GW - 55

MONITORING REPORTS

DATE:

1991

ENVIROTECH INC.

Results of Laboratory Analysis of Groundwater for Site Assessment

Thriftway Bloomfield Refinery

Project #91819

October 1991

5796 U.S. HIGHWAY 64 - 3014 • FARMINGTON, NEW MEXICO 87401 • PHONE: (505) 632-0615

ENVIROTECH INC.

UNDERGROUND TANK TESTING • SITE ASSESSMENT • SITE REMEDIATION

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OIL CONSERVATION DIV.
SANTA FE

October 11, 1991

Thriftway Marketing Corporation

Attn: Mr. Ken Sinks
Environmental Specialist
710 East 20th
Farmington, New Mexico 87401

RE: Results of Laboratory Analysis of Groundwater for Site Assessment Thriftway Bloomfield Refinery

Project No: 91819

Dear Mr. Sinks:

Enclosed, are the results of aquifer pump tests and laboratory results of the groundwater samples collected at the Thriftway, Bloomfield Refinery. These tests and analyses are for the completion of the site assessment of hydrocarbon contamination at the refinery, initiated in June 1991 (refer to Results of Site Assessment, Hydrocarbon Contamination at Thriftway Bloomfield Refinery, prepared by Envirotech, Inc., dated July 1991).

As per your request, Envirotech has: 1] screened the laboratory results and prepared maps contouring the Benzene concentration and Total Dissolved Solids (refer to the attached Figures A-1 and A-2) and 2] analyzed the pump test data for characterization of the aquifer.

Groundwater Sampling and Analyses:

Groundwater sampling of the monitor wells constructed in June 1991 was performed by Mr. Jack Dewey, of Envirotech, Inc., on August 28 and 29, 1991. Groundwater samples were collected from the monitor wells after purging the wells of a minimum of three well volumes with a cleaned teflon bailer. The following samples were collected and analyzed:

1) For aromatic and halogenated volatile organics using EPA Methods 8010/8020, duplicate samples were placed in new 40

milliliter (ml) VOA vials, preserved with mercuric chloride.

2) For ICAP heavy metal analysis (EPA method 6010), a 250 ml water sample was collected in a new sample container and preserved with nitric acid.

3) For major anions and cations using standard EPA methods, a two liter water sample was collected in a clean sample container.

All sample containers were provided by the laboratory. After collection, all VOA samples were stored on ice until delivery to the laboratory.

Results of the groundwater analyses, laboratory quality control documentation, and sample chain-of-custody are attached in Section 1.

Summary of Laboratory Results:

Two contour maps were prepared to summarize the laboratory data and aid in the evaluation of the groundwater at the refinery site. Figure A-1, contours the results of the Benzene concentration in parts per billion (ppb or ug/l), determined by EPA Method 8020 for aromatic hydrocarbons. Figure A-2, contours the results of the Total Dissolved Solids determined at 180 degrees Celsius.

Review of Mr. Dewey's field notes, indicate that the samples collected from monitor wells (MW) #12 and MW #13 were switched during collection and labelling. The contour maps, Figure A-1 and Figure A-2, reflect the correct groundwater laboratory result locations.

Aquifer Characterization:

Pump testing was performed on two (2) monitor wells, MW #16 and MW #13, by Mr. Dewey of Envirotech, Inc., on September 19 and 20, 1991. The pump tests were performed using an electric parastallic pump (0.4 gallons per minute pumping rate) for drawdown. The drawdown and well recovery was measured and analyzed using a downhole pressure transducer and Rustrak Ranger II Data Logger with PRONTO support computer software manufactured by Gulton-Rustrak.

The results of the pump tests are presented in Figures B-1 to B-2 (Recovery) and Figures B-3 to B-4 (Drawdown), attached in Section 2.

Using the data acquired during the pump tests, the coefficient of transmissivity (T) and coefficient of storage (S) can be determined. The transmissivity and coefficient of storage are important parameters required to characterize an aquifer. The coefficient of transmissivity, is a measure of the capability of the aquifer to produce fluid. The coefficient of storage, is a

measure of the amount of water an aquifer will yield during withdrawal by pumping or drainage.

For the analysis, data measured during both the drawdown and recovery are used. For transmissivity, the residual drawdown (recovery) is plotted against the ratio of "time after pumping" (t) divided by "time after pumping stopped" (t'), refer to Figures B-1 and B-2.

The coefficient of transmissivity is estimated as:

$$T = 264Q/ds'$$

Where: T = coefficient of transmissivity [gallons per day per foot (gpd/ft)].
Q = the pumping rate in gpm.
ds' = the slope of [Residual Drawdown vs log(t/t')].

The coefficient of transmissivity for MW #13 and MW #16 are 117 gpd/ft and 2.64 gpd/ft, respectively.

For the coefficient of storage, the drawdown is plotted against the log of "t", refer to Figures B-3 and B-4.

The coefficient of storage is estimated as:

$$S = 0.3(T)t_o/r^2$$

Where: S = storage coefficient
t_o = intercept at zero drawdown [days]
r = distance from pumped well [assumed as 0.33 ft, the test bore diameter, since no observation well monitor during pump test]

The estimated coefficients of storage for MW #13 and MW #16 are 0.09 and 0.005, respectively. The literature [Fletcher G. Driscoll, Groundwater and Wells, (St. Paul, Minnesota: Johnson Filtration Systems Inc., 1986), pp. 205-267], indicates a coefficient of storage on the order of 0.01 for an unconfined aquifer, with soils classified as silty sands to sandy silts with variable amounts of clay and gravel.

LIMITATIONS AND CLOSURE

The scope of our services was limited to the collection of groundwater samples, laboratory analysis of the groundwater samples collected, and pump testing and analysis of the aquifer. These services were provided, as requested by Mr. Ken Sinks of Thriftway Marketing Corporation, to assist in the assessment of soil and groundwater with respect to hydrocarbon contamination at the

Thriftway Bloomfield Refinery.

This information has been prepared for the exclusive use of the Thriftway Marketing Corporation as it pertains to their refinery property, south of Bloomfield, New Mexico. All work has been preformed in accordance with generally accepted practices in geotechnical/environmental engineering and hydrogeology.

Respectfully Submitted,
ENVIROTECH INC.

Michael K. Lane, P.E.
Geological Engineer

Reviewed By:

Jack D. Dewey
Hydrologist

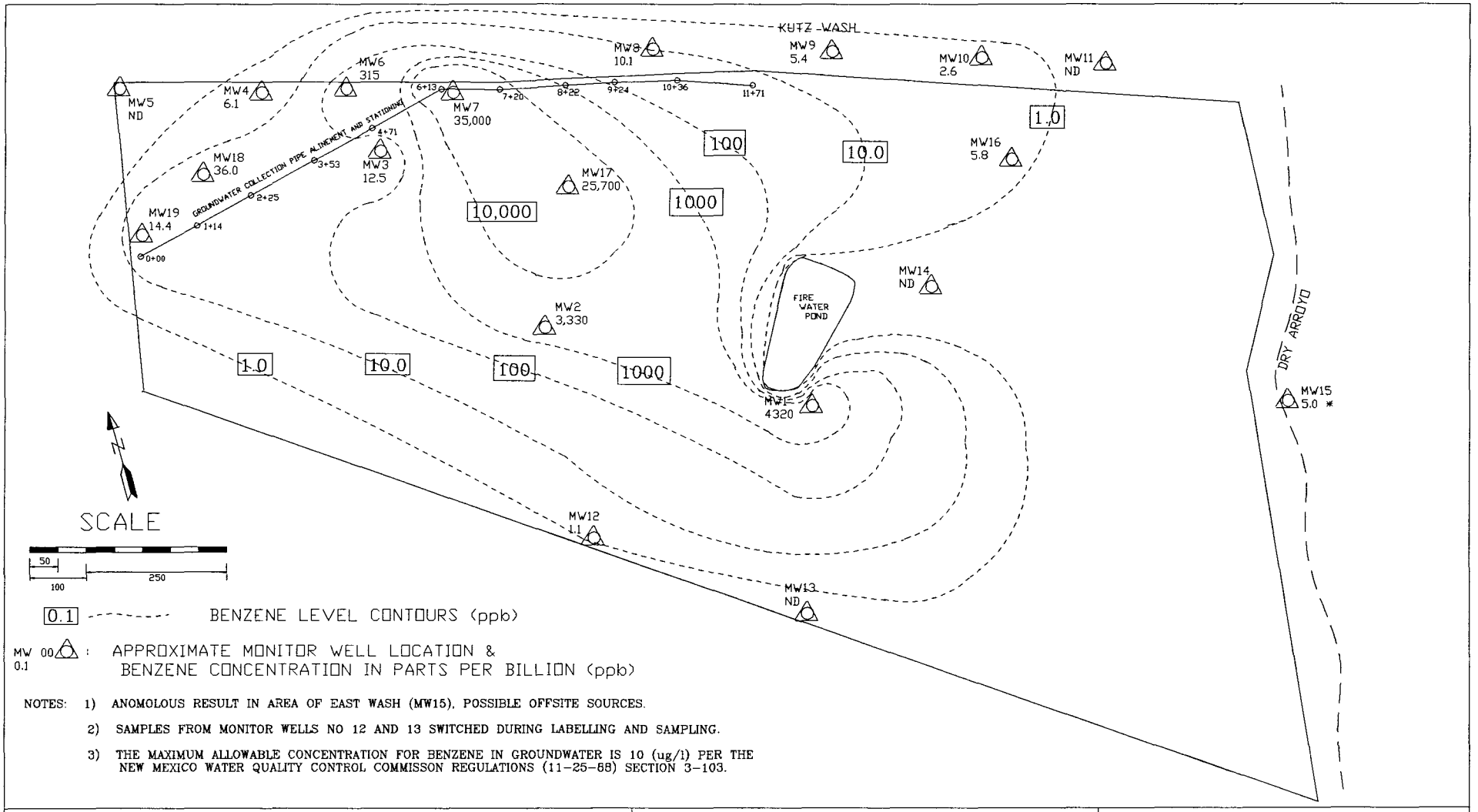
Morris Young
President

Attachments:

Section 1: Sheet A-1: Benzene in Groundwater Contour Map
Sheet A-2: TDS in Groundwater Contour Map
Laboratory Analysis: EPA Methods 8020/8010
Laboratory Analysis: Major Cations & Anions
Chain-of-Custodies

Section 2: Figure B-1: Pump Test Recovery for MW 13 (9-20-91)
Figure B-2: Pump Test Recovery for MW 16 (9-19-91)
Figure B-3: Pump Test Drawdown for MW 13 (9-20-91)
Figure B-4: Pump Test Drawdown for MW 16 (9-19-91)

C: Mr. R.J. Dalley, Thriftway Marketing Corporation



NOTES: 1) ANOMOLOUS RESULT IN AREA OF EAST WASH (MW15), POSSIBLE OFFSITE SOURCES.

2) SAMPLES FROM MONITOR WELLS NO 12 AND 13 SWITCHED DURING LABELLING AND SAMPLING.

3) THE MAXIMUM ALLOWABLE CONCENTRATION FOR BENZENE IN GROUNDWATER IS 10 (ug/l) PER THE NEW MEXICO WATER QUALITY CONTROL COMMISSON REGULATIONS (11-25-68) SECTION 3-103.

RESULTS OF GROUNDWATER ANALYSIS AT THRIFTWAY REFINERY THRIFTWAY MARKETING CORP. BLOOMFIELD, NEW MEXICO

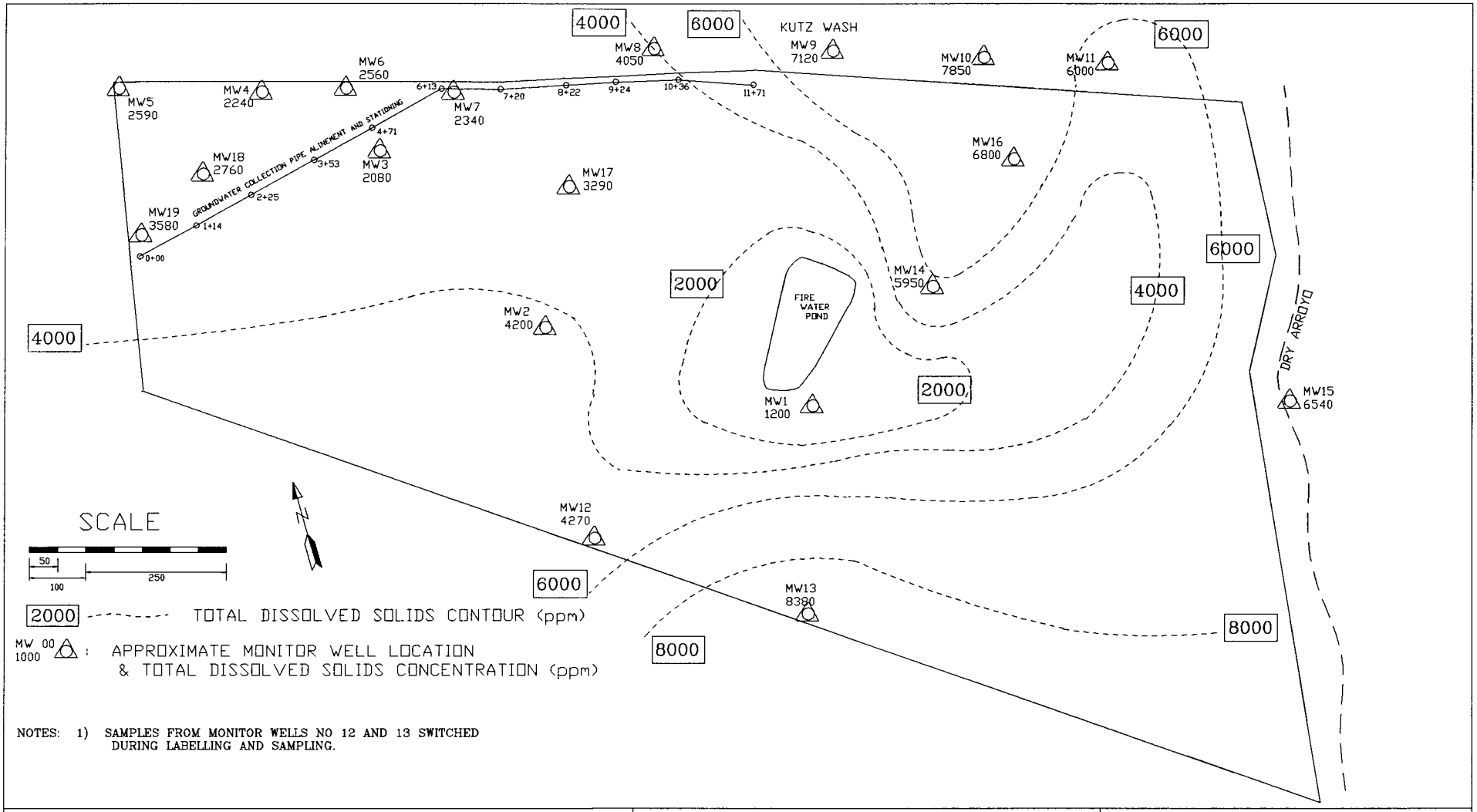
ENVIROTECH INC.

ENVIRONMENTAL SCIENTISTS & ENGINEERS
5796 U.S. HIGHWAY 64-3014
FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615

BENZENE IN GROUNDWATER

CONTOUR MAP

FIGURE A-1
AUGUST 1991
PROJECT NO: 91819



NOTES: 1) SAMPLES FROM MONITOR WELLS NO 12 AND 13 SWITCHED DURING LABELLING AND SAMPLING.

RESULTS OF GROUNDWATER ANALYSIS AT THRIFTWAY REFINERY THRIFTWAY MARKETING CORP. BLOOMFIELD, NEW MEXICO

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TOTAL DISSOLVE SOLIDS IN GROUNDWATER

CONTOUR MAP

FIGURE A-2
AUGUST 1991
PROJECT NO: 91819

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ENVIRONMENTAL SCIENTISTS

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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082891819-TB
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 ml

Analyte	Analytical Result	Detection Limit	Units
Benzene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
m,p-Xylene	ND	1.0	ug/L
o-Xylene	ND	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Lion
Analyst

David Young
Reviewed

ENVIROTECH INC.
ENVIRONMENTAL SCIENTISTS

5796 U.S. HIGHWAY 64-3014
FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615

** QUALITY ASSURANCE REPORT
METHOD BLANK - PURGABLE AROMATICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-MB
Matrix: Water
Preservative: $HgCL_2$
Sample Condition: received on ice

Date Reported: 9-6-91
Date Sampled:
Date Received:
Date Extracted:
Date Analyzed: 8-3--91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Benzene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
m,p-Xylene	ND	1.0	ug/L
o-Xylene	ND	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Carr
Analyst

David Young
Reviewed

ENVIROTECH INC.
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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Co.
Sample ID: Refinery
Lab ID#: 082891819-1
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-29-91
Injection Vol: 1 ul & 50 ul

Analyte	Analytical Result	Detection Limit	Units
Benzene	4321	1000	ug/L
Toluene	2352	100	ug/L
Ethylbenzene	634.7	100	ug/L
m,p-Xylene	4492	100	ug/L
o-Xylene	645.2	100	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Lyon
Analyst

Mark D. Young
Reviewed

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** QUALITY ASSURANCE REPORT
SURROGANTE STANDARD - PURGABLE AROMATICS

Laboratory Number: 082891819-2
Sample Matrix: Water
Preservative: $HgCl_2$
Sample Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Extracted:
Date Analyzed: 8-29-91

Analyte	% Recovery
Trifluorotoluene	101

QA ACCEPTANCE CRITERIA:

Analyte	Acceptance Range %
Trifluorotoluene	85 - 115

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Lyon
Analyst

Reviewed

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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-2
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-29-91
Date Received: 8-29-91
Date Analyzed: 8-30-91
Injection Vol: 200 ul

Analyte	Analytical Result	Detection Limit	Units
Benzene	3332	25.0	ug/L
Toluene	ND	25.0	ug/L
Ethylbenzene	536.3	25.0	ug/L
m,p-Xylene	972.1	25.0	ug/L
o-Xylene	ND	25.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Lamm
Analyst

David D. Young
Reviewed

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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-3
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-29-91
Injection Vol: 5 ml

Analyte	Analytical Result	Detection Limit	Units
Benzene	12.5	1.0	ug/L
Toluene	3.9	1.0	ug/L
Ethylbenzene	2.1	1.0	ug/L
m,p-Xylene	1.4	1.0	ug/L
o-Xylene	<1.0	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Eson
Analyst

Marvin D. Young
Reviewed

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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-4
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-29-91
Injection Vol: 5 ml

Analyte	Analytical Result	Detection Limit	Units
Benzene	6.1	1.0	ug/L
Toluene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
m,p-Xylene	ND	1.0	ug/L
o-Xylene	ND	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Larson
Analyst

Mark D. Young
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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-5
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-29-91
Injection Vol: 5 ml

Analyte	Analytical Result	Detection Limit	Units
Benzene	ND	1.0	ug/L
Toluene	1.5	1.0	ug/L
Ethylbenzene	<1.0	1.0	ug/L
m,p-Xylene	1.2	1.0	ug/L
o-Xylene	<1.0	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Larson
Analyst

David D. Young
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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082891819-5 Duplicate
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 ml

Analyte	Analytical Result	Detection Limit	Units
Benzene	ND	1.0	ug/L
Toluene	1.3	1.0	ug/L
Ethylbenzene	<1.0	1.0	ug/L
m,p-Xylene	1.4	1.0	ug/L
o-Xylene	<1.0	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Carson
Analyst

David Young
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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-6
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-29-91
Injection Vol: 5 ml & 100 ul

Analyte	Analytical Result	Detection Limit	Units
Benzene	314.8	50.0	ug/L
Toluene	5.8	1.0	ug/L
Ethylbenzene	81.9	1.0	ug/L
m,p-Xylene	231.7	50.0	ug/L
o-Xylene	3.8	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Lion
Analyst

Mavis D. Young
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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-8
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 ml

Analyte	Analytical Result	Detection Limit	Units
Benzene	10.1	1.0	ug/L
Toluene	16.8	1.0	ug/L
Ethylbenzene	1.9	1.0	ug/L
m,p-Xylene	12.9	1.0	ug/L
o-Xylene	3.8	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Crow
Analyst

Mark D. Young
Reviewed

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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-9
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 ml

Analyte	Analytical Result	Detection Limit	Units
Benzene	5.4	1.0	ug/L
Toluene	16.3	1.0	ug/L
Ethylbenzene	1.9	1.0	ug/L
m,p-Xylene	15.8	1.0	ug/L
o-Xylene	4.5	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Crow
Analyst

Mark D. Young
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PHONE: (505) 632-0615

EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-7
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-29-91
Injection Vol: 50 ul & 25 ul

Analyte	Analytical Result	Detection Limit	Units
Benzene	35037	200	ug/L
Toluene	60130	200	ug/L
Ethylbenzene	375.0	100	ug/L
m,p-Xylene	2741	100	ug/L
o-Xylene	602.2	100	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Larson
Analyst

David D. Young
Reviewed

ENVIROTECH INC.

ENVIRONMENTAL SCIENTISTS

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FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615

** QUALITY ASSURANCE REPORT
MATRIX SPIKE - PURGABLE AROMATICS

Laboratory Number: 082891819-10
Sample Matrix: Water
Preservative: $HgCl_2$
Sample Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Extracted:
Date Analyzed: 8-30-91

Analyte	Spike Added (ug/L)	Sample Result (ug/L)	Spiked Sample Result (ug/L)	Percent Recovery
Benzene	50	2.6	49.1	98
Toulene	50	9.3	47.1	94
Ethylbenzene	50	1.3	48.6	97

ND - Analyte not detected at athe stated detection limit.

