

3R - 261

# REPORTS

DATE:

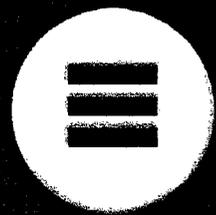
April 1, 1999

# QUARTERLY GROUNDWATER SAMPLING REPORT



**FORMER WELLEX FACILITY  
FARMINGTON, NEW MEXICO**

**APRIL 1, 1999**



**ENTACT**



ENTACT

*environmental tactics in waste management*

RECEIVED

APR 01 1999

ENVIRONMENTAL BUREAU  
OIL CONSERVATION DIVISION

March 31, 1999

Mr. William C. Olson  
State of New Mexico  
Energy, Minerals and Natural Resources Department  
Oil Conservation Division  
2040 S. Pacheco  
Santa Fe, New Mexico 87505  
505-827-7131

Re: Former Wellex Facility  
Farmington, New Mexico

Dear Mr. Olson:

Enclosed is one copy each, of a Quarterly Sampling Report and Groundwater Sampling Plan for the above referenced site. Groundwater sample results from the four site monitor wells indicate that concentrations of TPH, BTEX, WQCC metals, major cations and anions, and TDS are below New Mexico WQCC regulatory limits. Tabulated sample results are provided with the Quarterly Sampling Report. It is anticipated that groundwater will only be analyzed for concentrations of TPH and BTEX during the next quarterly sampling event scheduled for the week of June 14, 1999. One copy of these reports have also been forwarded to Mr. Denny Foust.

If you should have any questions concerning these reports please contact me at 972-580-1323 at your earliest convenience.

Sincerely,

*Marty Cox*  
Marty Cox



Soil remediation and groundwater assessment activities were conducted by ENTACT during June and July 1998 at the former Wellex facility located at 2600 Bloomfield Highway in Farmington, New Mexico. Specifications concerning these activities were described in the *Work Plan for Source Removal and Groundwater Monitoring Well Installation* (the Work Plan) dated January 27, 1998.

The objective of the soil remediation activities was to excavate and dispose of soil contaminated by historic releases from an oil/water separator. Although the horizontal extent of the impacted soil had been defined by previous investigations conducted by OVAC, Inc. and Brown & Root Environmental, prior investigations had not adequately defined the vertical extent of the historic release. To assess vertical extent and potential impacts to the upper groundwater aquifer, four monitor wells were installed approximately 44 feet below ground surface.

ENTACT installed monitor wells MW-01, MW-02, and MW-04 at the facility from June 9, 1998 through June 12, 1998 prior to soil removal activities to assess the groundwater conditions beneath the site. These monitor wells were installed north, west, and southwest of the former separator area.

Monitor well MW-03 was installed on July 14, 1998 downgradient of the eastern part of the excavation after soil removal activities were completed to ensure that the well construction was not undermined by the excavation activities.

Groundwater samples were collected from these monitor wells indicated the following:

- Concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX), volatile organic compounds, semivolatile organic compounds, and total petroleum hydrocarbon (TPH) were below laboratory detection limits in groundwater sample collected from monitor wells MW-01, MW-02, and MW-04.
- Concentrations of BTEX were below laboratory detection limits, and TPH was 0.324 mg/l in a groundwater sample collected from monitor well MW-03.

The New Mexico Energy, Minerals, and Natural Resources Department of the Oil Conservation Division (OCD) requested, in a letter dated January 22, 1999, that quarterly sampling be initiated at the site until groundwater

is below New Mexico Water Quality Control Commission (WQCC) standards for 4 consecutive quarters. Mr. Bill Olson, OCD Project Manager, further requested that groundwater collected from the monitor wells be analyzed for concentrations of WQCC metals, including major cations and anions, total dissolved solids (TDS), total petroleum hydrocarbons (TPH), and benzene, toluene, ethylbenzene, and xylene (BTEX). Mr. Olson indicated that after the initial sampling, if the WQCC metals and TDS sample results were below regulatory standards, then groundwater collected during subsequent sampling events could be analyzed for concentrations of BTEX and TPH.

### Quarterly Groundwater Sampling Activities

The first quarterly sampling event was conducted on March 15, 1999. Monitor wells MW-01 through MW-04 were sampled using USEPA SW-846 Protocol. Weather conditions during the sampling event were sunny with a few high clouds. Temperature on this date was about 50 degrees Fahrenheit, with moderate southwesterly winds, and no precipitation. During the site inspection, it was noted that the monitor wells were all found to be intact.

Prior to purging and sampling, the monitor wells were gauged to determine depth to groundwater. The groundwater gradient on March 15, 1999 was to the southeast. Gauging data for monitor wells MW-01 through MW-05 on this date indicated that water levels ranged from 38.28 feet to 38.82 feet below the top of casing elevations. Figure 3.1 illustrates the groundwater gradient on March 15, 1999.

GROUNDWATER GAUGING DATA				
Well ID	Well Depth	Depth to Water	Top of Casing Elevation	Corr. Water Elevation
MW-01	44.32	38.61	99.81	61.2
MW-02	44.06	38.82	100.1	61.28
MW-03	44.91	38.61	99.69	61.08
MW-04	44.05	38.28	99.41	61.13

Groundwater was then purged from the wells using a 'Whaler' direct current (D.C.) submersible pump. All monitor wells were purged of a minimum of three (3) well casing volumes of groundwater. Dedicated hoses were used at each well to prevent cross contamination between wells. Groundwater purged from the monitor wells was monitored for the parameters, of pH, conductivity, temperature. Additionally, water color and odor, if any, were noted. A copy of the field record form is illustrated on the following page.

