

GW - 30

REPORTS

YEAR(S):

1989

RM ENVIRONMENTAL IMPROVEMENT DIVISION, HAZARDOUS WASTE SECTION

CHAIN OF CUSTODY RECORD

PROJECT NO. PROJECT NAME			STATION LOCATION		NO. OF CONTAINERS	REMARKS			
DATE	TIME	BY	TO	INITIALS		DATE	TIME	BY	TO
8/28/85 10:28			X		1	w/HNO ₃			
8/28/85 10:30			X		1	w/H ₂ SO ₄			
8/28/85 10:35			X		1				
8/28/85 10:40			X		2				
8/28/85 11:25			X		1	w/HNO ₃			
8/28/85 11:30			X		1	w/H ₂ SO ₄			
8/28/85 11:35			X		1				
8/28/85 11:45			X		2				
8/28/85 12:25			X		1	w/HNO ₃			
8/28/85 12:30			X		1	w/H ₂ SO ₄			
8/28/85 12:35			X		1				
8/28/85 12:45			X		2				
8/28/85 1:20			X		1	w/HNO ₃			
8/28/85 1:30			X		1	w/H ₂ SO ₄			
8/28/85 1:40			X		1				

Received by: (Signature)	Date / Time	SEALS INTACT	YES ☐ NO ☐	Signature
<i>R. Phillips</i>	8/28/85			
Received by: (Signature)	Date / Time			Signature
<i>R. Phillips</i>	8/28/85			
Received by: (Signature)	Date / Time			Signature
<i>R. Phillips</i>	8/28/85			

RH ENVIRONMENTAL IMPROVEMENT DIVISION, HAZARDOUS WASTE SECTION

CHAIN OF CUSTODY RECORD

PROJECT NAME Phillips Lusk		STATION LOCATION		NO. OF CONTAINERS	REMARKS			
STA. NO.	DATE	TIME	DATE		TIME	DATE	TIME	REMARKS
14W-1	8/28/85	1:45		2				
14W-2	8/28/85			1				
14W-3	8/28/85			1				
14W-4	8/28/85			1				
14W-5	8/28/85			1				
14W-6	8/28/85			1				
14W-7	8/28/85			1				
14W-8	8/28/85			1				
14W-9	8/28/85			1				
14W-10	8/28/85			1				
14W-11	8/28/85			1				
14W-12	8/28/85			1				
14W-13	8/28/85			1				
14W-14	8/28/85			1				
14W-15	8/28/85			1				
14W-16	8/28/85			1				
14W-17	8/28/85			1				
14W-18	8/28/85			1				
14W-19	8/28/85			1				
14W-20	8/28/85			1				
14W-21	8/28/85			1				
14W-22	8/28/85			1				
14W-23	8/28/85			1				
14W-24	8/28/85			1				
14W-25	8/28/85			1				
14W-26	8/28/85			1				
14W-27	8/28/85			1				
14W-28	8/28/85			1				
14W-29	8/28/85			1				
14W-30	8/28/85			1				
14W-31	8/28/85			1				
14W-32	8/28/85			1				
14W-33	8/28/85			1				
14W-34	8/28/85			1				
14W-35	8/28/85			1				
14W-36	8/28/85			1				
14W-37	8/28/85			1				
14W-38	8/28/85			1				
14W-39	8/28/85			1				
14W-40	8/28/85			1				
14W-41	8/28/85			1				
14W-42	8/28/85			1				
14W-43	8/28/85			1				
14W-44	8/28/85			1				
14W-45	8/28/85			1				
14W-46	8/28/85			1				
14W-47	8/28/85			1				
14W-48	8/28/85			1				
14W-49	8/28/85			1				
14W-50	8/28/85			1				
14W-51	8/28/85			1				
14W-52	8/28/85			1				
14W-53	8/28/85			1				
14W-54	8/28/85			1				
14W-55	8/28/85			1				
14W-56	8/28/85			1				
14W-57	8/28/85			1				
14W-58	8/28/85			1				
14W-59	8/28/85			1				
14W-60	8/28/85			1				
14W-61	8/28/85			1				
14W-62	8/28/85			1				
14W-63	8/28/85			1				
14W-64	8/28/85			1				
14W-65	8/28/85			1				
14W-66	8/28/85			1				
14W-67	8/28/85			1				
14W-68	8/28/85			1				
14W-69	8/28/85			1				
14W-70	8/28/85			1				
14W-71	8/28/85			1				
14W-72	8/28/85			1				
14W-73	8/28/85			1				
14W-74	8/28/85			1				
14W-75	8/28/85			1				
14W-76	8/28/85			1				
14W-77	8/28/85			1				
14W-78	8/28/85			1				
14W-79	8/28/85			1				
14W-80	8/28/85			1				
14W-81	8/28/85			1				
14W-82	8/28/85			1				
14W-83	8/28/85			1				
14W-84	8/28/85			1				
14W-85	8/28/85			1				
14W-86	8/28/85			1				
14W-87	8/28/85			1				
14W-88	8/28/85			1				
14W-89	8/28/85			1				
14W-90	8/28/85			1				
14W-91	8/28/85			1				
14W-92	8/28/85			1				
14W-93	8/28/85			1				
14W-94	8/28/85			1				
14W-95	8/28/85			1				
14W-96	8/28/85			1				
14W-97	8/28/85			1				
14W-98	8/28/85			1				
14W-99	8/28/85			1				
14W-100	8/28/85			1				

SCIENTIFIC LABORATORY DIVISION

1000 Camino de Salud NE, Albuquerque, New Mexico 87105
(505) 841-2500

REPORT TO: Alice Baez, Hazardous Waste Section
NM510 725 St. Michaels Drive P.O. Box 9168
Santa Fe, New Mexico 87504

S.L.D. No.: OR-85-898

DATE REC.: 8/29/85

PHONE 505-984-0020 EX. 340

USER CODE: 53300

CONTAINERS WHICH ACCOMPANY THIS FORM ARE COLLECTIVELY REFERRED TO AS SAMPLE.

SUBMITTER: A. Baez

CODE

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LOCATION: Phillips - Lusk

CODE

TOWNSHIP			RANGE			SECTION			TRACTS		

SOURCE: NW-1

CODE

AQUIFER					DEPTH				

COLLECTED: 8/28/85 BY A. Baez

CODE

Y	Y	M	M	D	D	H	H	M	M
I	I	I	I	I	I	I	I	I	I

SAMPLE TYPE: WATER SOIL OTHER

CODE

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NEAREST CITY: Albuquerque

CODE

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pH= 1.0; Conductivity= 1800 umho/cm at 25 °C; Chlorine Residual=

Dissolved Oxygen= mg/l; Alkalinity=; Flow Rate=

Sampling Location, Methods and Remarks (i.e. colors, etc.)

Upgradient well #1

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Alice Baez

Method of shipment to the Laboratory Insulator Courier

This form accompanies 2 Septum Vials, 1 Glass Jugs,

Containers are marked as follows to indicate preservation (circle):

NP: No preservation; sample stored at room temperature.

P-Ice Sample stored in an ice bath (not frozen).

P-Na₂S₂O₃: Sample preserved with Na₂S₂O₃ to remove chlorine residual.

I (we) certify that this sample was transferred from Alice Baez to Rick Meyerheim at (location) SLD - Albuquerque on (date & time) and that the statements in this block are correct

Evidentiary Seals: Not Sealed Intact: Yes No

Signatures Alice Baez

(we) certify that this sample was transferred from to at (location) on (date & time) and that the statements in this block are correct

Evidentiary Seals: Not Sealed Intact: Yes No

Signatures

MW-1

QUALITATIVE	QUANTITATIVE	PURGEABLE SCREENS	QUALITATIVE	QUANTITATIVE	EXTRACTABLE SCREENS
		ALIPHATIC HYDROCARBON SCREEN			ALIPHATIC HYDROCARBONS
		AROMATIC HYDROCARBON SCREEN			CHLORINATED HYDROCARBON PESTICIDES
		HALOGENATED HYDROCARBON SCREEN			CHLOROPHENOXY ACID HERBICIDES
✓	✓	GAS CHROMATOGRAPH/MASS SPECTROMETER			HYDROCARBON FUEL SCREEN
					ORGANOPHOSPHATE PESTICIDES
					POLYCHLORINATED BIPHENYLS (PCB's)
					POLYNUCLEAR AROMATIC HYDROCARBONS
					TRIAZINE HERBICIDES
		SPECIFIC COMPOUNDS			SPECIFIC COMPOUNDS

ANALYTICAL RESULTS

COMPOUND	[PPB]	COMPOUND	[PPB]
GC/MS Purgeables	None Detected *		
		* DETECTION LIMIT	1ug/l

REMARKS: No purgeables detected by GC/MS

Seal(s) Intact: Yes X NO . Seal(s) broken by: R Meyerhein date: 9/12/85
I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.
Date(s) of analysis: 9/12/85. Analyst's signature: R Meyerhein
I certify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers signature: (Signature)



DATE RECEIVED	8/29/85	LAB NO.	WC-4356	USER CODE	☐ 59300 ☐ 59600 ☒ OTHER: 53300
Collection DATE	8/28/85	SITE INFORMATION	Sample location	At Hills - Lunk	
Collection TIME	10:30		Collection site description	Monitor well #1	
Collected by	Person/Agency Alice Darr NMED				

SEND
FINAL
REPORT
TO

GROUND WATER & HAZARDOUS WASTE BUREAU
NM ENVIRONMENT IMPROVEMENT DIVISION/HED
Crown Building, PO Box 968
Santa Fe, NM 87504-0968
Attn: Alice Darr

Station/
well code MW-1
Owner Phillips Petroleum Co.

SAMPLING CONDITIONS

☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water level	Discharge	Sample type
pH (00400) 4.0	Conductivity (Uncorrected) 1800 @ 25° μ mho	Water Temp. (00010) °C	Conductivity at 25°C (00094) μ mho	
Field comments				

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted	2	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 μ m membrane filter	☒ A: 2 ml H ₂ SO ₄ /L added
☒ NA: No acid added ☐ Other-specify:				

ANALYTICAL RESULTS from SAMPLES

NF, NA	Units	Date analyzed	F, NA	Units	Date analyzed
☒ Conductivity (Corrected) 25°C (00095)	μ mho		☒ Calcium (00915)	mg/l	
☐ Total non-filterable residue (suspended) (00530)	mg/l		☒ Magnesium (00925)	mg/l	
☒ Other: pH			☒ Sodium (00930)	mg/l	
☐ Other:			☒ Potassium (00935)	mg/l	
☐ Other:			☒ Bicarbonate (00440)	mg/l	
			☒ Chloride (00940)	mg/l	
			☒ Sulfate (00945)	mg/l	
			☒ Total filterable residue (dissolved) (70300)	mg/l	
			☒ Other: Fluoride		
NF, A-H ₂ SO ₄			F, A-H ₂ SO ₄		
☒ Nitrate-N +, Nitrate-N total (00630)	mg/l	20.87 9/5	☐ Nitrate-N +, Nitrate-N dissolved (00631)	mg/l	
☐ Ammonia-N total (00610)	mg/l		☐ Ammonia-N dissolved (00608)	mg/l	
☐ Total Kjeldahl-N ()	mg/l		☐ Total Kjeldahl-N ()	mg/l	
☐ Chemical oxygen demand (00340)	mg/l		☐ Other:		
☒ Total organic carbon ()	mg/l	3.13 10/5			
☐ Other:					
☐ Other:					
Laboratory remarks			Analyst	Date Reported: 10/28/85	Reviewed by: [Signature]



New Mexico Health and Environment Department
SCIENTIFIC LABORATORY DIVISION
700 Camino de Salud NE
Albuquerque, NM 87106 -- (505) 841-2555

NN

GENERAL WATER CHEMISTRY
and NITROGEN ANALYSIS

DATE RECEIVED	8/29/85	LAB NO.	WC-4352	USER CODE	☐ 59300 ☐ 59600 ☒ OTHER: 53300
Collection DATE	8/28/85	SITE INFORMATION	Sample location	Phillips - Lusk	
Collection TIME	10:30		Collection site description	Monitor well #1	
Collected by	Person/Agency		Alice Bare, NMED		

SEND
FINAL
REPORT
TO

GROUND WATER & HAZARDOUS WASTE BUREAU
NM ENVIRONMENT IMPROVEMENT DIVISION/HED
Crown Building, PO Box 968
Santa Fe, NM 87504-0968
Attn: Alice Bare

Station/
well code

MW-1

Owner

Phillips Petroleum Co.

SAMPLING CONDITIONS

☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water level	Discharge	Sample type
pH (00400)	Conductivity (Uncorrected)	Water Temp. (00010)	Conductivity at 25°C (00094)	
4.0	1800 @ 25°C μ mho	°C	μ mho	
Field comments				

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted	2	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 μ m membrane filter	☒ A: 2 ml H ₂ SO ₄ /L added
☒ NA: No acid added ☐ Other-specify:				

ANALYTICAL RESULTS from SAMPLES

NF, NA	Units	Date analyzed	F, NA	Units	Date analyzed
☒ Conductivity (Corrected) 25°C (00095)	1829 μ mho	12/2	☒ Calcium (00915)	212.0 mg/l	9-17
☐ Total non-filterable residue (suspended) (00530)			☒ Magnesium (00925)	112.2 mg/l	9-17
☒ Other: pH	7.93	11/25	☒ Sodium (00930)	103.5 mg/l	9-17
☐ Other:			☒ Potassium (00935)	5.07 mg/l	9-17
☐ Other:			☒ Bicarbonate (00440)	206.9 mg/l	11/25
			☒ Chloride (00940)	150.2 mg/l	10/21
			☒ Sulfate (00945)	714.9 mg/l	10/2
			☒ Total filterable residue (dissolved) (70300)	182.5 mg/l	10/10
			☒ Other: Fluoride	1.31	10/9
NF, A-H ₂ SO ₄			E, A-H ₂ SO ₄		
☒ Nitrate-N ⁺ , Nitrate-N total (00630)	mg/l		☐ Nitrate-N ⁺ , Nitrate-N dissolved (00631)	mg/l	
☐ Ammonia-N total (00610)	mg/l		☐ Ammonia-N dissolved (00608)	mg/l	
☐ Total Kjeldahl-N ()	mg/l		☐ Total Kjeldahl-N ()	mg/l	
☐ Chemical oxygen demand (00340)	mg/l		☐ Other:		
☒ Total organic carbon ()	mg/l				
☐ Other:					
☐ Other:					
Laboratory remarks			Analyst	Date Reported	Reviewed by
				11/26/85	[Signature]

REPORT TO: Hazardous Waste Section
Environmental Improvement Division
P.O. Box 968
Santa Fe, New Mexico 87504

METALS ANALYSIS REQUEST

LAB NUMBER

DATE RECEIVED

DATE REPORTED

Attn: Alice Barr
SLD USER CODE NUMBER 53300

Sample Number: MIN-1 Location: Phillips - Lusk
Sample Type: ☒ water ☐ soil ☐ sediment ☐ sludge ☐ other
Collected (date & time) 8/28/85 by: J. BARR
Temperature: 25° celcius conductivity: 1800 umhos/cm pH: 7.0
Sample container: ☒ 1-liter cubitainer(s) ☐ 1-quart glass jar(s) ☐ other
Treatment: ☐ Filtered ☒ 2 ml HNO3 ☒ ice ☐ other

☒ WATER ANALYSIS FOR ☐ dissolved ☐ suspended ☒ total
☐ SOIL ANALYSIS FOR ☐ supernatant ☐ total digestion ☐ EP Toxicity

☒ ICAP SCAN UG/ML OR UG/G DATE ANALYZED

Aluminum	Copper	Silicon
Barium	Iron	Silver
Beryllium	Lead	Strontium
Boron	Magnesium	Tin
Cadmium	Manganese	Vanadium
Calcium	Molybdenum	Yttrium
Chromium	Nickel	Zinc
Cobalt		

☒ ATOMIC ABSORPTION UG/ML OR UG/G DATE ANALYZED

Arsenic	Selenium	Mercury

☐ EP TOXICITY MG/L DATE ANALYZED

Arsenic	Chromium	Selenium
Barium	Lead	Silver
Cadmium	Mercury	

ANALYST

REVIEWER

COMMENTS:

Real broken in lab 9-4-85 @ 4500 JK

Lab Number: HM 1563

Date Submitted: 8/29/85

By: Alice Barr

Sample Code: MW-1 Phillips Lush

Date Analyzed: 12/13/85

Reviewed By: Jim Robby

Date Reported: 12/18/85

<u>Element</u>	<u>ICAP VALUE (MG/L)</u>	<u>AA VALUE (MG/L)</u>
Aluminum	<u><0.1</u>	<u> </u>
Barium	<u><0.1</u>	<u> </u>
Beryllium	<u><0.1</u>	<u> </u>
Boron	<u>0.2</u>	<u> </u>
Cadmium	<u><0.1</u>	<u> </u>
Calcium	<u>210.</u>	<u> </u>
Chromium	<u><0.1</u>	<u> </u>
Cobalt	<u><0.1</u>	<u> </u>
Copper	<u><0.1</u>	<u> </u>
Iron	<u>0.2</u>	<u> </u>
Lead	<u><0.1</u>	<u> </u>
Magnesium	<u>94.</u>	<u> </u>
Manganese	<u><0.05</u>	<u> </u>
Molybdenum	<u><0.1</u>	<u> </u>
Nickel	<u><0.1</u>	<u> </u>
Silicon	<u>36.</u>	<u> </u>
Silver	<u><0.1</u>	<u> </u>
Strontium	<u>3.3</u>	<u> </u>
Tin	<u><0.1</u>	<u> </u>
Vanadium	<u><0.1</u>	<u> </u>
Zinc	<u><0.1</u>	<u> </u>
Arsenic		<u>0.010</u>
Selenium		<u>0.009</u>
Mercury		<u><0.0005</u>

REPORT TO: Alice Baker, Hazardous Waste Section
Waste ID #25 St. Michaels Dr. P.O. Box 948
Santa Fe, New Mexico 87504

S.L.D. No.: OR-85-899

DATE REC.: 8/29/85

PHONE 505-984-0020 Ext-345

USER CODE: 53300

CONTAINERS WHICH ACCOMPANY THIS FORM ARE COLLECTIVELY REFERRED TO AS SAMPLES.

SUBMITTER: A. Baker

CODE

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LOCATION: Phillips-Lusk

CODE

TOWNSHIP			RANGE			SECTION			TRACTS

SOURCE: NW-2

CODE

AQUIFER					DEPTH				

COLLECTED: 8/28/85 BY A. Baker/K. Crossman

CODE

Y	V	M	M	D	D	H	H	M	I

SAMPLE TYPE: WATER SOIL OTHER

CODE

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NEAREST CITY: Albuquerque

CODE

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pH= 7.0; Conductivity= 2050 umho/cm at 23 °C; Chlorine Residual=

Dissolved Oxygen= mg/l; Alkalinity=; Flow Rate=

Sampling Location, Methods and Remarks (i.e. odors, etc.)

Downgradient well #2

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Alice Baker

Method of shipment to the Laboratory Parcelator Courier

This form accompanies 2 Septum Vials, Glass Jugs,

Containers are marked as follows to indicate preservation (circle):

NP: No preservation; sample stored at room temperature.

P-Ice Sample stored in an ice bath (not frozen).

P-Na₂S₂O₃: Sample preserved with Na₂S₂O₃ to remove chlorine residual.

I (we) certify that this sample was transferred from Alice Baker
to Kirk Meyerheim at (location) SLD-Albuquerque on
(date & time) and that the statements in this block are correct

Evidentiary Seals: Not Sealed Intact: Yes No

Signatures: Alice Baker

(we) certify that this sample was transferred from
to at (location) on
(date & time) and that the statements in this block are correct

Evidentiary Seals: Not Sealed Intact: Yes No

Signatures

LAB. FILE: OPG- 899 MW-2

PURGEABLE SCREENS		EXTRACTABLE SCREENS	
QUALITATIVE	QUANTITATIVE	QUALITATIVE	QUANTITATIVE
	ALIPHATIC HYDROCARBON SCREEN		ALIPHATIC HYDROCARBONS
	AROMATIC HYDROCARBON SCREEN		CHLORINATED HYDROCARBON PESTICIDES
	HALOGENATED HYDROCARBON SCREEN		CHLOROPHENOXY ACID HERBICIDES
✓	GAS CHROMATOGRAPH/MASS SPECTROMETER		HYDROCARBON FUEL SCREEN
			ORGANOPHOSPHATE PESTICIDES
			POLYCHLORINATED BIPHENYLS (PCB's)
			POLYNUCLEAR AROMATIC HYDROCARBONS
			TRIAZINE HERBICIDES
SPECIFIC COMPOUNDS		SPECIFIC COMPOUNDS	

ANALYTICAL RESULTS

COMPOUND	[PPB]	COMPOUND	[PPB]
GC/MS Purgeables			
[Tetrahydrofuran]	[> 30]		
[Butanone]	[> 5]		
Benzene	44		
Ethy/benzene	7		
		* DETECTION LIMIT	

REMARKS: Also detected but not quantitated were: C3 substituted Benzenes at about 5 ppb and a C4 substituted benzene at about 2 ppb. Results in [Brackets] are tentative (unconfirmed) results.

Seal(s) Intact: Yes X NO . Seal(s) broken by: R Meyerhein date: 9/12/85
I certify that I followed standard laboratory procedures of handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.
Date(s) of analysis: 9/12/85. Analyst's signature: R Meyerhein
I certify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers signature: [Signature]



New Mexico Health and Environment Department
SCIENTIFIC LABORATORY DIVISION
700 Camino de Salud NE
Albuquerque, NM 87106 — (505) 841-2555

GENERAL WATER CHEMISTRY
and NITROGEN ANALYSIS

DATE RECEIVED	8/29/85	LAB NO.	WC-4355	USER CODE	☐ 59300 ☐ 59600 ☒ OTHER: 53300
Collection DATE	8/28/85	SITE INFORMATION	Sample location		
Collection TIME	11:30		Phillips - Lusk		
Collected by - Person/Agency		Collection site description			
Alice Burre, NMEID		Monitor Well #2			

SEND
FINAL
REPORT
TO

GROUND WATER & HAZARDOUS WASTE BUREAU
NM ENVIRONMENT IMPROVEMENT DIVISION/HED
Crown Building, PO Box 968
Santa Fe, NM 87504-0968
Attn: Alice Burre

Station/
well code: MW-2
Owner: Phillips Petroleum Co.

SAMPLING CONDITIONS

☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water level	Discharge	Sample type
pH (00400) 7.0	Conductivity (Uncorrected) 2050 @ 23°	µmho	Water Temp. (00010) °C	Conductivity at 25°C (00094) µmho
Field comments				

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted: 2	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 µm membrane filter	☒ A: 2 ml H ₂ SO ₄ /L added
☒ NA: No acid added ☐ Other-specify:			

ANALYTICAL RESULTS from SAMPLES

NF, NA	Units	Date analyzed	F, NA	Units	Date analyzed
☒ Conductivity (Corrected) 25°C (00095)	µmho		☒ Calcium (00915)	mg/l	
☐ Total non-filterable residue (suspended) (00530)	mg/l		☒ Magnesium (00925)	mg/l	
☒ Other: pH			☒ Sodium (00930)	mg/l	
☐ Other:			☒ Potassium (00935)	mg/l	
☐ Other:			☒ Bicarbonate (00440)	mg/l	
			☒ Chloride (00940)	mg/l	
			☒ Sulfate (00945)	mg/l	
			☒ Total filterable residue (dissolved) (70300)	mg/l	
			☒ Other: Fluoride		
NF, A-H ₂ SO ₄			F, A-H ₂ SO ₄		
☒ Nitrate-N + Nitrate-N- total (00630)	0.17	mg/l	9/5		
☐ Ammonia-N total (00610)		mg/l			
☐ Total Kjeldahl-N ()		mg/l			
☐ Chemical oxygen demand (00340)		mg/l			
☒ Total organic carbon ()	8.58	mg/l	10/28/85		
☐ Other:					
☐ Other:					
Laboratory remarks			Analyst	Date Reported	Reviewed by
				10/28/85	Alan



NN

GENERAL WATER CHEMISTRY
& NITROGEN ANALYSIS

DATE RECEIVED	8/24/85	LAB NO.	WC-4351	USER CODE	☐ 59300 ☐ 59600 ☒ OTHER: 53300
Collection DATE	8/28/85	SITE INFORMATION	Sample location		
Collection TIME	11:30		Phillips - Lusk		
Collected by - Person/Agency		Collection site description			
Alice Kier, NMEID		Monitor Well #2			

SEND FINAL REPORT TO
GROUND WATER & HAZARDOUS WASTE BUREAU
NM ENVIRONMENT IMPROVEMENT DIVISION/HED
Crown Building, PO Box 968
Santa Fe, NM 87504-0968
Attn: Alice Kier

Station/
well code NW-2
Owner Phillips Petroleum Co.

SAMPLING CONDITIONS

☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water level	Discharge	Sample type
pH (00400) 7.0		Conductivity (Uncorrected) 2050 @ 23° μ mho	Water Temp. (00010) °C	Conductivity at 25°C (00094) μ mho
Field comments				

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted 2	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 μ m membrane filter	☒ A: 2 ml H ₂ SO ₄ added
☒ NA: No acid added ☐ Other-specify:			

ANALYTICAL RESULTS from SAMPLES

NF, NA	Units	Date analyzed	F, NA	Units	Date analyzed
☒ Conductivity (Corrected) 25°C (00095)	2188 μ mho	12/2	☒ Calcium (00915)	132.0 mg/l	9-17
☐ Total non-filterable residue (suspended) (00530)			☒ Magnesium (00925)	148.8 mg/l	9-17
☒ Other: pH 8.12			☒ Sodium (00930)	142.6 mg/l	9-17
☐ Other:			☒ Potassium (00935)	2.73 mg/l	9-17
☐ Other:			☒ Bicarbonate (00440)	418.9 mg/l	11/25
			☒ Chloride (00940)	377.4 mg/l	10/21
			☒ Sulfate (00945)	246.3 mg/l	10/8
			☒ Total filterable residue (dissolved) (70300)	1578 mg/l	10/10
			☒ Other: Fluoride	2.09	10/9
NF, A-H ₂ SO ₄			F, A-H ₂ SO ₄		
☒ Nitrate-N + Nitrate-N total (00630)	mg/l		☐ Nitrate-N + Nitrate-N dissolved (00631)	mg/l	
☐ Ammonia-N total (00610)	mg/l		☐ Ammonia-N dissolved (00608)	mg/l	
☐ Total Kjeldahl-N ()	mg/l		☐ Total Kjeldahl-N ()	mg/l	
☐ Chemical oxygen demand (00340)	mg/l		☐ Other:		
☒ Total organic carbon ()	mg/l				
☐ Other:					
☐ Other:					

Analyst Date Reported 11/26/85 Reviewed by

Laboratory remarks

SCIENTIFIC LABORATORY DIVISION

700 Southside Saled NE, Albuquerque, New Mexico 87105
(505) 841-2500

REPORT TO: Alia Base Hazardous Waste Section
MAILID 725 St. Michaels Drive P.O. Box 968
Santa Fe, New Mexico 87504

S.L.D. No.: OR- 85-900

DATE REC.: 8/29/85

PHONE 505-984-0020 Ext. 346

USER CODE: 53300

CONTAINERS WHICH ACCOMPANY THIS FORM ARE COLLECTIVELY REFERED TO AS SAMPLE.

SUBMITTER: A. Base CODE
LOCATION: Phillips - Lusk CODE
SOURCE: WW-3 CODE
COLLECTED: 8/28/85 BY A. Base / K. Crossman CODE
SAMPLE TYPE: WATER SOIL OTHER CODE
NEAREST CITY: Hobbs CODE

pH= 7.0; Conductivity= 2950 umho/cm at 23 °C; Chlorine Residual= _____
Dissolved Oxygen= _____ mg/l; Alkalinity= _____; Flow Rate= _____
Sampling Location, Methods and Remarks (i.e. odors, etc.)
Downgradient well #3

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. A. Base

Method of shipment to the Laboratory Puroator Courier

This form accompanies 2 Septum Vials, _____ Glass Jugs, _____

Containers are marked as follows to indicate preservation (circle):

- NP: No preservation; sample stored at room temperature.
P-Ice Sample stored in an ice bath (not frozen).
P-Na₂S₂O₃: Sample preserved with Na₂S₂O₃ to remove chlorine residual.

I (we) certify that this sample was transferred from Alia Base
to Rick Meyerheim at (location) SLD - Albuquerque on
(date & time) _____ and that the statements in this block are correct

Evidentiary Seals: Not Sealed Intact: Yes No

Signatures A. Base

(we) certify that this sample was transferred from _____
to _____ at (location) _____ on
(date & time) _____ and that the statements in this block are correct

Evidentiary Seals: Not Sealed Intact: Yes No

Signatures _____

ANALYSIS REQUESTED

LAB. NO.: ORG-

MW-3

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED. WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTITATIVE	PURGEABLE SCREENS	QUALITATIVE	QUANTITATIVE	EXTRACTABLE SCREENS
		ALIPHATIC HYDROCARBON SCREEN			ALIPHATIC HYDROCARBONS
		AROMATIC HYDROCARBON SCREEN			CHLORINATED HYDROCARBON PESTICIDES
		HALOGENATED HYDROCARBON SCREEN			CHLOROPHENOXY ACID HERBICIDES
✓	✓	GAS CHROMATOGRAPH/MASS SPECTROMETER			HYDROCARBON FUEL SCREEN
					ORGANOPHOSPHATE PESTICIDES
					POLYCHLORINATED BIPHENYLS (PCB's)
					POLYNUCLEAR AROMATIC HYDROCARBONS
					TRIAZINE HERBICIDES
		SPECIFIC COMPOUNDS			SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	[PPB]	COMPOUND	[PPB]
GC/MS Purgeables	-		
Benzene	68		
Toluene	1500		
Ethyl benzene	900		
p-Xylene	900		
m-Xylene	470		
o-Xylene	320		
[Naphthalene]	[Present]	* DETECTION LIMIT	

REMARKS: Also detected but not quantitated were 6 each 3-carbon substituted benzenes and 4 each 4-carbon substituted benzenes at about 20 ppb. The three carbon substituted benzenes were at about 20-300 ppb. Results in [Brackets] are tentative (unconfirmed) results

CERTIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes X NO . Seal(s) broken by: R. Meyerheim date: 9/12/85
 I certify that I followed standard laboratory procedures in handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.
 Date(s) of analysis: 9/12/85. Analyst's signature: R. Meyerheim
 I certify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers signature: C. B. [unclear]



New Mexico Health and Environment Department
SCIENTIFIC LABORATORY DIVISION
700 Camino de Salud NE
Albuquerque, NM 87106 — (505) 841-2555

pm

GENERAL WATER CHEMISTRY
and NITROGEN ANALYSIS

DATE RECEIVED	8/29/85	LAB NO.	4354	USER CODE	☐ 59300 ☐ 59600 ☒ OTHER: 53300
Collection DATE	8/28/85	SITE INFORMATION	Phillips - Lusk	Sample location	
Collection TIME	12:30	Collection site description	Monitor well #3		
Collected by	Person/Agency				
Alia BARE, NMEID					

SEND
FINAL
REPORT
TO

GROUND WATER & HAZARDOUS WASTE BUREAU
NM ENVIRONMENT IMPROVEMENT DIVISION/HED
Crown Building, PO Box 968
Santa Fe, NM 87504-0968
Attn: *Alia BARE*

Station/
well code *MW-3*
Owner *Phillips Petroleum Co.*

SAMPLING CONDITIONS

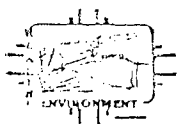
☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water level	Discharge	Sample type
pH (00400) <i>7.0</i>	Conductivity (Uncorrected) <i>2950 @ 23°C</i> μmho	Water Temp. (00010) °C	Conductivity at 25°C (00094) μmho	
Field comments				

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted	<i>2</i>	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 μm membrane filter	☒ A: 2 ml H_2SO_4 /L added
☒ NA: No acid added ☐ Other-specify:				

ANALYTICAL RESULTS from SAMPLES

NF, NA	Units	Date analyzed	F, NA	Units	Date analyzed
☒ Conductivity (Corrected) 25°C (00095)	μmho		☒ Calcium (00915)	mg/l	
☐ Total non-filterable residue (suspended) (00530)	mg/l		☒ Magnesium (00925)	mg/l	
☒ Other: <i>pH</i>			☒ Sodium (00930)	mg/l	
☐ Other:			☒ Potassium (00935)	mg/l	
☐ Other:			☒ Bicarbonate (00440)	mg/l	
			☒ Chloride (00940)	mg/l	
			☒ Sulfate (00945)	mg/l	
			☒ Total filterable residue (dissolved) (70300)	mg/l	
			☒ Other: <i>Fluoride</i>		
NF, A-H ₂ SO ₄			F, A-H ₂ SO ₄		
☒ Nitrate-N +, Nitrate-N- total (00630)	<i>0.21</i> mg/l	<i>10/15</i>	☐ Nitrate-N +, Nitrate-N- dissolved (00631)	mg/l	
☐ Ammonia-N total (00610)	mg/l		☐ Ammonia-N dissolved (00608)	mg/l	
☐ Total Kjeldahl-N ()	mg/l		☐ Total Kjeldahl-N ()	mg/l	
☐ Chemical oxygen demand (00340)	mg/l		☐ Other:		
☒ Total organic carbon ()	<i>27.6</i> mg/l	<i>10/15</i>			
☐ Other:					
☐ Other:					
Laboratory remarks			Analyst	Date Reported	Reviewed by
				<i>10/28/85</i>	<i>William</i>



NN

GENERAL WATER CHEMISTRY
AND NITROGEN ANALYSIS

DATE RECEIVED 8/24/85	LAB NO. WC-4350	USER CODE ☐ 59300 ☐ 59600 ☒ OTHER: 53300
Collection DATE 8/28/85	SITE INFORMATION Phillips - Lusk	Sample location
Collection TIME 12:30		Collection site description Monitor well #3
Collected by Person/Agency Alia Bare, NMEID		

SEND
FINAL
REPORT
TO

GROUND WATER & HAZARDOUS WASTE BUREAU
NM ENVIRONMENT IMPROVEMENT DIVISION/HED
Crown Building, PO Box 968
Santa Fe, NM 87504-0968
Attn: Alia Bare

Station/
well code MW-3
Owner Phillips Petroleum Co.

SAMPLING CONDITIONS

☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water level	Discharge	Sample type
pH (00400) 7.0	Conductivity (Uncorrected) 2950 @ 23°C	µmho	Water Temp. (00010) °C	Conductivity at 25°C (00094) µmho
Field comments				

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted 2	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 µm membrane filter	☒ A: 2 ml H ₂ SO ₄ /L added
☒ NA: No acid added ☐ Other-specify:			

ANALYTICAL RESULTS from SAMPLES

(NF, NA)	Units	Date analyzed	(F, NA)	Units	Date analyzed
☒ Conductivity (Corrected) 25°C (00095)	2879 µmho	12/2	☒ Calcium (00915)	1120.0 mg/l	9-17
☐ Total non-filterable residue (suspended) (00530)			☒ Magnesium (00925)	268.4 mg/l	9-17
☒ Other: pH	8.21	11/26	☒ Sodium (00930)	225.4 mg/l	9-17
☐ Other:			☒ Potassium (00935)	1.15 mg/l	9-17
☐ Other:			☒ Bicarbonate (00440)	675 mg/l	11/25
			☒ Chloride (00940)	607.4 mg/l	10/21
			☒ Sulfate (00945)	485.8 mg/l	10/8
			☒ Total filterable residue (dissolved) (70300)	2354 mg/l	10/10
			☒ Other: Fluoride	2.18	10/9
(NF, A-H ₂ SO ₄)			(F, A-H ₂ SO ₄)		
☒ Nitrate-N + Nitrate-N total (00630)	mg/l		☐ Nitrate-N + Nitrate-N dissolved (00631)	mg/l	
☐ Ammonia-N total (00610)	mg/l		☐ Ammonia-N dissolved (00608)	mg/l	
☐ Total Kjeldahl-N ()	mg/l		☐ Total Kjeldahl-N ()	mg/l	
☐ Chemical oxygen demand (00340)	mg/l		☐ Other:		
☒ Total organic carbon ()	mg/l		Analyst	Date Reported	Reviewed by
☐ Other:				11/26/85	
☐ Other:			Laboratory remarks		

PORT TO:

Hazardous Waste Section
Environmental Improvement Division
P.O. Box 968
Santa Fe, New Mexico 87504

METALS ANALYSIS REQUEST

LAB NUMBER

DATE RECEIVED

DATE REPORTED

Attn:

SLD USER CODE NUMBER 53300

Sample Number: MD-3 Location: Phillips-EuniceSample Type: ☒ water ☐ soil ☐ sediment ☐ sludge ☐ otherCollected (date & time) 8/26/85 12:30 PM by: A. BARRTemperature: celcius conductivity: umhos/cm pH: Sample container: ☒ 1-liter cubitainer(s) ☐ 1-quart glass jar(s) ☐ otherTreatment: ☐ Filtered ☒ 2 ml HNO₃ ☒ ice ☐ other☒ WATER ANALYSIS FOR ☐ dissolved ☐ suspended ☒ total☐ SOIL ANALYSIS FOR ☐ supernatant ☐ total digestion ☐ EP Toxicity☒ ICAP SCAN UG/ML OR UG/G DATE ANALYZED Aluminum Copper Silicon Barium Iron Silver Beryllium Lead Strontium Boron Magnesium Tin Cadmium Manganese Vanadium Calcium Molybdenum Yttrium Chromium Nickel Zinc Cobalt ☒ ATOMIC ABSORPTION UG/ML OR UG/G DATE ANALYZED Arsenic 0.077 Selenium <0.005 Mercury <0.005☐ EP TOXICITY MG/L DATE ANALYZED Arsenic Chromium Selenium Barium Lead Silver Cadmium Mercury ANALYST REVIEWER Jim Ashby

COMMENTS:

Seal broken in lab 4-5-85 @ 1500 JKSample digested

ICAP - SCREEN

Lab Number: HM 1534

Sample Code: MW -3

Date Submitted: 8/28/85

Date Reported: 12/9/85

By: Alice Barr

By: Jim Aubley

Date Analyzed: 11/8/85

Determination

Concentration (µg/ml) mg/l

Aluminum

0.6

Barium

0.2

Beryllium

<0.1

Boron

0.9

Cadmium

<0.1

Calcium

305.