QA ACCEPTANCE CRITERIA:

Analyte	Acceptance Range %
Benzene	39 - 150
Toluene	46 - 148
Ethylbenzene	32 - 160

Reference:

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Erom
Analyst

David D. Young
Reviewed

ENVIROTECH INC.
ENVIRONMENTAL SCIENTISTS

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FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615

EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-10
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 ml

Analyte	Analytical Result	Detection Limit	Units
Benzene	2.6	1.0	ug/L
Toluene	9.3	1.0	ug/L
Ethylbenzene	1.3	1.0	ug/L
m,p-Xylene	10.1	1.0	ug/L
o-Xylene	3.0	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Lewis
Analyst

David D. Young
Reviewed

ENVIROTECH INC.
ENVIRONMENTAL SCIENTISTS

5796 U.S. HIGHWAY 64-3014
FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615

EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-11
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 ml

Analyte	Analytical Result	Detection Limit	Units
Benzene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
Ethylbenzene	<1.0	1.0	ug/L
m,p-Xylene	2.1	1.0	ug/L
o-Xylene	<1.0	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Conner
Analyst

David D. Young
Reviewed

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** QUALITY ASSURANCE REPORT
SURROGANTE STANDARD - PURGABLE AROMATICS

Laboratory Number: 082891819-11
Sample Matrix: Water
Preservative: $HgCl_2$
Sample Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-29-91
Date Extracted:
Date Analyzed: 8-30-91

Analyte	% Recovery
Trifluorotoluene	98

QA ACCEPTANCE CRITERIA:

Analyte	Acceptance Range %
Trifluorotoluene	85 - 115

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael J. Lavon
Analyst

Mavis D. Young
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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-12
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 ml

Analyte	Analytical Result	Detection Limit	Units
Benzene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
m,p-Xylene	ND	1.0	ug/L
o-Xylene	ND	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael D. Lewis
Analyst

Mary D. Young
Reviewed

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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-13
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 ml

Analyte	Analytical Result	Detection Limit	Units
Benzene	1.1	1.0	ug/L
Toluene	3.6	1.0	ug/L
Ethylbenzene	<1.0	1.0	ug/L
m,p-Xylene	4.6	1.0	ug/L
o-Xylene	1.6	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Larson
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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-14
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-29-91
Date Received: 8-29-91
Date Analyzed: 8-30-91
Injection Vol: 5 ml

Analyte	Analytical Result	Detection Limit	Units
Benzene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
Ethylbenzene	<1.0	1.0	ug/L
m,p-Xylene	1.0	1.0	ug/L
o-Xylene	<1.0	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Larson
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1

EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-15
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-29-91
Date Received: 8-29-91
Date Analyzed: 8-30-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-15
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-29-91
Date Received: 8-29-91
Date Analyzed: 8-30-91
Injection Vol: 5 ml

Analyte	Analytical Result	Detection Limit	Units
Benzene	5.0	1.0	ug/L
Toluene	9.0	1.0	ug/L
Ethylbenzene	1.3	1.0	ug/L
m,p-Xylene	10.6	1.0	ug/L
o-Xylene	2.6	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

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Analyst

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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-16
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-29-91
Date Received: 8-29-91
Date Analyzed: 8-30-91
Injection Vol: 5 ml

Analyte	Analytical Result	Detection Limit	Units
Benzene	5.8	1.0	ug/L
Toluene	<1.0	1.0	ug/L
Ethylbenzene	42.9	1.0	ug/L
m,p-Xylene	2.9	1.0	ug/L
o-Xylene	<1.0	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-17
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-29-91
Date Received: 8-29-91
Date Analyzed: 8-30-91
Injection Vol: 25 ul

Analyte	Analytical Result	Detection Limit	Units
Benzene	25660	200.0	ug/L
Toluene	21453	200.0	ug/L
Ethylbenzene	1074	200.0	ug/L
m,p-Xylene	8246	200.0	ug/L
o-Xylene	2126	200.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-18
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 ml

Analyte	Analytical Result	Detection Limit	Units
Benzene	36.0	1.0	ug/L
Toluene	3.3	1.0	ug/L
Ethylbenzene	5.4	1.0	ug/L
m,p-Xylene	126.3	1.0	ug/L
o-Xylene	2.4	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

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Mark D. Young
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EPA METHOD 8020
PURGEABLE AROMATICS

Client: Thriftway Marketing Corp.
Sample ID: Refinery
Lab ID#: 082991819-19
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-6-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 mL & 0.5 mL

Analyte	Analytical Result	Detection Limit	Units
Benzene	14.4	1.0	ug/L
Toluene	5.7	1.0	ug/L
Ethylbenzene	578.2	10.0	ug/L
m,p-Xylene	1157	10.0	ug/L
o-Xylene	35.6	1.0	ug/L

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Lion
Analyst

Mary D. Young
Reviewed

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** QUALITY ASSURANCE REPORT
METHOD BLANK - PURGABLE HALOGENATED VOTATILE ORGANICS

Client:
Sample ID:
Lab ID#: Method Blank
Matrix: Water
Preservative:
Condition:

Date Reported: 9-9-91
Date Sampled:
Date Received:
Date Analyzed: 8-30-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

Lab Number: Date Sampled:

QA ACCEPTANCE CRITERIA:

Analyte	Acceptance Range (%)
Bromodichloromethane	42 - 172
Bromoform	13 - 159
Chlorobenzene	38 - 150
Chloroform	49 - 133
Dibromochloromethane	24 - 191
1,2-Dichlorobenzene	D - 193
1,3-Dichlorobenzene	7 - 187
1,4-Dichlorobenzene	42 - 143
1,1-Dichloroethane	47 - 132
1,2-Dichloroethane	51 - 147
1,1-Dichloroethene	28 - 167
trans-1,2-Dichloroethene	38 - 155
1,2-Dichloropropane	44 - 156
cis-1,2-Dichloropropene	22 - 178
trans-1,3-Dichloropropene	22 - 178
Tetrachlorethene	35 - 146
1,1,1-Trichloroethane	41 - 138
1,1,2-Trichloroethane	39 - 136
Trichlorethene	35 - 146
Trichlorofluoromethane	21 - 156

D = Detected; result must be greater than zero.

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael D. Eason
Analyst

David D Young
Reviewed

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** QUALITY ASSURANCE REPORT
SURROGANTE STANDARD RECOVERY - HALOGENATED VOLATILE ORGANICS

Laboratory Number: 082891819-1
Sample Matrix: Water
Preservative: $HgCl_2$
Sample Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Extracted:
Date Analyzed: 8-29-91

Analyte	% Recovery
Bromochloromethane	94

QA ACCEPTANCE CRITERIA:

Analyte	Acceptance Range %
Bromochloromethane	85 - 115

Reference:
Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Larson
Analyst

David D. Young
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** QUALITY ASSURANCE REPORT
MATRIX SPIKE - HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-3 Matrix Spike
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on Ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-29-91
Injection Vol: 5 mL

Analyte	Spike Added (ug/L)	Sample Result (ug/L)	Spiked Sample Result (ug/L)	Percent Recovery
Bromodichloromethane	10	ND	6.5	65
Bromoform	10	ND	8.3	83
Chlorobenzene	10	ND	9.1	91
Chloroform	10	ND	7.8	78
Dibromochloromethane	10	ND	9.9	99
1,2-Dichlorobenzene	10	ND	8.9	89
1,3-Dichlorobenzene	10	ND	8.8	88
1,4-Dichlorobenzene	10	ND	9.1	91
1,1-Dichloroethane	10	ND	6.3	63
1,2-Dichloroethane	10	ND	6.8	68
1,1-Dichloroethene	10	ND	7.2	72
trans-1,2-Dichloroethene	10	ND	8.2	82
1,2-Dichloropropane	10	ND	7.5	75
cis-1,2-Dichloropropene	10	ND	7.3	73
trans-1,3-Dichloropropene	10	ND	8.4	84
1,1,1,2-Tetrachloroethane	10	ND	6.9	69
Tetrachlorethene	10	ND	8.6	86
1,1,1-Trichloroethane	10	ND	9.0	90
1,1,2-Trichloroethane	10	ND	8.3	83
Trichlorethene	10	ND	9.3	93
Trichlorofluoromethane	10	ND	5.4	54

ND - Analyte not detected at given detection level.

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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-1
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-29-91
Injection Vol: 50 uL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	100.0	ug/uL
Bromoform	ND	100.0	ug/uL
Bromomethane & Chloroethane	ND	100.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	100.0	ug/uL
Chlorobenzene	ND	100.0	ug/uL
Chloroform	ND	100.0	ug/uL
Chloromethane & Vinyl Chloride	ND	100.0	ug/uL
Dibromochloromethane	ND	100.0	ug/uL
Dibromomethane	ND	100.0	ug/uL
1,2-Dichlorobenzene	ND	100.0	ug/uL
1,3-Dichlorobenzene	ND	100.0	ug/uL
1,4-Dichlorobenzene	ND	100.0	ug/uL
Dichlorodifluoromethane	ND	100.0	ug/uL
1,1-Dichloroethane	ND	100.0	ug/uL
1,2-Dichloroethane	ND	100.0	ug/uL
1,1-Dichloroethene	ND	100.0	ug/uL
trans-1,2-Dichloroethene	ND	100.0	ug/uL
cis-1,2-Dichloroethene	ND	100.0	ug/uL
1,2-Dichloropropane	ND	100.0	ug/uL
trans-1,3-Dichloropropene	ND	100.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	100.0	ug/uL

Lab ID#: 082891819-1 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	100.0	ug/uL
Tetrachlorethene	ND	100.0	ug/uL
1,1,1-Trichloroethane	ND	100.0	ug/uL
1,1,2-Trichloroethane	ND	100.0	ug/uL
Trichlorethene	ND	100.0	ug/uL
Trichlorofluoromethane	ND	100.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael J. Eaton
Analyst

David Young
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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-2
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-29-91
Injection Vol: 200 uL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	25.0	ug/uL
Bromoform	ND	25.0	ug/uL
Bromomethane & Chloroethane	ND	25.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	25.0	ug/uL
Chlorobenzene	ND	25.0	ug/uL
Chloroform	ND	25.0	ug/uL
Chloromethane & Vinyl Chloride	ND	25.0	ug/uL
Dibromochloromethane	ND	25.0	ug/uL
Dibromomethane	ND	25.0	ug/uL
1,2-Dichlorobenzene	ND	25.0	ug/uL
1,3-Dichlorobenzene	ND	25.0	ug/uL
1,4-Dichlorobenzene	ND	25.0	ug/uL
Dichlorodifluoromethane	ND	25.0	ug/uL
1,1-Dichloroethane	ND	25.0	ug/uL
1,2-Dichloroethane	ND	25.0	ug/uL
1,1-Dichloroethene	ND	25.0	ug/uL
trans-1,2-Dichloroethene	ND	25.0	ug/uL
cis-1,2-Dichloroethene	ND	25.0	ug/uL
1,2-Dichloropropane	ND	25.0	ug/uL
trans-1,3-Dichloropropene	ND	25.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	25.0	ug/uL

Lab ID#: 082891819-2 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	25.0	ug/uL
Tetrachlorethene	ND	25.0	ug/uL
1,1,1-Trichloroethane	ND	25.0	ug/uL
1,1,2-Trichloroethane	ND	25.0	ug/uL
Trichlorethene	ND	25.0	ug/uL
Trichlorofluoromethane	ND	25.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Erwin
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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-3
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-29-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

Lab ID#: 082891819-3 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-4
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-29-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

Lab ID#: 082891819-4 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-5
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-29-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

Lab ID#: 082891819-5 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-6
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-29-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

Lab ID#: 082891819-6 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-7
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-29-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	100	ug/uL
Bromoform	ND	100	ug/uL
Bromomethane & Chloroethane	ND	100	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	100	ug/uL
Chlorobenzene	ND	100	ug/uL
Chloroform	ND	100	ug/uL
Chloromethane & Vinyl Chloride	ND	100	ug/uL
Dibromochloromethane	ND	100	ug/uL
Dibromomethane	ND	100	ug/uL
1,2-Dichlorobenzene	ND	100	ug/uL
1,3-Dichlorobenzene	ND	100	ug/uL
1,4-Dichlorobenzene	ND	100	ug/uL
Dichlorodifluoromethane	ND	100	ug/uL
1,1-Dichloroethane	ND	100	ug/uL
1,2-Dichloroethane	ND	100	ug/uL
1,1-Dichloroethene	ND	100	ug/uL
trans-1,2-Dichloroethene	ND	100	ug/uL
cis-1,2-Dichloroethene	ND	100	ug/uL
1,2-Dichloropropane	ND	100	ug/uL
trans-1,3-Dichloropropene	ND	100	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	100	ug/uL

Lab ID#: 082891819-7 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	100	ug/uL
Tetrachlorethene	ND	100	ug/uL
1,1,1-Trichloroethane	ND	100	ug/uL
1,1,2-Trichloroethane	ND	100	ug/uL
Trichlorethene	ND	100	ug/uL
Trichlorofluoromethane	ND	100	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-8
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

Lab ID#: 082891819-8 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-9
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

Lab ID#: 082891819-9 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:
Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-10
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

Lab ID#: 082891819-10 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-11
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-29-91
Date Received: 8-29-91
Date Analyzed: 8-30-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

Lab ID#: 082891819-11 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-12
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 25 uL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

Lab ID#: 082891819-12 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael J. Parson
Analyst

David D. Young
Reviewed

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1

EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-13
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

Lab ID#: 082891819-13 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Paron
Analyst

David D Young
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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-14
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-29-91
Date Received: 8-29-91
Date Analyzed: 8-30-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

Lab ID#: 082891819-14 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael T. Eaton
Analyst

Reviewed

Lab ID#: 082891819-15 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael J. Larson
Analyst

David D. Young
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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-16
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-29-91
Date Received: 8-29-91
Date Analyzed: 8-30-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

Lab ID#: 082891819-16 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Eaton
Analyst

David D Young
Reviewed

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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-17
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 25 uL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	200	ug/uL
Bromoform	ND	200	ug/uL
Bromomethane & Chloroethane	ND	200	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	200	ug/uL
Chlorobenzene	ND	200	ug/uL
Chloroform	ND	200	ug/uL
Chloromethane & Vinyl Chloride	ND	200	ug/uL
Dibromochloromethane	ND	200	ug/uL
Dibromomethane	ND	200	ug/uL
1,2-Dichlorobenzene	ND	200	ug/uL
1,3-Dichlorobenzene	ND	200	ug/uL
1,4-Dichlorobenzene	ND	200	ug/uL
Dichlorodifluoromethane	ND	200	ug/uL
1,1-Dichloroethane	ND	200	ug/uL
1,2-Dichloroethane	ND	200	ug/uL
1,1-Dichloroethene	ND	200	ug/uL
trans-1,2-Dichloroethene	ND	200	ug/uL
cis-1,2-Dichloroethene	ND	200	ug/uL
1,2-Dichloropropane	ND	200	ug/uL
trans-1,3-Dichloropropene	ND	200	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	200	ug/uL

Lab ID#: 082891819-17 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	200	ug/uL
Tetrachlorethene	ND	200	ug/uL
1,1,1-Trichloroethane	ND	200	ug/uL
1,1,2-Trichloroethane	ND	200	ug/uL
Trichlorethene	ND	200	ug/uL
Trichlorofluoromethane	ND	200	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-18
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

Lab ID#: 082891819-18 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael J. Eron
Analyst

Mark D. Young
Reviewed

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EPA METHOD 8010
PURGEABLE HALOGENATED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-19
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

Lab ID#: 082891819-19 Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Eaton
Analyst

David D. Young
Reviewed

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EPA METHOD 8010
PURGEABLE HALOGEANTED VOLATILE ORGANICS

Client: Thriftway Marketing Inc.
Sample ID: Refinery
Lab ID#: 082891819-Travel Blank
Matrix: Water
Preservative: $HgCl_2$
Condition: Received on ice

Date Reported: 9-9-91
Date Sampled: 8-28-91
Date Received: 8-28-91
Date Analyzed: 8-30-91
Injection Vol: 5 mL

Analyte	Analytical Result	Detection Limit	Units
Bromodichloromethane	ND	1.0	ug/uL
Bromoform	ND	1.0	ug/uL
Bromomethane & Chloroethane	ND	1.0	ug/uL
Carbon tetrachloride & 1,1-Dichloropropene	ND	1.0	ug/uL
Chlorobenzene	ND	1.0	ug/uL
Chloroform	ND	1.0	ug/uL
Chloromethane & Vinyl Chloride	ND	1.0	ug/uL
Dibromochloromethane	ND	1.0	ug/uL
Dibromomethane	ND	1.0	ug/uL
1,2-Dichlorobenzene	ND	1.0	ug/uL
1,3-Dichlorobenzene	ND	1.0	ug/uL
1,4-Dichlorobenzene	ND	1.0	ug/uL
Dichlorodifluoromethane	ND	1.0	ug/uL
1,1-Dichloroethane	ND	1.0	ug/uL
1,2-Dichloroethane	ND	1.0	ug/uL
1,1-Dichloroethene	ND	1.0	ug/uL
trans-1,2-Dichloroethene	ND	1.0	ug/uL
cis-1,2-Dichloroethene	ND	1.0	ug/uL
1,2-Dichloropropane	ND	1.0	ug/uL
trans-1,3-Dichloropropene	ND	1.0	ug/uL
1,1,2,2-Tetrachloroethane & 1,2,3-Trichloropropane	ND	1.0	ug/uL

Lab ID#: 082891819-TB

Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael L. Eason
Analyst

Morris D. Young
Reviewed

Lab ID#: 082891819-TB

Report Date: 9-9-91

Analyte	Analytical Result	Detection Limit	Units
1,1,1,2-Tetrachloroethane	ND	1.0	ug/uL
Tetrachlorethene	ND	1.0	ug/uL
1,1,1-Trichloroethane	ND	1.0	ug/uL
1,1,2-Trichloroethane	ND	1.0	ug/uL
Trichlorethene	ND	1.0	ug/uL
Trichlorofluoromethane	ND	1.0	ug/uL

ND - Analyte not detected at given detection level.

Comments:

Reference:

Method 8010, Aromatic Volatile Organics, Test Methods for Evaluation Solid Waste, SW-846, United States Environmental Protection Agency, SW-846, Vol. IB, September 1990.

Michael J. Eaton
Analyst

David D Young
Reviewed

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANAYLSIS/PARAMETERS
THRIFTWAY MARKETING	REFINERY	
Sampler: (Signature) Jack D. Dewey	Chain of Custody Tape No.	

Sample No/ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	8010	8020						Remarks
MW # 2	8-29-91	1110	0829918 19-2	WATER	✓	✓						
MW #11	8-29-91	1045	0829918 19-11	WATER	✓	✓						
MW # 14	8-29-91	1005	0829918 19-14	WATER	✓	✓						
MW # 15	8-29-91	0925	0829918 19-15	WATER	✓	✓						
MW # 16	8-29-91	1025	0829918 19-16	WATER	✓	✓						
~~MW #17~~												

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Jack D. Dewey	8/29/91	1520	Michael J. Lenon	8-29-91	1500
~~Relinquished by: (Signature)~~ M 2 E		8-29-91	Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

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CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANAYLSIS/PARAMETERS							
THRIFTWAY MARKETING	REFINERY								
Sampler: (Signature) Jack D. Dewey	Chain of Custody Tape No.	8020	8010						Remarks
Sample No/ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix							
mw # 1	8-28-91	1610	0828911819-1	WATER	✓	✓						
mw # 3	8-28-91	1250	0828911819-3	WATER	✓	✓						
mw # 4	8-28-91	1205	0828911819-4	WATER	✓	✓						
mw # 5	8-28-91	1125	0828911819-5	WATER	✓	✓						
mw # 6	8-28-91	1230	0828911819-6	WATER	✓	✓						
mw # 7	8-28-91	1320	0828911819-7	WATER	✓	✓						
mw # 8	8-28-91	1420	0828911819-8	WATER	✓	✓						
mw # 9	8-28-91	1435	0828911819-9	WATER	✓	✓						
MW # 10	8-28-91	1455	0828911819-10	WATER	✓	✓						

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Jack D. Dewey	8/28/91	1700	Michael D. Eaton	8-28-91	1700
~~Relinquished by: (Signature)~~			Received by: (Signature)		
	M2E	8-28-91			
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH Inc.
5796 US HIGHWAY 64-3014
FARMINGTON, NEW MEXICO 87401
(505) 632-0615

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANAYLSIS/PARAMETERS							
THRIFTWAY MARKETING	REFINERY								
Sampler: (Signature) Jack D. Dewey	Chain of Custody Tape No.	8010	8020						Remarks
Sample No/ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix							
MW # 12	8-28-91	1550	0828 91819-12	WATER	✓	✓						
MW # 13	8-28-91	1530	0828 91819-13	WATER	✓	✓						
MW # 17	8-28-91	1355	0828 91819-17	WATER	✓	✓						
MW # 18	8-28-91	1103	0828 91819-18	WATER	✓	✓						
MW # 19	8-28-91	1030	0828 91819-19	WATER	✓	✓						

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Jack D. Dewey	8/28/91	1700	Michael D. Larson	8-28-91	1700
~~Relinquished by: (Signature)~~ M & E	8-28-91		Received by: (Signature)		
Relinquished by: (Signature)			~~Received by: (Signature)~~		

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Inter·Mountain Laboratories, Inc.

2506 W. Main Street
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CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-1		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7059	DATE COLLECTED:	08/29/91

Lab pH (s.u.)		7.32	
Lab conductivity, umhos/cm		2000	
Lab resistivity, ohm-m		5.01	
Total dissolved solids (180), mg/L		1200	
Total dissolved solids (calc), mg/L		1220	
Total alkalinity as CaC03, mg/L		1110	
Total hardness as CaC03, mg/L		269	
Sodium absorption ratio		10.9	
Fluoride, mg/L		0.77	
	mg/L	meq/L	
Bicarbonate as HC03	1360	22.3	
Carbonate as C03	0	0	
Chloride	19.4	0.55	
Sulfate	18.1	0.38	
Calcium	97.9	4.88	
Magnesium	6.04	0.5	
Potassium	2.82	0.07	
Sodium	409	17.8	
Major cations		23.3	
Major anions		23.2	
Cation/anion difference		0.14	%

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-1
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7059 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	0.014	<0.005
Calcium (Ca)	92.4	<0.5
Cadmium (Cd)	0.002	<0.002
Potassium (K)	0.7	<0.5
Magnesium (Mg)	9.1	<0.5
Sodium (Na)	348.3	<0.5
Lead (Pb)	0.02	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	ND	<0.1
Boron (B)	0.31	<0.01
Barium (Ba)	0.7	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	24.4	<0.05
Manganese (Mn)	1.60	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	0.01	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	25.9	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	0.10	<0.01

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

Wanda Orso
Water Lab Manager

Inter·Mountain Laboratories, Inc.