After purging, groundwater samples to be analyzed for concentrations of BTEX by USEPA Method 8021 protocol, were collected in duplicate using laboratory supplied 40 milliliter (ml) VOA vials with teflon screw top lids. These samples were preserved with 5% Mercuric Chloride, capped headspace free, labeled and stored in an ice chest cooled to 4 degrees Celsius. Triplicate samples were collected from each monitor well for analyses of WQCC Metals (TCLP Metals) by USEPA Method 1311. These samples were collected in 250 ml polypropylene bottles, labeled, and also stored in an ice chest for shipment to the laboratory. Groundwater samples collected for the analyses

of major cations and anions, including total dissolved solids (TDS) were stored in a single 500 ml polypropylene bottle.

### Groundwater Sampling Results

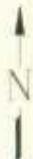
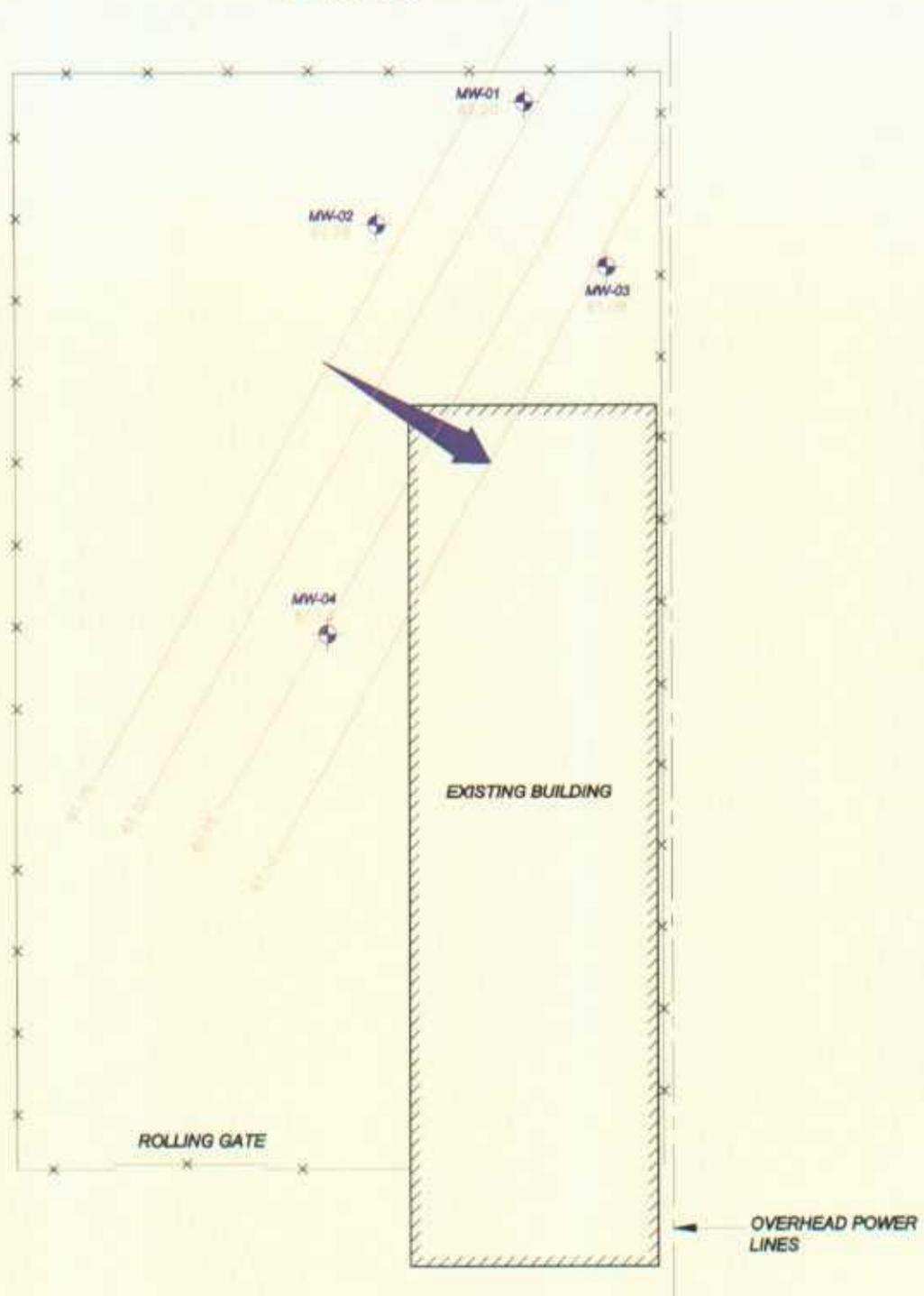
Comparison of analytical results from this sampling event to those samples collected in September 21, 1998, indicate that concentrations of TPH in all the monitor wells were now below detection limits. Concentrations of BTEX in groundwater samples collected on March 15, 1999, ranged from 0.0041 mg/l in monitor well MW-04 to 0.014 mg/l in

