3R - 53

REPORTS

DATE:
AUG. 1994

9-7-94 * ROGER ANDERSON - BILL IN ON 8TH
↳ BUREAU CHIEF

BILL OLSON 1-505-827-5885

9-12-94 VERBAL OK FROM BILL TO DISCONTINUE MONITORING FROM SELECTED WELLS. HE WILL REVIEW WHEN HE GETS TIME.

Roger Anderson
Bill Olson

BLAGG ENGINEERING, INC.
P.O. Box 87, Bloomfield, New Mexico 87413
Phone:(505)632-1199 Fax:(505)632-3903

August 2, 1994

14 TOTAL SITES DROPPED

Mr. William C. Olson
Hydrogeologist
Environmental Bureau
New Mexico Oil Conservation Division
Post Office Box 2088
Santa Fe, New Mexico 87504

RE: Amoco Groundwater Sampling
Various Well Locations
San Juan County, New Mexico

Dear Mr. Olson:

On July 1, 1994 Blagg Engineering submitted to you, on behalf of Mr. Buddy Shaw, Amoco Production Company, a spreadsheet containing groundwater sampling results for numerous Amoco well locations in San Juan County. On that list of well locations, the decision was made to discontinue sampling at five (5) locations due to groundwater sampling results never exceeding New Mexico Water Quality Control Commission (NMWQCC) standards:

Blanco A001	Decker LS 001A	Sullivan GC 1
Marcotte GC 1	Pritchard 005	

An additional nine (9) locations have shown laboratory results below NMWQCC standards for at least four consecutive quarters. We respectfully request permission to discontinue sampling at those locations also. This includes the following well locations:

Elliott Annie L B 5E	Florance 124	Florance 126
GCU 173	Riddle F LS 003A	SJ 28-7 Unit 183
Totah Vista GC 1	Totah Vista GC 1E	Valdez A 001

If you have any questions please contact Blagg Engineering at 632-1199.

L Tony Valdez

Respectfully submitted,
Blagg Engineering, Inc.

Robert E. O'Neill

Robert E. O'Neill, M.S.
Civil Engineering, Environmental

xc: Denny Foust, NMOCD Aztec Office
Buddy Shaw, Amoco Production Company - Farmington

REO/reo

AUG94-WO.LET

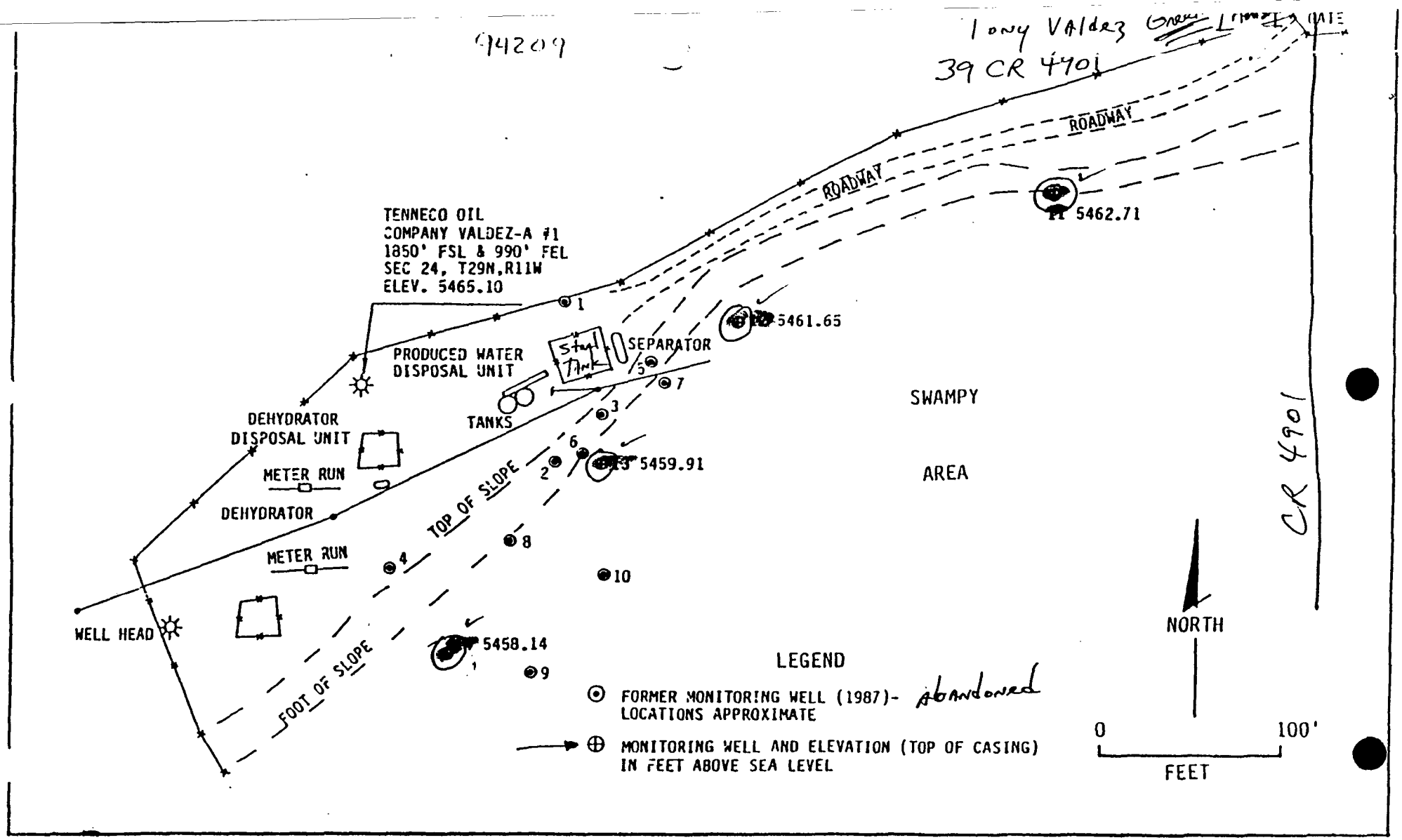

FIGURE 2-2

MONITOR WELL LOCATIONS AT VALDEZ A-1 WELL SITE, SAN JUAN COUNTY, NEW MEXICO

RES

BLAGG ENGINEERING INC.

MONITOR WELL QUARTERLY MONITORING DATA

DATE: 6-23-94 PROJECT NO: _____

CLIENT: Amoco CHAIN-OF-CUSTODY NO: 1804

LOCATION: VALDEZ A 001

PROJECT MANAGER: RES SAMPLER: RES

SWAMPY

MONITOR WELL DATA

WELL #	OVM (PPM)	pH	COND. (µMHO)	TEMP (°F)	D.T.W. (FT.)	OLD T.D. (FT.)	BAILED (GAL.)	PRODUCT (IN.)
MW-11	–	7.4	500	57.1	0.60	8.06	1.5	–
		CLOUDY -						
MW-12	–	7.2	800	60.8	2.93	8.12	1.0	–
		CLOUDY -	SLITY -	SLIGHT	SWAMP	ODOR		
MW-13	–	7.2	900	63.7	3.76	8.12	1.0	–
		CLOUDY	- SLITY -	SLIGHT	SWAMP	ODOR -	POOR RECOVERY	
MW-14	–	7.2	700	66.7	4.59	8.12	0.8	–
		MUDDY -	POOR	RECOVERY -		NO ODOR		

Notes: DTW = Depth to water
TD = Total depth
Bailed = Volume of water bailed from well prior to sampling.
Ideally a minimum of 3 well volumes:
1.25" well = 0.76 quarts per foot of water.
2" well = 0.49 gallons per foot of water.
4" well = 1.95 gallons per foot of water.
Note well diameter if not standard 2".

ON SITE TECHNOLOGIES, LTD.

AROMATIC VOLATILE ORGANICS

Attn:	*R. E. O'Neill*	Date:	6/25/94
Company:	*Blagg Engineering Inc.*	*Lab ID:*	*1804*
Address:	*P.O. Box 87*	*Sample ID:*	*1741*
City, State:	*Bloomfield, NM 87413*	*Job No.*	*2-1000*

Project Name:	***Valdez A #1***				
Project Location:	***MW - 11***				
Sampled by:	REO	Date:	6/23/94	Time:	14:40
Analyzed by:	DLA	Date:	6/25/94		
Sample Matrix:	*Liquid*				

Aromatic Volatile Organics

Component	****Measured Concentration ug/L***
Benzene	*ND*
Toluene	*1.7*
Ethylbenzene	*ND*
m,p-Xylene	*ND*
o-Xylene	*ND*
TOTAL	*1.7 ug/L*

ND - Not Detectable
*** - Method Detection Limit, 2 ug/L*

Method *- SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography*

Approved by: JA
Date: 6/27/94

FAX: (505) 327-1496 ▪ 24 HR. – (505) 327-7105 ▪ OFF.: (505) 325-8786
3005 NORTHRIDGE DRIVE ▪ SUITE F ▪ P. O. BOX 2606 ▪ FARMINGTON, NEW MEXICO 87499

ON SITE TECHNOLOGIES, LTD.

AROMATIC VOLATILE ORGANICS

Attn:	*R. E. O'Neill*	Date:	6/25/94
Company:	*Blagg Engineering Inc.*	*Lab ID:*	*1804*
Address:	*P.O. Box 87*	*Sample ID:*	*1742*
City, State:	*Bloomfield, NM 87413*	*Job No.*	*2-1000*

Project Name:	***Valdez A #1***				
Project Location:	***MW - 12***				
Sampled by:	REO	Date:	6/23/94	Time:	14:15
Analyzed by:	DLA	Date:	6/25/94		
Sample Matrix:	*Liquid*				

Aromatic Volatile Organics

Component	***Measured Concentration ug/L
Benzene	*ND*
Toluene	*ND*
Ethylbenzene	*ND*
m,p-Xylene	*ND*
o-Xylene	*ND*
TOTAL	*0.0 ug/L*

ND - Not Detectable
*** - Method Detection Limit, 2 ug/L*

Method *- SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography*

Approved by: DLA
Date: 6/27/94

FAX: (505) 327-1496 ▪ 24 HR. – (505) 327-7105 ▪ OFF.: (505) 325-8786
3005 NORTHRIDGE DRIVE ▪ SUITE F ▪ P. O. BOX 2606 ▪ FARMINGTON, NEW MEXICO 87499

ON SITE TECHNOLOGIES, LTD.

AROMATIC VOLATILE ORGANICS

Attn:	*R. E. O'Neill*	Date:	6/25/94
Company:	*Blagg Engineering Inc.*	*Lab ID:*	*1804*
Address:	*P.O. Box 87*	*Sample ID:*	*1743*
City, State:	*Bloomfield, NM 87413*	*Job No.*	*2-1000*

Project Name:	***Valdez A #1***				
Project Location:	***MW - 13***				
Sampled by:	REO	Date:	6/23/94	Time:	13:55
Analyzed by:	DLA	Date:	6/25/94		
Sample Matrix:	*Liquid*				

Aromatic Volatile Organics

Component	****Measured Concentration ug/L***
Benzene	*ND*
Toluene	*ND*
Ethylbenzene	*ND*
m,p-Xylene	*ND*
o-Xylene	*ND*
TOTAL	*0.0 ug/L*

ND - Not Detectable
*** - Method Detection Limit, 2 ug/L*

Method *- SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography*

Approved by:
Date: 6/27/94

FAX: (505) 327-1496 ▪ 24 HR. – (505) 327-7105 ▪ OFF.: (505) 325-8786
3005 NORTHRIDGE DRIVE ▪ SUITE F ▪ P. O. BOX 2606 ▪ FARMINGTON, NEW MEXICO 87499

ON SITE TECHNOLOGIES, LTD.