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CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-2		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7060	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.19
Lab conductivity, umhos/cm	6060
Lab resistivity, ohm-m	1.65
Total dissolved solids (180), mg/L	4200
Total dissolved solids (calc), mg/L	4030
Total alkalinity as CaC03, mg/L	1990
Total hardness as CaC03, mg/L	755
Sodium absorption ratio	21.2
Fluoride, mg/L	0.46

	mg/L	meq/L
Bicarbonate as HC03	2420	39.7
Carbonate as C03	0	0
Chloride	49.4	1.39
Sulfate	1460	30.3
Calcium	285	14.2
Magnesium	10.7	0.88
Potassium	5.2	0.13
Sodium	1030	58.2
Major cations		73.4
Major anions		71.4
Cation/anion difference		1.37 %

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-2
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7060 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	0.007	<0.005
Calcium (Ca)	108.6	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	0.7	<0.5
Magnesium (Mg)	34.2	<0.5
Sodium (Na)	1085.1	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	ND	<0.1
Boron (B)	0.50	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	0.40	<0.05
Manganese (Mn)	0.20	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	15.5	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	ND	<0.01

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

Wanda Orso
Water Lab Manager

Inter·Mountain Laboratories, Inc.

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CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-3		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7061	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.39
Lab conductivity, umhos/cm	3240
Lab resistivity, ohm-m	3.08
Total dissolved solids (180), mg/L	2080
Total dissolved solids (calc), mg/L	1970
Total alkalinity as CaC03, mg/L	1030
Total hardness as CaC03, mg/L	425
Sodium absorption ratio	12.6
Fluoride, mg/L	0.77

	mg/L	meq/L
Bicarbonate as HC03	1260	20.7
Carbonate as C03	0	0
Chloride	134	3.77
Sulfate	449	9.34
Calcium	145	7.23
Magnesium	15.3	1.26
Potassium	6.18	0.16
Sodium	598	26
Major cations		34.7
Major anions		33.8
Cation/anion difference		1.28 %

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-3
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7061 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	0.019	<0.005
Calcium (Ca)	99.9	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	ND	<0.5
Magnesium (Mg)	17.5	<0.5
Sodium (Na)	535	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	ND	<0.1
Boron (B)	0.36	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	5.90	<0.05
Manganese (Mn)	1.03	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	11.7	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	ND	<0.01

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

Wanda Orso
Water Lab Manager

Inter·Mountain Laboratories, Inc.

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CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-4		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7062	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.50
Lab conductivity, umhos/cm	3680
Lab resistivity, ohm-m	2.72
Total dissolved solids (180), mg/L	2240
Total dissolved solids (calc), mg/L	2250
Total alkalinity as CaC03, mg/L	1170
Total hardness as CaC03, mg/L	314
Sodium absorption ratio	18.4
Fluoride, mg/L	0.69

	mg/L	meq/L
Bicarbonate as HC03	1430	23.4
Carbonate as C03	0	0
Chloride	390	11
Sulfate	276	5.74
Calcium	113	5.65
Magnesium	7.67	0.63
Potassium	6.02	0.15
Sodium	750	32.6
Major cations		39.1
Major anions		40.2
Cation/anion difference		1.41 %

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-4
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7062 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	0.044	<0.005
Calcium (Ca)	75.4	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	2.0	<0.5
Magnesium (Mg)	10.9	<0.5
Sodium (Na)	658.4	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	ND	<0.1
Boron (B)	0.46	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	5.43	<0.05
Manganese (Mn)	1.88	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	12.4	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	ND	<0.01

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

Wanda Orso
Water Lab Manager

Inter·Mountain Laboratories, Inc.

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CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-5		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7063	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.96
Lab conductivity, umhos/cm	4240
Lab resistivity, ohm-m	2.36
Total dissolved solids (180), mg/L	2590
Total dissolved solids (calc), mg/L	2480
Total alkalinity as CaC03, mg/L	929
Total hardness as CaC03, mg/L	62.4
Sodium absorption ratio	52.3
Fluoride, mg/L	1.02

	mg/L	meq/L
Bicarbonate as HC03	1130	18.6
Carbonate as C03	0	0
Chloride	439	12.4
Sulfate	506	10.5
Calcium	16.9	0.84
Magnesium	4.91	0.4
Potassium	4.03	0.1
Sodium	949	41.3
Major cations		42.6
Major anions		41.5
Cation/anion difference		1.34 %

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-5
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7063 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	0.005	<0.005
Calcium (Ca)	14.0	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	1.6	<0.5
Magnesium (Mg)	3.4	<0.5
Sodium (Na)	725.6	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	ND	<0.1
Boron (B)	0.34	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	0.63	<0.05
Manganese (Mn)	0.16	<0.02
Molybdenum (Mo)	0.02	<0.02
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	9.0	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	ND	<0.01

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

Wanda Orso
Water Lab Manager

Inter·Mountain Laboratories, Inc.

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CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-6		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7064	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.71
Lab conductivity, umhos/cm	3940
Lab resistivity, ohm-m	2.54
Total dissolved solids (180), mg/L	2560
Total dissolved solids (calc), mg/L	2570
Total alkalinity as CaC03, mg/L	1000
Total hardness as CaC03, mg/L	369
Sodium absorption ratio	18.1
Fluoride, mg/L	0.69

	mg/L	meq/L	
Bicarbonate as HC03	1220	20	
Carbonate as C03	0	0	
Chloride	168	4.74	
Sulfate	852	17.7	
Calcium	126	6.26	
Magnesium	13.5	1.11	
Potassium	5.94	0.15	
Sodium	801	34.8	
Major cations		42.4	
Major anions		42.5	
Cation/anion difference		0.12	%

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-6
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7064 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	0.011	<0.005
Calcium (Ca)	86.7	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	3.2	<0.5
Magnesium (Mg)	12.9	<0.5
Sodium (Na)	651.8	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	ND	<0.1
Boron (B)	0.53	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	1.21	<0.05
Manganese (Mn)	1.37	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	10.9	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	0.01	<0.01

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

Wanda Orso
Water Lab Manager

Inter·Mountain Laboratories, Inc.

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CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-7		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7065	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.62
Lab conductivity, umhos/cm	3620
Lab resistivity, ohm-m	2.76
Total dissolved solids (180), mg/L	2340
Total dissolved solids (calc), mg/L	2310
Total alkalinity as CaC03, mg/L	1090
Total hardness as CaC03, mg/L	375
Sodium absorption ratio	15.7
Fluoride, mg/L	0.69

	mg/L	meq/L	
Bicarbonate as HC03	1330	21.8	
Carbonate as C03	0	0	
Chloride	31	0.88	
Sulfate	782	16.3	
Calcium	112	5.6	
Magnesium	23.2	1.91	
Potassium	4.42	0.11	
Sodium	700	30.5	
Major cations		38.1	
Major anions		38.9	
Cation/anion difference		1.1	%

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-7
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7065 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	0.013	<0.005
Calcium (Ca)	105.4	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	1.6	<0.5
Magnesium (Mg)	26.4	<0.5
Sodium (Na)	580.3	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	0.1	<0.1
Boron (B)	0.43	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	0.25	<0.05
Manganese (Mn)	0.79	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	13.6	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	0.09	<0.01

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

Wanda Orso
Water Lab Manager

Inter·Mountain Laboratories, Inc.

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CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-8		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7066	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.66	
Lab conductivity, umhos/cm	5070	
Lab resistivity, ohm-m	1.97	
Total dissolved solids (180), mg/L	4050	
Total dissolved solids (calc), mg/L	4160	
Total alkalinity as CaC03, mg/L	354	
Total hardness as CaC03, mg/L	1040	
Sodium absorption ratio	12.3	
Fluoride, mg/L	0.84	
	mg/L	meq/L
Bicarbonate as HC03	431	7.07
Carbonate as C03	0	0
Chloride	32.5	0.92
Sulfate	2610	54.4
Calcium	346	17.3
Magnesium	44	3.62
Potassium	6.06	0.15
Sodium	915	39.8
Major cations		60.8
Major anions		62.3
Cation/anion difference		1.22 %

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-8
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7066 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	0.006	<0.005
Calcium (Ca)	161.0	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	5.3	<0.5
Magnesium (Mg)	33.1	<0.5
Sodium (Na)	685.8	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	ND	<0.1
Boron (B)	0.40	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	4.0	<0.05
Manganese (Mn)	3.24	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	7.9	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	ND	<0.01

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

Wanda Orso
Water Lab Manager

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-9		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7067	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.89
Lab conductivity, umhos/cm	8390
Lab resistivity, ohm-m	1.19
Total dissolved solids (180), mg/L	7120
Total dissolved solids (calc), mg/L	7210
Total alkalinity as CaC03, mg/L	466
Total hardness as CaC03, mg/L	1400
Sodium absorption ratio	20.1
Fluoride, mg/L	0.77

	mg/L	meq/L	
Bicarbonate as HC03	569	9.32	
Carbonate as C03	0	0	
Chloride	57.2	1.61	
Sulfate	4610	96.1	
Calcium	465	23.2	
Magnesium	58.3	4.79	
Potassium	6.84	0.17	
Sodium	1730	75.3	
Major cations		103	
Major anions		107	
Cation/anion difference		1.7	%

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-9
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7067 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	ND	<0.005
Calcium (Ca)	196.2	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	4.6	<0.5
Magnesium (Mg)	50.6	<0.5
Sodium (Na)	1487.5	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	ND	<0.1
Boron (B)	0.63	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	ND	<0.05
Manganese (Mn)	0.89	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	6.9	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	ND	<0.01

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

Wanda Orso
Water Lab Manager

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CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-10		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7068	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.87
Lab conductivity, umhos/cm	9140
Lab resistivity, ohm-m	1.09
Total dissolved solids (180), mg/L	7850
Total dissolved solids (calc), mg/L	8030
Total alkalinity as CaC03, mg/L	392
Total hardness as CaC03, mg/L	1420
Sodium absorption ratio	22.9
Fluoride, mg/L	0.66

	mg/L	meq/L	
Bicarbonate as HC03	479	7.85	
Carbonate as C03	0	0	
Chloride	92.2	2.6	
Sulfate	5160	108	
Calcium	473	23.6	
Magnesium	59.4	4.88	
Potassium	12.7	0.33	
Sodium	1990	86.5	
Major cations		115	
Major anions		118	
Cation/anion difference		1.16	%

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-10
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7068 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	0.006	<0.005
Calcium (Ca)	195.3	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	8.6	<0.5
Magnesium (Mg)	41.6	<0.5
Sodium (Na)	1699	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	0.2	<0.1
Boron (B)	0.53	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	2.01	<0.05
Manganese (Mn)	3.06	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	9.2	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	ND	<0.01

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

Wanda Orso
Water Lab Manager

Inter·Mountain Laboratories, Inc.

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CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-11		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7069	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.49	
Lab conductivity, umhos/cm	6900	
Lab resistivity, ohm-m	1.45	
Total dissolved solids (180), mg/L	6000	
Total dissolved solids (calc), mg/L	6100	
Total alkalinity as CaC03, mg/L	246	
Total hardness as CaC03, mg/L	1480	
Sodium absorption ratio	15	
Fluoride, mg/L	0.48	
	mg/L	meq/L
Bicarbonate as HC03	300	4.91
Carbonate as C03	0	0
Chloride	25.3	0.71
Sulfate	4030	83.9
Calcium	518	25.9
Magnesium	44.8	3.68
Potassium	9.5	0.24
Sodium	1320	57.5
Major cations		87.3
Major anions		89.6
Cation/anion difference		1.29 %

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-11
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7069 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	ND	<0.005
Calcium (Ca)	207.4	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	7.6	<0.5
Magnesium (Mg)	37.4	<0.5
Sodium (Na)	1121.9	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	ND	<0.1
Boron (B)	0.22	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	ND	<0.05
Manganese (Mn)	4.47	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	6.9	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	ND	<0.01

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

Wanda Orso
Water Lab Manager

Inter-Mountain Laboratories, Inc.

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CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-12		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7070	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.44
Lab conductivity, umhos/cm	10500
Lab resistivity, ohm-m	0.953
Total dissolved solids (180), mg/L	8380
Total dissolved solids (calc), mg/L	8820
Total alkalinity as CaC03, mg/L	1730
Total hardness as CaC03, mg/L	1840
Sodium absorption ratio	23.4
Fluoride, mg/L	0.56

	mg/L	meq/L
Bicarbonate as HC03	2110	34.6
Carbonate as C03	0	0
Chloride	305	8.61
Sulfate	4550	94.8
Calcium	427	21.3
Magnesium	188	15.5
Potassium	6.65	0.17
Sodium	2310	100
Major cations		137
Major anions		138
Cation/anion difference		0.26 %

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-12
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7070 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	ND	<0.005
Calcium (Ca)	240.4	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	11.1	<0.5
Magnesium (Mg)	123.4	<0.5
Sodium (Na)	2011.6	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	47.8	<0.1
Boron (B)	1.14	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	0.10	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	170.8	<0.05
Manganese (Mn)	6.56	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	0.09	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	57.5	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	0.12	<0.05
Zinc (Zn)	0.35	<0.01

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

Wanda Orso
Water Lab Manager

Inter·Mountain Laboratories, Inc.

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CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-13		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7071	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.78	
Lab conductivity, umhos/cm	4920	
Lab resistivity, ohm-m	2.03	
Total dissolved solids (180), mg/L	4270	
Total dissolved solids (calc), mg/L	4160	
Total alkalinity as CaC03, mg/L	242	
Total hardness as CaC03, mg/L	1610	
Sodium absorption ratio	7.46	
Fluoride, mg/L	0.77	

	mg/L	meq/L	
Bicarbonate as HC03	296	4.85	
Carbonate as C03	0	0	
Chloride	47.2	1.33	
Sulfate	2670	55.6	
Calcium	527	26.3	
Magnesium	72.1	5.93	
Potassium	6.26	0.16	
Sodium	689	29.9	
Major cations		62.3	
Major anions		61.8	
Cation/anion difference		0.41	%

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-13
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7071 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	ND	<0.005
Calcium (Ca)	212.9	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	3.8	<0.5
Magnesium (Mg)	60.7	<0.5
Sodium (Na)	274.3	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	1.9	<0.1
Boron (B)	0.44	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	2.41	<0.05
Manganese (Mn)	0.61	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	0.01	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	9.4	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	0.01	<0.01

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

Wanda Orso
Water Lab Manager

Inter·Mountain Laboratories, Inc.

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CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-14		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7072	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.61
Lab conductivity, umhos/cm	6970
Lab resistivity, ohm-m	1.43
Total dissolved solids (180), mg/L	5950
Total dissolved solids (calc), mg/L	6030
Total alkalinity as CaC03, mg/L	482
Total hardness as CaC03, mg/L	1650
Sodium absorption ratio	13.9
Fluoride, mg/L	0.52

	mg/L	meq/L	
Bicarbonate as HC03	589	9.65	
Carbonate as C03	0	0	
Chloride	64.7	1.82	
Sulfate	3790	79	
Calcium	467	23.3	
Magnesium	117	9.6	
Potassium	4.61	0.12	
Sodium	1300	56.5	
Major cations		89.5	
Major anions		90.4	
Cation/anion difference		0.5	%

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-14
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7072 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	ND	<0.005
Calcium (Ca)	195.4	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	3.9	<0.5
Magnesium (Mg)	64.2	<0.5
Sodium (Na)	1181.7	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	ND	<0.1
Boron (B)	0.51	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	ND	<0.05
Manganese (Mn)	0.63	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	7.2	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	ND	<0.01

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

Wanda Orso
Water Lab Manager

Inter·Mountain Laboratories, Inc.

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CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-15		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7073	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.86
Lab conductivity, umhos/cm	7790
Lab resistivity, ohm-m	1.28
Total dissolved solids (180), mg/L	6540
Total dissolved solids (calc), mg/L	6610
Total alkalinity as CaC03, mg/L	206
Total hardness as CaC03, mg/L	1250
Sodium absorption ratio	19.4
Fluoride, mg/L	0.94

	mg/L	meq/L	
Bicarbonate as HC03	251	4.12	
Carbonate as C03	0	0	
Chloride	19.4	0.55	
Sulfate	4430	92.2	
Calcium	407	20.3	
Magnesium	56.2	4.62	
Potassium	6.69	0.17	
Sodium	1570	68.4	
Major cations		93.5	
Major anions		96.9	
Cation/anion difference		1.79	%

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-15
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7073 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	ND	<0.005
Calcium (Ca)	186.4	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	5.8	<0.5
Magnesium (Mg)	42.8	<0.5
Sodium (Na)	1434.6	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	ND	<0.1
Boron (B)	0.37	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	ND	<0.05
Manganese (Mn)	0.70	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	5.5	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	ND	<0.01

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

Wanda Orso
Water Lab Manager

Inter·Mountain Laboratories, Inc.

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CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-16		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7074	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.53
Lab conductivity, umhos/cm	8080
Lab resistivity, ohm-m	1.24
Total dissolved solids (180), mg/L	6800
Total dissolved solids (calc), mg/L	6950
Total alkalinity as CaC03, mg/L	517
Total hardness as CaC03, mg/L	1430
Sodium absorption ratio	18.9
Fluoride, mg/L	0.89

	mg/L	meq/L
Bicarbonate as HC03	628	10.3
Carbonate as C03	0	0
Chloride	109	3.08
Sulfate	4350	90.5
Calcium	464	23.1
Magnesium	66.9	5.5
Potassium	7.35	0.19
Sodium	1650	71.6
Major cations		100
Major anions		104
Cation/anion difference		1.73 %

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-16
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7074 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	ND	<0.005
Calcium (Ca)	191.5	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	6.7	<0.5
Magnesium (Mg)	50.4	<0.5
Sodium (Na)	1528.8	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	ND	<0.1
Boron (B)	0.48	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	0.25	<0.05
Manganese (Mn)	3.83	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	8.1	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	ND	<0.01

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

Wanda Orso
Water Lab Manager

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CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-17		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7075	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.50
Lab conductivity, umhos/cm	4290
Lab resistivity, ohm-m	2.33
Total dissolved solids (180), mg/L	3290
Total dissolved solids (calc), mg/L	3280
Total alkalinity as CaC03, mg/L	727
Total hardness as CaC03, mg/L	916
Sodium absorption ratio	10.5
Fluoride, mg/L	0.33

	mg/L	meq/L
Bicarbonate as HC03	885	14.5
Carbonate as C03	0	0
Chloride	61	1.72
Sulfate	1720	35.7
Calcium	292	14.6
Magnesium	45.5	3.74
Potassium	3.71	0.09
Sodium	730	31.8
Major cations		50.2
Major anions		52
Cation/anion difference		1.8 %

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CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-17
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7075 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	0.005	<0.005
Calcium (Ca)	144.6	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	3.8	<0.5
Magnesium (Mg)	38.3	<0.5
Sodium (Na)	658.4	<0.5
Lead (Pb)	0.02	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	1.7	<0.1
Boron (B)	0.29	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	3.59	<0.05
Manganese (Mn)	1.03	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	0.01	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	20.3	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	0.06	<0.01

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

Wanda Orso
Water Lab Manager

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-18		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7076	DATE COLLECTED:	08/29/91

Lab pH (s.u.)		7.83
Lab conductivity, umhos/cm		4500
Lab resistivity, ohm-m		2.22
Total dissolved solids (180), mg/L		2760
Total dissolved solids (calc), mg/L		2630
Total alkalinity as CaC03, mg/L		1490
Total hardness as CaC03, mg/L		157
Sodium absorption ratio		34.6
Fluoride, mg/L		0.65

	mg/L	meq/L
Bicarbonate as HC03	1820	29.9
Carbonate as C03	0	0
Chloride	551	15.5
Sulfate	132	2.74
Calcium	42.2	2.1
Magnesium	12.6	1.04
Potassium	4.97	0.13
Sodium	996	43.3
Major cations		46.6
Major anions		48.2
Cation/anion difference		1.69 %

Inter·Mountain Laboratories, Inc.

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Farmington, New Mexico 87401

CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-18
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7076 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	0.037	<0.005
Calcium (Ca)	38.8	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	3.7	<0.5
Magnesium (Mg)	8.6	<0.5
Sodium (Na)	868.8	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	2.2	<0.1
Boron (B)	0.39	<0.01
Barium (Ba)	0.6	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	7.13	<0.05
Manganese (Mn)	1.21	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	0.01	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	15.2	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	0.01	<0.01

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

Wanda Orso
Water Lab Manager

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-19		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7077	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	7.83	
Lab conductivity, umhos/cm	5170	
Lab resistivity, ohm-m	1.93	
Total dissolved solids (180), mg/L	3580	
Total dissolved solids (calc), mg/L	3580	
Total alkalinity as CaC03, mg/L	1340	
Total hardness as CaC03, mg/L	487	
Sodium absorption ratio	21.9	
Fluoride, mg/L	0.92	
	mg/L	meq/L
Bicarbonate as HC03	1630	26.8
Carbonate as C03	0	0
Chloride	196	5.52
Sulfate	1290	26.8
Calcium	147	7.34
Magnesium	29	2.39
Potassium	4.42	0.11
Sodium	1110	48.3
Major cations		58.1
Major anions		59.2
Cation/anion difference		0.87 %

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-19
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7077 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	ND	<0.005
Calcium (Ca)	67.8	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	1.4	<0.5
Magnesium (Mg)	21.0	<0.5
Sodium (Na)	771.8	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	4.3	<0.1
Boron (B)	0.49	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	6.62	<0.05
Manganese (Mn)	0.62	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	18.9	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	0.04	<0.01

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

Wanda Orso
Water Lab Manager

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-10 Lab Split 7068		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7078	DATE COLLECTED:	08/29/91

Lab pH (s.u.)		7.98
Lab conductivity, umhos/cm		9080
Lab resistivity, ohm-m		1.1
Total dissolved solids (180), mg/L		7920
Total dissolved solids (calc), mg/L		8000
Total alkalinity as CaC03, mg/L		408
Total hardness as CaC03, mg/L		1420
Sodium absorption ratio		23.2
Fluoride, mg/L		0.79
	mg/L	meq/L
Bicarbonate as HC03	498	8.16
Carbonate as C03	0	0
Chloride	90.6	2.55
Sulfate	5120	107
Calcium	472	23.5
Magnesium	58.3	4.8
Potassium	10.7	0.27
Sodium	2010	87.3
Major cations		116
Major anions		117
Cation/anion difference		0.63 %

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2506 W. Main Street
Farmington, New Mexico 87401

CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-10 Lab Split 7068
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7078 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	0.006	<0.005
Calcium (Ca)	192.5	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	8.6	<0.5
Magnesium (Mg)	48.2	<0.5
Sodium (Na)	1722	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	0.2	<0.1
Boron (B)	0.53	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	1.73	<0.05
Manganese (Mn)	2.95	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	8.9	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	ND	<0.01

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

Wanda Orso
Water Lab Manager

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT:	Envirotech Inc.	DATE REPORTED:	10/01/91
ID:	MW-15 Lab Split 7073		
SITE:	Thriftway Refinery	DATE RECEIVED:	08/29/91
LAB NO:	F7079	DATE COLLECTED:	08/29/91

Lab pH (s.u.)	8.11	
Lab conductivity, umhos/cm	7740	
Lab resistivity, ohm-m	1.29	
Total dissolved solids (180), mg/L	6660	
Total dissolved solids (calc), mg/L	6540	
Total alkalinity as CaC03, mg/L	215	
Total hardness as CaC03, mg/L	1240	
Sodium absorption ratio	19.2	
Fluoride, mg/L	1.17	
	mg/L	meq/L
Bicarbonate as HC03	262	4.3
Carbonate as C03	0	0
Chloride	21.3	0.6
Sulfate	4370	91
Calcium	411	20.5
Magnesium	52.7	4.33
Potassium	6.45	0.16
Sodium	1550	67.6
Major cations		92.6
Major anions		95.9
Cation/anion difference		1.71 %

Inter·Mountain Laboratories, Inc.