GROUNDWATER SAMPLE RESULTS, mg/l				
Analyte	MW-01	MW-02	MW-03	MW-04
TPH	ND	ND	ND	ND
Benzene	0.0025	0.0045	0.0022	0.0005
Toluene	0.0042	0.004	0.0014	0.0002
Ethylbenzene	ND	0.0019	0.0015	0.0005
Xylenes (total)	0.0073	0.0026	0.0072	0.0029
Arsenic	0.0104	0.0065	0.012	0.0037
Barium	0.0027	0.0068	0.0037	0.0059
Cadmium	0.0012	0.004	0.0005	0.001
Chromium	0.0008	0.0023	0.0018	0.0016
Lead	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Selenium	0.0021	0.0032	0.0031	0.0005
Silver	ND	ND	ND	ND
pH	7.03	7.17	7.23	7.25
Conductivity (umhos/cm)	1,430	1,255	1,265	1,205
TDS	715	625	632	600
Total Alkalinity as CaCO3	134	270	276	256
Total Hardness as CaCO3	456	396	416	392
Bicarbonate as HCO3	134	270	276	256
Carbonate as CO3	<1	<1	<1	<1
Hydroxide as OH	<1	<1	<1	<1
Nitrate Nitrogen	2	2	2.4	2.3
Nitrite Nitrogen	0.005	0.005	0.014	0.007
Chloride	182	34	32	36
Fluoride	0.87	0.93	0.96	0.91
Phosphate	0.4	<0.1	0.8	0.2
Sulfate	202	210	216	207
Iron	0.101	0.001	0.025	0.021
Calcium	182	158	165	144
Magnesium	<0.1	<0.1	<0.1	7.81
Potassium	4.5	2.5	2.1	2.6
Sodium	56	44	39	39.5



# GROUNDWATER GRADIENT MAP

## 3-15-99



**LEGEND**

-  MONITORING WELL
-  FENCE
-  GRADIENT LINE
-  GROUNDWATER FLOW DIRECTION



**ENTACT**

FIGURE:  
FORMER WELLEX FACILITY,  
FARMINGTON, NM.

SCALE: APPROX. 1" = 35'	DRAWN BY: ENTACT
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FIGURE 3-1

**GROUNDWATER SAMPLE RESULTS, mg/l**

Analyte	MW-01	MW-02	MW-03	MW-04	Detection Limit	Regulatory Limit
TPH	ND	ND	ND	ND	0.2	0.01
Benzene	0.0025	0.0045	0.0022	0.0005	0.0002	0.75
Toluene	0.0042	0.004	0.0014	0.0002	0.0002	0.75
Ethylbenzene	ND	0.0019	0.0015	0.0005	0.0002	0.62
Xylenes (total)	0.0073	0.0026	0.0072	0.0029	0.0001	0.1
Arsenic	0.0104	0.0065	0.012	0.0037	0.0001	1
Barium	0.0027	0.0068	0.0037	0.0059	0.0001	0.01
Cadmium	0.0012	0.004	0.0005	0.001	0.0001	0.05
Chromium	0.0008	0.0023	0.0018	0.0016	0.0001	0.05
Lead	ND	ND	ND	ND	0.0001	0.002
Mercury	ND	ND	ND	ND	0.0001	0.05
Selenium	0.0021	0.0032	0.0031	0.0005	0.0001	0.05
Silver	ND	ND	ND	ND	0.0001	6.0- 9.0
pH	7.03	7.17	7.23	7.25		
Conductivity (umhos/cm)	1,430	1,255	1,265	1,205		1,000
TDS	715	625	632	600		
Total Alkalinity as CaCO3	134	270	276	256		
Total Hardness as CaCO3	456	396	416	392		
Bicarbonate as HCO3	134	270	276	256		
Carbonate as CO3	<1	<1	<1	<1		
Hydroxide as OH	<1	<1	<1	<1		
Nitrate Nitrogen	2	2	2.4	2.3		10
Nitrite Nitrogen	0.005	0.005	0.014	0.007		
Chloride	182	34	32	36		250
Fluoride	0.87	0.93	0.96	0.91		1.6
Phosphate	0.4	<0.1	0.8	0.2		
Sulfate	202	210	216	207		600
Iron	0.101	0.001	0.025	0.021		1
Calcium	182	158	165	144		
Magnesium	<0.1	<0.1	<0.1	7.81		
Potassium	4.5	2.5	2.1	2.6		
Sodium	56	44	39	39.5		

# ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## EPA METHOD 8015 Modified Nonhalogenated Volatile Organics Total Petroleum Hydrocarbons

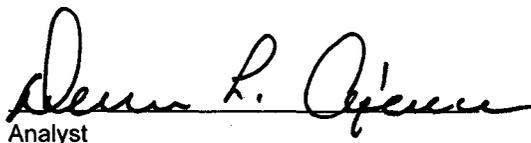
Client:	ENTACT	Project #:	806103
Sample ID:	MW 01	Date Reported:	03-23-99
Laboratory Number:	E815	Date Sampled:	03-15-99
Chain of Custody No:	6754	Date Received:	03-22-99
Sample Matrix:	Water	Date Extracted:	03-23-99
Preservative:	Cool	Date Analyzed:	03-23-99
Condition:	Cool and Intact	Analysis Requested:	8015 TPH

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

ND - Parameter not detected at the stated detection limit.