Chromium

0.5

Cobalt

<0.1

Copper

<0.1

Iron

5.3

Lead

<0.1

Magnesium

120.

Manganese

2.8

Molybdenum

<0.1

Nickel

<0.1

Silicon

26.

Silver

<0.1

Strontium

4.9

Tin

<0.1

Vanadium

<0.1

Yttrium

<0.1

Zinc

<0.1

ATOMIC ABSORPTION ANALYSES

Determination

Concentration (µg/ml)

Arsenic

0.077

Selenium

<0.005

Mercury

<0.0005

REPORT TO: Alta Barr, Hazardous Waste Section
AMBI 125 St. Michaels Drive P.O. Box 968
Santa Fe, New Mexico 87504

S.L.D. No.: OR-85-901

DATE REC.: 8/29/85

PHONE 505-984-0020 Ext-340

USER CODE: 53300

CONTAINERS WHICH ACCOMPANY THIS FORM ARE

SUBMITTER: A. Barr

LOCATION: Phillips-Lusk

SOURCE: MW-4

COLLECTED: 8/28/85 BY A. Barr

SAMPLE TYPE: WATER SOIL OTHER

NEAREST CITY: Hobbs

pH= 9.2; Conductivity= 2150 umho/cm

Dissolved Oxygen= _____ mg/l; Alkalinity

Sampling Location, Methods and Remarks

Downgradient well #4

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. A. Barr

Method of shipment to the Laboratory Insulator Courier

This form accompanies 2 Septum Vials, _____ Glass Jugs, _____

Containers are marked as follows to indicate preservation (circle):

NP: No preservation; sample stored at room temperature.

P-Ice Sample stored in an ice bath (not frozen).

P- $\text{Na}_2\text{S}_2\text{O}_3$: Sample preserved with $\text{Na}_2\text{S}_2\text{O}_3$ to remove chlorine residual.

I (we) certify that this sample was transferred from A. Barr
to Bob Meyerhans at (location) SLD-Albuquerque on
(date & time) _____ and that the statements in this block are correct

Evidentiary Seals: Not Sealed Intact: Yes No

Signatures A. Barr

(we) certify that this sample was transferred from _____
to _____ at (location) _____ on
(date & time) _____ and that the statements in this block are correct

Evidentiary Seals: Not Sealed Intact: Yes No

Signatures _____

ANALYSES REQUIRED

LAB. NO. C-85-901

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL TEST REQUIRED. WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

MW-4

QUALITATIVE	QUANTITATIVE	PURGEABLE SCREENS	QUALITATIVE	QUANTITATIVE	EXTRACTABLE SCREENS
		ALIPHATIC HYDROCARBON SCREEN			ALIPHATIC HYDROCARBONS
		AROMATIC HYDROCARBON SCREEN			CHLORINATED HYDROCARBON PESTICIDES
		HALOGENATED HYDROCARBON SCREEN			CHLOROPHENOLY ACID HERBICIDES
✓	✓	GAS CHROMATOGRAPH/MASS SPECTROMETER			HYDROCARBON FUEL SCREEN
					ORGANOPHOSPHATE PESTICIDES
					POLYCHLORINATED BIPHENYLS (PCB's)
					POLYNUCLEAR AROMATIC HYDROCARBONS
					TRIAZINE HERBICIDES
		SPECIFIC COMPOUNDS			SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	[PPB]	COMPOUND	[PPB]
Trichloro methane	2		
No other Purgeables Detected	*		
		* DETECTION LIMIT	100/12

REMARKS:

CERTIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes X NO . Seal(s) broken by: R Meyerhan date: 9/12/85
 I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.
 Date(s) of analysis: 9/12/85. Analyst's signature: R Meyerhan
 I certify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers signature: (Signature)



New Mexico Health and Environment Department
SCIENTIFIC LABORATORY DIVISION
700 Camino de Salud NE
Albuquerque, NM 87106 — (505) 841-2555

PN

GENERAL WATER CHEMISTRY
and NITROGEN ANALYSIS

DATE RECEIVED	8/29/85	LAB NO	60-4353	USER CODE	☐ 59300 ☐ 59600 ☒ OTHER: 53300
Collection DATE	8/28/85	SITE INFORMATION	Sample location: Phillips - Luck		
Collection TIME	1:30	Collection site description	Monitor well # 4		
Collected by — Person/Agency	Alice BARR, NMED				

SEND
FINAL
REPORT
TO

GROUND WATER & HAZARDOUS WASTE BUREAU
NM ENVIRONMENT IMPROVEMENT DIVISION/HED
Crown Building, PO Box 968
Santa Fe, NM 87504-0968
Attn: Alice BARR

Station/
well code MW-4

Owner Phillips Petroleum Co.

SAMPLING CONDITIONS

☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water level	Discharge	Sample type
pH (00400) 6.9	Conductivity (Uncorrected) 2850 @ 22°C µmho	Water Temp. (00010) °C	Conductivity at 25°C (00094) µmho	
Field comments				

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted 2	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 µm membrane filter	☒ A: 2 ml H ₂ SO ₄ /L added
☒ NA: No acid added ☐ Other-specify:			

ANALYTICAL RESULTS from SAMPLES

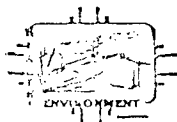
NF, NA	Units	Date analyzed	F, NA	Units	Date analyzed
☒ Conductivity (Corrected) 25°C (00095)	µmho		☒ Calcium (00915)	mg/l	
☐ Total non-filterable residue (suspended) (00530)	mg/l		☒ Magnesium (00925)	mg/l	
☒ Other: pH			☒ Sodium (00930)	mg/l	
☐ Other:			☒ Potassium (00935)	mg/l	
☐ Other:			☒ Bicarbonate (00440)	mg/l	
			☒ Chloride (00940)	mg/l	
			☒ Sulfate (00945)	mg/l	
			☒ Total filterable residue (dissolved) (70300)	mg/l	
			☒ Other: Fluoride		
NF, A-H ₂ SO ₄			F, A-H ₂ SO ₄		
☒ Nitrate-N + Nitrate-N total (00630)	6.12 mg/l	8/5	☐ Nitrate-N +, Nitrate-N dissolved (00631)	mg/l	
☐ Ammonia-N total (00610)	mg/l		☐ Ammonia-N dissolved (00608)	mg/l	
☐ Total Kjeldahl-N ()	mg/l		☐ Total Kjeldahl-N ()	mg/l	
☐ Chemical oxygen demand (00340)	mg/l		☐ Other:		
☒ Total organic carbon ()	7.1 mg/l	10/15			
☐ Other:					
☐ Other:					

Analyst

Date Reported: 10/28/85

Reviewed by: [Signature]

Laboratory remarks



New Mexico Health and Environment Department
SCIENTIFIC LABORATORY DIVISION
700 Camino de Salud NE
Albuquerque, NM 87106 — (505) 841-2555

NN

GENERAL WATER CHEMISTRY AND NITROGEN ANALYSIS

DATE RECEIVED	8/29/85	LAB NO.	100-4344	USER CODE	☐ 59300 ☐ 59600 ☒ OTHER: 53300
Collection DATE	8/28/85	SITE INFORMATION	Sample location: Phillips - Lusk		
Collection TIME	1:30	Collection site description	Monitor well #4		
Collected by — Person/Agency	Alra BARR, NMED				

SEND
FINAL
REPORT
TO

GROUND WATER & HAZARDOUS WASTE BUREAU
NM ENVIRONMENT IMPROVEMENT DIVISION/HED
Crown Building, PO Box 968
Santa Fe, NM 87504-0968
Attn: Alice BARR

Station/
well code MW-4

Owner Phillips Petroleum Co.

SAMPLING CONDITIONS

☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water level	Discharge	Sample type
pH (00400) 6.9	Conductivity (Uncorrected) 2850 @ 22°C µmho	Water Temp. (00010) °C	Conductivity at 25°C (00094) µmho	
Field comments				

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted 2	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 µm membrane filter	☒ A: 2 ml H ₂ SO ₄ /L added
☒ NA: No acid added ☐ Other-specify:			

ANALYTICAL RESULTS from SAMPLES

NF, NA	Units	Date analyzed	F, NA	Units	Date analyzed
☒ Conductivity (Corrected) 25°C (00095) 3455 µmho	µmho	12/2	☒ Calcium (00915) 280.8 mg/l	mg/l	9-17
☐ Total non-filterable residue (suspended) (00530)	mg/l		☒ Magnesium (00925) 143.9 mg/l	mg/l	9-17
☒ Other: pH 7.84		11/25	☒ Sodium (00930) 708.2 mg/l	mg/l	9-17
☐ Other:			☒ Potassium (00935) 3.57 mg/l	mg/l	9-17
☐ Other:			☒ Bicarbonate (00440) 237.6 mg/l	mg/l	11/25
NF, A-H ₂ SO ₄			☒ Chloride (00940) 549.6 mg/l	mg/l	10/21
☒ Nitrate-N + Nitrate-N total (00630)	mg/l		☒ Sulfate (00945) 1057 mg/l	mg/l	10/8
☐ Ammonia-N total (00610)	mg/l		☒ Total filterable residue (dissolved) (70300) 3033 mg/l	mg/l	10/10
☐ Total Kjeldahl-N ()	mg/l		☒ Other: Sulfide 2.14		10/9
☐ Chemical oxygen demand (00340)	mg/l		F, A-H ₂ SO ₄		
☒ Total organic carbon ()	mg/l		☐ Nitrate-N + Nitrate-N dissolved (00631)	mg/l	
☐ Other:			☐ Ammonia-N dissolved (00608)	mg/l	
☐ Other:			☐ Total Kjeldahl-N ()	mg/l	
			☐ Other:		
Laboratory remarks			Analyst	Date Reported: 11/26/85	Reviewed by: [Signature]



REPORT TO: Alice Barr
Unidentified P.O. Box 4108
Santa Fe, New Mexico 87504

S.L.D. No.: CR-904-17-B
DATE REC.: 8/29/85
PHONE 505-984-0920 Ext. 1540
USER CODE: 53300

CONTAINERS WHICH ACCOMPANY THIS FORM ARE COLLECTIVELY REFERRED TO AS SAMPLE.

SUBMITTER: A. Barr COD
LOCATION: Phillips-Lusk COD
SOURCE: Pond PND 3 COD
COLLECTED: 8/28/85 BY A. Barr / K. Crossman COD
SAMPLE TYPE: WATER SOIL OTHER COD
NEAREST CITY: Hobbs COD

pH=____; Conductivity=____ umho/cm at ____
Dissolved Oxygen=____ mg/l; Alkalinity=____
Sampling Location, Methods and Remarks (i.e.)
2nd Pond surface water

Cooling water
blowdown
pond

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Alice Barr

Method of shipment to the Laboratory Purdon Courier

This form accompanies 2 Septum Vials, ____ Glass Jugs, ____

Containers are marked as follows to indicate preservation (circle):

NP: No preservation; sample stored at room temperature.

P-Ice: Sample stored in an ice bath (not frozen).

P- $\text{Na}_2\text{S}_2\text{O}_3$: Sample preserved with $\text{Na}_2\text{S}_2\text{O}_3$ to remove chlorine residual.

I (we) certify that this sample was transferred from Alice Barr
to Rick Meyerheim at (location) SLD-Albuquerque on
(date & time) _____ and that the statements in this block are correct

Evidentiary Seals: Not Sealed Intact: Yes No

Signatures _____

(we) certify that this sample was transferred from _____
to _____ at (location) _____ on
(date & time) _____ and that the statements in this block are correct

Evidentiary Seals: Not Sealed Intact: Yes No

Signatures _____

LAB. No.: ORG-85-904

⑧ PND-3

REMARKS :

COMPOUND	[PPB]	COMPOUND	[PPB]
[Thiobis methane]	[1]		
		* DETECTION LIMIT	

REMARKS: Results in [brackets] are tentative (unconfirmed) values
No other purgeables detected.

CERTIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes X NO . Seal(s) broken by: R Meyerheim date: 9/13/85
I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.
Date(s) of analysis: 9/13/85. Analyst's signature: R Meyerheim
I certify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers signature: [Signature]

REPORT TO: Hazardous Waste Section
Environmental Improvement Division
P.O. Box 968
Santa Fe, New Mexico 87504

Attn: Al BARR
SLD USER CODE NUMBER 53300

METALS ANALYSIS REQUEST

LAB NUMBER

DATE RECEIVED

DATE REPORTED

Sample Number: PND 1 Location: Phillips - Luck Sediment
Sample Type: water soil ☒ sediment sludge other
Collected (date & time) 8/28/85 by: Al BARR / K. Prossman
Temperature: celcius conductivity: umhos/cm pH:
Sample container: 1-liter cubitainer(s) ☒ 1-quart glass jar(s) other
Treatment: Filtered 2 ml HNO3 ☒ ice other

 WATER ANALYSIS FOR dissolved suspended total
☒ SOIL ANALYSIS FOR supernatant ☒ total digestion EP Toxicity

☒ ICAP SCAN UG/ML OR UG/G DATE ANALYZED
Aluminum Copper Silicon
Barium Iron Silver
Beryllium Lead Strontium
Boron Magnesium Tin
Cadmium Manganese Vanadium
Calcium Molybdenum Yttrium
Chromium Nickel Zinc
Cobalt

☒ ATOMIC ABSORPTION UG/ML OR UG/G DATE ANALYZED
Arsenic Selenium Mercury

 EP TOXICITY MG/L DATE ANALYZED
Arsenic Chromium Selenium
Barium Lead Silver
Cadmium Mercury

ANALYST REVIEWER Jim Ashby

COMMENTS:

real broken 9-11-85 1100 JIC

Sample Digested
50 ml wash (liquid measure)

REPORT TO: Hazardous Waste Section
Environmental Improvement Division
P.O. Box 968
Santa Fe, New Mexico 87504

METALS ANALYSIS REQUEST

LAB NUMBER

7/11-1572

DATE RECEIVED

8/24/85

DATE REPORTED

12/18/85

Attn: Alice Barr

SLD USER CODE NUMBER 53300

Sample Number: ~~Field Blank~~ Location: Phillips - Leach Pond surface water

Sample Type: ☒ water ☐ soil ☐ sediment ☐ sludge ☐ other

Collected (date & time) 8/21/85 10:30 by: A. Barr

Temperature: _____ celcius conductivity: _____ umhos/cm pH: _____

Sample container: ☒ 1-liter cubitainer(s) ☐ 1-quart glass jar(s) ☐ other

Treatment: ☐ Filtered ☒ 2 ml HNO3 ☒ ice ☐ other

☒ WATER ANALYSIS FOR ☐ dissolved ☐ suspended ☒ total

☐ SOIL ANALYSIS FOR ☐ supernatant ☐ total digestion ☐ EP Toxicity

☒ ICAP SCAN UG/ML OR UG/G DATE ANALYZED _____

Aluminum	_____	Copper	_____	Silicon	_____
Barium	_____	Iron	_____	Silver	_____
Beryllium	_____	Lead	_____	Strontium	_____
Boron	_____	Magnesium	_____	Tin	_____
Cadmium	_____	Manganese	_____	Vanadium	_____
Calcium	_____	Molybdenum	_____	Yttrium	_____
Chromium	_____	Nickel	_____	Zinc	_____
Cobalt	_____				

☒ ATOMIC ABSORPTION UG/ML OR UG/G DATE ANALYZED _____

Arsenic	_____	Selenium	_____	Mercury	_____
_____	_____	_____	_____	_____	_____

☐ EP TOXICITY MG/L DATE ANALYZED _____

Arsenic	_____	Chromium	_____	Selenium	_____
Barium	_____	Lead	_____	Silver	_____
Cadmium	_____	Mercury	_____		

ANALYST _____

REVIEWER

Jim Bohly

COMMENTS:

seal broken 9-11-85 1100 JK

Lab Number: #1572

Date Submitted: 8/29/85

By: Alice Barr

Sample Code: Phillips Lusk Pond Surface Water

Date Analyzed: 12/13/85

Reviewed By: Jim Bahly

Date Reported: 12/18/85

Element	ICAP VALUE (MG/L)	AA VALUE (MG/L)
Aluminum	<u><0.1</u>	<u> </u>
Barium	<u>0.3</u>	<u> </u>
Beryllium	<u><0.1</u>	<u> </u>
Boron	<u>0.2</u>	<u> </u>
Cadmium	<u><0.1</u>	<u> </u>
Calcium	<u>240.</u>	<u> </u>
Chromium	<u><0.1</u>	<u> </u>
Cobalt	<u><0.1</u>	<u> </u>
Copper	<u><0.1</u>	<u> </u>
Iron	<u><0.1</u>	<u> </u>
Lead	<u><0.1</u>	<u> </u>
Magnesium	<u>25.</u>	<u> </u>
Manganese	<u><0.05</u>	<u> </u>
Molybdenum	<u><0.1</u>	<u> </u>
Nickel	<u><0.1</u>	<u> </u>
Silicon	<u>33.</u>	<u> </u>
Silver	<u><0.1</u>	<u> </u>
Strontium	<u>2.4</u>	<u> </u>
Tin	<u><0.1</u>	<u> </u>
Vanadium	<u><0.1</u>	<u> </u>
Zinc	<u><0.1</u>	<u> </u>
Arsenic		<u>0.019</u>
Selenium		<u><0.005</u>
Mercury		<u><0.0005</u>

Kearney/Centaur Division
A.T. Kearney, Inc.
225 Reinekers Lane
P.O. Box 1438
Alexandria, Virginia, 22313
703 683 7932
Facsimile 703 683 2407

Management
Consultants

Julie

ATKEARNEY

March 31, 1989

Mr. Thomas D. Clark
Regional Project Officer
U.S. Environmental Protection Agency
1445 Ross Avenue
Dallas, TX 75202-2733

Reference: EPA Contract No. 68-01-7374; Work Assignment No. R26-06-05;
Phillips Petroleum-Lusk Natural Gas Plant; Maljamar, New
Mexico; EPA I.D. No. NMD000709634; Comprehensive Ground-
Water Monitoring Evaluation (CME), Final Report

Dear Mr. Clark:

As you requested, we have enclosed one copy of the draft report and one copy of the cover letter for the above-referenced project. We are sending the original report and two copies of the report to Julie Wanslow at the New Mexico Environmental Improvement Division.

As a result of this evaluation, we found several technical deficiencies which may constitute violations of 40 CFR Parts 264 and 270. Detailed lists of deficiencies and potential regulatory violations are provided in our report.

Because of the unusual length of time required for analysis of samples by the EID laboratory and the fact that the current contract terminates on March 31, 1989, we will be unable to respond to any comments you may have concerning this report. However, we would like to offer you a copy of the report (excluding Appendices C, D and E) on a floppy disk in "Word Perfect 5.0" format. This will allow you to make revisions to the report as you require.

RECEIVED

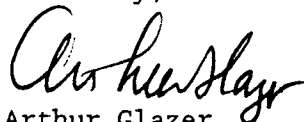
APR 03 1989

HAZARDOUS WASTE SECTION

Mr. Thomas D. Clark
March 31, 1989
Page 2

Please contact me or Steve Muse, the Work Assignment Manager, at (703) 548-4700, if you have any questions.

Sincerely,

A handwritten signature in cursive script, appearing to read "Arthur Glazer".

Arthur Glazer
Technical Director

Enclosure

cc: R. Rabatine, OSDH (original and two copies)
J. Levin
D. Bean
S. Muse
A. Schaffer (w/o enclosure)
B. Stewart, SAIC

COMPREHENSIVE GROUND-WATER MONITORING EVALUATION
FINAL REPORT

Phillips Petroleum-Lusk Natural Gas Plant
Maljamar, New Mexico
EPA I.D. Number NMD000709634

Prepared for:

U.S. Environmental Protection Agency
Region VI
1445 Ross Avenue
Dallas, Texas 75202-2733

Prepared by:

Kearney/Centaur
A Division of A. T. Kearney, Inc.
225 Reinekers Lane
Alexandria, VA 22313

Contract No. 68-01-7374
Work Assignment No. R26-06-05

March 1989

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION.....	4
1.1 Description, Objective and Scope.....	4
1.2 Documents and Other References Used.....	4
1.3 Components of the Comprehensive Ground-Water Monitoring Evaluation.....	4
1.4 Facility Description and Operation.....	5
1.5 History of the Regulatory Status of Phillips Petroleum-Lusk Natural Gas Plant.....	6
1.5.1 Status of the Permit Process for the Lusk Natural Gas Plant.....	6
1.5.2 Ground-Water Monitoring Status of the Lusk Facility...	6
2.0 KEY FINDINGS.....	9
3.0 DISCUSSION OF THE OFFICE EVALUATION AND FIELD EVALUATION FOR THE PHILLIPS-LUSK NATURAL GAS PLANT.....	16
4.0 ANALYTICAL RESULTS.....	18
5.0 SUMMARY AND CONCLUSIONS.....	20
5.1 Office Evaluation.....	20
5.1.1 Adequacy of the Characterization of Subsurface Geology and Identification of Related Data Gaps.....	20
5.1.2 Adequacy of the Characterization of the Uppermost Aquifer and Related Data Gaps.....	21
5.1.3 Adequacy of the Design and Construction of the Ground- water Monitoring Well and Related Data Gaps.....	22
5.1.4 Adequacy of the Ground-Water Monitoring Program and Related Data Gaps.....	24
5.2 Field Evaluation.....	24
5.2.1 Adequacy of the Design and Construction of the Ground- Water Monitoring System.....	24
5.2.2 Adequacy of Sample Collection Procedures.....	25
5.2.3 Adequacy of Sample Preservation and Handling Procedures.....	26
5.2.4 Adequacy of Chain-of-Custody Procedures.....	27

TABLE OF CONTENTS (Cont.)

	<u>Page</u>
5.2.5 Adequacy of Field Quality Assurance/Quality Control Program.....	28
5.2.6 Surficial Well Inspection and Field Observations.....	28
5.3 Conclusions Concerning the Adequacy of the Ground-Water Monitoring Program.....	28
6.0 REFERENCES.....	30
Appendix A - Office Evaluation Checklist.....	A-1
Appendix B - Field Evaluation Checklist.....	B-1
Appendix C - Field Log.....	C-1
Appendix D - Photo Log.....	D-1
Appendix E - Analytical Results.....	E-1

List of Figures

Figure 1-1: Site Map Showing Existing and New Ground-Water Monitoring System.....	7
Figure 5-1: Typical Monitor Well Design.....	23

List of Tables

Table 2-1: Technical Deficiencies Which May Constitute Violations.....	10
Table 4-1: Summary of Analytical Results.....	19

1.0 INTRODUCTION

1.1 Description, Objective and Scope

A Comprehensive Ground-Water Monitoring Evaluation (CME) is a detailed evaluation of the design and operation of the ground-water monitoring systems at RCRA-regulated facilities. The objective of the CME is to determine if a facility has, in place, a ground-water monitoring system which is adequately designed, and operated to detect releases of hazardous constituents, or to define the rate and extent of migration of contaminants from a regulated land-based treatment, storage, or disposal unit. This is a requirement under 40 CFR 265, Subpart F.

The purpose of this CME report is to present the findings of the CME conducted at the Phillips Petroleum - Lusk Natural Gas Plant (Lusk) and to identify technical deficiencies which may constitute regulations under 40 CFR Part 265 and applicable sections of 40 CFR Part 270.

1.2 Documents and Other References Used

The references used to prepare this report include the facility's RCRA Part A permit application; correspondence between the facility and EPA Region VI and the New Mexico Environmental Improvement Division (NMEID); previously conducted facility inspection reports; the facility's contractor reports; regional geologic and hydrogeologic reports; the facility's sampling and analysis plan; communications with NMEID and Phillips personnel; and interviews with Phillips personnel during the a field evaluation. A complete list of references is presented as Section 6.0.

1.3 Components of the Comprehensive Ground-Water Monitoring Evaluation

A CME is a two-phased process consisting of both office and field evaluation components. The office evaluation is the first phase of the CME and is intended to determine the adequacy of the design of the facility's ground-

water monitoring system (GWMS). The field evaluation is the second phase of the process, and involves a field evaluation of the operation of the system, as well as verification (where possible) of the findings of the office evaluation.

To assist the evaluator in the CME process, office and field evaluation checklists (Appendices A and B, respectively) were adapted from the RCRA Ground-Water Monitoring Technical Enforcement Guidance Document (TEGD) and from OSWER Directive Number 9950.2, "Final RCRA Comprehensive Ground-Water Monitoring Evaluation (CME) Guidance Document." These checklists are completed by the evaluator for each facility at which a CME is performed.

1.4 Facility Description and Operation

The Lusk facility (EPA ID No. NMD000709634) is located near Maljamar, Eddy County, in the southeastern part of New Mexico (Section 19, T19S, R32E). The Lusk facility is currently functioning only as a pumping station. At the Lusk facility, raw natural gas is collected from nearby production fields and is pumped via pipelines to the Phillips-Eunice facility for subsequent processing. Formerly, the Lusk facility processed raw natural gas for recovery of natural gas liquids and sulfur. The Lusk facility operated a surface impoundment for the treatment of cooling tower blowdown from approximately 1967 until 1984. The water contained chromium which was used as a corrosion inhibitor. In 1982, the facility discontinued using chromium and began using a non-hazardous phosphate treatment for corrosion control (3). The Lusk facility submitted a request for waiver of ground-water monitoring requirements in December 1982. The request was not granted by NMEID or by EPA, and NMEID called in the facility's Part B permit. Phillips chose, instead, to submit a closure plan for the Lusk surface impoundment. In March of 1984, Phillips installed four ground-water monitoring wells to monitor the surface impoundment at the Lusk facility. These wells were cased with five-inch diameter PVC to a depth of 50 feet. The wells had screen lengths of thirty to thirty-five feet (68). These wells were deemed inadequate by NMEID due to the excessive screen lengths. In April 1988, NMEID issued a

Compliance Order/Schedule requiring Phillips-Lusk to install new monitoring wells. The new well system was installed at Phillips-Lusk in March 1988, and the old wells were plugged and abandoned (66).

1.5 History of the Regulatory Status of the Phillips Petroleum-Lusk Natural Gas Plant

1.5.1 Status of the Permit Process for the Lusk Facility

Phillips submitted a Notification of Hazardous Waste Activity and a Part A permit application to EPA for the Lusk facility in November 1980. A closure plan for Lusk was submitted to EPA in September 1983, and was subsequently revised in February 1984. The closure plan was approved by NMEID in March 1984 (39), pending results of confirmation sampling to verify that no hazardous constituents remained in the impoundment. A closure report with sampling results was submitted to NMEID in June 1984. Phillips installed four ground-water monitoring wells for the surface impoundment in 1984. NMEID initiated closure proceedings for the Lusk facility in March 1986. In September 1986, NMEID approved the Lusk closure plan with conditions. The approval conditions required Phillips to submit a post-closure plan to address NMEID's concerns about the adequacy of the Lusk ground-water monitoring system (53). As a result, a new ground-water monitoring system was installed at Lusk in March 1988, and the old wells were plugged. A map depicting the surface impoundment and the associated ground-water monitoring wells is shown in Figure 1-1.

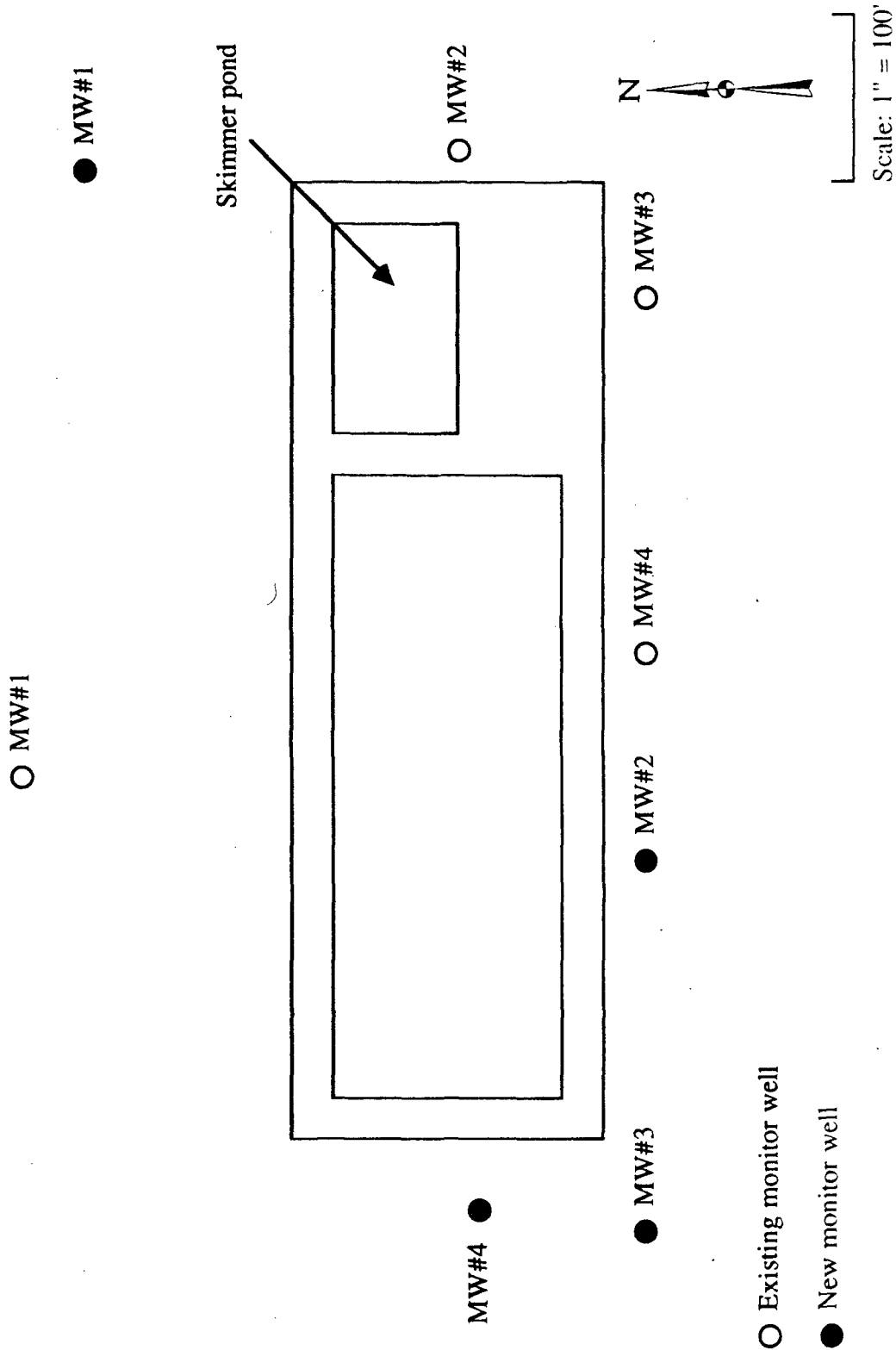
1.5.2 Ground-Water Monitoring Status of the Lusk Facility

The Lusk facility operated a surface impoundment for the disposal/treatment of cooling tower blowdown water from approximately 1967 until 1984. The facility installed four interim status monitoring wells to monitor the uppermost aquifer beneath the surface impoundment in 1984. These wells were judged to be inadequate by EID and EPA Region VI. Phillips installed four new monitoring wells in March 1988 to fulfill requirements of an EID compliance order concerning post-closure ground-water monitoring. The facility began

Figure 1-1

Site Map Showing Existing And New Ground-Water Monitoring Systems

Phillips-Lusk Natural Gas Plant



sampling these wells in May 1988. EID considers the Lusk facility to be in the detection phase of monitoring (11,19). The facility is in the process of establishing the initial background data (i.e., first four quarters of sampling data) for the new wells. The sampling done by the facility at the time of this CME represented the second quarterly sampling event for the new wells at the Phillips-Lusk facility.

In June 1988, Phillips submitted the "Sampling and Analysis Plan for Phillips 66 Natural Gas Company, Artesia, Eunice, Lee, and Lusk Gasoline Plants." An evaluation of Phillips' implementation of this sampling plan is included in Section 5.2 of this report.

2.0 KEY FINDINGS

This section presents the findings of the CME in terms of the ground-water performance standards which have not been met by the Lusk facility, the technical deficiencies which were discovered during the office and field evaluations, and the regulations under 40 CFR Parts 265 and 270 which may have been violated. Table 2-1 summarizes the findings. Subsequent sections provide the basis for these findings and present further details about the facility and its operations.

Table 2-1

Ground-Water Performance Standard Requirements Which Were Not Met	Technical Deficiencies Which May Constitute Violations	Regulatory Citations Under 40 CFR Parts
Uppermost aquifer must be correctly identified	- o Failure to clearly define the extent of the uppermost aquifer in the area of the facility - o Failure to adequately consider aquifers which may be hydraulically interconnected to the uppermost aquifer	§265.90(a) §265.91(a)(1) (a)(2) *§270.14(c)(2) §265.90(a) §265.91(a)(1) (a)(2) *§270.14(c)(2)
Ground-water flow directions and rates must be properly defined	o Failure to collect data sufficient to establish ground-water flow directions and rate (relying too heavily on regional data)	§265.90(a) §265.91(a)(1) (a)(2) *§270.14(c)(2)
Geologic and hydrogeologic formations underlying the site must be fully characterized	- o Failure to assess significance of vertical gradients when evaluating flow rates and directions - o Failure to prepare flow nets	§265.90(a) §265.91(a)(1) (a)(2) §270.14(c)(2) §270.14(c)(2)

* Indicates Potential Class I regulatory violation.

Table 2-1 (cont.)

Ground-Water Performance Standard Requirements Which Were Not Met	Technical Deficiencies Which May Constitute Violations	Regulatory Citations Under 40 CFR Parts 265 and 270
Geologic and hydrogeologic formations underlying the site must be fully characterized (cont.)	o Failure to document the procedure for establishing the potentiometric surface	\$265.90(a) \$265.91(a)(1) (a)(2) *\$270.14(c)(2)
	o Failure to document the method(s) of obtaining samples during the 1984 boring program	\$265.90(a) \$265.91(a)(1)
	o Failure to consider temporal and seasonal variations in water levels when establishing flow directions	\$265.90(a) \$265.91(a)(1) (a)(2) \$270.14(c)(2)
	o Failure to perform pump tests to determine hydraulic conductivity of uppermost aquifer	\$270.14(c)(2)
	o Failure to collect sufficient hydrogeologic data to support selection of the geometric dimensions of the uppermost aquifer	\$265.90(a) \$265.91(a)(1) (a)(2) \$270.14(c)(2)

* Indicates potential Class I regulatory violation.

Table 2-1 (cont.)

Ground-Water Performance Standard Requirements Which Were Not Met	Technical Deficiencies Which May Constitute Violations	Regulatory Citations Under 40 CFR Parts 265 and 270
Geologic and hydrogeologic formations underlying the site must be fully characterized (cont.)	- o Failure to document presence or absence of confining layer - o Failure to perform sufficient pump tests to prove a lack of interconnection between aquifers - o Failure to drill sufficient borings in the site investigative program to establish accurate correlation of geologic units between boreholes - o Failure to provide geologic and hydrogeologic cross-sections concerning subsurface conditions - o Failure to prepare field notes - o Failure to prepare geologic cross-sections, and soil maps - o Failure to perform material tests and geochemical analyses on boring samples - o Failure to prepare structure maps of the water-bearing formations and confining layer - o Failure to adequately characterize site hydrogeology	§270.14(c)(2) §270.14(c)(2) §270.14(c)(2) §270.14(c)(2) §270.14(c)(2) §270.14(c)(2) §270.14(c)(2) §270.14(c)(2)

Table 2-1 (cont.)

Ground-Water Performance Standard Requirements Which Were Not Met	Technical Deficiencies Which May Constitute Violations	Regulatory Citations Under 40 CFR Parts 265 and 270
Geologic and hydrogeologic formations underlying the site must be fully characterized (cont.)	- o Failure to document qualifications of personnel supervising boring program in 1984 - o Overreliance on regional geologic and hydrogeologic data in site investigation - o Failure to provide a topographic map prepared by a licensed surveyor - o Failure to prepare a contour map accurately depicting the potentiometric surface of the uppermost aquifer - o Failure to document methods or criteria used to correlate and analyze subsurface data - o Failure to provide documentation of criteria used to select boring locations - o Failure to have 1984 boring logs prepared by a qualified geologist - o Failure to prepare adequate borings logs	\$270.14(c)(2) \$270.14(c)(2) \$270.14(c)(2) \$270.14(c)(2) \$270.14(c)(2) \$270.14(c)(2) \$270.14(c)(2) \$270.14(c)(2)

* Indicates potential Class I regulatory violation.

Table 2-1 (cont..)

Ground-Water Performance Standard Requirements Which Were Not Met	Technical Deficiencies Which May Constitute Violations	Regulatory Citations Under 40 CFR Parts 265 and 270
Samples from background and down- gradient wells must be properly collected and analyzed	o Failure to transfer samples directly to containers from bailer	\$265.90(a) \$265.92(a) \$265.93(d)(4) \$270.14(c)(4)
	o Failure to make proper use of sample blanks	\$265.90(a) \$265.92(a) \$265.93(d)(4) \$270.14(c)(4)
	o Failure to document in the sampling and analysis plan the cleaning procedures for sample containers for inorganics	\$265.90(a) \$265.92(a) \$265.93(d)(4) \$270.14(c)(4)
	o Failure to use sampling methods which can detect immiscible layers	\$265.90(a) \$265.92(a) \$265.93(d)(4) \$270.14(c)(4)
	o Improper handling of samples for volatiles analysis; samples agitated as placed in containers	\$265.90(a) \$265.92(a) \$265.93(d)(4) \$270.14(c)(4)

* Indicates potential Class I regulatory violation.

Table 2-1 (cont.)

Ground-Water Performance Standard Requirements Which Were Not Met	Technical Deficiencies Which May Constitute Violations	Regulatory Citations Under 40 CFR Parts 265 and 270
Samples from background and downgradient wells must be properly collected and analyzed (cont.)	o Chain-of-custody form does not request time or date of collection	\$265.90(a) \$265.92(a) \$265.93(d)(4) \$270.14(c)(4)

* Indicates Potential Class I regulatory violation.

3.0 DISCUSSION OF THE OFFICE EVALUATION AND FIELD EVALUATION AT PHILLIPS LUSK NATURAL GAS PLANT

The office evaluation and field evaluation phases of a CME involve review of the available file material concerning the facility's ground-water monitoring program and ground-water monitoring system (GWMS) design and a site visit for the purpose of evaluating the operation of the GWMS. Checklists for both the office and field evaluation have been developed to aid the technical reviewer in the evaluation. These checklists have been completed for this CME and are attached as Appendixes A and B. Findings and conclusions of the office and field evaluations are presented in Sections 5.1 and 5.2, respectively.