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Farmington, New Mexico 87401

CLIENT: Envirotech Inc. DATE REPORTED: 10/01/91
ID: MW-15 Lab Split 7073
SITE: Thriftway Refinery DATE RECEIVED: 08/29/91
LAB NO: F7079 DATE COLLECTED: 08/29/91

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

	Analytical Result:	Detection Limit:
Arsenic (As)	ND	<0.005
Calcium (Ca)	184.1	<0.5
Cadmium (Cd)	ND	<0.002
Potassium (K)	6.0	<0.5
Magnesium (Mg)	41.8	<0.5
Sodium (Na)	1372.5	<0.5
Lead (Pb)	ND	<0.02
Selenium (Se)	ND	<0.005

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

	Analytical Result:	Detection Limit:
Silver (Ag)	ND	<0.01
Aluminum (Al)	ND	<0.1
Boron (B)	0.36	<0.01
Barium (Ba)	ND	<0.5
Beryllium (Be)	ND	<0.005
Cobalt (Co)	ND	<0.05
Chromium (Cr)	ND	<0.02
Copper (Cu)	ND	<0.01
Iron (Fe)	ND	<0.05
Manganese (Mn)	0.67	<0.02
Molybdenum (Mo)	ND	<0.02
Nickel (Ni)	ND	<0.01
Antimony (Sb)	ND	<0.05
Silicon (Si)	5.5	<0.05
Thallium (Tl)	ND	<0.5
Vanadium (V)	ND	<0.05
Zinc (Zn)	ND	<0.01

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

Wanda Orso
Water Lab Manager

Inter- Mountain Laboratories, Inc.

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANALYSES / PARAMETERS
Envirotech Inc. Thriftway	Refinery	
Sampler: (Signature) Jack D. Dewey	**Chain of Custody Tape No.**	**Remarks**

Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers	1 +	2M Metals			
MW 1	8/28/91	1605	9	Water	2					
" 2	8/29/91	1100								
" 3	8/28/91	1245								
" 4	8/28/91	1135								
" 5	8/28/91	1115								
" 6	8/28/91	1215								
" 7	8/28/91	1315								
" 8	8/28/91	1415								
" 9	8/28/91	1430								
" 10	8/29/91	1450								
" 11	8/29/91	1040								
" 12	8/28/91	1540								
" 13	8/28/91	1520								
" 14	8/29/91	0955								

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Jack D. Dewey	8/29/91	4:30p			
Relinquished by: (Signature)	**Date**	**Time**	**Received by: (Signature)**	**Date**	**Time**
Relinquished by: (Signature)	**Date**	**Time**	**Received by laboratory: (Signature)**	**Date**	**Time**
				8/29/91	1636

Inter-Mountain Laboratories, Inc.

24026

☐ 1633 Terra Avenue Sheridan, Wyoming 82801 Telephone (307) 672-8945	☐ 1714 Phillips Circle Gillette, Wyoming 82716 Telephone (307) 682-8945	☑ 2506 West Main Street Farmington, NM 87401 Telephone (505) 326-4737	☐ 910 Technology Blvd. Suite B Bozeman, Montana 59715 Telephone (406) 586-8450	☐ Route 3, Box 256 College Station, TX 77845 Telephone (409) 776-8945	☐ 3304 Longmire Drive College Station, TX 77845 Telephone (409) 774-4999

Inter-Mountain Laboratories, Inc.

CHAIN OF CUSTODY RECORD

Client/Project Name: Envirotech Inc. Thriftway

Project Location: Refinery

Sampler: (Signature) Jack D. Dewey

Chain of Custody Tape No.

ANALYSES / PARAMETERS

Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers	1/+	NM Metals			Remarks
MW 15	8/29/91	0920	7073 / [illegible]	[illegible]	2					
" 16	8/29/91	1020	74							
" 17	8/28/91	1345	75							
" 18	8/22/91	1057	76							
" 19	8/22/91	1027	77							

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Jack D. Dewey	8/29/91	4:30 P			
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by laboratory: (Signature)	Date	Time
			[illegible]	[illegible]	[illegible]

Inter-Mountain Laboratories, Inc.

☐ 1633 Terra Avenue, Sheridan, Wyoming 82801, Telephone (307) 672-8945

☐ 1714 Phillips Circle, Gillette, Wyoming 82716, Telephone (307) 682-8945

☑ 2506 West Main Street, Farmington, NM 87401, Telephone (505) 326-4737

☐ 910 Technology Blvd. Suite B, Bozeman, Montana 59715, Telephone (406) 586-8450

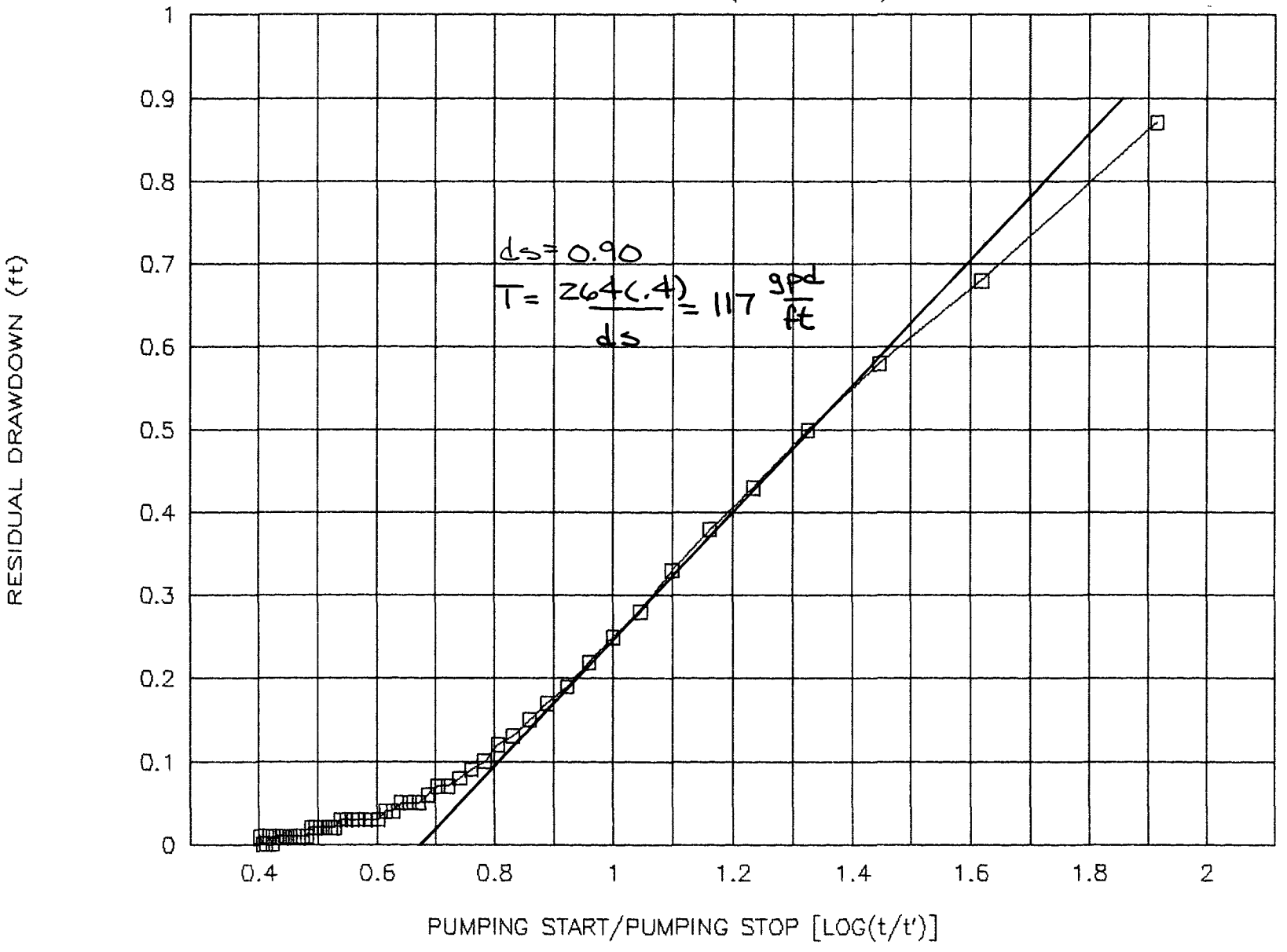
☐ Route 3, Box 256, College Station, TX 77845, Telephone (409) 776-8945

☐ 3304 Longmire Drive, College Station, TX 77845, Telephone (409) 774-4999

24025

PUMP TEST RECOVERY OF MW#13

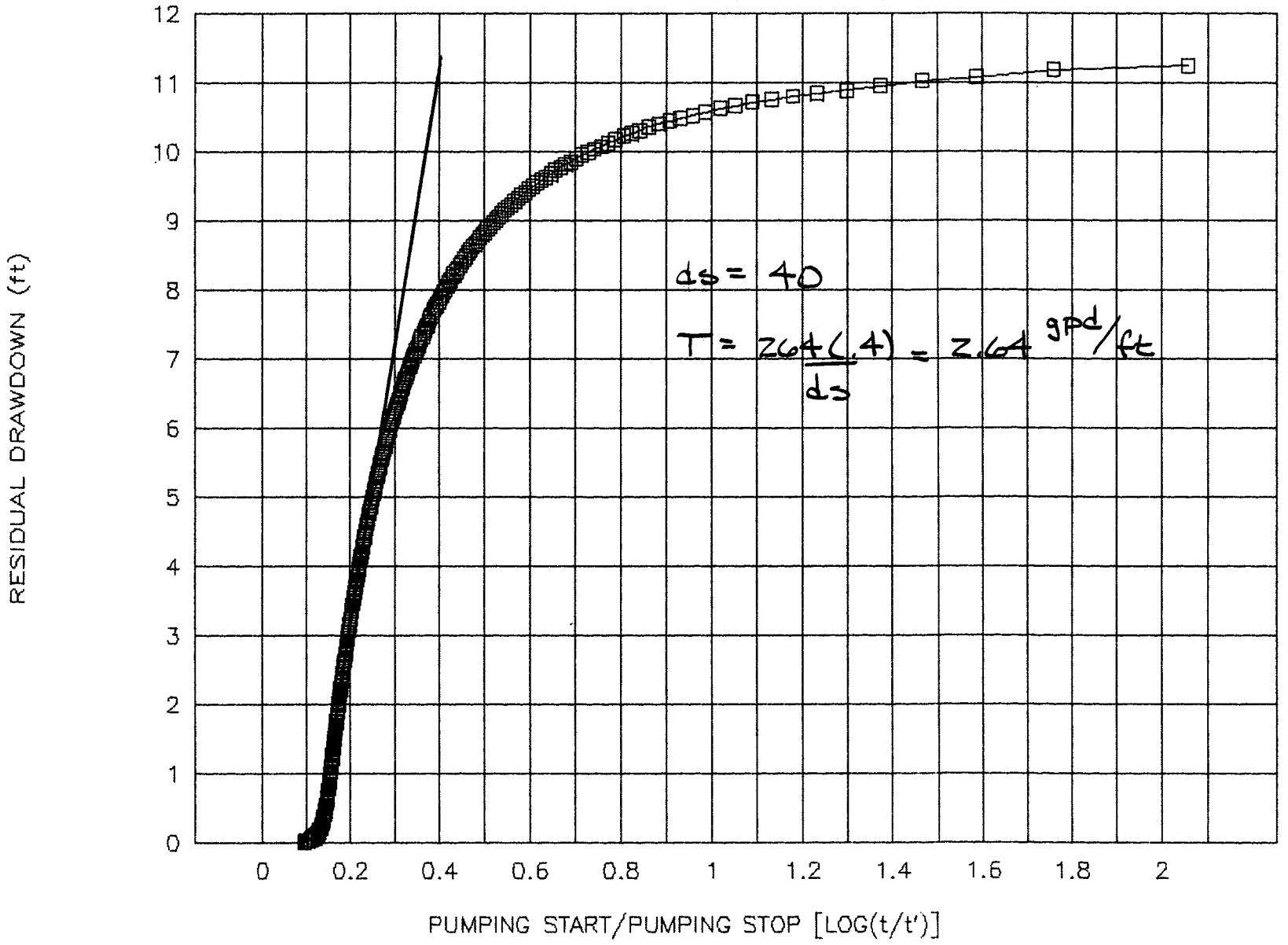
THRIFTWAY REFINERY (20-SEP-91)



PROJECT: 91819
FIGURE B-1

PUMP TEST RECOVERY OF MW#16

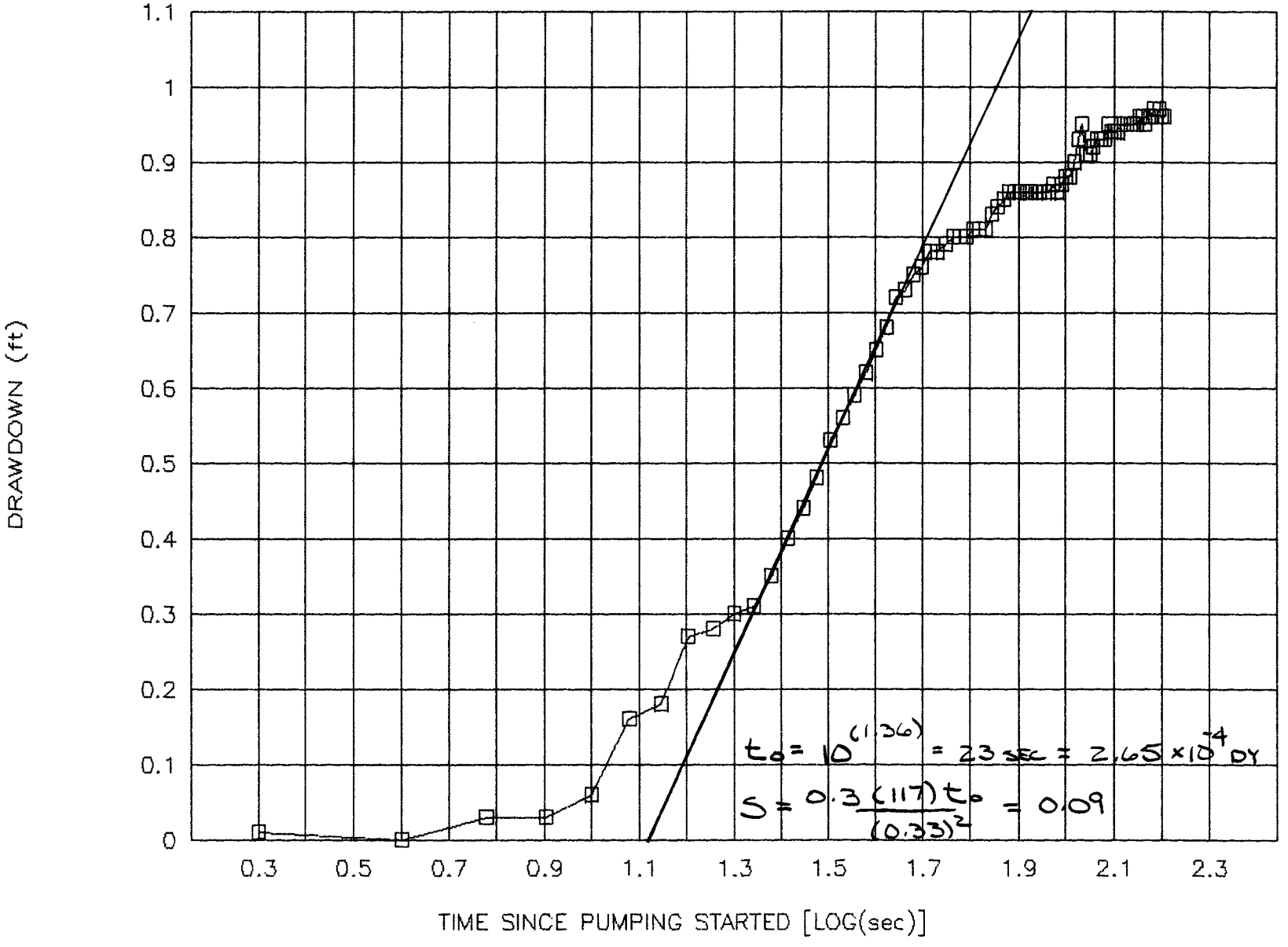
THRIFTWAY REFINERY (19-SEP-91)



PROJECT: 91819
FIGURE B-2

PUMP TEST DRAWDOWN OF MW#13

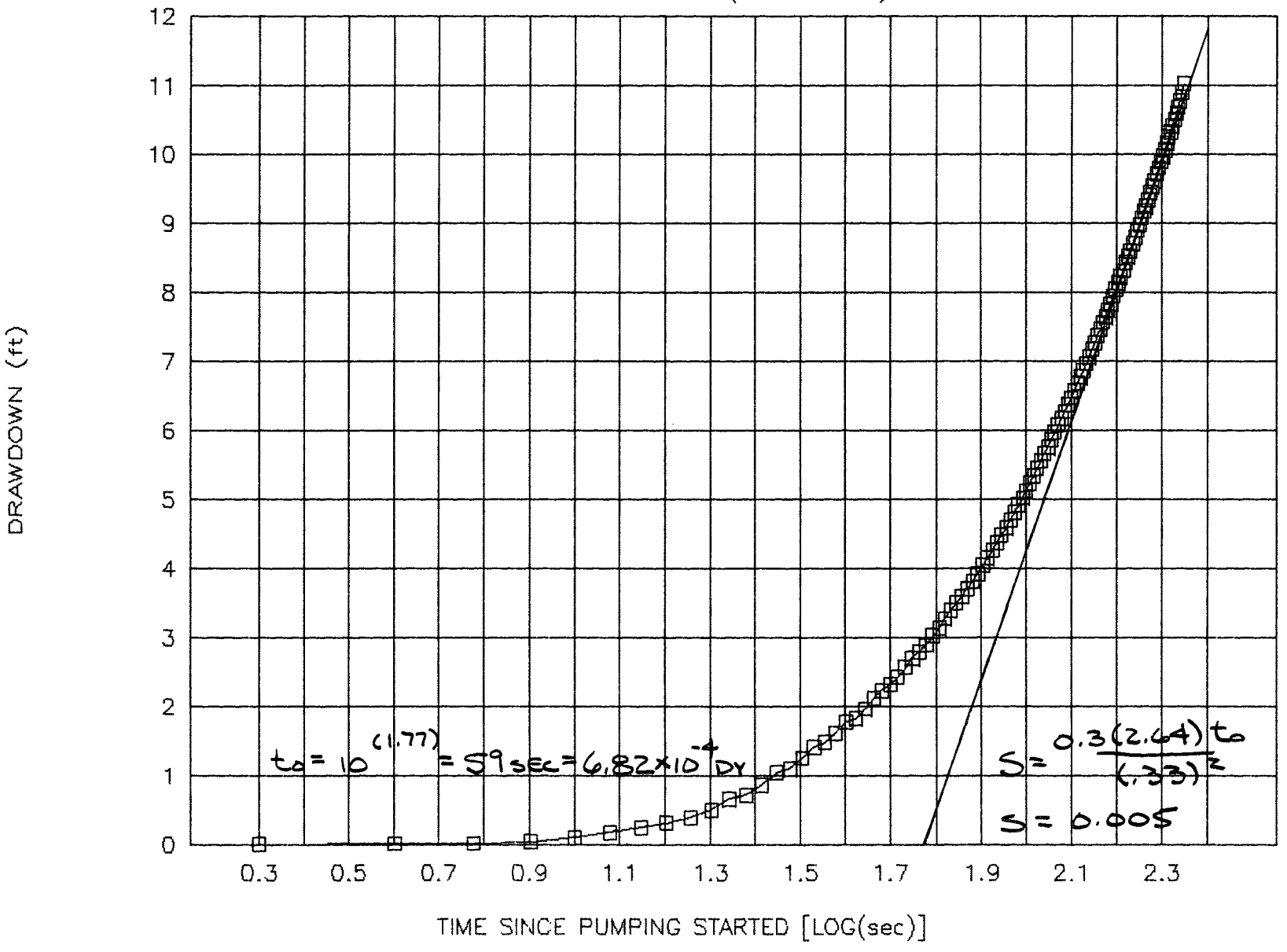
THRIFTWAY REFINERY (20-SEP-91)



PROJECT: 91819
FIGURE B-3

PUMP TEST DRAWDOWN OF MW#16

THRIFTWAY REFINERY (19-SEP-91)



PROJECT: 91819
FIGURE B-4

ENVIROTECH INC.

RECEIVED
AUG 19 1991
OIL CONSERVATION DIV.
SANTA FE

Results of Site Assessment Hydrocarbon Contamination at Thriftway Bloomfield Refinery

for

Thriftway Marketing Corp.

Project #91819

June 1991

5796 U.S. HIGHWAY 64 - 3014 • FARMINGTON, NEW MEXICO 87401 • PHONE: (505) 632-0615

ENVIROTECH INC.