References: Method 8015B, Nonhalogenated Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Comments: **Welex site, Farmington.**

  
Analyst

  
Review

# ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## EPA METHOD 8015 Modified Nonhalogenated Volatile Organics Total Petroleum Hydrocarbons

Client:	ENTACT	Project #:	806103
Sample ID:	MW 02	Date Reported:	03-23-99
Laboratory Number:	E816	Date Sampled:	03-15-99
Chain of Custody No:	6754	Date Received:	03-22-99
Sample Matrix:	Water	Date Extracted:	03-23-99
Preservative:	Cool	Date Analyzed:	03-23-99
Condition:	Cool and Intact	Analysis Requested:	8015 TPH

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

ND - Parameter not detected at the stated detection limit.

References: Method 8015B, Nonhalogenated Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Comments: **Welex Site, Farmington.**

  
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# ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## EPA METHOD 8015 Modified Nonhalogenated Volatile Organics Total Petroleum Hydrocarbons

Client:	ENTACT	Project #:	806103
Sample ID:	MW 03	Date Reported:	03-23-99
Laboratory Number:	E817	Date Sampled:	03-15-99
Chain of Custody No:	6754	Date Received:	03-22-99
Sample Matrix:	Water	Date Extracted:	03-23-99
Preservative:	Cool	Date Analyzed:	03-23-99
Condition:	Cool and Intact	Analysis Requested:	8015 TPH

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

ND - Parameter not detected at the stated detection limit.

References: Method 8015B, Nonhalogenated Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Comments: **Welex Site, Farmington.**

  
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PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## EPA METHOD 8015 Modified Nonhalogenated Volatile Organics Total Petroleum Hydrocarbons

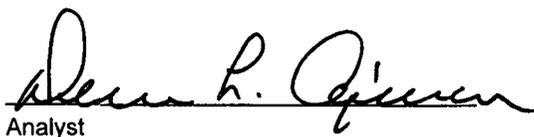
Client:	ENTACT	Project #:	806103
Sample ID:	MW 04	Date Reported:	03-23-99
Laboratory Number:	E818	Date Sampled:	03-15-99
Chain of Custody No:	6754	Date Received:	03-22-99
Sample Matrix:	Water	Date Extracted:	03-23-99
Preservative:	Cool	Date Analyzed:	03-23-99
Condition:	Cool and Intact	Analysis Requested:	8015 TPH

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

ND - Parameter not detected at the stated detection limit.

References: Method 8015B, Nonhalogenated Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Comments: **Welex Site, Farmington.**

  
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# ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## EPA Method 8015 Modified Nonhalogenated Volatile Organics Total Petroleum Hydrocarbons

### Quality Assurance Report

Client:	QA/QC	Project #:	N/A
Sample ID:	03-23-TPH QA/QC	Date Reported:	03-23-99
Laboratory Number:	E815	Date Sampled:	N/A
Sample Matrix:	Methylene Chloride	Date Received:	N/A
Preservative:	N/A	Date Analyzed:	03-23-99
Condition:	N/A	Analysis Requested:	TPH

	I-Cal Date	I-Cal RF	C-Cal RF	% Difference	Accept Range
Gasoline Range C5 - C10	03-15-99	4.5896E-002	4.5814E-002	0.18%	0 - 15%
Diesel Range C10 - C28	03-15-99	3.1578E-002	3.1527E-002	0.16%	0 - 15%

Blank Conc. (mg/L)	Concentration	Detection Limit
Gasoline Range C5 - C10	ND	0.2
Diesel Range C10 - C28	ND	0.1
Total Petroleum Hydrocarbons	ND	0.2

Duplicate Conc. (mg/L)	Sample	Duplicate	% Difference	Accept Range
Gasoline Range C5 - C10	ND	ND	0.0%	0 - 30%
Diesel Range C10 - C28	ND	ND	0.0%	0 - 30%

Spike Conc. (mg/L)	Sample	Spike Added	Spike Result	% Recovery	Accept Range
Gasoline Range C5 - C10	ND	25.0	25.0	100%	75 - 125%
Diesel Range C10 - C28	ND	25.0	25.0	100%	75 - 125%

ND - Parameter not detected at the stated detection limit.

References: Method 8015B, Nonhalogenated Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Comments: QA/QC for samples E815 - E818.

  
Analyst

  
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# ENVIROTECH LABS

PRactical SOLUTIONS FOR A BETTER TOMORROW

## EPA METHOD 8021 AROMATIC VOLATILE ORGANICS

Client:	ENTACT	Project #:	806103
Sample ID:	MW 01	Date Reported:	03-17-99
Chain of Custody:	6748	Date Sampled:	03-15-99
Laboratory Number:	E815	Date Received:	03-16-99
Sample Matrix:	Water	Date Analyzed:	03-17-99
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	2.5	1	0.2
Toluene	4.2	1	0.2
Ethylbenzene	ND	1	0.2
p,m-Xylene	3.3	1	0.2
o-Xylene	4.0	1	0.1
<b>Total BTEX</b>	<b>14.0</b>		

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	97 %
	Bromofluorobenzene	97 %

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **Welex Site, Farmington.**

  
Analyst

  
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# ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## EPA METHOD 8021 AROMATIC VOLATILE ORGANICS