AROMATIC VOLATILE ORGANICS

Attn:	*R. E. O'Neill*	Date:	6/25/94
Company:	*Blagg Engineering Inc.*	*Lab ID:*	*1804*
Address:	*P.O. Box 87*	*Sample ID:*	*1744*
City, State:	*Bloomfield, NM 87413*	*Job No.*	*2-1000*

Project Name:	***Valdez A #1***				
Project Location:	***MW - 14***				
Sampled by:	REO	Date:	6/23/94	Time:	15:00
Analyzed by:	DLA	Date:	6/25/94		
Sample Matrix:	*Liquid*				

Aromatic Volatile Organics

Component	****Measured Concentration ug/L***
Benzene	*ND*
Toluene	*ND*
Ethylbenzene	*ND*
m,p-Xylene	*ND*
o-Xylene	*ND*
TOTAL	*0.0 ug/L*

ND - Not Detectable
*** - Method Detection Limit, 2 ug/L*

Method *- SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography*

Approved by: Da Ck
Date: 6/27/94

FAX: (505) 327-1496 ▪ 24 HR. – (505) 327-7105 ▪ OFF.: (505) 325-8786
3005 NORTHRIDGE DRIVE ▪ SUITE F ▪ P. O. BOX 2606 ▪ FARMINGTON, NEW MEXICO 87499

ON SITE TECHNOLOGIES LIMITED

657 W. Maple ▪ P. O. Box 2606 ▪ Farmington, NM 87499
LAB: (505) 325-5667 ▪ FAX: (505) 325-6256

CHAIN OF CUSTODY RECORD

No 1804

Date: 6-23-94

Page 1 of 1

Purchase Order No.:	Reference No.:		
SEND INVOICE TO: Name		REPORT RESULTS TO: Name R. E. O'NEILL	Title
Company BLAGG ENGINEERING, INC.	Dept.	Company SAME	
Address P.O. BOX 87		Mailing Address	
City, State, Zip BLOOMFIELD, N.M. 87413		City, State, Zip	
		Telephone No. 632-1199	Telefax No. 632-3903

Special Instructions:
VALDEZ A #1

Sampler: R. E. O'NEILL

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE/ GRAB	PRESERVATIVES	Number of Containers	BTEX								Remarks (matrix)
MW-11 6/23	1440		$HgCl_2$/ICE	2	✓		1741-1804						WATER
MW-12 "	1415		"	2	✓		1742-1804						"
MW-13 "	1355		"	2	✓		1743-1804						"
MW-14 "	1500		"	2	✓		1744-1804						"

Relinquished by: R. E. O'Neill	Date/Time 6/23 1527	Received by: Tom Vee	Date/Time 6/24/94 1527
Relinquished by: Tom Vee	Date/Time 6/24/94 1552	Received by: Lisa E. Pojman	Date/Time 6/24/94 1552
Relinquished by:	Date/Time	Received by:	Date/Time

Method of Shipment:

Authorized by: _____ Date _____
(Client Signature Must Accompany Request)

Rush	5 Working Days	10 Working Days	Sampling Location:

Distribution: White – On Site Yellow – LAB Pink – Sampler Goldenrod – Client

ENVIROTECH INC.

MONITOR WELL QUARTERLY MONITORING DATA

DATE: 3-9-94 PROJECT NO: 94209

CLIENT: Amoco #92140 CHAIN-OF-CUSTODY NO: 3412

LOCATION: VALDEZ A 001

PROJECT MANAGER: REO SAMPLER: CLM

4 BAILERS

MONITOR WELL DATA

WELL #	OVM (PPM)	pH	COND. (µMHO)	TEMP (°C)	D.T.W. (FT.)	OLD T.D. (FT.)	BAILED (GAL.)	PRODUCT (IN.)
MW #11		7.2	500	10°	1.65	8.06	1.5	0
			No Odor, Cloudy					
MW #12		7.0	800	5°	3.05	8.12	1.0	0
		No odor, cloudy reddish color						
MW #13		6.7	1000	3°	3.77	8.12	1.0	0
			Lotion like odor, Clear w/ Black Precipitate					
MW #14		6.8	1000	4°	4.66	8.12	1.0	0
			no odor, Cloudy					

Notes: DTW = Depth to water
TD = Total depth
Bailed = Volume of water bailed from well prior to sampling.
Ideally a minimum of 3 well volumes:
1.25" well = 0.76 quarts per foot of water.
2" well = 0.49 gallons per foot of water.
4" well = 1.95 gallons per foot of water.
Note well diameter if not standard 2".

3 hrs

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW #11	Date Reported:	03-11-94
Laboratory Number:	7016	Date Sampled:	03-10-94
Sample Matrix:	Water	Date Received:	03-10-94
Preservative:	HgCl and Cool	Date Analyzed:	03-11-94
Condition:	Cool and Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.2
Toluene	1.1	0.3
Ethylbenzene	0.3	0.2
p,m-Xylene	1.3	0.2
o-Xylene	0.4	0.2

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	97 %
Bromofluorobenzene	100 %

Method: Method 5030A, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: Valdez A 001 94209

Analyst

Review

ENVIROTECH LABS

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PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW #12	Date Reported:	03-11-94
Laboratory Number:	7017	Date Sampled:	03-10-94
Sample Matrix:	Water	Date Received:	03-10-94
Preservative:	HgCl and Cool	Date Analyzed:	03-11-94
Condition:	Cool and Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.2
Toluene	0.5	0.3
Ethylbenzene	0.5	0.2
p,m-Xylene	1.3	0.2
o-Xylene	ND	0.2

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	97 %
Bromofluorobenzene	99 %

Method: Method 5030A, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: Valdez A 001 94209

Analyst

Review

ENVIROTECH LABS
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PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW #13	Date Reported:	03-11-94
Laboratory Number:	7018	Date Sampled:	03-10-94
Sample Matrix:	Water	Date Received:	03-10-94
Preservative:	HgCl and Cool	Date Analyzed:	03-11-94
Condition:	Cool and Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.2
Toluene	1.3	0.3
Ethylbenzene	ND	0.2
p,m-Xylene	ND	0.2
o-Xylene	ND	0.2

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	96 %
Bromofluorobenzene	100 %

Method: Method 5030A, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: Valdez A 001 94209

Analyst

Review

ENVIROTECH LABS

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PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW #14	Date Reported:	03-11-94
Laboratory Number:	7019	Date Sampled:	03-10-94
Sample Matrix:	Water	Date Received:	03-10-94
Preservative:	HgCl and Cool	Date Analyzed:	03-11-94
Condition:	Cool and Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.2
Toluene	1.0	0.3
Ethylbenzene	ND	0.2
p,m-Xylene	0.9	0.2
o-Xylene	0.4	0.2

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	97 %
Bromofluorobenzene	98 %

Method: Method 5030A, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: Valdez A 001 94209

Analyst

Review

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANALYSIS/PARAMETERS # 94209
Amoco # 92140	Valdez A 001	
Sampler: (Signature) Charles J Mc	Chain of Custody Tape No.	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX						Remarks
MW # 11	3-10-94	950	7016	WATER	2	✓						
MW # 12	3-10-94	930	2017	WATER	2	✓						
MW # 13	3-10-94	855	7018	WATER	2	✓						
MW #14	3-10-94	835	7019	WATER	2	✓						

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Charles J Mc	3-10-94	1425	Jean L. Quenon	3-10-94	1422
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.
5796 U.S. Highway 64-3014
Farmington, New Mexico 87401
(505) 632-0615

ENVIROTECH INC.

MONITOR WELL QUARTERLY MONITORING DATA

DATE: 9-9-93 PROJECT NO: 92140/94209

CLIENT: Amoco

LOCATION: Valdez A-1

PROJECT MANAGER: REO (RY) CHAIN-OF-CUSTODY NO: 2993

MONITOR WELL DATA

WELL #	OVM (PPM)	pH	COND. (µMHO)	TEMP (°C)	D.T.W. (FT.)	T.D. (FT.)	BAILED (GAL.)	PRODUCT (IN.)
MW#11	—	7.2	430	18	0'-1"	8.06	~~2~~ 2 bailed dry	NONE
			NO HC ODOR - NO FREE PRODUCT					
MW#12	—	7.7	500	18	2.26'	8.12	1-bailed dry	None
			NO HC ODOR OR FREE PRODUCT					
MW#13	—	7.4	570	20	3.76	8.12	1-bailed dry	None
		~~7.4~~	NO HC	ODOR OR FREE PRODUCT				
MW#14	—	7.5	450	18	~~3.46~~ 4.46	8.12	1-bailed dry	None
			NO HC ODOR OR FREE PRODUCT					

Notes: DTW = Depth to water
TD = Total depth
Bailed = Volume of water bailed from well prior to sampling.
A minimum of 3 well volumes.
(2") well = 0.49 gallons per foot of water.
4" well = 1.95 gallons per foot of water.
Note well diameter if not standard 2".

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PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW # 11	Date Reported:	09-13-93
Laboratory Number:	6065	Date Sampled:	09-09-93
Sample Matrix:	Water	Date Received:	09-09-93
Preservative:	HgCl & Cool	Date Analyzed:	09-13-93
Condition:	Cool & Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.2
Toluene	ND	0.4
Ethylbenzene	ND	0.4
p,m-Xylene	0.4	0.3
o-Xylene	ND	0.3

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	105 %
Bromofluorobenzene	101 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: Valdez A-1 94209

Analyst

Review

2993

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	94209 ANALYSIS/PARAMETERS
Amoco 92140	VALDEZ A-1	
Sampler: (Signature) Robert M Young	Chain of Custody Tape No.	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX						Remarks
MW #11	9-9-93	1045	6065	WATER	2	✓						
MW #12	"	1100	6066	"	2	✓						
MW #13	"	1130	6067	"	2	✓						
MW #14	"	1200	6068	"	~~4~~ 2	✓						

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Robert M Young	9-9-93	1230	[illegible]	9-9-93	1300
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.
5796 U.S. Highway 64-3014
Farmington, New Mexico 87401
(505) 632-0615

san juan repro Form 578-81

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW # 11	Date Reported:	03-25-93
Laboratory Number:	4853	Date Sampled:	03-24-93
Sample Matrix:	Water	Date Received:	03-24-93
Preservative:	HgCl & Cool	Date Analyzed:	03-24-93
Condition:	Cool & Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.3
Toluene	ND	0.8
Ethylbenzene	ND	0.2
p,m-Xylene	ND	0.6
o-Xylene	ND	0.3

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	92 %
Bromofluorobenzene	98 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: Valdez A-1 Monitor Wells 94209