UNDERGROUND TANK TESTING • SITE ASSESSMENT • SITE REMEDIATION

3111 KNUDSEN
FARMINGTON, NEW MEXICO 87401
PHONE: (505) 326-2822

September 17, 1990

Mr. William J. LeMay, Director
OIL CONSERVATION DIVISION
PO Box 2088
Santa Fe, New Mexico 87504

Re: Remediation Plan Proposal
Oil Contamination at Thriftway Refinery
Bloomfield, New Mexico

Dear Mr. LeMay:

Envirotech has conducted a site assessment to determine the origin of hydrocarbons present on the shallow groundwater at the Northwestern portion of Thriftway's Bloomfield Refinery.

The field investigation consisted of soil boring starting at the site where hydrocarbons were noted and proceeded in a direction until clean or near clean groundwater was encountered. The concentrations of volatile hydrocarbons were determined via the headspace method which consists of collecting a groundwater sample from the boring and testing it by placement of 8 ounces of sample into a clean 16 ounce jar sealed with aluminum foil. The sample is shaken and allowed to come to equalibrium for 5 minutes prior to insertion of the probe from a photoionization meter into the headspace. A direct reading of the volatile hydrocarbon is obtained. A Model 580A Organic Vapor Meter manufactured by Thermo Enviromental Instruments was utilized to obtain the measurements.

The boundary of the hydrocarbon plume was determined by seccessive borings in a direction until a value of 0 to 20 parts per million was obtained via this method.

As the field investigation proceeded it became evident that several hydrocarbon plumes were present with identifiable point sources, but that these plume had merged into the Northwestern area of the refinery as observed by OCD personnel on their previous site inspections at the refinery.

Identifiable areas of high hydrocarbon concentrations include the following specific areas.

A. Unlined waste water lagoons
B. Crude unit Process Oil collection tank
C. Crude unit and reformer process unit areas
D. Abandoned waste water lagoon
E. Fuel oil loading dock

These sites are identified as site A through E on the accompaning Thriftway Refinery Site Plan.

The location of each investigative boring is also identified by number on the site plan.

Organic vapor meter readings for each investigative boring is presented below. Where free product was observed on the shallow groundwater it is so noted.

SITE INVESTIGATION BORINGS SUMMARY

BORING NO.	OVM READING (ppm)		GROUNDWATER ELEVATION
1	860	free product	
2	902	free product	
3	0		
4	2		77.15
5	55		
6	11		
7	15		78.63
8	40		
9	89		
10	21		86.91
11	4		
12	7		
13	0		
14	22		
15	302		
16	312		
17	361		
18	0		68.72
19	722	free product	
20	526	free product	
21	203		
22	18		78.55
23	68		76.52
24	56		72.30
25	38		74.21
26	42		86.70
27	28		84.08
28	12		80.88
29	5		
30	42		70.43

As reported in the preceeding table, relative groundwater elevations were measured to determine the groundwater contours and direction of flow. The groundwater elevations are noted on the accompaning Ground Water Contour Map. It appears that the direction of flow is to the Northwest where free product has been observed on the shallow groundwater.

It appears that naturally occuring hydrocarbon contamination is flowing onto the refinery property from the oil production areas across county road 5500 which is South of the refinery property.

The proposed remediation plan addresses elimination of any future contamination at each of the identifiable point sources and remediation of the groundwater contamination to prevent discharge from the refinery property.

Specifically, the following action will be accomplished at each identified point source. The proposed date of compliance or completion is noted.

A. Unlined waste water lagoons
These lagoons have been closed and new doublelined lagoons with leak detection are under construction as submitted in the Thriftway Refinery Discharge Plan GW-55 dated July, 1990. Construction will be completed September 22, 1990.

B. Crude Unit Process Oil Collection Tank
The former tank was a concrete vault. This structure had developed cracks. During removal we noted an unsealed opening through the wall was allowing hydrocarbon leakage into the surrounding soil. The surrounding soil was excavated to remove the major portion of contamination. A new 10,000 gallon steel tank was installed with a 20 mil PVC liner surrounding the tank and a leak detection monitoring well.
The system was hydrostaticly tested at 4 pounds pressure. Completion date was approximately March 15, 1990.

C. Crude Unit and Reformer Unit Process Area
A new waste water collection sewer will be installed in the crude unit. This waste water sewer will be extended to connect with the wastwater sewer serving the Reformer and Hydrocracker units. Outfall from this wastewater sewer is skimmed of free hydrocarbon and then treated to assure compliance with Thriftway Discharge Plan GW-55 prior to introduction into the lined evaporative lagoons.
The entire process areas will have a 4" concrete floor with curbing installed to collect any hydrocarbon spills in this area and route them to the wastewater sewer system. Completion of the concrete floors and wastewater sewer system is scheduled for November 30, 1990.

D. Abandoned Wastewater Lagoon
Soil borings No. 1 & 2 encountered this abandoned wastewater lagoon. This lagoon was improperly closed by simply filling with granular fill. The entire lagoon area is currently being excavated. The excavated soils have been analyzed and are within levels acceptable for remediation at Envirotech's Soil Remediation Site located South of Bloomfield, New Mexico. The excavation will be backfilled with clean granular fill as part of the closure of this old lagoon. Closure is anticipated to be complete October 15, 1990.

E. Fuel Oil Loading Dock
A new concrete fuel oil loading dock complete with spill collection will be constructed to contain and prevent any future hydrocarbon spills from reaching the groundwater. Design of this loading dock is similar to the crude oil and gasoline docks recently constructed at this refinery. Completion of the fuel oil loading dock is anticipated by December 14, 1990.

The contaminated groundwater collection system will consist of a collection trench constructed with crushed washed 3/4" gravel, perforated PVC pipe and a collection sump as shown on the attached diagram titled Ground Water Remediation System.

The collected hydrocarbon contaminated groundwater will be skimmed of all free product by flowing through 2-20,000 gallon vertical tanks and then routed to an air stripping tower to treat the effluent to New Mexico Groundwater Standards. The treated effluent will be pumped as per the diagram to injection wells up-gradiant of the contaminated point sources. The injection wells are located on the Remediation System Site Plan.

Monitor wells will be constructed as per the typical monitor well detail at the locations identified on the Remediation System Site Plan to monitor the progress of the cleanup efforts.

The groundwater collection system is currently under construction. This will prevent any additional hydrocarbon movement on the water table. Installation of the balance of the treatment system and injection wells will be completed upon receipt of OCD approval of the remediation system design.

Sincerely,

ENVIROTECH INC.

Morris D. Young
President

MDY:mf

cc: Mr. F. L. Stark, VP, Thriftway

RESULTS OF SITE ASSESSMENT HYDROCARBON CONTAMINATION AT THRIFTWAY BLOOMFIELD REFINERY FACILITY 626 COUNTY ROAD 5500 BLOOMFIELD, SAN JUAN COUNTY, NEW MEXICO

PREPARED FOR
THRIFTWAY MARKETING CORPORATION

PROJECT NO: 91819

JULY 1991

ENVIROTECH INC.
Environmental Scientists & Engineers
5796 U.S. Highway 64-3014
Farmington, New Mexico

(505) 632-1865

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HYDROCARBON CONTAMINATION AT
THRIFTWAY BLOOMFIELD REFINERY FACILITY
626 COUNTY ROAD 5500
BLOOMFIELD, SAN JUAN COUNTY, NEW MEXICO

PROJECT NO: 91819

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- Remediation Plan Proposal, September 17, 1990

JULY 1991 PROJECT NO: 91819

RESULTS OF SITE ASSESSMENT HYDROCARBON CONTAMINATION AT THRIFTWAY BLOOMFIELD REFINERY FACILITY 626 COUNTY ROAD 5500 BLOOMFIELD, SAN JUAN COUNTY, NEW MEXICO

INTRODUCTION

Thriftway Marketing Corporation has retained Envirotech Inc. to conduct a site investigation to define the extent of subsurface hydrocarbon contamination that was noted at the Thriftway Bloomfield Refinery during the implementation of Discharge Plan GW-55. Soil and groundwater contaminated with petroleum hydrocarbons was discovered at the northwest portion of the refinery property. A limited site assessment was conducted that identified several sources of the contamination and a subsequent remediation plan was prepared in September 1990.

PURPOSE AND SCOPE OF SERVICES

The purpose of our investigation was to evaluate the site soil and groundwater conditions, and to provide conclusions relative to the extent of the contamination at the refinery site per the New Mexico Oil Conservation Division's direction.

The scope of services includes the following:

A. Exploration drilling, classification and testing of soils encountered,

B. Installation and development of groundwater monitoring wells,

C. Collection and laboratory analysis of groundwater samples, and

D. Preparation of this report.

This report has been prepared prior to the completion of all the laboratory analysis. A supplemental report will be submitted summarizing the laboratory results upon completion.

SITE DESCRIPTION

The property consists of approximately 60 acres. Twenty-five acres are fenced for the refinery complex. The property is located in the Southeast 1/4, of Section 32 and the Southwest 1/4, of the Southwest 1/4, of Section 33, T29N, R11W, and 7.35 acres in the Northeast 1/4, of the Northeast 1/4, of Section 9, T28N, R11W, NMPM, southwest of the Town of Bloomfield, County of San Juan, State of New Mexico. Refer to Appendix A for a Site Plan of the area. Access to the site is available form County Road 5500, located adjacent to the south boundary of the property.

All improvements on the property are within the fenced area and consist of various foundations, refinery process equipment, petroleum storage tanks, and structures associated with the receiving of crude oil, the refining, and distribution of fuel oil products.

Topographically, the refinery complex is roughly planar, with overall drainage toward the northwest. A small arroyo drains to the north along the east property line. Kutz Wash draining to the west borders the north portion of the property. The refinery grade is approximately ten feet above the east arroyo until it meets Kutz Wash floodplain, which is about five feet (5') above the active channel bed.

Vegetation is sparse within the fenced area, but along the wash and outside the compound the vegetation is moderate consisting of dry grasses, weeds, and sage brush.

GEOLOGY AND HYDROLOGY

The site is situated in the San Juan Basin in the Colorado Plateau physiographic province. The basin is a structural depression containing deep Tertiary fill covering rocks of the Late Cretaceous age. The geomorphology of the site may be generally classified as alluvial fan and flood plains in the narrow drainage of the San Juan River and associated ephemeral stream system of Kutz Wash.

Based on the available records from the New Mexico State Engineer's Office, there are three water supply wells within one-half mile radius of the refinery site. They are:

Location (T.R.Sec.Quad)	Name	Well No.	Use	Depth (ft)	Aquifer
29.11.32.343	Martin, Robert E.	SJ-0441	dom,stk	70	NA
29.11.32.4444	Thriftway Company	SJ-0103	min	263	Tkoa
29.11.32.4444	Thriftway Company	SJ-0103-S	min	254	Tkoa

Where: dom - domestic
stk - livestock
min - mineral
NA - Water bearing interval not available.
Tkoa - Ojo Alamo Sandstone

Both Thriftway water wells are artesian. High total dissolved solids and sulfide content render the water unusable for any industrial or domestic purposes except as a source of make up water to the refinery fire-fighting reserve pond. This reserve pond provides much of the shallow groundwater recharge at the refinery site, as the piezometric data presented in Appendix B-3 of this report indicates.

The Martin well is located approximately one-half mile west of the subject facility. This well is west of a small ephemeral arroyo. This drainage coarse is west and up-gradient of the hydrocarbon plume investigated. There is no reason to believe the subject plume could impact this water well.

Kutz Canyon Wash drains to the northwest feeding the San Juan River which is approximately 1.9 miles down gradient. The small arroyo, east of refinery, drains north to Kutz Wash. The Kutz wash drainage system is dry late spring and early fall with 0.2-5 csf (cubic feet per second) continuous flow the remainder of the year and additional runoff following any storm.

FIELD INVESTIGATION

Envirotech previously performed a limited site assessment to determine the origin of hydrocarbons discovered on the shallow groundwater at the northwest portion of the refinery site. Details and results of the earlier assessment were utilized in the preparation of the proposed remediation plan and sent under separate cover to the New Mexico Oil Conservation Division in September of 1990. A copy of the report is included in Appendix C.

This site investigation performed by Envirotech in June of 1991 was in conjunction with the implementation of the Discharge Plan GW-55 for the Thriftway Bloomfield Refinery. It included the drilling of shallow test holes, the installation of shallow groundwater monitor

wells, the measurement of relative groundwater levels, location of wells on the property, and the collection and submittal of groundwater samples for laboratory chemical analyses.

Field Exploration:

The field exploration, conducted from June 14 to 28, 1991, consisted of 19 borings to depths ranging from 10 to 26 feet below existing ground surface. The borings were drilled with a CME 55 truck mounted drilling rig using and eight inch (8") diameter hollow stem auger. Locations of the borings are presented in Appendix A.

Split-tube soil samples were taken a minimum of every five feet from the surface to groundwater during drilling. The split-tube sampler was decontaminated with phosphate free MSA Sanitizer II prior to each sampling event. Recovered soil samples were placed in pint size glass sample containers and sealed with aluminum foil for hydrocarbon vapor testing.

The split-tube soil samples along with cuttings developed during drilling were classified in accordance with the Unified Soil Classification System (ASTM: D 2487). Logs of the borings are included in the Appendix A and while the noted stratification lines represent approximate boundaries between soil types, the transitions may be gradual.

Completion of Borings:

All borings were completed as groundwater monitor wells. The monitor wells were constructed using two inch (2") diameter threaded coupling schedule 40 PVC casing. The screen section (0.02" slot size) was from three feet (3') above to ten feet (10') below the free water level encountered during drilling. The screened interval was gravel packed to a minimum of one foot (1') above the screen with 8-12 gradation silica sand and sealed with 200 mesh bentonite. Blank PVC was used to complete the wells to approximate site grade. Each monitor well was secured with an eight inch (8") diameter bolt-down steel monitor well cover, cement grouted, and locking cap installed. Refer to Appendix B for monitor well construction details.

Due to limited availability of 2" slotted PVC, borings MW 6 and MW 7 were completed with four inch diameter slotted PVC well screen and casing. Borings MW 8, MW 9, MW 10 and MW 15 were completed approximately 18 inches above grade and without the monitor well covers, as they are located outside the refinery complex and may be susceptible to intermittent flooding in the drainage. Specific well completion details are given on the boring logs, Appendix A.

Following construction of the wells, their locations were surveyed and well head elevations measured. The well survey data is presented in Appendix B.

Water Level Measurements:

The groundwater levels given on the boring logs were obtained during drilling and prior to monitor well completion. After completion all wells were permitted to equilibrate and water levels were measured with an electronic tape to the nearest 0.01 foot from the surveyed well head elevation point. The measured water levels are presented in Appendix B.

All monitor wells were developed after fluid level measurements for subsequent sampling and analysis from June 26, 1991 to June 27, 1991. The wells were developed by removing at least three well bore volumes or until the bore hole was pumped off. An electric parastallic pump was utilized with a pumping rate of approximately 0.4 GPM.

Soil and Groundwater Sampling and Analyses:

Split-tube soil samples and soil cuttings collected during drilling were field tested for volatile hydrocarbons. The concentration of volatile hydrocarbons was determined by the Headspace Field Method (Underground Storage Tank Regulations, State of New Mexico, Environmental Improvement Board, Part XII, Appendix C, July 26, 1990) using a photoionization detector, Model 580B Organic Vapor Meter (OVM) manufactured by Thermo Environmental Instruments. The results of these screening measurements are presented on the boring logs, Appendix A.

Groundwater sampling of the monitor wells is scheduled for the week of August 19, 1991. Groundwater samples will be collected from the monitor wells after purging the wells of a minimum of three well volumes with a cleaned teflon bailer. Duplicate samples were placed in new 40 milliliter (ml) VOA vials, preserved with hydrochloric acid, and analyzed for aromatic and halogenated volatile organics using EPA methods 8010/8020. A 250 ml water sample will be collected in a new sample container and preserved with nitric acid for ICAP heavy metal analysis (EPA method 6010). A two liter water sample will be collected in a clean sample container and analyzed for major anions and cations using standard EPA methods.

All sample containers will be provided by the laboratory. After collection all VOA samples will be stored on ice until delivery to the laboratory.

Results of the groundwater analyses will be submitted under separate cover upon completion.

SOIL AND GROUNDWATER CONDITIONS

Evaluation of the subsurface site characteristics to the depths explored, indicates the soil to be typically eolian and alluvial consisting of consolidated sands and silts, with variable amounts of clay and gravel. These silty sands overlay a highly plastic clay layer, encountered in several borings along the west portion of the property. This clay layer ranges in depth from ten (10) feet below the ground surface at MW 19 to 24 feet at MW 12. It may act as an aquitard separating shallow groundwater from deeper water zones. Thus no effort was made to drill below this clay layer and all wells were completed above this layer.

The top six inches (6") of soil were observed to be dry, becoming moist to saturated in the vadose zone above the free water level. Soils above the water level were typically light brown to moderate yellowish brown and medium gray below the water table. In the areas of hydrocarbon contamination, a dark gray/gray black soil discoloration was observed from the vadose zone to the first few feet below the water level.

Based upon the initial groundwater measurements, the groundwater ranges from six inches (6") to 16 feet below existing ground surface. The observed potentiometric surface is presented in Appendix B and is similar to the earlier field investigation reported in September 1990. The unlined fire water reserve pit located near the east central portion of the refinery complex appears to be recharging the shallow groundwater. The groundwater gradient and subsequent flow directions radiated away from a high in the immediate vicinity of the reserve pit, ranging from + 4 feet/foot adjacent to the reserve pit to 0.005 feet/foot to the southeast. A more regional gradient and flow direction is to the west and north at 0.012 feet/foot following Kutz Wash. The shallow alluvial groundwater represents an unconfined aquifer.

CONCLUSIONS

Based upon the field exploration, soil and groundwater sampling and available analysis, and review of the prior field investigations and ongoing site remediation, it appears that the hydrocarbon contamination is confined to the west - northwest portion of the property. It is anticipated that the proposed remediation being implemented will mitigate the present contamination problem.

Soil contamination appears to be concentrated in a plume extending from the central portion of the refinery complex toward the west northwest portion of the property. The soil contamination appears to be concentrated within the zone of groundwater fluctuation except in those areas identified previously as sources.

The fire water reserve pit is recharging the shallow alluvial groundwater. It does not appear to have driven any possible contamination to the east. Minor quantities of free product are present within the central portion of the soil contamination plume. Until completion of the laboratory analysis no definitive conclusions regarding the extent of dissolve phase contamination can be made.

LIMITATIONS AND CLOSURE

The recommendations given in this report are based on a visual observation of the site, subsurface soil conditions encountered at the test boring locations, and testing of soil and water samples collected during exploration and monitor well installation. This report does not reflect subsurface variations which may exist between sampling points.

The scope of our services was limited to the assessment of soil and groundwater contamination with respect to hydrocarbon contamination associated with typical crude oil refinery processes.

This report has been prepared for the exclusive use of the Thriftway Marketing Corporation as it pertains to their refinery property south of Bloomfield, New Mexico. All work has been preformed in accordance with generally accepted practices in geotechnical/environmental engineering and hydrogeology.

Respectfully Submitted,
ENVIROTECH INC.

Michael K. Lane, P.E.
Geological Engineer

Reviewed By:

Jack D. Dewey
Hydrologist

Morris Young
President

APPENDICES

684.doc

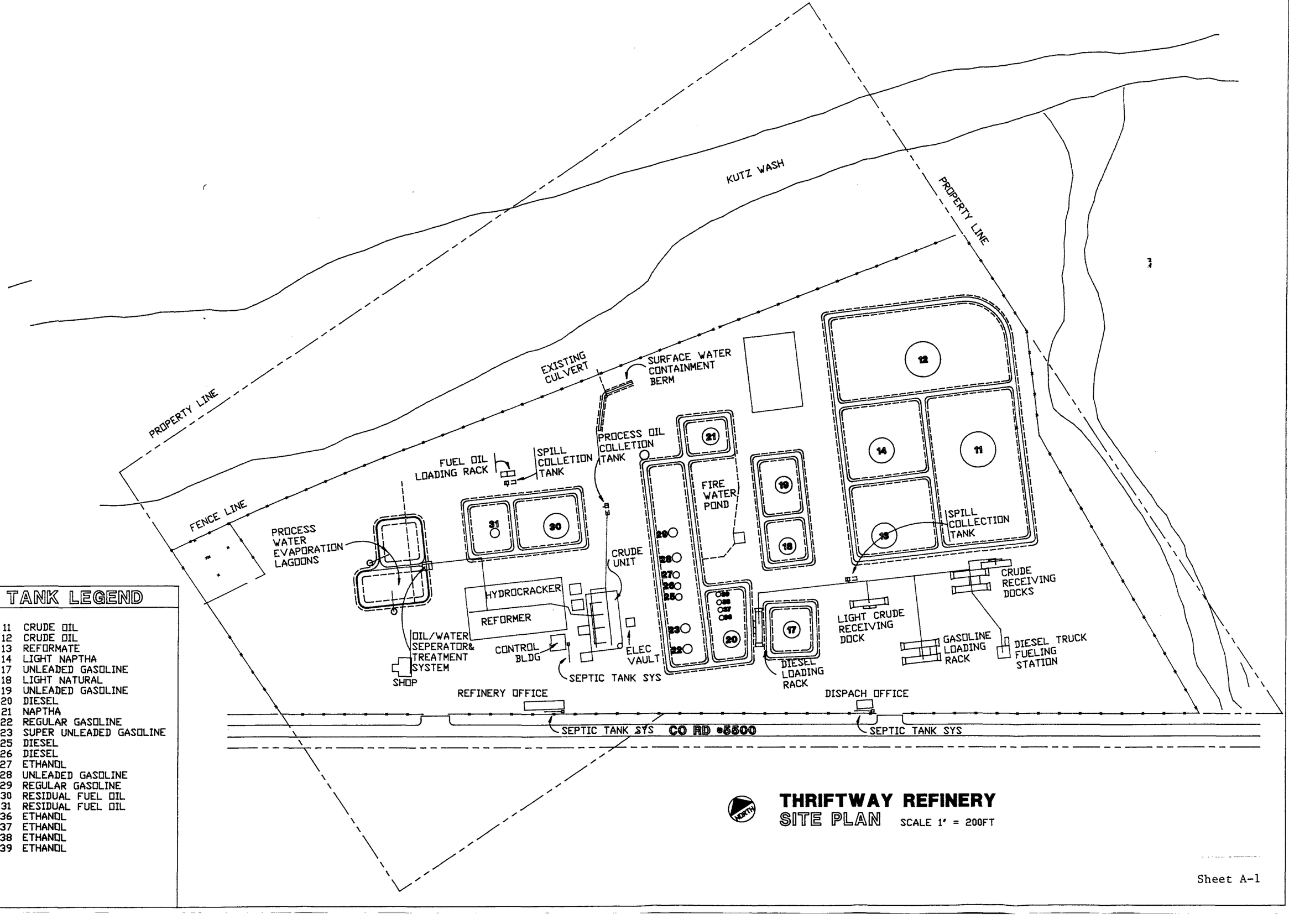
Appendix A

Project #91819

Site Plan A-1

Monitor Well Location Map A-1A

Logs of Borings A-2/A-20



TANK LEGEND

11	CRUDE OIL
12	CRUDE OIL
13	REFORMATE
14	LIGHT NAPTHA
17	UNLEADED GASOLINE
18	LIGHT NATURAL
19	UNLEADED GASOLINE
20	DIESEL
21	NAPTHA
22	REGULAR GASOLINE
23	SUPER UNLEADED GASOLINE
25	DIESEL
26	DIESEL
27	ETHANOL
28	UNLEADED GASOLINE
29	REGULAR GASOLINE
30	RESIDUAL FUEL OIL
31	RESIDUAL FUEL OIL
36	ETHANOL
37	ETHANOL
38	ETHANOL
39	ETHANOL