Client:	ENTACT	Project #:	806103
Sample ID:	MW 02	Date Reported:	03-17-99
Chain of Custody:	6748	Date Sampled:	03-15-99
Laboratory Number:	E816	Date Received:	03-16-99
Sample Matrix:	Water	Date Analyzed:	03-17-99
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	4.5	1	0.2
Toluene	0.4	1	0.2
Ethylbenzene	1.9	1	0.2
p,m-Xylene	1.9	1	0.2
o-Xylene	0.7	1	0.1

**Total BTEX** 9.4

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	100 %
	Bromofluorobenzene	100 %

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **Welex Site, Farmington.**

  
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# ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## EPA METHOD 8021 AROMATIC VOLATILE ORGANICS

Client:	ENTACT	Project #:	806103
Sample ID:	MW 03	Date Reported:	03-17-99
Chain of Custody:	6748	Date Sampled:	03-15-99
Laboratory Number:	E817	Date Received:	03-16-99
Sample Matrix:	Water	Date Analyzed:	03-17-99
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	2.2	1	0.2
Toluene	1.4	1	0.2
Ethylbenzene	1.5	1	0.2
p,m-Xylene	5.9	1	0.2
o-Xylene	1.3	1	0.1

Total BTEX 12.3

ND - Parameter not detected at the stated detection limit.

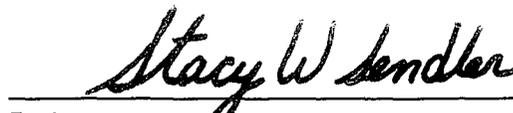
Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	97 %
	Bromofluorobenzene	97 %

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: Welex Site, Farmington.

  
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Review

# ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## EPA METHOD 8021 AROMATIC VOLATILE ORGANICS

Client:	ENTACT	Project #:	806103
Sample ID:	MW 04	Date Reported:	03-17-99
Chain of Custody:	6748	Date Sampled:	03-15-99
Laboratory Number:	E818	Date Received:	03-16-99
Sample Matrix:	Water	Date Analyzed:	03-17-99
Preservative:	HgCl <sub>2</sub> & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	0.5	1	0.2
Toluene	0.2	1	0.2
Ethylbenzene	0.5	1	0.2
p,m-Xylene	2.2	1	0.2
o-Xylene	0.7	1	0.1

Total BTEX 4.1

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	99 %
	Bromofluorobenzene	99 %

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: Welex Site, Farmington.

  
Analyst

  
Review

# ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## EPA METHOD 8021 AROMATIC VOLATILE ORGANICS QUALITY ASSURANCE REPORT

Client:	N/A	Project #:	N/A
Sample ID:	03-17-BTEX QA/QC	Date Reported:	03-17-99
Laboratory Number:	E815	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	N/A	Date Analyzed:	03-17-99
Condition:	N/A	Analysis:	BTEX

Calibration and Detection Limits (ug/L)	I-Cal RF	C-Cal RF	%Diff Accept. Range 0 - 15%	Blank Conc	Detect Limit
Benzene	7.0480E-002	7.0706E-002	0.32%	ND	0.2
Toluene	3.5438E-002	3.5445E-002	0.02%	ND	0.2
Ethylbenzene	4.3145E-002	4.3196E-002	0.12%	ND	0.2
p,m-Xylene	3.9965E-002	3.9973E-002	0.02%	ND	0.2
o-Xylene	3.9081E-002	3.9199E-002	0.30%	ND	0.1

Duplicate Conc. (ug/L)	Sample	Duplicate	%Diff	Accept Limit
Benzene	2.5	2.5	0.0%	0 - 30%
Toluene	4.2	4.2	0.0%	0 - 30%
Ethylbenzene	ND	ND	0.0%	0 - 30%
p,m-Xylene	3.3	3.5	6.1%	0 - 30%
o-Xylene	4.0	4.0	0.0%	0 - 30%

Spike Conc. (ug/L)	Sample	Amount Spiked	Spiked Sample	% Recovery	Accept Limits
Benzene	2.5	50.0	52.4	100%	39 - 150
Toluene	4.2	50.0	53.9	99%	46 - 148
Ethylbenzene	ND	50.0	50.1	100%	32 - 160
p,m-Xylene	3.3	100.0	103.1	100%	46 - 148
o-Xylene	4.0	50.0	53.7	99%	46 - 148

ND - Parameter not detected at the stated detection limit.

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.  
Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: QA/QC for samples E815 - E819.

  
Analyst

  
Review

# ENVIROTECH LABS

PRactical SOLUTIONS FOR A BETTER TOMORROW

## EPA METHOD 1311 TOXICITY CHARACTERISTIC LEACHING PROCEDURE TRACE METAL ANALYSIS

Client:	ENTACT	Project #:	806103
Sample ID:	MW 01	Date Reported:	03-19-99
Laboratory Number:	E815	Date Sampled:	03-15-99
Chain of Custody:	6748	Date Received:	03-16-99
Sample Matrix:	Water	Date Analyzed:	03-19-99
Preservative:	Cool	Date Extracted:	N/A
Condition:	Cool & Intact	Analysis Needed:	TCLP metals

Parameter	Concentration (mg/L)	Det. Limit (mg/L)	Regulatory Level (mg/L)
Arsenic	0.0104	0.0001	5.0
Barium	0.0027	0.001	21
Cadmium	0.0012	0.0001	0.11
Chromium	0.0008	0.0001	0.60
Lead	ND	0.0001	0.75
Mercury	ND	0.0001	0.025
Selenium	0.0021	0.0001	5.7
Silver	ND	0.0001	0.14

ND - Parameter not detected at the stated detection limit.