EPA Region VI and the New Mexico Environmental Improvement Division (EID) requested that the Kearney Team obtain replicates of ground-water samples taken by Phillips during the CME field evaluation at the Lusk facility. Samples were to be analyzed for volatile organics, semi-volatile organics, turbidity and Priority Pollutant Metals. EID requested that analytical services for the volatile and semi-volatile samples be provided by the Kearney Team and that the total metals and turbidity analyses be performed by the New Mexico Health and Environmental Department, Scientific Laboratory Division (SLD) in Albuquerque. At the request of SLD, samples submitted for total metals analyses were not field filtered and were preserved with nitric acid in the field. By contrast, the Phillips representative field-filtered his samples for metals analysis, and analyzed only for dissolved metals. The Kearney Team provided sample containers and preservatives as necessary for the replicate samples.

The field evaluation at the Lusk facility was conducted on October 24 and 25, 1988. The Kearney Team included Steve Muse and Marianne Smith (Kearney/Centaur). The team arrived at the facility at 10:00 a.m. Mountain Standard Time (MST) on October 24. The team met briefly with Mike Ford, who is the Staff Environmental Analyst for the Phillips Petroleum facilities in the area. The team explained to Mr. Ford that they would observe his techniques and procedures for well evacuation, sample collection and handling, and record-keeping. Ambient air temperatures ranged from 65°F to 75°F, winds were from the south at 5 to 10 mph

and skies were sunny during the two-day CME.

All samples were stored on ice in coolers from time of collection until they were delivered to the analytical laboratories by Federal Express on October 26, 1988.

4.0 ANALYTICAL RESULTS

The samples collected by the Kearney Team were submitted for analysis of volatiles, semivolatiles, turbidity and total metals and were shipped on the day of collection via overnight air service to the designated laboratories. The chain-of-custody and analytical request forms were completed and included with each shipment. A custody seal was affixed to each cooler prior to shipment. The laboratories were notified to expect delivery of the samples the following day.

The samples collected for analysis of organic parameters were submitted to the C-E Environmental, Inc. laboratory in Camarillo, CA. C-E Environmental analyzed for all CLP target compounds (volatile and semivolatile organics). In addition to the CLP target list, the samples were analyzed for 2-butanone, 1-methyl-naphthalene, (o,m,p-)cresol, and 7,12-dimethylantracene. The lab provided the standard CLP data package summarizing the results of the analyses and related QC data. A summary of the analytical results provided by CE Environmental is presented in Table 4-1. The complete data package is attached as Appendix E to this report.

The samples collected for the analysis of turbidity and total metals were shipped to the EID Scientific Laboratory Division (SLD) in Albuquerque. The high turbidity of some of the samples may have resulted in interferences which could influence the accuracy of the analytical results. Prior to delivery to the lab, the field team had completed all necessary analytical forms as required by SLD. The SLD lab analyzed the samples for total metals and for turbidity, and provided a data package summarizing the results of the analyses. A summary of the analytical results provided by SLD is included in Table 4-1. The complete data packages are included as Appendix E to this report.

TABLE 4-1
SUMMARY OF ANALYTICAL RESULTS
PHILLIPS-LUSK CME

PARAMETER	UNITS	MW-1	MW-2	MW-3	MW-4	MW-5 (2)	MW-6 (3)
pH (1)	Std. Unit	7.02	6.96	7.14	7.04	N.R. (4)	N.R.
Sp. Conductance (1)	umhos/cm	2850	1800	1900	2350	N.R.	N.R.
Turbidity	NTU	11.0	76	12	5.6	0.27	0.06
Aluminum	mg/l	0.4	3.1	0.6	0.3	N.D. (5)	N.D.
Boron	mg/l	0.3	0.3	0.4	0.3	N.D.	N.D.
Calcium	mg/l	300	220	200	250	0.1	N.D.
Iron	mg/l	0.4	4	0.4	0.4	N.D.	N.D.
Manganese	mg/l	0.33	1.2	0.32	0.8	N.D.	N.D.
Silicon	mg/l	23	32	29	33	N.D.	N.D.
Strontium	mg/l	4.5	2.2	2.5	3.2	N.D.	N.D.
Tin	mg/l	0.4	0.2	0.3	0.3	N.D.	N.D.
Vanadium	mg/l	0.1	N.D.	N.D.	N.D.	N.D.	N.D.
Arsenic	mg/l	0.013	0.046	0.017	0.014	N.D.	N.D.
VOAs:							
Methylene chloride	ug/l	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chloroform	ug/l					1 3	2 3
B/N/As:	ug/l	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

- (1) Field measurement reported.
(2) "MW-5" was the equipment blank.
(3) "MW-6" was the field blank (distilled water).
(4) "N.R." indicates this parameter was not run in the field.
(5) "N.D." indicates this analyte was not detected above method quantification limits.

5.0 SUMMARY AND CONCLUSIONS

5.1 Office Evaluation

The following sections are conclusions drawn from the CME office evaluation of the Phillips Petroleum Lusk facility: Section 5.1.1 addresses the adequacy of facility's evaluation of site subsurface geology; Section 5.1.2 addresses the adequacy of the facility's site hydrogeologic assessment; and Section 5.1.3 addresses the adequacy of the design and construction of the facility's ground-water monitoring wells.

5.1.1 Adequacy of the Characterization of Subsurface Geology and Related Data Gaps

Data from a 1984 subsurface investigation performed at the Lusk facility was reviewed. The study was conducted in order to determine appropriate locations for monitoring wells associated with the facility's former surface impoundment. While data collected during the investigation is useful and necessary, the depth of termination of the borings completed during the study is not sufficient to adequately characterize site subsurface geology.

Several deficiencies and data gaps, which the facility should address, were noted during review of the facility's geologic information. The following is a description of these deficiencies:

- o Criteria used to select spacing or depth of termination of borings was not provided;
- o Methods of drilling and sample collection used during the 1984 study were not provided;
- o Boring samples from the 1984 study were not logged by a qualified geological professional;

- o Lithologic descriptions of the different strata encountered during the 1984 study were not complete or detailed enough;
- o Lithologic logs from both studies (especially the 1984 work) were incomplete, lacking information such as sampling intervals and depth and vertical extent of water-bearing units;
- o No geochemical or petrographic analyses were performed on samples from either study;
- o No geologic cross-sections were prepared; and
- o A site topographic map with contours intervals of two feet was not prepared.

5.1.2 Adequacy of the Characterization of the Uppermost Aquifer and Related Data Gaps

The hydrogeologic assessment conducted at the Lusk facility is incomplete and identification of the uppermost aquifer has not been accomplished. The following deficiencies and data gaps identified during the office evaluation should be addressed by the facility:

- o No materials tests (e.g., sieve analysis) were performed on borings samples;
- o No piezometers were installed for use in determining the hydraulic gradient;
- o No pump tests or slug tests were performed;
- o Values for hydraulic conductivity were obtained from a text on hydrogeology;

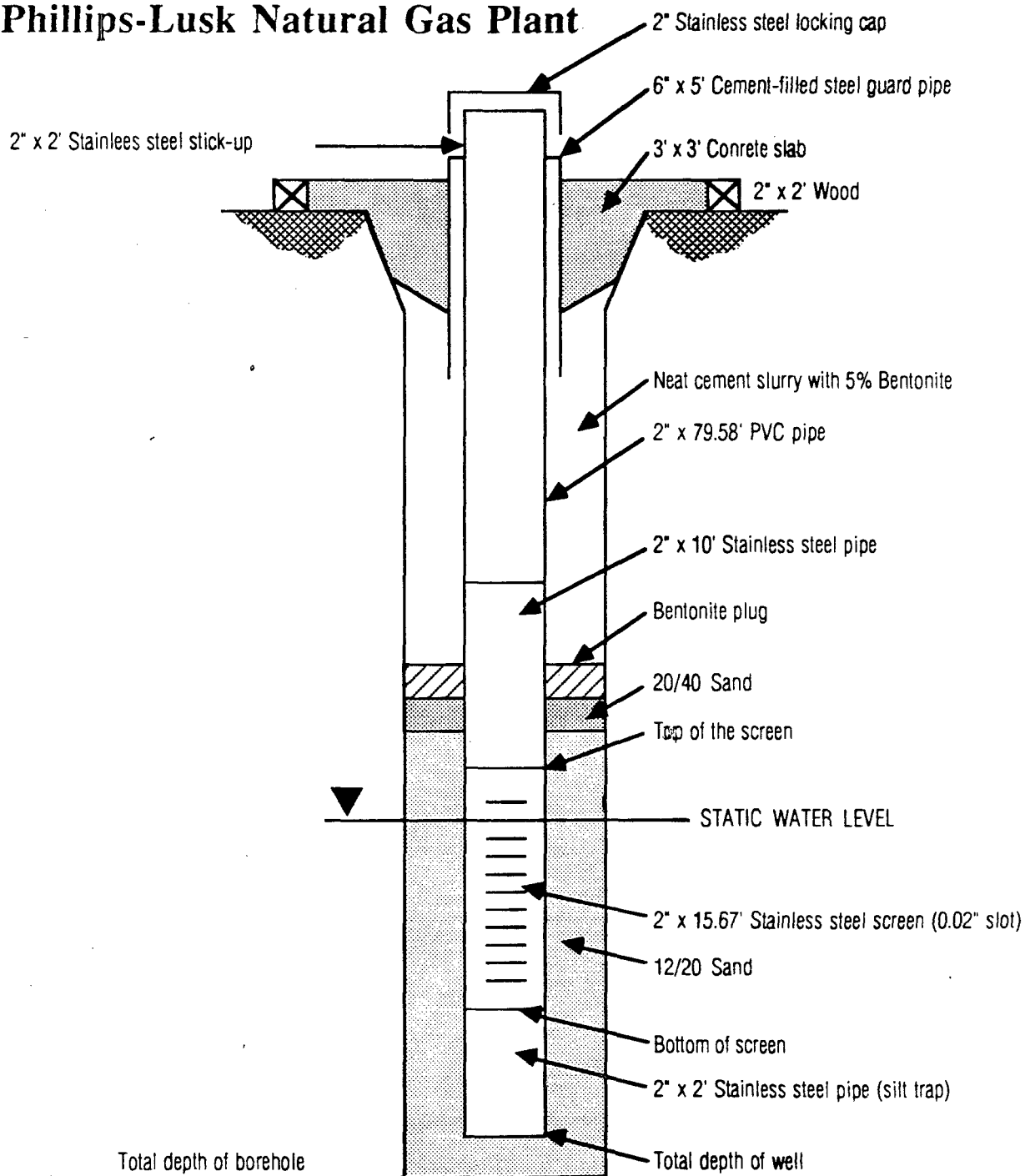
- o No hydrogeologic cross-sections were prepared;
- o Presence or absence of a confining layer beneath the uppermost aquifer has not been documented, and the hydrogeologic properties of the confining layer have not been established.
- o Narrative description and calculation of ground-water flow rate were not provided;
- o The potentiometric surface map based on data collected in May 1988 does not include static water level data;
- o A vertical component of flow through unsaturated and saturated zones was not considered; and
- o Flow nets have not been prepared.

5.1.3 Adequacy of the Design and Construction of the Ground Water Monitoring Wells and Related Data Gaps

The Lusk facility has closed the surface impoundment which the GWMS monitors and is awaiting approval of its closure certification by EPA and EID. This evaluation of the design and construction of the GWMS is based on requirements for detection monitoring under 40 CFR Parts 265.90 and 265.91. The design and construction of the monitoring wells at the Lusk facility meet the performance standards for such systems as discussed in the RCRA TEGD. Figure 5-1 shows the typical monitor well design for the Phillips Lusk facility.

Typical Monitor Well Design

Phillips-Lusk Natural Gas Plant



5.1.4 Adequacy of the Ground-Water Monitoring Program and Related Data Gaps

This section addresses the adequacy of the detection monitoring program which has been implemented by the Phillips-Lusk facility. The following technical deficiencies were noted in the Phillips-Lusk facility's detection monitoring program:

- o The facility has not provided a rationale for the well screen lengths selected or for the vertical placement of the well screens in the upgradient or downgradient wells; and
- o No rationale was provided for terminating the boreholes at the selected depths (55 to 60 feet below ground surface).

5.2 Field Evaluation

The field evaluation at the Lusk facility was conducted October 24-25, 1988 to verify the findings of the office evaluation and to collect ground-water samples. This section summarizes the findings of the field evaluation as follows: Section 5.2.1, ground-water monitoring system design and construction, Section 5.2.2, sample preservation and handling procedures; Section 5.2.4, chain-of-custody procedures; Section 5.2.5, implementation of quality assurance/quality control program; and Section 5.2.6, field observation and surficial well inspection.

5.2.1 Adequacy of the Design and Construction of the Ground-Water Monitoring System

During the field evaluation the following information presented in the facility's hydrogeologic assessment was verified:

- o Numbers and locations of monitoring wells;
- o A concrete pad measuring 3 feet by 3 feet and approximately six inches thick was installed at the surface around the casing stick-up;
- o Two-inch diameter stainless steel casing inside a six-inch protective casing inside an 8-inch surface casing was visible at the surface;
- o The annular space between the primary casing and the secondary casing was sealed with concrete; and the annular space between the secondary casing and the surface casing was sealed with concrete;
- o All wells were structurally stable at the surface; and
- o All wells were fitted with locking caps.

5.2.2 Adequacy of Sample Collection Procedures

The following deficiencies in sample collection procedures were identified during the field evaluation:

- o Sufficient care was not taken to ensure that sampling devices were not allowed to contact the ground or other potentially contaminated surfaces;
- o The owner/operator deviated from his sampling and analysis plan by not following adequate decontamination procedures for all equipment used during the sampling event. Some equipment, such as the well-depth measuring device and polypropylene beakers, were not decontaminated between wells.

- o The owner/operator does not employ techniques capable of detecting immiscible layers prior to well evacuation.
- o Except for the samples for volatiles, samples were not transferred directly from the bailer to the sample container. Samples were transferred from the bailer to a polypropylene beaker which had been rinsed with well water. The polypropylene beaker was then used to fill the sample containers. This practice increases the potential for cross-contamination between wells because the beaker had not been properly decontaminated between wells, and increases the potential for loss of volatile organics from the sample.
- o Samples for analysis of volatiles were excessively agitated while filling the sample containers; this practice may have increased the potential for loss of volatile organics from the samples.
- o No equipment blanks are collected at the time of equipment decontamination; and
- o The owner/operator uses polypropylene rope instead of fluorocarbon coated wire or single-strand stainless steel wire to lower and retrieve bailers.

5.2.3 Adequacy of Sample Preservation and Handling Procedures

The owner/operator's sampling and analysis plan was reviewed prior to the field evaluation. During the field evaluation, the owner/operator was observed while collecting, handling and preserving samples to ascertain if the procedure documented in the plan were followed. The following deficiencies in the plan or in the owner/operator's implementation of the plan were identified:

- o The owner/operator's sampling and analysis plan states that equipment blanks will be collected only when equipment is

decontaminated by steam cleaning. Equipment blanks should be collected whenever sampling equipment is decontaminated in the field;

- o The owner/operator's sampling and analysis plan states that equipment blanks will be analyzed for benzene, toluene, ethyl benzene and xylene (BTEX). Equipment blanks are used to ensure that cross-contamination has not occurred and, therefore, should be analyzed in the laboratory for the same parameters as the environmental samples;
- o The owner/operator's sampling and analysis plan states that trip blanks will be provided and analyzed only for BTEX. Trip blanks are used to verify the effectiveness of the laboratory's sample container decontamination and, therefore, should be analyzed for the same parameters as the environmental samples; and
- o The owner/operator's sampling and analysis plan includes procedures to be used by the analytical laboratory for cleansing sample containers for organics, but the cleaning procedure for sample containers for inorganics analysis is not specified.

5.2.4 Adequacy of Chain-of-Custody Procedures

Chain-of-custody procedures documented in the owner/operator's sampling and analysis plan are generally adequate and are properly implemented in the field, with two exceptions:

- o The field logbook maintained by the owner/operator is a looseleaf notebook. Some of the information entered in the logbook is required under 40 CFR 265.92 and 265.94 and, as such, should be recorded in a bound notebook with pre-numbered pages to provide a more defensible record for documenting field data.

- o The date and time of sample collection are not included in the chain-of-custody record.

5.2.5 Adequacy of Field Quality Assurance/Quality Control Program

Most of the data generated through sampling and analysis of ground-water samples at the Lusk facility should be considered valid and reliable. However, the deficiencies noted in Section 5.2.2, 5.2.3 and 5.2.4 of this report should be addressed by the facility immediately to ensure that all data can be relied upon to determine what impact the facility's operations have had on the quality of the ground-water.

5.2.6 Surficial Well Inspection and Field Observations

Field observations noted no deficiencies in the structural integrity of the ground-water monitoring wells at the Phillips-Lusk facility. Field observations verified the locations of the wells, and that the wells are adequately maintained, protected, and secure. The well casing elevations are surveyed to a standard/consistent benchmark. None of the ground-water samples were visibly turbid.

5.3 Conclusions Concerning the Adequacy of the Ground-Water Monitoring Program

The Lusk facility is in the detection phase of monitoring under 40 CFR Part 265 Subpart F. The detection monitoring program is not adequate due to the technical deficiencies noted in Sections 5.1 and 5.2 of this report. Table 2-1 summarizes the technical deficiencies which may constitute violations of the ground-water performance standards under regulations in 40 CFR 265, Subpart F. Based on the results of this evaluation, the ground-water monitoring system at the Phillips-Lusk facility is inadequate due to technical deficiencies in the following major areas:

- o The geologic and hydrogeologic investigations have not resulted in adequate or complete characterization of the uppermost aquifer (see Section 5.1.2);
- o Ground-water flow directions and rates have not been properly defined (see Section 5.1.2);
- o Geologic and hydrogeologic formations underlying the site have not been fully characterized (see Section 5.1.1); and
- o Samples from background and downgradient wells have not been properly collected and analyzed (See Section 5.2.2 and 5.2.3).

6.0 REFERENCES

1. Ground Water Monitoring Waiver, Lusk Gasoline Plant, Lea County, New Mexico, December 1982.
2. Letter to Jim Turner from Scott Nicholson, Re: Discharge of the chromium treated cooling tower water, July 28, 1983.
3. Sampling information, September 26, 1983.
4. Deficiencies in Compliance Order Responses, December, 1983.
5. Record of communication, Re: Phillips Lusk Closure Plan, New Mexico, February 21, 1984.
6. Letter to Director, New Mexico Environmental Improvement Division (NMEID) from Glenn Cox, Phillips, Re: Financial test to demonstrate financial responsibility, March 27, 1984.
7. Letter to Phillips Petroleum from Arthur Young & Company, re: Financial Statements, March 27, 1984.
8. Letter to Raymond Sisneros, NMEID from B.F. Ballard, Phillips, Re: RCRA Financial Requirements, March 28, 1984.
9. Letter to Reese Copeland, Phillips, and James Turner, U.S. EPA, from Thomas Yost, Administrative Law Judge, U.S. EPA, Re: Eunice Natural Gas Plant, Lee Natural Gas Plant, Artesia Natural Gas Plant, May 22, 1984.
10. Record of Communication between Frank Collis, Phillips, and Joyce Stubblefield, Re: Submittal of additional information regarding Compliance Orders, May 22, 1984.
11. Letter to Thomas Yost, Administrative Law Judge, U.S. EPA, from James Turner, U.S. EPA, Re: Lusk, May 30, 1984.
12. Letter to Reece Copeland, Phillips, from James Turner, U.S. EPA, Re: RCRA Compliance Orders in the Matter of Lusk, May 31, 1984.
13. Record of Communication between Frank Collis, Phillips, and Joyce Stubblefield, Re: Enforcement cases, June 11, 1984.
14. Letter to Peter Pache, NMEID, from William Taylor, Enforcement Section, Re: Inspection reports by Region VI, July 16, 1984.
15. Record of Communication between Joyce Stubblefield and Boyd Hamilton, NMEID, Re: Phillips 4 Cases, July 17, 1984.
16. Letter to Joyce Stubblefield, U.S. EPA, from B.F. Ballard, Phillips, Re: Additional Information Lusk, July 17, 1984.

17. Record of Communication between Joyce Stubblefield and Frank Collis, Phillips, Re: Submittal of Information on Phillips, July 18, 1984.
18. Letter to Greg Mello, NMEID, from B.F. Ballard, Phillips, Re: Lee, Eunice, and Artesia Plant Closure and Post-Closure Plans, July 18, 1984.
19. Letter to Boyd Hamilton NMEID from B.F. Ballard, Phillips, Re: Lee Natural Gas Plant, July 18, 1984.
20. General Waste Analysis Plan for Lusk, Lee, Eunice, and Artesia, March 20, 1984.
21. Attachment 2: Addendum to General Waste Analysis Plan, March 20, 1984.
22. Letter to Thomas Yost, U.S. EPA, from James Turner, Re: Lee Natural Gas Plant, July 19, 1984.
23. Letter to William Taylor, U.S. EPA, from Peter Pache, NMEID, Re: Enforcement Actions July 19, 1984.
24. Letter to Thomas Yost, from Reese Copeland, Phillips, Re: Extension of Time, July 26, 1984.
25. Record of Communication between Frank Collis, Phillips, and Joyce Stubblefield, Re: Status of Closure Plans Cost Estimates, July 26, 1984.
26. Memorandum to Enforcement Files from Joyce Stubblefield, Re: Lusk, Lee, Artesia, and Eunice, July 26, 1984.
27. Record of Communication between Frank Collis, Phillips, and Joyce Stubblefield, Re: Phillips Closure Plans, August 6, 1984.
28. Letter to Joyce Stubblefield from B.F. Ballard, Re: Lusk Closure and Post Closures, August 13, 1984.
29. Letter to Reese Copeland, Phillips, from James Turner, Office of Regional Counsel, Re: Phillips Natural Gas Plants August 21, 1984.
30. Letter to James Turner, U.S EPA, from Reese Copeland, Phillips, Re: Compliance Order Responses, August 3, 1984.
31. Letter to James Turner from Reese Copeland, Re: Consent Agreement and Final Order, August 22, 1984.
32. Letter to Michael Ford, Phillips, from Robert Lowry, NMEID, Re: Analytical parameters, August 22, 1984.
33. Letter to Reese Copeland from James Turner, Re: Consent Agreements and Final Orders, August 27, 1984.
34. Record of Communication between Boyd Hamilton and David Malefsky, Re: Comments on Lusk's GWM Plan, September 14, 1984.

35. Memorandum to Peter Pache, from Boyd Hamilton, NMEID, Re: File Review Phillips, March 21, 1985.
36. Letter to William Rhea from Jack Ellvinger, Re: Land Disposal Facilities, December 17, 1985.
37. Notice of Intent to Terminate Interim Status and to Close the Surface Impoundment Used for the Disposal and Treatment of Hazardous Waste, March 38, 1986.
38. Letter to Rodney Holsworth from Peter Pache, Re: Groundwater Sampling at Phillips, June 13, 1985.
39. Letter to Peter Pache from Thomas Kellahin, Kellahin and Kellahin, Re: Lusk Plant, July 18, 1985.
40. Memorandum of Meeting with Jack Ellinger and B.F. Ballard, Re: Closure of 4 Phillips Plants, March 4, 1986.
41. Letter to B.F. Ballard, Phillips, from Jack Ellvinger, NMEID, Re: Closure proceedings, March 12, 1986.
42. Letter to Carlos Castillo from Ann Claassen, NMEID, Re: Sampling Results, April 8, 1986.
43. Letter to Jack Ellvinger, NMEID, from B.F. Ballard, Phillips, Re: Supplemental Sampling Results, March 21, 1986.
44. Letter to Peter Pache, NMEID, from John Peterson, U.S. Dept of Interior, Fish and Wildlife Service, Re: Closure Action, May 12, 1986.
45. Oversight Review of Phillips Closure Plans, May 15, 1986.
46. Letter to Peter Pache, NMEID, from Sam Becker, U.S. EPA, Re: Closure Plans, May 21, 1986.
47. Memorandum of Meeting with Jack Ellvinger and Frank Collis, Phillips, Re: Closure Plans, June 27, 1986.
48. Letter to Frank Collis from Jack Ellvinger, NMEID, Re: EPA's comments on closure plans, June 5, 1986.
49. Letter to Jack Ellvinger, NMEID, from B.F. Ballard, Phillips, Re: Response to EPA's Comments on Lusk Closure Plan, July 9, 1986.
50. Results of Sampling Phillips' Artesia, Eunice, Lee, and Lusk Plants, August 1986.
51. Letter to B.F. Ballard from Peter Pache, NMEID, Re: Lee Plant Closure Plan Approval, September 30, 1986.

52. Letter to B.F. Ballard, Phillips, from Peter Pache, NMEID, Re: Eunice Plant Closure Plant Approval, September 30, 1986.
53. Letter to B.F. Ballard, Phillips, from Peter Pache, NMEID, Re: Lusk Plant Closure Plant Approval, September 30, 1986.
54. Letter to William Taylor, U.S. EPA, from Peter Pache, NMEID, Re: Approval of Phillips Gas Plants Closure Plans, October 1, 1986.
55. CEI Report, Lee Plant, September 15-16, 1987.
56. Letter to B.F. Ballard, Phillips, from John Gould, NM Health & Environment, Re: Phillips/NMEID Meeting of September 23, 1987, October 13, 1987.
57. Letter to Jack Ellvinger, NMEID, from B.F. Ballard, Phillips, Re: Closure and Post-Closure Plans, October 26, 1987.
58. Letter to Jack Ellvinger, NMEID, from B.F. Ballard, Phillips, Re: Artesia, Lee, Eunice and Lusk Plant Surface Impoundments, October 27, 1987.
59. Letter to Jack Ellvinger, NMEID, from B.F. Ballard, Phillips, Re: Artesia, Lee, Eunice and Lusk Plants Groundwater Monitoring, November 12, 1987.
60. Letter to Jack Ellvinger, NMEID, from B.F. Ballard, Phillips, Re: Artesia, Lee, Eunice and Lusk Plants Notice of Violation, November 18, 1987.
61. Memorandum of Meeting or Conversation with Bill Stoltz and Boyd Hamilton, Re: Phillips - Existing Wells, November 25, 1987.
62. (Phillips) Upgraded Monitoring Well Network Locations and Construction Details, undated.
63. Sampling and Analysis Plan for Phillips 66 Natural Gas Company Artesia, Eunice, Lee and Lusk Gasoline Plants, June 3, 1988.
64. Letter to Boyd Hamilton, Hazardous Waste Bureau, from Bruce Stearns, Phillips, Re: Compliance Schedule /Assessment Plan Outlines, Artesia, Eunice, Lee and Lusk Gasoline Plants, June 6, 1988.
65. Letter to B.F. Ballard from Jack Ellvinger, NMEID, Re: Notice of Violation - Lusk, September 26, 1988.
66. Report on the Installation of Ground-Water Monitoring System, Phillips 66 Natural Gas Company, Phillips-Lusk Plant, by Geoscience Consultants, Ltd., June 3, 1988.
67. Ground-Water Monitoring Checklist --Phillips-Lusk Plant, NMEID, September 15, 1987.

68. Boring logs, completion diagrams, and well-location map, Phillips-Lusk, September 17, 1987.

Facility Name: Phillips Petroleum-Lusk Natural Gas Plant
EPA I.D. Number: NMD000709634

Revision 1
October 1988

APPENDIX A

Office Evaluation Checklist: Technical Evaluation of the Design of the Ground-Water Monitoring System

Notes:

1. This checklist is adapted from OSWER Directive Number 9950.2, "Final RCRA Comprehensive Ground-Water Monitoring Evaluation (CME) Guidance Document."
2. One of these checklists must be completed for each CME office evaluation that is conducted; the completed checklist then must be included in the CME office evaluation report as well as the final CME report.
3. This checklist is a tool to be used by the technical reviewer to assure that all elements of a CME office evaluation are covered and to identify data gaps. Each line in the right-hand column should be filled out using a "Y" (YES) or "N" (NO) for each corresponding question in the left-hand column. Where the file information is incomplete, use the designation "I" (Incomplete).

A. Review of relevant documents:

1. What documents were obtained for use in the Office Evaluation:

- | | | |
|----|---|----------|
| a. | RCRA Part A permit application? | <u>Y</u> |
| b. | RCRA Part B permit application? | <u>Y</u> |
| c. | Correspondence between the owner/operator and appropriate agencies or citizens' groups? | <u>Y</u> |
| d. | Previously conducted facility inspection reports? | <u>Y</u> |
| e. | Facility's contractor reports? | <u>Y</u> |
| f. | Regional hydrogeologic, geologic, or soil reports? | <u>Y</u> |
| g. | The facility's Sampling and Analysis Plan? | <u>Y</u> |
| h. | Ground-Water Quality Assessment Program Outline (or Plan, if the facility is in assessment monitoring)? | <u>Y</u> |

B. Evaluation of the Owner/Operator's Hydrogeologic Assessment:

1. Did the owner/operator use the following direct techniques in the hydrogeologic assessment:

- | | | |
|----|---|-----------|
| a. | Logs of the soil borings/rock corings (documented by a professional geologist, soil scientist, or geotechnical engineer)? | <u>Y*</u> |
|----|---|-----------|

* Only logs from wells constructed in 1988, not for logs from wells constructed in 1984.

Information
Provided
(Y/N/I)

- | | | |
|-------|--|----------|
| b. | Materials tests (e.g., grain size analyses, standard penetration tests)? | <u>N</u> |
| c. | Piezometer installation for water level measurements at different depths? | <u>N</u> |
| d. | Slug tests? | <u>N</u> |
| e. | Pump tests? | <u>N</u> |
| f. | Geochemical analyses of soil samples? | <u>N</u> |
| g. | Other (specify) (e.g., hydrochemical diagrams and wash analysis) <u>None</u> | <u>N</u> |
| <hr/> | | |
| <hr/> | | |

2. Did the owner/operator use the following indirect techniques to supplement direct techniques data:

- | | | |
|-------|---|----------|
| a. | Geophysical well logs? | <u>N</u> |
| b. | Tracer studies? | <u>N</u> |
| c. | Resistivity and/or electromagnetic conductance? | <u>N</u> |
| d. | Seismic survey? | <u>N</u> |
| e. | Hydraulic conductivity measurements of cores? | <u>N</u> |
| f. | Aerial photography? | <u>N</u> |
| g. | Ground penetrating radar? | <u>N</u> |
| h. | Other (specify) <u>None</u> | |
| <hr/> | | |

- | | | |
|----|---|----------|
| 3. | Did the owner/operator document and present the raw data from the site hydrogeologic assessment? | <u>N</u> |
| 4. | Did the owner/operator document methods (criteria) used to correlate and analyze the information? | <u>N</u> |

5. Did the owner/operator prepare the following:

- | | | |
|----|--|-------------|
| a. | Narrative description of geology? | <u>Y</u> |
| b. | Geologic cross-sections? | <u>N</u> |
| c. | Geologic and soil maps? | <u>N*</u> |
| d. | Boring/coring logs? | <u>Y</u> |
| e. | Structure contour maps of the differing water-bearing zones and confining layer? | <u>N**</u> |
| f. | Narrative description and calculation of ground-water flows? | <u>N</u> |
| g. | Water table/potentiometric map? | <u>Y***</u> |
| h. | Hydrologic cross sections? | <u>N</u> |

6. Did the owner/operator obtain a regional map of the area and delineate the facility?

Y

If yes, does this map illustrate:

- | | | |
|----|--|----------|
| a. | Surficial geology features? | <u>Y</u> |
| b. | Streams, rivers, lakes, or wetlands near the facility? | <u>Y</u> |
| c. | Discharging or recharging wells near the facility? | <u>N</u> |

* Geologic maps not prepared; regional soil map provided.

** Owner/operator has not fully characterized uppermost aquifer and/has not identified a confining layer.

*** Potentiometric surface map inadequate.

7. Did the owner/operator obtain a regional hydro-geologic map? N

If yes, does this hydrogeologic map indicate:

- a. Major areas of recharge/discharge? N/A
b. Regional ground-water flow direction? N/A
c. Potentiometric contours which are consistent with observed water level elevations? N/A

8. Did the owner/operator prepare a facility site map? Y

If yes, does the site map show:

- a. Regulated units of the facility (e.g., landfill areas, impoundments)? Y
b. Any seeps, springs, streams, ponds, or wetlands? N/A
c. Location of monitoring wells, soil borings, or test pits? Y
d. How many regulated land-based units does the facility have (specify)?
If more than one regulated unit then, one*
o Does the waste management area encompass all regulated units? N/A
OR
o Is a waste management area delineated for each regulated unit? N/A

* Surface impoundment undergoing RCRA closure.

C. Characterization of Subsurface Geology of Site

1. Soil boring/test pit program:

- a. Were the soil borings/test pits performed under the supervision of a qualified professional? Y*
- b. Did the owner/operator provide documentation for selecting the spacing for borings? Y
- c. Were the borings drilled to the depth of the first confining unit below the uppermost zone of saturation or ten feet into bedrock? I**
- d. Were the following method(s) of drilling used:
 - o Auger (hollow or solid stem)? N
 - o Mud rotary? N
 - o Reverse rotary? N
 - o Cable tool? N
 - o Jetting? N
 - o Other (specify) Air rotary was used to penetrate caliche layer near surface. followed by air-foam rotary to bottom of borehole. Water was used as the drilling fluid.
- e. Were continuous sample corings taken? N***
- f. Were the samples obtained by the following methods:
 - o Split spoon? N

* Only the borings completed in 1988, not the borings completed in 1984.

** Confining unit not identified.

*** Not attempted due to fine-grained, unconsolidated sediments at site.

- o Shelby tube, or similar? N
- o Rock coring? N
- o Ditch sampling? N
- o Other (specify) Drill cuttings; coring
was not attempted due to fine-grained
sediments
- g. Were the sample corings logged by a qualified professional in geology? Y*
- h. Does the field boring log include the following information:
 - o Hole name/number? Y*
 - o Date started and finished? Y*
 - o Driller's name? Y*
 - o Hole location (i.e., map and elevation)? Y*
 - o Drill rig type and bit/auger size? Y**
 - o Gross petrography (e.g., rock type) for each geologic unit? Y*
 - o Gross mineralogy of each geologic unit? Y*
 - o Gross structural interpretation of each geologic unit and structural features (e.g., fractures, gouge material, solution channels, buried streams or valleys, identification of depositional material)? N
 - o Development of soil zones and vertical extent and description of soil type? Y

* Only the borings completed in 1988, not the borings completed in 1984.

** Bit/auger size not specified in boring logs.

- o Depth of water-bearing unit(s) and vertical extent of each? N
- o Depth and reason for termination of borehole? N*
- o Depth and location of any contaminant encountered in borehole? N/A
- o Sample location/number? Y
- o Percent sample recovery? N
- o Narrative descriptions of:
 - Geologic observations? Y
 - Drilling observations? N
- i. Were the following analytical tests performed on the borehold samples:
 - o Mineralogy (e.g., microscopic tests and x-ray diffraction)? N
 - o Petrographic analysis:
 - degree of crystallinity and cementation of matrix? N
 - degree of sorting, size fraction (i.e., sieving), textural variations? N
 - rock type(s)? N
 - soil type? N
 - approximate bulk geochemistry? N
 - existence of microstructures that affect or indicate fluid flow? N
 - o Falling head tests? N
 - o Static head tests? N
 - o Settling measurements? N

* Reason for termination not provided.

Information
Provided
(Y/N/I)

- o Centrifuge tests? N
- o Column drawings? N

D. Verification of subsurface geological data

1. Has the owner/operator used indirect geophysical methods to supplement knowledge of geological conditions between borehole locations? N
2. Do the number of borings and analytical data indicate that the confining layer displays a low enough permeability to impede the migration of contaminants to any stratigraphically lower water-bearing units? I*
3. Is the confining layer laterally continuous across the entire site? I*
4. Did the owner/operator consider the chemical compatibility of the site-specific waste types and the geologic materials of the confining layer? I*
5. Did the geologic assessment address or provide means for resolution of any information gaps of geologic data? N
6. Do the laboratory data corroborate the field data

* Confining layer not identified.

for petrography?

N*

7. Do the laboratory data corroborate the field data
for mineralogy and subsurface geochemistry?

N**

E. Presentation of geologic data

1. Did the owner/operator present geologic cross-
sections of the site?

N

2. Do cross-sections:

- a. identify the types and characteristics of
the geologic materials present? N/A
- b. define the contact zones between different
geologic materials? N/A
- c. note the zones of high permeability or fracture? N/A
- d. give detailed borehole information including:
 - o location of borehole? N/A
 - o depth of termination? N/A
 - o location of screen (if applicable)? N/A
 - o depth of zone(s) of saturation? N/A
 - o backfill procedure? N/A

3. Did the owner/operator provide a topographic map

* No laboratory data provided.

** No laboratory data generated.

which was constructed by a licensed surveyor?

N

4. Does the topographic map provide:

a. contours at a maximum interval of two feet?

N/A*

b. locations and illustrations of man-made features (e.g., parking lots, factory buildings, drainage ditches, storm drains, pipelines)?

N/A

c. descriptions of nearby water bodies?

N/A

d. descriptions of off-site wells?

N/A

e. site boundaries?

N/A

f. individual RCRA units?

N/A

g. delineation of the waste management area(s)?

N/A

h. well and boring locations?

N/A

5. Did the owner/operator provide an aerial photograph depicting the site and adjacent off-site features?

N

6. Does the photograph clearly show surface water bodies, adjacent municipalities, and residences and are these clearly labelled?

N/A

F. Identification of the Uppermost Aquifer

* No topographic map provided.

1. Ground-water flow direction:

- a. Were the well casing heights measured by a licensed surveyor to the nearest 0.01 feet? Y
- b. Were the well water levels allowed to stabilize after construction and development for a minimum of 24 hours prior to measurements? Y
- c. Were the well water level measurements taken to the nearest 0.01 feet? Y*
- d. Were the well water level measurements taken from all wells within a 24-hour period? Y
- e. Was the water level information obtained from (check appropriate one):
 - o multiple piezometers placed in single borehole? N
 - o vertically nested piezometers in closely spaced separate boreholes? N
 - o monitoring wells? Y
- f. Did the owner/operator provide construction details for the piezometers or wells? Y
- g. How were the static water levels measured:
 - o Electric water sounder? Y
 - o Wetted tape? Y
 - o Air line? N
 - o Other (specify) None

* The steel tape used to measure static water level was marked at one-foot intervals. Measurements between the one-foot marks were made with a surveyors' tape with divisions every 1/32-inch.