THRIFTWAY REFINERY
SITE PLAN
SCALE 1" = 200FT

Sheet A-1

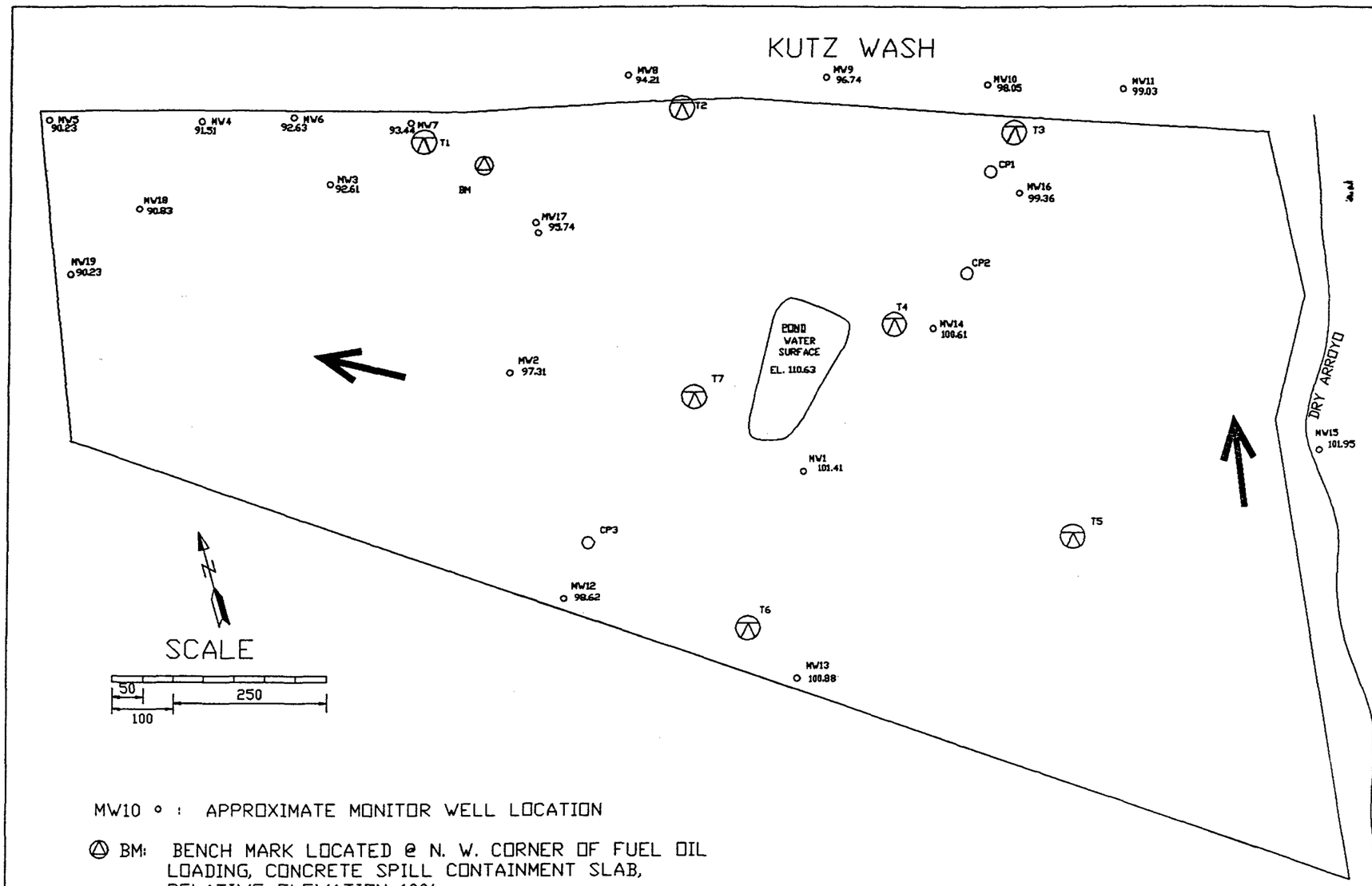
DATE	REVISION	BY
10/29/90	SEPTIC & OIL/WATER SYS	MY

ENVIROTECH INC.
ENVIRONMENTAL SCIENTISTS
(505) 326-2882
3111 KNUDSEN
FARMINGTON, NM 87401

SITE PLAN
THRIFTWAY REFINERY
BLOOMFIELD, NEW MEXICO
THRIFTWAY MARKETING CORP
710 E 20th ST FARMINGTON, NM 87401

DATE: JULY'90
DRAWN: GEB
PROJ. 9023
SCALE: 1"=100'
SHEET C1
OF 3

KUTZ WASH



MW	X	Y
1	+524	-510
2	+44	-345
3	-253	+21
4	-462	+70
5	-712	+74
6	-312	+78
7	-103	+93
8	+233	+148
9	+559	-144
10	+826	+133
11	+1048	+125
12	+134	-722
13	+516	-855
14	+738	-272
15	+1376	-474
16	+879	-46
17	+63	-112
18	-564	-74
19	-675	-182

MW10 ∘ : APPROXIMATE MONITOR WELL LOCATION

△ BM: BENCH MARK LOCATED @ N. W. CORNER OF FUEL OIL LOADING, CONCRETE SPILL CONTAINMENT SLAB, RELATIVE ELEVATION 100'

APPROXIMATE GROUNDWATER FLOW DIRECTION

THRIFTWAY REFINERY
BLOOMFIELD, NEW MEXICO
THRIFTWAY MARKETING CORP
710 E 20TH ST, FARMINGTON, NM, 87401

ENVIROTECH INC.
ENVIRONMENTAL SCIENTISTS
5796 U.S. HIGHWAY 64-3014
FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615

GROUNDWATER
WELL MAP
JUNE 1991
FIGURE A-1A

ENVIROTECH Inc.

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(505) 632-0615

TEST BORING REPORT

BORING No: MW1
JOB No: 91819
PAGE No: A2
LOCATION: REF TO PLAN
DATE START: 6-17-91
DATE FINISH: 6-17-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/ FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 114.6 BM)	SM				LIGHT BROWN TO MODERATE YELLOWISH BROWN SITLY FINE TO MEDIUM SAND, DRY TO SL. MOIST, FRIM.
5		23.3	SPT	11	
	SM				
10		51.3	SPT	21	SAME AS ABOVE (SAA) MOIST TO WET
	SM				DARY GRAY TO GRAYISH BLACK SITY MEDIUM TO COARSE SAND, WET, FIRM, NONCOHESIVE, STRONG PETORLEUM ODOR.
		OS	SPT	17	
	SM				SAA, SATURATED, FREE PRODUCT
15					
	SP				DARK TO MEDIUM GRAY MEDIUM SAND WITH SOME SILT, FIRM, SATURATED.
					FLOWING SAND.
20					
					TOTAL DEPTH: 22 FEET
					GROUNDWATER DEPTH: 11.5 FEET @ 11:30
25					COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B1)
					RELATIVE ELEVATION: 114.08' (BM)
					WELL TD: 21 FEET
					CASING: 2" Sch. 40 PVC (THREADED COUPLING)
					SCREEN: 13' w/ 0.020" SLOTS (8'-21')
					GRAVEL PACK: 8-12 SILICA SAND (7'-21')
					SEAL: 200 MESH BENTONITE @ 7'
30					NOTES: OS - OFF SCALE (>2000 ppm)
					SPT - STANDARD SPLIT-TUBE PENETROMETER

DRAWING: 819M1
DATE: 08-01-91
BY: MKL

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TEST BORING REPORT

BORING No: MW2
JOB No: 91819
PAGE No: A3
LOCATION: REF TO PLAN
DATE START: 6-17-91
DATE FINISH: 6-17-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/ FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 100.1 BH)	SM				MODERATE BROWN TO MODERATE YELLOWISH BROWN SITLY FINE TO MEDIUM SAND, DRY TO SL. MOIST, FRIM, SL. PETROLEUM ODOR.
	SM	46.7	CUT'G	NA	LIGHT BROWN TO OLIVE GRAY, SANDY SILT WITH SMALL GRAVEL, MOIST, FIRM TO DENSE.
5	SM	41.2	SPT	19	BROWNISH GRAY FINE SAND, MOIST, DENSE.
	ML/CL	52.7	SPT	23	OLIVE GRAY SANDY SILT TO SANDY CLAY, PLASTIC, MOIST, STIFF, SLIGHT PETROLEUM ODOR.
	ML/CL		▼		SAME AS ABOVE (SAA), DARK GRAY TO GRAY BLACK, SATURATE, FREE PRODUCT.
10	SW	522	SPT	23	DARK GRAY WELL GRADED SAND WITH SILT, SATURATED, DENSE, NONCOHESIVE.
15	SW				MEDIUM GRAY WELL GRADED SAND WITH SOME SILT, SATURATED, FIRM, NONCOHESIVE. FLOWING SAND.
20					
25					TOTAL DEPTH: 20 FEET GROUNDWATER DEPTH: 9.0 FEET @ 14:10 COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B3) RELATIVE ELEVATION: 107.62' (BM) WELL TD: 19 FEET CASING: 2" Sch. 40 PVC (THREADED COUPLING) SCREEN: 13' w/ 0.020" SLOTS (6'-19') GRAVEL PACK: 8-12 SILICA SAND (4'-19') SEAL: 200 MESH BENTONITE @ 4'
30					NOTES: SPT - STANDARD SPLIT-TUBE PENETROMETER

DRAWING: 819M2
DATE: 08-01-91
BY: MKL

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TEST BORING REPORT

BORING No: MW3
JOB No: 91819
PAGE No: A4
LOCATION: REF TO PLAN
DATE START: 6-25-91
DATE FINISH: 6-26-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 96.9 BM)	SM				BROWN TO MODERATE YELLOWISH BROWN SITLY FINE TO MEDIUM SAND, DRY TO SL. MOIST, MEDIUM DENSE.
		56.1	SPT	18	
	SM				SAME AS ABOVE (SAA), DARK GRAY TO GRAY BLACK, WET, STRONG PETROLEUM ODOR, FREE PRODUCT AT WATER LEVEL.
5	SM	602	SPT	14	
	SW				OLIVE GRAY WELL GRADED SAND WITH SOME SILT, SATURATED, FIRM, NONCOHESIVE.
10					FLOWING SAND.
					GRAVELS TO COBBLES.
15					
20					TOTAL DEPTH: 17 FEET GROUNDWATER DEPTH: 4.0 FEET @ 8:45 (6-26) COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B3) RELATIVE ELEVATION: 96.28' (BM) WELL TD: 14 FEET CASING: 2" Sch. 40 PVC (THREADED COUPLING) SCREEN: 13' w/ 0.020" SLOTS (1'-14') GRAVEL PACK: 8-12 SILICA SAND (1'-14') SEAL: 200 MESH BENTONITE @ 1'
25					NOTES: SPT - STANDARD SPLIT-TUBE PENETROMETER
30					

DRAWING: 819M3
DATE: 08-02-91
BY: MKL

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TEST BORING REPORT

BORING No: MW4
JOB No: 91819
PAGE No: A5
LOCATION: REF TO PLAN
DATE START: 6-18-91
DATE FINISH: 6-18-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 96.4 BM)	SM	7.2	CUT'G	NA	LIGHT BROWN SITLY FINE TO MEDIUM SAND, DRY TO SL. MOIST, LOOSE TO MEDIUM DENSE.
5	SM	17.1	SPT	22	BROWNISH GRAY SILTY SAND WITH SMALL GRAVEL, MOIST TO WET, SLIGHT PETROLEUM ODOR.
	SW				DARK GRAY TO GRAY BLACK WELL GRADED SAND WITH SILT, DENSE, WET TO SATURATED, NONCOHESIVE.
10		202	SPT	21	
	SW				MEDIUM GRAY TO BROWNISH GRAY WELL GRADED SAND, SATURATED, FIRM, NONCOHESIVE.
15					FLOWING SAND.
20					
25					TOTAL DEPTH: 20 FEET GROUNDWATER DEPTH: 9.0 FEET @ 12:00 COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B4) RELATIVE ELEVATION: 95.82' (BM) WELL TD: 18 FEET CASING: 2" Sch. 40 PVC (THREADED COUPLING) SCREEN: 13' w/ 0.020" SLOTS (5'-18') GRAVEL PACK: 8-12 SILICA SAND (4'-18') SEAL: 200 MESH BENTONITE @ 4'
30					NOTES: SPT - STANDARD SPLIT-TUBE PENETROMETER

DRAWING: 819M4
DATE: 08-02-91
BY: MKL

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TEST BORING REPORT

BORING No: MW5
JOB No: 91819
PAGE No: A6
LOCATION: REF TO PLAN
DATE START: 6-19-91
DATE FINISH: 6-19-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 95.0 BM)	SM	5.7	SPT	11	LIGHT BROWN SITLY FINE TO MEDIUM SAND, LOOSE TO SL. DENSE, DRY TO SL. MOIST.
	SM				SAME AS ABOVE (SAA), BROWNISH GRAY, MOIST.
5	SW	16.1	SPT	14	DARK GRAY TO GRAY BLACK WELL GRADED SAND, WET TO SATURATED, DENSE, STRONG PETROLEUM ODOR.
	SW				OLIVE GRAY WELL GRADED SAND WITH SOME SILT, SATURATED, FIRM, NONCOHESIVE.
10					FLOWING SAND.
15	CL/CH				LIGHT GRAY GRAVELLY SANDY CLAY, PLASTIC, STIFF,SATURATED.
20					TOTAL DEPTH: 16 FEET GROUNDWATER DEPTH: 6.0 FEET @ 10:30 COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B4) RELATIVE ELEVATION: 94.66' (BM) WELL TD: 16 FEET CASING: 2" Sch. 40 PVC (THREADED COUPLING) SCREEN: 13' w/ 0.020" SLOTS (3'-16') GRAVEL PACK: 8-12 SILICA SAND (2'-16') SEAL: 200 MESH BENTONITE @ 2'
25					NOTES: SPT - STANDARD SPLIT-TUBE PENETROMETER DISCONTIUNUED DRILL @ 16' TO PREVENT POSSIBLE CROSS CONTAMINATION OF DEEPER WATER BEARING ZONES.
30					

DRAWING: 819M5
DATE: 08-02-91
BY: MKL

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TEST BORING REPORT

BORING No: MW6
JOB No: 91819
PAGE No: A7
LOCATION: REF TO PLAN
DATE START: 6-25-91
DATE FINISH: 6-25-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 96.8' BM)	SP	144.6	SPT	17	MODERATE YELLOWISH BROWN FINE TO MEDIUM SAND WITH SILT, TRACE SMALL GRAVEL, DRY TO SL. MOIST, FIRM TO MEDIUM DENSE.
	SP	324	CUT'G	NA	SAME AS ABOVE (SAA), MEDIUM BLUISH GRAY TO OLIVE GRAY, LOOSE, MOIST TO WET.
5	SW				DARK GRAY TO GRAY BLACK WELL GRADED SAND, WET TO SATURATED, SLIGHTLY DENSE, STRONG PETROLEUM ODOR.
		703	SPT	9	
					GRAVELS AND COBBLES.
10	SW				OLIVE GRAY WELL GRADED SAND WITH SOME SILT, SATURATED, MODERATE DENSE, NONCOHESIVE.
					FLOWING SAND.
15					
20					TOTAL DEPTH: 17 FEET GROUNDWATER DEPTH: 5.5 FEET @ 14:50 COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B4) RELATIVE ELEVATION: 96.31' (BM) WELL TD: 15 FEET CASING: 4" Sch. 40 PVC (THREADED COUPLING) SCREEN: 13' w/ 0.020" SLOTS (2'-15') GRAVEL PACK: 8-12 SILICA SAND (1'-15') SEAL: 200 MESH BENTONITE @ 1' NOTES: SPT - STANDARD SPLIT-TUBE PENETROMETER
25					
30					

DRAWING: 819M6
DATE: 08-02-91
BY: MKL

ENVIROTECH Inc.

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TEST BORING REPORT

BORING No: MW7
JOB No: 91819
PAGE No: A8
LOCATION: REF TO PLAN
DATE START: 6-25-91
DATE FINISH: 6-26-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 97.3' BM)	SM	193.6	CUT'G	NA	MODERATE BROWN SITLY FINE TO MEDIUM SAND WITH GRAVEL, LOOSE TO SL. DENSE, DRY TO MOIST.
		327	SPT	13	
	SM		▼		SAME AS ABOVE (SAA), BROWNISH GRAY GRADING TO DARK GRAY, STRONG PETROLEUM ODOR, FREE PRODUCT AT WATER LEVEL.
5	SM	411	SPT	16	
	SW				LIGHT GRAY TO OLIVE GRAY WELL GRADED SAND WITH SOME SILT, SATURATED, FIRM, NONCOHESIVE.
10					FLOWING SAND.
15					
20					TOTAL DEPTH: 17 FEET GROUNDWATER DEPTH: 3.0 FEET @ 14:30 COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B5) RELATIVE ELEVATION: 96.79' (BM) WELL TD: 14 FEET CASING: 4" Sch. 40 PVC (THREADED COUPLING) SCREEN: 13' w/ 0.020" SLOTS (1'-14') GRAVEL PACK: 8-12 SILICA SAND (1'-14') SEAL: 200 MESH BENTONITE @ 1'
25					NOTES: SPT - STANDARD SPLIT-TUBE PENETROMETER
30					

DRAWING: 819M7
DATE: 08-02-91
BY: MKL

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TEST BORING REPORT

BORING No: MW8
JOB No: 91819
PAGE No: A9
LOCATION: REF TO PLAN
DATE START: 6-25-91
DATE FINISH: 6-25-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/ FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 95.9' BM)	SM	1.2	SPT	3	LIGHT BROWN SITLY FINE SAND (EOLIAN), LOOSE, DRY TO SL. MOIST.
	SM	5.6	SPT	4	SAME AS ABOVE (SAA), DARK GRAY, WET TO SATURATED.
5					
	SW				OLIVE GRAY TO LIGHT GRAY WELL GRADED SAND WITH SOME SILT AND GRAVELS, MEDIUM DENSE, SATURATED, NONCOHESIVE.
10					FLOWING SAND.
	CL/ CH				BLUEISH GRAY GRAVELLY CLAY, PLASTIC, STIFF, SATURATED.
15					
20					TOTAL DEPTH: 15 FEET GROUNDWATER DEPTH: 3.0 FEET @ 11:15 COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B5) RELATIVE ELEVATION: 97.04' (BM) WELL TD: 14 FEET CASING: 2" Sch. 40 PVC (THREADED COUPLING) SCREEN: 13' w/ 0.020" SLOTS (1'-14') GRAVEL PACK: 8-12 SILICA SAND (1'-14') SEAL: 200 MESH BENTONITE @ 1'
25					NOTES: SPT - STANDARD SPLIT-TUBE PENETROMETER DISCONTIUNUED DRILL @ 16' TO PREVENT POSSIBLE CROSS CONTAMINATION OF DEEPER WATER BEARING ZONES.
30					

DRAWING: 819M8
DATE: 08-02-91
BY: MKL

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TEST BORING REPORT

BORING No: MW9
JOB No: 91819
PAGE No: A10
LOCATION: REF TO PLAN
DATE START: 6-24-91
DATE FINISH: 6-24-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/ FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 99.3 BM)	SM	3.8	SPT	3	YELLOWISH BROWN SITLY FINE TO MEDIUM SAND (EOLIAN), LOOSE, DRY TO SL. MOIST.
	SM				
	SM	2.1	SPT	5	SAME AS ABOVE (SAA), BROWNISH GRAY, MOIST TO SATURATED.
5					
	SW				OLIVE GRAY TO LIGHT GRAY WELL GRADED SAND WITH SOME SILT AND GRAVELS, MEDIUM DENSE, SATURATED, NONCOHESIVE.
10					FLOWING SAND.
					MINOR GRAVELS.
15					
					TOTAL DEPTH: 16 FEET
					GROUNDWATER DEPTH: 3.0 FEET @ 11:00
					COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B5)
					RELATIVE ELEVATION: 100.16' (BM)
					WELL TD: 14 FEET
					CASING: 2" Sch. 40 PVC (THREADED COUPLING)
					SCREEN: 13' w/ 0.020" SLOTS (1'-14')
					GRAVEL PACK: 8-12 SILICA SAND (1'-14')
20					SEAL: 200 MESH BENTONITE @ 1'
					NOTES: SPT - STANDARD SPLIT-TUBE PENETROMETER
25					
30					

DRAWING: 819M9
DATE: 08-02-91
BY: MKL

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TEST BORING REPORT

BORING No: MW10
JOB No: 91819
PAGE No: A11
LOCATION: REF TO PLAN
DATE START: 6-25-91
DATE FINISH: 6-25-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/ FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 100.2 BM)	SM				LIGHT BROWN SITLY FINE TO MEDIUM SAND (EOLIAN), LOOSE, DRY TO MOIST.
	SW	1.2	SPT	3	
		1.2	SPT	9	OLIVE GRAY TO LIGHT GRAY WELL GRADED SAND WITH SOME SILT AND GRAVELS, MEDIUM DENSE, SATURATED, NONCOHESIVE.
5					GRAVELS.
10					FLOWING SAND.
15	CL/ CH				BLUEISH GRAY GRAVELLY CLAY, PLASTIC, STIFF, SATURATED.
20					
25					
30					

TOTAL DEPTH: 15 FEET
GROUNDWATER DEPTH: 1.5 FEET @ 9:30

COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B1)
RELATIVE ELEVATION: 101.55' (BM)
WELL TD: 14 FEET
CASING: 2" Sch. 40 PVC (THREADED COUPLING)
SCREEN: 13' w/ 0.020" SLOTS (1'-14')
GRAVEL PACK: 8-12 SILICA SAND (1'-14')
SEAL: 200 MESH BENTONITE @ 1'

NOTES: SPT - STANDARD SPLIT-TUBE PENETROMETER

DISCONTIUNUED DRILLING @ 15' TO PREVENT POSSIBLE CROSS CONTAMINATION OF DEEPER WATER BEARING ZONES.