References: Method 1311, Toxicity Characteristic Leaching Procedure, SW-846, USEPA, December 1996.

Methods 3010, 3020, Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, USEPA, December 1996.

Methods 7060, 7080, 7131, 7191, 7470, 7421, 7740, 7761 Analysis of Metals by GFAA and Cold Vapor Techniques, SW-846, USEPA. December 1996.

Note: Regulatory Limits based on 40 CFR part 261 subpart C section 261.24, August 24, 1998.

Comments: **Welex Site, Farmington.**

  
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PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## EPA METHOD 1311 TOXICITY CHARACTERISTIC LEACHING PROCEDURE TRACE METAL ANALYSIS

Client:	ENTACT	Project #:	806103
Sample ID:	MW 02	Date Reported:	03-19-99
Laboratory Number:	E816	Date Sampled:	03-15-99
Chain of Custody:	6748	Date Received:	03-16-99
Sample Matrix:	Water	Date Analyzed:	03-19-99
Preservative:	Cool	Date Extracted:	N/A
Condition:	Cool & Intact	Analysis Needed:	TCLP metals

Parameter	Concentration (mg/L)	Det. Limit (mg/L)	Regulatory Level (mg/L)
Arsenic	0.0065	0.0001	5.0
Barium	0.0058	0.001	21
Cadmium	0.0040	0.0001	0.11
Chromium	0.0023	0.0001	0.60
Lead	ND	0.0001	0.75
Mercury	ND	0.0001	0.025
Selenium	0.0032	0.0001	5.7
Silver	ND	0.0001	0.14

ND - Parameter not detected at the stated detection limit.

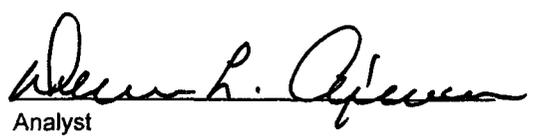
References: Method 1311, Toxicity Characteristic Leaching Procedure, SW-846, USEPA, December 1996.

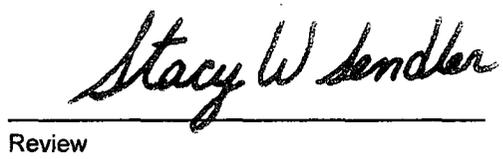
Methods 3010, 3020, Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, USEPA, December 1996.

Methods 7060, 7080, 7131, 7191, 7470, 7421, 7740, 7761 Analysis of Metals by GFAA and Cold Vapor Techniques, SW-846, USEPA. December 1996.

Note: Regulatory Limits based on 40 CFR part 261 subpart C section 261.24, August 24, 1998.

Comments: **Welex Site, Farmington.**

  
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## EPA METHOD 1311 TOXICITY CHARACTERISTIC LEACHING PROCEDURE TRACE METAL ANALYSIS

Client:	ENTACT	Project #:	806103
Sample ID:	MW 03	Date Reported:	03-19-99
Laboratory Number:	E817	Date Sampled:	03-15-99
Chain of Custody:	6748	Date Received:	03-16-99
Sample Matrix:	Water	Date Analyzed:	03-19-99
Preservative:	Cool	Date Extracted:	N/A
Condition:	Cool & Intact	Analysis Needed:	TCLP metals

Parameter	Concentration (mg/L)	Det. Limit (mg/L)	Regulatory Level (mg/L)
Arsenic	0.0120	0.0001	5.0
Barium	0.0037	0.001	21
Cadmium	0.0005	0.0001	0.11
Chromium	0.0018	0.0001	0.60
Lead	ND	0.0001	0.75
Mercury	ND	0.0001	0.025
Selenium	0.0031	0.0001	5.7
Silver	ND	0.0001	0.14

ND - Parameter not detected at the stated detection limit.

References: Method 1311, Toxicity Characteristic Leaching Procedure, SW-846, USEPA, December 1996.

Methods 3010, 3020, Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, USEPA, December 1996.

Methods 7060, 7080, 7131, 7191, 7470, 7421, 7740, 7761 Analysis of Metals by GFAA and Cold Vapor Techniques, SW-846, USEPA. December 1996.

Note: Regulatory Limits based on 40 CFR part 261 subpart C section 261.24, August 24, 1998.

Comments: **Welex Site, Farmington.**

  
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## EPA METHOD 1311 TOXICITY CHARACTERISTIC LEACHING PROCEDURE TRACE METAL ANALYSIS

Client:	ENTACT	Project #:	806103
Sample ID:	MW 04	Date Reported:	03-19-99
Laboratory Number:	E818	Date Sampled:	03-15-99
Chain of Custody:	6748	Date Received:	03-16-99
Sample Matrix:	Water	Date Analyzed:	03-19-99
Preservative:	Cool	Date Extracted:	N/A
Condition:	Cool & Intact	Analysis Needed:	TCLP metals

Parameter	Concentration (mg/L)	Det. Limit (mg/L)	Regulatory Level (mg/L)
Arsenic	0.0037	0.0001	5.0
Barium	0.0059	0.001	21
Cadmium	0.0010	0.0001	0.11
Chromium	0.0016	0.0001	0.60
Lead	ND	0.0001	0.75
Mercury	ND	0.0001	0.025
Selenium	0.0005	0.0001	5.7
Silver	ND	0.0001	0.14

ND - Parameter not detected at the stated detection limit.