-
- h. Was the well water level measured in wells with equivalent screened intervals at an equivalent depth below the saturated zone? Y
 - i. Has the owner/operator provided a site water table (potentiometric) contour map? If yes: Y*
 - o Do the potentiometric contours appear logical and accurate based on topography and presented data? (Consult water level data.) Y
 - o Are ground-water flow-lines indicated? Y
 - o Are static water levels shown? Y
 - o Can hydraulic gradients be estimated? Y
 - j. Did the owner/operator develop hydrologic cross-sections of the vertical flow component across the site using measurements from all wells? N
 - k. Did the owner construct flow nets? N
 - l. Do the owner/operator's flow nets include:
 - o piezometer locations? N/A
 - o depth of screening? N/A
 - o width of screening? N/A
 - o measurements of water levels from all wells and piezometers? N/A

2. Seasonal and temporal fluctuations in ground-water level

* Based on data from 5/88.

- a. Do fluctuations in static water levels occur? Y
- o If yes, are the fluctuations caused by any of the following:
- Off-site well pumping? I
 - Tidal processes or other intermittent natural variations (e.g., river stage)? N
 - On-site well pumping? I
 - Off-site, on-site construction or changing land use patterns? I
 - Deep well injection? I
 - Seasonal variations? Y
 - Other (specify) None
-
- b. Has the owner/operator documented sources and patterns that contribute to or affect the ground-water patterns below the waste management units? N
- c. Do water level fluctuations alter the general ground-water gradients and flow directions? I
- d. Based on water level data, do any head differentials occur that may indicate a vertical flow component in the saturated zone? N*
- e. Did the owner/operator implement means for gauging long-term effects on water movement that may result from on-site or off-site construction or changes in land-use patterns? N

3. Hydraulic conductivity

* Data not adequate to determine.

- a. How were hydraulic conductivities of the subsurface materials determined?
- o Single-well tests (slug tests)? N
 - o Multiple-well tests (pump tests)? N
 - o Other (specify) Not determined;
estimates submitted based on
values found in literature.
- b. If single-well tests were conducted, was it done by:
- o Adding or removing a known volume of water? N/A
 - o Pressurizing the well casing? N/A
- c. If single well tests were conducted in a highly permeable formation, were pressure transducers and high-speed recording equipment used to record the rapidly changing water levels? N/A
- d. Since single well tests only measure hydraulic conductivity in a limited area, were enough tests run to ensure a representative measure of conductivity in each hydrogeologic unit? N/A
- e. Is the owner/operator's slug test data (if applicable) consistent with existing geologic information (e.g., boring logs)? N/A
- f. Were other hydraulic conductivity properties determined? N
- g. If yes, provide any of the following data, if available:
- o Transmissivity N/A
 - o Storage coefficient N/A
 - o Leakage N/A

a. Has the extent of the uppermost saturated zone (aquifer) in the facility area been defined? N

If yes,

o Are soil boring/test pit logs included? Y*

o Are geologic cross-sections included? N

b. Is there evidence of confining (component, unfractured, continuous, and low permeability) layers beneath the site? I**

c. What is the hydraulic conductivity of the confining unit (if present)? Not determined

How was it determined? Not determined

d. Does potential for other hydraulic communication exist (e.g., lateral incontinuity between geologic units, facies changes, fracture zones, cross-cutting structures, or chemical corrosion/alteration of geologic units by leachate)? I***

*** Hydrogeologic assessment incomplete; confining layer not identified.

If yes or no, what is the rationale?

I*

Hydrogeologic assessment incomplete;
confining layer not identified or
characterized.

G. Evaluation of the Facility's Ground-Water Monitoring Wells'
Design and Construction

Note: These questions should be answered for each
different well design present at the facility.

1. Drilling methods

a. What drilling method was used for the well:

- | | |
|--|----------|
| o Hollow-stem auger? | <u>N</u> |
| o Solid-stem auger? | <u>N</u> |
| o Mud rotary? | <u>N</u> |
| o Air rotary? | <u>Y</u> |
| o Reverse rotary? | <u>N</u> |
| o Cable tool? | <u>N</u> |
| o Jetting? | <u>N</u> |
| o Air drill with casing hammer? | <u>N</u> |
| o Other (specify) <u>Air-foam rotary</u> | |

b. Were any cutting fluids (including water)
or additives used during drilling?

I**

* Hydrologic assessment incomplete; confining layer not identified.

** Information not provided.

If yes, specify:

Type of drilling fluid Potable water

Source of water used Not identified I*

Foam No

Polymers No

Other (specify) No

c. Was the cutting fluid, or additive, identified? Y

d. Was the drilling equipment steam-cleaned prior to
drilling the well? N

Other methods Hot-water washed

e. Was compressed air used during drilling? Y

o If yes, was the air filtered to remove oil? Y

f. Did the owner/operator document procedure for
establishing the potentiometric surface? Y

o If yes, explain how the location was
established?

Rising water level in borehole was
monitored with an electronic water
level indicator until static con-
ditions were reached.

g. Formation samples

o Were formation samples collected initially
during drilling? Y

o Were any continuous cores taken? N*

o If not, at what interval were samples taken? 5 ft

o How were the samples obtained:

- Split spoon? N

* No documentation was provided as to what type of sampling was performed during construction of former GWMS in 1984.

Information
Provided
(Y/N/I)

- Shelby tube? N
- Core drill? N
- Other (specify) Drill cuttings
- o Identify any physical and/or chemical tests performed on the formation samples:
None indicated

2. Monitoring well construction materials

- a. Identify construction materials (by number) and diameters (ID/OD). *

	<u>Material</u>	<u>Diameter (ID/OD)</u>
o Primary casing	<u>PVC</u>	<u>2" ID</u>
o Secondary or <u>out-</u> <u>side</u> casing (double construction)	<u>Stainless steel</u>	<u>2" ID</u>
o Screen	<u>Stainless Steel</u>	<u>2" ID</u> <u>(Slots 0.02")</u>

- b. How are the sections of casing and screen connected:

- o Pipe sections threaded? Y
- o Couplings (friction) with adhesive or solvent? N
- o Couplings (friction) with retainer screws? N
- o Other (specify) _____

- c. Were the materials steam-cleaned prior to

* See Exhibit 5-1 in report text.

installation?

Y*

If no, how were the materials cleaned?

3. Well intake design and well development

a. Was a well intake screen installed?

Y

o What is the length of the screen for
the well? 15 feet

(screen extends 5' above SWL)

o Is the screen manufactured?

Y

b. Was a filter pack installed?

Y

o What kind of filter pack was employed?
(specify) Pre-packaged 12/20 grade

silica sand

o Is the filter pack compatible with
formation materials?

Y

o How was the filter pack installed?

Through a tremie pipe

o What are the dimensions of the filter pack?

Filter pack was installed from bottom
of borehole to 2 to 3 feet above
the top of the screen

o Has a turbidity measurement of the well
water ever been made?

Y

o Have the filter pack and screen been
designed for the in-situ materials?

Y

c. Was the well developed?

Y

* Pre-packaged, factory steam-cleaned casing was used.

o What technique was used for well development:

- Surge block? N
- Bailer? N
- Air surging? N
- Water pumping? Y
- Other (specify) Overpumping using a 1.5-
inch stainless steel air-lift develop-
ment pump. Surging was used occasionally
to dislodge fines from the formation.
Surging utilized distilled water and
formation water.

4. Annular space seals

a. What is the annular space in the saturated zone directly above the filter pack filled with:

- Sodium bentonite? (specify type and grit) Y*
Pellets; grit not indicated
- Cement? (specify neat or concrete) N
- Other (specify) None

o Was the seal installed by:

- Dropping material down the hole and
tamping? N
- Dropping material down the inside of a
hollow-stem auger? N
- Tremie pipe method? Y

* One to three feet of 20/40 grade silica sand was placed over the filter pack, then bentonite seal. See Exhibit 5-1 in report text.

- Other (specify) See footnote *
- b. Was a different seal used in the unsaturated zone? Y
If yes,
 - o Was this seal made with:
 - Sodium bentonite? (specify type and grit) N/A
 - Cement? (specify neat or concrete) N/A
 - Other (specify) Neat cement slurry w/5% bentonite
 - o Was this seal installed by:
 - Dropping material down the hole and tamping? N
 - Dropping material down the inside of hollow stem auger? N
 - Other (specify) Tremie pipe
- c. Is the upper portion of the borehole sealed with a concrete cap to prevent infiltration from the surface? Y
- d. Is the well fitted with an above-ground protective device and bumper guards? Y
- e. Has the protective cover been installed with locks to prevent tampering? Y

* About 1 foot of 20/40 sand was placed above the bentonite to keep it from being dislodged when the borehole was grouted.

H. Evaluation of the Facility's Detection Monitoring Program

1. Placement of downgradient detection monitoring wells

- a. Are the ground-water monitoring wells or clusters located immediately adjacent to the waste management area? Y
- b. How far apart are the detection monitoring wells?
- c. Does the owner/operator provide a rationale for the location of each monitoring well or cluster? Y*
- d. Has the owner/operator identified the well screen lengths of each monitoring well or clusters? Y
- e. Does the owner/operator provide an explanation for the well screen lengths of each monitoring well or cluster? N
- f. Do the actual locations of monitoring wells or clusters correspond to those identified by the owner/operator? Y**

2. Placement of upgradient monitoring wells

- a. Has the owner/operator documented the location of each upgradient or background monitoring well or cluster? Y
- b. Does the owner/operator provide an explanation for the location(s) of the upgradient or background monitoring wells? Y

* Location based on data from former GWMS.

** Confirmed during field evaluation.

c. What length screen has the owner/operator
employed in the background monitoring well(s)?
15 feet

d. Does the owner/operator provide an explanation
for the screen length(s) chosen? N

e. Does the actual location of each background
monitoring well or cluster correspond to that
identified by the owner/operator? Y*

I. Evaluation of the Facility's Assessment Monitoring Program

1. If the facility is in detection monitoring, has
the owner/operator prepared a ground water quality
assessment program outline? Y

2. Does the owner/operator maintain a copy of the
outline at the facility? (If so, try to obtain a
copy of the outline during the field evaluation) N

3. Does the outline meet the requirements of 40 CFR
Part 265.93(a)? Y

4. If the facility is in assessment monitoring, does
the owner/operator have a ground-water quality
assessment program plan which has been approved
by EPA or the appropriate state agency? N/A

* Confirmed during field evaluation.

5. Does the owner/operator maintain a copy of the plan at the facility? (If so, try to obtain a copy of the plan during the field evaluation.) N/A
6. Does the assessment plan specify:
- a. The number, location, and depth of wells? N/A
 - b. The rationale for their placement and identify the basis that will be used to select subsequent sampling locations and depths in later assessment phases? N/A
7. Does the list of monitoring parameters include all hazardous waste constituents from the facility? N/A
- a. Does the water quality parameter list include other important indicators not classified as hazardous waste constituents? N/A
 - b. Does the owner/operator provide documentation for the listed wastes which are not included? N/A
8. Does the owner/operator's assessment plan specify the procedures to be used to determine the rate of constituent migration in the ground water? N/A
9. Has the owner/operator specified a schedule of implementation in the assessment plan? N/A
10. Have the assessment monitoring objectives been clearly defined in the assessment plan? N/A

- a. Does the plan include analyses and/or re-evaluation to determine if significant contamination has occurred in any of the detection monitoring wells? N/A
- b. Does the plan provide for a comprehensive program of investigation to fully characterize the rate and extent of contaminant migration from the facility? N/A
- c. Does the plan call for determining the concentrations of hazardous wastes and hazardous waste constituents in the ground water? N/A
- 11. Does the assessment plan identify the investigatory methods that will be used in the assessment phase? N/A
 - a. Is the role of each method in the evaluation fully described? N/A
 - b. Does the plan provide sufficient descriptions of the direct methods to be used? N/A
 - c. Does the plan provide sufficient descriptions of the indirect methods to be used? N/A
 - d. Will the method contribute to the further characterization of the contaminant movement? N/A
- 12. Are the investigatory techniques utilized in the assessment program based on direct methods? N/A
 - a. Does the assessment approach incorporate indirect methods to further support direct methods? N/A

- b. Will the planned methods called for in the assessment approach ultimately meet performance standards for assessment monitoring? N/A
 - c. Are the procedures well defined? N/A
 - d. Does the approach provide for monitoring wells similar in design and construction to the detection monitoring wells? N/A
 - e. Does the approach employ taking samples during drilling or collecting core samples for further analysis? N/A
13. Are the indirect methods to be used based on reliable and accepted geophysical techniques? N/A
- a. Are they capable of detecting subsurface changes resulting from contaminant migration at the site? N/A
 - b. Is the measurement at an appropriate level of sensitivity to detect ground-water quality changes at the site? N/A
 - c. Is the method appropriate considering the nature of the subsurface materials? N/A
 - d. Does the approach consider the limitations of these methods? N/A
 - e. Will the extent of contamination and constituent concentration be based on direct methods and sound engineering judgment? (using indirect methods to further substantiate the findings) N/A
14. Does the assessment approach incorporate any mathematical modeling to predict contaminant movement? N/A

- | | | |
|----|---|------------|
| a. | Will site specific measurements be utilized to accurately portray the subsurface? | <u>N/A</u> |
| b. | Will the derived data be reliable? | <u>N/A</u> |
| c. | Have the assumptions been identified? | <u>N/A</u> |
| d. | Have the physical and chemical properties of the site-specific wastes and hazardous waste constituents been identified? | <u>N/A</u> |

J. Conclusions

1. Subsurface geology:

- | | | |
|----|---|-----------|
| a. | Has sufficient data been collected to adequately define petrography and petrographic variation? | <u>N*</u> |
| b. | Has the subsurface geochemistry been adequately defined? | <u>N*</u> |
| c. | Was the boring/coring program adequate to define subsurface geologic variation? | <u>N*</u> |
| d. | Was the owner/operator's narrative description complete and accurate in its interpretation of the data? | <u>N*</u> |
| e. | Does the geologic assessment address or provide means to resolve any information gaps? | <u>N*</u> |

2. Ground-Water flowpaths:

- | | | |
|----|--|-----------|
| a. | Did the owner/operator adequately establish the horizontal and vertical components of ground-water flow? | <u>N*</u> |
|----|--|-----------|

* See Table 2-1 and Section 5.1.1 of this report.

- b. Were appropriate methods used to establish ground-water flowpaths? N*
 - c. Did the owner/operator provide accurate documentation? N*
 - d. Are the potentiometric surface measurements valid? Y*
 - e. Did the owner/operator adequately consider the seasonal and temporal effects on the ground water? N*
 - f. Were sufficient hydraulic conductivity tests performed to document lateral and vertical variation in hydraulic conductivity in the entire hydrogeologic subsurface below the site? N*
3. Uppermost aquifer:
- a. Did the owner/operator adequately define the uppermost aquifer? N
4. Monitoring well construction and design:
- a. Do the design and construction of the owner/operator's ground-water monitoring wells permit depth discrete ground-water samples to be taken? Y
 - b. Are the samples representative of ground-water quality? Y**
 - c. Are the ground-water monitoring wells structurally stable? Y

* See Table 2-1 and Section 5.1.1 of this report.

** Only for the upper portion of the aquifer.

- d. Does the ground-water monitoring well's design and construction permit an accurate assessment of aquifer characteristics?

Y*

5. Detection monitoring:

- a. Downgradient wells:

Do the location and screen lengths of the ground-water monitoring wells or clusters in the detection monitoring system allow the immediate detection of a release of hazardous waste or constituents from the hazardous waste management area to the uppermost aquifer?

Y

- b. Do the location and screen lengths of the upgradient (background) ground-water monitoring wells ensure the capability of collecting ground-water samples representative of upgradient (background) ground-water quality including any ambient heterogeneous chemical characteristics?

Y

6. Assessment monitoring:

- a. Has the owner/operator adequately characterized site hydrogeology to determine contaminant migration?
- b. Is the detection monitoring system adequately designed and constructed to immediately detect any contaminant release?

N

Y

* Only for the upper portion of the saturated zone.

- c. Are the procedures used to make a first determination of contamination adequate? N/A
- d. Is the assessment plan adequate to detect, characterize, and track contaminant migration? N/A
- e. Will the assessment monitoring wells, given site hydrogeologic conditions, define the extent and concentration of contamination in the horizontal and vertical planes? N/A
- f. Are the assessment monitoring wells adequately designed and constructed? N/A
- g. Are the sampling and analysis procedures adequate to provide true measures of contamination? N/A
- h. Do the procedures used for evaluation of assessment monitoring data result in determinations of the rate of migration, extent of migration, and hazardous constituent composition of the contaminant plume? N/A
- i. Are the data collected at sufficient frequency and duration to adequately determine the rate of migration? N/A
- j. Is the schedule of implementation adequate? N/A
- k. Is the owner/operator's assessment monitoring plan adequate? N/A
 - o If the owner/operator had to implement his assessment monitoring plan, was it implemented satisfactorily? N/A

APPENDIX B

FIELD EVALUATION CHECKLIST
FOR
PHILLIPS PETROLEUM
LUSK NATURAL GAS PLANT
BUCKEYE, NEW MEXICO

Facility Name: Phillips Petroleum - Lusk Natural Gas Plant
EPA I.D. Number: NMD000709634

Revision 1
July, 1988

APPENDIX B

Field Evaluation Checklist: Technical Evaluation of the Operation of the Ground-Water Monitoring System

-
- Notes:
1. This checklist is adapted from OSWER Directive Number 9950.2, "Final RCRA Comprehensive Ground-Water Monitoring Evaluation (CME) Guidance Document."
 2. One of these checklists must be completed for each CME field evaluation that is conducted; the completed checklist then must be included in the CME report.
 3. This checklist is a tool to be used by the technical reviewers to assure that all elements of a CME field evaluation are covered and to identify data gaps. Each line in the right-hand column should be filled out using a "Y" (YES) or "N" (NO) for each corresponding question in the left-hand column. Where the information is incomplete or unavailable at the time of the field evaluation, use the designation "U" (UNKNOWN). As appropriate, attempt to obtain the necessary information after the field evaluation, or indicate in the CME report that the information is unavailable. Specify in the report where missing information constitutes violations of 40 CFR Parts 265 or 270.

I. Check of Ground-Water Monitoring System

Note: Responses in this section apply to all wells in the system.

A. Ground-water monitoring system design:

Do the numbers, depths, and locations of monitoring wells correspond with those reported in the facility's hydrogeologic assessment Y

B. Monitoring well construction:

1. Identify construction materials and well diameters:

	<u>Material</u>	<u>Diameter (ID/OD)</u>
a. Primary casing	<u>*</u>	<u>2" ID</u>
b. Secondary or outside casing (guard casing)	<u>Steel</u>	<u>6" ID</u>
c. Surface casing	<u>Steel</u>	<u>8" ID</u>

2. Is the upper portion of the borehole sealed with concrete to prevent infiltration from the surface? Y

3. Is the well fitted with an above-ground protective device? Y

* As-built drawings indicate a ten foot section of stainless steel casing between the screen and the bottom of the PVC and a two foot section of stainless steel pipe at the top of the PVC. Two-inch stainless steel casing was visible at the surface.

4. Is the protective cover fitted with
locks to prevent tampering?

Y

II. Review of Sample Collection Procedures

A. Measurement of well depth elevations:

1. Are measurements made of both depth to
standing water and depth to the bottom of
the well?

Y

2. Are measurements taken to the nearest
0.01 feet?

Y

3. What measuring device is used?
Olympic Model 150 Electric well
probe and wetted steel tape

4. Is there a reference point established by
a licensed surveyor?

Y

5. Is the measuring equipment properly
cleaned between well locations to prevent
cross-contamination?

Y

B. Detection of immiscible layers:

1. Are procedures used which will detect
light-phase immiscible layers?

N

2. Are procedures used which will detect
dense-phase immiscible layers?

N

C. Sampling of immiscible layers:

1. Are the immiscible layers sampled
separately prior to well evacuation?

N

2. Do the procedures used minimize mixing
with water-soluble phases?

N

D. Well evacuation:

1. Are low-yielding wells evacuated to
dryness?

N/A

2. Are high-yielding wells evacuated so
that at least three casing volumes are
removed?

Y

3. What device is used to evacuate the
wells?

Pre-cleaned, Teflon bailer

4. If any problems are encountered (e.g., equipment malfunction), are they noted in a field logbook?

Y

E. Sample withdrawal:

1. For low-yielding wells, are samples for volatile, pH, and oxidation/reduction potential drawn first after the well recovers?
2. Are sampling devices either bottom valve bailers or positive gas displacement bladder pumps?
3. If bailers are used, is fluorocarbon resin-coated wire, single-strand stainless steel wire, or monofilament used to raise and lower the bailer?
4. If bladder pumps are used, are they operated in a continuous manner to prevent aeration of the sample?
5. If bailers are used, are they lowered

Y*

Y

N**

N/A

* Initially, the facility o/o was using the first bailer volume to run field parameters before collecting the volatiles sample. The inspection team commented on this, and the o/o subsequently changed this procedure.

** Retrieval line is braided polypropylene rope.

Information
Provided
(Y/N/U)

5. If bailers are used, are they lowered slowly to prevent degassing of the water? Y
6. If bailers are used, are the contents transferred to the sample container in a way that minimizes agitation and aeration? N
7. Is care taken to avoid placing clean sampling equipment on the ground or other contaminated surfaces prior to insertion into the well? N
8. If dedicated sampling equipment is not used, is equipment disassembled and thoroughly cleaned between samples? N/A
9. If samples are for inorganic analysis, does the cleaning procedure for sampling equipment include the following sequential steps:
 - a. Nonphosphate detergent wash? Y
 - b. Dilute acid rinse (HNO_3 or HCl)? N*
 - c. Tap water rinse? N**
 - d. Type II reagent-grade water? Y***
10. If samples are for organic analysis, does the cleaning procedure for sampling

* Tap Water

** Methanol.

*** Distilled water

equipment include the following
sequential steps:

- | | | |
|-----|--|------------|
| a. | Nonphosphate detergent wash? | <u>Y</u> |
| b. | Tap water rinse? | <u>Y</u> |
| c. | Distilled/deionized water rinse? | <u>N**</u> |
| d. | Acetone rinse? | <u>N*</u> |
| e. | Pesticide-grade hexane rinse? | <u>N*</u> |
| 11. | Is sampling equipment thoroughly dry
before use? | <u>Y</u> |
| 12. | Are equipment blanks taken to ensure
that sample cross-contamination has not
occurred? | <u>N</u> |
| 13. | If volatile samples are taken with a
positive gas displacement bladder pump,
are pumping rates below 100 ml/min? | <u>N/A</u> |

F. In-situ or field analyses:

- | | | |
|----|---|----------|
| 1. | Are the following labile (chemically unstable)
parameters determined in the field: | |
| a. | pH? | <u>Y</u> |
| b. | Temperature? | <u>Y</u> |
| c. | Specific conductivity? | <u>Y</u> |
| d. | Redox potential? | <u>N</u> |
| e. | Chlorine? | <u>N</u> |
| f. | Dissolved oxygen? | <u>N</u> |

* Distilled water.

Information
Provided
(Y/N/U)

- g. Turbidity? N
- h. Other (specify) None
2. Are the in-situ determinations made after well evacuation and sample removal? Y
3. If a sample is withdrawn from the well, are parameters measured from a split portion? Y
4. Is monitoring equipment calibrated according to manufacturers' specifications and consistent with SW-846? Y
5. Is the date, procedure, and maintenance for equipment calibration documented in the owner/operator's field logbook? Y

III. Review of Sample Preservation and Handling Procedures

A. Sample containers:

1. Are samples transferred from the sampling device directly to their compatible containers? N*
2. Are sample containers for metals (inorganics) analyses polyethylene with polypropylene caps? Y

* Samples were collected in polyethylene beakers and transferred to appropriate containers. The beakers were rinsed with well water prior to collecting the samples.

Information
Provided
(Y/N/U)

- | | | |
|----|---|------------|
| 3. | Are sample containers for organics analyses glass bottles with fluorocarbon resin-lined caps? | <u>Y</u> |
| 4. | If glass bottles are used for metals samples, are the caps fluorocarbon resin-lined? | <u>N/A</u> |
| 5. | Are the sample containers for metal analyses cleaned using these sequential steps: | |
| | a. Nonphosphate detergent wash? | <u>I*</u> |
| | b. 1:1 nitric acid rinse? | <u>Y</u> |
| | c. Tap water rinse? | <u>I</u> |
| | d. 1:1 hydrochloric acid rinse? | <u>I</u> |
| | e. Tap water rinse? | <u>I</u> |
| | f. Distilled/deionized water rinse? | <u>I</u> |
| 6. | Are the sample containers for organic analyses cleaned using these sequential steps: | |
| | a. Nonphosphate detergent/hot water wash? | <u>Y</u> |
| | b. Tap water rinse? | <u>Y</u> |
| | c. Distilled/deionized water rinse? | <u>Y</u> |
| | d. Acetone rinse? | <u>Y</u> |
| | e. Pesticide-grade hexane rinse? | <u>Y</u> |
| 7. | Are trip blanks used for each sample container type to verify cleanliness? | <u>N**</u> |

* Procedures for decontamination of sample containers for metals analyses were not provided in the Sampling and Analysis Plan.

** VOA vials only.

B. Sample preservation procedures:

1. Are samples for the following analyses cooled to 4°C:

a. TOC?	<u>Y</u>
b. TOX?	<u>Y</u>
c. Chloride?	<u>Y</u>
d. Phenols?	<u>N/A</u>
e. Sulfate?	<u>Y</u>
f. Nitrate?	<u>Y</u>
g. Coliform bacteria?	<u>Y</u>
h. Cyanide?	<u>N/A</u>
i. Oil and grease?	<u>N/A</u>
j. Hazardous constituents (Modified Appendix IX)?	<u>Y*</u>

2. Are samples for the following analyses field acidified to pH <2 with HNO₃:

a. Iron?	<u>N/A</u>
b. Manganese?	<u>N/A</u>
c. Sodium?	<u>N/A</u>
d. Total metals?	<u>N/A</u>
e. Dissolved metals?	<u>Y</u>
f. Fluoride?	<u>N**</u>
g. Endrin?	<u>Y**</u>
h. Lindane?	<u>Y</u>
i. Methoxychlor?	<u>Y</u>
j. Toxaphene?	<u>Y</u>
k. 2,4, D?	<u>Y</u>

* Purgeables and pesticides/herbicides only.

** Stored at 4°C only.

Information
Provided
(Y/N/U)

- | | | |
|----|---|------------|
| 1. | 2,4,5, TP Silvex? | <u>Y</u> |
| m. | Radium? | <u>Y</u> |
| n. | Gross alpha? | <u>Y</u> |
| o. | Gross beta? | <u>Y</u> |
| 3. | Are samples for the following analyses
field-acidified to pH <2 with H ₂ SO ₄ : | |
| a. | Phenols? | <u>N/A</u> |
| b. | Oil and grease? | <u>N/A</u> |
| 4. | Is the sample for TOC analysis field-acidified
to pH <2 with HCl? | <u>N*</u> |
| 5. | Is the sample for TOX analysis preserved with
1 ml of 1.1 M sodium sulfite? | <u>N*</u> |
| 6. | Is the sample for cyanide analysis preserved with
NaOH to pH >12? | <u>N/A</u> |
| C. | Special handling considerations: | |
| 1. | Are organic samples handled without filtering? | <u>Y</u> |
| 2. | Are samples for volatile organics analyses
transferred to the appropriate vials to eliminate
headspace over the sample? | <u>Y</u> |
| 3. | Are samples for metals analyses split into two
portions? | <u>N</u> |

* Acidified to pH <2 with H₂SO₄ with no headspace.

Information
Provided
(Y/N/U)

4. Is the sample for dissolved metals filtered through a 0.45-micron filter? Y
5. Is the second portion analyzed for total metals without being filtered? N*
6. Is one equipment blank prepared each day of ground-water sampling? N**

IV. Review of Chain-of Custody Procedures

A. Sample labels:

1. Are sample labels used? Y
2. Do labels contain the following information:
- a. Sample identification number? Y
 - b. Name of collector? Y
 - c. Date and time of collection? Y
 - d. Place of collection? Y
 - e. Parameter(s) requested and preservatives used? Y
3. Do the labels remain legible even if wet? Y

* Samples are not analyzed for total metals.

** No equipment blanks were prepared.

B. Sample seals:

1. Are sample seals placed on containers or cooler to ensure that the samples are not altered? Y

C. Field logbook:

1. Is a field logbook maintained by the owner/operator? Y*
2. Does the logbook document the following:
- a. Purpose of sampling (e.g., detection or assessment monitoring)? N
 - b. Location of well(s)? Y
 - c. Total depth of each well? Y
 - d. Static water level depth and measurement technique? Y
 - e. Presence of immiscible layers and detection method? N
 - f. Collection method for immiscible layers and sample identification numbers? N
 - g. Well evacuation procedures? Y
 - h. Sample withdrawal procedure? Y
 - i. Date and time of collection? Y
 - j. Well sampling sequence? Y
 - k. Types of sample containers and sample identification number(s)? N**

* The owner/operator maintains field records in a spiral-bound notebook, not in a bound log book.

** Only sample identification number.

Information
Provided
(Y/N/U)

- | | | |
|-----------------------------|--|-----------|
| m. | Parameters requested? | <u>Y</u> |
| n. | Field analysis data and method(s)? | <u>Y</u> |
| o. | Sample distribution and transporter? | <u>N</u> |
| p. | Field observations? | |
| | o Unusual well recharge rates? | <u>N</u> |
| | o Equipment malfunction(s)? | <u>N</u> |
| | o Possible sample contamination? | <u>N</u> |
| | o Sampling rate? | <u>N</u> |
| D. Chain-of-custody record: | | |
| 1. | Is a chain-of-custody record included with each sample? | <u>Y</u> |
| 2. | Does it document the following: | |
| a. | Sample number? | <u>Y</u> |
| b. | Signature of collector? | <u>Y</u> |
| c. | Date and time of collection? | <u>N*</u> |
| d. | Sample type? | <u>Y</u> |
| e. | Station location? | <u>Y</u> |
| f. | Number of containers? | <u>Y</u> |
| g. | Parameters requested? | <u>Y</u> |
| h. | Signatures of persons involved in the chain-of-possession? | <u>Y</u> |
| i. | Inclusive dates of possession? | <u>Y</u> |

* Form does not request date or time of collection.

E. Sample analysis request sheet:

1. Does a sample analysis request sheet accompany each sample? Y
2. Does the request sheet document the following:
 - a. Name of person receiving the sample? Y
 - b. Date of sample receipt? Y
 - c. Laboratory sample number (if different than field number)? Y
 - d. Analyses to be performed? Y

V. Review of Quality Assurance/Quality Control Program

- A. Is the validity and reliability of the laboratory and field-generated data ensured by a Quality Assurance/Quality Control program? Y
- B. Does the Quality Assurance/Quality Control program include:
 1. Documentation of any deviations from approved procedures? Y
 2. Documentation of analytical results for:
 - a. Blanks? Y*
 - b. Standards? Y

* See Section 5.2.3 of the report text.

Information
Provided
(Y/N/U)

- | | | |
|---|---|-----------|
| c. | Duplicates? | <u>Y</u> |
| d. | Spiked Samples? | <u>Y</u> |
| e. | Detectable limits for each parameter
being analyzed? | <u>Y</u> |
| C. | Are approved statistical methods used? | <u>I</u> |
| D. | Are QC samples used to correct data? | <u>N</u> |
| E. | Are all data critically examined to ensure it
has been properly calculated and reported? | <u>Y</u> |
|
VI. <u>Surficial Well Inspection and Field Observations</u> | | |
| A. | Are the wells adequately maintained? | <u>Y</u> |
| B. | Are the monitoring wells protected and secure? | <u>Y</u> |
| C. | Do the wells have surveyed casing elevations? | <u>Y</u> |
| D. | Are the ground-water samples turbid? | <u>Y*</u> |
| E. | Have all physical characteristics of the site
been noted in the inspector's field notes (i.e.,
surface waters, topography, surface features)? | <u>Y</u> |
| F. | Has a site sketch been prepared by the field | |

* Some samples were turbid upon visual inspection and analytical results verify this.

Information
Provided
(Y/N/U)

inspector with a scale, north arrow, location(s)
of buildings, location(s) of regulated units,
location of monitoring wells, and a rough
depiction of the site drainage pattern?

N

APPENDIX C

FIELD LOG

Phillips Petroleum Corp - Lusk
10/24/88

Comprehensive Ground Water
Monitoring Evaluation

T195 R32E Sect 19

We met Mike Ford (Phillips)
in the Phillips Office in
Odessa, TX at 8:00 AM (CST)
and drove to the Lusk Plant
to observe well purging.

Steve Spivey (ATK)
Marlane Smith (ATK)
Mike Ford (Phillips) Staff Engineer
Analyst

All photos are recorded in
Mountain Standard Time, as well
as field notes

10/24/88

(1)

Leave facility 10:00 AM (MST)

Can't get to well because
Mike doesn't have key to
gate. We wait for someone
to deliver key.

Mike sets up winds and water
retained line outside well wait
for keys.

Retained line is polypropylene,
twisted rope; 100 ft.

Driller is to pull
cable NW-1 (approx) 10:50
Mike sets up device

Photo # 1 11:51 (this photo is in
CST but all the rest are in
MST) NW-1 looking southeast

Photo # 2 10:56 measuring static
water level prior to purging;
seeing steel legs and cracks;
west southwest

② SWL at MW-1 40.18 feet

"top of slanders steel casing 3571.51 NSL
Ground 3567.98 NSL

Calculated Well volume = 5.13 gallons
Casing diameter 2.25 I.D.

[Photo #3-11:05] bailer in well

[Photo #4-11:07] bailer in well

[Photo #5-11:10] purging well

[Photo #6-11:16] purging well

[Photo #7-11:17] purging well;
using top of bailer
purged water turbid

Purged six gallons total
Complete purging MW-1 11:30

[Photo #8-11:36] collecting colloform
sample

MW-1 appears structurally sound

③ Photo #9 11:43: measuring

Well depth at MW-1 casing
steel top. Upper metered casing - 20
feet ✓ Total depth 48.5 feet
except for first two feet which is
same MW-1 11:50 in tank

Arrive MW-2 11:55

[Photo #10-11:57] MW #2

Looking SE

SWL at MW-2 (from ~~37.77~~) 37.77 feet
Top of casing (slanders steel) 3566.99 NSL
Ground elevation 3564.24

[Photo #11-12:02] looking NE
former surface improvement

[Photo #12-12:02] looking east
toward MW-2 across surface
improvement

④ Photo # 13 - 12:03 Looking south
at MW-3

Photo # 14 - 12:03 Looking southeast
at MW-4

Begin purging MW-2 12:15

Photo # 15 - 12:17 Purging MW-2

Looking SW.
Purged water very turbid
MW-2 appears ~~standardly~~ standard
Completed purging MW-2 12:40
pulsed wire gillows total
White Foods says MW-2 not nearly turbid
Measure well depth 52.2 feet
using steel tape
Leave MW-2 12:50 for lunch
Return to site 1:40
Arrive MW-3 1:45

⑤ Measuring SWL at MW-3 = 40.76 feet

Photo # 16 - 1:46 Looking west
at MW-3

MW-3 appears ~~standardly~~ standard
Top of casing (standard steel) 3565.77' MSL
Ground elevation 3563.29' MSL

Photo # 17 - 1:54 Bailer in MW-3
prior to purging
Beginning purging 1:58

Water appears clear
Completed purging 2:15
Purged 17.5 gallons total
Measured well depth = 52.1'

Arrive MW-4 2:25

Photo # 18 - 2:26 Looking FNE
at MW-4

(6) SWL = 39.28' at MW-4
 Standby start casing duration = 35' 65.86' msl
 Ground duration = 35' 64.61' msl
 Begin purging 2:35
 2" water upward clear
 Complete purging 2:55
 purged 8 gallons total
 measured well depth = 5145'
 Leave facility 3:10
 Cages to meet Mike Ford here
 at 8:30 on 10/20/88 for sample
 collection.

(7) 10-25-88

0845 Arrived at Lush Field
 Mike Ford not here yet. Getting
 our bottles labeled & checking
 all equipment. Changed H₂O
 meter & cal. bracket. H₂O is
 malfunctioning and will not be able to use.
 Mike Ford arrived at 0900.

Begin collecting equipment bank
 at 9:20. Equipment blank
 is labeled MW-5.

Photo # 19 - 10.02

Collecting sample at MW-8

Conductivity = 2850 microhm/cm
 Temperature = 30.0°C
 pH = 7.02

Photo # 20 - 10.13 - vacuum

filter sample used for metals at MW-1

(8)

Photo # 21 @ 10:30 filling 1000 ml beaker to fill containers. (MW-1)

Complete sampling at MW-1 at 10:45.

Arrive at MW-2 11:45.

Water in MW-2 appears much less turbid than yesterday.

Photo # 22 - 11:56 collecting

sample at MW-2

Conductivity = 1800 micromhos

Temperature = 20°C

pH = 6.96

Collect field blank. ~~Collect~~ label it MW-6
Complete sampling at MW-2, 12:30.

Break for lunch 12:30 - 1:30

MW-3: Conductivity = 1900 micromhos
Temperature = 20°C

pH = 7.14

(9)

Photo # 23 - 2:13 preparing

to sample at MW-3

Complete sampling at 2:50 at MW-3

Collected duplicate BUA at MW-3
Water slightly turbid

Photo # 24 - 3:23 preparing

to sample at MW-4.