DRAWING: 819M10
DATE: 08-02-91
BY: MKL

ENVIROTECH Inc.

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TEST BORING REPORT

BORING No: MW11
JOB No: 91819
PAGE No: A12
LOCATION: REF TO PLAN
DATE START: 6-24-91
DATE FINISH: 6-24-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/ FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 1011 BM)	SM	ND	SPT	3	LIGHT BROWN SITLY FINE TO MEDIUM SAND (EOLIAN), LOOSE TO SL. DENSE, DRY TO MOIST.
	SW	ND	SPT	11	OLIVE GRAY TO LIGHT GRAY WELL GRADED SAND WITH SOME SILT AND GRAVELS, MEDIUM DENSE, SATURATED, NONCOHESIVE.
5					
10					FLOWING SAND.
15					
20					TOTAL DEPTH: 17 FEET GROUNDWATER DEPTH: 3.0 FEET @ 14:50 COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B1) RELATIVE ELEVATION: 103.63' (BM) WELL TD: 14 FEET CASING: 2" Sch. 40 PVC (THREADED COUPLING) SCREEN: 13' w/ 0.020" SLOTS (1'-14') GRAVEL PACK: 8-12 SILICA SAND (1'-14') SEAL: 200 MESH BENTONITE @ 1' NOTES: SPT - STANDARD SPLIT-TUBE PENETROMETER ND - NO ORGANIC VAPORS DETECTED w/ THE 580B OVM
25					
30					

DRAWING: 819M11
DATE: 08-02-91
BY: MKL

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TEST BORING REPORT

BORING No: MW12
JOB No: 91819
PAGE No: A13
LOCATION: REF TO PLAN
DATE START: 6-20-91
DATE FINISH: 6-21-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 111.9 BM)	GM	12.6	CUT'G	NA	MODERATE BROWN TO DARK YELLOWISH BROWN SILTY GRAVEL WITH SAND, DRY TO SL. MOIST, MEDIUM DENSE.
5	SW	22.6	SPT	21	LIGHT BROWN WELL GRADED SAND WITH MINOR SILT AND GRAVEL, MOIST, DENSE.
	ML				LIGHT BROWN MEDIUM TO COARSE SANDY SILT, SL. MOIST, DENSE.
10	ML	26.2	SPT	25	SAME AS ABOVE (SAA), MOIST, STIFF, SL. PLASTIC.
	ML		▼		BROWNISH GRAY TO DARK GRAY, SILTY FINE SAND TO SANDY SILT, WET TO SATURATED, DENSE, STRONG PETROLEUM ODOR.
15		269	SPT	23	
	SP				MEDIUM GRAY MEDIUM SAND, SATURATED, DENSE.
20					
25	CL/CH				LIGHT GRAY SANDY CLAY, PLASTIC, STIFF, SATURATED.
					TOTAL DEPTH: 26 FEET GROUNDWATER DEPTH: 14 FEET @ 9:30 (6-21)
30					COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B1) RELATIVE ELEVATION: 111.11' (BM) WELL TD: 24 FEET CASING: 2" Sch. 40 PVC (THREADED COUPLING) SCREEN: 13' w/ 0.020" SLOTS (11'-24') GRAVEL PACK: 8-12 SILICA SAND (9'-24') SEAL: 200 MESH BENTONITE @ 9' NOTES: SPT- STANDARD SPLIT-TUBE PENETROMETER

DRAWING: 819M12
DATE: 08-02-91
BY: MKL

ENVIROTECH Inc.

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TEST BORING REPORT

BORING No: MW13
JOB No: 91819
PAGE No: A14
LOCATION: REF TO PLAN
DATE START: 6-21-91
DATE FINISH: 6-21-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/ FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 117.4 BM)	SM				MODERATE BROWN SILTY MEDIUM TO FINE SAND WITH GRAVEL (1"), SAND, DRY TO SL. MOIST, MEDIUM DENSE.
		6.8	CUT'G	NA	
	ML				LIGHT BROWN FINE SANDY SILT, SL. MOIST, FIRM TO HARD, SL. PLASTIC.
5		3.8	SPT	21	
	SW				LIGHT BROWN WELL GRADED SAND WITH MINOR SILT AND GRAVEL, MOIST, DENSE.
	ML/ SM				INTERBEDDED SILT AND MEDIUM TO COARSE SAND LAYERS.
10		3.8	SPT	22	
					SAME AS ABOVE (SAA), MOIST, STIFF, SL. PLASTIC.
15	SP	13.4	SPT	30	MEDIUM GRAY TO OLIVE GRAY MEDIUM SAND WITH SOME SILT, WET TO SATURATED, DENSE.
	SP				
20					
25					TOTAL DEPTH: 26 FEET GROUNDWATER DEPTH: 16 FEET @ 10:00
30					COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B1) RELATIVE ELEVATION: 117.12' (BM) WELL TD: 26 FEET CASING: 2" Sch. 40 PVC (THREADED COUPLING) SCREEN: 13' w/ 0.020" SLOTS (13'-26') GRAVEL PACK: 8-12 SILICA SAND (10'-26') SEAL: 200 MESH BENTONITE @ 10' NOTES: SPT- STANDARD SPLIT-TUBE PENETROMETER

DRAWING: 819M12
DATE: 08-02-91
BY: MKL

ENVIROTECH Inc.

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TEST BORING REPORT

BORING No: MW14
JOB No: 91819
PAGE No: A15
LOCATION: REF TO PLAN
DATE START: 6-21-91
DATE FINISH: 6-21-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 112.4' BM)	SM/ML				LIGHT BROWN TO MODERATE YELLOWISH BROWN SITLY FINE SAND TO SANDY SILT, DRY TO SL. MOIST, LOOSE TO SL. DENSE.
5		10.8	SPT	16	
	CL				
10		10.8	SPT	23	LIGHT BROWN TO MEDIUM YELLOWISH BROWN FINE SANDY CLAY, MOIST, STIFF, PLASTIC.
	SM		▼		
	SM				LIGHT GRAY TO OLIVE SILTY MEDIUM TO FINE SAND, WET TO SATURATED, SL. DENSE.
15					
20					
	CL/CH				LIGHT GRAY SANDY GRAVELLY CLAY, PLASTIC, STIFF, SATURATED.
25					TOTAL DEPTH: 22 FEET GROUNDWATER DEPTH: 11.9 FEET @ 15:00 COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B1) RELATIVE ELEVATION: 111.94' (BM) WELL TD: 22 FEET CASING: 2" Sch. 40 PVC (THREADED COUPLING) SCREEN: 13' w/ 0.020" SLOTS (9'-22') GRAVEL PACK: 8-12 SILICA SAND (8'-22') SEAL: 200 MESH BENTONITE @ 8' NOTES: SPT - STANDARD SPLIT-TUBE PENETROMETER DISCONTINUED DRILLING @ 22' TO PREVENT POSSIBLE CROSS CONTAMINATION OF DEEPER WATER BEARING ZONES.
30					

DRAWING: 819M14
DATE: 08-05-91
BY: MKL

ENVIROTECH Inc.

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TEST BORING REPORT

BORING No: MW15
JOB No: 91819
PAGE No: A16
LOCATION: REF TO PLAN
DATE START: 6-24-91
DATE FINISH: 6-24-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 112.0 BM)	SM				LIGHT BROWN TO MODERATE YELLOWISH BROWN SITLY FINE TO MEDIUM SAND, DRY TO SL. MOIST, FRIM.
5	SM	1.2	SPT	10	SAME AS ABOVE (SAA), MOIST, SL. DENSE.
10	SP				BROWNISH GRAY FINE SAND, MOIST TO WET, DENSE.
	SW	2.1	SPT	25	MEDIUM GRAY WELL GRADED SAND WITH SOME SILT, SATURATED, FIRM, NONCOHESIVE. FLOWING SAND.
15					
20					
25					
30					

TOTAL DEPTH: 21 FEET
GROUNDWATER DEPTH: 11.0 FEET @ 13:30

COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B1)
RELATIVE ELEVATION: 114.53' (BM)
WELL TD: 21 FEET
CASING: 2" Sch. 40 PVC (THREADED COUPLING)
SCREEN: 13' w/ 0.020" SLOTS (8'-21')
GRAVEL PACK: 8-12 SILICA SAND (7'-21')
SEAL: 200 MESH BENTONITE @ 7'

NOTES: SPT - STANDARD SPLIT-TUBE PENETROMETER

DRAWING: 819M15
DATE: 08-05-91
BY: MKL

ENVIROTECH Inc.

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TEST BORING REPORT

BORING No: MW16
JOB No: 91819
PAGE No: A17
LOCATION: REF TO PLAN
DATE START: 6-21-91
DATE FINISH: 6-24-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/ FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 108.2' ASL)	SM				LIGHT BROWN TO MODERATE YELLOWISH BROWN SITLY FINE TO MEDIUM SAND, DRY TO SL. MOIST, LOOSE TO SL. DENSE.
	ML	34.2	CUT'G	NA	DARK YELLOWISH ORANGE TO LIGHT BROWN FINE SANDY SILT, MOIST, FIRM, SL. PLASTIC.
5					
	SM	101.3	SPT	14	LIGHT BROWN SILTY FINE SAND, SL. DENSE, MOIST TO WET.
	SM		▼		SAME AS ABOVE (SAA), BROWNISH GRAY.
	SM				SAA, DARK GRAY TO GRAY BLACK, SATURATED, SL. DENSE, STRONG PETROLEUM ODOR.
10		151.3	SPT	11	
	SW				LIGHT GRAY TO OLIVE WELL GRADED SAND, SATURATED, SL. DENSE NONCOHESIVE.
15					FLOWING SAND.
20					
25					TOTAL DEPTH: 22 FEET GROUNDWATER DEPTH: 8.5 FEET @ 8:15 (6-24) COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B1) RELATIVE ELEVATION: 107.64' (BM) WELL TD: 18.5 FEET CASING: 2" Sch. 40 PVC (THREADED COUPLING) SCREEN: 13' w/ 0.020" SLOTS (5.5'-18.5') GRAVEL PACK: 8-12 SILICA SAND (4'-18.5') SEAL: 200 MESH BENTONITE @ 4'
30					NOTES: SPT - STANDARD SPLIT-TUBE PENETROMETER

DRAWING: 819M16
DATE: 08-04-91
BY: MKL

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TEST BORING REPORT

BORING No: MW17
JOB No: 91819
PAGE No: A18
LOCATION: REF TO PLAN
DATE START: 6-20-91
DATE FINISH: 6-20-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/ FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 101.3 BM)	SM/ ML				LIGHT BROWN TO MODERATE YELLOWISH BROWN SITLY FINE TO MEDIUM SAND TO SANDY SILT, DRY TO SL. MOIST, DENSE.
	SM/ SC	21.0	CUT'G	NA	LIGHT OLIVE GRAY SILTY SAND TO CLAYEY SAND, MOIST, FIRM.
	SM/ SC		▼		SAME AS ABOVE (SAA), DARK GRAY TO GRAY BLACK, SATURATED,
5	SM/ SC	369	SPT	20	DENSE, STRONG PETROLEUM ODOR.
					SAA, WITH GRAVELS.
10	SW	59.3	SPT	19	LIGHT OLIVE GRAY TO PALE YELLOWISH BROWN, WELL GRADED SAND, SATURATED, DENSE.
15					FLOWING SAND AND OCCASIONAL GRAVEL STRINGERS.
20					
25					
30					

TOTAL DEPTH: 21 FEET
GROUNDWATER DEPTH: 4.8 FEET @ 15:00

COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B8)
RELATIVE ELEVATION: 100.84' (BM)
WELL 8D: 16 FEET
CASING: 2" Sch. 40 PVC (THREADED COUPLING)
SCREEN: 13' w/ 0.020" SLOTS (2'-16')
GRAVEL PACK: 8-12 SILICA SAND (1.5'-16')
SEAL: 200 MESH BENTONITE @ 1.5'

NOTES: SPT - STANDARD SPLIT-TUBE PENETROMETER

DRAWING: 819M17
DATE: 08-05-91
BY: MKL

ENVIROTECH Inc.

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TEST BORING REPORT

BORING No: MW18
JOB No: 91819
PAGE No: A19
LOCATION: REF TO PLAN
DATE START: 6-19-91
DATE FINISH: 6-20-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/ FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 94.6 BM)	SM				MODERATE YELLOW BROWN SITLY FINE TO MEDIUM SAND, LOOSE TO SL. DENSE, DRY TO SL. MOIST.
	SM	5.7	SPT	20	SAME AS ABOVE (SAA), MOIST, MEDIUM DENSE.
	SM		▼		SAME AS ABOVE (SAA), LIGHT OLIVE GRAY, WET.
5	SW				DARK GRAY TO GRAY BLACK WELL GRADED SAND, WET TO SATURATED, DENSE, STRONG PETROLEUM ODOR & OIL SHEAN.
		202.1	SPT	14	
	SW				OLIVE GRAY WELL GRADED SAND WITH SOME SILT, SATURATED, DENSE, NONCOHESIVE.
10					FLOWING SAND.
15	CL/ CH				LIGHT GRAY GRAVELLY SANDY CLAY, PLASTIC, STIFF,SATURATED.
20					TOTAL DEPTH: 16 FEET GROUNDWATER DEPTH: 3.9 FEET @ 8:00 (6-20) COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B1) RELATIVE ELEVATION: 94.04' (BM) WELL TD: 14 FEET CASING: 2" Sch. 40 PVC (THREADED COUPLING) SCREEN: 13' w/ 0.020" SLOTS (1'-14') GRAVEL PACK: 8-12 SILICA SAND (1'-14') SEAL: 200 MESH BENTONITE @ 1'
25					NOTES: SPT - STANDARD SPLIT-TUBE PENETROMETER DISCONTIUNUED DRILL @ 16' TO PREVENT POSSIBLE CROSS CONTAMINATION OF DEEPER WATER BEARING ZONES.
30					

DRAWING: 819M18
DATE: 08-05-91
BY: MKL

ENVIROTECH Inc.

5796 US HWY. 64, FARMINGTON, NM 87401
(505) 632-0615

TEST BORING REPORT

BORING No: MW19
JOB No: 91819
PAGE No: A20
LOCATION: REF TO PLAN
DATE START: 6-20-91
DATE FINISH: 6-20-91
DRILLER: JWM
PREPARED BY: MKL

PROJECT: THRIFTWAY REFINERY, GROUNDWATER REMEDIATION
CLIENT: THRIFTWAY MARKETING CORPORATION
CONTRACTOR: ENVIROTECH INC.
EQUIPMENT USED: CME-55 MOBIL DRILL RIG w/ 8" HSA

DEPTH FEET	USCS	OVM PPM	SAMPLE TYPE	BLOW/ FOOT	FIELD CLASSIFICATION AND REMARKS
GROUND ELEVATION (APPROX 93.2 BM)	SM				MODERATE YELLOW BROWN SITLY FINE TO MEDIUM SAND, LOOSE TO SL. DENSE, DRY TO SL. MOIST.
	SM	11.6	SPT	15	SAME AS ABOVE (SAA), LIGHT OLIVE GRAY, WET.
	SW		▼		
	SW				DARK GRAY TO GRAY BLACK WELL GRADED SAND, WET TO SATURATED,
5		210.1	SPT	9	DENSE, STRONG PETROLEUM ODOR & OIL SHEAN.
	SW				OLIVE GRAY WELL GRADED SAND WITH SOME SILT, SATURATED, DENSE, NONCOHESIVE.
10	CL/ CH				LIGHT GRAY GRAVELLY SANDY CLAY, PLASTIC, STIFF,SATURATED.
15					
20					
25					
30					

TOTAL DEPTH: 10 FEET
GROUNDWATER DEPTH: 3.5 FEET @ 10:00

COMPLETION: GROUNDWATER MONITOR WELL (REF. TYPICAL B1)
RELATIVE ELEVATION: 93.64' (BM)
WELL TD: 10 FEET
CASING: 2" Sch. 40 PVC (THREADED COUPLING)
SCREEN: 8' w/ 0.020" SLOTS (2'-10')
GRAVEL PACK: 8-12 SILICA SAND (1'-10')
SEAL: 200 MESH BENTONITE @ 1'

NOTES: SPT - STANDARD SPLIT-TUBE PENETROMETER
DISCONTINUED DRILLING @ 10' TO PREVENT POSSIBLE CROSS CONTAMINATION OF DEEPER WATER BEARING ZONES.

DRAWING: 819M19
DATE: 08-05-91
BY: MKL

Appendix B

Project #91819

Summary of Monitor Well Data, June 1991 .....B-1

Groundwater Contour Map B-2

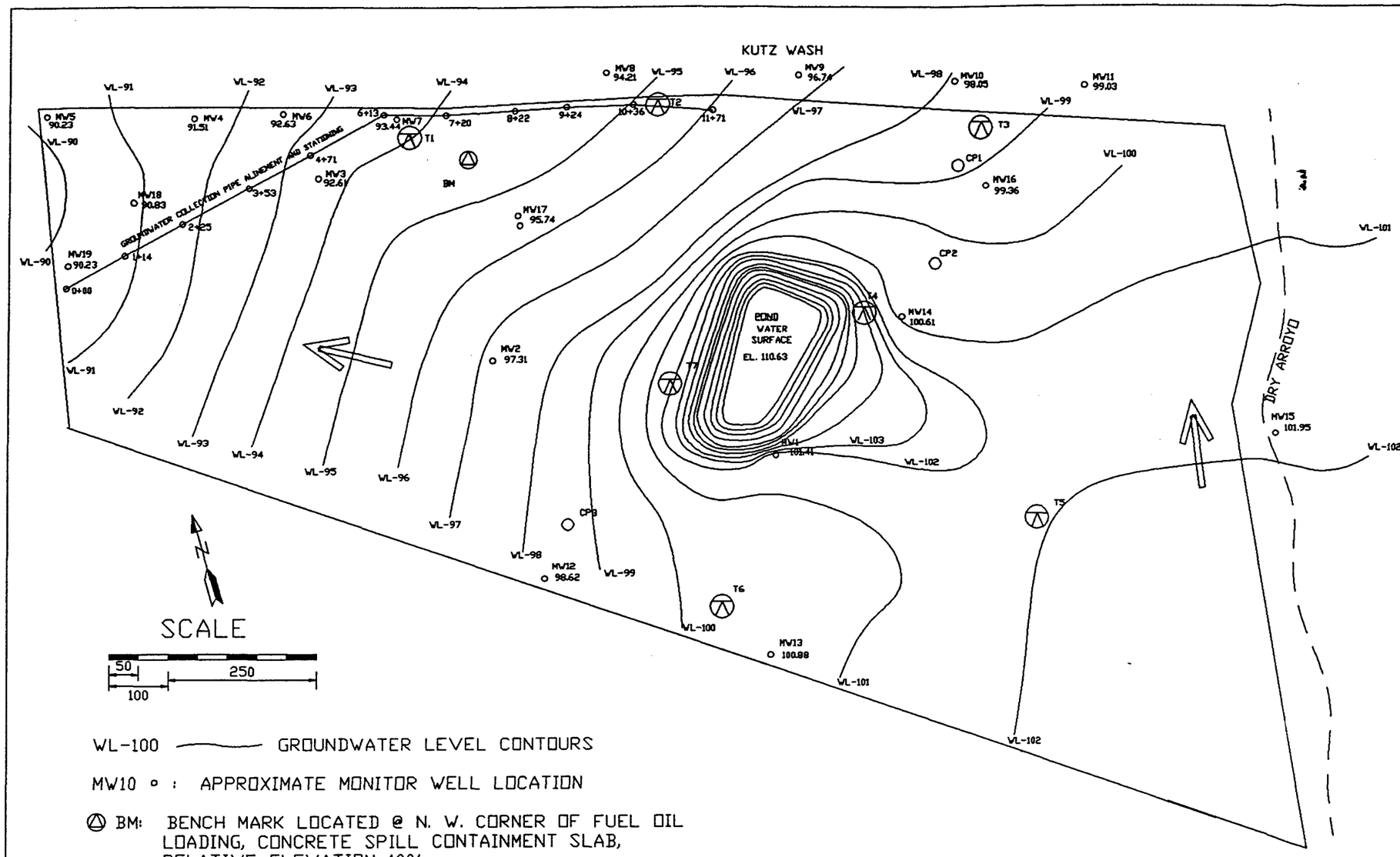
Monitor Well Construction Details.....B-4/B-9

SUMMARY OF MONITOR WELL DATA
THRIFTWAY REFINERY, BLOOMFIELD, NEW MEXICO

WELL NO.	TOTAL DEPTH (FEET)	SCREENED INTERVAL (FEET)	WELL HEAD ELEVATION (FEET)	DRILLING WATER LEVEL (WL) (FEET)	WL 6/27 28/91 MEASURED (FEET)	RELATIVE ELEVATION (FEET)
1	22	11-21	114.08	12	12.67	101.41
2	20	06-19	107.62	9	10.31	97.31
3	17	01-14	69.28	4	3.67	92.61
4	20	05-18	95.82	9	4.31	91.51
5	16	03-16	94.66	6	4.43	90.23
6	17	02-15	96.31	5.5	3.68	92.63
7	17	01-14	96.79	5	3.35	93.44
8	15	01-14	97.04	3	2.83	94.21
9	16	01-14	100.16	4	3.42	96.74
10	15	01-14	101.55	3	3.50	98.05
11	17	01-14	103.63	3	4.60	99.03
12	26	11-24	111.11	14	12.51	98.62
13	26	13-26	117.12	16	16.24	100.88
14	22	09-22	111.94	11.95	11.33	100.61
15	21	08-21	114.53	11	12.58	101.95
16	22	8.5-18.5	107.64	8.5	8.28	99.36
17	21	02-16	100.84	4.75	5.10	95.74
18	16	01-14	94.04	3.75	3.21	90.83
19	10	02-10	93.64	3.5	2.90	90.23

NOTES:

1) Total Depth - Total Depth below existing ground surface during drilling
2) MW #6 & #7 completed with 4" scheduled 40 PVC all others completed with 2" PVC.
3) All elevations based on Bench Mark (BM) datum of 100'.



