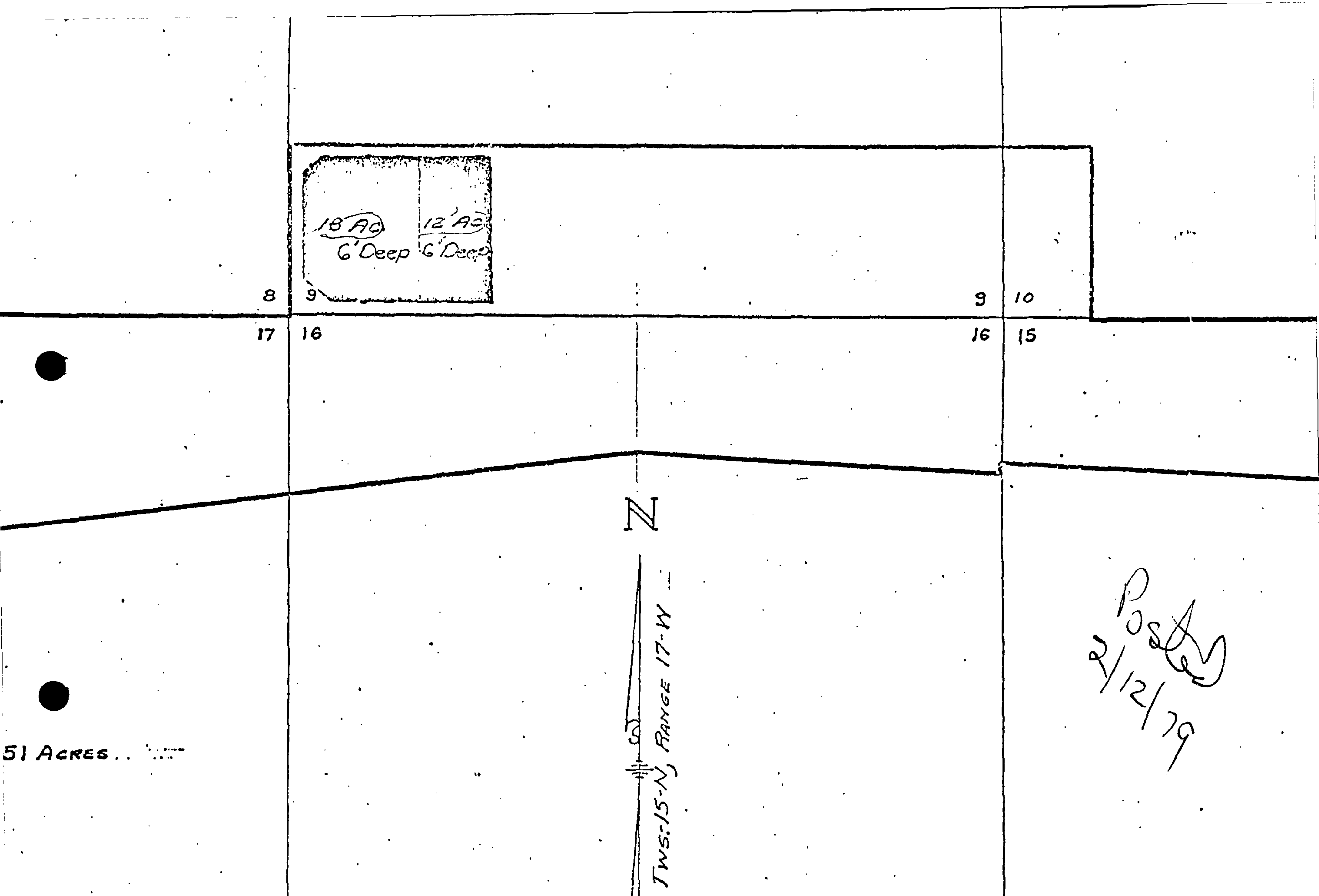
cc: K. E. Beasley
G. C. Kardos
File

WINGATE PLANT

These ponds receive all waste water from the plant and camp. The water from Pond #1 flows by gravity into Pond #2. All sanitary sewage goes through a septic system before being pumped into these waste ponds.

Annual volume - 36,013,000 gallons.

The ponds are lined with rock rip-rap.



EL PASO NATURAL GAS COMPANY
EL PASO, TEXAS

WINGATE PLANT SIT

SCALE 1" = 1000'	DATE 9-22-72	N
DRAWN BY RAF	CHECKED BY	

-.1 (5-52)

EL PASO NATURAL GAS COMPANY
SAN JUAN DIVISION LABORATORY
DECEMBER 6, 1978
WATER ANALYSIS

WINGATE PLANT WASTE WATER POND

SAMPLE SECURED 11-29-78 by H.L. HADLOCK

ANALYSIS NUMBER: 2-9385

pH	6.8
Total hardness as $CaCO_3$	4500
Calcium as $CaCO_3$	2350
Magnesium as $CaCO_3$	2150
P Alkalinity as $CaCO_3$	0
Total Alkalinity as $CaCO_3$	8
Cloride as Cl	835
Sulfate as SO_4	6350
Silica as SiO_2	
Iron as Fe	
Total Solids	23950
Sodium as Na	
Chromate as Cr	2.4
Conductivity @ 25°C	15000
Phosphate as PO_4	0