Conductivity = 2550 micromhos

Temperature = 20°C

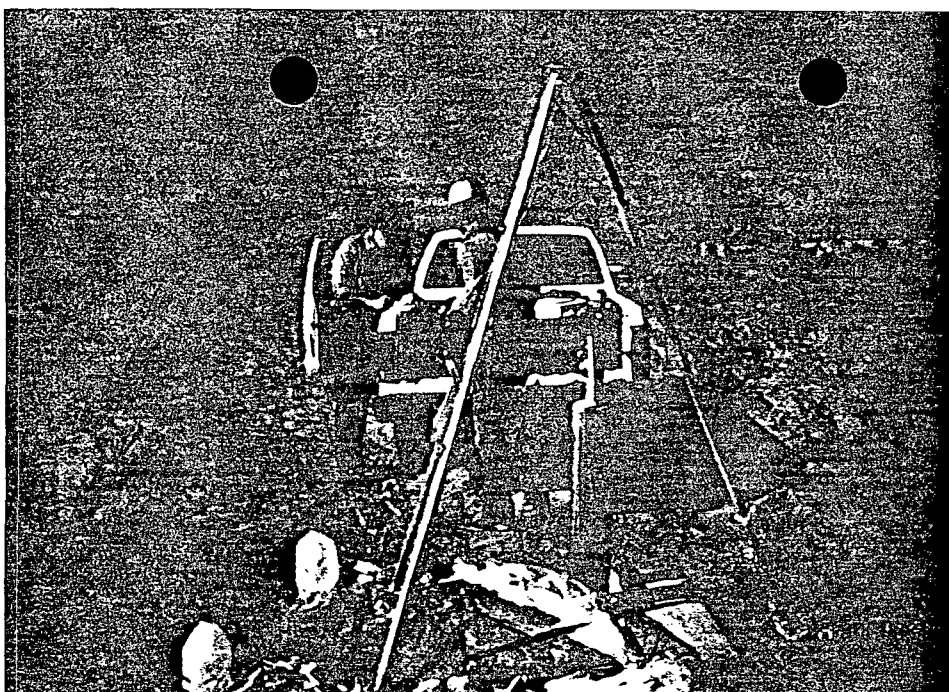
pH = 7.04

Completed sampling at 3:55

Left facility at 16:35.

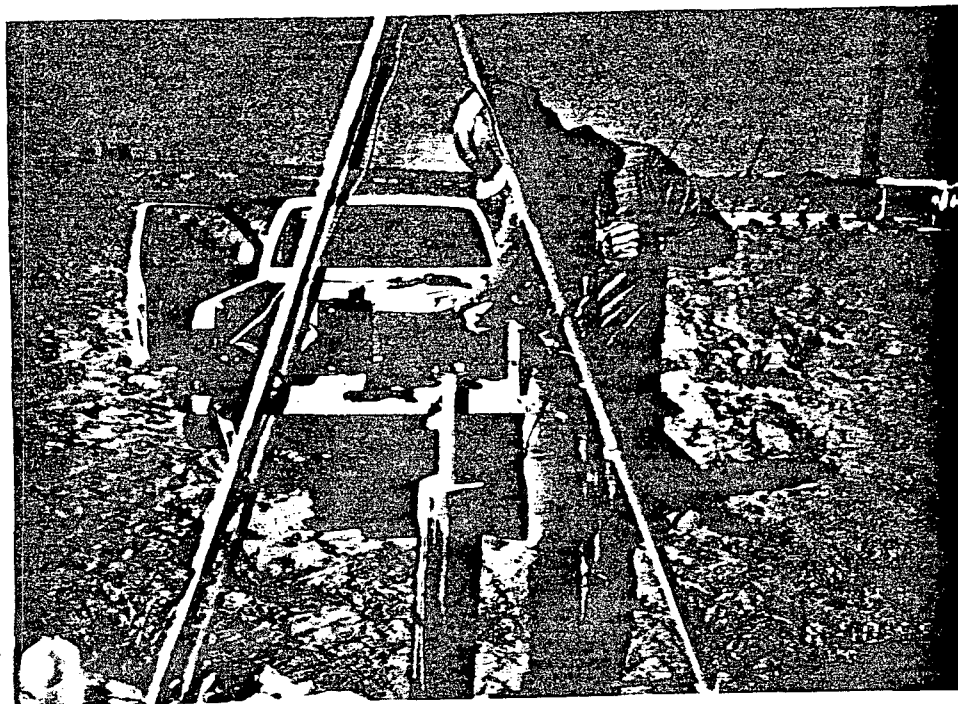
APPENDIX D

PHOTOGRAPH LOG
PHILLIPS LUSK CME



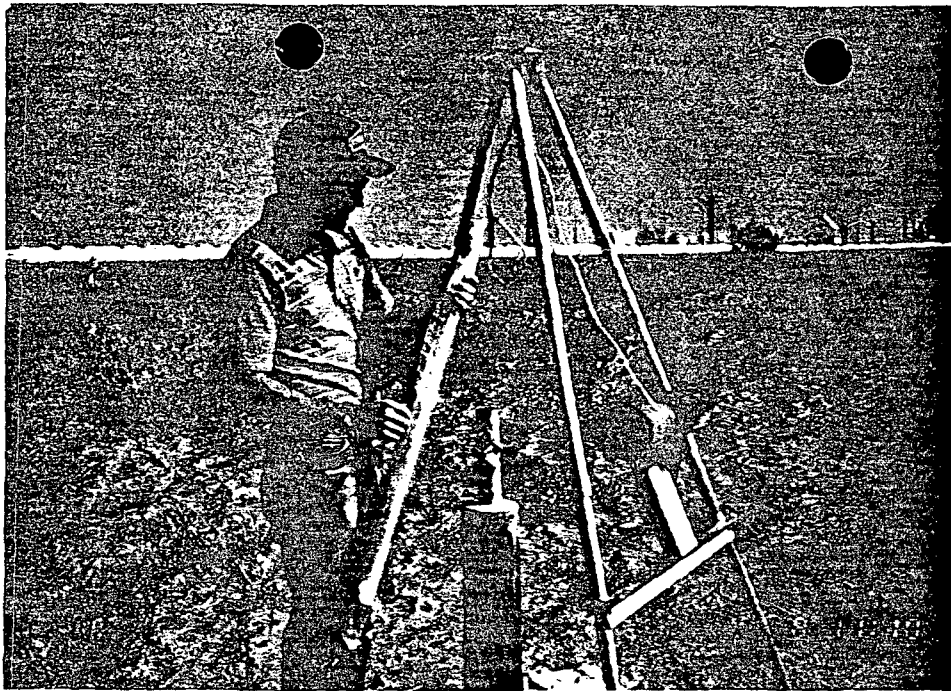
D-1. Phillips-Lusk 10/24/88 11:51 a.m. (CST) (10:51 a.m. MST)

Setting up tripod at MW-1 prior to checking static water level. Note: Clean plastic sheeting spread on ground around well.



D-2. Phillips-Lusk 10/24/88 10:56 a.m. MST

Measuring static water level at MW-1 using chalked steel tape.

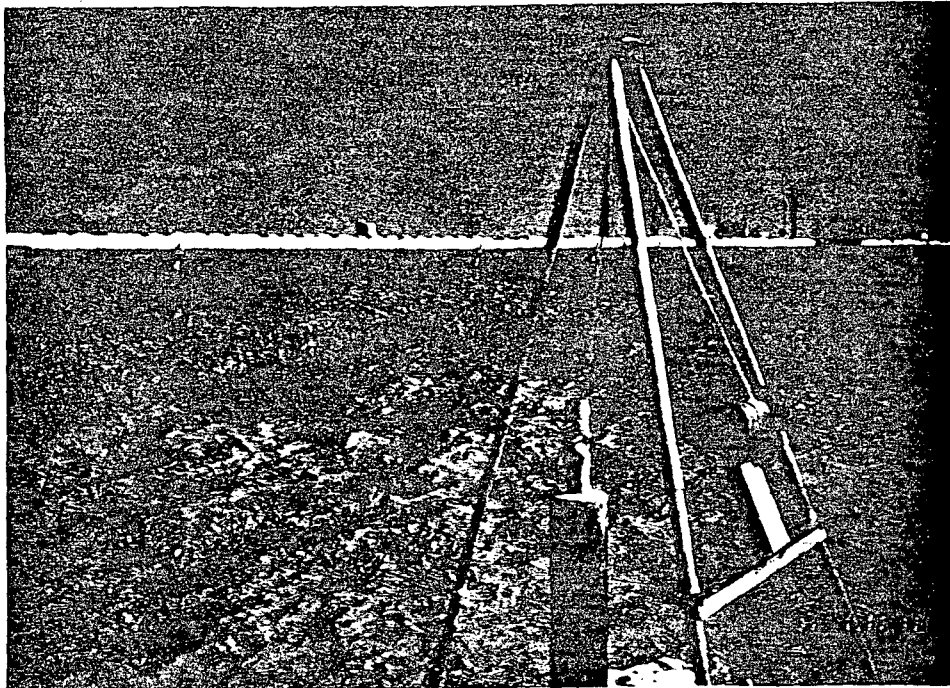


D-3. Phillips-Lusk

10/24/88

11:10 a.m. MST

Attaching new polypropylene retrieval line to bailer and removing bailer from protective plastic bag.

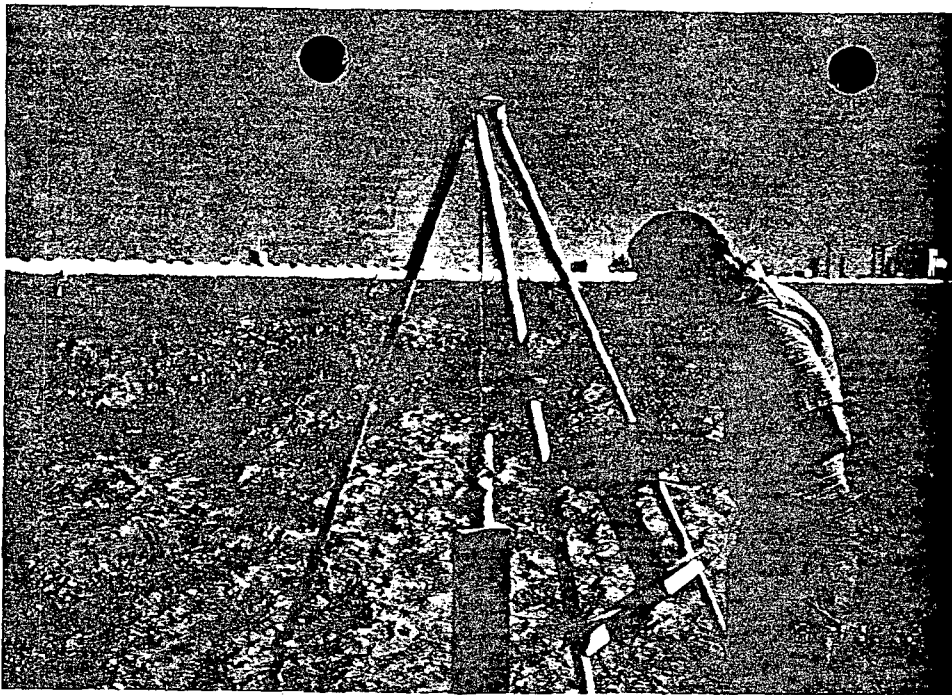


D-4. Phillips-Lusk

10/24/88

11:10 a.m. MST

View of equipment set-up after placing bailer into well casing.

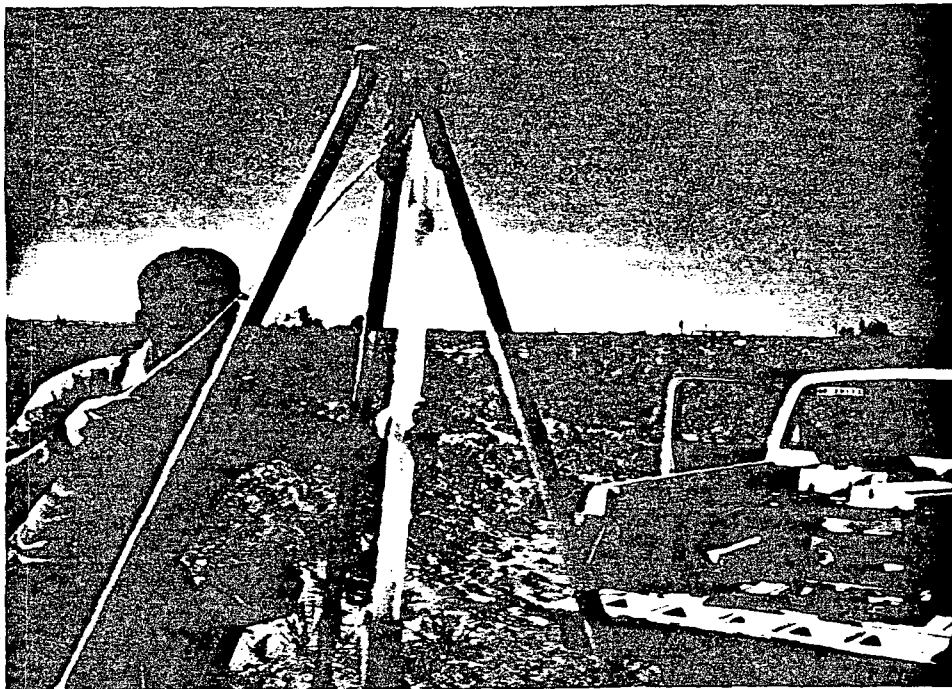


D-5. Phillips-Lusk

10/24/88

11:12 a.m. MST

Lowering bailer into MW-1.

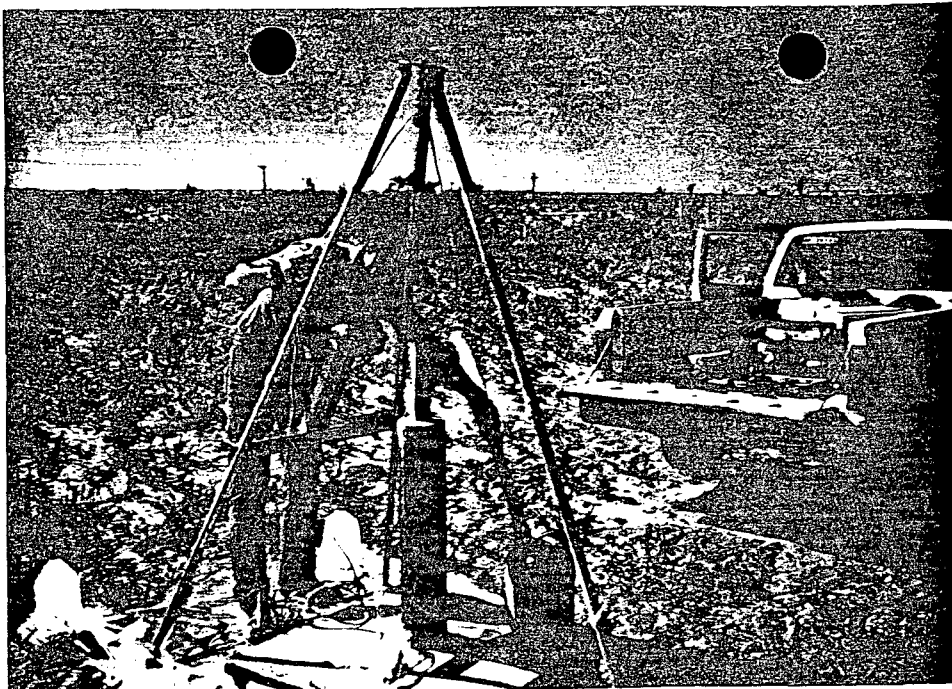


D-6. Phillips-Lusk

10/24/88

11:16 a.m. MST

Removing first bailer volume during purging of MW-1.



D-7. Phillips-Lusk

10/24/88

11:17 a.m. MST

Emptying purge water into measuring bucket. Purged water was disposed in a lined pit. Water was slightly turbid.

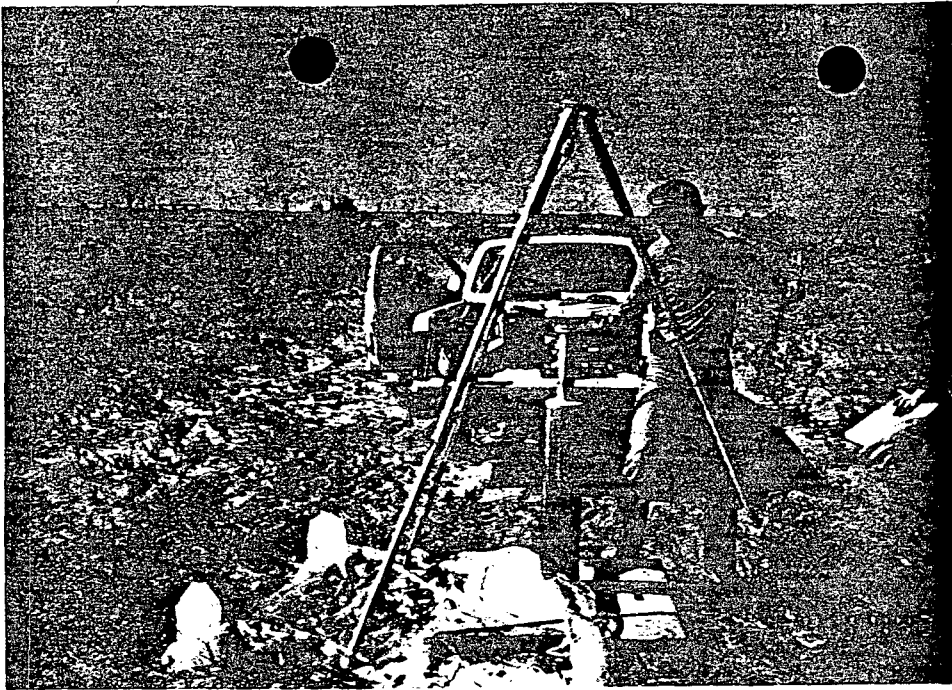


D-8. Phillips-Lusk

10/24/88

11:35 a.m. MST

Facility representative collecting coliform sample.

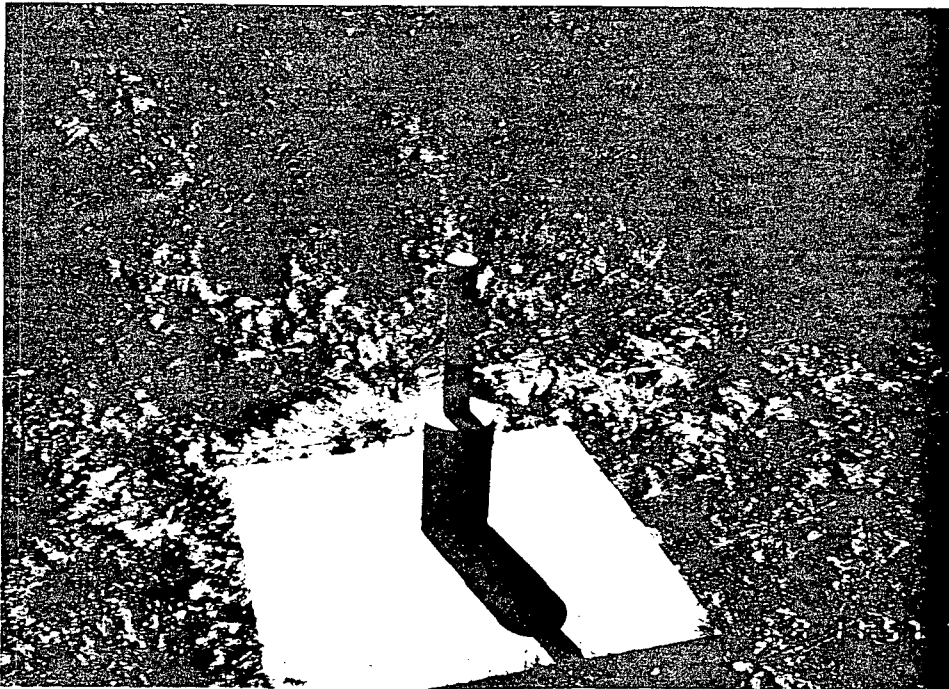


D-9. Phillips-Lusk

10/24/88

11:43 a.m. MST

Checking total depth of MW-1 after purging well.

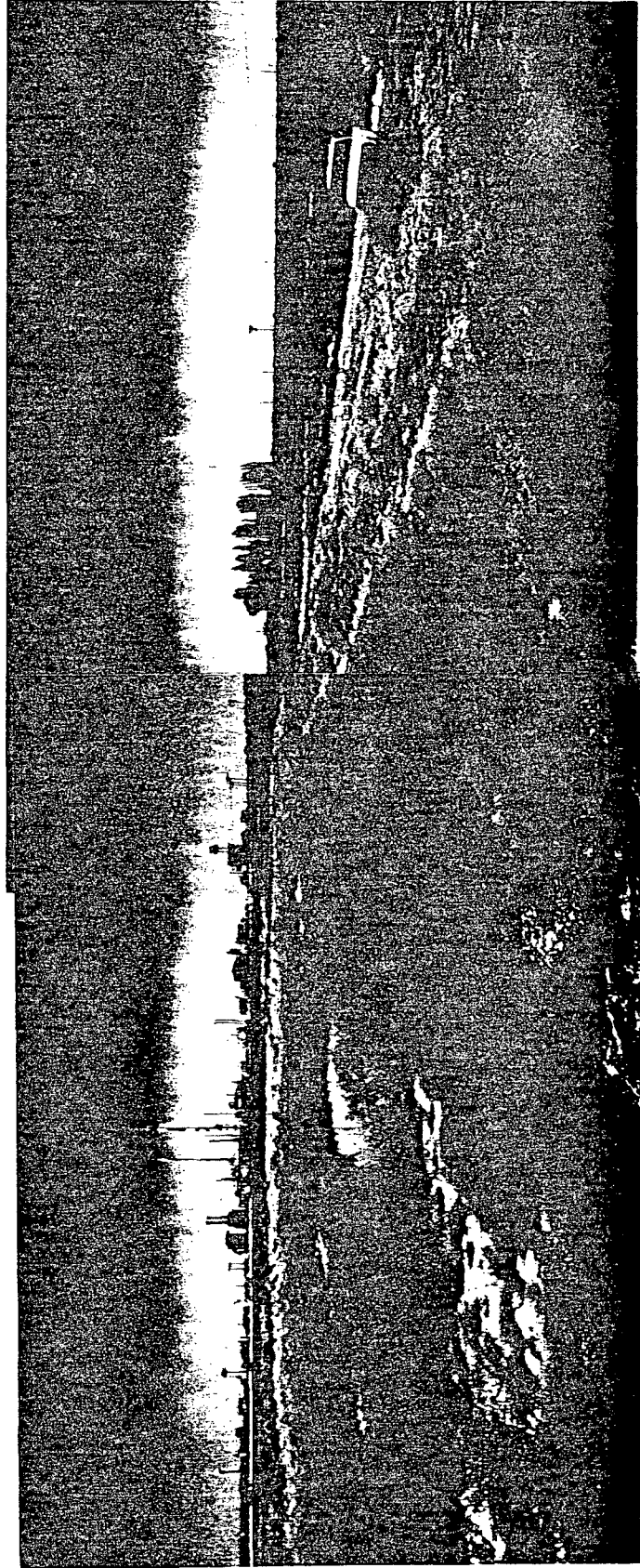


D-10. Phillips-Lusk

10/24/88

11:57 a.m. MST

View of MW-2 showing well apron, surface casing, and locking cap.

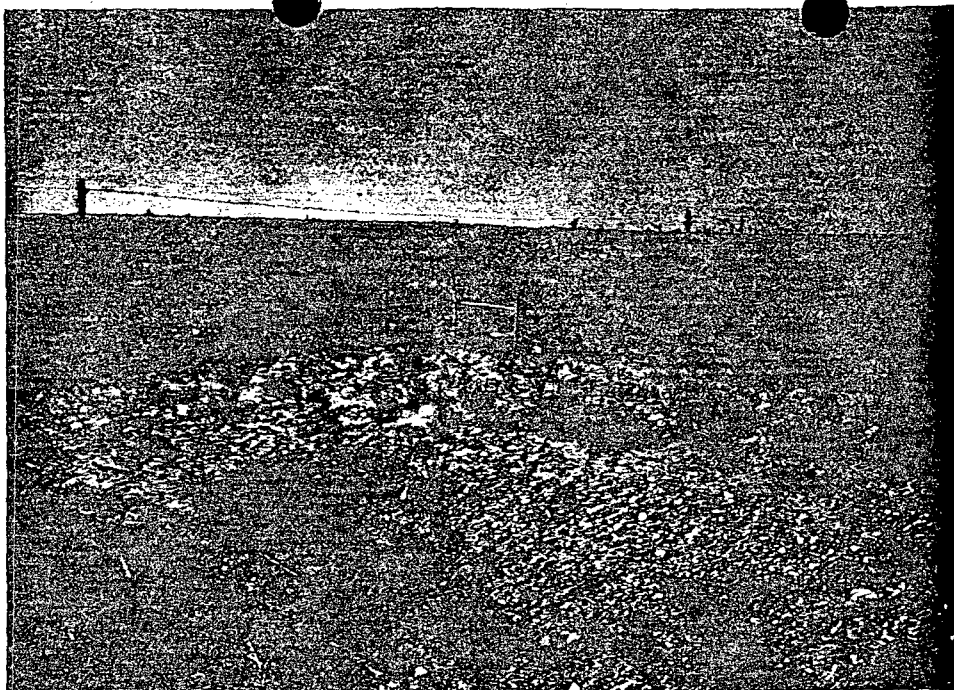


D-11 and D-12. Phillips-

Lusk10/24/88

12:02 p.m. MST

View across surface impoundment looking north toward Lusk Natural Gas Plant, with MW-2 to the right.

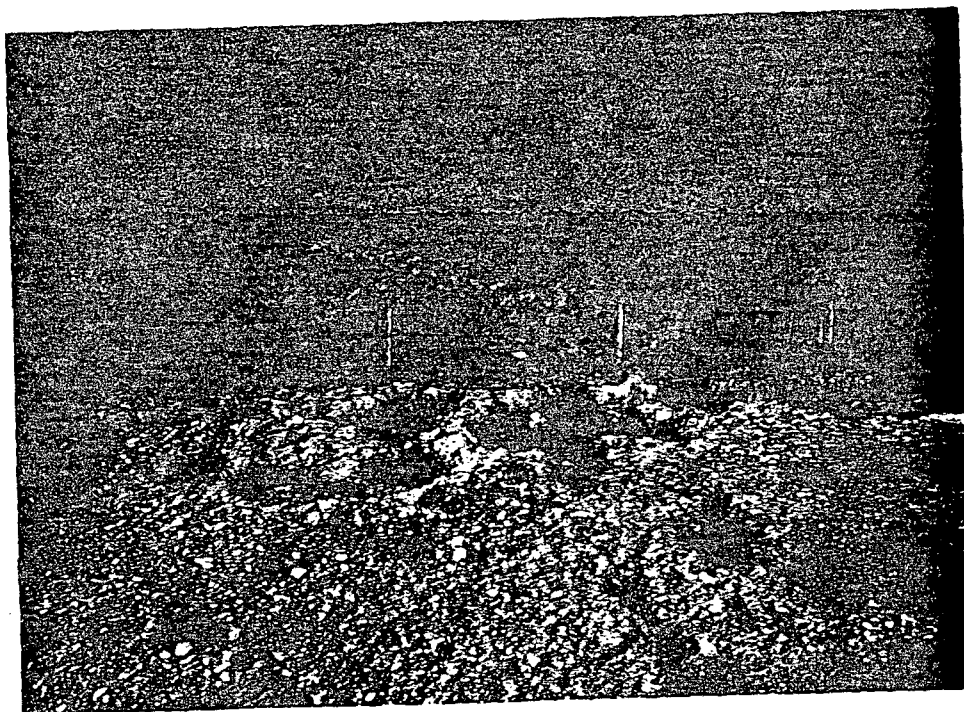


D-13. Phillips-Lusk

10/24/88

12:02 p.m. MST

View from edge of surface impoundment looking south toward MW-3.

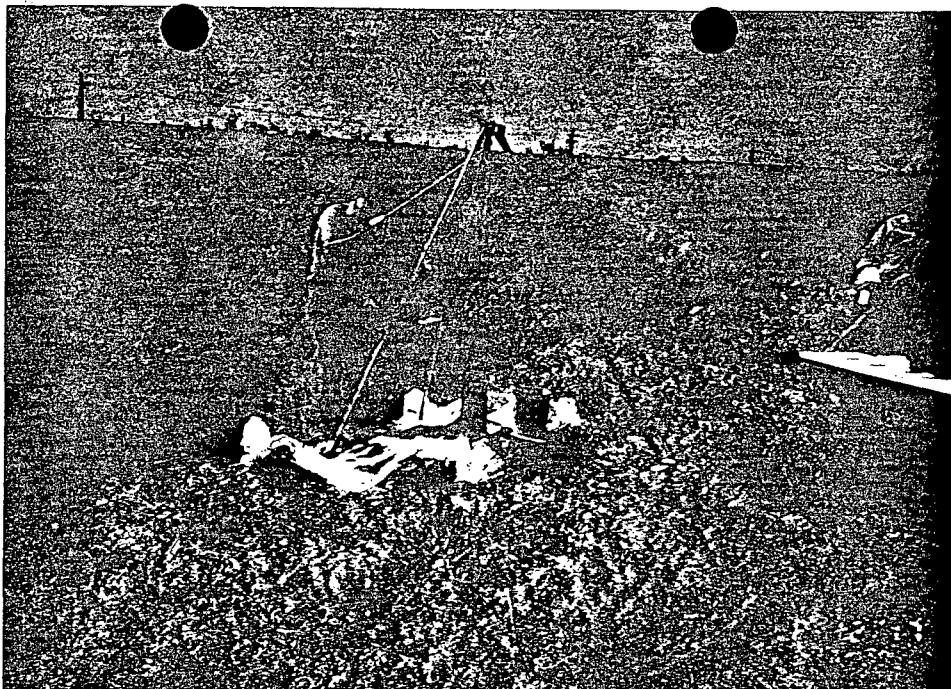


D-14. Phillips-Lusk

10/24/88

12:03 p.m. MST

View from edge of surface impoundment looking southwest toward MW-4.



D-15. Phillips-Lusk

10/24/88

12:17 p.m. MST

View looking southwest showing Phillips representative purging MW-2. Water was very turbid.

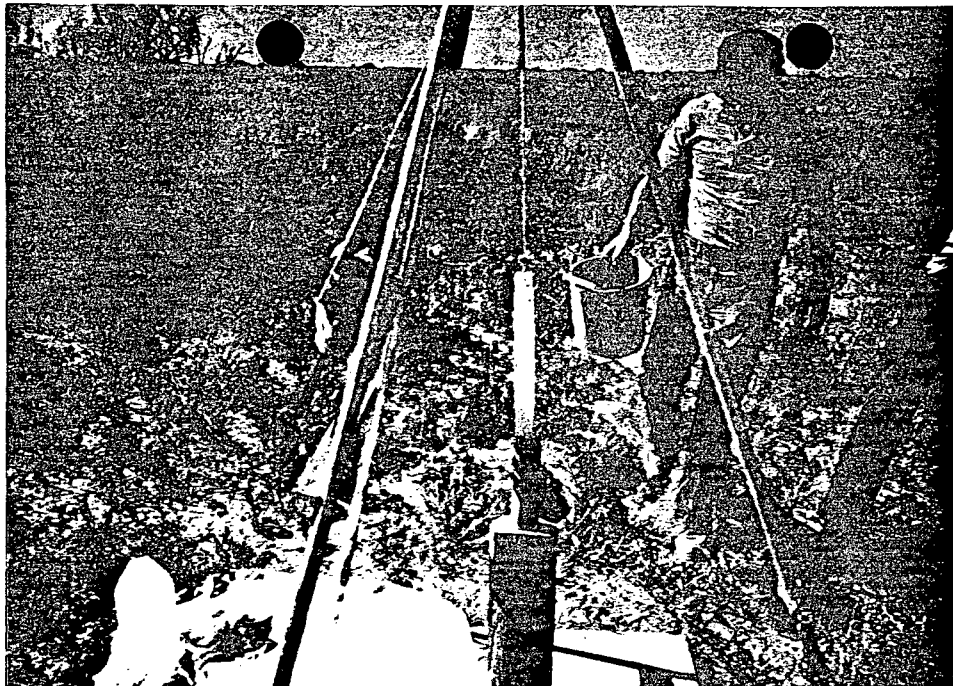


D-16. Phillips-Lusk

10/24/88

1:45 p.m. MST

Checking static water level at MW-3.

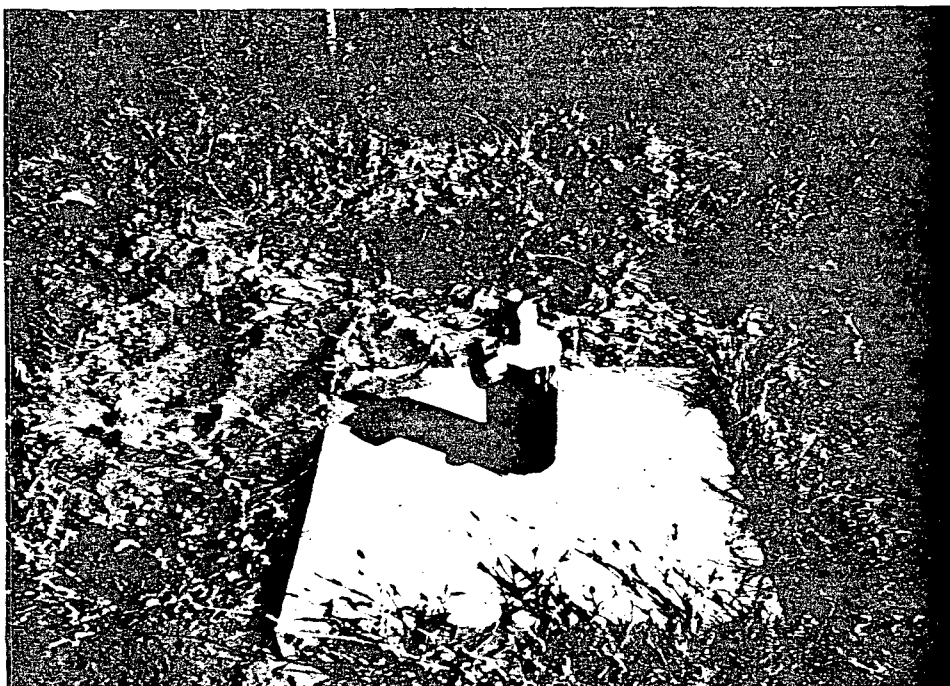


D-17. Phillips-Lusk

10/24/88

1:54 p.m. MST

Pre-cleaned, dedicated bailer attached to new section of polypropylene rope prior to lowering into MW-3.

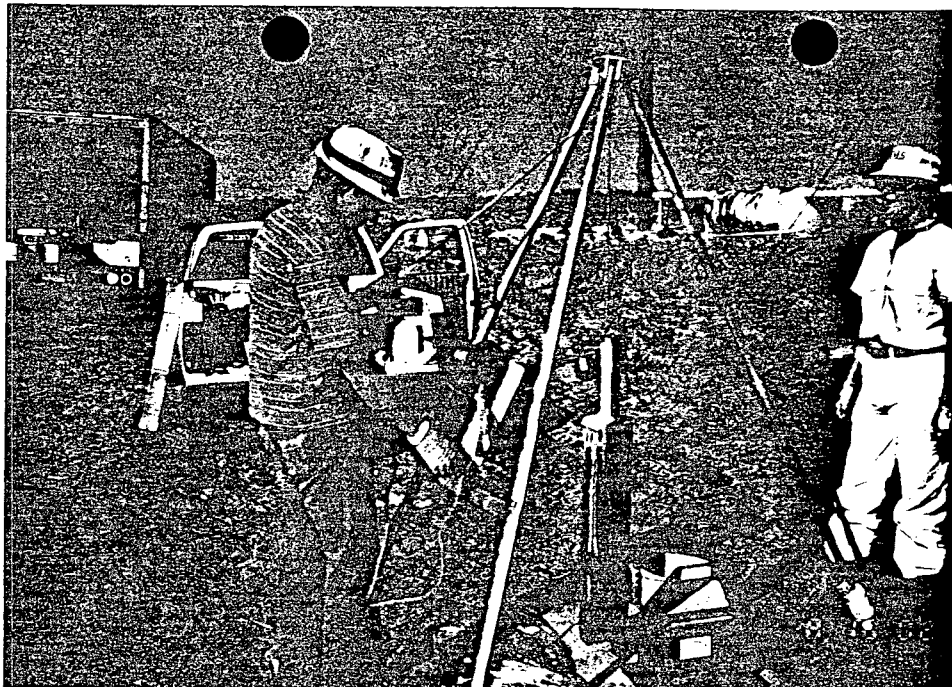


D-18. Phillips-Lusk

10/24/88

2:26 p.m. MST

View looking ENE at MW-4 after unlocking well cap.

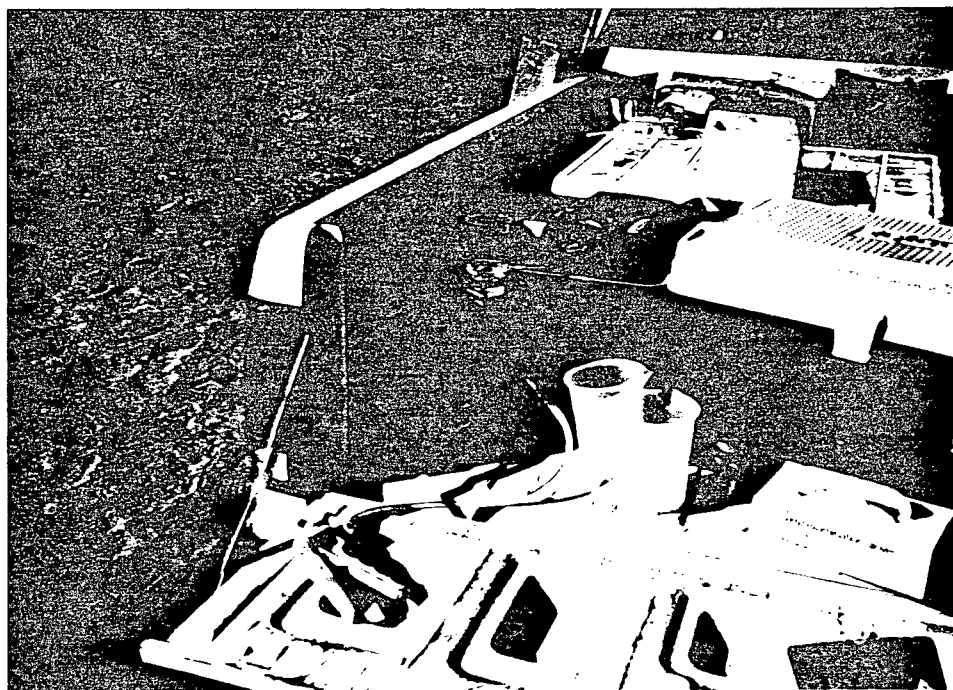


D-19. Phillips-Lusk

10/25/88

10:02 a.m. MST

Lowering bailer into MW-1 to begin sampling.