MW	X	Y
1	+524	-510
2	+44	-345
3	-253	+21
4	-462	+70
5	-712	+74
6	-312	+78
7	-103	+93
8	+233	+148
9	+559	-144
10	+826	+133
11	+1048	+125
12	+134	-722
13	+516	-855
14	+738	-272
15	+1376	-474
16	+879	-46
17	+63	-112
18	-564	-74
19	-675	-182

WL-100 ——— GROUNDWATER LEVEL CONTOURS

MW10 ∘ : APPROXIMATE MONITOR WELL LOCATION

BM: BENCH MARK LOCATED @ N. W. CORNER OF FUEL OIL LOADING, CONCRETE SPILL CONTAINMENT SLAB, RELATIVE ELEVATION 100'

APPROXIMATE GROUNDWATER FLOW DIRECTION

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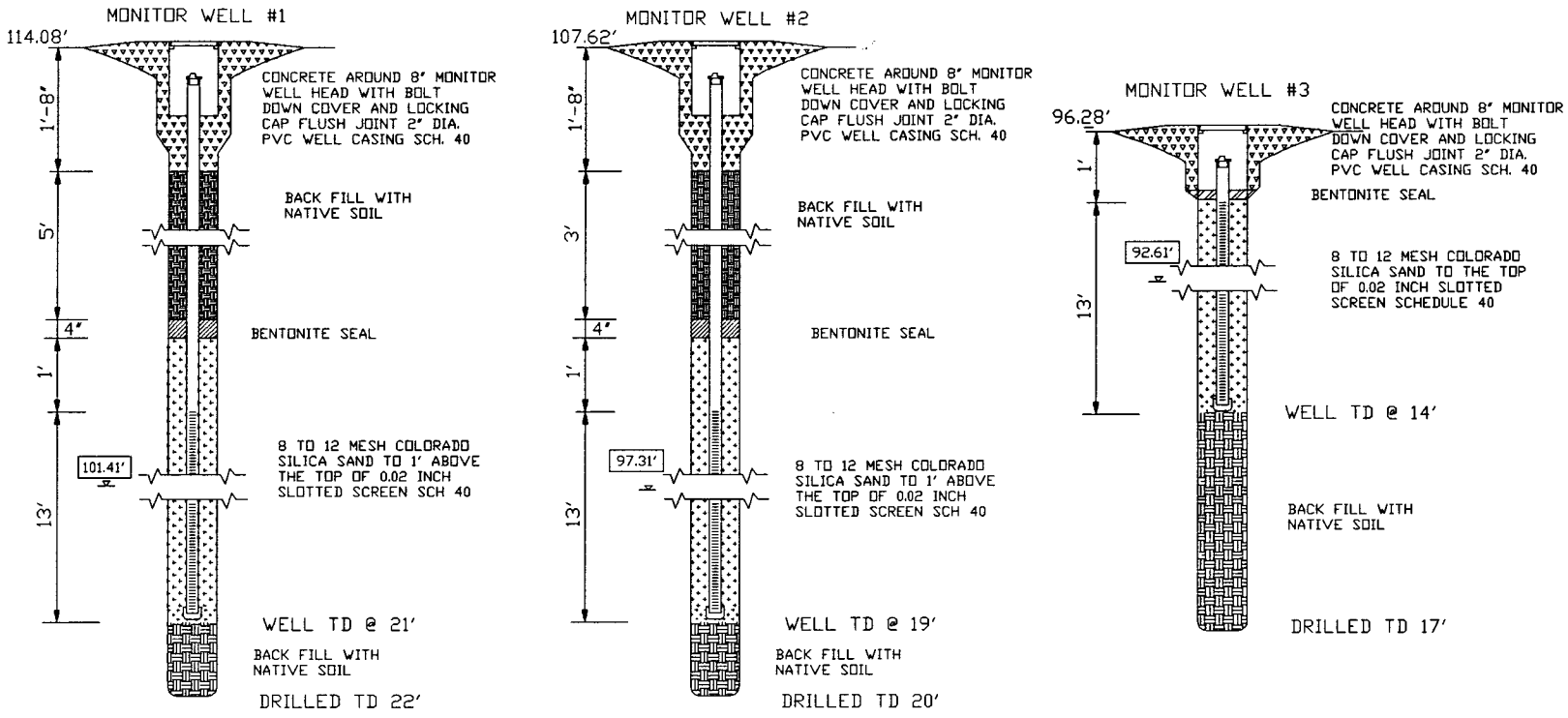
BLOOMFIELD, NEW MEXICO
THRIFTWAY MARKETING CORP
710 E 20TH ST, FARMINGTON, NM, 87401

ENVIROTECH INC.
ENVIRONMENTAL SCIENTISTS
5796 U.S. HIGHWAY 64-3014
FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615

GROUNDWATER CONTOUR MAP
JUNE 1991
FIGURE B-2



97.31' RELATIVE GROUNDWATER SURFACE ELEVATION ON DATE MEASURED
114.08' RELATIVE ELEVATION OF THE MEASURING POINT

MONITOR WELL DETAIL
THRIFTWAY REFINERY
BLOOMFIELD, NEW MEXICO

ENVIROTECH INC.

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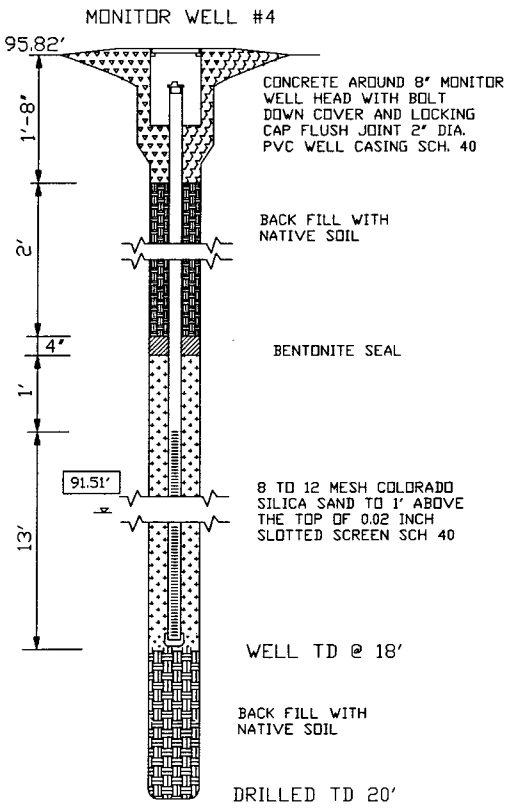
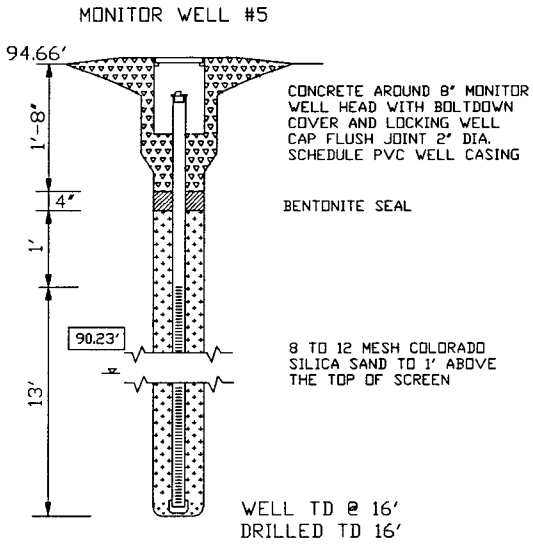
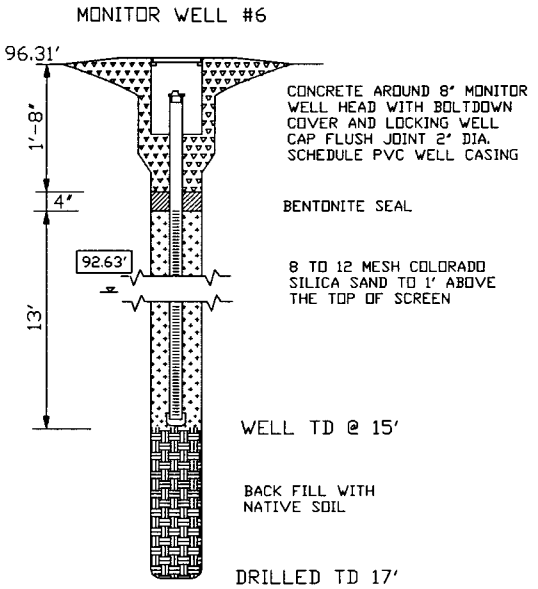
PHONE: (505) 632-0615

ENGINEER: J. DEWEY
DRAFTER: J. DEWEY
DATE: AUGUST 9, 1991
SHEET B3







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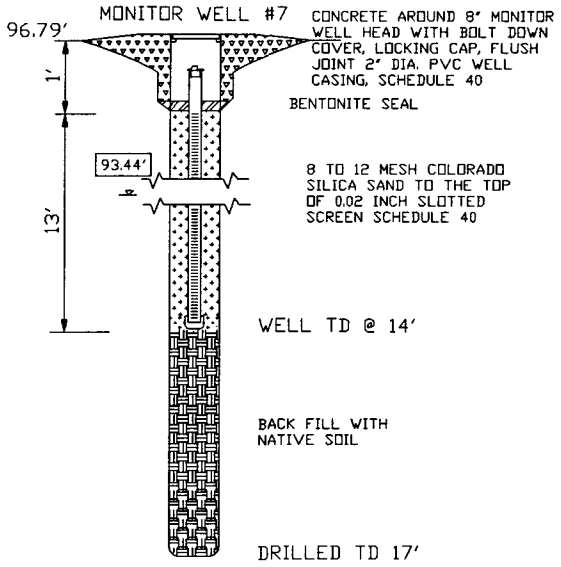
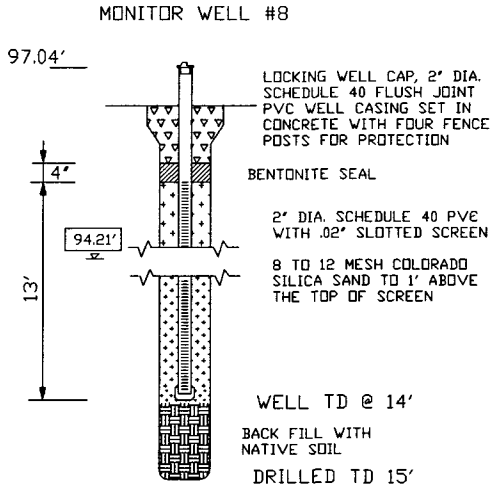
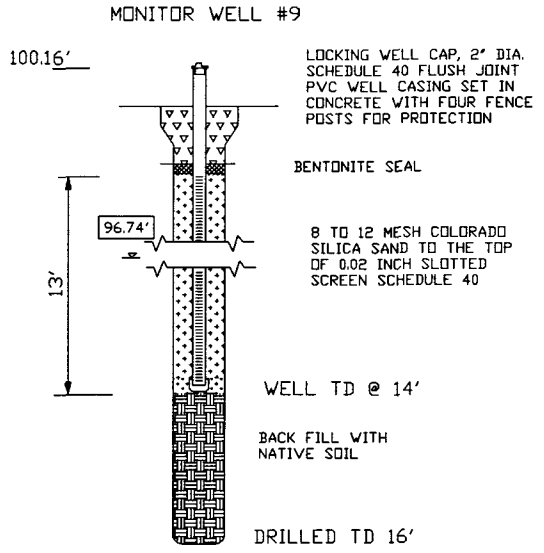
SHEET B4







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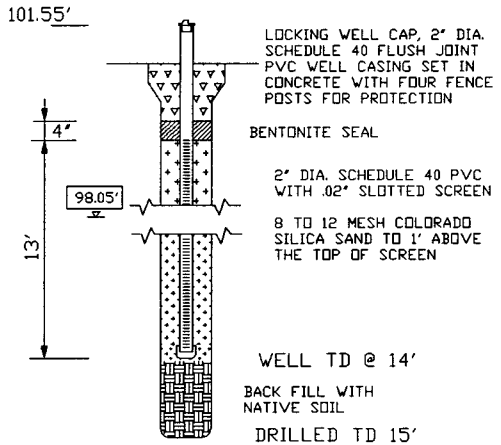
SHEET B5

MONITOR WELL #10



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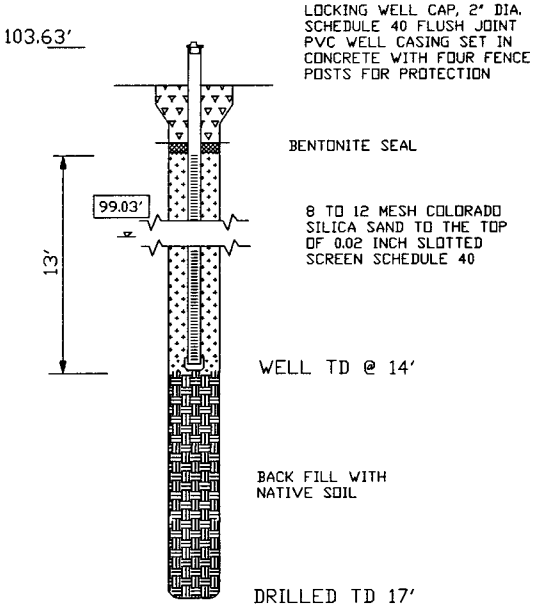

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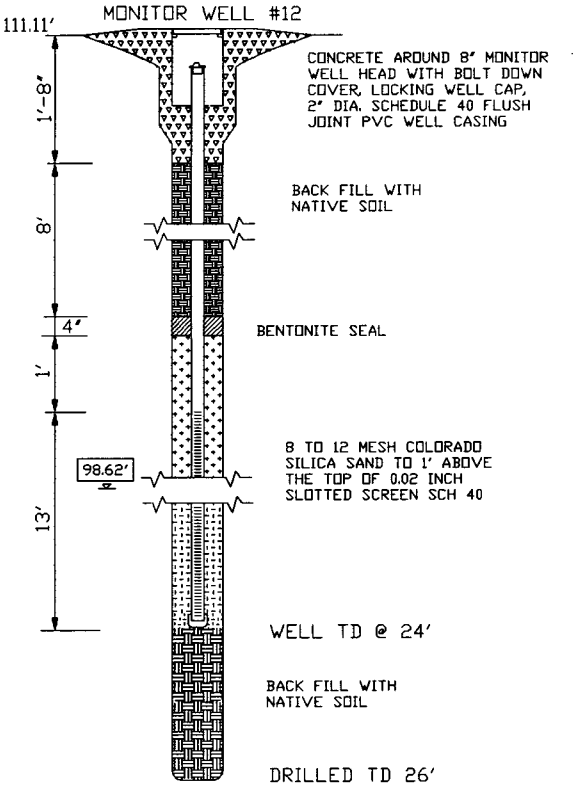

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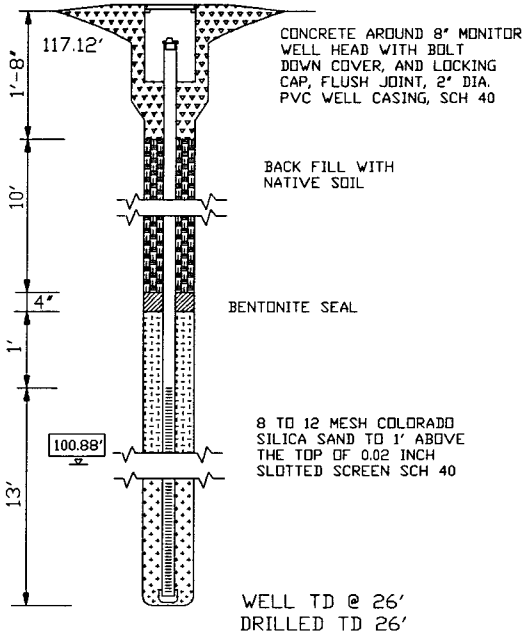
SHEET B6

MONITOR WELL #13



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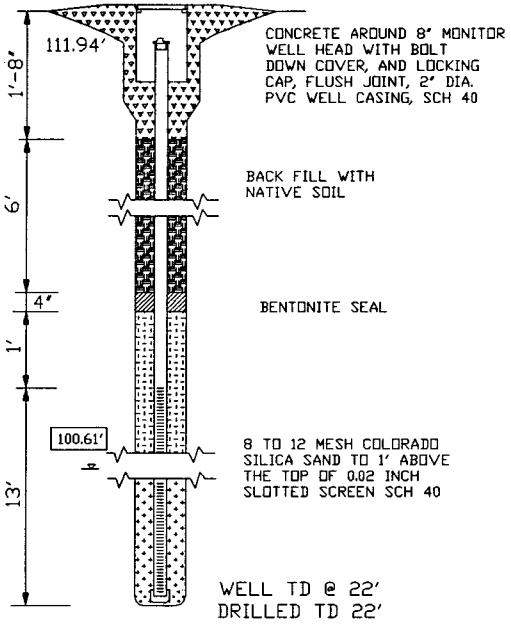

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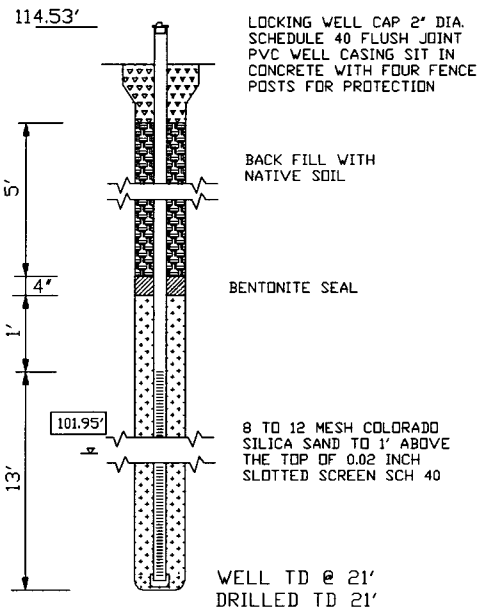

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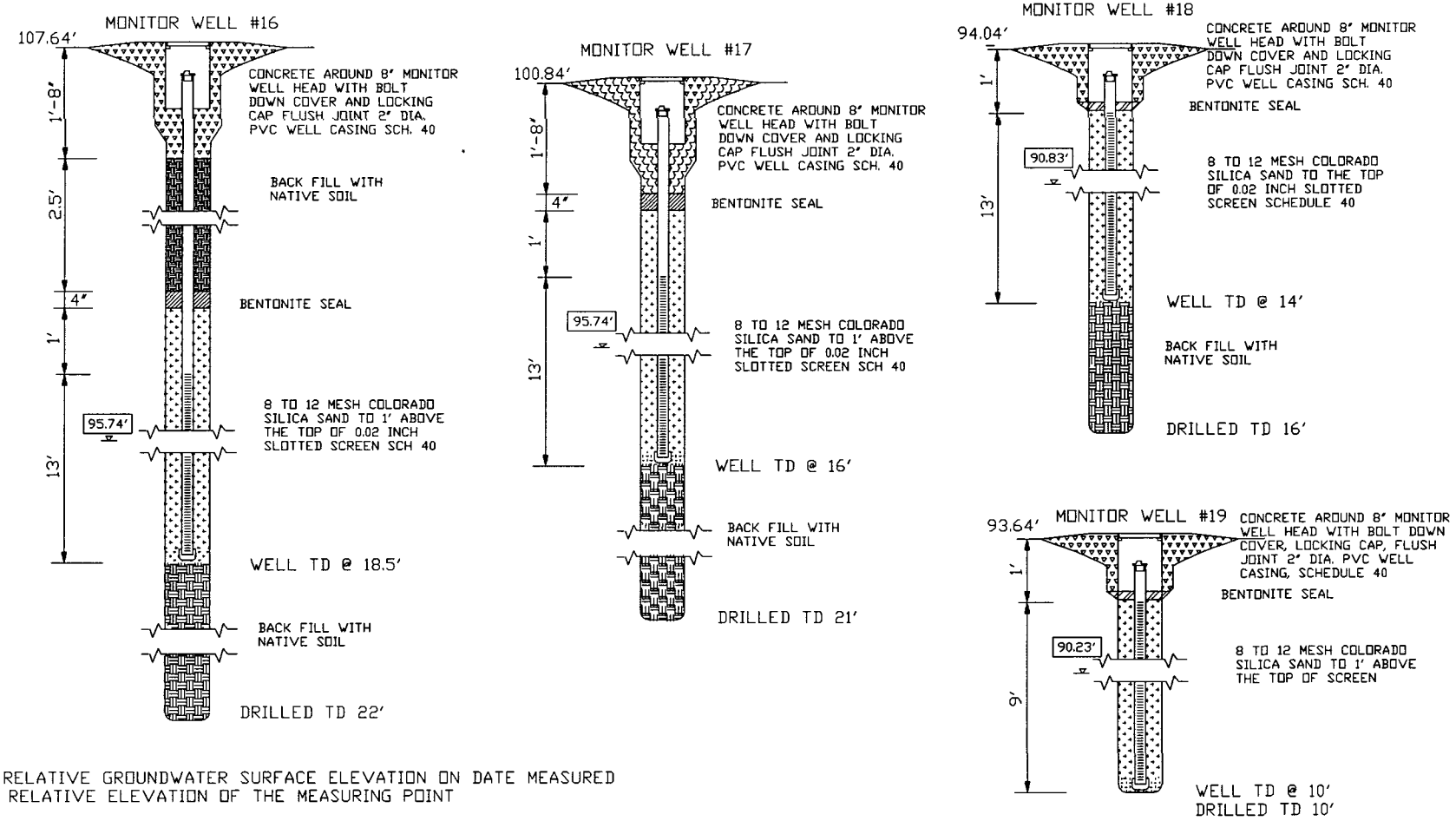
SHEET B7



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SHEET B8

Appendix C

Project #91819

Remediation Plan Proposal.....C-1