Analyst

Review

ENVIROTECH LABS
5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

MODIFIED EPA METHOD 8015
NONHALOGENATED VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	Monitor Well #11	Date Reported:	03-25-93
Laboratory Number:	4853	Date Sampled:	03-24-93
Sample Matrix:	Water	Date Received:	03-24-93
Preservative:	Cool	Date Analyzed:	03-25-93
Condition:	Cool and Intact	Analysis Requested:	TPH

Parameter	Concentration (mg/L)	Det. Limit (mg/L)
Gasoline Range (C5 - C10)	ND	0.1
Diesel Range (C10 - C28)	ND	0.2
C28 - C44 Range	ND	0.1
Total Petroleum Hydrocarbons	ND	0.2

Method: Method 8015, Nonhalogenated Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: Valdez A-1 Monitor Wells 94209

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

MODIFIED EPA METHOD 8015
NONHALOGENATED VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	Monitor Well #12	Date Reported:	03-25-93
Laboratory Number:	4854	Date Sampled:	03-24-93
Sample Matrix:	Water	Date Received:	03-24-93
Preservative:	Cool	Date Analyzed:	03-25-93
Condition:	Cool and Intact	Analysis Requested:	TPH

Parameter	Concentration (mg/L)	Det. Limit (mg/L)
Gasoline Range (C5 - C10)	ND	0.1
Diesel Range (C10 - C28)	ND	0.2
C28 - C44 Range	ND	0.1
Total Petroleum Hydrocarbons	ND	0.2

Method: Method 8015, Nonhalogenated Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: Valdez A-1 Monitor Wells 94209

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW # 13	Date Reported:	03-25-93
Laboratory Number:	4852	Date Sampled:	03-24-93
Sample Matrix:	Water	Date Received:	03-24-93
Preservative:	HgCl & Cool	Date Analyzed:	03-24-93
Condition:	Cool & Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.3
Toluene	ND	0.8
Ethylbenzene	ND	0.2
p,m-Xylene	ND	0.6
o-Xylene	ND	0.3

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	92 %
Bromofluorobenzene	104 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: Valdez A-1 Monitor Wells 94209

Analyst

Review

ENVIROTECH LABS
5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

MODIFIED EPA METHOD 8015
NONHALOGENATED VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	Monitor Well #13	Date Reported:	03-25-93
Laboratory Number:	4852	Date Sampled:	03-24-93
Sample Matrix:	Water	Date Received:	03-24-93
Preservative:	Cool	Date Analyzed:	03-25-93
Condition:	Cool and Intact	Analysis Requested:	TPH

Parameter	Concentration (mg/L)	Det. Limit (mg/L)
Gasoline Range (C5 - C10)	ND	0.1
Diesel Range (C10 - C28)	ND	0.2
C28 - C44 Range	ND	0.1
Total Petroleum Hydrocarbons	ND	0.2

Method: Method 8015, Nonhalogenated Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: Valdez A-1 Monitor Wells 94209

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW # 14	Date Reported:	03-25-93
Laboratory Number:	4851	Date Sampled:	03-24-93
Sample Matrix:	Water	Date Received:	03-24-93
Preservative:	HgCl & Cool	Date Analyzed:	03-24-93
Condition:	Cool & Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.3
Toluene	ND	0.8
Ethylbenzene	0.3	0.2
p,m-Xylene	0.9	0.6
o-Xylene	0.5	0.3

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	96 %
Bromofluorobenzene	100 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: Valdez A-1 Monitor Wells 94209

Analyst

Review

ENVIROTECH LABS
5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

MODIFIED EPA METHOD 8015
NONHALOGENATED VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	Monitor Well #14	Date Reported:	03-25-93
Laboratory Number:	4851	Date Sampled:	03-24-93
Sample Matrix:	Water	Date Received:	03-24-93
Preservative:	Cool	Date Analyzed:	03-25-92
Condition:	Cool and Intact	Analysis Requested:	TPH

Parameter	Concentration (mg/L)	Det. Limit (mg/L)
Gasoline Range (C5 - C10)	ND	0.1
Diesel Range (C10 - C28)	ND	0.2
C28 - C44 Range	ND	0.1
Total Petroleum Hydrocarbons	ND	0.2

Method: Method 8015, Nonhalogenated Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: Valdez A-1 Monitor Wells 94209

Analyst

Review

CHAIN OF CUSTODY RECORD

94209

Client/Project Name	Project Location	ANALYSIS/PARAMETERS
Amoco 92140	Monitor Wells Valdez A-1	
Sampler: (Signature) J. Weakee	Chain of Custody Tape No.	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX 8015 →						Remarks
Monitor Well #14	3-24-93	1320	4851	WATER	2	✓	✓					
Monitor Well #13	3-24-93	1330	4852	WATER	2	✓	✓					
Monitor Well #11	3-24-93	1400	4853	WATER	2	✓	✓					
Monitor Well #12	3-24-93	1340	4854	WATER	2	✓	✓					

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
J. Weakee	3-24-92	1430	Linda Ruder	3-24-93	1430
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.
5796 U.S. Highway 64-3014
Farmington, New Mexico 87401
(505) 632-0615

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REPORTS

DATE:
SEPT. 1988

REPORT ON GROUND-WATER MONITORING AND ANALYTICAL RESULTS AT THE TENNECO VALDEZ A-1 WELL SITE, SAN JUAN COUNTY, NEW MEXICO

September 14, 1988

Prepared for:

Mr. Martin Buys
Environmental Coordinator
TENNECO OIL COMPANY
6162 South Willow Drive
Englewood, CO 80111

Prepared by:

GEOSCIENCE CONSULTANTS, LTD.

HEADQUARTERS
500 Copper Avenue, NW
Suite 200
Albuquerque, New Mexico 87102
(505) 842-0001
FAX (505) 842-0595

WEST COAST REGIONAL OFFICE
1400 Quail Street
Suite 140
Newport Beach, CA 92660
(714) 724-0536
FAX (714) 724-0538

EASTERN REGIONAL OFFICE
1109 Spring Street
Suite 706
Silver Spring, Maryland 20910
(301) 587-2088
FAX (301) 587-3625

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1.0 EXECUTIVE SUMMARY

Geoscience Consultants, Ltd. (GCL) has examined water-quality data and sampling history pertaining to the Tenneco Valdez A-1 natural gas well site in San Juan County, New Mexico. Hydrocarbon constituents, including benzene, toluene, ethylbenzene and xylenes (BTEX) have been identified, in low concentrations, in ground and surface water immediately downgradient from the site.

Ground-water concentrations of BTEX components in excess of 100 micrograms per liter (ug/l) were found in samples from some temporary monitor wells installed during 1987. However, BTEX has not been found in such high concentrations in samples from permanent monitor wells installed in 1987 (and sampled three times since then). All constituents were below New Mexico Water Quality Control Commission (NMWQCC) drinking water standards in all four permanent monitor wells when they were sampled in November 1987, and also in June 1988.

2.0 SITE BACKGROUND

The Valdez A-1 site of Tenneco Oil Company (Tenneco) is located in the southeast quarter of Section 24, Township 29 N., Range 11 W., in San Juan County, New Mexico (Figure 2-1). It includes a natural gas production well, oil and water separator and dehydrator units, oil storage tanks, and associated pipelines and other facilities.

2.1 HYDROGEOLOGIC SETTING

The Valdez A-1 site is situated on the northwest bank of a broad topographic depression through which the intermittent stream draining Potter Canyon enters the San Juan River (Figure 2-1). The site is bordered on the north by agricultural fields and on the southeast by a grassy marsh in which there is commonly standing water as much as a foot deep. The elevation of the marsh is approximately 6 feet below that of the pad at the well site. Ground-water flow beneath the site is southward toward the marsh, based on data from monitor wells and topographic considerations.

The shallowest lithologic unit at the Valdez A-1 site is alluvium of the San Juan River valley, which is at least 40 feet deep beneath the site. The alluvium is underlain by mudstones, shales, and sandstones of the Nacimiento Formation of Paleocene age (New Mexico State Highway Dept., n.d.; Stone and others, 1983).

Irrigation water draining from the agricultural fields north of the Valdez site flows southward in accordance with the topographic gradient, toward the marsh and the San Juan River. Surface water in the marsh appears to be hydrologically connected with shallow ground water in the lower Potter Canyon drainage and in the San Juan River floodplain. Ground water flowing beneath the well site may come to the surface in the marsh, or may continue southward or southwestward in the subsurface toward the San Juan River.

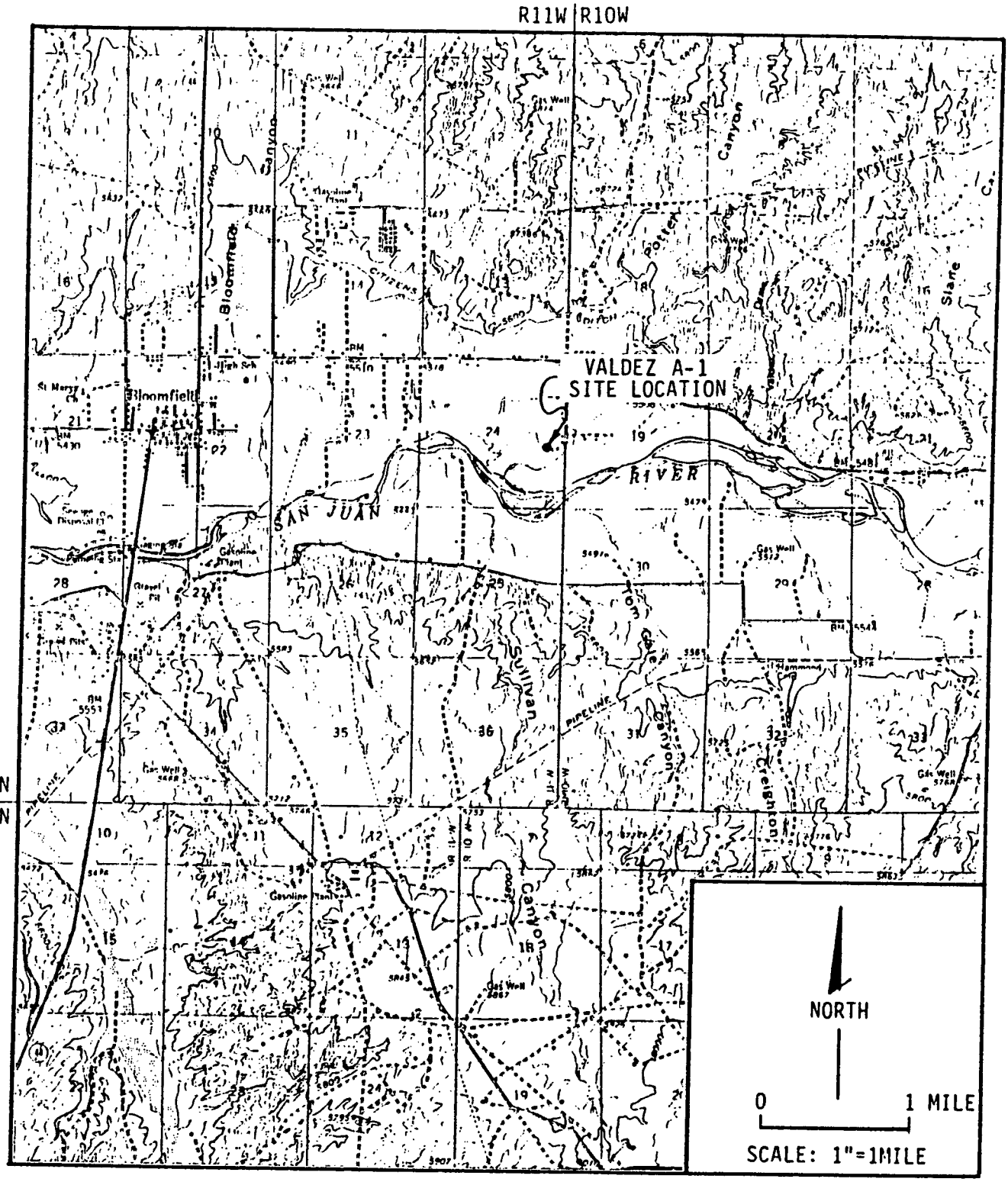

FIGURE 2-1

LOCATION MAP OF THE TENNECO VALDEZ A-1 SITE

(BASE FROM USGS 15 MINUTE BLOOMFIELD QUADRANGLE)