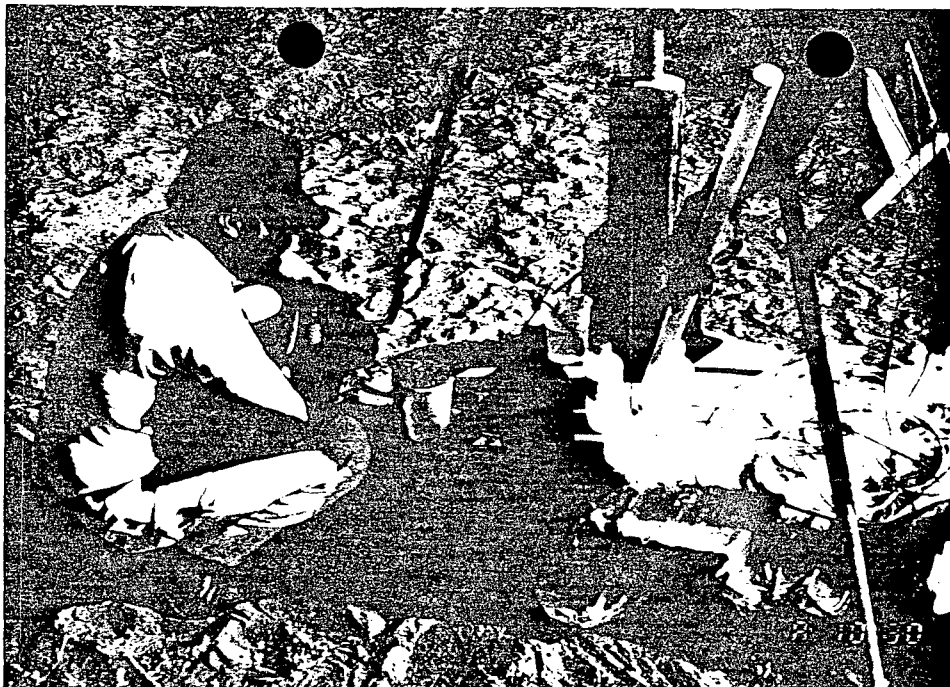


D-20. Phillips-Lusk

10/25/88

10:12 a.m. MST

Filtration apparatus set up used by Phillips to field-filter samples for dissolved metals.

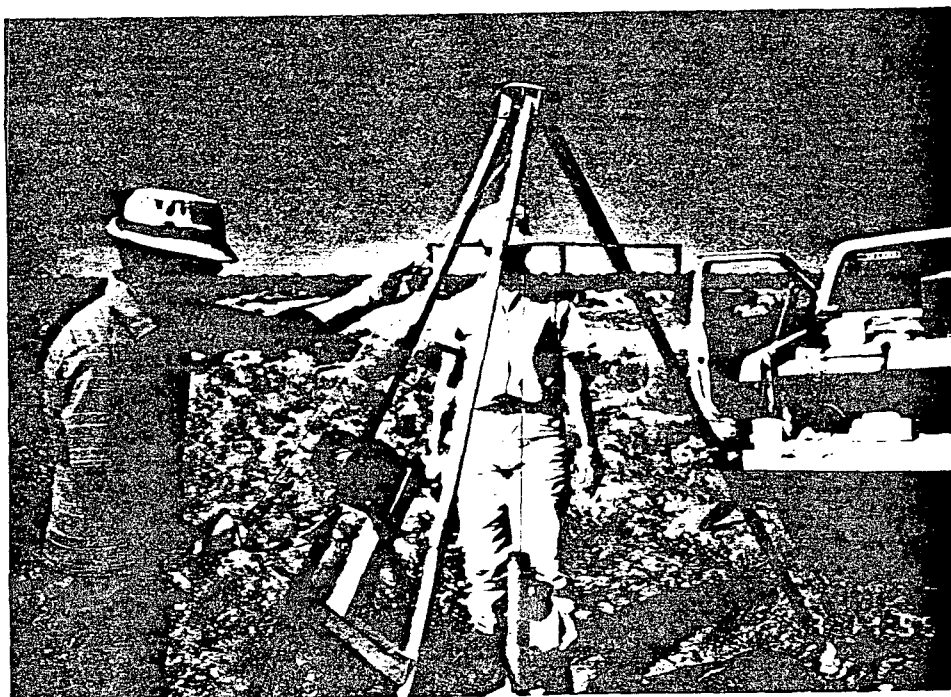


D-21. Phillips-Lusk

10/25/88

10:30 a.m. MST

View of Phillips representative's sample collection technique at MW-1. Water was transferred to polypropylene beaker prior to pouring into sample containers.



D-22. Phillips-Lusk

10/25/88

11:56 a.m. MST

Retrieving bailer from MW-2 during sample collection.

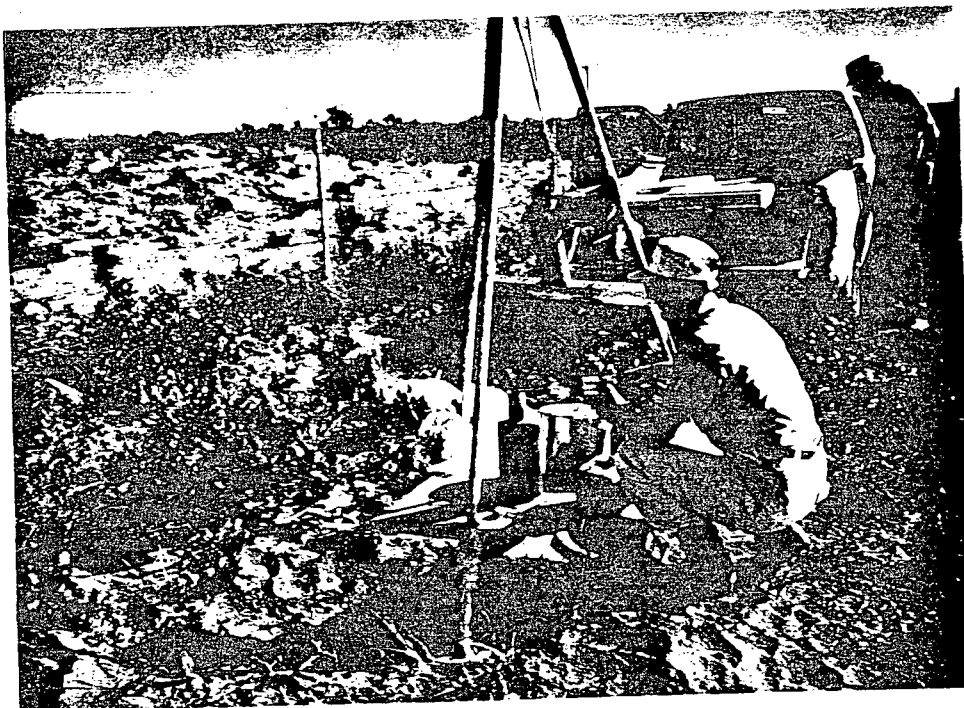


D-23. Phillips-Lusk

10/25/88

2:13 p.m. MST

Sample collection technique at MW-3: Transferring sample from bailer into polyethylene beaker prior to transferring to sample containers.



D-24. Phillips-Lusk

10/25/88

3:23 p.m. MST

Checking well head-space for organic vapors using HNu photoionization detector prior to sampling at MW-4. No organic vapors were detected.

APPENDIX E

ANALYTICAL RESULTS

ENVIRONMENTAL MONITORING AND SERVICES, INC.
 Analytical Results Summary for A.T. KEARNEY
 PHILIPS - LUSK PLANT
 RFS: 80452

Client Sample I.D.	EMSI Number	Date Received	Rep	Method	Analyte	Result	Detection Limit (*)	Units	Date Analyzed	Dil Factor
MW-1	CAT-880012	10/27/88	Orig		TURBIDITY	11.0	.020	NTU	11/29/88	1.0
MW-2	CAT-880013	10/27/88	Orig		TURBIDITY	76.0	.020	NTU	11/29/88	1.0
MW-3	CAT-880014	10/27/88	Orig		TURBIDITY	12.0	.020	NTU	11/29/88	1.0
MW-4	CAT-880015	10/27/88	Orig		TURBIDITY	5.60	.020	NTU	11/29/88	1.0
MW-5	CAT-880016	10/27/88	Orig		TURBIDITY	.270	.020	NTU	11/29/88	1.0
MW-6	CAT-880017	10/27/88	Orig		TURBIDITY	.060	.020	NTU	11/29/88	1.0
			Dup		TURBIDITY	.060	.020	NTU	11/29/88	1.0

* - To obtain the true detection limit, multiply this value by the value under the "Dil Factor" column.
 ND - Not detected at the true detection limit.



Date Received	10/3/88	Lab No.	ICAP-534	User Code	☐ 59400 ☐ 59300	☐ 53400 ☐ 59500	☒ 53300	
COLLECTION DATE & TIME:				yy	mm	dd	hh	mm
10-25-88				88	10	25	10	00
COLLECTED BY:				Steve Mure (Kearney/Centauri)				

TO: Jim Ashby 841-2553

GROUND WATER & HAZARDOUS WASTE BUREAU
NEW MEXICO EID/HED
PO BOX 968 - RUNNELS BUILDING
SANTA FE, NM 87504-0968

ATTN: Julie Wandow
PHONE: 027-2928

STATION/ WELL CODE: MW-1

SITE LOCATION:
County: EDDY

Township, Range, Section, Tract: (10N06E24342)

LATITUDE, LONGITUDE:

SAMPLING CONDITIONS:

☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water Level: 40.18 ft. Broc	Discharge:	Sample Type: Ground water
pH(00400) 7.02	Conductivity(Uncorr.) 2850 umho	Water Temp.(00010) 20 °C	Conductivity at 25°C (00094)	umho

FIELD COMMENTS: upgradient well

SAMPLE FIELD TREATMENT

Check proper boxes:

☒ WPN: Water Preserved w/HNO ₃ Non-Filtered	☐ WPF: Water Preserved w/HNO ₃ Filtered
--	---

LAB ANALYSIS REQUESTED:

Acidified in Field - Do Not Filter

☒ ICAP Scan Mark box next to metal if AA is required.

ANALYTICAL RESULTS (MG/L)

ELEMENT	ICAP VALUE	AA VALUE	ELEMENT	ICAP VALUE	AA VALUE
Aluminum	0.4		Silicon	23.	
Barium	<0.1	MS (MS)	Silver	<0.1	X <0.001
Beryllium	<0.1	X <0.02	Strontium	4.5	
Boron	0.3		Tin	0.4	
Cadmium	<0.1	☐ X 0.002	Vanadium	0.1	
Calcium	300.		Zinc	<0.1	
Chromium	<0.1	☐ X <0.005	Arsenic		☐ X 0.013
Cobalt	<0.05		Selenium		☐ X <0.005
Copper	<0.1	X <0.05	Mercury		
Iron	0.4 X				
Lead	<0.1	☐ X <0.005			
Magnesium	170 X				
Manganese	0.33 X				
Molybdenum	<0.1				
Nickel	<0.1	X <0.05			

LAB COMMENTS: some HNO₃ added @ SLD JAA

11/16/88 DIGESTED.

ICAP Analyst: JAA

Analysis Date: 12/12/88

Reviewer: John L. Schaefer

Date Reviewed: 2/9/89

Relinquished
by Marianne Smith
10-27-88 @
7:00 PM

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-1LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110288C16

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ Date Analyzed: 11/02/88

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	5	U
67-64-1-----	Acetone	10	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	10	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
108-05-4-----	Vinyl Acetate	10	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	Trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	10	U
591-78-6-----	2-Hexanone	10	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	5	U
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Total Xylenes	5	U

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-1LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110288C16

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ Date Analyzed: 11/02/88

Column (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-1LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111188S03

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/11/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

108-95-2-----	Phenol	10	U
111-44-4-----	bis(2-Chloroethyl) Ether	10	U
95-57-8-----	2-Chlorophenol	10	U
541-73-1-----	1,3-Dichlorobenzene	10	U
106-46-7-----	1,4-Dichlorobenzene	10	U
100-51-6-----	Benzyl Alcohol	10	U
95-50-1-----	1,2-Dichlorobenzene	10	U
95-48-7-----	2-Methylphenol	10	U
108-60-1-----	bis(2-Chloroisopropyl) Ether	10	U
106-44-5-----	4-Methylphenol	10	U
621-64-7-----	N-Nitroso-Di-n-Propylamine	10	U
67-72-1-----	Hexachloroethane	10	U
98-95-3-----	Nitrobenzene	10	U
78-59-1-----	Isophorone	10	U
88-75-5-----	2-Nitrophenol	10	U
105-67-9-----	2,4-Dimethylphenol	10	U
65-85-0-----	Benzoic Acid	50	U
111-91-1-----	bis(2-Chloroethoxy) Methane	10	U
120-83-2-----	2,4-Dichlorophenol	10	U
120-82-1-----	1,2,4-Trichlorobenzene	10	U
91-20-3-----	Naphthalene	10	U
106-47-8-----	4-Chloroaniline	10	U
87-68-3-----	Hexachlorobutadiene	10	U
59-50-7-----	4-Chloro-3-Methylphenol	10	U
91-57-6-----	2-Methylnaphthalene	10	U
77-47-4-----	Hexachlorocyclopentadiene	10	U
88-06-2-----	2,4,6-Trichlorophenol	10	U
95-95-4-----	2,4,5-Trichlorophenol	50	U
91-58-7-----	2-Chloronaphthalene	10	U
88-74-4-----	2-Nitroaniline	50	U
131-11-3-----	Dimethyl Phthalate	10	U
208-96-8-----	Acenaphthylene	10	U
606-20-2-----	2,6-Dinitrotoluene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-1LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111188S03

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/11/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

99-09-2-----3-Nitroaniline	50	U
83-32-9-----Acenaphthene	10	U
51-28-5-----2,4-Dinitrophenol	50	U
100-02-7-----4-Nitrophenol	50	U
132-64-9-----Dibenzofuran	10	U
121-14-2-----2,4-Dinitrotoluene	10	U
84-66-2-----Diethylphthalate	10	U
7005-72-3-----4-Chlorophenyl-phenylether	10	U
86-73-7-----Fluorene	10	U
100-01-6-----4-Nitroaniline	50	U
534-52-1-----4,6-Dinitro-2-Methylphenol	50	U
86-30-6-----N-Nitrosodiphenylamine (1)	10	U
101-55-3-----4-Bromophenyl-phenylether	10	U
118-74-1-----Hexachlorobenzene	10	U
87-86-5-----Pentachlorophenol	50	U
85-01-8-----Phenanthrene	10	U
120-12-7-----Anthracene	10	U
84-74-2-----Di-n-Butylphthalate	10	U
206-44-0-----Fluoranthene	10	U
129-00-0-----Pyrene	10	U
85-68-7-----Butylbenzylphthalate	10	U
91-94-1-----3,3'-Dichlorobenzidine	20	U
56-55-3-----Benzo(a)Anthracene	10	U
218-01-9-----Chrysene	10	U
117-81-7-----bis(2-Ethylhexyl)Phthalate	4	J
117-84-0-----Di-n-Octyl Phthalate	10	U
205-99-2-----Benzo(b)Fluoranthene	10	U
207-08-9-----Benzo(k)Fluoranthene	10	U
50-32-8-----Benzo(a)Pyrene	10	U
193-39-5-----Indeno(1,2,3-cd)Pyrene	10	U
53-70-3-----Dibenz(a,h)Anthracene	10	U
191-24-2-----Benzo(g,h,i)Perylene	10	U
90-12-0-----1-Methylnaphthalene	10	U
108-39-4-----meta-Cresol	10	U

(1) - Cannot be separated from Diphenylamine
FORM I SV-2

1/87 Rev.

57-97-6-----7,1-Dimethylbenzanthracene

10

U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-1LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111188S03

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/11/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

Number TICs found: 1 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000-00-0	UNKNOWN OXYGENATED	9.35	50	J



WNN

GENERAL WATER CHEMISTRY
and NITROGEN ANALYSIS

DATE RECEIVED 10/31/88	LAB NO. UC-4444	USER CODE ☐ 59300 ☐ 59600 ☒ OTHER: 53300 EID
Collection DATE 10/25/88	SITE INFORMATION Sample location Phillips - Lusk MW-1 NEW MEXICO	Collection site description NATURAL GAS PROCESSOR
Collection TIME 1000		
Collected by — Person/Agency Steve MUSE KEARNEY/Contract		

SEND
FINAL
REPORT
TO

ATTN: Chris Dean
GROUND WATER & HAZARDOUS WASTE BUREAU
NM ENVIRONMENT IMPROVEMENT DIVISION/HED
PO Box 968
Santa Fe, NM 87504-0968
Attn: Julie Wanslow

RECEIVED

NOV 21 1988

881025	1000

Station/ well code MW-1
OWNER Phillips Petroleum

SAMPLING CONDITIONS

☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water level 40.18' BTDC	Discharge GROUND WATER BUREAU	Sample type Ground water
pH (00400) 7.02	Conductivity (Uncorrected) 2850 μ mho	Water Temp. (00010) 20 °C	Conductivity at 25°C (00094) μ mho	
Field comments upgradient well				

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted 1	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 μ membrane filter	☐ A: 2 ml H ₂ SO ₄ /L added
☒ NA: No acid added ☐ Other-specify:			

ANALYTICAL RESULTS from SAMPLES

NF, NA	Units	Date analyzed	F, NA	Units	Date analyzed
☐ Conductivity (Corrected) 25°C (00095)	μ mho		☐ Calcium (00915)	mg/l	
☐ Total non-filterable residue (suspended) (00530)	mg/l		☐ Magnesium (00925)	mg/l	
☒ Other: TURBIDITY	12.3	11/14	☐ Sodium (00930)	mg/l	
☐ Other:			☐ Potassium (00935)	mg/l	
☐ Other:			☐ Bicarbonate (00440)	mg/l	
			☐ Chloride (00940)	mg/l	
			☐ Sulfate (00945)	mg/l	
			☐ Total filterable residue (dissolved) (70300)	mg/l	
			☐ Other:		
NF, A-H ₂ SO ₄			F, A-H ₂ SO ₄		
☐ Nitrate-N + Nitrate-N total (00630)	mg/l		☐ Nitrate-N + Nitrate-N dissolved (00631)	mg/l	
☐ Ammonia-N total (00610)	mg/l		☐ Ammonia-N dissolved (00608)	mg/l	
☐ Total Kjeldahl-N ()	mg/l		☐ Total Kjeldahl-N ()	mg/l	
☐ Chemical oxygen demand (00340)	mg/l		☐ Other:		
☐ Total organic carbon ()	mg/l				
☐ Other:					
☐ Other:					
Analyst			Date Reported	Reviewed by	
			11/14/88	CS	

Laboratory remarks

Analyze turbidity immediately after shaking.
Relinquished by Marianne Smith 10/27/88 @ 7:00pm



Date Received	10/3/88	Lab No.	ICAP-533	User Code	☐ 59400 ☐ 59300	☐ 53400 ☐ 59500	☒ 53300	
COLLECTION DATE & TIME:				yy	mm	dd	hh	mm
10-25-88				88	10	25	12	00
COLLECTED BY:								
Steve Mure (Kearney/Centaur)								

TO: Jim Ashby 841-2553

GROUND WATER & HAZARDOUS WASTE BUREAU
NEW MEXICO EID/HED
PO BOX 968 - RUNNELS BUILDING
SANTA FE, NM 87504-0968

ATTN: Julie Wanslow
PHONE: 827-2928

OWNER: Phillips Pet

SITE LOCATION:
County: EDDY

Township, Range, Section, Tract: (10N06E24342)

+

STATION/ WELL CODE: MW-2

LATITUDE, LONGITUDE:

SAMPLING CONDITIONS:

☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water Level: 37.77 ft. BTOC	Discharge:	Sample Type: Ground water
pH(00400) 6.96	Conductivity(Uncorr.) 1800 umho	Water Temp.(00010) 20 °C	Conductivity at 25 °C (00094) umho	

FIELD COMMENTS: Down gradient well

SAMPLE FIELD TREATMENT

Check proper boxes:

☒ WPN: Water Preserved w/HNO ₃ Non-Filtered	☐ WPF: Water Preserved w/HNO ₃ Filtered
--	---

LAB ANALYSIS REQUESTED:

☒ ICAP Scan
Mark box next to metal if AA is required.

ANALYTICAL RESULTS (MG/L)

ELEMENT	ICAP VALUE	AA VALUE	ELEMENT	ICAP VALUE	AA VALUE
Aluminum	3.1 2.8 ml		Silicon	32.	
Barium	<0.1		Silver	<0.1	X <0.001
Beryllium	<0.1	X <0.02	Strontium	2.2	
Boron	0.3		Tin	0.2	
Cadmium	<0.1	☐ X 0.001	Vanadium	<0.1	
Calcium	220.		Zinc	0.3	
Chromium	<0.1	☐ X 0.025	Arsenic		☐ X 0.046
Cobalt	<0.05		Selenium		☐ X <0.005
Copper	<0.1	X 0.05	Mercury		
Iron	4.0 X				
Lead	<0.1	☐ X 0.020			
Magnesium	79. X				
Manganese	1.2 X				
Molybdenum	<0.1				
Nickel	<0.1	X <0.05			

LAB COMMENTS: 5.0ml HNO₃ added @ SLD. JAA

11/16/88 DIGESTED.

LOC. Relinquished by
Amarie Smith
10-27-88@
7:00pm

ICAP Analyst: JAA

Analysis Date: 12/12/88

Reviewer: John Smith

Date Reviewed: 2/9/89



SCIENTIFIC LABORATORY DIVISION
700 Camino de Salud NE
Albuquerque, NM 87106 — (505) 341-2555

GENERAL WATER CHEMISTRY
and NITROGEN ANALYSIS

DATE RECEIVED	10/31/88	LAB NO.	WC445	USER CODE	☐ 59300 ☐ 59600 ☒ OTHER: 53300 EID
Collection DATE	10/25/88	SITE INFORMATION	Sample location		
Collection TIME	1200		Phillips - Lusk NM MW-2		
Collected by — Person/Agency		Collection site description			
Steve Mure, Kearney/Center		B81025/1200			

ATTN: Chris Dean

SEND
FINAL
REPORT
TO

GROUND WATER & HAZARDOUS WASTE BUREAU
NM ENVIRONMENT IMPROVEMENT DIVISION/HED
PO Box 968
Santa Fe, NM 87504-0968
Attn: Julie Wanslow EID

RECEIVED

NOV 21 1988

Station/
well code MW-2

Owner: PHWASTE Petroleum

SAMPLING CONDITIONS

GROUND WATER/HAZ

☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water level	37.77 ft. BTOC	Discharge	BUREAU	Sample type	Groundwater
pH (00400)	6.96	Conductivity (Uncorrected)	1800 μ mho	Water Temp. (00010)	20 °C	Conductivity at 25°C (00094)	μ mho
Field comments							

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted	1	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 μ membrane filter	☐ A: 2 ml H ₂ SO ₄ /L added
☒ NA: No acid added ☐ Other-specify:				

ANALYTICAL RESULTS from SAMPLES

NF, NA	Units	Date analyzed	F, NA	Units	Date analyzed
☐ Conductivity (Corrected) 25°C (00095)	μ mho		☐ Calcium (00915)	mg/l	
☐ Total non-filterable residue (suspended) (00530)	mg/l		☐ Magnesium (00925)	mg/l	
☒ Other: Turbidity	ntu	11/14	☐ Sodium (00930)	mg/l	
☐ Other:			☐ Potassium (00935)	mg/l	
☐ Other:			☐ Bicarbonate (00440)	mg/l	
			☐ Chloride (00940)	mg/l	
			☐ Sulfate (00945)	mg/l	
			☐ Total filterable residue (dissolved) (70300)	mg/l	
			☐ Other:	HAZARDOUS	
NF, A-H ₂ SO ₄			F, A-H ₂ SO ₄		
☐ Nitrate-N +, Nitrate-N total (00630)	mg/l		☐ Nitrate-N +, Nitrate-N dissolved (00631)	mg/l	
☐ Ammonia-N total (00610)	mg/l		☐ Ammonia-N dissolved (00608)	mg/l	
☐ Total Kjeldahl-N ()	mg/l		☐ Total Kjeldahl-N ()	mg/l	
☐ Chemical oxygen demand (00340)	mg/l		☐ Other:		
☐ Total organic carbon ()	mg/l				
☐ Other:					
☐ Other:					
Analyst			Date Reported		Reviewed by
			11/14/88		

Laboratory remarks

Analyze turbidity immediately after shaking.
Relinquished by Marianne Smith 10/27/88 @ 7:00 p.m.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-2LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110288C11

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ Date Analyzed: 11/02/88

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	5	U
67-64-1-----	Acetone	10	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	10	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
108-05-4-----	Vinyl Acetate	10	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	Trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	10	U
591-78-6-----	2-Hexanone	10	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	5	U
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Total Xylenes	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-2LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID:

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110288C11

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. Date Analyzed: 11/02/88

Column (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-2LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111188S04

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/11/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

108-95-2-----	Phenol	10	U
111-44-4-----	bis(2-Chloroethyl) Ether	10	U
95-57-8-----	2-Chlorophenol	10	U
541-73-1-----	1,3-Dichlorobenzene	10	U
106-46-7-----	1,4-Dichlorobenzene	10	U
100-51-6-----	Benzyl Alcohol	10	U
95-50-1-----	1,2-Dichlorobenzene	10	U
95-48-7-----	2-Methylphenol	10	U
108-60-1-----	bis(2-Chloroisopropyl) Ether	10	U
106-44-5-----	4-Methylphenol	10	U
621-64-7-----	N-Nitroso-Di-n-Propylamine	10	U
67-72-1-----	Hexachloroethane	10	U
98-95-3-----	Nitrobenzene	10	U
78-59-1-----	Isophorone	10	U
88-75-5-----	2-Nitrophenol	10	U
105-67-9-----	2,4-Dimethylphenol	10	U
65-85-0-----	Benzoic Acid	50	U
111-91-1-----	bis(2-Chloroethoxy) Methane	10	U
120-83-2-----	2,4-Dichlorophenol	10	U
120-82-1-----	1,2,4-Trichlorobenzene	10	U
91-20-3-----	Naphthalene	10	U
106-47-8-----	4-Chloroaniline	10	U
87-68-3-----	Hexachlorobutadiene	10	U
59-50-7-----	4-Chloro-3-Methylphenol	10	U
91-57-6-----	2-Methylnaphthalene	10	U
77-47-4-----	Hexachlorocyclopentadiene	10	U
88-06-2-----	2,4,6-Trichlorophenol	10	U
95-95-4-----	2,4,5-Trichlorophenol	50	U
91-58-7-----	2-Chloronaphthalene	10	U
88-74-4-----	2-Nitroaniline	50	U
131-11-3-----	Dimethyl Phthalate	10	U
208-96-8-----	Acenaphthylene	10	U
606-20-2-----	2,6-Dinitrotoluene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-2LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111188S04

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/11/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

99-09-2-----3-Nitroaniline	50	U
83-32-9-----Acenaphthene	10	U
51-28-5-----2,4-Dinitrophenol	50	U
100-02-7-----4-Nitrophenol	50	U
132-64-9-----Dibenzofuran	10	U
121-14-2-----2,4-Dinitrotoluene	10	U
84-66-2-----Diethylphthalate	10	U
7005-72-3-----4-Chlorophenyl-phenylether	10	U
86-73-7-----Fluorene	10	U
100-01-6-----4-Nitroaniline	50	U
534-52-1-----4,6-Dinitro-2-Methylphenol	50	U
86-30-6-----N-Nitrosodiphenylamine (1)	10	U
101-55-3-----4-Bromophenyl-phenylether	10	U
118-74-1-----Hexachlorobenzene	10	U
87-86-5-----Pentachlorophenol	50	U
85-01-8-----Phenanthrene	10	U
120-12-7-----Anthracene	10	U
84-74-2-----Di-n-Butylphthalate	10	U
206-44-0-----Fluoranthene	10	U
129-00-0-----Pyrene	10	U
85-68-7-----Butylbenzylphthalate	10	U
91-94-1-----3,3'-Dichlorobenzidine	20	U
56-55-3-----Benzo(a)Anthracene	10	U
218-01-9-----Chrysene	10	U
117-81-7-----bis(2-Ethylhexyl)Phthalate	10	U
117-84-0-----Di-n-Octyl Phthalate	10	U
205-99-2-----Benzo(b)Fluoranthene	10	U
207-08-9-----Benzo(k)Fluoranthene	10	U
50-32-8-----Benzo(a)Pyrene	10	U
193-39-5-----Indeno(1,2,3-cd)Pyrene	10	U
53-70-3-----Dibenz(a,h)Anthracene	10	U
191-24-2-----Benzo(g,h,i)Perylene	10	U
90-12-0-----1-Methylnaphthalene	10	U
108-39-4-----meta-Cresol	10	U

(1) - Cannot be separated from Diphenylamine
FORM I SV-2

1/87 Rev.

57-97-6-----7,12-dimethylbenzanthracene	10	U
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(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-2LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111188S04

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/11/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

Number TICs found: 3 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000-00-0	UNKNOWN ALCOHOL ISOMER	9.24	24	J
2. 000-00-0	UNKNOWN	12.04	8.0	J
3. 000-00-0	UNKNOWN NITROGENATED	18.07	88	J



YSC
WPN

GENERAL WATER CHEMISTRY
& NITROGEN ANALYSIS

DATE RECEIVED 10/31/88	LAB NO. WC-4446	USER CODE ☐ 59300 ☐ 59600 ☒ OTHER: 53300 EID
Collection DATE 10/25/88	SITE INFORMATION	Sample location Phillips - Lusk NM MW-3
Collection TIME 1415		Collection site description 881025 / 1415
Collected by — Person/Agency Steve Muse, Kearney/Centaur		

SEND
FINAL
REPORT
TO

ATTN: Chris Dean
GROUND WATER & HAZARDOUS WASTE BUREAU
NM ENVIRONMENT IMPROVEMENT DIVISION/HED
PO Box 968
Santa Fe, NM 87504-0968
Attn: Julie Wanslow **EID**
RECEIVED
NOV 21 1988
GROUND WATER / HAZARDOUS WASTE
BUREAU

Station/
well code **MW-3**
Owner **Phillips Petroleum**

SAMPLING CONDITIONS

☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water level 40.76 ft BTOC	Discharge	Sample type Ground water
pH (00400) 7.14	Conductivity (Uncorrected) 1900 μmho	Water Temp. (00010) 20 °C	Conductivity at 25°C (00094) μmho	
Field comments				

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted 1	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 μm membrane filter	☐ A: 2 ml H ₂ SO ₄ /L added
☒ NA: No acid added ☐ Other-specify:			

ANALYTICAL RESULTS from SAMPLES

NF, NA	Units	Date analyzed	F, NA	Units	Date analyzed
☐ Conductivity (Corrected) 25°C (00095)	μmho		☐ Calcium (00915)	mg/l	
☐ Total non-filterable residue (suspended) (00530)	mg/l		☐ Magnesium (00925)	mg/l	
☒ Other: Turbidity	22	11/14	☐ Sodium (00930)	mg/l	
☐ Other:			☐ Potassium (00935)	mg/l	
☐ Other:			☐ Bicarbonate (00440)	mg/l	
			☐ Chloride (00940)	mg/l	
			☐ Sulfate (00945)	mg/l	
			☐ Total filterable residue (dissolved) (70300)		
			☐ Other:		
NF, A-H ₂ SO ₄			F, A-H ₂ SO ₄		
☐ Nitrate-N +, Nitrate-N total (00630)	mg/l		☐ Nitrate-N +, Nitrate-N dissolved (00631)	mg/l	
☐ Ammonia-N total (00610)	mg/l		☐ Ammonia-N dissolved (00608)	mg/l	
☐ Total Kjeldahl-N ()	mg/l		☐ Total Kjeldahl-N ()	mg/l	
☐ Chemical oxygen demand (00340)	mg/l		☐ Other:		
☐ Total organic carbon ()	mg/l				
☐ Other:					
☐ Other:					
Analyst		Date Reported	Reviewed by		
		11/14/88	[Signature]		

Laboratory remarks
Analyze turbidity immediately after shaking.
Relinquished by Marienne Smith 10/27/88 at 7:00 pm



Date Received	10/31/88	Lab No	ICAP-532	User Code	☐ 59400 ☐ 59300	☐ 53400 ☐ 59500	☒ 53300	
COLLECTION DATE & TIME:				yy	mm	dd	hh	mm
10-25-88				88	10	25	14	15

COLLECTED BY:
Steve Muse (Kearney/Centaur)

TO: Jim Ashby 841-2553

COLLECTION SITE DESCRIPTION
Phillips-Lusk MW-3

OWNER: Phillips Petroleum

GROUND WATER & HAZARDOUS WASTE BUREAU
NEW MEXICO EID/HED
PO BOX 968 - RUNNELS BUILDING
SANTA FE, NM 87504-0968

SITE LOCATION:
County: EDDY

Township, Range, Section, Tract: (10N06E24342)

ATTN: Julie Wanslow
PHONE: 827-2928

STATION/ WELL CODE: MW-3

LATITUDE, LONGITUDE: MW-3

SAMPLING CONDITIONS:

☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water Level: 40.76 ft. BTOC	Discharge:	Sample Type: Groundwater
pH(00400) 7.14	Conductivity(Uncorr.) 1900 umho	Water Temp.(00010) 20 °C	Conductivity at 25 °C (00094) umho	

FIELD COMMENTS: Down gradient well

SAMPLE FIELD TREATMENT

Check proper boxes:

☒ WPN: Water Preserved w/HNO ₃ Non-Filtered	☐ WPF: Water Preserved w/HNO ₃ Filtered
---	--

LAB ANALYSIS REQUESTED:

☒ ICAP Scan
Mark box next to metal if AA is required.

ANALYTICAL RESULTS (MG/L)

ELEMENT	ICAP VALUE	AA VALUE	ELEMENT	ICAP VALUE	AA VALUE
Aluminum	0.6		Silicon	29.	
Barium	<0.1		Silver	<0.1	X <0.001
Beryllium	<0.1	X <0.02	Strontium	2.5	
Boron	0.4		Tin	0.3	
Cadmium	<0.1	☐ X 0.003	Vanadium	<0.1	
Calcium	200.		Zinc	<0.1	
Chromium	<0.1	☐ X 0.031	Arsenic		☐ X 0.017
Cobalt	<0.05		Selenium		☐ X <0.005
Copper	<0.1	X <0.05	Mercury		
Iron	0.4 X				
Lead	<0.1	☐ X <0.005			
Magnesium	ms. 95.				
Manganese	0.32 X				
Molybdenum	<0.1				
Nickel	<0.1	X <0.05			

HAZARDOUS WASTE SECTION

LAB COMMENTS: 5.0 ml HNO₃ added @ SLD JAA

DIGESTED: 11/16/88

ICAP Analyst: JAA

Analysis Date: 12/12/88

Reviewer: [Signature]

Date Reviewed: 2/9/89

DOC Relinquished by
Marlene Smith
10-27-88 @
7:00 pm

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-3LUS

Lab Name: EMSI Contract: 0452 0459
 Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____
 Matrix: (soil/water) WATER Lab Sample ID: _____
 Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110288C12
 Level: (low/med) LOW Date Received: 10/27/88
 % Moisture: not dec. _____ Date Analyzed: 11/02/88
 Column: (pack/cap) CAP Dilution Factor: 1.00

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	-----Chloromethane	10	U
74-83-9	-----Bromomethane	10	U
75-01-4	-----Vinyl Chloride	10	U
75-00-3	-----Chloroethane	10	U
75-09-2	-----Methylene Chloride	7	B
67-64-1	-----Acetone	4	BJ
75-15-0	-----Carbon Disulfide	5	U
75-35-4	-----1,1-Dichloroethene	5	U
75-34-3	-----1,1-Dichloroethane	5	U
540-59-0	-----1,2-Dichloroethene (total)	5	U
67-66-3	-----Chloroform	5	U
107-06-2	-----1,2-Dichloroethane	5	U
78-93-3	-----2-Butanone	10	U
71-55-6	-----1,1,1-Trichloroethane	5	U
56-23-5	-----Carbon Tetrachloride	5	U
108-05-4	-----Vinyl Acetate	10	U
75-27-4	-----Bromodichloromethane	5	U
78-87-5	-----1,2-Dichloropropane	5	U
10061-01-5	-----cis-1,3-Dichloropropene	5	U
79-01-6	-----Trichloroethene	5	U
124-48-1	-----Dibromochloromethane	5	U
79-00-5	-----1,1,2-Trichloroethane	5	U
71-43-2	-----Benzene	5	U
10061-02-6	-----Trans-1,3-Dichloropropene	5	U
75-25-2	-----Bromoform	5	U
108-10-1	-----4-Methyl-2-Pentanone	10	U
591-78-6	-----2-Hexanone	10	U
127-18-4	-----Tetrachloroethene	5	U
79-34-5	-----1,1,2,2-Tetrachloroethane	5	U
108-88-3	-----Toluene	5	U
108-90-7	-----Chlorobenzene	5	U
100-41-4	-----Ethylbenzene	5	U
100-42-5	-----Styrene	5	U
1330-20-7	-----Total Xylenes	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-3LUS

Lab Name: EMSI Contract: 0452 0459
Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____
Matrix: (soil/water) WATER Lab Sample ID: _____
Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110288C12
Level: (low/med) LOW Date Received: 10/27/88
% Moisture: not dec. _____ Date Analyzed: 11/02/88
Column (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-3LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111188S05

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/11/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

108-95-2-----	Phenol	10	U
111-44-4-----	bis(2-Chloroethyl) Ether	10	U
95-57-8-----	2-Chlorophenol	10	U
541-73-1-----	1,3-Dichlorobenzene	10	U
106-46-7-----	1,4-Dichlorobenzene	10	U
100-51-6-----	Benzyl Alcohol	10	U
95-50-1-----	1,2-Dichlorobenzene	10	U
95-48-7-----	2-Methylphenol	10	U
108-60-1-----	bis(2-Chloroisopropyl) Ether	10	U
106-44-5-----	4-Methylphenol	10	U
621-64-7-----	N-Nitroso-Di-n-Propylamine	10	U
67-72-1-----	Hexachloroethane	10	U
98-95-3-----	Nitrobenzene	10	U
78-59-1-----	Isophorone	10	U
88-75-5-----	2-Nitrophenol	10	U
105-67-9-----	2,4-Dimethylphenol	10	U
65-85-0-----	Benzoic Acid	50	U
111-91-1-----	bis(2-Chloroethoxy) Methane	10	U
120-83-2-----	2,4-Dichlorophenol	10	U
120-82-1-----	1,2,4-Trichlorobenzene	10	U
91-20-3-----	Naphthalene	10	U
106-47-8-----	4-Chloroaniline	10	U
87-68-3-----	Hexachlorobutadiene	10	U
59-50-7-----	4-Chloro-3-Methylphenol	10	U
91-57-6-----	2-Methylnaphthalene	10	U
77-47-4-----	Hexachlorocyclopentadiene	10	U
88-06-2-----	2,4,6-Trichlorophenol	10	U
95-95-4-----	2,4,5-Trichlorophenol	50	U
91-58-7-----	2-Chloronaphthalene	10	U
88-74-4-----	2-Nitroaniline	50	U
131-11-3-----	Dimethyl Phthalate	10	U
208-96-8-----	Acenaphthylene	10	U
606-20-2-----	2,6-Dinitrotoluene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-3LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111188S05

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/11/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

99-09-2-----	3-Nitroaniline	50	U
83-32-9-----	Acenaphthene	10	U
51-28-5-----	2,4-Dinitrophenol	50	U
100-02-7-----	4-Nitrophenol	50	U
132-64-9-----	Dibenzofuran	10	U
121-14-2-----	2,4-Dinitrotoluene	10	U
84-66-2-----	Diethylphthalate	10	U
7005-72-3-----	4-Chlorophenyl-phenylether	10	U
86-73-7-----	Fluorene	10	U
100-01-6-----	4-Nitroaniline	50	U
534-52-1-----	4,6-Dinitro-2-Methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (1)	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-Butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
56-55-3-----	Benzo(a)Anthracene	10	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0-----	Di-n-Octyl Phthalate	10	U
205-99-2-----	Benzo(b)Fluoranthene	10	U
207-08-9-----	Benzo(k)Fluoranthene	10	U
50-32-8-----	Benzo(a)Pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3-----	Dibenz(a,h)Anthracene	10	U
191-24-2-----	Benzo(g,h,i)Perylene	10	U
90-12-0-----	1-Methylnaphthalene	10	U
108-39-4-----	meta-Cresol	10	U

(1) - Cannot be separated from Diphenylamine
FORM I SV-2

1/87 Rev.