--all results expressed as parts per million --- trace is less than 0.1 ppm --

REMARKS:

cc; G.B.Harshfield
J.L.Allison
L.E.McElrath Jr.
L.J.Estlack
M.A.Manley
File

R. L. Ellsbury
Chemist

El Paso
Natural Gas Company

RECEIVED
AUG - 7 1987
OIL CONSERVATION DIVISION
SANTA FE

P. O. BOX 4990
FARMINGTON, NEW MEXICO 87499
PHONE: 505-325-2841

August 5, 1987

Mr. David G. Boyer
Hydrogeologist/Environmental Bureau Chief
Energy and Minerals Department
New Mexico Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87501-2088

Subject: New Mexico Highway Department use of Wingate Plant Wastewater

Dear Mr. Boyer:

Attached are the analytical results for samples collected from the two wastewater ponds at the El Paso Natural Gas Company's Wingate Plant. As we have discussed, Mr. Ken Parker of the New Mexico Highway Department has requested the use of this water as a dust suppressant during construction activities in the near future. We would appreciate your granting permission for this use. Any correspondence related to this issue should be addressed to El Paso and the New Mexico Highway Department. Please feel free to contact me at (505)-325-2841 or Mr. Parker at (505)-827-5361 should you require further information.

Sincerely yours,

Kenneth E. Beasley III
Compliance Engineer

KEB:cam

cc: Ken Parker
New Mexico Highway Department
P.O. Box 1149
Santa Fe, New Mexico 87504-1149

Report of Chemical Analysis

Consulting Geotechnical, Materials and Environmental Engineers
Geologists, Scientists and Chemists

Raba-Kistner Consultants, Inc.

P.O. Box 690287, San Antonio, TX 78269-0287
12821 W. Golden Lane, San Antonio, TX 78249
(512) 699-9090

To: El Paso Natural Gas Company
P.O. Box 4990
Farmington, New Mexico 87499

Attn: Mr. Kenneth E. Beasley

Project No.: SA0687-0003-007
Assignment No.: 6-10983
Date: 6/05/87

Subject: Chemical Analysis of Water Sample

Background: Water samples were reportedly collected from Wingate Plant by Mr. Kardos with EPNG on 5/14/87.

Test Method: Metals - EPA Method 600/4-79-020
VOAs - EPA 624

Test Results:

	Wastewater Pond No. 1, J87-013 (6-10735-1)	Wastewater No. 2, J87-014 (6-10735-2)
I. Metals:		
Arsenic, mg/L	<0.01	<0.01
Barium, mg/L	<0.3	<0.3
Cadmium, mg/L	0.03	0.12
Chromium, mg/L	0.02	0.07
Lead, mg/L	0.19	0.49
Mercury, mg/L	<0.001	<0.001
Selenium, mg/L	<0.01	<0.01
Silver, mg/L	0.03	0.09
II. VOA	See attached	See Attached

Raba-Kistner Consultants, Inc.

by

Frank B. Schweitzer
Vice-President, Chemistry

Project No.: SA0687-0003-007
Assignment No.: J87-013 (6-10983)

(PURGEABLES)
(EPA Method 624)

Compound	Concentration (ug/L)	Method Detection Limits (ug/L)
Chloromethane	N.D.	5.0
Bromomethane	N.D.	5.0
Vinyl Chloride	N.D.	10.0
Chloroethane	N.D.	5.0
Methylene Chloride	N.D.	2.8
Trichlorofluoromethane	N.D.	5.0
1,1-Dichloroethene	N.D	2.8
1,1-Dichloroethane	N.D.	4.7
Trans-1,2-Dichloroethene	N.D.	1.6
Chloroform	N.D.	1.6
1,2-Dichloroethane	N.D.	2.8
1,1,1-Trichloroethane	N.D.	3.8
Carbon Tetrachloride	N.D.	2.8
Bromodichloromethane	N.D.	2.2
1,2-Dichloropropane	N.D.	6.0
Trans-1,3-Dichloropropene	N.D.	5.0
Trichloroethene	N.D	1.9
Dibromochloromethane	N.D.	3.1
1,1,2-Trichloroethane	N.D	5.0
cis-1,3-Dichloropropene	N.D.	5.0
Benzene	N.D.	4.4
2-Chloroethylvinyl Ether	N.D.	5.0
Bromoform	N.D.	4.7
1,1,2,2-Tetrachloroethane	N.D.	6.9
Tetrachloroethene	N.D	4.1
Toluene	N.D.	6.0
Chlorobenzene	N.D.	6.0
Ethylbenzene	N.D.	7.2
Xylenes	N.D.	5.0