2.2 RECENT SITE HISTORY

In late 1986, the New Mexico Oil Conservation Division (OCD) received a complaint of oil spills at the Valdez A-1 site. Limited sampling by the OCD in November 1986 indicated the presence of xylenes in water samples drawn from a shallow borehole hand-augered at the site. Tenneco was advised of the OCD findings and initiated a site investigation during early 1987. The Tenneco investigation has included limited sampling of 10 shallow, temporary monitor wells installed during early 1987, and repeated sampling of 4 permanent monitor wells which have been in place since August 1987 (Figure 2-2). Geoscience Consultants, Ltd. (GCL) personnel were present during sampling of the permanent monitor wells on June 28, 1988 and have reviewed the results of previous sampling and analyses from the site.

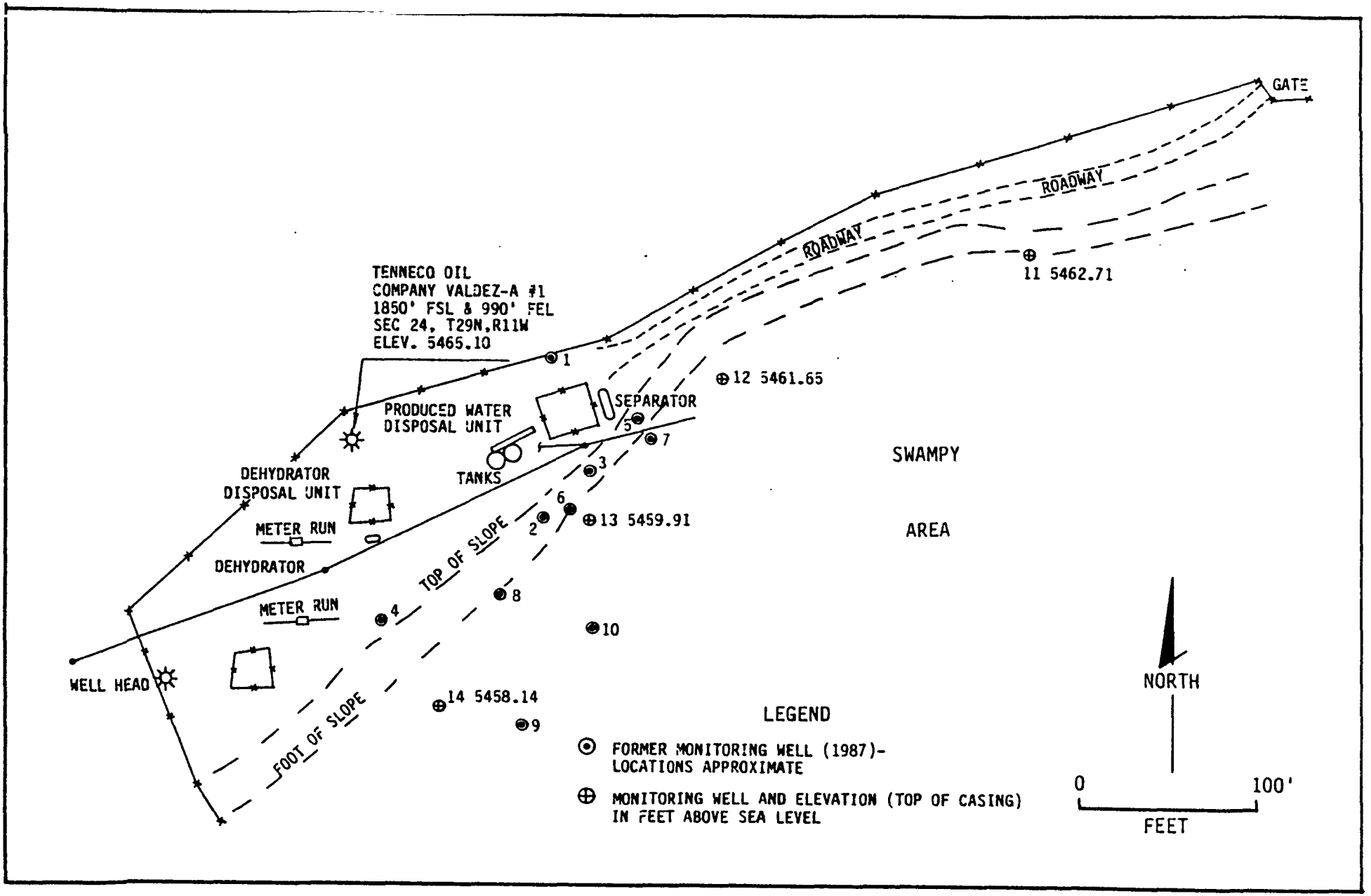

FIGURE 2-2

MONITOR WELL LOCATIONS AT VALDEZ A-1 WELL SITE, SAN JUAN COUNTY, NEW MEXICO

3.0 SAMPLING AND ANALYSES

Sampling and analyses at the Valdez A-1 site have been performed for benzene, toluene, ethylbenzene and xylenes (BTEX) in all wells, and for BTEX, ground-water quality parameters and selected metals in the permanent wells.

3.1 SAMPLING HISTORY

Monitor wells 1 through 10 at the Valdez A-1 site (Figure 2-2) were temporary installations which were sampled once for BTEX and then removed. Wells 11 through 14 are permanent installations with polyvinyl chloride (PVC) casing. Wells 11 through 14 have been sampled three times for BTEX, and once for other parameters.

3.2 ANALYTICAL RESULTS

The results of BTEX analyses on samples from temporary wells 1 through 10 are shown in Table 3-1. During analysis of the samples, which were taken in April and May 1987, various BTEX constituents were identified in water from wells 2, 3, 5, 6, 7 and 8. All of these wells were located within about 100 feet downgradient from the separator and the produced water disposal unit (Figure 2-2). No BTEX constituents were identified in water from the upgradient well (1) or the wells located farther west and south of the separator area (4, 9 and 10).

Analysis of samples from the permanent monitor wells during 1987 and 1988 identified the local presence of toluene, ethylbenzene and xylenes, at concentrations less than 10 micrograms per liter (ug/l) for each constituent, in wells 12, 13 and 14 (Table 3-2). Toluene was also detected in surface water from the swampy area near the wells (Table 3-2). No benzene has been detected in water from the permanent monitor wells or in the surface water. The data from sampling events on August 4, 1987 and June 28, 1988 show BTEX constituents in the monitor wells, while the results of the intermediate sampling event on November 10, 1987 showed no BTEX detected in the wells, but 3.9 ug/l of toluene in surface water from the swampy area.

TABLE 3-1

ANALYTICAL RESULTS FOR ORGANIC CONSTITUENTS
VALDEZ A-1 SITE
TEMPORARY MONITOR WELLS

WELL #	BENZENE 4/02/87	TOLUENE 4/02/87	ETHYLBENZENE 4/02/87	TOTAL XYLENES 4/02/87
# 1	ND	ND	ND	ND
# 2	87	ND	62	750
# 3	600	ND	82	1000
# 4	ND	ND	ND	ND
# 5	ND	ND	110	1260
# 6	ND	ND	ND	570

	5/05/87	5/05/87	5/05/87	5/05/87
# 7	ND	ND	ND	600
# 8	380	1100	ND	3400
# 9	ND	ND	ND	ND
# 10	ND	ND	ND	ND

ND = NOT DETECTED Detection limit is 0.5 micrograms per liter for all constituents listed.

ALL ANALYSES ARE REPORTED IN MICROGRAMS/LITER

TABLE 3-2

ANALYTICAL RESULTS FOR ORGANIC CONSTITUENTS
VALDEZ A-1 SITE
PERMANENT MONITOR WELLS AND SURFACE WATER

WELL #	BENZENE 8/04/87	TOLUENE 8/04/87	ETHYLBENZENE 8/04/87	TOTAL XYLENES 8/04/87
# 11	ND	ND	ND	ND
# 12	ND	0.58	0.56	ND
# 13	ND	8.1	ND	ND
# 14	ND	0.61	ND	0.96
SURFACE WATER	ND	0.54	ND	ND

	11/10/87	11/10/87	11/10/87	11/10/87
# 11	ND	ND	ND	ND
# 12	ND	ND	ND	ND
# 13	ND	ND	ND	ND
# 14	ND	ND	ND	ND
SURFACE WATER	ND	3.9	ND	ND

	6/28/88	6/28/88	6/28/88	6/28/88
# 11	ND	ND	ND	ND
# 12	ND	ND	ND	ND
# 13	ND	9.8	ND	ND
# 14	ND	ND	ND	3.5
SURFACE WATER	NA	NA	NA	NA

NA = NOT ANALYZED
ND = NOT DETECTED Detection limit is 0.5 micrograms per liter for all constituents listed.

ALL ANALYSES ARE REPORTED IN MICROGRAMS/LITER

All BTEX constituents detected in water from the permanent wells were below the New Mexico Water Quality Control Commission standards for drinking water. Maximum allowable concentrations in drinking water are: benzene, 10 ug/l; toluene, 750 ug/l; ethylbenzene, 750 ug/l; and total xylenes, 620 ug/l (New Mexico Water Quality Control Commission, 1987, p. 21).

The surface water sample taken on August 4, 1987 showed several apparently anomalous chemical characteristics, when compared with ground-water samples taken on the same date (Table 3-3). The surface water had a very high apparent specific conductance, though it was not abnormally high in dissolved solids. Also, no bicarbonate was detected in the analysis, although bicarbonate is generally characteristic of ground water in the area. There was also a marked discrepancy in total cations (12.2 milliequivalents per liter) relative to total anions (only 3.6 milliequivalents per liter). The cause of the apparently anomalous chemical characteristics of this sample is not known.

Surface water was not sampled during the June 1988 sampling event.