57-97-6-----7,12-dimethylbenzanthracene	10	U
---	----	---

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-3LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111188S05

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/11/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

Number TICs found: 4 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000-00-0	UNKNOWN	10.60	12	J
2. 000-00-0	UNKNOWN	12.05	24	J
3. 000-00-0	UNKNOWN	14.49	10	J
4. 000-00-0	UNKNOWN NITROGENATED	18.07	110	J



WNN

GENERAL WATER CHEMISTRY
and NITROGEN ANALYSIS

DATE RECEIVED	10/31/88	LAB NO.	62-447	USER CODE	☐ 59300 ☐ 59600 ☒ OTHER: 53300 EID
Collection DATE	10/25/88	SITE INFORMATION	Sample location		
Collection TIME	3:30 PM MST		Phillips, Lusk NM MW-4		
Collected by — Person/Agency		Collection site description			
Steve Muse, Kearney/Kentaur		881025 / 1530 MST			

Attn: Chris Dean

SEND
FINAL
REPORT
TO

GROUND WATER & HAZARDOUS WASTE BUREAU
NM ENVIRONMENT IMPROVEMENT DIVISION/HED
PO Box 968
Santa Fe, NM 87504-0968

Attn: Julie Wanslow

RECEIVED

NOV 21 1988

GROUND WATER/HAZARDOUS WASTE BUREAU

Station/Well code

WASTE MW-4

Owner

Phillips Petroleum

SAMPLING CONDITIONS

☒ Bailed ☒ Dipped	☐ Pump ☐ Tap	Water level	39.28 ft. BTOC	Discharge		Sample type	Ground water
pH (00400)	7.04	Conductivity (Uncorrected)	2350 μ mho	Water Temp. (00010)	20 °C	Conductivity at 25 °C (00094)	μ mho
Field comments							

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted	/	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 μ m membrane filter	☐ A: 2 ml H ₂ SO ₄ /L added
☒ NA: No acid added ☐ Other-specify:				

ANALYTICAL RESULTS from SAMPLES

NF, NA	Units	Date analyzed	F, NA	Units	Date analyzed
☐ Conductivity (Corrected) 25 °C (00095)	μ mho		☐ Calcium (00915)	mg/l	
☐ Total non-filterable residue (suspended) (00530)	mg/l		☐ Magnesium (00925)	mg/l	
☒ Other: TURBIDITY	5.3	11/4	☐ Sodium (00930)	mg/l	
☐ Other:			☐ Potassium (00935)	mg/l	
☐ Other:			☐ Bicarbonate (00440)	mg/l	
NF, A-H ₂ SO ₄			☐ Chloride (00940)	mg/l	
☐ Nitrate-N +, Nitrate-N total (00630)	mg/l		☐ Sulfate (00945)	mg/l	
☐ Ammonia-N total (00610)	mg/l		☐ Total filterable residue (dissolved) (70300)	mg/l	
☐ Total Kjeldahl-N ()	mg/l		☐ Other:		
☐ Chemical oxygen demand (00340)	mg/l		HAZARDOUS WASTE SECTION		
☐ Total organic carbon ()	mg/l		F, A-H ₂ SO ₄		
☐ Other:			☐ Nitrate-N +, Nitrate-N dissolved (00631)	mg/l	
☐ Other:			☐ Ammonia-N dissolved (00608)	mg/l	
			☐ Total Kjeldahl-N ()	mg/l	
			☐ Other:		
Laboratory remarks			Analyst	Date Reported	Reviewed by
Analyze Turbidity immediately after shaking				11/14/88	C
Relinquished by: Harriette Smith 10-27-88 at 7:00 p.m.					

Date Received	10/31/88	Lab No.	ICAP-531	User Code	☐ 59400 ☐ 59300	☐ 53400 ☐ 59500	☒ 53300
COLLECTION DATE & TIME: 10-25-88				yy mm dd hh mm 88 10 25 15 30	COLLECTION SITE DESCRIPTION Phillips-Lusk mw-4		

COLLECTED BY:
Steve Huse (Kearney/Centaur)

TO: Jim Ashby 841-2553

OWNER: Phillips Petroleum

GROUND WATER & HAZARDOUS WASTE BUREAU
NEW MEXICO EID/HED
PO BOX 968 - RUNNELS BUILDING
SANTA FE, NM 87504-0968

SITE LOCATION:

County: EDDY

Township, Range, Section, Tract: (10N06E24342)

ATTN: Julie Wanslow

PHONE: 827-2928

STATION/ WELL CODE: MW-14

LATITUDE, LONGITUDE: -

SAMPLING CONDITIONS:

☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water Level: 39.28 ft. BTOC	Discharge:	Sample Type:
pH(00400) 7.04	Conductivity(Uncorr.) 2350 umho	Water Temp.(00010) 20°C	Conductivity at 25°C (00094) umho	

FIELD COMMENTS: Down Gradient well

SAMPLE FIELD TREATMENT

Check proper boxes:

☒ WPN: Water Preserved w/HNO₃ Non-Filtered
☐ WPF: Water Preserved w/HNO₃ Filtered

LAB ANALYSIS REQUESTED:

☒ ICAP Scan
Mark box next to metal if AA is required.

ANALYTICAL RESULTS (MG/L)

ELEMENT	ICAP VALUE	AA VALUE	ELEMENT	ICAP VALUE	AA VALUE
Aluminum	0.3		Silicon	33.	
Barium	<0.1	MS (MS)	Silver	<0.1	<0.001
Beryllium	<0.1	X <0.02	Strontium	3.2	
Boron	0.3		Tin	0.3	
Cadmium	<0.1	☐ X 0.002	Vanadium	<0.1	
Calcium	250.		Zinc	<0.1	
Chromium	<0.1	☐ X 0.057	Arsenic		☐ 0.014
Cobalt	<0.05		Selenium		☐ <0.005
Copper	<0.1	X <0.05	Mercury		
Iron	0.4 X				
Lead	<0.1	☐ X <0.005			
Magnesium	120.				
Manganese	0.80 X				
Molybdenum	<0.1				
Nickel	<0.1	X <0.05			

LAB COMMENTS: 5.0ml HNO₃ added at SL2, JTA

11/6/88 DIGESTED.

ICAP Analyst: JTA

Analysis Date: 12/12/88

Reviewer: John S. Smith

Date Reviewed: 2/9/89

Joe Relling, checked by
Vanane Smith
10-27-88
at 7:00pm

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-4LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110288C13

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ Date Analyzed: 11/02/88

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	5	U
67-64-1-----	Acetone	10	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	10	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
108-05-4-----	Vinyl Acetate	10	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	Trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	10	U
591-78-6-----	2-Hexanone	10	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	5	U
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Total Xylenes	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-4LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110288C13

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ Date Analyzed: 11/02/88

Column (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-4LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111688S09

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 11/16/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/17/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

108-95-2-----Phenol	10	U
111-44-4-----bis(2-Chloroethyl) Ether	10	U
95-57-8-----2-Chlorophenol	10	U
541-73-1-----1,3-Dichlorobenzene	10	U
106-46-7-----1,4-Dichlorobenzene	10	U
100-51-6-----Benzyl Alcohol	10	U
95-50-1-----1,2-Dichlorobenzene	10	U
95-48-7-----2-Methylphenol	10	U
108-60-1-----bis(2-Chloroisopropyl) Ether	10	U
106-44-5-----4-Methylphenol	10	U
621-64-7-----N-Nitroso-Di-n-Propylamine	10	U
67-72-1-----Hexachloroethane	10	U
98-95-3-----Nitrobenzene	10	U
78-59-1-----Isophorone	10	U
88-75-5-----2-Nitrophenol	10	U
105-67-9-----2,4-Dimethylphenol	10	U
65-85-0-----Benzoic Acid	50	U
111-91-1-----bis(2-Chloroethoxy) Methane	10	U
120-83-2-----2,4-Dichlorophenol	10	U
120-82-1-----1,2,4-Trichlorobenzene	10	U
91-20-3-----Naphthalene	10	U
106-47-8-----4-Chloroaniline	10	U
87-68-3-----Hexachlorobutadiene	10	U
59-50-7-----4-Chloro-3-Methylphenol	10	U
91-57-6-----2-Methylnaphthalene	10	U
77-47-4-----Hexachlorocyclopentadiene	10	U
88-06-2-----2,4,6-Trichlorophenol	10	U
95-95-4-----2,4,5-Trichlorophenol	50	U
91-58-7-----2-Chloronaphthalene	10	U
88-74-4-----2-Nitroaniline	50	U
131-11-3-----Dimethyl Phthalate	10	U
208-96-8-----Acenaphthylene	10	U
606-20-2-----2,6-Dinitrotoluene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-4LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111688S09

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 11/16/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/17/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

99-09-2-----3-Nitroaniline	50	U
83-32-9-----Acenaphthene	10	U
51-28-5-----2,4-Dinitrophenol	50	U
100-02-7-----4-Nitrophenol	50	U
132-64-9-----Dibenzofuran	10	U
121-14-2-----2,4-Dinitrotoluene	10	U
84-66-2-----Diethylphthalate	10	U
7005-72-3-----4-Chlorophenyl-phenylether	10	U
86-73-7-----Fluorene	10	U
100-01-6-----4-Nitroaniline	50	U
534-52-1-----4,6-Dinitro-2-Methylphenol	50	U
86-30-6-----N-Nitrosodiphenylamine (1)	10	U
101-55-3-----4-Bromophenyl-phenylether	10	U
118-74-1-----Hexachlorobenzene	10	U
87-86-5-----Pentachlorophenol	50	U
85-01-8-----Phenanthrene	10	U
120-12-7-----Anthracene	10	U
84-74-2-----Di-n-Butylphthalate	10	U
206-44-0-----Fluoranthene	10	U
129-00-0-----Pyrene	10	U
85-68-7-----Butylbenzylphthalate	10	U
91-94-1-----3,3'-Dichlorobenzidine	20	U
56-55-3-----Benzo(a)Anthracene	10	U
218-01-9-----Chrysene	10	U
117-81-7-----bis(2-Ethylhexyl)Phthalate	10	U
117-84-0-----Di-n-Octyl Phthalate	10	U
205-99-2-----Benzo(b)Fluoranthene	10	U
207-08-9-----Benzo(k)Fluoranthene	10	U
50-32-8-----Benzo(a)Pyrene	10	U
193-39-5-----Indeno(1,2,3-cd)Pyrene	10	U
53-70-3-----Dibenz(a,h)Anthracene	10	U
191-24-2-----Benzo(g,h,i)Perylene	10	U
90-12-0-----1-Methylnaphthalene	10	U
108-39-4-----meta-Cresol	10	U

(1) - Cannot be separated from Diphenylamine
FORM I SV-2

1/87 Rev.

57-97-6-----7,1●Dimethylbenzanthracene__	●	10	U
(1) - Cannot be separated from Diphenylamine			

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-4LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111688S09

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 11/16/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/17/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

Number TICs found: 4 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000-00-1	UNKNOWN	7.32	10	BJ
2. 000-00-0	UNKNOWN CHLORINATED	9.89	8.0	J
3. 000-00-0	UNKNOWN	11.42	40	J
4. 000-00-0	UNKNOWN NITROGENATED	17.37	48	J

Date Received	10/31/88	Lab No.	ICAP-530	User Code	☐ 59400 ☐ 59300	☐ 53400 ☐ 59500	☒ 53300
COLLECTION DATE & TIME:		YY	mm	dd	hh	mm	
10-25-88		88	10	25	09	20	
COLLECTED BY:				COLLECTION SITE DESCRIPTION			
Steve Mase (Kearney/Centaur)				Phillips - Lusk MW-5*			

TO: Jim Ashby 841-2553

OWNER: Phillips Petroleum

GROUND WATER & HAZARDOUS WASTE BUREAU
NEW MEXICO EID/HED
PO BOX 968 - RUNNELS BUILDING
SANTA FE, NM 87504-0968

SITE LOCATION:
County: EDDY

Township, Range, Section, Tract: (10N06E24342)

ATTN: Julie Wanslow
PHONE: 827-2928

STATION/ WELL CODE: MW-5

LATITUDE, LONGITUDE:

SAMPLING CONDITIONS:

☒ Bailed	☐ Pump	Water Level:	Discharge:	Sample Type:
☐ Dipped	☐ Tap			
pH(00400)	Conductivity(Uncorr.)	Water Temp.(00010)	Conductivity at 25°C (00094)	
	umho	°C	umho	

FIELD COMMENTS: *EQUIPMENT BLANK

SAMPLE FIELD TREATMENT

Check proper boxes:

☒ WPN: Water Preserved w/HNO ₃ Non-Filtered	☐ WPF: Water Preserved w/HNO ₃ Filtered
--	---

LAB ANALYSIS REQUESTED:

☒ ICAP Scan
Mark box next to metal if AA is required.

ANALYTICAL RESULTS (MG/L)

ELEMENT	ICAP VALUE	AA VALUE	ELEMENT	ICAP VALUE	AA VALUE
Aluminum	<0.1		Silicon	<0.1	
Barium	<0.1		Silver	<0.1	X <0.001
Beryllium	<0.1	X <0.02	Strontium	<0.1	
Boron	<0.1		Tin	<0.1	
Cadmium	<0.1	☐ X <0.001	Vanadium	<0.1	
Calcium	0.1		Zinc	<0.1	
Chromium	<0.1	☐ X <0.005	Arsenic		☐ X <0.005
Cobalt	<0.05		Selenium		☐ X <0.005
Copper	<0.1	X <0.05	Mercury		
Iron	<0.1 X				
Lead	<0.1	☐ X <0.005			
Magnesium	<0.1				
Manganese	<0.05 X				
Molybdenum	<0.1				
Nickel	<0.1	X <0.05			

LAB COMMENTS: Some HNO₃ added @ 5LD. JAA

ICAP Analyst: JAA

Reviewer: J. Ashby

Analysis Date: 12/12/88

Date Reviewed: 1/18/89

LOC Relinquished
by Marianne Smith
10-27-88 @
7:00 PM



WNN

GENERAL WATER CHEMISTRY
NITROGEN ANALYSIS

DATE RECEIVED	10/31/88	LAB NO.	WC-448	USER CODE	☐ 59300 ☐ 59600 ☒ OTHER: 53300 EFD
Collection DATE	10/25/88	SITE INFORMATION	Sample location		
Collection TIME	9:20 AM		Phillips Lusk, NM MW-5		
Collected by — Person/Agency		Collection site description			
Steve Muse, Kearney/Centaur		881025/0920			

SEND
FINAL
REPORT
TO

ATTN: Chris Dean

GROUND WATER & HAZARDOUS WASTE BUREAU
NM ENVIRONMENT IMPROVEMENT DIVISION/HED
PO Box 968
Santa Fe, NM 87504-0968

Attn: Julie Wanslow

RECEIVED

NOV 21 1988

Station/
well code MW-5

Owner Phillips Petroleum

SAMPLING CONDITIONS

☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water level	GROUND	HAZARDOUS WASTE BUREAU	Sample type
					Ground water
pH (00400)		Conductivity (Uncorrected)	μmho	Water Temp. (00010)	°C
					Conductivity at 25°C (00094)
					μmho
Field comments					
EQUIPMENT BLANK					

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted	1	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 μmembrane filter	☐ A: 2 ml H ₂ SO ₄ /L added
☒ NA: No acid added ☐ Other-specify:				

ANALYTICAL RESULTS from SAMPLES

NF, NA	Units	Date analyzed	F, NA	Units	Date analyzed
☐ Conductivity (Corrected) 25°C (00095)	μmho		☐ Calcium (00915)	mg/l	
☐ Total non-filterable residue (suspended) (00530)	mg/l		☐ Magnesium (00925)	mg/l	
☒ Other: TURBIDITY	0.21	11/14	☐ Sodium (00930)	mg/l	
☐ Other:			☐ Potassium (00935)	mg/l	
☐ Other:			☐ Bicarbonate (00440)	mg/l	
			☐ Chloride (00940)	mg/l	
			☐ Sulfate (00945)	mg/l	
			☐ Total filterable residue (dissolved) (70300)		
			☐ Other:		
NF, A-H ₂ SO ₄			F, A-H ₂ SO ₄		
☐ Nitrate-N +, Nitrate-N total (00630)	mg/l		☐ Nitrate-N +, Nitrate-N dissolved (00631)	mg/l	
☐ Ammonia-N total (00610)	mg/l		☐ Ammonia-N dissolved (00608)	mg/l	
☐ Total Kjeldahl-N ()	mg/l		☐ Total Kjeldahl-N ()	mg/l	
☐ Chemical oxygen demand (00340)	mg/l		☐ Other:		
☐ Total organic carbon ()	mg/l				
☐ Other:					
☐ Other:					
Analyst			Date Reported		
			11/14/88		
Reviewed by					

Laboratory remarks

ANALYZE TURBIDITY immediately after shaking.

Relinquished by Marianne Smith 10/27/88 @ 7:00 p.m.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-5LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110288C14

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ Date Analyzed: 11/02/88

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	1	BJ
67-64-1-----	Acetone	10	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	3	J
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	10	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
108-05-4-----	Vinyl Acetate	10	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	Trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	10	U
591-78-6-----	2-Hexanone	10	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	5	U
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Total Xylenes	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-5LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110288C14

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ Date Analyzed: 11/02/88

Column (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 2 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-54-3	HEXANE	3.17	25	J
2. 000-00-0	ALKENE	4.12	20	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-5LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111188S07

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/11/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

108-95-2-----	Phenol	10	U
111-44-4-----	bis(2-Chloroethyl) Ether	10	U
95-57-8-----	2-Chlorophenol	10	U
541-73-1-----	1,3-Dichlorobenzene	10	U
106-46-7-----	1,4-Dichlorobenzene	10	U
100-51-6-----	Benzyl Alcohol	10	U
95-50-1-----	1,2-Dichlorobenzene	10	U
95-48-7-----	2-Methylphenol	10	U
108-60-1-----	bis(2-Chloroisopropyl) Ether	10	U
106-44-5-----	4-Methylphenol	10	U
621-64-7-----	N-Nitroso-Di-n-Propylamine	10	U
67-72-1-----	Hexachloroethane	10	U
98-95-3-----	Nitrobenzene	10	U
78-59-1-----	Isophorone	10	U
88-75-5-----	2-Nitrophenol	10	U
105-67-9-----	2,4-Dimethylphenol	10	U
65-85-0-----	Benzoic Acid	50	U
111-91-1-----	bis(2-Chloroethoxy) Methane	10	U
120-83-2-----	2,4-Dichlorophenol	10	U
120-82-1-----	1,2,4-Trichlorobenzene	10	U
91-20-3-----	Naphthalene	10	U
106-47-8-----	4-Chloroaniline	10	U
87-68-3-----	Hexachlorobutadiene	10	U
59-50-7-----	4-Chloro-3-Methylphenol	10	U
91-57-6-----	2-Methylnaphthalene	10	U
77-47-4-----	Hexachlorocyclopentadiene	10	U
88-06-2-----	2,4,6-Trichlorophenol	10	U
95-95-4-----	2,4,5-Trichlorophenol	50	U
91-58-7-----	2-Chloronaphthalene	10	U
88-74-4-----	2-Nitroaniline	50	U
131-11-3-----	Dimethyl Phthalate	10	U
208-96-8-----	Acenaphthylene	10	U
606-20-2-----	2,6-Dinitrotoluene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-5LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111188S07

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/11/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

99-09-2-----3-Nitroaniline	50	U
83-32-9-----Acenaphthene	10	U
51-28-5-----2,4-Dinitrophenol	50	U
100-02-7-----4-Nitrophenol	50	U
132-64-9-----Dibenzofuran	10	U
121-14-2-----2,4-Dinitrotoluene	10	U
84-66-2-----Diethylphthalate	10	U
7005-72-3-----4-Chlorophenyl-phenylether	10	U
86-73-7-----Fluorene	10	U
100-01-6-----4-Nitroaniline	50	U
534-52-1-----4,6-Dinitro-2-Methylphenol	50	U
86-30-6-----N-Nitrosodiphenylamine (1)	10	U
101-55-3-----4-Bromophenyl-phenylether	10	U
118-74-1-----Hexachlorobenzene	10	U
87-86-5-----Pentachlorophenol	50	U
85-01-8-----Phenanthrene	10	U
120-12-7-----Anthracene	10	U
84-74-2-----Di-n-Butylphthalate	10	U
206-44-0-----Fluoranthene	10	U
129-00-0-----Pyrene	10	U
85-68-7-----Butylbenzylphthalate	10	U
91-94-1-----3,3'-Dichlorobenzidine	20	U
56-55-3-----Benzo(a)Anthracene	10	U
218-01-9-----Chrysene	10	U
117-81-7-----bis(2-Ethylhexyl)Phthalate	10	U
117-84-0-----Di-n-Octyl Phthalate	10	U
205-99-2-----Benzo(b)Fluoranthene	10	U
207-08-9-----Benzo(k)Fluoranthene	10	U
50-32-8-----Benzo(a)Pyrene	10	U
193-39-5-----Indeno(1,2,3-cd)Pyrene	10	U
53-70-3-----Dibenz(a,h)Anthracene	10	U
191-24-2-----Benzo(g,h,i)Perylene	10	U
90-12-0-----1-Methylnaphthalene	10	U
108-39-4-----meta-Cresol	10	U

(1) - Cannot be separated from Diphenylamine
FORM I SV-2

1/87 Rev.

57-97-6-----7,1	Dimethylbenzanthracene	10	U
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(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-5LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111188S07

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/11/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

Number TICs found: 5 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000-00-0	UNKNOWN PHENOL	7.93	8.0	J
2. 000-00-0	UNKNOWN	8.20	8.0	J
3. 000-00-0	CYCLOHEXANE ISOMER	8.60	10	J
4. 000-00-0	UNKNOWN ALCOHOL	12.27	16	J
5. 000-00-0	PROPANOIC ACID ISOMER	18.92	44	J



WNN

GENERAL WATER CHEMISTRY
and NITROGEN ANALYSIS

DATE RECEIVED	10/31/88	LAB NO.	WC-4449	USER CODE	☐ 59300 ☐ 59600 ☒ OTHER: 53300 EID
Collection DATE	10/25/88	SITE INFORMATION	Sample location		
Collection TIME	1100		Phillips - Lusk, NM MW-6		
Collected by — Person/Agency		Collection site description			
Steve Mace Kearney/County		881025/1100			

SEND
FINAL
REPORT
TO

ATTN: Chris Dean
GROUND WATER & HAZARDOUS WASTE BUREAU
NM ENVIRONMENT IMPROVEMENT DIVISION/HED
PO Box 968
Santa Fe, NM 87504-0968

Attn: Julie Wanslow

RECEIVED

NOV 21 1988

Station/
well code MW-6

SAMPLING CONDITIONS

☒ Bailed ☐ Dipped	☐ Pump ☐ Tap	Water level	Discharge	Sample type
pH (00400)		Conductivity (Uncorrected) μmho	Water Temp. (00010) $^{\circ}\text{C}$	Conductivity at 25 $^{\circ}\text{C}$ (00094) μmho
Field comments				
FIELD BLANK				

SAMPLE FIELD TREATMENT — Check proper boxes

No. of samples submitted	1	☒ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 μm membrane filter	☐ A: 2 ml H_2SO_4 /L added
☒ NA: No acid added ☐ Other-specify:				

ANALYTICAL RESULTS from SAMPLES

NF, NA	Units	Date analyzed	F, NA	Units	Date analyzed
☐ Conductivity (Corrected) 25 $^{\circ}\text{C}$ (00095)	μmho		☐ Calcium (00915)	mg/l	
☐ Total non-filterable residue (suspended) (00530)	mg/l		☐ Magnesium (00925)	mg/l	
☒ Other: TURBIDITY	0.15	11/14	☐ Sodium (00930)	mg/l	
☐ Other:			☐ Potassium (00935)	mg/l	
☐ Other:			☐ Bicarbonate (00440)	mg/l	
			☐ Chloride (00940)	mg/l	
			☐ Sulfate (00945)	mg/l	
			☐ Total filterable residue (dissolved) (70300)	mg/l	
			☐ Other:		
NF, A-H $_2$ SO $_4$			HAZARDOUS		
☐ Nitrate-N $^{+}$, Nitrate-N total (00630)	mg/l		☐ Nitrate-N $^{+}$, Nitrate-N dissolved (00631)	mg/l	
☐ Ammonia-N total (00610)	mg/l		☐ Ammonia-N dissolved (00608)	mg/l	
☐ Total Kjeldahl-N ()	mg/l		☐ Total Kjeldahl-N ()	mg/l	
☐ Chemical oxygen demand (00340)	mg/l		☐ Other:		
☐ Total organic carbon ()	mg/l				
☐ Other:					
☐ Other:					
Laboratory remarks			Analyst	Date Reported	Reviewed by
Analyze Turbidity immediately after shaking.				11/14/88	CS
Relinquished by Marianne Smith 10-27-88 @ 7:00 pm					

Date Received	10/31/88	Lab No.	ICAP-529	User Code	☐ 59400 ☐ 59300	☐ 53400 ☐ 59500	☒ 53300
COLLECTION DATE & TIME:		yy	mm	dd	hh	mm	
10-25-88		88	10	25	11	00	

COLLECTED BY:
Steve Muse (Kernsey/Centaur)

COLLECTION SITE DESCRIPTION

Phillips Petroleum MW-6

(Field Blank)

TO: Jim Ashley 841-4555

OWNER: Phillips Petroleum

GROUND WATER & HAZARDOUS WASTE BUREAU

NEW MEXICO EID/HED

PO BOX 968 - RUNNELS BUILDING

SANTA FE, NM 87504-0968

SITE LOCATION:

County: Eddy

Township, Range, Section, Tract: (10N06E24342)

ATTN: Julie Wanslow

PHONE: 827-2928

STATION WELL CODE: MW-6

LATITUDE, LONGITUDE:

SAMPLING CONDITIONS:

☐ Bailed	☐ Pump	Water Level:	Discharge:	Sample Type:
☒ Dipped	☐ Tap			

pH(00400)	Conductivity(Uncorr.)	Water Temp.(00010)	Conductivity at 25°C(00094)
	umho	°C	umho

FIELD COMMENTS: * FIELD BLANK

SAMPLE FIELD TREATMENT

Check proper boxes:

☒ WPN: Water Preserved w/HNO ₃ Non-Filtered	☐ WPF: Water Preserved w/HNO ₃ Filtered
---	--

LAB ANALYSIS REQUESTED:

☒ ICAP Scan
Mark box next to metal if AA is required.

ANALYTICAL RESULTS (MG/L)

ELEMENT	ICAP VALUE	AA VALUE	ELEMENT	ICAP VALUE	AA VALUE
Aluminum	<0.1		Silicon	<0.1	
Barium	<0.1		Silver	<0.1	X <0.001
Beryllium	<0.1	X <0.02	Strontium	<0.1	
Boron	<0.1		Tin	<0.1	
Cadmium	<0.1	☐ X <0.001	Vanadium	<0.1	
Calcium	<0.1		Zinc	<0.1	
Chromium	<0.1	☐ X <0.005	Arsenic		☐ X <0.005
Cobalt	<0.05		Selenium		☐ X <0.005
Copper	<0.1	X <0.05	Mercury		
Iron	<0.1 X				
Lead	<0.1	☐ X <0.005			
Magnesium	<0.1				
Manganese	<0.05 X				
Molybdenum	<0.1				
Nickel	<0.1	X <0.05			

LAB COMMENTS: 5.0 ml HNO₃ added @ SLD, JAACOE Relinquished
By Marianne Smith
10-27-88 @
7:00 pm

ICAP Analyst: JAA

Analysis Date: 12/12/88

Reviewer: Jim Ashley

Date Reviewed: 1/18/89

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-6LUS

Lab Name: EMSI Contract: 0452 0459
 Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____
 Matrix: (soil/water) WATER Lab Sample ID: _____
 Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110388C05
 Level: (low/med) LOW Date Received: 10/27/88
 % Moisture: not dec. _____ Date Analyzed: 11/03/88
 Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	2	BJ
67-64-1-----	Acetone	10	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	3	J
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	10	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
108-05-4-----	Vinyl Acetate	10	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	Trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	10	U
591-78-6-----	2-Hexanone	10	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	5	U
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Total Xylenes	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-6LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110388C05

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ Date Analyzed: 11/03/88

Column (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-6LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111088S04

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/10/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

108-95-2-----Phenol	10	U
111-44-4-----bis(2-Chloroethyl) Ether	10	U
95-57-8-----2-Chlorophenol	10	U
541-73-1-----1,3-Dichlorobenzene	10	U
106-46-7-----1,4-Dichlorobenzene	10	U
100-51-6-----Benzyl Alcohol	10	U
95-50-1-----1,2-Dichlorobenzene	10	U
95-48-7-----2-Methylphenol	10	U
108-60-1-----bis(2-Chloroisopropyl) Ether	10	U
106-44-5-----4-Methylphenol	10	U
621-64-7-----N-Nitroso-Di-n-Propylamine	10	U
67-72-1-----Hexachloroethane	10	U
98-95-3-----Nitrobenzene	10	U
78-59-1-----Isophorone	10	U
88-75-5-----2-Nitrophenol	10	U
105-67-9-----2,4-Dimethylphenol	10	U
65-85-0-----Benzoic Acid	50	U
111-91-1-----bis(2-Chloroethoxy)Methane	10	U
120-83-2-----2,4-Dichlorophenol	10	U
120-82-1-----1,2,4-Trichlorobenzene	10	U
91-20-3-----Naphthalene	10	U
106-47-8-----4-Chloroaniline	10	U
87-68-3-----Hexachlorobutadiene	10	U
59-50-7-----4-Chloro-3-Methylphenol	10	U
91-57-6-----2-Methylnaphthalene	10	U
77-47-4-----Hexachlorocyclopentadiene	10	U
88-06-2-----2,4,6-Trichlorophenol	10	U
95-95-4-----2,4,5-Trichlorophenol	50	U
91-58-7-----2-Chloronaphthalene	10	U
88-74-4-----2-Nitroaniline	50	U
131-11-3-----Dimethyl Phthalate	10	U
208-96-8-----Acenaphthylene	10	U
606-20-2-----2,6-Dinitrotoluene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-6LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111088S04

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/10/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

99-09-2-----3-Nitroaniline	50	U
83-32-9-----Acenaphthene	10	U
51-28-5-----2,4-Dinitrophenol	50	U
100-02-7-----4-Nitrophenol	50	U
132-64-9-----Dibenzofuran	10	U
121-14-2-----2,4-Dinitrotoluene	10	U
84-66-2-----Diethylphthalate	10	U
7005-72-3-----4-Chlorophenyl-phenylether	10	U
86-73-7-----Fluorene	10	U
100-01-6-----4-Nitroaniline	50	U
534-52-1-----4,6-Dinitro-2-Methylphenol	50	U
86-30-6-----N-Nitrosodiphenylamine (1)	10	U
101-55-3-----4-Bromophenyl-phenylether	10	U
118-74-1-----Hexachlorobenzene	10	U
87-86-5-----Pentachlorophenol	50	U
85-01-8-----Phenanthrene	10	U
120-12-7-----Anthracene	10	U
84-74-2-----Di-n-Butylphthalate	10	U
206-44-0-----Fluoranthene	10	U
129-00-0-----Pyrene	10	U
85-68-7-----Butylbenzylphthalate	10	U
91-94-1-----3,3'-Dichlorobenzidine	20	U
56-55-3-----Benzo(a)Anthracene	10	U
218-01-9-----Chrysene	10	U
117-81-7-----bis(2-Ethylhexyl)Phthalate	10	U
117-84-0-----Di-n-Octyl Phthalate	10	U
205-99-2-----Benzo(b)Fluoranthene	10	U
207-08-9-----Benzo(k)Fluoranthene	10	U
50-32-8-----Benzo(a)Pyrene	10	U
193-39-5-----Indeno(1,2,3-cd)Pyrene	10	U
53-70-3-----Dibenz(a,h)Anthracene	10	U
191-24-2-----Benzo(g,h,i)Perylene	10	U
90-12-0-----1-Methylnaphthalene	10	U
108-39-4-----meta-Cresol	10	U

(1) - Cannot be separated from Diphenylamine
FORM I SV-2

1/87 Rev.

57-97-6-----7,12-dimethylbenzanthracene	10	U
---	----	---

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-6LUS

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111088S04

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/10/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

Number TICs found: 4 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000-00-0	UNKNOWN ALCOHOL ISOMER	8.02	12	J
2. 000-00-0	UNKNOWN	8.27	8.0	J
3. 000-00-0	UNKNOWN	8.47	8.0	J
4. 000-00-0	CYCLOHEXANE ISOMER	8.67	14	J

1A
VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK01

Lab Name: EMSI Contract: 0465 0466

Lab Code: EMSI Case No.: ATK-2 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110788C05

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/07/88

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
74-87-3	-----Chloromethane	10	U
74-83-9	-----Bromomethane	10	U
75-01-4	-----Vinyl Chloride	10	U
75-00-3	-----Chloroethane	10	U
75-09-2	-----Methylene Chloride	3	J
67-64-1	-----Acetone	10	U
75-15-0	-----Carbon Disulfide	5	U
75-35-4	-----1,1-Dichloroethene	5	U
75-34-3	-----1,1-Dichloroethane	5	U
540-59-0	-----1,2-Dichloroethene (total)	5	U
67-66-3	-----Chloroform	5	U
107-06-2	-----1,2-Dichloroethane	5	U
78-93-3	-----2-Butanone	10	U
71-55-6	-----1,1,1-Trichloroethane	5	U
56-23-5	-----Carbon Tetrachloride	5	U
108-05-4	-----Vinyl Acetate	10	U
75-27-4	-----Bromodichloromethane	5	U
78-87-5	-----1,2-Dichloropropane	5	U
10061-01-5	-----cis-1,3-Dichloropropene	5	U
79-01-6	-----Trichloroethene	5	U
124-48-1	-----Dibromochloromethane	5	U
79-00-5	-----1,1,2-Trichloroethane	5	U
71-43-2	-----Benzene	5	U
10061-02-6	-----Trans-1,3-Dichloropropene	5	U
75-25-2	-----Bromoform	5	U
108-10-1	-----4-Methyl-2-Pentanone	10	U
591-78-6	-----2-Hexanone	10	U
127-18-4	-----Tetrachloroethene	5	U
79-34-5	-----1,1,2,2-Tetrachloroethane	5	U
108-88-3	-----Toluene	5	U
108-90-7	-----Chlorobenzene	5	U
100-41-4	-----Ethylbenzene	5	U
100-42-5	-----Styrene	5	U
1330-20-7	-----Total Xylenes	5	U

15
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK01

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-2 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111488S04

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ dec. _____ Date Extracted: 11/03/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/14/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

108-95-2-----	Phenol	10	U
111-44-4-----	bis(2-Chloroethyl) Ether	10	U
95-57-8-----	2-Chlorophenol	10	U
541-73-1-----	1,3-Dichlorobenzene	10	U
106-46-7-----	1,4-Dichlorobenzene	10	U
100-51-6-----	Benzyl Alcohol	10	U
95-50-1-----	1,2-Dichlorobenzene	10	U
95-48-7-----	2-Methylphenol	10	U
108-60-1-----	bis(2-Chloroisopropyl) Ether	10	U
106-44-5-----	4-Methylphenol	10	U
621-64-7-----	N-Nitroso-Di-n-Propylamine	10	U
67-72-1-----	Hexachloroethane	10	U
98-95-3-----	Nitrobenzene	10	U
78-59-1-----	Isophorone	10	U
88-75-5-----	2-Nitrophenol	10	U
105-67-9-----	2,4-Dimethylphenol	10	U
65-85-0-----	Benzoic Acid	50	U
111-91-1-----	bis(2-Chloroethoxy) Methane	10	U
120-83-2-----	2,4-Dichlorophenol	10	U
120-82-1-----	1,2,4-Trichlorobenzene	10	U
91-20-3-----	Naphthalene	10	U
106-47-8-----	4-Chloroaniline	10	U
87-68-3-----	Hexachlorobutadiene	10	U
59-50-7-----	4-Chloro-3-Methylphenol	10	U
91-57-6-----	2-Methylnaphthalene	10	U
77-47-4-----	Hexachlorocyclopentadiene	10	U
88-06-2-----	2,4,6-Trichlorophenol	10	U
95-95-4-----	2,4,5-Trichlorophenol	50	U
91-58-7-----	2-Chloronaphthalene	10	U
88-74-4-----	2-Nitroaniline	50	U
131-11-3-----	Dimethyl Phthalate	10	U
208-96-8-----	Acenaphthylene	10	U
606-20-2-----	2,6-Dinitrotoluene	10	U

2A
WATER VOLATILE SURROGATE RECOVERY

Lab Name: EMSI Contract: 0465 0466
 Lab Code: EMSI Case No.: ATK-2 SAS No.: _____ SDG No.: _____

	EPA SAMPLE NO.	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #	OTHER	TOT OUT
	=====	=====	=====	=====	=====	=====
01	MW-1EUN	89	105	98		0
02	MW-1LEE	109	107	101		0
03	MW-2EUN	101	104	97		0
04	MW-2EUN	104	114	93		0
05	MW-3EUN	94	109	104		0
06	MW-3LEE	91	99	89		0
07	MW-4EUN	105	114	92		0
08	MW-4LEE	104	112	56 *		1
09	MW-4LEEDL	88	98	92		0
10	MW-5EUN	98	114	109		0
11	MW-5LEE	100	104	93		0
12	MW-6EUN	93	109	99		0
13	MW-6LEE	108	112	102		0
14	MW-1LEEMS	104	113	98		0
15	MW-1LEEMSD	99	115	96		0
16	VLK01	107	114	89		0
17	VLK02	100	113	92		0

QC LIMITS

S1 (TOL) = Toluene-d8 (88-110)
 S2 (BFB) = Bromofluorobenzene (86-115)
 S3 (DCE) = 1,2-Dichloroethane-d4 (76-114)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK01

Lab Name: EMSI Contract: 0465 0466
Lab Code: EMSI Case No.: ATK-2 SAS No.: _____ SDG No.: _____
Matrix: (soil/water) WATER Lab Sample ID: _____
Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110788C05
Level: (low/med) LOW Date Received: _____
% Moisture: not dec. _____ Date Analyzed: 11/07/88
Column (pack/cap) CAP Dilution Factor: 1.00

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK01

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-2 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111488S04

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ dec. _____ Date Extracted: 11/03/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/14/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

99-09-2-----	3-Nitroaniline	50	U
83-32-9-----	Acenaphthene	10	U
51-28-5-----	2,4-Dinitrophenol	50	U
100-02-7-----	4-Nitrophenol	50	U
132-64-9-----	Dibenzofuran	10	U
121-14-2-----	2,4-Dinitrotoluene	10	U
84-66-2-----	Diethylphthalate	10	U
7005-72-3-----	4-Chlorophenyl-phenylether	10	U
86-73-7-----	Fluorene	10	U
100-01-6-----	4-Nitroaniline	50	U
534-52-1-----	4,6-Dinitro-2-Methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (1)	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-Butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
56-55-3-----	Benzo(a)Anthracene	10	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0-----	Di-n-Octyl Phthalate	10	U
205-99-2-----	Benzo(b)Fluoranthene	10	U
207-08-9-----	Benzo(k)Fluoranthene	10	U
50-32-8-----	Benzo(a)Pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3-----	Dibenz(a,h)Anthracene	10	U
191-24-2-----	Benzo(g,h,i)Perylene	10	U
90-12-0-----	1-Methylnaphthalene	10	U
108-39-4-----	meta-Cresol	10	U

(1) - Cannot be separated from Diphenylamine
FORM I SV-2

1/87 Rev.