References: Method 1311, Toxicity Characteristic Leaching Procedure, SW-846, USEPA, December 1996.

Methods 3010, 3020, Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, USEPA, December 1996.

Methods 7060, 7080, 7131, 7191, 7470, 7421, 7740, 7761 Analysis of Metals by GFAA and Cold Vapor Techniques, SW-846, USEPA. December 1996.

Note: Regulatory Limits based on 40 CFR part 261 subpart C section 261.24, August 24, 1998.

Comments: Welex Site, Farmington.

  
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PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 1311  
TOXICITY CHARACTERISTIC  
LEACHING PROCEDURE  
TRACE METAL ANALYSIS  
Quality Assurance Report

Client:	QA/QC	Project #:	N/A
Sample ID:	03-19-TCM QA/QC	Date Reported:	03-19-99
Laboratory Number:	E807	Date Sampled:	N/A
Sample Matrix:	TCLP Extract	Date Received:	N/A
Analysis Requested:	TCLP Metals	Date Analyzed:	03-19-99
Condition:	N/A	Date Extracted:	N/A

Blank & Duplicate Conc. (mg/L)	Instrument Blank	Method Blank	Detection Limit	Sample	Duplicate	% Diff	Acceptance Range
Arsenic	ND	ND	0.0001	0.0175	0.0173	1.1%	0% - 30%
Barium	ND	ND	0.001	ND	ND	0.0%	0% - 30%
Cadmium	ND	ND	0.0001	0.0101	0.0100	1.0%	0% - 30%
Chromium	ND	ND	0.0001	ND	ND	0.0%	0% - 30%
Lead	ND	ND	0.0001	0.0096	0.0097	1.0%	0% - 30%
Mercury	ND	ND	0.0001	ND	ND	0.0%	0% - 30%
Selenium	ND	ND	0.0001	ND	ND	0.0%	0% - 30%
Silver	ND	ND	0.0001	ND	ND	0.0%	0% - 30%

Spike Conc. (mg/L)	Spike Added	Sample	Spiked Sample	Percent Recovery	Acceptance Range
Arsenic	0.1000	0.0175	0.117	99.7%	80% - 120%
Barium	1.000	ND	0.998	99.8%	80% - 120%
Cadmium	0.0500	0.0101	0.0602	100.2%	80% - 120%
Chromium	0.0500	ND	0.0498	99.6%	80% - 120%
Lead	0.1000	0.0096	0.110	99.9%	80% - 120%
Mercury	0.0250	ND	0.0249	99.6%	80% - 120%
Selenium	0.1000	ND	0.0997	99.7%	80% - 120%
Silver	0.0500	ND	0.0499	99.8%	80% - 120%

ND - Parameter not detected at the stated detection limit.

References: Method 1311, Toxicity Characteristic Leaching Procedure, SW-846, USEPA, Dec. 1996

Methods 3010, 3020, Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, USEPA, December 1996.

Methods 7060B, 7081, 7131A, 7191, 7470A, 7421, 7740, 7761 Analysis of Metals by GFAA and Cold Vapor Techniques, SW-846, USEPA, December 1996.

Comments: QA/QC for samples E807, E815 - E818 and E797 - E799.

  
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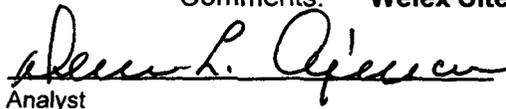
## CATION / ANION ANALYSIS

Client:	ENTACT	Project #:	806103
Sample ID:	MW 01	Date Reported:	03-17-99
Laboratory Number:	E815	Date Sampled:	03-15-99
Chain of Custody:	6748	Date Received:	03-16-99
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	03-17-99
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		Units
pH	7.03	s.u.		
Conductivity @ 25° C	1,430	umhos/cm		
Total Dissolved Solids @ 180C	715	mg/L		
Total Dissolved Solids (Calc)	711	mg/L		
SAR	1.1	ratio		
Total Alkalinity as CaCO3	134	mg/L		
Total Hardness as CaCO3	456	mg/L		
Bicarbonate as HCO3	134	mg/L	2.20	meq/L
Carbonate as CO3	<1	mg/L	0.00	meq/L
Hydroxide as OH	<1	mg/L	0.00	meq/L
Nitrate Nitrogen	2.0	mg/L	0.03	meq/L
Nitrite Nitrogen	0.005	mg/L	0.00	meq/L
Chloride	182	mg/L	5.13	meq/L
Fluoride	0.87	mg/L	0.05	meq/L
Phosphate	0.4	mg/L	0.01	meq/L
Sulfate	202	mg/L	4.21	meq/L
Iron	0.101	mg/L		
Calcium	182	mg/L	9.08	meq/L
Magnesium	<0.1	mg/L	0.00	meq/L
Potassium	4.5	mg/L	0.12	meq/L
Sodium	56.0	mg/L	2.44	meq/L
Cations			11.63	meq/L
Anions			11.63	meq/L
Cation/Anion Difference			0.05%	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
Water And Waste Water", 18th ed., 1992.

Comments: Welex Site, Farmington.