TABLE 3-3

GCL

ANALYTICAL RESULTS INORGANIC AND METAL
VALDEZ A-1 SITE
PERMANENT MONITOR WELLS AND SURFACE WATER

Sampled August 4, 1987

	WELL #11	WELL #12	WELL #13	WELL #14	SURFACE WATER	REPORTING LIMIT
pH	7.47	7.55	7.18	7.44	7.56	--
Specific Conductance (umhos/cm at 25°C)	727	904	1240	1760	19700	1
Total Dissolved Solids	540	660	890	1230	920	10
Fluoride	0.7	0.8	0.8	0.6	0.9	0.1
Chloride	4	21	10	3	ND	3
Nitrate & Nitrite (as N)	ND	0.2	0.1	ND	0.3	0.1
Sulfate	115	180	154	42	171	5
Bicarbonate Alkalinity (as $CaCO_3$)	287	337	656	1060	ND	5
Ammonia (as N)	ND	2.3	1.0	1.1	0.3	0.3
Calcium	142	161	230	363	157	0.1
Iron	3.0	7.8	29	70	ND	0.05
Magnesium	8.8	14	25	36	15	0.1
Potassium	ND	ND	5	8	ND	5
Sodium	28	62	92	149	72	0.05
Total Cations (meq/L)	9.2	12.5	19.3	31.6	12.2	0.1
Total Anicons (meq/L)	8.3	11.1	16.7	22.2	3.6	0.3

ND = NOT DETECTED
ALL VALUES IN MILLIGRAMS PER LITER EXCEPT AS NOTED
meq/L = MILLIEQUIVALENTS PER LITER
umhos/cm = MICROMHOS PER CENTIMETER

4.0 CONCLUSIONS

The results of ground- and surface-water sampling and analysis at Valdez A-1 site indicate local hydrocarbon presence in the water immediately downgradient from the site. However, no BTEX constituents have been detected at concentrations in excess of state regulatory limits in the four permanent monitor wells. It therefore appears that the relatively high BTEX concentrations in ground water identified in the temporary wells in early 1987 are no longer typical of ground water at the site. The ground-water table intersects the land surface in the marsh south of the well site. Consequently, to the extent that higher concentrations of BTEX constituents may still exist in the surface water, they can be expected to volatilize to the atmosphere promptly, and are unlikely to be transported far from the site in either surface or ground water. GCL therefore concludes that there is no reason at present to suspect potential for damage to human health or the environment.

5.0 REFERENCES

New Mexico State Highway Department, n.d., Geology and Aggregate Resources, District V: Geology Section, New Mexico State Highway Department.

New Mexico Water Quality Control Commission, 1987, New Mexico Water Quality Control Commision Regulations, as Amended through February 27, 1987: Santa Fe, N. M., 82 p.

Stone, W. J., Lyford, F. P., Frenzel, P. F., Mizell, N. H., and Padgett, E. T., 1983, Hydrogeology and water resources of San Juan Basin, New Mexico: New Mexico Bureau of Mines and Mineral Resources Hydrologic Report 6, 70 p.

APPENDIX A

LABORATORY REPORTS OF ANALYTICAL RESULTS

INORGANIC PARAMETERS

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ AUGER #2

Laboratory ID: 63342-002 Enseco ID: 63342-002

Matrix: Water Sampled: 04/02/87 Received: 04/03/87

Authorized: 04/03/87

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed
Total Dissolved Solids	895	mg/L	10	160.1	04/13/87
Nitrite as N	0.03	mg/L	0.01	353.2	04/04/87
Sulfate	403	mg/L	5	300.0	04/08/87
Sulfite	N.D.	mg/L	2	377.1	04/06/87
Oil & Grease	2	mg/L	0.5	413.2	04/29/87

N.D. = Not detected

Approved by: Lindsay Breyer

INORGANIC PARAMETERS

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ AUGER #3

Laboratory ID: 63342-003 Enseco ID: 63342-003

Matrix: Water Sampled: 04/02/87 Received: 04/03/87

Authorized: 04/03/87

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed
Total Dissolved Solids	840	mg/L	10	160.1	04/13/87
Nitrite as N	0.02	mg/L	0.01	353.2	04/04/87
Sulfate	270	mg/L	5	300.0	04/08/87
Sulfite	N.D.	mg/L	2	377.1	04/06/87
Oil & Grease	N.D.	mg/L	0.5	413.2	04/29/87

N.D. = Not detected

Approved by: Lindsay Breyer

Enseco

INORGANIC PARAMETERS

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ AUGER #4

Laboratory ID: 63342-004 Enseco ID: 63342-004

Matrix: Water Sampled: 04/02/87 Received: 04/03/87

Authorized: 04/03/87

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed
Total Dissolved Solids	1010	mg/L	10	160.1	04/13/87
Nitrite as N	0.05	mg/L	0.01	353.2	04/04/87
Sulfate	356	mg/L	5	300.0	04/08/87
Sulfite	N.D.	mg/L	2	377.1	04/06/87
Oil & Grease	N.D.	mg/L	0.5	413.2	04/29/87

N.D. = Not detected

Approved by: Lindsay Breyer

INORGANIC PARAMETERS

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ AUGER #5

Laboratory ID: 63342-005 Enseco ID: 63342-005

Matrix: Water Sampled: 04/02/87 Received: 04/03/87

Authorized: 04/03/87

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed
Total Dissolved Solids	785	mg/L	10	160.1	04/13/87
Nitrite as N	0.03	mg/L	0.01	353.2	04/04/87
Sulfate	278	mg/L	5	300.0	04/08/87
Sulfite	N.D.	mg/L	2	377.1	04/06/87
Oil & Grease	2	mg/L	0.5	413.2	04/29/87

N.D. = Not detected

Approved by: Lindsay Breyer

PRIORITY POLLUTANT VOLATILE ORGANICS

EPA METHOD 624

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ AUGER #1

Laboratory ID: 63342-001 Enseco ID: 63342-001

Matrix: Water Sampled: 04/02/87 Received: 04/03/87

Authorized: 04/03/87 Analyzed: 04/07/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	5.0
Bromoform	N.D.	ug/L	5.0
Carbon tetrachloride	N.D.	ug/L	5.0
Chlorobenzene	N.D.	ug/L	5.0
Dibromochloromethane	N.D.	ug/L	5.0
Chloroethane	N.D.	ug/L	10
2-Chloroethylvinyl ether	N.D.	ug/L	10
Chloroform	N.D.	ug/L	5.0
Bromodichloromethane	N.D.	ug/L	5.0
1,1-Dichloroethane	N.D.	ug/L	5.0
1,2-Dichloroethane	N.D.	ug/L	5.0
1,1-Dichloroethene	N.D.	ug/L	5.0
1,2-Dichloropropane	N.D.	ug/L	5.0
Ethylbenzene	N.D.	ug/L	5.0
Methylbromide	N.D.	ug/L	10
Chloromethane	N.D.	ug/L	10
Methylene chloride	N.D.	ug/L	25
1,1,2,2-Tetrachloroethane	N.D.	ug/L	5.0
Tetrachloroethylene	N.D.	ug/L	5.0
Toluene	N.D.	ug/L	5.0
trans-1,2-Dichloroethene	N.D.	ug/L	5.0
1,1,1-Trichloroethane	N.D.	ug/L	5.0
1,1,2-Trichloroethane	N.D.	ug/L	5.0
Trichloroethylene	N.D.	ug/L	5.0
Vinyl chloride	N.D.	ug/L	10
m-Xylene	N.D.	ug/L	5.0
o & p-Xylenes	N.D.	ug/L	5.0
cis-1,3-Dichloropropene	N.D.	ug/L	5.0
trans-1,3-Dichloropropene	N.D.	ug/L	5.0

N.D. = Not detected

Reported by: Alan Alai Approved by: Michael Brooks

PRIORITY POLLUTANT VOLATILE ORGANICS

EPA METHOD 624

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ AUGER #2

Laboratory ID: 63342-002 Enseco ID: 63342-002

Matrix: Water Sampled: 04/02/87 Received: 04/03/87

Authorized: 04/03/87 Analyzed: 04/08/87

Parameter	Result	Units	Reporting Limit
Benzene	87	ug/L	40
Bromoform	N.D.	ug/L	40
Carbon tetrachloride	N.D.	ug/L	40
Chlorobenzene	N.D.	ug/L	40
Dibromochloromethane	N.D.	ug/L	40
Chloroethane	N.D.	ug/L	80
2-Chloroethylvinyl ether	N.D.	ug/L	80
Chloroform	N.D.	ug/L	40
Bromodichloromethane	N.D.	ug/L	40
1,1-Dichloroethane	N.D.	ug/L	40
1,2-Dichloroethane	N.D.	ug/L	40
1,1-Dichloroethene	N.D.	ug/L	40
1,2-Dichloropropane	N.D.	ug/L	40
Ethylbenzene	62	ug/L	40
Methylbromide	N.D.	ug/L	80
Chloromethane	N.D.	ug/L	80
Methylene chloride	N.D.	ug/L	200
1,1,2,2-Tetrachloroethane	N.D.	ug/L	40
Tetrachloroethylene	N.D.	ug/L	40
Toluene	N.D.	ug/L	40
trans-1,2-Dichloroethene	N.D.	ug/L	40
1,1,1-Trichloroethane	N.D.	ug/L	40
1,1,2-Trichloroethane	N.D.	ug/L	40
Trichloroethylene	N.D.	ug/L	40
Vinyl chloride	N.D.	ug/L	80
m-Xylene	450	ug/L	40
o & p-Xylenes	300	ug/L	40
cis-1,3-Dichloropropene	N.D.	ug/L	40
trans-1,3-Dichloropropene	N.D.	ug/L	40

N.D. = Not detected

Reported by: Alan Alai Approved by: Michael Brooks

PRIORITY POLLUTANT VOLATILE ORGANICS

EPA METHOD 624

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ AUGER #3

Laboratory ID: 63342-003 Enseco ID: 63342-003

Matrix: Water Sampled: 04/02/87 Received: 04/03/87

Authorized: 04/03/87 Analyzed: 04/08/87

Parameter	Result	Units	Reporting Limit
Benzene	600	ug/L	40
Bromoform	N.D.	ug/L	40
Carbon tetrachloride	N.D.	ug/L	40
Chlorobenzene	N.D.	ug/L	40
Dibromochloromethane	N.D.	ug/L	40
Chloroethane	N.D.	ug/L	80
2-Chloroethylvinyl ether	N.D.	ug/L	80
Chloroform	N.D.	ug/L	40
Bromodichloromethane	N.D.	ug/L	40
1,1-Dichloroethane	N.D.	ug/L	40
1,2-Dichloroethane	N.D.	ug/L	40
1,1-Dichloroethene	N.D.	ug/L	40
1,2-Dichloropropane	N.D.	ug/L	40
Ethylbenzene	82	ug/L	40
Methylbromide	N.D.	ug/L	80
Chloromethane	N.D.	ug/L	80
Methylene chloride	N.D.	ug/L	200
1,1,2,2-Tetrachloroethane	N.D.	ug/L	40
Tetrachloroethylene	N.D.	ug/L	40
Toluene	N.D.	ug/L	40
trans-1,2-Dichloroethene	N.D.	ug/L	40
1,1,1-Trichloroethane	N.D.	ug/L	40
1,1,2-Trichloroethane	N.D.	ug/L	40
Trichloroethylene	N.D.	ug/L	40
Vinyl chloride	N.D.	ug/L	80
m-Xylene	570	ug/L	40
o & p-Xylenes	430	ug/L	40
cis-1,3-Dichloropropene	N.D.	ug/L	40
trans-1,3-Dichloropropene	N.D.	ug/L	40