N.D.= Not Detected

Project No.: SA0687-0003-007
Assignment No.: J87-104 (6-10735-2)

(PURGEABLES)
(EPA Method 624)

Compound	Concentration (ug/L)	Method Detection Limits (ug/L)
Chloromethane	N.D.	5.0
Bromomethane	N.D.	5.0
Vinyl Chloride	N.D.	10.0
Chloroethane	N.D.	5.0
Methylene Chloride	N.D.	2.8
Trichlorofluoromethane	N.D.	5.0
1,1-Dichloroethene	N.D	2.8
1,1-Dichloroethane	N.D.	4.7
Trans-1,2-Dichloroethene	N.D.	1.6
Chloroform	N.D.	1.6
1,2-Dichloroethane	N.D.	2.8
1,1,1-Trichloroethane	N.D.	3.8
Carbon Tetrachloride	N.D.	2.8
Bromodichloromethane	N.D.	2.2
1,2-Dichloropropane	N.D.	6.0
Trans-1,3-Dichloropropene	N.D.	5.0
Trichloroethene	N.D	1.9
Dibromochloromethane	N.D.	3.1
1,1,2-Trichloroethane	N.D	5.0
cis-1,3-Dichloropropene	N.D.	5.0
Benzene	N.D.	4.4
2-Chloroethylvinyl Ether	N.D.	5.0
Bromoform	N.D.	4.7
1,1,2,2-Tetrachloroethane	N.D.	6.9
Tetrachloroethene	N.D	4.1
Toluene	N.D.	6.0
Chlorobenzene	N.D.	6.0
Ethylbenzene	N.D.	7.2
Xylenes	N.D.	5.0

N.D.= Not Detected

EL PASO NATURAL GAS COMPANY
SAN JUAN DIVISION LABORATORY
FARMINGTON, NEW MEXICO
PROCESS WATER ANALYSIS

SAMPLE NAME: WINGATE POND #1
DATE SECURED: MAY 14, 1987

ANALYSIS NO.: 2-12154
SECURED BY: G.C. MARCOS

COMPONENT	SAMPLE SIZE	ml. TIT	AS $CaCO_3$	AS ION	epm
pH				8.77	
TOTAL ALKALINITY	50	6.4	128		
P ALKALINITY	50	1.5	30		
BICARBONATE	50	3.4	68	83	1.36
CARBONATE	50	3	60	36	1.20
HYDROXIDE	50	0	0	0	0.00
CHLORIDE	10	48.4		4840	136.45
SULFATE				2321	48.28
TOTAL HARDNESS	10	23.8	2380		
CALCIUM	10	12.9	1290	516	25.8
MAGNESIUM	10	10.9	1090	267	21.95
IRON				PRESENT	
SODIUM (CALCULATED)				3210	139.57
CHROMIUM AS CrO4				NT	
SULFITE AS SO3				NT	
PHOSPHATE AS PO4				NT	
TOTAL DISSOLVED SOLIDS				12300	
CONDUCTIVITY AT 25C.				18500 MICROMHOS	

ALL RESULTS EXPRESSED AS PARTS PER MILLION-TRACE IS LESS THAN 0.1 ppm

cc: [redacted]
J. F. BARNETT
FILE

Sandra Aragon
CHEMIST

SCF 1/86

EL PASO NATURAL GAS COMPANY
SAN JUAN DIVISION LABORATORY
FARMINGTON, NEW MEXICO
PRODUCED WATER ANALYSIS

SAMPLE NAME: WINGATE POND #2
DATE SECURED: MAY 14, 19[illegible]7

ANALYSIS NO.: D-10155
SECURED BY: G.C. [illegible]RIOS

COMPONENT	SAMPLE SIZE	ml. TIT	AS CaCO3	AS ION	epm
pH				8.31	
TOTAL ALKALINITY	50	7.4	148		
P ALKALINITY	50	1.2	24		
BICARBONATE	50	5	100	122	2.00
CARBONATE	50	2.4	48	24	[illegible]
HYDROXIDE	50	0	0	0	0.00
CHLORIDE	25(100:1)	[illegible]		32,800 [illegible]	924.9[illegible]
SULFATE				[illegible]190	191.01
TOTAL HARDNESS	5	47.4	9480		
CALCIUM	5	14.2	2840	[illegible]	56.8
MAGNESIUM	5	33.2	6640	1627	1[illegible]3.72
IRON				PRESENT	
SODIUM (CALCULATED)				21256	925.61
CHROMIUM AS CrO4				NT	
SULFIDE AS H2S				NT	
PHOSPHATE AS PO4				NT	
TOTAL DISSOLVED SOLIDS				[illegible]8240 68240	
CONDUCTIVITY AT 25C.				116900 MICROMHOS	

ALL RESULTS EXPRESSED AS PARTS PER MILLION-TRACE IS LESS THAN 0.1 ppm

CC: [redacted]
J. F. BARNETT
FILE

Sandra Aragon
CHEMIST

DC [illegible]786