  
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PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## CATION / ANION ANALYSIS

Client:	ENTACT	Project #:	806103
Sample ID:	MW 02	Date Reported:	03-17-99
Laboratory Number:	E816	Date Sampled:	03-15-99
Chain of Custody:	6748	Date Received:	03-16-99
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	03-17-99
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		Units
pH	7.17	s.u.		
Conductivity @ 25° C	1,255	umhos/cm		
Total Dissolved Solids @ 180C	625	mg/L		
Total Dissolved Solids (Calc)	615	mg/L		
SAR	1.0	ratio		
Total Alkalinity as CaCO3	270	mg/L		
Total Hardness as CaCO3	396	mg/L		
Bicarbonate as HCO3	270	mg/L	4.43	meq/L
Carbonate as CO3	<1	mg/L	0.00	meq/L
Hydroxide as OH	<1	mg/L	0.00	meq/L
Nitrate Nitrogen	2.0	mg/L	0.03	meq/L
Nitrite Nitrogen	0.005	mg/L	0.00	meq/L
Chloride	34.0	mg/L	0.96	meq/L
Fluoride	0.93	mg/L	0.05	meq/L
Phosphate	<0.1	mg/L	0.00	meq/L
Sulfate	210	mg/L	4.37	meq/L
Iron	0.001	mg/L		
Calcium	158	mg/L	7.88	meq/L
Magnesium	<0.1	mg/L	0.00	meq/L
Potassium	2.5	mg/L	0.06	meq/L
Sodium	44.0	mg/L	1.91	meq/L
Cations			9.86	meq/L
Anions			9.84	meq/L
Cation/Anion Difference			0.25%	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 Water And Waste Water", 18th ed., 1992.

Comments: **Welex Site, Farmington.**

  
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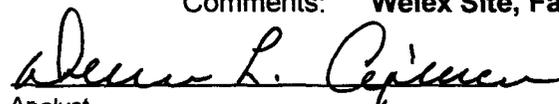
## CATION / ANION ANALYSIS

Client:	ENTACT	Project #:	806103
Sample ID:	MW 03	Date Reported:	03-17-99
Laboratory Number:	E817	Date Sampled:	03-15-99
Chain of Custody:	6748	Date Received:	03-16-99
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	03-17-99
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		Units
pH	7.23	s.u.		
Conductivity @ 25° C	1,265	umhos/cm		
Total Dissolved Solids @ 180C	632	mg/L		
Total Dissolved Solids (Calc)	627	mg/L		
SAR	0.8	ratio		
Total Alkalinity as CaCO3	276	mg/L		
Total Hardness as CaCO3	416	mg/L		
Bicarbonate as HCO3	276	mg/L	4.52	meq/L
Carbonate as CO3	<1	mg/L	0.00	meq/L
Hydroxide as OH	<1	mg/L	0.00	meq/L
Nitrate Nitrogen	2.4	mg/L	0.04	meq/L
Nitrite Nitrogen	0.014	mg/L	0.00	meq/L
Chloride	32.0	mg/L	0.90	meq/L
Fluoride	0.96	mg/L	0.05	meq/L
Phosphate	0.8	mg/L	0.03	meq/L
Sulfate	216	mg/L	4.50	meq/L
Iron	0.025	mg/L		
Calcium	166	mg/L	8.28	meq/L
Magnesium	<0.1	mg/L	0.00	meq/L
Potassium	2.1	mg/L	0.05	meq/L
Sodium	39.0	mg/L	1.70	meq/L
Cations			10.03	meq/L
Anions			10.04	meq/L
Cation/Anion Difference			0.05%	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
Water And Waste Water", 18th ed., 1992.

Comments: Welex Site, Farmington.

  
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# ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## CATION / ANION ANALYSIS

Client:	ENTACT	Project #:	806103
Sample ID:	MW 04	Date Reported:	03-17-99
Laboratory Number:	E818	Date Sampled:	03-15-99
Chain of Custody:	6748	Date Received:	03-16-99
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	03-17-99
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		Units
pH	7.25	s.u.		
Conductivity @ 25° C	1,205	umhos/cm		
Total Dissolved Solids @ 180C	600	mg/L		
Total Dissolved Solids (Calc)	596	mg/L		
SAR	0.9	ratio		
Total Alkalinity as CaCO3	256	mg/L		
Total Hardness as CaCO3	392	mg/L		
Bicarbonate as HCO3	256	mg/L	4.20	meq/L
Carbonate as CO3	<1	mg/L	0.00	meq/L
Hydroxide as OH	<1	mg/L	0.00	meq/L
Nitrate Nitrogen	2.3	mg/L	0.04	meq/L
Nitrite Nitrogen	0.007	mg/L	0.00	meq/L
Chloride	36.0	mg/L	1.02	meq/L
Fluoride	0.91	mg/L	0.05	meq/L
Phosphate	0.2	mg/L	0.01	meq/L
Sulfate	207	mg/L	4.31	meq/L
Iron	0.021	mg/L		
Calcium	144	mg/L	7.19	meq/L
Magnesium	7.81	mg/L	0.64	meq/L
Potassium	2.6	mg/L	0.07	meq/L
Sodium	39.5	mg/L	1.72	meq/L
Cations			9.61	meq/L
Anions			9.61	meq/L
Cation/Anion Difference			0.00%	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
Water And Waste Water", 18th ed., 1992.

Comments: **Welex Site, Farmington.**

  
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*ENTACT uses proprietary technology in additive and treatment processing to achieve it's fixation and permeability results. Patents are both issued and pending, including U.S. Patent #5,588,947 and #5,591,116*

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