N.D. = Not detected

Reported by: Alan Alai Approved by: Michael Brooks

PRIORITY POLLUTANT VOLATILE ORGANICS

EPA METHOD 624

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ AUGER #4

Laboratory ID: 63342-004 Enseco ID: 63342-004

Matrix: Water Sampled: 04/02/87 Received: 04/03/87

Authorized: 04/03/87 Analyzed: 04/07/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	5.0
Bromoform	N.D.	ug/L	5.0
Carbon tetrachloride	N.D.	ug/L	5.0
Chlorobenzene	N.D.	ug/L	5.0
Dibromochloromethane	N.D.	ug/L	5.0
Chloroethane	N.D.	ug/L	10
2-Chloroethylvinyl ether	N.D.	ug/L	10
Chloroform	N.D.	ug/L	5.0
Bromodichloromethane	N.D.	ug/L	5.0
1,1-Dichloroethane	N.D.	ug/L	5.0
1,2-Dichloroethane	N.D.	ug/L	5.0
1,1-Dichloroethene	N.D.	ug/L	5.0
1,2-Dichloropropane	N.D.	ug/L	5.0
Ethylbenzene	N.D.	ug/L	5.0
Methylbromide	N.D.	ug/L	10
Chloromethane	N.D.	ug/L	10
Methylene chloride	N.D.	ug/L	25
1,1,2,2-Tetrachloroethane	N.D.	ug/L	5.0
Tetrachloroethylene	N.D.	ug/L	5.0
Toluene	N.D.	ug/L	5.0
trans-1,2-Dichloroethene	N.D.	ug/L	5.0
1,1,1-Trichloroethane	N.D.	ug/L	5.0
1,1,2-Trichloroethane	N.D.	ug/L	5.0
Trichloroethylene	N.D.	ug/L	5.0
Vinyl chloride	N.D.	ug/L	10
m-Xylene	N.D.	ug/L	5.0
o & p-Xylenes	N.D.	ug/L	5.0
cis-1,3-Dichloropropene	N.D.	ug/L	5.0
trans-1,3-Dichloropropene	N.D.	ug/L	5.0

N.D. = Not detected

Reported by: Alan Alai Approved by: Michael Brooks

PRIORITY POLLUTANT VOLATILE ORGANICS

EPA METHOD 624

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ AUGER #5

Laboratory ID: 63342-005 Enseco ID: 63342-005

Matrix: Water Sampled: 04/02/87 Received: 04/03/87

Authorized: 04/03/87 Analyzed: 04/08/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	80
Bromoform	N.D.	ug/L	80
Carbon tetrachloride	N.D.	ug/L	80
Chlorobenzene	N.D.	ug/L	80
Dibromochloromethane	N.D.	ug/L	80
Chloroethane	N.D.	ug/L	160
2-Chloroethylvinyl ether	N.D.	ug/L	160
Chloroform	N.D.	ug/L	80
Bromodichloromethane	N.D.	ug/L	80
1,1-Dichloroethane	N.D.	ug/L	80
1,2-Dichloroethane	N.D.	ug/L	80
1,1-Dichloroethene	N.D.	ug/L	80
1,2-Dichloropropane	N.D.	ug/L	80
Ethylbenzene	110	ug/L	80
Methylbromide	N.D.	ug/L	160
Chloromethane	N.D.	ug/L	160
Methylene chloride	N.D.	ug/L	400
1,1,2,2-Tetrachloroethane	N.D.	ug/L	80
Tetrachloroethylene	N.D.	ug/L	80
Toluene	N.D.	ug/L	80
trans-1,2-Dichloroethene	N.D.	ug/L	80
1,1,1-Trichloroethane	N.D.	ug/L	80
1,1,2-Trichloroethane	N.D.	ug/L	80
Trichloroethylene	N.D.	ug/L	80
Vinyl chloride	N.D.	ug/L	160
m-Xylene	790	ug/L	80
o & p-Xylenes	470	ug/L	80
cis-1,3-Dichloropropene	N.D.	ug/L	80
trans-1,3-Dichloropropene	N.D.	ug/L	80

N.D. = Not detected

Reported by: Alan Alai Approved by: Michael Brooks

PRIORITY POLLUTANT VOLATILE ORGANICS

EPA METHOD 624

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ AUGER #6

Laboratory ID: 63342-006 Enseco ID: 63342-006

Matrix: Water Sampled: 04/02/87 Received: 04/03/87

Authorized: 04/03/87 Analyzed: 04/08/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	25
Bromoform	N.D.	ug/L	25
Carbon tetrachloride	N.D.	ug/L	25
Chlorobenzene	N.D.	ug/L	25
Dibromochloromethane	N.D.	ug/L	25
Chloroethane	N.D.	ug/L	50
2-Chloroethylvinyl ether	N.D.	ug/L	50
Chloroform	N.D.	ug/L	25
Bromodichloromethane	N.D.	ug/L	25
1,1-Dichloroethane	N.D.	ug/L	25
1,2-Dichloroethane	N.D.	ug/L	25
1,1-Dichloroethene	N.D.	ug/L	25
1,2-Dichloropropane	N.D.	ug/L	25
Ethylbenzene	N.D.	ug/L	25
Methylbromide	N.D.	ug/L	50
Chloromethane	N.D.	ug/L	50
Methylene chloride	N.D.	ug/L	120
1,1,2,2-Tetrachloroethane	N.D.	ug/L	25
Tetrachloroethylene	N.D.	ug/L	25
Toluene	N.D.	ug/L	25
trans-1,2-Dichloroethene	N.D.	ug/L	25
1,1,1-Trichloroethane	N.D.	ug/L	25
1,1,2-Trichloroethane	N.D.	ug/L	25
Trichloroethylene	N.D.	ug/L	25
Vinyl chloride	N.D.	ug/L	50
m-Xylene	400	ug/L	25
o & p-Xylenes	170	ug/L	25
cis-1,3-Dichloropropene	N.D.	ug/L	25
trans-1,3-Dichloropropene	N.D.	ug/L	25

N.D. = Not detected

Reported by: Alan Alai Approved by: Michael Brooks

PRIORITY POLLUTANT VOLATILE ORGANICS

EPA METHOD 624

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ #7

Laboratory ID: 63564-001 Enseco ID: 63564-001

Matrix: Water Sampled: 05/05/87 Received: 05/07/87

Authorized: 05/07/87 Analyzed: 05/11/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	50
Bromoform	N.D.	ug/L	50
Carbon tetrachloride	N.D.	ug/L	50
Chlorobenzene	N.D.	ug/L	50
Dibromochloromethane	N.D.	ug/L	50
Chloroethane	N.D.	ug/L	100
2-Chloroethylvinyl ether	N.D.	ug/L	100
Chloroform	N.D.	ug/L	50
Bromodichloromethane	N.D.	ug/L	50
1,1-Dichloroethane	N.D.	ug/L	50
1,2-Dichloroethane	N.D.	ug/L	50
1,1-Dichloroethene	N.D.	ug/L	50
1,2-Dichloropropane	N.D.	ug/L	50
Ethylbenzene	N.D.	ug/L	50
Methylbromide	N.D.	ug/L	100
Chloromethane	N.D.	ug/L	100
Methylene chloride	N.D.	ug/L	250
1,1,2,2-Tetrachloroethane	N.D.	ug/L	50
Tetrachloroethylene	N.D.	ug/L	50
Toluene	N.D.	ug/L	50
trans-1,2-Dichloroethene	N.D.	ug/L	50
1,1,1-Trichloroethane	N.D.	ug/L	50
1,1,2-Trichloroethane	N.D.	ug/L	50
Trichloroethylene	N.D.	ug/L	50
Vinyl chloride	N.D.	ug/L	100
m-Xylene	420	ug/L	50
o & p-Xylenes	180	ug/L	50
cis-1,3-Dichloropropene	N.D.	ug/L	50
trans-1,3-Dichloropropene	N.D.	ug/L	50

N.D. = Not detected

Reported by: Stephen Siegal Approved by: Michael Brooks

PRIORITY POLLUTANT VOLATILE ORGANICS

EPA METHOD 624

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ #8

Laboratory ID: 63564-002 Enseco ID: 63564-002

Matrix: Water Sampled: 05/05/87 Received: 05/07/87

Authorized: 05/07/87 Analyzed: 05/11/87

Parameter	Result	Units	Reporting Limit
Benzene	380	ug/L	320
Bromoform	N.D.	ug/L	320
Carbon tetrachloride	N.D.	ug/L	320
Chlorobenzene	N.D.	ug/L	320
Dibromochloromethane	N.D.	ug/L	320
Chloroethane	N.D.	ug/L	640
2-Chloroethylvinyl ether	N.D.	ug/L	640
Chloroform	N.D.	ug/L	320
Bromodichloromethane	N.D.	ug/L	320
1,1-Dichloroethane	N.D.	ug/L	320
1,2-Dichloroethane	N.D.	ug/L	320
1,1-Dichloroethene	N.D.	ug/L	320
1,2-Dichloropropane	N.D.	ug/L	320
Ethylbenzene	N.D.	ug/L	320
Methylbromide	N.D.	ug/L	640
Chloromethane	N.D.	ug/L	640
Methylene chloride	N.D.	ug/L	1600
1,1,2,2-Tetrachloroethane	N.D.	ug/L	320
Tetrachloroethylene	N.D.	ug/L	320
Toluene	1100	ug/L	320
trans-1,2-Dichloroethene	N.D.	ug/L	320
1,1,1-Trichloroethane	N.D.	ug/L	320
1,1,2-Trichloroethane	N.D.	ug/L	320
Trichloroethylene	N.D.	ug/L	320
Vinyl chloride	N.D.	ug/L	640
m-Xylene	2100	ug/L	320
o & p-Xylenes	1300	ug/L	320
cis-1,3-Dichloropropene	N.D.	ug/L	320
trans-1,3-Dichloropropene	N.D.	ug/L	320

N.D. = Not detected

Reported by: Stephen Siegal Approved by: Michael Brooks

PRIORITY POLLUTANT VOLATILE ORGANICS

EPA METHOD 624

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ #9

Laboratory ID: 63564-003 Enseco ID: 63564-003

Matrix: Water Sampled: 05/05/87 Received: 05/07/87

Authorized: 05/07/87 Analyzed: 05/11/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	5.0
Bromoform	N.D.	ug/L	5.0
Carbon tetrachloride	N.D.	ug/L	5.0
Chlorobenzene	N.D.	ug/L	5.0
Dibromochloromethane	N.D.	ug/L	5.0
Chloroethane	N.D.	ug/L	10
2-Chloroethylvinyl ether	N.D.	ug/L	10
Chloroform	N.D.	ug/L	5.0
Bromodichloromethane	N.D.	ug/L	5.0
1,1-Dichloroethane	N.D.	ug/L	5.0
1,2-Dichloroethane	N.D.	ug/L	5.0
1,1-Dichloroethene	N.D.	ug/L	5.0
1,2-Dichloropropane	N.D.	ug/L	5.0
Ethylbenzene	N.D.	ug/L	5.0
Methylbromide	N.D.	ug/L	10
Chloromethane	N.D.	ug/L	10
Methylene chloride	N.D.	ug/L	25
1,1,2,2-Tetrachloroethane	N.D.	ug/L	5.0
Tetrachloroethylene	N.D.	ug/L	5.0
Toluene	N.D.	ug/L	5.0
trans-1,2-Dichloroethene	N.D.	ug/L	5.0
1,1,1-Trichloroethane	N.D.	ug/L	5.0
1,1,2-Trichloroethane	N.D.	ug/L	5.0
Trichloroethylene	N.D.	ug/L	5.0
Vinyl chloride	N.D.	ug/L	10
m-Xylene	N.D.	ug/L	5.0
o & p-Xylenes	N.D.	ug/L	5.0
cis-1,3-Dichloropropene	N.D.	ug/L	5.0
trans-1,3-Dichloropropene	N.D.	ug/L	5.0