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLK01

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-2 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111488S04

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ dec. _____ Date Extracted: 11/03/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/14/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

Number TICs found: 1 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000-00-1	PROPENE ISOMER	8.30	16	J

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SBLK02

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-2 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID:

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 112088S05

Level: (low/med) LOW Date Received:

% Moisture: not dec. dec. Date Extracted: 11/07/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/21/88

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000-00-1	UNKNOWN	7.73	10	J
2. 000-00-2	UNKNOWN	10.19	34	J
3. 000-00-3	UNKNOWN	10.35	56	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK02

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-2 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 112088S05

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ dec. _____ Date Extracted: 11/07/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/21/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

108-95-2-----	Phenol	10	U
111-44-4-----	bis(2-Chloroethyl) Ether	10	U
95-57-8-----	2-Chlorophenol	10	U
541-73-1-----	1,3-Dichlorobenzene	10	U
106-46-7-----	1,4-Dichlorobenzene	10	U
100-51-6-----	Benzyl Alcohol	10	U
95-50-1-----	1,2-Dichlorobenzene	10	U
95-48-7-----	2-Methylphenol	10	U
108-60-1-----	bis(2-Chloroisopropyl) Ether	10	U
106-44-5-----	4-Methylphenol	10	U
621-64-7-----	N-Nitroso-Di-n-Propylamine	10	U
67-72-1-----	Hexachloroethane	10	U
98-95-3-----	Nitrobenzene	10	U
78-59-1-----	Isophorone	10	U
88-75-5-----	2-Nitrophenol	10	U
105-67-9-----	2,4-Dimethylphenol	10	U
65-85-0-----	Benzoic Acid	50	U
111-91-1-----	bis(2-Chloroethoxy) Methane	10	U
120-83-2-----	2,4-Dichlorophenol	10	U
120-82-1-----	1,2,4-Trichlorobenzene	10	U
91-20-3-----	Naphthalene	10	U
106-47-8-----	4-Chloroaniline	10	U
87-68-3-----	Hexachlorobutadiene	10	U
59-50-7-----	4-Chloro-3-Methylphenol	10	U
91-57-6-----	2-Methylnaphthalene	10	U
77-47-4-----	Hexachlorocyclopentadiene	10	U
88-06-2-----	2,4,6-Trichlorophenol	10	U
95-95-4-----	2,4,5-Trichlorophenol	50	U
91-58-7-----	2-Chloronaphthalene	10	U
88-74-4-----	2-Nitroaniline	50	U
131-11-3-----	Dimethyl Phthalate	10	U
208-96-8-----	Acenaphthylene	10	U
606-20-2-----	2,6-Dinitrotoluene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK02

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-2 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 112088S05

Level: (low/med) LOW Date Received: _____

Moisture: not dec. _____ dec. _____ Date Extracted: 11/07/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/21/88

SPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

99-09-2-----	3-Nitroaniline	50	U
83-32-9-----	Acenaphthene	10	U
51-28-5-----	2,4-Dinitrophenol	50	U
100-02-7-----	4-Nitrophenol	50	U
132-64-9-----	Dibenzofuran	10	U
121-14-2-----	2,4-Dinitrotoluene	10	U
84-66-2-----	Diethylphthalate	10	U
7005-72-3-----	4-Chlorophenyl-phenylether	10	U
86-73-7-----	Fluorene	10	U
100-01-6-----	4-Nitroaniline	50	U
534-52-1-----	4,6-Dinitro-2-Methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (1)	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-Butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
56-55-3-----	Benzo(a)Anthracene	10	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0-----	Di-n-Octyl Phthalate	10	U
205-99-2-----	Benzo(b)Fluoranthene	10	U
207-08-9-----	Benzo(k)Fluoranthene	10	U
50-32-8-----	Benzo(a)Pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3-----	Dibenz(a,h)Anthracene	10	U
191-24-2-----	Benzo(g,h,i)Perylene	10	U
90-12-0-----	1-Methylnaphthalene	10	U
108-39-4-----	meta-Cresol	10	U

(1) - Cannot be separated from Diphenylamine
FORM I SV-2

1/87 Rev.

(1) - Cannot be separated from Diphenylamine

VOLATILE METHOD BLANK SUMMARY

Lab Name: EMSI Contract: 0452 0
Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____
Lab File ID: 110388C04 Lab Sample ID: _____
Date Analyzed: 11/03/88 Time Analyzed: 0700
Matrix: (soil/water) WATER Level: (low/med) LOW
Instrument ID: 4021

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	MW-1ART		110388C06	0802
02	MW-2ART		110388C07	0827
03	MW-3ART		110388C08	0851
04	MW-4ART		110388C12	1114
05	MW-5ART		110388C10	1019
06	MW-6ART		110388C11	1045
07	MW-6LUS		110388C05	0740
08	MW-4ARTMS		110388C16	1256
09	MW-4ARTMSD		110388C17	1325

COMMENTS: VBLK02
5C TO 110C @ 6C/MIN ON FINN 4021

WATER VOLATILE SURROGATE RECOVERY

Lab Name: EMSI Contract: 0452 0455
 Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

	EPA SAMPLE NO.	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #	OTHER	TOT OUT
01	MW-1ART	95	97	95		0
02	MW-1LUS	97	91	84		0
03	MW-2ART	99	96	91		0
04	MW-2LUS	99	91	92		0
05	MW-3ART	96	99	90		0
06	MW-3LUS	97	94	95		0
07	MW-4ART	95	98	91		0
08	MW-4LUS	89	93	91		0
09	MW-5ART	100	97	95		0
10	MW-5LUS	102	97	84		0
11	MW-6ART	92	100	88		0
12	MW-6LUS	102	101	93		0
13	MW-4ARTMS	94	98	86		0
14	MW-4ARTMSD	98	98	89		0
15	VBLK01	96	93	92		0
16	VBLK02	109	98	91		0

QC LIMITS

S1 (TOL) = Toluene-d8 (88-110)
 S2 (BFB) = Bromofluorobenzene (86-115)
 S3 (DCE) = 1,2-Dichloroethane-d4 (76-114)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

VOLATILE METHOD BLANK SUMMARY

Lab Name: EMSI Contract: 0452 0109
Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____
Lab File ID: 110288C09 Lab Sample ID: _____
Date Analyzed: 11/02/88 Time Analyzed: 1228
Matrix: (soil/water) WATER Level: (low/med) LOW
Instrument ID: 4021

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	=====	=====	=====	=====
01	MW-1LUS		110288C16	1628
02	MW-2LUS		110288C11	1335
03	MW-3LUS		110288C12	1409
04	MW-4LUS		110288C13	1436
05	MW-5LUS		110288C14	1504

COMMENTS: VBLK01
5C AT 5MIN THEN 6C/MIN TO 100C ON FINN 4021

VOLATILE ORGANICS ANALYSIS DATA SHEET

VBLK01

Lab Name: EMSI Contract: 0452 0459
Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____
Matrix: (soil/water) WATER Lab Sample ID: _____
Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110288C09
Level: (low/med) LOW Date Received: _____
% Moisture: not dec. _____ Date Analyzed: 11/02/88
Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	1	J
67-64-1-----	Acetone	1	J
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	10	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
108-05-4-----	Vinyl Acetate	10	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	Trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	10	U
591-78-6-----	2-Hexanone	10	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	5	U
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Total Xylenes	5	U

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

VBK01

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110288C09

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/02/88

Column (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

VOLATILE ORGANICS ANALYSIS DATA SHEET

VBLK02

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110388C04

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/03/88

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg) <u>UG/L</u>	<u>Q</u>
74-87-3	-----Chloromethane	10	U
74-83-9	-----Bromomethane	10	U
75-01-4	-----Vinyl Chloride	10	U
75-00-3	-----Chloroethane	10	U
75-09-2	-----Methylene Chloride	1	J
67-64-1	-----Acetone	10	U
75-15-0	-----Carbon Disulfide	5	U
75-35-4	-----1,1-Dichloroethene	5	U
75-34-3	-----1,1-Dichloroethane	5	U
540-59-0	-----1,2-Dichloroethene (total)	5	U
67-66-3	-----Chloroform	5	U
107-06-2	-----1,2-Dichloroethane	5	U
78-93-3	-----2-Butanone	10	U
71-55-6	-----1,1,1-Trichloroethane	5	U
56-23-5	-----Carbon Tetrachloride	5	U
108-05-4	-----Vinyl Acetate	10	U
75-27-4	-----Bromodichloromethane	5	U
78-87-5	-----1,2-Dichloropropane	5	U
10061-01-5	-----cis-1,3-Dichloropropene	5	U
79-01-6	-----Trichloroethene	5	U
124-48-1	-----Dibromochloromethane	5	U
79-00-5	-----1,1,2-Trichloroethane	5	U
71-43-2	-----Benzene	5	U
10061-02-6	-----Trans-1,3-Dichloropropene	5	U
75-25-2	-----Bromoform	5	U
108-10-1	-----4-Methyl-2-Pentanone	10	U
591-78-6	-----2-Hexanone	10	U
127-18-4	-----Tetrachloroethene	5	U
79-34-5	-----1,1,2,2-Tetrachloroethane	5	U
108-88-3	-----Toluene	5	U
108-90-7	-----Chlorobenzene	5	U
100-41-4	-----Ethylbenzene	5	U
100-42-5	-----Styrene	5	U
1330-20-7	-----Total Xylenes	5	U

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

VBLK02

Lab Name: EMSI Contract: 0452 0459
Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____
Matrix: (soil/water) WATER Lab Sample ID: _____
Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110388C04
Level: (low/med) LOW Date Received: _____
% Moisture: not dec. _____ Date Analyzed: 11/03/88
Column (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

MW-6LUSMS

Lab Name: EMSI Contract: 0452 0459
 Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____
 Matrix: (soil/water) WATER Lab Sample ID: _____
 Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111188S08
 Level: (low/med) LOW Date Received: 10/27/88
 % Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88
 Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/11/88
 GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
 (ug/L or ug/Kg) UG/L Q

108-95-2-----	Phenol	10	U
111-44-4-----	bis(2-Chloroethyl) Ether	10	U
95-57-8-----	2-Chlorophenol	10	U
541-73-1-----	1,3-Dichlorobenzene	10	U
106-46-7-----	1,4-Dichlorobenzene	10	U
100-51-6-----	Benzyl Alcohol	10	U
95-50-1-----	1,2-Dichlorobenzene	10	U
95-48-7-----	2-Methylphenol	10	U
108-60-1-----	bis(2-Chloroisopropyl) Ether	10	U
106-44-5-----	4-Methylphenol	10	U
621-64-7-----	N-Nitroso-Di-n-Propylamine	10	U
67-72-1-----	Hexachloroethane	10	U
98-95-3-----	Nitrobenzene	10	U
78-59-1-----	Isophorone	10	U
88-75-5-----	2-Nitrophenol	10	U
105-67-9-----	2,4-Dimethylphenol	10	U
65-85-0-----	Benzoic Acid	50	U
111-91-1-----	bis(2-Chloroethoxy) Methane	10	U
120-83-2-----	2,4-Dichlorophenol	10	U
120-82-1-----	1,2,4-Trichlorobenzene	10	U
91-20-3-----	Naphthalene	10	U
106-47-8-----	4-Chloroaniline	10	U
87-68-3-----	Hexachlorobutadiene	10	U
59-50-7-----	4-Chloro-3-Methylphenol	10	U
91-57-6-----	2-Methylnaphthalene	10	U
77-47-4-----	Hexachlorocyclopentadiene	10	U
88-06-2-----	2,4,6-Trichlorophenol	10	U
95-95-4-----	2,4,5-Trichlorophenol	50	U
91-58-7-----	2-Chloronaphthalene	10	U
88-74-4-----	2-Nitroaniline	50	U
131-11-3-----	Dimethyl Phthalate	10	U
208-96-8-----	Acenaphthylene	10	U
606-20-2-----	2,6-Dinitrotoluene	10	U

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

MW-6LUSMS

Lab Name: EMSIContract: 0452 0459Lab Code: EMSI Case No.: ATK-1

SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER

Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) MLLab File ID: 111188S08Level: (low/med) LOWDate Received: 10/27/88

% Moisture: not dec. _____ dec. _____

Date Extracted: 10/31/88Extraction: (SepF/Cont/Sonc) CONTDate Analyzed: 11/11/88GPC Cleanup: (Y/N) N pH: _____Dilution Factor: 1.0

CAS NO.

COMPOUND

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

99-09-2-----	3-Nitroaniline	50	U
83-32-9-----	Acenaphthene	10	U
51-28-5-----	2,4-Dinitrophenol	50	U
100-02-7-----	4-Nitrophenol	50	U
132-64-9-----	Dibenzofuran	10	U
121-14-2-----	2,4-Dinitrotoluene	10	U
84-66-2-----	Diethylphthalate	10	U
7005-72-3-----	4-Chlorophenyl-phenylether	10	U
86-73-7-----	Fluorene	10	U
100-01-6-----	4-Nitroaniline	50	U
534-52-1-----	4,6-Dinitro-2-Methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (1)	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-Butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
56-55-3-----	Benzo(a)Anthracene	10	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0-----	Di-n-Octyl Phthalate	10	U
205-99-2-----	Benzo(b)Fluoranthene	10	U
207-08-9-----	Benzo(k)Fluoranthene	10	U
50-32-8-----	Benzo(a)Pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3-----	Dibenz(a,h)Anthracene	10	U
191-24-2-----	Benzo(g,h,i)Perylene	10	U
90-12-0-----	1-Methylnaphthalene	10	U
108-39-4-----	meta-Cresol	10	U

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

1/87 Rev.

37570 7/12 Dimethylbenzamide
(1) - Cannot be separated from Diphenylamine

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

MW-6LUSMSD

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111188S09

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/11/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

108-95-2-----	Phenol	10	U
111-44-4-----	bis(2-Chloroethyl) Ether	10	U
95-57-8-----	2-Chlorophenol	10	U
541-73-1-----	1,3-Dichlorobenzene	10	U
106-46-7-----	1,4-Dichlorobenzene	10	U
100-51-6-----	Benzyl Alcohol	10	U
95-50-1-----	1,2-Dichlorobenzene	10	U
95-48-7-----	2-Methylphenol	10	U
108-60-1-----	bis(2-Chloroisopropyl) Ether	10	U
106-44-5-----	4-Methylphenol	10	U
621-64-7-----	N-Nitroso-Di-n-Propylamine	10	U
67-72-1-----	Hexachloroethane	10	U
98-95-3-----	Nitrobenzene	10	U
78-59-1-----	Isophorone	10	U
88-75-5-----	2-Nitrophenol	10	U
105-67-9-----	2,4-Dimethylphenol	10	U
65-85-0-----	Benzoic Acid	50	U
111-91-1-----	bis(2-Chloroethoxy) Methane	10	U
120-83-2-----	2,4-Dichlorophenol	10	U
120-82-1-----	1,2,4-Trichlorobenzene	10	U
91-20-3-----	Naphthalene	10	U
106-47-8-----	4-Chloroaniline	10	U
87-68-3-----	Hexachlorobutadiene	10	U
59-50-7-----	4-Chloro-3-Methylphenol	10	U
91-57-6-----	2-Methylnaphthalene	10	U
77-47-4-----	Hexachlorocyclopentadiene	10	U
88-06-2-----	2,4,6-Trichlorophenol	10	U
95-95-4-----	2,4,5-Trichlorophenol	50	U
91-58-7-----	2-Chloronaphthalene	10	U
88-74-4-----	2-Nitroaniline	50	U
131-11-3-----	Dimethyl Phthalate	10	U
208-96-8-----	Acenaphthylene	10	U
606-20-2-----	2,6-Dinitrotoluene	10	U

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

LFA SAMPLE NO.

MW-6LUSMSD

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111188S09

Level: (low/med) LOW Date Received: 10/27/88

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/11/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg) <u>UG/L</u>	<u>Q</u>
99-09-2-----	3-Nitroaniline	50	U
83-32-9-----	Acenaphthene	10	U
51-28-5-----	2,4-Dinitrophenol	50	U
100-02-7-----	4-Nitrophenol	50	U
132-64-9-----	Dibenzofuran	10	U
121-14-2-----	2,4-Dinitrotoluene	10	U
84-66-2-----	Diethylphthalate	10	U
7005-72-3-----	4-Chlorophenyl-phenylether	10	U
86-73-7-----	Fluorene	10	U
100-01-6-----	4-Nitroaniline	50	U
534-52-1-----	4,6-Dinitro-2-Methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (1)	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-Butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
56-55-3-----	Benzo(a)Anthracene	10	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0-----	Di-n-Octyl Phthalate	10	U
205-99-2-----	Benzo(b)Fluoranthene	10	U
207-08-9-----	Benzo(k)Fluoranthene	10	U
50-32-8-----	Benzo(a)Pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3-----	Dibenz(a,h)Anthracene	10	U
191-24-2-----	Benzo(g,h,i)Perylene	10	U
90-12-0-----	1-Methylnaphthalene	10	U
108-39-4-----	meta-Cresol	10	U

(1) - Cannot be separated from Diphenylamine
FORM I SV-2

1/87 Rev.

1,1'-bis(4-chlorophenyl)ethane-2,2'-diol
(1) - Cannot be separated from Diphenylamine

SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: EMSI Contract: 0452 009
Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____
Lab File ID: 111088S03 Lab Sample ID: _____
Date Extracted: 10/31/88 Extraction: (SepF/Cont/Sonc) CONT
Date Analyzed: 11/10/88 Time Analyzed: 1648
Matrix: (soil/water) WATER Level: (low/med) _____
Instrument ID: 4500B

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	MW-1LUS		111188S03	11/11/88
02	MW-2LUS		111188S04	11/11/88
03	MW-3LUS		111188S05	11/11/88
04	MW-5LUS		111188S07	11/11/88
05	MW-6LUS		111088S04	11/10/88
06	MW-6LUSMS		111188S08	11/11/88
07	MW-6LUSMSD		111188S09	11/11/88

COMMENTS: 51207-0452 AT KEARNEY METHOD BLANK 10/31/88 (H2O)
1.5 MIN @ 35C, THEN 10C/MIN TO 300C (FINN 4500B)

SBLK01

Lab Name: EMSIContract: 0452 0459Lab Code: EMSICase No.: ATK-1

SAS No.: _____

SDG No.: _____

Matrix: (soil/water) WATER

Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) MLLab File ID: 111088S03

Level: (low/med) _____

Date Received: _____

% Moisture: not dec. _____ dec. _____

Date Extracted: 10/31/88Extraction: (SepF/Cont/Sonc) CONTDate Analyzed: 11/10/88GPC Cleanup: (Y/N) N pH: _____Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
---------	----------	---	---

108-95-2-----	Phenol	10	U
111-44-4-----	bis(2-Chloroethyl) Ether	10	U
95-57-8-----	2-Chlorophenol	10	U
541-73-1-----	1,3-Dichlorobenzene	10	U
106-46-7-----	1,4-Dichlorobenzene	10	U
100-51-6-----	Benzyl Alcohol	10	U
95-50-1-----	1,2-Dichlorobenzene	10	U
95-48-7-----	2-Methylphenol	10	U
108-60-1-----	bis(2-Chloroisopropyl) Ether	10	U
106-44-5-----	4-Methylphenol	10	U
621-64-7-----	N-Nitroso-Di-n-Propylamine	10	U
67-72-1-----	Hexachloroethane	10	U
98-95-3-----	Nitrobenzene	10	U
78-59-1-----	Isophorone	10	U
88-75-5-----	2-Nitrophenol	10	U
105-67-9-----	2,4-Dimethylphenol	10	U
65-85-0-----	Benzoic Acid	50	U
111-91-1-----	bis(2-Chloroethoxy) Methane	10	U
120-83-2-----	2,4-Dichlorophenol	10	U
120-82-1-----	1,2,4-Trichlorobenzene	10	U
91-20-3-----	Naphthalene	10	U
106-47-8-----	4-Chloroaniline	10	U
87-68-3-----	Hexachlorobutadiene	10	U
59-50-7-----	4-Chloro-3-Methylphenol	10	U
91-57-6-----	2-Methylnaphthalene	10	U
77-47-4-----	Hexachlorocyclopentadiene	10	U
88-06-2-----	2,4,6-Trichlorophenol	10	U
95-95-4-----	2,4,5-Trichlorophenol	50	U
91-58-7-----	2-Chloronaphthalene	10	U
88-74-4-----	2-Nitroaniline	50	U
131-11-3-----	Dimethyl Phthalate	10	U
208-96-8-----	Acenaphthylene	10	U
606-20-2-----	2,6-Dinitrotoluene	10	U

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

LAB SAMPLE NO.

SBLK01

Lab Name: EMSIContract: 0452 0459Lab Code: EMSICase No.: ATK-1

SAS No.: _____

SDG No.: _____

Matrix: (soil/water) WATER

Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) MLLab File ID: 111088S03

Level: (low/med) _____

Date Received: _____

% Moisture: not dec. _____ dec. _____

Date Extracted: 10/31/88Extraction: (SepF/Cont/Sonc) CONTDate Analyzed: 11/10/88GPC Cleanup: (Y/N) N pH: _____Dilution Factor: 1.0

CAS NO.

COMPOUND

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Q

99-09-2-----	3-Nitroaniline	50	U
83-32-9-----	Acenaphthene	10	U
51-28-5-----	2,4-Dinitrophenol	50	U
100-02-7-----	4-Nitrophenol	50	U
132-64-9-----	Dibenzofuran	10	U
121-14-2-----	2,4-Dinitrotoluene	10	U
84-66-2-----	Diethylphthalate	10	U
7005-72-3-----	4-Chlorophenyl-phenylether	10	U
86-73-7-----	Fluorene	10	U
100-01-6-----	4-Nitroaniline	50	U
534-52-1-----	4,6-Dinitro-2-Methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (1)	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-Butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
56-55-3-----	Benzo(a)Anthracene	10	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0-----	Di-n-Octyl Phthalate	10	U
205-99-2-----	Benzo(b)Fluoranthene	10	U
207-08-9-----	Benzo(k)Fluoranthene	10	U
50-32-8-----	Benzo(a)Pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3-----	Dibenz(a,h)Anthracene	10	U
191-24-2-----	Benzo(g,h,i)Perylene	10	U
90-12-0-----	1-Methylnaphthalene	10	U
108-39-4-----	meta-Cresol	10	U

(1) - Cannot be separated from Diphenylamine
FORM I SV-2

1/87 Rev.

(1) - Cannot be separated from Diphenylamine

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLK01

Lab Name: EMSI Contract: 0452 0459
Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____
Matrix: (soil/water) WATER Lab Sample ID: _____
Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111088S03
Level: (low/med) _____ Date Received: _____
% Moisture: not dec. _____ dec. _____ Date Extracted: 10/31/88
Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/10/88
GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SBLK02

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111488S03

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ dec. _____ Date Extracted: 11/02/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/14/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

108-95-2-----	Phenol	10	U
111-44-4-----	bis(2-Chloroethyl) Ether	10	U
95-57-8-----	2-Chlorophenol	10	U
541-73-1-----	1,3-Dichlorobenzene	10	U
106-46-7-----	1,4-Dichlorobenzene	10	U
100-51-6-----	Benzyl Alcohol	10	U
95-50-1-----	1,2-Dichlorobenzene	10	U
95-48-7-----	2-Methylphenol	10	U
108-60-1-----	bis(2-Chloroisopropyl) Ether	10	U
106-44-5-----	4-Methylphenol	10	U
621-64-7-----	N-Nitroso-Di-n-Propylamine	10	U
67-72-1-----	Hexachloroethane	10	U
98-95-3-----	Nitrobenzene	10	U
78-59-1-----	Isophorone	10	U
88-75-5-----	2-Nitrophenol	10	U
105-67-9-----	2,4-Dimethylphenol	10	U
65-85-0-----	Benzoic Acid	50	U
111-91-1-----	bis(2-Chloroethoxy) Methane	10	U
120-83-2-----	2,4-Dichlorophenol	10	U
120-82-1-----	1,2,4-Trichlorobenzene	10	U
91-20-3-----	Naphthalene	10	U
106-47-8-----	4-Chloroaniline	10	U
87-68-3-----	Hexachlorobutadiene	10	U
59-50-7-----	4-Chloro-3-Methylphenol	10	U
91-57-6-----	2-Methylnaphthalene	10	U
77-47-4-----	Hexachlorocyclopentadiene	10	U
88-06-2-----	2,4,6-Trichlorophenol	10	U
95-95-4-----	2,4,5-Trichlorophenol	50	U
91-58-7-----	2-Chloronaphthalene	10	U
88-74-4-----	2-Nitroaniline	50	U
131-11-3-----	Dimethyl Phthalate	10	U
208-96-8-----	Acenaphthylene	10	U
606-20-2-----	2,6-Dinitrotoluene	10	U

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SBLK02

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111488S03

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ dec. _____ Date Extracted: 11/02/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/14/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

99-09-2-----3-Nitroaniline	50	U
83-32-9-----Acenaphthene	10	U
51-28-5-----2,4-Dinitrophenol	50	U
100-02-7-----4-Nitrophenol	50	U
132-64-9-----Dibenzofuran	10	U
121-14-2-----2,4-Dinitrotoluene	10	U
84-66-2-----Diethylphthalate	10	U
7005-72-3-----4-Chlorophenyl-phenylether	10	U
86-73-7-----Fluorene	10	U
100-01-6-----4-Nitroaniline	50	U
534-52-1-----4,6-Dinitro-2-Methylphenol	50	U
86-30-6-----N-Nitrosodiphenylamine (1)	10	U
101-55-3-----4-Bromophenyl-phenylether	10	U
118-74-1-----Hexachlorobenzene	10	U
87-86-5-----Pentachlorophenol	50	U
85-01-8-----Phenanthrene	10	U
120-12-7-----Anthracene	10	U
84-74-2-----Di-n-Butylphthalate	10	U
206-44-0-----Fluoranthene	10	U
129-00-0-----Pyrene	10	U
85-68-7-----Butylbenzylphthalate	10	U
91-94-1-----3,3'-Dichlorobenzidine	20	U
56-55-3-----Benzo(a)Anthracene	10	U
218-01-9-----Chrysene	10	U
117-81-7-----bis(2-Ethylhexyl)Phthalate	10	U
117-84-0-----Di-n-Octyl Phthalate	10	U
205-99-2-----Benzo(b)Fluoranthene	10	U
207-08-9-----Benzo(k)Fluoranthene	10	U
50-32-8-----Benzo(a)Pyrene	10	U
193-39-5-----Indeno(1,2,3-cd)Pyrene	10	U
53-70-3-----Dibenz(a,h)Anthracene	10	U
191-24-2-----Benzo(g,h,i)Perylene	10	U
90-12-0-----1-Methylnaphthalene	10	U
108-39-4-----meta-Cresol	10	U

(1) - Cannot be separated from Diphenylamine
FORM I SV-2

1/87 Rev.

(1) - Cannot be separated from Diphenylamine

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SBLK02

Lab Name: EMSI Contract: 0452 0459
 Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____
 Matrix: (soil/water) WATER Lab Sample ID: _____
 Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111488S03
 Level: (low/med) LOW Date Received: _____
 % Moisture: not dec. _____ dec. _____ Date Extracted: 11/02/88
 Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/14/88
 GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SBLK03

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111688S08

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ dec. _____ Date Extracted: 11/16/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/16/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

108-95-2-----	Phenol	10	U
111-44-4-----	bis(2-Chloroethyl) Ether	10	U
95-57-8-----	2-Chlorophenol	10	U
541-73-1-----	1,3-Dichlorobenzene	10	U
106-46-7-----	1,4-Dichlorobenzene	10	U
100-51-6-----	Benzyl Alcohol	10	U
95-50-1-----	1,2-Dichlorobenzene	10	U
95-48-7-----	2-Methylphenol	10	U
108-60-1-----	bis(2-Chloroisopropyl) Ether	10	U
106-44-5-----	4-Methylphenol	10	U
621-64-7-----	N-Nitroso-Di-n-Propylamine	10	U
67-72-1-----	Hexachloroethane	10	U
98-95-3-----	Nitrobenzene	10	U
78-59-1-----	Isophorone	10	U
88-75-5-----	2-Nitrophenol	10	U
105-67-9-----	2,4-Dimethylphenol	10	U
65-85-0-----	Benzoic Acid	50	U
111-91-1-----	bis(2-Chloroethoxy) Methane	10	U
120-83-2-----	2,4-Dichlorophenol	10	U
120-82-1-----	1,2,4-Trichlorobenzene	10	U
91-20-3-----	Naphthalene	10	U
106-47-8-----	4-Chloroaniline	10	U
87-68-3-----	Hexachlorobutadiene	10	U
59-50-7-----	4-Chloro-3-Methylphenol	10	U
91-57-6-----	2-Methylnaphthalene	10	U
77-47-4-----	Hexachlorocyclopentadiene	10	U
88-06-2-----	2,4,6-Trichlorophenol	10	U
95-95-4-----	2,4,5-Trichlorophenol	50	U
91-58-7-----	2-Chloronaphthalene	10	U
88-74-4-----	2-Nitroaniline	50	U
131-11-3-----	Dimethyl Phthalate	10	U
208-96-8-----	Acenaphthylene	10	U
606-20-2-----	2,6-Dinitrotoluene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK03

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111688S08

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ dec. _____ Date Extracted: 11/16/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/16/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

99-09-2-----	3-Nitroaniline	50	U
83-32-9-----	Acenaphthene	10	U
51-28-5-----	2,4-Dinitrophenol	50	U
100-02-7-----	4-Nitrophenol	50	U
132-64-9-----	Dibenzofuran	10	U
121-14-2-----	2,4-Dinitrotoluene	10	U
84-66-2-----	Diethylphthalate	10	U
7005-72-3-----	4-Chlorophenyl-phenylether	10	U
86-73-7-----	Fluorene	10	U
100-01-6-----	4-Nitroaniline	50	U
534-52-1-----	4,6-Dinitro-2-Methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (1)	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-Butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
56-55-3-----	Benzo(a)Anthracene	10	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0-----	Di-n-Octyl Phthalate	10	U
205-99-2-----	Benzo(b)Fluoranthene	10	U
207-08-9-----	Benzo(k)Fluoranthene	10	U
50-32-8-----	Benzo(a)Pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3-----	Dibenz(a,h)Anthracene	10	U
191-24-2-----	Benzo(g,h,i)Perylene	10	U
90-12-0-----	1-Methylnaphthalene	10	U
108-39-4-----	meta-Cresol	10	U

(1) - Cannot be separated from Diphenylamine
FORM I SV-2

1/87 Rev.

(1) - Cannot be separated from Diphenylamine

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SBLK03

Lab Name: EMSI Contract: 0452 0459

Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111688S08

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ dec. _____ Date Extracted: 11/16/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/16/88

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

Number TICs found: 1 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====
1. 000-00-1	UNKNOWN OXYGENATED	7.33	8.0	J

Lab Name: EMSI Contract: 0452 04
 Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____

	EPA SAMPLE NO.	S1 (NBZ) #	S2 (FBP) #	S3 (TPH) #	S4 (PHL) #	S5 (2FP) #	S6 (TBP) #	OTHER	TOT OUT
01	MW-1ART	51	51	49	63	56	54		0
02	MW-1LUS	49	47	78	62	37	45		0
03	MW-2ART	37	48	35	23	25	12		0
04	MW-2LUS	54	61	51	22	16 *	16		1
05	MW-3ART	50	51	46	9 *	5 *	6 *		3
06	MW-3ARTRE	50	87	100	D	7 *	24		1
07	MW-3LUS	50	53	59	44	40	52		0
08	MW-4ART	37	44	64	44	52	19		0
09	MW-4LUS	66	75	93	22	38	48		0
10	MW-5ART	36	46	58	38	42	35		0
11	MW-5LUS	37	51	81	89	86	59		0
12	MW-6ART	55	47	57	46	57	46		0
13	MW-6LUS	52	44	74	79	71	60		0
14	MW-6LUSMS	42	53	81	77	90	69		0
15	MW-6LUSMSD	46	58	83	68	77	67		0
16	SBLK01	70	52	78	62	74	41		0
17	SBLK02	51	53	67	64	56	43		0
18	SBLK03	42	64	97	49	86	64		0

QC LIMITS

S1 (NBZ) = Nitrobenzene-d5 (35-114)
 S2 (FBP) = 2-Fluorobiphenyl (43-116)
 S3 (TPH) = Terphenyl (33-141)
 S4 (PHL) = Phenol-d5 (10-94)
 S5 (2FP) = 2-Fluorophenol (21-100)
 S6 (TBP) = 2,4,6-Tribromophenol (10-123)

Column to be used to flag recovery values
 * Values outside of contract required QC limits
 D Surrogates diluted out

Lab Name: EMSI Contract: 0452 0459
 Lab Code: EMSI Case No.: ATK-1 SAS No.: _____ SDG No.: _____
 Matrix Spike - EPA Sample No.: MW-6LUS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC LIMITS REC.
Phenol	200	0	139	70	12- 89
2-Chlorophenol	200	0	141	71	27-123
1,4-Dichlorobenzene	100	0	63.2	63	36 97
N-Nitroso-di-n-prop. (1)	100	0	66.4	66	41 116
1,2,4-Trichlorobenzene	100	0	62.2	62	39 98
4-Chloro-3-methylphenol	200	0	149	75	23 97
Acenaphthene	100	0	66.8	67	46-118
4-Nitrophenol	200	0	108	54	10- 80
2,4-Dinitrotoluene	100	0	64.2	64	24- 96
Pentachlorophenol	200	0	76.6	38	9-103
Pyrene	100	0	75.4	75	26-127

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD REC.
Phenol	200	122	61	14	42 12- 89
2-Chlorophenol	200	130	65	9	40 27-123
1,4-Dichlorobenzene	100	63.8	64	-2	28 36 97
N-Nitroso-di-n-prop. (1)	100	72.2	72	-9	38 41 116
1,2,4-Trichlorobenzene	100	68.2	68	-9	28 39 98
4-Chloro-3-methylphenol	200	150	75	0	42 23 97
Acenaphthene	100	73.6	74	-10	31 46-118
4-Nitrophenol	200	97.8	49	10	50 10- 80
2,4-Dinitrotoluene	100	68.0	68	-6	38 24- 96
Pentachlorophenol	200	73.2	37	3	50 9-103
Pyrene	100	79.2	79	-5	31 26-127

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
 * Values outside of QC limits

RPD: 0 out of 11 outside limits
 Spike Recovery: 0 out of 22 outside limits

COMMENTS: 51407-0452 AT KEARNEY 880017 (H2O)
 1.5 MIN @ 35C, THEN 10C/MIN TO 300C (FINN 4500B)

1A
VOLATILE ORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK02

Lab Name: EMSI Contract: 0465 0466

Lab Code: EMSI Case No.: ATK-2 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: _____

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110888C07

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/08/88

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	5	U
67-64-1-----	Acetone	10	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	10	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
108-05-4-----	Vinyl Acetate	10	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	Trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	10	U
591-78-6-----	2-Hexanone	10	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	5	U
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Total Xylenes	5	U

1E
VOLATILE ORGANIC ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK02

Lab Name: EMSI Contract: 0465 0466
Lab Code: EMSI Case No.: ATK-2 SAS No.: _____ SDG No.: _____
Matrix: (soil/water) WATER Lab Sample ID: _____
Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110888C07
Level: (low/med) LOW Date Received: _____
% Moisture: not dec. _____ Date Analyzed: 11/08/88
Column (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====