N.D. = Not detected

Reported by: Stephen Siegal Approved by: Michael Brooks

PRIORITY POLLUTANT VOLATILE ORGANICS

EPA METHOD 624

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ #10

Laboratory ID: 63564-004 Enseco ID: 63564-004

Matrix: Water Sampled: 05/05/87 Received: 05/07/87

Authorized: 05/07/87 Analyzed: 05/11/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	5.0
Bromoform	N.D.	ug/L	5.0
Carbon tetrachloride	N.D.	ug/L	5.0
Chlorobenzene	N.D.	ug/L	5.0
Dibromochloromethane	N.D.	ug/L	5.0
Chloroethane	N.D.	ug/L	10
2-Chloroethylvinyl ether	N.D.	ug/L	10
Chloroform	N.D.	ug/L	5.0
Bromodichloromethane	N.D.	ug/L	5.0
1,1-Dichloroethane	N.D.	ug/L	5.0
1,2-Dichloroethane	N.D.	ug/L	5.0
1,1-Dichloroethene	N.D.	ug/L	5.0
1,2-Dichloropropane	N.D.	ug/L	5.0
Ethylbenzene	N.D.	ug/L	5.0
Methylbromide	N.D.	ug/L	10
Chloromethane	N.D.	ug/L	10
Methylene chloride	N.D.	ug/L	25
1,1,2,2-Tetrachloroethane	N.D.	ug/L	5.0
Tetrachloroethylene	N.D.	ug/L	5.0
Toluene	N.D.	ug/L	5.0
trans-1,2-Dichloroethene	N.D.	ug/L	5.0
1,1,1-Trichloroethane	N.D.	ug/L	5.0
1,1,2-Trichloroethane	N.D.	ug/L	5.0
Trichloroethylene	N.D.	ug/L	5.0
Vinyl chloride	N.D.	ug/L	10
m-Xylene	N.D.	ug/L	5.0
o & p-Xylenes	N.D.	ug/L	5.0
cis-1,3-Dichloropropene	N.D.	ug/L	5.0
trans-1,3-Dichloropropene	N.D.	ug/L	5.0

N.D. = Not detected

Reported by: Stephen Siegal Approved by: Michael Brooks

Enseco

INORGANIC PARAMETERS

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 SWAMP WATER

Laboratory ID: 64218-005 Enseco ID: 64218-005

Matrix: Water Sampled: 08/04/87 Received: 08/05/87

Authorized: 08/05/87

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed
pH	~~1.56~~ *	units	0.01	150.1	08/05/87
Specific Conductance @ 25C	19700	umhos/cm	1	120.1/9050	08/05/87
Total Dissolved Solids	920	mg/L	10	160.1	08/12/87
Fluoride	0.9	mg/L	0.1	340.2	08/18/87
Chloride	N.D.	mg/L	3	300.0	08/09/87
Nitrate + Nitrite as N	0.3	mg/L	0.1	353.2	08/11/87
Sulfate	171	mg/L	5	300.0	08/09/87
Total Alkalinity as CaCO3	N.D.	mg/L	5	310.1/403	08/05/87
Bicarb. Alkalinity as CaCO3	N.D.	mg/L	5	310.1/403	08/05/87
Carbonate Alkalinity as CaCO3	N.D.	mg/L	5	310.1/403	08/05/87
Ammonia as N	0.3	mg/L	0.1	350.1	08/19/87
Total Cations	12.2	meq/L	0.1	104C	08/25/87
Total Anions	3.6	meq/L	0.3	104C	08/25/87
% Difference	54.2	%	0.1	104C	08/25/87

*Laboratory error; Correct value 7.56
per M.B. 9/12/88.

N.D. = Not detected

Approved by: Lindsay Breyer

Sample: 64218-005

Enseco

METALS PARAMETERS

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 SWAMP WATER

Laboratory ID: 64218-005 Enseco ID: 64218-005

Matrix: Water Sampled: 08/04/87 Received: 08/05/87

Authorized: 08/05/87

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed
Calcium	157	mg/L	0.1	200.7	08/20/87
Iron	N.D.	mg/L	0.05	200.7	08/20/87
Magnesium	15	mg/L	0.1	200.7	08/20/87
Potassium	N.D.	mg/L	5	200.7	08/20/87
Sodium	72	mg/L	0.05	200.7	08/20/87

N.D. = Not detected

Approved by: Will Pratt

BENZENE/ TOLUENE/ ETHYLBENZENE/ XYLENES (BTX)

EPA METHOD 602

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 SWAMP WATER

Laboratory ID: 64218-005 Enseco ID: 64218-005

Matrix: Water Sampled: 08/04/87 Received: 08/05/87

Authorized: 08/05/87 Analyzed: 08/11/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	0.50
Ethylbenzene	N.D.	ug/L	0.50
Toluene	0.54	ug/L	0.50
Xylene,m	N.D.	ug/L	0.50
Xylenes,o & p	N.D.	ug/L	0.50

N.D. = Not detected

Reported by: Mike Faught Approved by: Maureen McDevitt

Enseco

INORGANIC PARAMETERS

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 #11

Laboratory ID: 64218-001 Enseco ID: 64218-001

Matrix: Water Sampled: 08/04/87 Received: 08/05/87

Authorized: 08/05/87

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed
pH	7.47	units	0.01	150.1	08/05/87
Specific Conductance @ 25C	727	umhos/cm	1	120.1/9050	08/05/87
Total Dissolved Solids	540	mg/L	10	160.1	08/12/87
Fluoride	0.7	mg/L	0.1	340.2	08/18/87
Chloride	4	mg/L	3	300.0	08/09/87
Nitrate + Nitrite as N	N.D.	mg/L	0.1	353.2	08/11/87
Sulfate	115	mg/L	5	300.0	08/09/87
Total Alkalinity as CaCO3	287	mg/L	5	310.1/403	08/05/87
Bicarb. Alkalinity as CaCO3	287	mg/L	5	310.1/403	08/05/87
Carbonate Alkalinity as CaCO3	N.D.	mg/L	5	310.1/403	08/05/87
Ammonia as N	N.D.	mg/L	0.1	350.1	08/11/87
Total Cations	9.2	meq/L	0.1	104C	08/24/87
Total Anions	8.3	meq/L	0.3	104C	08/24/87
% Difference	5.2	%	0.1	104C	08/24/87

N.D. = Not detected

Approved by: Lindsay Breyer

Enseco

METALS PARAMETERS

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 #11

Laboratory ID: 64218-001 Enseco ID: 64218-001

Matrix: Water Sampled: 08/04/87 Received: 08/05/87

Authorized: 08/05/87

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed
Calcium	142	mg/L	0.1	200.7	08/20/87
Iron	3.0	mg/L	0.05	200.7	08/20/87
Magnesium	8.8	mg/L	0.1	200.7	08/20/87
Potassium	N.D.	mg/L	5	200.7	08/20/87
Sodium	28	mg/L	0.05	200.7	08/20/87

N.D. = Not detected

Approved by: Will Pratt

Sample: 64218-001

BENZENE/ TOLUENE/ ETHYLBENZENE/ XYLENES (BTX)

EPA METHOD 602

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 #11

Laboratory ID: 64218-001 Enseco ID: 64218-001

Matrix: Water Sampled: 08/04/87 Received: 08/05/87

Authorized: 08/05/87 Analyzed: 08/11/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	0.50
Ethylbenzene	N.D.	ug/L	0.50
Toluene	N.D.	ug/L	0.50
Xylene,m	N.D.	ug/L	0.50
Xylenes,o & p	N.D.	ug/L	0.50

N.D. = Not detected

Reported by: Mike Faught Approved by: Maureen McDevitt

INORGANIC PARAMETERS

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 #12

Laboratory ID: 64218-002 Enseco ID: 64218-002

Matrix: Water Sampled: 08/04/87 Received: 08/05/87

Authorized: 08/05/87

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed
pH	7.55	units	0.01	150.1	08/05/87
Specific Conductance @ 25C	904	umhos/cm	1	120.1/9050	08/05/87
Total Dissolved Solids	660	mg/L	10	160.1	08/12/87
Fluoride	0.8	mg/L	0.1	340.2	08/18/87
Chloride	21	mg/L	3	300.0	08/09/87
Nitrate + Nitrite as N	0.2	mg/L	0.1	353.2	08/11/87
Sulfate	180	mg/L	5	300.0	08/09/87
Total Alkalinity as CaCO3	337	mg/L	5	310.1/403	08/05/87
Bicarb. Alkalinity as CaCO3	337	mg/L	5	310.1/403	08/05/87
Carbonate Alkalinity as CaCO3	N.D.	mg/L	5	310.1/403	08/05/87
Ammonia as N	2.3	mg/L	0.1	350.1	08/11/87
Total Cations	12.5	meq/L	0.1	104C	08/24/87
Total Anions	11.1	meq/L	0.3	104C	08/24/87
% Difference	5.7	%	0.1	104C	08/24/87

N.D. = Not detected

Approved by: Lindsay Breyer

Enseco

METALS PARAMETERS

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 #12

Laboratory ID: 64218-002 Enseco ID: 64218-002

Matrix: Water Sampled: 08/04/87 Received: 08/05/87

Authorized: 08/05/87

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed
Calcium	161	mg/L	0.1	200.7	08/20/87
Iron	7.8	mg/L	0.05	200.7	08/20/87
Magnesium	14	mg/L	0.1	200.7	08/20/87
Potassium	N.D.	mg/L	5	200.7	08/20/87
Sodium	62	mg/L	0.05	200.7	08/20/87

N.D. = Not detected

Approved by: Will Pratt

Sample: 64218-002

BENZENE/ TOLUENE/ ETHYLBENZENE/ XYLENES (BTX)

EPA METHOD 602

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 #12

Laboratory ID: 64218-002 Enseco ID: 64218-002

Matrix: Water Sampled: 08/04/87 Received: 08/05/87

Authorized: 08/05/87 Analyzed: 08/11/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	0.50
Ethylbenzene	0.56	ug/L	0.50
Toluene	0.58	ug/L	0.50
Xylene,m	N.D.	ug/L	0.50
Xylenes,o & p	N.D.	ug/L	0.50

N.D. = Not detected

Reported by: Mike Faught Approved by: Maureen McDevitt

INORGANIC PARAMETERS

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 #13

Laboratory ID: 64218-003 Enseco ID: 64218-003

Matrix: Water Sampled: 08/04/87 Received: 08/05/87

Authorized: 08/05/87

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed
pH	7.18	units	0.01	150.1	08/05/87
Specific Conductance @ 25C	1240	umhos/cm	1	120.1/9050	08/05/87
Total Dissolved Solids	890	mg/L	10	160.1	08/12/87
Fluoride	0.8	mg/L	0.1	340.2	08/18/87
Chloride	10	mg/L	3	300.0	08/09/87
Nitrate + Nitrite as N	0.1	mg/L	0.1	353.2	08/11/87
Sulfate	154	mg/L	5	300.0	08/09/87
Total Alkalinity as CaCO3	656	mg/L	5	310.1/403	08/05/87
Bicarb. Alkalinity as CaCO3	656	mg/L	5	310.1/403	08/05/87
Carbonate Alkalinity as CaCO3	N.D.	mg/L	5	310.1/403	08/05/87
Ammonia as N	1.0	mg/L	0.1	350.1	08/11/87
Total Cations	19.3	meq/L	0.1	104C	08/25/87
Total Anions	16.7	meq/L	0.3	104C	08/25/87
% Difference	7.3	%	0.1	104C	08/25/87

N.D. = Not detected

Approved by: Lindsay Breyer

Enseco

METALS PARAMETERS

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 #13

Laboratory ID: 64218-003 Enseco ID: 64218-003

Matrix: Water Sampled: 08/04/87 Received: 08/05/87

Authorized: 08/05/87

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed
Calcium	230	mg/L	0.1	200.7	08/20/87
Iron	29	mg/L	0.05	200.7	08/20/87
Magnesium	25	mg/L	0.1	200.7	08/20/87
Potassium	5	mg/L	5	200.7	08/20/87
Sodium	92	mg/L	0.05	200.7	08/20/87

N.D. = Not detected

Approved by: Will Pratt

Sample: 64218-003

BENZENE/ TOLUENE/ ETHYLBENZENE/ XYLENES (BTX)

EPA METHOD 602

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 #13

Laboratory ID: 64218-003 Enseco ID: 64218-003

Matrix: Water Sampled: 08/04/87 Received: 08/05/87

Authorized: 08/05/87 Analyzed: 08/11/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	0.50
Ethylbenzene	N.D.	ug/L	0.50
Toluene	8.1	ug/L	0.50
Xylene,m	N.D.	ug/L	0.50
Xylenes,o & p	N.D.	ug/L	0.50

N.D. = Not detected

Reported by: Mike Faught Approved by: Maureen McDevitt

INORGANIC PARAMETERS

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 #14

Laboratory ID: 64218-004 Enseco ID: 64218-004

Matrix: Water Sampled: 08/04/87 Received: 08/05/87

Authorized: 08/05/87

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed
pH	7.44	units	0.01	150.1	08/05/87
Specific Conductance @ 25C	1760	umhos/cm	1	120.1/9050	08/05/87
Total Dissolved Solids	1230	mg/L	10	160.1	08/12/87
Fluoride	0.6	mg/L	0.1	340.2	08/18/87
Chloride	3	mg/L	3	300.0	08/09/87
Nitrate + Nitrite as N	N.D.	mg/L	0.1	353.2	08/11/87
Sulfate	42	mg/L	5	300.0	08/09/87
Total Alkalinity as CaCO3	1060	mg/L	5	310.1/403	08/05/87
Bicarb. Alkalinity as CaCO3	1060	mg/L	5	310.1/403	08/05/87
Carbonate Alkalinity as CaCO3	N.D.	mg/L	5	310.1/403	08/05/87
Ammonia as N	1.1	mg/L	0.1	350.1	08/11/87
Total Cations	31.6	meq/L	0.1	104C	08/25/87
Total Anions	22.2	meq/L	0.3	104C	08/25/87
% Difference	17.5	%	0.1	104C	08/25/87

N.D. = Not detected

Approved by: Lindsay Breyer

METALS PARAMETERS

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 #14

Laboratory ID: 64218-004 Enseco ID: 64218-004

Matrix: Water Sampled: 08/04/87 Received: 08/05/87

Authorized: 08/05/87

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed
Calcium	363	mg/L	0.1	200.7	08/20/87
Iron	70	mg/L	0.05	200.7	08/20/87
Magnesium	36	mg/L	0.1	200.7	08/20/87
Potassium	8	mg/L	5	200.7	08/20/87
Sodium	149	mg/L	0.05	200.7	08/20/87

N.D. = Not detected

Approved by: Will Pratt

BENZENE/ TOLUENE/ ETHYLBENZENE/ XYLENES (BTX)

EPA METHOD 602

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 #14

Laboratory ID: 64218-004 Enseco ID: 64218-004

Matrix: Water Sampled: 08/04/87 Received: 08/05/87

Authorized: 08/05/87 Analyzed: 08/11/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	0.50
Ethylbenzene	N.D.	ug/L	0.50
Toluene	0.61	ug/L	0.50
Xylene,m	N.D.	ug/L	0.50
Xylenes,o & p	0.96	ug/L	0.50

N.D. = Not detected

Reported by: Mike Faught Approved by: Maureen McDevitt

Sample: 64218-004

BENZENE/ TOLUENE/ ETHYLBENZENE/ XYLENES (BTX)

EPA METHOD 602

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 SW1

Laboratory ID: 64967-005 Enseco ID: 64967-005

Matrix: Water Sampled: 11/10/87 Received: 11/11/87

Authorized: 11/11/87 Analyzed: 11/12/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	0.50
Ethylbenzene	N.D.	ug/L	0.50
Toluene	3.9	ug/L	0.50
m-Xylene	N.D.	ug/L	0.50
o & p-Xylene(s)	N.D.	ug/L	0.50

N.D. = Not detected

Reported by: Michael Hoffman Approved by: Robert Keck

BENZENE/ TOLUENE/ ETHYLBENZENE/ XYLENES (BTX)

EPA METHOD 602

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 #11

Laboratory ID: 64967-001 Enseco ID: 64967-001

Matrix: Water Sampled: 11/10/87 Received: 11/11/87

Authorized: 11/11/87 Analyzed: 11/12/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	0.50
Ethylbenzene	N.D.	ug/L	0.50
Toluene	N.D.	ug/L	0.50
m-Xylene	N.D.	ug/L	0.50
o & p-Xylene(s)	N.D.	ug/L	0.50

N.D. = Not detected

Reported by: Michael Hoffman Approved by: Robert Keck

Enseco

BENZENE/ TOLUENE/ ETHYLBENZENE/ XYLENES (BTX)

EPA METHOD 602

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 #12

Laboratory ID: 64967-002 Enseco ID: 64967-002

Matrix: Water Sampled: 11/10/87 Received: 11/11/87

Authorized: 11/11/87 Analyzed: 11/12/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	0.50
Ethylbenzene	N.D.	ug/L	0.50
Toluene	N.D.	ug/L	0.50
m-Xylene	N.D.	ug/L	0.50
o & p-Xylene(s)	N.D.	ug/L	0.50

N.D. = Not detected

Reported by: Michael Hoffman Approved by: Robert Keck

Enseco

BENZENE/ TOLUENE/ ETHYLBENZENE/ XYLENES (BTX)

EPA METHOD 602

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 #13

Laboratory ID: 64967-003 Enseco ID: 64967-003

Matrix: Water Sampled: 11/10/87 Received: 11/11/87

Authorized: 11/11/87 Analyzed: 11/12/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	0.50
Ethylbenzene	N.D.	ug/L	0.50
Toluene	N.D.	ug/L	0.50
m-Xylene	N.D.	ug/L	0.50
o & p-Xylene(s)	N.D.	ug/L	0.50

N.D. = Not detected

Reported by: Michael Hoffman Approved by: Robert Keck

Sample: 64967-003

Enseco

BENZENE/ TOLUENE/ ETHYLBENZENE/ XYLENES (BTX)

EPA METHOD 602

Client Name: TENNECO OIL COMPANY

Client ID: VALDEZ A1 #14

Laboratory ID: 64967-004 Enseco ID: 64967-004

Matrix: Water Sampled: 11/10/87 Received: 11/11/87

Authorized: 11/11/87 Analyzed: 11/12/87

Parameter	Result	Units	Reporting Limit
Benzene	N.D.	ug/L	0.50
Ethylbenzene	N.D.	ug/L	0.50
Toluene	N.D.	ug/L	0.50
m-Xylene	N.D.	ug/L	0.50
o & p-Xylene(s)	N.D.	ug/L	0.50

N.D. = Not detected

Reported by: Michael Hoffman Approved by: Robert Keck

Enseco

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 602

Client Name: Tenneco Oil Company
Client ID: VALDEZ A1 #11
Lab ID: 000614-0001-SA Enseco ID: 1005299
Matrix: AQUEOUS Sampled: 28 JUN 88 Received: 29 JUN 88
Authorized: 29 JUN 88 Prepared: NA Analyzed: 30 JUN 88

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	0.50
Toluene	ND	ug/L	0.50
Ethyl benzene	ND	ug/L	0.50
Total xylenes	ND	ug/L	0.50

ND=Not Detected
NA=Not Applicable

Reported By: Stan Dunlavy Approved By: Kim Zilis

The cover letter is an integral part of this report.
Rev 230787

Enseco

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 602

Client Name: Tenneco Oil Company
Client ID: VALDEZ A1 #12
Lab ID: 000614-0002-SA Enseco ID: 1005300
Matrix: AQUEOUS Sampled: 28 JUN 88 Received: 29 JUN 88
Authorized: 29 JUN 88 Prepared: NA Analyzed: 30 JUN 88

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	0.50
Toluene	ND	ug/L	0.50
Ethyl benzene	ND	ug/L	0.50
Total xylenes	ND	ug/L	0.50

ND=Not Detected
NA=Not Applicable

Reported By: Stan Dunlavy Approved By: Kim Zilis

The cover letter is an integral part of this report.
Rev 230787

Enseco

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 602

Client Name: Tenneco Oil Company
Client ID: VALDEZ A1 #13
Lab ID: 000614-0003-SA Enseco ID: 1005301
Matrix: AQUEOUS Sampled: 28 JUN 88 Received: 29 JUN 88
Authorized: 29 JUN 88 Prepared: NA Analyzed: 30 JUN 88

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	0.50
Toluene	9.8	ug/L	0.50
Ethyl benzene	ND	ug/L	0.50
Total xylenes	ND	ug/L	0.50

ND=Not Detected
NA=Not Applicable

Reported By: Stan Dunlavy Approved By: Kim Zilis

The cover letter is an integral part of this report.
Rev 230787

Enseco

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 602

Client Name: Tenneco Oil Company
Client ID: VALDEZ A1 #14
Lab ID: 000614-0004-SA Enseco ID: 1005302
Matrix: AQUEOUS Sampled: 28 JUN 88 Received: 29 JUN 88
Authorized: 29 JUN 88 Prepared: NA Analyzed: 30 JUN 88

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	0.50
Toluene	ND	ug/L	0.50
Ethyl benzene	ND	ug/L	0.50
Total xylenes	3.5	ug/L	0.50

ND=Not Detected
NA=Not Applicable

Reported By: Stan Dunlavy Approved By: Kim Zilis

The cover letter is an integral part of this report.
Rev 230787